UNCLASSIFIED

NAVSHIPS 0967-303-8610

TECHNICAL MANUAL

for

ANTENNA COUPLER GROUPS AN/SRA-38,-39,-40,-49,-50

DEPARTMENT OF THE NAVY

NAVAL SHIP SYSTEMS COMMAND

UNCLASSIFIED

PUBLICATION: 9 MAY 1969

LIST OF EFFECTIVE PAGES

Page Numbers	Change in Effect
Title page	Original
ii to ix	Original
1-0 to 1-10	Original
2-1 to 2-18	Original
3-1 to 3-8	Original
4-1 to 4-22	Original
5-1 to 5-48	Original
6-1 to 6-18	Original

Name of Contractor: Pickard & Burns Electronics Division
Continental Electronics Manufacturing Co.
103 Fourth Avenue
Waltham, Massachusetts 02154

Contract: NObsr 95352

Errors found in this publication (other than obvious typographical errors), which have not been corrected by means of Temporary Corrections or Permanent Changes should be reported. Such report should include the complete title of the publication and the publication number (short title); identify the page and line or figure and location of the error; and be forwarded to the Electronics Publications Section of the Bureau of Ships.

All Navy requests for NAVSHIPS electronics publications listed in the current issue of NAVSANDA Publications 2002 "Requisitioning Guide and Index of Forms and Publications," Cognizance Symbol I, or in a subsequent issue of the Electronics Information Bulletin should be directed to the appropriate Forms and Publications Supply Point.

APPROVAL AND PROCUREMENT RECORD PAGE

Approval Data for: NAVSHIPS 0967-303-8610

Technical Manual for Antenna Coupler
Groups AN/SRA-38, -39, -40, -49 and-50

Approval Authority: Department of the Navy, Bureau of Ships, Ltr NObsr 95352

Serial: 10008

Contract or Purchase	Ships Applicable	Quantity of Manuals	Quantity of Equipment	Building Yard

Remarks:

Date:

Certification: It is hereby certified that NAVSHIPS 0967-303-8610 to be provided under contract or purchase order NObsr 95352 has been approved by the approval data shown above.

Bruno S. Andracchio
Manager Technical Services
Pickard & Burns Electronics Division
Continental Electronics Manufacturing Co.
103 Fourth Avenue
Waltham, Massachusetts 02154

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Figure		Page

SECTION 5 - MAINTENANCE (CONT)

Figure		Page

SECTION 5 - MAINTENANCE (CONT)

LIST OF TABLES

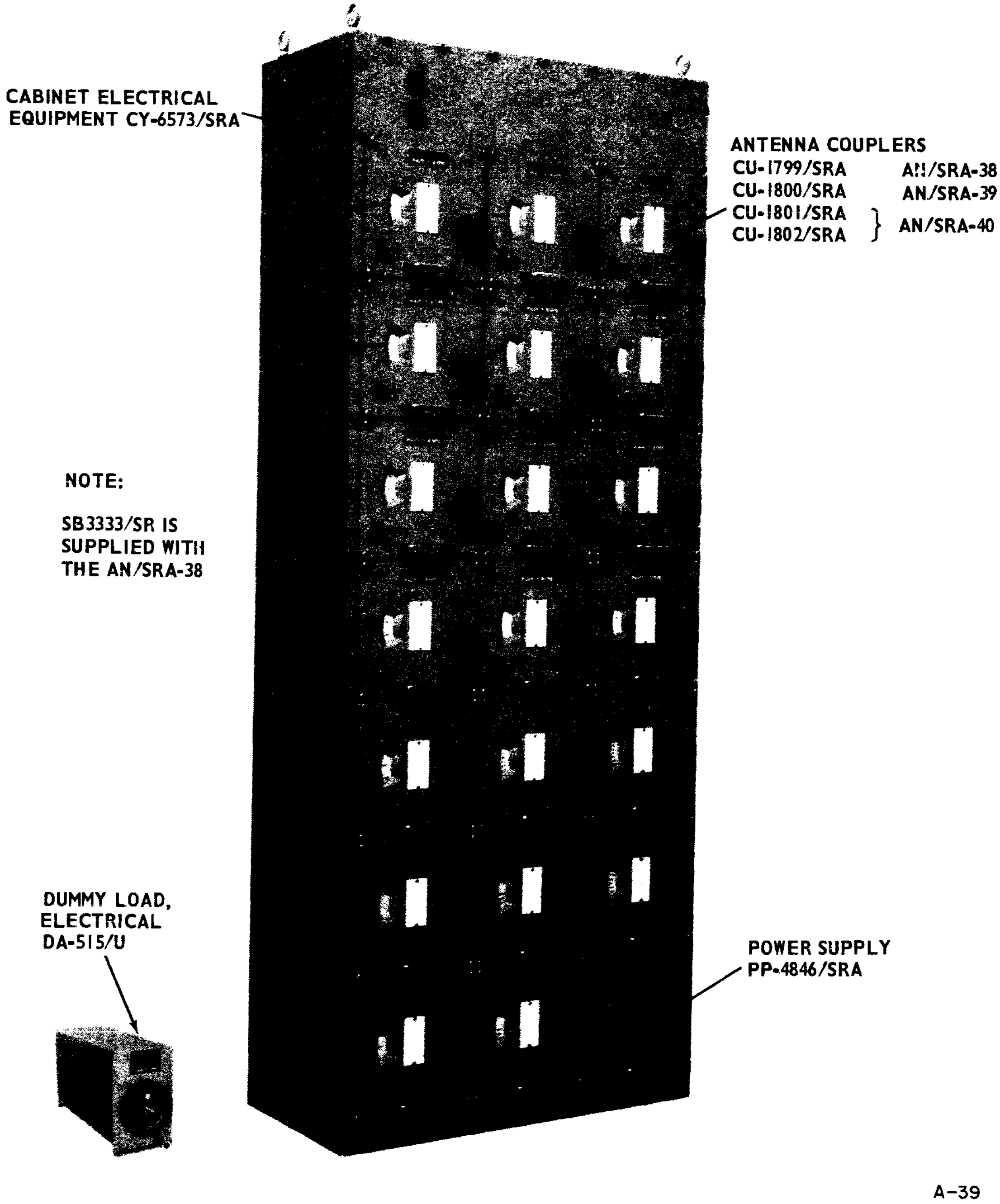


FIGURE 1-1. ANTENNA COUPLER GROUP AN/SRA-38, -39, & -40

Section 1

GENERAL INFORMATION

1-1. SCOPE

a. This technical manual describes the following Antenna Coupler Groups: AN/SRA-38, AN/SRA-39, AN/SRA-40, AN/SRA-49 and AN/SRA-50. Functional and physical descriptions are provided, together with installation and operating instructions, troubleshooting and maintenance procedures, and parts lists.

b. This technical manual is in effect upon receipt. Extracts from this manual may be used in the preparation of other Department of Defense publications.

1-2. GENERAL DESCRIPTIONS

a. OVERALL FUNCTION. - The coupler groups described herein are designed to connect up to twenty medium-frequency and high-frequency receivers to a single antenna, with a highly selective degree of frequency isolation. Each of the five coupler groups consists of 14 to 20 individual antenna couplers and a single power supply module, all slide-mounted in a special electronic equipment rack. An antenna input distribution line termination (dummy load) is also supplied. In addition, there are provisions for patching the outputs from the various antenna couplers to external receivers.

b. ANTENNA COUPLER MODULES. - Each antenna coupler consists of four synchronously tuned resonant circuits which filter out unwanted antenna signals, passing a relatively narrow band of input frequencies to the appropriate receiver. Each module also contains a single printed-circuit board (PC-172) which functions as an overload protection device and as a white noise generator used for tuning each coupler to the desired frequency. Table 1-1 lists the frequency coverage of each of the four types of antenna couplers used in the various antenna coupler groups.

c. COUPLER GROUPS. - Components of the five coupler groups described herein are listed in Table 1-2. Ordinarily, coupler groups are employed in the following manner.

(1) AN/SRA-38, -39, and -40 are used in conjunction with a separate patch panel cabinet (CY-4516) to furnish inputs for up to 50 receivers covering the frequency range of 2 to 30 MHz. See Figure 1-1.

(2) AN/SRA-49 is used to couple a single antenna to up to 20 receivers covering the frequency range of 2 to 30 MHz. See Figure 1-2.

(3) AN/SRA-50 is used to couple a single antenna to up to 14 receivers covering the frequency range of 4 to 30 MHz. See Figure 1-3.

1-3. EQUIPMENT SUPPLIED

a. Table 1-3 lists equipment supplied with the coupler group outlined in Paragraph 1-2c (1) above.

b. Table 1-4 lists equipment supplied with the coupler group outlined in Paragraph 1-2c (2) above.

c. Table 1-5 lists equipment supplied with coupler group outlined in Paragraph 1-2c (3) above.

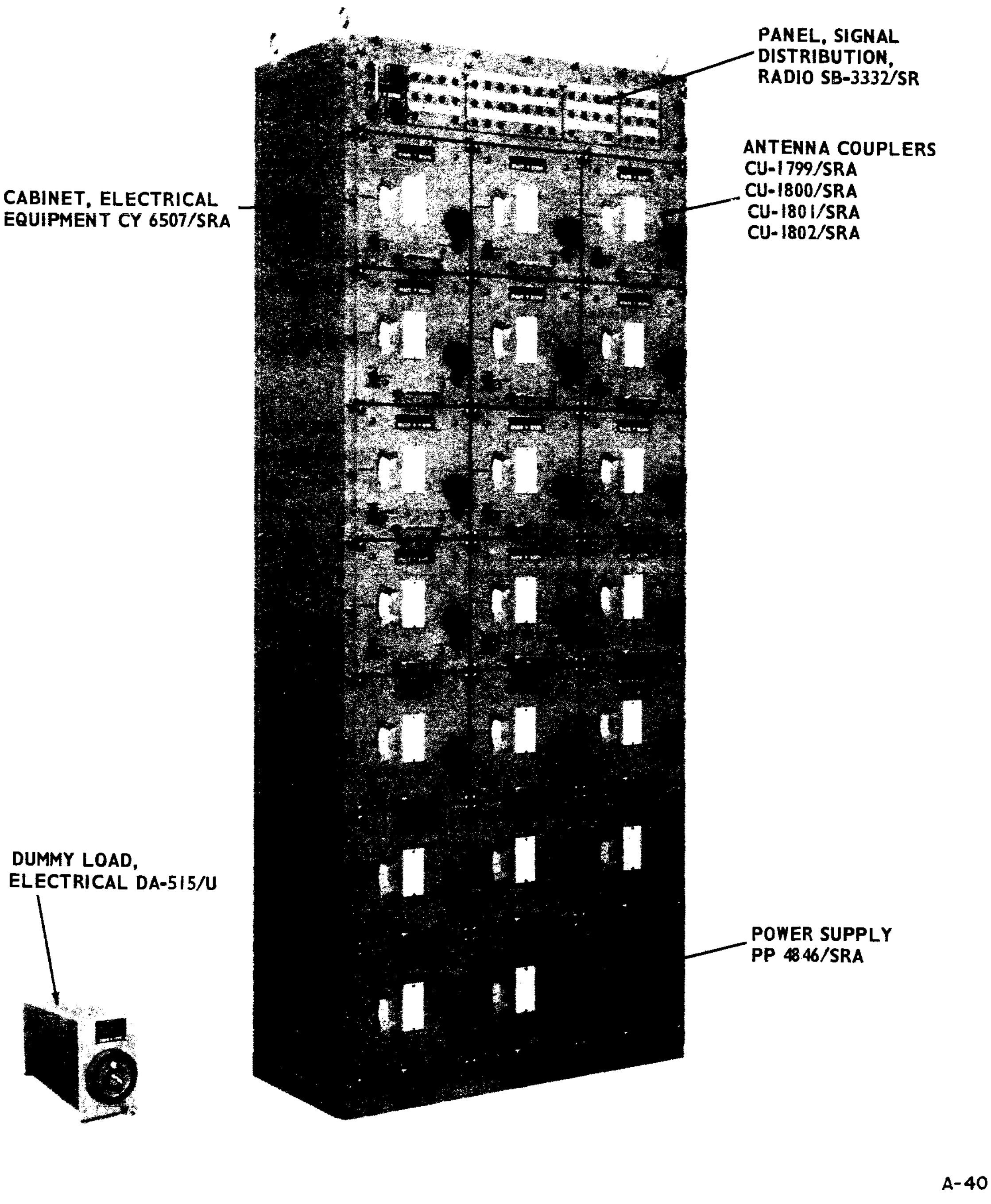


FIGURE 1-2. ANTENNA COUPLER GROUP AN/SRA-49

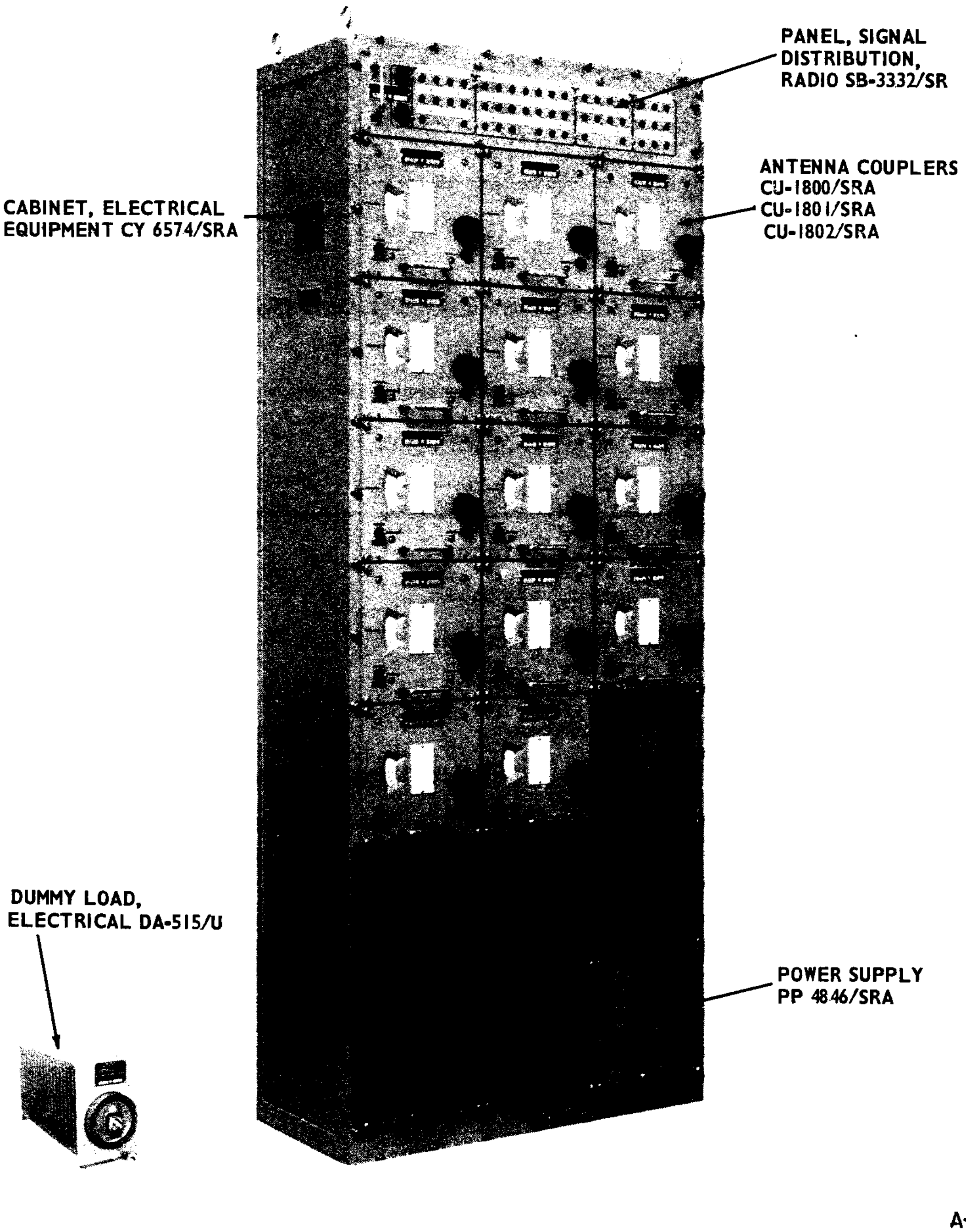


FIGURE 1-3. ANTENNA COUPLER GROUP AN/SRA-50

TABLE 1-1. REFERENCE DATA

ANTENNA COUPLER	FREQUENCY RANGE (MHz)		
	LOW LIMIT	NOMINAL	HIGH LIMIT
CU-1799/SRA	1.99	2-6	6.02
CU-1800/SRA	3.99	4-12	12.02
CU-1801/SRA	9.90	10-17	17.40
CU-1802/SRA	16.60	17-30	30.50

TABLE 1-2. COUPLER GROUP COMPONENTS

QUANTITY AN/SRA					NOMENCLATURE	PART OR MODEL NO.
-38	-39	-40	-49	-50		
20			6		Coupler, Antenna	CU-1799/SRA
	20		6	6	Coupler, Antenna	CU-1800/SRA
		10	4	4	Coupler, Antenna	CU-1801/SRA
		10	4	4	Coupler, Antenna	CU-1802/SRA
1	1	1	1	1	Power Supply	PP-4846/SRA
			1		Cabinet, Electrical Equipment	CY-6507/SRA
1	1	1			Cabinet, Electrical Equipment	CY-6573/SRA
				1	Cabinet, Electrical Equipment	CY-6574/SRA
1	1	1	1	1	Dummy Load, Electrical	DA-515/U
			1	1	Panel, Signal Distribution, Radio	SB-3332/SR
1					Panel, Signal Distribution, Radio	SB-3333/SR
50			20	20	Patch Cords	20-37184
136	20	20			Connector	M 39012/16-0001
3	3	3	27	21	Connector	M 39012/06-0002
1	1	1	1	1	Connector	MS 3108R-16-10S
1	1	1	1	1	Connector	MS 3108R-28-12P
1	1	1	1	1	Connector	MS 3108R-18-1S
				6	Blank Panel Assembly	02-3188

TABLE 1-3. EQUIPMENT SUPPLIED WITH AN/SRA-38, -39, -40

QTY PER EQUIP	NOMENCLATURE		OVER-ALL DIMENSIONS (INCHES)			VOLUME	WEIGHT
	NAME	DESIG.	HEIGHT	WIDTH	DEPTH	(CU FT)	(LB)
1	Coupler Group	AN/SRA-38	71	27	17-11/16	19-1/2	465
1	Coupler Group	AN/SRA-39	71	27	17-11/16	19-1/2	465
1	Coupler Group	AN/SRA-40	71	27	17-11/16	19-1/2	465
3	Dummy Load, Electrical	DA-515/U	8-1/2	5-5/16	17	1/2	20
1	Panel, Signal Distribution Radio	SB-3333/SR	15-23/32	19	5-1/8	.9	18-1/2
50	Patch Cords	20-37184					
176*	Connectors	M39012/16-0001 (UG88 G/U)					
3	Connectors	M39012/06-0002 (UG573 C/U)					
3**	Test Fixture Assembly	02-13501-1					
3**	Extender Cable	13-13548-1					
6	Technical Manual	NAVSHIPS 0967-303-8610					

*116 ea. supplied with SB-3333/SR
20 ea. supplied with AN/SRA-38, -39, -40

**Supplied and stored with Power Supply PP4846/SRA.

TABLE 1-4. EQUIPMENT SUPPLIED WITH AN/SRA-49

QTY PER EQUIP	NOMENCLATURE		OVER-ALL DIMENSIONS (INCHES)			VOLUME (CU FT)	WEIGHT (LB)
	NAME	DESIG.	HEIGHT	WIDTH	DEPTH		
1	Coupler Group	AN/SRA-49	71	27	17-11/16	19-1/2	500
1	Dummy Load, Electrical	DA-515/U	8-1/2	5-5/16	17	1/2	20
20	Patch Cords	20-37184					
27	Connectors	M39012/06-0002 (UG573 C/U)					
1*	Test Fixture Assembly	02-13501-1					
1*	Extender Cable	13-13548-1					
2	Technical Manual	NAVSHIPS 0967-303-8610					

*Supplied and stored with Power Supply PP4846/SRA

TABLE 1-5. EQUIPMENT SUPPLIED WITH AN/SRA-50

QTY PER EQUIP	NOMENCLATURE		OVER-ALL DIMENSIONS (INCHES)			VOLUME	WEIGHT
	NAME	DESIG.	HEIGHT	WIDTH	DEPTH	(CU FT)	(LB)
1	Coupler Group	AN/SRA-50	71	27	17-11/16	19-1/2	415
1	Dummy Load, Electrical	DA-515/U	8-1/2	5-5/16	17	1/2	20
20	Patch Cords	20-37184					
21	Connectors	M39012/06-0002 (UG573 C/U)					
2	Technical Manual	NAVSHIPS 0967-303-8610					
1*	Test Fixture Assembly	02-13501-1					
1*	Extender Cable	13-13548-1					

*Supplied and stored with Power Supply PP4846/SRA

1-4. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

Table 1-6 lists equipment and publications not supplied which are required for proper operation, troubleshooting, and maintenance of the coupler groups described herein.

1-5. PREPARATION FOR RESHIPMENT

The equipment shall be prepared for reshipment in accordance with the requirements of Military Specification MIL-E-17555F. The equipment shall be cleaned, preserved and packaged by Level A in accordance with MIL-P-116 and shall be packed and marked by Level B.

Level A preservation is protection against corrosion, deterioration and physical damage during shipment and indeterminate storage.

Level B packing is protection against damage during shipment and storage to be in structures offering protection from the weather.

TABLE 1-6. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	COUPLER GROUP CHARACTERISTICS MEASURED
	NAME	DESIG.		
1	Signal Generator	HP606B or equivalent	Trouble-shooting and maintenance procedures.	2.0 - 30 MHz
1	Signal Generator	SG-85/URM-25	Trouble-shooting and maintenance procedures.	2.0 - 30 MHz
1	Sweep/Signal Generator	Telonic SM-2000 or equivalent	Trouble-shooting and maintenance procedures.	2.0 - 30 MHz
1	Vector Voltmeter	HP8405A or equivalent	Trouble-shooting and mainten- procedures	2.0 - 30 MHz
1	RF Millivoltmeter	HP411A or equivalent	Trouble-shooting and maintenance procedures	2.0 - 30 MHz
1	Electronic Counter	HP5245L or equivalent	Trouble-shooting and maintenance procedures.	2.0 - 30 MHz
1	Oscilloscope	Tektronix Model 545A or equivalent	Trouble-shooting and maintenance procedures.	2.0 - 30 MHz
1	Pre-amplifier	Tektronix Type CA	Trouble-shooting and maintenance procedures.	2.0 - 30 MHz
1	Low Power Attenuator	Telonic TG 9050 or equivalent	Trouble-shooting and maintenance procedures.	50 ohm 84.5 db, 0.5 db increments

TABLE 1-6. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED (CONT.)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	COUPLER GROUP CHARACTERISTICS MEASURED
	NAME	DESIG.		
3	Terminations Feed Through	Tektronix 011-049 or equivalent	Trouble-shooting and maintenance procedures.	50 ohms 1 watt coupler termination.
1	AC/DC Voltmeter	HP410B or equivalent	Trouble-shooting and maintenance procedures.	1 v ± 3% 2-30 MHz 115 vac ±10%, 60Hz 18 vdc ±5% 32 vdc ±25%
1	Antenna	2-6 MHz Broadband	Reception of RF signals for AN/SRA-38	
1	Antenna	4-12 MHz Broadband	Reception of RF signals for AN/SRA-39	
1	Antenna	10-30 MHz Broadband	Reception of RF signals for AN/SRA-40	
1	Antenna	35-foot 4-wire trussed whip or 35-foot twin whip	Reception of RF signals for AN/SRA-49	
1	Antenna	35-foot 4-wire trussed whip or 35-foot twin whip	Reception of RF signals for AN/SRA-50	
1	Grounding Strap		Interconnection	

NOTE: HP-606/B is preferred to SG-85/URM-25 - See alignment Section 5

Section 2

INSTALLATION

2-1. UNPACKING AND HANDLING

There are no special unpacking and handling procedures required other than those normal precautions taken during the installation and care of complex electronic equipment. Each coupler group is shipped in two crates, one containing the coupler group itself, and the other containing the associated dummy load. Table 2-1 provides pertinent dimensions and weights.

TABLE 2-1. DIMENSION AND WEIGHT DATA

UNIT		DIMENSIONS (IN.) H	W	D	VOLUME (CU FT)	WEIGHT (LBS)
AN/SRA-38, -39, -40, -49	Crated	80	34	20	32	550
	Uncrated	See Figure 2-3 (-38, -39 -40) See Figure 2-4 (-49)			19-1/2	465
AN/SRA-50	Crated	80	34	20	32	450
	Uncrated	See Figure 2-4			19-1/2	415
Dummy Load DA-515/U	Crated	9	12	20	1-1/4	25
	Uncrated	See Figure 2-5			1/2	20

2-2. POWER REQUIREMENTS

a. Input power required for each coupler group is 105-125 vac, 57-63 Hz, 1ϕ. Power consumption is 35W normal, 134W maximum. Heat dissipated is normally 20W.

b. No input power is required for the dummy load. Load power rating is 600W continuous duty, or 900W for intermittent duty up to 15 minutes.

c. GROUNDING. - To insure that the cabinet is properly grounded, a pad with two 1/4-20 screw holes is provided on the rear lower side of the cabinet. See Figures 2-3 and 2-4. It is imperative that a grounding buss be connected from this pad to the framework of the ship.

2-3. INSTALLATION REQUIREMENTS

a. ANTENNA COUPLER GROUP SYSTEMS. - The pictorial representation of the AN/SRA-38, -39 and -40 Antenna Coupler Groups, when used as a system, is shown in Figure 2-1. In addition, the connections of the antenna; Dummy Load, DA515/U; and Signal Distribution Panel, SB-3333/SR; is included.

The pictorial representation of the AN/SRA-49 and -50 Antenna Coupler Groups is shown in Figure 2-2. Included is the connection to the antenna and the Dummy Load, DA-515/U. The Signal Distribution Panel SB-3332/SR is an integral part of the AN/SRA-49 and -50 and is not shown separately.

The coupler groups are designed for operation in an ambient temperature from 0° to 50°C (32° to 122°F).

Figures 2-9, 2-10, and 2-11 are the interconnecting system wiring diagrams for each of the antenna coupler groups.

b. ANTENNA COUPLER GROUP. - Minimum area requirements for installation, operation and servicing are shown in the dimensional drawings of Figure 2-3 and Figure 2-4.

Locations for the Antenna Couplers, CU-1799/SRA, CU-1800/SRA, CU-1801/SRA and CU-1802/SRA; Power Supply PP-4846/SRA; and the Signal Distribution Panel SB-3332/SR are designated by assembly "A" numbers assigned to positions in the Antenna Coupler Group cabinet. See Figures 2-3 and 2-4. Table 2-2 lists the type of unit and its location referenced by "A" number.

c. DUMMY LOAD, ELECTRICAL, DA-515/U. - Requirements for locating position of dummy load are as follows:

(1) Distance between the input jack of the dummy load and antenna output jack 1J2 of the associated coupler group should not exceed 60 inches.

(2) Mounting area must be sufficient to provide at least six inches of free space above and on all sides of the unit to permit heat dissipation by convection.

(3) Mounting surface must be horizontal to the deck, so that ventilating fins are essentially vertical. Figure 2-5 provides dimensional data relating to installation of the dummy load.

(4) Where vertical space permits proper air circulation, the dummy load may be mounted on top of the associated antenna coupler group.

d. SIGNAL DISTRIBUTION PANEL, SB-3333/SR AND SB-3332/SR. - The SB-3333/SR is shown in Figure 2-6 for both outline dimensions and front panel patching connections. The panel is designed for mounting in a standard CY-4516 cabinet.

The SB-3332/SR is part of the AN/SRA-49 and -50 Antenna Coupler Groups and is shown in Figure 2-7 for front panel patching connections only.

2-4. INPUT/OUTPUT CONNECTORS

Figure 2-8 illustrates the location of RF and power input and all other jacks located on the top of each Antenna Coupler Group.

Table 2-3 lists the relationship of the output/input jacks of Figure 2-8 and the internal connection to components of the Antenna Coupler Groups. In the AN/SRA-38, -39 and -40 the outputs of the Antenna Couplers are connected to the top panel directly. In the AN/SRA-49 and -50 the outputs of the Antenna Couplers are connected internally to the Signal Distribution Panel SB-3332/SR, which in turn is connected to the top panel. Refer to the coupler group schematics in Section 5 for details.

Note that in order to obtain RF outputs from the various couplers to the top panel output jacks 1J6 through 1J25 on the AN/SRA-49 and -50, the patch cords must be inserted on the front panel of the Signal Distribution Panel SB-3332/SR. Normal patching connects COUPLER A1 (the antenna coupler located in position A1, See Table 2-2) to RECEIVER 1. Other patching arrangements can be used. A marking plate is located on the face of each coupler and also on the Signal Distribution Panel to be used for identifying purposes by the operator.

2-5. CABLE ASSEMBLIES

Tables 2-4, 2-5, and 2-6 describe each cable assembly required, point of origin, point of destination, and function for the various Antenna Coupler Groups.

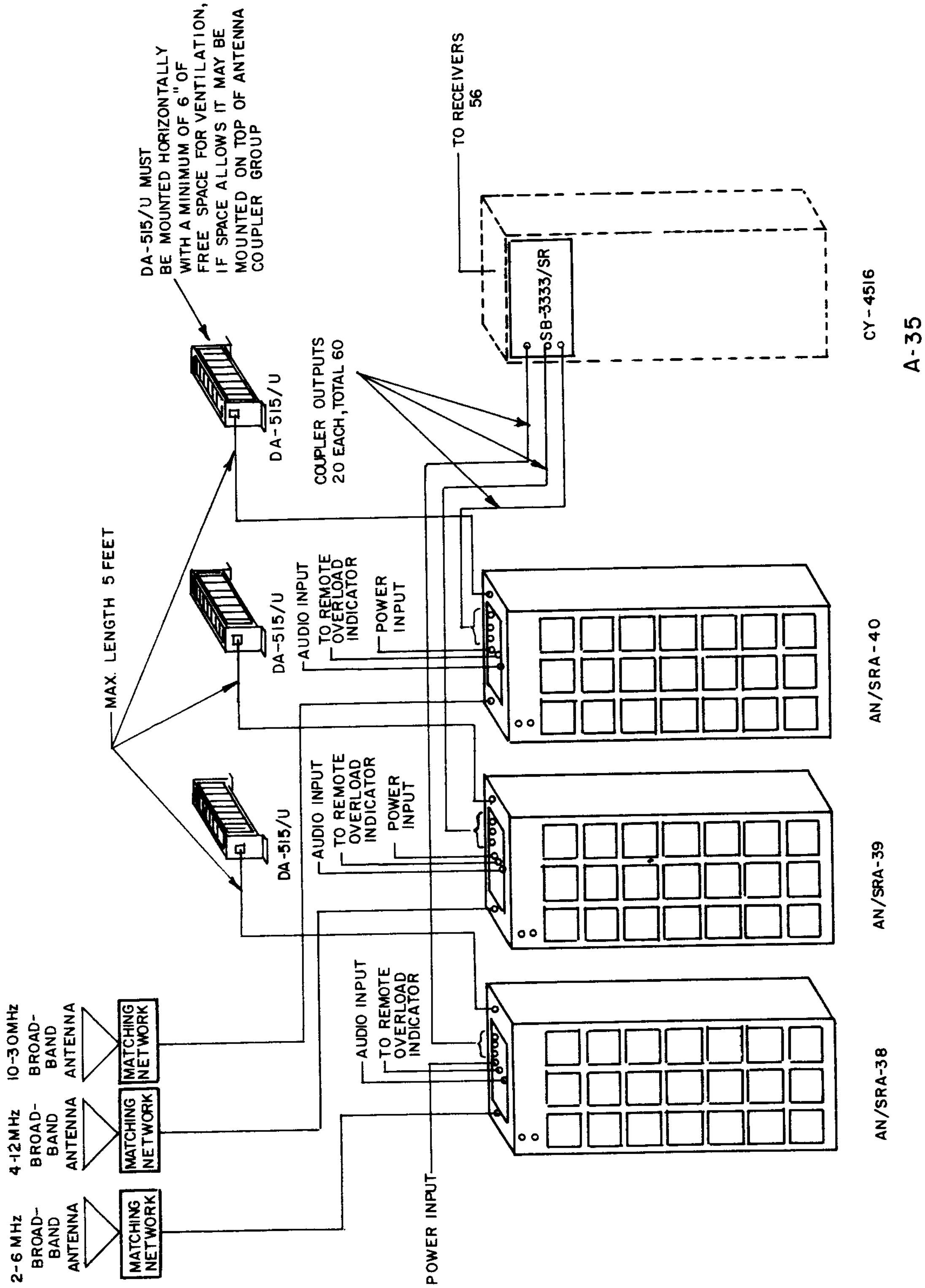


FIGURE 2-1. PICTORIAL REPRESENTATION OF AN/SRA-38, -39, AND -40 CABLING.

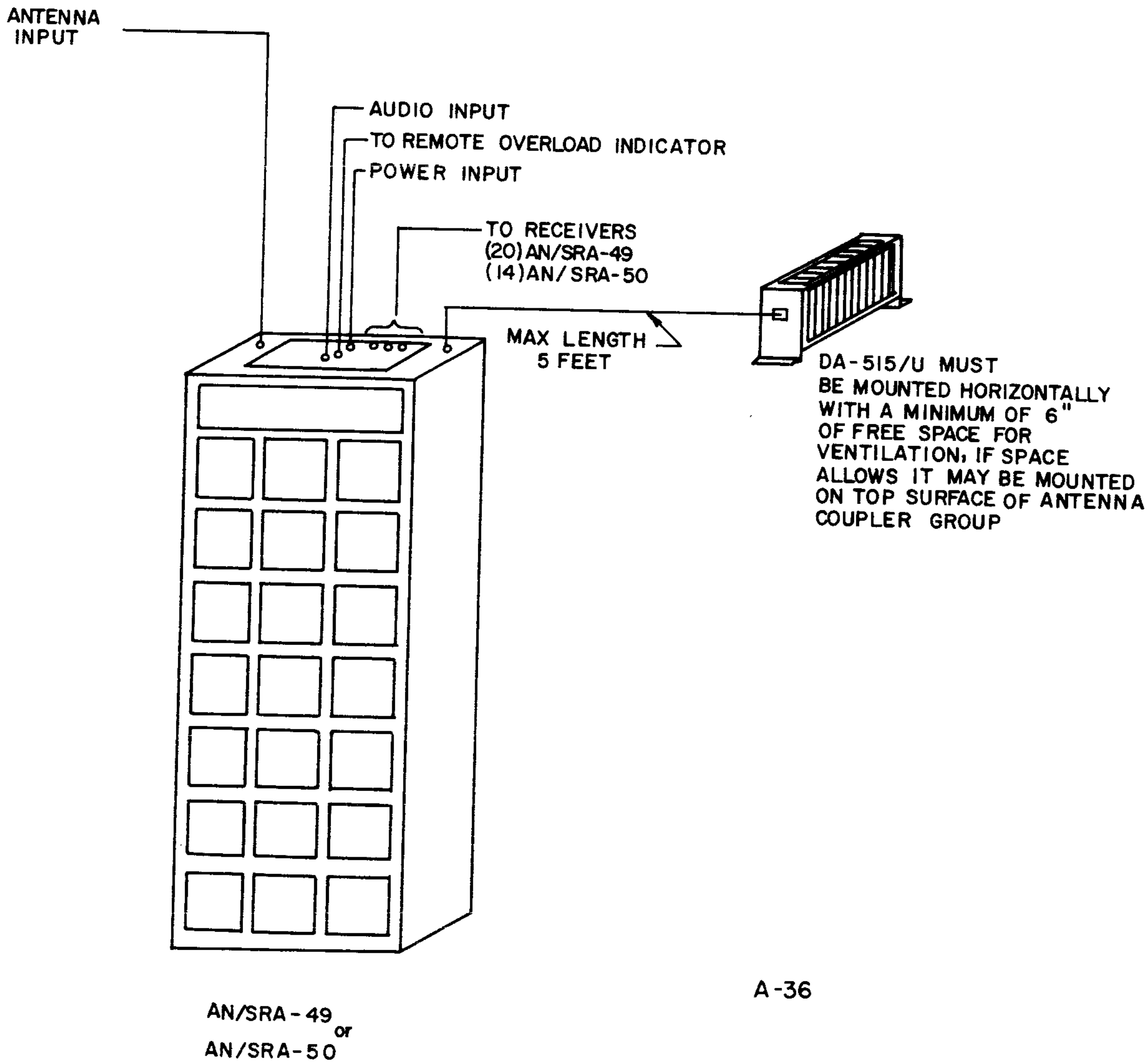
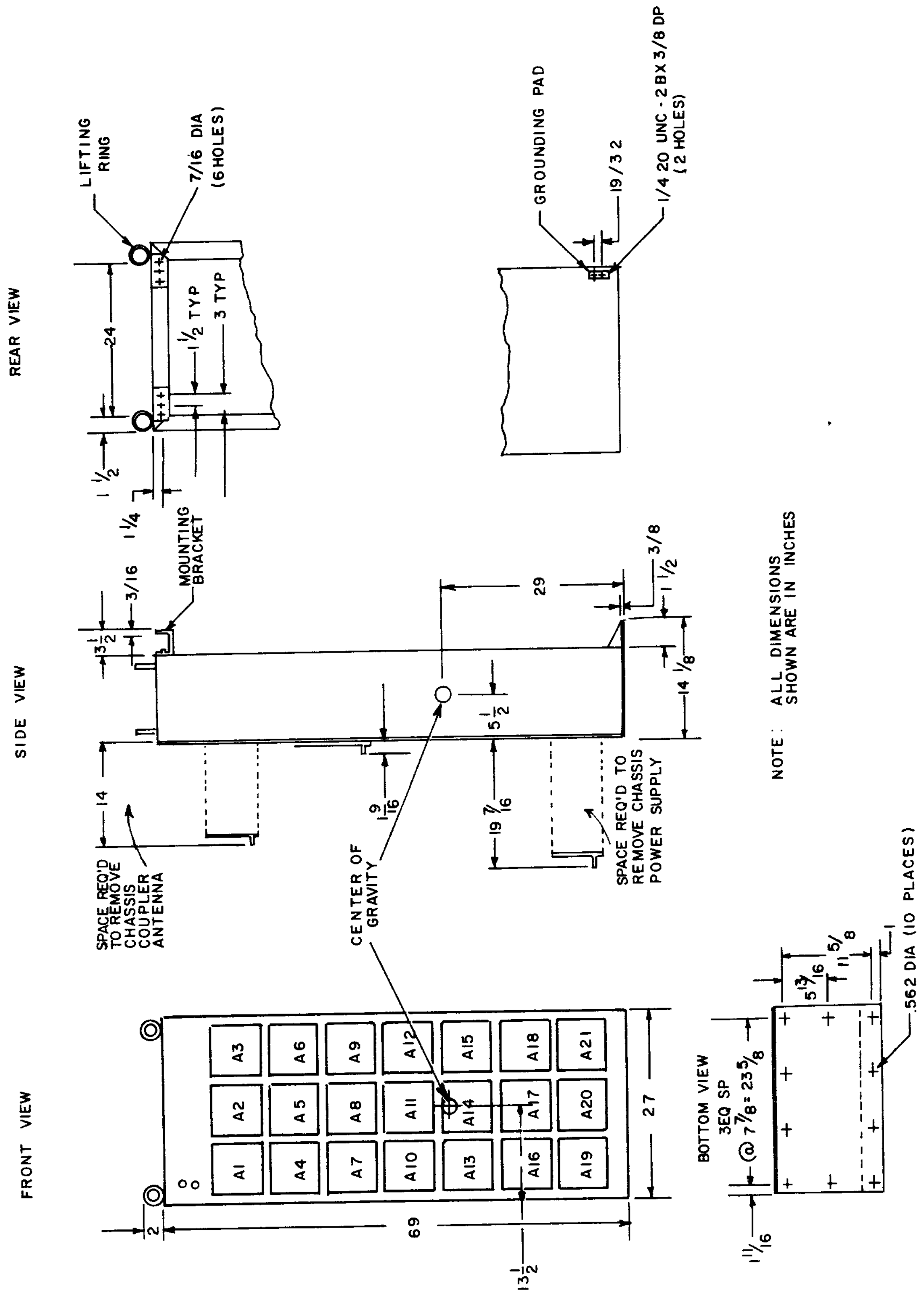


FIGURE 2-2. PICTORIAL REPRESENTATION OF AN/SRA-49 AND -50 CABLING



A-34

FIGURE 2-3. DIMENSIONAL DATA, ANTENNA COUPLER GROUPS AN/SRA-38, -39 AND -40

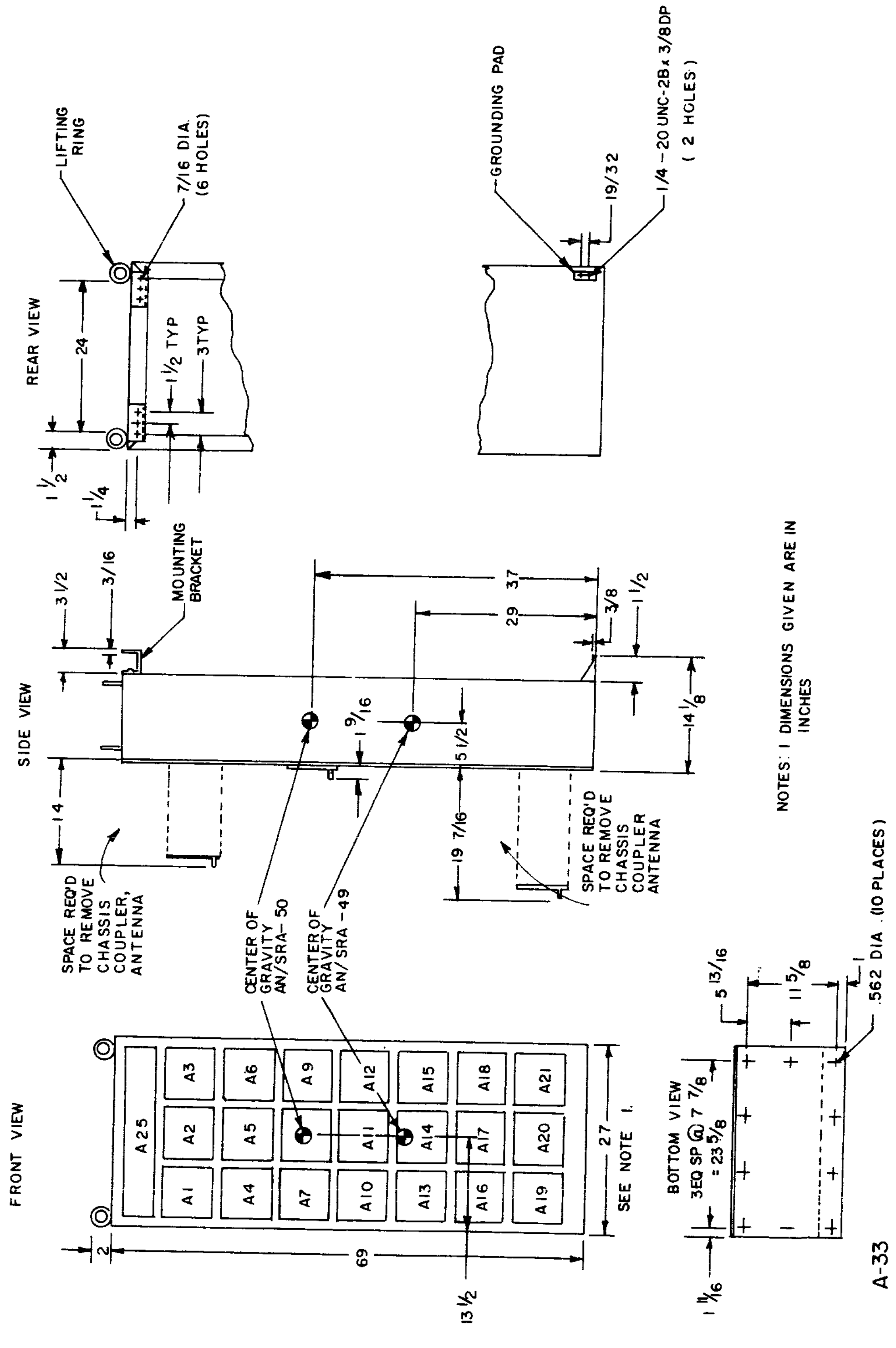


FIGURE 2-4. DIMENSIONAL DATA, ANTENNA COUPLER GROUPS AN/SRA-49 AND -50

TABLE 2-2. LOCATION OF UNITS IN ANTENNA COUPLER GROUPS

UNIT LOCATION	ANTENNA COUPLER GROUP				
	AN/SRA-38	AN/SRA-39	AN/SRA-40	AN/SRA-49	AN/SRA-50
A1	CU-1799/SRA	CU-1800/SRA	CU-1802/SRA	CU-1802/SRA	CU-1802/SRA
A2	↑	↑	CU-1802/SRA	CU-1801/SRA	CU-1801/SRA
A3			CU-1801/SRA	CU-1799/SRA	CU-1800/SRA
A4			CU-1802/SRA	CU-1802/SRA	CU-1802/SRA
A5			CU-1802/SRA	CU-1800/SRA	CU-1801/SRA
A6			CU-1801/SRA	CU-1799/SRA	CU-1800/SRA
A7			CU-1802/SRA	CU-1802/SRA	CU-1802/SRA
A8			CU-1802/SRA	CU-1800/SRA	CU-1801/SRA
A9			CU-1801/SRA	CU-1799/SRA	CU-1800/SRA
A10			CU-1802/SRA	CU-1802/SRA	CU-1802/SRA
A11			CU-1801/SRA	CU-1800/SRA	CU-1800/SRA
A12			CU-1801/SRA	CU-1799/SRA	CU-1800/SRA
A13			CU-1802/SRA	CU-1801/SRA	CU-1801/SRA
A14			CU-1801/SRA	CU-1800/SRA	CU-1800/SRA
A15			CU-1801/SRA	CU-1799/SRA	NONE
A16			CU-1802/SRA	CU-1801/SRA	NONE
A17			CU-1801/SRA	CU-1800/SRA	NONE
A18			CU-1801/SRA	CU-1799/SRA	NONE
A19	↓	↓	CU-1802/SRA	CU-1801/SRA	NONE
A20	CU-1799/SRA	CU-1800/SRA	CU-1801/SRA	CU-1800/SRA	NONE
A21	PP-4846/SRA	PP-4846/SRA	PP-4846/SRA	PP-4846/SRA	PP-4846/SRA
A22	INTERNAL RF DISTRIBUTION LINE (LEFT SIDE)				
A23	INTERNAL RF DISTRIBUTION LINE (CENTER)				
A24	INTERNAL RF DISTRIBUTION LINE (RIGHT SIDE)				
A25	NONE	NONE	NONE	SB-3332/SR	SB-3332/SR

NOTE: See TABLE 1-1 for Antenna Coupler Frequency Coverage.

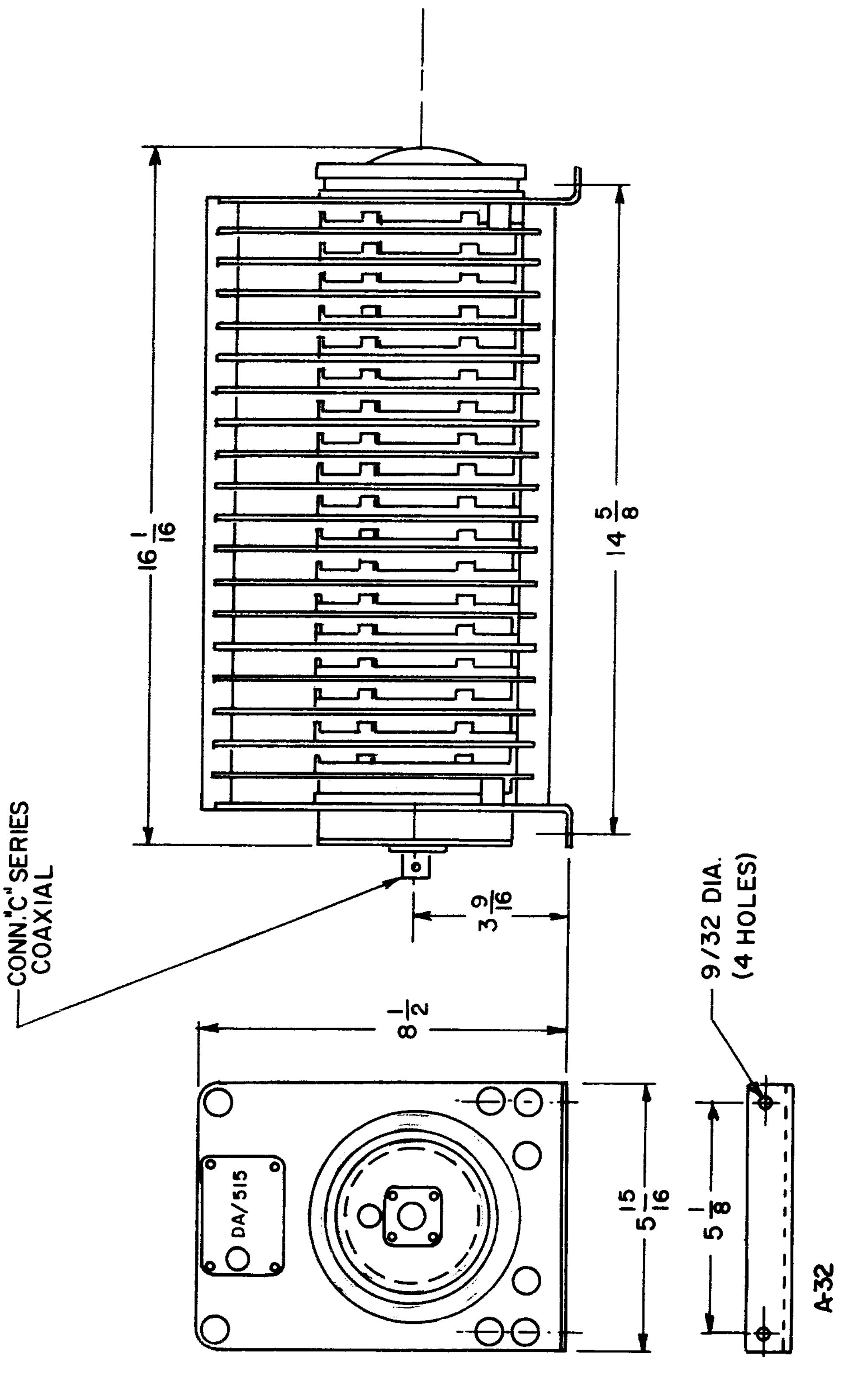


FIGURE 2-5. DIMENSIONAL DATA, DUMMY LOAD, ELECTRICAL, DA-515/U

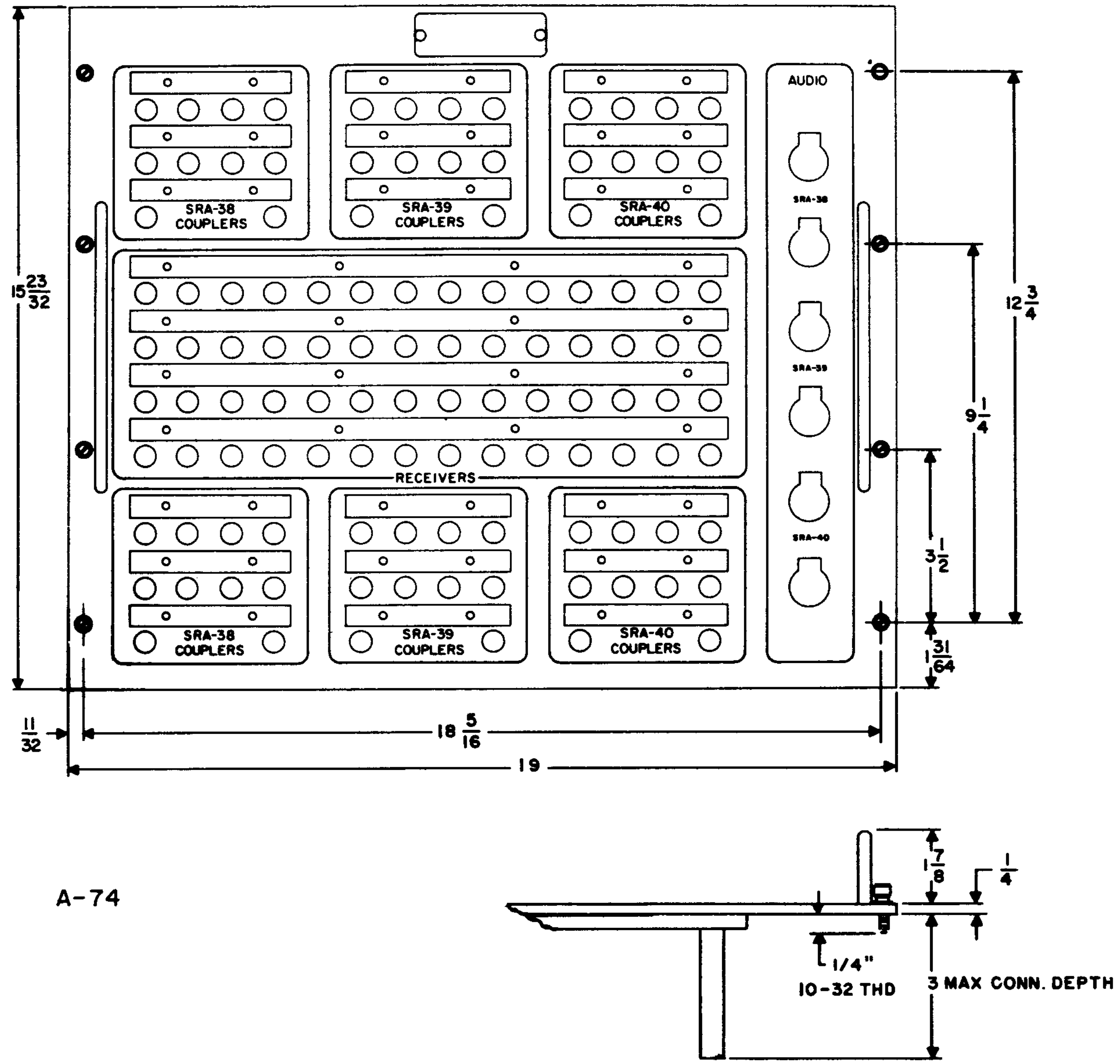


FIGURE 2-6. SIGNAL DISTRIBUTION PANEL SB-3333/SR, DIMENSIONAL OUTLINE.

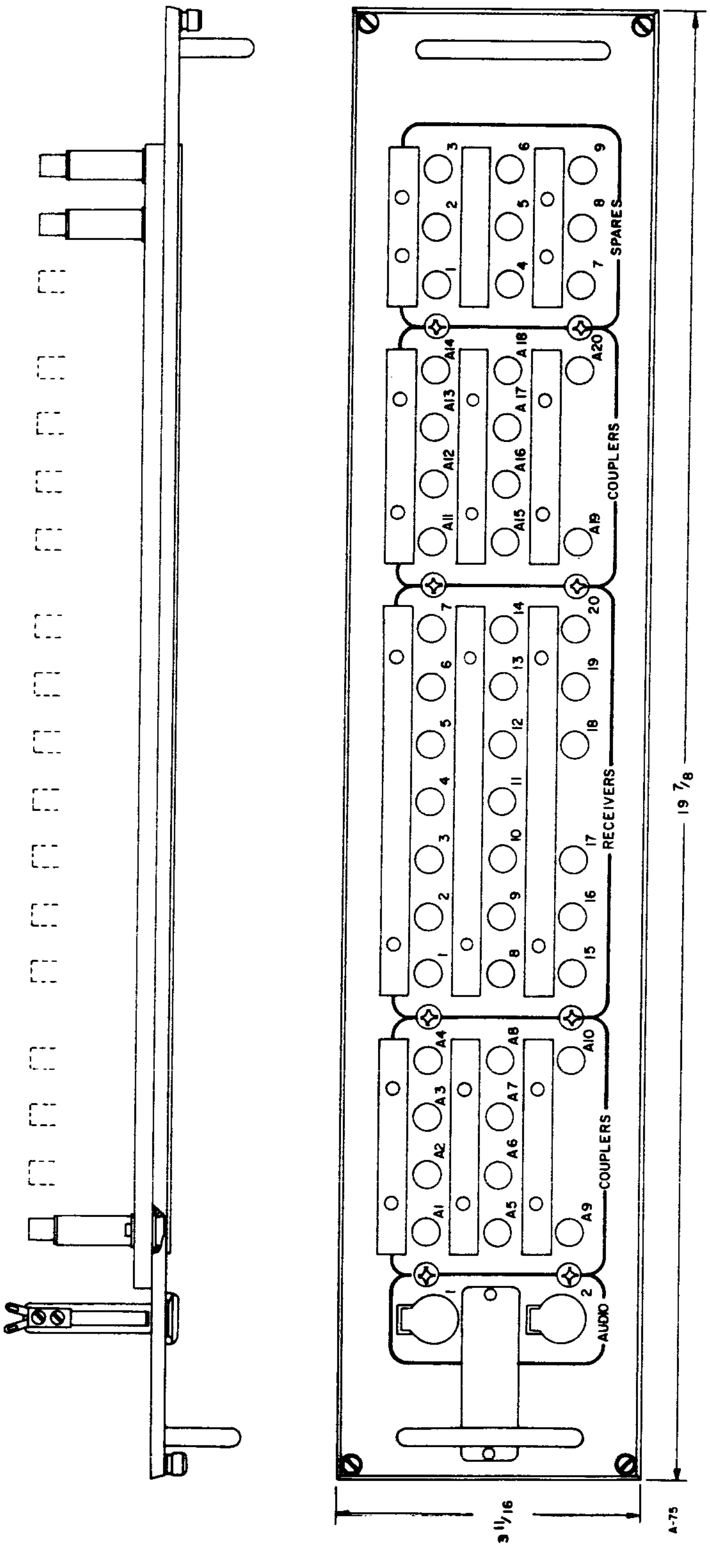
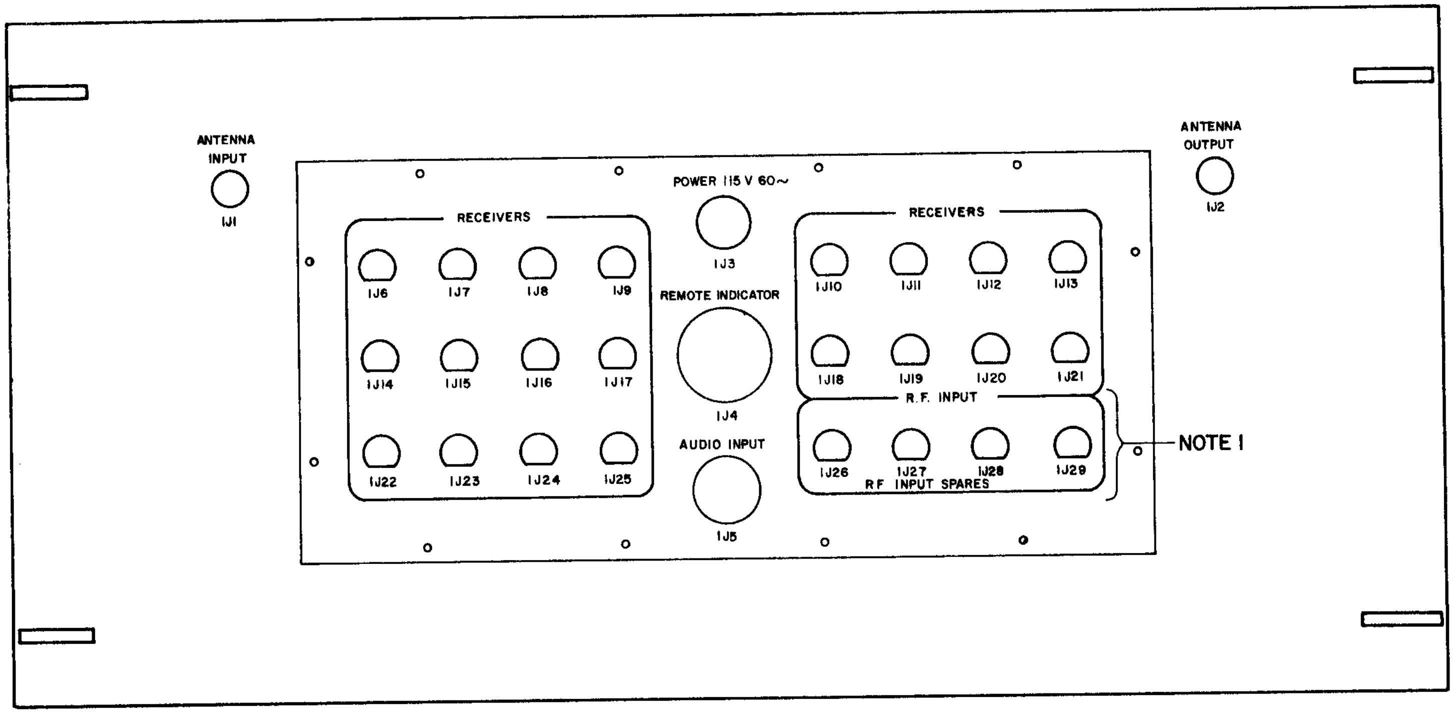


FIGURE 2-7. SIGNAL DISTRIBUTION PANEL, SB-3332/SR P/O AN/SRA-49 AND -50

TOP VIEW OF COUPLER GROUP



NOTES: 1. JACKS 1J26 THRU 1J29 ARE INCLUDED ONLY ON COUPLER GROUPS AN/SRA-49 AND AN/SRA-50

2.

MATING CONNECTORS		
1J1 & 1J2	M39012/06-0002	UG573C/U
1J3	MS3108R-16-10S	
1J4	MS3108R-28-12P	
1J5	MS3108R-18-1S	
AN/SRA-38-39-40 1J6-1J25	M 39012/16-0001	UG 88G/U
AN/SRA-49 1J6 THRU 1J29	M 39012/06-0002	

A-51

FIGURE 2-8. INPUT AND OUTPUT CONNECTIONS, ANTENNA COUPLER GROUPS AN/SRA-38, -39, -40, -49 AND -50

TABLE 2-3. TOP PANEL CONNECTIONS

JACK REF. DESIG.	AN/SRA-38, 39, 40 UNIT AND LOCATION	AN/SRA-49, 50 UNIT AND LOCATION	FUNCTION
1J1	RF Interface Input	RF Interface Input	Ship's Antenna Line
1J2	RF Interface Output	RF Interface Output	Ship's Antenna Termination
1J3	PP-4846/SRA-P1 Location A21	PP-4846/SRA-P1 Location A21	115 VAC 60 Hz to Power Supply
1J4	Antenna Couplers P4-1 Locations A1-A20	Antenna Couplers P4-1 Locations A1-A20	Remote Overload Indication
1J5	Audio 1, 2	SB-3332/SR Audio 1, 2 Location A25	Audio From Receivers
1J6	Antenna Coupler A1	SB-3332/SR Receiver 1	Coupler RF Output
1J7	A2	2	
1J8	A3	3	
1J9	A4	4	
1J10	A13	13	
1J11	A14	14	
1J12	A15	15	
1J13	A16	16	
1J14	A5	5	
1J15	A6	6	
1J16	A7	7	
1J17	A8	8	
1J18	A17	17	
1J19	A18	18	
1J20	A19	19	
1J21	A20	20	
1J22	A9	9	
1J23	A10	10	
1J24	A11	11	
1J25	Antenna Coupler A12	SB-3332/SR Receiver 12	Coupler RF Output
1J26	None	SB-3332/SR Spares 1	RF Input/Output Spares
1J27		2	
1J28		3	
1J29	None	SB-3332/SR Spares 4	RF Input/Output Spares

TABLE 2-4. CABLE CONNECTIONS AN/SRA-38, -39 AND -40

NAVY CABLE DESIG-NATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIG-NATION	TO	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIG-NATION	FUNCTION	CURRENT IN AMPS
CO-03MOF(3-18) 0330	MED DUTY 18 AWG	3	WHT	SHIPS 115V AC 60 Hz			AN/SRA-38,39,40	1J3	A	PRI POWER	.9 MAX
			BLK						C		
			GREEN						B		
TTRS-2	T.S.P.	4	WHT	SHIPS AUDIO			AN/SRA-38,39,40	1J5	A	COMM.	
			BLK						B		
			SHLD						C		
			WHT						D		
			BLK						E		
			SHLD						J		
									F	NOT USED	
									G	NOT USED	
									H	NOT USED	
									I	NOT USED	
MSCA-24		21	BLK	REMOTE OVERLOAD INDICATOR			AN/SRA-38,39,40	1J4	A	LAMP RETURNS	.04
			WHT						B		
			GREEN						C		
			ORANGE						D		
			BLU						E		
			WHT/BLK						F		
			RED/BLK						G		
			GRN/BLK						H		
			ORG/BLK						J		
			BLU/BLK						K		
			BLK/WHT						L		
			RED/WHT						M		
			GRN/WHT						N		
			BLU/WHT						P		
			BLK/RED						R		
			WHT/RED						S		
			ORG/RED						T		
			BLU/RED						U		
			GRN/RED						V		
			ORG/GRN						W		
			RED						X	PWR 32 V	.82 MAX
									Y		
									Z		
									a		
									b		
									d		
			SHLD						CABINET GRD	SHLD	
RG-215/U	RF	2	NA	SHIPS ANTENNA			AN/SRA-38,39,40	1J1		ANTENNA INPUT	
RG-223/U	RF	2	NA	PANEL, SIGNAL DISTRIBUTION, RADIO SB-3333/SR 1J1 THRU 1J20 AN/SRA-38 1J21 THRU 1J40 AN/SRA-39 1J41 THRU 1J60 AN/SRA-40				1J6 1J7 1J8 1J9 1J14 1J15 1J16 1J17 1J22 1J23 1J24 1J25 1J10 1J11 1J12 1J13 1J18 1J19 1J20 1J21		ANTENNA COUPLER OUTPUT	
RG-214/U	RF	2	NA	AN/SRA-38 39 & 40	1J2		DUMMY LOAD, ELECTRICAL DA-515/U		"C" COAX.	TERM.	

A-78

TABLE 2-4. CABLE CONNECTIONS AN/SRA-38, -39 AND -40 (CONT.)

NAVY CABLE DESIG-NATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIG-NATION	TO	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIG-NATION	FUNCTION	CURRENT IN AMPS
CO-03MOF(3-18) 0330	MED DUTY 18 AWG	3	WHT	SHIPS 115V AC 60 Hz			AN/SRA-49	1J3	A	PRI POWER	.9 MAX
			BLK						C		
			GREEN						B		
TTRS-2	T.S.P.	4	WHT	SHIPS AUDIO			AN/SRA-49	1J5	A	COMM	
			BLK						B		
			SHLD						C		
			WHT						D		
			BLK						E		
			SHLD						J		
									F	NOT USED	
									G	NOT USED	
									H	NOT USED	
									I	NOT USED	
MSCA-24		21	BLK	REMOTE OVERLOAD INDICATOR			AN/SRA-49	1J4	A	LAMP RETURNS	.04
			WHT						B		
			GREEN						C		
			ORANGE						D		
			BLU						E		
			WHT/BLK						F		
			RED/BLK						G		
			GRN/BLK						H		
			ORG/BLK						J		
			BLU/BLK						K		
			BLK/WHT						L		
			RED/WHT						M		
			GRN/WHT						N		
			BLU/WHT						P		
			BLK/RED						R		
			WHT/RED						S		
			ORG/RED						T		
			BLU/RED						U		
			GRN/RED						V		
			ORG/GRN						W		
			RED						X	PWR 32 V	.82 MAX
									Y		
									Z		
									a		
									b		
									d		
			SHLD						CABINET GRD	SHLD	
RG-215/U	RF	2	NA	SHIPS ANTENNA			AN/SRA-49	1J1		ANTENNA INPUT	
RG-214/U	RF	2	NA	RECEIVER 1				1J6		ANTENNA COUPLER OUTPUT	
				2				1J7			
				3				1J8			
				4				1J9			
				5				1J14			
				6				1J15			
				7				1J16			
				8				1J17			
				9				1J22			
				10				1J23			
				11				1J24			
				12				1J25			
				13				1J10			
				14				1J11			
				15				1J12			
				16				1J13			
				17				1J18			
				18				1J19			
				19				1J20			
				20				1J21			
								1J26		SPARE	
								1J27		SPARE	
								1J28		SPARE	
								1J29		SPARE	
RG-214/U	RF	2	NA	AN/SRA-49	1J2		DUMMY LOAD, ELEC DA-515/U		"C" COAX	TERM.	

A-76

TABLE 2-4. CABLE CONNECTIONS AN/SRA-38, -39 AND -40 (CONT.)

NAVY CABLE DESIG-NATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIG-NATION	TO	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIG-NATION	FUNCTION	CURRENT IN AMPS
CO-03MOF(3-18) 0330	MED. DUTY 18 AWG	3	WHT BLK GREEN	SHIPS 115V AC 60 Hz			AN/SRA-50	1J3	A C B	PRI POWER	.9 MAX
TTRS-2	T.S.P.	4	WHT BLK SHLD WHT BLK SHLD	SHIPS AUDIO			AN/SRA-50	1J5	A B C D E J F G H I	COMM NOT USED NOT USED NOT USED NOT USED	
MSCA-24		21	BLK WHT GREEN ORANGE BLU WHT/BLK RED/BLK GRN/BLK ORG/BLK BLU/BLK BLK/WHT RED/WHT GRN/WHT BLU/WHT BLK/RED WHT/RED ORG/RED BLU/RED GRN/RED ORG/GRN RED	REMOTE OVERLOAD INDICATOR			AN/SRA-50	1J4	A B C D E F G H J K L M N P R S T U V W X Y Z a b d	LAMP RETURNS (X:) PWR 32 V	.04 (X:) .82 MAX
			SHLD				CAB GRD			SHLD	
RG-215/U	RF	2	NA	SHIPS ANT			AN/SRA-50	1J1		ANTENNA INPUT	
RG-214/U	RF	2	NA	RECEIVER 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20			AN/SRA-50	1J6 1J7 1J8 1J9 1J14 1J15 1J16 1J17 1J22 1J23 1J24 1J25 1J10 1J11 1J12 1J13 1J18 1J19 1J20 1J21		ANTENNA COUPLER OUTPUT	
								1J26 1J27 1J28 1J29		SPARE SPARE SPARE SPARE	
RG-214/U	RF	2	NA	AN/SRA-50	1J2		DUMMY LOAD, ELEC DA-515/U		"C" COAX.	TERM.	

A-77

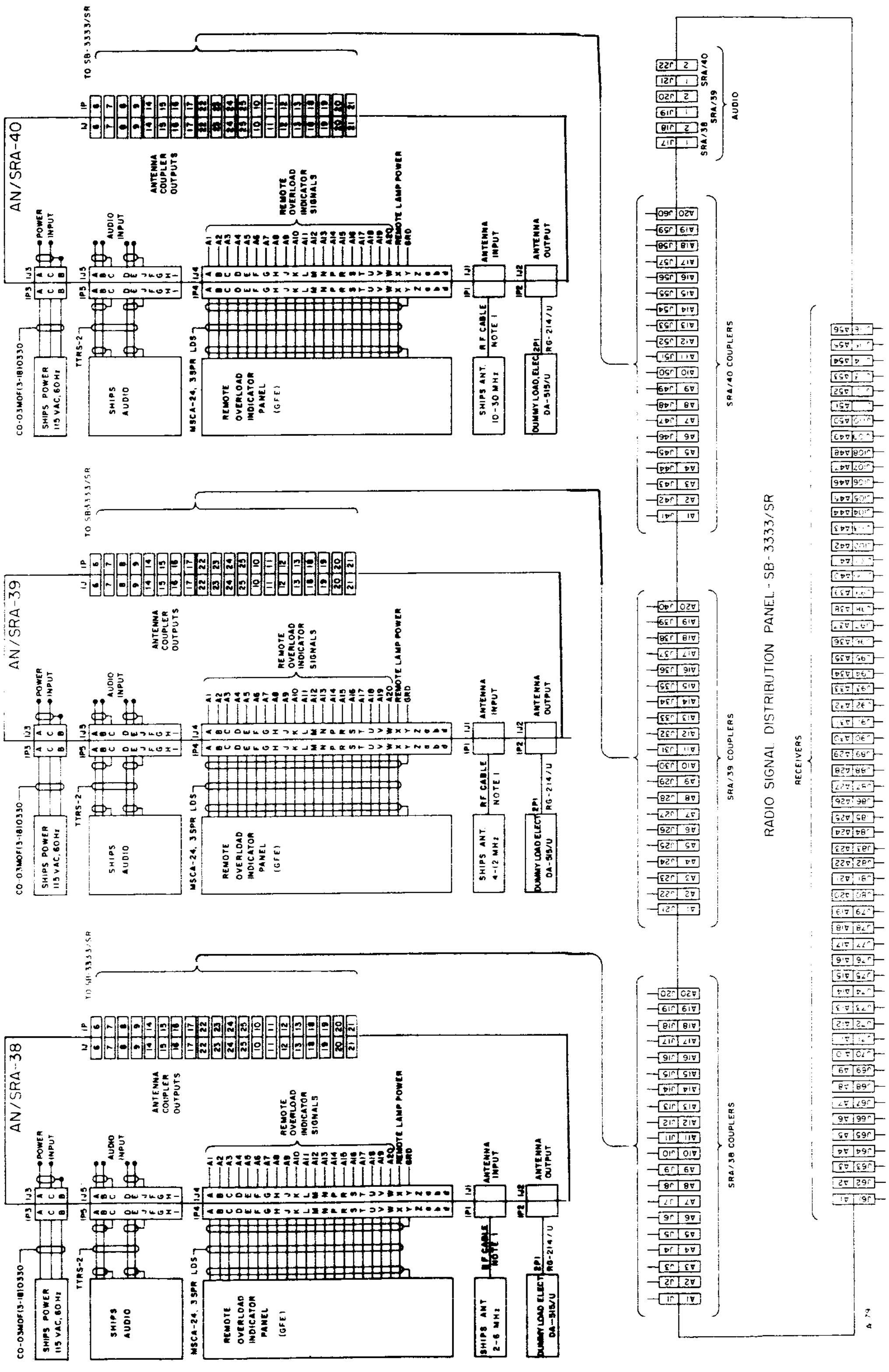


FIGURE 2-9. SYSTEM WIRING DIAGRAM, ANTENNA COUPLER GROUPS AN/SRA-38, -39, AND -40

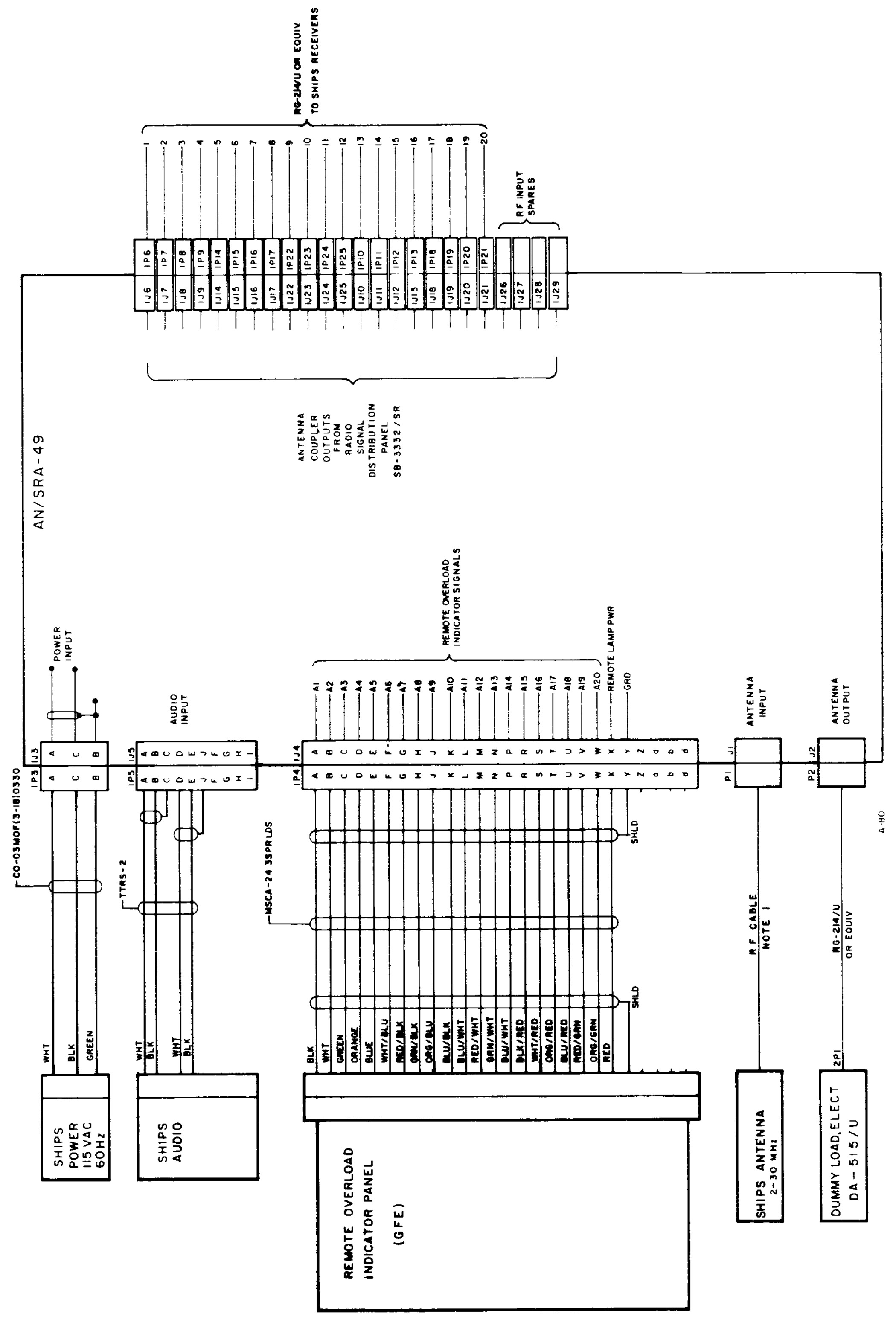


FIGURE 2-10. SYSTEM WIRING DIAGRAM, ANTENNA COUPLER GROUP AN/SRA-49

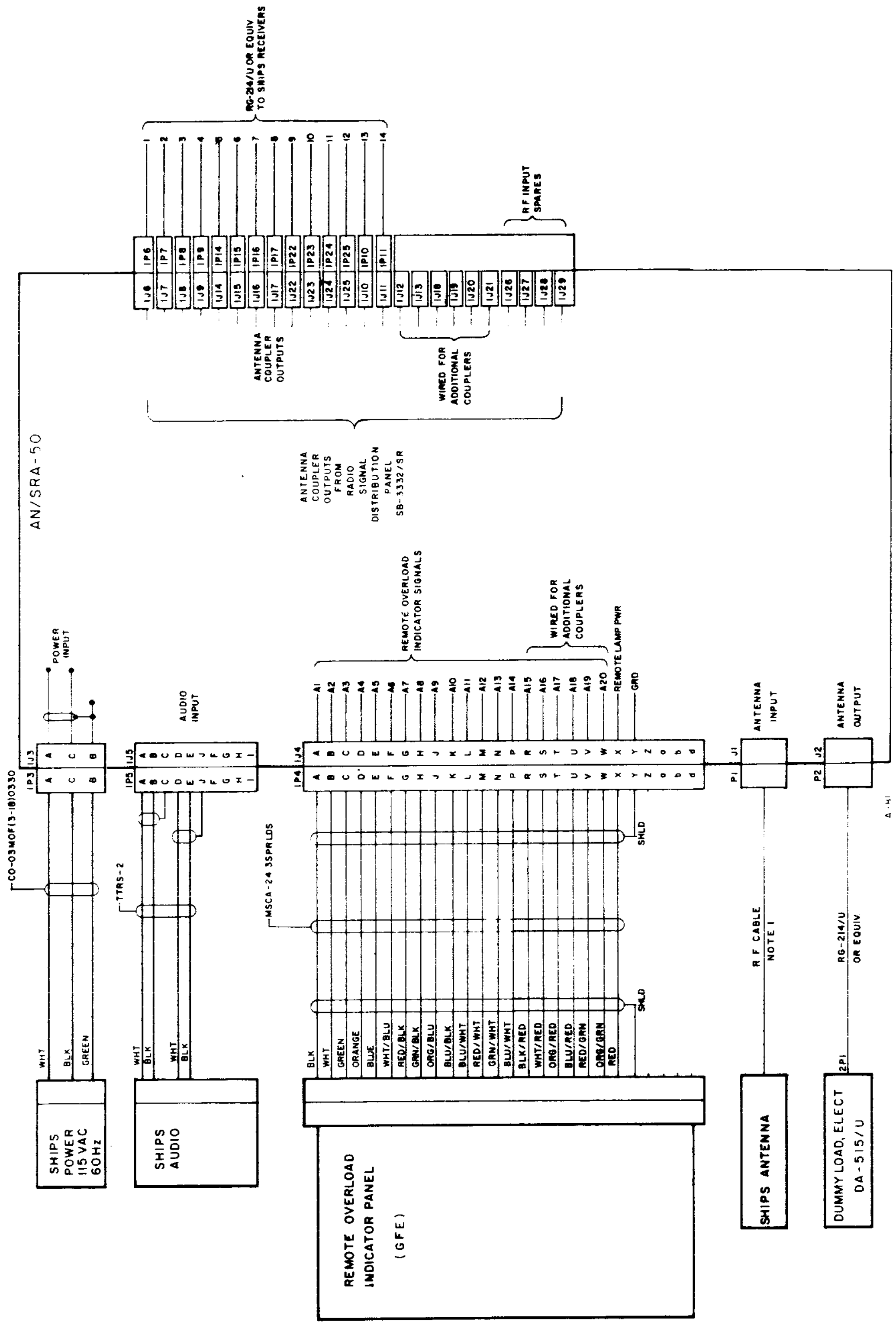


FIGURE 2-11. SYSTEM WIRING DIAGRAM, ANTENNA COUPLER GROUP AN/SRA-50

Section 3

OPERATION

3-1 FUNCTIONAL OPERATION

a. GENERAL.-Each Antenna Coupler Group is designed to provide an operation with a flexible means of connecting a single antenna to a number of different MF and HF radio receivers. Frequency selective plug-in antenna couplers permit preselecting any desired frequency in a given frequency band for application to a receiver. Tuning to the desired frequency is accomplished by means of a front tuning control and indicator dial located on each antenna coupler. Table 3-1 lists antenna couplers by nomenclature and frequency band. These antenna couplers are interchangeable and any coupler may be installed in any compartment location excepting that location reserved for the power supply. It is suggested, however, that the original antenna coupler placement be retained (See Table 2-2) since information in this technical manual is based on this equipment arrangement. (The AN/SRA-38, 39, and 40 coupler groups contain specific frequency bands and coupler interchangeability may be restricted due to antenna design.)

Each antenna coupler contains a three position COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch used to select the operating mode of the unit. An OVERLOAD indicator lamp on each unit illuminates whenever an RF overload occurs or when the tuning unit is placed in the DECOUPLED or NOISE GEN DECOUPLED mode of operation. Connector J3 on top of the coupler group enclosure cabinet provides outputs to a remote indicator panel (not supplied) used to monitor the overload status of each coupler in a given coupler group.

Power for all couplers in a coupler group is provided by a single regulated power supply, located in the bottom right hand compartment in the enclosure cabinet.

b. PATCHING PROVISIONS.-Antenna Coupler Groups AN/SRA-49 and AN/SRA-50 each contain a Signal Distribution Panel, hereafter called an internal transfer panel, which provides for convenient interchange of receiver inputs and antenna coupler output connections. This panel permits an operator to use several frequency ranges on the same receiver without

TABLE 3-1

PLUG-IN ANTENNA COUPLER UNITS

ANTENNA COUPLER	FREQUENCY
CU-1799/SRA	2 thru 6 MHz
CU-1800/SRA	4 thru 12 MHz
CU-1801/SRA	10 thru 17 MHz
CU-1802/SRA	17 thru 30 MHz

major cabling changes. Figure 2-7 illustrates the arrangement of jacks on the transfer panel. Twenty patch cords, terminated in coaxial RF plugs, are provided with the equipment. No sepecial procedures, other than normal care, are applicable to operation of the transfer panel.

Antenna Coupler Groups AN/SRA-38, -39, and -40 contain no internal patching facilities. On these coupler groups the operator will make coupler-to-receiver wiring changes at the remote transfer panel (Figure 2-6).

c. OPERATING MODES. - All antenna couplers in any coupler group, regardless of frequency band, contain the same operating controls and provide the same basic operating modes. The couplers operate independently and their operating controls do not interact unless couplers are tuned to the same operating frequency. A single power supply is common, and if de-energized will disable all couplers in that group. Specific operating modes are as follows.

(1) COUPLED-Operation in this mode essentially allows the antenna coupler to function as a tunable band-pass filter. Adjustment to the pass-band center frequency is by means of the FREQUENCY CONTROL. Specifically the coupler performs the following functions:

(a) Couples the receiver input to the antenna.

(b) Rejects signals of local transmitters separated by at least $\pm$ 3% of coupler center frequency.

(c) Protects the receiver input circuits from high RF voltage and possible damage.

(d) Provides internal protective circuits to prevent damage to the coupler itself from high on-channel RF inputs.

(e) Provides an indication of an overload condition.

NOTE. Two conditions that can cause high RF voltage to enter the coupler are:

(a) The coupler channel may be tuned through the frequency band of a local high power transmitter.

(b) A receiver and transmitter may be operating alternately on the same frequency.

When high level RF inputs occur, the overload cycle is initiated and decouples the unit from the antenna input, limiting the output signal to a maximum of 1.0 volt. Once the overload is detected, internal delay circuitry maintains the OVERLOAD mode of operation for between 0.8 and 1.0 second after the overloading signal has been removed. This delay prevents the overload circuit from attempting to follow keyed transmissions from nearby transmitters.

(2) DECOUPLED. - In this operating mode, the RF input of the coupler unit is decoupled from the antenna and power is removed from the overload protection. Hence, an overload which occurs when the unit is DECOUPLED cannot damage the antenna coupler or associated receiver.

Operation in the DECOUPLED mode is normally selected when a coupler is not in use. The equipment is designed so that a power failure will automatically intiate DECOUPLED operation.

(3) NOISE GEN DECOUPLED. - Operation in this mode energizes a white noise generator used to tune the individual couplers to the operating frequency of the receiver. In this mode, the antenna input is decoupled. The switch is spring loaded to prevent its remaining in the noise mode.

3-2. OPERATING PROCEDURES

a. OPERATING CONTROLS AND INDICATORS. - All controls and indicators essential to operation of antenna couplers in a coupler group are shown in Figures 5-32 and 5-22, which illustrate front panels of the PP-4846/SRA Power Supply and the CU-1802/SRA Antenna Coupler respectively. Controls and indicators on the CU-1802/SRA Antenna Coupler are identical to those on other antenna couplers used in the various coupler groups. Table 3-2 lists each control and briefly describes the function of each.

b. SEQUENCE OF OPERATION

(1) TURN-ON AND CHECK OUT PROCEDURE. - Before operating the equipment, the following procedures should be observed to ensure that the equipment is properly turned on and ready for operation. If an operator cannot obtain the prescribed indications, turn-on procedure should be halted until the appropriate troubleshooting and repair procedures are performed. Refer to Figures 5-22 and 5-32 for operating control identification.

(a) Ensure that the antenna coupler group is properly connected to a single-phase 115 volt 60 Hz source. Check to determine that the equipment is properly grounded as prescribed in Paragraph 2-2 of this technical manual.

(b) Ensure that all antenna couplers in the coupler group are properly seated in the equipment cabinet.

CAUTION

Never attempt to force a coupler into the equipment cabinet. Excessive force may damage connectors located at the rear of the unit. Be extremely careful in removing an antenna coupler from the equipment cabinet. Coupler slides are not equipped with stops.

(c) Check all cable connectors for tightness. Tighten as required.

(d) If the coupler group contains a transfer panel, examine patch cords and plugs to ensure that they are in good mechanical condition. Then, insert patch cords as desired between the various coupler outputs and receiver inputs.

(e) Place the power supply POWER switch to ON. Observe that indicator lamp DS1 is illuminated. If lamp does not light, check indicator fuses F1, F2 and F3; if a fuse holder is illuminated, it is an indication that the fuse inside is blown. If required, replace blown fuses.

TABLE 3-2

OPERATING CONTROLS AND INDICATORS

CONTROL OR INDICATOR	FIGURE REFERENCE	FUNCTION
POWER Switch	S1(5-32)	Controls line power to coupler group power supply.
POWER indicator	DS1(5-32)	Indicates regulated dc output is available from power supply.
Indicator Fuse F1	F1(5-32)	Indicates "blown" condition on input power fusing.
Indicator Fuse F2 Indicator Fuse F3	F2(5-32) F3(5-32) }	Indicates "blown" condition on + 28 vdc output fusing when load is applied.
COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch	S1(5-22)	Selects operating mode of antenna coupler.
OVERLOAD indicator lamp	DS1(5-22)	Illuminates when an overload input condition occurs or when the antenna coupler mode switch is in the DECOUPLED or NOISE GEN DECOUPLED position.
FREQUENCY indicator dial	FIG 5-22	Indicates operating frequency of antenna coupler
FREQUENCY control knob	FIG 5-22	Controls operating frequency of antenna coupler
FREQUENCY tuning lock	FIG 5-22	Locks or unlocks frequency control and indicator dial
Coupler Marking Plate	FIG 5-22	Plastic plate used for writing by operating personnel.
Internal Transfer Panel	FIG 5-20	Provides for convenient interconnection of coupler outputs to receiver inputs with the AN/SRA-49 or -50.
Audio Jacks	J1 (5-20)	Provides receiver audio output to transfer panel.
Remote Transfer Panel	FIG 5-21	Provides for interconnection of coupler outputs to receiver inputs when AN/SRA -38, -39, & -40 coupler groups are used as a system.

(f) Set the COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch on all couplers in a coupler group to the DECOUPLED position. Observe that the OVERLOAD indicator lamp on all couplers in the coupler group is lit. If an OVERLOAD lamp does not light, check the bulb and replace if necessary.

CAUTION

Replace overload indicator lamp with 28 volt type 327 bulb only. Use of bulbs with lower filament voltages, such as type 328, will damage lamp driver transistor Q13.

(g) Set the COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch on all couplers in a coupler group to the COUPLED position. Observe that the OVERLOAD indicator lamp on all units is extenguished. If a lamp on a coupler remains lit, check the receiver associated with the coupler to determine whether RF signals are present at the frequency to which the coupler is tuned. If no RF signal is detected at the receiver, the antenna coupler is malfunctioning and should be repaired before operation is attempted. If RF signals are detected at the operating frequency of the coupler, set the receiver to a clear frequency within the operating range of the coupler and retune the coupler to that frequency. The OVERLOAD lamp should go out.

(h) Turn-on and checkout is now complete. If malfunctions exist, refer to the Troubleshooting and Maintenance sections of this technical manual for fault location and repair information. Otherwise, the antenna coupler group is now ready for operation.

(2) OPERATING PROCEDURES. -The following procedures apply to individual antenna couplers in a coupler group.

(a) Tune the receiver to the desired reception frequency within the tuning range of the antenna coupler feeding the receiver.

(b) Unlock coupler tuning by rotating the outer LOCK dial of the FREQUENCY control on the coupler approximately 1/4 turn ccw.

(c) Using the FREQUENCY control knob, set the FREQUENCY indicator dial to the desired reception frequency.

(d) To fine tune the unit, proceed as follows:

1. If actual radio signals are present at the frequency, set the COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch on the coupler to the COUPLED position. Tune the FREQUENCY control very slowly until best reception is encountered at the radio receiver. If receiver is located remote from the coupler group, operator should utilize the AUDIO connection on the equipment rack to determine from the receiver output when best reception is obtained.

2. If no radio signals are present on the desired frequency, depress and hold the COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch in the NOISE GEN DECOUPLED position. Tune the FREQUENCY control on the coupler for a peak in receiver noise level at the operating frequency. When this peak is encountered, the coupler is tuned to the frequency of the receiver. If coupler group is located remote from the receiver, utilize the AUDIO jack facilities as required. When tuning is completed, set the COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch to the COUPLED position

TABLE 3-3

SUMMARIZED OPERATING PROCEDURES

STEP	PROCEDURE	INDICATION/RESULT
1	Ensure coupler group is connected to power line and is properly grounded.	
2	Check cable connectors for tightness. If coupler group contains a transfer panel, insert patch cords for desired receiver-coupler interconnections.	
3	Set power supply POWER switch to ON.	Indicator lamp on power supply is lit
4	Set COUPLED-DECOUPLED-NOISE GEN DECOUPLED switches on all couplers in the group to DECOUPLED	OVERLOAD indicator lamps on all couplers are lit.
5	Tune the receiver to desired reception frequency.	
6	Rotate the outer LOCK dial of the FREQUENCY control on antenna coupler (s) in use 1/4 turn ccw.	Tuning is unlocked; tuning knob turns freely rotating FREQUENCY indicator dial.
7	Using tuning knob, set the FREQUENCY indicator dial to desired operating frequency.	Coupler is tuned to approximate receiver frequency. Fine tune unit per Step 8.
8	Fine tune the coupler (s) as follows, utilizing AUDIO jack on equipment cabinet to monitor receiver audio if receiver and coupler are not located in the same area.	
	a. If actual radio signals are present on operating frequency set COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch to COUPLED. Adjust FREQUENCY knob on coupler for best reception at radio receiver.	OVERLOAD indicator lamp is extinguished
	b. If no radio signals are present at operating frequency, depress and hold COUPLED-DECOUPLED-NOISE GEN DECOUPLED switch in the NOISE GEN DECOUPLED position. Tune antenna coupler FREQUENCY control for a peak in receiver noise level at operating frequency. Set switch to the COUPLED position.	OVERLOAD lamp remains illuminated when switch is depressed; lamp is extinguished when switch is placed in COUPLED position. Coupler is now tuned to receiver operating frequency.

NOTE

Outputs available from any coupler group at a given frequency are divided among all antenna couplers tuned to that frequency. Hence, if two couplers in a group are tuned to the same frequency, output from each will be less than that obtained if only one coupler were used.

(e) Lock coupler tuning in place by rotating the outer LOCK dial of the FREQUENCY control approximately 1/4 turn cw.

(f) To operate the coupler at a different frequency, repeat steps (a) through (e).

3-3. SUMMARY OF OPERATING PROCEDURES

Table 3-3 gives a complete summary of all procedures required to properly turn-on and operate equipment described in this manual. If prescribed indications are not obtained, refer to Paragraph 3-2 for detailed check-out procedures.

3-4. EMERGENCY OPERATION

There are no emergency operating procedures applicable to the equipment.

3-5. OPERATOR MAINTENANCE

a. OPERATING CHECKS AND ADJUSTMENTS. - Other than those procedures detailed in Paragraph 3-2, there are no special operating checks or adjustments applicable to the equipment.

b. PREVENTIVE MAINTENANCE. - Operator is responsible for ensuring that the equipment is physically ready for operation. Units should be kept clean, free from any accumulation of dust, dirt or oil. Plugs and jacks should be inspected frequently to ensure that contacts are in good condition. Particular care should be taken to inspect patch cord plugs for accumulated dirt before inserting them in the transfer panel. It is far easier to clean a transfer plug than to remove dirt from inside jacks on the transfer panel. After a cleanliness check is conducted, operator should ensure that mounting hardware, where accessible, is tightened. Loose fittings permit excessive vibration which may shorten equipment life. There are no lubrication procedures applicable to the equipment.

Section 4

TROUBLESHOOTING

4-1. GENERAL. -This section provides all data required to enable a maintenance technician to quickly and accurately troubleshoot Antenna Coupler Groups AN/SRA-38, 39, 40, 49 and 50. Included are fault location tables, detailed functional and circuit descriptions, and servicing block diagrams.

4-2. TROUBLESHOOTING PROCEDURES.

a. EQUIPMENT COMPOSITION. -Each antenna coupler group consists of an equipment cabinet which contains, depending on model, from 14 to 20 plug-in antenna couplers. Individual antenna couplers contain passive tuning networks protected against overload by a PC-172 solid-state protection circuit. A single plug-in power supply provides dc voltages required for operation of the protection circuits and associated indicator lamps.

b. SYMPTOM RECOGNITION.-Table 4-1 lists possible indications of system malfunction while Table 4-2 details trouble symptoms which might occur in individual antenna couplers. While these tables can not, of course, tabulate every possible symptom of equipment malfunction, indications which might be encountered during normal operation are listed. It is possible, however, for equipment performance to deteriorate slowly, thus escaping immediate notice. For this reason the equipment should be checked periodically to ensure its optimum compliance with operating standards listed in Section 5 of this manual.

c. FAULT LOCATION. -Probable causes of equipment malfunction are listed in Tables 4-1 and 4-2. If a fault cannot be located using the tables, utilize diagrams and circuit descriptions in this section in conjunction with logical troubleshooting techniques to isolate the malfunction. Refer to Section 5 of this manual for repair information.

4-3. OVERALL FUNCTIONAL DESCRIPTION.

a. GENERAL. -Each antenna coupler group consists of an equipment cabinet, from 14 to 20 plug-in antenna couplers, a 50Ω dummy load line termination, and a plug-in power supply module. Figure 4-1 illustrates the arrangement of functional blocks in a coupler group. Note that although only three antenna couplers are shown in the diagram, each coupler group contains from 14 to 20 plug-in couplers. Coupler Groups AN/SRA-49 and 50 each contain a transfer panel for interconnection of coupler outputs and receiver inputs.

b. EQUIPMENT CABINET (CY-6507, 6573, and 6574/SRA). -Antenna inputs enter the equipment via coaxial jack J1 located atop the cabinet. Inputs are distributed internally by means of a 50Ω RF interface assembly fitted with banana jacks which accomodate banana plugs on individual couplers. Couplers in a coupler group connect in series between the antenna input and the 50Ω dummy load,hence a shorting bar is required to maintain circuit continuity when an individual coupler is removed. Transmission line and jacks are designed to maintain a constant 50Ω impedance across the 2-30 MHz frequency range regardless of the number of couplers in use. Figure 4-2 shows the RF input wiring sequence in the equipment cabinet. Note that the RF interface assembly distributes the antenna signals vertically and does not proceed sequentially through the numbered subassemblies. The RF output and power distribution interface provides the remaining connections to the couplers. RF outputs from couplers connect via coaxial jacks on this interface to connectors atop the equipment cabinet or to an internal transfer panel, when provided with equipment. DC power and remote indicator connections are made to the individual couplers via a power connector mounted in this interface assembly at each coupler location. Figure 4-3 shows typical configuration of both wiring interfaces.

c. PLUG-IN ANTENNA COUPLERS. - All antenna couplers included in a coupler group are functionally identical, regardless of frequency range. Each coupler consists of a capacitor-tuned four section resonant filter network, protected against input overload by a solid-state PC-172 overload protection circuit. A white noise

TABLE 4-1

SYSTEM TROUBLESHOOTING PROCEDURES

SYMPTOM	PROBABLE CAUSE
Couplers are all inoperative; no overload indicators functioning.	Power supply inoperative
Little or no RF output from all couplers in a group. Overload indicators function normally. *	Antenna input shorted RF connectors dirty, broken or not mating properly
Little or no RF output from all couplers in a group. Overload indicators function normally.	Dummy load open or incorrectly connected Shorted capacitor C1, C2, or C11 in antenna coupler located in position A1.
All couplers operate normally but overload indicators do not function.	Power supply +28 vdc output inoperative.
Little or no RF output from more than one coupler. Other couplers in the same group function normally. All overload indicators function properly.	A short circuit to ground exists in the RF transmission line.

*NOTE: For purposes of Tables 4-1 and 4-2 normal operation of overload indicators is construed as follows: Overload lamps illuminate when coupler mode switch is in DECOUPLED or NOISE GEN DECOUPLED position. Lamps are extinquished in the COUPLED position. Unused antenna couplers should be in DECOUPLED mode.

TABLE 4-2

ANTENNA COUPLER TROUBLESHOOTING PROCEDURES

SYMPTOM	PROBABLE CAUSE
Little or no RF output; Overload indicator functions normally.	Relay K1 contacts defective (closed) Output cabling defective Coupler badly misaligned Tuning components damaged Diode CR5 in PC-172 shorted
Little or no RF output; local and remote overload indicator lamps remain illuminated in all switch positions.	Defective PC-172; Q16, Q14, or Q17 shorted collector to emitter; Q11, Q15 Q18 or Q19 open Amplifier circuits in PC-172 oscillating; Switch S1 faulty (open).
Little or no RF output; local and remote indicator lamps do not illuminate in any switch position.	Plug P4 improperly seated. 18 vdc wiring to coupler broken. Capacitor C2 or C21 in PC-172 shorted.
Overload indicator functions normally but tuned frequency of coupler does not agree with indicator dial setting.	Coupler not properly aligned. Dial shaft position slipped.
RF output normal but local and remote overload indicators do not function.	Plug P4 improperly seated +28 vdc wiring to coupler broken Q12 in PC-172 shorted; Q13 or R37 open.
Input signals of substantially less (10 to 47 db) than 0. 8 volt rms cause the overload circuit to oscillate at approximately 1 Hz.	Transistor Q2 or Q7 in PC-172 shorted. Any component in collector cirucit of Q2 or Q7 shorted to ground.
Input signals of 0. 8 volt rms or greater cause the overload circuit to oscillate at approximately 1 Hz.	Transistor Q2 or Q7 in PC-172 open. Also open in collector circuit of Q2 or Q7.
RF output normal, in both coupled and Decoupled positions overload indicators function normally, however RF overload on input fails to initiate overload mode of operation.	RF amplifier, detector, or Schmitt trigger circuits in PC-172 defective Q11 shorted; Q16 open.

TABLE 4-2. ANTENNA COUPLER TROUBLESHOOTING PROCEDURES (CONT).

SYMPTOM	PROBABLE CAUSE
RF output normal; in Decoupled mode overload indicators function properly and indicate when RF overload is present, however, RF output is not attenuated when overload indicator is illuminated.	Relay K1 contacts not making properly when relay coil is deenergized.
Coupler operation normal but recovery time of overload circuit is appreciably greater than 1.0 second.	R48 in PC-172 drifted high in value Transistor Q18 or Q19 defective.
Coupler operation normal but recovery time of overload circuit is appreciably less than 0.8 second.	Leakage across C12 in PC-172 Transistor Q18 or Q19 defective Resistor R48 low in value.
Coupler operation normal in all respects but noise generator does not function when mode switch is depressed to NOISE GEN DECOUPLED position.	Transistors Q8, Q9, Q10 or diode CR3 in PC-172 defective. Switch S1 defective. NOISE probe in resonator #2 shorted or improperly positioned.

generator used for tuning the equipment is located on the PC-172 board. Figure 4-4 illustrates functional composition common to CU-1799, 1800, 1801, and 1802 antenna couplers.

Input signals, applied to the first resonator section, are tuned, then inductively coupled to the next section via a coupling window cut into the section enclosure. The tuned output from resonator 2 is coupled to resonator 3 by means of a common inductive coupling link in resonator section 2. The output of resonator 3 is coupled through a second coupling window to resonator section 4. The output from section 4 connects to RF output plug P3. A shutter in each coupling window permits adjustment of the amount of coupling between sections 1 and 2 and between sections 3 and 4. The PC-172 protective circuit consists of five solid-state amplifier stages and a detector used to trip a Schmitt trigger and a delay multivibrator which in turn operate a protective relay in the first resonator section. Outputs from the PC-172 also feed lamp driver circuits which light local and remote overload indicators. The PC-172 receives RF input signals from a capacitive probe in resonator section 4.

Additional overload protection is provided by a spark gap connected between the first resonator coil and chassis ground.

d. POWER SUPPLY, PP-4846/SRA.

(1) GENERAL.-The PP-4846/SRA Power Supply is used in all coupler groups to provide the dc voltages required for operation of all antenna couplers within a given group. Two dc outputs are available:+28 vdc at 2.0 amperes, unregulated, for

operation of local and remote overload indicator lamps, and a regulated +18 vdc at 1.0 ampere used to power the PC-172 overload protection and white noise generator circuits located in each antenna coupler. Completely self-contained in a single plug-in module, the power supply is designed to mount in the lower right equipment compartment (location 1A21) in all coupler groups.

(2) FUNCTIONAL DESCRIPTION. - Figure 4-5 illustrates functional composition of the power supply. AC line power enters the supply enclosure via jack J1 and is applied via fuses F1 and F2 and switch S1 to the primary winding of transformer T1. The output of T1 is rectified and filtered to provide an unregulated + 28 vdc output, applied through fuse F3 to jack J1. DC output from the filter is also applied to a series regulator transistor, the operating point of which is controled by a PC-175 regulator control circuit, adjusted to maintain a constant +18 vdc output. Output from the series regulator is applied to jack J1.

e. RADIO SIGNAL DISTRIBUTION PANELS SB-3332/SR AND SB-3333/SR.

(1) RADIO SIGNAL DISTRIBUTION PANEL SB-3332/SR. - This panel is part of the AN/SRA-49 and AN/SRA-50 Antenna Coupler Groups, and consists of 49 RF jacks mounted on a removable rack panel. See Figure 2-7.

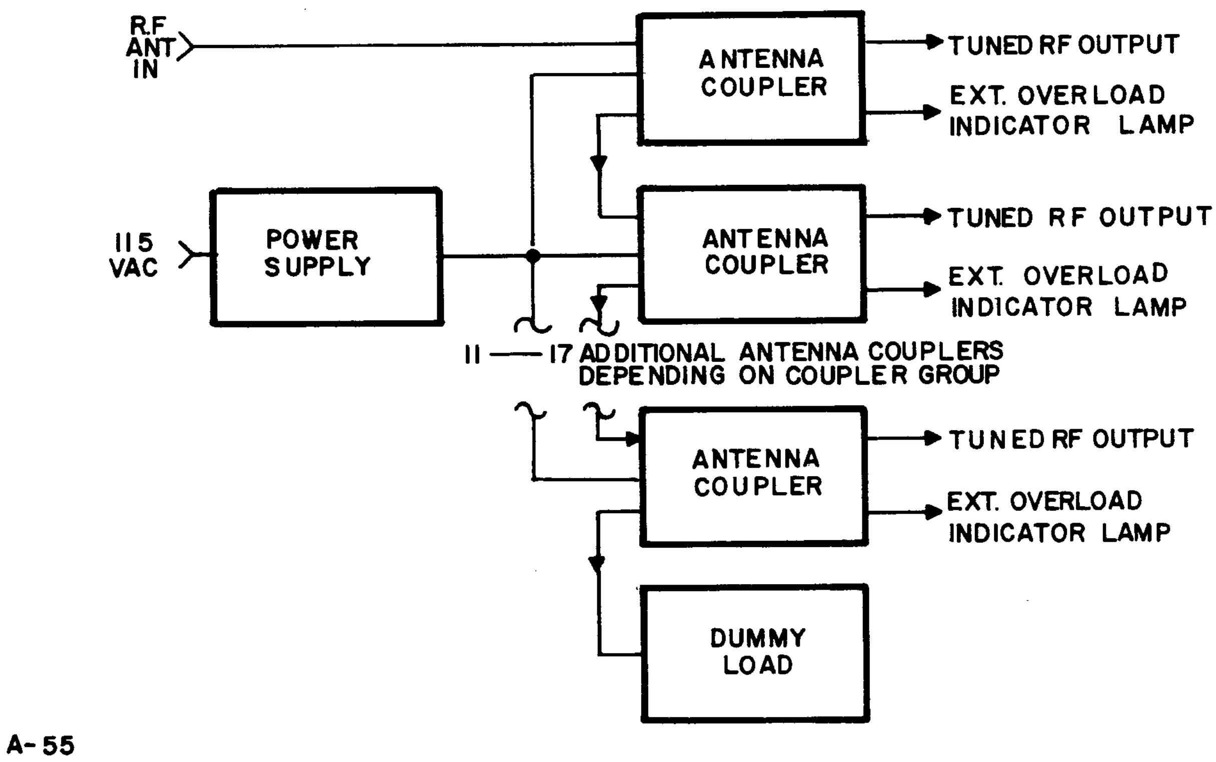


FIGURE 4-1. SYSTEM BLOCK DIAGRAM - ANTENNA COUPLER GROUPS AN/SRA-38, -39, -40, -49, AND -50

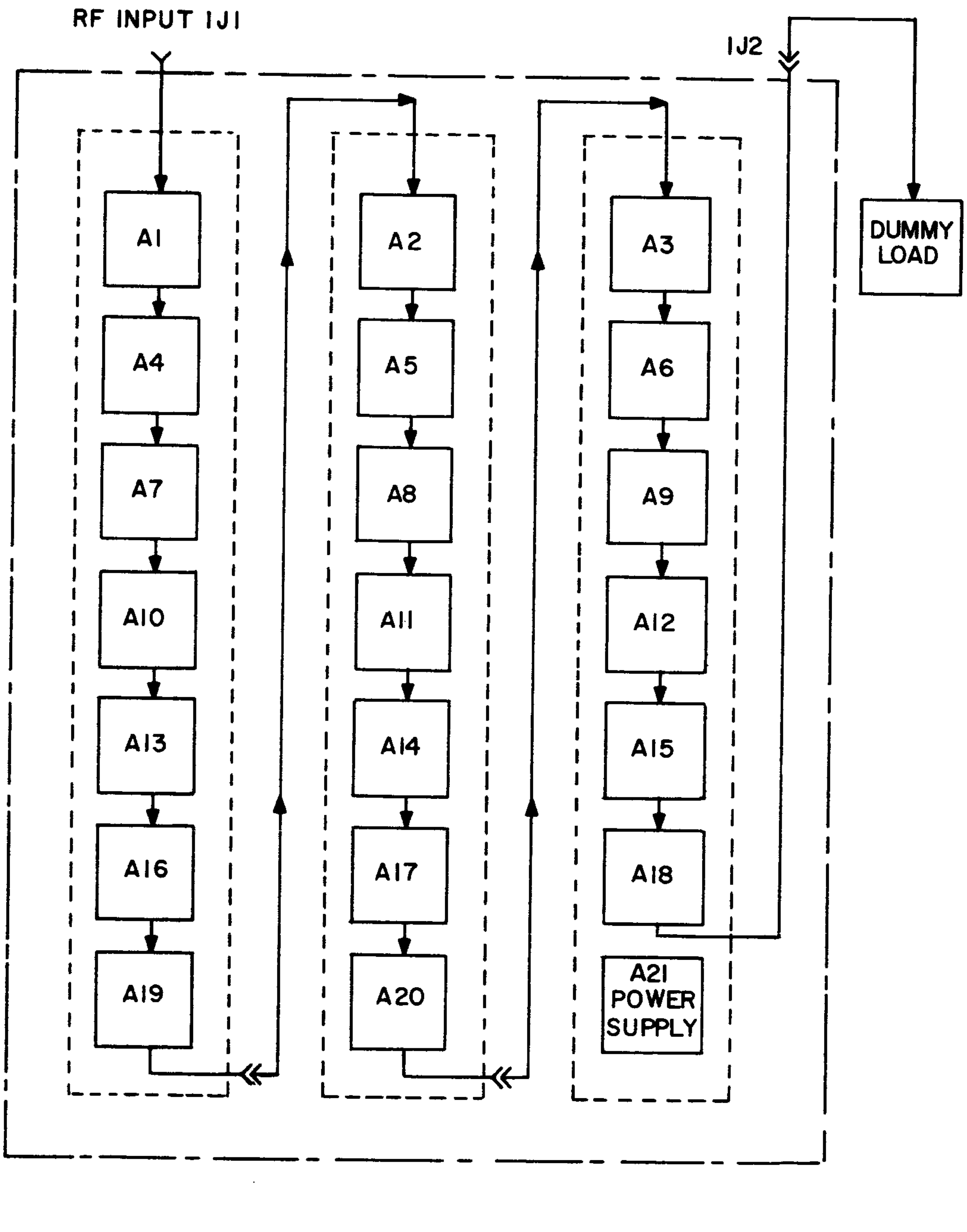


FIGURE 4-2. RF INPUT WIRING SEQUENCE, EQUIPMENT CABINET

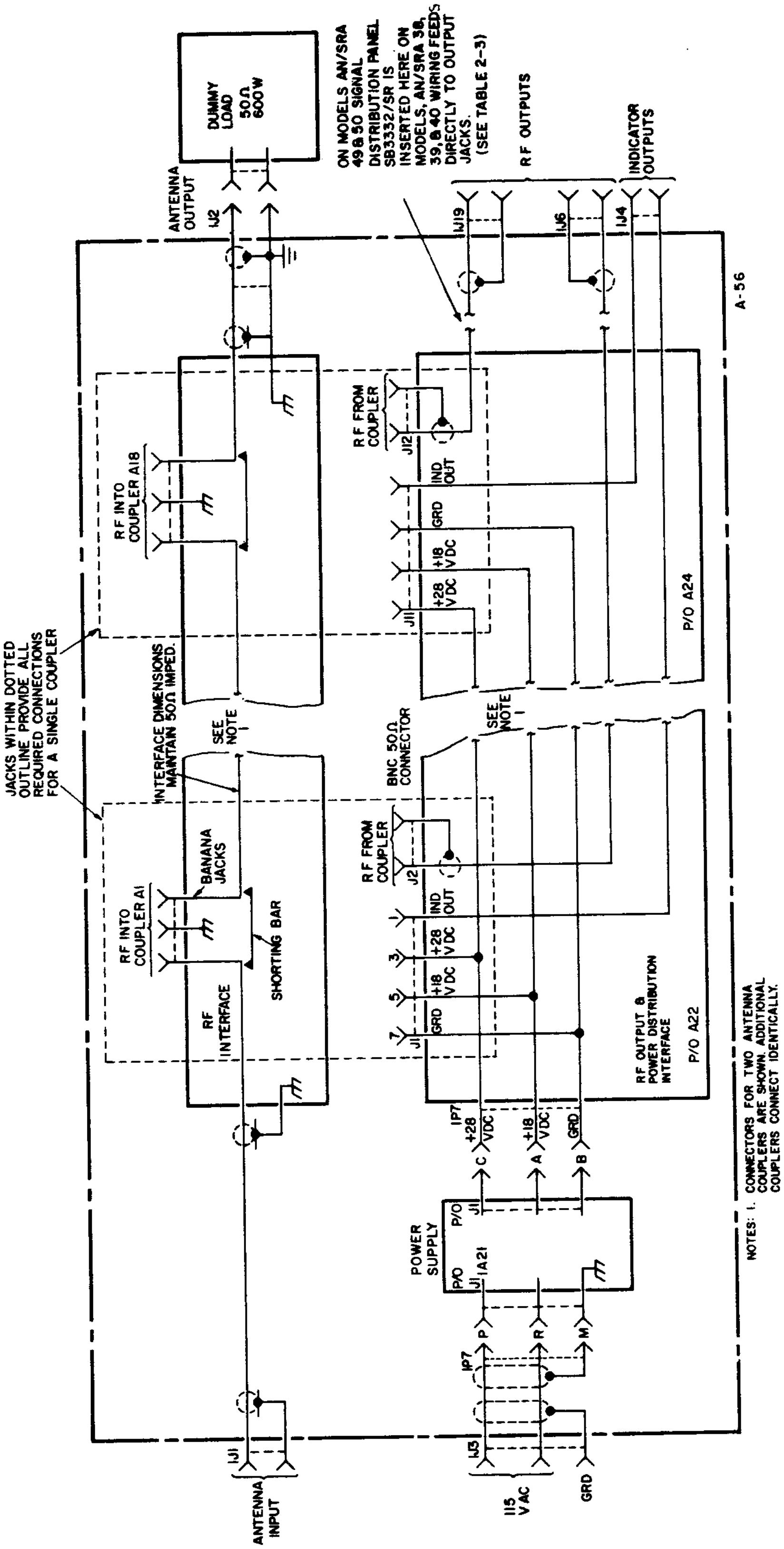


FIGURE 4-3. SIMPLIFIED WIRING DIAGRAM-EQUIPMENT CABINET

In the AN/SRA-49 and 50 Antenna Coupler Group, 20 jacks connect to antenna coupler outputs and 20 are connected to the coupler group output panel for connection to receivers. Nine spares are provided. Each coupler group is delivered with sufficient patch cords to make all required interconnections.

(2) RADIO SIGNAL DISTRIBUTION PANEL SB-3333/SR. -This panel, designed for use with the AN/SRA-38, 39, and 40 antenna coupler group system, contains a total of 116 RF jacks. Sixty jacks are available for connection to shipboard receivers. Patch cords are supplied with the equipment to permit interconnecting coupler outputs and receiver inputs. The SB-3333/SR Distribution Panel is not supplied in a rack or equipment cabinet and must be mounted in a GFE enclosure.

4-4. DETAILED CIRCUIT DESCRIPTION.

a. ANTENNA COUPLERS CU-1799, 1800, 1801, and 1802.

(1) GENERAL. -Figure 4-6 illustrates the schematic diagram for antenna couplers CU-1799, 1800, 1801 and 1802. While all couplers employ essentially the same circuitry, differing component values are required for operation over the four different frequency ranges. Table 4-3 gives component values used on all couplers.

(2) RF CIRCUITS. -Each coupler functions as a four stage tuned filter designed to pass a narrow band of frequencies while rejecting all other input signals. Resonant frequency of an antenna coupler is varied by means of a front panel FREQUENCY control which simultaneously tunes an air-variable capacitor for each of the four resonator sections. Typical response curve for a properly aligned coupler is shown in Figure 5-4. RF circuits function as follows.

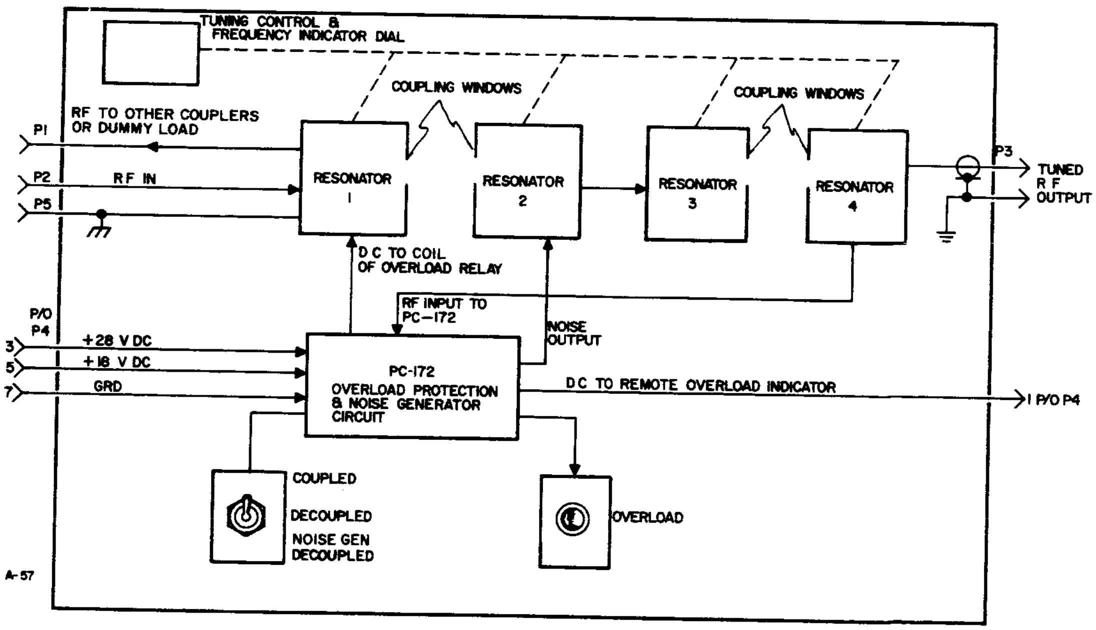


FIGURE 4-4. FUNCTIONAL BLOCK DIAGRAM, ANTENNA COUPLERS CU-1799, 1800, 1801, AND 1802/SRA

(a) RESONATOR NO. 1

Input signals enter the first resonator stage via plug P1 and are applied to inductor L1. Capacitors C1, C2 and C11 operate in conjunction with L1 to simulate a section of 50 ohm transmission line when the coupler is in the decoupled mode of operation or tuned off frequency. Signals are inductively coupled from L1 to inductor L2 which, together with capacitors C3 and C4, functions as a series resonant filter circuit. Normal tuning of the resonant frequency is accomplished by varying capacitor C4, mechanically geared to the front panel FREQUENCY control knob and indicator dial. Trimmer capacitor C3, which adjusts the resonant frequency of the section to exact operating frequency of the coupler as shown on the FREQUENCY indicator dial, is used only for alignment purposes.

The first resonator also contains the following provisions for suppressing high input voltages in the coupler.

1. SURGE PROTECTOR E1. - Connected between the high side of L2 and ground, E1 provides spark gap protection against high voltages during the 2.0 ms required for protective relay K1 to operate after an overload is detected. The surge protector is gas filled and can stand high currents for short intervals. Voltage rating for the spark gap is 800 volts and maximum current 35 amps.

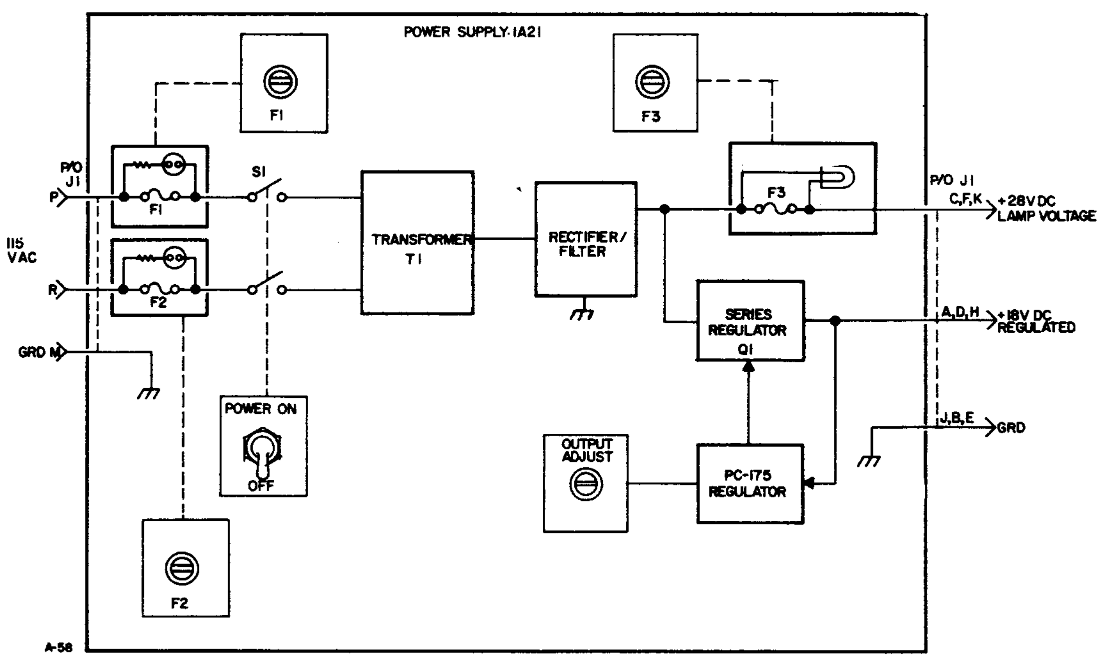


FIGURE 4-5. FUNCTIONAL BLOCK DIAGRAM, POWER SUPPLY PP-4846/SRA

2. RELAY K1. - Normally Closed contacts of relay K1 ground the high side of inductor L 2 when the relay coil is de-energized thereby attenuating input signals in the first resonator by approximately 40 db. Control circuits for K1 are located on the PC-172 Overload Protection Circuit discussed in detail in Paragraph 4-4a(3).

(b) RESONATOR NO. 2. -RF signals from L2 are coupled to inductor L3 and L4 connected in series in the second resonator via a coupling window cut into the side of the resonator enclosure. An adjustable shutter in the window permits varying coupling between resonator sections. This window is adjusted at the factory for optimum coupling and should not require readjustment in the field. Capacitor C6, geared to the FREQUENCY indicator dial and control, varies the operating frequency of the resonator while trimmer C5 is used for alignment purposes. A wire probe in the second resonator injects broadband noise from the PC-172 noise generator circuits into the antenna coupler when switch S1 is in the NOISE GEN DECOUPLED position.

(c) RESONATOR NO. 3. -Outputs from the second resonator feed from the high side of inductor L4, directly to L5 in the third resonator. Here, capacitor C7, geared to the FREQUENCY control, adjusts operating frequency while trimmer C8 provides alignment adjustment.

(d) RESONATOR NO. 4. -Window coupling, identical to that employed between sections 1 and 2, transfers signals from L5 to inductor L6 in Section 4. Capacitor C9 geared to the FREQUENCY control adjusts operating frequency; trimmer capacitor C10 is used for alignment. Inductors L6 and L7, connected as a resonant impedance transformer, provide a 50 ohm output impedance at coaxial connector P3. A capacitive probe in the fourth resonator provides input signals to the PC-172 Overload Protection Circuit.

(3) PC-172 OVERLOAD PROTECTIVE CIRCUIT.

(a) GENERAL. - Overload protection and noise generator circuits located on the PC-172 printed circuit board function independently and share no common circuit elements. Figure 4-7 is a functional block diagram while Figure 4-8 is a schematic diagram of the PC-172 circuit board. Refer to paragraph 3-1c for overload information.

(b) OVERLOAD PROTECTIVE CIRCUIT. -This circuit provides a means of sensing and immediately attenuating overloading input signals at the tuned frequency of an antenna coupler by de-energizing protective relay K1 in the first resonator section. In order to sense both the beginning and end of an overload condition, gated amplifier stages are used which provide increased gain during overload to compensate for the attenuation introduced by relay K1. When input overload ceases, a delay circuit maintains the overload condition for an additional 900 ms. Lamp driver circuits are provided for external display of coupler operating mode.

1. COMPOSITION. The following subcircuits comprise the overload protective circuit.

a. GATED WIDEBAND AMPLIFIER. -The wideband amplifier consists of an emitter-follower input stage followed by a three stage gated-gain amplifier and a gated-gain peaking amplfier. RF input from the capacitive prove in the fourth resonator of the antenna coupler is applied to emitter-follower transistor Q1. Capacitor C1 in the base circuit of Q1 adjusts the input level and hence the firing point of the overload circuit. The output from Q1 drives amplifier Q3, the gain of which is switched by gate transistor Q2. When Q2 is "off", the gain of Q3 is determined by the sum of resistances R9 and R10 in parallel with R7. When Q2 is turned on, resistor R10 is by-passed, and the gain is set by the resistance of R9. The outputs at the collector of Q3 is coupled directly to the base of amplifier transistor Q4 which in turn drives emitter-follower transistor Q5. A negative feedback loop composed of RC network C7 and R11 injects a signal at the emitter of Q3. Amplifier gain at the output of Q5 is approximately 6 db with Q2 open and 43 db when Q2 is switched on. The signal is then applied to peaking amplifier Q6, the gain of which is controlled by gate transistor Q7. When Q7 is "off", gain of the peaking amplifier 0 db;gain with Q7 turned on is 10 db. Since this amplifier must operate over a frequency range of 2-30 MHz, capacitors C13 and C14 are included to increase high frequency gain when Q7 is switched on.

b. DETECTOR/VOLTAGE DOUBLER. -Diodes CR1 and CR2, resistor R38, and capacitor C11 form a detector/voltage doubler circuit used to rectify RF outputs from transistor Q6.

c. SCHMITT TRIGGER. -DC voltages from the voltage doubler are applied to the base of transistor Q14, which, together with transistor Q15, forms a Schmitt trigger circuit. With no input signal applied Q14 is biased "off" while Q15 remains "on". When the dc level at the base of Q14 exceed 1.5 volt, the circuit changes state and Q14 turns "on", turning "off" transistor Q15. The circuit remains in this state until input voltage falls below the 1.5 volt threshold level. Output from Q15 is applied to the bases of gate transistors Q2 and Q7 and to the base of inverter transistor Q16.

d. INVERTER. Transistor Q16 functions as an inverter, providing an output which is 180° out of phase with the input signal. Normally Q16 is biased to cutoff through Q15. When an overload occurs, Q16 turns "on".

e. "AND" GATE. -Diodes CR6 and CR9 and resistor R33 function as an "AND" gate which forward-biases relay driver transistor Q11 when both inputs to the gate are "high" (normal operation). During overload, the cathode of CR6 is clamped to ground through Q16, and forward drive is removed from Q11. The second leg of the gate, CR9, connects to a delay multivibrator which operates for 900 ms after the overload is removed.

f. DELAY MULTIVIBRATOR. -Transistors Q17, Q18, and Q19 form a delay multivibrator circuit driven by inverter transistor Q16. During normal operation transistors Q18 and Q19, connected in a Darlington configuration, are biased "on" through timing resistor R48. This biases Q17 off, maintaining a "high" level on the cathode of diode CR9. When an overload occurs and Q16 turns on, the resulting negative voltage transient applied to the base of Q17 via a differentiating circuit (capacitor C4 and resistor R46) has no effect on Q17, since it is already biased "off". When the overload is removed, the collector of Q16 rises and the resulting positive spike turns on Q17, which, in turn, cuts "off" transistors Q18 and Q19. Timing capacitor C12 then starts to charge through resistor R48 and Q17, until, after approximately 900 ms, the base voltage at Q18 is high enough to turn that transistor "on" causing the circuit to change state. During the 900 ms period when Q17 is on, the cathode of gate diode CR9 is clamped to ground, disabling relay driver Q11 for an additional 900 ms after the overload is removed.

g. RELAY DRIVER. -During normal operation, relay driver Q11, forward biased by and "AND" gate, provides a ground return path which energizes the coil of K1. When overload occurs, Q11 is cut off, the ground is removed from K1 and the relay is de-energized. Resistor R35 provides current limiting protection for Q11 and permits use of Q11 as an emitter-follower to drive a subsequent lamp driver circuit.

h. LAMP DRIVER. -Transistors Q12 and Q13 function as a driver for local and remote overload indicator lamps. During normal operation when relay driver Q11 is "on", Q12 is forward-biased, cutting off Q13 which in turn removes the ground return from the indicator lamps. During overload, when Q11 is "off", Q12 is cut off, turning on Q13, which provides a ground return causing overload illuminate. Resistor R37 provides overcurrent protection for Q13 and capacitor C22 supresses voltage transients.

2. OPERATION. - The overload protection circuit operates in any of three modes: Normal Operation, Overload or Recovery. These modes occur only in the sequence noted above. Operating states of various stages during the three operating modes are as follows:

a. NORMAL OPERATION. -During normal operation the RF amplifier portions of the protective circuit provide 6 db of gain. Q14 is "off" and Q15 "on", maintaining gain gates Q2 and Q7 is an "off" state. Q16 is cut off holding the cathode of CR6 "high". Simultaneously, Q18 and Q19 are "on" cutting off Q17 which holds the cathode of CR9 "high". With both inputs "high", and "AND" gate forward biases Q11 energizing relay K1. Q11 also turns on Q12 which in turn cuts off Q13 and the indicator lights are not illuminated.

b. OVERLOAD. When overload occurs, the incoming RF signal produces a dc output from the detector/voltage doubler in excess of 1.5 volt. This exceeds the trigger level of the Schmitt trigger, turning Q14 "on" which turns Q15 "off". Inverter Q16 is biased "on" clamping the cathode of CR6 in the "AND" gate to ground, which cuts off Q11 de-energizing relay K1. With Q11 off, Q12 is turned off turning on Q13 which activates the overload indicator lamps.

When relay K1 is de-energized, its contacts close and attenuate RF signals in the first resonator section approximately 40 db. Additional gain is therefore required in the amplifier circuit to prevent the overload circuit from releasing as the input voltage is attenuated. This extra gain is provided by by-passing resistor R10 and shunting resistor R19 through gain gates Q2 and Q7, turned "on" when Q15 turns "off". The gain of the amplifier is increased by approximately 47 db.

c. RECOVERY. When the overloading signal is removed, Q14 turns off, turning on Q15, which de-energizes the gain gates and reduces the gain of the amplifier by

47 db. Simultaneously, Q16 turns off and its collector and the cathode of CR6 in the "AND" gate go "high". The differentiated positive spike turns "on" Q17 in the delay multivibrator, which turns "off" Q18 and Q19 and clamps the cathode of CR9 in the "AND" gate to ground. Q17 remains "on" until the intrinsic 900 ms delay period is completed. Thus the relay driver, Q11, is disabled for an additional 900 ms after overload is removed. After this period, Q17 again turns "off", and the cathode of CR9 goes "high". With both inputs "high" the AND gate forward biases Q11, activating the relay to remove attenuation in the coupler's first resonator section. Q12 is "on", turning off Q13. The overload lights are disabled and the cycle is complete.

(c) NOISE GENERATOR. - Noise is injected into the coupler via a probe located in resonator number 2. The noise generator, enabled in the NOISE GEN DECOUPLED position of the coupler function switch, contains the following circuit stages.

1. NOISE CIRCUITS. - When + 18 vdc is applied to the circuit, Zener diode CR3 is biased by approximately 75μA producing broadband noise which is buffered and amplified by transistor Q8.

2. CASCADE AMPLIFIER. - The output of Q8 is amplified by transistors Q9 and Q10 connected as a cascade amplifier with a gain of approximately 30 db. Noise output from Q9 connects to a capacitive probe in the second resonator section.

b. POWER SUPPLY PP-4846/SRA.

(1) GENERAL. - Figure 4-9 illustrates the schematic diagram for the PP-4846/SRA power supply which powers all couplers in a given coupler group. The supply provides unregulated + 28 vdc and regulated + 18 vdc outputs and incorporates a potentiometer adjustment for varying the regulated output between 16.5 and 19.5 vdc.

(2) COMPOSITION. - The power supply consists of the following subcircuits.

(a) RECTIFIER/FILTER. - 115 vac line voltage is applied to the primary of transformer T1 via switch S1 and indicator fuses F1 and F2. The secondary of T1 feeds a full wave bridge rectifier consisting of diodes CR1 through CR4 . Output of the bridge connects to an RF filter circuit formed by resistor R1 and capacitor C1. +28 vdc from the filter feeds directly to the voltage regulator circuit and, via indicator fuse F3, to the unregulated +28 vdc output of the supply.

(b) VOLTAGE REGULATOR. - The voltage regulator consists of a chassis mounted series regulator transistor controlled by regulator circuitry mounted on a PC-175 printed circuit board (A1).

1. SERIES REGULATOR. - Outputs from filter are applied to the collector of Q1, the emitter of which connects through current sensing resistor R3 to the regulated output of the supply. Base drive to Q1 is controlled by outputs from the PC-175 regulator circuit.

2. PC-175 REGULATOR CIRCUIT. - The PC-175 Regulator Circuit consists of a two stage regulator, transistors Q1 and Q2, and a current limiter, transistor Q3.

Output voltage is set by potentiometer R2 which varies the base voltage on transistor Q1 in relation to the Zener referenced emitter voltage (Diode CR1 and resistor R3). Output voltage from Q1 is directly coupled to the compound Darlington series regulator circuit formed by transistor Q2 and chassis-mounted transistor Q1.

As the output load current increases, the output voltage and the base voltage of transistor Q1 decreases. This action reduces the drive voltage supplied to transistor Q1, thereby increasing the collector voltage. This forward biases Q2 which in turn increases forward drive to chassis mounted series regulator Q1, increasing the output voltage to compensate for the greater load current.

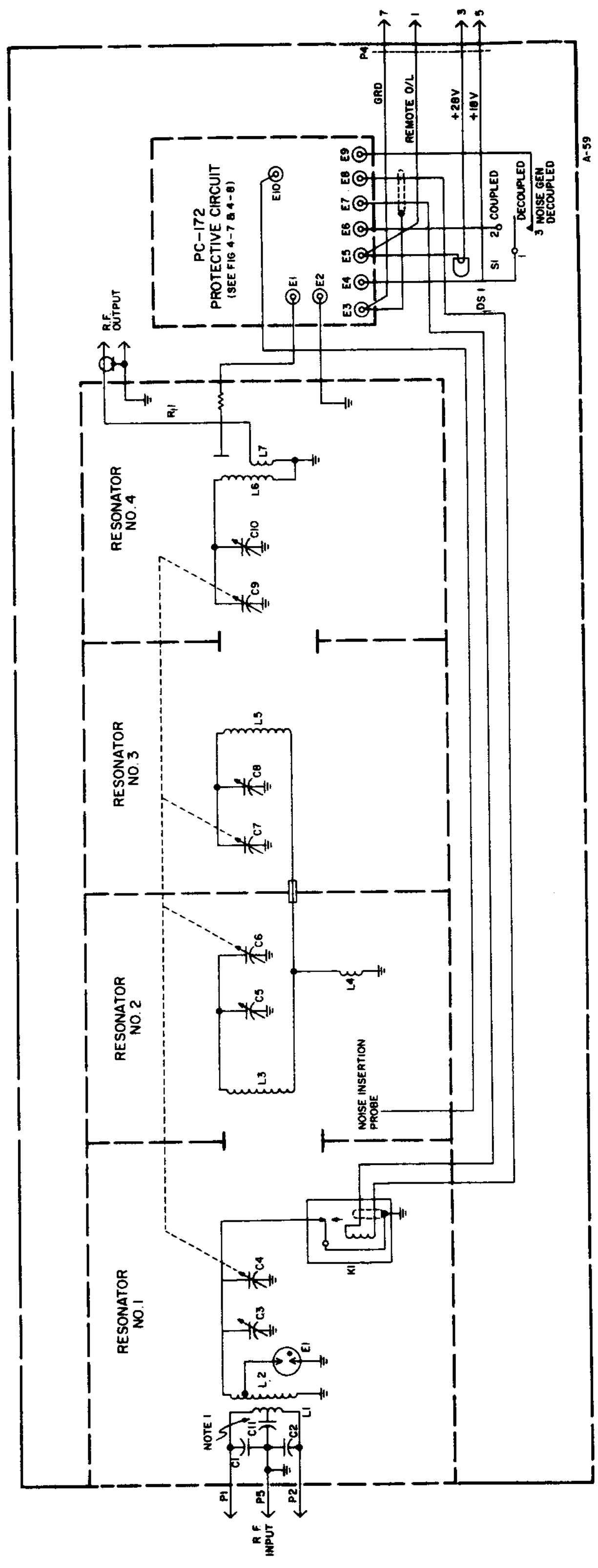
Conversely as the load current decreases, the output voltage tends to rise causing an increase in drive voltage at transistor Q1 decreasing the voltage applied to Q2 base and subsequently the output voltage at the emitter of series regulator Q1.

Current limiting is accomplished by transistor Q3, which receives an input directly proportional to the output current sensed across chassis mounted resistor R3. This voltage is applied between the base and emitter of transistor Q3.

As the output current exceeds approximately 1.2 amperes, transistor Q3 turns on clamping the voltage appearing at the base of Q2 toward ground even though the output voltage of transistor Q1 increases due to the increased load current. As the load current increases above the limit, transistor Q3 clamps the base voltage of Q2 lower until the output of Q3 is shorted and the collector voltage of Q1 approaches zero.

TABLE 4-3. PARTS IDENTIFICATION

REF DES	CU-1799/SRA	CU-1800/SRA	CU-1801/SRA	CU-1802/SRA
C1	39 pf	22 pf	36 pf	27 pf
C2	39 pf	22 pf	36 pf	27 pf
C3	1.6/8.5 pf	1.6/8.5 pf	1.6/8.5 pf	1.6/8.5 pf
C4	14/280 pf	14/280 pf	8/81 pf	8/81 pf
C5	1.4/9.2 pf	1.4/9.2 pf	1.4/9.2 pf	1.4/9.2 pf
C6	14/280 pf	14/280 pf	8/81 pf	8/81 pf
C7	14/280 pf	14/280 pf	8/81 pf	8/81 pf
C8	1.4/9.2 pf	1.4/9.2 pf	1.4/9.2 pf	1.4/9.2 pf
C9	14/280 pf	14/280 pf	8/81 pf	8/81 pf
C10	1.4/9.2 pf	1.4/9.2 pf	1.4/9.2 pf	1.4/9.2 pf
C11	39 pf	27 pf	Not Used	Not Used
DS1	MS25237-327	MS25237-327	MS25237-327	MS25237-327
E1	P&B 20-37110-4	P&B 20-37110-4	P&B 20-37110-4	P&B 20-37110-4
K1	P&B 03-13530	P&B 03-13530	P&B 03-13530	P&B 03-13530
L1	1 7/8 Turns	1 1/4 Turns	1 Turn	1 Turn
L2	27 1/2 Turns, 25 μh	13 3/4 Turns, 6 μh	11 Turns, 3.7 μh	6 Turns, 1.25 μh
L3	Same as L2	13 1/2 Turns, 6 μh	Same as L2	Same as L2
L4	2 1/4 Turns	1 Turn	1 Turn	1/2 Turn
L5	Same as L2	Same as L3	Same as L2	Same as L2
L6	Same as L2	Same as L2	Same as L2	Same as L2
L7	1 1/2 Turns	1 1/8 Turns	1 Turn	1 Turn



NOTES: 1. C11 and Center Tap to L1 are not used in CU-1801/SRA, CU-1802/SRA
2. See Parts Identification in Table 4-3.

FIGURE 4-6. SCHEMATIC DIAGRAM, ANTENNA COUPLERS CU-1799, 1800, 1801, AND 1802/SRA

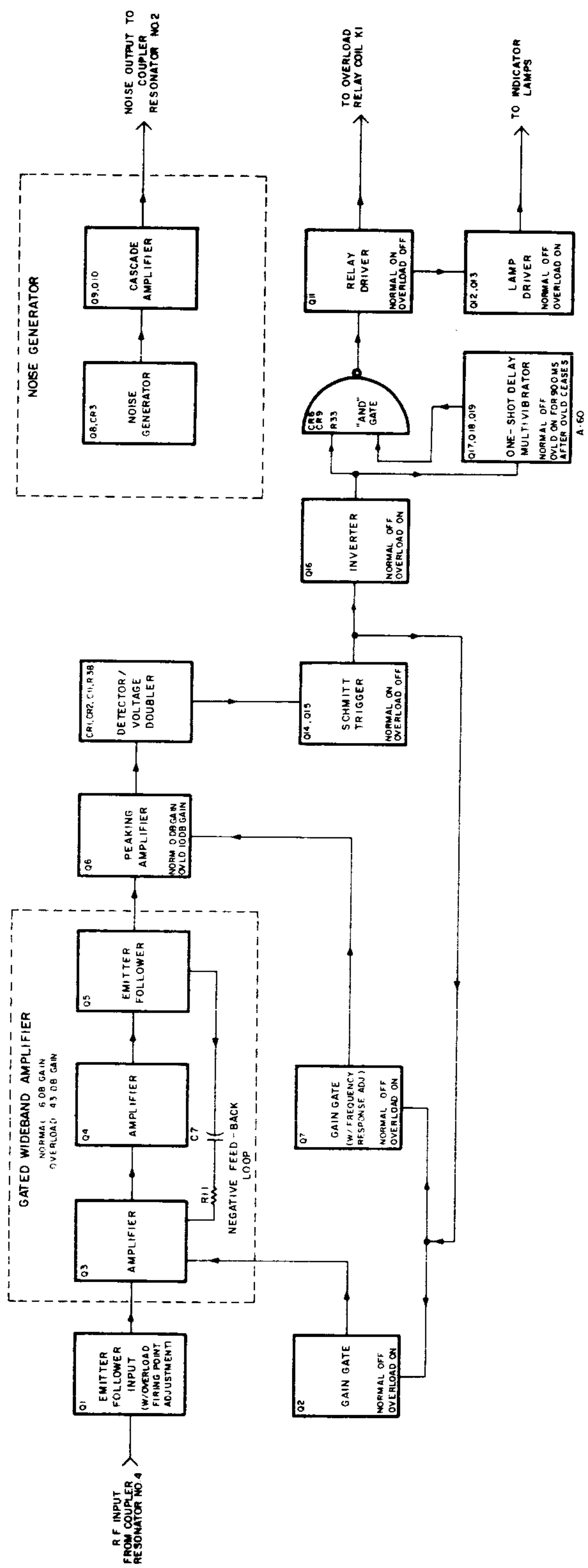


FIGURE 4-7. PC-172 OVERLOAD PROTECTION CIRCUIT, BLOCK DIAGRAM

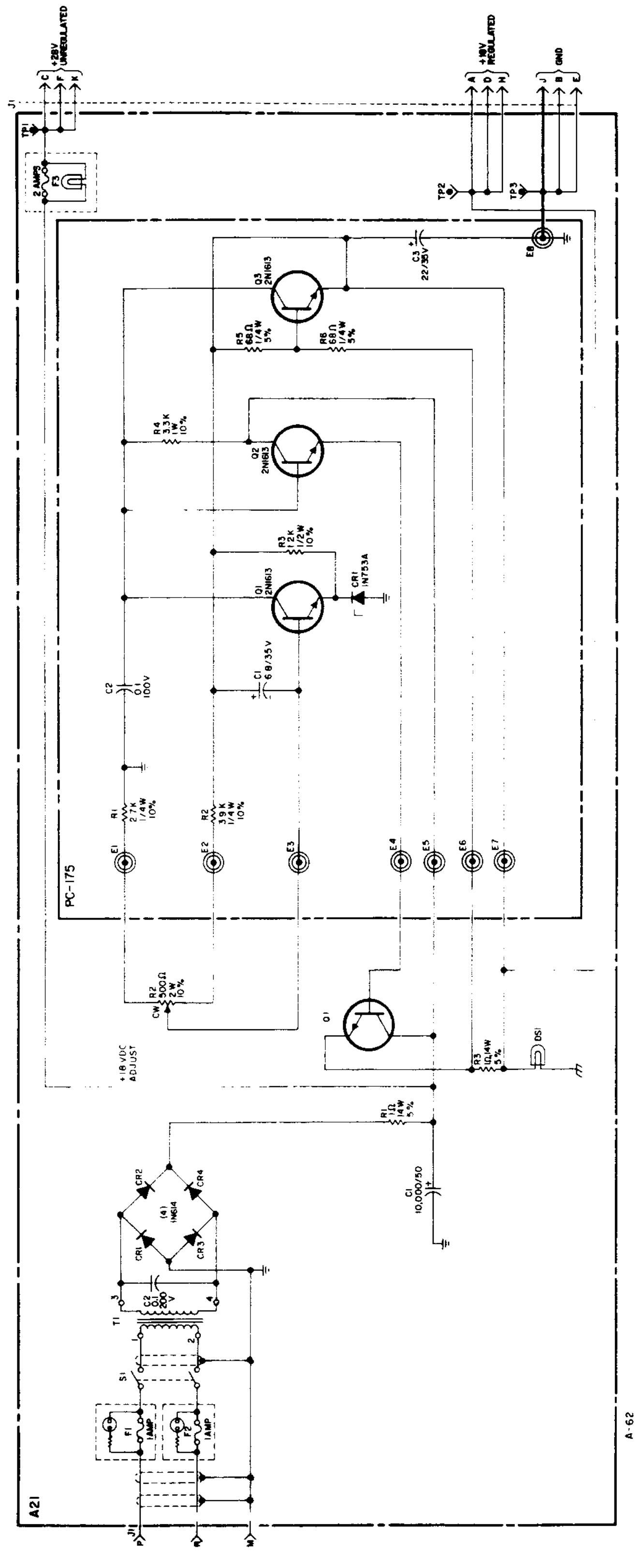


FIGURE 4-9. SCHEMATIC DIAGRAM - POWER SUPPLY PP-4846/SRA

TABLE 4-4

PC-172 RESISTANCE/VOLTAGE MEASUREMENTS TO GROUND (E3)

PROBE POINT	RESISTANCE	DC VOLTAGES			
		COUPLED NO-SIGNAL	COUPLED OVERLOAD	DECOUPLED NO-SIGNAL	NOISE GEN DECOUPLED
E1	3.2K	3.4	3.3	3.4	
E2	0	0	0	0	
E3	0	0	0	0	
E4	3.5K	18	18	18	
E5	18K	28	4	4	
E6	23K	18	18	0	
E7	23K	18	18	0	
E8	20K	1.1	18	0	
E9	9.1K	0	0	0	18
E10	10K	0	0	0	9.4
Q1 E	680	2.7	2.6	2.7	
B	3.2K	3.4	3.3	3.4	
C	4.5K	13	13	13	
Q2 E	0	0	0	0	
B	1.7K	.5	.8	.5	
C	7.5K	16.5	.1	16.5	
Q3 E	1K	1.9	1.8	1.9	
B	680	2.7	2.6	2.7	
C	7K	5.7	5.6	5.7	
Q4 E	1.2K	5.0	4.9	5.0	
B	7K	5.7	5.6	5.7	
C	5.6K	7.5	7.2	7.5	
Q5 E	2.2K	6.8	6.5	6.8	
B	5.6K	7.5	7.2	7.5	
C	3.5K	16.5	16.5	16.5	
Q6 E	1.5K	6.0	5.9	6.0	
B	2.2K	6.8	6.5	6.8	
C	4.2K	14.5	13.0	14.5	
Q7 E	0	0	0	0	
B	2.8K	.5	.7	.5	
C	520	2.0	.2	2.0	
Q8 E	0	0	0	0	0
B	∞	0	0	0	.7
C	10K	0	0	0	14.0
Q9 E	15K	0	0	0	3.5
B	2K	0	0	0	4.2
C	10K	0	0	0	9.4
Q10 E	110	0	0	0	.3
B	4.5K	0	0	0	1.0
C	15K	0	0	0	3.5

TABLE 4-4. PC-172 RESISTANCE/VOLTAGE MEASUREMENTS TO GROUND (E3) (CONT.)

PROBE POINT	RESISTANCE TO GRD	DC VOLTAGES			
		COUPLED NO-SIGNAL	COUPLED OVERLOAD	DECOUPLED NO-SIGNAL	NOISE GEN DECOUPLED
Q11 E	91	.8	0	.1	
B	6.8K	1.7	.4	.9	
C	20K	1.1	18	0	
Q12 E	0	0	0	0	
B	91	.8	0	.1	
C	6.5K	.1	.7	.7	
Q13E	0	0	0	0	
B	6.5K	.1	.7	.7	
C	18K	28	.2	.2	
Q14 E	220	.9	1.2	.9	
B	27K	0	2.0	0	
C	5K	12	1.3	12	
Q15 E	220	.9	1.2	.9	
B	2K	1.6	.8	1.6	
C	1.8K	1.0	4.4	1.0	
Q16 E	0	0	0	0	
B	1.8K	.4	.8	.4	
C	5.6K	16.5	.2	16.5	
Q17 E	0	0	0	0	
B	8.8K	.2	.2	.2	
C	7K	16.5	16.5	16.5	
Q18 E	1.5 Meg				
B	1.2 Meg	1.4	1.4	1.4	
C	7.5K	.9	.9	.9	
Q19 E	0				
B	1.5 Meg				
C	7.5 K	.9	.9	.9	

NOTES:

1. Resistance measured with Power Supply disconnected.
2. All measurements to ground, (E3) using a VTVM/Multimeter HP 410B.
3. All collector resistance measurements taken on the R x 1K scale. When measuring transistor circuits the polarity and scale setting of the ohmmeter affects the readings as the transistors exhibit resistances that depend on the polarity and applied voltage.
4. DC Voltages measured with +18 v and 28 v power supply voltages applied.

Section 5

MAINTENANCE

5-1. FAILURE REPORTS AND PREFORMANCE AND OPERATIONAL REPORTS

Note

The Naval Ship Systems Command no longer requires the submission of failure reports for all equipments. Failure Reports and Performance and Operational Reports are to be prepared for designated equipments (refer to Electronics Installation and Maintenance Book, NAVSHIPS 900, 000) only to the extent required by existing directives. All failures shall be reported for those equipments requiring the use of Failure Reports.

5-2. PREVENTIVE MAINTENANCE

Preventive maintenance is intended to maintain the equipment in an operational status whenever it is needed. It includes a systematic routine of operational checks and inspections performed at regular intervals. Any fault, no matter how minor it appears, may trigger a catastrophic failure of the equipment when it is needed most. The preventive maintenance program described here will enable the equipment operator to detect such faults and avoid breakdowns by reporting potential causes of malfunctions to the proper maintenance personnel.

a. CHASSIS REMOVAL AND INSTALLATION

(1) CHASSIS WITHDRAWAL- Each antenna coupler and power supply is mounted in the coupler group cabinet on a slide rail located at the bottom center of the module. To withdraw a chassis for inspection or servicing, loosen the four captive screws, one at each corner of the front panel. Gently pull the chassis forward because there is no stop on the drawer slide.

(2) CHASSIS REMOVAL. - To remove a chassis from the cabinet, simply withdraw the chassis which separates from the slide mechanism.

(3) CHASSIS REPLACEMENT To reinstall a chassis in the cabinet, pull out the cabinet slide rail fully. Engage the chassis rail in the cabinet slide, and slide the chassis into the cabinet until the slide rail detent engages.

CAUTION

Serious damage to the plugs at the rear of each chassis or the jacks on the cabinet may result if force is used to mate them. Ensure that jacks and plugs are properly aligned before inserting chassis fully into cabinet. Slide the chassis fully into the cabinet and rotate the front panel locking screws fully cw to secure the chassis.

b. VISUAL INSPECTION

(1) GENERAL. -Remove each coupler unit and the power supply, in turn, and examine interior components for dust, dirt, or other foreign matter, and for moisture or other contaminants. Using a soft brush and lint-free cloth, carefully wipe the banana jacks and supporting insulators clean and dry as necessary.

(2) OVERHEATING. -Visually check printed circuit boards and other components for discoloration of resistor surfaces, blistering or bulging of encapsulated components, leakage of insulating compounds, or oxidation of metal-to-metal contacts.

Note

Should any sign of overheating be found, examine all components associated with the affected component to determine if the failure is isolated to that component. It is possible, for example, that a defective filter resistor may be caused by leakage in an associated capacitor. Replacement of such a capacitor before total failure will avoid equipment failure.

(3) MECHANICAL TIGHTNESS. - Ensure that all nuts, bolts, screws, and other fasteners are secure.

(4) WIRING. -Check all leads and patch cords for cracked or brittle insulation. Examine for breaks or worn areas. Be especially alert for the possibility of short circuits at jacks and plugs.

(5) CONTROLS. - Operate all switches to each position, observing for freedom of movement and positive action of springs or detents. Ensure that knob locks on all tuning knobs are operable, and that knobs rotate freely in the unlocked position.

(6) JACKS AND PLUGS. - Inspect the contact areas of all jacks and plugs for mechanical tightness and signs of deterioration or corrosion. Ensure that leads are secure.

c. LUBRICATION. -No lubrication procedures are prescribed for this equipment. The tuning gear train has permanently sealed bearings and operates with dry gears.

5-3. TEST EQUIPMENT AND SPECIAL TOOLS

Table 5-1 lists special tools and test equipment required to maintain and service antenna coupler groups.

5-4. ANTENNA COUPLER TESTS

a. GENERAL. -Procedures described in this section enable the service technician to determine performance characteristics of antenna couplers CU-1799/SRA, CU-1800/SRA, CU-1801/SRA and CU-1802/SRA.

b. DEFINITIONS. -The following parameters are pertinent to satisfactory coupler performance.

(1) FREQUENCY RANGE. - Minimum and maximum frequencies at which the coupler satisfactorily passes signals to a receiver.

(2) BANDWIDTH. - Difference between the minimum and maximum frequencies at which the coupler output signal is down 3 db from the frequency of maximum signal strength. When a signal lies between the upper and lower 3 db points it is said to be within the passband of the coupler.

(3) RIPPLE. - Variations of signal output within the passband referenced to the center frequency signal (Refer to Figure 5-9).

(4) DIAL CALIBRATION AND BACKLASH. - Accuracy and resettability of the FREQUENCY dial reading with respect to the actual center of the filter passband.

(5) INSERTION LOSS. - Power ratio at the receiver before and after the insertion of the coupler group in the transmission line.

(6) ISOLATION. - Attenuation at ± 5% of the center frequency.

(7) PROTECTIVE CIRCUIT TRIGGER LEVEL. - The minimum coupler output voltage required to trigger the PC-172 Overload Protection Circuit.

(8) PROTECTIVE CIRCUIT HOLD-IN TIME. - The length of time the protective circuit will remain actuated after the overload signal is removed.

(9) NOISE GENERATOR OUTPUT. - The noise signal strength at the output of the coupler in the NOISE GEN DECOUPLED mode.

c. MEASUREMENTS. - Accuracy of measurements will be influenced by the instruments used in the test setup. For best results a stable signal generator and a frequency counter should be used for input signals and a sensitive, stable RF voltmeter should be used for output readings. Allow a resonable amount of warm up time before making measurements.

(1) FREQUENCY RANGE MEASUREMENTS

(a) Connect the antenna coupler group and the test equipment as shown in Figure 5-1.

(b) Set the signal generator output frequency to F_2 (see Table 5-2).

(c) Connect test cables as in position 1.

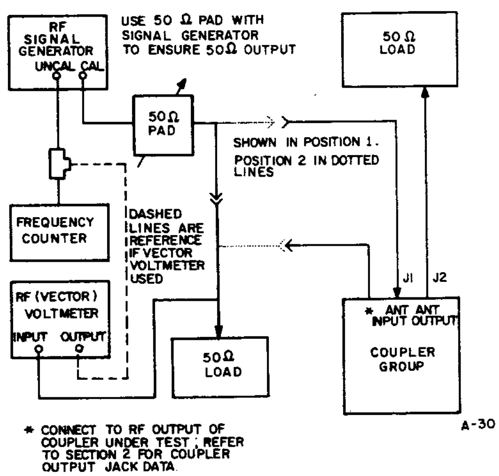


FIGURE 5-1. ANTENNA COUPLER TEST SETUP

TABLE 5-1

TEST EQUIPMENT AND TOOLS REQUIRED

QTY REQUIRED	NOMENCLATURE NAME	DESIG.	CHARACTERISTICS REQUIRED OR USE
1	Signal Generator	HP606B or equivalent	2.0 - 30 MHz range 50 Ω output
1	Signal Generator	SG-85/ URM-25	2.0 - 30 MHz range 50 Ω output
1	Sweep/Signal Generator	Telonic SM-2000 or equivalent	2.0 - 30 MHz range 50 Ω output
1	Vector Voltmeter	HP8405A or equivalent	2.0 - 30 MHz range
1	RF Millivoltmeter	HP411A or equivalent	2.0 - 30 MHz range
1	Electronic Counter	HP5245L or equivalent	2.0 - 30 MHz range
1	Oscilloscope	Tektronix Model 545A or equivalent	2.0 - 30 MHz range
1	Pre-amplifier	Tektronix Type CA	2.0 - 30 MHz range
1	Low Power Attenuator	Telonic TG 9050 or equivalent	50 ohm 84.5 db, 0.5 db increments
3	Terminations Feed Through	Tektronix 011-049 or equivalent	50 ohms 1 watt coupler termination
1	AC/DC Voltmeter	HP410B or equivalent	1 v ± 3% 2-30 MHz 115 vac ± 10%, 60 Hz 18 vdc ± 5% 32 vdc ± 25%
1	Receiver	R390A or R1051	2.0 - 30 MHz range
1	Power Supply (can use PP4846/ SRA in cabinet)	HP721A or equivalent	18 v 150 ma

TABLE 5-1.

TEST EQUIPMENT AND TOOLS REQUIRED (CONT)

QTY REQUIRED	NOMENCLATURE		CHARACTERISTICS REQUIRED OR USE
	NAME	DESIG.	
1	Power Supply Test Cable		For coupler power
1	Test Fixture	P&B 02-13501 (Fig. 5-43)	Coupler interface when removed from cabinet
1 ea.	Phillips Screwdriver Size 0, 1, & 2		For mounting Hardware in coupler
1	Bristol Screwdriver 6 - 32 setscrew 4 flutes 4" long		Gear Setscrews
1	Bristol Screwdriver 8 - 32 setscrew 6 flutes 4" long		Gear Setscrews
1	Slotted screwdriver 1/8" x 3" long		Trimmer Capacitors adjustment
1	Machinist awl 4" long		Tuning capacitor Shaft adjustment

TABLE 5-2

TEST FREQUENCIES

FREQ.	CU-1799/SRA	CU-1800/SRA	CU-1801/SRA	CU-1802/SRA
F_1	1.99	3.99	9.90	16.60
F_2	2.00	4.00	10.00	17.00
F_3	3.50	7.00	13.00	23.00
F_4	6.00	12.00	17.00	30.00
F_5	6.02	12.02	17.40	30.50

(d) Adjust signal generator output level for full scale reading on the 0 db scale of the RF voltmeter.

(e) Rotate coupler FREQUENCY control until it hits the stop at the low frequency end.

(f) Connect test cables as in position 2.

(g) Ensure that coupler under test is in the COUPLED mode and that all other couplers in the coupler group are either in the DECOUPLED mode or tuned to their respective upper frequency limits.

(h) Peak the output voltage as read on the RF voltmeter by varying the frequency of the signal generator in the vicinity of the low frequency limit.

(i) The output frequency of the signal generator will indicate the low frequency limit of the coupler and should be at least as low as that specified as F_1 in Table 5-2.

(j) Repeat steps (b) through (h) for the coupler high frequency limit.

(k) The signal generator output frequency will indicate the high frequency limit of the coupler and should be at least as high as that specified as F_5 in Table 5-2.

(2) BANDWIDTH AND RIPPLE MEASUREMENTS

(a) Connect the antenna coupler group and test equipment as shown in Figure 5-1.

(b) Connect test cables as in position 2.

(c) Ensure the coupler under test is in the COUPLED mode and that all other couplers in the coupler group are in the DECOUPLED mode.

(d) Set the signal generator output frequency to F_2.

(e) Tune the coupler in the vicinity of F_2 until a peak is obtained on the RF voltmeter.

(f) Adjust the signal generator output level for a convenient reference level (i. e. 0 db on the 0 db scale).

(g) Increase signal generator output frequency until reading on the RF voltmeter is down 3 db. Record this frequency.

(h) Repeat step (g) above but decrease the signal generator frequency. Record this frequency.

Note

If there are more than two frequencies which are 3 db down, then the ripple is excessive (see Figure 5-9) and the coupler should be aligned (Refer to paragraph 5-5).

(i) Subtract the frequency obtained in step (h) from that obtained in step (g). The result is the bandwidth of the coupler and should be about 1% to 1 1/2% of center frequency.

(j) Repeat steps (d) through (i) for F_3 and F_4.

(3) DIAL CALIBRATION AND BACKLASH

(a) Connect antenna coupler group and test equipment as shown in figure 5-1.

(b) Connect test cables as in position 1 and adjust signal generator output to 0 db on the 0 db scale with 10 db in the attenuator.

(c) Adjust the signal generator output frequency to F_2.

(d) Connect test cables as in position 2; ensure that the coupler under test is in the COUPLED mode and that all other units are DECOUPLED.

(e) With the frequency of the coupler set below F_2, slowly increase the frequency of the coupler until a peak is obtained on the RF voltmeter. Record FREQUENCY dial reading at which this peak occurs.

(f) Detune the coupler above F_2, then slowly decrease the frequency of the coupler until a peak is obtained on the RF voltmeter. Record this frequency.

(g) The backlash or difference in dial readings should be less than 1/10 the of the bandwidth of the coupler. Dial readings should both be within 2% of F_2.

(h) Repeat steps (b) through (g) for F_3 and F_4.

(i) If excessive backlash or improper readings exist, check for loose set screws in the gear trains or loosely mounted capacitors (Refer to paragraph 5-5o.)

(4) INSERTION LOSS

(a) Connect the antenna coupler group and test equipment as shown in Figure 5-1.

(b) Connect the test cables as in position 1 and ensure that the coupler under test is in the COUPLED position and that all other units are DECOUPLED.

(c) Set the signal generator output frequency to F_2 and set output level to 0 db on the 0 db scale of the RF voltmeter.

(d) Connect test cables as in position 2 and tune the coupler for maximum reading on the RF voltmeter. Record this reading.

(e) The difference in dB between readings obtained in steps (c) and (d) is the insertion loss of the coupler. Refer to Table 5-3 for typical readings. The allowable limits are ± 2 dB.

(f) Repeat steps (b) through (e) for F_3 and F_4.

(5) ISOLATION TEST

(a) Connect the antenna coupler group and test equipment as shown in Figure 5-1. Use the vector voltmeter for these tests.

(b) Connect test cables as in position 1.

(c) Ensure the coupler under test is in the COUPLED mode and that all other couplers in the coupler group are in the DECOUPLED mode.

(d) Set the signal generator output frequency to F_2.

(e) Adjust the signal generator output level for a convenient reference level (i. e. 0 db on the 0 db scale).

(f) Connect test cables as in position 2 and tune the coupler in the vicinity of F_2 until a peak is obtained on the RF voltmeter.

(g) Tune the generator to 5% above F_2 and 5% below F_2. Record the db losses indicated on the vector voltmeter. Make sure that the generator output level does not change from step (e).

(h) Repeat steps (d) through (g) for F_3 and F_4.

(i) Refer to Table 5-3 for typical isolation values. Allowable limits are ± 2 dB.

(6) PROTECTIVE CIRCUIT TRIGGER LEVEL AND HOLD-IN TIME.

(a) Connect the antenna coupler group and test equipment as shown in Figure 5-1.

(b) Connect test cables in position 1.

(c) Ensure that coupler under test is in the COUPLED mode and that all other units in the coupler group are DECOUPLED.

(d) Set the signal generator output level to approximately 1.0 volt at frequency F_3.

(e) Connect test cables as in position 2.

(f) Tune the coupler in the vicinity of F_3. Set the coupler at maximum output.

(g) Slowly increase the signal generator output level until the protective circuit actuates as evidenced by a drop in output voltage and an indication of the OVERLOAD indicator lamp. Overload should occur as the coupler output approaches one volt.

(h) Remove signal to coupler and observe the OVERLOAD indicator. It should remain illuminated for approximately one second. If it stays on for appreciably more than one second or goes out immediately, the circuit is not operating properly.

(7) NOISE GENERATOR TEST

(a) Connect the antenna coupler, receiver, and load as shown in Figure 5-2.

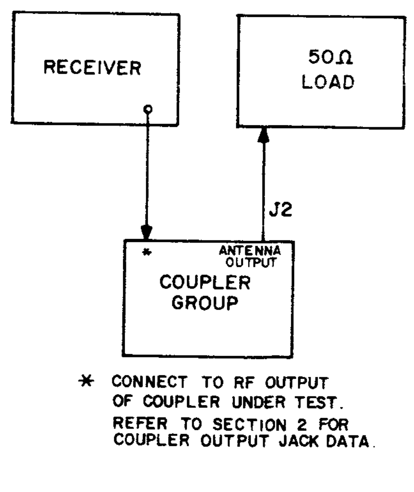


FIGURE 5-2. NOISE GENERATOR TEST SETUP

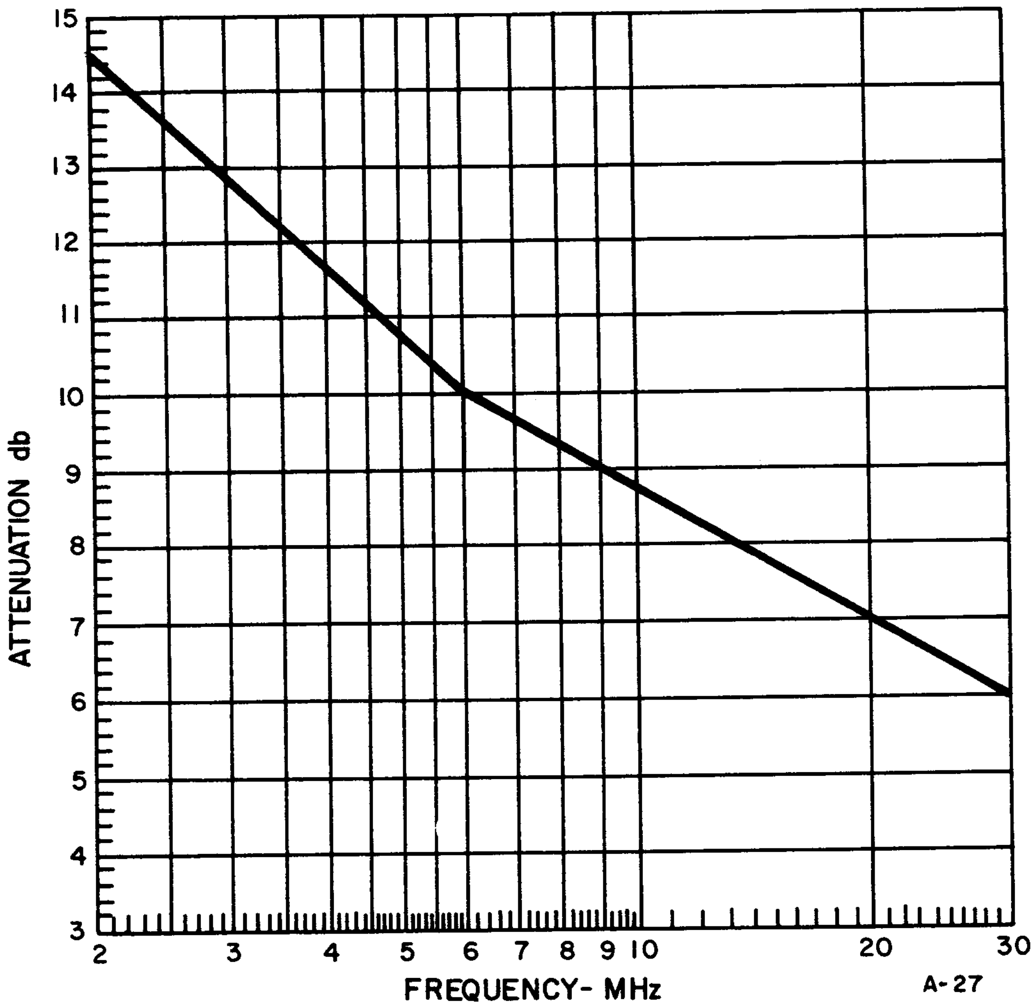


FIGURE 5-3. TYPICAL INSERTION LOSS VERSUS FREQUENCY FOR CU-1799, 1800, 1801 AND 1802/SRA ANTENNA COUPLERS

(b) Tune the receiver to F_3 and set RF gain so that background noise is discernable in speaker or phones.

(c) Set the coupler FREQUENCY dial to F_3.

(d) Depress the coupler mode switch to the NOISE GEN DECOUPLED position while observing the output of the receiver.

(e) Noise level on receiver should increase greatly. While holding the mode switch in NOISE GEN DECOUPLED position adjust FREQUENCY setting slightly until greatest noise level is obtained. Receiver and coupler frequency dial settings should agree.

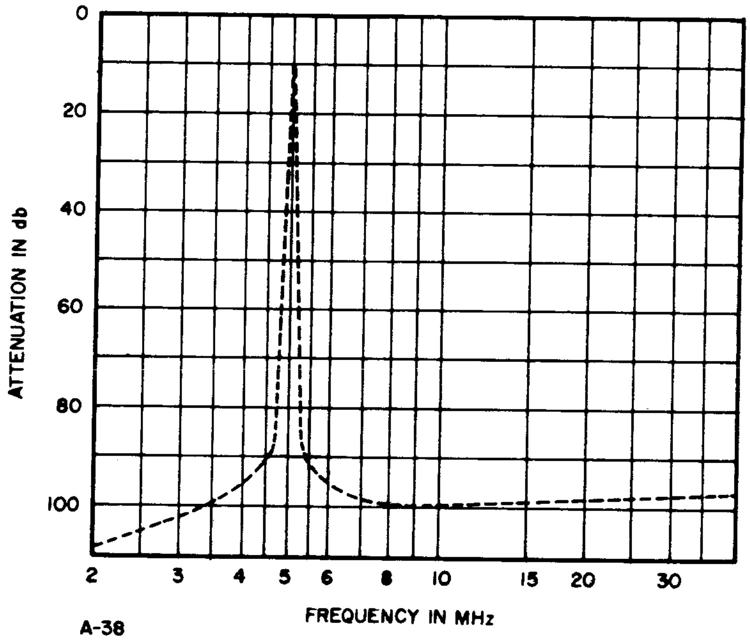


FIGURE 5-4. TYPICAL ANTENNA COUPLER RESPONSE CURVE (COUPLER TUNED TO 5 MHz)

TABLE 5-3

INSERTION LOSS AND ISOLATION VERSUS FREQUENCY

ANTENNA COUPLER	MEASURED FREQUENCY MHz	TYPICAL INSERTION LOSS (DB)	TYPICAL ISOLATION
CU-1799/SRA	2.00 3.50 6.00	14.5 12.3 10.0	80.0 74.5 69.0
CU-1800/SRA	4.00 7.00 12.00	11.7 9.7 8.3	73.0 68.0 63.0
CU-1801/SRA	10.00 13.00 17.00	8.8 8.1 7.4	64.5 62.0 59.0
CU-1802/SRA	17.00 23.00 30.00	7.4 6.7 6.0	59.0 56.5 54.0

NOTE: The curve in Figure 5-3 shows the typical center frequency insertion loss for all frequencies from 2 to 30 mc.

5-5. ALIGNMENT AND ADJUSTMENT PROCEDURES

a. GENERAL

The antenna coupler is a four stage filter, the characteristics of which are determined by the circuit constants. The amplitude frequency response curve of the filter is influenced primarily by the co-efficient of coupling (K) between adjacent resonators, the Q of the resonant LC circuits and the tuning of the resonant frequency (f_o) of each resonator

(1) The co-efficient of coupling between adjacent resonators is held within operating limits by the mechanical tolerances of the structure and components. There is a limited adjustment of coupling between resonators #1 and #2 and resonators #3 and #4 by means of the sliding curtain in the window opening between sections. In practice, these curtains should be fully extended outward and have been set in this position at the factory.

(2) The Q of the resonator elements is determined by the choice of components in the design. Poor solder connections, loose grounds or any "lossy" element in the LC circuit can cause a degradation in Q and a consequent impairment of the filter characteristics.

(3) The last item, tuning, is therefore the only major adjustment that can be used to obtain the desired response curve. This alignment procedure will outline approved methods to use in obtaining the proper filter characteristicss throughout the frequency range of each coupler.

(4) Proper alignment of the antenna couplers is obtained by standard alignment techniques. When using a sweep generator, adjust the output at the high and low frequency ends for maximum output and symmetrical waveform. Because adjacent resonators interact with each other when tuned, it is necessary to repeat the sequence of adjusting each resonator two or three times. The coupler should track properly throughout the tuning band if the alignment is followed as outlined in this section.

(5) Since adjustment has been made at the high and low frequency ends of the coupler frequency band, it is necessary to check the alignment throughout the range. This check can be accomplished quite easily with the use of a sweep generator and therefore alignment should be attempted only when such equipment is available. If a sweep generator is not available adjustments can be accomplished with a signal generator, however, this method can result in proper alignment at the end points with improper alignment in mid-band. Checks should be made at several points in mid-band if this latter method is used.

b. DETAILS

(1) Alignment of an antenna coupler is seldom required unless tuning components have been replaced.

(2) Frequency range, insertion loss, bandwidth, ripple, isolation and dial calibration all depend on proper alignment of the coupler. Only when a coupler is in proper alignment, will these characteristics be within tolerance.

(3) If a coupler has to be aligned, it must be removed from the coupler group. An external 18 v power supply will facilitate the adjustments.

(4) Be sure that the coupler is not misaligned because of physical or mechanical faults. Inspect coupler for broken leads, loose solder connections, shorts, deformed coils, bent capacitor plates or loose gear set screws before attempting realignment. A correction of any of the preceding faults may cause the coupler to not necessarily require realignment.

(5) For proper alignment, a sweep generator and oscilloscope are necessary. Figure 5-5 depicts the test equipment hookup, Figure 5-11 shows the alignment access points, points, and Figures 5-7, 5-8 and 5-9 display the relavent oscilloscope waveforms.

(6) Alignment without a sweep generator can be accomplished using the test equipment hookup of Figure 5-6. This method should be used only under conditions of extreme necessity.

(7) Before aligning the coupler, note the two types of methods provided. Each procedure has a particular application as described below.

(a) PROCEDURE 1a is the recommended alignment procedure for CU-1799.

(b) PROCEDURE 1b is the recommended alignment procedure for CU-1800.

(c) PROCEDURE 1c is the recommended alignment procedure for CU-1801.

(d) PROCEDURE 1d is the recommended alignment procedure for CU-1802.

(e) PROCEDURE 2a is used with CU-1799 only when a sweep generator and/or oscilloscope are not available.

(f) PROCEDURE 2b is used with CU-1800 only when a sweep generator and/or oscilloscope are not available.

(g) PROCEDURE 2c is used with CU-1801 only when a sweep generator and/or oscilloscope are not available.

(h) PROCEDURE 2d is used with CU-1802 only when a sweep generator and/or oscilloscope are not available.

c. SPECIAL PRECAUTIONS

(1) CU-1799/SRA and CU-1800/SRA

It is mandatory that the four tuning capacitors are mechanically in step and secured in that position before attempting high and low frequency end alignment. Failure to have the capacitors in step will cause mis-alignment in mid-band. Low frequency tracking is accomplished by varying the inductance loops. High frequency tracking is effected by the trimmers.

(2) CU-1801/SRA and CU-1802/SRA

(a) Alignment should begin with the capacitors mechanically in step. However, the alignment on these units is accomplished without inductance adjustments. This is possible by holding the inductance of the resonating coils to a precise value in their manufacture and also by the use of a capacitor plate design which over the useable tuning range gives a constant percentage shift in frequency versus dial rotation. (A small dial rotation of the tuning capacitor will give the same percentage shift in frequency at the low frequency end as at the high frequency end). This fact allows a greater capacitance shift for a given small dial rotation at the high capacitance end than at the low capacitance end.

(b) The alignment used in adjusting low frequency tracking is to rotate the capacitor shafts with respect to each other. The high frequency tracking is accomplished in a normal manner using trimmers. This method requires repetition of adjustments at both ends of the dial as in conventional alignment of inductance and trimmers.

(3) TRIMMERS

The presence of the protective relay and spark gap in the first resonator add to the stray capacitance in that resonator. Therefore, less trimmer capacitor is needed in the first resonator, so start alignment with this trimmer set to a smaller value than for the other three resonators.

(4) COVERS

(a) Aligning the CU-1799 and CU-1800 must be finalized with the covers on. However, it is necessary to adjust the inductance loops and access to them is best obtained with the covers removed. In practice low frequency adjustment can be made with the covers off although the dial reading will be different when the covers are replaced. Do not tighten the dial set screws unless the covers are on.

CAUTION

When aligning with covers off make certain the test bench is non-metallic. It is also advisable to place the coupler with the open resonators facing to the right and left. If an open resonator is placed on a bench face down the bench may affect the tuning of that resonator.

(b) Do not align the CU-1801 or CU-1802 with the covers removed. No adjustments are needed internally.

(5) SET SCREWS

On each gear and on the dial there are two set screws. When aligning a coupler, only slightly tighten one of the set screws because it is often necessary to reset dial and gears. After the coupler is fully aligned, be sure to tighten all set screws.

d. PROCEDURE 1a. CU-1799 ALIGNMENT WITH SWEEP GENERATOR AND OSCILLOSCOPE

(1) Remove the side covers and mechanically align the four tuning capacitors (C4, C6, C7 and C9) at full mesh by loosening both set screws on each gear. Tighten the set screws and set the dial to the first graduation on the low frequency end.

(2) Move the inductance loops to mid-position (see Figure 5-11).

(3) Set trimmer (C3) in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(4) Connect the coupler and test equipment as shown in Figure 5-5.

(5) Set the sweep generator and marker to 2 MHz.

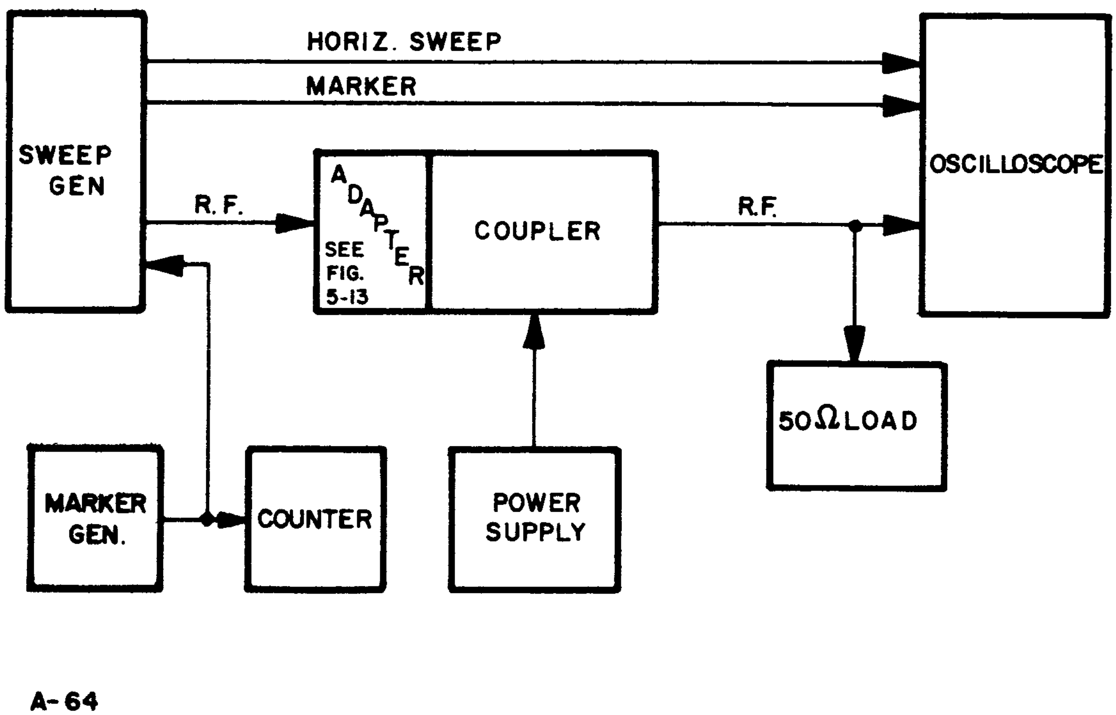


FIGURE 5-5. ALIGNMENT HOOKUP FOR PROCEDURE 1

(6) Tune coupler so that marker is in center of waveform displayed.

(7) Lock the coupler dial. Adjust the inductor loops for a symmetrical and maximum output waveform (see Figure 5-7).

(8) Temporarily replace the side covers with one screw in the center hole.

(9) Tune coupler for maximum response at 2 MHz.

(10) Loosen the set screws on the main dial and set it to 2 MHz. Tighten the set screws.

(11) Set the coupler FREQUENCY dial to 6 MHz.

(12) Set the sweep generator and marker to 6 MHz.

(13) Peak waveform for maximum and symmetrical pattern at this frequency with the four trimmers (C3, C5, C8 and C10).

(14) Remove covers and repeat steps (5) through (13) as needed until alignment is acceptable.

(15) Simultaneously turn the coupler FREQUENCY control and center frequency control of the sweep generator from high to low frequency end. Observe the symmetry of response. When alignment is complete the waveforms should be acceptable throughout the tuning range.

(16) Tighten all set screws. Replace all cover screws and recheck alignment.

e. PROCEDURE 1b. CU-1800 ALIGNMENT WITH SWEEP GENERATOR AND OSCILLOSCOPE

(1) Remove the side covers and mechanically align the four tuning capacitors (C4, C6, C7 and C9) at full mesh by loosening both set screws on each gear. Tighten the set screws and set the dial to the first graduation on the low frequency end.

(2) Move the inductance loops to mid-position (see Figure 5-11).

(3) Set trimmer (C3) in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(4) Connect the coupler and test equipment as shown in Figure 5-5.

(5) Set the sweep generator and marker to 4 MHz.

(6) Tune coupler so that marker is in center of waveform displayed.

(7) Lock the coupler dial. Adjust the inductor loops for a symmetrical and maximum output waveform (see Figure 5-7).

(8) Temporarily replace the side covers with one screw in the center hole.

(9) Tune coupler for maximum response at 4 MHz.

(10) Loosen the set screws on the main dial and set it to 4 MHz. Tighten the set screws.

(11) Set the coupler FREQUENCY dial to to 12 MHz.

(12) Set the sweep generator and marker to 12 MHz.

(13) Peak waveform for maximum and symmetrical pattern at this frequency with the four trimmers (C3, C5, C8 and C10).

(14) Remove covers and repeat steps (5) through (13) as needed until alignment is acceptable.

(15) Simultaneously turn the coupler FREQUENCY control and center frequency control of the sweep generator from high to low frequency end. Observe the symmetry of response. When alignment is complete the waveforms should be acceptable throughout the tuning range.

(16) Tighten all set screws. Replace all cover screws and recheck alignment.

f. PROCEDURE 1c - CU-1801 ALIGNMENT WITH SWEEP GENERATOR AND OSCILLOSCOPE

(1) Remove the side covers. Mechanically align the four tuning capacitors (C4, C6, C7 and C9) visually. To rotate capacitor shaft with respect to gear, loosen both set screws. For initial alignment of capacitors, set the dial to 10 MHz; the rotors should be in the position shown in Figure 5-10. Slightly tighten the set screws as the capacitors and dial may be reset later.

(2) Set trimmer C3 in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(3) Re-install the covers.

(4) Connect the coupler and test equipment as shown in Figure 5-5.

(5) Set the sweep generator and marker to 10 MHz.

(6) Tune the coupler FREQUENCY control until the marker is in the center of the waveform displayed. Lock the front tuning knob.

(7) Loosen the set screws which hold the gear on the C4 (tuning capacitor) shaft. Insert an awl into an alignment hole (see Figure 5-11) on the C4 shaft and adjust C4 for best waveform. Lightly tighten the set screws.

(8) Repeat step (7) for C6, C7 and C9. Lightly tighten capacitor gear set screws.

(9) Loosen the set screws in the dial gear. Set the dial to read 10 MHz when the coupler is tuned for maximum output of waveform with marker.

(10) Set sweep generator and marker to 17 MHz.

(11) Tune coupler dial to 17 MHz. Lock the front tuning knob.

(12) Adjust the four trimmers for symmetrical and maximum output.

(13) Repeat steps (5) through (12) as needed until alignment is acceptable.

(14) Simultaneously turn the coupler FREQUENCY control and center frequency control of the sweep generator from high to low frequency end. Observe the symmetry of response. When alignment is complete the waveforms should be acceptable throughout the tuning range.

(15) Tighten all set screws, replace all covers screws and recheck alignment.

g. PROCEDURE 1d - CU-1802 ALIGNMENT WITH SWEEP GENERATOR AND OSCILLOSCOPE

(1) Remove the side covers. Mechanically align the four tuning capacitors (C4, C6, C7 and C9) visually. To rotate capacitor shaft with respect to gear, loosen both set screws. For initial alignment of capacitors, set the dial to 17 MHz; the rotors should be shown in Figure 5-10. Slightly tighten the set screws as the capacitors and dial may be reset later.

(2) Set trimmer C3 in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(3) Re-install the covers.

(4) Connect the coupler and test equipment as shown in Figure 5-5.

(5) Set the sweep generator and marker to 17 MHz.

(6) Tune the coupler FREQUENCY control until the marker is in the center of the waveform displayed. Lock the front tuning knob.

(7) Loosen the set screws which hold the gear on the C4 (tuning capacitor) shaft. Insert an awl into an alignment hole (see Figure 5-11) on the C4 shaft and adjust C4 for best waveform. Lightly tighten the set screws.

(8) Repeat step (7) for C6, C7 and C9. Lightly tighten capacitor gear set screws.

(9) Loosen the set screws in the dial gear. Set the dial to read 17 MHz when the coupler is tuned for maximum output of waveform with marker.

(10) Set sweep generator and marker to 30 MHz.

(11) Tune coupler dial to 30 MHz. Lock the front tuning knob.

(12) Adjust the four trimmers for symmetrical and maximum output.

(13) Repeat steps (5) through (12) as needed until alignment is acceptable.

(14) Simultaneously turn the coupler FREQUENCY control and center frequency control of the sweep generator from high to low frequency end. Observe the symmetry of response. When alignment is complete the waveforms should be acceptable throughour the tuning range.

(15) Tighten all set screws, replace all covers screws and recheck alignment.

h. PROCEDURE 2a - CU-1799 ALIGNMENT WITH SIGNAL GENERATOR AND RF VOLTMETER'

(1) Remove the side covers and mechanically align the four tuning capacitors C4, C6, C7 and C9 at full mesh by loosening both set screws on each gear. Tighten set screws and set the dial to the first graduation on the low frequency end.

(2) Move the inductance loops to mid-position (see Figure 5-11).

(3) Set trimmer (C3) in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(4) Connect the coupler and test equipment as shown in Figures 5-6.

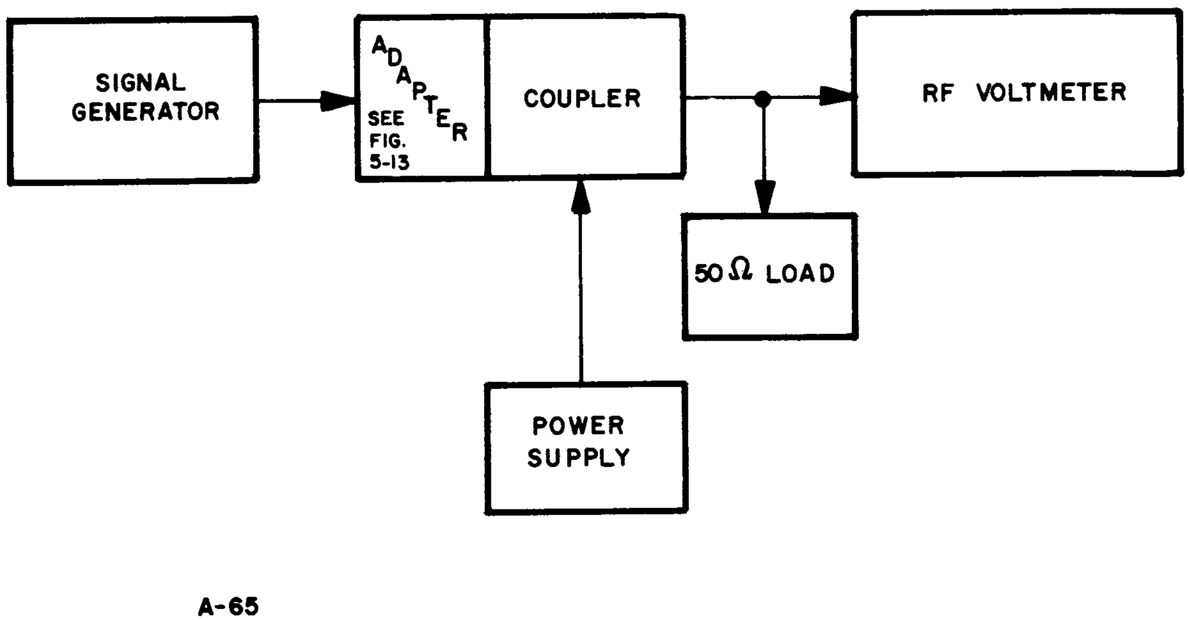


FIGURE 5-6. ALIGNMENT HOOKUP FOR PROCEDURE 2

(5) Set signal generator to 2 MHz.

(6) Tune coupler FREQUENCY control for maximum output.

(7) Lock the coupler dial. Adjust the four inductor loops with a non-metallic tool for maximum output.

(8) Temporarily replace the covers with one screw in the center hole.

(9) Tune coupler FREQ-QUENCY control for maximum output.

(10) Loosen set screws in main dial and set it to read 2 MHz. Tighten set screws.

(11) Set the coupler FREQ-QUENCY dial to 6 MHz.

(12) Set signal generator to 6 MHz.

(13) Peak output with the four trimmers (C3, C5, C8 and C10).

(14) Remove covers and re-peat steps (5) through (12) as needed until alignment is acceptable.

(15) Check the output at several frequencies between the high and low ends, for acceptable operation in mid-band. When alignment is com-plete, the outputs should be acceptable throughout the tuning range.

(16) Tighten all set screws, replace all cover screws and re-check alignment.

i. PROCEDURE 2b - CU-1800 ALIGNMENT WITH SIGNAL GENERATOR AND RF VOLTMETER

(1) Remove the side covers and mechanically align the four tuning capacitors C4, C6, C7 and C9 at full mesh by loosening both set screws on each gear. Tighten set screws and set the dial to the first graduation on the low frequency end.

(2) Move the inductance loops to mid-position (see Figure 5-11).

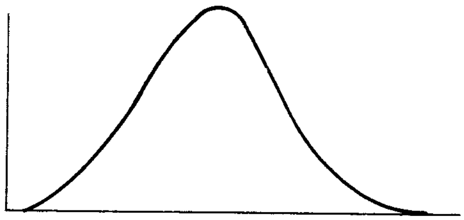


FIGURE 5-7. IDEAL WAVEFORM

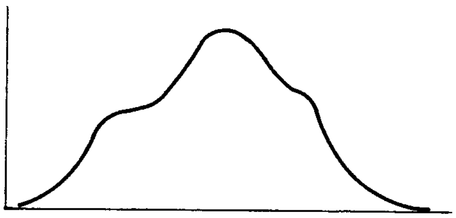


FIGURE 5-8. ACCEPTABLE WAVEFORM

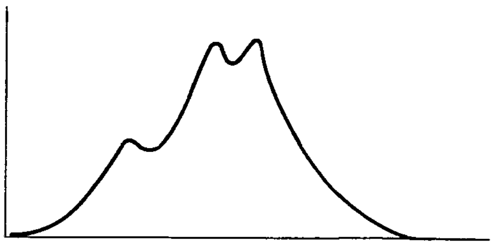


FIGURE 5-9. EXCESSIVE RIPPLE

A-66

(3) Set trimmer (C3) in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(4) Connect the coupler and test equipment as shown in Figure 5-6.

(5) Set signal generator to 4 MHz.

(6) Tune coupler FREQUENCY control for maximum output.

(7) Lock the coupler dial. Adjust the four inductor loops with a non-metallic tool for maximum output.

(8) Temporarily replace the covers with one screw in the center hole.

(9) Tune coupler FREQUENCY control for maximum output.

(10) Lossen set screws in main dial and set it to 4 MHz. Tighten set screws.

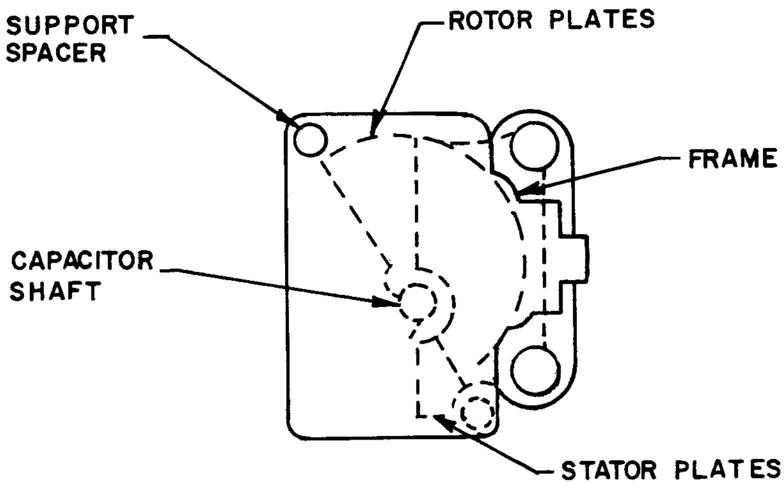
(11) Set the coupler FREQUENCY dial to 12 MHz.

(13) Peak output with the four trimmers (C3, C5, C8 and C10).

(14) Remove covers and repeat steps (5) through (12) as needed until alignment is acceptable.

(15) Check the output at several frequencies between the high and low ends, for acceptable operation in mid-band. When alignment is complete, the outputs should be acceptable throughout the tuning range.

(16) Tighten all set screws, replace all cover screws and re-check alignment.



A-67

FIGURE 5-10. VISUAL CAPACITOR SHAFT ALIGNMENT (CU-1801 AND 1802/SRA)

j. PROCEDURE 2c - CU-1801 ALIGNMENT WITH SIGNAL GENERATOR AND RF VOLTMETER

(1) Remove the side covers. Mechanically align the four tuning capacitors (C4, C6, C7 and C9) visually. To rotate capacitor shaft with respect to gear, loosen both set screws. For initial alignment of capacitors, set the dial to 10 MHz; the rotors should be in the position shown in Figure 5-10. Slightly tighten the set screws as the capacitors and dial may be reset later.

(2) Set Trimmer C3 in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(3) Re-install the covers.

(4) Connect the coupler and test equipment as shown in Figure 5-6.

(5) Set signal generator to 10 MHz.

(6) Tune the coupler FREQUENCY control for maximum output. Lock the front tuning knob.

(7) Loosen the set screws which hold the gear on the C4 (tuning capacitor) shaft. Insert an awl into an alignment hole (see Figure 5-11) on the C4 shaft and adjust C4 for a maximum output. Lightly tighten the set screws.

(8) Repeat step (7) for C6, C7 and C9. Lightly tighten capacitor gear set screws.

(9) Loosen the set screws in the dial gear. Set the dial to read 10 MHz when coupler is tuned to maximum output.

(10) Set signal generator to 17 MHz.

(11) Tune coupler dial to 17 MHz. Lock the front tuning knob.

(12) Peak the output with the four trimmers (C3, C5, C8 and C10)

(13) Repeat steps (5) through (12) as needed until alignment is acceptable.

(14) Check the output at several frequencies between the high and low ends, for acceptable operation in mid-band. When alignment is complete, the outputs should be acceptable throughout the tuning range.

(15) Tighten all set screws, replace all cover screws and recheck alignment.

k. PROCEDURE 2d - CU-1802 ALIGNMENT WITH SIGNAL GENERATOR AND RF VOLTMETER

(1) Remove the side covers. Mechanically align the four tuning capacitors (C4, C6, C7 and C9) visually. To rotate capacitor shaft with respect to gear, loosen both set screws. For initial alignment of capacitors, set the dial to 17 MHz; the rotors should be in the position shown in Figure 5-10. Slightly tighten the set screws as the capacitors and dial may be reset later.

(2) Set trimmer C3 in resonator #1 to 1/4 mesh and the other three trimmers to mid-position.

(3) Re-install the covers.

(4) Connect the coupler and test equipment as shown in Figure 5-6.

(5) Set signal generator to 17 MHz.

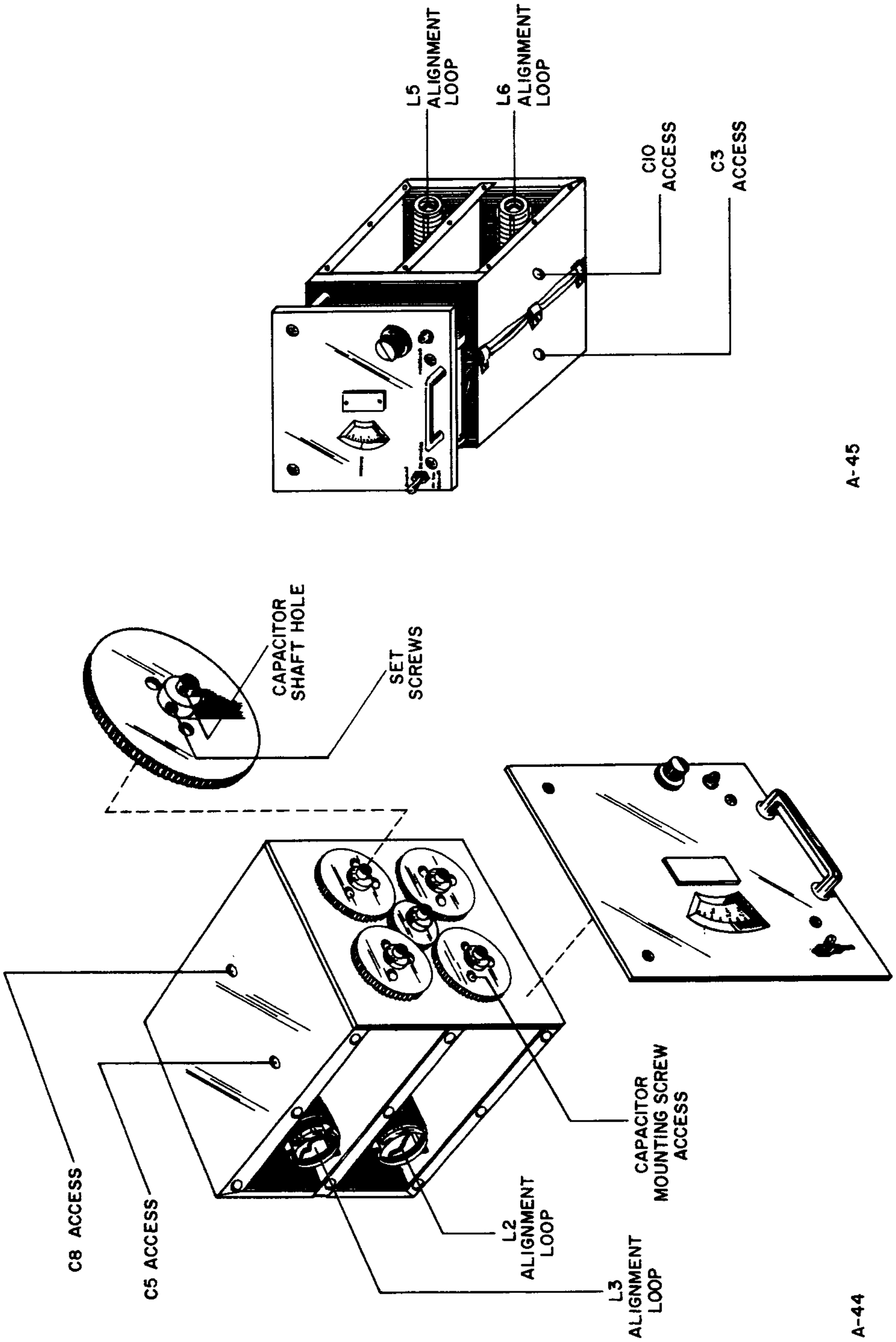


FIGURE 5-11. ALIGNMENT ACCESS POINTS

(6) Tune the coupler FREQUENCY control for maximum output. Lock the front tuning knob.

(7) Loosen the set screws which hold the gear on the C4 (tuning capacitor) shaft. Insert an awl into an alignment hole (see Figure 5-11) on the C4 shaft and adjust C4 for a maximum output. Lightly tighten set screws.

(8) Repeat step (7) for C6, C7 and C9. Lightly tighten capacitor gear set screws.

(9) Loosen the set screws in the dial gear. Set the dial to read 17 MHz when coupler is tuned to maximum output.

(10) Set signal generator to 30 MHz.

(11) Tune coupler dial to 30 MHz. Lock the front tuning knob.

(12) Peak the output with the four trimmers (C3, C5, C8 and C10).

(13) Repeat steps (5) through (12) as needed until alignment is acceptable.

(14) Check the output at several frequencies between the high and low ends, for acceptable operation in mid-band. When alignment is complete, the outputs should be acceptable throughout the tuning range.

(15) Tighten all set screws, replace all cover screws and re-check alignment.

l. PROTECTIVE CIRCUIT

(1) Remove the coupler from the equipment cabinet.

(2) Remove the rear panel from coupler.

(3) Connect the antenna coupler and test equipment as shown in Figure 5-1.

(4) Ensure that the coupler is in the COUPLED mode.

(5) Set the signal generator and coupler FREQUENCY dial to a common frequency at mid-range.

(6) Slowly increase the signal generator output level until the protective circuit actuates as evidenced by a drop in output voltage and an indication on the OVERLOAD indicator lamp. Overload should occur when RF voltmeter indicates coupler output between 0.2 and 1.0 volts.

(7) Turn the overload point adjust capacitor C1 (see Figure 5-23) a small amount.

(8) Repeat steps (6) and (7) until the overload occurs between 0.2 and 1.0 volts.

m. HIGH FREQUENCY RESPONSE ADJUSTMENT. - The high frequency response adjust capacitor C14, located on PC-172, has negligible effect on couplers CU-1799, CU-1800 and CU-1801. In the CU-1802 coupler, C14 will generally be set a maximum capacity.

n. NOISE GENERATOR ADJUSTMENT. - The noise generator has a fixed output, however the amount of coupling can be varied by bending the noise generator probe, located in the resonator #2 cavity (see Figure 5-24). With the coupler connected to a receiver, bend the noise generator probe toward L3 to increase the noise to a distinguishable amount.

o. ANTI-BACKLASH ADJUSTMENT.

(1) Tighten both the set-screws in each gear. If backlash is still noticable, the capacitor shafts may be misaligned.

(2) Take off the front panel by removing the four mounting screws. It is not necessary to unsolder any connections.

(3) Remove the dial and drive gear.

(4) Remove the dial from the shaft and put the shaft with the drive gear back into place, engaging each of the capacitor gears.

(5) Turn one of the capacitor gears and notice if the drive gear wobbles. If so, one of the capacitors may not be mounted properly.

(6) Tighten the capacitor mounting screws (refer to Figure 5-11) by pushing the capacitor gear toward the drive gear so that the two gears fully mesh.

(7) Repeat step (6) for each capacitor gear until the drive gear does not wobble as in step (5).

5-6. REPAIR OF PATCH CORDS AND RF CABINET CONNECTORS

a. PATCH CORDS. -Refer to Figure 5-14 for exploded view of the patch board connector. Use RG 223 coaxial cable or equivalent if cable is damaged.

b. RF AND CABINET CONNECTORS. -Refer to Figure 5-19 for detailed internal wiring and connector data in the power and RF interfaces.

5-7. REPLACEMENT OF VARIABLE CAPACITORS (Figure 5-17).

Before replacing a main tuning capacitor, note the following.

a. To replace a capacitor, it is necessary to take off the front panel by removing the four mounting screws. It is not necessary to unsolder any connections from the front panel.

b. Before tightening the front capacitor mounting screws (see Figure 5-11), perform the anti-backlash procedure (Paragraph 5-5o).

c. When replacing a capacitor in CU-1799 or CU-1800 unit, note that improper positioning of the rear mounting support can deform the rotor plates.

d. Mechanically align all four capacitors to be in step with the dial before replacing the front panel.

e. It will be necessary to completely re-align the coupler (refer to paragraph 5-5).

5-8. PARTS IDENTIFICATION ILLUSTRATIONS.

Figures 5-14 through 5-35 identify and locate each item in the cabinets, and antenna couplers within the various antenna coupler groups.

5-9. PRIMARY POWER DISTRIBUTION.

Figure 5-36 illustrates primary power distribution in all antenna coupler groups.

5-10. WIRING DIAGRAMS.

Figures 5-37 and 5-38 illustrate wiring within each coupler group. Suspected wiring failures may be detected by point-to-point continuity measurements utilizing these figures as a reference.

5-11. MECHANICAL ALIGNMENT OF RF AND POWER INTERFACES

a. GENERAL

(1) The RF transmission line and power interface have been mounted and secured in the rear of the cabinet to allow the couplers to mount in any of the 20 coupler compartments. In most cases couplers can be interchanged from one compartment to another. Care must be exercised in doing this to be certain the rear mating parts are not damaged in case misalignment has occured. If a coupler does not engage with normal force it usually can be inserted if the 4 Phillips screws holding the front panel to the coupler are loosened about 1 turn. This procedure will allow the panel to move slightly with respect to the coupler enclosure. Retighten the 4 screws after the coupler has been inserted into its designated compartment.

(2) The alignment of the rear interfaces in the cabinet should not be adjusted unless physical damage has occurred and couplers cannot be inserted in the compartments. If an RF transmission line or power interface is found defective and it is necessary to replace or repair it, extreme care must be exercised to assure proper alignment when it is replaced. It is suggested that this alignment be attempted only by trained mechanical technicians. Figure 5-12 shows the installation of the various supports, angle brackets and interfaces with key dimensions needed for proper assembly.

(3) No special tools are required but standard tools of the following types are needed:

(a) Phillips screwdriver size 1, 6".

(b) Phillips screwdriver size 2, 8".

(c) Phillips screwdriver size 2,15".

(d) Set of allen wrenches.

(e) Set of hex nut drivers and box wrenches.

(f) Set of open end wrenches.

(g) Machinist's 12 inch ruled square.

b. DISASSEMBLY. - In order to remove or replace either an RF or Power interface it will necessary to remove the front panel from the cabinet and the rear coupler support angle brackets (See Figure 5-12). Note that shims are used in back of the RF interface to maintain proper front to rear dimensions, the dimensions are given on Figure 5-12. If the cabinet has been completely disassembled, follow the steps outlined in the cabinet assembly procedure. If only limited disassembly has occured only those portions of the procedure affecting the parts to be reinstalled are necessary. If the procedure is carefully followed the correct vertical, horizontal and depth dimensions can be obtained.

c. RF TRANSMISSION LINE INTERFACE. - The RF transmission line is designed with a cluster of three banana jacks that engage with mating plugs on the coupler. The coupler plugs are fixed in position while the center jack on the transmission line is fixed and the two outer jacks have a limited float. The center jack serves as a rear alignment pin for the coupler, and therefore is carefully held in manufacture to the same spacing dimensions between

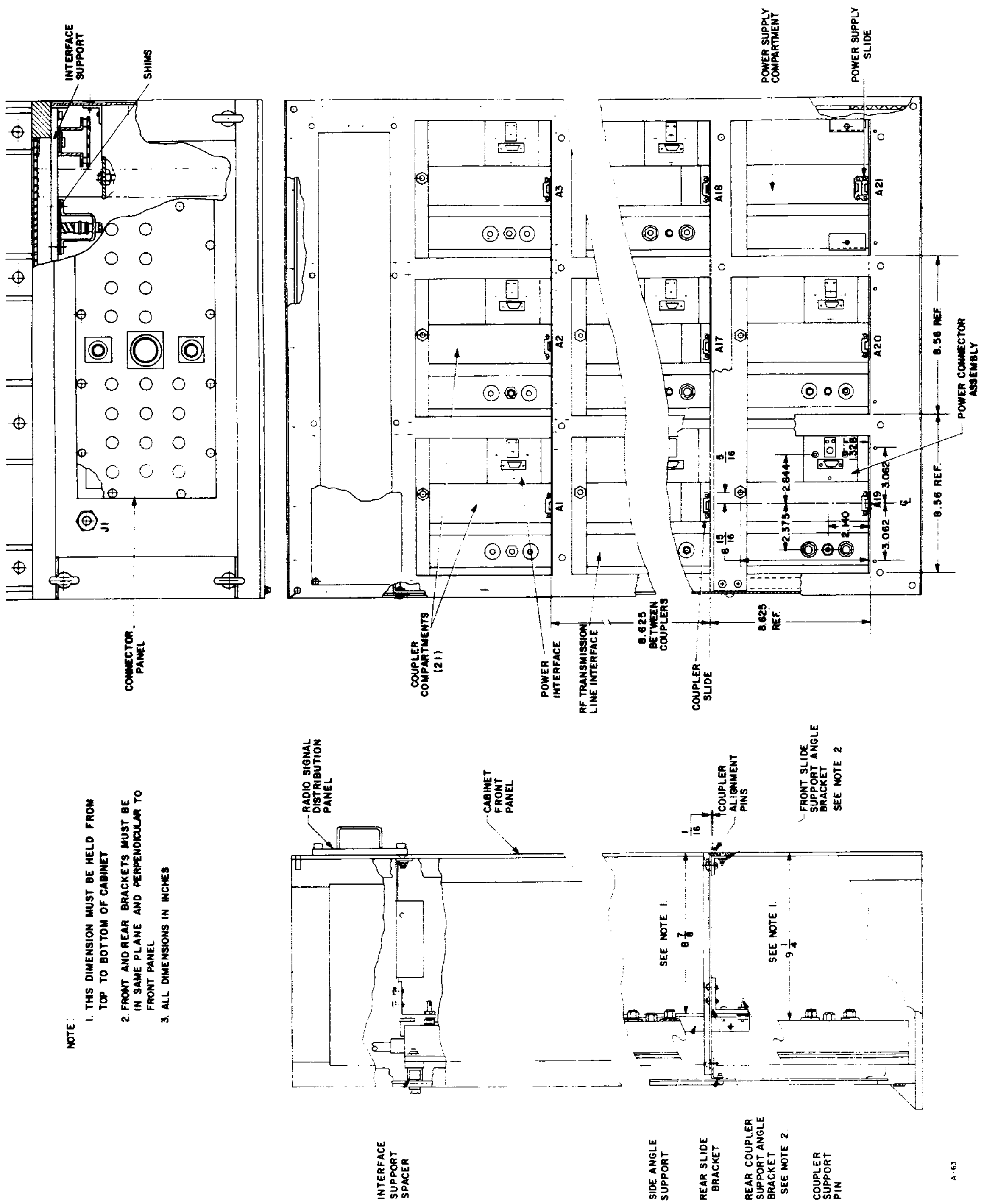


FIGURE 5-12. MECHANICAL ALIGNMENT

couplers as the coupler openings on the cabinet front panel. When installing a transmission line, it is imperative that it be positioned both horizontally and vertically to line up with the front panel compartments.

d. POWER INTERFACE. - The Power interface consists of a U channel support with a floating connector assembly for each coupler unit. The U channel is fastened to the interface support bars in the rear of the cabinet with no alignment required. Each floating connector assembly must be positioned to mate with the connectors and pick-up pins on the coupler.

e. SUPPORT ANGLE BRACKETS

(1) The rear coupler support angle brackets are designed to fasten the coupler at the slide position and also furnish a mounting for the coupler support pin.

(2) It is important that the rear support angle brackets are positioned parallel to the front panel, that is the same depth front to rear, to prevent binding of the coupler alignment pin when it is inserted. The bracket must also be positioned in the proper vertical position to prevent binding of the slide on the coupler.

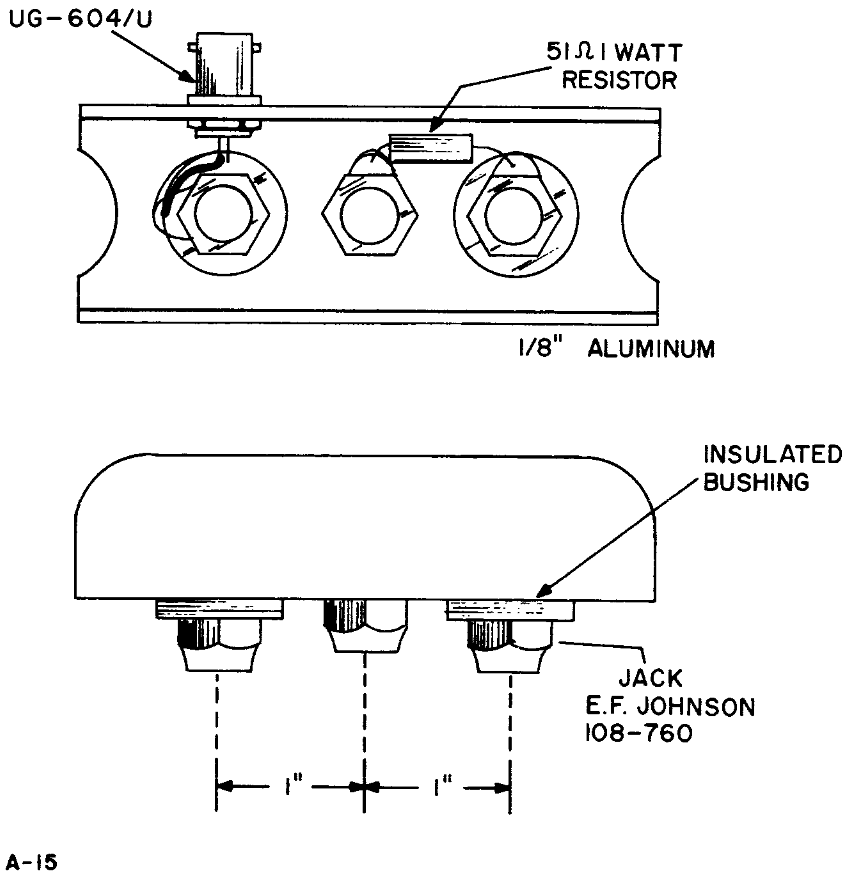


FIGURE 5-13. TEST ADAPTER

(3) The depth from front to rear is obtained by adjusting the position of the side angle supports fastened to each side of the cabinet. The vertical position is adjusted by means of the mounting screws to the side angle supports.

(4) The front slide support angle bracket is mounted against the front panel and must also be positioned properly to prevent binding of the slide mechanism. Details of the alignments will be found in the step by step procedure.

f. CABINET ASSEMBLY PROCEDURES.

(1) Assemble the five interface supports and spacers in the rear of the cabinet.

(2) Mount the RF and Power interfaces in position but do not secure the hardware mounting the RF interface. Shims behind the RF interface may be necessary to obtain the front to rear dimension. See Figure 5-12. Depth from front of cabinet (no panel) to front face of RF interface must be 9 ± 1/32 inches (9 1/4" ± 1/32 when meausred to face of panel if installed.)

(3) Mount the side angle supports to the side walls of the cabinet. Ensure that the front face of the angles are parallel to (spaced equal depth from) the front of the cabinet. Depth from the front of cabinet (no panel) to front face of the side angles must be 8 5/8" ± 1/32 (8 7/8" ± 1/32 when measured to face of panel if installed.)

(4) Assemble coupler support pins to the rear coupler support angle bracket. Tighten support pin nut only enough to hold pin in position, but do not secure it.

(5) Mount the rear coupler support angles in the cabinet to the side angle supports. Lightly tighten the hardware.

(6) Assemble the front slide support angle bracket to cabinet front panel. Lightly tighten the hardware.

(7) Assemble front panel to cabinet. Ensure that the front panel is square on the cabinet; there should be approximately a 1/16 gap at the bottom. Secure all hardware and pin front panel to cabinet.

(8) Secure the front slide support angle bracket to the front panel at each coupler opening. The top surface of the bracket should be 1/16" above panel cut out. Slide mounting holes should be in the center of coupler panel cut outs.

(9) Assemble the slides in the cabinet including rear slide bracket hardware to rear coupler support angle bracket, and front slide support angle bracket.

(10) Tighten all rear coupler support angle brackets. Top surface of rear support angles must be at same height as top surface of front slide support angles. Use a machinist square for this measurement, and check all three horizontal coupler compartments associated with each support angle.

g. ALIGNMENT. -The preceding steps have accomplished assembly of the various angles and brackets supporting the RF and Power interfaces. It will now be necessary to position the interfaces so that the coupler pins and connectors will mate properly when a coupler is installed.

(1) The alignment will consist of positioning the following parts and all must be done before a coupler can be inserted.

(a) RF interface

(b) Power Connector assembly.

(c) Coupler support pin.

(d) Slide mechanism

NOTE

Figure 5-12 gives reference dimensions for nominal locations of the preceding parts.

h. RF INTERFACE. -Position the RF interface so that the center banana jack in each coupler is 2. 140 inches above the top surface of the rear coupler support angle bracket and 2. 375 inches to the left of the exact center of the coupler panel cutout. If the vertical dimension cannot be obtained on all coupler positions recheck the bracket mountings. Secure the RF interface lightly by tightening the mounting screws on the back side of the cabinet.

i. POWER CONNECTOR ASSEMBLY. -Position the Power Connector Assembly so that coupler pick-up pin holes are 2. 844 inches to the right of the exact center of the coupler panel cutout and the lower pin hole is 1. 328 inches above the top surface of the rear coupler support angle bracket. The assembly can be positioned by depressing the assembly against the springs securing it and moving it horizontally and vertically as required. It will remain in position when released.

j. COUPLER SUPPORT PIN. The coupler support pin should be slightly loose so position it 5/16 inch to the right of the exact center of the coupler panel cutout and 6 15/16 above the rear coupler support angle bracket. Leave the support pin lightly secured.

k. SLIDE MECHANISM. -Position the bottom section of the slide in the exact center of the coupler cut out and lightly secure the mounting hardware to the front and rear angle supports.

l. DETAILED ALIGNMENT. With the preliminary alignment accomplished it should be possible to insert a coupler into a compartment and obtain proper mating in the rear. Use extreme care when first inserting a coupler; it may damage the rear mating parts. By inserting a coupler in the top and bottom of a vertical row and then securing the RF interface, the other coupler positions in that row should be set properly.

m. COUPLER INSERTION. - Insert a coupler and inspect the mating of the following:

(1) The three banana jacks into the RF line.

(2) The pick-up pins and connectors into the power connector assembly.

(3) The coupler support pin.

If the coupler support pin is out of position it will prevent seating of the coupler. Reach in and move the coupler support pin as necessary to place it in position. If the coupler will still not seat properly loosen the 4 Phillips screws holding the front panel to the coupler about 1 turn. Push the coupler into the compartment and retighten the 4 screws. Remove the coupler and carefully secure the coupler support pin without disturbing its position. Tighten the slide to the support brackets. Reinsert the coupler and check for proper mating

NOTE

A properly seated coupler will often require considerable force to insert but USE CARE or damage may result.

n. FINAL TIE-DOWN. -

(1) Insert a coupler in the top left compartment (A1) and bottom left compartment (A19). Tighten front screws holding the coupler to the front panel.

(2) Tighten the bolts securing the left (rear cabinet) RF interface in place.

(3) Repeat steps (1) and (2) with couplers in positions A2 and A20 and secure the center transmission line in place.

(4) Repeat steps (1) and (2) with the couplers in positions A3 and A18 and secure the right transmission line in place.

(5) Check that all brackets and interfaces are secured tightly.

(6) Insert the couplers in their respective holes as described in paragraph 5-11m.

5-12. POWER SUPPLY ADJUSTMENT.

Adjust R2 (See Figure 5-35) for 18 $\pm$ 1 vdc output.

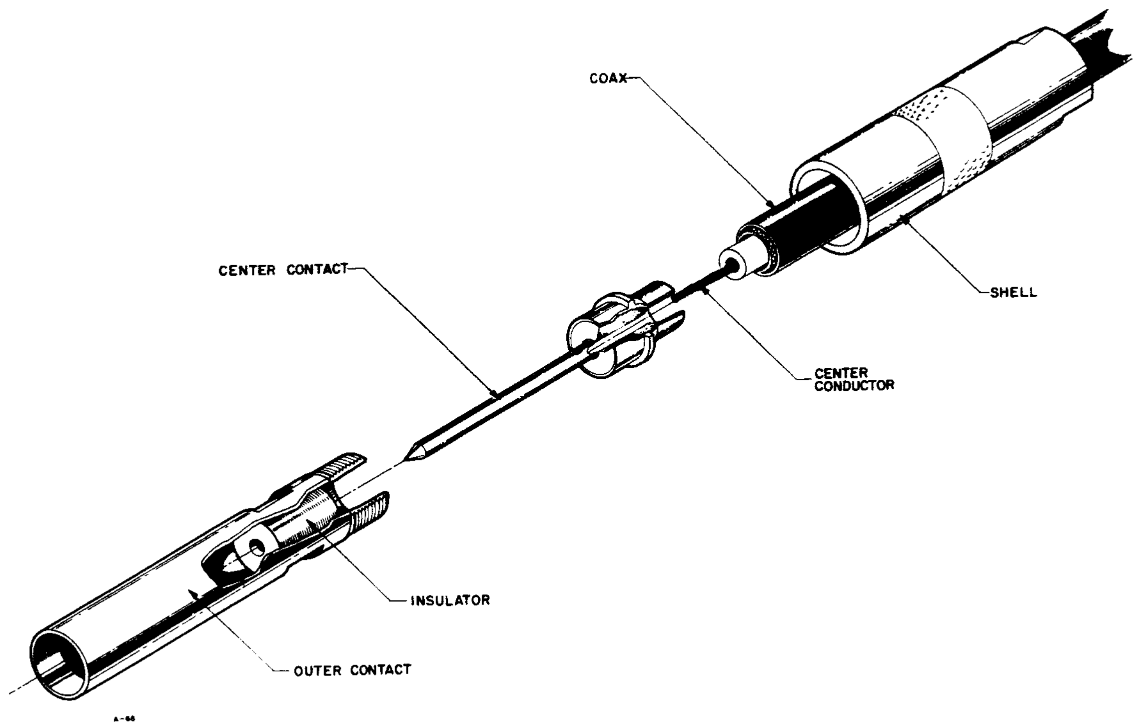


FIGURE 5-14. PATCH CORD ASSEMBLY

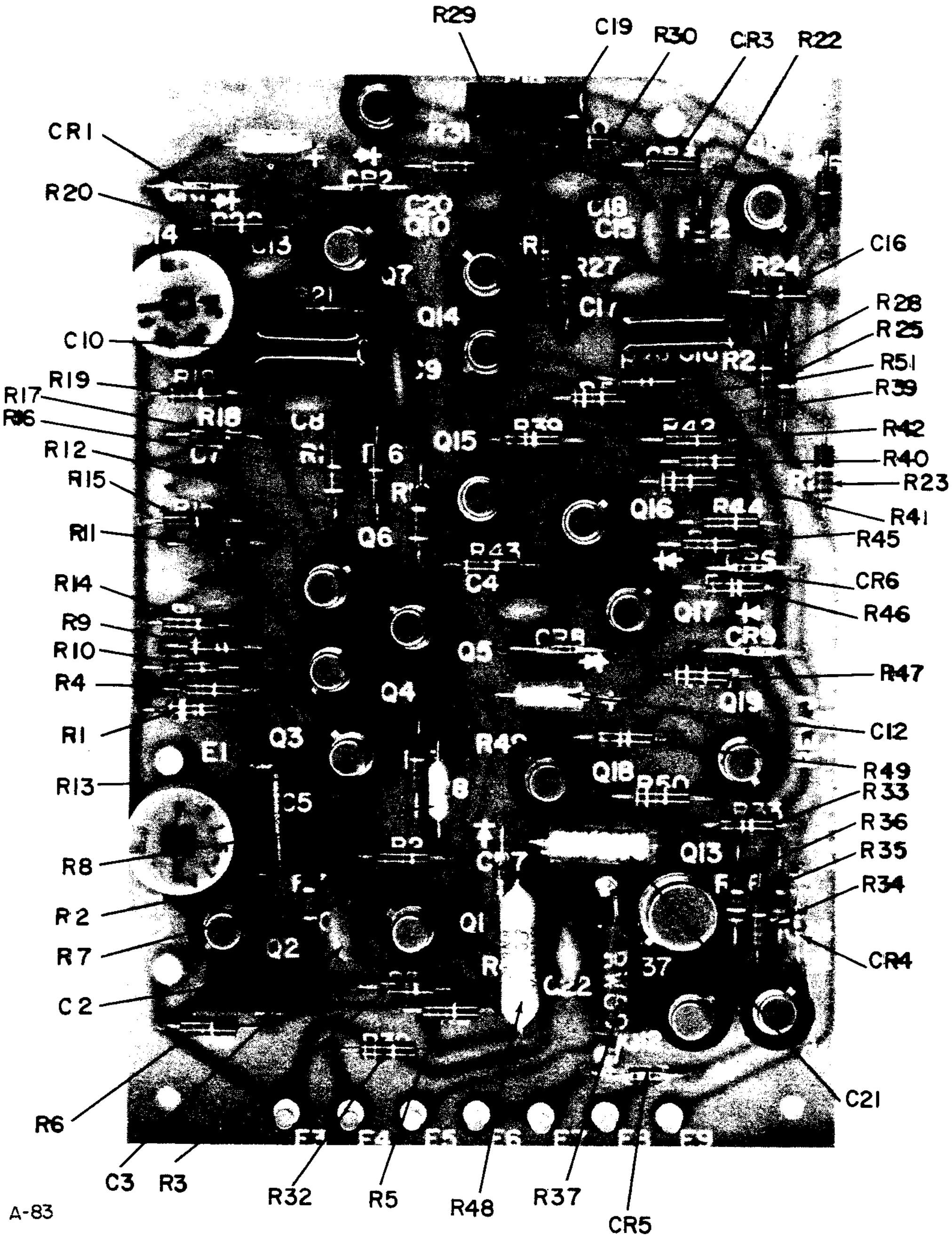
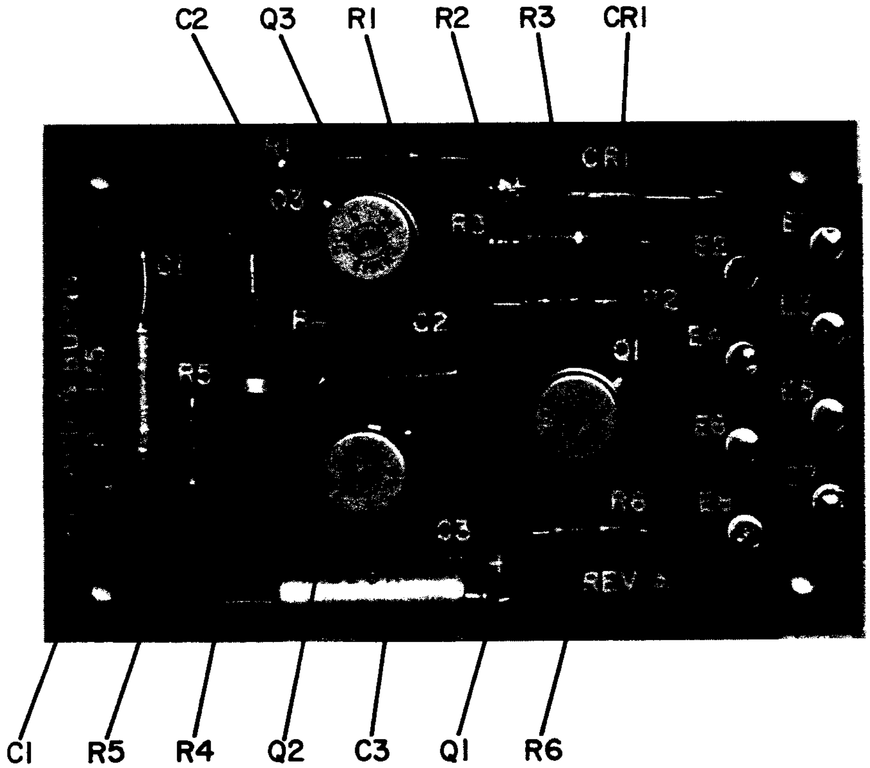


FIGURE 5-15. PC-172 CIRCUIT BOARD PARTS LOCATION



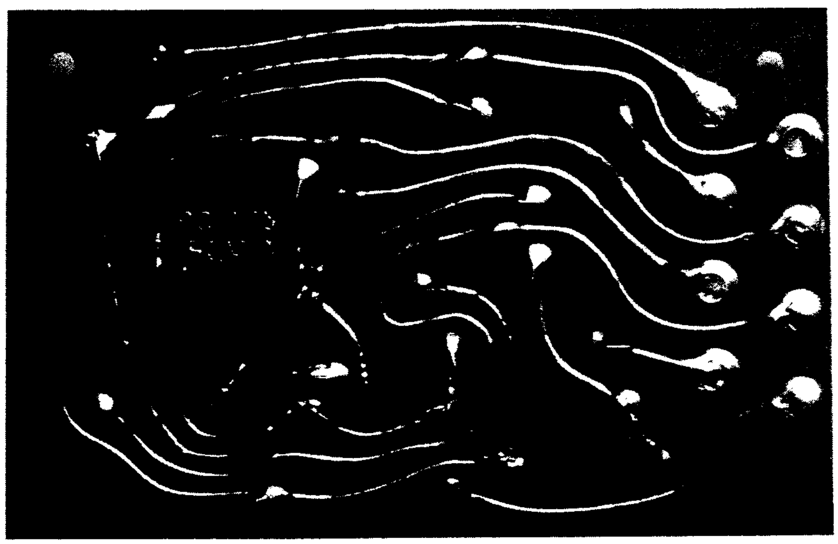


FIGURE 5-16. PC-175 CIRCUIT BOARD - PARTS LOCATION

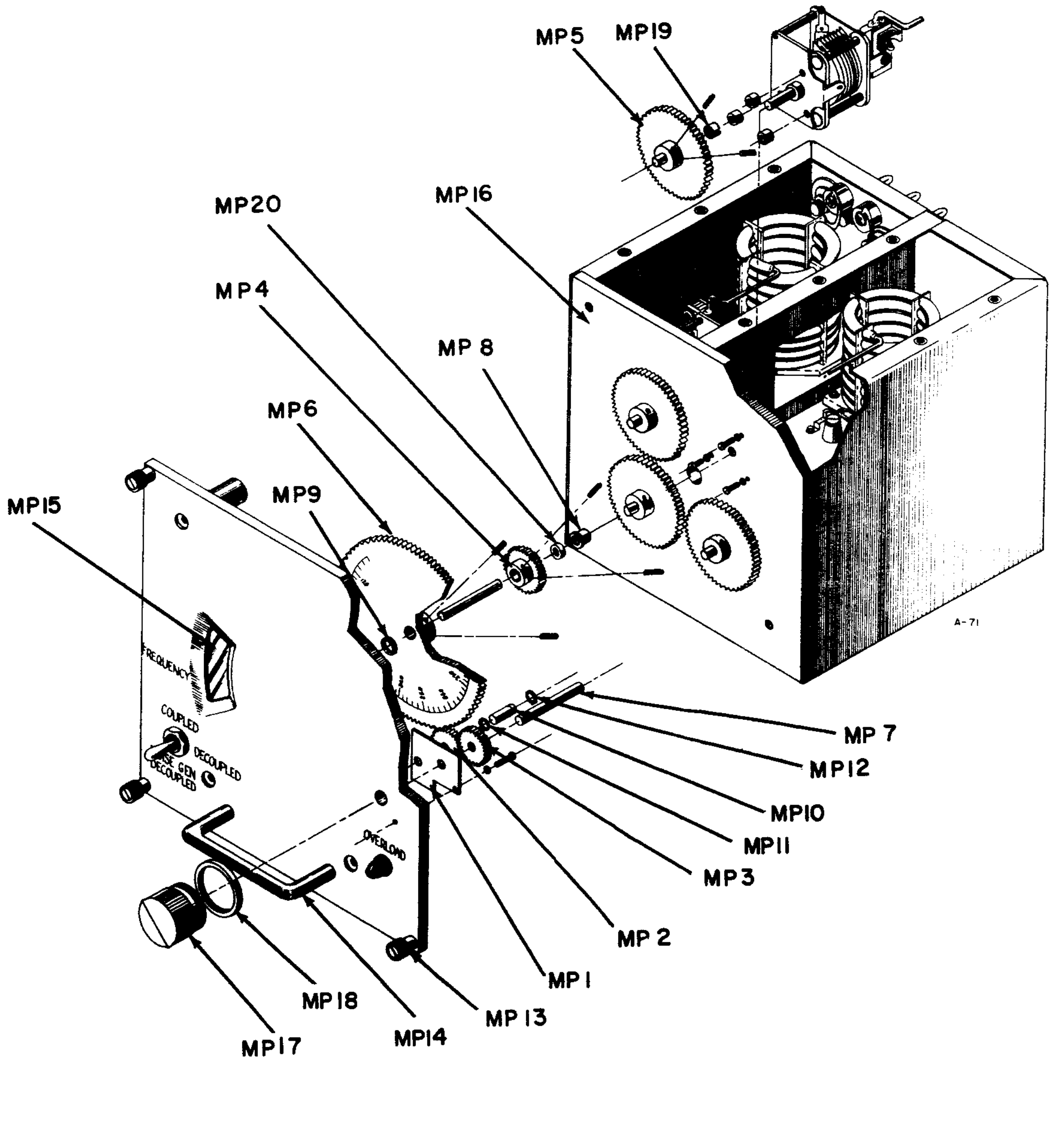
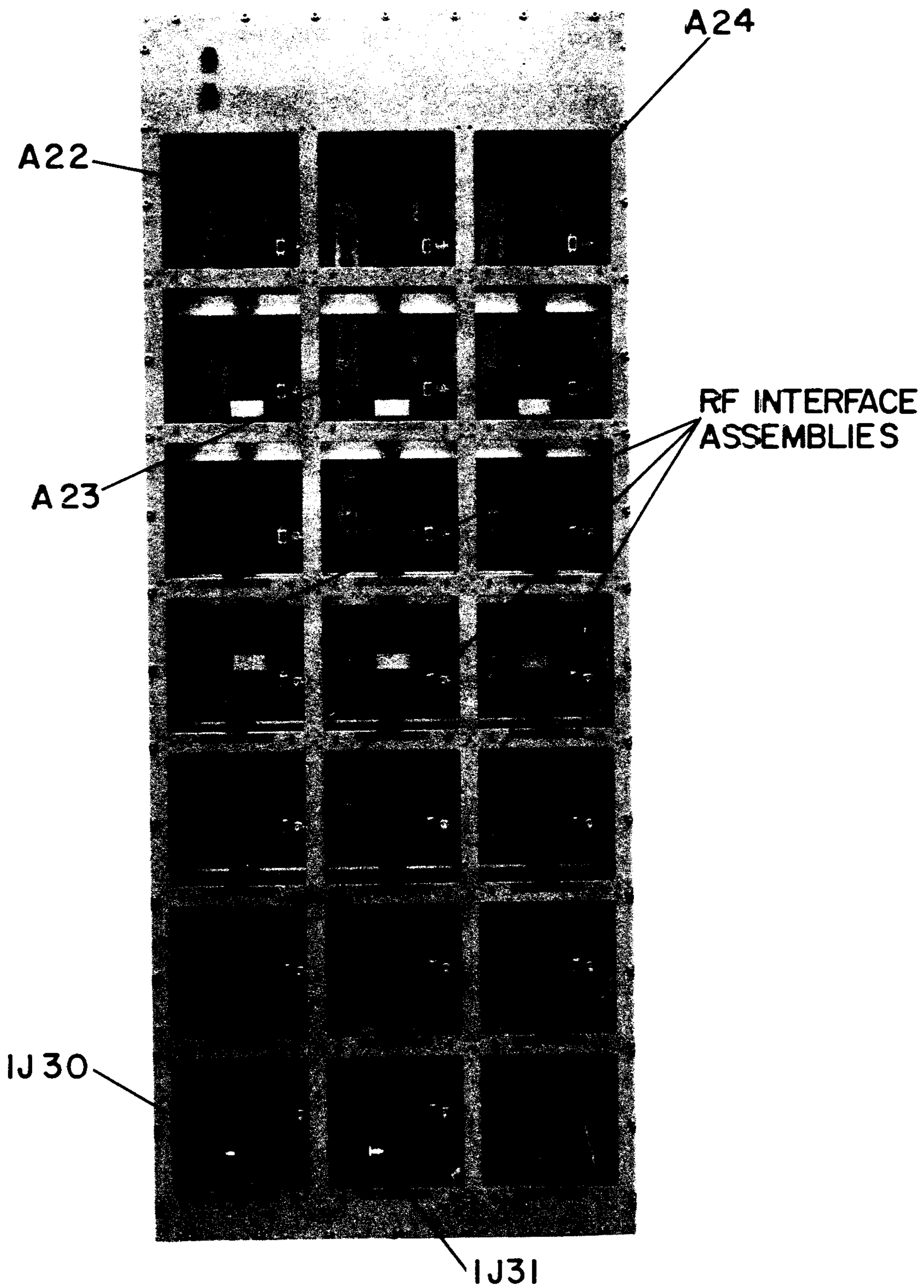
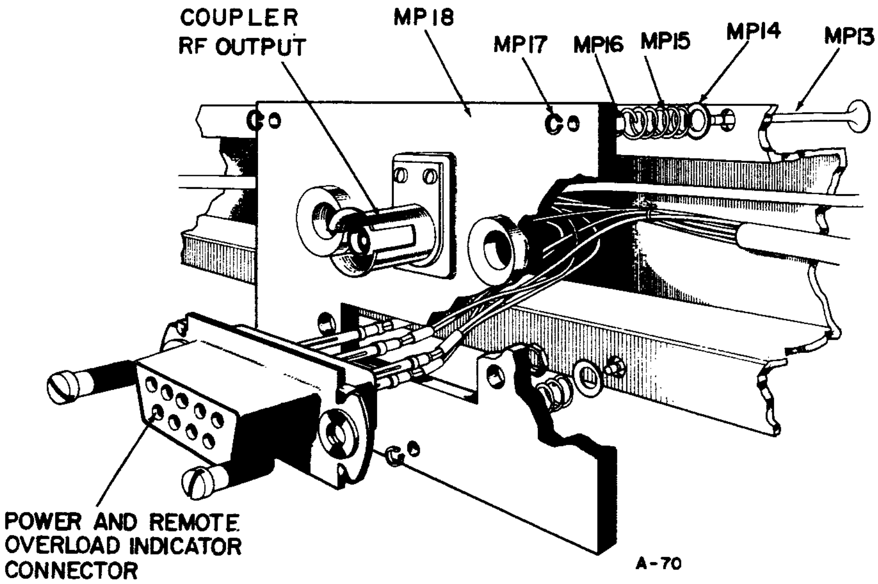


FIGURE 5-17. MECHANICAL PARTS IDENTIFICATION

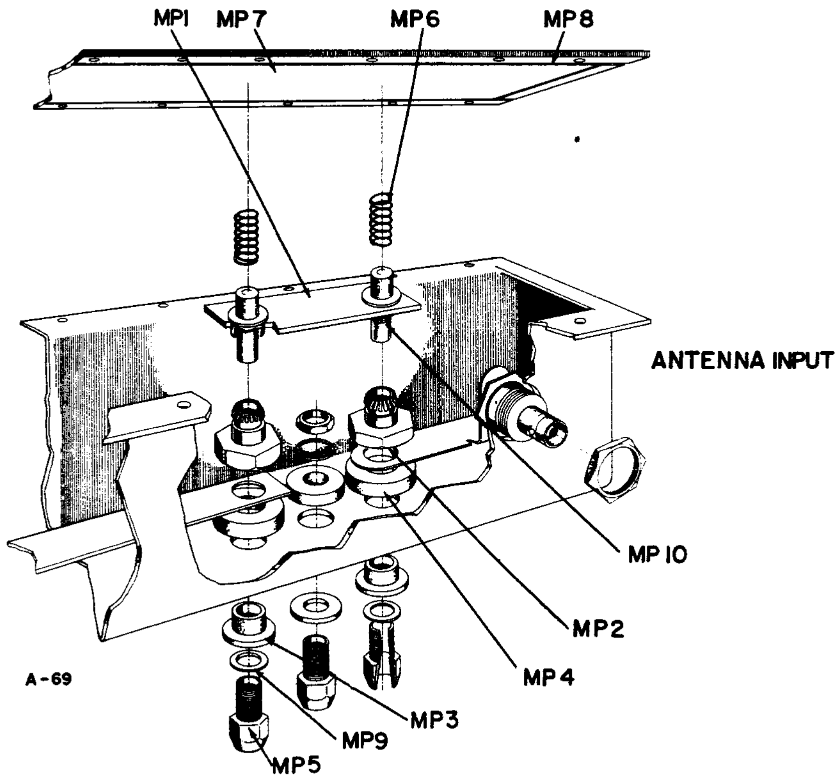


A-102

FIGURE 5-18. ELECTRICAL EQUIPMENT CABINET - PARTS LOCATION

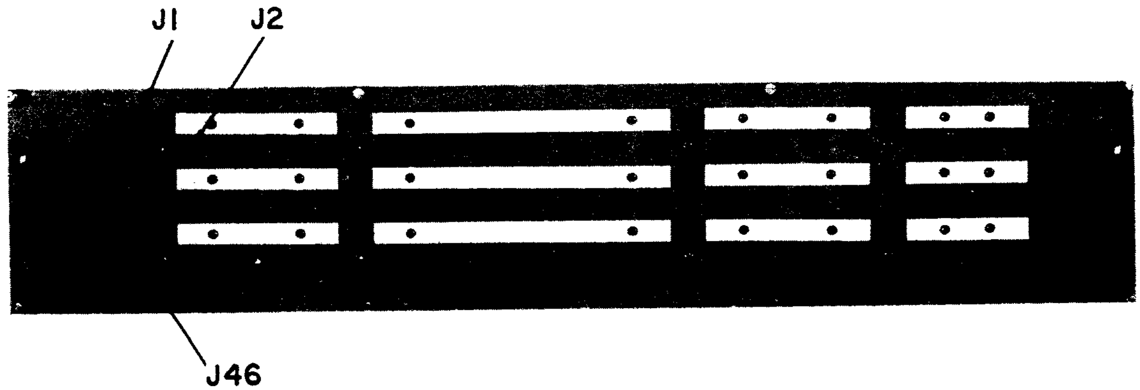


POWER INTERFACE



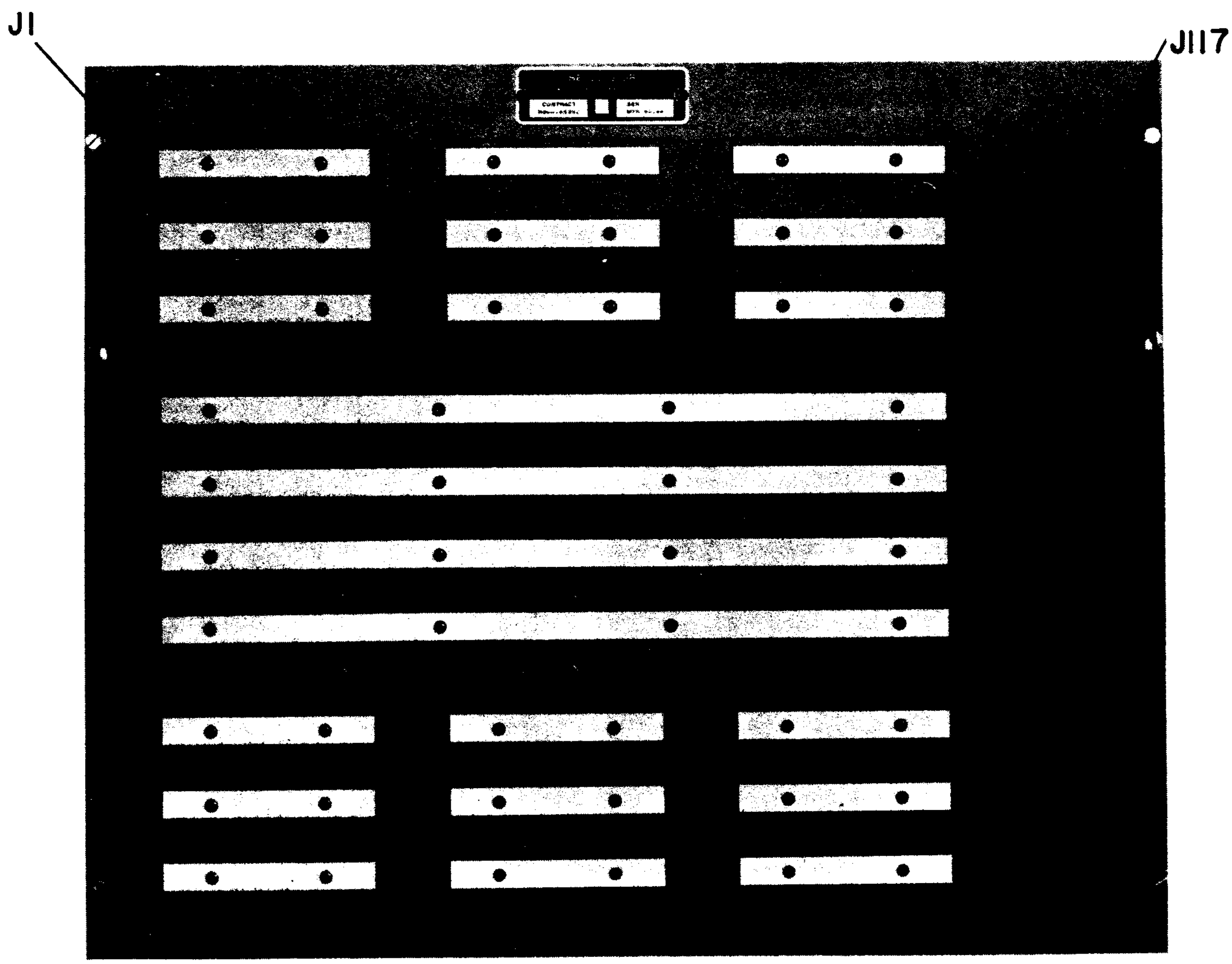
RF INTERFACE

FIGURE 5-19. POWER AND RF INTERFACE INTERNAL WIRING



A-101

FIGURE 5-20. SB-3332/SR SIGNAL DISTRIBUTION PANEL - PARTS LOCATION



A-99

FIGURE 5-21. SB-3333/SR SIGNAL DISTRIBUTION PANEL - PARTS LOCATION

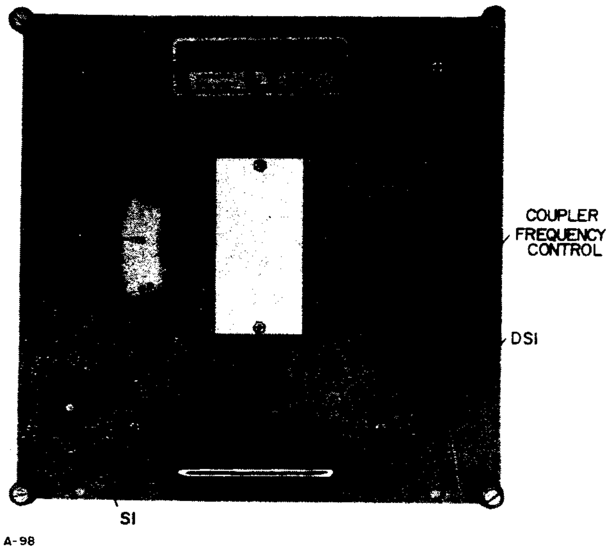


FIGURE 5-22. COUPLER, ANTENNA CU-1802/SRA - PARTS IDENTIFICATION (Front View)

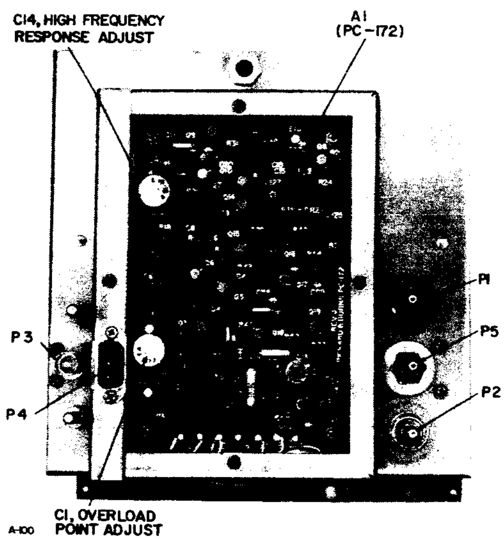


FIGURE 5-23. COUPLER, ANTENNA CU-1799, 1800, 1801, 1802 - PARTS IDENTIFICATION (Rear View with cover removed)

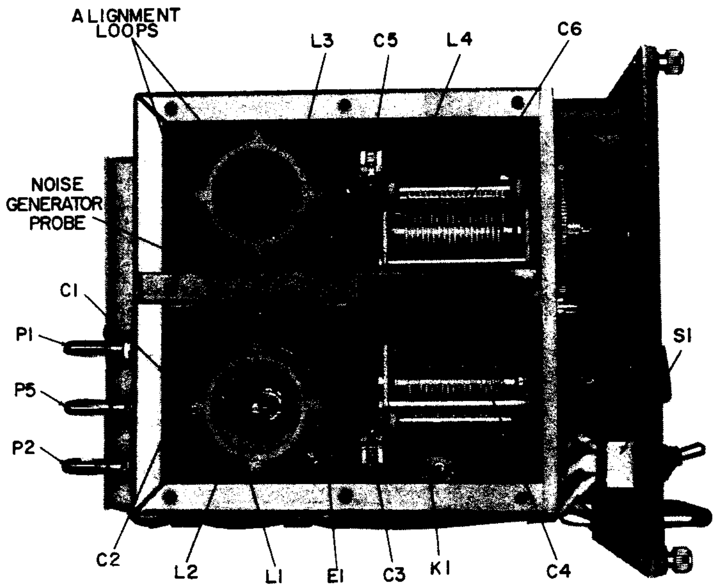


FIGURE 5-24. COUPLER, ANTENNA CU-1799/SRA - PARTS IDENTIFICATION (Left Side View)

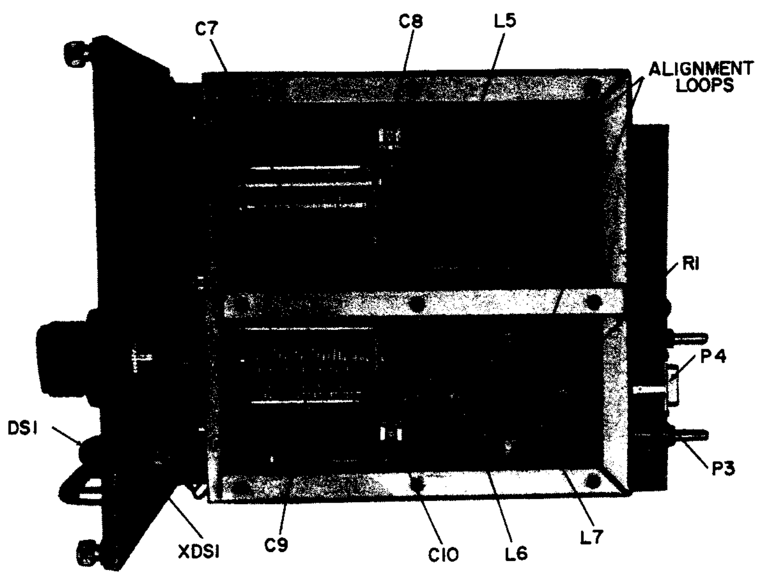


FIGURE 5-25. COUPLER, ANTENNA CU-1799/SRA - PARTS IDENTIFICATION (Right Side View)

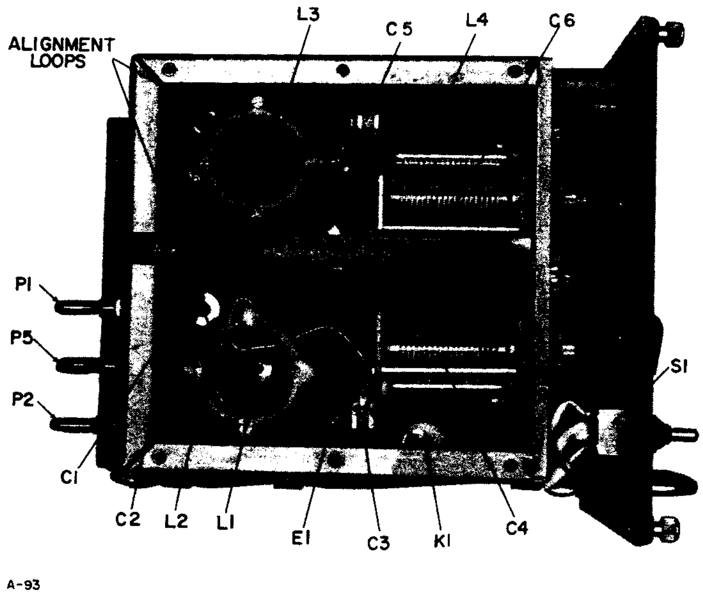


FIGURE 5-26. COUPLER, ANTENNA CU-1800/SRA - PARTS IDENTIFICATION (Left Side View)

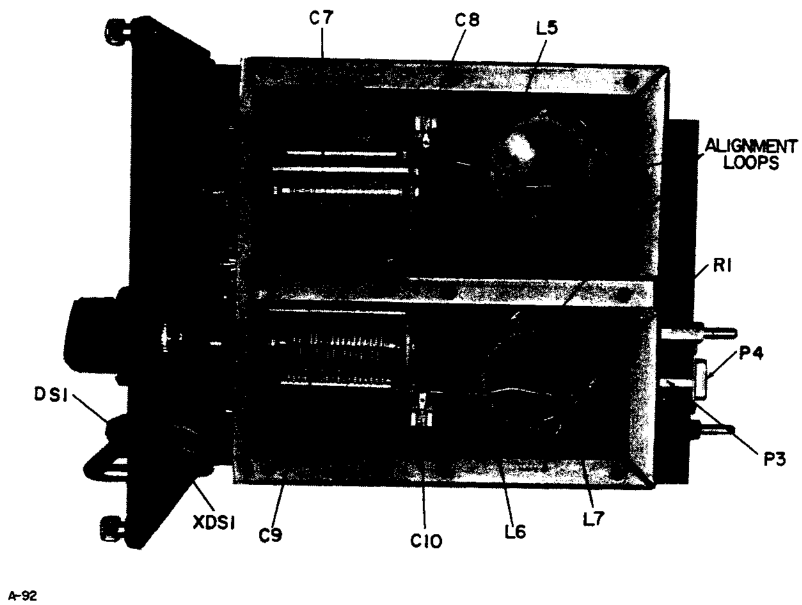
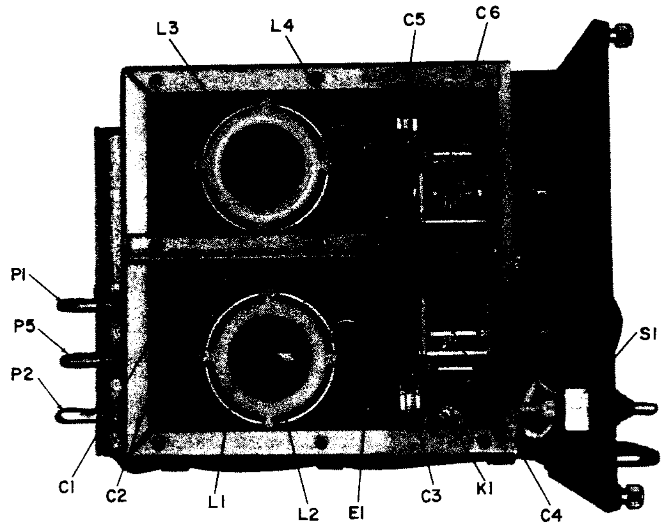
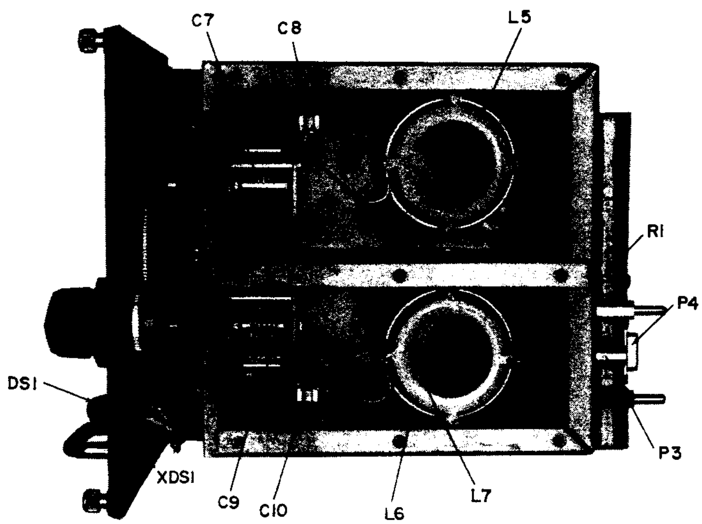


FIGURE 5-27. COUPLER, ANTENNA CU-1800/SRA - PARTS IDENTIFICATION (Right Side View)



A-95
FIGURE 5-28. COUPLER, ANTENNA CU-1801/SRA - PARTS IDENTIFICATION (Left Side View)



A-94
FIGURE 5-29. COUPLER, ANTENNA CU-1801/SRA - PARTS IDENTIFICATION (Right Side View)

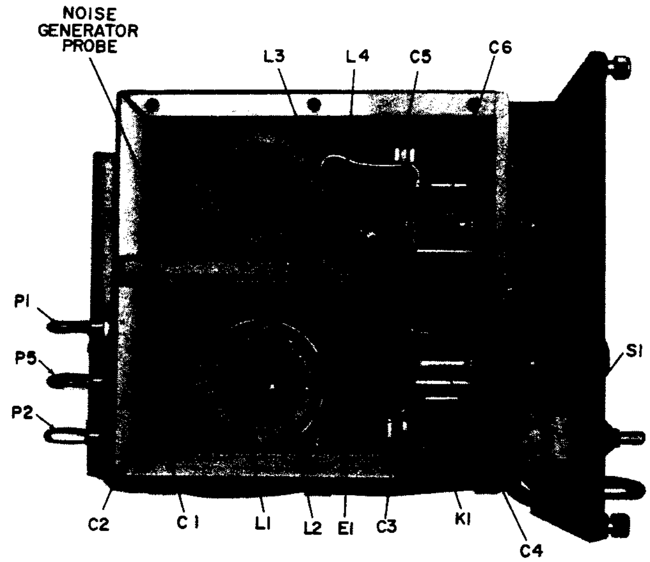


FIGURE 5-30. COUPLER, ANTENNA CU-1802/SRA - PARTS IDENTIFICATION (Left Side View)

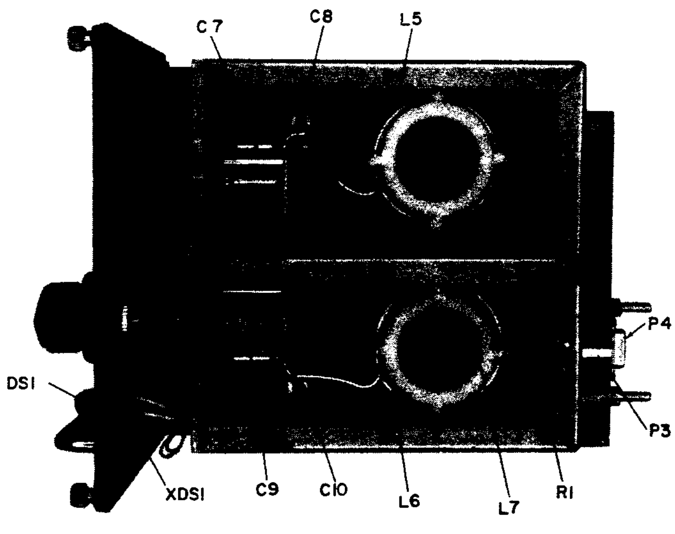


FIGURE 5-31. COUPLER, ANTENNA CU-1802/SRA - PARTS IDENTIFICATION (Right Side View)

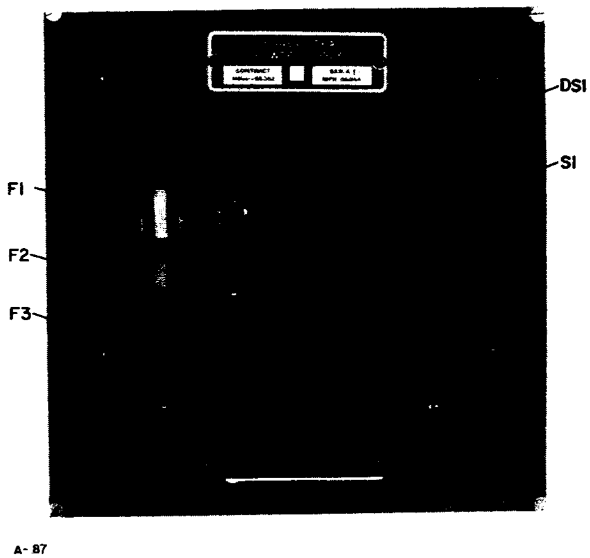


FIGURE 5-32. POWER SUPPLY, PP-4846/SRA - PARTS IDENTIFICATION (Front View)

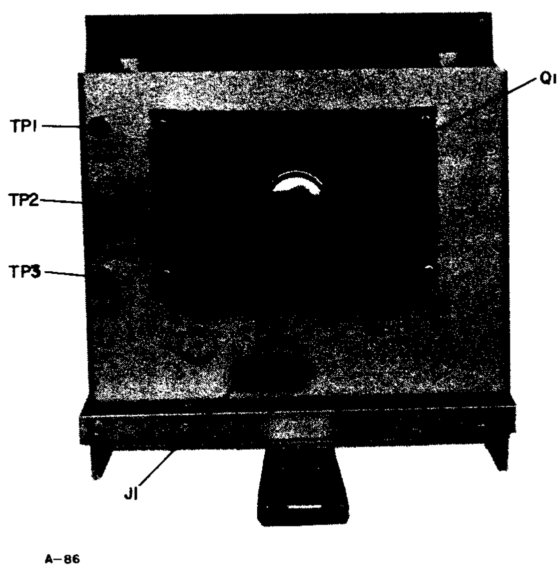


FIGURE 5-33. POWER SUPPLY, PP-4846/SRA - PARTS IDENTIFICATION (Rear View)

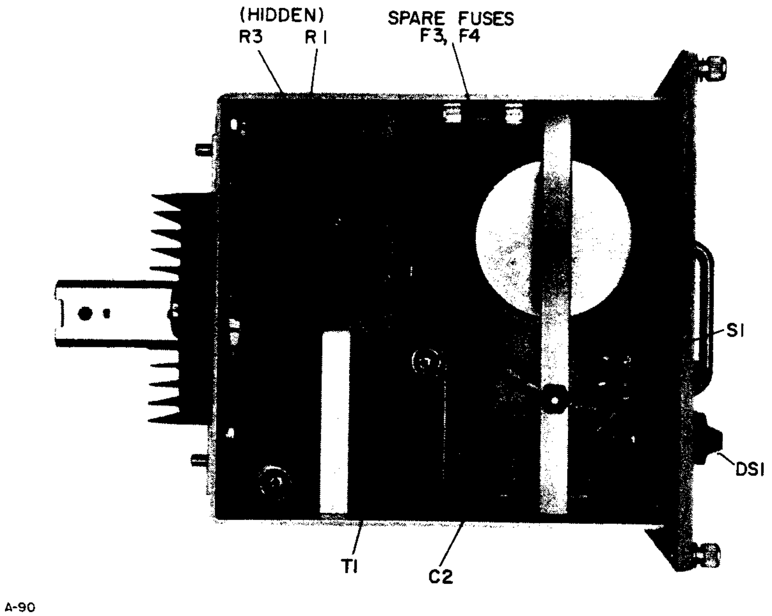


FIGURE 5-34. POWER SUPPLY, PP-4846/SRA - PARTS IDENTIFICATION (Top View)

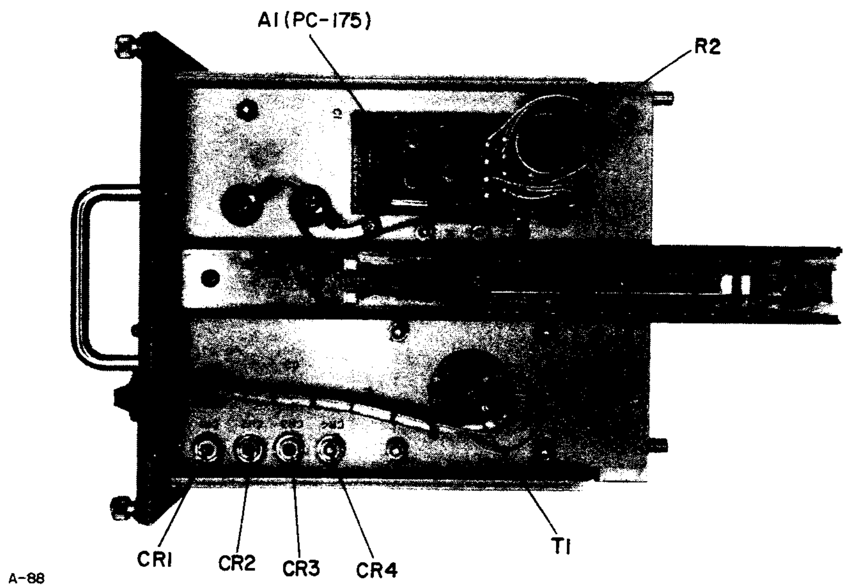


FIGURE 5-35. POWER SUPPLY, PP-4846/SRA - PARTS IDENTIFICATION (Bottom View)

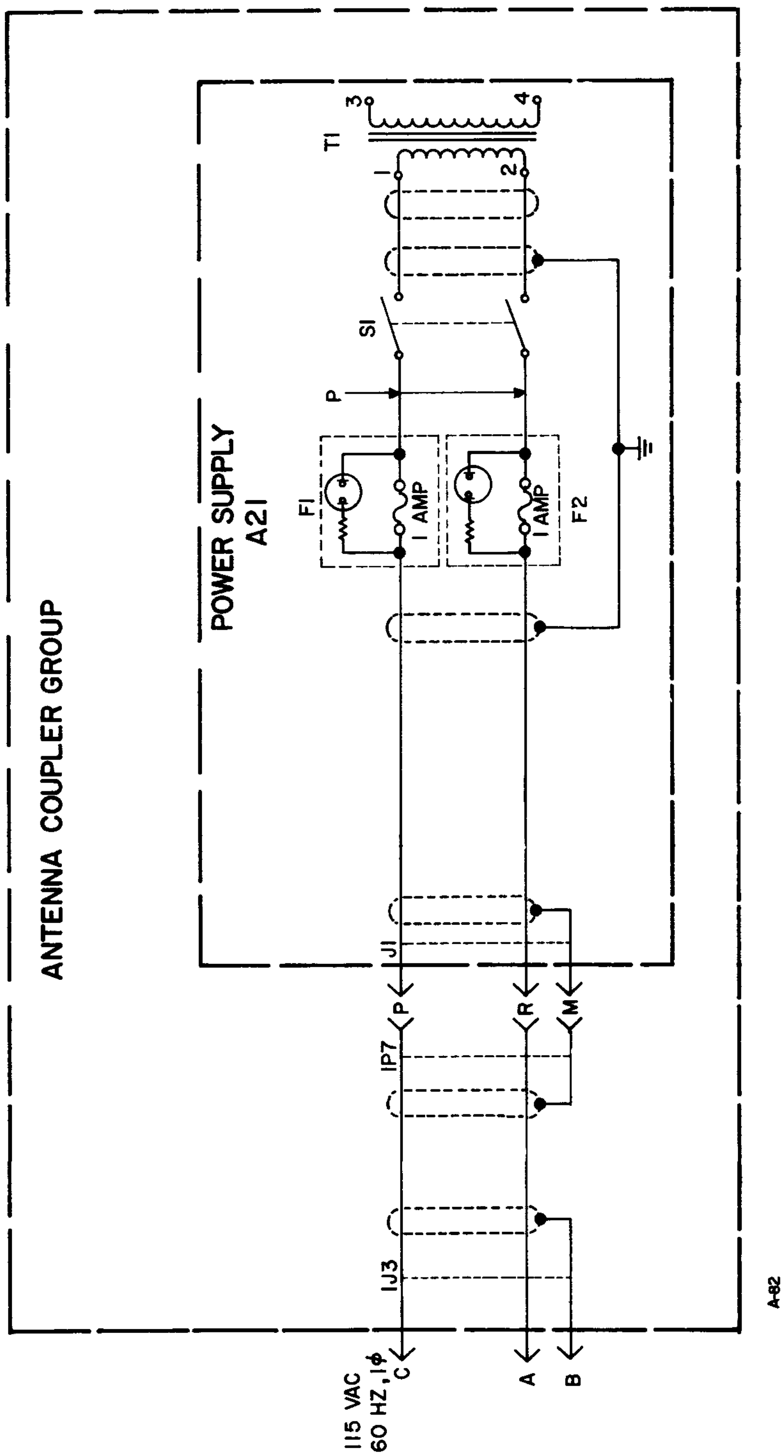


FIGURE 5-36. PRIMARY POWER DISTRIBUTION - ANTENNA COUPLER GROUPS AN/SRA-38, -39, -40, -49 AND -50

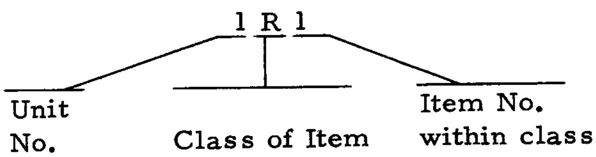
Section 6

PARTS LIST

6-1. INTRODUCTION.

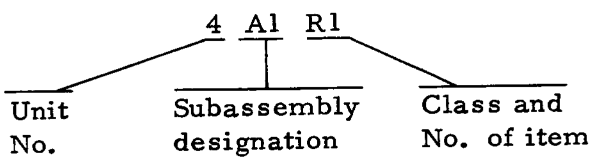
a. REFERENCE DESIGNATIONS. - The unit numbering method of assigning reference designations has been used to identify units, assemblies, subassemblies, and parts. This method has been expanded as much as necessary to adequately cover the various degrees of subdivision of the equipment. Examples of this unit numbering method and typical expansions of the same are illustrated by the following:

Example 1:



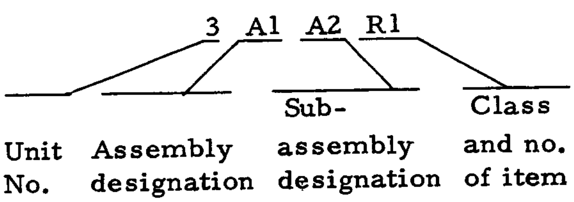
Read as: First (1) resistor (R) of first unit (1).

Example 2:



Read as: First (1) resistor (R) of first (1) subassembly (A) of fourth (4) unit.

Example 3:



Read as: First (1) resistor (R) of second (2) subassembly (A) of first (1) subassembly (A) of third (3) unit.

b. REF DESIG PREFIX. - Partial reference designations are used on the equipment and illustrations. The parti al reference deisgnations consist of the class letter (s) and the identifying item number. The complete reference designations may be obtained by placing the proper prefix before the partial reference designations. Prefixes are provided on illustrations. following the notation "REF DESIG PREFIX".

6-2. LIST OF UNITS.

Each coupler group includes: an equipment cabinet, (Unit 1), with antenna couplers, a power supply, and RF and power interfaces; and a dummy load designated Unit 2.

6-3. MAINTENANCE PARTS LIST.

a. Tables 6-1 through 6-19 list all units and their maintenance parts. The units are listed alphabetically-numerically by class of part following the unit designation. Thus the parts for each unit are grouped together. Each table provides the following information: (1) the complete reference designation of each unit, assembly, subassembly, or part, (2) noun name and brief description, and (3) identification of the illustration which pictorially locates the part.

b. Antenna Coupler groups are listed first with their subassemblies and associated equipment. Use the table reference to further break down each assembly into individual parts.

6-4. LIST OF MANUFACTURERS.

Table 6-20 lists the manufacturers of parts used in the equipment. The table includes the manufacturer's code used in Tables 6-1 through 6-19 to identify the manufacturers.

6-5. STOCK NUMBER IDENTIFICATION.

Allowance Parts List (APL) issued by the Electronics Supply Office (ESO) include Federal Stock Numbers and Source Maintenance and Recoverability Codes. Therefore, reference should be made to the APL prepared for the equipment for stock numbering information.

TABLE 6-1. AN/SRA-38 ANTENNA COUPLER GROUP

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION	TABLE REF.
1	1-1	CABINET, ELECTRICAL EQUIPMENT CY-6573/SRA, PB dwg 02-666-2	6-7
1A1-1A20	5-24, 5-25	COUPLER, ANTENNA, CU-1799/SRA, PB dwg 02-654-1	6-11
1A21	1-1	POWER SUPPLY PP-4846/SRA, PB dwg 02-680-1	6-16
2	1-1	DUMMY LOAD, ELECTRICAL, DA 515/U PB dwg 20-37129-1	6-19
3	5-21	PANEL, SIGNAL DISTRIBUTION, SB 3333/SR PB dwg 01-3204	6-18

TABLE 6-2. AN/SRA-39 ANTENNA COUPLER GROUP

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION	TABLE REF.
1	1-1	CABINET, ELECTRICAL EQUIPMENT CY-6573/SRA, PB dwg 02-666-2	6-7
1A1-1A20	5-26, 5-27	COUPLER, ANTENNA, CU-1800/SRA, PB dwg 02-655-1	6-12
1A21	1-1	POWER SUPPLY PP-4846/SRA, PB dwg 02-680-1	6-16
2	1-1	DUMMY LOAD, ELECTRICAL, DA 515/U PB dwg 20-37129-1	6-19

TABLE 6-3. AN/SRA-40 ANTENNA COUPLER GROUP

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION	TABLE REF.
1	1-1	CABINET, ELECTRICAL, EQUIPMENT CY-6573/SRA, PB dwg 02-666-2	6-7
1A1	5-30, 5-31	COUPLER, ANTENNA, CU-1802/SRA, PB dwg 02-657-1	6-14
1A2		Same as 1A1	
1A3	5-28, 5-29	COUPLER, ANTENNA, CU-1801/SRA, PB dwg 02-656-1	6-13
1A4		Same as 1A1	
1A5		Same as 1A1	
1A6		Same as 1A3	
1A7		Same as 1A1	
1A8		Same as 1A1	
1A9		Same as 1A3	
1A10		Same as 1A1	
1A11		Same as 1A3	
1A12		Same as 1A3	
1A13		Same as 1A1	
1A14		Same as 1A3	
1A15		Same as 1A3	
1A16		Same as 1A1	
1A17		Same as 1A3	
1A18		Same as 1A3	
1A19		Same as 1A1	
1A20		Same as 1A3	
1A21	1-1	POWER SUPPLY PP-4846/SRA, PB dwg 02-680-1	6-16
2	1-1	DUMMY LOAD, ELECTRICAL, DA 515/U PB dwg 20-37129-1	6-19

TABLE 6-4. AN/SRA-49 ANTENNA COUPLER GROUP

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION	TABLE REF.
1	1-2	CABINET, ELECTRICAL EQUIPMENT CY-6507/SRA, PB dwg 02-666-1	6-6
1A1	5-30, 5-31	COUPLER, ANTENNA, CU-1802/SRA, PB dwg 02-657-1	6-14
1A2	5-28, 5-29	COUPLER, ANTENNA, CU-1801/SRA, PB dwg 02-656-1	6-13
1A3	5-24, 5-25	COUPLER, ANTENNA, CU-1799/SRA, PB dwg 02-654-1	6-11
1A4		Same as 1A1	

TABLE 6-4. (Continued)

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION	TABLE REF.
1A5	5-26, 5-27	COUPLER, ANTENNA, CU-1800/SRA, PB dwg 02-655-1	6-12
1A6		Same as 1A3	
1A7		Same as 1A1	
1A8		Same as 1A5	
1A9		Same as 1A3	
1A10		Same as 1A1	
1A11		Same as 1A5	
1A12		Same as 1A3	
1A13		Same as 1A2	
1A14		Same as 1A5	
1A15		Same as 1A3	
1A16		Same as 1A2	
1A17		Same as 1A5	
1A18		Same as 1A3	
1A19		Same as 1A2	
1A20		Same as 1A5	
1A21	1-2	POWER SUPPLY PP-4846/SRA, PB dwg 02-680-1	6-16
1A25	1-2	PANEL, SIGNAL DISTRIBUTION, SB 3332/SR PB dwg 02-694	6-17
2	1-2	DUMMY LOAD, ELECTRICAL, DA 515/U PB dwg 20-37129-1	6-19

TABLE 6-5. AN/SRA-50 ANTENNA COUPLER GROUP

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION	TABLE REF.
1	1-3	CABINET, ELECTRICAL EQUIPMENT CY-6574/SRA, PB dwg 02-666-3	6-6
1A1	5-30, 5-31	COUPLER, ANTENNA CU-1802/SRA, PB dwg 02-657-1	6-14
1A2	5-28, 5-29	COUPLER, ANTENNA, CU-1801/SRA, PB dwg 02-656-1	6-13
1A3	5-26, 5-27	COUPLER, ANTENNA, CU-1800/SRA, PB dwg 02-655-1	6-12
1A4		Same as 1A1	
1A5		Same as 1A2	
1A6		Same as 1A3	
1A7		Same as 1A1	
1A8		Same as 1A2	

TABLE 6-5. (Continued)

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION	TABLE REF.
1A9		Same as 1A3	
1A10		Same as 1A1	
1A11		Same as 1A3	
1A12		Same as 1A3	
1A13		Same as 1A2	
1A14		Same as 1A3	
1A21	1-3	POWER SUPPLY PP-4846/SRA, PB dwg 02-680-1	6-16
1A25	1-3	PANEL SIGNAL DISTRIBUTION, SB 3332/SR PB dwg 02-694	6-17
2	1-3	DUMMY LOAD, ELECTRICAL, DA 515/U PB dwg 20-37129-1	6-19

TABLE 6-6. CABINET, ELECTRICAL EQUIPMENT CY-6507/SRA, CY-6574/SRA: PB dwg 02-666-1, -3

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
1J1, 1J2	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type M39012/11-0002 (UG 570 B/U).
1J3	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type MS3102R16-10P.
1J4	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type MS3102R28-12S.
1J5	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type MS3102R-18-1P.
1J6-1J29	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type M39012/09-0002 (UG 704 C/U).
1J30, 1J31	5-18	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type M39012/14-0001 (UG 569 B/U).
P1(A25J2)-P1(A25J45)		CONNECTOR, PLUG, ELECTRIC: MIL type M39012/16-0001 (UG 88 G/U)
A22, A23	5-18	POWER INTERFACE ASSEMBLY: PB, dwg 02-3182-1 Refer to Table 6-9.
A24	5-18	POWER INTERFACE ASSEMBLY: PB, dwg 02-3182-2 Refer to Table 6-10.
	5-18	RF INTERFACE ASSEMBLY: PB, dwg 02-3084-1 Refer to Table 6-8.
	5-18	RF INTERFACE ASSEMBLY: PB, dwg 02-3084-2 Refer to Table 6-8.
	5-18	RF INTERFACE ASSEMBLY: PB, dwg 02-3084-3 Refer to Table 6-8.

TABLE 6-7. CABINET, ELECTRICAL EQUIPMENT CY-6573/SRA PB, dwg 02-666-2

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
1J1, 1J2	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type M39012/11-0002 (UG 570 B/U).
1J3	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type MS3102R16-10P.
1J4	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type MS3102R28-12S.
1J5	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type MS3102R-18-1P.
1J6-1J25	2-8	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type M39012/19-0001 (UG 909 C/U).
1J30, 1J31	5-18	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type M39012/14-0001 (UG 569 B/U).
A22, A23	5-18	POWER INTERFACE ASSEMBLY: PB, dwg 02-3182-1 Refer to Table 6-9.
A24	5-18	POWER INTERFACE ASSEMBLY: PB, dwg 02-3182-2 Refer to Table 6-10.
	5-18	RF INTERFACE ASSEMBLY: PB, dwg 02-3084-1 Refer to Table 6-8.
	5-18	RF INTERFACE ASSEMBLY: PB, dwg 02-3084-2 Refer to Table 6-8.
	5-18	RF INTERFACE ASSEMBLY: PB, dwg 02-3084-3 Refer to Table 6-8.

TABLE 6-8. RF INTERFACE ASSEMBLY: PB, dwg 02-3084-1, -2, -3 Figure 5-19.

REF. DESIG.	NAME AND DESCRIPTION
MP1	INTERCONNECT BAR ASSY: PB, dwg 03-13326-1
MP2	NUT CONTACT ASSY: PB, dwg 03-13360-1
MP3	BUSHING INSULATING: PB, dwg 04-23447-2
MP4	WASHER INSULATING: PB, dwg 04-23448-2
MP5	BUSHING, CONNECTOR (BANANA JACK): PB, dwg 04-23269-1
MP6	SPRING: PB, dwg 06-23389-1
MP7	PLATE INTERFACE: PB, dwg 04-3056-1
MP8	GASKET R.F.: MX 01-0101-0006
MP9	WASHER FLAT: MS9549-12
MP10	GUIDE PIN (P/O MP1): PB, dwg 04-23450-1

TABLE 6-9. (A22, A23) POWER INTERFACE ASSEMBLY: PB dwg 02-3182-1, FIGURE 5-19.

REF. DESIG.	NAME AND DESCRIPTION
J1	CONNECTOR, RECEPTACLE, ELECTRIC: PB dwg 20-36985-2.
J2	CONNECTOR, RECEPTACLE, ELECTRIC: PB dwg 20-37128-2.
J3	Same as J1
J4	Same as J2
J5	Same as J1
J6	Same as J2
J7	Same as J1
J8	Same as J2
J9	Same as J1
J10	Same as J2
J11	Same as J1
J12	Same as J2
J13	Same as J1
J14	Same as J2
MP13	RETAINER SPRING: PB dwg 04-23558-1
MP14	WASHER CUP: PB dwg 04-23560-1
MP15	SPRING: PB dwg 06-23562-1
MP16	SPACER: AM 9318-P140
MP17	RETAINING RING: TA 5305-12 (.015) MD
MP18	CONNECTOR PLATE: PB dwg 03-13484-1

TABLE 6-10. (A24) POWER INTERFACE ASSEMBLY: PB dwg 02-3182-2, FIGURE 5-19.

REF. DESIG.	NAME AND DESCRIPTION
J1	CONNECTOR, RECEPTACLE, ELECTRIC: PB dwg 20-36985-2
J2	CONNECTOR, RECEPTACLE, ELECTRIC: PB dwg 20-37128-2
J3	Same as J1
J4	Same as J2
J5	Same as J1
J6	Same as J2
J7	Same as J1
J8	Same as J2
J9	Same as J1
J10	Same as J2
J11	Same as J1
J12	Same as J2

TABLE 6-10. (Continued)

REF. DESIG.	NAME AND DESCRIPTION
MP13	RETAINER SPRING: PB dwg 04-23558-1
MP14	WASHER CUP: PB dwg 04-23560-1
MP15	SPRING: PB dwg 06-23562-1
MP16	SPACER: AM 9318-P140
MP17	RETAINING RING: TA 5305-12(.015) MD
MP18	CONNECTOR PLATE: PB dwg 03-13484-1

TABLE 6-11. COUPLER, ANTENNA CU-1799/SRA: PB dwg 02-654-1

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
A1	5-23	CIRCUIT CARD ASSEMBLY: PB dwg 11-3154-1 Refer to Table 6-15
C1, C2	5-24	CAPACITOR, FIXED, CERAMIC DIELECTRIC: PB dwg 20-37133-7
C3	5-24	CAPACITOR, VARIABLE, AIR DIELECTRIC: JN dwg 189-527-4
C4	5-24	CAPACITOR, VARIABLE, AIR DIELECTRIC: PB dwg 20-37108-2
C5	5-24	CAPACITOR, VARIABLE, AIR DIELECTRIC: JN dwg 189-503-4
C6	5-24	Same as C4
C7	5-25	Same as C4
C8	5-25	Same as C5
C9	5-25	Same as C4
C10	5-25	Same as C5
C11	4-6	Same as C1
DS1	5-25	LAMP, INDICATOR: MIL type MS25237-327
E1	5-24	SPARK GAP: PB dwg 20-37110-4
K1	5-24	PROTECTIVE RELAY ASSEMBLY: PB dwg 02-13530-1
L1, L2	5-24	COIL, ASSY RF: PB dwg 03-13466-1
L3	5-24	COIL, RF: PB dwg 03-13369-1
L4	5-25	COIL, RF: PB dwg 05-13470-1
L5	5-25	Same as L3
L6, L7	5-25	COIL, ASSY RF: PB dwg 03-13467-1
MP1	5-17	GEAR ARM: PB dwg 03-13372-1
MP2	5-17	SPUR GEAR: PB dwg 04-13384-1
MP3	5-17	SPUR GEAR: PB dwg 04-13393-1
MP4	5-17	SPUR GEAR: PB dwg 04-12970-1
MP5	5-17	SPUR GEAR: PB dwg 04-12918-1
MP6	5-17	DIAL GEAR: PB dwg 06-13388-1
MP7	5-17	SHAFT: PB dwg 04-23258-1
MP8	5-17	BEARING: PB dwg 04-23261-2

TABLE 6-11. (Continued)

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
MP9	5-17	SPACER: PB dwg 04-23281-4
MP10	5-17	SHAFT: Part of MP1
MP11	5-17	SPACER: PB dwg 04-23281-7
MP12	5-17	RETAINING RING: TA 5100-18
MP13	5-17	CAPTIVE SCREW: PB dwg 04-23499-1
MP14	5-17	HANDLE: PB dwg 04-23501
MP15	5-17	WINDOW: PB dwg 04-23534
MP16	5-17	RESONATOR ASSEMBLY: PB dwg 02-670-1
MP17	5-17	KNOB: MS 91528-3D2B
MP18	5-17	KNOB LOCK: RY KL1251-G
MP19	5-17	SPLIT BUSHING: PB dwg 04-23456-1
MP20	5-17	SPACER: PB dwg 04-23281-5
P1, P2	5-24	CONNECTOR, PLUG, ELECTRIC: PB dwg 04-23310-1
P3	5-25	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-37128-1
P4	5-25	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-36985-1
P5	5-24	Same as P1
R1	5-24	RESISTOR, FIXED RC20GF101K
S1	5-24	TOGGLE SWITCH: JAN type MS35058-31.
XDS1	5-25	LAMP HOLDER: PB dwg 20-37134-1

TABLE 6-12. COUPLER,ANTENNA CU-1800/SRA: PB dwg 02-655-1

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
A1	5-23	CIRCUIT CARD ASSEMBLY: PB dwg 11-3154-1. Refer to Table 6-15.
C1, C2	5-26	CAPACITOR, FIXED, CERAMIC DIELECTRIC: PB dwg 20-37133-1
C3	5-26	CAPACITOR, VARIABLE, AIR DIELECTRIC: PB dwg 189-527-4
C4	5-26	CAPACITOR, VARIABLE, AIR DIELECTRIC: PB dwg 20-37108-2
C5	5-26	CAPACITOR, VARIABLE, AIR DIELECTRIC: JN dwg 189-503-4
C6	5-26	Same as C4
C7	5-27	Same as C4
C8	5-27	Same as C5

TABLE 6-12. (Continued)

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
C9	5-27	Same as C4
C10	5-27	Same as C5
C11	4-6	CAPACITOR, FIXED, CERAMIC DIELECTRIC: PB dwg 20-37113-3
DS1	5-27	LAMP, INDICATOR: MIL type MS25237-327
E1	5-26	SPARK GAP: PB dwg 20-37110-4
K1	5-26	PROTECTIVE RELAY ASSEMBLY: PB dwg 02-13530-1
L1, L2	5-26	COIL, ASSY RF: PB dwg 03-13469-1
L3	5-26	COIL, RF: PB dwg 03-13401-1
L4	5-26	COIL, RF: PB dwg 05-13470-2
L5	5-27	Same as L3
L6, L7	5-27	COIL, ASSY RF: PB dwg 03-13468-1
MP1	5-17	GEAR ARM: PB dwg 03-13372-1
MP2	5-17	SPUR GEAR: PB dwg 04-13384-1
MP3	5-17	SPUR GEAR: PB dwg 04-13393-1
MP4	5-17	SPUR GEAR: PB dwg 04-12970-1
MP5	5-17	SPUR GEAR: PB dwg 04-12918-1
MP6	5-17	DIAL GEAR: PB dwg 06-13389-1
MP7	5-17	SHAFT: PB dwg 04-23258-1
MP8	5-17	BEARING: PB dwg 04-23261-2
MP9	5-17	SPACER: PB dwg 04-23281-4
MP10	5-17	SHAFT: Part of MP1
MP11	5-17	SPACER: PB dwg 04-23281-7
MP12	5-17	RETAINING RING: TA 5100-18
MP13	5-17	CAPTIVE SCREW: PB dwg 04-23499-1
MP14	5-17	HANDLE: PB dwg 04-23501
MP15	5-17	WINDOW: PB dwg 04-23534
MP16	5-17	RESONATOR ASSEMBLY: PB dwg 02-699-1
MP17	5-17	KNOB: MS 91528-3D2B .
MP18	5-17	KNOB LOCK: RY KL1251-G
MP19	5-17	SPLIT BUSHING: PB dwg 04-23456-1
MP20	5-17	SPACER: PB dwg 04-23281-5
P1, P2	5-26	CONNECTOR, PLUG, ELECTRIC: PB dwg 04-23310-1
P3	5-27	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-37128-1
P4	5-27	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-36985-1
P5	5-26	Same as P1
R1	5-26	RESISTOR, FIXED RC20GF101K
S1	5-26	TOGGLE SWITCH: JAN type MS35058-31
XDS1	5-27	LAMP HOLDER: PB dwg 20-37134-1

TABLE 6-13. COUPLER, ANTENNA CU-1801/SRA: PB dwg 02-656-1

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
A1	5-23	CIRCUIT CARD ASSEMBLY: PB dwg 11-3154-1 Refer to Table 6-15
C1, C2	5-28	CAPACITOR, FIXED, CERAMIC DIELECTRIC: PB dwg 20-37133-6
C3	5-28	CAPACITOR, VARIABLE, AIR DIELECTRIC: JN dwg 189-527-4
C4	5-28	CAPACITOR, VARIABLE, AIR DIELECTRIC: PB dwg 20-37108-1
C5	5-28	CAPACITOR, VARIABLE, AIR DIELECTRIC: JN dwg 189-503-4
C6	5-28	Same as C4
C7	5-29	Same as C4
C8	5-29	Same as C5
C9	5-29	Same as C4
C10	5-29	Same as C5
DS1	5-29	LAMP, INDICATOR: MIL type MS25237-327
E1	5-28	SPARK GAP: PB dwg 20-37110-4
K1	5-28	PROTECTIVE RELAY ASSEMBLY: PB dwg 02-13530-1
L1, L2	5-28	COIL, ASSY RF: PB dwg 03-13456-1
L3	5-28	COIL, RF: PB dwg 03-13455-1
L4	5-28	COIL, RF: PB dwg 05-13470-3
L5	5-29	Same as L3
L6, L7	5-29	COIL, ASSY RF: PB dwg 03-13457-1
MP1	5-17	GEAR ARM: PB dwg 03-13372-2
MP2	5-17	SPUR GEAR: PB dwg 04-13384-2
MP3	5-17	SPUR GEAR: PB dwg 04-13393-2
MP4	5-17	SPUR GEAR: PB dwg 04-12970-1
MP5	5-17	SPUR GEAR: PB dwg 04-12918-1
MP6	5-17	DIAL GEAR: PB dwg 06-13390-1
MP7	5-17	SHAFT: PB dwg 04-23380-1
MP8	5-17	BEARING: PB dwg 04-23261-2
MP9	5-17	SPACER: PB dwg 04-23281-4
MP10	5-17	SHAFT: Part of MP1
MP11	5-17	SPACER: PB dwg 04-23281-6
MP12	5-17	RETAINING RING: TA 5100-25
MP13	5-17	CAPTIVE SCREW: PB dwg 04-23499-1
MP14	5-17	HANDLE: PB dwg 04-23501
MP15	5-17	WINDOW: PB dwg 04-23534
MP16	5-17	RESONATOR ASSEMBLY: PB dwg 02-671-1
MP17	5-17	KNOB : MS 91528-3D2B
MP18	5-17	KNOB LOCK: RY KL1251-G
MP19	5-17	SPLIT BUSHING: PB dwg 04-23456-1
MP20	5-17	SPACER: PB dwg 04-23281-5

TABLE 6-13. (Continued)

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
P1, P2	5-28	CONNECTOR, PLUG, ELECTRIC: PB dwg 04-23310-1
P3	5-29	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-37128-1
P4	5-29	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-36985-1
P5	5-28	Same as P1
R1	5-28	RESISTOR, FIXED RC20GF101K
S1	5-28	TOGGLE SWITCH: JAN type MS35058-31
XDS1	5-29	LAMP HOLDER: PB dwg 20-37134-1

TABLE 6-14. COUPLER, ANTENNA CU-1802/SRA: PB dwg 02-657-1

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
A1	5-23	CIRCUIT CARD ASSEMBLY: PB dwg 11-3154-1 Refer to Table 6-15
C1, C2	5-30	CAPACITOR, FIXED, CERAMIC DIELECTRIC: PB dwg 20-37133-3
C3	5-30	CAPACITOR, VARIABLE, AIR DIELECTRIC: JN dwg 189-527-4
C4	5-30	CAPACITOR, VARIABLE, AIR DIELECTRIC: PB dwg 20-37108-1
C5	5-30	CAPACITOR, VARIABLE, AIR DIELECTRIC: JN dwg 189-503-4
C6	5-30	Same as C4
C7	5-31	Same as C4
C8	5-31	Same as C5
C9	5-31	Same as C4
C10	5-31	Same as C5
DS1	5-31	LAMP, INDICATOR: MIL type MS25237-327
E1	5-30	SPARK GAP: PB dwg 20-37110-4
K1	5-30	PROTECTIVE RELAY ASSEMBLY: PB dwg 02-13530-1
L1, L2	5-30	COIL, ASSY RF: PB dwg 03-13413-1
L3	5-30	COIL, RF: PB dwg 03-13414-1
L4	5-30	COIL, RF: PB dwg 05-13470-4
L5	5-31	Same as L3
L6, L7	5-31	COIL, ASSY RF: PB dwg 03-13415-1
MP1	5-17	GEAR ARM: PB dwg 03-13372-2
MP2	5-17	SPUR GEAR: PB dwg 04-13384-2
MP3	5-17	SPUR GEAR: PB dwg 04-13393-2
MP4	5-17	SPUR GEAR: PB dwg 04-12970-1
MP5	5-17	SPUR GEAR: PB dwg 04-12918-1

TABLE 6-14. (Continued)

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
MP6	5-17	DIAL GEAR: PB dwg 06-13391-1
MP7	5-17	SHAFT: PB dwg 04-23380-1
MP8	5-17	BEARING: PB dwg 04-23261-2
MP9	5-17	SPACER: PB dwg 04-23281-4
MP10	5-17	SHAFT: Part of MP1
MP11	5-17	SPACER: PB dwg 04-23281-6
MP12	5-17	RETAINING RING: TA 5100-25
MP13	5-17	CAPTIVE SCREW: PB dwg 04-23499-1
MP14	5-17	HANDLE: PB dwg 04-23501
MP15	5-17	WINDOW: PB dwg 04-23534
MP16	5-17	RESONATOR ASSEMBLY: PB dwg 02-700-1
MP17	5-17	KNOB: MS 91528-3D2B
MP18	5-17	KNOB LOCK: RY KL1251-G
MP19	5-17	SPLIT BUSHING: PB dwg 04-23456-1
MP20	5-17	SPACER: PB dwg 04-23281-5
P1, P2	5-30	CONNECTOR, PLUG, ELECTRIC: PB dwg 04-23310-1
P3	5-31	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-37128-1
P4	5-31	CONNECTOR, PLUG, ELECTRIC: PB dwg 20-36985-1
P5	5-30	Same as P1
R1	5-30	RESISTOR, FIXED RC20GF101K
S1	5-30	TOGGLE SWITCH: JAN type MS35058-31
XDS1	5-31	LAMP HOLDER: PB dwg 20-37134-1

TABLE 6-15. (A1) CIRCUIT CARD ASSEMBLY: PB, dwg 11-3154-1
REFER TO FIGURE 5-15.

REF. DESIG.	NAME AND DESCRIPTION
C1	CAPACITOR, FIXED, ELECTROLYTIC: ET dwg 557-051-10A
C2	CAPACITOR, FIXED, ELECTROLYTIC: PB dwg 20-36804-2
C3, C4	CAPACITOR, FIXED, ELECTROLYTIC: JAN type CK60AW102M
C5	Same as C2
C6	CAPACITOR, FIXED, ELECTROLYTIC: JAN type CK60BX100K
C7-C9	Same as C3
C10	Same as C2
C11, C12	CAPACITOR, FIXED, ELECTROLYTIC: PB dwg 19-36982-15

TABLE 6-15. (Continued)

REF. DESIG.	NAME AND DESCRIPTION
C13	CAPACITOR, FIXED, ELECTROLYTIC: JAN type CK60BX101K
C14	CAPACITOR, FIXED ELECTROLYTIC: ET dwg 557-051-109F
C15	CAPACITOR, FIXED, ELECTROLYTIC: JAN type CK60BX221K
C16	Same as C2
C17,C18	Same as C3
C19	Same as C2
C20	Same as C15
C21	CAPACITOR, FIXED, ELECTROLYTIC: PB dwg 19-36982-17
C22	Same as C3
CR1, CR2	DIODE: JAN type 1N914
CR3	DIODE: PB dwg 20-37140-1 (IRC 1N758A)
CR4-CR9	Same as CR1
Q1-Q12	TRANSISTOR: JAN type 2N706
Q13	TRANSISTOR: JAN type 2N1613
Q14-Q19	Same as Q1
R1	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF392J
R2	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF153J
R3	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF102J
R4	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF681K
R5	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF272K
R6	Same as R5
R7	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF472K
R8	RESISTOR, FIXED, COMPOSITION: JAN type RN55D5621F
R9	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF4R7K
R10, R11	Same as R3
R12	Same as R7
R13	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF222K
R14	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF122J
R15	Same as R13
R16	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF271K
R17	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF271K

TABLE 6-15. (Continued)

REF. DESIG.	NAME AND DESCRIPTION
R18	Same as R3
R19	Same as R17
R20	Same as R7
R21	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF510J.
R22	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF104K
R23	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF182K
R24	Same as R21
R25	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF682K
R26	Same as R13
R27	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF622J
R28	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF221K
R29	Same as R2
R30	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF332K
R31	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF111J
R32	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF330K
R33	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF103K
R34	Same as R25
R35	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF910J
R36	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF392K
R37	RESISTOR, FIXED, COMPOSITION: JAN type RW69V101J
R38	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF273K
R39	Same as R33
R40	Same as R13
R41	Same as R36
R42	Same as R28
R43	Same as R7
R44, R45	Same as R13
R46	Same as R33
R47	Same as R36
R48	RESISTOR, FIXED, COMPOSITION: JAN type RN65C5113F
R49	Same as R33
R50, R51	Same as R36

TABLE 6-16. (A21) POWER SUPPLY ASSEMBLY: PB dwg 02-680-1

REF. DESIG.	FIG. REF.	NAME AND DESCRIPTION
C1	5-34	CAPACITOR, FIXED, ELECTROLYTIC: JAN type CE71C103G
C2	5-34	CAPACITOR, FIXED, ELECTROLYTIC: JAN type CP05A1KC104K3
CR1-CR4	5-34	DIODE: PB dwg 19-36983-13
DS1	5-34	LAMP, INDICATOR: MIL type MS25237-327
F1, F2	5-32	FUSE: JAN type F02B250V1AS
F3	5-32	FUSE: JAN type F02A250V2AS
F4	5-34	Same as F1
F5	5-34	Same as F3
J1	5-33	CONNECTOR, INSERT: WL dwg MS18174-1
Q1	5-34	TRANSISTOR: PB dwg 19-36981-7
R1	5-34	RESISTOR, FIXED, WIREWOUND: JAN type RW31G1R0
R2	5-35	RESISTOR, VARIABLE: JAN type RV4LAYSA501A
R3	5-34	Same as R1
S1	5-34	SWITCH, TOGGLE: MIL type MS35059-22
T1	5-34	TRANSFORMER: PB dwg 20-37112-1
A1	5-35	CIRCUIT CARD ASSEMBLY: PB dwg 11-13453-1
A1C1	5-16	CAPACITOR, FIXED, ELECTRIC: PB dwg 19-36982-29
A1C2	5-16	CAPACITOR, FIXED, ELECTRIC: PB dwg 20-36804-2
A1C3	5-16	CAPACITOR, FIXED, ELECTRIC: PB dwg 19-36982-32
A1CR1	5-16	DIODE: PB dwg 19-36983-4
A1Q1-A1Q3	5-16	TRANSISTOR: PB dwg 19-36981-5
A1R1	5-16	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF272K
A1R2	5-16	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF392K
A1R3	5-16	RESISTOR, FIXED, COMPOSITION: JAN type RC20GF122K
A1R4	5-16	RESISTOR, FIXED, COMPOSITION: JAN type RC32GF332K
A1R5, A1R6	5-16	RESISTOR, FIXED, COMPOSITION: JAN type RC07GF680J

TABLE 6-17. (A25) SB-3332/SR SIGNAL DISTRIBUTION PANEL FIGURE 5-20

REF. DESIG.	NAME AND DESCRIPTION
J1	CONNECTOR, JACK, TELEPHONE: SW M-441
J2-J45	CONNECTOR, RECEPTICAL, ELECTRIC: PB dwg dwg 20-37183-1
J46	Same as J1

TABLE 6-18. (3) SB-3333/SR SIGNAL DISTRIBUTION PANEL FIGURE 5-21

REF. DESIG.	NAME AND DESCRIPTION
J1-J116	CONNECTOR, RECEPTICAL, ELECTRIC: PB dwg 20-37183-1
J117-J122	CONNECTOR, JACK, TELEPHONE: SW M-441

TABLE 6-19. ADDITIONAL EQUIPMENT SUPPLIED

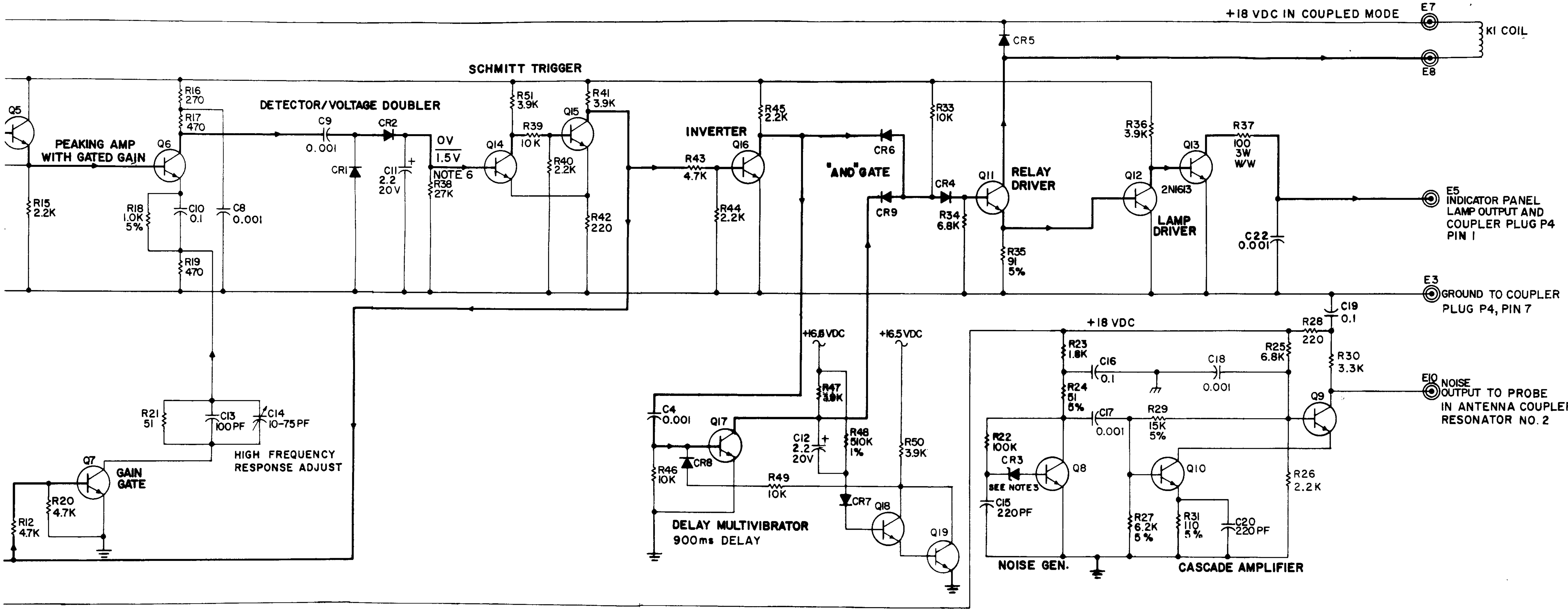
REF. DESIG. (IF ANY)	NAME AND DESCRIPTION
	PATCH CORD PB dwg 20-37184
	TP PL-4W 1
	CONNECTOR, ELECTRICAL: MS39012/16-0001 (UG88 G/U)
	CONNECTOR, ELECTRICAL: MS39012/06-0002 (UG573 G/U)
	CONNECTOR, ELECTRICAL: MS3108R-16-10S
	CONNECTOR, ELECTRICAL: MS3108R-28-12P
	CONNECTOR, ELECTRICAL: MS3108R-18-1S
	BLANK PANEL ASSEMBLY: PB dwg 02-3188
2	DUMMY LOAD, ELECTRICAL, DA-515/U, PB dwg 20-37129-1
2J1	CONNECTOR, RECEPTACLE, ELECTRIC: MIL type UG-570 B/U

TABLE 6-19. (Continued)

REF. DESIG. (If Any)	NAME AND DESCRIPTION
	TEST FIXTURE ASSEMBLY: PB dwg 02-13501
J1-J3	CONNECTOR, RECEPTACLE, ELECTRIC: JN108-760
J4	CONNECTOR, RECEPTACLE, ELECTRIC: JAN type UG604/U
R1	RESISTOR, FIXED, COMPOSITION: JAN type RC32GF510J
	LEAD ELECTRICAL, EXTENDER CABLE: PB dwg 13-13548-1
J1	CONNECTOR, RECEPTACLE, ELECTRIC: PB dwg 20-36985-3
P1	CONNECTOR, RECEPTACLE, ELECTRIC: PB dwg 20-36985-1

TABLE 6-20. LIST OF MANUFACTURERS

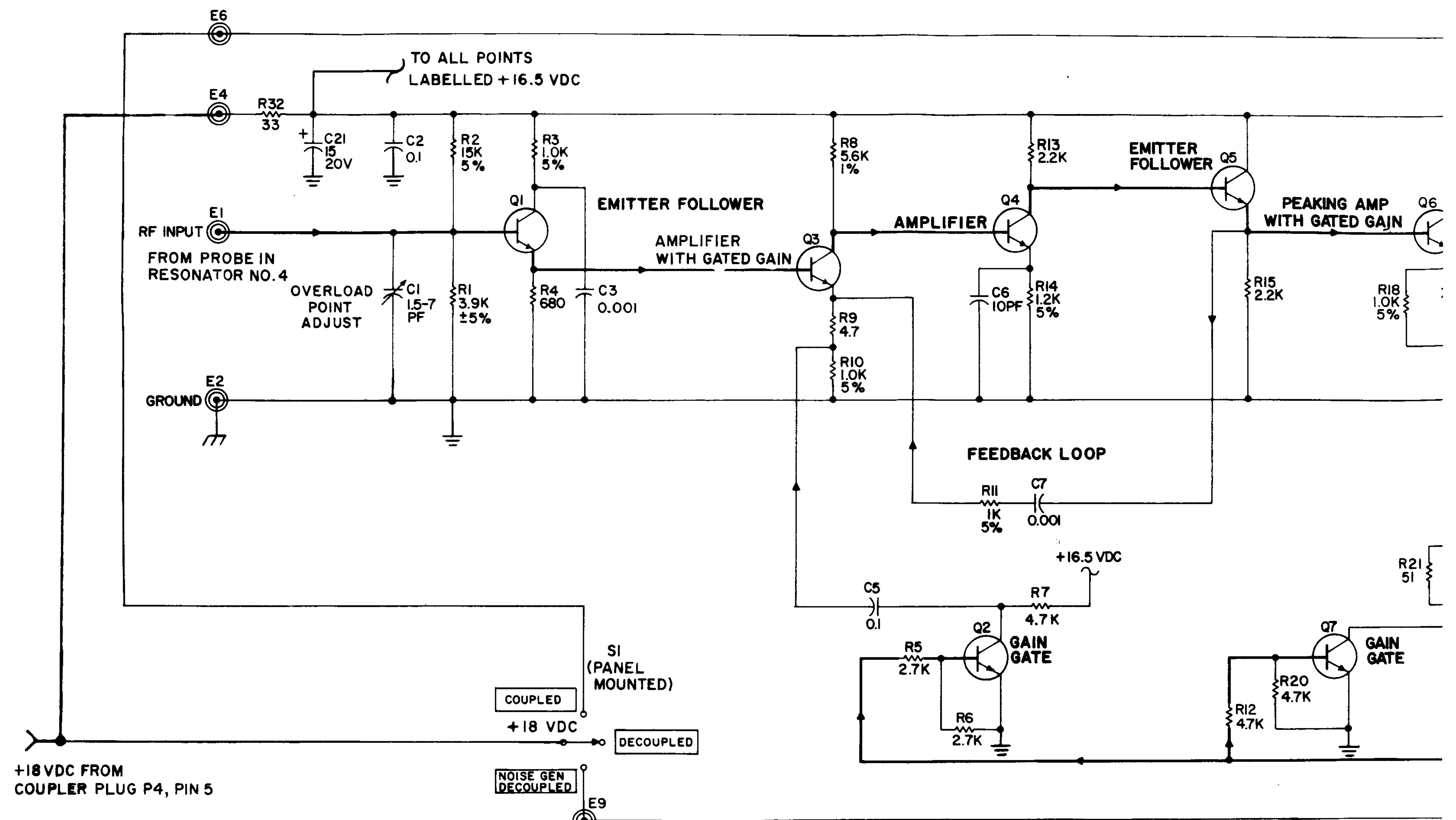
MFR CODE	NAME	ADDRESS
AL	Amphenol Corp.	Broadview, Ill.
AM	Amatom Electronic Hardware Co., Inc.	New Rochelle, N. Y.
BD	Bird Electronic Corporation	Cleveland, Ohio
EM	Eagle Metalcraft, Inc.	East Syracuse, N. Y.
ET	Erie Technological Products, Inc., Electronics Division	Erie, Pa.
HM	Hammerlund Mfg., Inc.	Mars Hill, N.C.
IRC	IRC, Inc.	Philadelphia, Pa.
JN	EF Johnson Co.	Waseca, Minn.
MX	Metex	Clark, N. J.
PB	Continental Electronics Manufacturing Co. Pickard & Burns Electronics Division	Waltham, Mass.
RY	Raytheon Co.	Lexington, Mass.
SW	Swtichcraft Inc.	Chicago, Ill.
TA	Waldes Kohinoor, TruArc Division	Long Island City N. Y.
TP	Trompeter Electronics, Inc.	Chatsworth, Cal.
WL	Westlab, Inc., Kalamazoo Div. of Western Tablet and Stationary Corp.	Kalamazoo, Mich.



NOTES-UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTORS ARE 1/4 WATT AT 10%
2. ALL TRANSISTORS ARE JAN 2N706 UNLESS OTHERWISE SPECIFIED.
3. ALL DIODES EXCEPT CR3 ARE JAN 1N914; CR3 IS A ZENER DIODE PER P&B SPECIFICATION 20-37140-1.
4. ALL RESISTANCE VALUES ARE IN OHMS.
5. ALL CAPACITANCE VALUES ARE IN MICROFARADS
6. 0V = NORMAL; 1.5V = OVERLOAD

FIGURE 4-8. PC-172 OVERLOAD PROTECTION CIRCUIT, SCHEMATIC DIAGRAM


E6
TO ALL POINTS
LABELLED +16.5 VDC
E4
R32
33
C21
15
20V
C2
0.1
R2
15K
5%
R3
1.0K
5%
R8
5.6K
1%
R13
2.2K
EMITTER
FOLLOWER
Q5
Q1
EMITTER FOLLOWER
Q4
AMPLIFIER
PEAKING AMP
WITH GATED GAIN
Q6
E1
RF INPUT
FROM PROBE IN
RESONATOR NO. 4
AMPLIFIER
WITH GATED GAIN
Q3
OVERLOAD
POINT
ADJUST
C1
1.5-7
PF
R1
3.9K
±5%
R4
680
C3
0.001
C6
10PF
R14
1.2K
5%
R15
2.2K
R18
1.0K
5%
R9
4.7
R10
1.0K
5%
E2
GROUND
FEEDBACK LOOP
R11
1K
5%
C7
0.001
+16.5 VDC
R21
51
C5
0.1
R7
4.7K
Q2
GAIN
GATE
Q7
GAIN
GATE
R5
2.7K
R6
2.7K
R20
4.7K
R12
4.7K
S1
(PANEL
MOUNTED)
COUPLED
+18 VDC
DECOUPLED
NOISE GEN
DECOUPLED
E9
+18 VDC FROM
COUPLER PLUG P4, PIN 5

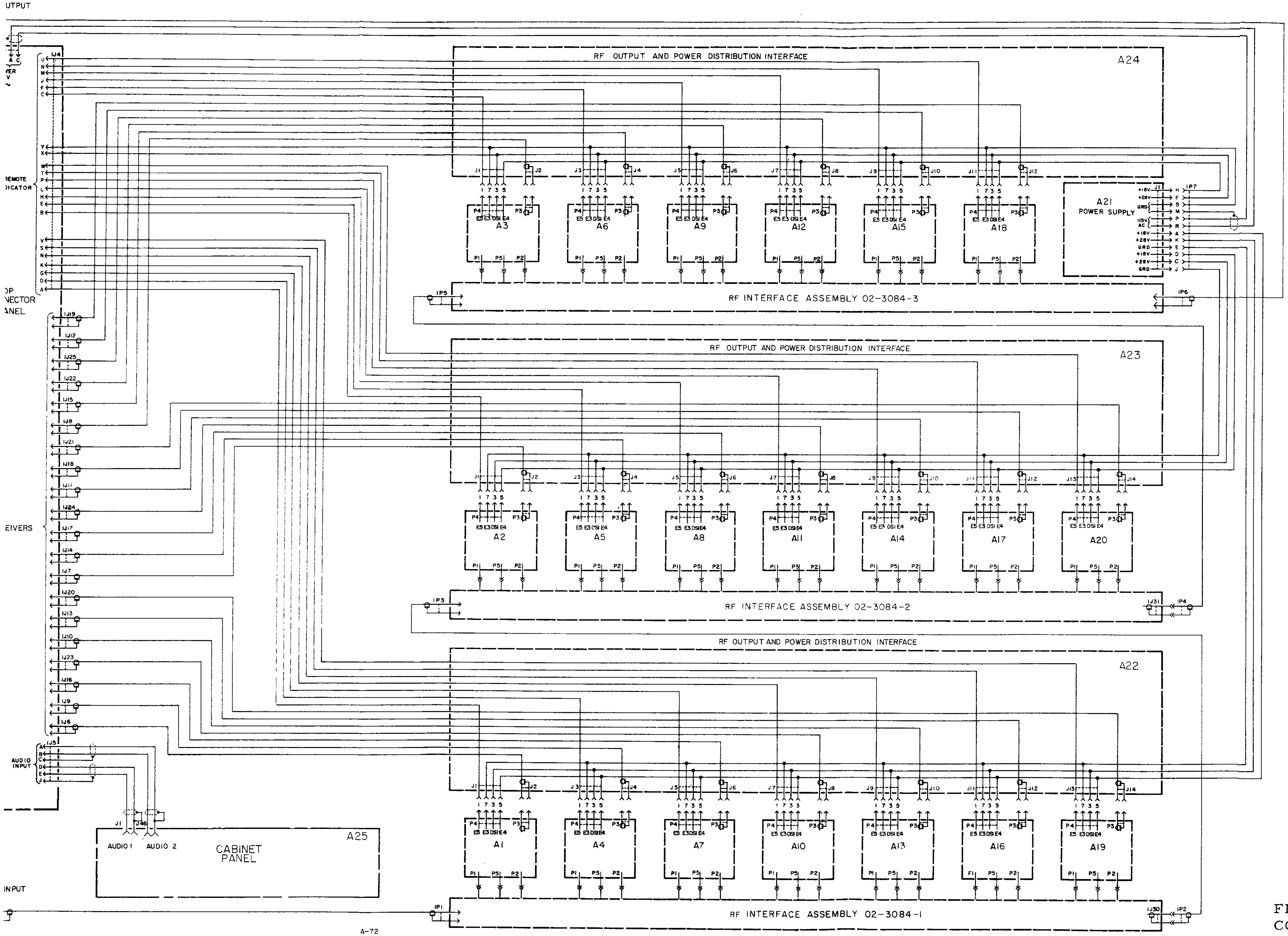
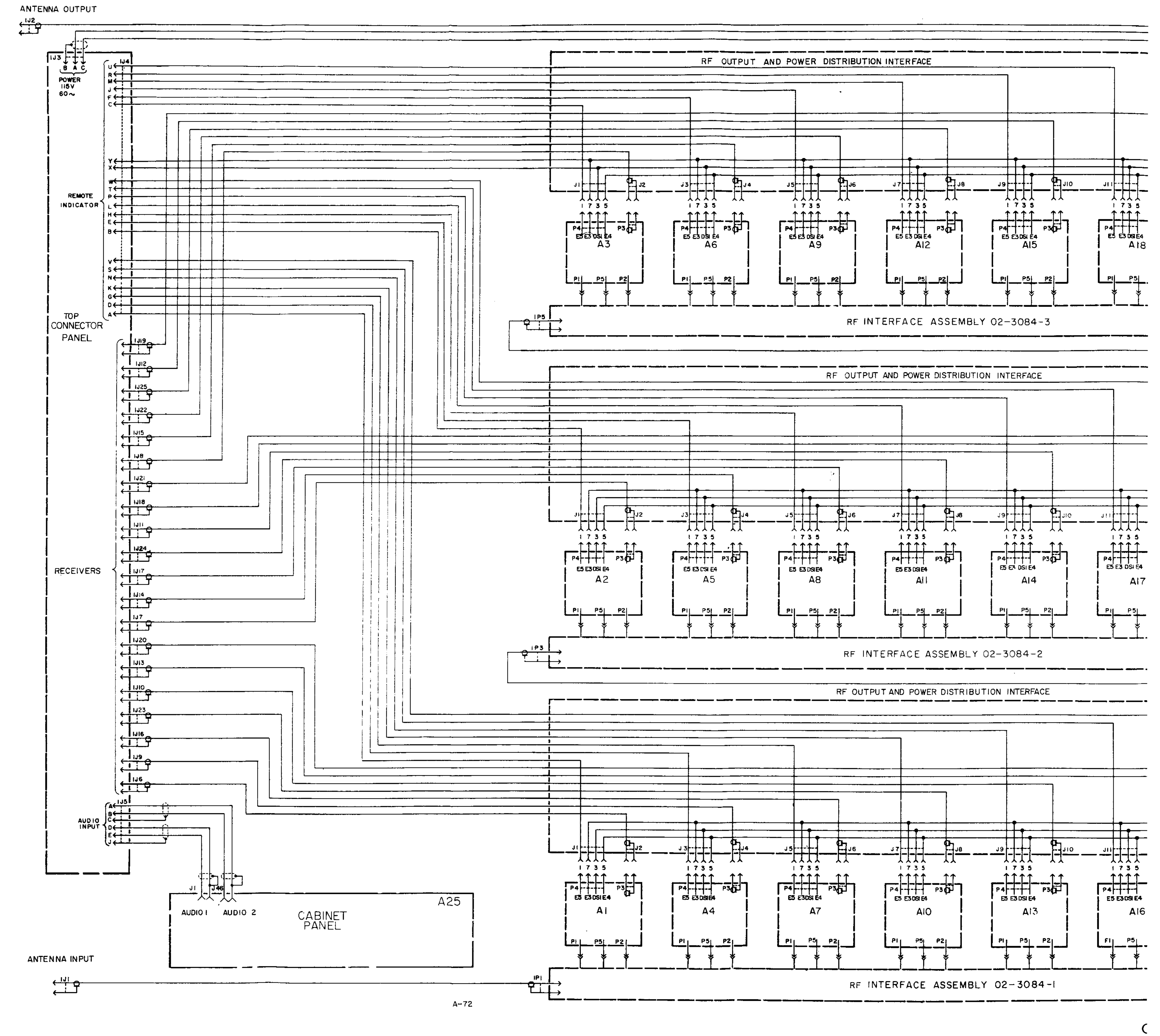


FIGURE 5-37. SCHEMATIC, ANTENNA COUPLER GROUPS, AN/SRA-38, -39 AND -40



ANTENNA OUTPUT
POWER 115V 60~
REMOTE INDICATOR
TOP CONNECTOR PANEL
RECEIVERS
AUDIO INPUT
RF OUTPUT AND POWER DISTRIBUTION INTERFACE
RF INTERFACE ASSEMBLY 02-3084-3
RF INTERFACE ASSEMBLY 02-3084-2
RF INTERFACE ASSEMBLY 02-3084-1
A25
CABINET PANEL
AUDIO 1
AUDIO 2
ANTENNA INPUT
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
A18

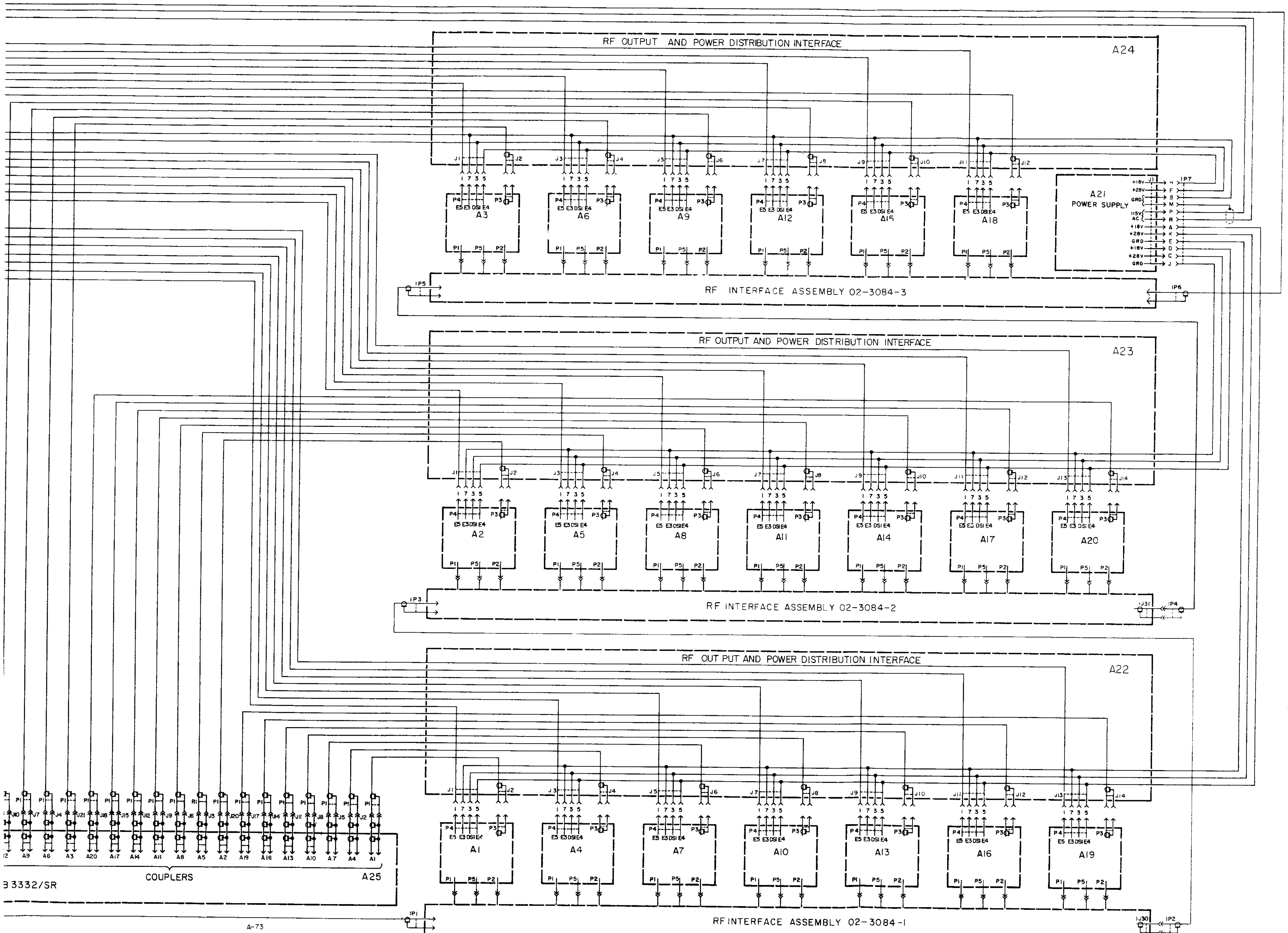
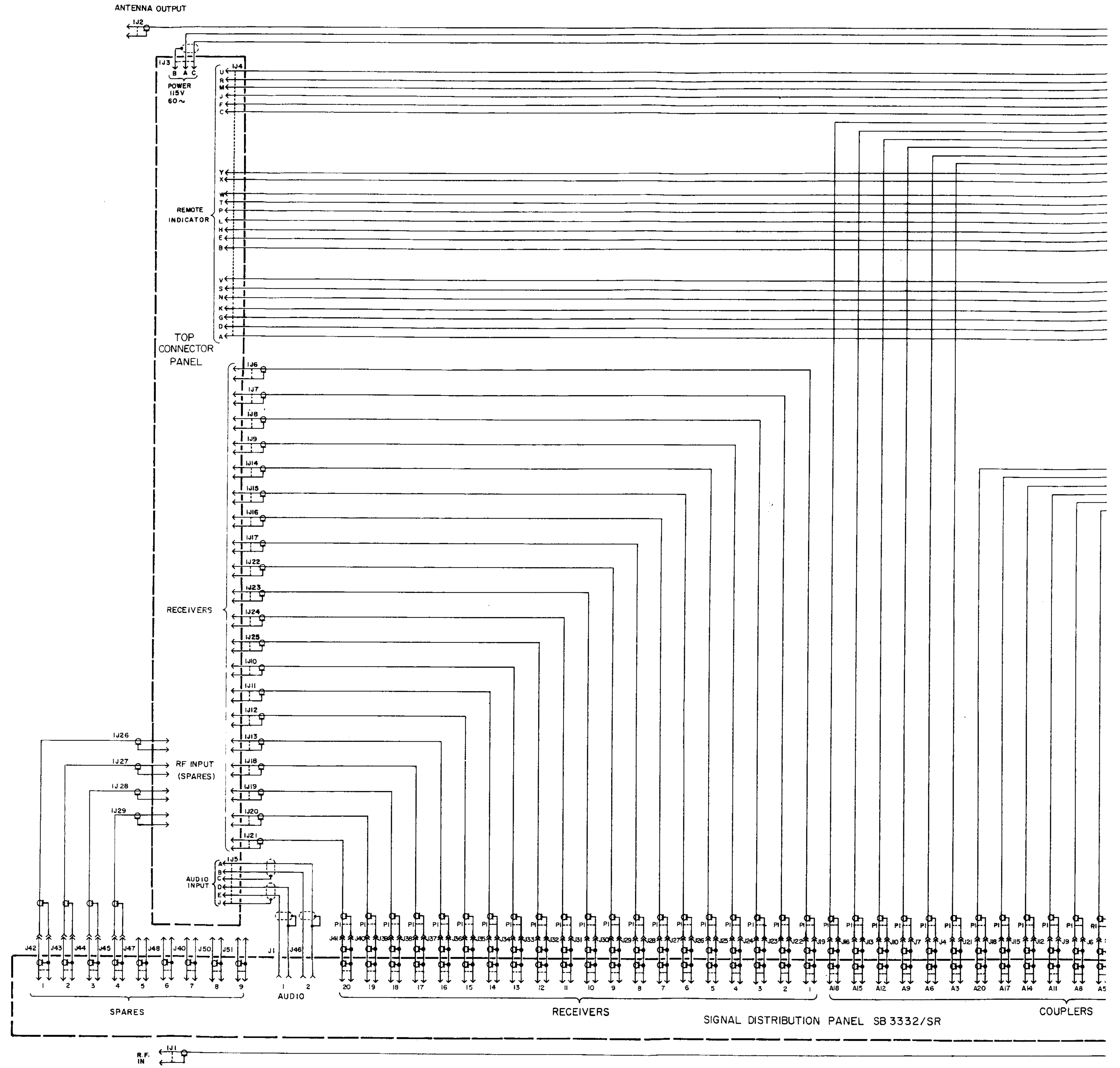


FIGURE 5-38. SCHEMATIC, ANTENNA COUPLER GROUPS, AN/SRA-49 AND -50


ANTENNA OUTPUT
POWER 115V 60~
REMOTE INDICATOR
TOP CONNECTOR PANEL
RECEIVERS
RF INPUT (SPARES)
AUDIO INPUT
SPARES
AUDIO
RECEIVERS
SIGNAL DISTRIBUTION PANEL SB 3332/SR
COUPLERS
R.F. IN