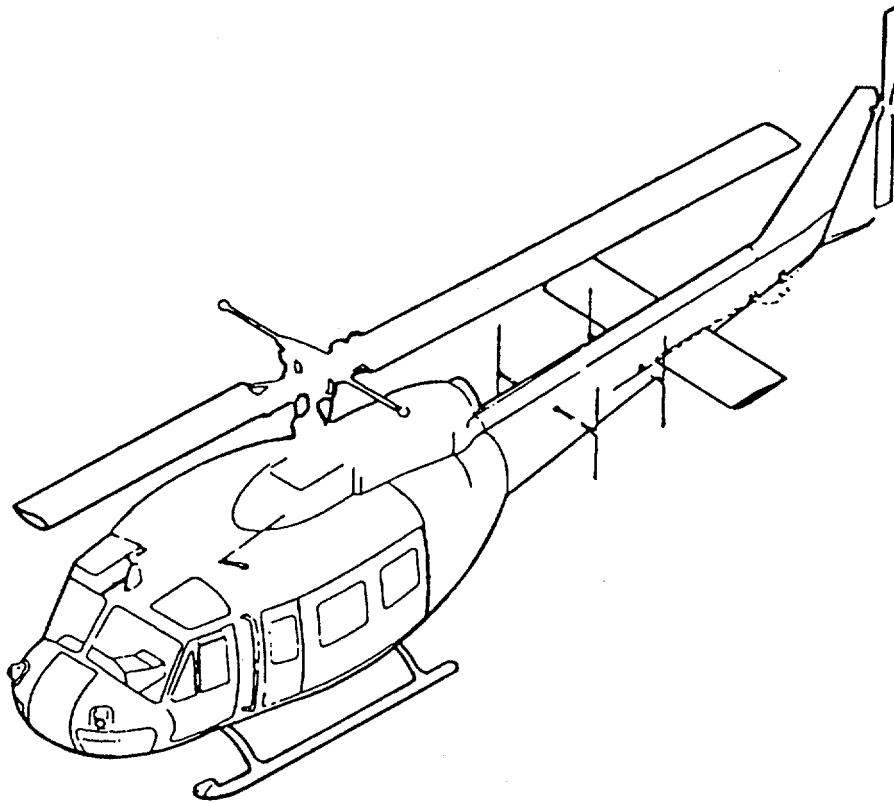


TECHNICAL MANUAL  
UNIT AND INTERMEDIATE  
MAINTENANCE MANUAL



ELECTRONIC EQUIPMENT CONFIGURATIONS, ARMY MODELS

UH-1D (NSN 1520-00-859-2670) (EIC: N/A)  
UH-1H (NSN 1520-00-087-7637) (EIC: RUA)  
UH-1V (NSN 1520-01-043-4949) (EIC: RUE)  
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No. 1

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DEPARTMENT OF THE ARMY  
Washington, DC, 15 January 1999

**Unit And intermediate  
Maintenance Manual**

**ELECTRONIC EQUIPMENT CONFIGURATIONS,  
ARMY MODELS  
UH-1D (NSN 1520-00-859-2670) (EIC: N/A)  
UH-1H (NSN 1520-00-087-7637) (EIC: RUA)  
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Remove Pages	Insert Pages
v and vi	v and vi
ix and x	ix and x
1-1 and 1-2	1-1 and 1-2
1-15 and 1-16	1-15 and 1-16
1-21 and 1-22	1-21 and 1-22
1-53 through 1-56	1-53 through 1-56
1-83 and 1-84	1-83 and 1-84
1-85/(1-86 blank)	1-85 through 1-87/(1-88 blank)
21-5 and 21-6	21-5 through 21-6.1/(21-6.2 blank)
21-7 and 21-8	21-7 and 21-8
24-3 through 24-6	24-3 through 24-6
39-5 through 39-12	39-5 through 39-12
None	43-1 through 43-46
B-13 and B-14	B-13 and B-14
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**WARNING**

READ AND OBSERVE ALL WARNINGS AT BEGINNING OF THIS MANUAL A REVIEW OF TB 385-4, SAFETY PRECAUTIONS FOR MAINTENANCE OF ELECTRICAL/ELECTRONIC EQUIPMENT, IS RECOMMENDED



- 5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK
- 1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
- 2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER
- 3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL
- 4 SEND FOR HELP AS SOON AS POSSIBLE
- 5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION



**WARNING**

Personnel performing instructions involving operating procedures and practices which are included or implied in this technical manual shall observe the following precautions. Disregard of these warnings and precautionary information may result in injury, death, or an aborted mission.

Trichlorotrifluoroethane, trichloroethane and similar chemical solvents will no longer be used for ordinary cleaning of equipment. These substances threaten public health and the environment by destroying ozone in the earth's upper atmosphere. Suitable nonhazardous cleaning materials will be used instead, such as a clean cloth, water and mild detergent. Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 pounds per square inch gauge (30 psig) and then only with effective chip guarding and personnel protective equipment (industrial safety glasses and full faceshield).

Electrical shock hazard may exist between equipment not connected by a common ground. Be sure to connect common grounds of test instrument and test equipment to power source ground before applying power to avoid possible serious injury to personnel.

**DANGEROUS CHEMICALS ARE USED  
IN NICKEL-CADMIUM BATTERIES**

The electrolyte used in nickel-cadmium batteries contains potassium hydroxide (KOH), which is a caustic agent. Serious and deep burns of body tissue will result if the electrolyte comes in contact with the eyes or any part of the body. Use rubber gloves, rubber apron, and protective goggles when handling the electrolyte. If accidental contact with the electrolyte is made, use **ONLY** clean water and immediately (seconds count) flush contaminated areas. Continue flushing with large quantities of clean water for at least 15 minutes. Seek medical attention without delay.



Technical Manual  
No. 11-1520-210-23

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, DC, 1 July 1996

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Maintenance Manual**

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UH-1H (NSN 1520-00-087-7637) (EIC: RUA)  
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HELICOPTERS**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LEO-P-MM-T, Fort Monmouth, New Jersey 07703-5007. The fax number is 908-532-3421, DSN 992-3421. You may also e-mail your recommendations to AMSEL-LC-LEO-PUBS-CHG@cecom3.monmouth.army.mil

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

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## HOW TO USE THIS MANUAL

This manual tells you how to repair the electronics configuration in the UH-1 D/H, UH-1 H and UH-1 V Helicopters.

You must familiarize yourself with the entire maintenance procedure before beginning the maintenance task.

During training, they told you that the surest and quickest way to fix your equipment was by using your manual.

The information below tells you how this manual is organized.

Principles of operation for each system in the helicopter are covered in chapter 1, section III.

All specific maintenance tasks for a given system are contained in one chapter. For instance, chapter 14, Intercommunications Set Maintenance, contains instructions for

- Removal and installation of control units and discriminators by AVUM personnel.
- Disassembly, cleaning, inspection, repair and assembly of impedance matching network by AVIM personnel.
- Removal and installation of foot and cyclic stick switches by AVUM personnel.
- Cabling and connector maintenance by AVUM personnel.
- Operational checks and troubleshooting by AVUM personnel.
- Audio Threshold System troubleshooting by AVIM personnel.
- Impedance matching network troubleshooting by AVIM personnel.

The beginning of each maintenance chapter contains a listing of major subjects covered, by paragraph and page number.

Detailed information on operation of the equipment in the helicopter is contained in TM 55-1520-210-10.

When a trouble has been isolated to a particular unit, use the information in TM 11-1 520-210-20P-1, TM 1 1-210-210-34 P-1, or TM 11-1520-210-34P to order replacement parts.

Unusual terms and abbreviations used in this manual are defined in appendix C.



# CHAPTER 1

## INTRODUCTION

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## SECTION I. GENERAL INFORMATION

### 1-1. SCOPE

Type of Manual:	Aviation Unit and Intermediate Maintenance Manual
Equipment Name:	UH-1 D/H, UH-1 H and UH-1 V Helicopter Electronic Configurations
Equipment Purpose:	Utility Helicopter (UH-1 D/H and UH-1 H) and Medevac Helicopter (UH-1 V)

### 1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

### 1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

b. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

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

### 1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-ED-CFO, Fort Monmouth, New Jersey 07703-5023. We'll send you a reply.

### 1-5. ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness. Disassembly and repacking of the equipment for shipment or limited storage are covered in the appropriate technical manuals listed in appendix A.

### 1-6. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

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



**1-7. RELIABILITY IMPROVEMENT WARRANTY (RIW)**

A number of equipment installed in the UH-1 D/H, UH-1 V (MEDEVAC), and UH-1 H helicopters are being maintained under a warranty with the manufacturer of the equipment. Except for removal of defective units and replacement, no other maintenance (other than inspection and cleaning) can be performed on these equipments. If difficulty exists in equipment, under RIW, proper replacement procedures must be followed as provided in the individual equipment manuals. Failure to follow the proper RIW procedures could possibly result in default of the warranty. The equipments under RIW are:

Receiving Set, Radio AN/ARN-123  
 Receiving, Radio R-1963/ARN  
 Altimeter Set, Electronic AN/APN-209  
 Distance Measuring Equipment AN/ARN-124  
 Detecting Set, Radar Signal AN/APR-39(V)  
 Countermeasures Set AN/ALQ-144(V)  
 Radar Warning System AN/APR-44(V).

**SECTION II. EQUIPMENT DESCRIPTION AND DATA****1-8. EQUIPMENT OPERATION**

Equipment operating instructions are contained in TM 55-1520-210-10 and pertinent manuals listed in appendix A.

**1-9. UH-1 D/H CONFIGURATIONS AND SERIAL NUMBERS**

Electronic configurations installed aboard Army model UH-1 D/H or UH-1 V helicopters with corresponding serial numbers are shown below. Helicopters from the list chosen for UH-1 V modification are specified in paragraph 1-11.

<u>Configuration</u>	<u>Helicopter Model</u>	<u>Helicopter Serial Number</u>
A	YUH-1 D	60-6028 through 60-6034
B	UH-1 D/H	62-2106 through 62-2113 62-12351 through 62-12372
C	UH-1 D/H	63-8739 through 63-8859 63-12956 through 63-13002
D	UH-1 D/H	64-1 3492 through 64-13901
E	UH-1 D/H	65-9565 through 65-10135 65-12773 through 65-12776 65-12847 through 65-12852 65-12857 through 65-12895
F	UH-1 D/H	66-746 through 66-1210 66-1600 through 66-1 6448
G	UH-1 D/H	66-8574 through 66-8577 66-16449 through 66-17144



## 1-11. UH-1V CONFIGURATIONS AND SERIAL NUMBER (FROM UH-1D/H)

<u>Configuration</u>	<u>Helicopter Model</u>	<u>Helicopter Serial Number</u>
H	UH-1 D/H	67-1 7145 through 67-1 7402 67-1 7405 through 67-1 7476 67-1 7483 through 67-1 7556 67-1 7558 through 67-1 7859 67-18411 through 67-1 8413 67-1 8558 through 67-1 8577 67-1 9475 through 67-1 9537
I	UH-1 D/H	68-15214 through 68-15324
J	UH-1 D/H	68-15325 through 68-15778 68-16050 through 68-16628 69-15000 through 69-15959  69-1 6650 through 69-1 6670 69-1 6692 through 69-1 6732 (except 69-1 6713) 70-15700 through 70-15874 70-15913 through 70-15932 70-1 6200 through 70-1651 8

**NOTE**

UH-1 D/H designation in this manual applies to the avionic equipment configuration only. (UH-1 D helicopters have T-53-L9, L9A or -1 1 series engines while UH-1 H helicopters have a T-53-L13 series engine.) UH-1 H designation in this manual refers to the electronic configuration installed on helicopters with serial numbers 71-20000 and subsequent. Avionics configurations are further defined in paragraph 1-12.

**1-10. UH-1H CONFIGURATION AND SERIAL NUMBERS**

Electronics configurations installed aboard Army model UH-1 H or UH-1 V helicopters bear serial numbers 70-20000 and subsequent. Helicopters from this list chosen for U H-1 V modification are specified in paragraph 1-11.1.



**1-11. UH-1V CONFIGURATION AND SERIAL NUMBERS (FROM UH-1D/H)**

Helicopters listed below were selected from model UH-1 D/H, configurations F through I for conversion to UH-1 V (MEDEVAC). Once modified, by MWO 55-1520-210-30/48, these helicopters will remain UH-1V (M EDEVAC) even when returned to depot for repair.

<u>Serial Numbers</u>	<u>Serial Numbers</u>	<u>Serial Numbers</u>
66-00873, 66-00890	66-16898, 66-16965	68-15749, 68-15754
66-00941, 66-00954	66-16971, 66-16972	68-15773, 68-16077
66-10018, 66-01046	66-16998, 66-17004	68-16084, 68-16138
66-01050, 66-01052	66-17024, 66-17030	68-16165, 68-16174
66-01068, 66-01086	66-17013, 66-17054	68-16187, 68-16235
66-01104, 66-01105	66-17081, 66-17089	68-16261, 68-16263
66-01127, 66-01193	66-17091, 66-17100	68-16321, 68-16349
66-16005, 66-16013	66-17111, 66-17099	68-16355, 68-16415
66-16034, 66-16108	66-17144, 67-17146	68-16417, 68-16421
66-16119, 66-16143	67-17189, 67-17198	68-16446, 68-16507
66-16115, 66-16187	67-17216, 67-17220	68-16519, 68-16553
66-16201, 66-16228	67-17236, 67-17258	68-16563, 68-16596
66-16239, 66-16243	67-17268, 67-17289	69-15002, 69-15016
66-16252, 66-16272	67-17292, 67-17334	69-15053, 69-15062
66-16291, 66-16296	67-17406, 67-17414	69-15081, 69-15102
66-16316, 66-16328	67-17416, 67-17455	69-15144, 69-15171
66-16355, 66-16366	67-17523, 67-17526	69-15180, 69-15208
66-16372, 66-16387	67-17527, 67-17534	69-15219, 69-15229
66-16395, 66-16415	67-17535, 67-17540	69-15248, 69-15249
66-16419, 66-16431	67-17547, 67-17637	69-15253, 69-15267
66-16446, 66-16456	67-17645, 67-17661	69-15268, 69-15271
66-16475, 66-16478	67-17725, 67-17781	69-15282, 69-15294
66-16484, 66-16506	67-17808, 67-17810	69-15298, 69-15322
66-16508, 66-16513	67-17813, 67-17814	69-15323, 69-15326
66-16525, 66-16538	67-19494, 67-19521	69-15330, 69-15331
66-16609, 66-16620	67-19534, 68-15214	69-15332, 69-15339
66-16633, 66-16639	68-15227, 68-15431	69-15341, 69-15370
66-16678, 66-16680	68-15444, 68-15461	69-15408, 69-15425
66-16717, 66-16729	68-15492, 68-15526	69-15469, 69-15474
66-16757, 66-16821	68-15532, 68-15543	69-15481, 69-15518
66-16827, 66-16836	68-15550, 68-15592	69-15636, 69-15683
66-16868, 66-16877	68-15593, 68-15622	69-15545, 69-15719
66-16879, 66-16894	68-15688, 68-15743	69-15730, 69-15758



**1-11. UH-1V CONFIGURATION AND SERIAL NUMBERS (FROM UH-1D/H) - Continued**

<u>Serial Numbers</u>	<u>Serial Numbers</u>	<u>Serial Numbers</u>
69-15790, 69-15814	70-00152, 70-16209	70-16379, 70-16380
69-15818, 69-15844	70-01522, 70-16224	70-16381, 70-16382
69-15845, 69-15848	70-16225, 70-16238	70-16383, 70-16385
69-15854, 69-15915	70-16248, 70-16249	70-16386, 70-16387
69-15913, 69-15924	70-16259, 70-16262	70-16389, 70-16390
69-15926, 69-15928	70-16266, 70-16280	70-16391, 70-16392
69-15929, 69-15930	70-16309, 70-16360	70-16393
69-15931, 69-16652	70-16361, 70-16364	70-16394, 70-16437
69-16719, 69-16727	70-16368, 70-16370	70-16439, 70-16440
70-15711, 70-15754	70-16371, 70-16372	70-16464, 70-16465
70-15860, 70-15209	70-16373, 70-16378	70-16468

**1-11.1 UH-1V Configuration and Serial Numbers (From UH-1 H).**

Helicopters listed below were selected from model UH-1 H for conversion to UH-1 V (MEDEVAC). Once modified, by MWO 55-1520-210-30/48, these helicopters will remain model UH-1V (MEDEVAC) even when returned to depot for repair.

<u>Serial Numbers</u>	<u>Serial Numbers</u>	<u>Serial Numbers</u>
71-20009, 71-20018	72-21517, 72-21533	74-22298, 74-22299
71-20023, 71-20024	72-21547, 72-21559	74-22311, 74-22312
71-20026, 71-20050	72-21629, 72-21638	74-22341, 74-22354
71-20063, 71-20088	73-21664, 73-21666	74-22366, 74-22372
71-20105, 71-20156	73-21717, 73-21718	74-22373, 74-22376
71-20159, 71-20164	73-21719, 73-21720	74-22377, 74-22397
71-20177, 71-20206	73-21732, 73-21745	74-22407, 74-22421
71-20214, 71-20223	73-21748, 73-21756	74-22425, 74-22428
71-20228, 71-20247	73-21763, 73-21765	74-22430, 74-22431
71-20271, 71-20280	73-21767, 73-21778	74-22432, 74-22433
71-20284, 71-20285	73-21791, 73-21807	74-22442, 74-22447
71-20294, 71-20300	73-21820, 73-21832	74-22463, 74-22468
71-20301, 71-20302	73-21859, 73-22066	74-22472, 74-22473
71-20303, 71-20305	73-22067, 73-22080	74-22482, 74-22498
71-20306, 71-20307	73-22091, 73-22097	74-22542
71-20315, 72-21508		



**1-12. FACILITIES AND ELECTRONIC EQUIPMENT**

- Operational facilities provided by individual equipments installed aboard each model/configuration helicopter are listed in 1-12.1 through 1-12.7 below.
- The facilities are grouped according to general function.
- X in Configuration column means component is installed in helicopter.
- Y in Configuration column means complete provisions are made, but component may not be installed.
- Z in Configuration column means adequate space, weight and power for components have been allocated, but a retrofit or modification program will be required to install the component.
- Numbers in parentheses indicate quantities.
- Equipment nomenclature containing an asterisk indicates that more than one model of an equipment may be used. For example, Antenna AT-454(\*) represents Antenna AT-454/ARC and AT-454A/ARC.



1-12.1 Communications Facilities

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
FM Liaison No. 1	Radio Set AN/ARC-44	X	X											
	Receiver-Transmitter, Radio RT-294(*)/ARC-44	X	X											
	Mounting MT-1268/AR	X	X											
	Dynamotor DY-107(*)/AR	X	X											
	Mounting MT-1267/AR	X	X											
	Panel, Control SB-327/ARC	X	X											
	Control Panel Assembly P/N 204-075-219 (SA-474/AR modified)	X	X											
	Antenna AT-454(*)/ARC (consisting of)													
	Antenna Element AT-455(*)/ARC	X	X											
	Base, Antenna AB-340(*)/ARC	X	X											
	Coupler, Antenna CU-361 (*)/ARC	X	X											
	Radio Set AN/ARC-54			X	X	X	X	X	X	X	X	X		1
	Receiver-Transmitter, Radio RT-348/ARC-54			X	X	X	X	X	X	X	X	X		
	Mounting MT-1535			X	X	X	X	X	X	X	X	X		
	Control, Radio Set C-3835/ARC-54			X	X	X	X	X	X	X	X	X		
	Antenna AT-765/ARC				X	X								
	Antenna AS-1703/AR			X			X	X	X	X	X			
	Coupler, Antenna CU-942/ARC-54			X			X	X	X	X	X			
	Antenna VHF COMM FM 10-30-1											X		
	Antenna, Homing AS-1922/ARC			X	X	X	X	X	X	X	X	X		
	Radio Set AN/ARC-131			X	X	X	X	X	X	X	X	X		
	Receiver-Transmitter, Radio RT-823/ARC-131			X	X	X	X	X	X	X	X	X		
	Control Unit C-7088/ARC-131			X	X	X	X	X	X	X	X	X		
	Mounting MT-3664/ARC-131			X	X	X	X	X	X	X	X	X		



1-12.1 Communications Facilities. - Continued

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
UHF Command	Radio Set AN/ARC-55(*)	X	X											
	Receiver-Transmitter, Radio RT-349(*)/ARC-55	X	X											
	Mounting MT-1536/ARC-55	X	X											
	Control, Radio Set C-1 827/ARC-55	X	X											
	Antenna AT-450/ARC	X	X											
	Antenna AT-1108/ARC	X												
			X	X	X	X	X	X	X	X	X	X		2
	Radio Set AN/ARC-51 (*)													
	Receiver-Transmitter, Radio RT-702/ARC-51 X or RT-742/ARC-51 BX			X	X	X	X	X	X	X	X	X		3
	Control, Radio Set C-4677/ARC-51 X or C-6287/ARC-51 BX			X	X	X	X	X	X	X	X	X		4
	Indicator, Standing Wave Ratio ID-1003/ARC			X	X	X	X	X	X	X	X	X		
	Cooler, Air, Electronic Equipment			X	X	X	X	X	X	X	X	X		
	HD-615/ARC-51			X	X	X	X	X	X	X	X	X		
	Radio Set AN/ARC-1 64(V)											X	X	5
VHF AM Radio Set	Receiver-Transmitter, Radio RT-1167/ARC-1 64(V)											X	X	
	Filter, UHF TRM (591 5-00-450-4677AH)											X	X	
	Radio Set AN/ARC-1 15			X	X	X	X	X				X		
	Antenna AT-1108/ARC			X	X	X	X	X				X		2
	Filter BPF-40-03P			X	X	X	X	X				X		



Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
Voice Security	Computer, Voice Security TSEC/KY-28 or TSEC/KY-58			Y	Y	Y	Y	Y	Y	Y	Y	Y		7
	Control Indicator, Voice Security C-8157/ARC			Y	Y	Y	Y	Y	Y	Y	Y	Y		
	Mounting MT-3802/ARC			X	X	X	X	X	X	X	X	X		
	Light, Remote Cipher			X	X	X	X	X	X	X	X	X		
VHF Command											(2)	(2)	(2)	
	Radio Set AN/ARC-73A	Y	Y											8
	Receiver, Radio R- 1123(*)/ARC-73	Y	Y											
	Transmitter, Radio T-879(*)/ARC-73	Y	Y											
	Mounting MT-2699/ARC-73	Y	Y											
	Antenna, Collins model 37R-2	Y												2
	Antenna AT-1108/ARC X		X	X	X	X	X	X	X	X	X	X		
	Control, Radio Set C-4074(*)/ARC-73A or 614U-5,614-6or61 6 U-6	Y	Y	Y	Y	Y	Y							
	Power Relay K28	Y	Y	Y	Y	Y	Y							
	Radio Set AN/ARC-134			X	X	X	X	X	X	X	X			
	Receiver-Transmitter RT-857/ARC-134			X	X	X	X	X	X	X	X			
	Mounting MT-3791/ARC-134			X	X	X	X	X	X	X	X			
	Control, Radio Set C-7197/ARC-134			X	X	X	X	X	X	X	X			
VHF Emergency Radio Transmitter	Transmitter, Radio T-366A/ARC	X	X	X		X	X							9
	Mount MT- 1142/ARC	X	X	X		X	X							
	Dynamotor DY-86/ARN-30	X	X	X		X	X							
	Filter, Direct Current Power R-726/AR	X	X	X		X	X							
	Relay, Switch RE-275/AR (ARC Type K-18)	X	X	X		X	X							
	Sidetone Relay K-12 (MS24139-5)	X	X	X		X	X							
	Switch Panel, P/N 204-075-709	X	X											
	Control Panel P/N 204-075-708	X	X											
	Control Panel (ARC Type C-80B)			X		X	X							

1-10



1-12.1 Communications Facilities. - Continued

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
FM Liaison No. 2	Radio Set AN/ARC-1 14			X	X	X	X	X	X	X	X	X		
	Antenna FM 10-30-1			X	X	X	X	X	X	X	X	X		
	Antenna AS-1 703/ARC												X	
	Coupler, Antenna CU-942B/ARC												X	
	Box, Audio Pad Impedance													
HF SSB Set	Panel, Radio Select													
			X	X	X	X	X	X	X	X				
			X	X	X	X	X	X	X	X				
	Radio Set AN/ARC-102		Y	Y	Y	Y	Y	Y	Y	Y	Y			
	Receiver-Transmitter RT-698/ARC-102		Y	Y	Y	Y	Y	Y	Y	Y	Y			
	Inverter, Power Static with Mount													
	PP-3702/ARC-1 02		Y	Y	Y	Y	Y	Y	Y	Y	Y			
	Control, Radio Set C-3940/ARC-94		Y	Y	Y	Y	Y	Y	Y	Y	Y			
	Network, Impedance Matching CU-991/AR		Y	Y	Y	Y	Y	Y						
	Network, Impedance Matching CU-1658/A									Y	Y	Y		
Auxiliary FM Receiver	Mounting MT-3772/A									Y	Y	Y		
	Antenna, Longwire P/N 204-075-609	Y	Y											
	Antenna, Longwire P/N 205-706-027			Y	Y	Y	Y	Y	Y					
	Kit, Antenna P/N 205-706-027-1												Y	
	Receiving Set, Radio AN/AFF-49	Z	Z	Z	Z	Z	Z	Z						
	Control, Receiver C-2177/AR	Z	Z	Z	Z	Z	Z	Z						
	Receiver, Radio R-809/ARC	Z	Z	Z	Z	Z	Z	Z						
	Mounting MT-1835/AR	Z	Z	Z	Z	Z	Z	Z						
	Receiver R-1297								Z	Z	Z			



1-12.1 Communications Facilities. - Continued

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
Intercommunications	Panel, Signal Distribution, Radio SB-329/AR	X (3)	X (3)											
	Relay, Auxiliary Signal Switch K21	(3)	(3)											
	Relays K17 and K18	X	X											
	Network, Impedance Matching CU-435/AIC	X	X											
	Control, Intercommunication Set C-1 611 (*)/AIC			X (4)	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)			
	Relays K1 and K2		X	X	X	X	X	X	X					
	Discriminator MD-736/A		X	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)				10
	Control, Communication System C-6533/ARC											X (4)		
	Audio Threshold System M D-1047/ARC											X		
	Impedance Matching Network A16	X	X	X	X	X	X	X	X	X	X	X		11
	Cyclic Stick Switch X942-2	X (2)	X (2)	X (2)	X (2)	X (2)	X (2)	X (2)	X (2)	X (2)	X (2)	X (2)		12
	Foot Switch	X (2)	X (2)	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)	X (4)		13



1-12.2 Navigation Facilities

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
Low Frequency (lf) Automatic Direction Finding (adf)	Direction Finder Set AN/ARN-59(V)	X	X	X	X	X								
	Receiver, Radio R-836/ARN	X	X	X	X	X								
	Mount MT-2018/ARN	X	X	X	X	X								
	Dynamotor DY-150/ARN	X	X	X	X	X								
	Mount MT-2019/ARN	X	X	X	X	X								
	Control, Receiver C-2275/ARN	X	X	X	X	X								
	Antenna, Sensing P/N 204-075-328	X	X	X	X	X								
	Antenna, Loop AT-780/ARN	X	X	X	X	X								
	Direction Finder Set AN/ARN-83						X	X	X	X	X	X		
	Receiver R-1391/ARN-83						X	X	X	X	X	X		
	Mounting MT-3605/ARN-83						X	X	X	X	X	X		
	Control, Direction Finder C-6899/ARN-83						X	X	X	X	X	X		
	Antenna, Loop AS-1863/ARN-83						X	X	X	X	X	X		
	Antenna, Sensing P/N 205-075-325						X	X	X	X	X	X		
Gyromagnetic Compass	Aircraft Magnetic Compass Type J2	X	X	X	X	X	X							
	Induction Compass Transmitter Type C-2	X	X											
	Induction Compass Transmitter T-611/ASN			X	X	X	X							
	Magnetic Flux Compensator CN-405/ASN	X	X	X	X	X	X							
	Electronic Control Amplifier Type A2	X	X	X	X	X	X							
	Electrically Driven Gyro Control Type S-3A	X	X	X	X	X	X							
	Ac-Dc Power Interlock Relay	X	X	X	X	X	X							
	Gyromagnetic Compass Set AN/ASN-43							X	X	X	X	X		
	Induction Compass Transmitter T-611/ASN							X	X	X	X	X		
	Magnetic Flux Compensator CN-405/ASN							X	X	X	X	X		
	Directional Gyro CN-998/ASN							X	X	X	X	X		
	Electronic Control Amplifier AM-3209/ASN	X	X	X	X	X	X	X	X	X	X	X		*



1-12.2 Navigation Facilities - Continued

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
FM Homing	Antenna Group AN/ARA-31	X	X											14
	Element, Antenna AT-624(*)/AR	X	X											
	Network, Impedance Matching CU-459/AR	X	X											
	Keyer KY-149(*)/AR	X	X											
	Mounting MT-1620/AR	X	X											
	Switch Assembly SA-474/AR (modified)	X	X											
Marker Beacon Receiver	Homing Antenna AS-1922(*)/ARC			X	X	X	X	X	X	X	X	X		15 16
	Homing Facility Indicator Relays K-53 and K-54			X	X	X	X	X	X	X	X	X		
	Radio R-1041/ARN		X	X	X	X	X	X				Y		
	Receiver, Radio R-737/ARN	X							X	X	X			
	Mounting MT-2292/ARN	X	X	X	X	X	X	X	X	X	X			
	Antenna Collins Model 37RX-2		X											
	Antenna 37X-2	X		X										
	Antenna AT-640(*)/ARN				X	X	X	X	X	X	X	X		



1-12.2 Navigation Facilities - Continued

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
VHF Navigation	Receiving Set, Radio AN/ARN-30D or	X	X	X										17
	Receiving Set, Radio AN/ARN-30E				X	X								
	Receiver, Radio R-1021/ARN-30D	X	X	X	X	X								
	Mounting MT-1174/ARN-30A	X	X	X	X	X								
	Mounting MT-1175/ARN-30A	X	X	X	X	X								
	Power Supply PP-2792/ARN-30D	X	X	X	X	X								
	Converter, Signal Data CV-265A/ARN-30A	X	X	X	X	X								
	Indicator, Course ID-453/ARN-30	X	X	X	X	X								
	Control C-3436/ARN-30D	X	X	X										
	Control C-3436A/ARN-30E				X	X								
VHF Omni Range Set	Antenna AS-1304/ARN	X	X	X	X	X								17
	Receiving Set, Radio AN/ARN-82						X	X	X	X	X	Y		
	Receiver, Radio R-1388/ARN-82(*)						X	X	X	X	X	Y		
	Mounting MT-3600/ARN-82						X	X	X	X	X	Y		
	Control, Radio Set C-6873/ARN-82			Z	Z	Z	X	X	X	X	X	X		
	Indicator, Course ID-1347C/ARN-82						X	X	X	X	X	X		
Glide Slope/Marker Beacon Receiver	Antenna AS-1304/ARN-30						X	X	X	X	X	X		18
	Receiver, Radio R-1963/ARN					X	X	X	X		X	Y		
	Mount MT-4835/ARN						X	X	X	X	X			
	Antenna AS-3188/ARN						X	X	X	X	X	Y		
	Antenna AT-640(*)/ARN						X	X	X	X	X	X	X	



1-12.2 Navigation Facilities. - Continued

1-16  
Change 1

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
VHF Omni Range/ Instrument Landing System (VOR/I LS) Set	Receiving Set, Radio AN/ARN-123(V)			Z	Z	Z	Z	Z	Z	Z	Z	Z	X	
	Receiver, Radio R-2023/ARN-123(V)			Z	Z	Z	Z	Z	Z	Z	Z	Z	X	
	Mounting Base, Electrical Equipment MT-4834/ARN-123(V)			Z	Z	Z	Z	Z	Z	Z	Z	Z	X	
	Control C-10048/ARN-123(V)			Z	Z	Z	Z	Z	Z	Z	Z	Z	X	
Radar Altimeter	Radar Altimeter Set AN/APN-100	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z			
	Receiver-Transmitter, Radar RT-446/APN-100	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z			
	Indicator, Height ID-721/APN-100	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z			
	Calibrator, Electronic Altimeter Set, FR-129/APN-100	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z			
	Altimeter Set, Electronic AN/APN-209												X	19
	Receiver-Transmitter Height Indicator RT-1115/APN-209												X	
	Indicator, Height ID-1917/APN-209												X	
	Antenna AS-2595/APN-194												X	
													(2)	
Distance Measuring Equipment (DME)	Distance Measuring Equipment AN/ARN-124												X	20
	Receiver-Transmitter RT-1294/ARN-124												X	
	Indicator ID-2192/ARN-124												X	
	Mount MT-6035A/ARN-124												X	
	Antenna AT-741 A/A												X	
Global Positioning Satellite (GPS) Navigation Set	Navigation Set, Satellite Signals AN/ASN-175													20A
	Receiver/Display Unit P/N 82128-00											X	X	
	Servo Amplifier P/N 81827-00											X	X	
	GPS Antenna P/N 22433-40											X	X	
	Remote Switch Assy P/N 95372877											X	X	

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1-12.3 Indicating Facilities.

Facility	Equipment or component	UH-1 D/H configuration											UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J				
Radio Magnetic Indicator (rmi)	Indicator, Course ID-998/ASN	X	X	X	X	X	X	X	X	X	X	X		21	
	Indicator, Course ID-250/ARN	X	X	X	X	X	X	X	X	X	X	X		22	
Attitude Display	Converter, Radio Magnetic Indicator CV-1275/ARN	X	X	X	X	X									
	Attitude Indicator, Model 4005G	X	X	X	X	X	X	X	X	X	X	X			
	Roll and Pitch Gyro, Type MD-1	X	X	X	X	X	X	X	X	X	X	X			
	Rate Switching Gyro, Type MC-1	X	X	X	X	X	X	X	X	X	X	X		23	
	Amplifier, Attitude Indicator, Type 5404G	X	X	X	X										
	Attitude Indicator, Type J8	X	X	X	X	X	X	X	X	X	X	X			



1-12.4 Identification Facilities.

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
Identification Friend or Foe (IFF) Transponder	Transponder Set AN/APX-44	Y	X	X	X	X	X		X					24
	Receiver-Transmitter RT-494/APX-44	Y	X	X	X	X	X	X	X					
	Control, Transponder Set C-2714/APX-44	Y	X	X	X	X	X	X	X					
	Mount MT-2100/APX-44	Y	X	X	X	X	X	X	X					
	Relay, IFF Power Failure K68			X	X	X	X	X	X					
	Light, IFF Caution			X	X	X	X	X	X					25
	Antenna AT-884/APX-44	Y	X	X	X	X	X	X	X					
	Transponder Set AN/APX-72			Y	Y	Y	Y	Y	Y	X	X	X		
	Receiver-Transmitter, Radar RT-859/APX-72			Y	Y	Y	Y	Y	Y	X	X	X		
	Mounting MT-3809/APX-72			Y	Y	Y	Y	Y	Y	X	X	X		
	Control, Transponder Set C-6280/APX-72			Y	Y	Y	Y	Y	Y	X	X	X		
	Test Set TS-1943/APX-72			Y	Y	Y	Y	Y	Y	X	X	X		
	Computer, Transponder KIT-1A/TSEC			Y	Y	Y	Y	Y	Y	X	X	X		
	Mount MT-3513/APX-72									X	X	X		
	Antenna AT-884/APX-44									X	X	X		
	Light, Code Hold									X	X	X		
	Switch, Code Hold									X	X	X		



1-12.5 Detection and Warning Facilities.

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
Radar Signal Detecting Set	Radar Signal Detecting Set AN/APR-39(V) Receiver R-1838/APR-39	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		26
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	Comparator CM-440/APR-39 Control C-9326/APR-39 Indicator IP-1150/APR-39 Antenna, Blade AS-2890/APR-39 Antenna, Spiral AS-2891/APR-39	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)		
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	Antenna, Spiral AS-2892/APR-39	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)		
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
		(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)		
Proximity Warning Facility YG-1054	Receiver-Transponder Antenna			X	X	X	X	X	X	X	X	X		
				X	X	X	X	X	X	X	X	X		



## 1-12.6 Power Sources.

Facility	Equipment or component	UH-1 D/H configuration										UH-1H	UH-1V	Notes
		A	B	C	D	E	F	G	H	I	J			
Dc Source	Battery BB-433/A	X	X	X	X	X	X	X	X	X	X	X		
Ac Source	Motor-Generator PU-543(*)/A	X	X	X	X	X	X	X	X	X		X		27

## NOTES

1. Radio Sets AN/ARC-54 and AN/ARC-131 are functionally and physically interchangeable. Radio Set AN/ARC-131 may be installed in lieu of Radio Set AN/ARC-54.
2. Antenna AT-1108/ARC is used for both UHF and VHF communications.
3. Helicopters modified per MWO 55-1520-210-30/24 have a second AN/ARC-51 BX installed to provide dual communications capability and uses a separate AT-450/ARC antenna.
4. Radio set controls are not interchangeable: C-4677/ARC-51 X must be used with RT-702/ARC-51X and C-6287/ARC-51 BX must be used with RT-742/ARC-51 BX. UH-1 H helicopters use only AN/ARC-51 BX components.
5. Helicopters modified per MWO 55-1520-210-30/47.
6. Radio Set AN/ARC-115 is installed in UH-1 H and in selected UH-1 D/H helicopters. Paragraph 1-9 lists serial numbers of UH-1 D/H helicopters selected for modification per MWO 55-1520-210-30/37.
7. When installed operates with AN/ARC-54 or AN/ARC-131 to provide voice security.
8. Helicopters modified per MWO's 55-1520-210-30/25 and 55-1520-210-30/33 have provisions for and equipment installed for AN/ARC-134 in lieu of AN/ARC-73A.
9. Operated with R-1021/ARN-30D or R-3188/ARN-82 to provide VHF command communications. Installed only up to and including 16306 in configuration F. Utilizes VH F Command antenna.
10. Helicopters modified per MWO 55-1520-210-40/1 (configurations F, G and H), MWO 55-1520-210-40/2 (configurations C, D and E) and MWO 55-1520-210-40/3 (configuration J).
11. Refer to FO-36 for difference data concerning Impedance Matching Network A16.
12. Two switches installed, all configurations.
13. Helicopters modified per MWO 55-1520-210-30/27 have foot switches installed at door gunners stations.
14. Operates with AN/ARC-44.
15. Operates with AN/ARC-54 or AN/ARC-131.



## 1-12.6 Power Sources. - Continued

### NOTES - Continued

16. Refer to paragraph 1-38 for differences in operation of relays.
17. Also displays FM Homing information.
18. Helicopters modified per MWO 55-1520-210-30/45.
19. Helicopters modified per MWO 55-1520-210-30/48 (Medevac only).
20. Helicopters modified per MWO 55-1520-210-30/49 (Medevac only).
- 20A. Helicopters modified per MWO 55-1520-210-50-32.
21. Pilot's indicator; displays vhf navigation, lf-adf and gyromagnetic compass data.
22. Copilot's indicator; displays vhf navigation, lf-adf and gyromagnetic data.
23. Rate switching gyro type MC-1 is being removed, with no replacement, by depot maintenance.
24. In configurations C through H, adapter cables are used with AN/APX-44 which are removed when AN/APX-72 is installed.
25. When MWO 55-1520-219-30-4 is accomplished, encoded altitude data from copilot's AAU-32/A altimeter encoder is transmitted during mode C operation.
26. Helicopters modified per MWO 55-1520-210-50-6.
27. Two installed, one main and one spare, all configurations.



### **1-13. UH-1 D/H HELICOPTER CHARACTERISTICS, CAPABILITIES AND FEATURES**

- UH-1 D/H helicopters are single engine helicopters designed for utility missions.
- Some helicopters are fitted with armament subsystems M23 (two 7.62 mm machine guns) or M59 (one 7.62 mm and one 50 caliber machine gun).
- Some helicopters are fitted with armament subsystems M56 and M132 for mine dispersing.
- Some helicopters are fitted with M52 smoke generator subsystems.
- Some helicopters are fitted with a rescue hoist.
- The electronic configuration provide capabilities for air-to-air communications, air-to-ground communications, communications between crewmembers and point-to-point navigation.
- The electronic configuration has been modified and upgraded by numerous MWO's. Refer to DA Pam 310-1 for a list of MWO's and applications.

### **1-14. UH-1H HELICOPTER CHARACTERISTICS, CAPABILITIES AND FEATURES**

- UH-1 H helicopters are similar to UH-1 D/H helicopters.
- Equipment in the electronic configuration of UH-1 H helicopters is newer and lighter in weight than that of UH-1 D/H.
- The configuration was previously referred to as Standard Lightweight Avionics Equipment (SLAE).
- The electronic configuration has been modified and upgraded by numerous MWO's. Refer to DA Pam 310-1 for a list of MWO's and applications.

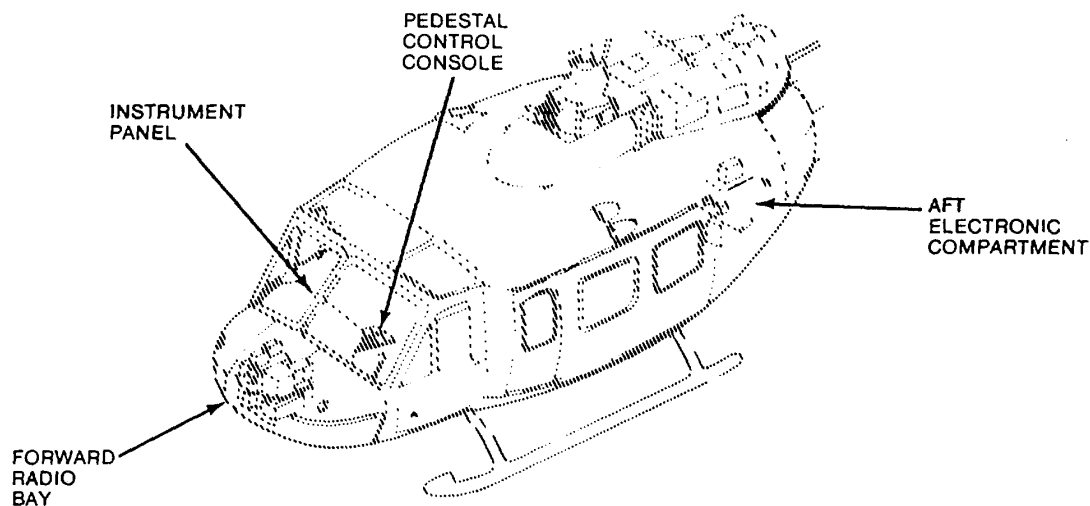
### **1-15. UH-1V HELICOPTER CHARACTERISTICS, CAPABILITIES AND FEATURES**

- Certain helicopters have been renomenclatured as UH-1V.
- The helicopter is fitted with litters and is designed to fly Medevac missions.
- Changes to the electronic configuration consist of the addition of Electronic Altimeter AN/APN-209(V), a 5-volt instrument lighting system, and Distance Measuring Equipment (DME) AN/ARN-124.
- Once renomenclatured these helicopters will remain as UH-1V, even when sent to depot maintenance. They will be repaired and returned to the organization that sent them to depot.
- Equipment in the electronic configuration, except that listed above, is dependent upon TMS of helicopter prior to renomenclature.

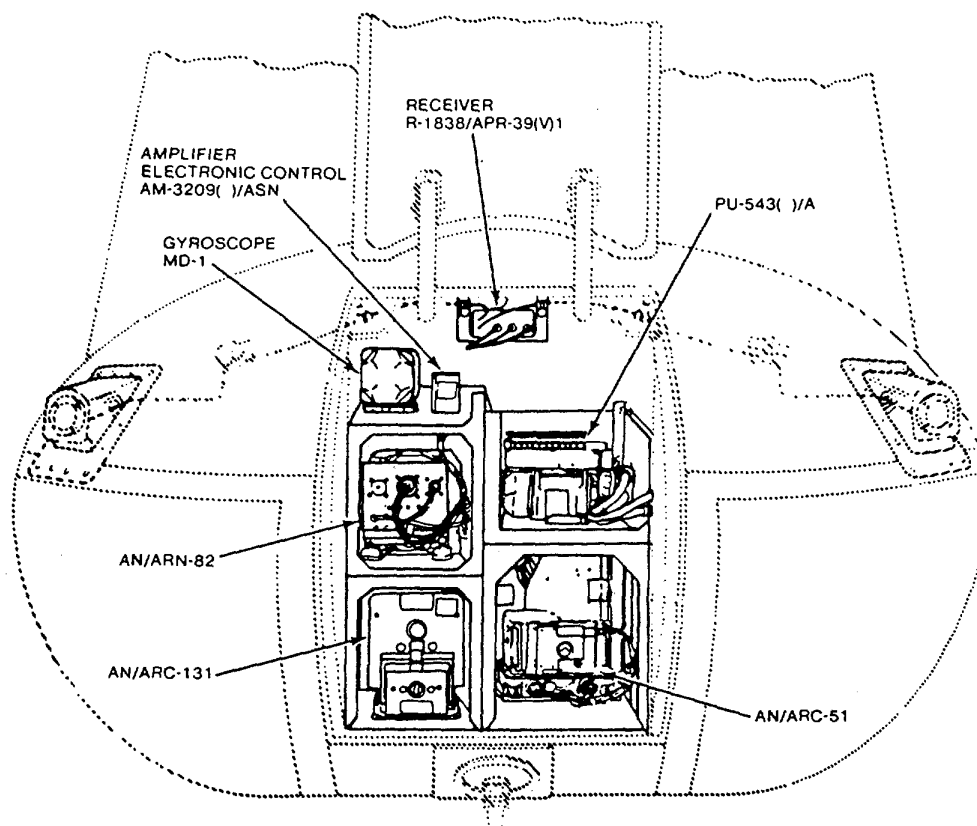


## 1-16. LOCATION OF MAJOR COMPONENTS

Major components of the electronic configuration are located in forward radio bay, pedestal control console, instrument panel and aft electronic compartment. Typical arrangements are described in the following subparagraphs.

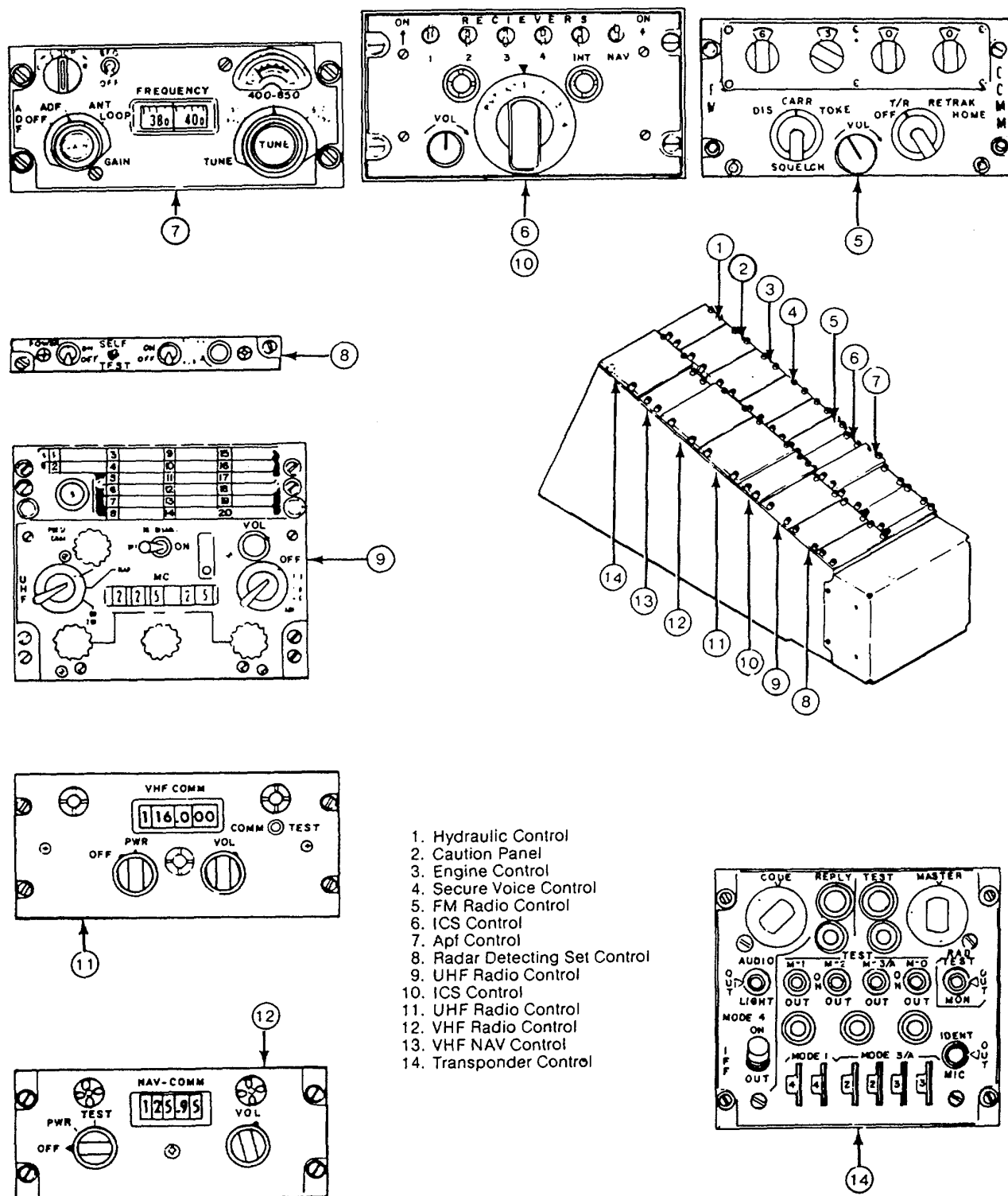


### 1-16.1 Location of Major Components, Typical Forward Radio Bay.



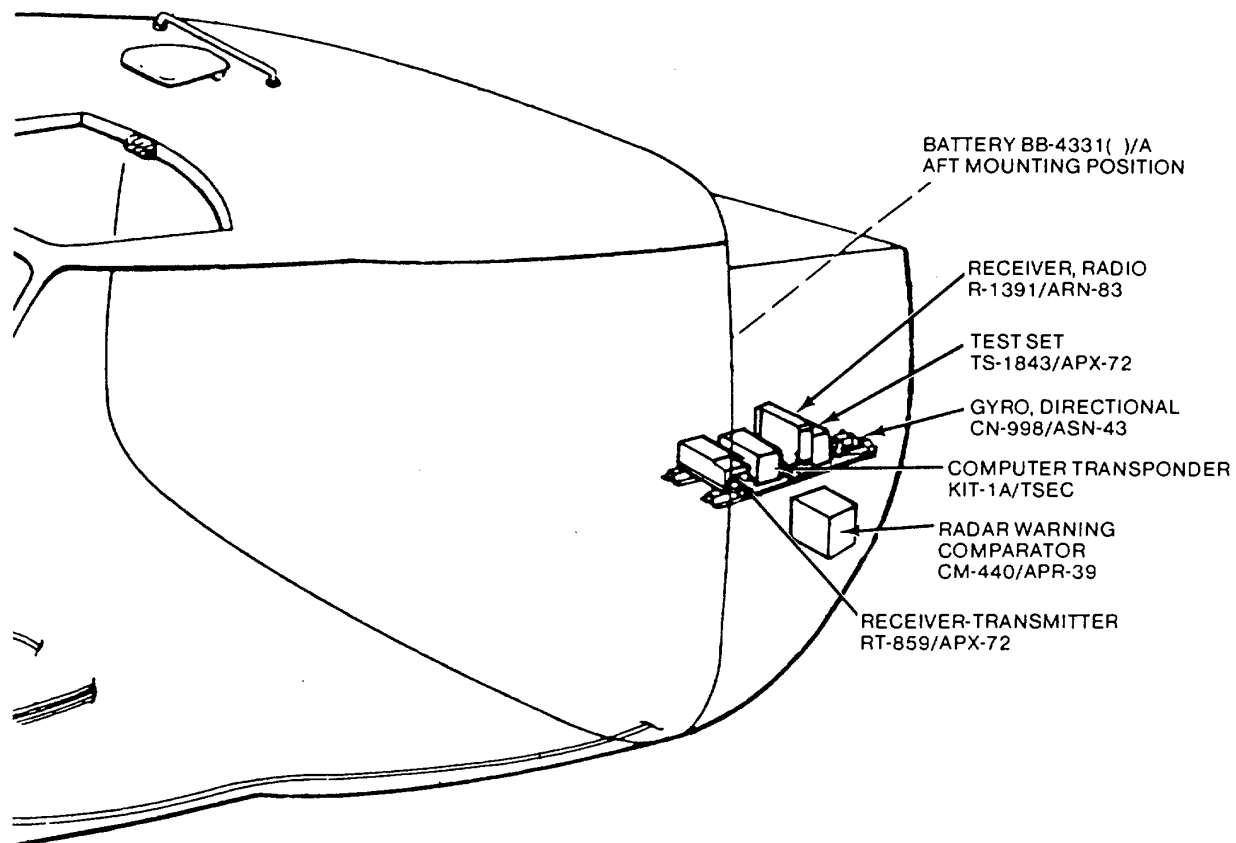


# 1-16.2 Location of Major Components, Typical Pedestal Control Console.

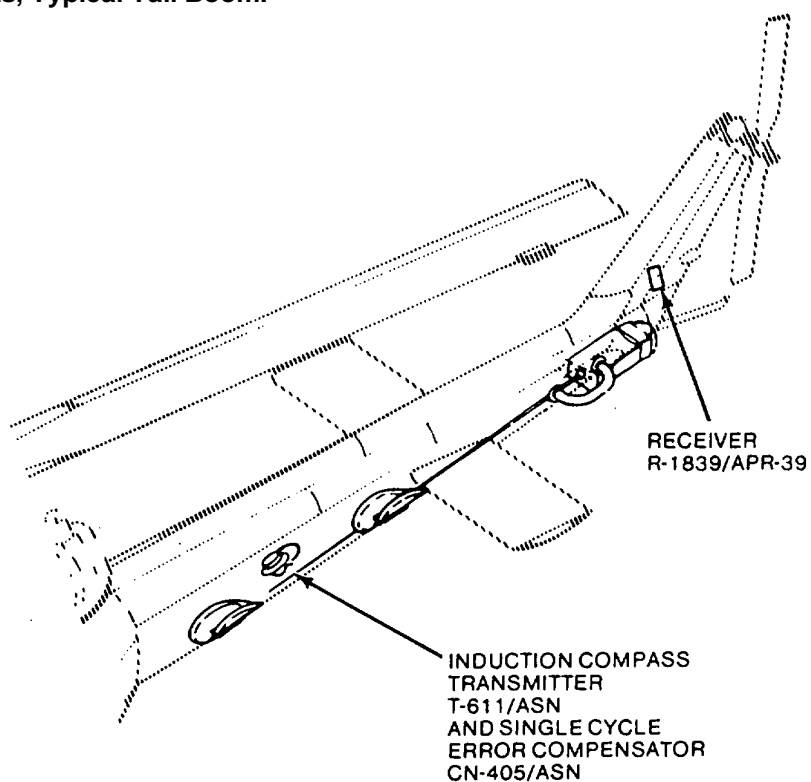




1-16.3 Location of Major Components, Typical Aft Electronic Compartment.

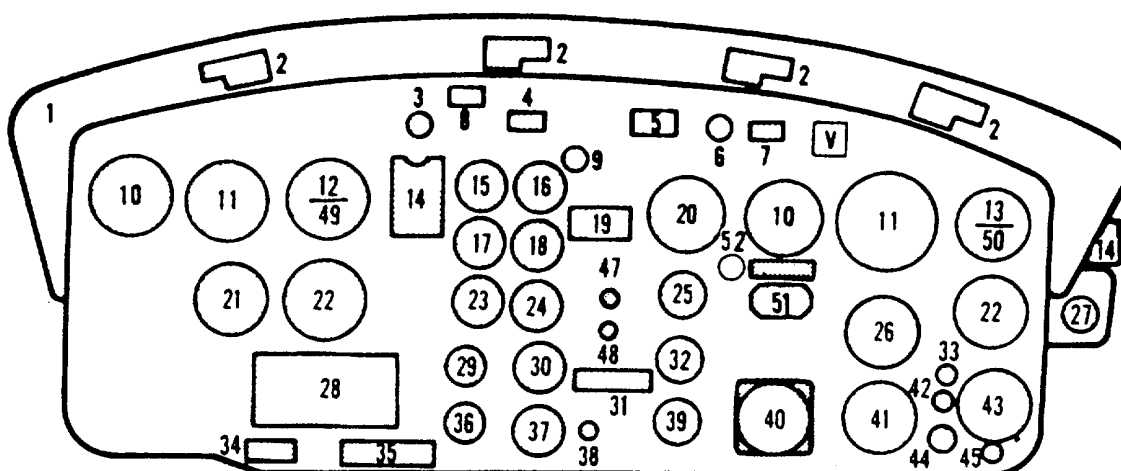


1-16.4 Location of Major Components, Typical Tail Boom.





## 1-16.5 Location of Major Components, Typical Instrument Panel.

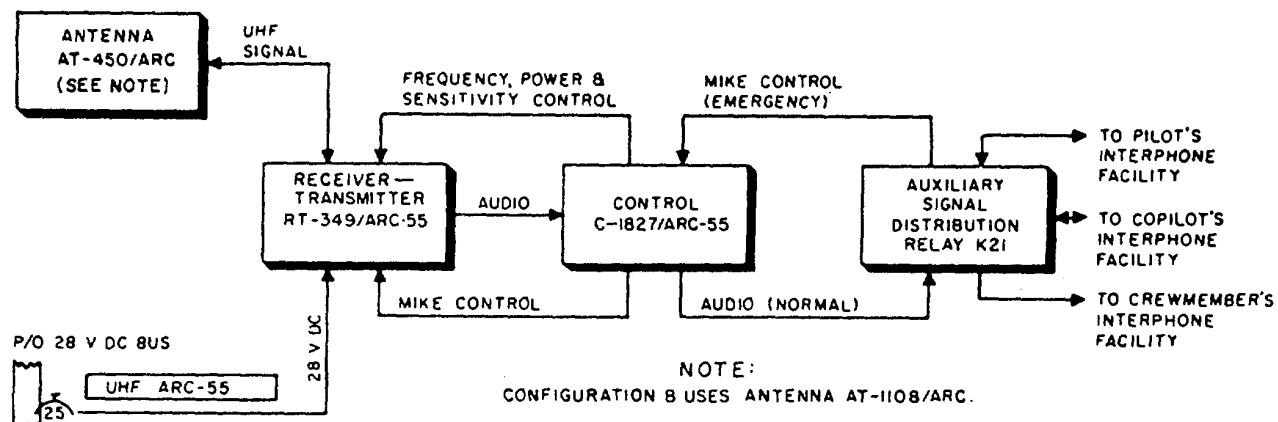


- |  |  |
|--|--|
| 1. Glareshield                               | 27. Magnetic Compass   |
| 2. Secondary Lights                          | 28. Operating Limits Decal   |
| 3. Engine Inlet Filter Clogged Warning Light | 29. Main Generator Loadmeter   |
| 4. Master Caution                            | 30. DC Voltmeter   |
| 5. RPM Warning Light                         | 31. Engine Caution Decal   |
| 6. Fire Detector Test Switch                 | 32. Gas Producer Tachometer Indicator  |
| 7. Fire Warning Indicator Light              | 33. Marker Beacon Light  |
| 8. Radio Call Designator                     | 34. Engine Installation Decal  |
| 9. Fuel Gage Test Switch                     | 35. Transmitter selector Decal   |
| 10. Airspeed Indicator                       | 36. Standby Generator Loadmeter  |
| 11. Altitude Indicator                       | 37. AC Voltmeter   |
| 12. Altimeter Indicator (AAU-32/A)           | 38. Compass Slaving Switch   |
| 13. Altimeter Indicator (AAU-31/A)           | 39. Exhaust Gas Temperature Indicator  |
| 14. Compass Correction Card Holder           | 40. Turn and Slip Indicator  |
| 15. Fuel Pressure Indicator                  | 41. Omni Indicator   |
| 16. Fuel Quantity Indicator                  | 42. Marker Beacon Sensing Switch   |
| 17. Engine Oil Pressure Indicator            | 43. Clock  |
| 18. Engine Oil Temperature Indicator         | 44. Marker Beacon Volume Control   |
| 19. Cargo Caution Decal                      | 45. Cargo Release Armed Light  |
| 20. Dual Tachometer                          | 47. IFF Code Hold Light  |
| 21. Radio Compass Indicator                  | 48. IFF Code Hold Switch   |
| 22. Vertical Velocity Indicator              | 49. <input checked="" type="checkbox"/> Height Indicator Remote                |
| 23. Transmission Oil Pressure Indicator      | 50. <input checked="" type="checkbox"/> Receiver-Transmitter, Height Indicator |
| 24. Transmission Oil Temperature Indicator   | 51. <input checked="" type="checkbox"/> DME Indicator                          |
| 25. Torquemeter Indicator                    | 52. <input checked="" type="checkbox"/> DME Hold Light                         |
| 26. Radio Compass Indicator                  |  |



## SECTION III. PRINCIPLES OF OPERATION

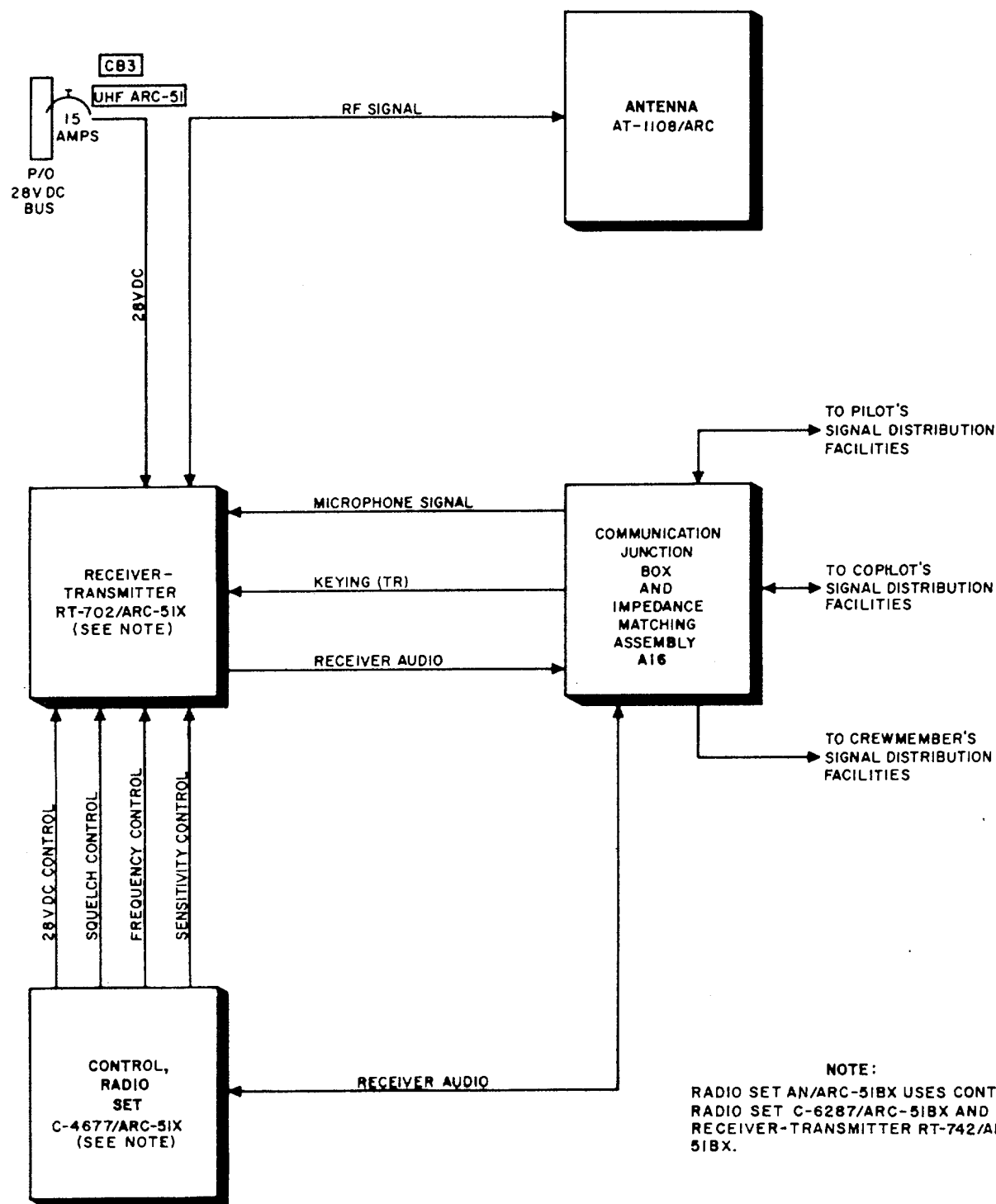
## 1-17. UHF COMMAND RADIO SET AN/ARC-55(\*)



- Provides two-way, amplitude-modulated voice communications.
- Frequency range 225.0 to 399.9 M Hz in 0.1 -MHz steps.
- Contains provisions for monitoring predetermined (guard) channel between 238.0 and 248.0 MHz.
- Transmits and receives on same frequency using same antenna.
- Transmitter portion can be tone modulated for emergency or direction finding purposes.
- Primary +28 Vdc power supplied through UHF ARC-55 circuit breaker.
- Auxiliary signal distribution relay powered through FM ARC-44 circuit breaker.



# 1-18. UHF COMMAND RADIO SET AN/ARC-51(\*)X





**1-18. UHF COMMAND RADIO SET AN/ARC-51(\*)X - Continued**

- Provides two-way, amplitude-modulated voice communications.
- Frequency range 225.00 to 399.95 M Hz in 0.05-MHz steps.
- Transmits and receives on same frequency using same antenna.
- Contains provisions for monitoring predetermined (guard) channel.
- Transmitter portion may be tone modulated for emergency or direction finding purposes.
- Primary power +28 Vdc supplied through UHF ARC-51 circuit breaker.

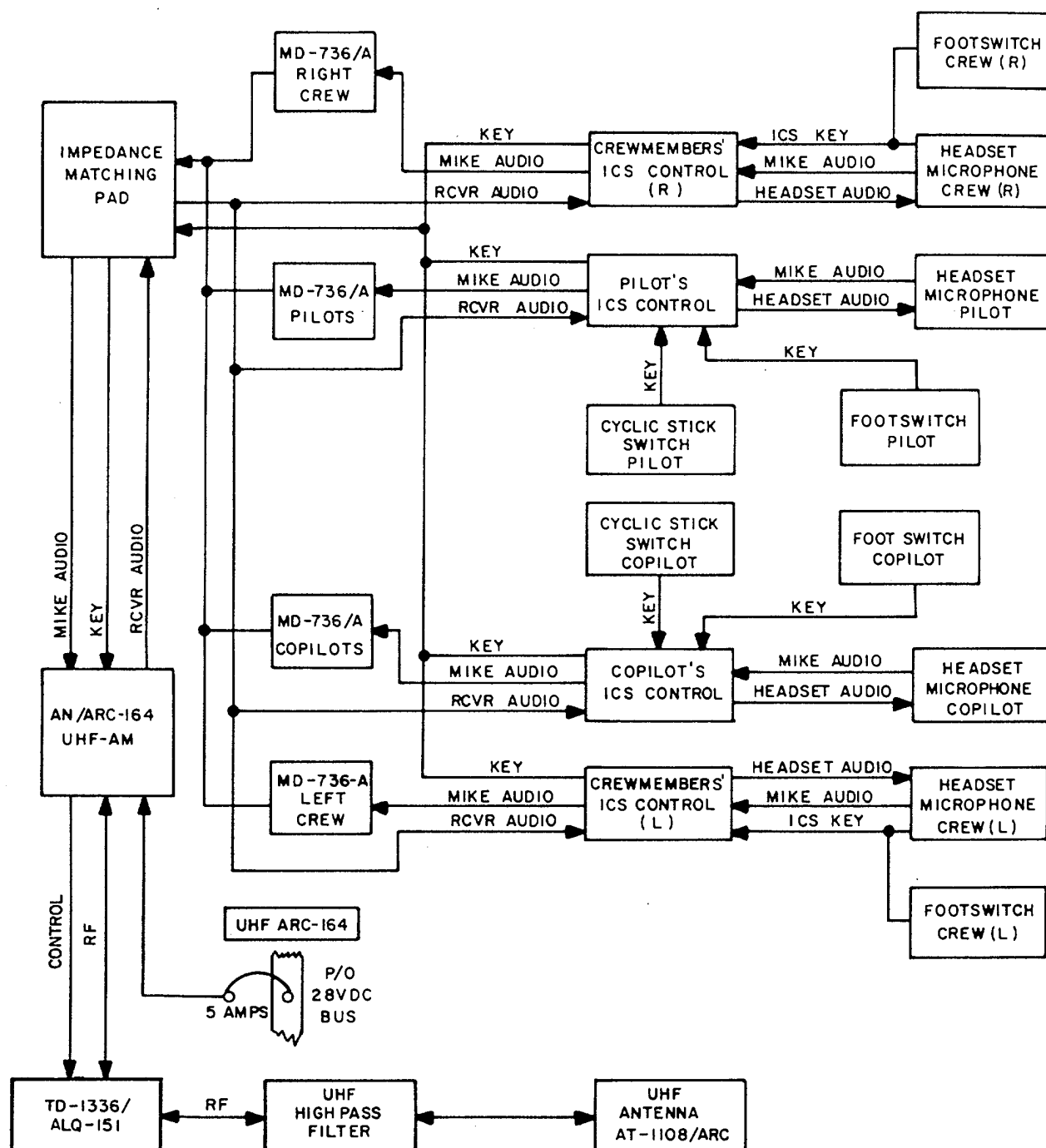
**NOTE**

Control units and receiver-transmitters are not interchangeable. C-4766/ARC-51X must be used with RT-702/ARC-51X and C-6287/ARC-51 BX must be used with RT-742/ARC-51 BX.

- When installed as UHF Command No. 2 (MWO 55-1520-210-30/24), circuit breaker is marked NO. 2 UHF COMM and Antenna AT-454(\*)/ARC is used.



1-19. UHF COMMAND RADIO SET AN/ARC-164(V)

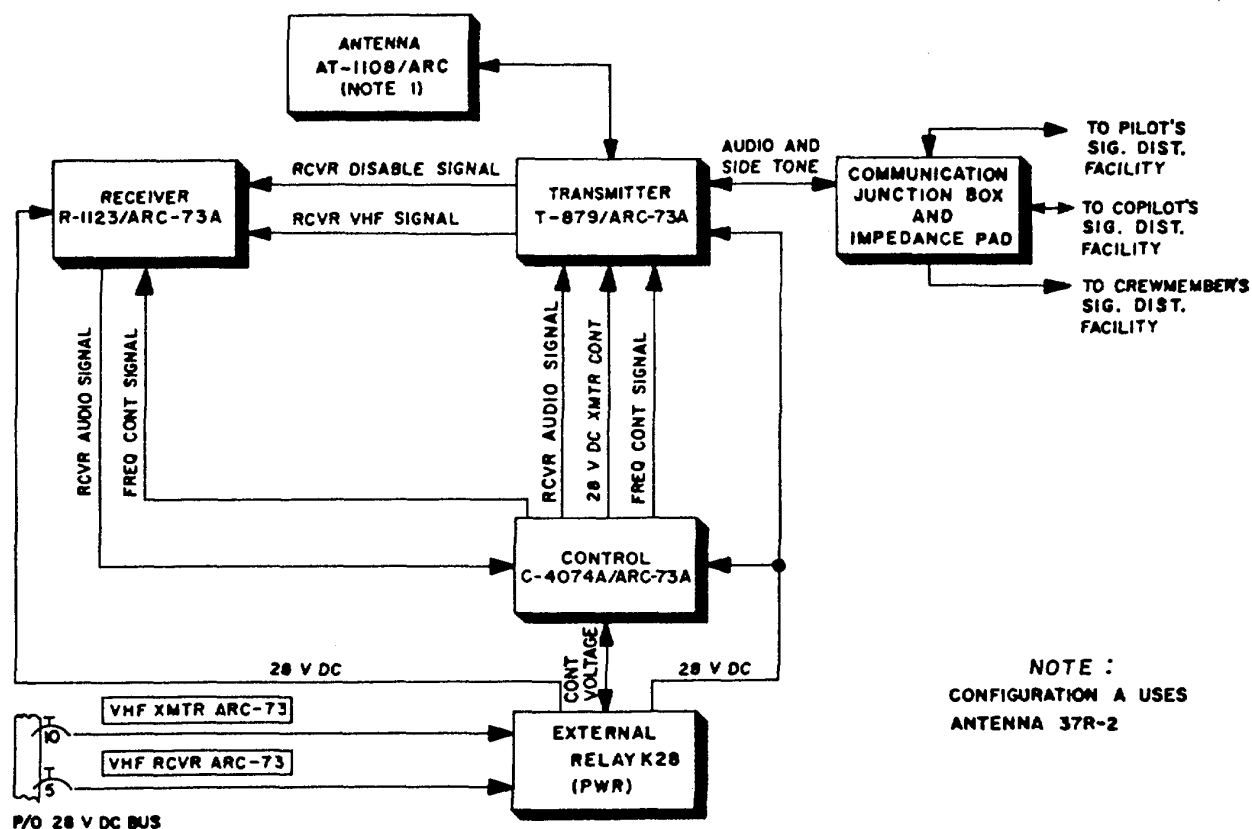




### 1-19. UHF COMMAND RADIO SET AN/ARC-164(V) - Continued

- Provides two-way, amplitude-modulated voice communications.
- Frequency range 225.000 to 399.975 MHz in 0.025-MHz steps.
- Has auxiliary guard receiver, nominally tuned to 243.000 MHz.
- Consists of single unit receiver-transmitter with all operator-usable controls on front panel.
- UHF high pass filter restricts received signals to desired band.
- Primary +28 Vdc supplied through UHF-AM COMM AN/ARC-164 circuit breaker.

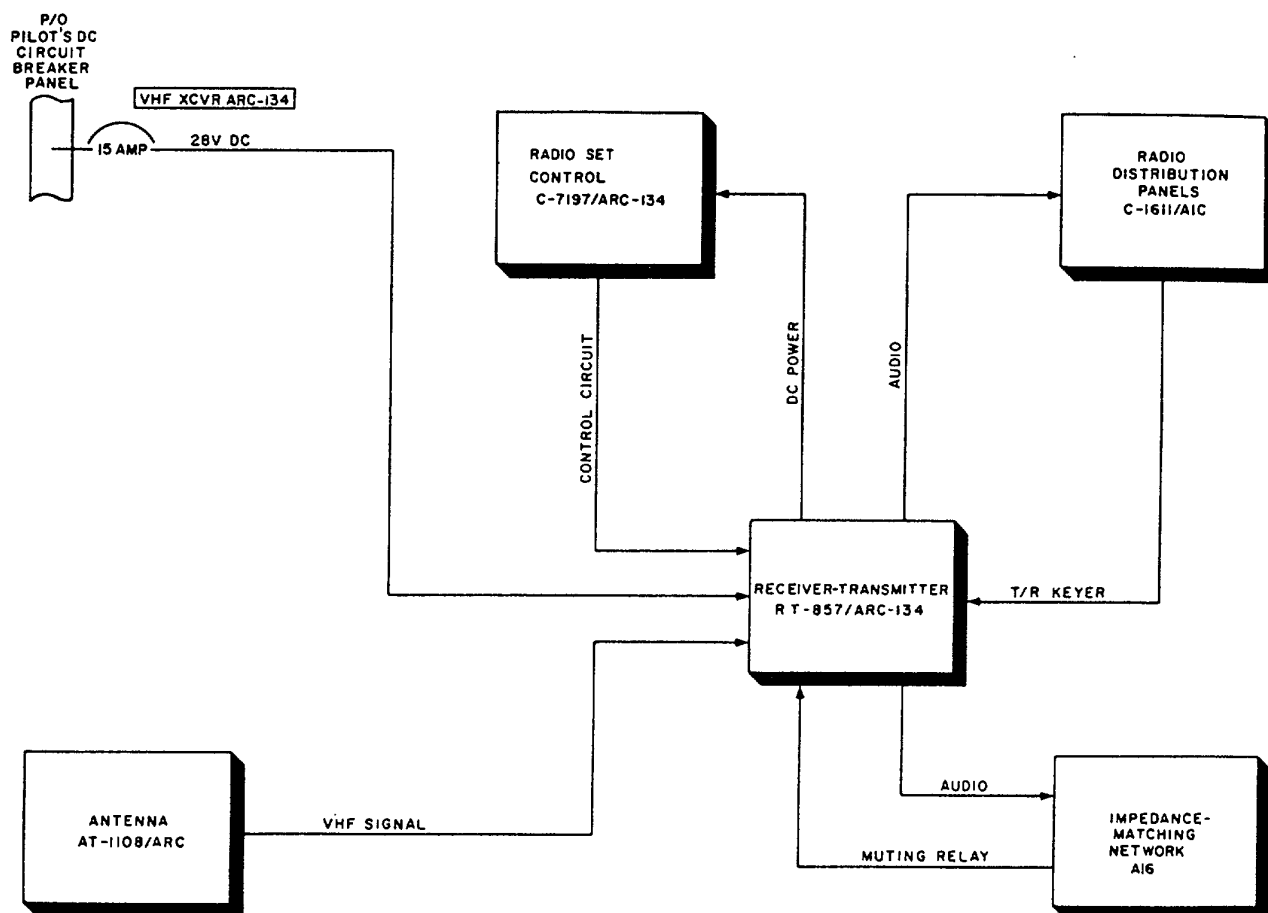
### 1-20. VHF COMMAND RADIO SET AN/ARC-73



- Provides two-way, amplitude-modulated voice communications.
- Frequency range of 116.00 to 151.95 MHz in 0.05-MHz steps.
- Control simultaneously tunes receiver and transmitter to selected frequency.
- External relay K28, controlled by C-4074/ARC-73A, applies power to receiver and transmitter.
- Primary +28 Vdc supplied through VHF XMTR ARC-73 and VHF RCVR ARC-73 circuit breakers.



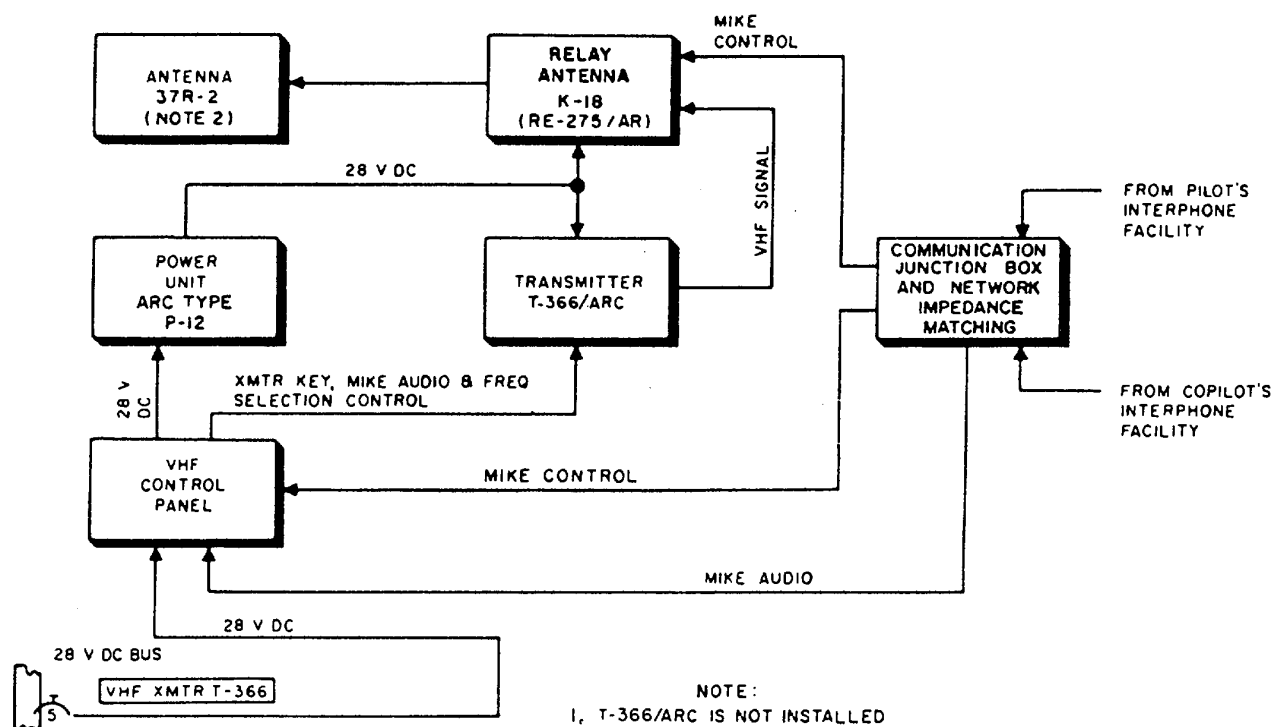
## 1-21. VHF COMMAND RADIO SET AN/ARC-134



- Provides two-way, amplitude-modulated voice communications.
- Frequency range 116.00 to 149.975 MHz in 0.025-MHz steps.
- Transmits and receives on same frequency using same antenna.
- Primary +28 Vdc supplied through VHF XCVR ARC-134 circuit breakers.



## 1-22. VHF EMERGENCY TRANSMITTER T-366(\*)/ARC



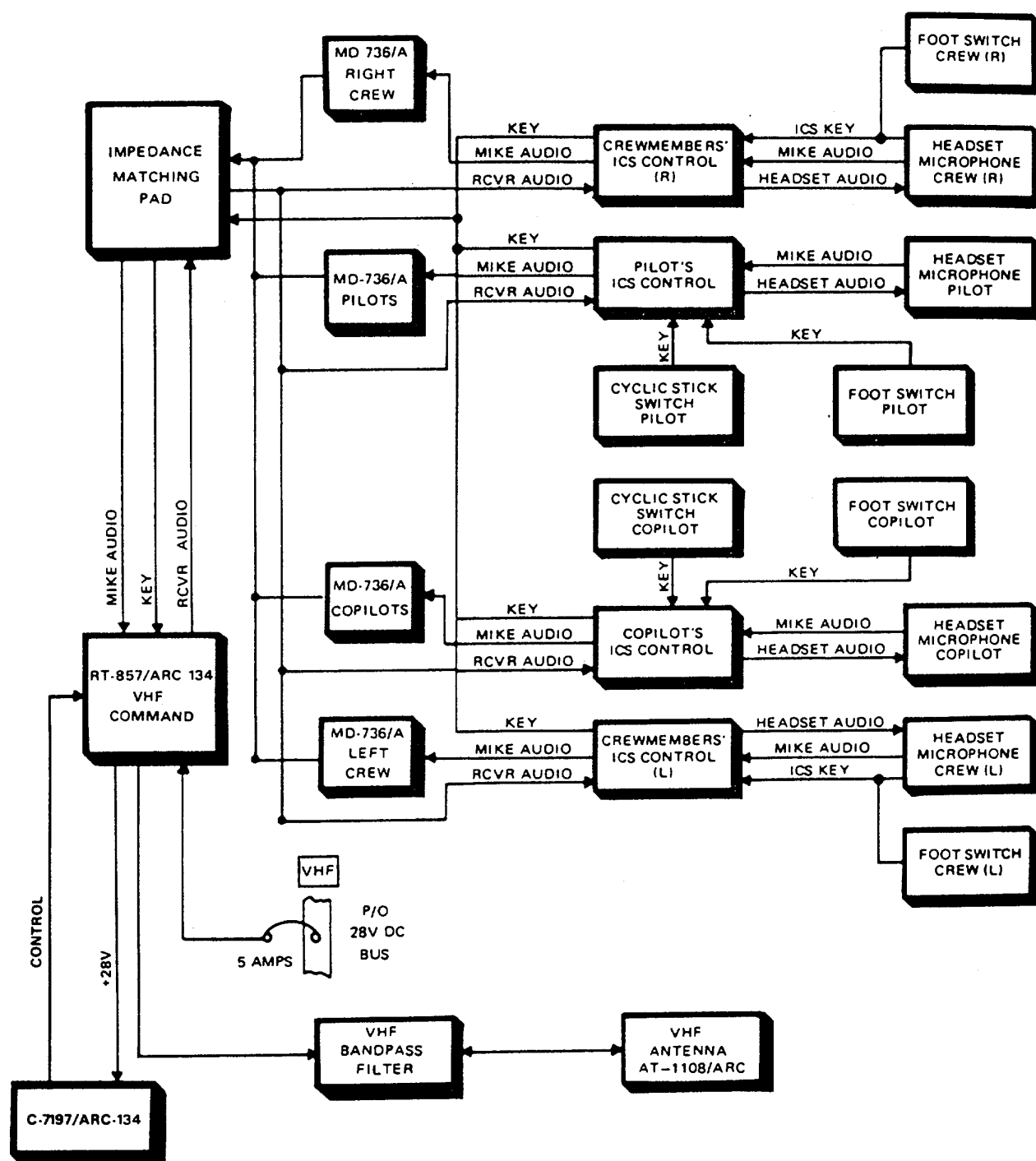
## NOTE:

1. T-366/ARC IS NOT INSTALLED ON CONFIGURATION D.
2. AT-1108/ARC VHF ANTENNA IS USED ON CONFIGURATIONS B, C, E AND F.

- Provides transmission of amplitude-modulated voice communications signals.
- Five-channel crystal controlled transmitter.
- Operates in 2 MHz band between 116.0 and 132.0 MHz.
- Primary +28 Vdc supplied through VHF XMTR T-366 circuit breaker.



## 1-23. VHF AM RADIO SET AN/ARC-115



NOTE: Audio Threshold System (Z20) replaces four MD-736/A's in UH-1 H installation.

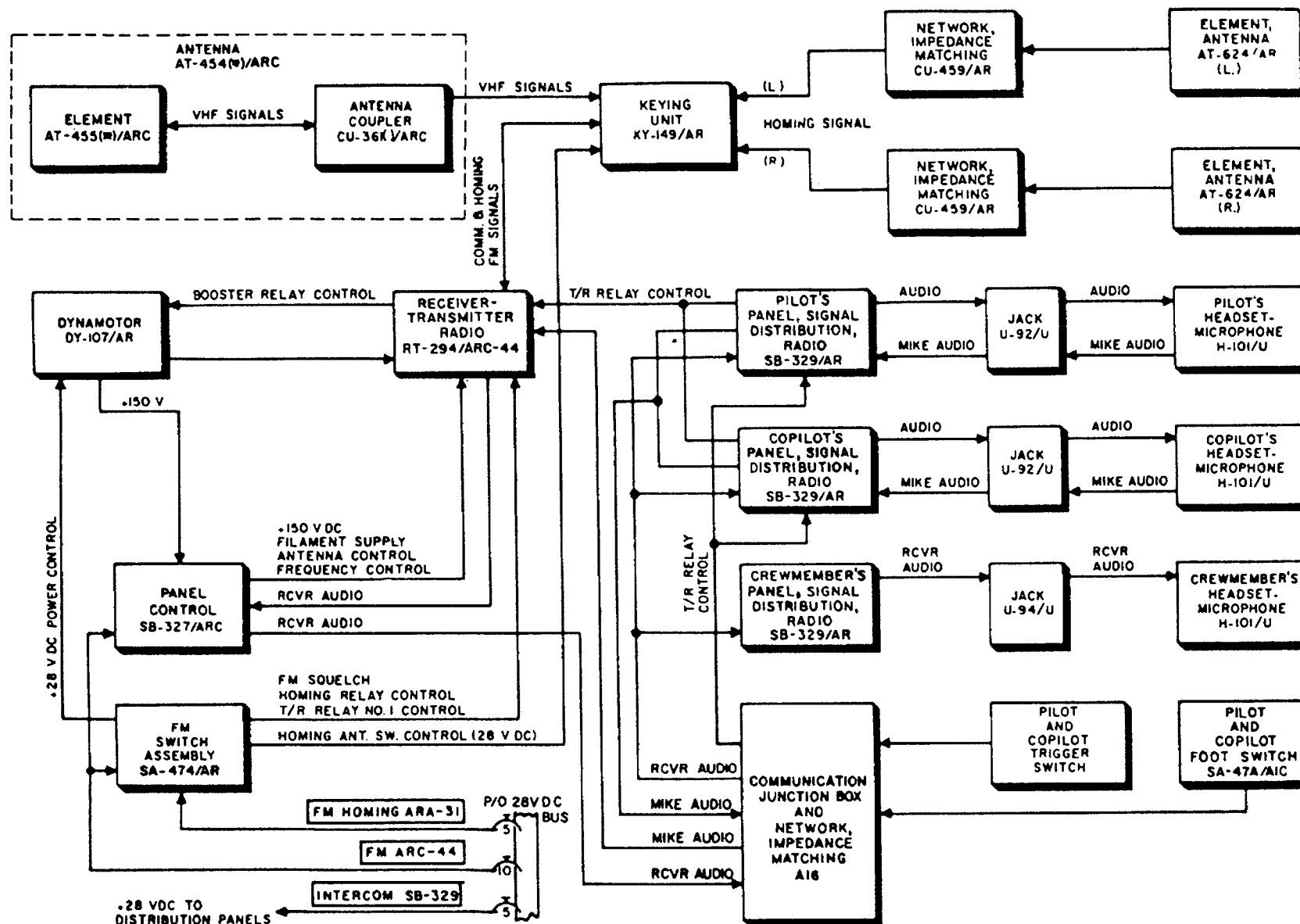


**1-23. VHF AM RADIO SET AN/ARC-115 - Continued**

- Provides two-way, amplitude-modulated voice communications.
- Frequency range 116.000 to 149.975 MHz in 0.025-MHz steps.
- Fixed-tuned guard receiver (119.0 to 124.0 MHz) included in set.
- Transmits and receives on same frequency using same antenna.
- Primary +28 Vdc supplied through VHF ARC-115 circuit breaker.



## 1-24. FM LIAISON NUMBER 1 AN/ARC-44



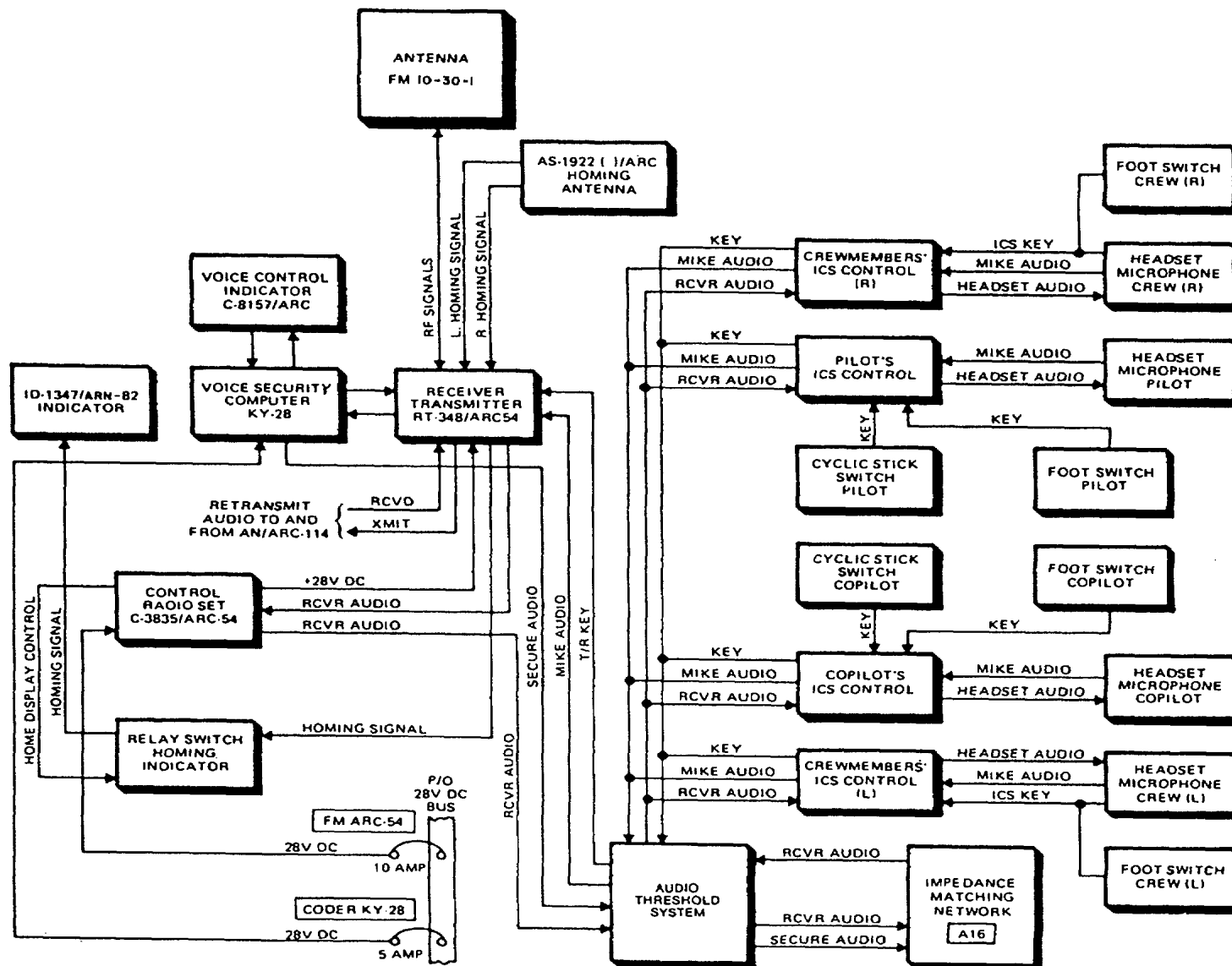


**1-24. FM LIAISON NUMBER 1 AN/ARC-44 - Continued**

- Provides two-way voice communications within helicopter (interphone).
- Provides two-way frequency-modulated voice communications (radio).
- Frequency range 24.0 to 51.9 MHz in 0.1-MHz steps.
- When used with Antenna Group AN/ARA-31 provides FM Homing data.
- FM Homing data displayed on ID-453/ARN-30.
- Transmits and receives on same frequency using same antenna.
- Primary +28 Vdc supplied through FM ARC-44, FM HOMING ARA-31 and INTERCOM SB-329 circuit breaker.



## 1-25. FM LIAISON NUMBER 1 AN/ARC-54 OR AN/ARC-131





**1-25. FM LIAISON NUMBER 1 AN/ARC-54 OR AN/ARC-131 - Continued****NOTE**

Radio Sets AN/ARC-54 and AN/ARC-131 are physically and functionally interchangeable. Either may be installed, but not both.

- Provides two-way, frequency-modulated voice communications.
- Provides FM Homing data.
- When operated with Voice Security Computer TSEC/KY-28 or TSEC/KY-58 provides secure two-way communications.
- Two external relays K53 and K54 transfer homing data to indicator.

**1-25.1 Installation Differences.**

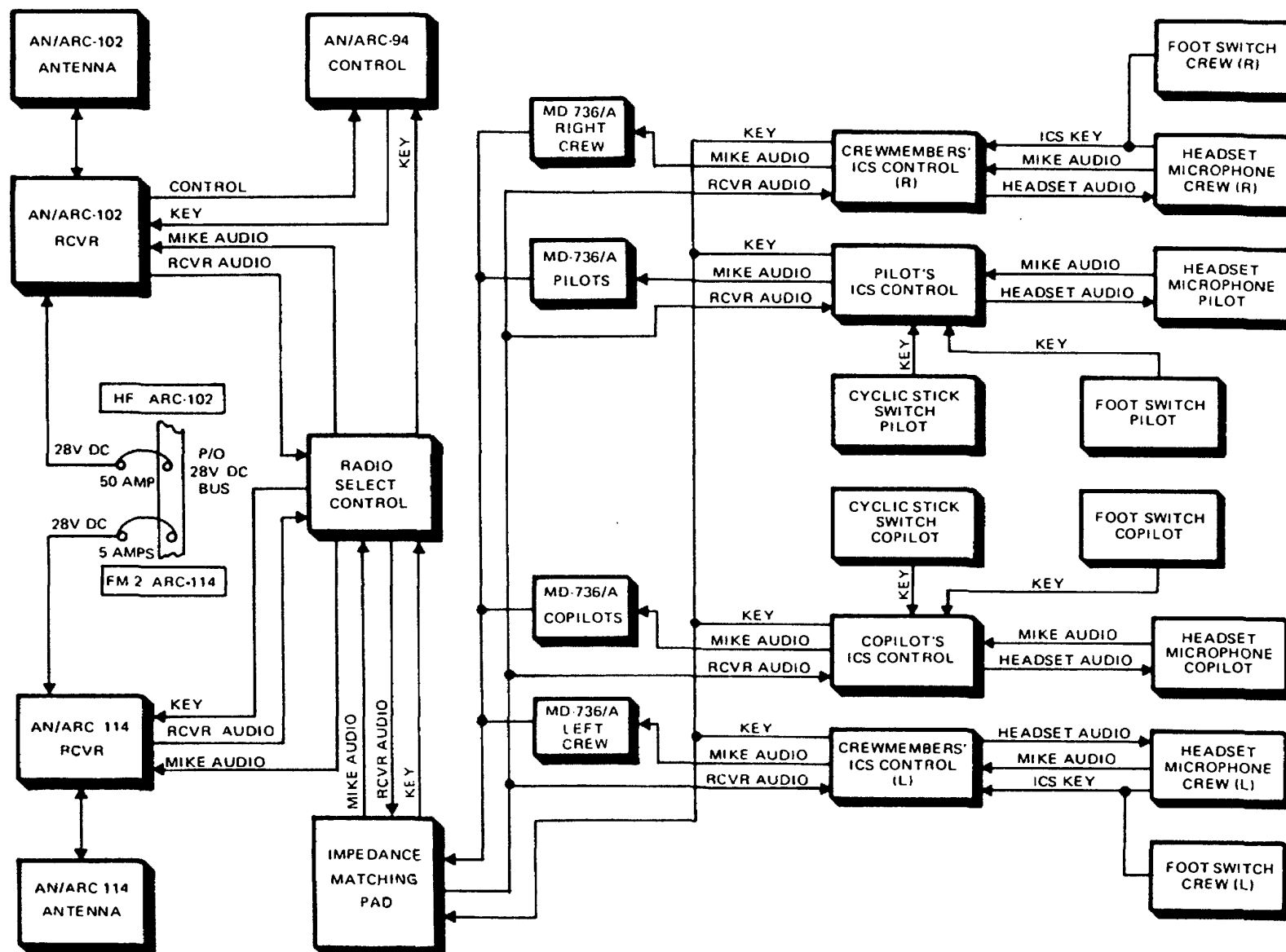
- A** Radio Set AN/ARC-54 frequency range is 30.00 to 69.95 MHz in 0.05-MHz steps, crystal controlled: AN/ARC-131 frequency range is 30.00 to 75.95 MHz in 0.05-MHz steps.
- B** Retransmit capability, if provided, is in conjunction with AN/ARC-114 installed as FM Liaison Number 2.
- C** Provisions for secure voice may be either TSEC/KY-28 or TSEC/KY-58.
- D** Communications antenna:
  - UH-1 D/H configuration D uses CU-942/ARC and AT-765/ARC.
  - UH-1 D/H configurations C and F through I use CU-942/ARC and AS-1703/ARC.
  - UH-1 H uses FM 10-30-1.
- E** Homing antenna 637A-2 is used for UH-1 D/H, AS-1922/ARC is used for UH-1 H.
- F** Homing data is displayed on ID-453/ARN-30 in UH-1 D/H configurations C, D and E or ID-1 347/ARN-82 in UH-1 D/H configurations F through J and UH-1 H.
- G** Audio Threshold System (Z20) is used in UH-1 H, four Discrete Signal Discriminators MD736/A are used in UH-1 D/H.

**1-26. VOICE SECURITY EQUIPMENT TSEC/KY-28 OR TSEC/KY-58**

- Provides secure two-way voice communications in tactical environments; they operate with FM Liaison Number 1.
- TSEC/KY-58 replaces TSEC/KY-28 but encoded data from one cannot be decoded by the other.
- TSEC/KY-58 has a battery installed to retain keying information when helicopter power is removed.
- TSEC/KY-28 is filled (keyed) using KYK-28/TSEC or KYK-38/TSEC.
- TSEC/KY-58 is filled (keyed) using KYK-13/TSEC Electronic Transfer Device or KOI-18/TSEC General Purpose Tape Reader.
- More detailed descriptions of the equipment are classified.



## 1-27. FM LIAISON NUMBER 2 AN/ARC-114





**1-27. FM LIAISON NUMBER 2 AN/ARC-114 - Continued**

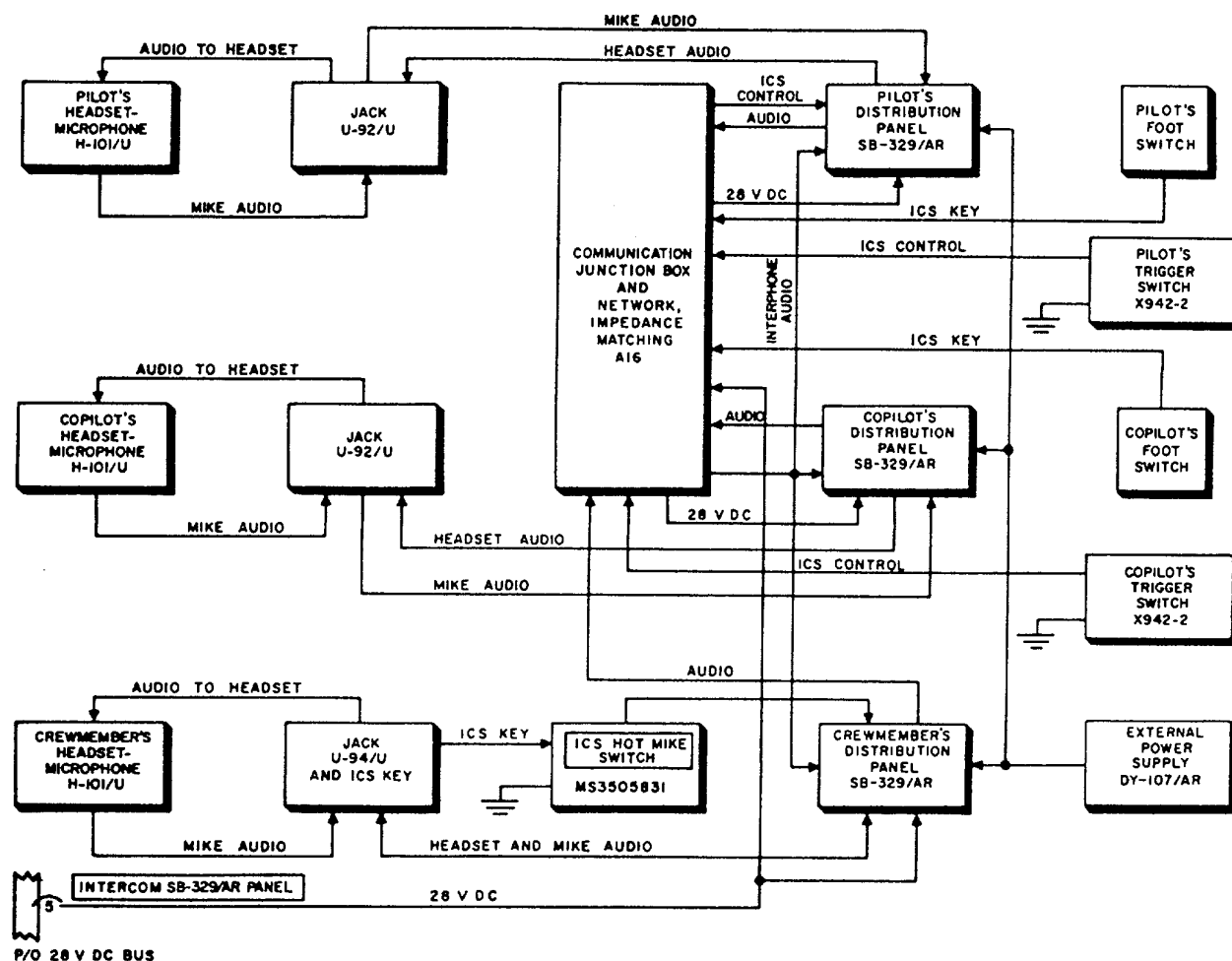
- Complete provisions for operating a second FM set in clear voice mode.
- Complete provisions for operating in retransmission (relay) mode in conjunction with AN/ARC-54 or AN/ARC-131 (FM Number 1).
- Frequency range 30.00 to 75.95 MHz in 0.05-MHz steps.
- Fixed-tuned guard receiver (40.0 to 41.0 MHz) included in set.
- Transmits and receives on same frequency using same antenna.
- Primary +28 Vdc supplied through FM 2 ARC-114 circuit breaker.

**1-27.1 Installation Differences.**

- A** UH-1 D/H uses Antenna FM 10-30-1, UH-1 H uses Antenna AS-1703/ARC and Coupler CU-942/ARC.
- B** Radio select control is not used in UH-1 H.
- C** The four discriminators MD-736/A used in UH-1 D/H are replaced by Audio Threshold System (Z20) in UH-1 H.



## 1-28. SIGNAL DISTRIBUTION PANEL SB-329/AR



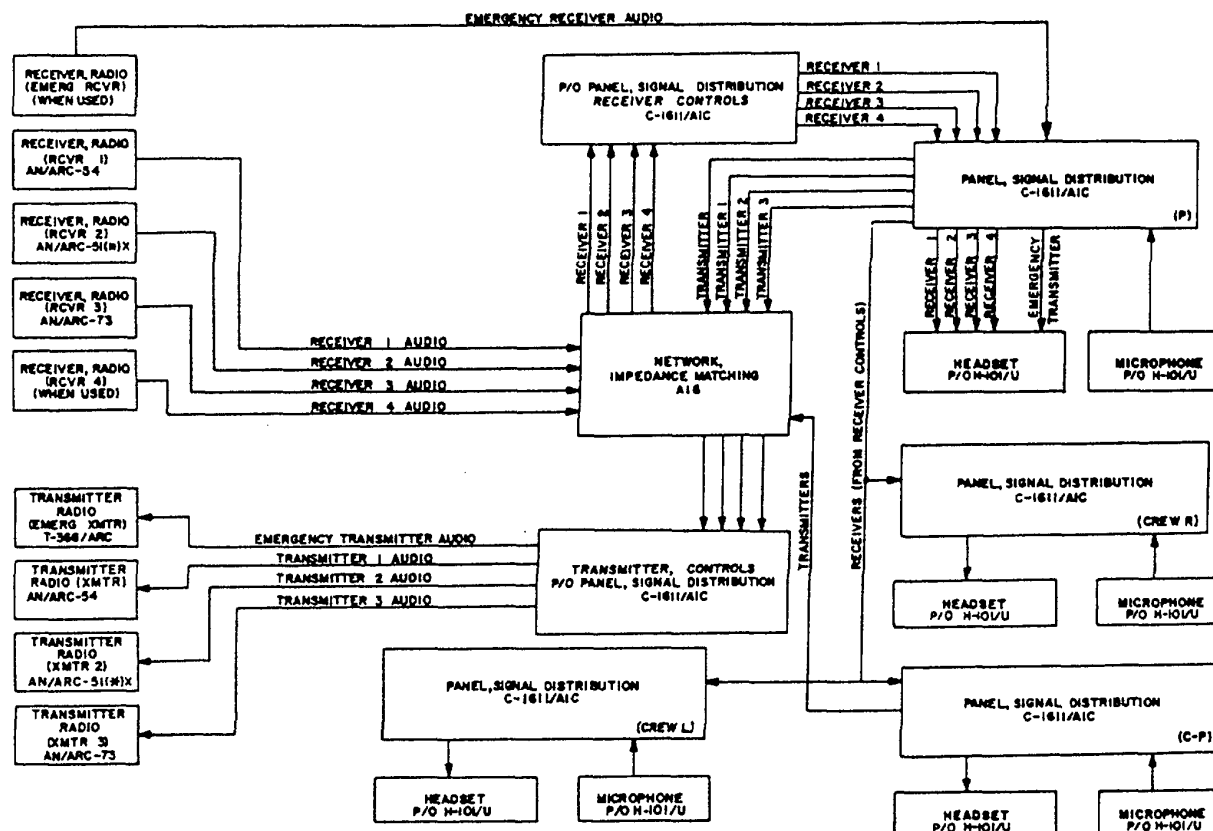
- Provides communications between crewmembers of helicopter (intercom).
- Rotary switch connects headset and microphone to interphone line or one of three communications receiver-transmitters.
- Pilot and copilot trigger switches (cyclic stick) keying control signal for intercom or radio.
- Pilot and copilot foot switches provide keying of intercom.
- Five toggle switches permit connection of audio from communications and/or navigation receivers to headset in addition to rotary switch selection.
- Intercom signals are received regardless of rotary or toggle switch position.
- Primary +28 Vdc supplied through INTERCOM SB-329/AR PANEL circuit breaker.



## 1-28. SIGNAL DISTRIBUTION PANEL SB-329/AR-Continued

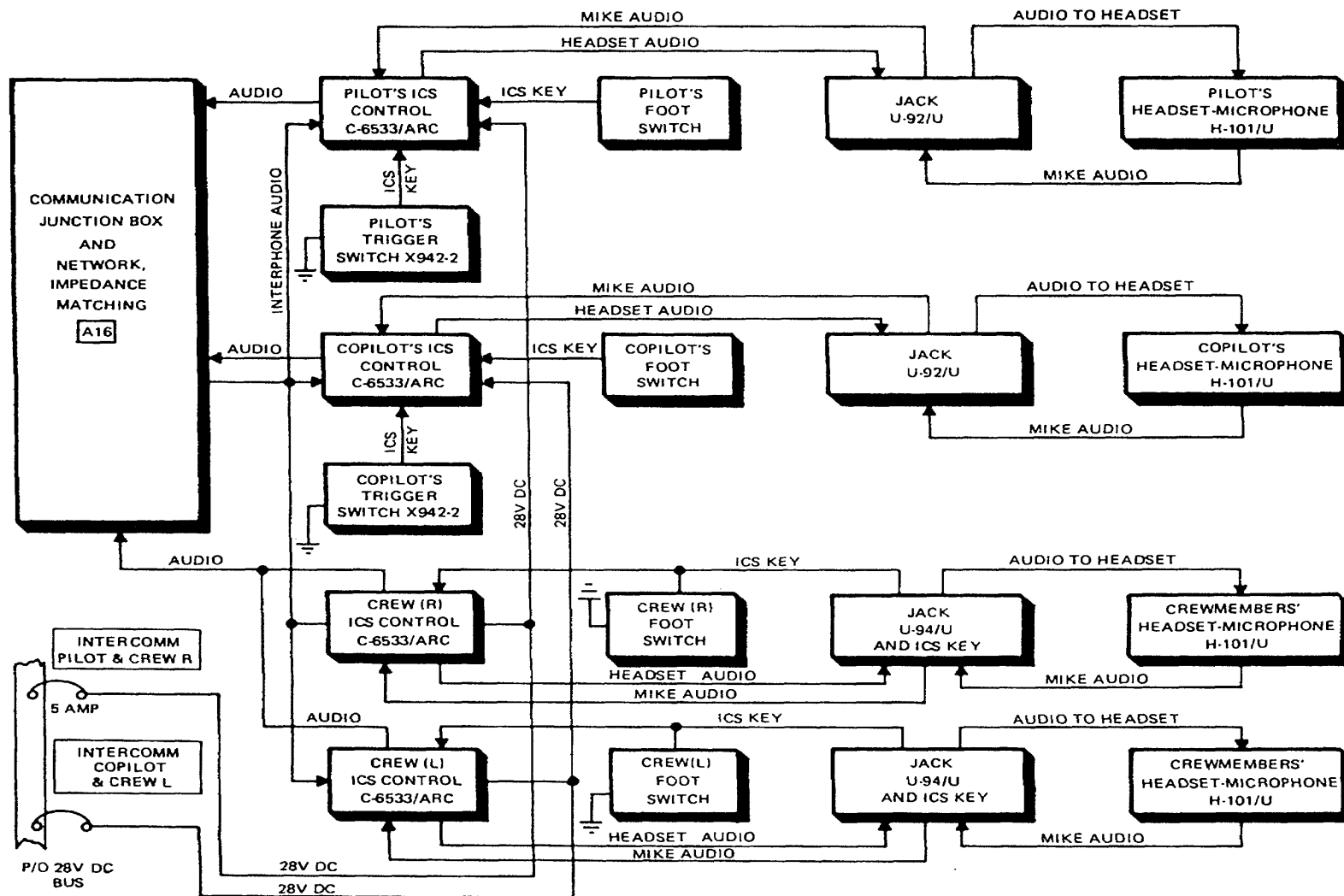
- Additional power required for operation supplied by DY-107/AR.
- Primary +28 Vdc for DY-1 07 supplied through FM ARC-44 circuit breaker.

## 1-29. INTERCOMMUNICATIONS SET CONTROL C-1611/AIC



- Provides communications between crewmembers of helicopter (intercom).
- Rotary switch connects headset and microphone to intercom, private intercom or one of four communications receiver-transmitters.
- Six toggle switches permit connection of audio from intercom, communications and/or navigation receivers to headset in addition to rotary switch selection.
- Keying can be accomplished using either cyclic stick switch or foot switch at pilot and copilot stations, or hot mike or foot switch at crewmember stations.
- HOT MIKE switch and first detent of cyclic stick switch circuit configuration is such that microphone audio is fed to intercom circuits regardless of rotary switch position.
- Each C-1611 (\*)/AIC contains a microphone preamplifier with automatic gain control (agc), feedback signal line control, microphone power amplifier, headset amplifier and power filter.
- +28 Vdc is the only power required for operation. Power is supplied through INTERCOM-CPLT & CREW-L and INTERCOM PILOT & CREW-R circuit breakers.





1-30. INTERCOMMUNICATIONS SET CONTROL C-6533/ARC

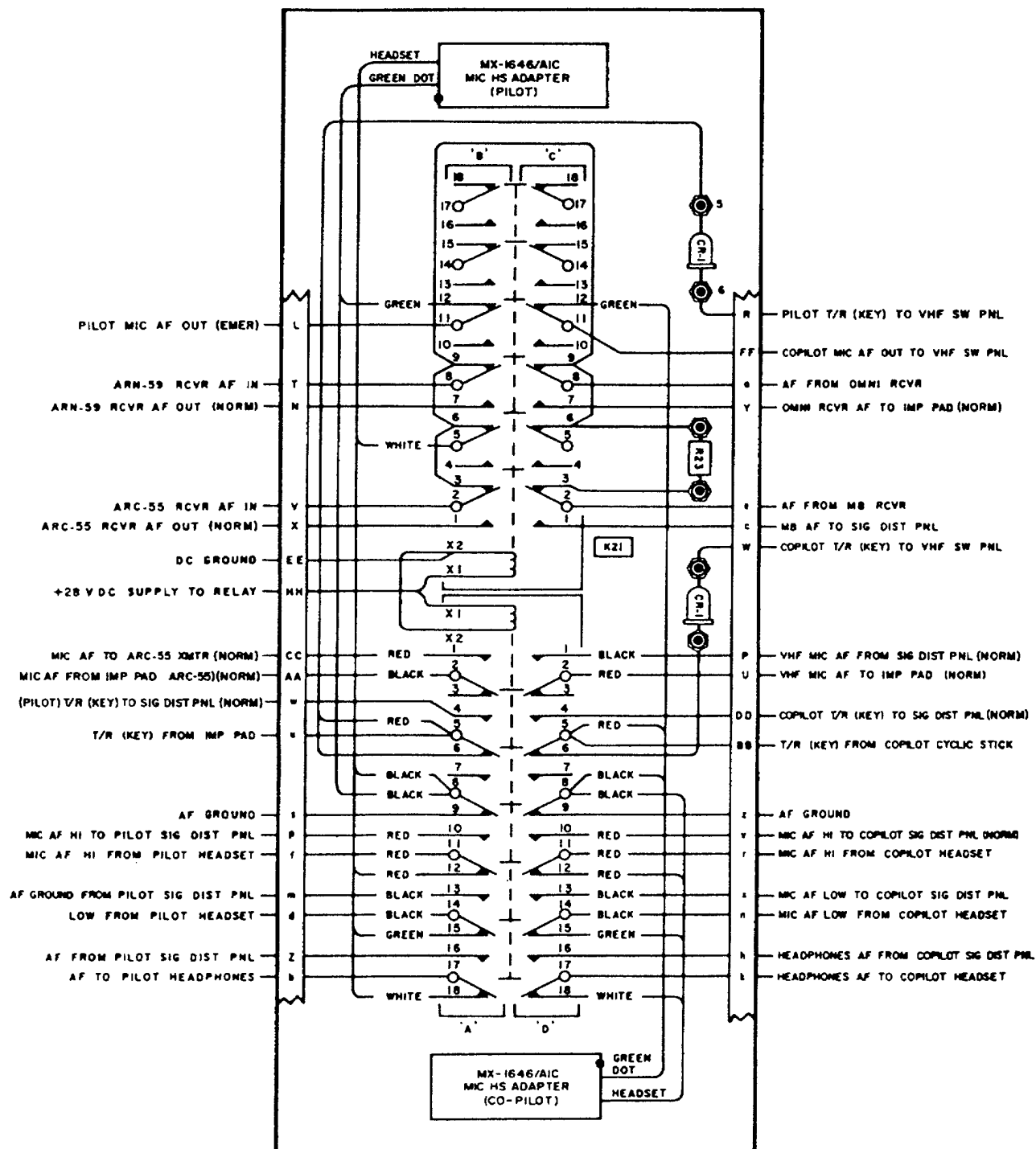


**1-30. INTERCOMMUNICATIONS SET CONTROL C-6533/ARC-Continued**

- Provides communications between crewmembers of helicopter (intercom).
- Rotary switch connects headset and microphone to intercom or one of five communications receiver-transmitters.
- Seven toggle switches permit connection of audio from communications and/or navigation receivers in addition to rotary switch selection.
- Keying can be accomplished using cyclic stick switch at pilot or copilot stations or foot switch at all stations.
- HOT MIKE switch permits hand free intercommunications from any station regardless of rotary switch selection.
- +28 Vdc is the only power required for operation. Power is supplied through INTERCOMM PILOT & CREW R and INTERCOMM COPILOT & CREW L circuit breakers.



## 1-31. AUXILIARY SIGNAL DISTRIBUTION BOX

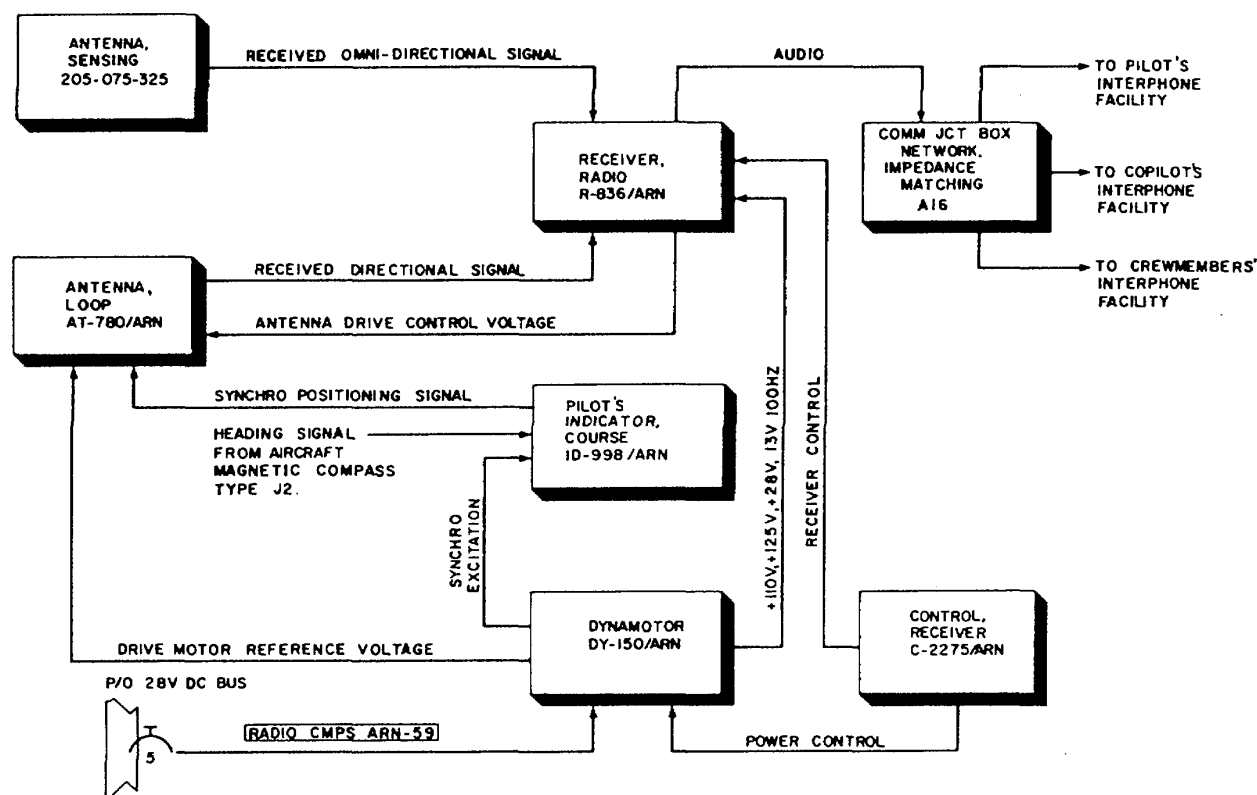




### 1-31. AUXILIARY SIGNAL DISTRIBUTION BOX- Continued

- Permits communications on UHF Command Radio Set and monitoring of navigation receivers by pilot and copilot if SB-329/AR panels fail.
- Power to energize relay K21 supplied by Dynamotor DY-107/AR.

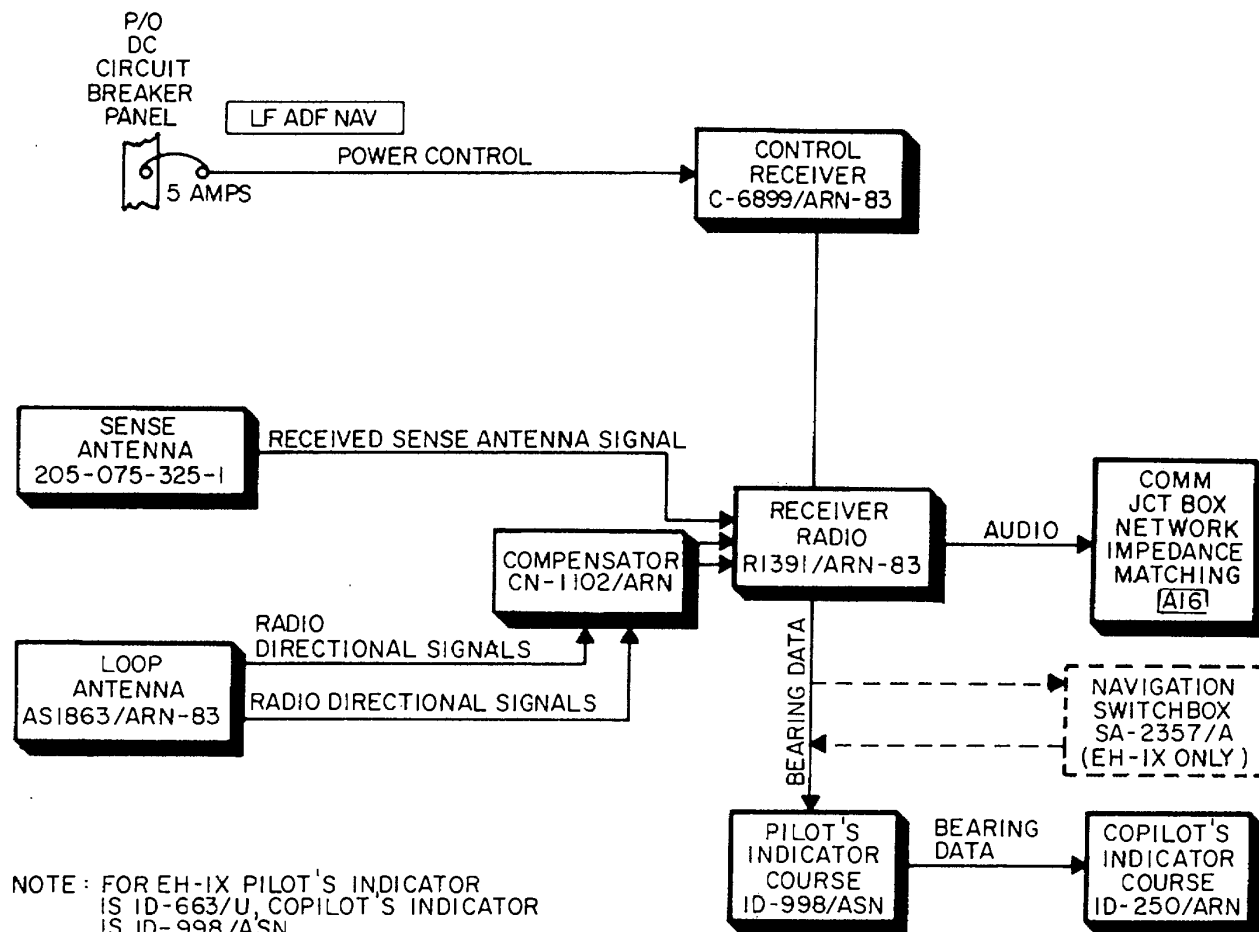
### 1-32. DIRECTION FINDING SET AN/ARN-59



- Provides, automatically, direction to a transmitting station.
- Frequency range of 190 to 1750 kHz in three bands: 190 to 400 kHz, 400 to 840 kHz, and 840 to 1750 kHz.
- Can be operated manually using just the loop antenna for aural null direction finding.
- Can be operated manually using just the sense antenna for reception of range or broadcast stations.
- Primary +28 Vdc supplied through LF NAV ADF circuit breaker.
- Additional power required for operation supplied by Dynamotor DY-1 50/ARN.



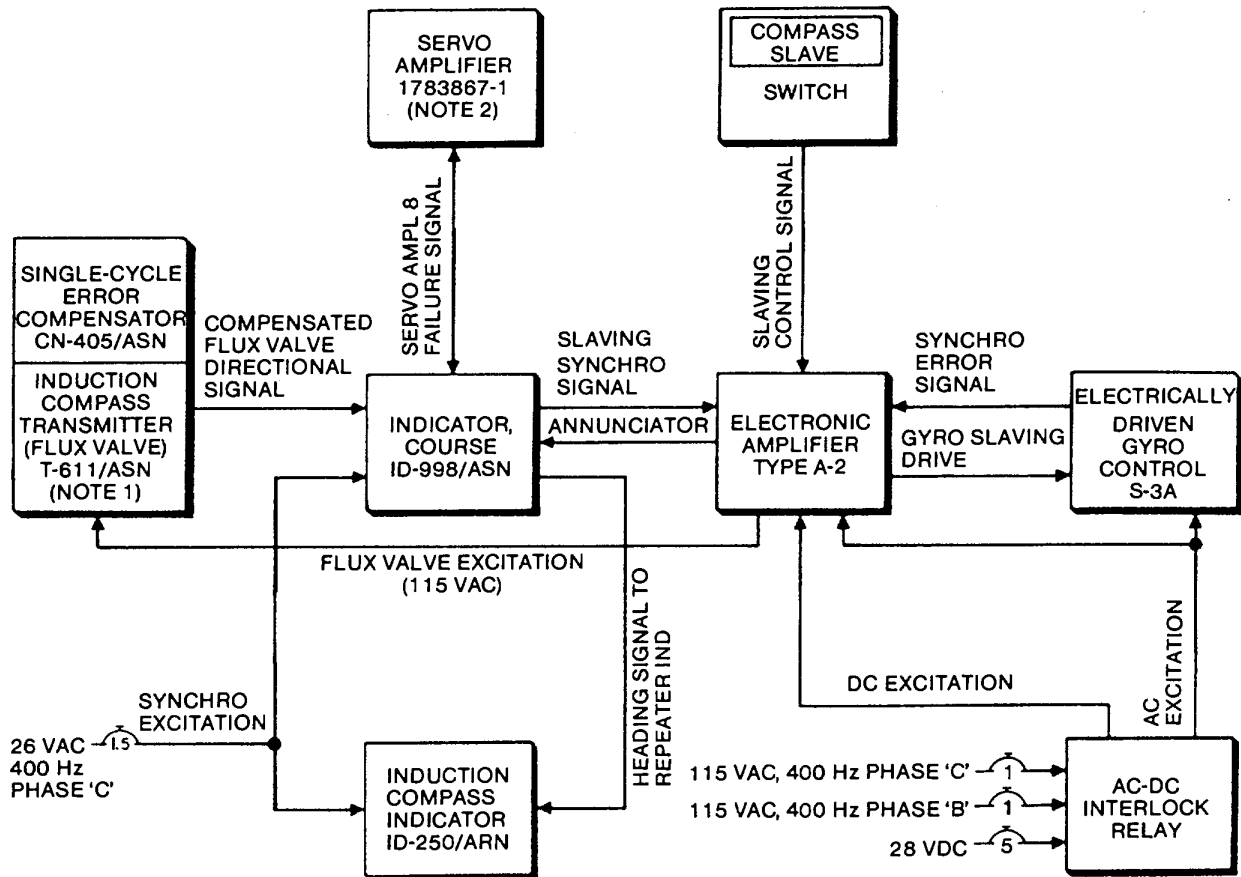
## 1-33. DIRECTION FINDING SET AN/ARN-83



- Provides, automatically, direction to a transmitting station.
- Frequency range of 190 to 1750 kHz in three bands; 190 to 400 kHz, 400 to 840 kHz and 840 to 1 750 kHz.
- Can be operated manually using just loop antenna for aural null direction finding.
- Can be operated using just sense antenna for reception of range or broadcast stations.
- Primary +28 Vdc supplied through LF NAV ADF circuit breaker.



# 1-34. MAGNETIC COMPASS SYSTEM TYPE J2



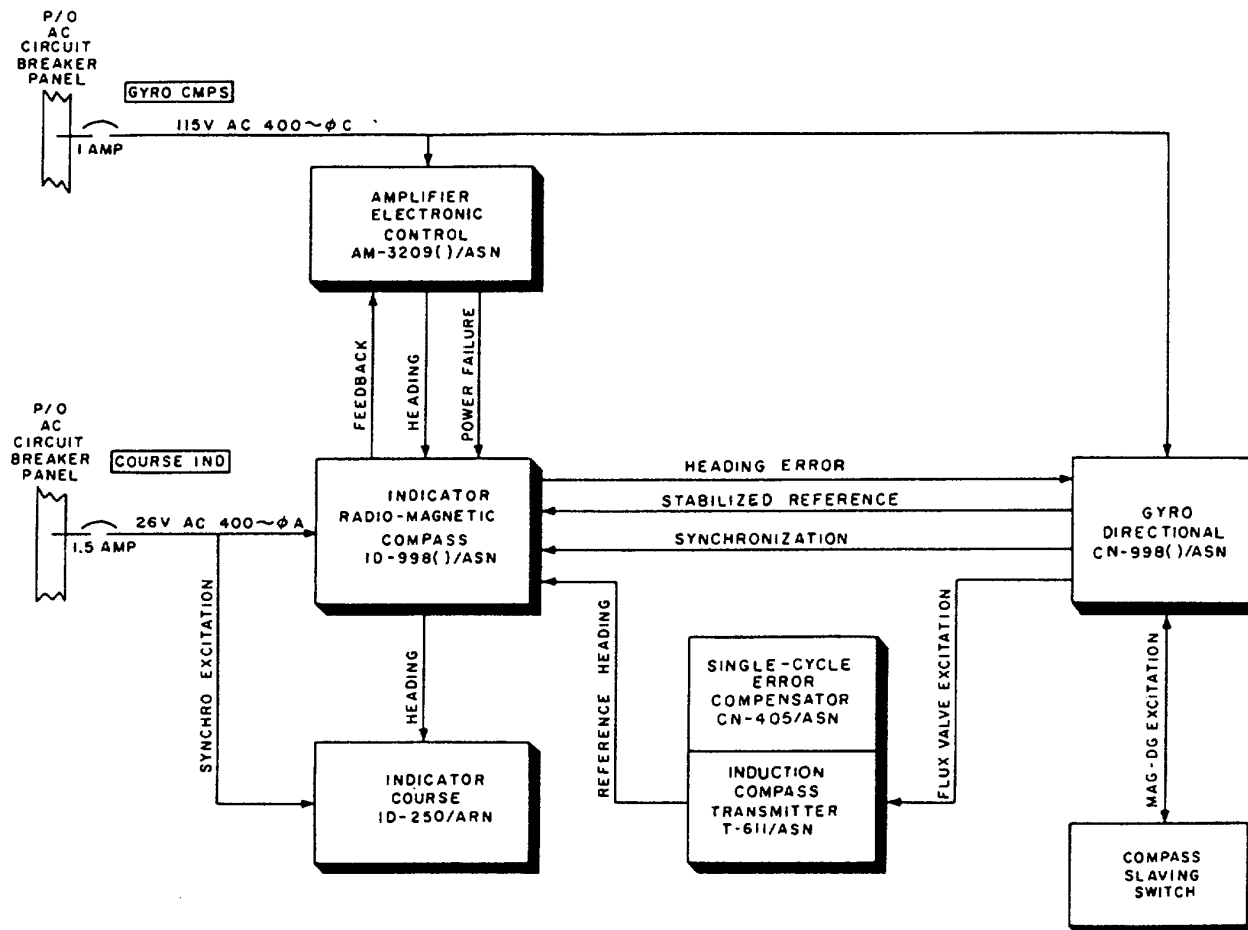
## NOTES:

1. CONFIGURATIONS A AND B USE C-2 TRANSMITTER
2. SERVO AMPLIFIER 1783867-1 IS INTERCHANGEABLE WITH AMPLIFIER, ELECTRONIC CONTROL AM-3209 (\*) /ASN

- Provides magnetic compass indications (helicopter heading) that are stabilized by a gyro.
- Single-cycle error compensator reduces distortion caused by airframe, magnetic material or electrical equipment.
- With COMPASS SLAVE switch to IN, the electrically driven gyro is slaved to induction compass transmitter.
- With COMPASS SLAVE switch to OUT, heading is determined by electrically driven gyro only.
- Power requirements are:
  - +28 Vdc supplied through J2 CMPS IND circuit breaker.
  - 115 Vac, 400 Hz, Phase B supplied through J2 COMP circuit breaker.
  - 115 Vac, 400 Hz, Phase C supplied through J2 COMP circuit breaker.
  - 26 Vac, 400 Hz, supplied through COURSE IND circuit breaker.



## 1-35. GYROMAGNETIC COMPASS SET AN/ASN-43



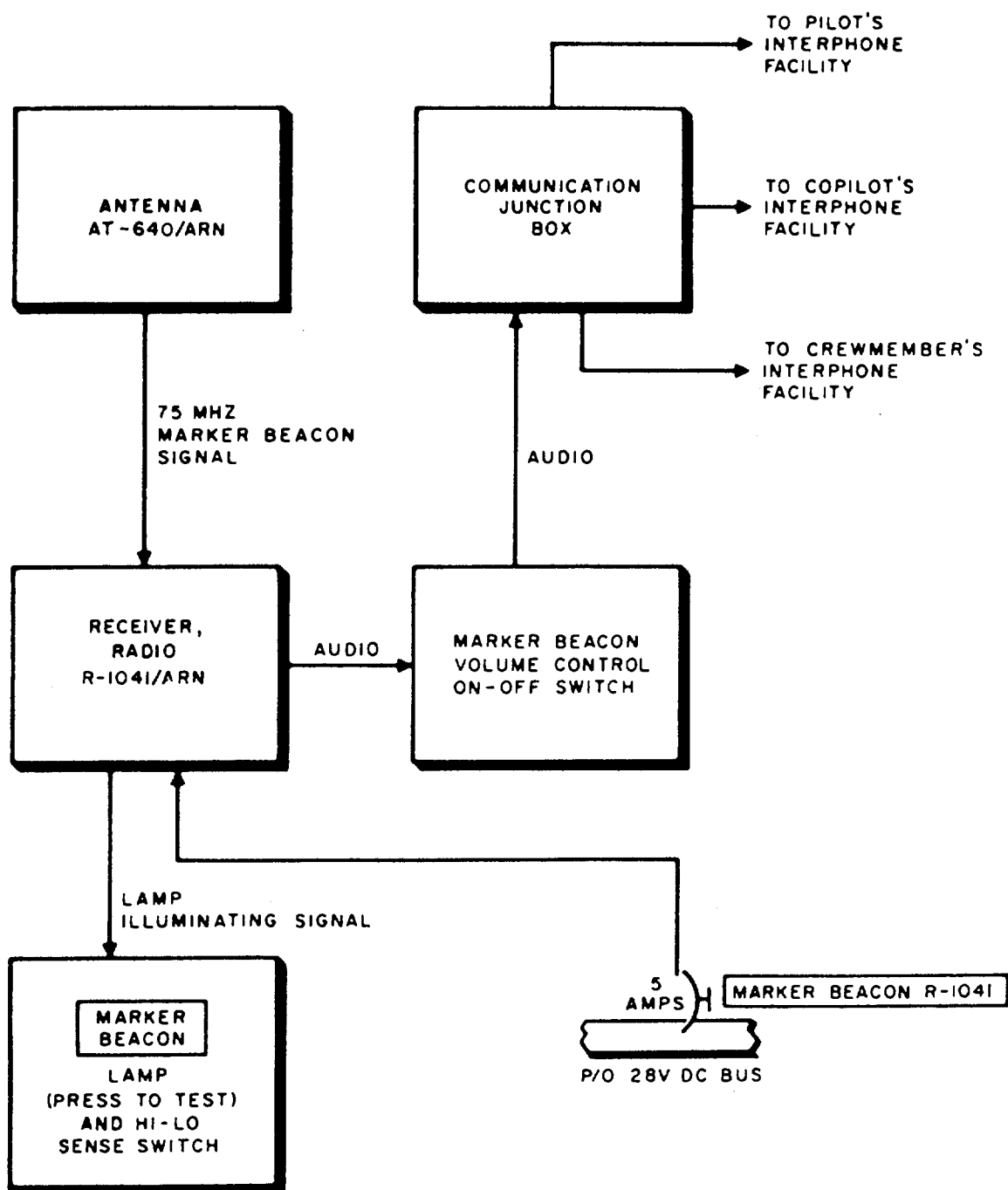
- Provides magnetic compass indications (helicopter heading) that are stabilized by a gyro.
- Single-cycle error compensator reduces distortion caused by airframe, magnetic material or electrical equipment.
- When compass slaving switch is in MAG, directional gyro is slaved to induction compass transmitter.
- When compass slaving switch is in DG, heading is determined by directional gyro only.
- Power requirements are:

115 Vac, 400 Hz Phase C supplied through GYRO CMPS circuit breaker.

26 Vac, 400 Hz Phase A supplied through COURSE IND circuit breaker.



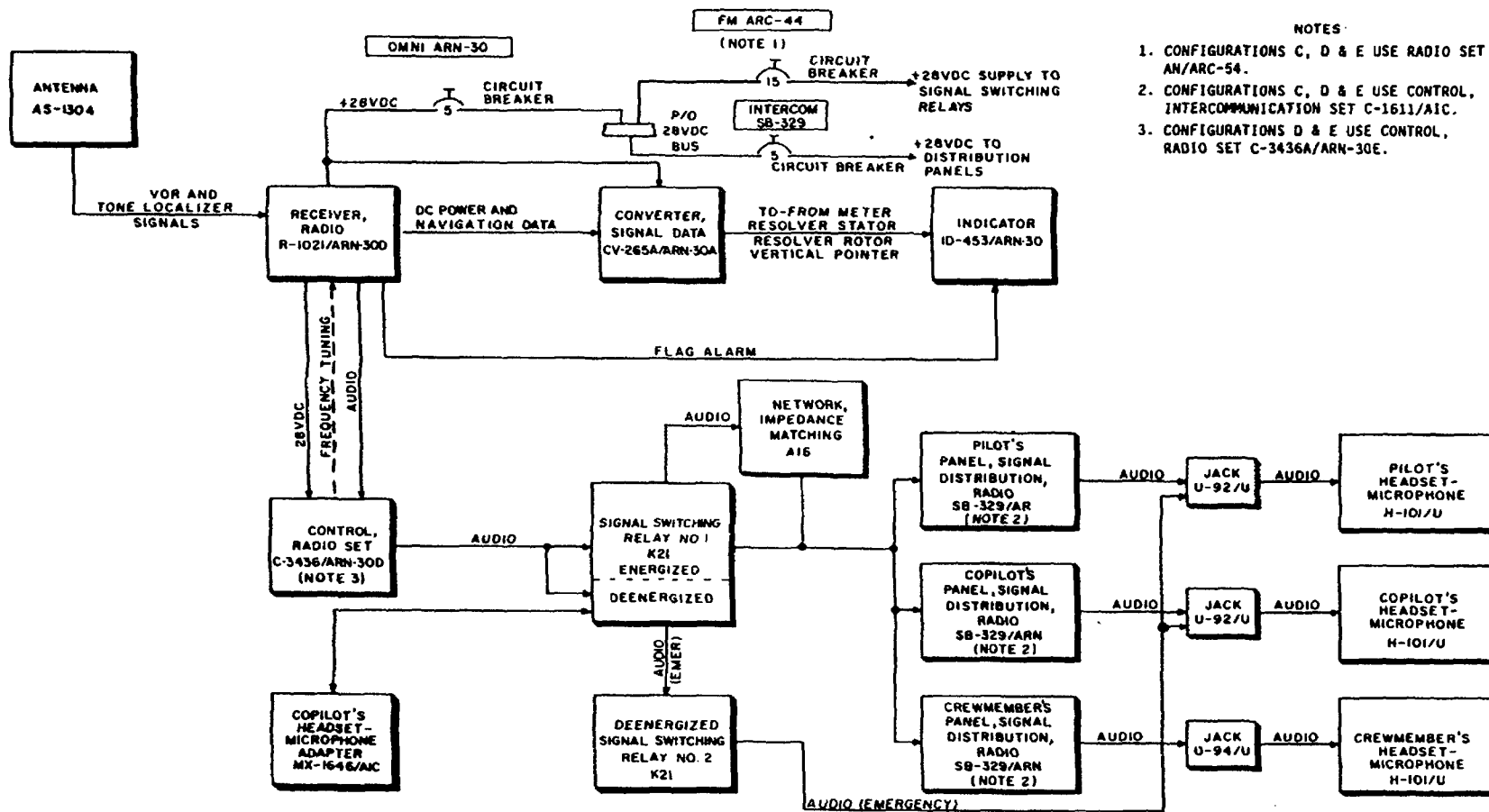
**1-36. MARKER BEACON RECEIVER R-1041 (\*) /ARN**



- Provides aural and visual indications when helicopter is in signal cone of transmitting station.
- Aural indication is tone (continuous or coded) heard in headset.
- Visual indication is lamp on instrument panel that lights at same rate and duration as aural tone.
- Primary +28 Vdc supplied through MARKER BEACON R-1 041 circuit breaker.



## 1-37. VHF NAVIGATION SET AN/ARN-30



## NOTES:

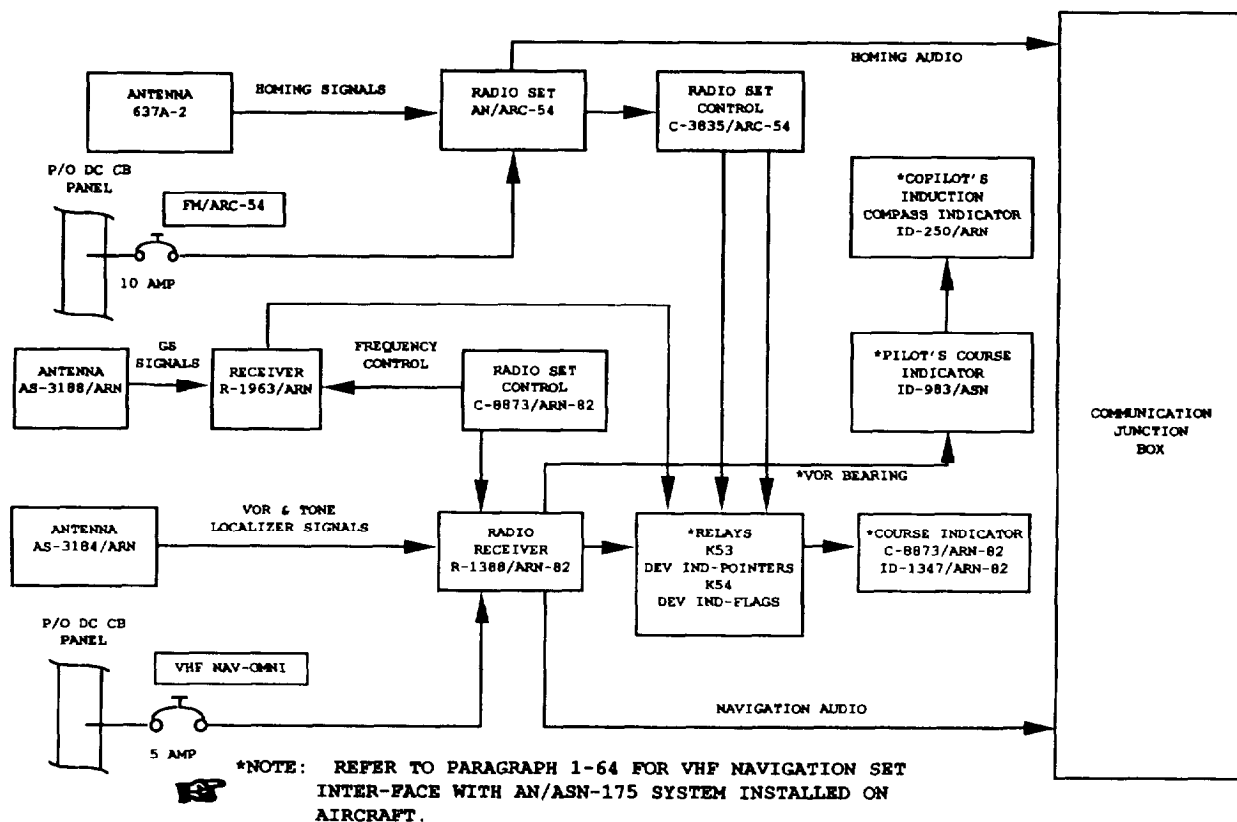
1. CONFIGURATIONS C, D & E USE RADIO SET AN/ARC-54.
2. CONFIGURATIONS C, D & E USE CONTROL, INTERCOMMUNICATION SET C-1611/AIC.
3. CONFIGURATIONS D & E USE CONTROL, RADIO SET C-3436A/ARN-30E.



### 1-37. VHF NAVIGATION SET AN/ARN-30 - Continued

- Provides visual navigation (course and/or track) information.
- Provides audio signal for identification of transmitting station.
- Frequency range 108.0 to 125.9 Mhz in 0.1 -MHz steps.
- Flag alarm signal causes OFF flag to appear in indicator if received signal is unreliable or no signal is received.
- When operating in FM Homing mode, ID-453/ARN-30 will display homing data.
- AN/ARN-30E is functionally the same as AN/ARN-30D but uses a control unit (C-3436A/ARN-30E) with additional capability of tuning an associated glideslope receiver (if installed).
- Primary +28 Vdc supplied through OMN I ARN-30 circuit breaker, remaining power requirements produced by PP-279/ARN-30 (mounted on receiver).

### 1-38. VHF NAVIGATION SET AN/ARN-82



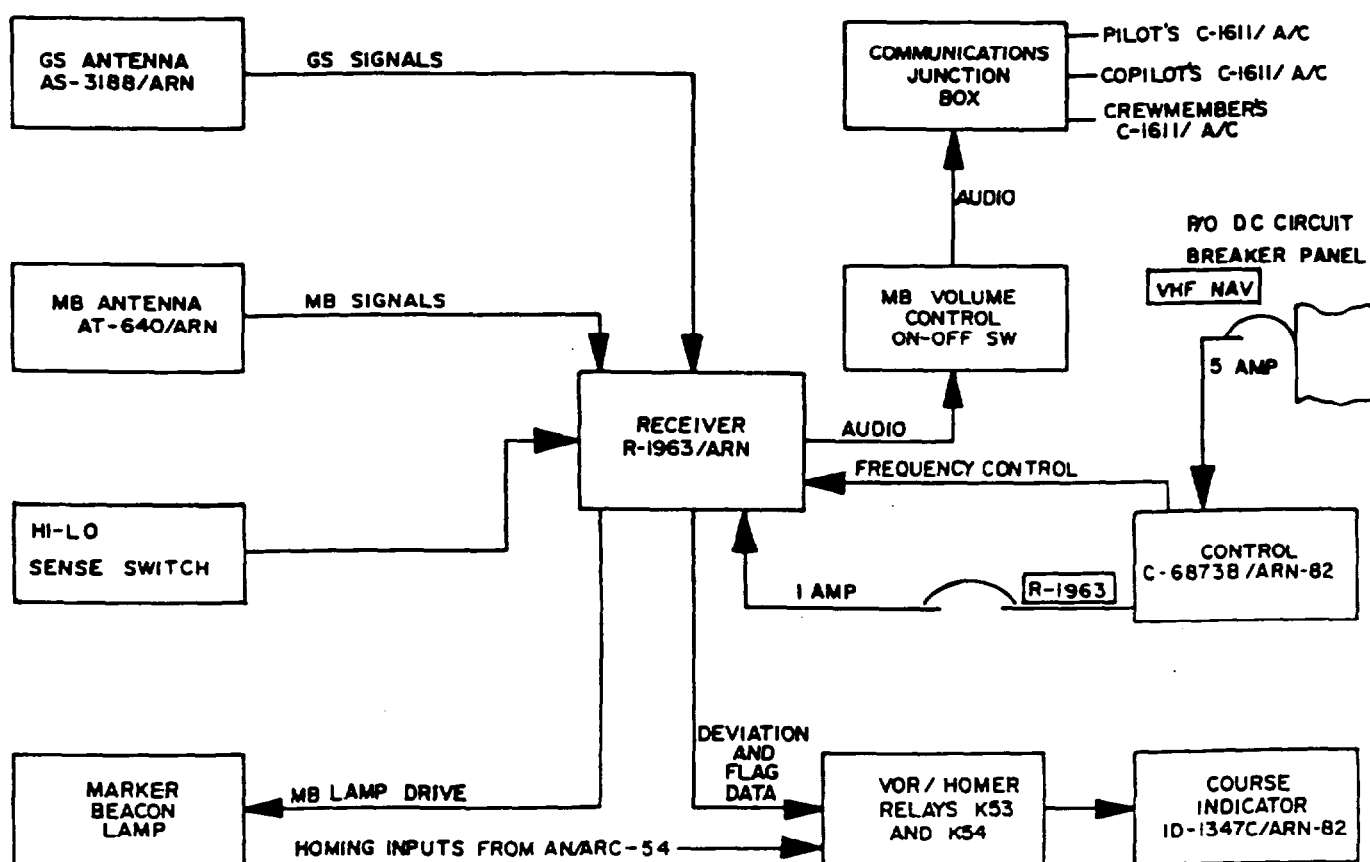
- Provides visual navigation (course and/or track) information.
- Provides audio signal for identification of transmitting station.
- Frequency range 108.00 to 126.95 Mhz in 0.05-MHz steps.



### 1-38. VHF NAVIGATION SET AN/ARN-82-Continued

- When FM Homing is activated, ID-1347/ARN-82 is automatically switched by KS3 and K54 to display homing inputs from AN/ARC-54.
- Controls marker beacon/glideslope when R-1963/ARN is installed.
- Primary +28 Vdc supplied through VHF NAV OMNI circuit breaker.

#### 1-38.1 Glideslope/Marker Beacon Receiver R-1963/ARN.



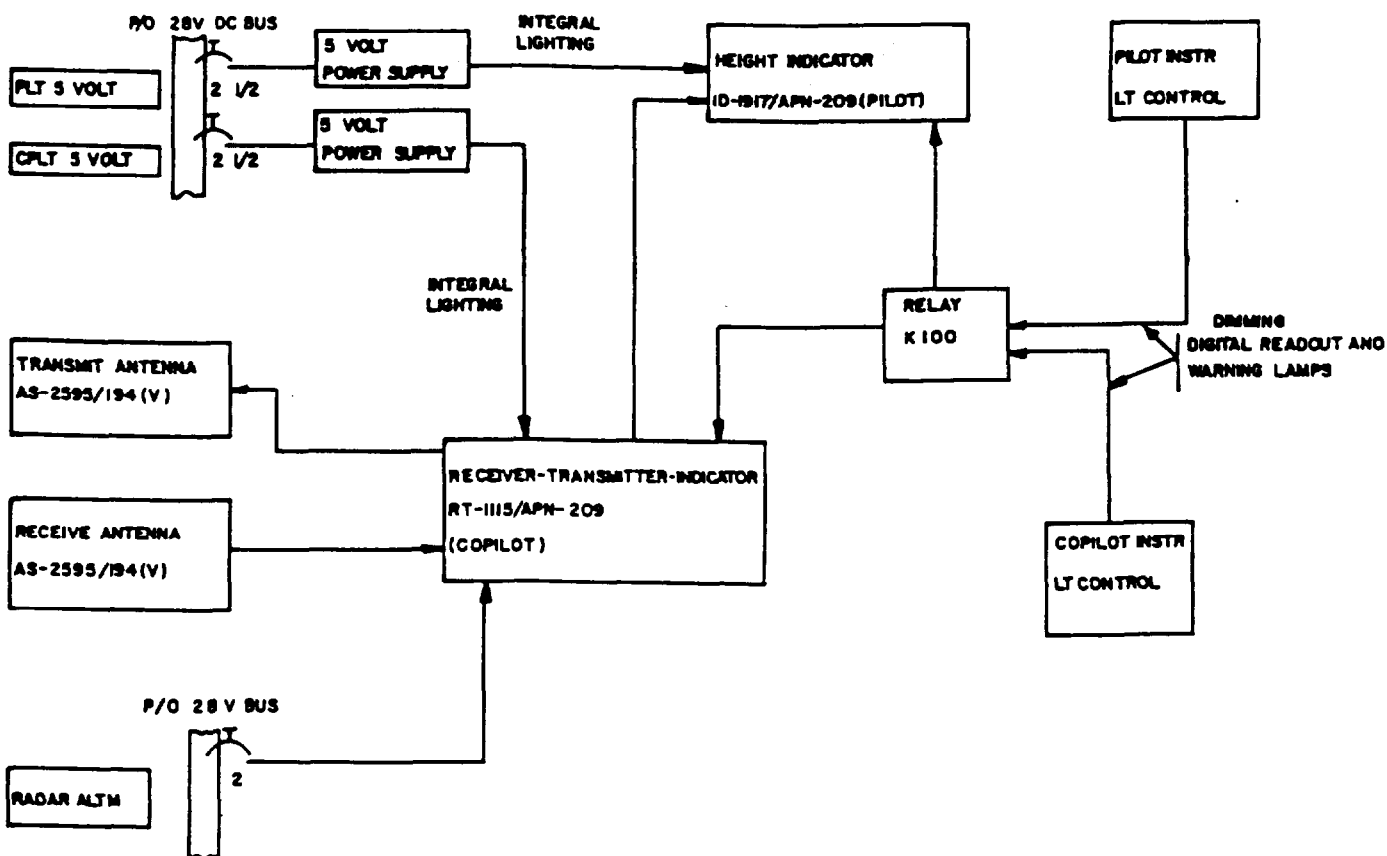
- Provides visual glideslope (above or below approach altitude) information.
- Provides aural and visual marker beacon information when helicopter is in signal cone of transmitting station.
- Aural indication is tone (continuous or coded) heard in headset.
- Visual indication is lamp on instrument panel that lights at same rate and duration as aural tone.
- Frequency range is 329.15 to 335.00 MHz in 0.15 MHz steps for glideslope section. Marker beacon section is fixed-tuned to 75 MHz.
- Controlled by C-6873B/ARN-82.
- Glideslope channel made in conjunction with VOR/ILS channel.



### 1-38.1 Glideslope/Marker Beacon Receiver R-1963/ARN.-Continued

- Glideslope audio is not connected to intercom.
- When FM Homing is activated, ID-1347/ARN-82 is automatically switched by relays K53 and K54 to display homing inputs from AN/ARC-54.
- Primary +28 Vdc supplied through MB/GS R-1963 circuit breaker.

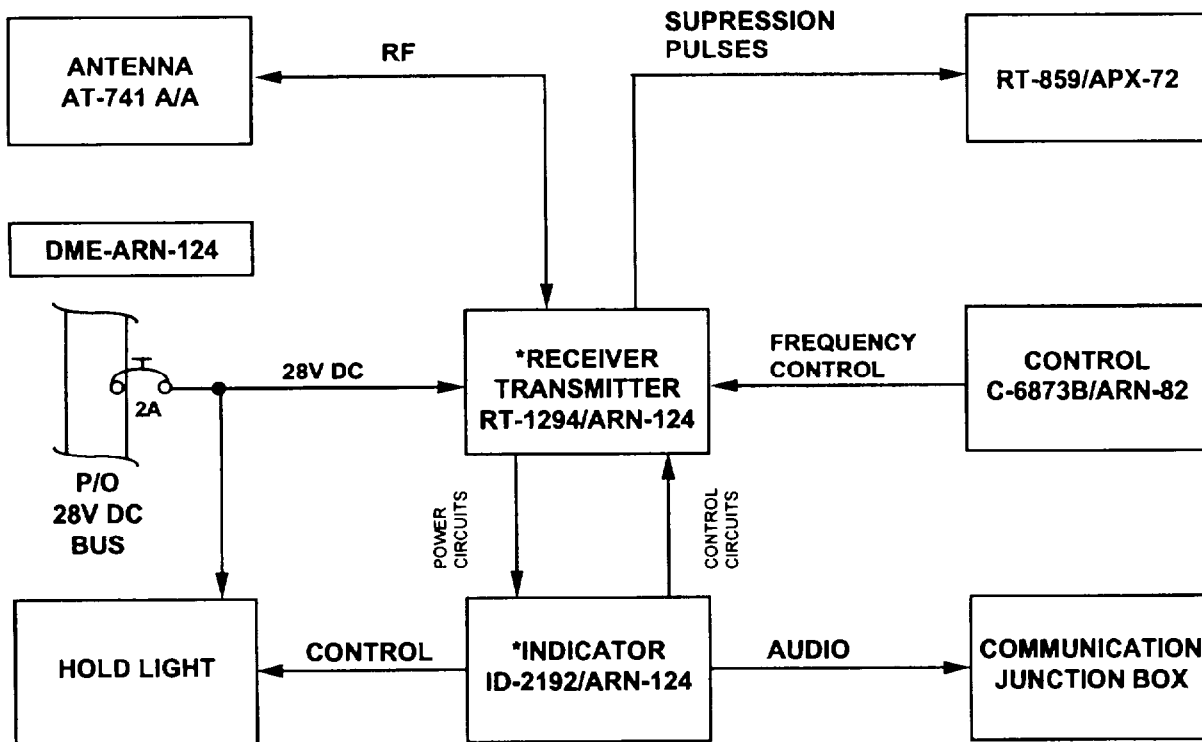
### 1-39. ELECTRONIC (RADAR) ALTIMETER AN/APN-209



- Provides indication of absolute height (altitude) above terrain from 1500 feet to touchdown.
- Incorporates a self-test feature.
- Indicators incorporate adjustable high and low altitude warning indexes.
- Respective HI or LO warning lamp lights if helicopter goes above or below selected altitude.
- Integral lighting of indicators provided by 5 Vdc power supplies: If 5 V power supply is set to OFF, 28 Vdc lighting is provided through instrument lighting controls.
- Primary +28 Vdc supplied through RADAR ALTM APN-209 circuit breaker.



1-40. DISTANCE MEASURING EQUIPMENT (DME) AN/ARN-124

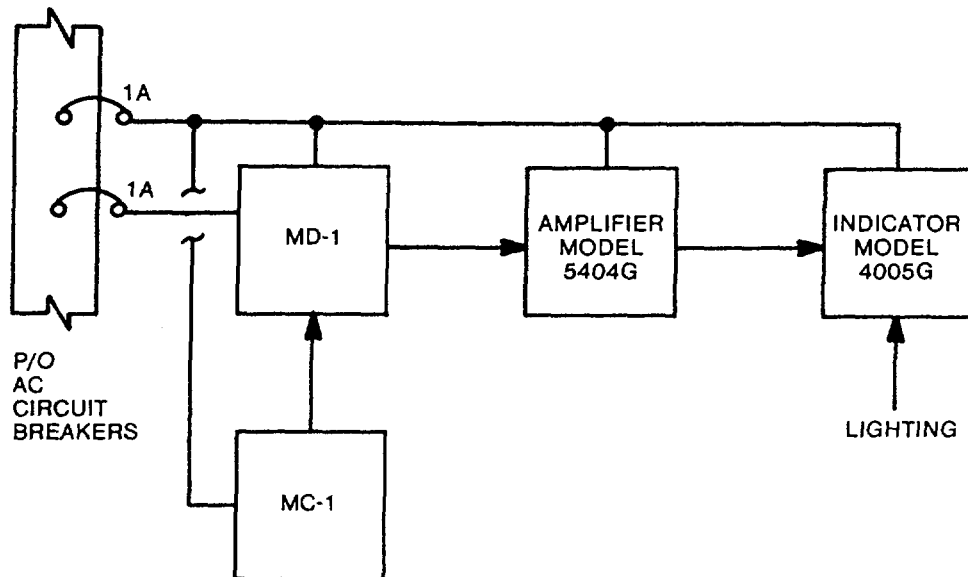


**\*NOTE: REFER TO PARAGRAPH 1-64 FOR DME INTERFACE WITH AN/ASN-175 SYSTEM INSTALLED ON AIRCRAFT.**

- Provides slant range distance to selected ground station.
- Distance presented as digital readout in hundreds, tens, units and tenths nautical miles.
- Frequency range 962 to 1212 MHz, controlled by C-6873B/ARN-82.
- DME channel is automatically paired with VOR channel
- DME station identification (coded tone) is fed to intercom.
- DME HOLD light, as controlled by ID-2192/ARN-124, is lit when AN/ARN-124 is in standby mode.
- When DME HOLD light is lit, changing VOR channel will not change DME channel until the hold light goes out.
- incorporates a self-test feature activated by on ID-2192/ARN-124.

Primary +28 Vdc supplied through DME ARN-124 circuit breaker.

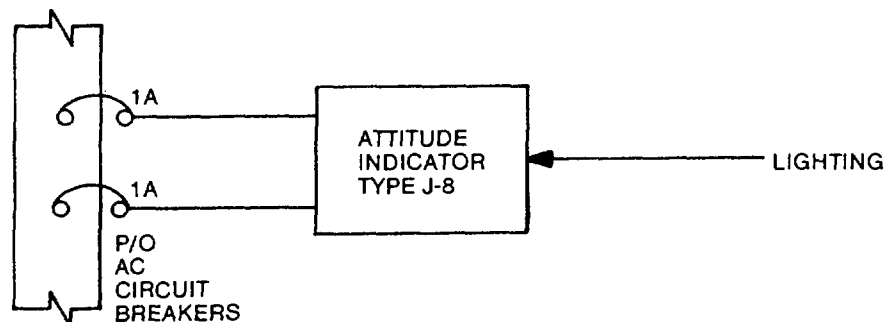


**1-41. PILOTS ATTITUDE INDICATING SYSTEM**

- Provides pilot with visual indication of helicopter's vertical attitude in relation to horizon.
- MC-1 provides rate of change data to MD-1.
- MD-1 senses helicopter attitude, receives rate of change data and provides combined data to amplifier.
- Amplifier model 5404G amplifies data from MD-1 to sufficient strength to drive indicator.
- Requires 115 Vac, 400 Hz, 3-phase power supplied by circuit breakers on ac circuit breaker panel.

**NOTE**

Indicator Amplifier Model 5404G is not used on helicopters with serial numbers 65-9565 and subsequent. Rate Switching Gyro MC-1 is being removed from the helicopters, with no replacement, by depot maintenance.

**1-42. COPILOTS ATTITUDE INDICATING SYSTEM**

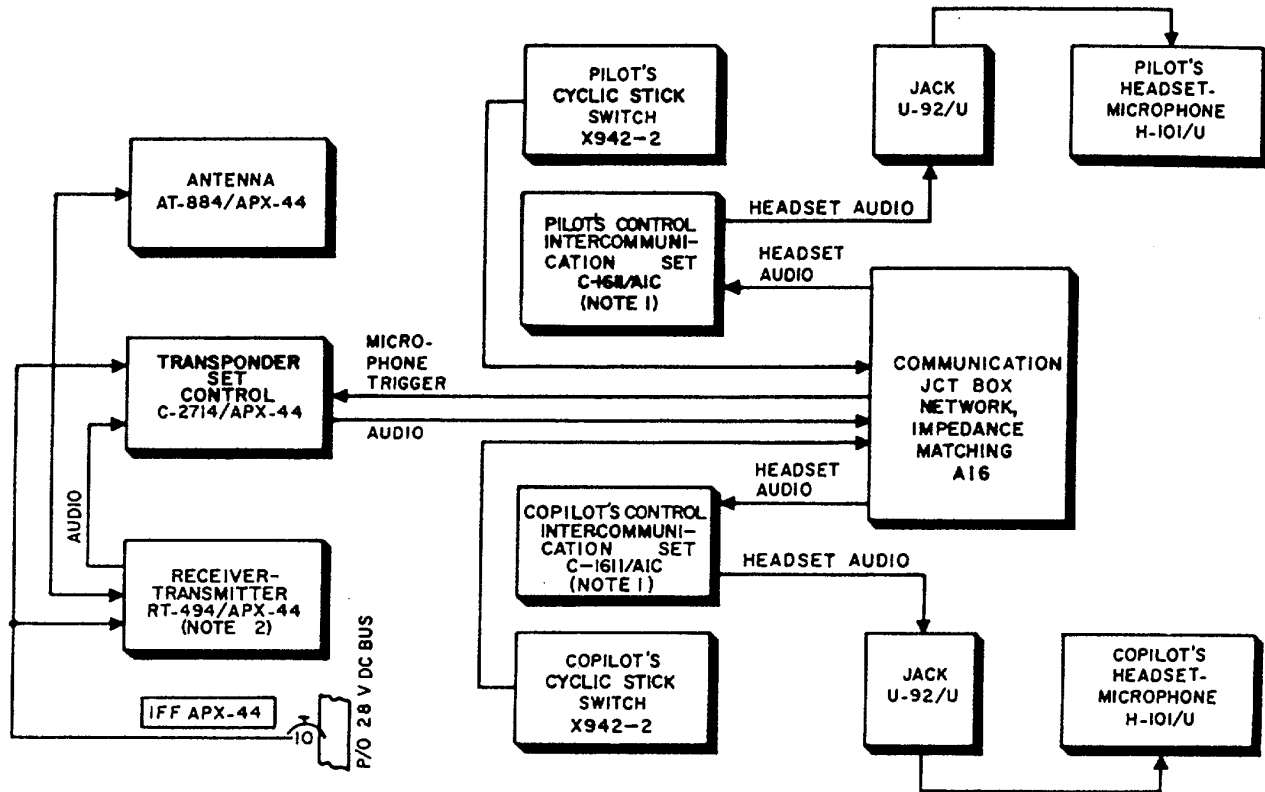
- Provide copilot with visual indication of helicopters vertical attitude in relation to horizon.
- Self-contained system.
- Requires 115 Vac, 400 Hz, 3-phase power supplied by circuit breakers on ac circuit breaker panel.



## 1-43. TRANSPONDER SET AN/APX-44

## NOTES

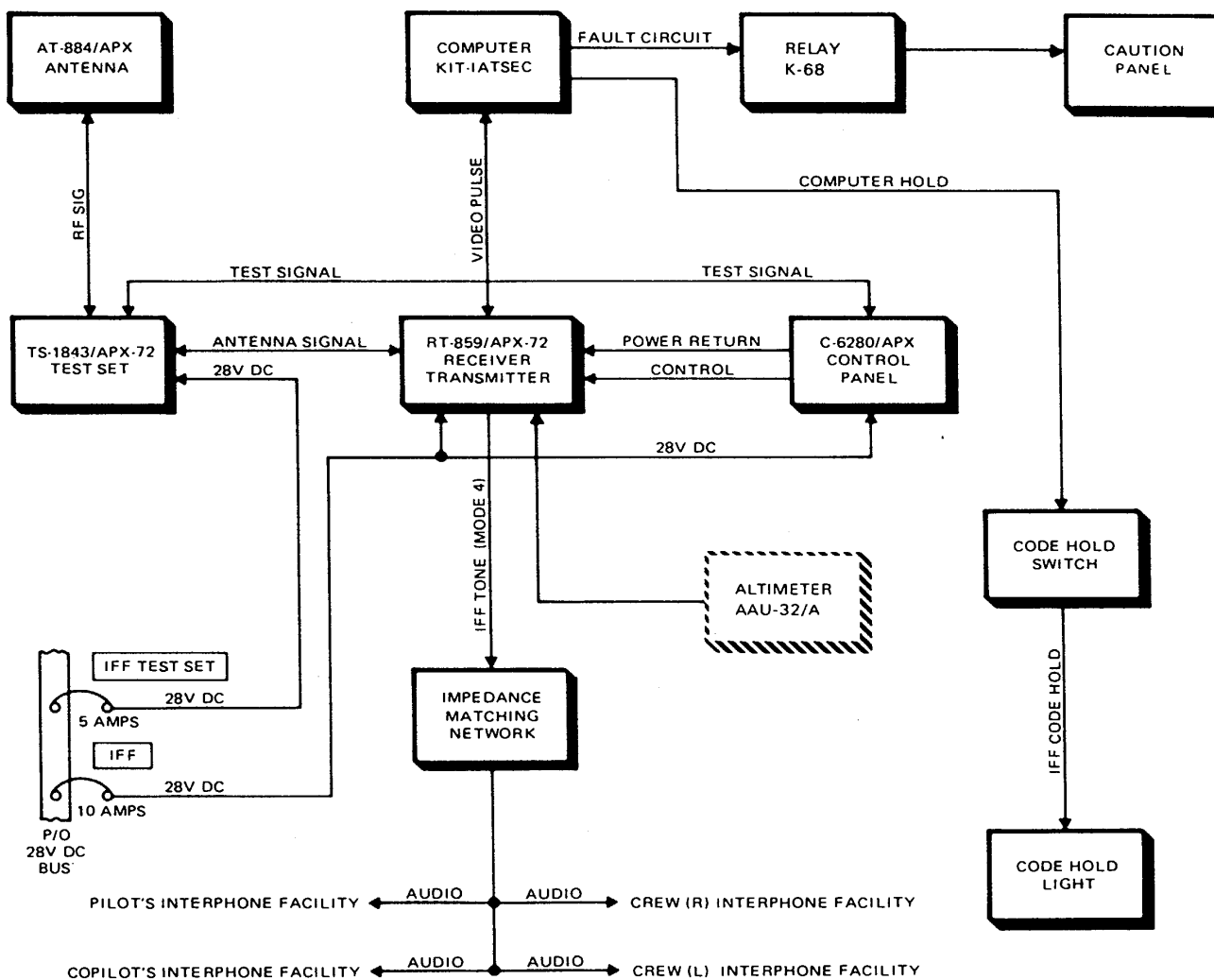
1. CONFIGURATIONS A&B USE PANEL, SIGNAL DISTRIBUTION, RADIO SB-329/AR.
2. CONFIGURATIONS C TROUGH HAVE PROVISIONS FOR TRANSPONDER SET AN/APX-2; CONFIGURATIONS I AND J HAVE AN/APX-72 INSTALLED.



- Provides facilities for identification friend or foe (iff).
- Receives coded interrogation signals from ground station, evaluates them, and automatically transmits coded reply.
- Has capability of transmitting coded pulse informing ground station that helicopter is in distress (EMER).
- If power to transponder is interrupted warning lamp on master caution panel will light.
- Visual display of signals is displayed on front of receiver-transmitter.
- Receives on 1030 M Hz and transmits on 1090 M Hz using one antenna, AT-884/APX.
- Requires 28 Vdc supplied through circuit breaker on dc circuit breaker panel.



## 1-44. TRANSPONDER SET AN/APX-72





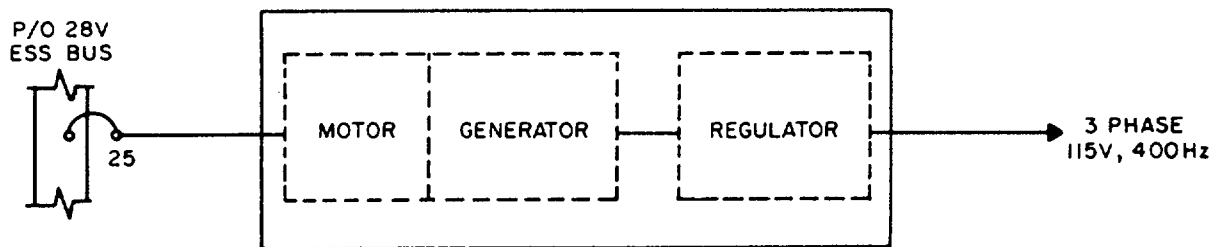
**1-44. TRANSPONDER SET AN/APX-72-Continued**

- Receives coded interrogation pulses and transmits coded replies.
- Modes 1, 2 and 3A processed directly by RT-859/APX-72.
- Mode C adds coded pressure altitude information to reply.
- Mode 4 signals processed by KIT-1 A/TSEC then sent to RT-859/APX-72.
- EMER mode notifies ground station of aircraft in distress.
- Reply codes for modes 1 and 3A set on C-6280/APX.
- Reply code for mode 2 set on RT-859/APX-72.
- Reply code for mode 4 determined by KIT-1 A/TSEC.
- TS-1 843/APX, activated by C-6280/APX, generates test signal for RT-859/APX and evaluates reply; if correct, lamp illuminates on C-6280/APX.

**NOTE**

Transponder Set AN/APX-72 may be used without KIT-1 A/TSEC and TS-1843/APX.

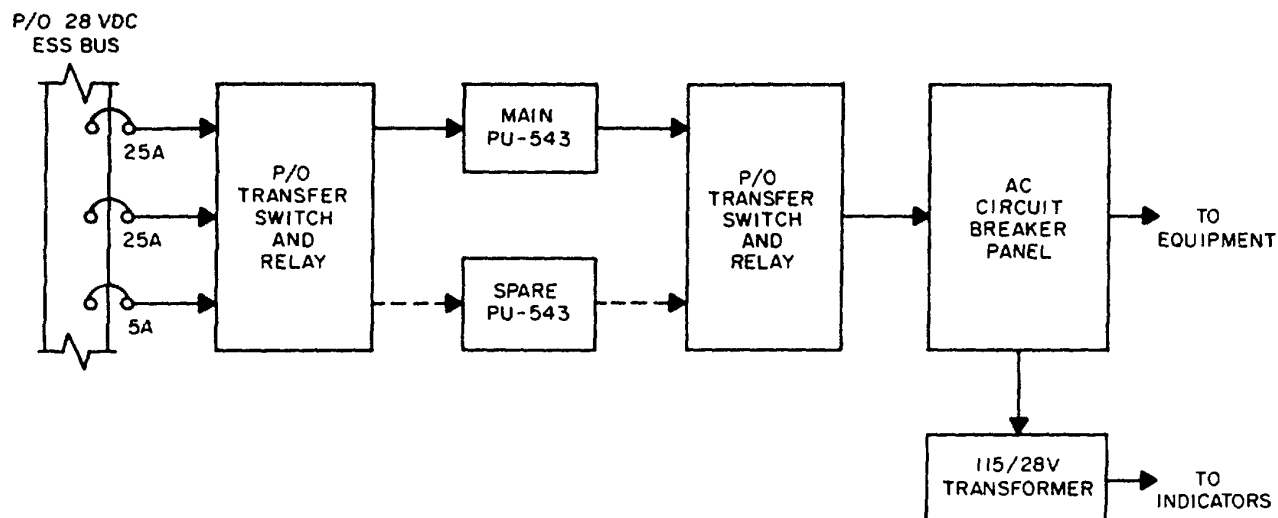
- Requires 28 Vdc for operation.

**1-45. MOTOR-GENERATOR PU-543(\*)/A**

- Two motor-generators are installed, only one in use at a time.
- Spare motor-generator may be switched in if main fails.
- Output frequency and voltage are regulated.
- Regulator circuits adjustable externally.
- Input power 28 Vdc at 24 amps.
- Output 115 V, 400 Hz, 3-phase, rated at 250 volt amps.



## 1-45.1 AC Power Distribution.

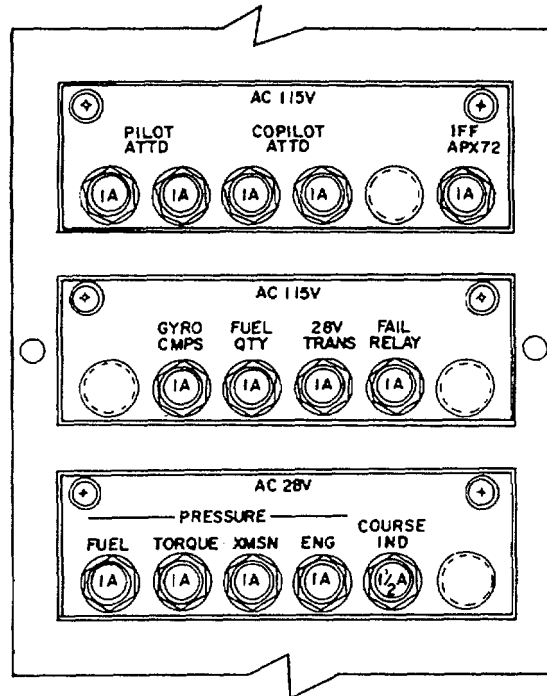


- 28 Vdc supplied by dc essential bus.
- Transfer switch and relay passes 28 Vdc to selected motor-generator.
- Motor-generator produces 115 V, 400 Hz, 3-phase ac.
- Transfer switch and relay passes ac to circuit breaker panel.
- From circuit breaker panel, power is supplied to equipment as required, and to 115 V to 28 V transformer.
- 28 Vac from transformer is used by selected indicators.



**1-45.2 AC Circuit Breaker Panel.**

- The ac circuit breaker panel is located on lower right hand side of control pedestal console.
- A typical ac circuit breaker panel is depicted below.

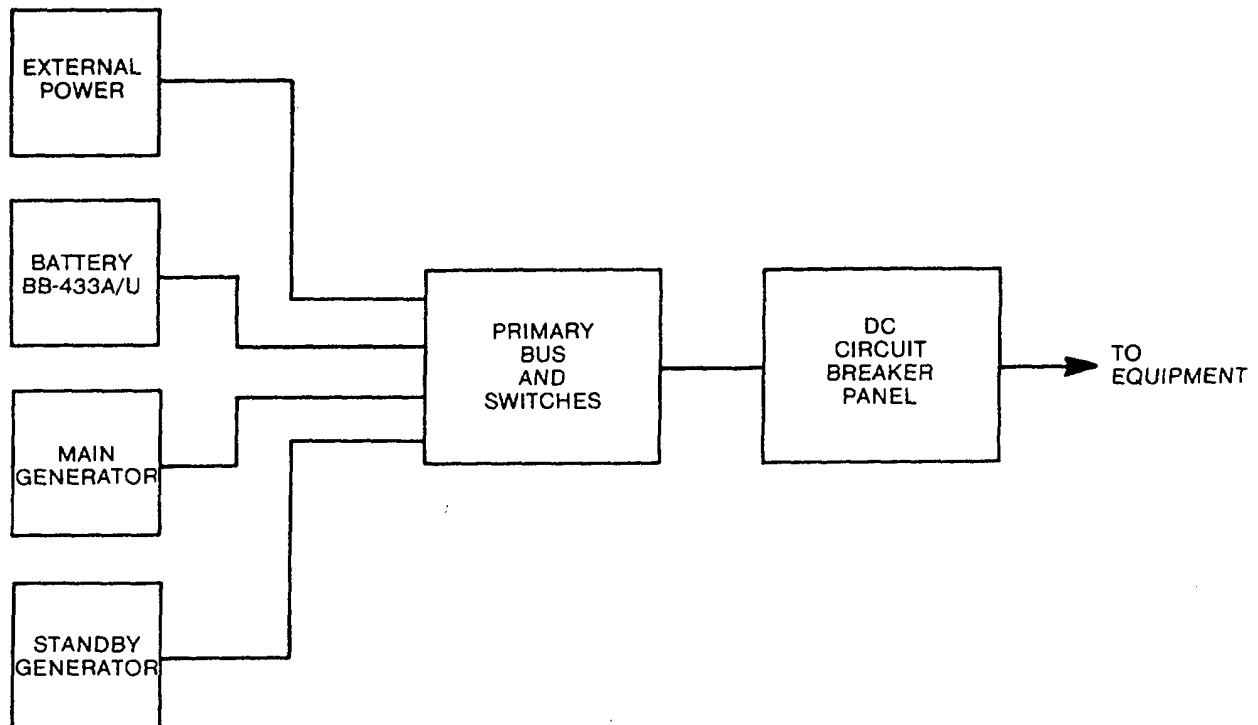
**1-46. STORAGE BATTERY BB-433/A**

- 24 V, rechargeable nickel-cadmium battery.
- 19 cells, each with vented filler cap.
- Filler cap vent plug allows gas to escape.

**NOTE**

State of discharge of battery cannot be checked by specific gravity tests.



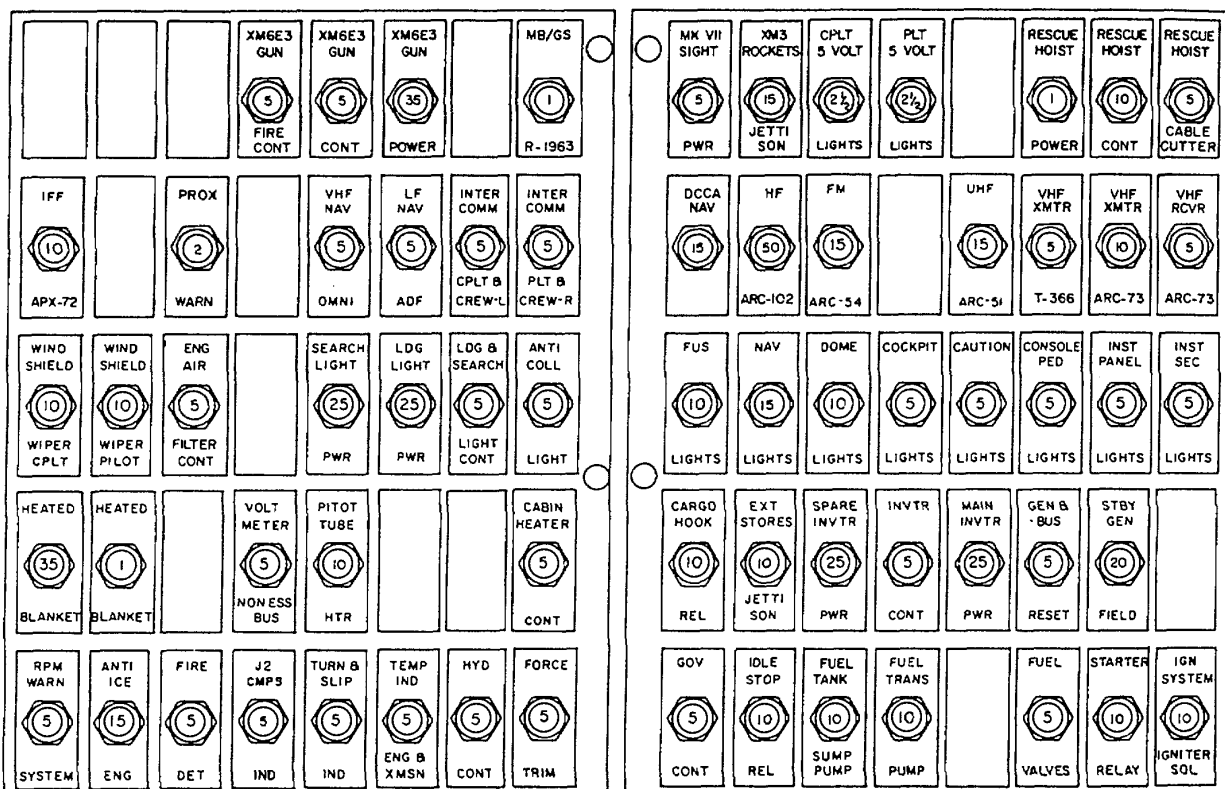
**1-46.1 DC Power Distribution.**

- DC source, as selected by switches, is supplied to primary bus.
- Primary bus supplies dc power to circuit breaker panel.
- From circuit breaker panel dc power is supplied to equipment as required.



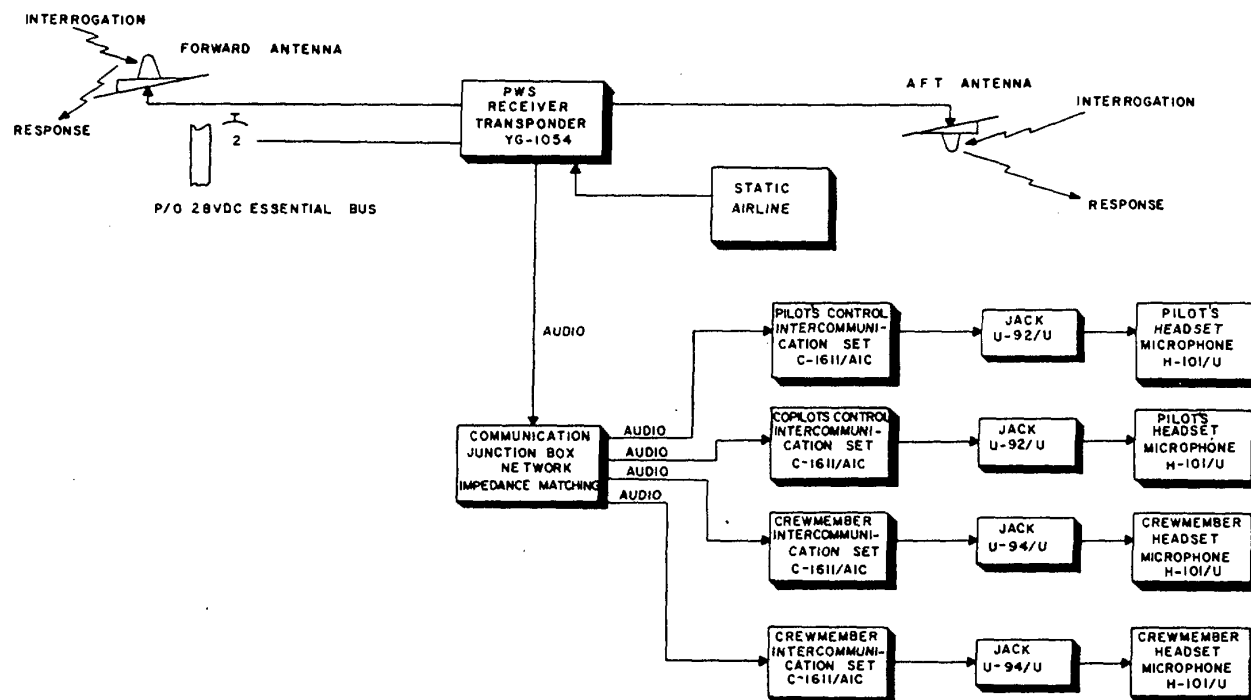
## 1-46.2 DC Circuit Breaker Panel.

- The dc circuit breaker panel is located on overhead, between pilot and copilot.
- A typical dc circuit breaker panel is depicted below.





## 1-47. RECEIVER-TRANSPONDER YG-1045 (PROXIMITY WARNING SYSTEM)



- Provides audio and visual alarm when a similarly equipped aircraft (intruder) enters protected airspace.
- Protected airspace is an altitude band of plus or minus 300 feet at a selectable range of 1000, 2000 or 5000 feet.

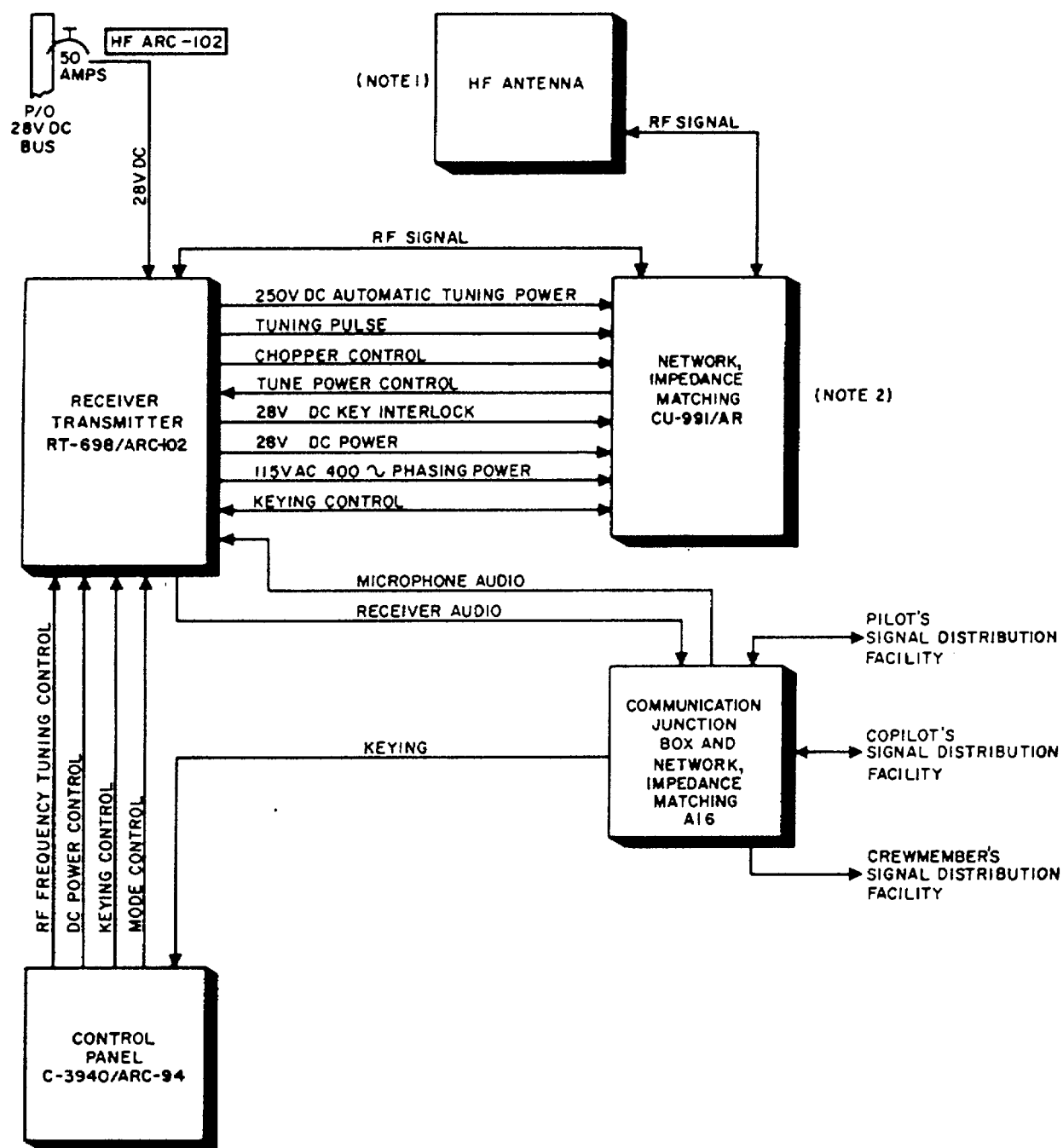
**NOTE**

Earlier model transponders with part number HG1001 ACD1 have a maximum range of 3000 feet.

- Audio alarm is beeping tone in headset.
- Visual alarm is flashing arrow segment indicating intruder is above, below or at same altitude.
- The warnings are used to avoid mid-air collisions.
- The facility is installed for training purposes only.
- Primary +28 Vdc supplied through PROX WARN circuit breakers.



## 1-48. HF SSB RADIO SET AN/ARC-102



## NOTES:

1. ANTENNA P/N 204-075 USED ON UH-1D/H CONFIGURATIONS C AND D, P/N 205-706-027 USED ON UH-1D/H CONFIGURATIONS E THROUGH J AND P/N 205-706-027-1 USED ON UH-1 H.

2. REPLACED BY NETWORK IMPEDANCE MATCHING CU-1658/AR ON UH-1 D/H CONFIGURATIONS, I, J AND UH-1 H.

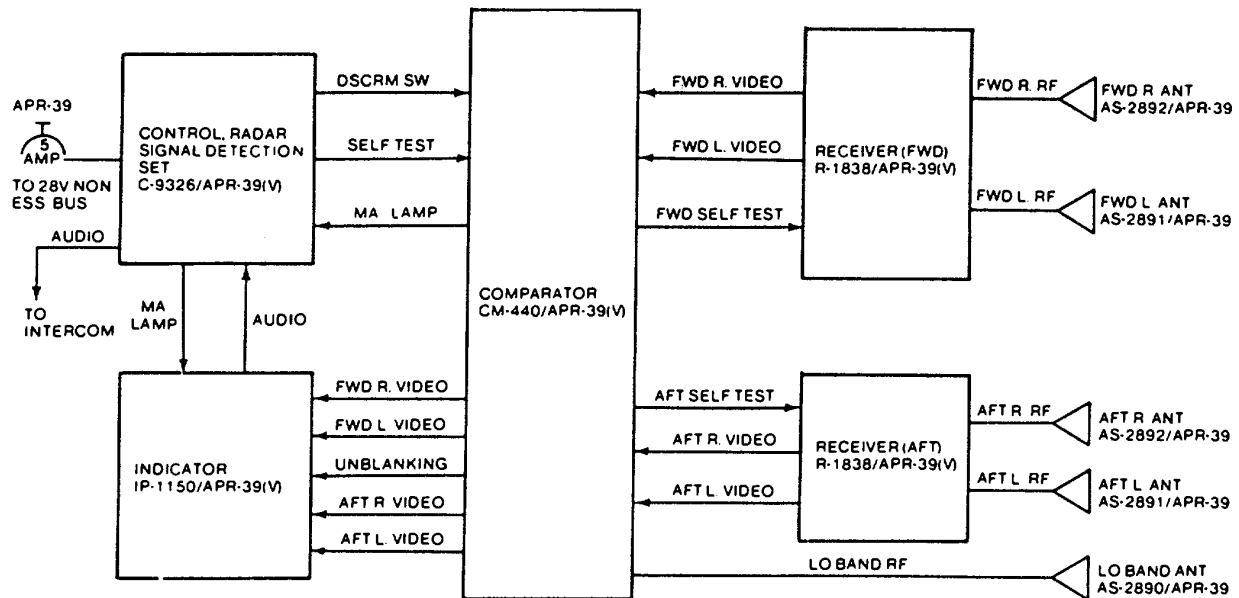


#### 1-48. HF SSB RADIO SET AN/ARC-102-Continued

- Provides air-to-air or air-to-ground communications with fixed or mobile stations.
- Frequency range 2.000 to 29.999 MHz in 0.001 MHz steps.
- Pilot or copilot can select mode of operation to:
  - USB (upper sideband).
  - LS B (lower sideband).
  - AM (amplitude modulated compatible).
  - DATA (teletype).
  - CW (continuous wave).
- Impedance Matching Network CU-991/AR (or CU-1658/AR) matches antenna to selected frequency.
- Primary +28 Vdc provided through HF ARC-102 circuit breaker.
- Additional power required for operation supplied by PP-3702/ARC-102 (part of receiver-transmitter mount).



## 1-49. RADAR SIGNAL DETECTING SET AN/APR-39(V)



- Alerts crew when helicopter enters radar threat environment.
- Provides audio and visual alarm indicating hostile fire-control tracking radar in area.
- Received signal displayed as strobe on I P-1150/APR-39(V).
- Direction of strobe indicates relative bearing.
- Length of strobe indicates relative strength.

## NOTE

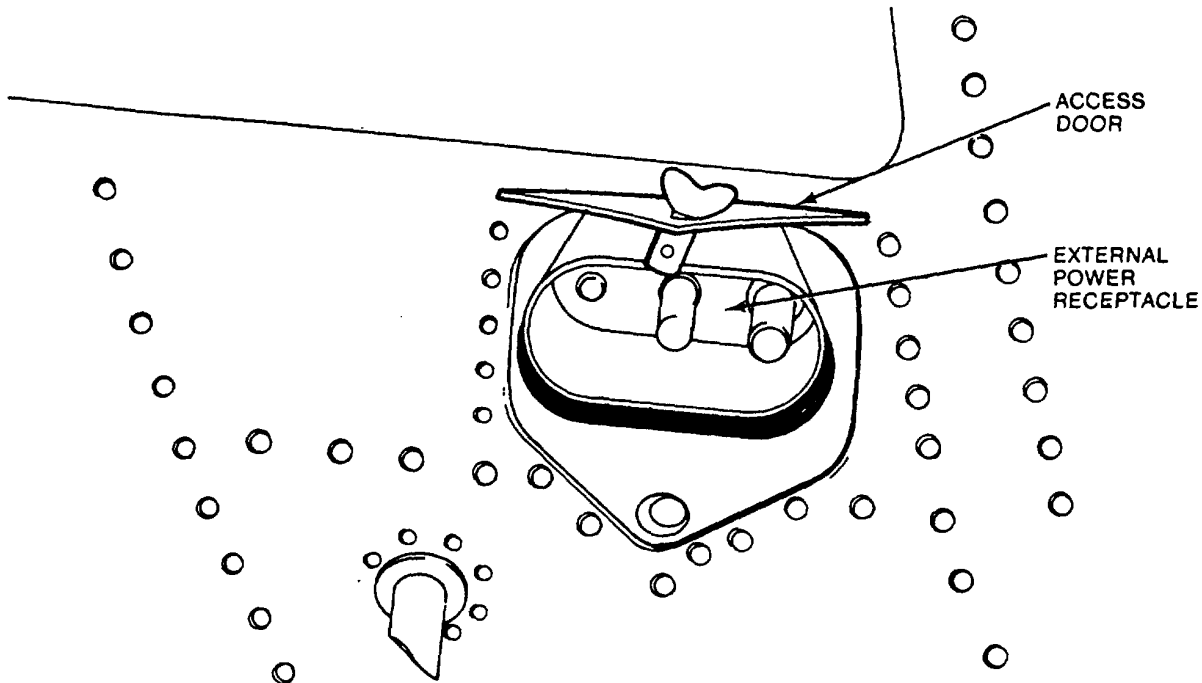
Length of the strobe on IP-11 50/APR-39(V) cannot be used to determine distance to emitter.

- Audio alarm is tone fed to headset.
- A SELF TEST feature checks approximately 90% of circuitry.
- DSCRM ON reduces display of signals not meeting threat criteria.
- Primary +28 Vdc supplied through RADAR WARN APR-39 circuit breaker.



## SECTION IV. PREVENTIVE MAINTENANCE PROCEDURES

## 1-50. AUXILIARY POWER UNIT CONNECTION



- An auxiliary power unit should be used when maintenance requiring power is performed and helicopter engine is not running. This prevents excessive drain on helicopter battery.
- Aircraft ground servicing unit, multipurpose, type MA-1 or equivalent should be used.
- Do not connect auxiliary power unit without checking with organization maintenance or helicopter crew chief.
- To connect auxiliary power unit proceed as follows:
  - A On overhead dc power panel, set BATTERY switch OFF.

**CAUTION**

Helicopter battery switch must always be in OFF position while auxiliary power unit is connected. Reversed polarity between helicopter battery circuit and auxiliary power unit can damage electrical parts and cause a serious fire.

- B Loosen spring-lock fastener and open access door.
- C Connect power unit plug to external power receptacle.

**NOTE**

When auxiliary power unit plug is inserted in receptacle, the auxiliary power unit relay is energized and electrical power is supplied directly to main battery bus for distribution.



### 1-51. PREVENTIVE MAINTENANCE PROCEDURES (AVUM)

- Preventive maintenance checks and services are performed on a daily and a phased interval basis.
- The periods of phased maintenance checks and services for the helicopter are provided in TM 55-1520-210-PMS, TM 55-1520-210-PM and TM 55-1520-210-23.
- Preventive maintenance checks and services of the electronic configuration will be scheduled concurrently with applicable phased maintenance checks and services of the helicopter.
- The daily checks are performed when the pilot or crewmember performs preflight checks and are contained in TM 55-1520-210-10 and TM 55-1520-210-10CL.
- Preventive maintenance checks and services consist of performing the operational checks on the equipments in the electronic configuration as specified in the following chapters.
- All deficiencies or shortcomings noted during performance of preventive maintenance checks and services of the electronics configuration will be reported to AVIM personnel using forms and procedures specified in DA Pam 738-750.
- Deficiencies that cannot be corrected by AVUM personnel should be deadlined and reported to AVIM using the form specified in DA Pam 738-750.

### 1-52. PERIODIC PULLOUT INTERVALS

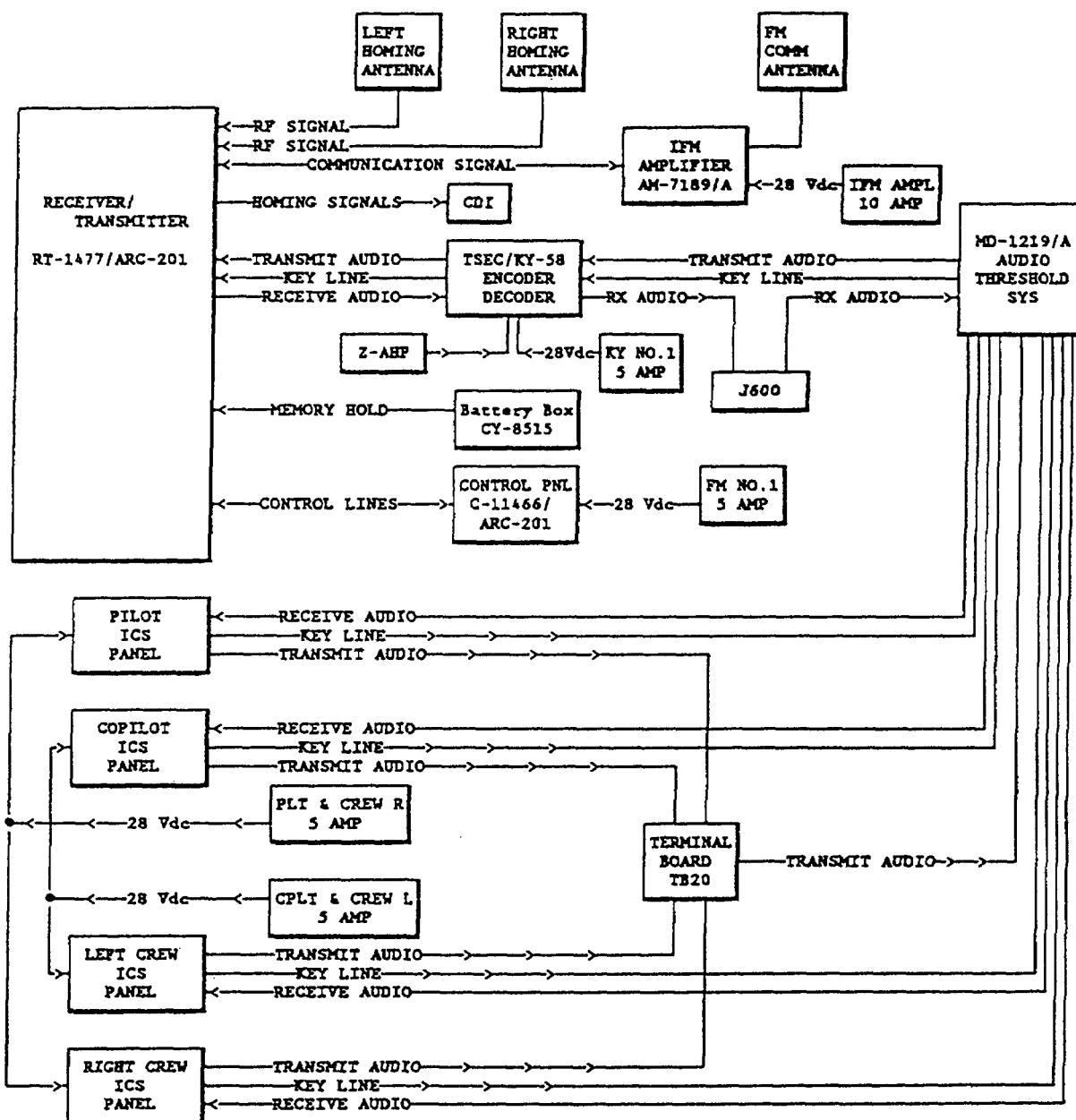
- The only equipment in the electronic configuration that has a periodic-pullout interval is Motor-Generator PU-543(\*)/A.
- Both main and spare PU-543(\*)/A should be removed every 200 flying hours.
- When motor generators are pulled out, ac and dc brushes should be checked for wear. If brushes are worn, motor generator must be forwarded to AVIM. Paragraph 24-1 contains brush inspection instructions.
- When motor generators are reinstalled, the one removed from the main position should go into the spare position and vice versa.

### 1-53. ALINEMENT INTERVALS

- The helicopter compass system, J-2 or AN/ASN-43, must be alined once a year.
- The compass system should also be alined whenever frequent navigation errors are reported.
- Alinement procedures are contained in paragraph 14-8 and are performed by AVIM personnel.



1-54. FM LIAISON NO.1 AN/ARC-201 WITH AUDIO THRESHOLD SYSTEM MD-1219/A





**1-54. FM LIAISON NO.1 AN/ARC-201-Continued****NOTE**

Radio Set RT-1477/ARC-201 is mounted on an adapter tray which interfaces with existing AN/ARC-131 mount and wiring harness.

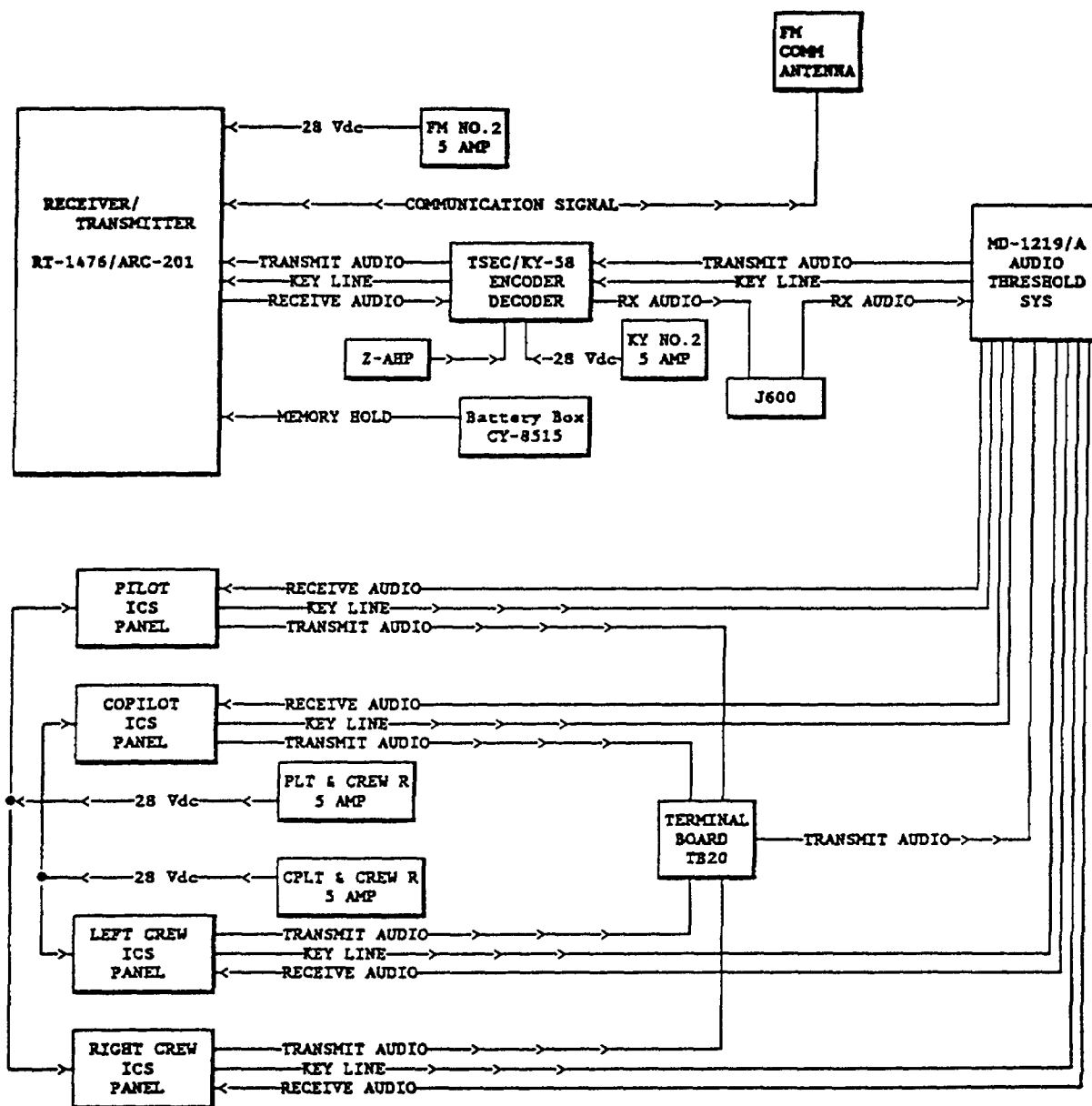
- Provides selectable channels from 30.00 Mhz to 87.975 Mhz in steps of .025 Mhz.
- Provides two-way, frequency modulated voice communications.
- Provides Homing data.
- Provides secure two-way communications when operated with TSEC/KY-58.
- Provides improved fm communications during NOE flight envelopes when operated with IFM AM-7189/A .
- Provides retransmission capability when second AN/ARC-201 (FM No.2) is installed.
- Provides two-way voice communications in frequency hopping mode.

**1-54.1 Installation Differences.**

**A** When the AN/ARC-201 system is installed, Antenna AS-1703/ARC and Coupler CU-942/ARC are removed and replaced with Antenna AS-3839/ARC-201 and Coupler CU-2396/ARC-201.



1-55. FM LIAISON NO. 2 AN/ARC-201 WITH AUDIO THRESHOLD SYSTEM MD-1219/A





**1-55. FX LIAISON NO.2 AN/ARC-201-Continued**

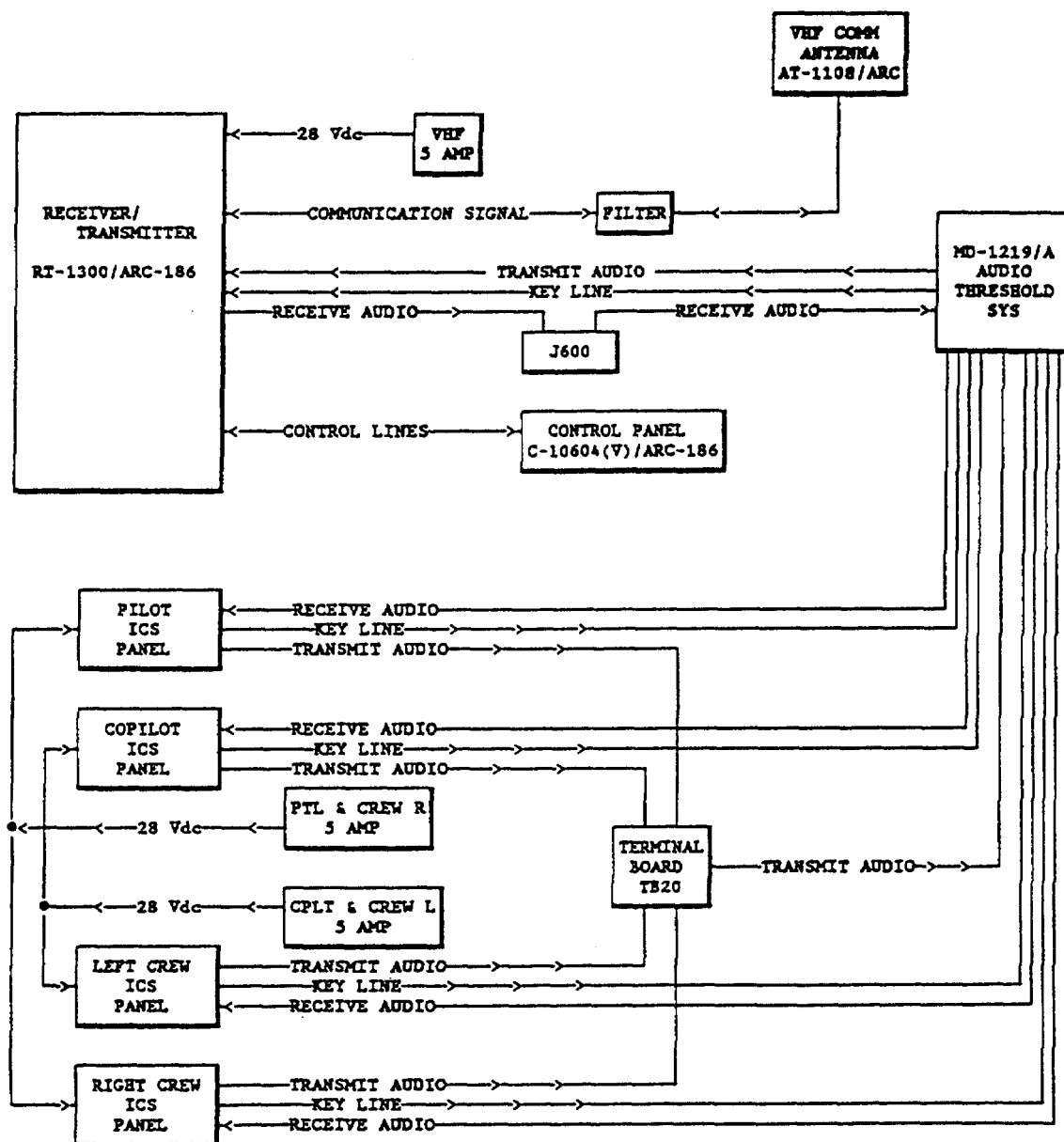
- Provides selectable channels from 30.00 Mhz to 87.975 Mhz in steps of .025 Mhz.
- Provides two-way, frequency modulated voice communications.
- Provides secure two-way communications when operated with TSEC/KY-58.
- Provides retransmission capability when second AN/ARC-201 (FM No.1) is installed.
- Provides two-way voice communications in frequency hopping mode.

**1-55.1 Installation Differences.**

A When the AN/ARC-201 system is installed, Antenna FM 10-30-1 is removed and replaced with Antenna AS-3841/ARC.



1-56. VHF AM RADIO SET AN/ARC-186 WITH AUDIO THRESHOLD SYSTEM MD-1219/A





**1-56. VHF AX RADIO SET AN/ARC-186-Continued**

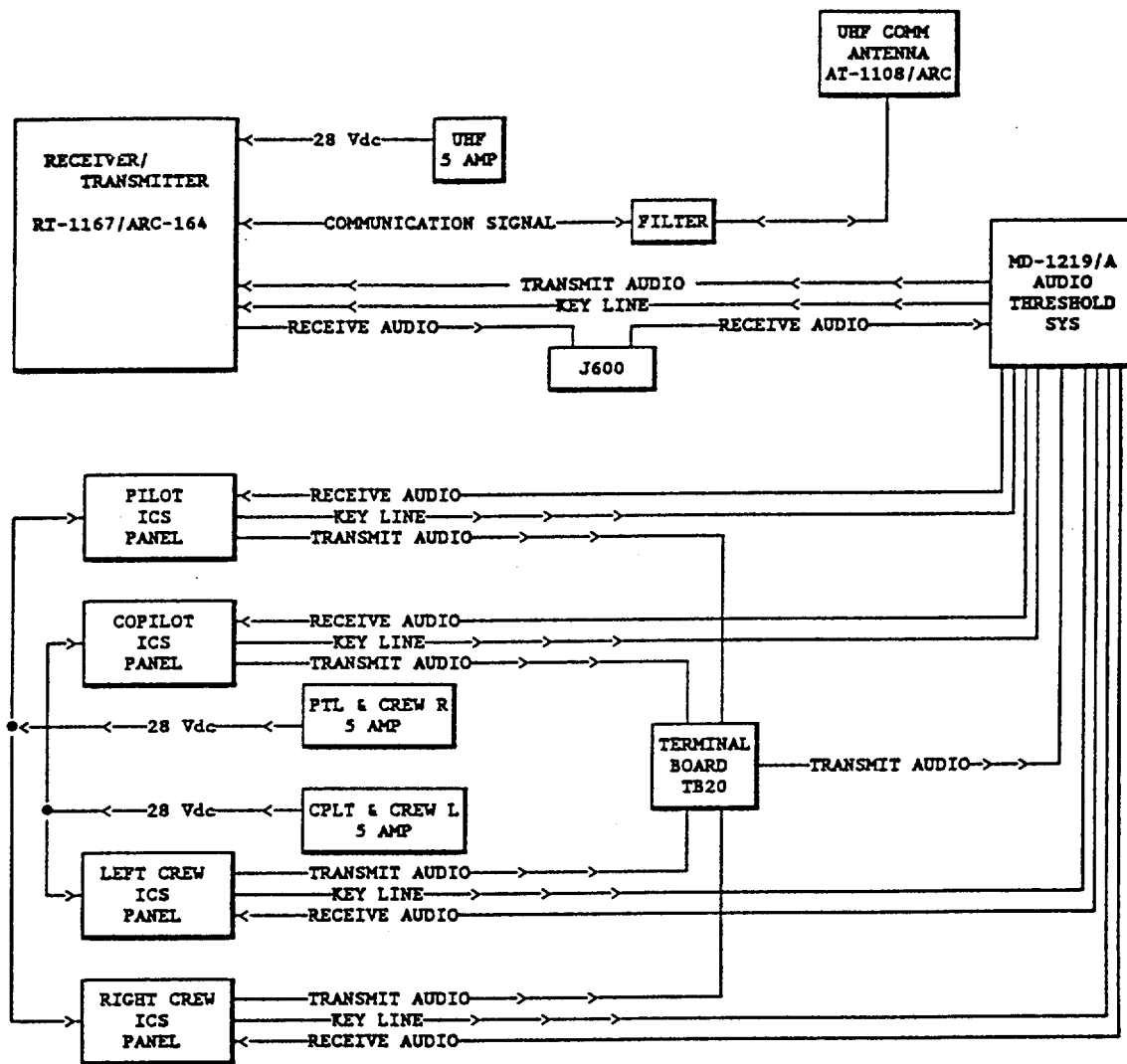
- Provides two-way amplitude-modulated voice communications.
- Transmit and receive frequency range is from 116.000 to 151.975 Mhz.
- Receive frequency only, 108.000 to 115.975 Mhz.
- Transmits and receives on same frequency.
- Primary power supplied through VHF ARC-186 circuit breaker.

**NOTE**

The AN/ARC-186 can be operated as an FM receiver-transmitter if an FM antenna is connected to the FM port of the receiver-transmitter.



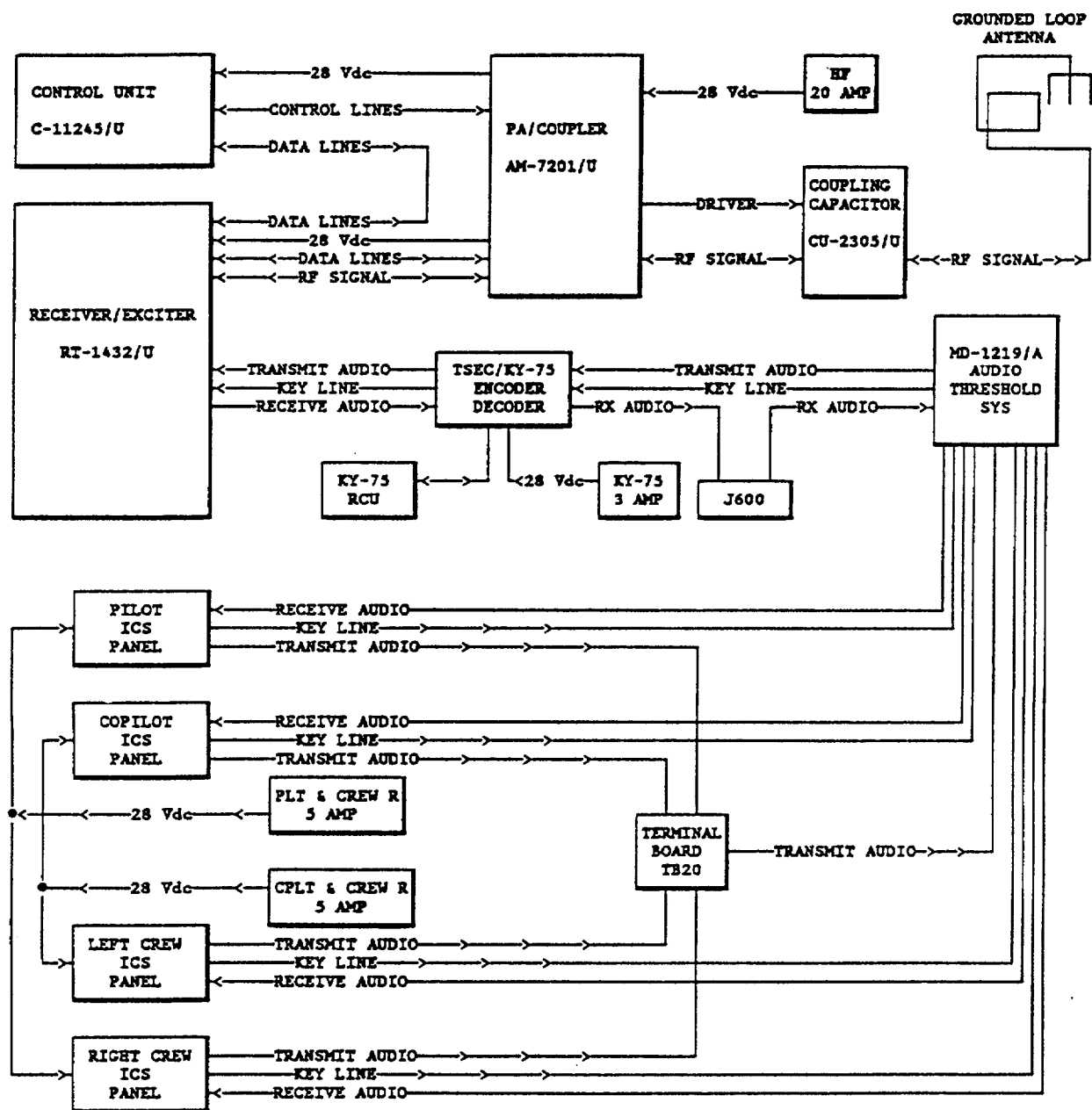
## 1-57. UHF AM RADIO SET AN/ARC-164 (V) WITH AUDIO THRESHOLD SYSTEM MD-1219/A



- Provides two-way, amplitude-modulated voice communications.
- Frequency range 225.000 to 399.975 Mhz in .025-Mhz steps.
- Has auxiliary guard receiver, tuned to 243.00 Mhz.
- Consists of single unit receiver-transmitter with all operable controls on front panel.
- UHF high pass filter restricts received signals to desired band.
- Primary power supplied through UHF ARC-164 circuit breaker.



1-58. HF RADIO SET AN/ARC-199 WITH AUDIO THRESHOLD SYSTEM MD-1219/A



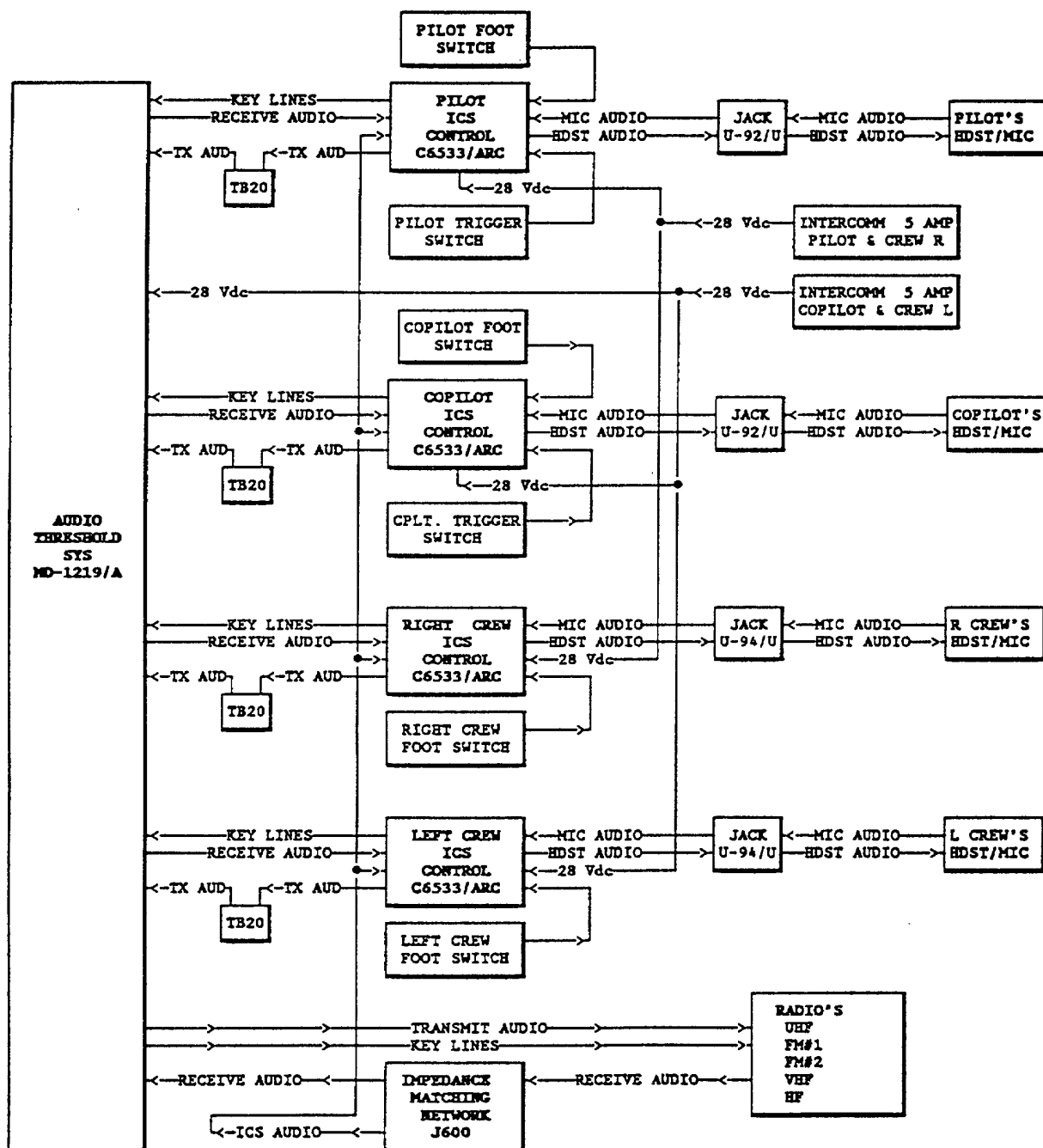


**1-58. HP RADIO SET AN/ARC-199-Continued**

- Provides two-way voice communications in three selectable modulation modes; USB, LSB, and AM. In addition to the voice modulation modes there is CW, DATA transmission, and TEST modes.
- Frequency range is from 2 to 30 Mhz in 100 Hz increments.
- Provides up to 20 preset channels which are continuously scanned by the receiver.
- Transmission and reception can be on the same or different frequencies.
- Transmitter power out is selectable; LO, MED, and HI.
- Provides selectable addressing, which screens out unwanted messages.
- System can be operated in clear or secure voice when KY-75 is installed.
- The system has Built-in-Test Equipment (BITE) which is able to isolate faults to a particular unit.
- Primary power is provided through HPF ARC-199 circuit breaker.



## 1-59 INTERCOMMUNICATIONS SET CONTROL C-6533/ARC WITH AUDIO THRESHOLD SYSTEM MD-1219/A



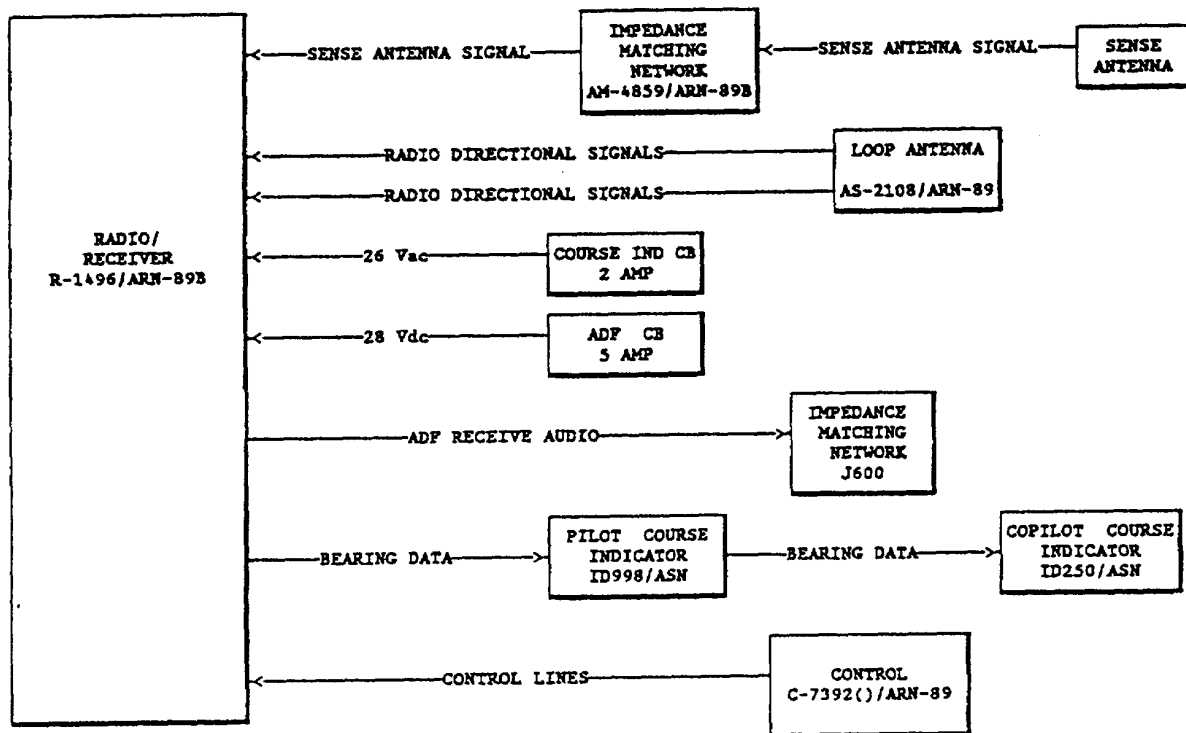


**1-59. INTERCOMMUNICATIONS SET CONTROL C-6533/ARC-Continued**

- Provides communications between crewmembers of helicopter (intercom).
- Rotary switch connects headset and microphone to intercom or one of five communications receiver-transmitter.
- Seven toggle switches permit connection of audio from communications and/or navigation receivers in addition to rotary switch selection.
- Keying can be accomplished using cyclic stick switch at pilot or copilot stations or foot switch at all stations.
- HOT MIKE switch permits hand free intercommunications from any station regardless of rotary switch selection.
- + 28 Vdc is the only power required for operation. Power is supplied through INTERCOMM PILOT & CREW R and INTERCOMM COPILOT & CREW L circuit breaker.

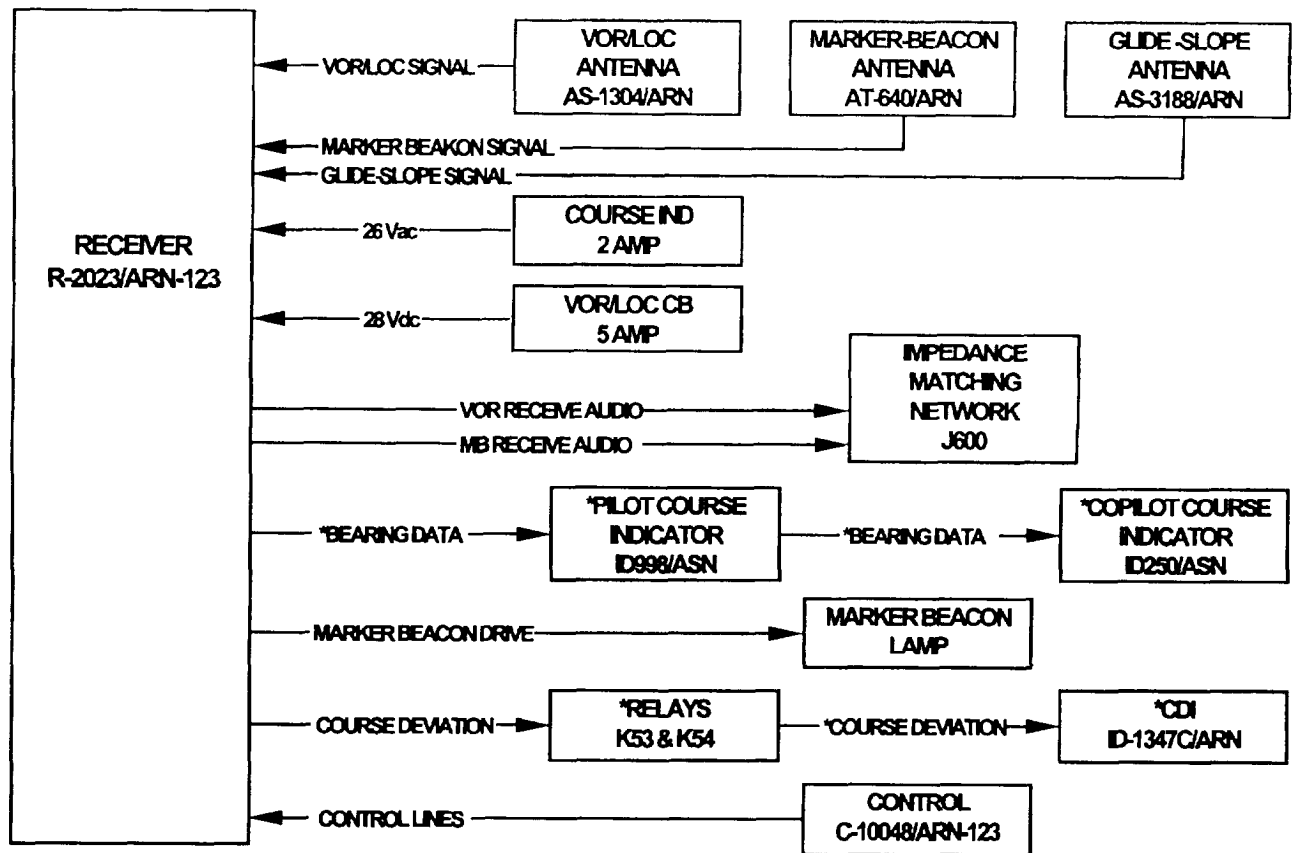


## 1-60. DIRECTION FINDING SET AN/ARN-89



- Provides, automatically, direction to a transmitting station.
- Frequency range of 100 to 3000 Khz.
- Direction finding can be operated manually by adjusting loop antenna for an aural null.
- Can be operated for reception of range or broadcast stations by selection of sense antenna.
- Primary 26 Vac supplied through COURSE IND circuit breaker.
- Primary 28 Vdc supplied through ADF NAV circuit breaker.





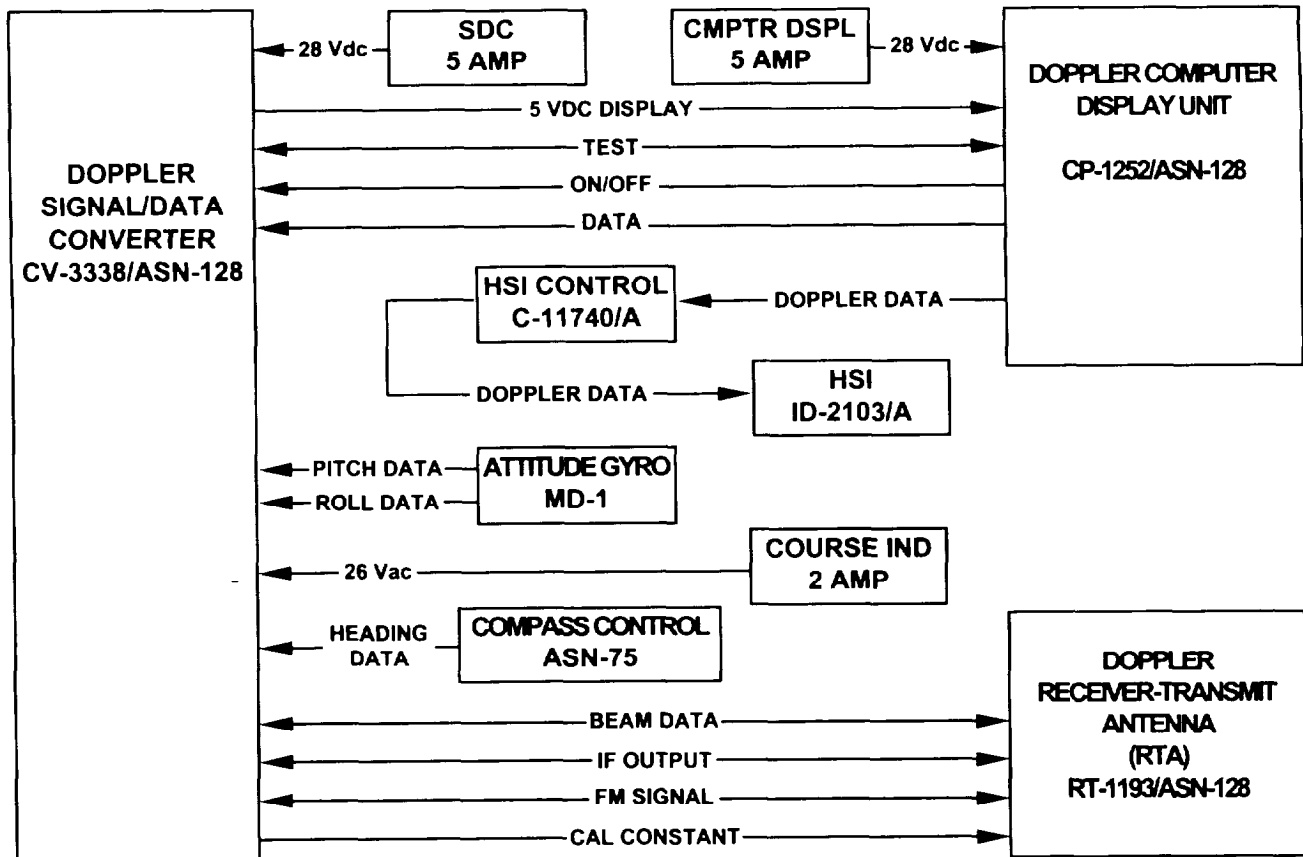
**NOTE:** REFER TO PARAGRAPH 1-64 FOR VHF NAVIGATION SET INTER-FACE WITH AN/ASN-175 SYSTEM INSTALLED ON AIRCRAFT.

#### 1-61. VHF NAVIGATION SET AN/ARN-123

- Frequency range 108.00 to 117.95 Mhz in .05 Mhz steps.
- Provides visual navigation (course and/or track) information.
- Provides audio signal for identification of transmitting station.
- Flag alarm signal causes OFF signal is unreliable or no signal is received.
- flag to appear in indicator if received When FM homing is activated, K53 and K54 are automatically switched to display FM homing information on ID-1347/ARN.
- Provides visual glideslope (above or below approach altitude) information.
- Provides aural and visual marker beacon information. Aural indication is tone heard in headset, visual indication is illumination of marker beacon lamp on instrument panel.
- Primary 28 Vdc supplied through VOR/LOC circuit breaker.
- Primary 26 Vac supplied through COURSE IND circuit breaker.



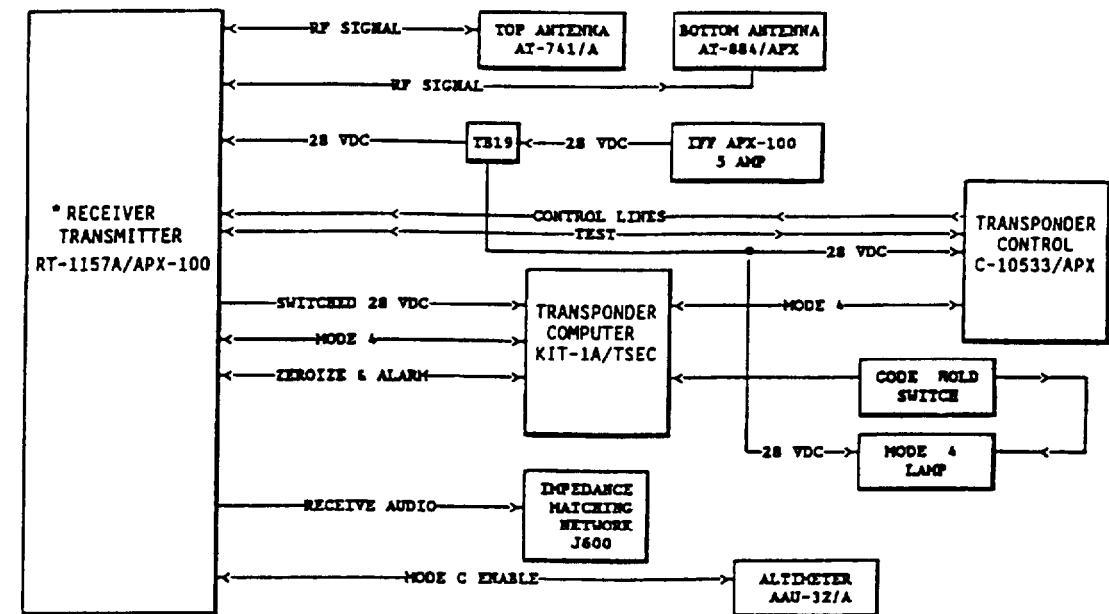
1-62. DOPPLER NAVIGATION SET AN/ASN-128



- Provides a self contained worldwide navigation system that requires no ground based aids.
- Provides position readout in both universal transverse mercator (UTM) and latitude/longitude (LAT/LONG).
- Provides heading, pitch/roll, velocity, position, and steering data from ground level to 10,000 ft.
- Provides Built-in-Test-Equipment (BITE) which continuously monitors system operation.
- Provides a BACKUP navigation mode in the event of RTA failure.
- 28 Vdc is provided through CMPTR DSPL and SDC circuit breakers.
- 26 Vac is provided through COURSE IND circuit breaker.



## 1-63. TRANSPONDER SET AN/APX-100

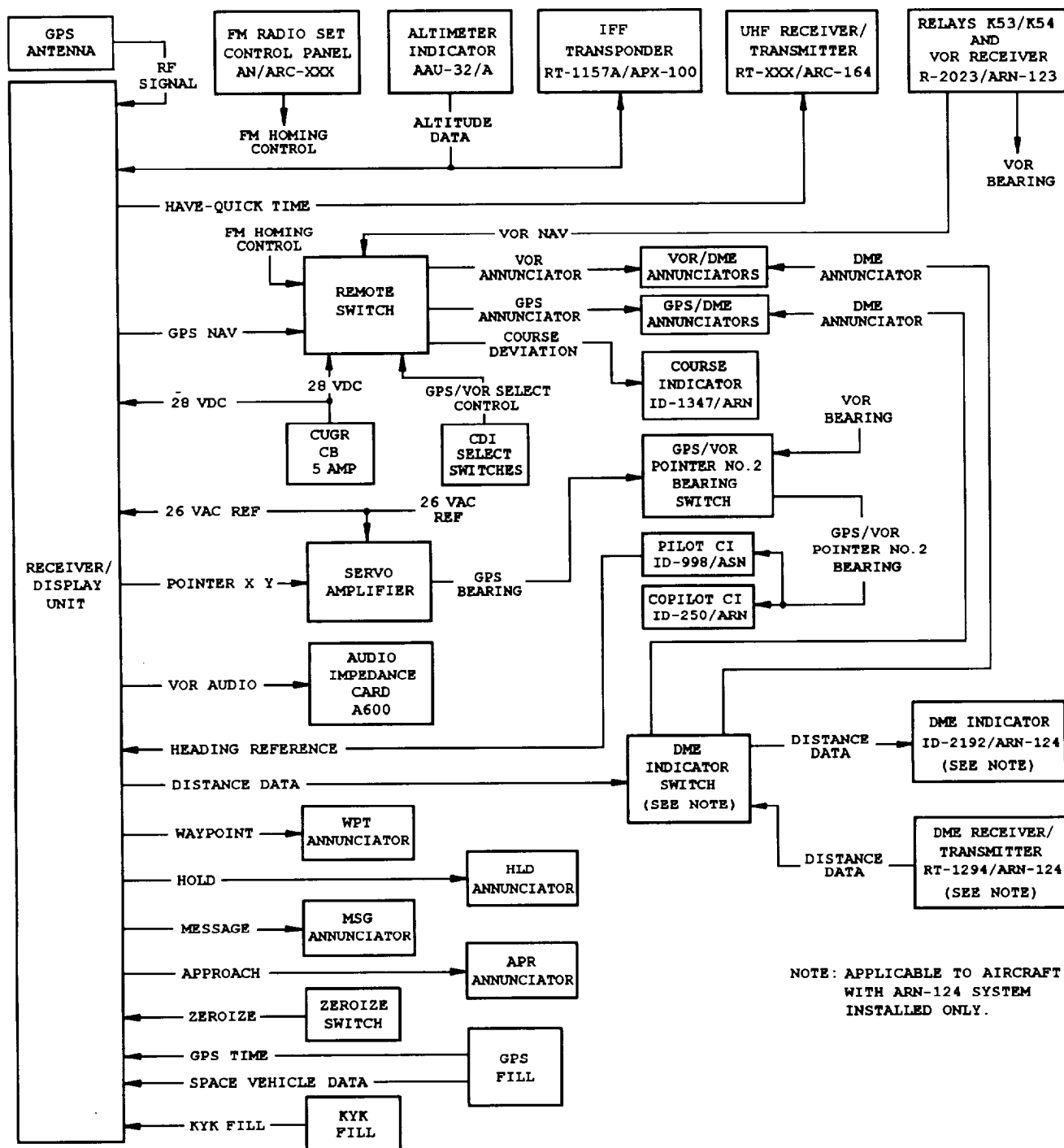


**\*NOTE: REFER TO PARAGRAPH 1-44 FOR IFF TRANSPONDER INTER-FACE WITH ANIASH-175 SYSTEM INSTALLED ON AIRCRAFT.**

- Receives coded interrogation pulses and transmits coded replies.
- Modes 1, 2, and 3A processed directly by RT-1157A/APX-100.
- Mode C adds coded pressure altitude information to reply.
- Mode 4 signals processed by KIT-1A/TSEC then sent to RT-1157A/APX-100.
- EMER mode notifies ground station of aircraft in distress.
- Reply codes for modes 1 and 3A are set on control C-10533/APX.
- Reply code for mode 2 are set on RT-1157A/APX-100.
- Reply code for mode 4 determined by KIT-1A/TSEC.
- 28 Vdc supplied through IFF APX-100 circuit breaker.



1-64. Satellite Signals Navigation Set AN/ASN-175





**1-64. Satellite Signals Navigation Set AN/ASN-175 - Continued**

- Provides precise position of aircraft in three dimensions (3D) based upon information received from Global Positioning System (GPS) satellites. The AN/ASN-175 system calculates position, velocity, and time (PVT) from the GPS precise positioning system (PPS). It also provides destination, ground speed, ground track, Estimated Time of Arrival (ETA), and other relevant data to the operator.
- Includes a six channel P(Y) code continuous tracking, dual frequency compatible receiver/display unit, an omnidirectional flat antenna with an integral preamplifier, a 3-channel servo amplifier, a remote switch, and various instrument panel switches and annunciators.
- Calculates aircraft's position to within 16 meters when operating in P(Y) mode.
- Uses Receiver Autonomous Integrity Monitoring (RAIM) to determine if received GPS signals is sufficient to maintain required accuracy and alerts operator if available GPS signals cannot support 3-D PVT solution.
- Graphically displays Course Deviation Indicator (CDI) data and Track Angle Error (TAE) data.
- Uses altitude and heading data from aircraft to validate calculations and supplements this data when access to GPS is less than optimum.
- Protects against deception and denial of PVT service from GPS by providing anti-jamming capability and by implementing anti-spoofing Y-code functions.
- Interfaces with existing aircraft navigation system to display bearing, course deviation, and distance data (if applicable), when selected, on the instrument panel indicators.
- Provides GPS outputs to activate instrument panel annunciators for displaying operational status of AN/ASN-175 system.
- Provides Have-Quick timing signal to UHF Receiver/Transmitter in UHF Command Radio Set AN/ARC-164 System.
- Provides automatic switching from GPS to VOR system operation when FM homing is activated.
- Provides comprehensive Built-in-Test (BIT) functions.
- Primary +28 Vdc is supplied through GPS AN/ASN-175 circuit breaker.







## CHAPTER 2 MISCELLANEOUS MAINTENANCE INSTRUCTIONS FOR AVIONICS SYSTEMS AND COMPONENTS

Subject	Para.	Page
General Cleaning and Repainting Instructions .....	2-1	2-1
Inspection Instructions .....	2-2	2-2
General Repair Techniques .....	2-3	2-2
Safety Wiring .....	2-4	2-2
Wiring Repairs .....	2-5	2-2
Repair Parts .....	2-6	2-4
Special Tools, Test Measurement and Diagnostic Equipment and Support Equipment .....	2-7	2-4
Service Upon Receipt .....	2-8	2-4

### SECTION I. GENERAL REQUIREMENTS

#### 2-1. GENERAL CLEANING AND REPAINTING INSTRUCTIONS

- Whenever maintenance is performed, electronics equipment in surrounding area should be checked for cleanliness.
- When required, remove moisture, dust and loose dirt with clean soft cloth.

#### WARNING

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

- Remove grease, fungus and ground-in dirt with cloth dampened (not wet) with cleaning compound.
- Remove dust and lint from connectors with soft bristle brush; remove moisture with dry cloth.
- Remove rust and corrosion from metal surfaces by lightly sanding with fine sandpaper.
- Brush two thin coats of paint on base metal to protect from corrosion.
- Painting instructions and materials are contained in SB 11-573.
- Cleaning and refinishing practices are specified in TB 43-0118.

#### CAUTION

Do not apply lacquer to enamel painted surfaces. Lacquer will loosen existing enamel.

- Use lacquer for all items originally painted with lacquer. Use enamel base paint for all items originally painted with enamel base paint.



## 2-2. INSPECTION INSTRUCTIONS

- Whenever performing maintenance, inspect electronic components in surrounding area for dents, cracks, gouges or other obvious defects.
- Replace any component with dents so deep that interior components may have been damaged or broken.
- Replace any component whose outer case has been penetrated by gouging.
- Replace any indicator or component with broken or cracked glass faceplates.

## 2-3. GENERAL REPAIR TECHNIQUES

- Repair techniques listed in this paragraph may apply to any component in the electronic configuration. Repair techniques and procedures that are unique to a facility or component are covered in later chapters of this manual.
- Do the following whenever necessary:
  - A Tighten setscrew on any loose knobs. Make sure knob is not pushed down so far on shaft that binding will occur.
  - B Replace any missing or broken knobs, lamps, fuses, etc.
  - C Tighten any loose connectors.
  - D Tighten fasteners that secure equipment in mountings.

## 2-4. SAFETY WIRING

- Attaching hardware and electrical connectors for components of electronic configurations are secured with safety wire to prevent loosening during service.
- Electrical and rf connectors with a mechanical lock are not safety wired since that would act against their locking feature.
- Refer to SB 11 -543 and TM 55-1500-323-25 for safety wiring instructions.

## 2-5. WIRING REPAIRS

- Connectors and wiring that may be repaired by AVUM personnel are identified in the respective facility maintenance chapter.
- All other connectors and wiring must be replaced, or repaired by higher level maintenance.
- Refer to wiring or schematic diagram specified by the maintenance chapter wiring data.
- For general wiring repair information, refer to TM 55-1500-323-25 and TM 55-1500-204-25/1.



## 2-5.1 Wire Identification Codes.

- Wires of the electronic configuration are identified by wire numbers as explained below.

<u>RC</u>	<u>1 30</u>	<u>A</u>	<u>20</u>	<u>N</u>
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>

**A** Identifies facility; may be code letters from chart below or portion of equipment nomenclature such as APN209.

**B** Cable number; differentiates between cables (or wires) within a facility.

**C** Cable segment; identifies cable segment (between terminals or connections).

**D** Wire size; indicates size (gauge) of wire used.

**E** Ground letter; (only letter N is used) indicates cable or wire that completes circuit to ground.

### Facility Code Identification Chart

Code letters	Functions
RZ	Interphone
RF	FM liaison set (vhf liaison)
RU	Uhf command set
RC	Emergency vhf transmitter (command)
RV	Vhf radio set (vhf command)
SX	IFF transponder set (radar recognition)
RM	Marker Beacon
RN	VHF Navigation, ADF navigation
F	Compass and attitude indicating systems
RL	Hf ssb/am radio set (liaison)
RA	Instruments, landing
RH	Homing
PWD	Proximity warning
RS	Ship communication
RX	Records
RP	Radio power

### NOTE

Prior to disconnecting wires from connectors, switches, etc., it is suggested the wires be tagged for easy identification.



**SECTION II. REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT  
AND DIAGNOSTIC EQUIPMENT (TMDE) AND SUPPORT EQUIPMENT**

**2-6. REPAIR PARTS**

Parts needed to repair UH-1 (\*) electronic configurations are listed in TM 11-1520-210-20P, TM 11-1520-210-34 P, TM 11-1520-210-20 P-1 and TM 11-1520-210-34 P-1

**2-7. SPECIAL TOOLS, TEST MEASUREMENT AND DIAGNOSTIC EQUIPMENT AND SUPPORT EQUIPMENT**

Special tools, test, measurement and diagnostic equipment and support equipment required to maintain the electronic configurations are listed in appendix B of this manual, plus TM 11-1520-210-20P, TM 11-1520-210-3H P, TM 11-1520-210-20P-1 and TM 11-1520-210-34P-1.

**SECTION III. SERVICE UPON RECEIPT**

**2-8. SERVICE UPON RECEIPT**

Instructions for service upon receipt are contained in individual equipment publications contained in appendix A.



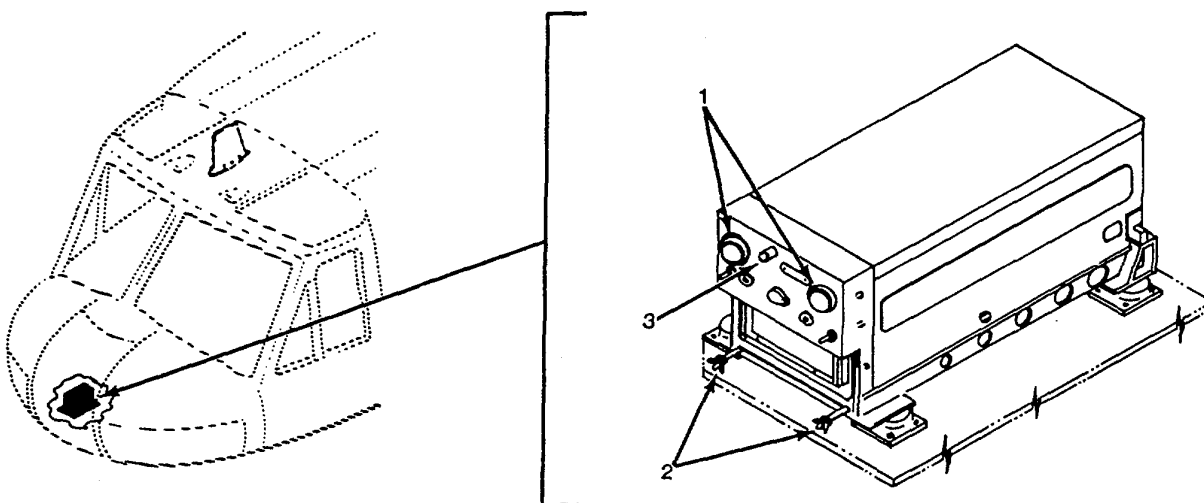
## CHAPTER 3

### UHF COMMAND RADIO SET AN/ARC-55(\*) MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-349(*)/ARC-55 Maintenance (AVU M) .....	3-1	3-1
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Antenna AT-450/ARC Maintenance (AVUM) .....	3-3	3-3
Antenna AT-1 108/ARC Maintenance (AVUM) .....	3-4	3-3
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UHF Command Radio Set AN/ARC-55(*) Operational Checks (AVUM) .....	3-6	3-4
UHF Command Radio Set AN/ARC-55(*) Troubleshooting (AVUM) .....	3-7	3-5

### SECTION I. MAINTENANCE PROCEDURES

#### 3-1. RECEIVER-TRANSMITTER RT-349(\*)/ARC-55 MAINTENANCE (AVUM)



##### 3-1.1 Removal Instructions.

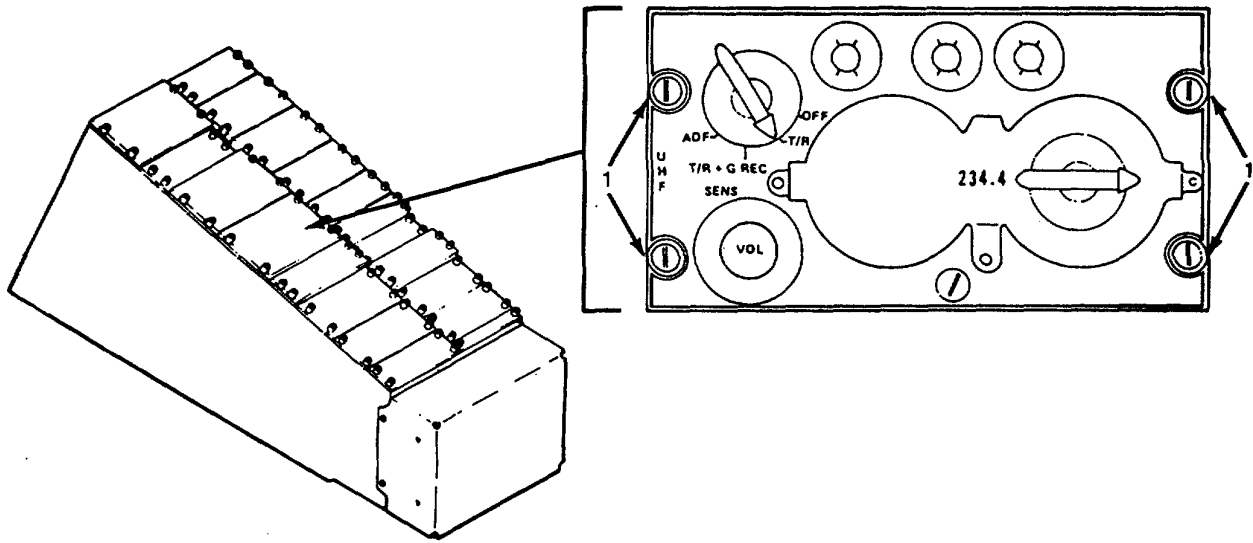
- A** Disconnect two electrical (1) and one coaxial (3) connector.
- B** Cut safety wire, and loosen two wingnuts (2).
- C** Grasp handle (4), slide RT-349(\*)/ARC-55 forward to disengage guide pins at rear of mounting.
- D** Lift RT-349(\*)/ARC-55 out of mounting.

##### 3-1.2 Installation Instructions.

- A** Place RT-349(\*)/ARC-55 in mounting and slide back to engage guide pins at rear of MT-1536/ARC-55.
- B** Position wingnut assembly over flanges on receiver-transmitter and tighten wingnuts (2).
- C** Safety wire both wingnuts.
- D** Reconnect two electrical (1) and one coaxial (3) connector.



### 3-2. CONTROL C-1827/ARC-55 MAINTENANCE (AVUM)



#### 3-2.1 Removal Instructions.

- A** Loosen four spring-lock fasteners (1).

#### **CAUTION**

Be careful not to pull control so far from pedestal console that wiring or connector will be damaged.

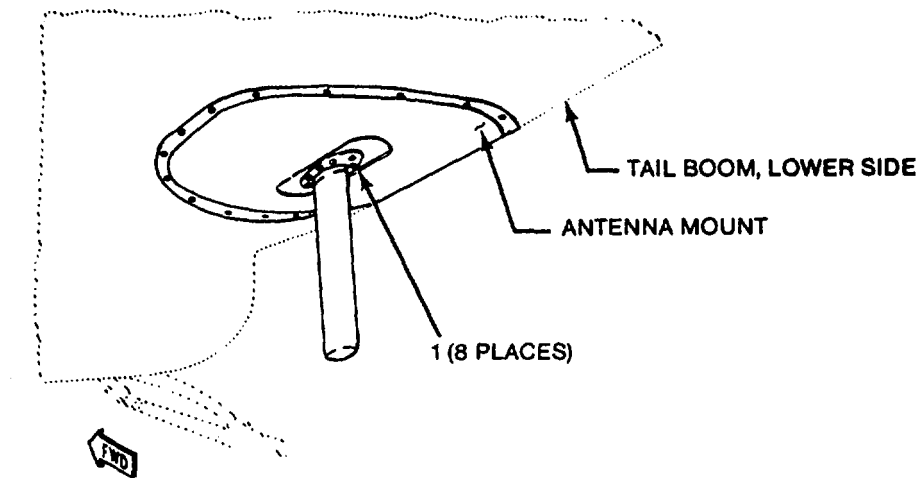
- B** Carefully lift control far enough to gain access to back of control.
- C** Disconnect electrical connector from back of control, then remove control.

#### 3-2.2 Installation Instructions.

- A** Hold C-1827/ARC-55 near pedestal console and connect electrical connector to rear of control.
- B** Position control in pedestal console.
- C** Tighten four spring-lock fasteners (1).



### 3-3. ANTENNA AT-450/ARC MAINTENANCE (AVUM)



#### 3-3.1 Removal Instructions.

- A Remove eight screws (1) that secure antenna to helicopter.

#### **CAUTION**

Be careful not to pull antenna so far from helicopter that wiring or connector will be damaged.

- B Lift antenna from helicopter and disconnect coaxial connector.

- C Remove antenna.

#### 3-3.2 Installation Instructions.

- A Hold antenna close to helicopter and connect coaxial connector.

- B Position antenna on helicopter and secure with eight screws (1).

- C Apply a small bead of RTV sealant around antenna base where it contacts helicopter skin.

- D Refer to TM 11-6625-545-15 and check Standing Wave Ratio (SWR) using AN/URM-261.

### 3-4. ANTENNA AT-1108/ARC MAINTENANCE (AVUM)

Refer to paragraph 5-3 for maintenance instructions.

### 3-5. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P1401, P1403, P1405, P1408 (Configuration A only), P1407 and P3801.
- Refer to FO-1 1 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wiring.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.



## SECTION II. OPERATIONAL CHECKS

### 3-6. UHF COMMAND RADIO SET AN/ARC-55 OPERATIONAL CHECK (AVUM)

These checks are used to ensure Radio Set AN/ARC-55 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Radio Set

##### Equipment Conditions

Reference:

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunications Set operational.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER ON CHECKS

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress UHF ARC-55 VHF XCVR ARC-44 and SB-329/AR circuit breakers.  
Control unit panel lamps light, blower motor on rt operates.
2. Set selector switch on control unit to TR+G REC.
3. Set intercom switches to allow transmission and reception with AN/ARC-55.
4. Set control unit frequency selectors to assigned test frequency.  
Channel tone heard in headset.

#### CAUTION

Allow a minimum of five minutes warm-up prior to keying transmitter.

5. From pilot then copilot station, fully depress cyclic stick trigger switch and speak into microphone.  
Sidetone heard in headset.

#### NOTE

If possible, avoid communications checks with base control tower. When authorized, use another uhf receiver-transmitter and frequency.

6. Conduct two-way communications check with other receiver-transmitter.  
Clear and audible two way communications.
  7. While receiving another uhf station, rotate control unit SENS control throughout its range.  
Volume of received signal should vary smoothly with no chirps or dead spots.
-



## SECTION III. TROUBLESHOOTING

### 3-7. UHF COMMAND RADIO SET AN/ARC-55 TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in UHF Command Radio Set AN/ARC-55.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.'
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 3-6.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Control unit panel lamps do not light.	<b>A</b> Defective lamp. <b>A</b> Replace defective lamp. <b>B</b> Defective control unit. <b>B</b> Replace C-1827/ARC-55.	
2. Blower does not operate.	Defective receiver-transmitter. Replace RT-349/ARC-55.	
3. Radio set will not tune to desired frequency.	<b>A</b> Defective control unit. <b>A</b> Replace C-1827/ARC-55 <b>B</b> Defective receiver-transmitter. <b>B</b> Replace RT-349/ARC-55.	
4. Radio set continues to tune.	<b>A</b> Defective receiver-transmitter. <b>A</b> Replace RT-349/ARC-55. <b>B</b> Defective control unit. <b>B</b> Replace C-1827/ARC-55.	
5. No sidetone heard in headset; or distorted audio.	Defective receiver-transmitter. Replace RT-349/ARC-55.	
6. Radio set does not provide signals sufficient to maintain two-way communications.	<b>A</b> Defective receiver-transmitter. <b>A</b> Replace RT-349/ARC-55. <b>B</b> Defective control unit. <b>B</b> Replace C-1827/ARC-55. <b>C</b> Defective wiring. <b>C</b> Check interunit wiring, repair or replace as necessary. <b>D</b> Defective antenna. <b>D</b> Replace AT- 1108/ARC (AT-450/ARC for configuration A).	
7. SENS control does not vary volume of receiver or introduces chirps.	Defective control unit. Replace C-1 827/ARC-55.	



**3-7.1. Signal and Voltage Measurements (AVUM).**

- If a trouble develops in UHF Command Radio Set AN/ARC-55 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-11 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**3-7.1.1 Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB1 2	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB269	9	Ground	Not applicable	0
TB2011	11	Receive Audio	AN/ARC-55 energized	Audio hi
TB209	9	Transmit key line	AN/ARC-55 energized, intercom rotary switch set to 2	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB21	10	Transmit audio	AN/ARC-55 energize, microphone keyed and audio applied	Audio hi
P1 403	P	Primary power	FM ARC-55 circuit breaker energized	28 Vdc



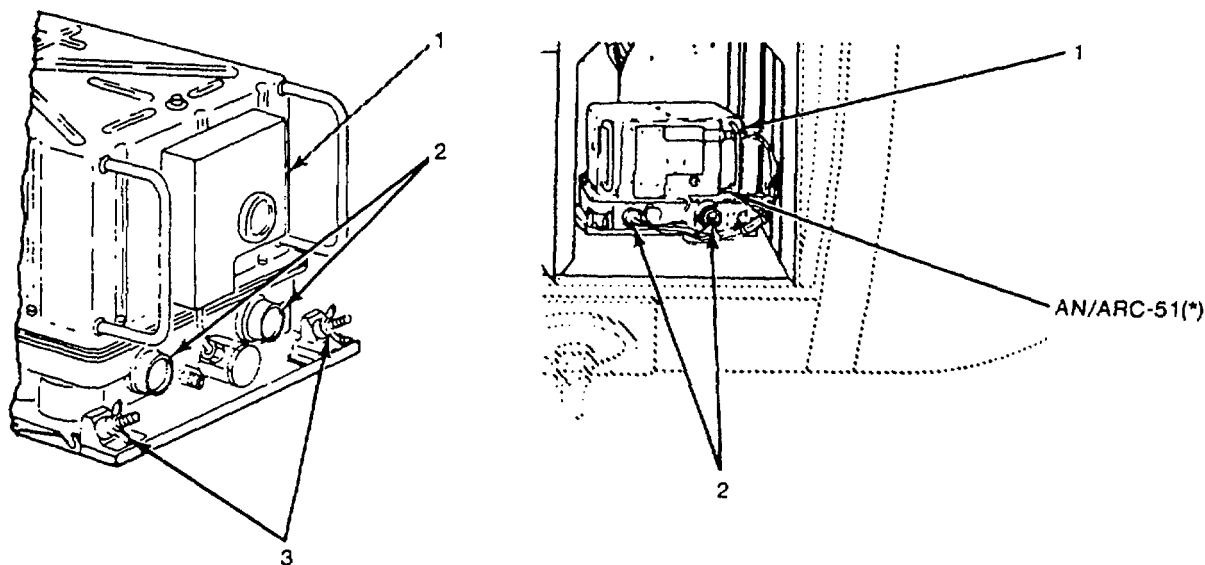
## CHAPTER 4

### UHF COMMAND RADIO SET AN/ARC-51X OR AN/ARC-51 BX MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-702/ARC-51 X or RT-742/ARC-51 B(*)		
Maintenance (AVUM) .....	4-1	4-1
Standing Wave Ratio Indicator ID-1003/ARC Maintenance (AVUM) .....	4-2	4-2
Air Cooler HD-615/ARC-51 X(*) Maintenance (AVUM) .....	4-3	4-2
Control C-4677/ARC-51 X or C-6287/ARC-51 BX Maintenance (AVUM) .....	4-4	4-3
Antenna AT-1 108/ARC Maintenance (AVU M) .....	4-5	4-3
Cabling and Connector Maintenance (AVUM) .....	4-6	4-4
UHF Command Radio Set AN/ARC-51 (*) Operational Checks (AVUM) .....	4-7	4-4
UHF Command Radio Set AN/ARC-51 (*) Troubleshooting (AVUM) .....	4-8	4-6

### SECTION I. MAINTENANCE PROCEDURES

#### 4.1 RECEIVER-TRANSMITTER RT-702/ARC-51X OR RT-742/ARC-51B(\*) MAINTENANCE (AVUM)



#### NOTE

RT-702/ARC-51 X must be used with C-4677/ARC-51 X and RT-742/ARC-51 B(\*) must be used with C-6287/ARC-51 BX.

##### 4-1.1 Removal Instructions.

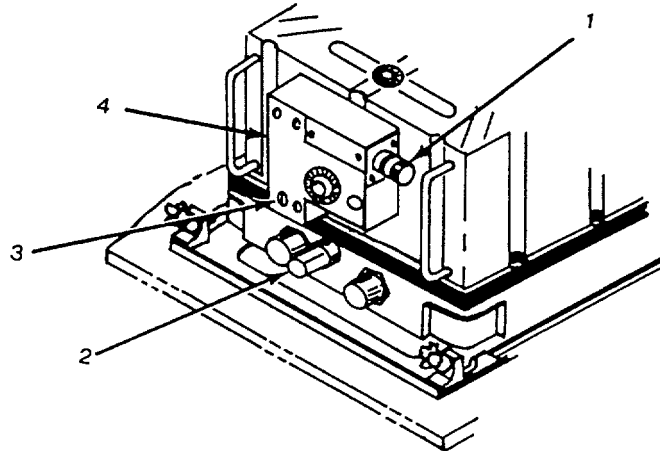
- A** Locate receiver-transmitter in forward radio compartment.
- B** Tag, then disconnect two electrical connectors (2).
- C** Disconnect antenna connector (1).
- D** Cut safety wire and loosen wingnuts (3).
- E** Slide receiver-transmitter forward and remove from mount.



#### 4-1.2 Installation Instructions.

- A Place receiver-transmitter in mount and slide to rear engaging guide pins.
- B Tighten wingnuts (3) and safety wire.
- C Connect antenna connector (1).
- D Connect two electrical connectors (2).

#### 4-2. STANDING WAVE RATIO INDICATOR ID-1003/ARC MAINTENANCE (AVUM)



#### 4-2.1 Removal Instructions.

- A Disconnect coaxial connector (1).
- B Disconnect electrical connector (2).
- C Loosen captive screws (3) that secure indicator (4) to receiver-transmitter.
- D Remove indicator.

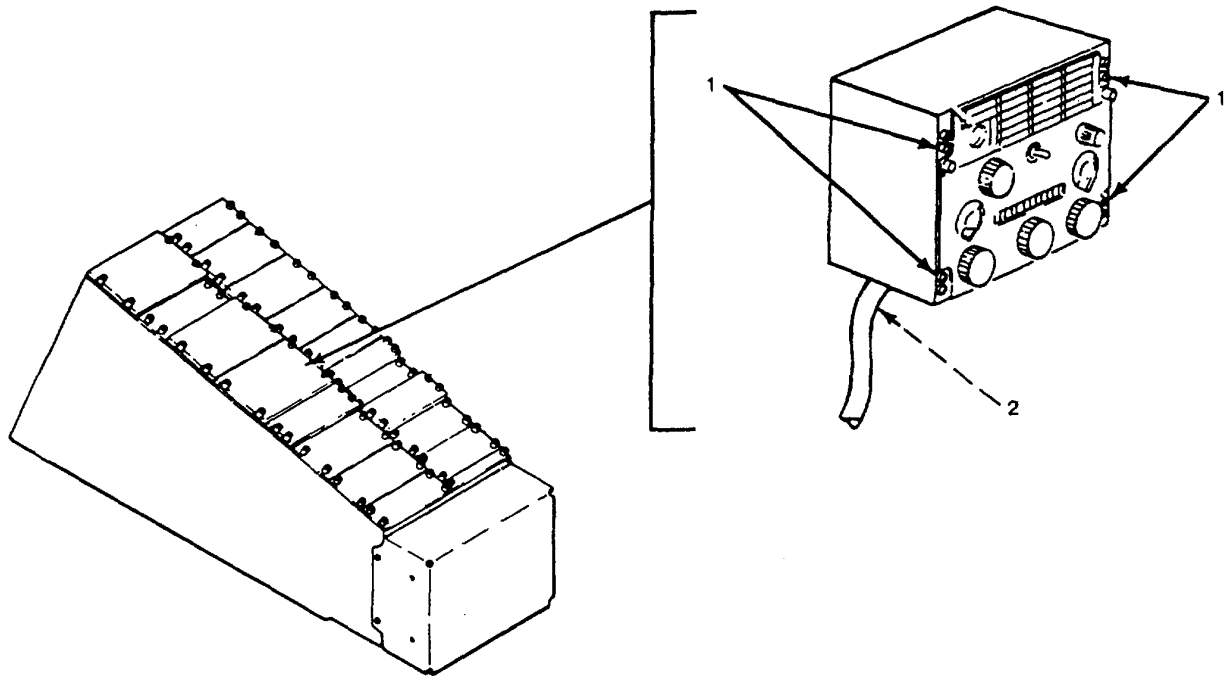
#### 4-2.2 Installation Instructions.

- A Position indicator (4) on receiver-transmitter and secure with captive screws (3).
- B Connect electrical connector (2).
- C Connect coaxial connector (1).

#### 4-3. AIR COOLER HD-615/ARC-51(\*) MAINTENANCE (AVUM)

Information not available from government.



**4-4. CONTROL C-4677/ARC-51 X OR C-6287/ARC-51 BX MAINTENANCE (AVUM)****NOTE**

C-4677/ARC-51 X must be used with RT-702/ARC-51 X and C-6287/ARC-51 BX must be used with RT-742/ARC-51 BX.

**4-4.1 Removal Instructions.**

- A** Locate control in pedestal.
- B** Loosen eight spring-lock fasteners (1) that secure control to pedestal.

**CAUTION**

Be careful not to pull control so far from pedestal that wiring or connector will be damaged.

- C** Lift control from pedestal and remove connector (2) from rear.

**4-4.2 Installation Instructions.**

- A** Connect cable connector (2) to rear of control.
- B** Position control in pedestal console and secure with eight spring-lock fasteners (1).

**4-5. ANTENNA AT-1108/ARC MAINTENANCE (AVUM)**

Refer to paragraph 5-3 for AT-1108/ARC maintenance.



**4-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
P1401, P1403, P1405, P3801, and P1407.
- Refer to FO-12 and FO-13 for wiring data.

**NOTE**

Some helicopters have a second UHF Radio Set AN/ARC-51(\*) installed.  
Refer to FO-12 and FO-13 for No. 2 UHF wiring data.

- Multiwire runs are repaired by replacing connectors or splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

**SECTION II. OPERATIONAL CHECKS****4-7. UHF COMMAND RADIO SET AN/ARC-51(\*) OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Radio Set AN/ARC-51 (\*) is performing properly. The check are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Test Equipment**

Radio Set

**Equipment Conditions**

Reference

**Personnel Required**

Two Technicians

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunications Set operational.

---

**PROCEDURE****NORMAL INDICATIONS****REMARKS**

---

**POWER OFF CHECKS**

- Check that all components are installed, securely mounted and safety wired (if required).
- Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

- Depress UHF ARC-51 INTERCOMM CPLT & CREW L, INTERCOMM PILOT & CREW R, and CONSOLED PED LIGHTS circuit breakers.
- Set function switch to T/R.

**CAUTION**

Allow five minutes warm-up time prior to keying transmitter.

**NOTE**

Steps 3 through 5 are for C-4677/ARC51X only

- Set SENS control to full clockwise.  
Rushing noise heard in headset (after approximately one minute warm-up).



# 4-7. UHF COMMAND RADIO SET AN/ARC-51(\*) OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## POWER ON CHECKS - Continued

4. Set SENS control to full counterclockwise.  
Rushing noise disappears.
  5. Set SENS control to full clockwise, then turn counterclockwise until rushing noise just disappears.  
If indications in steps three through five cannot be obtained, refer to troubleshooting paragraph 4-9.
  6. Set SQ DISABLE switch to OFF.  
Rushing noise in headset.  
If no rushing noise, refer to troubleshooting, paragraph 4-9.
  7. Rotate VOL control throughout its range.  
Corresponding increase/decrease in noise volume.  
If normal indication not obtained, refer to troubleshooting paragraph 4-8. Set SQ DISABLE to ON if desired.
  8. Set channel selector to MAN.
  9. Operate, in turn, 10-, 1-, and 0.1-MHz controls.  
800 Hz tone in headset during channeling cycle.  
If no tone refer to troubleshooting paragraph 4-8.
  10. Set channel selector to PRESET CHAN.
  11. Operate PRESET CHAN selector to different channels.  
800 Hz tone in headset during channeling cycle.  
If no tone refer to troubleshooting paragraph 4-8.
  12. Select assigned test frequency channel using PRESET CHAN or manual selector.
- NOTE**
- If possible, avoid communications checks with base control tower.  
When authorized, use another uhf receiver-transmitter and frequency.
  - While one technician conducts communications checks a second technician checks forward and reflected power. Forward power is read directly on ID-1 003/ARC-51 (front of RT-742) and reflected power by depressing PRESS FOR REFL POWER switch.
13. Depress microphone push-to-talk button and speak into microphone.  
Sidetone heard in headset.  
If no sidetone refer to troubleshooting paragraph 4-9.
  14. Conduct two-way communications check with other receiver-transmitter on at least three frequencies across uhf band.  
Clear two-way communications on all frequencies:  
The second technician should read at least 20 watts forward and less than 5 watts reflected power for all frequencies.  
Refer to troubleshooting paragraph 4-8.



**4-7. UHF COMMAND RADIO SET AN/ARC-51 (\*) OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS - Continued**

15. Request other station make test transmission on guard frequency.  
 Received signal from guard receiver loud and clear.  
 Guard receiver operation is verified by switching function selector between T/R and T/R + GUARD.

**Section III. TROUBLESHOOTING****4-8. UHF COMMAND RADIO SET AN/ARC-51 (\*) TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in UHF Command Radio Set AN/ARC-51 (\*).
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 4-7.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION****NOTE**

Receiver-transmitter refers to either RT-702/ARC-51 X or RT-742/ARC-51 BX: Control unit refers to either C-4677/ARC-51 X or C-4677/ARC-51X or C-6287/ARC-51 BX. The units are not interchangeable. When replacing, make sure unit installed has same part number as unit removed.

- SENS control does not function properly.
  - Defective control unit.
    - Replace control unit.
  - Defective receiver-transmitter.
    - Replace receiver-transmitter.
- SQ DISABLE switch does not disable or enable squelch circuits.
  - Defective control unit.
    - Replace control unit.
  - Defective receiver-transmitter.
    - Replace receiver-transmitter.



**4-8. UHF COMMAND RADIO SET AN/ARC-51 (\*) TROUBLESHOOTING (AVUM) - Continued**

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
<hr/>		
3. VOL control does not vary audio level smoothly or introduces chirps.	Defective control unit.	Replace control unit.
4. No tone heard in headset during channel changing cycle.	Defective receiver-transmitter.	Replace receiver-transmitter.
5. Transmitted power indication is less than 20 watts.	<b>A</b> Defective receiver-transmitter.	<b>A</b> Replace receiver-transmitter.
	<b>B</b> Defective reflectometer.	<b>B</b> Replace ID-1003/ARC-51.
6. Reflected power indication is greater than five watts.	<b>A</b> Defective receiver-transmitter.	<b>A</b> Replace receiver-transmitter.
	<b>B</b> Defective cabling between receiver-transmitter and an.tenna.	<b>B</b> Check cabling and connectors, replace or repair as necessary.
	<b>C</b> Defective antenna.	<b>C</b> Replace AT-1108/ARC.
	<b>D</b> Defective reflectometer.	<b>D</b> Replace ID-1003/ARC-51.
7. No sidetone in headset during transmission.	Defective receiver-transmitter.	Replace receiver-transmitter.
8. Radio set fails to provide two-way communications on all frequencies.	Defective receiver-transmitter.	Replace receiver-transmitter.
9. No or weak guard receiver output.	<b>A</b> Defective receiver-transmitter.	<b>A</b> Replace receiver-transmitter.
	<b>B</b> Defective control unit.	<b>B</b> Replace control unit.

**4-8.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in UHF Command Radio Set AN/ARC-51 (\*) and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-1 2 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.



**4-8.1 Signal and Voltage Measurements (AVUM). - Continued**

- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Refer to 4-8.1.1 for UH-1 D/H or 4-8.1.2 for UH-1 H. Refer to 4-8.1.3 for AN/ARC-51 (\*) No. 2 (when installed).

**4-8.1.1 UH-1D/H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB26	3, 6	Audio and power ground	Not applicable	0
TB12	1	Panel lighting circuit breaker energized	CONSOLE PED LIGHTS	0-28 Vdc
TB20	11	Transmit key line  switch set to 2	AN/ARC-51 (*) ener- gized, intercom rotary	28 Vdc microphone unkeyed, then on when microphone is keyed
P1 403	A and B	Primary power	AN/ARC-51 (*) energized	28 Vdc
P600	Y	Microphone audio	AN/ARC-51 (*) ener- gized, microphone keyed and signal applied	Audio hi
P600	B	Receive audio	AN/ARC-51 (*) energized	Audio hi

**4-8.1.2 UH-1 H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB66 TB20	9 2	Ground Transmit audio	Not applicable AN/ARC-51 (*), ener- gized, intercom rotary switch set to 2, micro- phone keyed and signal applied	0 Audio hi
TB2 P1403	3 A B	Receive audio Primary power	AN/ARC-51 (*) energized AN/ARC-51 (*) energized	Audio hi 28 Vdc



**4-8.1.3 AN/ARC-51 (\*) No. 2 Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	3, 7	Ground	Not applicable	0
TB20	13	Transmit keying control	AN/ARC-51(*) No. 2 energized	28 Vdc when micro- phone is unkeyed, then 0 when microphone is keyed
P1403	A, B	Primary power	AN/ARC-51 (*) No. 2 energized	28 Vdc



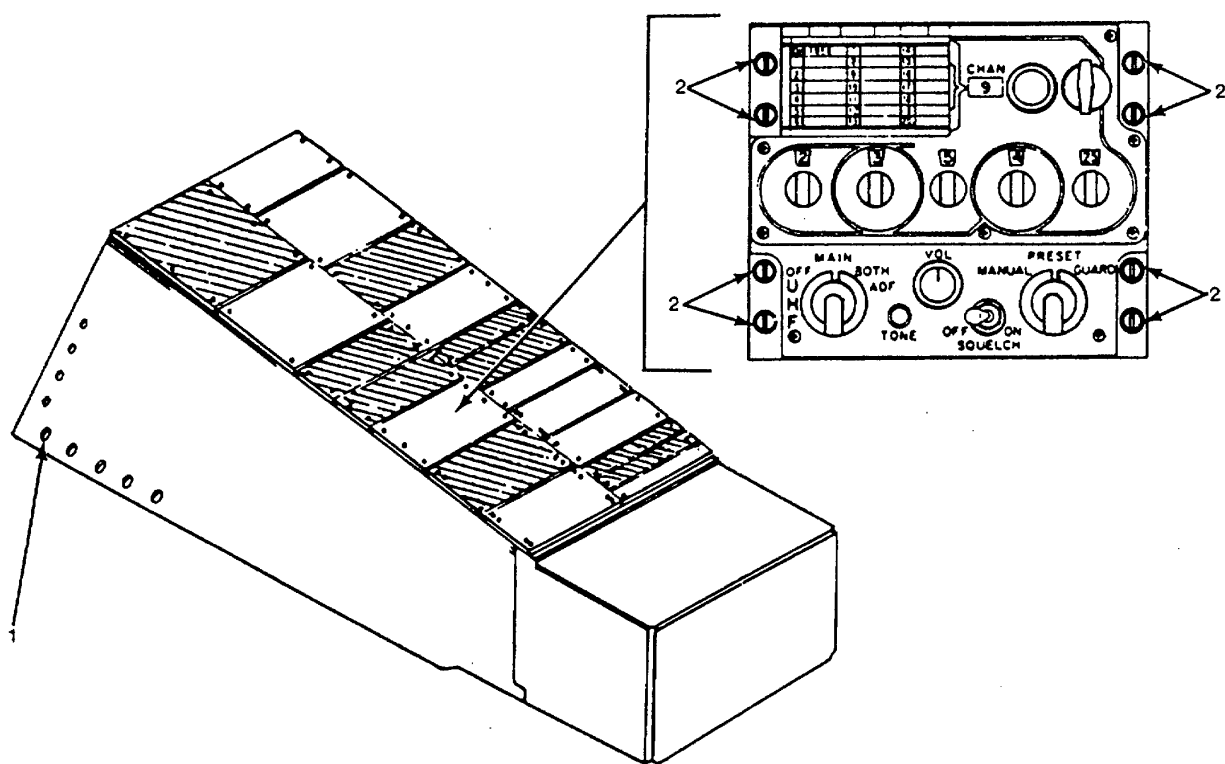
## CHAPTER 5

### UHF COMMAND RADIO SET AN/ARC-164(V) MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-1167(*)/ARC-164 Maintenance (AVUM) .....	5-1	5-1
UHF TRM Filter Maintenance (AVU M) .....	5-2	5-2
Antenna AT-1 108/ARC Maintenance (AVUM) .....	5-3	5-3
Cabling and Connector Maintenance (AVUM) .....	5-4	5-4
UHF Command Radio Set AN/ARC-1 64(V) Operational Checks (AVUM) .....	5-5	5-4
UHF Command Radio Set AN/ARC-1 64(V) Troubleshooting (AVUM) .....	5-6	5-5

#### SECTION I. MAINTENANCE PROCEDURES

##### 5-1. RECEIVER-TRANSMITTER RT-1167(\*)/ARC-164 MAINTENANCE (AVUM)



##### 5-1.1 Removal Instructions.

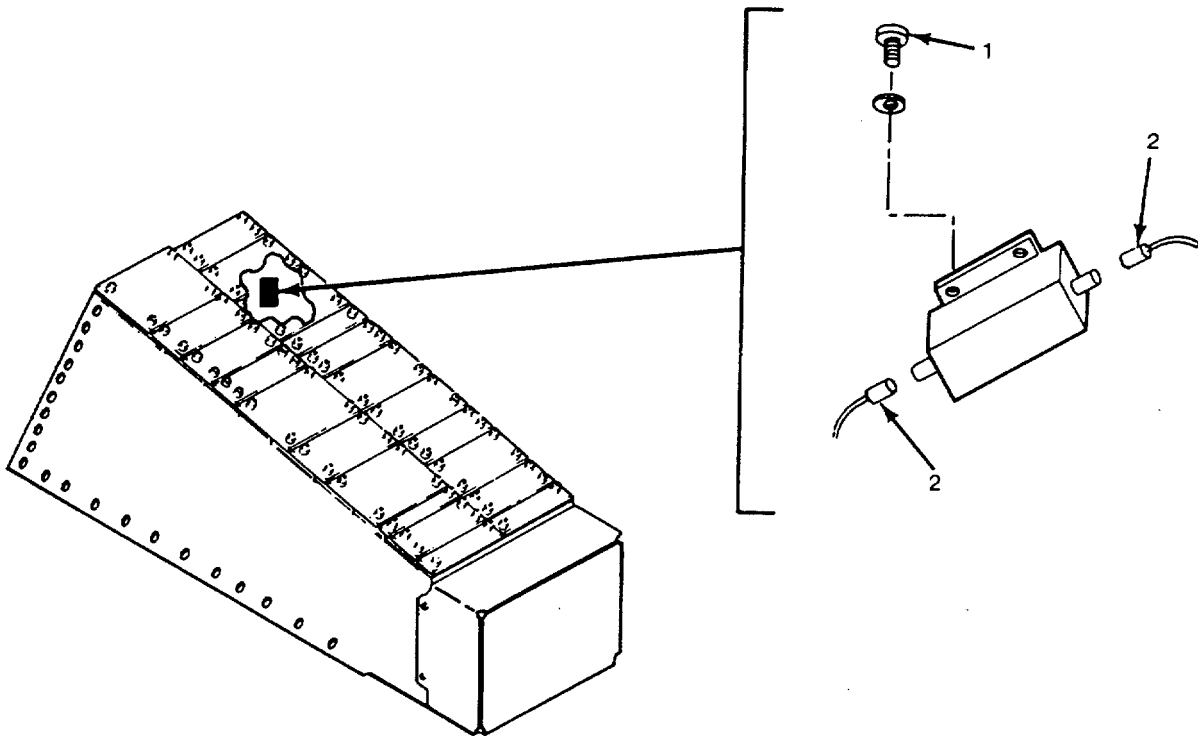
- A Remove left-side access cover from pedestal console by removing screws (1).
- B Disconnect one coaxial and one electrical connector from back of receiver-transmitter.
- C Loosen eight spring-lock fasteners (2).
- D Lift receiver-transmitter from pedestal console.



### 5-1.2 Installation Instructions.

- A Position receiver-transmitter in pedestal console and secure with eight spring-lock fasteners (2).
- B Reach through opened access cover and connect one coaxial and one electrical connector to back of receiver-transmitter.
- C Install access cover on left side of pedestal console and secure with screws (1).

### 5-2. UHF TRM FILTER MAINTENANCE (AVUM)



#### 5-2.1 Removal Instructions.

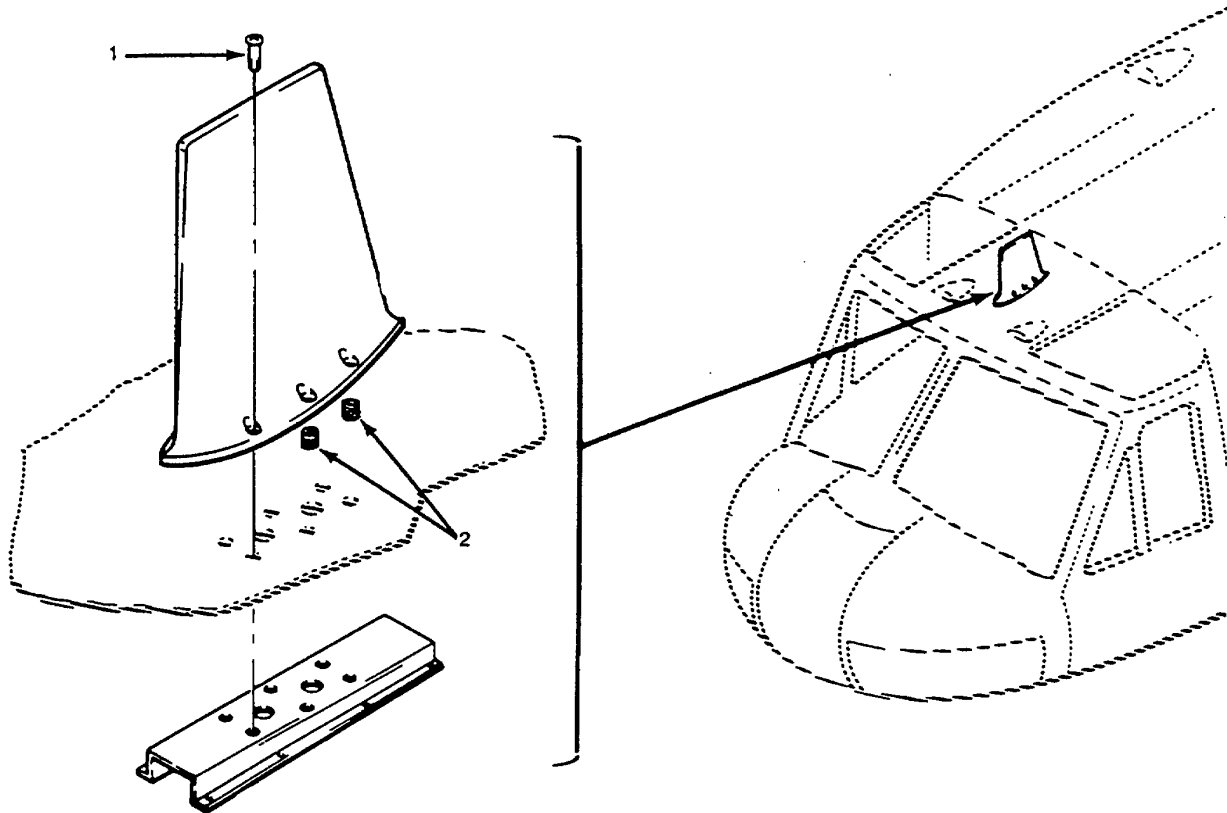
- A Remove side panel from center console.
- B Tag for identification then disconnect two coaxial connectors (2).
- C Remove four screws (1) that secure UHF TRM Filter to bulkhead and remove filter.

#### 5-2.2 Installation Instructions.

- A Position UHF TRM Filter against bulkhead and secure with four screws (1).
- B Connect two coaxial connectors and remove tags.
- C Replace side panel on center console.



### 5-3. ANTENNA AT-1 108/ARC MAINTENANCE (AVUM)



#### 5-3.1 Removal Instructions.

- A** Remove six screws (1) holding antenna mounting plate (2).

#### **CAUTION**

Be careful not to lift antenna so far that antenna leads or connectors may be damaged.

- B** Lift antenna from mounting plate.  
**C** Remove two antenna lead connectors from receptacles (2).

#### 5-3.2 Installation Instructions.

- A** Connect two antenna leads to receptacles (2).  
**B** Position antenna on mounting plate and secure with six screws (1).  
**C** Apply a small bead of RTV sealant around antenna base where it contacts helicopter skin.  
**D** Refer to TM 1 1-6625-545-15 and check Standing Wave Ratio (SWR) using AN/URM-261.



#### 5-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P1 (on RT unit), P1 and P2 on coaxial cables ARC-164-101A and ARC 164-101B.
- Refer to FO-15 and FO-16 for wiring data.
- Multiwire cables are repaired by replacing connectors or splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

### SECTION II. OPERATIONAL CHECKS

#### 5-5. UHF COMMAND RADIO SET ANIARC-164(V) OPERATIONAL CHECKS (AVUM)

These checks are used to ensure radio set AN/ARC-164(V) is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Radio Set

##### Equipment Conditions

Reference  
Paragraph 1-50 Auxiliary Power Unit connected.  
  
Paragraph 14-13 Intercommunication Set operational.

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#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF INSPECTION

- Check that all components are installed, securely mounted and safety wired (if required).
- Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON INSPECTION

- Depress UHF ARC-164, INTERCOM CPLT, INTERCOM PILOT and CONSOLE PED LIGHTS circuit breakers.
- Set function switch to BOTH.  
Panel lamps light.
- Set MANUAL-PRESET-GUARD switch to MANUAL.
- Set SQUELCH ON-OFF switch to ON.
- Check that BW switch is set to WB.



## 5-5. UHF COMMAND RADIO SET AN/ARC-164(V) OPERATIONAL CHECKS (AVUM) - Continued

### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

### POWER ON INSPECTION - Continued

6. Set manual frequency selector switches to a frequency not locally assigned.

#### CAUTION

Allow five minutes warm-up time before keying transmitter.

7. Press TONE push-button.  
Tone signal heard in headset.  
If no tone, refer to troubleshooting paragraph 4-9.
8. Set SQUELCH ON-OFF switch to OFF.  
Rushing noise heard in headset.  
If no rushing noise, refer to troubleshooting paragraph 5-9, if normal, return switch to ON.
9. Set manual frequency selector switches to assigned test frequency.

#### NOTE

If possible, avoid communications checks with base control tower. When authorized, use another uhf receiver-transmitter and frequency.

10. Depress microphone push-to-talk button and call for radio check.  
Sidetone heard in headset.
11. Listen for reply; during reception, rotate volume control.  
Volume increases and decreases smoothly.  
If no reply, repeat steps 9 through 11 using a different frequency and/or station; if still no reply, refer to troubleshooting, paragraph 5-9. If volume does not vary smoothly, replace RT-1 1 67/ARC-1 64(V).

## SECTION III. TROUBLESHOOTING

### 5-6. UHF COMMAND RADIO SET AN/ARC-164(V) TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in UHF Command Radio Set AN/ARC-1 64(V).
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 5-5.



**5-6. UHF COMMAND RADIO SET AN/ARC-1 64(V) TROUBLESHOOTING (AVUM) - Continued**

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
<hr/>		
1. Radio set does not energize (no noise in headset, no sidetone).	<b>A</b> Primary power not supplied. <b>A</b> Reset circuit breaker then check fuse in radio set. <b>B</b> Defective radio set. <b>B</b> Replace RT-11 67(*)/ARC-164.	
2. SQUELCH does not operate properly.	<b>A</b> Squelch improperly adjusted. <b>A</b> Adjust squelch. <b>B</b> Defective radio set. <b>B</b> Replace RT-1 1 67(*)/ARC-1 64.	
3. Radio set fails to provide adequate signals to maintain two-way communications.	<b>A</b> Defective radio set. <b>A</b> Replace RT-1 167(*)/ARC-1 64. <b>B</b> Defective cabling. <b>B</b> Check interunit connectors, repair or replace as necessary. <b>C</b> Defective filter. <b>C</b> Replace UHF TRM Filter. <b>D</b> Defective antenna. <b>D</b> Replace AT-1 108/ARC.	
5-6.1 Signal and Voltage Measurements (AVUM).		
<ul style="list-style-type: none"> <li>If a trouble develops in UHF Command Radio Set AN/ARC-1 64(V) and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-15 and FO-16, and trace the wiring to power source, basic signal equipment or installation item to locate fault.</li> <li>Terminal board location is shown on FO-1 through FO-4.</li> <li>Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.</li> <li>The TB or P column lists terminal board or plug number where measurement should be taken.</li> <li>The Terminal column lists terminal or pin number for the measurement.</li> <li>The Terminal function column lists the function of the voltage or signal being measured.</li> <li>The Equipment operation column lists specific equipment operations required to have voltage or signal present.</li> <li>The Voltage column lists voltage or signal that should be present during stated equipment operation.</li> <li>Refer to 5-6.1.1 for UH-10/H and 5-6.1.2 for UH-1 H.</li> </ul>		



**5-6.1.1. UH-1 D/H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	3	Receive audio	AN/ARC-164(V) energized	Audio hi
TB20	11	Transmit keying control	AN/ARC-164(V) energized intercom rotary switch set to 2	28 Vdc microphone unkeyed, then 0 when microphone is keyed
P1	D	Primary power	AN/ARC-164(V) energized	28 Vdc

**5-6.1.2 UH-1H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	1	Microphone audio return (ground)	Not applicable	0
TB20	2	Microphone audio	AN/ARC-164(V) energized intercom rotary switch set to 2, microphone keyed and signal applied	Audio hi
TB20	3	Receive audio	AN/ARC-164(V)	Audio hi
TB26	3	Receive audio return (ground)	Not applicable	0
P1	D	Primary power	AN/ARC-164(V) energized	28 Vdc



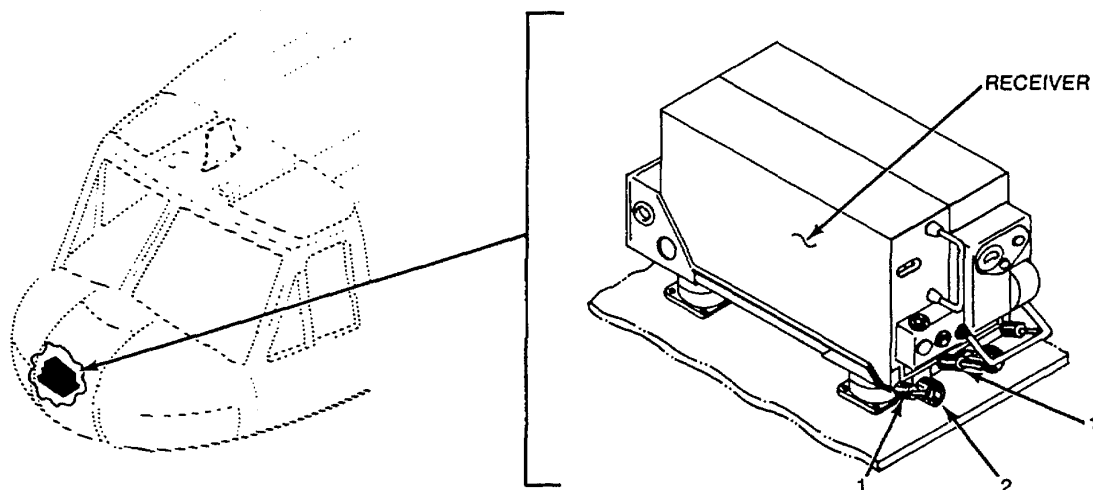
## CHAPTER 6

### VHF COMMAND RADIO SET AN/ARC-73(\*) MAINTENANCE

Subject	Para.	Page
Receiver R-1123(*)/ARC-73 Maintenance (AVUM).....	6-1	6-1
Transmitter T-879(*)/ARC-73 Maintenance (AVUM).....	6-2	6-2
Mount MT-2699/ARC-73 Maintenance (AVUM).....	6-3	6-3
Control Unit Maintenance (AVUM).....	6-4	6-4
Antenna AT-1108/ARC Maintenance (AVUM).....	6-5	6-4
Cabling and Connector Maintenance (AVUM).....	6-6	6-5
VHF Command Radio Set AN/ARC-73(*) Operational Checks (AVUM).....	6-7	6-5
VHF Command Radio Set AN/ARC-73(*) Troubleshooting (AVUM).....	6-8	6-6

#### SECTION I. MAINTENANCE PROCEDURES

##### 6-1. RECEIVER R-1123(\*)/ARC-73 MAINTENANCE (AVUM)



###### 6-1.1 Removal Instructions.

- A** Cut safety wire and loosen two knurled knobs (1).
- B** Loosen extractor knob (2) until electrical connector at back of receiver is disengaged from connector on mounting.
- C** Grasp handle and lift receiver out of mount.

###### 6-1.2 Installation Instructions.

- A** Position receiver in mounting with lip on bottom front of receiver fitted into groove in extractor mechanism.

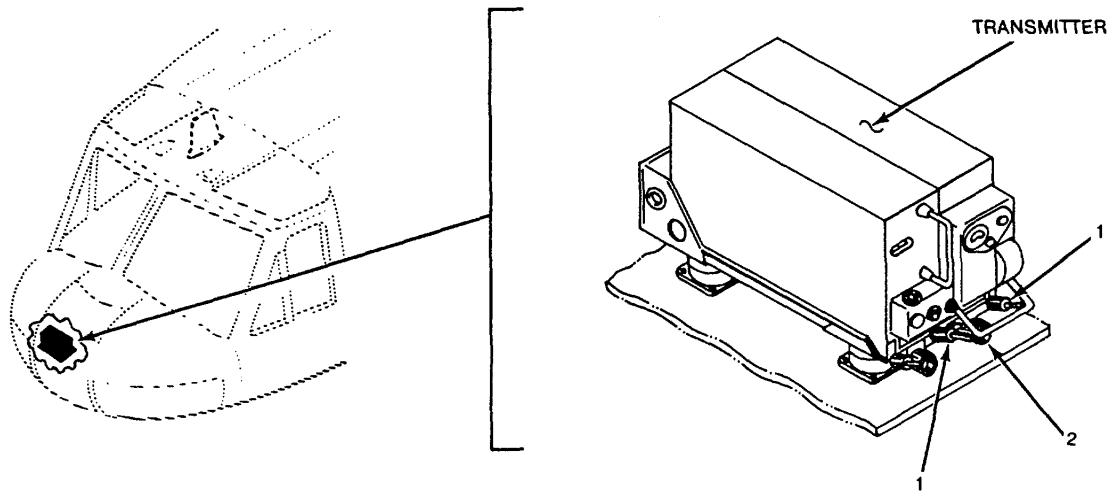
#### **CAUTION**

Ensure proper mating of connectors on receiver and mounting while tightening extractor mechanism.

- B** Tighten extractor knob (2) until receiver is properly seated in mounting.
- C** Position knurled knobs (1) over flanges on front of receiver and tighten knobs.
- D** Safety wire knobs.



## 6-2. TRANSMITTER T-879(\*)/ARC-73 MAINTENANCE (AVUM)



### 6-2.1 Removal Instructions.

- A Cut safety wire and loosen two knurled knobs (1).
- B Loosen extractor knob (2) until electrical connector at back of transmitter is disengaged from connector or mounting.
- C Grasp handle and lift transmitter from mounting.

### 6-2.2 Installation Instructions.

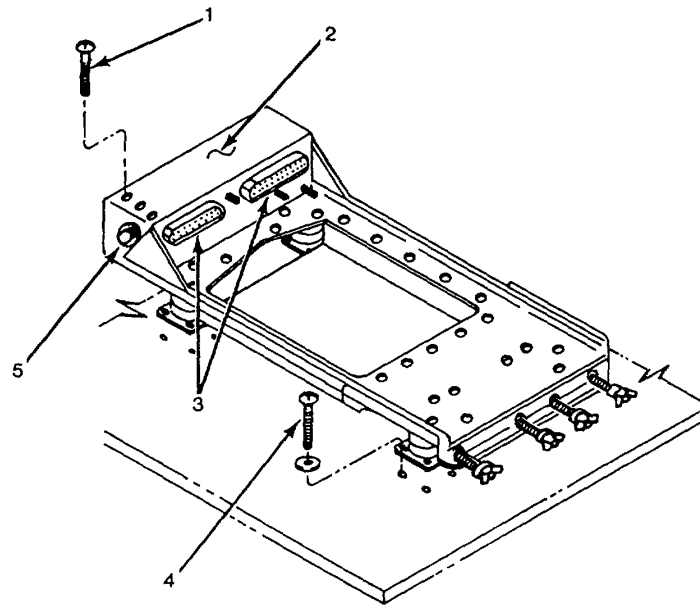
- A Position transmitter in mounting with lip on bottom front of transmitter fitted into groove in extractor mechanism.

#### **CAUTION**

Ensure proper mating of connectors on transmitter and mounting while tightening extractor mechanism.

- B Tighten extractor knob (2) until transmitter is properly seated in mounting.
- C Position knurled knobs (1) over flanges on front of transmitter and tighten knobs.
- D Safety wire knobs.



**6-3. MOUNT MT-2699/ARC-73 MAINTENANCE (AVUM]****6-3.1 Removal Instructions.**

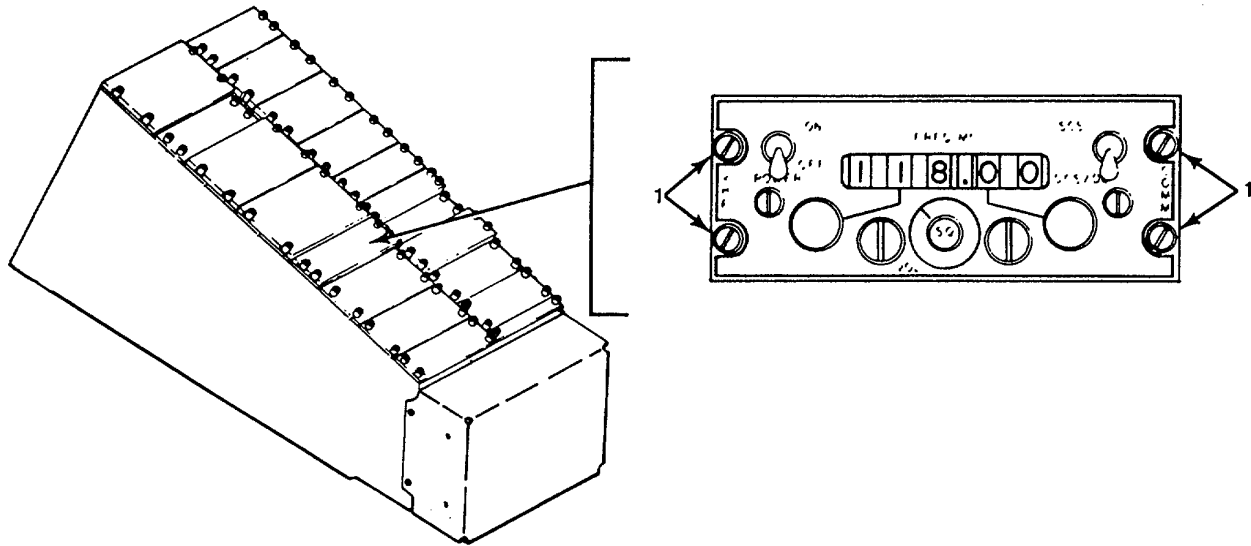
- A Remove receiver (paragraph 6-1.1) and transmitter (paragraph 6-2.1).
- B Remove screws (1) that secure rear cover (2) and remove cover.
- C Remove screws that secure electrical connectors (3) in mount.
- D Remove electrical connectors and rubber grommet (5) from mount.
- E Remove screws and washers (4) that secure mount to equipment shelf and remove mount.

**6-3.2 Installation Instructions**

- A Position mount on equipment shelf and secure with screws and washers (4).
- B Position electrical connectors (3) in mount and secure with screws previously removed.
- C Insert rubber grommet (5) into cover cable slot.
- D Position rear cover (2) on mount and secure with screws (1).
- E Install receiver (paragraph 6-1.2) and transmitter (paragraph 6-2.2).



#### 6-4. CONTROL UNIT MAINTENANCE (AVUM)



##### NOTE

Either C-4074(\*)/ARC-73A, 61 4U-5, 61 4-6 or 61 6U-6 may be installed. The controls are similar in appearance and function; maintenance procedures are identical.

##### 6-4.1 Removal Instructions.

- A** Loosen four spring-lock fasteners (1).

##### CAUTION

Be careful not to pull control so far from pedestal console that wiring or connector may be damaged.

- B** Lift control from pedestal console and disconnect electrical connector from back of control.  
**C** Remove control.

##### 6-4.2 Installation Instructions.

- A** Hold control near pedestal console and connect electrical connector to back of control.  
**B** Position control in pedestal console and secure with four spring-lock fasteners (1).

#### 6-5. ANTENNA AT-1 108/ARC MAINTENANCE (AVUM)

Refer to paragraph 5-3 for AT-1 108/ARC maintenance instructions.



## 6-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P1905, P1904, P1903, P1 902 (Configuration A only), P804, P805, and P1906
- Refer to FO-17 for wiring data.
- Multiwire cables are repaired by replacing connectors or splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

## SECTION II. OPERATIONAL CHECKS

### 6-7. VHF COMMAND RADIO SET AN/ARC-73(\*j) OPERATIONAL CHECKS (AVUM)

These checks are used to ensure radio set AN/ARC-55 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

<u>Test Equipment</u>	<u>Equipment Conditions</u>
Radio Set	Reference Paragraph 1-50 Auxiliary Power Unit connected. Paragraph 14-13 Intercommunication Set operational.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress VHF XMTR ARC-73, VHF RCVR ARC-73 and INTERCOM circuit breakers.
2. Set switches on intercom set to allow transmission and reception with AN/ARC-73..
3. On control unit set POWER switch ON.  
Control unit lamps light.
4. Adjust volume control to midposition.
5. Rotate SQ control fully ccw, then cw until rushing noise just stops.

#### NOTE

If possible avoid communications checks with base control tower. When authorized use another vhf receiver-transmitter and frequency.



**6-7. VHF COMMAND RADIO SET AN/ARC-73(\*) OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS - Continued**

6. Adjust frequency selectors to assigned test frequency.  
Frequency display on control unit should agree with frequency display in MC window on receiver.

**CAUTION**

Allow 15 minutes warm-up time before keying transmitter.

7. From pilot, then copilot station fully depress cyclic stick switch and speak into microphone.  
Sidetone heard in headset.
8. Conduct two-way communications check with other vhf receiver-transmitter.  
Clear and audible two-way communications.
9. While receiving another vhf station rotate VOL control throughout its range.  
Volume of received signal should vary smoothly with no chirps or dead spots.

**SECTION III. TROUBLESHOOTING****6-8. VHF COMMAND RADIO SET AN/ARC-73(\*) TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in VHF Command Radio Set AN/ARC-73(\*).
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 6-8.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. Control panel lamps do not light; transmission and reception not functional.
  - A** Interunit cabling not secure.
    - A** Check interunit cabling, repair or replace as necessary.
  - B** Defective radio set component.
    - B** Replace components in order listed until radio set functions:
      1. Control C-4074(\*)/ARC-73.
      2. Receiver R-1 123(\*)/ARC-73.
      3. Transmitter T-879(\*)/ARC-73.



**6-8. VHF COMMAND RADIO SET AN/ARC-73 (\*) TROUBLESHOOTING (AVUM) = Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
2. Audio intelligibility poor.	<b>A</b> Defective receiver.	<b>A</b> Replace R-1 123(*)/ARC-73.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-4074(*)/ARC-73.
3. Squelch control does not cut-off receiver noise.	<b>A</b> Defective receiver.	<b>A</b> Replace R-1123(*)/ARC-73.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-4074(*)/ARC-73.
4. Frequency in control unit window is not the same as displayed on receiver.	Defective control unit.	<b>B</b> Replace C-4074(*)/ARC-73.
5. No sidetone heard in headset.	Defective receiver.	<b>B</b> Replace R-1123(*)/ARC-73.
6. Transmitter, receiver and control unit continue to operate when power switch is set to OFF.	<b>A</b> Defective interunit cabling.	<b>A</b> Check cabling and connectors, repair or replace as necessary.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-4074(*)/ARC-73.
7. VOL control does not vary audio level smoothly or introduces chirps.	Defective control unit.	<b>B</b> Replace C-4074(*)/ARC-73.

**6-8.1 Signal and Voltage Measurements [AVUM].**

- If a trouble develops in VHF Command Radio Set AN/ARC-73(\*) and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-17 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-17.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.



**6-8.1 Signal and Voltage Measurements (AVUM). - Continued**

- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment 6-8.1.1 Signal and Voltage Measurements (AVUM).

**6-8.1.1. Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	3	Panel lighting	CONSOLE PED LIGHTS energized	028 Vdc
TB26	1, 5, 9, 10 11	Ground	Not applicable	0
TB21	10	Transmit audio	AN/ARC-73(*) energized intercom rotary switch set to 3, microphone keyed and signal applied	
TB21	2, 3	Primary power, Configurations A and B	AN/ARC-73(*) energized	28 Vdc
TB19	3, 4	Primary power; Configurations C through F	AN/ARC-73(*) energized	28 Vdc



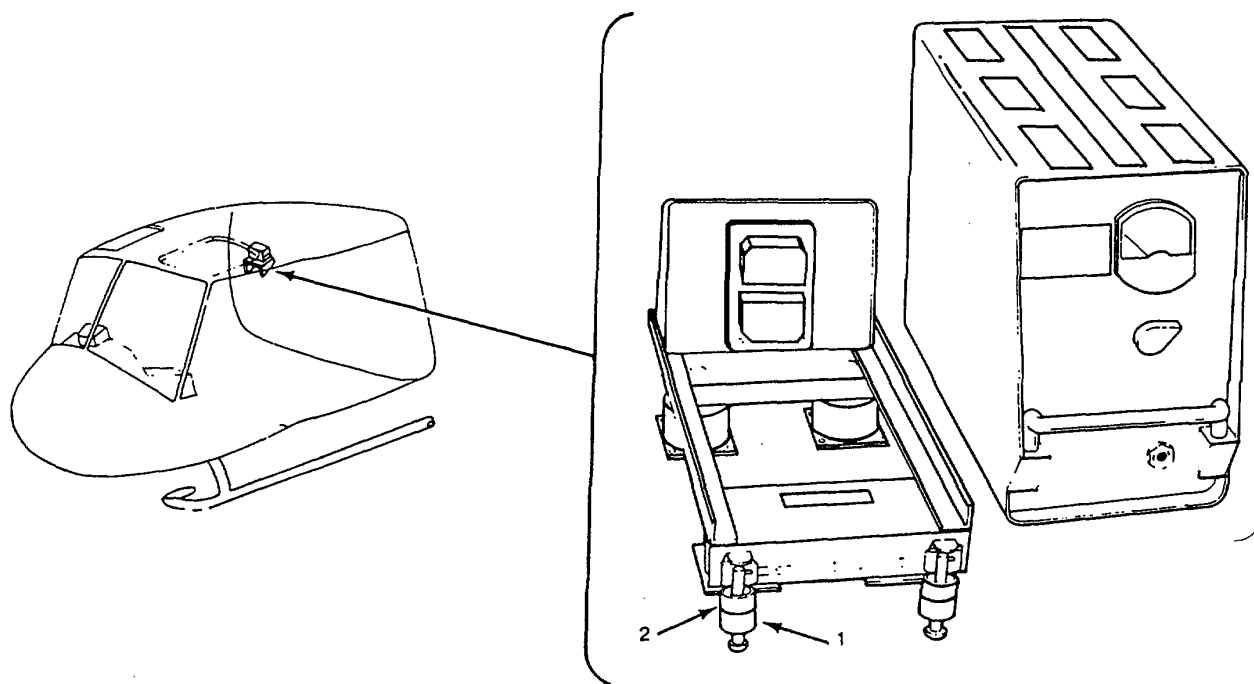
## CHAPTER 7

### VHF COMMAND RADIO SET AN/ARC-134 MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-857/ARC-134 Maintenance (AVUM).....	7-1	7-1
Control C-7197/ARC-134 Maintenance (AVUM).....	7-2	7-2
Mount MT-3791/ARC-134 Maintenance (AVUM).....	7-3	7-3
Antenna AT-1 108/ARC Maintenance (AVUM).....	7-4	7-3
Cabling and Connector Maintenance (AVUM).....	7-5	7-3
VHF Command Radio Set AN/ARC-134 Operational Checks (AVUM) .....	7-6	7-4
VHF Command Radio Set AN/ARC-134 Troubleshooting (AVUM).....	7-7	7-5

### SECTION I. MAINTENANCE PROCEDURES

#### 7-1. RECEIVER-TRANSMITTER RT-857/ARC-134 MAINTENANCE (AVUM)



##### 7-1.1 Removal Instructions.

- A Loosen two knurled retainer nuts (1).
- B Slip hold-down clamps (2) off lugs on front of RT-857/ARC-134.
- C Slide RT-857/ARC-134 forward, then lift out of mount.



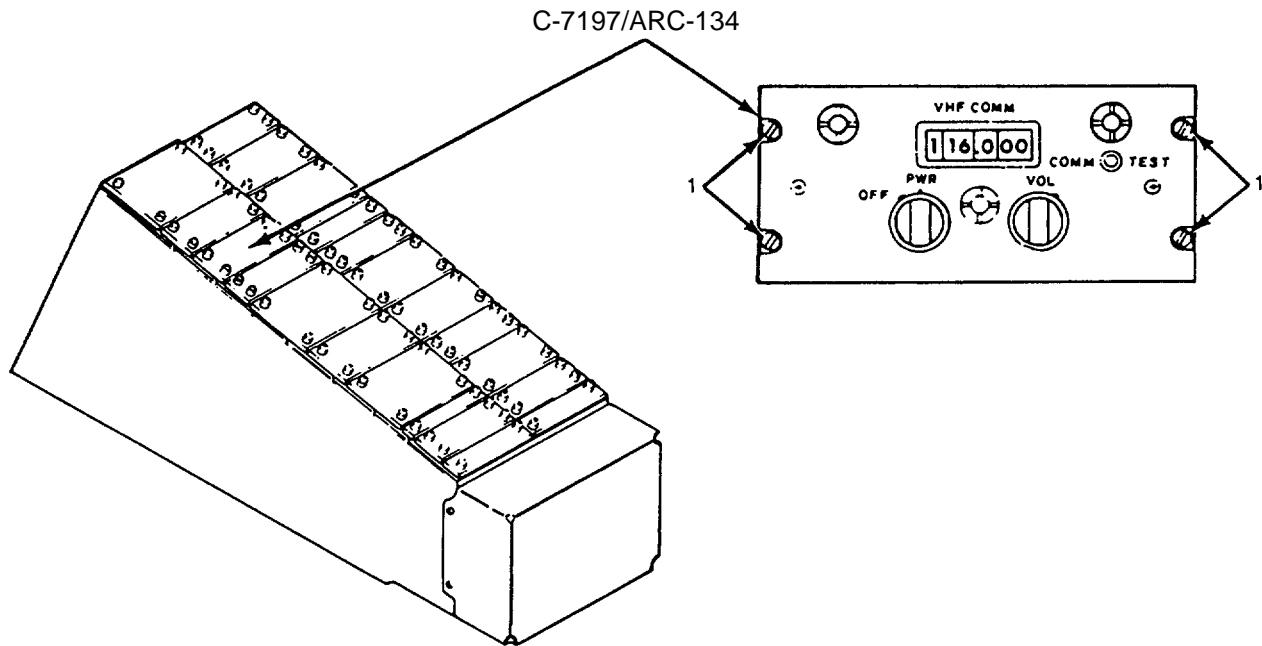
## 7-1.2 Installation Instructions.

### CAUTION

When installing RT-857/ARC-134 be sure connector pins on back of unit line up with plug in mount.

- A Place RT-857/ARC-134 in mount and carefully slide unit back engaging connector in mount.
- B Slip holddown clamps (2) over lugs on front of RT-857/ARC-134.
- C Tighten knurled retainer nuts (1).

## 7-2. CONTROL C-7197/ARC-134 MAINTENANCE (AVUM)



## 7-2.1 Removal Instructions.

- A Loosen four spring-lock fasteners (1).

### CAUTION

Be careful not to pull control so far from pedestal console that wiring or connector will be damaged.

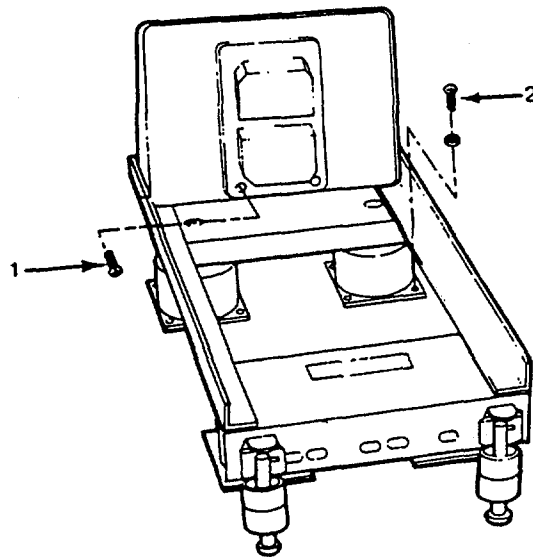
- B Carefully lift C-7197/ARC-134 to gain access, then disconnect electrical connector on back of unit.
- C Remove C-7197/ARC-134.

## 7-2.2. Installation Instructions.

- A Connect electrical connector to back of C-7197/ARC-134.
- B Position C-7197/ARC-134 in pedestal console and secure with four spring-lock fasteners (1).



### 7-3. MOUNT MT-3791/ARC-134 MAINTENANCE (AVUM)



#### 7-3.1 Removal Instructions.

- A Remove receiver-transmitter per paragraph 7-1.1.
- B Remove four screws that secure electrical connectors to mount and detach electrical connectors.
- C Remove sixteen screws, nuts and washers that secure mount to equipment shelf.
- D Remove mount.

#### 7-3.2. Installation Instructions.

- A Position mount on equipment shelf and secure with sixteen screws, nuts and washers.
- B Position connectors in mount and secure with four screws.
- C Replace receiver-transmitter per paragraph 7-1.2.

### 7-4. ANTENNA AT-1 108/ARC MAINTENANCE (AVUM)

Refer to paragraph 5-3 for AT-1 108/ARC maintenance.

### 7-5. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:
- Refer to FO-18 and FO-19 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.



**SECTION II. OPERATIONAL CHECKS****7-6. VHF COMMAND RADIO SET AN/ARC-134 OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Radio Set AN/ARC-134 is performing properly. The check are also used' after repairs to make sure the problem was fixed.

**INITIAL SETUP**Test Equipment

Radio Set

Equipment Conditions

Reference

Paragraph 1-50 Auxiliary Power Unit connected.  
Paragraph 14-13 Intercommunication Set  
operational.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

1. Depress VHF XCVR COMM, INTERCOMM CPLT & CREW L and INTERCOMM PLT & CREW R circuit breakers.

**CAUTION**

Allow at least 5 minutes warm-up time prior to keying transmitter.

2. Set OFF/PWR switch to PWR.  
Indicator dial should light.
3. On RT-857/ARC-134, set meter switch to LINE V position.  
Meter indicates approximately 27V.
4. O RT-857/ARC-134, set meter switch to REG SUP position.  
Meter indicates approximately 20V.
5. On C-7197/ARC-134, select a frequency on which no signals are heard, then depress COMM TEST switch. Background noise heard in headset.
6. On RT-857/ARC-134, set meter switch to AGC.  
Meter indicates 0.05 (1 scale division) with COMM TEST switch depressed.
7. Select assigned test frequency.

**NOTE**

If possible, avoid communications checks with base control tower. When authorized, use another vhf receiver-transmitter and frequency.



**7-6. VHF COMMAND RADIO SET AN/ARC-134 OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS - Continued**

8. Conduct two way communications check with other receiver-transmitter.  
Sidetone heard in headset during transmission. Other receiver-transmitter should receive clear and audible transmission, and reception from other receiver-transmitter should be clear and audible.
9. During reception, rotate VOL control on C-7197/ARC-134 throughout its range.  
Audio level should vary smoothly.

**SECTION III. TROUBLESHOOTING****7-7. VHF COMMAND RADIO SET AN/ARC-134 TROUBLESHOOTING (AVUM)**

The table below is provided to assist maintenance personnel in locating malfunctions in Radio Set AN/ARC-134.

- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 7-6.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. Dial indicators do not glow.
  - A Defective circuit breaker.
    - A Reset or replace circuit breaker.
  - B Defective control.
    - B Replace Control C-7197/ARC-134.
2. No meter indication on receiver-transmitter meter, switch in LINE V or REG SUP position.  
Defective receiver-transmitter.  
Replace Receiver-Transmitter RT-857/ARC-134.
3. Depressing COM TEST switch on control does not noise in headset or meter indication (RT meter switch in AGC).
  - A Defective control.
    - A Replace C-71 97/ARC-134.
  - B Defective receiver-transmitter.
    - B Replace RT-857/ARC-134.



**7-7. VHF COMMAND RADIO SET AN/ARC-134 TROUBLESHOOTING (AVUM) - Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
4. No reception or transmission of signals.	<b>A</b> Defective receiver-transmitter.	<b>A</b> Replace RT-857/ARC-134.
	<b>B</b> Defective control.	<b>B</b> Replace C-7197/ARC-134.
	<b>C</b> Defective antenna.	<b>C</b> Replace AT-1 108/ARC.
5. Audio level cannot be varied by radio set VOL control. Defective radio set control.		Replace C-71 97/ARC-134.
6. Dial indicators remain lit when radio set is turned OFF. Defective radio set control.		Replace C-7197/ARC-134..

**7-7.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in VHF Command Radio Set AN/ARC-134 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-18 and FO-19, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.



**7-7.1.1 Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	2	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	2, 3	Ground	Not applicable	0
TB20	12	Transmit key control	AN/ARC-134 energized, intercom rotary switch set to 3	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	4	Receive audio	AN/ARC-134 energized	Audio hi
P3200A	3, 4	Primary power	AN/ARC-134 energized	28 Vdc
TB5 through 8	4	Transmit audio, configuration F serial number 66-16307 through configuration J only	AN/ARC-134 energized, intercom rotary switch set to 3, microphone keyed and signal applied	Audio hi



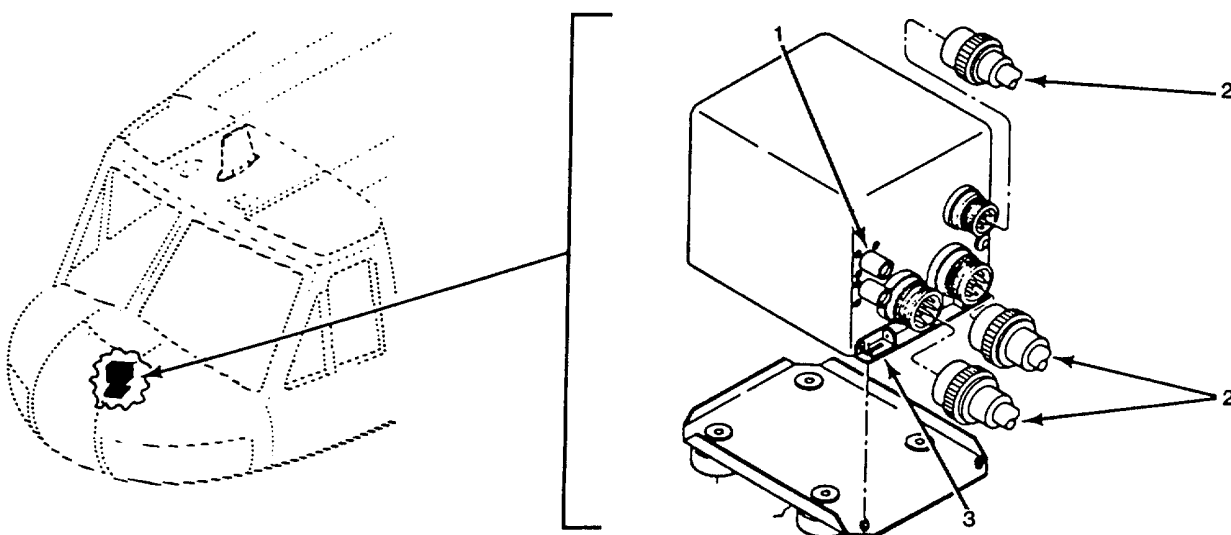
## CHAPTER 8

### VHF EMERGENCY TRANSMITTER T-366(\*)/ARC MAINTENANCE

Subject	Para.	Page
Transmitter T-366(*)/ARC Maintenance (AVUM).....	8-1	8-1
Dynamotor DY-86/ARN-30 Maintenance (AVUM).....	8-2	8-2
Power Unit P-12 Maintenance (AVUM).....	8-3	8-3
Control Panel P/N 204-075-709 Maintenance (AVUM).....	8-4	8-4
Cabling and Connector Maintenance (AVUM) .....	8-5	8-5
VHF Emergency Transmitter T-366(*) Operational Checks (AVU M).....	8-6	8-5
VHF Emergency Transmitter T-366(*) Troubleshooting (AVUM).....	8-7	8-6

#### SECTION I. MAINTENANCE PROCEDURES

##### 8-1. TRANSMITTER T-366(\*)/ARC MAINTENANCE (AVUM)



###### 8-1.1 Removal Instructions.

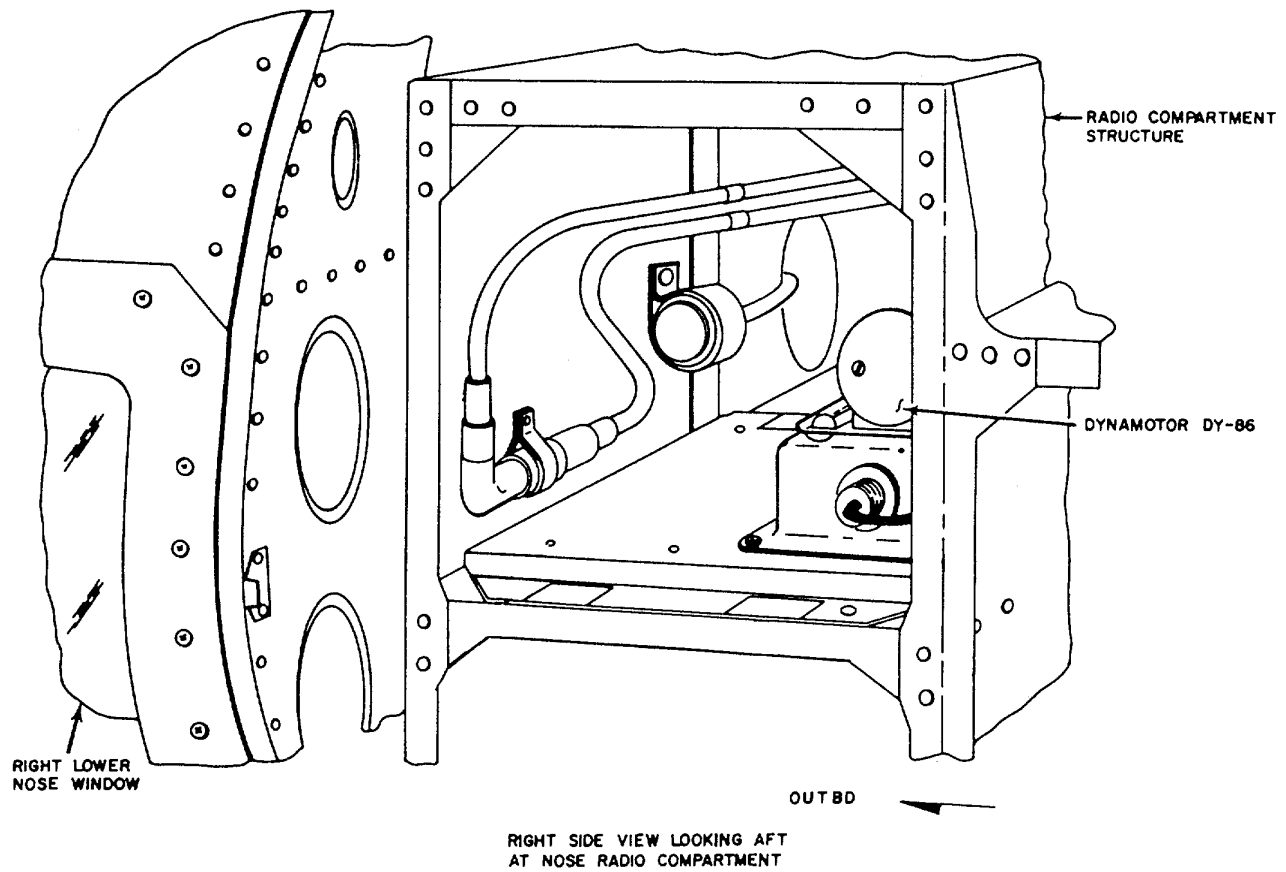
- A Disconnect three electrical connectors (2) and one coaxial (1) connector; cover openings.
- B Release two pin-lock fasteners (3) by sliding them inboard.
- C Remove transmitter.

###### 8-1.2 Installation Instructions.

- A Position transmitter in mounting.
- B Secure transmitter in mounting by sliding two pin-lock fasteners (3) outboard.
- C Remove covers and connect three electrical connectors (2) and one coaxial connector.



## 8-2. DYNAMOTOR DY-86/ARN-30 MAINTENANCE (AVUM)

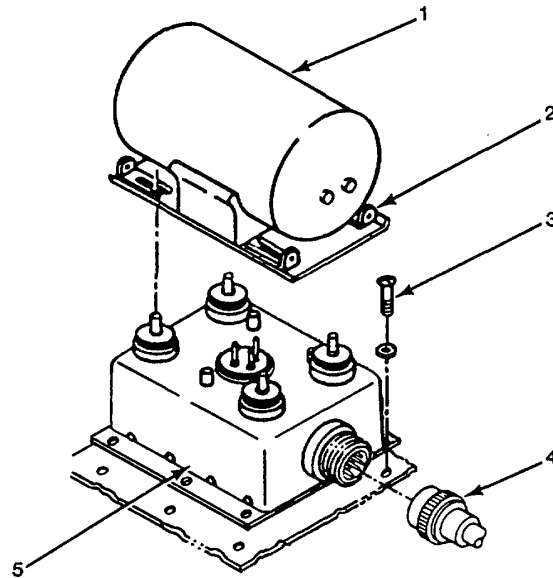


### 8-2.1 Removal Instructions.

- A Remove RT-294(\*)/ARC-44 (paragraph 10-1) or RT-384/ARC-54 (paragraph 11-1) to gain access to dynamotor.
- B Cut safety wire and slide four snap-lock fasteners (2) that secure dynamotor (1) power unit (5).



### 8-2.1 Removal Instructions.-Continued



C Lift dynamotor off power unit.

### 8-2.2 Installation Instructions.

A Position dynamotor (1) on power unit (5) and press down firmly to engage connectors.

B Slide four snap-lock fasteners (2) into locked position.

C Safety wire snap-lock fasteners.

D Replace RT-294(\*)/ARC-44 (paragraph 10-1) or RT-384/ARC-54 (paragraph 11-1).

### 8-3. POWER UNIT P-12 MAINTENANCE (AVUM)

#### 8-3.1 Removal Instructions.

A Remove dynamotor per paragraph 8-2.1.

B Disconnect electrical connector (4).

C Cut safety wire and remove two screws (3) and washers that secure power unit to shelf.

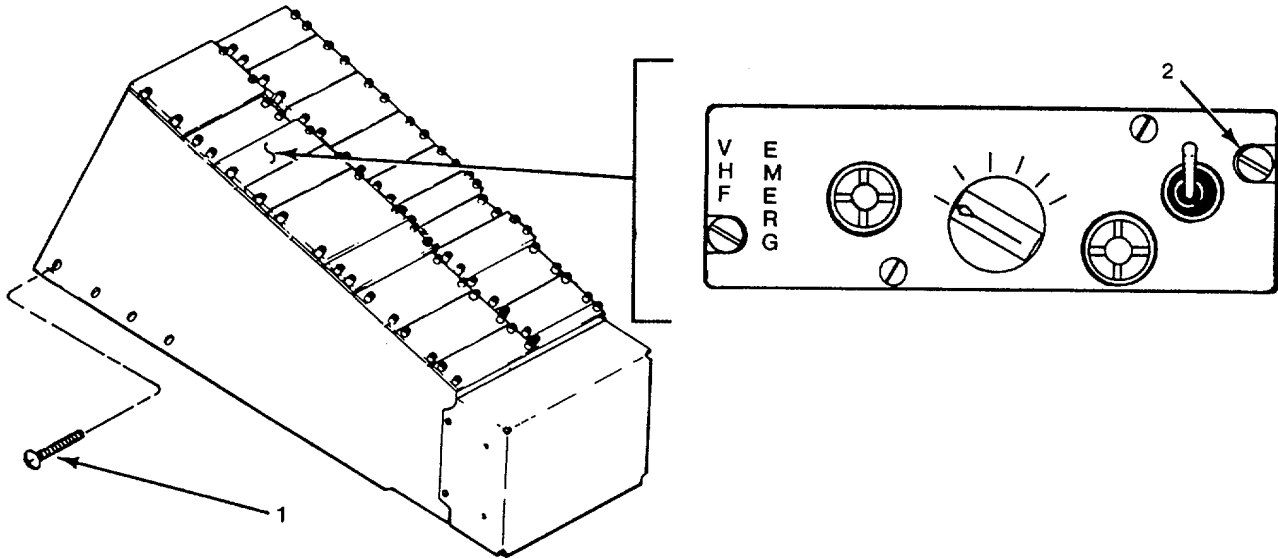
D Slide power unit forward and remove from shelf.



### 8-3.2 Installation Instructions.

- A Place power unit on shelf, slide back until engaged in rear retaining bracket (not shown).
- B Secure power unit to shelf with two screws (3) and washers.
- C Connect electrical connector (4).
- D Replace dynamotor per paragraph 8-2.2.

### 8-4. CONTROL PANEL P/N 204-075-709 MAINTENANCE (AVUM)



#### 8-4.1 Removal Instructions.

- A Remove screws (1) then remove side panel from pedestal console.
- B Reach inside pedestal console and disconnect electrical connector from back of control panel.
- C Loosen two spring-lock fasteners (2) and lift control panel from pedestal console.

#### 8-4.2 Installation Instructions.

- A Position control panel in pedestal console and secure with two spring-lock fasteners (2).
- B Reach inside pedestal console and connect electrical connector to back of control panel.
- C Replace side panel on pedestal console and secure with screws (1).



**8-5. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P2302, P2303, P2304, P2306, P802, P804, P806, P2307, P162 and P163.
- Refer to FO-20 and FO-21 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

**SECTION II. OPERATIONAL CHECKS****8-6. VHF EMERGENCY TRANSMITTER T-366(\*) OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Transmitter T-366(\*) is performing properly. The checks are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Test Equipment**

Radio Set

**Equipment Conditions**

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunication Set operational.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

- Check that all components are installed, securely mounted and safety wired (if required).
- Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

- Depress VHF XMTR T-366 circuit breaker.
- On control panel, set ON-OFF switch to ON, and select desired channel.
- Set intercom switches to allow transmission on T-366(\*)/ARC and receive on a VHF receiver (AN/ARN-30, AN/ARN-82 or AN/ARC-73).
- On vhf switch panel (P/N 204-075-709) select STBY VH F.

**NOTE**

If possible avoid communications checks with base control tower. When authorized, use another vhf receiver-transmitter and frequency.

- Conduct communications check with other receiver-transmitter. Check that both pilot and copilot stations can transmit.

Clear and audible communications from both ICS stations.



### SECTION III. TROUBLESHOOTING

#### 8-7. VHF EMERGENCY TRANSMITTER T-366(\*)/ARC TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in VHF Emergency Transmitter T-366(\*)/ARC.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 8-6.

---

#### SYMPTOM

#### PROBABLE CAUSE

#### CORRECTIVE ACTION

---

No output from transmitter.

- A** Defective or incorrect cable connections.
    - A** Check cabling and connections, repair or replace as necessary.
  - B** Defective high voltage supply.
    - B** Replace DY-86/ARN-30.
  - C** Defective tube.
    - C** Check all vacuum tubes in transmitter, replace if defective.
  - D** Defective transmitter.
    - D** Replace T-366(\*)/ARC.
-



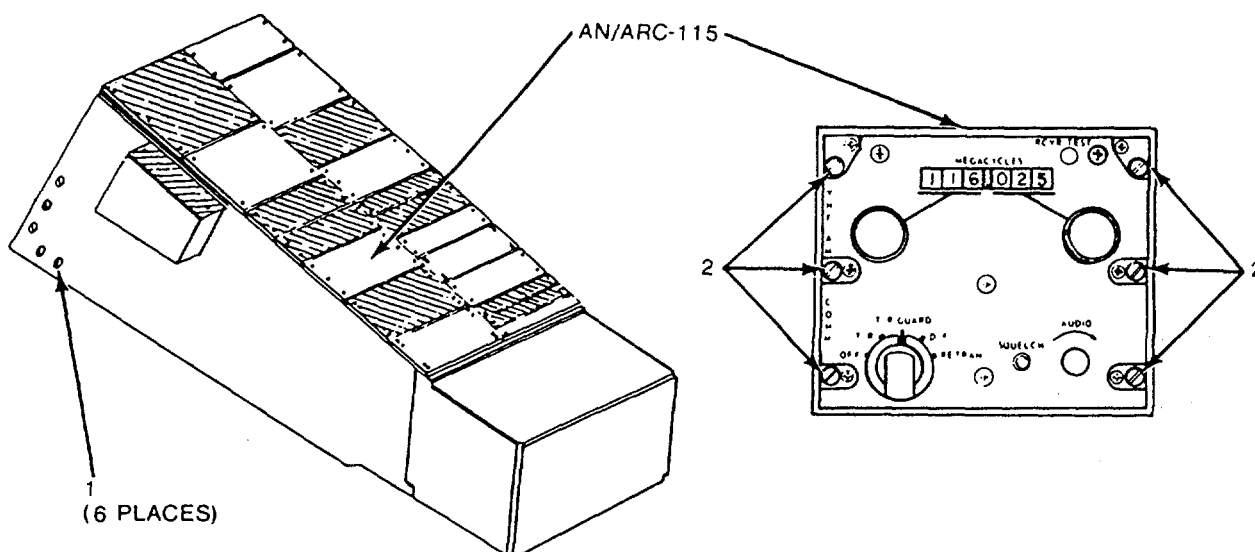
## CHAPTER 9

### VHF AM RADIO SET AN/ARC-115(\*) MAINTENANCE

Subject	Para.	Page
Radio Set AN/ARC-115(*) Maintenance (AVUM) .....	9-1	9-1
Antenna AT-1108/ARC Maintenance (AVUM).....	9-2	9-2
Bandpass Filter BPF-40-03P Maintenance (AVUM).....	9-3	9-2
Cabling and Connector Maintenance (AVUM) .....	9-4	9-2
VHF AM Radio Set AN/ARC-115(*) Operational Checks (AVUM) .....	9-5	9-3
VHF AM Radio Set AN/ARC-115(*) Troubleshooting (AVUM) .....	9-6	9-4

#### SECTION I. MAINTENANCE PROCEDURES

##### 9-1. RADIO SET AN/ARC-115(\*) MAINTENANCE (AVUM)



##### 9-1.1 Removal Instructions.

- A** Remove left-side panel of pedestal console by removing screws (1).
- B** Reach inside pedestal console and disconnect one coaxial and electrical connector from back of AN/ARC-115.
- C** Loosen six spring-lock fasteners (2) and lift AN/ARC-115(\*) from pedestal console.

##### 9-1.2 Installation Instructions.

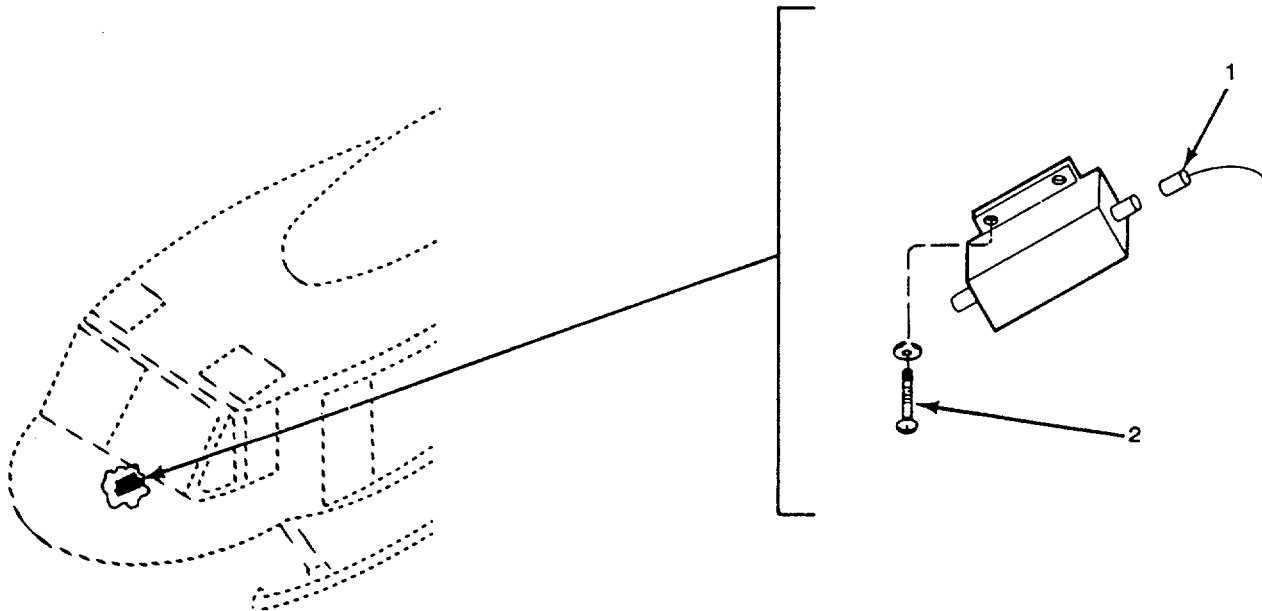
- A** Position AN/ARC-115 in pedestal console and secure with six spring-lock fasteners.
- B** Reach inside pedestal console and connect one coaxial and one electrical connector to back of AN/ARC-115.
- C** Position left-side panel and secure with screws (1).



## 9-2. ANTENNA AT-1 108/ARC MAINTENANCE (AVUM)

Refer to paragraph 5-3 for AT-11 08/ARC maintenance.

## 9-3. BANDPASS FILTER BPF-40-03P MAINTENANCE (AVUM)



### 9-3.1 Removal Instructions.

- A** Disconnect two coaxial connectors (1) from filter.
- B** Remove four screws and washers (2) that secure filter to bulkhead.
- C** Remove filter.

### 9-3.2 Installation Instructions.

- A** Position filter against bulkhead and secure with four screws and washers (2).
- B** Reconnect two coaxial connectors (1).

## 9-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel: P1, P2, P600 and P1906.
- Refer to FO-22 and FO-23 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.



## SECTION II. OPERATIONAL CHECKS

### 9-5. VHF AM RADIO SET ANIARC-115 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Radio Set AN/ARC-115 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Radio Set

##### Equipment Conditions

Reference

Paragraph 1-50 Auxiliary Power Unit connected.  
Paragraph 14-13 Intercommunication Set operational.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed and securely mounted.
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress VHF-AM COMM ARC-1 15, INTERCOM CPLT and INTECOM PILOT circuit breakers.
2. On pedestal control panel, set ARC- 1 5 function switch to T/R, and adjust frequency to 116.500 MHz.
3. On pedestal control panel, depress ARC-115 RCVR TEST button.  
Tone heard in headset.
4. Repeat step 3 for frequency settings of 123.500, 132.500, 138.050 and 148.800 MHz.  
Tone heard in headset, each frequency.
5. Select assigned test frequency.

#### NOTE

If possible, avoid communications checks with base control tower. When authorized use another vhf receiver-transmitter and frequency.

6. Conduct two-way communications check with other receiver-transmitter.  
Sidetone heard in headset during transmission. Other receiver-transmitter should receive clear and audible transmission, reception from other receiver-transmitter should be clear and audible.
7. During reception, rotate AUDIO control.  
Audio level should vary smoothly.
8. Verify squelch function.  
Audio output should be quiet except during signal reception.



**9-5. HF AM RADIO SET AN/ARC-115(\*) OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS-Continued**

9. Set function selector to T/R GUARD.
10. Request other receiver-transmitter transmit on guard channel (121.5 MHz).  
Guard receiver audio should be clear and audible.

**SECTION III. TROUBLESHOOTING****9-6. HF AM RADIO SET AN/ARC-115(\*) TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in VHF AM Radio Set AN/ARC-115(\*).
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 9-5.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. No audio tone in headset when RCVR TEST button is depressed.  
Defective radio set.  
Replace AN/ARC-115.
2. No reception or transmission of signals.  
**A** Defective radio set.  
**A** Replace AN/ARC-115.  
**B** Defective bandpass filter.  
**B** Replace BPF 40-03-P.  
**C** Defective antenna.  
**C** Replace AT-1 108/ARC.
3. AUDIO control does not vary level smoothly.  
Defective radio set.  
Replace AN/ARC-115.
4. Noise heard in headset when no signals are being received.  
Defective radio set.  
Replace AN/ARC-115.
5. No reception on guard receiver.  
Defective radio set.  
Replace AN/ARC-1 15.



**9-6. VHF AM RADIO SET AN/ARC-115 TROUBLESHOOTING (AVUM)-Continued**

- If a trouble develops in VHF AM Radio Set AN/ARC-115 and the preceding operational check and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-22 and FO-23 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-22.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon where measurement should be taken.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Refer to 9-6.1.1 for UH-1 D/H or 9-6.1.2 for UH-1 H.

**9-6.1.1 UH-1 D/H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	2	Ground	Not applicable	0
TB20	12	Transmit key control	AN/ARC-115 energized intercom rotary switch set to 3	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	4	Receive audio	AN/ARC-115 energized	Audio hi
P1151	D	Primary power	An/ARC-115 energized	28 Vdc

**9-6.1.2 UH-1 H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	5	Transmit audio	AN/ARC-115 energized, intercom rotary switch set to 3, microphone keyed and signal applied	Audio hi
TB20	10	Receive audio	AN/ARC-115 energized	Audio hi
TB26	4	Ground	Not applicable	0
TB66	7	Audio return (ground)	Not applicable	0
P3201	D	Primary power	AN/ARC-115 energized	28 Vdc



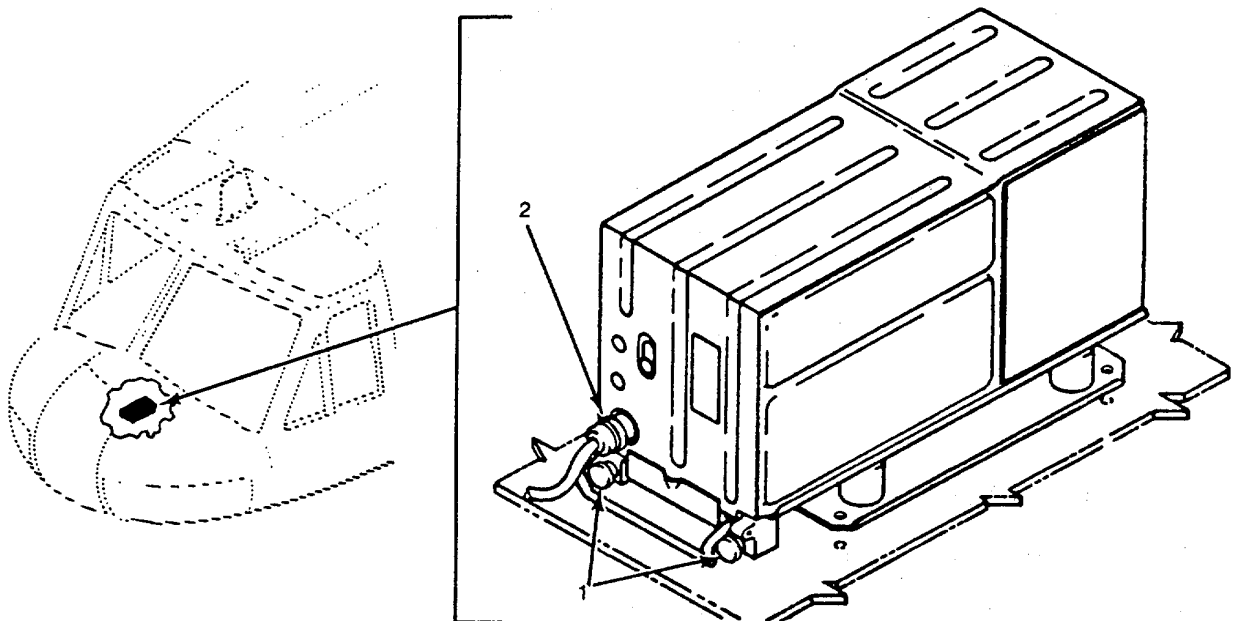
## CHAPTER 10

### FM LIAISON NO. 1 AN/ARC-44 MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-294(*)/ARC-44 Maintenance (AVU M).....	10-1	10-1
Mount MT-1268/AR Maintenance (AVUM).....	10-2	10-2
Dynamotor DY-1 07(*)/ARC Maintenance (AVU M).....	10-3	10-3
Mount MT-1267(*)/AR Maintenance (AVUM).....	10-4	10-4
Control Panel SB-327/ARC-44 or SA-474/AR (Modified) Maintenance (AVUM).....	10-5	10-5
Antenna AT-454(*)/ARC Maintenance (AVUM).....	10-6	10-6
Antenna Coupler CU-361 (*)/ARC Maintenance (AVU M).....	10-7	10-7
Cabling and Connector Maintenance (AVUM).....	10-8	10-8
FM Liaison No. 1 AN/ARC-44 Operational Check (AVUM).....	10-9	10-8
FM Liaison No. 1 AN/ARC-44 Troubleshooting (AVU M).....	10-10	10-9

### SECTION I. MAINTENANCE PROCEDURES

#### 10-1. RECEIVER-TRANSMITTER RT-294(\*)/ARC-44 MAINTENANCE (AVUM)



##### 10-1.1 Removal Instructions.

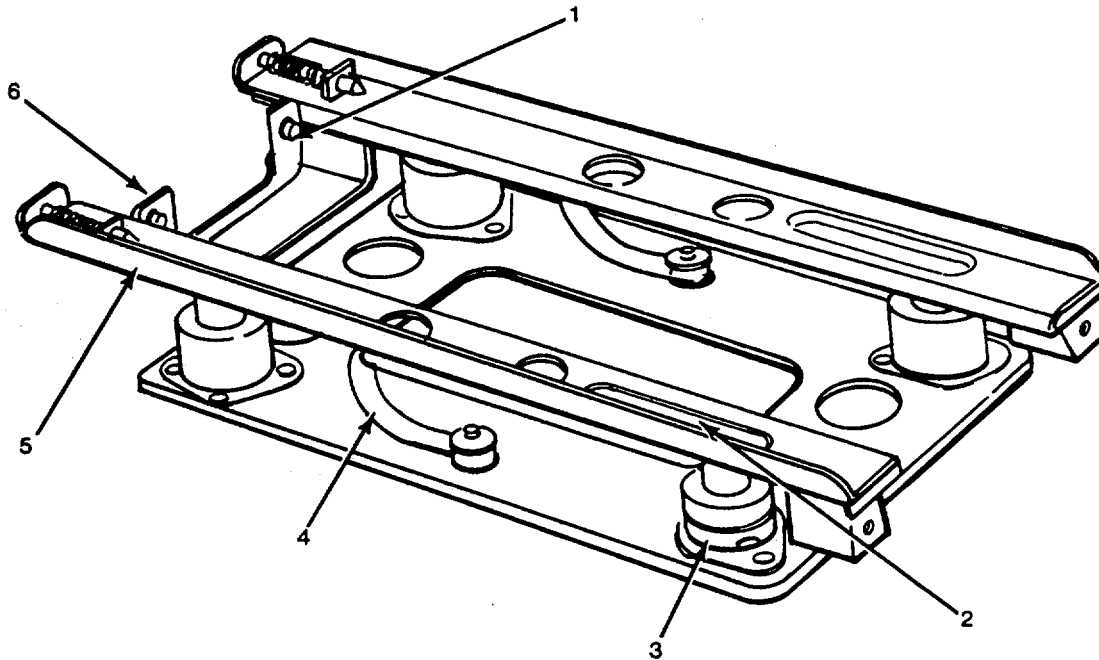
- A Disconnect antenna cable (2) from front of receiver-transmitter.
- B Cut and remove safety wire from thumbscrews (1).
- C Unscrew both thumbscrews; turn both thumbscrews at the same time and at the same rate.
- D Slide receiver-transmitter forward to disengage electrical connector then lift receiver-transmitter out of mount.



### 10-1.2 Installation Instructions.

- A Place receiver-transmitter on mount.
- B Carefully slide receiver-transmitter back into mount making sure guide pins and electrical connectors engage properly.
- C Tighten the two thumbscrews (1) that secure the receiver-transmitter in the mount.
- D Reconnect antenna cable (2) to front of receiver-transmitter.

### 10-2. MOUNT MT-1288/AR MAINTENANCE (AVUM)



#### 10-2.1 Removal Instructions.

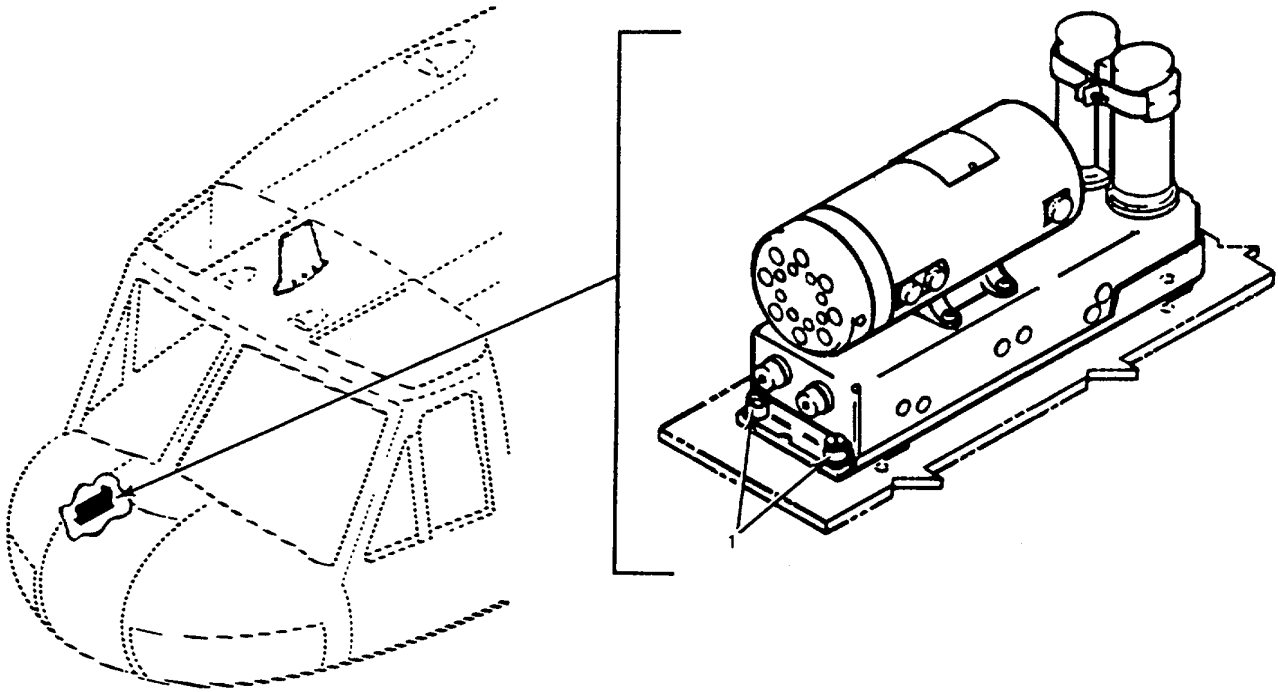
- A Remove receiver-transmitter per paragraph 10-1.1.
- B Remove two screws (1) that secure electrical connector (6) to mount tray (5).
- C Remove screws, nuts and washers that secure ground straps (4) to mount tray.
- D Remove four screws (2) that secure mount tray to vibration isolators (3).
- E Remove mount tray.

#### 10-2.2 Installation Instructions.

- A Place mount tray (5) on vibration isolators (3) and secure with four screws (2).
- B Secure ground straps (4) to mount tray with screws, nuts and washers.
- C Position electrical connector (6) on rear of mount tray and secure with two screws (1).
- D Replace receiver-transmitter per paragraph 10-1.2.



### 10-3. DYNAMOTOR DY-107(\*)/AR MAINTENANCE (AVUM)



#### 10-3.1 Removal Instructions.

- A Remove RT-294(\*)/ARC-44 (paragraph 10-1).
- B Cut safety wire and remove two screws (1) that secure dynamotor in mount.
- C Slide dynamotor forward to disconnect it from electrical connector and guide pins on mounting.
- D Slide dynamotor forward until clear of guide rails and lift out of mounting.

#### 10-3.2 Installation Instructions.

- A Position dynamotor on mounting then slide to back until electrical connectors and guide pins mate.

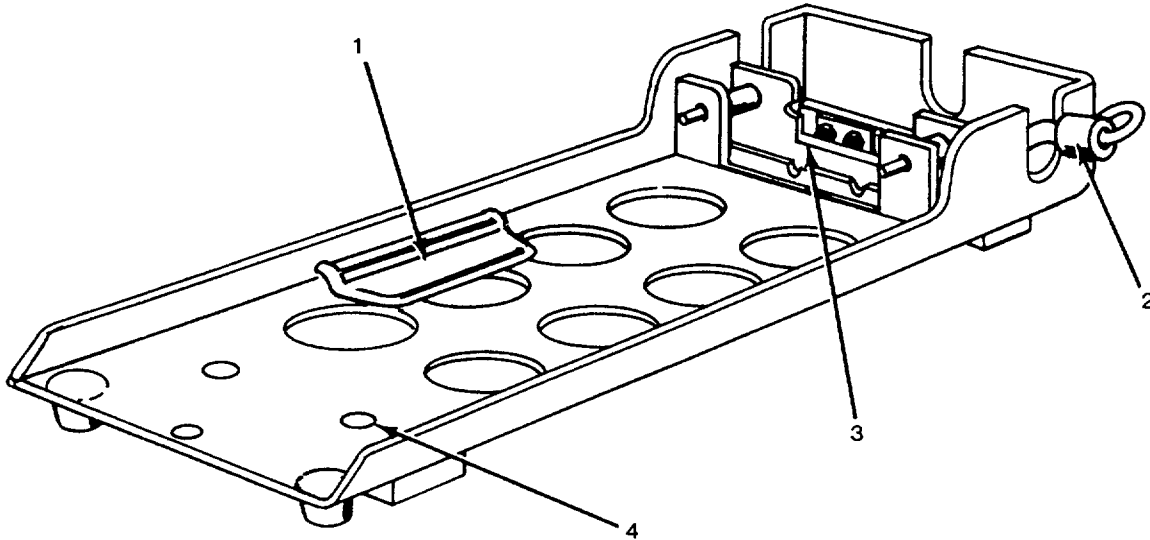
#### **CAUTION**

Make sure guide pins and connectors are aligned or connectors may be damaged.

- B Firmly seat dynamotor on electrical connector.
- C Secure dynamotor with mounting screws.
- D Safety wire two mounting screws.
- E Replace RT-294(\*)/ARC-44.



#### 10-4. MOUNT MT-1267/AR MAINTENANCE (AVUM)



##### 10-4.1 Removal Instructions.

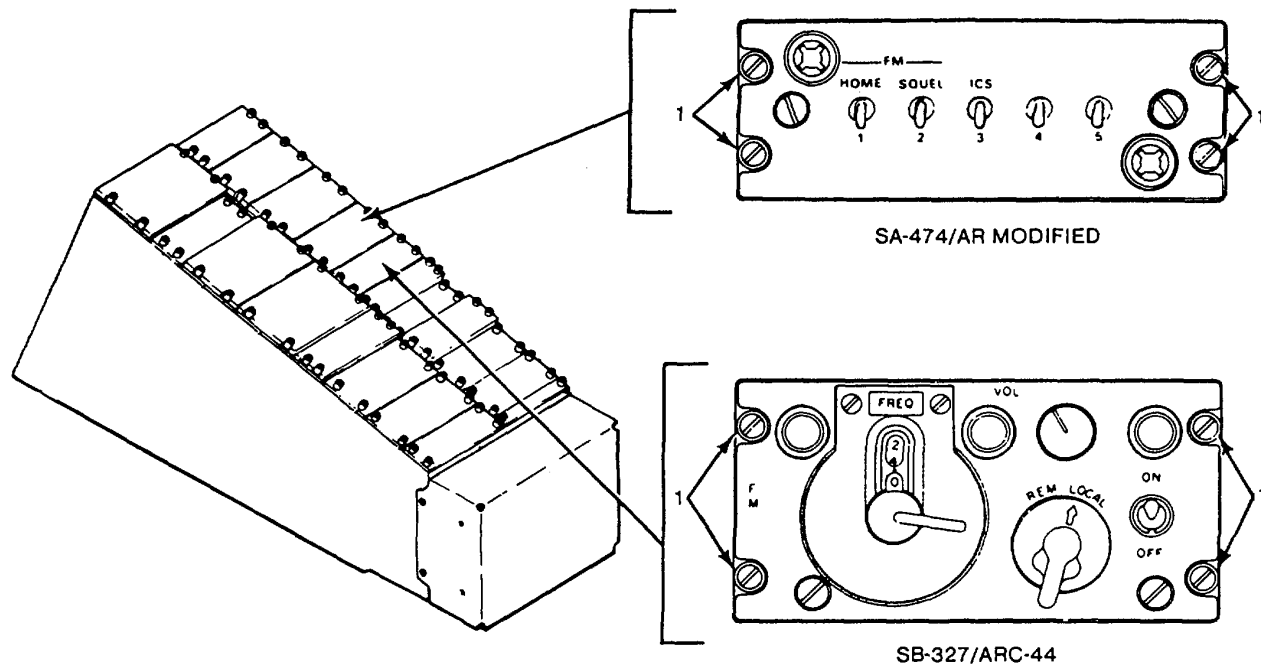
- A Remove dynamotor per paragraph 10-3.1.
- B Remove screw, nut and washers from cable clamp (2), and carefully free cable from cable clamp.
- C Remove two nuts that secure electrical connector (3) to mount (1).
- D Remove screws (4) that secure mount to helicopter.
- E Remove mount.

##### 10-4.2 Installation Instructions.

- A Position mount (1) and secure with screws (4).
- B Position electrical connector (3) at rear of mount and secure with two nuts.
- C Route cable through cable clamp (2) and secure with screw, nut and washer.
- D Replace dynamotor per paragraph 10-3.2.



## 10-5. CONTROL PANEL SB-327/ARC-44 OR SA-474/AR (MODIFIED) MAINTENANCE (AVUM)



### 10-5.1 Removal Instructions.

- A Loosen four spring-lock fasteners (1).

#### **CAUTION**

Be careful not to pull control so far from pedestal console that wiring or electrical connector will be damaged.

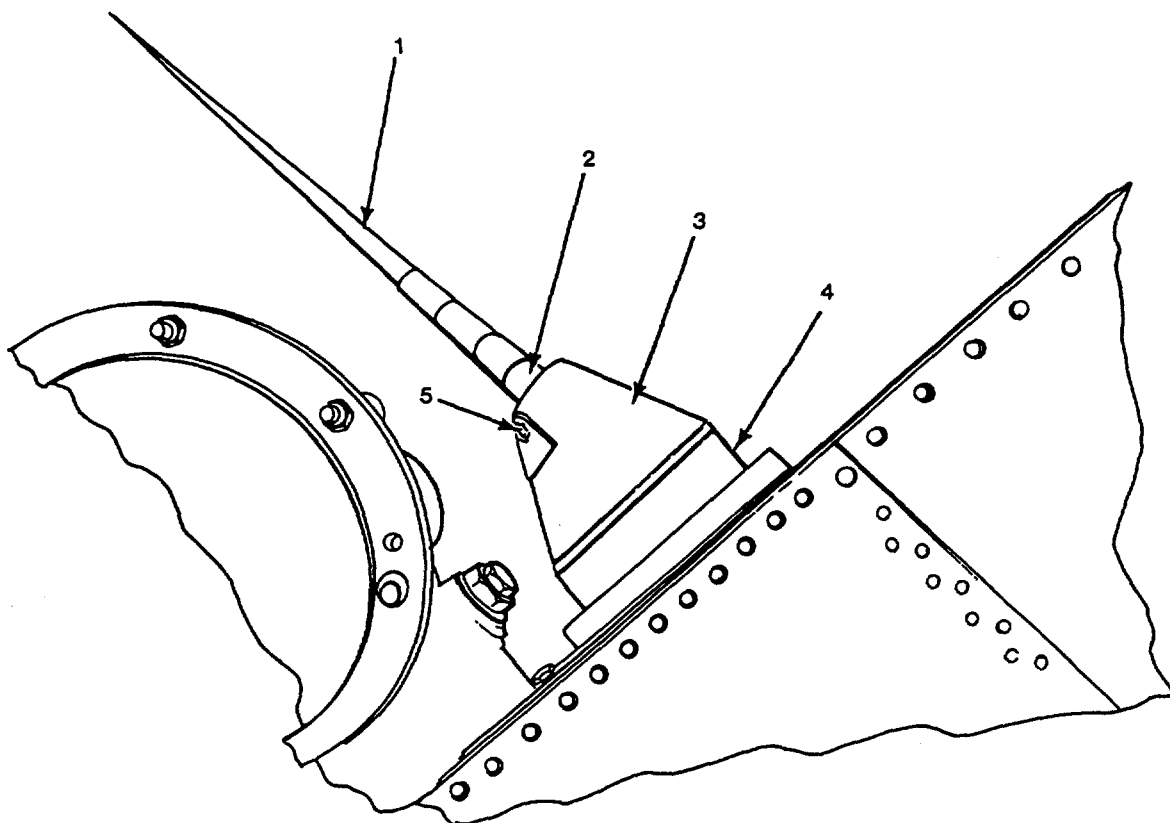
- B Lift control from pedestal console far enough to reach spring-lock fasteners securing electrical connector to back of control.
- C Loosen two spring-lock fasteners and disconnect electrical connector.
- D Remove control.

### 10-5.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connector.
- B Tighten two spring-lock fasteners that secure connector to control.
- C Position control in pedestal and secure with four spring-lock fasteners (1).



## 10-6. ANTENNA AT-454(\*)/ARC MAINTENANCE (AVUM)



### 10-6.1 Removal Instructions.

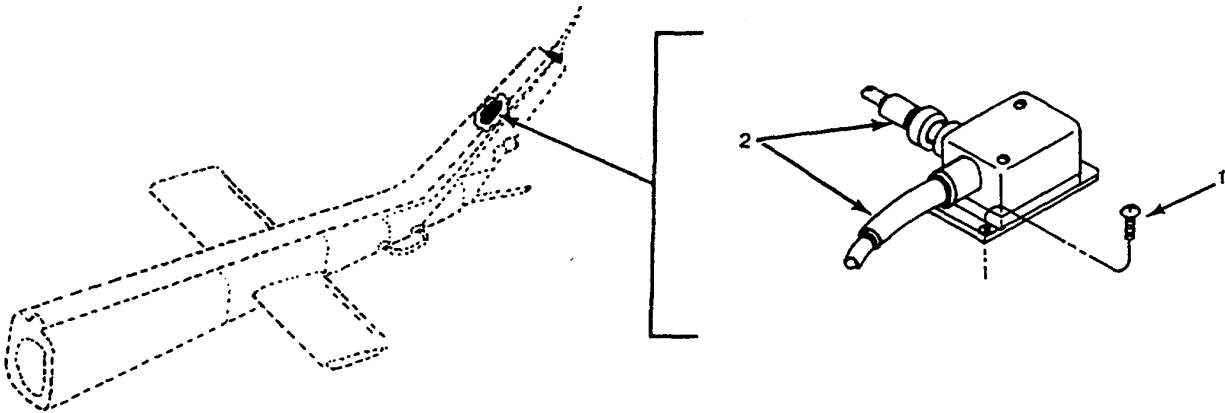
- A Remove setscrew (5) with 1/4-inch Allen wrench.
- B Loosen antenna element lock nut (2).
- C Unscrew antenna element AT-455(\*)/ARC (1) from antenna base.
- D Disconnect coaxial cable from base.
- E Remove six screws that secure antenna base (3) to mounting bracket.
- F Remove Antenna Base AB-340(\*)/ARC.

### 10-6.2 Installation Instructions.

- A Position antenna base (3) on mounting bracket and secure with six screws.
- B Connect coaxial cable to antenna base.
- C Screw antenna element (1) into antenna base and tighten lock nut (2).
- D Replace setscrew (5).



## 10-7. ANTENNA COUPLER CU-361(\*)/ARC MAINTENANCE (AVUM)



### 10-7.1 Removal Instructions.

- A Remove antenna and base per 10-6.1 above.
- B Remove screws that secure cover to tail boom housing.
- C Remove cover.
- D Disconnect coaxial connectors (2) from coupler.
- E Remove four screws (1) that secure coupler to tail boom.
- F Remove coupler.

### 10-7.2 Installation Instructions.

- A Position coupler on tail boom and secure with four screws (1).
- B Connect coaxial connectors (2) from keyer to coupler.
- C Position cover over tail boom housing and secure with screws.
- D Install antenna per paragraph 10-6.2 above.



### 10-8. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P803, P81 5, P101, P602, P603, P604, P605, P606, P307, P201, P702, J609, P609, P601 R, P601 L, P701 and P610.
- Refer to FO-24 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

## SECTION II. OPERATIONAL CHECKS

### 10-9. FM LIAISON NO. I AN/ARC-44 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Radio Set AN/ARC-44 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Radio Set

##### Equipment Conditions

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 1 4-13 Intercommunication Set operational.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress FM ARC-44 circuit breaker.
2. On control panel, set ON-OFF switch to ON and LOCAL-REM switch to LOCAL.

#### NOTE

If possible avoid communications checks with base control tower. When authorized use another vhf receiver-transmitter and frequency.

3. On control panel select test frequency.

#### CAUTION

Allow five minutes warm-up time before keying transmitter.

4. From pilot then copilot station fully depress cyclic stick switch and speak into microphone. Sidetone heard in headset.



**10-9. FM LIAISON NO. 1 AN/ARC-44 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS-Continued**

5. Conduct communications check with other vhf receiver-transmitter.  
Clear and audible two way communications.
6. While receiving another station rotate VOL control throughout its range.  
Volume of received signal should vary smoothly with no chirps or dead spots.

**SECTION III. TROUBLESHOOTING****10-10. FM LIAISON NO. 1 AN/ARC-44 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in FM Liaison No. 1 AN/ARC-44.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 10-9.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. Panel lamps do not light.
  - A** Defective lamp.  
**A** Replace lamp.
  - B** Defective wiring or circuit breaker.  
**B** Check wiring and circuit breaker, repair or replace as necessary.
  - C** Defective control unit.  
**C** Replace SA-474/AR (Modified).
2. No sidetone heard in headset when pilot's cyclic stick switch is operated.
  - A** Defective trigger switch.  
**A** Check pilot's trigger switch, replace if defective.
  - B** Defective interphone relay.  
**B** Check pilot's interphone relay for 28 Vdc between terminals A and B, and for continuity between terminals M and N. Replace relay if necessary.
  - C** Defective relay No. 2.  
**C** Check for continuity between contacts 9 and 17 of signal switching relay No. 2; if not present, replace relay.
  - D** Defective distribution panel.  
**D** Replace SB-329/AR.



**10-10. FM LIAISON NO. 1 AN/ARC-44 TROUBLESHOOTING (AVUM)-Continued****SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

- | SYMPTOM   | PROBABLE CAUSE  | CORRECTIVE ACTION |
|---|---|-------------------|
| 3. No sidetone heard in headset when copilot's cyclic stick switch is operated. | <p><b>A</b> Defective trigger switch.</p> <p><b>A</b> Check copilot's trigger switch, replace if defective.</p> <p><b>B</b> Defective interphone relay.</p> <p><b>B</b> Check copilot's interphone relay for 28 Vdc between terminals A and B, and for continuity between terminals M and N; if not present replace relay.</p> <p><b>C</b> Defective fail safe relay No. 2.</p> <p><b>C</b> Check for continuity between terminals 9 and 17 of fail safe relay No. 2; if not present, replace relay.</p> <p><b>D</b> Defective distribution panel.</p> <p><b>D</b> Replace SB-329/AR.</p> |                   |
| 4. Radio does not provide adequate signal to maintain two-way communications.   | <p><b>A</b> Defective receiver-transmitter.</p> <p><b>A</b> Replace RT-249(*)/ARC-44.</p> <p><b>B</b> Defective dynamotor.</p> <p><b>B</b> Replace DY-107(*)/AR.</p> <p><b>C</b> Defective coupler.</p> <p><b>C</b> Replace CU-361.</p> <p><b>D</b> Defective antenna.</p> <p><b>D</b> Replace AT-454(*)/ARC.</p>   |                   |
| 5. VOL control does not vary audio level smoothly.                              | <p>Defective control unit.</p> <p>Replace SA-474/AR (modified).</p>   |                   |

**10-10.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in FM Liaison No. 1 AN/ARC-44 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-24 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.



**10-10.1.1 Signal and Voltage Measurements (AVUM)**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	2, 3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB19	6, 7	Primary power	AN/ARC-44 energized	28 Vdc
TB19	9	Power for homing relay and keyer	AN/ARC-44 energized, AN/ARA-31 energized, homing operation selected	28 Vdc
TB20	2	Receive audio	AN/ARC-44 energized	Audio hi
TB20	10	Transmit key control	AN/ARC-44 energized	28 Vdc when microphone is unkeyed, then 0 when microphone is keyed
P201	A	Primary power	AN/ARC-44 energized	28 Vdc



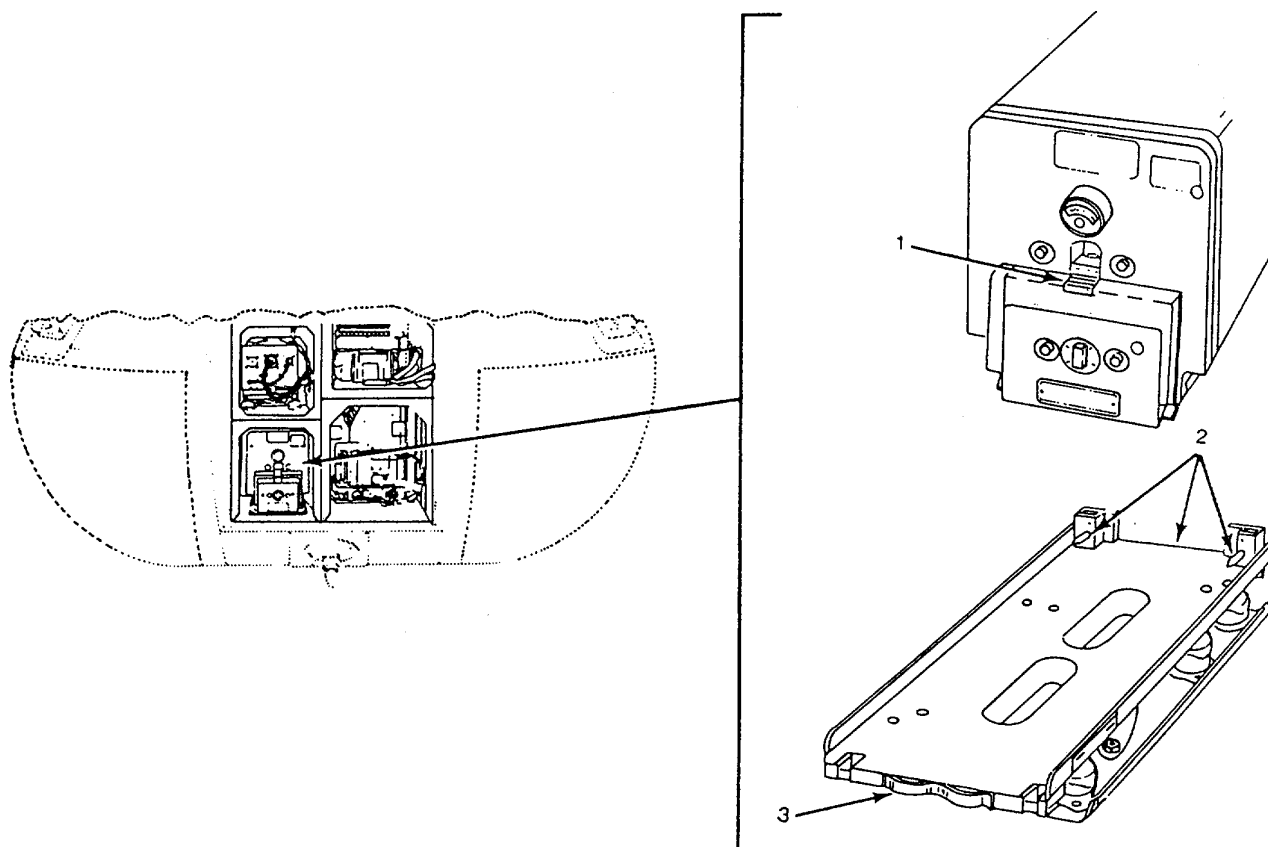
## CHAPTER 11

## FM LIAISON NO. 1 AN/ARC-54 OR AN/ARC-131 MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-348/ARC-54 or RT-823/ARC-131 Maintenance Procedures (AVUM) .....	11-1	11-1
Mount MT-1535/ARC-54 or MT-3664/ARC-131 Maintenance (AVUM) .....	11-2	11-3
Control C-3835/ARC-54 or C-7088/ARC-131 Maintenance (AVUM).....	11-3	11-4
Antenna AT-765/ARC Maintenance (AVUM) .....	11-4	11-5
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FM Liaison No. 1 AN/ARC-54 or AN/ARC-131 Troubleshooting (AVUM).....	11-10	11-11

## SECTION I. MAINTENANCE PROCEDURES

## 11-1. RECEIVER-TRANSMITTER RT-348/ARC-54 OR RT-823/ARC-131 MAINTENANCE PROCEDURES (AVUM)





**11-1.1 Removal Instructions.**

- A** Release locking handle catch (1) by sliding upward.
- B** Position and pull locking handle (3) outward and downward.
- C** Slide receiver-transmitter forward and lift out of mount.

**11-1.2 Installation Instructions.**

- A** Position receiver-transmitter in mount guide rails.
- B** Carefully slide receiver-transmitter backwards to engage guide pins and electrical connector (2).
- C** Lift locking handle (3), press inward then down.
- D** Slide locking handle catch (1) downward.

**11-1.3 Receiver-Transmitter RT-348/ARC-54 or RT-823/ARC-131 Squelch Adjustment (AVUM).****NOTE**

This procedure requires adjustment of controls on the pedestal control panel, monitoring audio signals from the Intercommunications set, and adjustment of a control located on front of receiver-transmitter (in forward radio compartment). A long extension cord connected to the headset or a second technician may be required.

- A** Depress FM/ARC-54, INTERCOMM/PILOT& CREW R and INTERCOMM COPILOT& CREW L circuit breakers on 28 Vdc circuit breaker panel.
- B** Set OFF, T/R, RETRAN, HOME switch on ARC-131 control panel to T/R.
- C** Set C-1611/AIC RECEIVERS 1 switch to ON (up), and VOL control to mid position.
- D** Set SQUELCH switch on control panel to CARR.
- E** Adjust VOL control on control panel for minimum background noise.

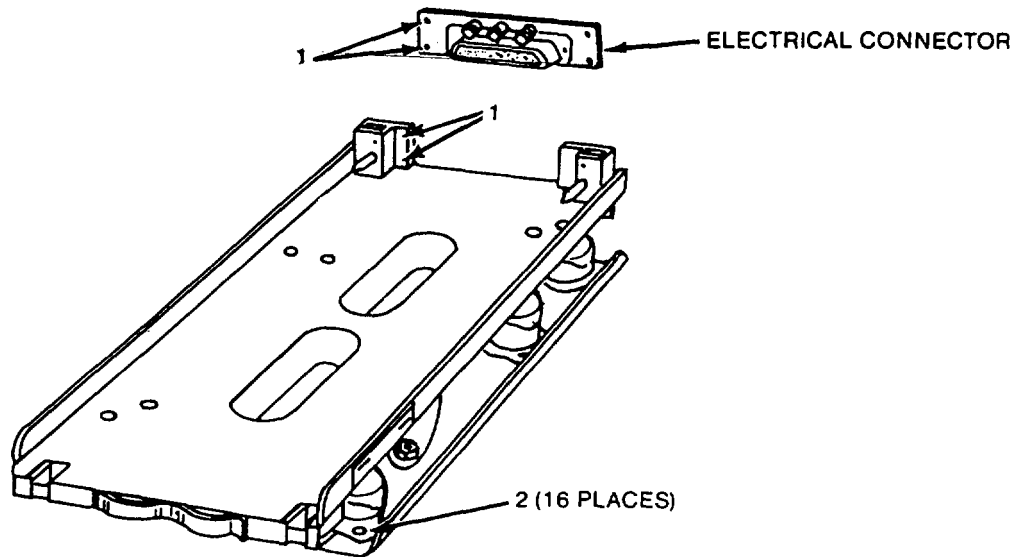
**NOTE**

Select a channel that is not in use for the following procedures. Squelch circuits cannot be properly adjusted if a signal is being received.

- F** Set SQ ADJ on front of receiver-transmitter fully counterclockwise.
- G** Slowly turn SQ ADJ control clockwise until background noise just disappears. Do not rotate the SQ ADJ beyond the point where background noise disappears.
- H** Check squelch adjustment on several frequencies throughout range of radio. If all frequencies are not fully squelched, readjust SQ ADJ slightly clockwise.



## 11-2. MOUNT MT-1535/ARC-54 OR MT-3664/ARC-131 MAINTENANCE (AVUM)



### 11-2.1 Removal Instructions.

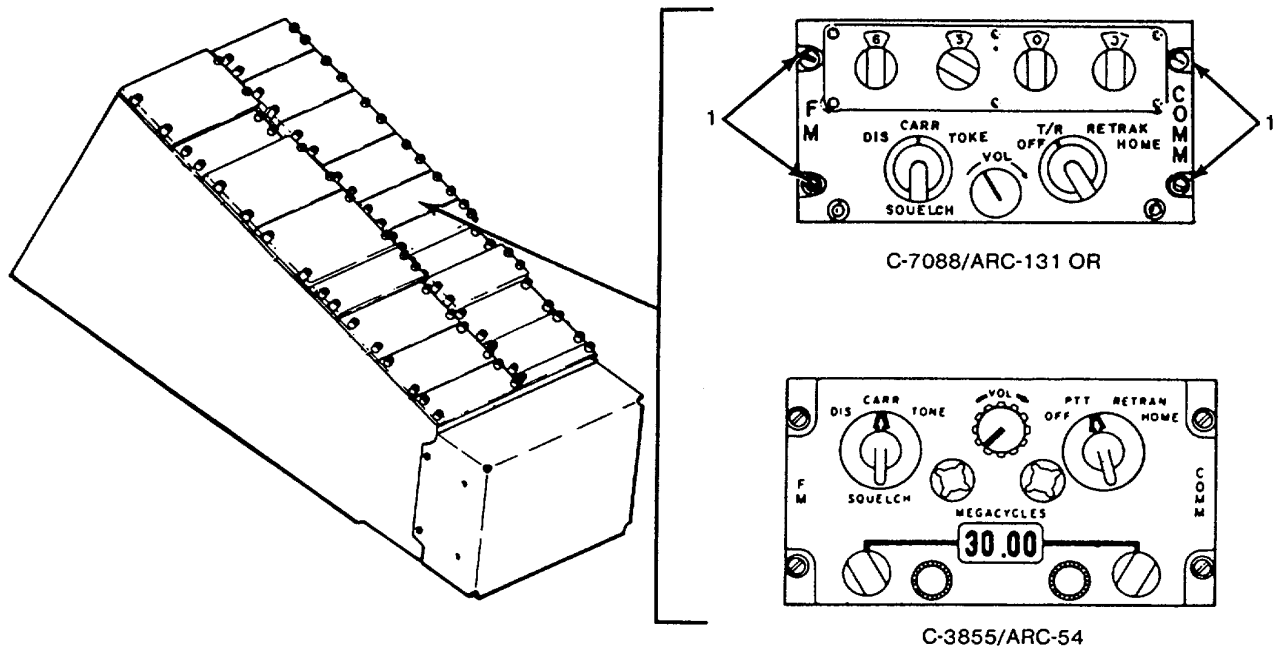
- A Remove receiver-transmitter per paragraph 11.1.1.
- B Remove four screws (1) securing electrical connector to mount.
- C Remove six screws (2) securing mount to helicopter.

### 11-2.2 Installation Instructions.

- A Position mount in forward radio bay with mounting screw holes alined.
- B Secure mount to helicopter with sixteen screws (2).
- C Position electrical connector on mount and secure with four screws (1).
- D Install receiver-transmitter per paragraph 11-1.2.



### 11-3. CONTROL C-3835/ARC-54 OR C-7088/ARC-131 MAINTENANCE (AVUM)



#### 11-3.1 Removal Instructions.

- A Loosen four spring-lock fasteners (1) that secure control to pedestal panel.

#### **CAUTION**

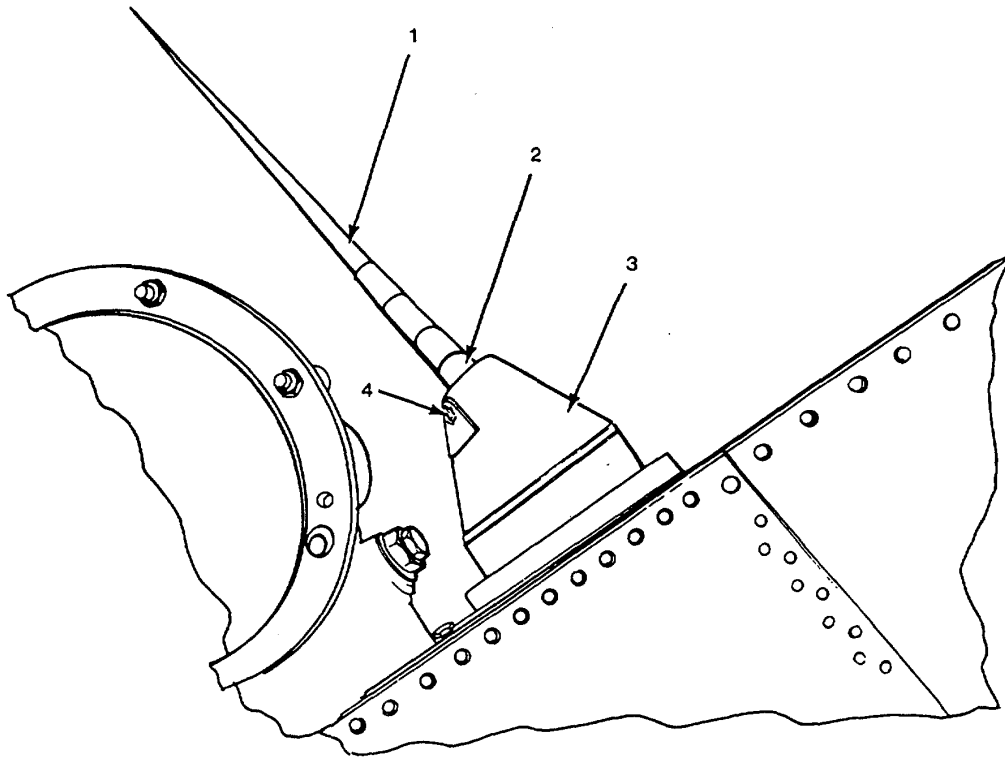
Be careful not to pull control so far from pedestal panel that wiring or connector will be damaged.

- B Lift control from pedestal to gain access to rear of control.
- C Loosen two spring-lock fasteners that secure connector to back of control and disconnect electrical connector.
- D Remove control.

#### 11-3.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connector.
- B Tighten two spring-lock fasteners that secure connector to control.
- C Position control in pedestal console and tighten four spring-lock fasteners (1).



**11-4. ANTENNA AT-765/ARC MAINTENANCE (AVUM)****11-4.1 Removal Instructions.**

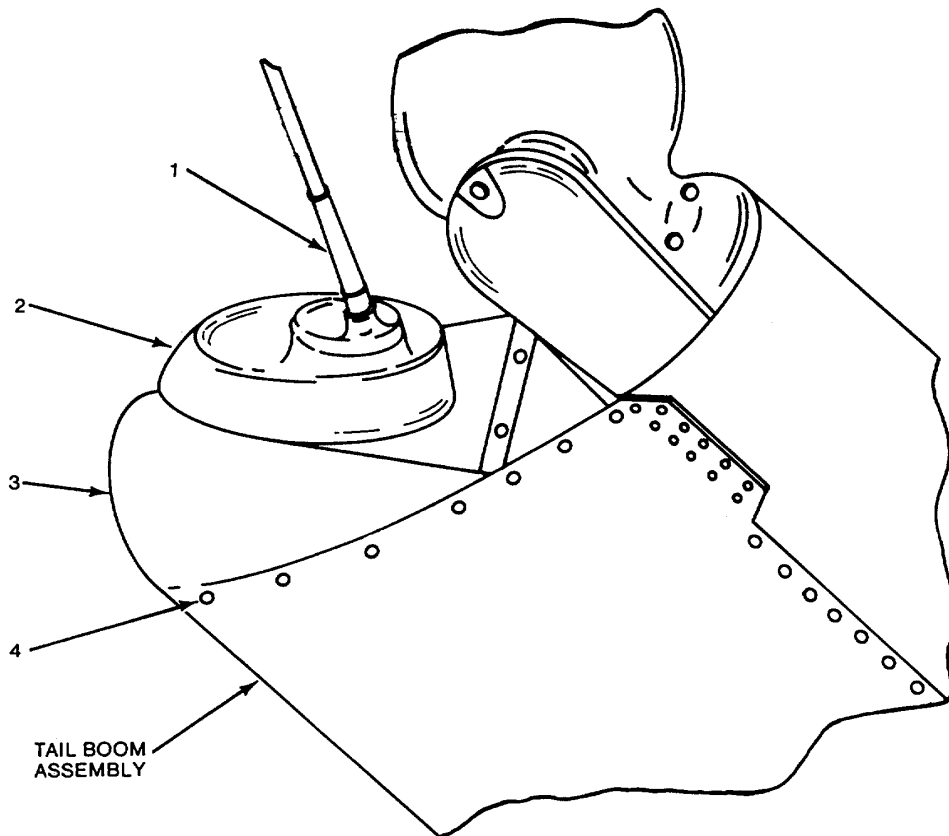
- A Remove setscrew (4) with 1/4-inch Allen wrench.
- B Loosen antenna element lock nut (2).
- C Unscrew antenna element (1) from antenna base.
- D Disconnect coaxial cable from base.
- E Remove six screws that secure antenna base (3) to mounting bracket.
- F Remove antenna base.

**11-4.2 Installation Instructions.**

- A Position antenna base (3) on mounting bracket and secure with six screws.
- B Connect coaxial cable to antenna base.
- C Screw antenna element (1) into antenna base and tighten lock nut (2).
- D Replace setscrew (4).



## 11-5. ANTENNA AS-1703/AR AND COUPLER CU-942/ARC MAINTENANCE (AVUM)



### 11-5.1 Removal Instructions.

- A Remove screws (4) that secure coupler support to tail boom assembly.

#### **CAUTION**

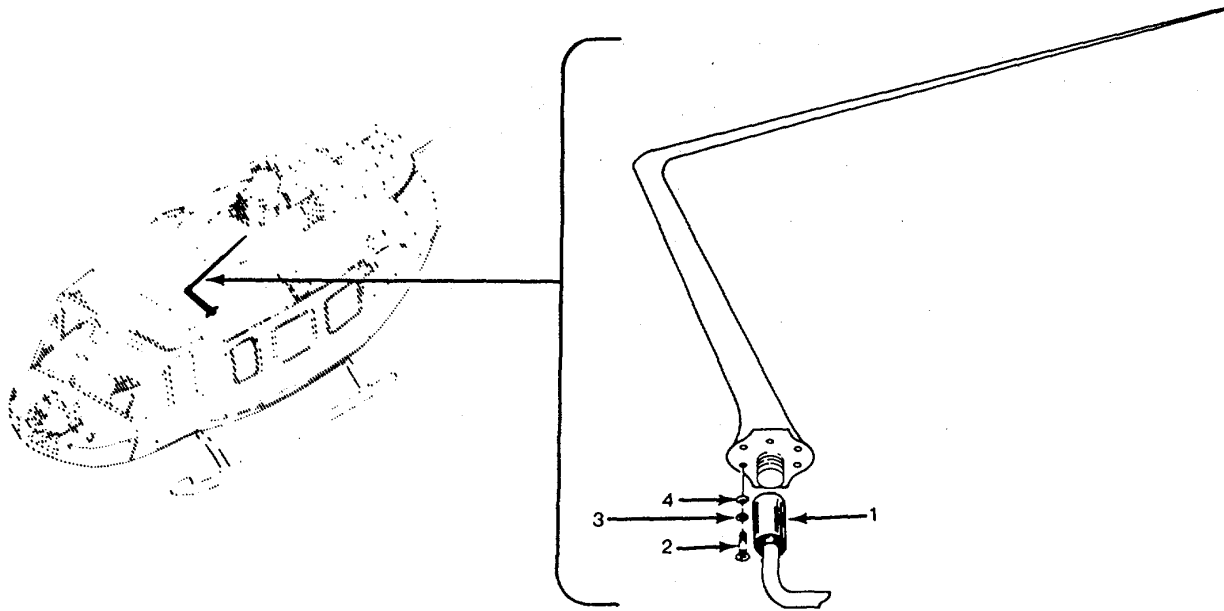
Be careful not to lift coupler support so far from tail boom assembly that coaxial cable or connector attached to antenna coupler will be damaged.

- B Carefully lift coupler support to gain access and disconnect coaxial connector from antenna coupler (2).
- C Remove coupler support (3), coupler (2) and antenna (1).

### 11-5.2 Installation Instructions.

- A Hold coupler support (3) near tail boom assembly and connect coaxial connector to antenna coupler (2).
- B Position coupler support on tail boom assembly and secure with screws (4).



**11-6. ANTENNA FM 10-30-1 MAINTENANCE (AVUM)****NOTE**

Two technicians are required. One outside to support or position antenna, one inside to perform procedures.

**11-6.1 Removal Instructions.**

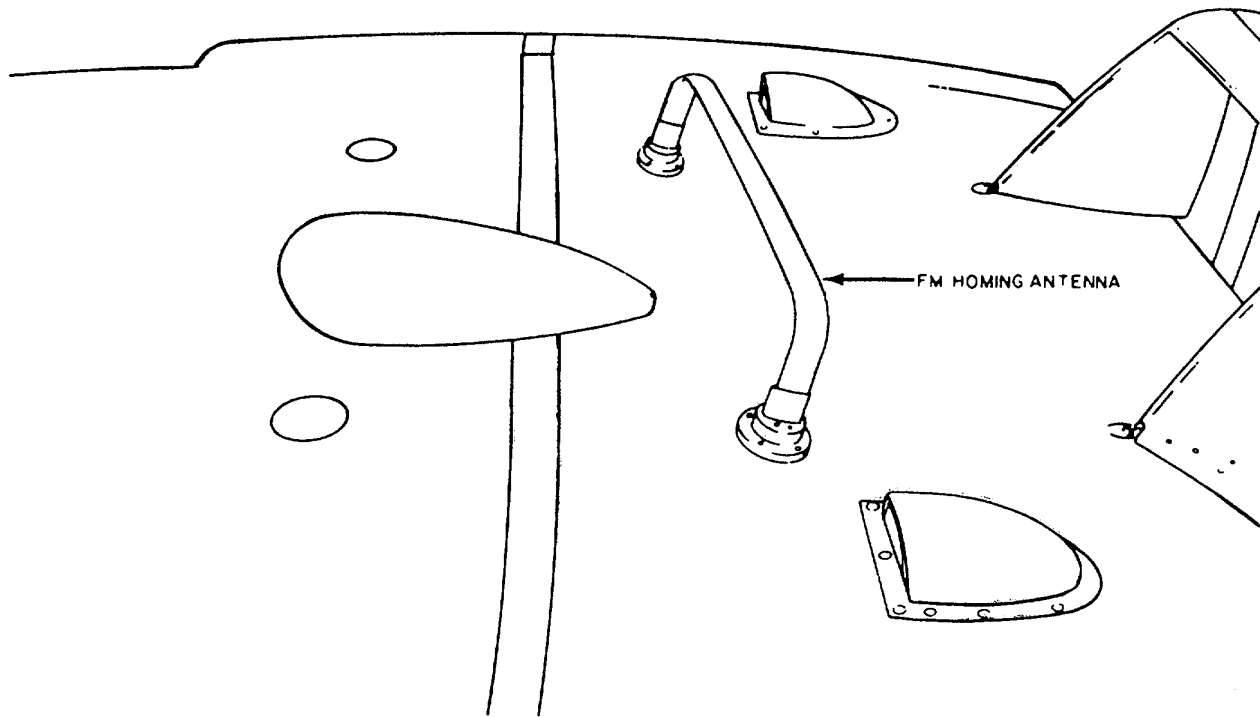
- A** Remove left-side overhead insulation blanket.
- B** Disconnect coaxial cable connector (1) from antenna base.
- C** Remove six screws (2), lockwashers (3) and flat washers (4) that secure antenna to helicopter.
- D** From outside helicopter, remove antenna.

**11-6.2 Installation Instructions.**

- A** From outside of helicopter, position antenna and align screw holes in base of antenna with holes in helicopter.
- B** Secure antenna to helicopter with 12 screws (2), lockwasher (3) and flat washers (4).
- C** Connect coaxial connector (1) to antenna.
- D** Replace overhead insulation blanket.



## 11-7. ANTENNA AS-1922/ARC MAINTENANCE (AVUM)



### 11-7.1 Removal Instructions.

- A Remove two screws (1) and two screws (2) at each end of antenna.

#### **CAUTION**

Be careful not to pull antenna so far from helicopter skin that coaxial cable or connector will be damaged.

- B Lift antenna from helicopter skin and disconnect coaxial connector at each end of antenna.
- C Remove antenna.

### 11-7.2 Removal Instructions.

- A Hold antenna near mounting point and connect coaxial connector at each end of antenna.
- B Position antenna against helicopter skin and align holes in antenna base with holes in helicopter skin.
- C Secure each end of antenna with two long screws and two short screws.
- D Apply small bead or RTV sealant between helicopter skin and antenna base at each end of antenna.



**11-8. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:

P605, P609, P1601, P2105, P2106, P2107, P601 R, P601 L, P2103, P2101, P2102, J2102, P2104, J2104, P2111, P3301 and P3302.

**NOTE**

P2102/J2102 (tail boom disconnect) is not used in UH-1H, P2111, P3301, and P3303 are used only on UH-1H.

- Refer to FO-25 and FO-26 for wiring data.
- Multiwire cabling is repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

**SECTION II. OPERATIONAL CHECKS****11-9. FM LIAISON NO. 1 AN/ARC-54 OR AN/ARC-131 OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Radio Set AN/ARC-54 or AN/ARC-131 is operating properly. The checks are also used after repairs to make sure the problem was fixed.

**NOTE**

Radio Sets AN/ARC-54 and AN/ARC-131 are physically and functionally interchangeable. The procedures listed below may be used to check either radio set.

**INITIAL SETUP****Test Equipment**

Radio Set

**Equipment Conditions**

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunication Set operational.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

- Check that all components are installed, securely mounted and safety wired (if required).
- Check that all connectors are tightened and for evidence of chafed or broken wiring.



**11-9. FM LIASON NO. 1 AN/ARC-54 OR AN/ARC-131 OPERATIONAL CHECKS (AVUM) - Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**POWER ON CHECKS**

1. Depress FM ARC-54 or FM ARC-134 circuit breaker.  
Control panel lamps light, receiver-transmitter blower operates.
2. Set intercom switches to permit transmission and reception with FM liaison radio set.
3. On control panel set function switch to PTT (AN/ARC-54) OR T/R (AN/ARC-131).  
Blower in receiver-transmitter operates.
4. On control panel set SQUELCH switch to DIS then to CARR.  
Loud noise in headset when SQUELCH in DIS, noise decreases considerably in CARR.

**NOTE**

If possible avoid communications checks with base control tower. When authorized use another fm receiver-transmitter and frequency.

5. On control panel set frequency selectors to test frequency.  
Tone heard in headset while receiver-transmitter is tuning.

**CAUTION**

Allow five minutes warm-up before keying transmitter.

6. Conduct communications check with other fm receiver-transmitter.  
Clear and audible two-way communications.
7. While receiving other station, rotate VOL control throughout its range.  
Volume of received signal should vary smoothly with no chirps or dead spots.
8. If a fm homing transmitter site is available locally, select its frequency and set function switch to HOME.

Morse code D (dah-dit-dit), Morse Code U (dit,-dit-dah) or a steady tone in headset. Indication depends on location of transmitter. The pilot's ID-1347 course indicator vertical and horizontal bars should deflect and the LOC and GS flags should disappear.

**NOTE**

The following test is for helicopters with a second fm radio set installed. It requires a ground station capable of transmitting on one frequency and receiving on another frequency.

9. Select frequencies on fm 1 and fm 2 as directed by ground station.
10. On fm 1 control panel select RETRAN.  
FM 1 will automatically retransmit signal received by fm 2.  
Indication must be confirmed by ground station.



**SECTION III. TROUBLESHOOTING****11-10. FM LIAISON NO. 1 AN/ARC-54 OR AN/ARC-131 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in FM Liaison No. 1 AN/ARC-54 or AN/ARC-131.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 11-9.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Blower in receiver-transmitter does not operate when power is applied. Defective receiver-transmitter.	Replace receiver-transmitter.	
2. When SQUELCH switch is set to DIS no loud rushing noise is heard or noise does not decrease when SQUELCH is set to CARR.	A Defective control unit.	A Replace control unit.
	B Defective receiver-transmitter.	B Replace receiver-transmitter.
3. Radio set does not provide adequate signal to maintain two way communications.	A Defective receiver-transmitter.	A Replace receiver-transmitter.
	B Defective control unit.	B Replace control unit.
	C Defective antenna.	B Replace fm antenna.
4. VOL control does not vary audio level smoothly or introduces chirps. Defective control unit.		Replace control unit.
5. No 800 Hz tone heard in headset while radio set is channeling.	A Defective control unit.	A Replace control unit.
	B Defective receiver-transmitter.	B Replace receiver-transmitter.
6. No coded signal heard in headset when HOM E operation is selected.	A Defective homing antenna.	A Replace homing antenna.
	B Defective receiver-transmitter.	B Replace receiver-transmitter.
	C Defective control unit.	Replace control unit.



# **11-10. FM LIASON NO. 1 AN/ARC-54 OR AN/ARC-131 TROUBLESHOOTING (AVUM) - Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
7. FM Liaison No. 1 does not retransmit signals received by FM No. 2.		
A Defective No. 1 control unit.	A Replace fm No. 1 control unit.	
B Defective No. 1 receiver-transmitter.	B Replace fm No. 1 receiver-transmitter.	

## **11-10.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in FM Liaison No. 1 AN/ARC-54 or AN/ARC-131 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-25 and FO-26, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon where measurement should be taken.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Refer to 11-10.1.1 for U H-1 D/H or 11-10.1.2 for UH-1 H.



**11-10.1.1 UH-1D/H Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	1	Panel lighting (radio set control)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB12	3	Panel lights (KY control)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	10	Transmit key control	Radio set energized, intercom rotary switch set to 1	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	2	Receive audio	Radio set energized	Audio hi
TB26	2, 7	Ground	Not applicable	0
2107	C	Primary power	Radio set energized	28 Vdc
<p style="text-align: center;"><b>NOTE</b> TB 19 measurements below apply only to configurations I and J.</p>				
TB19	5	Primary power	Radio set energized	28 Vdc
TB19	7	Switched power to coupler and receiver-transmitter.	Radio set energized	28 Vdc



**11-10.1.2 UH-1H Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	1	Panel lights (radio set control)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB12	2	Panel lights (KY control)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	7	Ground	Not applicable	0
TB66	4, 5	Audio common (ground)	Not applicable	0
TB20	4	Transmit audio	Radio set energized, intercom rotary switch set to 1, microphone keyed and signal applied	Audio hi
TB19	5	Primary power	Radio set energized	28 Vdc
TB64	13	Power to audio threshold and remote cipher lights	KY unit energized and CIPHER selected	28 Vdc
TB70	4A, 4 B	Power to right crew remote cipher light	KY unit energized and CIPHER selected	28 Vdc
TB70	4F, 4G	Power to left crew remote cipher light	KY unit energized and CIPHER selected	28 Vdc
TB19	4	Transmit key line	Radio set energized, intercom rotary switch set to 1	28 Vdc microphone unkeyed, then 0 when microphone is keyed



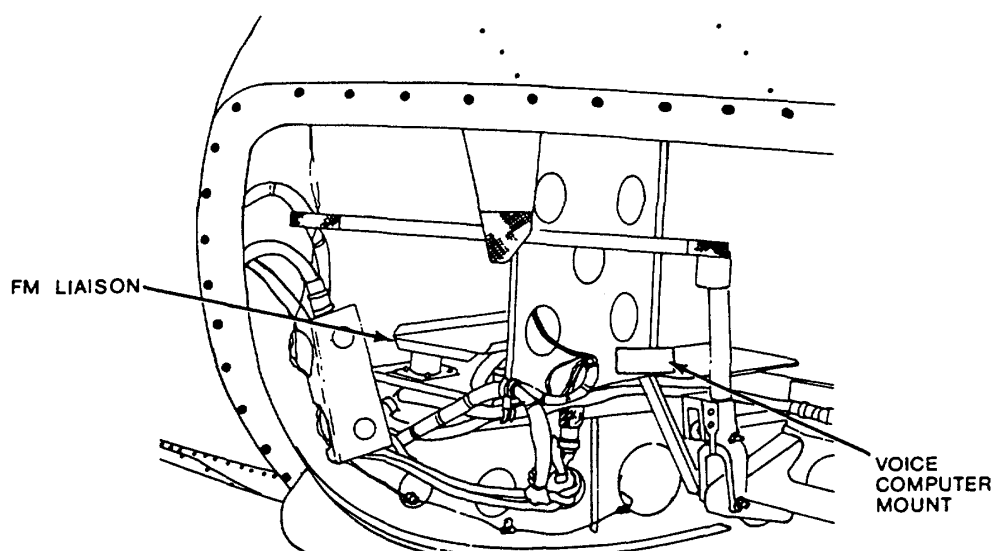
## CHAPTER 12

### VOICE SECURITY UNIT TSEC/KY-28 OR TSEC/KY-58 MAINTENANCE

Subject	Para.	Page
Voice Security Computer TSEC/KY-28 or TSEC/KY/KY-58 Maintenance (AVUM) .....	12-1	12-1
Control-Indicator C-8157!ARC or Remote Control Z-AHP Maintenance (AVUM) .....	12-2	12-2
Cabling and Connector Maintenance (AVUM).....	12-3	12-3
Voice Security Unit TSEC/KY-28 or TSEC/KY-58 Operational Checks (AVUM) .....	12-4	12-3
Voice Security Unit TSEC/KY-28 or TSEC/KY-58 Troubleshooting (AVUM) .....	12-5	12-5

### SECTION I. MAINTENANCE PROCEDURES

#### 12-1. VOICE SECURITY COMPUTER TSEC/KY-28 OR TSEC/KY-58 MAINTENANCE (AVUM)



#### NOTE

To improve access to voice security computer, raise collective to full stop position and depress left pedal prior to maintenance steps.

##### 12-1.1 Removal Instructions, TSEC/KY-28.

- A** Disconnect two electrical connectors and reconnect to appropriate jumper connectors below unit.
- B** Cut safety wire and loosen two wingnuts that secure unit in mount.
- C** Slide computer forward and lift out of mount.



### 12-1.2 Removal Instructions, TSEC/KY-58.

- A Loosen two self-locking fasteners that secure computer in mount.
- B Slide computer forward and disconnect two electrical connectors.
- C Lift computer out of mount. Install connectors on jumper plugs.

### 12-1.3 Installation Instructions, TSEC/KY-28.

- A Place computer in mount and slide to rear making sure guide pins are engaged.
- B Tighten and safety wire two wingnuts that secure computer in mount.
- C Disconnect two electrical connectors from jumper receptacles and connect them to computer.

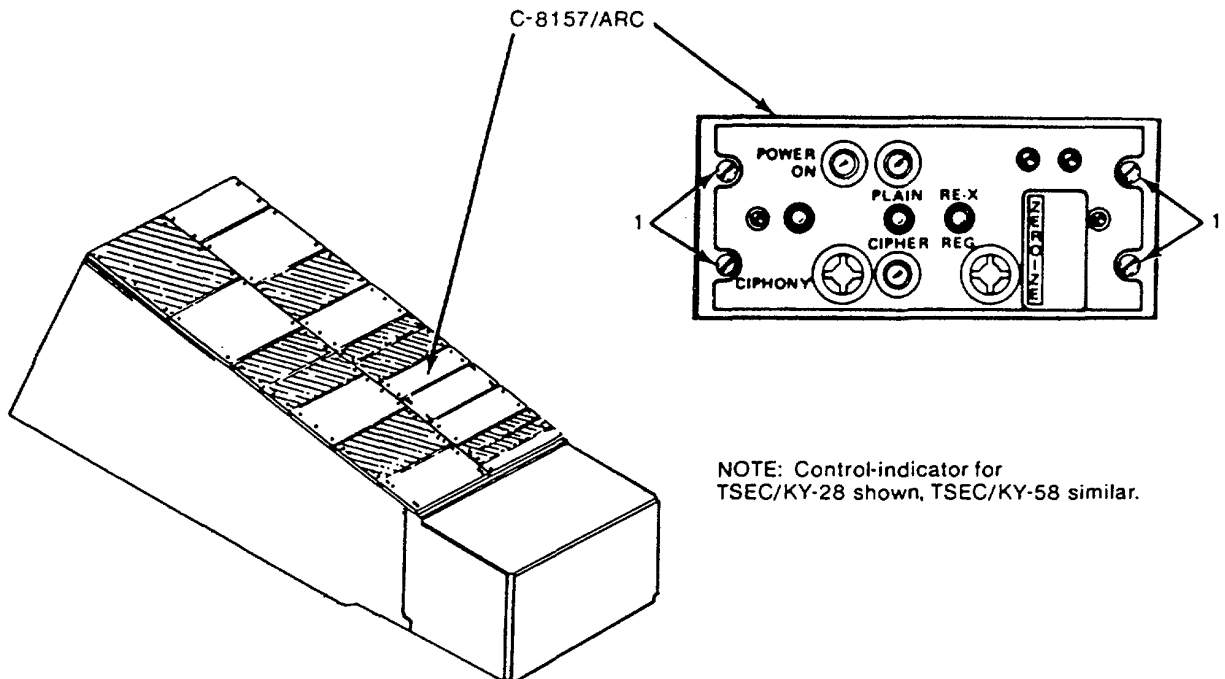
### 12-1.4 Installation Instructions, TSEC/KY-58.

- A Place computer in mount and connect two electrical connectors to computer rear panel.
- B Slide computer back into mount making sure guide pins are engaged.
- C Tighten two self-locking fasteners to secure computer in mount.

#### **WARNING**

If the fasteners do not have a self-locking feature, safety wire shall be installed to the fasteners in accordance with standard procedures. If fasteners have a self-locking feature which is not functioning properly, replace the fastener or install safety wire.

## 12-2. CONTROL-INDICATOR C-8157/ARC OR REMOTE CONTROL Z-AHP MAINTENANCE (AVUM)



NOTE: Control-indicator for TSEC/KY-28 shown, TSEC/KY-58 similar.



**12-2.1 Removal Instructions.**

- A** Loosen four spring-lock fasteners (1) that secure control-indicator to pedestal console.

**CAUTION**

Be careful not to pull control-indicator so far from pedestal console that wiring or connector will be damaged.

- B** Carefully pull control-indicator from pedestal console and disconnect electrical connector from rear of unit.  
**C** Remove control-indicator.

**12-2.2 Installation Instructions.**

- A** Hold control-indicator near pedestal console and connect electrical connector to rear of unit.  
**B** Position control-indicator and secure to pedestal console with four spring-lock fasteners (1).

**12-3. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:
  - A** UH-1 D/H configurations C through H: P2201, J2201A, P2202, J2202A, and P2203.
  - B** UH-1 D/H configurations I, J and UH-1 H: P421, J421, P422, J422 and P423.
- Refer to FO-25 and FO-26.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Paragraph 2-5 contains general wiring repair information.

**SECTION II. OPERATIONAL CHECKS****12-4. VOICE SECURITY UNIT TSEC/KY-28 OR TSEC/KY-58 OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Voice Security Unit TSEC/KY-28 or TSEC/KY-58 is operating properly. The checks are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Equipment Conditions**

Reference

Paragraph 1-50 Auxiliary Power Unit connected.  
 Paragraph 14-13 Intercommunications Set operational.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

- Check that all components are installed, securely mounted and safety wired (if required).



**12-4. VOICE SECURITY UNIT TSEC/KY-28 OR TSEC /KY-58 OPERATIONAL CHECKS (AVUM) - Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**POWER OFF CHECKS - Continued**

2. Check that electrical connectors are removed from dummy receptacles and connected to voice security computer.
3. Check that all connectors are tightened and for evidence of chafed or broken wiring

**POWER ON CHECKS**

**NOTE**

If voice security computer (TSEC/KY-28 or TSEC/KY-58) is installed and connected the VOICE SECURITY circuit breaker must be energized and power turned on to use the VHF FM radio set. If the computer is installed but the electrical connectors are connected to the adjacent dummy receptacles, the computer is bypassed.

1. Depress KY-28 (or KY-58) VOICE SECURITY circuit breaker.
2. Refer to TM 11-5810-244-series (KY-28) or TM 11-5810-262-series (KY-58) and fill (key) voice security computer.

**NOTE**

The voice security unit operates in conjunction with FM Liaison No.1 radio set. Make sure the radio set is operational before proceeding.

3. On voice security control set POWER switch to ON, PLAIN/CIPHER switch to CIPHER and RE-X/REG switch to REG.  
Constant tone will be heard in headset for approximately 2 seconds, then will change to an interrupted tone: Green cipher lamp should light.

**NOTE**

When the voice security unit is installed and connected, it must be turned on to use FM Liaison No. 1 Radio Set for either plain or ciphered communications.

4. Momentarily press then release press-to-talk switch.  
Interrupted tone stops.  
Equipment is in a standby mode. No transmission or reception can be made if interrupted tone continues after pressing the press-to-talk switch.
5. Press and hold the press-to-talk switch, do not talk.  
After approximately one-half second a short beep will be heard in headset.
6. Conduct a two-way communications check with a similarly equipped receiver-transmitter.  
Clear and audible two-way communications possible

**NOTE**

Although TSEC/KY-28 and TSEC/KY-58 are similar in overall function, ciphered communications from one computer cannot be deciphered by the other computer.



**12-4. VOICE SECURITY UNIT TSEC/KY-28 OR TSEC/KY-58 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS-Continued**

7. On voice security control set PLAIN/CIPHER switch to PLAIN.  
     Red PLAIN lamp lights.  
     Voice security computer has no effect on transmitted or received signals in this condition.

**Section III. TROUBLESHOOTING****12-5. VOICE SECURITY UNIT TSEC/KY-28 OR TSEC/KY-58 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Voice Security Unit TSEC/KY-28 or TSEC/KY-58.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 12-4.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

No communications in CIPHER mode.

- |          |                                  |          |  |
|----------|----------------------------------|----------|--|
| <b>A</b> | Voice computer improperly keyed. | <b>A</b> | Check keying device and re-key computer. |
| <b>B</b> | Faulty control unit.             | <b>B</b> | Replace C-81 57/ARC or Z-AMP.            |
| <b>C</b> | Faulty voice security unit.      | <b>C</b> | Replace TSEC/KY-28 or TSEC/KY-58.        |

**NOTE**

Refer to FM Liaison No. 1 for voltage and signal measurements if the above corrective actions do not correct the problem.



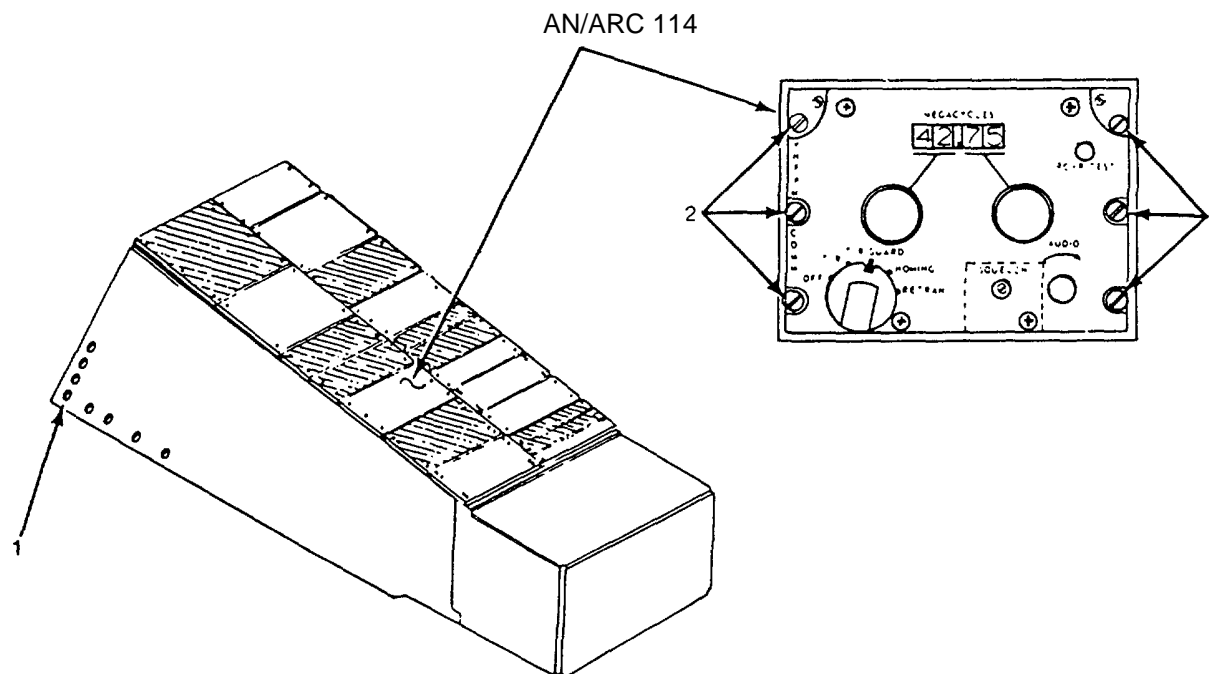
## CHAPTER 13

### FM LIAISON NO. 2 AN/ARC-114 MAINTENANCE

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Radio Select Panel Maintenance (AVUM) .....	13-5	13-3
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#### Section I. MAINTENANCE PROCEDURES

##### 13-1. RADIO SET AN/ARC-114 MAINTENANCE (AVUM)



##### 13-1.1 Removal Instructions.

- A Remove side panel from pedestal console by removing screws (1).
- B Reach inside pedestal console and disconnect one coaxial and one electrical connector.
- C Loosen six spring-lock fasteners (2).
- D Lift radio set out of pedestal console.

##### 13-1.2 Installation Instructions.

- A Position radio set in pedestal console and tighten six spring-lock fasteners.
- B Reach inside pedestal console and connect one coaxial and one electrical connector.
- C Replace side panel of pedestal console and secure with screws (1).

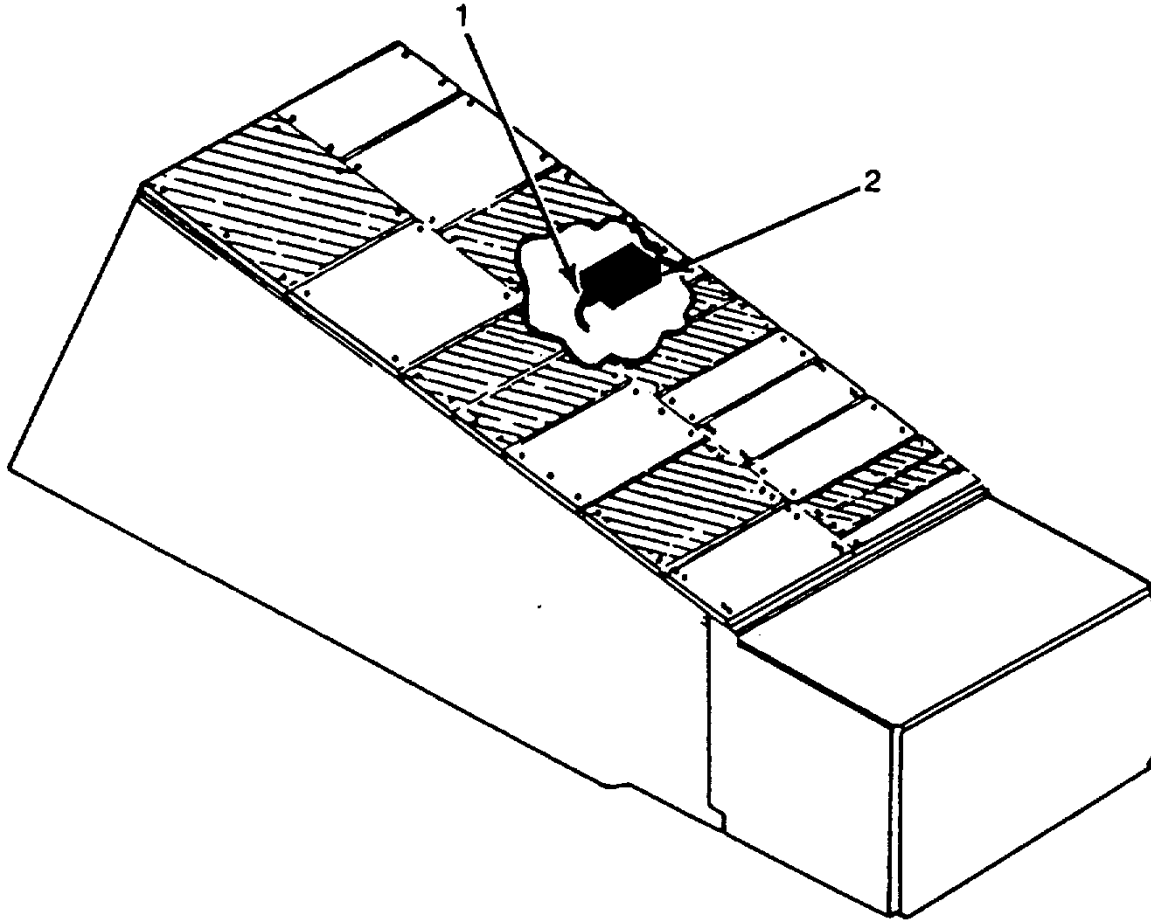


**13-2. ANTENNA FM 10-30-1 MAINTENANCE (AVUM)**

Antenna FM 10-30-1 is used for FM Liaison No. 2 in UH-1 D/H configurations only. Maintenance instructions are contained in paragraph 11-6.

**13-3. ANTENNA AS-1703/ARC AND COUPLER CU-942/AR MAINTENANCE (AVUM)**

Antenna AS-1703/ARC and Coupler CU-942/AR are used for FM Liaison No. 2 in UH-1 H helicopters. Maintenance instructions are contained in paragraph 11-5.

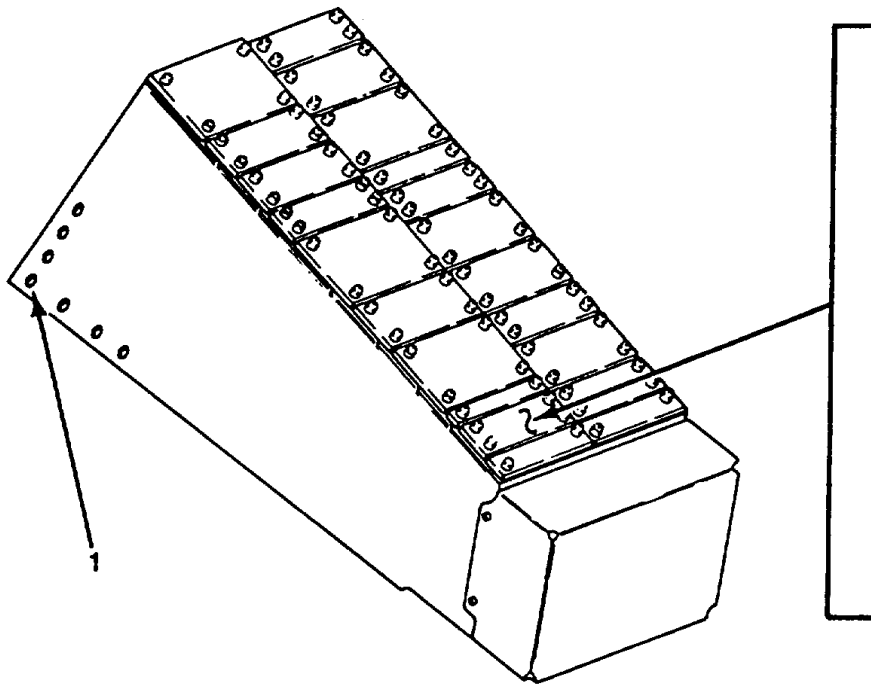
**13-4. AUDIO PAD IMPEDANCE BOX MAINTENANCE (AVUM)****13-4.1 Removal Instructions.**

- A Remove controls as needed to gain access to audio pad impedance box.
- B Disconnect electrical connector (1).
- C Remove screws that secure audio pad impedance box (2) to center console.
- D Remove audio pad impedance box.

**13-4.2 Installation Instructions.**

- A Position audio pad impedance box (2) on center console and secure with screws.
- B Connect electrical connector (1).
- C Replace controls removed to gain access.



**13-5. RADIO SELECT PANEL MAINTENANCE (AVUM)**

Art not Available  
from Government

**13-5.1 Removal Instructions.**

- A** Remove screws (1) that secure side panel to pedestal console and remove side panel.
- B** Reach inside pedestal console and disconnect electrical connector from rear of radio select panel.
- C** Loosen turnlock fasteners and lift radio select panel from pedestal console.

**13-5.2 Installation Instructions.**

- A** Position radio select panel in pedestal console and secure with turnlock fasteners.
- B** Reach into pedestal console and connect electrical connector to rear of radio select panel.
- C** Position side panel on pedestal console and secure with screws (1).

**13-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:
- P1141, P1142, P1143, P1144, P1145, P1146, P1147, P1808 and 1600.
- Refer to FO-27 and FO-28 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.



## Section II. OPERATIONAL CHECKS

**13-7. FM LIAISON NO. 2 AN/ARC-114 OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Radio Set AN/ARC-114 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Test Equipment**

Radio Set

**Equipment Conditions**

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunication Set operational.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

1. Depress FM ARC-114 circuit breaker.
2. Set intercom and radio select control panel (if installed) switches to allow transmission and reception with AN/ARC-114.
3. On AN/ARC-114 set function selector to T/R.
4. Set frequency selectors to 32.10 MHz then depress and hold RCVR TEST pushbutton.  
Tone heard in headset.
5. Repeat step 4 using 34.10, 41.50, 46.65 and 72.05 MHz.  
Tone heard in headset for each frequency tested.

**NOTE**

If possible avoid communications checks with base control tower. When authorized, use another vhf fm receiver-transmitter and frequency.

6. On AN/ARC-114 select test frequency.
7. From pilot, then copilot station fully depress cyclic stick switch and speak into microphone.  
Sidetone heard in headset.
8. Conduct communications check with other receiver-transmitter.  
Clear and audible two way communications.
9. While receiving other station rotate AUDIO control throughout its range.  
Volume of received signal should vary smoothly with no chirps or dead spots.
10. Have other receiver-transmitter make transmission on guard frequency (40.50 MHz).



**13-7. FM LIAISON NO. 2 AN/ARC-114 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS-Continued**

11. On AN/ARC-114 set function selector to T/R GUARD.  
     Reception of other receiver-transmitter by guard receiver.  
     Verification that signal being received is from guard receiver can be made by switching function selector from T/R GUARD to TR during signal reception.
12. On AN/ARC-114 set frequency selector to 40.50 MHz and depress RCVR TEST pushbutton.  
     Tone in headset.

**Section III. TROUBLESHOOTING****13-8. FM LIAISON NO. 2 AN/ARC-114 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in FM Liaison No. 2 AN/ARC-114.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 13-7.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. No tone in headset when RCVR TEST button is depressed.
  - A** Defective circuit breaker.
    - A** Reset or replace circuit breaker as necessary.
  - B** Defective interunit cabling.
    - B** Check connectors and cabling, repair or replace as necessary.
  - C** Defective receiver-transmitter.
    - C** Replace AN/ARC-114.
  - D** Defective antenna.
    - D** Replace fm No. 2 antenna.
2. Squelch inoperative or no sidetone heard during transmission.
  - A** Defective interunit cabling.
    - A** Check connectors and cabling, repair or replace as necessary.
  - B** Defective receiver-transmitter.
    - B** Replace AN/ARC-114.



13-8. FM LIAISON NO. 2 AN/ARC-114 TROUBLESHOOTING (AVUM)-Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
3. Radio set does not provide adequate signals to maintain two-way communications.	<b>A</b> Defective receiver-transmitter.	<b>A</b> Replace AN/ARC-114.
	<b>B</b> Defective antenna.	<b>B</b> Replace fm No. 2 antenna.
4. AUDIO control does not smoothly vary audio level or introduces chirps.	Defective receiver-transmitter.	Replace AN/ARC-114.
5. No reception on guard receiver.	Defective receiver-transmitter.	Replace AN/ARC-114.

13-8.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in FM Liaison No. 2 AN/ARC-114 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-27 and FO-28, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Refer to 13-8.1.1 for UH-1 D/H or 13-8.1.2 for UH-1 H.



**13-8.1.1 UH-1 D/H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	13	Transmit key control	AN/ARC- 114 energized, intercom rotary switch set to 4, and radio select switch set to FM 2	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB26	2	Ground	Not applicable	0
P1141	D	Primary power	AN/ARC-114 energized	28 Vdc

**13-8.1.2 UH-1H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26 TB20	1, 2, 4 7	Ground Transmit audio	Not applicable AN/ARC-114 energized, intercom rotary selector set to 5, microphone keyed and signal applied	0 Audio hi
TB20 P3302	12 D	Receive audio Primary power	AN/ARC-114 energized AN/ARC-114 energized	Audio hi 28 Vdc



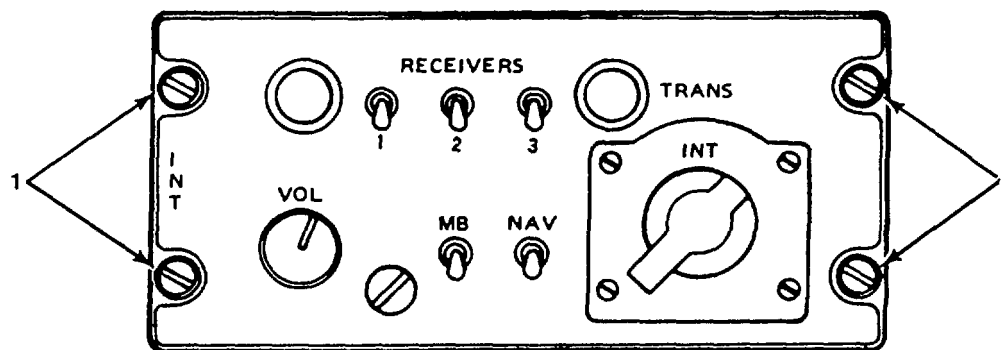
## CHAPTER 14

### INTERCOMMUNICATIONS SET MAINTENANCE

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#### Section I. MAINTENANCE PROCEDURES

##### 14-1. SIGNAL DISTRIBUTION PANEL SB-329/AR MAINTENANCE (AVUM)



#### NOTE

Three panels are installed: two in pedestal console for pilot and copilot, and one at crewmembers station. Maintenance procedures are the same for all panels.



### 14-1.1 Removal Instructions.

- A** Loosen four spring-lock fasteners (1) that secure panel to pedestal console or mounting bracket.

#### CAUTION

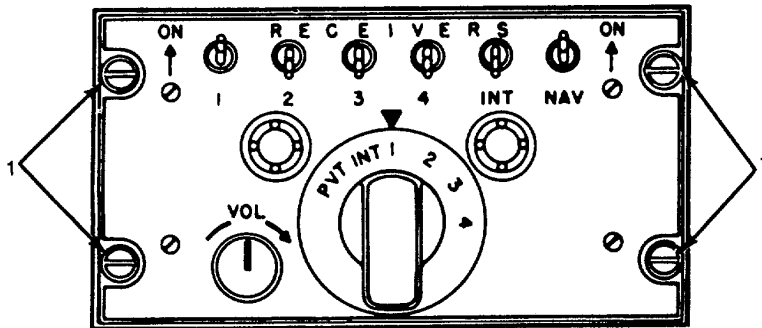
Be careful not to pull panel so far from mounting that wiring or connector will be damaged.

- B** Pull panel far enough from mounting to reach spring-lock fasteners that secure electrical connector on back of panel.  
**C** Loosen two spring-lock fasteners on back of panel and disconnect electrical connector.  
**D** Remove panel.

### 14-1.2 Installation Instructions.

- A** Hold panel near mounting and connect electrical connector to receptacle on back of panel.  
**B** Tighten two spring-lock fasteners that secure connector to back of panel.  
**C** Position panel in pedestal console or mounting bracket and secure with four spring-lock fasteners.

### 14-2. CONTROL INTERPHONE C-1611(\*)/AIC MAINTENANCE (AVUM)



#### NOTE

Some models have guards on receiver switch. C-1611 D/AIC has eight fasteners (1) instead of four.

Four control panels are installed: two in pedestal console for pilot and copilot; one each at crew right and crew left stations. Maintenance procedures are the same for all panels.



#### 14-2.1 Removal Instructions.

- A Loosen spring-lock fasteners (1) that secure unit to pedestal or mounting bracket.

#### CAUTION

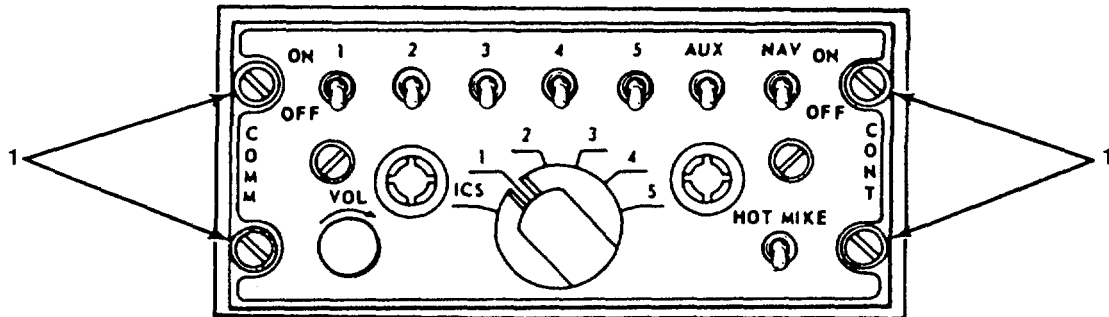
Be careful not to pull control panel so far from mounting point that wiring or connector will be damaged.

- B Lift control panel far enough from pedestal or mounting bracket to gain access to rear of panel.
- C Loosen spring-lock fasteners that secure connector to rear of panel.
- D Remove electrical connector and lift out control panel.

#### 14-2.2 Installation Instructions.

- A Place control panel close enough to pedestal or mounting bracket that connector assembly can be mated with connector on rear of control panel.
- B Connect electrical connector to rear of control panel and tighten spring-lock fasteners.
- C Position control panel in pedestal or mounting bracket and secure with spring-lock fasteners.

#### 14-3. CONTROL, COMMUNICATIONS C-6533/ARC MAINTENANCE (AVUM)



Four control panels are installed: two in pedestal console for pilot and copilot; one each at crew right and crew left stations. Maintenance procedures are the same for all controls.

#### 14-3.1 Removal Instructions.

- A Loosen spring-lock fasteners (1) that secure unit to pedestal or mounting bracket.

#### CAUTION

Be careful not to pull control panel so far from mounting point that wiring or connector will be damaged.

- B Lift control panel far enough from pedestal or mounting bracket to gain access to rear of panel.



#### 14-3.1 Removal Instructions. - Continued

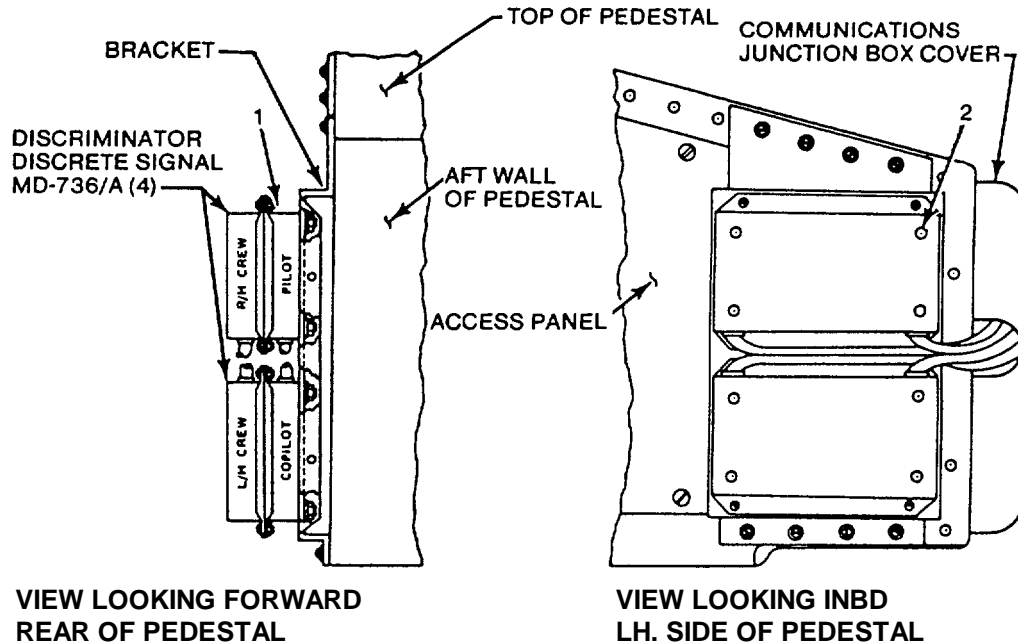
- C Loosen spring-lock fasteners that secure connector to rear of panel.
- D Remove electrical connector and lift out control panel.

#### 14-3.2 Installation Instructions.

- A Place control panel close enough to pedestal or mounting bracket that connector assembly can be mated with connector on rear of control panel.
- B Connect electrical connector to rear of control panel and tighten spring-lock fasteners.
- C Position control panel in pedestal or mounting bracket and secure with spring-lock fasteners.

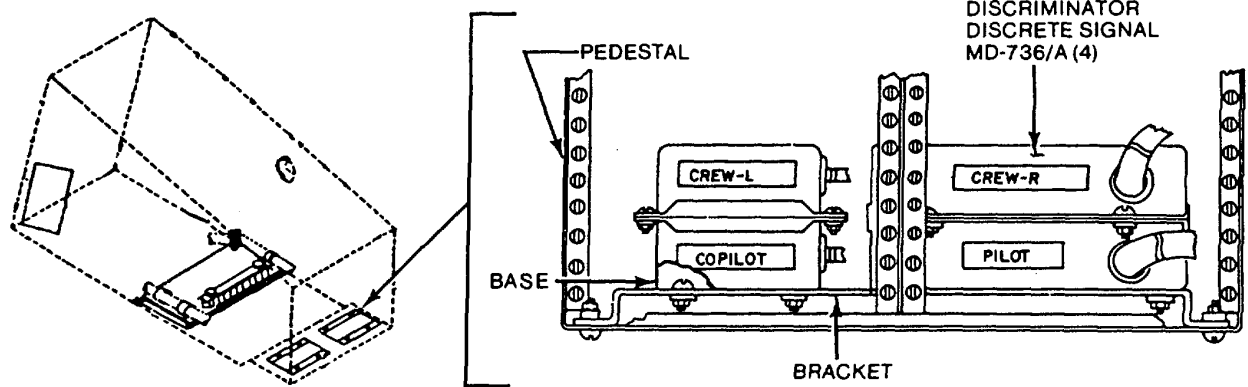
#### 14-4. DISCRETE SIGNAL DISCRIMINATORS MD-736/A MAINTENANCE (AVUM)

Four discriminators MD-736/A are located on front of pedestal console, left side, in configurations C, D and E.



- Four discriminators M D-736/A are located in front of pedestal console, on a flow-mounted bracket, in configurations F through I.



**14-4. DISCRETE SIGNAL DISCRIMINATORS MD-736/A MAINTENANCE (AVUM)-Continued**

- Four discriminators MD-736/A are located on face of pedestal, behind map case, on configuration J.

**14-4.1 Removal Instructions, Configurations C through I, Crew (R or L).**

- Remove four screws that secure front cover to pedestal console and remove front cover.
- Loosen four captive screws (2) that secure cover to discriminator, remove cover.
- Tag, then disconnect wiring to discriminator.
- Remove four screws, nuts and washers (1) that mount discriminator to one below.
- Remove discriminator.

**14-4.2 Installation Instructions, Configurations C through I, Crew (R or L).**

- Position discriminator and secure with four screws, nuts and washers (1).
- Connect wiring to discriminator and remove tags.
- Position cover and secure by tightening four captive screws (2).
- Replace pedestal console front cover and secure with four screws.

**14-4.3 Removal Instructions, Configurations C through I, Pilot or Copilot.**

- Remove four screws that secure front cover to pedestal console and remove front cover.
- Remove four screws, nuts and washers (1) that secure Crew discriminator to bottom discriminator, and displace.
- Loosen four captive screws (2) that secure cover to discriminator, remove cover.
- Tag, then disconnect wiring to discriminator.

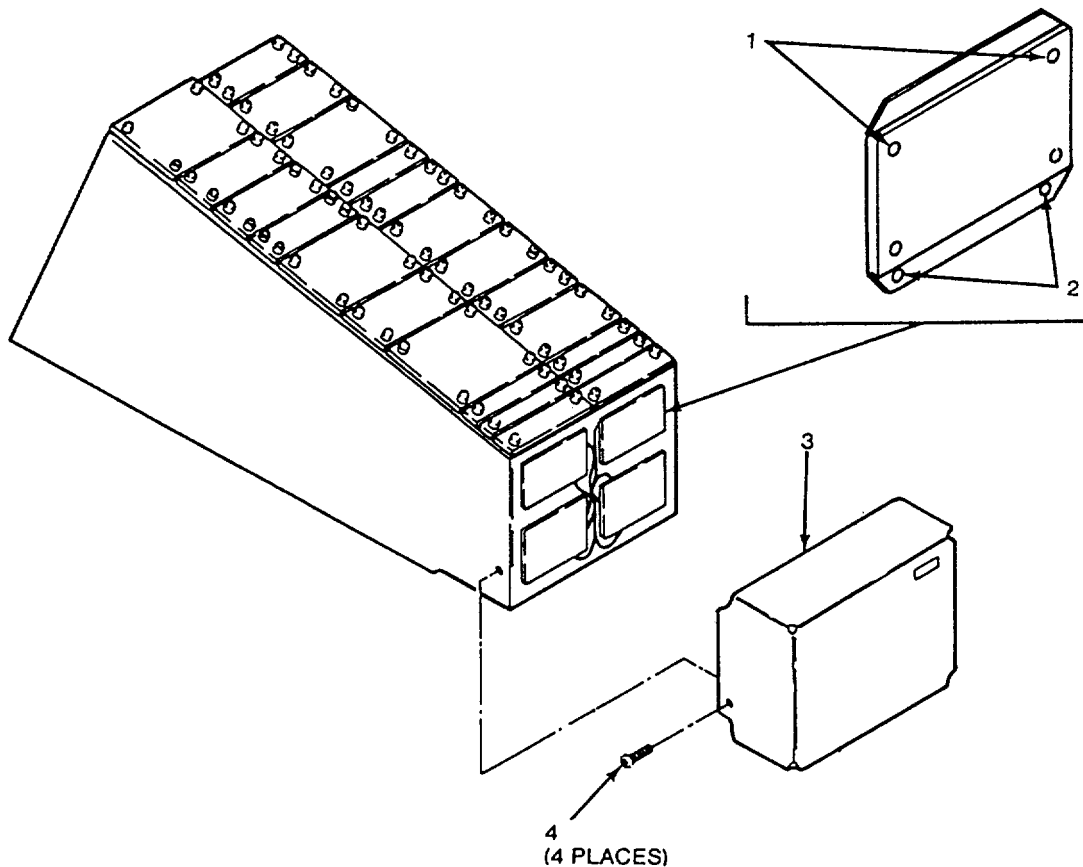


**14-4.3 Removal Instructions, Configurations C through I, Pilot or Copilot.-Continued**

- E Remove four screws that secure printed circuit boards to base and remove printed circuit boards.
- F Remove four screws and washers (3) that secure discriminator base to bracket.
- G Remove discriminator.

**14-4.4 Installation Instructions, Configurations F through I, Pilot or Copilot**

- A Position discriminator base on bracket and secure with four screws and washers (3).
- B Install printed circuit boards into base and secure with four screws.
- C Reconnect wiring and remove tags.
- D Position discriminator cover and secure with four screws (2).
- E Position Crew discriminator and secure with four screws, nuts and washers (1).
- F Replace pedestal console cover and secure with four screws.

**14-4.5 Removal Instructions, Configuration J.****NOTE**

MD-736/A is not used on UH-1 H or configurations A or B of UH-1 D/H.



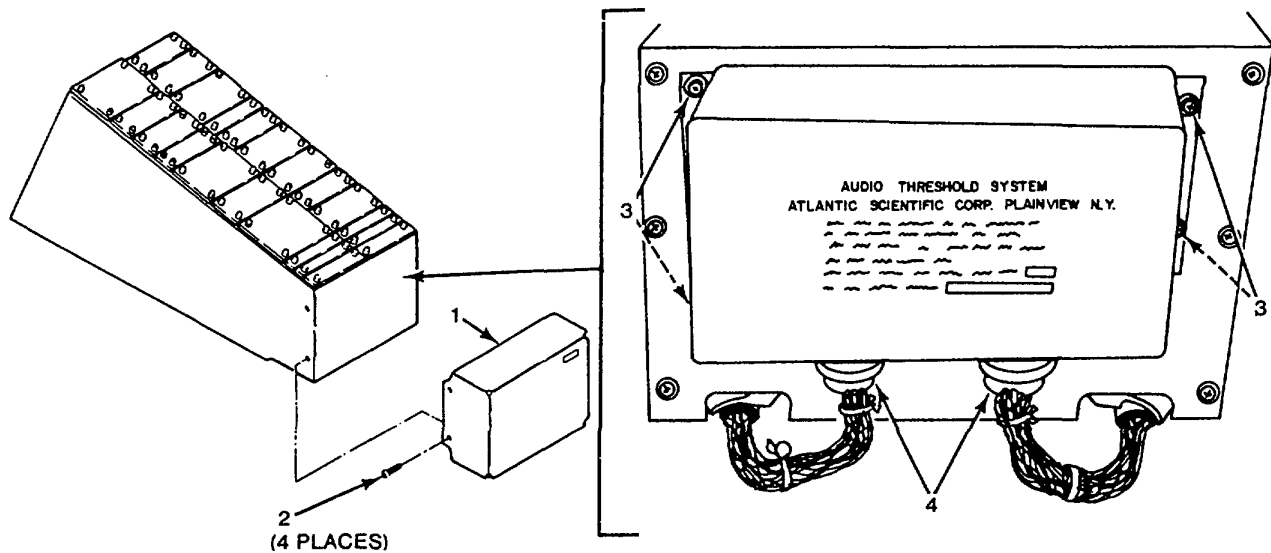
#### 14-4.5 Removal Instructions, Configuration J. - Continued

- A Remove four screws (4) and pull cover (3) from front of pedestal console.
- B Loosen four captive screws (1) and remove discriminator cover.
- C Tag then disconnect wiring to discriminator.
- D Remove four screws (2) and pull discriminator from pedestal cover.

#### 14-4.6 Installation Instructions, Configuration J.

- A Position discriminator on pedestal console and secure with four screws (2).
- B Connect wiring to discriminator and remove tags.
- C Position cover over discriminator and secure with four captive screws (1).
- D Position cover (3) on front of pedestal console and secure with four screws (4).

#### 14-5. AUDIO THRESHOLD SYSTEM MD-1047/ARC MAINTENANCE (AVUM)



##### 14-5.1 Removal Instructions.

- A Remove four screws (2) and pull cover (1) from face of pedestal console.
- B Disconnect two electrical connectors (4).
- C Remove four screws (3) and pull M D-1047/ARC from pedestal console.

##### 14-5.2 Installation Instructions.

- A Position MD-1047/ARC on pedestal console and secure with four screws (3).
- B Connect two electrical connectors (4).

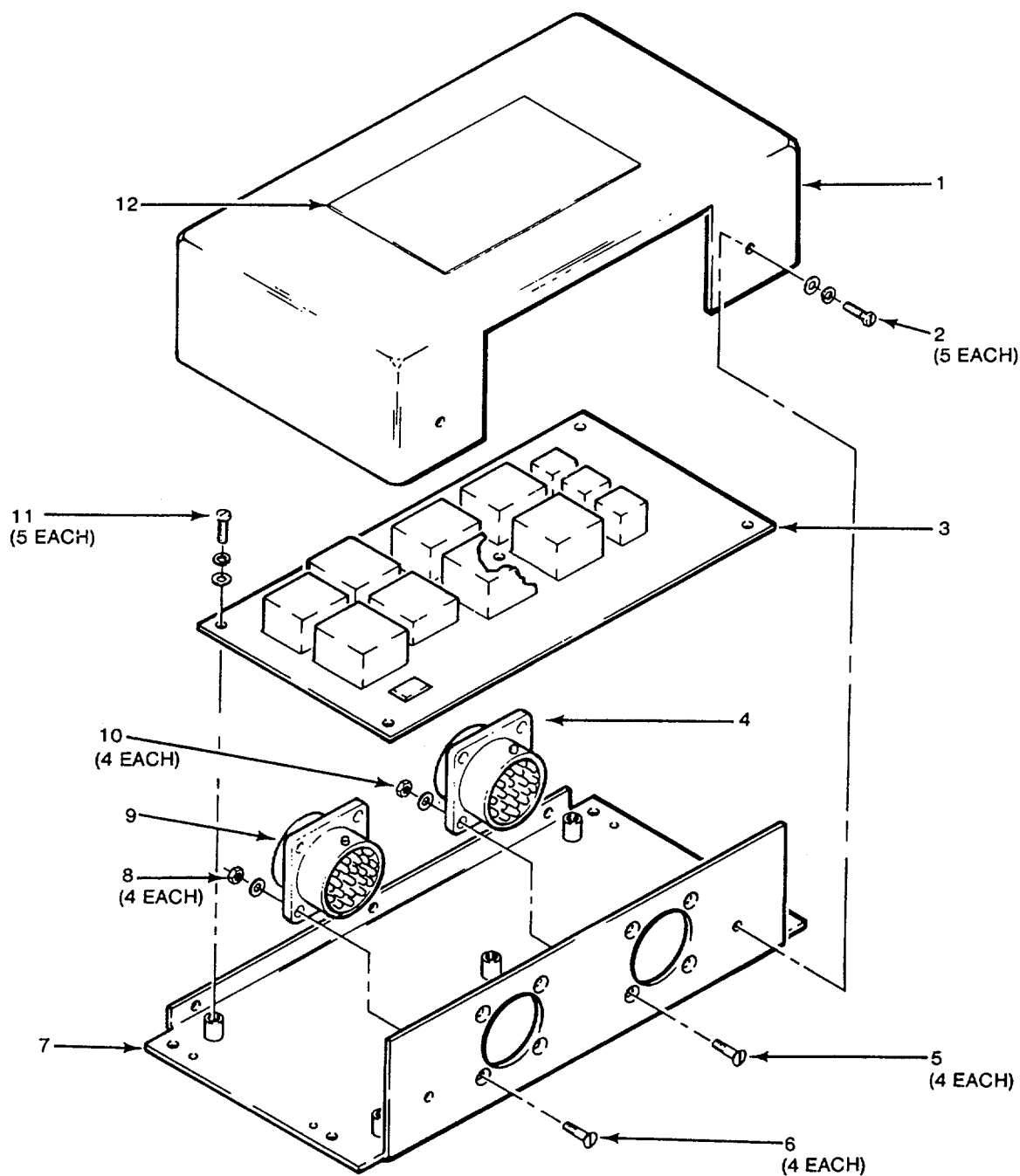


**14-5.2 Installation Instructions.-Continued**

**C** Position cover (1) and secure with four screws (2).

**14-6. AUDIO THRESHOLD SYSTEM MAINTENANCE (AVIM)**

Aviation Intermediate Maintenance (AVIM) of the Audio Threshold System MD-1047/ARC consists of disassembly, cleaning, inspection repair, and assembly.

**14-6.1 Audio Threshold System Disassembly.**



**14-6.1 Audio Threshold System Disassembly.-Continued**

- A** Remove five screws, lockwashers and flat washers (2) that secure cover (1).
- B** Lift cover (1) off chassis (7).
- C** Remove four screws (5), nuts and washers (10) that secure J2 (4) to chassis.
- D** Remove four screws (6), nuts and washers (8) that secure J1 (9) to chassis.
- E** Remove five screws, lockwashers and flat washers that secure printed circuit board (3) to chassis.
- F** Lift circuit card assembly (cca), with connectors attached, from chassis.
- G** If nameplate (12) is damaged, it can be removed by peeling it off cover (1).

**14-6.2 Audio Threshold System Cleaning.**

- A** Remove moisture, dust and loose dirt with clean soft cloth.

**WARNING**

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

- B** Remove grease, fungus and ground in dirt with clean cloth dampened (not wet) with trichlorotrifluoroethane.
- C** Remove dust and dirt from connectors using soft bristle brush.
- D** Remove moisture from connectors using soft cloth.

**14-6.3 Audio Threshold System Inspection.**

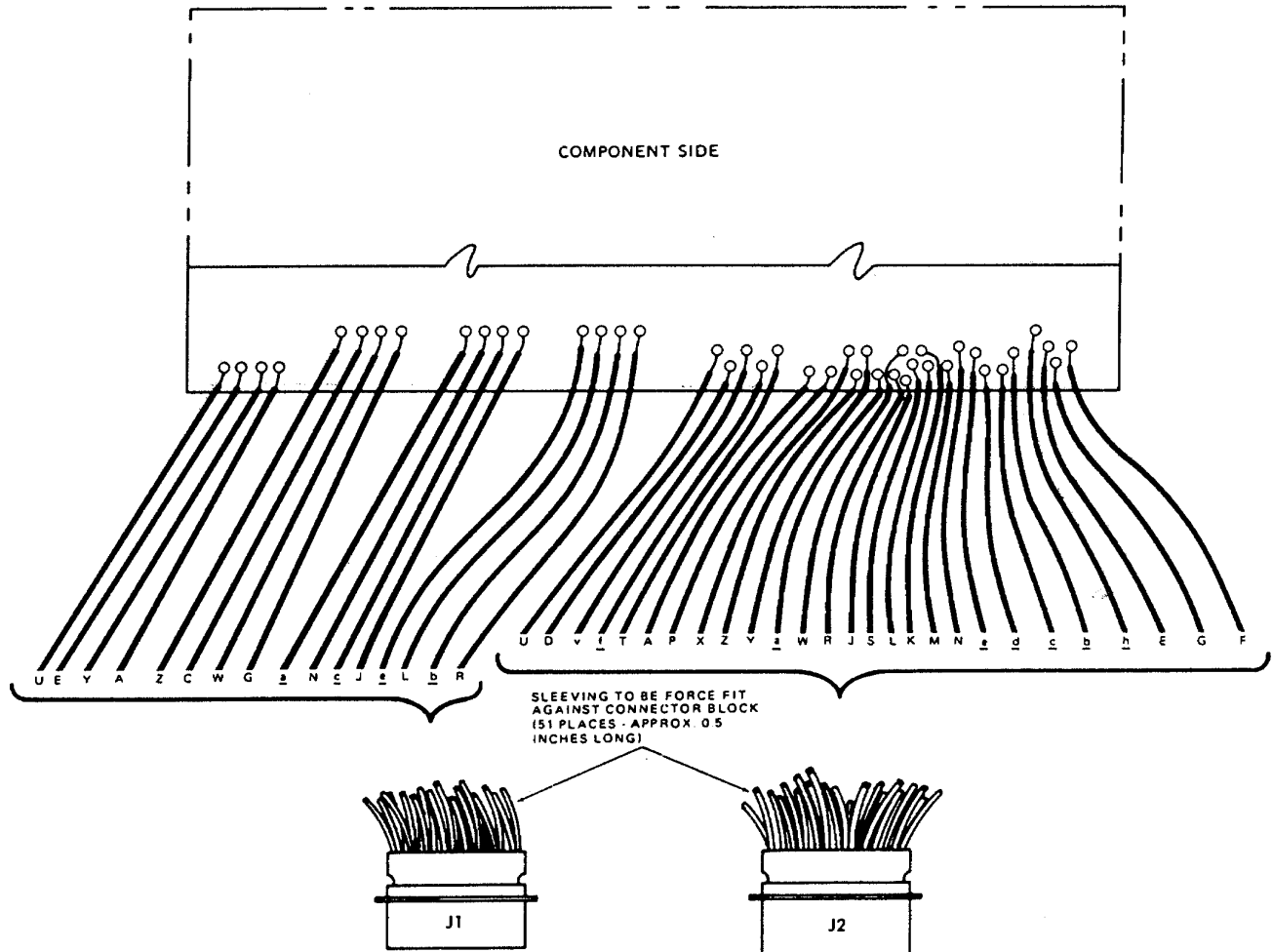
The chart below specifies inspection and repair requirements for disassembled parts.

Item	Inspect for	Repair
Cover	Punctures, deep dents, and damage to finish requiring touch up.	Touchup or replace.
Chassis	Punctures, deep dents, damaged fasteners and damaged finish requiring touchup.	Touchup or replace.
Circuit board assembly:		
Printed circuit board	Cracked board or damaged surface coating.	Replace or recoat.
Solder joints	Loose or cold solder joints.	Resolder
Connectors	Insert damage.	Replace connector.
Parts on circuit board assembly	Physical damage.	Replace part.



#### 14-6.4 Audio Threshold System Repair.

- A** To repair or replace connectors J1 or J2 proceed as follows:
1. Unsolder lead at circuit card assembly.
  2. Use insert/extract tool (NAS 1664-20) and remove pin/pins from connector.
  3. Clip off any damaged pins.
  4. Slide 1/2-inch piece of sleeving on replacement lead.
  5. Strip wire and crimp on new connector pin.
  6. Use insert/extract tool (NAS 1664-20) and insert pin/pins into connector.
  7. Using diagram below and FO-38 solder leads to pins on cca.



- B** To replace faulty component on cca proceed as follows:

**NOTE**

Initial setup applies to part removal and part installation.



## 14-6.4 Audio Threshold System Repair.-Continued

**INITIAL SETUP:****Tools**

Tool Kit TK-100

Tool Kit TK-105

**Equipment Condition**Circuit Card Assembly (cca) removed  
from chassis.**Materials/Parts**

Trichlorotrifluoroethane (cleaning solvent)

Soft bristle brush

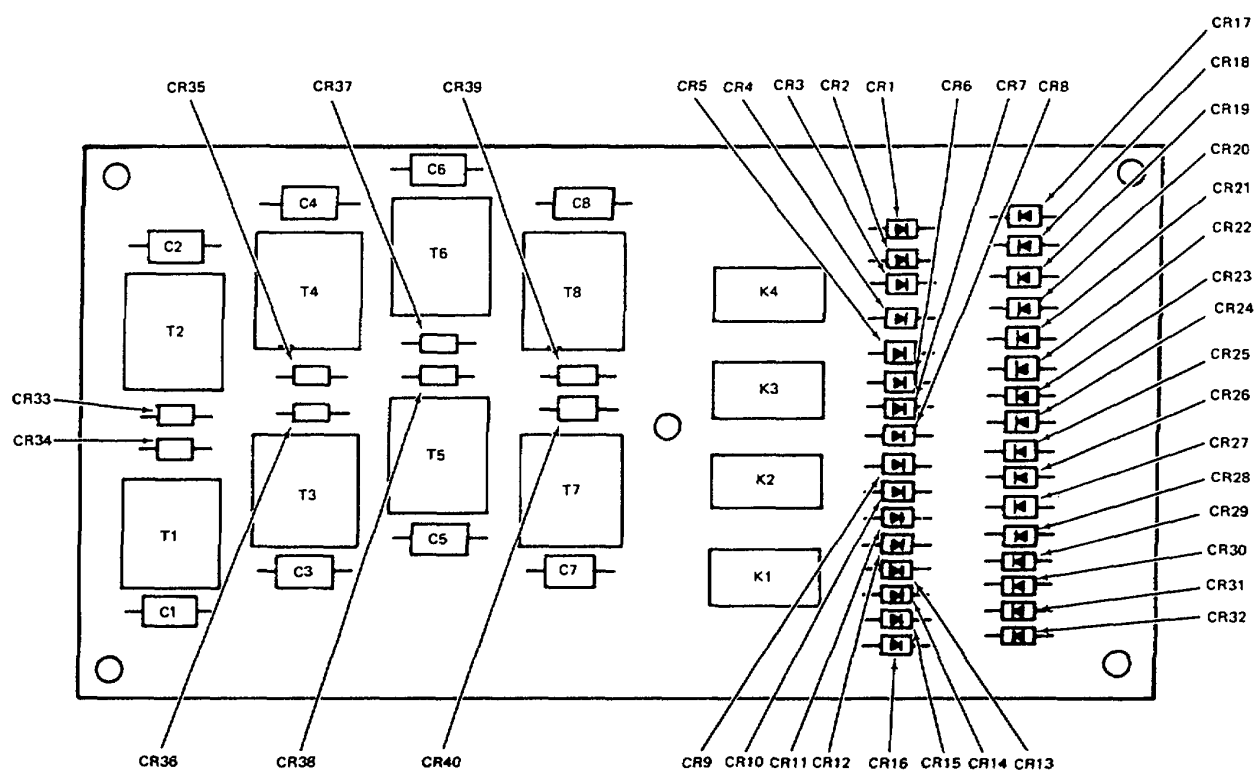
Replacement Parts (TM 11-1520-210-34P)

**General Safety Information**

Volatile and toxic solvent hazard.

**Part Removal**

1. Locate part to be removed.



2. If necessary, attach heat shunt to part lead.
3. Unsolder and remove part.



## 14-6.4 Audio Threshold System Repair.-Continued

## Part Installation

**WARNING**

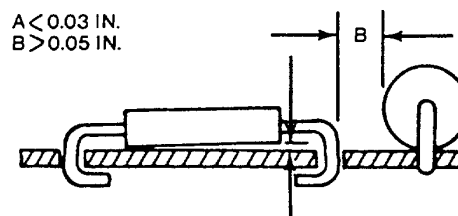
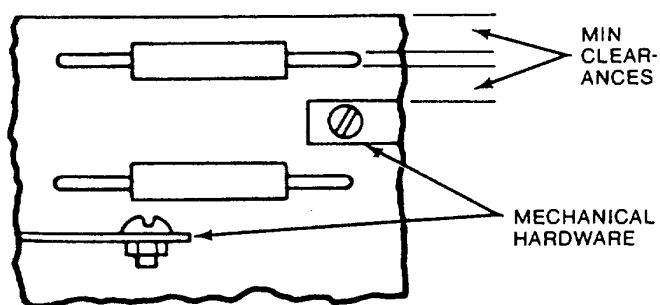
Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged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

1. Clean mounting holes for replacement part thoroughly with solvent and soft bristle brush.

**NOTE**

Refer to FO-38 and ensure proper polarity connection if replacing diode.

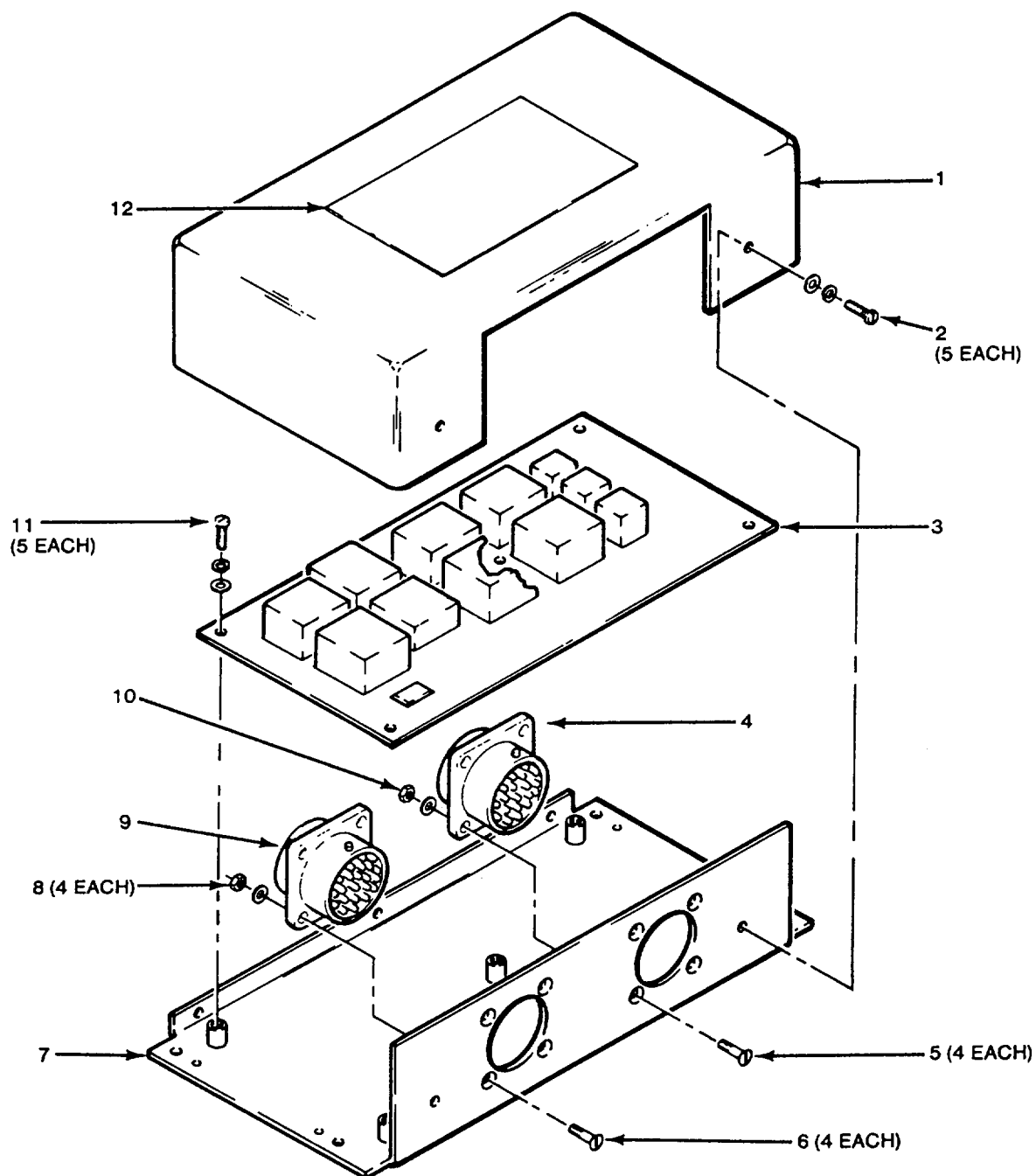
2. Mount and solder replacement part on cca in accordance with mounting criteria below.

**Mounting Criteria:**

- A Part body should have minimum clearance of 0.05 inch from card edge.
- B Part body and leads positioned in line between mounting holes.
- C Part leads should have minimum clearance of 0.05 inch from nearest electrical conducting element or mechanical hardware.
- D Part body should have minimum clearance of 0.03 inch from nearest mechanical hardware.
- E Part leads should not be nicked, flattened or broken.
- F Part should be seated firmly on card. Maximum tilt from card should be 0.03 inch.
- G Part lead should have minimum clearance of 0.05 inch from noninsulated portion of another part when parts are not connected to same electrical junction.



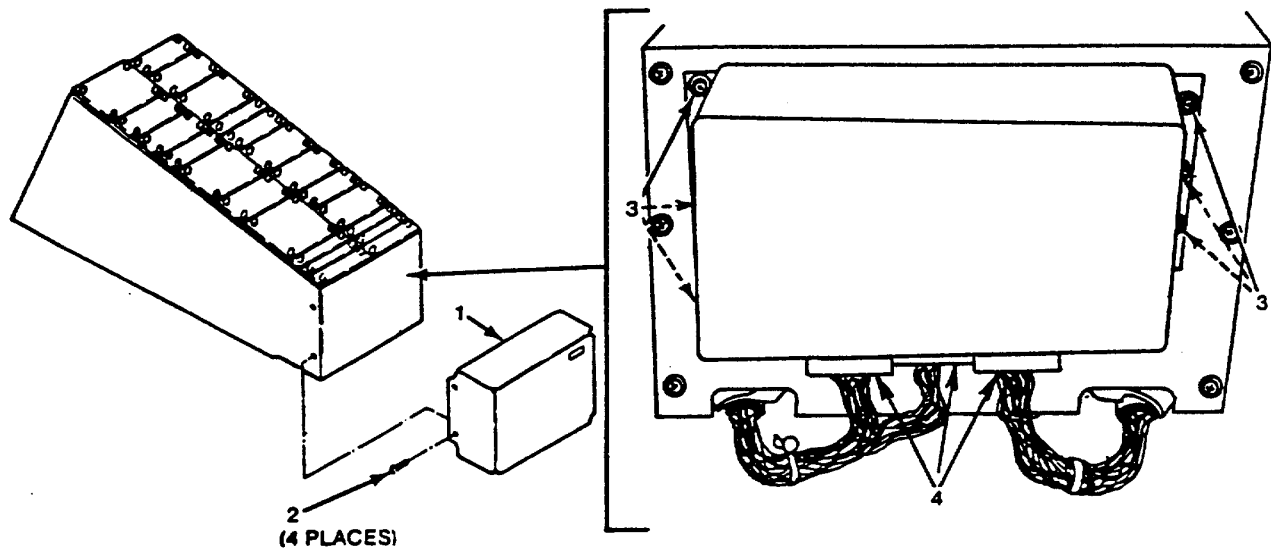
## 14-6.5 Audio Threshold System Assembly



- A Position circuit card assembly (3) on chassis (7) and secure with five screws, lockwashers and flat washers (11).
- B Position J1 (9) into chassis and secure with four screws (6), nuts and washers (8).
- C Position J2 (4) into chassis and secure with four screws (5), nuts and washers (10).
- D Position cover (1) over chassis and secure with five screws (2).



# 14-6A. Audio Threshold System MD-1219/A MAINTENANCE (AVUM)



## 14-6A.1 Removal Instructions.

- A Remove four screws (2) and pull cover (1) from face of pedestal console.
- B Remove six screws (3) and lower MD-1219/A from pedestal console.
- C Disconnect three electrical connectors (4) and remove MD-1219/A.

## 14-6A.2 Installation Instructions.

- A Position MD-1219/A near face of pedestal console and connect three electrical connectors (4).
- B Secure MD-1219/A to pedestal console with six screws (3).
- C Position cover (1) and secure with four screws (2).

### **NOTE**

Refer to FO-37A for Wiring Diagram on C-6533/ARC Intercommunication System with MD-1219/A Audio Threshold System.

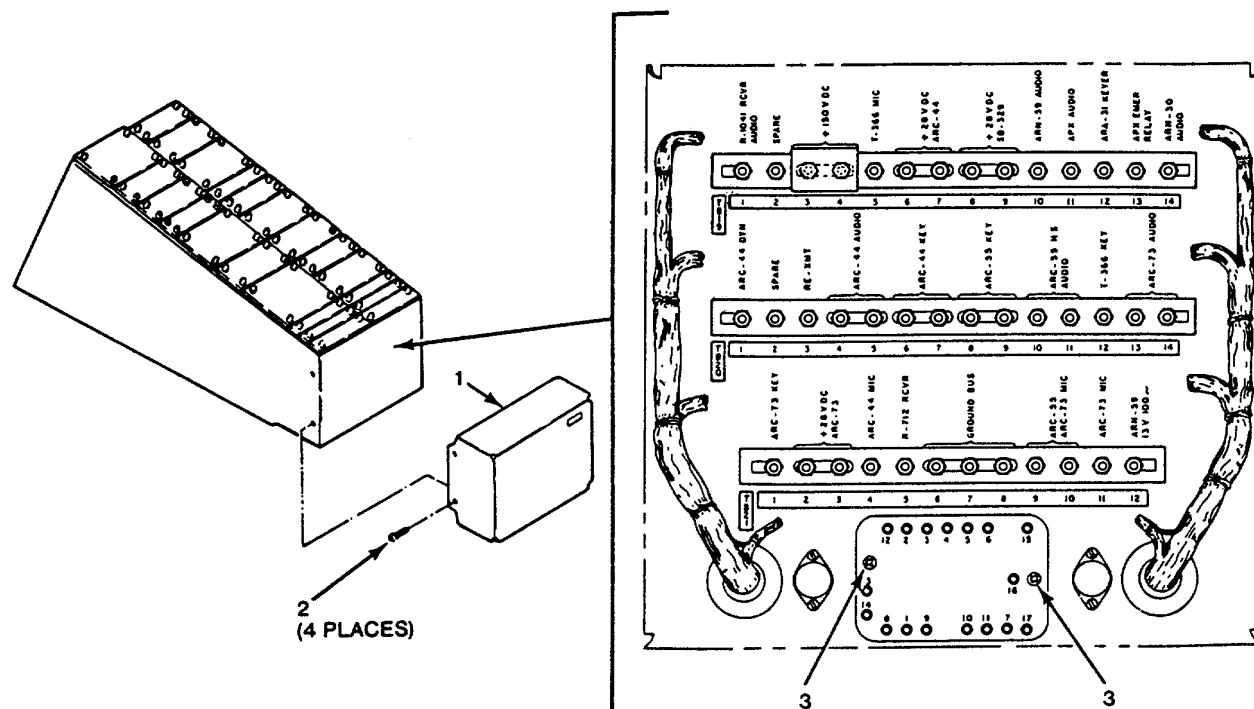


## 14-7. IMPEDANCE MATCHING NETWORK (A16) MAINTENANCE (AVUM)

AVUM maintenance procedures for impedance matching network A16 are covered in the following subparagraphs:

- UH-1 D/H Configurations A and B, subparagraphs 14-7.1 and 14-7.2.
- UH-1 D/H Configurations C through I, subparagraphs 14-7.3 and 14-7.4.
- UH-1 D/H Configuration J and UH-1 H, subparagraphs 14-7.5 and 14-7.6.

### 14-7.1 Removal Instructions, UH-1D/H Configurations A and B.



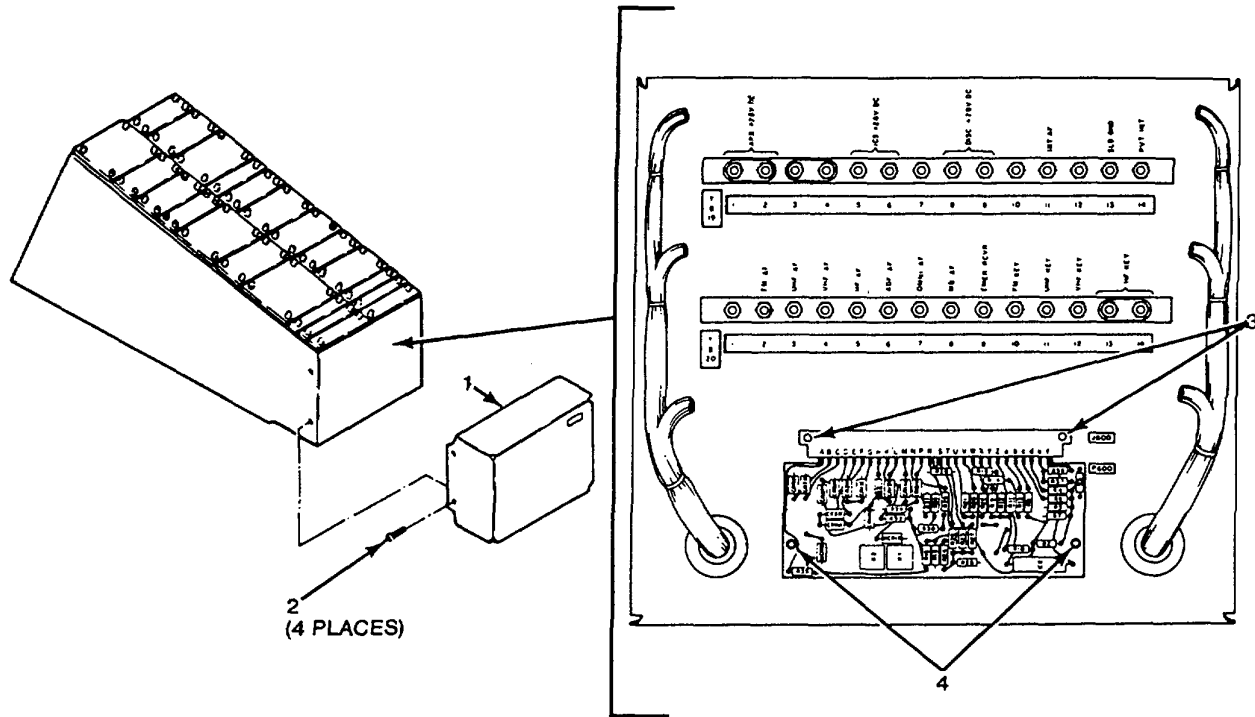
- A Remove four screws (2) and pull cover (1) from pedestal console.
- B Tag then disconnect wiring to impedance matching network.
- C Remove two screws and washers (3) and pull impedance matching network from pedestal console.



### 14-7.2 Installation Instructions, UH-1D/H Configurations A and B.

- A Position impedance matching network on pedestal console and secure with two screws and washers (3).
- B Connect wiring to impedance matching network and remove tags.
- C Position cover (1) and secure with four screws (2).

### 14-7.3 Removal Instructions, UH-1D/H Configurations C through I.



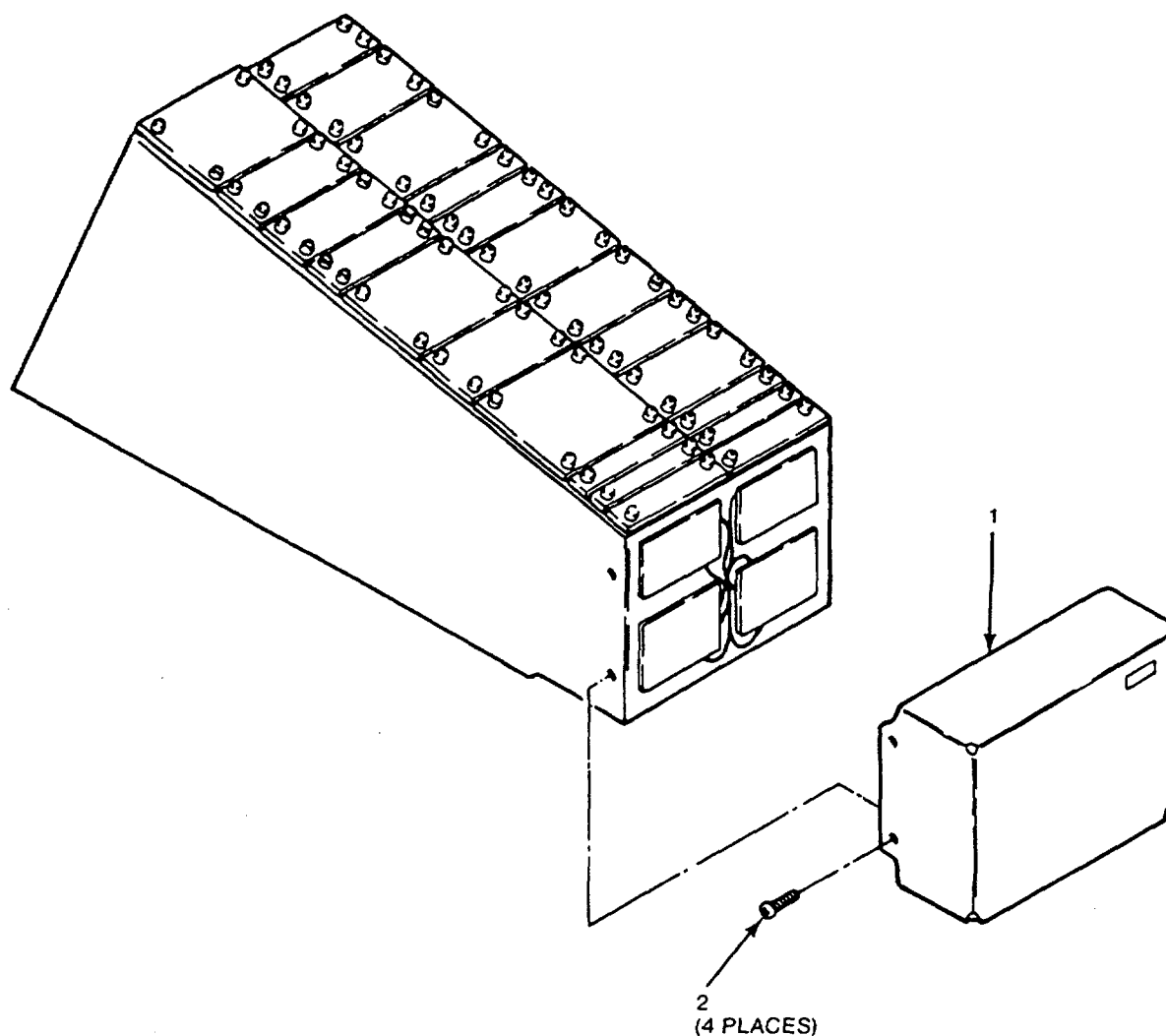
- A Remove four screws (2) and pull cover (1) from pedestal console.
- B Remove two nuts and washers (3) that secure electrical connector to panel.
- C Remove two screws and washers (4) that secure impedance matching network to panel.
- D Carefully separate impedance matching network from electrical connector.

#### 14-7.4 Installation Instructions, UH-1D/H Configurations C through I.

- A Carefully connect electrical connector to impedance matching network.
- B Position electrical connector on panel and secure with two nuts and washers (3).
- C Secure impedance matching network to panel with two screws and washers (4).
- D Position cover (1) and secure to pedestal console with four screws (2).



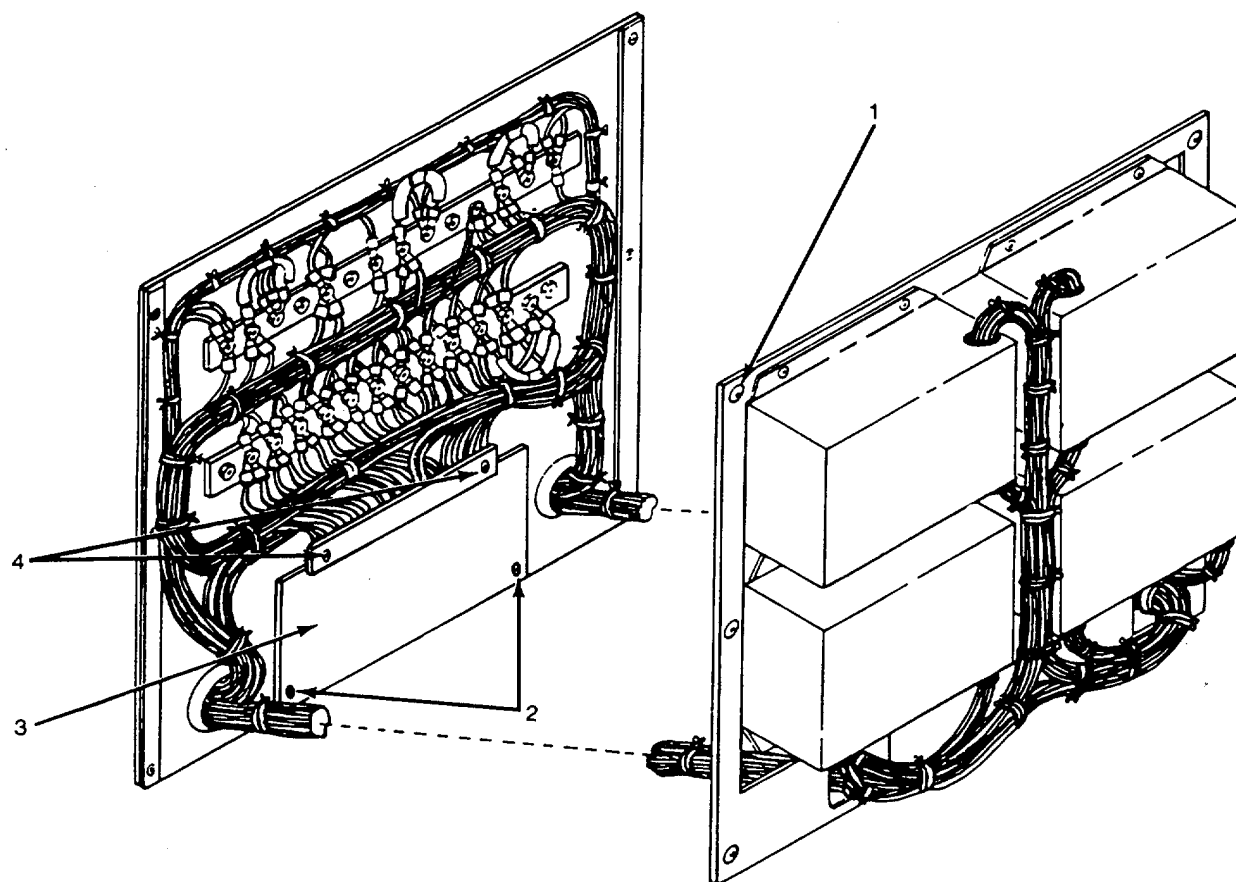
## 14-7.5 Removal Instructions UN-1D/H Configuration J and UH-1H.



- A Remove four screws (2) and pull cover (1) from pedestal console.
- B Remove six screws (1) and pull discriminators or audio threshold unit away from pedestal to gain access to impedance matching network (3).
- C Remove two screws (2) that secure impedance matching network to pedestal console.
- D Remove two screws (4) that secure electrical connector.
- E Carefully disconnect electrical connector and remove impedance matching network.



## 14-7.6 Installation Instructions, UH-1D/H Configuration J and UH-1 H.



- A Connect electrical connector to impedance matching network.
- B Position impedance matching network on pedestal console and replace two screws (4) through electrical connector.
- C Secure impedance matching network to pedestal console with two screws (2).
- D Position discriminators or audio threshold unit against face of pedestal console and secure with six screws (1).
- E Position cover and secure with four screws removed in 14-7.5A above.



**14-8. IMPEDANCE MATCHING NETWORK MAINTENANCE (AVIM)**

- This paragraph covers Aviation Intermediate Maintenance (AVIM) procedures for impedance matching networks on UH-1 series helicopters.
- Different impedance matching networks are used for the different configurations. When replacing parts, make sure to refer to proper parts layout and parts designation charts.
- Maintenance procedures for all impedance matching networks are provided in the chart below.

**INITIAL SETUP:****Tools**

Tool Kit TK-100  
Tool Kit TK-105

**Equipment Conditions**

Impedance matching network removed from  
helicopter.

**Materials/Parts**

Trichlorotrifluoroethane (cleaning solvent)  
Soft bristle brush  
Replacement parts (TM 11-1520-21 0-35P and  
TM 11-1520-21 0-34P-1 )

**General Safety Information**

Volatile and toxic solvent hazard

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**Maintenance Procedures**

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1. Remove dust and dirt from both sides of impedance matching network with soft bristle brush.
2. Inspect for loose connections or cold solder joints. Resolder as required.
3. Inspect for cracks or damage to printed circuit board.
4. Remove damaged or malfunctioning components from circuit card assembly (cca) as follows:
  - A Refer to diagram of FO-36 and locate component.
  - B If necessary attach heat shunt to part lead.
  - C Unsolder and remove part.
5. Install replacement components on cca as follows:

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**WARNING**

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



## 14-8. IMPEDANCE MATCHING NETWORK MAINTENANCE (AVIM)-Continued

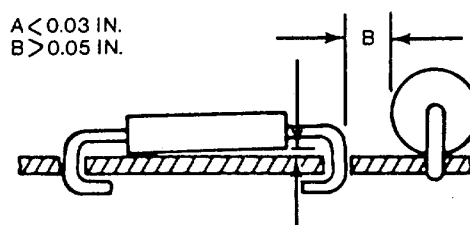
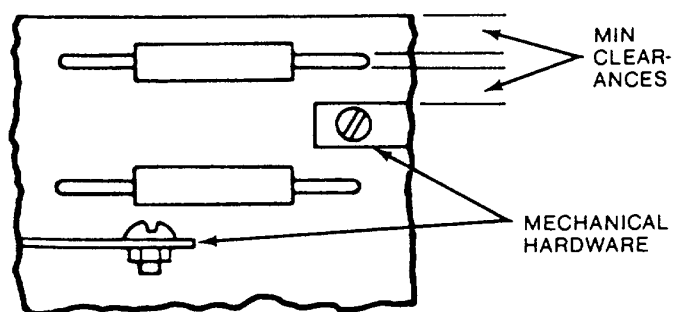
## Maintenance Procedures- Continued

- A Clean mounting holes for replacement component thoroughly with solvent and soft bristle brush.

**NOTE**

If installing a replacement diode, check appropriate parts layout and schematic diagram to ensure proper polarity.

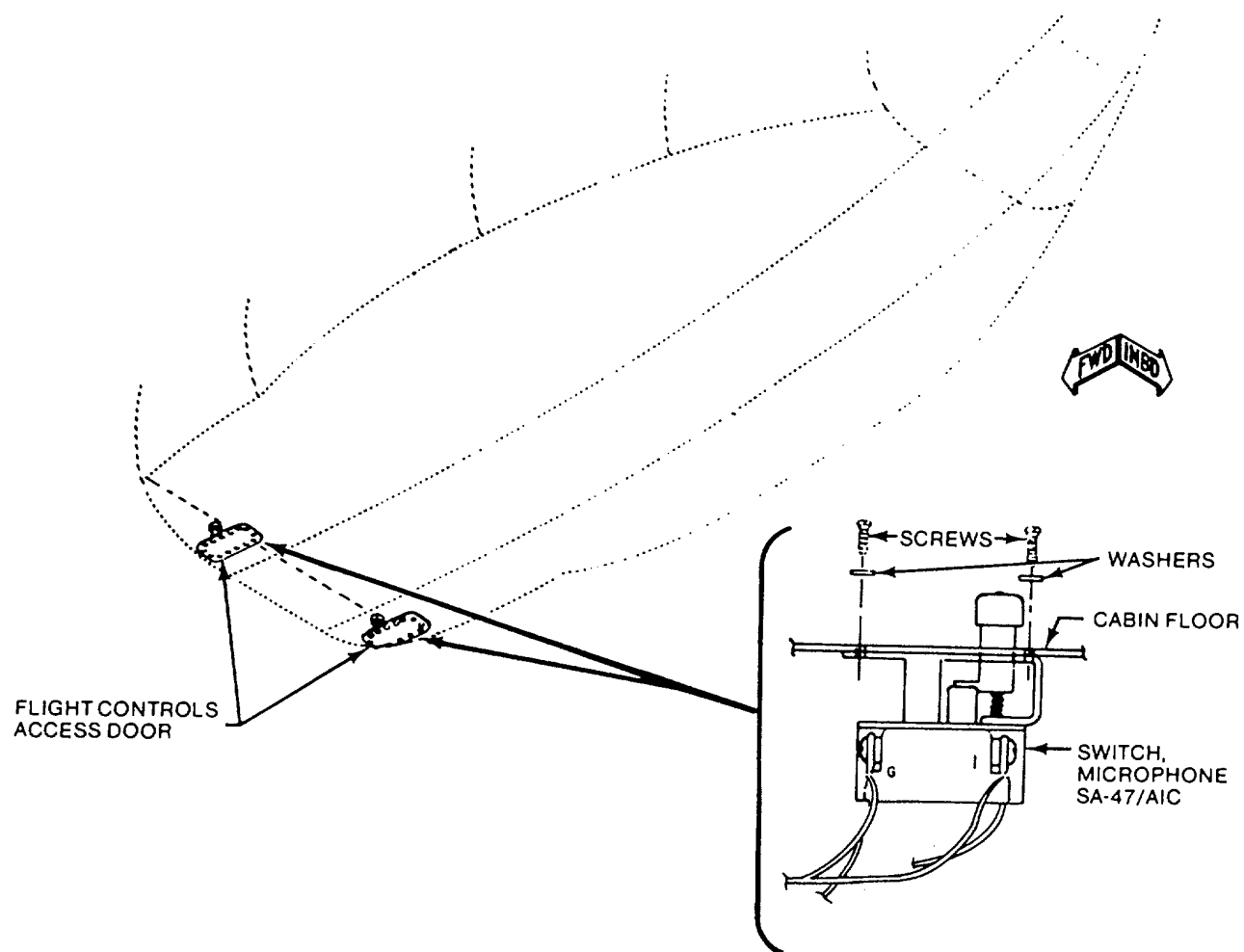
- B Mount and solder replacement part in accordance with mounting criteria below.

**Mounting Criteria:**

- A Part body should have minimum clearance of 0.05 inch from card edge.
- B Part body and leads positioned in line between mounting holes.
- C Part leads should have minimum clearance of 0.05 inch from nearest electrical conducting element or mechanical hardware.
- D Part body should have minimum clearance of 0.03 inch from nearest mechanical hardware.
- E Part leads should not be nicked, flattened or broken.
- F Part should be seated firmly on card. Maximum tilt from card should be 0.03 inch.
- G Part lead should have minimum clearance of 0.05 inch from noninsulated portion of another part when parts are not connected to same electrical junction.



## 14-9. FOOT SWITCH MAINTENANCE (AVUM)



### 14-9.1 Removal Instructions, Pilot or Copilot Foot Switch.

- A From outside helicopter, remove flight control access door by removing screws and pulling access door from helicopter.
- B Tag then disconnect wires connected to foot switch.
- C From inside helicopter, remove two screws and washers that secure switch to cabin floor.
- D Remove switch through flight control access door.



#### 14-9.2 Installation Instructions, Pilot or Copilot Foot Switch.

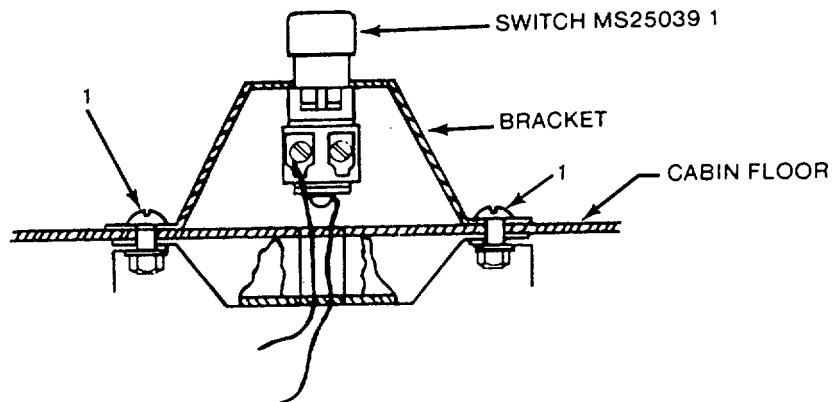
- A Working through flight control access door, connect wires to foot switch terminals and remove tags.

##### NOTE

Two technicians may be required for steps B and C.

- B Insert switch pushbutton through cabin floor and align screw holes on switch assembly with holes in cabin floor.
- C Secure switch to cabin floor with two screws and washers.
- D Replace flight control door and secure with screws removed in 9-5.1 A.

#### 14-9.3 Removal Instructions, Crewmember Foot Switch.

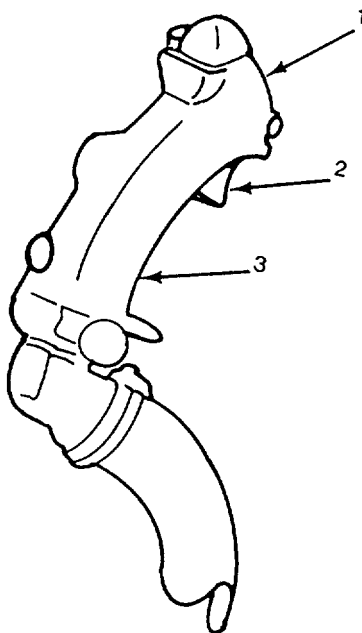


- A Remove two screws and washers (1) that secure bracket to cabin floor.
- B Tag then disconnect wires connected to switch.
- C Remove screws and washers (2) that secure switch to bracket.

#### 14-9.4 Installation Instructions, Crewmember Foot Switch.

- A Connect wires to terminals of switch and remove tags.
- B Position bracket on cabin floor and secure with two screws and washers (1).

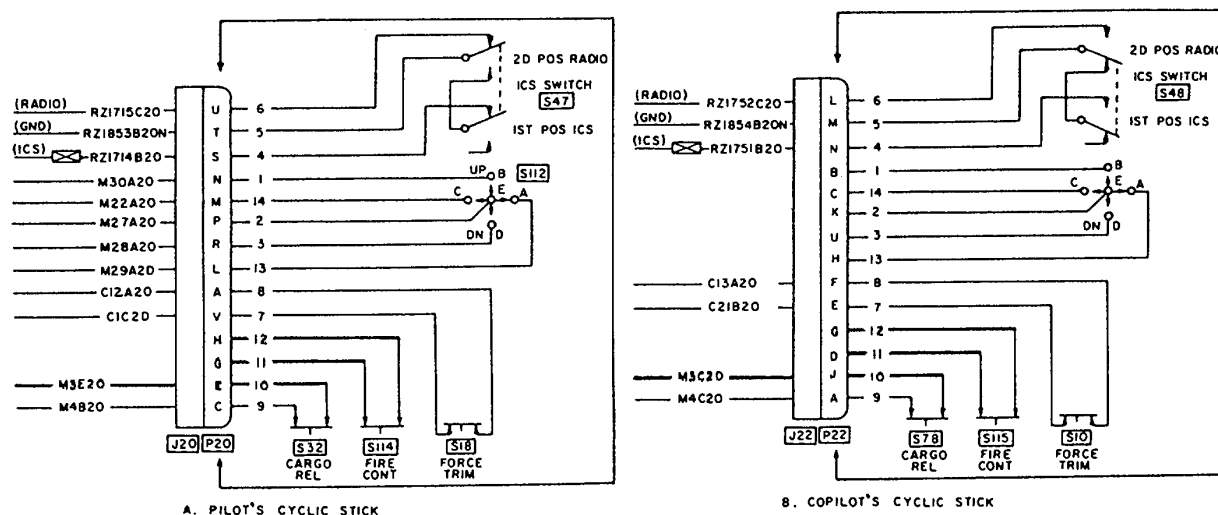


**14-10. CYCLIC STICK SWITCH MAINTENANCE (AVUM)****14-10.1 Removal Instructions.**

- A Remove two screws at top of cyclic stick grip (1).
- B Remove cyclic grip cover (3).
- C Loosen clamps (not shown) at base of stick and slide switch (2) upward.
- D Tag for identification then disconnect wires attached to switch.
- E Remove switch.



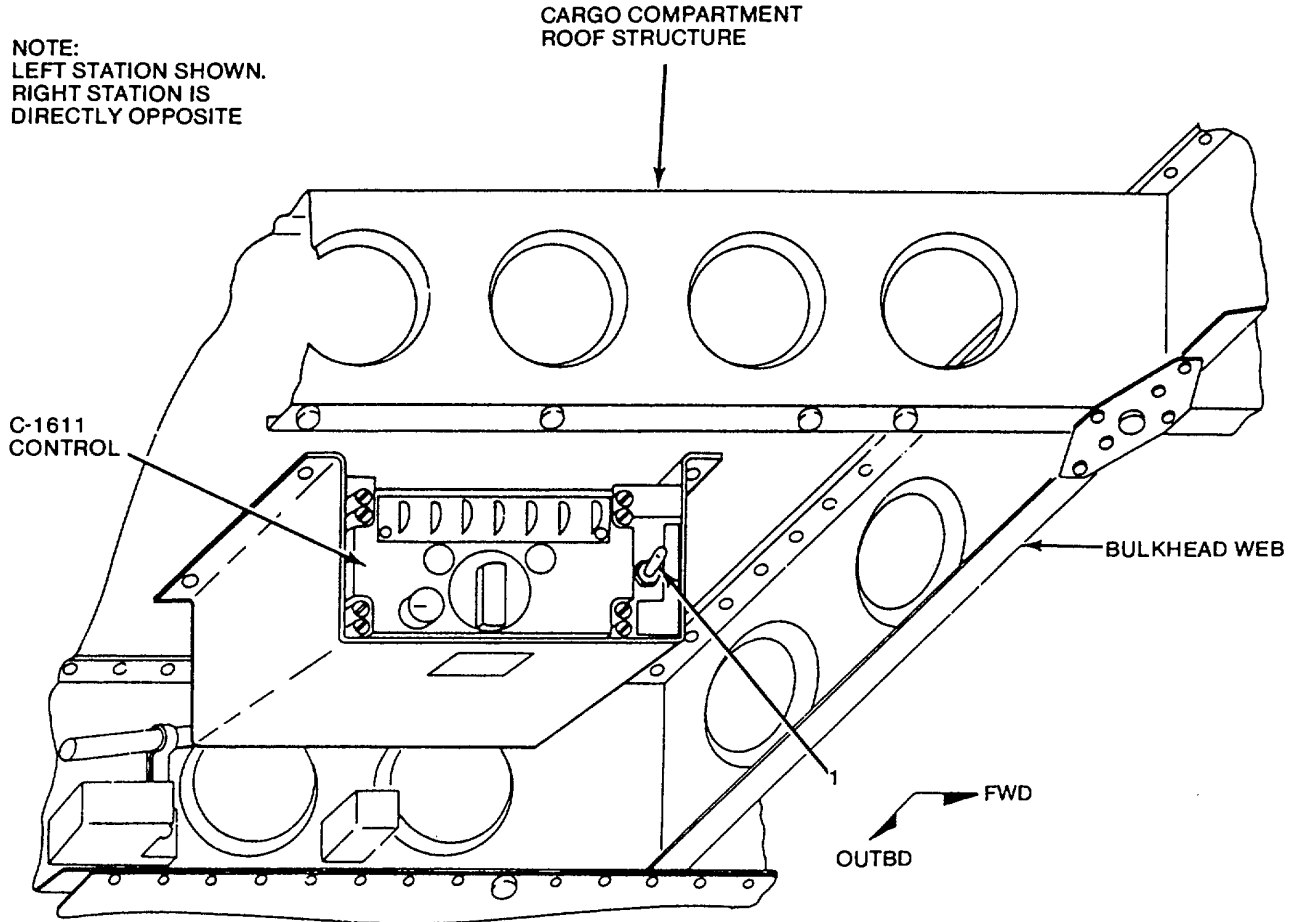
## 14-10.2 Installation Instructions.

**NOTE**

Cargo release switches S32 and S38 are normally open. They are drawn normally closed to show a completed electrical circuit.

- A Connect wires to switch and remove identification tags.
- B Slide switch (2) down into cyclic stick grip.
- C Remove slack from cable assembly and tighten clamps (not shown) at base of cyclic stick grip.
- D Position cyclic stick grip cover (3) on cyclic stick and secure at top with two screws.



**14-11. HOT MIKE SWITCH MAINTENANCE (AVUM)****14-11.1 Removal Instructions.**

- A Remove C-1611/AIC per paragraph 14-2.1.
- B Remove retaining nut and washer (1).
- C Tag then disconnect wires to HOT MIKE switch.
- D Remove hot mike switch.

**14-11.2 Installation Instructions.**

- A Connect wires to switch and remove tags.
- B Insert switch through rear of mounting plate.
- C Secure switch to mount plate with retaining nut and washer (1).
- D Install C-1611/AIC per paragraph 14-2.2.



**14-12. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors, and cabling between them, that may be repaired or replaced by AVUM personnel are listed in the table below. The bottom of the table shows the wiring diagram foldout number.

Connectors in configurations										UH-1H
A	B	C	D	E	F	G	H	I	J	
P301A	P301A	P301A	P301A	P301A	P301A	P301A	P301A	P301A	P301A	J308L
		P301B	P301B	P301B	P301B	P301B	P301B	P301B	P301B	J308R
P301L	P301L	P301L	P301L	P301L	P301L	P301L	P301L	P301L	P301L	J309L
P301R	P301R	P301R	P301R	P301R	P301R	P301R	P301R	P301R	P301R	J309R
P600	P600	J600	J600	J600	J600	J600	J600	J600	J600	J319A
P610	P610									J319B
J610	J610									J600
J308L	J308L	J308L	J308L	J308L	J308L	J308L	J308L	J308L	J308L	P319
J308R	J308R	J308R	J308R	J308R	J308R	J308R	J3308R	J308R	J308R	P600
J330 9	309	J309	J309	J309	J309	J309	330 9	309	J309	P3303
P20	P20	P20	P20	P20	P20	P20	P20	P20	P20	P3304
J20	J20	J20	J20	J20	J20	J20	J20	J20	J20	P3805
P22	P22	P22	P22	P22	P22	P22	P22	P22	P22	J3806
P162	P162	P162	P162	P162	P162					P3810
							P319 J319	P319 J319	P319 J319	
F0-30		F0-31			F0-33				F0-35	F0-37

- Repairs are made by repairing or replacing connectors by splicing individual wires.
- Paragraph 2-5 contains general wiring repair information.

**SECTION II. OPERATIONAL CHECKS****14-13. INTERCOMMUNICATIONS SET OPERATIONAL CHECKS (AVUM)**

- AVUM operational checks of the intercommunications sets listed below are contained in subparagraph 14-13.1:
  - SM-329/AR (Helicopter serial numbers 60-6028 through 62-12372)
  - C-1 611 (\*)/A/C (Helicopter serial numbers 63-8739 through 70-16518)
  - C-6533/ARC (Helicopter serial numbers 70-2000 and subsequent)
- Operational checks of the intercommunications set (all models) involves using. communications and navigation equipment installed on the helicopter for input/output devices. Therefore, the technician performing operational checks must be thoroughly familiar with operation of helicopter electronics equipment.
- If the intercommunications set appears to fail a given check, verify that the equipment used as input/output equipment is operating properly before presuming an intercommunications set fault. For example, if you cannot monitor a radio set from one station, try to monitor the same radio set from another station or by connecting a headset directly to the radio set. Intercom problems should be checked much the same way. For example, if pilot cannot receive intercom transmission from copilot, check if pilot can receive intercom from crewmember station and/or if crewmember station can receive intercom from copilot.
- Initial setup for operational checks on all models of the intercommunications set are identical and listed below.



**14-13. INTERCOMMUNICATIONS SET OPERATIONAL CHECKS (AVUM)-Continued****INITIAL SETUP:****Personnel Required**

Two Technicians (required for intercom checks between cockpit and crew stations only.)

**Equipment Conditions**

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

**14-13.1 INTERCOMMUNICATIONS SET WITH SB-329/AR OR C-1611(\*) OR C-6533/ARC OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**SECTION III. TROUBLESHOOTING****14-14. INTERCOMMUNICATIONS SET TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in the Intercommunication Sets.
- Unless otherwise note, entries in the table apply to all intercommunication set configurations.
- Entries apply to any intercommunication station: if system is present at all stations probable cause is in selected communications or navigation equipment.
- Indications of malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 14-13.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

Cannot transmit on any radio or intercom.

- |   |                        |
|---|------------------------|
| A | Defective microphone   |
| A | Replace microphone     |
| B | Defective control unit |
| B | Replace control unit   |



**14-14. INTERCOMMUNICATIONS SET TROUBLESHOOTING (AVUM)-Continued**

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
No receiver or intercom audio in headset.	A Defective headset.	
	A Replace headset.	
B Defective control unit.		
	B Replace control unit.	
An intercom station can transmit (or receive) on a radio; radio set is good.	A Defective impedance matching network.	
	A Replace impedance matching network.	
B Defective M D-736/A or M D-1047/ARC.		
	B Replace that station M D-736/A or the M D-1047/ARC.	
No intercom station can transmit (or receive) on a radio; radio set is good.	Defective impedance matching network.	
	Replace impedance matching network.	
Pilot (or copilot) unable to transmit using cyclic stick switch, foot switch operation normal.	Defective cyclic stick switch.	
	Replace cyclic stick switch.	
Pilot (or copilot) unable to transmit using foot switch, cyclic stick switch operation normal.	Defective foot switch.	
	Replace foot switch.	
Hot mike operation inoperative.	Defective control unit (C-6533/ARC) or defective switch.	
	Replace C-6533/ARC or HOT MIKE switch as applicable.	

**14-14.1 SB-329/AR Signal and Voltage Measurements (AVUM).**

- If a trouble develops in SB-329/AR (Configurations A and B) and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-30 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon where measurement should be taken.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.



**14-14.1 SB329/AR Signal and Voltage Measurements (AVUM).-Continued**

- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**NOTE**

**Refer to 1 4-14.2 for Intercommunication Set C-1 611 (\*)/AIC or 14.4.3 for Intercommunication Set C-6533/ARC.**

**4-14.1.1 SB-329/AR Signal and Voltage Measurements (AVUM)**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	2	Panel lighting (copilot)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB12	3	Panel lighting (pilot)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB2 TB19	2 8,9	Panel lighting (crew) Filament power	FM and INTERCOM SB-329 circuit breakers energized	0-28 Vdc 28 Vdc
TB19	10	ADF (ARN-59) receiver audio	Intercom and ADF receiver energized, ADF receiving signal	Audio hi
TB19	14	OMNI (ARN-30) receiver audio	Intercom and OMNI receiver energized, OMNI receiving signal	Audio hi
TB19	1	Marker beacon audio	Intercom and marker beacon receiver energized marker beacon receiving signal from ramp test set	Audio hi
TB19	3,4	High voltage	FM and INTERCOM SB-329 circuit breakers energized	150 Vdc
TB20	4 5	No. 1 Radio		

**14-14.2 C-1611 (\*)/AIC Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Intercommunication Set C-1611 (\*)/AIC and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to F0-31, F0-33 and F0-35, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-3.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.



**14-14.2 C-1611(\*)/AIC Signal and Voltage Measurements (AVUM). - Continued**

- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Based on the type of problem and helicopter configuration, refer to one of the subparagraphs listed below for measurement points and values.
  - 14-14.2.1 Pilot Station Failure.
  - 14-14.2.2 Copilot Station Failure.
  - 14-14.2.3 Crew Right Station Failure.
  - 14-14.2.4 Crew Left Station Failure.
  - 14-14.2.5 Partial Failure, Any Station, Configurations C through I.
  - 14-14.2.6 Partial Failure, Any Station, Configuration J.

**14-14.2.1 Pilot Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	2	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB23	3	Microphone audio	INTERCOM PLT & CREW R circuit breaker energized, microphone keyed and sig- nal applied	Audio hi
TB23	2	Headset audio	INTERCOM PLT & CREW R circuit breaker energized, signal from any receiver or intercom present	Audio hi
P301 R	37	Primary power	INTERCOM PLT & CREW R circuit breaker energized	28 Vdc
TB26	4	Ground	Not applicable	0



**14-14.2.2 Copilot Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB22	3	Microphone audio	INTERCOM CPLT & CREW L circuit breaker energized, microphone keyed and signal applied	Audio hi
TB22	2	Headset audio	INTERCOM CPLT & CREW L circuit breaker energized, signal from any receiver or intercom present	Audio hi
P301L	37	Primary power	INTERCOM CPLTN & CREW L circuit breaker energized	28 Vdc
TB26	4	Ground	Not applicable	0

**14-14.2.3 Crew Right Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB2	2	Panel lights	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB52	1	Microphone audio (not installed in configuration J)	INTERCOM PLT & CREW R circuit breaker energized, microphone keyed and signal applied	Audio hi
TB52	5	Headset audio (not installed in configuration J)	INTERCOM PLT & CREW R circuit breaker energized, signal from any receiver or intercom present	Audio
TB52	4	Microphone control (not installed in configuration J)	INTERCOM PLT & CREW R circuit breaker energized	28 Vdc microphone unkeyed, then 0 when microphone is keyed
P301A	37	Primary power	INTERCOM PLT & CREW R circuit breaker energized	28 Vdc
TB26	4	Ground: Check also TB62-13 on configurations C through I	Not applicable	0



**14-14.2.4 Crew Left Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB2	2	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB33	1	Microphone audio (not installed in configuration J)	INTERCOM CPLT & CREW L circuit breaker energized, microphone keyed and signal applied	Audio hi
TB33	5	Headset audio (not installed in configuration J)	INTERCOM CPLT & CREW L circuit breaker energized, signal from any receiver or intercom present	Audio hi
TB33	4	Microphone control (not installed in configuration J)	INTERCOM CPLT & CREW L circuit breaker energized	28 Vdc microphone unkeyed, then 0 when microphone is keyed
P301B	37	Primary power	INTERCOM CPLT & CREW L circuit breaker energized	28 Vdc
TB26	4	Ground: Check also TB62-16	Not applicable	0



### 14-14.2.5 Partial Failure, Any Station, Configurations C Through I Signal and Voltage Measurements (AVUM).

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB20	2	Receiver 1 audio: Check also TB62-6	Radio 1 (ARC-54) energized and receiving signal	Audio hi
TB20	3	Receiver 2 audio: Check also TB62-7	Radio 2 (ARC-51) energized and receiving signal	Audio hi
TB20	4	Receiver 3 audio: Check also TB62-8	Radio 3 (ARC-134) energized and receiving signal	Audio hi
TB20	5	Receiver 4 audio: Check also TB62-5	Radio 4 (ARC-51 #2, ARC-114 or ARC-102) energized and receiving signal	Audio hi
TB20	6	LF ADF audio: Check also TB62-1	ARN-59 or ARN-83 energized and receiving signal	Audio hi
TB20	7	OMNI audio: Check also TB62-2	ARN-30, ARN-82 or ARN-123 energized and receiving signal	Audio hi
TB20	8	Marker beacon audio: Check also TB62-3 (ARN-124 ident audio, UH-1 V)	R-1041 or R-1963 energized and receiving signal from ramp test set	Audio hi
TB20	10	Transmitter 1 key control: Check also TB62-9	Intercom and radio 1 energized, intercom rotary switch set to 1	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	11	Transmitter 2 key control: Check also TB62-10	Intercom and radio 2 energized, intercom rotary switch set to 2	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	12	Transmitter 3 key control: Check also TB62-1 1	Intercom and radio 3 energized, intercom rotary switch set to 3	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	13,14	Transmitter 4 key control: Check also TB63-1 (CREW R) and TB63-8 (CREW L)	Intercom and radio 4 energized, intercom rotary switch set to 4	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB19	10,11	Intercom audio	Intercom energized, any station rotary switch set to INT, microphone keyed and signal applied	Audio hi



**14-14.2.5 Partial Failure, Any Station, Configurations C Through I Signal and Voltage Measurements (AVUM). - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB19	14	Private intercom audio	Intercom energized, any station rotary switch set to PVT, microphone keyed and signal applied	Audio hi
TB19	13	Ground (when MD-736 is installed)	Not applicable	0
TB19	8	Primary power, left MD-736's when installed	LEFT ICS circuit breaker energized	28 Vdc
TB19	9	Primary power, right MD-736's when installed	RIGHT ICS circuit breaker energized	28 Vdc
TB62	12	Crew right foot switch control	INTERCOM PILOT & CREW R circuit breaker energized	28 Vdc, then 0 when crew right foot switch is depressed
TB62	13	Ground	Not applicable	0
TB62	14	Crew right HOT MIC key control	INTERCOM PLT & CREW R circuit breaker energized	28 Vdc, then 0 when crew right HOT MIC switch is set to ON or MOM
TB62	15	Crew left foot switch control	INTERCOM CPLT & CREW L circuit breaker energized	28 Vdc, then 0 when crew left foot switch is depressed
TB62	16	Ground	Not applicable	0
TB62	17	Crew left HOT MIC key control	INTERCOM CPLT & CREW L circuit breaker energized	28 Vdc, then 0 when crew left HOT MIC switch is set to ON or MOM
TB63	1	Crew right transmitter 4 key control (to TB20-14)	Intercom and radio 4 energized, intercom rotary switch set to 4	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	2	Crew right PVT intercom audio (to TB19-14)	Intercom energized, any station rotary switch set to PVT, microphone keyed and signal applied	Audio hi



**14-14.2.5 Partial Failure, Any Station, Configurations C Through I Signal and Voltage Measurements (AVUM). - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB63	3	Crew right intercom audio (to TB19-11)	Intercom energized, any station rotary switch set to INT, microphone keyed and signal applied	Audio hi
TB63	4	Crew right intercom key control	Intercom energized, crew right rotary switch set to PVT or INT	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	5	Crew right HOT MIC key control	Intercom energized, crew right rotary switch set to PVT or INT	28 Vdc, then 0 when crew right HOT MIC switch is set to ON or MOM
TB63	6	Crew right talk amplifier control	Intercom energized, microphone keyed or HOT MIC switch closed	0 (ground)
TB63	7	Transmitter control in	Intercom energized, crew right foot switch depressed	0 (ground)
TB63	8	Crew left transmitter 4 key control (to TB2D-14)	Intercom and radio 4 energized, intercom rotary switch set to 4	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	9	Crew left PVT intercom audio (to TB19-14)	Intercom energized, any station rotary switch set to PVT, microphone keyed and signal applied	Audio hi
TB63	10	Crew left intercom audio (to TB19-11)	Intercom energized, any station rotary switch set to INT, microphone keyed and signal applied	Audio hi
TB63	11	Crew left intercom key control	Intercom energized, crew left rotary switch set to PVT or INT	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	12	Crew left HOT MIC key control	Intercom energized, crew left rotary switch set to PVT or INT	28 Vdc, then 0 when crew left HOT MIC switch is set to ON or MOM
TB63	13	Crew left talk amplifier control	Intercom energized, microphone keyed or HOT MIC switch closed	0 (ground)



**14-14.2.5 Partial Failure, Any Station, Configurations C Through I Signal and Voltage Measurements (AVUM). - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB63	14	Transmit control in	Intercom energized, crew left foot switch depressed	0 (ground)
TB63	15	Crew left transmitter 3 key control (configurations F through I only)	Intercom and radio 3 energized, intercom rotary switch set to 3	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	16	Crew left transmitter 2 key control (configurations F through I only)	Intercom and radio 2 energized, intercom rotary switch set to 2	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB64	1	Crew right transmitter 1 audio	Intercom and radio 1 energized, intercom rotary switch set to 1, microphone keyed and signal applied	Audio hi
TB64	2	Crew right transmitter 2 audio	Intercom and radio 2 energized, intercom rotary switch set to 2, microphone keyed and signal applied	Audio hi
TB64	3	Shields	Not applicable	0
TB64	4	Crew right transmitter 3 audio	Intercom and radio 3 energized, intercom rotary switch set to 3, microphone keyed and signal applied	Audio hi
TB64	5	Crew right transmitter 4 audio	Intercom and radio 4 energized, intercom rotary switch set to 4, microphone keyed and signal applied	Audio hi
TB64	6, 7	Audio common	Not applicable	0
TB64	8	Crew left transmitter 1 audio	Intercom and radio 1 energized, intercom rotary switch set to 1, microphone keyed and signal applied	Audio hi
TB64	9	Crew left transmitter 2 audio	Intercom and radio 2 energized, intercom rotary switch set to 2, microphone keyed and signal applied	Audio hi



#### 14-14.2.5 Partial Failure, Any Station, Configurations C Through I Signal and Voltage Measurements (AVUM). - Continued

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB64	10	Crew left transmitter 3 audio	Intercom and radio 3 energized, intercom rotary switch set to 3, microphone keyed and signal applied	Audio hi
TB64	11	Crew left transmitter 4 audio	Intercom and radio 4 energized, intercom rotary switch set to 4, microphone keyed and signal applied	Audio hi
TB64	12	Shields	Not applicable	0

#### 14-14.2.6 Partial Failure, Any Station, Configuration J Signal and Voltage Measurements (AVUM).

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB20	1, 2	Receiver 1 audio: Check also TB62-6 (pilot and copilot) and TB62-18 (crew)	Radio 1 (ARC-54) energized and receiving signal	Audio hi
TB20	3	Receiver 2 audio: Check also TB62-7	Radio 2 (ARC-51) energized and receiving signal	Audio hi
TB20	4	Receiver 3 audio: Check also TB62-8	Radio 3 (ARC-1 34) energized and receiving signal	Audio hi
TB20	5	Receiver 4 audio: Check also TB62-5	Radio 4 (ARC-51 #2, ARC-114 or ARC-102) energized and receiving signal	Audio hi
TB20	6	LF ADF audio: Check also TB62-1	ARN-59 or ARN-83 energized and receiving signal	Audio hi
TB20	7	OMNI audio: Check also TB62-2	ARN-30, ARN-82 or ARN-123 energized and receiving signal	Audio hi
TB20	8	Marker beacon audio: Check also TB62-3 (ARN-124 ident audio, UH-1 V)	R-1041 or R-1963 energized and receiving signal from ramp test set	Audio hi
TB20	10	Transmitter 1 key control: Check also TB62-9	Intercom and radio 1 energized, intercom rotary switch set to 1	28 Vdc microphone unkeyed, then 0 when microphone is keyed



**14-14.2.6 Partial Failure, Any Station, Configuration J Signal and Voltage Measurements (AVUM). - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB20	11	Transmitter 2 key control: Check also TB62-10	Intercom and radio 2 energized, intercom rotary switch set to 2	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	12	Transmitter 3 key control: Check also TB62-11	Intercom and radio 3 energized, intercom rotary switch set to 3	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB20	13, 14	Transmitter 4 key control terminal 1 3 used for pilot and copilot, 14 used for crew	Intercom and radio 4 energized, intercom rotary switch set to 4	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB19	11	Intercom audio	Intercom energized, any station rotary switch set to INT, microphone keyed and signal applied	Audio hi
TB19	14	Private intercom audio	Intercom energized, any station rotary switch set to PVT, microphone keyed and signal applied	Audio hi
TB19	13	Ground	Not applicable	0
TB19	8	Primary power	LEFT ICS circuit breaker energized	28 Vdc
TB19	9	Primary power	RIGHT ICS circuit breaker energized	28 Vdc
TB62	12	Crew right foot switch control	INTERCOM PILOT& CREW R circuit breaker energized	28 Vdc, then 0 when crew right foot switch is depressed
TB62	13	Ground	Not applicable	0
TB62	14	Crew right HOT MIC key control	INTERCOM PLT& CREW R circuit breaker energized	28 Vdc, then 0 when crew right HOT MIC switch is set to ON or MOM
TB62	15	Crew left foot switch control	INTERCOM CPLT & CREW L circuit breaker energized	28 Vdc, then 0 when crew left foot switch is depressed
TB62	16	Ground	Not applicable	0
TB62	17	Crew left HOT MIC key control	INTERCOM CPLT& CREW L circuit breaker energized	28 Vdc, then 0 when crew left HOT MIC switch is set to ON or MOM



**14-14.2.6 Partial Failure, Any Station, Configuration J Signal and Voltage Measurements (AVUM]. - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB63	1	Crew right transmitter 4 key control	Intercom and radio 4 energized, intercom rotary switch set to 4	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	2	Crew right PVT intercom audio	Intercom energized, any station rotary switch set to PVT, microphone keyed and signal applied	Audio hi
TB63	3	Crew right intercom audio	Intercom energized, any station rotary switch set to 4, microphone keyed and signal applied	Audio hi
TB63	4	Crew right intercom key control	Intercom energized, crew right rotary switch set to PVT or INT	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	5	Crew right HOT MIC key control	Intercom energized, crew right rotary switch set to PVT or INT	28 Vdc, then 0 when crew right HOT MIC switch is set to ON or MOM
TB63	6	Crew right talk amplifier control	Intercom energized, microphone keyed or HOT MIC switch closed	0 (ground)
TB63	7	Audio common	Not applicable	0
TB63	8	Crew right transmitter control in	Intercom energized, crew right microphone keyed or HOT MIC switch closed	0 (ground)
TB63	9	Shields	Not applicable	0
TB63	10	Crew right transmitter 1 audio	Intercom and radio 1 energized, intercom rotary switch set to 1, microphone keyed and signal applied	Audio hi
TB63	11	Crew right transmitter 2 audio	Intercom and radio 2 energized, intercom rotary switch set to 2, microphone keyed and signal applied	Audio hi
TB63	12	Crew right transmitter 3 audio	Intercom and radio 3 energized, intercom rotary switch set to 3, microphone keyed and signal applied	Audio hi



**14-14.2.6 Partial Failure, Any Station, Configuration J Signal and Voltage Measurements (AVUM). - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB63	13	Crew right transmitter 4 audio	Intercom and radio 4 energized, intercom rotary switch set to 4, microphone keyed and signal applied	Audio hi
TB63	14	Crew left transmitter 4 key control	Intercom and radio 4 energized, intercom rotary switch set to 4	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	15	Crew left transmitter 3 key control	Intercom and radio 3 energized, intercom rotary switch set to 3	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB63	16	Crew left transmitter 2 key control	Intercom and radio 2 energized, intercom rotary switch set to 2	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB64	1	Crew left PVT intercom audio	Intercom energized, any station rotary switch set to PVT, microphone keyed and signal applied	Audio hi
TB64	2	Crew left intercom key control	Intercom energized, crew left rotary switch set to PVT or INT	28 Vdc microphone unkeyed, then 0 when microphone is keyed
TB64	3	Crew left transmitter control in	Intercom energized, crew left microphone keyed or HOT MIC switch closed	0 (ground)
TB64	4	Crew left HOT MIC key control	Intercom energized, crew left rotary switch set to PVT or INT	28 Vdc, then 0 when crew left HOT MIC switch is set to ON or MOM
TB64	5	Crew left talk amplifier control	Intercom energized, microphone keyed or HOT MIC switch closed	0 (ground)
TB64	6	Crew left transmitter 1 audio	Intercom and radio 1 energized, intercom rotary switch set to 1, microphone keyed and signal applied	Audio hi
TB64	7	Crew left transmitter 2 audio	Intercom and radio 2 energized, intercom rotary switch set to 2, microphone keyed and signal applied	Audio hi



### 14-14.2.6 Partial Failure, Any Station, Configuration J Signal and Voltage Measurements (AVUM). - Continued

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB64	8	Crew left transmitter 3 audio	Intercom and radio 3 energized, intercom rotary switch set to 3, microphone keyed and signal applied	Audio hi
TB64	9	Crew left transmitter 4 audio	Intercom and radio 4 energized, intercom rotary switch set to 4, microphone keyed and signal applied	Audio hi
TB64	10	Shields	Not applicable	0

### 14-14.3 C-6533/ARC Signal and Voltage Measurements (AVUM).

- If a trouble develops in Intercommunication Set C-6533/ARC and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-37 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement. The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Based on the type of problem, refer to the appropriate subparagraph below for measurement points and values.
  - 14-14.3.1 Pilot Station Failure.
  - 14-14.3.2 Copilot Station Failure.
  - 14-14.3.3 Crew Right Station Failure.
  - 14-14.3.4 Crew Left Station Failure.
  - 14-14.3.5 Partial Failure, Any Station.



**14-14.3.1 Pilot Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	2	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB23	2	Handset audio	Intercom energized and audio supplied by any receiver or another intercom station	Audio hi
TB23	3	Microphone audio	Intercom energized, microphone keyed and signal applied	Audio hi
P3810	S	Primary power	INTERCOM PLT & CREW R circuit breaker energized	28 Vdc
TB66	6	Ground	Not applicable	0
TB20	14	Intercom audio	Intercom energized and another station transmitting intercom (ICS)	Audio hi

**14-14.3.2 Copilot Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	2	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB22	2	Headset audio	Intercom energized and audio supplied by any receiver or another intercom station	Audio hi
TB22	3	Microphone audio	Intercom energized, microphone keyed and signal applied	Audio hi
P3810	S	Primary power	INTERCOM C PLT & CREW L circuit breaker energized	28 V
TB66	6	Ground	Not applicable	0
TB20	14	Intercom audio	Intercom energized and another station transmitting intercom (ICS)	Audio hi



**14-14.3.3 Crew Left Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB70	3: F, G, H	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
P3805	S	Primary power	INTERCOM CPLT & CREW L circuit breaker energized	28 Vdc
P3805	M	Ground	Not applicable	0
TB70	7: D, E, J	Microphone transmit control: check also TB62-6	INTERCOM CPLT & CREW L circuit breaker energized	28 Vdc, then 0 when foot switch depressed or microphone keyed

**14-14.3.4 Crew Right Station Failure Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB70	3: F, G, H	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
P3806	S	Primary power	INTERCOM PLT & CREW R circuit breaker energized	28 Vdc
P3806	M	Ground	Not applicable	0
TB70	3: D, E, J	Microphone transmit control: check also TB62-3	INTERCOM PLT & CREW R circuit breaker energized	28 Vdc, then 0 when foot switch depressed or microphone keyed

**14-14.3.5 Partial Failure, Any Station Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	2	Panel lighting: check also at TB64-14 and TB70, section 3-F, G, H	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	14	Intercom audio: check also at TB64-7 and TB70, section 2-F, G, H	Intercom energized and another station transmitting intercom (ICS)	Audio hi
TB20	4	No. 1 radio (ARC-54) transmit audio: check also at TB64-2 and TB70; section 1-A, B, C	Intercom and No. 1 radio energized, intercom rotary switch set to 1, microphone keyed and signal applied	Audio hi
TB20	2	No. 2 radio (ARC-51) transmit audio: check also at TB64-3 and TB70; section 1-D, E, J	Intercom and No. 2 radio energized, intercom rotary switch set to 2, microphone keyed and signal applied	Audio hi



**14-14.3.5 Partial Failure, Any Station Signal and Voltage Measurements (AVUM). - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB20	5	No. 3 radio (ARC-115) transmit audio: check also at TB64-4 and TB70; section 1-F, G, H	Intercom and No. 3 radio energized, intercom rotary switch set to 3, microphone keyed and signal applied	Audio hi
TB20	6	No. 4 radio (ARC-102) transmit audio: check also at TB64-5 and TB70; section 2-A, B, C	Intercom and No. 4 radio energized, intercom rotary switch set to 4, microphone keyed and signal applied	Audio hi
TB20	7	No. 5 radio (ARC-114) transmit audio: check also at TB64-6 and TB70; section 2-D, E, J	Intercom and No. 5 radio energized, intercom rotary switch set to 5, microphone keyed and signal applied	Audio hi
TB20	3	No. 2 radio (ARC-51) receive audio: check also TB63-2 and TB70; section 5-A, B, C	Intercom and No. 2 radio energized: No. 2 radio receiving signal	Audio hi
TB20	10	No. 3 radio (ARC-115) receive audio: check also TB63-3 and TB70; section 5-D, E, J	Intercom and No. 3 radio energized, No. 3 radio receiving signal	Audio hi
TB20	11	No. 4 radio (ARC-102) receive audio: check also TB63-4 and TB70; section 5-F, G, H	Intercom and No. 4 radio energized, No. 4 radio receiving signal	Audio hi
TB20	12	No. 5 radio (ARC-114) receive audio: check also TB63-5 and TB70; section 6-A, B, C	Intercom and No. 5 radio energized, No. 5 radio receiving signal	Audio hi
TB20	8	Marker beacon receiver audio: check also TB63-9 and TB70, section 7-F, G, H	Intercom and marker beacon receiver energized, marker beacon signal received	Audio hi
TB20	9	IFF audio: check also TB63-8 and TB70, section 7-A, B, C	Intercom and IFF set energized, IFF receiving signal from ramp test set	Audio hi
TB19	3	ADF (ARN-83) receiver audio: check also TB63-7 and TB70, section 6-F, G, H	Intercom and ADF energized, ADF receiving signal	Audio hi



**14-14.3.5 Partial Failure, Any Station Signal and Voltage Measurements (AVUM). - Continued**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB19	7	VOR (ARN-82) receiver audio: check also TB63-6 and TB70, section 6-D, E, J	Intercom and VOR energized, VOR receiving signal	Audio hi
TB19	4	No. 1 radio (ARC-54) transmit key control: check also TB64-8 and TB70, section 3-A, B, C	Intercom and No. 1 radio energized, intercom rotary switch set to 1	28 Vdc, microphone unkeyed, then 0 when microphone is keyed

**14-14.3.6 C-6533/ARC Intercom System Grounds.**

Poor or missing ground connections can cause a variety of problems in the intercom system. These problems may affect one or all intercom positions and one or all interconnected radios. Check for good connections to ground at the following points:

TB22-5	TB19-6	TB70, Section 4:
TB23-5	TB26-1, 2, 3	Terminals C, D, E, H, J, K
TB20-1	TB64-1	TB70, Section 8:
TB66-1, 2, 3, 6, 7, 9	TB63-10	Terminals A through K

**14-15. AUDIO THRESHOLD SYSTEM TROUBLESHOOTING (AVIM)**

- To decrease troubleshooting time, audio threshold system has been divided into two functional sections.
- One section deals with audio circuits, the other with control circuits.
- Testing and troubleshooting of each section is divided into power off checks and power on checks.
- Power off checks consist of visual inspection and resistance checks.
- Power on checks consist of injecting audio or control signals and checking specified results.
- All testing and troubleshooting by AVIM personnel is done with audio threshold system removed from helicopter.
- If symptoms reported by AVUM personnel indicate a particular function or facility, test that circuit first, otherwise proceed in order listed.

**14-15.1 Visual Inspection.**

Perform visual inspections from table below.

Step No.	Test procedure	Performance standard
1.	Inspect for mechanical condition and absence of dirt and foreign material.	No physical damage, dirt, or foreign material.
2.	Inspect electrical connector for burnt, broken, or bent pins and foreign material.	All connector pins clean and straight and no dirt or foreign material



**14-15.2 Audio Circuits Power Off Checks.**

- Perform resistance checks listed in table below. Pins refer to J1.
- Set up multimeter to measure resistance. Select a scale that will provide near midscale indications.
- If any item does not meet performance standard, replace or repair that item (para. 14-6).

Step No.	From Pin	To Pin	Performance standard	Item checked	Facility
1	B	F	0 ohms	Printed Wiring	ARC-51
2	B	A	infinity	Not Shorted	ARC-51
3	U	A	600 ohms	T1 Winding	ARC-51
4	U	Y	0 ohms	Printed Wiring	ARC-51
5	U	E	600 ohms	T2 Winding	ARC-51
6	H	D	0 ohms	Printed Wiring	ARC-115
7	H	G	infinity	Not Shorted	ARC-115
8	Z	G	600 ohms	T3 Winding	ARC-115
9	Z	W	0 ohms	Printed Wiring	ARC-115
10	Z	C	600 ohms	T4 Winding	ARC-115
11	K	P	0 ohms	Printed Wiring	ARC-102
12	K	J	infinity	Not Shorted	ARC-102
13	a	J	600 ohms	T5 Winding	ARC-102
14	a	c	0 ohms	Printed Wiring	ARC-102
15	a	N	600 ohms	T6 Winding	ARC-102
16	S	M	0 ohms	Printed Wiring	ARC-114
17	S	R	infinity	Not Shorted	ARC-114
18	e	R	600 ohms	T7 Winding	ARC-114
19	e	b	0 ohms	Printed Wiring	ARC-114
20	e	L	600 ohms	T8 Winding	ARC-114



### 14-15.3 Audio Circuits Power On Checks.

#### INITIAL SETUP

##### Test Equipment

Audio Oscillator (NSN 6625-00-678-5616)  
Oscilloscope AN/USM-488  
Multimeter AN/USM-486

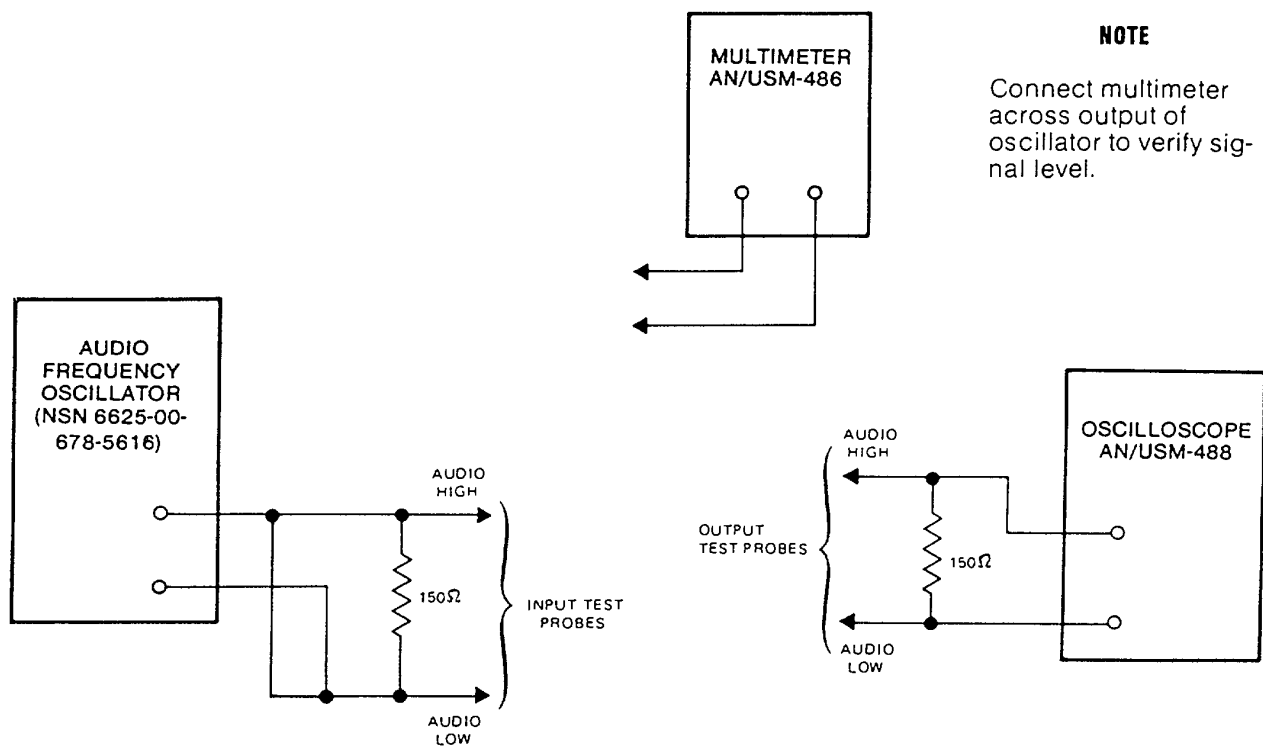
##### Tools

Tool Kit TK-100

##### Materials

Resistors, 1 50 Ohms (2 required)

Set up test equipment as shown.



##### **NOTE**

Connect multimeter across output of oscillator to verify signal level.

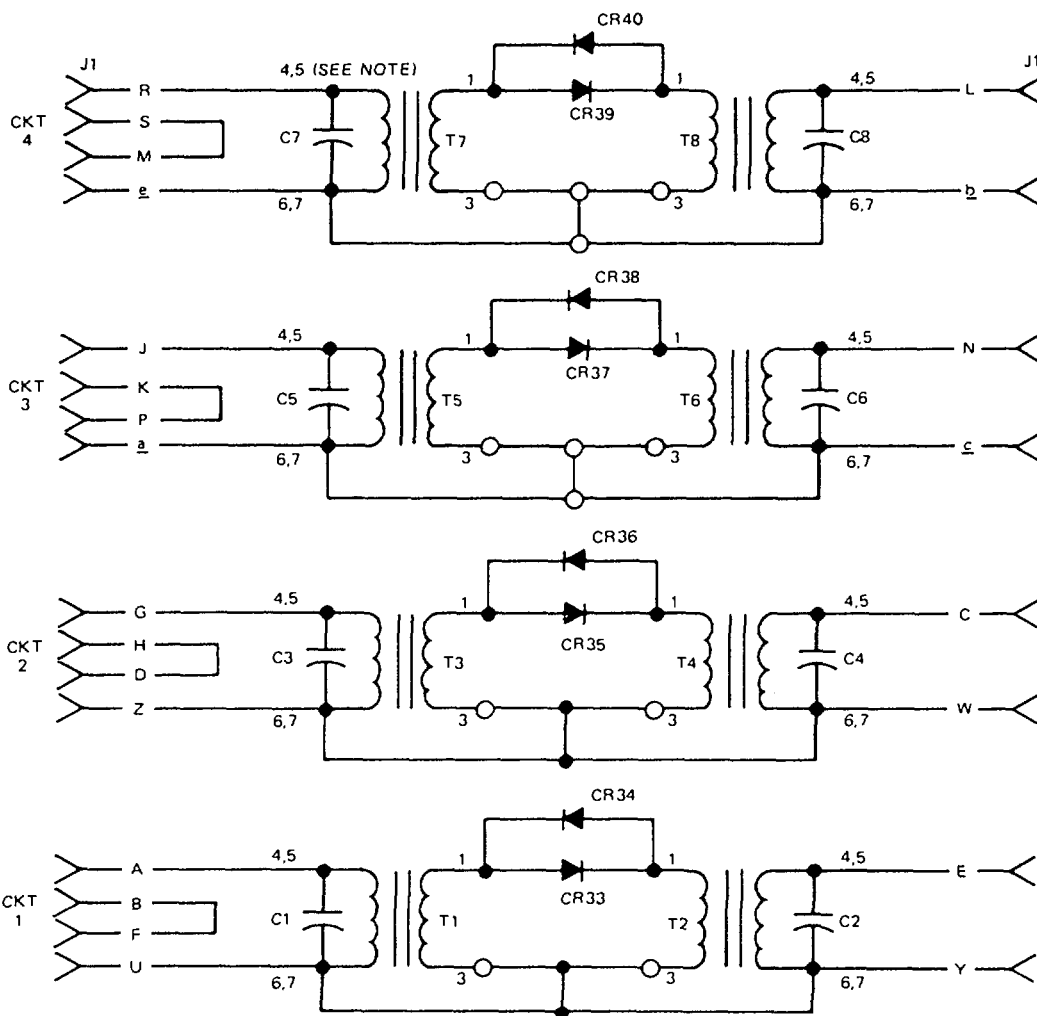
- Connect test equipment as stated in instruction column. If normal indications are not obtained, refer to troubleshooting table.
- If problem reported by AVUM personnel indicates a particular circuit, perform those tests first, otherwise proceed in order listed.
- Refer to schematic diagram (below) of audio circuits while performing tests.



## 14-15.3 Audio Circuits Power On Checks. - Continued

## NOTE

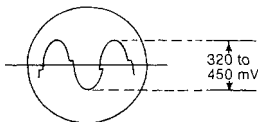
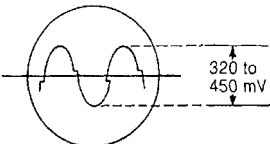
4, 5, 6, 7 indicates that the respective terminals are bussed.



Step	Test procedure	Normal indication
<b>CIRCUIT 1 TESTS</b>		
1.	Connect audio oscillator to J1 -A (high) and J1 - U (low). Adjust oscillator for output of 1000 Hz at 300 millivolts.	None.  <b>NOTE</b> Verify signal level with multimeter.

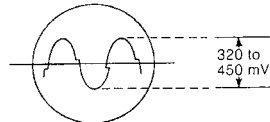


## 14-15.3 Audio Circuits Power On Checks. - Continued

Step	Test procedure	Normal indication
	<b>CIRCUIT 1 TESTS - Continued</b>	
2.	Connect oscilloscope to output J1-E (high) and J1 -Y (low).  <b>NOTE</b>  If peak-to-peak voltage on oscilloscope is marginal, connect multimeter and check for 120 to 160 millivolts rms.	Oscilloscope presentation as shown  
3.	Adjust output of audio oscillator to 10 millivolts.	Peak-to-peak voltage on oscilloscope drops
4.	Reset output of audio oscillator to 300 millivolts.	None
5.	Move oscilloscope leads to check output of circuit 2: J1 -C (high) and J1 -W (low).	Peak-to-peak voltage less than 5 millivolts.
6.	Check output of circuit 2: J1 -N (high) and J1 -C (low).	Peak-to-peak voltage less than 5 millivolts.
7.	Check output of circuit 4: J1 -L (high) and J1-B (low).	Peak-to-peak voltage less than 5 millivolts.
	<b>CIRCUIT 2 TESTS</b>	
8.	Connect audio oscillator to J1-G (high) and J1 -Z (low). Adjust oscillator for output of 1000 Hz at 300 millivolts.	None.  <b>NOTE</b>  Verify signal level with multimeter.
9.	Connect oscilloscope to output J1-C (high) and J1-W (low).  <b>NOTE</b>  If peak-to-peak voltage on oscilloscope is marginal, connect multimeter and check for 120 to 160 millivolts rms.	Oscilloscope presentation as shown  
10.	Adjust output of audio oscillator to 10 millivolts.	Peak-to-peak voltage on oscilloscope drops to less than 5 millivolts
11.	Reset output of audio oscillator to 300 millivolts.	None.

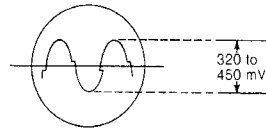


## 14-15.3 Audio Circuits Power On Checks. - Continued

Step	Test procedure	Normal indication
	<b>CIRCUIT 2 TESTS - Continued</b>	
12.	Move oscilloscope leads to check output of circuit 1: J1-E (high) and J1-Y (low).	Peak-to-peak voltage less than 5 millivolts.
13.	Check output of circuit 3: J1-N (high) and J1-C (low).	Peak-to-peak voltage less than 5 millivolts.
14.	Check output of circuit 4: J1-L (high) and J1-B (low).	Peak-to-peak voltage less than 5 millivolts.
	<b>CIRCUIT 3 TESTS</b>	
15.	Connect audio oscillator to J1-J (high) and J1-A (low). Adjust oscillator for output of 1000 Hz at 300 millivolts.	None
		<b>NOTE</b> Verify signal level with multimeter.
16.	Connect oscilloscope to output J1-N (high) and J1-C (low).	Oscilloscope presentation as shown.
	<b>NOTE</b>  If peak-to-peak voltage on oscilloscope is marginal, connect multimeter and check for 120 to 160 millivolts rms.	
17.	Adjust output of audio oscillator to 10 millivolts.	Peak-to-peak voltage less than 5 millivolts.
18.	Reset output of audio oscillator to 300 millivolts.	None.
19.	Move oscilloscope leads to check output of circuit 1: J1-E (high) and J1-Y (low).	Peak-to-peak voltage less than 5 millivolts.
20.	Check output of circuit 2: J1-C (high) and J1-W (low).	Peak-to-peak voltage less than 5 millivolts.
21.	Check output of circuit 4: J1-L (high) and J1-B (low).	Peak-to-peak voltage less than 5 millivolts.



**14-15.5 Control Circuits Power On Checks. - Continued**

Step	Test procedure	Normal indication
	<b>CIRCUIT 4 TESTS</b>	
22.	Connect audio oscillator to J1 -R (high) and J1 -E (low). Adjust oscillator for output of 1000 Hz at 300 millivolts.	None.
		<b>NOTE</b>
		Verify signal level with multimeter.
23.	Connect oscilloscope to output J1 -L (high) and J1-B (low).	Oscilloscope presentation as shown.
	<b>NOTE</b>	
	If peak-to-peak voltage on oscilloscope is marginal, connect multimeter and check for 120 to 160 millivolts rms.	
24.	Adjust output of audio oscillator to 10 millivolts.	Peak-to-peak voltage on oscilloscope drops to less than 5 millivolts.
25.	Reset output of audio oscillator to 300 millivolts.	None.
26.	Move oscilloscope leads to check output of circuit 1: J1-E (high) and J1-Y (low).	Peak-to-peak voltage less than 5 millivolts.
27.	Check output of circuit 2: J1 -C (high) and J1-W (low).	Peak-to-peak voltage less than 5 millivolts.
28.	Check output of circuit 3: J1-N (high) and J1-C (low).	Peak-to-peak voltage less than 5 millivolts.

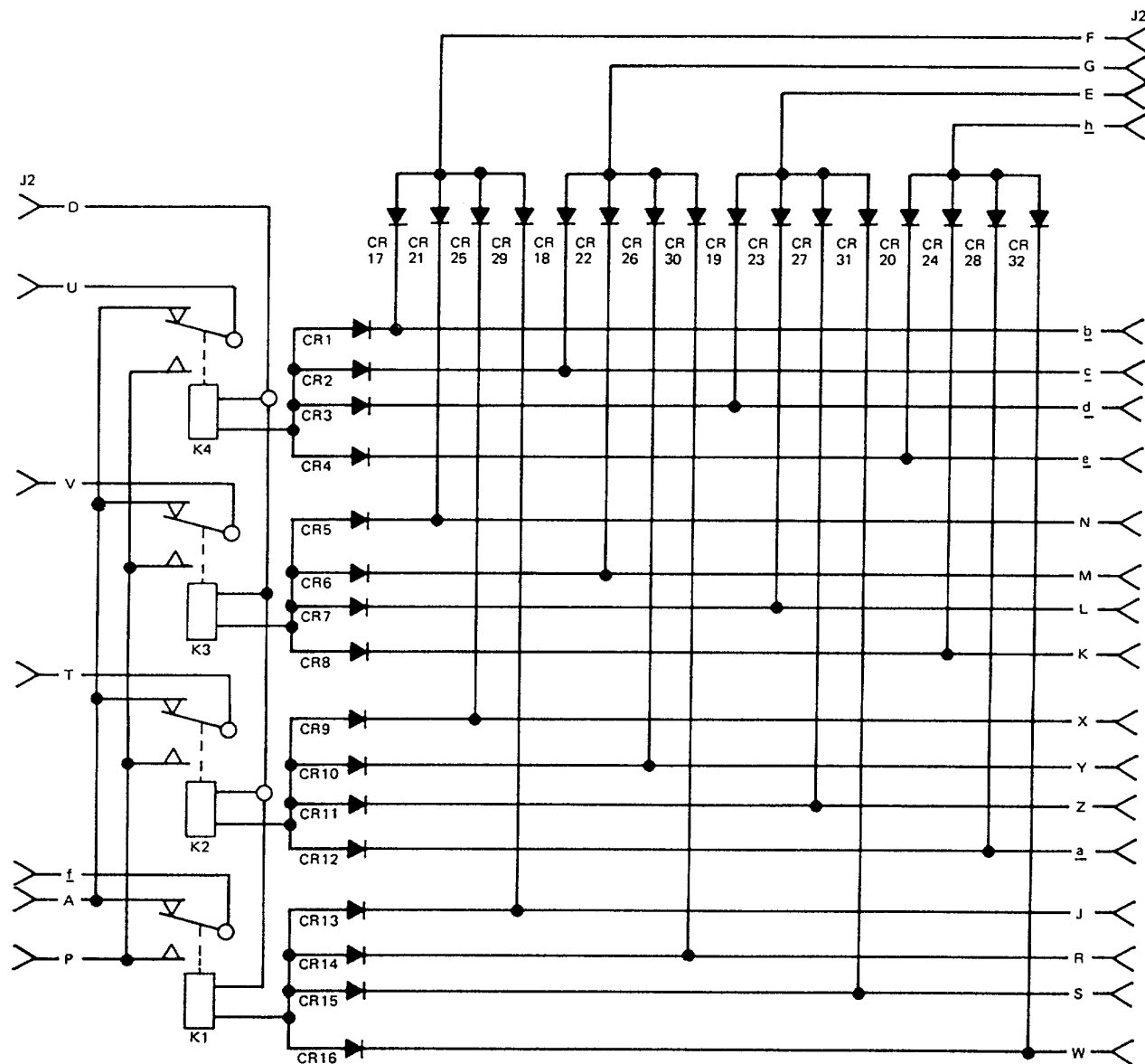


### 14-5.3.1 Audio Section Troubleshooting Chart.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1.	Inadequate input signal. Shorted input or output capacitor or transformer. Perform continuity checks and replace defective part.	
2.	Inadequate output signal. A Shorted input or output capacitor or transformer. A Perform continuity checks and replace defective part. B Open circuit in input or output transformer or signal diode. B Perform continuity checks and replace defective part.	
3.	Excessive output. Defective transformer. Perform continuity checks and replace defective part.	
4.	Distorted output. Open signal diode. Perform resistance measurements and replace defective diode.	
5.	No low signal isolation. Shorted signal diode. Perform resistance measurements and replace defective diode.	
6.	Inadequate isolation between channels. Defective wiring in circuit board assembly. Perform continuity checks and replace or repair defective wiring.	



# 14-15.4 Control Circuits Power Off Checks.





**14-15.4 Control Circuits Power Off Checks. - Continued**

- \* Perform resistance checks listed in table below. Pins refer to J2.
- \* To determine meter polarity for diode checks proceed as follows:
  - A Connect meter probes between pins h and w, note meter reading.
  - B Reverse meter leads, note meter reading.
  - C Reconnect meter to obtain lowest resistance reading: the probe now connected to pin h should be connected to the pin listed in "From Pin" column for remainder of test.
- \* Proper diode action is indicated when ratio between forward diode reading and reverse diode reading is at least 100 to 1.
- \* Refer to control section schematic at left during these checks.

Step no.	From Pin	To Pin	Performance standard	Item checked	Facility
1	h	W	Forward diode	CR32	ARC-114
2	h	a	Forward diode	CR28	ARC-114
3	h	K	Forward diode	CR24	ARC-114
4	h	e	Forward diode	CR20	ARC-114
5	W	h	Reverse diode	CR32	ARC-114
6	a	h	Reverse diode	CR28	ARC-114
7	K	h	Reverse diode	CR24	ARC-114
8	e	h	Reverse diode	CR20	ARC-114
9	E	S	Forward diode	CR31	ARC-102
10	E	Z	Forward diode	CR27	ARC-102
11	E	L	Forward diode	CR23	ARC-102
12	E	d	Forward diode	CR19	ARC-102
13	S	E	Reverse diode	CR31	ARC-102
14	Z	E	Reverse diode	CR27	ARC-102
15	L	E	Reverse diode	CR23	ARC-102
16	d	E	Reverse diode	CR19	ARC-102
17	G	R	Forward diode	CR30	ARC-115
18	G	Y	Forward diode	CR26	ARC-115
19	G	M	Forward diode	CR22	ARC-115
20	G	c	Forward diode	CR18	ARC-115
21	R	G	Reverse diode	CR30	ARC-115
22	Y	G	Reverse diode	CR26	ARC-115
23	M	G	Reverse diode	CR22	ARC-115
24	c	G	Reverse diode	CR18	ARC-115
25	F	J	Forward diode	CR29	ARC-51



**14-15.4 Control Circuits Power Off Checks. - Continued**

Step no.	From Pin	To Pin	Performance standard	Item checked	Facility
26	F	X	Forward diode	CR25	ARC-51
27	F	N	Forward diode	CR21	ARC-51
28	F	b	Forward diode	CR1 7	ARC-51
29	J	F	Reverse diode	CR29	ARC-51
30	X	F	Reverse diode	CR25	ARC-51
31	N	F	Reverse diode	CR21	ARC-51
32	b	F	Reverse diode	CR1 7	ARC-51
33	D	W	Forward diode + 80 ohms	CR16 + K1 Winding	ARC-1 14
34	D	a	Forward diode + 80 ohms	CR12 + K2 Winding	ARC-1 14
35	D	K	Forward diode + 80 ohms	CR8 + K3 Winding	ARC-1 14
36	D	e	Forward diode + 80 ohms	CR4 + K4 Winding	ARC-1 14
37	D	S	Forward diode + 80 ohms	CR15 + K1 Winding	ARC-102
38	D	Z	Forward diode + 80 ohms	CR11 + K2 Winding	ARC-102
39	D	L	Forward diode + 80 ohms	CR7 + K3 Winding	ARC-102
40	D	d	Forward diode + 80 ohms	CR3 + K4 Winding	ARC-102
41	D	R	Forward diode + 80 ohms	CR14 + K1 Winding	ARC-1 15
42	D	Y	Forward diode + 80 ohms	CR10 + K2 Winding	ARC-1 15
43	D	M	Forward diode + 80 ohms	CR6 + K3 Winding	ARC-1 15
44	D	c	Forward diode + 80 ohms	CR2 + K4 Winding	ARC-1 15
45	D	J	Forward diode + 80 ohms	CR1 3 + K1 Winding	ARC-51
46	D	X	Forward diode + 80 ohms	CR9 + K2 Winding	ARC-51
47	D	N	Forward diode + 80 ohms	CR5 + K3 Winding	ARC-51
48	D	b	Forward diode + 80 ohms	CR1 + K4 Winding	ARC-51
49	W	D	Reverse diode	CR1 6	ARC-114
50	a	D	Reverse diode	CR1 2	ARC-1 14
51	K	D	Reverse diode	CR8	ARC-114
52	e	D	Reverse diode	CR4	ARC-114
53	S	D	Reverse diode	CR15	ARC-102
54	Z	D	Reverse diode	CR11	ARC-102
55	L	D	Reverse diode	CR7	ARC-102
56	d	D	Reverse diode	CR3	ARC-102
57	R	D	Reverse diode	CR14	ARC-1 15
58	Y	D	Reverse diode	CR1 0	ARC-115
59	M	D	Reverse diode	CR6	ARC-115
60	c	D	Reverse diode	CR2	ARC-115
61	J	D	Reverse diode	CR13	ARC-51



**14-15.4 Control Circuits Power Off Checks. - Continued**

Step no	From Pin	To Pin	Performance standard	Item checked	Facility
62	X	D	Reverse diode	CR9	ARC-51
63	N	D	Reverse diode	CR5	ARC-51
64	b	D	Reverse diode	CR1	ARC-51
65	A	U	0 ohms	K4 NC Contacts	Left crew
66	A	V	0 ohms	K3 NC Contacts	Right crew
67	A	T	0 ohms	K2 NC Contacts	Copilot
68	A	f	0 ohms	K1 NC Contacts	Pilot
69	P	U	Infinity	K4 NO Contacts	Left crew
70	P	V	Infinity	K3 NO Contacts	Right crew
71	P	T	Infinity	K2 NO Contacts	Copilot
72	P	f	Infinity	K1 NO Contacts	

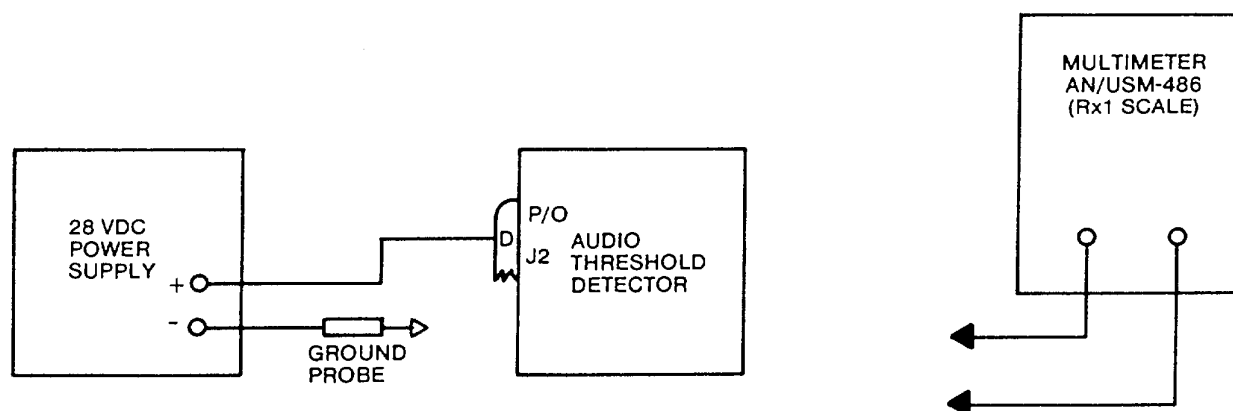
**14-15.5 Control Circuits Power On Checks.****INITIAL SETUP****Test Equipment**

28 Vdc Power Supply  
Multimeter AN/USM-486

**Tools**

Tool Kit TK-1 00

Set up test equipment as shown.



- \* Perform checks as indicated in table below.
- \* If problems reported by AVUM personnel indicate a particular circuit perform those tests first, otherwise proceed in order listed.
- \* If normal indications are not obtained, replace associated relay (para 1 4-6.4).



**14-15.5 Control Circuits Power On Checks. - Continued**

Step	Test procedure	Normal indication
	<b>RELAY K1 CHECKS</b>	
1.	Energize relay K1 by connecting ground probe to J2-J.	None.
	<b><u>CAUTION</u></b>	
	When connecting multimeter, make sure to probe only pins listed. Otherwise meter may be damaged.	Other-
2.	Check resistance between J2-P and J2-f.	0 ohms.
3.	Check resistance between J2-A and J2-f.	Infinity.
	<b>RELAY K2 CHECKS</b>	
4.	Energize relay K2 by connecting ground probe to J2-X	None.
	<b><u>CAUTION</u></b>	
	When connecting multimeter, make sure to probe only pins listed. Otherwise meter may be damaged.	Other-
5.	Check resistance between J2-P and J2-T.	0 ohms.
6.	Check resistance between J2-A and J2-T.	Infinity.
7.	Energize relay K3 by connecting grand probe to J2-N.	None.
	<b><u>CAUTION</u></b>	
	When connecting multimeter, make sure to probe only pins listed. Otherwise meter may be damaged.	Other-
8.	Check resistance between J2-P and J2-V.	0 ohms.
9.	Check resistance between J2-A and J2-V.	Infinity.
	<b>RELAY K4 CHECKS</b>	
10.	Energize relay K4 by connecting ground probe to J2-b	None.
	<b><u>CAUTION</u></b>	
	When connecting multimeter, make sure to probe only pins listed. Otherwise meter may be damaged.	Other-
11.	Check resistance between J2-P and J2-U.	0 ohms.
12.	Check resistance between J2-A and J2-U.	Infinity.



# 14-16. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS A AND B TROUBLESHOOTING (AVIM)

- \* Impedance matching network troubleshooting by Aviation Intermediate Maintenance (AVIM) consists of resistance checks.
- \* All measurements may be taken with components connected on printed circuit board.
- \* Performance standard values given in the table below were obtained using Multimeter ME-26/U. Use of a different meter may provide slightly different results.
- \* Make component checks by placing meter across component leads.
- \* If all component values are normal, check printed wiring on both sides of the component.
- \* If reported malfunction indicates a specific component or circuit, test it first to reduce troubleshooting time. Otherwise, proceed in order listed.
- \* Part numbers and reference designators are listed in chart below.

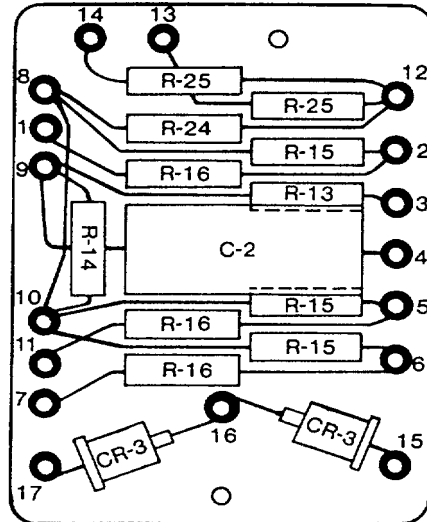
REF DESIG	Part number	Part designation
C2	CP05A1 KB474K	CAPACITOR, 47 ufd 100 Vdc
CR3	IN440B	DIODE, PIV 100 V, 300 mA
R13	RC32GF1 82J	RESISTOR, 100 V, 300 mA
R14	RC30GF122J	RESISTOR, 12Kn, 1 W
R15	RC32GF121J	RESISTOR, 120n, 1 W
R16	RC30GF221J	RESISTOR, 220n, 1 W
R24	RC30GF681J	RESISTOR, 680n, 1 W
R25	RC32GF682J	RESISTOR, 6.8Kn, 1 W

204-075-349  
CONFIGURATIONS A & B



## 14-16. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS A AND B TROUBLESHOOTING(AVIM) - Continued

- \* Set up meter to measure resistance.
- \* Ohmmeter range should be set to a range of at least twice the value listed in Performance Standard column.



Step	Test procedure	Normal indication
1	<p><b>A</b> Inspect for broken or loose connections and damage</p> <p><b>B</b> Inspect board for cracks or damage.</p> <p><b>C</b> Inspect board for damaged printed circuit.</p>	<p><b>A</b> All solder connections are tight and no damage is evident.</p> <p><b>B</b> No cracked or damaged insulating varnish is evident.</p> <p><b>C</b> No damage to the printed circuit is</p>
2	Check R13.	1,700 to 1,900 ohms.
3	Check R1 4.	1.1 K to 1.3 K.
4	Check R15.	110 to 130 ohms.
5	Check R16.	208 to 232 ohms.
6	Check R24.	641 to 719 ohms.
7	Check R25.	6.4 K to 7.2 K.
8	<p><b>A</b> Check C2.</p> <p><b>B</b> Reverse polarity and observe deflection again.</p>	<p><b>A</b> Quick pointer deflection to near full scale and gradual (4 seconds) return to 0.</p> <p><b>B</b> Same as above.</p>

**14-58**



# 14-16. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATIONS A AND B TROUBLESHOOTING (AVIM)-Continued

Step no.	Test procedure	Performance standard
9	A Check CR3. B Reverse leads on CR3.	A Forward resistance 100 ohms. B Reverse resistance 3 megohms.

# 14-17. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS C, D, E AND F UP TO AND INCLUDING 66-16306 TROUBLESHOOTING (AVIM)

- Impedance matching network troubleshooting by Aviation Intermediate Maintenance (AVIM) consists of resistance checks.
- All measurements may be taken with components connected on printed circuit board.
- Performance standard values given in the table below were obtained using Multimeter ME-26/U. Use of a different meter may provide slightly different results.
- Make component checks by placing meter across component leads.
- If all component values are normal, check printed wiring on both sides of the component.
- If reported malfunction indicates a specific component or circuit test it first to reduce troubleshooting time. Otherwise, proceed in order listed.
- Part numbers and reference designators are listed in chart below.

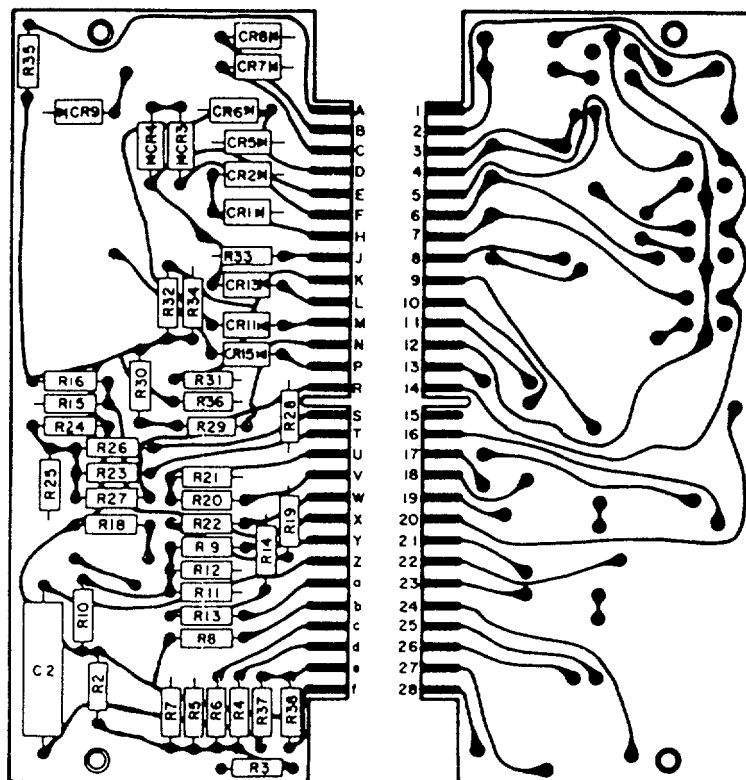
-1 REF DESIG	Part Number	Part Designation	-1 REF DESIG	Part Number	Part Designation
C1	CL25BJ180UP3	CAPACITOR, 18 $\mu$ fd 50 Vdc	R22	RC20GF121J	RESISTOR, 120 $\Omega$ , 1/2 W, 5%
C2	CL25BJ180UP3	CAPACITOR, 18 $\mu$ fd 50 Vdc	R23	561J	560
CR1	IN2071	DIODE	R24	151J	150
CR2			R25	680J	68
CR3			R26	680J	68
CR4			R27	680J	68
CR5			R28	680J	68
CR6			R29	151J	150
CR7			R30	151J	150
CR8			R31	820J	82
CR9			R32	221J	220
CR11			R33	820J	82
CR12			R34	221J	220
CR13			R35	151J	150
CR14			R36	151J	150
CR15			R37	560J	56
CR16	IN2071	DIODE	R38	RC20GF560J	RESISTOR, 56 $\Omega$ , 1/2 W, 5%
R2	C2A-126 C2A-126	RELAY, SPDT RELAY, SPDT			
R2	RC20GF121J	RESISTOR, 120 $\Omega$ , 1/2 W, 5%			
R3	101J	100			
R4	101J	100			
R5	101J	100			
R6	101J	100			
R7	101J	100			
R8	151J	150			
R9	101J	100			
R10	680J	68			
R11	101J	100			
R12	101J	100			
R13	101J	100			
R14	101J	100			
R15	331J	330			
R16	221J	220			
R17	820J	82			
R18	360J	56			
R19	121J	120			
R20	121J	120			
R21	RC20GF121J	RESISTOR, 120 $\Omega$ , 1/2 W, 5%			

204-075-399-CONFIGURATIONS C, D, E, AND F UP TO AND INCLUDING 66-16306



# 14-17. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS C, D, E AND F UP TO AND INCLUDING 66-16306 TROUBLESHOOTING (AVIM)-Continued

- Set up meter to measure resistance.
- Ohmmeter range should be set to a range of at least twice the value listed in Performance Standard column.



Step no.	Test procedure	Performance standard
1	<b>A</b> Inspect for broken or loose connections and damage. <b>B</b> Inspect board for cracks or damage. <b>C</b> Inspect board for damaged printed circuit.	<b>A</b> All solder connections are tight and no damage is evident. <b>B</b> No cracked or damaged insulating varnish is evident. <b>C</b> No damage to the printed circuit is evident.
2	Check R2.	110 to 130 ohms.
3	Check R3.	95 to 105 ohms.
4	Check R4.	95 to 105 ohms.
5	Check R5.	95 to 105 ohms.
6	Check R6.	95 to 105 ohms.



**14-17. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS C, D, E AND F UP TO  
AND INCLUDING 66-16306 TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
7	Check R7.	95 to 105 ohms.
8	Check R8.	144 to 158 ohms.
9	Check R9.	95 to 105 ohms.
10	Check R10.	64 to 72 ohms.
11	Check R11.	95 to 105 ohms.
12	Check R12.	95 to 105 ohms.
13	Check R13.	95 to 105 ohms.
14	Check R14.	95 to 105 ohms.
15	Check R15.	310 to 350 ohms.
16	Check R16.	208 to 232 ohms.
17	Check R17.	77 to 87 ohms.
18	Check R18.	53 to 59 ohms.
19	Check R19.	110 to 130 ohms.
20	Check R20.	110 to 130 ohms.
21	Check R21.	110 to 130 ohms.
22	Check R22.	110 to 130 ohms.
23	Check R23.	530 to 590 ohms.
24	Check R24.	144 to 158 ohms.
25	Check R25.	64 to 72 ohms.
26	Check R26.	64 to 72 ohms.
27	Check R27.	64 to 72 ohms.
28	Check R28.	64 to 72 ohms.
29	Check R29.	144 to 158 ohms.
30	Check R30.	144 to 158 ohms.
31	Check R31.	77 to 87 ohms.
32	Check R32.	208 to 232 ohms.
33	Check R33.	77 to 87 ohms.



**14-17. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS C, D, E AND F UP TO  
AND INCLUDING 66-16306 TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
34	Check R34.	208 to 232 ohms.
35	Check R35.	144 to 158 ohms.
36	Check R36.	144 to 158 ohms.
37	Check R37.	53 to 59 ohms.
38	Check R38.	53 to 59 ohms.
39	<b>A</b> Check C1.	<b>A</b> Quick pointer deflection to near full scale and gradual (4 seconds) return to 0.
	<b>B</b> Reverse polarity and observe deflection again.	<b>B</b> Same as <b>A</b> above.
40	<b>A</b> Check C2.	<b>A</b> Same as step 39 <b>A</b> .
	<b>B</b> Same as 39 <b>B</b> .	<b>B</b> Same as step 39 <b>B</b> .
41	<b>A</b> Check CR1.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR1.	<b>B</b> Reverse resistance 3 megohms.
42	<b>A</b> Check CR2.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR2..	<b>B</b> Same as step 41 <b>B</b> .
43	<b>A</b> Check CR3.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR3.	<b>B</b> Same as step 41 <b>B</b> .
44	<b>A</b> Check CR4.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR4.	<b>B</b> Same as step 41 <b>B</b> .
45	<b>A</b> Check CR5.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR5.	<b>B</b> Same as step 41 <b>B</b> .
46	<b>A</b> Check CR6.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR6.	<b>B</b> Same as step 41 <b>B</b> .
47	<b>A</b> Check CR7.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR7.	<b>B</b> Same as step 41 <b>B</b> .
48	<b>A</b> Check CR8.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR8.	<b>B</b> Same as step 41 <b>B</b> .
49	<b>A</b> Check CR9.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR9.	<b>B</b> Same as step 41 <b>B</b> .
50	<b>A</b> Check CR10.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR10.	<b>B</b> Same as step 41 <b>B</b> .
51	<b>A</b> Check CR11.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR11.	<b>B</b> Same as step 41 <b>B</b> .
52	<b>A</b> Check CR1 2.	<b>A</b> Same as step 41 <b>A</b> .
	<b>B</b> Reverse leads on CR12.	<b>B</b> Same as step 41 <b>B</b> .



**14-17. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS C, D, E AND F UP TO  
AND INCLUDING 66-16306 TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
53	<b>A</b> Check CR13. <b>B</b> Reverse leads on CR13.	<b>A</b> Same as step 41 <b>A</b> . <b>B</b> Same as step 41 <b>B</b> .
54	<b>A</b> Check CR14. <b>B</b> Reverse leads on CR14.	<b>A</b> Same as step 41 <b>A</b> . <b>B</b> Same as step 41 <b>B</b> .
55	<b>A</b> Check CR15. <b>B</b> Reverse leads on CR15.	<b>A</b> Same as step 41 <b>A</b> . <b>B</b> Same as step 41 <b>B</b> .
56	<b>A</b> Check CR16. <b>B</b> Reverse leads on CR16.	<b>A</b> Same as step 41 <b>A</b> . <b>B</b> Same as step 41 <b>B</b> .
57	Check K1.	700 ohms.
58	Check K2.	700 ohms.



# 14-17. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATIONS C, D, E AND F UP TO AND INCLUDING 66-16306 TROUBLESHOOTING (AVIM)-Continued

Step no.	Test procedure	Performance standard
59	<p>Refer to schematic below and check printed wiring.</p>	<p>No open printed wiring.</p> <p><b>NOTE</b> When AN/ARC-1 23(V) VOR/ILS set is installed, resistor R31 is replaced with shorting wire. Resistor R32 performance standard changed to 142-158 ohms.</p>

204-075-399-3  
CONFIGURATIONS C, D, E, AND F UP TO AND  
INCLUDING 66-16306



# 14-18. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATION F BEGINNING WITH 66-16307 AND CONFIGURATIONS G, H AND I TROUBLESHOOTING (AVIM)

- Impedance matching network troubleshooting by Aviation Intermediate Maintenance (AVIM) consists of resistance checks.
- All measurements may be taken with components connected on printed circuit board.
- Performance standard values given in the table below were obtained using Multimeter ME-26/U.
- Use of a different meter may provide slightly different results.
- Make component checks by placing meter across component leads.
- If all component values are normal, check printed wiring on both sides of the component.
- If reported malfunction indicates a specific component or circuit, test it first to reduce troubleshooting time. Otherwise, proceed in order listed.
- Part numbers and reference designators are listed in chart below.

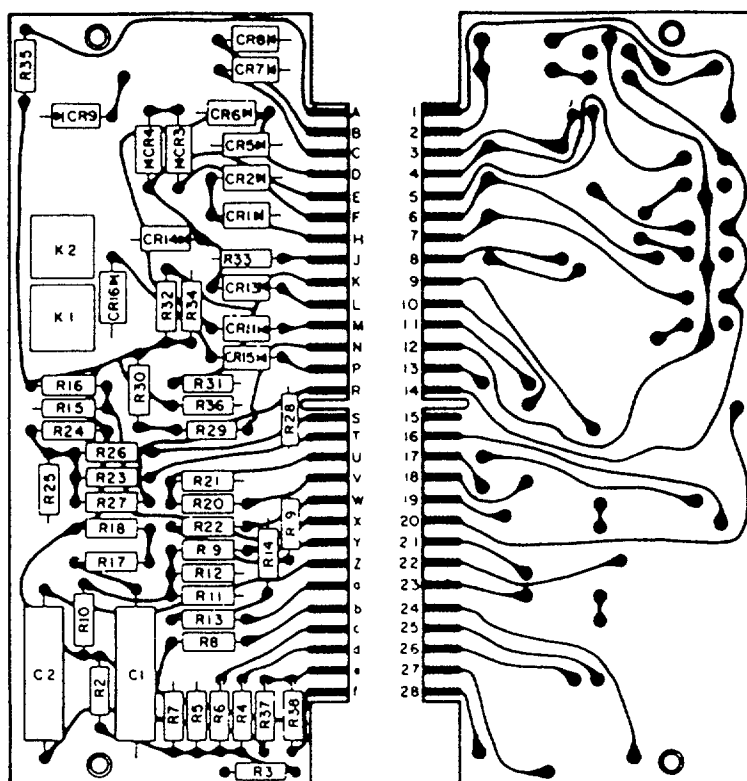
-1 REF DESIG	Part Number	Part Designation	-1 REF DESIG	Part Number	Part Designation
C1	CL25BJ180UP3	CAPACITOR, 18 $\mu$ fd 50 Vdc	R22	RC20GF121J	RESISTOR, 120 $\Omega$ 1/2 W, 5%
C2	CL25BJ180UP3	CAPACITOR, 18 $\mu$ fd 50 Vdc	R23	561J	560
CR1	IN2071	DIODE	R24	151J	150
CR2			R25	680J	68
CR3			R26	680J	68
CR4			R27	680J	68
CR5			R28	680J	68
CR6			R29	151J	150
CR7			R30	151J	150
CR8			R31	820J	82
CR9			R32	221J	220
CR11			R33	820J	82
CR12			R34	221J	220
CR13			R35	151J	150
CR14			R36	151J	150
CR15			R37	560J	56
CR16	IN2071	DIODE	R38	RC20GF560J	RESISTOR, 56 $\Omega$ 1/2 W, 5%
		PIV 600 VOLTS 750 mA @ 25°C			
R2	C2A-126 C2A-126	RELAY, SPDT RELAY, SPDT			
R2	RC20GF121J	RESISTOR, 120 $\Omega$ 1/2 W, 5%			
R3	101J	100			
R4	101J	100			
R5	101J	100			
R6	101J	100			
R7	101J	100			
R8	151J	150			
R9	101J	100			
R10	680J	68			
R11	101J	100			
R12	101J	100			
R13	101J	100			
R14	101J	100			
R15	331J	330			
R16	221J	220			
R17	820J	82			
R18	360J	56			
R19	121J	120			
R20	121J	120			
R21	RC20GF121J	RESISTOR, 120 $\Omega$ 1/2 W, 5%			
	CONTINUED-				

204-075-399 CONFIGURATION F BEGINNING WITH 66-16307,  
AND CONFIGURATIONS G THROUGH I



# 14-18. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATION F BEGINNING WITH 66-16307 AND CONFIGURATIONS G, H AND I TROUBLESHOOTING (AVIM)-Continued

- Set up meter to measure resistance.
- Ohmmeter range should be set to a range of at least twice the value listed in Performance Standard column.



Step no.	Test procedure	Performance standard
1	<b>A</b> Inspect for broken or loose connections and damage. <b>B</b> Inspect board for cracks or damage. varnish is evident. <b>C</b> Inspect board for damaged printed circuit.	<b>A</b> All solder connections are tight and no damage is evident. <b>B</b> No cracked or damage insulating varnish is evident. <b>C</b> No damage to the printed circuit is evident.
2	Check R2.	110 to 130 ohms.
3	Check R3.	95 to 105 ohms.
4	Check R4.	95 to 105 ohms.
5	Check R5.	95 to 105 ohms.
6	Check R6.	95 to 105 ohms.
7	Check R7.	95 to 105 ohms.



**14-18. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION F BEGINNING WITH 66-16307 AND CONFIGURATIONS G, H AND I TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
8	Check R8.	144 to 158 ohms.
9	Check R9.	95 to 105 ohms.
10	Check R10.	64 to 72 ohms.
11	Check R11.	95 to 105 ohms.
12	Check R12.	95 to 105 ohms.
13	Check R13.	95 to 105 ohms.
14	Check R14.	95 to 105 ohms.
15	Check R15.	310 to 350 ohms.
16	Check R16.	208 to 232 ohms.
17	Check R19.	110 to 130 ohms.
18	Check R20.	110 to 130 ohms.
19	Check R21.	110 to 130 ohms.
20	Check R22.	110 to 130 ohms.
21	Check R23.	530 to 590 ohms.
22	Check R24.	144 to 158 ohms.
23	Check R25.	64 to 72 ohms.
24	Check R26.	64 to 72 ohms.
25	Check R27.	64 to 72 ohms.
26	Check R28.	64 to 72 ohms.
27	Check R29.	144 to 158 ohms.
28	Check R30.	144 to 158 ohms.
29	Check R31.	370 to 410 ohms.
30	Check R32.	171 to 189 ohms.
31	Check R33.	370 to 410 ohms.
32	Check R34.	171 to 189 ohms.
33	Check R35.	144 to 158 ohms.
34	Check R36.	144 to 158 ohms.



**14-18. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION F BEGINNING WITH 66-16307 AND CONFIGURATIONS G, H AND I TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
35	Check R37.	77 to 87 ohms.
36	Check R38.	53 to 59 ohms.
37	<b>A</b> Check C2.  <b>B</b> Reverse polarity and observe deflection again.	<b>A</b> Quick pointer deflection to near full scale and gradual (4 seconds) return to 0. <b>B</b> Same as A above.
38	<b>A</b> Check CR1. <b>B</b> Reverse leads on CR1.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
39	<b>A</b> Check CR2. <b>B</b> Reverse leads on CR2.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
40	<b>A</b> Check CR3. <b>B</b> Reverse leads on CR3.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
41	<b>A</b> Check CR4. <b>B</b> Reverse leads on CR4.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
42	<b>A</b> Check CR5. <b>B</b> Reverse leads on CR5.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
43	<b>A</b> Check CR6. <b>B</b> Reverse leads on CR6.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
44	<b>A</b> Check CR7. <b>B</b> Reverse leads on CR7.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
45	<b>A</b> Check CR8. <b>B</b> Reverse leads on CR8.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
46	<b>A</b> Check CR9. <b>B</b> Reverse leads on CR9.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
47	<b>A</b> Check CR10. <b>B</b> Reverse leads on CR10.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
48	<b>A</b> Check CR11. <b>B</b> Reverse leads on CR11.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
49	<b>A</b> Check CR12. <b>B</b> Reverse leads on CR12.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
50	<b>A</b> Check CR13. <b>B</b> Reverse leads on CR13.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
51	<b>A</b> Check CR14. <b>B</b> Reverse leads on CR14.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.
52	<b>A</b> Check CR15. <b>B</b> Reverse leads on CR15.	<b>A</b> Forward resistance 100 ohms. <b>B</b> Reverse resistance 3 megohms.

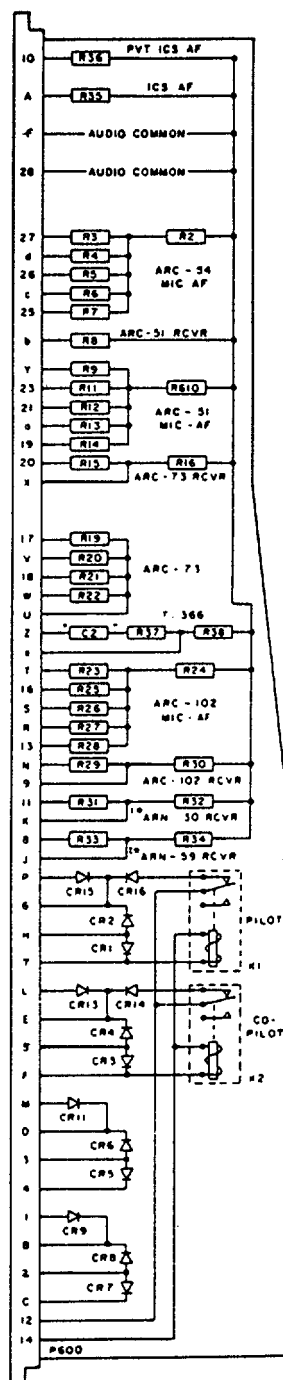


**14-18. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION F BEGINNING WITH 66-16307 AND CONFIGURATIONS G, H AND I TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
53	<b>A</b> Check CR16. <b>B</b> Reverse leads on CR16.	<b>A</b> Forward resistance 1 00 ohms. <b>B</b> Reverse resistance 3 megohms.
54	Check K1	700 ohms.
55	Check K2.	700 ohms.
56	Refer to schematic diagram below and check printed wiring.	No open printed wiring.



14-18. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION F BEGINNING WITH 66-16307 AND CONFIGURATIONS G, H AND I TROUBLESHOOTING (AVIM)-Continued



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CONFIGURATIONS F BEGINNING WITH 66-307 AND CONFIGURATIONS G, H, AND I

**NOTE**

When AN/ARN-123 (V) VOR/ILS set is installed, resistor R31 is replaced with shorting wire. Resistor R32 performance standard changed to 142-158 ohms.



# 14-19. IMPEDANCE MATCHING NETWORK, UH-ID/H CONFIGURATION J AND UH-IV TROUBLESHOOTING (AVIM)

- Impedance matching network troubleshooting by Aviation Intermediate Maintenance (AVIM) consists of resistance checks.
- All measurements may be taken with components connected on printed circuit board.
- Performance standard values given in the table below were obtained using Multimeter ME-26/U.
- Use of a different meter may provide slightly different results.
- Make component checks by placing meter across component leads.
- If all component values are normal, check printed wiring on both sides of the component.
- If reported malfunction indicates a specific component or circuit, test it first to reduce troubleshooting time. Otherwise, proceed in order listed.
- Part numbers and reference designators are listed in chart below.

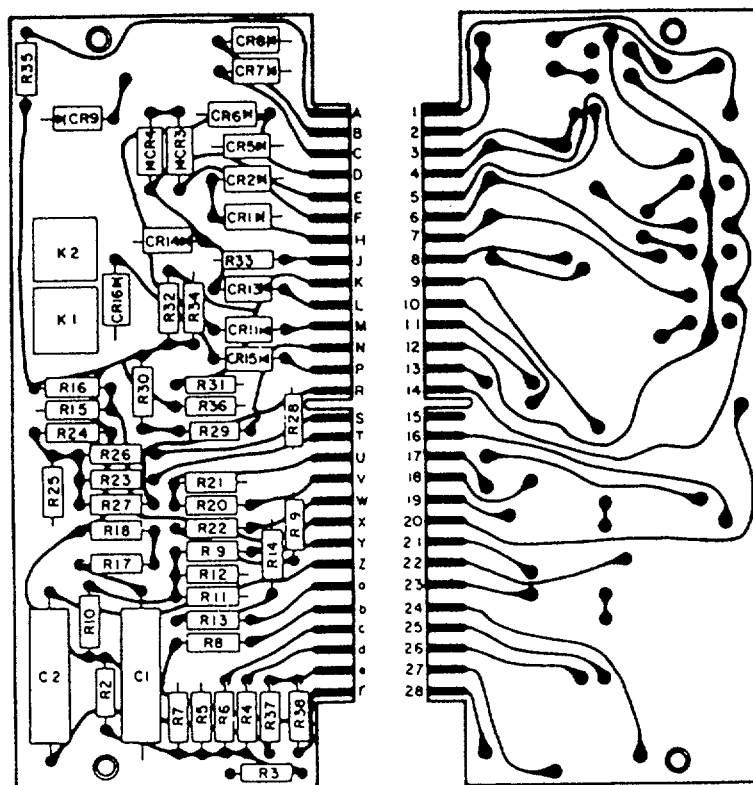
-1 REF DESIG	Part Number	Part Designation	-1 REF DESIG	Part Number	Part Designation
C1 C2 CR1 CR2 CR3 CR4 CR5 CR6 CR7 CR8 CR9 CR11 CR12 CR13 CR14 CR15 CR16	CL25BJ180UP3 CL25BJ180UP3 IN2071	CAPACITOR, 18 $\mu$ fd 50 Vdc CAPACITOR, 18 $\mu$ fd 50 Vdc DIODE  PIV 600 VOLTS 750 mA @ 25°C	R22 R23 R24 R25 R26 R27 R28 R29 R30 R31 R32 R33 R34 R35 R36 R37 R38	RC20GF121J 561J 151J 680J 680J 680J 680J 151J 151J 820J 221J 820J 221J 151J 151J 560J RC20GF560J	RESISTOR, 120 $\Omega$ 1/2 W, 5% 560 150 68 68 68 68 150 150 82 220 82 220 150 150 56 RESISTOR, 56 $\Omega$ 1/2 W, 5%
R2	C2A-126 C2A-126	RELAY, SPDT RELAY, SPDT			
R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21	RC20GF121J 101J 101J 101J 101J 101J 151J 101J 101J 680J 101J 101J 101J 331J 221J 820J 360J 121J 121J RC20GF121J CONTINUED -	RESISTOR, 120 $\Omega$ 1/2 W, 5% 100 100 100 100 100 150 100 100 68 100 100 100 330 220 82 56 120 120 RESISTOR, 120 $\Omega$ 1/2 W, 5%			

204-075-399  
CONFIGURATION J



# 14-19. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION J AND UH-1V TROUBLESHOOTING (AVIM)-Continued

- Set up meter to measure resistance.
- Ohmmeter range should be set to a range of at least twice the value listed in Performance Standard column.



Step no.	Test procedure	Performance standard
1	<p><b>A</b> Inspect for broken or loose connections and damage.</p> <p><b>B</b> Inspect board for cracks or damage.</p> <p><b>C</b> Inspect board for damaged printed circuit.</p>	<p><b>A</b> All solder connections are tight and no damage is evident.</p> <p><b>B</b> No cracked or damage insulating varnish is evident.</p> <p><b>C</b> No damage to the printed circuit is evident.</p>
2	Check R2.	110 to 130 ohms.
3	Check R3.	95 to 105 ohms.
4	Check R4.	95 to 105 ohms.
5	Check R5.	95 to 105 ohms.
6	Check R6.	95 to 105 ohms.



**14-19. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION J AND UH-1V  
TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
7	Check R 7.	95 to 105 ohms.
8	Check R 8.	144 to 155 ohms.
9	Check R 9.	95 to 105 ohms.
10	Check R 10.	110 to 130 ohms.
11	Check R 11.	95 to 105 ohms.
12	Check R 12.	95 to 105 ohms.
13	Check R 13.	95 to 105 ohms.
14	Check R 14.	95 to 105 ohms.
15	Check R 15.	310 to 350 ohms.
16	Check R 16.	208 to 232 ohms.
17	Check R 18.	144 to 1 58 ohms.
18	Check R 19.	110 to 130 ohms.
19	Check R 20.	110 to 130 ohms.
20	Check R 21.	110 to 130 ohms.
21	Check R 22.	110 to 130 ohms.
22	Check R 23.	530 to 590 ohms.
23	Check R 24.	950 to 1050 ohms.
24	Check R 25.	64 to 72 ohms.
25	Check R 26.	64 to 72 ohms.
26	Check R 27.	64 to 72 ohms.
27	Check R 28.	64 to 72 ohms.
28	Check R 29.	144 to 158 ohms.
29	Check R 30.	144 to 158 ohms.
30	Check R 31.	370 to 410 ohms.
31	Check R 32.	171 to 189 ohms.
32	Check R 33.	370 to 410 ohms.
33	Check R 34.	171 to 189 ohms.



# 14-19. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION J AND UH-1V TROUBLESHOOTING (AVIM)-Continued

Step no.	Test procedure	Performance standard
34	Check R35.	144 to 158 ohms.
35	Check R36.	144 to 158 ohms.
36	Check R37.	77 to 87 ohms.
37	Check R38.	53 to 59 ohms.
38	<b>A</b> Check C2.	<b>A</b> Quick pointer deflection to near full scale and gradual (4 seconds) return to 0.
	<b>B</b> Reverse polarity and observe deflection again.	<b>B</b> Same as A above.
39	<b>A</b> Check CR1.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR1.	<b>B</b> Reverse resistance 3 megohms.
	<b>A</b> Check CR2.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR2.	<b>B</b> Reverse resistance 3 megohms.
40	<b>A</b> Check CR3.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR3.	<b>B</b> Reverse resistance 3 megohms.
41	<b>A</b> Check CR4.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR4.	<b>B</b> Reverse resistance 3 megohms.
42	<b>A</b> Check CR5.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR5.	<b>B</b> Reverse resistance 3 megohms.
43	<b>A</b> Check CR6.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR6.	<b>B</b> Reverse resistance 3 megohms.
44	<b>A</b> Check CR7.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR7.	<b>B</b> Reverse resistance 3 megohms.
45	<b>A</b> Check CR8.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR8.	<b>B</b> Reverse resistance 3 megohms.
46	<b>A</b> Check CR9.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR9.	<b>B</b> Reverse resistance 3 megohms.
47	<b>A</b> Check CR10.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR10.	<b>B</b> Reverse resistance 3 megohms.
48	<b>A</b> Check CR11.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR11.	<b>B</b> Reverse resistance 3 megohms.
49	<b>A</b> Check CR12.	<b>A</b> Forward resistance 1 00 ohms.
	<b>B</b> Reverse leads on CR12.	<b>B</b> Reverse resistance 3 megohms.
50	<b>A</b> Check CR13.	<b>A</b> Forward resistance 100 ohms.
	<b>B</b> Reverse leads on CR13.	<b>B</b> Reverse resistance 3 megohms.

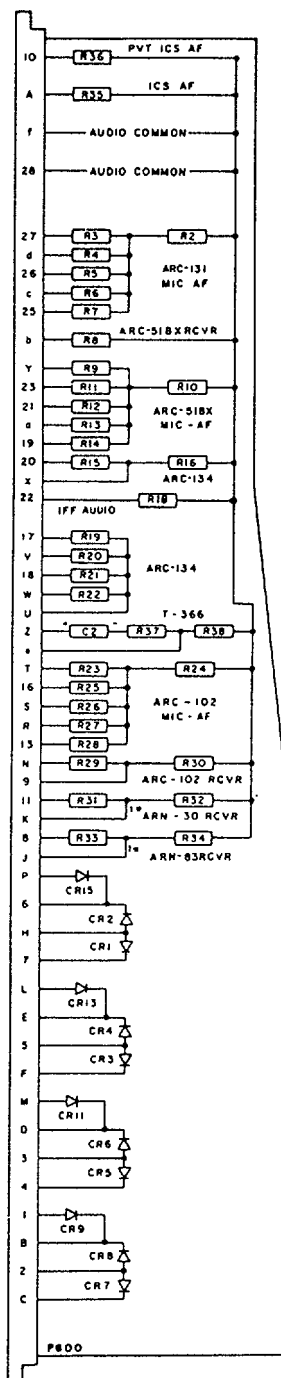


**14-19. IMPEDANCE MATCHING NETWORK, UH-1D/H CONFIGURATION J AND UH-1V  
TROUBLESHOOTING (AVIM)-Continued**

Step no.	Test procedure	Performance standard
51	A Check CR15. B Reverse leads on CR15.	A Forward resistance 100 ohms. B Reverse resistance 3 megohms.
52	Refer to schematic diagram below and check printed wiring.	No open printed wiring.



# 14-19. IMPEDANCE MATCHING NETWORK, UH-1 D/H CONFIGURATION J AND UH-1 V TROUBLESHOOTING (AVIM)-Continued



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CONFIGURATION J  
AND UH-1V

## NOTE

When the AN/ARN-1 23(V) VOR/ILS set is installed, resistor R31 is replaced with shorting wire. Resistor R32 performance standard changed to 142-158 ohms.



**14-20. IMPEDANCE MATCHING NETWORK, UH-1 H TROUBLESHOOTING (AVIM)**

- Impedance matching network troubleshooting by Aviation Intermediate Maintenance (AVIM) consists of resistance checks.
- All measurements may be taken with components connected on printed circuit board.
- Performance standard values given in the table below were obtained using Multimeter ME-26/U.
- Use of a different meter may provide slightly different results.
- Pin to Pin measurements check all components (resistors) and circuits that are wiring only.
- If performance standards are normal, check printed wiring on both sides of resistors.
- If reported malfunction indicates a specific component or facility, test it first to reduce troubleshooting time. Otherwise, proceed in order listed.
- Part numbers and reference designators are listed in chart below.

-1 REF DESIG	Part number	Part designation
R602	RCR20G151JS	RESISTOR 150 $\Omega$ , 1/2 W, 5%
R603	RCR20G151JS	150
R604	RCR20G151JS	150
R605	RCR20G151JS	150
R606	RCR20G151JS	150
R608	RCR20G151JS	150
R610	RCR20G151JS	150
R611	RCR20G151JS	150
R612	RCR20G391JS	390
R613	RCR20G181JS	180
R614	RCR20G122JS	1.2K
R617	RCR20G151JS	RESISTOR 150 $\Omega$ , 1/2 W, 5%

Step no.	Test procedure	Performance standard
1	Inspect for broken or loose components and for damage.	All solder connections are tight and no damage is evident.
2	Inspect boards for cracks or damage.	No cracked or damaged varnish.
3	Inspect printed circuit.	No damage.

- Set up meter to measure resistance.
- Ohmmeter scale should be a range of at least twice the value listed in Performance Standard column.



**14-20. IMPEDANCE MATCHING NETWORK, UH-1 H TROUBLESHOOTING (AVIM)-Continued**

Step no.	From Pin	To Pin	Performance standard	Item checked	Facility
1	f	28	0 ohms	None	All
2	e	27	0 ohms	None	ARC-115
3	e	f	142 to 158 ohms	R603	ARC-115
4	d	f	142 to 158 ohms	R604	ARC-114
5	d	26	0 ohms	None	ARC-114
6	25	f	142 to 158 ohms	R605	Interphone
7	b	f	142 to 158 ohms	R606	ARC-51
8	b	24	0 ohms	None	ARC-51
9	22	f	142 to 158 ohms	R608	APX-72
10	20	f	142 to 158 ohms	R610	KY-28
11	W	19	142 to 158 ohms	R602	ARC-102
12	W	f	142 to 158 ohms	R611	ARC-102
13	V	f	370 to 410 ohms	R612	ARN-83
14	V	18	171 to 189 ohms	R613	ARN-83
15	U	T	0 ohms	None	ARC-102
16	U	f	1.14K to 1.26K ohms	R614	ARC-102
17	S	f	142 to 158 ohms	R617	ARN-123 (V)



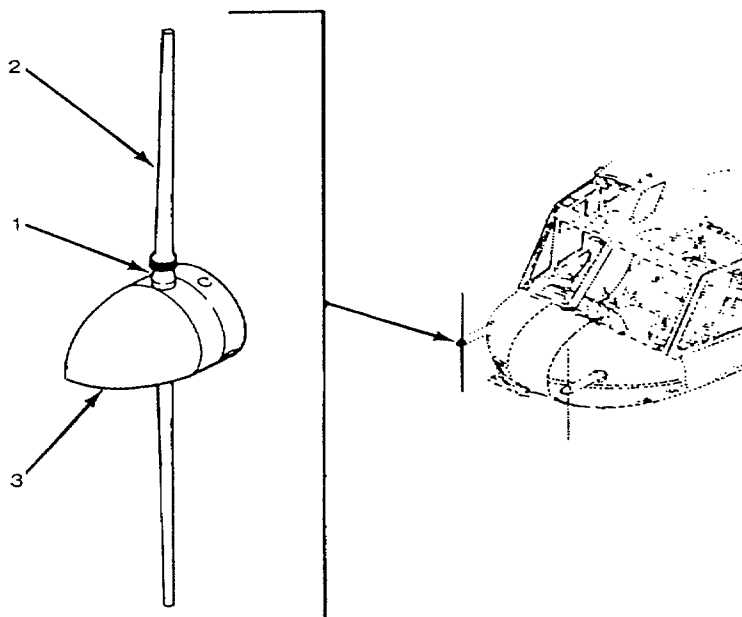
## CHAPTER 15

### ANTENNA GROUP AN/ARA-31 (FM HOMING) MAINTENANCE

Subject	Para.	Page
Element Antenna AT-624(*)/AR Maintenance (AVU M).....	15-1	15-1
Impedance Matching Network CU-459/AR Maintenance (AVUM).....	15-2	15-2
Keyer KY-149(*) /AR Maintenance (AVUM) .....	15-3	15-3
Switch Assembly SA-474/AR (Modified) Maintenance (AVU M).....	15-4	15-4
Cabling and Connector Maintenance (AVUM).....	15-5	15-4
FM Homing Operational Checks (AVUM).....	15-6	15-4
FM Homing Troubleshooting (AVUM) .....	15-7	15-5

#### SECTION I. MAINTENANCE PROCEDURES

##### 15-1. ELEMENT ANTENNA AT-624 (\*)/AR MAINTENANCE (AVUM)



##### 15-1.1 Removal Instructions.

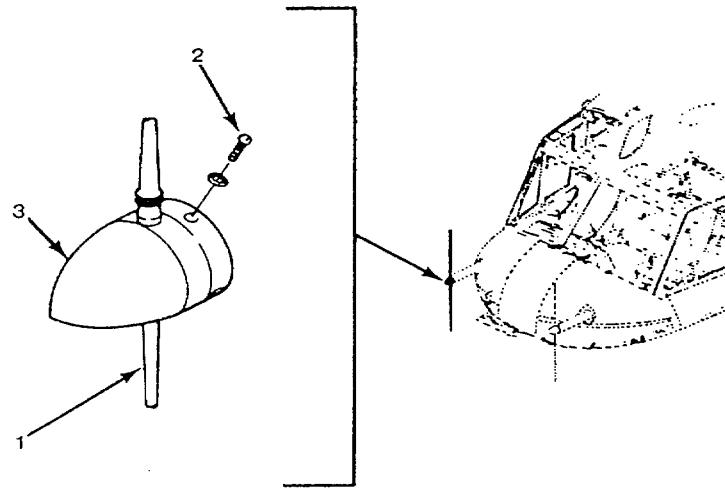
- A Loosen setscrew (1).
- B Unscrew element (2) from impedance matching network (3).

##### 15-1.2 Installation Instructions.

- A Screw antenna element two into impedance matching network (3). Hand tighten.
- B Apply staking lacquer (MIL-S-22473) to setscrew(1) and tighten setscrew.



## 15-2. IMPEDANCE MATCHING NETWORK CU-459/AR MAINTENANCE (AVUM)



### 15-2.1 Removal Instructions.

- A Remove upper and lower antenna elements per paragraph 15-1.1.
- B Remove three screws and washers (2).

#### **CAUTION**

Be careful not to pull impedance matching network so far from antenna support that antenna cable running through support will be damaged.

- C Pull impedance matching network from support and disconnect coaxial connector.
- D Remove impedance matching network.

### 15-2.2 Installation Instructions.

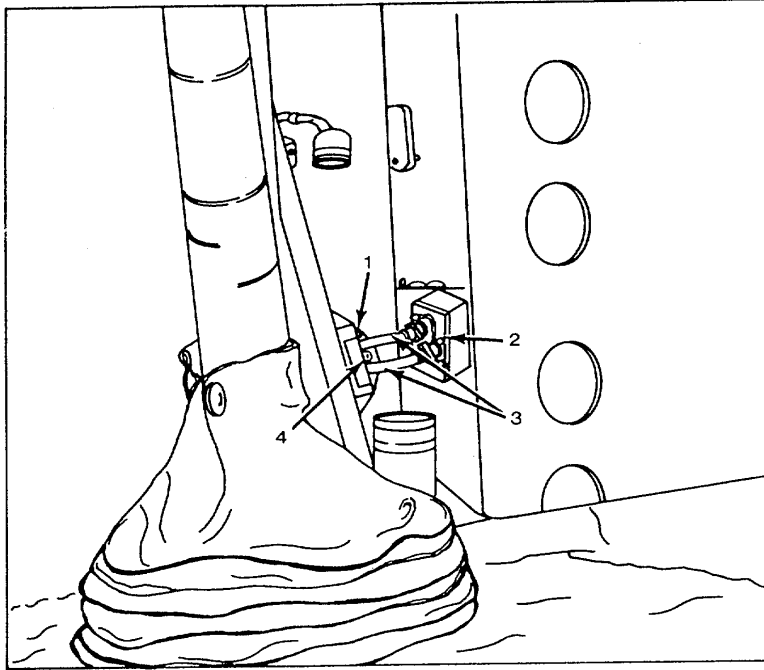
- A Hold impedance matching network (3) near antenna support and connect coaxial connector.

#### **NOTE**

One impedance matching network should be rotated 180° from the other.

- B Position impedance matching network on antenna support and secure with three screws and washers (2).
- C Install antenna elements per paragraph 15-1.2.



**15-3. KEYER KY-149 (\*)/AR MAINTENANCE (AVUM)****15-3.1 Removal Instructions.**

- A** Loosen spring latches (5) and raise cover.
- B** Tag, then remove four coaxial connectors (3).
- C** Cut safety wire and disconnect electrical connector (4).
- D** Cut safety wire and remove two mounting screws (1).
- E** Lift front of keyer and slide forward to disengage guide pins.
- F** Remove keyer.

**15-3.2 Installation Instructions**

- A** Slide keyer into mounting until guide pins are firmly engaged and push front of keyer over front mounting stud.
- B** Secure keyer with two mounting screws (1).
- C** Connect electrical connector (4).
- D** Connect four coaxial connectors (3) and remove tags.
- E** Safety wire two mounting screws (1) and electrical connector (4).
- F** Position cover over keyer and secure with spring latch fasteners (5).



**15-4. SWITCH ASSEMBLY SA-474/AR (MODIFIED) MAINTENANCE (AVUM)**

Refer to paragraph 10-5 for SA-474/AR (Modified) maintenance.

**15-5. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:
- P6011, P601 R, P603, P604, P605, P606
- Refer to FO-39 (AN/ARC-44) for wiring data.
- P606 is repaired by repairing or replacing connector or by splicing individual wires.
- Coaxial cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

**SECTION II. OPERATIONAL CHECKS****15-6. FM HOMING OPERATIONAL CHECK (AVUM)**

These checks are used to ensure AN/ARA-13 (FM homing) is operating properly. The checks are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Test Equipment**

Radio Set

**Equipment Conditions**

Reference:  
Paragraph 1-50 Auxiliary Power Unit connected.  
Paragraph 14-13 Intercommunication Set operational.  
Paragraph 10-9 FM LIASON NO. 1 AN/ARC-44 operational.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

1. Depress FM HOMING ARA-31 circuit breaker.
2. Set switches on intercom to permit reception of signals from AN/ARC-44 (FM Liason No. 1) radio.



**15-6. FM HOMING OPERATIONAL CHECK (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****NOTE**

Antenna Group AN/ARA-31 is used with Radio Set AN/ARC-44 (only) to provide FM Homing capabilities.

3. On AN/ARC-44 control panel, select an FM Homing station frequency.
  4. Set fm switch assembly HOME switch to HOME.  
Morse code D (dah-dit-dit), Morse code U (dit-dit-dah) or a steady tone (400 Hz) heard in headset.
- Indications depend on location of fm homing station.

**SECTION III. TROUBLESHOOTING****15-7. FM HOMING TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Antenna Group AN/ARA-31 (FM Homing).
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 15-6.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

No coded audio or 400 Hz tone heard in headset when FM HOMING is selected.

- |          |                                       |          |                           |
|----------|---------------------------------------|----------|---------------------------|
| <b>A</b> | Defective antenna.                    | <b>A</b> | Replace AT-624(*)         |
| <b>B</b> | Defective impedance matching network. | <b>B</b> | Replace CU-459/AR.        |
| <b>C</b> | Defective keyer.                      | <b>C</b> | Replace KY-149(,)/AR.     |
| <b>D</b> | Defective switch assembly.            | <b>D</b> | Replace SA-474/AR.        |
| <b>E</b> | Defective fm radio.                   | <b>E</b> | Replace RT-294(*)/ARC-44. |

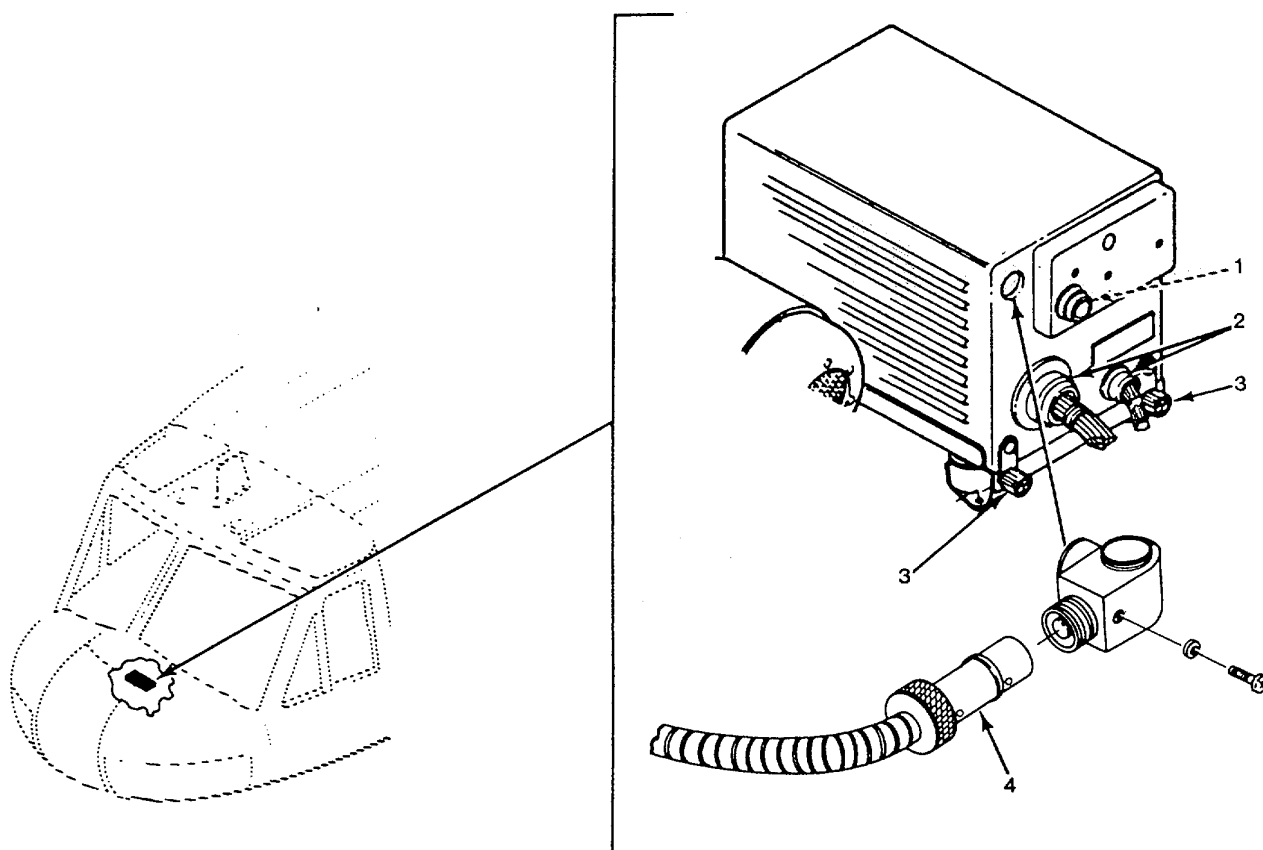


# **CHAPTER 16** **DIRECTION FINDING SET AN/ARN-59 MAINTENANCE**

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Control C-2275/ARN-59 Maintenance (AVUM).....	16-2	16-2
Antenna AT-780/ARN Maintenance (AVUM) .....	16-3	16-3
Sensing Antenna P/N 204-075-328 Maintenance (AVUM).....	16-4	16-4
Dynamotor DY-1 50/ARN Maintenance (AVUM) .....	16-5	16-5
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## **SECTION I. MAINTENANCE PROCEDURES**

### **16-1. RECEIVER R-836/ARN MAINTENANCE (AVUM)**





## 16-1. RECEIVER R-836/ARN MAINTENANCE (AVUM)- Continued

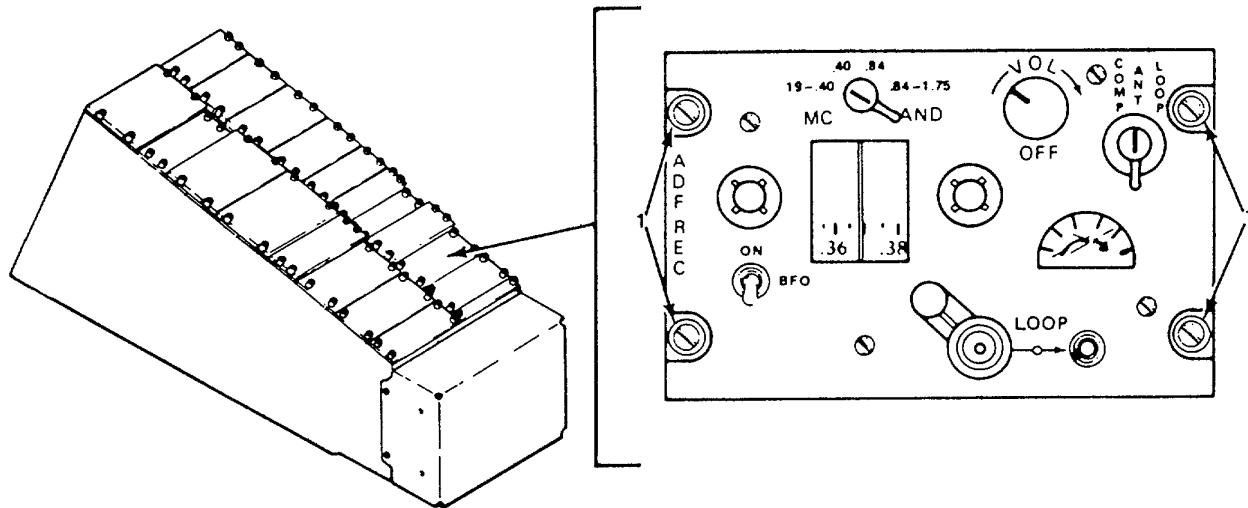
### 16-1.1 Removal Instructions.

- A Disconnect mechanical linkage (4).
- B Disconnect coaxial connector (1).
- C Disconnect two electrical connectors (2).
- D Cut safety wire and loosen two knurled nuts (3) on link fasteners.
- E Lift front of receiver to clear mounting and remove receiver.

### 16-1.2 Installation Instructions.

- A Position receiver in mounting and secure by tightening two knurled nuts (3) on link fasteners.
- B Connect two electrical connectors (2).
- C Connect coaxial connector (1).
- D Connect mechanical linkage (4).
- E Safety wire two link fasteners.
- F Perform adjustment procedure in paragraph 16-7

## 16-2. CONTROL C-2275/ARN-59 MAINTENANCE (AVUM)





**16-2. CONTROL C-2275/ARN-59 MAINTENANCE (AVUM)-Continued****16-2.1 Removal Instructions.**

- A Loosen four spring-lock fasteners (1).

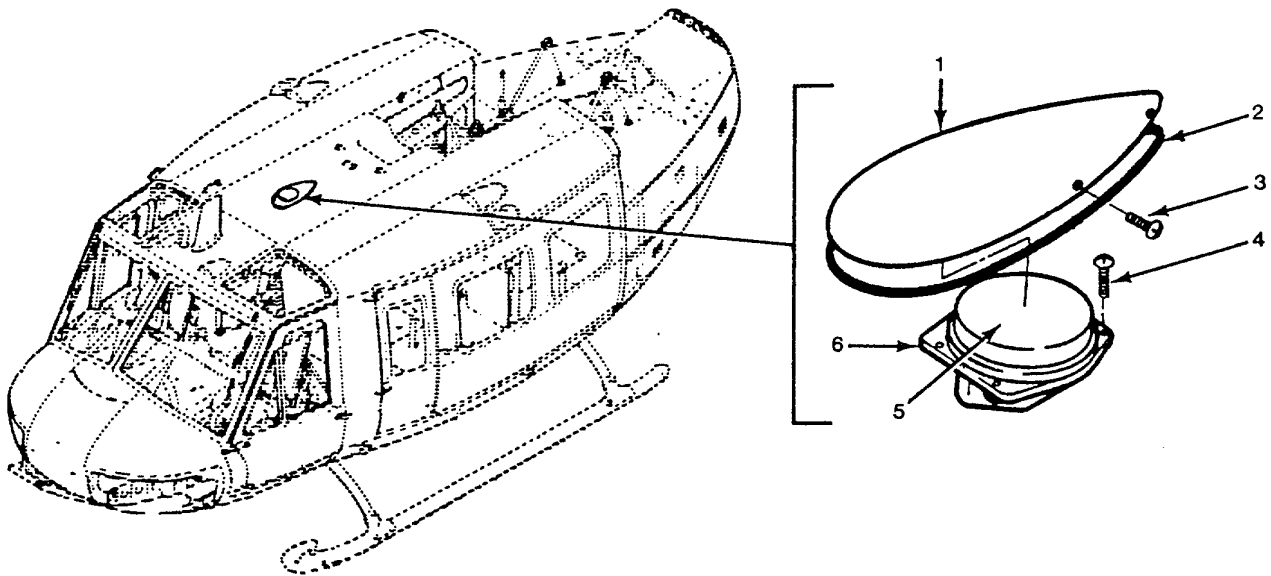
**CAUTION**

Be careful not to pull control so far from pedestal console that electrical wiring, connector or mechanical linkage will be damaged.

- B Carefully lift control from pedestal console and disconnect electrical connector from rear of control.
- C Disconnect mechanical linkage from rear of control.
- D Remove control.

**16-2.2 Installation Instructions.**

- A Hold control near pedestal console and connect mechanical linkage to rear of control.
- B Connect electrical connector to rear of control.
- C Perform adjustment procedure per paragraph 16-7.

**16-3. ANTENNA AT-780/ARN MAINTENANCE (AVUM)**



### 16-3. ANTENNA AT-780/ARN MAINTENANCE (AVUM)-Continued

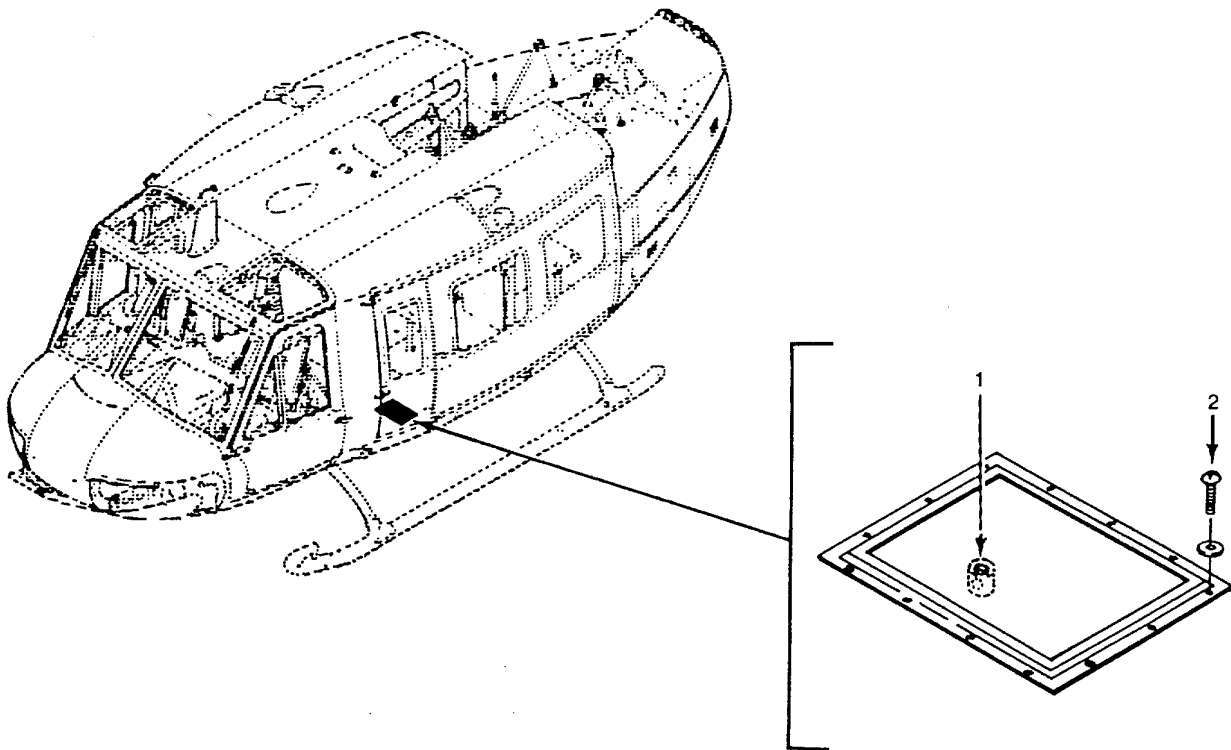
#### 16-3.1 Removal Instructions.

- A From inside helicopter, disconnect two electrical connectors.
- B From outside helicopter, remove six screws (3) that secure antenna cover (1).
- C Lift cover and remove gasket (2) from antenna housing (5).
- D Remove four screws (4) and remove antenna assembly (6).

#### 16-3.2 Installation Instructions.

- A Position antenna assembly on mounting and secure with four screws (4).
- B Cement new gasket between antenna housing (5) and antenna cover (1).
- C Apply cement to underside of antenna cover (1).
- D Position antenna cover and secure with six screws (3).
- E From inside helicopter, connect two electrical connectors.

### 16-4. SENSING ANTENNA P/N 204-075-328 MAINTENANCE (AVUM)





**16-4. SENSING ANTENNA P/N 204-075-328 MAINTENANCE (AVUM) - Continued****16-4.1 Removal Instructions.**

- A** From inside helicopter, disconnect antenna cable connector (1).

**NOTE**

Antenna cable connector can be reached through access door on left side of helicopter, forward end of tail boom.

- B** From outside helicopter, remove thirteen screws and washers (2).

- C** Remove antenna housing and antenna as a unit.

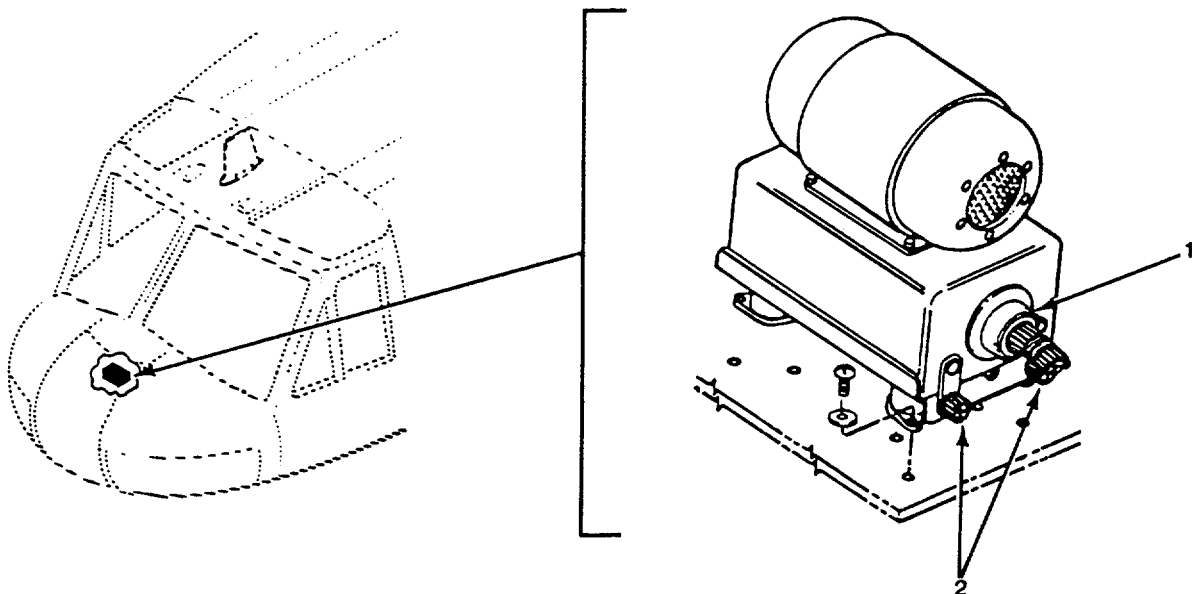
**16-4.2 Installation Instructions.**

- A** Position antenna housing, with antenna inside, against helicopter skin.

- B** Secure antenna housing with thirteen screws (2).

- C** From inside helicopter, connect antenna cable connector (1) to antenna.

- D** Close and secure access door.

**16-5. DYNAMOTOR DY-1 50/ARN MAINTENANCE (AVUM)**



## **16-5. DYNAMOTOR DY-150/ARN MAINTENANCE (AVUM) - Continued**

### **16-5.1 Removal Instructions.**

- A** Disconnect electrical connector (1).
- B** Cut safety wire and loosen two knurled nuts (2) on link fasteners.
- C** Lift front of dynamotor up to clear mounting and remove dynamotor.

### **16-5.2 Installation Instructions.**

- A** Position dynamotor in mount and secure by tightening two knurled nuts (2).
- B** Connect electrical connector (1).
- C** Safety wire knurled nuts on link fasteners.

## **16-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel: P407, P404, P406, P408, P302, P405, P402, P403, and P401.
- Refer to FO-40 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wire
- RF cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

## **16-7. ADJUSTMENT AND LUBRICATION PROCEDURES (AVUM)**

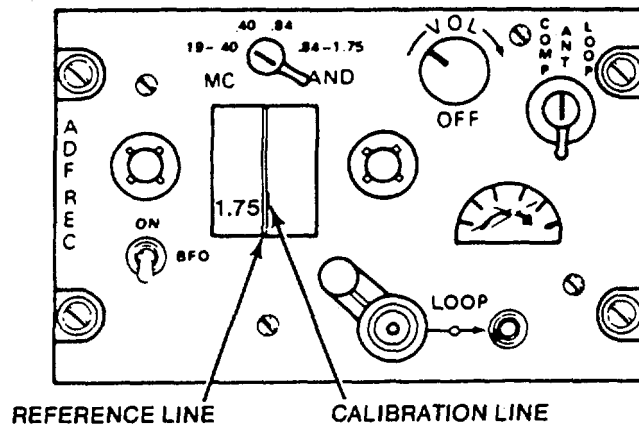
### **16-7.1 Removal Instructions.**

- Procedures below are used to ensure proper tuning of the direction finding set.
- Adjustment and lubrication should be performed anytime Receiver R-836/ARN, Control C-2275/ ARN or the mechanical linkage has been disconnected.

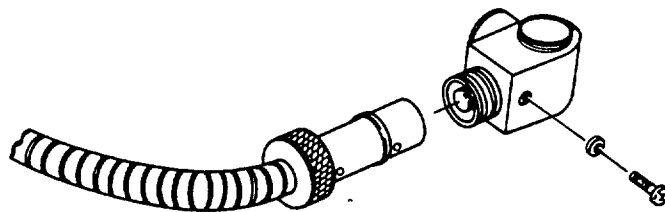


## 16-7.2 Adjustments and Lubrication.

- A Rotate tuning crank on C-2275/ARN CCW until it reaches mechanical stop. Do not force beyond this point.
- B Loosen four spring-lock fasteners that secure control to pedestal console (if necessary).
- C Lift control from pedestal console and disconnect mechanical linkage on rear of control.
- D Set MC BAND selector to .84 - 1.75.
- E Turn tuning crank until line just to the right of high frequency end of tuning dial is aligned with reference line.



- F Use a thin, long-handled brush and apply a thin coat of grease (NSN 9150-00-257-5358) to gears on rear of control unit.
- G Reconnect mechanical linkage to rear of C-2275/ARN, being careful not to move tuning shaft or mechanical linkage spline.
- H Position control in pedestal console and secure with four turnlock fasteners.



- I Remove gearing unit from receiver.
- J Remove two screws and washers that secure gearing unit cover in place.
- K Apply a thin coat of grease (NSN 9150-00-257-5358) to gears.
- L Position cover on gearing unit and secure with two screws and washers.
- M Install gear unit on receiver.

## 16-7.3 Loop Antenna Compensation.

Refer to TB 11 -5826-21 7-30-1 for loop antenna compensation procedures.



## Section II. OPERATIONAL CHECKS

### 16-8. DIRECTION FINDING SET AN/ARN-59 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Direction Finding Set AN/ARN-59 is operating properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Equipment Conditions

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunications Set operational.

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#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

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#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress LF NAV ADF circuit breaker.
2. Set intercom switches to permit monitoring AN/ARN-59 audio.
3. On C-2275/ARN-59 set OFF VOL control to midposition.  
Lamps in control unit light, dynamotor runs.
4. Set function switch to ANT and rotate VOL control for noise in headset.
5. Turn timing control to receive a radio station.  
FREQUENCY dial changes, tuning meter indicates signal strength and audio heard in headset.
6. Repeat step 3 for remaining frequency bands (2).
7. Set BFO-ON switch to ON and tune to radio station.  
Beat notes can be heard in headset.  
Return to OFF if desired.
8. Tune to radio station of known bearing.
9. Set function switch to LOOP. Hold LOOP L- R switch in L position until null is heard in headset.  
Number 1 needle on ID-998(\*)/U and ID-250/ARN rotates counterclockwise until LOOP L- R switch is released.  
Note bearing indicated by number 1 needle at audio null.



**16-8. DIRECTION FINDING SET AN/ARN-59 OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

10. Hold LOOP L - R switch in R position until audio null is heard in headset.  
Number 1 needle on ID-998(\*)/U and ID-250/ARN rotates clockwise until LOOP L - R switch is released. Bearing indicated by number 1 needle is 180° from bearing in step 9.
11. Use LOOP L - R switch and move number 1 needle 900 (either direction).
12. Set function switch to COMP.  
Number 1 needles rotate and show a bearing of radio station (same as null in step 9 or 10).
13. Set VOL control to OFF.  
Dynamotor stops running.

**Section III. TROUBLESHOOTING****16-9. DIRECTION FINDING SET AN/ARN-59 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Direction Finding Set AN/ARN-59.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or cause of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 1 6-8.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. Control unit lamps do not light.
  - A** Defective lamp.
    - A** Check lamps for proper seating, replace defective lamps.
  - B** Defective interunit cabling or circuit breaker.
    - B** Check connectors, cabling and circuit breakers, repair or replace as necessary.
  - C** Defective control unit.
    - C** Replace C-2275/ARN.
2. Dynamotor does not run.
  - A** Defective interunit cabling.
    - A** Check connectors and cabling, repair or replace as necessary.
  - B** Defective dynamotor.
    - B** Replace DY-150/ARN.



**16-9. DIRECTION FINDING SET AN/ARN-59 TROUBLESHOOTING (AVUM) - Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
3. No audio or intermittent noise in headset; tuning indicator does not indicate signal strength.	<b>A</b> Mechanical linkage out of adjustment.	<b>A</b> Adjust mechanical linkage.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-2275/ARN-59.
	<b>C</b> Defective receiver.	<b>C</b> Replace R-836/ARN.
	<b>D</b> Defective sense antenna.	<b>D</b> Replace 204-075-328 sense antenna.
4. Beat signal (audio note) not heard in headset when BFO switch is set to ON.	<b>A</b> Defective control unit.	<b>A</b> Replace C-2275/ARN-59.
	<b>B</b> Defective receiver.	<b>B</b> Replace R-836/ARN.
5. Indicator needle does not rotate when LOOP L- R switch is actuated.	<b>A</b> Defective loop antenna cabling.	<b>A</b> Check connectors and cabling to loop antenna, repair or replace as necessary.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-2275/ARN-59.
	<b>C</b> Defective loop antenna.	<b>C</b> Replace AT-780/ARN.
6. Audio null not heard when loop antenna is rotated.	<b>A</b> Defective loop antenna cabling.	<b>A</b> Check connectors and cabling to loop antenna, repair or replace as necessary.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-2275/ARN-59.
	<b>C</b> Defective loop antenna.	<b>C</b> Replace AT-780/ARN.
7. Indicators do not point to azimuth of radio station.	<b>A</b> Defective loop antenna cabling.	<b>A</b> Check connectors and cabling to loop antenna, repair or replace as necessary.
	<b>B</b> Defective receiver.	<b>B</b> Replace R-836/ARN.
8. Set does not tune exactly to desired frequency.	<b>A</b> Mechanical linkage not adjusted properly.	<b>A</b> Adjust mechanical linkage.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-2275/ARN-59.
9. Dynamotor does not stop running when VOL control is set to OFF.	<b>A</b> Defective control unit.	<b>A</b> Replace C-2275/ARN-59.



**16-9.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Direction Finding Set AN/ARN-59 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-40 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**16-9.1.1 Signal and Voltage Measurements FAVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	10, 11	Ground	Not applicable	0
TB1	-	Indicator power	28V TRANS and COURSE IND ac circuit breakers energized	26 Vac
TB1	*	Stator X error signal *Wire #RN2905A20	AN/ARN-59 energized	Synchro signal 400 Hz, 26 Vac maximum
TB1	*	Stator Y error signal *Wire #RN2904A20	AN/ARN-59 energized	Synchro signal 400 Hz, 26 Vac maximum
TB19	10	Receiver audio, configurations A and B	AN/ARN-59 energized	Audio hi



**16-9.1.1 Signal and Voltage Measurements (AVUM). - Continued**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB20	6	Receiver audio, configurations C, D and E	AN/ARN-59 energized	Audio hi
TB21	12	AC supply to receiver and loop, configurations A and B	AN/ARN-59 energized	13 Vac, 100 Hz
TB19	12	AC supply to receiver and loop antenna, configurations C, D and E	AN/ARN-59 energized	13 Vac, 100 Hz
P408	1	Primary power	AN/ARN-59 energized	28 Vdc

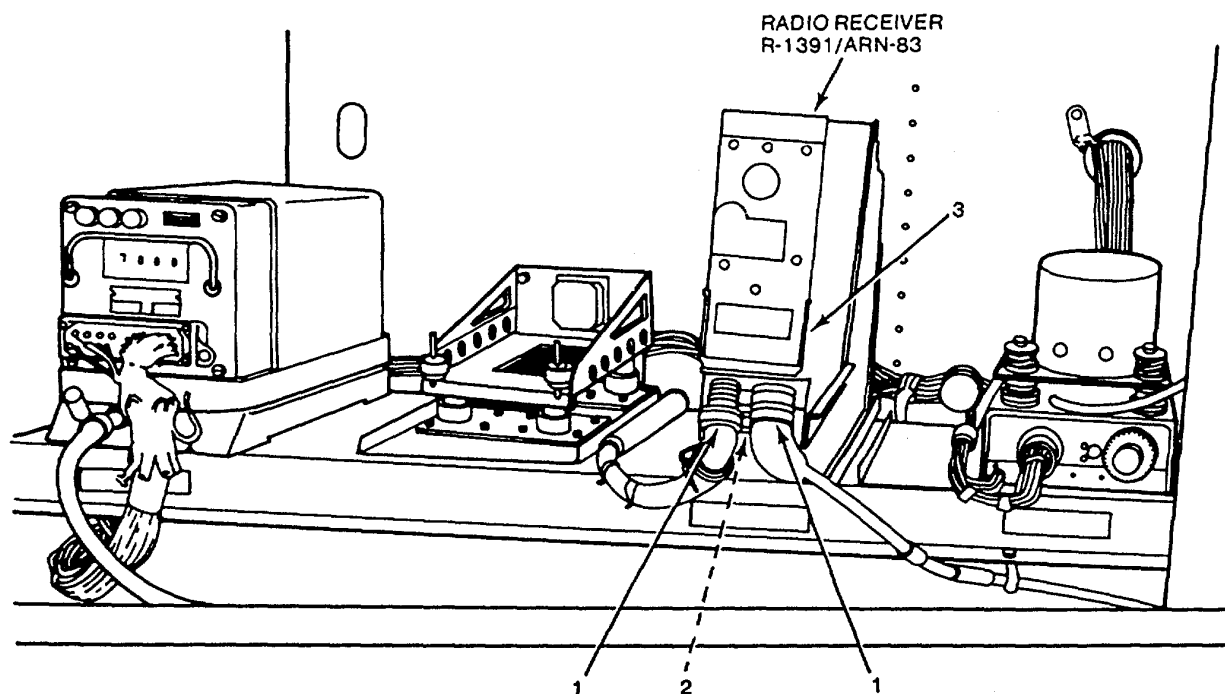


## CHAPTER 17

### DIRECTION FINDING SET AN/ARN-83 MAINTENANCE

Subject	Para.	Page
Receiver R-1391/ARN-83 Maintenance (AVUM) .....	17-1	17-1
Control C-6899/ARN-83 Maintenance (AVUM).....	17-2	17-2
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Antenna AS-1863/ARN-83 Maintenance (AVUM).....	17-4	17-4
Antenna P/N 205-075-325-1 Maintenance (AVUM).....	17-5	17-5
Cabling and Connector Maintenance (AVUM).....	17-6	17-6
Direction Finding Set AN/ARN-83 Operational Checks (AVUM) .....	17-7	17-6
Direction Finding Set AN/ARN-83 Troubleshooting (AVUM).....	17-8	17-7

### Section I. MAINTENANCE PROCEDURES



#### 17-1. RECEIVER R-1391/ARN-83 MAINTENANCE (AVUM)

##### 17-1.1 Removal Instructions.

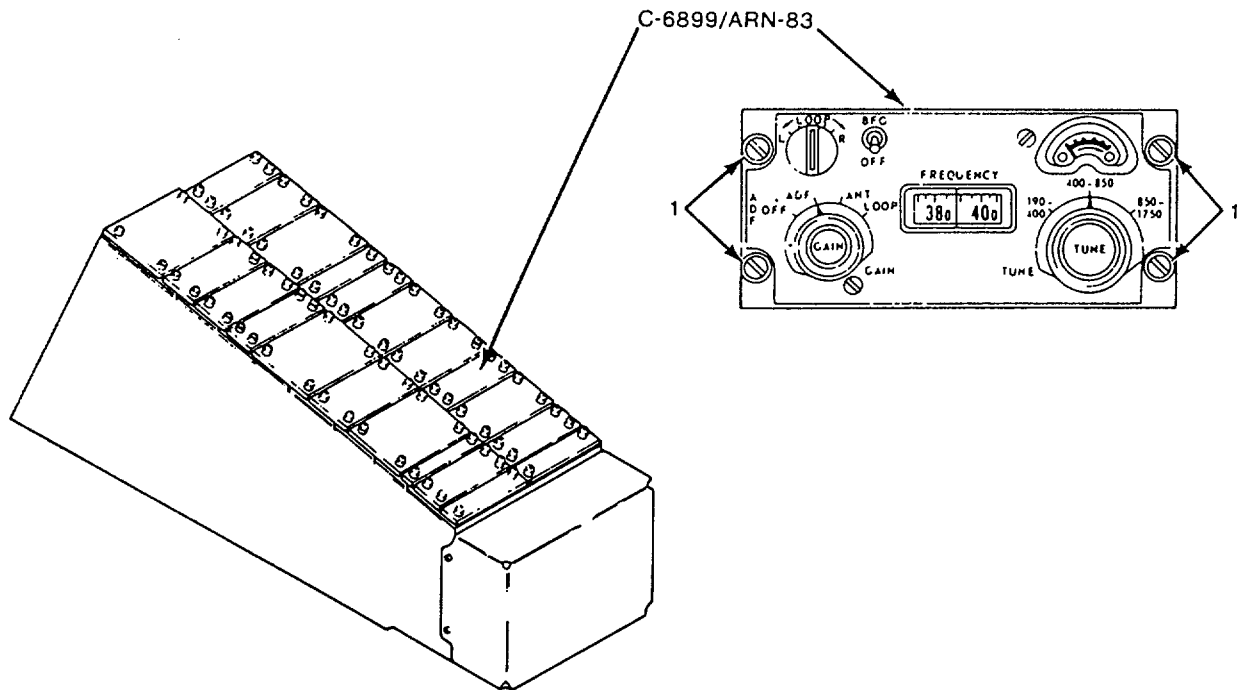
- A Disconnect two antenna cable connectors (1).
- B Cut and remove safety wire from thumb-nut (2).
- C Loosen thumb-nut (2) until clear of flange on front of receiver.
- D Grasp handle (3) and pull receiver forward out of mount.



### 17-1.2 Installation Instructions.

- A Position receiver in mount and carefully slide backward until connector on rear of receiver engages connector on mount.
- B Lift thumb-nut (2) and tighten until thumb-nut is engaged securely over flange on front of receiver.
- C Safety wire thumb-nut.
- D Reconnect two antenna connectors (1) to front of receiver.

### 17-2. CONTROL C-6899/ARN-83 MAINTENANCE (AVUM)



#### NOTE

Position of control in pedestal console varies slightly between models.  
Maintenance procedures are identical.

### 17-2.1 Removal Instructions.

- A Loosen four spring-lock fasteners (1) that secure control to pedestal console.

#### CAUTION

Be careful not to pull control so far from pedestal console that wiring or connector will be damaged.

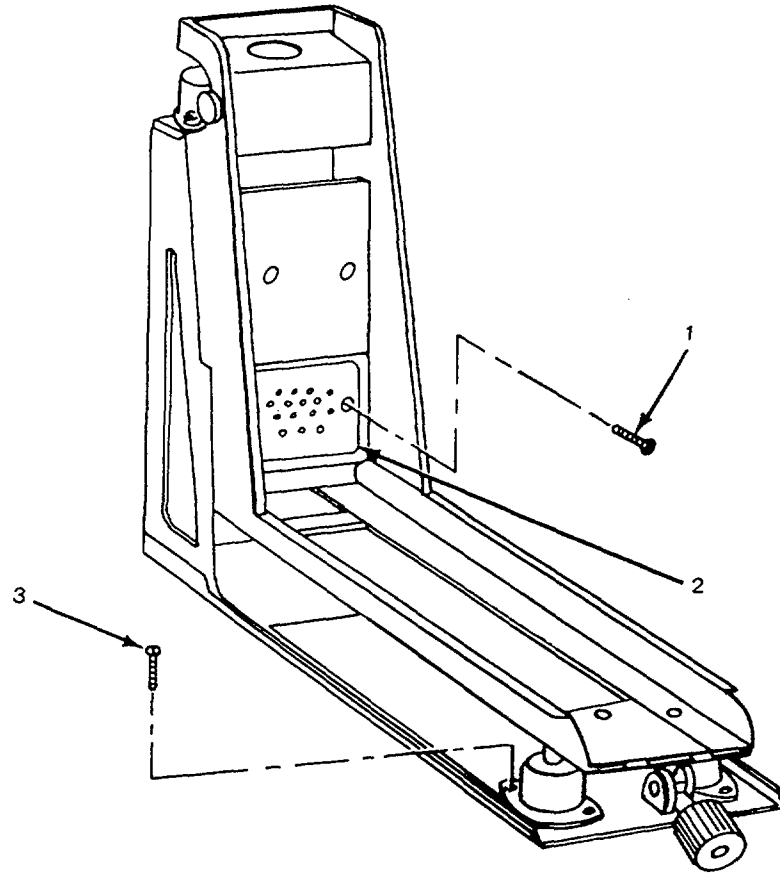
- B Carefully lift control from pedestal console and disconnect electrical connector from rear of control.
- C Remove control.



### 17-2.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connector to rear of control.
- B Position control in pedestal console and secure with four spring-lock fasteners (1).

### 17-3. MOUNT MT-3605/ARN-83 MAINTENANCE (AVUM)



### 17-3.1 Removal Instructions.

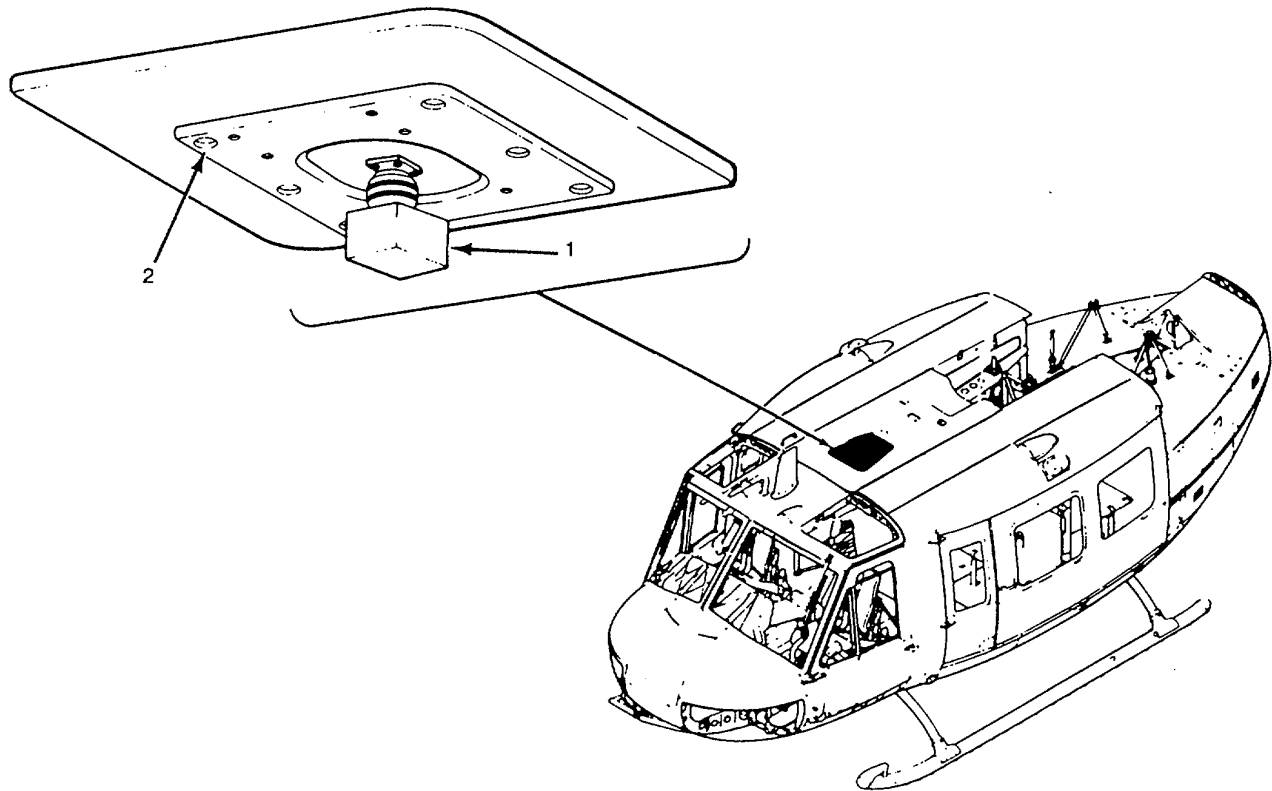
- A Remove R-1 391 /ARN-83 per paragraph 17-1.1.
- B Remove screws (1) that secure electrical connector (2) to mount.
- C Push electrical connector out through rear of mount.
- D Remove eight screws (3) that secure mount to helicopter.
- E Remove mount.

### 17-3.2 Installation Instructions.

- A Insert electrical connector (2) through rear of mount.
- B Position electrical connector and secure to mount using screws (1).
- C Position mount and secure to helicopter using eight screws (3).
- D Install T-1 391/ARN-83 per paragraph 17-1.2.



## 17-4. ANTENNA AS-1863/ARN-83 MAINTENANCE (AVUM)



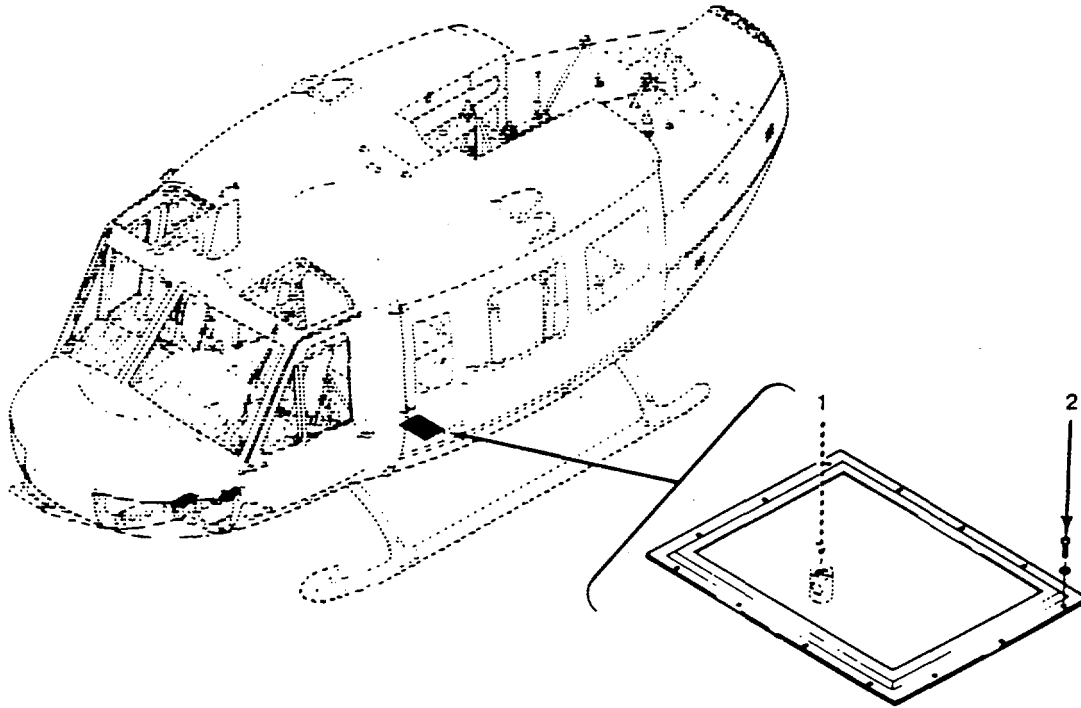
### 17-4.1 Removal Instructions.

- A From inside helicopter, disconnect antenna cable connector (1).
- B From outside helicopter, remove six screws (2).
- C Lift antenna from helicopter roof.
- D Remove any sealant remaining on helicopter roof.

### 17-4.2 Installation Instructions.

- A Apply a small bead of RTV sealant around outside edge of antenna.
- B Position antenna on helicopter roof and secure with six screws (2).
- C From inside helicopter connect antenna cable connector (1) to antenna.



**17-5. ANTENNA P/N 205-075-325-1 MAINTENANCE (AVUM)****17-5.1 Removal Instructions.**

- A** From inside helicopter, disconnect antenna cable connector (1).

**NOTE**

Antenna cable connector can be reached through access door on left side of helicopter, forward end of tail boom.

- B** From outside helicopter, remove 1 3 screws and washers (2).
- C** Remove antenna housing and antenna as a unit.

**17-5.2 Installation Instructions.**

- A** Position antenna housing, with antenna inside, against helicopter skin.
- B** Secure antenna housing with 1 3 screws (2).
- C** From inside helicopter connect antenna cable connector (1) to antenna.
- D** Close and secure access door.



**17-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel.

P404, P406, P407, P302, P403, P401, P402.

- Refer to FO-41 and FO-42 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- RF cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

**Section II. OPERATIONAL CHECKS****17-7. DIRECTION FUNCTION SET AN/ARN-83 OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Direction Finding Set AN/ARC-83 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Equipment Conditions**

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunications Set operational.

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**PROCEDURE****NORMAL INDICATIONS****REMARKS**

---

**POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

1. Depress LF NAV ADF, INTERCOMM CPLT & CREW L. INTERCOMM PILOT & CREW R and COURSE IND circuit breaker.
2. Set function switch to ANT and rotate GAIN control for noise in headset.
3. Turn tuning control to receive a radio station.  
FREQUENCY dial changes, tuning meter indicates signal strength and audio heard in headset.
4. Repeat step 3 for remaining frequency bands (2).



**17-7. DIRECTION FINDING SET AN/ARN-83 OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

5. Set BFO-OFF switch and tune to radio station.  
Beat notes can be heard in headset.  
Return BFO-OFF to OFF if desired.
6. Tune to radio station of known bearing.

**NOTE**

When performing steps 7 and 8 below note that the first detent L or R will rotate the #1 needle slow and second detent L or R will rotate the needle fast.

7. Set function switch to LOOP-Hold LOOP L-R switch in L position until null is heard in headset.  
Number 1 needle on ID-998(\*)/U and ID-250/ARN rotates counterclockwise until LOOP L-R switch is released.  
Note bearing indicated by number 1 needle at audio null.
8. Hold LOOP L-R switch in R position until audio null is heard in headset.  
Number 1 needle on ID-998(\*)/U and ID-250/ARN rotates clockwise until LOOP L-R switch is released. Bearing indicated by number 1 needle is 180 from bearing in step 7.
9. Use LOOP L-R switch and move number 1 needles 90 (either direction).
10. Set function switch to ADF.  
Number 1 needles rotate and show bearing of radio station (same as null in step 7 or 8).

**Section III. TROUBLESHOOTING****17-8. DIRECTION FINDING SET AN/ARN-83 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Direction Finding Set AN/ARN-83.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 17-7.



**17-8. DIRECTION FINDING SET AN/ARN-83 TROUBLESHOOTING (AVUM) - Continued**

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
1. Front panel, tuning meter or dial window lamps not lit.	Control unit lamps burned out.	Replace C-6899/ARN-83.
2. No noise in headset when set is on and GAIN control adjusted fully clockwise.	<b>A</b> Defective receiver.	<b>A</b> Replace R-1391/ARN-83.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-6899/ARN-83.
3. Receiver does not switch frequency range.	<b>A</b> Defective receiver.	<b>A</b> Replace R-1391 /AR N-83.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-6899/ARN-83.
4. No signals received in ANT mode, LOOP and ADF modes normal.	Defective sense antenna.	Replace sense antenna P/N 205-075-325-1.
5. No indication on tuning meter when signal is received.	Defective control unit.	Replace C-6899/ARN-83.
6. With BFO on, no beat notes heard in headset.	Defective receiver.	Replace R-1 391/ARN-83.
7. Null cannot be obtained in loop mode.	<b>A</b> Defective control unit.	<b>A</b> Replace C-6899/ARN-83.
	<b>B</b> Defective receiver.	<b>B</b> Replace R-1391/ARN-83.
	<b>C</b> Defective loop antenna.	<b>C</b> Replace AS-1863/ARN-83.
8. Positioning LOOP switch has not effect on bearing pointers, audio normal.	<b>A</b> Defective control unit.	<b>A</b> Replace C-6899/ARN-83.
	<b>B</b> Defective loop antenna.	<b>B</b> Replace AS-1863/ARN-83.
	<b>C</b> Defective cable between loop antenna and receiver.	<b>C</b> Check antenna cable connections. Replace or repair defective cable.
	<b>D</b> Defective indicator.	<b>D</b> Replace ID-998/ASN.
9. Bearing pointer will not rotate in ADF mode.	<b>A</b> Defective indicator.	<b>A</b> Replace ID-998/ASN.
	<b>B</b> Defective receiver.	<b>B</b> Replace R-1391/ARN-83.



**1-7-8.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Direction Finding Set AN/ARN-83 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO- 41 and FO-42, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Refer to 17-8.1.1 for UH-1 D/H or 17-8.1.2 for UH-1 H.

<b>17-8.1.1 UH-ID/H Signal and Voltage Measurements (AVUM).</b>				
<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB26	5,10, 11	System ground	Not applicable	0
TB12	1	Panel and dial lights	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	6	Audio to intercom	AN/ARN-83 energized and tuned to a station	Audio hi
TB1	8	Stator Y error signal	AN/ARN-83 energized	Synchro signal, 400 Hz, 26 Vac maximum
TB1	9	Stator X error signal	AN/ARN-83 energized	Synchro signal, 400 Hz, 26 Vac maximum
P302	K	Primary power	LF NAV ADF circuit breaker energized	28 Vdc
P407	26	Primary power (switched)	AN/ARN-83 energized	28 Vdc



## 17-8.1.2 UH-1 H Signal and Voltage Measurements (AVUM).

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	3,10	Ground	Not applicable	0
TB19	3	Receiver Audio	AN/ARN-83 energized	Audio hi
TB1	8	Stator Y error signal	AN/ARN-83 energized	Synchro signal, 400 Hz, 26 Vac maximum
TB1	9	Stator X error signal	AN/ARN-83 energized	Synchro signal, 400 Hz, 26 Vac maximum
P302	K	Primary power	AN/ARN-83 energized	28 Vdc
P302	J	Tuning reference signal	AN/ARN-83 energized	26 Vac, 400 Hz
P302	J	Tuning reference signal	AN/ARN-83 energized	26 Vac, 400 Hz
P407	26	Switched power to receiver	AN/ARN-83 energized	28 Vdc
P407	8	Tuning reference signal	AN/ARN-83 energized	26 Vac, 400 Hz
P407	18	Bearing data reference signal	AN/ARN-83 energized	26 Vac, 400 Hz

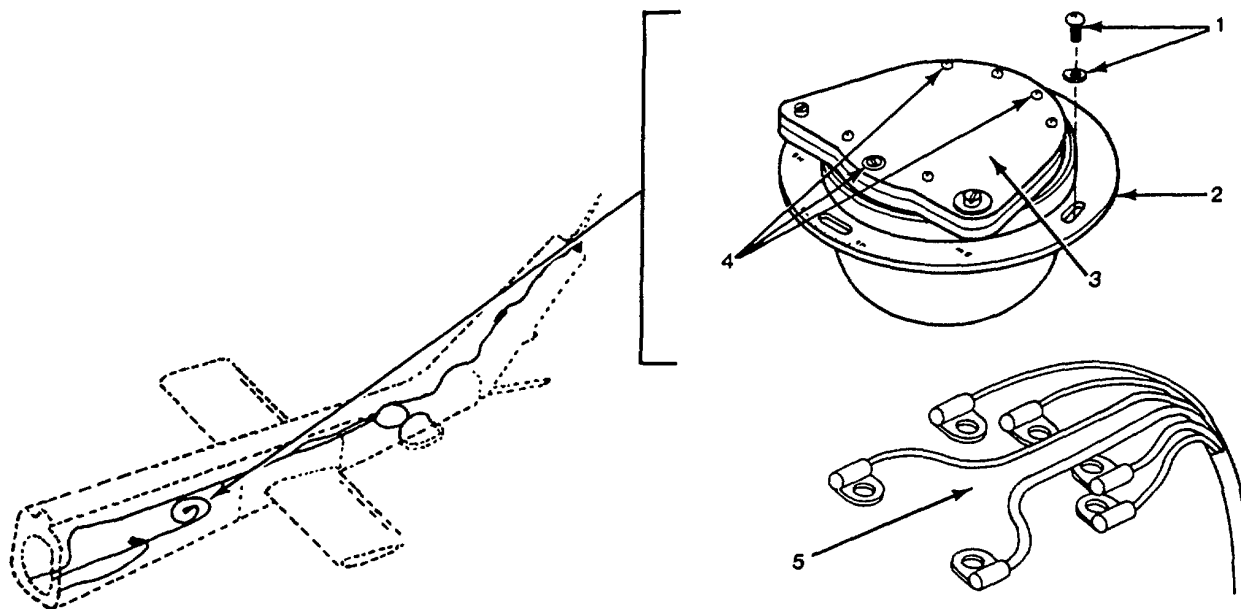


**CHAPTER 18**  
**MAGNETIC COMPASS SYSTEM J2 OR GYROMAGNETIC COMPASS**  
**SET AN/ASN-43 MAINTENANCE**

Subject	Para.	Page
Induction Compass Transmitter C-2 or Induction Compass Transmitter T-61 1 /ASN and Magnetic Flux Compensator CN-405/ASN Maintenance(AVUM) .....	18-1	18-1
Electrically Driven Gyro Control Type S-3A Maintenance (AVU M) .....	18-2	18-2
Electronic Amplifier Type A-2 Maintenance (AVUM) .....	18-3	18-3
.....	18-3	
Directional Gyro CN-998/ASN Maintenance (AVU M) .....	18-4	18-4
Electronic Control Amplifier AM-3209(*)/ASN Maintenance (AVUM).....	18-5	18-5
Cabling and Connector Maintenance (AVUM).....	18-6	18-5
Gyromagnetic Compass Set AN/ASN-43 and Standby Magnetic Compass Alinement(AVIM).....	18-7	18-6
Magnetic Compass System J2 Operational Checks (AVUM).....	18-8	18-11
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**Section I. MAINTENANCE PROCEDURES**

**18-1. INDUCTION COMPASS TRANSMITTER C-2 OR INDUCTION COMPASS TRANSMITTER T-611/ASN AND MAGNETIC FLUX COMPENSATOR CN-405/ASN MAINTENANCE (AVUM)**



**NOTE**

The induction compass transmitter and compensator are mechanically and electrically connected. Removal or installation of one requires removal or installation of the other.

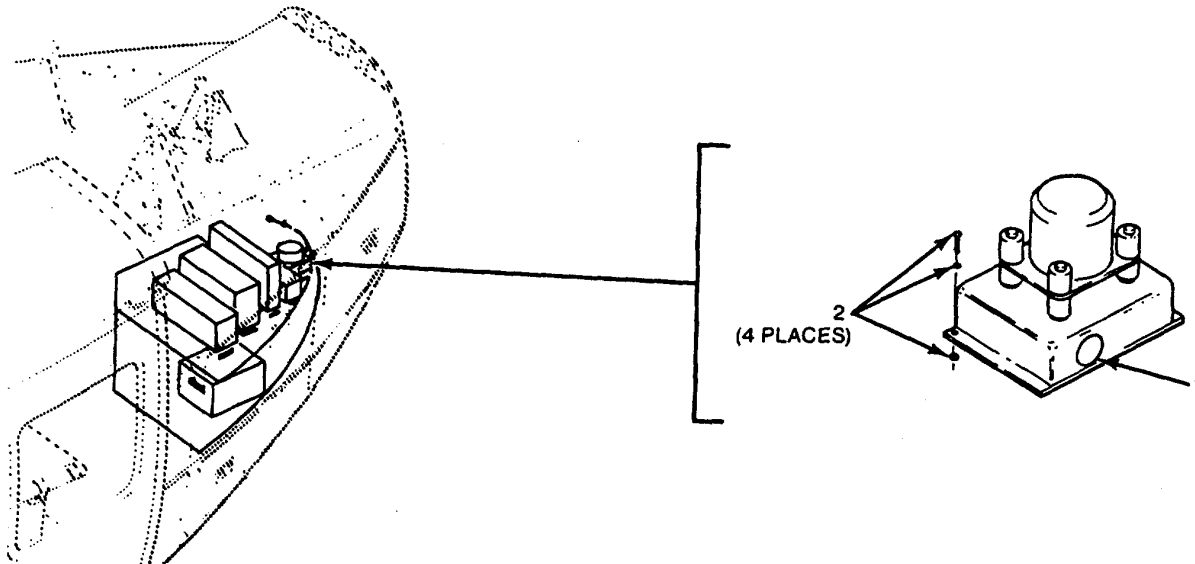


**18-1.1 Removal Instructions.**

- A** Remove three screws and washers (1) that secure compass transmitter to mounting bracket.
- B** Lift transmitter (2) and compensator (3) from mounting bracket.
- C** Remove three screws (4) that secure compensator to transmitter.
- D** Separate transmitter (2) and compensator (3).
- E** Tag six wires (5), attached to compass transmitter, for later identification.
- F** Remove six nuts and washers (not shown), then disconnect wiring.
- G** Remove transmitter or compensator.

**18-1.2 Installation Instructions.**

- A** Connect six wires (5) to compass transmitter, secure with six nuts and washers, then remove
- B** Position compensator (3) on transmitter (2) and secure with three screws (4).
- C** Position assembled compensator and compass transmitter on mounting bracket and secure with three screws and washers (1).

**18-2. ELECTRICALLY DRIVEN GYRO CONTROL TYPE S-3A MAINTENANCE (AVUM)****NOTE**

Exact location in aft electronic compartment varies between configurations.



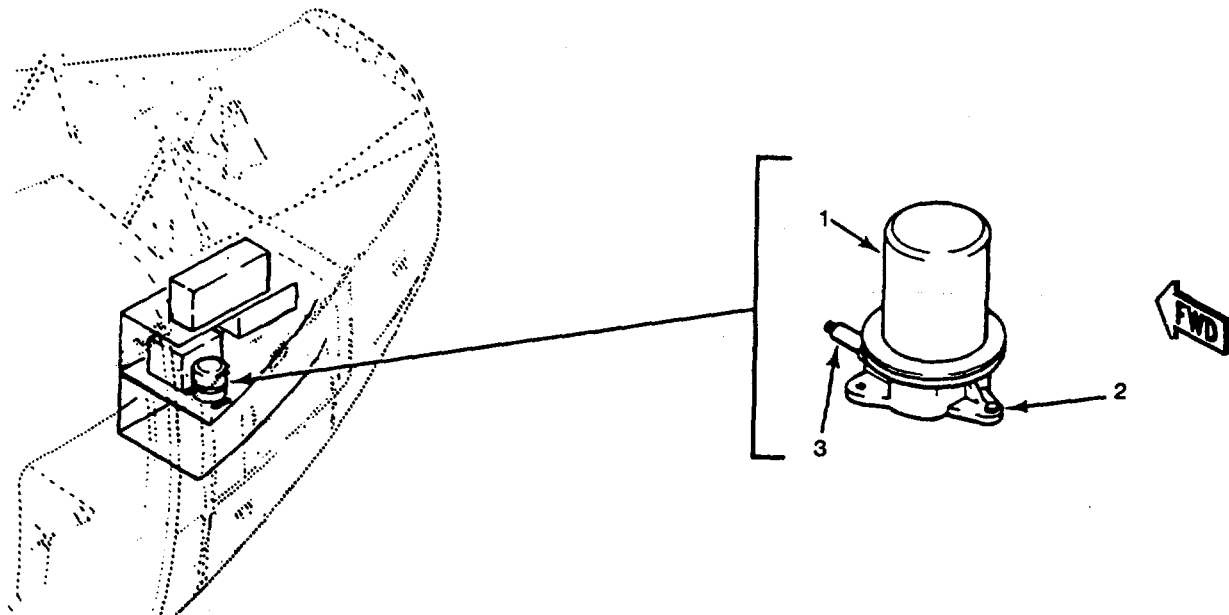
### 18-2.1 Removal Instructions.

- A Disconnect electrical connector (3).
- B Remove three nuts, bolts and washers (2) that secure gyro control (1) to shelf.
- C Remove gyro control.

### 18-2.2 Installation Instructions.

- A Position gyro control (1) on shelf and secure with three nuts, bolts and washers (2).
- B Connect electrical connector (3).

## 18-3. ELECTRONIC AMPLIFIER TYPE A-2 MAINTENANCE (AVUM)



### NOTE

Exact location in aft electronic compartment varies between configurations.

### 18-3.1 Removal Instructions.

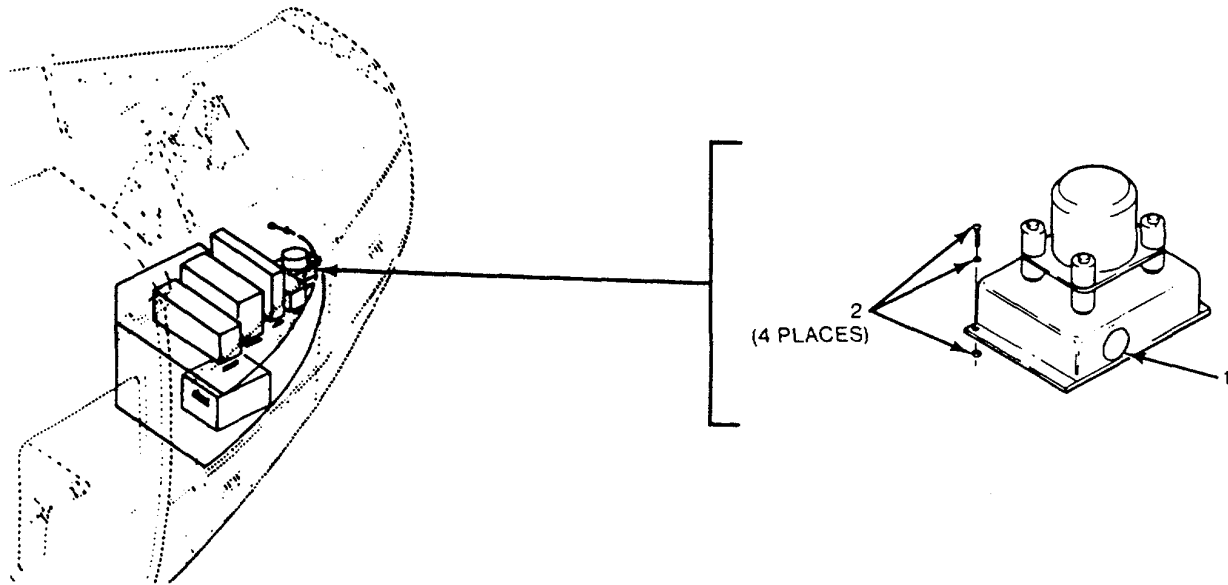
- A Cut safety wire and disconnect electrical connector (1).
- B Cut safety wire and disengage snap slide fasteners (2).
- C Remove compass amplifier from mounting studs.



### 18-3.2 Installation Instructions.

- A Position amplifier on mounting studs and engage snap-slide fasteners (2).
- B Connect electrical connector (1).
- C Safety wire snap-slide fasteners (2) and electrical connector (1).

### 18-4. DIRECTIONAL GYRO CN-998/ASN MAINTENANCE (AVUM)



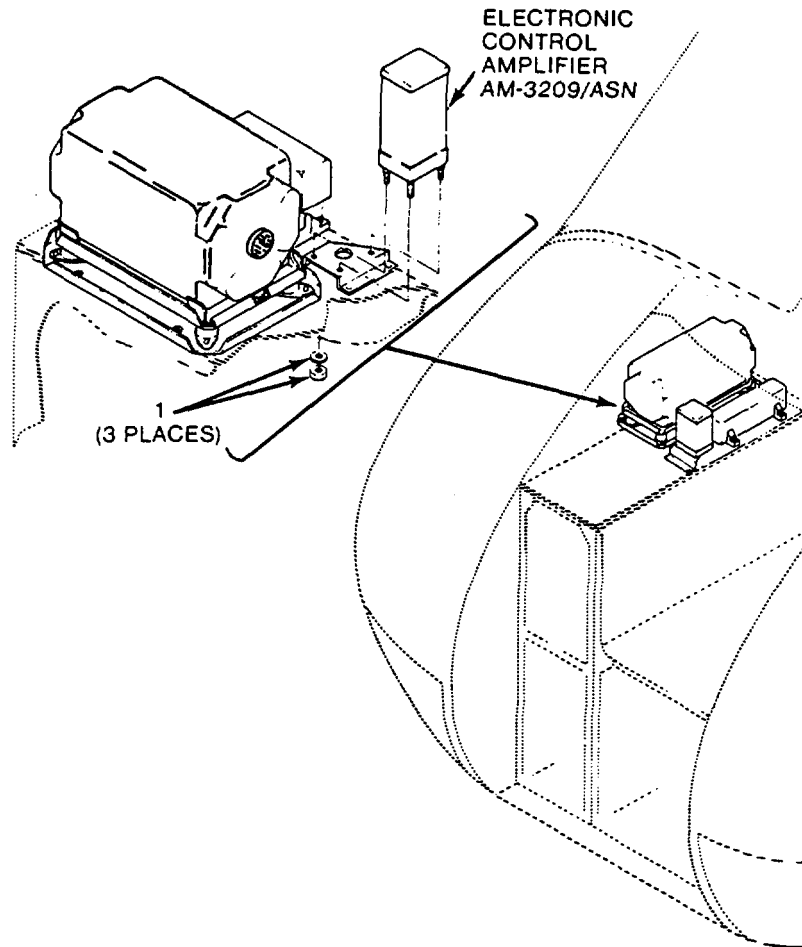
### 18-4.1 Removal Instructions.

- A Disconnect electrical connector (1).
- B Remove four screws, nuts and washers (2) that secure CN-998/ASN to electrical compartment shelf.
- C Remove CN-998/ASN.

### 18-4.2 Installation Instructions.

- A Position CN-998/ASN on electrical compartment shelf and secure with four screws, nuts and washers (2).
- B Connect electrical connector (1).



**18-5. ELECTRONIC CONTROL AMPLIFIER AM-3209(\*)/ASN MAINTENANCE (AVUM)****18-5.1 Removal Instructions.**

- A** Remove three nuts and washers (1) that secure AM-3209/ASN to mounting bracket.
- B** Carefully lift AM-3209/ASN up from mating connector.

**18-5.2 Installation Instructions.**

- A** Carefully insert AM-3209/ASN into mating connector.
- B** Secure AM-3209/ASN mounting bracket with three nuts and washers (1).

**18-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Compass System J2 connectors, and cabling between them, that may be repaired or replaced by AVUM personnel are:  
P410, J410, P411, P412, P413, P409, P506 and J506.
- Compass Set AN/ASN-43 connectors, and cabling between them, that may be repaired or replaced by AVUM personnel are:  
P410, J410, P411, P409, P415, P506 and J506.



**18-6. CABLING AND CONNECTOR MAINTENANCE (AVUM) - Continued**

- Refer to FO-43 for wiring data on J2 compass system, or FO-44 and FO-45 for AN/ASN-43 compass set.
- Cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Paragraph 2-5 contains general wiring repair information.

**18-7. GYROMAGNETIC COMPASS SET AN/ASN-43 AND STANDBY MAGNETIC COMPASS ALINEMENT (AVIM)**

Alinement must be accompanied when any of the following occurs:

- Annually.
- After replacing Induction Compass Transmitter T-61 1 (\*)/ASN, Magnetic Flux Compensator CN-405(\*)/ASN, Directional Gyro CN-998/ASN-43 or Standby Magnetic Compass AQU-5(\*).
- Whenever frequent navigation errors are reported.

**NOTE**

Steps A thru I of this procedure ensure the compass set is operational. They do not serve as an accuracy check and may be performed in or near hanger or on compass rose.

**INITIAL SETUP****Tools Required**

Alinement Tool Kit 1 8-530.

**Equipment Conditions**

Helicopter on compass rose.

**Personnel Required**

One soldier to operate helicopter engine and one technician.

Helicopter engine running (auxiliary power unit may be used for steps A thru O).

- A** Depress GYRO and COURSE IND circuit breakers on ac circuit breaker panel. ID-998/ASN power failure indicator (OFF flag) should disappear and panel lamps light.
- B** Set MAG/DG switch, on instrument panel, to MAG.
- C** Engage and turn ID-998/ASN synchronizing knob in each direction. Compass card should rotate smoothly and in conjunction with synchronizing knob.
- D** Synchronize system. (Turn synchronizing knob in direction indicated by annunciator until annunciator is centered.)

**NOTE**

If helicopter engine is not running, indicator should be tapped lightly before reading.



**18-7. GYROMAGNETIC COMPASS SET AN/ASN-43 AND STANDBY MAGNETIC COMPASS ALINEMENT (AVIM) - Continued**

- E** Engage and turn synchronizing knob clockwise until heading indication increases by 10 degrees. Annunciator should deflect to a dot ( ).
- F** Check that compass card indicates slaving downscale.
- G** Synchronize system (Step D above).
- H** Engage and turn synchronizing knob counterclockwise until heading indication decreased by 10 degrees. Annunciator should deflect to a cross (+). Check that compass card indicates slaving upscale.

**CAUTION**

Do not move helicopter for 25 minutes after power has been removed from AN/ASN-43 or MD-1 (pilot's attitude indicating gyro). If helicopter is moved before gyro's come to rest, serious gyro damage may result. If, however, helicopter must be moved after shutdown, reapply power to AN/ASN-43 and/or MD-1. After 5 minutes, helicopter may be safely moved.

**NOTE**

The remaining steps in this procedure should be performed with helicopter on compass rose.

- J** Secure all equipment in position occupied during normal flight. Place all controls and levers in normal position.
- K** Ensure personnel near remote compass transmitter (tail section of helicopter) or magnetic standby compass have no magnetic material on their person. (Magnetic materials may include tools, pocket knives, mechanical pencils, metal watchbands, eyeglasses with magnetic frames, badges, etc.)
- L** Any jack, lift, hoist or dolly used to lift helicopter to level flight position should be nonmagnetic.

**NOTE**

If magnetic parts are used, or if in doubt, check the effect device has on the compass. Measure distance the device will be from remote transmitter; using that distance as radius, have device moved in a circle around helicopter while observing compass indicator. If heading changes more than 1/4 degree, device should not be used.

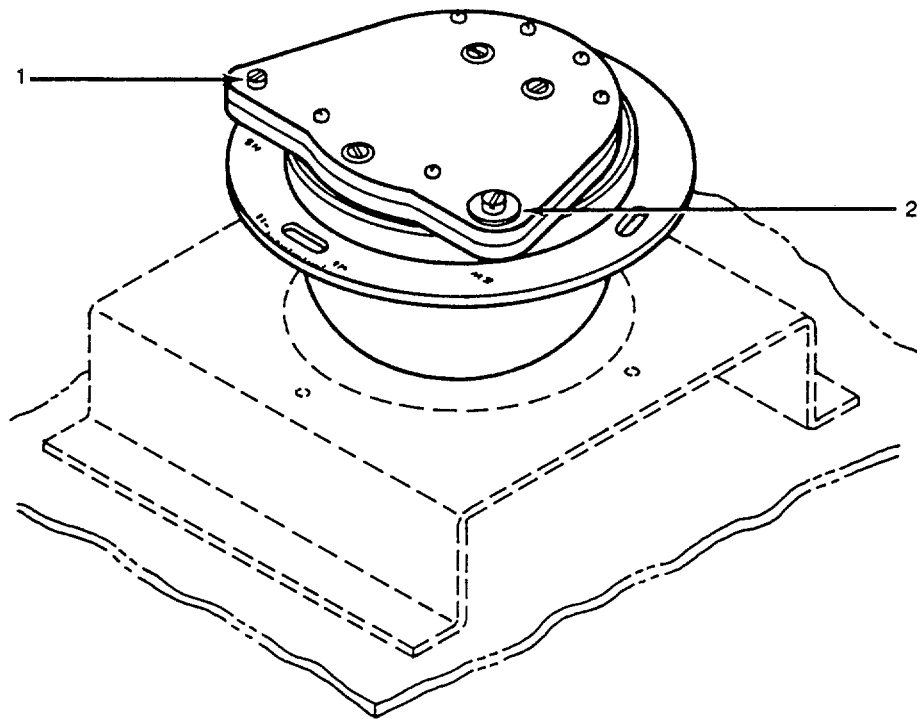
- M** Remove magnetic objects such as trucks, automobiles or other aircraft from compass rose area to a point where they will have no magnetic effect on compass system.

**NOTE**

Compass system must have been energized and operating in slaved (MAG) mode for at least 10 minutes before proceeding. Aline gyromagnetic and standby magnetic compass at same time.



# **18-7. GYROMAGNETIC COMPASS SET AN/ASN-43 AND STANDBY MAGNETIC COMPASS ALINEMENT (AVIM) - Continued**



**N** Set N-S(1) and E-W(2) flux valve compensator screws to null effect by aligning dots on screws with dot on compensator case.

**O** Loosen compensator mounting screws (3) and align index mark with helicopter fore and aft centerline.

## **NOTE**

If an auxiliary power unit has been used, aircraft engine should be started and run at flight rpm for the remaining steps. Helicopter should be positioned on compass rose.

**P** Energize all electrical/avionics equipment normally used during flight.

**Q** Slowly rotate helicopter 360 degrees. I D-998/ASN compass card should smoothly follow helicopter rotation and indicate approximately the heading marked on compass rose.

**R** Place helicopter on compass rose magnetic east (90 degrees) heading. Note compass indicated heading of both gyromagnetic and standby magnetic compass.

**S** Repeat step R above, on south (180 degrees), west (270 degrees), and north (360 or 000 degrees) magnetic heading.

**T** While helicopter is still on the north (360 or 000 degrees) heading, compute coefficient A as shown below in the example:



**18-7. GYROMAGNETIC COMPASS SET AN/ASN-43 AND STANDBY MAGNETIC COMPASS ALINEMENT (AVIM)- Continued**

Magnetic Heading (Compass Rose)		Compass Reading (Helicopter)	Deviation
E	(090 )	091	+1
S	(180 )	182	+2
W	(270 )	272	+2
N	(000 )	359	-1

Coefficient A:

$$A = \frac{E+S + W+N \text{ (deviation)}}{4}$$

$$A = \frac{+1 -2 +2 -1}{4}$$

$$A = \frac{+4 = +1}{4}$$

**U** Rotate compass transmitter to change ID-998/ASN reading an amount equal to and of opposite algebraic sign to coefficient A.

**V** Repeat steps R thru U, to obtain smallest possible coefficient A.

**W** Record final cardinal headings. Tighten and lock mounting screws.

**X** Position helicopter on north magnetic heading and compute coefficient C as shown below.

Magnetic Heading	Compass Reading*	Deviation
000°	359°	-1°
180°	*181°	+1°

Coefficient C:

$$C = \frac{N-S}{2}$$

$$C = \frac{-2 = -1}{2}$$

\*Obtained from final recorded headings of step W above.



# 18-7. GYROMAGNETIC COMPASS SET AN/ASN-43 AND STANDBY MAGNETIC COMPASS ALINEMENT (AVIM) - Continued

Y Adjust N-S compensator screw to change I D-998/ASN reading on amount equal to and of opposite algebraic sign to coefficient C.

Z Position helicopter on east magnetic heading and compute coefficient B as shown below.

Magnetic Heading	Compass Reading*	Deviation
090°	089°	-1.0°
270°	*270.5	+0.5°

Coefficient B:

$$B = \frac{E - W}{2}$$

$$B = \frac{-1 - (+0.5)}{2} = \frac{-1.5}{2} = -0.75^\circ$$

\* Obtained from final recorded headings in step W above.

**AA** Recheck cardinal headings (N, S, E, W) and readjust if necessary.

## NOTE

When marked cardinal heading lines are within 1/2 degree of magnetic direction, coefficients B and C shall be 1/2 degree or less.

**AB** Position helicopter on 12 headings (each 30 degrees of compass rose). Record deviation on flight operation log planning sheet and in assembly and inspect log for re-recording on compass correction cards (if required). **AC** Record serial number of following units on serial number sheet in assembly and inspection log and on reverse side of compass card (if required).

Transmitter, Induction Compass T-61 1 (\*)/ASN  
Compensator, Magnetic Flux CN-405(\*)/ASN  
Compass, Standby Magnetic AQU-5A

## NOTE

Should any of units listed in ac above fail during or after compass rose swing, repeat alinement procedures.

**AD** Seal N-S(1) and E-W(2) flux valve compensator screws by filling recessed portion of screws with inspection torque laquer.



## Section II. OPERATIONAL CHECKS

### 18-8. MAGNETIC COMPASS SYSTEM J2 OPERATIONAL CHECKS (AVUM]

These checks are used to ensure Magnetic Compass System J2 is performing properly. They are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Equipment Conditions

Reference: Paragraph 1-50, auxiliary

Power Unit connected.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.
3. Rotate SET HDG control in both directions.  
Heading dial and points rotate smoothly.
4. Check desiccant crystals in humidity indicator.  
Crystals should be blue.
5. Check mechanical action of slaving cutout switch.  
No binding of switch.

#### POWER ON CHECKS

1. Energize helicopter ac and dc electrical systems.  
NONE  
Energizing helicopter electrical systems applies power to the compass systems.
2. Set compass slaving switch to IN.  
Indicator compass cards should indicate correct heading plus or minus 2 degrees.  
If necessary, ground-swing helicopter to known magnetic heading.



**18-9. GYROMAGNETIC COMPASS SET AN/ASN43 OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Gyromagnetic Compass Set AN/ASN-43 is performing properly. They are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Equipment Conditions**

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.
3. On base of CN-998/ASN (located in forward radio compartment) set LATTITUDE knob to local latitude, and LATTITUDE switch to N for northern hemisphere operations or S for southern hemisphere operations.

**POWER ON CHECKS**

1. Depress GYRO CMPS and COURSE IND circuit breakers.  
Power failure indicator on ID-998/ASN disappears, lamps light in ID-998/ASN and ID-250/ ARN.
2. On instrument panel set MAG-DG switch to MAG.
3. On ID-998(\*)/ASN, turn synchronizing knob in direction indicated by annunciator until annunciator is centered (nulled).  
Magnetic heading indicated on ID-998(\*)/ASN should agree with known magnetic heading, ID-250/ARN heading agrees with ID-998/ASN.
4. Turn SYN knob until heading is 10 degrees greater than that in step 3. Observe that the IND. starts to slave back to heading. Repeat for 10 degrees less than the heading noted in step 3.
5. On instrument panel, set MAG-DG switch to DG.  
On ID-998(\*)/ASN, annunciator moves to center position and remains.
6. On ID-998(\*)/ASN rotate synchronizing knob to set scale dial to a known heading reference.  
Annunciator remains centered.
7. Deenergize (pull) GYRO CMPS circuit breaker.  
On ID-998(\*)/ASN, power failure indicator appears, panel lamps remain lit.



## Section III. TROUBLESHOOTING

**18-10. MAGNETIC COMPASS SYSTEM J2 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Magnetic Compass System J2.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 18-8.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Heading dial and pointer do not rotate freely.	A Defective indicator.	A Replace indicator.
2. SET HDG control does not rotate freely or has no effect on indicator.	A Setscrew worn or improperly adjusted.	A Replace or adjust setscrew as required.
	B Defective indicator.	B Replace indicator.
3. Desiccant crystals are pink.	A Saturated crystals.	A Replace crystals.
4. Indicator heading error greater than 2°.	A Defective indicator.	A Replace indicator.
	B Compass out of alignment.	B Refer to AVIM personnel.

**18-10.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Magnetic Compass System J2 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-43 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.



**18-10.1 Signal and Voltage Measurements (AVUM). - Continued**

- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operation required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**18-10.1.1 Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
10	5, 6	Ground	Not applicable	0
10	1, 2	Primary AC power, phase C	J2 system energized	115 Vac, 400 Hz
10	3	Primary AC power, phase A	J2 system energized	115 Vac, 400 Hz
10	4	Primary DC power	J2 system energized	28 Vdc

**18-11. GYROMAGNETIC COMPASS SET AN/ASN-43 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Gyromagnetic Compass Set AN/ASN-43.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 18-9.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Power failure indicator does not disappear and panel lamps do not light.	<p><b>A</b> Defective indicator.</p> <p><b>B</b> Defective directional gyro.</p> <p><b>C</b> Defective interconnecting cables or connector.</p>	<p><b>A</b> Replace I D-998/ASN.</p> <p><b>B</b> Replace CN-998/ASN-43.</p> <p><b>C</b> Repair or replace cabling on connector.</p>



**18-11. GYROMAGNETIC COMPASS SET AN/ASN-43 TROUBLESHOOTING (AVUM) - Continued****SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

- 
- |          |   |
|----------|---|
| 2.       | Annunciator does not move when synchronizing knob on ID-998/ASN is turned.                              |
| <b>A</b> | Defective directional gyro.<br><b>A</b> Replace CN-998/ASN-43.  |
| <b>B</b> | Defective indicator.<br><b>B</b> Replace ID-998/ASN.  |
| <b>C</b> | Defective compass transmitter.<br><b>C</b> Replace T-61 1/ASN.  |
| <b>D</b> | Defective compensator.<br><b>D</b> Replace CN-405/ASN.  |
|          |   |
| 3.       | ID-998/ASN scale dial does not move, but annunciator reacts properly.                                   |
| <b>A</b> | Defective indicator.<br><b>A</b> Replace ID-998/ASN.  |
| <b>B</b> | Defective control amplifier.<br><b>B</b> Replace AM-3209/ASN.   |
| 4.       | Annunciator will not center (or continue to move) when MAG/DG switch is set to DG.                      |
| <b>A</b> | Defective MAG/DG switch.<br><b>A</b> Replace MAG/DG switch.   |
| <b>B</b> | Defective directional gyro.<br><b>B</b> Replace CN-998/ASN-43.  |
| 5.       | Annunciator does not remain centered when in DG mode and known heading is selected.                     |
| <b>A</b> | Defective MAG/DG switch.<br><b>A</b> Replace MAG/DG switch.   |
| <b>B</b> | Defective directional gyro.<br><b>B</b> Replace CN-998/ASN-43.  |
| 6.       | ID-250/ARN compass card does not follow ID-998/ASN.   |
| <b>A</b> | Defective I D-250/ARN.<br><b>A</b> Replace ID-250/ARN.  |
| <b>B</b> | Defective ID-998/ASN.<br><b>B</b> Replace ID-998/ARN.   |
| 7.       | Power failure indicator does not appear and panel lamps remain lit when circuit breaker is deenergized. |
| <b>A</b> | Defective indicator.<br><b>A</b> Replace I D-998/ASN.   |
- 

**18-11.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Gyromagnetic Compass System AN/ASN-43 and the preceding operational checks and troubleshooting chart do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-45 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.



**18-11.1 Signal and Voltage Measurements (AVUM) - Continued**

- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operation required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB10 TB10	4,5,6,7 1, 2	System ground Primary power	Not applicable GYRO CMPS circuit breaker energized	0 115 Vac, 400 Hz
TB1	12	Indicator rotor	28V TRANS and COURSE IND circuit breakers energized	26 Vac, 400 Hz
P415	7	Primary power (AM-3209(*)/ASN)	GYRO CMPS circuit breaker energized	115 Vac, 400 Hz



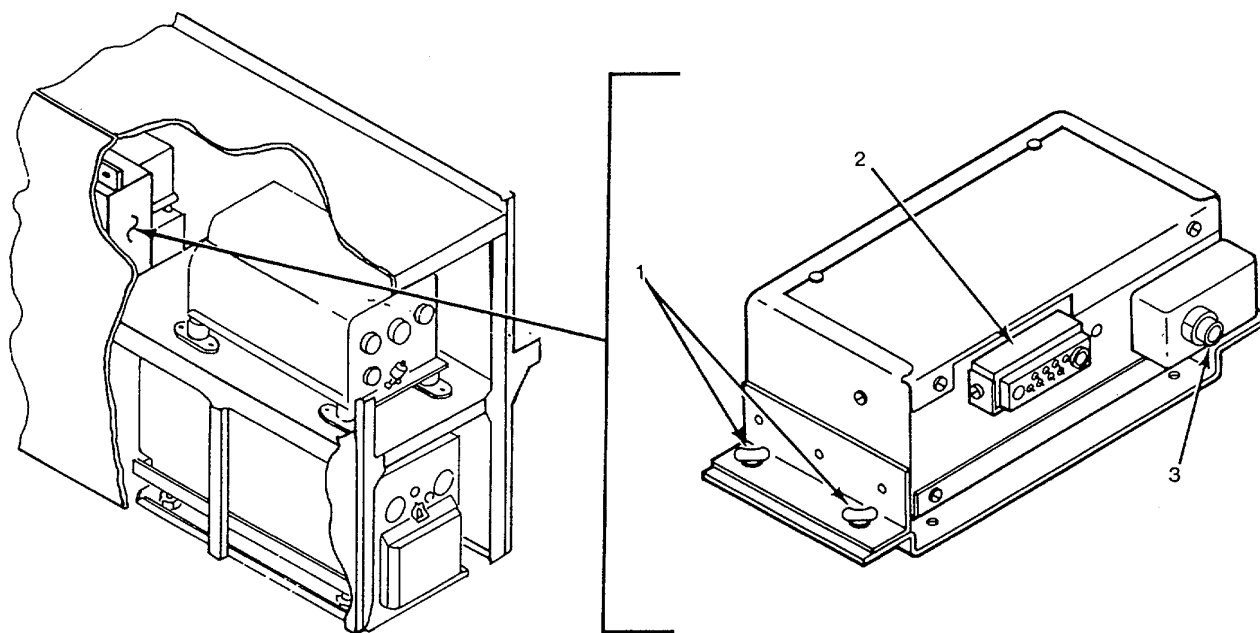
## CHAPTER 19

### MARKER BEACON RECEIVER R-1041(\*)/ARN MAINTENANCE

Subject	Para.	Page
Receiver R-1 041 (*)/ARN Maintenance (AVUM).....	19-1	19-1
Antenna AT-640/ARN Maintenance (AVUM).....	19-2	19-2
Cabling and Connector Maintenance (AVUM).....	19-3	19-2
Marker Beacon Receiver R-1041(*)/ARN Operational Checks (AVUM).....	19-4	19-2
Marker Beacon Receiver R-1041 (*)/ARN Troubleshooting (AVUM).....	19-5	19-3

#### Section I. MAINTENANCE PROCEDURES

#### 19-1 RECEIVER R-1041(\*)/ARN MAINTENANCE (AVUM)



##### 19-1.1 Removal Instructions.

- A Remove R-1 388/ARN-82 per paragraph 21-1.1.
- B Loosen four spring-lock fasteners (1) and pull receiver slightly forward.
- C Disconnect coaxial connector (3).
- D Loosen two captive screws (not shown) and disconnect electrical connector (2).
- E Remove receiver.



## 19-1.2 Installation Instructions.

- A Engage electrical connector (3) and tighten two captive screws.'
- B Connect coaxial connector (2).
- C Position receiver and secure with four spring-lock fasteners (1).
- D Install R-1388/ARN-82 per paragraph 21-1.2.

## 19-2. ANTENNA AT-640/ARN MAINTENANCE (AVUM)

Refer to paragraph 22-2 for AT-640(\*)/ARN maintenance.

## 19-3. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
P501, P506, J506, P502, P503
- Paragraph 2-5 contains general wiring repair information.
- Refer to FO-46 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- RF cables are repaired by replacing connectors or coaxial cable.

## Section II. OPERATIONAL CHECKS

## 19-4. MARKER BEACON RECEIVER R-1041(\*)/ARN OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Marker Beacon Receiver R-1041 (\*)/ARN is performing properly. The checks are also used after repairs to make sure the problem was fixed.

## INITIAL SETUP

### Test Equipment

Test Oscillator BC-376(\*)/U  
or  
Receiver Test Set AN/ARM-1 86

### Equipment Conditions

Reference  
Paragraph 1-50 Auxiliary Power Unit  
connected.

### Personnel Required

Two Technicians

Paragraph 14-13 Intercommunications Set  
operational.

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.



## 19-4. MARKER BEACON RECEIVER R-1041(\*)/ARN OPERATIONAL CHECKS (AVUM) - Continued

### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

### POWER ON CHECKS WITH TEST OSCILLATOR BC-376(\*)/U

1. Depress MARKER BEACON R-1 041, INTERCOMM CPLT & CREW L and INTERCOMM PILOT & CREW R circuit breakers.
2. On instrument panel set marker beacon ON/OFF/VOLUME control midposition and SENS switch to HIGH.
3. Set BC-376(\*)/U power ON, fully extend antenna and position oscillator 10 to 20 feet from marker beacon antenna.
4. Move BC-376(\*)/U closer to marker beacon antenna until strong signal is heard in headset.
5. On BC-376(\*)/U set MODULATION to 400 Hz.  
On instrument panel, marker beacon indicator lamp lights and 400 Hz tone heard in headset.
6. On BC-376(\*)/U set MODULATION to 1300 Hz then 3000-Hz.  
On instrument panel, marker beacon indicator lamp lights and corresponding tone heard in headset.
7. On instrument panel set marker beacon SENS switch to LOW.  
On instrument panel, marker beacon indicator lamp goes out.
8. On BC-376(\*)/U increase rf output until marker beacon indicator lamp (on instrument panel) lights.  
Marker beacon indicator lamp lights and tone heard in headset.
9. On instrument panel, rotate ON/OFF/VOLUME control throughout its range.  
Marker beacon audio level should vary smoothly with no chirps or dead spots.

### NOTE

Steps 1-9 for Test Oscillator BC-376(\*)/U only. Refer to TM 11-6625-2976-12 AN/ARM186 Operators Manual for operational checks with the AN/ARM-186.

## Section III. TROUBLESHOOTING

### 19-5. MARKER BEACON RECEIVER R-1041 ARN TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in Marker Beacon Receiver R-1041(\*)/ARN.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 19-4.
-



**19-5. MARKER BEACON RECEIVER R-1041/ARN TROUBLESHOOTING (AVUM) - Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Indicator lamp does not light when pressed.	Defective indicator lamp.	Replace lamp.
Audio tone inaudible and/or indicator lamp does not light.	<b>A</b> Defective circuit breaker.	<b>A</b> Reset or replace circuit breaker.
	<b>B</b> Defective receiver.	<b>B</b> Replace R-1041/ARN.
	<b>C</b> Defective indicator lamp.	<b>C</b> Replace lamp.

**19-5.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Marker Beacon Receiver R-1041 (\*)/ARN and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-46 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

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**4-8.1.1 UH-1D/H Signal and Voltage Measurements (AVUM)**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB26	3	Ground	Not applicable	0
TB20	8	Receiver audio (except configuration B)	R-1041 (*)/ARN energized and receiving signal	Audio hi
TB19	1	Receiver audio (configuration B only)	R-1 041 (*)/ARN energized and receiving signal	Audio hi
TB63	9	Receiver audio, crew R and crew L, on UH-1 H only	R-1 041 (*)/ARN energized and receiving signal	Audio hi
J506	M	Primary power	R-1041 (*)/ARN energized	28 Vdc
P501	E	Switch primary power	R-1 041 (*)/ARN energized	28 Vdc
P501	<b>A</b>	Ground	Not applicable	0

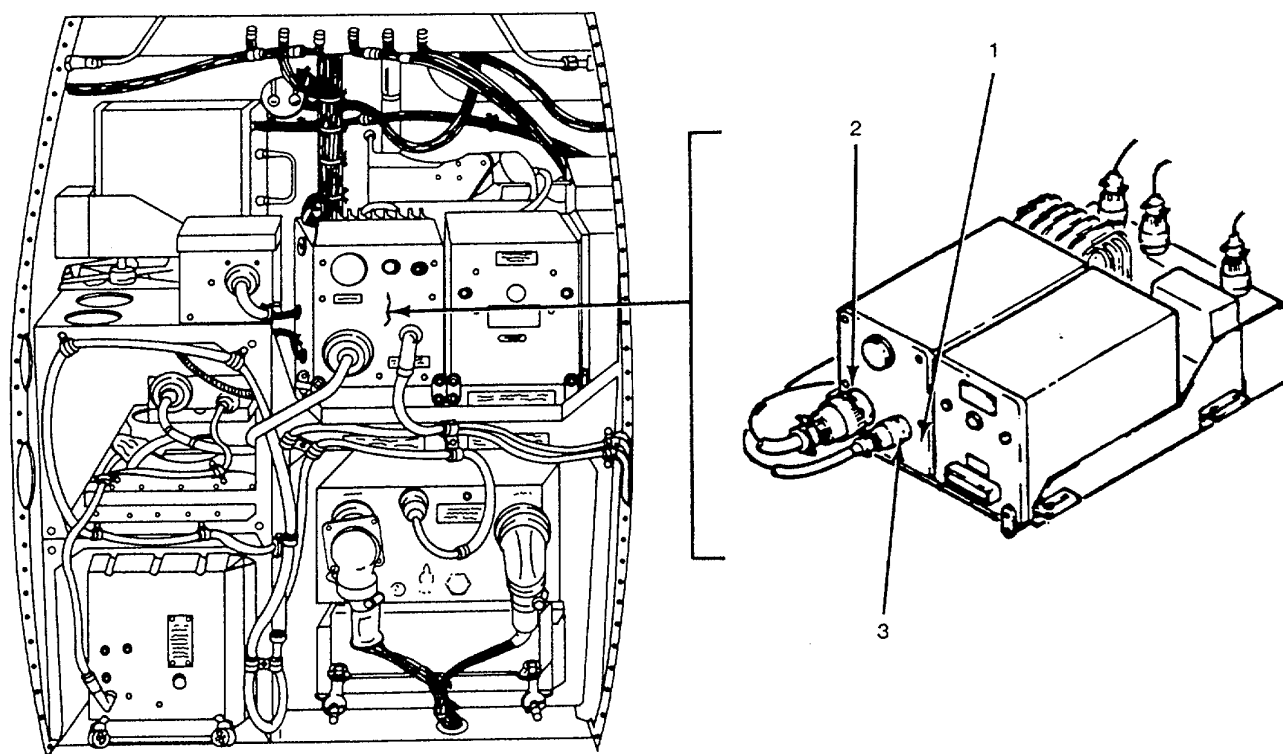


# **CHAPTER 20** **VHF NAVIGATION SET AN/ARN-30(\*) MAINTENANCE**

Subject	Para.	Page
Receiver R-1 021 (*)/ARN-30(*) Maintenance (AVUM).....	20-1	20-1
Converter CV-265A/ARN-30(*) Maintenance (AVUM).....	20-2	20-2
Power Supply (Dynaverter) PP-2792/ARN-30(*) Maintenance (AVUM).....	20-3	20-3
Mount MT-1175/ARN-30(*) Maintenance (AVUM).....	20-4	20-4
Mount MT-1174/ARN-30(*) Maintenance (AVUM).....	20-5	20-5
Control C-3436(*)/ARN-30(*) Maintenance (AVUM).....	20-6	20-6
Indicator ID-453/ARN-30(*) Maintenance (AVUM).....	20-7	20-7
Antenna AS-1304/ARN Maintenance (AVUM).....	20-8	20-8
Converter CV-1275/ARN Maintenance (AVUM).....	20-9	20-8
Cabling and Connector Maintenance (AVUM) .....	20-10	20-9
VHF Navigation Set AN/ARN-30(*) Operational Checks (AVUM).....	20-11	20-9
VHF Navigation Set AN/ARN-30(*) Troubleshooting (AVUM).....	20-12	20-11

## **Section I. MAINTENANCE PROCEDURES**

### **20-1. RECEIVER R-1 021 (\*)/ARN-30(\*) MAINTENANCE (AVUM)**





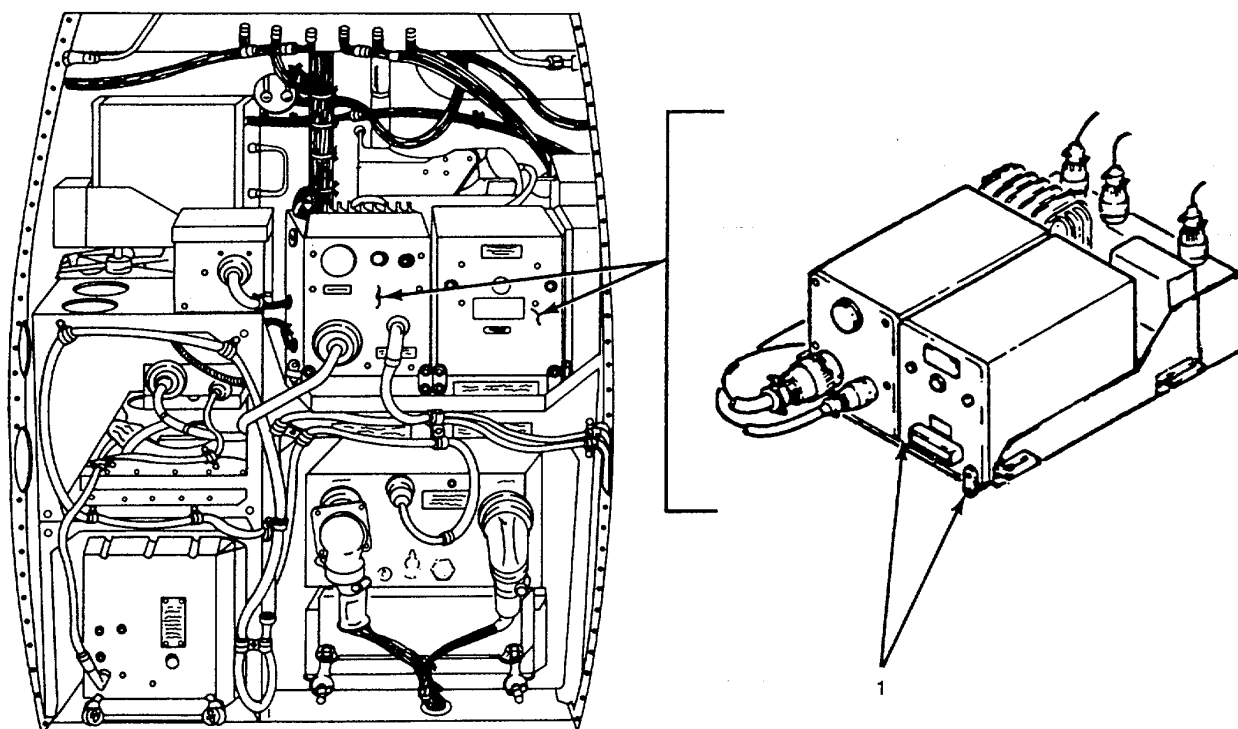
### 20-1.1 Removal Instructions.

- A Disconnect coaxial connector (3) and electrical connector (2) or mechanical linkage (not shown).
- B Loosen two knurled nuts (1) and drop link fasteners from securing posts on front of receiver.
- C Slide receiver forward then lift out of mounting.

### 20-1.2 Installation Instructions.

- A Position receiver in mount, then slide back making sure electrical connectors on back of receiver are engaged with mounting receptacle.
- B Place link fasteners over securing posts on front of receiver and tighten two knurled nuts.
- C Connect electrical connector (2) or mechanical linkage and coaxial connector (3).

### 20-2. CONVERTER CV-265A/ARN-30(\*) MAINTENANCE (AVUM)





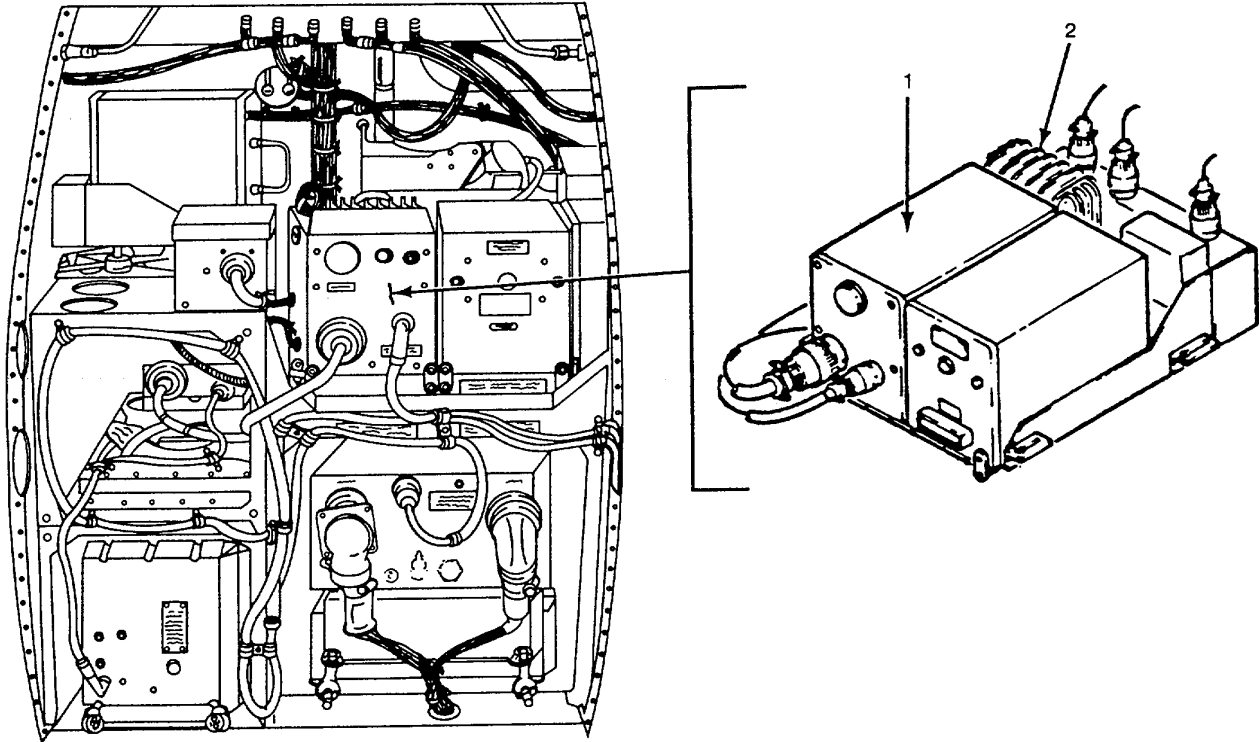
**20-2.1 Removal Instructions.**

- A Loosen two knurled nuts (1) and drop link fasteners from securing posts on front of converter.
- B Pull converter forward, then lift out of mounting.

**20-2.2 Installation Instructions.**

- A Position converter in mounting, then slide back making sure connectors on back of converter are engaged with mounting receptacles.
- B Place link fasteners over securing posts on front of converter and tighten knurled nuts (1).

**20-3. POWER SUPPLY (DYNAVERTER) PP-2792/ARN-30(\*) MAINTENANCE (AVUM)**



**20-3.1 Removal Instructions.**

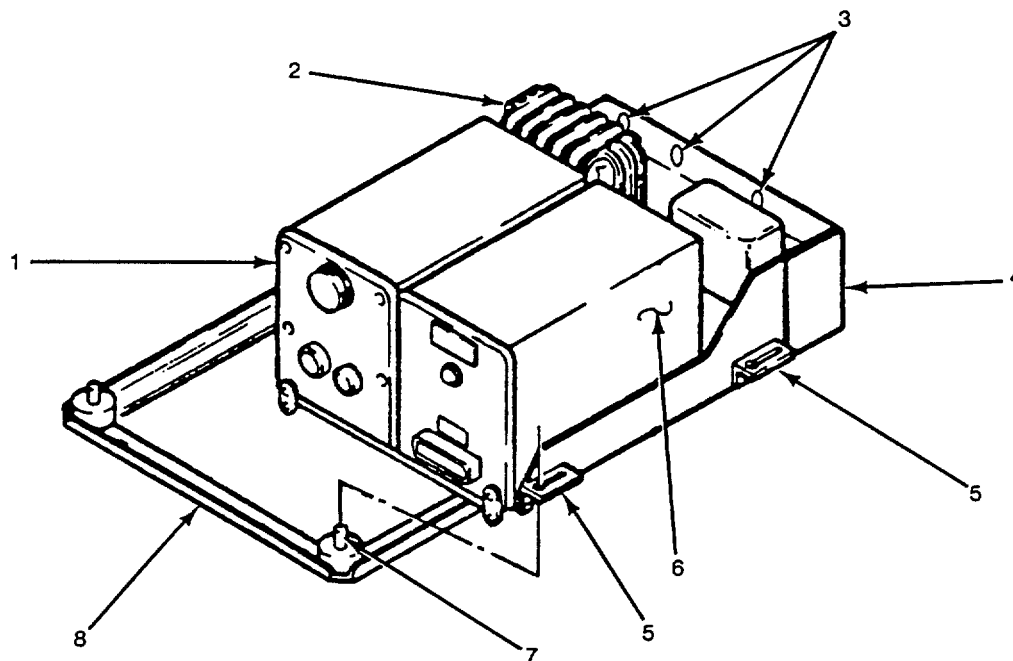
- A Remove receiver (1) per paragraph 20-1.1.
- B Cut safety wire and slide snap-slidefasteners (not shown) away from securing posts on power supply.
- C Lift power supply (2) free of receiver.



**20-3.2 Installation Instructions.**

- A Position power supply on receiver and firmly engage power supply connector with mounting receptacle.
- B Slide snap-slide fasteners (not shown) over securing posts on power supply.
- C Safety wire snap-slide fasteners.
- D Install receiver per paragraph 20-1.2.

**20-4. MOUNT MT-1 175/ARN-30(\*) MAINTENANCE (AVUM)**



**20-4.1 Removal Instructions.**

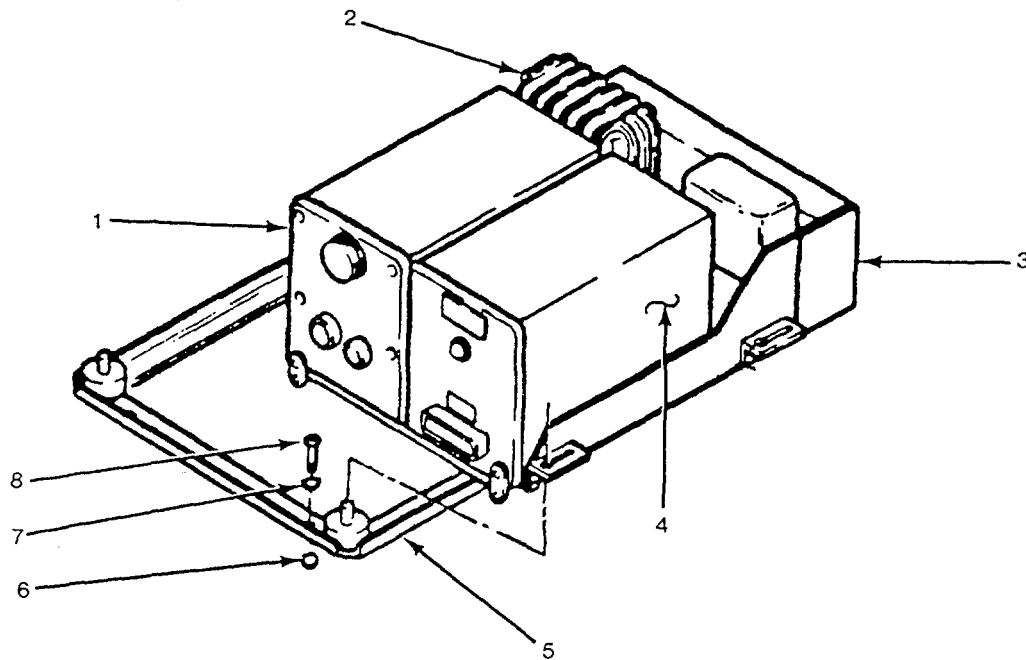
- A Remove receiver (1), power supply (2) and converter (6) per paragraphs 20-1.1, 20-2.1 and 20-3.1.
- B Tag, then disconnect three electrical connectors (3).
- C Cut safety wire, then slide snap-slide fasteners (5) off securing posts (7).
- D Lift MT-1 175/ARN-30(\*) (4) off MT-1 174/ARN-30(\*) (8).



#### 20-4.2 Installation Instructions.

- A Position MT-1 175/ARN-30(\*) (4) on MT-1 174/ARN-30(\*) (8) and secure with snap-slide fasteners (5).
- B Safety wire snap-slide fasteners (5).
- C Connect three electrical connectors (3) and remove tags.
- D Install power supply (2), receiver (1) and converter (6) per paragraphs 20-1.2, 20-2.2 and 20-3.2.

#### 20-5. MOUNT MT-1174/ARN-30(\*) MAINTENANCE (AVUM)



#### 20-5.1 Removal Instructions.

- A Remove receiver (1), power supply (2), converter (4), and MT-11 75/ARN-30(\*) (3) per paragraphs 20-1.1, 20-2.1, 20-3.1 and 20-4.1.
- B Remove eight screws, nuts and washers (6, 7 and 8).
- C Lift MT-1174/ARN-30(\*) (5) from equipment rack.

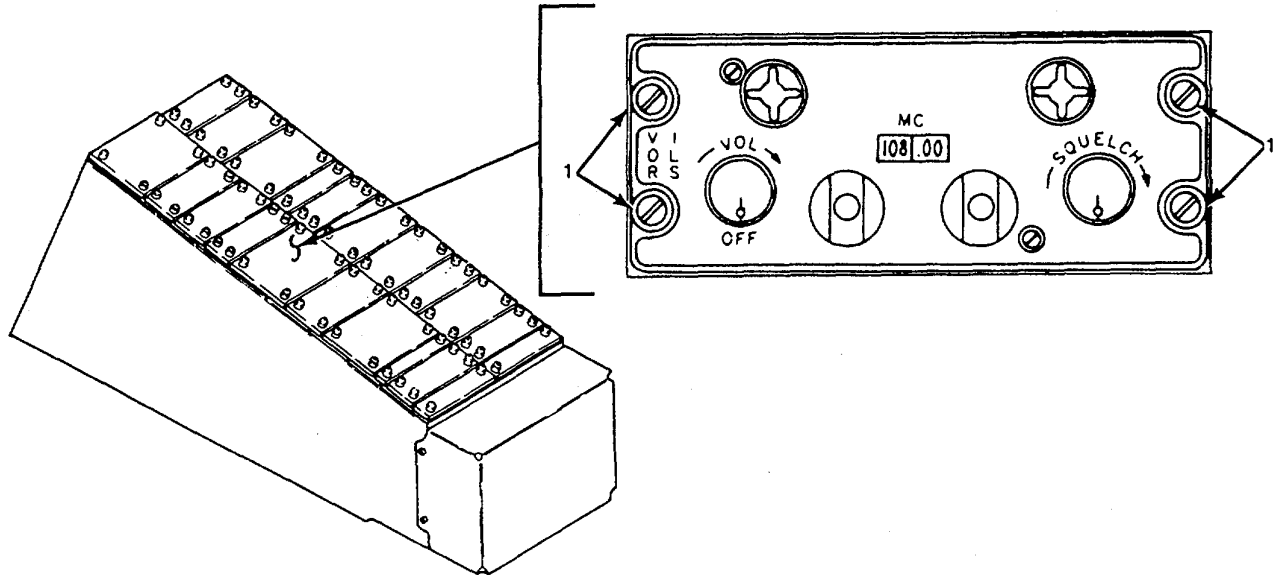
#### 20-5.2 Installation Instructions.

- A Position MT-1174/ARN-30(\*) (5) on equipment rack and secure with eight screws, nuts and washers (6, 7 and 8).
- B Replace MT-11 75/ARN-30(\*) (3), power supply (2), converter (4) and receiver (1) per paragraphs 20-1.2, 20-2.2, 20-3.2 and 20-4.2.



**20-6. CONTROL C-3436(\*)/ARN-30[\*] MAINTENANCE (AVUM)****WARNING**

The dial on C-3436/ARN-30D is painted with radioactive paint. If glass is broken handle with extreme care and follow procedures in AR40-14.



C-3436/ARN-30D is installed in UH-1 D/H configurations A, B and C. Its face plate is marked VHF NAV and two electrical receptacles are provided on back of control. C-3436A/ARN-30E is installed on UH-1 D/H configurations D and E. Its face plate is marked VHF ILS, three electrical connectors are provided on back of control, and has a slightly greater physical depth. C-3436A/ARN-30E adds the capability of tuning a separate glide-slops receiver (if installed).

**20-6.1 Removal Instructions.**

- A** Loosen four spring-lock fasteners (1).

**CAUTION**

Be careful not to pull control so far from pedestal console that electrical wiring or mechanical linkage (if installed) may be damaged.

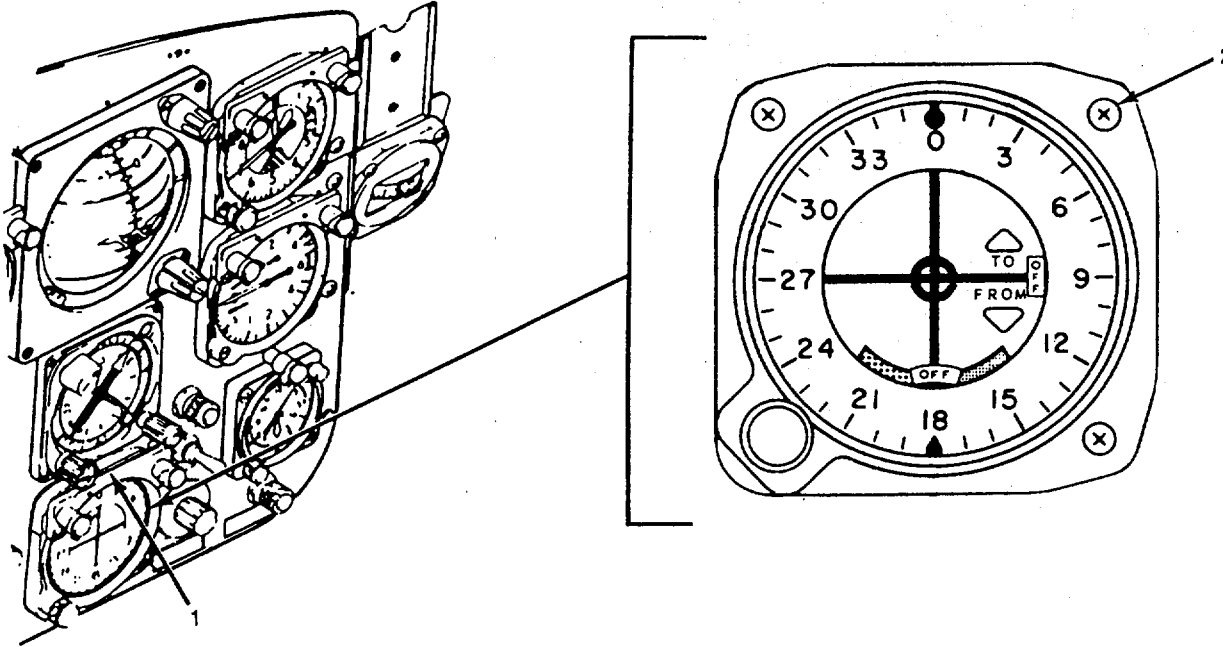
- B** Lift control from pedestal console and disconnect electrical connectors (and mechanical linkage if installed).  
**C** Remove control.



### 20-6.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connectors (and mechanical link-age if installed).
- B Position control in pedestal console and secure with four spring-lock fasteners (1).

### 20-7. INDICATOR ID-453/ARN-30(\*) MAINTENANCE (AVUM)



#### 20-7.1 Removal Instructions.

- A Snap down light shield (1) and remove lamps.
- B Remove mounting screws (at each corner of light shield) and remove light shield from indicator.
- C Remove screws (2) from each corner of indicator.

#### **CAUTION**

Be careful not to pull indicator so far from instrument panel that electrical wiring will be damaged.

- D Pull indicator from instrument panel and disconnect electrical connector.
- E Remove indicator.

#### 20-7.2 Installation Instructions.

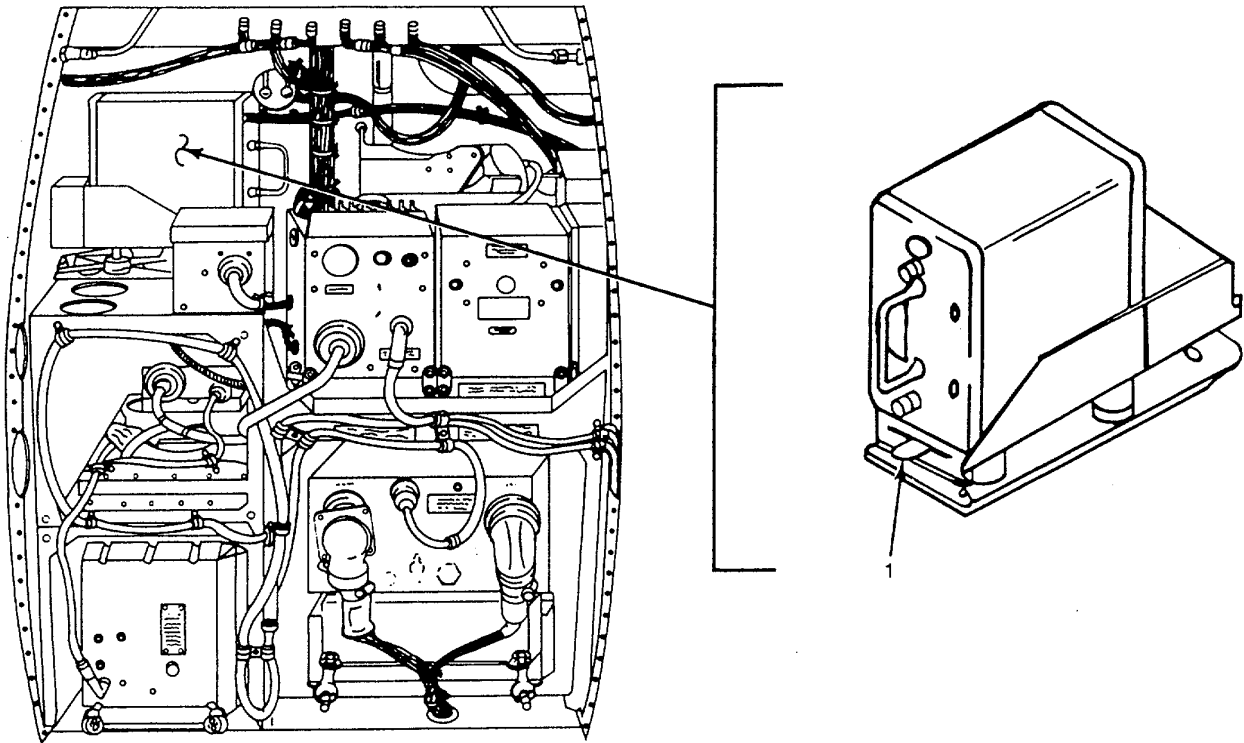
- A Hold indicator close to instrument panel and connect electrical connector.
- B Slide indicator into instrument panel and secure with screw (2) in each corner.
- C Position light shield (1) on indicator and secure with screw on each corner.
- D Replace lamps and snap light shield in place.



## 20-8. ANTENNA AS-1304/ARN MAINTENANCE (AVUM)

Refer to paragraph 21-3 for Antenna AS-1 304/ARN maintenance.

## 20-9. CONVERTER CV-1275/ARN MAINTENANCE (AVUM)



### 20-9.1 Removal Instructions.

- A Cut safety wire and slide snap-slide fastener (1) away from securing post on mounting.
- B Lift front of converter slightly and pull forward to gain access to electrical connector.
- C Disconnect electrical connector and remove converter.

### 20-9.2 Installation Instructions.

- A Position converter in or near mount and connect electrical connector.
- B Slide converter back into mount making sure guide pins on mount are engaged.
- C Lift mounting clip on converter over post on mount and lock snap-slide fasteners.
- D Lockwire snap-slide fasteners.



## 20-10. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P303, P310, P304, P305, P306, P1706, P311, P1501, P1601, P1303, J1303, P801, J801, P1305, P1307, P610 and P403.
- Refer to FO-47 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or by replacing coaxial cable.

### Section II. OPERATIONAL CHECKS

## 20-11. VHF NAVIGATION SET AN/ARN-30(\*) OPERATIONAL CHECKS (AVUM)

These checks are used to ensure VHF Navigation Set AN/ARN-30(\*) is performing properly. The checks are also used after repairs to make sure the problem was fixed.

### INITIAL SETUP:

#### Test Equipment

Signal Generator SG-13  
or  
Receiver Test Set AN/ARN-186

#### Equipment Conditions

Reference  
Paragraph 1-50 Auxiliary Power Unit  
connected.  
Paragraph 14-13 Intercommunications Set  
operational.

### NOTE

Three POWER ON CHECKS are given: One check uses a local ground station, one uses Signal Generator SG-13 and one uses Receiver Test Set AN/ARM-186. Only one check need be performed.

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## POWER OFF CHECKS

- Check that all components are installed, securely mounted and safety wired (if required).
- Check that all connectors are tightened and for evidence of chafed or broken wiring.

## POWER ON CHECKS WITH LOCAL GROUND STATION

- Depress AN/ARN-30 RCVR OMNI, COURSE IND and INTERCOM circuit breakers.  
Vertical flag on indicator disappears, TO/FROM meter remains stable.
- Rotate VOL/OFF control fully cw.  
Receiver noise heard in headset.



**20-11. VHF NAVIGATION SET AN/ARN-30(\*) OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS WITH LOCAL GROUND STATION - Continued**

3. Adjust frequency selectors until ground station frequency appears in frequency (MC) window on control.  
OFF vertical flag on indicator disappears, TO/FROM meter on indicator indicates either TO or FROM, station call sign heard in headset.
4. On ID-453/ARN-30(\*) adjust course selector knob until course indicated by ID-453/ARN(\*) is same as number 2 needle on ID-998/ASN.  
Vertical needle on ID-453/ARN-30(\*) centers, TO/FROM meter indicates TO.
5. On ID-453/ARN-30(\*) adjust course selector knob until course indicated on ID-453/ARN-30(\*) is 180' from number to needle on ID-998/ASN.  
Vertical needle on ID-453/ARN-30(\*) centers, TO/FROM meter indicates FROM.
6. Rotate VOL/OFF control throughout its range.  
Volume of station identification signal in headset varies smoothly with no chirps on deadspots.
7. Set SQUELCH control fully ccw, then slowly adjust cw until receiver noise just disappears.  
Receiver noise heard in headset, then disappears leaving station identification signal audible in headset.
8. Set VOL/OFF control fully ccw (OFF).  
OFF vertical flag appears on ID-453/ARN-30(\*).
9. Deenergize AN/ARN-30(\*) RCVR OMNI circuit breaker.  
Control unit lamps go out.

**POWER ON CHECKS WITH SIGNAL GENERATOR SG-13**

1. Depress AN/ARN-30(\*) RCVR OMNI, COURSE IND and INTERCOM circuit breakers.  
Vertical flag on indicator disappears, TO/FROM meter remains stale.
2. Rotate VOL/OFF control fully cw.  
Receiver noise heard in headset.
3. Connect SG-13 to a 21 to 29 Vdc power source and rotate SET LINE TO 21 V cw to turn on SG-13.  
Allow 15 minute warmup then rotate SET LINE TO 21 V control for 21 (20.5 to 21.5) volts indication on meter.
4. On SG-13 set controls as follows:
 

MEGACYCLES	114.90
METER	CAR
CARRIER SET	Adjust for red line indication on meter
AUDIO SELECTOR	VOR
MICROVOLTS	10K
NAV GS	NAV
VOR	0



**20-11. VHF NAVIGATION SET AN/ARN-30(\*) OPERATIONAL CHECKS (AVUM) - Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**POWER ON CHECK WITH SIGNAL GENERATOR SG-13 - Continued**

5. On AN/ARN-30(\*) control unit adjust frequency selectors until 114.90 appears in MC window.
6. On ID-453/ARN-30(\*) adjust course selector knob until vertical indicator needle is centered.  
Course indicator dial on ID-453/ARN-30(\*) should read between 355 and 5 degrees.
7. Set VOR control on SG-13 to each of its other positions and readjust ID-453/ARN-30(\*) course selector to center vertical indicator needle.  
Course indicator dial should agree with VOR setting +5°.
8. Set VOL/OFF control fully ccw (OFF).  
OFF vertical flag appears on I D-453/ARN-30(\*).
9. Deenergize AN/ARN-30(\*) RCVR OMNI circuit breaker.  
Control unit lamps go out.

**POWER ON CHECKS WITH RECEIVER TEST SET AN/ARM-186**

1. Depress AN/ARN-30(\*) RCVR OMNI and COURSE IND circuit breakers.  
Vertical flag on indicator disappears, TO/FROM meter remains stable.
2. Rotate VOL/OFF control fully cw.  
Receiver noise heard in headset.
3. Refer to TM 11 -6625-2976-1 2 and complete operational checks.

**Section III. TROUBLESHOOTING**

**20-12. VHF NAVIGATION SET AN/ARN-30(\*) TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in VHF Navigation Set AN/ARN-30(\*).
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operation checks described in paragraph 20-11.



**20-12. VHF NAVIGATION SET AN/ARN-30(\*) TROUBLESHOOTING (AVUM) - Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Vertical flag on course indicator remains visible or TO-FROM flag shifts from TO to FROM when circuit breakers are depressed.	<b>A</b> Defective receiver.	<b>A</b> Replace R-1021/ARN-30(*).
	<b>B</b> Defective control unit.	<b>B</b> Replace C-3436/ARN-30(*).
	<b>C</b> Defective power supply.	<b>C</b> Replace PP-2792/ARN-30(*).
2. No receiver noise when VOL control is rotated fully cw.	<b>A</b> Defective control unit.	<b>A</b> Replace C-3436/ARN-30(*).
	<b>B</b> Defective receiver.	<b>B</b> Replace R-1021/ARN-30(*).
3. Call sign inaudible.	<b>A</b> Defective receiver.	<b>A</b> Replace R-1021/ARN-30(*).
	<b>B</b> Defective converter.	<b>B</b> Replace CV-265(*)/ARN-30(*).
	<b>C</b> Defective control unit.	<b>C</b> Replace C-3436/ARN-30(*).
4. OFF vertical flag on course indicator remains visible; station call sign either cannot be heard at all or is indistinct.	<b>A</b> Defective converter.	<b>A</b> Replace CV-265(*)/ARN-30(*).
	<b>B</b> Defective receiver.	<b>B</b> Replace R-1021/ARN-30(*).
	<b>C</b> Defective course indicator.	<b>C</b> Replace I D-453(*)/ARN-30(*).
5. Course pointer does not move or moves erratically when course selector knob is rotated.	Defective course indicator.	Replace I D-453(*)/ARN-30(*).
6. OFF vertical flag on course indicator remains in sight. (All other indications normal.)	Defective course indicator.	Replace I D-453(*)/ARN-30(*).
7. OFF vertical flag on course indicator appears or disappears erratically.	Defective course indicator.	Replace I D-453(*)/ARN-30(*).
8. Course indicator dial does not agree with test set (or ID-998/ASN) within $\pm 5^\circ$ .	<b>A</b> Defective course indicator.	<b>A</b> Replace I D-453(*)/ARN-30(*).
	<b>B</b> Defective converter.	<b>B</b> Replace CV-265(*)/ARN-30(*).



**20-12.1 Signal and Voltage Measurement (AVUM).**

If a trouble develops in VHF Navigation Set AN/ARN-30(\*) and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-47 and trace the wiring to power source, basic signal equipment or installation item to locate fault.

- Terminal board location is shown on FO-1.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**20-12.1.1 Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB19	4	Receiver audio, configurations A and B	AN/ARN-30(*) energized and receiving signal	Audio hi
TB20	7	Receiver audio, configurations C, D and E	AN/ARN-30(*) energized and receiving signal	Audio hi
TB26	10	Ground	Not applicable	0
TB1	12	Instrument power	28 V TRANS and COURSE IND circuit breakers energized	26 Vac, 400 Hz
P305	A	Primary	AN/ARN-30(*) energized	28 Vdc

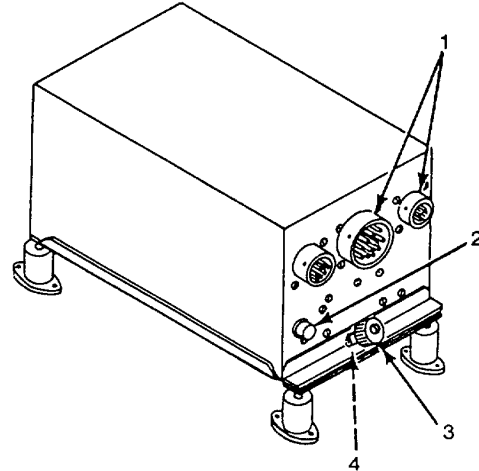
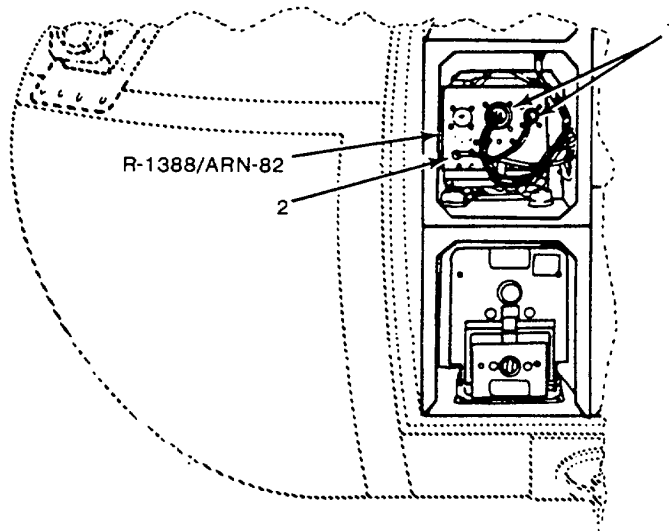


## CHAPTER 21 VHF NAVIGATION SET AN/ARN-82 MAINTENANCE

Subject	Para.	Page
Receiver R-1 388/ARN-82 Maintenance (AVUM).....	21-1	21-1
Control C-6873/ARN-82 Maintenance (AVUM).....	21-2	21-2
Antenna AS-1304/ARN Maintenance (AVUM).....	21-3	21-3
Indicator ID-1347(*)/ARN Maintenance (AVUM).....	21-4	21-4
Cabling and Connector Maintenance (AVUM).....	21-5	21-5
VHF Navigation Set AN/ARN-82 Operational Checks (AVUM).....	21-6	21-5
VHF Navigation Set AN/ARN-82 Troubleshooting (AVUM).....	21-7	21-6

### Section I. MAINTENANCE PROCEDURES

#### 21-1. RECEIVER R-1388/ARN-82 MAINTENANCE (AVUM)



##### 21-1.1 Removal Instructions.

- A Disconnect two electrical connectors (1) and one coaxial connector (2).
- B Cut safety wire and loosen thumbnut (3).
- C Lift cylindrical latch (4) and swivel latch mechanism downward, free of stud on front of receiver.
- D Pull receiver forward out of mount.

##### 21-1.2 Installation Instructions.

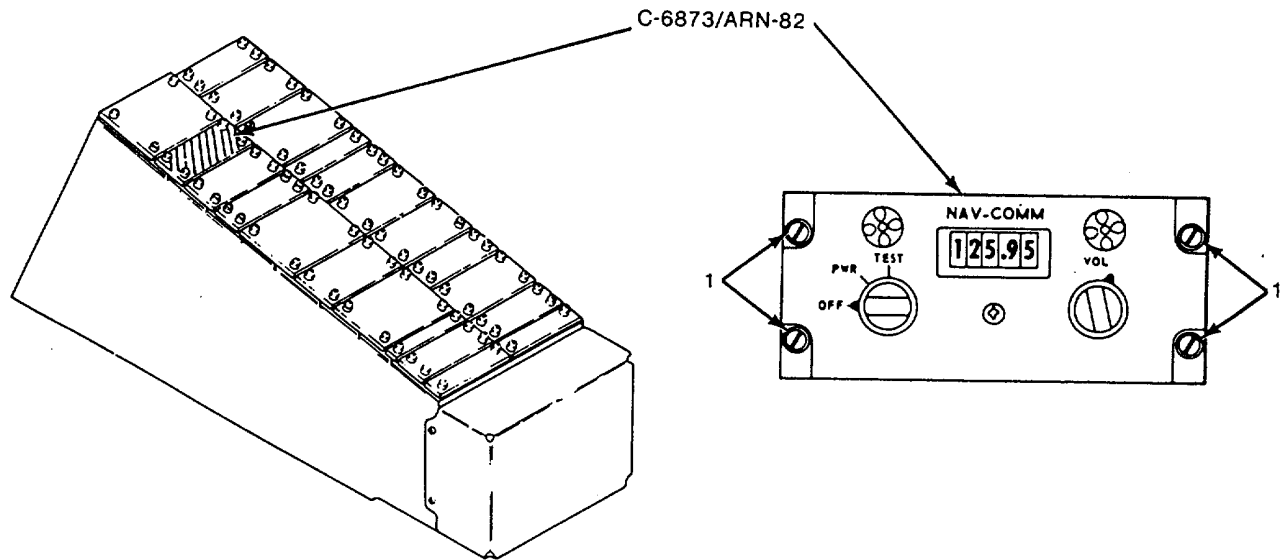
- A Slide receiver back into mount making sure lip on back of receiver fits under groove on back of mount.
- B Lift latch mechanism up and slide cylindrical latch (4) over lip on front of receiver.
- C Tighten thumbnut (3) to secure receiver in mount.



## 21-1.2 Installation Instructions-Continued

- D Safety wire thumbnut.
- E Reconnect two electrical connectors (1) and one coaxial connector (2).

## 21-2. CONTROL C-6873/ARN-82 MAINTENANCE (AVUM)



### 21-2.1 Removal Instructions.

- A Loosen four spring-lock fasteners (1) that secure control to pedestal console.

### **CAUTION**

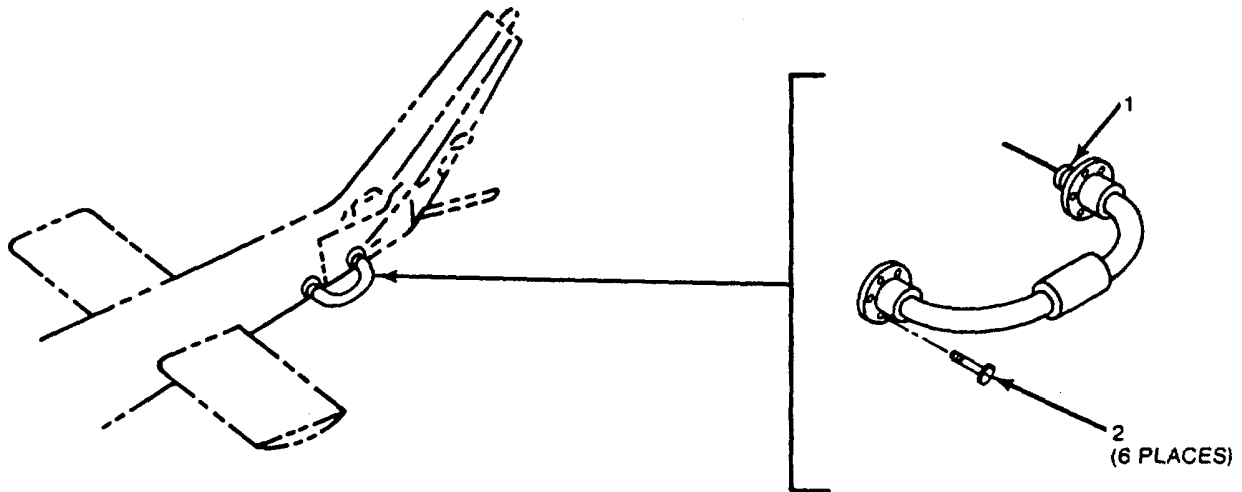
Be careful not to pull control so far from pedestal console that wiring or connector will be damaged.

- B Carefully lift control from pedestal console and disconnect electrical connector at back of control.
- C Remove control.

### 21-2.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connector to back of control.
- B Position control in pedestal console and secure with four spring-lock fasteners (1).





### 21-3. ANTENNA AS-1304/ARN MAINTENANCE (AVUM)

#### NOTE

One AS-1 304/ARN is installed on each side of helicopter tail section. Maintenance procedures are identical except coaxial connector is aft on one side and forward on the other.

#### 21-3.1 Removal Instructions.

- A Remove six screws (2) at each end of antenna.

#### CAUTION

Be careful not to pull antenna so far from helicopter skin that coaxial cable or connector will be damaged.

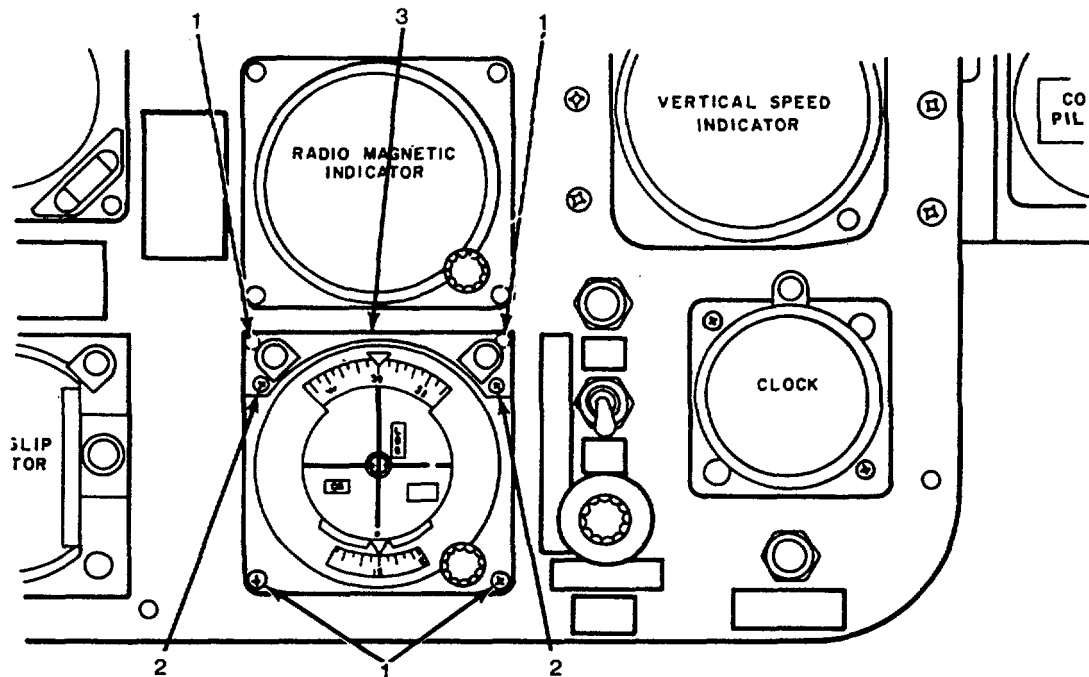
- B Firmly pull antenna a short distance from helicopter and disconnect coaxial connector (1) at antenna base.
- C Remove antenna.
- D Remove traces of RTV sealant.

#### 21-3.2 Installation Instructions.

- A Hold antenna close to mounting point and connect coaxial connector (1) at antenna base.
- B Apply small bead of RTV sealant around each base surface.
- C Carefully position antenna on helicopter skin with screw holes aligned.
- D Secure antenna with six screws (2) at each end.
- E Remove any excess RTV sealant.



## 21-4. INDICATOR ID-1347(\*)/ARN-82 MAINTENANCE (AVUM)



### 21-4.1 Removal Instructions.

- A Remove two screws (2) that secure light shield (3) to indicator.
- B Remove light shield (3).
- C Remove mounting screw (1) from each corner of indicator.

### CAUTION

Be careful not to pull indicator so far from instrument panel that electrical wiring or connector will be damaged.

- D Carefully pull indicator from instrument panel and disconnect electrical connector from rear of indicator.
- E Remove indicator.

### 21-4.2 Installation Instructions.

- A Hold indicator close to instrument panel and connect electrical connector to rear of ID-1 347(\*)/ARN.
- B Position indicator in instrument panel and secure with four screws (1).
- C Position light shield (3) on indicator and secure with two screws (2).



## 21-5. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
  
P303, P304, P306, P403, P409, P311, P1601, P1303, J1303, P601, P801, J801, P1305 and P1307.
- Refer to FO-48 and FO-49 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

## Section II. OPERATIONAL CHECKS

### 21-6. VHF NAVIGATION SET AN/ARN-82 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Navigation Set AN/ARN-82 is performing properly. The checks are also used after repair to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Test Set AN/ARM-186

##### Equipment Conditions

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 intercommunications Set operational.

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress VHF NAV NO 1 OMNI, INTERCOMM CPLT & CREW L, PLT & CREW R and COURSE IND circuit breakers.
- 1A. On aircraft with AN/ASN-175 system installed, perform the following:
  - a. Depress GPS AN/ASN-175 circuit breaker.
  - b. Press CDI SEL VOR switch/DME indicator assembly on pilot's side of instrument panel.  
VOR lamps light in CDI SEL VOR switch/DME indicator assembly
  - c. Set NO. 2 BRG PTR switch on pilot's side of instrument panel to VOR.
2. On C-6873/ARN-82, set OFF/PWR/TEST switch to PWR.  
Panel lamps light.
3. On ID-1347(\*)/ARN-82, set OBS control for 0 under course index.
4. On C-6873/ARN-82, set OFF/PWR/TEST switch to TEST.  
On ID-1347(\*)/ARN-82, vor/localizer needle centers and to/from flag indicates FR.  
ID-250 and ID-998 course indicators #2 VOR needle will go to 180 degrees if a R-1388/A receiver is installed.
5. On C-6873/ARN-82, set frequency controls to communications frequency (between 118.00 and 126.95 MHz) and OFF/PWR/TEST switch to PWR.



21-6. VHF NAVIGATION SET AN/ARN-82 OPERATIONAL CHECKS (AVUM) - Continued

PROCEDURE	NORMAL INDICATIONS	REMARKS
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POWER ON CHECKS - Continued

NOTE

If possible, avoid communications checks with base control tower. When authorized, use another vhf receiver-transmitter and frequency.

- Use one of helicopter communications receiver-transmitters and request communications check on frequency selected in step 5.  
Transmission from other station should be clear and audible on AN/ARN-82 receiver.
- When transmission from other station is complete set C-6873/ARN-82 OFF/PWR/TEST switch to TEST.  
Noise should be heard in headset.
- On C-6873/ARN-82 set OFF/PWR/TEST switch to PWR.  
No noise should be heard in headset.  
This step checks receiver squelch circuits.
- On C-6873/ARN-82 set OFF/PWR/TEST switch to OFF.  
Panel lamps go out.

Section III. TROUBLESHOOTING

21-7. VHF NAVIGATION SET AN/ARN-82 TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in VHF Navigation Set AN/ARN-82.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list ail possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 10-7.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. VOR lamps do not light when CDI SEL VOR switch/DME indicator assembly is pressed.	<div>A Defective remote switch</div> <div>B Defective CDI SEL VOR switch/DME indicator assembly.</div> <div>C Defective VOR lamps in CDI SEL VOR switch/DME indicator assembly.</div> <div>D Defective wiring.</div>	<div>A Replace remote switch. (Refer to Chapter 43.)</div> <div>B Replace assembly.</div> <div>C Replace lamps.</div> <div>D Repair or replace wiring as required.</div>
IA. Panel lamps on C-6873/ARN-82 do not light when power is applied.	Defective control unit.	Replace C-6873/ARN-82.



**21-7. VHF NAVIGATION SET AN/ARN-82 TROUBLESHOOTING (AVUM) - Continued****SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

2. VOR/localizer needle does not center or TO/FROM indicator indicates FROM when OFF/PWR/TEST switch is set to TEST.

**A** Defective receiver.

**A** Replace R-1388/ARN-821(\*).

**B** Defective course indicator.

**B** Replace ID-1347(\*)/ARN-82.

**C** Defective control unit.

**C** Replace C-6873/ARN-82.

**D** Defective antenna.

**D** Replace AS-1304/ARN.

**E** Defective remote switch assembly.

**E** Replace assembly. (Refer to Chapter 43.)

**F** Defective wiring.

**F** Repair or replace wiring or coaxial cable as required.

2A. ID-250 and/or ID-998 course indicator(s) #2 VOR needle does not go to 180 degrees (R-1388/A receiver installed) when OFF/PWR/TEST switch is set to TEST.

**A** Defective receiver.

**A** Replace R-1388/ARN-82(\*).

**B** Defective NO. 2 BRG PTR switch.

**B** Replace switch.

**C** Defective course indicator

**C** Replace ID-250 or ID-998 as required.

**D** Defective wiring.

**D** Repair or replace wiring as required.







**21-7. VHF NAVIGATION SET AN/ARN-82 TROUBLESHOOTING (AVUM) - Continued****SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

- 
- |   |   |  |
|---|---|--|
| 3. Voice reception not heard or not clear and audible during communications test.                     | <b>A</b> Defective receiver.<br><b>B</b> Defective antenna.             | <b>A</b> Replace R-1388/ARN-82(*).<br><b>B</b> Replace AS-1 304/ARN  |
| 4. Noise is not heard in headset when communications frequency selected and POWER switch set to TEST. | Defective receiver.   | Replace R-1388/ARN-82(*)   |
| 5. Noise is not decreased when communications frequency selected and power switch reset to PWR.       | Defective receiver.   | Replace R-1388/ARN-824(*)  |
| 6. Panel lamps do not go out when power switch is set to OFF.   | <b>A</b> Defective control unit.<br><b>B</b> Defective circuit breaker. | <b>A</b> Replace C-6873/ARN-82.<br><b>B</b> Replace circuit breaker. |
- 

**21-7.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in VHF Navigation Set AN/ARN-82 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-48 and FO-49, and trace the wiring to power source, basic signal equipment or installation item to locate fault,
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

Refer to 21-7.1.1 for UH-1 D/H or 21-7.1.2 for UH-1H.



**21-7.1.1 UH-1D/H Signal and Voltage Measurement (AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB26	10	System ground	Not applicable	0
TB1	12	Indicator rotor power	28 V TRANS and COURSE IND circuit breakers energized	26 Vac, 400 Hz ,
TB1 2	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	7	Receive audio	AN/ARN-82 energized and receiving a signal	audio hi
P304	A, R	Switched power (receiver)	VHF NAV NO.1 OMNI circuit breaker energized	28 Vdc
P31 1	2	Primary power (control unit)	VHF NAV NO. 1 OMNI circuit breaker energized	28 Vdc
TB1	6	Stator Y error signal	AN/ARN-82 energized and receiving a signal	Synchro signal, 400 Hz, 26 V max
TB1	7	Stator X error signal	AN/ARN-82 energized and receiving a signal	Syncro signal 400 Hz, 26 Vmax

**21-7.1.2 UH-1H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB26	10	Ground	Not applicable	0
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB1	12	Indicator rotor power	28 V TRANS and COURSE IND circuit breakers energized	26 Vac, 400 Hz
TB19	7	Receiver audio	AN/ARN-82 energized and receiving signal	Audio hi
P311	Z	Primary power	AN/ARN-82 energized	28 Vdc
P304	A, J	Switched power to receiver	AN/ARN-82 energized	28 Vdc
TB1	6	Stator Y error signal	AN/ARN-82 energized and receiving signal	Synchro signal 400 Hz, 26 Vac maximum
TB1	7	Stator X error signal	AN/ARN-82 energized and receiving signal	Syncro signal, 400 Hz, 26 Vac maximum
TB66	10	Vertical pointer drive (ID-1347/ARN)	AN/ARN-82 energized and receiving signal	Deviation signal, 400 Hz, 26 Vac maximum

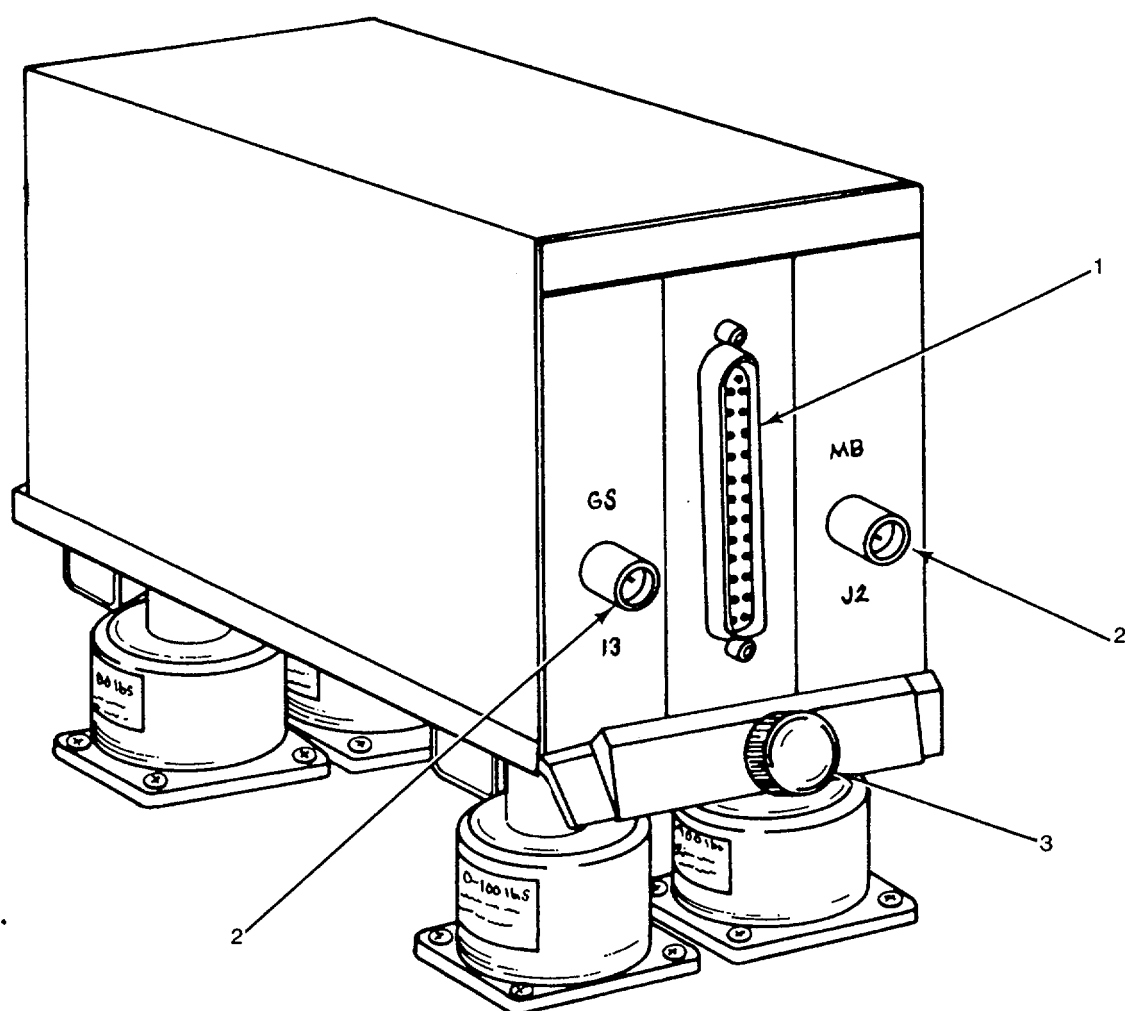


# **CHAPTER 22** **GLIDESLOPE/MARKER BEACON RECEIVER R-1963/ARN MAINTENANCE**

Subject	Para.	Page
Receiver R-1963/ARN Maintenance (AVUM).....	22-1	22-1
Antenna AT-640(*)/ARN Maintenance (AVUM).....	22-2	22-2
Antenna AS-3188/ARN Maintenance (AVUM).....	22-3	22-3
Cabling and Connector Maintenance (AVUM).....	22-4	22-4
Glideslope/Marker Beacon Receiver R-1963/ARN Operational Checks (AVUM)..	22-5	22-4
Glideslope/Marker Beacon Receiver R-1963/ARN Troubleshooting (AVUM).....	22-6	22-6

## **Section I. MAINTENANCE PROCEDURES**

### **22-1. RECEIVER R-1 963/ARN MAINTENANCE (AVUM)**





**22-1. RECEIVER R-1 963/ARN MAINTENANCE (AVUM)-Continued**

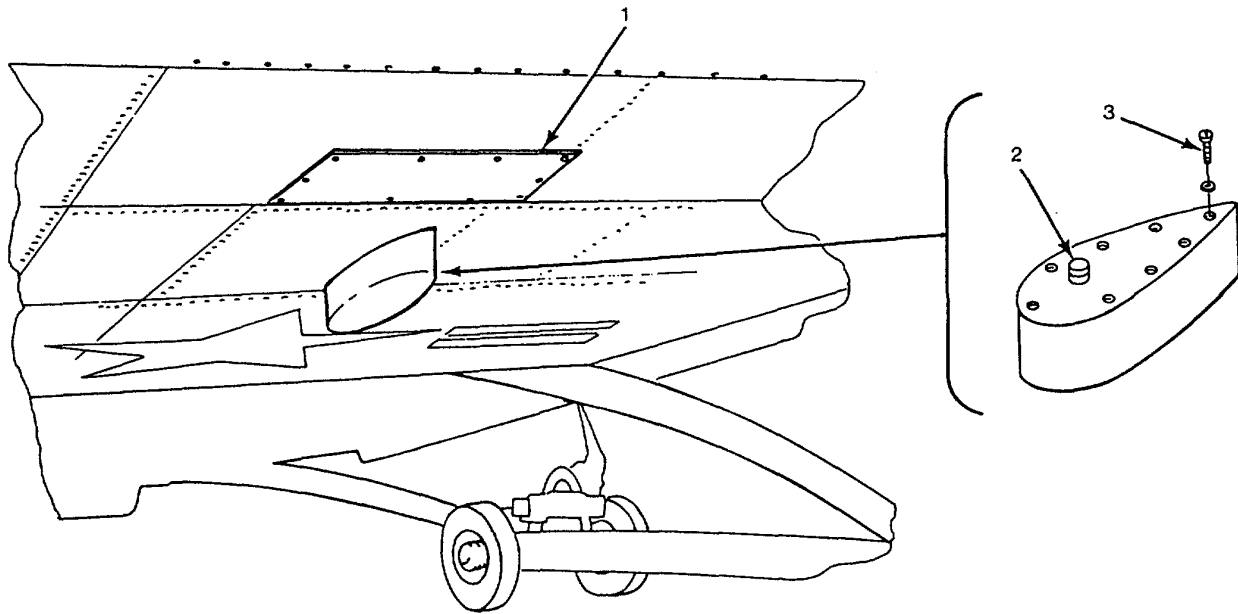
Receiver R-1963/AR N is mounted in nose electronic compartment on helicopters with serial numbers 70-16468 and earlier. On helicopters with serial numbers 71-20009 and subsequent, R-1 963/ARN is mounted in flight station (cockpit). Maintenance procedures below apply to either location.

**22-1.1 Removal Instructions.**

- A Loosen two captive screws (not shown) and disconnect electrical connector (1).
- B Tag then disconnect two coaxial connectors (2).
- C Loosen knurled nut (3) until retaining clamp is clear of lip on front of receiver.
- D Pull receiver forward out of mount.

**22-1.2 Installation Instructions.**

- A Position receiver in mount and slide back making sure lip on back of receiver fits into groove on mount.
- B Tighten knurled knob (3).
- C Connect two coaxial connectors (2) and remove tags.
- D Connect electrical connector (1) and secure with two captive screws (not shown).

**22-2. ANTENNA AT-640(\*)/ARN MAINTENANCE (AVUM)**



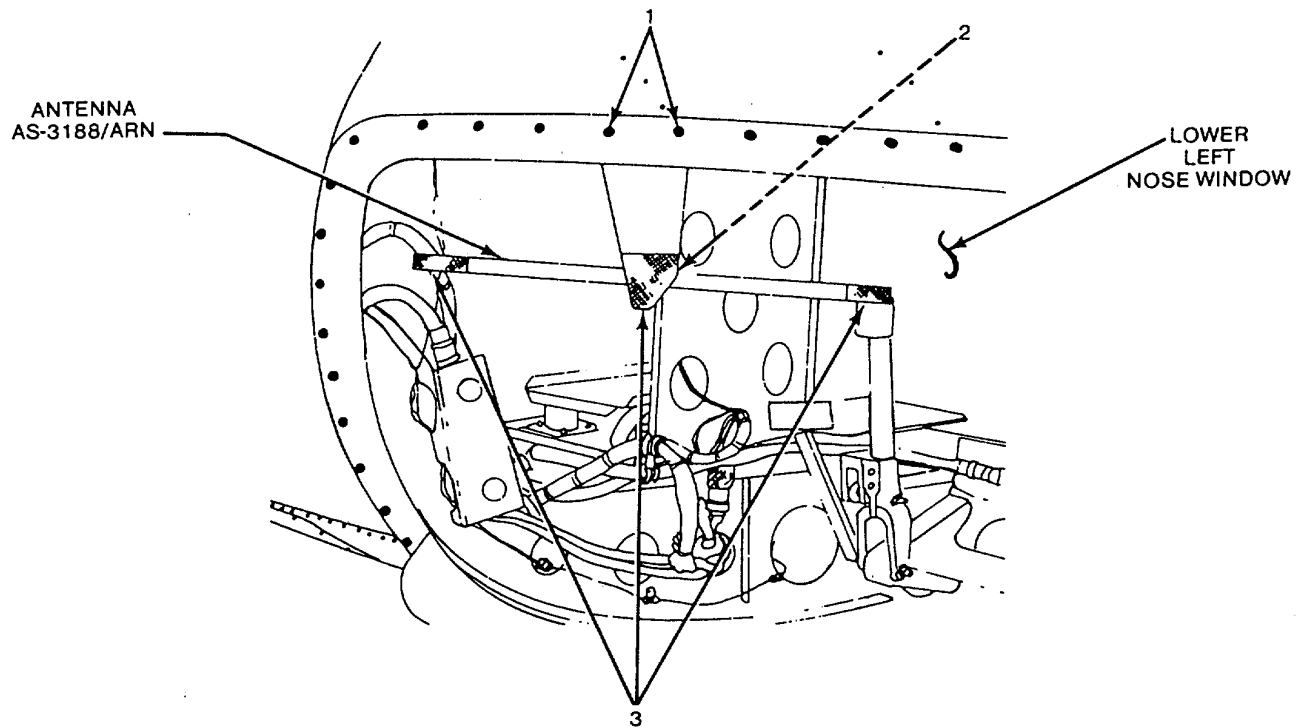
### 22-2.1 Removal Instructions.

- A Remove access panel by loosening ten spring-lock fasteners (1).
- B Reach through access opening and disconnect coaxial connector (2), then remove six screws and washers (3).
- C Pull antenna down away from helicopter skin.

### 22-2.2 Installation Instructions.

- A Position antenna against helicopter skin and secure with six screws and washers (3).
- B Connect coaxial connector (2).
- C Replace access cover and secure with ten spring-lock fasteners (1).

### 22-3. ANTENNA AS-3188/ARN MAINTENANCE (AVUM)



### 22-3.1 Removal Instructions.

- A Disconnect coaxial connector (2).
- B Remove two screws (1) that secure antenna mounting bracket to lower left window support frame.
- C Separate three Velcro pile tabs (3) and remove antenna.



**22-3.2 Installation Instructions.**

- A Position antenna with three Velcro tabs (3) against inside of lower left window.
- B Secure antenna mounting bracket to lower left window support frame with two screws (1).
- C Connect coaxial connector (2).

**22-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel.  
P1, P2, P3, P4, P506, J506, P311 and P1601.
- Refer to FO-61 for wiring data.  
Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

**Section II. OPERATIONAL CHECKS****22-5. GLIDESLOPE/MARKER BEACON RECEIVER R-1963/ARN OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Glideslope/Marker Beacon Receiver R-1 963/ARN is performing properly. The checks are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Test Equipment**

Receiver Test Set AN/ARM-186  
or  
Signal Generator SG-13/ARN  
and  
Test Oscillator BC-37 6(\*)/U

**Equipment Conditions**

Reference  
Paragraph 1-50 Auxiliary Power Unit  
connected.  
  
Paragraph 14-13 Intercommunications Set  
operational.

**Personnel Required**

Two Technicians

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**PROCEDURE****NORMAL INDICATIONS****REMARKS**

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**POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS WITH S6-13 AND BC-376**

1. Depress MB/GS R-1963, VHF NAV OMNI and COURSE IND circuit breakers.



**22-5. GLIDESLOPE/MARKER BEACON RECEIVER R-1963/ARN OPERATIONAL CHECKS (AVUM)-  
Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**POWER ON CHECKS WITH SG-13 AND BC-376-Continued**

2. On C-6873(\*)/ARN-82 set power switch to PWR and allow three minute warm-up.
3. On instrument panel, set marker beacon ON/OFF VOLUME control to midrange, set marker beacon SENS switch to HIGH, and depress marker beacon indicator (press-to-test) light.  
Indicator lamp lights.
4. On C-6873(\*)/ARN-82 set power switch to TEST.  
Marker beacon indicator lamp lights.  
Return power switch to PWR.
5. Connect SG-13 to 21 to 29 Vdc power source, then rotate SET LINE TO 21 V control cw to turn SG-13 on. Allow 15 minute warm-up.
6. Set METER switch to LINE then rotate SET LINE TO 21 V control for 21 (20.5 to 21.5) volts indication on meter.
7. Set controls on SG-13 as follows:
 

MEGACYCLES	109.30 (332.00 MHz)
AUDIO SELECTOR	GLIDESLOPE
NAV GS	GS
MICROVOLTS	1 K
METER	CAR
CARRIER SET	Adjust for red-line indication on meter
LOC GS	DOWN
8. Set frequency controls on C-6873(\*)/ARN to 109.30 MHz.
9. Position SG-13/ARN 50 feet directly in front of helicopter center and move toward helicopter until Glideslope indicator warning flag is driven out of view.
10. On SG-13/ARN set MICROVOLTS control to 10 K and LOC-GS control to center (white line).  
Glideslope deviation needle is within center donut.
11. On SG-13/ARN set LOC-GS control to UP.  
Glideslope deviation needle deflects full scale upward.
12. On SG-13/ARN set LOC-GS control to DOWN.  
Glideslope deviation needle deflects full scale downward.
13. On BC-376 set power switch ON and fully extend antenna.
14. Position BC-376 10 to 20 feet from marker beacon antenna. Move BC-376 closer to antenna until strong signal is heard in headset.  
Strong signal in headset, marker beacon indicator lamp (on instrument panel) lights.
15. On BC-376(\*)/U set MODULATION to 400 Hz.  
On instrument panel, marker beacon indicator lamp lights and 400 Hz tone heard in headset.



## 22-5. GLIDESLOPE/MARKER BEACON RECEIVER R-1963/ARN OPERATIONAL CHECKS (AVUM) - Continued

### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

### POWER ON CHECKS WITH SG-13 AND BC-376-Continued

16. On BC-376(\*)/U, set MODULATION to 1300 Hz then 3000 Hz.  
On instrument panel, marker beacon indicator lamp lights and corresponding tone heard in headset.
17. On instrument panel, set marker beacon SENS switch to LOW.  
On instrument panel, marker beacon indicator lamp goes out.
18. On BC-376(\*)/U, increase RF output until marker beacon indicator lamp (on instrument panel) lights.  
Marker beacon indicator lamp lights and tone heard in headset.
19. On instrument panel, rotate ON/OFF/VOLUME control throughout its range.  
Marker beacon audio level should vary smoothly with no chirps or dead spots.

### POWER ON CHECKS WITH AN/ARM-186

Refer to TM 11-6625-2976-12 and complete operational checks.

## Section III. TROUBLESHOOTING

### 22-6. GLIDESLOPE/MARKER BEACON RECEIVER R-1963/ARN TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in Glideslope/Marker Beacon Receiver R-1963/ARN.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 22-7.

### SYMPTOM

#### PROBABLE CAUSE

#### CORRECTIVE ACTION

1. Marker beacon lamp does not light when depressed (press-to-test).
  - A Defective lamp.
    - A Replace lamp.
  - B Defective circuit breaker or wiring.
    - B Check circuit breaker and wiring, repair or replace as necessary.
2. Marker beacon lamp does not light when C-6873(\*)/ARN-82 power switch is set to TEST.
  - A Defective control unit.
    - A Replace C-6873(\*)/ARN-82.
  - B Defective receiver.
    - B Replace R-1963/ARN.



## 22-6. GLIDESLOPE/MARKER BEACON RECEIVER R-1963/ARN TROUBLESHOOTING (AVUM)- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
3. The red GS warning flag is not visible when no glideslope signals are being received.	Defective indicator.	Replace I D-1347(*)/ARN-82.
4. The red GS flag does not disappear when glideslope signals are being received horizontal pointer deflects properly.	<b>A</b> Defective indicator. <b>B</b> Defective receiver. <b>C</b> Defective relay K-54.	<b>A</b> Replace ID-1347(*)/ARN-82. <b>B</b> Replace R-1963/ARN. <b>C</b> Refer to higher category maintenance.
5. Horizontal pointer does not deflect properly, but red GS flag disappears when glideslope signals are received.	<b>A</b> Defective indicator. <b>B</b> Defective receiver. <b>C</b> Defective relay K-53.	<b>A</b> Replace ID-1347(*)/ARN. <b>B</b> Replace R-1963/ARN. <b>C</b> Refer to higher category maintenance.
6. Horizontal pointer does not deflect properly and red GS does not disappear when glideslope signals are received.	<b>A</b> Defective circuit breaker. <b>B</b> Defective receiver. <b>C</b> Defective interunit cabling. <b>D</b> Defective glideslope antenna.	<b>A</b> Check MB/GS R-1963 and VHF NAV OMNI circuit breakers. Reset, repair or replace as necessary. <b>B</b> Replace R-1963/ARN. <b>C</b> Check connectors and wiring, repair or replace as necessary. <b>D</b> Replace AS-3188/ARN.
7. Marker beacon indicator lamp does not light and no signal heard in headset using test oscillator; press-to-test feature operative.	<b>A</b> Defective antenna or receiver.	<b>A</b> Set test oscillator RF power to 0 and connect oscillator directly to RF input of receiver. Gradually increase test oscillator RF output: If indications are now normal, replace AT-640(*)/ARN. If indications still abnormal, replace R-1 963/ARN.
8. Marker beacon indicator does not light using test oscillator; press-to-test and audio tone normal.	Defective receiver.	Replace R-1963/ARN.
9. No marker beacon tone heard in headset, indicator lamp operative.	<b>A</b> Defective receiver. <b>B</b> Defective MARKER BEACON VOLUME control. <b>C</b> Defective wiring.	<b>A</b> Replace R-1963/ARN. <b>B</b> Replace MARKER BEACON VOLUME control. <b>C</b> Check wiring, repair or replace as necessary.



## 22-6. GLIDESLOPE/MARKER BEACON RECEIVER R-1 963/ARN TROUBLESHOOTING (AVUM)- Continued

### SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

- |     |  |   |   |   |                                       |
|-----|--|---|---|---|---------------------------------------|
| 10. | Marker beacon indicator does not go out when MARKER BEACON SENSING switch is set to LOW. | A | Defective switch.                       | A | Replace MARKER BEACON SENSING switch. |
|     |  | B | Defective receiver.                     | B | Replace receiver.                     |
| 11. | MARKER BEACON VOLUME control does not vary audio level smoothly or introduces chirps.    |   | Defective MARKER BEACON VOLUME control. |   | Replace MARKER BEACON VOLUME control. |

### 22-6.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in Glideslope/Marker Beacon Receiver R-1 963/ARN and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-61 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during equipment operation.

#### 22-6.1.1 Signal and Voltage Measurements (AVUM).

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB20	8	Marker beacon audio	R-1 963/ARN energized and receiving marker beacon signal	Audio hi
TB26	3	Ground (audio return)	Not applicable	0
P1	5	Switched primary power	R-1963/ARN energized	28 Vdc
P1	27	Ground	Not applicable	0

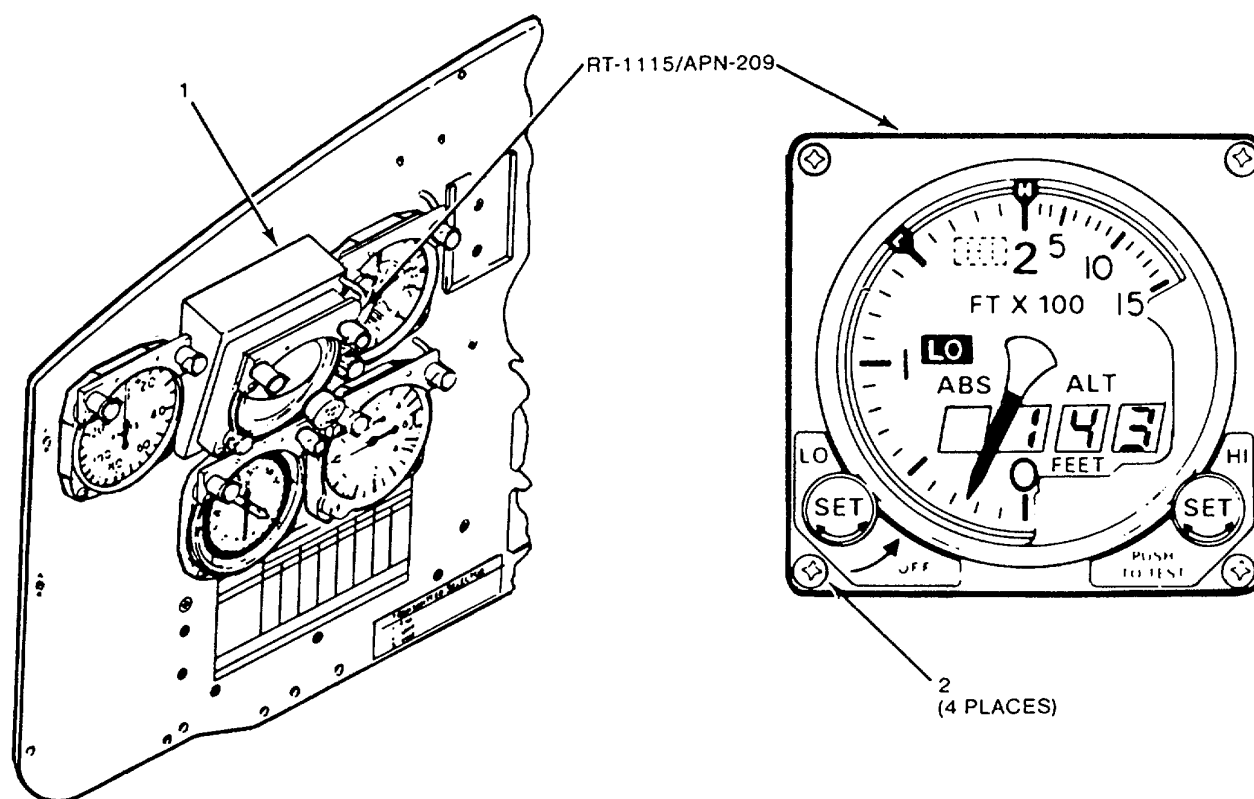


# **CHAPTER 23** **ELECTRONIC ALTIMETER SET AN/APN-209(V) MAINTENANCE**

Subject	Para.	Page
Receiver-Transmitter (and Indicator) RT-1115/APN-209 Maintenance (AVUM).....	23-1	23-1
Remote Indicator ID-1917/APN-209 Maintenance (AVUM).....	23-2	23-3
Antennas AS-2595/APN-194 Maintenance (AVUM).....	23-3	23-4
Cabling and Connector Maintenance (AVUM).....	23-4	23-5
Electronic Altimeter Set AN/APN-209(*) (V) Operational Checks (AVUM).....	23-5	23-5
Electronic Altimeter Set AN/APN-209(*) (V) Troubleshooting (AVUM).....	23-6	23-7

## **Section I. MAINTENANCE PROCEDURES**

### **23-1. RECEIVER-TRANSMITTER (AND INDICATOR) RT-1115/APN-209 MAINTENANCE (AVUM]**





### 23-1.1 Removal Instructions.

- A** Remove four screws (2) that secure RT-1115/APN-209 and wedge shaped spacer (2) to instrument panel.

#### **CAUTION**

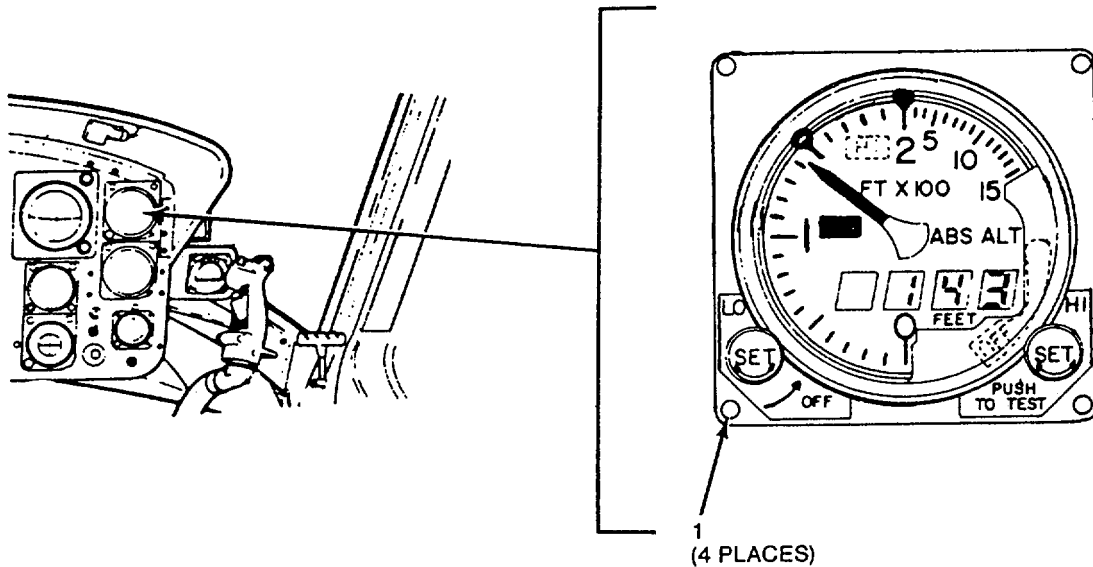
Be careful not to pull RT-1115/APN-209 so far from instrument panel that wiring or connectors will be damaged.

- B** Carefully pull RT-1115/APN-209 from instrument panel until connectors are exposed.
- C** Tag for identification, then disconnect two electrical and two coaxial connectors.
- D** Remove RT-1115/APN-209. Retain spacer and screws for installation.

### 23-1.2 Installation and Adjustment Procedures.

- A** Insert RT-1115/APN-209 through wedge shaped spacer (2).
- B** Hold RT-1115/APN-209 near instrument panel and connect electrical connector to rear of rt.
- C** Position unit partially into instrument panel. Leave it out enough to gain access to adjustment screws (3 and 4).
- D** Depress RADAR ALTM/APN-209, CO-PI LOT 5-VOLT/LIGHTS and INST PANEL/LIGHTS circuit breakers on 28 VDC circuit breaker panel.
- E** Turn LO SET knob clockwise to energize altimeter. Allow approximately two minutes warm-up time.
- F** If necessary, adjust upper screw (3) with jewelers screwdriver to cause digital display to read between 0 and 0 to 3 feet.
- G** If necessary, adjust lower screw (4) with jewelers screwdriver to cause pointer to read  $0 \pm 5$  feet.
- H** Turn LO SET knob counterclockwise to de-energize altimeter and de-energize RADAR ALTM/APN-209, CO-PILOT 5-VOLT/LIGHTS and INST PANEL/LIGHTS circuit breaker.
- I** Position RT-1115/APN-209 into instrument panel, making sure colored dot on wedge shaped spacer (2) is in upper right corner.
- J** Secure RT-1115/APN-209 with four screws (2).



**23-2. REMOTE INDICATOR ID-1917/APN-209 MAINTENANCE (AVUM)****23-2.1 Removal Instructions.**

- A** Remove four screws (1).

**CAUTION**

Be careful not to pull indicator so far from instrument panel that wiring or connector may be damaged.

- B** Pull indicator from instrument panel with electrical connector is exposed.

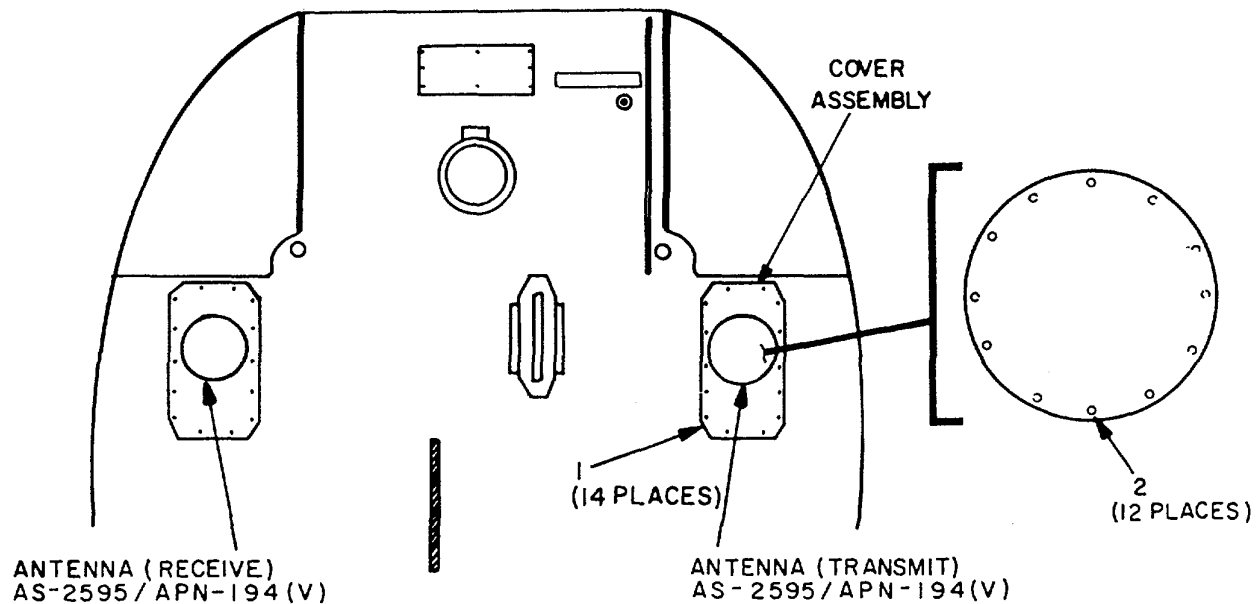
- C** Disconnect electrical connector and remove indicator.

**23-2.2 Installation Instructions.**

- A** Insert indicator through wedge-shaped spacer, then connect electrical connector to rear of indicator.
- B** Position indicator in instrument panel and ensure colored dot on wedge shaped spacer is in upper right corner.
- C** Secure indicator in instrument panel with four screws (1).



### 23-3. ANTENNAS AS-2595/APN-194(V) MAINTENANCE (AVUM)



#### 23-3.1 Removal Instructions.

- A** Remove 14 screws (1) that secure antenna cover assembly to helicopter.

#### **CAUTION**

Be careful not to pull antenna so far from helicopter that coaxial cable or connector will be damaged.

- B** Carefully pull antenna cover assembly and antenna from helicopter skin and disconnect coaxial connector.
- C** Remove 12 screws (2) that secure antenna to cover assembly.
- D** Remove antenna and gasket.

#### 23-3.2 Installation Instructions .

#### **NOTE**

The holes in antenna and cover assembly are drilled to align in one position only.



### 23-3.2 Installation Instructions-Continued

- A** Position antenna and gasket on cover assembly so all holes are aligned.
- B** Secure antenna to cover assembly with 12 screws (2).
- C** Hold cover assembly and antenna close to helicopter and connect coaxial connector to rear of antenna.
- D** Position cover assembly on helicopter and secure with 14 screws (1).

### 23-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:

P1, (RT and remote indicator) P2, P3, P4, P1501 (Receive) and P1501 (Transmit).

- Refer to FO-50 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- RF cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

## Section II. OPERATIONAL CHECKS

### 23-5. ELECTRONIC ALTIMETER SET AN/APN-209(\*) (V) OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Electronic Altimeter Set AN/APN-209(\*) (V) is performing properly. The checks are also used after repair to make sure the problem was fixed.

#### NOTE

Initial setup consists of connecting auxiliary power unit per paragraph 1-50.

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

#### POWER OFF INSPECTION

1. Check that all components are installed and securely mounted.
2. Check that all connectors are tightened and for evidence of broken or frayed wiring.

#### POWER ON INSPECTION

1. Depress RADAR ALTM/APN-209, CO-PILOT 5-VOLT LIGHTS and INST PANEL/LIGHTS circuit breakers on 28 VDC circuit breaker panel.
2. Rotate LO SET Knob until LO altitude bug indicates 0 feet.  
Indicator lamps should light.  
If lamps do not light, check copilots instrument lighting control.
3. Rotate HI SET knob until HI altitude bug indicates 800 feet.



## 23-5. ELECTRONIC ALTIMETER AN/APN-209(\*) (V) OPERATIONAL CHECKS (AIVUM)- Continued

### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

4. Allow 2 minutes for warm-up.
  - A OFF flag should disappear.
    - A If OFF flag does not disappear, reset circuit breakers; if still visible, refer to troubleshooting paragraph 23-6.
  - B Pointer should indicate  $0 \pm 5$  feet.
    - B If pointer is close to correct, refer to adjustment procedure, paragraph 23-1.2, otherwise refer to troubleshooting, paragraph 23-6.
  - C Digital indicator should read between -0 to +3 feet.
    - C If reading is close to correct, refer to adjustment paragraph 23-1.2, otherwise refer to troubleshooting paragraph 23-6.
5. Turn LO SET knob clockwise until LO altitude bug indicates 100 feet.  
LO altitude warning lamp lights.  
If lamp does not light, refer to troubleshooting paragraph 23-6.
6. Press and hold HI SET knob. (Activates self test circuits).  
Pointer and digital display indicate between 900 and 1100 feet, LO warning light goes out and HI warning lamp lights.  
If indications not correct, refer to troubleshooting paragraph 23-6.
7. Release HI SET knob.  
Pointer returns to  $0 \pm 5$  feet, digital display reads between 0 and 0 to 3 feet, HI warning lamp goes out and LO warning lamp lights.  
  
If any indication not obtained, refer to troubleshooting paragraph 23-6.
8. Repeat checks from remote indicator: References to adjustment procedures do not apply to remote indicator.

### Section III. TROUBLESHOOTING

## 23-6. ELECTRONIC ALTIMETER SET AN/APN-209(\*) (V) TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in Electronic Altimeter Set AN/APN-209.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 23-5.



### 23-6.1 Signal and Voltage Measurements (AVUM).

- 23-7**



**23-6.1.1 Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB13	4	28 V lighting	INST PANEL LIGHTS circuit breaker energized, copilot's instrument panel lights energized, pilot altimeter indicator energized	0-28 Vdc
TB13	9	28 V lighting	INST PANEL LIGHTS circuit breaker energized, copilot's instrument panel lights energized, copilot altimeter indicator energized	0-28 Vdc
TB100	3	5 V lighting	PLT 5 VOLT LIGHTS circuit breaker energized, pilot altimeter indicator energized	0-5 Vdc
TB100	8	5 V lighting	CPLT 5 VOLT LIGHTS circuit breaker energized, copilot altimeter indicator energized	0-5 Vdc
P1 (Pilot)	1	Primary power	RADAR ALTM APN-209 circuit breaker energized	28 Vdc
P1 (Copilot)	9	Primary power	RADAR ALTM APN-209 circuit breaker energized	28 Vdc

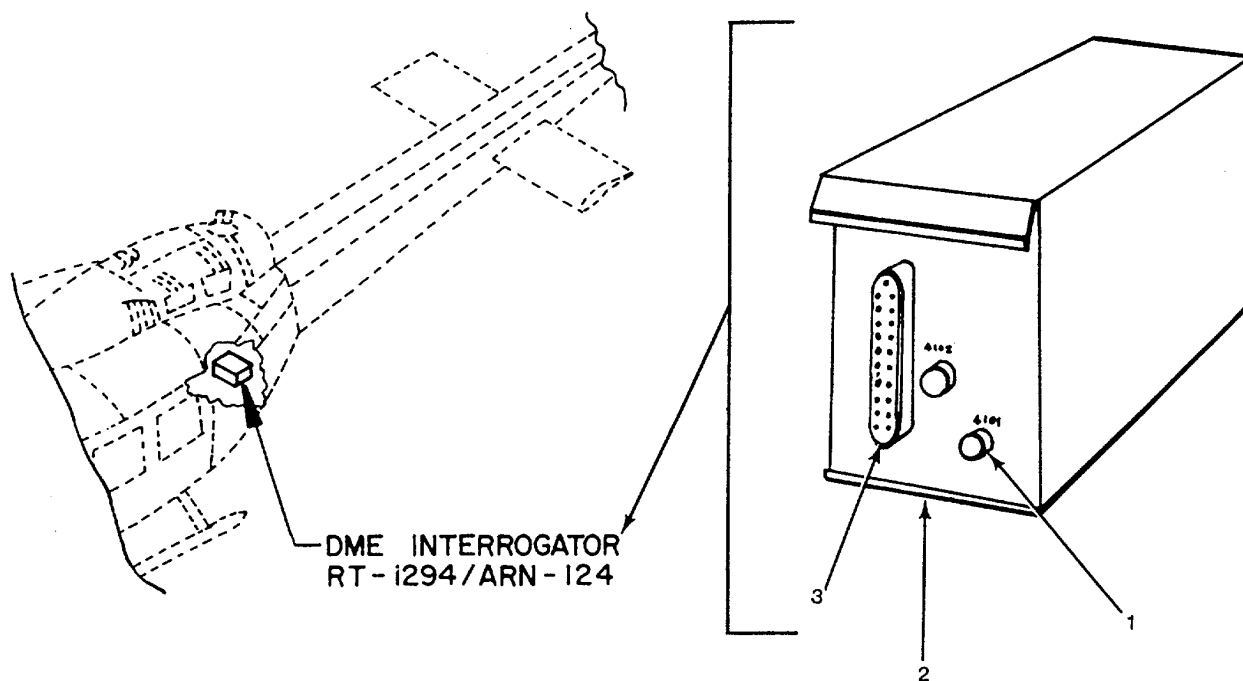


# **CHAPTER 24** **DISTANCE MEASURING EQUIPMENT AN/ARN-124 MAINTENANCE**

Subject	Para.	Page
Receiver-Transmitter RT-1294/ARN-124 Maintenance (AVUM).....	24-1	24-1
Control-Indicator ID-2192/ARN-124 Maintenance (AVUM).....	24-2	24-2
Antenna AT-741(*)/ARN Maintenance (AVUM).....	24-3	24-3
Cabling and Connector Maintenance (AVUM).....	24-4	24-4
Distance Measuring Equipment AN/ARN-124 Operational Checks (AVUM).....	24-5	24-4
Distance Measuring Equipment AN/ARN-124 Troubleshooting (AVUM).....	24-6	24-5

## **Section I. MAINTENANCE PROCEDURES**

### **24-1. RECEIVER-TRANSMITTER RT-1294/ARN-124 MAINTENANCE (AVUM)**





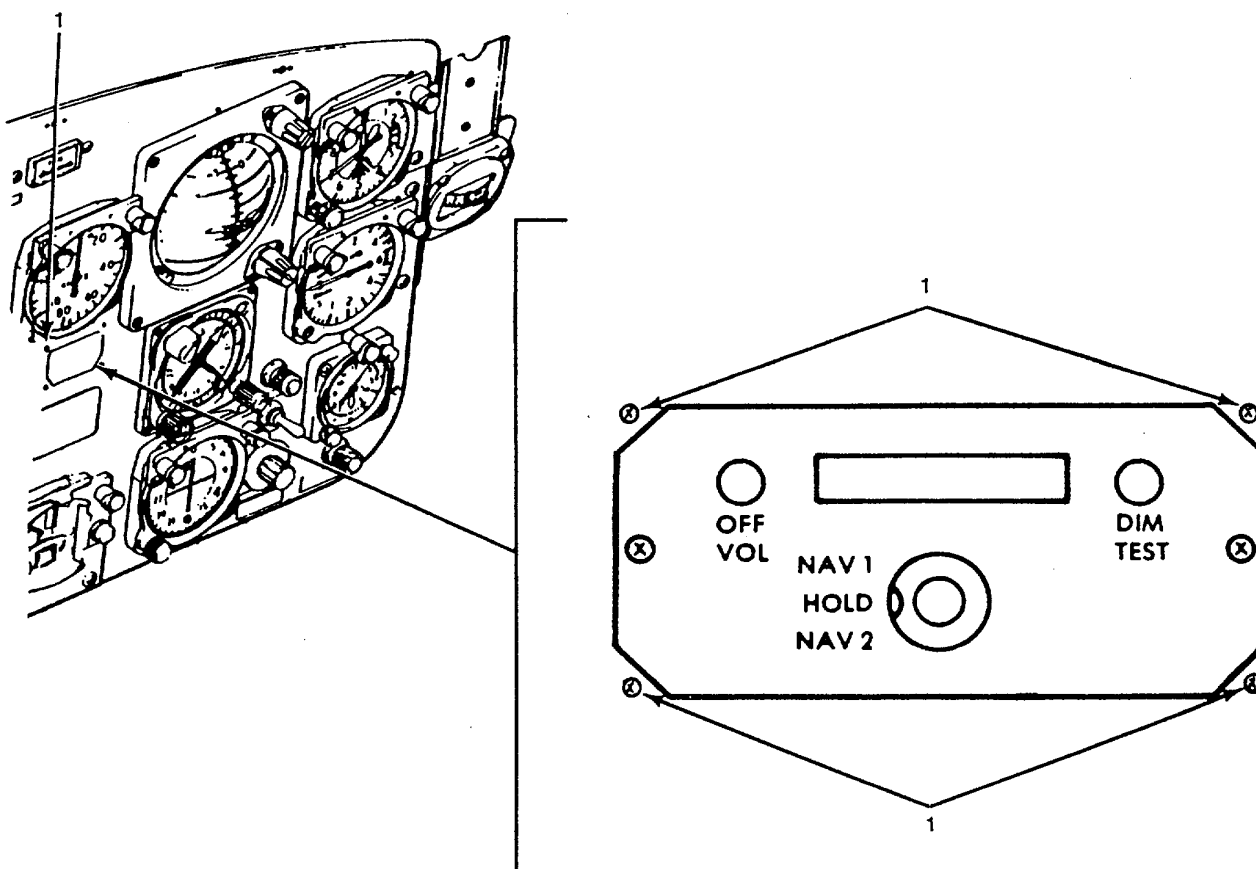
### 24-1.1 Removal Instructions.

- A Loosen two captive screws (not shown) and disconnect electrical connector (3).
- B Disconnect electrical connector (1).
- C Loosen thumbnut (2) until holddown bar is clear of lip on receiver-transmitter.
- D Lift front of receiver-transmitter slightly and pull receiver-transmitter out of mount.

### 24-1-2 Installation Instructions.

- A Position receiver-transmitter in mount and slide back making sure lip on back of receiver-transmitter fits snugly under groove on mount.
- B Position holddown bar over lip on front of receiver-transmitter and tighten thumbnut (2).
- C Connect coaxial connector (1).
- D Connect electrical connector (3) and secure with two captive screws (not shown).

### 24-2. CONTROL INDICATOR ID-2192/ARN-124 MAINTENANCE (AVUM)





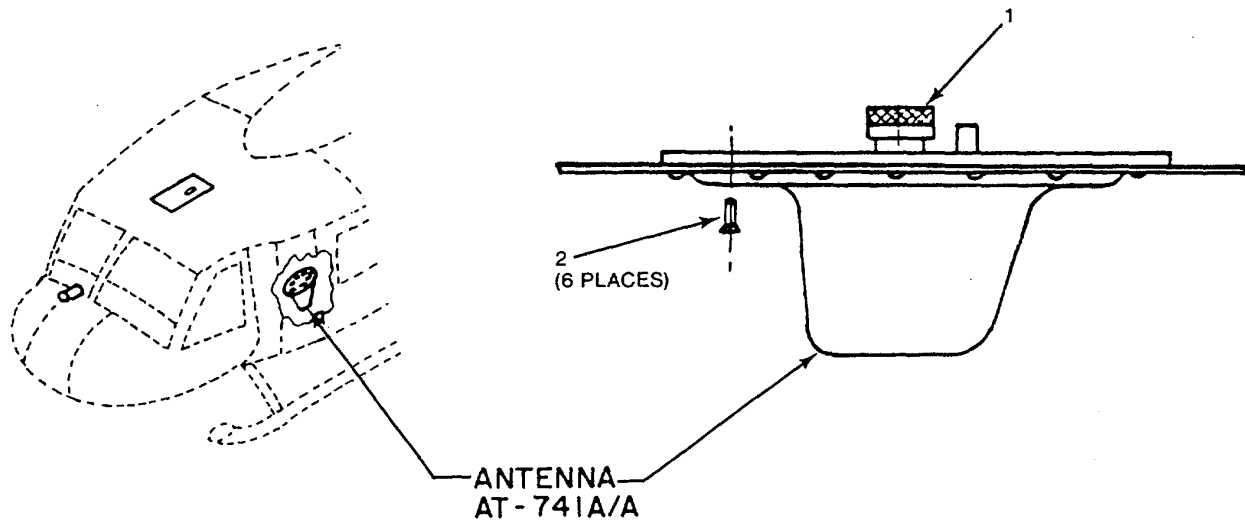
### 24-2.1 Removal Instructions.

- A Remove four screws (1) that secure control-indicator to instrument panel.
- B From back of instrument panel, remove control-indicator.
- C Disconnect electrical connector from back of control-indicator.

### 24-2.2 Installation Instructions.

- A At back of instrument panel, connect electrical connector to back of control-indicator.
- B From back of instrument panel, insert control-indicator and secure with four screws (1).

### 24-3. ANTENNA AT-741 (\*)/ARN MAINTENANCE (AVUM)



### 24-3.1 Removal Instructions.

- A Remove six screws (2).

#### CAUTION

Be careful not to pull antenna so far from helicopter skin that coaxial connector or cable will be damaged.

- B Disconnect coaxial connector (1).
- C Remove any traces of sealant from helicopter skin.



### 24-3.2 Installation Instructions.

- A Hold antenna close to helicopter skin and connect coaxial connector (1).
- B Position antenna against helicopter skin and secure with six screws (2).
- C Apply a small bead of RTV sealant around base of antenna where it contacts helicopter skin

### 24-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P101, P102, P103, P201 and P311.
- Refer to FO-51 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- RF cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

## Section II. OPERATIONAL CHECKS

### 24-5. DISTANCE MEASURING EQUIPMENT AN/ARN-124 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Distance Measuring Equipment AN/ARN-1 24 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Equipment Conditions

- Reference  
Paragraph 1-50 Auxiliary Power Unit connected.  
Paragraph 14-13 Intercommunications Set operational.

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#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress DME ARN-124 and VHF NAV OMNI circuit breakers.
- 1A. On aircraft with AN/ASN-175 system installed, set DME IND (indicator) switch on pilot's side of instrument panel to VORTAC position.  
DME lamps light in CDI SEL VOR switch/DME indicator assembly on pilot's side of instrument panel.
2. On ID-2192/ARN-124, set OFF/VOL control to midposition and NAV 1/HOLD/NAV 2 switch to NAV1.
3. Depress and hold DIM/TEST switch.  
Indicator should display 0.0.



**24-5. DISTANCE MEASURING EQUIPMENT AN/ARN-124 OPERATIONAL CHECKS (AVUM) -Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

4. Adjust display brightness by rotating DIM/TEST control.  
Brightness of display varies as DIM/TEST control is rotated.  
Release DIM/TEST switch.
5. On VHF Navigation Set, select an operating VOR-DME station if available.  
ID-2192/ARN-124 should indicate distance (in nautical miles) to selected station.
6. On ID-2192/ARN-124, set NAV1/HOLD/NAV2 switch to HOLD.  
On instrument panel DME HOLD lamp lights and 1350 Hz tone heard in headset.

**Section III. TROUBLESHOOTING****24-6. DISTANCE MEASURING EQUIPMENT AN/ARN-124 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Distance Measuring Equipment AN/ARN-124.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 24-5.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. DME lamps in CDI SEL VOR switch/DME indicator assembly do not light when DME IND switch is set to VORTAC position.
  - A** Defective lamps or CDI SEL VOR switch/DME indicator assembly.  
**A** Replace lamps or assembly as required.
  - B** Defective DME IND switch.  
**B** Replace switch.
- 1A. No or incorrect readout when DIM/TEST switch is depressed.
  - A** Defective indicator.  
**A** Replace ID-2192/ARN-124.
  - B** Defective interrogator.  
**B** Replace RT-1294/ARN-124.
2. No audio and no readout in display window.
  - A** Defective indicator.  
**A** Replace ID-2192/ARN-124
  - B** Defective interrogator.  
**B** Replace RT-1294/ARN-124.
  - C** Defective antenna.  
**C** Replace AT-741A/A



**24-6. DISTANCE MEASURING EQUIPMENT AN/ARN-124 TROUBLESHOOTING (AVUM) - Continued****SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

3. Indicator displays incorrect distance to known VOR-DME station.
- A** Defective interrogator.
    - A** Replace RT-1294/ARN-124.
  - B** Defective indicator.
    - B** Replace ID-2192/ARN-124.
  - C** Defective DME IND switch.
    - C** Replace switch.
4. DME HOLD lamp does not light and no tone heard in headset when NAV1/HOLD/NAV 2 is set to HOLD.
- A** Defective indicator.
    - A** Replace ID-2192/ARN-124.
  - B** Defective interrogator.
    - B** Replace RT-1294/ARN-124.

**24-6.1 Signal and Voltage Measurements (AVUM).**

If a trouble develops in Distance Measuring Equipment AN/ARN-124 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-51 and trace the wiring to power source, basic signal equipment or installation item to locate fault.

- Terminal board location is shown on FO-3 and FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**24-6.1.1 Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB13	1	Panel lighting	Circuit breaker energized	0-28 Vdc
TB26	3, 9	Ground	Not applicable	0
TB20	8	TACAN audio (ident)	AN/ARN-124 energized and receiving signal	Audio hi
P102	6	Primary power	AN/ARN-124 energized	28 Vdc



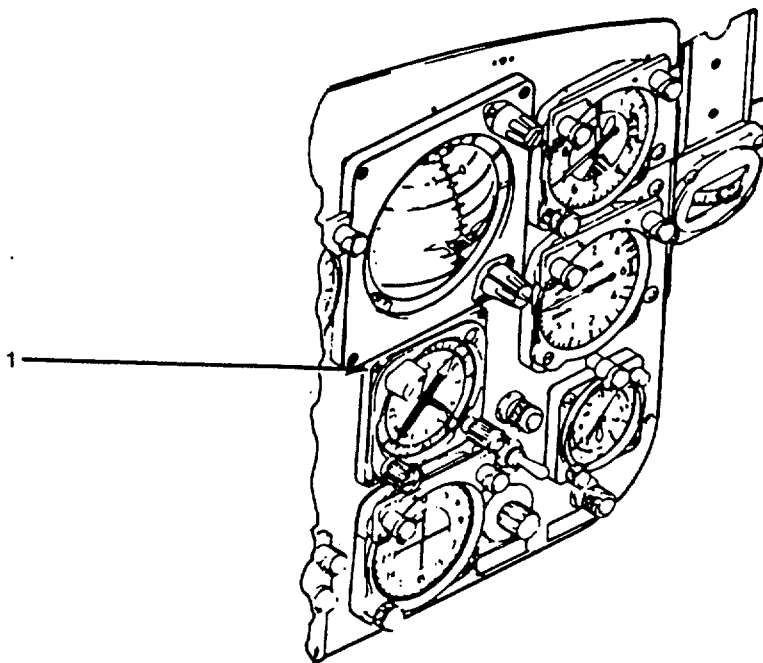
## CHAPTER 25

### COURSE INDICATOR ID-998/ASN MAINTENANCE

Subject	Para.	Page
Course Indicator ID-998/ASN Maintenance (AVUM).....	25-1	25-1
Course Indicator ID-998/ASN Operational Checks (AVUM).....	25-2	25-2
Course Indicator ID-998/ASN Troubleshooting (AVUM).....	25-3	25-2

#### Section I. MAINTENANCE PROCEDURES

##### 25-1. COURSE INDICATOR ID-998/ASN MAINTENANCE (AVUM)



##### 25-1.1 Removal Instructions.

- A** Remove four screws (1) that secure ID-998/ASN to instrument panel.

#### CAUTION

Be careful not to pull indicator so far from instrument panel that electrical wiring or connector will be damaged.

- B** Slide ID-998/ASN out of instrument panel to gain access and disconnect electrical connector from back of indicator.
- C** Remove ID-998/ASN.

##### 25-1.2 Installation Instructions.

- A** Hold ID-998/ASN near instrument panel and connect electrical connector to back of indicator.
- B** Slide indicator into instrument panel and secure with four screws (1).



**Section II. OPERATIONAL CHECKS****25-2. COURSE INDICATOR ID-998/ASN OPERATIONAL CHECKS (AVUM)**

Operational checks of the ID-998/ASN are performed as part of the operational checks of the compass, vhf navigation, and adf systems.

**Section III. TROUBLESHOOTING****25-3. COURSE INDICATOR ID-998/ASN TROUBLESHOOTING (AVUM)**

Troubleshooting of the ID-998/ASN is performed by comparing results of other system operational checks and a process of elimination. For instance, if adf audio information is normal and bearing information is displayed on the ID-250/ARN but not on ID-998/ASN, the ID-998/ASN is probably defective. If ID-998/ASN indications are normal using one system, but abnormal using another, the ID-998/ASN is not a probable cause of the fault.



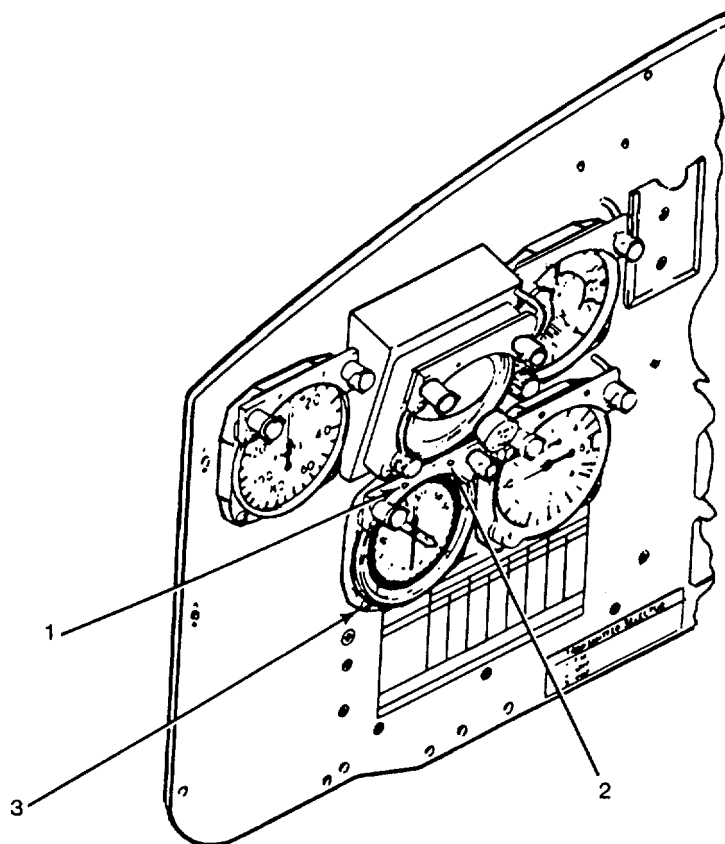
## CHAPTER 26

### COURSE INDICATOR ID-250/ARN MAINTENANCE

Subject	Para.	Page
Course Indicator ID-250/ARN Maintenance (AVUM).....	26-1	26-1
Course Indicator ID-250/ARN Operational Checks (AVUM).....	26-2	26-2
Course Indicator ID-250-ARN Troubleshooting (AVUM).....	26-3	26-2

### SECTION I. MAINTENANCE PROCEDURES

#### 26-1. COURSE INDICATOR ID-250/ARN MAINTENANCE (AVUM)



##### 26-1.1 Removal Instructions.

- A** Remove two screws (1) that hold light shield (2) to indicator and remove light shield.
- B** Remove four screws (3) that secure indicator to instrument panel.



**26-1.1 Removal Instructions.-Continued****CAUTION**

Be careful not to pull indicator so far from instrument panel that electrical wiring or connector will be damaged.

- C** Slide indicator out of instrument panel to gain access and disconnect electrical connector from back of indicator.
- D** Remove ID-250/ARN.

**26-1.2 Installation Instructions.**

- A** Hold ID-250/ARN near instrument panel and connect electrical connector to back of indicator.
- B** Slide indicator into instrument panel and secure it with four screws (3),
- C** Position light shield (2) on ID-250/ARN and secure with two screws (1).

**SECTION II. OPERATIONAL CHECKS****26-2. COURSE INDICATOR ID-250/ARN OPERATIONAL CHECKS (AVUM).**

Operational checks of the ID-250/ARN are performed as part of the operational checks of compass, vhf navigation and adf systems.

**SECTION III. TROUBLESHOOTING****26-3. COURSE INDICATOR ID-250/ARN TROUBLESHOOTING (AVUM).**

Troubleshooting of the ID-250/ARN is performed by comparing results of other system operational checks and a process of elimination. For instance, if adf audio information is normal and bearing information is displayed on the ID-998/ASN but not on ID-250/ARN, the ID-250/ARN is probably defective. If ID-250/ARN indications are normal using one system, but abnormal using another, the ID-250/ARN is not a probable cause of the fault.



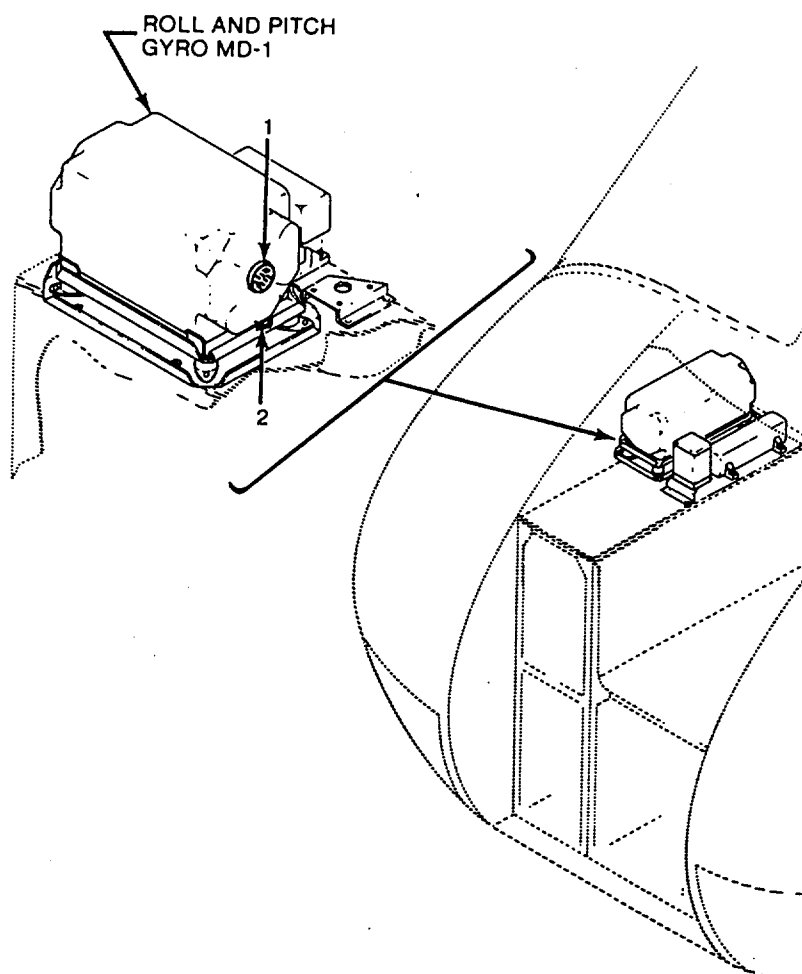
## CHAPTER 27

### ATTITUDE INDICATING SYSTEM MAINTENANCE

Subject	Para.	Page
Roll and Pitch Gyro MD-1 Maintenance (AVUM).....	27-1	27-1
Rate Switching Gyro MC-1 Maintenance (AVUM).....	27-2	27-2
Attitude Indicator Model 4005G Maintenance (AVUM).....	27-3	27-3
Attitude Indicator Amplifier Model 5404G Maintenance (AVUM).....	27-4	27-4
Copilot's Attitude Indicator Type J8 Maintenance (AVUM).....	27-5	27-5
Cabling and Connector Maintenance (AVUM).....	27-6	27-6
Attitude Indicating System Operational Checks (AVUM).....	27-7	27-6
Attitude Indicating System Troubleshooting (AVUM).....	27-8	27-7

#### Section I. MAINTENANCE PROCEDURES

##### 27.1 ROLL AND PITCH GYRO MD-1 MAINTENANCE (AVUM)





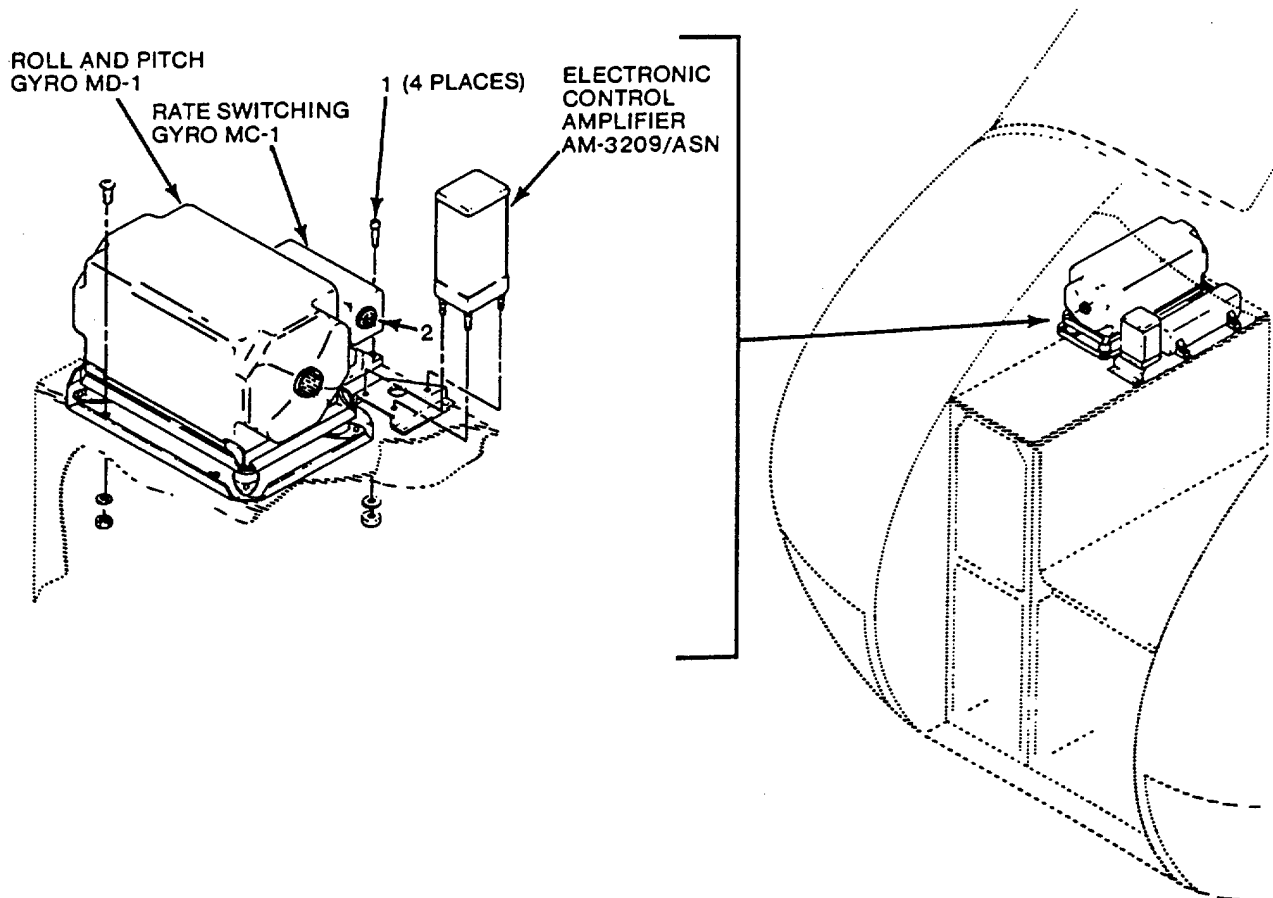
**27-1.1 Removal Instructions.****WARNING**

Make sure power has been removed from M D-1 gyro for at least 25 minutes before proceeding. Injury to personnel or damage to equipment may occur if the gyro is handled before this time.

- A Disconnect electrical connector (1) from front of gyro.
- B Loosen wingnut (2) until holddown clamp is clear of flange on front of gyro.
- C Pull gyro forward while lifting slightly and remove gyro from amount.

**27-1.2 Installation Instructions.**

- A Position back of gyro on mount and slide back making sure flange on back of gyro engages lip on mount.
- B Tighten wingnut (2) until holddown clamp is secured over flange on front of gyro.
- C Connect electrical connector (1) to front of gyro.

**27.2. RATE SWITCHING GYRO MC-1 MAINTENANCE (AVUM)**



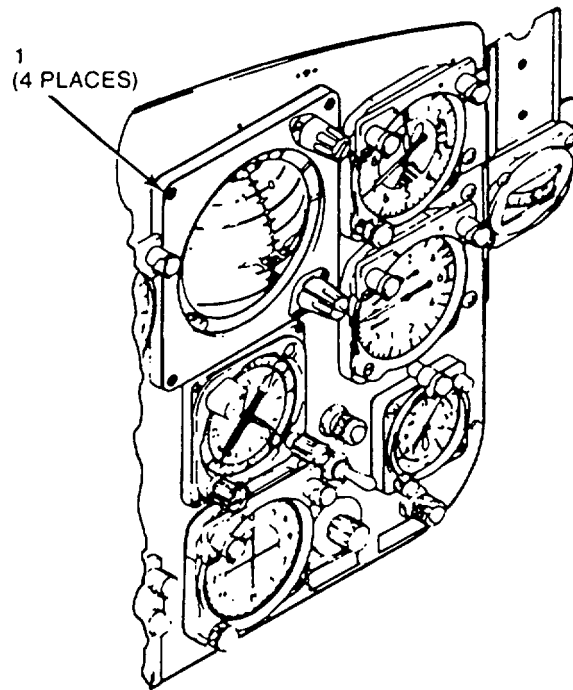
### 27-2.1 Removal Instructions.

- A Disconnect electrical connector (2).
- B Remove four screws (1) that secure gyro to equipment rack.
- C Remove gyro.

### 27-2.2 Installation Instructions.

- A Position gyro on equipment rack and secure with four screws (1).
- B Connect electrical connector (2).

### 27-3. ATTITUDE INDICATOR TYPE 4005G MAINTENANCE (AVUM)



#### NOTE

Two electrical receptacles are provided on back of indicator; only one (J131) is used on configuration E and subsequent.



### 27-3.1 Removal Instructions.

- A Remove four screws (1) that secure indicator to instrument panel.'

#### CAUTION

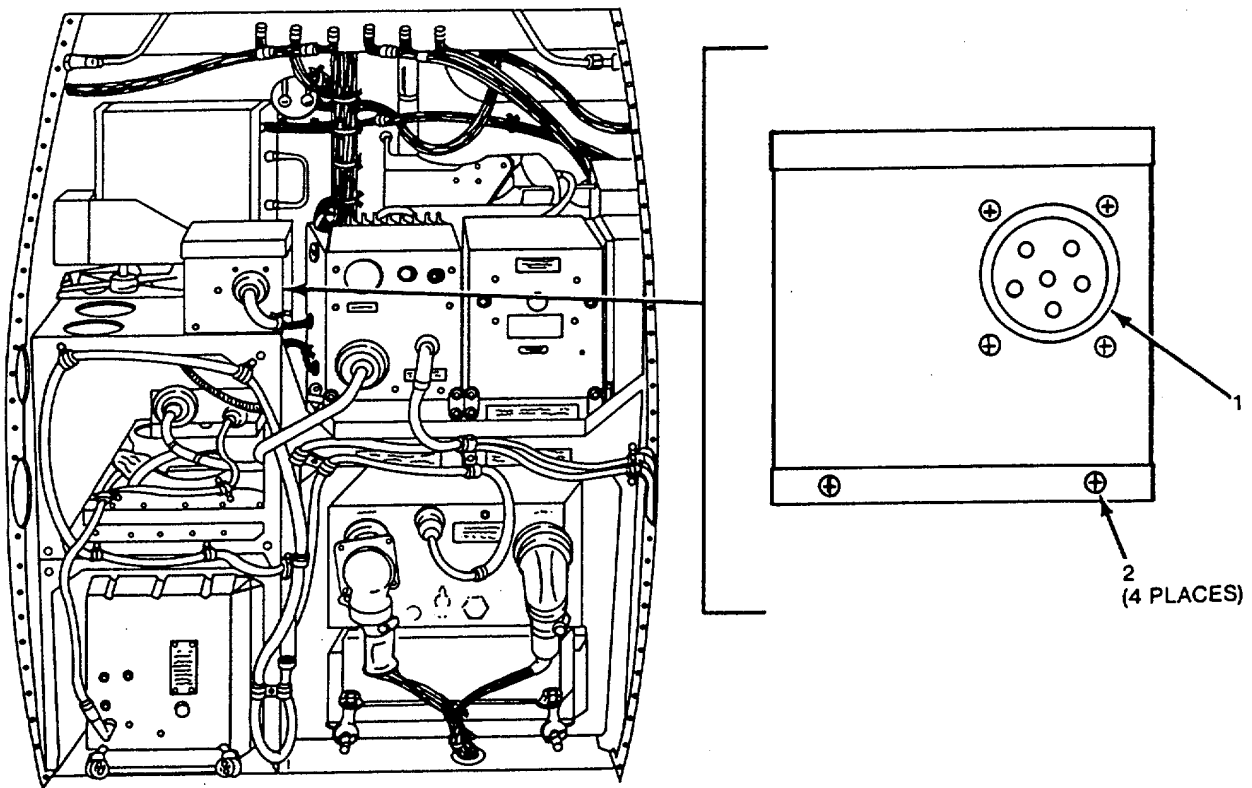
Be careful not to pull indicator so far from instrument panel that wiring or connector will be damaged.

- B Carefully pull indicator out of instrument panel and disconnect electrical connector from rear of indicator.
- C Remove indicator.

### 27-3.2 Installation Instructions.

- A Hold indicator close to instrument panel and connect electrical connector to rear of indicator.
- B Position indicator in instrument panel and secure with four screws (1).

### 27-4. ATTITUDE INDICATOR AMPLIFIER MODEL 54046 MAINTENANCE (AVUM)





#### 27-4.1 Removal Instructions.

- A Disconnect electrical connector (1).
- B Remove four screws (2) that secure amplifier to equipment rack.
- C Remove amplifier.

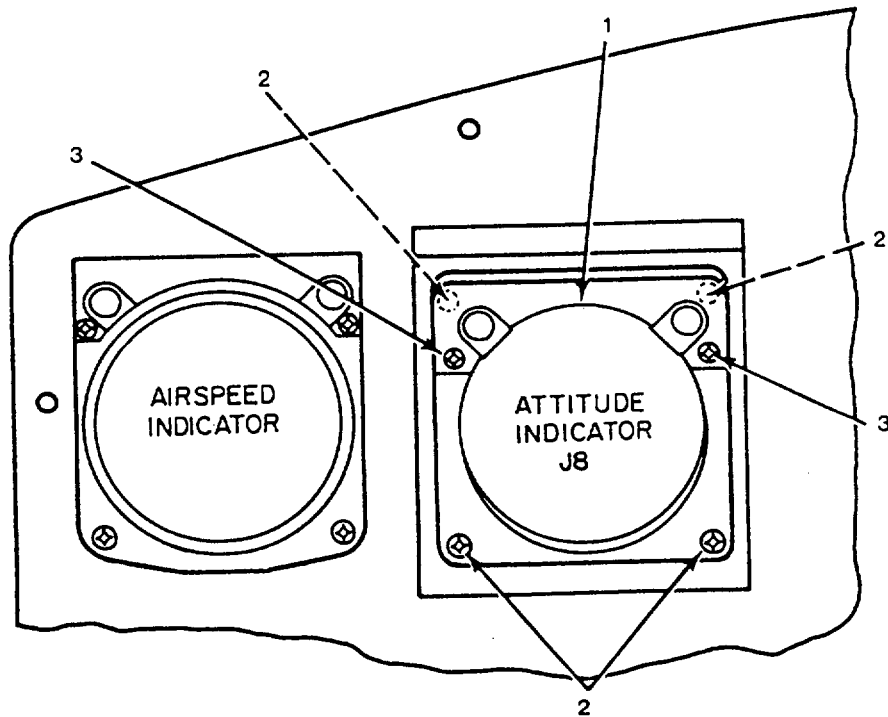
#### 27-4.2 Installation Instructions.

- A Position amplifier on equipment rack and secure with four screws (1).
- B Connect electrical connector (1).

### 27-5. COPILOT'S ATTITUDE INDICATOR TYPE J8 MAINTENANCE (AVUM)

#### NOTE

Copilot's attitude indicator is a self-contained attitude indicating unit.





**27-5.1. Removal Instructions.**

- A** Remove two screws (3) that secure light shield (2) to indicator.
- B** Remove light shield (1).
- C** Remove four screws (2) that secure indicator to instrument panel.

**CAUTION**

Be careful not to pull indicator so far from instrument panel that wiring or connector will be damaged.

- D** Carefully pull indicator out of instrument panel and disconnect electrical connector from rear of indicator.
- E** Remove indicator.

**27-5.2. Installation Instructions.**

- A** Hold indicator close to instrument panel and connect electrical connector to rear of indicator.
- B** Position indicator in instrument panel and secure with four screws (2).
- C** Position light shield (1) on indicator and secure with two screws (3).

**27-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
P131, P6, P129, P130\*, P164\*, and P165\*  
\* Connectors marked with \* are not used in some configurations.
- Refer to FO-52 for wiring data.
- Cabling repairs are by repairing or replacing connectors or by splicing individual wires.
- Paragraph 2-5 contains general wiring repair information.

**Section II. OPERATIONAL CHECKS****27-7. ATTITUDE INDICATING SYSTEM OPERATIONAL CHECKS (AVUM)**

These checks are used to ensure Attitude Indicating Systems (Pilot's and Copilot's) are performing properly. They are also used after repairs to make sure the problem was fixed.

**NOTE**

Initial setup consists of connecting an auxiliary power unit per paragraph 1-50.



**27-7. ATTITUDE INDICATING SYSTEM OPERATIONAL CHECKS (AVUM)-Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
---------	----------------	-------------------

**POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS****NOTE**

Pull the CAGE knob on the copilot's attitude indicator before performing step 1 below.

1. Depress two PILOT ATTD and two COPILOT ATTD circuit breakers.  
Movement of horizon bar in relation to miniature airplane in center of indicator denotes operation of copilot's system. After approximately two minutes, OFF flag on pilot's and copilot's indicator should disappear.
2. Adjust roll trim knob to align vertical axis of sphere with center mark on top of indicator.  
Roll trim knob adjusts vertical axis smoothly.
3. Adjust pitch trim knob to center horizon on indicator sphere over miniature airplane indicating normal flight attitude.  
Pitch trim knob adjusts horizon smoothly.
4. Deenergize PILOT and COPILOT ATTD circuit breakers.  
OFF warning flags appear.

**Section III. TROUBLESHOOTING****27-8. ATTITUDE INDICATING SYSTEM TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in the Attitude Indicating Systems.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.  
The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 27-7.



## 27-8. ATTITUDE INDICATING SYSTEM TROUBLESHOOTING (AVUM)-Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. OFF warning flag on pilot's indicator does not disappear after warmup.	<b>A</b> Defective circuit breaker.	<b>A</b> Replace circuit breaker.
<b>B</b> Defective indicator.	<b>B</b> Replace pilots attitude indicator, model 4005G.	
2. Pointer on indicator sphere will not aline with indicator center mark.	<b>A</b> Defective indicator.	<b>A</b> Replace indicator, model 4005G.
<b>B</b> Defective roll and pitch gyro.	<b>B</b> Replace MD-1.	
<b>C</b> Defective rate switching gyro.	<b>C</b> Replace MC-1.	
<b>D</b> Defective attitude indicator amplifier.	<b>D</b> Replace amplifier, model 5404G, P/N 136703-01-02.	
3. Horizon on indicator sphere will not center on miniature airplane.	<b>A</b> Defective indicator.	<b>A</b> Replace pilot's indicator, model 5004G.
<b>B</b> Defective roll and pitch gyro.	<b>B</b> Replace MD-1.	
<b>C</b> Defective rate switching gryo.	<b>C</b> Replace MC-1.	
<b>D</b> Defective attitude indicator amplifier.	<b>D</b> Replace amplifier model 5405G, P/N 136703-01-02.	
4. OFF warning flag does not appear on pilot's indicator when circuit breaker is deenergized.	<b>A</b> Defective circuit breaker.	<b>A</b> Replace circuit breaker.
<b>B</b> Defective indicator.	<b>B</b> Replace pilot's indicator model 4005G.	
5. Horizon bar on copilot's indicator does not move when circuit breaker is depressed.	<b>A</b> Defective circuit breaker.	<b>A</b> Replace circuit breaker.
<b>B</b> Defective indicator.	<b>B</b> Replace copilots indicator type J8.	



**27-8.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in the Attitude Indicating Systems and the preceding operational checks and troubleshooting chart do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-52 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB29 P6	3, 6 A, C	Ground Primary power (J8)	Not applicable COPILOT ATTD circuit breakers energized	115 Vac, 400 Hz
P1 29	B, C	Primary power (MD-1)	PILOT ATTD circuit breakers energized	115 Vac, 400 Hz



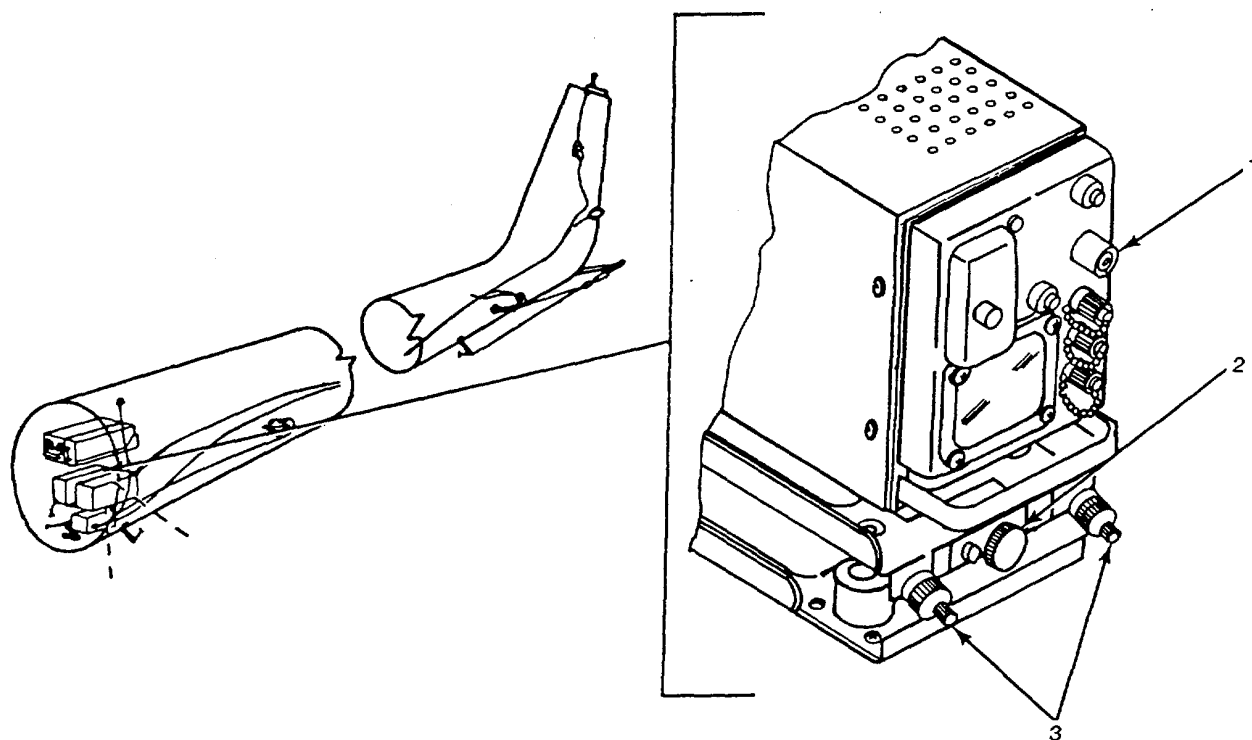
## CHAPTER 28

### TRANSPONDER SET AN/APX-44 MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-494/APX-44 Maintenance (AVUM).....	28-1	28-1
Mount MT-2100/APX-44 Maintenance (AVUM).....	28-2	28-2
Control C-2714/APX-44 Maintenance (AVUM).....	28-3	28-3
Antenna AT-844/APX-44 Maintenance (AVUM).....	28-4	28-4
Cabling and Connector Maintenance (AVUM).....	28-5	28-4
Transponder Set An/APX-44 Operational Checks (AVUM).....	28-6	28-5
Transponder Set AN/APX-44 Troubleshooting (AVUM).....	28-7	28-10

### SECTION I. MAINTENANCE PROCEDURES

#### 28.1 RECEIVER-TRANSMITTER RT-494/APX-44 MAINTENANCE (AVUM)





### 28-1.1 Removal Instructions

- A Disconnect coaxial connector (1).
- B Loosen two knurled nuts (3), and lift holddown clamps off studs on receiver-transmitter.
- C Loosen injector-ejector knob (3) until receiver-transmitter is out far enough to disengage guide pins and electrical on mount.
- D Lift front of receiver-transmitter to clear injector-ejector and remove receiver-transmitter.

### 28-1.2 Installation Instructions.

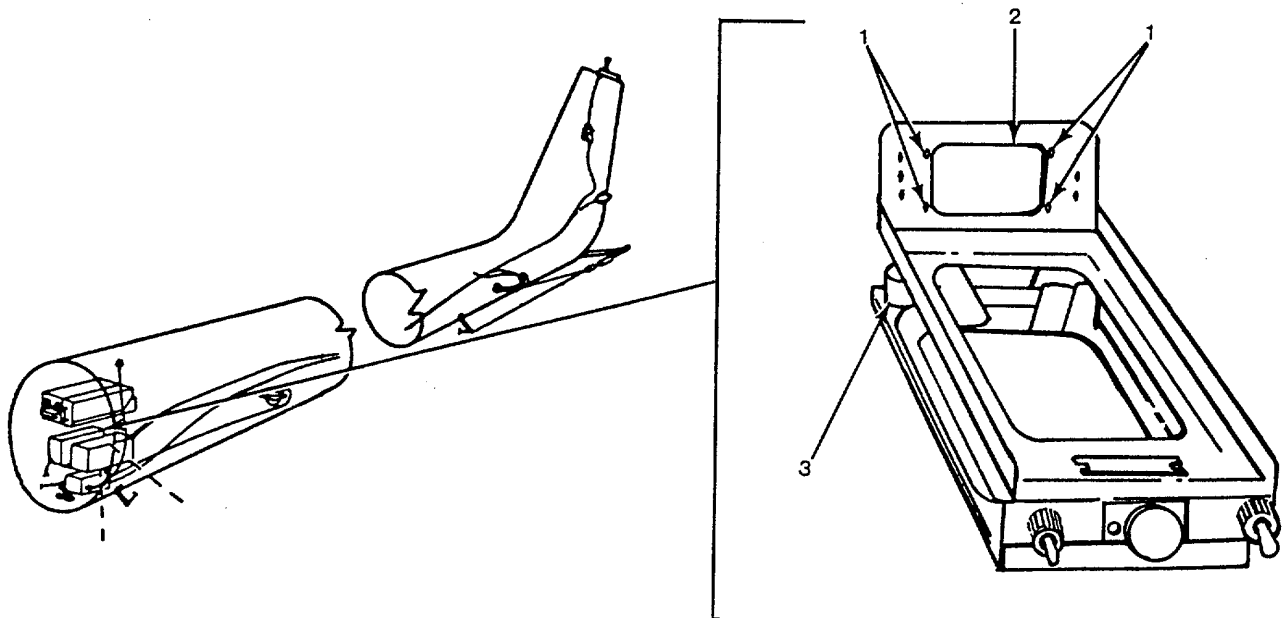
- A Position receiver-transmitter in mount and slide to rear until guide pins on back of mount just engage guide holes on receiver-transmitter.
- B Before mount and receiver-transmitter electrical connectors engage, lift front of receiver-transmitter and position lip on front of receiver-transmitter in groove on injector-ejector mechanism.

#### **CAUTION**

Make sure electrical connectors on receiver-transmitter and mount are properly aligned during next step or connectors may be damaged.

- C Tighten injector-ejector knob (2) until receiver-transmitter is firmly seated in mount.
- D Engage holddown clamps and tighten two knurled knobs (3).
- E Connect coaxial connector (1) to front of receiver-transmitter.

### 28-2. MOUNT MT-2100/APX-44 MAINTENANCE (AVUM)





**28-2.1 Removal Instructions.**

- A Remove RT-494/APX-44 per paragraph 29-1.1.
- B Remove four screws (1) that secure electrical connector (2) in mount.
- C Remove four screws, nuts and washers (not shown) that secure shock-mount (3) to equipment shelf.
- D Pull connector to rear out of mounting.
- E Repeat step C for three remaining shock mounts.

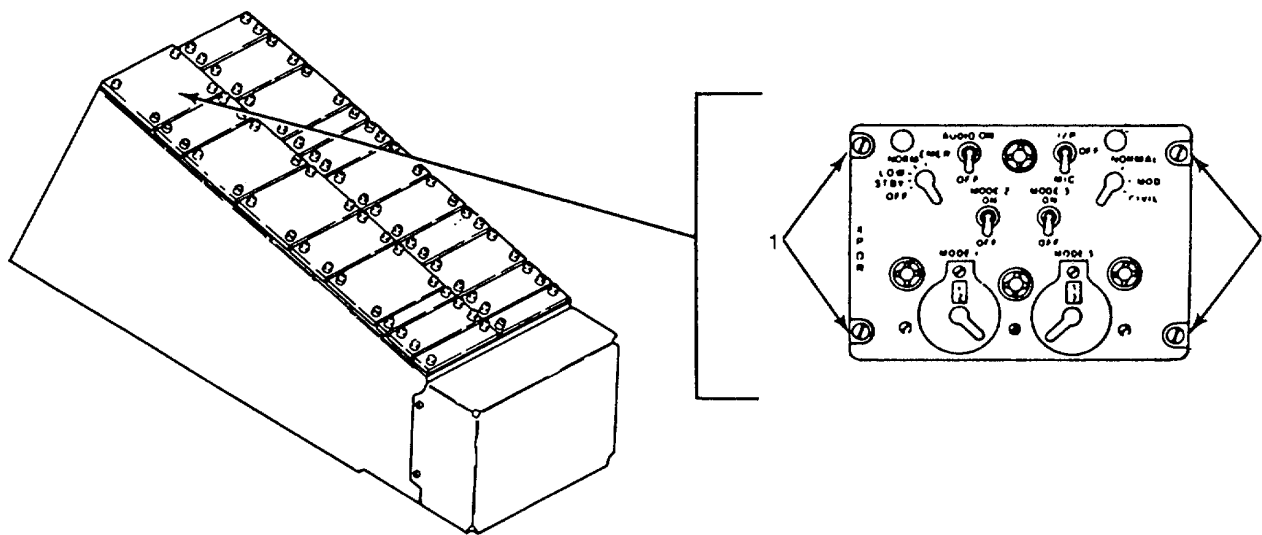
**28-2.2 Installation Instructions.**

- A Position mount on electrical equipment shelf and secure shock-mount (3) with four screws, nuts and washers.
- B Repeat step A for remaining three shock-mounts.
- C Position electrical connector (2) in mount and secure with four screws (1).

**NOTE**

Key ways on electrical connector will fit into mount only one way.

- D Install receiver-transmitter per paragraph 29-1.2.

**28-3. CONTROL C-2714/APX-44 MAINTENANCE (AVUM)**



### 28-3.1 Removal Instructions.

- A Loosen four spring-lock fasteners (1).

#### **CAUTION**

Be careful not to pull control so far from pedestal console that electrical wiring or connector will be damaged.

- B Lift control from pedestal console and disconnect electrical connector on rear of control.
- C Remove control.

### 28-3.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connector to rear of control.
- B Position control in pedestal console and secure with four spring-lock fasteners (1).

### 28-4. ANTENNA AT-884/APX-44 MAINTENANCE (AVUM)

Refer to paragraph 30-6 for AT-884/APX maintenance.

### 28-5. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel: P902, P903, P906, J906, P901, J907, P904, C96 and P910.

#### **NOTE**

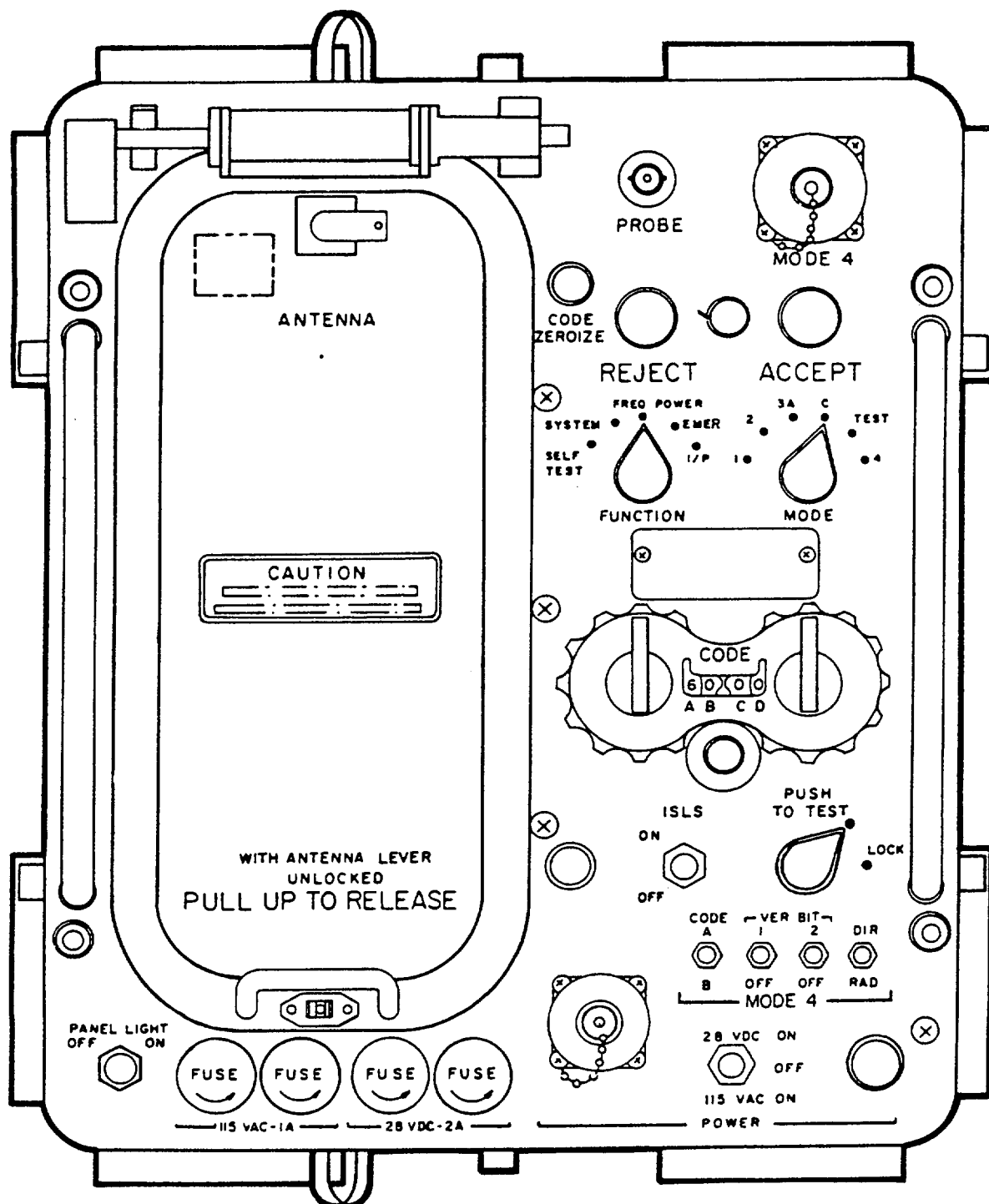
Only P902, P903, P901 and P904 are used in UH-1 D/H configurations A and B. UH-1 D/H configuration I and subsequent are wired for and utilize AN/APX-72.

- Refer to FO-53 for UH-1 D/H configurations A through D wiring data or FO-54 for UH-1 D/H configurations E through H wiring data.
- Multiwire cabling is repaired by replacing or repairing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing coaxial connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.



# SECTION II. OPERATIONAL CHECKS

## 28-6. TRANSPONDER SET AN/APX-44 OPERATIONAL CHECKS (AVUM)



Test Set AN/APM-123(V)1 shown above is used to perform the Operational checks on Transponder Set AN/APX-44.



## 28-6. TRANSPONDER SET AN/APX-44 OPERATIONAL CHECKS AVUM) - Continued

These checks are used to ensure Transponder Set AN/APX-44 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

### INITIAL SETUP

#### Test Equipment

Test Set AN/APM-1 23(V) 1

Attenuator, 55 dB at 25 W

#### Equipment Condition

References

Paragraph 1-50: Auxiliary Power Unit connected.

Paragraph 14-13: Intercommunications Set operational.

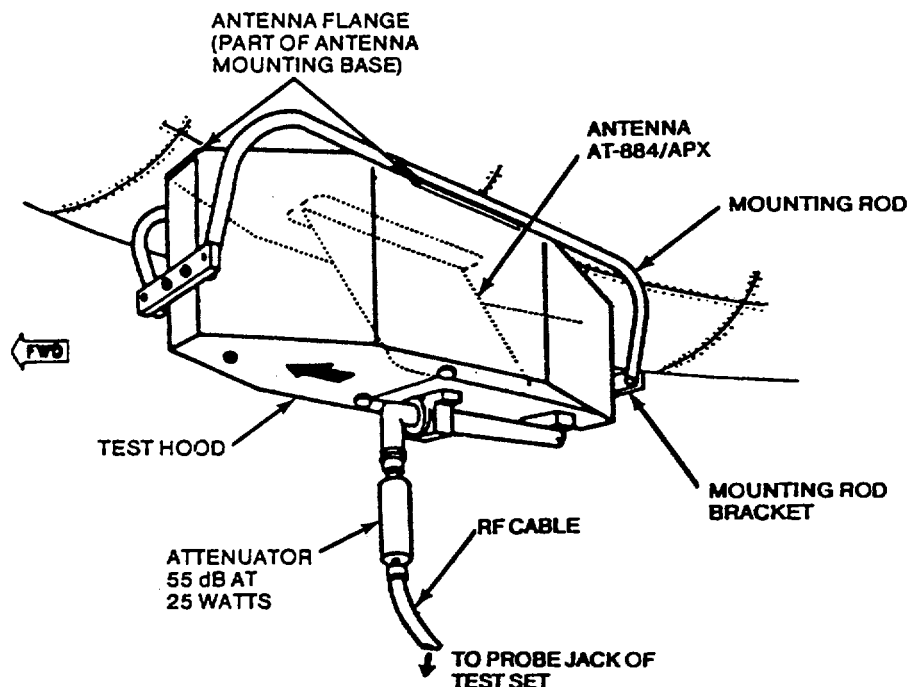
### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

### POWER OFF INSPECTION

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chaffed or frayed wiring.
3. Connect Test Set AN/PAM-123(V)1 as follows:
  - A Remove cover from test set. (Accessories are stored in cover.)
  - B Release antenna hood locking lever and lift hood from test set.





**28-6. TRANSPONDER SET AN/APX-44 OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

- |          | NORMAL INDICATIONS  | REMARKS |
|----------|---|---------|
| <b>C</b> | Position antenna hood over antenna. Coaxial connector on antenna hood should be toward tail of helicopter.                  |         |
| <b>D</b> | Hold antenna hood tightly against helicopter skin and rotate mounting rods up to snap into mounting flange on antenna base. |         |

**NOTE**

Ensure antenna hood is tight against helicopter skin to prevent radiation of rf signals. During tests, emergency codes 7600 (communications failure) and 7700 (aircraft in distress) are used. These signals must not be radiated.

- |          |   |  |
|----------|---|--|
| <b>E</b> | Connect 55 dB attenuator coaxial connector. |  |
|----------|---|--|

**CAUTION**

Failure to use 55 dB attenuator will seriously damage test set.

- |          |  |  |
|----------|--|--|
| <b>F</b> | Connect coaxial cable (from test set cover) to 55 dB attenuator then to PROBE connector on test set. |  |
| <b>G</b> | Ensure MASTER switch on transponder control panel is set to OFF.                                     |  |
| <b>H</b> | On AN/APM-123(V)1, set POWER OFF and PUSH TO TEST/LOCK in PUSH TO TEST position.                     |  |
| <b>I</b> | Connect test set power cable (from test set cover) to test set and to power source.                  |  |

**NOTE**

Test set will operate on 115 Vac, 60 Hz; 115 Vac, 400 Hz; or 28 Vdc.

4. Depress circuit breakers on 28 Vdc circuit breaker panel as follows:  
2 IFF/APX( ), INTERCOMM/CPLF+CREW Land INTERCOMM/PLT+CREW R.



**28-6. TRANSPONDER SET AN/APX-44 OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

5. On transponder control panel, set controls as follows:

**Control****Position**

Master Control	STBY (for 3 to 5 minutes, then to NORM)
AUDIO	OFF
I/P/OFF/MIC	OFF
NORMAUMOD/CIVIL	NORMAL
MODE 2	OFF
MODE 3	OFF
MODE 1 (code wheels)	00
MODE 2 (code switches or transponder)	0000
MODE 3 (code wheels)	00

6. Set controls on test set as follows:

**Control****Position**

FUNCTION	SELFTEST
MODE	1
CODE	0000
ISLS (side lobe suppression)	OFF
POWER	ON

**NOTE**

Transponder and test set must have warmed up for ten minutes before proceeding.

7. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.

**NOTE**

When the test set FUNCTION switch is in SELF TEST, the ACCEPT lamp indicates acceptable operation of the test set and the REJECT lamp indicates failure of the test set; if the FUNCTION switch is in any other position, the indications apply to transponder set being checked.



## REMARKS



**SECTION III. TROUBLESHOOTING****28-7. TRANSPONDER SET AN/APX-44 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in IFF Set AN/APX-44.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- The manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 28-6.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Pilot lamp on control unit does not light when set is turned on.	A Defective lamp.	A Replace lamp.
	B Defective fuse.	B Replace fuse on RT-494/APX-44.
	C Defective transponder.	C Replace RT-494/APX-44.
	D Defective control.	D Replace G-2714/APX-44.
2. Indications on test set not as specified for any step.	A Defective control.	A Replace C-2714/APX-44.
	B Defective transponder.	B Replace RT-494/APX-44.
	C Defective antenna.	C Replace AT-884/APX-44.

**28-7.1. Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Transponder Set AN/APX-44 and the preceding operational checks and troubleshooting chart do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-53 and FO-54, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 thru FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.



**28-7.1 Signal and Voltage Measurements (AVUM). - Continued**

- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists the voltage or signal that should be present during stated equipment operation.

**28-7.1.1 Signal and Voltage Measurements [AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB19	1, 2	Primary power	AN/APX-44 energized	28 Vdc
TB19	10	IFF audio	AN/APX-44 energized and receiving signal from ramp test set	Audio hi



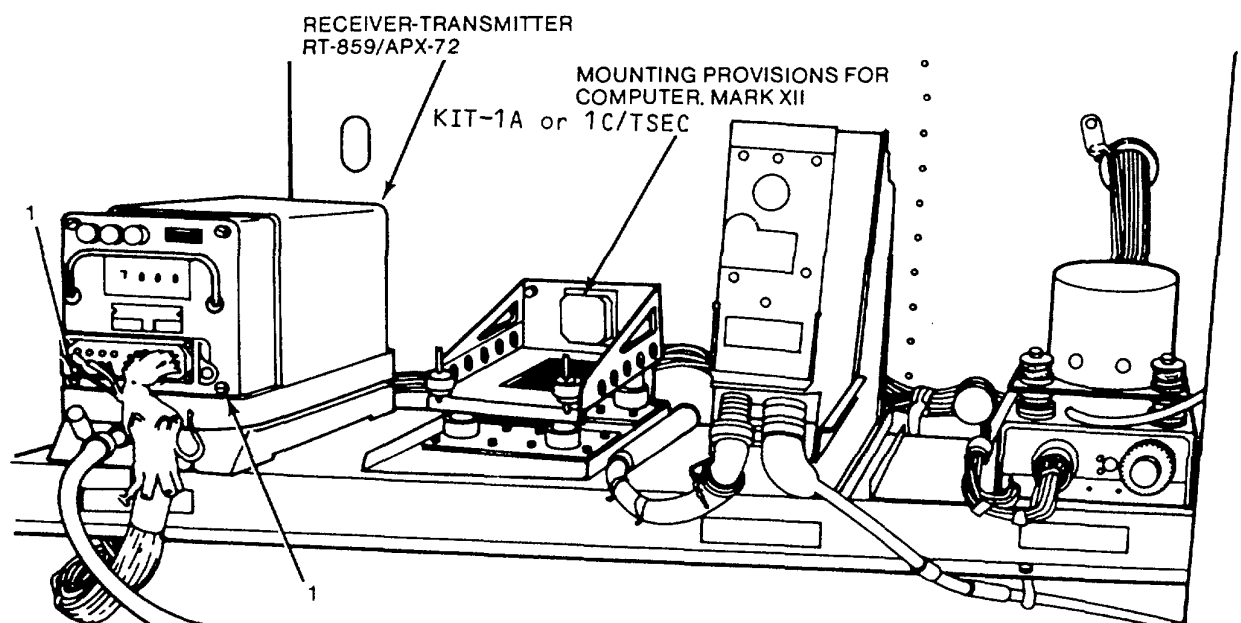
## CHAPTER 29

### TRANSPONDER SET AN/APX-72 MAINTENANCE (AVUM)

Subject	Para.	Page
Receiver-Transmitter RT-859/APX-72 Maintenance (AVUM).....	29-1	29-1
Control C-6280/APX-72 Maintenance (AVUM).....	29-2	29-2
Test Set TS-1843/APX-72 Maintenance (AVU M).....	29-3	29-3
Computer KIT-1A/TSEC Maintenance (AVUM) .....	29-4	29-4
Mount MT-3949A/U (KIT-1A/TSEC) Maintenance (AVUM) .....	29-5	29-5
Antenna AT-884/APX-44 Maintenance (AVUM).....	29-6	29-6
Cabling and Connector Maintenance (AVUM) .....	29-7	29-6
Transponder Set AN/APX-72 Operational Checks (AVUM).....	29-8	29-7
Transponder Set AN/APX-72 Troubleshooting (AVUM).....	29-9	29-18

### SECTION I. MAINTENANCE PROCEDURES

#### 29-1. RECEIVER-TRANSMITTER RT-859/APX-72 MAINTENANCE (AVUM)





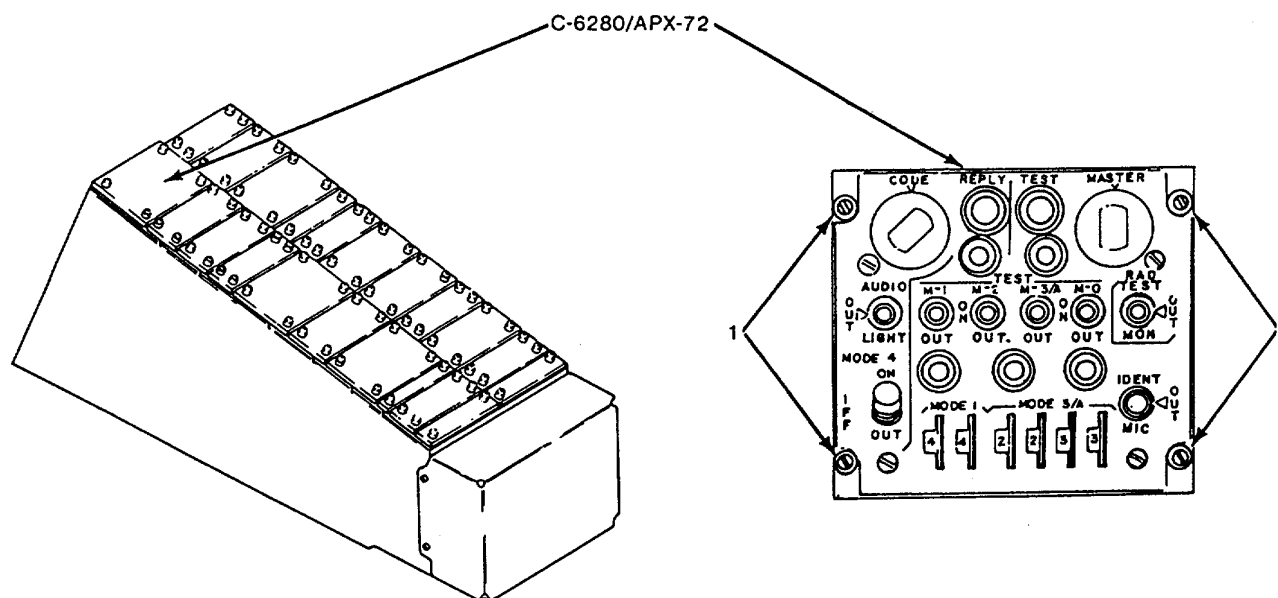
### 29-1.1 Removal Instructions.

- A Loosen two captive screws (1) and disconnect electrical connector.
- B Disconnect coaxial cable from front of RT-859/APX-72.
- C Loosen two thumbnuts (2) until clear of flanges on front of RT-859/APX-72.
- D Grasp handle and pull RT-859/APX-72 out and clear of mount.

### 29-1.2 Installation Instructions.

- A Position RT-859/APX-72 between guide rails on mount and slide to rear. Make sure lip on back of mount is over flange on back of RT-859/APX-72.
- B Lift two thumbnuts (2) over flanges on front of RT-859/APX-72 and tighten thumbnuts.
- C Connect coaxial connector to front of RT-859/APX-72.
- D Connect electrical connector and tighten two captive screws (1).

### 29-2. CONTROL C-6280/APX-72 MAINTENANCE (AVUM)





### 29-2.1 Removal Instructions.

- A Loosen four spring lock fasteners (1).

#### **CAUTION**

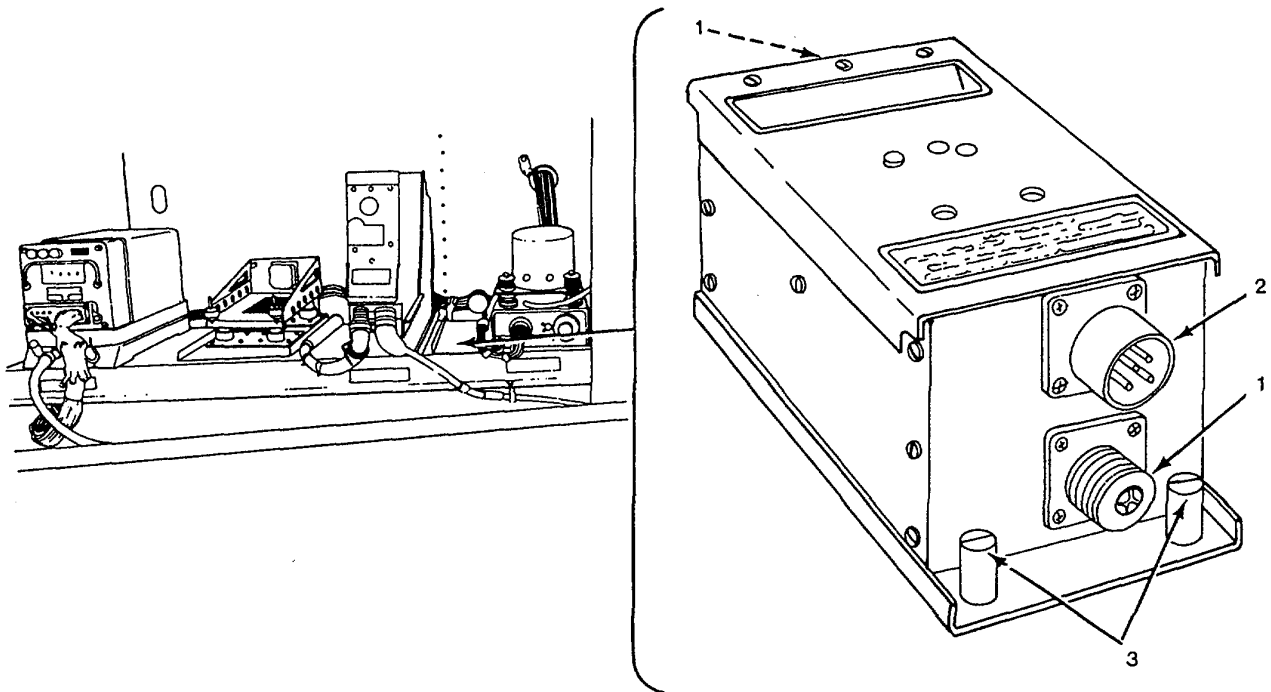
Be careful not to pull control so far from pedestal console that electrical wiring or connector will be damaged.

- B Carefully pull control from pedestal console and disconnect electrical connector from rear of control.
- C Remove control.

### 29.2-2 Installation Instructions.

- A Hold control close to pedestal console and connect electrical connector to rear of control.
- B Position control in pedestal console and tighten four spring-lock fasteners (1).

### 29-3. TEST SET TS-1843/APX-72 MAINTENANCE (AVUM)



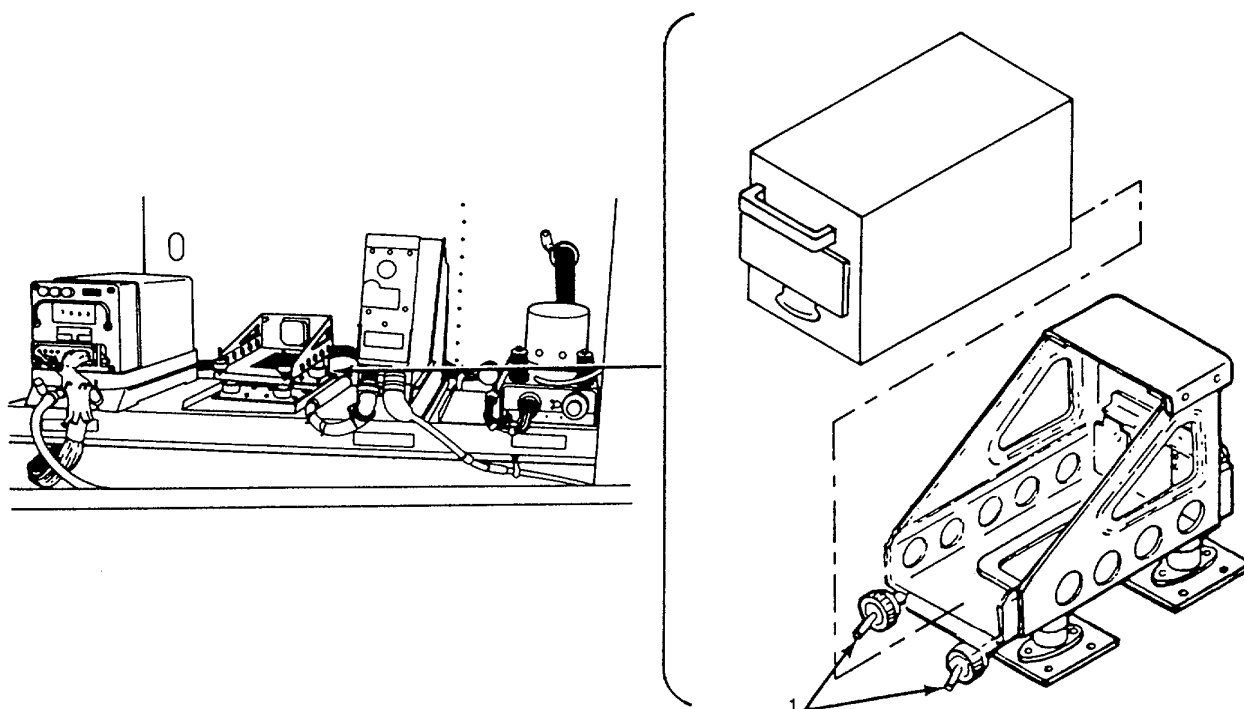
### 29-3.1 Removal Instructions.

- A Disconnect one electrical (2) and two coaxial (1) connectors.
- B Loosen two captive screws (3) on front of test set.
- C Slide test set forward and out of mount.



**29-3.2 Installation Instructions.**

- A Position test set in mount and slide to rear. Make sure flanges on rear of test set are engaged in slots in rear of mount.
- B Tighten two captive screws (3) on front of test set.
- C Connect one electrical (2) and two coaxial (1) connectors.

**29-4. COMPUTER KIT-1A OR 1C/TSEC MAINTENANCE (AVUM)****29-4.1 Removal instructions.**

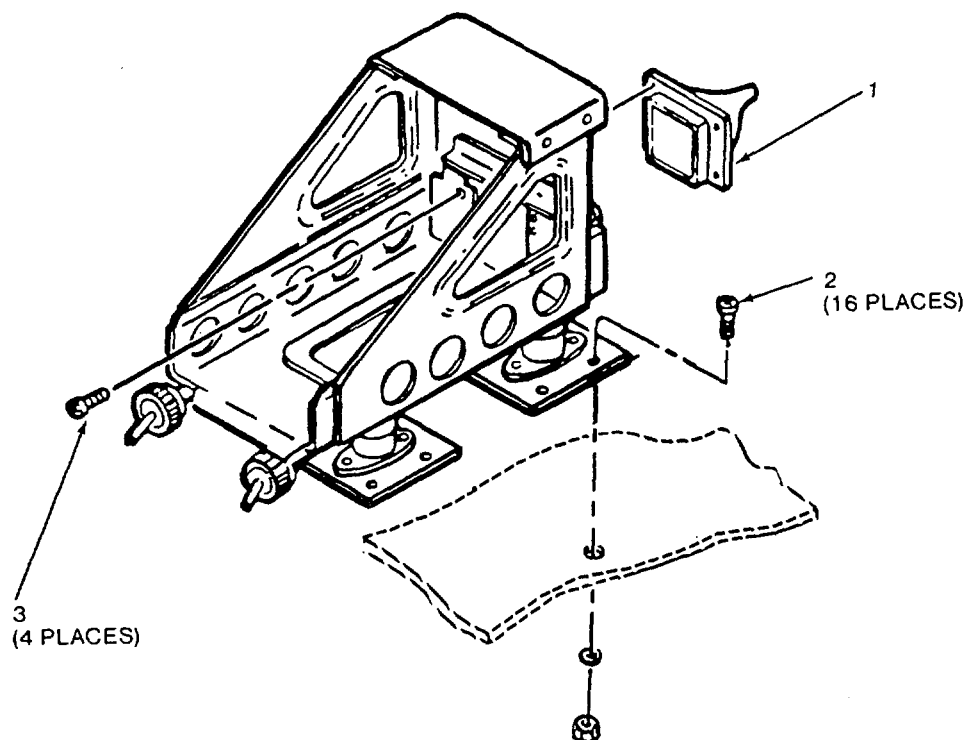
- A Loosen two knurled knobs (1) and lift cylindrical latches off stud on computer.
- B Pull computer forward out of mount.

**29-4.2 Installation Instructions**

- A Position computer in mount and slide back, making sure guide pins and connectors align.
- B Firmly seat computer in mount.
- C Position cylindrical latches over studs on computer and tighten knurled knobs (1)



## 29-5. MOUNT MT-3949A/U (KIT-1A/TSEC) MAINTENANCE (AVUM)



### 29-5.1 Removal Instructions.

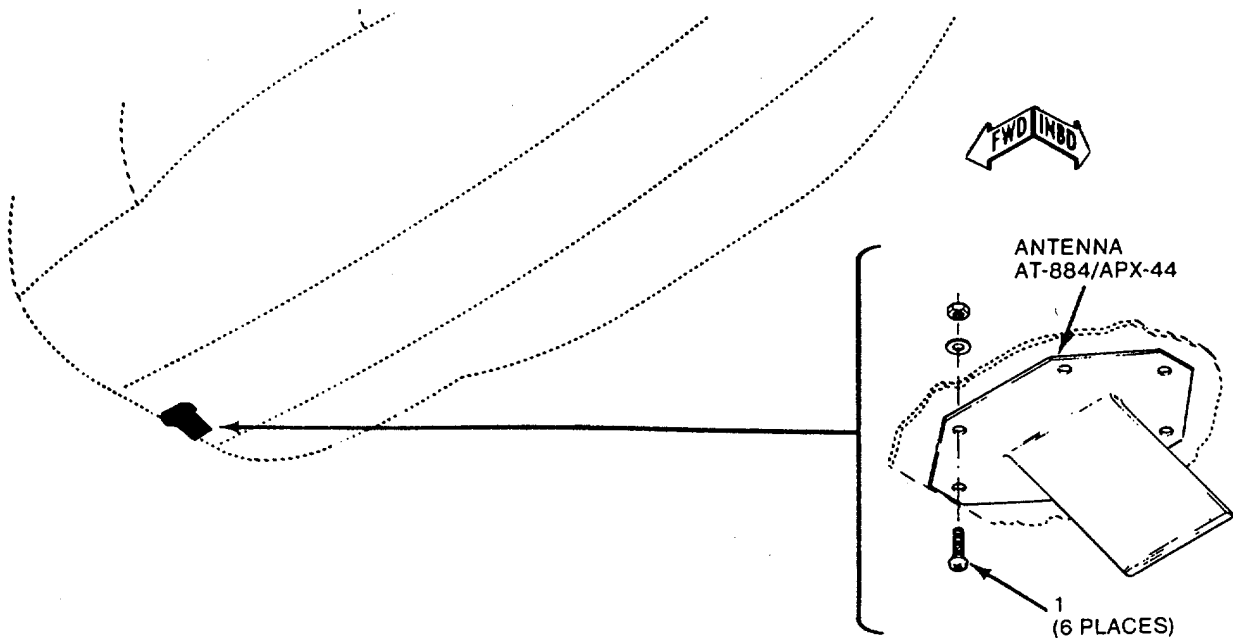
- A Remove KIT-1A or 1C/TSEC per paragraph 29-4.1.
- B Remove four screws (3) that secure electrical connector to mount.
- C Remove electrical connector (1).
- D Remove 16 screws, nuts and washers (2) and remove mount.

### 29-5.2 Installation Instructions.

- A Position mount on equipment rack and secure with 16 screws, nuts and washers (2).
- B Position electrical connector (1) in mount and secure with four screws (3).
- C Install KIT-1A or 1C/TSEC per paragraph 29-4.2.



## 29-6. ANTENNA AT-884/APX-44 MAINTENANCE (AVUM)



### 29-6.1 Removal Instructions.

- A Remove six screws (1) that secure antenna to helicopter skin.

#### **CAUTION**

Be careful not to pull antenna so far from helicopter skin that coaxial cable or connector will be damaged.

- B Carefully pull antenna from helicopter skin and disconnect coaxial connector from antenna base.
- C Remove antenna.

### 29-6.2 Installation Instructions.

- A Hold antenna close to helicopter skin and connect coaxial connector to base of antenna.
- B Position antenna on helicopter skin and secure with six screws (1).

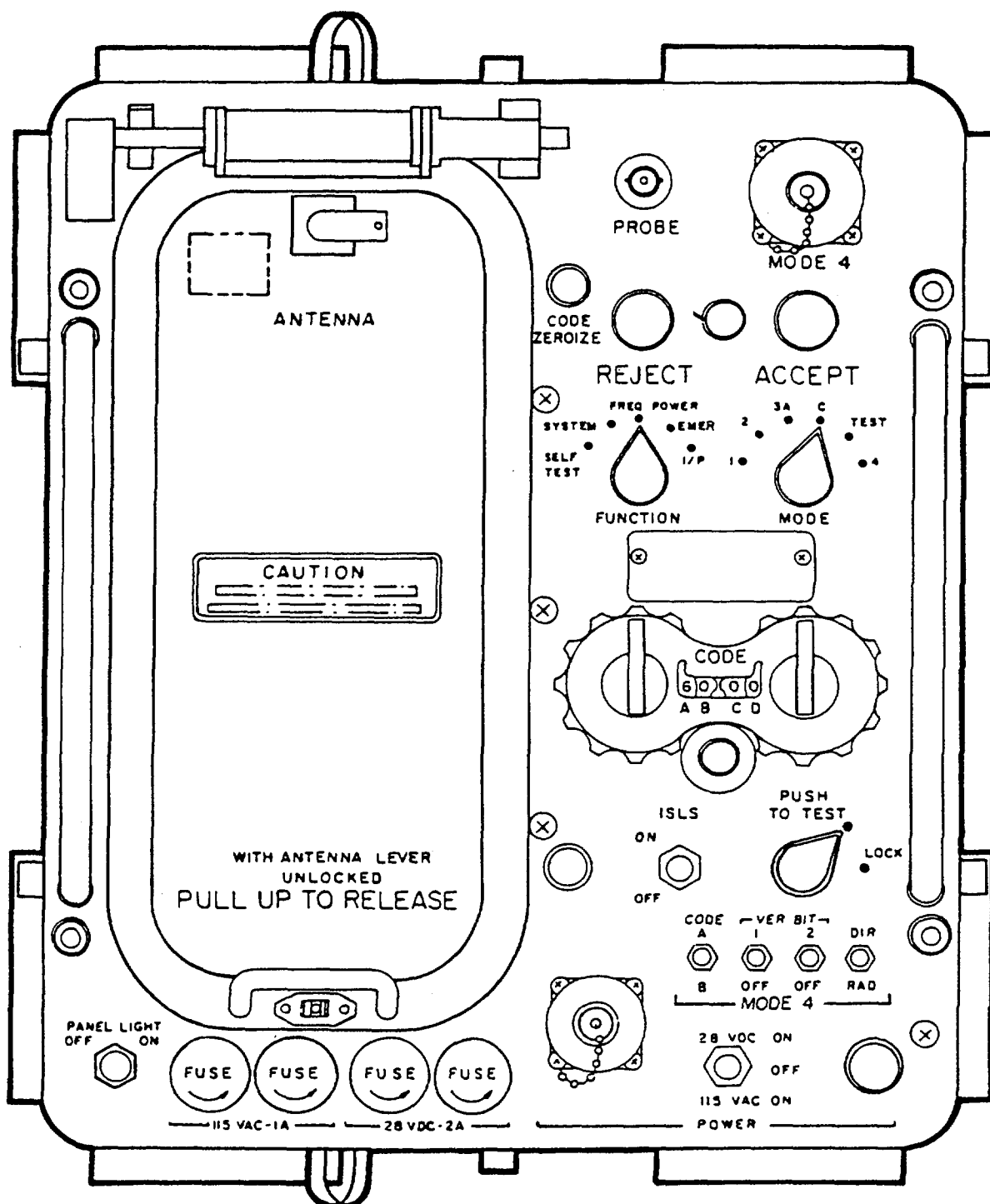
## 29-7. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
P916, P913, P917, P918, P919, P920, P914, P921, P506 and J506.
- Refer to FO-55 and FO-56 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- RF cables are repaired by repairing or replacing connectors or replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.



## SECTION II. OPERATIONAL CHECKS

### 29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)





## 29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM) - Continued

- These checks are used to ensure Transponder Set AN/APX-72 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

### INITIAL SETUP

#### Test Equipment

Test Set AN/APM-123(V)1  
Attenuator, 55 dB at 25W

AN/APM-378  
AN/APM-424(V)2

#### Equipment Conditions

Reference

Paragraph 1-50: Auxiliary Power Unit Connected  
Paragraph 14-13: Intercommunications Set operational

TM 11-4920-296-14+P  
TM 11-6625-3090-12+P

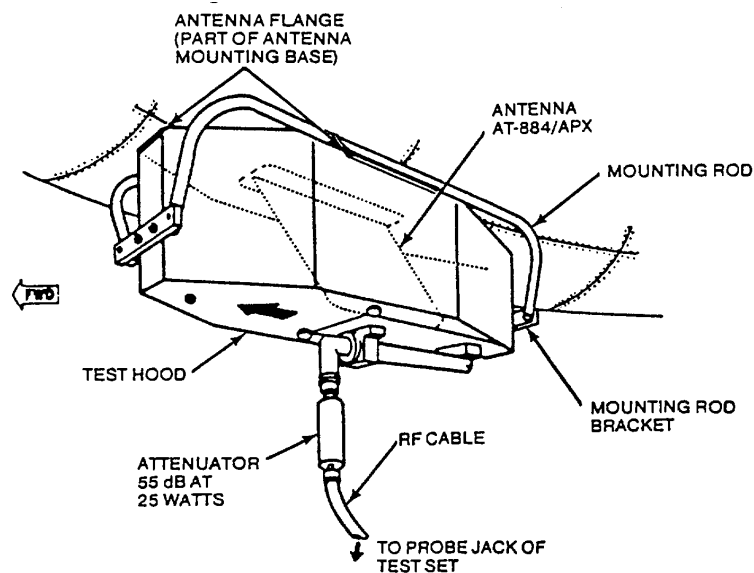
### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

### POWER OFF INSPECTION

- Check that all components are installed, securely mounted and safety-wired (if required).
- Check that all connectors are tightened and for evidence of chaffed or frayed wiring.
- Connect Test Set AN/APM-123(V) as follows:
  - Remove cover from test set. (Accessories are stored in cover.)
  - Release antenna hood locking lever and lift hood from test set.





**29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

- c. Position antenna hood over antenna. Coaxial connector on antenna hood should be toward tail of helicopter.
- d. Hold antenna hood tightly against helicopter skin and rotate mounting rods up to snap into mounting flange on antenna base.

**NOTE**

Ensure antenna hood is tight against helicopter skin to prevent radiation of RF signals. During tests, emergency codes 7600 (communications failure) and 7700 (aircraft in distress) are used. These signals must not be radiated.

- e. Connect 55 dB attenuator coaxial connector.

**NOTE**

Failure to use 55 dB attenuator will seriously damage test set.

- f. Connect coaxial cable (from test set cover) to 55 dB attenuator then to PROBE connector on test set.
- g. Ensure MASTER switch on transponder control panel is set to OFF.
- h. On AN/APM-1 23(V)1, set POWER OFF and PUSH TO TEST/LOCK in PUSH TO TEST position.
- i. Connect test set power cable (from test set cover) to test set and to power source.

**NOTE**

Test set will operate on 115 Vac, 60 Hz; 115 Vac, 400 Hz; or 28 Vdc.

- 4. Depress circuit breakers on 28 VDC circuit breaker panel as follows:

2 IFF/APX( ), INTERCOMM/CPLT 4 CREW. Land INTERCOMM/PLT & CREW R.

- 5. On transponder control panel, set controls as follows:

	<u>Control</u>	<u>Position</u>
MASTER		STBY (for 3 minutes then NORM)
IDENT		OUT
M-1		ON
M-2		OFF
M-3/A		OFF
M-C		OFF
MODE 1 (code wheels)		00
MODE 2 (code wheels on transponder)		0000
Mode 3/A (code wheels)		0000
MODE 4 ON/OUT		OUT
AUDIO/OUT/LIGHT		OUT
CODE (Mode 4)		ZERO



**29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

6. Set controls on test set as follows:

FUNCTION	SELF TEST
MODE	1
CODE	0000
ISLS (side lobe suppression)	OFF
POWER	ON

**NOTE**

Transponder and test set must have warmed up for 10 minutes before proceeding.

7. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.

**NOTE**

The ACCEPT lamp on test set indicates acceptable test set and transponder operation; REJECT lamp indicates failure of test set or transponder.

8. Repeat step 7 with test set MODE switch in 2, 3/A and C position.  
ACCEPT lamp lights for each test.  
If REJECT lamp lights, test set is malfunctioning.

**MODE 1 CHECKS**

9. On test set, set FUNCTION switch to SYSTEM and MODE switch to 1; depress PUSH TO TEST switch.  
ACCEPT lamp lights.
10. On transponder control set MODE 1 code wheels to 73; on test set, set code wheels to 7300.
11. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.

**MODE 2 CHECKS**

12. On transponder set control panel, set switches as follows:

M-1	OFF
M-2	ON
MODE 1 (code wheels)	00

13. On transponder receiver-transmitter set code switches to 0000.
14. On test set, set MODE switch to 2 and CODE switches to 0000.
15. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.



**29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****MODE 2 CHECKS-Continued**

16. On transponder receiver-transmitter, set code wheels to 7777.
17. On test set, set CODE wheels 7777.
18. On test set, depress PUSH TO TEST switch.  
Accept lamp lights.

**MODE 3/A CHECKS**

19. On transponder control panel, set switches as follows:

M-2	OUT
M-3	ON
MODE 3/A (code wheels)	7777

20. On test set, set MODE switch to 3/A and depress PUSH TO TEST switch.  
ACCEPT lamp lights.
21. On transponder control panel, set MODE 3/A code wheels to 0000.
22. On test set, set CODE wheels to 0000 and depress PUSH TO SET switch.  
ACCEPT lamp lights.

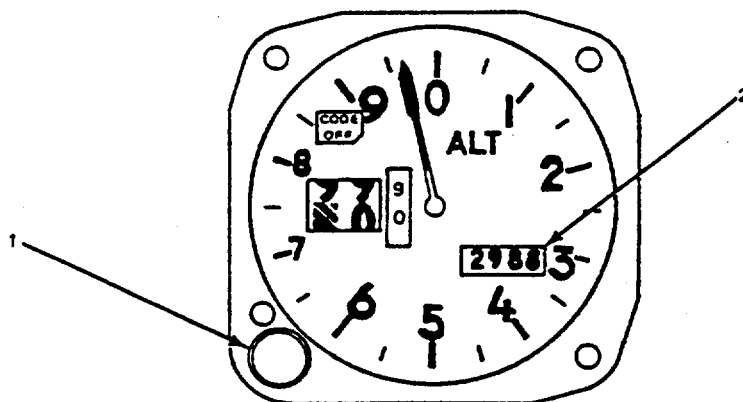
**RAD TEST MODE CHECKS**

- 22.1 On the test set rotate MODE selector switch to TEST.

23. On transponder control panel, hold RAD TEST/OUT/MON switch in RAD TEST position and depress PUSH TO TEST switch on test set.  
ACCEPT lamp lights.
24. Reset code wheels on transponder control panel (MODE 3/A) and test set to 7777 and repeat step 23.

**MODE C CHECKS**

25. Set transponder control panel M-C switch ON and all other MODE switch OUT.
26. On test set, set MODE switch to C.





**29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

27. Rotate zero set knob (1) on AAU-21 /A until 29.92 appears in window (2).
28. Observe AAU-21/A pointer indication and set CODE wheels on test set as indicated in the chart below.

Altimeter-Encoder, AAU-21/ pointer indication (feet)	Reply code to be set into AN/APM-1 23(V)1
-200	0640
-100	0660
000	0620
100	0630
200	0610
300	0210
400	0230
500	0220
600	0260
700	0240
800	0340
900	0360

**NOTE**

Tolerance (accuracy) of Altimeter-Encoder AAU-21/A is plus or minus 40 feet. If indicated altitude from step 28 is between altitudes listed, use nearest altitude and reply code. If normal indications are not obtained, try the other altitude and reply before rejecting transponder.

29. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.

**EMERGENCY CHECKS****NOTE**

Confine EMERGENCY position and codes 7600 or 7700 in either modes 2 or 3/A to closed loop testing. Code 7600 signifies a communications failure and code 7700 signifies an aircraft in distress.

On transponder set control, the two code selector MODE 1 wheels correspond to codes A and B on test set and the four code selector wheels for modes 2 and 3/A correspond to codes A, B, C and D on the test set.

30. On transponder control panel, set controls as follows:

M-1, M-2, M-3/A	Optional
MODE 1 (code wheels)	00
MODE 2 (code wheels on transponder)	0000
MODE 3/A (code wheels)	Optional
MASTER	EMER

31. On test set, set CODE wheels to 0000 and FUNCTION switch to EMER.



## 29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued

### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

32. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.
33. On test set, set MODE switch to 2 and repeat step 32.
34. On test set, set CODE wheels to 7700 and MODE switch to 3/A.
35. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.
36. On transponder control panel, set MODE 3/A code wheels to any number.
37. On test set, depress PUSH TO TEST switch.  
ACCEPT lamp lights.
38. Repeat steps 36 and 37 for two additional random settings of MODE 3/A code wheels.  
ACCEPT lamp lights regardless of transponder control MODE 3/A code setting.

### IDENT CHECKS

39. On transponder control panel, set controls as follows:

M-1, M-2, and M-3/A	ON
MODE 1 (code wheels)	00
MODE 2 (code wheels on transponder)	0000
MODE 3/A (code wheels)	0000
MASTER	NORM

40. On test set, set controls as follows:

FUNCTION	I/P
MODE	1
PUSH TO TEST/LOCK	LOCK
CODE	0000

41. On transponder control, momentarily set IDENT/OUT/MIC switch to IDENT.  
ACCEPT lamp on test set lights for 15 to 30 seconds.
42. Repeat step-41 with test set MODE switch set to 2 and 3A.

### NOTE

The MIC position of I DENT switch is disabled and does not require further testing.

43. Return PUSH TO TEST/LOCK to PUSH TO TEST.



## 29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued

### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

#### NOTE

The remaining steps check optional units TS-1843/APX and KIT-1 A/TSEC. If these units are not installed, test is complete; remove power, disconnect test equipment and return AN/APX-72 to operational condition.

### MODE 4 CHECKS (KIT-1A/TSEC)

#### NOTE

Prepare equipment for Nonradiation operation (Direct Coupling). The test set is connected thru attenuator CN-1088A/U directly to RT-859(\*)/APX-72.

44. Connect KIT-1 A/TS EC to test set using CX-1 221 6/APM-1 23(V) from test set cover. CODE ZEROIZE lamp on test set should light.

#### NOTE

Operational testing of MODE 4 requires the KIT-1 A be keyed. Code Changer Key KIK-1 8/TSEC, set to operational code of the day, should be used.

45. Key KIT-1 A/TSEC, using Code Changer Key KIK-18/TSEC as follows:
  - a. Lift slide-lock fastener on front of KIT-1 A/TSEC and allow spring loaded door to open.
  - b. Position KIK-18/TSEC over opening in KIT-1 A/TSEC and firmly insert KIK-18/TSEC into KIT-1 A/TSEC.
  - c. Remove KIK-18/TSEC.
  - d. Hold door on KIT-1 A/TSEC closed and fasten slide-lock fastener.

#### NOTE

If door on KIT-1 A/TSEC is opened, computer is zeroized; repeat steps b thru d.

46. Observe ZEROIZE lamp on test set.  
ZEROIZE lamp should not be lit.
47. Disconnect cable CX-12216/APM-1 23( and store in test set cover.
48. Install KIT-1 A/TS EC per paragraph 29-4.2.



## 29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued

### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

49. On transponder control panel, set controls as follows:

MASTER	NORM
TEST M-1/OUT	OUT
TEST M-2/OUT	OUT
TEST MM-3/A/OUT	OUT
TEST M-C/OUT	OUT
AUDIO/OUT/LIGHT	AUDIO
CODE	A
MODE 4 ON/OUT	OUT
RAD TEST/OUT/MON	OUT

50. Connect headset to intercom.

51. On test set, set controls as follows:

FUNCTION	SYSTEM
MODE 4 DIR/RAD	DIR
MODE 4 CODE A/B	A
MODE switch	4

52. On test set, depress PUSH TO TEST switch and observe the following:

- On test set, REJECT lamp lights.
- Audio tone heard in headset.
- IFF CAUTION lamp, on helicopter instrument panel, lights.

53. Key KIT-1 A/TSEC by repeating step 45.

54. Repeat step 52.

55. On transponder control, set MODE 4 switch to ON.

56. On test set, depress PUSH TO TEST switch and observe the following:

- On test set, ACCEPT lamp lights.
- On transponder control panel, REPLY lamp lights.
- Audio tone heard in headset.
- On helicopter instrument panel, IFF CAUTION lamp is not lit.

57. On transponder control panel, set AUDIO/OUT/LIGHT switch to LIGHT.

58. Repeat step 56.

Indications are same except no audio tone is heard.

59. On test set, set MODE 4 CODE A/B switch to B; depress PUSH TO TEST switch.  
REJECT lamp lights momentarily, then ACCEPT lamp lights.  
Return A/B switch to A.

60. On test set, set MODE 4 VER BIT 1/OFF to 1; depress PUSH TO TEST switch.  
REJECT lamp lights  
Return VER BIT 1 switch to OFF.

61. On test set, set MODE 4 VER BIT 2/OFF to 2; depress PUSH TO TEST switch.  
REJECT lamp lights.  
Return VER BIT 2 switch to OFF.



**29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

- 
62. On test set, set ISLS ON/OFF switch to ON; depress PUSH TO TEST switch.  
REJECT lamp lights.  
Return ISLS to OFF.
63. On helicopter instrument panel, set CODE HOLD switch to ON.  
CODE HOLD lamp, on instrument panel lights.
64. On transponder control panel, set CODE switch to HOLD, then return to A.
65. Wait at least 15 seconds.  
CODE HOLD lamp lit, IFF CAUTION lamp not lit.  
Verifies KIT-1 A does not zeroize in code hold condition and power on.
66. On transponder control panel, set MASTER switch to OFF, wait at least 30 seconds.
67. On transponder control panel, set MASTER switch to STBY, allow about 30 seconds warm-up, then set MASTER switch to NORM.  
CODE HOLD lamp lit, IFF CAUTION lamp not lit.
68. On test set, briefly depress PUSH TO TEST switch.  
ACCEPT lamp should light.  
Indicates KIT-1 A does not zeroize in code hold condition and power off.

**NOTE**

If the transponder set is not in code hold condition, KIT-1 A or 1 C/TSEC will zeroize code if power is interrupted more than five seconds. This protects the code of the day from compromise. To assure the code will zeroize, always return IFF CODE HOLD switch on helicopter instrument panel to OFF unless code hold condition is required by test or flight procedure.

69. On test set, depress PUSH TO TEST switch and turn to LOCK position; observe the following:
- On test set, REJECT lamp lights.
  - Audio tone heard in headset.
  - IFF CAUTION lamp, on helicopter instrument panel, lights.

**TS-1843/APX CHECKS**

70. On transponder control panel, set controls as follows:

MASTER	NORM
IDENT	OUT
MODE 1, 2, 3/A	ON
M-C	OUT
MODE 1 (code wheels)	Any code
MODE 2 (code wheels on transponder)	Any code
MODE 3/A (code wheels)	Any code
RAD TEST/OUT/MON	OUT



**29-8. TRANSPONDER SET AN/APX-72 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

71. On transponder control panel, position and hold TEST/M-1 /ON/OUT to up (TEST) position.  
 TEST lamp on transponder control panel lights.  
 TEST lamp lit indicates TS-1843/APX has initiated a mode 1 check, BT-859/APX-72 has recognized the interrogation and transmitted a reply, and that TS-1843/APX has evaluated the reply and is satisfied frequency, power, bracket pulse spacing and antenna VSWR are within specified limits.
72. Repeat step 71 using M-2, M-3/A and M-C TEST toggle switches.  
 TEST lamp on transponder control panel should light for each check.
73. On test set, set FUNCTION switch to SYSTEM.
74. On transponder control panel, set controls as follows:

TEST M-1 (toggle switch)	OUT
TEST M-3/A (toggle switch)	OUT
RAD TEST/OUT/MON	OUT
MODE 1 (code wheels)	33
MODE 3/A (code wheels)	0000

**NOTE**

In following steps, RAD TEST/OUT/MON switch is set to MON. Do not leave switch in this position when not actually testing; return switch to OUT.

75. On transponder control panel, set RAD TEST/OUT/MON switch to MON.
76. On test set, depress PUSH TO TEST switch.  
 ACCEPT lamp on test set and TEST lamp on transponder control panel light simultaneously. Test lamp remains lit as long as ACCEPT lamp is lit.  
 Release PUSH TO TEST switch when indications are observed.

**NOTE**

TEST lamp on transponder control panel may blink out at slow steady rate. This is normal and does not indicate a failure. Failure is indicated if TEST lamp does not light or flickers at random rate.

77. On transponder control panel, set RAD TEST/OUT/MON switch to RAD TEST.  
 Test lamp should not light.
78. On transponder control panel, set RAD TEST/OUT/MON switch to OUT.
79. Remove power and disconnect test equipment.



### SECTION III. TROUBLESHOOTING

#### 29-9. TRANSPONDER SET AN/APX-72 TROUBLESHOOTING (AVUM).

- The table below is provided to assist maintenance personnel in locating malfunctions in Transponder Set AN/APX-72.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective action, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 29-8.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Transponder set will not energize.	A Defective circuit breaker.	A Replace circuit breaker.
	B Defective control panel.	B Replace C-6280/APX-72.
	C Defective interconnecting cables.	C Make continuity checks. Repair or replace cabling as required.
2. No output in any mode.	A Defective control panel.	A Replace C-6280/APX-72.
	B Defective fuse in RT-850/APX-72.	B Check and replace defective fuse.
	C Defective receiver-transmitter.	C Replace RT-850/APX-72.
3. Output low or intermittent in any or all modes.	Defective receiver-transmitter.	Replace RT-859/APX-72.
4. No output from a single mode, all others normal.	A Improper mode enable switch or code setting.	A Check and reset enable switches and code.
	B Defective control panel.	B Replace C-6280/APX-72.
5. Mode IV inoperative, all other modes normal.	Defective transponder computer.	Replace KIT-1A or 1C/TSEC.
6. TEST lamp on C-6280/APX-72 fails to light, all other tests normal.	A Defective lamp.	A Replace TEST lamp on C-6280/APX-72.
	B Defective test set.	B Replace TS-1843/APX-72.



**29-9. TRANSPONDER SET AN/APX-72 TROUBLESHOOTING (AVUM)-Continued**

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
7. TEST lamp on C-6280/APX-72 responds normally, all other tests fail.		
A	Defective rf cable between TS-1843/APX-72 and antenna.	A Repair or replace rf cable.
B	Defective test set.	B Replace TS-1 843/APX-72.
C	Defective antenna.	C Replace AT-884/APX.
8. Interference in other helicopter radios or interphone.		
A	Defective rf cables.	A Check transponder set rf cables; tighten connectors; repair or replace defective cables.
B	Defective receiver-transmitter.	B Replace RT-859/APX-72.
C	Defective test set.	C Replace TS-1843/APX-72.
D	Equipment receiving interference defective.	D Replace equipment receiving interference.

**29-9.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Transponder Set AN/APX-72 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-55 and FO-56, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through 4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Refer to paragraph 29-9.1.1 for UH-1 D/H or 29-9.1.2 for UH-1 H.



**29-9.1.1. UH-1 D/H Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB19	1, 2	Primary power	AN/APX-72 energized	28 Vdc
TB19	10	IFF Audio	AN/APX-72 energized and receiving signal from ramp test set	Audio hi
P918	1	Primary power, TS-1843/ APX, configuration I and J only	AN/APX-72 energized	28 Vdc
TB26	6, 7, 8	Ground, configurations I and J only	Not applicable	0

**29-9.1.2. UH-1 H Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB12	6	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	7, 8	Ground	Not applicable	0
TB19	1	Primary power	AN/APX-72 energized	28 Vdc
TB20	9	IFF Audio	AN/APX-72 energized and receiving signal from ramp test set	Audio hi



## CHAPTER 30 POWER SOURCES MAINTENANCE

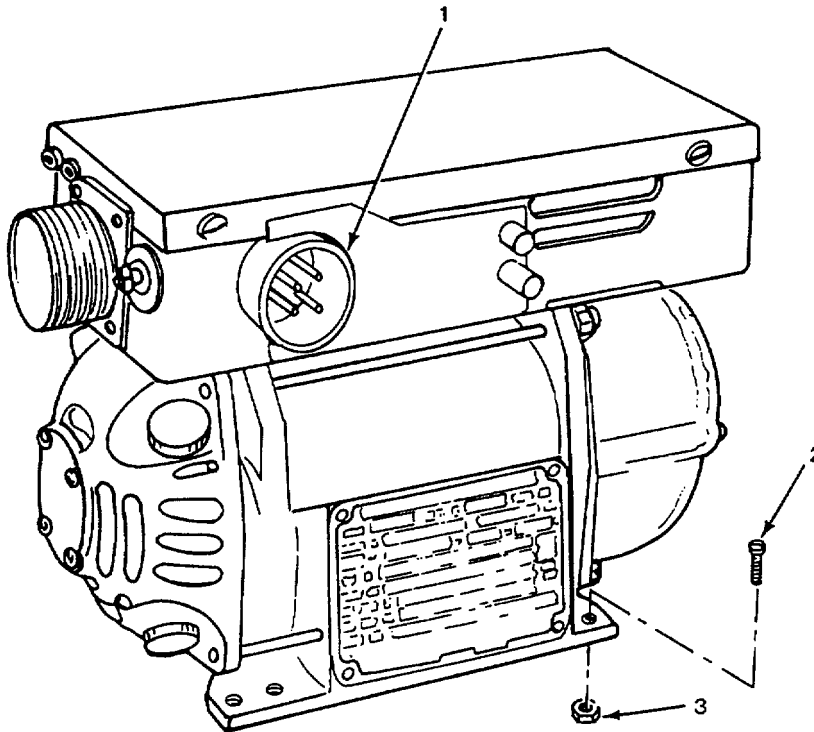
Subject	Para.	Page
Motor-Generator PU-543(*)/A Maintenance (AVUM).....	30-1	30-1
Storage Battery BB-443(*)/A Maintenance (AVUM).....	30-2	30-4
Motor Generator PU-543(*)/A Operational Checks (AVUM).....	30-3	30-5
Motor Generator PU-543(*)/A Troubleshooting (AVUM).....	30-4	30-6

### SECTION I. MAINTENANCE PROCEDURES

#### 30-1. MOTOR-GENERATOR PU-543(\*)/A MAINTENANCE (AVUM)

- Maximum time interval between phase inspections of PU-543(\*)/A is 200 flight hours.
- Phase maintenance of PU-543(\*)/A should be scheduled to coincide with helicopter phase maintenance (150 hours) to reduce inspection downtime.
- During phase maintenance, the following should be accomplished:
  - A** Remove main and spare PU-543(\*)/A per paragraph 30-1.1; clean exterior and check for evidence of physical damage.
  - B** Remove and inspect ac and dc brushes per paragraph 30-1.3.
  - C** Reinstall in reverse positions (main becomes spare, spare becomes main).
  - D** Check voltage and frequency of both inverters, adjust if necessary (per TM 11 -6125-220-20).
- Maintenance procedures are identical for main and spare PU-543(\*)/A.



**30 1. MOTOR GENERATOR PU-543(\*)/A MAINTENANCE (AVUM)-Continued****NOTE**

Motor generators are located in aft radio compartment on UH1 D/H configurations A and B. All other configurations have motor generators in nose electronics compartment.

**30-1.1 Removal Instructions.**

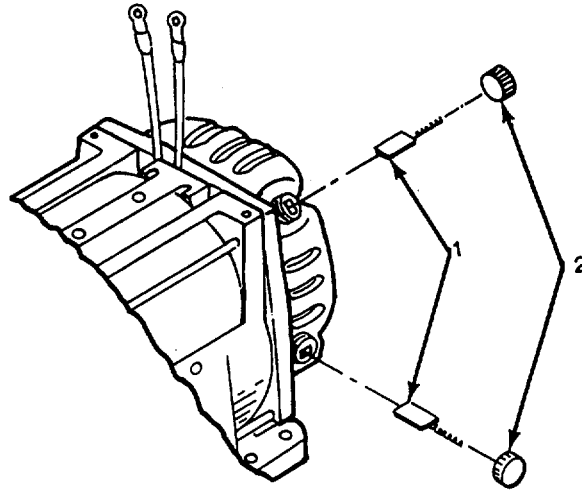
- A** Disconnect electrical connector (1) from PU-543(\*)/A.
- B** Remove four bolts (2) and nuts (3) that secure PU-543(\*)/A to electrical shelf.
- C** Remove PU-543(\*)/A.

**30-1.2 Installation Instructions.**

- A** Check that mounting surfaces on electrical shelf and PU-543(\*)/A mounting plate are free of grease and oil.
- B** Position PU-543(\*)/A on electrical shelf and secure with four bolts and nuts (2).
- C** Connect electrical connector (1 ) and safety wire in place.



### 30-1.3 Inspection of Brushes.



- A Remove PU-543(\*)/A from helicopter per paragraph 30-1.1.
- B Remove one ac brush cap (2) and inspect ac brush (1).

#### NOTE

To avoid improper reinstallation remove, inspect and reinstall one brush at a time. Maximum permissible wear is indicated by wear mark (groove) 1/32-inch wide in brush. Wear mark may be diagonal groove in bottom width of brush (preferred type) or parallel groove on bottom of brush.

- C If any brush is worn down to wear mark, reinstall brush and send PU-543(\*)/A to AVIM.
- D Install brush (1) and secure with cap (2).

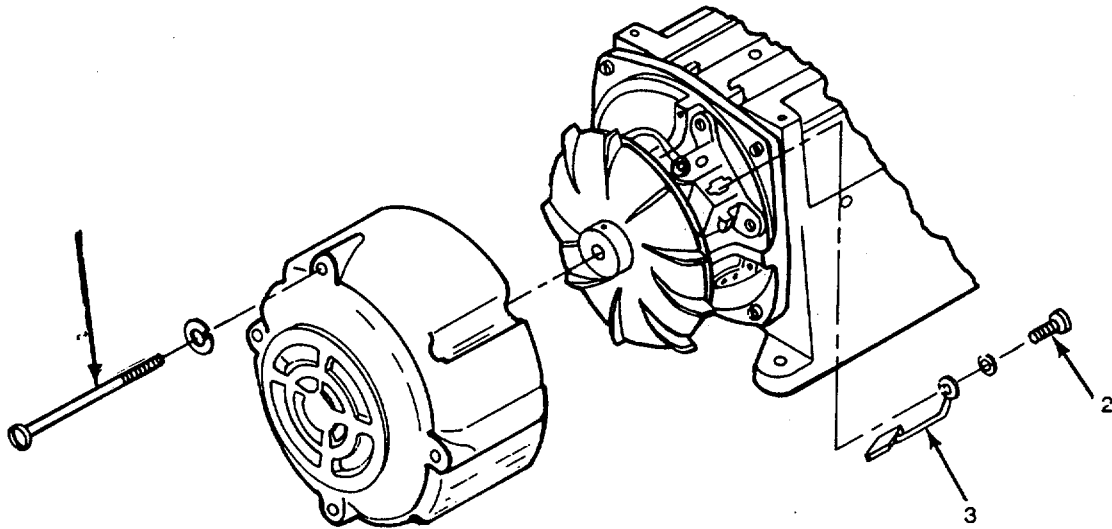
#### NOTE

Under normal conditions, wear down to end of wear mark (approximately 1/2 original brush length) will yield at least 500 hours service at full load. When ac or dc brushes are worn down to wear mark, PU-543(\*)/A is sent to AVIM for commutation checks and services as well as brush replacement and seating.

- E Repeat steps B, C and D for remaining ac brushes, one at a time.



### 30-1.3 Inspection of Brushes- Continued



- F Remove four screws and washers (1).
- G Pull fan cover off PU-543(\*)/A.
- H Remove one screw and washer (2).
- I Lift do brush from dc bell end and inspect brush (3). If brush is worn down to wear mark reinstall brush and fan cover, steps I and K, then send PU-543(\*)/A to AVIM.
- J Reinstall brush in do bell end and secure with screw and washer (2).
- K Repeat steps H and I for remaining brushes, one at a time.
- L Slide fan cover over do end of PU-543(\*)/A and secure with four screws and washers (1). install PU-543(\*)/A per paragraph 30-1.2.

### 30-2. STORAGE BATTERY BB-443(\*)/A MAINTENANCE (AVUM)

#### WARNING

#### **DANGEROUS CHEMICALS ARE USED IN NICKEL-CADMIUM BATTERIES**

The electrolyte used in nickel-cadmium batteries contains potassium hydroxide (KOH), which is a caustic agent. Serious and deep burns of body tissue will result if the electrolyte comes in contact with the eyes or any part of the body. Use rubber gloves, rubber apron, and protective goggles when handling the electrolyte. If accidental contact with the electrolyte is made, use ONLY clean water and immediately (seconds count) flush contaminated areas. Continue flushing with large quantities of clean water for at least 15 minutes. Seek medical attention without delay.



**30-2. STORAGE BATTERY BB-4431(\*)/A MAINTENANCE (AVUM)-Continued**

- For Storage Battery BB-443(\*)/A maintenance procedures, refer to TM 55-1520-210-23.
- For shop servicing and maintenance instructions, refer to TM 11-6140-203-14-3.
- Battery may be installed in either nose electronic compartment or aft radio compartment depending on mission requirements.

**SECTION II. OPERATIONAL CHECKS****30-3. MOTOR-GENERATOR PU-543(\*)/A OPERATIONAL CHECKS (AVUM)**

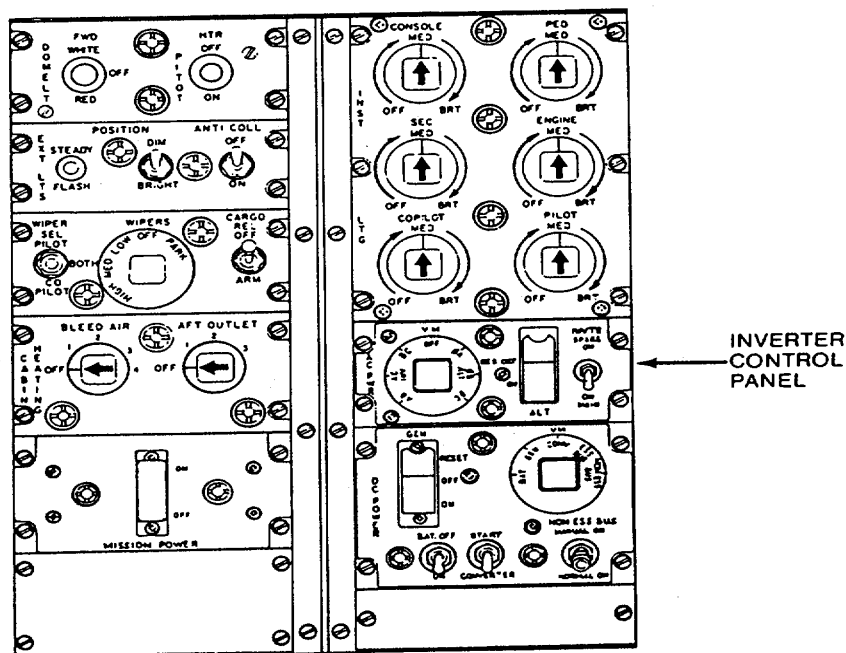
These checks are used to ensure Motor-Generator PU-543(\*)/A is performing properly. The checks are also used after repairs to make sure the problem is fixed.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that main and spare motor generators are installed, securely mounted, and safety wired (as required).
2. Check that all connectors are tightened and for evidence of chaffed or broken wiring.

**POWER ON CHECKS**

1. Depress SPARE INVTR POOR, INVTR CONT and MAIN INVTR PWR circuit breakers on do circuit panel.





**30-3. MOTOR GENERATOR PU-543(\*)/A OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

2. An overhead console, (inverter control panel) set INVTR SPARE ON/MAIN ON to MAIN ON.  
Main inverter should start.
3. On inverter control panel, set VM switch to AB, then AC and BC.  
AC voltage indicated in each position.
4. On inverter control panel, set VM switch to ØA, then ØB and ØC.  
Between 112.5 and 117.5 Vac in each position.
5. On inverter control panel, set INVTR SPARE ON/MAIN ON to SPARE ON, then repeat steps 3 and 4.  
Spare inverter carries ac power load.

**SECTION III. TROUBLESHOOTING****30-4. MOTOR-GENERATOR PU 543(\*)/A TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Motor-Generator (inverter) PU-543(\*)/A:
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify supervisor.
- After completing the corrective action, perform operational checks described in paragraph 31-3.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. Main and/or spare inverter will not operate.
  - A Defective circuit breaker or wiring.
    - A Reset INVTR PWR and IINVTR CONT circuit breakers: Check continuity of dc wiring, repair or replace as necessary.
  - B Poor bonding to ground.
    - B Clean and tighten ground connections.
  - C Defective inverter control.
    - C Check for 28 Vdc on both main and spare switch terminals; replace faulty control.
  - D Defective inverter.
    - D Replace PU-543(\*)/A.



#### 30 4. MOTOR GENERATOR PU 543(\*)/A TROUBLESHOOTING (AVUM)-Continued

2. Inverter runs but no voltage to instrument.
    - A Faulty wiring.
      - A Check continuity of ac wiring repair or replace as necessary.
    - B Defective inverter changeover relay.
      - B Check continuity of relay contacts, replace faulty relay.
    - C Defective inverter.
      - C Check for 115 Vac output from inverter; replace faulty converter.
  3. Incorrect indicated voltage or frequency.
    - A Low input voltage.
      - A Check for proper input voltage, correct low primary voltage condition.
    - B Voltage regulator improperly-adjusted.
      - B Refer to TM 11-6125-220-20 and adjust regulator.
    - C Defective inverter.
      - C Replace PU-543(\*)/A.
-



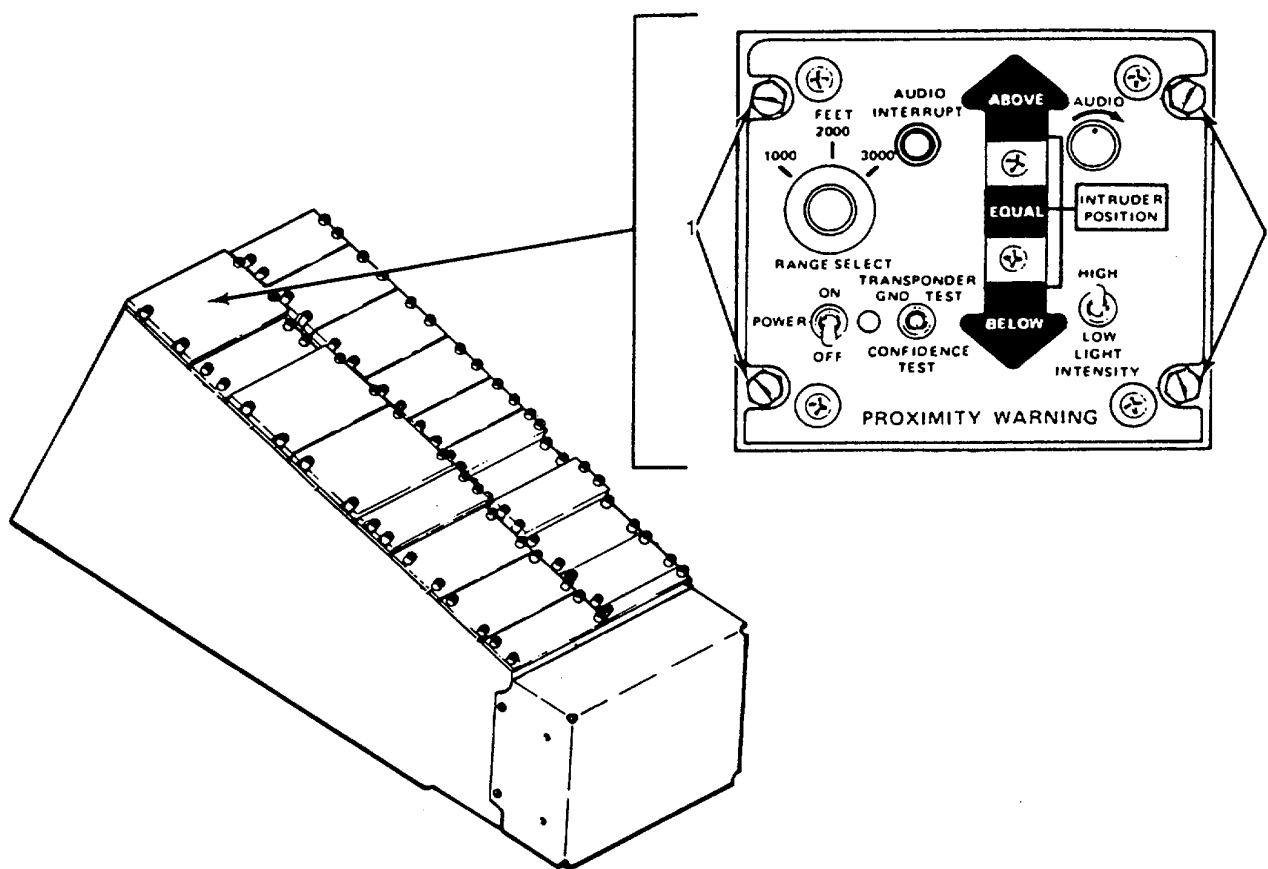
## CHAPTER 31

### PROXIMITY WARNING FACILITY YG-1 054 MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter (Transponder) Maintenance (AVUM).....	31-1	31-1
Forward Antenna Maintenance (AVUM).....	31-2	31-3
Aft Antenna Maintenance (AVUM).....	31-3	31-5
Cabling and Connector Maintenance (AVUM).....	31-4	31-7
Proximity Warning Facility YG-1 054 Operational Checks (AVUM).....	31-5	31-7
Proximity Warning Facility YG-1 054 Troubleshooting (AVU M).....	31-6	31-9

### SECTION I. MAINTENANCE PROCEDURES

#### 31-1. RECEIVER-TRANSMITTER (TRANSPONDER) MAINTENANCE (AVUM)



##### 31-1.1. Removal Instructions.

- A Loosen four spring-lock fasteners (1).

#### **CAUTION**

Be careful not to pull transponder so far from pedestal console that electrical wiring, connector or static air line will be damaged.



### 31-1. RECEIVER-TRANSMITTER (TRANSPONDER) MAINTENANCE (AVUM)-Continued

- B Lift transponder from pedestal console and disconnect electrical connector and static air line.

#### NOTE

When Proximity Warning Facility is permanently removed from helicopter, static air line which was connected to transponder must be plugged and tested prior to flight

- C Tag then disconnect two coaxial connectors.
- D Remove transponder.

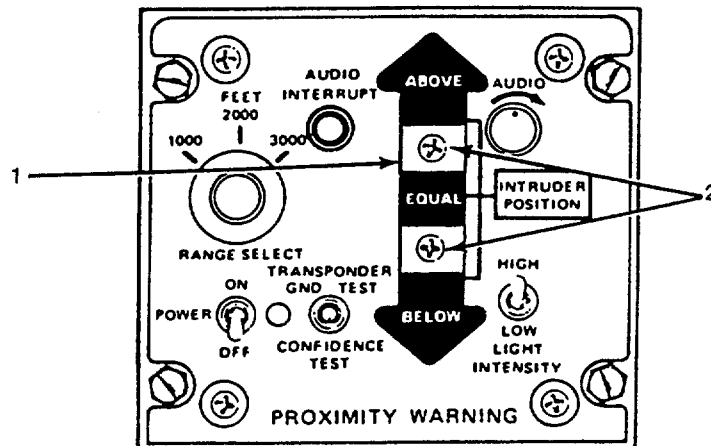
#### 31-1.2. Installation Instructions.

- A Hold transponder near pedestal console and connect two coaxial connectors to rear of transponder, remove tags.
- B Connect electrical connector and static air line to rear of transponder.
- C Position transponder in pedestal console and secure with four spring-lock fasteners (1).

#### 31-1.3. Power Lamp Replacement.

- A Remove power lamp lens by turning CCW.
- B Remove and discard old lamp.
- C Install new lamp.
- D Replace power lamp lens.

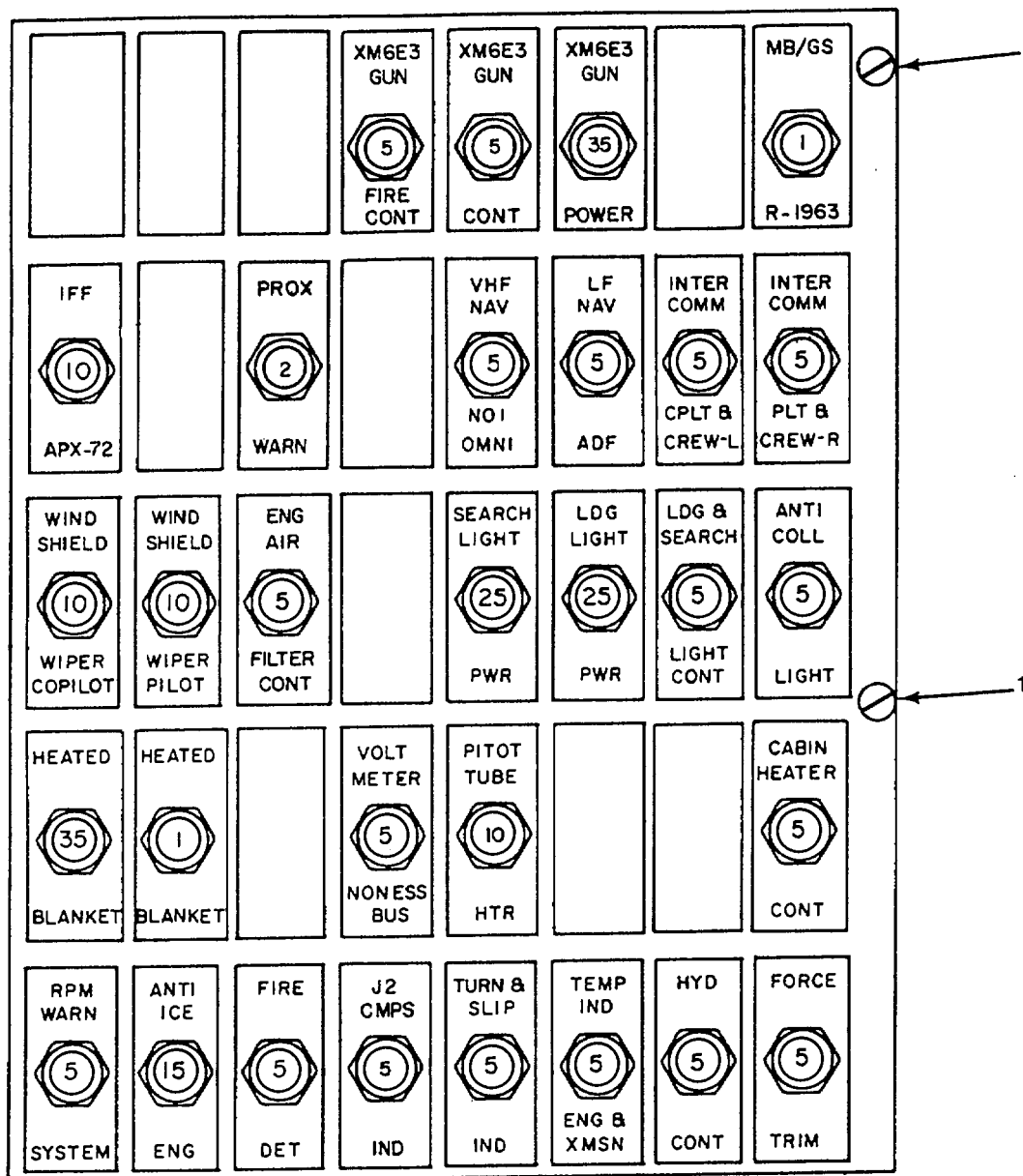
#### 31-1.4. ABOVE, EQUAL or BELOW Lamp Replacement.



- A Remove two screws (2).
- B Lift direction display (1) and filter (not shown).
- C Remove and replace defective lamp.
- D Replace filter and direction filter, secure with two screws (2).



## 31-2. FORWARD ANTENNA MAINTENANCE (AVUM)



## 31-2.1. Removal Instructions.

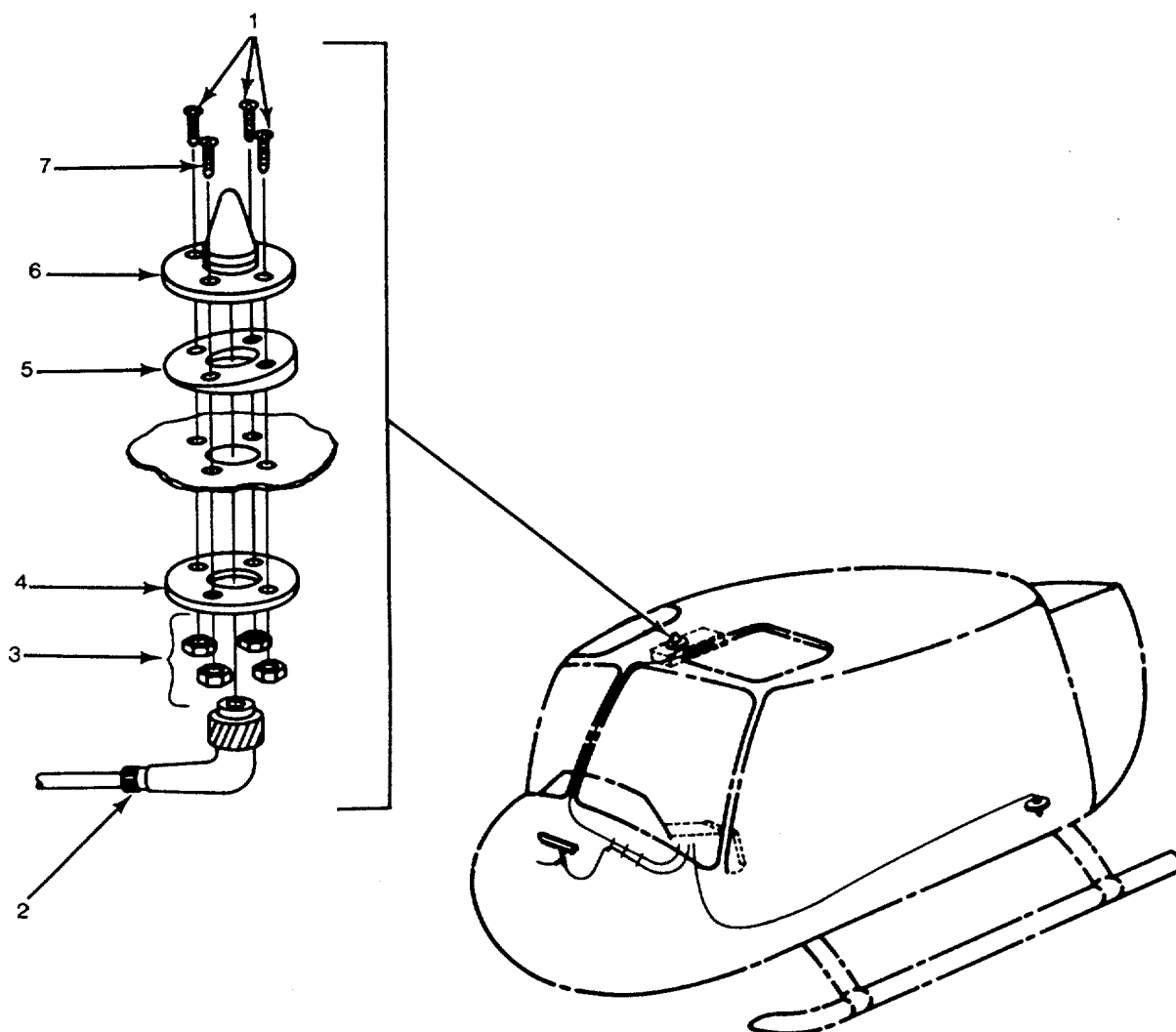
**WARNING**

Make sure electrical power is not applied to helicopter during forward antenna maintenance. The copilots circuit breaker panel is opened during these procedures. Electrical shock causing injury or death could occur if personnel come in contact with exposed energized circuits.

- A Open copilots side of circuit breaker panel by loosening two spring-lock fasteners (1).



## 31-2.1. Removal Instructions-Continued



- B** Disconnect coaxial cable (2) from antenna.
- C** While one technician inside helicopter hold nuts (3), a second technician, outside helicopter, remove four screws (1 and 2).
- D** Pull antenna (6) and antenna wedge (5) from helicopter.
- E** Remove traces of RTV sealant from antenna and antenna wedge.

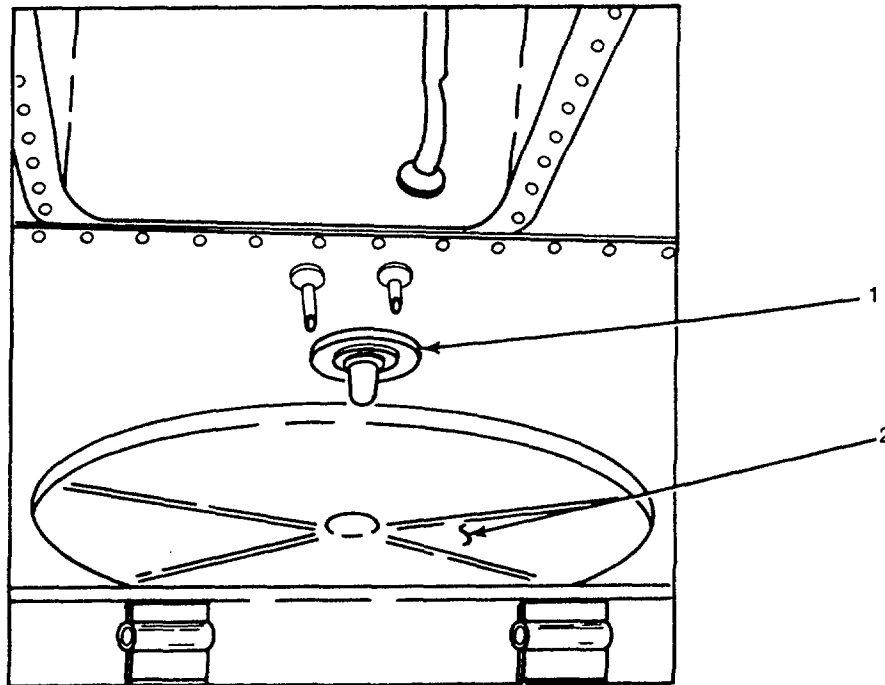
**NOTE**

When Proximity Warning Facility is permanently removed from helicopter, holes in skin must be repaired by authorized personnel before helicopter leaves training command.



**31-2.2. Installation Instructions.**

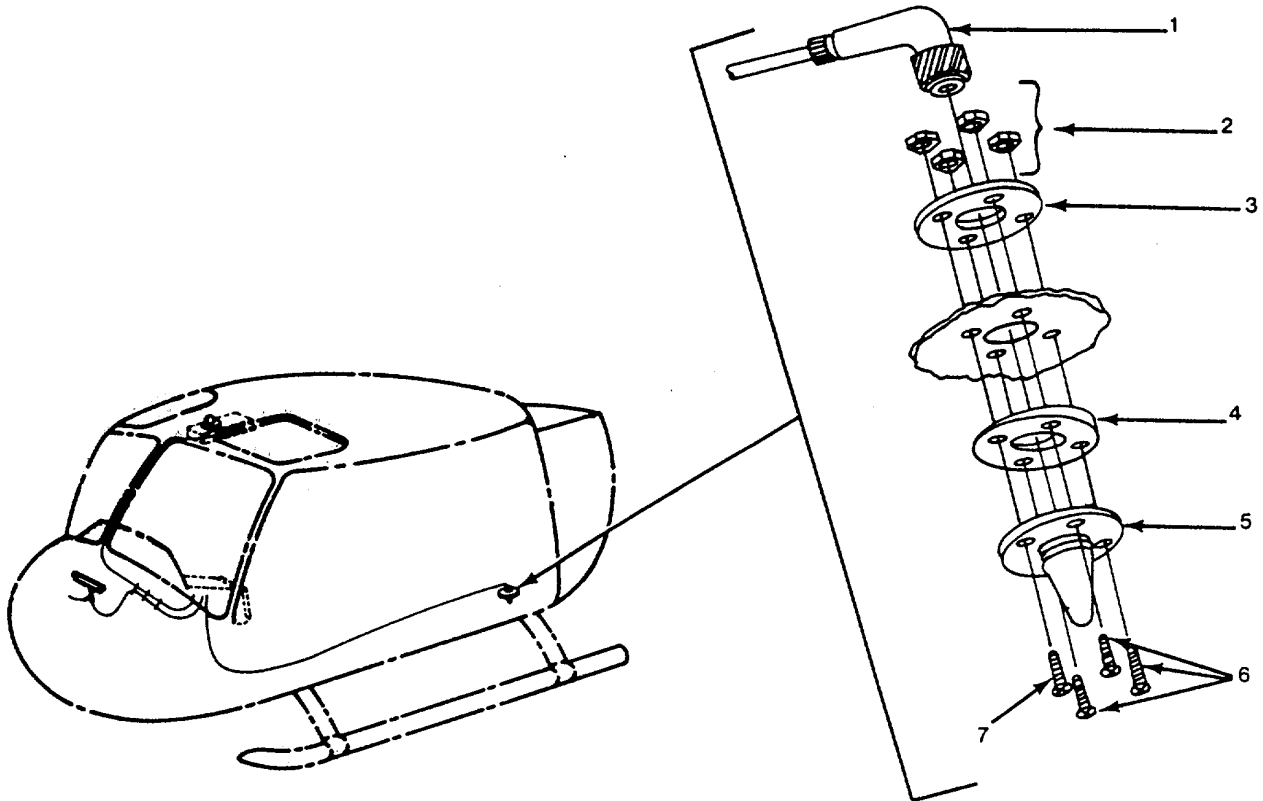
- A** From outside helicopter, position antenna wedge (5) over hole for antenna with thin edge facing forward.
- B** Position antenna (6) over wedge and airline holes.
- C** Insert short (8-32x3/4) screw (7) through forward hole, then remaining three longer (8-32x7/8) screws (1) through remaining holes.
- D** From inside helicopter, install washer assembly (4) and secure antenna with four nuts (3).
- E** Connect coaxial connector (2) to antenna.
- F** Apply small bead of RTV sealant between helicopter skin and antenna wedge, then between antenna wedge and antenna.
- G** Close and fasten circuit breaker panel.

**31-3. AFT ANTENNA MAINTENANCE (AVUM)**



**31-3.1. Removal Instructions.**

- A** Underneath helicopter, just forward of antenna (1), remove access door by loosening 10 spring-lock fasteners along outside edge of door.



- B** Reach through access opening and disconnect coaxial connector (1).
- C** Remove four screws (6 and 7).
- D** Pull antenna (5) and antenna wedge (4) from helicopter skin.
- E** Remove traces of RTV sealant from antenna and antenna wedge.

**NOTE**

When Proximity Warning Facility is permanently removed from helicopter, holes in skin must be repaired by authorized personnel before helicopter leaves training command.

**31-3.2. Installation Instructions.**

- A** Position wedge (4) against helicopter with thin edge facing forward.
- B** Position antenna (5) over wedge and align holes.
- C** Insert short (8-32x3/4) screw (7) through forward hole, and longer (8-32x7/8) screws (6) through remaining holes.



**31-3.2. Installation Instructions-Continued**

- D** Position washer assembly (3) over screws and secure with four nuts (2).
- E** Connect coaxial connector (1) to antenna.
- F** Replace and secure access door.

**31-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P1, P3, P4, P5, and P6. P2 (J2) is not used in H-1 series helicopters.
- Refer to FO-57 for wiring data.
- P1 is repaired by repairing or replacing connector or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or by replacing coaxial cable.

**NOTE**

Rf cables in the Proximity Warning Facility are cut to a specific length. If coaxial cable must be replaced, use only size and length specified on FO-57.

**Section II. OPERATIONAL CHECKS****31-5. PROXIMITY WARNING FACILITY YG-1054 OPERATIONAL CHECKS (AVUM)**

- These checks are used to ensure Proximity Warning Facility YG-1054 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

**INITIAL SETUP****Test Equipment****Equipment Conditions**

Ground Transponder Tester  
UG2330AA01

Reference  
Paragraph 1-50 Auxiliary Power  
Unit connected.  
  
Paragraph 14-13 Intercommunications  
Set operational.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.



**31-5. PROXIMITY WARNING FACILITY YG-1054 OPERATIONAL CHECKS (AVUM)-Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**POWER ON CHECKS**

1. Depress PROX WARN circuit breaker.
2. On transponder set POWER switch ON and allow 1 minute warm-up.  
Power on lamp glows.

**NOTE**

The ABOVE, EQUAL and BELOW lamps normally light and cycle one time when power is initially applied.

3. Set TRANSPONDER GND TEST/CONFIDENCE TEST to CONFIDENCE TEST.  
ABOVE, EQUAL and BELOW lamps alternately flash, pulsing audio tone heard in pilot and copilot headset.
4. Rotate AUDIO control throughout its range.  
Audio level of tone in headset varies smoothly with no chirps or dead spots.
5. Set LIGHT INTENSITY switch to HIGH then LOW.  
Intensity of lamps varies with switch position.
6. On ground transponder tester, set power switch ON. Position tester within line of sight of helicopter at a distance no greater than 3000 feet.
7. On transponder, set TRANSPONDER GND TEST/CONFIDENCE TEST switch to TRANSPONDER GND TEST.  
BELOW, EQUAL and ABOVE indicators flash, in cycle, and pulsing audio tone heard in pilot and copilot headset.

**NOTE**

The ground transponder tester simulates another helicopter that cycles between 180 feet above to 180 feet below ground level once every 16 seconds. To avoid interference with operating helicopters, signals from the ground transponder tester can only be decoded by transponders in the ground transponder test mode.

8. On transponder, set POWER switch to OFF.



### Section III. TROUBLESHOOTING

#### 31-6. PROXIMITY WARNING FACILITY YG-1054 TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in Proximity Warning Facility YG-1054.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 32-5.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1.	No lamps light when power is applied. Defective circuit breaker or wiring. Reset circuit breaker; check connectors and wiring, repair or replace as necessary.	
2.	A single lamp does not light. Panel lamp loose in socket or defective. Check panel lamp for proper seating, replace defective lamp.	
3.	Receiver-transponder ABOVE, EQUAL and BELOW lamps do not light when CONFIDENCE TEST switch is ON. Defective receiver-transponder. Replace YG-1054 receiver-transponder.	
4.	Receiver-transponder ABOVE, EQUAL and BELOW lamps do not cycle when TRANSPONDER GND TEST switch is ON and Ground Transponder test set is used. <b>A</b> Defective receiver-transponder. <b>A</b> Replace YG-1054 receiver-transponder. <b>B</b> Defective ground transponder test set. <b>B</b> Check ground transponder test set, repair or replace as necessary. <b>C</b> Defective cabling between receiver-transponder and antennas. <b>C</b> Check cabling between receiver-transponder and antennas, repair or replace as required. <b>D</b> Defective antenna. <b>D</b> Replace antenna.	

##### 31-6.1. Signal and Voltage Measurements (AVUM).

- If a trouble develops in Proximity Warning Facility YG-1054 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-57 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.



**31-6.1. Signal and Voltage Measurements (AVUM)-Continued**

- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**31-6.1.1. Signal and Voltage Measurements (AVUM).**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28Vdc
TB26	1, 4, 5	Ground	Not applicable	0
TB20	9	Audio	YG-1054 energized and receiving signal from ramp test set	Audio hi
P1	A	Primary power	YG-1054 energized	28Vdc



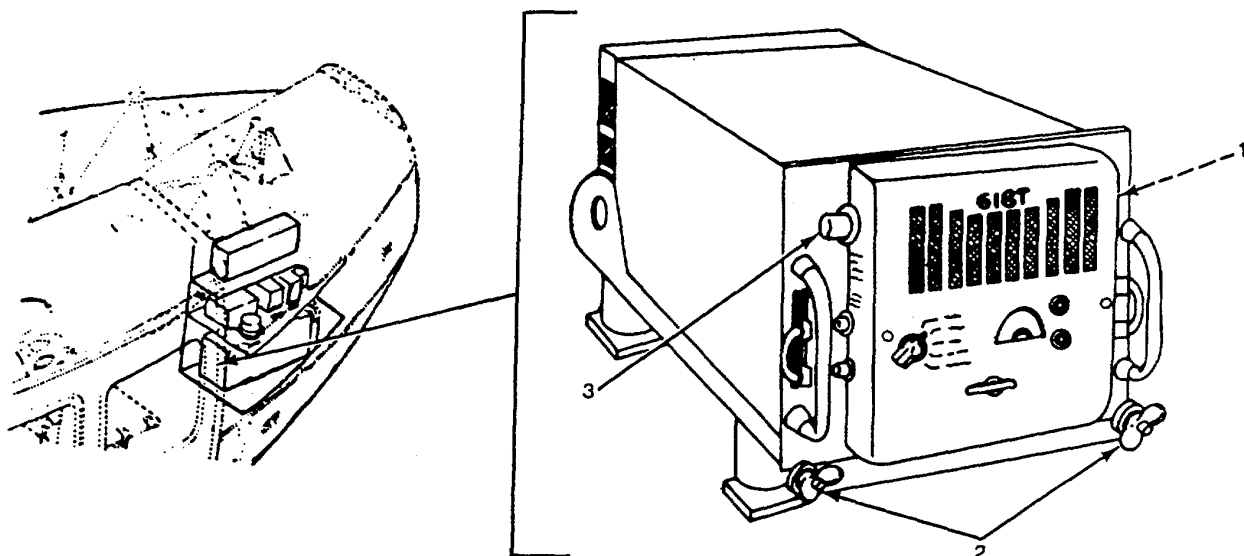
## CHAPTER 32

### HF SSB RADIO SET AN/ARC-102 MAINTENANCE

Subject	Para.	Page
Receiver-Transmitter RT-698/ARC-102 Maintenance (AVUM).....	32-1	32-1
Inverter-Mounting PP-3702/ARC-102 Maintenance (AVUM).....	32-2	32-2
Control C-3940/ARC-94 Maintenance (AVUM).....	32-3	32-3
Network, Impedance Matching CU-991/AR or CU-1 658/AR Maintenance (AVUM) .....	32-4	32-4
Antenna, Longwire P/N 204-075-609 or P/N 205-706-027 or P/N 205-706-027-1.....	32-5	32-5
Cabling and Connector Maintenance (AVUM).....	32-6	32-9
HF SSB Radio Set AN/ARC-1 02 Operational Checks (AVUM) .....	32-7	32-9
HF SSB Radio Set AN/ARC-1 02 Troubleshooting (AVUM).....	32-8	32-12

### SECTION I. MAINTENANCE PROCEDURES

#### 32-1. RECEIVER-TRANSMITTER RT-698/ARC-102 MAINTENANCE [AVUM)



##### 31-1.1 Removal Instructions.

- A Tag, then disconnect coaxial connectors (1) and (3).
- B Cut safety wire, loosen two wing nuts (2) and disengage holddown clamps.
- C Pull receiver-transmitter forward out of mount.

##### 32-1.2 Installation Instructions.

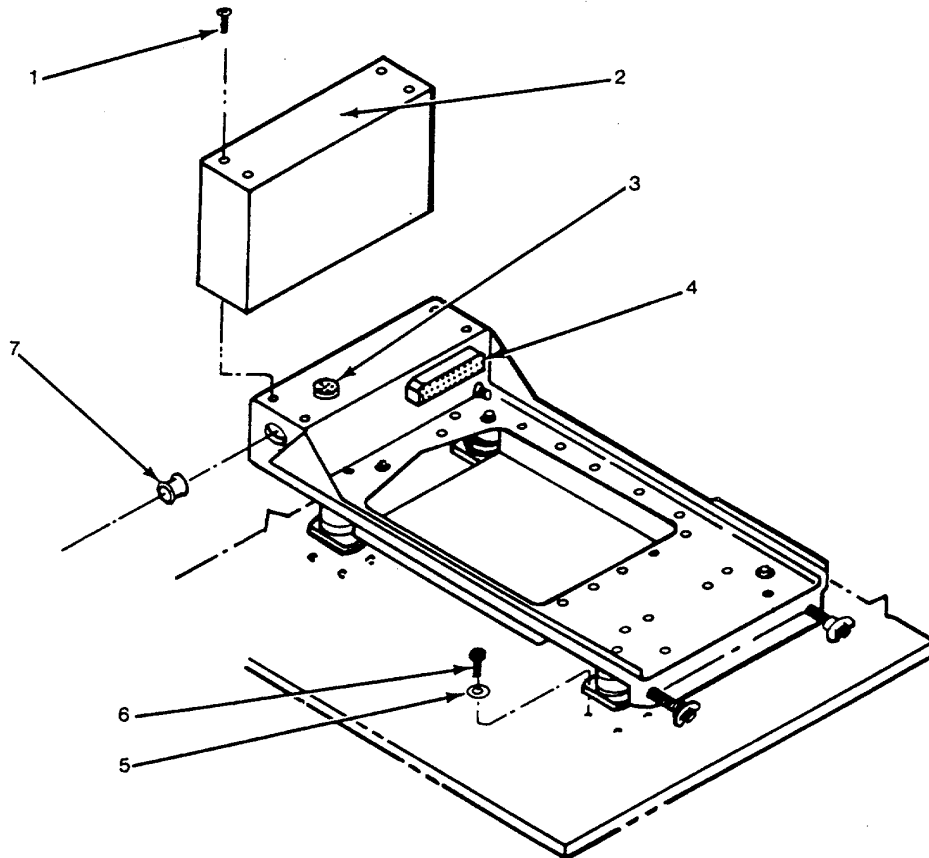
- A Position receiver-transmitter in mount and slide back making sure electrical connectors in mount and on receiver-transmitter are alined then firmly seated.



### 32-1.2 Installation Instructions. - Continued

- B Connect two coaxial connectors (1) and (3), then remove tags.
- C Position holddown clamps over studs on front of receiver-transmitter and tighten wing nuts (2).
- D Safety wire wing nuts.

### 32-2. INVERTER-MOUNTING PP-3702/ARC-102 MAINTENANCE (AVUM)



#### 32-2.1 Removal Instructions.

- A Remove receiver-transmitter RT-698/ARC-102, per paragraph 32-1.1.
- B Loosen four socket-head capscrews (1) and inverter (2) corners.
- C Pull inverter up to disengage inverter and mounting connectors.
- D Remove 16 screws (6) and washers (5) that secure mounting to equipment shelf.
- E Remove five screws from top and six screws from bottom of rear mounting cover and remove the cover.
- F Remove four attaching screws from receiver-transmitter receptacle (4).
- G Remove two attaching screws from inverter receptacle (3).

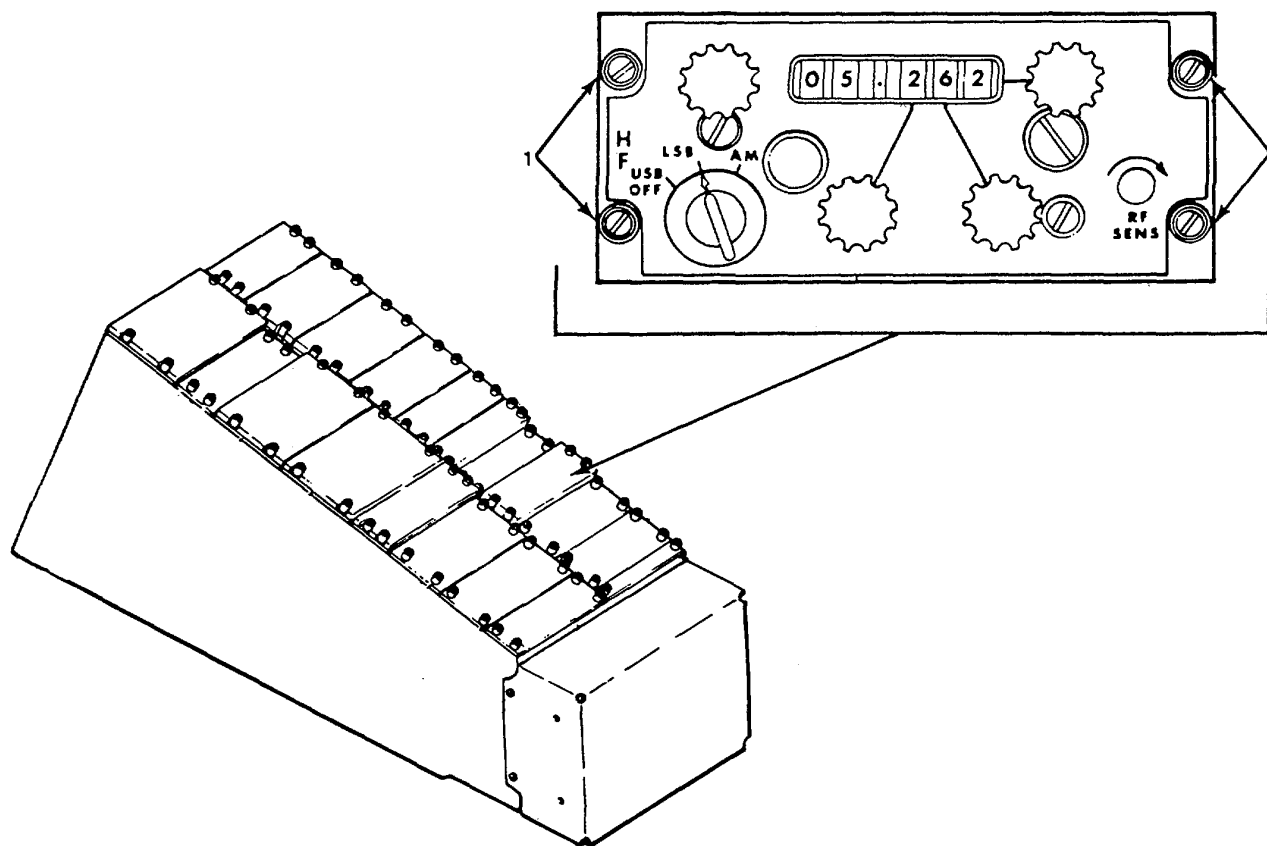


**32-2.1 Removal Instructions. - Continued**

- H Remove the sockets, rubber grommet (7) and cable from mounting.
- I Remove mounting from shelf.

**32-2.2 Installation Instructions.**

- A Position receiver-transmitter receptacle (4) in mounting and secure with four screws.
- B Position inverter receptacle (3) in mounting and secure with two screws.
- C Insert rubber grommet (7) in cover cable slot.
- D Position cover on rear of mounting and secure with five screws on top and six screws on bottom.
- E Position mounting on equipment shelf and secure with 16 screws (6) and washers (5).
- F Position inverter (2) on mounting and tighten four socket-head capscrews (1).
- G Install receiver-transmitter RT-698/ARC-102 per paragraph 31-1.2.

**32-3. CONTROL C-3940/ARC-94 MAINTENANCE (AVUM)**



**32-3.1 Removal Instructions.**

- A** Loosen four spring-lock fasteners (1).

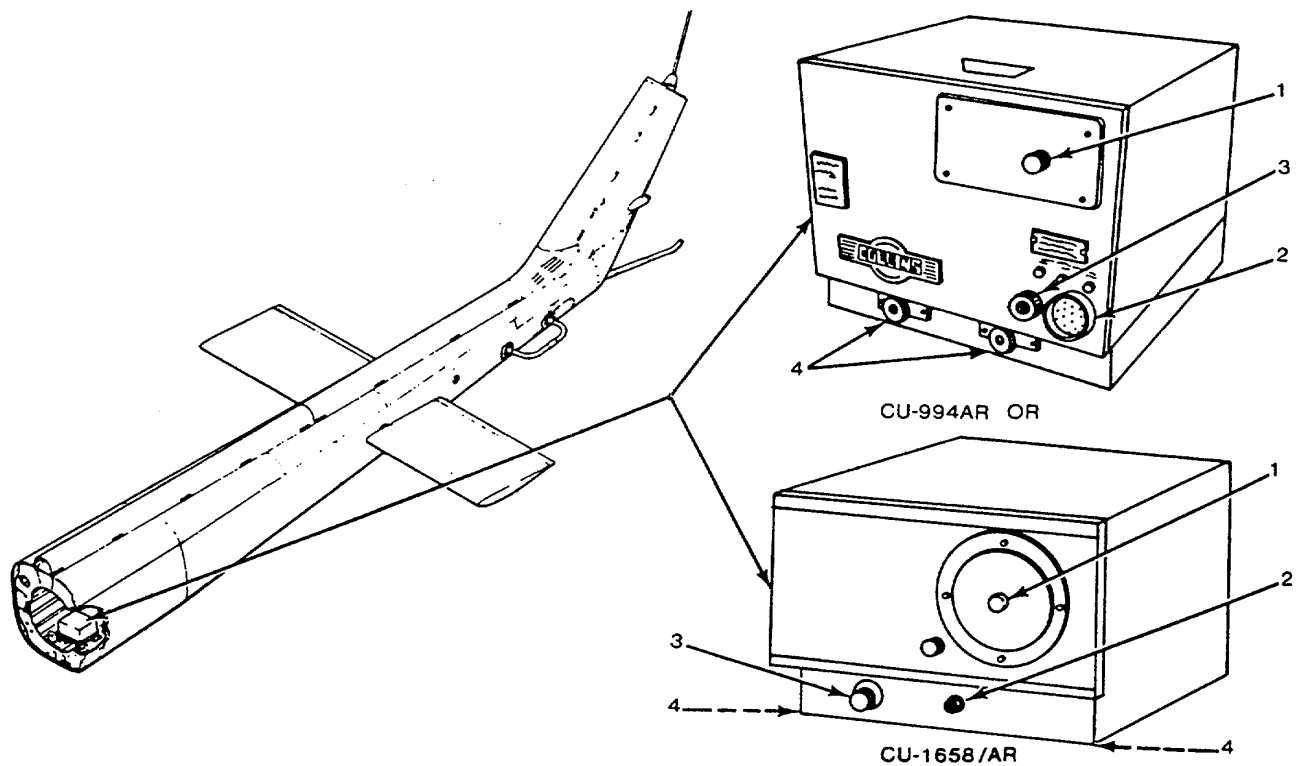
**CAUTION**

Be careful not to pull control so far from pedestal console that electrical wiring or connector will be damaged.

- B** Lift control from pedestal console and disconnect electrical connector from rear of control.  
**C** Remove control.

**32-3.2 Installation Instructions.**

- A** Hold control near pedestal console and connect electrical connector to back of control.  
**B** Position control in pedestal console and secure with four spring-lock fasteners.

**32-4. NETWORK, IMPEDANCE MATCHING CU-991/AR or CU-1658/AR MAINTENANCE (AVUM)****32-4.1 Removal Instructions.**

- A** Loosen knurled nut (1) and disconnect antenna leadn from slotted post.  
**B** Disconnect electrical connector (2) and coaxial connector (3).  
**C** Cut safety wire and loosen two knurled knobs (4).



### 32-4.1 Removal Instructions. - Continued

- D Pull impedance matching network forward to disengage from rear retaining flange, then lift out of mounting.

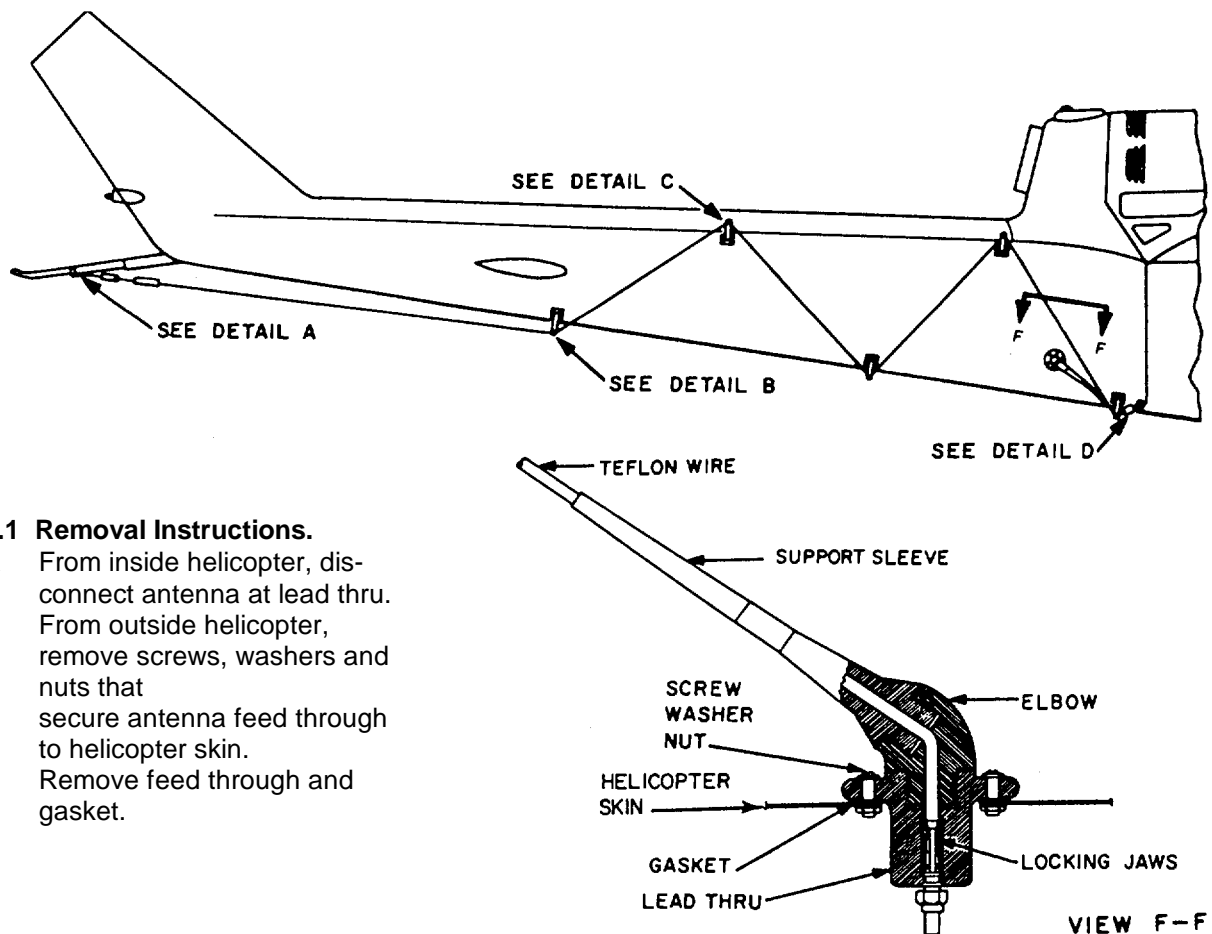
### 32-4.2 Installation Instructions.

- A Position impedance matching network in mounting, then slide to rear engaging retaining flange.
- B Tighten knurled knobs (4) or retaining clamps.
- C Connect electrical connector (2) and coaxial connector (3).
- D Insert antenna lead in through slotted post and secure with knurled nuts (1).
- E Safety wire knurled knobs (4).

### 32-5. ANTENNA, LONGWIRE P/N 204-075-609 OR P/N 205-706-027 OR P/N 205-706-027-1 MAINTENANCE (AVUM)

#### NOTE

Maintenance procedures for above listed longwire antennas are identical.

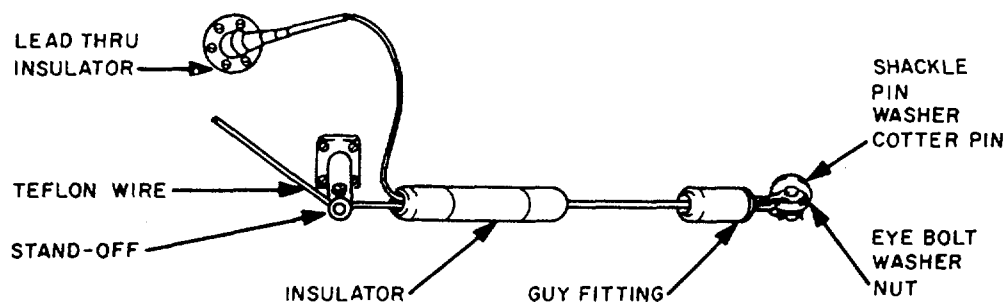


### 32-5.1 Removal Instructions.

- A From inside helicopter, disconnect antenna at lead thru.
- B From outside helicopter, remove screws, washers and nuts that secure antenna feed through to helicopter skin.
- C Remove feed through and gasket.

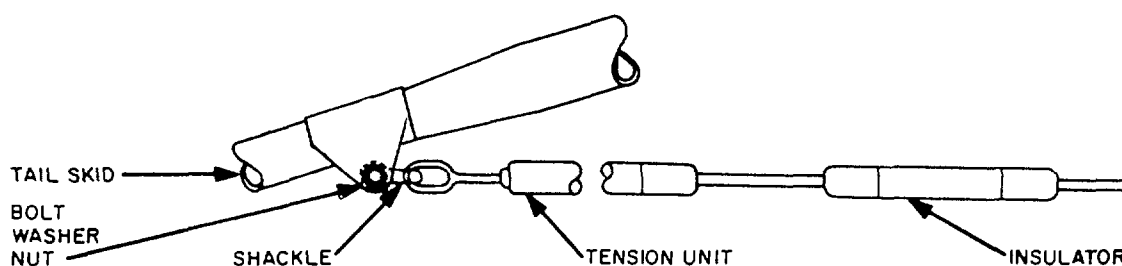


### 32-5.1 Removal Instructions. - Continued



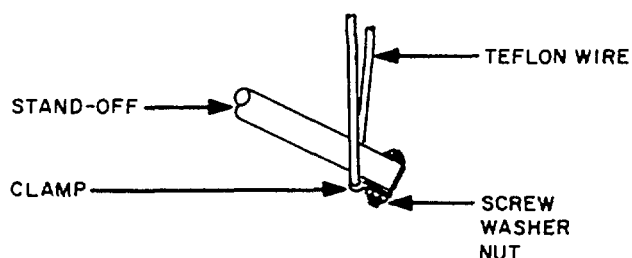
DETAIL D

- D** Carefully disconnect antenna from forward shackle by removing cotter pin, washer and shackle pin.

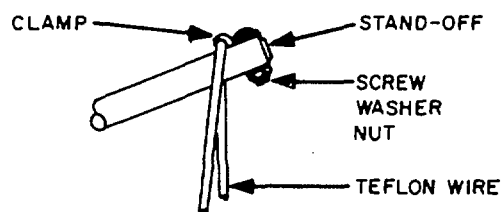


DETAIL A

- E** Carefully remove nut, bolt and washer that secures rear shackle to tail skid.



DETAIL B

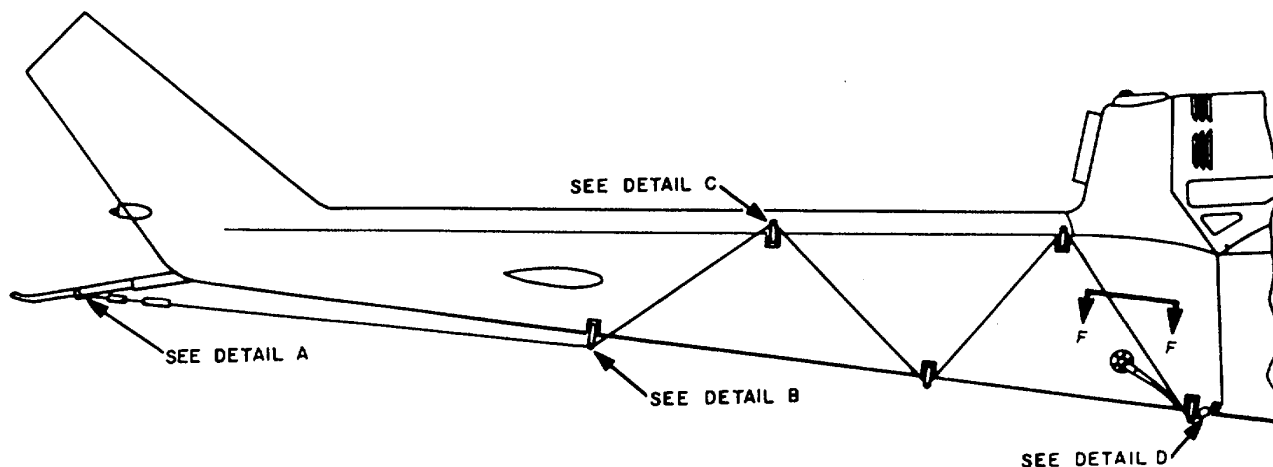


DETAIL C

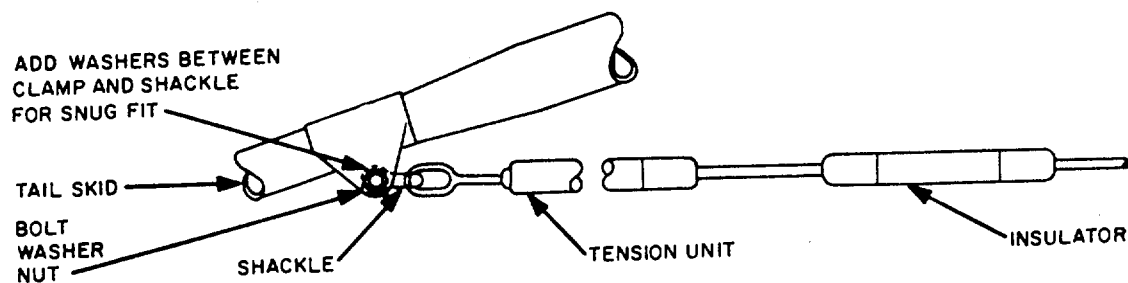
- F** Remove screws, nuts and washers that secure clamps (and antenna) to the standoffs.  
**G** Carefully coil and stow (if required) antenna.  
**H** Repeat procedure (if required) for other side of helicopter.



### 32-5.2 Installation Instructions.

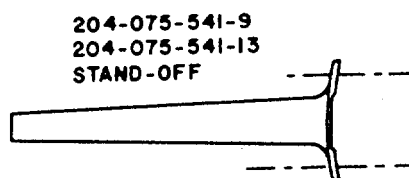
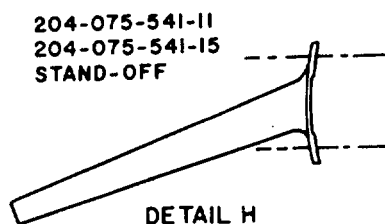


- A** Uncoil antenna and lay out on ground according to antenna pattern on helicopter.



DETAIL A

- B** Attach rear shackle to clamp on tail skid with bolt, washers and nut. Add washers as required for a snug fit between clamp and shackle.

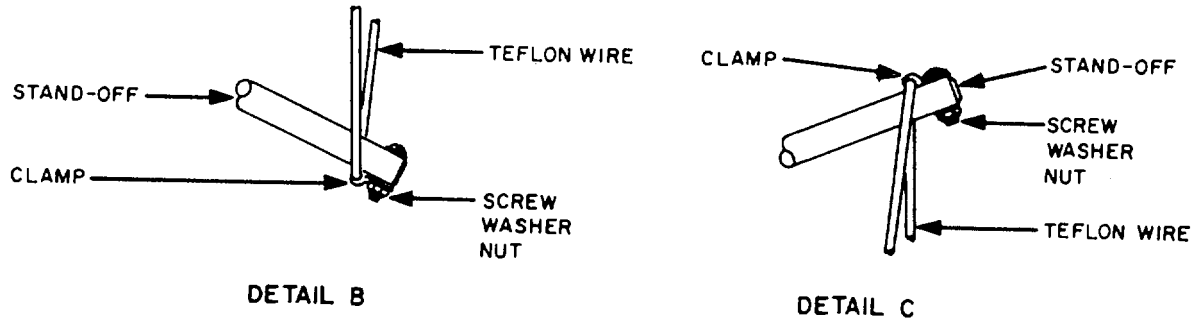


#### NOTE

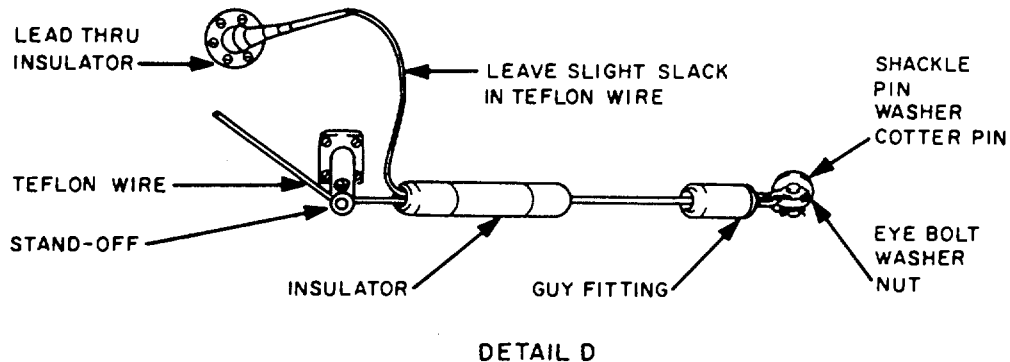
STAND-OFF -9 (8 REQ'D) AND -11 (2 REQ'D) USED ON CONFIGURATION E SERIAL NOS. 64-14035 THRU 64-14100. RESPECTIVE DASH NUMBERS ARE INTER-CHANGEABLE FROM SHIP TO SHIP.



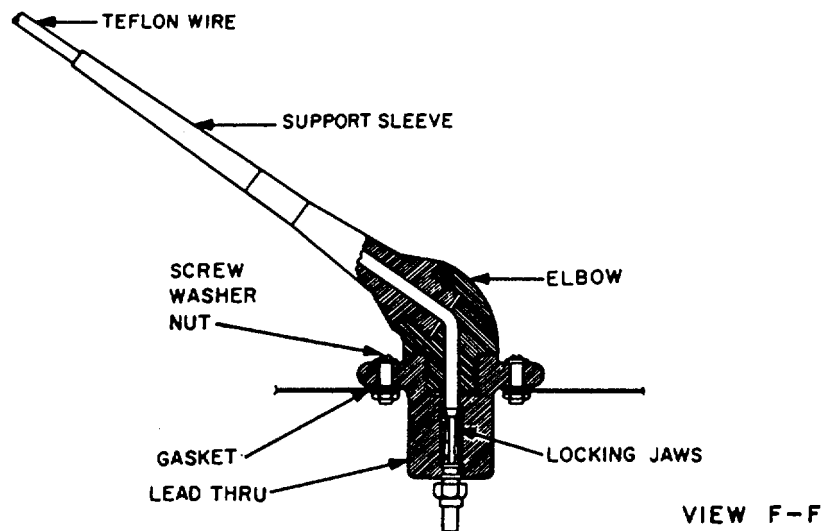
### 32-5.2 Installation Instructions. - Continued



- C** Loosely secure antenna and clamps to five standoffs with screws, washers and nuts. Do not tighten at this time.



- D** Secure forward guy fitting to eyebolt using shackle pin and washer. Insert cotter pin in shackle pin.



- E** Position gasket and feed through assembly on helicopter skin and secure with screws, washers and nuts.
- F** Make sure tension is equal between standoffs then tighten screws and nuts. (See details B and C.)
- G** From inside helicopter reconnect antenna at lead thru.



### 32-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel: P1801, P1806, P1809, P1805, J1805, P1807, J1807, P1804, P1803, P1808, P1802 and J1802.
- Refer to FO-58 and FO-59 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing coaxial connectors or by replacing coaxial cable.
- Paragraph 2-5 contains general wiring repair information.

## SECTION II. OPERATIONAL CHECKS

### 32-7. HF SSB RADIO SET AN/ARC-102 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Radio Set AN/ARC-102 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### General Safety Instructions

##### **WARNING**

Dangerous rf energy is radiated by this equipment. Do not transmit when personnel are near or touching hf antenna.

##### Equipment Conditions

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunications Set operational

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress HF ARC-102 circuit breaker.
2. Set switches on intercom to permit transmission and reception with AN/ARC-102.
3. On C-3940/ARC-94, set function selector to USB, allow five minute warning. Dial lamps on control unit light, receiver-transmitter blower operate.
4. Set frequency selector to each WWV frequency as follows: 2.500, 5.000, 10.000, 15.000, 20.000 and 25.000 MHz.



### 32-7. HF SSB RADIO SET AN/ARC-102 OPERATIONAL CHECKS (AVUM) - Continued

#### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

5. While monitoring WWV, rotate function selector through USB, LSB and AM positions. Quality and pitch of voice or tone reception should remain unchanged in all three modes.
6. On front of RT-698/ARC-102 set meter selection switch to 28V then to 130V. Meter should indicate in red area for both positions.
7. On C-3940/ARC-94 select a frequency on which transmitter may be keyed.

#### NOTE

After changing frequency of the radio set, keying transmitter for first time initiates a tuning cycle by Impedance Matching Network CU-991/AR or CU-1658/AR. The radio set is transmitting during the tuning cycle and a tone can be heard in headset. Do not key transmitter while tuned to WWV or when another station is transmitting on frequency selected. The tuning cycle may be initiated by the equipment in some configurations.

8. On front of RT-698/ARC-102, set meter selector switch to 1500V. Meter should read 0 (with transmitter unkeyed).

#### CAUTION

Receiver-transmitter blower must speed up when transmitter is keyed. If it does not, immediately unkey transmitter and investigate.

9. Key transmitter and read meter. Meter should indicate in read area, blower motor speeds up.

#### NOTE

Transmitter may be keyed by fully depressing pilot's or copilot's cyclic stick switch or foot switch, or by pressing PTT switch on a microphone plugged in jack on front of RT-698/ARC-102.

10. On C-3940/ARC-102, set function selector to AM.
11. On RT-698/ARC-102, set meter selector switch to PA MA. Meter should indicate 0 (with transmitter unkeyed).
12. Disconnect coaxial jumper cable from 500 KC STD jack on right-side front panel of RT-698/ARC-102.
13. Key transmitter. Meter should indicate approximately 300 milliamperes (ma).
14. Unkey transmitter, then reconnect coaxial jumper.
15. Key transmitter and speak into microphone while observing meter. Meter should indicate in red area and not vary while transmitter is being modulated.



### 32-7. HF SSB RADIO SET AN/ARC-102 OPERATIONAL CHECK (AVUM) - Continued

#### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

16. On C-3940/ARC-102, set function selector to LSB.  
Meter should indicate approximately 260 ma.
17. Key transmitter and speak into microphone.  
Meter indicator should follow applied audio with peaks of approximately 300 ma.
18. Repeat steps 16 and 17 with mode selector set to USB.
19. On C-3940/ARC-102, set function selector to AM, allow CU-991/AR or CU-1658/AR to complete tuning cycle.

#### NOTE

CU-991/AR should complete tuning cycle in thirty seconds or less, CU-1658/AR should complete tuning cycle in approximately three seconds.

20. Key transmitter and observe CU-991/AR or CU-1658/AR.  
Meter on CU-991 /AR should indicate below red area. On CU-1658/AR, green lamp should be lit and amber lamp should be extinguished.

#### CAUTION

After each tuning cycle, wait at least 30 seconds before selecting a new frequency and returning CU-991/AR or CU-1658/AR. This will prevent overheating of a time delay relay in coupler.

21. Select several frequencies at random within 2 to 24 MHz range and repeat steps 19 and 20.

#### CAUTION

The maximum duty cycle of CU-991/AR is five minutes on and five minutes off. Do not key transmitter beyond this time limit.

22. After impedance matching network (antenna coupler) has passed steps 19 through 21, it is advisable to conduct actual communications checks. Use at least three frequencies (if possible) and establish two-way communications with stations located several miles from helicopter.

#### NOTE

Frequency selection is limited to 2.000 to 25.000 MHz when CU-991/AR is installed. When CU-1658/AR is installed, entire range of RT-698/ARC-102 (2.000 to 29.999 M Hz) may be used.



## SECTION III. TROUBLESHOOTING

## 32-8. HF SSB RADIO SET AN/ARC-102 TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in HF SSB Radio Set AN/ARC-102.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or cause of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 32-7.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Panel lamps do not light or blower does not operate.	A Defective circuit breaker or primary power wiring.	A Reset circuit breaker and check primary power wiring; repair or replace as necessary.
	B Defective lamps.	B Replace defective lamps.
	C Defective receiver-transmitter.	C Replace RT-698/ARC-102.
	D Defective control unit.	D Replace C-3940/ARC-94.
2. Quality or pitch of WWV changes when function selector is rotated through USB, LSB, and AM.	A Defective receiver-transmitter.	A Replace RT-698/ARC-102.
	B Defective control unit.	B Replace C-3940/ARC-102.
3. No background noise or received signals heard in headset.	A Defective circuit breaker or interunit wiring.	A Reset or replace circuit breaker, repair or replace cabling as necessary.
4. Meter does not indicate in red area with selector set to 28V.	A Low input voltage.	A Check for proper input voltage, correct low primary voltage condition.
	C Defective receiver-transmitter.	C Replace RT-698/ARC-102.
5. Meter does not indicate in red area with selector set to 130V.	A Defective static power inverter.	A Replace PP-3702/ARC-102.
	B Defective receiver-transmitter.	B Replace RT-698/ARC-102.



**32-8. HF SSB RADIO SET AN/ARC-102 TROUBLESHOOTING (AVUM) - Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
6.	When transmitter is keyed, blower does not speed up and/or meter does not indicate in red area with selector set to 1500V.	<p><b>A</b> Defective receiver-transmitter.  <b>A</b> Replace RT-698/ARC-102.</p> <p><b>B</b> Defective static power inverter.  <b>B</b> Replace PP-3702/ARC-102.</p>
7.	Meter readings not as specified with selector set to PA MA and transmitter keyed.	<p><b>A</b> Defective receiver-transmitter.  <b>A</b> Replace RT-698/ARC-102.</p> <p><b>B</b> Defective microphone audio circuitry.  <b>B</b> Check microphone, microphone audio wiring and impedance matching network or audio threshold unit; repair or replace as necessary.</p>
8.	Radio set is not mute after desired frequency has been set.	<p><b>A</b> Defective control unit.  <b>A</b> Replace C-3940/ARC-94.</p> <p><b>B</b> Defective receiver-transmitter.  <b>B</b> Replace RT-698/ARC-102.</p>
9.	1000 Hz tone not heard when microphone is keyed after frequency change.	<p><b>A</b> Defective receiver-transmitter.  <b>A</b> Replace RT-698/ARC-102.</p> <p><b>B</b> Defective antenna coupler.  <b>B</b> Replace CU-991/AR or CU-1658/AR.</p>
10.	Antenna coupler does not complete tuning cycle within specified time.	<p><b>A</b> Defective antenna coupler.  <b>A</b> Replace CU-991/AR or CU-1658/AR.</p> <p><b>B</b> Defective antenna.  <b>B</b> Replace longwire antenna P/N204-075-609 or P/N 205-706-027.</p> <p><b>C</b> Defective receiver-transmitter.  <b>C</b> Replace RT-698/ARC-102.</p>
11.	Antenna coupler meter reading, or advisory lamp indication, not as specified.	<p><b>A</b> Defective antenna coupler.  <b>A</b> Replace CU-991/AR or CU-1658/AR.</p> <p><b>B</b> Defective antenna.  <b>B</b> Replace longwire antenna P/N 204-075-609 or P/N 205-706-027.</p> <p><b>C</b> Defective rf cabling.  <b>C</b> Check rf cabling between receiver-transmitter and coupler, and between coupler and antenna; repair or replace as necessary.</p>
12.	Volume cannot be controlled by adjusting RF SENS knob.	<p><b>A</b> Defective control unit.  <b>A</b> Replace C-3940/ARC-94.</p>



**32-8.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in HF SSB Radio Set AN/ARC-102 and the preceding operational checks and troubleshooting charts do not indicate the course of the trouble, refer to the chart below and check for voltages or signals, refer to FO-58 and FO-59 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.
- Refer to 32-8.1.1 for UH-1 D/H configurations A through H or 32-8.1.2 for UH-1 D/H configurations I and J and UH-1 H.

**32-8.1.1 UH-1D/H Configurations A through H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB12	2	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	6	Ground	Not applicable	0
TB44	2, 3, 4	Primary power	AN/ARC-102 energized	28 Vdc
TB44	5	Switched ground	AN/ARC-102 energized	28 Vdc, then 0 when USB, LSB, or AM is selected on C-3940/ARC-94
TB44	6, 7	AC power from inverter to receiver-transmitter	AN/ARC-102 energized	115 Vac, 400 Hz
TB20	13	Transmit key line	AN/ARC-102 energized, intercom rotary switch set to 4	28 Vdc, then 0 when microphone is keyed



**32-8.1.2 UH-1D/H Configurations I and J, and Signal and Voltage Measurements (AVUM)**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	2	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	6, 9	Ground Not applicable		0
TB44	1 thru 16	Primary power	AN/ARC-102 energized	28 Vdc
TB44	7	Switched ground	AN/ARC-102 energized	28 Vdc, then 0 when USB, LSB, or AM is selected on C-3940/ARC-94
TB44	10	Switched ground	AN/ARC-102 energized and HF selected on intercom rotary switch	28 Vdc, then 0 when transmitter is keyed
TB19	8	Transmit key line (UH-1 H)	AN/ARC-102 energized and intercom rotary switch set to 4	28 Vdc, then 0 when microphone keyed
TB20	13	Transmit key line (UH-1 D/H configur- ations I and J)	AN/ARC-102 energized and intercom rotary switch set to 4	28 Vdc, then 0 when microphone keyed
TB20	11	Receive audio (UH-1 H)	AN/ARC-102 energized	Audio hi
TB20	6	Transmit audio (UH-1 H)	AN/ARC-102 energized, intercom rotary switch set to 4, microphone keyed and signal applied	Audio hi

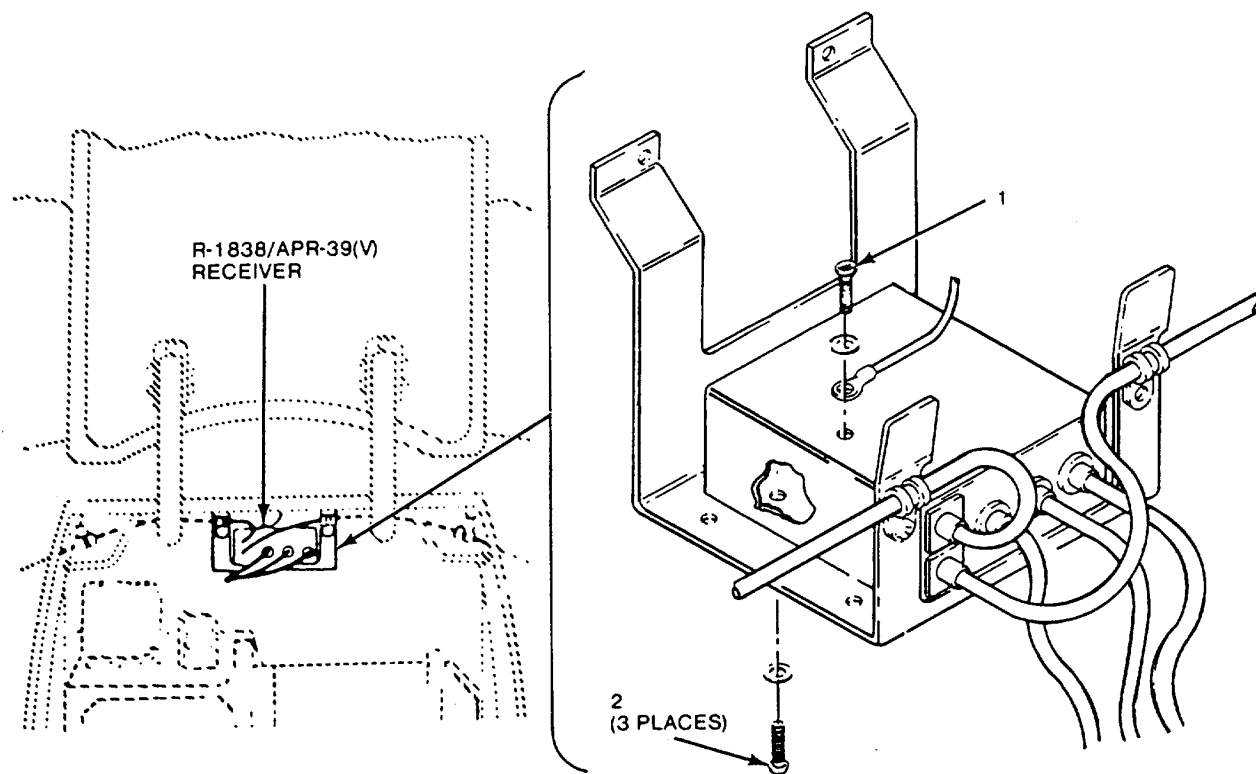


# **CHAPTER 33** **RADAR SIGNAL DETECTING SET AN/APR-39(V) MAINTENANCE**

Subject	Para.	Page
Forward Receiver R-1838/APR-39(V) Maintenance (AVUM) .....	33-1	33-1
Aft Receiver R-1838/APR-39(V) Maintenance (AVUM) .....	33-2	33-3
Comparator CM-440/APR-39(V) Maintenance (AVUM) .....	33-3	33-5
Indicator IP-1 150/APR-39(V) Maintenance (AVUM) .....	33-4	33-6
Control C-9326/APR-39(V) Maintenance (AVUM) .....	33-5	33-7
Right Spiral Antennas AS-2891/APR-39(V) Maintenance (AVUM) .....	33-6	33-8
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## **SECTION I. MAINTENANCE PROCEDURES**

### **33-1. FORWARD RECEIVER R-1838/APR-39(V) MAINTENANCE (AVUM)**





### 33-1.1 Removal Instructions.

#### **CAUTION**

Be extremely careful not to cause excessive bends or kinks in semi-rigid coaxial cables.

- A** Tag for identification, then carefully disconnect five coaxial connectors from front of receiver.
- B** Remove three screws and washers (2) from underneath mounting.
- C** Lift receiver and pull forward to gain access to bondingstrap.
- D** Remove screw and washer (1) that secures grounding jumper to top of receiver, then remove receiver.

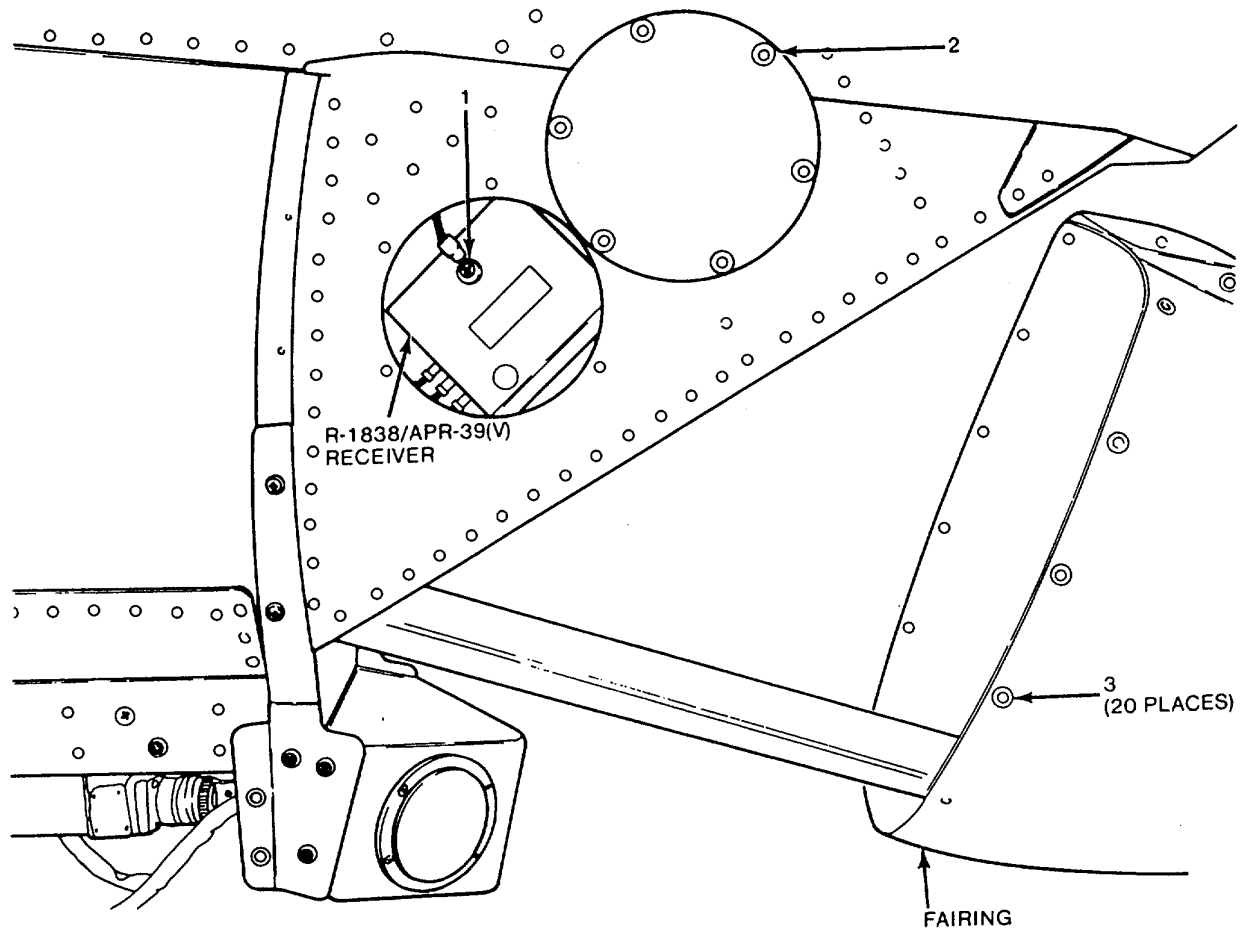
### 33-1.2 Installation Instruction.

#### **CAUTION**

Be sure screws used to secure grounding jumper and to secure receiver to mount are of proper length. If screws are too long they will penetrate electrical wiring.

- A** Hold receiver close mount and position grounding jumper on top of receiver.
- B** Secure grounding jumper with screw and washer (1).
- C** Slide receiver into mount with connectors facing forward.
- D** Secure receiver in mount with three screws and washers (2).
- E** Connect five coaxial connectors to appropriate receptacles and remove tags.
- F** Torque all coaxial connectors 7 to 10 inch-pounds using T-8438.



**33-2. AFT RECEIVER R-1838/APR-39(V) MAINTENANCE (AVUM)****33-2.1 Removal Instructions.**

- A** Remove 20 screws (3) holding fiberglass fairing to tailboom.
- B** Lower fairing away from tailboom.
- C** Remove left-side inspection plate by removing six screws (2).

**CAUTION**

Be extremely careful not to cause excessive bends or kinks in semi-rigid coaxial cables.

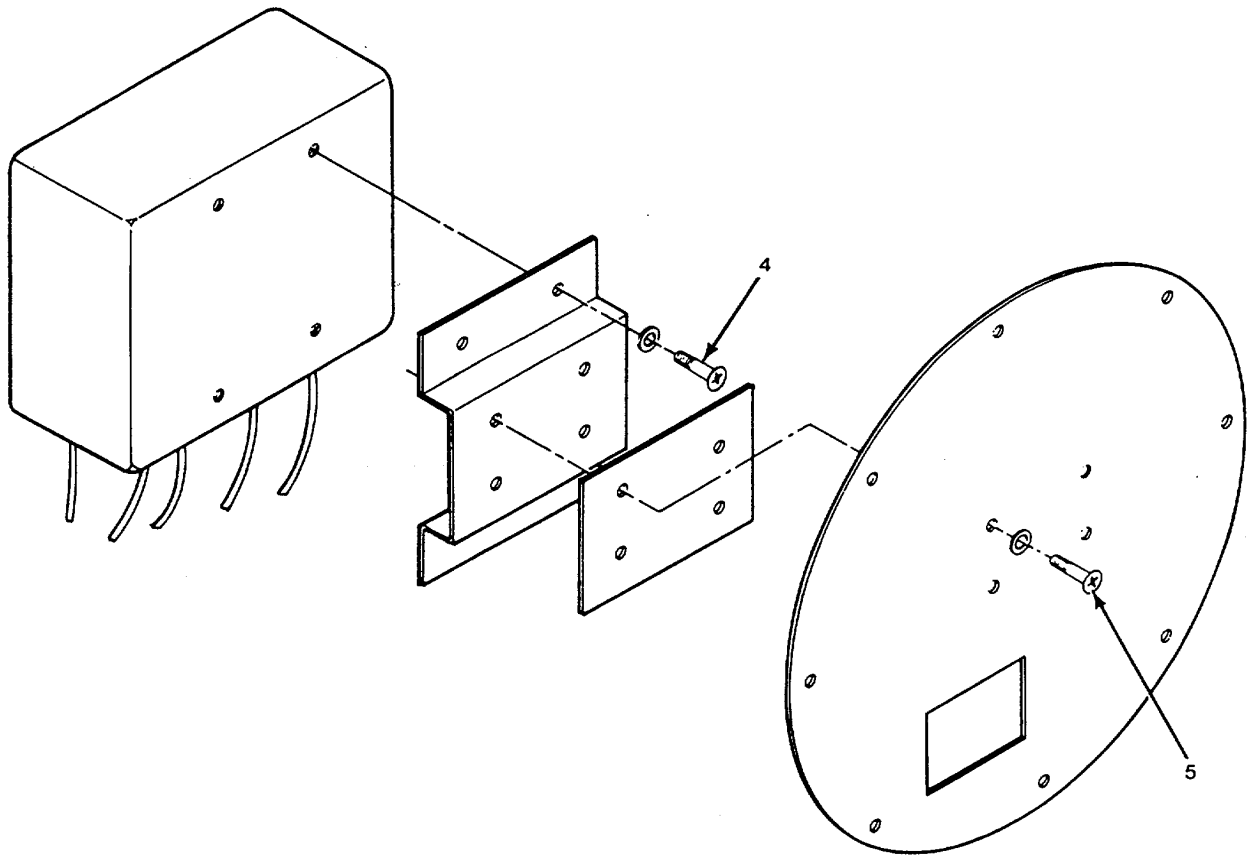
- D** Reaching through left side inspection opening, tag for identification then disconnect five coaxial cables.
- E** Remove right-side inspection plate by removing six screws.
- F** Pull right-side inspection cover from helicopter skin.



**33-2.1 Removal Instructions - Continued****NOTE**

Aft receiver and mount are attached to right side inspection cover.

- G** Remove screw and washer (1) securing ground strap to receiver.



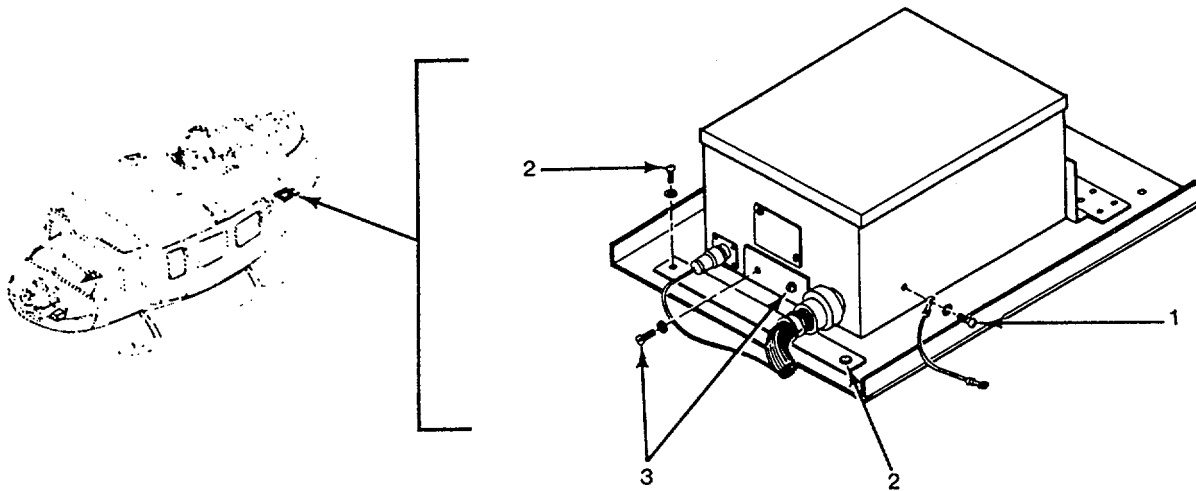
- H** Remove four screws and washers (5) and lift receiver and mounting bracket from inspection plate.
- I** Remove two screws and washers (4) and lift receiver from mounting bracket.



### 33-2. 2. Installation Instructions.

- A Position receiver on mounting bracket and secure with two screws and washers (4).
- B Position mounting bracket on inspection plate and secure with four screws and washers (5).
- C Position ground strap on top of receiver and secure with screw and washer (1).
- D Position right-side inspection plate on skin of helicopter and secure with six screws.
- E Reach through left-side inspection opening, connect five coaxial connectors then remove tags.
- F Torque all coaxial connectors 7 to 10 inch-pounds using T-8438.
- G Position left-side inspection plate on helicopter skin and secure with six screws (2).
- H Position fiberglass fairing on tailboom and secure with 20 screws (3).

### 33-3. COMPARATOR CM-440/APR-39(V) MAINTENANCE (AVUM)



#### 33-3.1. Removal Instructions.

- A Disconnect electrical connector.

#### **CAUTION**

Be extremely careful not to cause excessive bends or kinks in semi-rigid coaxial cable.

- B Carefully disconnect coaxial cable.
- C Remove screw and washer (1) that secures grounding jumper to comparator.
- D Remove two screws and washers (2) from front mounting plate.
- E Slide comparator forward and out of mount.
- F Remove front then rear mounting bracket by removing two screws and washers (3) from each.



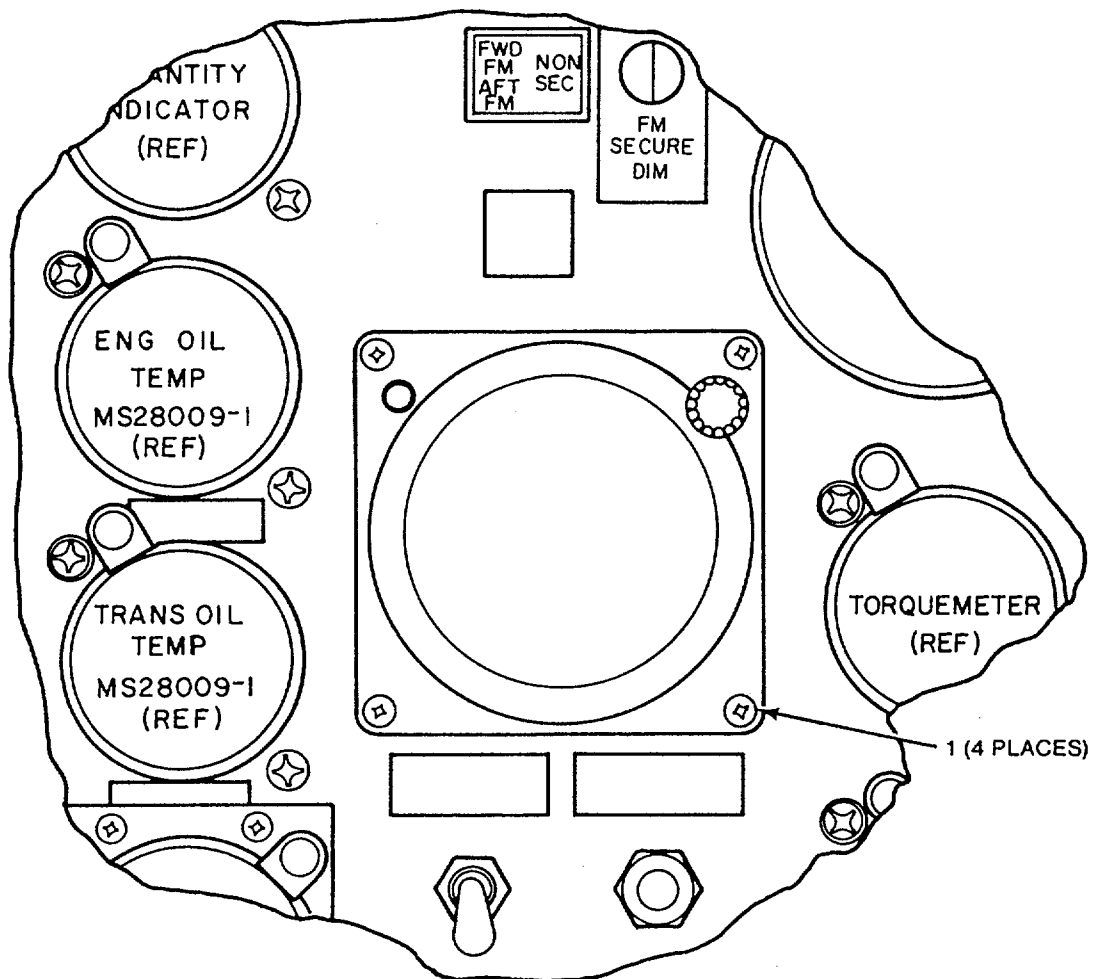
### 33-3.2. Installation Instructions.

#### **CAUTION**

Be sure screws used to secure grounding jumper and mounting brackets are proper length. If screws are too long they will penetrate electrical wiring.

- A Secure front then rear mounting brackets to comparator using two screws and washers (3) each place.
- B Position comparator on mount with rear mounting bracket under mounting plate.
- C Position front mounting plate over mounting bracket and secure with two screws and washers (2).
- D Secure grounding jumper to comparator with screw and washer (1).
- E Connect electrical connector.
- F Connect coaxial connector and torque 7 to 10 inch-pounds using T-8438.

### 33-4. INDICATOR IP-1150/APR-39[V] MAINTENANCE (AVUM).





### 33-4.1. Removal Instructions.

- A Remove four screws (1) that secure indicator to instrument panel

#### **CAUTION**

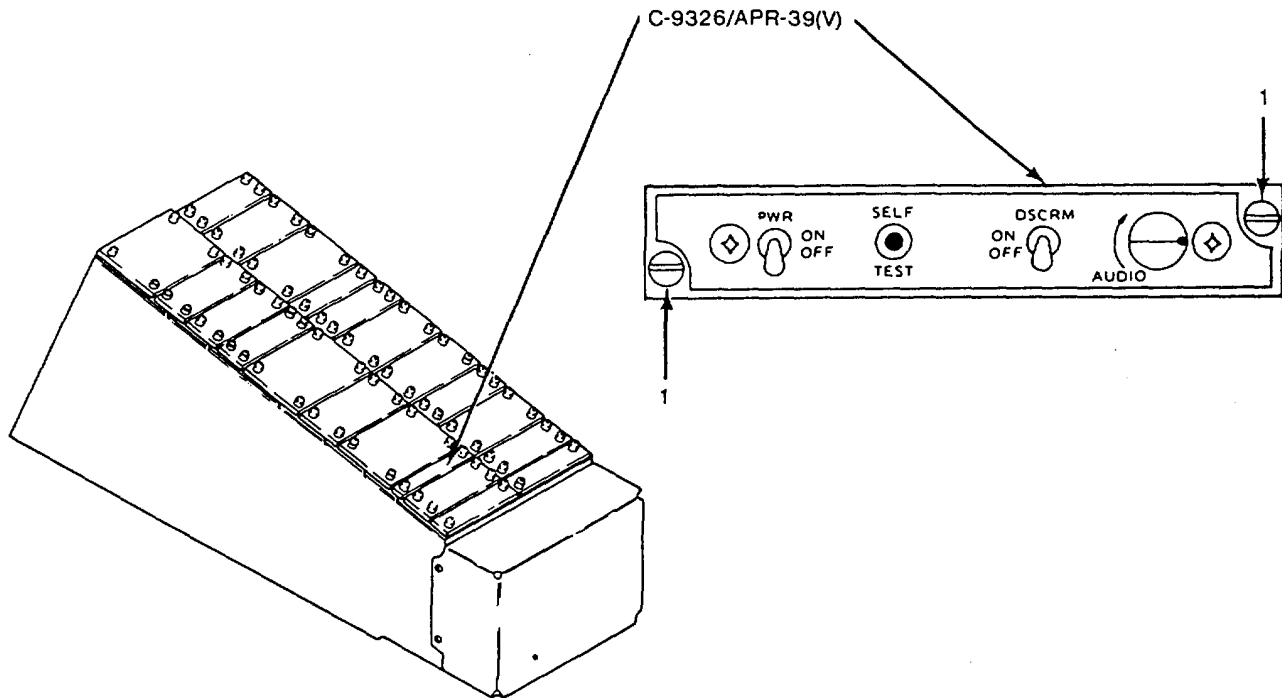
Be careful not to pull indicator so far from instrument panel that electrical wiring or connector will be damaged.

- B Carefully pull indicator from instrument panel and disconnect electrical connector.  
C Remove indicator.

### 33-4.2. Installation Instructions.

- A Hold indicator close to instrument panel and connect electrical connector to rear of indicator.  
B Position indicator in instrument panel and secure with four screws (1).

## 33-5. CONTROL C-9326/APR-39(V) MAINTENANCE (AVUM)



#### **NOTE**

Position in pedestal console may vary.

### 33-5.1. Removal Instructions.

- A Loosen two spring-lock fasteners (1).

#### **CAUTION**

Be careful not to pull control so far from pedestal console that electrical wiring or connector will be damaged.



### 33-5.1 Removal Instructions. - Continued

- B** Carefully pull control out of pedestal console far enough to gain access to spring-lock fasteners on connector.
- C** Loosen two spring-lock fasteners on connector, and disconnect electrical connector from rear , of control.
- D** Remove control.

### 33-5.2. Installation Instructions.

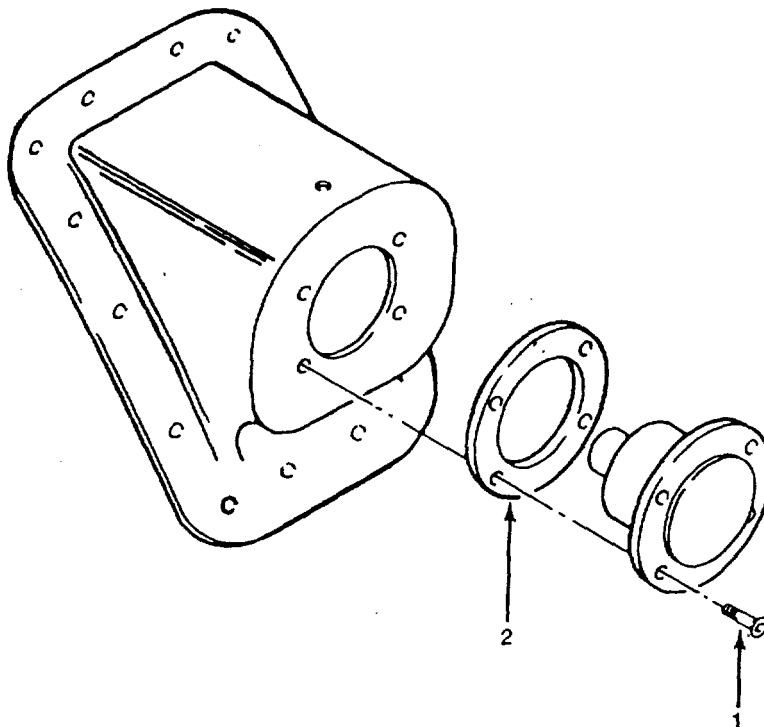
- A** Hold control close to pedestal console and connect electrical connector.
- B** Tighten two spring-lock fasteners that secure connector to rear of control.
- C** Position control in pedestal console and secure with two spring-lock fasteners (1).

### 33-6. RIGHT SPIRAL ANTENNAS AS-2891/APR-39(V) MAINTENANCE (AVUM)

- Two right spiral antennas are installed, one on left forward side and one on right aft side of helicopter.
- Left and right side refers to sides of helicopter if standing behind it looking toward nose.

#### NOTE

Right spiral antenna AS-2891/APR-39(V) is identical in external appearance to left spiral antenna AS-2892/APR-39(V). Be sure correct part number antenna is used.





### 33-6.1. Removal Instructions.

**A** Remove four screws (1) that secure antenna to helicopter.

#### **CAUTION**

Be careful not to pull antenna so far from helicopter that semi-rigid coaxial cable or connector will be damaged. Avoid excessive bends or kinks in semi-rigid coax.

**B** Carefully pull antenna far enough from mount to gain access to connector.

**C** Disconnect coaxial connector and remove antenna.

### 33-6.2. Installation Instructions.

- A** Remove paint and any remaining sealant from around mounting holes and perimeter of antenna to ensure proper bonding.
- B** Position white dot on antenna up, insert semi-rigid coax through spacer (2). and connect semi-rigid coax to antenna.
- C** Torque connector 7 to 10 inch-pounds using T-8438 torque wrench.

#### **NOTE**

White dot on antenna must be positioned up to ensure proper system operation.

- D** Position antenna in fairing and secure with four screws (1).
- E** Apply bead of RTV sealant around outer perimeter of antenna.

### 33-7. LEFT SPIRAL ANTENNA AS-2892/APR-39(V) MAINTENANCE (AVUM)

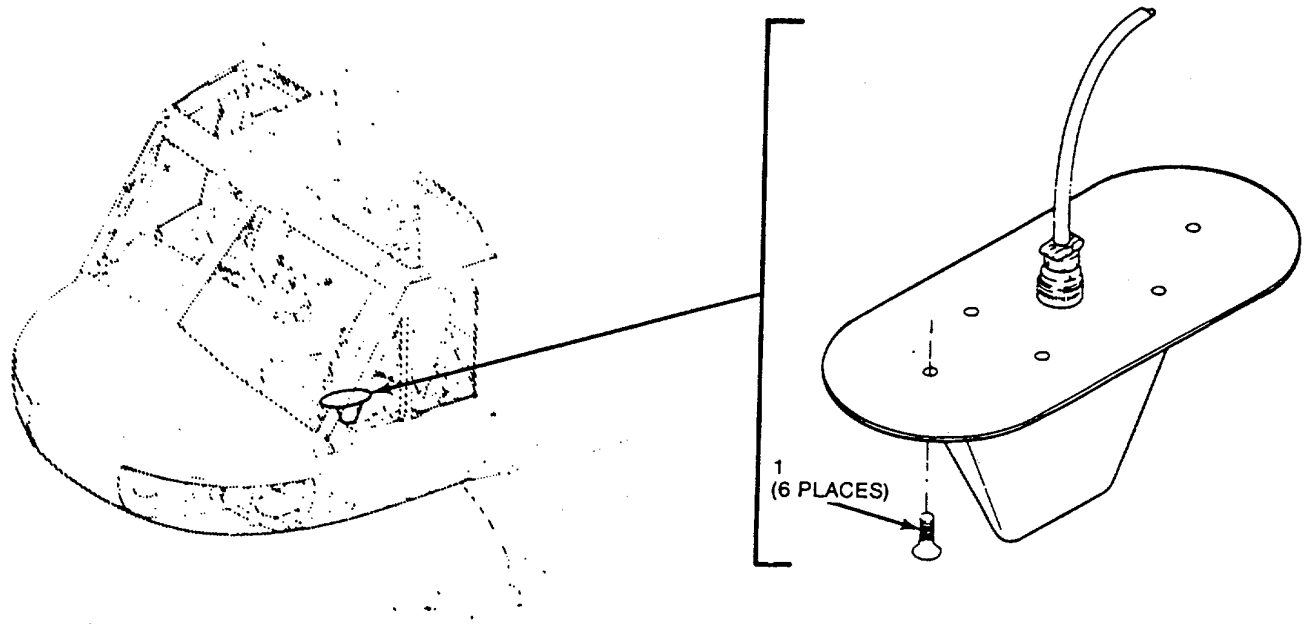
- Two left spiral antennas are installed, one on right forward side and one on left aft side of helicopter.
- Left and right side refers to sides of helicopter if standing behind it and looking toward nose.

#### **NOTE**

Left spiral antenna AS-2892/APR-39(V) is identical in external appearance to right spiral antenna AS-2891/APR-39(V). Be sure correct part number antenna is used.

- Except for location on helicopter, maintenance procedures for the left and right spiral antennas are identical. Refer to paragraph 33-6.1 for removal and 33-6.2 for installation.



**33-8. BLADE ANTENNA AS-2890/APR-39(V) MAINTENANCE (AVUM)****33-8.1. Removal Instructions.**

**A** Remove six screws (1) that secure antenna to helicopter.

**CAUTION**

Be careful not to pull antenna so far from helicopter that semi-rigid coaxial cable or connector will be damaged. Avoid excessive bends or kinks in semi-rigid coax.

**B** Carefully pull antenna far enough from helicopter to gain access to connector.

**C** Disconnect coaxial connector and remove antenna.

**33-8.2. Installation Instructions.**

- A** Remove paint from around mounting holes.
- B** Remove any remaining sealant from mounting surface.
- C** Hold antenna close to helicopter skin and connect coaxial connector.
- D** Torque coaxial connector 7 to 10 inch pounds using T-8438 torque wrench.
- E** Position antenna on helicopter and secure with six screws (1).
- F** Apply small bead of RTV sealant around perimeter of antenna.



### 33-9. SEMI-RIGID COAXIAL CABLE MAINTENANCE (AVUM)

- Semi-rigid coaxial cable is used between spiral antennas and receivers and between the blade antenna and comparator.
- Semi-rigid coaxial cables are not repaired. When troubleshooting indicates a fault to semi-rigid coax, the cable is replaced.
- Procedures given below apply to all semi-rigid coaxial cables used in the AN/APR-30(V) system.

#### 33-9.1. Removal Instructions.

- A** Disconnect coaxial connector from antenna and from receiver or comparator.
- B** Remove and retain all loop clamps that secure semi-rigid coax to helicopter by removing attaching screw, nut and washers.
- C** Remove semi-rigid coaxial cable, taking note of path and points where it is secured to helicopter.

#### 33-9.2. Installation Instructions.

#### CAUTION

Be careful not to cause excessive bends or kinks in semi-rigid coaxial cable.

- A** Route semi-rigid coaxial cable along original path.
- B** Secure coax to helicopter using loop clamps, screws, nuts and washers removed in paragraph 33-9.1. **B**.
- C** Connect coaxial connectors to antenna and receiver or comparator.
- D** Torque coaxial connectors 7 to 10 inch pounds using T-8438.

### 33-10. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:
- Forward receiver P3, P4, P5; aft receiver P3, P4, P5; tail boom disc P1, J1, P2, J2, P3, J3, comparator P1; indicator P1; and control P1.
- Refer to FO-60 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Paragraph 2-5 contains general wiring repair information.



## SECTION II. OPERATIONAL CHECKS

### 33-11. RADAR SIGNAL DETECTING SET AN/APR-39V} OPERATIONAL CHECKS (AVUM)

- These checks are used to ensure Radar Signal Detecting Set AN/APR-39(V) is performing properly. They are also used after repairs to make sure the problem was fixed.
- Two power on operational checks are given. The preferred method uses external test equipment SM-674(\*)/UPM. The alternate method uses test circuits built into AN/APR-39(V).

#### INITIAL SETUP

##### Test Equipment

Test Set, Flight Line

Simulator SM-674(\*)/UPM<sup>(1)</sup>

Personnel Required

Two Technicians, one to  
operate test set,  
one to operate equipment.

<sup>(1)</sup>Not required for alternate method.

##### Equipment Conditions

Reference

Paragraph 1-50 Auxiliary Power Unit connected.

Paragraph 14-13 Intercommunications Set operational.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety-wired (if required).
2. Check that all connectors are tightened and for evidence of chaffed or broken wiring.

#### POWER ON CHECKS

1. Depress RADAR WARN/APR-39, INTERCOM CPLT & CREW L and INTERCOM PILOT & CREW R circuit breakers.
2. On AN/APR-34(V) control panel, set PWR switch to ON, DRSCM switch to ON and AUDIO control to mid position.

#### NOTE

If alternate check is to be used, proceed to step 15.

3. Set switches on test set as follows:

TRK/SCAN ..... TRK  
PW ..... WIDE  
PRF ..... LOW



**33-11. RADAR SIGNAL DETECTING SET AN/APR-39(V) OPERATIONAL CHECKS (AVUM) - Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

4. Technician with test set should position himself in front of helicopter (relative bearing approximately 0°) and aim test set at forward antennas.
5. Squeeze trigger on test set.  
No display.
6. On test set, set PW switch to NAR, squeeze trigger.  
No display.
7. On test set, set PRF switch to HIGH, squeeze trigger.  
On IP-1 150/APR-39(V), strobe appears at approximately 0° and PRI tone is heard in headset.
8. On test set, set TRK/SCAN switch to SCAN, squeeze trigger.  
On IP-1 150/APR-39(V), flashing strobe appears at approximately 0°, MA lamp flashes, warning tone heard on headset.
9. On test set, set TRK/SCAN switch to SCAN, squeeze trigger.  
On IP- 1150/APR-39(V) flashing strobe appears and PRI tone is heard in headset.
10. On test set, set TRK/SCAN switch to TRK, squeeze trigger.  
On IP-1 150/APR-39(V), after a few seconds, flashing strobe appears, MA lamp flashes, and warning tone heard in headset.
11. On AN/APR-39(V) control panel, set DSCRM switch to OFF.
12. On test set, set TRK/SCAN switch to GDNC, squeeze trigger.  
On IP-1150/APR-39(V), MA lamp flahses and warning tone heard in headset.
13. Position technician with test set behind helicopter (relative bearing 1800) and aim test set at aft antennas.
14. On test set, set TRK/SCAN to TRK, PW to WI DE, PRF to LOW and squeeze trigger.  
On IP-1 150/APR-39(V), strobe appears at approximately 1800 and PRI tone is heard in headset. Tone should be lower in frequency than tone heard in step 7.

**SELF TEST CIRCUIT CHECKS****NOTE**

Complete POWER ON CHECKS steps 1 and 2 before proceeding.

15. On AN/APR-39(V) control panel, press and hold SELF TEST switch.  
On IP-1 150/APR-39(V) a strobe appears and tone is heard in headset; after a few seconds another strobe appears, 1800 from first; after a few more seconds MA lamp begins flashing and tone becomes wailing.
16. On AN/APR-39(V) control panel set DSCRM switch to OFF and repeat step 15.  
Indications are same as in step 15 except both strobes appear simultaneously.



## SECTION III. TROUBLESHOOTING

**33-12. RADAR SIGNAL DETECTING SET AN/APR-39(V) TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Radar Signal Detecting Set AN/APR-39(V).
- Indication of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective actions. If a malfunction is not listed or is not corrected by the corrective action, notify your supervisor.
- After computing the corrective action, perform operational checks as described in para. 33-11.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

- 
- |  |                                   |   |
|--|-----------------------------------|---|
| 1. System fails to self test properly.                                       | <b>A</b> Defective control panel. | <b>A</b> Replace C-9326/APR-39(V).          |
|  | <b>B</b> Defective indicator.     | <b>B</b> Replace IP-1150/APR-39(V).         |
|  | <b>C</b> Defective comparator.    | <b>C</b> Replace CM-440/APR-39(V).          |
| 2. Indicator strobes do not brighten or dim when BRIL control is rotated.    | Defective indicator.              | Replace IP-1150/APR-39(V).                  |
| 3. Audio level does not vary when AUDIO control is varied.                   | Defective control.                | Replace C-9316/APR-39(V).                   |
| 4. No indications when test set is radiating toward forward antennas.        | <b>A</b> Defective receiver.      | <b>A</b> Replace forward R-1 838/APR-39(V). |
|  | <b>B</b> Defective comparator.    | <b>B</b> Replace CM-440/APR-39(V).          |
| 5. No indications when test set is radiating toward aft antennas.            | <b>A</b> Defective receiver.      | <b>A</b> Replace aft R-1 838/APR-39(V).     |
|  | <b>B</b> Defective comparator.    | <b>B</b> Replace CM-440/APR-39(V).          |
| 6. No indications when test set is radiating toward forward or aft antennas. | Defective comparator.             | Replace CM-440/APR-39(V).                   |
-



**33-12.1. Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Radar Signal Detecting Set AN/APR-39(V) and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-60 and trace the wiring to power source, basic signal equipment or installation item to locate. fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**33-12.1.1 Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal Function	Equipment Operation	Voltage
TB12	3	Panel lighting (UH-10/H)	CONSOLE PED LIGHTS circuit breaker energized	0-28Vdc
TB12	5	Panel lighting (UH-1H)	CONSOLE PED LIGHTS circuit breaker energized	0-28Vdc
3422TB1	1	Ground	Not applicable	0
3422A1 P1	12	Primary power	AN/APR-39(V) energized	28Vdc
TB20	9	Receiver audio (UH-10/H)	AN/APR-39(V) energized and receiving signal from ramp test set.	Audio hi
3422TB1	2	Receiver audio (UH-1H)	AN/APR-39(V) energized and receiving signal from ramp test set	Audio hi



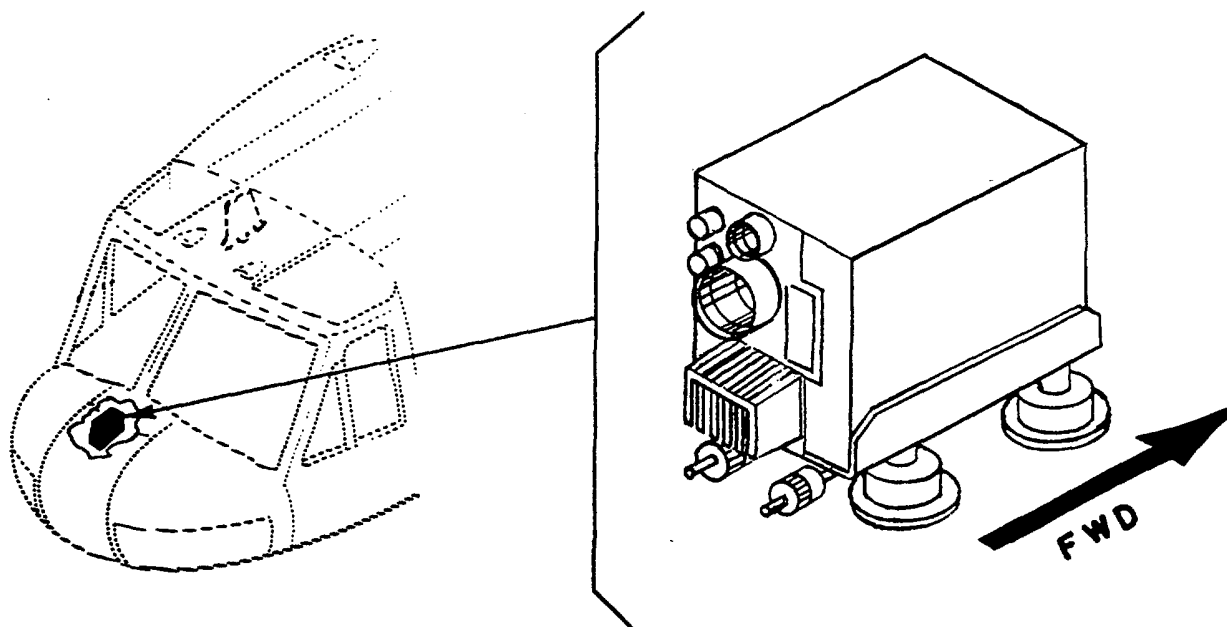
## CHAPTER 34

### VHF AM RADIO SET AN/ARC-186 MAINTENANCE

Subject	Para.	Page
Radio Set RT-1300/ARC-186 Maintenance (AVUM) .....	34-1	34-1
Control C-10604(V)/ARC-186 Maintenance (AVUM) .....	34-2	34-2
Antenna AT-1108/ARC Maintenance (AVUM).....	34-3	34-2
Bandpass Filter BPF-40-03P Maintenance (AVUM).....	34-4	34-3
Cabling and Connector Maintenance (AVUM) .....	34-5	34-3
VHF AM Radio Set AN/ARC-186 Operational Checks (AVUM). ....	34-6	34-3
VHF AM Radio Set AN/ARC-186 Troubleshooting (AVUM) .....	34-7	34-5

### SECTION I. MAINTENANCE PROCEDURES

#### 34-1. RADIO SET AN/ARC-186 MAINTENANCE (AVUM)



##### 34-1. 1 Removal Instructions.

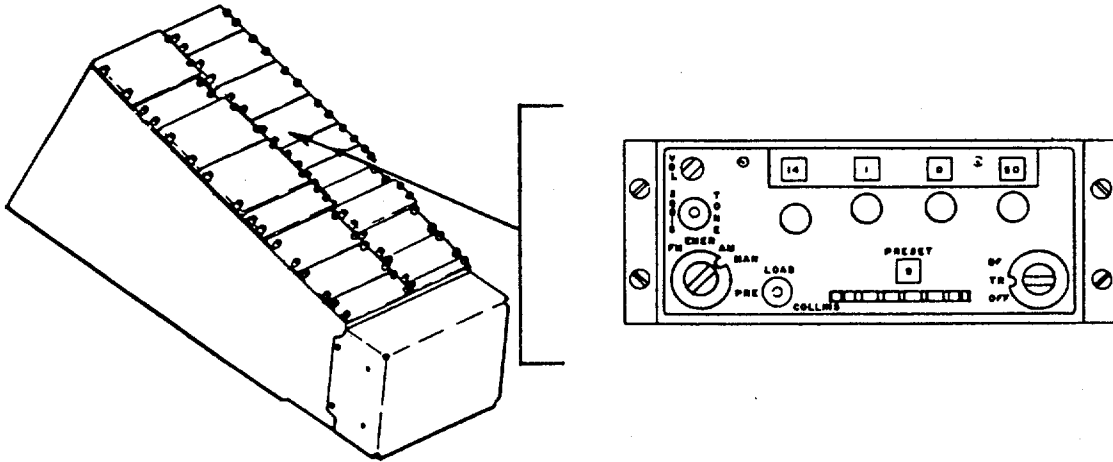
- A Disconnect electrical connectors and antenna cable from radio set.
- B Cut safety wire and unscrew thumbnuts securing radio to mount.
- C Slide set aft to disengage mount guide pins and remove set from mount.



### 34-1.2 Installation Instructions.

- A Place radio set in mount and slide set onto guide pins of mount.
- B Secure set in mount by tightening thumbnuts. Secure thumbnuts with safety wire.
- C Connect electrical connectors and antenna cable.

### 34-2. CONTROL C-10604(V)/ARC-186 MAINTENANCE (AVUM)



#### 34-2.1 Removal Instructions.

- A Loosen four spring-lock fasteners and carefully lift control from pedestal.
- B Disconnect electrical connector.

#### 34-2.2 Installation Instructions.

- A Connect electrical connector and carefully insert into pedestal.
- B Secure four spring-lock fasteners.

### 34-3. ANTENNA AT-1108/ARC MAINTENANCE (AVUM)

Refer to Chapter 5, paragraph 5-3, for AT-1108/ARC maintenance.



#### 34-4. BANDPASS FILTER BPF-40-03P MAINTENANCE (AVUM)

Refer to Chapter 9, paragraph 9-3, for BPF-40-03P maintenance.

#### 34-5. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:

P1, P2, P3, P4, P600, and P1906.

- Refer to FO-63 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Chapter 2, paragraph 2-5, contains general wiring repair information.

### SECTION II. OPERATIONAL CHECKS

#### 34-6. VHF AM RADIO SET AN/ARC-186 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Radio Set AN/ARC-186 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Radio Set

##### Equipment Conditions

Reference

Chapter 1, para. 1-50, Auxiliary Power Unit connected.

Chapter 9, para 14-13, Intercommunication Set operational.



### 34-6. VHF AM RADIO SET AN/ARC-186 OPERATIONAL CHECKS (AVUM)-CONTINUED

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#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed and securely mounted.
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

#### POWER ON CHECKS

1. Depress VHF-AM ARC-186, INTERCOM CPLT and INTERCOM PLT circuit breakers.
2. On pedestal control panel, set ARC-186 MODE switch to MAN, FUNCTION switch to TR, and SQ DIS/TONE switch to mid-position.
3. Select assigned test frequency.

#### NOTE

If possible, avoid communications checks with base control tower. When authorized use another vhf receiver-transmitter and frequency.

4. Conduct two-way communications check with other receiver- transmitter.  
Sidetone heard in headset during transmission. Other receiver- transmitter should receive clear and audible transmission, reception from other receiver-transmitter should be clear and audible.
5. During reception, rotate AUDIO control.  
Audio level should vary smoothly.
6. Verify squelch function.  
Audio output should be quiet except during signal reception.
7. Repeat steps 4 thru 6 for two additional frequencies.

#### NOTE

For communication checks select one frequency from the low, mid and high frequency range of the VHF-AM whenever possible. 8. Set MODE switch to EMER AM.



**34-6. VHF AM RADIO SET AN/ARC-186 OPERATIONAL CHECKS (AVUM)-CONTINUED****PROCEDURE****NORMAL INDICATIONS****REMARKS**

9. Request other receiver-transmitter to transmit on guard channel (121.5 MHz).  
Receive audio should be clear and audible.

**NOTE**

The AN/ARC-186 when in EMER AM mode transmitter and receiver are tuned to the guard channel. All communications should be kept to a minimum.

**SECTION III. TROUBLESHOOTING****34-7. VHF-AM RADIO SET AN/ARC-186 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in VHF AM Radio Set AN/ARC-186.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 34-6.

**SYMPTOM****PROBABLE CAUSE****CORRECTIVE ACTION**

1. No reception or transmission of signals.
- |   |                            |   |                      |
|---|----------------------------|---|----------------------|
| A | Defective radio set.       | A | Replace AN/ARC-186.  |
| B | Defective bandpass filter. | B | Replace BPF 40-03-P. |
| C | Defective antenna.         | C | Replace AT-1108/ARC. |



### 34-7. VHF AM RADIO SET AN/ARC-186 TROUBLESHOOTING (AVUM) - CONTINUED

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
2. AUDIO control does not vary level smoothly. Defective radio set. Replace AN/ARC-186.		
3. Noise heard in headset when no signals are being received. Defective radio set. Replace AN/ARC-186.		
4. No reception on EMER AM. Defective radio set. Replace AN/ARC-186.		

#### 34-7.1 Signal and Voltage Measurements (AVUM)

- If a trouble develops in VHF AM Radio Set AN/ARC-186 and the preceding operational checks and troubleshooting charts do not indicate the source of the problem, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-63 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon other inputs.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.



**34-7.1. 1 UH-1D/H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	3	Panel-lighting	CONSOLE PED LIGHTS circuit breaker in.	0-28 Vdc
TB26	4	Ground	Not applicable	0
TB20	12	Transmit key control	AN/ARC-186 energized ICS rotary switch set to 3	28 Vdc Mic unkeyed, 0 when keyed
TB20	4	Receive audio	AN/ARC-186 energized	Audio Hi
P600	Z	Transmit audio	AN/ARC-186 energized ICS rotary switch set to 3	Audio Hi
P1	D	Primary power	AN/ARC-186 energized	28 Vdc

**34-7.1. 2 UH-1H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	5	Transmit audio	AN/ARC-186 energized ICS rotary switch set to 3	Audio Hi
TB20	10	Receive audio	AN/ARC-186 energized	Audio Hi
TB26	4	Ground	Not applicable	0
TB66	7	Audio return (ground)	Not applicable	0
P1	D	Primary power	AN/ARC-186 energized	28 Vdc

**NOTE**

If MD-1219/A Audio Threshold System is installed refer to Chapter 42 for transmit audio, receive audio, and key line information.



**CHAPTER 35**  
**FM LIAISON NO. 1 AN/ARC-201 MAINTENANCE**

Subject	Para.	Page
Receiver-Transmitter RT-1477/ARC-201 and Adapter Mount MT-6373/ARC-201 Maintenance (AVUM).....	35-1	35-1
Mount MT-3664/ARC-131 Maintenance (AVUM).....	35-2	35-2
Control C-11466/ARC-201 Maintenance (AVUM).....	35-2	35-3
IFM Amplifier AM-7189A/ARC Maintenance (AVUM).....	35-4	35-4
IFM Mount MT-6592/ARC Maintenance (AVUM) .....	35-5	35-5
Antenna AS-3839/ARC-201 and Coupler CU-2396/ARC-201 Maintenance (AVUM) .....	35-6	35-5
Antenna AS-1922/ARC Maintenance (AVUM).....	35-7	35-6
Cabling and Connector Maintenance (AVUM).....	35-8	35-6
Dimmer Network Assembly/Panel Lighting Inverter Maintenance (AVUM) .....	35-8.1	35-6.1
FM Liaison No. 1 AN/ARC-201 Operational Checks (AVUM).....	35-9	35-7
FM Liaison No. 1 AN/ARC-201 Troubleshooting (AVUM).....	35-10	35-11

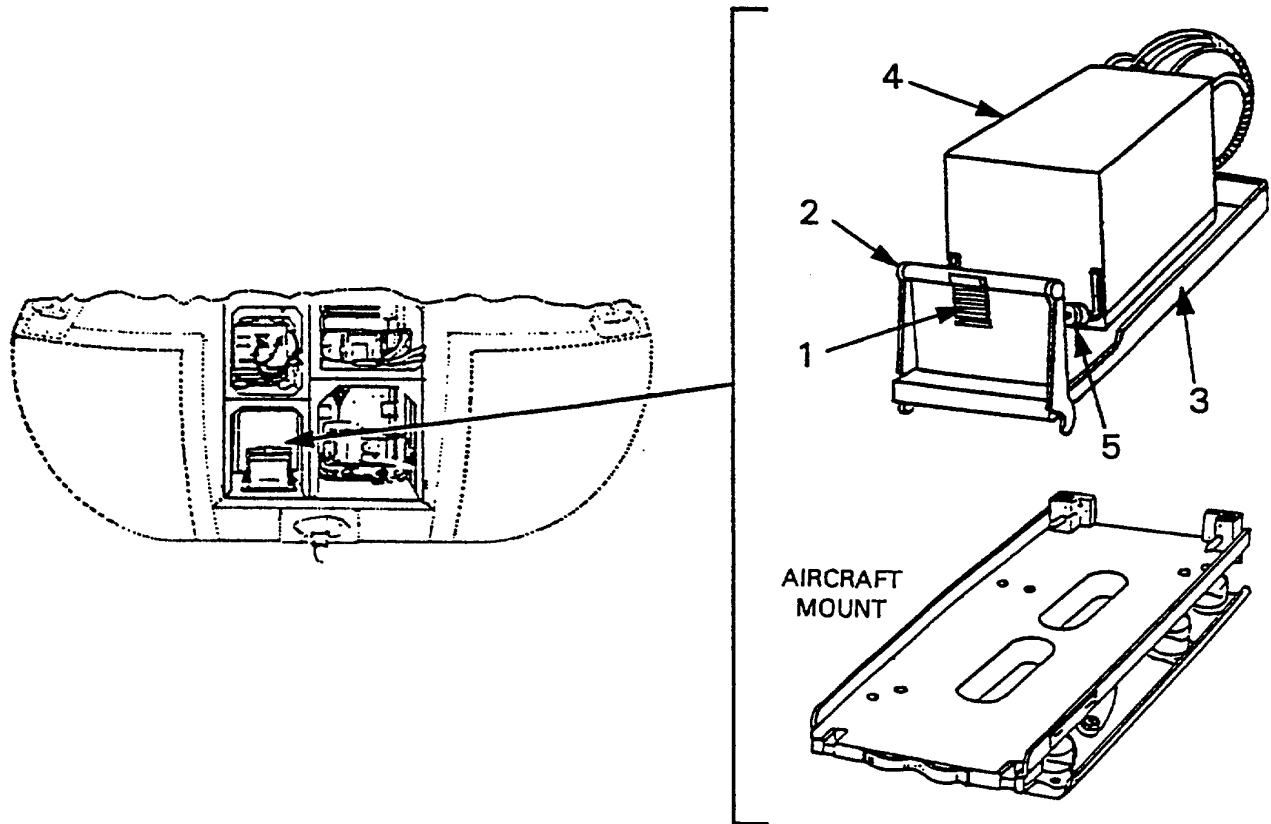
**SECTION I. MAINTENANCE PROCEDURES**

**35-1. RECEIVER-TRANSMITTER RT-1477/ARC-201 AND ADAPTER MOUNT MT-6373/ARC-201 MAINTENANCE PROCEDURES (AVUM)**

**35-1 Removal Instructions.**

- A** Release locking handle catch (1) by sliding downward.
- B** Position and pull locking handle (2) outward and downward.
- C** Slide adapter mount (3) and receiver-transmitter (4) forward and lift out of aircraft mount.
- D** Disconnect connectors from receiver-transmitter (4).
- E** Loosen two thumbnuts (5) and remove receiver-transmitter (4) from adapter mount (3).





### 35-1.2 Installation Instructions.

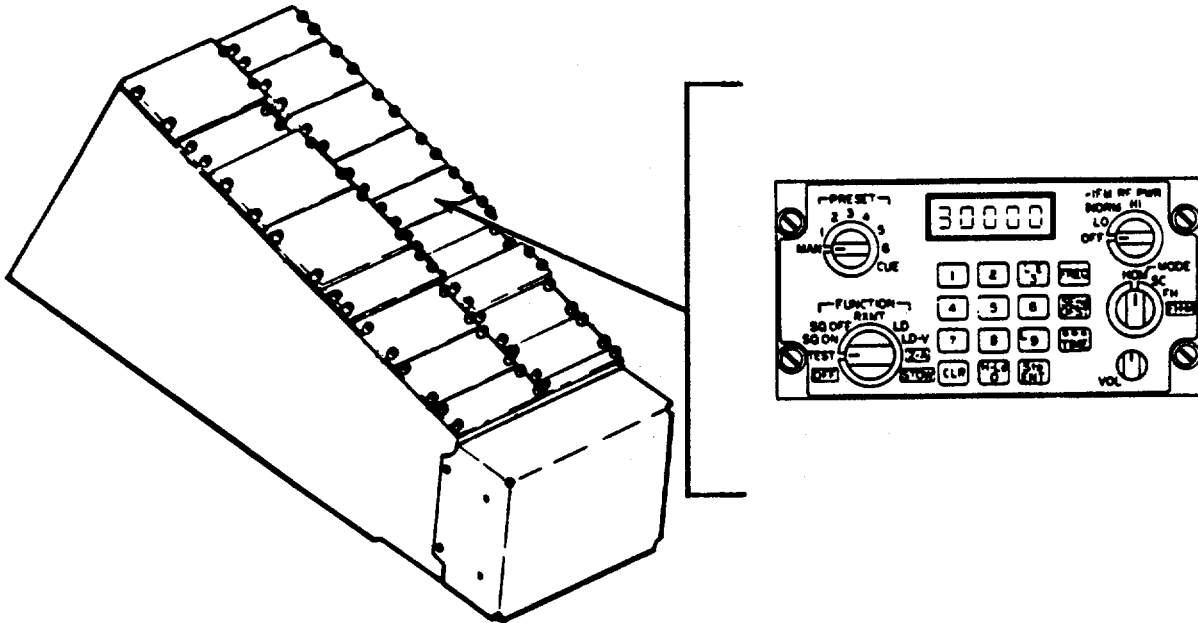
- A Position receiver-transmitter (4) on adapter mount (3) and tighten thumbnuts (5) to secure unit.
- B Attach connectors to receiver-transmitter (4).
- C Position adapter mount (3) with receiver-transmitter in aircraft mount.
- D Carefully slide unit backwards to engage guide pins and electrical connectors.
- E Lift locking handle (2) into place and secure with catch (1).

### 35-2. MOUNT MT-3664/ARC-131 MAINTENANCE (AVUM)

Refer to Chapter 11, paragraph 11-2, for MT-3664/ARC-131 maintenance.



### 35-3. CONTROL C-11466/ARC-201 MAINTENANCE (AVUM)



#### 35-3.1 REMOVAL INSTRUCTIONS

- A** Loosen four spring-lock fasteners that secure control to pedestal panel.

#### **CAUTION**

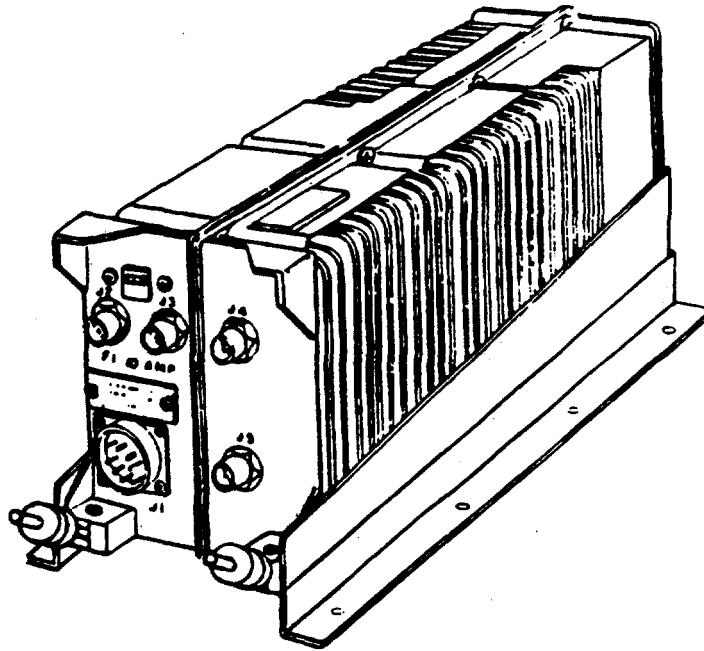
Be careful not to pull control so far from pedestal panel that wiring or connector will be damaged.

- B** Lift control from pedestal to gain access to connector on rear of control.
- C** Disconnect connector and remove control.

#### 35-3.2 INSTALLATION INSTRUCTIONS.

- A** Connect electrical connector to rear of control.
- B** Insert control into pedestal console.
- C** Tighten four spring-lock fasteners.



**35-4. IFM AMPLIFIER AM-7189A/ARC MAINTENANCE (AVUM)****35-4.1 Removal Instructions.**

- A** Disconnect connectors from IFM amplifier.
- B** Loosen self-locking thumbnuts securing IFM in mount.
- C** Remove IFM.

**NOTE**

IFM rf cables should be connected to the IFM bypass whenever the IFM amplifier is removed. This allows the FM liaison system to operate and prevents possible damage to the system.

**35-4.2 Installation Instructions**

- A** Position IFM amplifier in mount.
- B** Engage guide pins of mount and tightened self-locking thumbnuts.
- C** Connect connectors to IFM.

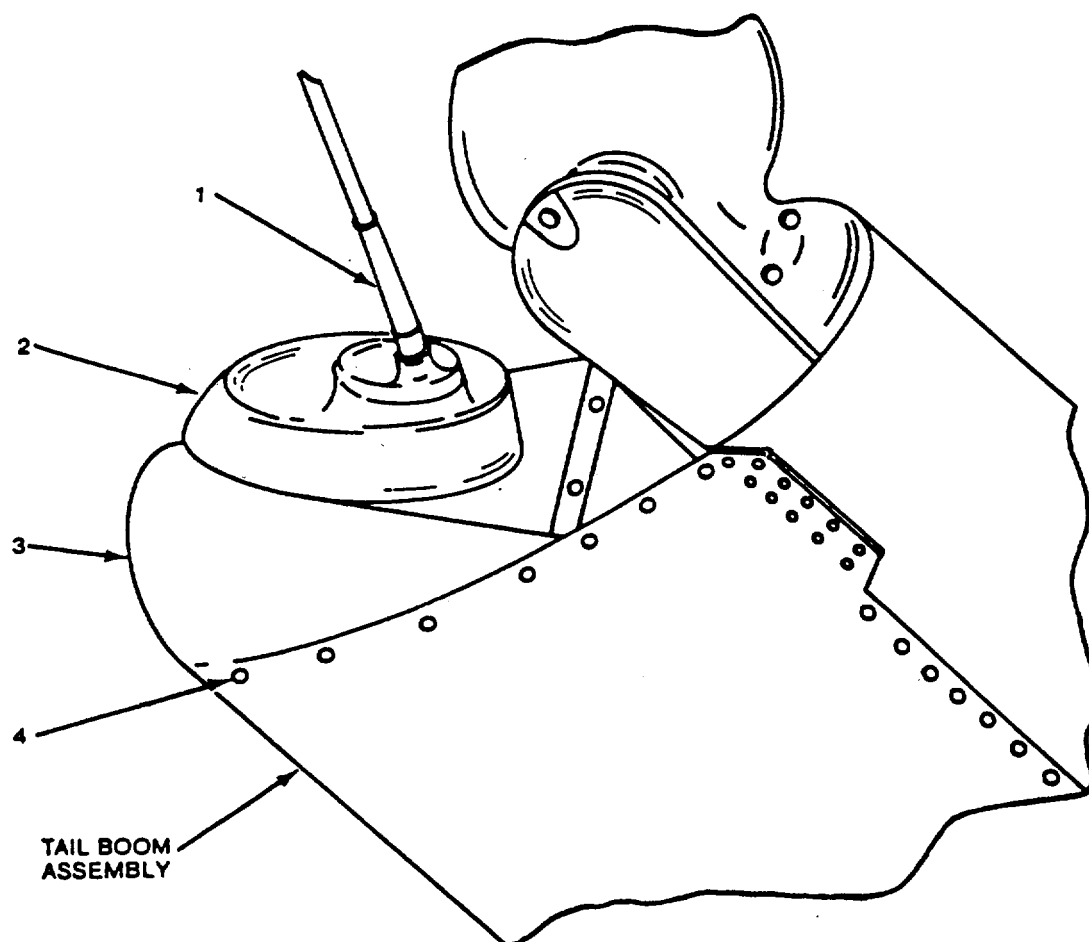


**35-5. IFX MOUNT MT-6592/ARC MAINTENANCE (AVUM)****35-5.1 Removal Instructions**

- A Remove IFM from mount. Refer to paragraph 35-4.1
- B Remove eight screws and washers securing mount to aircraft frame.
- C Remove mount.

**35-5.2 Installation Instructions.**

- A Install mount and secure to aircraft frame using eight screws and washers.
- B Install IFM. Refer to paragraph 35-4.2.

**35-6. ANTENNA AS-3839/ARC-201 AND COUPLER CU-2396/ARC-201 MAINTENANCE (AVUM)**



**35-6.1 Removal Instructions.**

- A** Remove screws (4) that secure coupler support to tailboom assembly.

**CAUTION**

Be careful not to lift support so far from tailboom assembly that rf cable attached to antenna coupler is damaged.

- B** Carefully lift coupler support to gain access and disconnect rf cable from antenna coupler (2).
- C** Remove coupler support (3), coupler (2) and antenna (1).
- D** Remove coupler (2) from coupler support (3) by removing six screws.
- E** Remove antenna (1) from coupler (2) by unscrewing in a counterclockwise direction.

**35-6.2 Installation Instructions.**

- A** Attach antenna (1) to coupler (2) by screwing in a clockwise direction.
- B** Attach coupler (2) to coupler support (3) with six screws.
- C** Hold coupler support (3) near tailboom assembly and connect rf cable to antenna coupler (2).
- D** Position coupler support on tailboom assembly and secure with screws (4).

**35-7. ANTENNA AS-1922/ARC MAINTENANCE (AVUM)**

Refer to Chapter 11, paragraph 11-7, for AS-1922/ARC maintenance.

**35-8. CABLING AND CONNECTOR MAINTENANCE (AVUM)**

Refer to Chapter 11, paragraph 11-8, for cabling and connector maintenance.

**NOTE**

The AN/ARC-201 system described in this chapter is designed to interface directly with existing wiring of AN/ARC-54 or AN/ARC-131 systems.



### 35-8.1 Dimmer Network Assembly (90197092-501) / Panel Lighting Inverter (CSK-9-03049-1) Maintenance (AVUM)

#### 35-8.1.1 Adjust ARC-201 panel lighting voltage.

##### NOTE

This procedure only necessary if dimmer network assembly or lighting voltage inverter was replaced.

- A** Turn power off.
- B** Remove FM1 ARC-201 control head from pedestal and disconnect P2107 from J1.

##### NOTE

FM No. 2 ARC-201 must be in place for this procedure to provide proper load for dimmer network and panel lighting inverter.

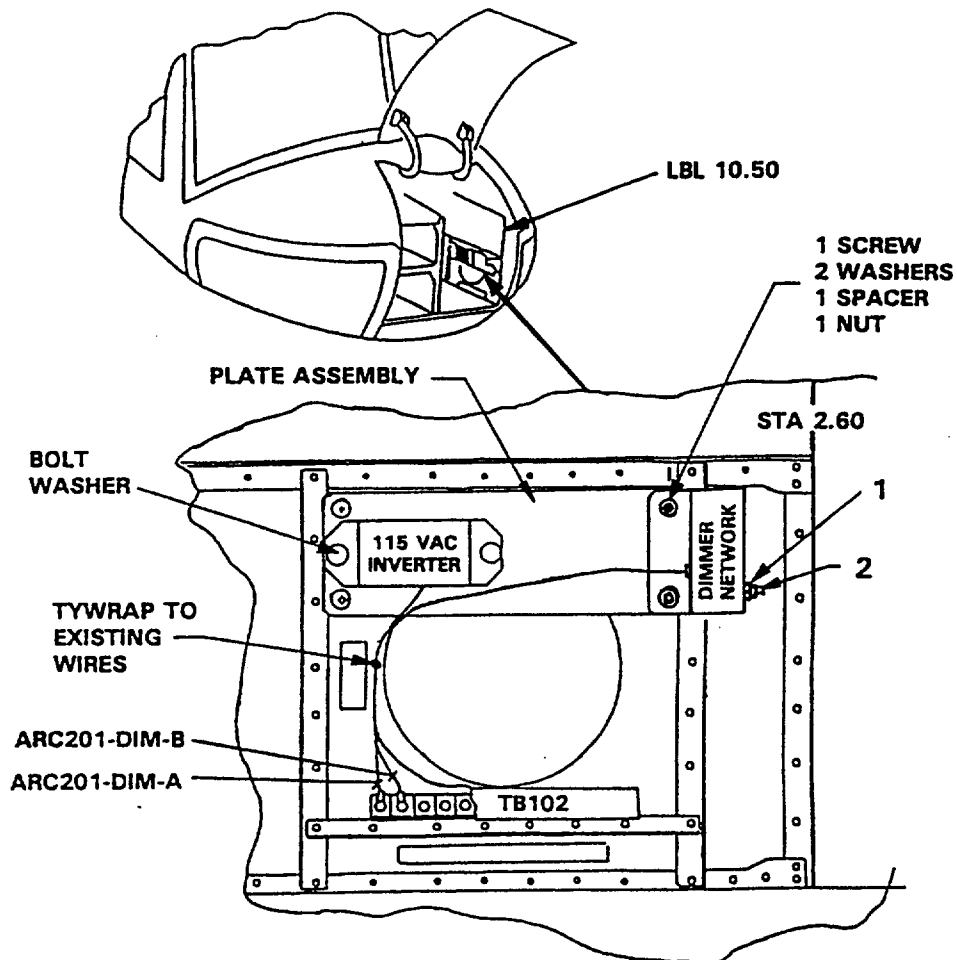
- C** Connect multimeter (dc) between TB102 terminal 1 and ground
- D** Turn power on. Check FM NO. 1 and cockpit pedestal lighting circuit breakers are energized.
- E** Turn pedestal instrument light control to maximum bright.
- F** Read dc voltage and turn power off.
- G** Connect multimeter (ac) between P2107-A (was connected to FM1 ARC-201 control panel J1) and ground.
- H** Loosen locking nut (1) on dimmer network assembly rheostat (2) shaft. See illustration.
- I** Turn power on.
- J** Adjust rheostat (2) so ac output voltage corresponds to dc input voltage (from step F) according to

INPUT (VDC)	OUTPUT (VAC)
20	45.5
21	47.5
22	50.0
23	52.5
24	55.0
25	57.5
26	60.0
27	62.5
28	65.0
29	67.5
30	70.0

**TABLE 1**



- K** Tighten locking nut (1).
- L** Turn power off.
- M** Install FM1 control panel in pedestal and reconnect P2107 to J1.



**115 VOLT PANEL LIGHTING INVERTER/DIMMER NETWORK ASSEMBLY.**

#### 35-8.1.2 Dimmer Network Assembly Removal.

- A** Disconnect wires ARC201-DIM-A and ARC201-DIM-B from TB102.
- B** Cut TYWRAP holding wires.
- C** Remove two screws, four washers, two spacers and nuts securing dimmer to plate.



### 35-8.1.3 Dimmer Network Assembly Installation.

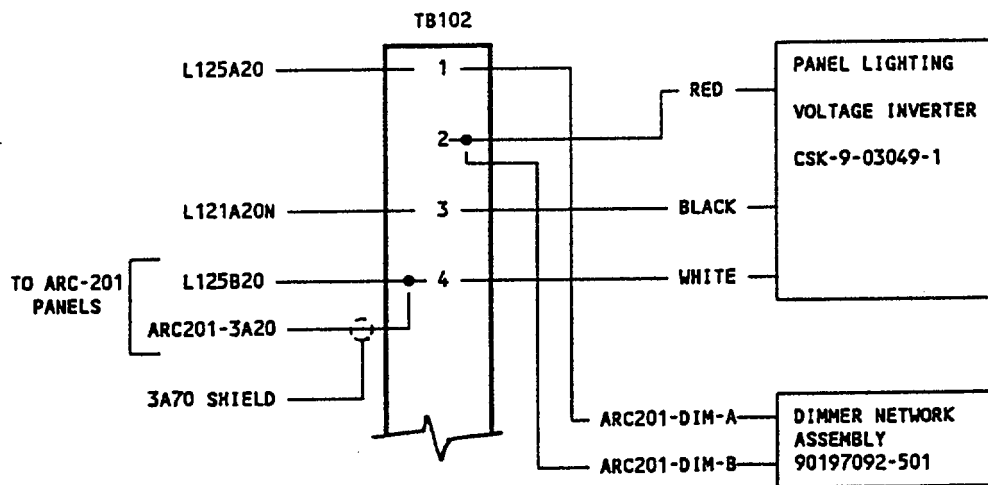
- A Secure dimmer to plate using two screws, four washers, two spacers and nuts. Position screw heads outboard of LBL 10.50.
- B Connect wires ARC201-DIM-A and ARC201-DIM-B to TB102 terminals 1 and 2 respectively.
- C Secure wires with TYWRAP.

### 35-8.1.4 Panel Lighting Inverter Removal.

- A Disconnect red, black and white wires from TB102 terminals 2, 3 and 4.
- B Cut TYWRAP holding wires.
- C Remove two bolts and washers securing inverter to plate.

### 35-8.1.5 Panel Lighting Inverter Installation.

- A Secure inverter to plate using two bolts and washers.
- B Connect red, black and white wires to TB102 terminals 2, 3 and 4 respectively.
- C Secure wires with TYWRAP.



INVERTER/DIMMER WIRING DIAGRAM.



## SECTION II. OPERATIONAL CHECKS

### 35-9. FM LIAISON NO. 1 AN/ARC-201 OPERATIONAL CHECKS (AVUM )

These checks are to ensure Radio Set AN/ARC-201 is operating properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Radio Set  
Thru-line wattmeter  
ECCM fill device

##### Equipment Conditions

Reference  
Chapter 1, para. 1-50, Auxiliary  
Power Unit connected.  
Chapter 14, para. 14-13, Inter-  
communication Set operational.

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.



**35-95. FM LIAISON NO. 1 AN/ARC-201 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS****NOTE**

Operation of AN/ARC-201 system requires KY-58 remote control indicator (ZAHP) or bypass assembly be installed.

1. Depress **FM** Liaison and **IFM** circuit breakers.
2. Set intercom rotary switches to allow transmission and reception on FM No.1 and FM No.2.
3. On AN/ARC-201 set **FUNCTION** selector switch to **TEST**.  
Unit display: All dashes for 1 second, "E's" for 3 seconds, "8's" for 3 seconds, "GOOD" for 5 seconds then extinguishes.
4. Set **FUNCTION** selector to **SQ OFF**, **MODE** selector to **SC**, and **PRESET** selector to **MAN**.  
Unit display: All dashes or a previously stored frequency.
5. Press **FREQ** then **CLR** button on key pad.  
Unit display: All dashes.
6. Use key pad to enter desired test frequency then press STO/ENT.  
Unit display: Test frequency.

**NOTE**

If possible avoid communications checks with base control tower.

7. Conduct communications check.  
Clear and audible two-way communications.
8. While receiving other station, rotate VOL control throughout its range.  
Volume of received signal should vary smoothly with no chirps or dead spots.

**IFM AMPLIFIER CHECKS****NOTE**

If IFM is not installed IFM power selector must be in the OFF position. Symptom- No sidetone during transmission.

9. Connect a thruline wattmeter at output of IFM amplifier. Use at least a 50 watt element with a frequency range within that of the FM radio.



**35-95. FM LIASION NO. 1 AN/ARC-201 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****IFM AMPLIFIER CHECKS-CONT.**

10. On AN/ARC-201 set **IFM RF PWR** selector to **LO** and key radio.  
Wattmeter indicates 2.5 watts minimum.
11. Set **IFM RF PWR** selector to **NORM** and key radio.  
Wattmeter indicates 10 watts minimum.
12. Set **IFM RF PWR** selector to **HI** and key radio.  
Wattmeter indicates 40 watts minimum.
13. Set **IFM RF PWR** selector to **OFF** and disconnect thruline wattmeter.

**FREQUENCY HOPPING CHECKS****NOTE**

To perform a communications check in frequency hopping mode the other fm station must be an AN/ARC-201 SINCGARS radio. The procedures listed below must be performed on both radios.

14. Verify same frequency is entered on both radios.
15. Set **FUNCTION** selector switch to **LD-V. MODE** selector to **FH**, and **PRESET** selector to **MAN**.  
Unit display: FILL T
16. Connect **ECCM** fill device. Set **ECCM** power switch to ON and selector switch to **T1**. On AN/ARC-201 press **H-LD/O** key.  
Unit display: Blinks STO T then steady COLD.
17. On **ECCM** fill device set **T1** to **1**. On ARC-201 set **FUNCTION** selector switch to **LD**, and press **H-LD/O** key.  
Unit display: Hopset number. HF---
18. Remove ECCM fill device.
19. Press **STO/ENT** key then **1**.  
This stores hopset data in PRESET 1 of AN/ARC-201.
20. Press **TIME** key once  
Unit display: 2 digits left corner. 00\_\_



**35-95. FM LIASION NO. 1 AN/ARC-201 OPERATIONAL CHECKS (AVUM)-Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**FREQUENCY HOPPING CHECKS-CONT.**

21. Press **CLR** key and enter day number then press **ENT** key.  
Unit display: Day number.
22. Press **TIME** key again.  
Unit display: 4 digits. (hours and minutes)
23. Press **CLR** key and enter hours and minutes then press **ENT** key.  
Unit display: 4 digits. (hours and minutes)

**NOTE**

Time of day (Steps 20 thru 23) on both radios must be within 1 minute of each other in order to communicate with each other in FH mode.

24. On both radios set **FUNCTION** selector to **SQ OFF**, **MODE** selector to **FH**, and **PRESET** selector to **1**.  
Unit display: Hopset number. F\_\_
25. Conduct communication check.  
Clear and audible two-way communications.

**HOMING CHECKS**

26. On AN/ARC-201 set frequency to a known FM homing station.
27. Set **MODE** selector switch to **HOM**.  
Observe homing information displayed on CDI.

**RETRANS CHECKS**

**NOTE**

The following test is for aircraft having a second AN/ARC-201 installed (FM 2).



**35-95. FM LIAISON NO. 1 AN/ARC-201 OPERATIONAL CHECKS (AVUM)-Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**RETRANS CHECKS-CONT.**

28. Select frequencies on FM No.1 and FM No.2 as directed by ground station.
29. Set **FUNCTION** selector switch to **RXMT** on FM 1.  
FM 1 will automatically retransmit signals received by FM 2.  
Indication must be confirmed by ground station.

**SECTION III. TROUBLESHOOTING**

**35-10. FM LIAISON NO.1 AN/ARC-201 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in FM Liaison No.1 AN/ARC-201.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 35-9.



**35.10. FM LIAISON NO. 1 AN/ARC-201 TROUBLESHOOTING (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

- 
- |    |   |
|----|---|
| 1. | No sidetone or poor two-way communication.<br><b>A</b> Defective radio.<br><b>A</b> Replace radio.<br><b>B</b> Defective coax. cable.<br><b>B</b> Repair coax. cable.<br><b>C</b> Defective IFM.<br><b>C</b> Replace IFM.<br><b>D</b> Defective antenna.<br><b>D</b> Replace antenna. |
| 2. | With FUNCTION selector in TEST, display reads FAIL7.<br><b>A</b> Defective system wiring.<br><b>A</b> Isolate and repair wiring.  |
| 3. | With FUNCTION selector in TEST, display reads FAIL8, FAIL1 or FAIL3.<br><b>A</b> Defective radio.<br><b>A</b> Replace radio.  |
| 4. | Receive audio and sidetone are good but transmitter output is not modulated.<br><b>A</b> KY-58 remote control unit (Z-AHP) not installed.<br><b>A</b> Install KY-58 remote control unit.  |

**NOTE**

The KY-58 remote control unit or bypass assembly must be installed at all times in order for AN/ARC-201 to operate properly.

- |    |  |
|----|--|
| 5. | With MODE selector in HOM position, no indication on homing indicator when receiving rf carrier.<br><b>A</b> Defective fm homing antenna.<br><b>A</b> Replace antenna.<br><b>B</b> Defective bearing indicator.<br><b>B</b> Replace indicator.<br><b>C</b> Defective radio.<br><b>C</b> Replace radio. |
| 6. | No ARC-201 panel lighting.<br><b>A</b> Defective system wiring.<br><b>A</b> Isolate and repair wiring.<br><b>B</b> Defective Dimmer Network Assembly.<br><b>B</b> Replace Dimmer.<br><b>C</b> Defective Panel Lighting Inverter.<br><b>C</b> Replace Inverter.   |



### 35-10.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in FM Liaison No.1 AN/ARC-201 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-64, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon where the measurement should be taken.
- The TB or P column lists terminal or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.



**35-10.1.1 UH-1D/H Signal and Voltage Measurements (AVUM)**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB102	4	Panel lighting (radio set)	CONSOLE PED LIGHTS circuit breaker energized	0-70 Vac (typical)
TB12	3	Panel lighting (KY control)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB20	10	Transmit key control	Radio set energized ICS rotary switch set to 1	Unkeyed 28 Vdc, keyed 0 Vdc
TB20	2	Receive audio	Radio set energized	Audio Hi
TB26	2, 7	Ground	Not applicable	0
P2017	C	Primary power	Radio set energized	28 Vdc
<p style="text-align: center;"><b><u>NOTE</u></b> TB19 measurements below apply to configurations I and J.</p>				
TB19	5	Primary power	Radio set energized	28 Vdc
TB19	7	Switched power to coupler and receiver-transmitter	Radio set energized	28 Vdc



**35-10.1.2 UH-1H Signal and Voltage Measurements (AVUM)**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB102	4	Panel lighting (radio set)	CONSOLE PED LIGHTS circuit breaker energized	0-70 Vac (typical)
TB12	2	Panel lighting (KY control)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB26	7	Ground	Not applicable	0
TB66	4, 5	Audio common (ground)	Not applicable	0
TB20	4	Transmit audio	Radio set energized. ICS rotary selector set to 1 and signal applied	Audio Hi
TB19	5	Primary power	Radio set energized	28 Vdc
TB64	13	Power to audio threshold and remote cipher lights	KY unit energized and cipher selected	28 Vdc
TB70	4A, 4B	Power to right crew cipher light	KY unit energized and cipher selected	28 Vdc
TB70	4F, 4G	Power to left crew cipher light	KY unit energized and cipher selected	28 Vdc
TB20	10	Transmit key line	Radio set energized ICS rotary switch set to 1	Unkeyed 28 Vdc, keyed 0 Vdc

**NOTE**

If MD-1219/A Audio Threshold System is installed refer to Chapter 1-54 for transmit audio, receive audio, and key line information.



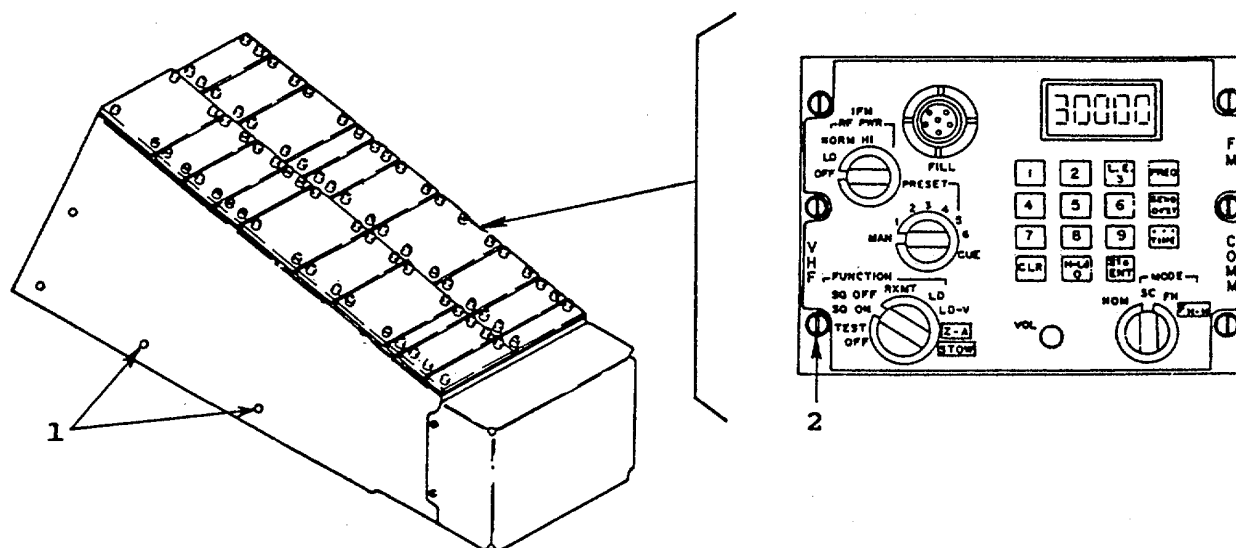
## CHAPTER 36

### FM LIAISON NO.2 AN/ARC-201 MAINTENANCE

Subject	Para.	Page
Radio Set AN/ARC-201 Maintenance (AVUM).....	36-1	36-1
Antenna AS-3841/ARC Maintenance (AVUM).....	36-2	36-2
Battery Box CY-8515/ARC Maintenance (AVUM).....	36-3	36-3
Cabling and Connector Maintenance (AVUM).....	36-4	36-4
FM Liaison No.2 AN/ARC-201 Operational Checks (AVUM).....	36-5	36-4
FM Liaison No.2 AN/ARC-201 Troubleshooting (AVUM).....	36-6	36-5

## SECTION I. MAINTENANCE PROCEDURES

### 36-1. RADIO SET AN/ARC-201 MAINTENANCE (AVUM)



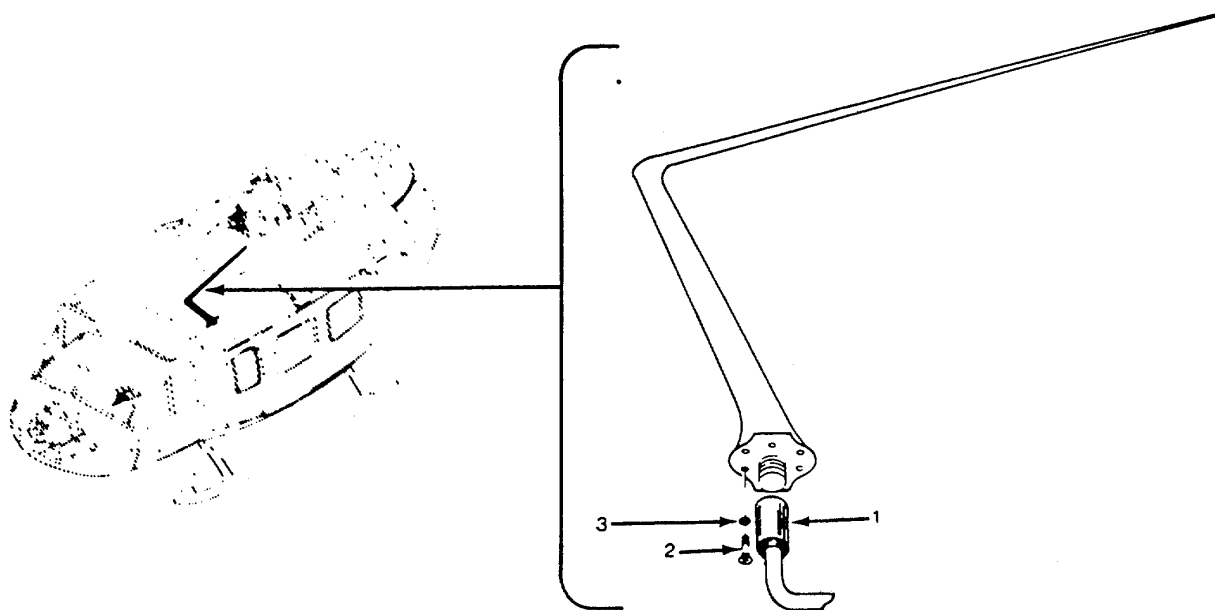
#### 36-1.1 Removal Instructions.

- A Remove side panel from pedestal console by removing screws (1).
- B Reach inside pedestal console and disconnect coaxial cable and electrical connectors.
- C Loosen six spring-lock fasteners (2).
- D Lift radio set out of pedestal console.



**36-1.2 Installation Instructions.**

- A** Position radio set in pedestal console.
- B** Connect coaxial cable and electrical connectors.
- C** Tightened six spring-lock fasteners and replace pedestal side panel, securing with screws.

**36-2. ANTENNA AS-3841/ARC MAINTENANCE (AVUM)****NOTE**

Two technicians are required. One outside to support or position, one inside to perform procedures.

**36-2.1 Removal Instructions.**

- A** Remove left-side overhead insulation blanket.
- B** Disconnect coaxial cable connector (1) from antenna base.
- C** Remove eight screws (2) and washers (3) that secure antenna to helicopter.
- D** Remove antenna.



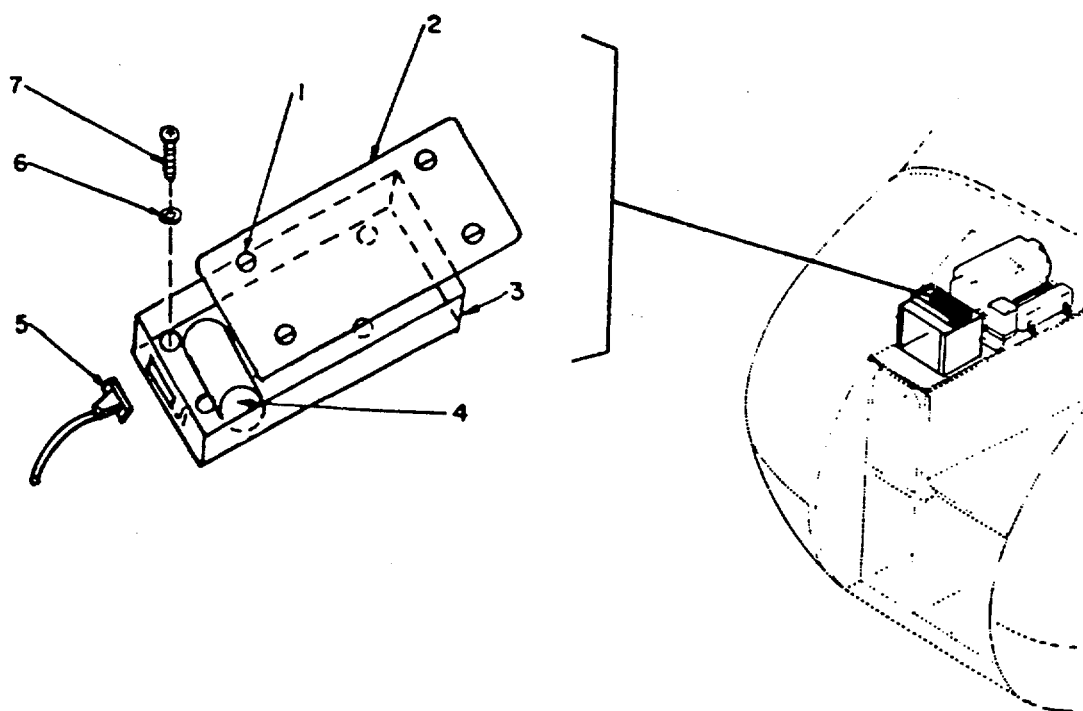
## 36-2.2 Installation Instructions

### NOTE

Clean antenna and aircraft mounting surface prior to installation.

- A From outside of helicopter, position antenna and align screw holes in base of antenna with holes in helicopter.
- B Secure antenna to helicopter with eight screws (2) and washers (3) and apply a thin bead of RTV along outside edge of antenna.
- C Connect coaxial connector (1) to antenna.
- D Replace overhead insulation blanket.

## 36-3. BATTERY BOX CY-8515/ARC MAINTENANCE (AVUM)



### 36-3.1 Removal Instructions.

- A Loosen two screws and remove connector (5).
- B Loosen four spring-lock fasteners (1) and remove battery box cover (2).
- C Remove five 1.5 volt "C" size batteries (4).
- D Remove four screws (7) and washers (6) and remove battery box (3).



### 36-3.2 Installation Instructions.

- A Position battery box (3) in place and secure with four screws (7) and washers (6).
- B Install five 1.5 volt "C" size batteries (4).
- C Position cover (2) in place and secure by tightening four springlock fasteners (1).
- D Connect connector (5) and tighten two screws.

### 36-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
P1, P2145, P2146, P2147, P2148, P1144, P1145, P1146, and P1147.
- Refer to FO-65 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Chapter 2, paragraph 2-5, contains general wiring repair information.

## SECTION II. OPERATIONAL CHECKS

### 36-5. FM LIAISON NO.2 AN/ARC-201 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Radio Set AN/ARC-201 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### Test Equipment

Radio Set

##### Equipment Conditions

Reference

Chapter 1, para. 1-50, Auxiliary  
Power Unit connected.  
Chapter 14, para. 14-13 Inter-  
communication Set operational.



**36-5. FM LIAISON NO.2 AN/ARC-201 OPERATIONAL CHECKS (AVUM)-Continued**

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
<b>POWER OFF CHECKS</b>		
<ol style="list-style-type: none"> <li>1. Check that all components are installed, securely mounted and safety wired (if required).</li> <li>2. Check that all connectors are tightened and for evidence of chafed or broken wiring.</li> </ol>		
<b>POWER ON CHECKS</b>		
<p>Refer to Chapter 35, paragraph 35-9, for operational checks. Perform all checks except for IFM and HOMING, FM No.2 is not wired for either of these functions.</p>		

**SECTION III. TROUBLESHOOTING**

**36-6. FM LIAISON NO.2 AN/ARC-201 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in FM Liaison No.2 AN/ARC-201.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in Chapter 35, paragraph 35-9.



### 36-6. FM LIAISON NO.2 AN/ARC-201 TROUBLESHOOTING (AVUM)-Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
---------	----------------	-------------------

Refer to Chapter 35, paragraph 35-10, for troubleshooting FM NO.2 AN/ARC-201. All symptoms of a malfunction are the same except those pertaining to IFM and HOMING, FM No.2 is not wired for either of these functions.

#### 36-6.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in FM Liaison No.2 AN/ARC-201 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-65 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is shown in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.



**36-6.1.1 UH-1D/H Signal and Voltage Measurements (AVUM)**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB102	4	Panel lighting (radio set)	CONSOLE PED LIGHTS circuit breaker energized	0-70 Vac' (typical)
TB20	13	Transmit key control	AN/ARC-201 energized. ICS rotary switch set to 4, and radio select switch set to FM 2	Unkeyed 28 Vdc, keyed 0 Vdc
TB26	2	Ground	Not applicable	0
P1	D	Primary power	ARC-201 energized	28 Vdc

**36-6.1.2 UH-1H Signal and Voltage Measurements (AVUM)**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB102	4	Panel lighting (radio set)	CONSOLE PED LIGHTS circuit breaker energized	0-70 Vac (typical)
TB26	1, 2, 4	Ground	Not applicable	0
TB20	7	Transmit audio	AN/ARC-201 energized. ICS rotary switch set to 5	Audio Hi
TB20	12	Receive audio	ARC-201 energized	Audio Hi
P1	D	Primary power	ARC-201 energized	28 Vdc

**NOTE**

If MD-1219/A Audio Threshold System is installed refer to Paragraph 1-55 for transmit audio, receive audio, and key line information.



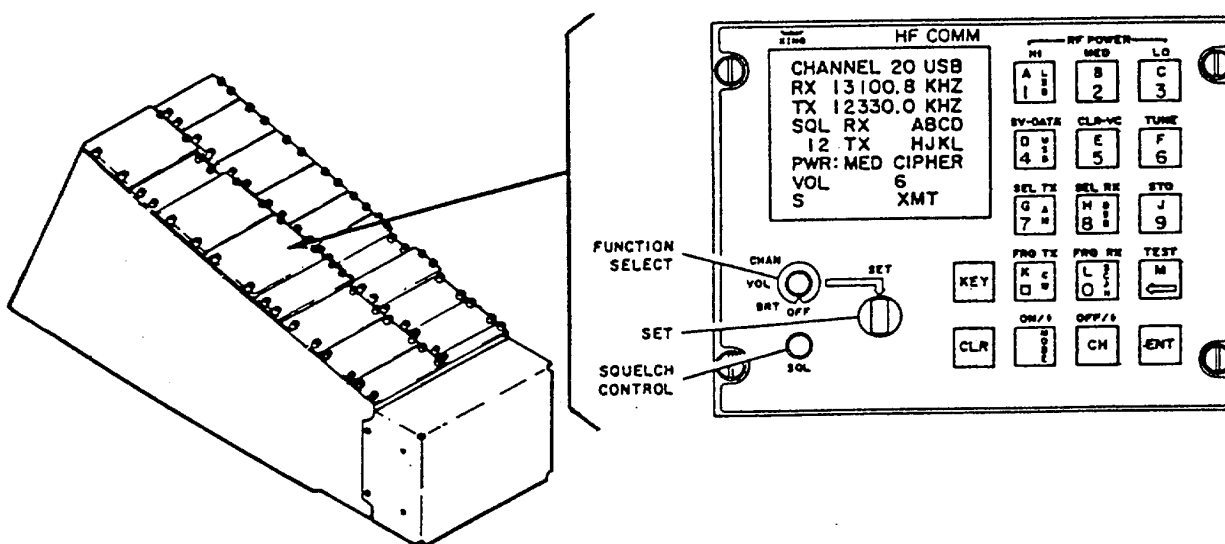
## CHAPTER 37

### HF RADIO SET AN/ARC-199 MAINTENANCE

Subject	Para.	Page
Control C-11245/U Maintenance (AVUM).....	37-1	37-1
Receiver-Exciter RT-1432/U Maintenance (AVUM).....	37-2	37-2
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Amplifier-Coupler AM-7201/U Maintenance (AVUM).....	37-4	37-4
Mount P/N 247-6697-03 Maintenance (AVUM).....	37-5	37-5
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## SECTION I. MAINTENANCE PROCEDURES

### 37-1. CONTROL C-11245/U MAINTENANCE (AVUM)





### 37-1.1 Removal Instructions.

- A Loosen four spring-lock fasteners.

#### CAUTION

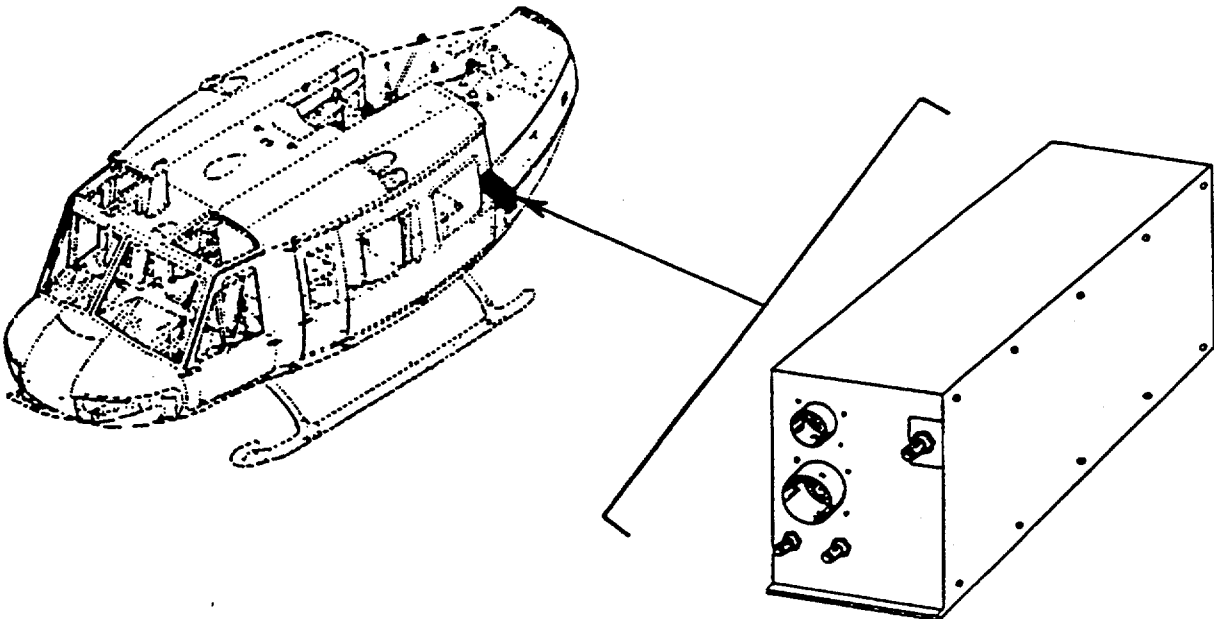
Be careful not to pull control so far from pedestal console that electrical wiring or connector will be damaged.

- B Lift control from pedestal console and disconnect electrical connector from rear of control
- C Remove control.

### 37-1.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connector to back of control.
- B Position control in pedestal console and secure four spring-lock fasteners.

### 37-2. RECEIVER-EXCITER RT-1432/U MAINTENANCE (AVUM)





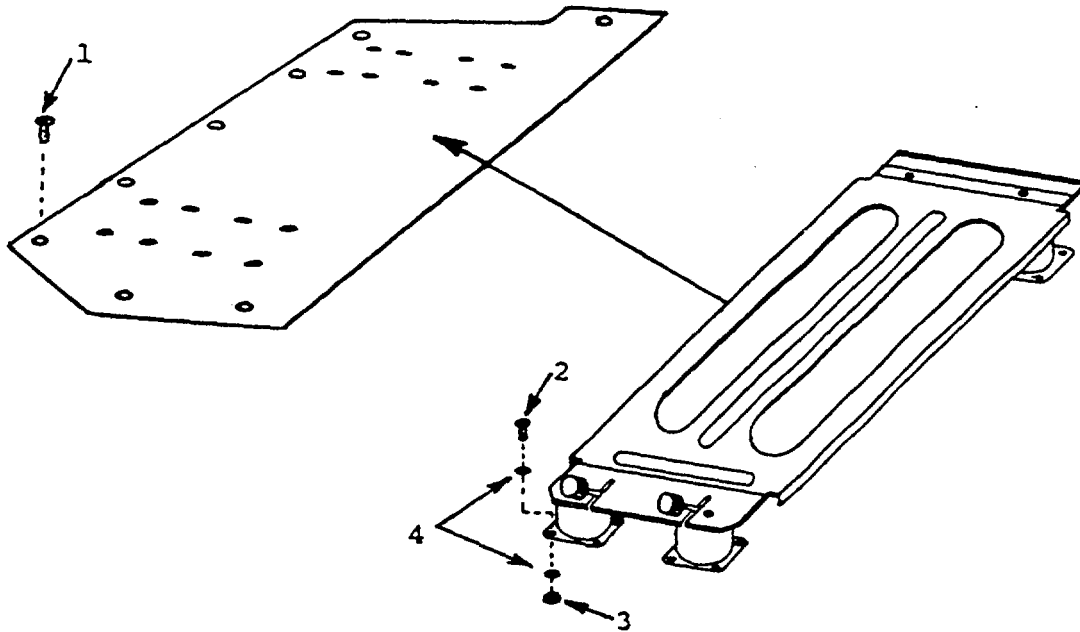
### 37-2.1 Removal Instructions.

- A Disconnect electrical and coaxial connectors.
- B Loosen self-locking thumbnuts.
- C Pull receiver-exciter forward to disengage from rear retaining flange, then lift from mount.

### 37-2.2 Installation Instructions.

- A Position receiver-exciter in mount and slide aft to engage retaining flange.
- B Tighten self-locking thumbnuts.
- C Connect electrical and coaxial connectors.

### 37-3. MOUNT P/N 2003202-0000 MAINTENANCE (AVUM)



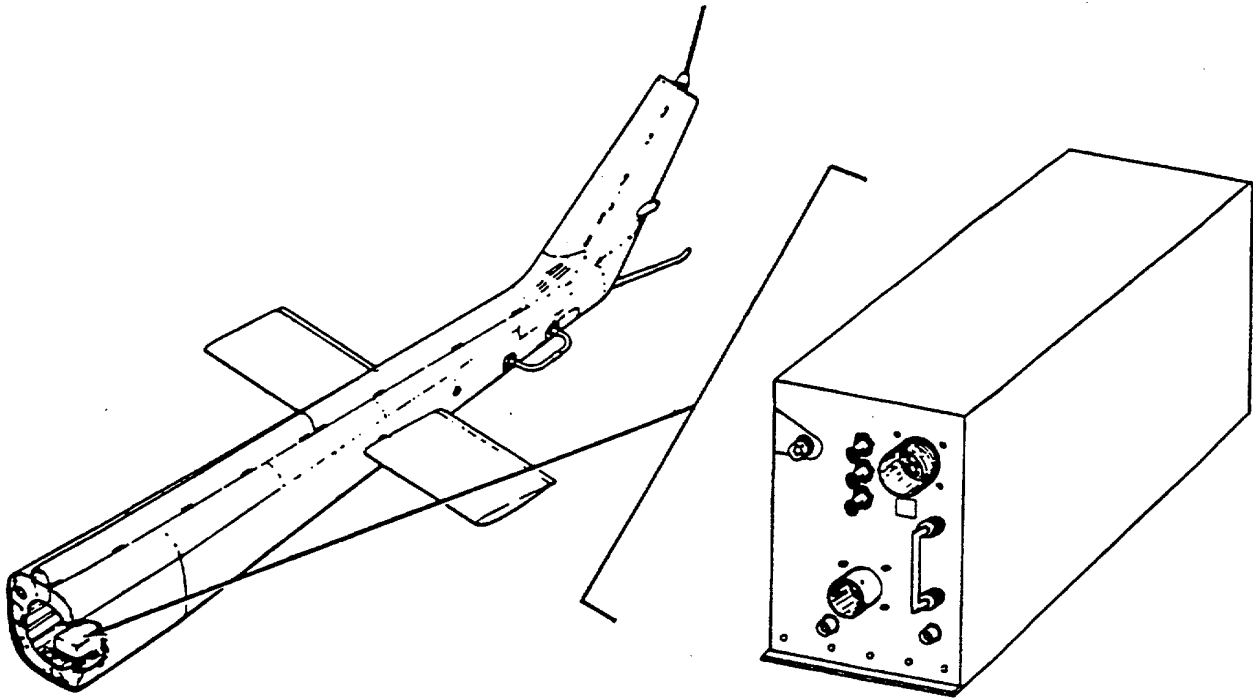
### 37-3.1 Removal Instructions.

- A Remove receiver-exciter per paragraph 37-2.
- B Remove screws securing avionics shelf to aircraft frame (1).
- C Remove sixteen screws (2), sixteen self-locking nuts (3), and thirty two washers (4) securing mount to shelf.



**37-3.2 Installation Instructions.**

- A** Position mount on shelf and secure with sixteen screws (2), sixteen self-locking nuts (3), and thirty two washers (4).
- B** Position shelf in aircraft and secure with screws (1).
- C** Install receiver-exciter per paragraph 37-2.

**37-4. AMPLIFIER-COUPLER AM-7201/U MAINTENANCE (AVUM)****37-4.1 Removal Instructions.**

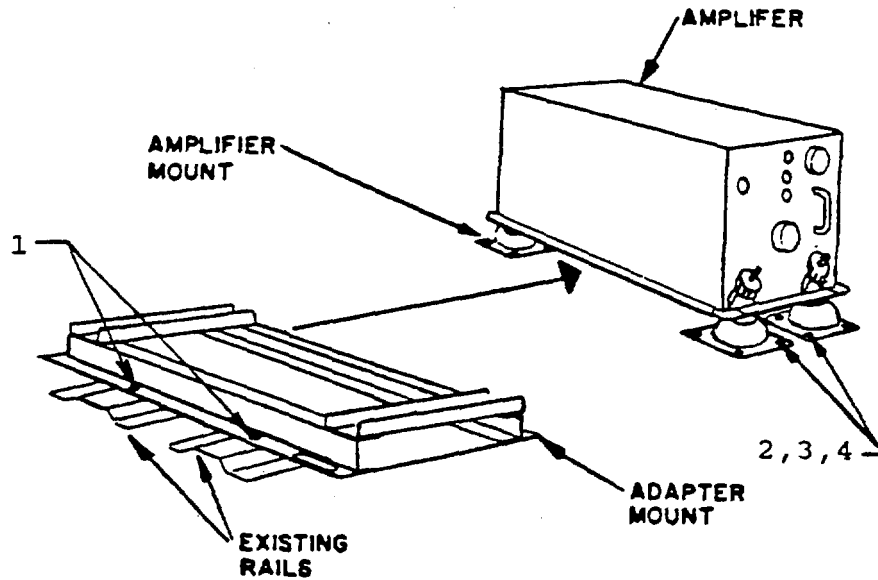
- A** Disconnect 2 electrical connectors and 1 coaxial connector from front of amplifier-coupler.
- B** Disconnect coaxial connector and bonding straps from rear of amplifier-coupler.
- C** Loosen self-locking thumbnuts.
- D** Pull amplifier-coupler forward to disengage from rear retaining flange, then lift from mount.



### 37-4.2 Installation Instructions.

- A Position amplifier-coupler in mount and slide aft to engage retaining flange.
- B Tighten self-locking thumbnuts.
- C Connect coaxial connector and bonding straps to rear of amplifier-coupler.
- D Connect 2 electrical connectors and 1 coaxial connector to front of amplifier-coupler.

### 37-5. MOUNT P/N 247-6697-03 MAINTENANCE (AVUM)



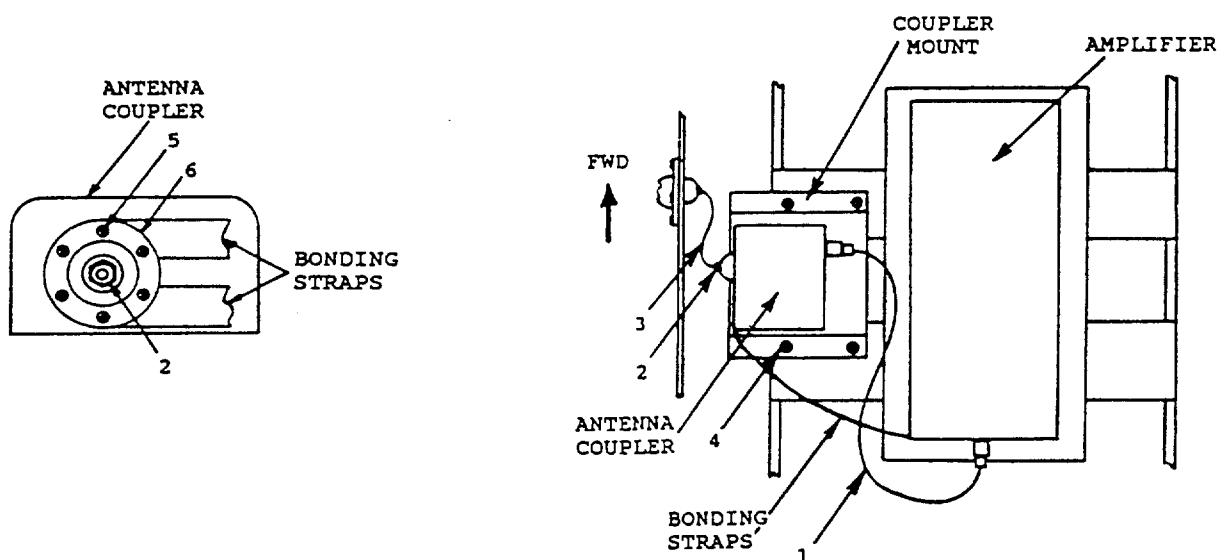
### 37-5.1 Removal Instructions.

- A Remove amplifier-coupler per paragraph 37-4.
- B Remove four screws (1) securing adapter tray to aircraft rails and lift adapter tray and mount from aircraft.
- C Remove sixteen screws (2), sixteen self-locking nuts (3), and thirty two washers (4) securing mount to adapter tray.
- D Separate mount from adapter tray.



**37-5.2 Installation Instructions.**

- A** Position mount on adapter tray and secure with sixteen screws (2), sixteen self-locking nuts (3), and thirty two washers (4).
- B** Position adapter tray in aircraft and secure with four screws (1).
- C** Install amplifier-coupler per paragraph 37-4.

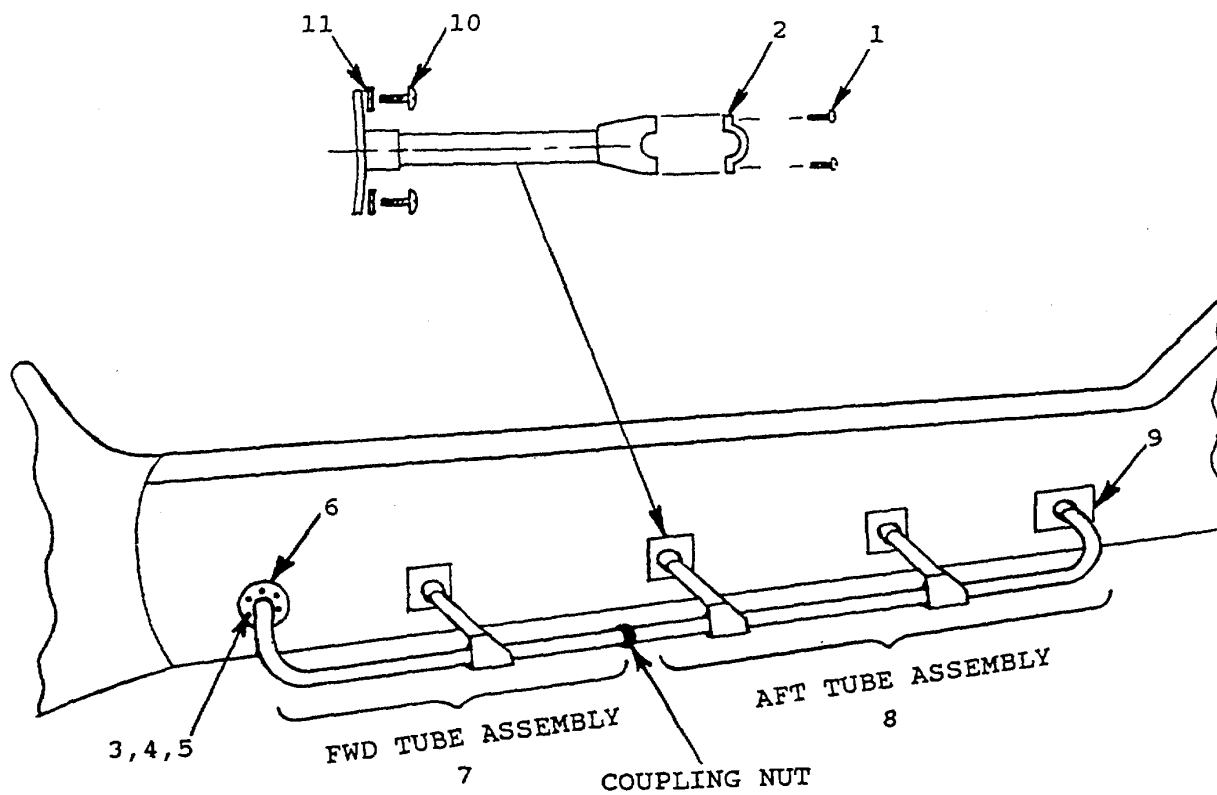
**37-6. ANTENNA COUPLER CU-2305/ARC-199 MAINTENANCE (AVUM)****37-6.1 Removal Instructions.**

- A** Remove amplifier-coupler per paragraph 37-4.
- B** Disconnect coaxial cable (1) from antenna coupler.
- C** Loosen retaining nut (2) on insulator and remove antenna wire (3).
- D** Remove four screws (4) securing coupler mount to aircraft rails.
- E** Remove antenna coupler and mount from aircraft.
- F** Disconnect bonding straps by removing six screws (5) and ring (6).
- G** Remove four screws from bottom side of mount and separate coupler from mount.



**37-6.2 Installation Instructions.**

- A Secure antenna coupler to mount with four screws.
- B Secure bonding straps to coupler with ring (6) and six screws (5).
- C Position coupler and mount in aircraft and secure with four screws (4).
- D Connect antenna wire (3) to insulator and tighten retaining nut (2).
- E Connect coaxial cable (1) to antenna coupler.
- F Install amplifier-coupler per paragraph 37-4.

**37-7. ANTENNA AS-384-01A MAINTENANCE (AVUM)**



### 37-7.1 Removal Instructions.

#### NOTE

Two technicians are required to remove portions of HF antenna assembly.

- A** From inside tailboom disconnect antenna wire from antenna feedthru (6).
- B** Remove four screws (1) and cap (2) securing antenna tube to first standoff.
- C** Remove six screws (3), six self-locking nuts (4), and twelve washers (5) securing antenna feedthru.
- D** Loosen coupling nut at junction of fwd and aft tube assembly and remove fwd antenna tube assembly (7).
- E** Loosen and uncouple aft tube assembly (8) from termination plate (9) at rear of tailboom.
- F** Remove four screws (1) and cap (2) securing aft tube assembly to two remaining standoffs.
- G** Remove aft tube assembly.
- H** Remove four screws (10) and washers (11) securing each standoff to aircraft skin.

### 37-7.2 Installation Instructions.

#### NOTE

Clean the standoffs, feedthru and aircraft mounting surface prior to installation.

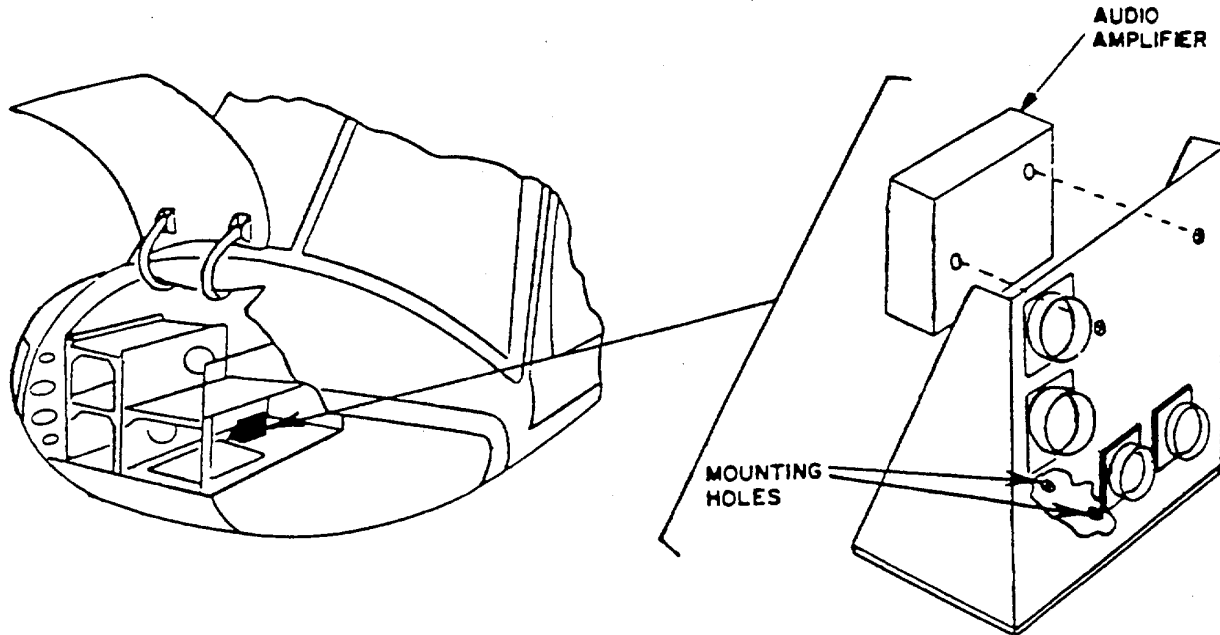
- A** Position each of three standoffs in place and secure with four screws (10) and washers (11). Apply a thin bead of RTV along outside edge of standoffs.
- B** Loosely secure aft tube assembly (8) to the last two standoffs using four screws (1) and cap (2) for each standoff.
- C** Couple and tighten aft tube assembly to termination plate (9) at rear of tailboom.
- D** Position fwd tube assembly (7) in place and tighten coupling nut to aft tube assembly.
- E** Secure antenna feedthru (6) with six screws (3), six self-locking nuts (4), and twelve washers (5). Apply a thin bead of RTV along outside edge of feedthru.



### 37-7.2 Installation Instructions.-Continued

- F Install four screws (1) and cap (2) to secure fwd tube assembly to first standoff.
- G Tighten four screws (1) and cap (2) on standoffs supporting aft tube assembly.
- H From inside tailboom connect antenna wire to antenna feedthru (6).

### 37-8. BYPASS ASSEMBLY P/N DSK-9-03230-501 MAINTENANCE (AVUM)



#### 37-8.1 Removal Instructions.

- A Remove connectors from bypass assembly.
- B Remove two screws and washers securing bypass assembly to aircraft shelf.
- C Remove bypass assembly.

#### 37-8.2 Installation Instructions.

- A Position bypass assembly in place and secure with two screws and washers.
- B Connect electrical connectors to bypass assembly.



### 37-9. BYPASS ASSEMBLY MAINTENANCE (AVIM)

Aviation Intermediate Maintenance (AVIM) of Bypass Assembly, P/N DSK-9-03230-501, consists of removal and installation of Audio Amplifier.

#### 37-9.1 Audio Amplifier Removal.

- A** Unsolder five wires to audio amplifier.
- B** Remove two screws and washers securing audio amplifier to Bypass Assembly.
- C** Remove audio amplifier.

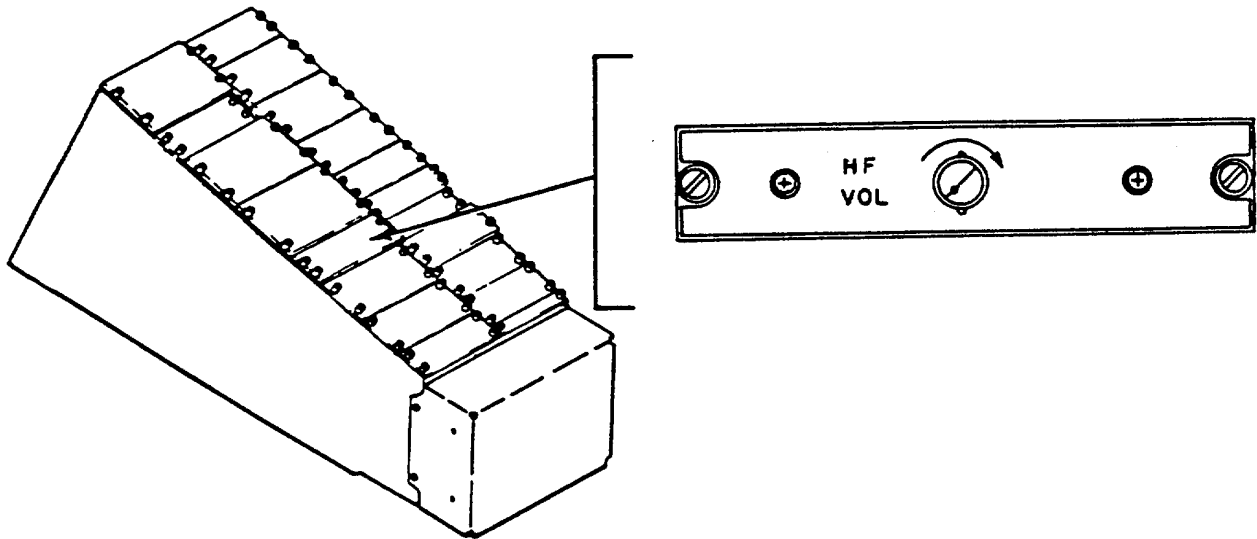
#### 37-9.2 Audio Amplifier Installation.

- A** Secure new audio amplifier to Bypass Assembly with two screws and washers.
- B** Solder five wires to audio amplifier as follows.

<u>Wire No.</u>	<u>Audio Amp. Pin Ident.</u>
1-22 -----	INTER - GND
2-22 -----	PHONE IN GND
3-22 -----	REC - AMP IN
4-22 -----	+ 28 VDC
5-22 -----	AMP OUT



### 37-10. VOLUME CONTROL P/N DSK-9-05010-501 MAINTENANCE (AVUM)



#### 37-10.1 Removal Instructions.

- A Loosen two spring-lock fasteners.

#### **CAUTION**

Be careful not to pull control so far from pedestal console that electrical wiring or connector will be damaged.

- B Lift control from pedestal console and disconnect electrical connector from rear of control.
- C Remove control.

#### 37-10.2 Installation Instructions.

- A Hold control near pedestal console and connect electrical connector to back of control.
- B Position control in pedestal console and secure two spring-lock fasteners.



### 37-11. VOLUME CONTROL P/N DSK-9-05010-501 MAINTENANCE (AVIM)

Aviation Intermediate Maintenance (AVIM) of Volume Control P/N DSK-9-05010-501, consists of removal and installation of volume control (variable resistor).

#### 37-11.1 Volume Control Removal.

- A Loosen hex head screw with proper size allen wrench and remove volume control knob.
- B Remove two screws and washers securing internally lite panel to control assembly.
- C Unsolder wires to volume control.
- D Loosen and remove jamnut and lockwasher securing volume control.
- E Remove volume control.

#### 37-11.2 Volume Control Installation.

- A Position new volume control in place and secure with jamnut and lockwasher.
- B Solder wires from connector to volume control as follows:

<u>CONNECTOR J1. PIN</u>	<u>VOL. CONTROL TERMINAL</u>
B and E -----	CCW
D-----	C
A-----	CW

- C Position internally lite panel in place and secure with two screws and washers.
- D Reinstall volume control knob and adjust knob marker to read approximately 7 o'clock when fully CCW.



### 37-12. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by AVUM personnel:  
P9701, P9702, P9703, P9704, P9705, P9706, P9731, P9732, P9733, P9721, P9724, P9725, P9726, P9741, and P9742.
- Refer to FO-66 for wiring data.
- Multiwire cables are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing coaxial connectors or by replacing coaxial cable.
- Chapter 2, paragraph 2-5, contains general wiring repair information.

## SECTION II. OPERATIONAL CHECKS

### 37-13. HF RADIO SET AN/ARC-199 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Radio Set AN/ARC-199 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

##### General Safety Instructions

##### WARNING

Dangerous rf energy is radiated by this equipment. Do not transmit when personnel are near or touching hf antenna.

##### Equipment Conditions

##### Reference

Chapter 1, para. 1-50,  
Auxiliary Power Unit  
connected.

---

#### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.



**37-13. HF RADIO SET AN/ARC-199 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS**

1. Depress HF ARC-199 circuit breaker.
2. Set rotary switch on intercom to permit transmission and reception.
3. On C-11245/U, set function selector to **BRT**.  
After approx. 10 seconds CRT is illuminated.
4. Rotate **SET** switch CW or CCW to a comfortable illumination level.  
CRT illumination level varies.
5. Set function selector to **VOL**.
6. Rotate **SET** switch CW until volume level on CRT indicates **MAX**.  
CRT volume level indicates **MAX**.
7. On remote HF volume control adjust audio to a comfortable level.  
All audio adjustments are made on remote HF volume control.
8. Set function selector to **CHAN**.
9. Rotate **SET** switch until **CHANNEL 0** is displayed.  
Do not rotate **SET** switch to quickly or channel number will not be displayed.
10. Enter 2500.0 KHZ (WWV) as a receive frequency by using the following keystrokes.  
Receive frequency on CRT indicates **2500.0 KHZ**.

FRQ RX

**PRESS** KEY + L S  
C  
A  
N + 4 digits min.  
+ decimal pt.  
+ one digit. + ENT

11. Enter 2500.0 KHZ (WWV) as a transmit frequency by using the following keystrokes.  
Transmit frequency on CRT indicates **2500.0 KHZ**.

FRQ TX

**PRESS** KEY + K C  
W + 4 digits min.  
+ decimal pt.  
+ one digit. + ENT



# 37-13. HF RADIO SET AN/ARC-199 OPERATIONAL CHECKS (AVUM)-Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## POWER ON CHECKS - Continued

12. Enter **MED** as a transmit power level by using the following keystrokes.

Power level on CRT indicates **MED**.

**PRESS**      KEY      +      X      +      ENT

X = LO, MED, or HI

13. Enter **AM** as a selected modulation source by using the following keystrokes.

Modulation source on CRT indicates **AM**.

**PRESS**      ON/ ↑  
M  
O  
D  
E      +      X      +      ENT

X = LSB, USB, **AM** or **CW**

14. Initiate system Built-in-Test (BITE) sequence using the following keystrokes.

CRT initially displays checker-board pattern, then an inverse checker-board pattern, after which **TEST IN PROGRESS** will be displayed for the remainder of the test. Once the BITE is completed the display should indicate **TEST PASS**.

If **TEST FAIL** is displayed refer to paragraph 37-12.

**PRESS**      KEY      TEST  
M  
←      +      ENT

## RECEIVER TESTS

15. Monitor selected WWV station on 2500.0 KHZ and wait for reference audio tone. Change modulation source from **AM** to **USB**, then to **LSB** during reception of audio tone.

Quality and pitch of voice or tone should be clear and audible and should not change significantly.

Refer to step 13 for selection of **AM**, **LSB**, or **USB** modes.



### 37-13. HF RADIO SET AN/ARC-199 OPERATIONAL CHECKS (AVUM)-Continued

#### PROCEDURE

#### NORMAL INDICATIONS

#### REMARKS

#### RECEIVER TESTS - Continued

16. During reception of WWV station vary the squelch control.  
Audio can be muted and unmuted depending upon squelch setting.
17. Repeat steps 15 and 16 for the following frequencies, 5000.0, 10000.0, 15000.0 and 20000.0 KHZ.  
Refer to step 10 for entering receive frequencies.

#### ANTENNA TUNE TEST

18. Select a frequency between 2000.0 and 3099.9 KHZ and enter it as a transmit frequency.  
Transmit frequency is displayed on CRT.  
Refer to step 11 for entering transmit frequencies.
19. Initiate antenna tuning sequence by using the following keystrokes.  
**TUNE** indicator appears on CRT for duration of tuning cycle and extinguishes when tuning is complete.

**PRESS**      KEY      +      TUNE  
F  
6      +      ENT

20. Select a frequency from each of the following frequency bands and repeat steps 18 and 19.

- |                        |                         |
|------------------------|-------------------------|
| * 3100.0 - 4899.9 KHZ  | * 11900.0 - 18099.9 KHZ |
| * 4900.0 - 7599.9 KHZ  | * 18100.0 - 29999.9 KHZ |
| * 7600.0 - 11899.9 KHZ |                         |



**37-13. HF RADIO SET AN/ARC-199 OPERATIONAL CHECKS (AVUM)-Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**COMMUNICATIONS CHECK**

21. After AN/ARC-199 has completed all preceding tests it is advisable to conduct actual communication checks. Use at least one frequency from each band listed in step 20 (if possible) and establish two-way communications with stations located several miles from aircraft.
- Quality and pitch of voice should be clear and audible and not change significantly when changing modulation source (AM, LSB, or USB). Adequate sidetone is audible during all transmissions.

**SECTION III. TROUBLESHOOTING**

**37-14. HF RADIO SET AN/ARC-199 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in HF Radio Set AN/ARC-199.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable causes or cause of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor
- After completing the corrective action, perform operational checks described in paragraph 37-11.



**37-14. HF RADIO SET AN/ARC-199 TROUBLESHOOTING (AVUM)-Continued**

<b>SYMPTOM</b>		<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
<hr/>			
1.	CRT does not illuminate when control is turned on.	<b>A</b> Defective circuit breaker or primary power wiring.	<b>A</b> Reset circuit breaker and check primary power wiring; repair or replace as necessary.
		<b>B</b> Defective control unit.	<b>B</b> Replace C-11245/U.
2.	Continuous BITE Test.	<b>A</b> Defective control unit.	<b>B</b> Replace C-11245/U
3.	TEST FAIL 971 is displayed on CRT upon completion of BITE.	<b>A</b> Defective control unit.	<b>A</b> Replace C-11245/U.
4.	TEST FAIL 972 is displayed on CRT upon completion of BITE.	<b>A</b> Defective amplifier-coupler.	<b>A</b> Replace AM-7201/U.
5.	TEST FAIL 973 is displayed on CRT upon completion of BITE.	<b>A</b> Defective receiver-exciter.	<b>A</b> Replace RT-1432/U.
6.	During reception of WWV quality and pitch of voice or tone changes significantly when switching modulation source from AM to LSB to USB.	<b>A</b> Defective receiver-exciter.	<b>A</b> Replace RT-1432/U.
7.	Radio Set will not tune to transmit frequency.	<b>A</b> Defective amplifier-coupler.	<b>A</b> Replace AM-7201/U.
		<b>B</b> Defective antenna coupler.	<b>B</b> Replace CU-2305/ARC-199.
8.	Radio Set tunes to proper frequency but will not transmit or receive.	<b>A</b> KY-75 Bypass assembly not connected.	<b>A</b> Connect Bypass assembly.
		<b>B</b> Defective receiver-exciter.	<b>B</b> Replace RT-1432/U.

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### 37-14. HF RADIO SET AN/ARC-199 TROUBLESHOOTING (AVUM)-Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
9. No sidetone and receive audio or weak sidetone and receive audio.		
<b>A</b> Defective control unit.	<b>A</b> Replace C-11245/U.	
<b>B</b> Defective audio amplifier in Bypass assembly.	<b>B</b> Replace audio amplifier.	
<b>C</b> Defective remote HF volume control.	<b>C</b> Replace volume control.	

#### 37-14.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in HF Radio Set AN/ARC-199 and the preceding operational checks and troubleshooting charts do not indicate the source of the trouble, refer to the chart below and check for voltages or signals, refer to FO-66 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-1 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.



**37-14.1.1 UH-1D/H and UH-1H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB102	4	Panel lighting (HF control)	CONSOLE PED LIGHTS circuit breaker energized	0-115 Vac
TB12	2	Panel lighting (KY control)	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
P9701	A	Power PTT relay	KY circuit breaker energized	28 Vdc
P9704	K,F	Primary power	KY circuit breaker energized	28 Vdc
TB1	4	Audio amplifier power (bypass assembly)	KY circuit breaker energized	28 Vdc
P9726	B	HF primary power	HF circuit breaker energized	28 Vdc
TB20	5	Receive audio (UH-1D/H)	AN/ARC-199 energized	Audio Hi
TB20	11	Receive audio (UH-1H)	AN/ARC-199 energized	Audio Hi



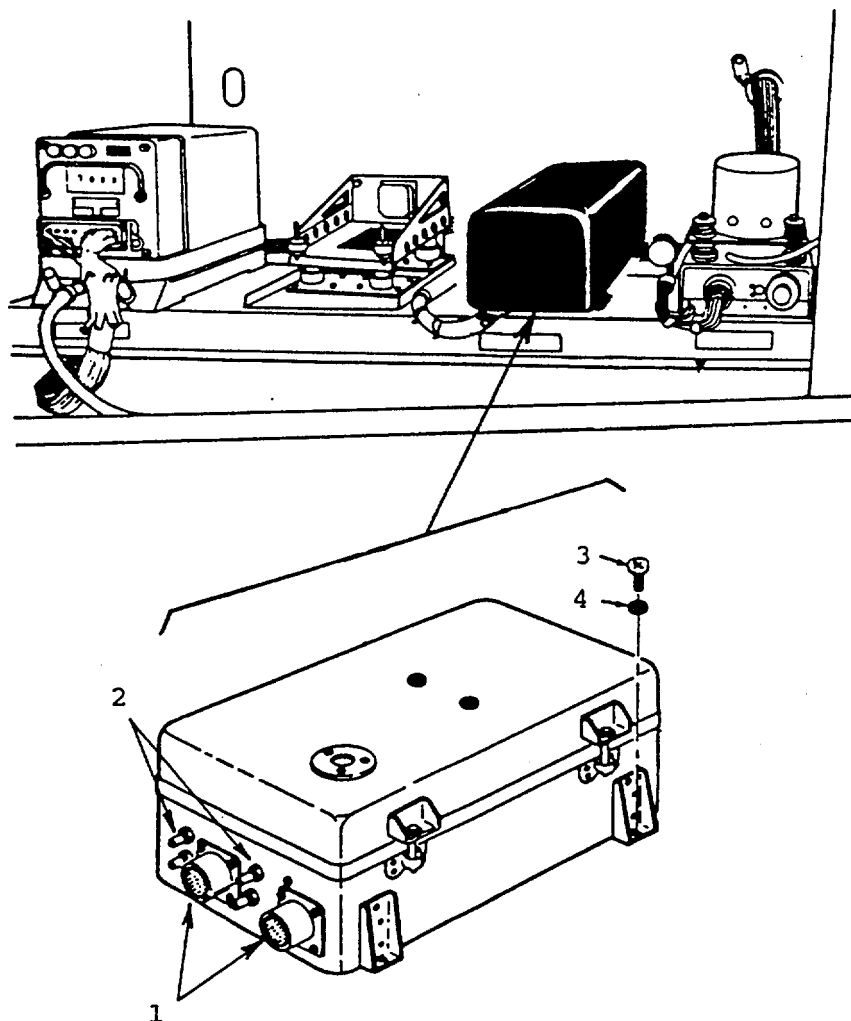
## CHAPTER 38

## DIRECTION FINDING SET AN/ARN-89B MAINTENANCE

Subject	Para.	Page
Receiver R-1496/ARN-89B Maintenance (AVUM).....	38-1	38-1
Control C-7392()/ARN-89 Maintenance (AVUM).....	38-2	38-2
Sense Amplifier AM-4859()/ARN-89 Maintenance (AVUM).....	38-3	38-3
Loop Antenna AS-2108()/ARN-89 Maintenance (AVUM).....	38-4	38-4
Sense Antenna P/N 205-075-325-1 Maintenance (AVUM).....	38-5	38-5
Cabling and Connector Maintenance (AVUM).....	38-6	38-6
Direction Finding Set AN/ARN-89B Operational Checks (AVUM).....	38-7	38-6
Direction Finding Set AN/ARN-89B Troubleshooting (AVUM) .....	38-8	38-8

## SECTION I. MAINTENANCE PROCEDURES

## 38-1. RECEIVER R-1496/ARN-89B MAINTENANCE (AVUM)





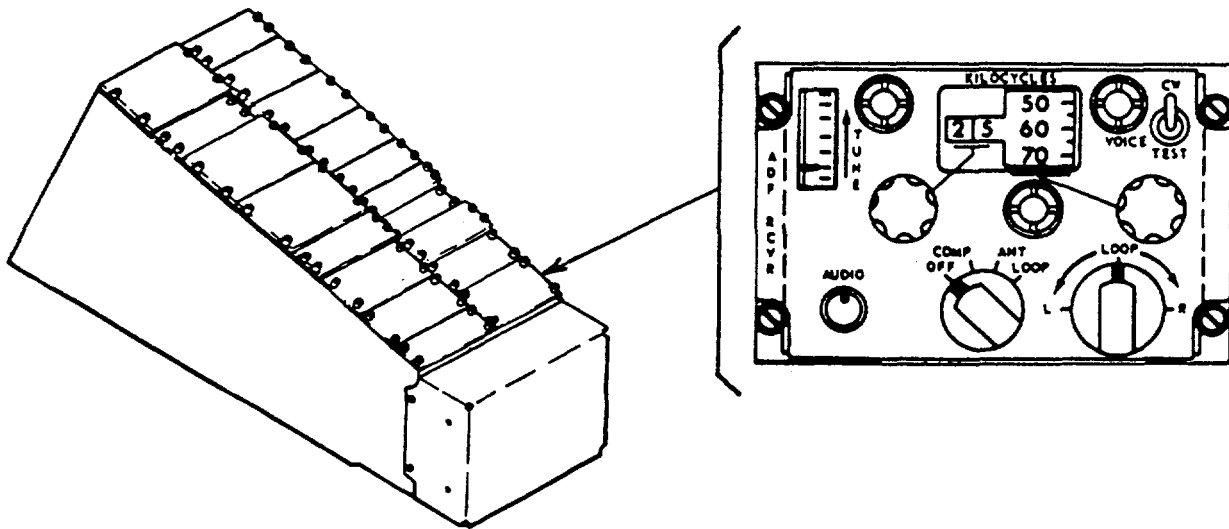
### 38-1.1 Removal Instructions.

- A Disconnect electrical (1) and coaxial (2) connectors.
- B Remove four screws (3) and washers (4) securing receiver to mounting surface.
- C Remove receiver.

### 38-1.2 Installation Instructions.

- A Position receiver in place and secure with four screws (3) and washers (4) to mounting surface.
- B Connect electrical (1) and coaxial (2) connectors.

## 38-2. CONTROL C-7392()/ARN-89 MAINTENANCE (AVUM)



### 38-2.1 Removal Instructions.

- A Loosen four spring-lock fasteners and carefully lift control from pedestal console.
- B Disconnect electrical and coaxial connectors from rear of control.
- C Remove control.



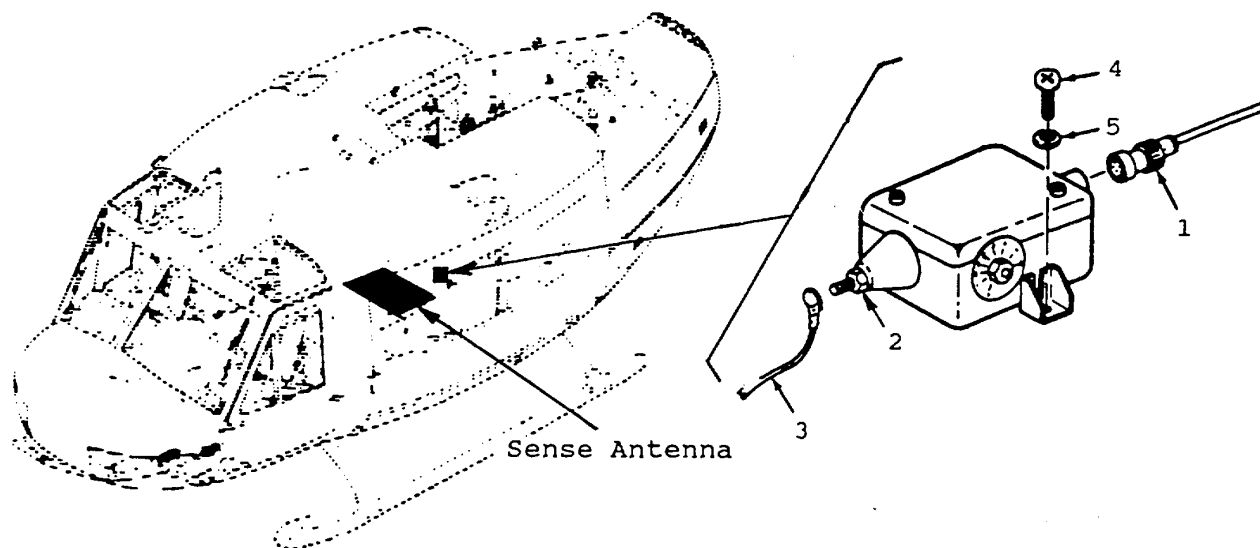
### 38-2.2 Installation Instructions.

A Connect electrical and coaxial connectors to rear of control.

B Position control in pedestal console.

C Tightened four spring-lock fasteners.

### 38-3. SENSE AMPLIFIER AM-4859(I)/ARN-89 MAINTENANCE (AVUM)



#### 38-3.1 Removal Instructions

A Disconnect coaxial cable (1) from amplifier.

B Loosen retaining nut (2) and remove sense antenna lead (3) from amplifier.

C Remove two screws (4) and washers (5) securing amplifier.

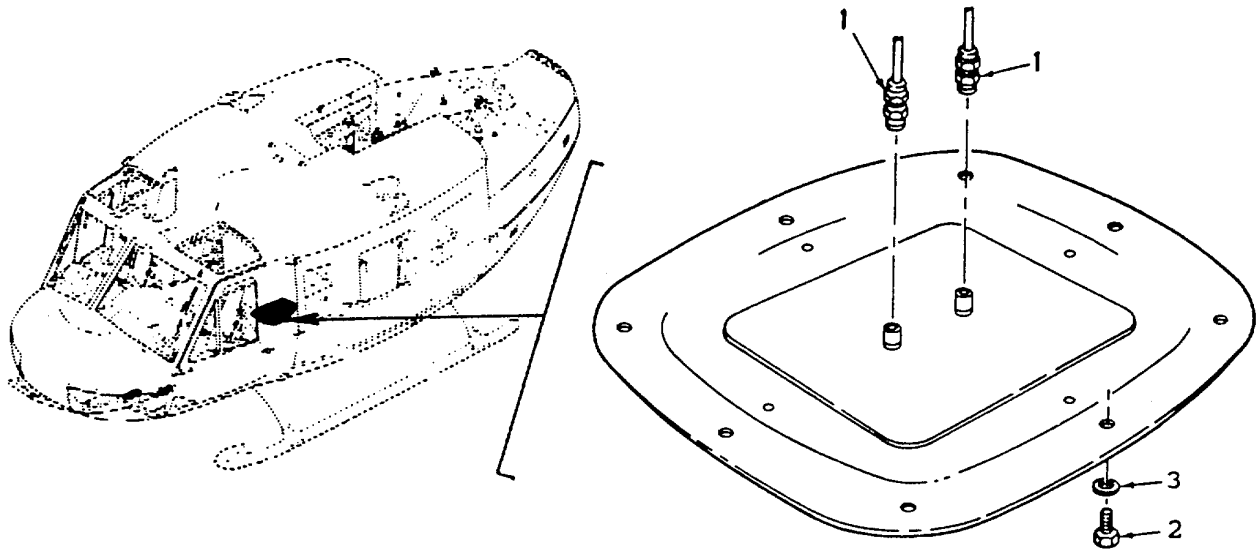
D Remove amplifier.

#### 38-3.2 Installation Instructions.

A Position amplifier in place and secure with two screws (4) and washers (5).

B Connect coaxial cable (1) and sense antenna lead (3) to amplifier.



**38-4. LOOP ANTENNA AS-2108()/ARN-89 MAINTENANCE (AVUM)****38-4.1 Removal Instructions.**

- A From underside of helicopter, remove eight screws (2) and washers (3) securing antenna.
- B Gently lower antenna to prevent damage to coaxial cables.
- C Disconnect two coaxial cables (1) from antenna.
- D Remove loop antenna.

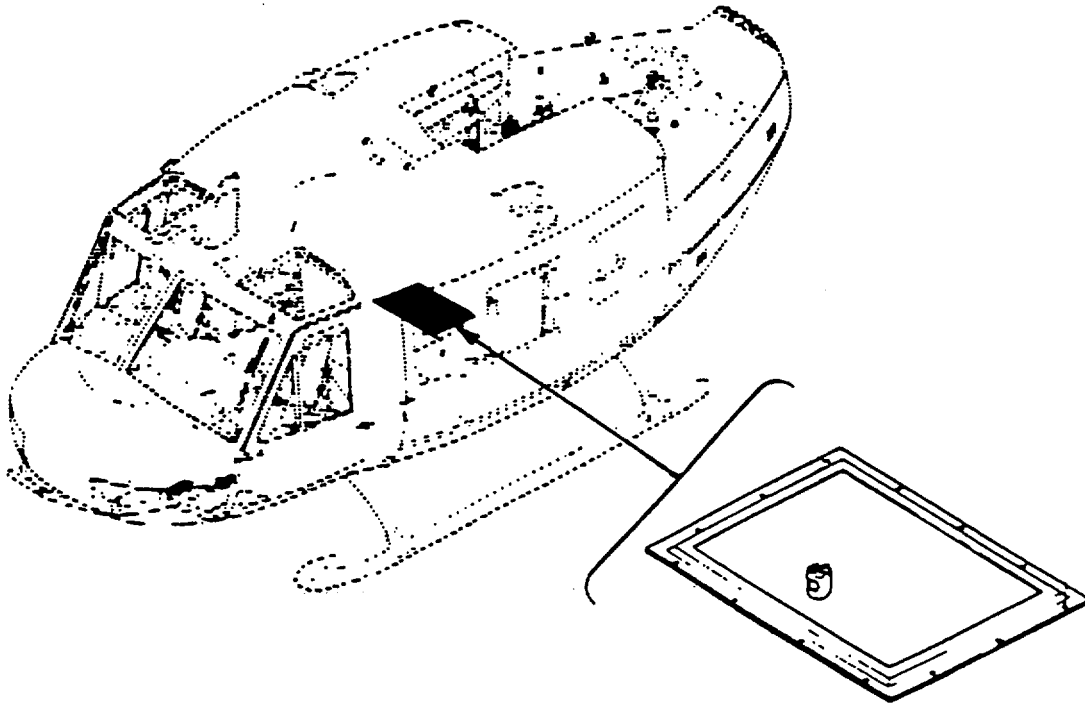
**38-4.2 Installation Instructions.****NOTE**

Clean aircraft surface prior to installing loop antenna.

- A Position loop antenna in place and connect two coaxial cables (1).
- B Secure loop antenna with eight screws (2) and washers (3).
- C Apply a thin bead of RTV along outside edge of antenna.



### 38-5. SENSE ANTENNA P/N 205-075-325-1 MAINTENANCE (AVUM)



#### 38-5.1 Removal Instructions.

A From underside of helicopter, remove thirteen screws and washers securing antenna.

B Carefully lower antenna and disconnect coaxial cable.

C Remove antenna.

#### 38-5.2 Installation Instructions.

A Connect coaxial cable to antenna.

B Position antenna in place and secure with thirteen screws and washers.



### 38-6. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below and cabling between them may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
IP1, 1P2, 1P3, 1P4, 1P5, 1P6, 3P1, 4P1, 4P2, 2P1, 2P2, P403.
- Refer to FO-67 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires
- RF cables are repaired by replacing connectors or coaxial cables
- Chapter 2, paragraph 2-5, contains general wiring repair information

## Section II. OPERATIONAL CHECKS

### 38-7. DIRECTIONAL FINDING SET AN/ARN-89B OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Direction Finding Set AN/ARN-89B is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

#### Equipment Conditions

##### Reference

Chapter 1, paragraph 1-50, Auxiliary Power Unit connected.

Chapter 9, paragraph 14-13, Intercommunications Set operational.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.



**38-7. DIRECTION FINDING SET AN/ARN-89B OPERATION AL CHECKS (AVUM)-CONT.**

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**PROCEDURE****NORMAL INDICATIONS****REMARKS**

---

**POWER ON CHECKS**

1. Push ADF circuit breaker, and set inverter switch to MAIN.
2. Set ICS control panel NAV switch to up position.
3. On ID-998/ASN indicator, set RMI BRG PNTR switch to ADF.  
ADF bearing information is displayed on  
NO.1 needles on both RMI's.
4. Set mode selector switch on ADF control panel to ANT, volume control to midrange, and CW-VOICE- TEST  
switch to VOICE.  
Receive audio from station (if previously entered) or noise in headset.
5. Turn KILOCYCLES control knobs to frequency of a station 10 to 100 miles from aircraft.  
TUNE meter indicates signal strength and receive audio heard in headset.
6. Repeat step 5 for at least 2 other frequencies.
7. While tuned to a station set mode selector switch on ADF control panel to LOOP. Adjust LOOP L-R control  
to obtain maximum indication on TUNE meter.  
TUNE meter indicates maximum.
8. Adjust AUDIO control to obtain mid-scale indication on TUNE meter.  
TUNE meter indicates mid-scale.
9. Set mode selector switch from LOOP to ANT.  
TUNE meter indicates approximately the same for both LOOP and ANT mode.
10. Set mode selector switch to LOOP, and rotate LOOP L-R control to extreme right.  
No.1 bearing pointers on both RMI's rotate to right (CW)  
until LOOP L-R control is released.
11. Rotate LOOP L-R control to extreme left.  
No.1 bearing pointers on both RMI's rotate to left (CCW)  
until LOOP L-R control is released.



**38-7. DIRECTION FINDING SET AN/ARN-89B OPERATIONAL CHECKS (AVUM)-CONT.**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

12. Rotate LOOP L-R control to either left or right, and hold until No.1 bearing pointers rotate through 360 degrees.  
Two audible nulls can be detected, 180 degrees apart, as bearing pointers rotate through 360 degrees.
13. Set mode selector switch to ANT, and CW-VOICE-TEST switch to CW.  
BFO (beat frequency oscillator) tone heard in headset.
14. Rotate KILOCYCLES control knobs through selected station frequency.  
BFO tone should vary.
15. Return CW-VOICE-TEST switch to VOICE position.
16. Set mode selector switch to COMP.  
No.1 bearing pointers on both RMI's indicate bearing to station.

**NOTE**

For accurate bearing, compass must be on and synchronized.

17. Repeat step 16 for at least 2 other frequencies.

**Section III. TROUBLESHOOTING**

**38.8 DIRECTION FINDING SET AN/ARN-89B TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in Direction Finding Set AN/ARN-89B.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction



**38.8 DIRECTION FINDING SET AN/ARN-89B TROUBLESHOOTING (AVUM)-CONT.**

- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 38-7.

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
1. ADF circuit breaker will not stay closed.	<b>A</b> Defective circuit breaker.	<b>A</b> Replace circuit breaker.
	<b>B</b> Defective ADF receiver.	<b>B</b> Replace R-1496/ARN-89B.
	<b>C</b> Defective ADF control.	<b>C</b> Replace C-7392()/ARN-89.
2. No TUNE meter indication or audio output signal in ANT mode.	<b>A</b> Defective sense amplifier.	<b>A</b> Replace AM-4589()/ARN-89.
	<b>B</b> Defective ADF control.	<b>B</b> Replace C-7392()/ARN-89.
	<b>C</b> Defective ADF receiver	<b>C</b> Replace R-1496/ARN-89B
	<b>D</b> Defective sense antenna cable.	<b>D</b> Repair or replace antenna cable.
	<b>E</b> Defective sense antenna.	<b>E</b> Replace sense antenna, P/N 205-075-325-1.
3. Unable to obtain correct bearing indication in COMP mode.	<b>A</b> Defective ADF receiver.	<b>A</b> Replace R-1496/ARN-89B.
	<b>B</b> Defective ADF control.	<b>B</b> Replace C-7392()/ARN-89.
	<b>C</b> Defective loop antenna	<b>C</b> Replace AS-2108()/ARN-89.
	<b>D</b> Defective coax cable	<b>D</b> Repair or replace coax cable.



### 38-8. DIRECTION FINDING SET AN/ARN-89B TROUBLESHOOTING (AVUM)-CONT.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
<hr/>		
4. No TUNE meter indication or audio output signal in LOOP mode.	<b>A</b> Defective ADF receiver.	<b>A</b> Replace R-1496/ARN-89B.
	<b>B</b> Defective control unit.	<b>B</b> Replace C-7392()/ARN-89.
	<b>C</b> Defective loop antenna.	<b>C</b> Replace AS-2108()/ARN-89.
	<b>D</b> Defective coax cable.	<b>D</b> Repair or replace coax cable.
<hr/>		

#### 38-8.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in Direction Finding Set AN/ARN-89B and the preceding operational checks and troubleshooting charts do not indicate the source of trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-67, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.



**38-8.1.1 UH-1D/H and UH-1H Signal and Voltage Measurements (AVUM).**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB12	1	Panel and dial lights	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
TB1	12	Synchro Rotor excitation	Course indicator circuit breaker energized	26 Vac
TB1	8	Stator Y error signal	AN/ARN-89B energized	400 Hz, 26 Vac maximum
TB1	9	Stator X error signal	N/ARN-89B energized	400 HZ, 26 Vac maximum
1P1	L	Primary power	ADF circuit breaker energized	28 Vdc



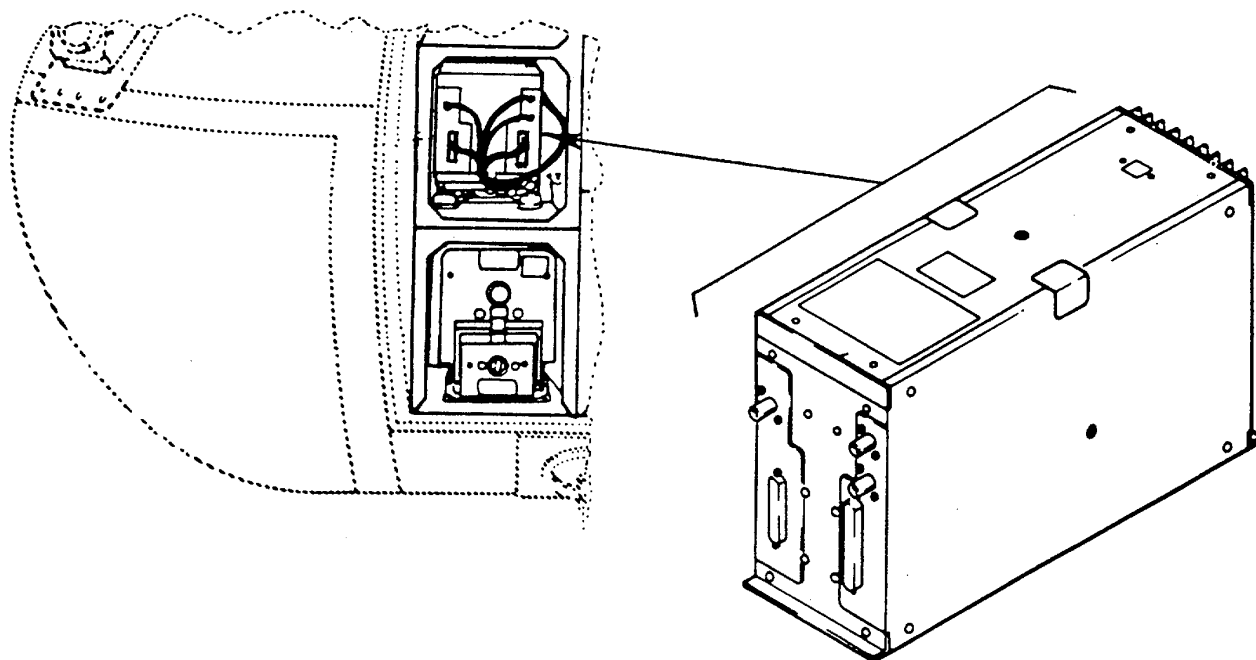
## CHAPTER 39

### VHF NAVIGATION SET AN/ARN-123 MAINTENANCE

Subject	Para.	Page
Receiver R-2023/ARN-123(V) Maintenance (AVUM) .....	39-1	39-1
Mount MT-4980/ARN-123(V) Maintenance (AVUM) .....	39-2	39-2
Control C-10048/ARN-123(V) Maintenance (AVUM) .....	39-3	39-3
Antenna AS-1304/ARN Maintenance (AVUM) .....	39-4	39-4
Antenna AS-3188/ARN Maintenance (AVUM) .....	39-5	39-4
Antenna AT-640()/ARN Maintenance (AVUM) .....	39-6	39-4
Indicator ID-1347()/ARN Maintenance (AVUM) .....	39-7	39-4
Cabling and Connector Maintenance (AVUM) .....	39-8	39-5
VHF Navigation Set AN/ARN-123		
Operational Checks (AVUM) .....	39-9	39-5
VHF Navigation Set AN/ARN-123		
Troubleshooting (AVUM) .....	39-10	39-9

### Section I. MAINTENANCE PROCEDURES

#### 39-1. RECEIVER R-2023/ARN-123(V) MAINTENANCE (AVUM)





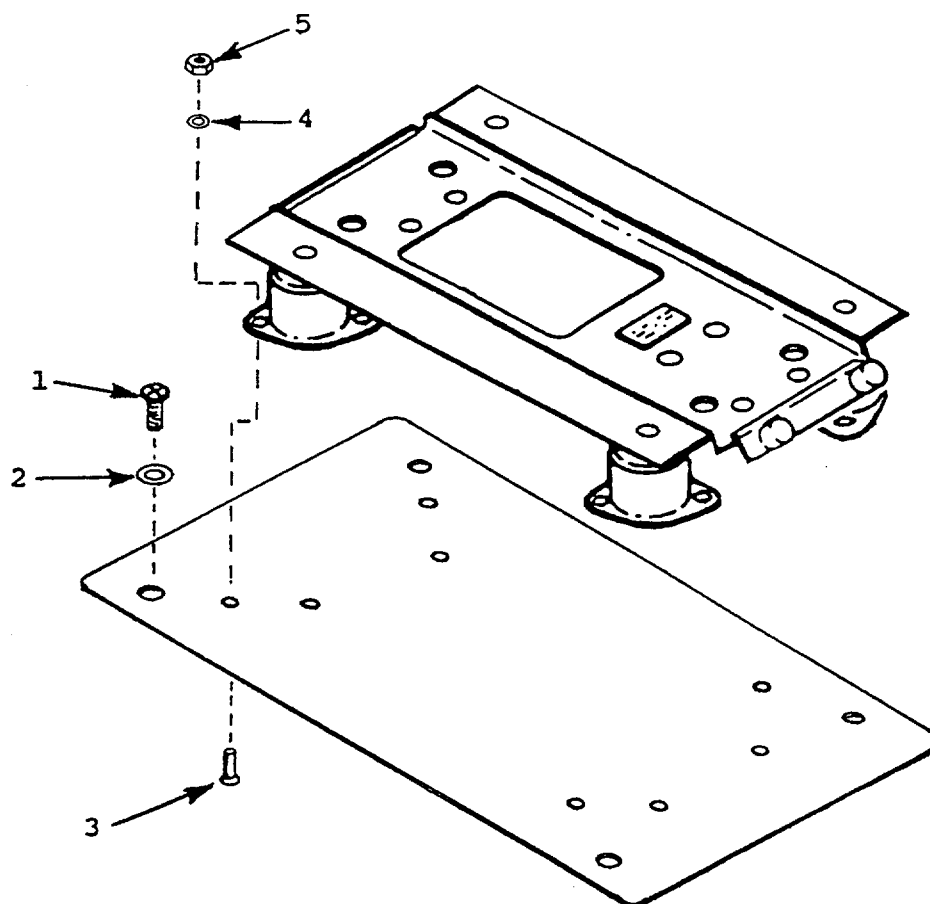
### 39-1.1 Removal Instructions

- A Disconnect electrical (1) and coaxial connectors (2) from front of receiver.
- B Loosen self-locking thumbnuts (3) securing receiver to mount.
- C Slide receiver forward and remove from mount.

### 39-1.2 Installation Instructions.

- A Position receiver in mount and slide aft.
- B Secure receiver in mount by tightening self-locking thumbnuts (3).
- C Connect electrical (1) and coaxial connectors (2) to front of receiver.

### 39-2. MOUNT MT-4980/ARN-123(V) MAINTENANCE (AVUM)





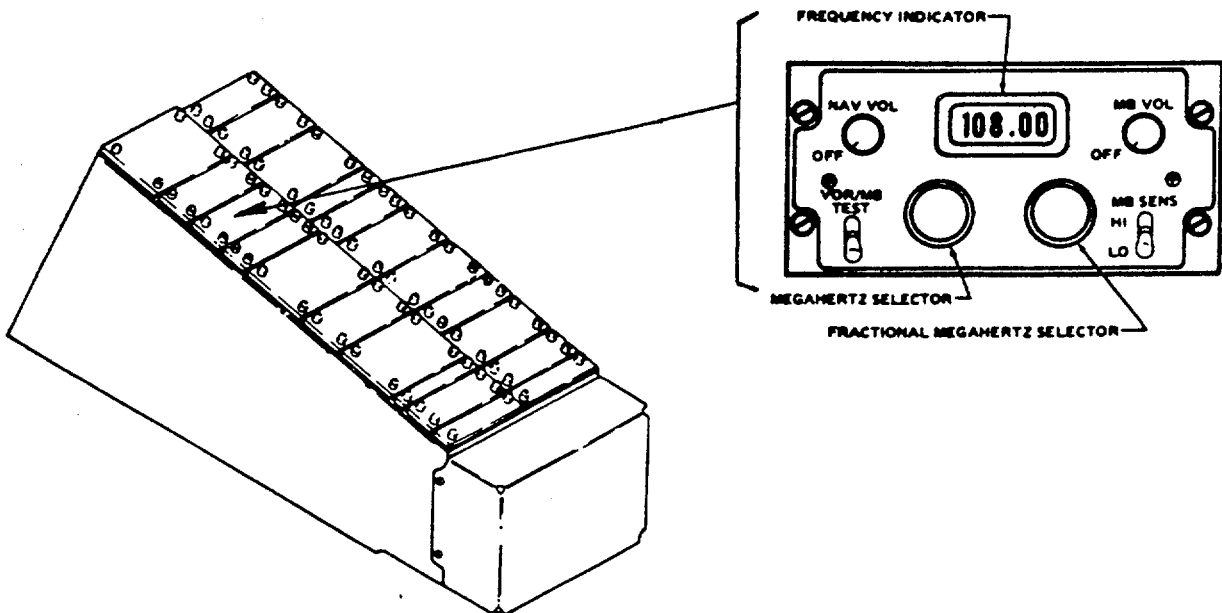
### 39-2.1 Removal Instructions.

- A Remove receiver per paragraph 39-1.
- B Remove four screws (1) and washers (2) securing mount and adapter plate to aircraft.
- C Remove eight screws (3), washers (4), and self-locking nuts (5) securing mount to adapter plate.
- D Remove mount.

### 39-2.2 Installation Instructions.

- A Position mount on adapter plate and secure with eight screws (3), washers (4), and self-locking nuts (5).
- B Position adapter plate with mount in aircraft and secure with four screws (1) and washers (2).
- C Install receiver per paragraph 39-1.

### 39-3. CONTROL C-10048/ARN-123(V) MAINTENANCE (AVUM)





### **39-3.1 Removal Instructions.**

A Loosen four spring-lock fasteners and carefully lift control from console pedestal.

#### **CAUTION**

Be careful not to pull control so far from pedestal that wiring or connector will be damaged.

B Loosen two screw-lock assemblies and remove electrical connector.

C Remove control.

### **39-3.2 Installation Instructions.**

A Position control near console pedestal and connect electrical connector.

B Tighten two screw-lock assemblies securing electrical connector.

C Insert control in pedestal console and tighten four spring-lock fasteners.

### **39-4. ANTENNA AS-1304/ARN MAINTENANCE (AVUM)**

Refer to Chapter 21, paragraph 21-3, for AS-1304/ARN maintenance.

### **39-5. ANTENNA AS-3188/ARN MAINTENANCE (AVUM)**

Refer to Chapter 22, paragraph 22-3, for AS-3188/ARN maintenance.

### **39-6. ANTENNA AT-640()/ARN MAINTENANCE (AVUM)**

Refer to Chapter 22, paragraph 22-2, for AT-640()/ARN maintenance

### **39-7. INDICATOR ID-1347()/ARN MAINTENANCE (AVUM)**

Refer to Chapter 21, paragraph 21-4, for ID-1347()/ARN maintenance.



### 39-8. CABLING AND CONNECTOR MAINTENANCE (AVUM)

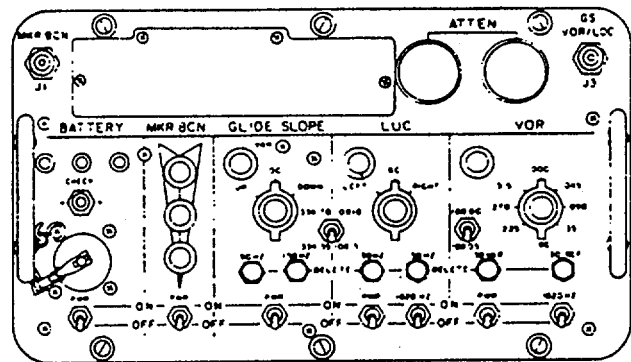
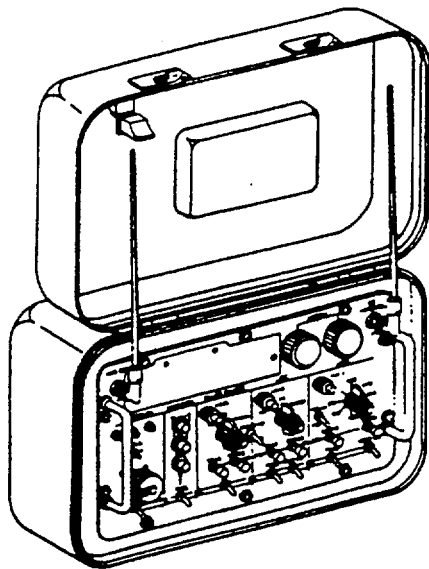
- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:

P11001, P11003, P12002, P12004, P12005, P1601, P1, P409, P403, P1303, J1303, P801, J801, P1305 and P1307.

- Refer to FO-68 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Chapter 2, paragraph 2-5, contains general wiring repair information.

## Section II. OPERATIONAL CHECKS

### 39-9. VHF NAVIGATION SET AN/ARN-123 OPERATIONAL CHECKS (AVUM)



Test Set AN/ARM-186 shown above is used to perform the Operational Checks on VHF Navigation Set AN/ARN-123.



39-9. VHF NAVIGATION SET AN/ARN-123 OPERATIONAL CHECKS (AVUM)-Continued

These checks are used to ensure Navigation Set AN/ARN-123 is performing properly. The checks are also used after repair to make sure the problem was fixed.

INITIAL SETUP

<u>Test Equipment</u>	<u>Equipment Conditions</u>
AN/ARM-186, VOR Test Set. (TM-11-6625-2976-12)	Reference Chapter 1, paragraph 1-50, Auxiliary Power Unit connected. Chapter 9, para. 14-13, Inter- communications Set operational.

PROCEDURE	NORMAL INDICATIONS	REMARKS
-----------	--------------------	---------

POWER OFF CHECKS

- 1. Check that all components are installed, securely mounted and safety wired (if required).
- 2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

POWER ON CHECKS

- 1. Depress VOR/ILS, INTERCOMM CPLT & CREW L, PLT & CREW R, COURSE IND, and GYRO CMPS circuit breakers.
- 1A. On aircraft with AN/ASN-175 system installed, depress GPS AN/ASN-175 circuit breaker.

VOR CHECKS

- 1B. On aircraft with AN/ASN-175 system installed, press CDI SEL VOR switch/DME indicator assembly on pilot's side of instrument panel.  
VOR lamps light in **CDI SEL VOR** switch/DME indicator assembly.
- 1C. On aircraft with AN/ASN-175 system installed, set **NO. 2 BRG PTR** switch on pilot's side of instrument panel to **VOR**.
- 2. On VOR control unit, rotate **NAV VOL** and **MB VOL** control knobs clockwise from off and adjust frequency control knobs to **108.00 MHZ**.  
Noise heard in headset.
- 3. On test set, place **BATTERY PWR** switch to **ON**, **VOR PWR** switch to **ON**, frequency select switch to **108.00**, and bearing select switch to **000**.  
NAV flag on ID-1347/ARN (CDI) retracts.



**39-9. VHF NAVIGATION SET AN/ARN-123 OPERATIONAL CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS****VOR CHECKS - Continued****NOTE**

When VOR signal is lost or weak (NAV flag in view), or with ILS mode selected, RMI bearing pointers park at 120 degrees relative bearing.

4. On CDI, rotate **OBS** knob to indicate a course of 315 degrees.
5. Hold **VOR/MB TEST** switch on VOR control unit in **TEST** position.  
CDI course deviation bar centers  $\pm 3$  degrees, NAV and HDG flags are retracted and TO/FROM flag indicates TO. RMI (ID-998 & ID-250) No.2 bearing pointers indicate 315 degrees  $\pm 5$  degrees. Marker beacon indicator is light.
6. Release **VOR/MB TEST** switch.
7. On CDI, rotate **OBS** knob to indicate a course of 0 degrees.  
CDI course deviation bar centers  $\pm 3$  degrees, NAV and HDG flags are retracted and TO/FROM flag indicates TO. RMI No.2 bearing pointers indicate 0 degrees  $\pm 5$  degrees.
8. On test set, rotate bearing select switch to **45, 90, 135, 180, 225, 270, and 315** degrees. On CDI, rotate **OBS** knob to coincide with test set bearing selection.  
CDI course deviation bar centers  $\pm 3$  degrees, NAV and HDG flags are retracted and TO/FROM flag indicates TO. RMI No.2 bearing pointers indicate test set bearing  $\pm 5$  degrees.
9. Rotate **OBS** knob on CDI 360 degrees.  
TO/FROM flag indicates TO when within 90 degrees either side of test set bearing and switches to FROM when exceeding 90 degrees.
10. On test set, place **1020 Hz** switch to **ON**. Rotate **NAV VOL** control on VOR control unit.  
Tone should be clear and audible and audio level should vary smoothly.
11. On test set, place **VOR PWR** switch to **OFF**.

**LOCALIZER CHECKS**

12. On test set, place **LOC PWR** switch to **ON**, frequency selector to **108.10**, and **LEFT-OC-RIGHT** selector to **OC**.



**38-7. DIRECTION FINDING SET AN/ARN-89B OPERATIONAL CHECKS (AVUM)-CONT.**

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**PROCEDURE****NORMAL INDICATIONS****REMARKS**

---

**LOCALIZER CHECKS - Continued**

13. On VOR control unit, adjust frequency control knobs to 108.10MHZ. CDI course deviation bar is centered and NAV flag is retracted.
14. On test set, place LEFT-OC-RIGHT selector to LEFT. CDI course deviation bar deflects left.
15. On test set, place LEFT-OC-RIGHT selector to RIGHT. CDI course deviation bar deflects right.
16. On test set, return LEFT-OC-RIGHT selector to OC and place 1020 HZ switch to ON.  
CDI course deviation bar returns to center and tone heard in headset.
17. On test set, place LOC PWR switch to OFF.

**GLIDESLOPE CHECKS**

18. On test set, place GLIDE SLOPE PWR switch to ON and UP-OC-DOWN selector to OC. CDI vertical deviation bar is centered and GS flag is retracted.
19. On test set, place UP-OC-DOWN selector to UP.  
CDI vertical deviation bar deflects up.
20. On test set, place UP-OC-DOWN selector to DOWN. CDI vertical deviation bar deflects down.
21. On test set, return UP-OC-DOWN selector to OC and place GLIDE SLOPE PWR switch to OFF.

**MARKER BEACON CHECKS**

22. On test set, place MKR BCN PWR switch to ON. Press and hold OUTER marker beacon button.  
Marker beacon indicator is light and 400 HZ tone is heard in headset.



**39-9. VHF NAVIGATION SET AN/ARN-123 OPERATIONAL CHECKS (AVUM) - Continued.**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

**MARKER BEACON CHECKS - Continued**

23. On VOR control unit, rotate MB VOL control and set to a comfortable level. Marker beacon audio varies and can be adjusted to comfortable level.
24. On test set, release OUTER marker beacon button and hold MIDDLE marker beacon button. Marker beacon indicator is light and 1300 HZ tone is heard in headset.
25. On test set, release MIDDLE marker beacon button and hold INNER marker beacon button. Marker beacon indicator is light and 3000 HZ tone is heard in headset.
26. On test set, place all power switches to OFF.
27. On VOR control unit, rotate NAV VOL and MB VOL control knobs counterclockwise to OFF.

**Section III. TROUBLESHOOTING**

**39-10. VHF NAVIGATION SET AN/ARN-123 TROUBLESHOOTING (AVUM)**

- The table below is provided to assist maintenance personnel in locating malfunctions in VHF Navigation Set AN/ARN-123.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.



39-10. VHF NAVIGATION SET AN/ARN-123 TROUBLESHOOTING (AVUM)-Continued

This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.

After completing the corrective action, perform operational checks described in paragraph 39-9.

SYMPTOM	
PROBABLE CAUSE	CORRECTIVE ACTION
1. VOR lamps do not come on when CDI SEL VOR switch/DME indicator assembly is pressed.	<div>A Defective remote switch.<div>A Replace remote switch. (Refer to Chapter 43.)</div></div> <div>B Defective CDI SEL VOR switch/DME indicator assembly.<div>B Replace assembly.</div></div> <div>C Defective VOR lamps in CDI SEL VOR switch/DME indicator assembly.<div>C Replace lamps.</div></div> <div>D Defective wiring.<div>D Check and repair wiring.</div></div>
1A. When VOR/MB TEST switch is in TEST position CDI and RMI do not indicate 315 degrees $\pm$ 3 degrees. MB light is illuminated.	<div>A Inadequate signal strength from test set.<div>A Increase signal strength.</div></div> <div>B Defective receiver.<div>B Replace R-2023/ARN-123.</div></div>
2. During VOR bearing tests, CDI does not display correct bearing, RMI indications are correct.	<div>A Defective CDI.<div>A Replace ID-1347()/ARN.</div></div> <div>B If ID-1347(C)/ARN is installed check switch setting.<div>B On rear of indicator, switch must be set to R-1388A position.</div></div> <div>C Defective receiver.<div>C Replace R-2023/ARN-123.</div></div> <div>D Defective wiring.<div>D Check and repair wiring.</div></div> <div>E If AN/ASN-175 is installed, defective remote switch.<div>E Replace remote switch. (Refer to Chapter 43.)</div></div> <div>F If AN/ASN-175 is installed, defective CDI SEL VOR switch/DME indicator assembly.<div>F Replace assembly.</div></div>



## 39-10. VHF NAVIGATION SET AN/ARN-123 TROUBLESHOOTING (AVUM)-Continued

## SYMPTOM

## PROBABLE CAUSE

## CORRECTIVE ACTION

- 
3. During VOR bearing tests, CDI displays correct bearing, both RMI indications are incorrect.
    - A Defective compass system.
      - A Check and repair compass system.
    - B Defective receiver
      - B Replace R-2023/ARN-123.
    - C If AN/ASN-175 is installed, defective NO. 2 BRG PTR switch.
      - C Replace switch.
    - D Defective wiring.
      - D Check and repair wiring.
  4. No received audio during VOR tests.
    - A Defective receiver.
      - A Replace R-2023/ARN-123.
    - B Defective control unit.
      - B Replace C-10048/ARN-123.
    - C Defective wiring.
      - C Check and repair wiring.
  5. During Localizer tests CDI course deviation bar does not move.
    - A Defective receiver.
      - A Replace R-2023/ARN-123.
    - B Defective CDI.
      - B Replace ID-1347()/ARN.
    - C Defective wiring.
      - C Check and repair wiring.
  6. During Glideslope tests CDI vertical deviation bar does not move.
    - A Defective receiver.
      - A Replace R-2023/ARN-123.
    - B Defective CDI.
      - B Replace ID-1347()/ARN.
    - C Defective glideslope antenna.
      - C Replace AS-3188/ARN.
    - D Defective wiring.
      - D Check and repair wiring.
  7. During MB tests marker beacon light does not illuminate and no audio tone.
    - A Defective receiver.
      - A Replace R-2023/ARN-123.
    - B Defective control unit.
      - B Replace C-10048/ARN-123.
    - C Defective MB antenna.
      - C Replace AT-6400/ARN.
    - D Defective wiring.
      - D Check and repair wiring.



### 39-10.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in VHF Navigation Set AN/ARN-123 and the preceding operational checks and troubleshooting charts do not indicate the source of trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-68, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.

#### 39-10.1.1 UH-1D/H and UH-1H Signal and Voltage Measurements (AVUM)

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB26 TB12	3,10 1	Ground Panel lighting	Not applicable CONSOLE PED LIGHTS circuit breaker energized	0 0-28Vdc
TB1	6	Stator Y error signal	AN/ARN-123 receiv- ing signal	400 Hz, 26 Vac maximum
TB1	7	Stator X error signal	AN/ARN-123 receiv- ing signal	400 Hz, 26 Vac maximum
TB20	7	Receive audio (UH-1D/H only)	AN/ARN-123 receiv- ing signal	Audio Hi
TB19	6	Receive audio (UH-1H only)	AN/ARN-123 receiv- ing signal	Audio Hi



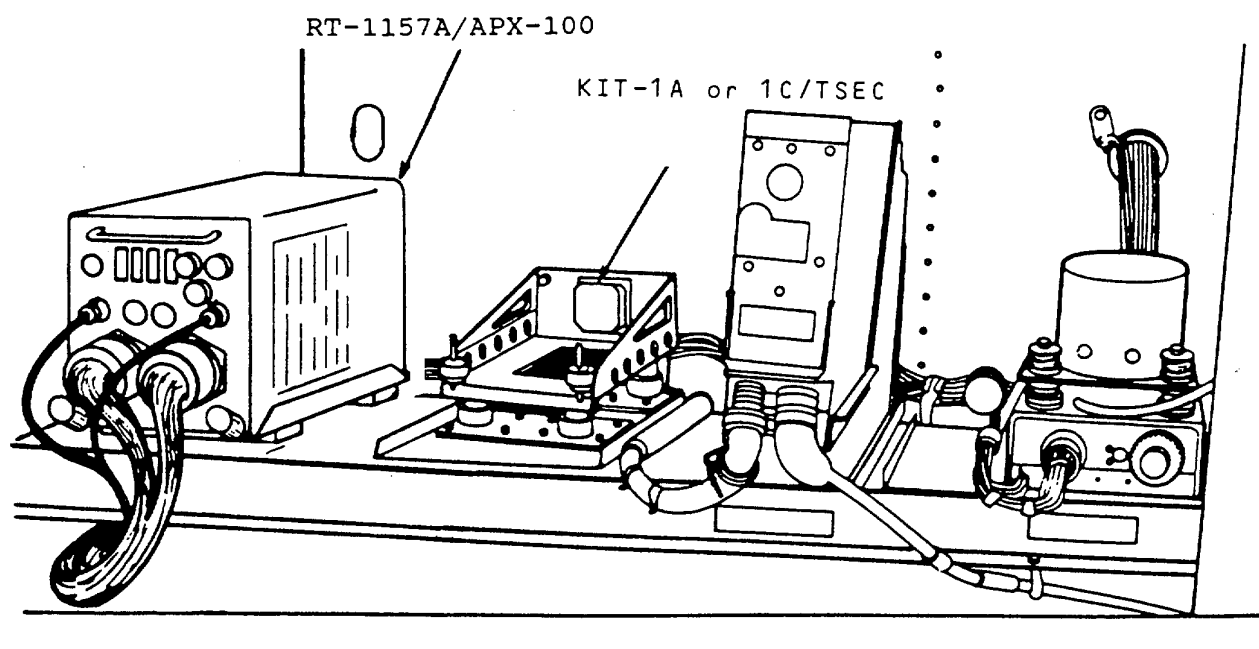
## CHAPTER 40

### TRANSPONDER SET AN/APX-100 MAINTENANCE (AVUM)

Subject	Para.	Page
Receiver Transmitter RT-1157A/APX-100 Maintenance (AVUM)	40-1	40-1
Mount MT-4811/APX-100 & Adapter Plate Maintenance (AVUM)	40-2	40-2
Control C-10533/APX-100 Maintenance (AVUM)	40-3	40-3
Computer KIT-1A/TSEC Maintenance (AVUM)	40-4	40-4
Mount MT-3949A/U Maintenance (AVUM)	40-5	40-4
Antenna AT-884/APX-44 Maintenance (AVUM)	40-6	40-4
Antenna AT-741/A Maintenance (AVUM) .....	40-7	40-5
Cabling and Connector Maintenance (AVUM)	40-8	40-6
Transponder Set AN/APX-100 Operational Checks (AVUM)	40-9	40-6
Transponder Set AN/APX-100 Troubleshooting (AVUM)	40-10	40-14

#### Section I. MAINTENANCE PROCEDURES

#### 40-1. RECEIVER TRANSMITTER RT-1157A/APX-100 MAINTENANCE (AVUM)



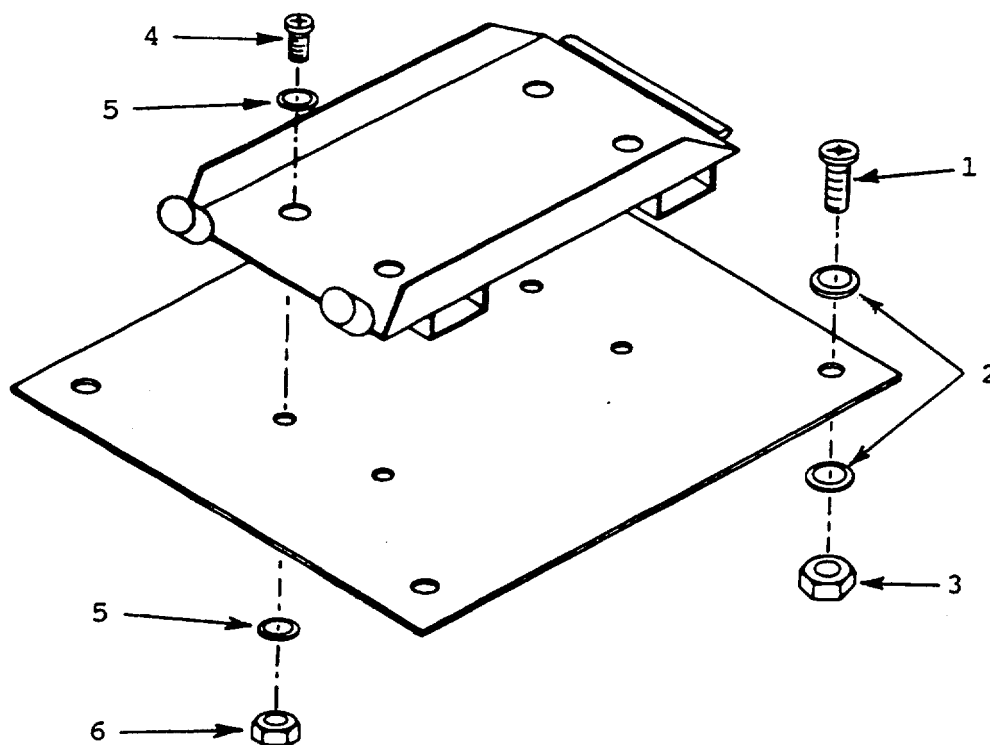


**40-1.1 Removal Instructions.**

- A Disconnect electrical connectors (1), and coaxial connectors (2) from front of RT-1157A/APX-100.
- B Loosen self-locking thumbnuts (3).
- C Slide receiver-transmitter forward to disengage rear retaining flange, then lift from mount.

**40-1.2 Installation Instructions.**

- A Position receiver-transmitter in mount and slide aft to engage rear retaining flange.
- B Tighten self-locking thumbnuts (3).
- C Connect electrical connectors (1), and coaxial connectors (2) to front of RT-1157A/APX-100.

**40-2. MOUNT MT-4811/APX-100 & ADAPTER PLATE MAINTENANCE (AVUM).**

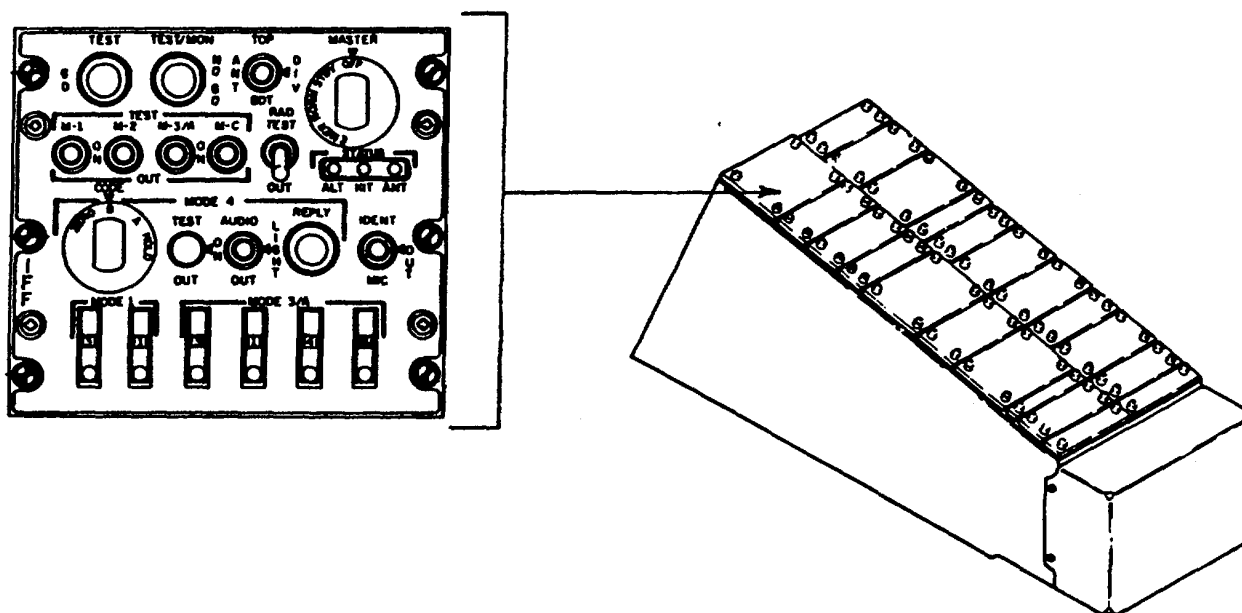


**40.2.1 Removal Instructions.**

- A Remove receiver-transmitter RT-1157A/APX-100 per paragraph 40-1.1.
- B Remove four screws (1), washers (2), and self-locking nuts (3) securing adapter plate and mount to aircraft shelf.
- C Remove adapter plate and mount from aircraft.
- D Remove four screws (4), washers (5), and self-locking nuts (6) and remove mount from adapter plate.

**40-2.2 Installation Instructions.**

- A Position mount on adapter plate and secure with four screws (4), washers (5), and self-locking nuts (6).
- B Position adapter plate and mount on aircraft shelf and secure with four screws (1), washers (2), and self-locking nuts (3).
- C Install receiver-transmitter RT-1157A/APX-100 per paragraph 40-1.2.

**40-3. CONTROL C-10533/APX-100 MAINTENANCE (AVUM).**



**40-3.1 Removal Instructions.**

- A Loosen four spring-lock fasteners.
- B Lift control from pedestal console and disconnect electrical connector from rear of control.
- C Remove control.

**40-3.2 Installation Instructions.**

- A Connect electrical connector to rear of control.
- B Position control in pedestal console and tighten four spring-lock fasteners.

**40-4. COMPUTER KIT-1A/TSEC MAINTENANCE (AVUM).**

Refer to Chapter 29 paragraph 29-4, for KIT-1A/TSEC maintenance.

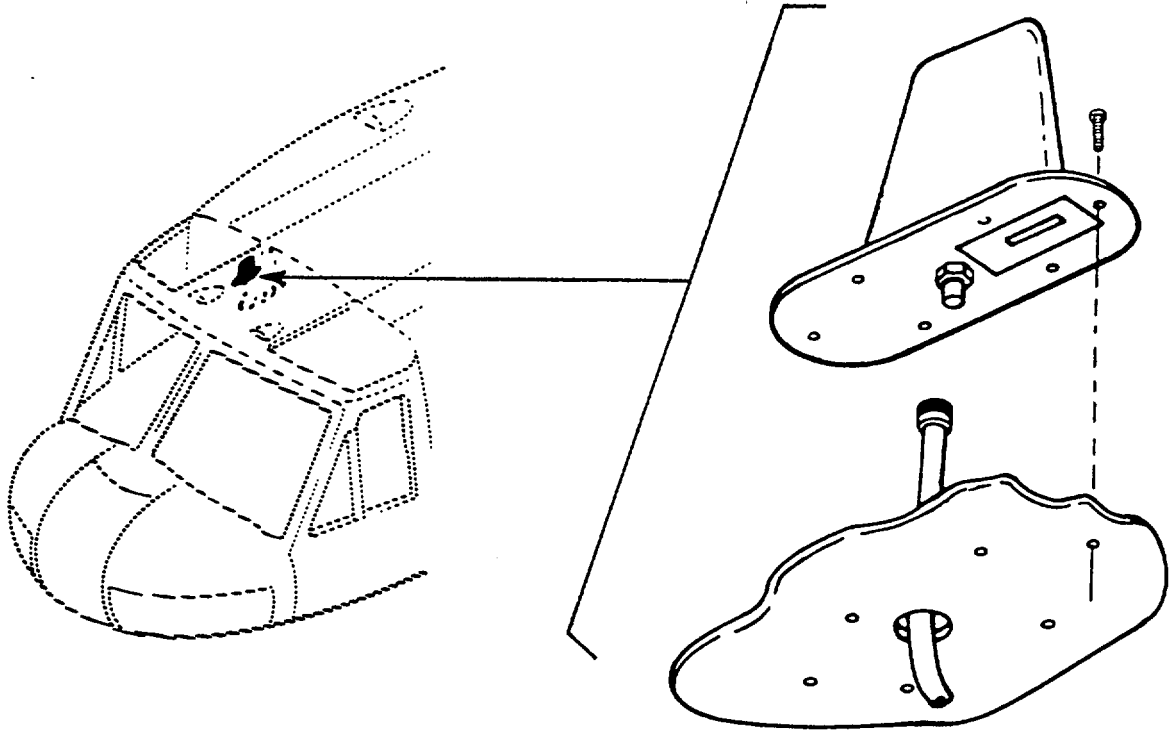
**40-5. MOUNT MT-3949A/U MAINTENANCE (AVUM).**

Refer to Chapter 29 paragraph 29-5, for MT-3949A/U maintenance.

**40-6. ANTENNA AT-884/APX-44 MAINTENANCE (AVUM).**

Refer to Chapter 29 paragraph 29-6, for AT-884/APX-44 maintenance.



**40-7. ANTENNA AT-741/A MAINTENANCE (AVUM).****40-7.1 Removal Instructions.**

- A From outside aircraft remove six screws securing antenna.
- B Carefully lift antenna from aircraft skin and disconnect coaxial cable.
- C Remove antenna.

**40-7.2 Installation Instructions.****NOTE**

Clean the antenna and aircraft mounting surface prior to installation.

- A Connect coaxial cable to antenna.
- B Position antenna in place and secure with six screws.
- C Apply a thin bead of RTV along outside edge of antenna.



#### 40-8. CABLING AND CONNECTOR MAINTENANCE (AVUM)

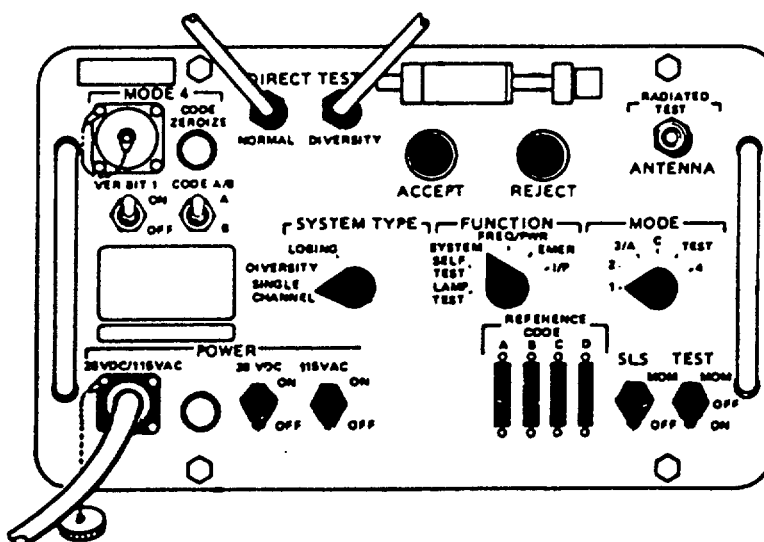
- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:

P1, P2, P3, P4, P8002, P311, P506, J506, P914, and J600.

- Refer to FO-69 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Chapter 2, paragraph 2-5, contains general wiring repair information.

#### Section II. OPERATIONAL CHECKS

#### 40-9. TRANSPONDER SET AN/APX-100 OPERATIONAL CHECKS (AVUM).





**40-9. TRANSPONDER SET AN/APX-100 OPERATIONAL CHECKS (AVUM).**

These checks are used to ensure Transponder Set AN/APX-100 is performing properly. The checks are also used after repair to make sure the problem was fixed.

**INITIAL SETUP:****Test Equipment**

AN/APM-378, IFF Test Set.  
MBIA, Pilot Static Test Set.

**Test Conditions**

Reference  
Chapter 1, para 1-50,  
Auxiliary Power Unit connected  
Chapter 9, para 14-13, Inter-  
communications Set operational

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER OFF CHECKS**

1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

1. Depress IFF APX-100, INTERCOM CPLT & CREW L, PLT & CREW R, AAU-31A ALT, and KIT-1A TSEC circuit breakers.
2. On transponder control panel, position **MASTER** switch to **STBY** for 2 minutes.  
**TEST/MON NO GO** lamp illuminates within 30 secs.
3. Position **MASTER** switch to **NORM**, and **ANT TOP/DIV/BOT** switch to **DIV**.

**TRANSPONDER SELF TEST**

4. Place and hold **M-1** switch to **TEST** position.  
TEST GO lamp illuminates.
5. Release **M-1** switch.  
TEST GO lamp extinguishes.
6. Repeat steps 4 & 5 for **M-2** and **M-3/A** switches.



# 40-9. TRANSPONDER SET AN/APX-100 OPERATIONAL CHECKS (AVUM).

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

#### NOTE

**TEST GO** lamp will illuminate when **M-C** switch is placed in **TEST** even when altimeter encoder is not installed.

7. Disconnect rf antenna cables J3 and J4 from IFF transponder.
8. Place and hold **M-1** switch to **TEST**.  
**TEST/MON NO GO** lamp and **STATUS ANT** lamp illuminate.
9. Release **M-1** switch.  
**TEST/MON NO GO** lamp and **STATUS ANT** lamp extinguish.
10. Repeat steps 8 & 9 for M-2 and M-3/A switches.

### AN/APM-378 SELF TEST

11. Connect test set (AN/APM-378) rf cables to IFF transponder. **NORMAL** to **J3** and **DIVERSITY** to **J4**.
12. Apply either 28 Vdc or 115 Vac (60 or 400 Hz) to test set and set **POWER** switch to **ON**.
13. Position test set switches and controls as follows:

<b>SYSTEM TYPE</b>	<b>SINGLE CHANNEL</b>
<b>FUNCTION</b>	<b>SELF TEST</b>
<b>REFERENCE CODE dials</b>	<b>0000</b>
<b>A, B, C, D</b>	
<b>SLS</b>	<b>OFF</b>
<b>TEST</b>	<b>ON</b>
<b>MODE</b>	<b>1</b>

Test set **ACCEPT** lamp illuminates.

14. Position test set **MODE** switch to **2**.  
Test set **ACCEPT** lamp illuminates.
15. Position test set **MODE** switch to **3/A**.  
Test set **ACCEPT** lamp illuminates.
16. Position test set **MODE** switch to **C**.  
Test set **ACCEPT** lamp illuminates.
17. Position test set **MODE** switch to **TEST**.  
Test set **ACCEPT** lamp illuminates.



**40-9. TRANSPONDER SET AN/APX-100 OPERATIONAL CHECKS (AVUM).****PROCEDURE****NORMAL INDICATIONS****REMARKS**

18. Position test set **FUNCTION** switch to **SYSTEM** and repeat steps 14, 15, 16, and 17.  
Test set **ACCEPT** lamp illuminates.
19. Position test set **SLS** switch to **MOM**, and **MODE** switch to 1, 2, and 3/A successively.  
Test set **ACCEPT** lamp illuminates.

**OPERATIONAL CHECKS****NOTE**

Confine **EMERGENCY** position and codes **7600** or **7700** in either modes **2** or **3/A** to closed loop testing. Code **7600** signifies a communications failure and code **7700** signifies an aircraft in distress.

20. On transponder control panel, position switches as follows:
- |            |     |
|------------|-----|
| M-1 TEST   | ON  |
| M-2 TEST   | ON  |
| M-3/A TEST | ON  |
| M-C TEST   | ON  |
| RAD TEST   | OUT |
| IDENT      | OUT |
| ANT        | BOT |
21. Position test set **MODE** switch to **1**, and **REFERENCE CODE** dials to **7300**.  
Test set **REJECT** lamp illuminates.
22. On transponder control panel, position **MODE 1** code dials to **73**.  
Test set **ACCEPT** lamp illuminates.
23. Position test set **MODE** switch to **2**, and **REFERENCE CODE** dials to **7777**.  
Test set **REJECT** lamp illuminates.
24. Position transponder **MODE 2** code dials to **7777** (located on front of receiver-transmitter).  
Test set **ACCEPT** lamp illuminates.
25. Position test set **MODE** switch to **3/A**.  
Test set **REJECT** lamp illuminates.



**40-9. TRANSPONDER SET AN/APX-100 OPERATIONA CHECKS (AVUM)-Continued**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

26. On transponder control panel, position **MODE 3/A** code dials to **7777**.  
Test set **ACCEPT** lamp illuminates.
27. Position test set **MODE** switch to **TEST**.  
Test set **REJECT** lamp illuminates.
28. Place and hold transponder control panel **RAD TEST** switch to **TEST**.  
Test set **ACCEPT** lamp illuminates.
29. Release **RAD TEST** switch and position all **CODE** dials to **0000**.
30. Position test set **FUNCTION** switch to **FREQ PWR**, and **MODE** switch to **1, 2, and 3/A**,  
Test set **ACCEPT** lamp illuminates in each mode.
31. Repeat steps 27, 28, and 29.
32. Position test set **FUNCTION** switch to **EMER** and **MODE** switch to **1**.  
Test set **REJECT** lamp illuminates.
33. On transponder control panel, position **M-1, M-2, and M-3/A** switches to **OUT** and **MASTER** switch to **EMER**.  
Test set **ACCEPT** lamp illuminates.
34. Position test set **MODE** switch to **2**.  
Test set **ACCEPT** lamp illuminates.
35. Position test set **MODE** switch to **M-3/A** and **REFERENCE CODE** dials to **7700**.  
Test set **ACCEPT** lamp illuminates.
36. Position test set **REFERENCE CODE** dials to **0000**, **FUNCTION** switch to **I/P** and **MODE** switch to **1**.
37. On transponder control panel, position **MASTER** switch to **NORM** and **M-1, M-2, and M-3/A** switches to **ON**.
38. On transponder control panel, momentarily position **IDENT** switch to **IDENT**.  
Test set **ACCEPT** lamp illuminates for 15 to 30 seconds.
39. Position test set **MODE** switch to **2** then **3/A** and repeat step 38.  
Test set **ACCEPT** lamp illuminates for 15- to 30 seconds.
40. Position test set **TEST** switch to **OFF**.



**40-9. TRANSPONDER SET AN/APX-100 OPERATIONA CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

- 
41. Position test set **SYSTEM TYPE** switch to **DIVERSITY**, **FUNCTION** switch to **SYSTEM**, **MODE** switch to **1**, and **TEST** switch to **ON**.
  42. On transponder control panel, position **ANT TOP/DIV/BOT** switch to **DIV**.  
Test set **ACCEPT** lamp illuminates.
  43. Remove rf cable from test set rf **NORMAL** connector.  
Test set **REJECT** lamp illuminates.
  44. Connect rf cable to test set rf **NORMAL** connector.  
Test set **ACCEPT** lamp illuminates.
  45. Remove rf cable from test set rf **DIVERSITY** connector.  
Test set **ACCEPT** lamp illuminates.
  46. Connect rf cable to test set rf **DIVERSITY** connector.  
Test set **ACCEPT** lamp illuminates.

**MODE C CHECKS**

47. Position test set switches and controls as follows:

<b>FUNCTION</b>	<b>SYSTEM</b>
<b>REFERENCE CODE</b>	<b>0000</b>
<b>A, B, C, D</b>	
<b>SLS</b>	<b>OFF</b>
<b>MODE</b>	<b>C</b>

48. On transponder control panel, position switches as follows:

<b>MASTER</b>	<b>NORM</b>
<b>M-1</b>	<b>ON</b>
<b>M-2</b>	<b>ON</b>
<b>M-3/A</b>	<b>ON</b>
<b>MODE 4</b>	<b>ON</b>
<b>M-C</b>	<b>ON</b>
<b>MODE 1 code</b>	<b>00</b>
<b>MODE 3/A code</b>	<b>0000</b>

**NOTE**

Use Pitot Static System Test Set (TM-55-4920-231-14) to establish required test altitudes as indicated on altimeter-encoder AAU-31A.



**40-9. TRANSPONDER SET AN/APX-100 OPERATIONA CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

49. Position test set **REFERENCE CODE** dials **A, B, C,** and **D** with reply code which corresponds to altitude displayed on **AAU-31A**.

Test set **ACCEPT** lamp illuminates.

Refer to chart below to convert **ALTITUDE**  
to **REPLY CODE**.

ALTITUDE (ft)	REPLY CODE				ALTITUDE (ft)	REPLY CODE			
	A	B	C	D		A	B	C	D
000 .....	0	6	2	0	3,500 .....	4	5	2	0
100 .....	0	6	3	0	3,600 .....	4	5	6	0
200 .....	0	6	1	0	3,700 .....	4	5	4	0
300 .....	0	2	1	0	3,800 .....	4	7	4	0
400 .....	0	2	3	0	3,900 .....	4	7	6	0
500 .....	0	2	2	0	4,000 .....	4	7	2	0
600 .....	0	2	6	0	4,100 .....	4	7	3	0
700 .....	0	2	4	0	4,200 .....	4	7	1	0
800 .....	0	3	4	0	4,300 .....	4	3	1	0
900 .....	0	3	6	0	4,400 .....	4	3	3	0
1,000 .....	0	3	2	0	4,500 .....	4	3	2	0
1,100 .....	0	3	3	0	4,600 .....	4	3	6	0
1,200 .....	0	3	1	0	4,700 .....	4	3	4	0
1,300 .....	0	7	1	0	4,800 .....	4	2	4	0
1,400 .....	0	7	3	0	4,900 .....	4	2	6	0
1,500 .....	0	7	2	0	5,000 .....	4	2	2	0
1,600 .....	0	7	6	0	5,100 .....	4	2	3	0
1,700 .....	0	7	4	0	5,200 .....	4	2	1	0
1,800 .....	0	5	4	0	5,300 .....	4	6	1	0
1,900 .....	0	5	6	0	5,400 .....	4	6	3	0
2,000 .....	0	5	2	0	5,500 .....	4	6	2	0
2,100 .....	0	5	3	0	5,600 .....	4	6	6	0
2,200 .....	0	5	1	0	5,700 .....	4	6	4	0
2,300 .....	0	1	1	0	5,800 .....	4	4	4	0
2,400 .....	0	1	3	0	5,900 .....	4	4	6	0
2,500 .....	0	1	2	0	6,000 .....	4	4	2	0
2,600 .....	0	1	6	0	6,100 .....	4	4	3	0
2,700 .....	0	1	4	0	6,200 .....	4	4	1	0
2,800 .....	4	1	4	0	6,300 .....	4	0	1	0
2,900 .....	4	1	6	0	6,400 .....	4	0	3	0
3,000 .....	4	1	2	0	6,500 .....	4	0	2	0
3,100 .....	4	1	3	0	6,600 .....	4	0	6	0
3,200 .....	4	1	1	0	6,700 .....	4	0	4	0
3,300 .....	4	5	1	0	6,800 .....	6	0	4	0
3,400 .....	4	5	3	0	6,900 .....	6	0	6	0



**40-9. TRANSPONDER SET AN/APX-100 OPERATIONA CHECKS (AVUM)-Continued****PROCEDURE****NORMAL INDICATIONS****REMARKS**

ALTITUDE (ft)	REPLY CODE				ALTITUDE (ft)	REPLY CODE			
	A	B	C	D		A	B	C	D
7,000 .....	6	0	2	0	8,700 .....	6	2	4	0
7,100 .....	6	0	3	0	8,800 .....	6	3	4	0
7,200 .....	6	0	1	0	8,900 .....	6	3	6	0
7,300 .....	6	4	1	0	9,000 .....	6	3	2	0
7,400 .....	6	4	3	0	9,100 .....	6	3	3	0
7,500 .....	6	4	2	0	9,200 .....	6	3	1	0
7,600 .....	6	4	6	0	9,300 .....	6	7	1	0
7,700 .....	6	4	4	0	9,400 .....	6	7	3	0
7,800 .....	6	6	4	0	9,500 .....	6	7	2	0
7,900 .....	6	6	6	0	9,600 .....	6	7	6	0
8,000 .....	6	6	2	0	9,700 .....	6	7	4	0
8,100 .....	6	6	3	0	9,800 .....	6	5	4	0
8,200 .....	6	6	1	0	9,900 .....	6	5	6	0
8,300 .....	6	2	1	0	10,000 .....	6	5	2	0
8,400 .....	6	2	3	0	10,100 .....	6	5	3	0
8,500 .....	6	2	2	0	10,200 .....	6	5	1	0
8,600 .....	6	2	6	0					

50. Position test set **POWER** switch to **OFF**.

**NOTE**

The following steps can be done only with the **MARK XII** computer installed.

51. On transponder control panel, position **MODE 4 CODE** switch to **A**.
52. Load an assigned test code in the **MARK XII** computer.
53. On transponder control panel, position **MODE 4 AUDIO/LIGHT/OUT** switch to **OUT**. Place and hold **MODE 4 TEST/ON/OUT** switch to **TEST**, then release.  
 Transponder **TEST GO** lamp illuminates, **MODE 4 REPLY** lamp and **KIT STATUS** lamp do not illuminate.
54. On transponder control panel, position **MASTER** switch to **OFF**.



### Section III. TROUBLESHOOTING

#### 40-10. TRANSPONDER SET AN/APX-100 TROUBLESHOOTING (AVUM).

- The table below is provided to assist maintenance personnel in locating malfunctions in Transponder Set AN/APX-100.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 40-9.

SYMPTOM		PROBABLE CAUSE	CORRECTIVE ACTION
1.	Transponder set will not energize.	A Defective circuit breaker.	A Replace circuit breaker.
		B Defective control panel.	B Replace C-10533/APX-100.
		C Defective wiring.	C Repair or replace wiring as required.
2.	No output in any mode.	A Defective control panel.	A Replace C-10533/APX-100.
		B Defective fuse in RT-1157A/APX-100.	B Replace fuse.
		C Defective receiver-transmitter.	C Replace RT-1157A/APX-100.
3.	Output low or intermittent in any or all modes.	A Defective receiver-transmitter.	A Replace RT-1157A/APX-100.



#### 40-10. TRANSPONDER SET AN/APX-100 TROUBLESHOOTING (AVUM) - Continued.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
4. STATUS ANT lamp on transponder control panel illuminates in self-test mode.	<div>A Defective control panel</div> <div>A Replace C-10533/APX-100.</div> <div>B Defective antenna or coaxial cable.</div> <div>B Repair or replace.</div>	
5. STATUS KIT lamp on transponder control panel illuminates when mode 4 is operated.	<div>A Defective Mark XII computer.</div> <div>A Replace Mark XII computer.</div> <div>B Defective transponder control panel.</div> <div>B Replace C-10533/APX-100.</div> <div>C Defective receiver-transmitter.</div> <div>C Replace RT-1157A/APX-100.</div> <div>D Defective wiring.</div> <div>D Repair wiring.</div>	

##### 40-10.1 Signal and Voltage Measurements (AVUM).

- If a trouble develops in Transponder Set AN/APX-100 and the preceding operational checks and troubleshooting charts do not indicate the source of trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-69, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.



**40-10.1.1 UH-1D/H Signal and Voltage Measurements (AVUM)**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	3	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized.	0-28 Vdc
TB19	1,2	Primary power	AN/APX-100 energized.	28 Vdc
TB19	1	IFF Audio	AN/APX-100 energized and receiving signal	Audio Hi
TB26	6,7,8	Ground	Not applicable	0

**40-10.1.2 UH-1H Signal and Voltage Measurements (AVUM)**

<b>TB or P</b>	<b>Terminal</b>	<b>Terminal function</b>	<b>Equipment operation</b>	<b>Voltage</b>
TB12	6	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized.	0-28 Vdc
TB26	7,8	Ground	Not applicable.	0
TB19	1	Primary power	AN/APX-100 energized.	28 Vdc
TB20	9	IFF Audio	AN/APX-100 energized and receiving signal.	Audio Hi

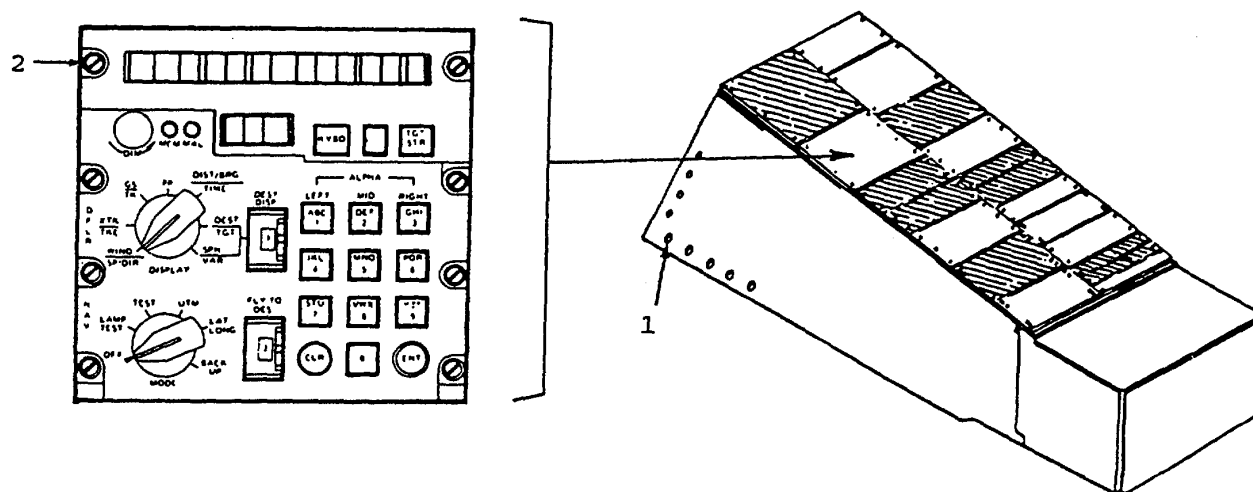


# **CHAPTER 41** **DOPPLER NAVIGATION SET AN/ASN-128 MAINTENANCE**

Subject	Para.	Page
Computer Display Unit CP-1252/ASN-128 Maintenance (AVUM)	41-1	41-1
Signal Data Converter CV-3338/ASN-128 Maintenance (AVUM)	41-2	41-2
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HSI ID-2103/A Maintenance (AVUM)	41-4	41-5
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Doppler Navigation Set AN/ASN-128 Troubleshooting (AVUM)	41-9	41-15

## **Section I. MAINTENANCE PROCEDURES**

### **41-1. COMPUTER DISPLAY UNIT CP-1252/ASN-128 MAINTENANCE (AVUM).**



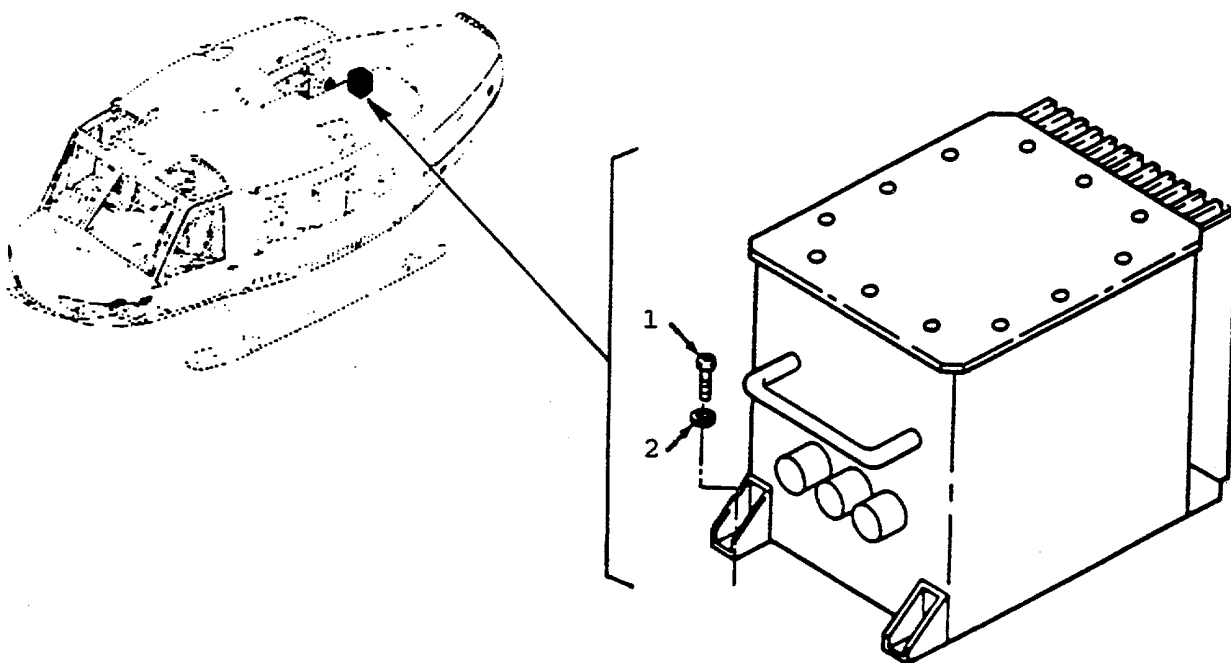


**41-1.1 Removal Instructions.**

- A Remove side panel from pedestal console by removing screws (1).
- B Reach inside pedestal console and disconnect electrical connectors from CDU.
- C Loosen eight spring-lock fasteners (2).
- D Lift CDU out of pedestal console.

**41-1.2 Installation Instructions.**

- A Position CDU in pedestal console.
- B Connect electrical connectors to rear of CDU.
- C Tighten eight spring-lock fasteners (2).
- D Replace pedestal side panel and secure with screws (1).

**41-2. SIGNAL DATA CONVERTER CV-3338/ASN-128 MAINTENANCE (AVUM).**



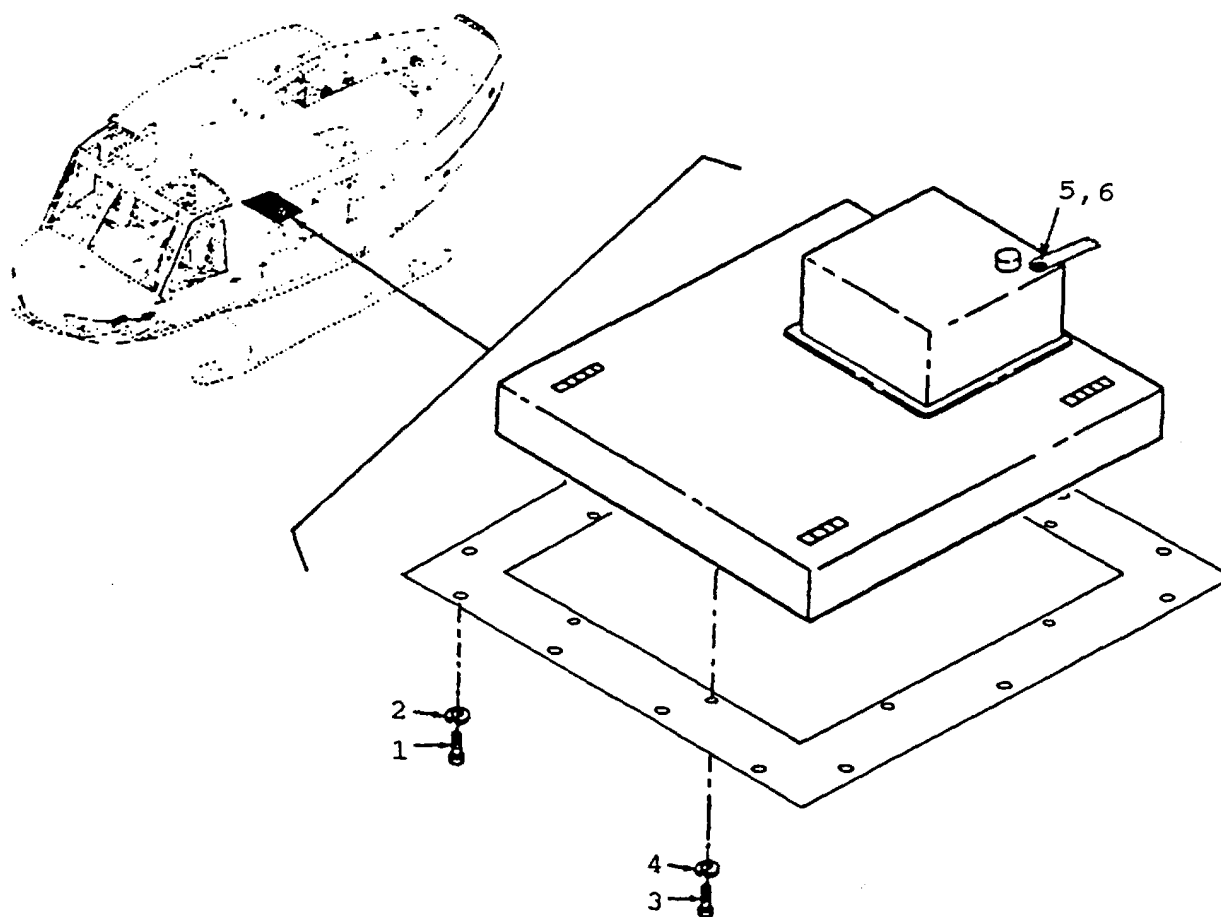
#### 41-2.1 Removal Instructions.

- A Disconnect electrical connectors from SDC.
- B Remove four screws (1) and washers (2) securing SDC to aircraft shelf.
- C Remove SDC.

#### 41-2.2 Installation Instructions.

- A Position SDC in place and secure with four screws (1) and washers (2).
- B Connect electrical connectors to SDC.

#### 41-3. RECEIVER-TRANSMITTER ANTENNA RT-1193/ASN-128 & ADAPTER PLATE MAINTENANCE (AVUM).





#### 41-3.1 Removal Instructions.

- A From underside of aircraft remove thirteen screws (1) and washers (2) securing Adapter Plate - RTA assembly to aircraft.

#### **CAUTION**

Carefully lower Adapter Plate - RTA assembly to prevent damage to electrical harness.

- B Lower Adapter Plate - RTA assembly and disconnect electrical connector.
- C Remove screw (5) and washer (6) securing bonding strap to RTA.
- D Remove eight screws (3) and washers (4) securing RTA to Adapter Plate.
- E Remove RTA.

#### 41-3.2 Installation Instructions.

- A Position RTA on Adapter Plate and secure with eight screws (3) and washers (4).

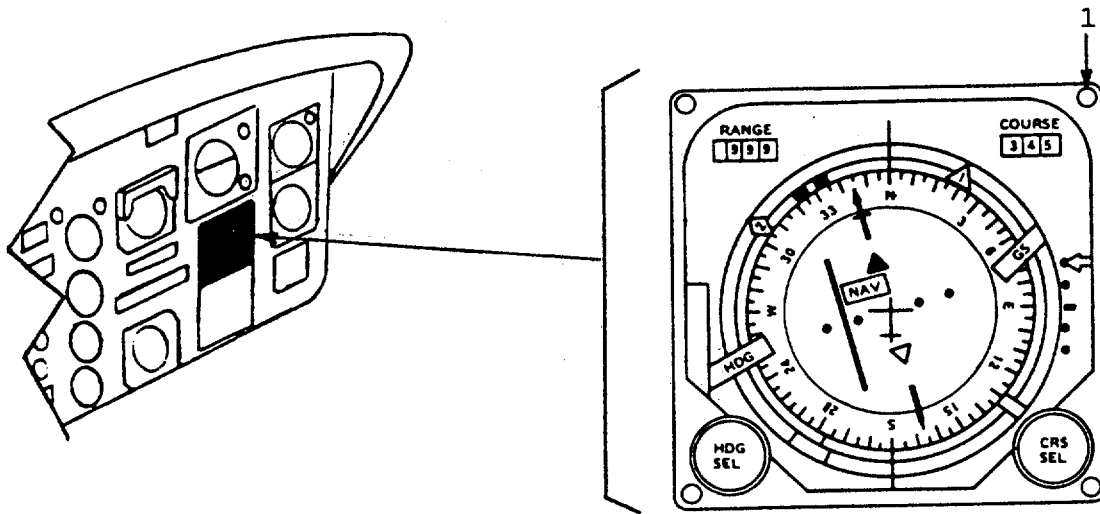
#### **CAUTION**

When mounting RTA to Adapter Plate be careful not to damage alignment pins on RTA or mating holes of Adapter Plate.

- B Secure bonding strap to RTA with screw (5) and washer (6).
- C Position Adapter Plate - RTA assembly in place and connect electrical connector.
- D Secure Adapter Plate - RTA assembly to aircraft with thirteen screws (1) and washers (2).



**41-4. HSI ID-2103/A MAINTENANCE (AVUM).**



**41-4.1 Removal Instructions.**

- A** Remove four screws (1) that secure HSI to instrument panel.

**CAUTION**

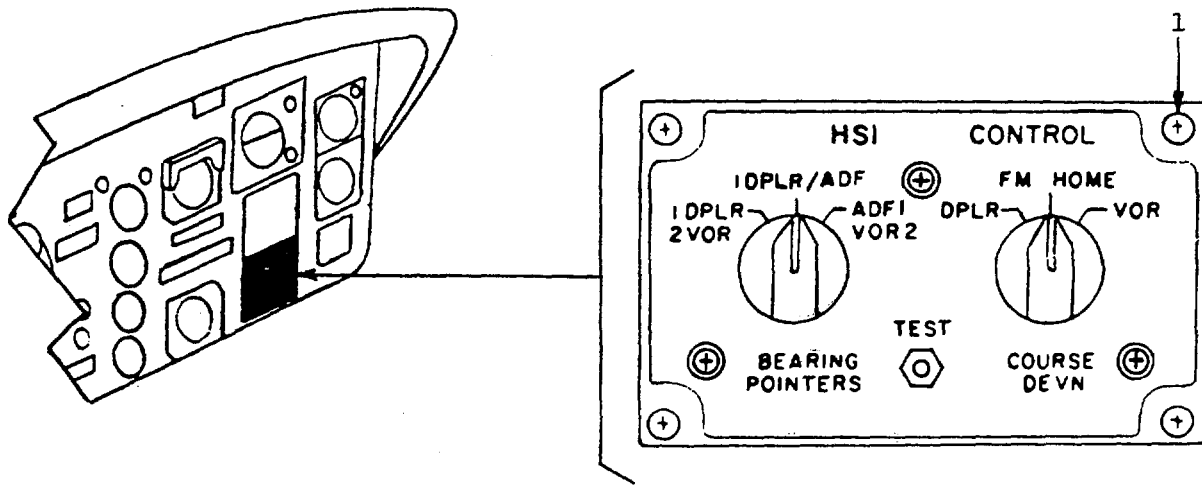
Be careful not to pull HSI so far from instrument panel to cause damage to electrical wiring or connector.

- B** Slide HSI out of instrument panel and disconnect electrical connector from rear of indicator.
- C** Remove HSI.

**41-4.2 Installation Instructions.**

- A** Position HSI near instrument panel and connect electrical connector to rear of HSI.
- B** Slide HSI into instrument panel and secure with four screws (1).



**41-5. HSI CONTROL C-11740/A MAINTENANCE (AVUM).****41-5.1 Removal Instructions.**

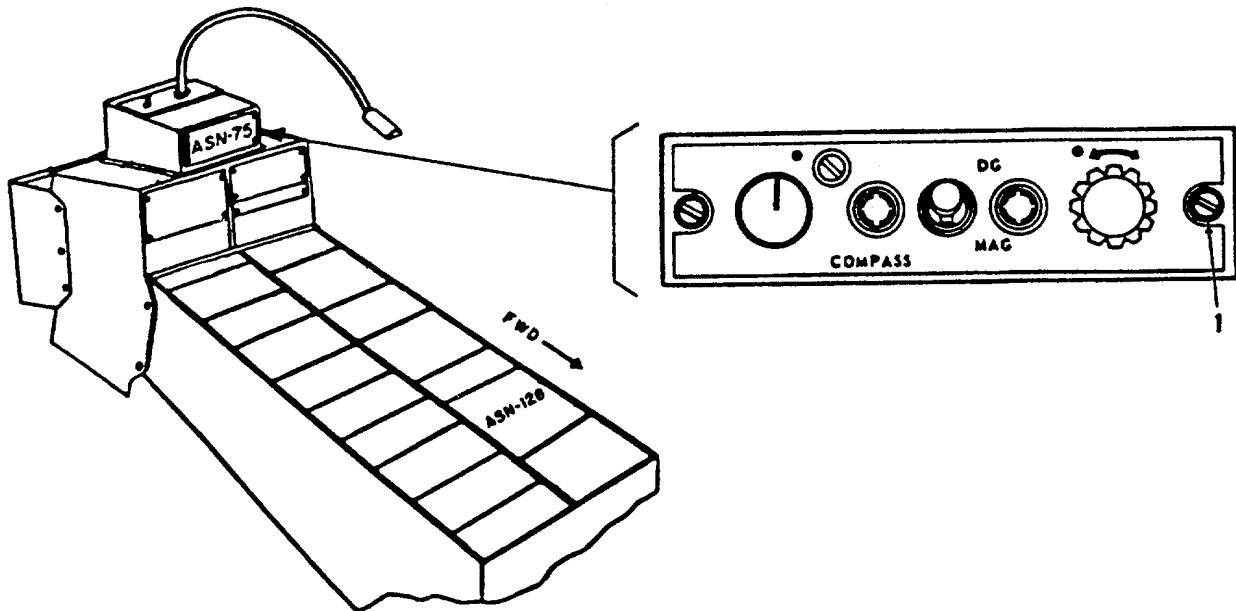
- A Reach behind instrument panel, on right side, and disconnect electrical connector on HSI and three electrical connectors on HSI Control.
- B Remove four screws (1) that secure HSI Control to instrument panel.
- C Slide HSI Control out of instrument panel and remove.

**41-5.2 Installation Instructions.**

- A Slide HSI Control into instrument panel and secure with four screws (1).
- B Reach behind instrument panel and connect electrical connector to HSI and three electrical connectors to HSI Control.



41-6. COMPASS CONTROLLER C-8021A/ASN-75 MAINTENANCE (AVUM).



41-6.1 Removal Instructions

- A Loosen two spring-lock fasteners securing Compass controller to pedestal extension

**CAUTION**

Be careful not to pull Compass Controller so far from pedestal to cause damage to electrical wiring or connector.

- B Pull Compass Controller out of pedestal extension and disconnect electrical connector from rear of control.
- C Remove control.

41-6.2 Installation Instructions.

- A Position Compass Controller near pedestal extension and connect electrical connector to rear of control.
- B Place control in pedestal console and tighten two spring-lock fasteners.



#### 41-7. CABLING AND CONNECTOR MAINTENANCE (AVUM).

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:
- Refer to FO-70 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by replacing connectors or coaxial cable.
- Chapter 2, paragraph 2-5, contains general wiring repair information.

### Section II. OPERATIONAL CHECKS

#### 41-8. DOPPLER NAVIGATION SET AN/ASN-128 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Doppler Navigation Set AN/ASN-128 is performing properly. The checks are also used after repair to make sure the problem was fixed.

#### INITIAL SETUP

##### Equipment Conditions

Reference  
Chapter 1, paragraph 1-50, Auxiliary Power Unit connected.

---

#### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

---

#### POWER OFF CHECKS

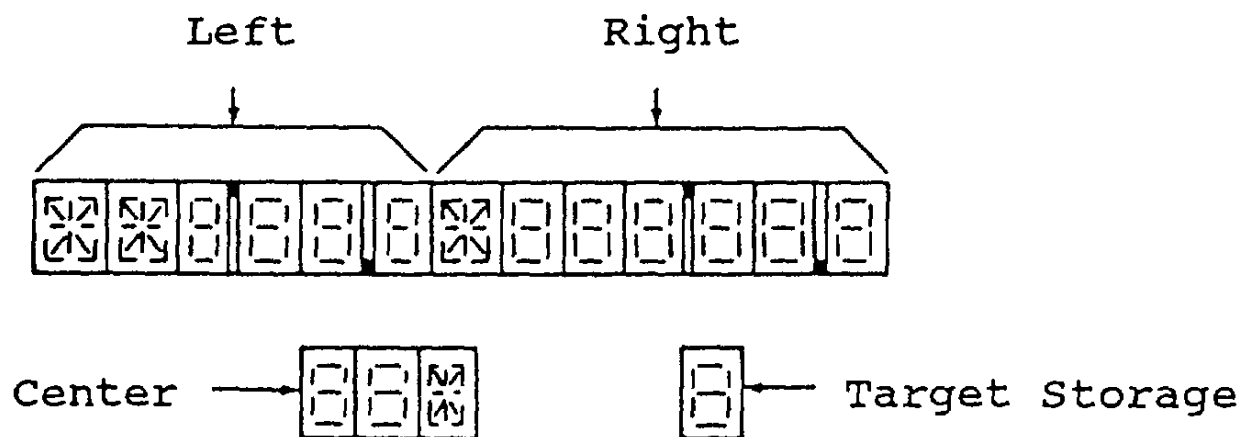
1. Check that all components are installed, securely mounted and safety wired (if required).
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.



## 41-8. DOPPLER NAVIGATION SET AN/ASN-128 OPERATIONAL CHECKS (AVUM)-CONT.

**PROCEDURE****NORMAL INDICATIONS****REMARKS****POWER ON CHECKS**

1. Depress AN/ASN-128, HSI, GYRO CMPS, ATTD GYRO, COURSE IND and PED 5V LIGHTS circuit breakers.
2. Position inverter switch to MAIN.
3. Rotate PED CONSOLE LIGHTS rheostat fully clockwise.  
Computer Display Unit (CDU) edge lighting, TGT STOR, KYBD, CLR, ENTR, FLY-TO-DEST, DEST DISP, and all keyboard pushbuttons are illuminated.
4. On CDU, pull up and rotate MODE switch to LAMP TEST.  
MEM and MAL indicator lamps are illuminated. Left, right, center, and target storage indicator displays are illuminated as shown.

**NOTE**

If EN is displayed on computer display unit KYBD pushbutton must be depressed.

5. Rotate MODE switch to TEST  
Ignore the random displays which may appear for up to 15 seconds. After approximately 15 seconds, the first two character positions in left display will display GO.

**NOTE**

If BU, MN, or NG, are displayed recycle the CDU MODE switch to OFF then back to TEST. In some cases a momentary failure may occur during initial turn on.



**41-8. DOPPLER NAVIGATION SET AN/ASN-128 OPERATIONAL CHECKS (AVUM)-CONT.****PROCEDURE****NORMAL INDICATIONS****REMARKS****NOTE**

The following procedures verify operation of CDU front panel switches and controls. In the following displays the letter A indicates any letter is acceptable in this location, and the letter X indicates any number is acceptable.

6. Rotate MODE switch to UTM, and DISPLAY switch to WIND SP/DIR.  
Two asterisks are displayed, one in left display and one in right display.
7. Rotate DISPLAY switch to XTK/TKE.  
Left and right displays will indicate as shown.

Left  
↓  
R or L XXX.X

Right  
↓  
R or L XXX°.

**NOTE**

Left display may indicate an asterisk (\*).

8. Rotate DISPLAY switch to PP.  
Left, right, and center displays will indicate as shown.

Left  
↓  
AAXXXX

Right  
↓  
XXXX

Center  
↓  
XXA

9. Rotate DISPLAY switch to DEST/TGT, and DEST DISP thumbwheel to P.  
Left, right, and center displays will indicate as shown.

Left  
↓  
AAXXXX

Right  
↓  
XXXX

Center  
↓  
XXA



**41-8. DOPPLER NAVIGATION SET AN/ASN-128 OPERATIONAL CHECKS (AVUM)-CONT.****PROCEDURE****NORMAL INDICATIONS****REMARKS**

10. Rotate MODE switch to LAT/LONG.  
Left and right displays will indicate as shown.

Left  
↓  
N or S XX°XX.X

Right  
↓  
E or W XXX°XX.X

11. Rotate MODE switch to BACKUP.  
Left, right, and center displays will indicate as shown.

Left  
↓  
AAXXX

Center  
↓  
XXA

Right  
↓  
XXXX

12. Rotate DISPLAY switch to SPH/VAR.  
Left and right displays will indicate as shown.

Left  
↓  
AAO or AA6

Right  
↓  
E or W XXX.X

13. Rotate DISPLAY switch to DEST/TGT, and DEST DISP thumbwheel to P.

14. Press KYBD pushbutton twice, and then keys 1, 2, 4, and 6.  
Center display indicates 12L.

15. Press CLR pushbutton.  
Center display indicates 12.

16. Press keys 2 and 1.  
Center display indicates 12D.

17. Press CLR pushbutton twice.  
Center display blanks.

18. Press KYBD pushbutton and keys 2, 1, 4, 6, 5, 6, 7, 8, 9, 0, 1, and 2.  
Left and right displays will indicate as shown.

Left  
↓  
DL 5678

Right  
↓  
9012



**41-8. DOPPLER NAVIGATION SET AN/ASN-128 OPERATIONAL CHECKS (AVUM)-CONT.****PROCEDURE****NORMAL INDICATIONS****REMARKS**

19. Rotate DISPLAY switch to GS/TK. Press the following pushbuttons and keys in the given order: KYBD twice, 0, 0, 0, KYBD, 0, 0, 0, and ENT.  
Left and right displays will indicate as shown.

Left  
↓  
000

Right  
↓  
0000

20. Rotate DISPLAY switch to SPH/VAR. Press the following pushbuttons and keys in the given order: KYBD twice, 1, 3, 4, 6, 0, KYBD, 2, 2, 0, 0, 0, 0, and ENT.  
Left and right displays will indicate as shown.

Left  
↓  
CL0

Right  
↓  
E000.0

21. Rotate DISPLAY switch to DEST/TGT. Set DEST DISP thumbwheel to P. Press the following pushbuttons and keys in the given order: KYBD twice, 3, 1, 5, 5, KYBD, 2, 2, 5, 4, 0, 0, 0, 0, 0, 0, 0, 0, and ENT.  
Left, right, and center displays will indicate as shown.

Left  
↓  
EM0000

Right  
↓  
0000

Center  
↓  
31N

22. Set DEST DISP thumbwheel to 1. Press the following pushbuttons and keys in the given order: KYBD twice, 3, 1, 5, 5, KYBD, 2, 2, 4, 6, 0, 0, 0, 0, 9, 0, 0, 0, and ENT.  
Left, right, and center displays will indicate as shown.

Left  
↓  
EL0000

Right  
↓  
0000

Center  
↓  
31N



**41-8. DOPPLER NAVIGATION SET AN/ASN-128 OPERATIONAL CHECKS (AVUM)-CONT.****PROCEDURE****NORMAL INDICATIONS****REMARKS**

- 
23. Press KYBD, set DEST DISP thumbwheel to 3, and press ENT.  
Same as step 22.
24. Press KYBD, set DEST DISP thumbwheel to 5, and press ENT.  
Same as step 22.
25. Press KYBD, set DEST DISP thumbwheel to 7, and press ENT.  
Same as step 22.
26. Press KYBD, set DEST DISP thumbwheel to 9, and press ENT.  
Same as step 22.
27. Set DEST DISP thumbwheel to H. Press the following pushbuttons and keys in the given order: KYBD twice, 3, 1, 5, 5, KYBD, 2, 1, 5, 4, 6, 5, 3, 6, 2, 0, 0, 0, and ENT.  
Left, right, and center displays will indicate as shown.
- Left

↓

DM6536

Center

↓

31N

Right

↓

2000
28. Press KYBD, set DEST DISP thumbwheel to 2, and press ENT.  
Same as step 27.
29. Press KYBD, set DEST DISP thumbwheel to 4, and press ENT.  
Same as step 27.
30. Press KYBD, set DEST DISP thumbwheel to 6, and press ENT.  
Same as step 27.
31. Press KYBD, set DEST DISP thumbwheel to 8, and press ENT.  
Same as step 27.
32. Press KYBD, set DEST DISP thumbwheel to 0, and press ENT.  
Same as step 27.



**41-8. DOPPLER NAVIGATION SET AN/ASN-128 OPERATIONAL CHECKS (AVUM)-CONT.**

**PROCEDURE**

**NORMAL INDICATIONS**

**REMARKS**

33. Rotate DISPLAY switch to DIST/BRG/TIME. Set FLY-TO-DEST thumbwheel to 1, 3, 5, 7, and 9.  
At each position left, right, and center displays indicate as shown.

Left  
↓  
010.0

Right  
↓  
180°

Center  
↓  
\*

34. Set FLY-TO-DEST thumbwheel to H, 2, 4, 6, 8, and 0.  
At each position left, right, and center displays indicate as shown.

Left  
↓  
040.0

Right  
↓  
3000

Center  
↓  
\*

35. Set DEST DISP thumbwheel to number displayed in target storage indicator. Rotate DISPLAY switch to DEST/TGT and press TGT/STR pushbutton.  
Left, right, and center displays will indicate as shown.

Left  
↓  
EM0000

Right  
↓  
0000

Center  
↓  
31N

36. Rotate MODE switch to OFF.



## Section III. TROUBLESHOOTING

## 41-9.DOPPLER NAVIGATION SET AN/ASN-128 TROUBLESHOOTING (AVUM).

- The table below is provided to assist maintenance personnel in locating malfunctions in Doppler Navigation Set AN/ASN-128.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.
- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform operational checks described in paragraph 41-8.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. MAL and MEM lights do not come on when MODE switch is set to LAMP TEST.	<p><b>A</b> Open or defective circuit breaker.</p> <p><b>A</b> Reset or replace circuit breaker.</p> <p><b>B</b> Defective Computer Display Unit.</p> <p><b>B</b> Replace CP-1252/ASN-128.</p>	
2. GO does not appear in left display during self-test.	<p><b>A</b> Defective Computer Display Unit.</p> <p><b>A</b> Replace CP-1252/ASN-128.</p> <p><b>B</b> Defective Compass System.</p> <p><b>B</b> Refer to Chapter 18, para. 18-8.</p> <p><b>C</b> Defective Attitude Indicating System.</p> <p><b>C</b> Refer to Chapter 27, para. 27-7.</p> <p><b>D</b> Defective wiring.</p> <p><b>D</b> Repair or replace wiring.</p>	
3. When data is entered on keyboard, CDU display is incorrect.	<p><b>A</b> Defective Computer Display Unit.</p> <p><b>A</b> Replace CP-1252/ASN-128.</p> <p><b>B</b> Defective Signal Data Converter.</p> <p><b>B</b> Replace CV-3338/ASN-128.</p>	



**41-9.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Doppler Navigation Set AN/ASN-128 and the preceding operational checks and troubleshooting charts do not indicate the source of trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-70, and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-2 through FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.

**41-9.1.1 UH-1H Signal and Voltage Measurements (AVUM)**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
P1 (CDU)	J,C	Primary power	AN/ASN-128 energized	28 Vdc
P1 (SDC)	W	Primary power	AN/ASN-128 energized	28 Vdc
P1 (SDC)	T	26 Vac Reference	COURSE INDICATOR circuit breaker energized.	26 Vac
TB101	5	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized.	0-5 Vdc



## CHAPTER 42

## DIRECTION FINDER SET AN/ARN-149(V)3 MAINTENANCE

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Subject	Para	Page
Receiver R-2382/ARN149(V) Maintenance (AVUM)		
Control C-12192/ARN-149(V) Maintenance (AVUM)		
Antenna AS-3933/ARN-149(V) Maintenance (AVUM)		
Direction Finder Set AN/ARN-149(V)3 Operational Checks		
Direction Finder Set AN/ARN-149(V)3 Troubleshooting		

## SECTION I MAINTENANCE PROCEDURES

**42-1 AN/ARN-149(V)3 Automatic Direction Finder system**

**42-1.1 GENERAL DESCRIPTION.** The AN/ARN-149(V)3 Automatic Direction Finder system receives frequencies from 100 to 2199.5 kHz and indicates bearing information to the transmitting station being received. This frequency range includes the standard commercial broadcast AM stations ( 550 to 1610 kHz) and the nondirectional beacons (NDB) (190 to 550 kHz range). The broadcast stations are required to identify themselves periodically and are normally located in known population areas; therefore, they are valuable as a navigation tool. The low power NDB has a limited range of 15 to 20 miles. Higher power NDB are used as outer markers at some locations and generally carry transcribed weather information or advisories. Compass locators transmit 2-letter ID groups. The outer marker transmits the first two characters, and the middle locator transmits the last two letters of the localizer ID group. Control of the AN/ARN-149(V)3 is provided by the C-12192/ARN-149 control panel.

**42-1.2 SYSTEM SUBUNITS.** The AN/ARN-149(V)3 Automatic Direction Finder (ADF) system is comprised of the following LRUs:

**R-2382/ARN-149 (V)** - receiver assembly,

**MT-6583/ARN-149 (V)** - mounting base for the receiver assembly,

**C-12192/ARN-149 (V)** - ADF control panel,

**AS-3933/ARN-149 (V)** - ADF combined sense and loop antenna.



## 42-2 REMOVAL AND INSTALLATION

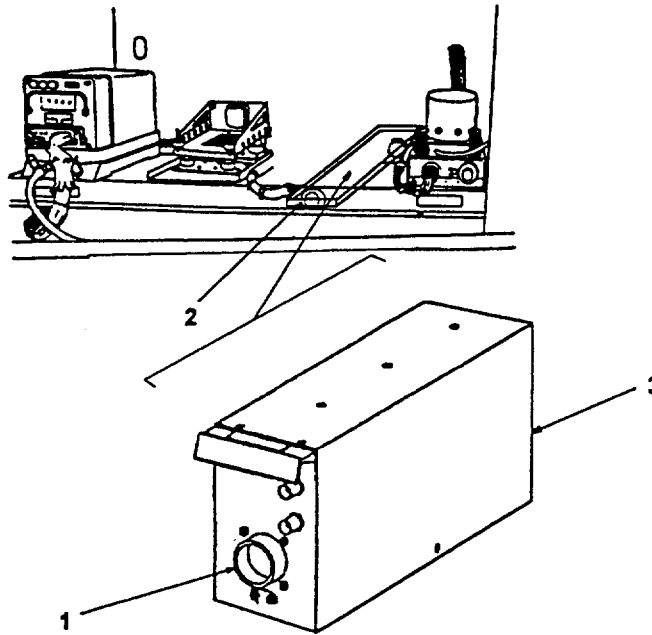
### 42-2.1 RECEIVER ASSEMBLY.

#### 42-2.1.1. Removal Instructions.

- A. Disconnect electrical connector (1) from front of receiver.
- B. Loosen knurled retainer (2) and remove from receiver.
- C. Remove receiver (3) from mount.

#### 42-2.1.2. Installation Instructions.

- A. Install receiver (3) into mount.
- B. Position and tighten knurled retainer (2).
- C. Connect electrical connector (1) to front of receiver.



### 42-2.2 CONTROL PANEL

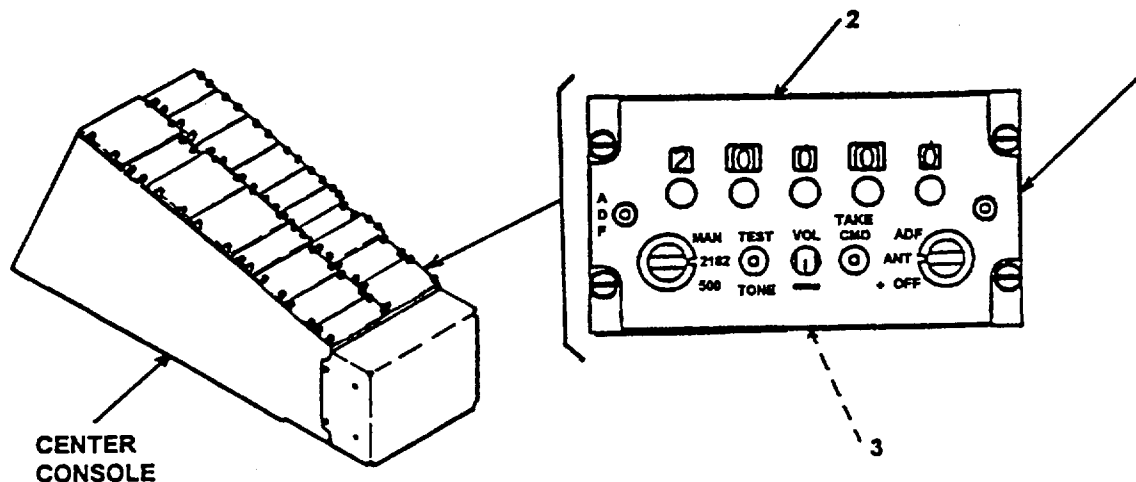
#### 42-2.2.1 Removal Instructions.

- A. Loosen four spring-lock fasteners (1).
- B. Lift control panel (2) from pedestal.
- C. Disconnect electrical connector (3) from control panel.



### 42-2.2.2 Installation Instructions.

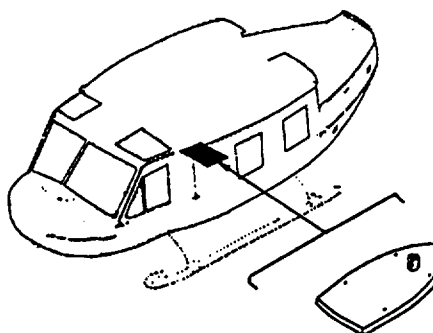
- A. Connect electrical connector (3) to control panel.
- B. Position control panel (2) in pedestal.
- C. Tighten four spring-lock fasteners (1).



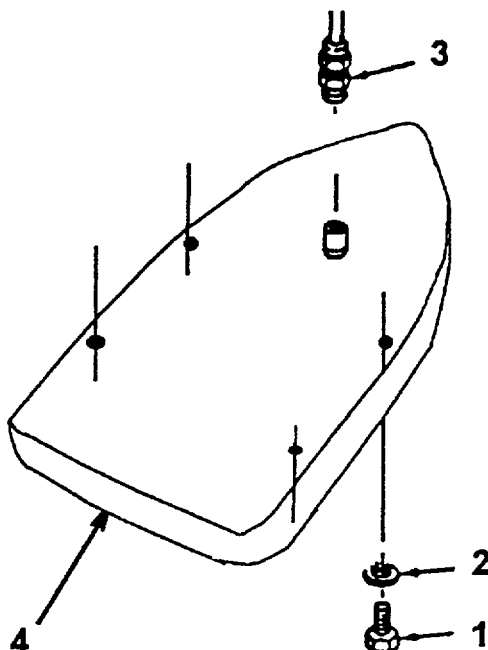
### 42-2.3 ANTENNA

#### 42-2.3.1 Removal Instructions

- A. From underside of aircraft, remove four screws (1) and washers (2) securing antenna.
- B. Disconnect electrical connector (3) from antenna.
- C. Remove antenna (4).







#### 42-2.3.2 Installation Instructions

##### NOTE

Clean aircraft surface prior to installing antenna.

- A. Position antenna (4) in place and connect electrical connector (3).
- B. Secure antenna using four screws (1) and washers (2).
- C. Apply a thin bead of RTV along outside edge of antenna.

#### Section II Operational checks

#### 42-2.4 Direction finding set AN/ARN-149 Operational Checks.

These checks are used to ensure Direction finding set AN/ARN-149 is performing properly. The checks are also used after repairs to make sure the problem was fixed.



**Initial Setup**  
**Equipment Conditions**

**Reference**

Chapter 1, paragraph 1-42, Auxiliary Power Unit connected.  
Chapter 9, paragraph 9-7, Intercommunications Set operational.

**Procedure**

**Normal Indications**

**Remarks**

**POWER OFF CHECKS**

1. Check that all components are installed, and securely mounted.
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

**POWER ON CHECKS**

1. Push **ADF** circuit breaker.
2. Set inverter switch to **MAIN**.
3. Set ICS control panel **NAV** switch to up position.
4. On ID-998/ASN indicator, set **RMI BRG PNTR** switch to **ADF**. ADF bearing information is displayed on No. 1 needles on both RMI's.
5. Set mode selector switch on ADF control panel to **ANT**, volume control to mid-range, and **MAN/2182/500** switch to **MAN**. Receive audio from station (if previously entered) or noise in headset.
6. Turn frequency controls to the frequency of a station 10 to 100 miles from the aircraft.
7. Repeat step 5 for the following frequency bands:
  - 190-279.5 kHz
  - 280-399.5 kHz
  - 400-599.5 kHz
  - 600-899.5 kHz
  - 900-1399.5 kHz
  - 1400-1749.5 kHz
7. While tuned to a station, set **MODE SELECTOR** to **ADF**. Tune the receiver to several station frequencies observing that the bearing indicator indicates a bearing suitable for the station received.
8. With the receiver tuned to a station frequency, note the bearing indication. Position and hold the **TEST/TONE** switch to the **TEST** position. Pointer should rotate 90 degrees from reference. Release the test switch, the pointer should return to the reference bearing.
9. Rotate the **MODE SELECTOR** to the **OFF** position. The audio should disappear from the headset.



### SECTION III

#### TROUBLESHOOTING

##### 42-2.5 Automatic Direction Finding Set AN/ARN-149(V)3

Troubleshooting.

The table below is provided to assist maintenance personnel in the locating of malfunctions in the Direction Finding set AN/ARN-149(V)3.

Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.

The next column lists probable cause or causes of the malfunction.

The last column lists recommended actions to correct the problem.

This manual cannot list all possible malfunctions nor all corrective actions. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.

After completing the corrective action, perform operational checks described in paragraph 42-4.

#### SYMPTOM

#### PROBABLE CAUSE

#### Corrective Action

1. ADF circuit breaker will not stay closed.
  - A. Defective circuit breaker.
    - A. Replace circuit breaker.
  - B. Defective ADF receiver.
    - B. Replace R-2382/ARN-149(V) receiver.
  - C. Defective ADF control.
    - C. Replace C-12192/ARN-149(V) control.
  - D. Defective ADF wiring to ADF circuit breaker.
    - D. Repair or replace wiring.



2. Unable to obtain correct bearing indication in ADF mode.
  - A. Defective ADF receiver.
    - A. Replace R-2382/ARN-149(V) receiver.
  - B. Defective ADF antenna.
    - B. Replace AS-3933/ARN-149(V) antenna.
  - C. Defective Coax cable.
    - C. Repair or replace coax cable.
  - D. Defective ADF control.
    - D. Replace C-12192/ARN-149(V) control.
  
3. Unable to hear audio in ANT mode.
  - A. Defective ADF receiver.
    - A. Replace R-2382/ARN-149(V) receiver.
  - B. Defective wiring to ICS.
    - B. Repair or replace wiring to ICS.
  - C. Defective ADF antenna.
    - C. Replace AS-3933/ARN-149(V) antenna.
  - D. Defective Coax cable.
    - D. Repair or replace coax cable.

#### 42-2.6 Signal and voltage Measurements

If a trouble develops in the ADF set AN/ARN-149(V) and the proceeding operational checks not indicate the source of trouble, refer to the chart below and check for voltages or signals listed. Refer to FO-71, and trace the wiring to power source, basic signal equipment or installation item to locate fault.

Terminal board location is shown on FO-2 through FO-4.

Only the type of signal is listed in some cases, such as audio and syncho signals, since the exact values are dependent on variable factors.

The TB or P column lists terminal board or plug number where measurements should be taken.

The terminal column lists terminal or pin number for the measurement.

The Terminal function column lists the function of the voltage or signal being measured.

The Equipment Operation column lists specific equipment operations required to have voltage or signal present.



TB or P	TERMINAL	TERMINAL FUNCTION	EQUIPMENT OPERATION	VOLTAGE
TB 12	1	Panel and dial lights power	CONSOLE PED LTS	0-28Vdc
TB 1	12	Syncho Rotor excitation	Course indicator circuit breaker energized.	26 Vac
TB 1	8	Stator Y error signal	AN/ARN-149 energized	400 Hz, 26 Vac maximum.
TB 1	9	Stator X error signal	AN/ARN-149 energized	400 Hz, 26 Vac maximum.
P2501	D	Primary Power	ADF circuit breaker energized.	28 Vdc
J600	28 (Hi) 8 (lo)	Audio interface.	Tone Mode enabled.	3.4 Vac into 150 ohms.



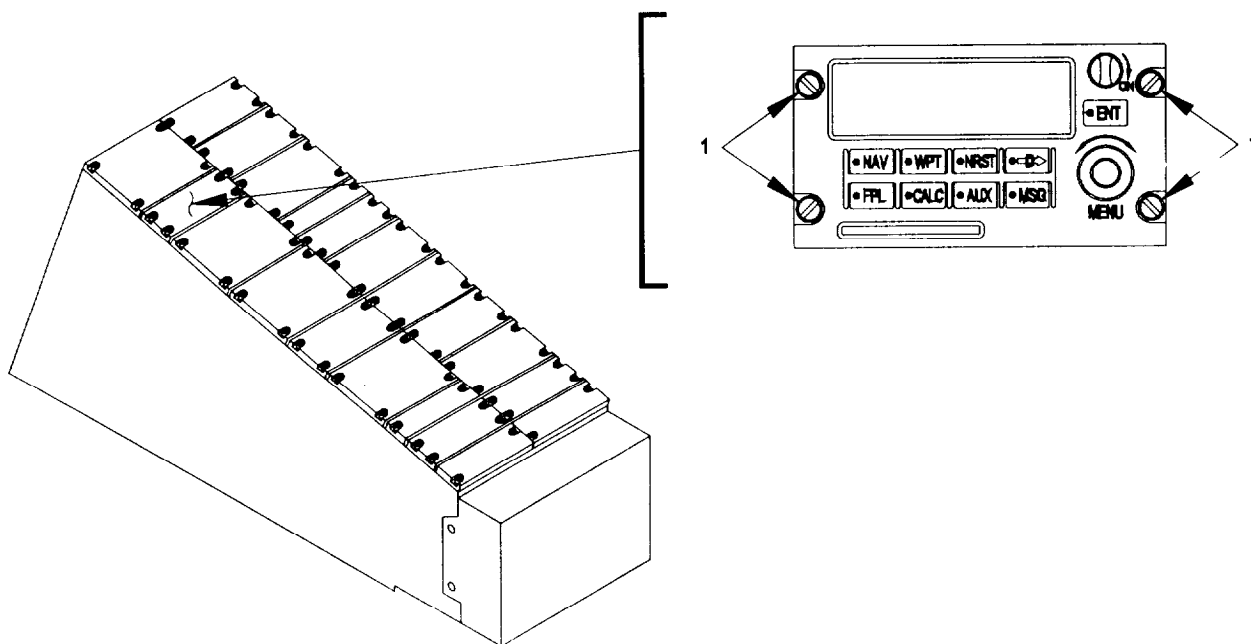
## CHAPTER 43

## SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 MAINTENANCE

Subject	Para.	Page
Receiver/Display Unit Maintenance (AVUM) . . . . .	43-1	43-1
Remote Switch Assembly/Servo Amplifier Maintenance (AVUM) . . . . .	43-2	43-2
Antenna Maintenance (AVUM) . . . . .	43-3	43-5
Cabling and Connector Maintenance (AVUM) . . . . .	43-4	43-6
Satellite Signals Navigation Set AN/ASN-175 Operational Checks (AVUM) . . . . .	43-5	43-6
Satellite Signals Navigation Set AN/ASN-175 Troubleshooting (AVUM) . . . . .	43-6	43-31

## Section I. MAINTENANCE PROCEDURES

## 43-1. RECEIVER/DISPLAY UNIT MAINTENANCE (AVUM)



## 43-1.1 Removal instructions.

- A Loosen four spring-lock fasteners (1) securing receiver/display unit (RDU) to pedestal console.



**CAUTION**

Be careful not to pull RDU so far from pedestal console that electrical wiring or connectors will be damaged.

**NOTE**

It may be necessary to remove control panel or blank panel, as applicable, above RDU in console to allow RDU to be lifted high enough for accessing rear cable connections.

**B** Carefully lift RDU from pedestal console and disconnect electrical connectors from rear of unit.

**C** Remove RDU.

**43-1.2 Installation Instructions.**

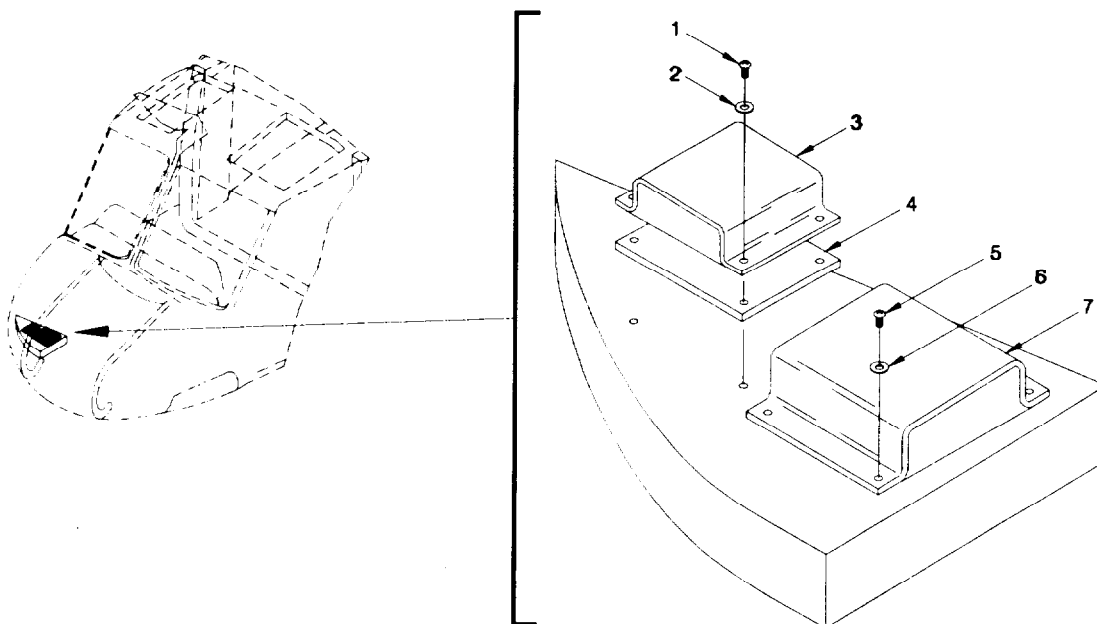
**NOTE**

If there is paint on the sides of the chassis where it meets the front panel, remove the paint.

**A** Hold receiver/display unit near pedestal console and connect electrical connectors to back of unit.

**B** Position receiver/display unit in pedestal console and tighten four spring-lock fasteners (1).

**43-2. REMOTE SWITCH ASSEMBLY/SERVO AMPLIFIER MAINTENANCE (AVUM)**





## 43-2.1 REMOTE SWITCH ASSEMBLY MAINTENANCE

### 43-2.1.1 Removal Instructions.

- A Locate remote switch assembly (7) on shelf mounted on upper right side adjacent to nose compartment shelf assembly.
- B Remove four strews(5) and washers(6) securing remote switch assembly to shelf.

#### CAUTION

Be careful not to pull remote switch assembly so far from shelf that electrical wiring or connector will be damaged.

- C Carefully lift remote switch assembly from shelf and pass assembly through opening above nose compartment shelf assembly to access attaching cable.
- D Disconnect electrical connector from remote switch assembly.
- E Remove remote switch assembly.

### 43-2.1.2 Installation Instructions.

- A Connect electrical connector to remote switch assembly(7).
- B Carefully place remote switch assembly, with connector facing aft, on mounting shelf through opening above nose compartment shelf assembly.
- C Secure remote switch assembly to shelf with four strews(5) and washers(6).

## 43-2.2. SERVO AMPLIFIER MAINTENANCE

### 43-2.2.1 Removal Instructions.

- A Remove remote switch assembly in accordance with paragraph 43-2.1.1.
- B Locate servo amplifier (3) adjacent to mounting area on shelf from which remote switch was removed in step A.



- C Remove four screws(1) and washers(2) securing servo amplifier and spacer plate (4) to shelf.

**CAUTION**

Be careful not to pull servo amplifier so far from shelf that electrical wiring or connector will be damaged.

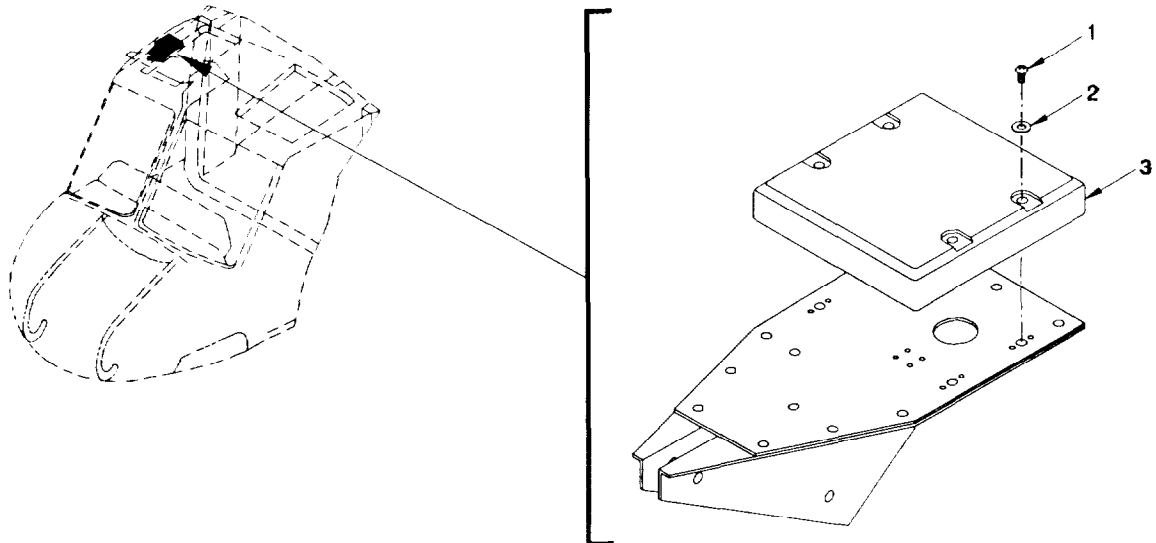
- D Carefully lift servo amplifier from shelf and pass amplifier through opening above nose compartment shelf assembly to access attaching cable.
- E Disconnect electrical connector from servo amplifier.
- F Remove servo amplifier and spacer plate.

**43-2.2.2 Installation Instructions.**

- A Connect electrical connector to servo amplifier (3).
- B Align mounting holes of servo amplifier and spacer plate (4).
- C Carefully place spacer plate and servo amplifier, with connector facing aft, on far side of mounting shelf through opening above nose compartment shelf assembly.
- D Secure spacer plate and servo amplifier to shelf with four screws(1) and washers(2).
- E Install remote switch assembly in accordance with paragraph 43-2.1.2.



### 43-3. ANTENNA MAINTENANCE (AVUM)



#### 43-3.1 Removal Instructions.

- A** Locate antenna (3) on antenna mount secured to upper wire strike cutter of aircraft.
- B** Disconnect RF coaxial cable connector from antenna and connect it to stowage connector on antenna bracket.
- C** Remove sealant around perimeter of antenna with non-metallic scraper.
- D** Remove four screws (1) and washers (2) securing antenna to mount.
- E** Remove antenna.

#### 43-3.2 Installation Instructions.

- A** Position antenna (4) on antenna mount with RF receptacle through hole in mount.
- B** Secure antenna to mount with four screws (2) and washers (3). Torque screws to 19 inch-pounds maximum.
- C** Disconnect RF coaxial cable connector from stowage connector on antenna bracket and connect it to antenna.
- D** Seal around perimeter of antenna using sealant MIL-S-81733.



#### 43-4. CABLING AND CONNECTOR MAINTENANCE (AVUM)

- Connectors listed below (and cabling between them) may be repaired or replaced by Aviation Unit Maintenance (AVUM) personnel:  
  
J2604, P102, P201, P403, P409, P916, P1601A, P2601, P2602, P2603, P2604, P2605, P2606, P2607, P2608, P2609, P26011, P8000, XDS2601, XDS2602, XDS2603, and XDS2604.
- Refer to FO-72 for wiring data.
- Multiwire runs are repaired by repairing or replacing connectors or by splicing individual wires.
- Rf cables are repaired by repairing or replacing connectors or by replacing coaxial cable.
- Chapter 2, paragraph 2-5 contains general wiring repair information.

### Section II. OPERATIONAL CHECKS

#### 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM)

These checks are used to ensure Satellite Signals Navigation Set AN/ASN-175 is performing properly. The checks are also used after repairs to make sure the problem was fixed.

#### INITIAL SETUP

<u>Test Equipment</u>	<u>Equipment Conditions</u>
Precision Lightweight GPS Receiver AN/PSN-11	Reference Chapter 1, paragraph 1-50
Electronic Transfer Device KYK-13/TSEC	Auxiliary Power Unit Connected.



# **43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued**

## **PROCEDURE**

### **NORMAL INDICATIONS**

### **REMARKS**

## **POWER OFF CHECKS**

1. Check that all components are installed, securely mounted, and safety wired (if required)
2. Check that all connectors are tightened and for evidence of chafed or broken wiring.

## **AN/ASN-175 SYSTEM INSTRUMENT PANEL LIGHTING CHECKS**

1. On INST LTG (instrument lighting) panel on overhead console, ensure that PILOT lighting rheostat is set to OFF (full counterclockwise position).
2. Depress aircraft GPS AN/ASN-175 circuit breaker.
3. Press CDI SEL GPS switch/DME indicator assembly on pilot's side of instrument panel.  
GPS indicator lamps in CDI SEL GPS switch/DME indicator assembly come on.
4. On INST LTG panel on overhead console, turn PILOT lighting rheostat clockwise to on and slowly adjust rheostat from minimum to maximum brightness (BRT) setting.  
GPS indicator lamps change from low to full brightness.
5. Turn PILOT lighting rheostat full counterclockwise to OFF.

## **AN/ASN-175 SYSTEM POWER ON/BIT CHECKS**

### **NOTES**

- Ensure a current Navigation Database Card is installed in GPS Navigation Set Receiver/Display Unit (RDU). Although the following checks can be performed with an expired card, this condition will be reported by the RDU during test.
- When the RDU is turned on, a BIT check is automatically performed in the AN/ASN-175 system. During this time, do not press any of the keys on RDU until the power on sequence is completed. If any key is pressed during the power on sequence, the RDU disregards the key press.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

PROCEDURE

NORMAL INDICATIONS

REMARKS

AN/ASN-175 SYSTEM POWER ON/BIT CHECKS - CONTINUED

6. On AC POWER panel on overhead console, set INVTR (inverter) switch to MAIN ON.
7. On RDU, turn power switch clockwise to ON position.  
Several introductory system displays appear briefly and then BIT cycles to a five second lamp self-test.
8. During the five second lamp self-test, observe all annunciators and keys on RDU and the GPS annunciators (WPT/HLD indicators and MSG/APR indicators) on the pilot's side of instrument panel during five second lamp self-test.  
All annunciators and keys on the RDU and the GPS annunciators illuminate for approximately five seconds.
9. Following the lamp self-test, observe BIT result lines that scroll up on RDU display.  
The following display appears one line at a time on RDU when BIT passes:

NAV Computer	OK
Aux IO Computer	OK
GPS Computer	OK
GPS Antenna	OK
Servo Amp	OK
Memory Battery	OK
Database	OK

If BIT fails, the applicable test result line(s) displays a FAIL. If a current Navigation Database Card is not installed or a card is missing, the Database result line displays EXPIRED or N/A, respectively. When a FAIL, EXPIRED, or N/A is displayed, the MSG annunciator on the RDU will flash. This cues AVUM personnel to press the MSG key on the RDU to display an error message that relates to the failure mode of the AN/ASN-175 system. If more than one failure occurs, as indicated by the flashing MSG annunciator, press MSG key to display each error message. Read error message in turn and take the appropriate action.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## ANTI-SPOOF/CRYPTOKEY STATUS CHECKS

10. Observe display on RDU until ANTI-SPOOF/CRYPTOKEY status screen appears as follows:

### NOTE

In the following display, the second line will scroll across continuously. The full line is NO KEYS NEED INITIALIZE.

A-S SAFETY OK

NO KEYS          NEED INITIALIZE

If GPS time/space vehicle data and cryptokeys are not being loaded into AN/ASN-175, perform steps 11 through 15. If GPS time/space vehicle data and cryptokeys are to be loaded and display is as shown, perform steps 16 through 22. If GPS time/space vehicle data and cryptokeys are to be loaded and display is not as shown, proceed to step 23. On newly installed RDUs, first perform the instructions for Programming RDU Auxiliary Input/Output Ports (steps 89 through 95) and for Programming User Units/Parameters (steps 96 through 153).

11. Observe that ENT key on the RDU is flashing.
12. Press ENT key.
13. Turn inner selector knob of MENU control counterclockwise until DISABLED is displayed and the first D in DISABLED is flashing.
14. Press ENT key to accept the DISABLED setting.
15. Proceed to step 47 (Barometric Altimeter AAU-32 Check).
16. Observe that ENT key on the RDU is flashing.
17. Press ENT key and observe display.  
A-S SAFETY: ENABLED is displayed and the E in ENABLED is flashing.
18. Press ENT key to accept the ENABLED setting.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

PROCEDURE

NORMAL INDICATIONS

REMARKS

ANTI-SPOOF/CRYPTOKEY STATUS CHECKS - CONTINUED

NOTE

A FUEL ON BOARD display may or may not appear at this time. This display is a configurable message that is normally off for the AN/ASN-175 system. If FUEL ON BOARD display does not appear, proceed directly to step 20. In the event that it is displayed, perform step 19 and then proceed to step 20.

19. Press ENT key.

20. Observe that PRESENT POSITION display appears.

POSITION EPE: - - - - - ° XXX° XX .xxx XXXX° XX .xxx X
---

The display that appears may not show present position because at this point in the initialization sequence the AN/ASN-175 is not calculating position.

21. If MSG annunciator on RDU is flashing, press MSG key on RDU to display each error message.

Read error message in turn and take the appropriate action.

NOTE

Messages that include DEAD RECKONING, RAIM ERROR, or RAIM UNAVAILABLE may be ignored at this time. Other messages should be cleared in the appropriate manner.

22. Proceed to step 36 (GPS Time/Space Vehicle (SV) Data Loading Checks)

23. Observe that ENT key on the RDU is flashing.

24. Press ENT key and observe display.

A-S SAFETY: ENABLED is displayed and the first E in ENABLED is flashing.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## ANTI-SPOOF/CRYPTOKEY STATUS CHECKS - CONTINUED

25. Press ENT key to accept the ENABLED setting.

### NOTE

A FUEL ON BOARD display may or may not appear at this time. This display is a configurable message that is normally off for the AN/ASN-175 system. If FUEL ON BOARD display does not appear, proceed directly to step 27. In the event that it is displayed, perform step 26 and then proceed to step 27.

26. Press ENT key.

27. Observe that PRESENT POSITION display appears.

```

POSITION EPE: - - - - -
L  L  XXX° XX .XXX XXXX° XX .XXX X

```

The display that appears may not show present position because at this point in the initialization sequence the AN/ASN-175 is not calculating position.

28. If MSG annunciator on RDU is flashing, press MSG key on RDU to display each error message.

Read error message in turn and take the appropriate action.

### NOTE

Messages that include DEAD RECKONING, RAIM ERROR, or RAIM UNAVAILABLE may be ignored at this time. Other messages should be cleared in the appropriate manner.

29. On RDU, press AUX key until USER SETUP mode appears on display.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

---

PROCEDURE

NORMAL INDICATIONS

REMARKS

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ANTI-SPOOF/CRYPTOKEY STATUS CHECKS - CONTINUED

30. Turn inner selector knob of MENU control on RDU until ANTI-SPOOF/CRYPTOKEYS STATUS display appears as follows:

A-S CANCELLED!  
VALID KEYS

31. Turn outer selector knob of MENU control on RDU until the following display appears:

ZEROIZE KEYS?  
(ENT)

32. Press ENT key to initiate the zeroize.  
Display changes as follows:

ZEROIZE KEYS  
ARE YOU SURE? (AUX)

33. Press AUX key to confirm the zeroize.

34. Observe display after the zeroize is confirmed.  
STANDBY is initially displayed and then changes to KEYS  
ZEROIZED.

If KEYS NOT ZEROIZED! appears on display,  
repeat the zeroize procedures in steps 28  
through 33. Observe that KEYS NOT  
ZEROIZED! is not displayed a second time,

NOTE

Messages that include DEAD RECKONING, RAIM ERROR,  
or RAIM UNAVAILABLE may be ignored at this time.  
Other messages should be cleared in the appro-  
priate manner.

35. If MSG annunciator on RDU is flashing, press MSG key on RDU to  
display each error message.

Read error message in turn and take the  
appropriate action.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## GPS TIME/SPACE VEHICLE (SV) DATA LOADING CHECKS

### NOTE

Although GPS time and SV data can be acquired directly from the satellites, the following steps will verify that the RDU can accept GPS time and SV data using Precision Lightweight GPS Receiver (PLGR) AN/PSN-11.

36. Connect AN/PSN-11 to GPS FILL DATA receptacle on lower left side (copilot's side) of instrument panel.
37. Set up AN/PSN-11 to load GPS time into RDU.  
XFER IN PROGRESS is displayed on RDU during loading of GPS time and changes to XFER COMPLETE after loading of GPS time has completed successfully.
38. Set up AN/PSN-11 to load SV data into RDU.  
XFER IN PROGRESS is displayed on RDU during loading of SV data and changes to XFER COMPLETE after loading of SV data has completed successfully.

## CRYPTOKEYS LOADING CHECK

### NOTE

The test results for the following procedure requires that SV data was successfully loaded into the RDU using the AN/PSN-11.

39. Connect Electronic Transfer Device KYK-13/TSEC to adapter attached to GPS FILL KYK connector on the lower left side (copilot's side) of instrument panel.  
KEY LOADER READ OK is displayed when KYK-13/TSEC is connected.
40. Set up KYK-13/TSEC to load current cryptokeys into RDU.
41. After current cryptokeys have been loaded, turn power switch on RDU off (full counterclockwise position).
42. Wait a few seconds and turn power switch clockwise to ON position.  
Several introductory system displays appear briefly.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

PROCEDURE

NORMAL INDICATIONS

REMARKS

CRYPTOKEYS LOADING CHECK - CONTINUED

43. Observe the five second lamp self-test.
44. Observe the BIT result lines that scroll up the display.
45. Press AUX key until USER SETUP mode appears on display.
46. Turn inner selector knob of MENU control until ANTI-SPOOF/CRYPTOKEYS STATUS display appears.  
VALID KEYS is displayed after cryptokeys loading has completed successfully.  
If KEYS LOADED appears on display, wait until RDU completes processing the previously loaded SV data and the VALID KEYS display appears. If VALID KEYS display fails to appear after 15 minutes, repeat the procedures in steps 40 through 46. Observe that VALID KEYS is displayed after designated procedures are repeated for a second time.

BAROMETRIC ALTIMETER AAU-32 CHECK

47. On AAU-32, turn zero set knob to 29.92 in window display.  
Note altitude displayed on AAU-32 to nearest 100-foot reading.
48. On RDU, press AUX key until SYSTEM STATUS is selected.
49. Turn outer selector knob of MENU control until GPS ALT: display appears.  
GPS altitude reading agrees with reading noted on AAU-32 to within 100 feet.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

#### REMARKS

## COURSE DEVIATION INDICATOR ID-1347/ARN CHECKS

50. On RDU, press AUX key until the CONFIGURE mode is activated.

51. Turn inner selector knob of MENU control clockwise until the following display appears:

I/O INTERFACE CHECK  
PRESS (ENT)

52. Press ENT key until the following display appears:

TEST CDI#1:5L GS:5D  
PRESS (ENT)

Verify that CDI needle moves when inner selector knob of MENU control is turned and that GS flag moves when outer selector knob of MENU control is turned.

53. Press ENT key until the following display appears and observe flag indication on CDI:

FLAG: FROM  
PRESS (ENT)

FROM flag in view.

54. Turn inner selector knob of MENU control one detent position at a time to obtain the displays shown below. For each display, verify that flag indications on CDI and external annunciator indications on instrument panel are as indicated.

FLAG: TO  
PRESS (ENT)

TO flag in view.

FLAG: OFF  
PRESS (ENT)

TO/FROM flag not in view.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

PROCEDURE

NORMAL INDICATIONS

REMARKS

COURSE DEVIATION INDICATOR (CDI) ID-1347/ARN CHECKS - CONTINUED

FLAG: NAV/DME VALID  
PRESS (ENT)

NAV VALID flag not in view.

FLAG: GS VALID  
PRESS (ENT)

GS flag not in view.

ANNUNCIATOR: APR  
PRESS (ENT)

External APR annunciator is illuminated.

ANNUNCIATOR: HLD  
PRESS (ENT)

External HLD annunciator is illuminated.

ANNUNCIATOR: : MSG  
PRESS (ENT)

External MSG annunciator is illuminated.

ANNUNCIATOR: : WPT  
PRESS (ENT)

External WPT annunciator is illuminated.

55. Press ENT key to accept the verification.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## COURSE INDICATORS ID-250/ARN AND ID-998/ASN CHECKS

56. Set NO. 2 BRG PTR (bearing pointer) switch on pilot's side of instrument panel to GPS position.

57. If already not present, press ENT key on RDU until the following display appears and observe bearing pointer on Course Indicator ID-998/ASN:

<p>TEST SYNCHRO #1 360°</p>
---------------------------------

Bearing pointer (double pointer) on ID-998/ASN points to 0° relative bearing (straight ahead).

58. Turn inner selector knob of MENU control clockwise one detent position at a time for one complete rotation. For each position, observe bearing pointer movement on Course Indicator ID-998/ASN. Bearing pointer on ID-998/ASN moves clockwise 30 degrees for each detent position and 360 degrees for one complete revolution.

59. Press ENT key to obtain the following display and observe bearing pointer on Course Indicator ID-250/ARN:

<p>TEST SYNCHRO #2 360 °</p>
----------------------------------

Bearing pointer (double pointer) on ID-250/ARN points to 0° relative bearing (straight ahead).

60. Turn inner selector knob of MENU control clockwise one detent position at a time for one complete rotation. For each position, observe bearing pointer movement on Course Indicator ID-250/ASN. Bearing pointer on ID-250/ARN moves clockwise 30 degrees for each detent position and 360 degrees for one complete revolution.

61. Set DME IND (indicator) switch on pilot's side of instrument panel to GPS position.  
DME indicator lamps in CDI SEL GPS switch/DME indicator assembly on pilot's side of instrument panel come on.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

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PROCEDURE

NORMAL INDICATIONS

REMARKS

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DME INDICATOR ID-2192/ARN-124 CHECKS

NOTE

Steps 62 through 66 are applicable to aircraft with Distance Measuring Equipment (DME) AN/ARN-124 system installed only.

62. Press ENT key on RDU once to obtain the following display:

TEST SYNCHRO #3  
NOT SELECTED

63. Press ENT key once to obtain the following display and observe reading on DME Indicator ID-2192/ARN-124 on pilot's side of instrument panel:

DME OUTPUT: 9.9 NM  
PRESS (ENT)

Reading on ID-2192/ARN-124 agrees with display.

64. Turn inner selector knob (or outer selector knob) of MENU control clockwise one detent position and observe readings on display and DME Indicator ID-2192/ ARN-124.

Readings change from 9.99NM to 99.9NM.

65. Turn inner selector knob (or outer selector knob) of MENU control to the next detent position and observe readings on display and DME Indicator ID-2192/ARN-124.

Readings change from 99.9NM to 299.9NM.

66. Press ENT key to complete the verification.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## FM HOMING GPS/VOR MODE CONTROL CHECKS

67. On FM Radio Set Control in AN/ARC-54, AN/ARC-131, or AN/ARC-201 system, set mode selector switch to HOME or HOM, as applicable, Observe navigational mode indication on both the CDI SEL GPS switch/DME indicator assembly and the CDI SEL VOR switch/DME indicator assembly on the instrument panel.  
Navigational mode automatically changes from GPS to VOR operation upon selection of FM homing mode operation as indicated by GPS indicator lamps in CDI SEL GPS switch/DME indicator assembly going out and VOR indicator lamps in CDI SEL VOR switch/DME indicator assembly coming on.
68. Press CDI SEL GPS switch/DME indicator assembly to activate GPS mode operation.  
GPS mode operation is inhibited from activating when FM homing operation is selected.
69. On FM Radio Set Control, deselect FM homing mode operation and press CDI SEL GPS switch/DME indicator assembly.  
GPS mode operation is restored.

## SATELLITE ACQUISITION CHECKS

### NOTE

The satellite acquisition checks must be performed outdoors to allow the AN/ASN-175 to acquire the GPS satellite signals required for test.

70. Press AUX key on RDU until SYSTEM STATUS is selected.  
Present position display appears and displays present position.

POSITION EPE: - - - - - L    L XXX <sup>0</sup> XX .XXX    XXXX <sup>0</sup> XX .XXX    x
--

71. Turn outer selector knob of MENU control clockwise until PRS ALT and GPS ALT display appears.  
Altitude readings are displayed for pressure altitude and GPS altitude.
72. Press AUX key until SENSOR STATUS is selected.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

PROCEDURE	NORMAL INDICATIONS	REMARKS
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SATELLITE ACQUISITION CHECKS - CONTINUED

73. Turn outer selector knob of MENU control clockwise until GPS TRACK display appears.  
GPS TRACK display lists the number of satellites (up to 9) being tracked.

NOTE

- The number before the colon in GPS TRACK display represents the number of satellites and the numbers following the colon represent the identification numbers of the satellites. A flashing number indicates that the satellite is being tracked, but is not currently being used by the AN/ASN-175 system in calculating the position.
- Acquisition of four or more satellites is required to obtain a high order of accuracy for three-dimensional position (latitude, longitude, and altitude). Latitude and longitude can be computed from only three satellites, making position accuracy dependent upon receiving altitude input data from the aircraft.

74. Turn outer selector knob of MENU control clockwise until a display similar to the following appears:

GPS	SV:	12	SIG	10.0
	ELV	025 °	AZM	250 °

NOTE

Numerical values selected for example purposes only.

Display indicates that satellite (SV) number 12 is being received with a signal to noise ratio of 10 to 1; it is currently at an elevation of 25 degrees above the horizon at an azimuth of 250 degrees true. A negative elevation would indicate that the satellite is below the horizon and not available for use in the position solution.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## SATELLITE ACQUISITION CHECKS - CONTINUED

75. Press WPT key to select VOR or NDB display.  
The inner selector knob of MENU control scans all of the VOR or NDB stations in the database. These stations are listed alphabetically by the VOR or NDB identifier.
76. Turn inner selector knob of MENU control to select local VOR or NDB station.  
Display indicates bearing (000 to 359 degrees) and distance (nautical miles) to VOR or NDB station, as selected,  
Specific information for the selected VOR or NDB station may be accessed using the outer selector knob of MENU control. The information displayed for the selected station includes: City, Name, Frequency, Code, and Position.
77. Press D → key to select displayed waypoint (VOR or NDB station).
78. Press D → key a second time to activate (fly to) selected waypoint.  
Bearing pointer (double pointer) on RMI's ID-250/ARN and ID-998/ASN move to bearing of active waypoint and DME indicator ID-2192/ARN-124 reads distance (not greater than 299 nautical miles) to active waypoint.

## CRYPTOKEYS ZEROIZING CHECK

### NOTE

The following procedure will zeroize the cryptokeys, if loaded previously, in the RDU.

79. Press AUX key on RDU until USER SETUP mode appears on display.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVIM) - Continued

---

PROCEDURE

NORMAL INDICATIONS

REMARKS

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CRYPTOKEYS ZEROIZING CHECK - CONTINUED

80. Turn inner selector knob of MENU control until SECURITY MODULE page appears as follows:

A-S	SAFETY	OK
VALID	KEYS	

81. Turn outer selector knob of MENU control until the following display appears:

ZEROIZE	KEYS?	
	(ENT)	

82. Press ENT key to initiate the keys zeroizing function.  
Observe that AUX key is flashing and that the following display appears:

ZEROIZE	KEYS	
ARE	YOU	SURE? (AUX)

NOTE

Press any key other than the AUX key to abort the zeroize keys function.

83. Press AUX key to complete the zeroize keys function.  
Display changes to STANDBY mode and after a few seconds the following display appears:

KEYS ZEROIZED
---------------



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## GPS ZEROIZE SWITCH CHECK

### NOTE

Actuation of the GPS ZEROIZE switch will erase all variables, if any, stored in the RDU and will reset the internal settings to factory default. As a result, the GPS ZEROIZE switch should be normally used when it is absolutely necessary to verify that it is functional or for emergency situations. In the event that the GPS ZEROIZE switch is actuated, the internal settings of the RDU will have to be reprogrammed to satisfy the aircraft requirements. Refer to Programming RDU Auxiliary Input/Output Ports (steps 89 through 95) and Programming User Units/Parameters (steps 95 through 111).

84. On center section of instrument panel, raise cover on GPS ZEROIZE switch and toggle switch to the up position to initiate the zeroize.

RDU resets, displays a ZEROIZE IS SUCCESSFUL message, and then cycles through the power on/BIT checks until the ANTI-SPOOF/CRYPTOKEY status screen appears as follows:

A-S SAFETY OK NO KEYS            NEED INITIALIZE
---

85. Observe that ENT key is flashing.
86. Press ENT key.
87. Turn outer selector knob of MENU control counterclockwise until DISABLE is displayed and the D in DISABLE is flashing.
88. Press ENT key to accept the DISABLE setting.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## PROGRAMMING RDU AUXILIARY INPUT/OUTPUT PORTS

### NOTE

The following procedures provide instructions for programming the auxiliary input/output (I/O) port settings of the RDU to satisfy the aircraft requirements.

89. Press AUX key on RDU until INSTALL SETUP mode appears on display.

PO. Turn inner selector knob of MENU control until AUX I/O SETUP display appears as follows:

<p>AUX I/O SETUP TURN OUTER KNOB</p>
--

There are seven auxiliary I/O port categories (HEADING INPUT, PRESSURE ALTITUDE INPUT, OLEO INPUT, SYNCHRO OUTPUT # 1, SYNCHRO OUTPUT # 2, SYNCHRO OUTPUT # 3, and DIGITAL OUTPUT # 3) that must be selected and programmed internally to satisfy the aircraft requirements.

91. Turn outer selector knob of MENU control until the first I/O port category (HEADING INPUT) display appears. (Refer to table 1.)

92. Press ENT key to allow configuration of the port.

93. Turn inner selector knob of MENU control to select the choice setting (XYZ Magnetic-Synchro) for aircraft.

94. Press ENT key to save the selection.

95. Repeat steps 91 through 94 until all I/O port settings are programmed into the aircraft as specified in table 1.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## PROGRAMMING RDU AUXILIARY INPUT/OUTPUT PORTS - CONTINUED

TABLE 1. I/O PORT SETTINGS

I/O PORT CATEGORY	CHOICE SETTINGS	AIRCRAFT SETTINGS
HEADING INPUT	*None XYZ Magnetic-Synchro XYZ TRUE-Synchro	XYZ Magnetic-Synchro
PRESSURE ALTITUDE INPUT	Serial-RS-422/RS-232 *Parallel	Parallel
OLEO INPUT-	*None Air Ground	None
SYNCHRO OUTPUT #1	*Off HDG       ----- T HDG     ----- DTK       ----- TDTK      ----- BRG T BRG TKE       ----- DA        ----- TKE-DA DA-TKE BRG-HDG   ----- +0.00   ----- +180   ----- SYNCHRO SIN/COS	**BRG-HDG+180° SYNCHRO
SYNCHRO OUTPUT #2	Same as SYNCHRO OUTPUT #1	**BRG- HDG+180° SYNCHRO
SYNCHRO OUTPUT #3	Same as SYNCHRO OUTPUT #1	Off
DIGITAL OUTPUT #3	ARINC 561 *ARINC 568	ARINC 561
<p>*Indicates factory default setting.</p> <p>**TO select BRG-HDG 180° SYNCHRO setting after obtaining the BRG-HDG 000° SYNCHRO display, proceed as follows:</p> <p>Turn outer selector knob of MENU control clockwise position and observe that first 0 in BRG-HDG 000° SYNCHRO display flashes.</p> <p>Turn inner selector knob of MENU control clockwise one detent position to obtain BRG-HDG +180° SYNCHRO setting display.</p>		



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## PROGRAMMING USER UNITS/PARAMETERS

### NOTE

The following procedures provide instructions for programming the user units and parameters. These include: Audio Level, Audio Tone Frequency, CDI Sensitivity, Estimated Time of Arrival (ETA), Position Coordinate System, Position Datum, Distance Units, Speed Units, Elevation Units, Barometric Setting Units, Temperature Units, Fuel Computation Units, Track Error Graphic, Display Light Intensity for Night Vision Goggles (NVG) and Magnetic Variation (MAGVAR).

96. Press AUX key until INSTALL SETUP mode is selected.

97. For each of the user unit/parameter listings below, turn inner selector knob of MENU control until SELECT USER UNITS, TURN OUTER KNOB is displayed. Then, turn outer selector knob of MENU control and note display.

<u>User Unit/Parameter</u>	<u>Display</u>
ETA	ETA TIME DISPLAY IS LOCAL
Distance Units	DISTANCE DISPLAY IN NAUTICAL MILES
Speed Units	SPEED DISPLAY IN KNOTS
Barometric Units	BAROMETRIC SET IN INCHES
Temperature Units	TEMP DISPLAY DEG CENTIGRADE (0C)
Fuel Computation Units	FUEL COMPUTATION IN POUNDS (JP-4)

If any display is not as shown, perform steps 98 through 100. After completing all six selections, proceed to step 101.

98. Press ENT key.

99. Turn inner selector knob of MENU control to select listed display.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## PROGRAMMING USER UNITS/PARAMETERS - CONTINUED

100. Press ENT key to save selection.
101. Turn inner selector knob of MENU control until SET AUDIO LEVEL is displayed.
102. Connect headset to pilot's or copilot's ICS connector.
103. On ICS, set AUX switch to ON.
104. On VOR control unit (AN/ARN-123 system), deselect NAV VOL switch from OFF position.
105. On RDU, press ENT key and observe that the following display appears:
- |            |            |
|------------|------------|
| VOLUME:    | INNER KNOB |
| FREQUENCY: | OUTER KNOB |
106. Turn inner selector knob of MENU control to set comfortable audio level.
107. Turn outer selector knob of MENU control to set desired audio tone frequency.
108. Press ENT key to save settings.
109. Turn inner selector knob of MENU control until the following display appears:
- |                 |
|-----------------|
| CDI SENSITIVITY |
| TURN OUTER KNOB |
110. Turn outer selector knob of MENU control until INTERNAL CDI ADJUST display appears.
- If display indicates FULL SCALE:= 1.0 <sup>N</sup>M,  
proceed to step 114; if not, perform  
steps 111 through 113.
111. Press ENT key.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

PROCEDURE

NORMAL INDICATIONS

REMARKS

PROGRAMMING USER UNITS/PARAMETERS - CONTINUED

112. Turn inner selector knob of MENU control to select FULL SCALE:=  
1.0 <sup>N</sup>M.

113. Press ENT key to save selection.

114. Turn outer selector knob of MENU control until EXTERNAL CDI  
ADJUST display appears.

If display indicates FULL SCALE:= 5.0 <sup>N</sup>M,  
proceed to step 118; if not, perform  
steps 115 through 117.

115. Press ENT key.

116. Turn inner selector knob of MENU control to select FULL SCALE:=  
5.0 <sup>N</sup>M.

117. Press ENT key to save selection.

118. Turn inner selector knob of MENU control until SELECT USER UNITS,  
TURN OUTER KNOB is displayed.

119. Turn outer selector knob of MENU control until POSITION DISPLAY 1  
display appears.

If latitude/longitude coordinate system  
(L/L DDMSS.SS) is displayed, proceed to  
step 123; if not, perform steps 120  
through 122.

120. Press ENT key.

121. Turn inner selector knob of MENU control to select L/L DDMSS.SS.

122. Press ENT key to save selection.

123. Turn outer selector knob of MENU control until POSITION DISPLAY 2  
display appears.

POSITION DISPLAY 2 indicates a secondary coordinate system  
that may be displayed.

If UTM/UPS is displayed for the secondary  
coordinate system, proceed to step 127;  
if not, perform steps 124 through 126.



43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS  
(AVUM) - Continued

PROCEDURE

NORMAL INDICATIONS

REMARKS

PROGRAMMING USER UNITS/PARAMETERS - CONTINUED

124. Press ENT key.
125. Turn inner selector knob of MENU control to select UTM/UPS.
126. Press ENT key to save selection.
127. Turn inner selector knob of MENU control until SELECT USER UNITS, TURN OUTER KNOB is displayed.
128. Turn outer selector knob of MENU control until the position datum display appears as follows:
- |                         |
|-------------------------|
| WGS-84 (WORLD)          |
| DTM: WGD      MGRS: NEW |
- If display appears, proceed to step 132;  
if not, perform steps 129 through 131.
129. Press ENT key.
130. Turn inner selector knob of MENU control until WGD is selected for DTM and WGS-84 (WORLD) to appear as the selected position datum.
131. Press ENT key to save selection..
132. Turn inner selector knob of MENU control until SELECT USER UNITS, TURN OUTER KNOB is displayed.
133. Turn outer selector knob of MENU control until ELEVATION display appears as follows:
- |                            |
|----------------------------|
| ELEVATION:    FEET         |
| REFERENCE:   MN   SEA   LV |
- If display appears, proceed to step 140;  
if not, perform steps 134 through 139.
134. Press ENT key.
135. Turn outer selector knob of MENU control to select ELEVATION field.
136. Turn inner selector knob of MENU control to select FEET.



# 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

## PROCEDURE

### NORMAL INDICATIONS

### REMARKS

## PROGRAMMING USER UNITS/PARAMETERS - CONTINUED

137. Turn outer selector knob of MENU control to select REFERENCE field.
138. Turn inner selector knob of MENU control to select MN SEA LV (mean sea level).
139. Press ENT key to save selections.
140. Turn inner selector knob of MENU control until TRACK ERROR GRAPHIC display appears. If display appears as follows, proceed to step 144; if not, perform steps 141 through 143.

<p>TRACK ERROR GRAPHIC COMBINE TKE/CDI YES</p>
--

141. Press ENT key.
142. Turn inner selector knob of MENU control to select YES for track error graphic display.
143. Press ENT key to save selection.
144. Turn inner selector knob of MENU control until SET DISPLAY INTENSITY LEVEL display appears.

### NOTE

Pressing ENT key will cause display to go to previously stored or lowest intensity settings for NVG ENABLED intensity settings.

145. Press ENT key and observe that display changes as follows:

<p>BACKLIGHT: INNER KNOB NIGHT LEVEL: OUT KNOB</p>
--

146. Turn inner selector knob of MENU control counterclockwise until intensity of key backlighting is at a minimum.
147. Turn outer selector knob of MENU control counterclockwise until intensity of display is at a minimum.



#### 43-5. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 OPERATIONAL CHECKS (AVUM) - Continued

##### PROCEDURE

##### NORMAL INDICATIONS

##### REMARKS

##### PROGRAMMING USER UNITS/PARAMETERS - CONTINUED

148. Turn inner and outer selector knobs of MENU control to adjust key backlighting and display intensity for optimum NVG levels.
149. Press ENT key to save settings.
150. Turn inner selector knob of MENU control until MAGVAR display appears.  
If MAGVAR: AUTO is not displayed, perform steps 151 through 153.
151. Press ENT key.
152. Turn inner selector knob of MENU control to select MAGVAR: AUTO display.  
When RDU is set to MAGVAR: AUTO, it will automatically enter the estimated magnetic variation.
153. Press ENT key to save selection.

##### AN/ASN-175 SYSTEM SHUTDOWN

154. Turn power switch on RDU to the off position (full counter-clockwise position).

### Section III. TROUBLESHOOTING

#### 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM)

- The table below is provided to assist maintenance personnel in locating malfunctions in Satellite Signals Navigation Set AN/ASN-175.
- Indications of a malfunction that may be reported by the operator or may be observed during operational checks are listed in the symptom column.
- The next column lists probable cause or causes of the malfunction.



#### 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

- The last column lists recommended actions to correct the problem.
- This manual cannot list all possible malfunctions nor all corrective measures. If a malfunction is not listed or is not corrected by the corrective actions, notify your supervisor.
- After completing the corrective action, perform the operational checks described in paragraph 43-7.

#### SYMPTOM

#### PROBABLE CAUSE

#### CORRECTIVE ACTION

1. Aircraft GPS AN/ASN-175 circuit breaker does not remain engaged (pressed in).
  - A Defective Receiver/Display Unit (RDU).  
A Replace RDU.
  - B Defective remote switch assembly.  
B Replace assembly.
  - C Defective GPS AN/ASN-175 circuit breaker.  
C Replace circuit breaker.
  - D Defective aircraft wiring.  
D Repair or replace wiring as required.
2. GPS indicator lamps do not come on when CDI SEL GPS switch/DME indicator assembly is pressed.
  - A Defective remote switch assembly.  
A Replace assembly.
  - B Defective CDI SEL GPS switch/DME indicator assembly.  
B Replace assembly.
  - C Defective GPS indicator lamps in CDI SEL GPS switch/DME indicator assembly.  
C Replace lamps.
  - D Defective aircraft wiring.  
D Repair or replace wiring as required.
3. GPS indicator lamps in the CDI SEL GPS switch/DME indicator assembly do not go from minimum to maximum brightness when PILOT lighting rheostat on INST LTG panel is adjusted from minimum to maximum brightness level.
  - A Defective remote switch assembly.  
A Replace assembly.
  - B Defective PILOT lighting rheostat.  
B Replace rheostat.
  - C Defective aircraft wiring.  
C Repair or replace wiring as required.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

4. RDU does not turn on when power switch is set to ON position and GPS ASN-175 circuit breaker is engaged.
  - A Defective RDU.
    - A Replace RDU.
  - B Loose or defective power switch control knob.
    - B Tighten or replace power switch control knob as required.
  - C Defective GPS ASN-175 circuit breaker.
    - C Replace circuit breaker.
  - D Defective aircraft wiring.
    - D Repair or replace wiring as required.
5. RDU display-character(s) in error or erratic.
 

Defective RDU.

Replace RDU.
6. One or more annunciators or keys on RDU fail to illuminate during five second lamp self test.
 

Defective RDU.

Replace RDU.
7. One or more external GPS annunciators (WPT/HLD indicators and MSG/APR indicators) on pilot's side of instrument panel fail to illuminate during five second lamp self test.
  - A Defective lamps.
    - A Replace lamps as required.
  - B Defective RDU.
    - B Replace RDU.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.
8. ADDRESS ERROR XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.
 

Defective RDU.

Replace RDU.
9. CHECK REGISTER XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.
 

Defective RDU.

Replace RDU.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

10. ERROR IN MSG FIND MESSAGE X NOT FOUND error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
11. ILLEGAL INTERRUPT XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
12. ILLGL INSTRUCTION XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
13. PRCSSR BUS ERROR XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
14. MESSAGE ROUTINE XXXXX NOT FOUND error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
15. PRIVILEGE VIOLTN XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
16. STACK FULL ERROR XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

17. TRAP OVERFLOW XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
18. ZERO DIVIDE XX CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL or GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
19. SECURITY-MODULE FAULT error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV Computer FAIL.  
Defective RDU.  
Replace RDU.
20. GPS RECEIVER FAIL ALIGNMENT ERROR CH#X error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
21. GPS RECEIVER FAIL BATTERY BACK-UP FAIL error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
22. GPS RECEIVER FAIL EXCESSIVE BIAS DOT error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
23. GPS RECEIVER FAIL SIGNAL PROCESSOR ERR error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying GPS Computer FAIL.  
Defective RDU.  
Replace RDU.



43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING  
(AVUM) - Continued

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SYMPTOM

PROBABLE CAUSE

CORRECTIVE ACTION

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24. GPS RECEIVER FAIL I/O TIMEOUT error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
25. GPS DISABLED BY USER SEE INSTALL: SERIAL error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying GPS Computer FAIL.  
Defective RDU.  
Replace RDU.
26. AIO CARD FAIL error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying AUX IO Computer FAIL.  
Defective RDU.  
Replace RDU.
27. AIO LAMP FAILED ERROR CODE XXXX error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying AUX IO Computer FAIL.  
Defective RDU.  
Replace RDU.
28. AIO PROCESSOR FAILED ERROR CODE XXXX error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying AUX IO Computer FAIL.  
Defective RDU.  
Replace RDU.
29. AIO SYNCHRO FAILED ERROR CODE XXXX error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying AUX IO Computer FAIL.  
Defective RDU.  
Replace RDU.
30. AIO DISABLED BY USER SEE INSTALL: SERIAL error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying AUX IO Computer FAIL.  
Defective RDU.  
Replace RDU.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

31. ERROR CODE 2: CONTACT FACTORY error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying NAV FAIL or Database FAIL.  
Defective Navigation Database Card.  
Replace Navigation Database Card.
32. DATABASE FAIL error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying Database FAIL.  
A Defective Navigation Database Card.  
A Replace Navigation Database Card.  
B Defective RDU.  
B Replace RDU.
33. DATABASE MISSING error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying Database FAIL.  
Defective Navigation Database Card.  
Replace Navigation Database Card.
34. DATABASE OUT-OF-DATE EXPIRED XX-XXX-XX error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying Database FAIL.  
Expired Navigation Database Card.  
Replace Navigation Database Card with current card.
35. MEM BATTERY LOW error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying Memory Battery FAIL.  
Defective RDU.  
Replace RDU.
36. GPS: ANTENNA FAULT error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying GPS Antenna FAIL.  
A Defective GPS Antenna.  
A Replace GPS Antenna.  
B Defective RDU.  
B Replace RDU.  
C Defective coaxial cabling.  
C Repair or replace coaxial cabling as required.



43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING  
(AVUM) - Continued

SYMPTOM

PROBABLE CAUSE

CORRECTIVE ACTION

37. SERVO AMPLIFIER FAILED error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes and BIT fails by displaying Servo Amp FAIL.
  - A Defective Servo Amplifier.
    - A Replace Servo Amplifier.
  - B Defective RDU.
    - B Replace RDU.
  - C Defective 26 Vac reference source.
    - C Refer to Chapter 9, Section II in TM 55-1520-210-23-2.
  - D Defective aircraft wiring.
    - D Repair or replace wiring as required.
38. BAROMETRIC ALTITUDE DATA INVALID error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.
  - A Defective RDU.
    - A Replace RDU.
  - B Defective Altimeter Indicator AAU-32/A.
    - B Refer to Chapter 8, para. 8-185 in TM 55-1520-210-23-2.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.
39. EXTERNAL ALTIMETER IS IN ERROR error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.
  - A Defective, RDU.
    - A Replace RDU.
  - B Defective Altimeter Indicator AAU-32/A.
    - B Refer to Chapter 8, para. 8-185 in TM 55-1520-210-23-2.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.
40. EXTERNAL ALTIMETER LOST COMMUNICATION error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.
  - A Defective RDU.
    - A Replace RDU.
  - B Defective Altimeter Indicator AAU-32/A.
    - B Refer to Chapter 8, para. 8-185 in TM 55-1520-210-23-2.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

- 
41. HEADING DATA INVALID error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.
- A Defective RDU.
    - A Replace RDU.
  - B Defective Compass System.
    - B Refer to Chapter 8, para. 8-18 in this TM.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.
42. FAULT ON EXTERNAL APR ANNUNCIATOR error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.
- A Defective APR annunciator lamps on instrument panel.
    - A Replace lamps.
  - B Defective RDU.
    - B Replace RDU.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.
43. FAULT ON EXTERNAL HLD ANNUNCIATOR error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.
- A Defective HLD annunciator lamps on instrument panel.
    - A Replace lamps.
  - B Defective RDU.
    - B Replace RDU.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.
44. FAULT ON EXTERNAL WPT ANNUNCIATOR error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.
- A Defective WPT annunciator lamps on instrument panel.
    - A Replace lamps.
  - B Defective RDU.
    - B Replace RDU.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.



43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING  
(AVUM) - Continued

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SYMPTOM

PROBABLE CAUSE

CORRECTIVE ACTION

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45. FAULT ON EXTERNAL MSG ANNUNCIATOR error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.

A Defective MSG annunciator lamps on instrument panel.

A Replace lamps.

B Defective RDU.

B Replace RDU.

C Defective aircraft wiring.

C Repair or replace wiring as required.

NOTE

The error message in step 46 will appear when a low voltage condition (23 Vdc or less) exists on the primary power system of the aircraft.

46. LOW VOLTAGE-INPUT VOLTAGE: XX.XV error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.

Defective aircraft power system.

Refer to Chapter 9, Section I in TM 55-1520-210-23-2.

NOTE

The error message in step 47 will appear when the voltage on the primary power system of the aircraft drops below 22.5 Vdc.

47. UNIT RESET DUE TO LOW INPUT VOLTAGE error message is displayed when MSG key is pressed after MSG annunciator on RDU flashes during normal system operation.

Defective aircraft power system.

Refer to Chapter 9, Section I in TM 55-1520-210-23-2.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

- 
48. RDU does not respond properly when a key or selector knob (inner or outer) of MENU control is actuated.
- A Defective RDU.
    - A Replace RDU.
  - B Loose or defective selector knob.
    - B Tighten or replace selector knob as required.
49. GPS time/space vehicle (SV) data fails to load into RDU.
- A Defective RDU.
    - A Replace RDU.
  - B Defective GPS FILL DATA receptacle on instrument panel.
    - B Replace receptacle.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.
50. Cryptokeys fail to load into RDU.
- A Defective RDU.
    - A Replace RDU.
  - B Defective GPS FILL KYK feed through connector on instrument panel.
    - B Replace connector.
  - C Defective connector attached to farside of GPS FILL KYK feed through connector.
    - C Replace connector.
  - D Defective aircraft wiring.
    - D Repair or replace wiring as required.
51. Altitude display reading on RDU does not agree with reading on barometric altimeter to within 100 feet during Barometric Altitude AAU-32 check.
- A Defective RDU.
    - A Replace RDU.
  - B Defective barometric altimeter AAU-32.
    - B Replace AAU-32.
  - C Defective aircraft wiring.
    - C Repair or replace wiring as required.



43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING  
(AVUM) - Continued

SYMPTOM

PROBABLE CAUSE

CORRECTIVE ACTION

52. Course Deviation Indicator ID-1347/ARN does not respond to commands from RDU during Course Deviation Indicator ID-1347/ARN checks.

A Defective RDU.

A Replace RDU.

B Defective remote switch assembly.

B Replace assembly.

C Defective NO. 2 BRG PTR switch.

C Replace switch.

D Defective course deviation indicator.

D Replace ID-1347/ARN.

E Defective aircraft wiring.

E Repair or replace wiring as required.

53. Any one or more of the external annunciators (APR, HDL, MSG, or WPT) on instrument panel does not illuminate in response to commands from RDU during Course Deviation Indicator ID-1347/ARN checks.

A Defective RDU.

A Replace RDU.

B Defective aircraft wiring.

B Repair or replace wiring as required.

54. Course Indicator ID-998/ASN does not respond to commands from RDU during Course Indicator ID-998/ASN checks.

A Defective RDU.

A Replace RDU.

B Defective servo amplifier.

B Replace amplifier.

C Defective CDI SEL GPS switch/DME indicator assembly.

C Replace assembly.

D Defective course indicator.

D Replace ID-998/ASN.

E Defective aircraft wiring.

E Repair or replace wiring as required.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVUM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

- 
55. Course Indicator ID-250/ARN does not respond to commands from RDU during Course Indicator ID-250/ARN checks.
- A Defective RDU.
    - A Replace RDU.
  - B Defective servo amplifier.
    - B Replace amplifier.
  - C Defective CDI SEL GPS switch/DME indicator assembly.
    - C Replace assembly.
  - D Defective course indicator.
    - D Replace ID-998/ASN.
  - E Defective aircraft wiring.
    - E Repair or replace wiring as required.
56. DME indicator lamps in CDI SEL GPS switch/DME indicator assembly do not come on when DME IND switch is set to GPS position.
- A Defective remote switch assembly.
    - A Replace assembly.
  - B Defective CDI SEL GPS switch/DME indicator assembly.
    - B Replace assembly.
  - C Defective DME indicator lamps in CDI SEL GPS switch/DME indicator assembly.
    - C Replace lamps.
  - D Defective aircraft wiring.
    - D Repair or replace wiring as required.
57. Control Indicator ID-2192/ARN-124 does not respond to commands from RDU during Control Indicator ID-2192/ARN-124 (DME) checks.
- A Defective RDU.
    - A Replace RDU.
  - B Defective DME IND switch.
    - B Replace switch.
  - C Defective DME indicator.
    - C Replace ID-2192/ARN-124.
  - D Defective aircraft wiring.
    - D Repair or replace wiring as required.



43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING  
(AVUM) - Continued

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SYMPTOM

PROBABLE CAUSE

CORRECTIVE ACTION

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58. Navigational mode fails to switch from GPS to VOR operation (indicated by GPS indicator lamps in CDI SEL GPS switch/DME indicator assembly not going out and VOR indicator lamps in CDI SEL VOR switch/DME indicator assembly not coming on) when mode selector switch on FM Radio Set Control in AN/ARC-54, AN/ARC-131, or AN/ARC-201 system is set to MODE or MOD position, as applicable, during FM homing GPS/VOR mode control checks.
- A Defective remote switch assembly.
    - A Replace assembly.
  - B Defective CDI SEL VOR switch/DME indicator assembly.
    - B Replace assembly.
  - C Defective VOR indicator lamps in CDI SEL VOR switch/DME indicator assembly.
    - C Replace lamps.
  - D Defective FM Radio Set Control.
    - D Replace control.
  - E Defective aircraft wiring.
    - E Repair or replace wiring as required.
59. GPS mode operation activates when CDI SEL GPS switch/DME indicator assembly is pressed with FM homing mode operation selected.
- A Defective remote switch assembly.
    - A Replace assembly.
  - B Defective aircraft wiring.
    - B Repair or replace wiring as required.
60. GPS mode operation is not restored when FM homing mode operation is deselected.
- Defective FM Radio Set Control.
    - Replace control.
61. One or more failures detected in response to commands from RDU during Satellite Acquisition checks.
- A Defective RDU.
    - A Replace RDU.
  - B Defective GPS antenna.
    - B Replace antenna.
  - C Defective GPS antenna cabling.
    - C Repair or replace cabling as required.



# 43-6. SATELLITE SIGNALS NAVIGATION SET AN/ASN-175 TROUBLESHOOTING (AVIM) - Continued

## SYMPTOM

### PROBABLE CAUSE

### CORRECTIVE ACTION

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- |  |  |
|--|--|
| <p>62. The keys zeroizing function of RDU fails to zeroize cryptokeys initially loaded during Cryptokeys Loading check.<br/>Defective RDU.</p> | <p>Replace RDU.</p>                            |
| <p>63. RDU fails to zeroize when GPS ZEROIZE switch on instrument panel is actuated.<br/>A Defective RDU.</p>                                  | <p>A Replace RDU.</p>                          |
| <p>B Defective GPS ZEROIZE switch.</p>   | <p>B Replace switch.</p>                       |
| <p>C Defective aircraft wiring.</p>  | <p>C Repair or replace wiring as required.</p> |
| <p>64. One or more auxiliary I/O port settings cannot be programmed in response to commands from the RDU.<br/>Defective RDU.</p>               | <p>Replace RDU.</p>                            |
| <p>65. One or more user units or parameters cannot be programmed in response to commands from the RDU.<br/>Defective RDU.</p>                  | <p>Replace RDU.</p>                            |
| <p>66. The AN/ASN-175 system fails to shutdown when power switch on RDU is set to the off position.<br/>Defective RDU.</p>                     | <p>Replace RDU.</p>                            |



**43-6.1 Signal and Voltage Measurements (AVUM).**

- If a trouble develops in Satellite Signals Navigation Set AN/ASN-175 and the preceding operational checks and troubleshooting charts do not indicate the source of trouble, refer to the chart below and check for voltages or signals listed. If the measured voltage or signal is not as specified, refer to FO-72 and trace the wiring to power source, basic signal equipment or installation item to locate fault.
- Terminal board location is shown on FO-4.
- Only the type of signal is listed in some cases, such as audio and synchro signals, since the exact values are dependent upon variable factors.
- The TB or P column lists terminal board or plug number where measurement should be taken.
- The Terminal column lists terminal or pin number for the measurement.
- The Terminal Function column lists the function of the voltage or signal being measured.
- The Equipment Operation column lists specific equipment operations required to have voltage or signal present.
- The Voltage column lists voltage or signal that should be present during stated equipment operation.

**43-6.1.3 UH-1H/V Signal and Voltage Measurements (AVUM)**

TB or P	Terminal	Terminal function	Equipment operation	Voltage
TB1	12	26 Vac reference	COURSE IND circuit breaker energized	26 Vac
TB13	1	Panel lighting	CONSOLE PED LIGHTS circuit breaker energized	0-28 Vdc
P2601 (RDU)	16, 17	Primary power	AN/ASN-175 energized	28 Vdc
P2602 (RDU)	19	Primary power	AN/ASN-175 energized	28 Vdc
P2602 (RDU)	21, 44	26 Vac reference	COURSE IND circuit breaker energized	26 Vac
P2606 (Servo Amp)	12, 13	26 Vac power and reference	COURSE IND circuit breaker energized	26 Vac
P2607 (Remote Switch)	4	Primary power	AN/ASN-175 energized	28 Vdc



## APPENDIX A REFERENCES

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AR 40-14	Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials (DLAR 1000.28).
DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms.
DA PAM 738-750	The Army Maintenance Management System.
FM 21-11	First Aid for Soldiers.
SB 11-543	Safety and Breakaway Wiring for Electronic Equipment in Aircraft.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronic Command Equipment.
SB 11-641	Repair and Return Procedures Under Reliability Improvement Warranty (RIW) for Radio Receiving Sets AN/ARN-123(V)1 (NSN 5826-01-061-2762), AN/ARN-123(V)3 (5826-01 + 058-6800) and AN/ARN-123(V)4 (5826-01-070-4067) and R-1963/ARN Receiver, Radio (5826-01-015-1574).
TB 11-5826-217-30-1	Correction of Quadrantal Error for Direction Finder Set AN/ARN-59(V) and Radio Compass AN/ARN-6, Loop Antenna in Army Aircraft.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-1520-210-20P	Organizational Maintenance Repair Parts and Special Tools Kit for Electronic Equipment Configurations, Army Model UH-1 D (NSN 1520-00-859-2670), UH-1 H (1520-00-087-7637) and UH-1 V (1 520-01-043-4949) Helicopters.
TM 11-1520-210-34P-1	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Electronic Configuration, Army Model UH-1 D (NSN 1520-00-859-2670), UH-1 H (1520-00-087-7637) and UH-1V (1 520-01-043-4949) Helicopters.
TM 11-5810-242-12 P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Communications Security Equipment, TSEC/KI-1 A: KIT-1 A/TSEC W/Z-ACA/1/TSEC (NSN 5810-00-061-3386), KI R-1 A/TSEC W/Z-ACA/1 /TSEC (5810-00-061-3388), KIT-1 A/TSEC W/Z-ACB/1 /TSEC (5810-00-430-0113) and KI R-1 A/TSEC W/Z-AC B/1 /TSEC (5810-00-430-0114).
TM 11-5820-518-20	Organizational Maintenance Manual for Radio Sets AN/ARC-51 X (NSN 5821-00-082-3698) and AN/ARC-51 BX (5821-00-082-3926).
TM 11-5820-518-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Radio Sets AN/ARC-51 X (NSN 5821-00-082-3698) and AN/ARC-51 BX (5821-00-082-3926).
TM 11-5820-518-35	Direct Support, General Support and Depot Maintenance Manual: Radio Sets AN/ARC-51 X (NSN 5821-00-082-3698) and AN/ARC-51 BX (5821-00-082-3926).
TM 11-5820-670-12	Operator's and Organizational Maintenance Manual: Radio Set AN/ARC-131 (NSN 5821-00-937-4686).
TM 11-5820-670-20P	Organizational Maintenance Repair Parts and Special Tools List for Radio Set AN/ARC-131 (NSN 5821-00-937-4686).
TM 11-5820-670-34	Direct Support and General Support (Aviation Intermediate) Maintenance Manual for Radio Set AN/ARC-131 (NSN 5821-00-937-4686).
TM 11-5821-207-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Transmitter, Radio T-366/ARC (NSN 5821-00-503-3434) and T-366A/ARC (5821-00-681-9779).
TM 11-5821-217-12	Operator's and Organizational Maintenance Manual for Radio Sets, AN/ARC-73 and AN/ARC-73A.



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TM 11-5821-217-20P	Organizational Maintenance Repair Parts and Special Tools List for Radio Sets, AN/ARC-073 and AN/ARC-73A; (AN/ARC-73, FSN 5821-681-9897) (AN/ARC-73A, 5821-752-0546).
TM 11-5821-244-12	Operator's and Organizational Maintenance Manual for Radio Set, AN/ARC-54 (NSN 5821-00-082-3598).
TM 11-5821-244-20	Organizational Maintenance Repair Parts and Special Tools List for Radio Set, AN/ARC-54 (FSN 5821-082-3598).
TM 11-5821-248-12	Operator's and Organizational Maintenance Manual for Radio Set, AN/ARC-102 (NSN 5821-00-050-8255).
TM 11-5821-248-20	Organizational Maintenance Repair Parts and Special Tools List for Radio Set, AN/ARC-102 (NSN 5821-00-050-8255).
TM 11-5821-259-20	Organizational Maintenance Manual for Radio Sets, AN/ARC-114 (NSN 5821-00-935-5071) and AN/ARC-114A (5821-00-165-2970): Network, Impedance Matching, CU-1 794/ARC-114 (5915-00-056-4953) and Network, Impedance Quadrature Hybrid, CU-1796/ARC-114 (5915-00-056-4951). (Reprinted w/Basic Incl C1.)
TM 11-5821-259-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Radio Set, AN/ARC-114 (FSN 5821-935-5071) and AN/ARC-1 1 4A (5821-165-2970). (Reprinted w/Basic Incl CI-4.)
TM 11-5821-259-35	Direct Support, General Support and Depot Maintenance Manual: Radio Sets AN/ARC-114 and AN/ARC-11 4A. (Reprinted w/Basic Incl C1 -4.)
TM 11-5821-260-12-1	Operator's and Organizational Maintenance Manual: Radio Set, AN/ARC-115(V)1 (NSN 5821-01-057-4037).
TM 11-5821-260-20	Organizational Maintenance Manual: Radio Set, AN/ARC-115. (Reprinted w/Basic Incl C3-4.)
TM 11-5821-260-20P-1	Organizational Maintenance Repair Parts and Special Tools List: Radio Set, AN/ARC-i 15(V)1 (NSN 5821-01-057-4037).
TM 11-5821-260-24P	Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Repair Parts and Special Tools) for Radio Set, AN/ARC-115 (FSN 5821-935-5072).
TM 11-5821-260-35	Direct Support, General Support and Depot Maintenance Manual: Radio Set, AN/ARC-115. (Reprinted w/Basic Incl C1.)
TM 11-5821-262-20	Organizational Maintenance Manual: Control, Communication System, C-6533/ARC.
TM 11-5821-262-35	Direct Support, General Support, and Depot Maintenance Manual: Control, Communication System, C-6533/ARC.
TM 11-5821-277-20	Organizational Maintenance Manual: Radio Sets, AN/ARC-134, AN/ARC-1 34A and AN/ARC-1 34 B. (Reprinted w/Basic Incl C1-3.)
TM 11-5821-277-20P	Organizational Maintenance Repair Parts and Special Tools List: Radio Set, AN/ARC-134 (NSN 5821-00-937-1086), AN/ARC-134A (5821-00-879-1377) and AN/ARC-1 34B (5821-00-181-0430).
TM 11-5821-277-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List for Radio Set, AN/ARC-134 (NSN 5821-00-937-1086) AN/ARC-134A (5821-00-879-1377) and AN/ARC-134 B (5821-00-181-0430).
TM 11-5821-277-35	Direct Support, General Support, and Depot Maintenance Manual: Radio Sets, AN/ARC-134, AN/ARC-134A and AN/ARC-134 B. (Reprinted w/Basic Incl C1-2.)
TM 11-5821-311-12	Operator's and Organizational Maintenance Manual for Receiver-Transmitter, Radio RT-11 67/ARC-164(V) (NSN 5821-00-138-7990). (Reprinted w/Basic Incl C1.)
TM 11-5821-311-20P	Organizational Repair Parts and Special Tools List for Receiver-Transmitter, Radio RT-1167/ARC-1 64(V) (NSN-5821-00-138-7990).
TM 11-5821-311-34	Direct Support and General Support Maintenance Manual: Receiver-Transmitter, Radio RT-1167/ARC-164(V) (NSN 5821-00-138-7990).



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TM 11-5821-311-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Receiver-Transmitter, Radio RT-11 67/ARC-1 64(V) (NSN 5821-00-138-7990).
TM 11-5826-211-50	Depot Maintenance Manual: Radio Magnetic Indicator ID-250A/ARN.
TM 11-5826-215-12	Operator's and Organizational Maintenance Manual for Receiving Sets, Radio, AN/ARN-30D and AN/ARN-30E.
TM 11-5826-219-12	Operator and Organizational Maintenance Manual: Receivers, Radio, R-1041/ARN and R-1041 A/ARN and R-1041 B/ARN.
TM 11-5826-219-35	Direct Support, General Support, and Depot Maintenance Manual for Receivers, Radio, R-1041/ARN and R-1041 A/ARN.
TM 11-5826-219-35/1	Direct Support, General Support and Depot Maintenance Manual: Receiver, Radio, R-1 041 B/ARN. (Reprinted w/Basic Incl C1.)
TM 11-5826-219-35P	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Receivers, Radio R-1041/ARN, R-1 041 A/ARN and R-1041 B/ARN.
TM 11-5826-233-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tool List (Including Depot Maintenance Repair Parts and Special Tools) for Converter, Signal Data CV-1275/ ARN (NSN 5826-00-846-2934).
TM 11 -5826-225-12	Operator and Organizational Maintenance Manual: Direction Finder Set AN/ARN-83 (NSN 5826-00-912-4415).
TM 11-5826-225-20P	Organizational Maintenance Repair Parts and Special Tools List for Direction Finder Set AN/ARN-83 (NSN 5826-00-912-4415).
TM 11 -5826-225-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Direction Finder Set AN/ARN-83 (NSN 5826-00-912-4415).
TM 11-5826-225-35	Direct Support, General Support, and Depot Maintenance Manual: Direction Finder Set, AN/ARN-83 (NSN 5826-00-91 2-441 5). (Reprinted w/Basic Incl C1-5.)
TM 11-5826-226-20	Organizational Maintenance Manual for Radio Receiving Sets, AN/ARN-82 (NSN 5826-00-402-5318), AN/ARN-82A (5826-00-168-8699) and AN/ARN-82B (5826-01-070-4066). (Reprinted w/Basic Incl C1-2).
TM 11-5826-226-20P-1	Organizational Maintenance Repair Parts and Special Tools List for Receiving Set, Radio AN/ARN-82B (NSN 5826-00-168-8699).
TM 11-5826-226-34	Direct Support, General Support and Depot Maintenance Manual: Radio Receiving Sets AN/ARN-82 (NSN 5826-00-402-5318), AN/ARN-82A and AN/ARN-82B (5826-00-168-8699). (Reprinted w/Basic Incl C1-4.)
TM 11-5826-226-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Receiving Sets, Radio AN/ARN-82 and AN/ARN-82A.
TM 11-5826-226-34P-1	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Receiving Set, Radio AN/ARM-82 B (NSN 5826-00-168-8699).
TM 11-5826-235-20	Organizational Maintenance Manual: TACAN Navigational Set AN/ARN-52(V).
TM 11-5826-235-24P-1	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools): TACAN Navigational Set AN/ARN-52(V) (FSN 5826-884-0899). (Republic Electronic Industries Corp.) (24X Microfiche).
TM 11-5826-235-25-1	Organizational, Direct Support, General Support, and Depot Maintenance Manual for TACAN Navigational Set AN/ARN-52(V). (Republic Electronics Industries Corp.)



## APPENDIX A- Continued

TM 11-5826-257-24	Organizational, Direct Support, and General Support Maintenance Manual: Radio Receiver R-1963/ARN (NSN 5826-01-015-1574).
TM 11-5826-258-20P	Organizational Maintenance Repair Parts and Special Tools List for Receiving Set, Radio, AN/ARN-123(V) (NSN 5826-01-016-2762).
TM 11-5826-258-24	Organizational, Direct Support, and General Support Maintenance Manual: Radio Receiving Sets, AN/ARN-123(V)1 (NSN 5826-01-016-2762), AN/ARN-1 23(V)2 (5826-01-016-2761), AN/ARN-1 23(V)3 (5826-01-058-6300) and AN/AR N-1 23(V)4 (5826-01-4067). (Reprinted w/Basic Incl C1.)
TM 11-5826-299-34	Direct and General Support Maintenance Manual for Indicator, Radio Magnetic Compass I D-998/ASN (NSN 5826-00-897-4889).
TM 11-5826-300-20	Organizational Maintenance Manual for Distance Measuring Set, AN/ARN-124 (NSN 5826-01-063-6005).
TM 11-5831-201-20	Organizational Maintenance Manual: Control, Intercommunication Set, C-1611 D/AIC (NSN 5831-00-933-9822) and Discriminator, Discrete Signal, M D-736/A. (Reprinted w/Basic Incl C1.)
TM 11-5831-201-20P	Organizational Maintenance Repair Parts and Special Tools List for Control, Intercommunication Set, C-1611 D/AIC and Discriminator, Discrete Signal, MD-736/A.
TM 11-5831-201-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Repair Parts and Special Tools) for Control Intercommunication Set C-1 611 D/AIC (NSN 5831-00-933-9822) and Discriminator, Discrete Signal MD-736/A (NSN 5821-00-937-7633).
TM 11-5831-201-35	Direct Support, General Support and Depot Maintenance Manual: Control, Intercommunication Set C-1 611 D/AIC and Discriminator, Discrete Signal MD-736/A. (Reprinted w/Basic Incl C1-2.)
TM 11-5841-268-23P	Organizational and Direct Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Control, Transponder Sets C-6280(P)/APX (NSN 5895-00-782-0844) and C-6280A(P)/APX (5895-00-089-4403).
TM 11-5841-268-25	Organizational, Field, Intermediate, Direct Support, General Support and Depot Maintenance with Illustrated Parts Breakdown for Control Transponder Set, C-6280(P)/APX, C-6280A(P)/APX, C-6717/APX and C-7483/APX (TO 12 P4-2APX-1 42; NAVAIR 35C6280-1). (Reprinted w/Basic Incl C1-2.)
TM 11-5841-283-12	Aviation Unit Maintenance Manual for Radar Signal Detecting Set, AN/APR-39(V) (NSN 5841-01-023-7112) (NAVAI R 16-30APR39-1).
TM 11-5841-283-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List for Radar Signal Detecting Set AN/ARN-39(V)1 (NSN 5841-01-023-7112) (NAVAIR 16-30APR39-2).
TM 11-5841-283-34-1	Aviation Intermediate Maintenance Manual for Radar Signal Detecting Set AN/APR-39(V)1 (NSN 5841-01-023-7112) (NAVAI R 16-30APR39-2).
TM 11-5841-284-23+ P	Operator's, Organizational and Direct Support Maintenance Manual (Including Repair Parts and Special Tools List): Altimeter Set, Electronic AN/APN-209(V)1 (NSN 5841-01-023-121 1).
TM 11-5841-292-13+ P	Operator's, Aviation Unit and Aviation Intermediate Maintenance Manual Including Repair Parts and Special Tools List for Altimeter Set, Electronic, AN/APN-209A(V)1 (NSN 5841-01-098-4339), AN/APN-209A(V)2, (5841-01-099-1796), AN/APN-209A(V)3, AN/APN-209 B(V)1, AN/APN-209B(V)2 and AN/APN-209B(V)3.
TM 11-5895-217-12	Operator and Organizational Maintenance Manual (Including Repair Parts List): Transponder Sets, AN/APX-44 and AN/APX-44 B.
TM 11-5895-490-20	Organizational Maintenance Manual for Receiver-Transmitter, Radio, RT-859/APX-72 (NSN 5895-00-089-7179) and RT-859A/APX-72 (5895-00-160-2198) and Mountings MT-3809/APX-72 (5895-00-063-9498) and MT-3948/APX-72 (5895-00-089-9202) (NAVSH IPS 0967-217-4010). (Reprinted w/Basic Incl C1-2.)



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TM 11-5895-490-20P	Organizational Maintenance Repair Parts and Special Tools List: Receiver-Transmitter RT-859/APX-72 and Mountings and MT-3809/APX-72 and MT-3948/APX-72.
TM 11-5895-490-34-1	Direct Support and General Support or Aviation Intermediate Maintenance (AVIM) Receiver-Transmitter, Radio, RT-859A/APX-72 (NSN 5895-00-149-1319) Using Test Set, AN/APM-305A (6625-01-052-3881).
TM 11-5895-490-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Repair Parts and Special Tools) for Receiver-Transmitters, Radio RT-859/APX-72 (NSN 5895-00-089-7179), RT-859A/APX-72 (5895-00-160-2198) and Mountings MT-3809/APX-72 (5895-00-063-9498) and MT-3498/APX-72 (5895-00-089-9202).
TM 11-5895-490-35	Intermediate and Direct/General Support Maintenance w/Depot Overhaul Instructions for Receiver-Transmitter, Radio, RT-859/APX-72, RT-859A/APX-72 and Mountings MT-3809/APX-72, MT-3948/APX-72 (NAVAIR 16-30APX72-2; NAVSH IPS 0967-21 7-4020; TO 12P4-2APX72-2).
TM 11-5895-555-23P	Organizational and Direct Support Maintenance Repair Parts and Special Tools List for Control, Indicator C-8157/ARC (NSN 5821-00-926-7230) and Mounting MT-3802/ARC (NSN 5810-00-937-1036) BB-433/A (6140-00-753-2251), BB-433A/A (6140-01-046-111 6), BB-434/A.
TM 11-5895-555-24	Organizational, Direct Support and General Support Maintenance Manual for Control Indicator C-8157/ARC and Mounting MT-3802/ARC.
TM 11-5915-201-15	Operator's, Organizational, Field and Depot Maintenance Manual: Network, Impedance Matching, CU-991 /AR (Collins Automatic Tuner Model 1801-2).
TM 11-5985-200-12	Operator's and Organizational Maintenance Manual: Antenna Groups AN/ARA-31 and AN/ARA-56 and Switch Assemblies SA-474/AR and SA-474A/AR.
TM 11-5985-200-20P	Organizational Maintenance Repair Parts and Special Tools List for Antenna Group AN/ARA-31 (NSN 5985-00-296-2457) and Switch Assembly SA-474/AR (5930-00-342-6074) and SA-474A/AR (5930-00-823-0959).
TM 11-5985-326-20	Organizational Maintenance Manual for Coupler, Antenna, CU-1658/A and CU-1669/GRC.
TM 11-6110-211-15	Organizational, Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tools List): Amplifier, Electronics Control, AM-3209/ASN. (Reprinted w/Basic Incl C11.)
TM 11-6110-211-24P	Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Amplifier, Electronic Control, AM-3209/ASN) (FSN 6110-678-8507).
TM 11-6125-206-14P	Operator's, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List (including Depot Maintenance Repair Parts and Special Tools) for Dynamotor DY-86/ARN-30 (FSN 6125-51 9-1310).
TM 11-6125-207-20P	Organizational Maintenance Repair Parts and Special Tools List for Dynamotors DY-107/AR, DY-107A/AR and DY-1 07 B/AR.
TM 11-6125-207-35	Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tools List) for Dynamotor, DY-107/AR, DY-1 07A/AR and DY-1 07 B/AR.



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TM 11-4920-296-14&P	Operator's, Organizational, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools) for Transponder Set, Test Set, AN/APM-378 (NSN 4920-00-134-1533).
TM 11-5821-318-12	Operator's & Aviation Unit Maintenance Manual for VHF AM/FM Radio Set AN/ARC-186(V) (NSN 5821-01-086-6243).
TM 11-5821-318-20P	Aviation Unit Maintenance, Repair Parts & Special Tools List for VHF AM/FM Radio Set AN/ARC-186(V) (NSN 5821-01-086-6243).
TM 11-5821-318-30	Aviation Unit Maintenance Manual for VHF AM/FM Radio Set AN/ARC-186(V) (NSN 5821-01-086-6243).
TM 11-5821-318-30P	Direct Support and General Support Maintenance Manual Repair Parts & Special Tools List for Receiver-Transmitter RT-1354/ARC-186(V).
TM 11-5821-330-13&P	Operator's, Aviation Unit and Intermediate Maintenance Manual (Includes Repair Parts & Special Tools List) for Radio Set AN/ARC-199 (NSN 5821-01-167-8296).
TM 11-5821-330-20P	Organizational Maintenance Repair Parts & Special Tools List for Radio Set AN/ARC-199.
TM 11-5821-331-13	Operator's, Aviation Unit and Intermediate Maintenance Manual for Amplifier Control C-11188A/ARC (NSN 5821-01-188-3424) and Radio Frequency Amplifier AM-7189A/ARC (NSN 5821-01-188-3332).
TM 11-5821-333-12	Operator's and Aviation Unit Maintenance Manual for Radio Sets AN/ARC-201 (V) and AN/ARC-201A(V).
TM 11-5821-333-23P	Aviation Unit and Intermediate Maintenance, Repair Parts & Special Tools List for Radio Sets AN/ARC-201 (V) and AN/ARC-201A(V).
TM 11-5821-333-30	Aviation Unit Maintenance for Radio Sets AN/ARC-201 (V) and AN/ARC-201 A(V).
TM 11-5826-227-20	Organizational Maintenance Manual for Direction Finder Set AN/ARN-89, AN/ARN-89A and AN/ARN-89B.
TM 11-5826-227-24P	Organizational, Direct Support, and General Support Repair Parts & Special Tools List for Direction Finder Set AN/ARN-89, AN/ARN-89A and AN/ARN-89B.
TM 11-5826-227-34	Direct Support and General Support Maintenance Manual for Direction Finder Set AN/ARN-89, AN/ARN-89A and AN/ARN-89B.



**APPENDIX A - Continued**

TM 11-5826-258-20P	Organizational Maintenance Repair Parts & Special Tools List for Radio Receiving Sets AN/ARN-123(V)1, AN/ARN-123(V)2, AN/ARN-123(V)3 and AN/ARN-123(V)4.
TM 11-5826-258-24	Organizational, Direct Support and General Support Maintenance Manual for Radio Receiving Sets AN/ARN-123(V)1, AN/ARN-123(V)2, AN/ARN-123(V)3 and AN/ARN-123(V)4.
TM 11-5841-281-12	Operator's and Organizational Maintenance Manual for Doppler Navigation Set AN/ASN-128.
TM 11-5841-281-20P	Organizational Maintenance Repair Parts & Special Tools List for Doppler Navigation Set AN/ASN-128.
TM 11-5895-1037-12	Operator's and Organizational Maintenance Manual for Transponder Set AN/APX-100(V).
TM 11-5895-1037-30&P	Intermediate Maintenance Manual with Illustrated Parts Breakdown for Transponder Set AN/APX-100(V).
TM 11-6625-3090-12&P	Operator's and Unit Maintenance Manual Including Repair Parts and Special Tools List for Transponder Test Set AN/APM-424(V)2 (NSN 6625-01-152-6705).



**APPENDIX B****MAINTENANCE ALLOCATION**

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**Section I. INTRODUCTION****B-1. MAINTENANCE ALLOCATION CHART**

a. This Maintenance Allocation Chart (MAC) assigns maintenance functions in accordance with the Three Levels of Maintenance concept for Army Aviation. These maintenance levels (categories) - Aviation Unit Maintenance (AVUM), Aviation Intermediate Maintenance (AVIM), and Depot Maintenance - are depicted on the MAC as:

AVUM, which corresponds to an O Code in the Repair Parts and Special Tools List (RPSTL)

AVIM, which corresponds to an F Code in the Repair Parts and Special Tools List (RPSTL)

DEPOT, which corresponds to a D Code in the Repair Parts and Special Tools List (RPSTL)

b. The maintenance to be performed below depot and in the field is described as follows:

(1) Aviation Unit Maintenance (AVUM) activities will be staffed and equipped to perform high frequency "On-Aircraft" maintenance tasks required to retain or return aircraft systems to a serviceable condition. The maintenance capability of the AVUM will be governed by the Maintenance Allocation Chart (MAC) and limited by the amount and complexity of ground support equipment (GSE), facilities required, authorized manning strength, and critical skills available. The range and quantity of authorized spare modules/components will be consistent with the mobility requirements dictated by the air mobility concept. (Assignments of maintenance tasks to divisional company size aviation units will consider the overall maintenance capability of the division, the requirements to conserve personnel and equipment resources, and air mobility requirements.)

(a) Company Size Aviation Units: Perform those tasks which consist primarily of preventive maintenance and maintenance repair and replacement functions associated with sustaining a high level of aircraft operational readiness. Perform maintenance inspections and servicing to include preflight, daily, intermediate, periodic (or phased), and special inspections as authorized by the MAC or higher headquarters. Identify the cause of equipment/system malfunctions using applicable technical manual troubleshooting instructions, built-in-test equipment (BITE), installed aircraft instruments, or test, measurement, and diagnostic equipment (TMDE). Replace worn or damaged modules/ components that do not require complex adjustments or system alignment and which can be removed/installed with available skills, tools, and ground support equipment. Perform operational and continuity checks and make minor repairs to the electrical system. Inspect, service and make operational, capacity, and pressure checks to hydraulic systems. Perform servicing, functional adjustments, and minor repair/replacement to the flight control, propulsion, power train, and fuel systems. Accomplish air frame repair that does not require extensive disassembly, jiggling, or alignment. The manufacture of air frame parts will be limited to those items which can be fabricated with tools and equipment found in current air mobile tool and shop sets. Evacuate unserviceable modules/components and end items beyond the repair capability of AVUM to the supporting AVIM.

(b) Less than Company Size Aviation Units: Aviation elements organic to brigade, group, battalion headquarters, and detachment size units are normally small and have less than ten aircraft assigned. Maintenance tasks performed by these units will be those which can be accomplished by the aircraft crew chief or assigned aircraft repair person and will normally be limited to preventive maintenance, inspections, servicing, spot painting, stop drilling, application of nonstress patches, minor adjustments, module/component fault diagnosis, and replacement of selected modules/components. Repair functions will normally be accomplished by the supporting AVIM unit.

(2) Aviation Intermediate Maintenance (AVIM) provides mobile, responsive "One-Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance.) AVIM may perform all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements.



**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
ELECTRONIC EQUIPMENT CONFIGURATIONS  
UH-1H AND UH-1V**

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
00	ELECTRONIC EQUIPMENT CONFIGURATION	INSPECT TEST SERVICE ADJUST REPLACE REPAIR	0.2 0.2 0.3 0.3 0.2			1 2 1,2 2 5, 6	
01	RADIO SET AN/ARC-51 BX				2.5		BF, A
0101	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4, 9, 10 2	BD
0102	RECEIVER-TRANSMITTER RT-742/ARC-51BX OR RT-742(B)/ARC-51BX OR RT-742(C)/ARC-51 BX	TEST REPLACE REPAIR	0.3 0.1		5.0	1,2, 4, 5, 6, 9,10, 18, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31	A
0103	CONTROL UNIT C-6287/ARC-51 BX	TEST REPLACE REPAIR	0.3 0.1		5.0	2, 4 2	
02	RADIO SET AN/ARC-134						B
0201	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4, 9,10 2	BD
0202	RECEIVER-TRANSMITTER RT-857/ARC-1 34	TEST  REPLACE  REPAIR	0.3  0.5			2, 4, 5, 6, 9, 10, 22, 23, 24, 25, 28, 30, 32, 34, 35, 36, 38, 39	B
0203	CONTROL C-7197/ARC-134	TEST REPLACE REPAIR	1.0 0.5		3.0	2, 4 2	



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
0204	MOUNT MT-3791/ARC-134 OR MT-3791 (A)/ARC-134 OR MT-3791 (B)/ARC-134 OR MT-3791 (C)/ARC-1 34	REPLACE REPAIR	0.5	2.0		2, 4	B
03	RADIO SET AN/ARC-131						BF, C
0301	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4, 9, 10 2	BD
0302	RECEIVER-TRANSMITTER RT-823/ARC-131	TEST  REPLACE  REPAIR	1.0  1.0			1,2, 4, 5, 6, 9, 10, 22, 23, 24, 25, 26, 37, 39, 40, 41, 42, 43, 44, 45	C
0303	CONTROL C-7088/ARC	TEST REPLACE REPAIR	1.0 1.0			2, 4 2	C
0304	MOUNT MT-3664/ARC-131	REPLACE REPAIR	1.0	2.0		2, 4	
04	COMMUNICATIONS SECURITY SET TSEC/KY-28	TEST REPLACE REPAIR	0.1 0.5			2, 4, 5, 6, 22, 25, 104, 105, 106, 107, 108	AH
05	CONTROL-INDICATOR, VOICE SECURITY C-8157/ARC	TEST REPLACE REPAIR	0.1 0.2	0.1			
06	RECEIVING SET, RADIO AN/ARN-82						D
0601	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4, 9, 10 2	BD
0602	RECEIVER R-1388/ARN-82 OR R-1388A/ARN-82	TEST REPLACE REPAIR	0.3 0.1			1, 2, 4, 5, 6, 13, 18, 22, 24, 26, 28, 29, 30, 34, 39, 46	
0603	CONTROL C-6873/ARN-82 OR C-6873A/ARN-82 OR C-6873B/ARN-82	TEST REPLACE REPAIR	0.3 0.1			2, 4 2	



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
0604	MOUNT MT-3600/ARN-82	REPLACE	0.5			2, 4	
0605	INDICATOR ID-1347, ID-1347A, ID-1347B OR ID-1347C	REPAIR		2.0			
07	DIRECTION FINDER SET AN/ARN-83	REPLACE	0.5	2.0		2, 4	
0701	RECEIVER R-1391/ARN-83	REPAIR					BF, E
		TEST	0.3			1,2, 4, 5, 6,18,22,	
		REPLACE	0.1			24, 26, 28, 29, 30, 34, 39, 46, 47	
0702	CONTROL C-6899/ARN-83	REPAIR			5.0		E
		TEST	0.3			2,4	
		REPLACE	0.1			2	
0703	MOUNT MT-360.5/ARN-3	REPAIR			3.0		
		REPLACE		0.5		2, 4	
08	CONTROL, INTERCOM- MUNICATIONS SET C-1611 D/AIC	REPAIR		2.0			
		INSPECT	0.1			1	
		TEST	0.2			2	
		REPLACE	0.1				
0801	DISCRETE SIGNAL DISCRIMINATOR MD-736/A	REPAIR			1.0		F
		TEST	0.2			1,2, 4, 5, 6, 22, 29	
		REPLACE	0.8				
09	COMPASS SET, GYROMAG- NETIC AN/ASN-43	REPAIR		2.0			F G, BF
0901	DIRECTIONAL GYRO CN-998/ASN-43 OR CN-998A/ASN-43 OR CN-998B/ASN-43	TEST	0.4			1, 2, 4, 5, 6, 25, 30, 39, 48. 49, 50, 51, 52, 53, 54, 55	
		REPLACE	0.5				
0902	CONNECTING CABLES	REPAIR			24.0		G
		TEST	0.2			2, 4	BD
		REPLACE	0.1			2	
0903	COMPASS TRANSMITTER T-611 ( )/ASN	REPAIR	0.5				G
		REPLACE		0.5			
		REPAIR			4.0		G



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
0904	INDICATOR, COURSE ID-250A/ASN	TEST REPLACE REPAIR	0.2 0.1		3.0	1 2	H
0905	INDICATOR, RADIO MAGNETIC COMPASS ID-998/ASN	TEST REPLACE REPAIR	0.2 0.1		3.0	1 2	I
10	GYROSCOPE, DISPLACEMENT MD-1	TEST REPLACE REPAIR	0.3 0.2			1 2	J
1001	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4	BD
1002	MOUNT MT-4177/A OR 110552-01 (LEAR)	REPLACE REPAIR	0.3	2.0		2	
11	GYROSCOPE, RATE MC-1	TEST REPLACE REPAIR	0.3 0.2			1 2	K
1101	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4 2	BD
12	RECEIVER, RADIO R-1041 B/ARN	TEST  REPLACE  REPAIR	0.2  0.1		5.0	1, 2, 4, 5, 6, 18, 22, 23, 26, 28, 30, 47, 56, 57	L
1201	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4 2	BD
1202	MOUNT MT-22921AR	REPLACE REPAIR	0.5	2.0		2, 4	
13	TRANSPONDER SET AN/APX-72A	BF					
1301	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4 2	BD
1302	RECEIVER-TRANSMITTER RT-859/APX-72 OR RT-859A/APX-72	TEST  REPLACE  REPAIR	0.3  0.1		0.3	1, 2, 4, 5, 6, 13, 24, 25, 26, 30, 58, 59, 60, 61, 62, 63, 64, 65, 66	N



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
1303	TRANSPONDER CONTROL C-6280A(P)/APX-72	TEST REPLACE REPAIR	0.3 0.1		3.0		M
1304	ANTENNA AT-884( )/APX-44	REPLACE REPAIR	0.3	1.0			
1305	COMPUTER KIT-1A/TSEC	TEST REPLACE REPAIR	0.4 0.3		4.0	2, 4, 13 2	AA
14	DETECTING SET, RADAR SIG- NAL AN/APR-39(V)1						BF, O
1401	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4 2	BD
1402	RECEIVER R-1838/APR-39(V)	TEST  REPLACE  REPAIR	0.3  0.3	  0.6		2, 4, 5, 6, 8, 25, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76	BE  O
1403	CONTROL C-9326/APR-39(V)	TEST REPLACE REPAIR	0.3 0.1	0.5		2, 4 2	BE
1404	INDICATOR IP-1150/APR-39(V)	TEST REPLACE REPAIR	0.3 0.3	0.5			BE
1405	COMPARATOR CM-480/APR-39(V)	TEST REPLACE REPAIR	0.2 0.3	0.4			BE
15	MOTOR GENERATOR PU-543( )/A OR PU-545/A	TEST  REPLACE  REPAIR	0.1  1.0		12.0	1, 2, 4, 5, 6, 25, 26, 29, 30, 43, 55, 77, 78, 79, 80, 81, 82, 83	T, U
16	BATTERY, STORAGE BB-433A	TEST REPLACE REPAIR	0.6 0.2	3.0		4, 84, 85, 86, 87	V



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
17	UHF/AM RADIO SYSTEMS AN/ARC-1 64(V)	TEST REPLACE REPAIR	0.4 0.3 1.0			2, 4, 9, 10 2	BF, P BG
1701	CONNECTING CABLES CSK-9-03000-501 DSK-9-03002-501	TEST REPLACE REPAIR	0.2 0.1 0.1			2, 4, 9, 10 2	BD
1702	RECEIVER-TRANSMITTER RT-11 67/ARC-1 64(V)	TEST REPLACE REPAIR	0.3 0.1 0.4			2, 4, 9, 10 3	BG
18	LF/ADF SYSTEM AN/ARN-89	TEST REPLACE REPAIR	0.3 0.4 1.0			2, 4 2	Q BH
1801	CONNECTING CABLES DSK-9-02954-501 DSK-9-03215-505 DSK-9-03215-506	TEST REPAIR	0.2 0.1			2, 4 2	BD
1802	RECEIVER R-1496/ARN-89	TEST REPLACE REPAIR	0.2 0.1		0.6	2, 4 2	W
1803	CONTROL UNIT C-7392A/ ARN-89	EST REPLACE REPAIR	0.6 0.1		0.6	2, 4 2	W
1804	SENSE, PRE-AMP, IMPED- ANCE AM-4859( )/ARN-89	TEST REPLACE ADJUST REPAIR	0.6 0.5 0.5	0.8		2, 4 2 2	W
19	RADIO RECEIVING SET AN/ARN-123(V)	TEST REPAIR	0.3 0.2			2, 4, 11, 12 2	S
1901	CONNECTING CABLES ESK-9-02976-501 CSK-9-03223-501 CSK-9-03223-502 RN5280A	TEST REPAIR	0.2 0.1			2, 4 2	BD
1902	RECEIVER R-2139/ARN-123(V) OR R-2023/ARN-123(V)	TEST REPLACE REPAIR	0.4 0.2 0.2			1, 2, 4, 5, 6, 11, 12, 18, 24, 26, 28, 29, 30, 34, 39, 46, 47	X



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
1903	CONTROL PANEL C-10048/ARN-123(V)	TEST REPLACE REPAIR	0.3 0.1 1.0			2, 4, 11, 12 2	X
20	RADAR ALTIMETER SYSTEM AN/APN-209(V)	TEST REPAIR	0.3 0.2			2, 5, 25, 32, 109, 110, 111	Z
2001	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4 2	BD
2002	RECEIVER-TRANSMITTER RT-1115/APN-209(V)	TEST REPLACE REPAIR	0.3 2.0	2.0		2, 4 2	Y, AK, AL
2003	HEIGHT INDICATOR ID-1917/APN-209(V)	TEST REPLACE REPAIR	0.3 0.1		2.0	2, 4 2	BE Y, AK, AL
21	TRANSPONDER SET, DIVERSITY APX-100(V)	TEST REPLACE REPAIR	0.6 0.2 1.0			2, 4, 13 2	AR, BF
2101	CONNECTING CABLES DSK-9-02959-501 BSK-9-03226-501	TEST REPAIR	0.2 0.1			2, 4 2	BD
2102	RECEIVER-TRANSMITTER RT-1157( )/APX-100	TEST REPLACE REPAIR	0.6 0.2 0.2			2, 4, 13 2	Z
2103	COMPUTER, KIT-1A/TSEC RT-1157( )/APX-100	TEST REPLACE REPAIR	0.4 0.3		4.0	2, 4, 13 2	AA
2104	CONTROL PANEL C-1 0533/APX-1 00(V)						
22	DOPPLER NAVIGATION SYS. AN/ASN-128	TEST REPAIR	0.3 0.1			2, 4 2	AS, BF
2201	CONNECTING CABLES ESK-9-03075-501 DSK-9-03250-501 BSK-9-03326-501	TEST REPAIR	0.2 0.1			2, 4 2	BD
2202	RECEIVER/TRANSMITTER- /ANTENNA RT-1193/ASN-128	TEST REPLACE REPAIR	0.3 0.2 0.2			NONE 2	AB



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
2203	SIGNAL DATA CONVERTER CV-3338/ASN-128	TEST REPLACE REPAIR	0.3 0.1 0.4			NONE 2	AB
2204	COMPUTER DISPLAY CP-1252/ASN-128	TEST REPLACE REPAIR	0.2 0.1 0.4			NONE 2	AB
2205	HSI CONTROL ASSY C-11740/A	TEST REPLACE REPAIR	0.3 0.1 0.4			NONE 2	AZ
2206	INDICATOR, HORIZONTAL SITUATION (HSI) ID-2103/A .	TEST REPLACE REPAIR	0.2 0.1 0.4			1 2	BB
2207	COMPASS CONTROL C-8021 ( )/ASN-75	TEST REPLACE REPAIR	0.1 0.1 0.3			2, 4 2	AC
2208	PRE-AMP, SENSE, IMPEDANCE AM-4859( )/ARN-89	TEST REPLACE ADJUST REPAIR	0.6 0.5 0.5	0.8		2, 4 2 2	W
23	VHF AM/FM RADIO SET AN/ARC-186	TEST REPAIR	0.4 0.3			2, 4, 14 2	AT, BF
2301	CONNECTING CABLES DSK-9-02953-501 DSK-9-02953-502 CSK-9-02986-501 CSK-9-02986-502	TEST REPAIR	0.2 0.1			2, 4 2	BD AD
2302	RECEIVER-TRANSMITTER RT-1300/ARC-186(V)	TEST REPLACE REPAIR	0.3 0.3	0.5		2, 4, 14 2	AD
2303	CONTROL, RADIO SET C-10604(V)6/ARC-186	TEST REPLACE REPAIR	0.3 0.2	0.2		2, 4, 14 2	AD
2304	CONTROL UNIT C-10606(V)6/ARC-186	TEST REPLACE REPAIR	0.3 0.2	0.2		2, 4, 14 2	AD
24	HF-SSB RADIO SYSTEM AN/ARC-199	TEST REPAIR	0.5 0.5			2, 49 2, 4	AU, BF



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
2401	CONNECTING CABLES ESK-9-03079-501 THRU -506 REPAIR BSK-9-03173-501 BSK-9-03173-502 DSK-9-03252-501	TEST REPLACE REPAIR	0.2 0.1			2, 4, 9, 10 2	BD
2402	RECEIVER-TRANSMITTER RT-1432/ARC-199	TEST REPLACE REPAIR	0.5 0.4		3.0	2, 4, 9, 15, 16, 17, 18, 19	AE
2403	CONTROL, DISPLAY C-11245/U	TEST REPLACE REPAIR	0.3 0.1		3.0	2, 4, 9, 10	AE
2404	AMPLIFIER-COUPLER AM-7201/U	TEST REPLACE REPAIR	0.2 0.1		3.0	2, 4, 15, 16, 17, 18, 19	AE
2405	ANTENNA COUPLER CU-2305/ARC-199	TEST REPLACE REPAIR	0.2 0.1		3.0	2, 4	
2406	HF VOLUME CONTROL C-1206/ARC	TEST REPLACE REPAIR	0.2 0.2 0.5				
25	FM COMM (FM-1 AND FM-2) AN/ARC-201	TEST REPAIR	0.6 0.5			2, 4	AV, BF
2501	RECEIVER-TRANSMITTER RT-1477/ARC-201	TEST REPLACE REPAIR	0.3 0.3	2.0		1, 2, 4, 9, 14, 17, 20, 21	AV
2502	CONTROL, RADIO SET C-11466/ARC-201	TEST REPLACE REPAIR	0.3 0.1	2.0		1, 2, 4, 9, 14, 17, 20, 21	AV
2503	RECEIVER-TRANSMITER, PANEL MOUNTED RT-1476/ARC-201	TEST REPLACE REPAIR	0.3 0.1	2.0			AV
2504	CONNECTING CABLES CSK-9-03068501 DSK-9-03207-501 CSK-9-03227-501 CSK-9-03227-502 DSK-9-03096-501 ON-512424-2	TEST REPAIR	0.5 0.3			2, 4	AV, BD



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
2505	POWER AMPLIFIER, IFM AM-7189A/ARC-201	TEST REPLACE REPAIR	0.5 0.2	2.0		2, 4	
26	RADIO SET AN/ARC-115	TEST REPLACE REPAIR	0.4 0.3	6.0		1, 2, 4, 5, 6, 9, 10, 14, 17, 22 24, 25, 26, 29, 38, 39, 89, 90, 91, 92, 93, 94, 95, 96, 97	AF
27	RADIO SET AN/ARC-54	TEST REPAIR	0.4 0.3			2, 4, 9, 10 2	AG, BC, BF
2701	CONNECTING CABLES	TEST REPAIR	0.2 0.1			2, 4 2	BD
2702	RECEIVER-TRANSMITER RT-348/ARC-54	TEST REPLACE REPAIR	1.0 1.0	4.0		1, 2, 4, 5, 6, 10, 18, 22, 23, 24, 25, 26, 29, 30, 31, 37, 39, 41, 89, 98, 99, 100, 101, 102, 103	AG
2703	CONTROL, RADIO SET C-3835/ARC-54	TEST REPLACE REPAIR		1.0 1.0	6.0	2, 4	
28	RADIO SET AN/ARC-114	TEST REPAIR	0.4 0.3	0.5	8.0	1, 2, 4, 5, 6, 9, 14, 18, 22, 23, 24, 25, 29, 39, 41, 90, 92, 94, 95, 96	BF, AJ
2801	COUPLER, ANTENNA CU-942B/ARC	TEST REPLACE REPAIR	0.2 0.1 0.3	0.3 0.5		2, 4	
29	RADIO SET AN/ARC-102	TEST REPAIR	0.4 0.3			2, 4, 9, 10 2	



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
2901	RECEIVER-TRANSMITER RT-698/ARC-102	TEST REPLACE REPAIR	0.2 0.3 0.3	0.5	8.0	1,2, 4, 5, 6,9, 10, 18,19, 22, 24, 25, 26, 29, 30, 31, 39, 64, 89, 90, 112, 113,114, 115	AM
2902	CONTROL, RADIO SET C-3940/ARC-94	TEST REPLACE REPAIR	0.1 0.2		8.0		
2903	INVERTER, POWER, STATIC PP-3702U/ARC-1 02	TEST REPLACE REPAIR	0.1 0.2	4.1			
2904	COUPLER, ANTENNA CU-1658/A	TEST REPLACE REPAIR	0.2 0.3	0.5	4.0		
2905	ANTENNA KIT, BELL P/N 305-706-027-1	TEST REPLACE REPAIR	0.2 0.3	0.5	1.0	2, 4	
30	ICS/AUDIO DISCRIMINATOR DSK-9-05079	INSPECT REPLACE REPAIR	0.1 0.1		2.0	1,2, 4, 5, 6, 22, 26, 30, 39, 94	AY, BF AN
3001	AUDIO DISCRIMINATOR MD-1 219A	TEST REPLACE REPAIR	0.1 0.1		2.0		AZ
3002	RADIO SET CONTROL C-6533( )/ARC	TEST REPLACE REPAIR	0.1 0.1	2.0			
3003	CONNECTING CABLES	TEST REPLACE	0.2 0.3				BD
31	INDICATOR ID-1351/A	TEST REPLACE REPAIR	0.1 0.2 0.4				AO
32	PROXIMITY WARNING SYS. YG-1054D1	TEST REPLACE REPAIR	0.2 0.3 1.0				AP



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARKS
			AVUM	AVIM	DEPOT		
3201	RECEIVER-TRANSMITTER HONEYWELL P/N HG1001-AOOL	TEST REPLACE REPAIR	0.2 0.3 1.0				AP
33	RECEIVER. RADIO R-1963/ARN	TEST REPLACE REPAIR	0.2 0.3		4.0		
34	COMMUNICATION SECURITY SET						AX, BF
3401	SECURE VOICE EQUIPMENT TSEC/KY-58	INSPECT TEST REPLACE REPAIR	0.1 0.1 0.2	0.5		5, 6, 116, 117, 118, 119, 120, 121, 122, 123, 124	A W
3402	INTERCONNECTING CABLE	TEST REPAIR	0.2 0.2				BD
35	AUTOMATIC DIRECTION FINDER ARN-149 (V)						
3501	RADIO RECEIVER R-2382/ARN-149 (V)	TEST REPLACE REPAIR	0.2 0.3		4.0		
3502	RADIO SET CONTROL C-12192/ARN-149 (V)	TEST REPLACE REPAIR	0.2 0.2		2.0		
3503	MOUNT MT-6583/ ARN-149 (V)	REPLACE REPAIR	0.5	2.0			
3504	CONNECTING CABLE	TEST REPAIR	0.2 0.1				BD
3505	ANTENNA PLATE ASSY (6B676) 4290358-501	INSPECT REPAIR	0.1 0.2				BI
36	SATELLITE SIGNALS NAVIGATION SET AN/ASN-175	TEST ADJUST REPAIR	0.1 0.1 0.2			2	BJ BK
3601	RECEIVER/DISPLAY UNIT TEST	INSPECT SERVICE ADJUST REPAIR REPLACE REPAIR	0.1 0.1 0.1 0.1 0.2		0.0	2 2	BL BM BN BO AZ
3602	ANTENNA	TEST REPLACE REPAIR	0.1 0.2		0.0	124 2	BO AZ
3603	SERVO AMPLIFIER	TEST REPLACE REPAIR	0.1 0.2		0.0	124 2	BO AZ



**SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS  
FOR  
ELECTRONIC EQUIPMENT CONFIGURATIONS  
UH-1H AND UH-1V**

<b>TOOL/TEST EQUIPMENT REF CODE</b>	<b>MAINT. CATEGORY</b>	<b>NOMENCLATURE</b>	<b>NATIONAL/NATO STOCK NUMBER</b>	<b>TOOL No.</b>
1	O	MULTIMETER AN/URM-105C	6625-00-999-6282	
2	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
3	O	TEST SET, TRANSPONDER AN/ARM-123(V)1	6625-00-948-0071	
4	F	ALTIMETER AN/USM-223	6625-00-999-7465	
5	F	TOOL KIT, ELECTRONIC EQUIPMENT TK-100 /G	5180-00-605-0079	
6	F	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
7	O	SIMULATOR, RADAR SIGNAL SM-674/UPM	6940-01-031-5887	
8	O	WRENCH, TORQUE T8438	5120-00-169-5776	
9	O	WATTMETER AN/URM-120	6625-00-813-8430	
10	O	DUMMY LOAD DA-75( )/U	6625-00-177-1639	
11	O	SIGNAL GENERATOR SG-13	6625-00-534-5875	
12	O	TEST OSCILLATOR BC-376(H)	6625-00-519-2408	
13	O	MODULATOR	6625-00-539-8563	
14	F	TEST FACILITIES KIT MK-994/AR	4920-00-802-7191	
15	F	TEST SET AN/URM-209		
16	F	50 OHM LOAD/30 DB ATTEN 8322	5985-00-736-8025	
17	D	POWER SUPPLY 28VDC HP6269B	4931-01-152-3209	
18	F	SIGNAL GENERATOR AN/URM-25D	6625-00-649-5193	
19	D	SPECTRUM ANALYZER AN/UPM-84A	6625-00-411-3872	
20	D	FM GENERATOR SG-1112(V)1/U	6625-00-566-3067	
21	D	FREQUENCY COUNTER TD-1225(V)1/U	7025-01-035-0316	
22	F	GENERATOR, SIGNAL AN/URM-127	6625-00-783-5965	
23	F	GENERATOR, SIGNAL AN/ASM-44C	6625-00-138-7773	
24	F	COUNTER, ELECTRONIC AN/USM-207A	6625-00-044-3228	
25	F	OSCILLOSCOPE AN/USM-281A	6625-00-228-2201	
26	F	MULTIMETER ME-26D/U	6625-00-913-9781	
27	F	MAINTENANCE KIT MK-731/ARC-51X	6625-00-082-4057	
28	F	METER, OUTPUT TS-585C/U	6625-00-244-0501	
29	F	ANALYZER, SPECTRUM TS-723D/U	6625-00-668-9418	
30	F	TEST SET, SEMICONDUCTOR TS-1 836B/U	6625-00-168-0954	



TOOL/TEST EQUIPMENT REF CODE	MAINT. CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL No.
31	F	TEST SET, ELECTRON TUBE TV-7D/U	6625-00-820-0064	
32	F	VOLTMETER, DIGITAL AN/GSM-64B	6625-00-022-7894	
33	F	ATTENUATOR VARIABLE CN-608U		
34	F	HEADSET H-216/U	5965-00-892-3353	
35	F	MICROPHONE, CARBON M-52A/U	5965-00-646-4678	
36	F	MAINTENANCE KIT MK-1004/ARC	5821-00-926-7292	
37	F	GENERATOR, SIGNAL AN/URM-1 03	6625-00-868-8352	
38	F	GENERATOR, SWEEP SIGNAL AN/USM-203C	6625-00-935 0145	
39	F	VOLTMETER ELEC ME-30F/U	6625-00-420-9354	
40	F	HEADSET H-78A/AIC	5965-00-636-3145	
41	F	METER, MODULATION ME-57/U	6625-00-647-3737	
42	F	MAINTENANCE KIT MK-1035/ARC-131	5821-00-935-0058	
43	F	STROBOSCOPE TS-805D/U	6625-00-196-2858	
44	F	TEST SET, RF POWER TS-2609/U	6625-00-933-8786	
45	F	TEST SET, RADIO AN/ARM-1	6625-00-892-5542	
46	F	TEST SET, RECEIVER AN/ARM-92B	6625-00-631-5501	
47	F	TEST SET, RECEIVER AN/ARM-180	6625-01-041-4161	
48	D	CALIBRATOR SET, MAGNETIC COMPASS AN/ASM-339(V)1	6605-00-782-0281	
49	F	VOLTMETER, PHASE ANGLE ME-223/U	6625-00-810-3917	
50	F	VOLTMETER, ELECTRONIC ME-227/U	6625-00-555-2312	
51	D	ADAPTER KIT MK-1040A/ASN	6605-00-816-0329	
52	F	TABLE TILT, GYRO MX-4042A	4920-00-937-2554	
53	F	TEST SET TS-2644/ASN	6625-00-879-1965	
54	F	TEST SET TS-2645/ASN	6625-00-879-1960	
55	D	BRIDGE, RESISTANCE ZX-4B/U	6625-00-166-0398	
56	F	TEST SET, RECEIVER AN/ARM-186	6625-00-557-1168	
57	F	ADAPTER UG-274B/U	5935-00-683-7892	
58	F	TEST SET, TRANSPONDER AN/APM-239A	6625-00-164-6551	
59	F	TEST SET, TRANSPONDER AN/APM-305	6625-00-437-7312	
60	F	SIGNAL GENERATOR AN/URM-64A	6625-00-519-2104	
61	F	SWEEP GENERATOR AN/USM-203C	6625-00-935-0145	
62	D	FREQUENCY, COMPARATOR CM-77/USM	5950-00-623-0255	
63	D	DIFFERENTIAL VOLTMETER ME-202B/U	6625-00-972-4046	
64	F	REPAIR KIT, PRINTED WIRING BOARD MK-772/U	5999-00-757-7042	



TOOL/TEST EQUIPMENT REF CODE	MAINT. CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL No.
65	F	CRYSTAL RECTIFIER TEST SET TS-268E/U	662-00-669-1215	
66	F	ADAPTER UG-564/U5935-00-258-9891		
67	F	GENERATOR SIGNAL AN/USM-213	6625-00-872-3215	
68	F	TEST SET, RF POWER AN/USM-260	6625-00-917-3099	
69	F	TEST ADAPTER, RADAR SIG. MX-Z 9848/APR-39(V)	5841-01-025-0379	
70	F	GENERATOR, SIGNAL SG-944	6625-00-107-8173	
71	F	GENERATOR, PULSE SG-1105/U (TWO EACH)	6625-01-010-3524	
72	O	TEST SET, FLIGHT LINE SIMULATOR SM-674/UPM	6940-01-031-5887	
73	F	MODULATOR DRIVER 8403A	6625-00-089-3146	
74	F	ATTENUATOR 8491 B-10	5985-00-454-6923	
75	F	PIN MODULATOR 8731B	6625-00-932-1852	
76	F	PIN MODULATOR 8734B	6625-00-113-6300	
77	D	TEST SET, BREAKDOWN INSULATION AN/GSM-6	6625-00-542-1331	
78	F	TEST SET, MOTOR GENERATOR AN/GSM-65	4920-00-348-5793	
79	O	TEST SET, ELECTRICAL POWER AN/UPM-93C	6624-00-971-6210	
80	F	POWER SUPPLY PP-4606G	6130-00-504-0327	
81	D	TEST SET, ARMATURE TS-965/U	6625-00-828-5810	
82	D	OHMMETER ZM-21 B/U	6625-00-172-6521	
83	D	TEST SET, CAPACITOR ZM-3/U	6625-00-229-1060	
84	F	CHARGER-ANALYZER, BATTERY AN/USM-432	6130-01-505-1574	
85	F	CABLE ASSEMBLY CX-11779/U	6150-00-410-9880	
86	F	CABLE ASSEMBLY CX-11934/U	6150-00-935-8722	
87	O	DISCHARGE FIXTURE CX-8927A/U	6110-00-014-6225	
88	F	GENERATOR, SIGNAL AN/URM-103	6625-00-868-8532	
89	F	VOLTMETER, ELECTRONIC AN/URM-145	6625-00-973-3986	
90	F	VOLTMETER, ELECTRONIC AN/USH-98A	6625-00-753-2115	
91	F	ATTENUATOR, VARIABLE CM-318/G	5895-00-623-0255	
92	D	ATTENUATOR, FIXED CN-796/U	5985-00-087-2547	
93	F	DETECTOR, R.F. DT-307/8	6625-00-876-3106	
94	F	HEADSET H-157( )/AIC	5965-00-755-4656	
95	D	TEST FACILITIES KIT MK-1191/AR	6625-00-179-2528	



TOOL/TEST EQUIPMENT REF CODE	MAINT. CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL No.
96	F	MAINTENANCE KIT MK-1102/AR	6625-00-179-1699	
97	F	GENERATOR, SIGNAL TS-421/U	6625-00-435-2588	
98	F	TEST SET, PLUG-IN UNIT AN/ARM-87	6625-00-908-0358	
99	F	FREQUENCY METER AN/USM-159	6625-00-892-5360	
100	D	METER, ADMITTANCE AN/USM-231	6625-00-511-0512	
101	F	ATTENUATOR, VARIABLE CN-970/U	5985-00-993-1377	
102	F	ATTENUATOR, VARIABLE CN-1128/U	5985-00-957-1860	
103	F	MAINTENANCE KIT, ELEC. EQUIP MK-733/ARC-54	5821-00-901-4327	
104	F	OSCILLOSCOPE AN/USM-117	6625-00-787-0304	
105	F	HANDSET H-1 89/GR	5965-00-069-8886	
106	F	MULTIMETER ME-303A/U	6625-00-421-7382	
107	F	POWER SUPPLY PP-4838/U	6625-00-931-6793	
108	F	TEST SET, REMOTE CONTROL TSEC/ST-28	5810-00-910-0260	
109	F	ATTENUATOR 794FM	5985-00-069-1648	
110	F	80063-OAPN		
111	F	ATTENUATOR 8491B-50	5985-00-138-5225	
112	F	TEST HARNESS AN/URM-157A	6625-00-236-1557	
113	D	DUMMY LOAD DA-340/URC	5821-00-019-6315	
114	F	ADAPTER, CONNECTOR MX-3341/U	5985-00-713-4356	
115	D	RADIO RECEIVER R-1122/GR	5820-00-858-5925	
116	O	HANDSET H-250/U	5965-00-043-3463	
117	F	ELECTRONIC TRANSFER DEVICE KYK-13/TSEC	5810-01-026-9618	
118	F	NET CONTROL DEVICE KYK-15/TSEC	5810-01-026-9619	
119	F	TESTER, TSEC/ST-44	5810-01-052-3637	
120	F	BOARD EXTRACTOR TOOL ON205104	5810-01-035-2860	
121	F	BENCH FIXTURE ON222036	5810-01-048-8168	
122	F	FILL CABLE ON512424	5810-01-066-7587	
123	F	OSCILLOSCOPE 549	6625-00-864-6438	
124	F	MULTIMETER COMMON DIGITAL 8100B		



## SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	Refer to TM 11-5820-581 Series Manuals for Repair.
B	Refer to TM 11-5821-277 Series Manuals for Repair.
C	Refer to TM 11-5820-670 Series Manuals for Repair.
D	Refer to TM 11-5826-226 Series Manuals for Repair.
E	Refer to TM 11-5826-225 Series Manuals for Repair.
F	Refer to TM 11-5831-201 Series Manuals for Repair.
G	Refer to TM 11-6605-202 Series Manuals for Repair.
H	Refer to TM 11-5826-211 Series Manuals for Repair.
I	Refer to TM 11-5826-299 Series Manuals for Repair.
J	Refer to Commercial or Air Force Manuals.
K	Refer to Air Force Manuals TO 5F6-4-3-3, TO 5F6-4-3-4 or Navy Manuals NAVAIR 05-20GE-22, NAVAIR 05-20GE-23.
L	Refer to TM 11-5826-219 Series Manuals for Repair.
M	Refer to TM 11-5841-268 Series Manuals for Repair.
N	Refer to TM 11-5895-490 Series Manuals for Repair.
O	Refer to TM 11-5841-283 Series Manuals for Repair.
P	Replacement for AN/ARC-51 BX.
Q	Replacement for AN/ARN-83.
R	Refer to TM 11-5895-201 Series Manuals for Repair.
S	Replacement for AN/ARN-82, R-1041/ARN and R-1 963/ARN.
T	Refer to TM 11-6125-220 Series Manuals for Repair.
U	Refer to TM 11-6125-240 Series Manuals for Repair.
V	Refer to TM 11-6140-203 Series Manuals for Repair.
W	Refer to TM 11-5826-227 Series Manuals for Repair.
X	Refer to TM 11-5826-258 Series Manuals for Repair.
Y	Refer to TM 11-5895-897 Series Manuals for Repair.
Z	Refer to TM 11-5895-1037 Series Manuals for Repair.
AA	Refer to TM 11-581 0-242 Series Manuals for Repair.
AB	Refer to TM 11-5841-281 Series Manuals for Repair.
AC	Refer to TO 5N1-2-19 Series Manuals for Repair.
AD	Refer to TM 11-5821-318 Series Manuals for Repair.
AE	Refer to TM 11-5821-330 Series Manuals for Repair.
AF	Refer to TM 11-5821-260 Series Manuals for Repair.
AG	Refer to TM 11-5821-244 Series Manuals for Repair.
AH	Refer to TM 11-5810-244 Series Manuals for Repair.
AI	Reserved.
AJ	Refer to TM 11-5821-259 Series Manuals for Repair.
AX	Refer to TM 11-5841-284 Series Manuals for Repair.



REFERENCE CODE	REMARKS																																																			
AL	Refer to TM 11-5841-292 Series Manuals for Repair.																																																			
AM	Refer to TM 11-5821-248 Series Manuals for Repair.																																																			
AN	Refer to TM 11-5821-262 Series Manuals for Repair.																																																			
AO	Refer to TM 11-5895-537 Series Manuals for Repair.																																																			
AP	Refer to Commercial Manuals.																																																			
AQ	Refer to TM 11-5826-257-24.																																																			
AR	Replacement for AN/APX-72. "Pending modification approval."																																																			
AS	Proposed new installation. "Pending modification approval."																																																			
AT	Replacement for AN/ARC-115 or AN/ARC-134. "Pending modification approval."																																																			
AU	Replacement for AN/ARC-102. "Pending modification approval."																																																			
AV	Replacement for AN/ARC-114. "Pending modification approval."																																																			
AW	Refer to TM 11-5810-262 Series Manuals for Repair.																																																			
AX	Replacement for KY-28. New for FM-#2. "Pending modification approval."																																																			
AY	Replacement for CI 1611/MD736. "Pending modification approval."																																																			
AZ	Contractor Repair.																																																			
BB	Refer to DMWR 11-5895-1115 Series Manuals for Repair.																																																			
BC																																																				
BD	Cabling not part of electronic configuration. Refer to TM 55-1520-210-23P for further breakdown.																																																			
BE	SRA - Special Repair Activity																																																			
BF	Repair shall consist of, but is not limited to, the replacement of the following after failure verification has been performed.																																																			
	<table><tr><th><u>Group No.</u></th><th><u>Nomenclature</u></th><th><u>Part Number</u></th></tr><tr><td>01</td><td>Electronic Equipment Air Cooler</td><td>HD-615/ARC-51X</td></tr><tr><td>01</td><td>Standing Wave Ratio Indicator</td><td>ID-1003/ARC</td></tr><tr><td>01</td><td>Antenna</td><td>AS-1304/ARN</td></tr><tr><td>01</td><td>Antenna</td><td>AT-1108/ARC</td></tr><tr><td>01</td><td>Antenna</td><td>AT-640( )/ARN</td></tr><tr><td>03</td><td>Connector Kit</td><td>709229-801</td></tr><tr><td>07</td><td>Antenna</td><td>AS-1863/ARN-83</td></tr><tr><td>09</td><td>Compensator</td><td>CN-405/ASN</td></tr><tr><td>09</td><td>Amplifier, Electronic Control</td><td>AM-3209/ASN</td></tr><tr><td>13</td><td>Aims Altimeter</td><td>AAU-32/A</td></tr><tr><td>13</td><td>Transponder Test Set</td><td>TS-1843( )/APX</td></tr><tr><td>13</td><td>Antenna</td><td>AT-741A/A</td></tr><tr><td>14</td><td>Blade Antenna</td><td>AS-2890/APR-39</td></tr><tr><td>14</td><td>Right Spiral Antenna</td><td>AS-2891/APR-39</td></tr><tr><td>14</td><td>Left Spiral Antenna</td><td>AS-2892/APR-39</td></tr><tr><td>17</td><td>Filter, UHF High Pass</td><td>TRM 5895-00-450-4677A7</td></tr></table>	<u>Group No.</u>	<u>Nomenclature</u>	<u>Part Number</u>	01	Electronic Equipment Air Cooler	HD-615/ARC-51X	01	Standing Wave Ratio Indicator	ID-1003/ARC	01	Antenna	AS-1304/ARN	01	Antenna	AT-1108/ARC	01	Antenna	AT-640( )/ARN	03	Connector Kit	709229-801	07	Antenna	AS-1863/ARN-83	09	Compensator	CN-405/ASN	09	Amplifier, Electronic Control	AM-3209/ASN	13	Aims Altimeter	AAU-32/A	13	Transponder Test Set	TS-1843( )/APX	13	Antenna	AT-741A/A	14	Blade Antenna	AS-2890/APR-39	14	Right Spiral Antenna	AS-2891/APR-39	14	Left Spiral Antenna	AS-2892/APR-39	17	Filter, UHF High Pass	TRM 5895-00-450-4677A7
<u>Group No.</u>	<u>Nomenclature</u>	<u>Part Number</u>																																																		
01	Electronic Equipment Air Cooler	HD-615/ARC-51X																																																		
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17	Filter, UHF High Pass	TRM 5895-00-450-4677A7																																																		



REFERENCE CODE	REMARKS		
BF (cont.)	<u>Group No.</u>	<u>Nomenclature</u>	<u>Part Number</u>
	21	Antenna	AT-744/A
	22	Power Supply	426703E
	22	Antenna, Sensing	DSK-9-04068-501
	23	Filter, Low Pass	LPF-40-29
	24	Antenna	AS-4137/ARC
	24	Power Supply, Inverter	71254-16
	25	Filter, Low Pass	AV802
	25	Power Supply, Inverter	71254-16
	25	Antenna Group	AS-3839/ARC, CU-2396/ARC-201
	25	Whip Antenna	AS-3841/ARC
	27	Antenna (FM), Bell	205-075-543-3
	27	Antenna, Homing, Bell	AS-1922( )/ARC, 205-075-345-1
	28	Antenna	AS-1703( )/ARC
	30	Audio Impedance	212-075-329-7
	32	Antenna, Honeywell	10027834-101
	34	Interface Adapter	Z-AHQ/KY-58
	34	Remote Control Unit	Z-AHP/KY-58
	35	Antenna	AS-3933/ARN-149 (V)
	35	Antenna Plate Repair	4290358-501
		Limited to Corrosion	
		Repair and Replacement	
		of Fasteners	
BG	Refer to TM 11-5821-311 Series Manuals for Repair.		
BH	Refer to TM 11-5821-227 Series Manuals for Repair.		
BJ	AVUM test includes built-in and operational test.		
BK	AVUM repair consists of LRU replacement.		
BL	Visually inspect for damage, corrosion, and loose knobs.		
	BM AVUM service limited to cleaning display surface with damp cloth and tightening loose knobs.		
BN	AVUM repair consists of LRU replacement or replacement of knobs.		
BO	Replace and return defective unit in accordance with instructions in Appendix H of TM 11-5826-315-12&P.		



## GLOSSARY

### Section I. ABBREVIATIONS

ac.....	Alternating current	inph .....	Inter-phone (Int)
adf .....	Automatic direction finder	max .....	Maximum
af .....	Audio frequency	mkr bcn.....	Marker beacon
am .....	Amplitude modulation	nav.....	Navigation
ant .....	Antenna	omni.....	Omnirange
ats.....	Audio Threshold System	ptt.....	Press to talk
att .....	Attitude	rcvr.....	Receiver
aux.....	Auxiliary	rf .....	Radio frequency
bat .....	Battery (electrical)	rfi.....	Radio frequency interference
bfo .....	Beat-frequency oscillator	squel .....	Squelch
dc.....	Direct current	ssb.....	single side band
fm .....	Frequency modulation	trans.....	Transmission
freq .....	Frequency	uhf.....	Ultra high frequency
gs.....	Glideslope	vac .....	Volts alternating current
hf.....	High frequency	var.....	Visual aural radio range
hz.....	Hertz	vdc .....	Volts direct current
ics .....	Interphonecommunication system	vhf.....	Very high frequency
if.....	Intermediate frequency	vol .....	volume
iff.....	Identification friend or foe	vor.....	VHF omni range
ils .....	Instrument landing system	xmtr.....	Transmitter

### Section II. DEFINITION OR UNUSUAL TERMS

The list of unusual terms and their definitions are as follows:

*Aft* - At, near, or toward the rear of a helicopter; also the rear section of a helicopter.

*Airframe* - Structural components of a helicopter including the framework and the skin.

*Attitude* - The aspect that a helicopter presents at any given moment, as determined by its inclinations about its three axes.

*Automatic direction finder*- Radio compass facility which permits automatic indication of the direction of the station to which it is tuned.

*Basic signal electronic equipment* - Equipment for which the Electronic Command has logistic and maintenance responsibility and for which there are DA publications covering troubleshooting, testing, alining, and repairing of the equipment through replacing maintenance parts and repairing specific maintenance parts. These equipments are used without modification in more than one helicopter and are government furnished to the helicopter manufacturer for installation.

*Bearing* - Position of a helicopter with respect to true or magnetic north. Measured in degrees, 0 to 360.

*Bus* - A conductor or group of conductors which serve as a common connection for two or more circuits.

*Compass rose* - A graduated circle marked in degrees and/or directions for calibration of helicopter magnetic compasses.

*Configuration* - A group of various equipments interconnected and interrelated to provide a large system that has numerous functions and capabilities.

*Course* - A planned route or direction of flight referenced to points on the earth.

*facility* - A group of equipments that may be physically separated but are integrated by cables or other interconnections to perform one function.

*Flux valve* - A direction-sensing element activated by the earth's magnetic field.

*Fore* - At, near, or toward the front of the helicopter; also the front section of a helicopter.

*Glidescope* - A radio transmitter placed along the runway that provides vertical guidance to helicopters during ils approach.

*Heading* - The relative direction in which the helicopter is pointed.



## GLOSSARY - Continued

*Homing* - Navigation toward a point.

*Hot mike* - Microphone always on (no push-to-talk function)

*instrument landing system* - a system providing visual course and descent information to helicopters during landing approach.

*Marker beacon* - Radio beacon placed along a runway to indicate the position of the helicopter.

*Null* - Zero signal indication.

*Omnidirectional* - In all directions.

*Satellite navigation signal* - A navigation signal received from Global Positioning System (GPS) satellites to provide precise position data of the aircraft in three dimensions (latitude, longitude and altitude).

*Safety wire* - Steel wire tied through holes in equipment mounting hardware to keep the equipment securely mounted, regardless of vibrations.

*Sense antenna* - An antenna used to resolve a 180° ambiguity in a directional antenna.

*Sidetone* - The portion of the signal from a transmitter used to monitor your own transmission.

*Slaved* - Synchronized with, forced to follow, or duplicate an action.

*Station* - A measurement in inches from a reference plane near the front of the helicopter, or, a position/location occupied by one of the crew members.

*To-from-meter*- indicates the direction a helicopter is heading in relation to a vor station.

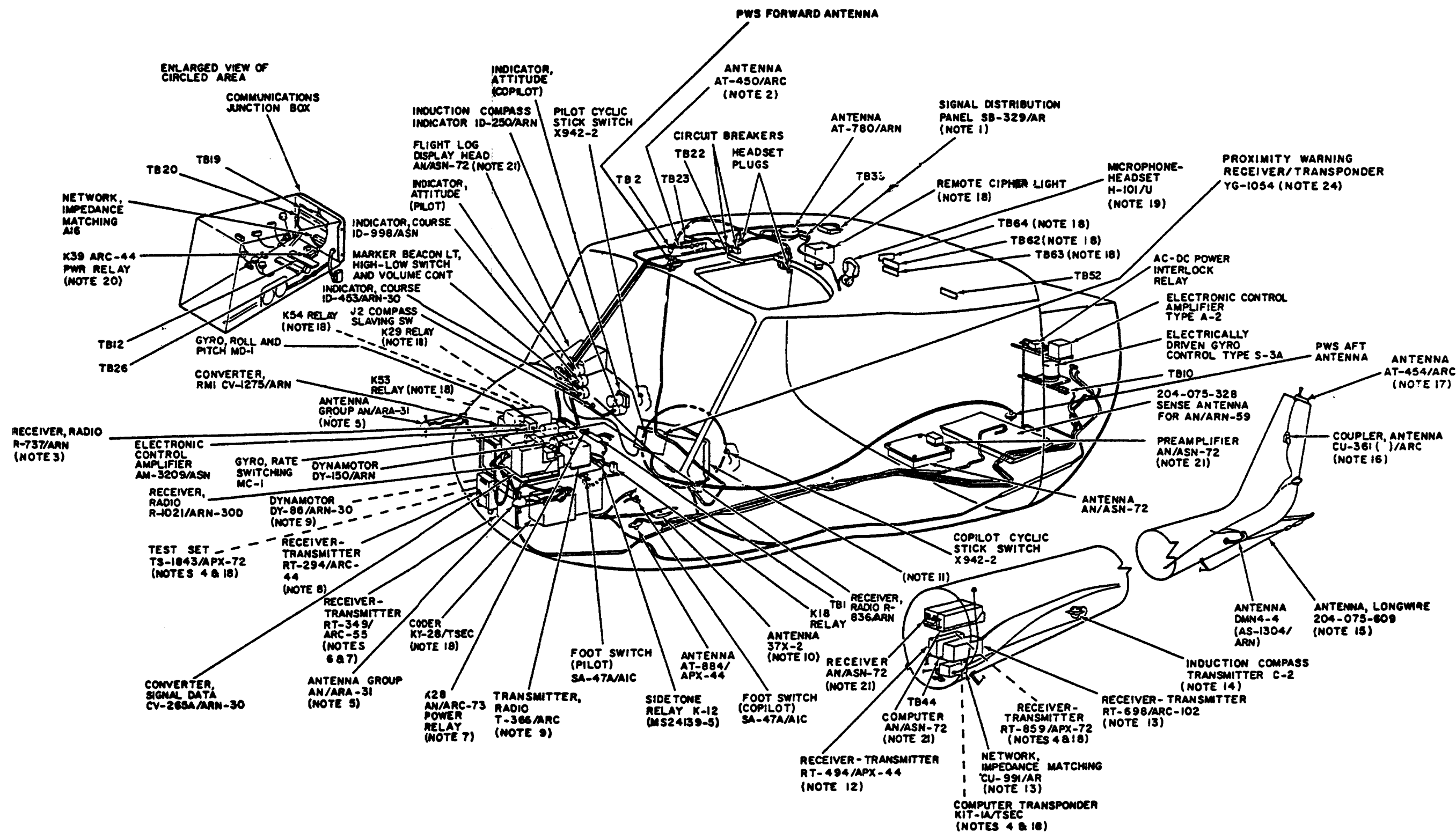
*Tone Localizer*- A transmitted signal with tones that identify the helicopter's direction from the runway during final approach or landing.

*Visual-aural range* - Radio range that transmits information for visual and aural interpretation in the helicopter. Information enables the pilot to follow prescribed course.



**NOTES:**

1. CONFIGURATIONS C,D, AND E USE CONTROL AMPLIFIER C-1611/ARC AT FOUR STATIONS.
2. CONFIGURATIONS B,C,D, AND E USE ANTENNA AT-1108/ARC.
3. CONFIGURATIONS B,C,D, AND E USE RECEIVER,RADIO R-1041/ARN
4. WHEN INSTALLED.
5. CONFIGURATIONS C,D,AND E USE ANTENNA ASSEMBLY 637A-2(205-075-345).
6. CONFIGURATIONS A AND B USE RECEIVER-TRANSMITTER RT-349/ARC-55 CONFIGURATIONS C,D, AND E USE RECEIVER-TRANSMITTER RT-702/ARC-SIX OR RT-742/ARC-51BX.
7. PROVISIONS FOR RADIO SET AN/ARC-73.
8. CONFIGURATIONS C, D, AND E USE RECEIVER-TRANSMITTER RT-348/ARC-54.
9. TRANSMITTER, RADIO T-366/ARC IS NOT USED IN CONFIGURATION D.
10. CONFIGURATION B USES ANTENNA 37RX-2. CONFIGURATIONS D AND E USE ANTENNA AT-64Q/ARN
11. WIRING INSTRUCTIONS FOR RADIO SET AN/ARC-73 ARE CONTAINED ON THE INSIDE OF THE PEDESTAL COVER.
12. CONFIGURATIONS C,D,AND E CONTAIN PROVISIONS FOR TRANSPONDER SET AN/APX-72. CONFIGURATION A ONLY HAS PROVISIONS FOR AN/APX-44.
13. CONFIGURATIONS C,D, AND E CONTAIN PROVISIONS FOR THIS EQUIPMENT.
14. CONFIGURATIONS C,D, AND E USE INDUCTION COMPASS TRANSMITTER T-611/ASN.
15. CONFIGURATIONS C AND D CONTAIN PROVISIONS FOR ANTENNA, LONGWIRE 204-075-609. CONFIGURATION E CONTAINS PROVISIONS FOR ANTENNA, LONGWIRE 205-706-027.
16. CONFIGURATIONS C,D, AND E USE COUPLER, ANTENNA CU-942/ARC-54
17. CONFIGURATION C USES ANTENNA AS-1703/AR; CONFIGURATIONS D AND E USE ANTENNA AT-765/ARC.
18. NOT USED ON CONFIGURATIONS A AND B.
19. CONFIGURATIONS C,D,AND E USE H-101/U AT FOUR STATIONS.
20. USED ONLY ON CONFIGURATIONS A AND B.
21. AN/ASN-72 NOT USED IN CONFIGURATION A
22. BATTERY BB-433/A IS MOUNTED EITHER IN FORWARD OR AFT MOUNTING POSITION DEPENDING ON MISSION REQUIREMENTS (SEE F THROUGH J ILLUSTRATIONS).
23. PU-543/A MOTOR GENERATORS INSTALLED IN AFT ELECTRONIC COMPARTMENT IN CONFIGURATIONS A AND B. INSTALLED IN NOSE ELECTRONIC COMPARTMENT IN C THROUGH E.
24. PROXIMITY WARNING FACILITY Y6-1054 PROVISIONS ARE ACCOMPLISHED BY MWO 55-1520-210-30/40 ON CONFIGURATIONS C THROUGH E.



FO-1. Outline of Helicopter Showing Relative Location of Electronic Equipment and Cable Routing, Configurations A through E.

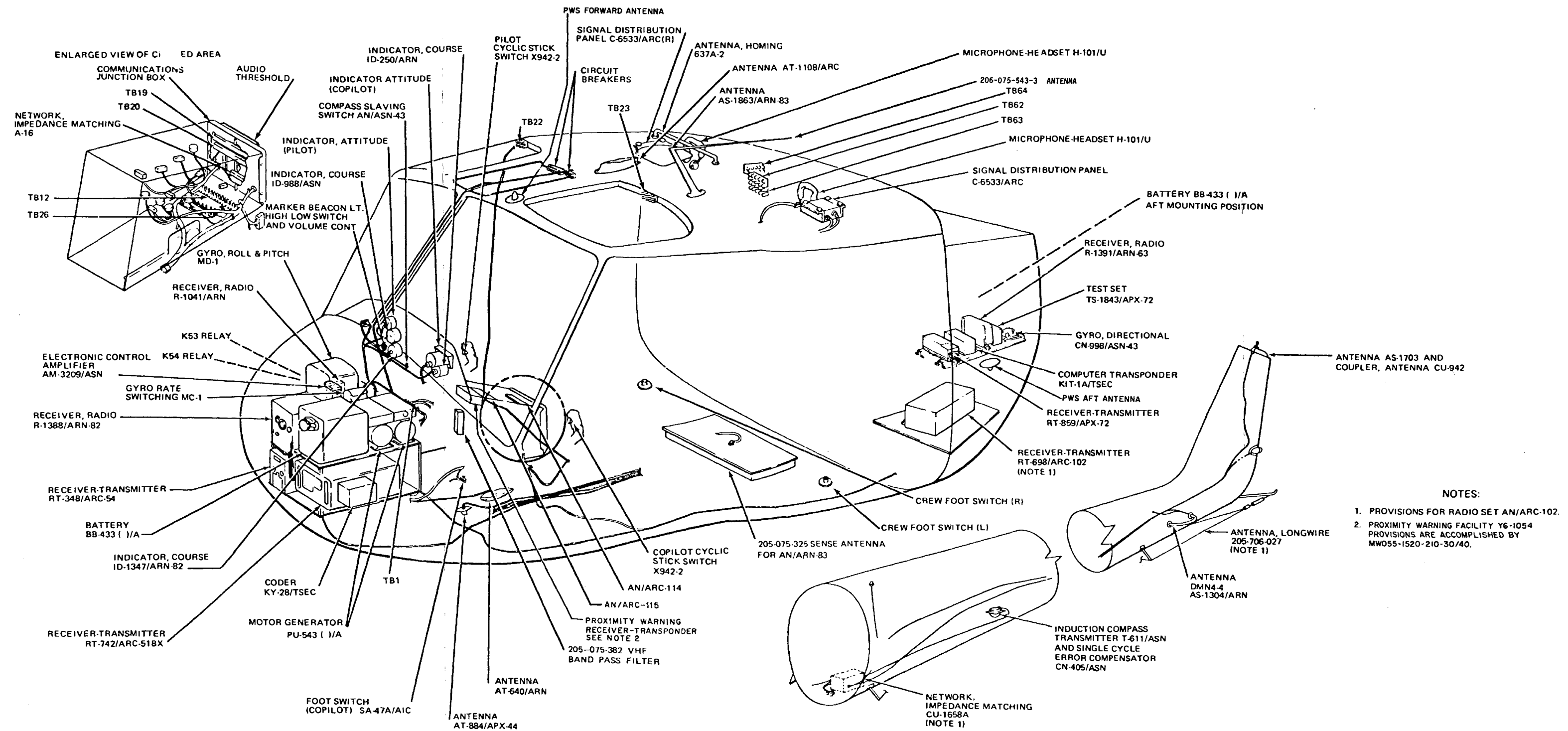






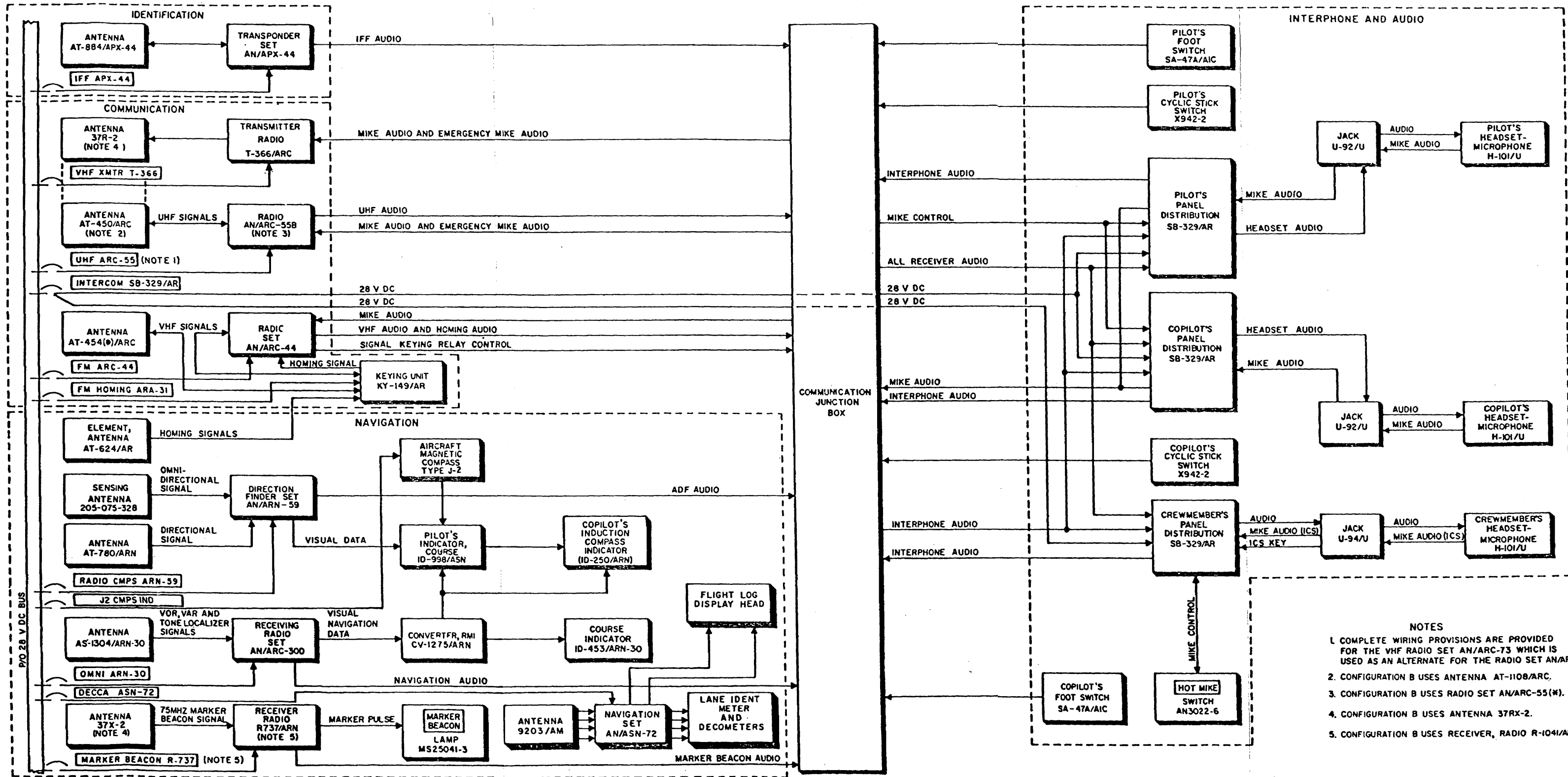






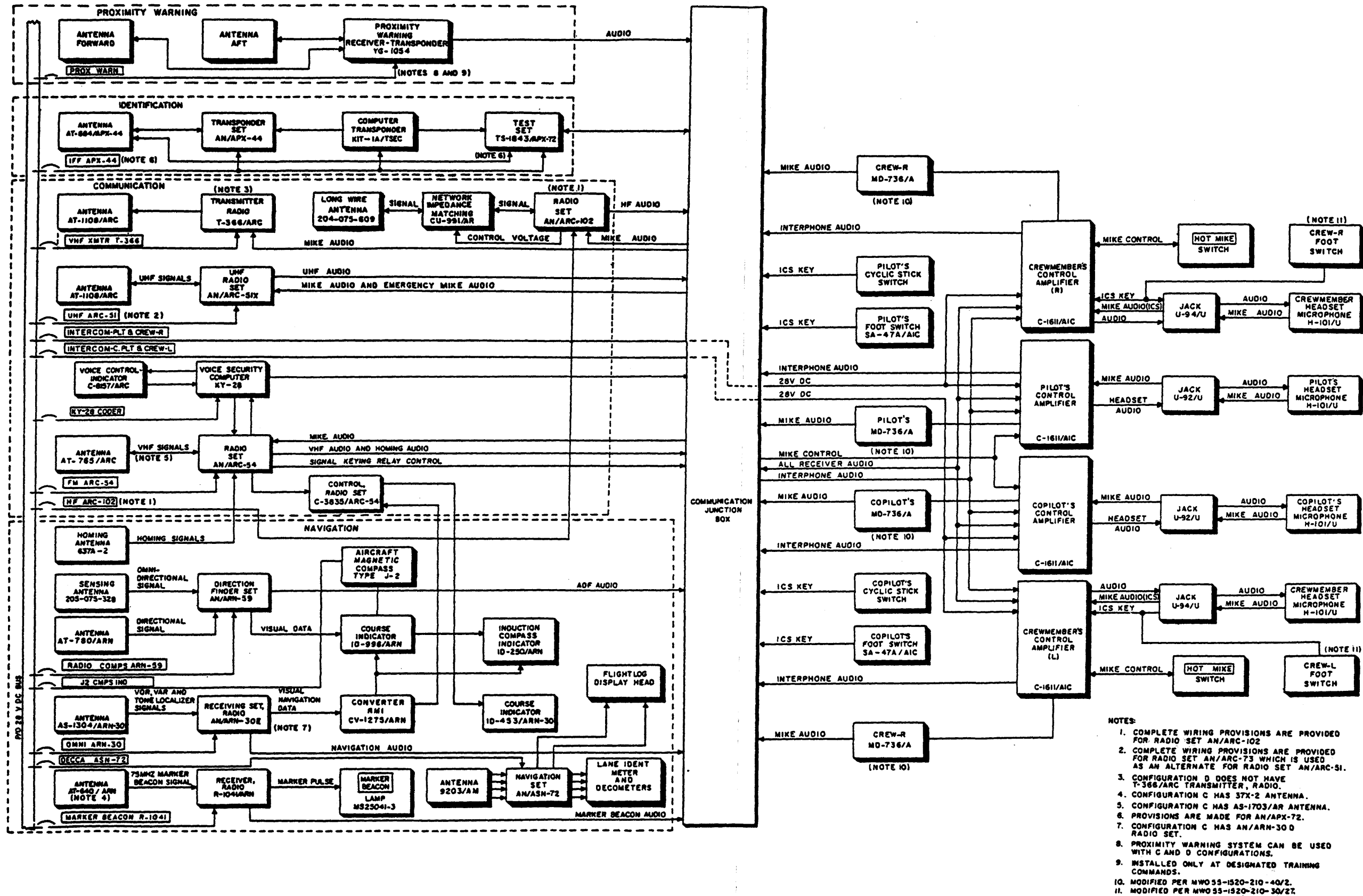
*FO-4. Outline Drawing of Helicopter Showing Relative Location of Electronics Equipment and Cable Routing, UH-1H.*  
**FP-7**





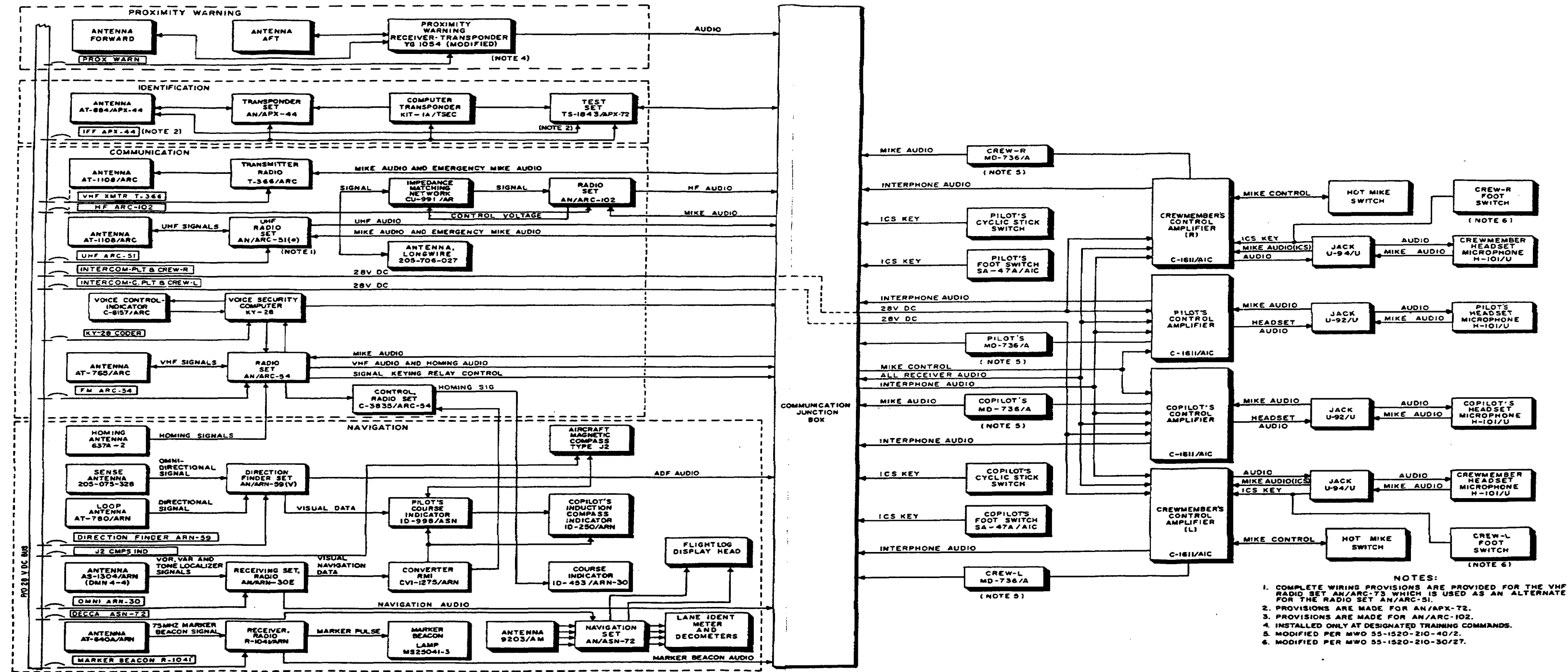
FO-5. UH-1D/H Configurations A and B Block Diagram.  
FP-9





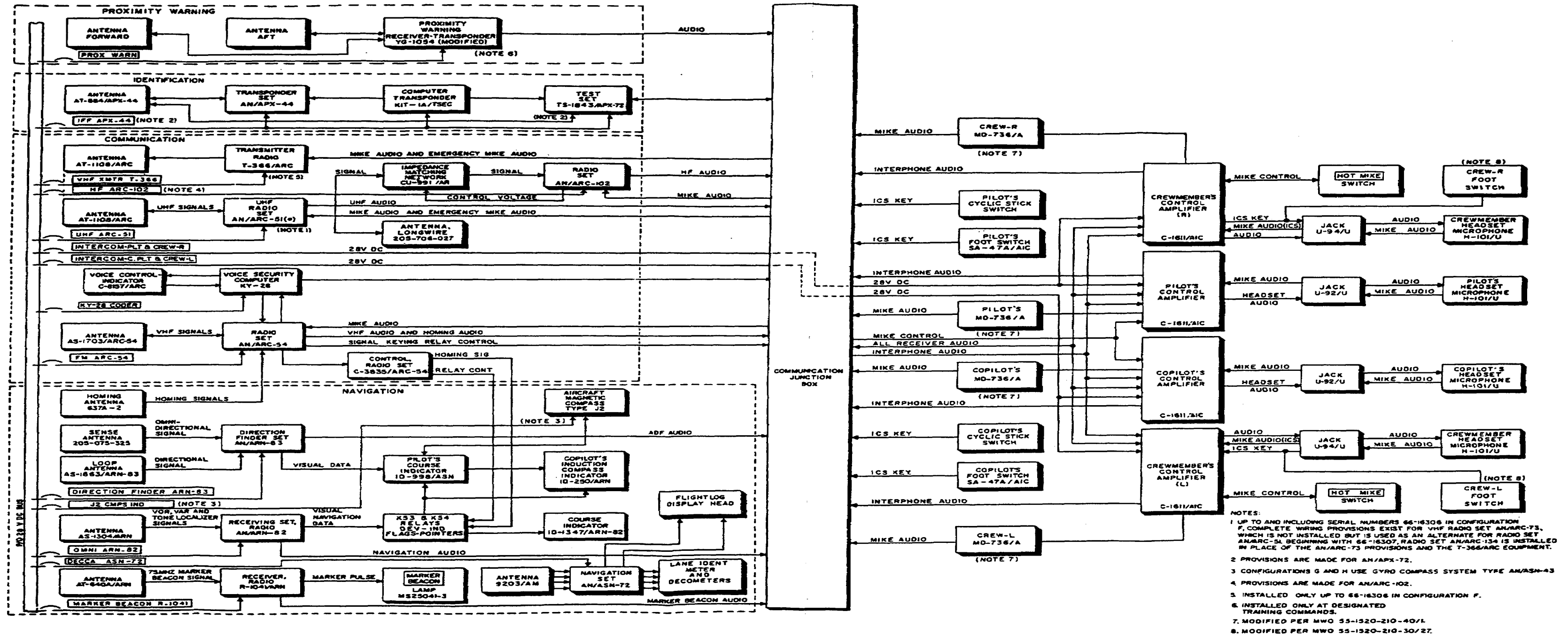
FO-6. UH-1D/H Configurations C and D Block Diagram.  
FP-11





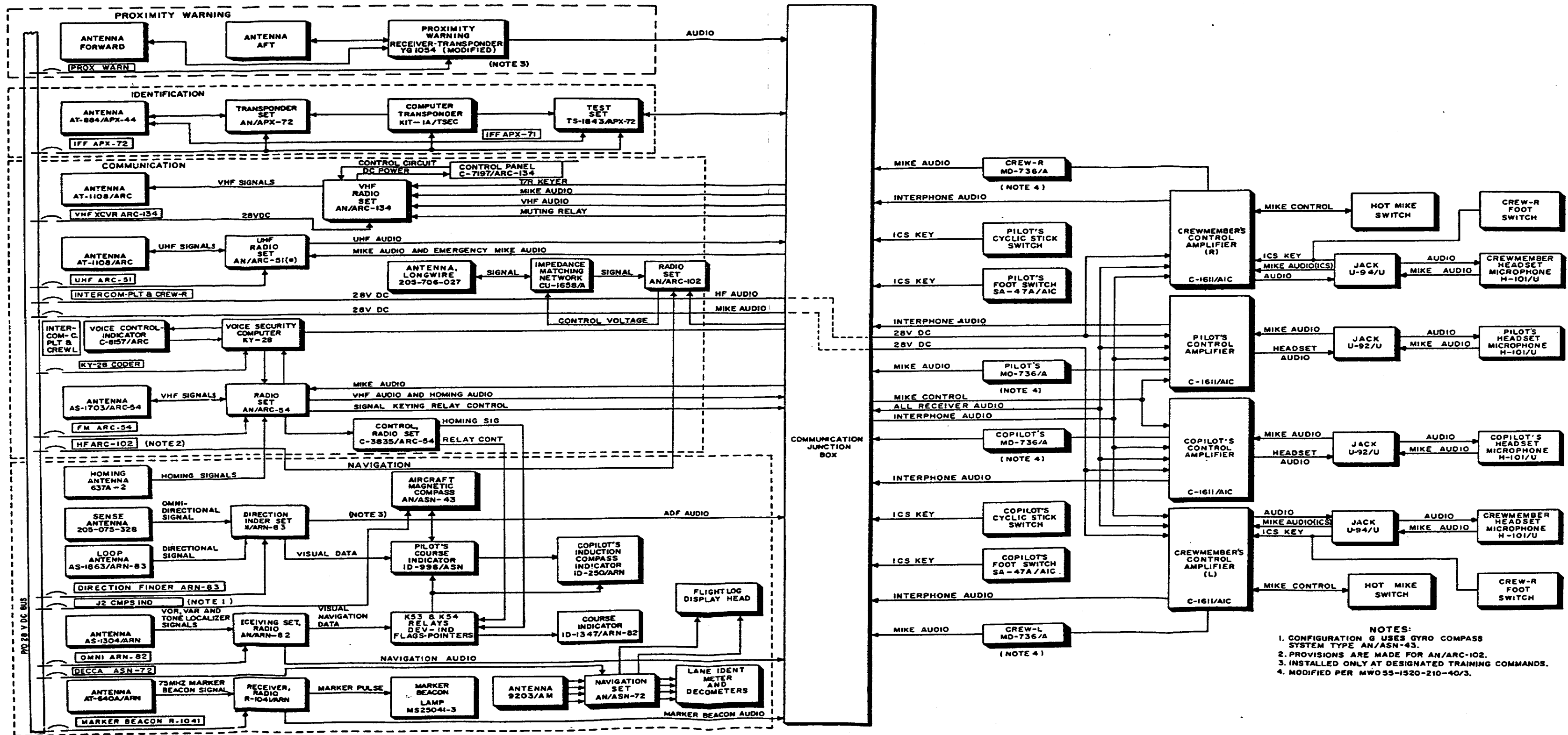
FO-7. UH-1D/H Configuration E Block Diagram





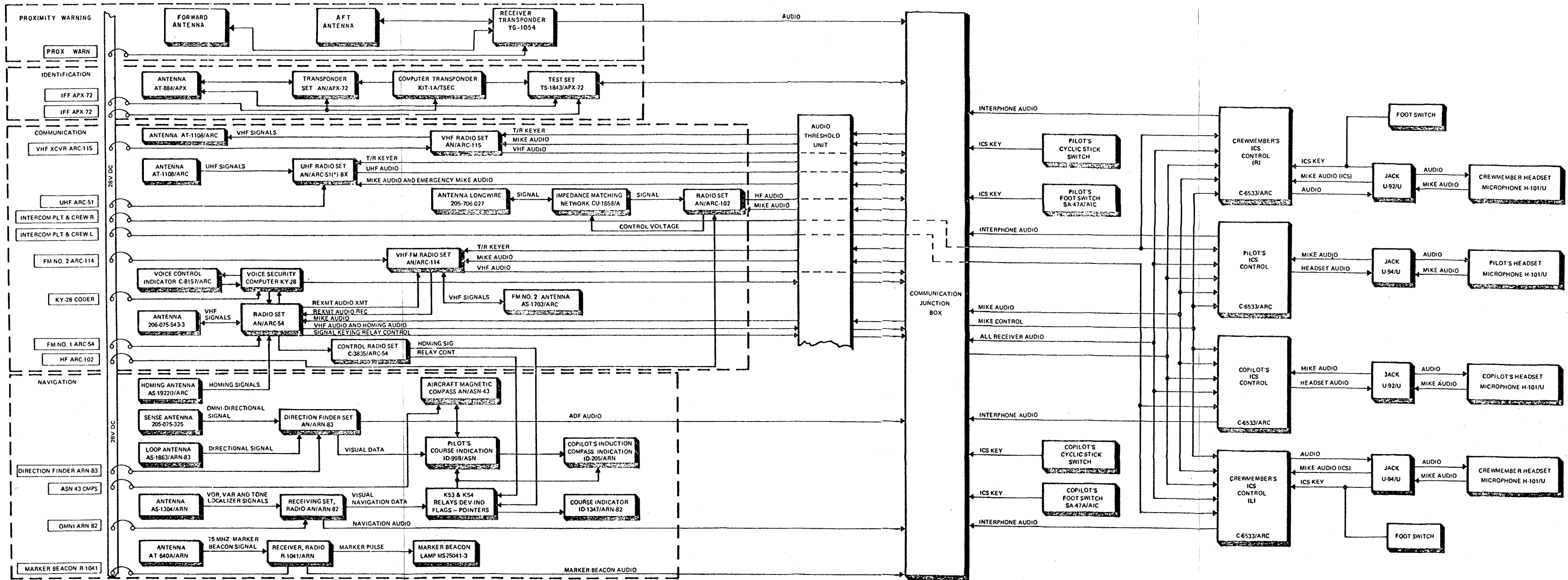
FO-8. UH-1D/H Configurations F through H Block Diagram.





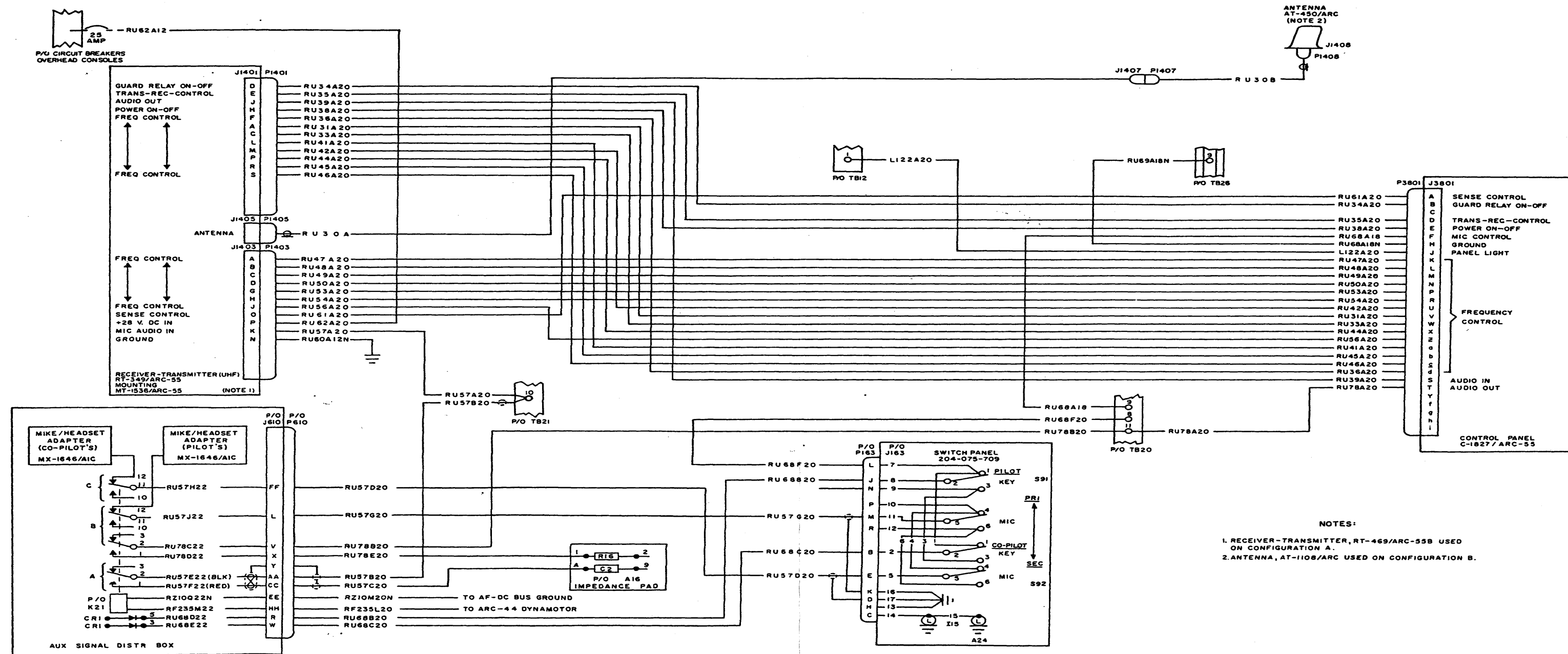
FO-9. UH-1D/H Configurations I and J Block Diagram.





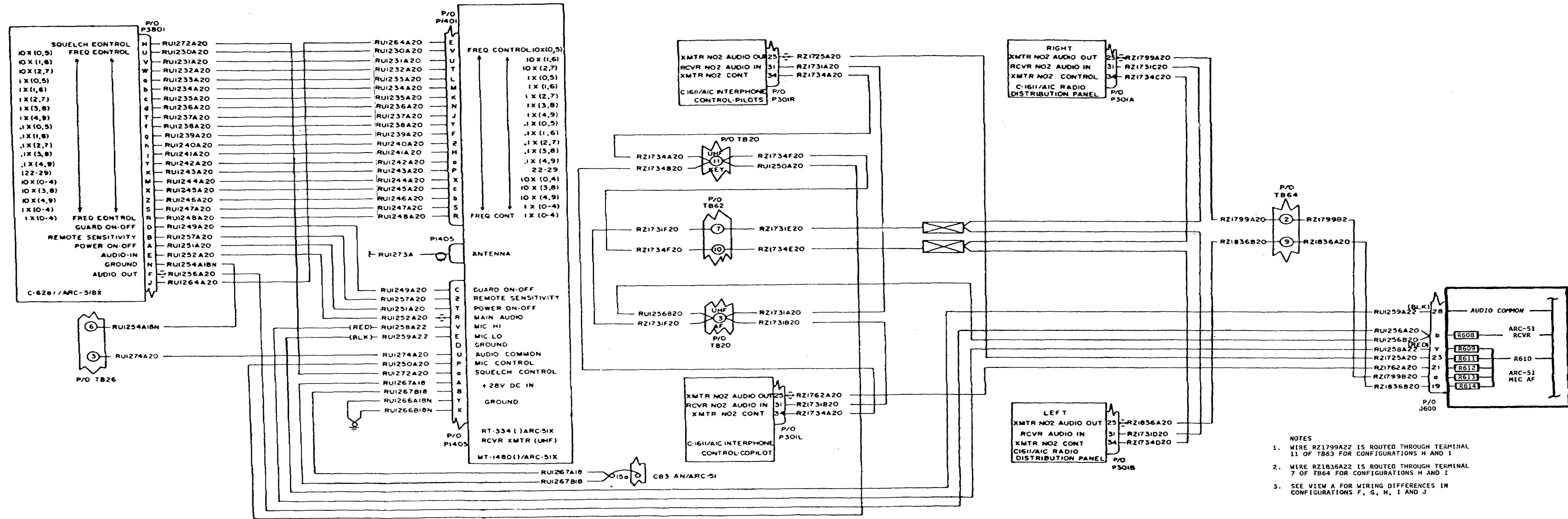
FO-10. UH-1H Configuration Block Diagram.





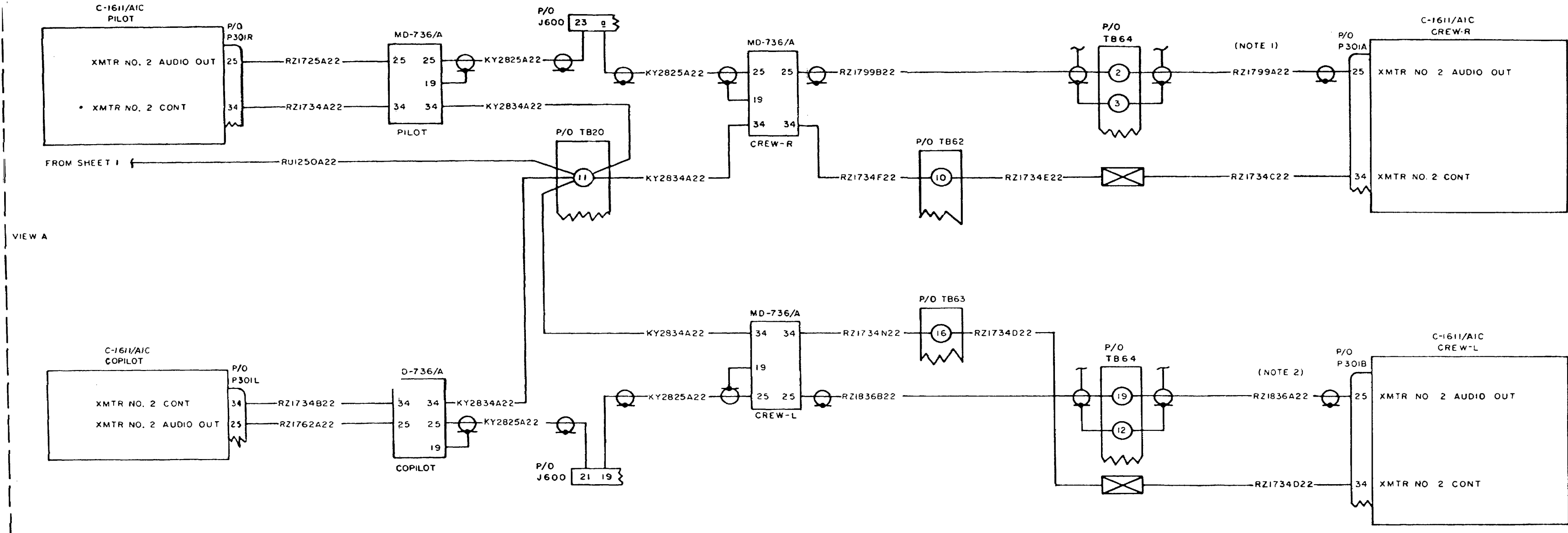
FO-11. UHF Command Radio Set AN/ARC-55 Wiring Diagram.





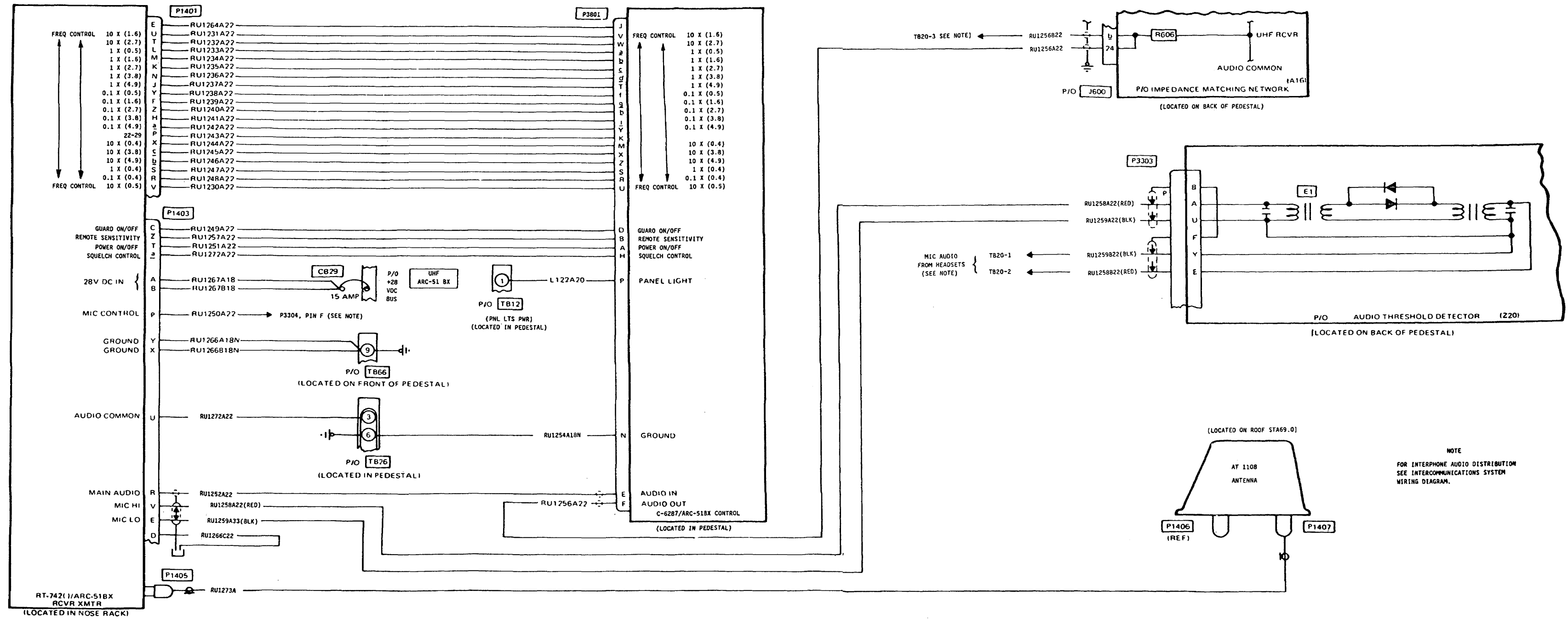
FO-12. UHF Command Radio Set AN/ARC-51 (\*)X  
Wiring Diagram, UH-1D/H (Sheet 1 of 2)





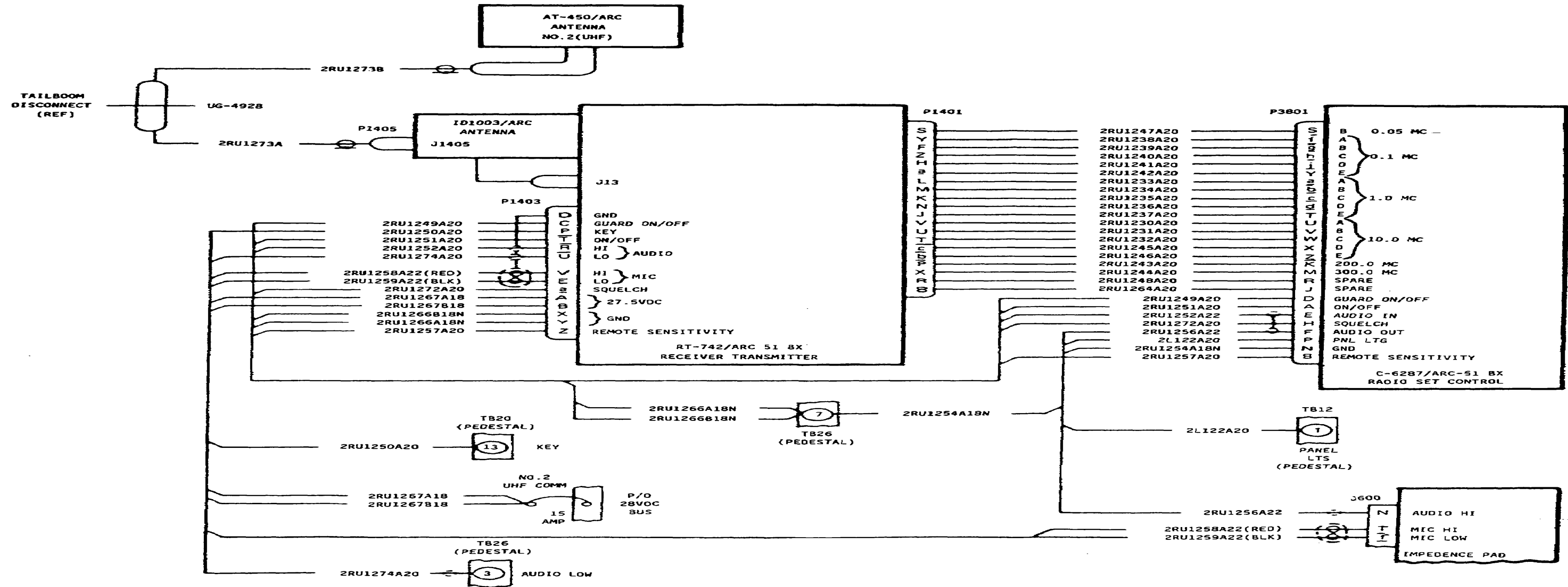
FO-12. UHF Command Radio Set AN/ARC-51 (\*)X  
Wiring Diagram, UH-1D/H (Sheet 2 of 2)





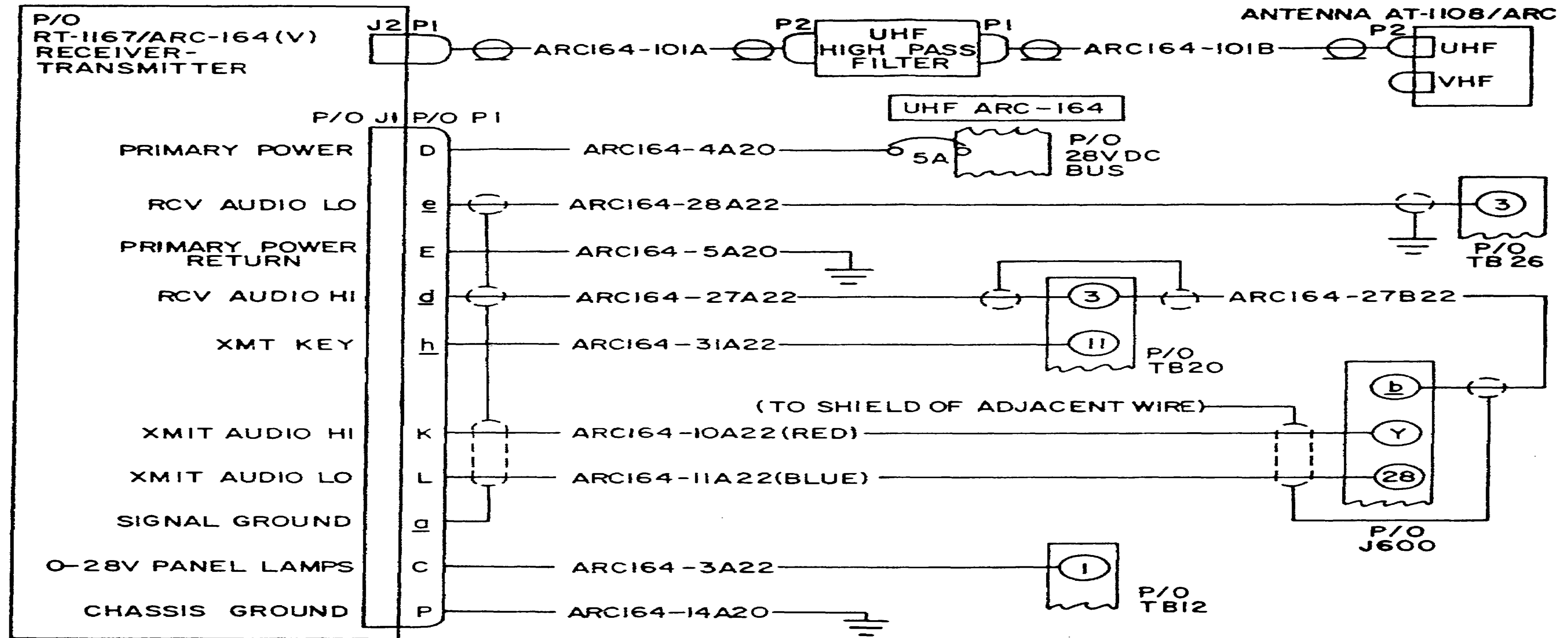
FO-13. UHF Command Radio Set AN/ARC-51BX  
Wiring Diagram, UH-1H.





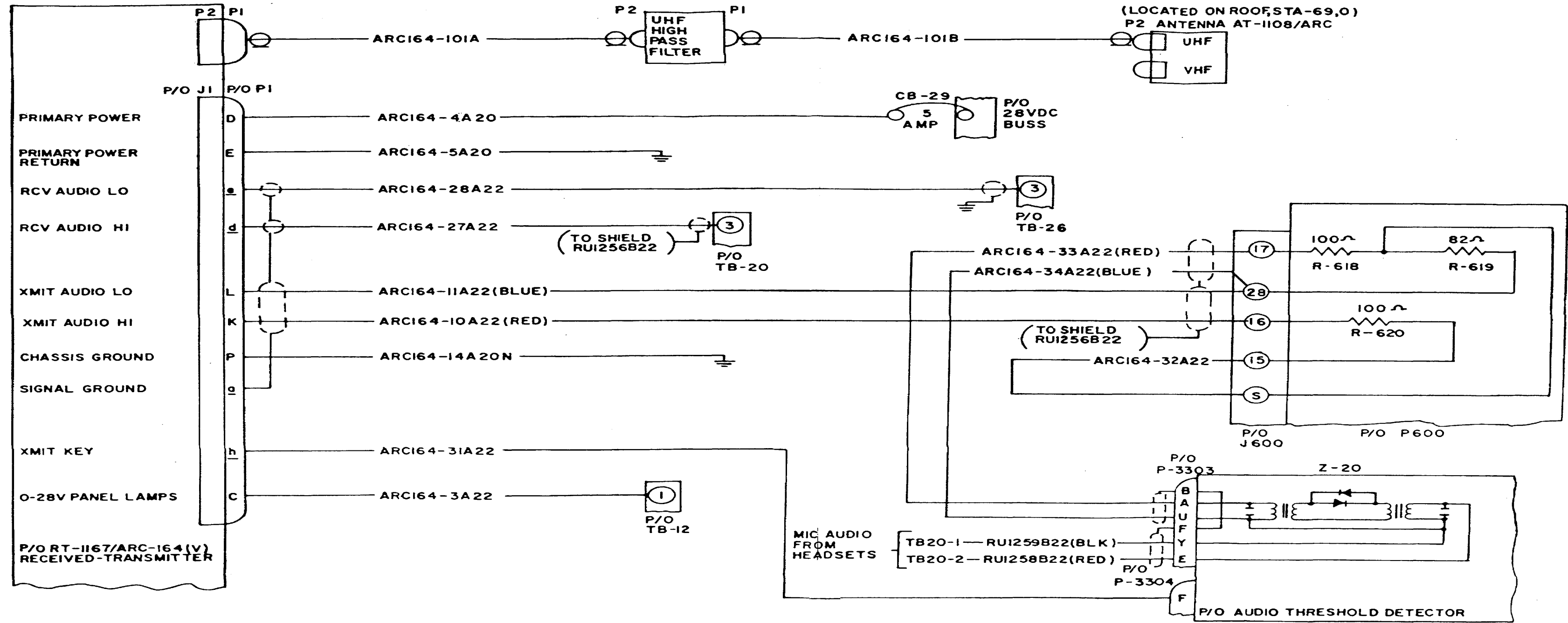
FO-14. UHF Radio Set AN/ARC-51BX No. 2  
Wiring Diagram, per MWO 55-1520-210-30/24.





FO-15. UHF Command Radio Set AN/ARC-164(V)  
Wiring Diagram, UH-1D/H).



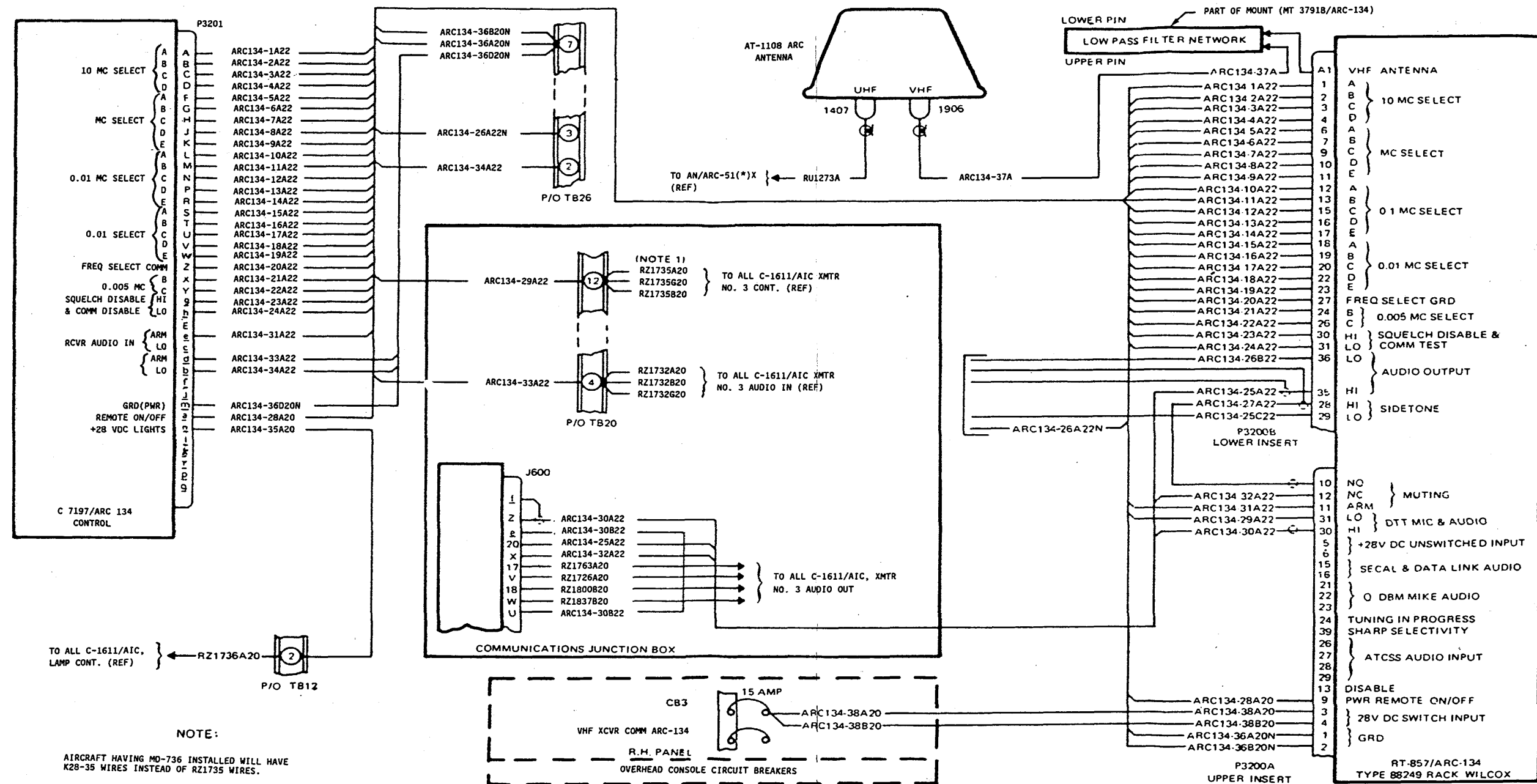


FO-16. UHF Command Radio Set AN/ARC-164(V)  
Wiring Diagram, UH-1H.



### FO-17. VHF Command Radio Set AN/ARC-73 Wiring Diagram



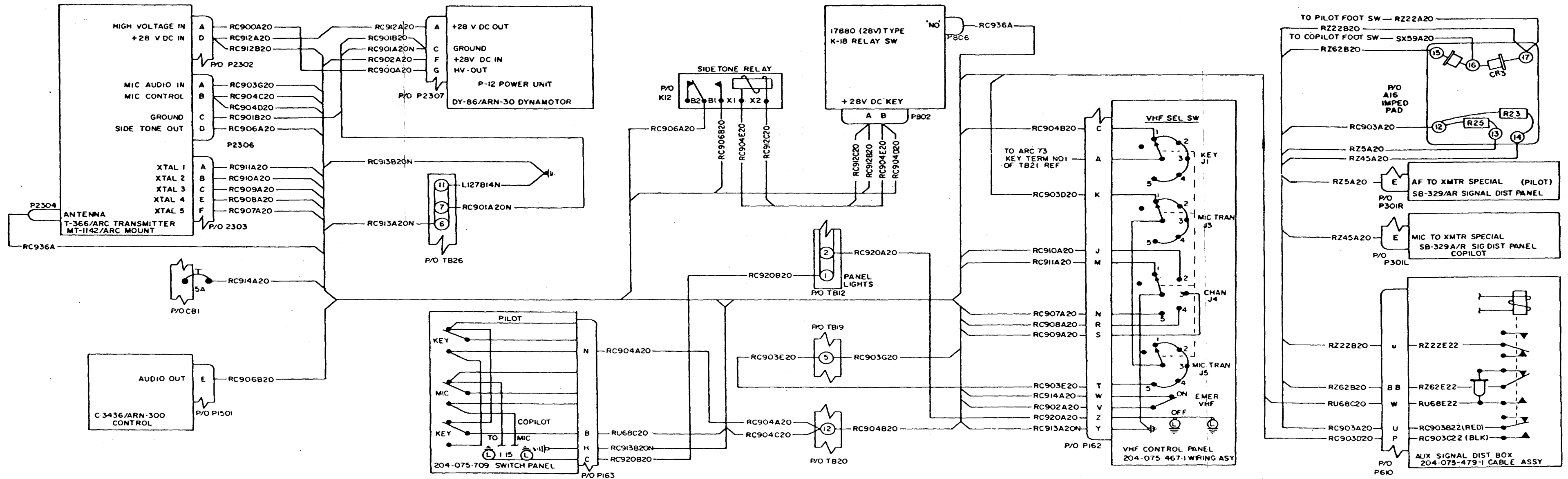


FO-18. VHF Command Radio Set AN/ARC-134 Wiring Diagram, Configuration C, D, E and F through Serial No. 66-16306







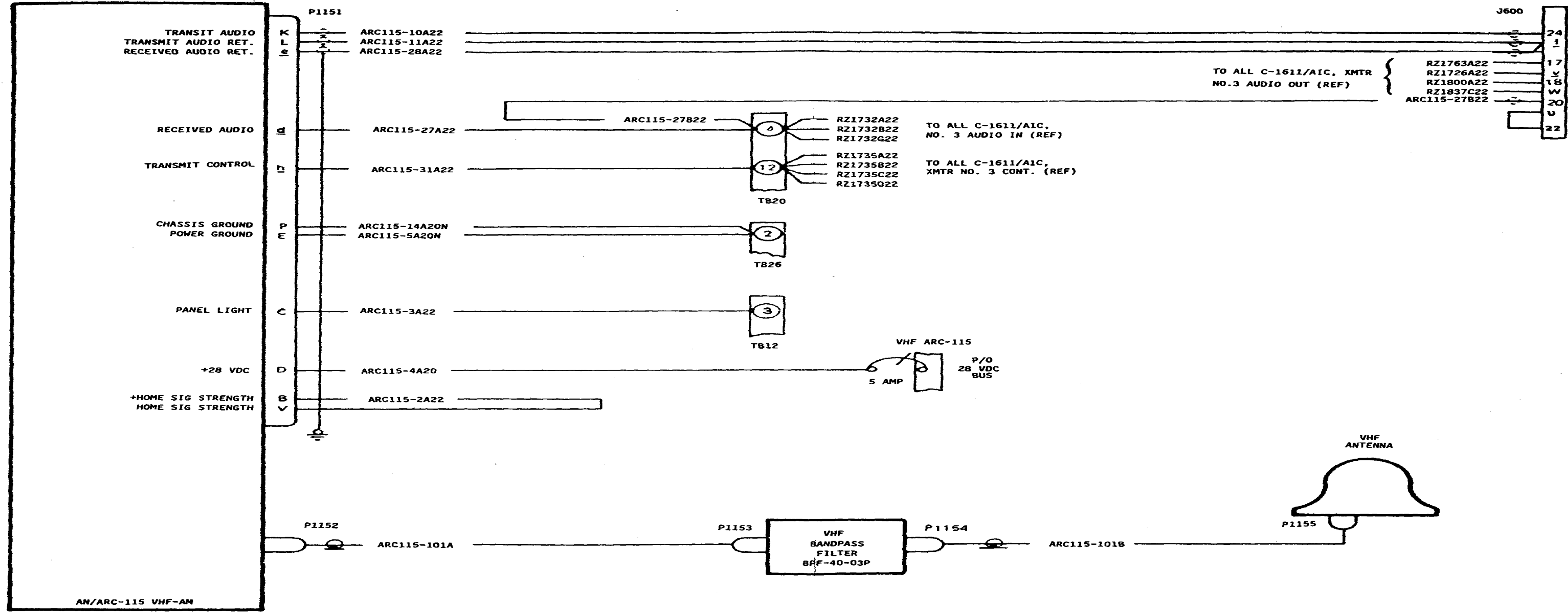


FO-20. VHF Emergency Transmitter T-366 (\*/ARC) Wiring Diagram, Configurations A and B.







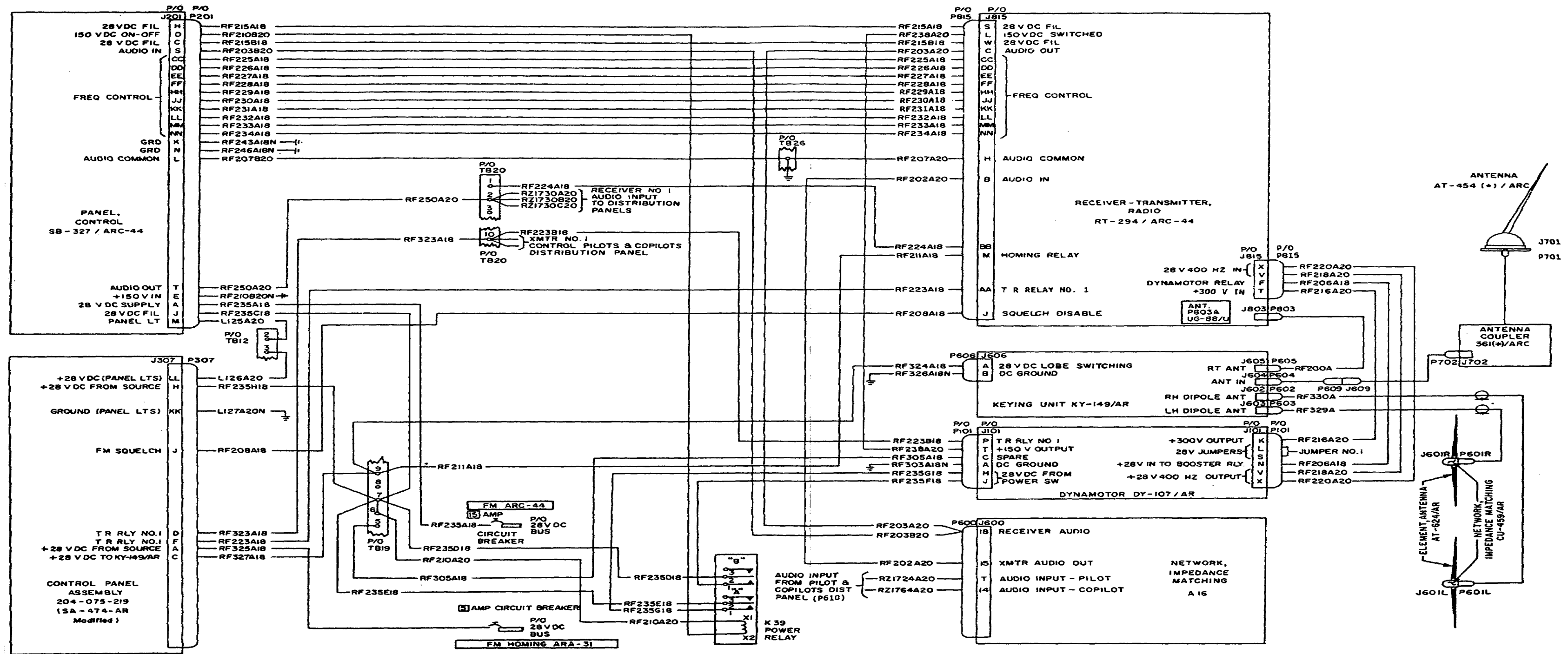


FO-22. VHF/AM Radio Set AN/ARC-115 Wiring  
Diagram, UH-1 D/H per MWO 55-1520-210-30/37.



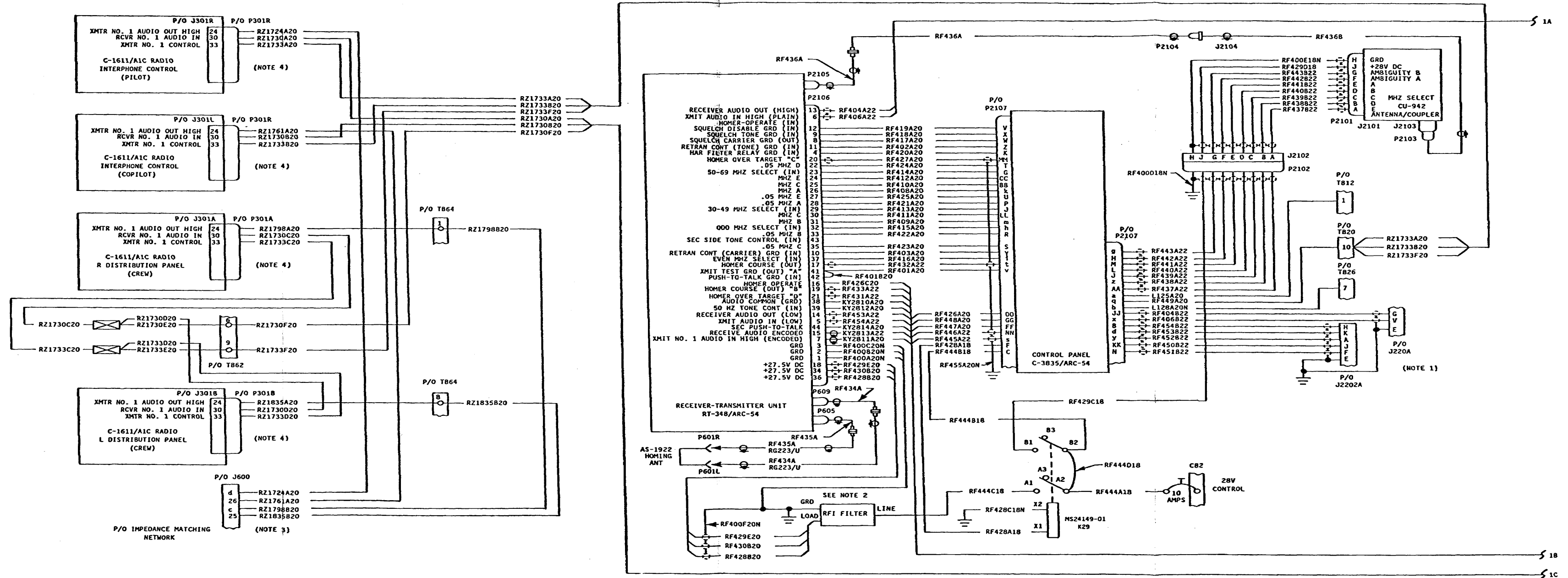
FO-23. VHF/AM Radio Set AN/ARC-115 Wiring Diagram, UH-1H.





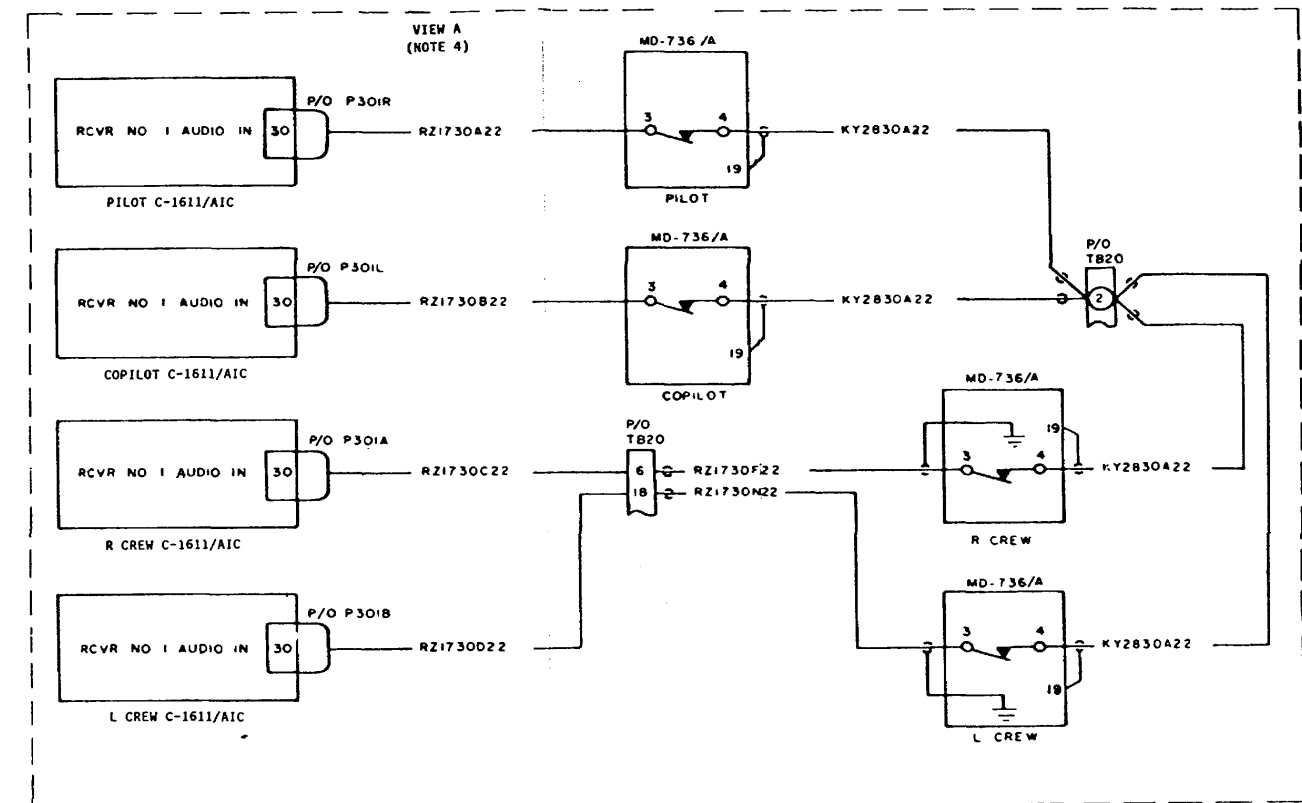
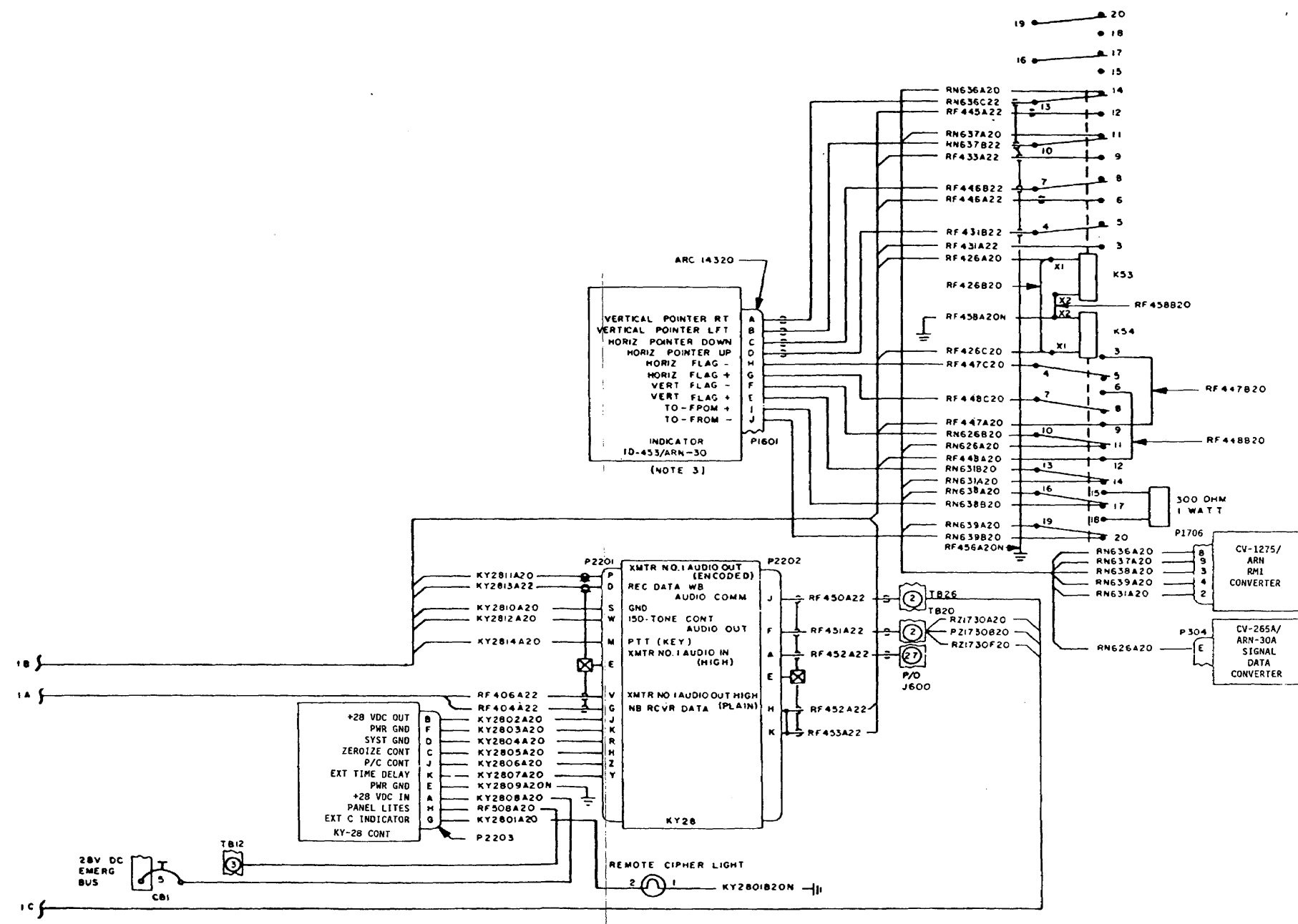
FO-24. FM Liaison No. 1 AN/ARC-44 Wiring Diagram, UH-1D/H.





FO-25. FM Liaison No. 1 AN/ARC-54 or AN/ARC-131 Wiring Diagram (with TSEC/KY-28), UH-1D/H) Sheet 1 of 2).





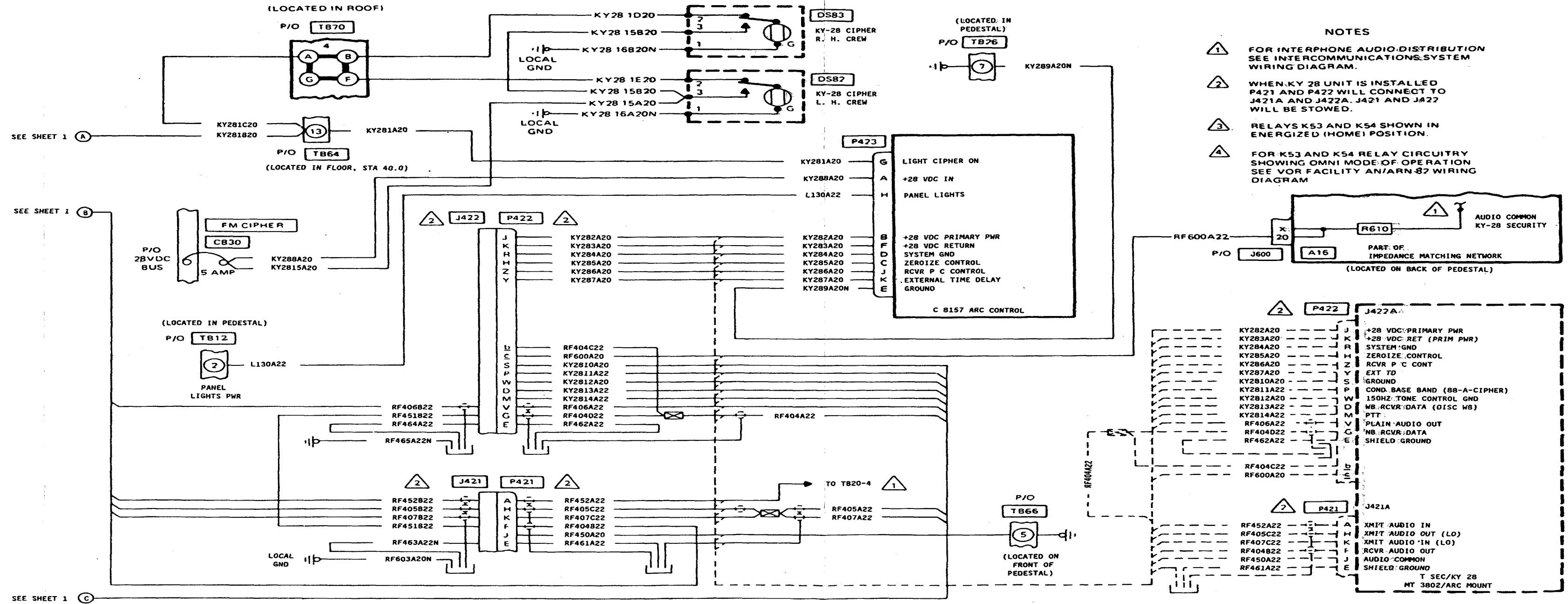
- NOTES:
1. WHEN THE KY-28 UNIT IS NOT USED, P2201 AND P2202 WILL BE PLUGGED INTO J2201A AND J2202A.
  2. RF1 FILTER NOT USED ON "D" CONFIGURATIONS.
  3. CONFIGURATIONS F, G AND SUBSEQUENT USE INDICATOR ID-1347/ARN-82.
  4. SEE VIEW A FOR C-1611/AIC "RECEIVER NO. 1 AUDIO IN" CIRCUITRY THROUGH MD-736/A DISCRETE SIGNAL DISCRIMINATOR (FOR F, G, H AND I CONFIGURATIONS).

FO-25. FM Liaison No. 1 AN/ARC-54 or AN/ARC-131 Wiring Diagram (with TSEC/KY-28), UH-1D/H) Sheet 2 of 2).

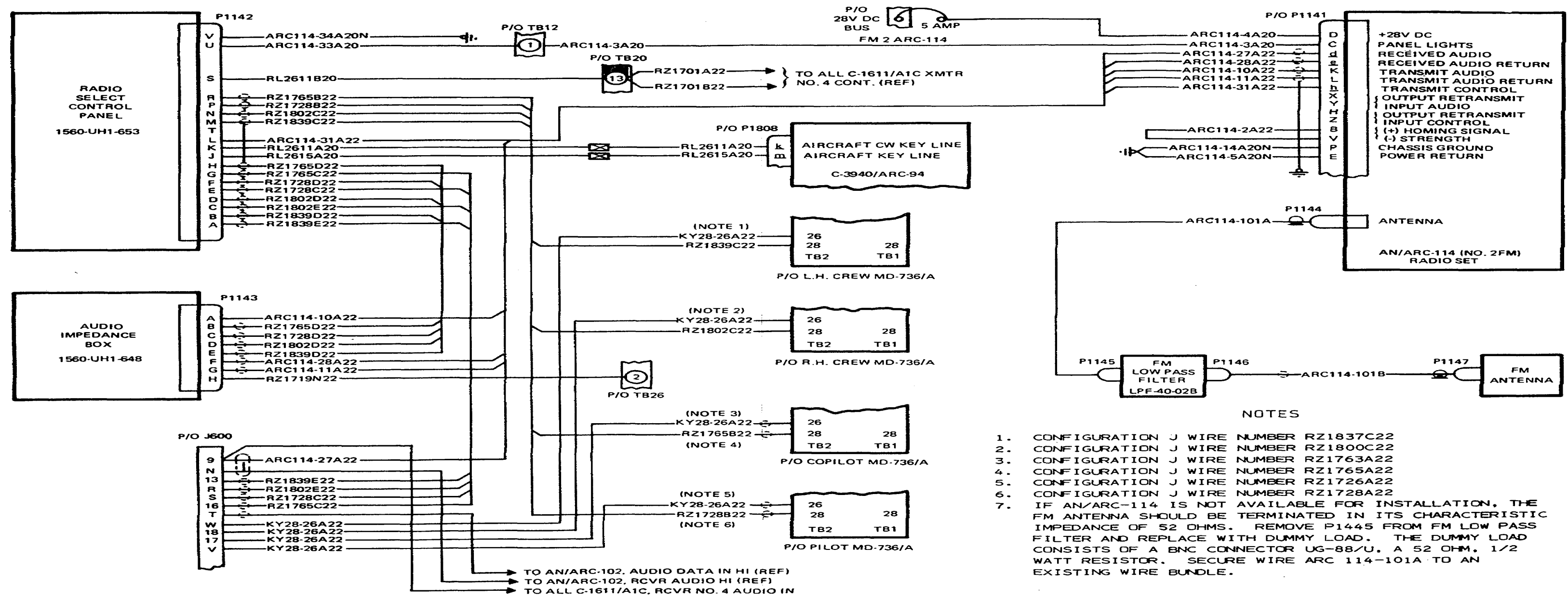


**FP-55**



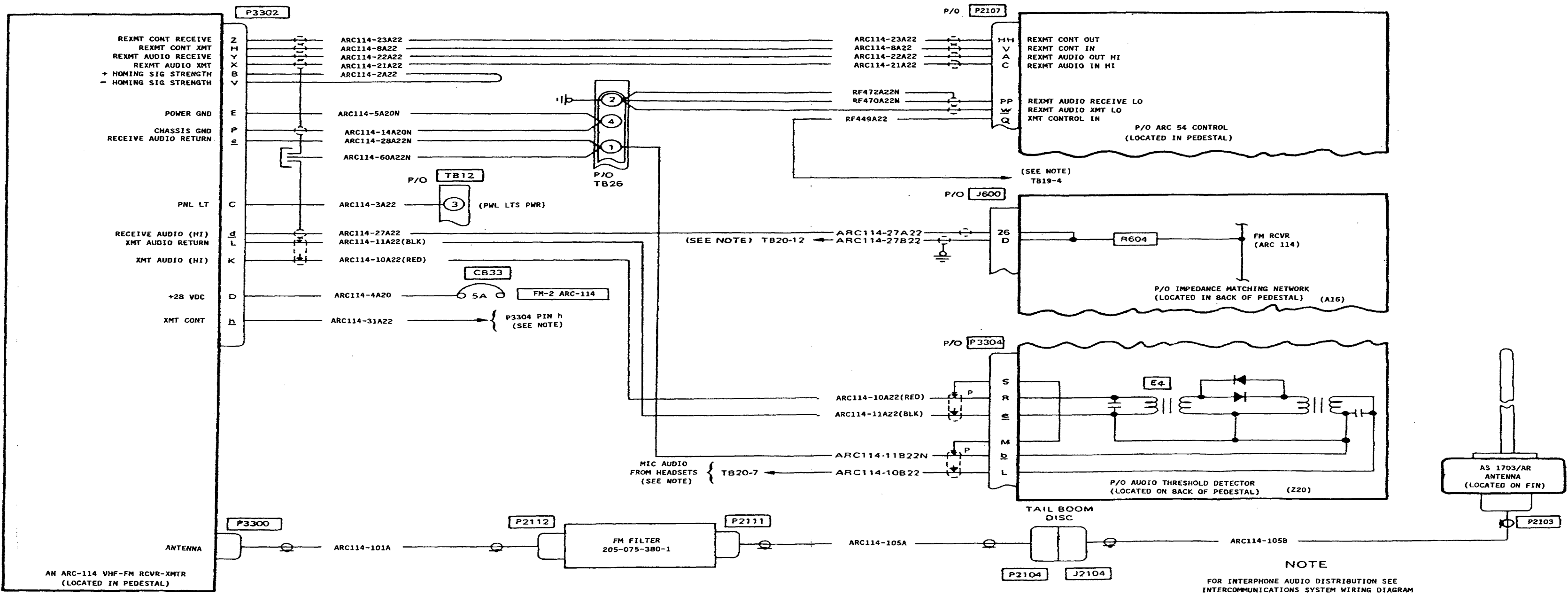






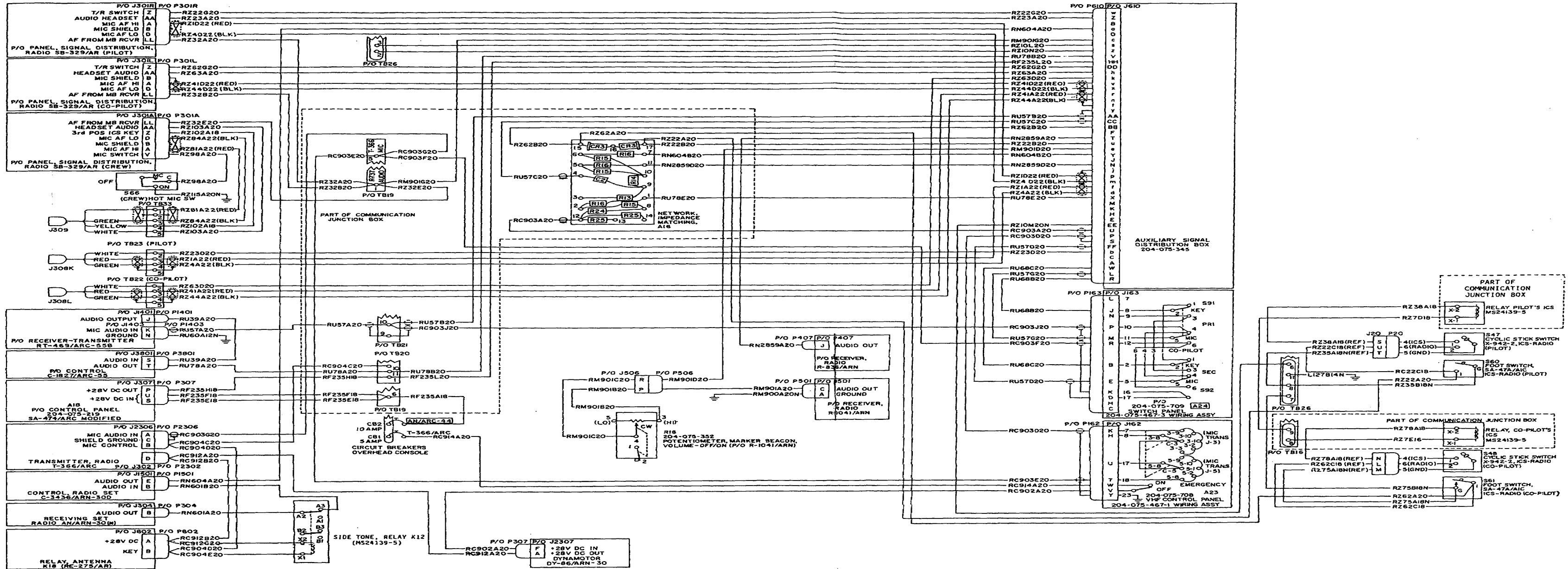
FO-27. FM Liaison No. 2 AN/ARC-114 Wiring Diagram UH-1D/H Per MWO 55-1520-210-30/36.





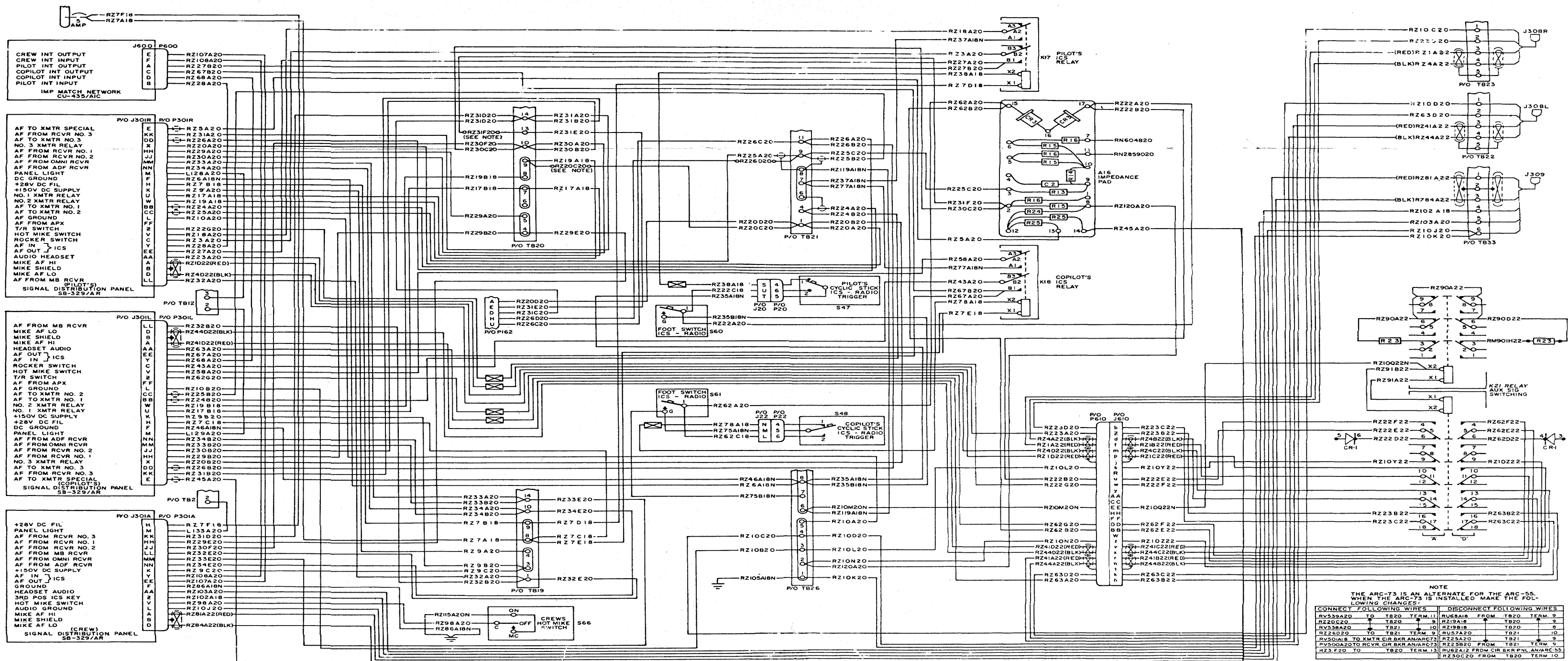
FO-28. FM Liaison No. 2 AN/ARC-114 Wiring Diagram, UH-1H.





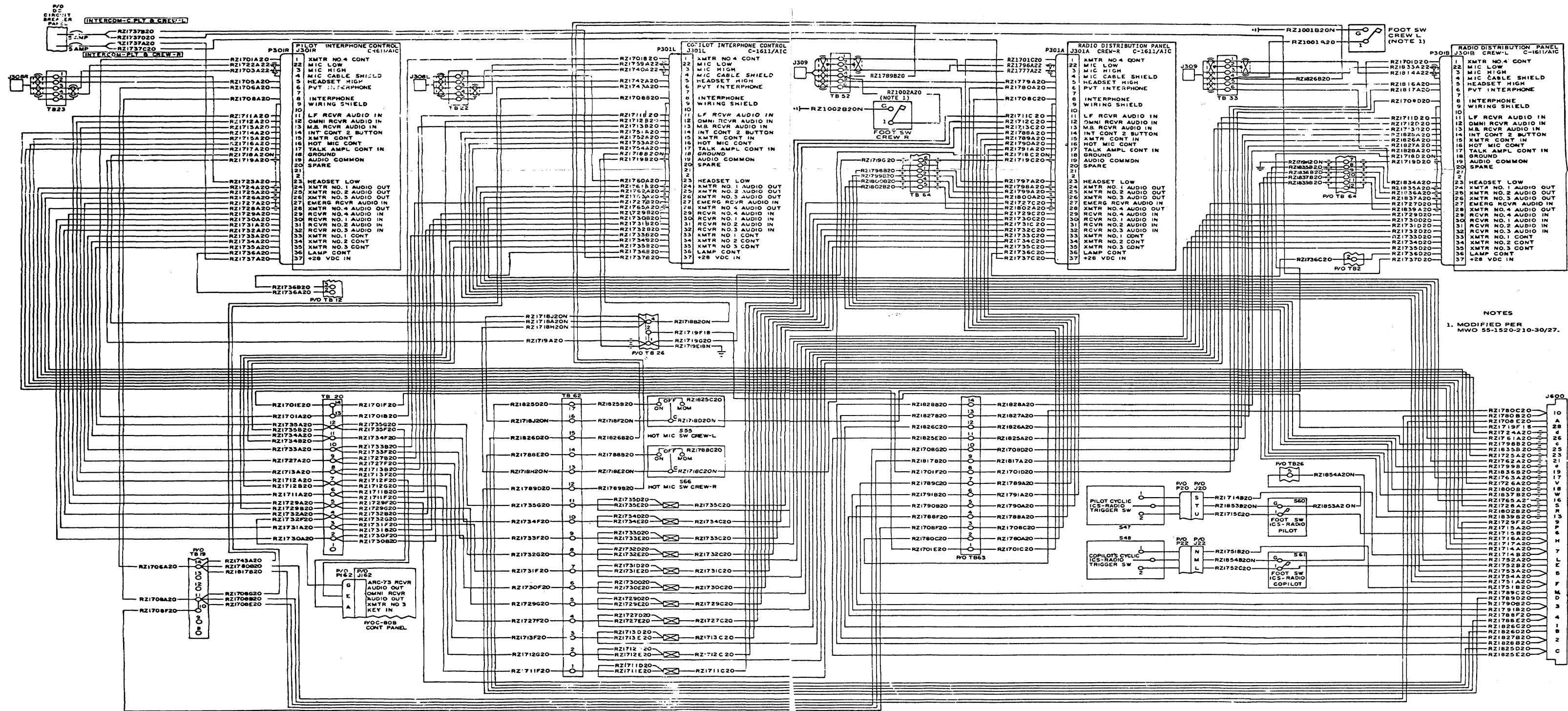
*FO-29. Auxiliary Signal Distribution Box Interconnecting Diagram, UH-1D/H Configurations A and B.*





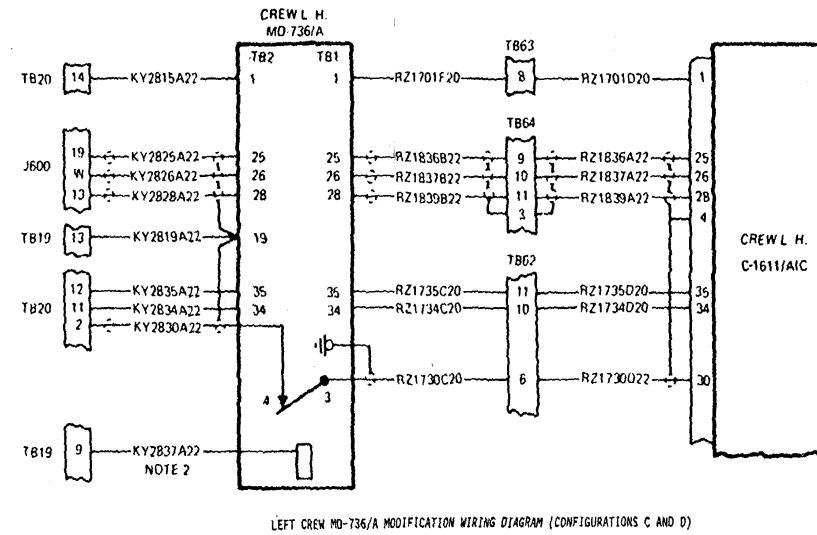
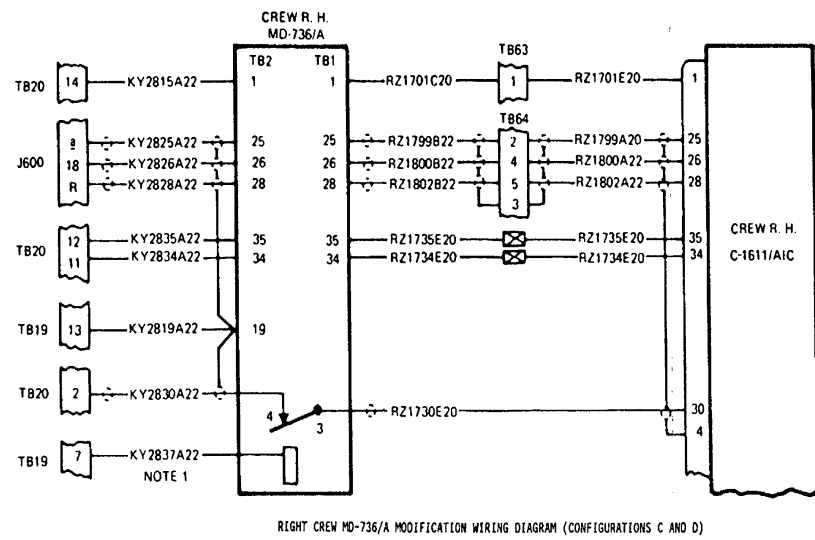
FO-30. Interunit Circuitry, Wiring Diagram, SB-329/AR, Configurations A and B.



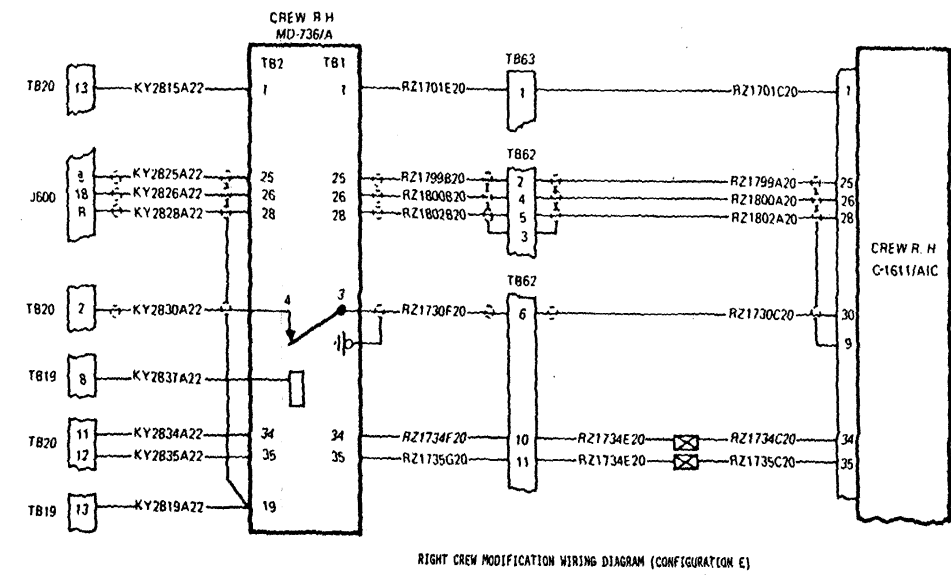
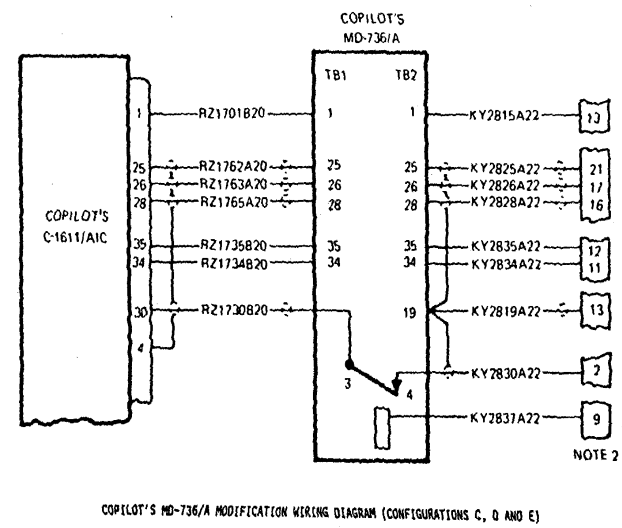
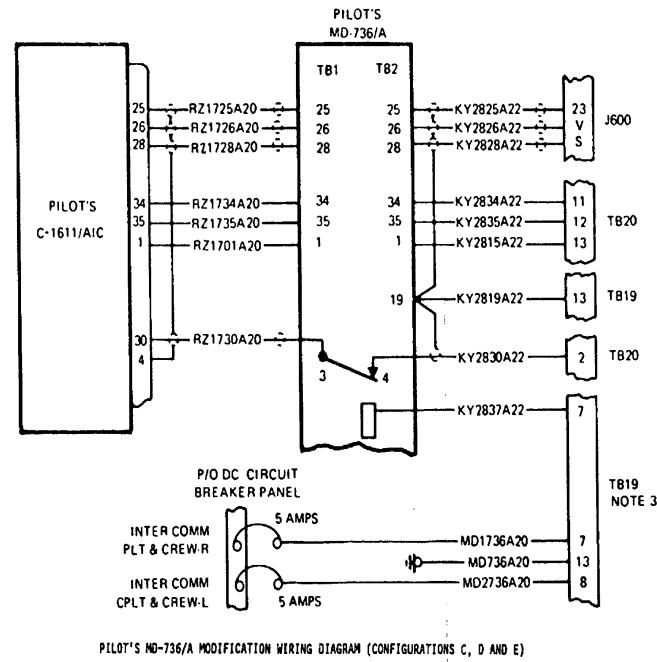
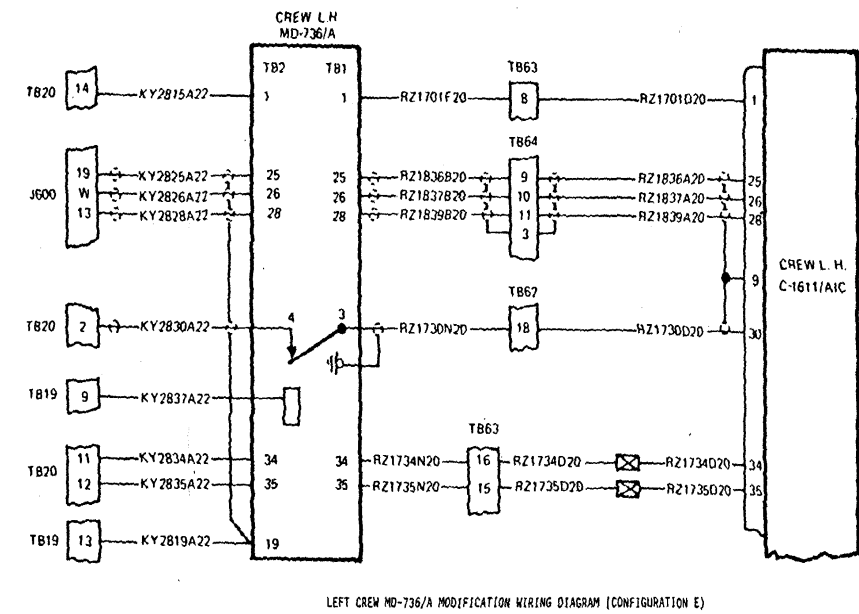


FO-31. Intercommunications Control Set C-1611/AIC, Interunit Circuitry, Wiring Diagram, Configurations C through E.





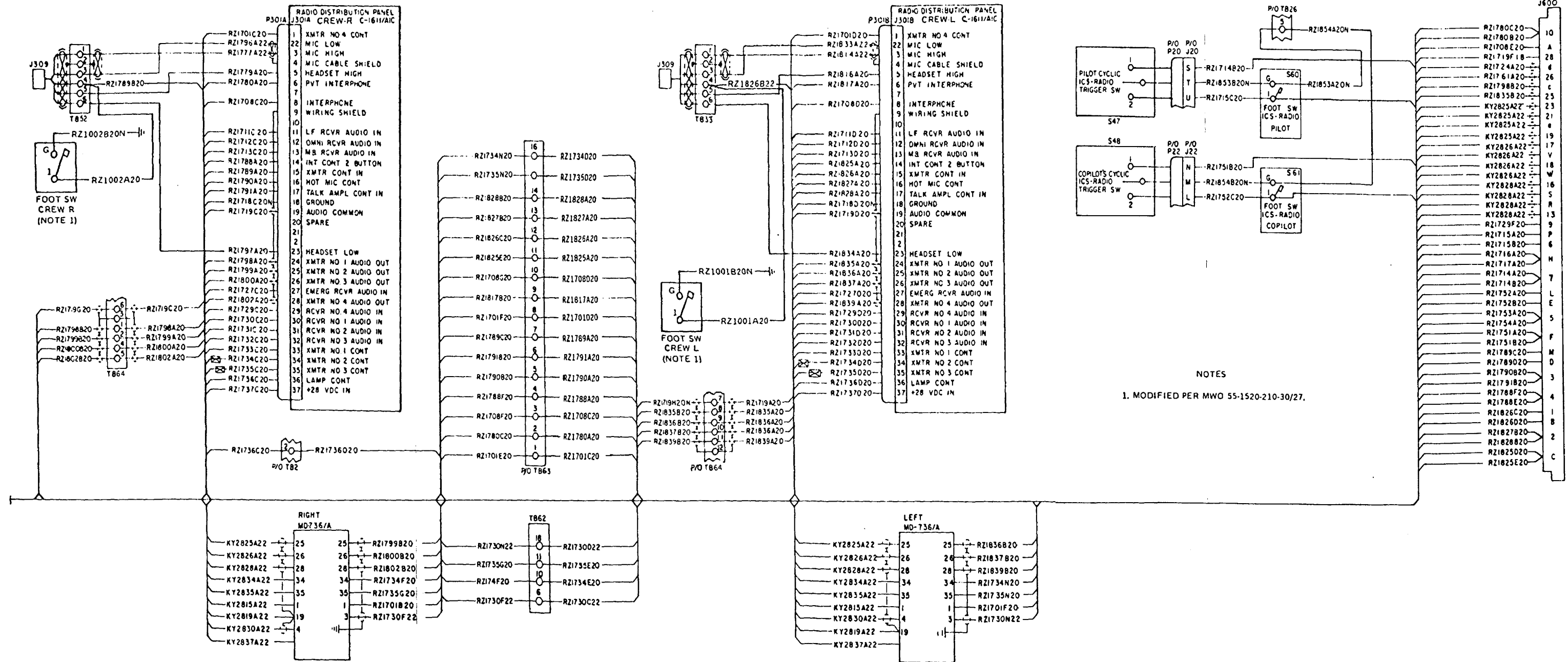
- NOTES:
1. ON CONFIGURATION C, AIRCRAFT WIRE KY2837A22 IS CONNECTED TO TERMINAL 8 OF TB19.
  2. ON CONFIGURATION D, AIRCRAFT WIRE KY2837A22 IS CONNECTED TO TERMINAL 8 OF TB19.
  3. ON CONFIGURATIONS C AND E, AIRCRAFT WIRES MD1736A20 AND KY2837A22 ARE ATTACHED TO TERMINAL 8 OF TB19 AND WIRE MD2736A20 IS ATTACHED TO TERMINAL 9 OF TB19.









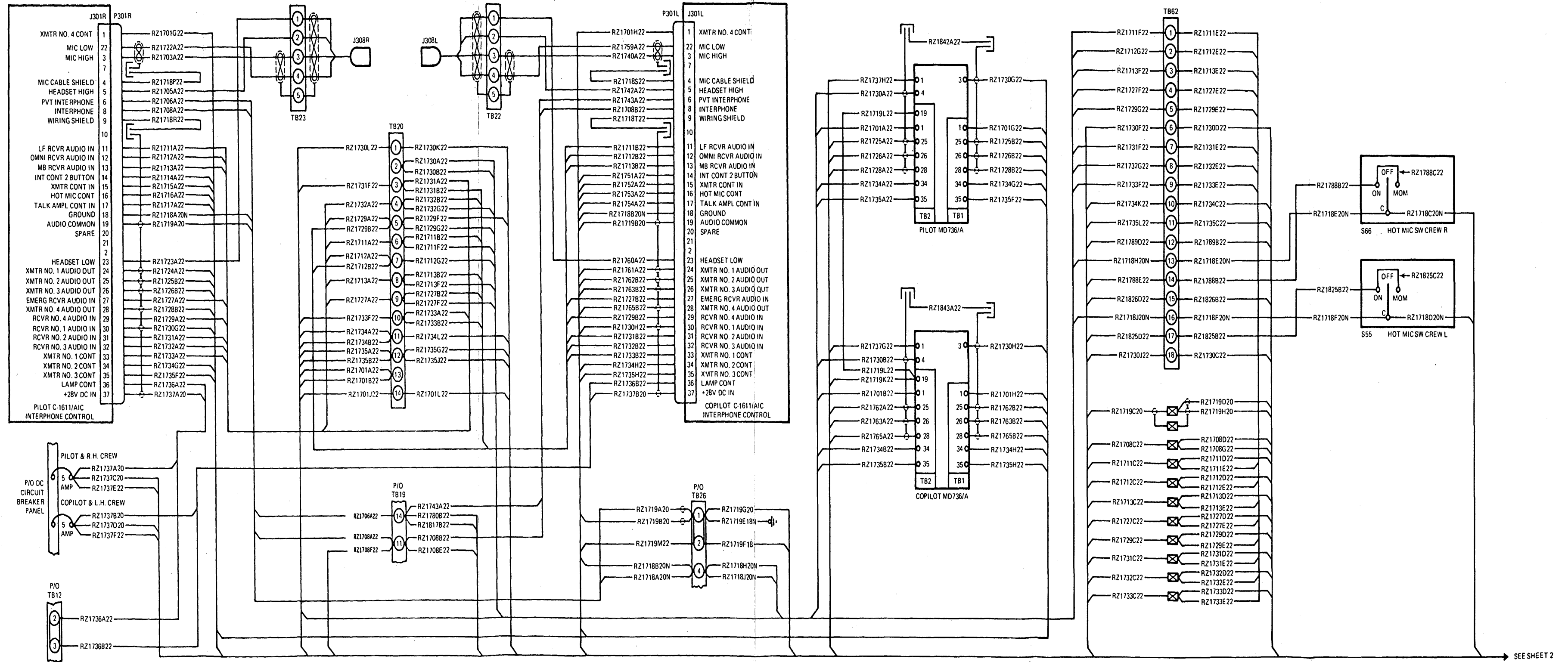


FO-33. Intercommunications Control Set C-1611(\*)/AIC Interunit Circuitry and Wiring Diagram, UH-1D/H Configurations F through I (Sheet 2 of 2)



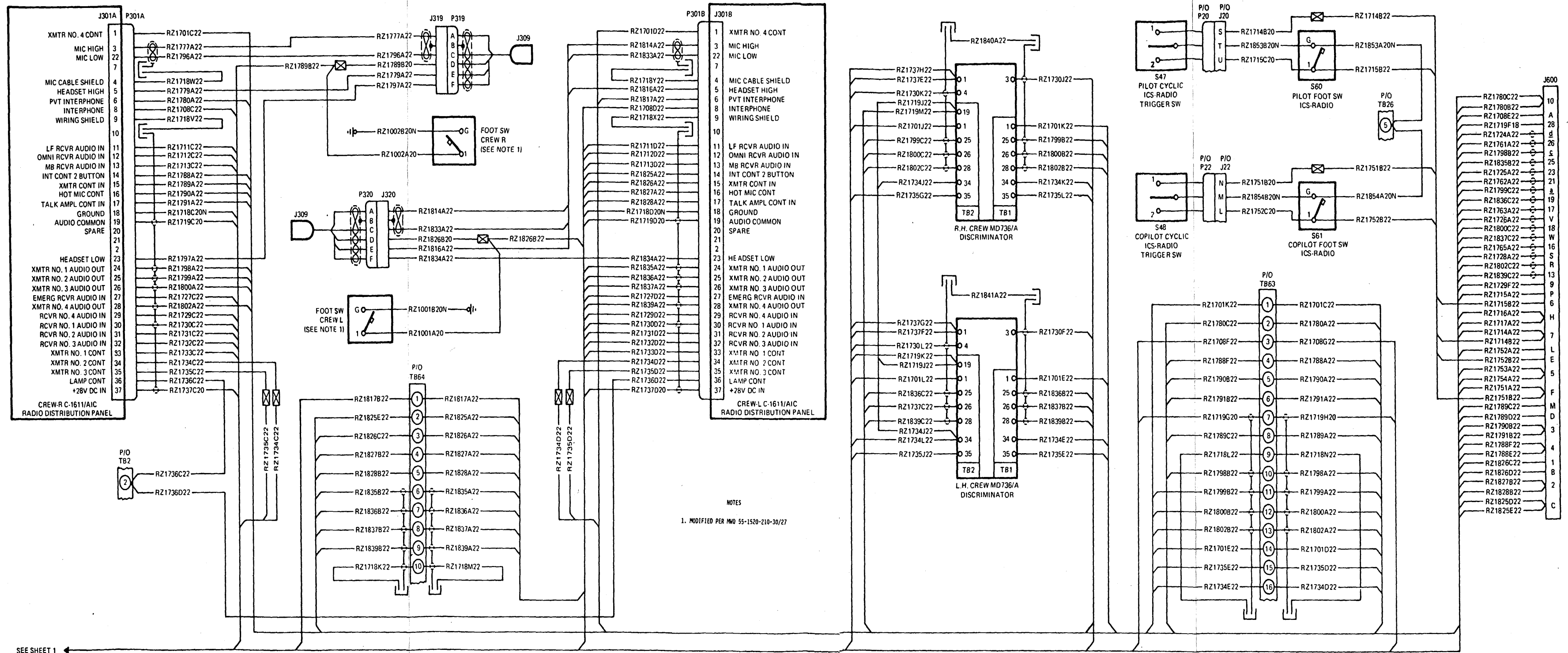




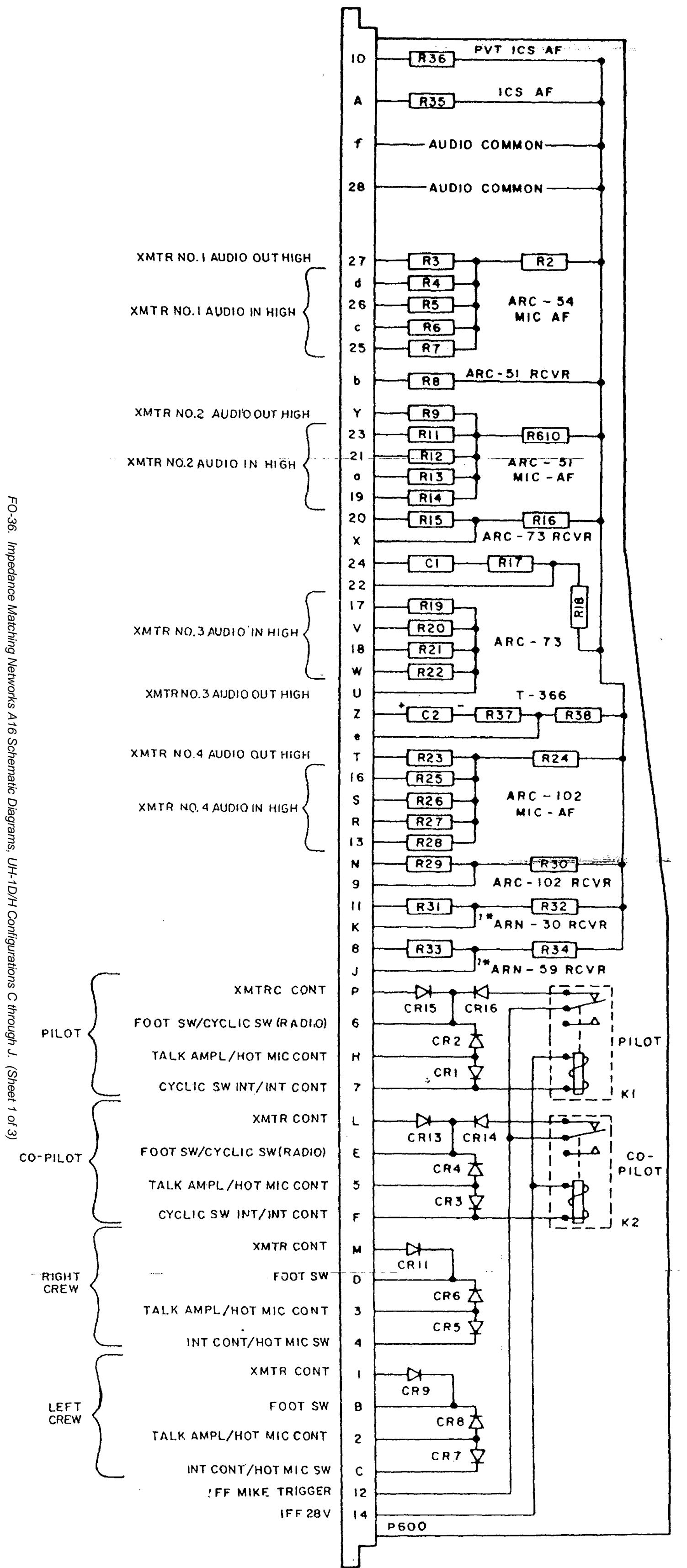


FO-35. Intercommunications Control Set C-1611(\*)/AIC Interunit Circuitry and Wiring Diagram, UH-1D/H Configuration J (Sheet 1 of 2).



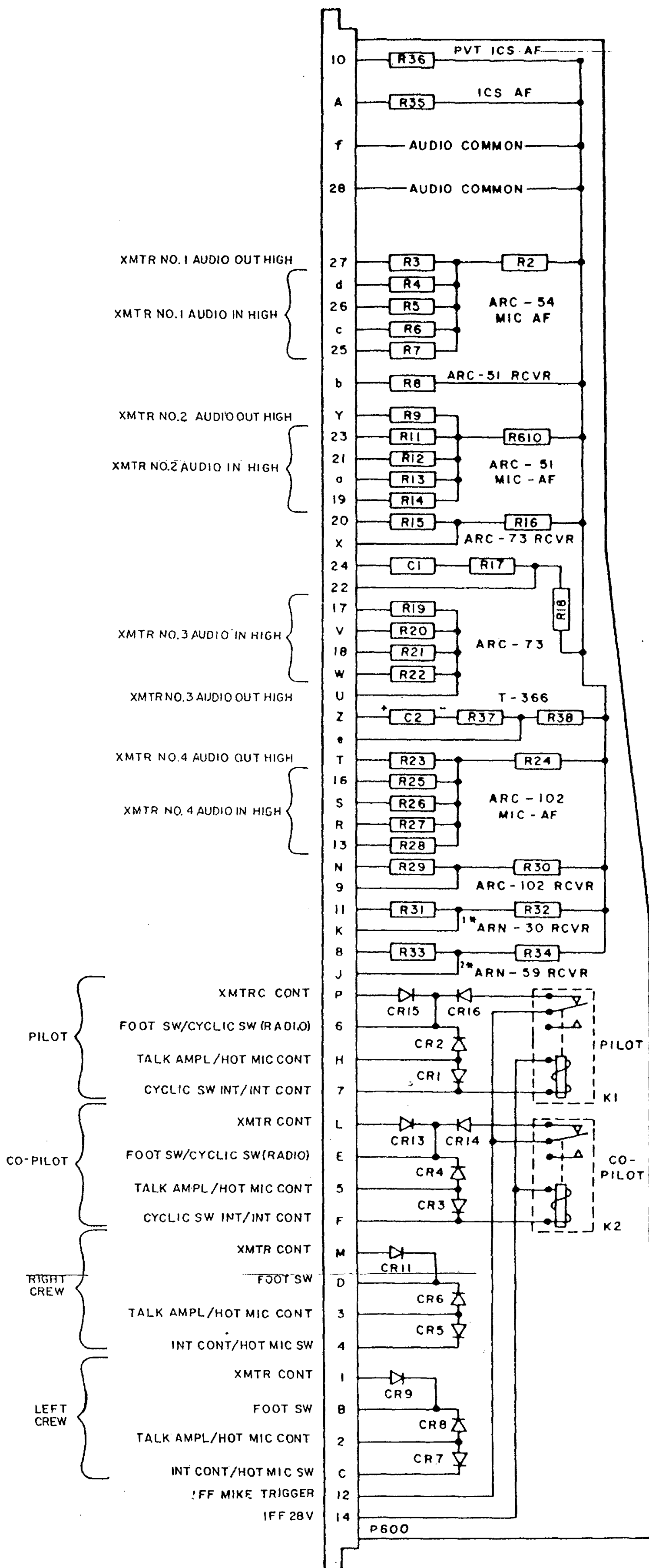






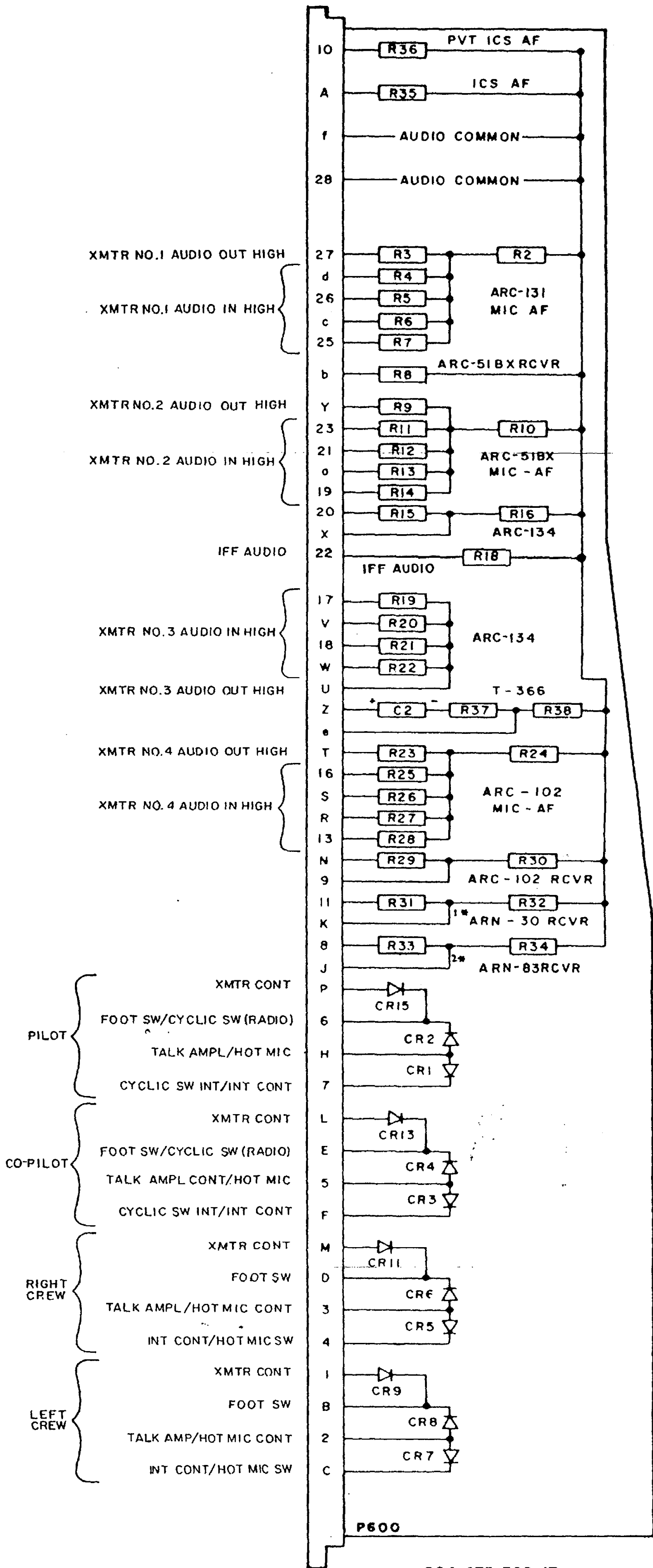
204-075-399-3  
CONFIGURATIONS C,D,E, AND F UP TO AND INCLUDING 66-16306





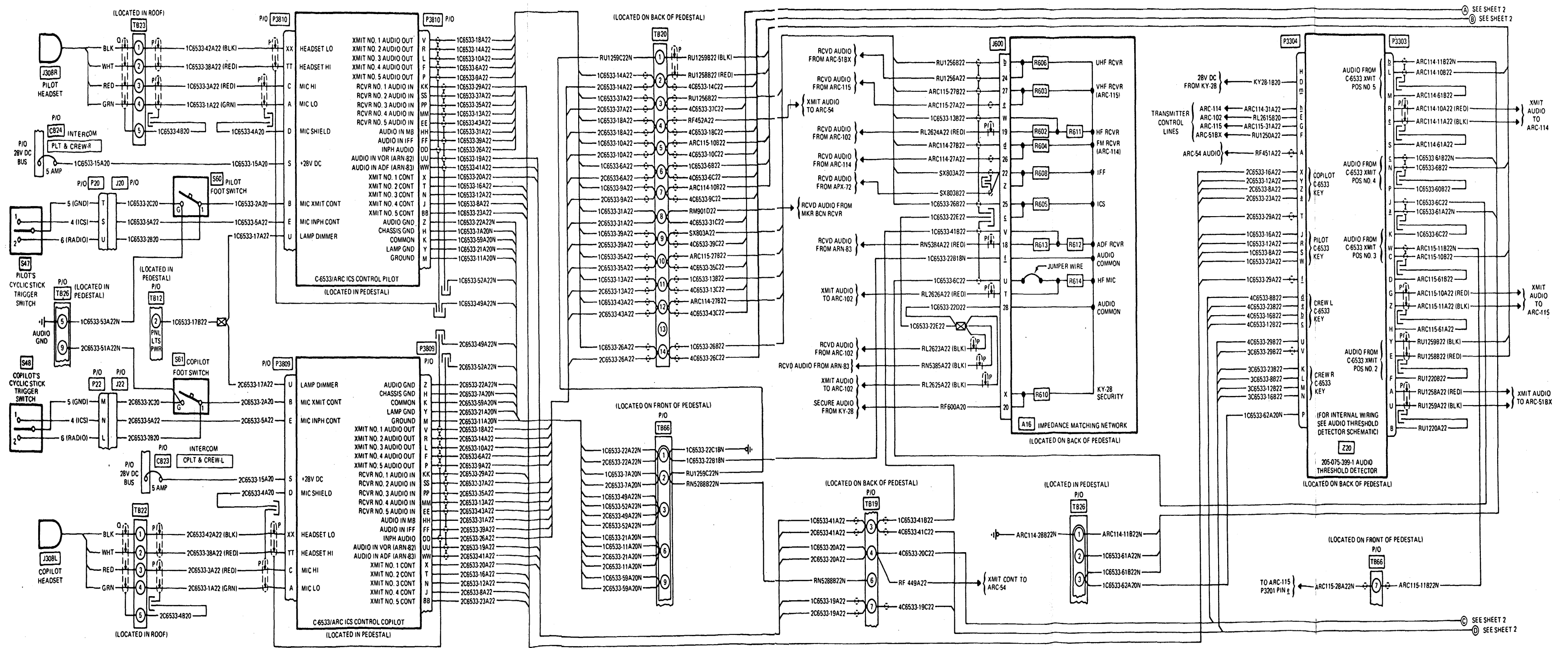
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CONFIGURATIONS C,D,E, AND F UP TO AND INCLUDING 66-16306





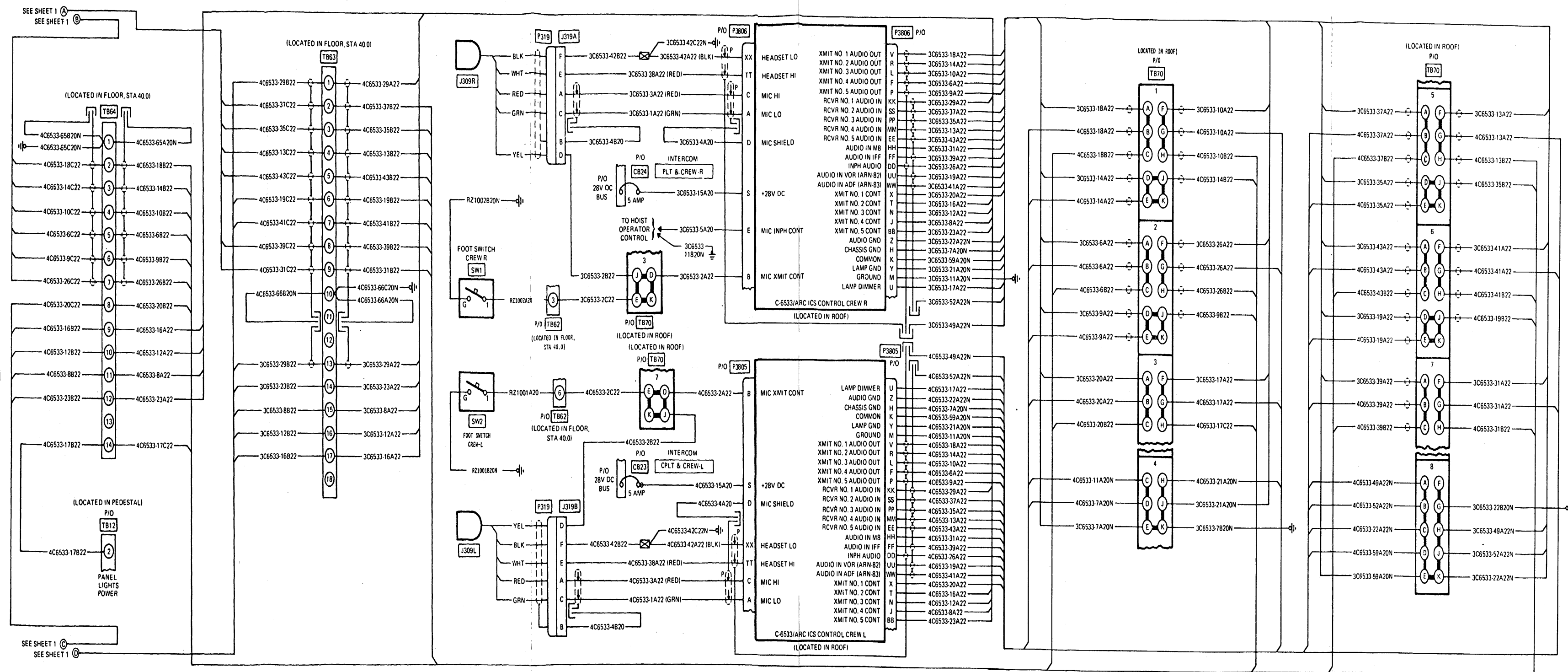
204-075-399-17  
CONFIGURATION J ONLY





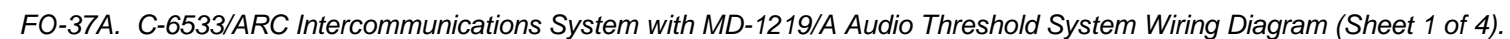
FO-37. C6533/ARC Intercommunications System Wiring Diagram, UH-1H (Sheet 1 of 2).



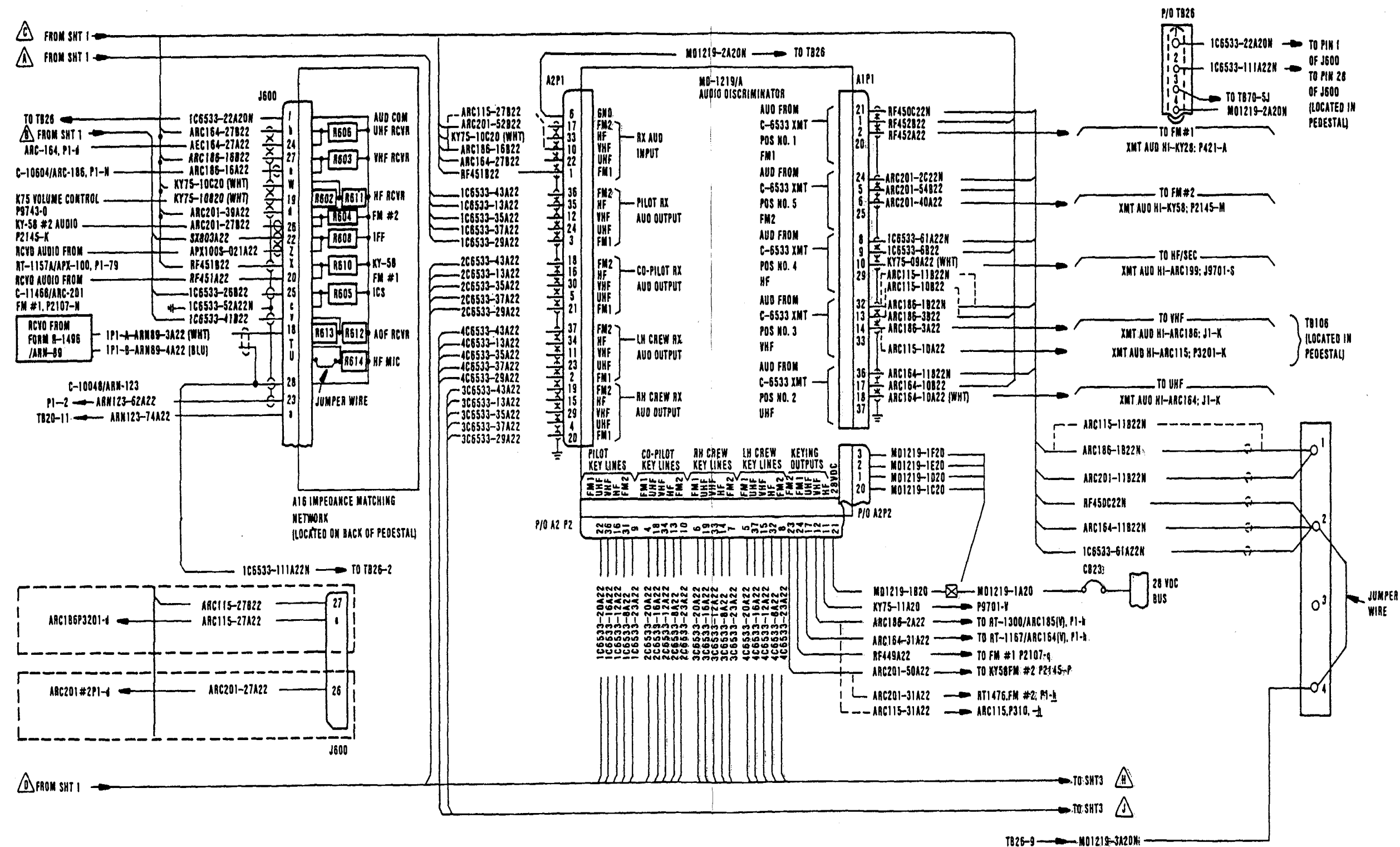


FO-37. C6533/ARC Intercommunications System Wiring Diagram, UH-1H (Sheet 2 of 2).

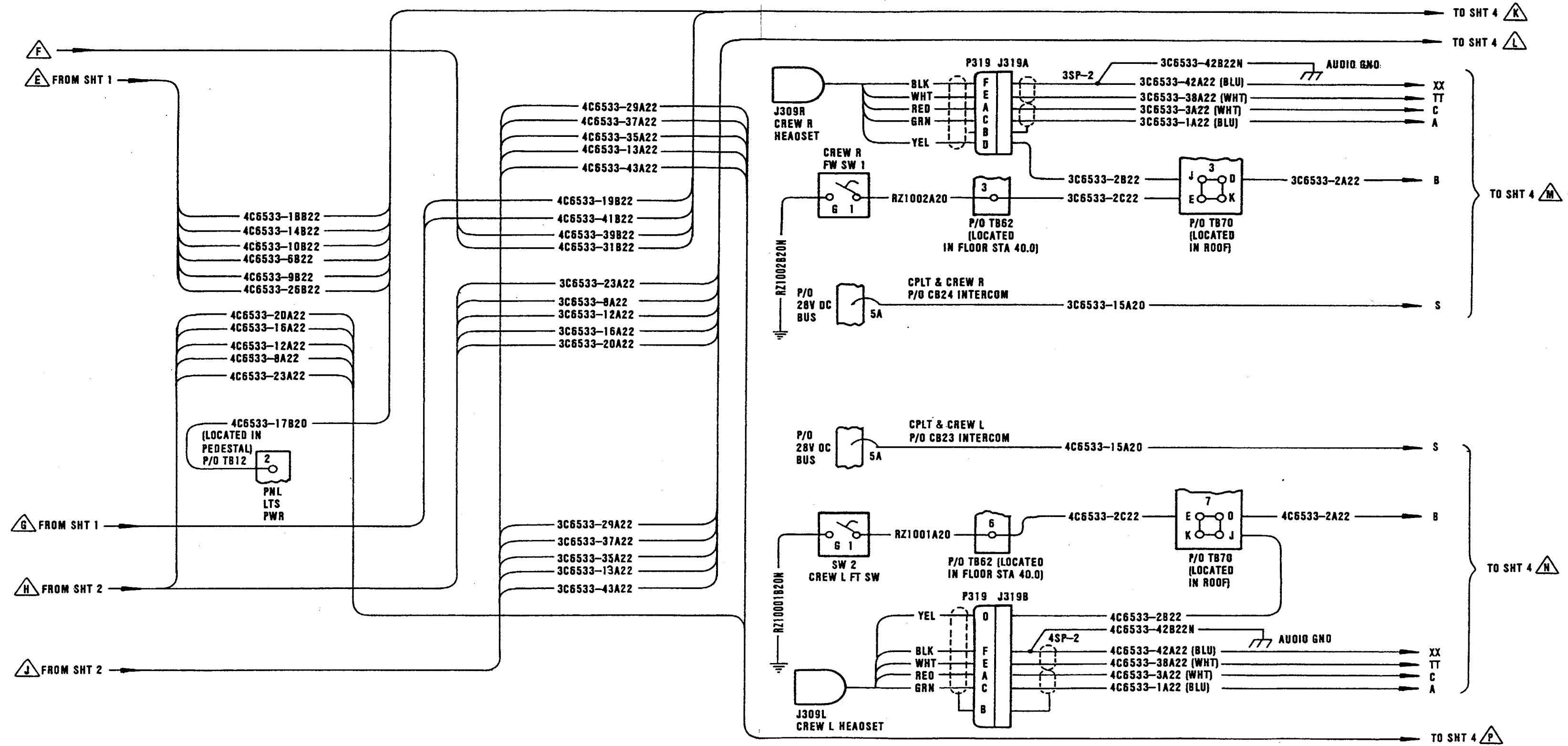






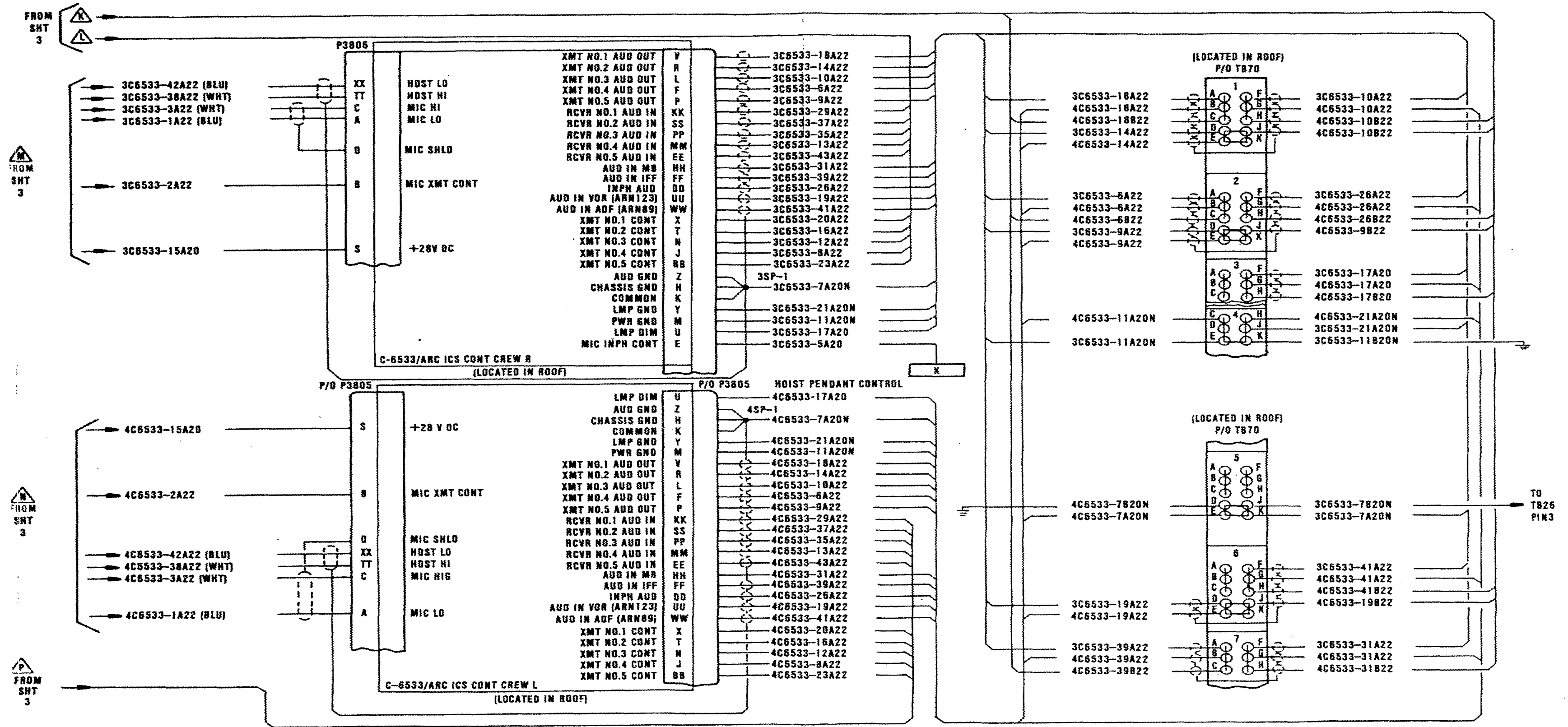






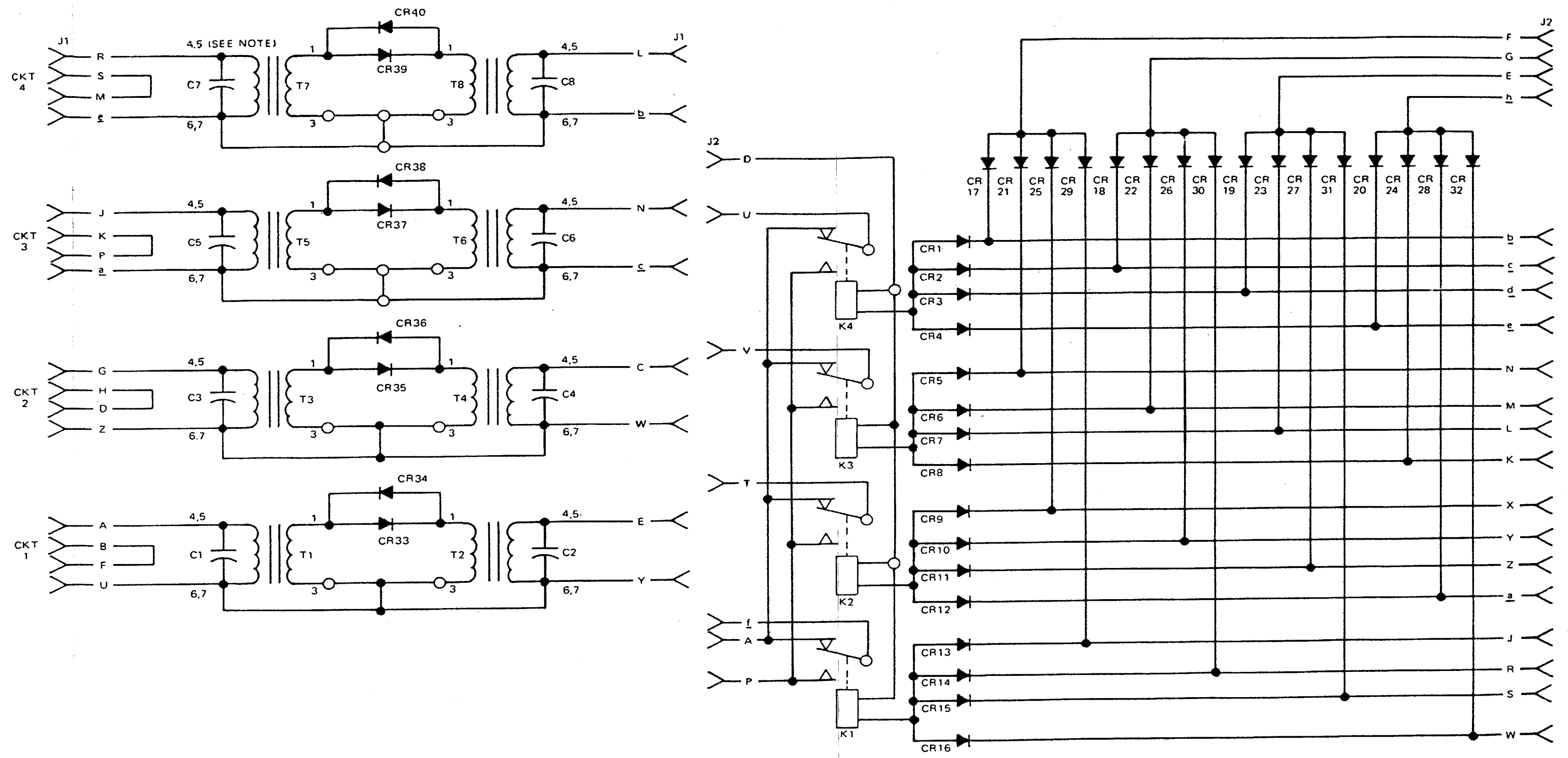
FO-37A. C-6533/ARC Intercommunications System with MD-1219/A Audio Threshold System Wiring Diagram (Sheet 3 of 4).





FO-37A. C-6533/ARC Intercommunications System with MD-1219/A Audio Threshold System Wiring Diagram (Sheet 4 of 4).

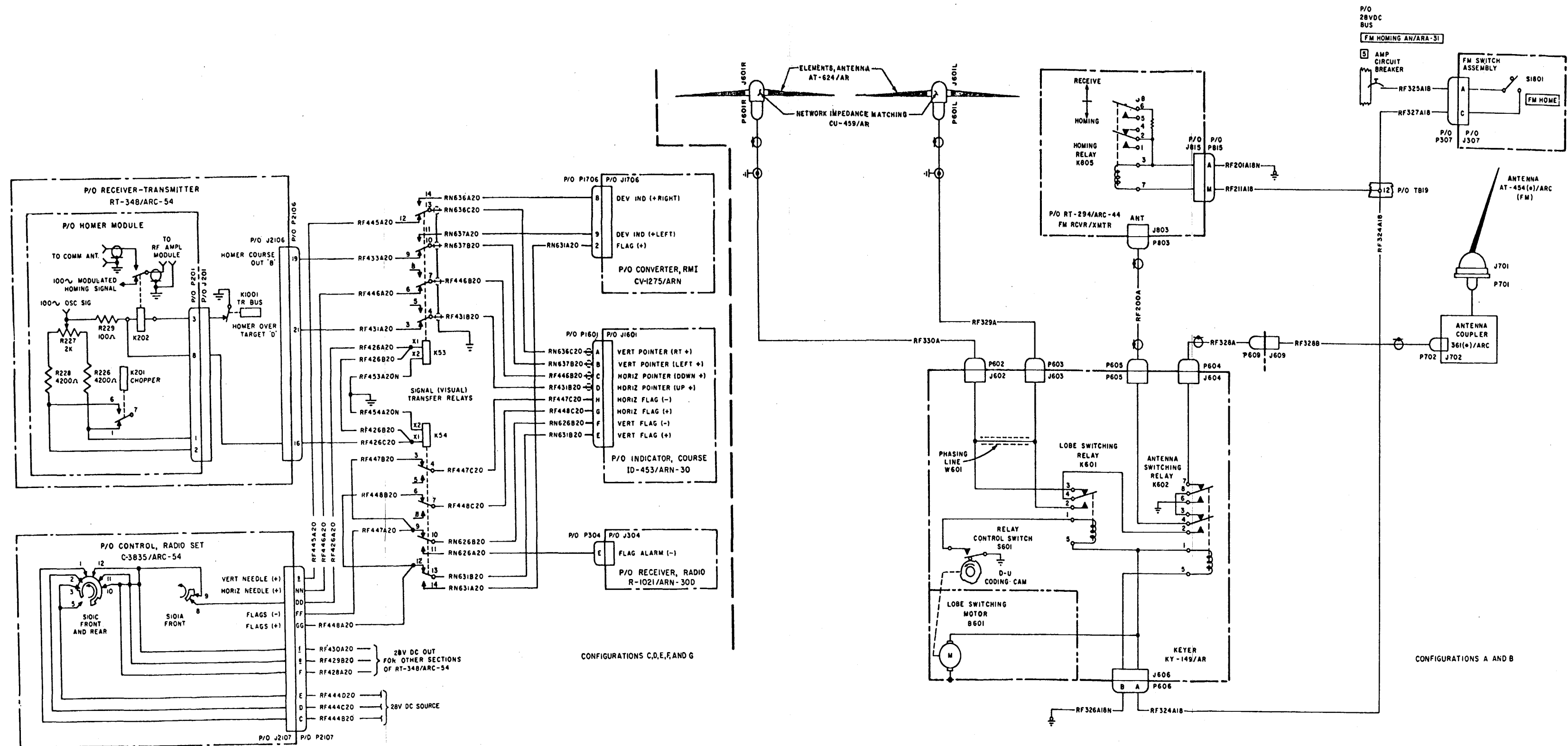




NOTE:  
4, 5, 6, 7 INDICATES THAT THE RESPECTIVE TERMINALS  
ARE BUSSED

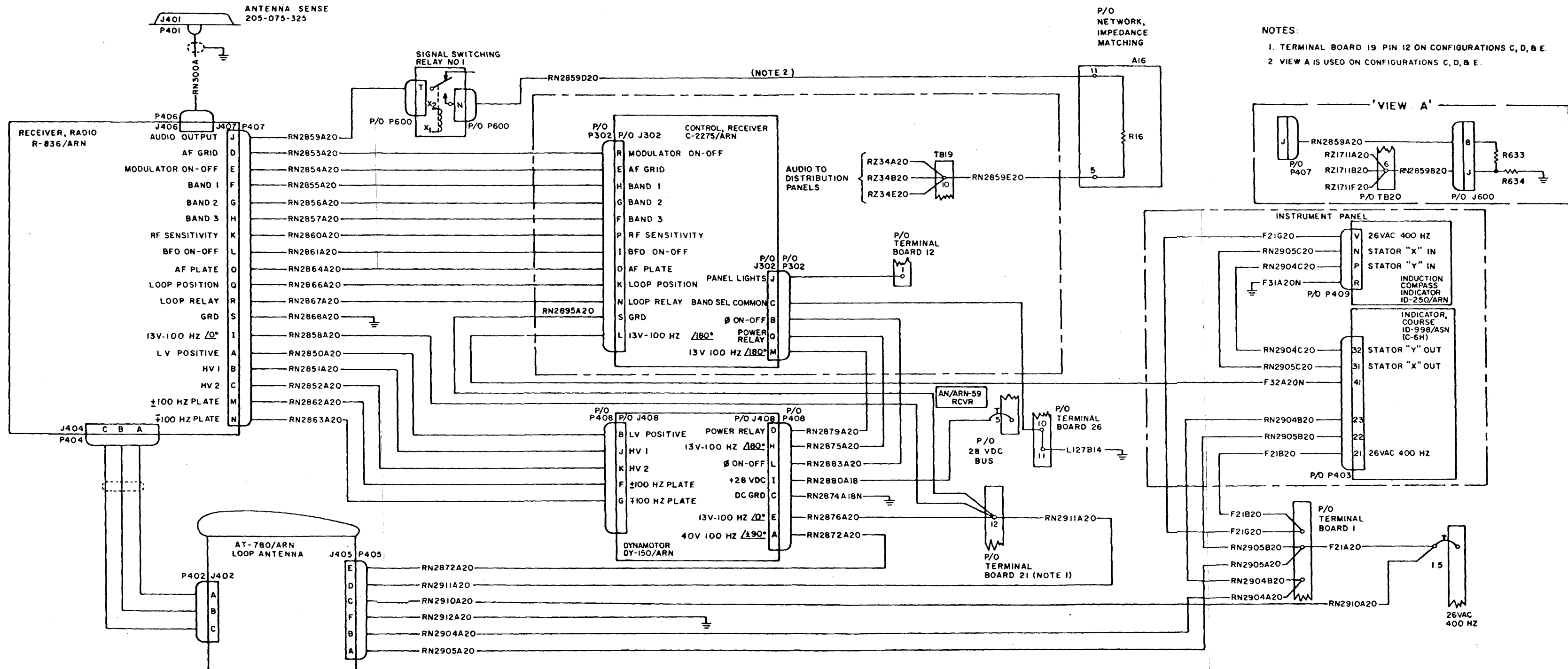
FO-38. Audio Threshold Detector Schematic Diagram, UH-1H





FO-39. FM Homing Set AN/ARA-31 Wiring Diagram UH-1D/H Configurations A and B.





FO-40. Direction Finder Set AN/ARN-59 Wiring Diagram.

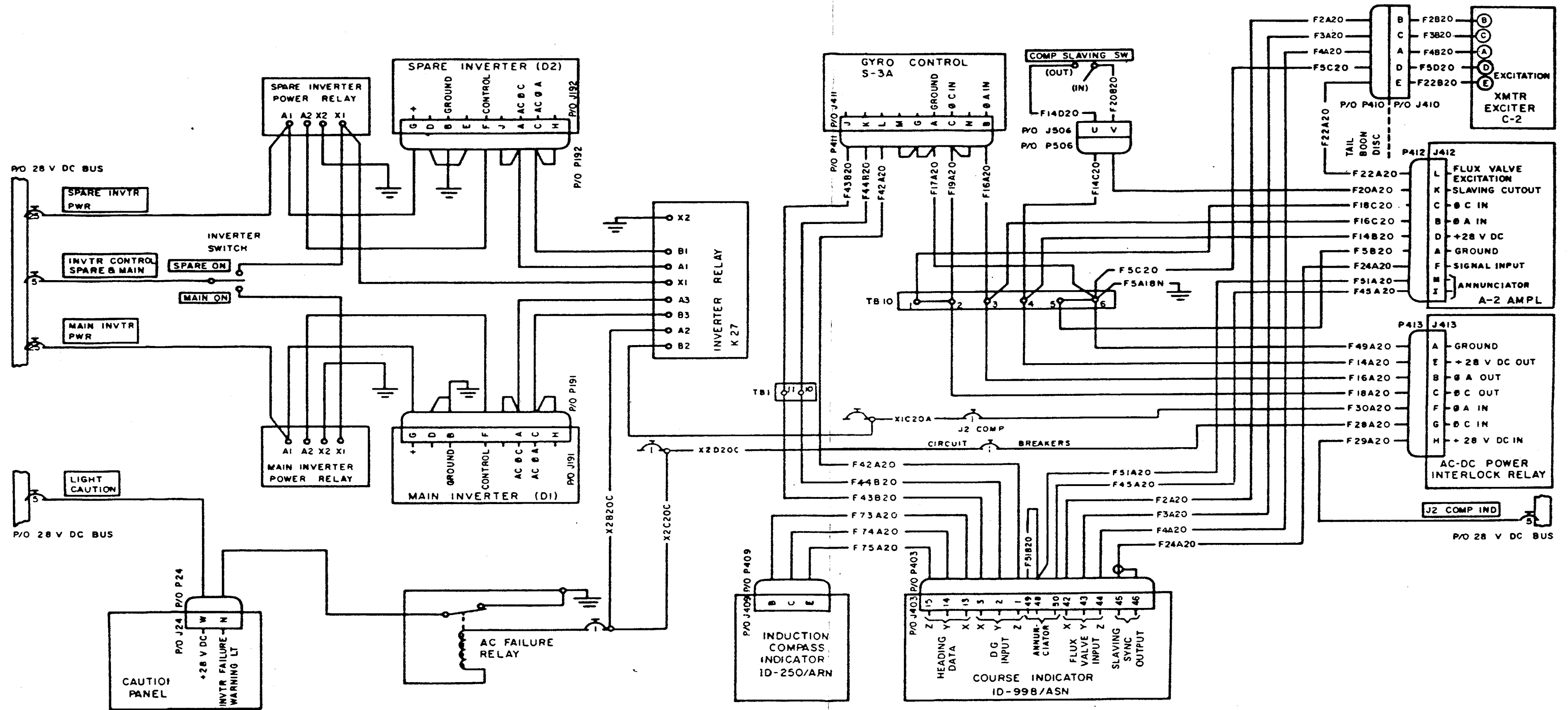


**FP-97**



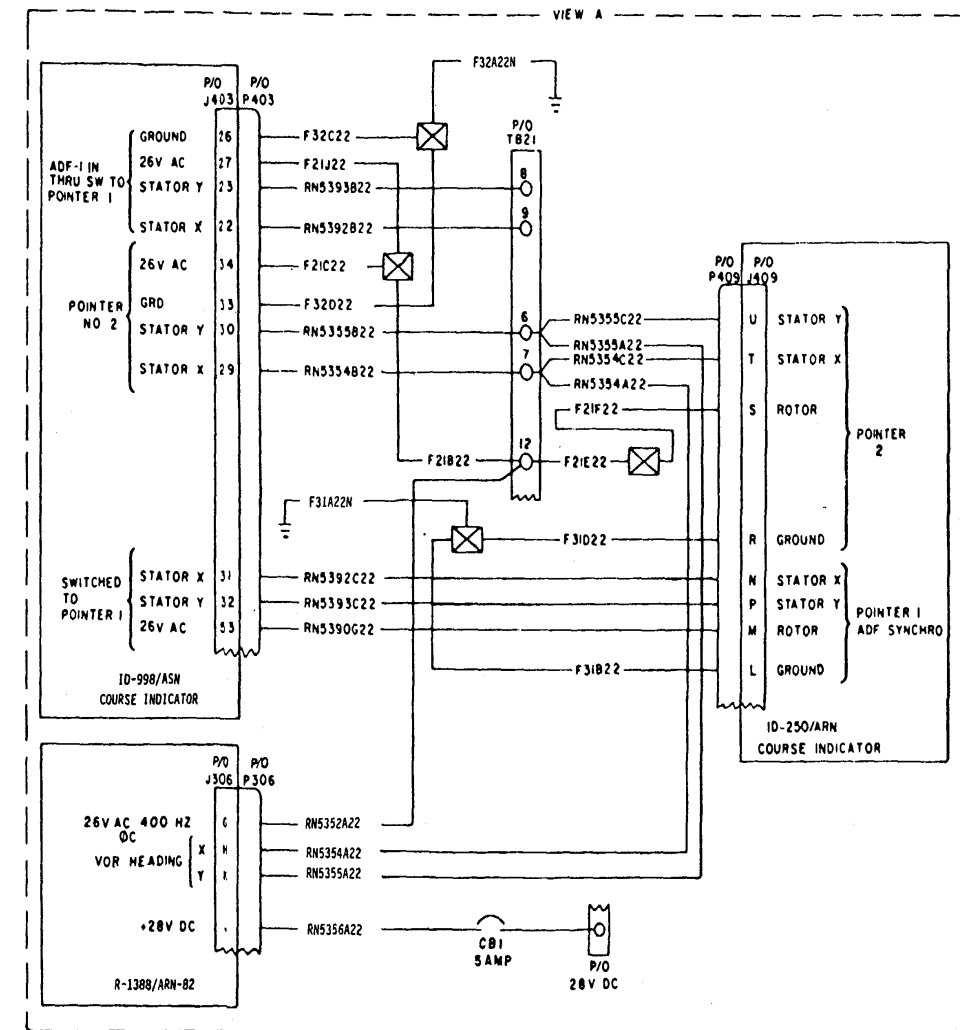
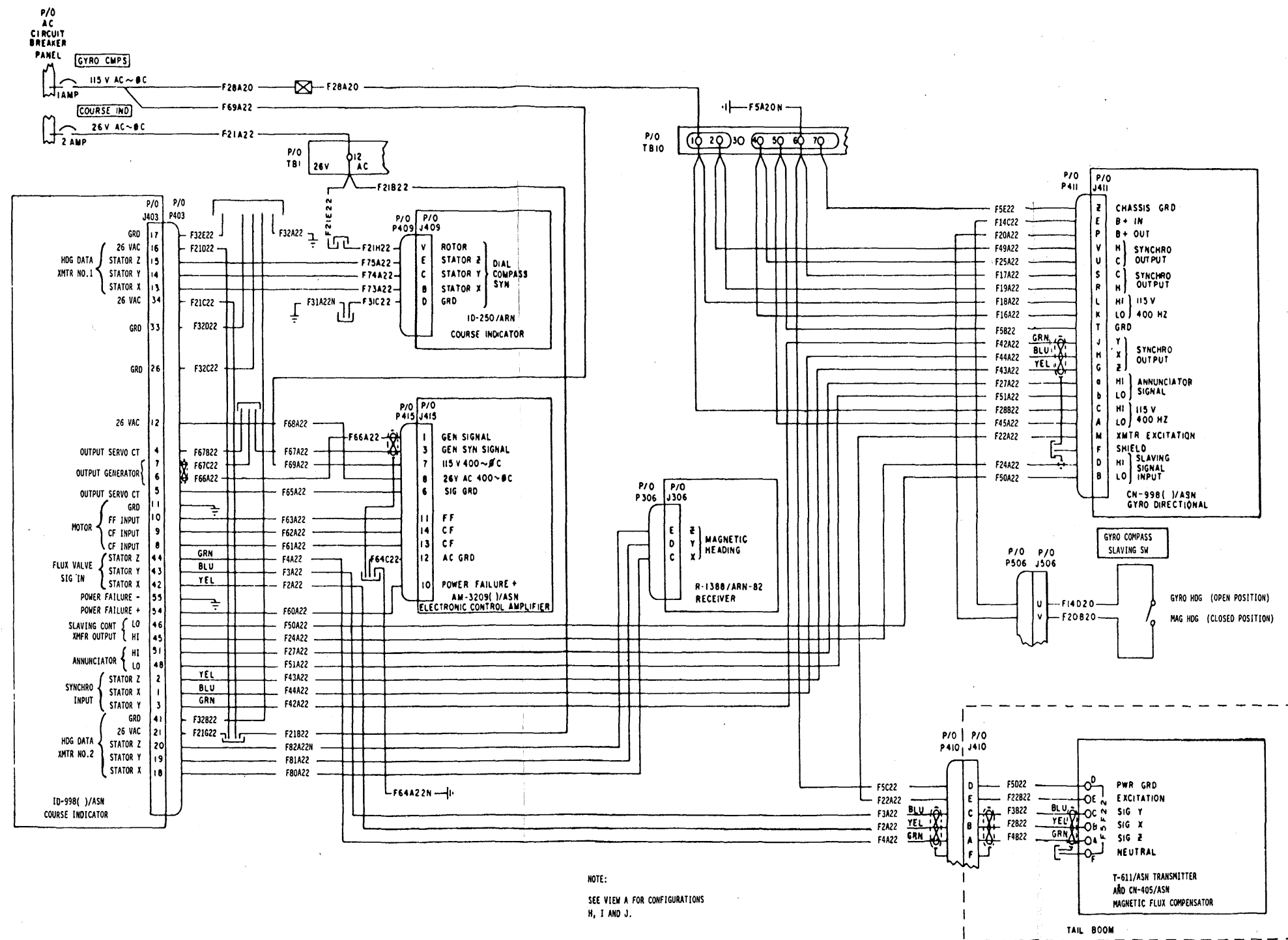






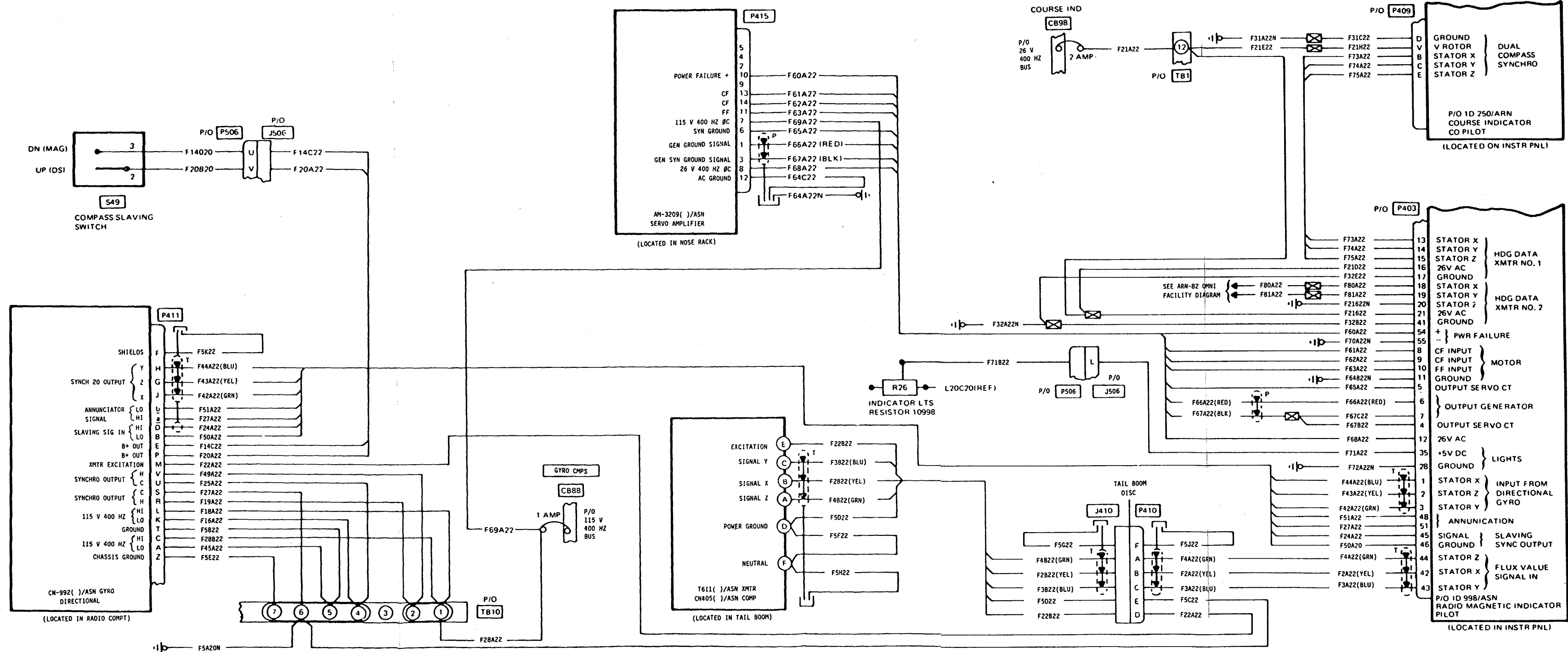
FO-43. Magnetic Compass Set Type J2 Wiring Diagram, UH-1D/H Configurations A through F.





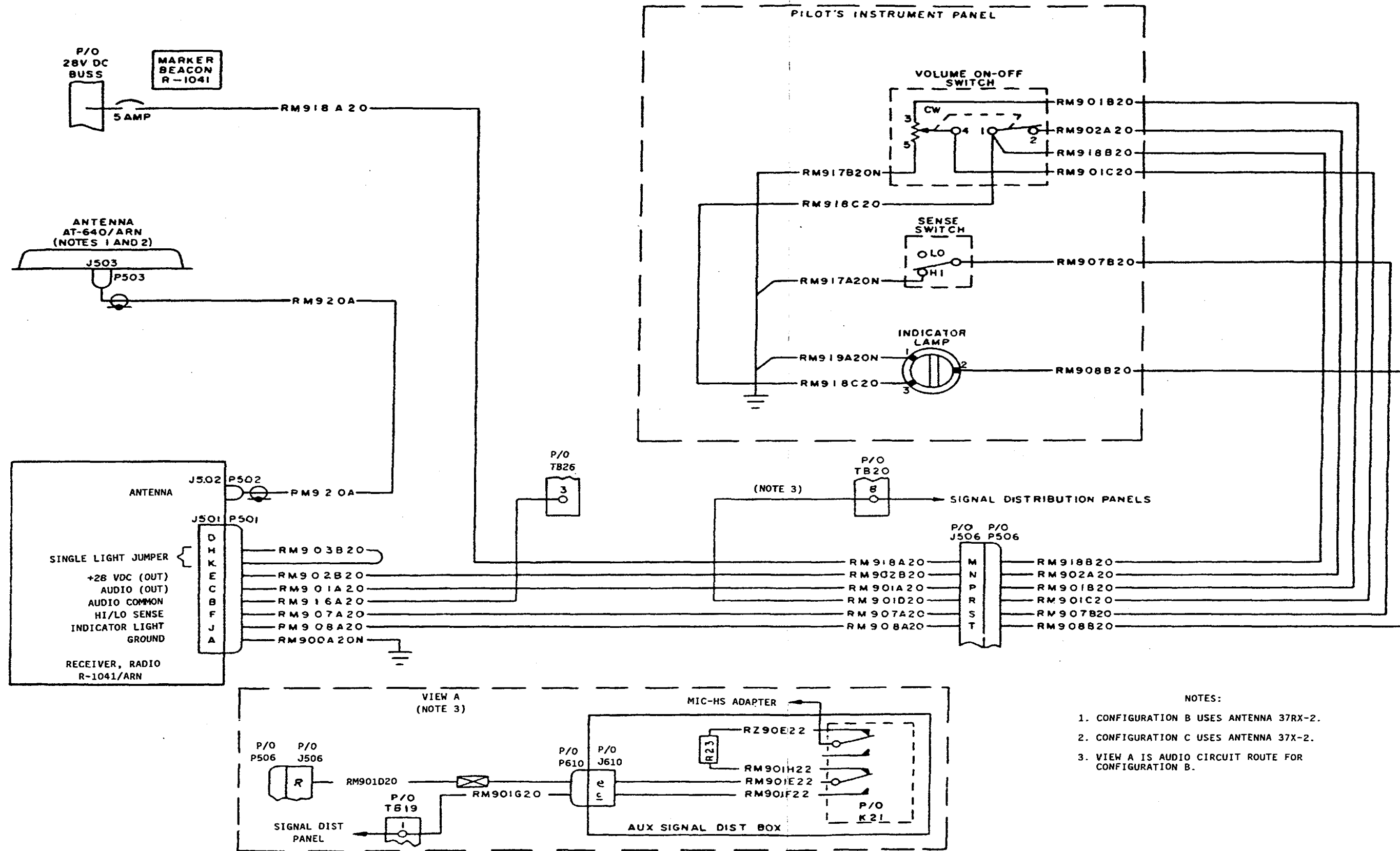
FO-44. Gyromagnetic Compass Set AN/ASN-43 Wiring Diagram, UH-1D/h Configurations G through J.





FO-45. Gyromagnetic Compass Set AN/ASN-43 Wiring Diagram, UH-1H.



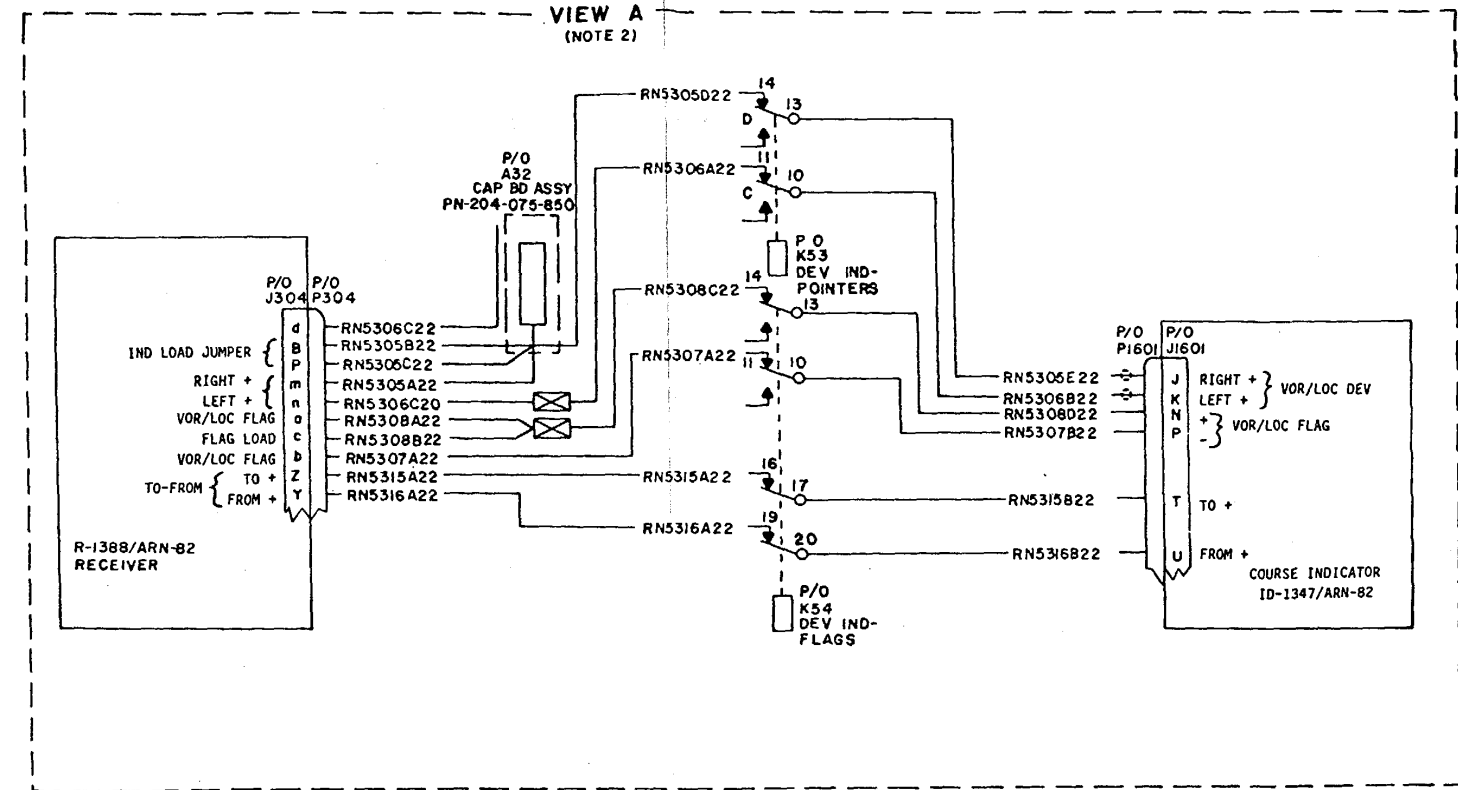
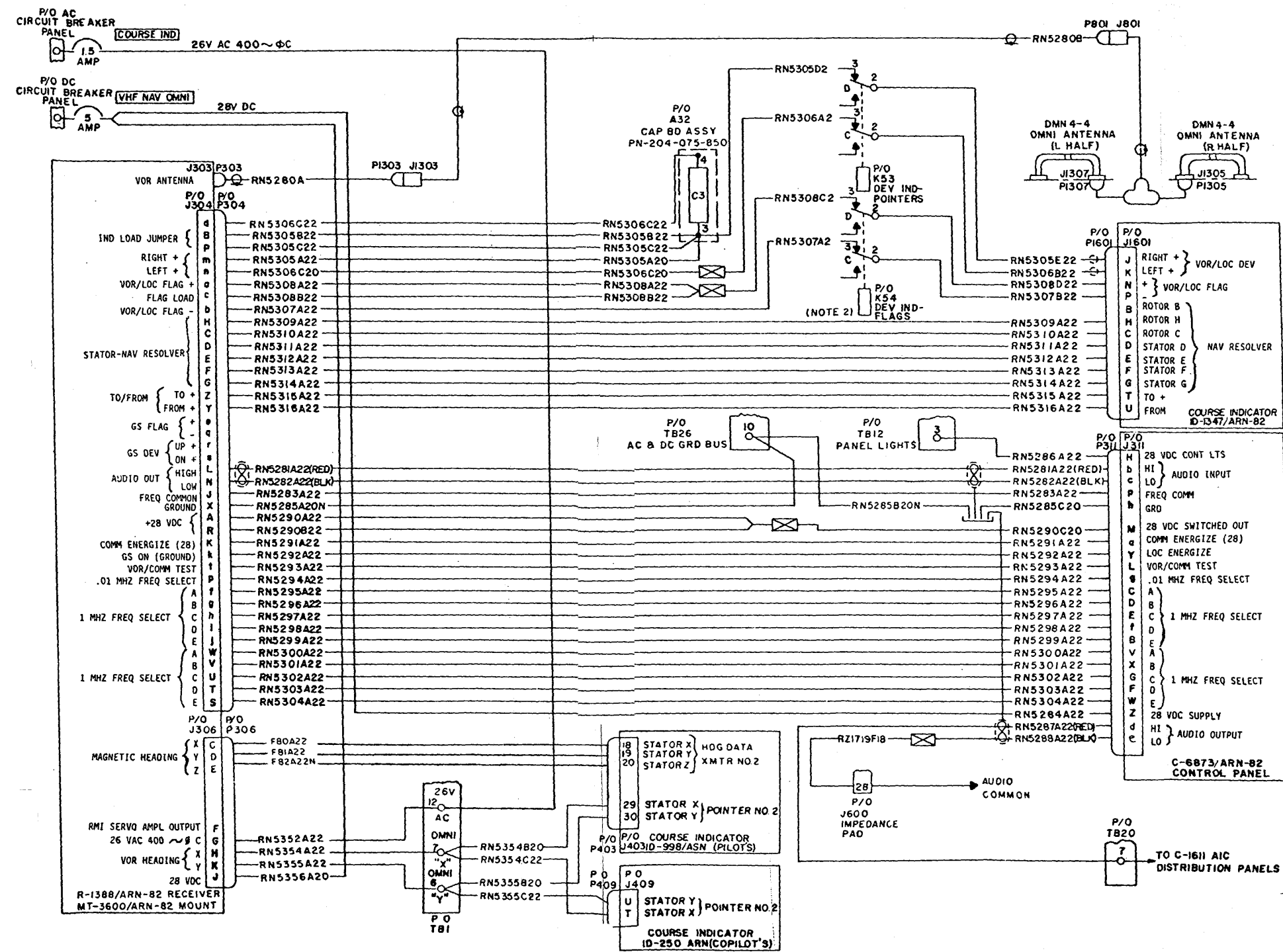


FO-46. Marker Beacon Receiver R-1041(\*)/ARN Wiring Diagram.



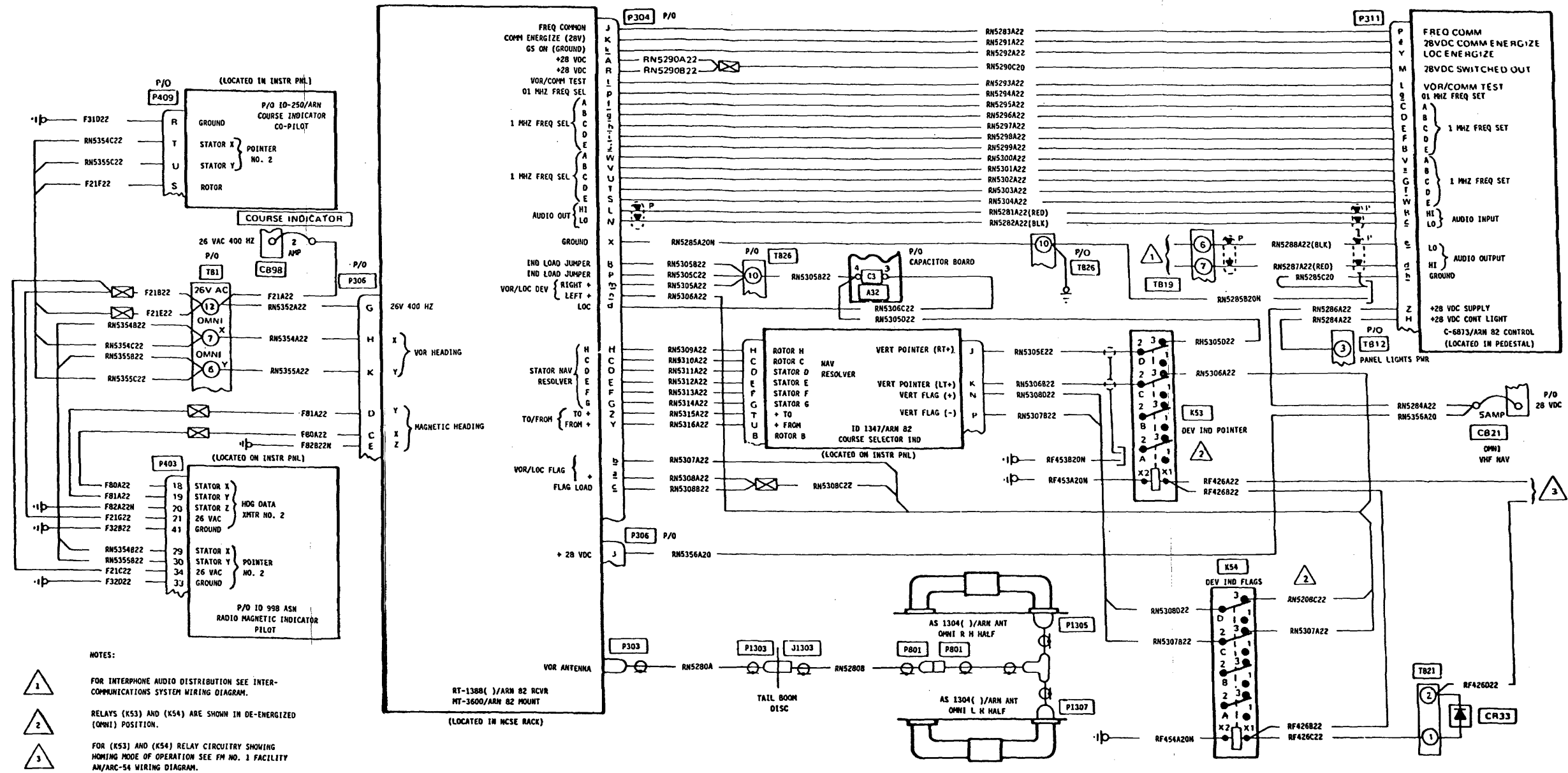






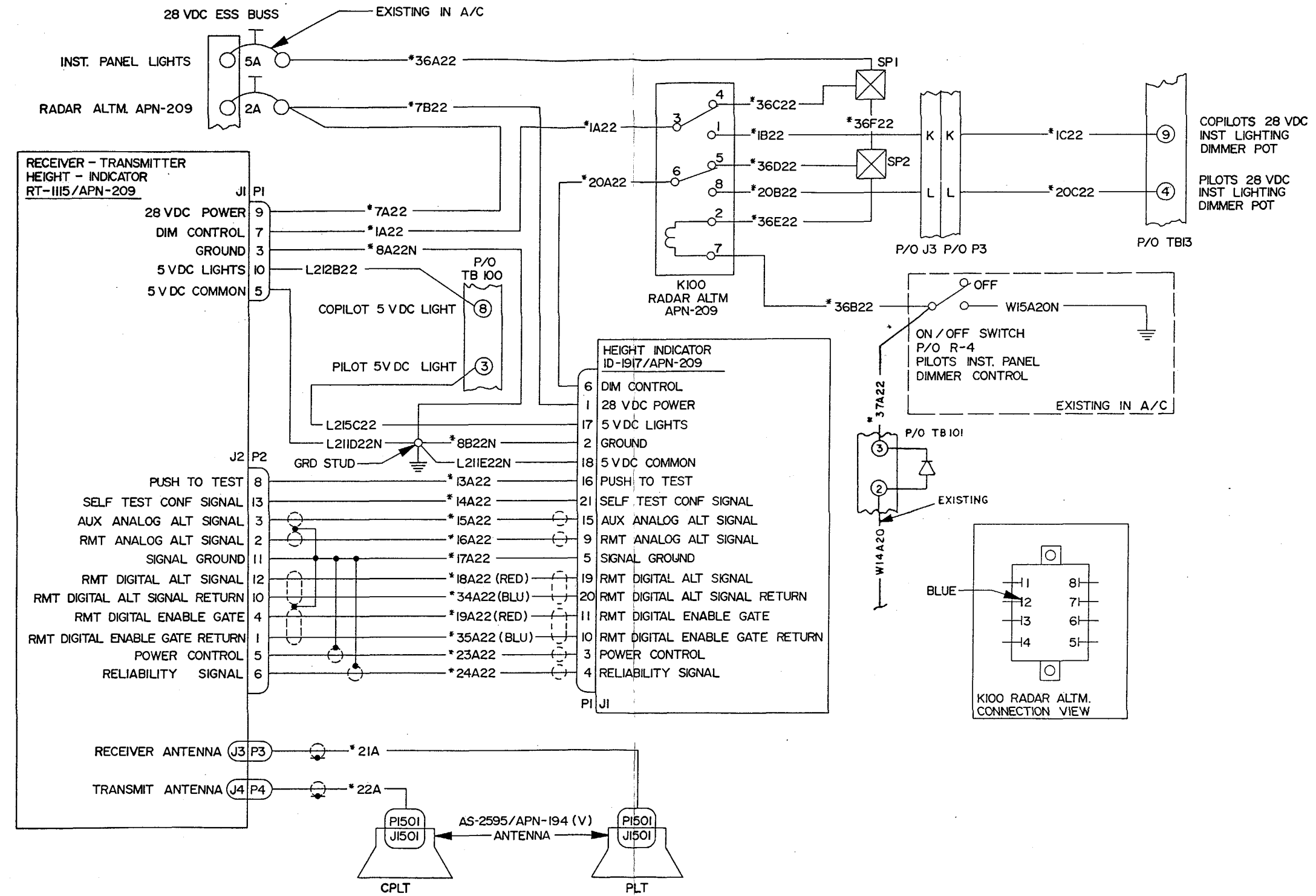
- NOTES:
- CONTROL PANEL C-808 IS INSTALLED ONLY THROUGH 66-16306 IN CONFIGURATION F. ON 66-16307 AND SUBSEQUENT, WIRE RN5287A22 IS ROUTED FROM PIN D OF P311 DIRECTLY TO TERMINAL 7 OF TB20.
  - SEE VIEW A FOR VARIATIONS APPLICABLE TO CONFIGURATIONS F, G AND THROUGH 67-17777 OF H.





FO-49. VHF Navigation Set AN/ARN-82 Wiring Diagram, UH-1H.





FO-50. Radar Altimeter Set AN/APN-209 Wiring Diagram.  
FP-115

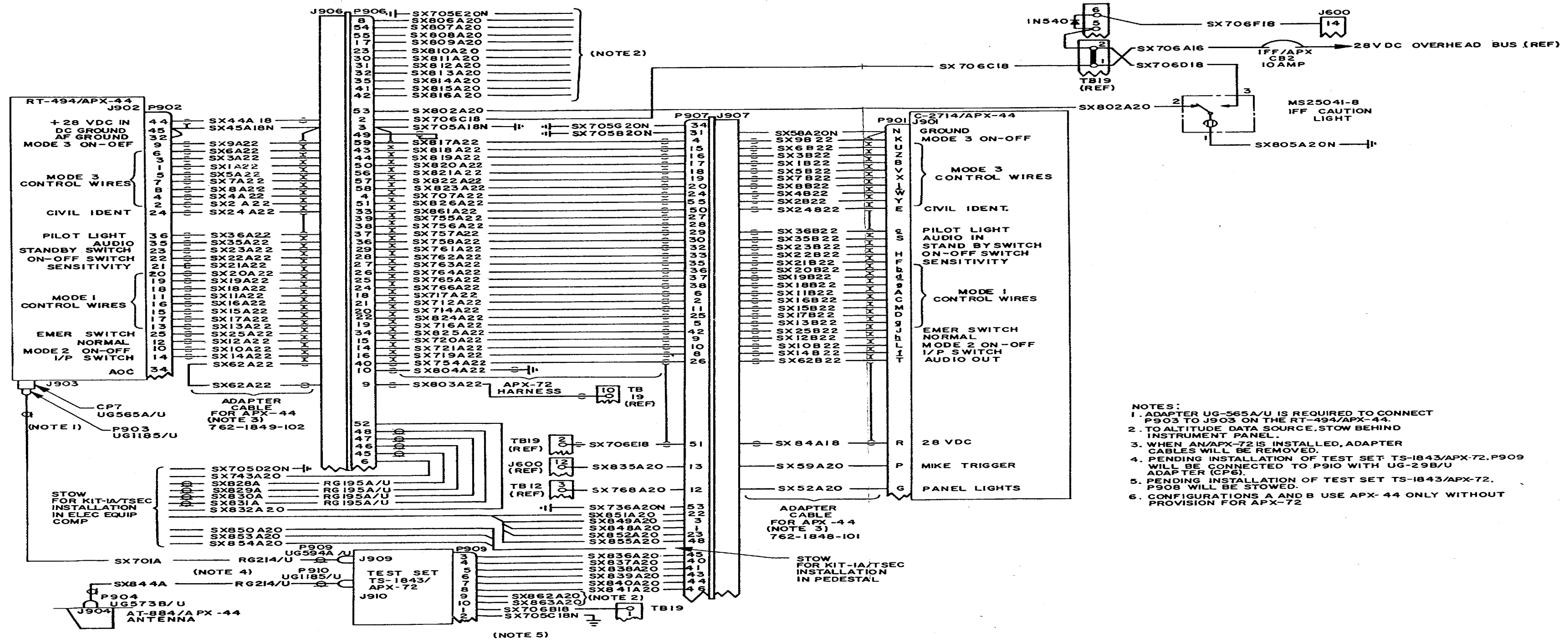






**FO-52. Attitude Indicating Systems Wiring Diagram.**  
**FP-119**



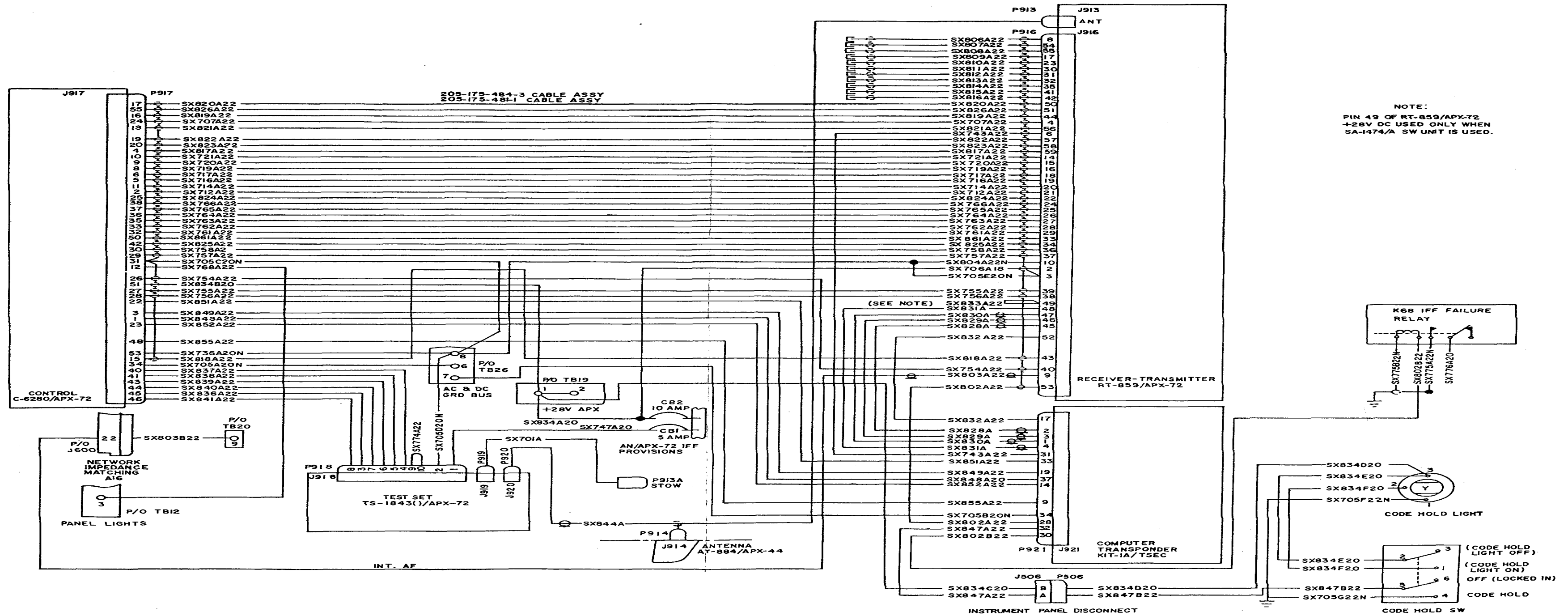


FO-53. Transponder Set AN/APX-44 and Adapter Cables for AN/APX-72 Wiring Diagram, UH-1D/H Configurations A through D.



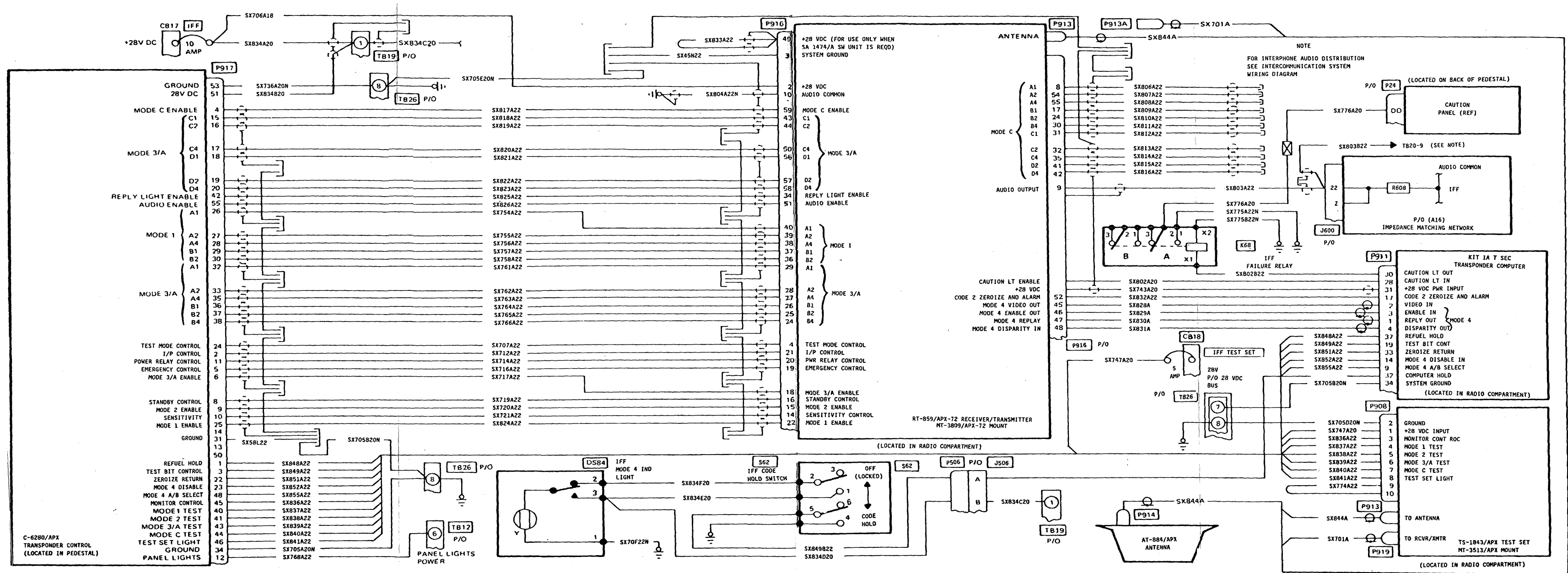






FO-55. Transponder Set AN/APX-72 Wiring Diagram, UH-1D/H Configurations I through J.

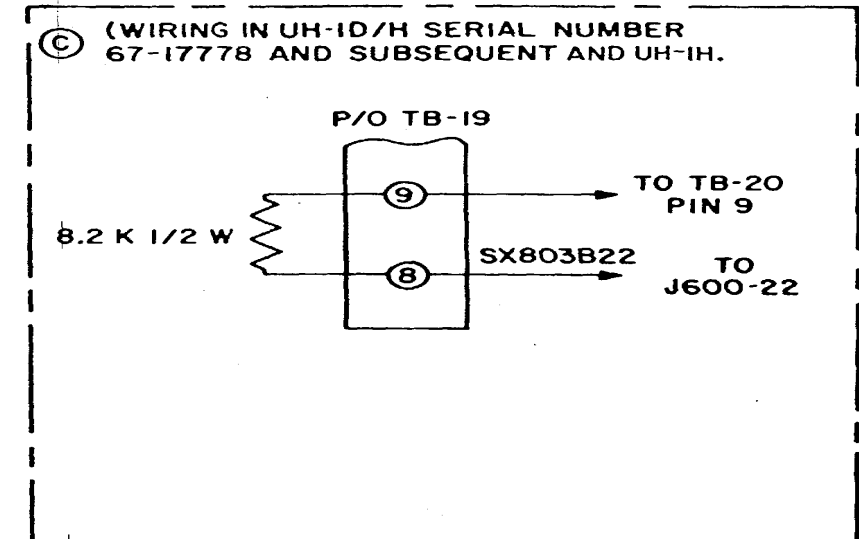
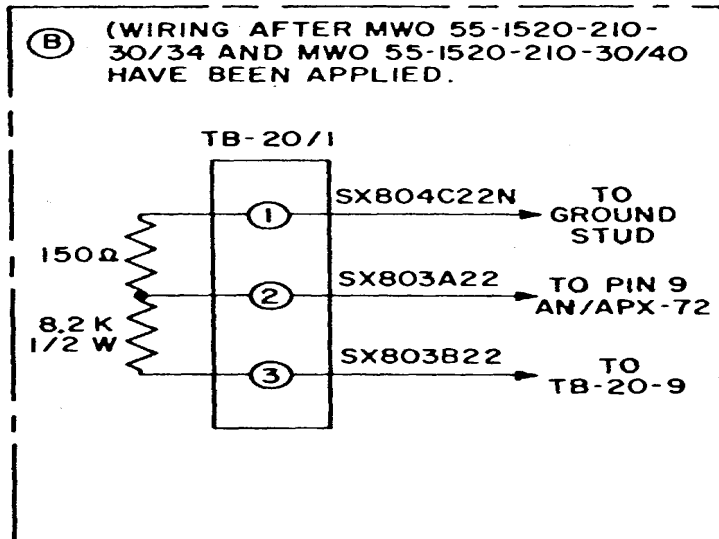
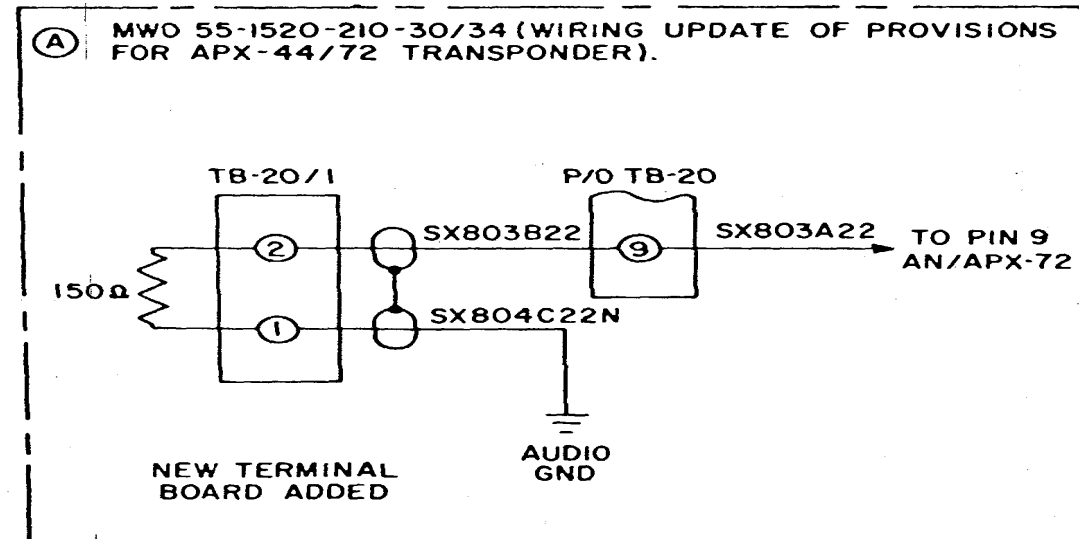
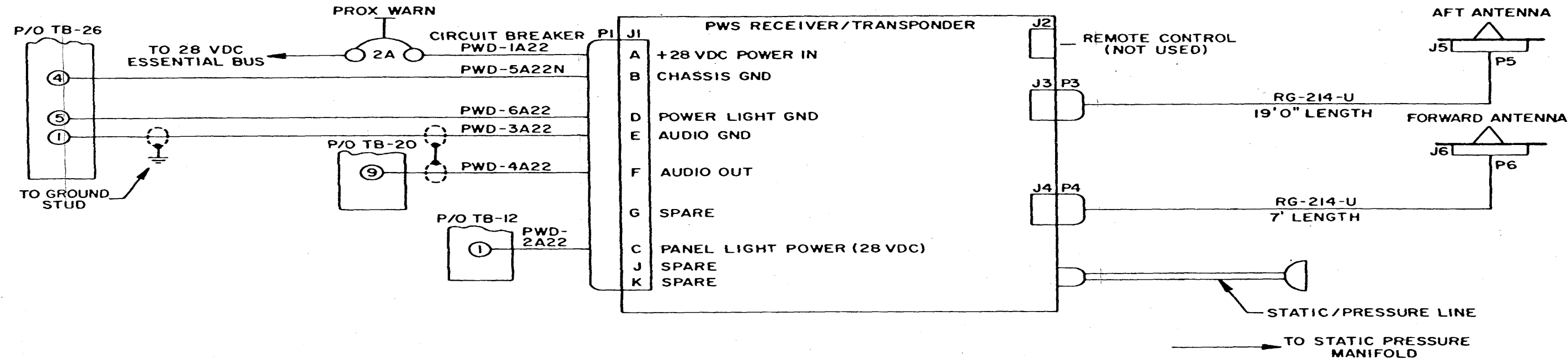




FO-56. Transponder Set AN/APX-72 Wiring Diagram, UH-1H

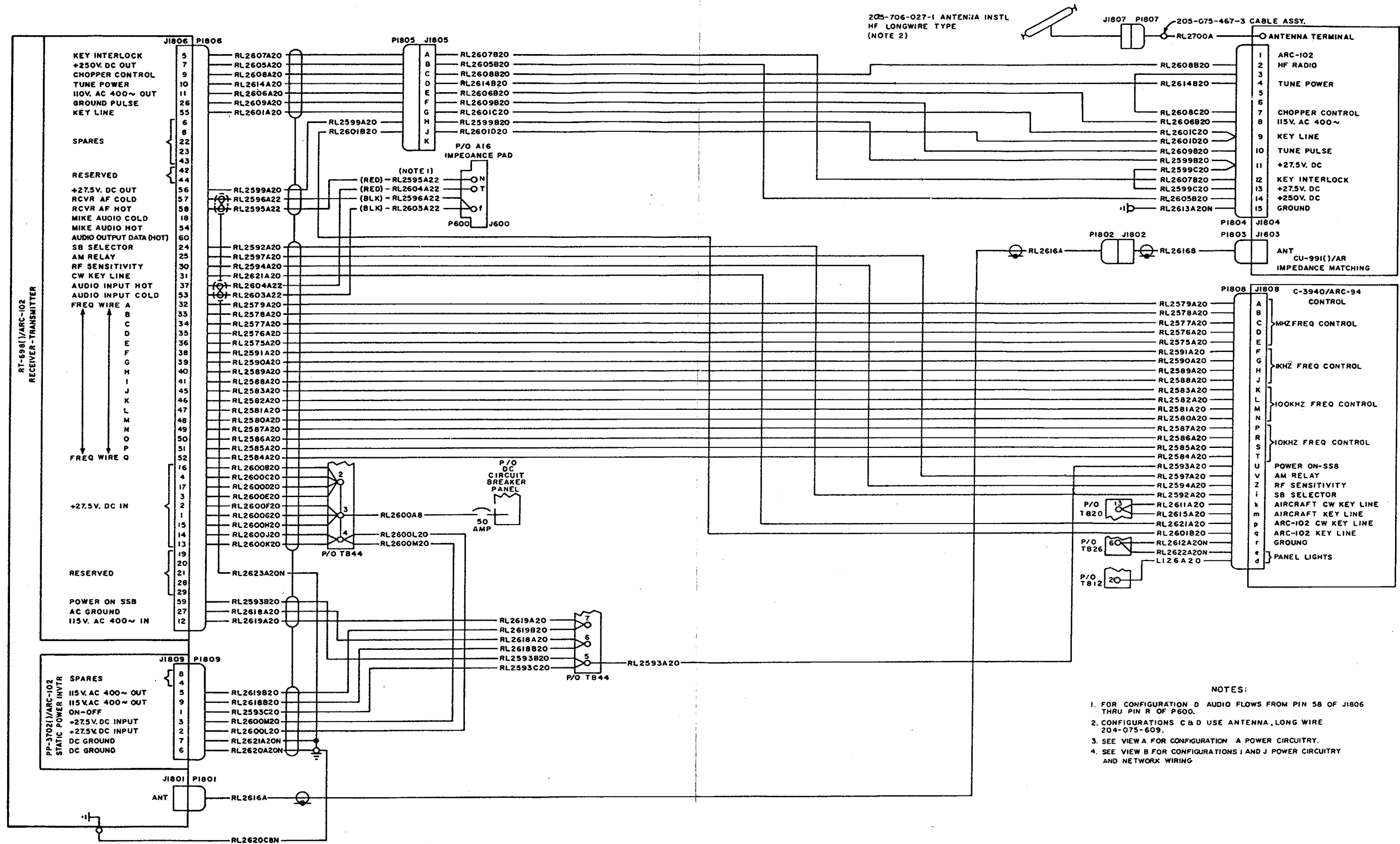


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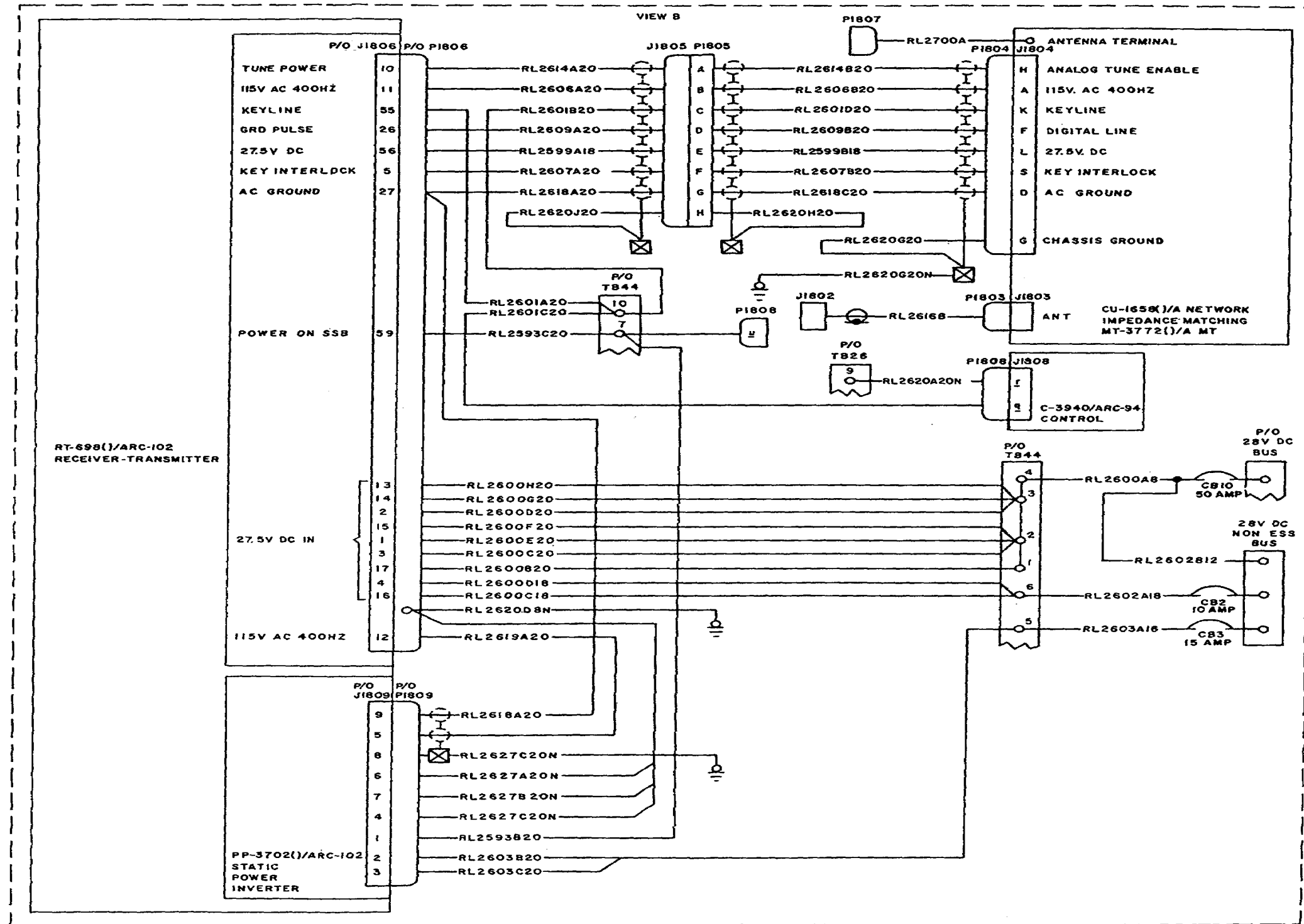
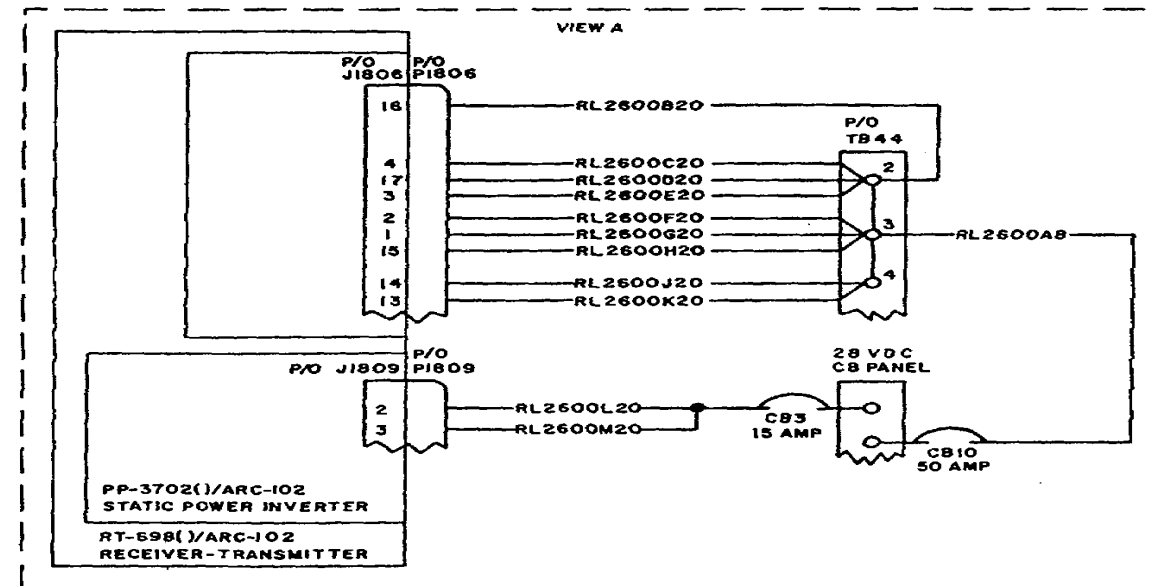
WIRE NO. SX803B22 IS REMOVED -20-9 AND CONNECTED TO TB-19-8.





FO-58. HF SSB Set AN/ARC-102 Wiring Diagram, UH-1D/H (Sheet 1 of 2)



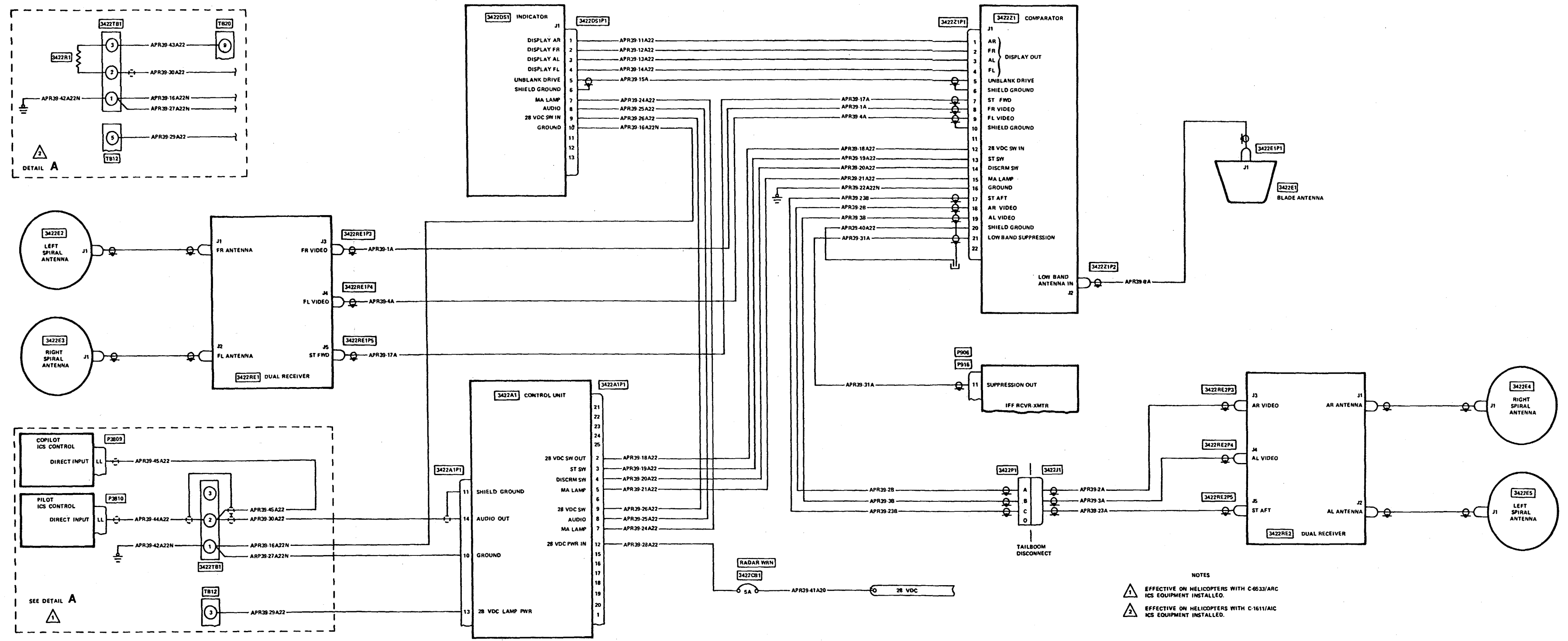


F0-58. HF SSB Set AN/ARC-102 Wiring  
Diagram, UH-1D/H (Sheet 2 of 2)



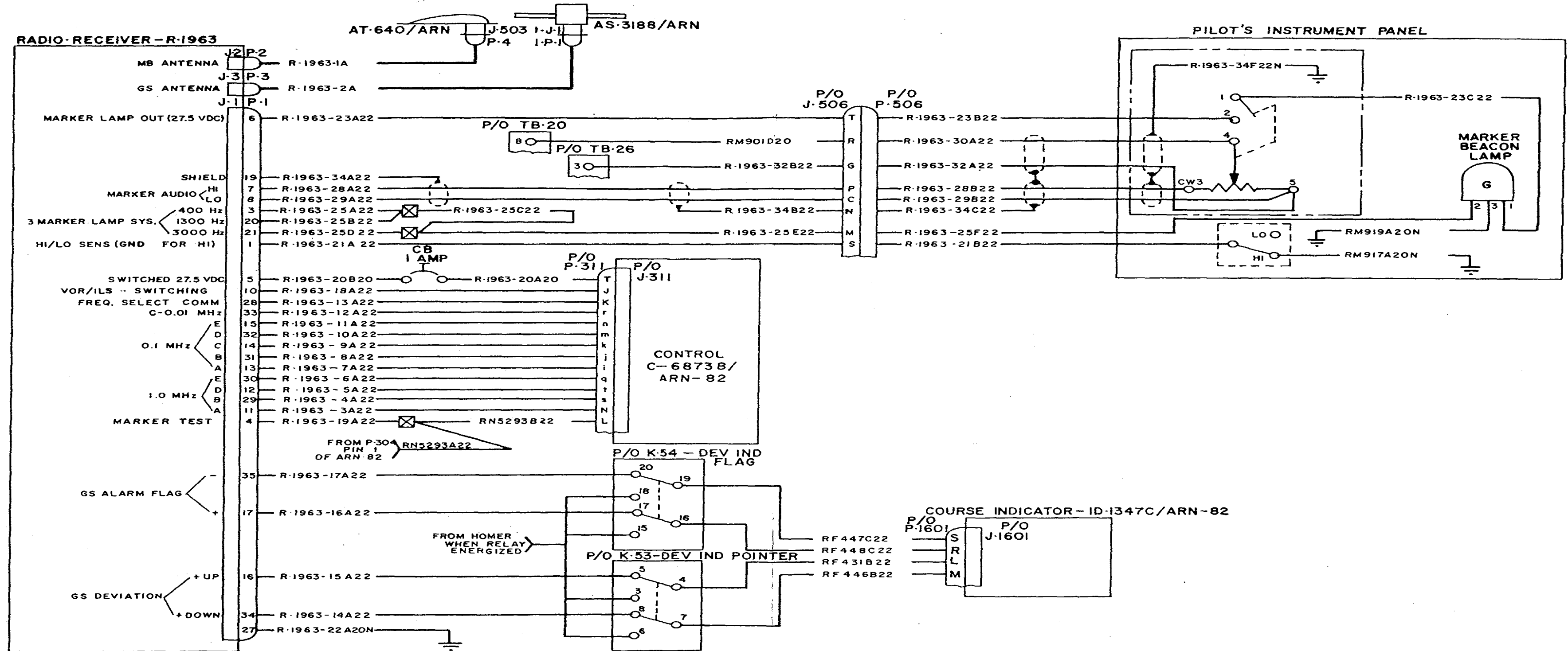
FO-59. HF SSB Set AN/ARC-102 Wiring Diagram, UH-1H





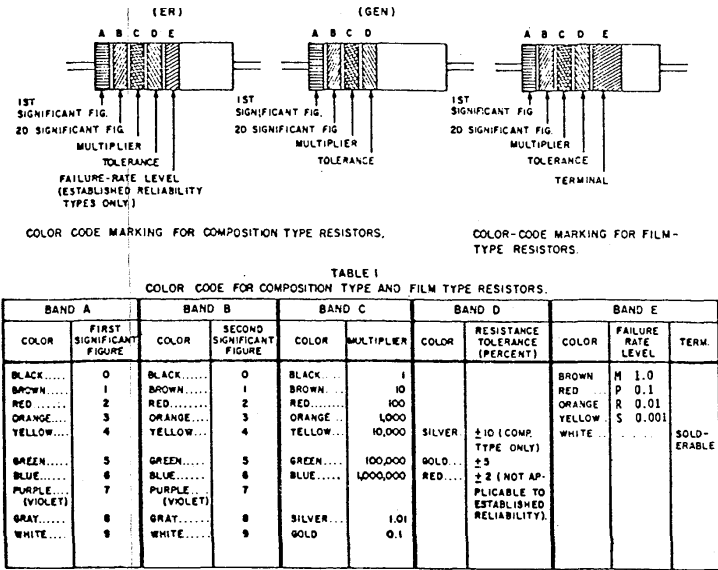
FO-60. Radar Signal Detecting Set AN/APR-39(V) Wiring Diagram





FO-61. Glideslope/Marker Beacon Receiver  
 R-1963/ARN Wiring Diagram, UH-1V.





BAND A — THE FIRST SIGNIFICANT FIGURE OF THE RESISTANCE VALUE (BANDS A THRU D SHALL BE OF EQUAL WIDTH.)

BAND B — THE SECOND SIGNIFICANT FIGURE OF THE RESISTANCE VALUE.

BAND C — THE MULTIPLIER (THE MULTIPLIER IS THE FACTOR BY WHICH THE TWO SIGNIFICANT FIGURES ARE MULTIPLIED TO YIELD THE NOMINAL RESISTANCE VALUE.)

BAND D — THE RESISTANCE TOLERANCE.

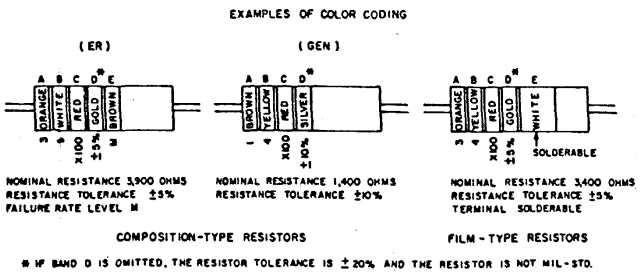
BAND E — WHEN USED ON COMPOSITION RESISTORS, BAND E INDICATES ESTABLISHED RELIABILITY FAILURE — (PERCENT FAILURE PER 1000 HOURS). ON FILM RESISTORS, THIS BAND SHALL BE APPROXIMATELY 1-1/2 TIMES THE WIDTH OF OTHER BANDS, AND INDICATES TYPE OF TERMINAL.

RESISTANCES IDENTIFIED BY NUMBERS AND LETTERS (THESE ARE NOT COLOR CODED)

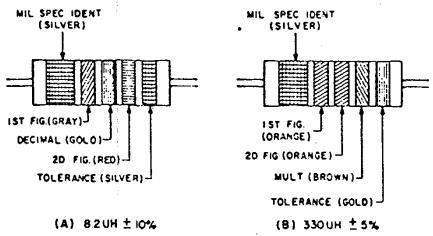
SOME RESISTORS ARE IDENTIFIED BY THREE OR FOUR DIGIT ALPHA NUMERIC DESIGNATORS. THE LETTER R IS USED IN PLACE OF A DECIMAL POINT WHEN FRACTIONAL VALUES OF AN OHM ARE EXPRESSED. FOR EXAMPLE:

2R7 = 2.7 OHMS 10R0 = 10.0 OHMS

FOR WIRE-WOUND-TYPE RESISTORS COLOR CODING IS NOT USED, IDENTIFICATION MARKING IS SPECIFIED IN EACH OF THE APPLICABLE SPECIFICATIONS.



A. COLOR CODE MARKING FOR MILITARY STANDARD RESISTORS.



COLOR CODING FOR TUBULAR ENCAPSULATED R.F. CHOKES. AT A, AN EXAMPLE OF OF THE CODING FOR AN 8.2UH CHOKES IS GIVEN. AT B, THE COLOR BANDS FOR A 330UH INDUCTOR ARE ILLUSTRATED

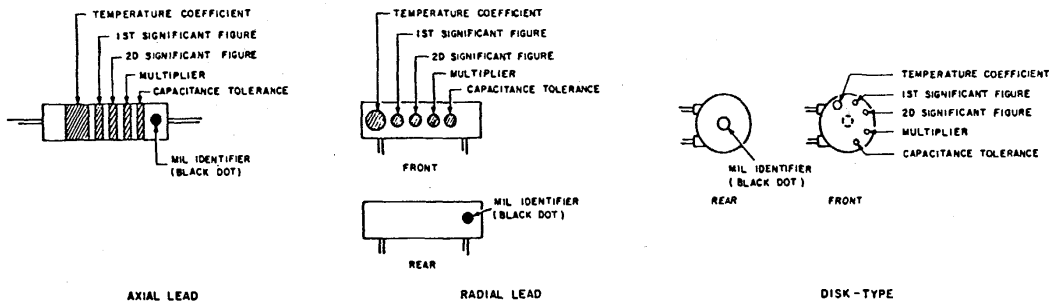
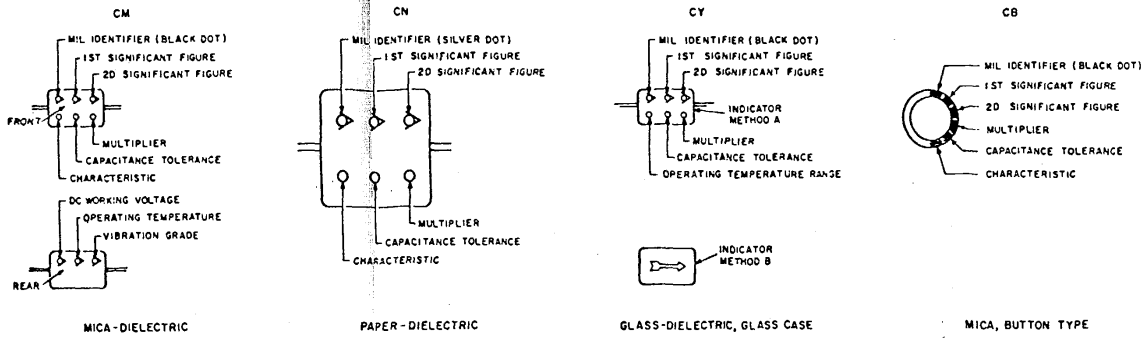
**TABLE 2: COLOR CODING FOR TUBULAR ENCAPSULATED R.F. CHOKES**

COLOR	SIGNIFICANT FIGURE	MULTIPLIER	INDUCTANCE TOLERANCE (PERCENT)
BLACK	0	1	
BROWN	1	10	1
RED	2	100	2
ORANGE	3	1,000	3
YELLOW	4		
GREEN	5		
BLUE	6		
VIOLET	7		
GRAY	8		
WHITE	9		
NONE		20	
SILVER		10	
GOLD		5	

MULTIPLIER IS THE FACTOR BY WHICH THE TWO COLOR FIGURES ARE MULTIPLIED TO OBTAIN THE INDUCTANCE VALUE OF THE CHOKES COIL.

B. COLOR CODE MARKING FOR MILITARY STANDARD INDUCTORS.

CAPACITORS, FIXED, VARIOUS-DIELECTRICS, STYLES CM, CN, CY, AND CB



C. COLOR CODE MARKING FOR MILITARY STANDARD CAPACITORS.

TABLE 3 — FOR USE WITH STYLES CM, CN, CY AND CB

COLOR	MIL ID	1ST SIG FIG	2D SIG FIG	MULTIPLIER	CAPACITANCE TOLERANCE	CHARACTERISTIC	DC WORKING VOLTAGE	OPERATING TEMP RANGE	VIBRATION GRADE
BLACK	CM, CN, CY, CB	0	0	1			±20% ±20%	A	
BROWN		1	1	10				B	
RED		2	2	100	±2%	±2%		C	
ORANGE		3	3	1,000	±30%			D	
YELLOW		4	4	10,000				E	
GREEN		5	5		±5%			F	
BLUE		6	6						
PURPLE (VIOLET)		7	7						
GRAY		8	8						
WHITE		9	9						
GOLD				0.1			±5% ±5%		
SILVER	CN				±10% ±10%	±10% ±10%			

TABLE 4 — TEMPERATURE COMPENSATING, STYLE CC

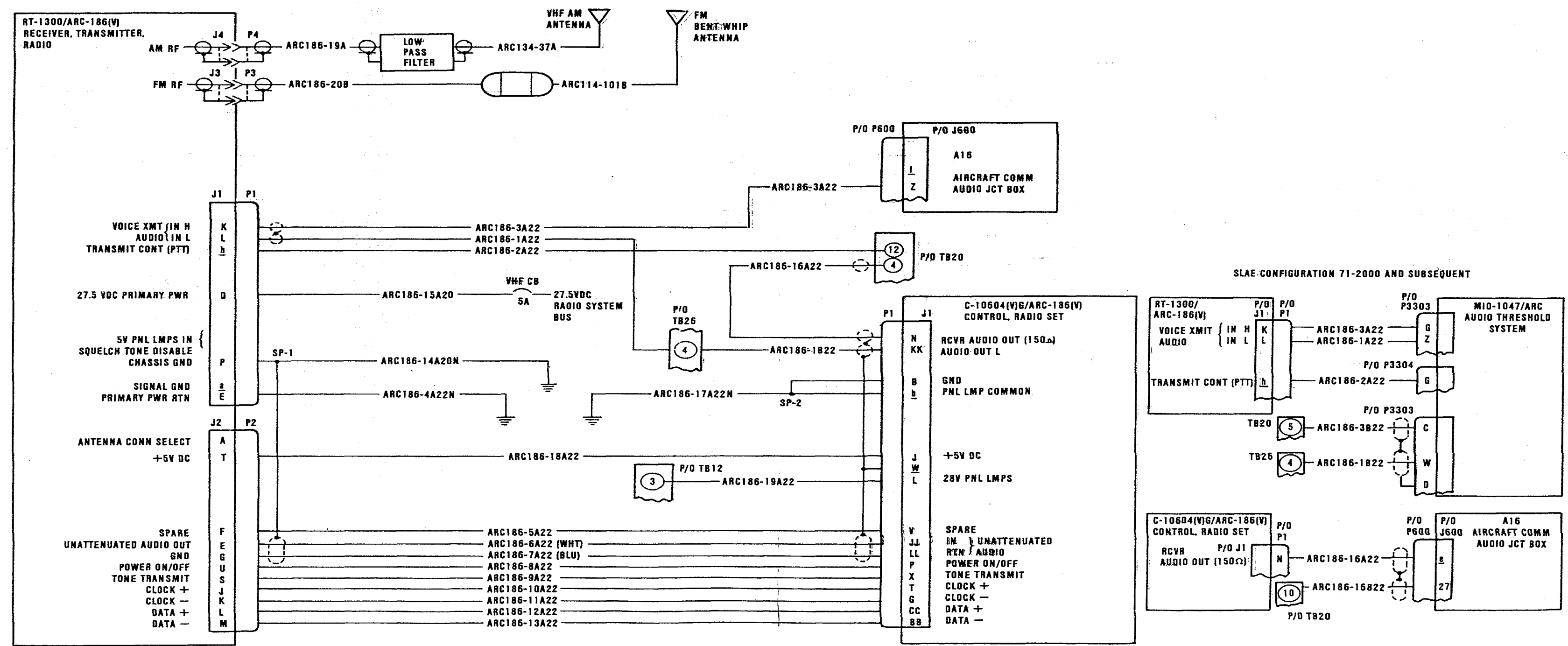
COLOR	TEMPERATURE COEFFICIENT	1ST SIG FIG	2D SIG FIG	MULTIPLIER	CAPACITANCE TOLERANCE	MIL CAPACITANCES	TEMPERATURE RANGE
BLACK	0	0	0	1			±20 UUF CC
BROWN	-30	1	1	10	±1%		
RED	-80	2	2	100	±2%	±0.25 UUF	
ORANGE	-150	3	3	1,000			
YELLOW	-220	4	4				
GREEN	-330	5	5		±5%	±0.5 UUF	
BLUE	-470	6	6				
PURPLE (VIOLET)	-750	7	7				
GRAY		8	8	0.01			
WHITE		9	9	0.1	±10%		
GOLD	+100					±10 UUF	
SILVER							

- THE MULTIPLIER IS THE NUMBER BY WHICH THE TWO SIGNIFICANT (SIG) FIGURES ARE MULTIPLIED TO OBTAIN THE CAPACITANCE IN UUF.
- LETTERS INDICATE THE CHARACTERISTICS DESIGNED IN APPLICABLE SPECIFICATIONS: MIL-C-5, MIL-C-250, MIL-C-112728 AND MIL-C-10950C RESPECTIVELY.
- LETTERS INDICATE THE TEMPERATURE RANGE AND VOLTAGE-TEMPERATURE LIMITS DESIGNATED IN MIL-C-110150.
- TEMPERATURE COEFFICIENT IN PARTS PER DEGREE CENTIGRADE.

FO-62. MIL STD Resistor and Capacitor Color Code Marking

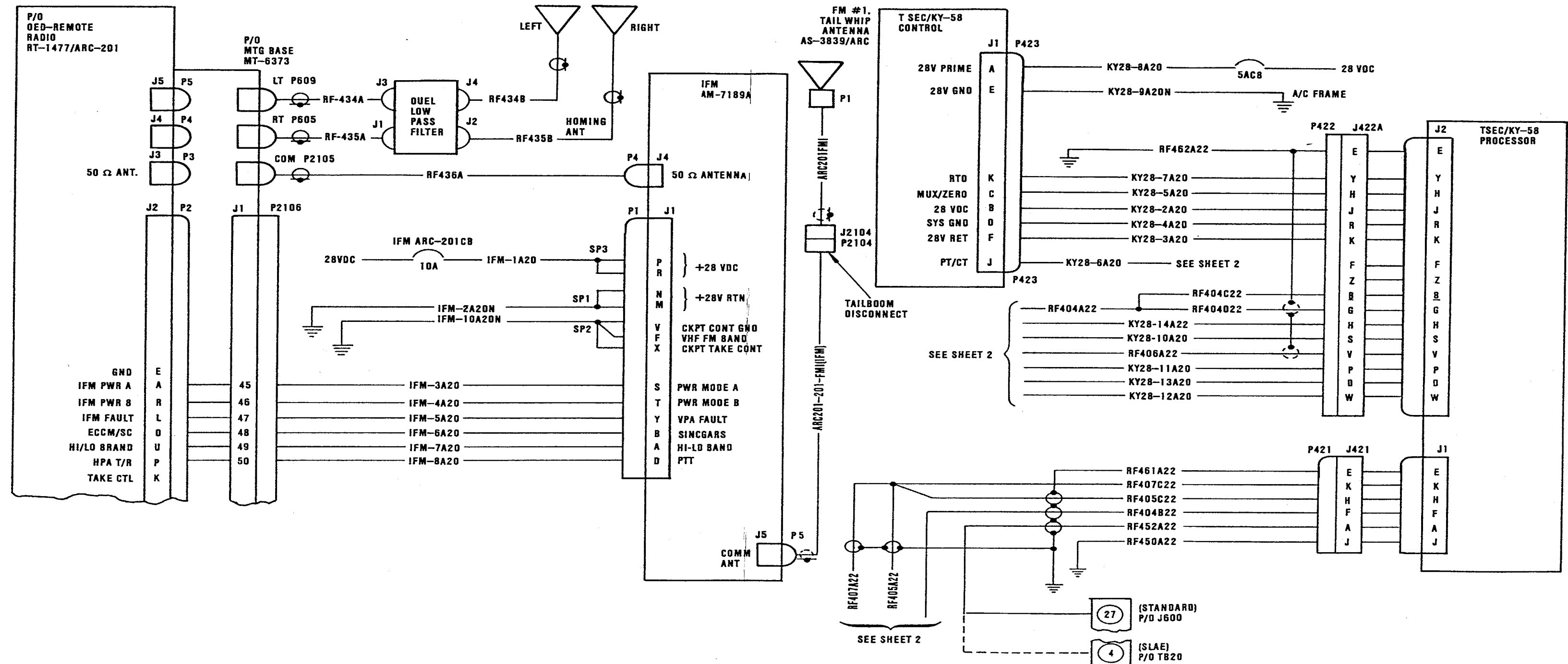
FO-62. MIL STD Resistor and Capcitor Color Code Marking





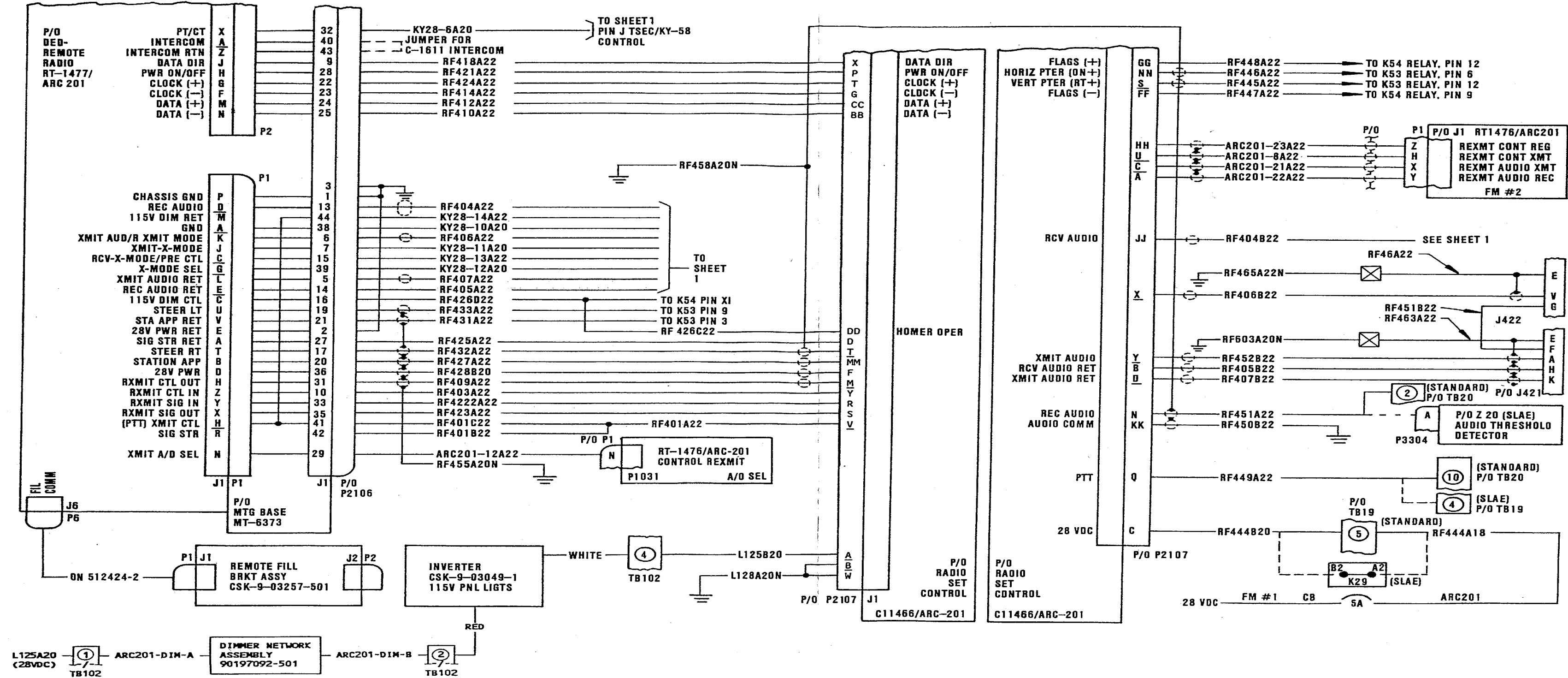
FO-63. VHF AM RADIO AN/ARC-186  
Wiring Diagram (Sheet 1 of 1)





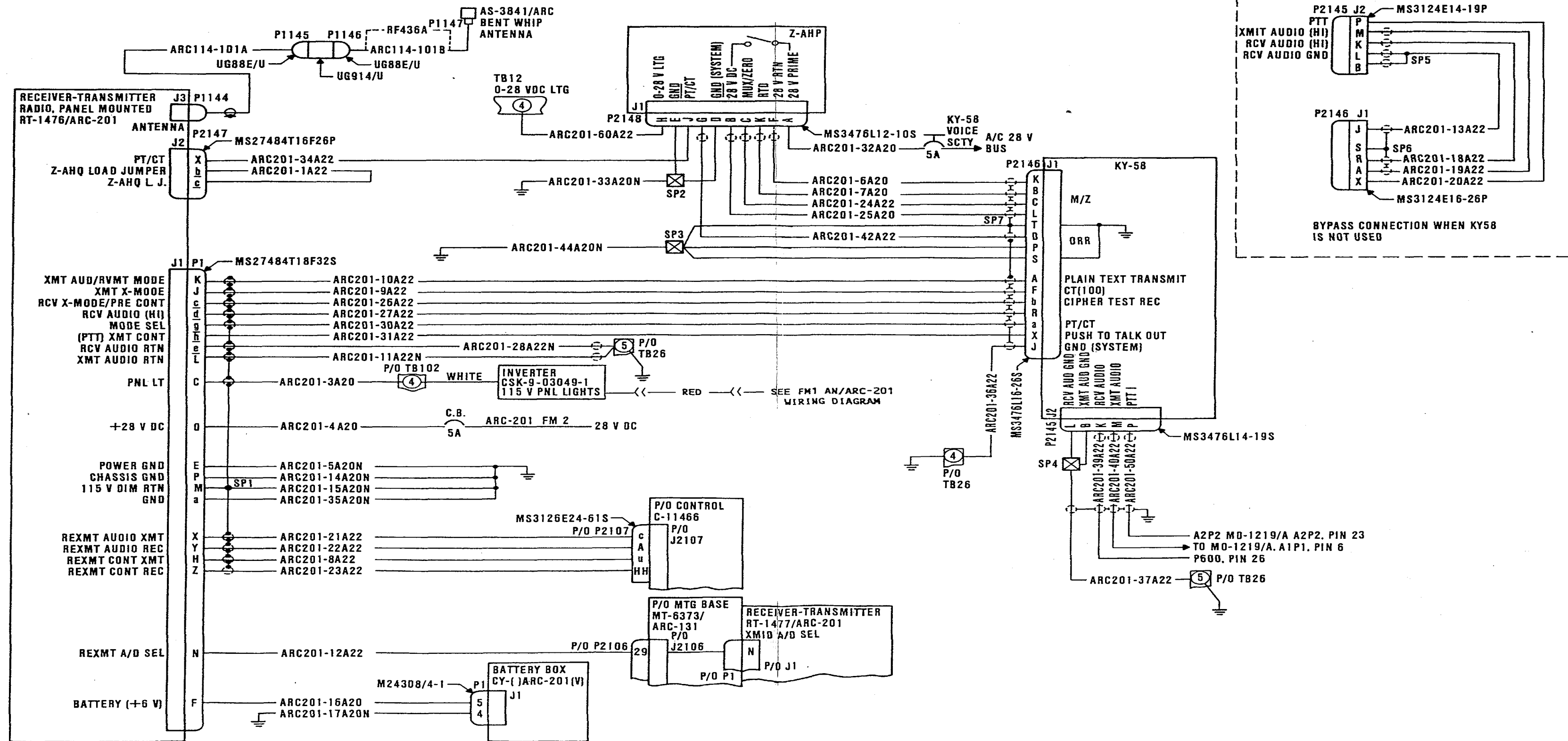
*F0-64. FM LIASON No. 1 AN/ARC-201 (with KY-58)  
Wiring Diagram (Sheet 1 of 2)*





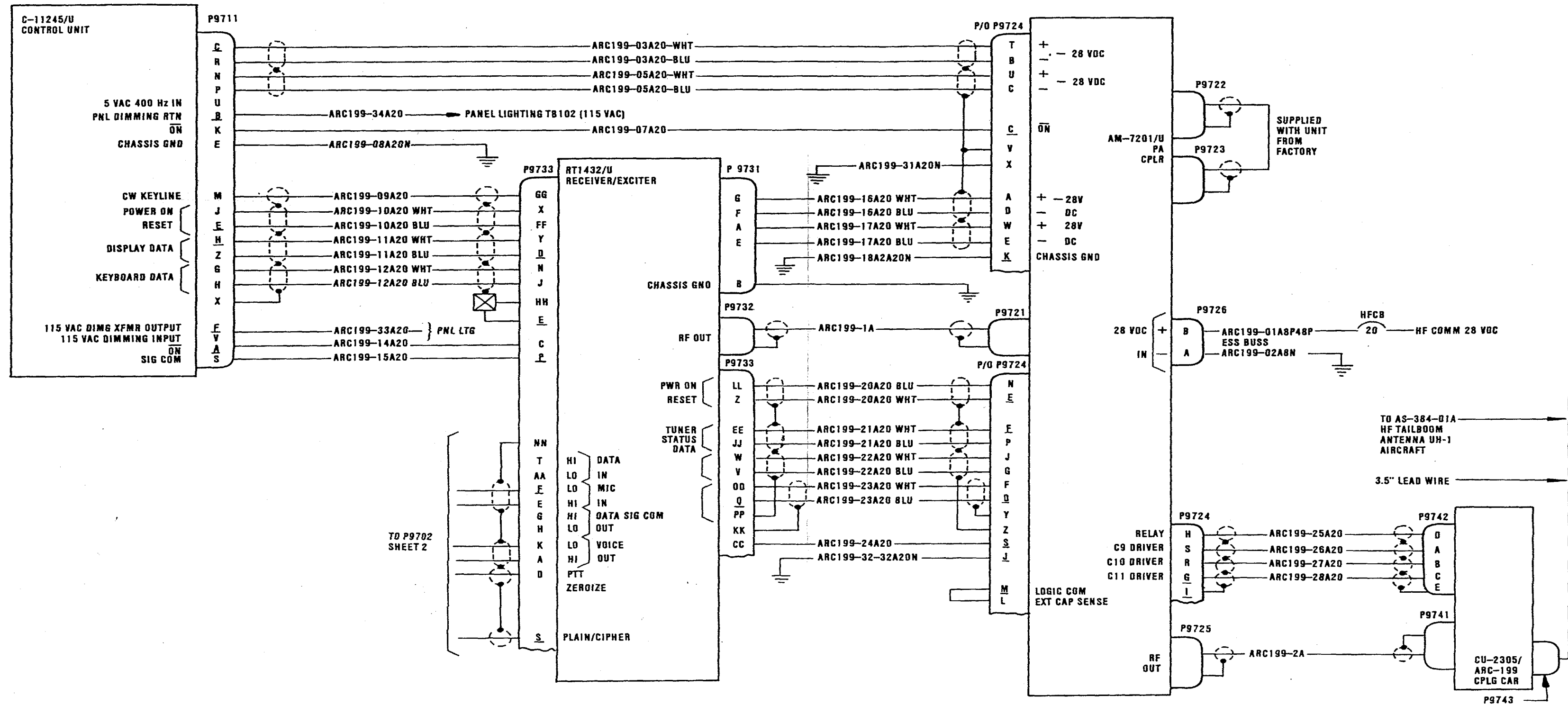
FO-64. FM LIASON NO. 1 AN/ARC-201 (with KY-58)  
 Wiring Diagram (Sheet 2 of 2).





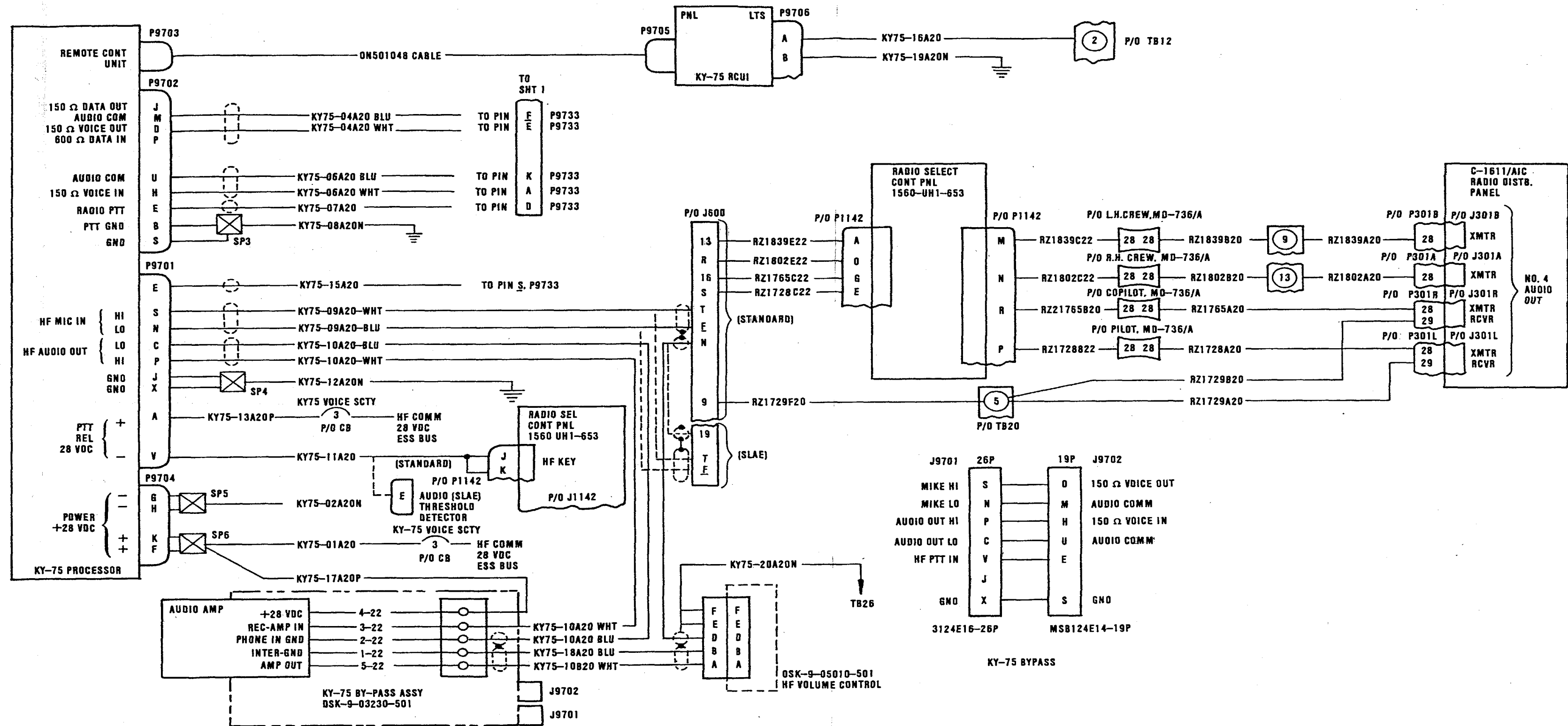
FO-65. FM LIAISON NO. 2 AN/ARC-201 (with KY-58)  
Wiring Diagram (Sheet 1 of 1)





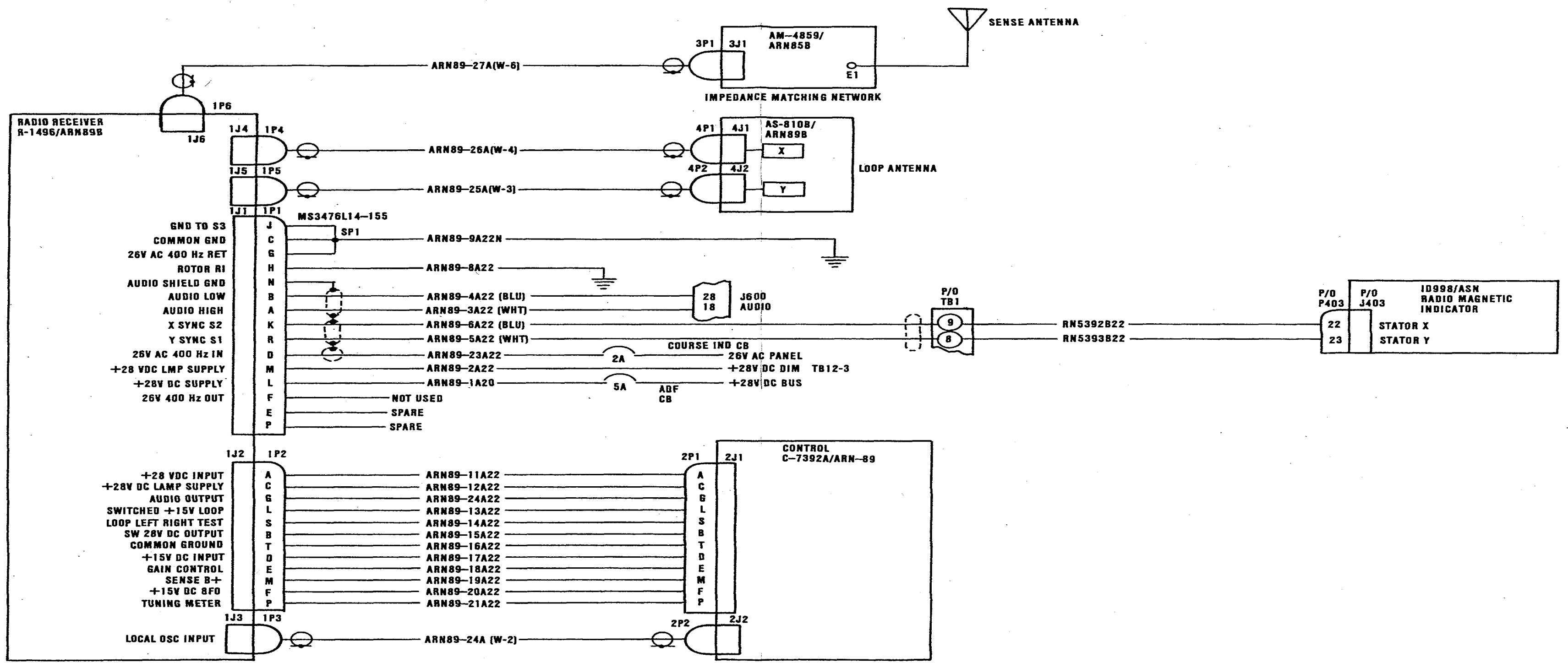
FO-66. HF RADIO SET AN/ARC-199 (with KY-75)  
Wiring Diagram (Sheet 1 of 2).





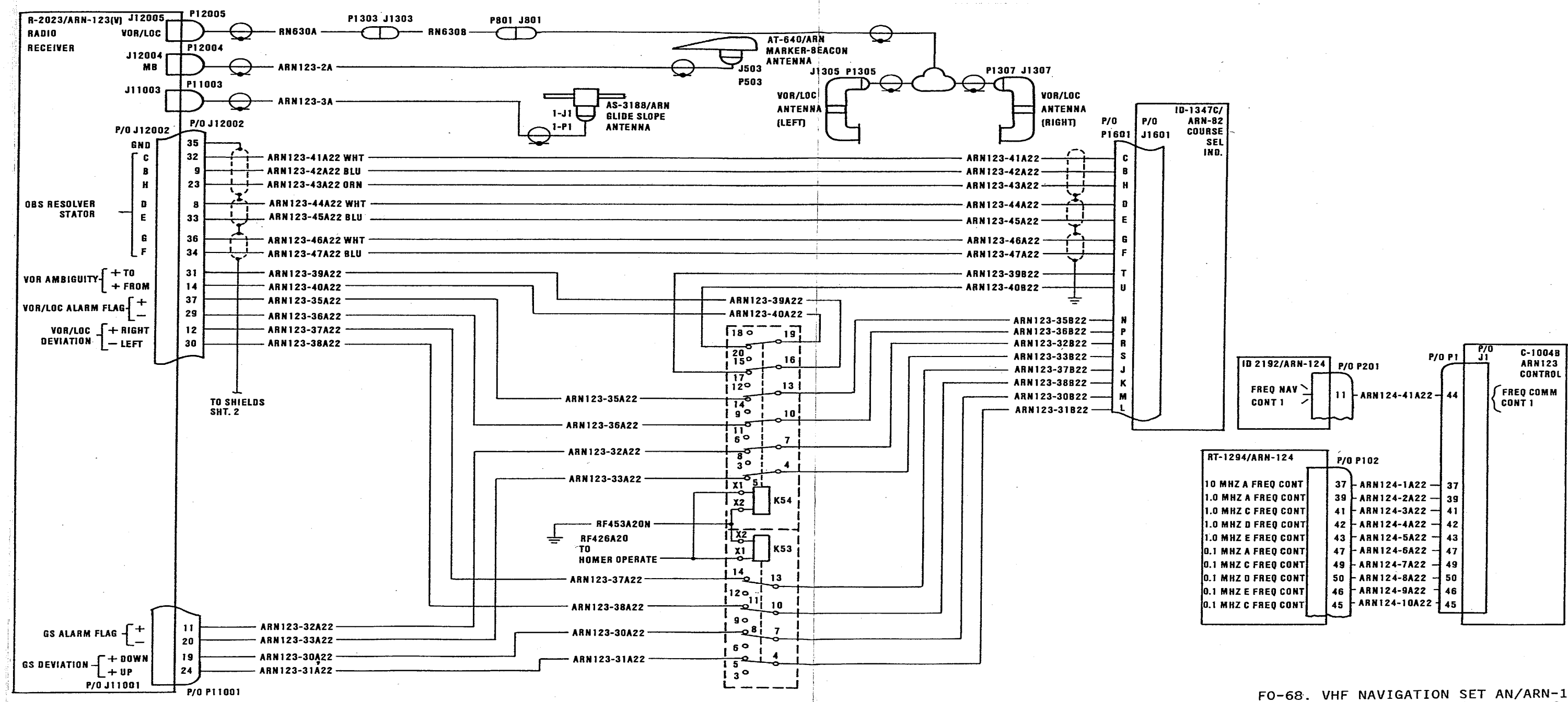
F0-66. HF RADIO SET AN/ARC-199 (with KY-75)  
Wiring Diagram (Sheet 2 of 2).





FO-67. DIRECTION FINDING SET AN/ARC-89  
Wiring Diagram (Sheet 1 of 1).



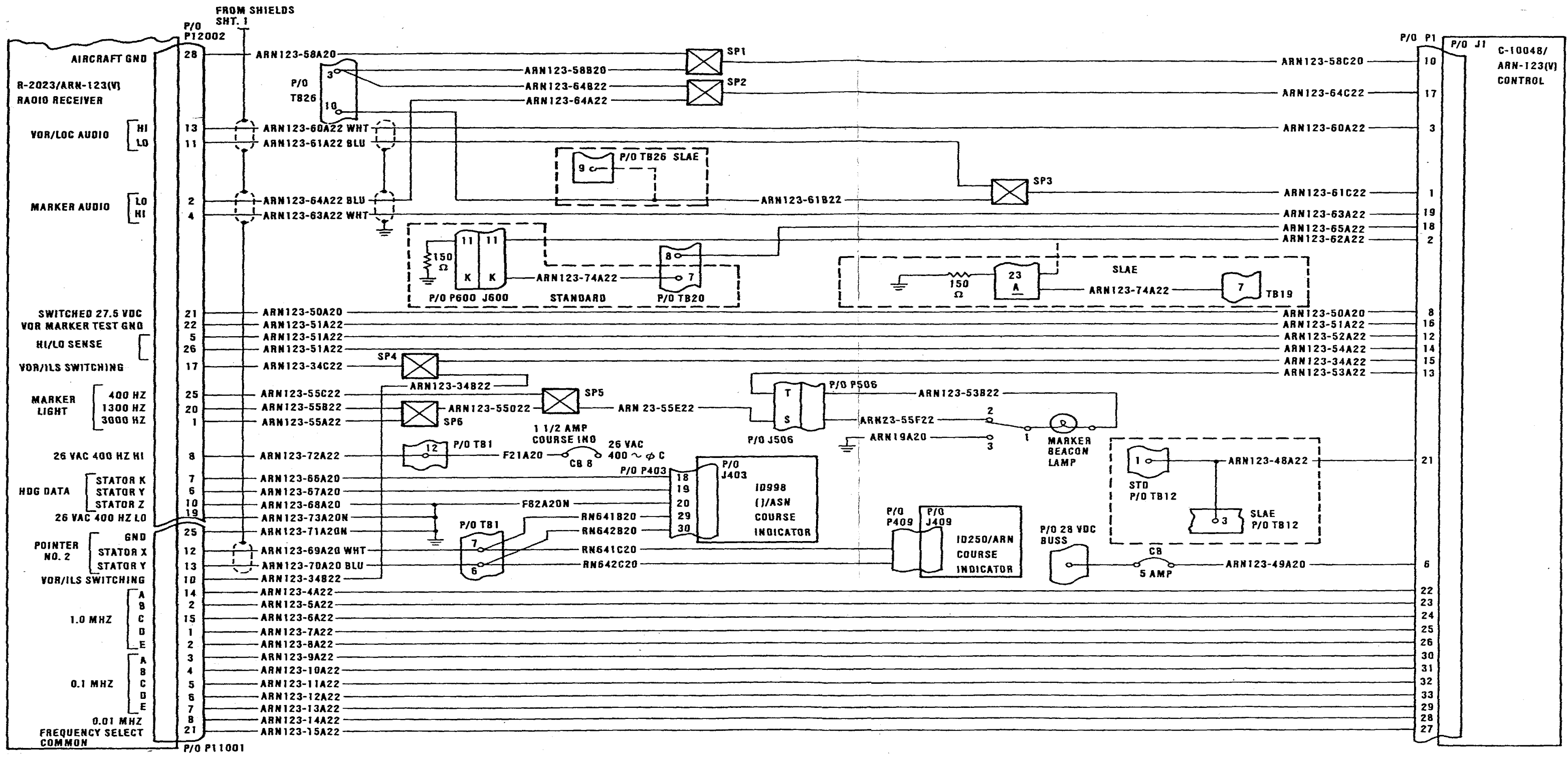


FO-68. VHF NAVIGATION SET AN/ARN-123  
Wiring Diagram (Sheet 1 of 2).

FP-157/(FP-158 blank)

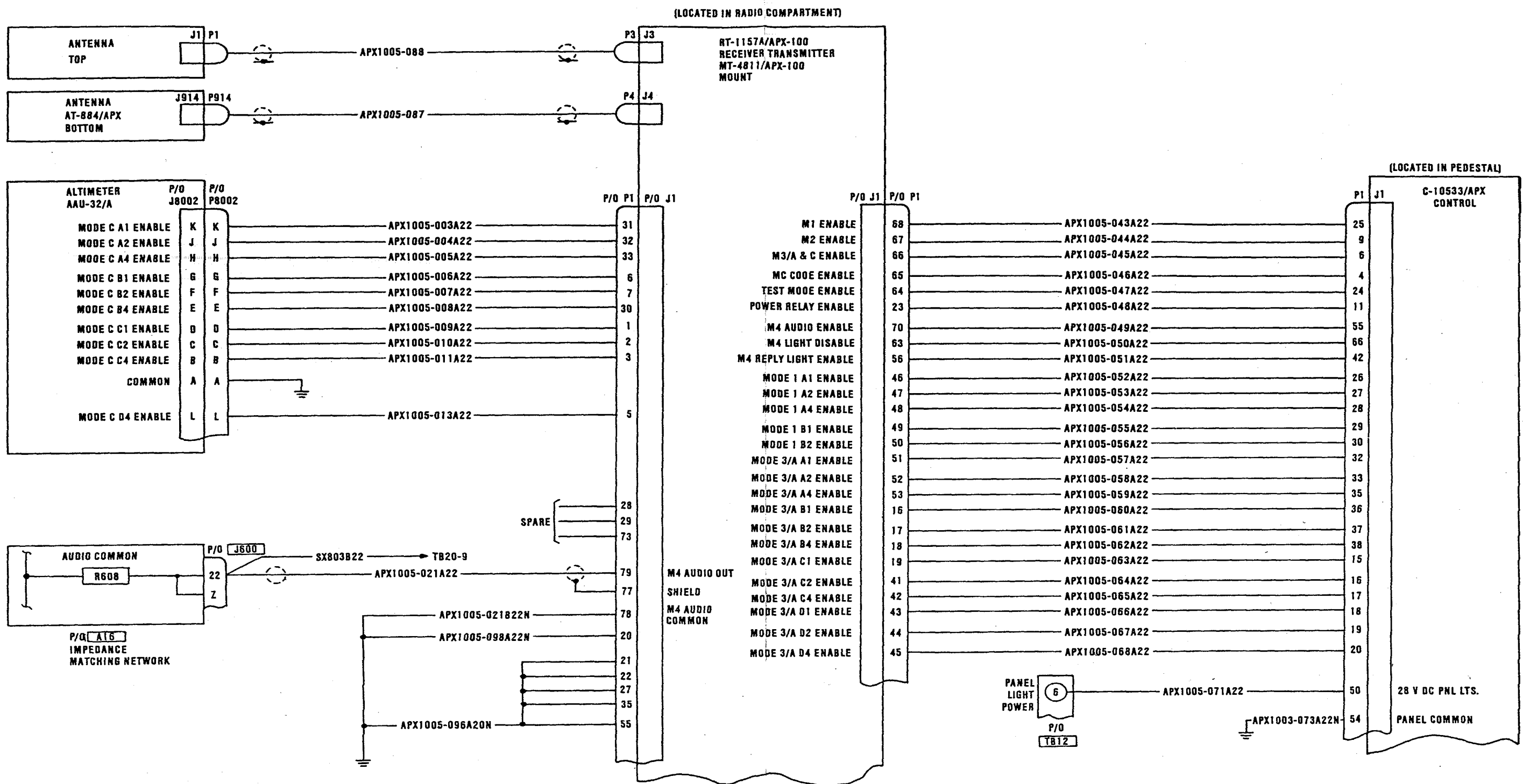
FO-68. VHF NAVIGATION SET AN/ARN-123  
Wiring Diagram (Sheet 1 of 2).





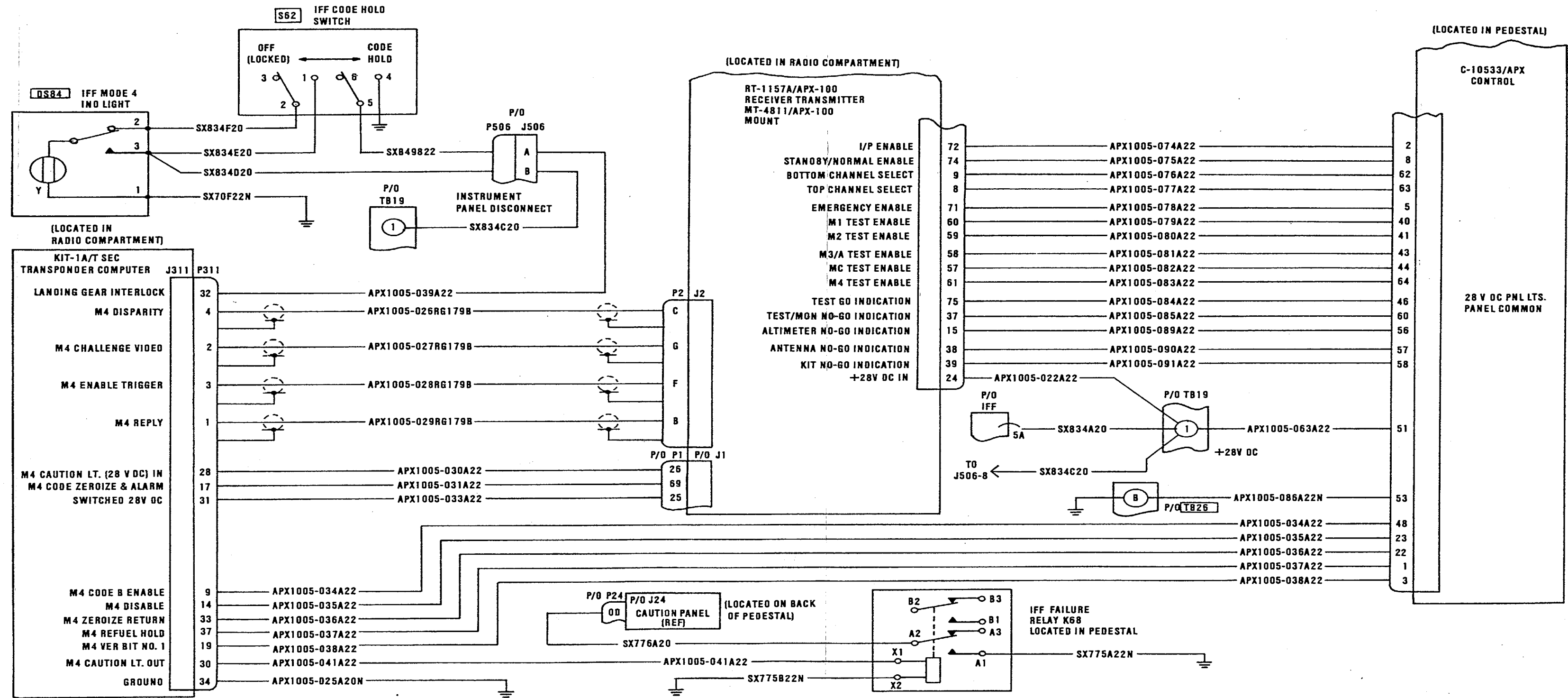
F0-68. VHF NAVIGATION SET AN/ARC-123  
Wiring Diagram (Sheet 2 of 2).





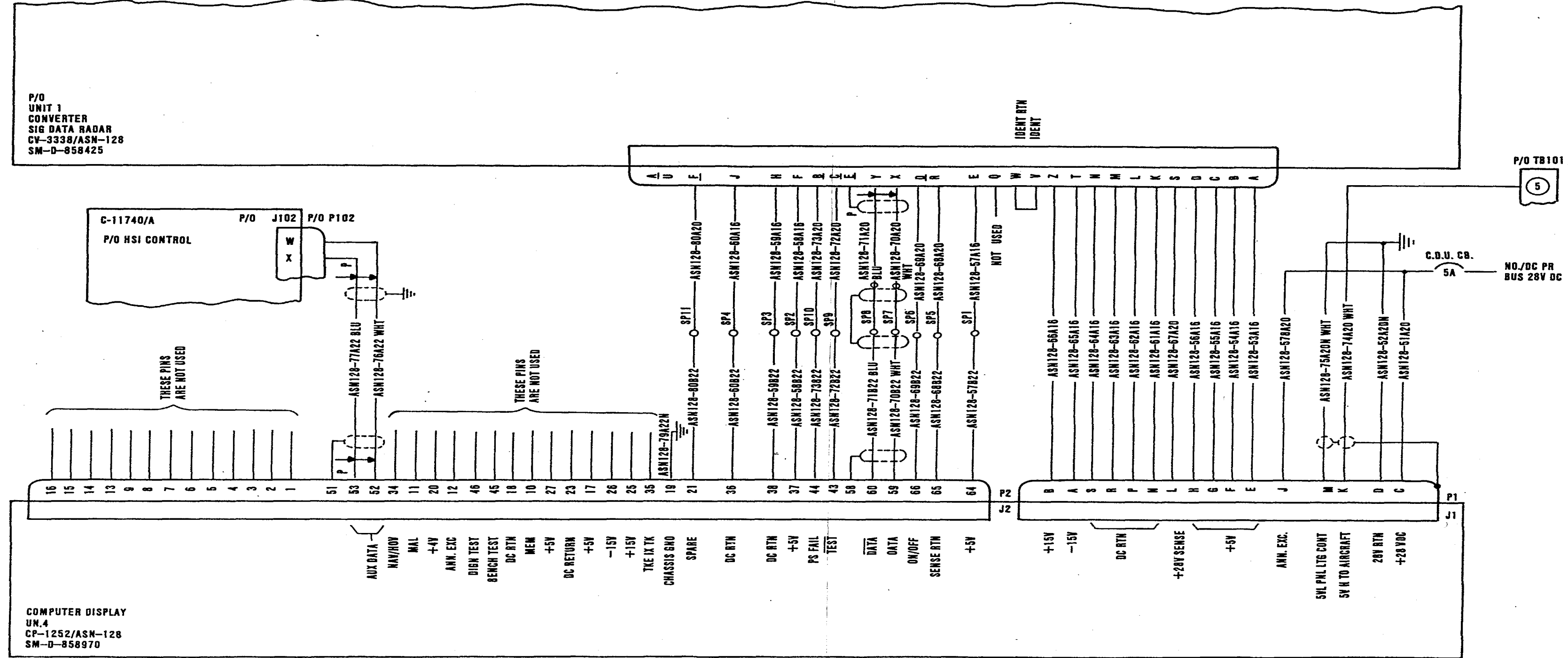
FO-69. TRANSPONDER SET AN/APX-100  
Wiring Diagram (Sheet 1 of 2).





F0-69. TRANSPONDER SET AN/APX-100  
Wiring Diagram (Sheet 2 of 2).



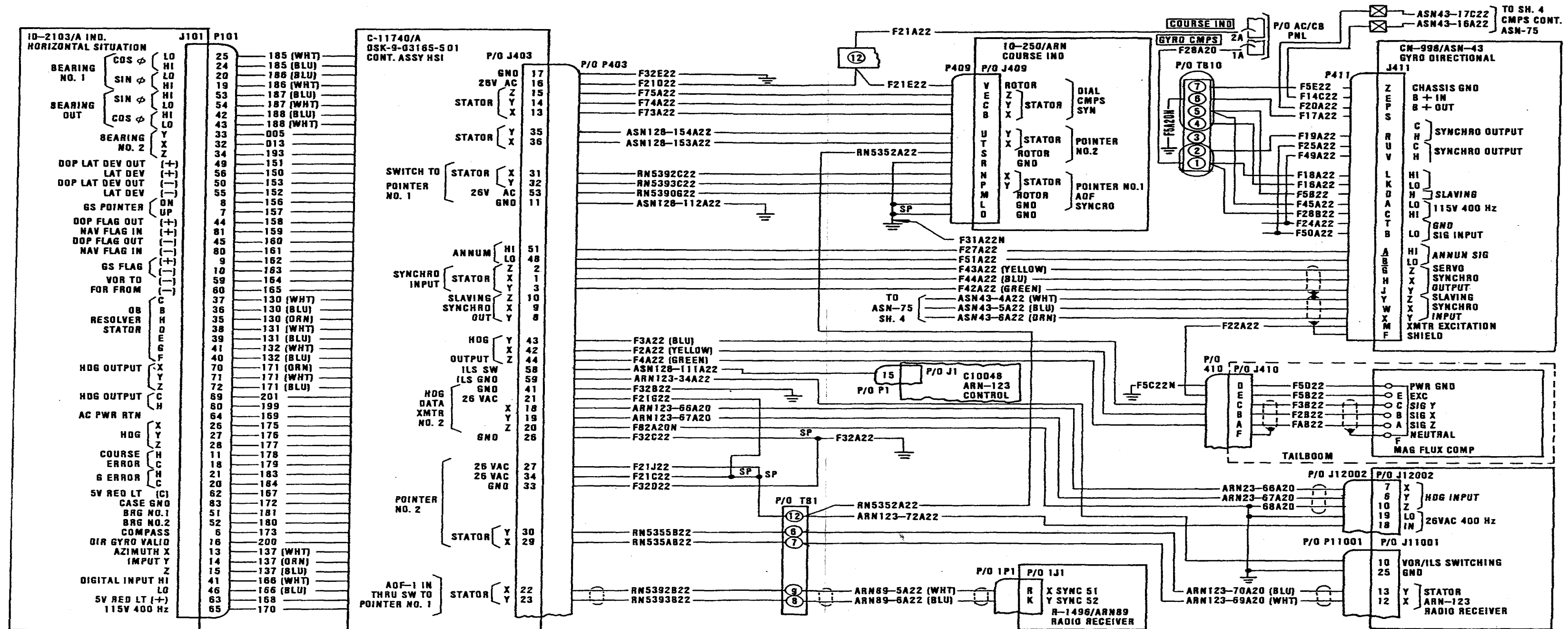


F0-70. DOPPLER NAVIGATION SET AN/ASN-128  
(with HSI ID-2103, HSI Control C-11740,  
and Compass Control C-8021A/ASN)  
Wiring Diagram (Sheet 1 of 5).



**FP-167**

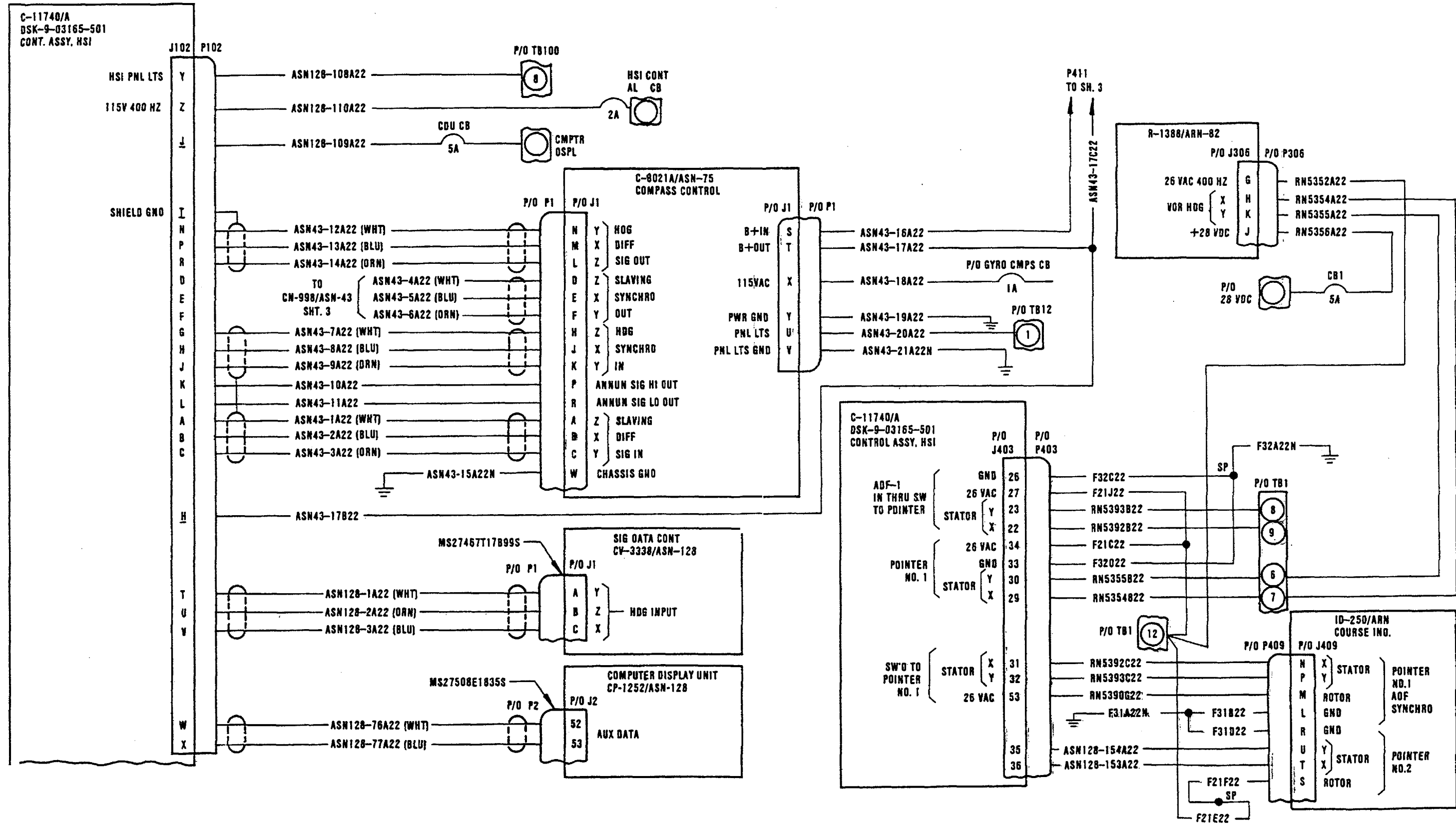










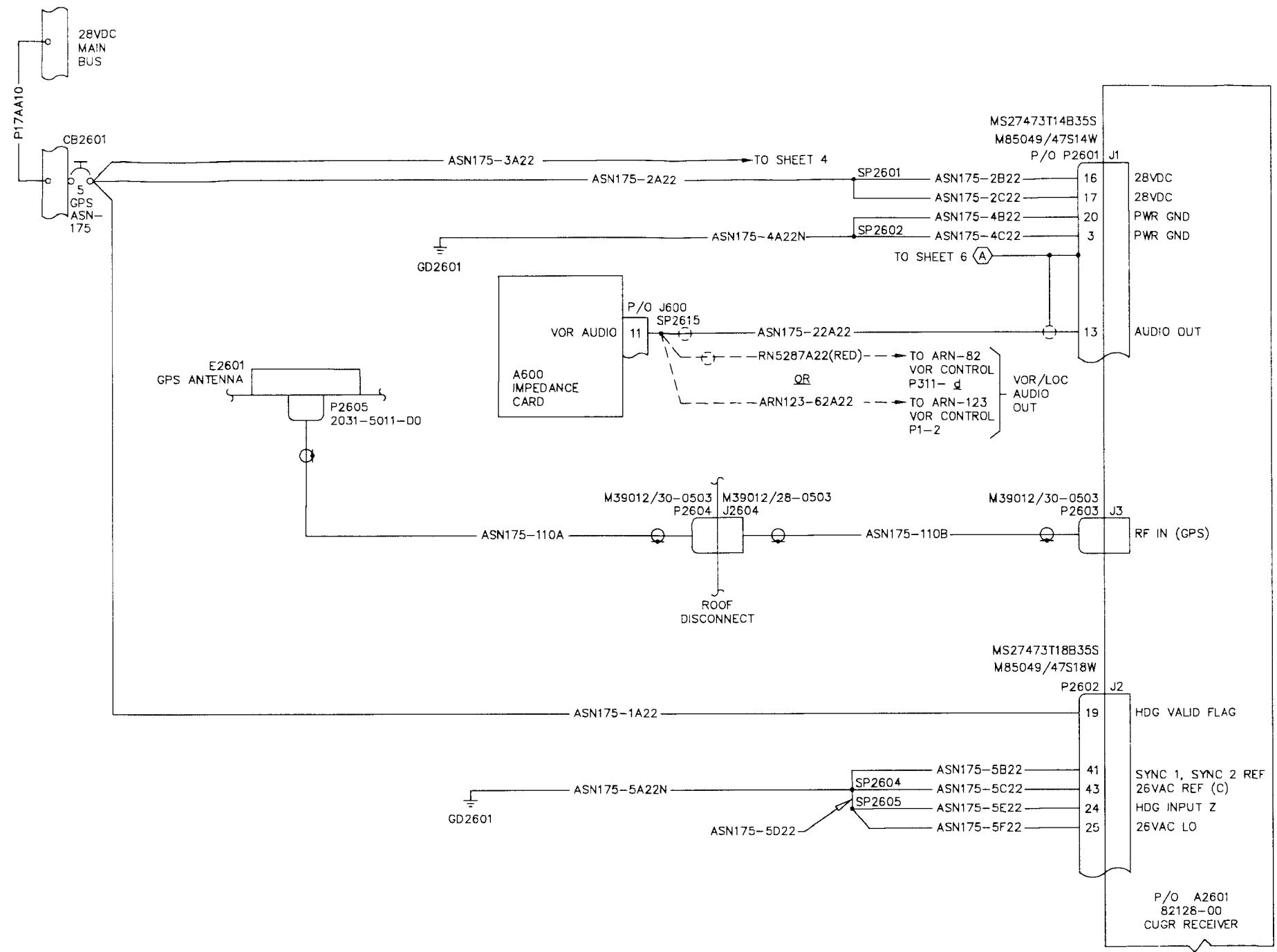


FO-70. DOPPLER NAVIGATION SET AN/ASN-128 (with HSI ID-2103, HSI Control C-11740, and Compass Control C-8021A/ASN) Wiring Diagram (Sheet 5 of 5).



**FO-71. DIRECTION FINDER SET AN/ARN-149(V)3 WIRING DIAGRAM**  
**FP-175**



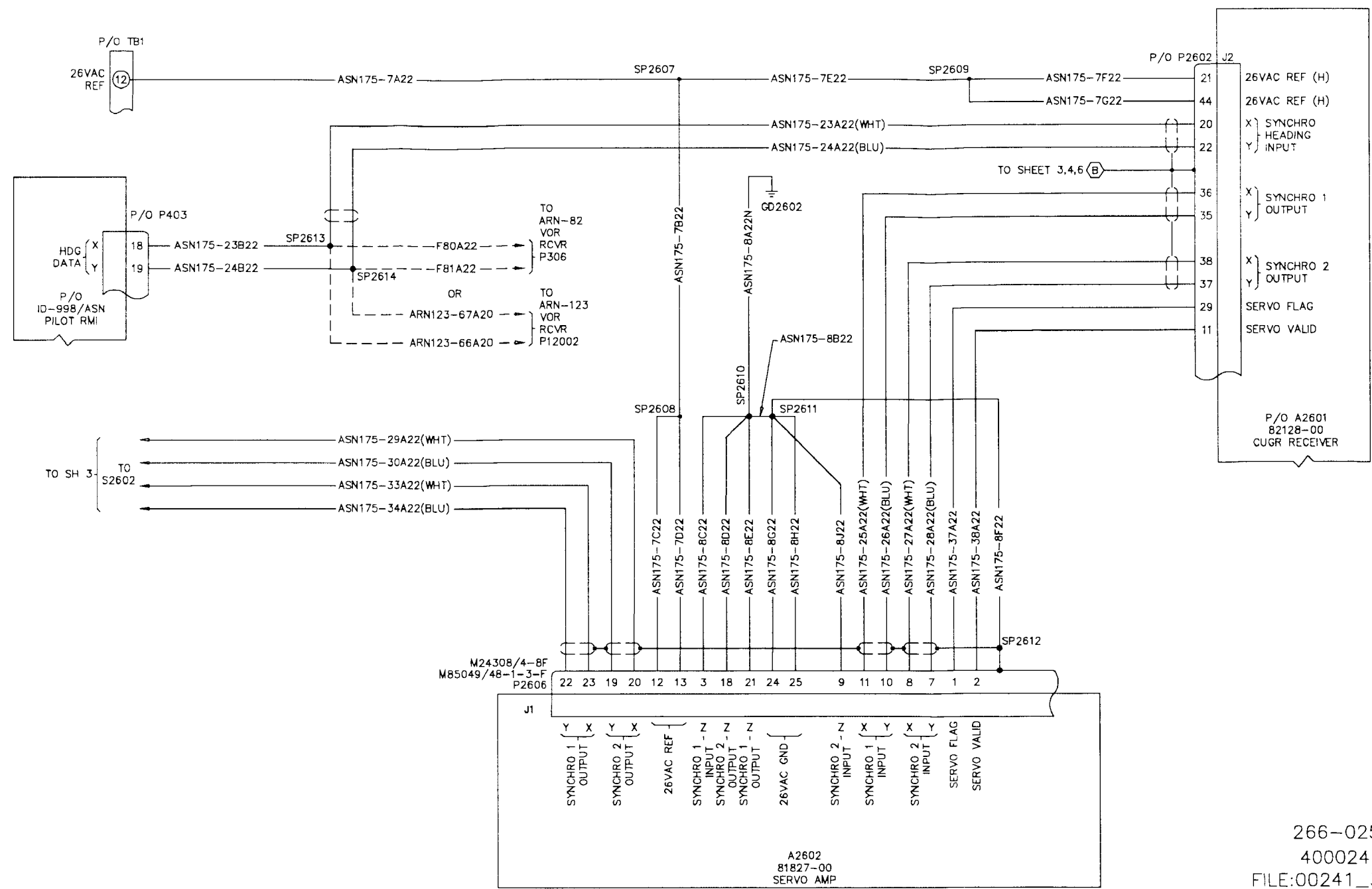


266-025  
4000241  
FILE:00241\_2

FO-72. Satellite Signals Navigation Set AN/ASN-175 (V)  
Wiring Diagram (Sheet 1 of 7)

Change 1 FP-177/(FP-178 blank)



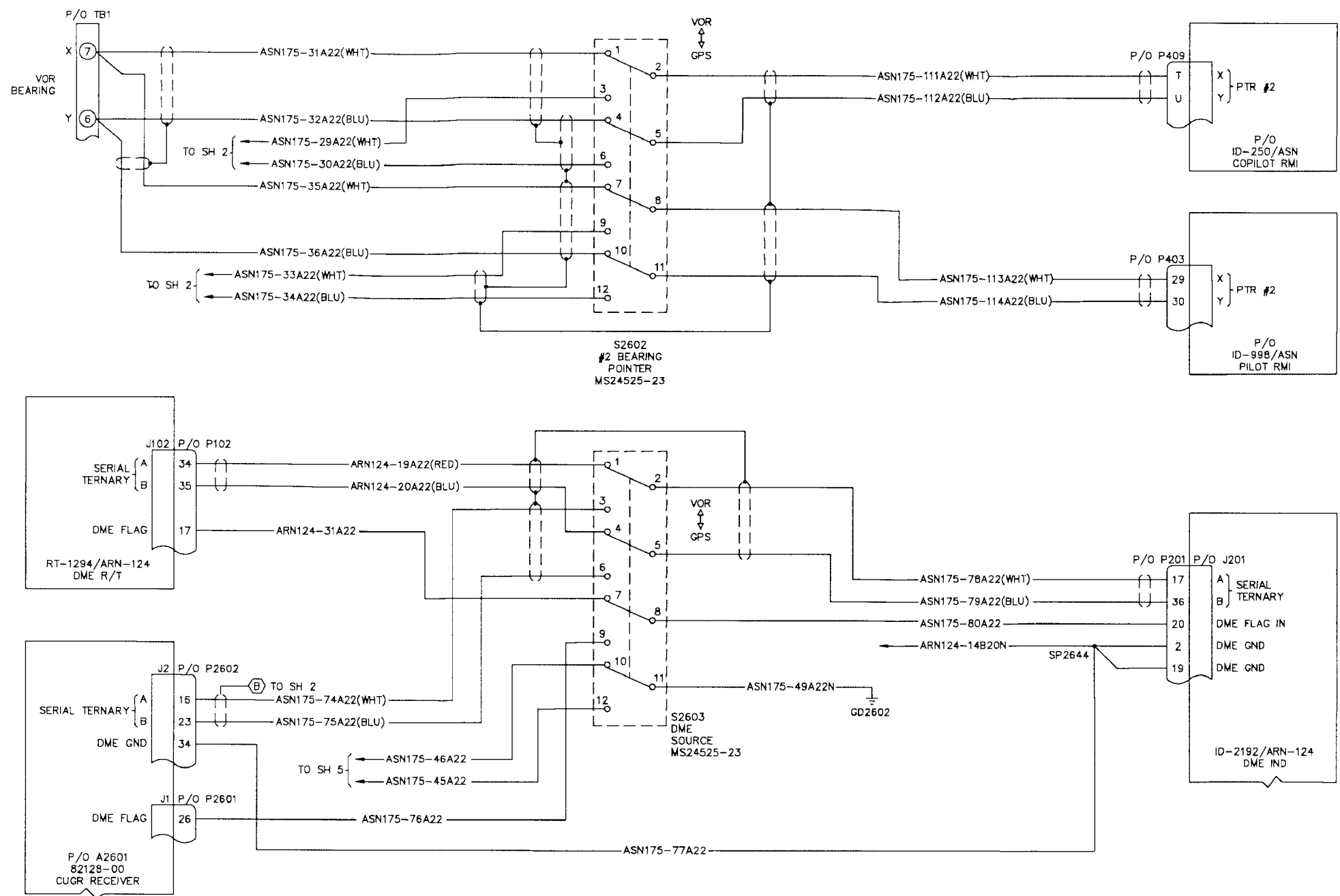


266-025  
4000241  
FILE:00241\_3

FO-72. Satellite Signals Navigation Set AN/ASN-175 (V)  
Wiring Diagram (Sheet 2 of 7)

Change 1 FP-179/(FP-180 blank)



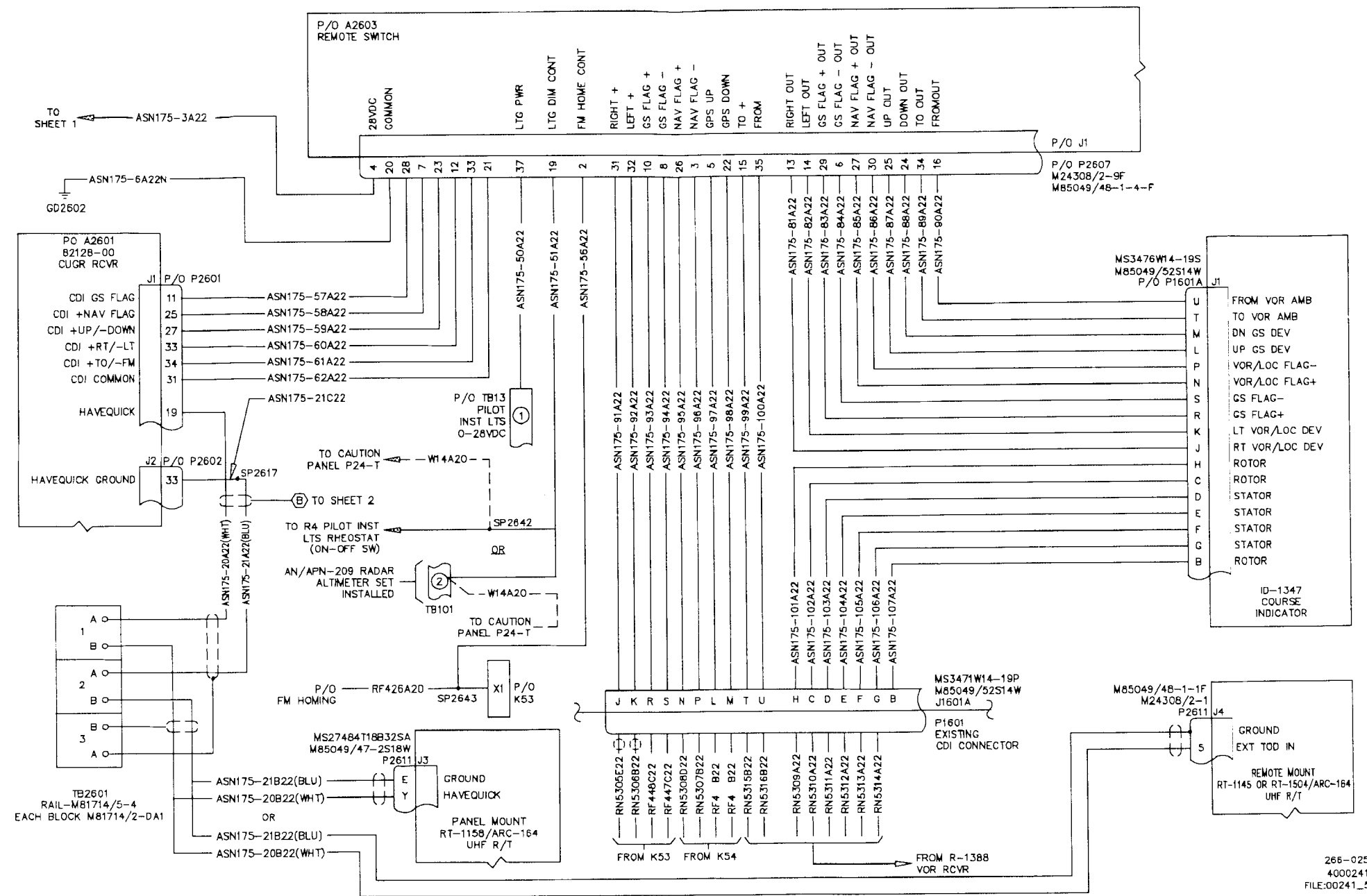


286-025  
4000241  
FILE:00241\_4

FO-72. Satellite Signals Navigation Set AN/ASN-175 (V)  
Wiring Diagram (Sheet 3 of 7)

Change 1 FP-181/(FP-182 blank)

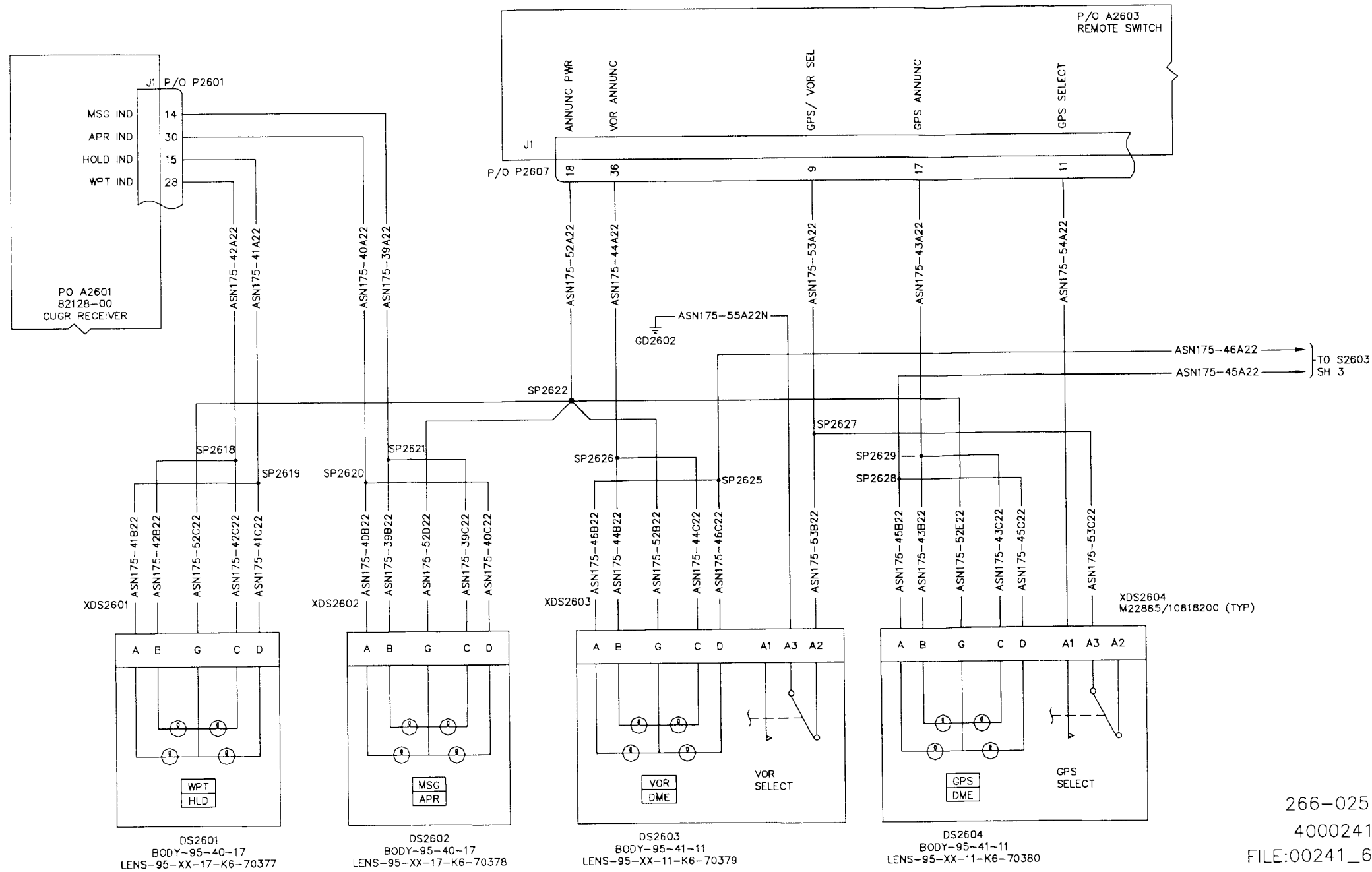




FO-72. Satellite Signals Navigation Set AN/ASN-175 (V)  
Wiring Diagram (Sheet 4 of 7)

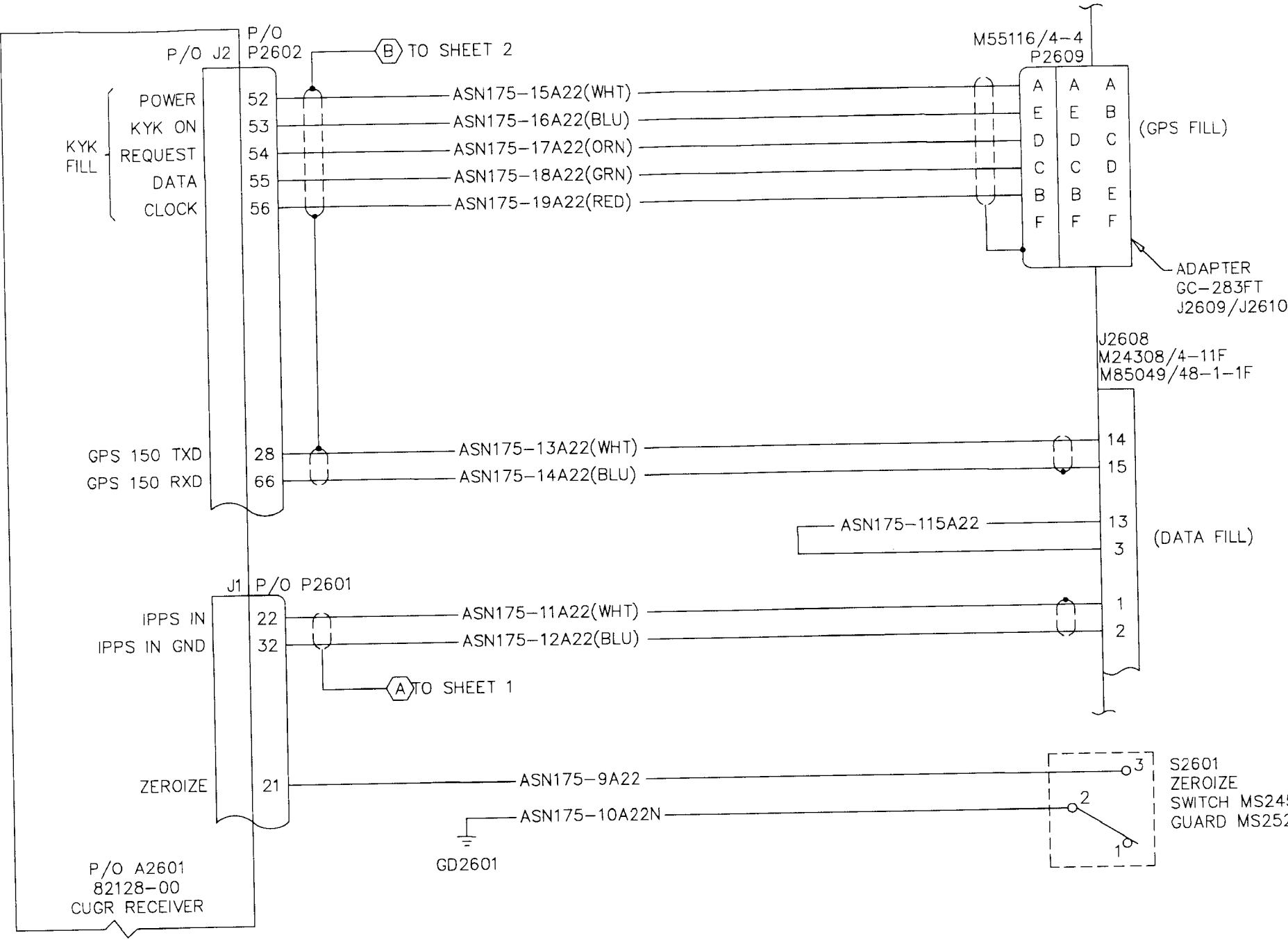
Change 1 FP-183/(FP-184 blank)





FO-72. Satellite Signals Navigation Set AN/ASN-175 (V)  
Wiring Diagram (Sheet 5 of 7)

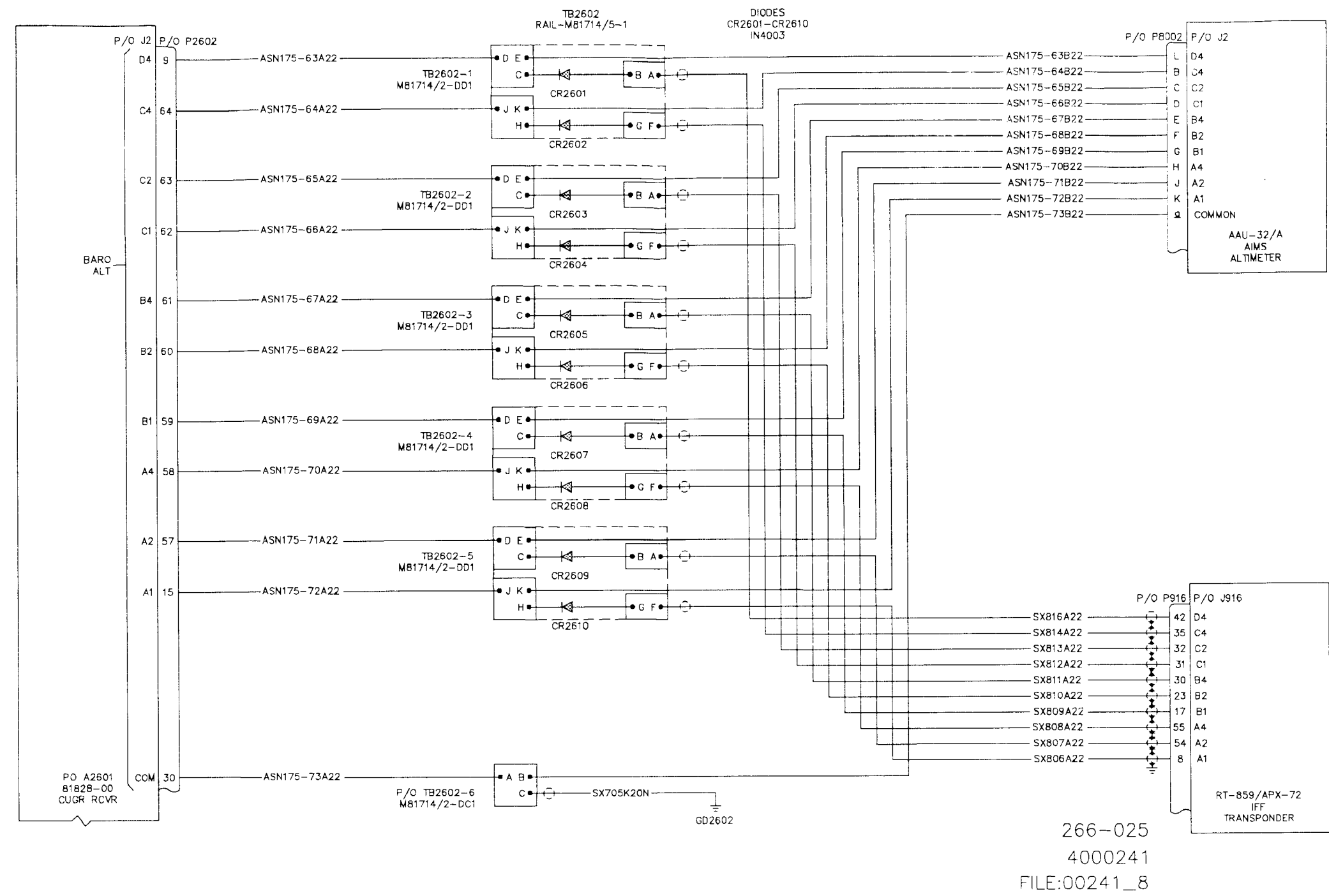




FO-72. Satellite Signals Navigation Set AN/ASN-175 (V)  
Wiring Diagram (Sheet 6 of 7)

Change 1 FP-187/(FP-188 blank)





FO-72. Satellite Signals Navigation Set AN/ASN-175 (V)  
Wiring Diagram (Sheet 7 of 7)

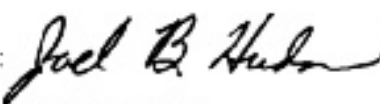
Change 1 FP-189/(FP-190 blank)



**TM 11-1520-210-23**

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*Chief of Staff*

Official:   
JOEL B. HUDSON  
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## THE METRIC SYSTEM AND EQUIVALENTS

### LENGTH MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

### CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

### TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

### APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Quarts	Liters	0.473
Gallons	Liters	0.946
Ounces	Liters	3.785
Pounds	Grams	28.349
Short Tons	Kilograms	0.454
Pound-Feet	Metric Tons	0.907
Pounds per Square Inch	Newton-Meters	1.356
Miles per Gallon	Kilopascals	6.895
Miles per Hour	Kilometers per Liter	0.425
	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Grams	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

