NAVELEX 0967-LP-879-5010

TECHNICAL MANUAL

FOR

RADIO TRANSMITTING SET AN/URT-23(V)

This manual supersedes NAVELEX 0967-879-5010 of 15 July 1975 and NAVELEX 0967-LP-191-7010 of 15 July 1975.

DEPARTMENT OF THE NAVY

NAVAL ELECTRONIC SYSTEMS COMMAND

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RECORD OF CHANGES

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SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to charges retained by capacitors. To avoid casualties, always remove power and discharge and ground a circuit before touching it.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid

RESUSCITATION

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.

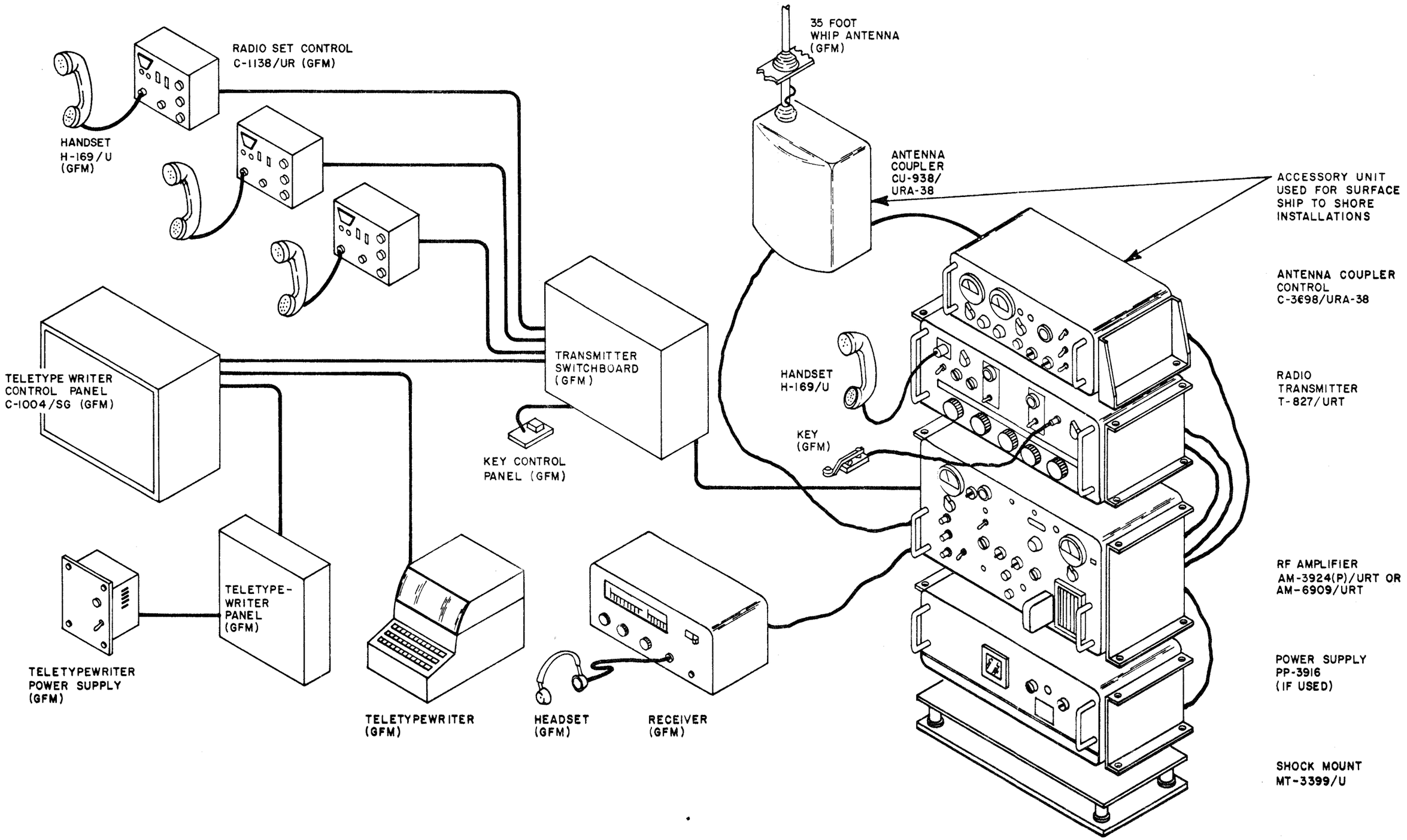

Figure 1-1. Typical Relationship of Units

SECTION 1

GENERAL INFORMATION

1-1. SCOPE.

1-2. This technical manual is in effect upon receipt and supercedes both NAVELEX 0967-191-7010, of 15 July 1975, and NAVELEX 0967-879-5010, of 15 July 1975. Extracts from this publication may be made to facilitate the preparation of other Department of Defense publications.

1-3. This technical manual describes and contains the necessary information for the installation, operation, troubleshooting, and maintenance of Radio Transmitting Set AN/URT-23(V). Additionally, this manual includes related tuning and operating information for accessory Antenna Coupler Group AN/URA-38. Hereinafter, Radio Transmitting Set AN/URT-23(V) will be referred to as the AN/URT-23(V).

1-4. DESCRIPTION.

1-5. GENERAL.

NOTE

All references to AM-3924(P)/URT also apply to AM-6909/URT equipment unless otherwise indicated.

1-6. The AN/URT-23(V) is a 1 KW single-sideband Radio Transmitting Set that can be supplied in any one of four possible configurations. The normal configuration will include Radio Transmitter T-827( )/URT, and will be capable of general purpose voice, continuous wave, and radio teletypewriter transmissions in the 2.0 to 30.0 MHz frequency range. The exact spacing and number of channels available for operation in this configuration is dependent on the model of the T-827( )/URT supplied as a part of the AN/URT-23(V) (paragraph 1-8). Stack or rack mounting may be used to install the units of the AN/URT-23(V) in a ship or shore fixed installation with other ancillary equipment to form a complete communications system such as that shown in figure 1-1. Any one of three three-phase primary power sources can be used to provide operating power to the AN/URT-23(V): 115 volts line-to-line, 400 Hz; or, 208 or 440 volts line-to-line, 60 Hz. The major units used to make up the four AN/URT-23(V) configurations are: Radio Transmitter T-827( )/URT, Radio Frequency Amplifier AM-3924(P)/URT, Radio Frequency Amplifier AM-6909/URT, Power Supply PP-3916/UR or (optionally) Power Supply PP-3917/UR, and Electrical Equipment Shock Mount Base MT-3399/U. Hereinafter, these units will be referred to as the T-827( )/URT, AM-3924(P)/URT, AM-6909/URT, PP-3916/UR, PP-3917/UR, and MT-3399/U, respectively.

1-7. RADIO TRANSMITTER T-827( )/URT.

1-8. The T-827( )/URT is a low level transmitter (exciter) which provides a USB, LSB, ISB, ISB/FSK CW, FSK, or Compatible AM RF signal of sufficient power (approximately 100 MW) to drive the AM-3924(P)/URT. Digital tuning is used to cover the 2.0 to 30.0 MHz frequency range. (Model T-827( )/URT tunes from 2.0 to 29.9995 MHz in 500 Hz increments; Model T-827B/URT and later models tune from 2.0 to 29.9999 MHz in 100 Hz increments.) A five wire coded output from the T-827( )/URT is also applied to the AM-3924(P)/URT to automatically tune it to the correct frequency band. The T-827( )/URT is housed in a metal case which can be stack or rack mounted with the associated units. For a more complete description, refer to the applicable technical manual for the particular model T-827( )/URT used.

1-9. RADIO FREQUENCY AMPLIFIER AM-3924(P)/URT.

1-10. The AM-3924(P)/URT (figures 5-6 through 5-17) is a two stage 40 dB linear power amplifier which produces an output of 1 KW of PEP and average power with a nominal input of 100 MW. Nineteen frequency bands are used to cover the 2.0 to 30.0 MHz operating frequency range. The operating band is automatically selected by a five-wire code generated by the T-827( )/URT or internally generated if the T-827( )/URT is not used. The code controls two motor-driven bandswitch assemblies on which are mounted broadband transformers used as interstage and output tuned circuits for the two amplifier stages. Automatic control circuits compensate for variations in system gain, mode of operation, or loading to protect the unit against overload. The AM-3924(P)/URT can be modified to allow operation with an exciter other than the T-827( )/URT (paragraph 2-49). Plugged mounting holes are provided in the front panel and rear of the case to allow the installation of the circuitry. The AM-3924(P)/URT operates from a three-phase primary power source of 115 volts line-to-line, 400 Hz; or 208 or 440 volts line-to-line, 60 Hz. All low voltages required for operation (except two of the relay control voltages) are internally produced. The high voltages required for powering the electron tubes used in the amplifier stages are produced by the associated Power Supply PP-3916/UR (when using 60 Hz primary power) or the optional internally mounted Power Supply PP-3917/UR (when using 400 Hz primary power).

1-11. The AM-3924(P)/URT consists of eight major subassemblies (one of which is the PP-3917/UR, when used) which are secured to a chassis and panel assembly. The chassis and panel assembly is mounted on ball bearing slides and is housed in a metal case. The slides allow the chassis to be fully extended from the case and locked in a horizontal position or rotated 90 degrees up and locked in a vertical position to facilitate servicing. All operating controls and indicators are located on the front panel. Those controls used only for initial set-up are protected by a hinged access cover. All connections are made at the rear of the case. The four electron tubes and the associated interstage broadband transformer assemblies are cooled by forced convection. Cooling air is drawn through a filter on the front panel and exhausted through a port on the rear of the case.

1-12. RADIO FREQUENCY AMPLIFIER AM-6909/URT.

1-13. AM-6909/URT is the nomenclature given to an AM-3924(P)/URT in which FC-14 AN/URT-23(V) has been installed. Field Change 14 is applicable only to AN/URT-23(V)'s which are powered by a PP-3916/UR. The purpose of Field Change 14 is to remove high level AC voltages from the multiconductor chassis connectors P3/J3. Field Change 14 installs a terminal board into the cavity where the PP-3617/UR would normally be installed if used. Therefore, the PP-3917/UR can not be installed and the nomenclature of the AM-3924(P)/URT was changed to AM-6909/URT after the Field Change installation. Other than the use of 400 Hz primary power and the Power Supply PP-3917/UR, the descriptions given in paragraph 1-10 and hereafter for the AM-3924(P)/URT apply to the AM-6909/URT except as otherwise specified.

1-14. POWER SUPPLY PP-3916/UR.

1-15. The PP-3916/UR (figure 5-20) produces operating voltages for the AM-6909/URT when operating from a 60 Hz, three phase, 208 or 440 volt line-to-line primary power source. All components of the PP-3916/UR, except the power transformers, are mounted on a chassis and panel assembly, which is hinge-mounted to a metal case. Loosening five front panel captive screws allows the chassis and panel assembly to be dropped 90 degrees to a horizontal position for servicing and troubleshooting. The power transformers are constructed as an integral part of the case. Two self-indicating fuse holders and a POWER ON indicator are located on the front panel of the PP-3916/UR; there are no operating controls. Connections to the PP-3916/UR are made at the rear of the case. Cooling air is drawn through a filter on the front panel and exhausted through a port on the rear of the case.

1-16. POWER SUPPLY PP-3917/UR.

1-17. The PP-3917/UR (figure 5-20) produces operating voltages for the AM-3924(P)/URT when operating from a 400 Hz, three phase, 115 volt line-to-line primary power source. When used, the PP-3917/UR is mounted as a subassembly of the AM-3924(P)/URT. All components of the PP-3917/UR

are mounted on a base plate which is secured to the underside of the AM-3924(P)/URT chassis. The PP-3917/UR is interconnected to two terminal boards on the AM-3924(P)/URT chassis through a harness to which two fanning strips are attached.

1-18. ELECTRICAL EQUIPMENT SHOCK MOUNT BASE MT-3399/U.

1-19. The MT-3399/U (figure 1-2) is used in shipboard installation as a resilient shock mounting base on which the units of the AN/URT-23(V) are stack mounted. It consists of an open frame structure attached to a flat mounting plate through vibration isolators. These isolators protect the units by damping shock and/or vibration of continuous or intermittent origin. Brackets are attached to the sides of each unit to enable the units to be secured to each other and in turn to the MT-3399/U. The MT-3399/U is anchored to the deck of the ship or some other suitable horizontal mounting surface. In addition, a sway brace secures the top of the stack to the bulkhead of the ship. This limits lateral motion, and thus, reduces the required sway space. The sway brace also prevents the stack from tilting when an equipment chassis is withdrawn from its case. The MT-3399/U and mounting brackets are constructed of aluminum to reduce the equipment's magnetic signature, thus making the mounting system suitable for use in configurations where the use of magnetic material is critical (such as on minesweepers).

1-20. REFERENCE DATA.

1-21. The following paragraphs contain data on the electrical characteristics of the units of the AN/URT-23(V).

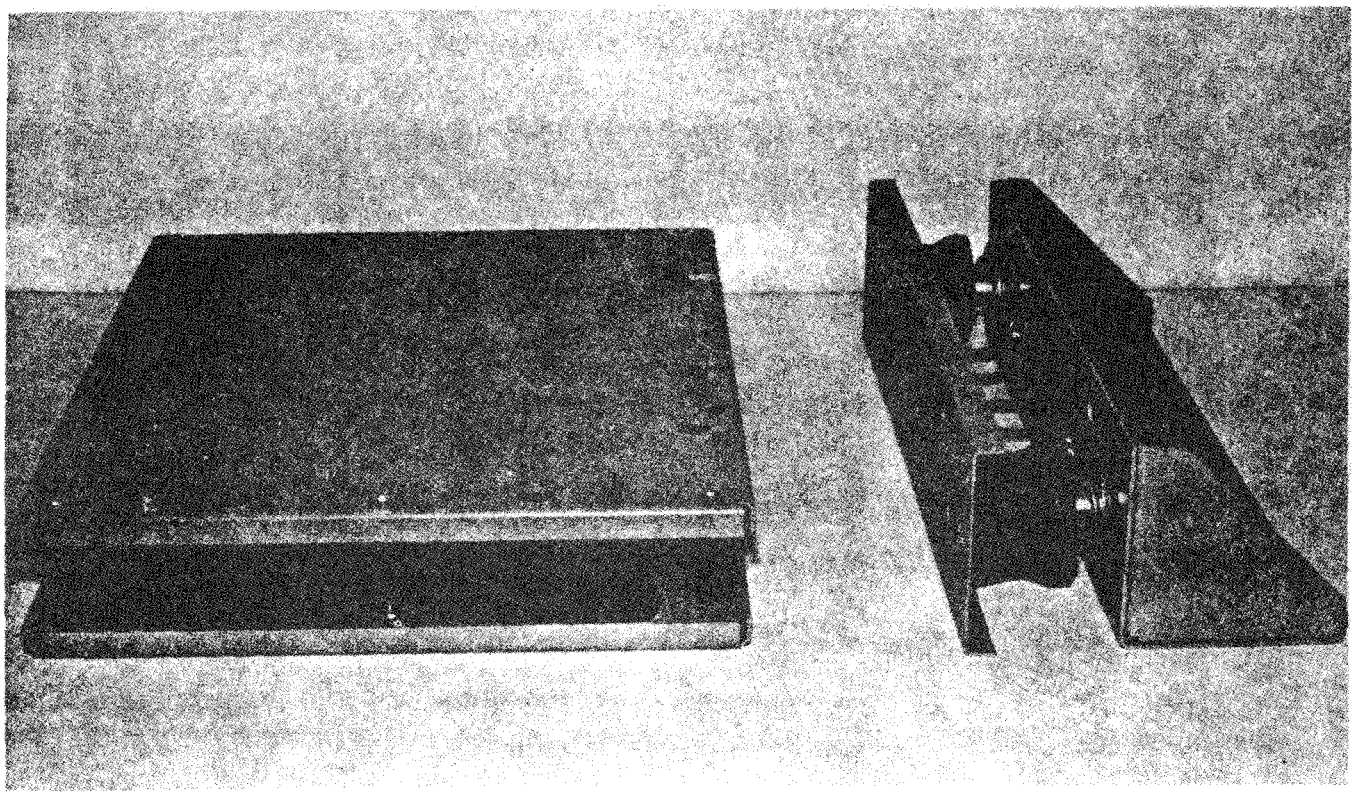

Figure 1-2. Electrical Equipment Shock Mount Base MT-3399/U

1-22. AN/URT-23(V) NAME PLATE DATA.

AN/URT-23(V) Transmitting Set, Radio
Supply: 115V, 3 Ø, 400 Hz; 208V Y/440V, 3 Ø, 60 Hz
Manufactured for Naval Electronic Systems Command
By contractor: R. F. Communications, Inc., Rochester, New York
Contract N00039-68-C-1584

1-23. RADIO TRANSMITTING SET AN/URT-23(V).

NOTE

Reference data indicated below reflects the operation of the AN/URT-23(V) in its normal operating configurations.

a. Primary power: 115 volts + 10% line-to-line, 400 Hz, three phase, three-wire (when using PP-3917/UR); or 208 or 440 volts ± 10% line-to-line, 60 Hz, three phase, three-wire (when using PP-3916/UR).

b. Power consumption: 4400 watts (when using PP-3917/UR); or 4500 watts (when using PP-3916/UR) at rated full power output.

c. Heat dissipation: 3400 watts (when using PP-3917/UR); or 3500 watts (when using PP-3916/UR) at rated full power output.

d. Power output: 1 kilowatt PEP for USB, LSB, ISB, and compatible AM (225 watts of carrier) emissions; 1 kilowatt average power for CW and FSK.

e. Modes of operation: USB, ISB, LSB, FSK, ISB/FSK (ISB with FSK on USB), CW and compatible AM.

f. Frequency range: The frequency range and increments of tuning depends upon the model of T-827( )/URT exciter used. Model T-827/URT tunes from 2.0000 to 29.9995 MHz in 0.5 KHz increments (56,000 channels). Model T-827B/URT and later versions tune from 2.000 to 29.9999 MHz in 0.1 KHz increments (280,000 channels). The AM-3924(P)/URT covers the 2.0 to 30.0 MHz frequency range in 19 bands.

g. Frequency stability: 1 part in 10^8 per day when the internal frequency standard is used. The stability of the transmitter on external standard is that of the external frequency standard used.

h. Intermodulation distortion: -30 dB maximum at full rated power output.

i. Carrier suppression: -50 dB minimum in USB or LSB with single tone (1 KHz) input.

j. Audio input impedance: 600 ohms in REMOTE: 30 ohms (nominal) in LOCAL.

k. Teletypewriter loop current input: SPACE = 0 ma; MARK = 5 ma minimum to 60 ma maximum.

l. Tuning time: 10 seconds.

m. Ambient temperature limitations (during operation): 0 to 50 degrees C (32 to 122 degrees F).

n. Required RF load: 50 ohms with a maximum VSWR of 4:1.

1-24. POWER SUPPLY OUTPUT VOLTAGES.

a. Power Supply PP-3916/UR:

(1) 115 volts, 60 Hz, single phase, 185 watts.

(2) 115 volts, 400 Hz, single phase, square wave, 70 watts.

(3) 500 VDC at 0.9 amperes (filtered).

(4) 2250 VDC at 1.2 amperes (filtered).

b. Power Supply PP-3917/UR:

(1) 115 volts, 60 Hz, single phase, square wave, 40 watts.

(2) 115 volts, 400 Hz, single phase, 215 watts.

(3) 500 VDC at 0.9 amperes (filtered).

(4) 2250 VDC at 1.2 amperes (unfiltered).

1-25. EQUIPMENT SUPPLIED.

1-26. The equipment supplied as a part of each of the four AN/URT-23(V) configurations is listed in table 1-1.

1-27. TYPICAL EQUIPMENT, CABLES, AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED.

1-28. Typical equipment, cables, and publications required but not supplied as part of the AN/URT-23(V) are listed in table 1-2. The exact requirements will depend on the configuration being used. If the indicated test equipment is not available, use an equivalent substitute.

1-29. FACTORY OR FIELD CHANGES.

1-30. Table 1-3 provides a list of field changes made to the AN/URT-23(V). Table 1-5 provides a list of factory changes made to the AN/URT-23(V).

TABLE 1-1. RADIO TRANSMITTING SET AN/URT-23(V) EQUIPMENT SUPPLIED

NOMENCLATURE		UNIT NO.	OVERALL DIMENSIONS (IN.)			VOLUME (FT^3)	WEIGHT (LBS)
NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
Radio Frequency Amplifier	AM-3924(P)/URT	1	12.36	17.38	20.00	2.36	95 (1)
Radio Frequency Amplifier	AM-6909/URT (4)	1	12.36	17.38	20.00	2.36	95
Power Supply	PP-3917/UR	1A1A8	(2)	(2)	(2)	(2)	30
Power Supply	PP-3916/UR	2	7.11	17.38	19.90	1.36	145
Radio Transmitter	T-827( )/URT	3	7.11	17.38	19.40	1.34	70
Electrical Equipment Shock Mount Base	MT-3399/U	4	3.5 (3)	19.69	16.88	0.70	20
Handset (including cord and plug assembly)	H-169/U with CX-1846A/U						
Interconnecting Cable	W1						

(1) Does not include weight of subassembly PP-3917/UR

(2) Optional unit, which when supplied, is a subassembly of the AM-3924(P)/URT

(3) Shock Mount height is with load applied

(4) Does not permit mounting of PP-3917/UR

TABLE 1-1. RADIO TRANSMITTING SET AN/URT-23(V) EQUIPMENT SUPPLIED (Cont.)

NOMENCLATURE		UNIT NO.	OVERALL DIMENSIONS (IN.)			VOLUME (FT^3)	WEIGHT (LBS)
NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
Interconnecting Cable	W2						
Interconnecting Cable	W3						
Connector	10-109618-1P (5)						
Connector	10-109620-19S (5)						
Connector	10-109628-12P (5)						
Connector	10-109628-21P (5)						
Connector	MS3106E-16S-5S						
Connector	MS3106E-10SL-4S (2 each)						
Connector	MS3106E-14S-2S						
Connector	UG-88E/U						
Connector	UG-941B/U						
Connector	UG-982/U						
Technical Manual	NAVELEX 0967-879-5010 (2 each)						

(5) Refer to NAVSHIPS drawing RE-B2695923.

TABLE 1-1. RADIO TRANSMITTING SET AN/URT-23(V) EQUIPMENT SUPPLIED (Cont.)

NOMENCLATURE		UNIT NO.	OVERALL DIMENSIONS (IN.)			VOLUME (FT^3)	WEIGHT (LBS)
NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
Operator's Instruction Chart	NAVSHIPS 0967-LP-879-5020						
Performance Standards Sheet	NAVSHIPS 0967-LP-879-5030						
Maintenance Standards Book	NAVSHIPS 0967-LP-879-5040						
Technical Manual Vol. I	NAVSHIPS 0967-032-0010 (2 ea.) for T-827/URT (6)						
Technical Manual Vol. II	NAVSHIPS 0967-032-0020 (2 ea.) for T-827/URT (6)						
Maintenance Standards Book	NAVSHIPS 0967-032-0030 (1 ea.) for T-827/URT (6)						
Technical Manual Vol. I	NAVSHIPS 0967-LP-200-3010 (2 ea.) for T-827B/URT and T-827E/URT (6)						
Technical Manual Vol. II	NAVSHIPS 0967-LP-200-3020 (2 ea.) for T-827B/URT and T-827E/URT (6)						
Maintenance Standards Book	NAVSHIPS 0967-LP-200-3030 (1 ea.) for T-827B/URT and T-827E/URT (6)						

TABLE 1-1. RADIO TRANSMITTING SET AN/URT-23(V) EQUIPMENT SUPPLIED (Cont.)

NOMENCLATURE		UNIT NO.	OVERALL DIMENSIONS (IN.)			VOLUME (FT^3)	WEIGHT (LBS)
NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
Technical Manual Vol I	NAVSHIPS 0967-LP-878-4010 (2 ea.) for T-827D/URT (6)						
Technical Manual Vol II	NAVSHIPS 0967-LP-878-4020 (2 ea.) for T-827D/URT (6)						
Operator's Instruction Chart	NAVSHIPS 0967-LP-878-4030 (1 ea.) for T-827D/URT (6)						
Performance Standards Sheet	NAVSHIPS 0967-LP-878-4040 (1 ea.) for T-827D/URT (6)						
Maintenance Standards Book	NAVSHIPS 0967-LP-878-4050 (1 ea.) for T-827D/URT (6)						
Screw	MS51959-63 (5)						
Support Clamp	10-36233-183 (5)						
Support Clamp	10-36233-203 (5)						
Support Clamp	10-36233-243 (5)						

(5) Refer to NAVSHIPS drawing RE-B2695923.

(6) Technical Manual numbers for the T-827( )/URT is determined by the model of T-827( )/URT supplied with the transmitter.

TABLE 1-1. RADIO TRANSMITTING SET AN/URT-23(V) EQUIPMENT SUPPLIED (Cont.)

NOMENCLATURE		UNIT NO.	OVERALL DIMENSIONS (IN.)			VOLUME (FT^3)	WEIGHT (LBS)
NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
Ground Cable	391-0021 (2 ea.) (7)						
Sealed Plug Assembly	391-9040 (8)						
Jumper 1A1P1	391-4000 (7)						

(7) RF Communications, Inc., Part Number

(8) Used only when the PP-3917/UR is used

TABLE 1-2. RADIO TRANSMITTING SET AN/URT-23(V), TYPICAL EQUIPMENT, CABLES, AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Antenna System	Broadband Antenna, Multicoupler, or Antenna Coupler Group AN/URA-38 for surface ship and shore installations. Antenna Tuner AN/BRA-11, 21 or 23 for submarine installations.	Radiation of RF Signals	Frequency Range: 2 to 30 Mhz Input Impedance: 50 ohms Power Input: 1 KW Average Maximum VSWR: 4:1
1	Cable Set		Interconnection of Equipment	Fabricate according to para. 2-29
1	Teletypewriter Panel	SB-1203/UG or TT-23/SG (or equivalent)	FSK Operation	
1	Teletypewriter Control Panel	C-1004/SG (or equivalent)	FSK Operation	
1	Teletypewriter Power Supply	PP-3934/U (or equivalent)	FSK Operation	
1	Key Control Panel	SB-315/U (or equivalent)	Keying for CW Operation	
3	Radio Remote Control	C-1138/UR (or equivalent)	Shipboard Remote Control Operation	
1	CW Key*		Local Keying for CW Operation	

*Optional

TABLE 1-2. RADIO TRANSMITTING SET AN/URT-23(V), TYPICAL EQUIPMENT, CABLES, AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED (Cont.)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Oscilloscope	AN/USM-117( )	Maintenance, Adjustment, and Troubleshooting Procedures	Frequency: DC to 30 MHz Sensitivity: 0 to 250 VAC P-P 0.1 to 300 VDC Input Impedance: 1 megohm
1	Radio Test Set	AN/TRM-3	Alignment Procedures	Frequency Range: 1 to 35 MHz Sweep: 1 MHz to 5 MHz Marker Frequency Inserts: 0.5, 1.0 and 5.0 MHz Output: Voltage: 1V RMS, MAX Impedance: 50 ohms
1	Electrical Dummy Load	DA-242/U	Maintenance, Adjustment, and Troubleshooting Procedures	Input Impedance: 50 ohm, coaxial Power: 2.5 KW RF from 2 to 30 MHz
1	Video Transfer Oscillator	AN/URM-153	To extend Frequency Range of AN/TRM-3	

TABLE 1-2. RADIO TRANSMITTING SET AN/URT-23(V), TYPICAL EQUIPMENT, CABLES, AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED (Cont.)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Two-Tone Audio Signal Generator	SG-376/U	Maintenance and Adjustment Procedures	Frequency Range: 20 Hz to 3000 Hz Output Voltage: 0 to 150 Millivolts/ tone Output Impedance: 600 ohms
2	Electronic Multimeter	AN/USM-116( ) with RF Cable Adapter UG-1447/ USM-116( )	Maintenance, Adjustment, and Troubleshooting Procedures	Frequency Range: 2 to 30 MHz Voltages: 1 to 250 VAC Input Impedance: 10 megohms
1	Multimeter	AN/PSM-4( )	Maintenance, Adjustment, and Troubleshooting Procedures	Frequency Range: 0 to 500 Hz Voltages: 0 to 600 VDC, 0 to 500 VAC RMS Input Impedance: DC: 20, 000 ohms per volt AC: 5, 000 ohms per volt
1	Signal Generator	SG-582/U or HP-606A	Maintenance, Adjustment, and Troubleshooting Procedures	Frequency Range: 2 to 30 MHz Output Voltage: 2. 5 VAC Output Impedance: 50 ohms

TABLE 1-2. RADIO TRANSMITTING SET AN/URT-23(V), TYPICAL EQUIPMENT, CABLES, AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED (Cont.)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Electronic Multimeter	ME-6D/U	Maintenance Procedures	Voltages: 0 to 200 MV Frequency Range: .3 to 3.5 KHz
1	Keying Fixture		Maintenance, Adjustment, and Troubleshooting Procedures	Fabricate according to paragraph 2-32
1	Set of Rack Mounting Brackets		Installation of Equipment	Fabricate according to paragraph 2-17
1	Exhaust Hood or Duct System		Installation of Equipment	Fabricate according to paragraph 2-21
1	Detector Test Fixture		Adjustment Procedures	Fabricate according to paragraph 5-18
1	Set of Indexing Jigs		Maintenance Procedures	Fabricate according to paragraph 5-46
1	Set of Printed Circuit Board Extenders	SK2500-100 SK2500-101	Troubleshooting Procedures	
1	Alignment Tool		Adjustment Procedures	Standard 0.100 hex-end, non-metallic, with undercut shaft
1	Standard Tool Set		Installation, Maintenance, and Adjustment Procedures	

TABLE 1-2. RADIO TRANSMITTING SET AN/URT-23(V), TYPICAL EQUIPMENT, CABLES, AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED (Cont.)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Technical Manual for AN/USM-117( )	NAVSHIPS 0967-092-0010	Maintenance and Troubleshooting Procedures	
1	Instruction Book for AN/TRM-3		Maintenance and Troubleshooting Procedures	
1	Instruction Book for AN/URM-153		Maintenance and Troubleshooting Procedures	
1	Technical Manual for SG-376/U	NAVSHIPS 0968-127-5010	Maintenance and Troubleshooting Procedures	
1	Technical Manual for AN/USM-116	NAVSHIPS 0968-805-0010 Tem. Chg. No. 4 NAVSHIPS 0969-805-0014	Maintenance and Troubleshooting Procedures	
1	Instruction Manual for AN/PSM-4	NAVSHIPS 91583	Maintenance and Troubleshooting Procedures	
1	Instruction Manual for SG-582/U	NAVSHIPS 0967-186-6010	Maintenance and Troubleshooting Procedures	
1	Technical Manual for ME-6D/U	NAVSHIPS 0967-091-0010 FC #1 NS 0967-091-0020	Maintenance and Troubleshooting Procedures	
1	Set of Extender Test Cables for T-827( )/URT		Maintenance of T-827( )/URT Plug in Modules	

TABLE 1-3. FIELD CHANGES

FIELD CHANGE NUMBER	FIELD CHANGE TITLE AND PURPOSE	SERIAL NO. AFFECTED	INDICATION OF ACCOMPLISHMENT
1	Installation of Standby and Emitting Status Monitoring Relays	Special Application	Two relays and receptacle installed on rear of AM-3924(P)/URT case
2	Elimination of Shock Hazard on Power Input Filter 1A2FL1	A1 through B336	Protective cover over terminals of power input filter
3	Installation of 10,000 Hour Time Meter	All serial numbers prefixed "A and B"	Presence of time meter on front panel of AM-3924(P)/URT
4	Removal of Bleeder Resistors from PP-3916/UR and PP-3917/UR	All serial numbers prefixed "A and B"	Absence of 2200,000 ohm bleeder resistors
5	Improve Reliability of Low Voltage Power Supply A2A8 in T-827/URT and T-827B/URT	All serial numbers	Diodes A2A8CR5–CR8 changed to type 1N5199
6	Modification to FSK circuit in T-827 ( )/URT	All serial numbers	Addition of 51,000 ohm resistor and reversal of diodes CR3 and CR4 in FSK Tone Generator 3A2A9
7	Addition of Fuse and Relay. Replacement of HV diode stacks	All serial numbers prefixed "A and B"	Presence of fuseholder and relay in AM-3924(P)/URT. New HV diode stacks in PP-3916/UR and PP-3917/UR
8	4 VDC Power Supply Modification in T-827B/URT	Early serials T-827B/URT	Presence of a heat-sink type resistor on chassis directly behind front panel
9	Removal of PA Bias Control Knob and Modification of Metal Cover Plate in AM-3924(P)/URT	All serial numbers prefixed "A and B"	Absence of PA Bias Knob. Slot cut out of metal cover plate over PA tubes
10	Replacement and Relocation of Interlock Switches in AM-3924(P)/URT Addition of Terminal Board and Interlock Covers in PP-3916/UR	All serial numbers prefixed "A and B"	Presence of interlock switches on right side of AM-3924(P)/URT, covers on terminal boards in PP-3916/UR
11	Air Cooling and HV Transient Protection in PP-3916/UR	All serial numbers prefixed "A and B"	Air Filter on front panel of PP-3916/UR. Blower fan package installed in PP-3916/UR.
12	Cooling of PP-3917/UR and AM-3924(P)/URT	All serial numbers prefixed "A and B"	Two 3/4 inch holes in AM-3924(P)/URT left wall plenum
13	Replacement of Push-to-Talk Relay 3A2K4	All serial numbers prefixed "A and B"	PTT relay "K4" having eight solder terminals in a rectangular configuration: and mounted on two 1/2 inch hex spacers.
14	Removes HV from 1A2P3	All serial numbers equipped with PP-3916/UR Power Supply	Decal on front panel redesignating AM-3924(P)/URT nomenclature to AM-6909/URT
15	Install HV filter capacitor	All serial numbers equipped with PP-3917/UR Power Supply	Capacitor C49 installed within the PA screen compartment behind TB1 and TB2.

TABLE 1-3 FIELD CHANGES (cont)

FIELD CHANGE NUMBER	FIELD CHANGE TITLE AND PURPOSE	SERIAL NO. AFFECTED	INDICATION OF ACCOMPLISHMENT
16	Eliminates chatter relay 3A2K1.	All serial numbers prefixed "A"	Installation of resistor 3A2R5 between standoffs 3A2E8 and 3A2E20 in the T-827E/URT.
17	Improves the reliability of AN/URT-23(V) "A" serials	All serial numbers prefixed "A"	Installation of TUNE indicator on AM-3924/AM-6909 front panel.
18	Improves the reliability of AN/URT-23 (V) "B" serials	All serial numbers prefixed "B"	Installation of TUNE indicator on AM-3924/AM6909 front panel.

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1-31. EQUIPMENT SIMILARITIES.

1-32. Table 1-4 provides equipment similarities between basic configurations of the AN/URT-23(V).

1-33. DIFFERENCES IN AN/URT-23(V) EQUIPMENTS.

1-34. This technical manual covers all AN/URT-23(V) equipments with serial numbers containing the prefix "A" (A1, A2, A3, etc.) and "B" (B1, B2, B3, etc.)

1-35. DIFFERENCES IN AN/URA-38 EQUIPMENTS.

1-36. Two separate versions of Antenna Coupler Group AN/URA-38 may be used with the AN/URT-23(V). These are the AN/URA-38 and AN/URA-38A. The AN/URT-23(V) is not affected by the differences between the two versions, where references are made in this manual to the AN/URA-38, the same information will also apply to the AN/URA-38A version.

1-37. DIFFERENCES IN T-827( )/URT EQUIPMENTS.

1-38. There are some slight differences in T-827( )/URT equipments which have been manufactured under different contracts for the armed forces. While none of these differences will affect the quality of performance or the compatibility of the T-827( )/URT with the rest of the AN/URT-23(V) system, the differences noted below will cause variations in set-up procedures and available operating channels.

NOTE

To determine which modifications have been made to the T-827( )/URT used with a given AN/URT-23(V), observe the model letter included in the nomenclature on the T-827( )/URT nameplate, then refer to the T-827( )/URT technical manual for a complete description of the modification(s) which apply to that nomenclature.

1-39. CHANGES AFFECTING TUNING.

1-40. The original T-827/URT tuned from 2.0 to 29.9995 MHz in 500 Hz increments (56,000 channels). Model T-827B/URT and later versions tune from 2.0 to 29.9999 MHz in 100 Hz increments (280,000 channels). Beyond providing more operating channels, this does not affect the operation of the AN/URT-23(V).

1-41. A separate modification made to some T-827( )/URT equipments does not affect the AN/URT-23(V), but does alter the tuning cycle of Antenna Group AN/URA-38 when it is used with the AN/URT-23(V). The T-827( )/URT provides a temporary ground to the "ground pulse" line from the AN/URT-23(V) to the AN/URA-38, to initiate an automatic tuning cycle in the AN/URA-38 when the position of the MC switches or the 100 KC switch on the front panel of the T-827( )/URT is changed (a frequency change of 100 KHz or greater is initiated). The modification adds two switches which initiate a tune cycle whenever the position of the 1 or 10 KC switches also are changed (a frequency change of 1 KHz or greater is made). This does not affect the five-wire code signals generated by the T-827( )/URT for tuning the AM-3924(P)/URT.

1-42. CHANGES AFFECTING SETUP AND ALIGNMENT.

1-43. Variations in circuitry of the Transmit Mode Selector, RF Amplifier, and Translator/Synthesizer dictate that more than one initial set-up and alignment procedure be provided. These procedures are found in paragraph 2-35.

1-44. The variations in circuitry are the addition of level-set potentiometers to the T-827( )/URT Mode Selector, RF Amplifier, and Translator/Synthesizer assemblies to reduce variations in gain between modes of operation, and between the high and low frequency bands. Since this will affect the T-827( )/URT RF output, which will in turn affect AN/URT-23(V) system set-up procedures, the procedure followed will depend upon whether the level-set potentiometers are in the assemblies or not.

1-45. Inspect the T-827( )/URT to determine if the level-set potentiometers are present. Loosen the front panel captive screws and slide the T-827( )/URT chassis out from its case.

a. Locate and remove the Mode Selector Assembly (A2A1). Remove the dust cover from the assembly and locate R86 on printed circuit board (PCB) A4. If resistor R86 is a potentiometer or fixed resistor of a value other than 3.3k ohm, replace R86 with a 3.3k, 1/4 watt resistor. Replace the dust cover and reinstall the Mode Selector into the T-827( )/URT.

b. Locate and remove the Translator/Synthesizer Assembly (A2A6). Locate the part number on the end of the staked base nearest the 1 KC and 10 KC Synthesizer (A2A6A3). If this P/N is 2058940-0502 then remove the dust cover of the RF Translator (A2A6A6) and determine if potentiometer R-60 has been added. If installed, this potentiometer will be located near the center of the PCB between FL1 and FL2. If R-60 is installed turn it to the maximum clockwise position (approximately 20 turns). Replace the dust cover on A2A6A6 and reinstall the Translator/Synthesizer into the T-827( )/URT.

If a different part number is on the base of A2A6 or if the potentiometer R-60 is not present, reinstall the Translator/Synthesizer into the T-827( )/URT.

c. Locate the RF Amplifier (A2A4) and determine if potentiometer A2A4A33R6 has been installed. This potentiometer, if installed, will be marked and visible from the top of the RF Amplifier without removal of the assembly.

d. If the potentiometer has been installed in the RF Amplifier refer to paragraph 2-41 for alignment of the transmitter. If the potentiometer is not installed refer to paragraph 2-40 for alignment of the transmitter.

1-46. PREPARATION FOR RESHIPMENT.

1-47. The AN/URT-23(V) is shipped complete in one shipping container. To prepare the AN/URT-23(V) for reshipment, remove all interconnecting cables and accessories connected to the units. Remove the stacked units from the MT-3399/U and bolt the MT-3399/U to the top of the equipment stack, cover the equipment stack with a waterproof cover and bolt the stack to a shipping pallet. Pack all Technical Manuals, interconnecting cables, accessories, etc., into a cardboard container and place on top of equipment stack. Crate system in accordance with applicable specifications.

TABLE 1-4. EQUIPMENT SIMILARITIES

ITEM	T-827/URT	T-827B/URT	T-827D/URT	T-827E/URT
Tuning increments	500 Hz	100 Hz	100 Hz	100 Hz
KCS controls	Incorporate stops	Incorporate stops	Stops not incorporated	Incorporate stops
Mode Selector Assembly A2A1	Interchange-able with T-827B and T-827D	Interchange-able with T-827 and T-827D	Interchange-able with T-827 and T-827B	See Note 1
Translator/ Synthesizer Assembly A2A6	Not inter changeable	Interchange-able with T-827D	Interchange-able with T-827B	See Note 2
RF Amplifier Assembly A2A4	Not Inter-changeable	See Note 3	See Note 3	See Note 3
Antenna Coup-ler ground pulse actuated by	MCS switches, 100 KCS switch	MCS switches, 100 KCS switch	MCS switches, 100, 10 and 1 KCS switch	MCS switches, 100, 10 and 1 KCS switch
Front panel lamps can be changed from front	No	No	Yes	No
Chassis may be tilted ±90 degrees when extended	No	No	Yes	No

Note 1: A2A1A4R86 changed from fixed 10-kilohm resistor to 10-kilohm potentiometer to permit adjustment of CW carrier reinsertion in AN/URT-23 system.

Note 2: A2A6A6A1R60, 500-ohm potentiometer, added to rf translator board to compensate for hi-lo-band gain variations when used in AN/URT-23 system.

Note 3: A2A4A38R6 changed from fixed 470-ohm resistor to 470-ohm potentiometer to compensate for gain variation when used in AN/URT-23 system.

TABLE 1-5. FACTORY CHANGES

FACTORY CHANGE NUMBER	FACTORY CHANGE TITLE AND PURPOSE	SERIAL NO. AFFECTED	INDICATION OF ACCOMPLISHMENT
1-AN/ URT-23(V)	Addition of 1A1A3L2. To flatten frequency response of Power meter 1A1M2.	All except A3 and A4.	None Apparent
2-AN/ URT-23(V)	Change value of 1A1A2C38 from 110 PF to 75 PF and 1A1A2C39 from 110 PF to 150 PF. To increase current rating.	All except A5, A6, A8, A9, A10, A13.	None Apparent
3-AN/ URT-23(V)	Delete resistor 1A1A6R20, add diode 1A1A6CR29 (1N914), and change 1A1A6R18 from 180 ohms to 820 ohms. To eliminate excessive leakage from 1A1A6Q19 at high temperature.	All except A5 through A71.	None Apparent
4-AN/ URT-23(V)	Change value of 1A1A2C28 from 1000 PF to 820 PF. To improve response characteristics of 3.0 to 3.5 MC band.	All except A3 through A145.	None Apparent
5-AN/ URT-23(V)	Change transistor type of 1A1A6Q17 from 2N398A to 2N2906A to increase reliability at 50°C.	A158 and up except: A159-A172, A174-A189, A191-A238, A240, A241, A243-A254, A256, A258, A259, A270, A278, A288, A289, A292, A295, A297-A302, A304-A306, A356, A359, A372, A395, A401, A427, A437, A438, A440-A442, A445-A449, A451-A453, A455-A459, A469, A528, A544, A549, A592, A661, A665, A670, A672, A677, A678, A680-A687, A700, A702-A705, A709, A710, A713-A727, A729.	
6-AN/URT-URT-23(V)	Change fuse 2A1F1 in PP-3916/UR from 5 Amp slow blow (MIL type F02B250-5A) to 8 Amp standard (MIL type F03A250-8A) to improve reliability.	Change 5 and Change 6 made to the same equipments. The list of serial numbers and exceptions listed for Change 5 also applies to Change 6.	None Apparent

TABLE 1-5. FACTORY CHANGES (Cont.)

FACTORY CHANGE NUMBER	FACTORY CHANGE TITLE AND PURPOSE	SERIAL NO. AFFECTED	INDICATION OF ACCOMPLISHMENT
7-AN/URT-23(V)	Change 3 Ø rectifiers 1A1A8CR1 and 1A1A8CR2 in PP-3917/UR and 2A1CR2 and 2A1CR3 in PP-3916/UR from D22-5002-000 to *8948-4015 to increase reliability.	All PP-3916/UR units over A1031, and all PP-3917/UR units over A199.	None Apparent
8-AN/URT-23(V)	Addition of ground pulse assembly to produce a ground pulse with any frequency change of 1 KC and 10 KC dials.	All T-827/URT units except: 365, 367-379, 381, 383, 384, 387, 392, 394-396, 399, 408, 415, 425, 430, 447, 451, 452, 455, 457, 462, 468, 469, 507, 511, 533, 540, 541, 543, 548, 550, 558, 562, 566, 570, 590-592, 608, 613, 619, 620, 623, 625-627, 629, 631-642, 646, 648-650, 653, 656, 659, 663, 665-670, 672, 674-680, 683, 684, 686, 688, 690-696, 698-703.	None Apparent

*Replaced by new type
in FC7-AN/URT-23(V);
CNTR, INC., PN 400000-001

SECTION 2

INSTALLATION

NOTE

All references to AM-3924(P)/URT also apply to AM-6909/URT equipment unless otherwise indicated.

2-1. UNPACKING AND HANDLING.

2-2. HANDLING.

2-3. The AN/URT-23(V) is shipped in a single crate, with all units attached to each other. The approximate shipping weight of the equipment is 500 pounds. Provisions will be required for loading, transportation, unloading, and setting the AN/URT-23(V) in place.

2-4. UNPACKING.

2-5. No special procedures are required for unpacking the AN/URT-23(V). However, since the equipment is made up of accurately calibrated precision units, rough handling should be avoided. Caution should be taken when removing sections of the packing carton to prevent damage to the controls, indicators, and connectors. For shore installations where the MT-3399/U is not used, return the MT-3399/U to stock supply for spare support.

2-6. POWER REQUIREMENTS.

2-7. The AN/URT-23(V) can be operated from any one of the three primary power sources listed in a through c below. For any of the voltage and frequency combinations listed, the AN/URT-23(V) requires a three phase, three wire primary power source which will supply 4600 watts with a minimum power factor of 0.88. When shipped from the manufacturer, the AN/URT-23(V) is wired and fused for operation from a 440 volt, 60 Hz primary power source. Paragraph 2-22 describes the wiring and fuse changes required for operation from any of the possible power sources listed below. Primary power distribution within the AN/URT-23(V) is shown in figures 5-22 and 5-23. Restored equipment will be delivered wired as requisitioned.

a. 115 volts line-to-line $\pm$10%, 400 Hz $\pm$5%, three phase, three wire. (AM-3924(P)/URT only.)

b. 208 volts line-to-line $\pm$10%, 48 to 63 Hz, three phase, three wire. (AM-6909/URT only.)

c. 440 volts line-to-line $\pm$10%, 60 Hz $\pm$5%, three phase, three wire. (AM-6909/URT only.)

NOTE

When operating from the source described in a above, Power Supply PP-3917/UR is used. When operating from the sources described in b and c above, Power Supply PP-3916/UR is used.

2-8. SITE SELECTION.

2-9. In selecting a shipboard installation site, adequate consideration must be given to space requirements (figure 2-1). This requirement will include space for servicing the slide-mounted T-827( )/URT and AM-3924(P)/URT when extended from their cases, and cable bends. In addition, during 400 Hz operation, the stack must be mounted at least four inches above deck to allow the AM-3924(P)/URT chassis only (when extended from case) to be rotated upwards for servicing. If the exhaust from the

AM-3924(P)/URT is to be ducted out of the area, adequate space must be allowed for the connection of the necessary ductwork to the rear of the AM-3924(P)/URT.

2-10. When selecting a shore installation site, similar considerations must be given to the space requirements. In addition, the equipment should be located so that the antenna can be mounted high enough to clear any surrounding hills, woods, or buildings. Also, the antenna should be located as far as possible from any high power transmission lines to prevent interference.

2-11. INSTALLATION REQUIREMENTS.

NOTE

The AM-3924(P)/URT can be modified for use in a special two-exciter system. The field change installation of additional circuitry will permit front panel switching of the RF input of the AM-3924(P)/URT from the T-827/URT to a second exciter (paragraph 2-49).

2-12. CONSIDERATIONS.

2-13. The following factors should be considered when determining the proper location of the system.

a. Best operating conditions.

b. Ease of maintenance, adjustment of equipment, and replacement and repair of defective parts or complete units.

c. Possibility of interaction between units and other electronic equipment in the vicinity.

d. Adequate heat dissipation (including convenience of duct installation, if desired).

e. Availability of an appropriate primary power source.

f. Availability of an adequate ground.

g. Accessibility of antenna systems.

2-14. INSTALLATION PROCEDURES.

2-15. The installation procedures vary with the configuration (rack or stack mounted), the number of units in the configuration, the primary power source available, and the ship in which the system is installed. The following paragraphs provide all the information required to install the AN/URT-23(V) for any type of installation.

2-16. STACK MOUNTING.

2-17. The AN/URT-23(V) is shipped with the units stacked. To install the equipment in a stack-mounted configuration, proceed as follows:

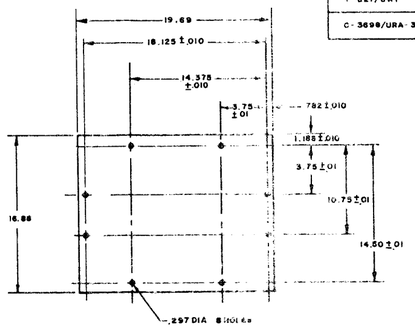
a. Select a location for the equipment, after considering all the factors listed in paragraph 2-12.

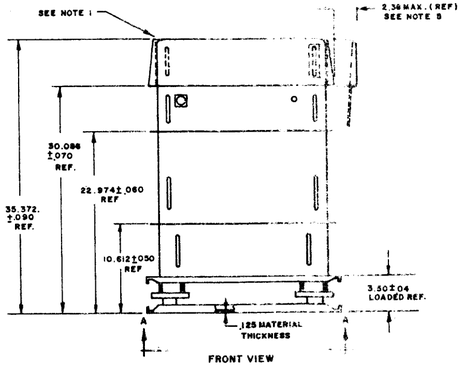
NOTES:

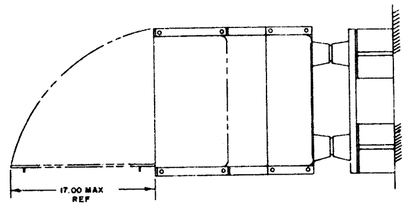
1. Optional mounting for coupler control unit C-3698/URA-38.
2. Dimensions shown on right side view *6.00, 25.00, 22.00) indicate clearance necessary to remove chassis from their respective cases. Clearance for withdrawal and tilting of chassis is within these limits.
3. Detail C represents six no. 6-32 tapped holes to facilitate mounting of exhaust air removal duct if required. Depth of screw penetration .100 inch maximum. Flow rate of exhaust air from AM-3924(P)/URT is 140 CFM. Exterior exhaust duct shall have inlet pressure no greater than 14.7 psi absolute at 140 CFM. Refer to Figure 2-3 for exhaust hood fabrication for installations not provided with exhaust air ducting.
4. If armored cables are used for interconnection, armor shall be cut back 10 inches from connector to avoid undesired stresses on MT-3399/U caused by cable stiffness.
5. Sway and lean clearance for equipment on shock mount is 2.38 inches in all directions when 4 units are mounted as shown. Cable clearance shown at rear is adequate for sway and lean on shock mount.
6. View B-B provides mounting hole template for sway brace installation.
7. Screw type bonds should be used to ground equipment cases at the points furnished and marked on the rear of each unit. (Solid copper ground straps preferred to braided type.)
8. When the PP-3916/UR is not in the stack, the amplifier AM-3924(P)/URT requires 8.5 inches bottom clearance for tilting chassis when it is extended out from the case on its slides.

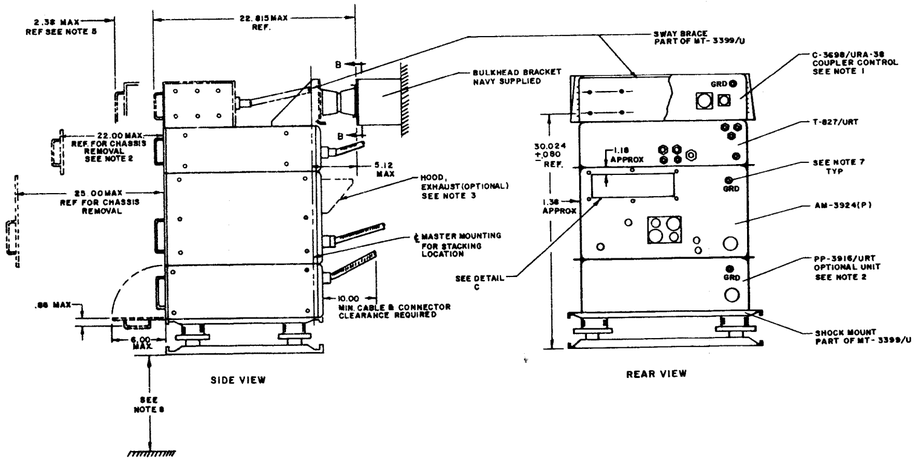
CHART 1

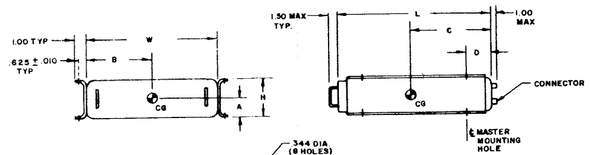
UNIT	OVER-ALL DIMENSIONS			CENTER OF GRAVITY			D	WEIGHT
	W	H	L	A	B	C		
AM-3924(P) URT	17.375 +.000 -.030	12.362 ±.010	17.474 +.030 -.000	6.38	6.27	9.15	1.335 ±.030	95 LBS
AM-3924(P)/URT WITH PP-3917/URT	17.375 +.000 -.030	12.362 ±.010	17.474 +.030 -.000	5.67	7.75	9.57	1.335 +.030	125 LBS
PP-3916/UR	17.375 +.000 -.030	7.112 ±.010	17.400 +.000 -.500	3.23	10.02	5.66	1.262 ±.020	145 LBS
T-827/URT	17.375 +.000 -.030	7.112 ±.010	16.90 ±.020	3.66	7.50	7.38	.758 +.015	70 LBS
C-3698/URA-38	17.360 ±.015	5.286 ±.020	8.50 ±.020	2.66	9.65	4.55	SEE DETAIL D	23 LBS

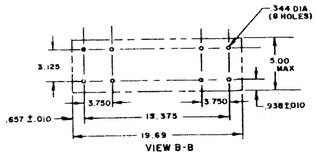


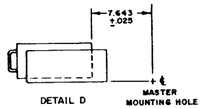












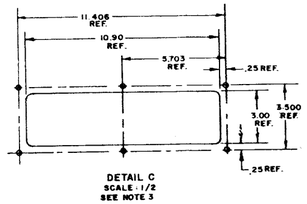


Figure 2-1. Radio Transmitting Set AN/URT-23(V), Outline and Mounting Dimensions

b. Prepare a mounting surface for the equipment stack. The equipment stack must be a minimum of four inches above the deck when the PP-3916/UR is not used (when 115 VAC 400 CPS primary power source is used).

c. Using the dimensions shown in view A-A of figure 2-1, drill eight 0.297 inch diameter holes for securing the shock mount base plate to selected mounting surface.

d. Remove the AN/URT-23(V) from the shipping carton.

e. Remove the MT-3399/U from the top of the stack. Save hardware.

f. Set MT-3399/U on mounting surface and bolt in place using 1/4-20 hardware (to be supplied by installing activity).

g. Lift and slowly lower the equipment stack onto the MT-3399/U and secure using the hardware removed from the MT-3399/U in step e.

CAUTION

The high center of gravity of the stacked units of the AN/URT-23(V) requires restriction of lateral motion. A sway brace is included as part of the MT-3399/U for this purpose.

h. Attach the swaybrace to the top unit of the AN/URT-23(V) with 5/16-18 hardware (to be supplied by the installing activity).

i. Measure the distance from the sway brace vibration isolators to the bulkhead (figure 2-1). Using the dimensions shown in view B-B of figure 2-1, modify bulkhead as required to interface with the sway brace. Secure swaybrace to bulkhead, using 5/16-18 hardware (to be supplied by the installing activity).

j. If used, position the C-3698/URA-38 as shown (phantom) in figure 2-1 and secure by bolting the mounting brackets to the top of the T-827/URT mounting brackets.

k. Refer to paragraph 2-22 and install the proper primary power jumpering and fusing.

l. Install cable and ground connections according to paragraph 2-28.

2-18. RACK MOUNTING.

2-19. The units can be rack mounted. To accomplish this, rack mounting brackets must be fabricated. Figure 2-2 provides all information required to fabricate the rack mounting brackets for shore installations. For shipboard installations refer to proper Installation Control Drawings. To install the equipment in rack, proceed as follows:

a. Remove the AN/URT-23(V) from the shipping container.

b. Remove the mounting bolts and separate the units.

c. Remove the stack mounting brackets from the sides of each unit. Return stack mounting brackets and MT-3399/U to stock supply.

d. For shore installations, use the information contained in figure 2-2 to fabricate rack mounting brackets for each unit. For shipboard installations, use information contained in Installation Control Drawings.

e. Attach the fabricated rack mounting brackets to the sides of the units. Slide each unit into the cabinet, and secure (mounting hardware to be supplied by the installing activity).

NOTE

It is advisable to use the same installation configuration used for stack mounting (figure 2-1) so that supplied cables will reach.

f. Refer to paragraph 2-22 and install the proper primary power jumpering and fusing.

g. Install cable and ground connections according to paragraph 2-28.

2-20. POWER SUPPLY PP-3917/UR. (Used in AM-3924(P)/URT only.)

2-21. The PP-3917/UR (optional accessory unit) is used only when the equipment is operated from a 115 VAC, 400 Hz primary power source. When operating from a 208 or 440 VAC, 60 Hz power source, the PP-3917/UR must be removed (if installed) from the AM-3924(P)/URT. To install the PP-3917/UR into the AM-3924(P)/URT, proceed as follows.

WARNING

Do not extend the AM-3924(P)/URT chassis from the case unless the case is securely mounted.

a. Loosen the right captive screws on the AM-3924(P)/URT front panel and slide the chassis out from the case until the chassis slides lock.

WARNING

Ensure that no primary power is connected to the AM-3924(P)/URT.

b. Release the chassis slide tilt locks, rotate chassis upward 90° until locks engage.

c. Remove high voltage protective cover over 1A1TB1 and 1A1TB2 (figure 5-8).

d. Remove jumpering strip from 1A1TB2 (if present). Remove cable guide bracket from left rear of chassis. Remove protective cover over 1A1K1.

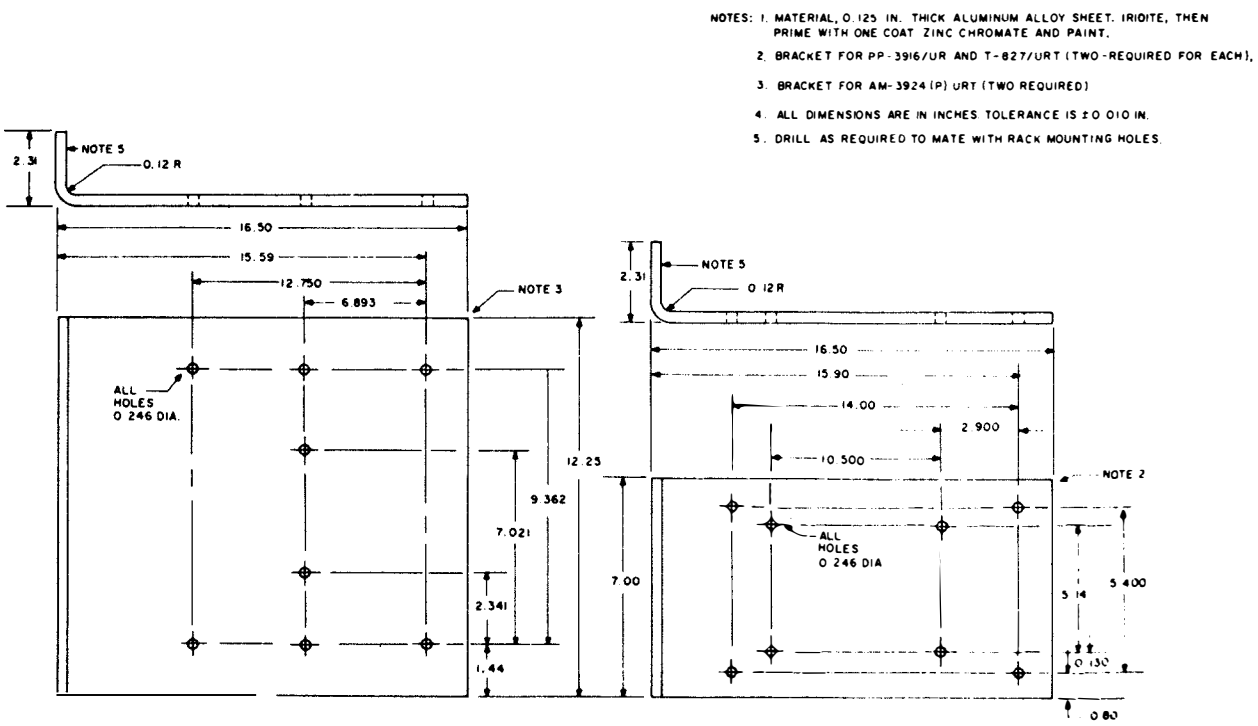


Figure 2-2. Rack Mounting Bracket Fabrication Details

e. Set PP-3917/UR into the space provided on left side of the AM-3924(P)/URT chassis underside and secure with 4 captive screws and the screw which was used to hold the protective cover over 1A1K1 (a large O. D. flat washer will be required for screw).

f. Connect PP-3917/UR cable harness fanning strips 1A1A8P1 and 1A1A8P2 (figure 5-20) to terminal boards 1A1TB1 and 1A1TB2, respectively.

g. Replace the high voltage protective cover over 1A1TB1 and 1A1TB2 (figure 5-8).

h. Mate the sealed plug assembly supplied with the PP-3917/UR to connector 1A2J1 on the rear of the AM-3924(P)/URT case.

i. Refer to paragraph 2-22 and make the necessary fusing and jumpering changes.

2-22. PRIMARY POWER JUMPERING AND FUSING.

2-23. The AN/URT-23(V) can be operated from any one of the three primary power sources listed in paragraph 2-7. As shipped, the equipment is wired and fused for 440 volts, 60 Hz primary power. If one of the other primary power sources is to be used, the equipment must be converted for operation from the new source. This conversion will consist of substituting jumpering strips on terminal boards within the AM-3924(P)/URT and the PP-3916/UR (when used). It will also consist of changing the primary fuses in the AM-3924(P)/URT and/or exchanging power supplies. The procedure below refers to table 2-1 which contains the different combinations of changes to be made. Figures 5-22 and 5-23, which show primary power distribution, will assist in understanding the changes to be made. The information listed below will assist in locating the terminal boards.

NOTE

Only one high voltage power supply is required. When converting an installation, remove the supply which no longer can be used from the installation and substitute with the required supply from stock. (The PP-3916/UR (AM-6909/URT) is used for 60 Hz primary power and the PP-3917/UR (AM-3924(P)/URT) is used for 400 Hz primary power.)

a. Terminal boards 1A1TB1 and 1A1TB2 are located at the bottom left of the AM-3924(P)/URT chassis under the high voltage protective cover nearest driver transformer assembly 1A1A4 (figure 5-8).

b. Terminal board 1A1TB4 is located on a bracket under the high voltage protective cover on top of the AM-3924(P)/URT chassis at the left side (figure 5-7).

c. The three primary power fuses are located on the front panel of the AM-3924(P)/URT (figure 3-2).

d. Terminal board 2A2TB1 is located inside the PP-3916/UR case on the bottom directly behind the hinged front panel (figure 5-21).

e. Fanning strips 1A1A8P1 and 1A1A8P2 are integral parts of the PP-3917/UR cable harness (figure 5-20).

2-24. INSTRUCTIONS.

2-25. To convert the AN/URT-23(V) for operation from a new power source (one of the three listed in paragraph 2-7), proceed as follows:

WARNING

Ensure that primary power is not connected to the AM-3924(P)/URT. Failure to do so will cause unswitched primary power to be present at the exposed terminals.

TABLE 2-1. PRIMARY POWER JUMPER CONNECTIONS AND FUSES

EQUIPMENT	TERMINAL BOARD OR FUSEHOLDER	MATING PLUG OR FUSE		
		440 VOLTS 60 Hz PRIMARY POWER	208 VOLTS 60 Hz PRIMARY POWER	115 VOLTS 400 Hz PRIMARY POWER
AM-3924(P)/ URT	1A1TB1 1A1TB2 1A1TB4	NONE 1A1P5 1A1P3	NONE 1A1P5 1A1P2	1A1A8P1 1A1A8P2 1A1P1 Sealed Plug to 1A2J1
	PRIMARY FUSES 1A1F1, F2, F3 1A1XF8	6 AMP Slow Blow 1 AMP Slow Blow	15 AMP Slow Blow 1.5 AMP Slow Blow	25 AMP Slow Blow 2.5 AMP Slow Blow
PP-3916/UR	2A2TB1	2A2P2	2A2P1	NONE

NOTE

Operation of the AN/URT-23(V) from a 60 Hz primary power source requires the installation of FC-14, redesignating the AM-3924(P)/URT to AM-6909/URT. For each step in the procedure, refer to table 2-1, and compare the information for the line voltage for which the set is presently connected with the information given for the line voltage to which the set is to be converted. For some steps the information will probably be the same, and no change in wiring configuration will be required.

a. Note the frequency of the intended primary power source. The PP-3916/UR will be required for 60 Hz operation, or PP-3917/UR will be required for 400 Hz operation. If necessary, requisition the required power supply from stock supply and install it (paragraph 2-14 or 2-20).

b. Loosen the eight front panel captive screws and slide the AM-3924(P)/URT chassis out from the case until the chassis slides lock.

c. Locate terminal boards 1A1TB1, 1A1TB2, and 1A1TB4 and ensure that proper jumpering strips are installed for the new intended primary power source according to the information in table 2-1.

d. Determine that the fuses in the three primary fuse holders and fuse holder 1A1XF8 on the AM-3924(P)/URT front panel have the proper current rating according to table 2-1.

e. Slide the AM-3924(P)/URT chassis back into the case and secure with the eight captive front panel screws.

f. If operation is intended from a 60 Hz source, open the front panel of the PP-3916/UR and ensure that the proper jumpering strip is installed on 2A2TB1 according to table 2-1.

g. Close and secure the front panel of the PP-3916/UR with the five front panel captive screws.

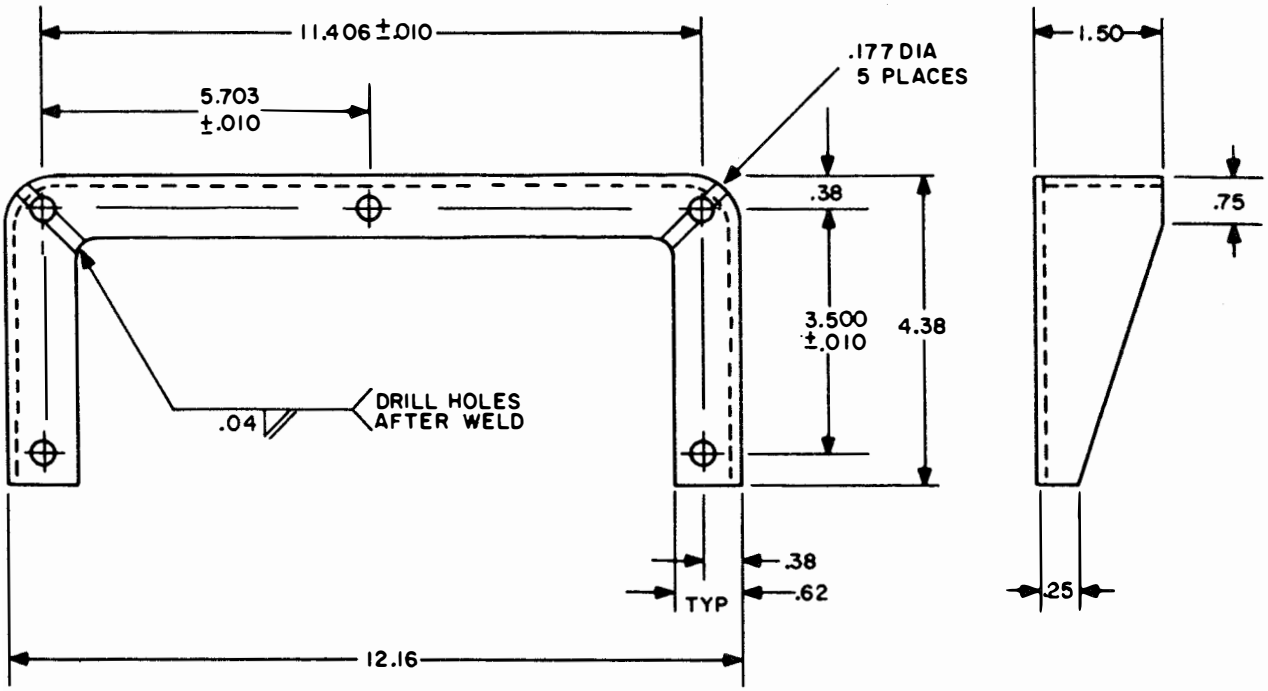
2-26. COOLING.

2-27. Precautions should be taken to ensure that nothing obstructs the AM-3924(P)/URT front panel air intake filter or the air exhaust at rear of the case. If exhaust air is ducted, provisions (such as a booster fan in the duct work) must be made to compensate for the impedance of the duct work so that a minimum of 140 CFM of air flows through the air exhaust on the rear of the case. Six holes, tapped for 6-32 hardware, are provided on the perimeter of the AM-3924(P)/URT exhaust port for attachment of the duct (figure 2-1). Length of 6-32 screws must be chosen to prevent interference with rubber gasket on far side of exhaust port (figure 2-1). If no ducting is to be used, and the units will be exposed to the elements, an exhaust hood should be fabricated using the information provided in figure 2-3. The hood should then be attached to the AM-3924(P)/URT exhaust port with 6-32 screws as shown in figure 2-1.

2-28. INTERCONNECTION REQUIREMENTS.

2-29. CABLE ASSEMBLIES.

2-30. Differences in system configurations and variations among installations will control the number and length of cables connected to the AN/URT-23(V). For these reasons, only up to three fabricated cables (table 1-1) and ground straps (depending on equipment configuration) are supplied as part of the AN/URT-23(V). Mating connectors for all other system connections are supplied. The installing activity furnishes all other materials and fabricates the required cables. Tables 2-2 through 2-9 list connector termination information. Refer to the applicable technical manuals for cable terminations in auxiliary and ancillary equipments.



NOTES:

1. REMOVE BURRS & SHARP EDGES .010 MAX
2. MATERIAL: 5052-H32 ALUM. ALY PER QQ-A-250/8 (.040 THK)
3. FINISH: IRIDITE PER MIL-C-5541
4. TOLERANCE: XX ±.020; XXX ±.005

Figure 2-3. Exhaust Hood Fabrication Details

TABLE 2-2. CABLE TYPES AND TERMINATIONS

NO.	FROM	MATING CONNECTOR	CABLE TYPE	MATING CONNECTOR	TO	REMARKS
W1	AM-3924(P)/URT J9	UG-88E/U	RG-223/U coaxial	UG-88E/U	T-827/URT J23	Supplied as part of AN/URT-23(V)
W2	AM-3924(P)/URT J7	10-109628-21P	Multiconductor	MS3116J-22-55S	T-827/URT J4	Supplied as part of AN/URT-23(V). See table 2-3 for pin connections.
W3	AM-3924(P)/URT J1	10-109628-17P	Multiconductor	10-109628-17S	PP-3916/ J1	Supplied as part of AN/URT-23(V). See table 2-4 for pin connections.
W4	AM-3924(P)/URT J5	10-109620-19S	Multiconductor (TSGU type)	-	Primary power	See table 2-5 for pin connections.
W5	AM-3924(P)/URT J6	10-109620-27P	Multiconductor	10-109620-27S	C-3698/ URA-38 J1	Supplied as AN/URA-38 cable W1. See table 2-6 for pin connections.
W6	AM-3924(P)/URT J4	UG-941B/U	RG-214/U coaxial	-	Receiver antenna	When transmitter antenna is used for receiver.
W7	AM-3924(P)/URT J2	10-109628-12P	Multiconductor (MSCU type)	-	Transmitter Switch-board	See table 2-7 for pin connections.
W8	AM-3924(P)/URT J3	UG-982/U	RG-219/U coaxial	-	Antenna System	1 KW RF output. With AN/URA-38, use connector type UG-982/U to mate with CU-938/URA-38 connector J2.
W9	AM-3924(P)/URT J8	10-109618-1P	Multiconductor (MSCU type)	-	Accessories	See table 2-8 for pin connections.

TABLE 2-2. CABLE TYPES AND TERMINATIONS (Cont.)

NO.	FROM	MATING CONNECTOR	CABLE TYPE	MATING CONNECTOR	TO	REMARKS
W10	T-827/URT J7 J7	MS3106E-14S-2S	Multiconductor (TTHFWU type)	-	FSK (Radio teletype-writer) equipment	See table 2-9 for pin connections.
W11	T-827/URT J5	MS3106E-10SL-4S	2 conductor (TTHFWU type)	-	Optional Remote Equipment	Aux. balanced 600 ohm USB/AM/ISB input
W12	T-827/URT J6	MS3106E-10SL-4S	2 conductor (TTHFWU	-	Optional Remote Equipment	Aux. balanced 600 ohm LSB/ISB input.

TABLE 2-3. CABLE W2 TERMINATIONS

WIRE SIZE	FROM CONNECTOR TYPE 10-109628-21P	TO CONNECTOR TYPE MS3116J-22055S	REMARKS
22	PIN A	PIN A	RF AMPL TUR CONT NO. 1
	B	B	RF AMPL TUR CONT NO. 2
	C	C	RF AMPL TUR CONT NO. 3
	D	D	RF AMPL TUR CONT NO. 4
	E	E	RF AMPL TUR CONT NO. 5
22	G	G	CW/FSK GRD
	H	i	SHLD GRD R. S. U.
22	J	J	INTLK +28V
	K	K	KEYLINE
	M	M	+28V STBY AND OPERATE
	N	N	+20V OPERATE
22	P	P	GRD PULSE
22 SHLD	R	R	115 VAC
22 SHLD	S	S	115 VAC COM
22	T	T	+20V CARR. REINSERT
22 SHLD	U	U	115 VAC REMOTE
22	V	V	-30 VDC
	Z	Z	COMMON GRD. SHLD. f, g, q or p, and r.
	a	CC	SPARE
	b	DD	SPARE
22	c	c	CW/FSK KEY
22 SHLD	d	d	APC
	e	e	PPC
	f	f	REMOTE 600 OHM LSB/ISB
22 SHLD	g	g	REMOTE 600 OHM LSB/ISB
	h	h	SHLD GRD d, e
22	j	t	TTY (-)
22	k	k	PTT +12V KEY
22	m	m	SPARE
22 SHLD	p	q	REMOTE 600 OHM USB/AM/ISB
22 SHLD	r	r	REMOTE 600 OHM USB/AM/ISB
22	s	SS	TTY (+)
22	X	s	EARPHONE AUDIO
22	PIN n	PIN H	12V NEGATIVE

TABLE 2-4. CABLE W3 TERMINATIONS

WIRE SIZE	FROM CONNECTOR TYPE 10-109628-17P	TO CONNECTOR TYPE 10-109628-17S	REMARKS
14	PIN A	PIN A	Ø A
14	B	B	Ø B
14	C	C	Ø C
22	D	D	Ø B-T1 INPUT
↕	E	E	Ø A-T1 INPUT
↕	F	F	115 VAC 60 Hz COM
↕	G	G	115 VAC 60 Hz HOT
↕	H	H	24V SWITCHED
↕	J	J	24V HOT
↕	K	K	115 VAC INV 400 Hz HOT
↕	L	L	115 VAC INV 400 Hz COM
↕	M	M	+500 VDC
↕	N	N	COM GRD
22	P	P	PWR SUPPLY INTLK
18	PIN R	PIN R	+2250 VDC

TABLE 2-5. CABLE W4 TERMINATIONS

WIRE SIZE	FROM CONNECTOR TYPE 10-109620-19S	TO PRIMARY POWER SOURCE (4600 WATTS)	REMARKS
12	PIN A		PHASE A (19.8 AMP)
12	PIN B		PHASE B (19.8 AMP)
12	PIN C		PHASE C (19.8 AMP)

TABLE 2-6. CABLE W5 TERMINATIONS

WIRE SIZE	FROM CONNECTOR TYPE 10-109620-27P	TO CONNECTOR TYPE 10-109620-27S	REMARKS
22	PIN A	PIN A	COM GRD
	B	B	KEYLINE
	E	E	GRD PULSE
	F	F	TUNE PWR CONT
	G	G	SPARE
	H	H	SPARE
22	PIN I	PIN I	SPARE
22	PIN J	PIN J	KEY INTLK
	L	L	115 VAC
22	PIN M	PIN M	115 VAC COM

TABLE 2-7. CABLE W7 TERMINATIONS

WIRE SIZE	FROM CONNECTOR TYPE 10-109628-12P	TO TRANSMITTER SWITCHBOARD	REMARKS
22	PIN A		COM GRD
22	B		12V POSITIVE
	C		SHLD GRD T, U, V, W
22	D		115 VAC COM
↕	E		TTY (+)
	F		TTY (-)
	G		PTT + 12V KEY
	H		115 VAC REMOTE
22	S		CW/FSK KEY
22 SHLD	T		REMOTE 600 OHM LSB/ISB INPUT
22 SHLD	U		REMOTE 600 OHM LSB/ISM INPUT
22 SHLD	V		REMOTE 600 OHM USB/AM/ISB INPUT
22 SHLD	W		REMOTE 600 OHM USB/AM/ISB INPUT
22	Z		12V NEGATIVE
↕	a		SPARE
	b		SPARE
	d		SPARE
22	PIN J		EARPHONE AUDIO

TABLE 2-8. CABLE W9 TERMINATIONS

WIRE SIZE	FROM CONNECTOR TYPE 10-109618-1P	TO ACCESSORY EQUIPMENT	REMARKS
22	PIN A		COM GRD
↕	B		KEYLINE
	C		+28V RCVR MUTING
	D		KEYLINE INTLK GRD
	E		CW/FSK GRD
	F		SPARE
	G		SPARE
	H		SPARE
	I		SPARE
22	PIN J		SPARE

TABLE 2-9. CABLE W10 TERMINATIONS

WIRE SIZE	FROM CONNECTOR TYPE MS3106E-14S-2S	TO FSK EQUIPMENT	REMARKS
22 ↕ 22	PIN A ↕ B ↕ C PIN D		LOCAL FSK KEY INPUT LOCAL TTY INPUT (+) LOCAK TTY INPUT (-) COM GRD

NOTE

All shielded cables must have shielding integrally connected to the shell of the connector. All armored cables must have armor stripped back 10 inches with armor connected to shell of connector with a flexible wire.

2-31. INTERCONNECTION.

NOTE

If the AN/URA-38 is used with the AN/URT-23(V), the cable supplied as AN/URA-38 cable W1 will be used as AN/URT-23(V) cable W5.

2-32. Interconnection of the equipment is shown in figure 2-4. All connections are made at the rear of the units. The PP-3917/UR does not appear on the illustration since all of its connections are made within the AM-3924(P)/URT. Use copper ground strap to connect the MT-3399/U to the nearest ground. The ground straps required to interconnect the units and MT-3399/U are supplied as a part of the AN/URT-23(V).

CAUTION

Ensure good metal-to-metal bonding between units, and between the system and a ground.

2-33. INSPECTION.

2-34. After the equipment has been installed, but before it is energized, a thorough inspection should be conducted to ensure that the AN/URT-23(V) is electrically and mechanically ready for operation. The following points should be checked. Replacement or repairs should be made if necessary.

a. Inspect each unit to ensure that all mounting hardware has been properly installed and tightened.

b. Ensure that the cable connections on the rear of the cases are correct, complete, properly seated, and tightened (figure 2-4.).

c. Determine that the ground straps are properly installed (figure 2-4).

d. If the equipment is stack mounted, ensure that the shock mount and sway brace are properly secured and free to sway.

e. Inspect all front panel controls and indicators for mechanical damage, looseness, or improper mechanical action.

f. Loosen the captive front panel screws and open the case of each equipment. Inspect the interior for signs of damage.

g. Check all fuse holders to ensure that each contains a fuse of the proper rating.

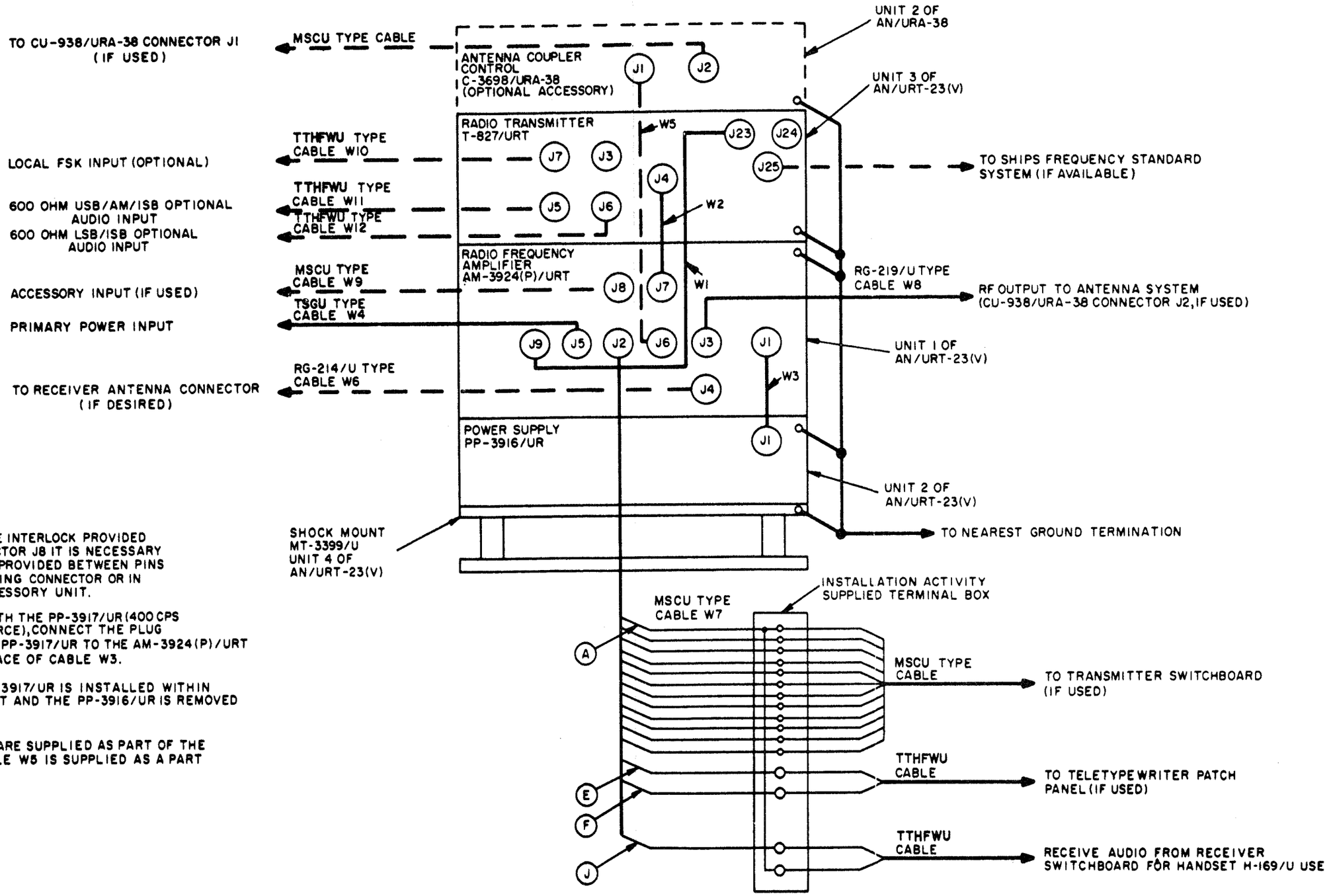
h. CAREFULLY CHECK OUT THE PRIMARY POWER CONNECTIONS IN THE AN/URT-23(V) TO MAKE SURE THAT IT IS PROPERLY WIRED AND FUSED FOR THE INTENDED POWER SOURCE.

i. Loosen the six front panel captive screws and pull the T-827/URT chassis from the case. Check that switch S1 on top of the Frequency Standard Electronic Assembly is set to EXT NORMAL (if ship's frequency standard is used. Ensure that switch S7 (AUX/NORM) just behind the front panel on the left, is set at NORM. Set CTR FREQ switch on top of FSK tone generator module at 2000. Slide chassis back into the case and secure by tightening two of the front panel captive screws.

2-35. ADJUSTMENT.

2-36. GENERAL.

2-37. Variations in system gain over the operating frequency range will require that the AM-3924(P)/URT or AM-6909/URT and T-827( )/URT be adjusted the first time the two are operated together after installation, and after any repair or replacement of assemblies affecting the output power of the transmitter. In addition, the tune power output level must be adjusted if the AN/URT-23(V) is to be operated with an antenna coupler system other than the AN/URA-38( ). The following paragraphs provide all the information required to perform these adjustments.



NOTES:

1. TO COMPLETE KEYLINE INTERLOCK PROVIDED IN ACCESSORY CONNECTOR J8 IT IS NECESSARY THAT A CLOSURE BE PROVIDED BETWEEN PINS B AND D OF THE MATING CONNECTOR OR IN ANY CONNECTED ACCESSORY UNIT.
2. WHEN OPERATING WITH THE PP-3917/UR (400 CPS PRIMARY POWER SOURCE), CONNECT THE PLUG SUPPLIED WITH THE PP-3917/UR TO THE AM-3924(P)/URT CONNECTOR J1 IN PLACE OF CABLE W3.
3. WHEN USED, THE PP-3917/UR IS INSTALLED WITHIN THE AM-3924(P)/URT AND THE PP-3916/UR IS REMOVED FROM THE SYSTEM.
4. CABLES W1 AND W2 ARE SUPPLIED AS PART OF THE AN/URT-23(V). CABLE W5 IS SUPPLIED AS A PART OF THE AN/URA-38.

Figure 2-4. Interconnection Diagram

2-37A. AN/URT-23(V) ALIGNMENT FOR SYSTEMS WITH 1A1A6 PRINTED CIRCUIT BOARDS, PN 0082D-3340.

NOTE

The following procedure is to be used for systems that have A6 APC/PPC printed circuit boards, PN 0082D-3340 installed. By virtue of Field Changes 17 and 18 to the AN/URT-23(V), the newer boards, formerly used only in the AN/URT-23A(V), are now compatible with the AN/URT-23(V). Due to APC/PPC circuitry changes a different alignment procedure is necessary to set the various level adjustments in the transmitter. The new boards are presented schematically in section 5 and logistically in section 6.

a. Refer to paragraph 2-39 for test equipment required. Turn on all test equipment and allow sufficient time to warm-up.

b. Refer to paragraph 2-40 and Table 2-10 for audio connections and standard audio inputs. Connect test equipment as shown in figure 2-5.

c. Set T-827( )/URT Mode Selector switch to STDBY and set AM-3924(P)/URT or AM-6909/URT PRIMARY POWER switch to ON.

d. REMOVE the 500 VDC fuse from the AM-3924(P)/URT or AM-6909/URT.

e. Disconnect the Coupler Control Unit cable, W5 (if used) from the rear of the AM-3924(P)/URT or AM-6909/URT at 1A2A1J6, if accessible. If the AN/URA-38 is used and the control cable is not accessible, set the power switch to ON (C-3698) and in the MANUAL mode momentarily press the right pushbutton for both the L and C elements to remove them from the HOME END stops. Set the C-3698 power switch to OFF.

NOTE

Extend the units from cases only as necessary to make measurements and adjustments. At no time should the AN/URT-23(V) be keyed with both the T-827( )/URT and the AM-3924(P)/URT or AM-6909/URT open as this could induce undesired oscillations which could damage the transmitter. If access to the RF output is made at the VSWR Bridge J2, make certain the 500 VDC fuse is removed from the AM-3924(P)/URT or AM-6906/URT at all times that the T-827( )/URT is extended from the case.

WARNING

Be extremely careful when working with the AM-3924 (P)/URT or AM-6909/URT chassis extended from the case. Voltages in excess of 2250 VDC and 2000 VRF may be encountered in this unit.

f. Set T-827( )/URT Mode Selector switch to USB and LOCAL/REMOTE switch to REMOTE. Frequency controls to 2.0000 MHz.

g. Connect Audio Signal Generator SG-376/U and Electronic Multimeter ME-6 D/U to USB Audio input on rear of the T-827( )/URT.

h. Loosen T-827( )/URT front panel captive screws and slide out of case to the locked position.

i. Defeat interlock switches on side of case, or on rear of front panel. Allow five minutes for system to stabalize. Set T-827( )/URT Mode Selector switch to USB.

j. Key transmitter using LOCAL key on the AM-3924(P)/URT or AM-6909/URT.

k. Set Tone A of SG-376/U to Standard Audio input A.

l. Measure output of left hand TRANS AUDIO AMPL (A2) at TP2 using ME-6D/U. Adjust A2R11 for an output of 100 mv $\pm$ 3 mv as read on ME-6D/U.

m. Measure output of TRANS IF AMPL (A12) at TP2 using CCVO-91H. Adjust A12R15 Gain Adjust for an indication of 7 mv $\pm$ .2 mv at A12TP2. Unkey system.

n. Disconnect SG-376/U and ME-6D/U from J5, and connect them to LSB Audio input J6, on rear of T-827( )/URT.

o. Set T-827( )/URT Mode Selector switch to LSB, and key transmitter using LOCAL key on the AM-3924(P)/URT or AM-6909/URT.

p. Insure that SG-376/U controls are set for Standard Audio input A.

q. Measure output of TRANS IF AMPL (A12) at TP2 using CCVO-91H. Adjust output of right hand TRANS AUDIO AMPL (A3) (A3R11) for an indication of 7 mv $\pm$ .2 mv as measured at A12TP2.

r. Set T-827( )/URT Mode Selector switch to FSK, and the LOCAL/REMOTE switch to LOCAL. FSK (RATT) key the transmitter by grounding pin A of J7 on the rear of the T-827( )/URT.

s. Set T-827( )/URT Line Level Meter switch to -10 dB, and adjust FSK (RATT) output level potentiometer (A9R26) for an indication of +2 dB on the Line Level Meter. Measure output of TRANS IF AMPL (A12) at TP2, indication should be 10 mv or greater. Unkey transmitter by removing ground at J7-A.

t.Set T-827( )/URT Mode Selector switch to AM, and key transmitter using LOCAL key on AM-3924(P)/URT or AM-6909/URT.

u. Measure the output of TRANS IF AMPL (A12) at TP2 using CCVO-91H. Adjust % MOD potentiometer R101 on the TRANS MODE SELECTOR (A1) for an indication of 7 mv $\pm$ .2 mv on the CCVO-91H.

v. Set Multipurpose Meter switch to INPUT PWR 0-150 MW, and adjust RF AMPL (A4) gain adjust R6 for an indication of 80 mw on the AM-3924(P)/URT or AM-6909/URT Multipurpose Meter.

w. Use the T-827( )/URT frequency controls to check various frequencies and search out the frequency with the lowest output as indicated on the AM-3924(P)/URT or AM-6909/URT Multipurpose Meter. Leave the controls set for the frequency with the lowest output.

NOTE

One good method is to start at 2.5555 MHz, then check 3.5555 MHz, 4.5555 MHz, etc. thru 29.5555 MHz, and then leave the MHz knobs set for the lowest frequency so far. Then step the 100 kHz knob thru positions 0 to 9 and leave it in its lowest output position. Then repeat with the 10 kHz, 1 kHz, and 100Hz controls.

x. Readjust the RF AMPL (A4) gain adjust R6 for an indication of 150 mw on the AM-3924(P)/URT or AM-6909/URT Multipurpose Meter. Increase this setting by one turn of the potentiometer to allow for future ambient temperature variations. Unkey transmitter. Close and secure T-827( )/URT.

y. Set T-827( )/URT Mode Selector switch to STDBY. Replace the 500 VDC fuse in the AM-3924(P)/URT or AM-6909/URT.

z. Set T-827( )/URT frequency controls to 4.5550 MHz, Mode Selector switch to USB, and LOCAL/REMOTE switch to REMOTE.

aa. Disconnect the SG-376/U and ME-6D/U from LSB Audio Input J6, and reconnect them to USB Audio Input J5 on the rear of the T-827( )/URT.

ab. Set PA PWR potentiometer 1A1R13 maximum ccw.

ac. Loosen AM-3924(P)/URT or AM-6906/URT front panel captive screws and slide PA out to its locked position. Defeat the interlock switches on the side of the case by pulling straight out. Allow five minutes for system to stabalize.

ad. Set PA PPC potentiometer 1A1R11 to midrange.

ae. Set PA APC potentiometer 1A1R12 fully clockwise.

CAUTION

Do not allow the transmitter to operate at greater than the specified output. Start immediate troubleshooting procedures if output control circuits are not functioning properly; that is, if output power significantly exceeds specified transmitter output.

af. Key the transmitter using the LOCAL key on the AM-3924(P)/URT or AM-6909/URT, and adjust the SG-376/U for an input of 210 mv @ 1 kHz as read on the ME-6D/U.

ag. Without exceeding 260 VAC on the AN/USM-116( ), alternately adjust the PPC potentiometer R11, and the PWR potentiometer R13 until the output is 245 VAC and the PWR potentiometer is fully clockwise. Unkey transmitter.

ah. Set APC potentiometer R12 fully ccw. Set LOCAL/REMOTE switch to LOCAL, and Mode Selector switch to CW. Key the transmitter using CW handkey.

ai. Adjust the APC potentiometer R12 for 225 VAC on AN/USM-116( ). Unkey transmitter.

aj. Set frequency to 21.0000 MHz and CW key the transmitter.

ak. Read AN/USM-116( ) and calibrate Power Meter 1A1M2 by adjusting METER CAL potentiometer 1A1R14 to indicate on the output power meter the power output in watts. Determine the actual power output using the AN/USM-116( ) reading and the following formula:

$$\text{Watts} = \frac{(\text{volts})^2}{50}$$

Unkey transmitter.

al. Disconnect all test equipment and reconnect Coupler Control Cable W5, if used, to 1A1A1J6 on rear of AM-3924(P)/URT or AM-6909/URT case. Return PA chassis into case and secure all captive screws on amplifier and exciter.

am. Procede to paragraph 2-43 and perform TUNE POWER ADJUSTMENT as necessary.

2-38. TEST EQUIPMENT.

2.39. The test equipment required is as follows:

a. Electrical Dummy Load DA-242/U.

b. Electronic Multimeter AN/USM-116( ).

c. Two-tone Audio Signal Generator SG-376/U.

d. RF Voltmeter CCVO-91H.

e. Electronic Multimeter ME-6D/U.

NOTE

Before proceeding, it will be necessary to determine whether the T-827( )/URT used with the AM-3924(P)/URT or AM-6909/URT includes the modification for level-set potentiometers as described in paragraph 1-42. One of the following procedures must be performed whenever an AM-3924(P)/URT or AM-6909/URT and T-827( )/URT are operated for the first time after installation, or whenever a repair affecting the output of the transmitter has been made.

2-40. AN/URT-23(V) ALIGNMENT PROCEDURE FOR SYSTEMS WITHOUT LEVEL-SET POT.

a. Turn all test equipment on and allow sufficient time for warmup. Connect test equipment as shown in figure 2-5.

NOTE

These procedures are written giving the most desirable access points for input and output signals, which is at the rear of the transmitter. If rear of transmitter is not accessable due to installation, access may be gained as follows:

1. Access the RF output of J-3 at the antenna patch panel (first alternative).

2. Access the RF output at the output of the VSWR Bridge 1A1A3J2 (second alternative).

CAUTION

This connection should be used as a last resort to access the RF Output since the AM-3924(P)/URT or AM-6909/URT can not be closed.

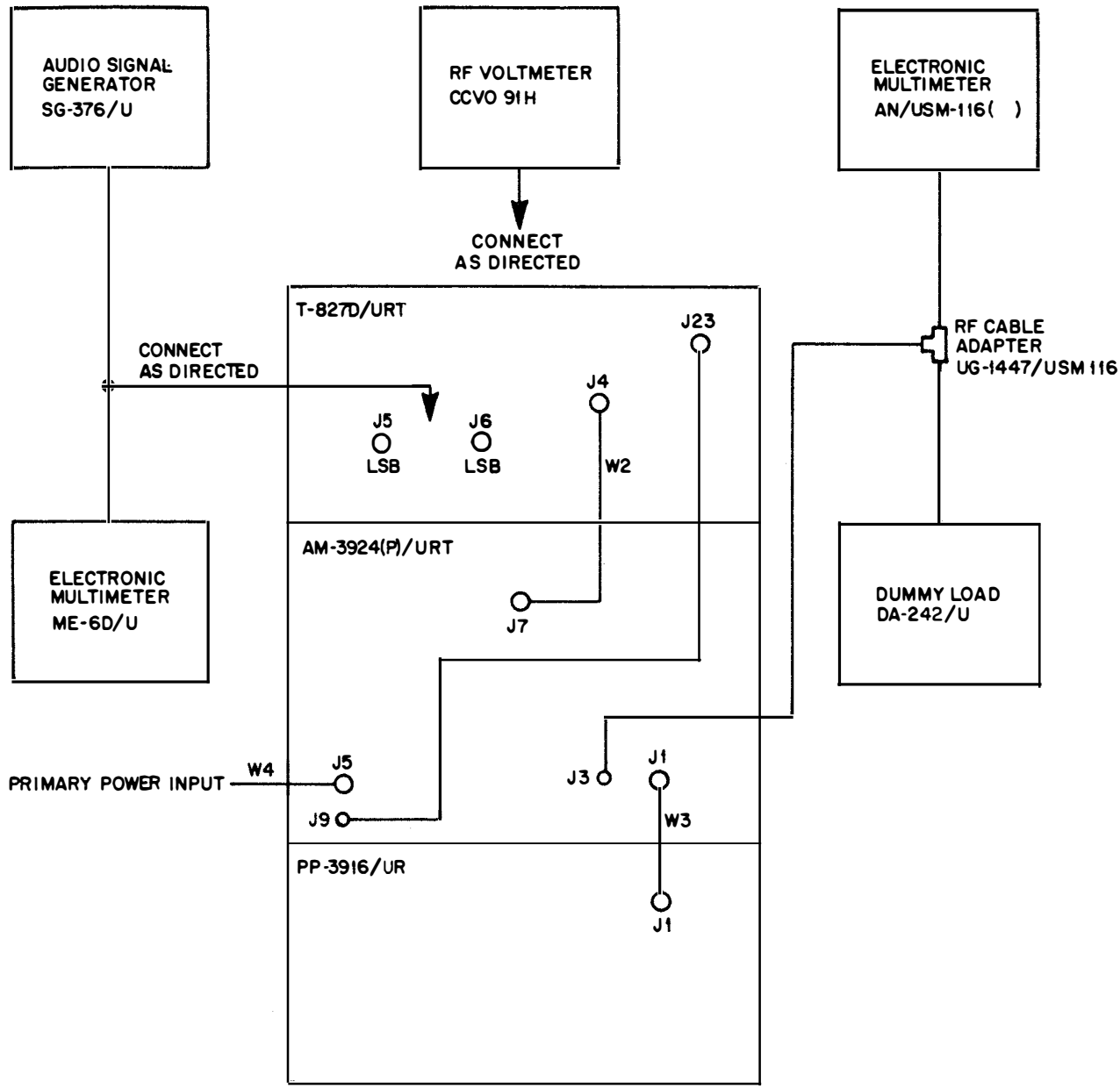
3. Parallel access the remote audio input jacks J5 and J6 on the T-827 ( )/URT by disconnecting the output leads on terminals 9 and 10 of a C-1138/UR. Connect the SG-376/U to the output leads removed from terminals 9 and 10 and patch the C-1138/UR to the desired sideband mode of the transmitter being adjusted as required below (first alternative). Refer to table 2-10 for Standard Audio input.

4. Access the Audio input at T-827( )/URT Handset jack pin C (+) and pin B (ground). (Second Alternative) Refer to table 2-10 for Standard Audio input.

TABLE 2-10. STANDARD AUDIO INPUT

ACCESS POINT	INPUT		
	A	B	AB
T-827( )/URT J5 or J6	1000 Hz @ 150 mv	1700 Hz @ 150 mv	A + B = approx. 190 mv
C-1138( )/UR Term 9 & 10	1000 Hz @ 150 mv	1700 Hz @ 150 mv	A + B = approx. 190 mv
T-827( )/URT HANDSET jack	1000 Hz @ 65 mv	1700 Hz @ 65 mv	A + B = approx. 85 mv
	A_1		
T-827( )/URT J5 or J6	1000 Hz @ 210 mv		
C-1138( )/UR Term 9 & 10	1000 Hz @ 210 mv		
T-827( )/URT HANDSET jack	1000 Hz @ 90 mv		

1. For standard audio input, connect ME-6D/U as shown in figure 2-5. Connect meter and generator as directed in paragraph 2-40 or 2-41 either to J5 or J6 of the T-827( )/URT or to an alternate as described in paragraph 2-40.
   a. NOTE 3 or 4.
2. Adjust for standard input levels above with system keyed using LOCAL key.
3. If T-827( )/URT HANDSET jack is used for the input, the LOCAL/REMOTE switch must be at LOCAL instead of REMOTE as described in the text of procedures.



TRANSMITTING SET AN/URT-23(V)

Figure 2-5. AN/URT-23(V) Alignment Test Setup

b. Perform steps a. through m. of paragraph 3-35. Set T-827( )/URT Mode Selector switch to STDBY.

c. If AN/URA-38( )antenna coupler system is used, turn C-3698 control power switch to ON. In the MANUAL mode momentarily press the right button for the L and C elements to move them off of the stops. Set C-3698/URA power switch to OFF.

NOTE

Extend the units from cases only as necessary to make measurements and adjustments. At no time should the AN/URT-23(V) be keyed with both the T-827( )/URT and the AM-3924(P)/URT or AM-6909/URT open as this could induce undesired oscillations which could damage the transmitter. If access to RF output is made at the VSWR Bridge J2, make certain that the 500 VDC fuse is removed from the AM-3924(P)/URT or AM-6909/URT at all times that the T-827( )/URT chassis is extended from its case.

CAUTION

Until the APC and PPC levels are properly set, the AN/URT-23(V) will have no limiting control on maximum power output. Excessive RF input to the AM-3924(P)/URT or AM-6909/URT will damage the amplifier circuits.

WARNING

Be extremely careful when working with the AM-3924(P)/URT or AM-6909/URT chassis extended from the case. Voltages in excess of 2250 VDC and 2000 VRF may be encountered in this unit.

d. Loosen the AM-3924(P)/URT or AM-6909/URT front panel captive screws and slide the chassis out from the case to the locked position.

e. Set PPC ADJ R11 (figure 5-6) and front panel PWR control maximum CCW.

f. Set APC ADJ R12 maximum CW.

g. Defeat interlock switches S1, S2, and S3 on side of case (figure 5-18) by pulling plunger shaft straight out. Allow five minutes for system to stabalize.

h. Set T-827( )/URT MCS and KCS controls for a frequency of 6.000 MHz.

i. Set T-827( )/URT Mode Selector to CW mode.

CAUTION

Be sure that AM-3924(P)/URT or AM-6909/URT PPC ADJ R11 has been set to maximum counterclockwise.

j. Connect a handkey to the T-827( )/URT front panel CW key jack.

k. Key system with handkey and carefully adjust AM-3924(P)/URT or AM-6909/URT PWR control fully clockwise (output should not exceed 200 VAC). Then adjust the PPC ADJ R11 until the AN/USM-116( ) connected to the UG-1447/USM-116 at the DA-242/U reads 230 VAC (RF output). This is a preliminary adjustment to protect the equipment by limiting maximum RF output during setup).

l. Unkey system.

m. Set T-827( )/URT Mode Selector switch to STDBY.

n. Release chassis slide locks and slide AM-3924(P)/URT or AM-6909/URT chassis back into case. Secure chassis with one or two captive screws.

o. Remove 500v fuse from AM-3924(P)/URT or AM-6909/URT.

p. Set T-827( )/URT LOCAL/REMOTE switch to REMOTE.

q. Connect Audio Signal Generator SG-376/U and Electronic Multimeter ME-6D/U to USB Audio input J5 on T-827( )/URT.

r. Loosen T-827( )/URT front panel captive screws and slide chassis out of case to the locked position.

s. Defeat interlock switches on side of case by pulling plunger straight out. Allow five minutes for system to stabilize. Set T-827( )/URT Mode Selector to USB.

t. Key transmitter using LOCAL KEY on AM-3924(P)/URT or AM-6909/URT.

u. Set Tone A of SG-376/U for Standard Audio input A.

v. Measure audio output of left hand TRANS AUDIO AMPL (A2) at TP2 using ME-6D/U. Adjust A2R11 for an output of 100 mv $\pm$ 3 mv as read on ME-6D/U.

w. Unkey system.

x. Disconnect SG-376/U and ME-6D/U from J5, and connect them to LSB Audio input J6 on T-827( )/URT.

y. Set T-827( )/URT Mode Selector to LSB.

z. Key transmitter using LOCAL KEY on AM-3924(P)/URT or AM-6909/URT.

aa. Insure that SG-376/U controls are set for Standard input A.

ab. Measure audio output of right hand TRANS AUDIO AMPL (A3) at TP2 using ME-6D/U, adjust A3R11 for an output of 100 mv $\pm$ 3 mv as read on ME-6D/U.

ac. Disconnect the SG-376/U and ME-6D/U from J6 and connect them to J5. Insure controls are set for standard input A. Set T-827( )/URT Mode Selector to USB.

ad. Using RF Voltmeter (CCVO-91H) observe the output of T-827( )/URT TRANS IF AMPL (A12) at A12TP2. Adjust A12R15 Gain Adjust for an indication of 7.0 mv $\pm$0.5 mv as read at A12TP2.

ae. Unkey system and disconnect SG-376/U and ME-6D/U from J5.

af. Set T-827( )/URT Mode Selector switch to AM and LOCAL/REMOTE switch to LOCAL.

ag. Key transmitter using LOCAL KEY on AM-3924(P)/URT or AM-6909/URT.

ah. Still observing the output at A12TP2, adjust the 0/0 (percent) MOD potentiometer R101 on the TRANS MODE SELECTOR assembly (A1). Set A1R101 for 7.0 mv $\pm$ 0.5 mv as read at A12TP2 on CCVO-91H.

ai. Unkey system.

aj. Set T-827( )/URT Mode Selector to RATT and key system by shorting pins A and D of J7 together on the rear of the T-827( )/URT, or key transmitter remotely with the ships RATT system in a MARK condition.

ak. Set USB Line Level meter switch in -10 dB position. Adjust the output level potentiometer (R26) on the RATT (FSK) Tone Generator assembly (A9) for a +2 dB indication on USB Line Level meter. Voltage at A12TP2 should be between 10 mv and 15 mv.

al. Unkey system.

am. Set T-827( )/URT Mode Selector to CW and key system using CW handkey.

an. Monitor the output at A12TP2. The level should be between 10 mv and 20 mv.

ao. Unkey system.

ap. Reconnect the SG-376/U and ME-6D/U to the LSB Audio input J6 on the rear of the T-827( )/URT.

aq. Set the T-827( )/URT LOCAL/REMOTE switch to REMOTE and the Mode Selector to LSB.

ar. Key system with the LOCAK KEY on the AM-3924(P)/URT. Insure that SG-376/U controls are set for standard input A.

as. Monitor the IF output at A12TP2. The level should be 7.0 mv + 0.5 mv. If not, adjust A2R11 (on right hand TRANS AUDIO AMPL) slightly to meet this requirement. Unkey system.

at. Set Mode Selector to STDBY and slide T-827( )/URT chassis into case. Secure with one or two captive screws. Replace 500 v fuse in AM-3924(P)/URT or AM-6909/URT.

au. Set standard input A of SG-376/U for an output of 0 volts (ATTEN dB to 90). Disconnect SG-376/U and ME-6D/U from J6 and reconnect them to J5.

NOTE

The following steps (av through bd) determine the frequencies with the highest and lowest gain by comparing the audio input level required at each frequency to produce 50 VRF output from the AN/URT-23(V). The frequency requiring the highest input level is the low gain frequency, the frequency requiring the lowest input level is the high gain frequency of the transmitter.

av. Set the T-827( )/URT for a frequency of 2.000 MHz and Mode Selector to USB. Key system using the LOCAL KEY on the AM-3924(P)/URT or AM-6909/URT.

aw. Slowly increase level of SG-376/U output until AN/USM-116( ) indicates 50 VRF at the DA-242/U. Note and record the ME-6D/U level at this frequency. Unkey system.

ax. Decrease SG-376/U output to 0 volts. Increase T-827( )/URT frequency by 1 MHz, key system and repeat step aw.

ay. Repeat step ax. for all MHz positions of the T-827( )/URT MCS controls. Note frequencies providing the highest and lowest ME-6D/U indication.

az. Set T-827( )/URT MCS controls at that frequency which provided the highest ME-6D/U indication in steps aw through ay. Repeat steps aw. through ay. using 100 kHz increments in place of 1 MHz increments.

ba. Set the T-827( )/URT 100 kHz control to the frequency which required the highest input level as indicated on the ME-6D/U. Repeat steps aw. through ay. using 10 kHz increments in place of 1 MHz increments.

bb. Set the T-827( )/URT 10 kHz control to the frequency which required the highest input level as indicated on the ME-6D/U. Repeat steps aw. through ay. using 1 kHz increments in place of 1 MHz increments. Note and record the complete T-827( )/URT frequency settings providing the highest ME-6D/U indications as determined in steps aw. through bb. (This frequency is the low gain frequency of the transmitter.

bc. Set T-827( )/URT MCS controls to the positions which provided the lowest ME-6D/U indications in steps aw. through ay. Set all T-827( )/URT KCS controls to zero.

bd. Following the procedure outlined in steps aw. through bb., determine and record the complete T-827( )/URT frequency settings which provide the lowest ME-6D/U indications. (High gain frequency.)

be. Unkey system and disconnect the SG-376/U and ME-6D/U. Set T-827( )/URT Mode Selector to STDBY.

NOTE

If the procedure of paragraph 2-41 is being followed, proceed to paragraph 2-42b for systems with level set pots. If not continue with paragraph 2-40 bf for systems without level set pots.

bf. Set T-827( )/URT frequency controls to that frequency which provided the lowest ME-6D/U indication as recorded in step bd.

bg. Loosen AM-3924(P)/URT or AM-6909/URT captive screws and slide chassis out of case to the locked position.

bh. Defeat interlock switches on case by pulling plunger shaft straight out. Allow five minutes for systems to stabilize.

bi. Set T-827( )/URT Mode Selector to USB.

bj. Reconnect SG-376/U and ME-6D/U to USB Audio input J5 on T-827( )/URT.

bk. Key system with the LOCAL KEY and set output A for standard input A, and output B for standard input B. Insure that both outputs are balanced and set OUTPUT selector to AB (two-tone output). ME-6D/U indication should increase to approximately 190 mv. Observe AN/USM-116( ) indication and adjust PPC ADJ (R11) for 224 VRF on the AN/USM-116( ).

bl. Unkey system and lock PPC ADJ (R11).

bm. Set T-827( )/URT LOCAL/REMOTE switch to LOCAL and Mode Selector to AM.

bn. Set AM-3924(P)/URT or AM-6909/URT APC ADJ (R12) maximum counterclockwise (CCW).

bo. Key system with LOCAK KEY and increase APC ADJ (R12) until the output of the transmitter as read on the AN/USM-116( ) is 106 VAC (225) watts. Lock APC ADJ (R12).

bp. Rotate AM-3924(P)/URT PWR control to maximum counterclockwise (CCW).

bq. Set T-827( )/URT Mode Selector to CW.

br. Key the system with the CW handkey, and carefully adjust PWR control clockwise while observing AN/USM-116( ). If system is properly adjusted AN/USM-116( ) should not exceed 230 VRF when PWR control is set fully clockwise. If an AN/USM-116( ) indication exceeds 230 VRF before the PWR control is fully clockwise, STOP, unkey system, set T-827( )/URT Mode Selector to USB, set LOCAL/REMOTE switch to REMOTE, and repeat procedure from step bj. through br.

bs. Unkey system and set T-827( )/URT frequency controls for 21.000 MHz. Set LOCAL/REMOTE switch to LOCAL.

bt. Key system with CW Key. The AN/USM-116( ) should indicate between 200 VRF and 240 VRF.

bu. With system still keyed, adjust AM-3924(P)/URT or AM-6909/URT Meter Cal (R14) for an indication in watts on the Power Meter, equivalent of the AN/USM-116( ) voltage indication. (To convert voltage to watts, use formula Watts=Voltage $^2/50$. Example 224 $v^2/50$=1003 Watts.

bv. Unkey system and set T-827( )/URT Mode Selector to USB.

bw. Set AM-3924(P)/URT or AM-6909/URT Key switch at TUNE KEY, and observe that Power Meter indicates 150 $\pm$ 50 Watts. If Power Meter indication is not within prescribed limits, perform procedures in paragraph 2-43.

bx. Set T-827( )/URT Mode Selector to STDBY and allow five minutes for PA tubes to cool. Set Mode Selector to OFF and AM-3924(P)/URT or AM-6909/URT Primary Power switch to OFF.

by. Slide AM-3924(P)/URT or AM-6909/URT into case and secure all front panel captive screws on amplifier and exciter.

bz. Disconnect all test equipment and reconnect system cables in their normal operational configuration as in figure 2-4.

2-41. AN/URT-23(V) ALIGNMENT PROCEDURES FOR SYSTEMS WITH LEVEL-SET POTENTIOMETERS.

2-42. To adjust system gain when the T-827( )/URT has an RF Amplifier assembly (A4) with gain potentiometer R6 installed (paragraph 1-44) perform the procedure below.

a. Perform steps a. through be. of paragraph 2-40.

b. Loosen AM-3924(P)/URT or AM-6909/URT captive screws and slide chassis out from case. Adjust APC ADJ (R12) and PPC ADJ (R11) fully clockwise. Slide chassis into case and secure.

c. Set T-827( )/URT frequency controls at that frequency which provided the highest ME-6D/U indication recorded in step bb. of paragraph 2-40 (low gain frequency).

d. Loosen T-827( )/URT front panel screws and slide chassis out from case to the locked position.

e. Defeat T-827( )/URT interlock switches by pulling plunger straight out.

WARNING

If the second alternative for accessing the RF output is being used (at VSWR Bridge), the T-827( )/URT must be closed prior to keying the transmitter. Unkey the transmitter before opening the T-827( )/URT to make RF amplifier adjustments, then close T-827( )/URT to make keyed observations.

f. Locate A4A38R6 on top of the RF Amplifier and rotate R6 (GAIN ADJUST) fully counterclockwise (CCW).

g. Set T-827( )/URT Mode Selector to USB.

h. Key system with LOCAL KEY and set SG-376/U channel A for standard input A and channel B for standard input B. Insure that both channels are balanced at 150 mv and set output selector to AB.

CAUTION

While making the following adjustments, remember that the AM-3924(P)/URT or AM-6909/URT APC ADJ and PPC ADJ have been temporarily set to disable the power control circuits of the transmitter.

i. Adjust T-827( )/URT RF Amplifier GAIN ADJ (A4A38R6) for an indication of 224 VRF on AN/USM-116( ).

j. Unkey system and disconnect SG-376/U and ME-6D/U from J5. Set T-827( )/URT Mode Selector to STDBY.

k. Slide T-827( )/URT chassis into case and secure with front panel screws.

l. Loosen AM-3924(P)/URT or AM-6909/URT front panel captive screws and slide chassis out of case to locked position. Defeat the interlock switches and allow five minutes for the system to stabilize.

m. Set T-827( )/URT Mode Selector to CW. Adjust PPC ADJ (R11) fully counterclockwise (CCW).

n. Set T-827( )/URT frequency controls to that frequency which required the lowest audio input recorded in step bd. of paragraph 2-40. Set LOCAL/REMOTE switch to LOCAL.

o. Key system with CW handkey and observe AN/USM-116( ).

p. Adjust PPC ADJ (R11) for an indication of 224 VRF on AN/USM-116( ). Lock PPC ADJ.

q. Unkey system.

r. Set T-827( )/URT Mode Selector to AM and set AM-3924(P)/URT or AM-6909/URT PWR control to maximum clockwise.

s. Set AM-3924(P)/URT or AM-6909/URT APC ADJ (R12) maximum counterclockwise (CCW).

t. Key system and observe AN/USM-116( ).

u. Increase APC ADJ (R12) until AN/USM-116( ) indicates 106 VRF (225 watts). Lock APC ADJ.

v. Unkey system.

w. Set T-827( )/URT frequency controls for 21.000 MHz and Mode Selector to CW.

x. Key system with handkey. The AN/USM-116( ) should indicate between 200 VRF and 240 VRF.

y. With system still keyed, adjust AM-3924(P)/URT or AM-6909/URT Meter Cal (R14) for an indication in watts on the Power Meter equivalent to the AN/USM-116( ) voltage indication.

NOTE

To convert voltage to watts, use formula Watts=Voltage ^{2}/50.
Example: 224v^2/50=1003 Watts.

z. Unkey system and set T-827( )/URT Mode Selector to USB.

aa. Set AM-3924(P)/URT or AM-6909/URT KEY switch at TUNE KEY and observe that Power Meter indicates 150 ± 50 Watts. If Power Meter indication is not within prescribed limits, perform paragraph 2-43.

ab. Set T-827( )/URT Mode Selector to STDBY and allow five minutes for PA tubes to cool. Set T-827( )/URT Mode Selector to OFF and AM-3924(P)/URT or AM-6909/URT Primary Power to OFF.

ac. Slide AM-3924(P)/URT or AM-6909/URT chassis into case and secure all front panel captive screws on amplifier and exciter.

ad. Disconnect all test equipment and reconnect system cables in their normal operational configuration as in figure 2-4.

2-43. TUNE POWER ADJUSTMENT.

2-44. The reduced tune power output from the AM-3924(P)/URT can be varied by changing the value of resistor R25 on APC-PPC assembly 1A1A6. The level of this output is set according to the requirements of the antenna coupler being used with the AN/URT-23(V). As shipped, the AM-3924(P)/URT tune power output is factory set to approximately 200 watts (for use with Antenna Coupler Group AN/URA-39). To adjust the tune power output level of the AM-3924(P)/URT, proceed as follows:

CAUTION

Reducing the value of resistor 1A1A6R25 increases the tune power output level of the AM-3924(P)/URT. If too small a value of resistor is used, the tune power output can exceed the 1 KW rated output of the AM-3924(P)/URT. The value of resistor 1A1A6R25 should never be less than 3.3 K ohms.

CAUTION

The APC and PPC adjustments will always have to be reset each time the tune power is changed.

a. If paragraph 2-40 or 2-41 has been performed previously, repeat steps a and b of that paragraph; otherwise, perform paragraph 2-40 or 2-41 in its entirety.

b. Disconnect SG-376/U.

c. Set the Key switch at TUNE KEY, verify TUNE lamp lights, and observe the reading on the front panel Power Meter.

d. Determine whether the indication in step c must be increased or decreased, to fall within the limits for tune power required by the antenna coupler to be used with the AN/URT-23(V).

NOTE

To decrease the tune power, increase the resistance of resistor 1A1A6R25.

e. Set the Key switch at NORMAL, and de-energize the AN/URT-23(V).

f. Locate and remove APC-PPC printed circuit board on the top left of the chassis (figure 5-7).

g. Locate resistor 1A1A6R25 on two stand-off terminals on the board (figure 5-16).

h. Using the soldering technique explained in paragraph 5-34, remove and discard resistor 1A1A6R25.

NOTE

Due to circuit differences, and APC-PPC settings, the value of 1A1A6R25 will vary between equipments. For approximately 200 watts of tune power, 1A1A6R25 will be approximately 5K. For 50 watts, 1A1A6R25 will be 20K to 30K.

i. From stock, select a fixed composition 1/4 watt resistor with a value which will produce the desired tune power output. Carefully solder the resistor between the two stand-off terminals on board 1A1A6.

j. Replace APC-PPC assembly 1A1A6 in the AM-3924(P)/URT chassis.

k. Repeat steps b and e to determine if the tune power output is now within the required limits.

l. Repeat steps d through k until the desired tune power output is obtained.

m. Check the APC and PPC adjustments by performing steps bf through bz of paragraph 2-40 or steps b through z of paragraph 2-41 as applicable.

2-45. PERFORMANCE CHECKS.

2-46. To ensure correct installation, perform the procedures in Section 3 for all modes of operation prior to releasing the equipment to operating personnel.

2-47. INTERFERENCE REDUCTION.

2-48. To reduce the possibility of RF interference, the system should be operated with all units bolted securely in their cases. The cable shielding, and ground connections in all fabricated cables should be carefully inspected to ensure proper terminations. The complete bonding system should also receive careful attention during installation. In addition, to assure a good ground for the antenna, the system must be installed close to an effective, permanent ground termination. All ground straps between equipments and between the system and the ground termination should be as short as possible, and connections should be clean and tight to ensure good bonding.

2-49. MODIFICATIONS REQUIRED FOR USE OF SECOND EXCITER.

2-50. GENERAL.

2-51. The AN/URT-23(V) system is designed for operation with the T-827( )/URT as an exciter. However, with modification, the AM-3924(P)/URT allows a second exciter to be used for keying the system as an RF source, while utilizing the T-827( )/URT as a frequency selector and source of standby and operate control signals for the AM-3924(P)/URT. The second exciter must have an otherwise unused keying switch or relay contact closure to ground, to key the AM-3924(P)/URT.

2-52. PARTS REQUIRED.

2-53. Table 2-11 lists the parts required to modify the AM-3924(P)/URT for exciter No. 2 operation.

2-54. MODIFICATION PROCEDURE.

2-55. To make the necessary changes to the AM-3924(P)/URT to permit use of a second exciter, follow the procedure below. The reference designators listed in table 2-11 and on figure 2-6 will be used for the new parts. Figure 2-6 is a partial schematic of the AM-3924(P)/URT showing the modifications required. Carefully solder all connections and cover exposed terminations with plastic tape or tubing. Use #22 AWG stranded wire, plastic insulated for 500 volts minimum for all wiring. During the installation, do not disturb or remove existing wiring and connections unless directed to do so.

TABLE 2-11. EXCITER NO. 2 MODIFICATION PARTS LIST

REF DESIG	DESCRIPTION
1A1DS4	LAMP, NEON: MIL type MS25252NE2D
1A1S2	SWITCH, TOGGLE: MIL type MS35059-22
1A1XDS4	LAMPHOLDER: MIL type LH74LC13CN
1A2C23	CAPACITOR, FIXED CERAMIC: MIL type CK70AW152M
1A2CR1	DIODE: MIL type 1N3611
1A2J10	CONNECTOR, COAXIAL: MIL type UG-909B/U
1A2K2	RELAY, DPDT: MFR, Hi-G Corp, Winsor Locks, Conn. (FMC 02289) P/N 2K1B126
1A2MP1	TERMINAL LUG: MFR, Vaco Products Co., Chicago, Ill. (FMC 79061) P/N 6401
P8	CONNECTOR (Mates with 1A2A1J8) MIL type MS3106A-18-1S with CLAMP, MS-3057-10A, or Bendix Corp, Scintilla Div, Santa Ana, Calif. (FMS 12143) P/N 10-109618-1P with CLAMP 10-36233-183.
P10	CONNECTOR (Mates with J10) MIL type UG-88E/U
--	CONNECTOR TO MATE WITH EXCITER NO. 2 RF OUTPUT TERMINATION.
--	CONNECTOR TO MATE WITH EXCITER NO. 2 KEYLINE AND GROUND RETURN TERMINATION.
--	WIRE, #22 AWG, STRANDED, INSULATED (LENGTH ENOUGH TO REACH TWICE EXCITER NO. 2 KEYLINE TERMINATION TO AM-3924(P)/URT CONNECTOR 1A2A1J8, PLUS APPROXIMATELY 15 FEET FOR CHASSIS WIRING).
--	WIRE, COAXIAL TYPE RG-223/U, OR RG-58/U (LENGTH ENOUGH TO REACH FROM EXCITER NO. 2 RF OUTPUT TERMINATION TO AM-3924(P)/URT CONNECTOR 1A2J10).
1A2CR2	DIODE: MIL type 1N3611 (Use 1A2A1CR2 which is removed when installing this modification).
--	INSULATED STANDOFF (2 each): MFR Sealectro Corp. Mamaroneck, N. Y. (FMC 98291), P/N ST-SM-ITUR-C4.

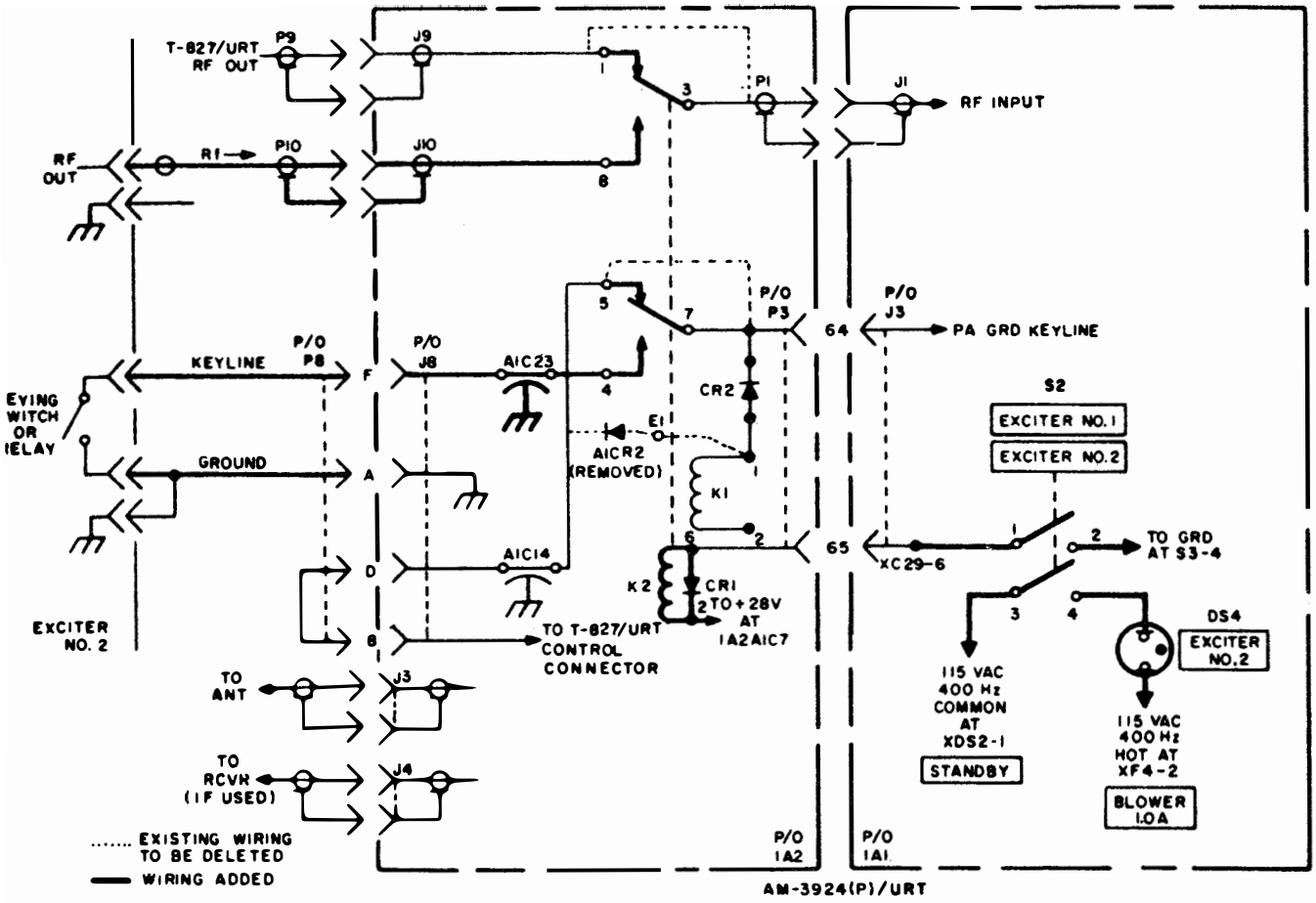


Figure 2-6. Exciter No. 2 Modifications, Schematic Diagram

WARNING

Primary power will be present at some chassis connections and at the connections in the rear of the case, unless primary power is shut off at the system source.

a. Deenergize and secure the system by shutting off the primary power at its source.

b. Slide the AM-3924(P)/URT chassis out from the case until the chassis slides lock. Discharge internal capacitors of Power Line filter FL1/J5 by shorting terminals A, B, and C to ground with a shorting probe.

c. Punch out the plug button in the front panel, next to the Power meter, and install lampholder 1A1XDS4 in the hole.

d. Open the access door on the front panel. Punch out the plug button over the Key switch, and install toggle switch 1A1S2 in the hole.

e. Install indicator lamp 1A1DS4 in the lampholder 1A1XDS4.

f. Solder a length of wire (approximately two feet) to terminal 6 of 1A1XC29, the socket for electrolytic capacitor 1A1C29. Dress the wire along the cable and through the hole behind the front panel to the underside of the chassis, to the newly installed switch 1A1S2. Cut and solder the wire to terminal 1 of 1A1S2.

g. Solder a length of wire (approximately 6 inches) to terminal 2 of 1A1S2. Dress the wire along the chassis cable to Key switch 1A1S3. Cut and solder the wire to terminal 4 (ground) of 1A1S3.

h. Solder a length of wire (approximately two feet) to terminal 3 of 1A1S2. Dress the wire along the chassis cable and through the hole behind the front panel, up to STANDBY lampholder 1A1XDS2. Cut and solder the wire to terminal 1 of 1A1XDS2 (in addition to the white-black-violet wire already there).

i. Solder a length of wire (approximately two feet) to terminal 4 of 1A1S2. Dress the wire along the chassis cable and through the hole behind the front panel, up to the newly installed lampholder 1A1XDS4. Cut and solder the wire to one terminal of 1A1XDS4.

j. Solder a length of wire (approximately two feet) to the unsoldered terminal of lampholder 1A1XDS4 (NOT the terminal used in step i). Dress the wire along the chassis cable to BLOWER fuse holder 1A1XF4. Cut and solder the wire to terminal 2 of 1A1XF4 in addition to the red wire already there.

k. This completes the modifications to the main chassis. Use lacing cord to spot tie the newly installed wires in place.

WARNING

The AM-3924(P)/URT chassis weighs approximately 125 pounds with the PP-3917/UR installed. Do not attempt to remove the chassis from the case without assistance.

CAUTION

Disconnect 1A2P3 bracket before attempting to unscrew the connector jackscrews, to avoid shearing the connector pins.

l. Disconnect the cables at the rear of the chassis. Release the chassis slide locks, and pull the chassis off from the slides. Set the chassis in a safe place while working on the case.

m. Fabricate a small bracket according to the instructions contained in figure 2-7, to mount relay 1A2K2 and 1A2CR2. Drill two holes in the rear of the case next to connector 1A2J9 for mounting the bracket, as shown in figure 2-7. Mount the relay to the bracket, installing the ground lug under one of the screws convenient to the relay terminals.

NOTE

To facilitate wiring, do not mount the bracket to the case at this time.

n. Remove the cover from filter box 1A2A1 on the inside rear of the case.

o. Punch out the plug button on the top side of the filter box, and install capacitor 1A2A1C23.

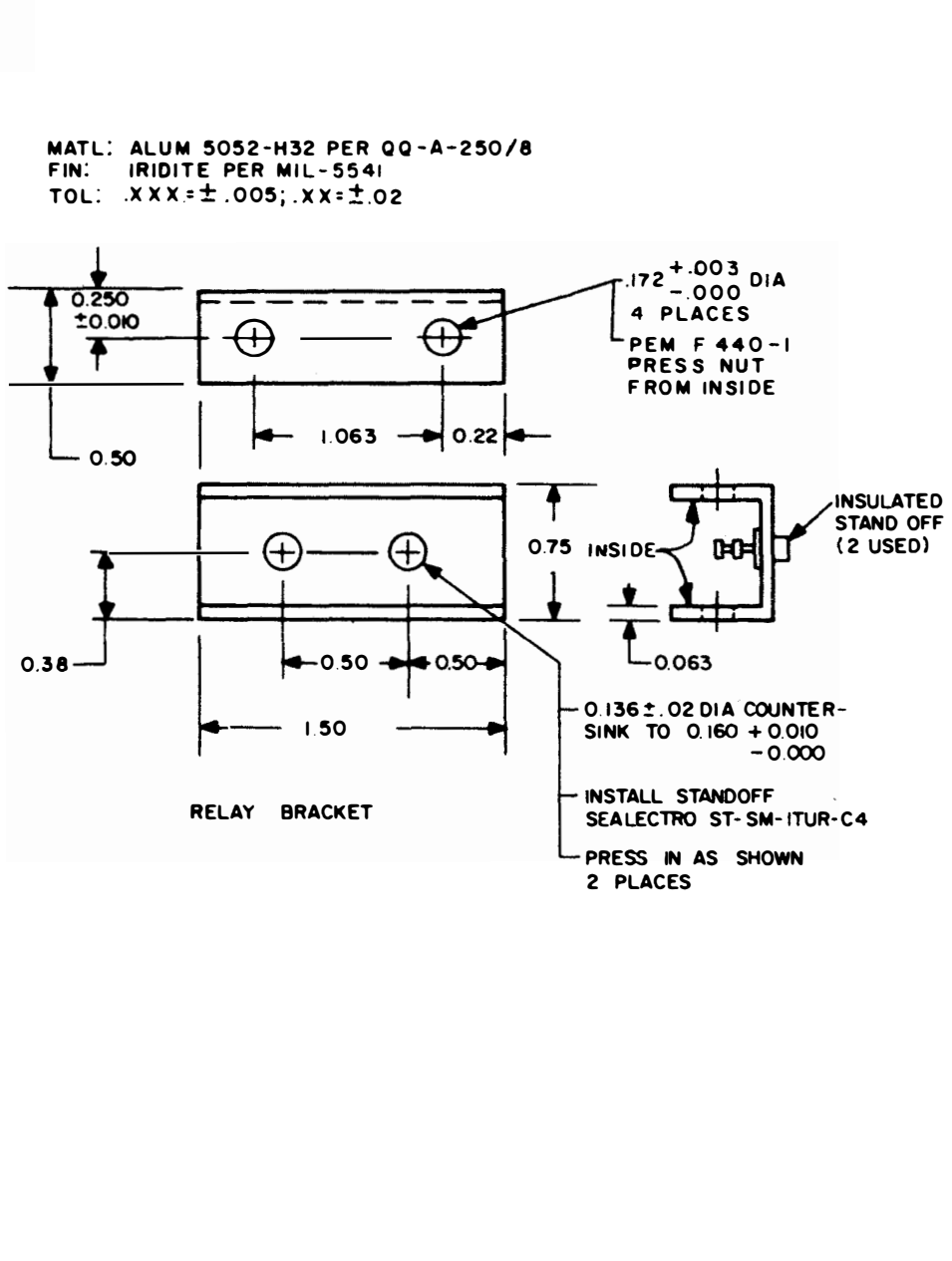
p. Solder a length of wire (approximately 6 inches) to the terminal of 1A2A1C23 inside the filter box. Cut and solder the other end of the wire to pin F of 1A2A1J8 (accessories connector).

q. Replace the cover on filter box 1A2A1.

r. Remove diode 1A2A1CR2 from between the end terminals of 1A2A1C14 and 1A2A1E1. Install the diode on the insulated terminals on the new relay bracket.

NOTE

Hereinafter, diode 1A2A1CR2, which was removed from the filter box and installed on the relay bracket will be called 1A2CR2.



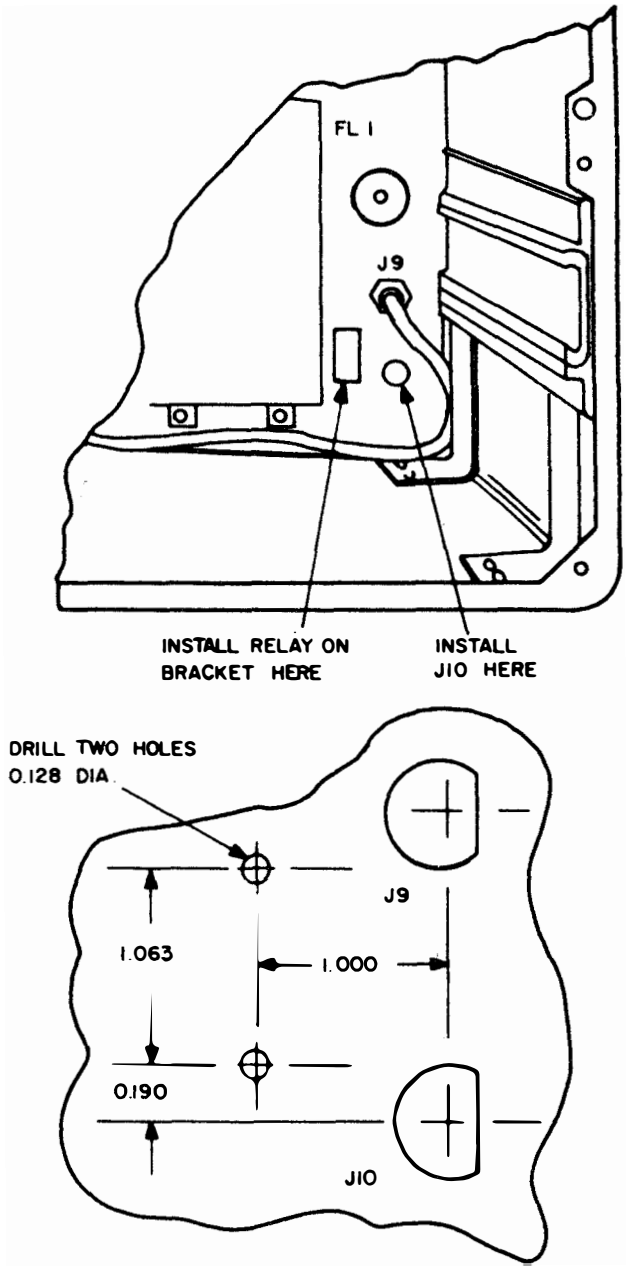


Figure 2-7. Exciter No. 2 Relay Bracket Details

s. Cut the cable lacing on the cable to capacitors 1A2A1C1 through 1A2A1C14.

t. Unsolder the wire from 1A2A1C14. Dress the wire along the cable and solder to pin 7 of 1A2K2.

u. Solder a length of wire (approximately 1 foot) to 1A2A1C14. Dress the wire along the cable, cut to length, and solder to pin 5 of 1A2K2.

v. Solder a length of wire (approximately one and a half foot) to 1A2A1C23. Dress the wire along the cable, cut to length, and solder to pin 4 of relay 1A2K2.

w. Carefully extract the end of the white-black-brown wire (installed by manufacturer for use in this modification) from the cabling beneath the filter box. Dress the wire along the cable, cut to length, and connect (but do not solder) to terminal 6 of 1A2K2.

x. Unsolder the wire from 1A2A1E1. Dress the wire along the cable, cut to length, and solder to the anode of 1A2CR2 on the relay bracket.

y. Solder a short length of wire between the cathode of 1A2CR2 on the relay bracket, and pin 7 of relay 1A2K2.

z. Solder a length of wire (approximately one and a half feet) to the terminal of capacitor 1A2A1C7. Dress the wire along the cable and connector (but do not solder) to terminal 2 of relay 1A2K2.

aa. Carefully install diode 1A2CR1, cathode to pin 2, and anode to pin 6 of 1A2K2. Solder the connections on pins 2 and 6 of 1A2K2.

ab. Cut the coaxial cable from 1A2J9 to 1A2P1 at a point where the cut ends of the coaxial cable can be conveniently dressed and soldered to relay 1A2K2.

ac. Dress the two ends of the coaxial cable and solder the shields to the solder lug previously installed under one of the relay mounting screws. If available, solder ferrules may be used to terminate the coaxial cable shields.

ad. Solder the center conductor of the coaxial cable from 1A2J9 to pin 1 of 1A2K2.

ae. Solder the center conductor of the coaxial cable from 1A2P1 to pin 3 of 1A2K2.

af. Install the UG-909B/U connector 1A2J10 on the end of a 6 inch length of coaxial cable (type RG-223/U or RG-58/U).

ag. Punch out the plug bottom in the rear of the case just beneath connector 1A2J9, and install connector 1A2J10 (with cable attached).

ah. Dress the coaxial cable from 1A2J10 to relay 1A2K2. Cut the cable to length, and dress and solder the cable shield to the solder lug next to the relay. Connect the cable center conductor to pin 8 of 1A2K2.

ai. Mount the bracket containing relay 1A2K2 to the rear wall of the case.

aj. Dress all cables so that nothing protrudes in front of the line filter (1A2FL1) and spot tie with lacing cord.

ak. Replace the chassis on the chassis slides and carefully connect the chassis cables.

al. Push the chassis back into the case and tighten the front panel captive screws to secure.

am. Using stencils or paint, mark the AM-3924(P)/URT front panel next to the newly installed components. Mark 1A1DS4 as EXCITER NO. 2. Mark 1A1S2 switch open position as EXCITER NO. 1, and switch closed as EXCITER NO. 2.

an. Refer to paragraph 2-56 for external cable modifications required.

2-56. SYSTEM CABLE MODIFICATIONS.

2-57. After the AM-3924(P)/URT has been modified for use with exciter no. 2, modify the system cabling as follows:

a. Obtain cable connectors which will mate with the RF output, and keyline and keyline return (ground) connections of exciter no. 2.

b. Fabricate a coaxial cable which will reach from the RF output of exciter no. 2 to AM-3924(P)/URT connector 1A2J10. Use RG-223/U or RG-58/U cable, and install a UG-88E connector to mate with 1A2J10, and the appropriate connector to mate with exciter no. 2 RF output at the other end.

c. Fabricate a two wire cable using #22 AWG stranded insulated wire, for the keyline and ground connections. For the termination at AM-3924(P)/URT, use one of the types of connectors listed for plug P8 (to mate with connector 1A2J8). On P8, wire the keyline to pin F and the ground termination to pin A. Then use a short length of buss wire to short terminal D to terminal B on the connector (figure 2-7). Refer to the exciter no. 2 technical manual for cable terminations at that end.

d. Install the fabricated cables.

2-58. MANUAL CORRECTIONS.

2-59. After the modification for using exciter no. 2 is complete, make the following changes to this manual, to ensure correct operation by all personnel.

a. Correct figures 2-4, 5-24, and 5-18 to show the wiring changes made during the modification (use figure 2-6 as a guide).

b. Add the repair parts listed in table 2-11 to the parts list in Section 6.

c. Add a note stating "See paragraph 2-60 for information relating to operation of units with EXCITER NO. 2 modification" after the following:

(1)

(2)

(3)

(4)

(5)

d. In table 3-4 (Preliminary Settings), under AM-3924(P)/URT, add: EXCITER NO. 1 -- EXCITER NO. 2 switch --- EXCITER NO. 1 position.

e. In table 3-5 (Common Symptoms of System Malfunction) add: "System will not key -- EXCITER NO. 1 - EXCITER NO. 2 switch in wrong position".

2-60. OPERATION USING EXCITER NO. 2.

2-61. The functions performed by exciter no. 2, when used with the AN/URT-23(V), are limited to controlling keying, and supplying an RF input to the AM-3924(P)/URT. Equipment turn on, standby/operate, and operate signals, and AM-3924(P)/URT frequency selection will still be controlled by the T-827( )/URT.

2-62. EQUIPMENT TURN-ON.

2-63. To turn on the equipment and prepare it for operation using exciter no. 2, proceed as follows:

a. Energize the equipment and set up for operation in the LSB mode, using exciter no. 1 (T-827 ( )/URT and the procedures described in paragraph 2-35.

b. Refer to the technical manual for exciter no. 2, and energize and set up exciter no. 2 for operation in the desired mode.

c. Proceed to paragraph 2-64 to tune the system.

2-64. TUNING.

2-65. To tune the system, proceed as follows:

a. Set the AM-3924(P)/URT EXCITER NO. 1 - EXCITER NO. 2 switch at EXCITER NO. 1.

b. Set up the AN/URT-23(V) in the normal manner for the desired operating frequency, using the desired procedure under paragraph 3-32.

c. Unkey the AN/URT-23(V).

d. Set up exciter no. 2 for the desired operating frequency, in the desired mode of operation.

CAUTION

The PPC circuits within the AM-3924(P)/URT are designed for limiting RF output to provide circuit protection. Fore more efficient operation, initially key exciter no. 2 at reduced power, then adjust exciter no. 2 for 1 KW output from the AM-3924(P)/URT.

e. Reduce the RF output of exciter no. 2 to minimum.

f. Set the EXCITER NO. 1 - EXCITER NO. 2 switch at EXCITER NO. 2.

g. Key the AN/URT-23(V) from exciter no. 2, and adjust exciter no. 2 RF output for 1 KW RF output from the AM-3924(P)/URT.

2-66. OPERATION.

2-67. To operate the AN/URT-23(V) using exciter no. 2, first perform the turn on and tuning procedures according to paragraphs 2-62 and 2-64 above, then proceed with operation in the desired mode, keying the system from the exciter no. 2. To change frequency, repeat paragraph 2-64 at the new frequency.

SECTION 3

OPERATION

NOTE

All references to the AM-3924(P)/URT in this section will also apply to the AM-6909/URT unless otherwise indicated.

3-1. FUNCTIONAL OPERATION.

3-2. GENERAL.

3-3. The AN/URT-23(V) is a 1 KW single-sideband Radio Transmitting Set capable of general purpose voice, CW, and FSK transmissions on any one of up to 280,000 channels in the 2.0 to 30.0 MHz frequency range. The exact spacing and number of operating channels available depends on the model of T-827( )/URT delivered with the AN/URT-23(V). In surface ship and shore installations, Antenna Coupler Group AN/URA-38 is normally used with the AN/URT-23(V) to automatically match the impedance of the system antenna to the 50-ohm transmission line. However, provisions are included to allow operation with any 50-ohm antenna coupling system. The following paragraphs describe the sequence of operation for any system configuration in which the AN/URT-23(V) may be installed.

3-4. AUTOMATIC OPERATION WITH ANTENNA COUPLER GROUP AN/URA-38.

3-5. TURN-ON.

3-6. Turning on the AM-3924(P)/URT PRIMARY POWER switch applies primary power to the PP-3916/UR (or PP-3917/UR). The power supply converts this input to 115-volt single phase power for the T-827( )/URT and AN/URA-38.

3-7. Setting the T-827( )/URT Mode Selector switch at STDBY energizes the T-827( )/URT power supply as well as two standby relays in the AM-3924(P)/URT. One relay energizes the internal power supplies, applying DC operating voltages to the control and protective circuits, and filament voltages to the electron tubes. Also, the other energized standby relay connects 115 volts, 400 Hz, single phase power to the blower and indicator lamps, causing the STANDBY indicator to light. (An inverter circuit supplies the 115 volts, 400 Hz when the PP-3916/UR is used). A time delay in the AM-3924(P)/URT forces the system to remain in this condition for three minutes regardless of any further actions at the T-827( )/URT, to allow the filaments of the electron tubes sufficient time to warm up.

3-8. Advancing the T-827( )/URT Mode Selector switch beyond STDBY energizes the AM-3924(P)/URT operate relay to connect three phase primary power to the high voltage power supplies in the PP-3916/UR (or PP-3917/UR) to produce the 2250 and 500 VDC required to power the electron tubes in the AM-3924(P)/URT. Also the STANDBY indicator is extinguished and the OPERATE indicator is turned on, indicating that the AM-3924(P)/URT is now fully energized and ready for operation.

3-9. INITIAL SET-UP.

3-10. The screen, bias, and plate voltages of the electron tubes are checked prior to keying the system by switching the Multipurpose meter switch through its various positions. If these voltages are correct, the system is keyed (without modulation) and the plate currents are checked. Final amplifier plate currents are adjusted with the front panel PA BIAS control. Maintenance procedures are required if any of the other parameters need adjustment.

3-11. TUNING.

3-12. Setting the frequency selector controls on the T-827( )/URT front panel automatically tunes all required circuits in both the T-827( )/URT and the AM-3924(P)/URT. (The AM-3924(P)/URT FREQUENCY MC switch must be set at AUTOMATIC.) Turning on the C-3698/URA-38 POWER switch causes the tuning elements in the CU-938/URA-38 to go to home (a predetermined position from which the tuning cycle is started.) Momentarily keying the system initiates the automatic tuning cycle, during which the AN/URA-38 automatically holds the system keyed and causes the AN/URT-23(V) to produce a 200 watt CW signal on which to tune. When the cycle is completed, the READY lamp on the C-3698/URA-38 front panel will light, and control of the system is returned to the T-827( )/URT. The entire system is now tuned and ready for full power transmissions.

3-13. OPERATION.

3-14. The desired mode of operation is selected at the T-827( )/URT Mode Selector switch. The system then can be keyed and transmissions made as desired. The AN/URA-38 will automatically fine-tune as required to compensate for variations in antenna impedance, thus maintaining the required load for the AM-3924(P)/URT. Automatic average and peak power control signals produced by the AM-3924-(P)/URT control the T-827( )/URT to maintain the RF power output at a maximum 1 KW PEP (lower if front panel PWR control has been adjusted). Forward and reflected power on the transmission line can be measured or monitored with the Power meter and Power meter switch. If any of the power supplies become overloaded, its indicating-type fuse will open and indicate the fault. Overload detectors in the AM-3924(P)/URT and AN/URA-38 unkey the system when other faults occur, and provide audible and visual indication of the overload condition. (The audible alarms can be disabled.) If a frequency change involving the MCS or KCS controls on the T-827( )/URT is made during operation, the AN/URA-38 will automatically home and halt until the system is momentarily keyed. The AN/URA-38 will then retune for the new operating frequency as previously explained in paragraph 3-11.

3-15. SILENT OPERATION WITH ANTENNA COUPLER GROUP AN/URA-38.

3-16. Silent operation (tuning without RF power) is identical to the procedures explained in paragraphs 3-5 through 3-13, with the exception of tuning. The AN/URA-38 is tuned in a silent mode using the LEFT and RIGHT pushbuttons, ELEMENT POSITION meter, and L-C switch on the C-3698/URA-38 front panel as explained in NAVSHIPS 0967-LP-204-0010 for the AN/URA-38 or NAVSHIPS 0967-LP-297-6010 for the AN/URA-38A. Full power transmissions then can be keyed as required. In the silent mode, the AN/URA-38 will automatically fine tune as required during the transmission the same as was done in automatic operation.

3-17. MANUAL OPERATION WITH ANTENNA COUPLER GROUP AN/URA-38.

3-18. Manual operation is identical to the procedures explained in paragraphs 3-5 through 3-13 with the exception of tuning. The system is keyed by holding the AM-3924(P)/URT Key switch at TUNE KEY, and the AN/URA-38 is tuned using the LEFT and RIGHT pushbuttons. L-C sqitch and DISCRIMINATOR NULL meter on the C-3698/URA-38 front panel as explained in NAVSHIPS 0967-LP-204-0010 for the AN/URA-38 or NAVSHIPS 0967-LP-297-6010 for the AN/URA-38A. Full power transmissions then can be keyed as required. However, in this mode of operation, there is no automatic fine-tuning of the AN/URA-38 during transmission.

3-19. OPERATION WITH ANY 50 OHM ANTENNA SYSTEM.

3-20. Operation with a 50-ohm antenna system other than the AN/URA-38 is the same as explained in paragraphs 3-5 through 3-13, with the exception of tuning. After the operating frequency is selected at the T-827( )/URT, the system is keyed by holding the Key switch at TUNE KEY. (As shipped, the AN/URT-23(V) is set for a 200 watt output for tuning. If a lower output is required, a resistance value in the AM-3924(P)/URT can be changed to provide the necessary level of tune power (Section 2).) The antenna system is then adjusted as required (refer to the technical manual for the equipment being used). If required, the REFLECTED PWR positions of the Power meter switch and the Power meter can be used to tune the antenna coupler for minimum reflected power.

3-21. DESCRIPTION OF OPERATING CONTROLS AND INDICATORS.

3-22. RADIO TRANSMITTER T-827( )/URT.

3-23. All controls and indicators required for operation of the T-827( )/URT are located on the front panel (figure 3-1). Table 3-1 lists each operator control and indicator and its function.

3-24. RADIO FREQUENCY AMPLIFIER AM-3924(P)/URT.

3-25. All controls and indicators required for normal operation of the AM-3924(P)/URT are located on the front panel (figure 3-2). Those controls used for initial setup are located under the hinged door located in the lower center of the front panel. Table 3-2 lists each operating control and indicator and its function.

3-26. POWER SUPPLY PP-3916/UR.

3-27. There are no operating controls located on the PP-3916/UR front panel. Only two indicating type fuses and an indicator lamp are provided. The two fuses (24V, 8A and FAN 1/4A) protect their respective circuits against overload. In either case, the indicator in the fuse holder lights when the fuse opens. The POWER ON indicator lights to indicate that the PP-3916/UR inverter has been energized. (This provides 115 VAC, 400 Hz, single phase power for the AM-3924(P)/URT blower and indicator lamps.)

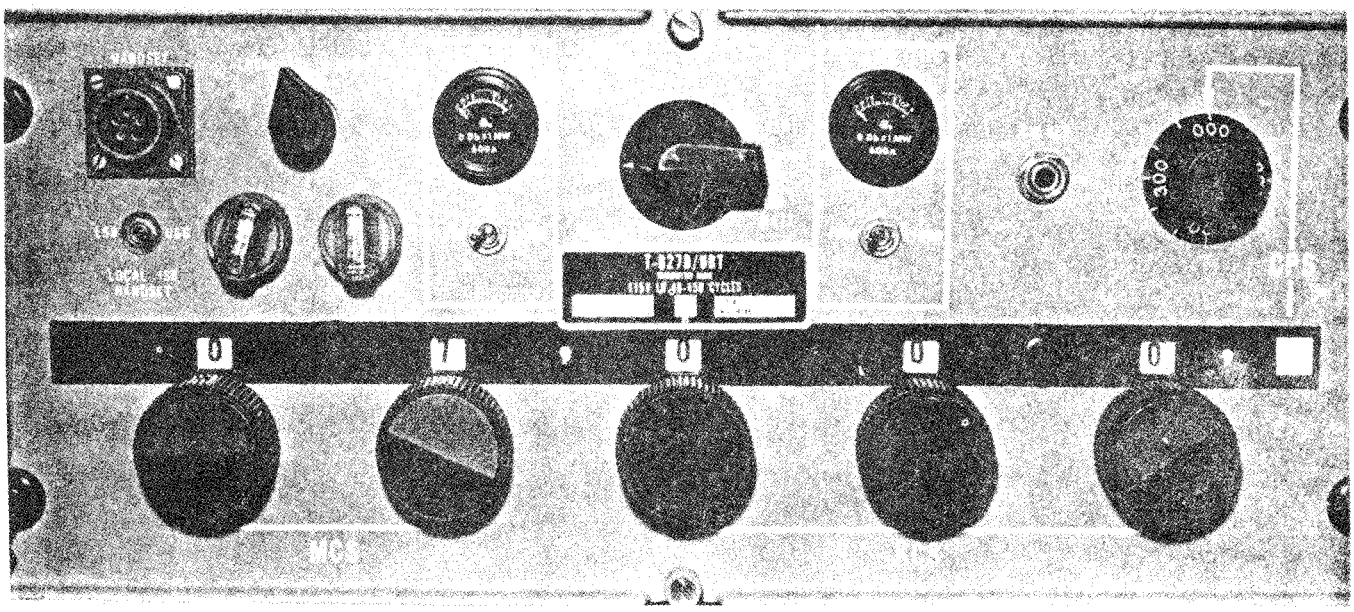


Figure 3-1. Radio Transmitter T-827( )/URT, Operating Controls, Indicators, and Connectors

TABLE 3-1. RADIO TRANSMITTER T-827( )/URT, OPERATING CONTROLS, INDICATORS, AND CONNECTORS

CONTROL/INDICATOR/ CONNECTOR	FUNCTION
LOCAL ISB HANDSET switch	Selects either USB or LSB handset audio input and output when Mode Selector is at ISB. Switch Position — Equipment Response LSB — Connects handset microphone and earphone to LSB channel. USB — Connects handset microphone and earphone to USB channel.
HANDSET connector	Used to connect handset to T-827( )/URT.
FUSE (with indicator)	Protects T-827( )/URT against overload; indicator glows when fuse is open.
FUSE (with indicator)	Protects T-827( )/URT against overload; indicator glows when fuse is open.
LOCAL-REMOTE switch	Selects local or remote key and input to T-827( )/URT. Switch Position — Equipment Response LOCAL — T-827( )/URT keying and input accomplished locally by operator. REMOTE — T-827( )/URT keying and input accomplished from a remote location.
LSB LINE LEVEL switch	Selects range for LSB LINE LEVEL meter. Switch Position — Equipment Response -10 dB — 10 dB has to be subtracted from LSB LINE LEVEL meter indication. +10 dB — 10 dB has to be added to LSB LINE LEVEL meter indication.

TABLE 3-1. RADIO TRANSMITTER T-827( )/URT, OPERATING CONTROLS, INDICATORS, AND CONNECTORS (Cont.)

CONTROL/INDICATOR/ CONNECTOR	FUNCTION	
LSB LINE LEVEL meter	Indicates LSB audio input line level.	
Mode Selector switch	Selects T-827( )/URT mode of operation.	
	Switch Position	Equipment Response
	OFF	No power is applied.
	STDBY	Energizes tube filaments.
	LSB	T-827( )/URT operates in LSB mode.
	FSK	T-827( )/URT operates in FSK mode.
	AM	T-827( )/URT operates in compatible AM mode (USB modulation plus carrier).
	CW	T-827( )/URT operates in CW mode. Transmitted frequency is at front panel frequency setting.
	USB	T-827( )/URT operates in USB mode.
	ISB	Simultaneous transmission on LSB and USB during remote operation. Transmission on either LSB or USB during local operation.
	ISB/FSK	T-827( )/URT operates in ISB/FSK mode. Simultaneous transmission of voice on LSB and FSK on USB.
USB LINE LEVEL switch	Selects range of USB LINE LEVEL meter.	
	Switch Position	Equipment Response
	-10 dB	10 dB has to be subtracted from USB LINE LEVEL meter indication.

TABLE 3-1. RADIO TRANSMITTER T-827( )/URT, OPERATING CONTROLS, INDICATORS, AND CONNECTORS (Cont.)

CONTROL/INDICATOR/ CONNECTOR	FUNCTION
USE LINE LEVEL switch (cont.)	Switch Position: +10 dB — Equipment Response: 10 dB has to be added to USB LINE LEVEL meter indication.
USB LINE LEVEL meter	Indicates USB audio input line level.
KEY jack	Used to connect local CW Handkey to T-827( )/URT.
CPS switch	Selects 100 Hz digit of desired operating frequency; digit selected will be displayed at CPS pointer.
10 MCS control	Selects 10 MC digit of desired operating frequency; digit selected will be displayed in window above control.
1 MCS control	Selects 1 MC digit of desired operating frequency; digit selected will be displayed in window above control.
100 KCS control	Selects 100 KC digit of desired operating frequency; digit selected will be displayed in window above control.
10 KCS control	Selects 10 KC digit of desired operating frequency; digit selected will be displayed in window above control.
1 KCS control	Selects 1 KC digit of desired operating frequency; digit selected will be displayed in window above control.

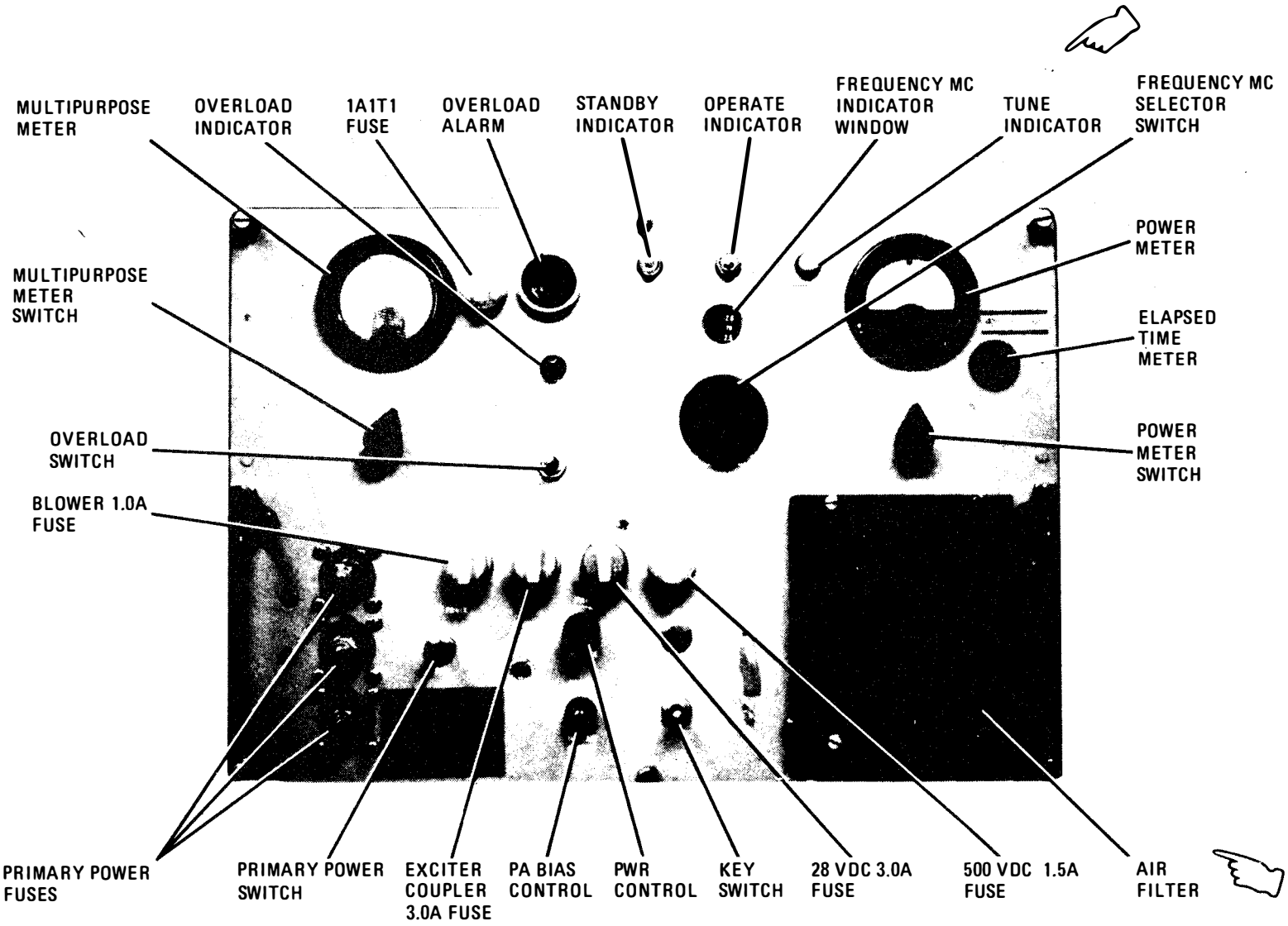


Figure 3-2. Radio Frequency Amplifier AM-3924(P)/URT, Operating Controls and Indicators

TABLE 3-2. RADIO FREQUENCY AMPLIFIER AM-3924(P)/URT, OPERATING CONTROLS AND INDICATORS

CONTROL/INDICATOR	FUNCTION
Multipurpose meter	Provides indications of the final and driver amplifier parameters as selected with the Multipurpose meter switch.
Multipurpose meter switch	Selects the final and driver amplifier parameters to be monitored with the Multipurpose meter. The parameters selected are:

Switch Position	Equipment Response
DRIVER 2 AMPERES	Multipurpose meter indicates cathode current of driver amplifier tube 1A1A1V2.
DRIVER 1 AMPERES	Multipurpose meter indicates cathode current of driver amplifier tube 1A1A1V1.
PA PLATE 2 AMPERES	Multipurpose meter indicates cathode current of final amplifier tube 1A1V2.
PA PLATE 1 AMPERES	Multipurpose meter indicates cathode current of final amplifier tube 1A1V1.
INPUT PWR 0-150 MW	RF level applied to input of driver amplifier by exciter is connected to Multipurpose meter.
PA PLATE VOLTS	DC voltage applied to plates of final amplifier tubes V1 and V2 is connected to Multipurpose meter.
DRIVER PLATE VOLTS	DC voltage applied to plates of driver amplifier tubes V1 and V2 is connected to Multipurpose meter.

TABLE 3-2. RADIO FREQUENCY AMPLIFIER AM-3924(P)/URT, OPERATING CONTROLS AND INDICATORS (Cont.)

CONTROL/INDICATOR	FUNCTION	
Multipurpose meter switch (cont.)	Switch Position	Equipment Response
	PA-DRIVER SCRNS VOLTS	DC voltage applied to screen grids of final amplifier tubes V1 and V2 and driver amplifier tubes V1 and V2 is connected to Multipurpose meter.
Elapsed time meter	Records number of hours of filament on time for the electron tubes.	
Overload alarm	Provides an audible indication when an overload occurs. The alarm can be disabled by setting the Overload alarm switch at DISABLE ALARM.	
Power meter	Provides an indication of forward or reflected output power in the ranges selected with the Power meter switch.	
Power meter switch	Selects range of forward or reflected power to be monitored with Power meter.	
Primary power fuses (three used, with indicators)	Provides overload protection to each phase of the primary power input. If the fuse in any phase opens, the associated indicator will light.	
BLOWER 1.0 A fuse (with indicator)	Protects the blower against overload; indicator lights if fuse opens.	
EXCITER COUPLER 3.0 A fuse (with indicator)	Protects the 115 volt single phase primary power output to the T-827( )/URT and AN/URA-38 (if used) from overload; indicator lights when fuse opens.	
500 VDC 1.5 A fuse (with indicator)	Protects the 500 VDC supply from overload within the AM-3924(P)/URT; indicator lights if fuse opens.	
PRIMARY POWER switch	When set at ON, primary power is supplied to AM-3924(P)/URT, T-827( )/URT, and AN/URA-38 (if used).	
Power Transformer 1A1T1 fuse (with indicator)	Provides overload protection to transformer; indicator lights if fuse opens.	

TABLE 3-2. RADIO FREQUENCY AMPLIFIER AM-3924(P)/URT, OPERATING CONTROLS AND INDICATORS (Cont.)

CONTROL/INDICATOR	FUNCTION
PWR control	Enables RF power output to be varied without disturbing APC and PPC adjustments. Normally set maximum CW.
PA BIAS control	Enables bias voltage to final amplifier tubes V1 and V2 to be adjusted.
OVERLOAD indicator	Lights to provide a visual indication when an overload occurs.
Overload switch	Determines condition of overload circuits. Switch Position — Equipment Response ALARM — Overload alarm is enabled. DISABLE ALARM — Audible overload alarm is disabled. RESET (spring-loaded) — Overload circuit is reset
TUNE indicator lamp	Lights when 1A1SS3 is depressed to TUNE KEY or the associated antennna coupler (AN/URA-38A) request tune power.
STANDBY indicator lamp	Lights when AM-3924(P)/URT is in a standby condition.
OPERATE indicator lamp	Lights when AM-3924(P)/URT is ready to transmit.
FREQUENCY MC selector switch	When set at AUTOMATIC, a five wire code from the T-827( )/URT is used to automatically tune the AM-3924(P)/URT to the selected band. When set at any one of the other nineteen positions, a five wire code is internally generated to automatically tune the AM-3924(P)/URT to the selected band.
FREQUENCY MC indicator window	Indicates band to which the AM-3924(P) URT is tuned.
Key switch	Provides a method by which AM-3924(P) URT can be keyed locally.

TABLE 3-2. RADIO FREQUENCY AMPLIFIER AM-3924(P)/URT, OPERATING CONTROLS AND INDICATORS (Cont.)

CONTROL/INDICATOR	FUNCTION	
Key switch (cont.)	Switch Position	Equipment Response
	NORMAL	Keying of AM-3924(P)/URT is accomplished from T-827( )/URT or AN/URA-38.
	TUNE KEY	AM-3924(P)/URT and T-827( )/URT are keyed to produce a low power carrier for tuning purposes.
	LOCAL KEY	AM-3924(P)/URT and T-827( )/URT are keyed for a normal power output as required by maintenance procedures.

3-28. POWER SUPPLY PP-3917/UR.

3-29. The PP-3917/UR is an optional subassembly for 400 Hz primary power operation of the AM-3924(P)/URT, and is completely enclosed when the AM-3924(P)/URT is in its case. Therefore, there are no operating controls or indicators for the PP-3917/UR. PP-3917/UR cannot be installed in the AM-6909/URT.

3-30. ANTENNA COUPLER GROUP AN/URA-38.

3-31. All controls and indicators required for the operation of the AN/URA-38 are located on the C-3698/URA-38 front panel (figure 3-3). Table 3-3 lists each operator control and indicator and its function.

3-32. OPERATING PROCEDURES.

3-33. The operating procedures listed below provide the required information to operate the AN/URT-23(V) with the AN/URA-38 or any other antenna coupler. In all cases, the procedures are identical with the exception of the method of tuning. When using an antenna coupler other than the AN/URA-38, supplement the tuning procedures below with the operating instructions in the manual for that equipment. The initial set-up procedures need be performed only when the equipment is energized the first time during any given operating period.

CAUTION

When operating the AN/URT-23(V) the first time after installation or maintenance, determine that the system alignment procedure (paragraph 2-35) has been performed. If an abnormal indication is observed during the procedure, refer to paragraph 3-59 before proceeding to the next step.

NOTE

For emergency shutdown, set AM-3924(P)/URT primary power switch to OFF.

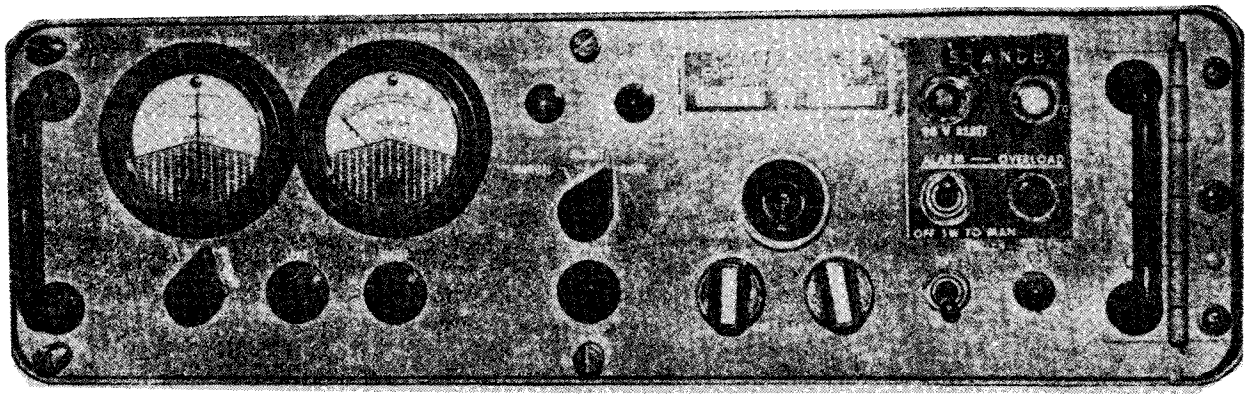


Figure 3-3. Antenna Coupler C-3698/URA-38, Operating Controls and Indicators

TABLE 3-3. ANTENNA COUPLER CONTROL C-3698/URA-38, OPERATING CONTROLS AND INDICATORS

CONTROL/INDICATOR	FUNCTION
DISCRIMINATOR NULL meter	Provides an indication of L or C element mistuning as selected by L-C switch during manual mode of operation.
ELEMENT POSITION meter	Provides an indication of L or C element positioning as selected by L-C switch.
L-C switch	Selects metering and switching required to tune L or C element during manual and silent modes of operation.
LEFT pushbutton	When depressed, tuning element selected by L-C switch is repositioned towards the home position which moves deflection of DISCRIMINATOR NULL or ELEMENT POSITION meter to left of scale.

TABLE 3-3. ANTENNA COUPLER CONTROL C-3698/URA-38, OPERATING CONTROLS AND INDICATORS (Cont.)

CONTROL/INDICATOR	FUNCTION
RIGHT pushbutton	When depressed, tuning element selected by L-C switch is repositioned toward the far end stops which moves deflection of DISCRIMINATOR NULL or ELEMENT POSITION meter to right of scale.
TUNING indicator	Lights when either servo motor is operating.
READY indicator	Lights when elements have been completed tuning during automatic mode of operation.
Mode Selector switch	Selects AN/URA-38 mode of operation. Switch Position — Equipment Response MANUAL — Permits manual tuning. SILENT — Permits coarse manual tuning without RF power. Fine tuning is automatic. AUTO — All tuning is automatic.
RETUNE pushbutton	When depressed with Mode Selector switch at AUTO or SILENT, a home cycle is initiated.
Overload alarm	Provides an audible indication when a pressure or temperature overload exists in the CU-938/URA-38. (OVERLOAD switch must be set at ALARM.)
FUSES 1. 50A (two used, with indicators)	Protects the AN/URA-38 against overload; indicator glows when either fuse opens.
STANDBY indicator lamp	Lamp will be lighted except when the associated transmitter is Keyed. The lamp provides visual indication of the Key Hold and Surveillance Defeat circuits.

TABLE 3-3. ANTENNA COUPLER CONTROL C-3698/URA-38, OPERATING CONTROLS AND INDICATORS (Cont.)

CONTROL/INDICATOR	FUNCTION
OVERLOAD switch	When set at ALARM, audible overload alarm is connected to overload circuit.
OVERLOAD indicator	Glows to provide a visual indication when a pressure or temperature overload exists in CU-938/URA-38.
POWER switch	Controls primary power application to AN/URA-38.
POWER indicator	Glows when AN/URA-38 is energized.
OVERLOAD RESET switch (28V)	Protects the 28 VDC supply from overload.

3-34. INITIAL SET-UP.

3-35. The following procedures only need be performed the first time the system is energized during any one given operating period.

NOTE

When setting equipment T-827( )/URT to desired operational frequency, assure proper dial frequency offset from assigned frequency (where appropriate) in accordance with the instruction procedure in JANAP-195, Basic Armed Forces Communication Plan.

a. Set all controls as listed in table 3-4.

b. Set AM-3924(P)/URT PRIMARY POWER switch to ON.

c. Set T-827( )/URT Mode Selector switch at STDBY. AM-3924(P)/URT blower will energize. and STANDBY indicator will light. PP-3916/UR (if used) POWER ON indicator will light.

TABLE 3-4. PRELIMINARY SETTINGS

EQUIPMENT	CONTROL	SETTING
T-827( )/URT	Mode Selector switch LOCAL-REMOTE switch	OFF LOCAL
AM-3924(P)/URT	PRIMARY POWER switch Overload switch Key switch FREQUENCY MC switch	OFF ALARM NORMAL AUTOMATIC
C-3698/URA-38	OVERLOAD switch POWER switch	ALARM OFF
Other Exciters	Primary Power switch	OFF
Other Antenna Couplers	Primary Power switch	OFF

NOTE

After three minutes, AM-3924(P)/URT time delay relay will energize, and system can be operated.

d. Set T-827( )/URT Mode Selector switch at ISB, LSB, or USB. After the three minute warm up period has elapsed, the AM-3924(P)/URT STANDBY indicator will extinguish, and OPERATE indicator will light.

e. Set AM-3924(P)/URT Multipurpose meter switch at PA-DRIVER SCRNS VOLTS. Multipurpose meter should indicate 290 $\pm$ 50 VDC.

f. Set Multipurpose meter switch at DRIVER PLATE VOLTS. Multipurpose meter should indicate 500 $\pm$ 75 VDC at nominal line voltage.

g. Set Multipurpose meter switch at PA PLATE VOLTS. Multipurpose meter should indicate 2250 $\pm$ 225 VDC at nominal line voltage.

h. Open access door on AM-3924(P)/URT front panel. Set Key switch at LOCAL KEY. Set Multipurpose meter switch at PA PLATE 1 AMPERES and then at PA PLATE 2 AMPERES. Note Multipurpose meter indication at both settings.

CAUTION

Excessive idle plate current (above 330 MA with no RF signal) will damage the AM-3924(P)/URT final amplifier tubes. Do not key system for long periods until the PA BIAS is properly adjusted.

i. Set Multipurpose meter switch at the position which provided the lowest indication in step h.

j. Observe Multipurpose meter and carefully rotate PA BIAS control to provide an indication of 240 MA.

k. Set Multipurpose meter switch to the position not used in step i. Multipurpose meter should indicate 280 MA or less.

l. Set Multipurpose meter switch at DRIVER 1 AMPERES and then at DRIVER 2 AMPERES. Note Multipurpose meter indication at both settings. The lower indication should be 320 MA, and the higher indication should not exceed 400 MA.

m. Set AM-3924(P)/URT Key switch at NORMAL.

n. Proceed to paragraph 3-36 and tune system as required.

3-36. TUNING.

3-37. The required tuning procedures depend on the mode of operation used when operating with the AN/URA-38 or the type of antenna coupler used in place of the AN/URA-38. Select the correct tuning procedure from the information provided in paragraphs 3-38 through 3-44.

3-38. ANTENNA COUPLER GROUP AN/URA-38 AUTOMATIC TUNING.

3-39. To tune the system when operating with the AN/URA-38 in an automatic mode, proceed as follows:

NOTE

The AN/URA-38 will not automatically tune when the T-827( )/URT Mode Selector switch is set at CW or FSK and the LOCAL KEY or TUNE switch is pressed.

a. Set the C-3698/URA-38 Mode Selector at AUTO.

b. Set C-3698/URA-38 POWER switch at ON. POWER indicator should light. TUNING indicator should light briefly unless tuning elements are already at the home position.

c. Set T-827( )/URT MCS and KCS controls, and CPS switch at desired operating frequency. Selected frequency will be displayed in small windows above MCS and KCS controls. AM-3924(P)/URT OPERATE indicator will extinguish while T-827( )/URT is automatically tuning. Dial behind FREQUENCY MC window will rotate as AM-3924(P)/URT automatically tunes to band including selected frequency.

d. Momentarily set AM-3924(P)/URT Key switch at LOCAL KEY. C-3698/URA-38 TUNING indicator will briefly light, and then READY indicator will light.

e. Hold AM-3924(P)/URT Key switch at TUNE KEY. Note AM-3924(P)/URT Power meter indication.

f. Rotate and hold AM-3924(P)/URT Power meter switch at REFL PWR 0-150 long enough to note Power meter indication. Release Key switch.

g. Indication in step e should be at least 25 times greater than indication in step f. If indication is correct, the system is tuned and ready for operation. Proceed to paragraph 3-46. If indication is not correct, momentarily depress C-3698/URA-38 RETUNE switch. C-3698/URA-38 READY indicator will extinguish and TUNING indicator will light briefly.

h. Repeat steps d through f. If indication is still not correct, set T-827( )/URT Mode Selector switch at STDBY and inform maintenance personnel.

3-40. ANTENNA COUPLER GROUP AN/URA-38 SILENT TUNING.

3-41. When the AN/URT-23(V) is operated with the AN/URA-38 under radio silence conditions, the system may be tuned for operation without using RF power as follows:

a. Set C-3698/URA-38 Mode Selector switch at SILENT.

b. Set C-3698/URA-38 POWER switch at ON. POWER indicator will light. TUNING indicator will briefly light unless tuning elements are already at home.

NOTE

The C-3698/URA-38 READY indicator does not function during silent tuning.

c. Set the T-827( )/URT MCS and KCS controls and CPS switch at desired operating frequency. Selected frequency will be displayed in small windows above MCS and KCS controls. AM-3924(P)/URT OPERATE indicator will extinguish while T-827( )/URT is automatically tuned. Dial behind FREQUENCY MC window will rotate as AM-3924(P)/URT automatically tunes to band including selected frequency.

d. Set C-3698/URA-38 L-C switch at L.

NOTE

Pre-recorded C-3698/URA-38 ELEMENT POSITION meter indications at the desired operating frequency for both L and C positions of L-C switch will be required.

e. Observe C-3698/URA-38 ELEMENT POSITION meter indication, and depress LEFT or RIGHT pushbutton as required until indication agrees with indication pre-recorded for operating frequency to be used.

f. Set L-C switch at C and repeat step e.

g. System is now ready to operate. When radio silence is lifted, proceed to paragraph 3-46. The AN/URA-38 will automatically make fine tuning adjustments during normal full power transmissions.

3-42. ANTENNA COUPLER GROUP AN/URA-38 MANUAL TUNING.

3-43. If manual tuning of the AN/URA-38 is desired or required as a result of automatic tuning circuitry failure, proceed as follows:

NOTE

The C-3698/URA-38 READY indicator does not function during manual operation.

a. Set T-827( )/URT MCS and KCS controls and CPS switch at desired operating frequency. Selected frequency will be displayed in small windows above MCS and KCS controls. AM-3924(P)/URT OPERATE indicator will extinguish while T-827( )/URT is automatically tuning. Dial behind FREQUENCY MC window will rotate as AM-3924(P)/URT automatically tunes to band including selected frequency.

b. Set C-3698/URA-38 Mode Selector switch at MANUAL.

c. Set the C-3698/URA-38 POWER switch at ON.

NOTE

If ELEMENT POSITION meter indications have been logged for the desired transmitting frequency, set L and C to the logged positions and proceed to step h.

The AM-3924(P)/URT Power meter may be used as a tuning guide, by tuning the AN/URA-38 for maximum forward, and minimum reflected power.

d. Set C-3698/URA-38 L-C switch at C.

e. Depress C-3698/URA-38 LEFT pushbutton until TUNING indicator extinguishes.

f. Momentarily depress RIGHT pushbutton.

g. Set C-3698/URA-38 L-C switch at L and repeat step e.

h. Open AM-3924(P)/URT front panel access door. Hold Key switch at TUNE KEY through step k.

i. Depress C-3698/URA-38 RIGHT pushbutton until a center (NULL) indication is obtained on DISCRIMINATOR NULL meter.

j. Set C-3698/URA-38 L-C switch at C, and repeat step i.

NOTE

L and C adjustments will affect each other. The null at some frequencies is very sharp. This requires that step k be performed very slowly and carefully to obtain a tuned (NULL) indication.

k. Alternately set the C-3698/URA-38 L-C switch at L and C and depress the LEFT and RIGHT pushbutton momentarily as required to move the DISCRIMINATOR NULL meter indication to the center mark for both settings of L-C switch.

l. Release AM-3924(P)/URT Key switch and close front panel access door.

m. The system is now tuned. Refer to paragraph 3-46 and operate as desired.

3-44. TUNING WITH AN ANTENNA COUPLER OTHER THAN AN/URA-38.

3-45. The AN/URT-23(V) will normally be operated with Antenna Coupler Group AN/URA-38. However, the AN/URT-23(V) may be operated with any 1 KW antenna coupler or tuned antenna system which will match the impedance of the antenna to the 50-ohm transmission line output of the AM-3924(P)/URT at the transmitting frequency. To tune the system for this type of operation, proceed as follows:

a. Refer to antenna coupler technical manual to determine the RF power input required during tuning, and if required, adjust the AM-3924(P)/URT tune power output according to paragraph 2-43.

b. Set T-827( )/URT MCS and KCS controls, and CPS switch at desired operating frequency. Selected frequency will be displayed in small windows above MCS and KCS controls. AM-3924(P)/URT OPERATE indicator will extinguish while T-827( )/URT is automatically tuning. Dial behind FREQUENCY MC window will rotate as AM-3924(P)/URT automatically tunes to band including selected frequency.

c. Hold AM-3924(P)/URT Key switch at TUNE KEY. Perform the required steps to match antenna impedance to 50-ohm transmission line output of AM-3924(P)/URT.

d. Release AM-3924(P)/URT Key switch and proceed to paragraph 3-46.

3-46. OPERATION.

3-47. After the system has been tuned, the AN/URT-23(V) may be operated either locally or remotely. Paragraphs 3-48 and 3-50 provide the required information to operate in either condition.

3-48. LOCAL OPERATION.

3-49. To operate the system locally, proceed as follows:

a. Set T-827( )/URT LOCAL-REMOTE switch at LOCAL.

b. Set T-827( )/URT Mode Selector switch at desired operating mode as follows:

1. For voice transmission, set Mode Selector switch at USB, LSB, or AM and connect handset to HANDSET connector.

2. To transmit CW, set Mode Selector switch to CW, and connect CW key to KEY jack on front panel.

3. To transmit FSK, set Mode Selector switch at FSK. Connect KEY and LOOP circuit to T-827( )/URT connector J7.

4. To transmit FSK and voice simultaneously, set Mode Selector switch at ISB/FSK. (FSK will be on USB, voice on LSB.)

5. To transmit voice alternately on LSB and USB, set Mode Selector switch at ISB and alternate LOCAL ISB HANDSET switch between USB and LSB as desired.

c. Key transmission as required.

d. If simplex operation is desired, an auxiliary receiver may be connected to the system antenna by using connector 1A2J4 on the rear of AM-3924(P)/URT.

e. During operation, the AM-3924(P)/URT Power meter indication should be monitored to assure that the antenna system maintains itself in a tuned condition. (With normal input power, a decrease in forward power will indicate abnormal operation which may be due to an improperly tuned antenna system.)

f. To change mode of operation, perform step b.

g. To change transmitting frequency, repeat the necessary procedures in paragraph 3-36.

h. If during operation the OVERLOAD circuits of either the AN/URA-38 or AN/URT-23(V) trip, an audible and visual indication of the condition will be present. The key interlock will energize, preventing operation. Set Overload switch momentarily at RESET. If OVERLOAD indicator and alarm remain on, refer problem to maintenance personnel.

3-50. REMOTE OPERATION.

3-51. To operate the system remotely, proceed as follows:

a. Set T-827( )/URT LOCAL-REMOTE switch at REMOTE.

b. Select a mode of operation (step b (1) through (4) of paragraph 3-48). In addition, remote operation allows simultaneous transmission of voice on both LSB and USB when Mode Selector is s at ISB.

c. Select desired remote control unit by switch selection at the transmitter switchboard.

d. Perform steps c through g of paragraph 3-48 as required.

3-52. SHUT-DOWN.

3-53. To shut-down the AN/URT-23(V) at the end of normal operation, proceed as follows:

NOTE

For emergency shut-down only, set the AM-3924(P)/URT PRIMARY POWER switch at OFF.

a. Ensure that the system is unkeyed.

NOTE

If AN/URT-23(V) is to be shut down for a brief period, set T-827( )/URT Mode Selector switch at STDBY. The AM-3924(P)/URT tube filaments will remain energized, so that the system can immediately be returned to full operation by setting the T-827( )/URT Mode Selector switch to the desired mode.

b. Turn off all associated equipment.

c. Set T-827( )/URT Mode Selector switch at OFF.

d. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

e. Set C-3698/URA-38 POWER switch at OFF.

3-54. OPERATOR MAINTENANCE.

3-55. OPERATING CHECKS.

3-56. When a system malfunction is encountered, the operator should perform the following checks to determine the cause and extent of the trouble.

a. Refer to the operating procedures and carefully check to ensure that no vital step has been omitted.

b. Attempt to operate in another mode.

c. Check all front panel fuses. If any are open, the associated indicator lamps will light. Replace open fuses. If fuse opens again, refer problem to maintenance personnel.

d. Determine that all cable connections are properly seated and tight, and that the cables are undamaged.

e. Determine that operation has not been interrupted by an interlock switch (equipment not properly seated in its case with front panel screws tightened).

3-57. PREVENTIVE MAINTENANCE.

3-58. To maintain the AN/URT-23(V) in a condition which will assist in ensuring dependable performance, the operator should perform the following maintenance checks and measures on a regularly established schedule. Refer to NAVSHIPS 0967-032-0020, NAVSHIPS 0967-200-3020, or NAVSHIPS 0967-878-4020 for operator's preventive maintenance on the T-827( )/URT.

WARNING

Ensure that all equipment is de-energized and that the primary power is secured at the source.

a. Remove and clean the AN/URT-23(V) air filters. Use water and a small amount of soap or liquid detergent. Rinse each filter in clean, fresh water and air dry. Spray filter media lightly and evenly with Filter Coat, and dry approximately 4 hours (for standard drying conditions) before reinstalling in equipment.

CAUTION

Dirty filters, or filters with an excess of Filter Coat, will restrict air flow and shorten equipment life. Clean filters with a light, even coating of "Filter Coat", ensure optimum performance.

b. Check the mechanical action of each switch and control. Report any indications of excessive wear or damage to higher echelon maintenance.

c. Ensure that each fuse holder contains a fuse of the proper value.

d. Loosen the eight front panel captive screws on the AM-3924(P)/URT and slide the chassis out from the case. Inspect the chassis interior for signs of mechanical damage, rust, or corrosion.

e. Inspect all wiring for signs of fraying, or damage. Pay particular attention to the cables between the rear of the chassis and the case, and on the bottom of the chassis.

f. Ensure that each subassembly is secure in its mounting. Check the complete chassis, front panel, and case for loose parts, or hardware. Tighten loose hardware.

g. Check the tension of the drive chain on the frequency selector mechanism. The chain should be tight, without excessive strain. Inspect sprocket assemblies for damage or wear.

h. Ensure that all high voltage shields are in place.

i. Open the hinged front panel of the PP-3916/UR and inspect the interior for signs of mechanical damage, rust, and corrosion.

j. Use a soft bristle brush and a lint free cloth to clean all available portions of the interior and exterior of the equipments.

k. Push the AM-3924(P)/URT back into its case, and close the hinged front panel of the PP-3916/UR. Secure each equipment with its front panel screws.

3-59. EMERGENCY MAINTENANCE.

3-60. If an equipment malfunction occurs when a technician is not available, attempt to determine the cause in a systematic manner. Perform the operating checks called out in paragraph 3-55. Attempt to isolate the fault to an equipment function. An intelligent description of the fault will be of great assistance to the maintenance personnel. Table 3-5 lists some of the more probable symptoms of equipment malfunction, and their causes. Notify higher echelon maintenance when the malfunction cannot be corrected at the operator level.

TABLE 3-5. COMMON SYMPTOMS OF SYSTEM MALFUNCTIONS

SYMPTOM	PROBABLE FAULT
Equipment will not energize	1. No primary power input. Check primary power source. Check power fuses. Check interlock switches. 2. T-827( )/URT internal power switch in AUX position. Set at NORMAL. 3. Check EXCITER-COUPLER fuse and T-827( )/URT fuses.
STANDBY indicator illuminates, blower does not operate.	Open BLOWER fuse.
OPERATE indicator does not illuminate. All Multipurpose meter indications zero.	1. Faulty T-827( )/URT. 2. Faulty AM-3924(P)/URT.

TABLE 3-5. COMMON SYMPTOMS OF SYSTEM MALFUNCTIONS (Cont.)

SYMPTOM	PROBABLE FAULT
No driver screen voltage.	Faulty AM-3924(P)/URT.
No driver plate voltage or screen voltage.	Open 500 VDC 1.5A fuse. (AM-3924(P)/URT.)
No PA plate voltage.	Faulty AM-3924(P)/URT, PP-3916/UR, or PP-3917/UR.
No input power when AN/URT-23(V) is keyed.	Faulty T-827( )/URT; interconnecting coaxial cable (to 1A2J9).
No driver or PA plate current (system will not key).	1. Jumper plug not connected to 1A2A1J8. 2. Faulty AM-3924(P)/URT.
Excessive driver plate currents	Faulty AM-3924(P)/URT.
OVERLOAD indicator illuminates (system not keyed).	1. AM-3924(P)/URT high voltage interlock or PP-3916/UR interlock open; jumper plug missing on 1A2J1 if PP-3917/UR is in use. 2. AM-3924(P)/URT blower not operating.
OVERLOAD indicator illuminates when system is keyed.	Excessive current in one or both of the PA tubes, due to faulty tube or improper RF output load. Check reflected power.
Low power output.	1. Improper RF load. Check reflected power. 2. Low RF input to AM-3924(P)/URT. Check input power. 3. Faulty AM-3924(P)/URT.
Excessive reflected power (VSWR greater than 4:1).	1. Improperly tuned antenna coupler. 2. Faulty transmission line. 3. Loss of antenna.

SECTION 4

TROUBLESHOOTING

NOTE

All references to AM-3924(P)/URT also apply to AM-6909/URT equipment unless otherwise indicated.

4-1. LOGICAL TROUBLESHOOTING.

4-2. The following six logical steps should be followed when troubleshooting Radio Transmitting Set AN/URT-23(V).

4-3. SYMPTOM RECOGNITION.

4-4. Symptom recognition, the first step in the troubleshooting procedure, is based on complete knowledge and understanding of equipment operating characteristics. Not all equipment troubles are the direct result of component failure; therefore, a trouble in the equipment is not always easy to recognize, since conditions of less than peak performance are not always apparent. This type of trouble is usually discovered during preventive maintenance, such as the Performance Operation and Maintenance Standards of Electronic Equipment (POMSEE) checks, or Planned Maintenance Subsystem (PMS) checks.

4-5. SYMPTOM ELABORATION.

4-6. After an equipment trouble has been recognized, use of front panel controls and other built-in indicating or testing aids should verify the original symptom. Checking or manipulating the setting of the operating controls may eliminate the trouble. Common troubles and an isolation procedure for each are listed in paragraph 4-200.

4-7. LISTING PROBABLE FAULTY FUNCTION.

4-8. The next step in the logical troubleshooting is to list some "logical choices" of the cause and likely location (functional section) of the trouble. The "logical choices" are based on knowledge of the equipment operation, identification of the trouble symptom, and information contained in this manual. Refer to the Radio Transmitting Set AN/URT-23(V) functional description and associated functional block diagrams.

4-9. LOCALIZING THE FAULTY FUNCTION.

4-10. For best efficiency in localizing trouble, the "logical choices" should be checked in the order that will require the least time; a selection is required to determine which section to test first. The selection should be based on the validity of the "logical choice" and the difficulties involved in making the necessary tests. If the tests do not prove that functional section is at fault, the next selection should be tested, and so on until the faulty functional section is located.

4-11. Voltage levels are included at significant check points on servicing block diagrams to aid in isolating the faulty functional section. Test data (such as information on control settings, critical adjustments, and required test equipment) are supplied to augment the functional description and servicing block diagrams.

4-12. LOCALIZING TROUBLE TO THE CIRCUIT.

4-13. After the faulty functional section has been isolated, it is often necessary to make additional "logical choices" as to which circuit(s) within the functional section is at fault. The servicing block diagrams provide the signal flow and test location information needed to bracket and then isolate the faulty circuit. Table 5-6 provides a listing of transistor DC voltage level for various operating conditions. Functional descriptions, simplified schematics, and pertinent test data for individual circuits (stages) of the functional section are in one area of the manual. Usually this information is on facing pages. Information too lengthy for this arrangement is in the test data portion of the troubleshooting information.

4-14. FAILURE ANALYSIS.

4-15. After the trouble (faulty component, misalignment, etc.) has been located, but prior to corrective action, the procedures followed up to this point should be reviewed to determine why the fault affected the equipment as it did. This review is necessary to make certain that the fault discovered is actually the cause of the malfunction and not a result of the malfunction.

4-16. FUNCTIONAL DESCRIPTION.

4-17. GENERAL.

4-18. Figure 4-1 illustrates the functional relationship of the AN/URT-23(V) in a typical radio set configuration. The T-827( )/URT allows the operator to select a voice LSB, USB, ISB, or Compatible AM, CW, or FSK mode of operation on any one of 56,000 or 280,000 channels (depending on model of T-827( )/URT used) in the 2.0 to 29.9999 MHz frequency range. When an operating channel is selected, the T-827( )/URT supplies a five wire code to the AM-3924(P)/URT to automatically tune it to the correct operating band. Once the AM-3924(P)/URT is tuned, the antenna coupler must be tuned to match the impedance of the antenna at the selected operating frequency to the 50 ohm transmission line of the AM-3924(P)/URT. When Antenna Coupler Group AN/URA-38 is the antenna coupler system used, the necessary control signals are passed between the AM-3924(P)/URT, T-827( )/URT, and AN/URA-38 to automatically tune the AN/URA-38 for the selected operating frequency.

4-19. When the system tuning is completed, a full power voice, CW, or FSK transmission can be keyed at the selected frequency and mode of operation. Voice and CW transmissions also can be keyed from any one of up to three remotely positioned Radio Set Controls C-1138/UR. Once a transmission is keyed, the T-827( )/URT produces a nominal 0.1 watt RF output to the AM-3924(P)/URT. The AM/3924(P)/URT linearity amplifies the RF output from the T-827( )/URT to 1 KW of PEP or average power for application through the antenna coupler matching network to the system antenna for radiation. During transmission, overload circuits continually monitor the system for an abnormal condition. If an overload develops, either in the AN/URT-23(V) or AN/URA-38, the entire system is unkeyed and locked off until the condition is corrected. In addition, an overload alarm and indicator on either the AM-3924(P)/URT or the AN/URA-38 is energized to provide visual and audible indication of the condition. The AM-3924(P)/URT develops and applies DC control signals to the T-827( )/URT that compensate for system gain variations, thereby preventing the RF power output from exceeding a safe limit. A transmit/receive relay is used in the AM-3924(P)/URT to connect the system antenna to an auxiliary receiver whenever a transmission is not being made.

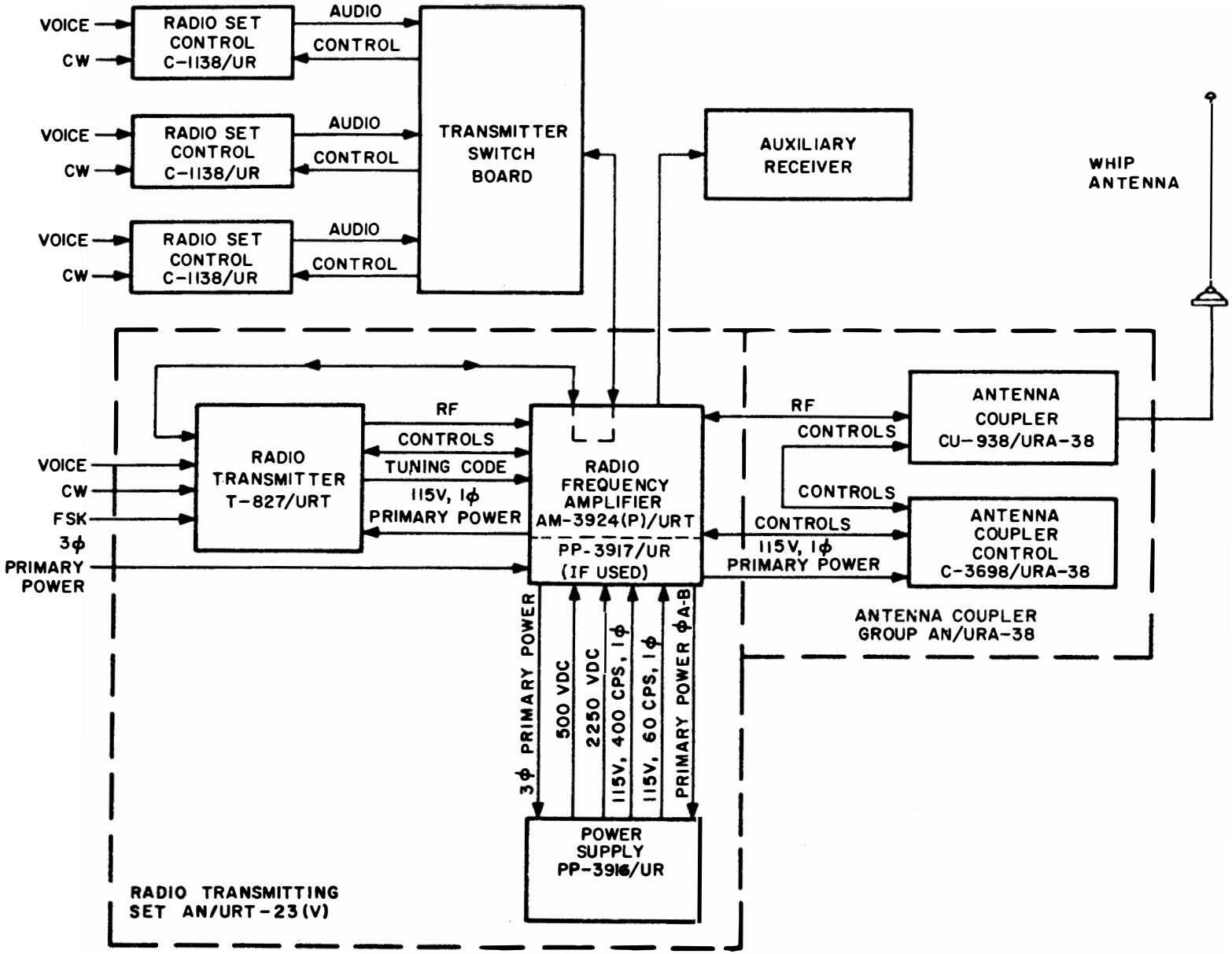


Figure 4-1. Typical Radio Set Block Diagram

20. The system operates from either a 208 or 440 volt, 60 Hz, three phase source or a 115 volt, 0 Hz, three phase source. Only one power supply is used, depending on the frequency of the primary wer: the PP-3916/UR with a 60 Hz source or the PP-3917/UR with a 400 Hz source. When the AM/ 24(P)/URT is turned on, phases A and B are applied to the power supply for conversion to single ase 115 volt power of the same frequency as the three phase primary power. This 115 VAC is applied primary power to the T-827( )/URT and/or AN/URA-38. When the system is placed in standby, the wer supply produces single phase power at both 115 VAC, 400 Hz and 115 VAC, 60 Hz for the control cuits in the AM-3924(P)/URT. When the system is placed in operate, the three phase primary power applied to the 500 and 2250 VDC power supply to supply high voltage to the electron tubes within the M-3924(P)/URT.

21. RADIO TRANSMITTING SET AN/URT-23(V).

22. The AN/URT-23(V) (figure 4-2) is a 1 KW radio transmitting set which consists of an exciter e T-827( )/URT), a linear power amplifier (the AM-3924(P)/URT), and a power supply (the PP- 6/UR or PP-3917/UR depending on the frequency of the primary power). For information concern- operation of the T-827( )/URT, refer to Technical Manuals referenced in table 1-1. e AN/URT-23(V) is normally operated with the AN/URA-38 (an automatic antenna coupler system) l an auxiliary receiver such as the R-1051/URR.

23. The AM-3924(P)/URT is driven by a low-level (nominal 100 MW) RF output from the T-827( )/ T. Two stages of amplification (a driver amplifier and a final amplifier) are used to linerly amplify s input to a level of 1 KW. Each stage consists of two parallel connected electron tubes and operates o one of nineteen pretuned transformer circuits. The transformer circuits for each stage are auto- tically switched into the amplifier circuit according to the operating frequency (paragraph 4-24. The 1 output from the final amplifier is applied through the VSWR bridge and the antenna transfer relay he antenna coupler system. The VSWR bridge samples both reflected and forward power for appli- ion to the front panel Power meter for measurement and monitoring. In addition, the VSWR bridge plies the necessary signals for the APC and PPC circuits to develop their respective control vol- es. The antenna transfer relay connects the antenna to an auxiliary receiver when the system is not ed.

24. An open-seeking circuit which employs a five-wire coding scheme is used to automatically dswitch the correct transformer assemblies into the driver and final amplifier circuits. The code generated either by an encoder within the T-827( )/URT, or internally by an encoder within the -3924(P)/URT when the T-827( )/URT is not used. In either case, the code consists of a pattern opens and grounds which establishes a ground path to one side of a relay coil through a decoded tch in the AM-3924(P)/URT bandswitching system. The ground path energizes the relay and in turn notor, which rotates the decoder and bandswitch assemblies until the ground path is broken. While ew channel is being selected, an inhibit signal is applied to the keying circuit to prevent the system m being keyed before the switches have stopped in the correct position. The power for driving the ing motor is 115 VAC, 60 Hz, obtained either from the PP-3917/UR 60 Hz inverter assembly or n the PP-3916/UR, depending on the frequency of the primary power source.

25. The VSWR bridge supplies a signal to the APC-PPC circuit which is, in essence, the envelope he RF output from the system. This signal is used to develop one control voltage which is propor- al to the peak power output from the system and another which is proportional to the average power. h control voltages are applied to the T-827( )/URT, in which they are used to prevent the RF power out of the system from exceeding a safe limit. In addition, a PPC voltage is applied to the AM/ 4(P)/URT bias circuits as a protective measure in the event that the control circuits in the T-827( )/ T fail or that the system is being operated with an exciter that does not have power control capabili- . In this condition, as the peak power output increases beyond its rated level, the bias voltage to driver amplifier is increased to reduce the RF output. The APC-PPC circuit can also be comman- to reduce the power output from the system to a lower value required for tuning the antenna coupler.

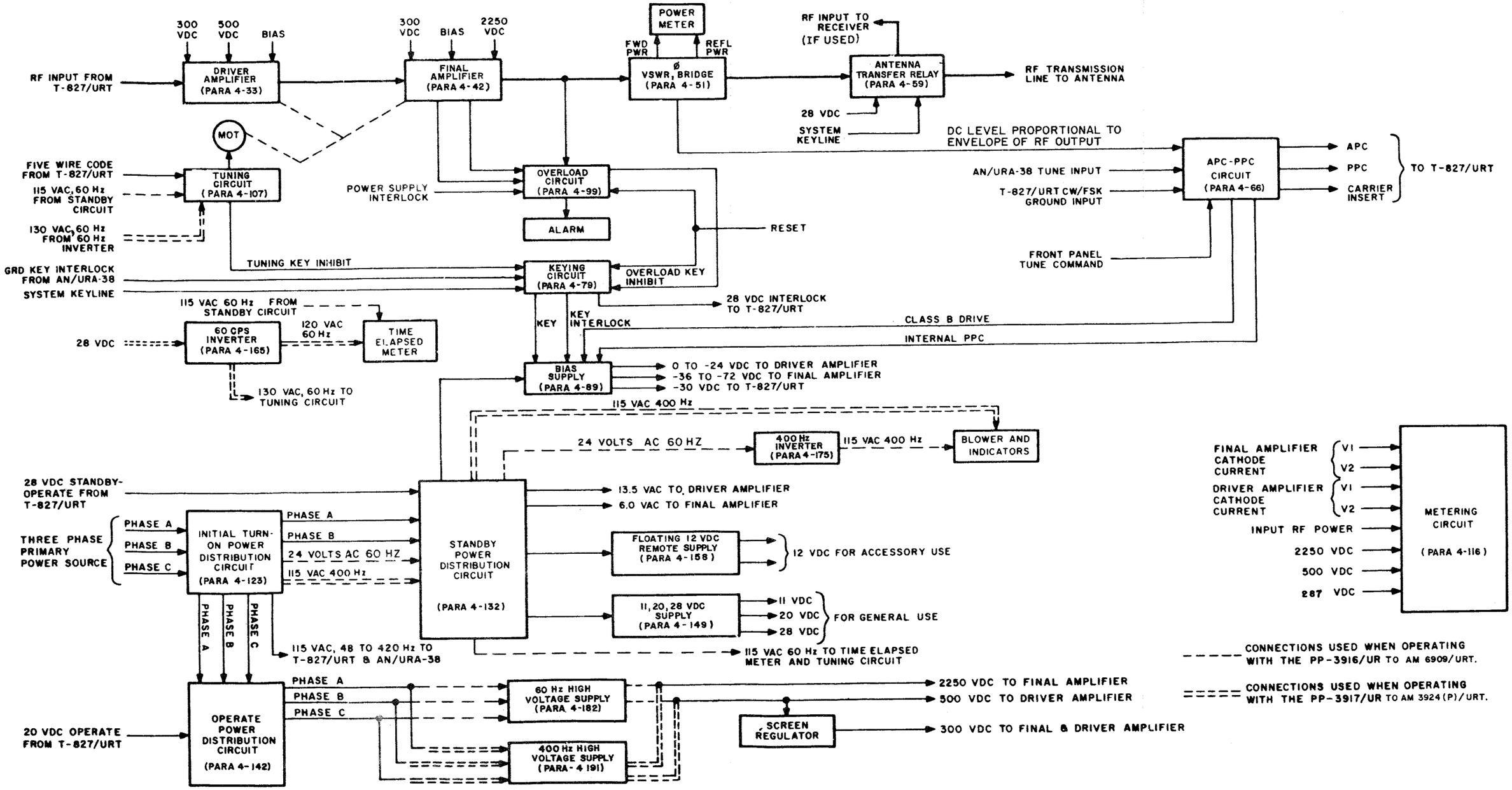


Figure 4-2. Radio Transmitting Set AN/URT-23(V), Functional Block Diagram

This is accomplished either manually with the front panel TUNE KEY switch or automatically by the AN/URA-38. At the same time, a carrier insert signal is supplied to the T-827( )/URT, causing that unit to provide the single tone carrier output required for tuning. If desired, a resistor in the PPC circuit can be changed in value to enable the tune power level to be set to other values required to tune antenna couplers other than the AN/URA-38. When operating in the CW or FSK mode, the CW/FSK ground from the T-827( )/URT is used to de-energize the APC detector and switch the PPC output to the T-827( )/URT APC input. Also, a class B drive signal is produced and applied to the bias power supply (paragraph 4-27) when the CW/FSK ground is present.

4-26. An overload detector is used to continually monitor the plate currents of the two final amplifier tubes, the RF output voltage, the air temperature of the PP-3916/UR and the air flow of the AM-3924(P)/URT. If a dangerous condition occurs in any of these areas, the overload circuit trips and provides an inhibit signal to the keying circuit, preventing further keying of the circuit until the overload has been cleared. When the overload circuit trips, an indicator lamp and an alarm are energized to provide both visual and audible indication that an overload condition has occurred. A front panel switch enables the audible overload alarm to be disabled. The overload circuit can be reset through the front panel RESET switch. However, if the overload was not of a momentary nature, the overload circuit will again immediately trip to prevent keying. In addition, the keying circuit remains inhibited whenever the overload switch is held in the reset position, thus preventing an operator from forcing operation in an overload condition.

4-27. The AM-3924(P)/URT is keyed on and off through the bias levels applied to the four electron tubes in the final and driver amplifiers. Keying is accomplished by grounding the system keyline at any of the other units or by setting the AM-3924(P)/URT front panel Key switch at TUNE KEY or LOCAL KEY. In any case, the keying circuit switches the bias voltage for the driver and final amplifier electron tubes from cutoff to operate levels. The keying circuit is inhibited (bias maintained beyond cutoff) whenever the tuning motor is energized, an overload occurs, the RESET switch is depressed, or the ground key interlock signal is supplied by the AN/URA-38. Also, whenever the tuning motor is energized or the ground key interlock signal is supplied by the AN/URA-38, the T-827( )/URT is unkeyed by cutting off the 28 VDC interlock signal that the AM-3924(P)/URT normally supplies to energize the T/R relays in the T-827( )/URT. DS4 on the front panel illuminates to alert the operator to this TUNE condition.

4-28. A metering circuit allows any one of eight parameters of the amplifier tubes to be connected to a meter for measurement or monitoring. These parameters consist of the cathode current of each of the four electron tubes, the input RF power to the driver amplifier, the plate supply voltages, and the screen supply voltage.

4-29. Turn-on is initiated by setting the PRIMARY POWER switch at ON. This action supplies phases A and B of the primary power to either the PP-3916/UR for 60 Hz power or the PP-3917/UR for 400 Hz power. In either case, the power supply converts this voltage to 115 VAC single phase power of the same frequency as the applied primary voltage. This 115 VAC power is supplied as primary power to the AN/URA-38 and T-827( )/URT. In addition, phases A and B of the primary power are applied to the lower power transformer through a normally open contact of one standby relay. Further control of the power distribution is now exercised from the T-827( )/URT.

4-30. When the T-827( )/URT Mode Selector switch is set at STDBY, a 28 VDC standby-operate signal is generated to energize the standby relays in the AM-3924(P)/URT. One set of relay contact switches either 115 VAC, 400 Hz from the PP-3917/UR directly to the indicators and blower, or 24 volts AC to the 400 Hz inverter in the PP-3916/UR, which in turn produces 115 VAC, 400 Hz output to the blower and indicators. Therefore, 115 VAC, 400 Hz is either directly or indirectly switched to energize the blower and indicators. The other set of relay contacts completes the circuit for phases A and B to the low power transformer 1A1T1. This transformer provides the following outputs: 6.0 VAC filament voltage for the final amplifier tubes, 13.5 VAC filament voltage for the driver amplifier tubes, and the AC inputs to the bias, $\pm$12 VDC remote, and 11, 20, and 28 VDC supplies. In addition, if the primary power source is 60 Hz, the transformer supplies 115 VAC output to the time elapsed meter. The bias supply develops operating and cutoff biases for the final and driver amplifier tubes. In addition, a -30 VDC signal is derived from the bias circuit for the T-827( )/URT RF delay circuit.

The + 12 VDC remote supply produces a floating 12 VDC output for remote use. All low DC voltages required to power the AM-3924(P)/URT control circuits are produced by the 11, 20, and 28 VDC supplies. The 28 VDC is also supplied to the time delay relay heater in the operate circuit and, if the primary power source is 400 Hz, to the 60 Hz inverter in the PP-3917/UR. The 60 Hz inverter produces 120 VAC, 60 Hz power for the time elapsed meter and 170 VAC, 60 Hz power for the tuning motor when operating from a 400 Hz primary power source.

4-31. Three minutes after application of heater power, the time delay relay closes. Thereafter, the system can be placed in an operate condition by setting the T-827( )/URT Mode Selector switch to any operate position. This supplies the 20 VDC operate signal to the operate circuit to energize the operate relay. Energizing the operate relay applies the three phase primary power to the PP-3916/UR 60 Hz high voltage supply or PP-3917/UR 400 Hz high voltage supply. In either case, the supply converts the three phase primary power to 2250 and 500 VDC. These DC voltages are used for plate power for the final and driver amplifier tubes, respectively. In addition, the 500 VDC drives a regulated 300 VDC screen supply in the AM-3924(P)/URT for both the final and driver amplifier tubes. Energizing the operate relay extinguishes the STANDBY indicator and lights the OPERATE indicator. The system is now energized for operation.

4-32. CIRCUIT DESCRIPTIONS.

4-33. DRIVER AMPLIFIER.

4-34. GENERAL.

4-35. The driver amplifier (figure 4-3) consists of two electron tubes, and interstage transformer assembly, and various other components. The function of this circuit is to linearly amplify the input from the T-827( )/URT to a level sufficient to drive the final amplifier (paragraph 4-42).

4-36. CIRCUIT DESCRIPTION.

4-37. The RF input from the T-827( )/URT at connector 1A2J9 is applied through connectors 1A2P1 and 1A1J1 and terminal 12 of terminal board TB1 to a nominal 50-ohm input load consisting of inductor L2 and resistor R6. Inductor L2 compensates for the input capacitance of the two electron tubes. The RF input is also applied to the metering circuit (paragraph 4-116). From the input load, the RF is coupled by capacitor C1 to the grids of the two electron tubes. The two parallel connected electron tubes are operated as a class A linear amplifier stage that provides a nominal 20 dB of power gain. One of nineteen broadband interstage transformer assemblies is used to couple the RF output from the driver amplifier to the input of the final amplifier.

4-38. The nineteen transformer assemblies are mounted on a motor-driven bandswitch assembly which is switched according to operating frequency to automatically connect the correct transformer assembly into the signal path (paragraph 4-107). Each transformer assembly above 8 MHz consists of a double tuned circuit which uses capacitive top coupling. This type of circuit provides a wide flat passband with very sharp skirts, i. e., broadband tuning. Below 8 MHz, conventional single tuned circuits are used.

4-39. The voltage drops developed across cathode resistors R1 and R2 are applied to the metering circuit for monitoring and measurement (paragraph 4-116). Each of the power supply input lines (bias. plate, and screen) is filtered to provide RF decoupling. Capacitors C2 through C12 and C19 are local RF bypasses. Resistor 1A1R24 is used for parasitic suppression.

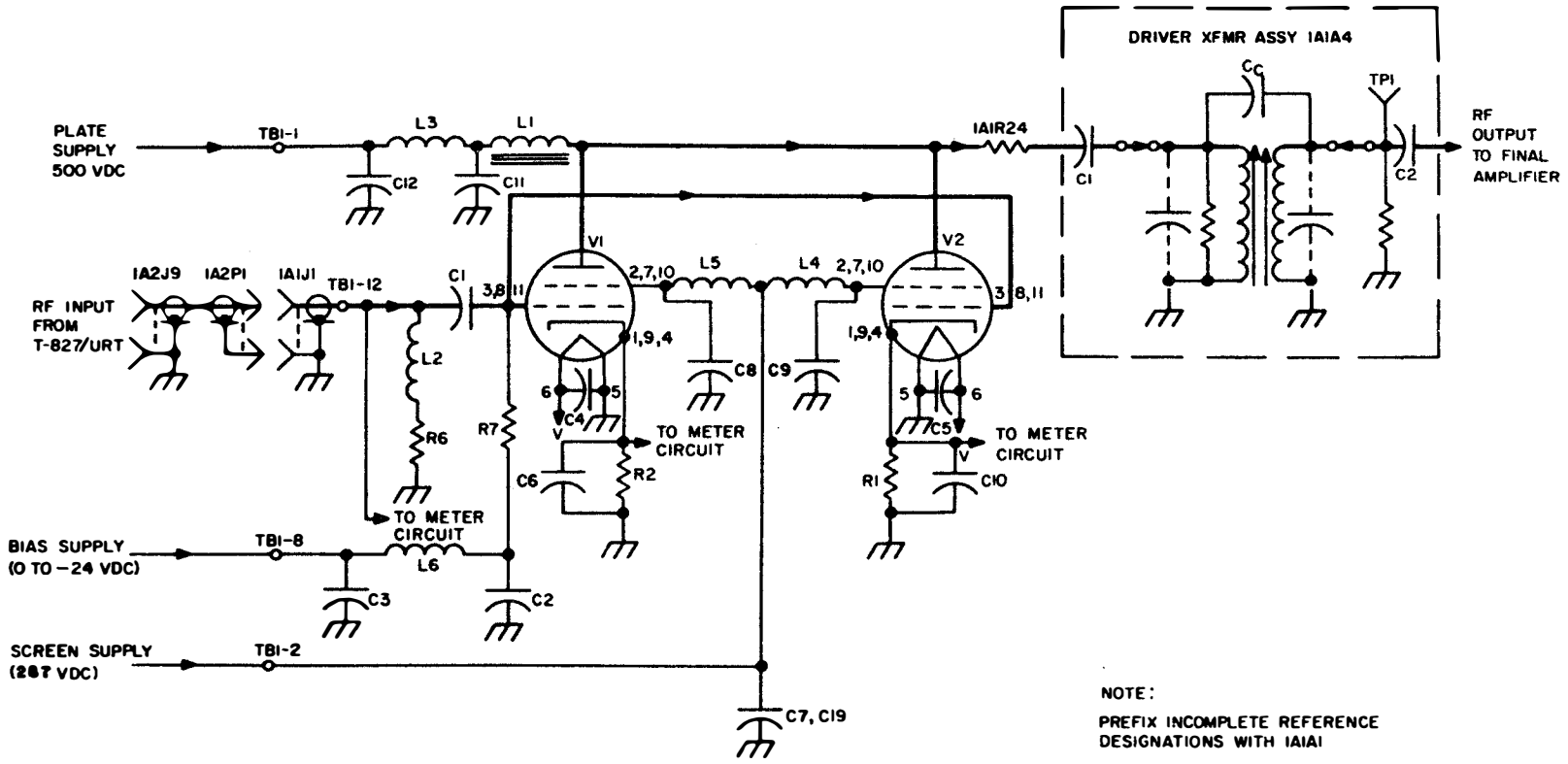


Figure 4-3. Driver Amplifier, Simplified Schematic Diagram

4-40. TEST DATA.

4-41. Pertinent references and applicable data for the driver amplifier are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-6909( )/URT, Case, Schematic Diagram, Figure 5-30.

c. Driver Transformer Assembly 1A1A4, Schematic Diagram, Figure 5-29.

d. Radio Frequency Amplifier AM-3924(P)/URT, Bottom View, Component Locations, Figure 5-8.

e. Driver Tube Assembly 1A1A1, Component and Test Point Locations, Figure 5-11.

f. Driver Transformer Assembly 1A1A4, Component and Test Point Locations, Figure 5-14.

g. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram, Figure 4-22.

h. Tube Socket Voltage and Resistance Measurements, Tables 5-3 and 5-4.

i. Driver Transformer Alignment Instructions, Paragraph 5-23.

j. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) Electronic Multimeter AN/USM-116( )

(3) Oscilloscope AN/USM-117

(4) Radio Test Set AN/TRM-3

(5) Signal Generator SG-582/U

4-42. FINAL AMPLIFIER.

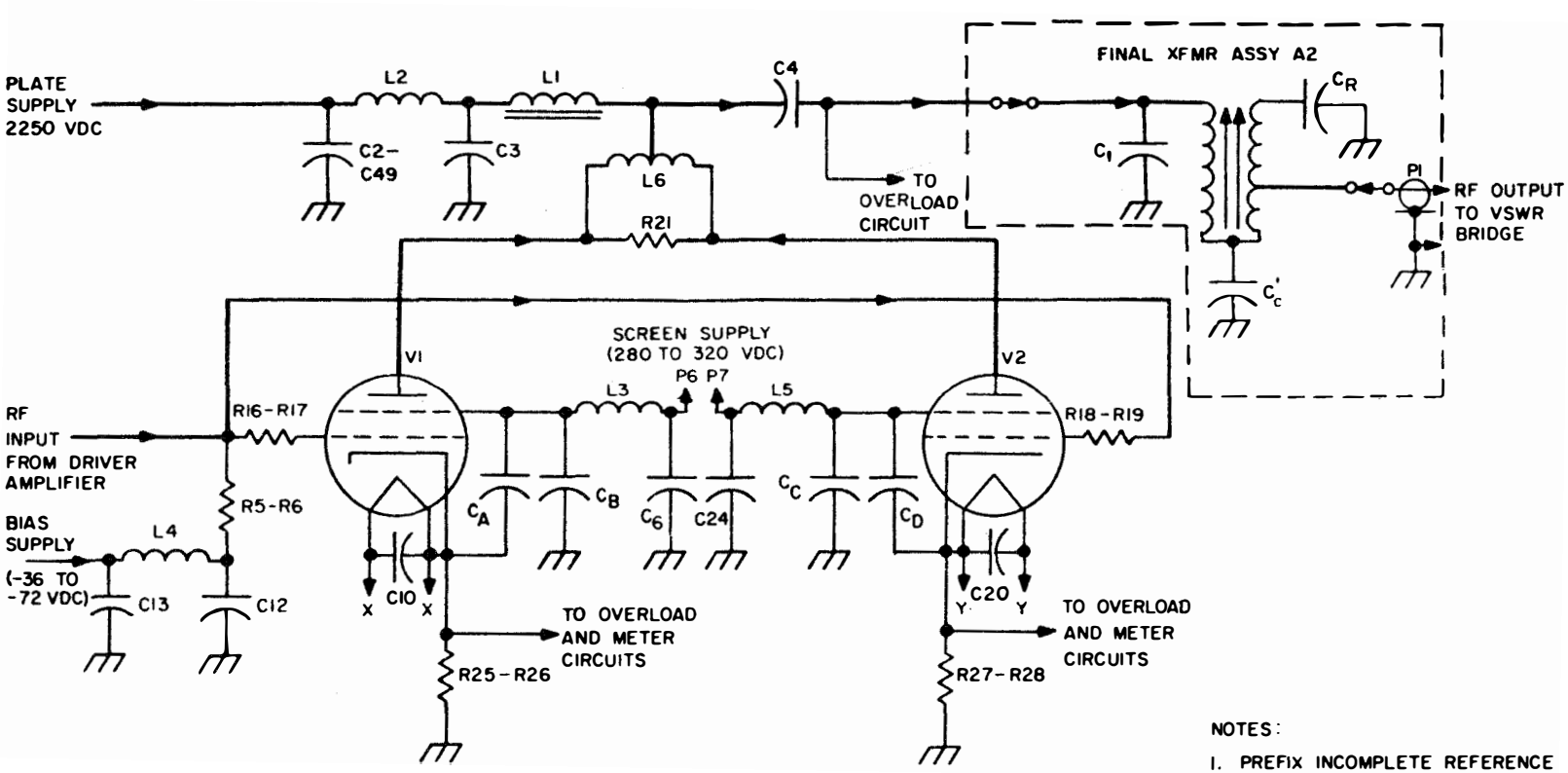
4-43. GENERAL.

4-44. The final amplifier (figure 4-4) consists of two electron tubes, an output transformer assembly, and various other parts. The function of this circuit is to linearly amplify the output from the driver amplifier to a level of 1 KW for application to an antenna.

4-45. CIRCUIT DESCRIPTION.

4-46. The RF output from the driver amplifier is applied through parasitic suppressors R16 and R17 to the grid of electron tube V1 and through parasitic suppressors R18 and R19 to the grid of electron tube V2. The two parallel-connected electron tubes are operated class AB_1 during voice operation (class B during CW or FSK operation) to provide a nominal 25 dB of power gain. The class of operation is determined by the bias voltage applied by the bias power supply (paragraph 4-89). One of nineteen broadband output transformers is used to couple the RF output from the final amplifier to a 50 ohm transmission line.

4-47. The nineteen transformer assemblies are mounted on a motor-driven bandswitch assembly which is switched according to the operating frequency to automatically connect the correct transformer assembly into the signal path (paragraph 4-107). Each transformer assembly consists of a double tuned circuit which uses capacitive bottom coupling. In addition, the secondary winding is tapped such that the top of the secondary winding and the secondary tuning capacitor form a series resonant circuit to trap second harmonics.



NOTES:

1. PREFIX INCOMPLETE REFERENCE DESIGNATIONS WITH IA1
2. C_A CONSISTS OF THE FOLLOWING PARALLEL CONNECTED CAPACITORS C5, C8, C45, C46, C47, C48
3. C_B CONSISTS OF THE FOLLOWING PARALLEL CONNECTED CAPACITORS C15, C16, C26, C11, C21, C38
4. C_C CONSISTS OF THE FOLLOWING PARALLEL CONNECTED CAPACITORS C23, C32, C33, C34, C39, C40
5. C_D CONSISTS OF THE FOLLOWING PARALLEL CONNECTED CAPACITORS C9, C17, C41, C42, C43, C44
6. CAPACITOR C49 NOT USED IN UNITS WITH SERIAL NUMBERS GREATER THAN A170

Figure 4-4. Final Amplifier, Simplified Schematic Diagram

4-48. The voltage drops developed across cathode resistor R25-R26 and R27-R28 are applied to the metering circuit for monitoring and measurement (paragraph 4-116) and to the overload circuit for monitoring (paragraph 4-99). Each of the power supply input lines (bias, plate, and screen) is filtered to provide RF decoupling. The voltage at the input to the final transformer assembly is also applied to the overload circuit for monitoring (paragraph 4-99). The cathode resistors are bypassed by capacitors C_A - C_B and C_C - C_D. The parallel connected resistors R5 and R6 provide grid loading to swamp the non-linear input impedance of the electron tubes, thus preventing distortion. Resistor R21 serves as a parasitic suppressor. Inductor L6 provides a low frequency bypass around resistor R21. Capacitors C10 and C20 are RF bypasses for the tube filament. Plugs P6 and P7 allow the screen voltages to be adjusted independently to balance the idling currents of the two tubes.

4-49. TEST DATA.

4-50. Pertinent references and applicable test data for the final amplifier are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Final Transformer Assembly 1A1A2, Schematic Diagram, Figure 5-28.

c. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

d. Final Amplifier Tube Socket Assembly, Bottom View, Component Locations, Figure 5-10.

e. Final Transformer Assembly 1A1A2, Component and Test Point Locations, Figure 5-12.

f. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram, Figure 4-22.

g. Tube Socket Resistance Measurements, Table 5-5.

h. Final Transformer Alignment Instructions, Paragraph 5-25.

i. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) Electronic Multimeter AN/USM-116( )

(3) Oscilloscope AN/USM-117

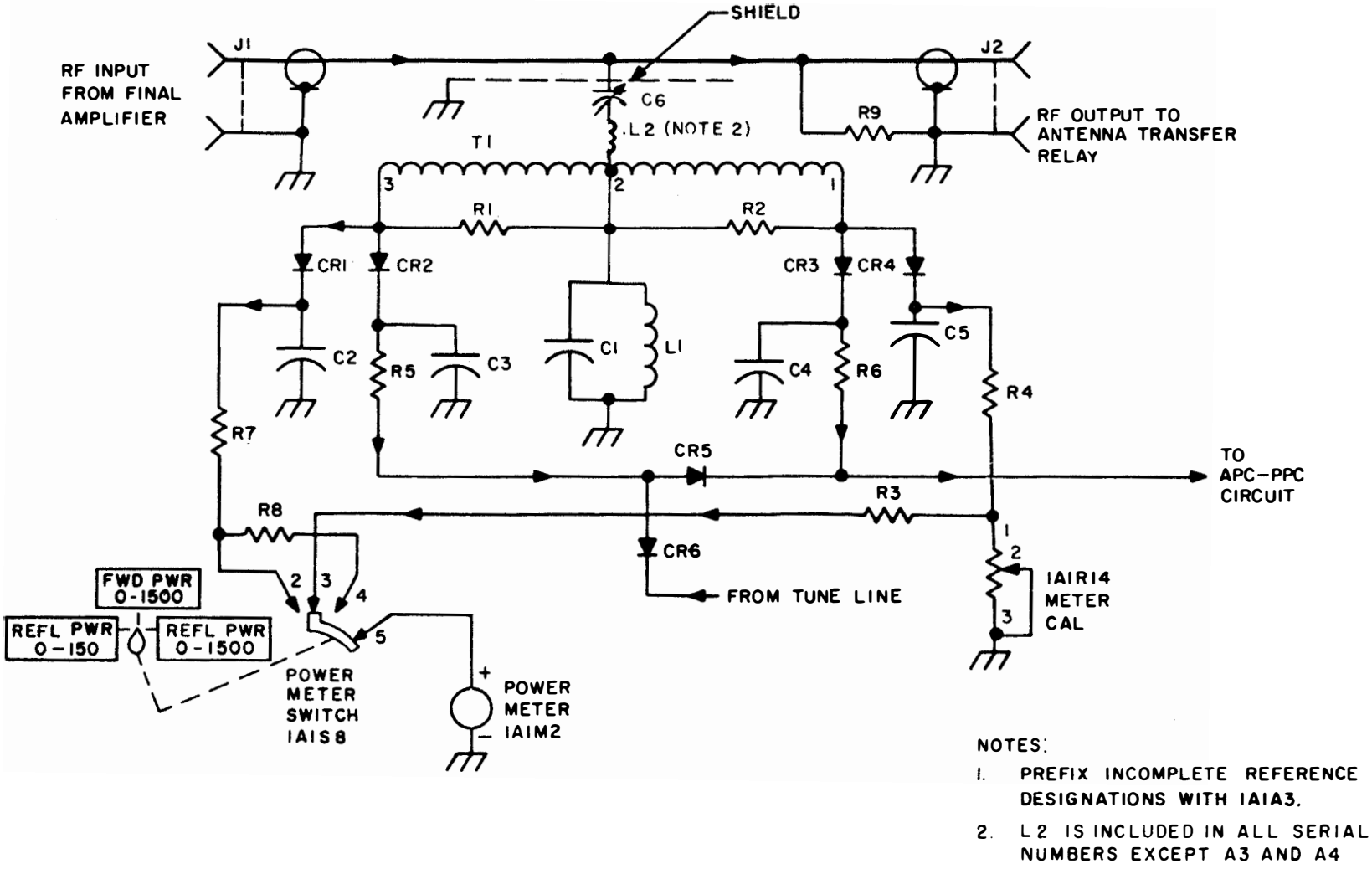
(4) Radio Test Set AN/TRM-3

(5) Signal Generator SG-582/U

4-51. VSWR BRIDGE.

4-52. GENERAL.

4-53. The VSWR bridge (figure 4-5) consists of a toroidal transformer and various voltage divider, detector, and filter networks. The function of this circuit is to provide outputs for Power meter 1A1M2 proportional to the forward and reflected power on the output transmission line. In addition, a single output related to both reflected and forward power is applied to the APC-PPC circuits (paragraph 4-66).



NOTES:

1. PREFIX INCOMPLETE REFERENCE DESIGNATIONS WITH 1A1A3.
2. L2 IS INCLUDED IN ALL SERIAL NUMBERS EXCEPT A3 AND A4

Figure 4-5. VSWR Bridge, Simplified Schematic Diagram

4-54. CIRCUIT DESCRIPTION.

4-55. The center conductor of the output transmission line passes through the center of toroidal transformer T1 and constitutes its single turn primary; the walls of the assembly serve as the shield for the transmission line. The short shield around the center conductor, grounded at only one end, does not serve as a part of the transmission line, but merely prevents undesired capacitive coupling between the center conductor and the secondary winding on the toroid. Current through the transmission line induces equal voltages in two parts of the center tapped secondary winding, one voltage being in phase with the line current and the other 180 degrees out of phase with the line current. Voltage divider C6-C1 provides a reference voltage at the center tap of toroidal transformer T1 that is in phase with the line voltage. When the load on the transmission line is resistive so that there is no reflected power, the line voltage and current are in phase. Trimmer C6 is adjusted so that the reference voltage is equal in magnitude to the induced voltage when the load on the transmission line is 50 ohms resistive. Therefore, the vector sum of the voltages between terminal 3 of transformer T1 (reflected power side of the bridge) and ground is zero, since the induced voltage is equal in magnitude and 180 degrees out of phase with the reference voltage. As the load changes to something other than 50 ohms resistive, causing reflected power on the line, the two voltages no longer exactly cancel and an output is produced at terminal 3 of transformer T1. This level is peak detected by diode CR1 and capacitor C2, and applied through calibrating resistor R7 to contact 2 of Power meter switch 1A1S8 and through calibrating resistor R8 to contact 4 of Power meter switch 1A1S8. Either range of reflected power can then be selected by the Power meter switch for application to Power meter 1A1M2 for measurement or monitoring. Similarly, the voltage at terminal 1 of transformer T1, the reference voltage and the induced voltage across resistor R2 add vectorially to produce a signal related to forward power. This voltage is peak detected by diode CR4 and capacitor C5, and applied to voltage divider R4-1A1R14. Potentiometer 1A1R14 allows the Power meter to be calibrated for a known amount of peak forward power (normally 1 KW). The output from the voltage divider is applied through calibrating resistor R3 to contact 3 of Power meter switch 1A1S8. Inductor L1 provides a DC path to ground from the center tap of toroidal transformer T1. Resistor R9 is a DC pull-down resistor to prevent the coupling capacitor in final transformer assembly 1A1A2 from holding a charge. At the high end of the frequency range, the leads of capacitor C1 produce a small amount of inductive reactance. Therefore, inductor L2 is used to provide a corresponding amount of inductive reactance in series with capacitor C6 so that the output from divider C6-C1 will be frequency insensitive. Capacitors C2 and C5 are large to hold their charge between audio cycles, thus making the Power meter indicate PEP watts (most other transmitters indicate average power).

4-56. The signal at terminal 1 (forward power side) of transformer T1 is detected by diode CR3 and applied through isolating resistor R6 to the APC-PPC circuit. This output is, in essence, the envelope of the RF output from the AM-3924(P)/URT and is used to derive the automatic peak and average power control voltages (paragraph 4-66). Any output from the reflected power side of transformer T1 is detected by diode CR2 and applied through resistor R5 and diode CR5 to the APC-PPC circuit. The value of resistor R5 is chosen so that no control voltage will be generated by the APC-PPC circuit due to reflected power until the reflected power level reaches approximately 360 watts (4:1 VSWR at 1 KW forward power). As the VSWR, and therefore the reflected power, increases above this point, the additional input to the APC-PPC circuit results in an increased output from the APC-PPC circuit to reduce the output from the AM-3924(P)/URT. Therefore, the equipment is protected against over-dissipation that would result from excessive VSWR on the transmission line. When the tune line is grounded diode CR6 grounds out the bottom of resistor R5, preventing reflected power limitation during tuning. Diode CR5 also prevents resistor R6 from being shorted out.

4-57. TEST DATA.

4-58. Pertinent references and applicable test data for the VSWR bridge are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. VSWR bridge 1A1A3, Components and Test Point Locations, Figure 5-13.

c. VSWR bridge Adjustment Procedures, Paragraph 5-9.

d. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram, Figure 4-22.

e. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) Electrical Dummy Load DA-242/U

(3) Electronic Multimeter AN/USM-116( )

4-59. ANTENNA TRANSFER RELAY.

4-60. GENERAL.

4-61. The Antenna transfer relay (figure 4-6) connects the antenna to the receiver input or the transmitter output depending on the condition of the system.

4-62. CIRCUIT DESCRIPTION.

4-63. The 28 VDC output from the internal power supply is always present on one side of the coil of relay K1. The other side of the coil is connected to the system keyline. The system can be keyed (keyline grounded) from the T-827( )/URT, C-3698/URA-38, or with the AM-3924(P)/URT front panel Key switch. When the system is keyed, the RF output from the VSWR bridge is applied through connectors 1A1A3J2, P4, and P5, the contacts of relay K1, and connectors P6 and J3 to the antenna. Whenever the keyline is not grounded, the antenna is connected to receiver input connector J4 through connectors J3 and P6, the contacts on relay K1, and connector P7.

4-64. TEST DATA.

4-65. Pertinent references and applicable data for the antenna transfer relay are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-6909( )/URT, Case, Schematic Diagram, Figure 5-30.

c. Radio Frequency Amplifier AM-3924(P)/URT, Case, Component Locations, Figure 5-18.

d. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

e. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram, Figure 4-22.

f. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

4-66. APC-PPC CIRCUIT.

4-67. GENERAL.

4-68. The APC-PPC circuit (figure 4-7) consists of twelve transistor stages. The function of this circuit is to generate control voltages that are applied to the T-827( )/URT (or used internally) to prevent the peak and average power levels of the RF output from the system from exceeding a safe level. The control voltages are derived from an output from VSWR bridge 1A1A3 (paragraph 4-51). This output is, in essence, the envelope of the RF output from the AM-3924(P)/URT.

4-69. CIRCUIT DESCRIPTION.

4-70. The output from VSWR bridge 1A1A3 is developed across a voltage divider consisting of resistors 1A1A3R6, R25, 1A1R13, and transistor Q7. During normal operation, shunt attenuator Q7 is turned on, connecting resistors R23 and 1A1R13 in parallel with resistor R25. This reduces the output from the VSWR bridge prior to application to the APC and PPC detectors. PWR control 1A1R13 is normally set maximum clockwise (minimum resistance). Therefore, the input to the APC and PPC

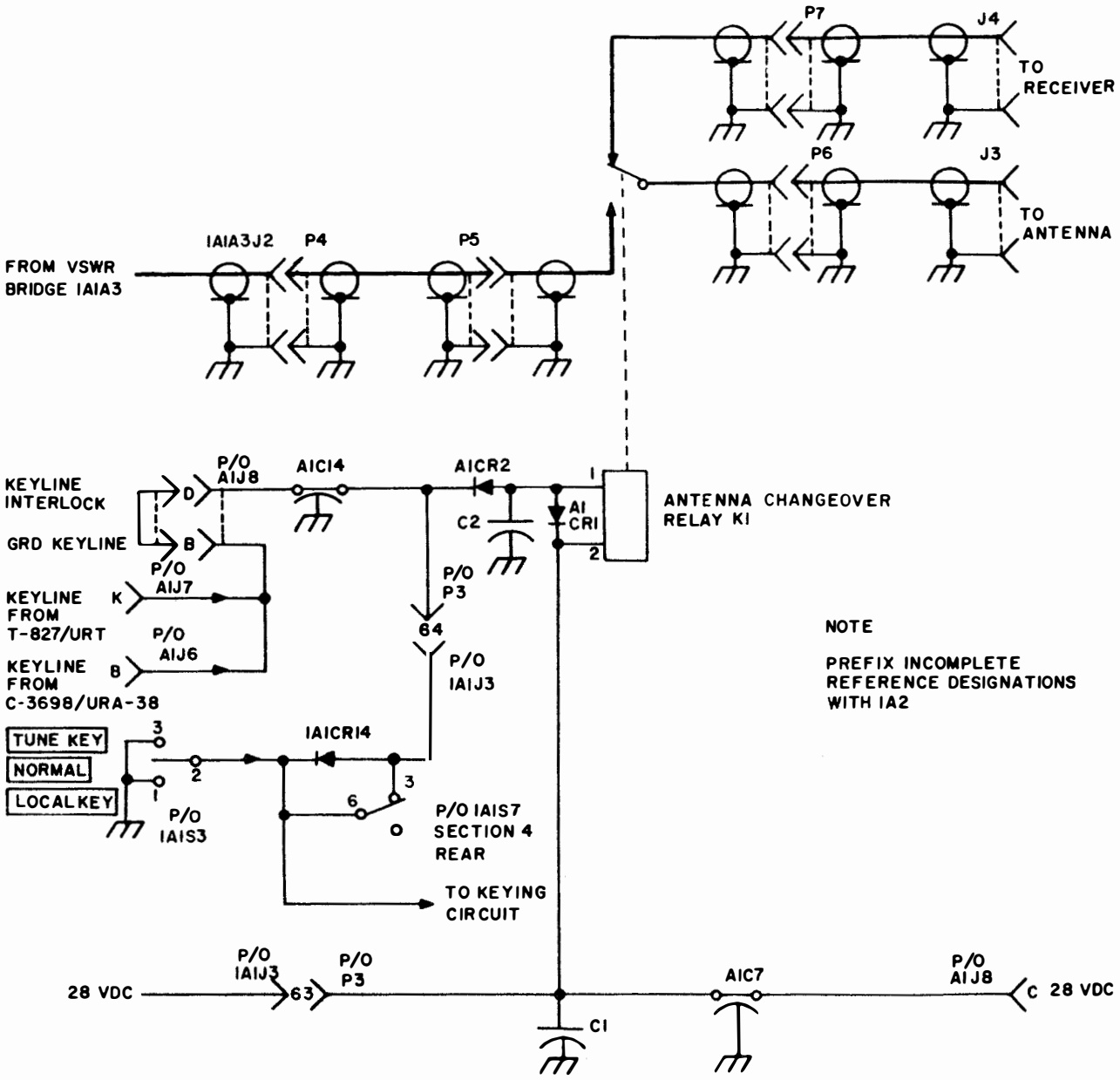


Figure 4-6. Antenna Transfer Relay, Simplified Schematic Diagram

detectors can be increased by inserting some resistance in series with resistor R23. When the system is placed in a tune condition, shunt attenuator Q7 is turned off (paragraph 4-76) allowing the full output from the VSWR bridge to be applied to the detectors. This increased input allows the detectors to be activated at a lower RF output to constrain the RF power output to a lower level for tuning an antenna coupler.

4-71. Threshold detector Q8 is turned on when the output from the attenuator exceeds the voltage developed across emitter resistor R26 by threshold reference Q11. The threshold level developed by threshold reference Q11 is adjusted (PPC ADJ 1A1R11) at the time of installation to a level which prevents threshold detector Q8 from turning on until its input represents 1 KW of RF output power. The output from threshold detector Q8 is raised in level by amplifier Q9 and applied through emitter follower Q10 and gate CR22 (when closed, see paragraph 4-74) to the T-827( )/URT PPC circuits. Diode CR11 provides temperature compensation for amplifier Q9. Emitter follower Q10 provides a low impedance source to drive the lines to the T-827( )/URT.

4-72. Amplifiers Q12 and Q13 and driver Q14 provide an amplified, low impedance duplicate of the output from the attenuator circuit which is applied to the modulation wiper. Diodes CR12 and CR9 are used to temperature compensate amplifiers Q12 and Q13, respectively. Thus, the stability of the amplifier circuits is greatly improved. The function of the modulation wiper is to average the peaks of the applied signal to produce a DC output which is proportional to the average power output from the system. Capacitor C3 charges through resistor R39 and discharges through resistor R38 and diode CR13. The discharge time constant is chosen to be somewhat shorter than the charging time constant; otherwise the voltage at capacitor C3 would tend to rise with complex waveforms and given an erroneously high indication of average power. Emitter follower Q15 provides a low impedance source for the following circuits. In conjunction with capacitor C4, emitter follower Q15 provides a fast-rise, slow-fall signal for application to the T-827( )/URT. At the time of installation, the gain of amplifier Q13 is adjusted with APC ADJ 1A1R12 to control the compatible AM carrier at 250 watts.

4-73. During voice operation (all modes except CW and FSK) the PPC and APC outputs are applied to the T-827( )/URT to control the peak and average levels of the system RF power output. During CW and FSK operation, the PPC circuits of the T-827( )/URT are not used. However, it is desired to preserve the rapid response and precise level sensing characteristics of the AM-3924(P)/URT to switch the PPC voltage to the APC circuits.

4-74. During voice operation, the 11 VDC at the collector of switch Q16 is dropped accross a voltage divider consisting of R41, CR24, and R19, producing approximately 2 VDC at the base of switch Q16. During normal operation, both the APC and PPC control voltages exceed this 2 VDC level. Therefore, both gate CR23 and switch Q16 will be reverse biased, allowing the outputs from the APC and PPC circuits to be applied to their respective circuits in the T-827( )/URT. When the T-827( )/URT is placed in a CW or FSK mode of operation, a ground is applied through diode CR8 to turn off the APC circuits. In addition, the CW/FSK ground is applied to the base circuit of switch Q19, energizing it. The resulting positive output from switch Q19 opens (reverse biases) the normally closed gate CR24, and changes the bias on the final amplifier tubes (paragraph 4-89) for class B operation. Zener diode CR27 reduces the maximum voltage seen at the collector of switch Q16, limiting the collector dissapation. Diode CR29 provides temperature compensation for switch Q19. Now the 11 VDC at the collector of switch Q16 is dropped across voltage divider R41-CR23-R32, resulting in approximately 2 VDC at the base of switch Q16. Since the APC circuit is de-energized, switch Q16 is forward biased and the 2 VDC is applied to the APC output to the T-827( )/URT. Since gate CR23 is closed (forward biased) the PPC voltage that is generated will increase the conduction of switch Q16; therefore, the PPC is applied to the APC line by emitter follower action.

4-75. Whenever normal power control is inoperative (either because of failure in the T-827( )/URT or because of the use of an exciter without power control capabilities), the PPC voltage will continue to rise in an effort to reduce the exciter output power. When the PPC voltage rises sufficiently, diode CR5 starts to turn off the internal PPC circuit (transistor Q3 in the bias supply, see paragraph 4-89) to increase the bias on the driver amplifier tubes, and thus reduce the RF power output to the desired level. Therefore, the AM-3924(P)/URT is always protected against excessive dissipation in the amplifier tubes and transformer assemblies. During internal PPC circuit action the AM-3924(P)/URT is not a linear amplifier and degrades performance in the sideband modes of operation.

NOTES:
1. PREFIX INCOMPLETE REFERENCE DESIGNATIONS WITH 1A1A6
2. R20 IS DELETED, R18 IS CHANGED AND CR29 IS ADDED ON ALL UNITS EXCEPT SERIAL NUMBERS A5 THROUGH A71 (SEE FIGURE 5.22).

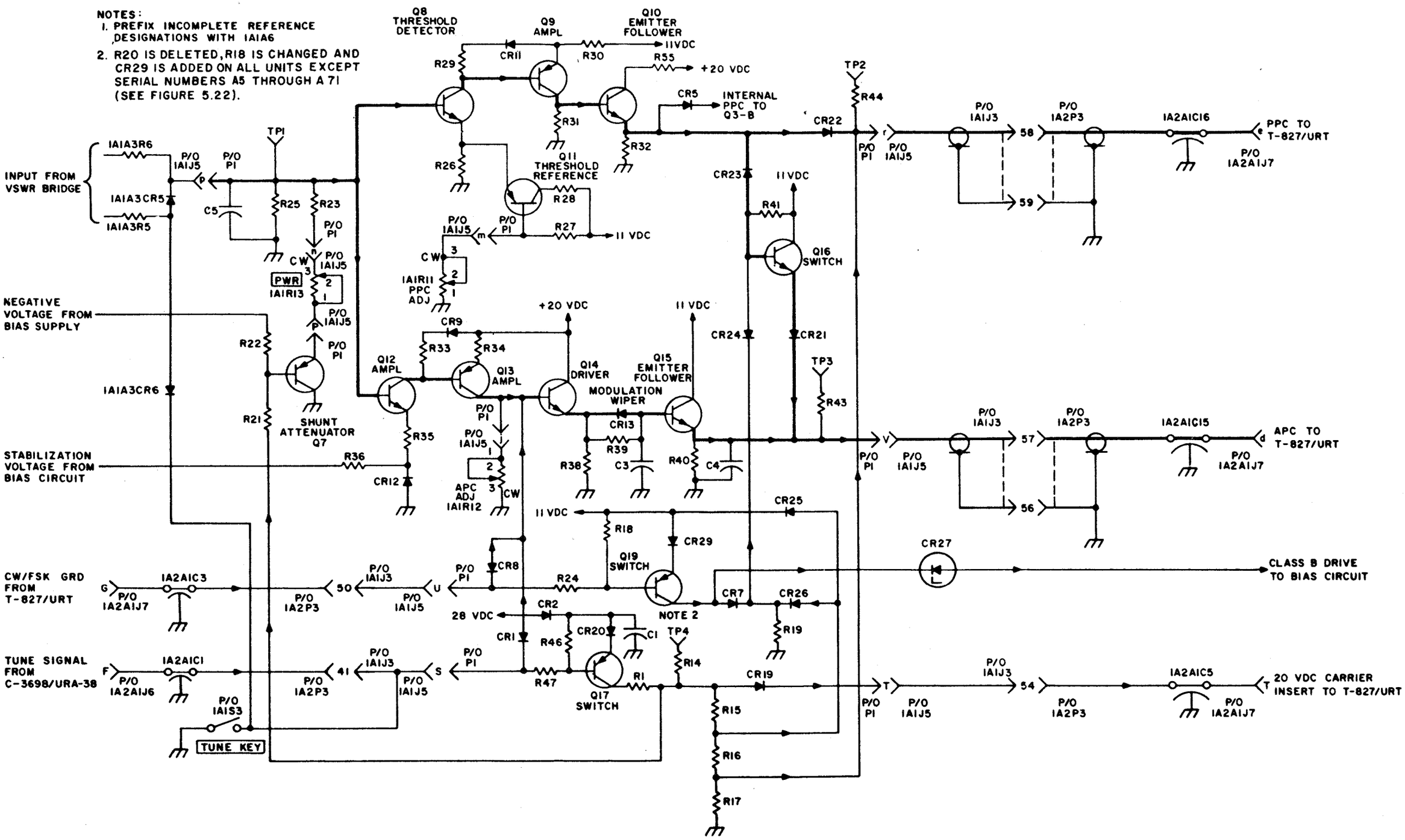


Figure 4-7. APC-PPC Circuit, Simplified Schematic Diagram

4-76. When a low power RF signal is required for tuning an antenna coupler, the tune line is grounded either automatically by the C-3698/URA-38 or by the front panel TUNE KEY switch. In either case, the ground turns off the APC circuits (through gate CR1) and turns on switch Q17, resulting in the +40 VDC generated by diode CR2 and capacitor C1 being applied to voltage divider R1-R15-R16-R17, producing four results:

a. The base voltage on shunt attenuator Q7 is raised sufficiently to cut it off, allowing the full output from the VSWR bridge to be applied to the PPC circuit. As a result, the generation of PPC voltage starts at a lower level of RF power output. As shipped, the value of resistor R25 is chosen such that a 200 watt RF output from the system is available for tuning. If desired, the value of resistor R25 can be changed (paragraph 2-43) to provide a tune power level other than 200 watts. Thus, the tune power requirements of any antenna coupler can be satisfied by changing the value of a single resistor.

b. In order to provide a single continuous tone on which to tune the antenna coupler, 20 VDC is applied through diode gate CR19 to the T-827( )/URT causing the carrier to be re-inserted into the RF output.

c. The positive level developed across resistors R16 and R17 is applied through diode gate CR26 to resistor R19. This opens gate CR24, closes gate CR23, and energizes switch Q16 to switch the PPC control voltage to the APC circuits as was explained in paragraph 4-74. The PPC circuit is used due to the rapid sensitive response to power beyond a specific point (as contrasted with the APC circuits), but is applied to the T-827( )/URT APC circuits because the PPC circuits in the exciter are not capable of controlling carrier level.

d. The positive level across resistor R17 (approximately 9 VDC) is applied to the T-827( )/URT PPC circuits. This signal cuts off the T-827( )/URT PPC circuits, preventing leakage of any sideband modulation that may be present.

Diode CR20 ensures positive cutoff of switch Q17. Diode CR25 prevents the voltage across resistors R16 and R17 from rising above 11 VDC when tune power is called for during an FSK or CW mode of operation.

4-77. TEST DATA.

4-78. Pertinent reference and applicable test data for the APC-PPC circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-6909( )/URT, Case, Schematic Diagram, Figure 5-30.

c. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

d. Radio Frequency Amplifier AM-3924(P)/URT, Case, Component Locations, Figure 5-18.

e. Printed Circuit Board Assembly 1A1A6, Component and Test Point Locations, Figure 5-16.

f. APC-PPC circuit, Servicing Block Diagram, Figure 4-23.

g. System Alignment, Paragraph 2-35.

h. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) Electronic Multimeter AN/USM-116( )

(3) Oscilloscope AN/USM-117

(4) PC Board Extenders 1A1MP81, 1A1MP96.

i. Transistor DC Voltage Measurements, Table 5-6.

4-79. KEYING CIRCUIT.

4-80. GENERAL.

4-81. The keying circuit (figure 4-8) consists of a key interlock, a key driver, a keying stage, a 28 VDC switch, and various gates and switches. The function of this circuit is to cause the bias power supply to provide operate bias to the four electron tubes whenever the system keyline is grounded, unless an overload exists, a tuning motor is energized, or the AN/URA-38 interlocks the keyline, in which case cutoff bias is maintained.

4-82. CIRCUIT DESCRIPTION.

4-83. When the AM-3924(P)/URT is keyed, ground is applied to the cathode of diode CR11. Therefore, voltage divider R12-R28-R16 drops the voltage at the base of key driver Q5 below that produced by voltage divider R13-R14 at the emitter, turning on key driver Q5 and thus keyer Q6. Keyer Q6 functions as a switch to short out resistor R8 in the bias circuit (paragraph 4-89).

4-84. Some of the circuits connected to the system keyline (the T/R relays) are connected to an unfiltered full-wave rectified 28 VDC line whose voltage drops instantaneously to zero 120 times per second. To prevent these momentary grounds from keying the AM-3924(P)/URT at a 120 Hz rate, an integrating network (R16 and C1) is used. The network also provides a delay when initially keyed to allow any exciter keying transients to collapse before the amplifier reaches full gain. Diode CR11 prevents the voltage at the base of transistor Q5 from rising above 11 volts when unkeyed. When FREQUENCY MC switch 1A1S7 is not set at AUTOMATIC, diode 1A1CR14 prevents the AM-3924(P)/URT from being keyed from the system keyline; in this condition the AM-3924(P)/URT can be keyed only with Key switch 1A1S3.

4-85. 28 VDC switch Q8-Q9 consists of two cascaded emitter followers which supply 28 VDC to the T/R relays in the T-827( )/URT. However, if the tuning motor is energized or the ground keyline interlock signal from the AN/URA-38 is present, the cathode of diode gate CR17 is grounded. This turns off 28 VDC switch Q8-Q9, preventing the T-827( )/URT from being keyed.

4-86. A ground keyline interlock input from the AN/URA-38 or a ground input from the tuning circuit (paragraph 4-107) lowers the voltage at the base of key interlock Q4 by virtue of divider R11-R10. This saturates key interlock Q4, preventing key driver Q5 from conducting even if the keyline is grounded. In addition, a key interlock signal is supplied through diode CR12 to the bias power supply to cut off PPC amplifier 1A1A6Q3 (paragraph 4-96). Thus, for both of these reasons the AM-3924(P)/URT can not be keyed. If an overload occurs, the overload circuit turns transistor Q4 on through resistor R5 and diode CR5, again preventing keying of the set so long as the overload circuit is latched up. Key interlock Q4 is also energized when the Overload switch is set at RESET, so the unit can not be forced to operate under overload conditions by holding the Overload switch in the RESET position. Diode CR9 drops the bias needed to turn on transistor Q4 by an additional 0.3 volts below 11 volts, ensuring that transistor Q4 will be solidly cut off until one of the key interlock inputs is energized.

4-87. TEST DATA.

4-88. Pertinent references and applicable test data for the keying circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

c. Printed Circuit Board 1A1A5, Component and Test Point Locations, Figure 5-15.

d. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram. Figure 4-22.

e. System Keying and Key Interlock Circuitry, Servicing Block Diagram. Figure 4-27.

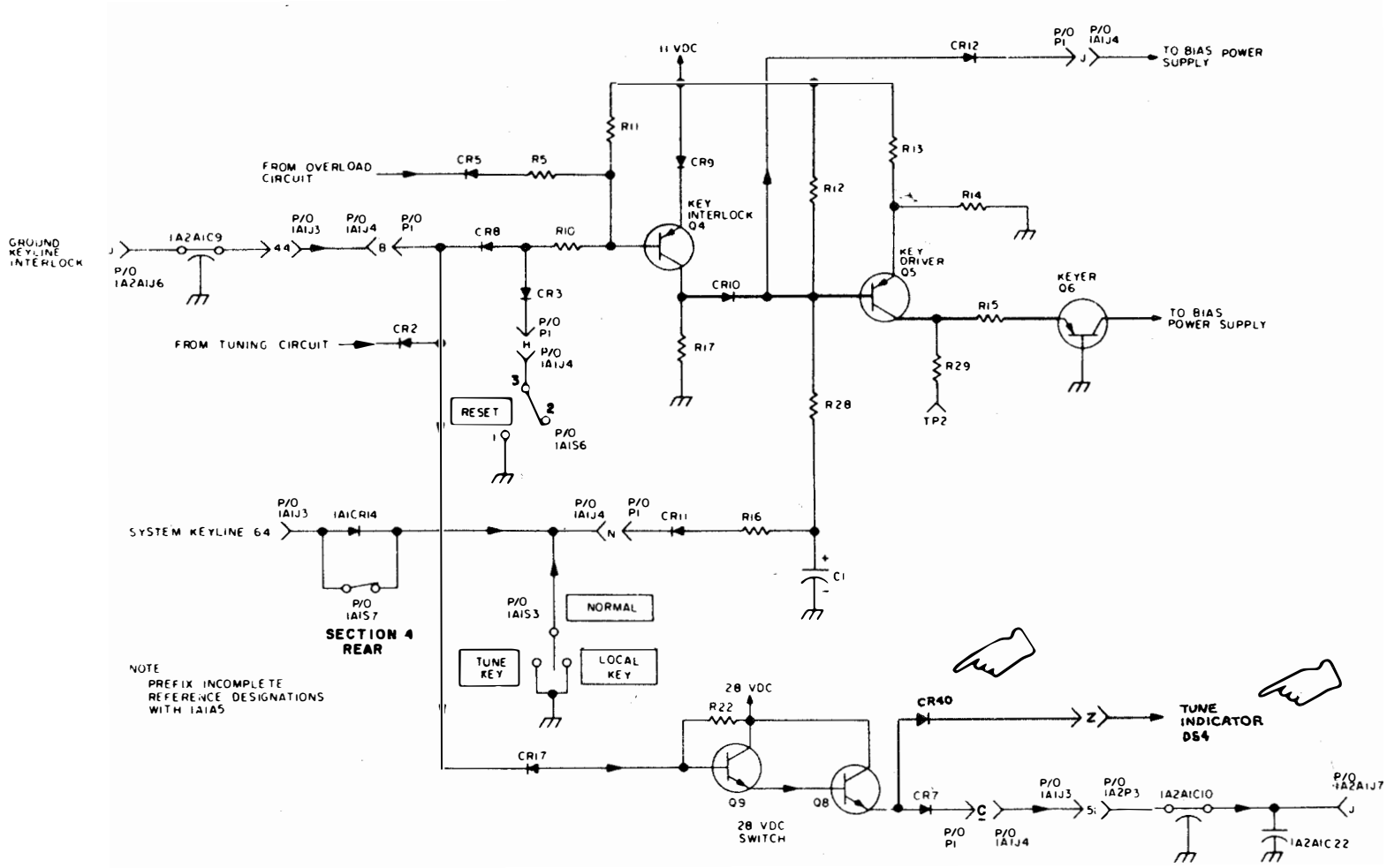


Figure 4-8. Keying Circuit, Simplified Schematic Diagram

f. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) PC Board Extender 1A1MP81, 1A1MP96.

g. Transistor DC Voltage Measurements, Table 5-6.

4-89. BIAS POWER SUPPLY.

4-90. GENERAL.

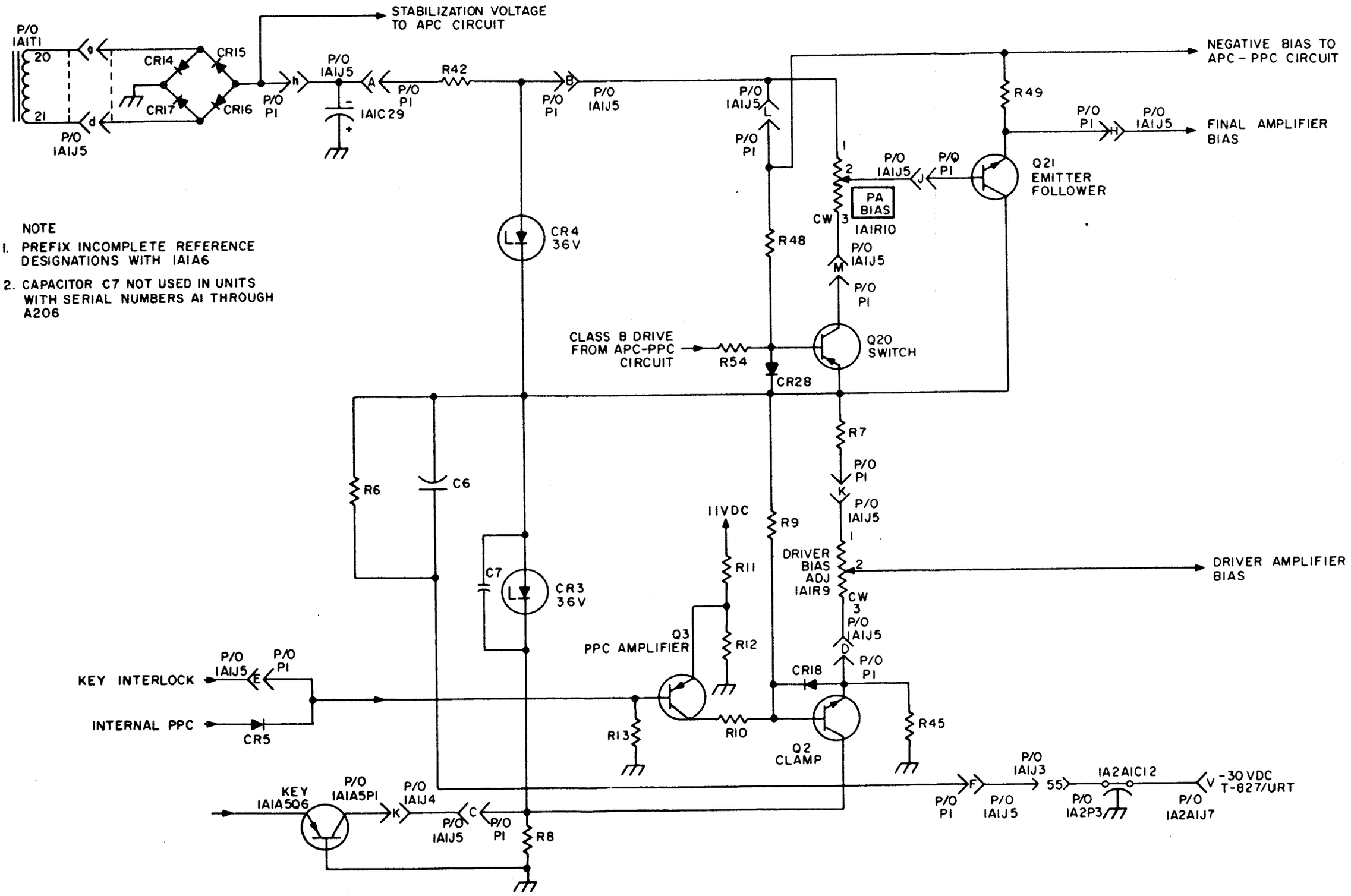
4-91. The bias power supply (figure 4-9) consists of a full-wave bridge rectifier and filter, a voltage regulator and divider, and various switching circuits. The function of this circuit is to provide the required grid bias voltages for operation of the electron tubes. Until the system is keyed, the outputs from the bias power supply are at the correct level to bias the electron tubes beyond cutoff. When the system is keyed, the bias voltages change to the values required to establish proper plate currents in the electron tubes according to the mode of operation. That is, the final amplifier bias is changed to the value required for class AB_1 operation of the tubes during voice operation or to the value required for class B operation during CW or FSK operation. The value of driver bias is such that the tubes operate class A. However, the driver bias can be controlled by the PPC circuit according to the AM-3924(P)/URT RF power output requirements (internal PPC).

4-92. CIRCUIT DESCRIPTION.

4-93. The output from winding 20-21 of transformer 1A1T1 is full-wave rectified by diodes CR14 through CR17, filtered by capacitor 1A1C29, and applied to a voltage regulator and divider circuit consisting of current limiting resistor R42, Zener diodes CR4 and CR3, and resistor R8. When the system is keyed, transistor 1A5Q6 of the keying circuit (paragraph 4-79) shorts out resistor R8, grounding the bottom side of the voltage regulator. In any mode of operation, except CW and FSK, switch Q20 is conducting into saturation, connecting the bottom of PA BIAS potentiometer 1A1R10 to -36 volts. Therefore, PA BIAS control 1A1R10 can be adjusted over the normal class AB_1 range of operating bias for the final amplifier tubes. The output from PA BIAS control 1A1R10 is applied through transistor Q21 to the final amplifier tubes by emitter follower action. During CW or FSK operation, a positive output from the APC-PPC circuit (paragraph 4-66) turns switch Q20 off. Due to the high collector-emitter impedance of transistor Q20 in this condition, the adjustment range of the PA BIAS control is insignificant, essentially causing the full output from the regulator-divider circuit (-72 volts) to be applied by the emitter follower action of transistor Q21 to the final amplifier tubes. Diode CR28 protects switch Q20 against excessive reverse base-emitter voltage. Emitter follower Q21 is used to allow grid current to be drawn by the amplifier tubes without losing regulation. That is, during class B operation, a larger amount of drive is required in order to obtain the rated output from the AM-3924(P)/URT. This can result in a small amount of grid current. If emitter follower Q21 were not used, this current would create a voltage drop across PA BIAS control 1A1R10, thus destroying the regulation and biasing the tubes further toward cutoff. However, with emitter follower Q21 in the circuit, the grid current is now drawn through the small collector-emitter resistance of the transistor resulting in essentially no shift of the bias voltage.

4-94. During normal operation with the T-827( )/URT, PPC amplifier Q3 is conducting sufficiently to turn on clamp Q2 into saturation. Therefore, the one end of Driver Bias Adj 1A1R9 is clamped to ground through transistors Q2 and 1A5Q6. In this condition, the potentiometer can be adjusted over the normal range of class A operating bias for the driver amplifier electron tubes (0 to -24 VDC).

4-95. When the system is not keyed, the short is removed from across resistor R8. The voltage drop that appears across the resistor in this condition drives the bias voltages for the four electron tubes into the cutoff region. Thus, the AM-3924(P)/URT is keyed on and off through the bias voltages applied to the four electron tubes. Resistor R45 is a pull-down resistor which prevents the cutoff bias applied to the driver tubes from exceeding the grid-to-cathode voltage rating.



NOTE

1. PREFIX INCOMPLETE REFERENCE DESIGNATIONS WITH 1AIA6
2. CAPACITOR C7 NOT USED IN UNITS WITH SERIAL NUMBERS AI THROUGH A206

Figure 4-9. Bias Circuit, Simplified Schematic Diagram

4-96. Normally, the APC-PPC output to the T-827( )/URT maintains the output power at 1 KW (paragraph 4-66). However, if there is a failure in the T-827( )/URT APC-PPC circuits, the PPC voltage will rise beyond its normal level in an attempt to reduce the output power. This increasing level is applied through isolation diode CR5 to gradually cut off PPC amplifier Q3. As the voltage at the collector of PPC amplifier Q3 falls (becomes more negative), so also does the base voltage of clamp Q2. By emitter follower action, then, the voltage at the bottom of Driver Bias Adj potentiometer 1A1R9 also falls, reducing the gain of the driver tubes until proper power output is obtained. Diode CR18 keeps any reverse base-to-emitter voltage at clamp Q2 from exceeding safe limits. If an overload occurs, or the tuning motor is energized, the keying circuit produces a key interlock signal (paragraph 4-79) that is applied to the base of PPC amplifier Q3. This cuts off transistor Q3, and clamp Q2. Therefore, the driver electron tubes will be biased at cutoff preventing operation until tuning is complete or the reason for the overload is removed. Resistor R6 and Capacitor C6 determine the amplitude and duration of the negative pulse applied to the -30 VDC lead to the T-827( )/URT to suppress turn-on transients when the exciter is keyed. (Refer to applicable T-827( )/URT technical manual referenced in table 1-1.)

4-97. TEST DATA.

4-98. Pretinent references and applicable data for the bias power supply are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

c. Printed Circuit Board 1A1A6, Component and Test Point Locations, Figure 5-16.

d. Driver Bias Adjustment Procedure, Paragraph 5-5.

e. Radio Frequency Amplifier AM-3924(P)/URT, DC power Control, Servicing Block Diagram, Figure 4-24.

f. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) PC Board Extender 1A1MP81, 1A1MP96.

g. Transistor DC Voltage Measurements, Table 5-6.

4-99. OVERLOAD CIRCUIT.

4-100. GENERAL.

4-101. The overload circuit (figure 4-10) consists of an overload detector, a 20 VDC switch, and various gates, switches, and indicators. The function of this circuit is to monitor the cathode current of the two final amplifier tubes, the RF output voltage from the final amplifier tubes, the flow of cooling air, and the temperature of the PP-3916/UR. If any of these are abnormal the overload circuit trips, unkeying the system and energizing an indicator lamp and alarm to provide visual and audible indication of the overload condition. The circuit can be reset by a front panel switch.

4-102. CIRCUIT DESCRIPTION.

4-103. Four inputs to the circuit are used to monitor for an overload condition as follows:

a. The RF output voltage from the plates of the final amplifier tubes is sampled by capacitive voltage divider C35-C36, detected by diode CR13, and developed across base resistor A5R8. Resistor R20 completes the DC path for diode CR13. Capacitor C37 is an RF bypass capacitor.

b. The voltage developed across the cathode resistor for final amplifier tube V1 is applied to base resistor A5R8 through RF decoupling network R7-C27-A5C5 and OR gate A5CR15.

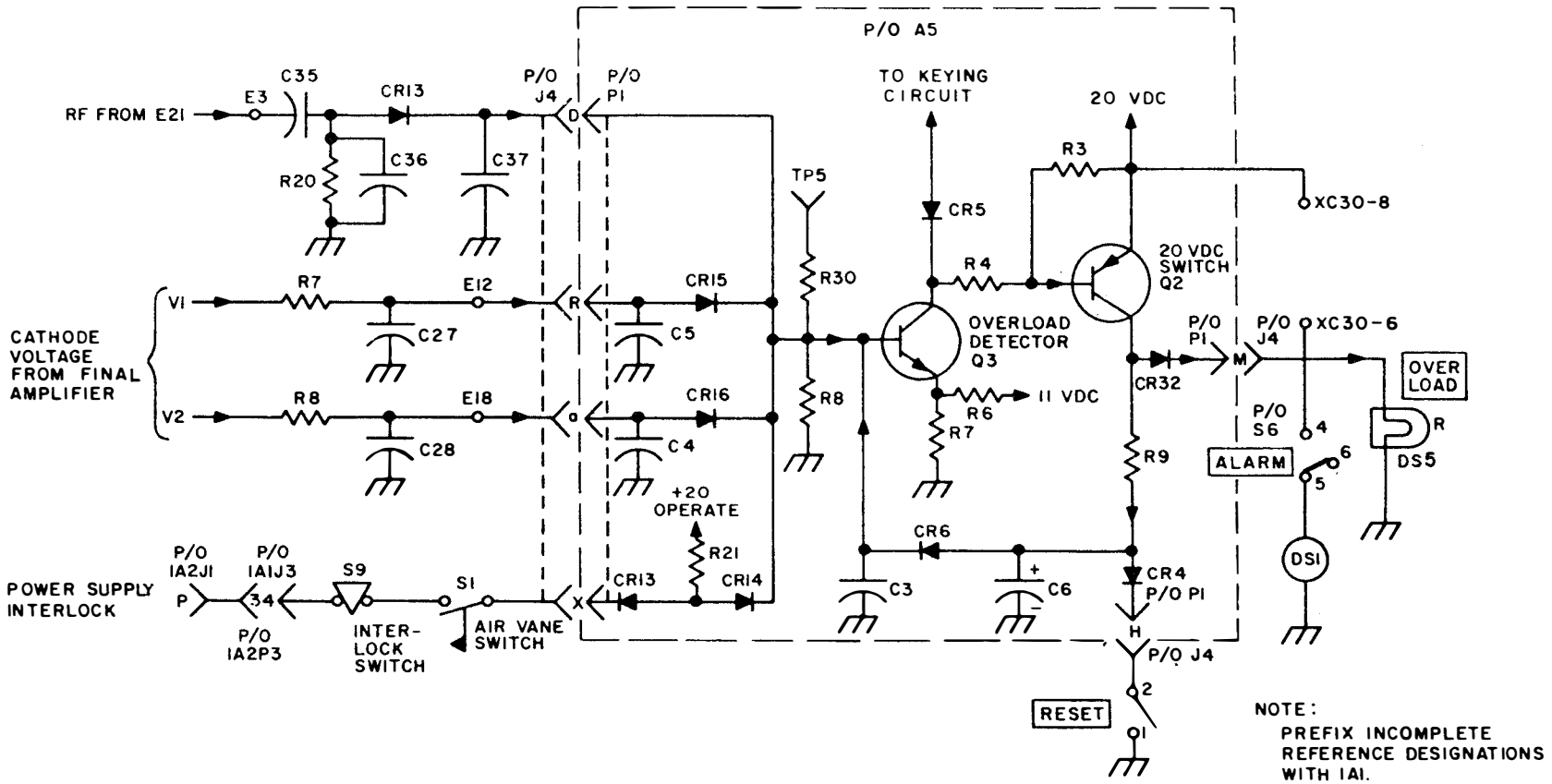


Figure 4-10. Overload Circuit, Simplified Schematic Diagram

c. The voltage developed across the cathode resistor for final amplifier tube V2 is applied to base resistor A5R8 through RF decoupling network R8-C28-A5C4 and OR gate A5CR16.

d. When the temperature of the PP-3916/UR is within safe limits and cooling air is being circulated through the AM-3924(P)/URT, ground is applied through the thermal switch in the PP-3916/UR, HV interlock switch S9, and air vane switch S1 to the cathode of diode A5CR13. Therefore, the full 20 VDC applied to resistor R21 is dropped across that resistor. If the thermal switch in the PP-3916/UR opens (temperature overload), if the cover is removed from the final amplifier (opening interlock switch S9), or if air vane switch S1 opens (air flow interrupted), the ground path to the cathode of diode A5CR13 is broken. This allows part of the 20 VDC to be developed across base resistor A5R8 through OR gate A5CR14.

4-104. When the voltage on any one of the input lines exceeds the threshold voltage developed by resistors A5R6 and A5R7, overload detector A5Q3 is forward biased. This turns on 20 VDC switch A5Q2. Capacitor C3 is an RF bypass. Transistor A5Q3 also draws enough current from the keying circuit through isolating diode A5CR5 to energize the key interlock circuit (paragraph 4-79) to prevent keying of the set. Diode A5CR5 prevents key interlock signals from tripping the overload circuit. Resistor A5R3 maintains 20 VDC switch A5Q2 cut-off when overload detector A5Q3 is not energized. When 20 VDC switch A5Q2 energizes, overload detector A5Q3 is locked on through diode A5CR6. Also, 20 VDC is applied through diode A5CR32 to OVERLOAD indicator lamp DS5 and through switch S6 (when set at ALARM) to overload alarm DS1. This energizes both the alarm and indicator, providing both visual and audible indication that an overload exists. Resistor A5R9 and capacitor A5C6 provide a millisecond delay in the latching of the circuit allowing extremely short overloads to pass without unkeying the system. Once energized, the overload circuit will remain on until primary power is removed or Overload switch S6 is momentarily set at RESET. When Overload switch S6 is set at RESET, clamp A5CR6 is disabled. If the overload was of a momentary nature, the overload circuit will be reset, releasing the key interlock and allowing operation to be resumed. However, if the overload remains the circuit will again pick up and prevent operation until the overload is located and removed.

4-105. TEST DATA.

4-106. Pertinent references and applicable test data for the overload circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

c. Printed Circuit Board 1A1A5, Component and Test Point Locations, Figure 5-15.

d. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram, Figure 4-22.

e. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

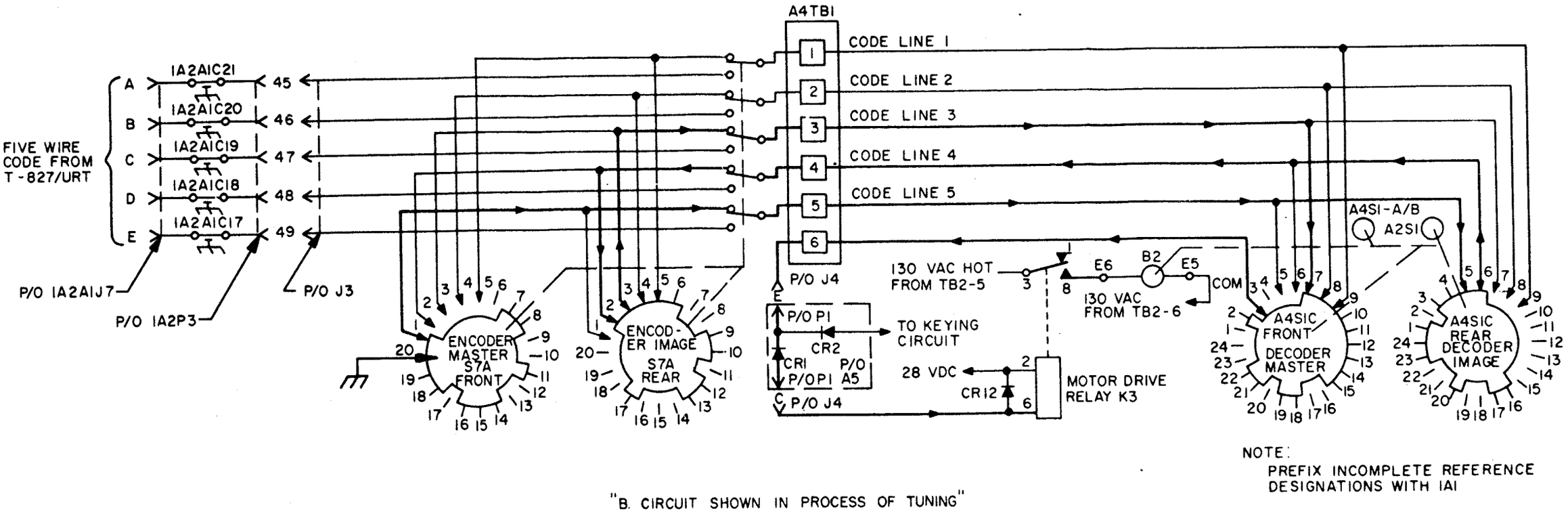
(2) PC Board Extender 1A1MP81, 1A1MP96.

f. Transistor DC Voltage Measurements, Table 5-6.

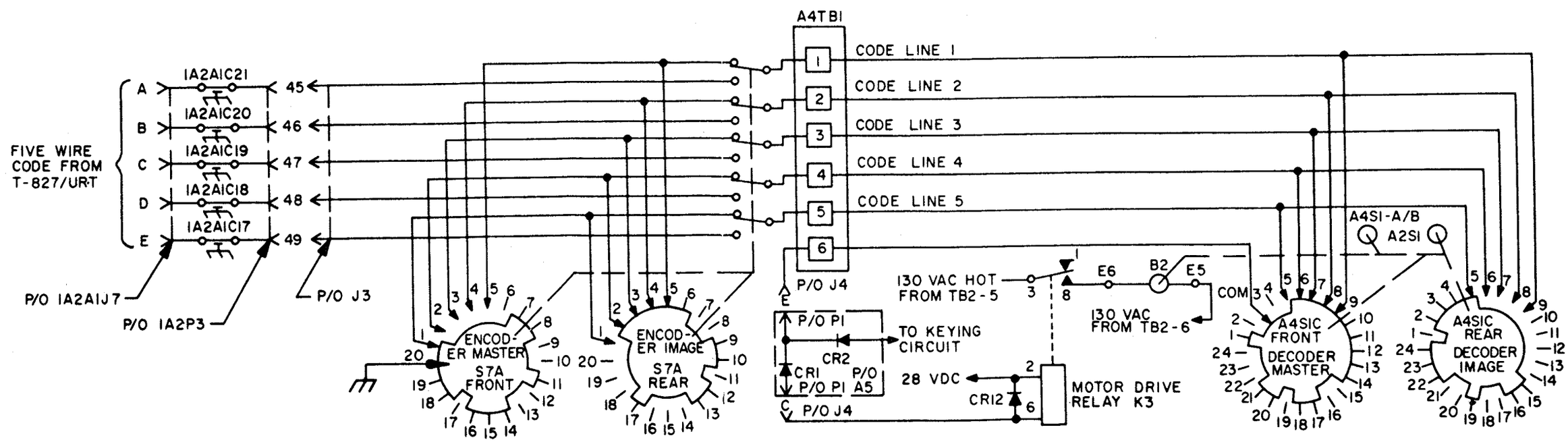
4-107. TUNING CIRCUIT.

4-108. GENERAL.

4-109. The tuning circuit (figure 4-11) consists of a decoder, an encoder, two bandswitches, a motor, a motor relay, and a gating circuit. The function of this circuit is to automatically position the bandswitches in the final and driver transformer assemblies according to the selected operating frequency.



"B. CIRCUIT SHOWN IN PROCESS OF TUNING"



"A. CIRCUIT SHOWN POSITIONED TO THE 2.0 TO 2.5 MC BAND"

Figure 4-11. Tuning Circuit, Simplified Schematic Diagram

4-110. CIRCUIT DESCRIPTION.

4-111. An open-seeking circuit that employs a five-wire coding scheme is used to automatically position the bandswitch assemblies in the driver and final transformer assemblies according to the selected operating frequency (paragraphs 4-33 and 4-42). Nineteen bands are used to cover the 2.0 to 30.0 MHz frequency range, and thus nineteen different five-wire codes are required for tuning (Table 4-1). The code is generated either externally (FREQUENCY MC switch S7 set at AUTOMATIC) by an encoder in the T-827( )/URT or internally by an encoder deck in switch S7 (FREQUENCY MC switch S7 set at one of the nineteen MC positions). In either case, a series of opens and grounds is applied to the five code lines, through which the code is connected to decoder switch deck A4S1C. This establishes a ground path through contact 3 of A4S1C-front, terminal 6 of A4TB1, gate A5CR1, to pin 6 of motor drive relay K3. Since pin 2 of relay K3 is at 28 VDC, relay K3 energizes, connecting 170 VAC, 60 Hz, to motor B2. The motor rotates the decoder switch and the two bandswitches until the decoder code is the complement of the code generated by the encoder. At this time, the ground path to relay K3 is broken, de-energizing motor B2.

TABLE 4-1. TUNING CODE CHART

BAND	CODE LINES*					BAND	CODE LINES*				
	1	2	3	4	5		1	2	3	4	5
2.0 to 2.5	0	0	0	0	1	10.0 to 12.0	1	1	1	0	0
2.5 to 3.0	0	0	0	1	1	12.0 to 14.0	1	1	0	0	1
3.0 to 3.5	0	0	1	1	1	14.0 to 16.0	1	0	0	1	0
3.5 to 4.0	0	1	1	1	1	16.0 to 18.0	0	0	1	0	0
4.0 to 5.0	1	1	1	1	0	18.0 to 20.0	0	1	0	0	1
5.0 to 6.0	1	1	1	0	1	20.0 to 22.0	1	0	0	1	1
6.0 to 7.0	1	1	0	1	1	22.0 to 24.0	0	0	1	1	0
7.0 to 8.0	1	0	1	1	1	24.0 to 26.0	0	1	1	0	0
8.0 to 10.0	0	1	1	1	0	26.0 to 28.0	1	1	0	0	0
						28.0 to 30.0	1	0	0	0	0

*0 = OPEN 1 = GROUND

4-112. Both the encoder and the decoder consist of a "master" section and an "image" section which is the mirror image of the master. The image sections are required to complete the ground path in certain combinations of encoder-decoder position (paragraph 4-113).

4-113. Figure 4-11A shows the circuit tuned for an operating frequency in the 2.0 to 2.5 MC band This can be seen by noting that decoder master A4S1C pattern (1, 1, 1, 1, 0) is the complement of encoder master S7A pattern (0, 0, 0, 0, 1). Suppose, however, that the AM-3924(P)/URT had previously been tuned to the 2.5 to 3.0 MC band (one position clockwise), and that FREQUENCY MC switch S7 has just been set at the 2.0 to 2.5 MC band (figure 4-11B). In this situation contacts 3 and 7-8-9 of the decoder master are connected, but this does not complete the ground path to relay K3 since code lines 1 through 3 are not grounded by encoder S7 master. Instead, the ground path is provided through the image decks: from S7A-20 front to S7A-1 front to A4S1C-5 rear to A4S1C-6 rear to S7A-2 rear to S7A-3 rear to A4S1C-7 front to A4S1C-3 front to terminal 6 of the relay. Thus the relay energizes and motor B2 turns the decoder and bandswitches. The masters and images ensure that there will always be a ground path for any combination of encoder and decoder positions until the decoder reaches the unique position corresponding to that of the encoder.

4-114. TEST DATA.

4-115. Pertinent references and applicable data for the tuning circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-6909( )/URT, Case, Schematic Diagram, Figure 5-30.

c. Driver Transformer Assembly 1A1A4, Schematic Diagram, Figure 5-29.

d. Driver Transformer Assembly 1A1A4, Component and Test Point Locations, Figure 5-14.

e. Radio Frequency Amplifier AM-3924(P)/URT, Bottom View, Component Locations, Figure 5-8.

f. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram, Figure 4-22.

g. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

4-116. MULTIPURPOSE METER CIRCUIT.

4-117. GENERAL.

4-118. The multipurpose meter circuit (figure 4-12) consists of a meter, switch, detector circuit, and various voltage dividers. The function of this circuit is to allow the important parameters of the amplifier to be monitored.

4-119. CIRCUIT DESCRIPTION.

4-120. Eight parameters are monitored as follows:

a. When the Multipurpose meter switch is set at DRIVER 2 AMPERES, the voltage developed across resistor A1R1 by the cathode current of electron tube A1V2 is applied through calibrating resistor A1R3 and contacts 1 and 9 of switch S5 to meter M1. Therefore, the cathode current of electron tube A1V2 can be measured or monitored. Capacitor A1C13 is an RF bypass.

b. When the Multipurpose meter switch is set at DRIVER 1 AMPERES, the voltage developed across resistor A1R2 by the cathode current of electron tube A1V1 is applied through calibrating resistor A1R4 and contacts 2 and 9 of switch S5 to meter M1. Therefore, the cathode current of electron tube A1V1 can be measured or monitored. Capacitor A1C14 is an RF bypass.

c. When the Multipurpose meter switch is set at PA PLATE 2 AMPERES, the voltage developed across resistor R27-R28 by the cathode current of electron tube V2 is applied through calibrating resistor R4 and contacts 3 and 9 of switch S5 to meter M1. Therefore, the cathode current of electron tube V2 can be monitored or measured. Capacitor C19 is an RF bypass.

d. When the Multipurpose meter switch is set at PA PLATE 1 AMPERES, the voltage developed across resistor R25-R26 by cathode current of electron tube V1 is applied through calibrating resistor R3 and contacts 4 and 9 of switch S5 to meter M1. Therefore, the cathode current of electron tube V1 can be monitored or measured. Capacitor C7 is an RF bypass.

e. The RF input to the AM-3924(P)/URT is coupled by capacitor A1C18 to voltage doubler-detector circuit A1CR1-CR2. The negative peaks of the RF input signal are clamped to ground by diode A1CR2. The positive peaks of the RF input signal are then detected by diode A1CR1, filtered by capacitor A1C17, and developed across base resistor A6R4, resulting in a DC signal equal to the peak-to-peak input voltage. Emitter follower A6Q1 provides the current gain required to operate the meter. Its output is applied through dropping resistor A6R3 and contacts 5 and 9 of switch S5 to meter M1. When When Multipurpose meter switch S5 is set at INPUT POWER 0-150 MW, meter M1 indicates RF input

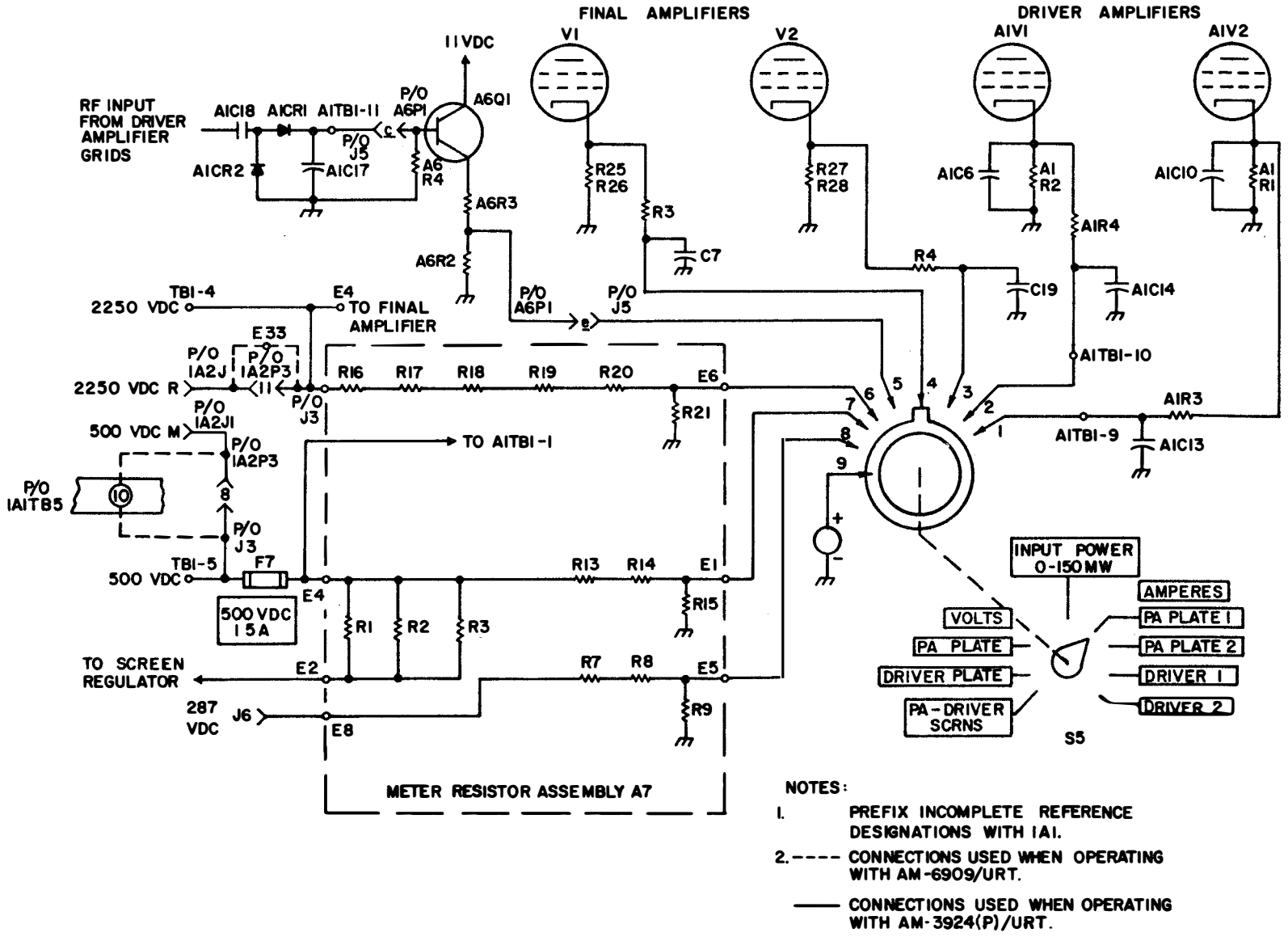


Figure 4-12. Metering Circuit, Simplified Schematic Diagram

voltage on a scale calibrated in terms of RF power. Resistor A6R2 serves as a load for transistor A6Q1 when switch S5 is in some other position.

f. The 2250 VDC output from the PP-3916/UR (1A2J1-R) or PP-3917/UR (TB1-4) is applied to the plates of final amplifier electron tubes V1 and V2 and to meter dropping resistors A7R16 through A7R20. Therefore, the plate voltage for the final amplifier tubes can be measured or monitored when the Multipurpose meter switch is set at PA PLATE VOLTS. Resistor A7R21 prevents the voltage at terminal A7E6 from rising to 2250 VDC when switch S5 is not set at PA PLATE VOLTS.

g. The 500 VDC output from the PP-3916/UR (1A2J1-M) or PP-3917/UR (TB1-5) is applied through fuse F7 to terminal 1 of A1TB1 for application to the plates of the driver amplifier electron tubes. The 500 VDC is also applied through the parallel connected current limiting resistors A7R1 through A7R3 to the screen regulator (paragraph 4-142) and to meter dropping resistors A7R13 and A7R14. Therefore, the plate voltage for the driver amplifier electron tubes can be measured or monitored when the Multipurpose meter switch is set at DRIVER PLATE VOLTS. Resistor A7R15 prevents the voltage at terminal A7E1 from rising to 500 VDC when switch S5 is not set at DRIVER PLATE VOLTS.

h. The 287 VDC at the J6 output of the screen voltage regulator is applied to meter dropping resistors A7R7 and A7R8. Therefore, the screen voltage to the final and driver amplifier electron tubes can be measured or monitored when the Multipurpose meter switch is set at PA-DRIVER SCRNS VOLTS. Resistor A7R9 prevents the voltages at terminal A7E5 from rising to 287 VDC when switch S5 is not set at PA-DRIVER SCRNS VOLTS.

4-121. TEST DATA.

4-122. Pertinent references and applicable data for the metering circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Printed Circuit Board Assembly 1A1A7, Component and Test Point Locations, Figure 5-17.

c. Driver Tube Assembly 1A1A1, Component and Test Point Locations, Figure 5-11.

d. Radio Frequency Amplifier AM-3924(P)/URT, Bottom View, Component Locations, Figure 5-8.

e. Radio Frequency Amplifier AM-6909( )/URT, Case, Schematic Diagram, Figure 5-30.

f. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram, Figure 4-22.

g. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) Signal Generator SG-582/U

h. Transistor DC Voltage Measurements, Table 5-6.

4-123. INITIAL TURN-ON CIRCUIT.

4-124. GENERAL.

4-125. The initial turn-on circuit (figure 4-13) consists of various transformers, switches, fuses, and jumpering schemes. The primary function of this circuit is to direct phases A and B of the primary power to the power supply for conversion to 115 volt, single phase primary power for the T-827( )/URT and AN/URA-38. The actual means of developing this power depends on whether the PP-3916/UR or PP-3917/UR is used with the system, i. e., whether the primary power is 60 or 400 Hz.

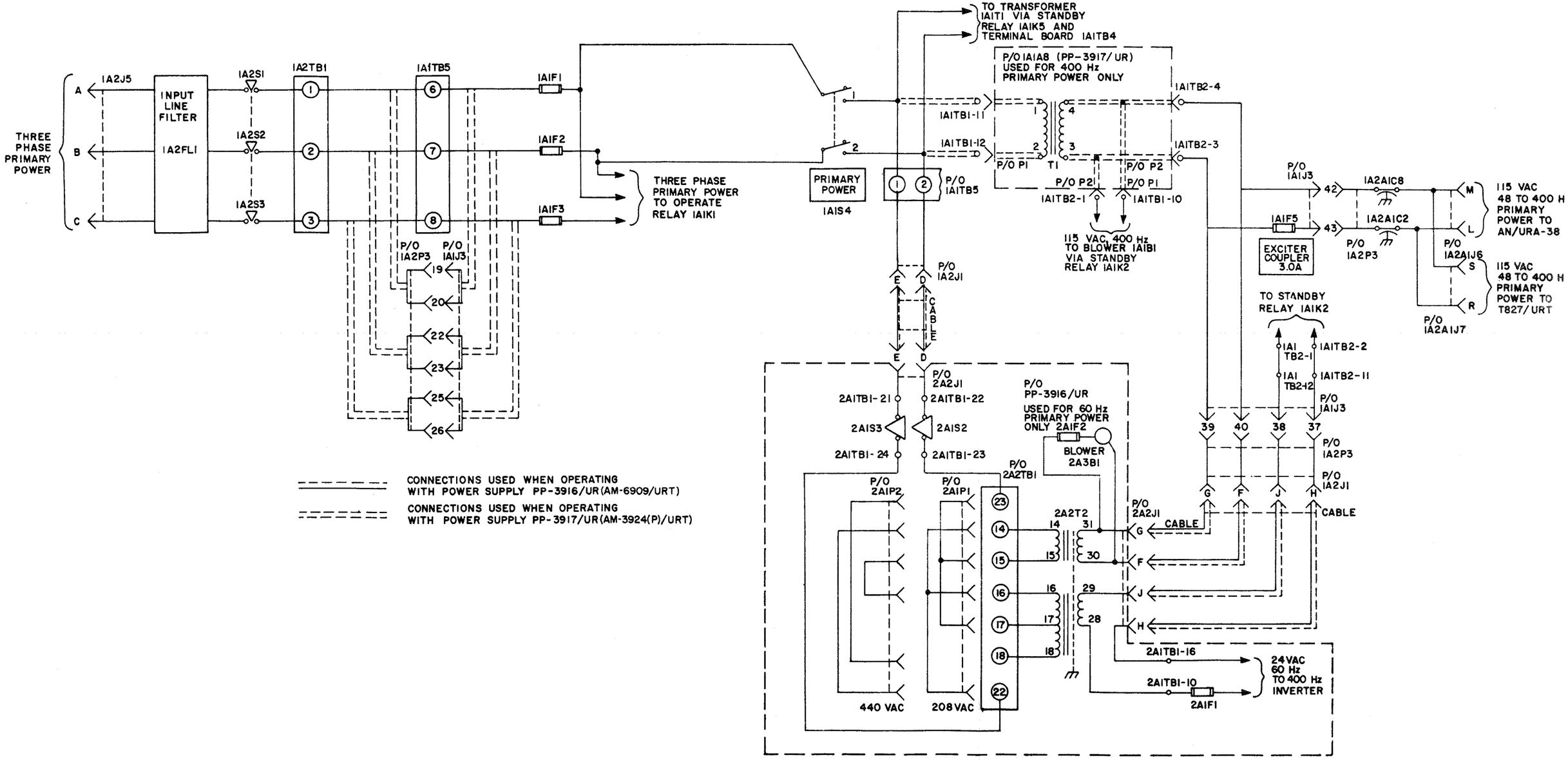


Figure 4-13. Initial Turn-On Circuit, Simplified Schematic Diagram

4-126. CIRCUIT DESCRIPTION.

4-127. When PRIMARY POWER switch 1A1S4 is set at ON, phases A and B of the primary power are applied to terminals 11 and 12 of terminal board 1A1TB1 (terminals 1 and 2 of 1A1TB5 in AM-6909/URT). The three phases are interlocked to prevent operation when the chassis is extended from the case. From terminal board 1A1TB1, phases A and B are applied (phase A through standby relay 1A1K5) to terminal board 1A1TB4 for connection to the internal power supply when the system is placed in standby (paragraph 4-132). Also, from terminal board 1A1TB1 (1A1TB5 in AM-6909/URT), phases A and B of the primary power are applied either to the PP-3916/UR or PP-3917/UR.

4-128. When the PP-3916/UR is used, phases A and B of the primary power are applied thru 2A2J1-E/D, and interlock switches S2/S3 to terminals 23 and 24 of the PP-3916/UR terminal board 2A1TB1. Both phases A and B are interlocked to prevent operation when the hinged front panel is opened. From terminal board 2A1TB1, phases A and B are applied through one of two jumpering schemes to the primary of transformer 2A2T2. The jumpering scheme used depends on whether the primary line-to-line voltage is 440 or 208. Transformer 2A2T2 has two 60 Hz outputs; 115 volts and 22.5 volts. The 115 volt AC output from winding 31-30 is applied to blower 2A3B1 and through the interconnecting cabling to the AM-6909/URT, from which it is supplied as primary power through connector 1A2AJ7 to the T-827( )/URT and through connector 1A2AJ6 to the AN/URA-38. The 24 volt AC output from transformer 2A2T2 is applied to the PP-3916/UR 400 Hz inverter.

4-129. When the PP-3917/UR is used, phases A and B of the primary power are jumpered through fanning strip 1A1A8P1 to the primary of transformer 1A1A8T1. The 115 VAC, 400 Hz, single phase output from transformer 1A1A8T1 is applied through fanning strip 1A1A8P2 to terminals 3 and 4 of the AM-3924(P)/URT terminal board 1A1TB2 and terminals 1 and 10 of terminal boards 1A1TB2 and 1A1TB1, respectively. From terminals 3 and 4 of terminal board 1A1TB2, the 115 volts is applied as primary power to the T-827( )/URT and AN/URA-38 through connectors 1A2A1J7 and 1A2A1J6, respectively. From terminal 10 of terminal board 1A1TB1 and terminal 1 of terminal board 1A1TB2, the 155 volt output is applied to the blower and indicator lights (paragraph 4-132), one side first being switched by standby relay 1A1K2.

4-130. TEST DATA.

4-131. Pertinent references and applicable data for the initial turn-on circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-6909/URT, Chassis, Schematic Diagram, Figure 5-26.

c. Radio Frequency Amplifier AM-3924(P)/URT, Case, Schematic Diagram, Figure 5-30A.

d. Radio Frequency Amplifier AM-6909/URT, Case, Schematic Diagram, Figure 5-30.

e. Power Supply PP-3916/UR, Schematic Diagram, Figure 5-32.

f. Power Supply PP-3917/UR, Schematic Diagram, Figure 5-31.

g. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

h. Radio Frequency Amplifier AM-3924(P)/URT, Case, Component Locations, Figure 5-18.

i. Radio Frequency Amplifier AM-6909/URT, Case, Component Locations, Figure 5-19.

j. Power Supply PP-3916/UR, Component Locations, Figure 5-21.

k. Power Supply PP-3917/UR, Component Locations, Figure 5-20.

l. Radio Frequency Amplifier AM-3924(P)/URT, DC Power Control, Servicing Block Diagram, Figure 4-24.

m. 60 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-25.

n. 400 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-26.

o. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

4-132. STANDBY POWER DISTRIBUTION CIRCUIT.

4-133. GENERAL.

4-134. The standby power distribution circuit (figure 4-14) consists of two relays, and various power supply and switching circuits. The function of this circuit is to produce all voltages required to operate the AM-3924(P)/URT, except the high voltages required by the electron tubes in the final and driver amplifiers.

4-135. CIRCUIT DESCRIPTION.

4-136. After initial turn-on has been accomplished at the AM-3924(P)/URT (paragraph 4-123) further control of the system is accomplished from the T-827( )/URT. When the T-827( )/URT Mode Selector switch is set at STDBY, the 28 VDC standby-operate from the T-827( )/URT is applied to standby relays 1A1K2 and 1A1K5. Since the other side of both standby relays is at ground, relays 1A1K2 and 1A1K5 energize. This connects phase A of the primary power through contacts of relay 1A1K5 to terminal 1 of terminal board 1A1TB4. (Phase B of the primary power was directly applied to terminal 13 of terminal board 1A1TB4 at the time that the PRIMARY POWER switch was set at ON (paragraph 4-123.) This line-to-line voltage is applied through one of three jumpering schemes to the primary windings of transformer 1A1T1. The exact jumpering scheme used depends on the line-to-line voltage of the primary power: 440, 208, or 115. Transformer 1A1T1 has six secondary windings: windings 24-25 and 22-23 provide the 6.0 VAC required by the filaments of the two electron tubes in the final amplifier. Winding 16-17 is used to produce the 13.5 VAC required by the filaments of the two electron tubes in the driver amplifier. Winding 18-19 produces the AC input voltage required by $\pm$ 12 VDC remote power supply (paragraph 4-158). Winding 13-14-15 produces the AC input voltage required by the 11, 20, 28 VDC power supply (paragraph 4-149). Winding 20-21 produces the AC input voltage required by the bias power supply (paragraph 4-89). In addition, if the primary power is 60 Hz, the 115 VAC output from winding 20-21 is applied through fanning strip 1A1P5 and terminal board 1A1TB2 to time elapsed meter 1A1B3. If the primary power is 400 Hz, the 28 VDC output from the 11, 20, 28 VDC power supply is applied through fanning strip 1A1A8P1 to the PP-3917/UR, 60 Hz inverter, which converts the 28 VDC to 155 and 170 VAC, 60 Hz power. The 155 VAC is applied through fanning strip 1A1A8P1 and terminal board 1A1TB2 to time elapsed meter 1A1B3, and the 170 VAC output from the 60 Hz inverter is applied through fanning strip 1A1A8P1 and terminal board 1A1TB2 to the tuning circuit. (When the primary power source is 60 Hz, 115 VAC is applied to the tuning circuit at the time of initial turn-on through terminals 3 and 4 of terminal board 1A1TB2 from the PP-3916/UR.) Therefore, regardless of the frequency of the primary power, the time elapsed meter and the tuning motor have the required 60 Hz power applied for operation.

4-137. The AM-3924(P)/URT indicator lamps and blower required 115 VAC, 400 Hz single phase power for operation. This power is developed when the system is placed in standby as follows. If the primary power source is 400 Hz, the 115 VAC, 400 Hz output from transformer 1A1A8T1 after initial turn-on (paragraph 4-123) is applied through contacts 3 and 8 of standby relay 1A1K2, terminal board 1A1A8P1, terminal board 1A1TB1, BLOWER 1.0A fuse 1A1F4 to one side of the blower and through operate relay 1A1K1 contacts 6 and 10 to STANDBY indicator 1A1DS2. Since the common side of the 115 VAC output from the PP-3917/UR is applied directly through fanning strip 1A1A8P1 and terminal board 1A1TB1 at the time of initial turn-on, the blower and STANDBY indicator lamp 1A1DS2 both energize, indicating that the system is in a standby condition.

4-138. If the primary power source is 60 Hz, the PP-3917/UR is not used and fanning strip 1A1A8P1 is connected. When the PP-3916 is used, the inverter is activated by slave relay 2A4K1. 24 VAC from 2A2T2 pins 28 and 29 is supplied to bridge rectifier CR4, CR5, CR6, and CR7 (thru F1). The DC output (typically 28 VDC) from this rectifier circuit is filtered by capacitor input filters (C2 and C3) and is applied to slave relay 2A4K1 to turn on the 400 Hz inverter thru contacts A1 and A2 of 2A4K1 (when tuned by relay contacts 1A1K2-3 and -8 are closed). Standby relay 1A1K2 is activated (contacts closed) in all modes selected at the T-827 function switch except OFF. When the PP-3916/UR

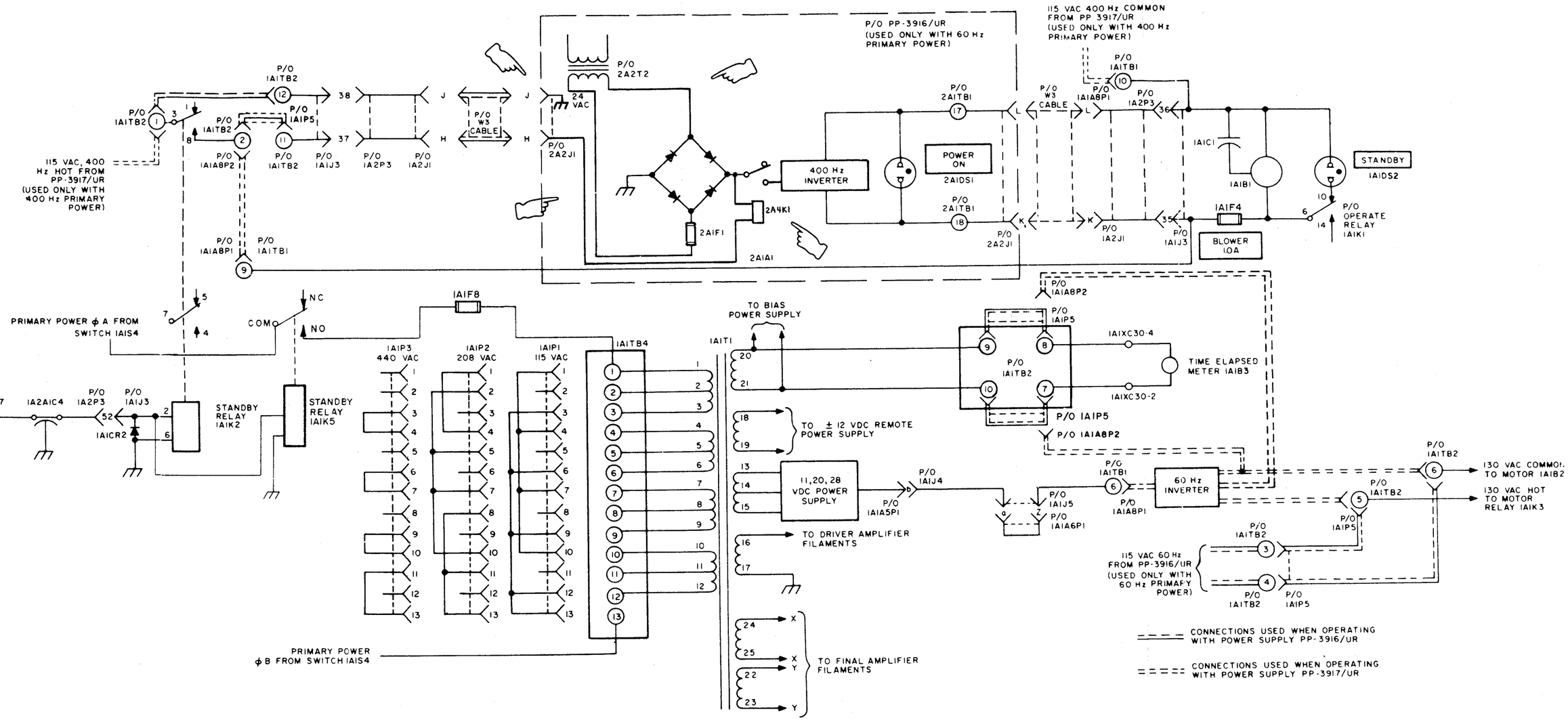


Figure 4-14. Standby Power Distribution Diagram

is used, 115 VAC, 400 Hz is produced by this unit. The 115 VAC, 400 Hz output produced by the inverter (paragraph 4-175) is applied to POWER ON INDICATOR LAMP 2A1DS1 and interconnecting cabling, to the AM-6909/URT STANDBY indicator lamp and blower. Therefore, the indicator lamps and blowers have 115 VAC, 400 Hz power switched to them at the time the system is placed in standby, regardless of the frequency of the primary power.

4-139. Thus, when the system is placed in standby, all voltages required for operation of the tuning, protection, control, filament, blower, indicator lamps, and time elapsed meter circuits are available. The only voltages not yet available are the high voltages required for powering the plates and screens of the electron tubes of the final and driver amplifiers (paragraph 4-142).

4-140. TEST DATA.

4-141. Pertinent references and applicable data for the standby power distribution circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-6909/URT, Chassis, Schematic Diagram, Figure 5-26.

c. Radio Frequency Amplifier AM-3924(P)/URT, Case, Schematic Diagram, Figure 5-30A.

d. Radio Frequency Amplifier AM-6909/URT, Case, Schematic Diagram, Figure 5-30.

e. Power Supply PP-3916/UR, Schematic Diagram, Figure 5-32.

f. Power Supply PP-3917/UR, Schematic Diagram, Figure 5-31.

g. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

h. Radio Frequency Amplifier AM-3924(P)/URT, Case, Component Locations, Figure 5-18.

i. Radio Frequency Amplifier AM-6909/URT, Case, Component Locations, Figure 5-19.

j. Power Supply PP-3916/UR, Component Locations, Figure 5-21.

k. Power Supply PP-3917/UR, Component Locations, Figure 5-20.

l. Radio Frequency Amplifier AM-3924(P)/URT, DC Power Control Servicing Block Diagram, Figure 4-24.

m. 60 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-25.

n. 400 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-26.

4-142. OPERATE POWER DISTRIBUTION CIRCUIT.

4-143. GENERAL.

4-144. The operate power distribution circuit (figure 4-15) consists of two relays, a relay driver transistor, a regulator circuit and one of two high voltage power supplies, depending on the frequency of the primary power. The function of this circuit is to produce the 2250 and 500 VDC voltages required by the plate and screen circuits of the final and driver amplifiers.

4-145. CIRCUIT DESCRIPTION

4-146. When the T-827( )/URT Mode Selector switch is set at any of its operate positions, the 20 VDC operate from the T-827( )/URT is applied to the contacts of time delay relay 1A1K4. Three minutes after application of heater power, (when the system is placed in standby, paragraph 4-149) time delay

relay 1A1K4 energizes, allowing the 20 VDC to reach voltage divider 1A1A5R19-20. The time delay is provided to allow the cathodes of the electron tubes to reach operating temperature (prior to application of plate and screen voltages). Since the emitter of relay driver 1A1A5Q7 is at ground through the power supply interlock line (paragraph 4-99), the voltage applied to divider 1A1A5R19-20 turns relay driver 1A1A5Q7 on into saturation, effectively grounding terminal 2 of relay 1A1K1. This energizes operate relay 1A1K1. Therefore, three phase primary power is applied to terminals 1, 2, and 3 of terminal board 1A1TB1 (1A1TB5 in AM-6909/URT), from which it is applied to either the 60 Hz or 400 Hz high voltage power supply, depending on the frequency of the primary power. In either case, the high voltage power supply converts the three phase primary power to 2250 VDC and 500 VDC. These DC voltages are applied to the plate circuits of the electron tubes in the final and driver amplifiers, respectively. The 500 VDC is regulated to provide screen voltages in 6.2 volt steps between 287 and 318 VDC for both the final and driver amplifiers. Energizing operate relay 1A1K1 also extinguishes the STANDBY indicator lamp and in its place energizes the OPERATE indicator lamp.

4-147. TEST DATA.

4-148. Pertinent references and applicable data for the operate power distribution circuit are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Radio Frequency Amplifier AM-6909/URT, Chassis, Schematic Diagram, Figure 5-26.

c. Radio Frequency Amplifier AM-3924(P)/URT, Case, Schematic Diagram, Figure 5-30A.

d. Radio Frequency Amplifier AM-6909/URT, Case, Schematic Diagram, Figure 5-30.

e. Power Supply PP-3916/UR, Schematic Diagram, Figure 5-32.

f. Power Supply PP-3917/UR, Schematic Diagram, Figure 5-31.

g. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations, Figure 5-7.

h. Printed Circuit Board 1A1A5, Component and Test Point Locations, Figure 5-15.

i. Radio Frequency Amplifier AM-3924(P)/URT, Case, Component Locations, Figure 5-18.

j. Radio Frequency Amplifier AM-6909/URT, Case, Component Locations, Figure 5-19.

k. Power Supply PP-3916/UR, Component Locations, Figure 5-21.

l. Power Supply PP-3917/UR, Component Locations, Figure 5-20.

m. Radio Frequency Amplifier AM-3924(P)/URT, DC Power Control, Servicing Block Diagram, Figure 4-24.

n. 60 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-25.

o. 400 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-26.

p. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) PC Board Extender 1A1MP81, 1A1MP96.

q. Transistor DC Voltage Measurements, Table 5-6).

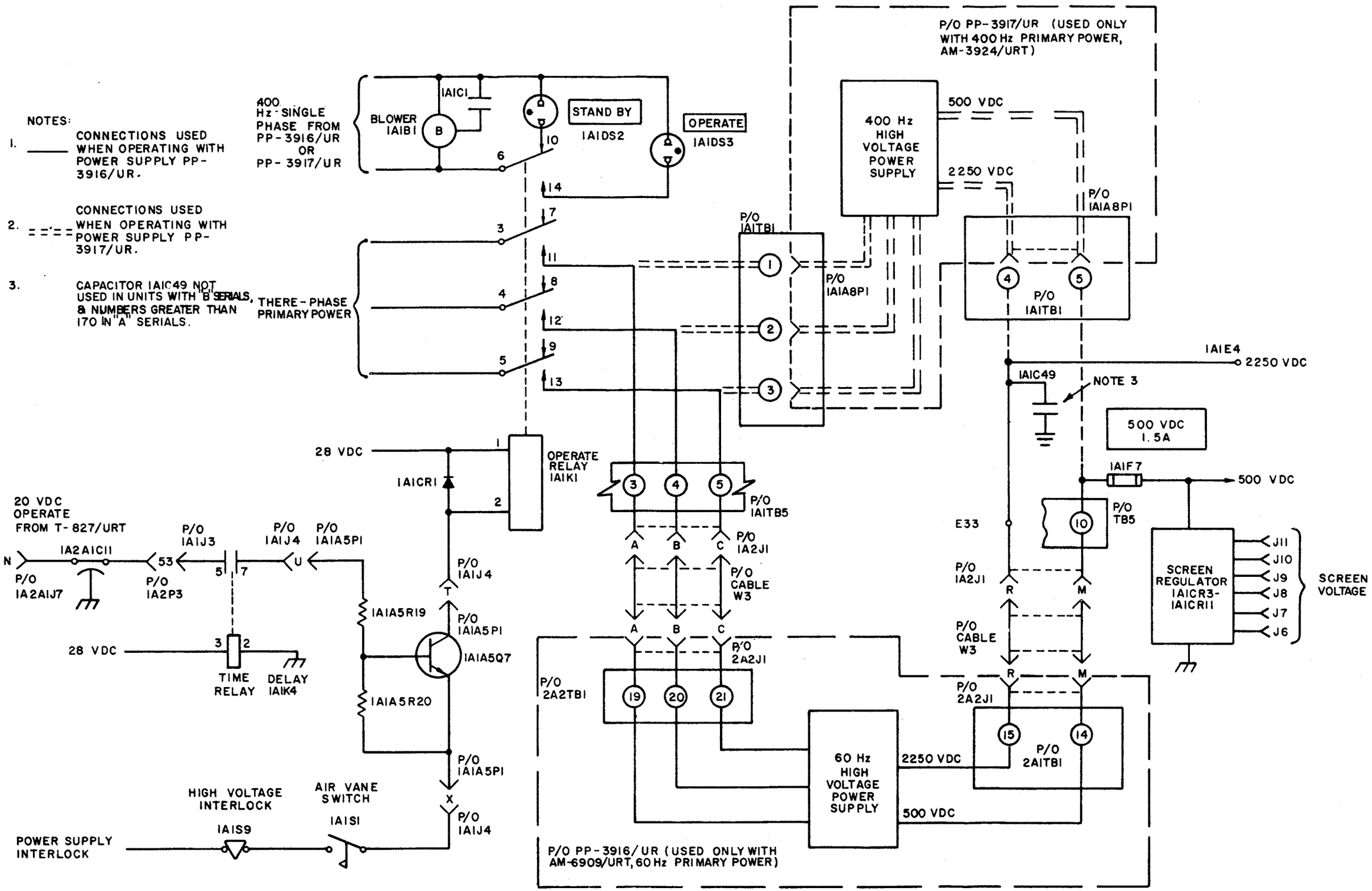


Figure 4-15. Operate Power Distribution Diagram

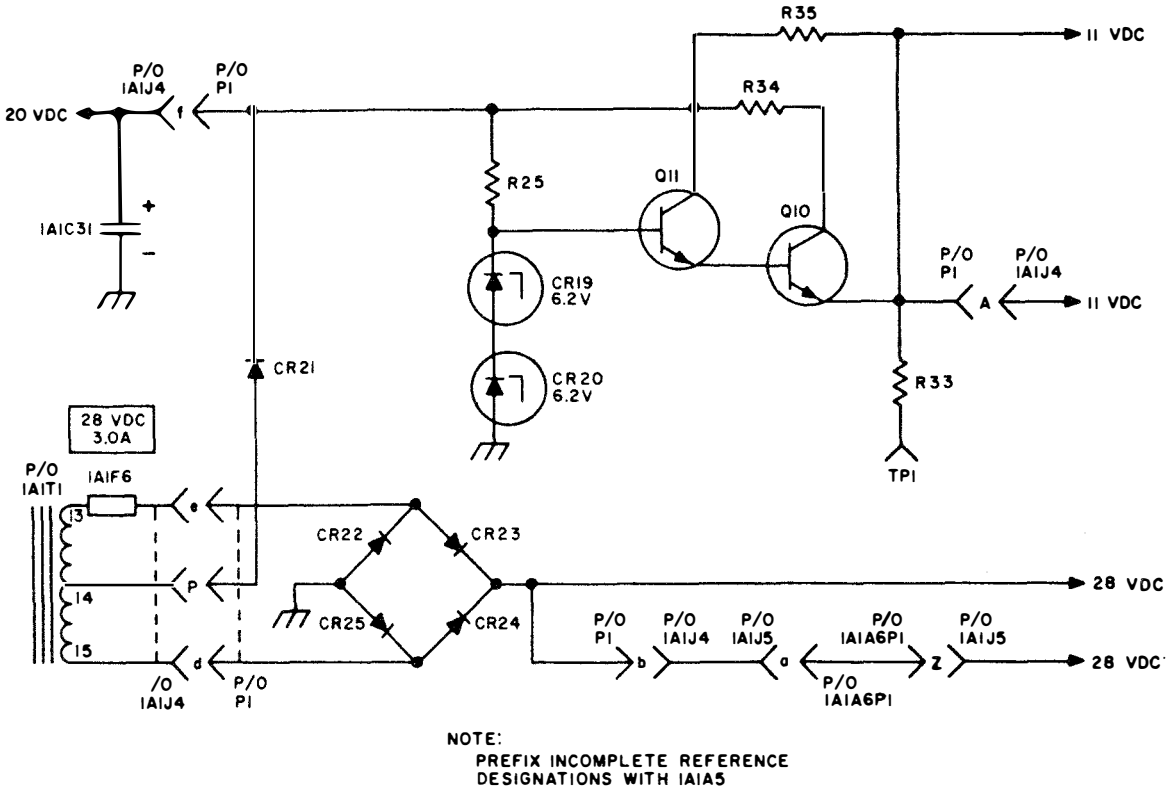


Figure 4-16. 11, 20, and 28 VDC Power Supply, Simplified Schematic Diagram

4-149. 11, 20, AND 28 VDC POWER SUPPLY.

4-150. GENERAL.

4-151. The 11, 20, and 28 VDC power supply (figure 4-16) consists of two full wave rectifiers, a regulator, and a filter. The function of these circuits is to produce all the low DC voltages required for operation of the AM-3924(P)/URT control circuits.

4-152. CIRCUIT DESCRIPTION.

4-153. The output from winding 13-15 of transformer 1A1T1 is full-wave rectified by diodes CR22 through CR25, producing an unfiltered VDC output whose average value is 28V. This voltage is used to energize the AM-3924(P)/URT relays and is applied through the 28 VDC switch circuit (paragraph 4-79), to energize the T-827( )/URT T/R relays. The 28 VDC connection to the relays is interlocked through pin b of connector P1 and 1A1J4 and pins A and Z of connectors 1A1J5 and 1A1A6P1. This interlock is provided so that the system can not be energized if either printed circuit board is removed from the equipment, therefore preventing operation in the absence of the control circuits. From pin Z of 1A1J5, the 28 VDC is applied to contact 3 of 1A1K4 time delay relay to initiate the three minute time delay for the heating of the electron tube filaments.

4-154. Since a bridge rectigier such as CR22 through CR25 always grounds whichever side of the transformer is instantaneously the negative side, the other side of the transformer (the side not grounded at any instant) must always be positive with respect to ground. Since terminal 14 of transformer 1A1T1 is the center-tap of a transformer which feeds a bridge rectifier, it follows that it also must always be positive with respect to ground, but with a voltage equal to one-half that of the full winding. Therefore, the voltage at terminal 14 is a full-wave rectified signal that is one-half of the full (28 VDC) output. Diode CR21 allows capacitor 1A1C31 to charge up to the peak value of the voltage

present at terminal 14. This constitutes the 20 VDC supply. Its output is applied to the 11 VDC regulator (paragraph 4-155), the overload circuit, and one contact of the elapsed time meter.

4-155. Voltage divider R25-CR19-CR20 provides a stable +12.4 VDC reference for the two emitter followers (Q11 and Q10) which constitute the 11 VDC regulator. The output voltage from the regulator is normally 11.2 VDC because 0.6 VDC is lost across each silicon transistor. Resistors R34 and R35 absorb some of the power which is dissipated by the regulator circuit, allowing the transistors to run cooler than would otherwise be possible.

4-156. TEST DATA.

4-157. Pertinent references and applicable test data for the 11, 20, and 28 VDC power supply are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Printed Circuit Board 1A1A5, Component and Test Point Locations, Figure 5-15.

c. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Location, Figure 5-7.

d. Radio Frequency Amplifier AM-3924(P)/URT, DC Power Control, Servicing Block Diagram, Figure 4-24.

e. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) PC Board Extender 1A1MP81, 1A1MP96.

f. Transistor DC Voltage Measurements, Table 5-6.

4-158. REMOTE ±12 VDC POWER SUPPLY.

4-159. GENERAL.

4-160. The remote ± 12 VDC power supply (figure 4-17) consists of a full wave rectifier filter, and a 3-pin Integrated Circuit voltage regulator. This circuit provides a floating regulated 12 VDC which is available at transmitter switchboard connector 1A2A1J2 for remote use.

4-161. CIRCUIT DESCRIPTION.

4-162. The output from winding 18-19 of transformer 1A1T1 is full wave rectified by diodes CR26 through CR29, filtered by capacitor 1A1C30, and applied to a voltage regulator IC1, a 7912KM series monolithic 3-terminal regulator, to achieve the desired regulation. This device incorporates built-in short circuit and thermal overload protection. Diodes CR60 and CR61 protect the IC against abnormal conditions, such as those created by component failure, or externally generated transients.

4-163. TEST DATA.

4-164. Pertinent reference and applicable test data for the remote ±12 VDC power supply are as follows:

a. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram, Figure 5-24.

b. Printed Circuit Board 1A1A5, Component and Test Point Locations, Figure 5-15.

c. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component and Test Point Locations, Figure 5-7.

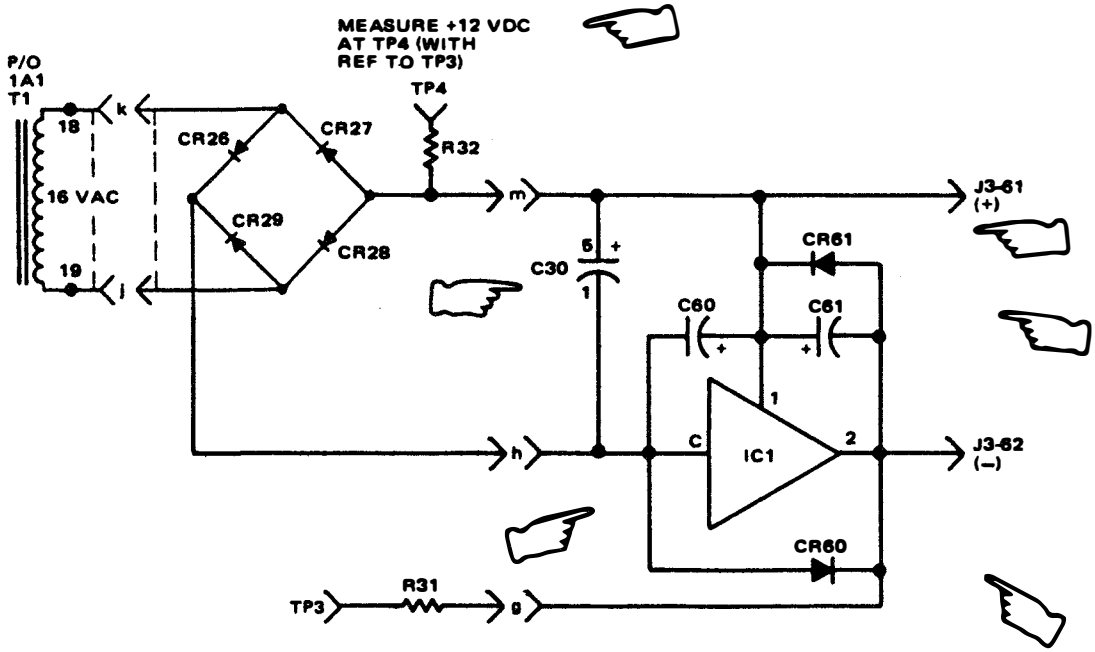


Figure 4-17. Remote ±12 VDC Power Supply, Simplified Schematic Diagram

d. Radio Frequency Amplifier AM-3924(P)/URT, DC Power Control, Servicing Block Diagram, Figure 4-24.

e. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

(2) PC Board Extender 1A1MP81, 1A1MP96.

f. Transistor DC Voltage Measurements, Table 5-6.

4-165. 60 Hz INVERTER.

4-166. GENERAL.

4-167. The 60 Hz inverter (figure 4-18) is a saturable core oscillator. The function of this circuit which forms a part of the PP-3917/UR, is to produce two single phase, 60 Hz outputs when the system is being operated from a 400 Hz primary power source: 155 VAC to power the time elapsed meter and 170 VAC to power the tuning motor.

4-168. CIRCUIT DESCRIPTION.

4-169. The 60 Hz inverter utilizes a saturable core transformer oscillator circuit to develop a square wave AC output from the 28 VDC input from the AM-3924(P)/URT internal power supply. When the AM-3924(P)/URT is set at standby, the 28 VDC supply is energized (paragraph 4-132 and 4-149). This voltage is applied through peak detecting diode CR1 and capacitor C1, putting about +37 volts on the

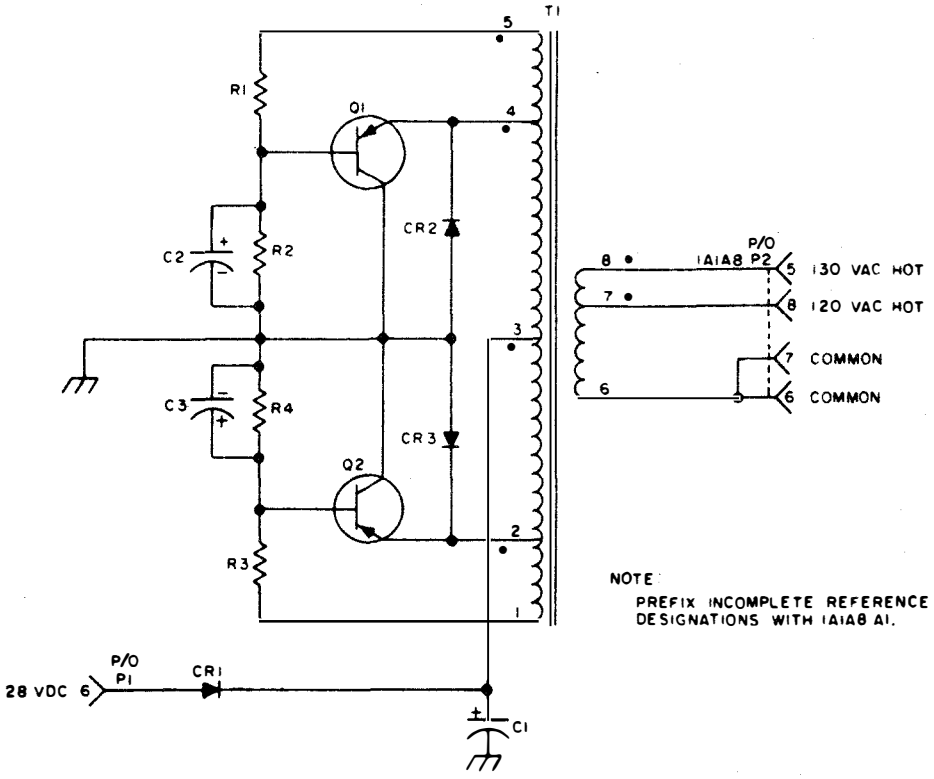


Figure 4-18. 60 Hz Inverter, Simplified Schematic Diagram

center tap of the primary winding (4-3-2) of transformer T1. Resistors R2 and R4 pull the bases of transistors Q1 and Q2 toward ground, tending to turn both transistors on. Since the two sides of the circuit are never precisely balanced, one transistor will tend to conduct more strongly than the other.

4-170. Assure that transistor Q1 is the one which conducts more strongly. This conduction induces a voltage in winding 3-4 with a polarity that makes terminal 3 more positive than terminal 4. Then by transformer action, terminal 4 is more positive than terminal 5, terminal 2 is more positive than terminal 3, and terminal 1 is more positive than terminal 2. Therefore, transistor Q2 becomes reverse biased and transistor Q1 becomes more strongly forward biased. Due to the positive feedback loop between base and emitter through feedback winding 4-5, the collector-to-emitter current flow will regeneratively increase rapidly until the transistor is driven into saturation. When this occurs, the primary voltage can no longer increase and a condition of quasi-stable equilibrium is maintained. During this equilibrium period, the voltage drop across the transistor is small, and essentially, the full 28 VDC is dropped across winding 3-4 of transformer T1. With a constant voltage across the winding, both the current and the magnetic flux increase until the core reaches saturation, a process requiring about 8.3 MSEC. At this time, the exciting current required by the transformer exceeds that which can be supplied by the transistor, so the current can rise no more. Therefore, transistor Q1 is regeneratively turned off, ending the first half cycle. As the flux in the transformer collapses, the polarity of the voltages induced in the transformer is opposite to that originally induced. Therefore, transistor Q2 becomes turned on and is regeneratively driven to saturation. Transistor Q2 then continues to conduct until the transformer core is driven into negative saturation. The flux will then again collapse, regeneratively turning transistor Q2 off and transistor Q1 back on, completing a full cycle. This switching action continues at a rate of 60 Hz, as determined by the magnetic, electrical, and dimensional characteristics of transformer T1, and the value of the supply voltage. The peak voltage from the emitter of either transistor Q1 or Q2 to ground is approximately twice the supply voltage, or 56 volts.

4-171. As the transistors turn on and off, spikes are produced in the circuit. Diodes CR2 and CR3 preclude possible transistor damage by preventing these spikes from pulling the emitters of the transistors below ground. Similarly, capacitors C2 and C3 bypass to ground and potentially damaging spikes at the bases. Resistors R1 and R3 limit the base current in transistors Q1 and Q2 to the correct value.

4-172. The AC voltage induced in the primary of transformer T1 is coupled by transformer action to the secondary. The 170 VAC developed between terminals 6 and 8 is applied to pins 5 and 6 of fanning strip P2 for connection to the tuning circuit (paragraph 4-132). The 155 VAC developed between terminals 6 and 7 is applied to pins 7 and 8 of fanning strip P2 for connection to the time elapsed meter (paragraph 4-132). When the tuning motor is energized, these voltages drop about 10% because of the heavy load imposed by the tuning motor. These voltages are higher than the 115 VAC applied during operation with a 60 Hz primary power source, since a higher peak square wave voltage is required to obtain the effects of a sine wave voltage.

4-173. TEST DATA.

4-174. Pertinent references and applicable data for the 60 Hz inverter are as follows:

a. Power Supply PP-3917/UR, Schematic Diagram, Figure 5-31.

b. Power Supply PP-3917/UR, Component Locations, Figure 5-20.

c. 60 Hz inverter 1A1A8A1, Component Locations, Figure 5-20.

d. 400 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-26.

e. Required Test Equipment:

(1) Oscilloscope AN/USM-117( )

(2) Multimeter AN/PSM-4( )

f. Transistor DC Voltage Measurements, Table 5-6.

4-175. 400 HZ INVERTER.

4-176. GENERAL.

4-177. The 400 Hz inverter (figure 4-19) is a saturable core oscillator. The function of this circuit, which is a part of the PP-3916/UR, is to produce a 150 VAC, 400 Hz, single phase output to power the blower and indicator lamps when operating from a 60 Hz primary power source.

4-178. CIRCUIT DESCRIPTION.

4-179. The 400 Hz inverter functions exactly like the 60 Hz inverter. When the system is placed in standby, the 28 VDC output from the bridge rectifier is switched by slave relay 2A4K1, which is controlled by 1A1K2 in the AM-6909/URT. The resulting 28 VDC output is applied to the center tap of transformer T1. The inverter then turns on and functions exactly like the 60 Hz inverter (paragraph 4-165). When the 400 Hz inverter turns on, POWER indicator lamp 2A1DS1 lights. Transient suppression is afforded by 2A4R3 and 2A4C1. The imbalance required for the circuit to start is provided by 2A4R4 in the base circuit of 2A1Q1, with no corresponding resistor for the other transistor.

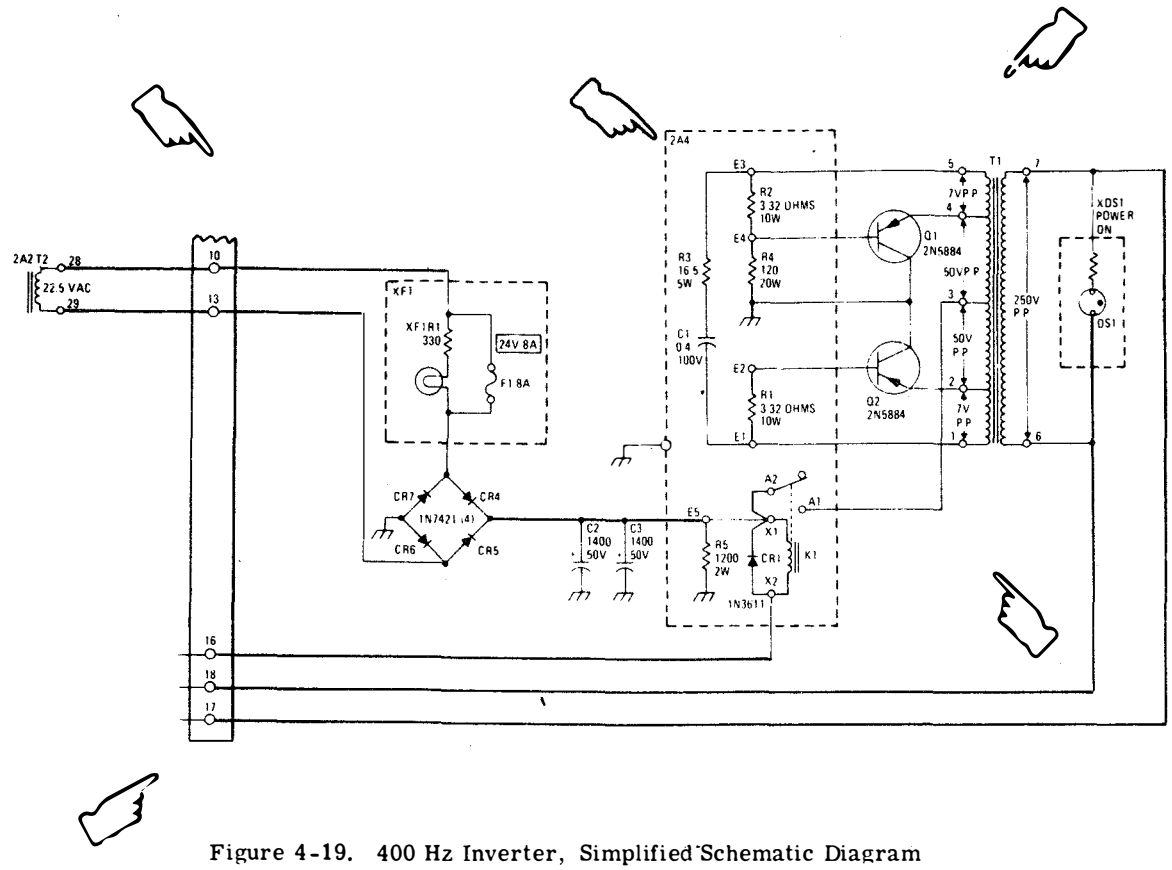


Figure 4-19. 400 Hz Inverter, Simplified Schematic Diagram

4-180. TEST DATA.

4-181. Pertinent references and applicable data for the 400 Hz inverter are as follows:

a. Power Supply PP-3916/UR, Schematic Diagram, Figure 5-32.

b. Power Supply PP-3916/UR, Component Locations, Figure 5-21.

c. 60 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-25.

d. Required Test Equipment:

(1) Oscilloscope AN/USM-117( )

(2) Multimeter AN/PSM-4( )

e. Transistor DC Voltage Measurements, Table 5-6.

4-182. 60 Hz HIGH VOLTAGE POWER SUPPLY.

4-183. GENERAL.

4-184. The 60 Hz high voltage power supply (figure 4-20) consists of a three-phase transformer, three three-phase diode blocks, and various other parts and connections. The function of this circuit is to produce the 2250 and 500 VDC required by the four electron tubes in the driver and final amplifiers when operating from a 60 Hz primary power source.

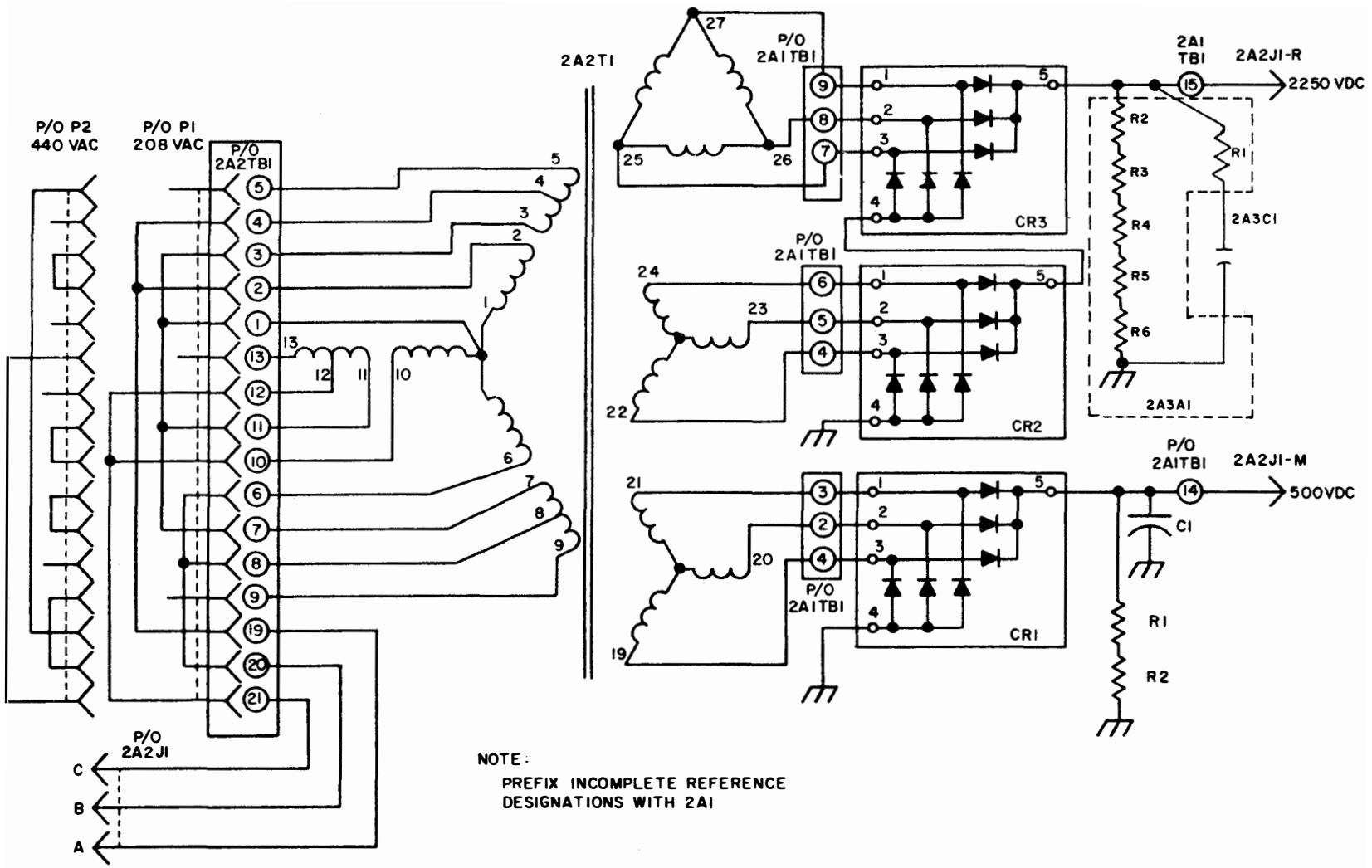


Figure 4-20. 60 Hz High Voltage Power Supply, Simplified Schematic Diagram

4-185. CIRCUIT DESCRIPTION.

4-186. When the system is placed in an operate condition (paragraph 4-142), the three phase primary power is applied to pins A, B, and C of connector 2A2J1, from which it is routed through one of two jumpering schemes to the primary windings of transformer 2A2T1. The primary is a wye type winding of which each leg consists of two windings. The windings are jumpered together according to the magnitude of the three phase voltage. The output from transformer 2A2T1 consists of three secondary windings: two wye type and one delta type.

4-187. The output from wye winding 19-20-21 is full-wave rectified by three phase diode stack CR1 to produce 500 VDC. This 500 VDC is filtered by capacitor C1, and applied through terminal 2A1TB1-14 to pin M of connector 2A2J1 from which it is connected to the AM-6909/URT (paragraph 4-142). The 500 VDC is used as plate voltage for the two electron tubes in the driver amplifier and as input to the screen regulator to provide screen voltage for all four final and driver amplifier electron tubes. Resistors R7 and R8 serve as a bleeder resistor.

4-188. The output from wye winding 22-23-24 is full-wave rectified by three phase diode stack CR2 to produce 1125 VDC. This 1125 VDC is used as the return for three phase diode stack CR3. The output from delta winding 25-26-27 is full-wave rectified by three phase diode stack CR3, producing an 1125 VDC that is added to the 1125 VDC output from three phase diode stack CR2. This results in the required 2250 VDC that is applied through terminal 2A1TB1-15 and pin R of connector 2A2J1 to the AM-6909/URT (paragraph 4-142). This 2250 VDC is filtered slightly by capacitor 1A1C49 and is used as plate voltage for the two electron tubes in the final amplifier. A wye and delta winding are used to produce the 2250 VDC rather than a single winding since the phase relationships inherent in this combination produce one-quarter the ripple amplitude and twice the ripple frequency as compared with a single winding, thus minimizing filter requirements. Resistors 2A3A1R2 through 2A3A1R6 serve as a bleeder resistor. Resistor 2A3A1R1 and capacitor 2A3C1 serve as a surge protector.

4-189. TEST DATA.

4-190. Pertinent references and applicable data for the 60 Hz high voltage power supply are as follows:

a. Power Supply PP-3916/UR, Schematic Diagram, Figure 5-32.

b. Power Supply PP-3916/UR, Component Locations, Figure 5-21.

c. 60 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-25.

d. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

4-191. 400 Hz HIGH VOLTAGE POWER SUPPLY.

4-192. GENERAL.

4-193. The 400 Hz high voltage power supply (figure 4-21) consists of a three-phase transformer, three three-phase diode stacks, and various other parts and connections. The function of this circuit is to produce the 2250 and 500 VDC required by the four electron tubes in the driver and final amplifiers when operating from a 400 Hz primary power source.

4-194. CIRCUIT DESCRIPTION.

4-195. The 400 Hz high voltage power supply functions basically like the 60 Hz high voltage power supply. When the system is placed in an operate condition (paragraph 4-142), the three phase primary power is applied to terminals 1, 2, and 3 of 1A1TB1 of the AM-3924(P)/URT from which it is routed through 1A1A8P1 to the primary winding of transformer 1A1A8T2. The output from transformer 1A1A8T2 consists of three secondary windings.

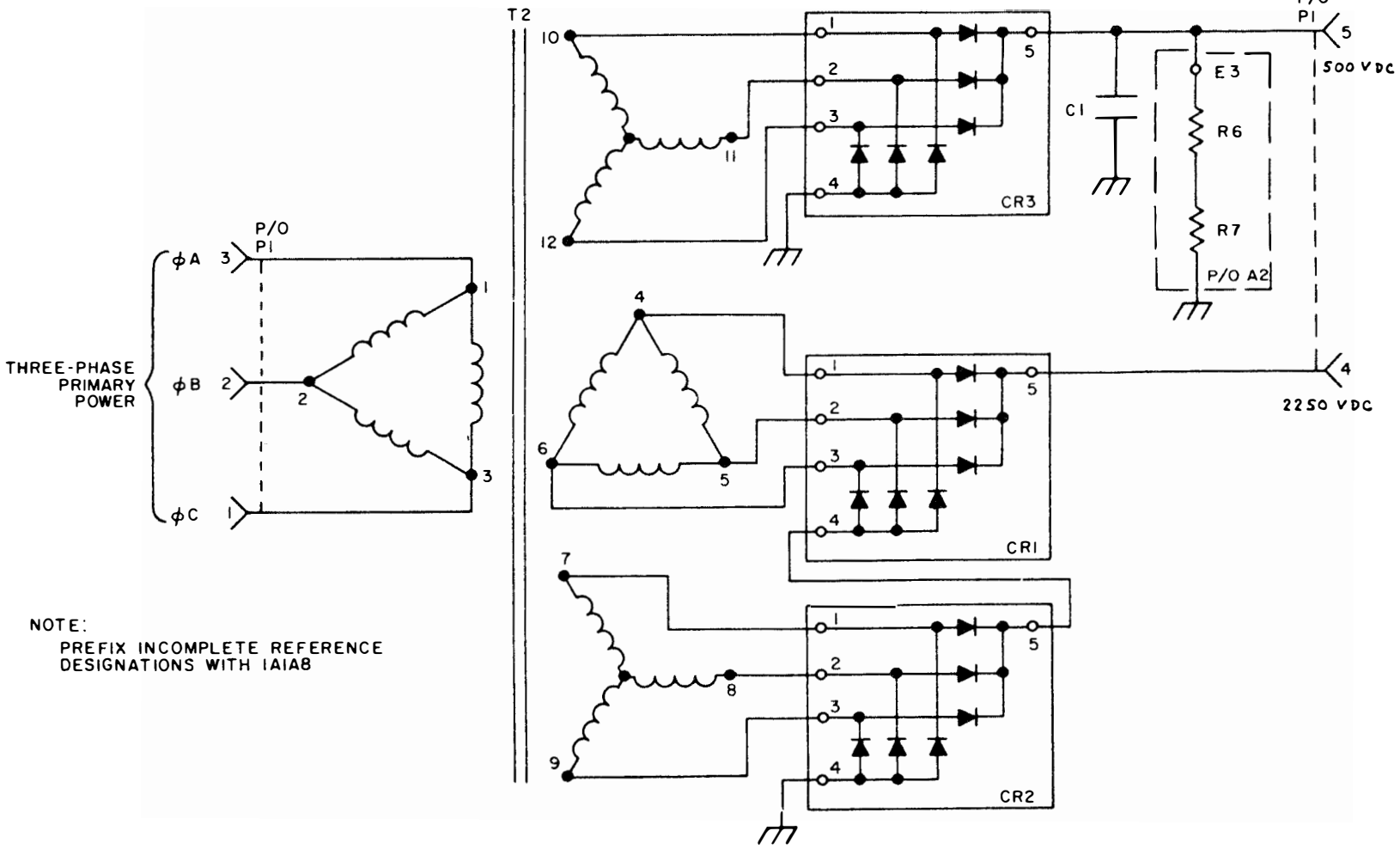


Figure 4-21. 400 Hz High Voltage Power Supply, Simplified Schematic Diagram

4-196. The output from secondary wye winding 10-11-12 is full wave rectified by three-phase diode stack CR3 to produce 500 VDC. This 500 VDC is filtered by capacitor C1, and applied through 1A1A8P1 to terminal 5 of 1A1TB1. The 500 VDC is used as plate voltage for the two electron tubes in the driver amplifier and as input to the screen regulator to provide screen voltage for all four final and driver amplifier electron tubes. Resistors A2R6 and A2R7 serve as a bleeder resistor.

4-197. The outputs from delta winding 4-5-6 and wye winding 7-8-9 are rectified by three-phase diode stacks CR1 and CR2 to produce 2250 VDC in the same manner done in the 60 Hz high voltage power supply (paragraph 4-188). The 2250 VDC from the rectifiers is applied through 1A1A8P1 to terminal 4 of 1A1TB1. This 2250 VDC is used as plate voltage for the two electron tubes in the final amplifier.

4-198. TEST DATA.

4-199. Pertinent references and applicable data for the 400 Hz high voltage power supply are as follows:

a. Power Supply PP-3917/UR, Schematic Diagram, Figure 5-31.

b. Power Supply PP-3917/UR, Component Locations, Figure 5-20.

c. 400 Hz High Voltage Distribution, Servicing Block Diagram, Figure 4-26.

d. Required Test Equipment:

(1) Multimeter AN/PSM-4( )

4-200. SYSTEM TROUBLESHOOTING.

4-201. Table 4-2 is not intended to be a complete troubleshooting chart. However, it provides information that may isolate a problem area without the requirement of a detailed analysis.

TABLE 4-2. TROUBLESHOOTING

SYMPTOM	PROBABLE FAULT
No RF output; final plate current increases with increased RF input.	Short to ground or an open circuit in final transformer assembly 1A1A2.
High reflected power	1. Mistuned antenna coupler. 2. Open or shorted transmission line.
Impossible to reach 1 KW output; driver current decreases with increased RF input.	1. PPC ADJ 1A1R11 or PWR control 1A1R13 misadjusted. 2. 500 VDC 1.5A fuse in AM-3924(P)/URT open. 3. Faulty PPC circuit in T-827( )/URT.
Essentially no RF output; no increase in final plate current with increase in RF input.	1. Driver tube assembly 1A1A1 not properly seated, or fault in assembly. 2. Driver transformer assembly 1A1A4 not properly seated, or fault in assembly. 3. Open resistor 1A1R24.

TABLE 4-2. TROUBLESHOOTING (Cont.)

SYMPTOM	PROBABLE FAULT
FREQUENCY MC dial does not stop at correct position.	1. If the switch in final transformer assembly 1A1A2 also stops out of position, the coupling on driver transformer assembly 1A1A4 has slipped. 2. If the switch in final transformer assembly 1A1A2 does stop in correct position, the set screws in FREQUENCY MC dial are loose. 3. Open, shorted, or miswired code line between case connector 1A2A1J7 and switch S1 in driver transformer assembly 1A1A4.
System does not energize.	1. Misaligned interlock switch 1A2S1 or 1A2S2. 2. NORM-AUX switch 3A1S7 in T-827( )/URT set at AUX.
Motor 1A1B2 does not de-energize.	1. Shorted or miswired code line between case connector 1A2A1J7 and switch S1 in driver transformer assembly 1A1A4. 2. Coupling on driver transformer assembly 1A1A4 does not pick up the mating coupling. 3. Shorted diode 1A1A5CR2 (if antenna coupler is connected).
Can't key system from T-827( )/URT.	1. Jumper missing between pins B and D of connector 1A2A1J8. 2. Frequency MC switch 1A1S7 not at AUTO.
Low RF power output.	1. Mistuned transformer assembly in driver transformer assembly 1A1A4 or final transformer assembly 1A1A2. 2. Coaxial cable between AM-3924(P)/URT and antenna coupler is not 50 ohms. 3. Misadjustment of APC and PPC circuits.
Excessive final plate current.	1. Mistuned transformer assembly in final transformer assembly 1A1A2. 2. Open coupling capacitor in final transformer assembly 1A1A2.
Low screen voltage.	Diode (1A1CR3 through 1A1CR6) in screen regulator shorted.
System will not go to operate.	1. Printed circuit board 1A1A5 and/or 1A1A6 not properly seated in the chassis connectors. 2. Faulty 1A1K4. 3. If overload trips, then airvane switch 1A1S1, RF interlock 1A1S9, or Power supply interlock 2A1S2, 2A1S3, 2A1S4 may be faulty.

NOTES:

1. Prefix incomplete reference designations with 1A1.
2. Heavy lines indicate main signal paths.
3. Letters outside transistor and tube blocks indicate element.
4. Equipment keyed, in CW mode, with 1 KW output.
5. Measurements made with AN/USM-116( ).

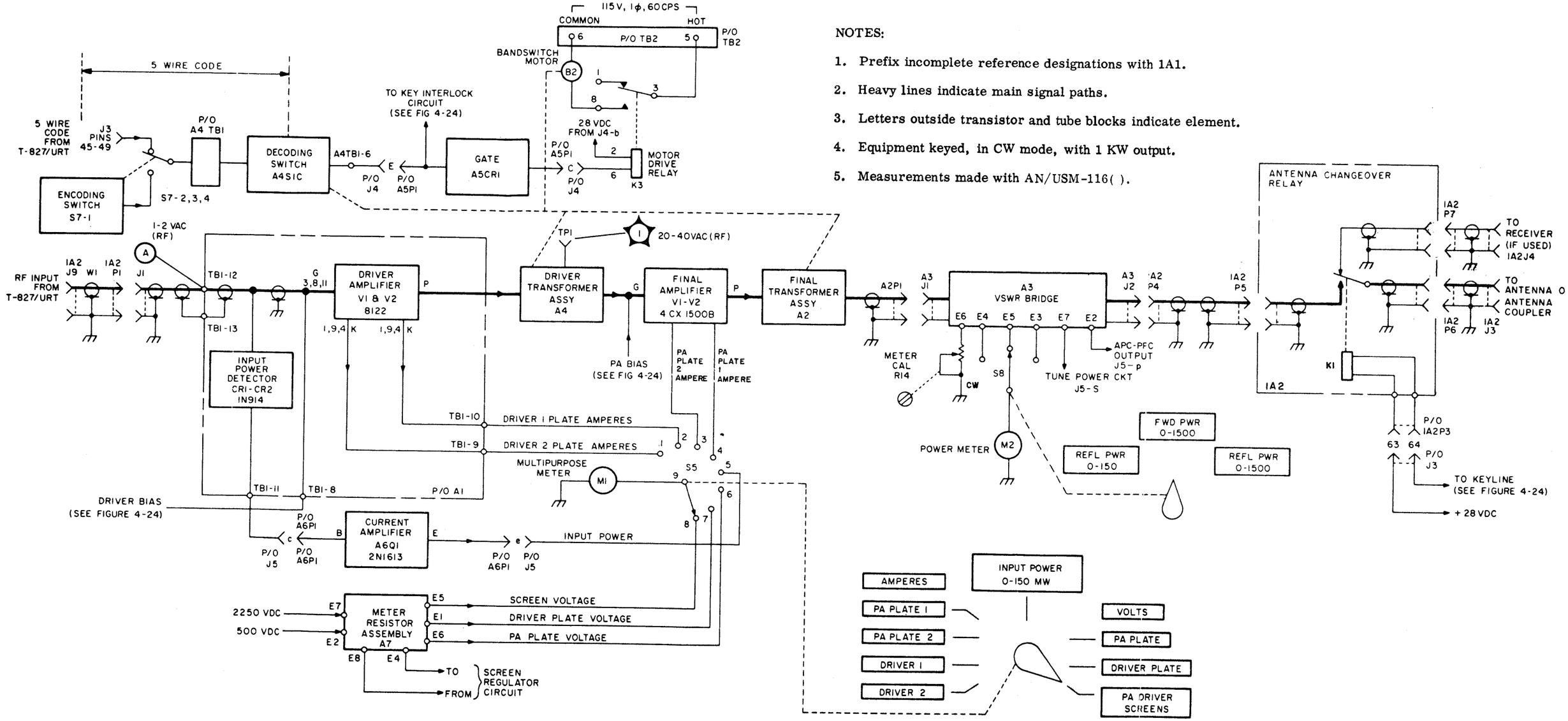


Figure 4-22. Radio Frequency Amplifier AM-3924(P)/URT, Main Signal Flow, Servicing Block Diagram

NOTES:

1. Prefix incomplete reference designations with 1A1A6.
2. Heavy lines indicate main signal paths.
3. Letters outside transistor blocks indicate element.
4. Equipment keyed, in CW mode, with 1 kw output.
5. Equipment keyed, 1 kw average output: 3 to 6 VDC (pulses with peaks of 9v); AM-3924(P)/URT in tune condition, 9 ± 1.0 VDC.
6. Equipment keyed, AM mode, no modulation: +4 to +5 VDC (Reading will change with frequency).
7. Equipment in standby or any operate mode except tune, unkeyed.
8. Equipment any mode except tune, 0 to 3 VDC, tune mode, 22 ± 2 VDC.
9. All measurements made with AN/USM-116( ).

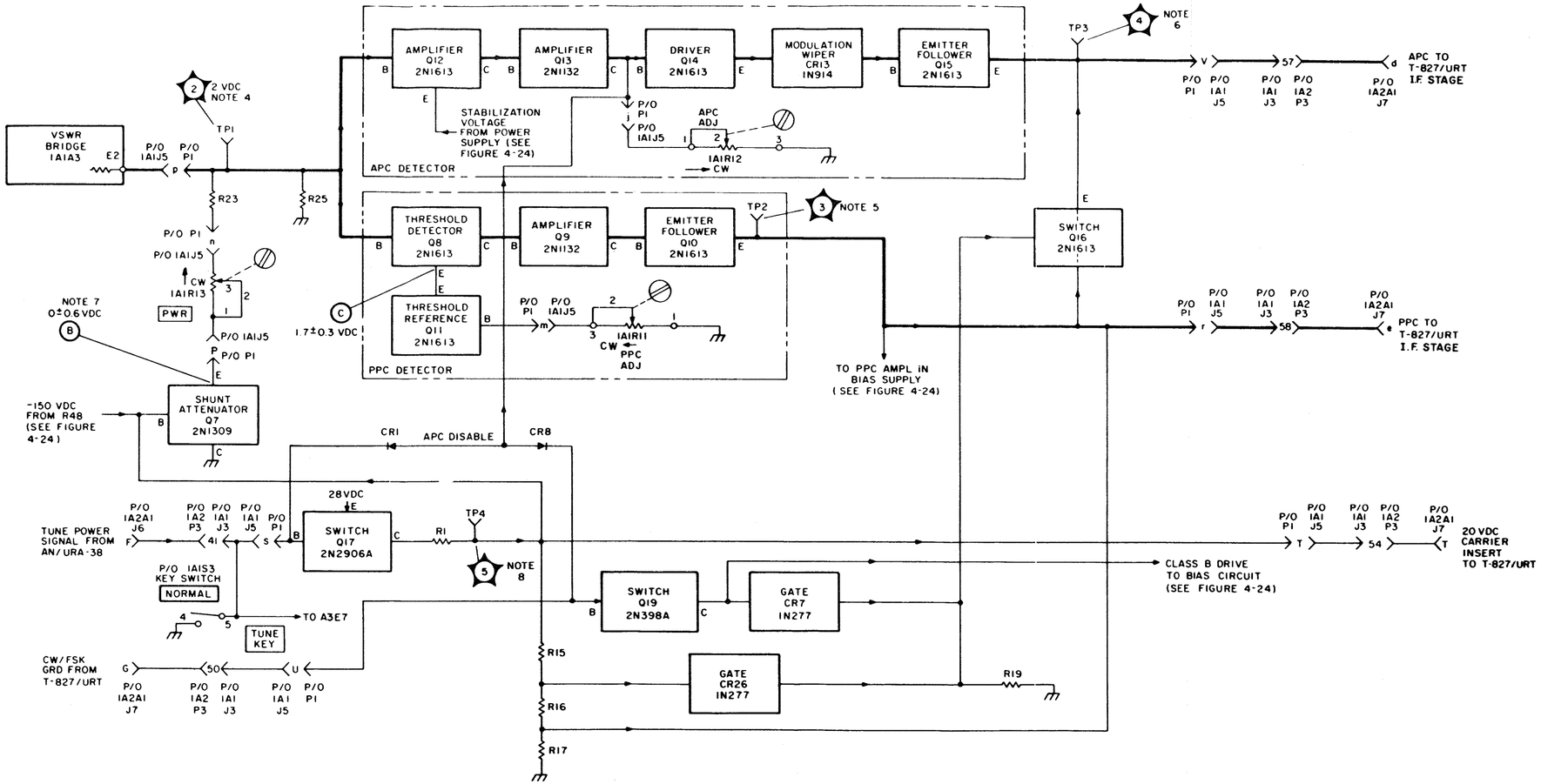


Figure 4-23. APC-PPC Circuit, Servicing Block Diagram

NOTES:

1. Prefix incomplete reference designations with 1A1.
2. Light lines indicate auxiliary or secondary signal paths.
3. Letters outside transistor blocks indicate element. Numbers on coils and transformers indicate terminal numbers.
4. Output from floating 12 volt supply T-827/URT in remote, equipment keyed from C-1138 radio set control in any operate mode, positive meter lead connected to A5TP4, negative lead connected to A5TP3, 11.8 ± 0.5 VDC.
5. Equipment in any operate mode, unkeyed, 11.2 ± 0.5 VDC.
6. Equipment in standby or any operate mode. (Measurements must be made with Remote Control connected, otherwise transistor leakage currents will affect voltage readings.)
7. Equipment in standby or any mode: key up, -130 VDC +20%; key down, -72 VDC +5%.
8. Equipment in standby or operate key up, -90 ± 10 VDC; operate, key down -5 ± 2 VDC, depending on setting of R9; key down, interlocked (motor relay energized, overload circuit tripped, coupler interlock grounded, or alarm switch held at reset) -33 ± 4 VDC.
9. Equipment interlocked (motor relay energized, overload circuit tripped, coupler interlock grounded, or alarm switch held at reset), 10 ± 1 VDC; equipment not interlocked, 0.5 ± 1 VDC.
10. Equipment interlocked: by energizing motor relay or grounding coupler interlock only, 0 ± 1 VDC; otherwise, 27 ± 2 VDC.
11. Equipment in operate: key up, and a key interlock present, -0.1 VDC; key down, + 4.5 VDC.
12. Equipment in standby or operate, unkeyed, 0 VDC; key down, in any AM or SSB mode, no signal, 1.0 ± 0.5 VDC; key down, any mode, with signal, 1.0 - 4.0 VDC; overload condition, 9.9 ± 1.0 VDC.
13. All measurements taken with AN/PSM-4( ).

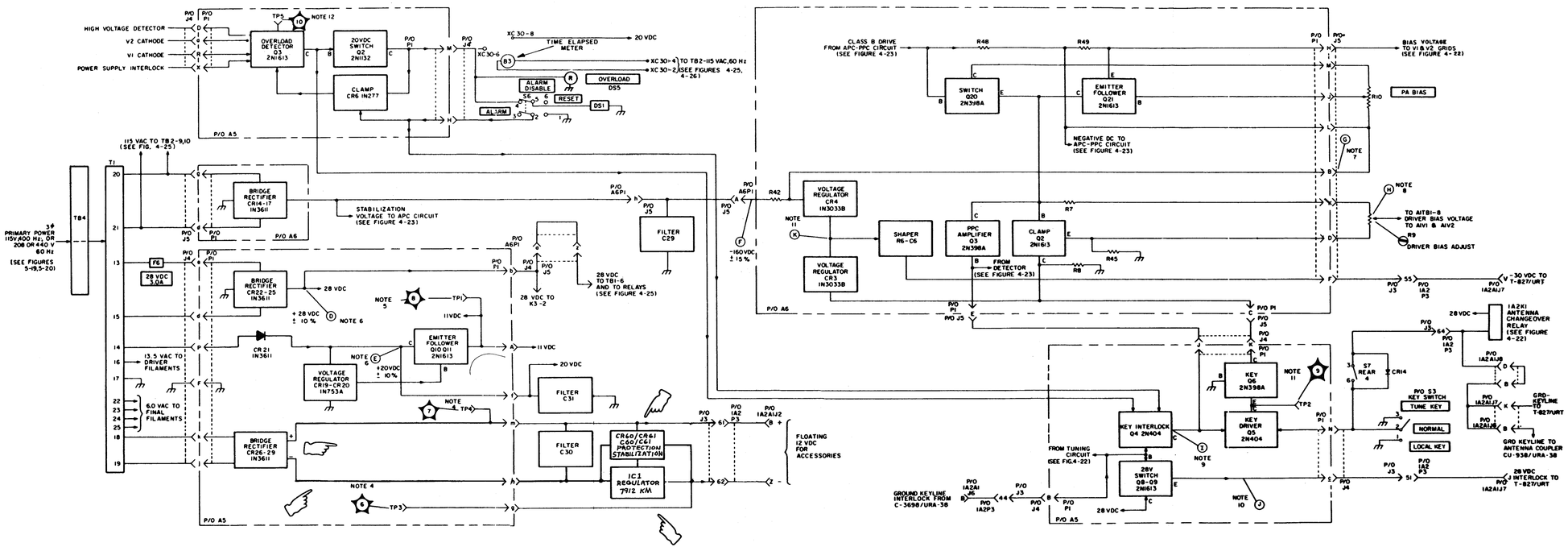


Figure 4-24. Radio Frequency Amplifier AM-3924(P)/URT, DC Power Control Servicing Block Diagram

NOTES:

1. Letters outside transistor blocks indicate element. Numbers on transformers and coils indicate terminal numbers.
2. All measurements except test points R, S, and T taken with AN/PSM-4( ) with respect to ground.
3. These measurements taken with AN/USM-117.
4. Measurements taken between indicated points.
5. Equipment in any operate mode.

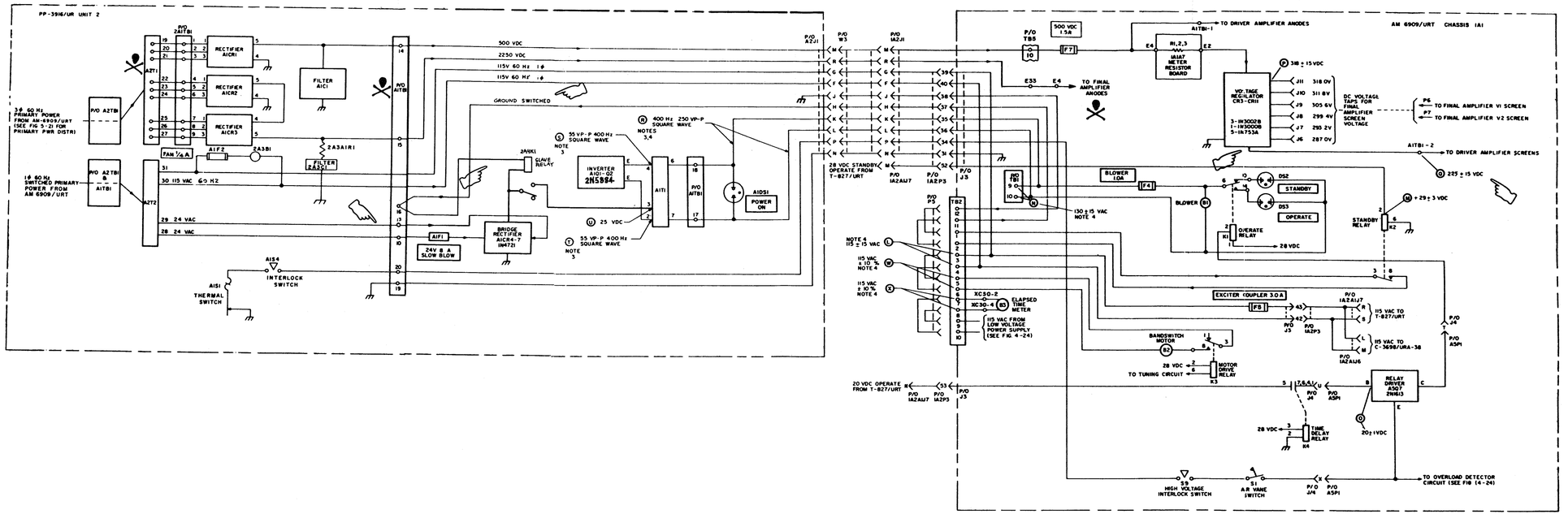


Figure 4-25. 60 Hz High Voltage Distribution, Servicing Block Diagram

NOTES:

1. Letters outside transistor blocks indicate element. Numbers on coils and transformers indicate terminal numbers.
2. All measurements taken with AN/PSM-4.
3. Measurements taken between indicated points.
4. Measurement taken with band switch motor operating.
5. AM-3924(P)/URT in any operate mode.

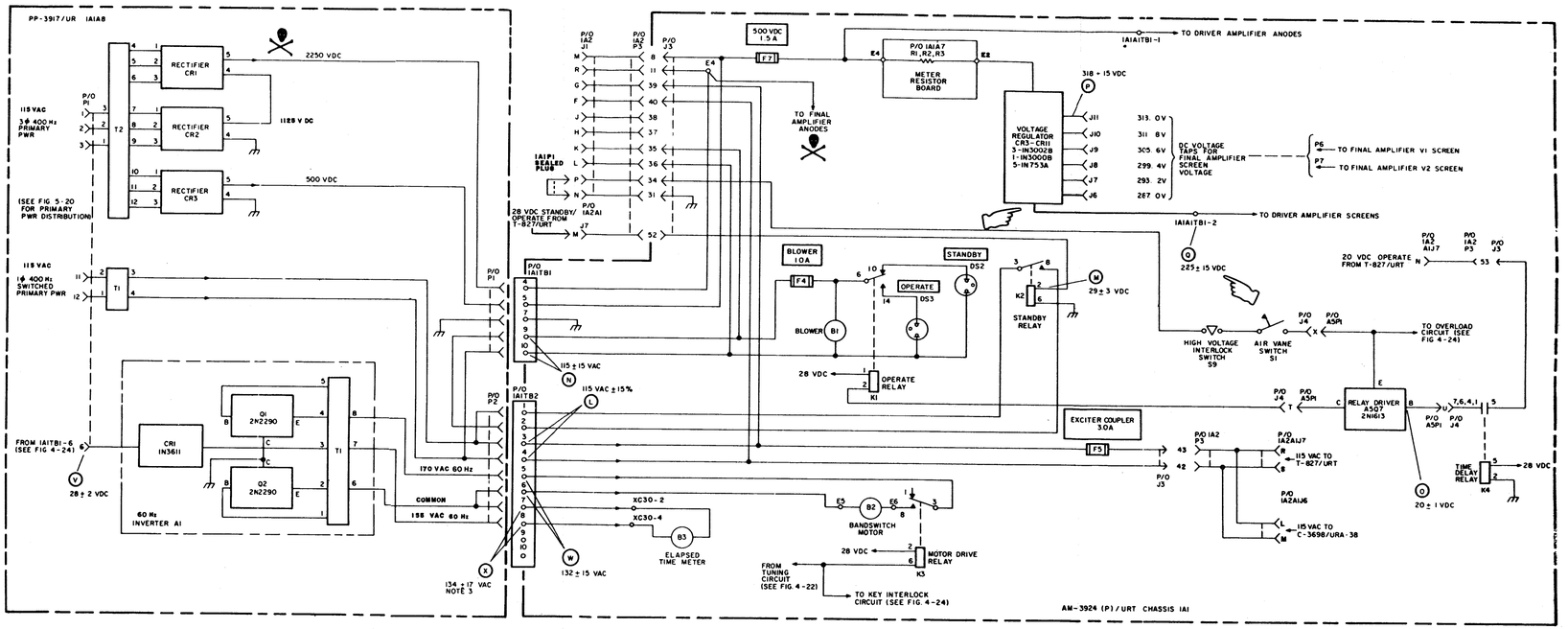


Figure 4-26. 400 Hz High Voltage Distribution, Servicing Block Diagram

NOTES:

1. Prefix each incomplete reference designator with the number of the assembly or subassembly within which it is shown.
2. T-827/URT is unit 3 in AN/URT-23(V) system, and is shown as such here. However, the T-827/URT Technical Manual may show 2 as Ref. Desig. Prefix, or the prefix may be lacking.
3. Sections of T-827/URT rotary switches 3A2S1 and 3A2S2 are shown as pole switches for clarity.

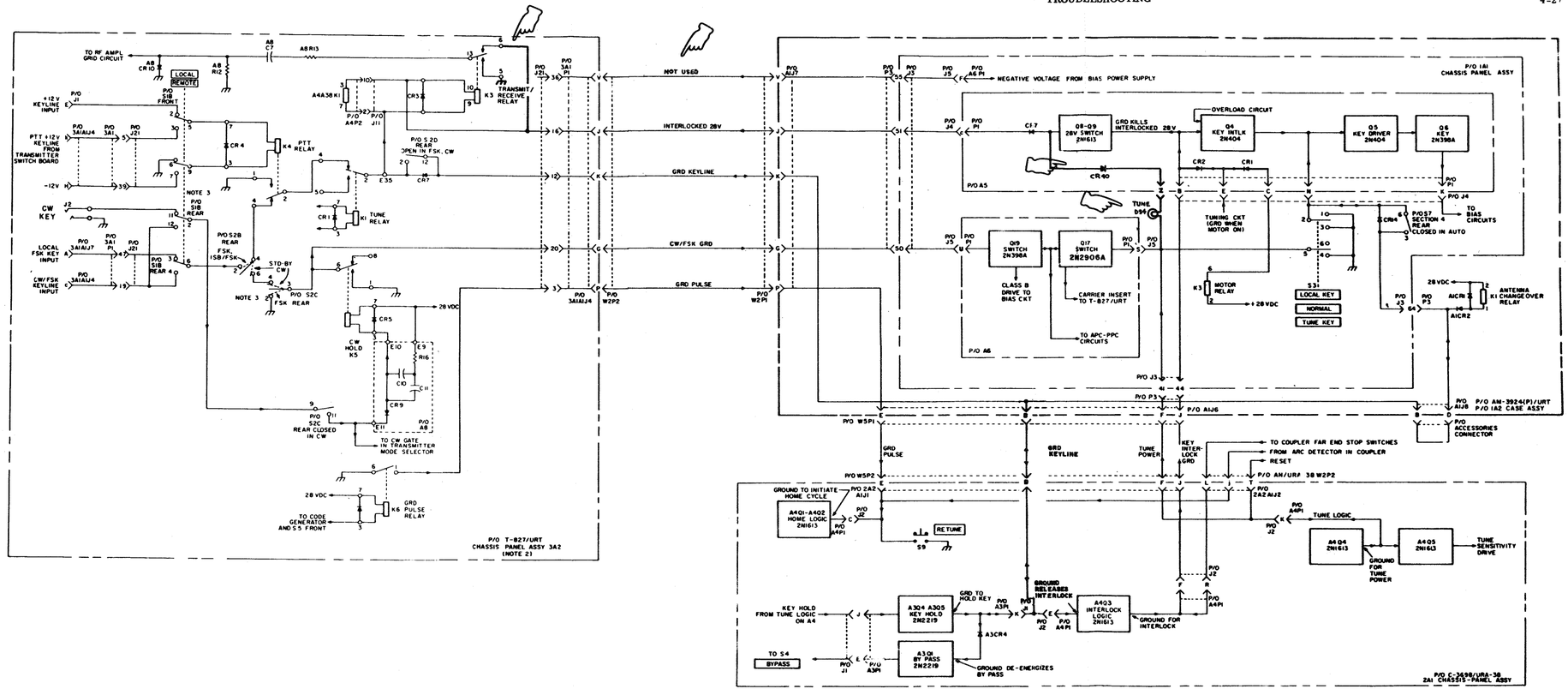


Figure 4-27. System Keying and Key Interlock Circuitry, Servicing Block Diagram

SECTION 5

MAINTENANCE

NOTE

All references to the AM-3924(P)/URT in this section will also apply to the AM-6909/URT unless otherwise indicated.

5-1. GENERAL.

NOTE

The Naval Electronic Systems Command no longer requires submission of failure reports for all equipments. Failure Reports and Performance and Operational Reports are to be accomplished 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. This section contains maintenance, adjustment, and parts replacement procedures for the AN/URT-23(V). For performance standards tests and preventive maintenance refer to the Maintenance Standards Book for Radio Transmitting Set AN/URT-23(V). Where applicable, the following procedures include interface information and instructions for the T-827( )/URT as part of the AN/URT-23 (V). For complete maintenance and adjustment procedures for the T-827( )/URT, refer to the Technical Manual for Radio Transmitter T-827( )/URT and paragraph 2-35 of this manual.

5-3. TUNING AND ADJUSTMENT.

5-4. There are no adjustment procedures required for the PP-3916/UR or the PP-3917/UR. For AM-3924(P)/URT power output and meter calibration adjustments, refer to Section 2 adjustment procedures (paragraphs 2-35 through 2-44).

5-5. DRIVER TUBES 1A1A1V1 AND 1A1A1V2 BIAS ADJUSTMENT.

5-6. When the plate current of either driver tube 1A1A1V1 or 1A1A1V2 is greater than 400 milliamperes or less than 260 milliamperes while the AM-3924(P)/URT is local keyed, the driver tube bias requires adjustment. To adjust the bias proceed as follows (refer to figure 5-6 for parts location):

a. Loosen eight captive screws on front panel and slide AM-3924(P)/URT chassis out from case.

b. Defeat the interlock switches on AM-3924(P)/URT by pulling switch plunger straight out.

c. Loosen lock nut on DRIVER BIAS ADJ 1A1R9 (figure 5-6) and set maximum CCW.

d. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

e. Set T-827( )/URT Mode Selector switch at STDBY. Wait five minutes for AM-3924(P)/URT to warm up.

f. Set T-827( )/URT Mode Selector switch at USB or LSB.

g. Set AM-3924(P)/URT Multipurpose Meter switch at DRIVER PLATE VOLTS. Multipurpose Meter should indicate 500 $\pm$ 60 VDC at nominal line voltage.

h. Set AM-3924(P)/URT Multipurpose Meter switch at PA-DRIVER SCRNS VOLTS. Multipurpose meter should indicate 290 $\pm$ 60 VDC at nominal line voltage.

i. Open access door on AM-3924(P)/URT front panel and set Key switch at LOCAL KEY.

j. Set Multipurpose Meter switch alternately at DRIVER 1 AMPERES and DRIVER 2 AMPERES and observe Multipurpose meter while slowly rotating DRIVER BIAS ADJ clockwise.

k. Set DRIVER BIAS ADJ for an indication of 200 milliamperes for tube which is indicating lowest plate current.

l. When tube indicating lowest plate current is set for 200 milliamperes, plate current of other tube should be between 200 and 280 milliamperes. If it is not, a tube is defective and should be replaced, or there is a defect in the circuit. Tighten lock nut on DRIVER BIAS ADJ.

m. Set AM-3924(P)/URT Key switch at NORMAL.

n. Set T-827( )/URT Mode Selector switch at OFF.

o. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

p. Release chassis slide locks and slide AM-3924(P)/URT chassis into case, securing it with eight captive screws on front panel.

5-7. POWER AMPLIFIER TUBES 1A1V1 AND 1A1V2 SCREEN VOLTAGE ADJUSTMENT.

5-8. The difference between the plate currents of AM-3924(P)/URT power amplifier tubes 1A1V1 and 1A1V2 should not exceed 40 milliamperes in any SSB mode with no audio input. When the difference exceeds 40 milliamperes, compensating adjustments in screen voltages should be made to reduce the difference, in order to maintain equal load sharing between the two tubes. To adjust the screen voltages proceed as follows:

WARNING

Lethal voltages exist within the AM-3924(P)/URT during operation. Screen voltage (300 VDC) is present at jacks J6 through J11. Refer to NAVSEA 0967-LP-000-0010 Electronics Installation and Maintenance Book Safety Precautions before proceeding.

a. Loosen eight captive screws on front panel of AM-3924(P)/URT and slide chassis out from case.

b. Defeat the interlock switches on AM-3924(P)/URT case by pulling switch plunger straight out.

c. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

d. Set T-827( )/URT Mode Selector switch at STDBY. Wait five minutes for AM-3924(P)/URT to warm up.

e. Set T-827( )/URT Mode Selector switch at USB or LSB.

f. Set AM-3924(P)/URT Multipurpose Meter switch at PA-DRIVER SCRNS VOLTS. Multipurpose Meter should indicate 290 $\pm$ 60 VDC at nominal line voltage.

g. Set AM-3924(P)/URT Multipurpose Meter switch at PA PLATE VOLTS. Multipurpose Meter should indicate 2250 $\pm$ 225 VDC at nominal line voltage.

h. Open access door on AM-3924(P)/URT front panel and rotate PA BIAS control maximum CCW.

i. Set AM-3924(P)/URT Key switch at LOCAL KEY.

CAUTION

Excessive plate current (over 750 MA) will damage final power amplifier tubes 1A1V1 and 1A1V2.

j. Set AM-3924(P)/URT Multipurpose Meter switch alternately at PA PLATE 1 AMPERES and PA PLATE 2 AMPERES and observe Multipurpose meter while slowly rotating PA BIAS control clockwise.

k. Set PA BIAS control so that the higher of the two meter indications in step j is 240 milliamperes.

l. Carefully note which final tube is drawing the higher plate current, and the difference in plate current between the two tubes.

m. Set AM-3924(P)/URT Key switch at NORMAL.

n. Set T-827( )/URT Mode Selector switch at STDBY (see CAUTION label on T1).

o. Locate screen voltage adjustment jacks J6 through J11 on left side of chassis (figure 5-6).

p. Observe position of two plugs coded P6 (brown) and P7 (red), screen voltage taps for tubes 1A1V1 and 1A1V2, respectively.

NOTE

Increasing the screen voltage will increase the plate current. Jacks J6 through J11 provide connections to a voltage divider network. Moving a screen voltage plug (P6 or P7) to a higher numbered jack will increase the plate current for that tube.

q. Determine which plug should be moved, from observation of relative position, compared to difference in plate current noted in step 1.

r. Move selected plug (P6 or P7) to a new jack position, (to increase or decrease plate current as required).

s. Repeat steps e and i through r until difference between plate currents is less than 40 milliamperes.

t. Repeat steps i, j and k, except set lower plate current at 240 milliamperes.

u. Set AM-3924(P)/URT Key switch at NORMAL.

v. Set T-827( )/URT Mode Selector switch at OFF.

w. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

x. Release chassis slide locks and slide chassis back into case, securing it with eight front panel captive screws.

5-9. VSWR BRIDGE 1A1A3 POWER OUTPUT CALIBRATION.

5-10. Capacitor 1A1A3C6 will not normally have to be readjusted to calibrate the VSWR bridge power output to the Power Meter, unless the adjustment has been disturbed by circuit repairs.

5-11. TEST EQUIPMENT.

5-12. The following test equipment will be required.

a. Electrical Dummy Load DA-242/U.

b. Electronic Multimeter AN/USM-116( ).

c. Signal Generator SG-582/U.

d. JFD Adjustment Tool, No. 5284 (NSN 9Q5120-00-724-3767).

5-13. INSTRUCTIONS.

5-14. To calibrate the VSWR bridge for proper power indications on the Power meter, proceed as follows:

a. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

NOTE

Lethal RF voltages are present at the AM-3924(P)/URT RF output connector 1A2J3 when the AN/URT-23(V) is keyed. Ensure that the AM-3924(P)/URT is de-energized before making cable connections.

b. Disconnect cable W8 from RF output connector 1A2J3 (figure 2-4) on rear of AM-3924(P)/URT case.

c. Connect a coaxial cable from connector 1A2J3 to DA-242/U through RF Cable Adapter UG-1447/USM-116( ). Connect AN/USM-116( ) to UG-1447/USM-116. Energize AN/USM-116( ) and set to measure 300 VAC.

d. Disconnect cable W1 from RF input connector 1A2J9 on rear of AM-3924(P)/URT case.

e. Energize SG-582/U, and set it for an unmodulated RF output of approximately 0 volts at 21 MHz. Connect SG-582/U to AM-3924(P)/URT RF input connector 1A2J9.

f. Loosen eight captive screws on front panel and slide AM-3924(P)/URT chassis out from case until chassis slides lock.

g. Remove protective shield from over left side of AM-3924(P)/URT chassis.

WARNING

Place insulating tape over jumper strip on 1A1TB4. Lethal voltages as high as 1200 VRF, 2250 VDC, and 440 VAC are present within the AM-3924(P)/URT chassis when the system is operating. Refer to NAVSEA 0967-LP-000-0010, Electronics Installation and Maintenance Book Safety Procedures before proceeding.

h. Defeat the interlock switches on front of AM-3924(P)/URT case by pulling switch plunger straight out.

i. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

j. Set T-827( )/URT Mode Selector switch at USB or LSB.

NOTE

The AM-3924(P)/URT will automatically remain in standby during the required three minute warmup.

k. Jumper 1A1A6TP1 (Brown) to chassis ground.

l. Set T-827( )/URT MCS and KCS controls at 21.000 MHz Observe that AM-3924(P)/URT FREQUENCY MC dial rotates until 20 to 22 is indicated in window.

m. Set AM-3924(P)/URT Key Switch at LOCAL KEY.

n. Carefully set output of SG-582/U for an indication of 223.6 ± 1 VAC on AN/USM-116( ).

o. Rotate and hold AM-3924(P)/URT Power meter switch at REFL PWR 0-150.

p. Insert adjustment tool, No. 5284 through access hole in VSWR bridge assembly (figure 5-6), and carefully adjust 1A1A3C6 (BAL TRIMMER) for minimum indication on Power meter.

q. Release AM-3924(P)/URT Power meter switch (it will reset to FWD PWR 0-1500) and remove screwdriver from 1A1A3C6.

r. Slowly adjust AM-3924(P)/URT METER CAL potentiometer 1A1R14 (figure 5-6) until Power Meter indicates 1 KW. (Ensure that AN/USM-116( ) still indicates 223.6 ± 1 VAC when performing this step.)

s. Set AM-3924(P)/URT Key switch at NORMAL.

t. Remove jumper from 1A1A6TP1.

u. Allow two minutes for system to cool then set T-827( )/URT Mode Selector switch at OFF.

v. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

w. Disconnect SG-582/U and reconnect cable W1 to AM-3924(P)/URT connector 1A2J9.

x. Disconnect DA-242/U and reconnect cable W8 to AM-3924(P)/URT connector 1A2J3.

y. Remove insulating tape and replace protective cover over left side of AM-3924(P)/URT chassis.

z. Release chassis slide locks and slide AM-3924(P)/URT chassis back into case, securing it with eight captive front panel screws.

5-15. CHAIN DRIVE ADJUSTMENT.

NOTE

If PP-3917/UR is used, it must first be removed before performing the procedure below.

5-16. To tighten the AM-3924(P)/URT chain drive proceed as follows:

a. Loosen eight captive front panel screws and slide chassis out from case.

b. Release chassis slide tilt locks and tilt chassis up to expose underside.

c. Locate two Phillips head screws which secure chain drive bracket assembly to main chassis, directly behind front panel (figure 5-8).

d. Loosen two screws.

e. Push bracket toward front panel to increase tension on chain.

CAUTION

The chain should be tight enough to eliminate all backlash. However, too much tension on the chain drive will cause excessive wear to the chain drive mechanism.

f. While maintaining light tension on chain drive bracket assembly, tighten two screws securing assembly to main chassis.

g. Inspect chain and sprockets for signs of wear. Lubricate with Hi-Lo Temperature Grease per MIL-G-23827.

NOTE

Reinstall the PP-3917/UR if it was removed at the beginning of the procedure.

h. Release chassis tilt locks and return chassis to a horizontal position.

i. Release chassis slide locks and slide chassis back into case, securing with eight captive front panel captive screws.

5-17. RADIO FREQUENCY AMPLIFIER AM-3924(P)/URT ALIGNMENT.

5-18. Complete alignment of the AM-3924(P)/URT consists of tuning the driver and final transformer assemblies. Alignment of these broadband transformers is very important to the overall performance of the AN/URT-23(V), therefore indiscriminate adjustment of the circuits without eliminating other probable causes of degradation of performance, or without proper test equipment should not be attempted.

5-19. TEST EQUIPMENT.

5-20. Test equipment required for alignment of the AM-3924(P)/URT is as follows:

a. Sweep Generator Texscan model VS-30, or an equivalent sweep generator capable of 5 MHz sweep bandwidth from 1 to 35 MHz, 0.5 VRF output, and multiple markers at 0.5, 1.0 and 5.0 MHz intervals throughout the range.

b. Dual trace oscilloscope, Tektronix model 535A, with type CA dual-trace plug-in unit, or equivalent.

c. Signal Generator SG-582/U.

d. Electrical Dummy Load DA-242/U.

e. Electronic Multimeter AN/USM-116( ) with tee-probe connector UG-1447/USM-116( ).

f. Detector Test Fixture (paragraph 5-21).

g. Driver Transformer Alignment tool (standard non-metallic 0.100 inch hex with undercut shaft).

h. PA Transformer Alignment tool (standard 1/4 inch nut driver).

5-21. DETECTOR TEST FIXTURE.

5-22. A small detector network will be required during alignment of the AM-3924(P)/URT. Figure 5-1 shows the components. Use one-quarter watt composition resistors, and ceramic or mica capacitors rated at or above 50 volts. The parts should be mounted on a surface no larger than 1/2 inch by 3/4 inch, and connected with leads not exceeding 1/4 inch.

5-23. DRIVER TRANSFORMER ALIGNMENT INSTRUCTIONS.

5-24. The driver transformer assemblies for the nineteen frequency bands are arranged on sixteen coil forms. Figure 5-29 illustrates the schematic representation of the coils, while table 5-1 lists the frequencies covered by each band. To align the coils for any one band, proceed as follows:

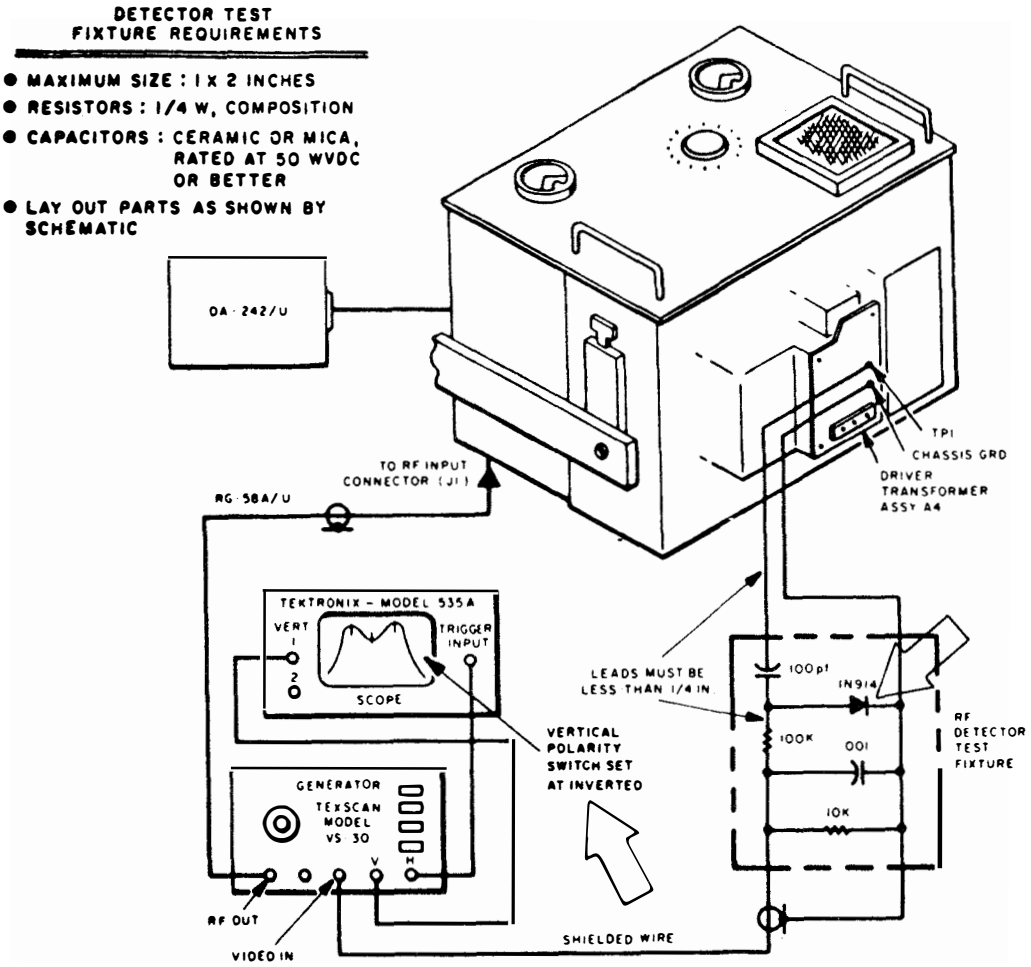


Figure 5-1. Driver Transformer Alignment, Test Setup

a. **Loosen** eight captive front panel screws and slide AM-3924(P)/URT chassis out from case **until slides lock. Release** chassis slide tilt locks and tip chassis up to expose underside.

b. **Disconnect 1A2P1** (RF input) from 1A1J1 on rear of AM-3924(P)/URT chassis.

c. **Disconnect 1A2P4** (RF output) from 1A1A3J2 on rear of AM-3924(P)/URT chassis. Connect **DA-242/U to 1A1A3J2.**

d. **Note position of P6** and P7, in jacks J6-11 at left rear of chassis, then unplug P6 and P7 and **ground to chassis so** that final power amplifier stage will be inoperative during alignment of driver **coils.**

e. **Connect output of Texscan** model VS-30 sweep generator to 1A1J1 on rear of AM-3924(P)/ **URT chassis. Connect Tektronix** model 535A oscilloscope as shown in figure 5-1.

f. **Connect test fixture** fabricated in paragraph 5-21 as shown in figure 5-1.

g. **Defeat the interlock switches on front** of AM-3924(P)/URT case by pulling switch plunger **straight out.**

h. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

i. Set T-827( )/URT Mode Selector switch at USB or LSB.

j. Turn on all test equipment and allow fifteen minutes for warmup.

NOTE

Driver bands 1-8 (2-8 MHz) consist of single tuned circuits. The coils for bands 1 and 2 have individual coil forms (A1 and A2 respectively), however, bands 3-4, 5-6, and 7-8, each share a common form. Insert the alignment tool "shallow" for low band adjustment and "deep" for high band adjustment.

Bands 9-19 are double tuned circuits, with both the primary and secondary windings on the same form (A6-A16, respectively). Insert alignment tool shallow for primary adjustment and deep for secondary adjustment.

k. Set T-827( )/URT MC and KC controls at center frequency of band to be aligned as shown in table 5-1. Observe that AM-3924(P)/URT FREQUENCY MC dial rotates until frequency range of band to be aligned is centered in window.

l. Set AM-3924(P)/URT Key switch at LOCAL KEY.

m. Set Texscan model VS-30 to sweep band to be aligned, with approximately 0.5 volts RF output. Set up Tektronix model 535A oscilloscope to display signal.

n. Insert marker frequencies for center and high and low ends of band to be aligned as indicated in table 5-1.

o. Carefully align coil(s) until markers for high and low edges of band conform to the same waveform pattern shown in table 5-1.

p. Set AM-3924(P)/URT Key switch at NORMAL.

q. If more than one coil form is to be aligned, refer to table 5-1 to determine coil form number, then repeat steps k through p before proceeding.

r. When all necessary alignments have been made, disconnect the sweep generator and oscilloscope.

s. Disconnect test fixture from Driver Transformer Assembly test point 1A1A4TP1.

t. Set T-827( )/URT Mode Selector switch at OFF.

u. Replace P6 and P7 in jacks from which they were removed in step d.

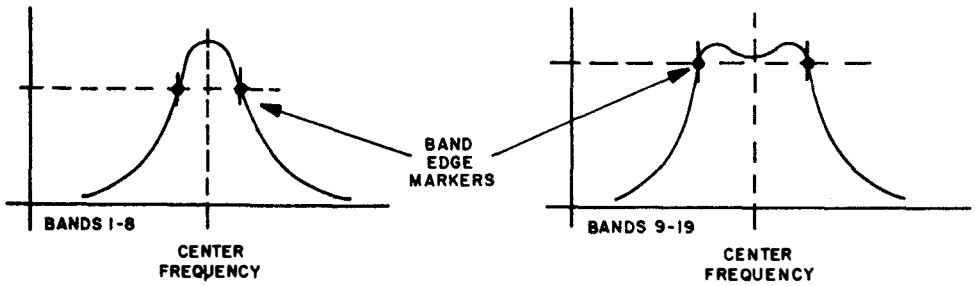
v. Reconnect AM-3924(P)/URT RF input cable connector 1A2P1 to 1A1J1.

w. Reconnect RF output cable connector 1A2P4 to 1A1A3J2 on rear of AM-3924(P)/URT chassis.

x. Release chassis tilt locks and return chassis to horizontal position. Release chassis slide locks and slide chassis back into case, securing it with eight captive screws on front panel.

TABLE 5-1. DRIVER TRANSFORMER BAND EDGES

BAND	COIL FORM	LOW EDGE	CENTER FREQUENCY	HIGH EDGE
1	A1	2.00 MHz	2.25 MHz	2.50 MHz
2	A2	2.50	2.75	3.00
3	A3	3.00	3.25	3.50
4	A3	3.50	3.75	4.00
5	A4	4.00	4.50	5.00
6	A4	5.00	5.50	6.00
7	A5	6.00	6.50	7.00
8	A5	7.00	7.50	8.00
9	A6	8.00	9.00	10.00
10	A7	10.00	11.00	12.00
11	A8	12.00	13.00	14.00
12	A9	14.00	15.00	16.00
13	A10	16.00	17.00	18.00
14	A11	18.00	19.00	20.00
15	A12	20.00	21.00	22.00
16	A13	22.00	23.00	24.00
17	A14	24.00	25.00	26.00
18	A15	26.00	27.00	28.00
19	A16	28.00	29.00	30.00



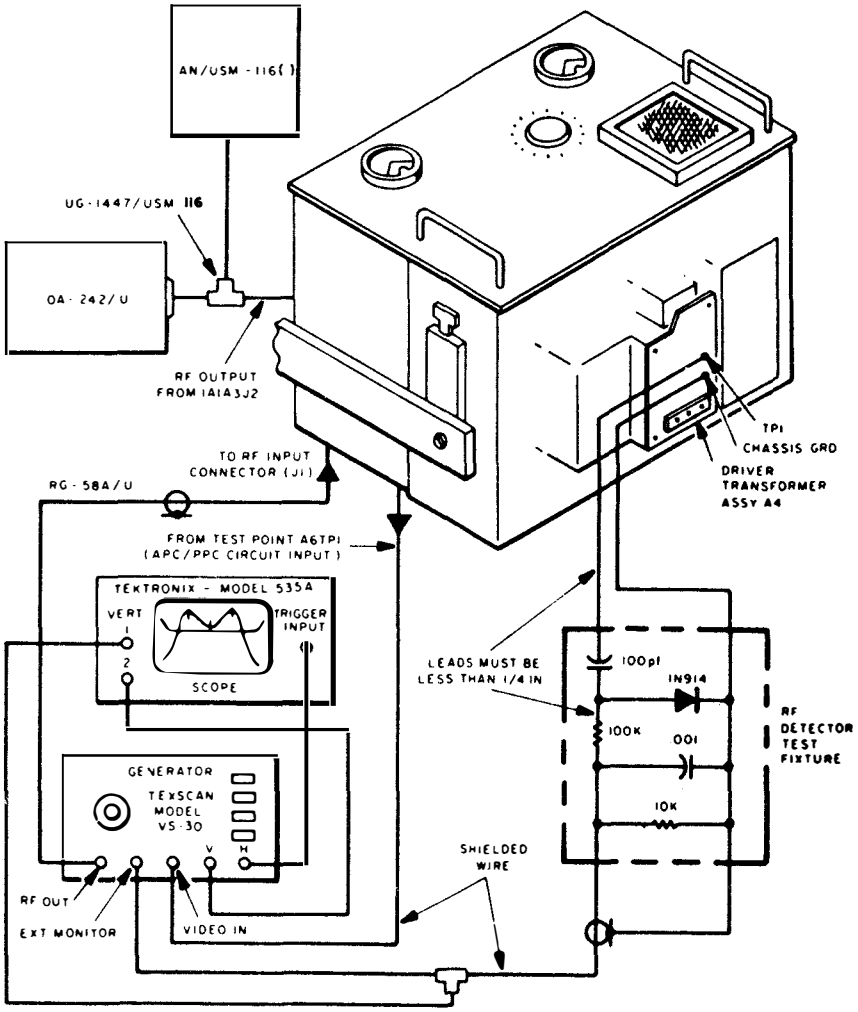


Figure 5-2. Final Transformer Alignment, Test Setup

5-25. FINAL TRANSFORMER ALIGNMENT INSTRUCTIONS.

5-26. The final transformer assemblies for the nineteen frequency bands are arranged on nineteen coil forms (figure 5-28). Frequency bands 1 and 2 both use coil forms 1 and 2 connected in series, and frequency bands 3 and 4 both use coil forms 3 and 4 connected in series. The coils for the remaining fifteen bands are arranged on fifteen separate forms, with two coils on each form providing a double-tuned circuit for each band (table 5-2). The slug tuned coils are aligned from the top of the form. The adjustment for the coil on the top of each form (coil L1) is color coded black for identification. To align the coils proceed as follows:

a. Loosen eight captive front panel screws and slide AM-3924(P)/URT chassis out from case until slides lock.

b. Disconnect 1A2P1 from 1A1J1 (RF input) on rear of AM-3924(P)/URT.

c. Disconnect 1A2P4 from 1A1A3J2 (RF output) on rear of AM-3924(P)/URT chassis.

d. Connect test equipment as shown in figure 5-2.

e. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

f. Set T-827( )/URT Mode Selector switch at USB or LSB.

g. Turn on all test equipment and allow fifteen minutes for warmup.

CAUTION

Do not allow AM-3924(P)/URT RF output to exceed 100 watts.

h. Set Texscan model VS-30 for approximately 0.5 volts RF output.

NOTE

The second trace on the oscilloscope will display the flat topped waveform of the remote flattening (AGC) input to the sweep generator. The flat portion of the wave must always be wider than the edges of the band being aligned.

i. Final transformer assemblies for bands 1 and 2 are mounted on coil forms 1 and 2 and must be aligned together. Similarly, bands 3 and 4 are mounted on coil forms 3 and 4 and must be aligned together. To align bands 1 and 2 or 3 and 4, proceed as follows:

(1) Set T-827( )/URT KC and MC controls for center frequency of higher of two bands to be aligned according to table 5-1 (i.e., 2.750 MHz or 3.750 MHz).

(2) Set AM-3924(P)/URT Key switch at LOCAL KEY.

(3) Set up Texscan model VS-30 sweep generator and Tektronix model 535A oscilloscope to sweep higher of two frequency bands to be aligned.

NOTE

Before starting alignment, preset black coded adjustment maximum counterclockwise, and plain adjustment maximum clockwise.

(4) Insert marker frequencies as indicated for higher band according to table 5-2.

(5) Turn black color coded adjustments on A2 (or A4) and uncoded adjustment on A1 (or A3) until waveform conforms to one indicated in table 5-2.

(6) Set AM-3924(P)/URT Key switch at NORMAL.

(7) Set AM-3924(P)/URT FREQUENCY MC switch to lower band (i.e., 2.0 to 2.5 MHz or 3.0 to 3.5 MHz).

(8) Set up Texscan model VS-30 and Tektronix model 535A to sweep lower band.

(9) Insert marker frequencies for high and low ends of band as indicated in table 5-2.

(10) Set AM-3924(P)/URT Key switch at LOCAL KEY.

(11) Tune black colored adjustment on A1 (or A3) until waveform conforms with waveform shown in table 5-2.

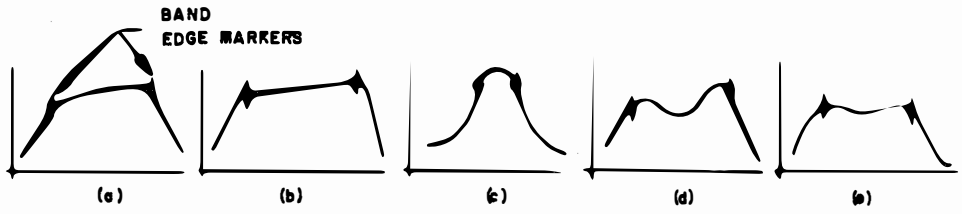
(12) Set AM-3924(P)/URT Key switch at NORMAL.

(13) Repeat steps (1) through (12) above until best compromise is obtained between two bands.

(14) If no other final plate transformer assemblies are to be aligned, proceed to paragraph 5-27.

TABLE 5-2. FINAL TRANSFORMER BAND EDGES

BAND	APPLICABLE ADJUSTMENT	REMARKS	SWEEP PATTERN	EDGE MARKERS MHz
1	A1 (black)	Align band 2 first	(a)	2, 2.5
2	A2 (black) and A1 (plain		(b)	2.5, 3
3	A3 (black)	Align band 4 first	(c)	3, 3.5
4	A4 (black) and A1 (plain)		(d)	3.5, 4
5	A5, both screws	Adjust primary first	(c)	4, 5
6	A6, both screws	(black screw)	(c)	5, 6
7	A7, both screws		(c)	6, 7
8	A8, both screws		(c)	7, 8
9	A9, both screws		(d)	8, 10
10	A10, both screws		(d)	10, 12
11	A11, both screws		(e)	12, 14
12	A12, both screws		(e)	14, 16
13	A13, both screws		(e)	16, 18
14	A14, both screws		(e)	18, 20
15	A15, both screws		(e)	20, 22
16	A16, both screws		(c)	22, 24
17	A17, both screws		(c)	24, 26
18	A18, both screws		(c)	26, 28
19	A19, both screws		(c)	28, 30



j. Coil forms 5 through 19, for frequency bands 5 through 19 (table 5-2) each contain two coils which form an over-coupled double-tuned circuit. To align any one of these bands, proceed as follows:

(1) Set AM-3924(P)/URT FREQUENCY MC switch to band to be aligned.

(2) Set AM-3924(P)/URT Key switch at LOCAL KEY.

(3) Set up Texscan model VS-30 and Tektronix model 535A to sweep band to be aligned.

(4) Insert marker frequencies at high and low ends of band to be aligned as called out in table 5-2.

NOTE

On the top of the coil forms, the primary coil adjustment is color coded black, the secondary coil adjustment has no color coding.

(5) Tune coil form primary and secondary until markers for high and low ends of band are in positions shown, and waveform conforms to waveform shown in table 5-2 for that frequency band.

(6) Set AM-3924(P)/URT Key switch at NORMAL.

k. Set T-827( )/URT Mode Selector switch at STDBY.

l. Disconnect Texscan model VS-30 and Tektronix model 535A.

NOTE

Do not disconnect DA-242/U from 1A1A3J2.

m. Refer to paragraph 5-27 and perform the alignment check procedure.

5-27. ALIGNMENT CHECK.

5-28. The following procedure will check the alignment procedures performed in paragraph 5-23 and 5-25 by checking plate currents versus RF output at the center and edges of each band. To check the alignment, proceed as follows:

a. Connect SG-582/U RF output to 1A1J2 (RF input) on chassis of AM-3924(P)/URT.

b. Set AM-3924(P)/URT PPC control 1A1R11 and APC control 1A1R12 fully CW. Set front panel PWR control fully clockwise.

CAUTION

With APC, PPC and PWR controls set fully clockwise, there will be no circuit protection for limiting RF output. Make SG-582/U adjustments carefully during the following steps to avoid exceeding rated 1 KW output of AM-3924(P)/URT.

c. Set up SG-582/U for an unmodulated RF output at 2 MHz and adjust output attenuators to provide minimum (or no) RF output.

d. Set the T-827( )/URT Mode Selector switch at USB or LSB, and set the MC and KC controls for a frequency of 2.000 MHz. Observe that the AM-3924(P)/URT FREQUENCY MEGACYCLES dial rotates to the 2.0-2.5 MHz band.

e. Set AM-3924(P)/URT Key switch at LOCAL KEY and check plate currents of 1A1V1 and 1A1V2 with the Multipurpose meter and switch. Adjust the PA BIAS control for 240 ma of plate current for the lowest current tube. The higher of the two currents should be less than 280 ma. If the difference between the two plate currents is greater than 40 ma, refer to paragraph 5-7 and adjust the screen voltage before proceeding.

f. Slowly increase the output of the SG-582/U until the AN/USM-116( ) indicates 224 VAC (equivalent of 1 KW RF output).

g. Check the plate current for 1A1V1 and for 1A1V2, and the RF output of the SG-582/U. The SG-582/U output (RF drive for the AM-3924(P)/URT should be a maximum of 2.24 volts (100 milliwatts), and the plate current for each final tube should be a maximum of 710 ma, with a difference of less than 80 ma between the two plate currents.

h. Reset the SG-582/U RF output to minimum.

i. Following the procedure above, use the T-827( )/URT MC and KC controls to select bands, then set the SG-582/U to the center frequency, and to each of the edge marker frequencies listed for each band in table 5-2, and check RF drive and final plate currents at each frequency. Record any band which requires RF drive of more than 2.24 volts. Also record any band in which the plate current for either tube exceeds 710 ma, the differences in plate currents at a given frequency is greater than 80 ma, or the differences in plate current for one tube exceeds 30 ma between band edge marker frequencies for the same band.

j. After all nineteen bands have been checked, repeat the final transformer alignment procedure (paragraph 5-25) for any band which exceeded the limits specified in step i.

k. Disconnect the SG-582/U RF output from 1A1J2 on the AM-3924(P)/URT chassis and reconnect cable 1A2P1 to AM-3924(P)/URT chassis connector 1A1J2.

i. Perform the system alignment procedure in paragraph 2-35 to reset the APC and PPC adjustments.

5-29. REPAIRS.

5-30. GENERAL PARTS REPLACEMENT TECHNIQUES.

5-31. There are no special procedures required for removal and replacement of any of the major assemblies of the AM-3924(P)/URT, nor are special instructions required for the removal of component parts from either the PP-3916/UR or the PP-3917/UR. Instructions for removal and replacement of assemblies and component parts within the T-827( )/URT are contained in the Technical Manual for the Radio Transmitter T-827( )/URT.

NOTE

If either transformer 2A2T1 or 2A2T2 of PP-3916/UR requires replacement, the complete transformer and case assembly must be replaced. Remove the components from the discarded assembly and install them on the new transformer and case assembly.

The socket-mounted electrolytic capacitors 1A1C29, 1A1C30, and 1A1C31, the elapsed time meter, and front panel mounted components on the AM-3924(P)/URT will be more accessible if the front panel is loosened. The front panel is secured to the chassis by three machine screws on each side and one in center of panel. If the top two machine screws on each side and one screw in panel center are removed, and the bottom ones loosened, the panel can be tipped forward slightly.

CAUTION

If all six mounting screws are removed and the front panel is allowed to hang without other support, the chain and the interconnecting wires may be snapped.

5-32. TUBE SOCKET REPAIRS.

5-33. To obtain access to Power Amplifier tubes 1A1V1 and 1A1V2 socket assembly proceed as follows:

a. If tube sockets require repair, remove tubes 1A1V1 and 1A1V2 (paragraph 5-37). Be sure and tag each tube for replacement in the socket from which it was removed - screen voltage taps are set up independently for each tube, to balance plate currents.

WARNING

Lethal RF and DC voltages exist on the connections and tube terminations. Determine that the equipment is fully de-energized and secured at the primary power source. Then short all exposed terminals to ground. Refer to NAVSEA 0967-LP-000-0010, paragraph 1-1d, Electronics Installation and Maintenance, Safety Procedures before continuing.

b. Remove driver tube assembly 1A1A1 (steps c through f of paragraph 5-42).

c. Remove driver transformer assembly 1A1A4.

d. Remove nine screws securing bottom plate to chassis.

e. Swing bottom plate out of way (wires need not be unsoldered).

f. Reassemble by reversing steps a through e.

5-34. PRINTED CIRCUIT BOARD PARTS REPLACEMENT TECHNIQUES.

CAUTION

When removing the DC Power Control Assembly or the APC-PPC Assembly, lift up on both board retaining levers simultaneously, to prevent tilting of the board which could damage the board or socket connections.

5-35. To remove either printed circuit board, grasp the two levers and simultaneously swing them upward and out. The action will automatically release the board, and extract it from its socket. When repairing the printed circuit boards, the procedures below should be carefully followed to avoid damage.

a. Use a pencil-type soldering iron with 25-watt maximum capacity. If only AC-operated irons are available, use an isolating transformer. Do not use a soldering gun; damaging voltages can be induced into the components and the very high temperature reached in a few seconds can damage components or the circuit board.

b. When soldering transistors or diodes, solder quickly; where wiring permits, use a heatsink (such as long nosed pliers) between the soldered joint and the body of the part being connected.

c. Excessive heat or pressure can lift the copper strip from the board. Copper that lifts off from the board should be cemented in place with a quick-drying acetate base cement or epoxy resin having good electrical insulating properties.

d. Use only high quality rosin core solder when repairing printed circuit boards. NEVER USE ACID CORE SOLDER OR PASTE FLUX.

e. A break in the copper strip of a printed circuit board should be repaired by soldering a short length of tinned copper wire across the break.

f. When removing parts from the printed circuit board, apply heat sparingly to the lead of the part to be replaced. Remove part from the printed circuit board as the iron heats the lead. Use an awl to carefully clean the inside of the holes left by the old part.

g. When the part is replaced, tin the leads on the new part. Bend the clean tinned leads on the new part and carefully insert them through the holes in the printed circuit board. Bend the leads close to the foil and cut so that approximately one-sixteenth of an inch of lead length is left. Hold part against the board and quickly solder the leads.

5-36. POWER AMPLIFIER TUBES 1A1V1 AND 1A1V2 REPLACEMENT.

5-37. REMOVAL.

5-38. To remove either of the final power amplifier tubes 1A1V1 or 1A1V2 from the AM-3924(P)/URT, proceed as follows:

NOTE

Mark tubes so that they may be returned to same socket (if same tubes are to be installed) to avoid changing screen voltage taps.

a. Set PRIMARY POWER switch at OFF.

b. Loosen eight captive screws on front panel and slide chassis out from case until chassis slides lock.

c. Remove and set aside ten machine screws which secure safety cover over tubes 1A1V1 and 1A1V2 on top rear of chassis (figure 5-7).

d. Remove cover.

WARNING

Lethal RF and DC voltages exist on the connections and tube terminations. Determine that the equipment is fully de-energized and secured at the source. Then carefully short all exposed terminals to ground. Refer to NAVSEA 0967-LP-000-0010, paragraph 1-1d Electronics Installation and Maintenance, Safety before continuing.

e. Use a screwdriver with a well-insulated handle or a shorting stick to short metal tops of tubes 1A1V1 and 1A1V2 to ground.

f. Carefully loosen anode clamp. Lift tube clamp off tube.

g. Without lifting, carefully rotate tube counterclockwise approximately sixty degrees until tube is free in socket. (Further rotation will be prevented by a hidden pin on bottom of socket.)

CAUTION

When lifting the tube out of the socket, proceed slowly. If the tube catches, rock the tube gently to free it. Excessive force can damage tube and socket contacts.

h. Lift tube straight up from socket and set it aside.

5-39. INSTALLATION.

5-40. To install a final power amplifier tube 1A1V1 or 1A1V2, proceed as follows:

NOTE

Before replacing tube 1A1V1 or 1A1V2, carefully inspect tube contacts on the tube and in the tube socket for signs of damage, or for signs of arcing which could indicate loose or improperly meshing contacts.

a. Observe guide pin in hole in base of tube, and orient tube so that guide pin mates with one of the slots in center guide post in tube socket.

b. Gently lower tube over guide post and into socket until tube touches bottom.

c. Carefully rotate tube clockwise. Tube should rotate approximately sixty degrees, with moderate mechanical resistance as contacts mesh, until a hidden pin prevents further rotation.

d. Push tube clamp down over tube end.

e. Carefully tighten screw on anode clamp.

f. Replace safety cover over tubes 1A1V1 and 1A1V2, securing it with ten machine screws which were previously removed.

NOTE

Steps g and i will not be necessary if tubes previously used are each returned to same socket from which it was removed.

g. Move plugs 1A1P6 and 1A1P7 (screen voltage connectors for tubes 1A1V1 and 1A1V2), to jacks 1A1J8 and 1A1J9 (figure 5-6).

h. If one or both tubes are replaced, record elapsed time meter indication for future computation of hours of operation for new tube or tubes replaced.

i. Refer to paragraph 5-7 and perform the complete screen voltage adjustment for tubes 1A1V1 and 1A1V2.

5-41. DRIVER AMPLIFIER TUBES 1A1A1V1 AND 1A1A1V2 REPLACEMENT.

5-42. REMOVAL.

5-43. To remove either of the AM-3924(P)/URT driver amplifier tubes 1A1A1V1 or 1A1A1V2, proceed as follows:

a. Set PRIMARY POWER switch at OFF.

b. Loosen eight captive screws on front panel and slide AM-3924(P)/URT chassis out from case until chassis slides lock.

c. Release chassis slide tilt locks and swing chassis up to vertical position.

WARNING

Lethal RF and DC voltages exist on the connections and tube terminations. Determine that the equipment is fully de-energized and secured at the primary power source. Then carefully short all exposed terminals to chassis ground. Refer to NAVSEA 0967-LP-000-0010, paragraph 1-1d Electronics Installation and Maintenance, Safety before continuing.

d. Remove protective shield that covers terminal board 1A1A1TB1 on bottom of driver tube assembly (figure 5-8).

e. Remove wires from terminal board 1A1A1TB1. (If wires are not numbered, tag for identification before removing).

CAUTION

When removing the Driver Tube Assembly, do not damage the spring contacts located between driver tube assembly 1A1A1 and driver transformer assembly 1A1A4.

f. Loosen two captive screws and carefully lift Driver Tube Assembly out from chassis.

g. Release tube clamp snap on tube to be removed.

h. Place a blunt tool against base of tube through underside of socket and push tube out. (These tubes fit very tightly in their sockets; be prepared to catch tube when it suddenly pops out.)

5-44. INSTALLATION.

5-45. To install a driver amplifier tube 1A1A1V1 or 1A1A1V2, proceed as follows:

a. Orient tube to properly align pins, and plug it into socket.

b. Engage and lock tube clamp snap.

CAUTION

When installing the Driver Tube Assembly, observe that the spring contacts located between driver tube assembly 1A1A1 and driver transformer 1A1A4 mate properly.

c. Carefully guide Driver Tube Assembly into position on bottom of the main chassis and secure by tightening two captive screws. Ensure that edges of Driver Tube Assembly mate properly with their slots in main chassis.

d. Reconnect wires removed from 1A1A1TB1 to terminals noted in step e, of paragraph 5-42.

e. Replace shield over terminal board 1A1A1TB1.

f. Perform driver tube bias adjustment (paragraph 5-5).

5-46. CHAIN DRIVE REPLACEMENT.

5-47. To replace a broken or damaged chain in the AM-3924(P)/URT FREQUENCY MC drive mechanism, proceed as follows:

a. Set PRIMARY POWER switch at OFF.

WARNING

Lethal RF and DC voltages exist on the connections and tube terminations. Determine that the equipment is fully de-energized and secured at the primary power source. Then carefully short all exposed terminals to chassis ground. Refer to NAVSEA 0967-LP-000-0010, paragraph 1-1d, Electronics Installation and Maintenance Safety before continuing.

b. Loosen eight captive screws on front panel and slide AM-3924(P)/URT chassis out from case until chassis slides lock.

c. Release chassis slide tilt locks and tilt chassis up to expose underside.

NOTE

If PP-3917/UR is used, it must be removed before performing the procedure below.

d. Loosen (but do not remove) two phillips head screws which secure chain drive bracket to chassis (figure 5-8).

e. Release chassis slide tilt locks and tilt chassis back to horizontal position.

f. On each side of chassis, locate three machine screws which secure front panel. Remove top two and loosen bottom machine screw on each side. In addition, remove one screw in center of panel so that front panel will tip forward slightly.

g. Remove damaged chain. (If chain is unbroken, it is easier to remove from bottom of chassis).

h. Loosen two Allen set screws on FREQUENCY MC dial sprocket located directly behind front panel (figure 5-8) so that sprocket rotates freely on shaft.

CAUTION

When tilting the chassis up or down during chain installation, move the chassis slowly and carefully to prevent damage to the loosely secured front panel.

i. Thread new chain around motor drive sprocket on motor 1A1B2 (figure 5-8), over sprockets on chain drive bracket, and around chain sprocket on FREQUENCY MC dial. Arrange chain so that ends meet for connection just behind chain drive bracket, underneath chassis. (A short length of buss wire can be used to fish the chain through chain drive bracket.)

CAUTION

Excessive pressure when connecting the chain ends will crush the chain.

j. Connect two ends of chain by inserting connecting line into split sphere and gently closing sphere around line with a small pair of pliers.

k. Tip front panel back in position and secure by replacing machine screws removed in step f. Tighten all seven panel-mounting screws.

CAUTION

Excessive tension on the chain drive will cause excessive wear.

1. Ensure that chain drive is properly engaged in all sprockets, then use a screwdriver to push chain drive bracket toward front panel to take up slack in chain. Apply light tension to hold bracket in place while tightening two Phillips head screws which secure bracket.

m. Check chain tension. Chain should have just enough tension to eliminate slack.

n. Release chassis slide tilt locks and tip chassis down to horizontal position.

o. Manually rotate dial behind FREQUENCY MC window (figure 5-7), until one set screw is accessible (bands 2.5-3.0 or 7.0-8.0).

NOTE

Reinstall PP-3917/UR if it was removed at the beginning of the procedure.

p. Defeat the interlock switches on AM-3924(P)/URT case by pulling switch plunger straight out (figure 5-18).

q. Set AM-3924(P)/URT PRIMARY POWER switch at ON and energize primary power source.

r. Set T-827( )/URT Mode Selector switch at STDBY.

WARNING

Lethal voltages as high as 2250 VDC and 440 VAC are present within the AM-3924(P)/URT chassis when it is energized. De-energize all equipment before making any adjustments.

s. Set AM-3924(P)/URT FREQUENCY MC switch to frequency band indicated in center of FREQUENCY MC window. AM-3924(P)/URT will automatically tune.

t. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

u. Carefully rotate dial behind FREQUENCY MC window, until numbers corresponding to setting of FREQUENCY MC switch are located in center of window.

v. Tighten set screw which is accessible on dial behind FREQUENCY MC window.

w. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

x. Set AM-3924(P)/URT FREQUENCY MC switch at each position except AUTOMATIC. For each position, observe that numbers corresponding to switch setting are centered in window. Note amount of adjustment in dial setting required to center them perfectly.

y. Reset AM-3924(P)/URT FREQUENCY MC switch to position which makes dial set screw accessible.

z. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

aa. Loosen dial set screw and make necessary compensating adjustments in dial position.

ab. Tighten set screw.

ac. Repeat steps w through ab until dial position is satisfactory.

ad. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

ae. Observe set screws on rear of dial and set FREQUENCY MC switch to different positions until second set screw is accessible for tightening (bands 2.5-3.0 or 7.0-8.0).

af. Set the T-827( )/URT Mode Selector switch at OFF.

ag. Set AM-3924(P)/URT PRIMARY POWER switch at OFF.

ah. Tighten second set screw on dial behind FREQUENCY MC window.

ai. Reset AM-3924(P)/URT FREQUENCY MC switch at AUTOMATIC.

aj. Release chassis slide locks and push the AM-3924(P)/URT chassis into case, securing it with eight captive screws on front panel.

5-48. BANDSWITCHING MOTOR REPLACEMENT.

CAUTION

The critical accuracy required for proper indexing of the driver and final transformer assembly switches to prevent RF arcing between contacts dictates that the transmission assembly couplings be very carefully aligned. If possible, it is advisable to replace transmission assembly and bandswitch motor as a complete assembly rather than replace the motor on the old assembly.

5-49. Two small indexing blocks, constructed according to paragraph 5-64 will be required to properly index the couplings on the transmission assembly during re-assembly. To replace the AM-3924(P)/URT transmission assembly bandswitch motor, proceed as follows:

NOTE

If PP-3917/UR is used, it must first be removed before performing the procedure below.

a. Remove final tubes 1A1V1 and 1A1V2 (paragraph 5-37). Since each tube has individual screen voltage adjustment to balance tube plate currents, mark each tube so that it may be replaced in same socket.

b. Disconnect 1A1A2P1 from VSWR bridge assembly 1A1A3.

c. Loosen screw from strap on contact block on final transformer assembly.

d. Remove screw securing cable clamp on coaxial cable to VSWR bridge.

e. Carefully loosen four captive screws and remove final transformer assembly.

f. Remove chain (steps c through g of paragraph 5-46).

g. Remove screw securing cable clamp on leads to bandswitching motor.

h. Unsolder two leads for bandswitching motor at standoff terminals on side of chassis plenum.

i. Remove Driver Tube Assembly (paragraph 5-41).

j. Remove driver transformer assembly (paragraph 5-56).

k. Remove the three screws securing the air seal plate over the transmission assembly (figure 5-9) and remove plate.

l. Remove transmission assembly from main chassis by removing four screws which secure assembly through chassis (two beneath final transformer assembly and one inside each final tube cooling chimney).

m. Remove screws securing cover to side of transmission assembly and remove cover.

CAUTION

Mechanical support must be provided when installing or driving out pins to prevent damage to the bearing.

n. Remove retaining ring that secures final transformer assembly coupling to motor shaft. Remove coupling.

o. Drive out pin on end of motor shaft and remove spring and flat washers (note order of removal, in order to assist in latter reassembly).

p. Drive out pins securing gear and bead chain sprocket to motor shaft. If necessary, rotate the gears by hand, or by inserting a screwdriver in end of driver transformer coupling shaft and turning clockwise to expose pins.

q. Remove retaining ring securing bearing on motor shaft.

r. Remove three screws securing motor to transmission assembly; remove and discard defective motor.

s. Position new motor by pushing motor shaft through hubs of sprocket and gear, and then through transmission assembly housing. Align motor and secure with three hex screws removed in step r.

t. Push bearing down on motor shaft and snap into hole in housing. (Bearing may remain in housing on some assemblies, eliminating the need for this step.)

u. Install bearing retaining ring on motor shaft.

v. Install two spring and one flat washer on motor shaft in same order removed.

NOTE

If pin was damaged, replace pin in end of motor shaft with type MS35677-3.

w. Reinstall coupling drive pin removed in step o.

x. Slip coupling over drive pin and secure with coupling retaining ring removed in step n.

y. Position the two indexing blocks (constructed according to paragraph 5-64) over the two couplings on the transmission assembly so that the slots in the two couplings are in the same relative position.

z. Temporarily install (but do not tighten) a no. 4 set screw on large gear on motor shaft.

aa. With gears engaged, hold transmission assembly with motor on bottom, and apply pressure to rotate large gear on motor shaft counterclockwise to absorb backlash. (Indexing blocks will prevent gear from turning.) Maintain counterclockwise pressure on gear while tightening set screw to lock gear in position.

ab. Remove indexing blocks.

ac. Install transmission assembly by positioning assembly under chassis and replacing four screws removed in step l.

ad. Solder two motor leads removed in step h to standoff terminals on side of chassis plenum.

ae. Temporarily reinstall final transformer assembly, securing with two screws.

af. Temporarily reinstall driver transformer assembly.

ag. Reinstall driver tube assembly.

ah. Reconnect the chassis cable connections to TB1 on the driver transformer assembly and the driver tube assembly.

ai. Defeat interlock switches S1, S2, and S3 on side of case, and S9 on top of chassis.

aj. Set AM-3924(P)/URT PRIMARY POWER switch at ON.

CAUTION

Do not key the system until installation has been completed.

ak. Set T-827( )/URT Mode Selector at STDBY.

al. Set AM-3924(P)/URT FREQUENCY MC switch to any random position and observe that band-switching motor tunes. (Since the bead chain has not been replaced, the FREQUENCY MC dial will not rotate.)

am. Reset FREQUENCY MC switch to 2.0-2.5.

an. Set AM-3924(P)/URT PRIMARY POWER at OFF.

ao. Carefully remove driver transformer assembly and check that switch wiper contacts are properly centered at position 1. (On switch contacts for band 1.)

ap. Carefully remove final transformer assembly and check that switch wiper contacts are properly centered at position 1.

CAUTION

Switch contacts must be properly centered to prevent arcing. The final transformer assembly switch wiper must be fully on the contact. The driver transformer assembly switch rotor may be off center slightly, but must be fully engaged with the contacts.

aq. If both driver and final transformer assembly switch center wipers are off center an equal amount in the same direction, the error may be corrected by adjusting the code deck. Remove the two plug buttons on the driver transformer assembly top plate. Loosen the top switch deck (the code deck) and rotate it slightly in the proper direction to correct the error, then tighten the switch deck, reinstall the driver and final transformer assemblies and repeat steps aj through ap to check proper switch positioning. (See figures 5-33, 5-34, and 5-35.)

ar. If driver and final transformer assembly switch center wipers are off center in opposite directions, the two indexing blocks used to locate the couplings were inaccurate, and the final transformer assembly coupling must be rotated to compensate for the error. Remove the transmission assembly, loosen the set screw temporarily installed on the gear on the motor shaft, rotate the coupling slightly to correct the error. Retighten set screw. Then repeat steps ac through ap to check switch indexing.

as. When switch indexing has been properly adjusted, remove final transmission assembly again.

at. Drill and pin gear on motor shaft, using a 1/16 drill, and pin removed in step p. (Drill new pin hole at right angles to old hole in gear, to prevent breaking drill.) When pinning is complete, remove set screw.

NOTE

If pin for either gear or sprocket was damaged during removal, replace with a type MS51987-70.

au. Hold sprocket firmly away from transmission assembly wall to provide clearance. Drill a 1/16 hole through sprocket hub and shaft and pin.

av. Install transmission assembly cover removed in step m.

aw. Reinstall transmission assembly.

ax. Solder two motor leads to standoff terminals on side of plenum.

ay. Reinstall driver and final transformer assemblies.

az. Following the procedure outlined in steps ai through ar, check final and driver transformer switch indexing again.

NOTE

If switch indexing is off after pinning, the driver transformer assembly switch code deck may be rotated slightly to correct error, as explained in step aq (only if switch rotors are off an equal amount in same direction). If the two switch wipers are off center in opposite directions, the transmission assembly must be removed again to correct the error. Carefully note the direction the driver transformer assembly coupling must be rotated to correct the error. Then remove transmission assembly from the chassis as described above. Remove the split ring from one end of the shaft for the center gear on the transmission assembly. Carefully disengage gear far enough to permit slipping gear on driver transformer assembly coupling one tooth in the proper direction to correct the error. Then reassemble.

ba. Reinstall both transformer assemblies, and driver tube assembly if removed.

bb. Reinstall two final tubes by performing steps a through e of paragraph 5-39. (Be sure and replace each tube in socket from which it was originally removed, or readjustment of screen voltage tape to equalize tube plate currents will be necessary.)

bc. Connect 1A1A2P1 to VSWR bridge, and reinstall cable clamp.

bd. Reinstall air seal plate removed in step k.

be. Reinstall bead chain according to paragraph 5-46.

bf. Tighten screw on strap on contact block of final transformer assembly.

bg. Replace cover over final tube compartment.

bh. Release chassis slide locks and return chassis to case.

5-50. FINAL TRANSFORMER ASSEMBLY 1A1A2 REMOVAL AND REPLACEMENT.

CAUTION

This assembly should be returned to the depot or to the contractor for any repairs which will require disturbing critical lead dress of the transformer assemblies.

5-51. Final transformer assembly 1A1A2 is a complex assembly in which lead dress and coil position will critically affect alignment. Since the assembly is built around the switch, the assembly will have to be almost completely dismantled in order to replace the switch. If an individual coil assembly must be removed for replacement, or if a coil assembly must be moved to attain access to a capacitor, remove the top plate and carefully note lead dress, coil connections, and coil orientation before making repairs.

Illustrated instructions for coil positioning, lead dress and connection are contained in figure 5- . Leads must be soldered with high temperature solder (type AG 1.5 or AG 2.5 per QQ-S-571) at all coil terminations. For switch replacement, a small jig, manufactured according to the specifications of paragraph 5-64 will be required for relocating the coupling on the end of the switch shaft. The switch replacement will have to be followed by a careful check for proper continuity, and a complete alignment of the final transformer assembly.

5-52. REMOVAL.

5-53. To remove the Final Transformer Assembly, proceed as follows:

a. Loosen eight captive front panel screws and pull AM-3924(P)/URT chassis out from case until chassis slides lock.

b. Remove cover from over final tubes by removing ten screws.

c. Loosen screw securing contact strip to contact block next to final tubes.

d. Remove cable clamp from coaxial cable to VSWR bridge.

e. Disconnect cable connector 1A1A2P1 from VSWR bridge.

f. Carefully loosen four captive screws and lift final transformer assembly out from chassis.

5-54. CONTINUITY CHECK.

5-55. To check for continuity between the proper final transformer assembly switch and coil connections, proceed as follows:

a. Connect AN/PSM-4( ) Multimeter between center lead of coaxial cable and input terminal on final transformer assembly top plate. Check for continuity with final transformer assembly switch in positions one through nineteen (20 through 24 are not used).

b. Reconnect AN/PSM-4( ) between center lead of coaxial cable and top of capacitor C10 (figure 5-12), and check continuity for switch positions one through nineteen.

c. Reconnect AN/PSM-4( ) between center lead of coaxial cable and top or bottom plate of final transformer assembly, and check switch positions one through nineteen again. Switch positions one through four should check approximately 7,000 ohms, switch positions five through nineteen should check open (infinity).

CAUTION

If assembly has been repaired, give final assembly a complete visual inspection, then reinstall on chassis. DO NOT KEY AM-3924(P)/URT until repaired assembly has been completely realigned according to paragraph 5-25.

5-56. DRIVER TRANSFORMER ASSEMBLY 1A1A4 SWITCH REPLACEMENT.

CAUTION

This assembly should be returned to the depot or to the contractor for any repairs which will require disturbing critical lead dress of the transformer assemblies.

5-57. Decoding switch wafer S1-c on driver transformer assembly 1A1A4 interprets the five wire code from the AM-3924(P)/URT FREQUENCY MC switch, or from the exciter, and energizes the band-switching motor as required to set the driver transformer assembly switch and the final transformer assembly switch to the proper channel. The decoding switch wafer is secured to the switch assembly by two small clamping blocks which permit the wafer to be rotated several degrees in either direction to correct errors in positioning of the driver and final transformer switch assemblies. (The error can only be corrected by rotating the decoding switch wafer if the error in positioning for the final and driver transformer assembly switches is in the same direction. Refer to note following step az of paragraph 5-48.

When disassembling the driver transformer assembly, carefully note orientation of each switch wafer to prevent errors in reassembly. Remove assembly top plate to gain access to switch connections. Note relative position of terminals on coil assemblies and set in the same position when reinstalling. Be careful when handling coil assemblies. Fine wire leads are easily broken. Steps al through az of paragraph 5-48 detail procedure for reorienting switch wipers after assembly. WHEN REASSEMBLY IS COMPLETE, ALWAYS ALIGN DRIVER TRANSFORMER ASSEMBLY.

5-58. FIXED CAPACITOR 1A1C4 REMOVAL AND REPLACEMENT.

WARNING

Observe all safety precautions.

5-59. REMOVAL.

5-60. To remove the fixed mica capacitor 1A1C4 from AM-3924(P)/URT, proceed as follows:

a. De-energize and secure all electrical power to the AN/URT-23(V).

b. Loosen eight front panel captive screws on AM-3924(P)/URT and pull chassis drawer out until chassis slides lock.

c. Remove metal protective cover from over final power amplifier tubes by removing ten screws.

d. Remove cable clamp from coaxial cable that connects to VSWR bridge assembly.

e. Disconnect cable connector 1A1A2P1 from J1 of VSWR bridge assembly.

f. Loosen screw that secures contact strap (or solder lug) to contact block of final transformer assembly 1A1A2.

g. Carefully loosen four captive screws and lift final transformer assembly 1A1A2 from chassis.

h. Disconnect each plate cap connector from top of power amplifier tubes 1A1V1 and 1A1V2.

i. Remove the button plug located on the wall plate exposing the 3/8" hole and lower screw fastened to capacitor 1A1C4.

j. Remove the lower screw from capacitor 1A1C4.

k. Remove the two top Phillips head screws from the insulator board to which the small coil and 33-ohm resistor are connected.

l. Remove the top, rear brass screw located near RF choke 1A1L1.

m. Lift out the entire assembly to which capacitor 1A1C4 is attached.

n. Remove the top screw from capacitor 1A1C4.

o. Remove capacitor 1A1C4.

p. Replace 1A1C4 with a new one.

q. Reassemble all parts removed by reversing steps c through n.

r. Release chassis locks and push chassis into case.

s. Secure the eight front panel screws.

5-61. PRINTED CIRCUIT BOARD EXTENDERS.

5-62. To enable testing and troubleshooting of the AM-3924(P)/URT printed circuit boards, two extenders are required:

1. Part Number SK-2500-101, extender for DC Power Control Assembly 1A1A5. (1A1MP81)

2. Part Number SK-2500-100, extender for APC-PPC Assembly 1A1A6. (1A1MP96)

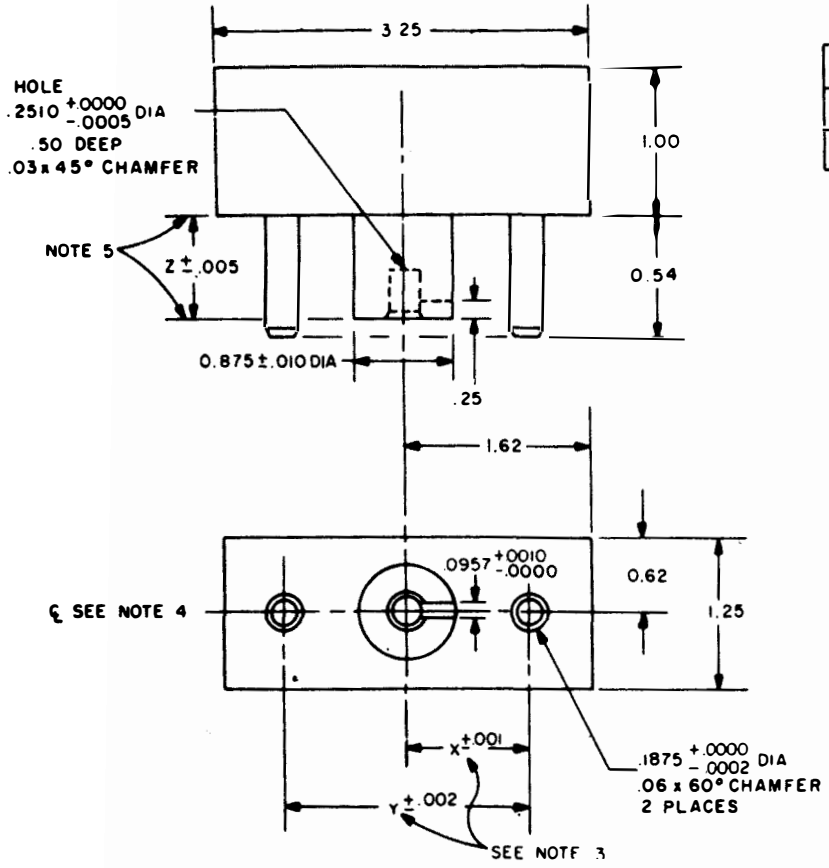
5-63. TEST FIXTURE FABRICATION.

5-64. INDEXING JIG FABRICATION.

5-65. In order to replace the components in the transmission assembly, or the switch in either of the transformer assemblies, small indexing jigs will be required. These small jigs orient the couplings on the switch (or gear) shaft so that both transformer assembly (1A1A4 and 1A1A2) switches will be indexed to the same channel by the bandswitching motor. Both switches have over 20 positions, therefore, evan a small error in layout or construction of the jig can result in serious equipment malfunction. When constructing the jigs, carefully observe all dimension tolerances. Fabricate the jigs from tool steel, with guide pins press fitted in proper relationship to reference holes. Figures 5-3 and 5-4 list dimensions and construction details.

5-66. VOLTAGE AND RESISTANCE MEASUREMENTS.

5-67. Table 5-3 through 5-6 provide voltage and resistance information for the tubes and transistors of the AM-3924(P)/URT, AM-6909( )/URT, PP-3916/UR, and PP-3917/UR. All voltage measurements should be made with a 20,000 ohms/voltmeter and should be within $\pm$ 20% of the indicated value. Unless otherwise specified, the voltage measurements are all DC levels and were made with the Multimeter common lead connected to chassis ground. No voltage measurements are provided for the final amplifier tubes, due to the extreme hazards involved in measurement. This circuit can be safely checked with the front panel Multipurpose meter, the resistance information in table 5-5, and by making continuity measurements between the tube socket and metering circuit. All resistance measurements should be made with the tubes in their sockets and with the exception of screen and grid circuit, should be within $\pm$ 20% of the indicated value. The screen and grid circuit resistance measurements may vary +300% and -70% due to the semiconductor circuits, depending on the meter in use and the temperature of the set.

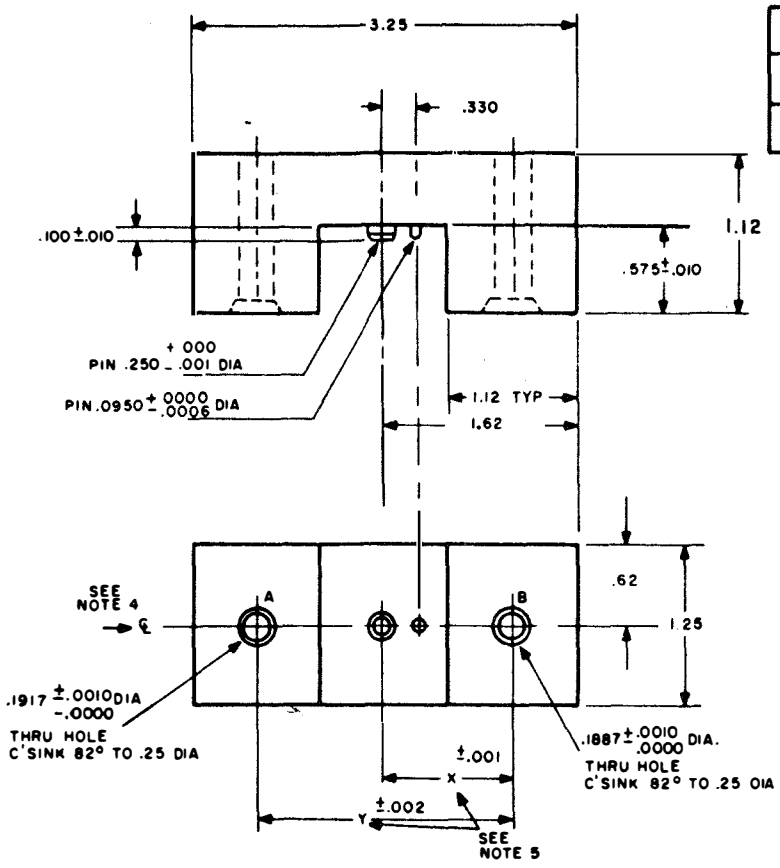


ASSY	X	Y	Z
1A1A4	.750	1.500	.578
1A1A2	1.125	2.250	.523

NOTES

1. MATL, TOOL STEEL
2. FINISH NONE
3. MAKE TWO JIGS ONE FOR FINAL AND ONE FOR DRIVER TRANSFORMER ASSY. SEE TABLE ABOVE FOR X, Y, AND Z DIMENSIONS.
4. ℄ OF GUIDE PINS AND ℄ OF SLOT TO BE WITHIN .001.
5. THESE TWO SURFACES MUST BE PARALLEL +.010 IN.
6. TOLERANCE: .XXX = ± .005
   .XX = ± .02

Figure 5-3. Fixtures to Locate Couplings on Transformer Assemblies



	X	Y
1A1A4 COUPLING	.750	1.500
1A1A2 COUPLING	1.125	2.250

NOTES

1. MATL: TOOL STEEL
2. FINISH: NONE
3. PRESS FIT PINS
4. ℄ OF PINS TO BE POSITIONED ON ℄ OF "A" AND "B" HOLES WITHIN .001
5. MAKE ONE FIXTURE FOR COUPLING MATING WITH 1A1A4 AND ONE FOR COUPLING MATING WITH 1A1A2. SEE TABLE ABOVE FOR X AND Y DIMENSIONS
6. TOLERANCES: .XXX=±.005 XX=±.02

Figure 5-4. Fixtures to Locate Couplings on Transmission Assembly

TABLE 5-3. DRIVER TUBE ASSEMBLY 1A1A1 VOLTAGE MEASUREMENTS

NOTE

The voltage measurements for the driver amplifier are made at the terminals of terminal board 1A1A1TB1 with protective cover removed. If the driver tube assembly were removed to gain access directly to the tube sockets, cooling air to both the driver and final amplifier tubes would be lost.

1A1A1TB1 TERMINAL No. / COND.	1 Plates	2 Scrns	6 Fila-ments	7 GRD	8 Grid Bias	9 V2 Cath-ode to meter	10 V1 Cath-ode to meter	11 Input pwr to meter	12 RF In-put	13 GRD
OPERATE	530	287	13.5 VAC	0	-98	0	0	0.85	0	0
KEYED, NO SIGNAL	510	287	13.5 VAC	0	-7.6	3.4*	3.4*	0	0	0
KEYED, 1 KW AVG (CW MODE)			13.5 VAC	0		3.4*	3.4*		0	0

*Multipurpose meter switch must not be set in DRIVER 1 AMPERES or DRIVER 2 AMPERES.

TABLE 5-4. DRIVER TUBES 1A1A1V1/V2 RESISTANCE MEASUREMENTS

NOTE

Resistance measurements made directly at the tube sockets, with the assembly wired into the set. To remove the 1A1A1 assembly without disconnecting the leads to 1A1A1TB1, first detach the small cable clamps holding the main cable against the rear lip of the chassis near 1A1A4.

TUBE SOCKET PIN NO. / COND	1	2	3	4	5	6	7	8	9	10	11
METER POSITIVE POLARITY	10.0	235K	23K	10.0	0	0.2	235K	23K	10.0	235K	23K
METER NEGATIVE POLARITY	10.0	36K	22K	10.0	0	0.2	36K	22K	10.0	36K	22K

TABLE 5-5. FINAL AMPLIFIER TUBES (1A1V1/V2) RESISTANCE MEASUREMENTS

NOTE

See paragraph 5-32 to obtain access to final tube sockets. These measurements are made with 1A1A1 and 1A1A4 disconnected and removed from the set. Figure 5-5 illustrates the final tube socket.

PIN / COND	FILAMENTS	GRID	SCREEN	PLATE	CATHODE
METER POSITIVE POLARITY	4.7	25K	175K*	800K	4.7
METER NEGATIVE POLARITY	4.7	39K	70K*	135K	4.7

*Screen resistance will vary with position of screen voltage taps P1 and P2.

TABLE 5-6. TRANSISTOR DC VOLTAGE MEASUREMENTS

NOTE

Numbers in parenthesis in E, B, and C columns refer to number of applicable note at end of table.

TRANSISTOR STAGE	CONDITION (NOTE 1)	DC VOLTAGE TO GROUND		
		E/2	B/1	C
Amplifier, Radio Frequency AM-3924(P)/URT (Prefix reference designations with 1A1.)				
IC1	Positive to A5TP4 Negative to point indicated	A5TP3 +12V	 0	IC1 Case +21V
A5Q2	Normal Overload	20.5 20.0	20.5 19.0	0.15 20.0
A5Q3	Normal (Unkeyed) Overload	4.6 9.2	0.3 9.9	20.5 9.3
A5Q4	Normal Coupler interlock grounded or bandswitch motor running	11.5 11.0	11.5 11.0	0.1 11.0

TABLE 5-6. TRANSISTOR DC VOLTAGE MEASUREMENTS (Cont.)

TRANSISTOR STAGE	CONDITION (NOTE 1)	DC VOLTAGE TO GROUND		
		E	B	C
A5Q5	Normal-Keyed Normal-Unkeyed Coupler Interlock grounded or band-switch motor running	5.8 8.4 8.4	5.5 10.5 11.0	4.5 -0.1 -0.1
A5Q6	Normal Keyed	-0.1 0.28	0 0	-68.0 0.35
A5Q7	P.S. (2A1S4) Interlock Closed P.S. (2A1S4) Interlock Open	0.5 17.5	1.1 18.0	0.5 28.5
A5Q8	Normal Coupler Interlock	26.0 0.24	26.5 0.22	27.0 27.0
A5Q9	Normal Coupler Interlock	26.5 0.5	27.0 0.65	27.0 27.0
A5Q10	Standby	11.0	11.5	18.0
A5Q11	Standby	11.5	12.0	20.0
A5Q12	Positive Ground (Note 7) Negative Ground (Note 7)	-12.1 -0.3	-12.4 -0.28	-21.0 -9.2
A6Q1	Keyed -1KW AVG Output (Notes 2, 3)	2.6	3.0	10.8
A6Q2	Normal-Unkeyed Normal-Keyed	-90.0 .17	-90.0 .77	-68.0 .23
A6Q3	Normal-Unkeyed Normal-Keyed	9.0 7.0	10.5 6.8	-90.0 6.9
A6Q7	Keyed -1KW AVG Output (Note 3) Tune Keyed - 200W	0 2.0	-0.17 11.5	0 0
A6Q8	Keyed -1KW AVG Output (Note 3)	1.46	1.88	6.35
A6Q9	Standby Keyed -1KW AVG Output (Note 3)	11.0 10.9	10.7 10.5	0 2.7(8)
A6Q10	Standby Keyed -1KW AVG Output (Note 3)	0.25 (8)2.40	0 (8)2.7	20.5 18.9
A6Q11	Standby Keyed -1KW AVG Output (Note 3)	(6)1.4 (6)1.4	(6)1.95 (6)1.95	(6)5.2 (6)6.4
A6Q12	Standby Keyed -250KW Output (Note 4)	-0.5 1.39	0 2.05	20.0 (5)19.7

TABLE 5-6. TRANSISTOR DC VOLTAGE MEASUREMENTS (Cont.)

TRANSISTOR STAGE	CONDITION (NOTE 1)	DC VOLTAGE TO GROUND		
		E	B	C
A6Q13	Standby Keyed -250W Output (Note 4)	20.2 (5)17.2	19.7 (5)16.7	0. (5)5.1
A6Q14	Standby Keyed -250W Output (Note 4)	0 (5)4.6	0.35 (5)5.1	20.4 19.2
A6Q15	Standby Keyed -250W Output (Note 4) Keyed -1KW AVG Output (Note 3)	0.01 (5)4.6 4.8	0 (5)4.5 0	11.0 11.0 11.2
A6Q16	Standby Keyed 1KW Output (Note 3)	0.01 2.38	0.8 2.8	11.0 11.0
A6Q17	Standby Tune Keyed	43.8 38.9	44.0 38.5	0.01 38.9
A6Q19	Standby Keyed (Note 3)	11.3 10.3	13.8 10.2	-70.0 10.2
A6Q20	Standby Normal - Keyed Keyed (Note 3)	-102.0 -33.6 -33.6	-102.0 -34.0 -34.1	-102.0 -34.0 -71.0
A6Q21	Standby Normal - Keyed Keyed (Note 3)	-116. -48.5(9) -71.	-114. -48.5(9) -72.	-107. -34.6 -34.6
Power Supply PP-3916/UR (Prefix reference designations with 2A1.)				
Q1		20.5	21.0	0
Q2		20.5	21.0	0
Power Supply PP-3917/UR (Prefix reference designations with 1A1A8A1.)				
Q1		41.0	42.5	0
Q2		41.0	42.5	0

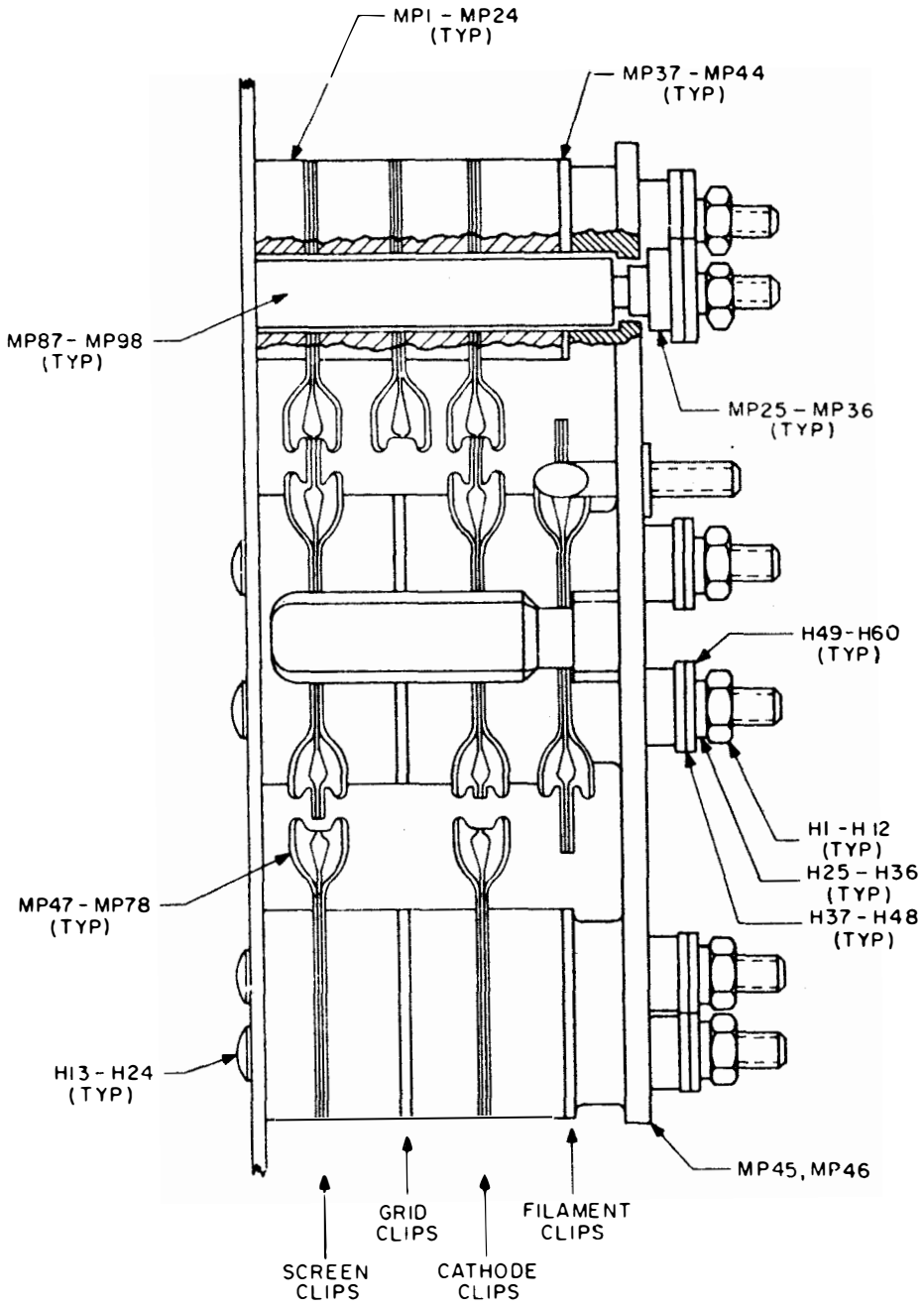
NOTES:

1. Measurements taken in LSB mode, unkeyed, unless otherwise specified; no modulation.
2. Readings may vary ± 1 volt or more depending on input power level.
3. CW mode.
4. AM mode; no modulation.
5. This reading may vary + 2 volts from set to set, and may change when a different T-827( )/URT is used.

TABLE 5-6. TRANSISTOR DC VOLTAGE MEASUREMENTS (Cont.)

NOTES: (Cont.)

6. This reading made on 10 V scale or higher to avoid loading due to meter resistance.
7. Note deleted by FC17 and FC 18.
8. The waveform at this point consists of a random series of short pulses; hence the reading on a DC voltmeter serves only as a guide.
9. Exact value depends on setting of PA BIAS control 1A1R10.



NOTE
AS SHOWN ABOVE, THE VIEW IS FROM THE REAR, AS IF LOOKING THRU THE REAR WALL OF THE CHASSIS.
XV1 IS SHOWN, XV2 IS IDENTICAL, EXCEPT IT IS A MIRROR IMAGE

Figure 5-5. Final Tube Socket Details

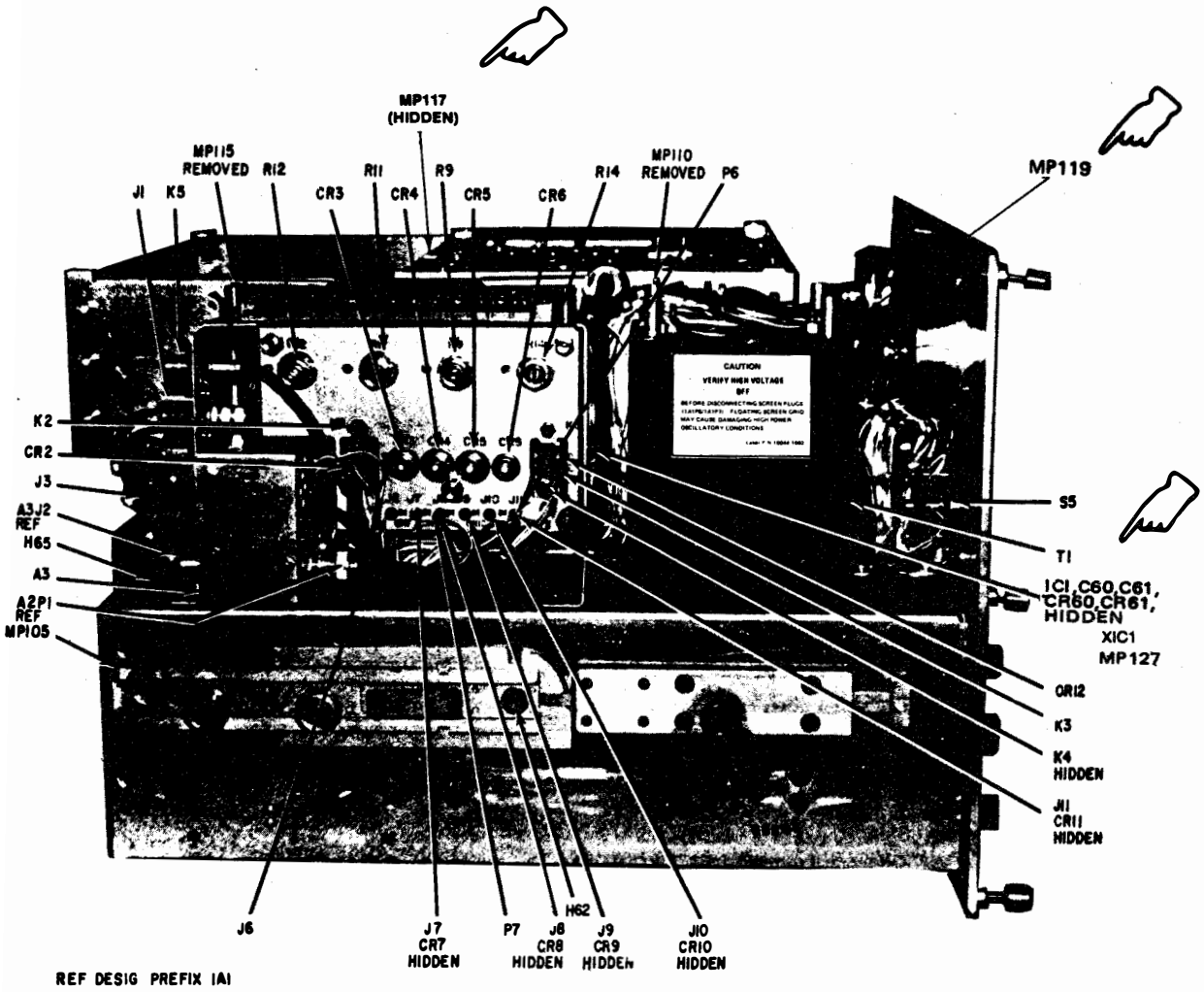
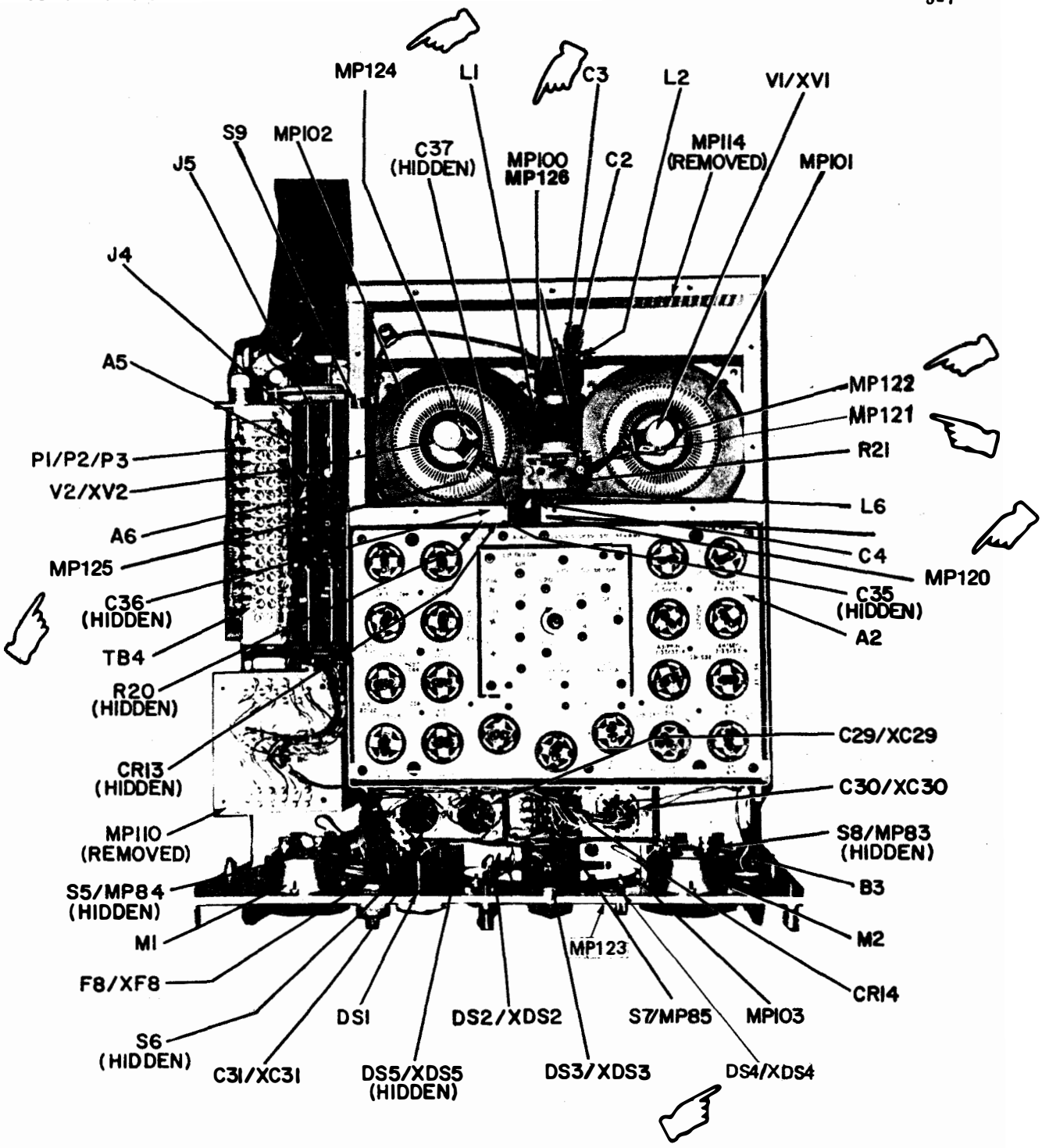


Figure 5-6. Radio Frequency Amplifier AM-3924(P)/URT, Side View, Component Locations



REF DESIG PREFIX (A)

Figure 5-7. Radio Frequency Amplifier AM-3924(P)/URT, Top View, Component Locations

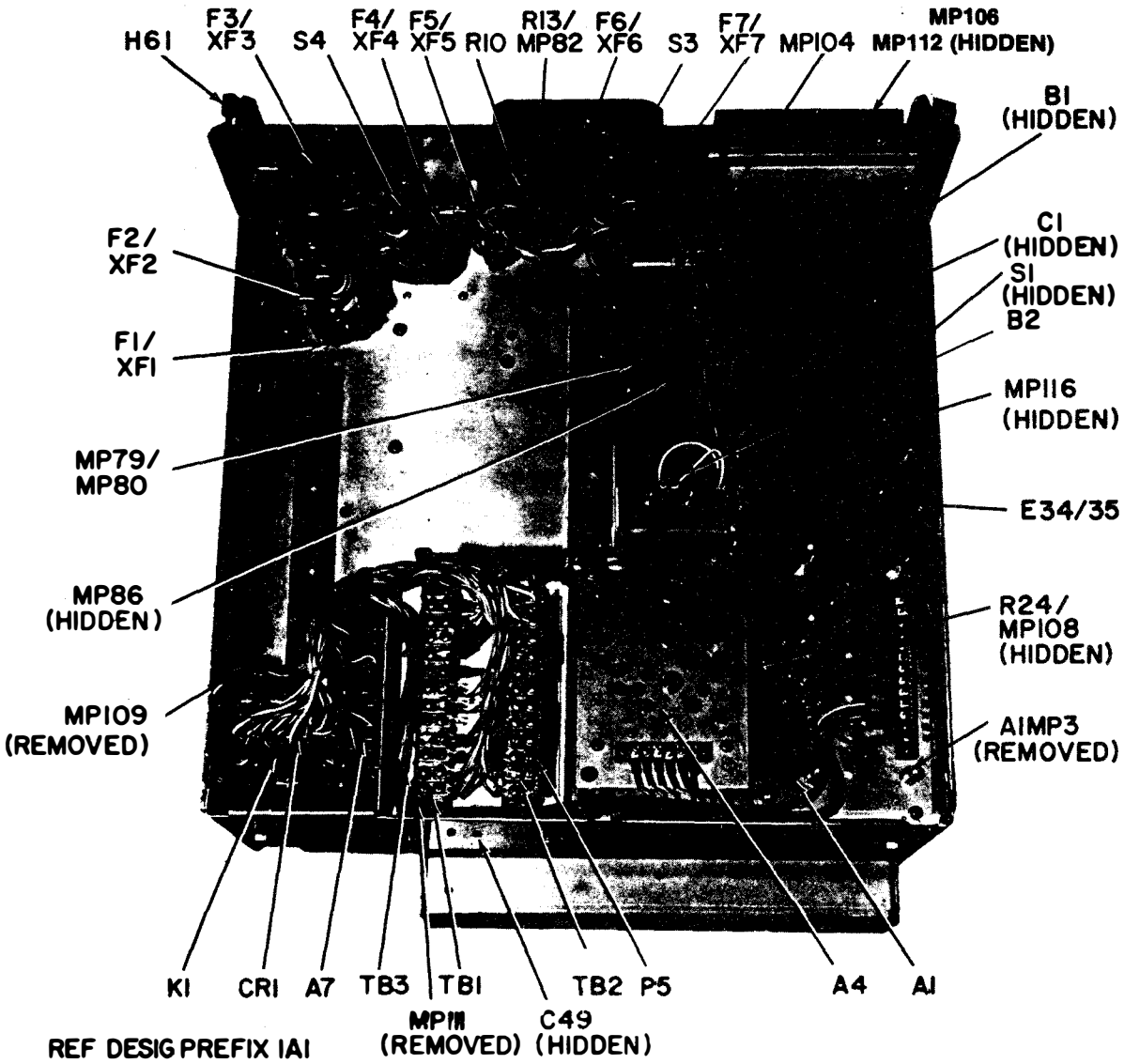


Figure 5-8. Radio Frequency Amplifier AM-3924(P)/URT, Bottom View, Component Locations

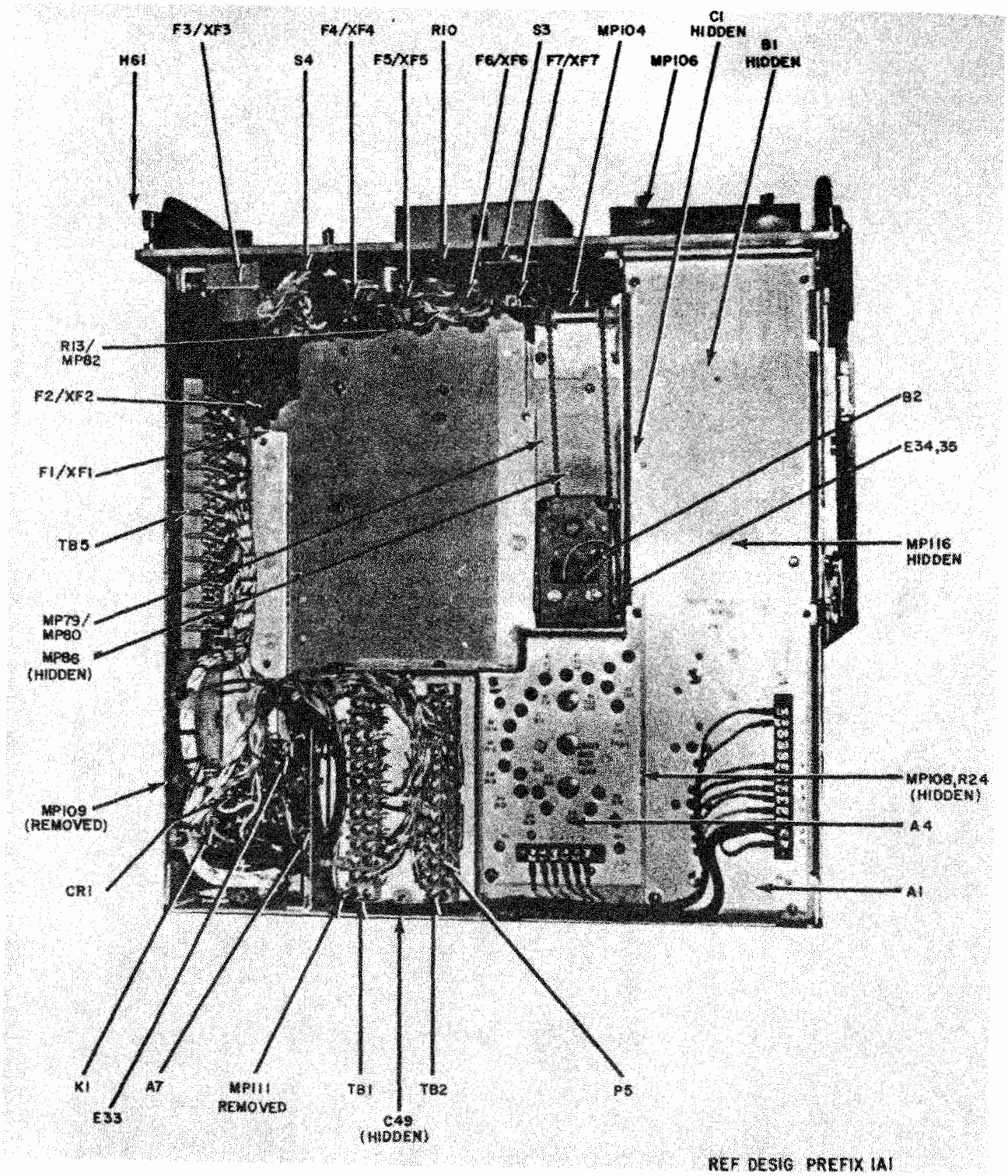
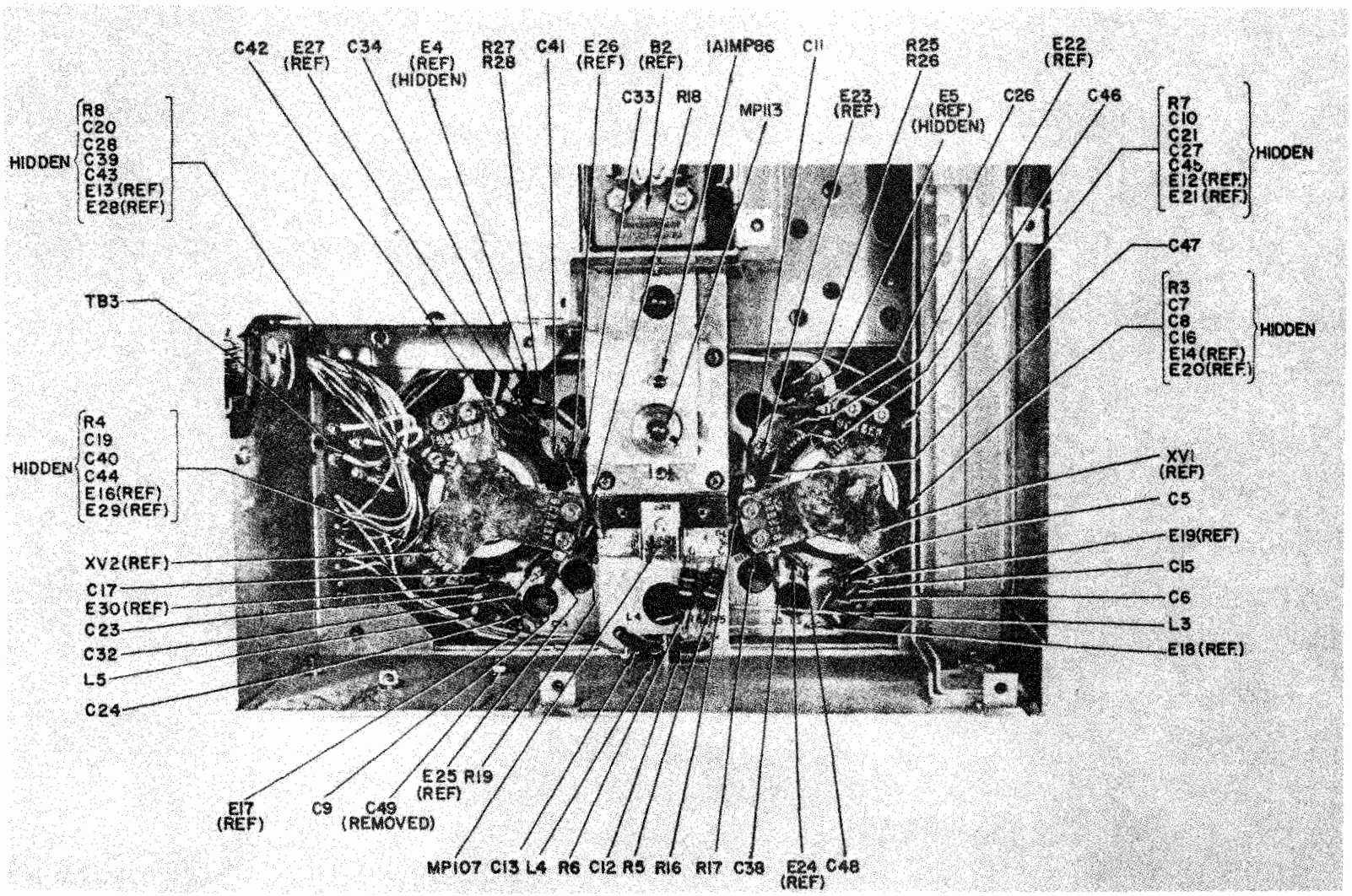


Figure 5-9. Radio Frequency Amplifier AM-6909/URT, Bottom View, Component Locations



REF DESIG PREFIX IAI

Figure 5-10. Final Amplifier Tube Socket Assembly, Bottom View, Component Locations

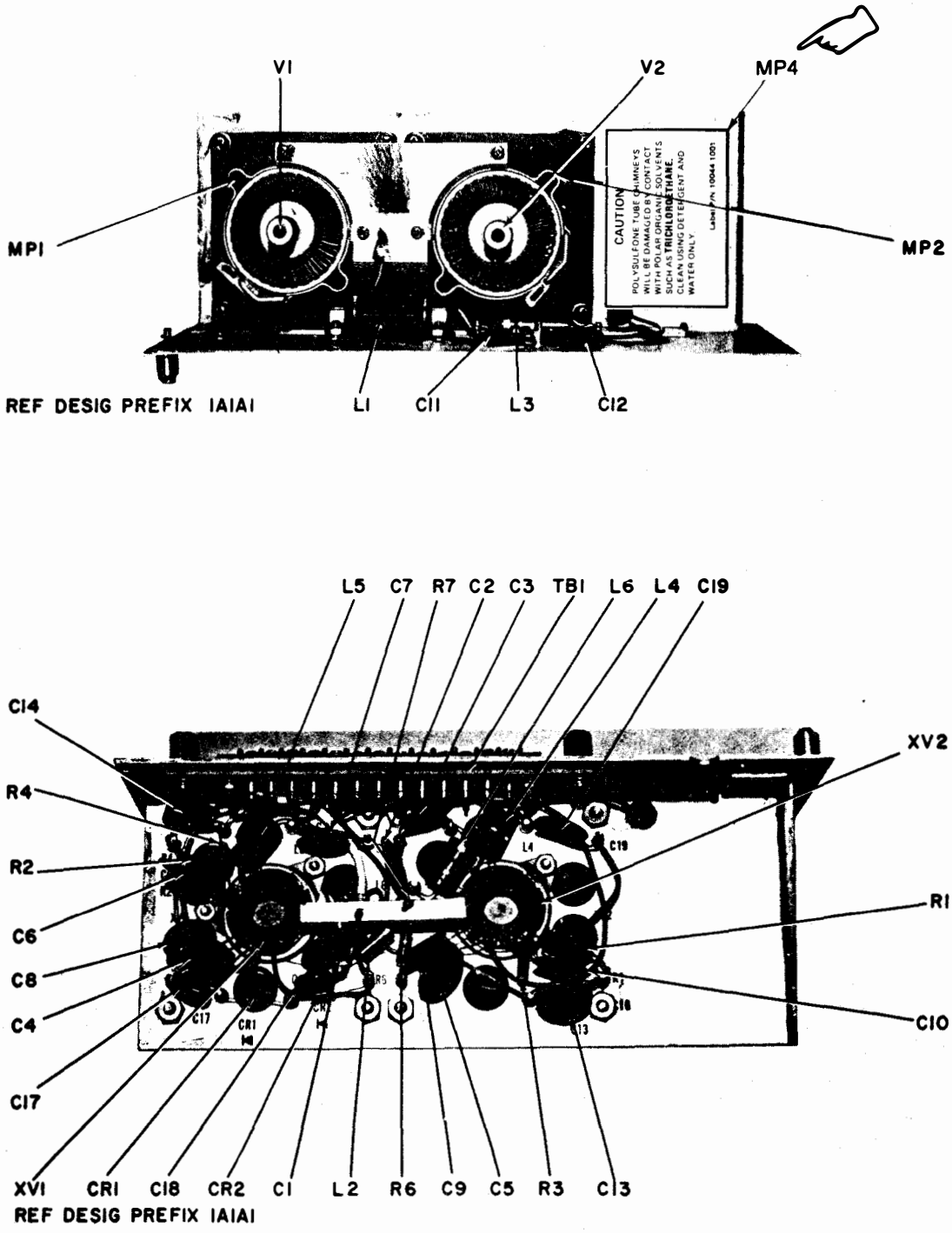
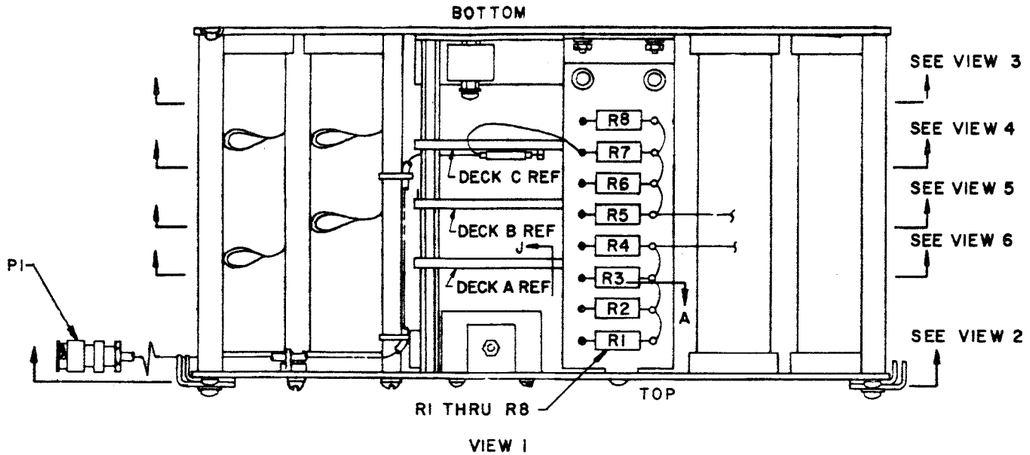
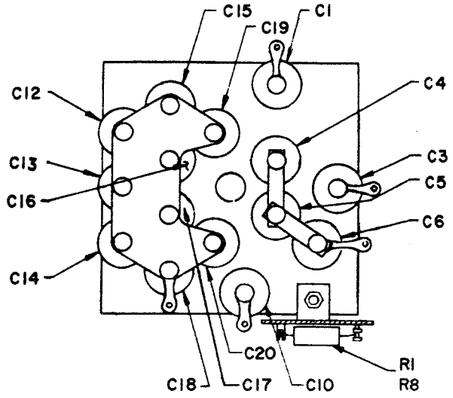


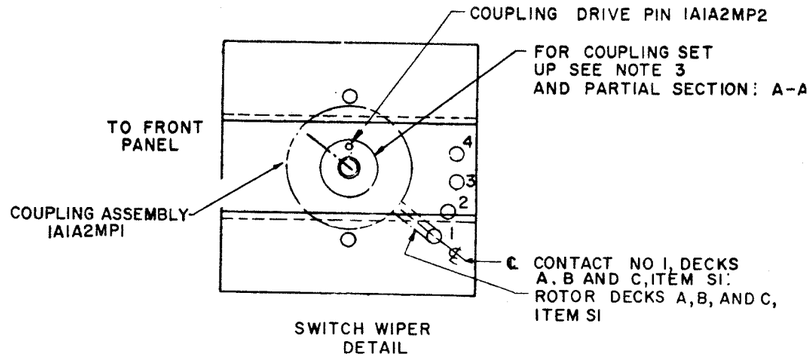
Figure 5-11. Driver Tube Assembly 1A1A1, Component and Test Point Locations



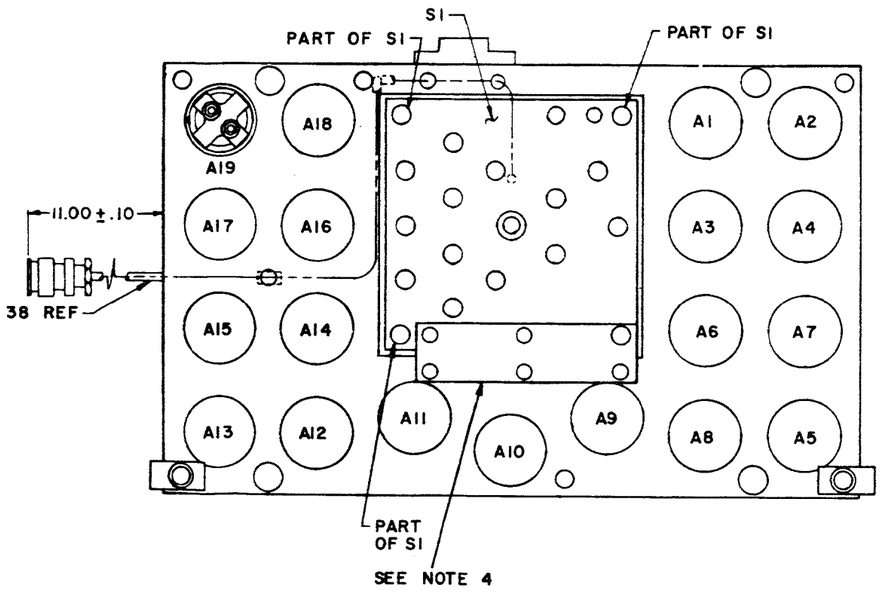
VIEW 1



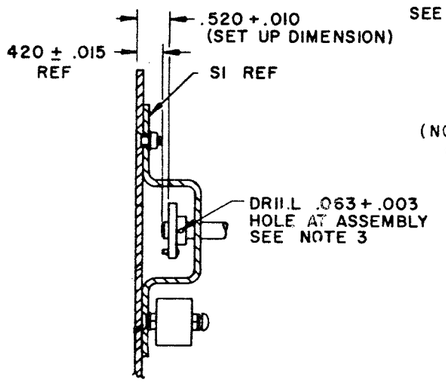
TOP
SWITCH PLATE
DETAIL
(SEE VIEW 3)



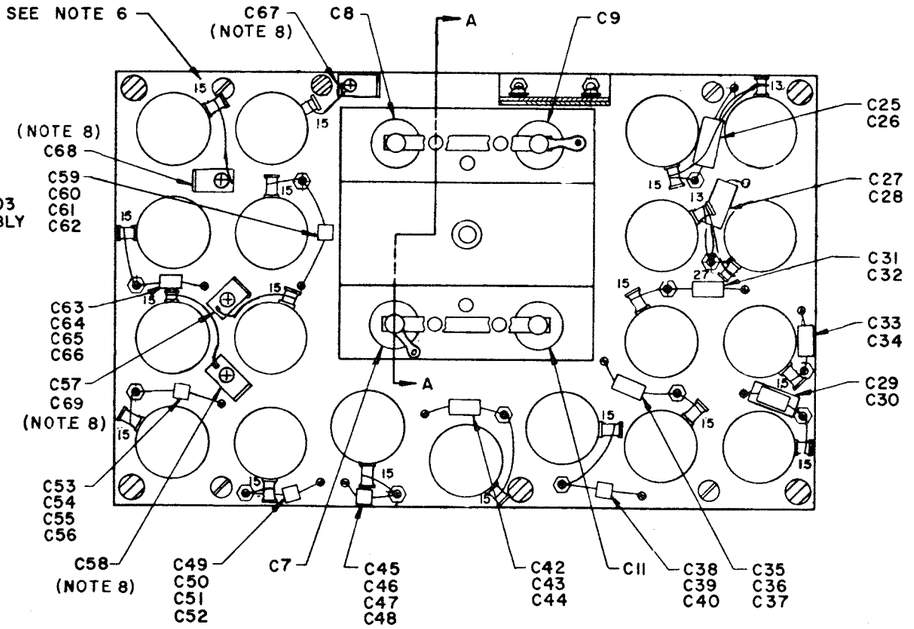
SWITCH WIPER
DETAIL



VIEW 2



PARTIAL SECTION
A-A



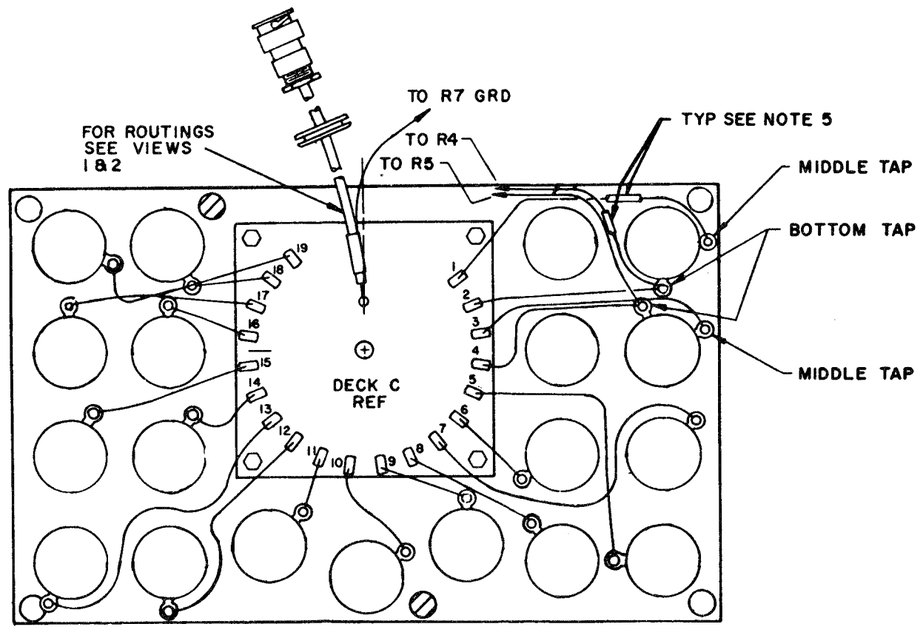
BOTTOM PLATE (SEE VIEW 1)

VIEW 3

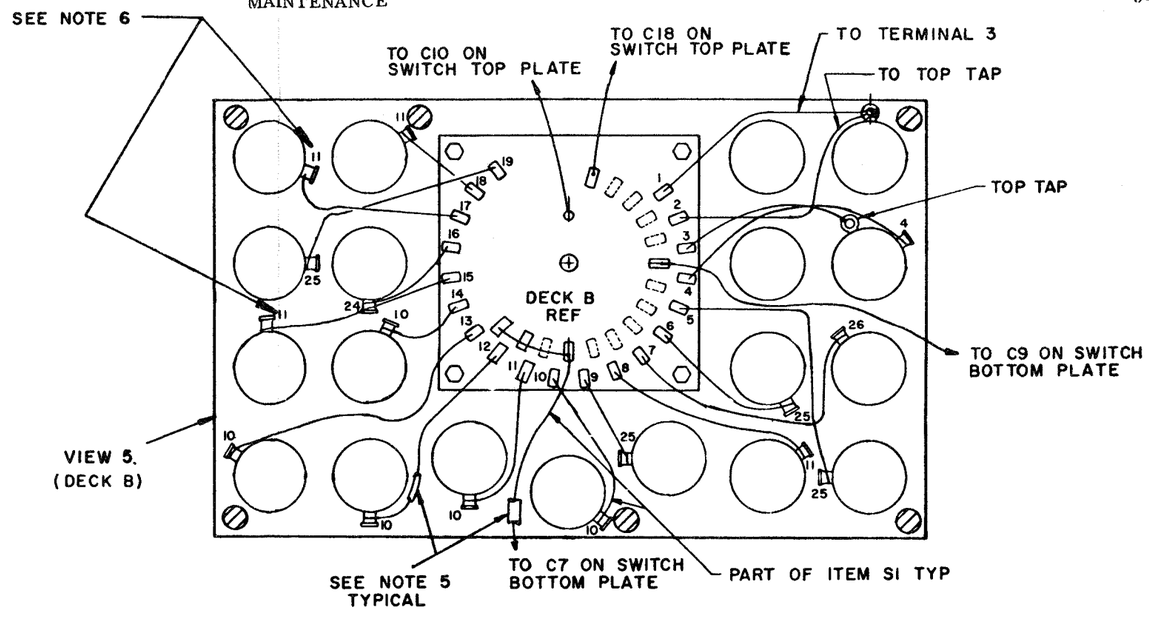
Figure 5-12. Final Transformer Assembly 1A1A2, Component and Test Point Locations
(Sheet 1 of 2)

NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. PREFIX THE PART DESIGNATION WITH 1A1A2
2. DRESS OF ALL COIL CONNECTIONS IS CRITICAL. IF LEADS MUST BE MOVED, REPLACE IN PRECISELY THE SAME LOCATION.
3. COUPLING SETUP-AFTER PINNING, COUPLING DRIVE PIN SHALL BE ORIENTED AS SHOWN & ROTORS ON SWITCH DECKS SHALL CENTER ON THEIR CONTACTS WITHIN ± 1° HEIGHT OF COUPLING TO BE AS SHOWN.
4. SHIM AS REQUIRED TO COMPENSATE FOR HEIGHT DIFFERENCE.
5. NO. 10 TEFLON TUBING SHALL COVER ALL BARE NO. 12 GAGE WIRE.
6. NUMBER SHOWN ADJACENT TO COIL TERMINAL IS THE HOLE ON COIL FORM IN WHICH THAT TERMINAL IS LOCATED.
7. ALL CONNECTIONS TO TRANSFORMER ASSYS (A1-A19) SHALL BE MADE WITH HIGH TEMPERATURE SOLDER, COMPOSITION Ag 1.5 PER QQ-S-571.
8. HARDWARE ON CAPACITOR HEATSINKS MUST BE TIGHT TO INSURE ADEQUATE COOLING.



VIEW 4
(DECK C)



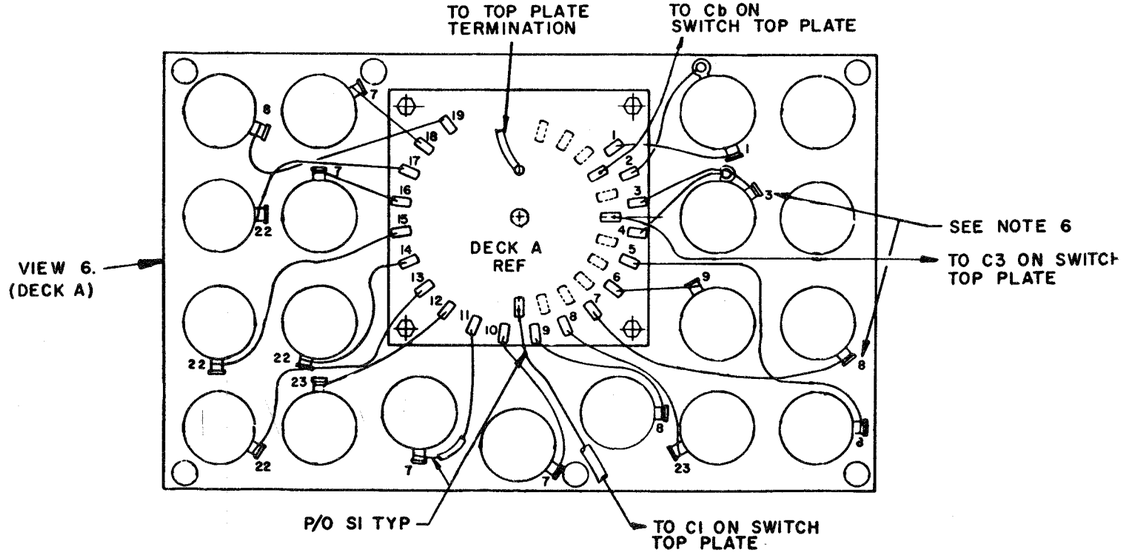


Figure 5-12. Final Transformer Assembly 1A1A2, Component and Test Point Locations (Sheet 2 of 2)

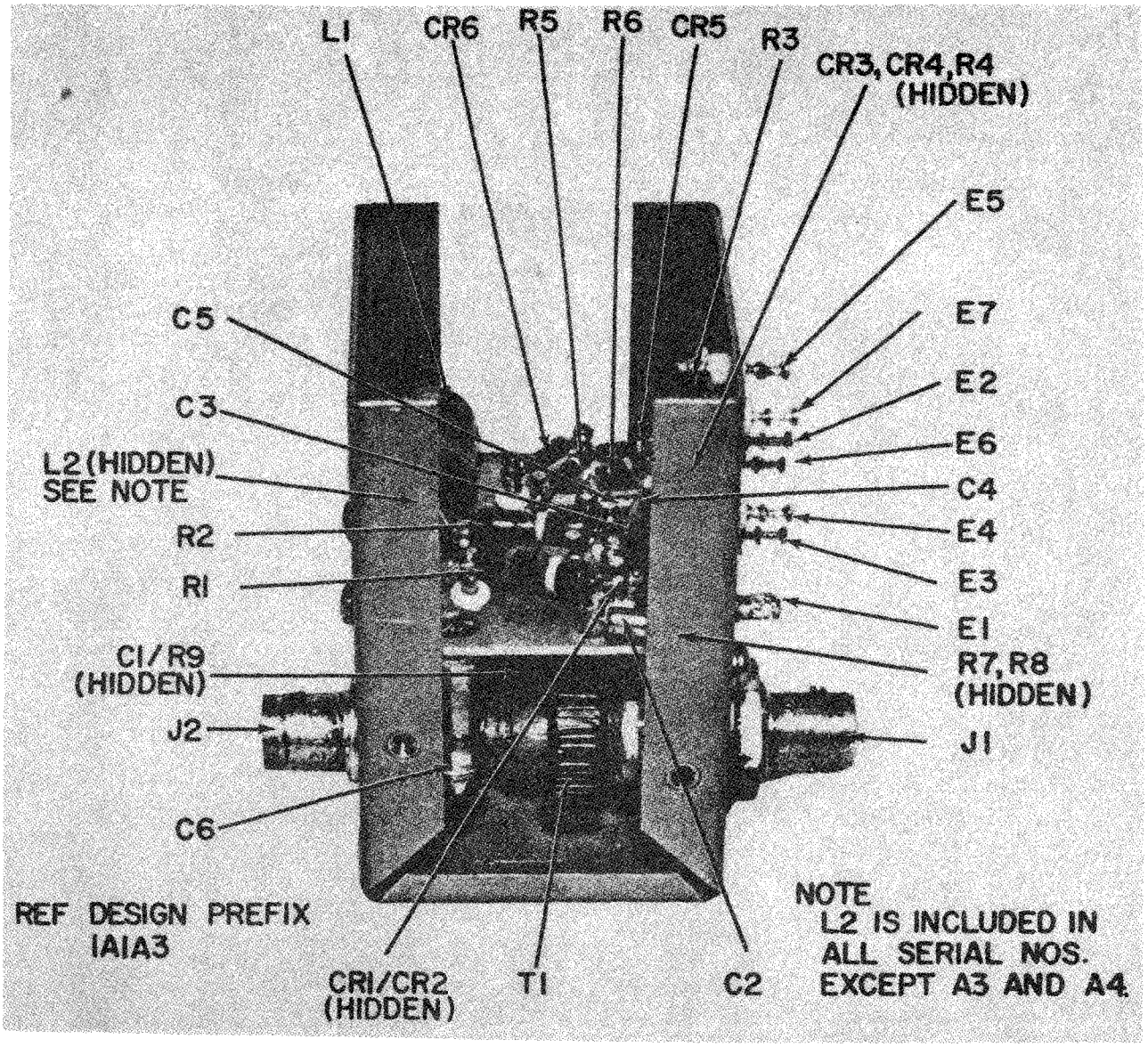
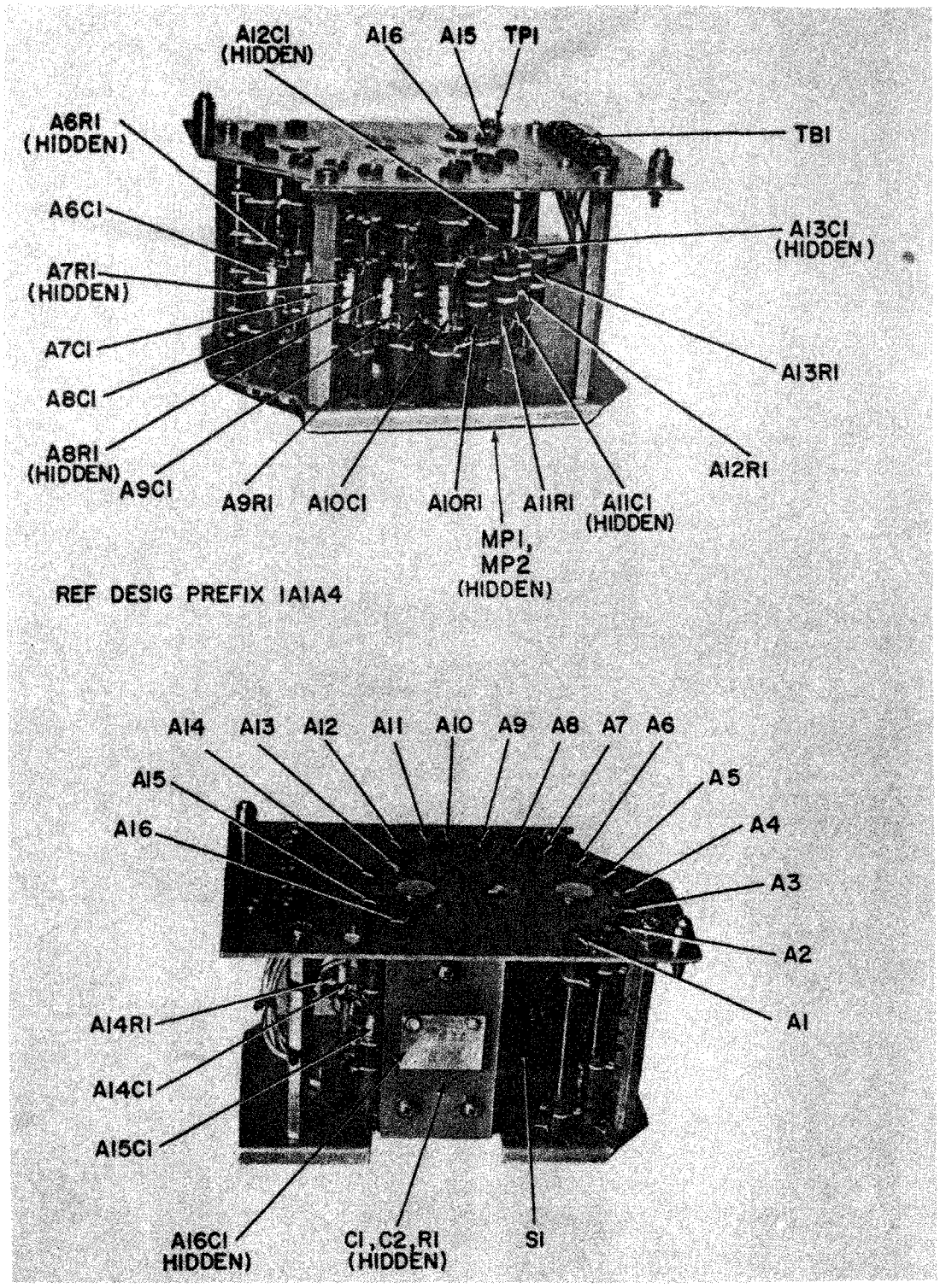


Figure 5-13. VSWR Bridge Assembly 1A1A3, Component and Test Point Locations



REF DESIG PREFIX 1A1A4

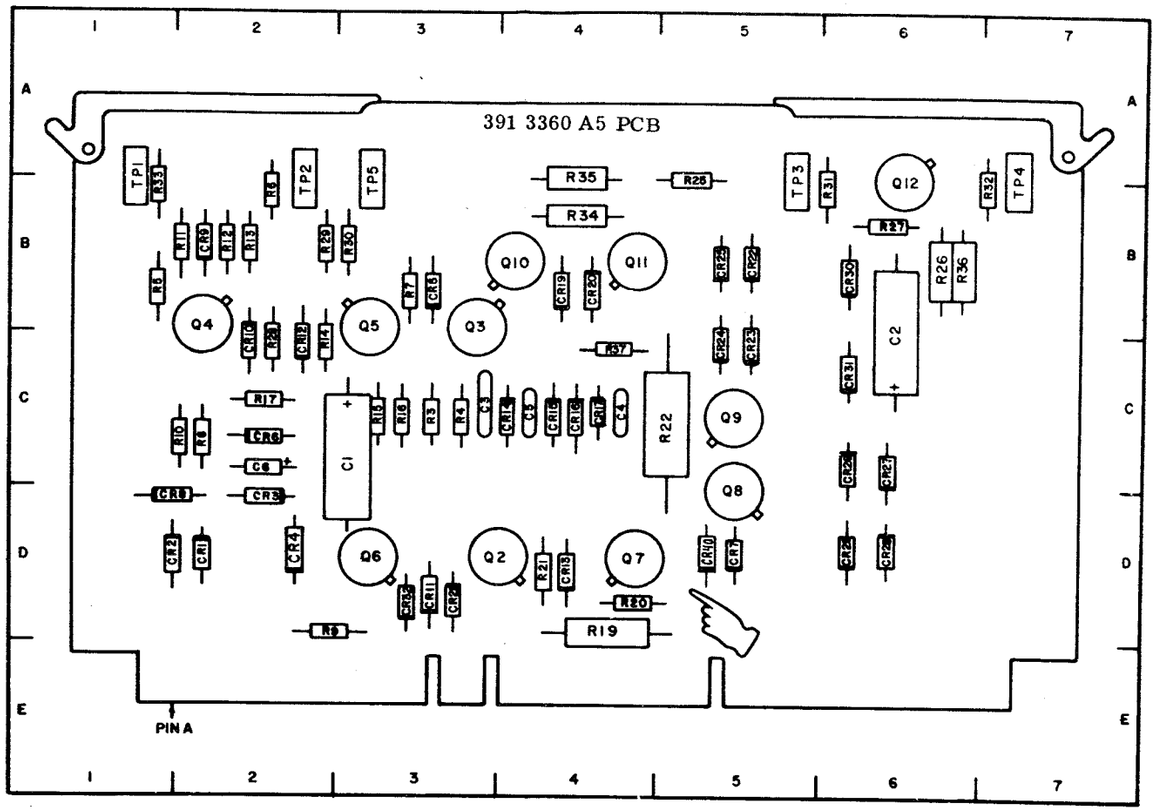
Figure 5-14. Driver Transformer Assembly 1A1A4, Component and Test Point Locations

PIN CALLOUTS

A - 11 VDC
B - Grd Keyline Interlock
C - Motor Relay Coil
D - High Voltage Detector
E - Decoder Ground
F - Chassis Ground
H - Reset
J - Bias Interlock
K - Keyer Output
L - (not used)
M - Overload Circuit
N - Keyline
P - 16 VAC
R - 1A1V1 Cathode Current
S - (S ks keyway)
T - Operate Relay Coil
U - 20 VDC Operate
V - (not used)
W - (not used)
X - Power Supply Interlock
Y - (not used)
Z - (not used)
a - 1A1V2 Cathode
b - 28 VDC Output
c - 28 VDC Interlock
d - 32 VAC
e - 32 VAC
f - 20 VDC
g - -12 VDC Remote
h - 12 VDC Remote Regulator Supply
j - 16 VAC
k - 16 VAC
m - +12 VDC Remote
n - (not used)
p - (not used)
r - 12 VDC Remote Regulator Drive

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	3C	CR24	5C	R11	1B
C2	6B	CR25	5B	R12	2B
C3	3C	CR26	6C	R13	2B
C4	4C	CR27	6C	R14	2C
C5	4C	CR28	6D	R15	3C
C6	2C	CR29	6D	R16	3C
		CR30	6B	R17	2C
CR1	1D	CR31	6C	R19	E
CR2	2D	CR32	3D	R20	D
CR3	2D	CR40	5D	R21	D
CR4	2D	Q2	3D	R22	5C
CR5	3B	Q3	3B	R25	5A
CR6	2C	Q4	1C	R26	6B
CR7	5D	Q5	3B	R27	6B
CR8	1D	Q6	2D	R28	2C
CR9	2B	Q7	D	R29	2B
CR10	2B	Q8	5D	R30	2B
CR11	3D	Q9	5C	R31	6B
CR12	2B	Q10	B	R32	7A
CR13	D	Q11	B	R33	1A
CR14	C	Q12	6A	R34	B
CR15	C			R35	A
CR16	C	R3	3C	R36	7B
CR17	C	R4	3C	R37	C
CR19	B	R5	1B		
CR20	B	R6	2A	TP1	1A
CR21	3D	R7	3B	TP2	2A
CR22	5B	R8	2C	TP3	5A
CR23	5C	R9	2E	TP4	7A
		R10	1C	TP5	3A



REF DESIG PREFIX 1A1A5

COMPONENT SIDE

Figure 5-15. Printed Circuit Board 1A1A5, Component and Test Point Locations

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	3D	CR29	6D	R13	3B
C2	6C	CR30	6B	R14	3C
C3	4A	CR31	6C	R15	3C
C4	5C	CR32	3D	R16	3C
C5	4D	CR33	4E	R17	2C
C6	4B	CR34	2B	R19	4D
C7	1D	CR35	5D	R20	4D
		CR36	4C	R21	4D
CR1	2D	CR40	5D	R22	1B
CR2	1D	Q2	3D	R25	5B
CR3	2E	Q3	3B	R26	6B
CR4	3E	Q4	2C	R27	6B
CR6	4B	Q5	3C	R28	3C
CR7	5D	Q6	3C	R29	3B
CR9	2C	Q7	4D	R30	4B
CR10	2C	Q8	5C	R31	6B
CR11	3D	Q9	1B	R32	6A
CR12	3C	Q10	5B	R33	3B
CR14	4C	Q11	5C	R34	5B
CR15	4C	Q12	6B	R35	5B
CR16	5C			R38	5C
CR19	5B	R3	4C	R39	6C
CR21	3D	R4	4C	R40	5D
CR22	5C	R6	2B	R41	1D
CR23	5D	R7	2B	R42	1B
CR24	5D	R8	1C		
CR25	5C	R9	4C	TP1	3A
CR26	6D	R10	2D	TP2	3A
CR27	6D	R11	2D	TP3	5A
CR28	6D	R12	2B	TP4	5A
				TP5	4A

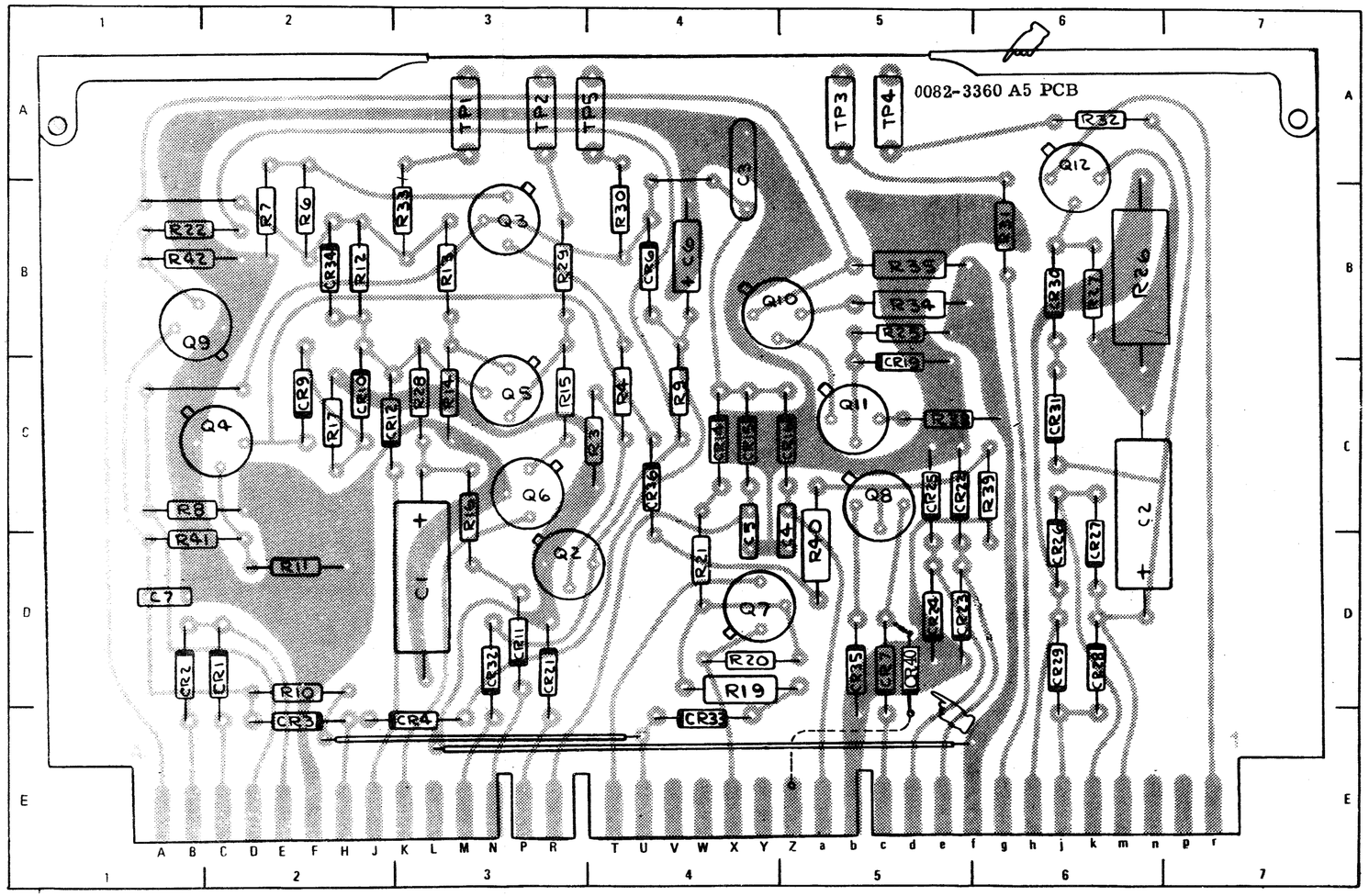


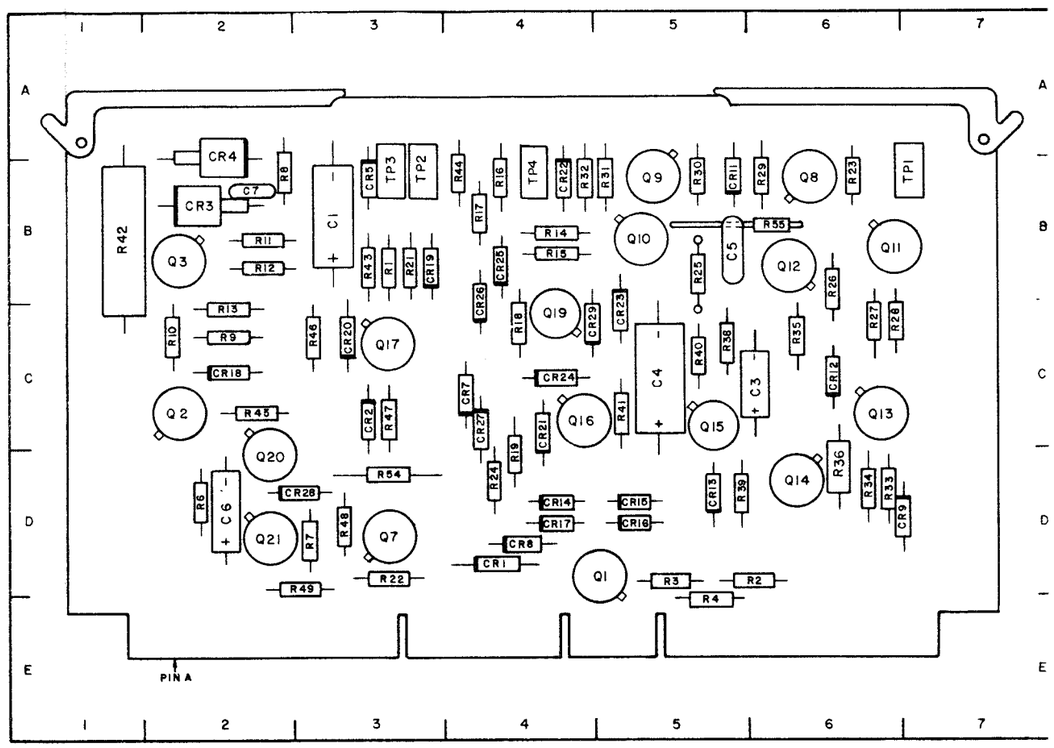
Figure 5-15A. DC Power Control PC Board Assembly 1A1A5, Component Locations Shows New 1A1A5 Assembly

PIN CALLOUTS

A - 160 VDC Input
B - 72 VDC Output
C - Keyer Input
D - Driver Bias Pot (+)
E - Bias Interlock
F - Negative Bias to T-827/URT
H - Bias to PA Grids
J - PA Bias Pot Output
K - Driver Bias Pot (-)
L - -72 VDC Input
M - PA Bias Pot Switched
N - GRD
P - Power Pot Return
R - +28 VDC
S - Tune Ground
T - +20 VDC Carrier Insert
U - CW/FSK GRD
V - APC Output
W - Chassis GRD
X - (X is slotted keyway)
Y - +11 Volts
Z - Interlock
a - Interlock
b - (not used)
c - Input Power Detector
d - 115 VAC
e - To Input Power Meter
f - Chassis Ground
g - 115 VAC
h - -160 VDC Output
j - APC Adjust
k - +20 VDC
m - PPC Adjust
n - To Power Pot
p - VSWR Bridge Output
r - PPC Output

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	3B	Q3	2B	R22	3D
C3	6C	Q7	3D	R23	6A
C4	5C	Q8	6A	R24	D
C5	5B	Q9	5A	R25	5B
C6	2D	Q10	5B	R26	6B
C7	2B	Q11	7B	R27	6C
		Q12	6B	R28	7C
CR1	D	Q13	7C	R29	6A
CR2	3C	Q14	6D	R30	5A
CR3	2B	Q15	5C	R31	5A
CR4	2A	Q16	C	R32	A
CR5	3A	Q17	3C	R33	7D
CR7	C	Q19	B	R34	6D
CR8	D	Q20	2D	R35	6C
CR9	7D	Q21	2D	R36	6D
CR11	5A			R38	5C
CR12	6C			R39	5D
CR13	5D	R1	3B	R40	5C
CR14	D	R2	6E	R41	5C
CR15	5D	R3	5E	R42	1B
CR16	5D	R4	5E	R43	3B
CR17	D	R6	2D	R44	B
CR18	2C	R7	2D	R45	2C
CR19	3B	R8	2B	R46	2C
CR20	3C	R9	2C	R47	3C
CR21	C	R10	2C	R48	3D
CR22	A	R11	2B	R49	2E
CR23	5C	R12	2B	R54	3D
CR24	C	R13	2C	R55	6B
CR25	B	R14	B		
CR26	B	R15	B	TP1	7A
CR27	C	R16	B	TP2	3A
CR28	2D	R17	B	TP3	3A
CR29	5C	R18	C	TP4	B
		R19	D		
Q1	5E				
		R21	3B		



REF. DESIG. PREFIX 1A1A6

COMPONENT SIDE

NOTE

On some production equipments R55 (zone 6B) is connected to contact k (+20 VDC) by a buss wire jumper passing through zones 2B, 2C, and 2D, instead of by copper (printed circuit) strip.

Figure 5-16. Printed Circuit Board 1A1A6, Component and Test Point Locations

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	3B	Q3	2D	R27	6C
C3	4A	Q7	3D	R28	6C
C4	4D	Q8	6B	R29	6A
C5	7C	Q9	6A	R30	6B
C6	2C	Q10	5A	R31	6A
C7	1B	Q11	6C	R32	5A
C8	2D	Q12	7D	R33	6D
C9	7C	Q13	6D	R35	7C
C10	5A	Q14	6C	R36	5C
		Q15	4C	R37	6D
CR1	3E	Q16	5B	R38	5B
CR2	3D	Q17	4C	R39	5C
CR3	1C	Q19	3B	R40	4D
CR4	1C	Q20	3C	R41	7B
CR5	2D	Q21	3D	R42	1D
CR8	5D	Q22	4A	R43	3B
CR9	6D	Q23	5C	R44	7B
CR10	5A	Q24	2B	R45	2C
CR11	6A			R46	3C
CR12	6C	R1	4C	R47	4D
CR13	5C	R2	5D	R48	3D
CR14	5D	R3	5D	R49	2E
CR15	6D	R4	5E	R54	3C
CR16	5D	R6	2E	R55	6B
CR17	5D	R7	3D	R56	7B
CR18	2D	R8	1C	R57	2C
CR19	4D	R9	2D	R58	5A
CR20	3C	R10	2D	R59	5A
CR22	5A	R11	3D	R60	5A
CR25	3A	R12	3D	R61	7C
CR26	4A	R13	2D	R62	6D
CR27	4B	R14	3B	R63	5C
CR28	2C	R15	4B	R64	5D
CR29	3B	R16	4A	R65	4C
CR31	2C	R17	2B	R66	4B
CR32	5B	R18	3B	R67	5B
CR34	6D	R19	2B	R68	5C
CR35	4B	R21	4D		
CR36	4C	R22	3D	TP1	7A
CR37	4B	R23	7E	TP2	7A
CR38	4B	R24	4C	TP3	3A
Q1	5D	R25	5B	TP4	3A
Q2	2D	R26	6B		

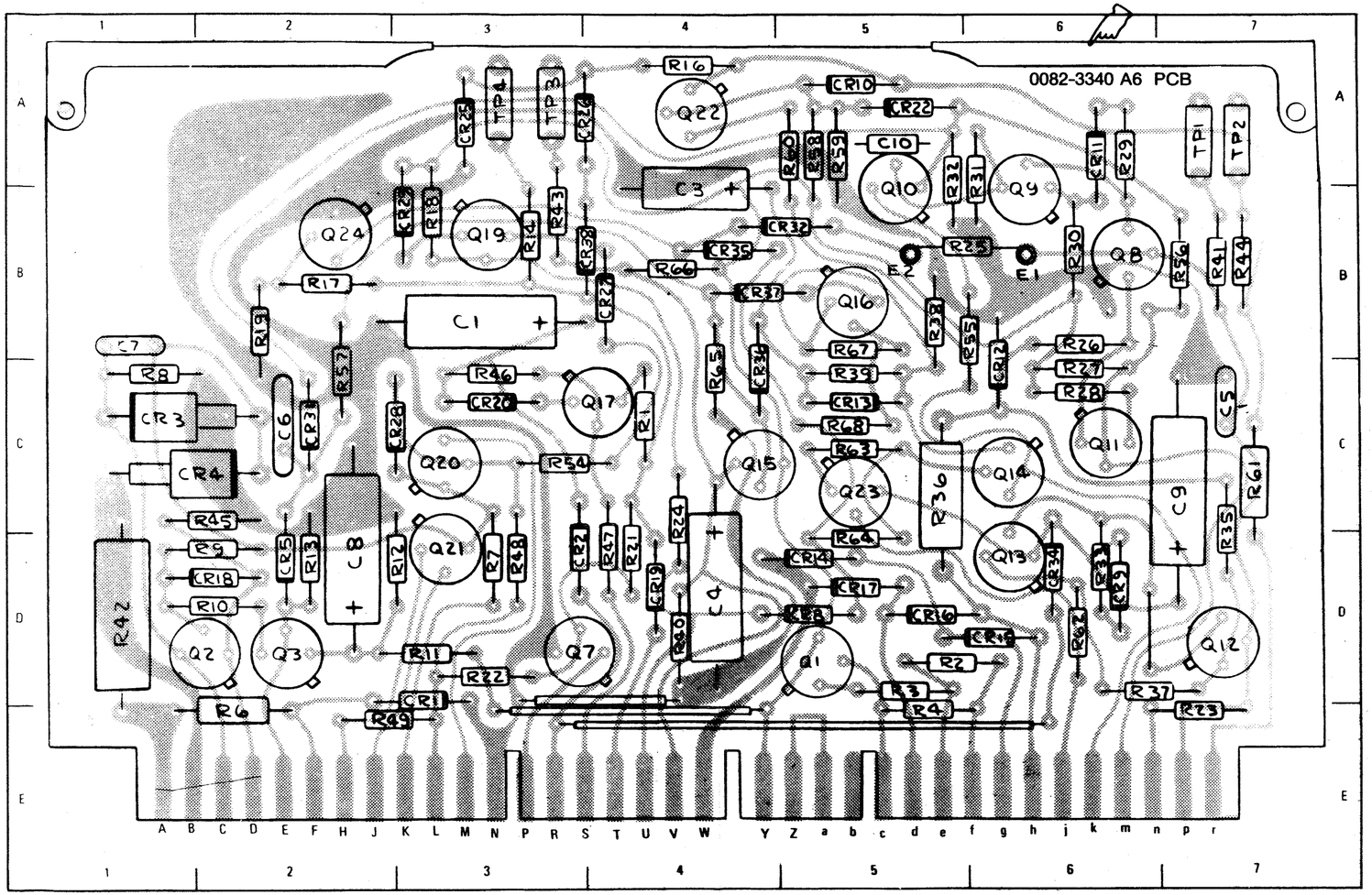
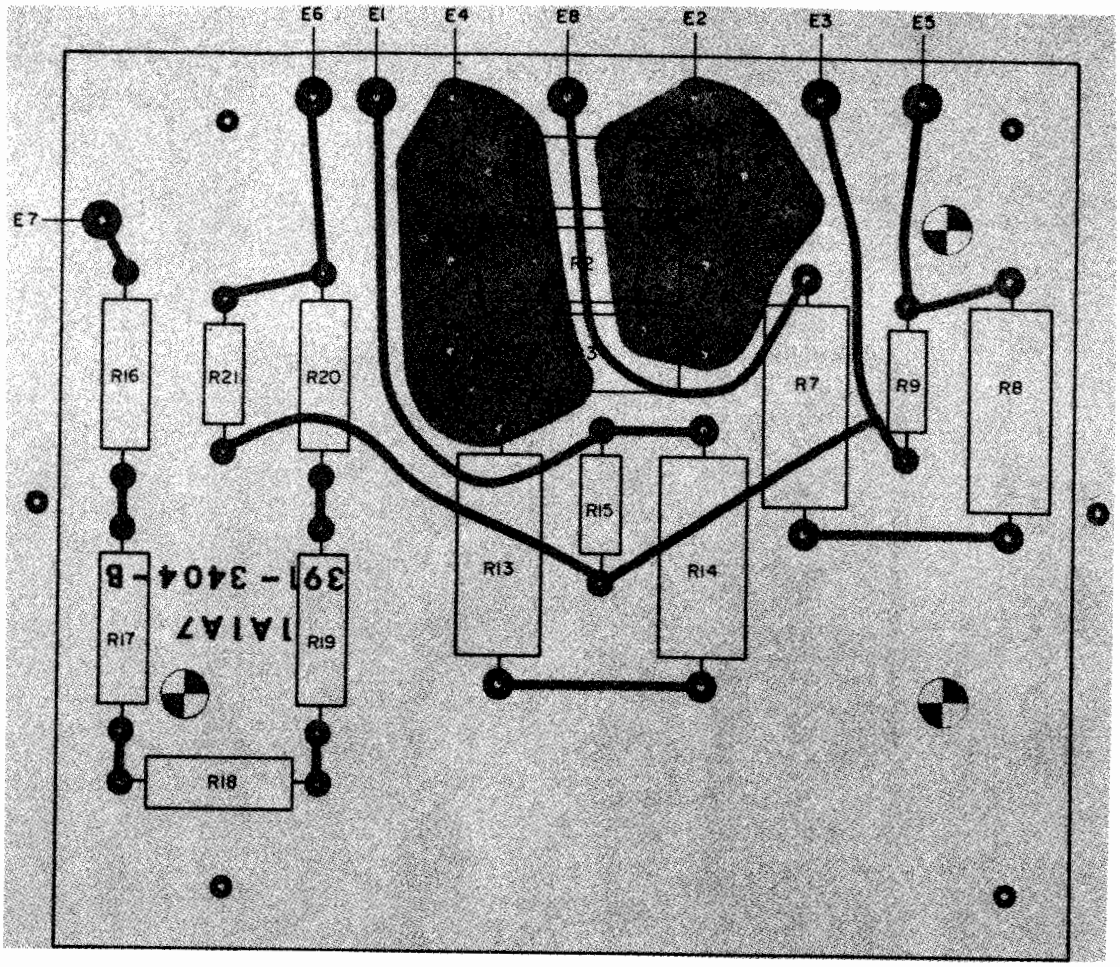


Figure 5-16A. APC-PPC PC Board Assembly 1A1A6, Component Locations Shows New 1A1A6 Assembly



REF DESIG PREFIX
1A1A7

PIN CALLOUTS

E1 - 2 VDC to 1A1S5-7*
E2 - 318 VDC to Screen Regulator
E3 - Chassis Ground
E4 - 500 VDC From 1A1XF7-2
E5 - 1.2 VDC to 1A1S5-8*
E6 - 10 VDC to 1A1S5-6
E7 - 2250 VDC From 1A1E4
E8 - 287 VDC From Screen Regulator

***Meter 1A1M1 Not Switched Into Circuit**

Figure 5-17. Printed Circuit Board 1A1A7, Component and Test Point Locations

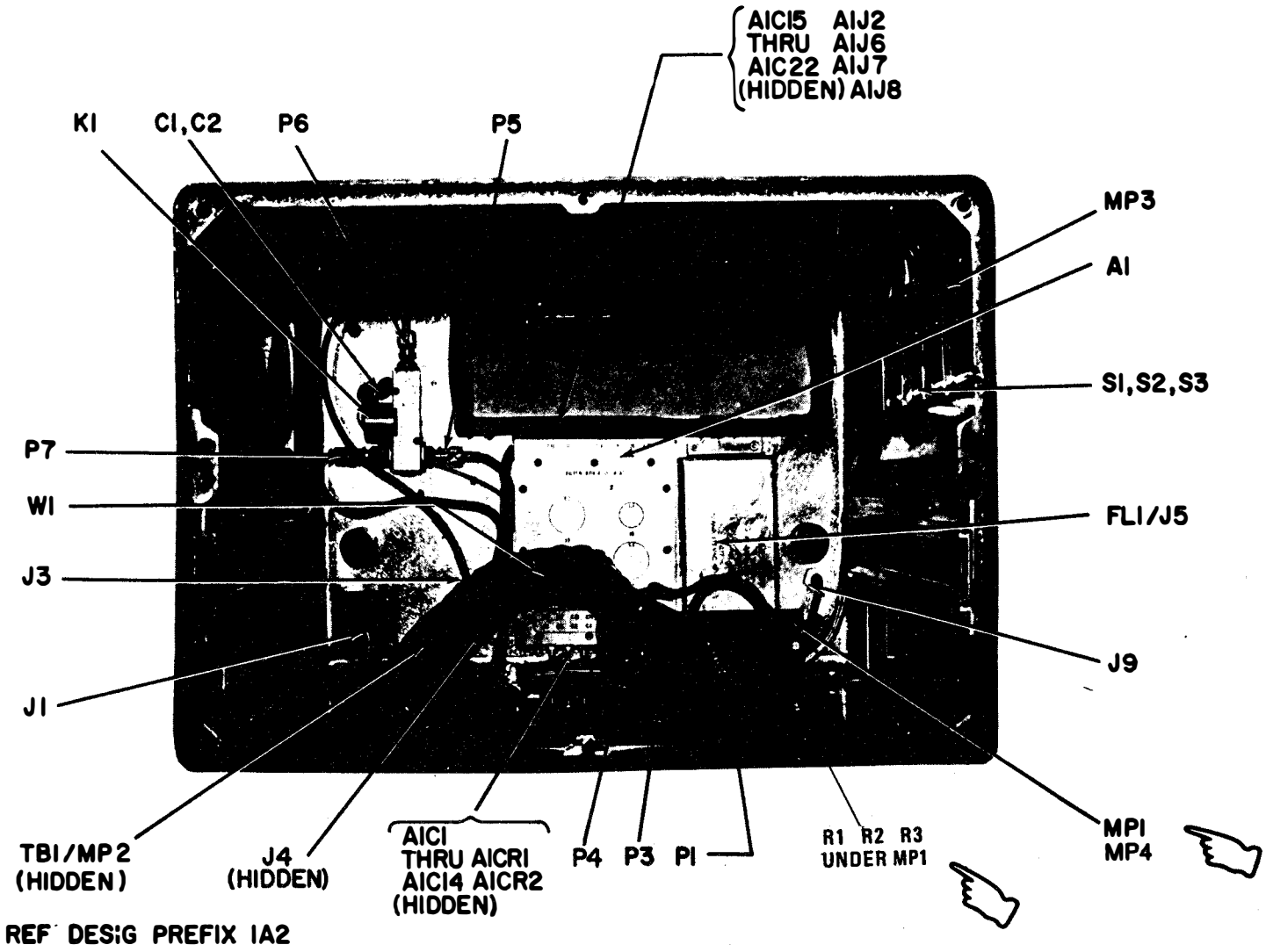


Figure 5-18. Radio Frequency Amplifier AM-3924(P)/URT, Case, Component Locations

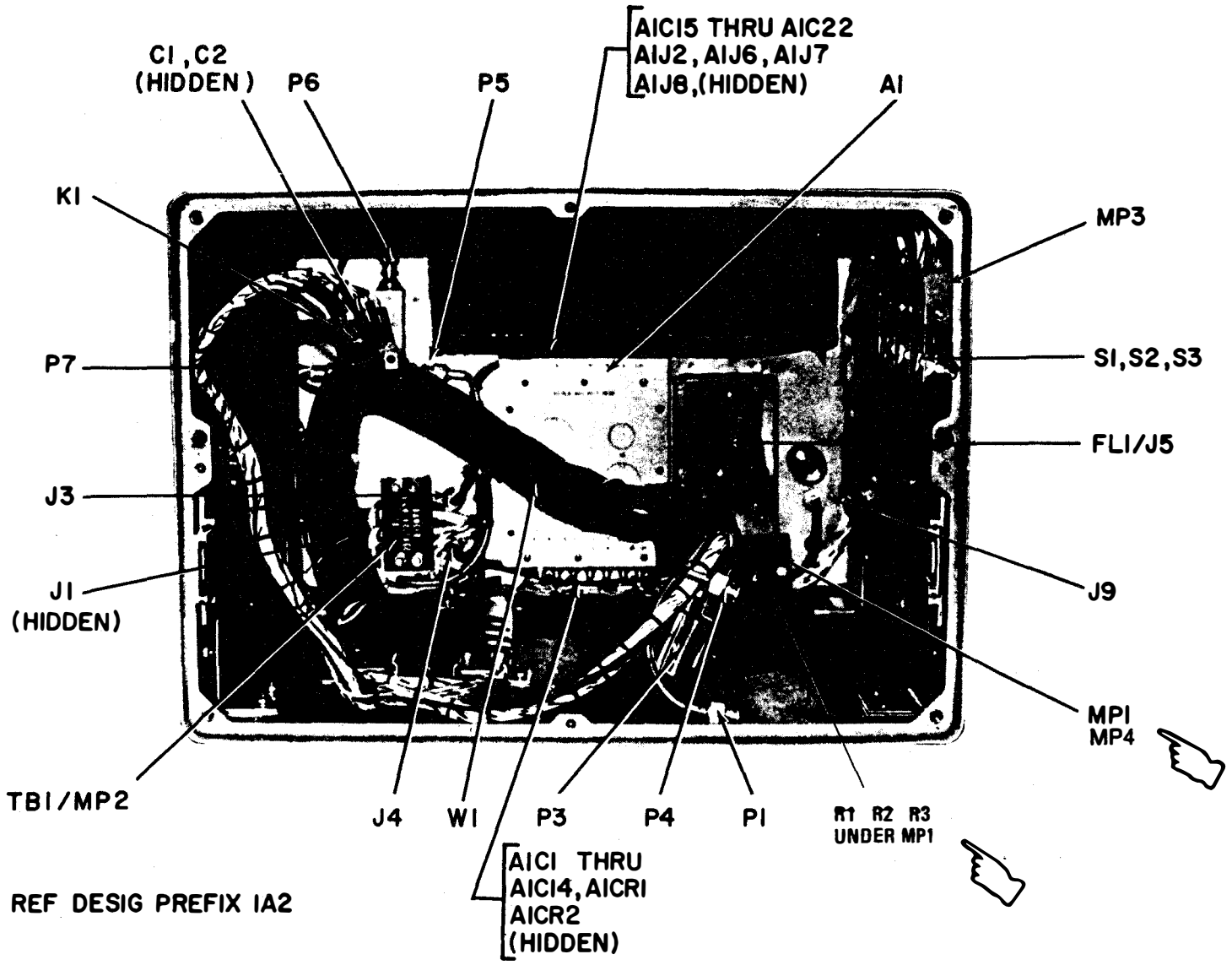
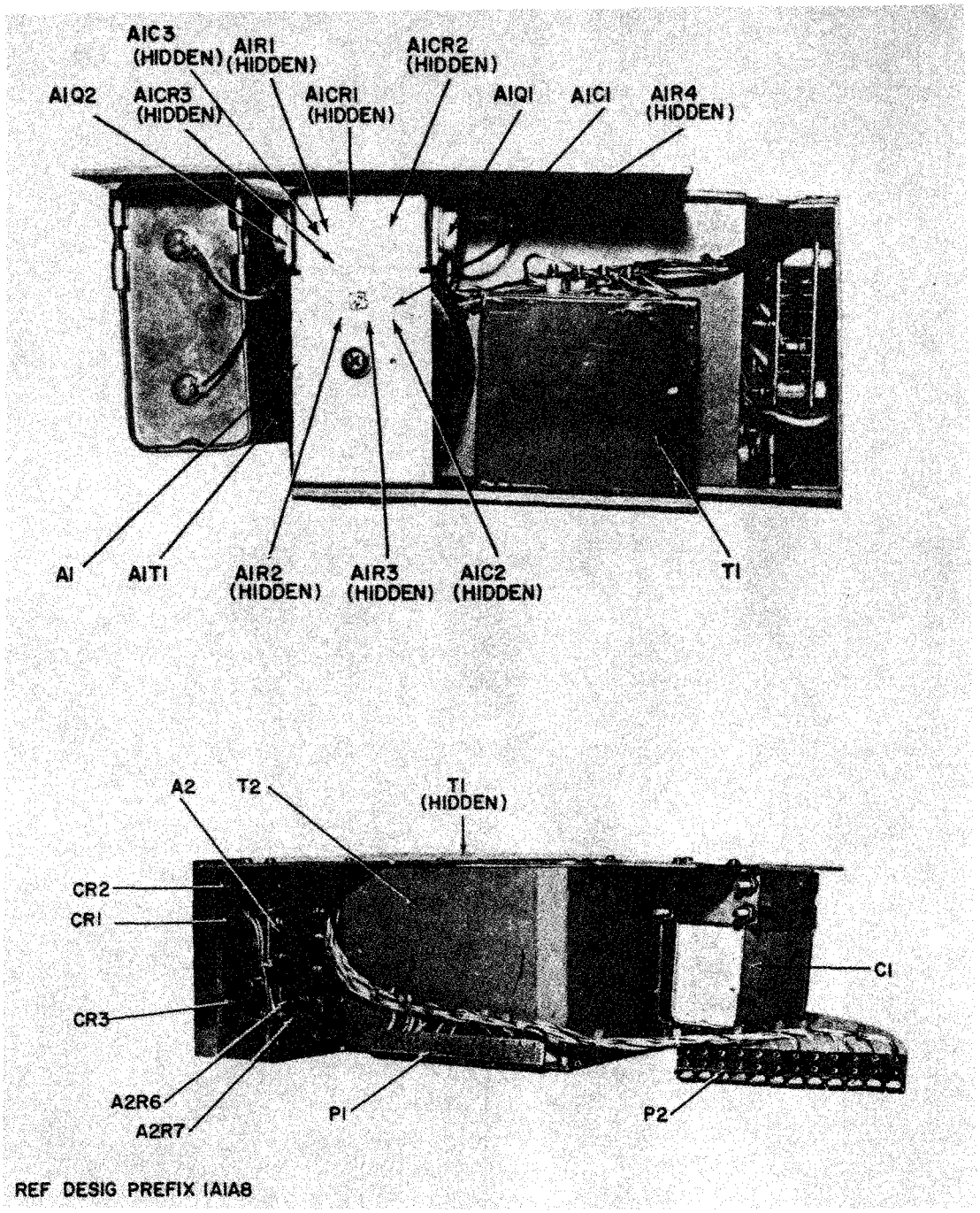
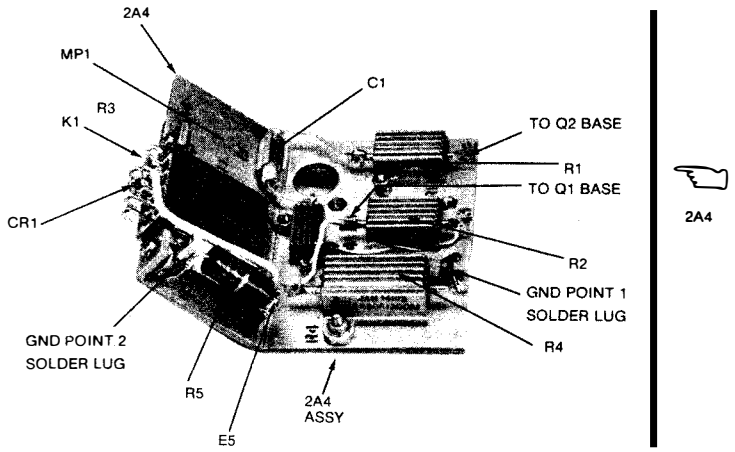


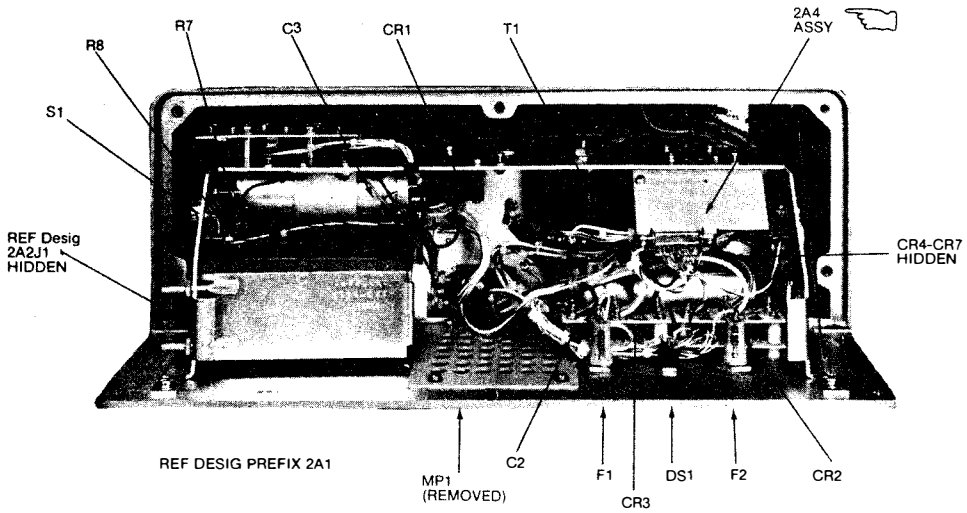
Figure 5-19. Radio Frequency Amplifier AM-6909/URT, Case, Component Locations



NOTE: A2RI THRU A2R5 HAVE BEEN REMOVED IN FIELD CHANGE 4

Figure 5-20. Power Supply PP-3917/UR, Component Locations





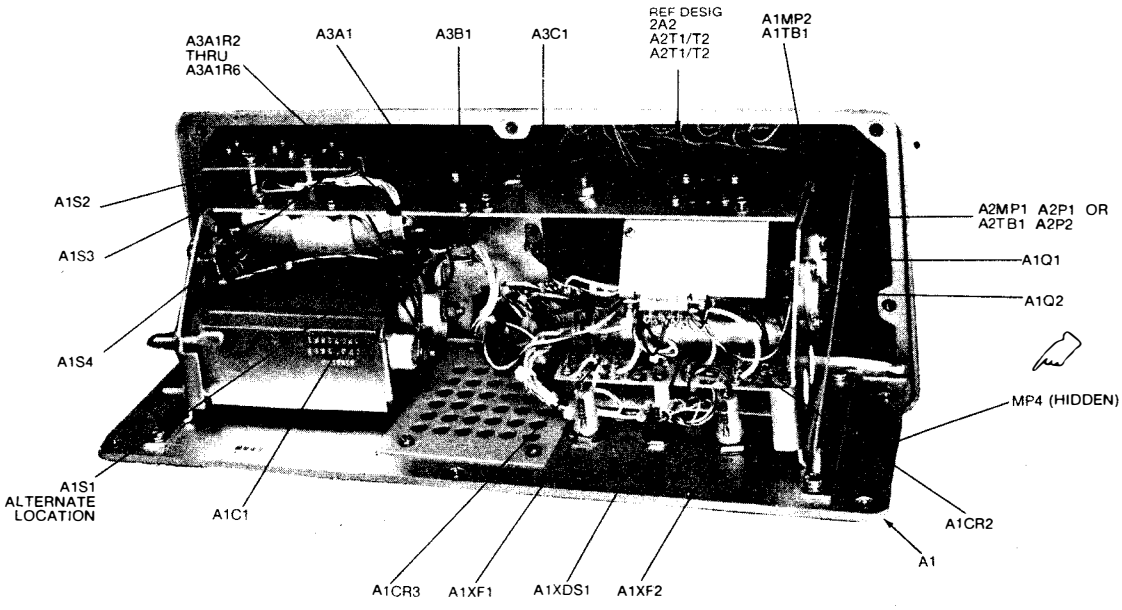


Figure 5-21. Power Supply PP-3916/UR, Component Locations

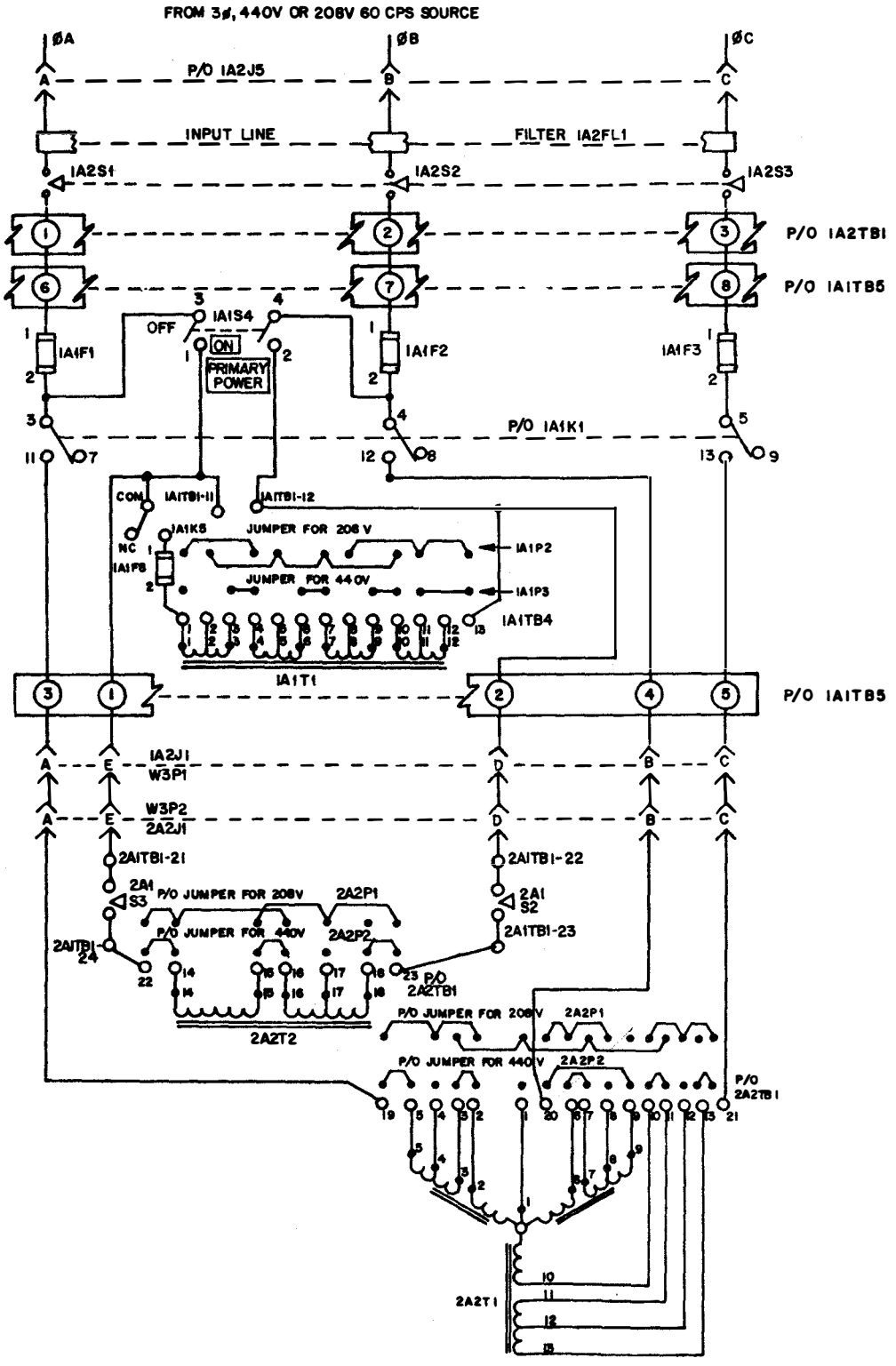


Figure 5-22. 60 Hz Primary Power Distribution Diagram

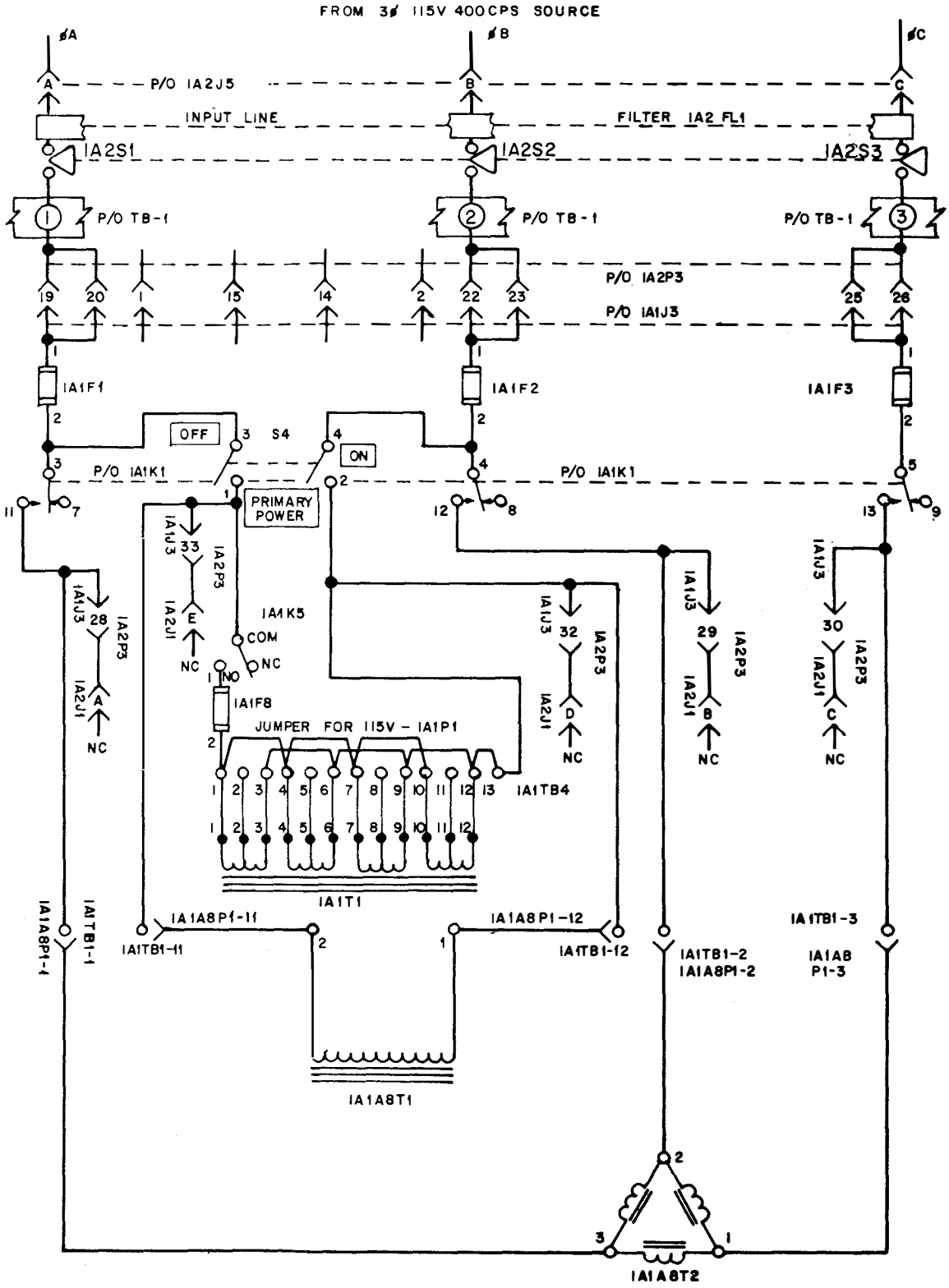


Figure 5-23. 400 Hz Primary Power Distribution Diagram

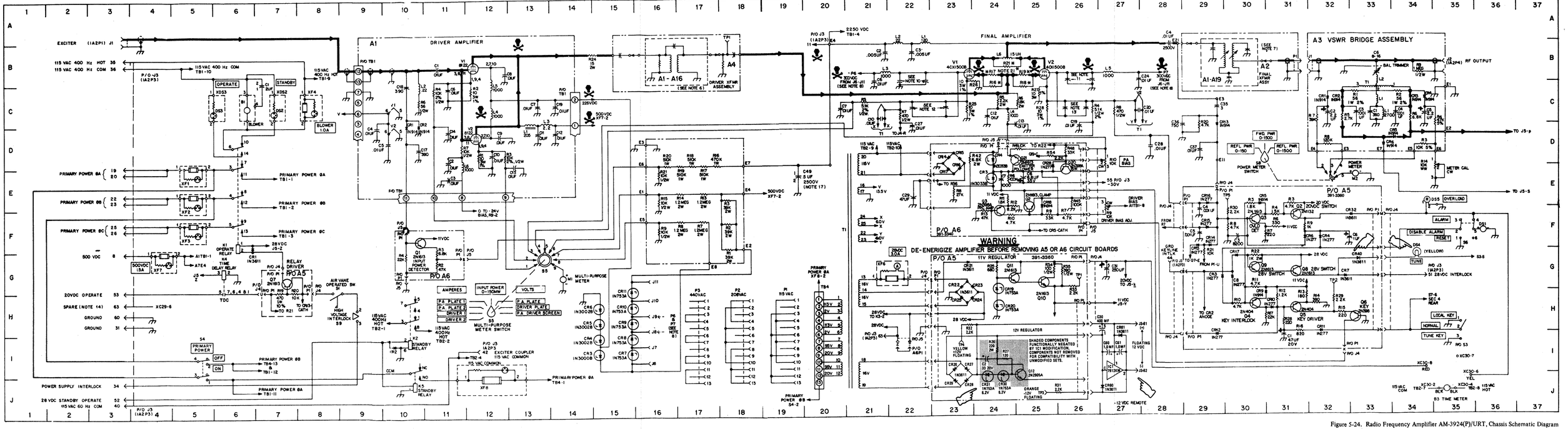


Figure 5-24. Radio Frequency Amplifier AM-3924(P)/URT, Chassis Schematic Diagram
Shows Original 1A1A5 and 1A1A6 PC Boards (Sheet 1 of 2)

PARTS LOCATION INDEX

REF DESIG	LOC
B1	6C
B2	55H
B3	35J
C1	7C
C2	21B
C3	22B
C4	28B
C5	23C
C6	21B
C7	20C
C8	23C
C9	26C
C10	21C
C11	22B
C12	24C
C13	25D
C15	22B
C16	22B
C17	26C
C19	26D
C20	27C
C21	22B
C23	26B
C24	27B
C26	22B
C27	22D
C28	28D
C29/XC29	22E
C30/XC30	27I
C31/XC31	27G
C32	26B
C33	26B
C34	26B
C35	29C
C36	28D
C37	29D
C38	22B
C39	26B
C40	26B
C41	26C
C42	26C
C43	26C
C44	26C
C45	23C
C46	23C
C47	23C
C48	23C
C60 C61	27I
CR1	6F
CR2	10I
CR3	15I
CR4	15I
CR5	15H
CR6	15H
CR7	15I
CR8	15I
CR9	15H
CR10	15H
CR11	15H
CR12	52I
CR13	29D
CR14	53G
CR60/CR61	27I
DS1	35F
DS2/XDS2	7C
DS3/XDS3	6C
DS4/XDS4	34G
DS5/XDS5	34E
F1/XF1	5E
F2/XF2	5E
F3/XF3	5F
F4/XF4	8C
F5/XF5	64H
F6/XF6	21G
F7/XF7	4G
IC1/XIC1	27I
J1	3A
J3	3B-J, 12I, 20B, 21H, 27E, 27H, 27J, 28G, 34G, 39G, 47C, E, F, G, 52C-F, 55G, 65G-J
J4	7G, 8G, 22G-J, 26G-J, 28E-H, 29E, 32I, 33F-H, 51H, 55H
J5	10F, 10G, 11G, 22I, 22D, 22E, 24D, 26D-E, 40C-H, 47C-I
J6	16I
J7	16I
J8	16H
J9	16H
J10	16H
J11	16G
K1	6F
K2	10I
K3	53I
K4	6G
L1	22B
L2	22B
L3	21B
L4	24C
L5	27B
L6	24B
M1	14G
M2	33E
P1	19H
P2	18H
P3	17H
P5	63F
P6	21B
P7	28B
Q1	27I
R3	21C
R4	26C
R5	24C
R6	25C
R7	22C
R8	27C
R9	27F
R10	27D
R11	39D
R12	39F
R13	39G
R14	35E
R16	24C
R17	24B
R18	25C
R19	25B
R20	29D
R21	24B
R24	15B
R25	23C
R26	24C
R27	25C
R28	25C
S1	8G
S3	35H, 39G
S4	5I
S5	12H
S6	35F
S7	54B
S8	30D
S9	8H
T1	21F
TB1	59G
TB2	62G
TB4	20H
V1	23B
V2	25B
A1C1	11B
A1C2	11D
A1C3	11E
A1C4	9D
A1C5	10D
A1C6	11C
A1C7	13C
A1C8	12B
A1C9	12D
A1C10	12D
A1C11	13D
A1C12	14D
A1C13	13E
A1C14	11D
A1C17	10D
A1C18	10C
A1C19	14C
A1CR1	10D
A1CR2	10D
A1L1	13D
A1L2	10C
A1L3	13D
A1L4	12C
A1L5	12C
A1L6	11D
A1R1	12D
A1R2	12C
A1R3	12D
A1R4	11C
A1R6	10C
A1R7	11D
A1TB1	9B, 10E, 14C
A1V1/XV1	11B
A1V2/XV2	12D
A2	30B
A3C1	33C
A3C2	32C
A3C3	33C
A3C4	34C
A3C5	34C
A3C6	33B
A3CR1	32C
A3CR2	32C
A3CR3	34C
A3CR4	34C
A3CR5	33D
A3CR6	33D
A3J1	32B
A3J2	35B
A3L1	33C
A3L2	33B
A3R1	33C
A3R2	34C
A3R3	34D
A3R4	35D
A3R5	32C
A3R6	34C
A3R7	32C
A3R8	32D
A3R9	34B
A3T1	33C
A4	18B
A4TB1	56C
A5C1	31I
A5C2	24I
A5C3	30F
A5C4	29F
A5C5	29F
A5C6	32F
A5CR1	51I
A5CR2	50I
A5CR3	29G
A5CR4	32F
A5CR5	30E
A5CR6	31F
A5CR7	32G
A5CR8	30G
A5CR9	30H
A5CR10	31H
A5CR11	32I
A5CR12	29I
A5CR13	29G
A5CR14	29F
A5CR15	29F
A5CR16	29E
A5CR17	30G
A5CR19	24G
A5CR20	24H
A5CR21	23G
A5CR22	23G
A5CR23	23G
A5CR24	23H
A5CR25	23H
A5CR26	23I
A5CR27	23I
A5CR28	23J
A5CR29	23J
A5CR30	25J
A5CR31	24J
A5CR32	33F
A5CR40	33G
A5Q2	31F
A5Q3	30F
A5Q4	30H
A5Q5	31H
A5Q6	33H
A5Q7	7G
A5Q8	31C
A5Q9	30G
A5Q10	25G
A5Q11	24G
A5Q12	25J
A5R3	31E
A5R4	31F
A5R5	30E
A5R6	31F
A5R7	30F
A5R8	30F
A5R9	31F
A5R10	30H
A5R11	30H
A5R12	31H
A5R13	31H
A5R14	32H
A5R15	32H
A5R16	31I
A5R17	30H
A5R19	7G
A5R20	7G
A5R21	29G
A5R22	30G
A5R25	24G
A5R26	24I
A5R27	25I
A5R28	31H
A5R29	32H
A5R30	30F
A5R31	26J
A5R32	25I
A5R33	26G
A5R34	25G
A5R35	26G
A5R36	24I
A5R37	50I
A5TP1	26G
A5TP2	32G
A5TP3	25J
A5TP4	25I
A5TP5	30E
A6C1	42G
A6C3	43F
A6C4	44F
A6C5	40D
A6C6	25E
A6C7	24E
A6CR1	40G
A6CR2	42G
A6CR3	24E
A6CR4	24E
A6CR5	44C
A6CR7	44G
A6CR8	45F
A6CR9	41E
A6CR11	41C
A6CR12	41F
A6CR13	43E
A6CR14	23D
A6CR15	23D
A6CR16	23E
A6CR17	23E
A6CR18	25F
A6CR19	45H
A6CR20	41G
A6CR21	45E
A6CR22	45C
A6CR23	45D
A6CR24	45D
A6CR25	44G
A6CR26	44G
A6CR27	44H
A6CR28	25E
A6CR29	44G
A6Q1	10F
A6Q2	25F
A6Q3	24F
A6Q7	41H
A6Q8	41C
A6Q9	42C
A6Q10	42C
A6Q11	41D
A6Q12	41E
A6Q13	42E
A6Q14	42E
A6Q15	44E
A6Q16	45E
A6Q17	41G
A6Q19	45G
A6Q20	26E
A6Q21	25D
A6R1	41G
A6R2	11G
A6R3	11G
A6R4	10G
A6R6	24E
A6R7	26F
A6R8	23E
A6R9	25F
A6R10	24F
A6R11	24E
A6R12	24F
A6R13	24F
A6R14	43G
A6R15	43H
A6R16	43H
A6R17	43H
A6R18	45G
A6R19	44G
A6R21	42H
A6R22	42I
A6R23	40C
A6R24	45G
A6R25	41C
A6R26	41C
A6R27	42D
A6R28	42D
A6R29	41B
A6R30	42B
A6R31	42C
A6R32	42C
A6R33	41E
A6R34	42E
A6R35	41E
A6R36	41F
A6R38	42F
A6R39	43F
A6R40	44F
A6R41	45D
A6R42	23E
A6R43	46E
A6R44	46C
A6R45	26F
A6R46	41G
A6R47	41G
A6R48	26D
A6R49	25D
A6R54	25D
A6R55	42B
A6TP1	40C
A6TP2	46C
A6TP3	46E
A6TP4	43G
A7R1	18F
A7R2	18F
A7R3	18E
A7R7	17F
A7R8	17F
A7R9	16F
A7R13	17E
A7R14	17E
A7R15	16E
A7R16	17D
A7R17	17D
A7R18	17D
A7R19	16D
A7R20	16D
A7R21	16E

Figure 5-24A. Radio Frequency Amplifier AM-3924(P)/URT, Chassis Schematic Diagram
Shows New (0082) 1A1A5 and 1A1A6 PC Boards (Sheet 1 of 2)

PARTS LOCATION INDEX

REF DESIG	LOC
B1	6C
B2	55H
B3	35J
C1	7C
C2	21B
C3	22B
C4	28B
C5	23C
C6	21B
C7	20C
C8	23C
C9	26C
C10	21C
C11	22B
C12	24C
C13	25D
C15	22B
C16	22B
C17	26C
C19	26D
C20	27C
C21	22B
C23	26B
C24	27B
C26	22B
C27	22D
C28	28D
C29/XC29	22E
C30/XC30	27I
C31/XC31	27G
C32	26B
C33	26B
C34	26B
C35	29C
C36	28D
C37	29D
C38	22B
C39	26B
C40	26B
C41	26C
C42	26C
C43	26C
C44	26C
C45	23C
C46	23C
C47	23C
C48	23C
C60/C61	27I
CR1	6F
CR2	10I
CR3	15I
CR4	15I
CR5	15H
CR6	15H
CR7	15I
CR8	15I
CR9	15H
CR10	15H
CR11	15H
CR12	52I
CR13	29D
CR14	53G
CR60/CR61	27I
DS1	35F
DS2/XDS2	7C
DS3/XDS3	6C
DS4/XDS4	34G
DS5/XDS5	34E
F1/XF1	5E
F2/XF2	5E
F3/XF3	5F
F4/XF4	8C
F5/XF5	64H
F6/XF6	21G
F7/XF7	4G
IC1/XIC1	27I
J1	3A
J3	3B-J, 12I, 20B, 21H, 27E, 27H, 27J, 28G, 34G, 39G, 47C, E, F, G, 52C-F, 55G, 65G-J
J4	7G, 8G, 22G-J, 26G-J, 28E-H, 29E, 32I, 33F-H, 51H, 55H
J5	10F, 10G, 11G, 22I, 22D, 22E, 24D, 26D-E, 40C-H, 47C-I
J6	16I
J7	16I
J8	16H
J9	16H
J10	16H
J11	16G
K1	6F
K2	10I
K3	53I
K4	6G
L1	22B
L2	22B
L3	21B
L4	24C
L5	27B
L6	24B
M1	14G
M2	33E
P1	19H
P2	18H
P3	17H
P5	63F
P6	21B
P7	28B
Q1	27I
R3	21C
R4	26C
R5	24C
R6	25C
R7	22C
R8	27C
R9	27F
R10	27D
R11	39D
R12	39F
R13	39G
R14	35E
R16	24C
R17	24B
R18	25C
R19	25B
R20	29D
R21	24B
R24	15B
R25	23C
R26	24C
R27	25C
R28	25C
S1	8G
S3	35H, 39G
S4	5I
S5	12H
S6	35F
S7	54B
S8	30D
S9	8H
T1	21F
TB1	59G
TB2	62G
TB4	20H
V1	23B
V2	25B
A1C1	11B
A1C2	11D
A1C3	11E
A1C4	9D
A1C5	10D
A1C6	11C
A1C7	13C
A1C8	12B
A1C9	12D
A1C10	12D
A1C11	13D
A1C12	14D
A1C13	13E
A1C14	11D
A1C17	10D
A1C18	10C
A1C19	14C
A1CR1	10D
A1CR2	10D
A1L1	13D
A1L2	10C
A1L3	13D
A1L4	12C
A1L5	12C
A1L6	11D
A1R1	12D
A1R2	12C
A1R3	12D
A1R4	11C
A1R6	10C
A1R7	11D
A1TB1	9B, 10E, 14C
A1V1/XV1	11B
A1V2/XV2	12D
A2	30B
A3C1	33C
A3C2	32C
A3C3	33C
A3C4	34C
A3C5	34C
A3C6	33B
A3CR1	32C
A3CR2	32C
A3CR3	34C
A3CR4	34C
A3CR5	33D
A3CR6	33D
A3J1	32B
A3J2	35B
A3L1	33C
A3L2	33B
A3R1	33C
A3R2	34C
A3R3	34D
A3R4	35D
A3R5	32C
A3R6	34C
A3R7	32C
A3R8	32D
A3R9	34B
A3T1	33C
A4	18B
A4TB1	56C
A5C1	31I
A5C2	24I
A5C3	30F
A5C4	29F
A5C5	29F
A5C6	32F
A5CR1	51I
A5CR2	50I
A5CR3	29G
A5CR4	32F
A5CR5	30E
A5CR6	31F
A5CR7	32G
A5CR8	30G
A5CR9	30H
A5CR10	31H
A5CR11	32I
A5CR12	29I
A5CR13	29G
A5CR14	29F
A5CR15	29F
A5CR16	29E
A5CR17	30G
A5CR19	24G
A5CR20	24H
A5CR21	23G
A5CR22	23G
A5CR23	23G
A5CR24	23H
A5CR25	23H
A5CR26	23I
A5CR27	23I
A5CR28	23J
A5CR29	23J
A5CR30	25J
A5CR31	24J
A5CR32	33F
A5CR40	33G
A5Q2	31F
A5Q3	30F
A5Q4	30H
A5Q5	31H
A5Q6	33H
A5Q7	7G
A5Q8	31C
A5Q9	30G
A5Q10	25G
A5Q11	24G
A5Q12	25J
A5R3	31E
A5R4	31F
A5R5	30E
A5R6	31F
A5R7	30F
A5R8	30F
A5R9	31F
A5R10	30H
A5R11	30H
A5R12	31H
A5R13	31H
A5R14	32H
A5R15	32H
A5R16	31I
A5R17	30H
A5R19	7G
A5R20	7G
A5R21	29G
A5R22	30G
A5R25	24G
A5R26	24I
A5R27	25I
A5R28	31H
A5R29	32H
A5R30	30F
A5R31	26J
A5R32	25I
A5R33	26G
A5R34	25G
A5R35	26G
A5R36	24I
A5R37	50I
A5TP1	26G
A5TP2	32G
A5TP3	25J
A5TP4	25I
A5TP5	30E
A6C1	42G
A6C3	43F
A6C4	44F
A6C5	40D
A6C6	25E
A6C7	24E
A6CR1	40G
A6CR2	42G
A6CR3	24E
A6CR4	24E
A6CR5	44C
A6CR7	44G
A6CR8	45F
A6CR9	41E
A6CR11	41C
A6CR12	41F
A6CR13	43E
A6CR14	23D
A6CR15	23D
A6CR16	23E
A6CR17	23E
A6CR18	25F
A6CR19	45H
A6CR20	41G
A6CR21	45E
A6CR22	45C
A6CR23	45D
A6CR24	45D
A6CR25	44G
A6CR26	44G
A6CR27	44H
A6CR28	25E
A6CR29	44G
A6Q1	10F
A6Q2	25F
A6Q3	24F
A6Q7	41H
A6Q8	41C
A6Q9	42C
A6Q10	42C
A6Q11	41D
A6Q12	41E
A6Q13	42E
A6Q14	42E
A6Q15	44E
A6Q16	45E
A6Q17	41G
A6Q19	45G
A6Q20	26E
A6Q21	25D
A6R1	41G
A6R2	11G
A6R3	11G
A6R4	10G
A6R6	24E
A6R7	26F
A6R8	23E
A6R9	25F
A6R10	24F
A6R11	24E
A6R12	24F
A6R13	24F
A6R14	43G
A6R15	43H
A6R16	43H
A6R17	43H
A6R18	45G
A6R19	44G
A6R21	42H
A6R22	42I
A6R23	40C
A6R24	45G
A6R25	41C
A6R26	41C
A6R27	42D
A6R28	42D
A6R29	41B
A6R30	42B
A6R31	42C
A6R32	42C
A6R33	41E
A6R34	42E
A6R35	41E
A6R36	41F
A6R38	42F
A6R39	43F
A6R40	44F
A6R41	45D
A6R42	23E
A6R43	46E
A6R44	46C
A6R45	26F
A6R46	41G
A6R47	41G
A6R48	26D
A6R49	25D
A6R54	25D
A6R55	42B
A6TP1	40C
A6TP2	46C
A6TP3	46E
A6TP4	43G
A7R1	18F
A7R2	18F
A7R3	18E
A7R7	17F
A7R8	17F
A7R9	16F
A7R13	17E
A7R14	17E
A7R15	16E
A7R16	17D
A7R17	17D
A7R18	17D
A7R19	16D
A7R20	16D
A7R21	16E

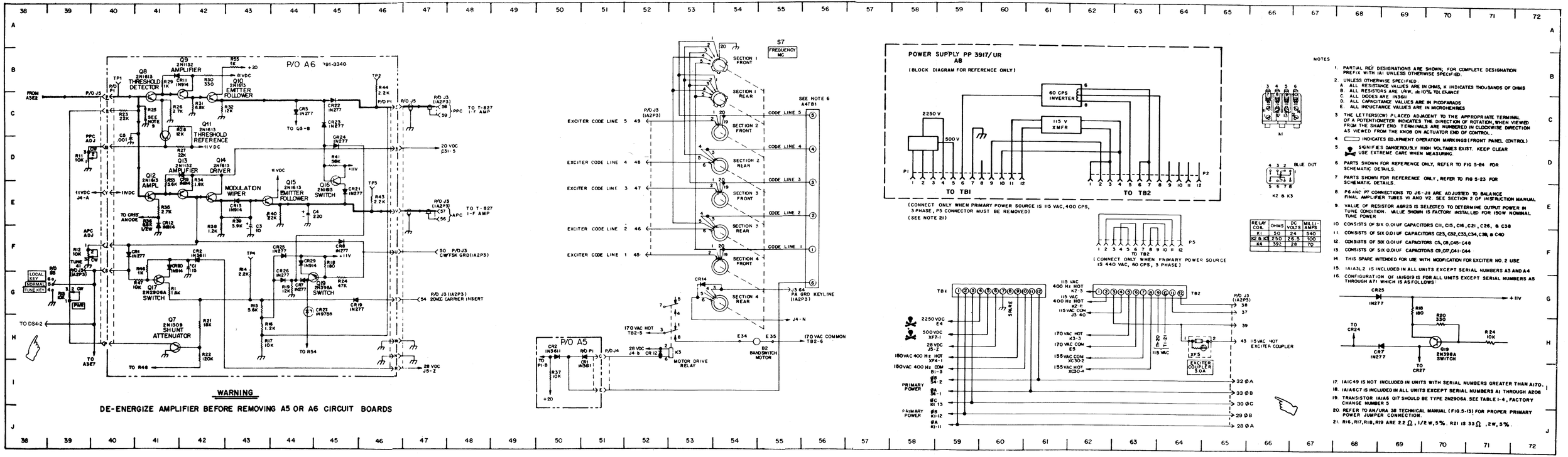
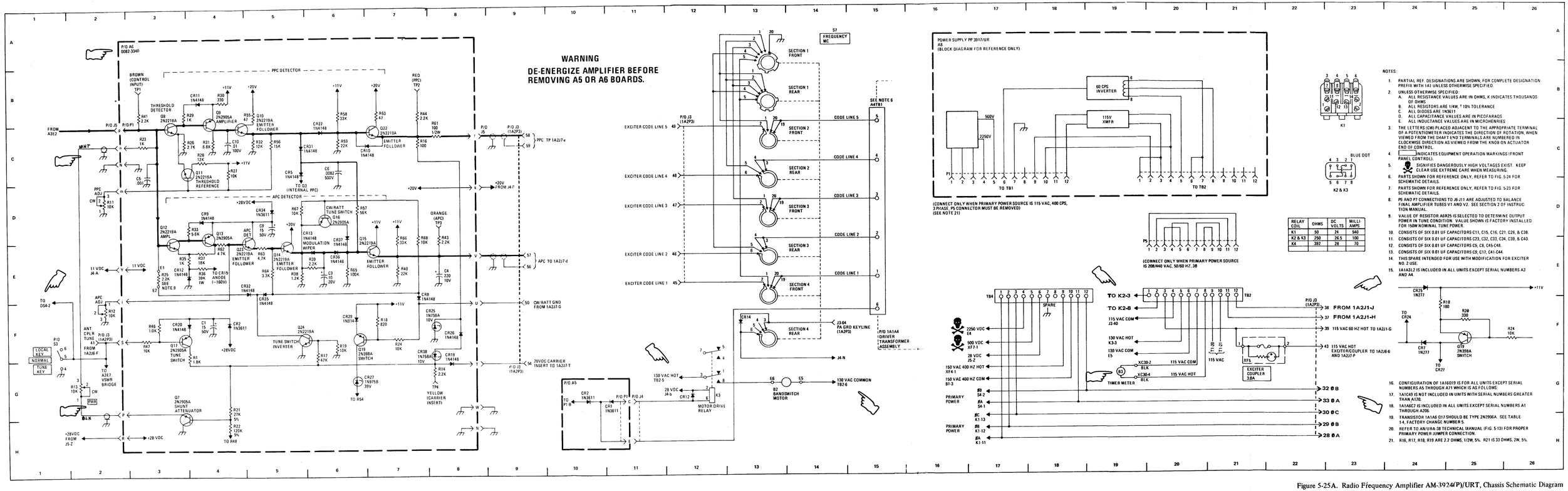


Figure 5-25. Radio Frequency Amplifier AM-3924(P)/URT, Chassis, Schematic Diagram
Shows Original 1A1A5 and 1A1A6 PC Boards (Sheet 2 of 2)



NOTES:

1. PARTIAL REF. DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION PREFIX WITH 1A1 UNLESS OTHERWISE SPECIFIED.
2. UNLESS OTHERWISE SPECIFIED:
   A. ALL RESISTANCE VALUES ARE IN OHMS, K INDICATES THOUSANDS OF OHMS
   B. ALL RESISTORS ARE 1/4W, ± 10% TOLERANCE
   C. ALL DIODES ARE 1N3611
   D. ALL CAPACITANCE VALUES ARE IN PICOFARADS
   E. ALL INDUCTANCE VALUES ARE IN MICROHENRIES
3. THE LETTERS (CW) PLACED ADJACENT TO THE APPROPRIATE TERMINAL OF A POTENTIOMETER INDICATES THE DIRECTION OF ROTATION, WHEN VIEWED FROM THE SHAFT END. TERMINALS ARE NUMBERED IN CLOCKWISE DIRECTION AS VIEWED FROM THE KNOB ON ACTUATOR END OF CONTROL.
4. [ ] INDICATES EQUIPMENT OPERATION MARKINGS (FRONT PANEL CONTROLS).
5. ⚠ SIGNIFIES DANGEROUSLY HIGH VOLTAGES EXIST. KEEP CLEAR USE EXTREME CARE WHEN MEASURING.
6. PARTS SHOWN FOR REFERENCE ONLY; REFER TO FIG. 5-24 FOR SCHEMATIC DETAILS.
7. PARTS SHOWN FOR REFERENCE ONLY; REFER TO FIG. 5-23 FOR SCHEMATIC DETAILS.
8. P5 AND P7 CONNECTIONS TO J6-J11 ARE ADJUSTED TO BALANCE FINAL AMPLIFIER TUBES V1 AND V2. SEE SECTION 2 OF INSTRUCTION MANUAL.
9. VALUE OF RESISTOR A6R25 IS SELECTED TO DETERMINE OUTPUT POWER IN TUNE CONDITION. VALUE SHOWN IS FACTORY INSTALLED FOR 150W NOMINAL TUNE POWER.
10. CONSISTS OF SIX 0.01 UF CAPACITORS C11, C15, C16, C21, C26, & C38.
11. CONSISTS OF SIX 0.01 UF CAPACITORS C23, C32, C33, C34, C38, & C40.
12. CONSISTS OF SIX 0.01 UF CAPACITORS C5, C8, C45-C48.
13. CONSISTS OF SIX 0.01 UF CAPACITORS C9, C17, C41-C44.
14. THIS SPARE INTENDED FOR USE WITH MODIFICATION FOR EXCITER NO. 2 USE.
15. 1A1A3J2 IS INCLUDED IN ALL UNITS EXCEPT SERIAL NUMBERS A3 AND A4.
16. CONFIGURATION OF 1A1G019 IS FOR ALL UNITS EXCEPT SERIAL NUMBERS AS THROUGH A71 WHICH IS AS FOLLOWS:
17. 1A1C40 IS NOT INCLUDED IN UNITS WITH SERIAL NUMBERS GREATER THAN A170.
18. 1A1AGC7 IS INCLUDED IN ALL UNITS EXCEPT SERIAL NUMBERS A1 THROUGH A206.
19. TRANSISTOR 1A1A6 Q17 SHOULD BE TYPE 2N2906A. SEE TABLE 1-4, FACTORY CHANGE NUMBER 5.
20. REFER TO AN/URA-38 TECHNICAL MANUAL (FIG. 5-13) FOR PROPER PRIMARY POWER JUMPER CONNECTION.
21. R16, R17, R18, R19 ARE 2.2 OHMS, 1/2W, 5%. R21 IS 33 OHMS, 2W, 5%.

Figure 5-25A. Radio Frequency Amplifier AM-3924(P)/URT, Chassis Schematic Diagram Shows New (0082) 1A1A5 and 1A1A6 PC Boards (Sheet 2 of 2)

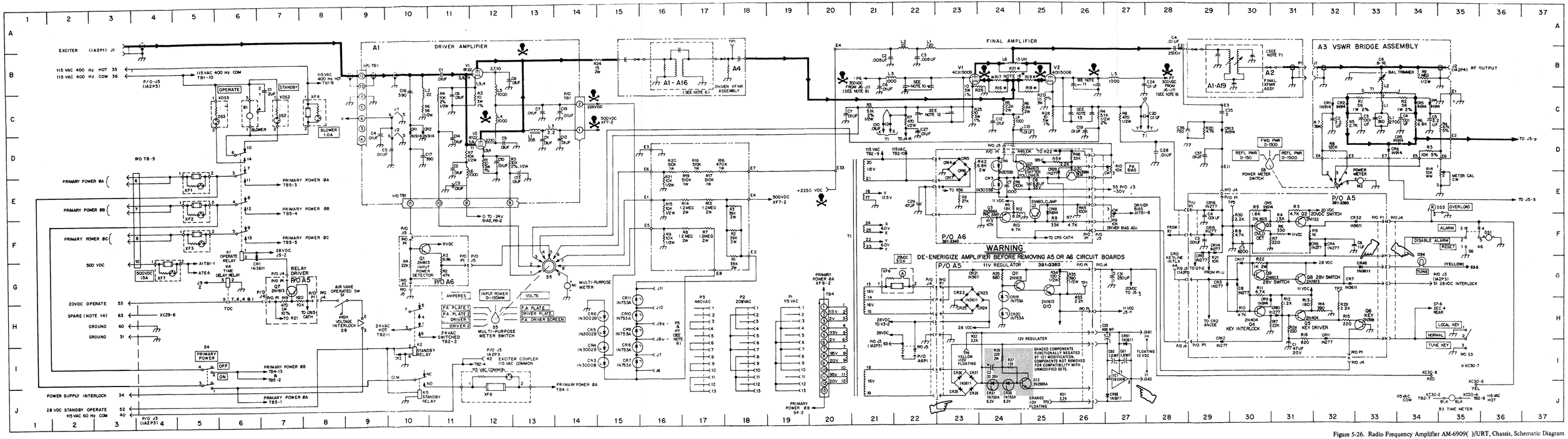


Figure 5-26. Radio Frequency Amplifier AM-6909( )/URT, Chassis, Schematic Diagram
Shows Original 1A1A5 and 1A1A6 PC Boards (Sheet 1 of 2)

PARTS LOCATION INDEX

REF DESIG	LOC
B1	6C
B2	55H
B3	35J
C1	7C
C2	21B
C3	22B
C4	28B
C5	23C
C6	21B
C7	20C
C8	23C
C9	26C
C10	21C
C11	22B
C12	24C
C13	25D
C15	22B
C16	22B
C17	26C
C19	26D
C20	27C
C21	22B
C23	26B
C24	27B
C26	22B
C27	22D
C28	28D
C29/XC29	22E
C30/XC30	27I
C31/XC31	27G
C32	26B
C33	26B
C34	26B
C35	29C
C36	28D
C37	29D
C38	22B
C39	26B
C40	26B
C41	26C
C42	26C
C43	26C
C44	26C
C45	23C
C46	23C
C47	23C
C48	23C
C60/C61	27I
CR1	6F
CR2	10I
CR3	15I
CR4	15I
CR5	15H
CR6	15H
CR7	15I
CR8	15I
CR9	15H
CR10	15H
CR11	15H
CR12	52I
CR13	29D
CR14	53G
CR60/CR61	27I
DS1	35F
DS2/XDS2	7C
DS3/XDS3	6C
DS4/XDS4	34G
DS5/XDS5	34E
F1/XF1	5E
F2/XF2	5E
F3/XF3	5F
F4/XF4	8C
F5/XF5	64H
F6/XF6	21G
F7/XF7	4G
IC1/XIC1	27I
J1	3A
J3	3B-J, 12I, 20B, 21H, 27E, 27H, 27J, 28G, 34G, 39G, 47C, E, F, G, 52C-F, 55G, 65G-J
J4	7G, 8G, 22G-J, 26G-J, 28E-H, 29E, 32I, 33F-H, 51H, 55H
J5	10F, 10G, 11G, 22I, 22D, 22E, 24D, 26D-E, 40C-H, 47C-I
J6	16I
J7	16I
J8	16H
J9	16H
J10	16H
J11	16G
K1	6F
K2	10I
K3	53I
K4	6G
L1	22B
L2	22B
L3	21B
L4	24C
L5	27B
L6	24B
M1	14G
M2	33E
P1	19H
P2	18H
P3	17H
P5	63F
P6	21B
P7	28B
Q1	27I
R3	21C
R4	26C
R5	24C
R6	25C
R7	22C
R8	27C
R9	27F
R10	27D
R11	39D
R12	39F
R13	39G
R14	35E
R16	24C
R17	24B
R18	25C
R19	25B
R20	29D
R21	24B
R24	15B
R25	23C
R26	24C
R27	25C
R28	25C
S1	8G
S3	35H, 39G
S4	5I
S5	12H
S6	35F
S7	54B
S8	30D
S9	8H
T1	21F
TB1	59G
TB2	62G
TB4	20H
V1	23B
V2	25B
A1C1	11B
A1C2	11D
A1C3	11E
A1C4	9D
A1C5	10D
A1C6	11C
A1C7	13C
A1C8	12B
A1C9	12D
A1C10	12D
A1C11	13D
A1C12	14D
A1C13	13E
A1C14	11D
A1C17	10D
A1C18	10C
A1C19	14C
A1CR1	10D
A1CR2	10D
A1L1	13D
A1L2	10C
A1L3	13D
A1L4	12C
A1L5	12C
A1L6	11D
A1R1	12D
A1R2	12C
A1R3	12D
A1R4	11C
A1R6	10C
A1R7	11D
A1TB1	9B, 10E, 14C
A1V1/XV1	11B
A1V2/XV2	12D
A2	30B
A3C1	33C
A3C2	32C
A3C3	33C
A3C4	34C
A3C5	34C
A3C6	33B
A3CR1	32C
A3CR2	32C
A3CR3	34C
A3CR4	34C
A3CR5	33D
A3CR6	33D
A3J1	32B
A3J2	35B
A3L1	33C
A3L2	33B
A3R1	33C
A3R2	34C
A3R3	34D
A3R4	35D
A3R5	32C
A3R6	34C
A3R7	32C
A3R8	32D
A3R9	34B
A3T1	33C
A4	18B
A4TB1	56C
A5C1	31I
A5C2	24I
A5C3	30F
A5C4	29F
A5C5	29F
A5C6	32F
A5CR1	51I
A5CR2	50I
A5CR3	29G
A5CR4	32F
A5CR5	30E
A5CR6	31F
A5CR7	32G
A5CR8	30G
A5CR9	30H
A5CR10	31H
A5CR11	32I
A5CR12	29I
A5CR13	29G
A5CR14	29F
A5CR15	29F
A5CR16	29E
A5CR17	30G
A5CR19	24G
A5CR20	24H
A5CR21	23G
A5CR22	23G
A5CR23	23G
A5CR24	23H
A5CR25	23H
A5CR26	23I
A5CR27	23I
A5CR28	23J
A5CR29	23J
A5CR30	25J
A5CR31	24J
A5CR32	33F
A5CR40	33G
A5Q2	31F
A5Q3	30F
A5Q4	30H
A5Q5	31H
A5Q6	33H
A5Q7	7G
A5Q8	31C
A5Q9	30G
A5Q10	25G
A5Q11	24G
A5Q12	25J
A5R3	31E
A5R4	31F
A5R5	30E
A5R6	31F
A5R7	30F
A5R8	30F
A5R9	31F
A5R10	30H
A5R11	30H
A5R12	31H
A5R13	31H
A5R14	32H
A5R15	32H
A5R16	31I
A5R17	30H
A5R19	7G
A5R20	7G
A5R21	29G
A5R22	30G
A5R25	24G
A5R26	24I
A5R27	25I
A5R28	31H
A5R29	32H
A5R30	30F
A5R31	26J
A5R32	25I
A5R33	26G
A5R34	25G
A5R35	26G
A5R36	24I
A5R37	50I
A5TP1	26G
A5TP2	32G
A5TP3	25J
A5TP4	25I
A5TP5	30E
A6C1	42G
A6C3	43F
A6C4	44F
A6C5	40D
A6C6	25E
A6C7	24E
A6CR1	40G
A6CR2	42G
A6CR3	24E
A6CR4	24E
A6CR5	44C
A6CR7	44G
A6CR8	45F
A6CR9	41E
A6CR11	41C
A6CR12	41F
A6CR13	43E
A6CR14	23D
A6CR15	23D
A6CR16	23E
A6CR17	23E
A6CR18	25F
A6CR19	45H
A6CR20	41G
A6CR21	45E
A6CR22	45C
A6CR23	45D
A6CR24	45D
A6CR25	44G
A6CR26	44G
A6CR27	44H
A6CR28	25E
A6CR29	44G
A6Q1	10F
A6Q2	25F
A6Q3	24F
A6Q7	41H
A6Q8	41C
A6Q9	42C
A6Q10	42C
A6Q11	41D
A6Q12	41E
A6Q13	42E
A6Q14	42E
A6Q15	44E
A6Q16	45E
A6Q17	41G
A6Q19	45G
A6Q20	26E
A6Q21	25D
A6R1	41G
A6R2	11G
A6R3	11G
A6R4	10G
A6R6	24E
A6R7	26F
A6R8	23E
A6R9	25F
A6R10	24F
A6R11	24E
A6R12	24F
A6R13	24F
A6R14	43G
A6R15	43H
A6R16	43H
A6R17	43H
A6R18	45G
A6R19	44G
A6R21	42H
A6R22	42I
A6R23	40C
A6R24	45G
A6R25	41C
A6R26	41C
A6R27	42D
A6R28	42D
A6R29	41B
A6R30	42B
A6R31	42C
A6R32	42C
A6R33	41E
A6R34	42E
A6R35	41E
A6R36	41F
A6R38	42F
A6R39	43F
A6R40	44F
A6R41	45D
A6R42	23E
A6R43	46E
A6R44	46C
A6R45	26F
A6R46	41G
A6R47	41G
A6R48	26D
A6R49	25D
A6R54	25D
A6R55	42B
A6TP1	40C
A6TP2	46C
A6TP3	46E
A6TP4	43G
A7R1	18F
A7R2	18F
A7R3	18E
A7R7	17F
A7R8	17F
A7R9	16F
A7R13	17E
A7R14	17E
A7R15	16E
A7R16	17D
A7R17	17D
A7R18	17D
A7R19	16D
A7R20	16D
A7R21	16E

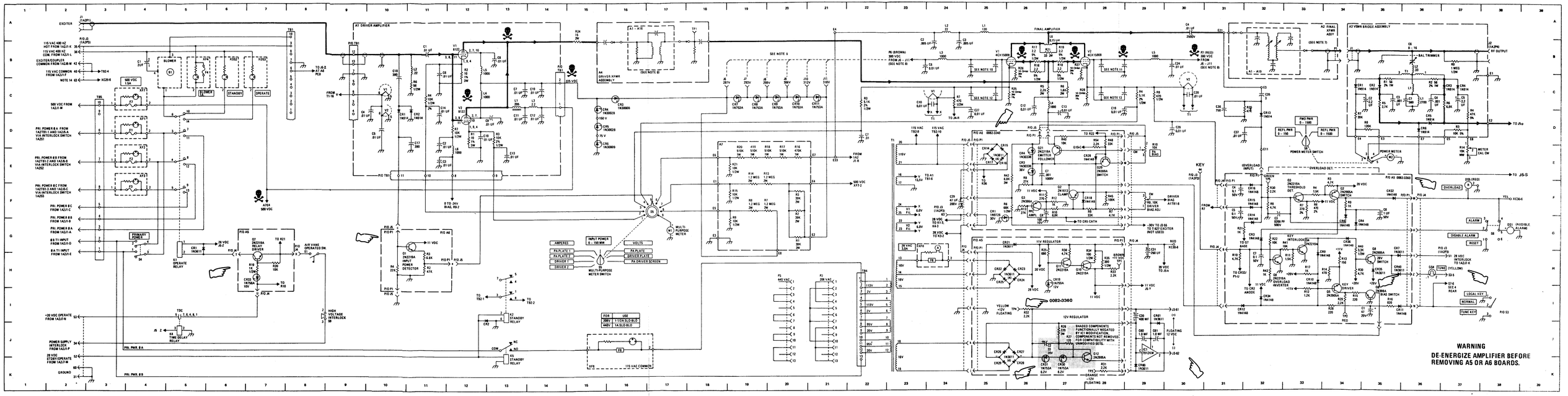


Figure 5-26A. Radio Frequency Amplifier AM-6909( )/URT, Chassis Schematic Diagram Shows New (0082) 1A1A5 and 1A1A6 PC Boards (Sheet 1 of 2)

PARTS LOCATION INDEX

REF DESIG	LOC
B1	6C
B2	55H
B3	35J
C1	7C
C2	21B
C3	22B
C4	28B
C5	23C
C6	21B
C7	20C
C8	23C
C9	26C
C10	21C
C11	22B
C12	24C
C13	25D
C15	22B
C16	22B
C17	26C
C19	26D
C20	27C
C21	22B
C23	26B
C24	27B
C26	22B
C27	22D
C28	28D
C29/XC29	22E
C30/XC30	27I
C31/XC31	27G
C32	26B
C33	26B
C34	26B
C35	29C
C36	28D
C37	29D
C38	22B
C39	26B
C40	26B
C41	26C
C42	26C
C43	26C
C44	26C
C45	23C
C46	23C
C47	23C
C48	23C
C60-C61	27I
CR1	6F
CR2	10I
CR3	15I
CR4	15I
CR5	15H
CR6	15H
CR7	15I
CR8	15I
CR9	15H
CR10	15H
CR11	15H
CR12	52I
CR13	29D
CR14	53G
CR60/CR61	27I
DS1	35F
DS2/XDS2	7C
DS3/XDS3	6C
DS4/XDS4	34G
DS5/XDS5	34E
F1/XF1	5E
F2/XF2	5E
F3/XF3	5F
F4/XF4	8C
F5/XF5	64H
F6/XF6	21G
F7/XF7	4G
IC1/XIC1	27I
J1	3A
J3	3B-J, 12I, 20B, 21H, 27E, 27H, 27J, 28G, 34G, 39G, 47C, E, F, G, 52C-F, 55G, 65G-J
J4	7G, 8G, 22G-J, 26G-J, 28E-H, 29E, 32I, 33F-H, 51H, 55H
J5	10F, 10G, 11G, 22I, 22D, 22E, 24D, 26D-E, 40C-H, 47C-I
J6	16I
J7	16I
J8	16H
J9	16H
J10	16H
J11	16G
K1	6F
K2	10I
K3	53I
K4	6G
L1	22B
L2	22B
L3	21B
L4	24C
L5	27B
L6	24B
M1	14G
M2	33E
P1	19H
P2	18H
P3	17H
P5	63F
P6	21B
P7	28B
Q1	27I
R3	21C
R4	26C
R5	24C
R6	25C
R7	22C
R8	27C
R9	27F
R10	27D
R11	39D
R12	39F
R13	39G
R14	35E
R16	24C
R17	24B
R18	25C
R19	25B
R20	29D
R21	24B
R24	15B
R25	23C
R26	24C
R27	25C
R28	25C
S1	8G
S3	35H, 39G
S4	5I
S5	12H
S6	35F
S7	54B
S8	30D
S9	8H
T1	21F
TB1	59G
TB2	62G
TB4	20H
V1	23B
V2	25B
A1C1	11B
A1C2	11D
A1C3	11E
A1C4	9D
A1C5	10D
A1C6	11C
A1C7	13C
A1C8	12B
A1C9	12D
A1C10	12D
A1C11	13D
A1C12	14D
A1C13	13E
A1C14	11D
A1C17	10D
A1C18	10C
A1C19	14C
A1CR1	10D
A1CR2	10D
A1L1	13D
A1L2	10C
A1L3	13D
A1L4	12C
A1L5	12C
A1L6	11D
A1R1	12D
A1R2	12C
A1R3	12D
A1R4	11C
A1R6	10C
A1R7	11D
A1TB1	9B, 10E, 14C
A1V1/XV1	11B
A1V2/XV2	12D
A2	30B
A3C1	33C
A3C2	32C
A3C3	33C
A3C4	34C
A3C5	34C
A3C6	33B
A3CR1	32C
A3CR2	32C
A3CR3	34C
A3CR4	34C
A3CR5	33D
A3CR6	33D
A3J1	32B
A3J2	35B
A3L1	33C
A3L2	33B
A3R1	33C
A3R2	34C
A3R3	34D
A3R4	35D
A3R5	32C
A3R6	34C
A3R7	32C
A3R8	32D
A3R9	34B
A3T1	33C
A4	18B
A4TB1	56C
A5C1	31I
A5C2	24I
A5C3	30F
A5C4	29F
A5C5	29F
A5C6	32F
A5CR1	51I
A5CR2	50I
A5CR3	29G
A5CR4	32F
A5CR5	30E
A5CR6	31F
A5CR7	32G
A5CR8	30G
A5CR9	30H
A5CR10	31H
A5CR11	32I
A5CR12	29I
A5CR13	29G
A5CR14	29F
A5CR15	29F
A5CR16	29E
A5CR17	30G
A5CR19	24G
A5CR20	24H
A5CR21	23G
A5CR22	23G
A5CR23	23G
A5CR24	23H
A5CR25	23H
A5CR26	23I
A5CR27	23I
A5CR28	23J
A5CR29	23J
A5CR30	25J
A5CR31	24J
A5CR32	33F
A5CR40	33G
A5Q2	31F
A5Q3	30F
A5Q4	30H
A5Q5	31H
A5Q6	33H
A5Q7	7G
A5Q8	31C
A5Q9	30G
A5Q10	25G
A5Q11	24G
A5Q12	25J
A5R3	31E
A5R4	31F
A5R5	30E
A5R6	31F
A5R7	30F
A5R8	30F
A5R9	31F
A5R10	30H
A5R11	30H
A5R12	31H
A5R13	31H
A5R14	32H
A5R15	32H
A5R16	31I
A5R17	30H
A5R19	7G
A5R20	7G
A5R21	29G
A5R22	30G
A5R25	24G
A5R26	24I
A5R27	25I
A5R28	31H
A5R29	32H
A5R30	30F
A5R31	26J
A5R32	25I
A5R33	26G
A5R34	25G
A5R35	26G
A5R36	24I
A5R37	50I
A5TP1	26G
A5TP2	32G
A5TP3	25J
A5TP4	25I
A5TP5	30E
A6C1	42G
A6C3	43F
A6C4	44F
A6C5	40D
A6C6	25E
A6C7	24E
A6CR1	40G
A6CR2	42G
A6CR3	24E
A6CR4	24E
A6CR5	44C
A6CR7	44G
A6CR8	45F
A6CR9	41E
A6CR11	41C
A6CR12	41F
A6CR13	43E
A6CR14	23D
A6CR15	23D
A6CR16	23E
A6CR17	23E
A6CR18	25F
A6CR19	45H
A6CR20	41G
A6CR21	45E
A6CR22	45C
A6CR23	45D
A6CR24	45D
A6CR25	44G
A6CR26	44G
A6CR27	44H
A6CR28	25E
A6CR29	44G
A6Q1	10F
A6Q2	25F
A6Q3	24F
A6Q7	41H
A6Q8	41C
A6Q9	42C
A6Q10	42C
A6Q11	41D
A6Q12	41E
A6Q13	42E
A6Q14	42E
A6Q15	44E
A6Q16	45E
A6Q17	41G
A6Q19	45G
A6Q20	26E
A6Q21	25D
A6R1	41G
A6R2	11G
A6R3	11G
A6R4	10G
A6R6	24E
A6R7	26F
A6R8	23E
A6R9	25F
A6R10	24F
A6R11	24E
A6R12	24F
A6R13	24F
A6R14	43G
A6R15	43H
A6R16	43H
A6R17	43H
A6R18	45G
A6R19	44G
A6R21	42H
A6R22	42I
A6R23	40C
A6R24	45G
A6R25	41C
A6R26	41C
A6R27	42D
A6R28	42D
A6R29	41B
A6R30	42B
A6R31	42C
A6R32	42C
A6R33	41E
A6R34	42E
A6R35	41E
A6R36	41F
A6R38	42F
A6R39	43F
A6R40	44F
A6R41	45D
A6R42	23E
A6R43	46E
A6R44	46C
A6R45	26F
A6R46	41G
A6R47	41G
A6R48	26D
A6R49	25D
A6R54	25D
A6R55	42B
A6TP1	40C
A6TP2	46C
A6TP3	46E
A6TP4	43G
A7R1	18F
A7R2	18F
A7R3	18E
A7R7	17F
A7R8	17F
A7R9	16F
A7R13	17E
A7R14	17E
A7R15	16E
A7R16	17D
A7R17	17D
A7R18	17D
A7R19	16D
A7R20	16D
A7R21	16E

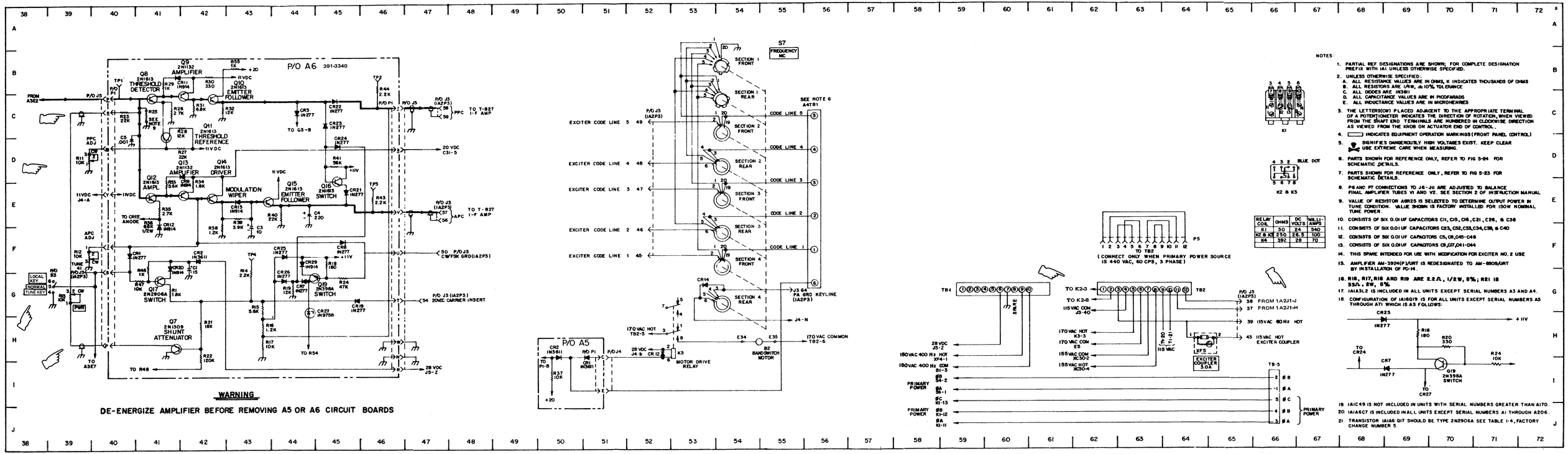


Figure 5-27. Radio Frequency Amplifier AM-6909( )/URT, Chassis Schematic Diagram Shows Original 1A1A5 and 1A1A6 PC Boards (Sheet 2 of 2)

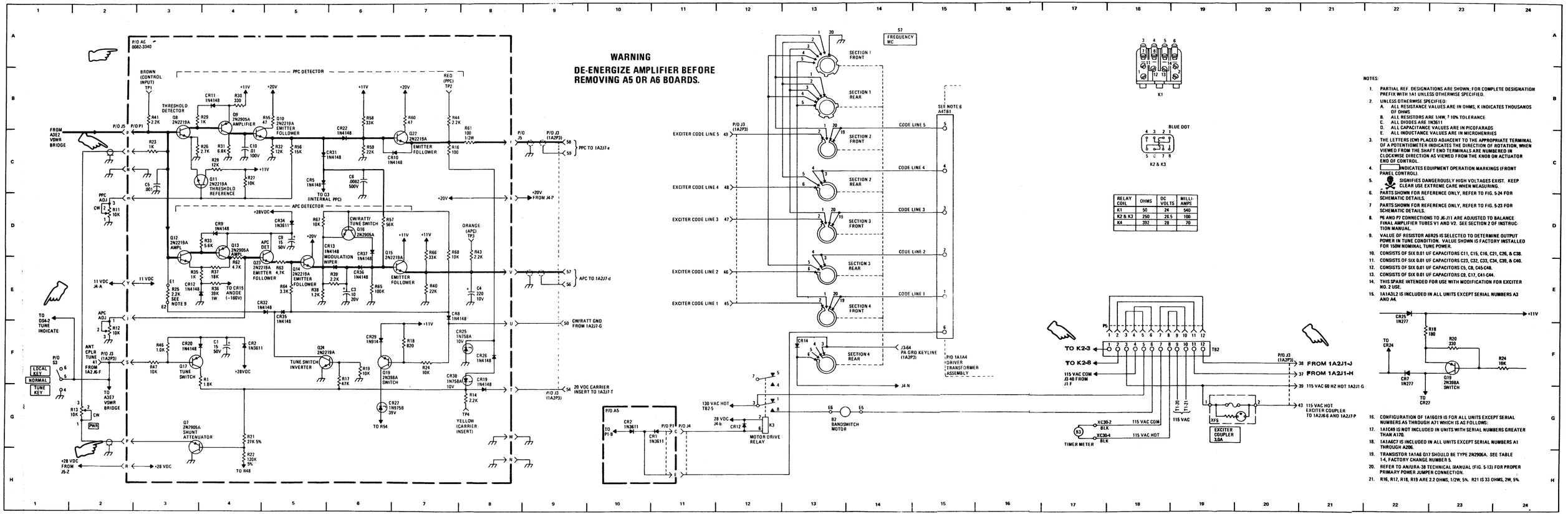


Figure 5-27A. Radio Frequency Amplifier AM-6909( )/URT, Chassis Schematic Diagram
Shows New (0082) 1A1A5 and 1A1A6 PC Boards (Sheet 2 of 2)

NOTES:

1 UNLESS OTHERWISE INDICATED ALL CAPACITORS ARE IN PICOFARADS AND RESISTORS ARE IN OHMS
2 SWITCH IS SHOWN IN 2.0-2.5 MC POSITION
3 ↓ INDICATES BLUE COLOR CODED TUNING SCREW
↑ INDICATES UNCODED SCREW
ARROWS INDICATE DIRECTION OF SLUG TRAVEL WITH CLOCKWISE ROTATION OF SCREW
4 PREFIX PARTIAL REFERENCE DESIGNATIONS WITH 1A1A2
5 * CONSISTS OF R1 THROUGH R4 IN PARALLEL, EACH 27K, 2W
** CONSISTS OF R5 THROUGH R8 IN PARALLEL, EACH 27K, 2W
6 VALUE SHOWN FOR C28 IS FOR ALL UNITS EXCEPT SERIAL NUMBERS A3 THROUGH A145 IN WHICH IT IS 1000 PF
7 VALUES SHOWN FOR C38 AND C39 IS FOR ALL UNITS EXCEPT SERIAL NUMBERS A5, A6, A8, A9, A10, A13 IN WHICH THEY ARE 100 PF

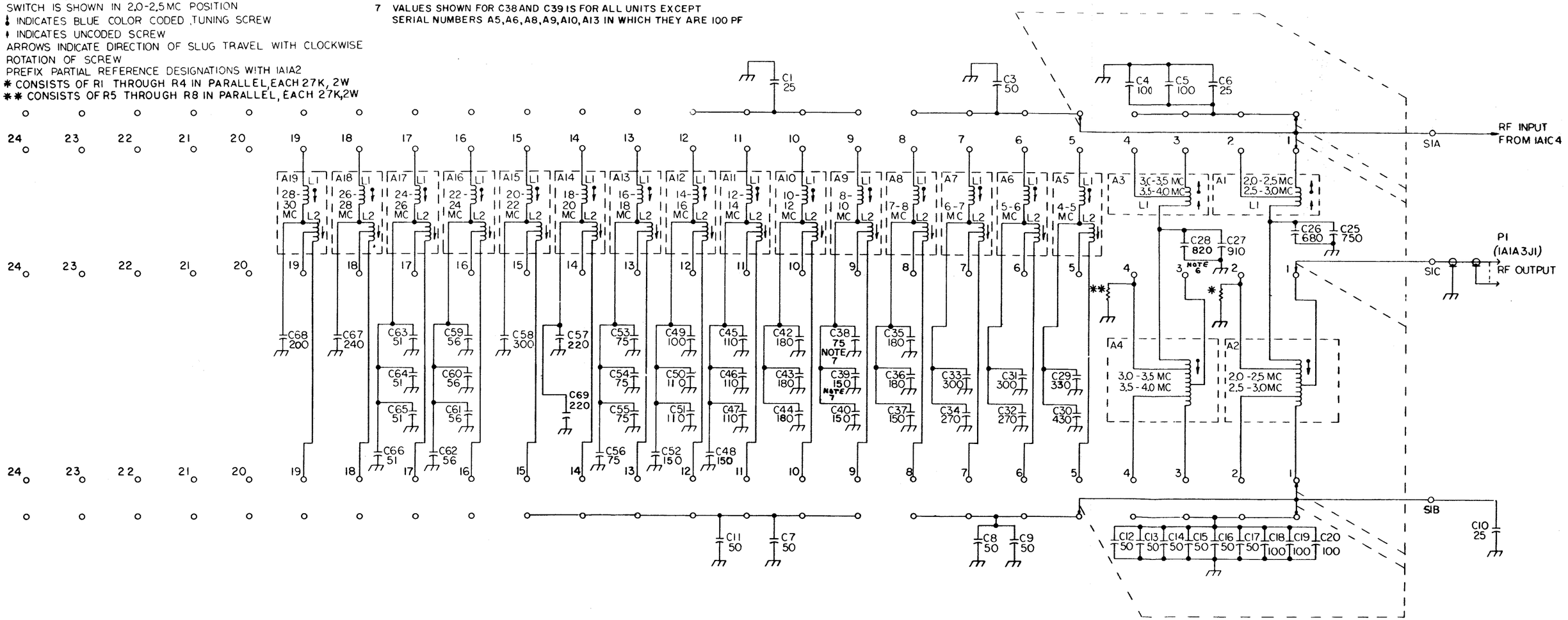


Figure 5-28. Final Transformer Assembly 1A1A2, Schematic Diagram

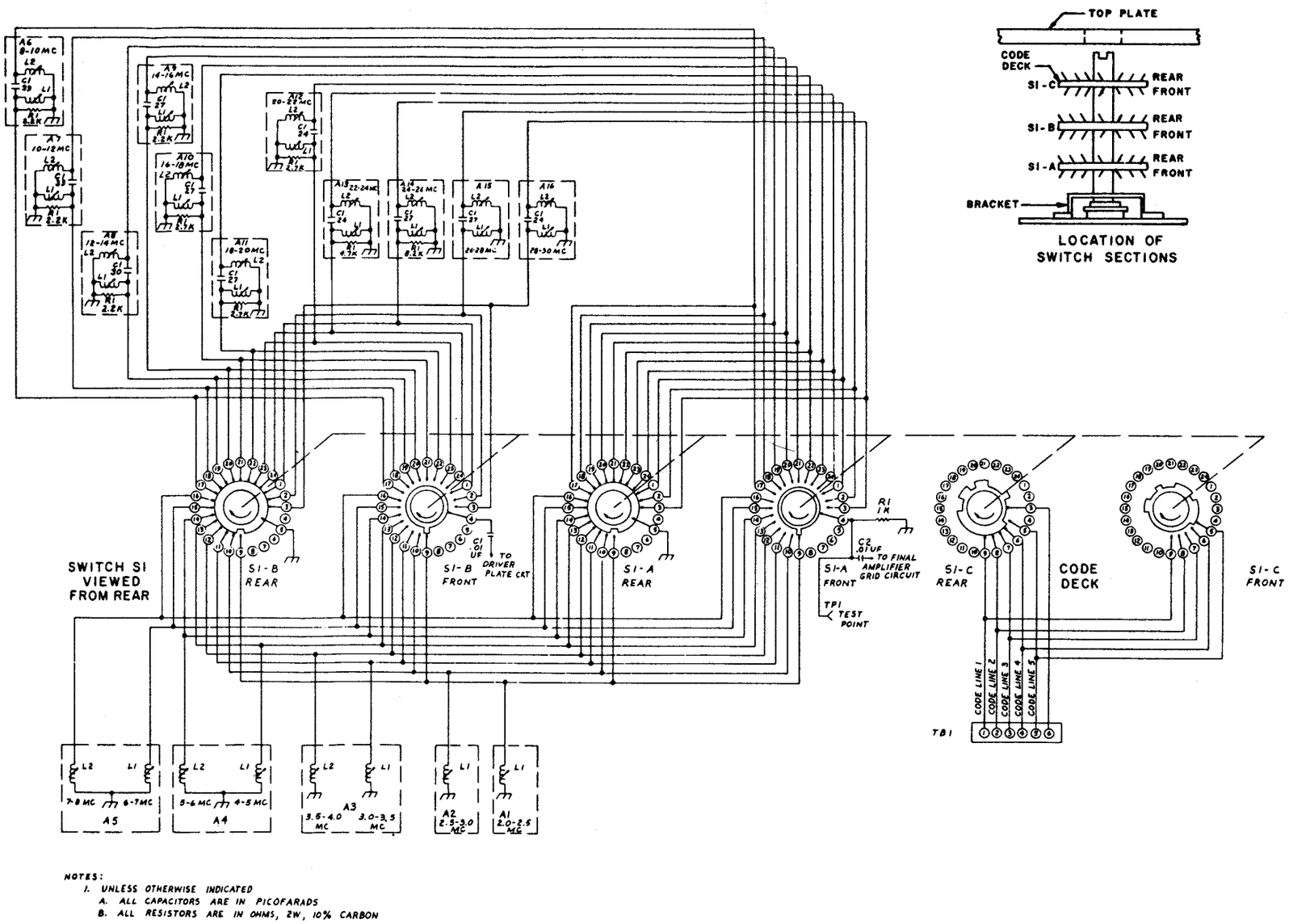
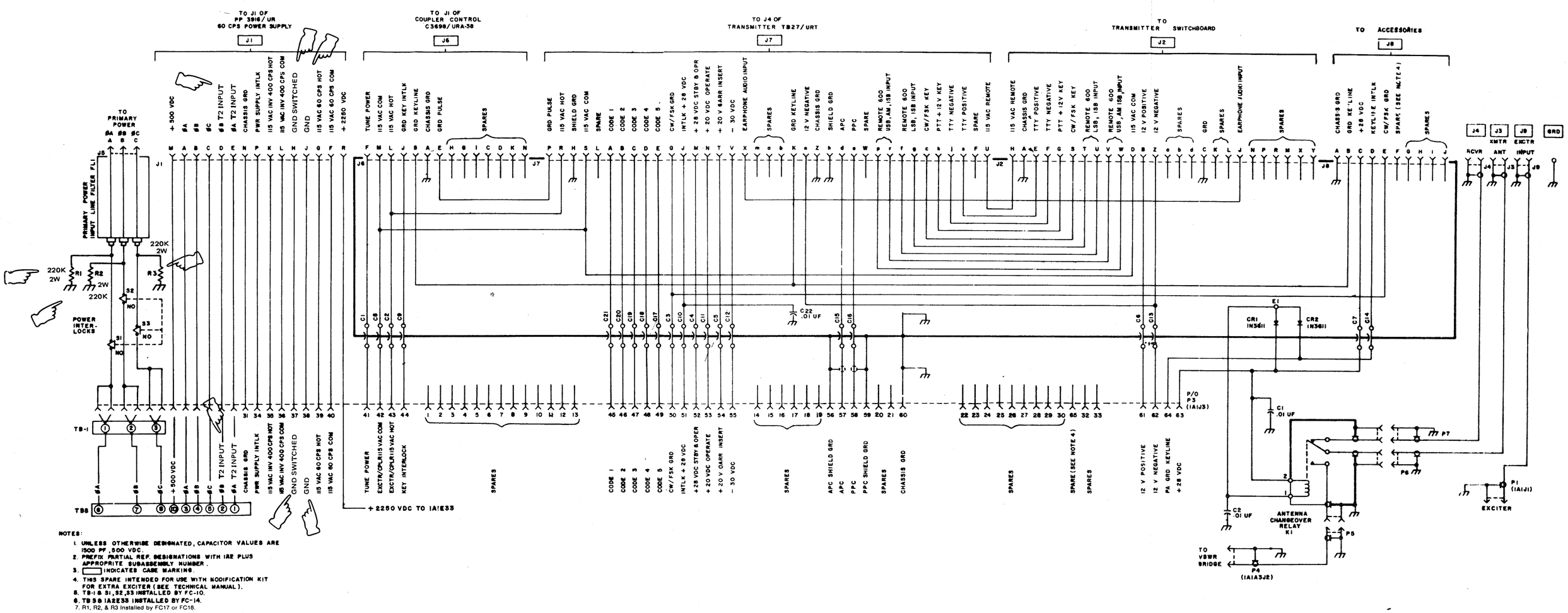


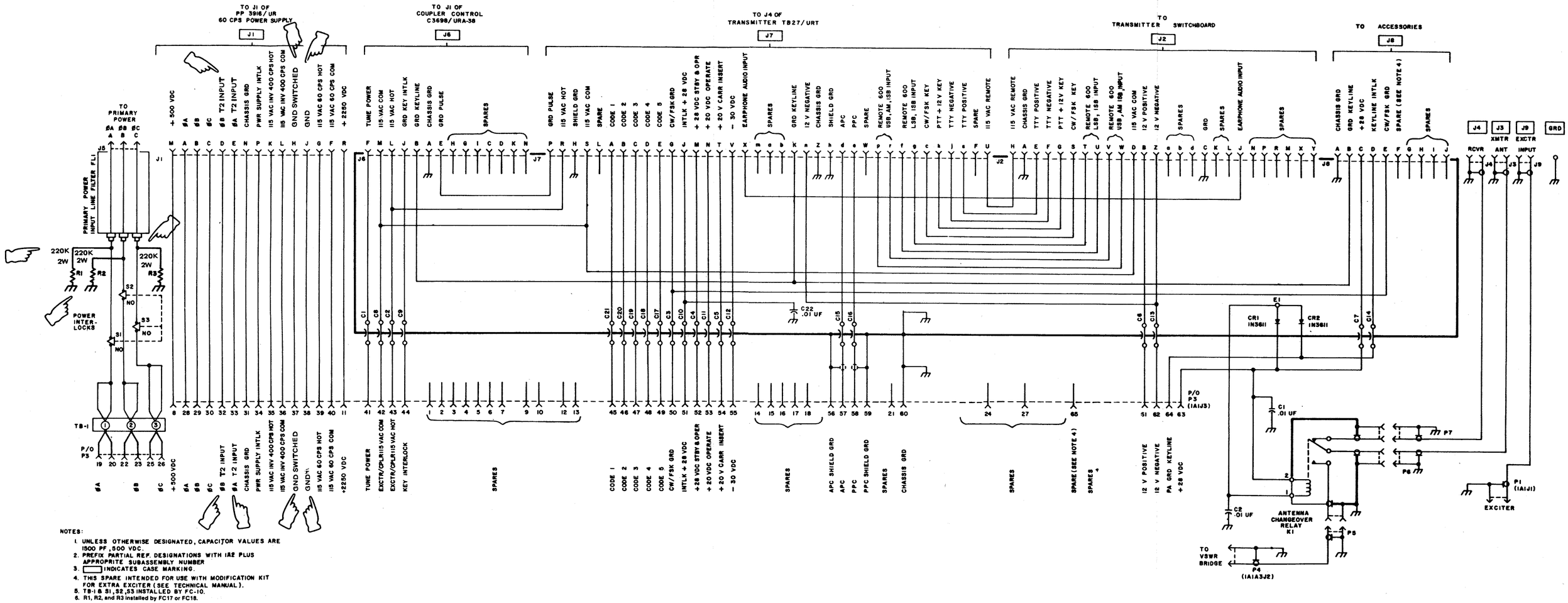
Figure 5-29. Driver Transformer Assembly 1A1A4, Schematic Diagram



NOTES:

1. UNLESS OTHERWISE DESIGNATED, CAPACITOR VALUES ARE 1500 PF, 500 VDC.
2. PREFIX PARTIAL REF. DESIGNATIONS WITH 1AE PLUS APPROPRIATE SUBASSEMBLY NUMBER.
3. ▭ INDICATES CASE MARKING.
4. THIS SPARE INTENDED FOR USE WITH MODIFICATION KIT FOR EXTRA EXCITER (SEE TECHNICAL MANUAL).
5. TB-1 & S1, S2, S3 INSTALLED BY FC-10.
6. TB 5 & 1A2E33 INSTALLED BY FC-14.
7. R1, R2, & R3 Installed by FC17 or FC18.

Figure 5-30. Radio Frequency Amplifier AM-6909( )/URT, Case, Schematic Diagram



NOTES:

1. UNLESS OTHERWISE DESIGNATED, CAPACITOR VALUES ARE 1500 PF, 500 VDC.
2. PREFIX PARTIAL REF. DESIGNATIONS WITH 1A2 PLUS APPROPRITE SUBASSEMBLY NUMBER
3. ▭ INDICATES CASE MARKING.
4. THIS SPARE INTENDED FOR USE WITH MODIFICATION KIT FOR EXTRA EXCITER (SEE TECHNICAL MANUAL).
5. TB-1 & S1, S2, S3 INSTALLED BY FC-10.
6. R1, R2, and R3 installed by FC17 or FC18.

Figure 5-30A. Radio Frequency Amplifier AM-3924(P)/URT, Case, Schematic Diagram

NOTES:
1. UNLESS OTHERWISE INDICATED ALL RESISTORS ARE IN OHMS, 1/2W, 10%
2. CR1 AND CR2 ARE 400000-001
3. CR3 IS D22-5001-000
4. PREFIX ALL INCOMPLETE REFERENCE DESIGNATIONS WITH 1A1A8.
5. CONNECT SEALED PLUG TO 1A2J1 ON AM-3924(P)URT WHEN PP-3917/UR IS USED

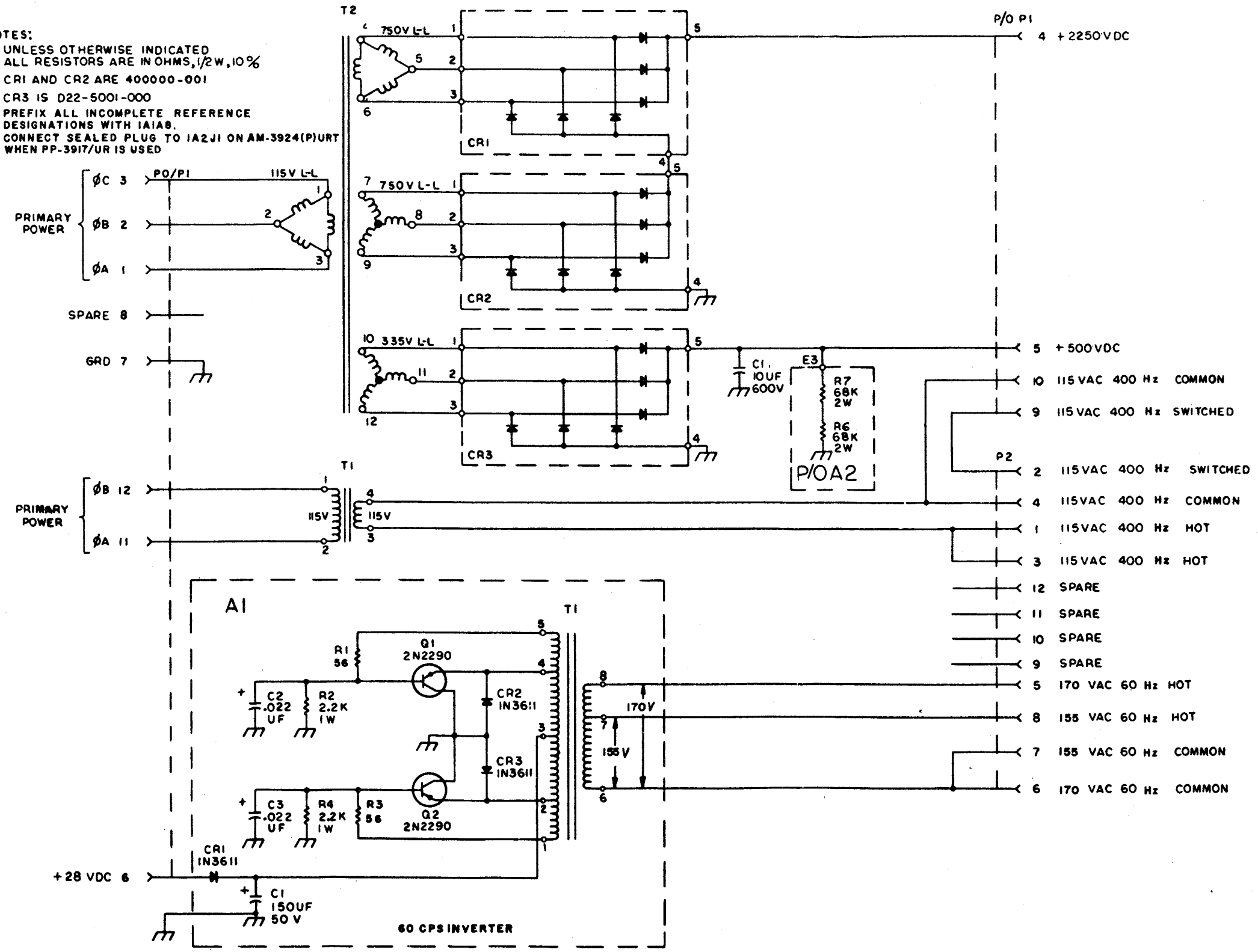
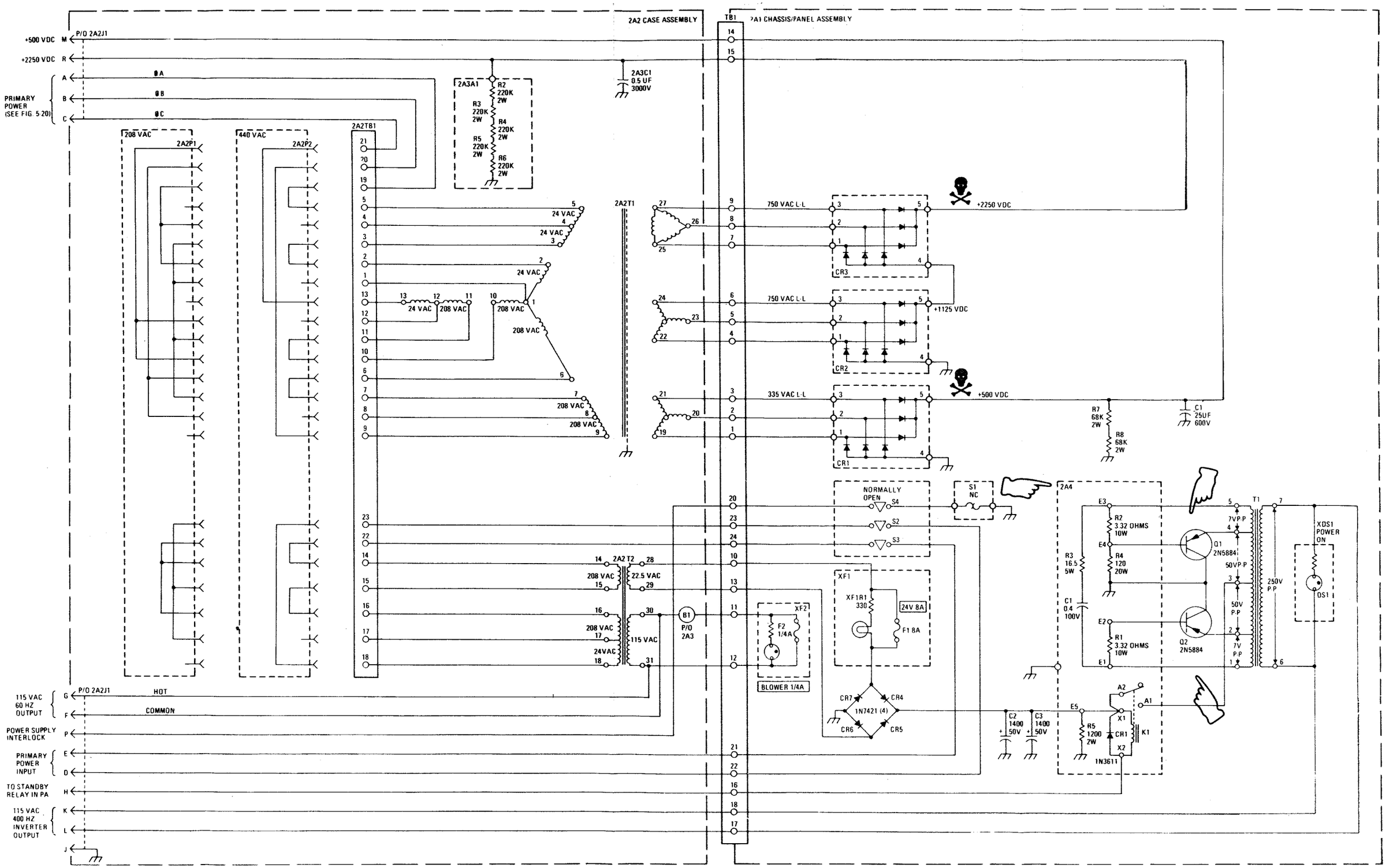


Figure 5-31. Power Supply PP-3917/UR, Schematic Diagram



NOTE: 2A4 Assembly added by FC17 or FC18.

Figure 5-32. Power Supply PP-3916/UR, Schematic Diagram

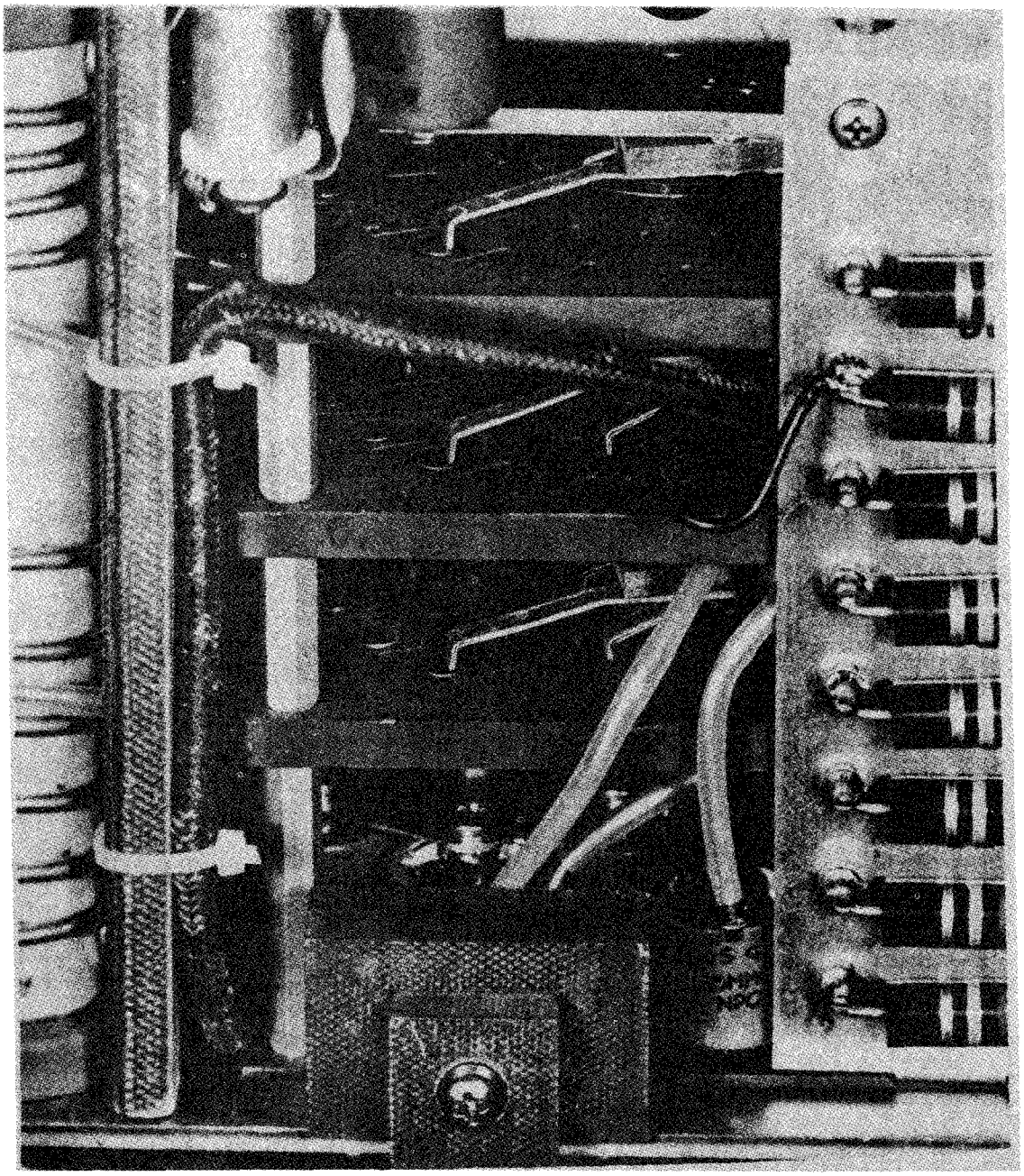


Figure 5-33. Final Transformer Contacts Properly Aligned in 28-30 MC Band Position

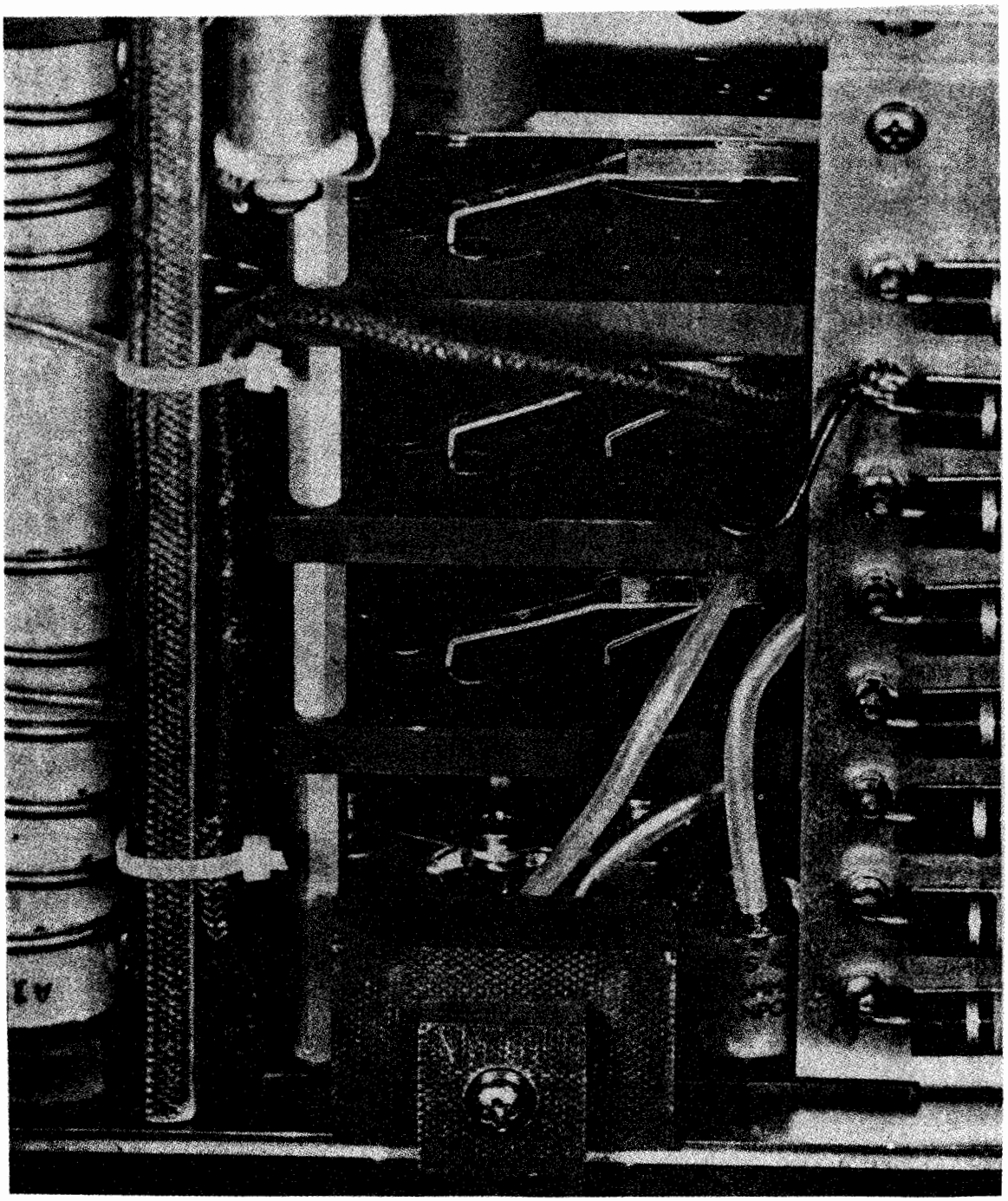


Figure 5-34. Final Transformer Contacts Misaligned (adjust driver transformer "code deck" counterclockwise to compensate)

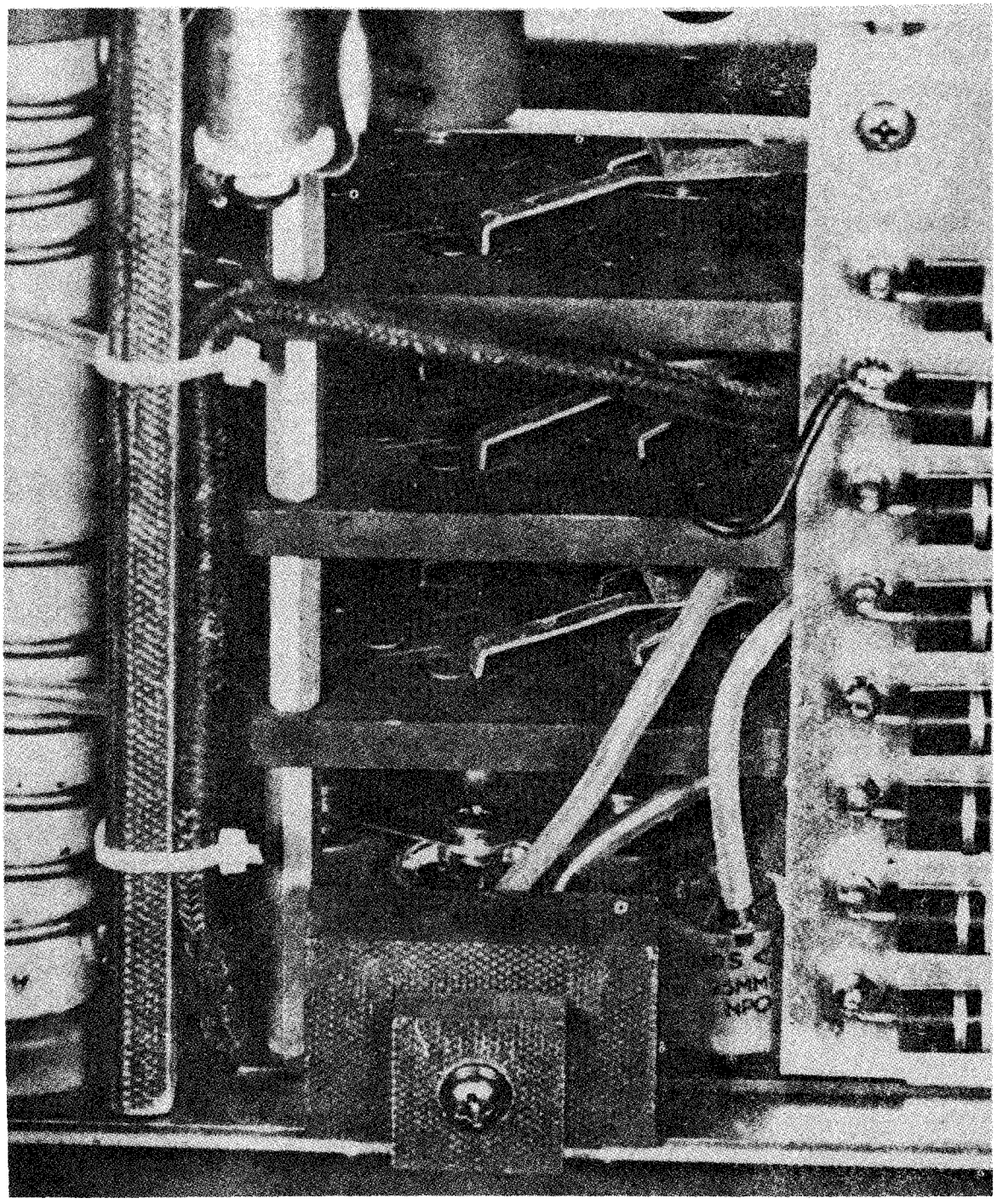


Figure 5-35. Final Transformer Contacts Misaligned (adjust driver transformer "code deck" clockwise to compensate)

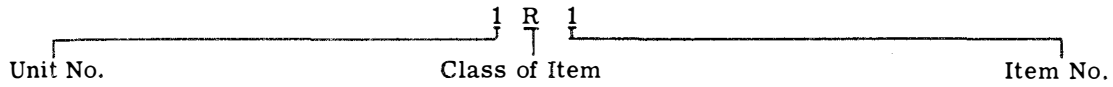
SECTION 6

PARTS LIST

6-1. REFERENCE DESIGNATIONS.

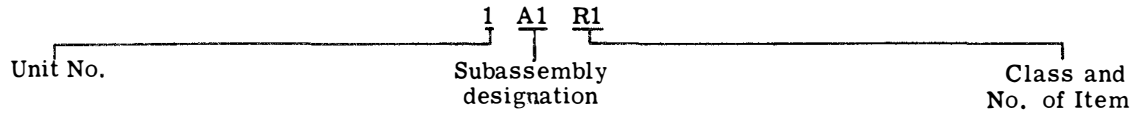
The unit numbering method of assigning reference designations has been used to identify units, assemblies, subassemblies, and parts. This method has been expanded as much as necessary to adequately cover the various degrees of subdivision of the equipment. Examples of this unit numbering method and typical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

Example 1:



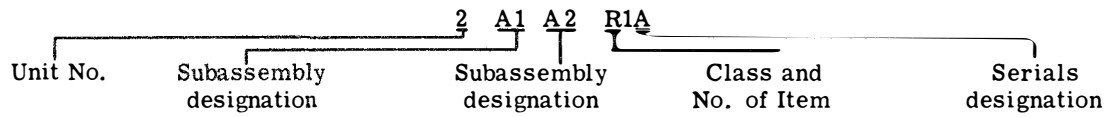
Read as: First (1) resistor (R) of first unit (1).

Example 2:



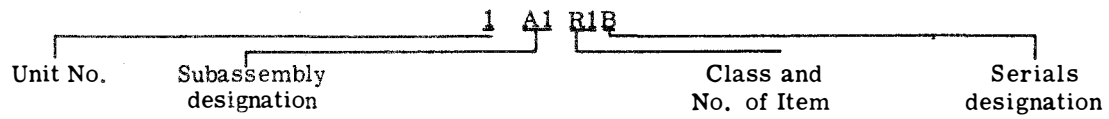
Read as: First (1) resistor (R) of first (1) subassembly (A) of first (1) unit.

Example 3:



Read as: (A) AN/URT-23 "A" serial only, first (1) resistor (R) of second (2) subassembly (A) of first (1) subassembly (A) of second (2) unit.

Example 4:



Read as: (B) AN/URT-23(V) "B" serial only, first (1) resistor (R) of first (1) subassembly (A) of first (1) unit.

NOTE

Those items without an "A" or "B" suffix to the designator are used in "A" and "B" serial equipments.

6-2. REFERENCE DESIGNATION PREFIX.

Partial reference designations are used on the equipment and illustrations. The partial reference designations 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".

6-3. LIST OF UNITS.

Table 6-1 is a listing of the units comprising the equipment. The units are listed by unit numbers in numerical order. Thus, when the complete reference designation of a part is known, this table will furnish the identification of the unit in which the part is located, since the first number of a complete reference designation identifies the unit. Table 6-1 also provides the following information for each unit listed: (1) quantity per equipment; (2) official name; (3) designation; (4) colloquial name; and (5) location of the first page of its parts listing in table 6-2.

6-4. MAINTENANCE PARTS LIST.

Table 6-2 lists all units and their maintenance parts. The units are listed in numerical sequence. Maintenance parts for each unit are listed alphabetically-numerically by class of part following the unit designation. Thus, the parts for each unit are grouped together. Table 6-2 provides the following information: (1) the complete reference designation of each unit, assembly, subassembly, or part; (2) reference to explanatory notes in paragraph 6-6; (3) noun name and brief description; and (4) identification of the illustration which locates the part.

Printed circuit boards, assembly boards, modules, etc., are listed first as individual items in the maintenance parts list. In addition, at the completion of a parts listing for each unit, the individual circuit board, assembly board, module, etc., is then broken down by components into separate parts listing. When there is a redundance of such electronic assemblies in subsequent units, reference is made to the parts breakdown previously listed.

6-5. LIST OF MANUFACTURERS.

Table 6-3 lists the manufacturers of parts used in the equipment. The table includes the manufacturer's code used in table 6-2 to identify the manufacturers.

6-6. NOTES.

The following notes provide information as referenced in table 6-2.

Note 1. Power Supply PP-3917/UR used only when primary power is 400 Hz.

Note 2. Power Supply PP-3916/UR used only when power is 60 Hz.

Note 3. Maintenance parts list for Radio Transmitter T-827( )/URT is listed in applicable tech manual referenced in Table 1-1.

Note 4. Base, Shock Mount, Electrical Equipment MT-3399/U is not used when AN/URT-23(V) is rack mounted.

Note 5. Not supplied as part of the AN/URT-23(V).

Note 6. Selected for desired tune power at the time of installation.

Note 7. Value and PN shown for 1A1A2C28 is for all units except serial numbers A3 through A145 in which it is a 1000 PF +5%, 500 VDCW, PN VY83C102J.

Note 8. Values and PN's shown for 1A1A2C38 and 1A1A2C39 are for all units except serial numbers A5, A6, A8, A9, A10, A13 in which there are 11 110 PF ±5%, 500 VDCW, PN VY 812111J.

Note 9. Inductor 1A1A3L2 is used in all units except serial numbers A3 and A4.

Note 10. Diode 1A1A6CR29 is used in all units except serial numbers A5 through A71.

Note 11. PN shown for 1A1A6R18 is for all units except serial numbers A5 through A71 in which it is an RC07GF181K.

Note 12. Resistor 1A1A6R20 is deleted for all units except A5 through A71 in which it is an RC07GF103K.

Note 13. Capacitor 1A1A6C7 is not used with serial numbers A1 through A206.

Note 14. Capacitor is not used in units with serial numbers greater than A170.

Note 15. Use corrected listing for replacement part. See table 1-5.

Note 16. AM-3924(P)/URT is redesignated AM-6909/URT with the installation of FC-14 AN/URT-23(V).

Note 17. F1-F3 requires 25A slow-blow fuse F09B250V25A for operation with 115V, 400 Hz primary power.

TABLE 6-1. LIST OF UNITS

UNIT NO.	QTY.	NOTE	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1	1	16	Radio Frequency Amplifier	AM-3924(P)/URT AM-6909/URT	Power Amplifier	
1A1A8		1	Power Supply	PP-3917/UR	Power Supply	
2	1	2	Power Supply	PP-3916/UR	Power Supply	
3	1	3	Radio Transmitter	T-827/URT	Exciter	
4	1	4	Base, Shock Mount, Electrical Equipment	MT-3399/U	Shock Mount	
			Ancillary items			

TABLE 6-2. MAINTENANCE PARTS LIST

AMPLIFIER, RADIO FREQUENCY AM-3924(P)/URT

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A		Amplifier, Radio Frequency AM-3924(P)/URT: MFR 14304, PN 391-1000	5-6/5-7
1B		Amplifier, Radio Frequency AM-3924(P)/URT: MFR 14304, PN 8948-1000	5-6/5-7
1A1A		Chassis-Panel Assembly: MFR 14304, PN 391-3100	5-7
1A1B		Chassis-Panel Assembly: MFR 14303, PN 8948-3100	5-7
1A1B1		Fan: 115V, 400 Hz, 1Ø, MFR 14303, PN B22-0001-000	5-8
1A1B2		Motor, Synchronous: 115V, 60 Hz, 1Ø, 6 RPM, MFR 14303, PN B11-0004-000	5-8
1A1B3		Meter Time Elapse: 115V, 60 Hz, 1Ø, 0-9999 HFR, MFR 13832, PN B19601	5-7
1A1C1		Capacitor, Fixed Paper: MIL type CP53B1EF205K1	5-8
1A1C2		Capacitor, Fixed Ceramic: .005 UF ± 20%, 3000VDCW MFR 14304, PN C11-0003-001	5-7
1A1C3		Same as 1A1C2	5-7
1A1C4		Capacitor, Fixed Mica: MIL type CM60BK103K03	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1C5		Capacitor, Fixed Ceramic: MIL type CK63AY103X	5-10
1A1C6 thru 1A1C13		Same as 1A1C5	5-10
1A1C14		Not used	
1A1C15 thru 1A1C17		Same as 1A1C5	5-10
1A1C18		Not used	
1A1C19 thru 1A1C21		Same as 1A1C5	5-10
1A1C22		Not used	
1A1C23		Same as 1A1C5	5-10
1A1C24		Same as 1A1C5	5-10
1A1C25		Not used	
1A1C26 thru 1A1C28		Same as 1A1C5	5-10
1A1C29A		Capacitor, Fixed Electrolytic: MIL type CE51C470K	5-7
1A1C29B		Capacitor, Fixed Electrolytic: MIL type CE560470P	5-7
1A1C30		Capacitor, Fixed Electrolytic: MIL type CE51C401F	5-7
1A1C31		Capacitor, Fixed Electrolytic: MIL type CE51C251F	5-7
1A1C32 thru 1A1C34		Same as 1A1C5	5-10
1A1C35		Capacitor, Fixed Ceramic: 3 PF NPO ± 5%, 500 VDCW, MFR 71590, PN 855-3Z	5-7
1A1C36		Capacitor, Fixed Mica: MIL type CM05D751J03	5-7
1A1C37		Same as 1A1C5	5-7
1A1C38 thru 1A1C48		Same as 1A1C5	5-10
1A1C49		Capacitor, Fixed Paper: 0.5 UF ± 10%, 3000VDCW, MFR 16727, PN A0C3M05	5-8
1A1C50 thru 1A1C59		Not used	
1A1C60, 1A1C61		Capacitor, 1.0 uF, 50V, ±20%, MIL type MS39003/01-2117	5-6

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1CR1		Diode: MIL type 1N3611	5-8
1A1CR2		Same as 1A1CR1	5-6
1A1CR3		Diode: MIL type 1N3000B	5-6
1A1CR4		Diode: MIL type 1N3002B	5-6
1A1CR5		Same as 1A1CR4	5-6
1A1CR6		Same as 1A1CR4	5-6
1A1CR7		Diode: MIL type 1N753A	5-6
1A1CR8 thru 1A1CR11		Same as 1A1CR7	5-6
1A1CR12		Same as 1A1CR1	5-6
1A1CR13		Diode: MIL type 1N914	5-7
1A1CR14		Same as 1A1CR1	5-7
1A1CR15 thru CR59		Not Used	
1A1CR60, 1A1CR61		Diode, Silicon, 1A, 200V: JAN 1N3611	5-6
1A1DS1		Alarm, sonalert: 6-29 VDC, 3014 ma, sound 68-80 db, 2.5 kHz, MFR 18787, PN SC-628	5-7
1A1DS2		Lamp, Neon: MIL type MS24242NE2D	5-7
1A1DS3		Same as 1A1DS2	5-7
1A1DS4		Lamp, Indicator TUNE 28V: MS2523-387	5-7
1A1DS5		Lamp, Incandescent: MIL type MS24237-327	5-7
1A1E33		Terminal, Standoff, High Voltage: MFR 17117, PN 3321-53-2	5-9
1A1E34		Terminal, Standoff: MFR 14303, PN E-35-0008	5-8
1A1E35		Same as 1A1E34	5-8
1A1F1	17	Fuse, Cartridge: MIL type F09B250V6A	5-8
1A1F2	17	Same as 1A1F1	5-8
1A1F3	17	Same as 1A1F1	5-8
1A1F4		Fuse, Cartridge: MIL type F02A250V1AS	5-8
1A1F5		Fuse, Cartridge: MIL type F02A250V3AS	5-8
1A1F6		Same as 1A1F5	5-8
1A1F7		Fuse, Cartridge: MIL type F02A250V1-1/2AS	5-8

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1F8		Fuse, Cartridge: MIL type F02B250V1A	5-7
1A1H1		Nut, Hex, Large Pattern, (Part of 1A1XV1/XV2): No. 4-40 UNC-2B, MFR 14304, PN J30-0002-003	5-5
1A1H2 thru 1A1H12		Same as 1A1H1	5-5
1A1H13		Screw, Machine, Binding Head, Cross Recessed (Part of 1A1XV1/XV2): No. 4-40 UNC-2A, 1.75 in. long, MFR 14304, PN J30-000-006	5-5
1A1H14 thru 1A1H24		Same as 1A1H13	5-5
1A1H25		Lockwasher, Split, Light Series, No. 4 (Part of 1A1XV1/XV2): MFR 14304, PN J30-0002-007	5-5
1A1H26 thru 1A1H36		Same as 1A1H25	5-5
1A1H37		Washer, Flat, Fiber (Part of 1A1XV1/XV2): .03 thick x .31 OD x .12 ID, MFR 14304, PN J30-0002-009	5-5
1A1H38 thru 1A1H48		Same as 1A1H37	5-5
1A1H49		Washer, Plain, Nickel Plated Brass (Part of 1A1XV1/XV2): .03 thick x .31 OD x .12 ID, MFR 14304, PN J30-0002-010	5-5
1A1H50 thru 1A1H60		Same as 1A1H49	5-5
1A1H61		Screw, Panel, Captive, CRES: MFR 14304, PN Z18-0001	5-8
1A1H62		Nut, Slide, Pivot: MFR 14304, PN 391-3597	5-6
1A1H63 and 1A1H64		Not Used	5-7
1A1H65		Grommet, Rubber: PN MS35489-17	5-6
1A1IC1		Integrated Circuit, 7912KM: MFR 14304, P/N I10-0002-004	5-6
1A1J1		Connector, Receptacle: MIL type M39012/19-001	5-6
1A1J2		Not used	
1A1J3		Connector, Receptacle: 66 pin, rectangular, MFR 14304, PN J10-0001-000	5-6

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1J4		Connector, Receptacle: 36 pin, MFR 02660, PN 143-036-01-107	5-7
1A1J5		Same as 1A1J4	5-7
1A1J6		Connector, Receptacle: 1 pin, MFR 98291, PN SKT-10-RED	5-6
1A1J7 thru 1A1J11		Same as 1A1J6	5-6
1A1K1		Relay, Solenoid: 24 VDC, 4 PDT, MFR 77342, PN PM17DY24V	5-8
1A1K2A		Relay, Armature: MIL type M5757/23-001	5-6
1A1K2B		Relay, Armature: MFR 14304, PN K32-0002-001	5-6
1A1K3		Same as 1A1K2A	5-6
1A1K4		Relay, Time Delay: MIL type M19648/1-021	5-6
1A1K5		Relay, Vacuum: 26.5 VDC, SPST, MFR 73905, PN RFID-26S	5-6
1A1L1		Coil, Fixed RF: MFR 14304, PN 8948-3307	5-7
1A1L2		Coil, Fixed RF: MIL type MS16221-15	5-7
1A1L3		Coil, Fixed RF: MIL type LT4K068	5-10
1A1L4		Same as 1A1L3	5-10
1A1L5		Same as 1A1L3	5-10
1A1L6		Coil, Fixed RF: MFT 14304, PN 391-3311	5-7
1A1M1		Meter, Panel: MFR 14304, PN 391-3677 (Multi-Purpose)	5-7
1A1M2		Meter, Panel: MFR 14304, PN 391-3676 (Power)	5-7
1A1MP1		Spacer, Ceramic (Part of 1A1XV1/XV2): MFR 14304, PN J30-0002-001	5-5
1A1MP2 thru 1A1MP24		Same as 1A1MP1	5-5
1A1MP25		Bushing, Ceramic (Part of 1A1XV1/XV2): MFR 14304, PN J30-0002-002	5-5
1A1MP26 thru 1A1MP36		Same as 1A1MP25	5-5
1A1MP37		Spacer, Silver Plate (Part of 1A1XV1/XV2): MFR 14304, PN J30-0002-004	5-5
1A1MP38 thru 1A1MP44		Same as 1A1MP37	5-5

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1MP26 thru 1A1MP36		Same as 1A1MP25	5-5
1A1MP37		Spacer, Silver Plate (Part of 1A1XV1/XV2): MFR 14304, PN J30-0002-004	5-5
1A1MP38 thru 1A1MP44		Same as 1A1MP37	5-5
1A1MP45		Mounting Base (Part of 1A1XV1/XV2): MFR 14304, PN J30-0002-005	5-5
1A1MP46		Same as 1A1MP45	5-5
1A1MP47		Contact Fingers (Part of 1A1XV1/XV2): MFR 14304, PN J30-0002-008	5-5
1A1MP48 thru 1A1MP78		Same as 1A1MP47	5-5
1A1MP79		Connector, Bead Chain: MFR 89606, PN 6-DB-SS	5-8
1A1MP80		Bead Chain: MFR 89606, PN 6-SS	5-8
1A1MP81		1A1A5 Extender Board: MFR 96596, PN SK2500-101	-
1A1MP82		Knob: MIL type MS91528-1D2B (Power)	5-8
1A1MP83		Knob: MIL type MS91528-1P2B (Power Meter)	5-7
1A1MP84		Same as 1A1MP83 (Multi-Purpose)	5-7
1A1MP85		Knob: MIL type MS91528-3F2B (Band Selector)	5-7
1A1MP86		Transmission Assembly: MFR 14304, PN 391-3250	5-10
1A1MP87		Spacer: MFR 14304, PN 391-3488	5-5
1A1MP88 thru 1A1MP98		Same as 1A1MP87	5-5
1A1MP99		1A1A6 Extender Board: MFR 96596, PN SK2500-100	-
1A1MP100		End Block: MFR 14304, PN 391-3314	5-7
1A1MP101		Chimney, Plastic, Final Tube: MFR 14304, PN 391-3490	5-7
1A1MP102		Same as 1A1MP101	5-7
1A1MP103		Megacycle Disk Assembly: MFR 14304, PN 391-3665	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1MP112		Media, Filter: MFR 14304, PN 10044-1009	5-8
1A1MP113		Coupling, Bottom: MFR 14304, PN 391-3260	5-10
1A1MP114		Shield, PA Tube Compartment: MFR 14304, PN 391-3455	5-7
1A1MP115		Shield, APC/PPC Printed Circuit Board: MFR 14304, PN 391-3573	5-6
1A1MP116		Assembly, Air Vane: MFR 14304, PN 391-3503	5-8
1A1MP117		Cover, Access Hole; MFR 14303, PN Z24-0001-001	5-6
1A1MP118		Not used	
1A1MP119		Label, CAUTION, Screen Voltage: MFR 14304, PN 10044-1002	5-6
1A1MP120		Strap, Connecting, Final Out: MFR 14304, PN 8948-3336	5-7
1A1MP121		Assembly, Anode Connecting Cable: MFR 14303 PN 10044-1004	5-7
1A1MP122		Clamp, Anode Connector: MFR 14304, PN 10044-1005	5-7
1A1MP123		Panel Marking, TUNE: MFR 14304, PN 10044-1012	5-7
1A1MP124		Same as 1A1MP122	5-7
1A1MP125		Same as 1A1MP121	5-7
1A1MP126		Block, Support, Plate Choke: MFR 14304, PN 8948-3331	5-7
1A1MP127		Insulator, Mica: MFR 14304, PN E11-0002-001	5-6
1A1P1		Plug, 115V Jumper: MFR 14304, PN 391-4000	5-7
1A1P2	5	Plug, 208V Jumper: MFR 14304, PN 391-4050	5-7
1A1P3		Plug, 440V Jumper: MFR 14304, PN 391-4100	5-7
1A1P4		Not used	
1A1P5		Plug, 60 Hz Jumper: MFR 14304, PN 391-3603	5-8
1A1P6		Connector, Plug: MFR 98291, PN PR300 BROWN	5-6
1A1P7		Connector, Plug: MFR 14304, PN PR300 RED	5-6
1A1Q1		Deleted by FC-17/FC-18	
1A1R1		Not used	
1A1R2		Not used	
1A1R3		Resistor, Fixed Film: MIL type RL20S512G	5-10
1A1R4		Same as 1A1R3	5-10

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1R5		Resistor, Fixed Composition: MIL type RC42GF222K	5-10
1A1R6		Resistor, Fixed Composition: MIL type RC42GF182K	5-10
1A1R7		Resistor, Fixed Composition: MIL type RC20GF471J	5-10
1A1R8		Same as 1A1R7	5-10
1A1R9		Resistor, Variable Wirewound: MIL type RA20LASB103A	5-6
1A1R10		Resistor, Variable Wirewound: MIL type RA20NASD103A	5-8
1A1R11		Same as 1A1R9	5-6
1A1R12		Same as 1A1R9	5-6
1A1R13		Same as 1A1R10	5-8
1A1R14		Same as 1A1R9	5-6
1A1R15		Not used	
1A1R16		Resistor, Fixed Composition: 2.2 Ohms ±5%, 1/2 watt, MFR 14304, PN R11-0001-001	5-10
1A1R17 thru 1A1R19		Same as 1A1R16	5-10
1A1R20		Resistor, Fixed Composition: MIL type RC20GF472J	5-7
1A1R21		Resistor, Fixed Composition: MIL type RC42GF330K	5-7
1A1R22		Not used	
1A1R23		Not used	
1A1R24		Resistor, Fixed Composition: MIL type RC42GF150K	5-8
1A1R25		Resistor, Fixed WW: MIL type RWR89S10R0FR	5-10
1A1R26 thru 1A1R28		Same as 1A1R25	5-10
1A1S1		Switch, Air Vane: SPST, No, MFR 14304, PN S95-0001-000	5-8
1A1S2		Not used	
1A1S3		Switch, Toggle: MIL type MS35059-31	5-8
1A1S4		Switch, Toggle: MIL type MS25100-22	5-8

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1S5		Switch, Rotary: MFR 14304, PN 391-3673	5-6
1A1S6		Same as 1A1S3	5-7
1A1S7		Switch, Rotary: MFR 14304, PN 391-3660	5-7
1A1S8		Switch, Rotary: MFR 14304, PN 391-3672	5-7
1A1S9		Switch, Interlock: MIL type MS16106-4	5-7
1A1T1		Transformer, Power: MFR 14304, PN 391-3562	5-6
1A1TB1		Terminal Board: MIL type 37TB12	5-8
1A1TB2		Same as 1A1TB1	5-8
1A1TB3		Terminal Board, Chassis: MFR 14304, PN 391-3596	5-10
1A1TB4		Terminal Board: MIL type 37TB13	5-6
1A1TB5		Terminal Board: MIL type 39TB10	5-9
1A1V1		Tube, Electronic: MFR 08594, PN 4CX1500B/ 8660	5-7
1A1V2		Same as 1A1V1	5-7
1A1XC1 thru 1A1XC28		Not used	
1A1XC29		Socket, Octal: MIL type TS101P02	5-7
1A1XC30		Same as 1A1XC29	5-7
1A1XC31		Same as 1A1XC29	5-7
1A1XDS1		Not used	
1A1XDS2		Lampholder: MIL type LH74LC12RT	5-7
1A1XDS3		Same as 1A1XDS2	5-7
1A1XDS4		Lamp holder (TUNE): LH73LC12YT	5-7
1A1XDS5		Lampholder: MIL type LH73LC12RT	5-7
1A1XF1		Fuse Holder: MIL type FHL12U	5-8
1A1XF2		Same as 1A1XF1	5-8
1A1XF3		Same as 1A1XF1	5-8
1A1XF4		Fuse Holder: MFR 14304, PN J50-0004-001	5-8

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1XF5		Same as 1A1XF4	5-8
1A1XF6		Fuse Holder: MFR 14304, PN J50-0004-002	5-8
1A1XF7		Same as 1A1XF4	5-8
1A1XF8		Same as 1A1XF4	5-7
1A1XIC1		IC Socket T03: MFR 14304, PN J30-0006-001,	5-6
1A1XV1/XV2		Not procured as an assembly	5-5
1A1A1		Driver Tube Assembly: MFR 14304, PN 391-3850	5-8
1A1A1C1 thru 1A1A1C14		Same as 1A1C5	5-11
1A1A1C15		Not used	
1A1A1C16		Not used	
1A1A1C17		Capacitor, Fixed Mica: MIL type CM05D391J03	5-11
1A1A1C18		Same as 1A1A1C17	5-11
1A1A1C19		Same as 1A1C5	5-11
1A1A1CR1		Same as 1A1CR13	5-11
1A1A1CR2		Same as 1A1CR13	5-11
1A1A1L1		Coil, Fixed RF: MFR 14304, PN 391-3860	5-11
1A1A1L2		Coil, Fixed RF: MIL type LT4K028	5-11
1A1A1L3		Coil, Fixed RF: MIL type LT4K005	5-11
1A1A1L4 thru 1A1A1L6		Same as 1A1L3	5-11
1A1A1MP1		Chimney Assembly, Driver Tube: MFR 14304, PN 391-3869	5-11
1A1A1MP2		Same as 1A1A1MP1	5-11
1A1A1MP3		Shield, Terminal Board: MFR 14304, PN 391-3580	5-8
1A1A1MP4		Label, CAUTION, Trichloroethane: MFR 14304, PN 10044-1001	5-11
1A1A1R1		Same as 1A1R25	5-11
1A1A1R2		Same as 1A1A1R1	5-11
1A1A1R3		Resistor, Fixed Film: MIL type RL30S103G	5-11
1A1A1R4		Same as 1A1A1R3	5-11
1A1A1R5		Not used	

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A1R6		Resistor, Fixed Composition: MIL type RC20GF560K	5-11
1A1A1R7		Resistor, Fixed Composition: MIL type RC20GF103K	5-11
1A1A1TB1		Terminal Board: 13 Terminal, MFR 75382, PN 411-1904-13	5-11
1A1A1V1		Tube, Electron: MFR 79089, PN 8122	5-11
1A1A1V2		Same as 1A1A1V1	5-11
1A1A1XV1		Tube socket: 11 Pin, MFR 74970, PN 124-311-100	5-11
1A1A1XV2		Same as 1A1A1XV1	5-11
1A1A2		Final Transformer Assembly: MFR 14304, PN 391-3700	5-7
1A1A2A1		2-2.5 MHz Transformer Assembly: MFR 14304, PN 391-3711	5-12
1A1A2A2		2.5-3.0 MHz Transformer Assembly: MFR 14304, PN 391-3712	5-12
1A1A2A3		3.0-3.5 MHz Transformer Assembly: MFR 14304, PN 391-3713	5-12
1A1A2A4		3.5-4.0 MHz Transformer Assembly: MFR 14304, PN 391-3714	5-12
1A1A2A5		4-5 MHz Transformer Assembly: MFR 14304, PN 391-3715	5-12
1A1A2A6		5-6 MHz Transformer Assembly: MFR 14304, PN 391-3716	5-12
1A1A2A7		6-7 MHz Transformer Assembly: MFR 14304, PN 391-3717	5-12
1A1A2A8		7-8 MHz Transformer Assembly: MFR 14304, PN 391-3718	5-12
1A1A2A9		8-10 MHz Transformer Assembly: MFR 14304, PN 391-3719	5-12
1A1A2A10		10-12 MHz Transformer Assembly: MFR 14304, PN 391-3720	5-12
1A1A2A11		12-14 MHz Transformer Assembly: MFR 14304, PN 391-3721	5-12
1A1A2A12		14-16 MHz Transformer Assembly: MFR 14304, PN 391-3722	5-12

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A2A13		16-18 MHz Transformer Assembly: MFR 14304, PN 391-3723	5-12
1A1A2A14		18-20 MHz Transformer Assembly: MFR 14304, PN 391-3724	5-12
1A1A2A15		20-22 MHz Transformer Assembly: MFR 14304, PN 391-3725	5-12
1A1A2A16		22-24 MHz Transformer Assembly: MFR 14304, PN 391-3726	5-12
1A1A2A17		24-26 MHz Transformer Assembly: MFR 14304, PN 391-3727	5-12
1A1A2A18		26-28 MHz Transformer Assembly: MFR 14304, PN 391-3728	5-12
1A1A2A19		28-30 MHz Transformer Assembly: MFR 14304, PN 391-3729	5-12
1A1A2C1		Capacitor, Fixed Ceramic: 25 PF ± 10%, 7500 VDCW, MFR 14304, PN C15-0001-001	5-12
1A1A2C2		Not used	
1A1A2C3		Capacitor, Fixed Ceramic: 50 PF ± 10%, 7500 VDCW, MFR 14304, PN C15-0001-002	5-12
1A1A2C4		Capacitor, Fixed Ceramic: 100 PF ± 10%, 5000 VDCW, MFR 14304, PN C15-0001-003	5-12
1A1A2C5		Same as 1A1A2C4	5-12
1A1A2C6		Same as 1A1A2C1	5-12
1A1A2C7 thru 1A1A2C9		Same as 1A1A2C3	5-12
1A1A2C10		Same as 1A1A2C1	5-12
1A1A2C11 thru 1A1A2C17		Same as 1A1A2C3	5-12
1A1A2C18 thru 1A1A2C20		Same as 1A1A2C4	5-12
1A1A2C21 thru 1A1A2C24		Not used	
1A1A2C25		Capacitor, Fixed Porcelain: 750 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-046	5-12

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A2C26		Capacitor, Fixed Porcelain: 680 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-045	5-12
1A1A2C27		Capacitor, Fixed Porcelain: 910 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-048	5-12
1A1A2C28	7	Capacitor, Fixed Porcelain: 820 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-047	5-12
1A1A2C29		Capacitor, Fixed Porcelain: 330 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-037	5-12
1A1A2C30		Capacitor, Fixed Porcelain: 430 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-040	5-12
1A1A2C31		Capacitor, Fixed Porcelain: 300 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-036	5-12
1A1A2C32		Capacitor, Fixed Porcelain: 270 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-035	5-12
1A1A2C33		Same as 1A1A2C31	5-12
1A1A2C34		Same as 1A1A2C32	5-12
1A1A2C35		Capacitor, Fixed Porcelain: 180 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-031	5-12
1A1A2C36		Same as 1A1A2C35	5-12
1A1A2C37		Capacitor, Fixed Porcelain: 150 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-029	5-12
1A1A2C38A	8	Capacitor, Fixed Porcelain: 75 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-022	5-12
1A1A2C38		Capacitor, Fixed Ceramic: 200 PF ± 5%, 2500 VDCW, MFR 14304, PN C11-0004-028	5-12
1A1A2C38B		Capacitor, Fixed Ceramic: 200 PF ± 5%, 2500 VDCW, MFR 14304, PN C11-0004-028	5-12
1A1A2C39A	8	Same as 1A1A2C37	5-12
1A1A2C39B		Not used	
1A1A2C40A		Same as 1A1A2C37	5-12
1A1A2C40B		Capacitor, Fixed Ceramic: 180 PF ± 10%, 2500 VDCW, MFR 14304, PN C11-0004-029	5-12
1A1A2C41		Not used	
1A1A2C42 thru 1A1A2C44		Same as 1A1A2C35	5-12

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A2C45		Capacitor, Fixed Porcelain: 110 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-026	5-12
1A1A2C46		Same as 1A1A2C45	5-12
1A1A2C47		Same as 1A1A2C45	5-12
1A1A2C48		Same as 1A1A2C37	5-12
1A1A2C49		Capacitor, Fixed Porcelain: 100 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0001-025	5-12
1A1A2C50		Same as 1A1A2C45	5-12
1A1A2C51		Same as 1A1A2C45	5-12
1A1A2C52		Same as 1A1A2C37	5-12
1A1A2C53 thru 1A1A2C56		Same as 1A1A2C38A	5-12
1A1A2C57		Capacitor, Fixed Ceramic: 220 PF ± 5%, 2500 VDCW, MFR 14304, PN C11-0004-009	5-12
1A1A2C58		Capacitor, Fixed Ceramic: 300 PF ± 5%, 2500 VDCW, MFR 14304, PN C11-0004-018	5-12
1A1A2C59A		Capacitor, Fixed Porcelain: 56 PF ± 5%, 500 VDCW, MFR 95275, PN VY81C560J	5-12
1A1A2C59B		Same as 1A1A2C38B	5-12
1A1A2C60A		Same as 1A1A2C59A	5-12
1A1A2C60B		Not used	
1A1A2C61A		Same as 1A1A2C59A	5-12
1A1A2C61B		Not used	
1A1A2C62A		Same as 1A1A2C59A	5-12
1A1A2C62B		Not used	
1A1A2C63A		Capacitor, Fixed Porcelain: 51 PF ± 5%, 500 VDCW, MFR 95275, PN VY81C510J	5-12
1A1A2C63B		Capacitor, Fixed Porcelain: 17 PF ± 5%, 500 VDCW, MFR 14304, PN C50-0004-017	5-12
1A1A2C64A		Same as 1A1A2C63A	5-12
1A1A2C64B		Same as 1A1A2C63B	5-12
1A1A2C65A		Same as 1A1A2C63A	5-12

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A2C65B		Same as 1A1A2C63B	5-12
1A1A2C66A		Same as 1A1A2C63A	5-12
1A1A2C66B		Same as 1A1A2C63B	5-12
1A1A2C67A		Capacitor, Fixed Porcelain: 240 PF ± 5%, 2500 VDCW, MFR 14304, PN C11-0004-024	5-12
1A1A2C67B		Same as 1A1A2C38B	5-12
1A1A2C68A		Same as 1A1A2C38B	5-12
1A1A2C68B		Same as 1A1A2C40B	5-12
1A1A2C69		Same as 1A1A2C57	5-12
1A1A2MP1		Coupling Assembly, Mechanical Drive: MFR 14304, PN 391-3261	5-12
1A1A2MP2		Pin Drive: MFR 14304, PN 391-3262	5-12
1A1A2P1		Connector, Plug: MIL type M39012/16-0001	5-12
1A1A2R1		Resistor, Fixed Composition: MIL type RC2GF273K	5-12
1A1A2R2 thru 1A1A2R8		Same as 1A1A2R1	5-12
1A1A2S1		Switch Assembly, Rotary: MFR 14304, PN 391-3732	5-12
1A1A3		VSWR Bridge Assembly: MFR 14304, PN 391-3420	5-6
1A1A3C1		Capacitor, Fixed Mica: MIL type CM05F361J03	5-13
1A1A3C2		Capacitor, Fixed Electrolytic: MIL type CS13BE225K	5-13
1A1A3C3		Capacitor, Fixed Ceramic: MIL type CK60AW102M	5-13
1A1A3C4		Same as 1A1A3C3	5-13
1A1A3C5		Same as 1A1A3C2	5-13
1A1A3C6		Capacitor, Variable Glass: MIL type PC51H160	5-13
1A1A3CR1 thru 1A1A3CR6		Same as 1A1ACR13	5-13
1A1A3J1		Same as 1A1J1	5-13
1A1A3J2		Connector, Coaxial: MIL type UG-625B/U	5-13

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A3L1		Coil, Fixed RF: MIL type LT4K071	5-13
1A1A3L2	9	Coil, Fixed RF: MIL type LT4K029	5-13
1A1A3R1		Resistor, Fixed Film: MIL type RL32S560G	5-13
1A1A3R2		Same as 1A1A3R1	5-13
1A1A3R3		Resistor, Fixed Film: MIL type RL07S103J	5-13
1A1A3R4		Resistor, Fixed Film: MIL type RL07S473J	5-13
1A1A3R5		Resistor, Fixed Composition: MIL type RC07GF272J	5-13
1A1A3R6		Resistor, Fixed Composition: MIL type RC07GF682J	5-13
1A1A3R7		Resistor, Fixed Composition: MIL type RC07GF393J	5-13
1A1A3R8		Resistor, Fixed Composition: MIL type RC07GF124J	5-13
1A1A3R9		Resistor, Fixed Composition: MIL type RC07GF105J	5-13
1A1A3T1		Transformer, Toroid: MFR 14304, PN 391-3426	5-13
1A1A4		Driver Transformer Assembly: MFR 14304, PN 391-3800	5-8
1A1A4C1		Same as 1A1C5	5-14
1A1A4C2		Same as 1A1C5	5-14
1A1A4MP1		Same as 1A1A2MP1	5-14
1A1A4MP2		Same as 1A1A2MP2	5-14
1A1A4R1		Resistor, Fixed Composition: MIL type RC42GF102K	5-14
1A1A4S1		Switch, Rotary: MFR 14304, PN 391-3830	5-14
1A1A4TB1		Terminal Board: 6 terminal, MFR 74382, PN 411-1904-6	5-14
1A1A4TP1		Jack, Test: MIL type MS16103-2A	5-14
1A1A4A1		2.0-2.5 MHz Transformer Assembly: MFR 14304, PN 391-3907	5-14
1A1A4A2		2.5-3.0 MHz Transformer Assembly: MFR 14304, PN 391-3808	5-14
1A1A4A3		3.0-4.0 MHz Transformer Assembly: MFR 14304, PN 391-3809	5-14
1A1A4A4		4.0-6.0 MHz Transformer Assembly: MFR 14304, PN 391-3810	5-14

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A4A5		6.0-8.0 MHz Transformer Assembly: MFR 14304, PN 391-3811	5-14
1A1A4A6		8.0-10.0 MHz Transformer Assembly: MFR 14304 PN 391-3812	5-14
1A1A4A6C1		Capacitor, Fixed Ceramic: MIL type CC25CH390G	5-14
1A1A4A6R1		Same as 1A1R5	5-14
1A1A4A7		10-12 MHz Transformer Assembly: MFR 14304, PN 391-3813	5-14
1A1A4A7C		Capacitor, Fixed Ceramic: MIL type CC25CH330G	5-14
1A1A4A7R1		Same as 1A1R5	5-14
1A1A4A8		12-14 MHz Transformer Assembly: MFR 14304, PN 391-3814	5-14
1A1A4A8C1		Capacitor, Fixed Ceramic: MIL type CC25CH3006	5-14
1A1A4A8R1		Same as 1A1R5	5-14
1A1A4A9		14-16 MHz Transformer Assembly: MFR 14304, PN 391-3815	5-14
1A1A4A9C1		Capacitor, Fixed Ceramic: MIL type CC25CH270G	5-14
1A1A4A9R1		Same as 1A1R5	5-14
1A1A4A10		16-18 MHz Transformer Assembly: MFR 14304, PN 391-3816	5-14
1A1A4A10C1		Same as 1A1A4A9C1	5-14
1A1A4A10R1		Resistor, Fixed Composition: MIL type RC43GF272K	5-14
1A1A4A11		18-20 MHz Transformer Assembly: MFR 14304, PN 391-3817	5-14
1A1A4A11C1		Same as 1A1A4A9C1	5-14
1A1A4A11R1		Same as 1A1A4A10R1	5-14
1A1A4A12		20-22 MHz Transformer Assembly: MFR 14304, PN 391-3818	5-14
1A1A4A12C1		Capacitor, Fixed Ceramic: MIL type CC20CH204G	5-14
1A1A4A12R1		Same as 1A1A4A10R1	5-14
1A1A4A13		22-24 MHz Transformer Assembly: MFR 14304, PN 391-3819	5-14
1A1A4A13C1		Same as 1A1A4A12C1	5-14
1A1A4A13R1		Resistor, Fixed Composition: MIL type RC42GF472K	5-14

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A4A14		24-26 MHz Transformer Assembly: MFR 14304, PN 391-3820	5-14
1A1A4A14C1		Same as 1A1A4A9C1	5-14
1A1A4A14R1		Resistor, Fixed Composition: MIL type RC42GF822K	5-14
1A1A4A15		26-28 MHz Transformer Assembly: MFR 14304, PN 391-3821	5-14
1A1A4A15C1		Same as 1A1A4A9C1	5-14
1A1A4A16		28-30 MHz Transformer Assembly: MFR 14304, PN 391-3822	5-14
1A1A4A16C1		Same as 1A1A4A12C1	5-14
1A1A5		Power Control PCB Assembly: MFR 14304, PN 391-3360	5-7
1A1A5C1		Capacitor, Fixed Electrolytic: MIL type CS13BE476K	5-15
1A1A5C2		Capacitor, Fixed Electrolytic: MIL type CS13BE336K	5-15
1A1A5C3		Capacitor, Fixed Ceramic: MIL type CK62AW822M	5-15
1A1A5C4		Same as 1A1A3C3	5-15
1A1A5C5		Same as 1A1A3C3	5-15
1A1A5C6		Capacitor, Fixed Electrolytic: MIL type CS13BF105K	5-15
1A1A5CR1		Same as 1A1CR1	5-15
1A1A5CR2		Same as 1A1CR1	5-15
1A1A5CR3		Diode: MIL type 1N277M	5-15
1A1A5CR4		Same as 1A1A5CR3	5-15
1A1A5CR5A		Same as 1A1A5CR3	5-15
1A1A5CR5B		Same as 1A1CR13	5-15
1A1A5CR6		Same as 1A1A5CR3	5-15
1A1A5CR7		Same as 1A1CR1	5-15
1A1A5CR8		Same as 1A1A5CR3	5-15
1A1A5CR9		Same as 1A1CR13	5-15
1A1A5CR10 thru 1A1A5CR16		Same as 1A1A5CR3	5-15
1A1A5CR17		Same as 1A1CR1	5-15
1A1A5CR18		Not used	

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A5CR19		Same as 1A1CR7	5-15
1A1A5CR20		Same as 1A1CR7	5-15
1A1A5CR21 thru 1A1A5CR29		Same as 1A1CR1	5-15
1A1A5CR30		Same as 1A1CR7	5-15
1A1A5CR31		Same as 1A1CR7	5-15
1A1A5CR32		Same as 1A1CR1	5-15
1A1A5CR33 thru CR39		Not used	
1A1A5CR40		Diode, Silicon, 1A, 200V: JAN 1N3611	5-15
1A1A5Q1		Not used	
1A1A5Q2		Transistor: MIL type 2N1132	5-15
1A1A5Q3		Transistor: MIL type 2N1613	5-15
1A1A5Q4		Transistor: MIL type 2N404	5-15
1A1A5Q5		Same as 1A1A5Q4	5-15
1A1A5Q6		Transistor: MIL type 2N398A	5-15
1A1A5Q7 thru 1A1A5Q11		Same as 1A1A5Q3	5-15
1A1A5Q12		Same as 1A1A5Q4	5-15
1A1A5R1		Not used	
1A1A5R2		Not used	
1A1A5R3		Resistor, Fixed Composition: MIL type RC07GF472K	5-15
1A1A5R4		Resistor, Fixed Composition: MIL type RC07GF391K	5-15
1A1A5R4B		Resistor, Fixed Composition: MIL type RC07GF152K	5-15
1A1A5R5		Resistor, Fixed Composition: MIL type RC07GF182K	5-15
1A1A5R6		Resistor, Fixed Composition: MIL type RC08GF331K	5-15
1A1A5R7		Resistor, Fixed Composition: MIL type RC07GF221K	5-15
1A1A5R8		Same as 1A1A5R3	5-15
1A1A5R9		Resistor, Fixed Composition: MIL type RC07GF102K	5-15
1A1A5R10		Same as 1A1A5R3	5-15
1A1A5R11		Same as 1A1A5R3	5-15
1A1A5R12		Resistor, Fixed Composition: MIL type RC07GF122K	5-15
1A1A5R13		Resistor, Fixed Composition: MIL type RC07GF181K	5-15

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A5R14		Same as 1A1A5R4A	5-15
1A1A5R15		Same as 1A1A5R7	5-15
1A1A5R16		Resistor, Fixed Composition: MIL type RC07GF821K	5-15
1A1A5R17		Resistor, Fixed Composition: MIL type RC07GF223K	5-15
1A1A5R18		Not used	
1A1A5R19		Resistor, Fixed Composition: MIL type RC32GF471K	5-15
1A1A5R20		Resistor, Fixed Composition: MIL type RC07GF103K	5-15
1A1A5R21		Same as 1A1A5R20	5-15
1A1A5R22		Same as 1A1A4R1	5-15
1A1A5R23		Not used	
1A1A5R24		Not used	
1A1A5R25		Resistor, Fixed Composition: MIL type RC07GF681K	5-15
1A1A5R26A		Resistor, Fixed Composition: MIL type RC20GF471K	5-15
1A1A5R26B		Resistor, Fixed Composition: MIL type RC07GF471K	5-15
1A1A5R27		Resistor, Fixed Composition: MIL type RC07GF121K	5-15
1A1A5R28		Same as 1A1A5R7	5-15
1A1A5R29		Resistor, Fixed Composition: MIL type RC07GF222K	5-15
1A1A5R30 thru 1A1A5R33		Same as 1A1A5R29	5-15
1A1A5R34		Resistor, Fixed Composition: MIL type RC20GF101K	5-15
1A1A5R35		Resistor, Fixed Composition: MIL type RC20GF391K	5-15
1A1A5R36		Same as 1A1A5R35	5-15
1A1A5R37		Same as 1A1A5R20	5-15
1A1A5TP1		Jack, Test: MFR 74970, PN 105-758	5-15
1A1A5TP2		Jack, Test: MFR 74970, PN 105-752	5-15
1A1A5TP3		Jack, Test: MFR 74970, PN 105-756	5-15
1A1A5TP4		Jack, Test: MFR 74970, PN 105-757	5-15
1A1A5TP5		Jack, Test: MFR 74970, PN 105-754	5-15
1A1A6		APC-PPC PCB Assembly: MFR 14304, PN 391-3340	5-7
1A1A6C1		Capacitor, Fixed Electrolytic: MIL type CS13BF156K	5-16

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A6C2		Not used	
1A1A6C3		Capacitor, Fixed Electrolytic: MIL type CS13BE106K	5-16
1A1A6C4		Capacitor, Fixed Electrolytic: MIL type CS13BE227K	5-16
1A1A6C5		Same as 1A1A3C3	5-16
1A1A6C6		Capacitor, Fixed Electrolytic: MIL type CS13BF685K	5-16
1A1A6C7	13	Same as 1A1A3C3	5-16
1A1A6CR1		Same as 1A1A5CR3	5-16
1A1A6CR2		Same as 1A1CR1	5-16
1A1A6CR3		Diode: MIL type 1N3033B	5-16
1A1A6CR4		Same as 1A1A6CR3	5-16
1A1A6CR5		Same as 1A1A6CR3	5-16
1A1A6CR6		Not used	
1A1A6CR7		Same as 1A1A5CR3	5-16
1A1A6CR8		Same as 1A1A6CR3	5-16
1A1A6CR9		Same as 1A1CR13	5-16
1A1A6CR10		Not used	
1A1A6CR11 thru 1A1A6CR13		Same as 1A1CR13	5-16
1A1A6CR14 thru 1A1A6CR17		Same as 1A1CR1	5-16
1A1A6CR18		Same as 1A1CR13	5-16
1A1A6CR19		Same as 1A1A5CR3	5-16
1A1A6CR20		Same as 1A1CR13	5-16
1A1A6CR21 thru 1A1A6CR26		Same as 1A1A5CR3	5-16
1A1A6CR27		Diode: MIL type 1N975B	5-16
1A1A6CR28		Same as 1A1A5CR3	5-16
1A1A6CR29		Same as 1A1CR13	5-16

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A6Q1		Same as 1A1A5Q3	5-16
1A1A6Q2		Same as 1A1A5Q3	5-16
1A1A6Q3		Same as 1A1A5Q6	5-16
1A1A6Q4 thru 1A1A6Q6		Not used	
1A1A6Q7		Transistor: MIL type 2N1309	5-16
1A1A6Q8		Same as 1A1A5Q3	5-16
1A1A6Q9		Same as 1A1A5Q2	5-16
1A1A6Q10 thru 1A1A6Q12		Same as 1A1A5Q3	5-16
1A1A6Q13		Same as 1A1A5Q2	5-16
1A1A6Q14 thru 1A1A6Q16		Same as 1A1A5Q3	5-16
1A1A6Q17	17	Transistor: MIL type 2N2906A	5-16
1A1A6Q18		Not used	
1A1A6Q19		Same as 1A1A5Q6	5-16
1A1A6Q20		Same as 1A1A5Q6	5-16
1A1A6Q21		Same as 1A1A5Q3	5-16
1A1A6R1		Same as 1A1A5R5	5-16
1A1A6R2		Resistor, Fixed Composition: MIL type RC07GF473K	5-16
1A1A6R3		Resistor, Fixed Composition: MIL type RC07GF682K	5-16
1A1A6R4		Same as 1A1A5R17	5-16
1A1A6R5		Not used	
1A1A6R6		Resistor, Fixed Composition: MIL type RC07GF104K	5-16
1A1A6R7		Same as 1A1A5R3	5-16
1A1A6R8		Resistor, Fixed Composition: MIL type RC07GF273K	5-16

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A6R9		Resistor, Fixed Composition: MIL type RC07GF333K	5-16
1A1A6R10		Same as 1A1A5R3	5-16
1A1A6R11		Same as 1A1A5R5	5-16
1A1A6R12		Resistor, Fixed Composition: MIL type RC07GF822K	5-16
1A1A6R13		Same as 1A1A6R2	5-16
1A1A6R14		Same as 1A1A5R29	5-16
1A1A6R15		Resistor, Fixed Composition: MIL type RC07GF562K	5-16
1A1A6R16		Same as 1A1A5R12	5-16
1A1A6R17		Same as 1A1A5R20	5-16
1A1A6R18	11	Same as 1A1A5R16	5-16
1A1A6R19		Resistor, Fixed Composition: MIL type RC07GF123K	5-16
1A1A6R20	12	Not used	
1A1A6R21		Resistor, Fixed Composition: MIL type RC07GF183K	5-16
1A1A6R22		Resistor, Fixed Composition: MIL type RC07GF124K	5-16
1A1A6R23		Same as 1A1A5R29	5-16
1A1A6R24		Same as 1A1A5R3	5-16
1A1A6R25	6	Same as 1A1A6R12	5-16
1A1A6R26		Resistor, Fixed Composition: MIL type RC07GF272K	5-16
1A1A6R27		Same as 1A1A5R17	5-16
1A1A6R28		Same as 1A1A6R19	5-16
1A1A6R29		Same as 1A1A5R9	5-16
1A1A6R30		Same as 1A1A5R6	5-16
1A1A6R31		Same as 1A1A6R3	5-16
1A1A6R32		Same as 1A1A6R19	5-16
1A1A6R33		Same as 1A1A6R15	5-16
1A1A6R34		Same as 1A1A5R5	5-16
1A1A6R35		Same as 1A1A6R26	5-16
1A1A6R36		Resistor, Fixed Composition: MIL type RC20GF683K	5-16

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A6R37		Not used	
1A1A6R38		Same as 1A1A5R12	5-16
1A1A6R39		Resistor, Fixed Composition: MIL type RC07GF392K	5-16
1A1A6R40		Same as 1A1A5R17	5-16
1A1A6R41		Resistor, Fixed Composition: MIL type RC07GF563K	5-16
1A1A6R42		Resistor, Fixed Composition: MIL type RC42GF682K	5-16
1A1A6R43		Same as 1A1A5R29	5-16
1A1A6R44		Same as 1A1A5R29	5-16
1A1A6R45		Same as 1A1A6R6	5-16
1A1A6R46		Same as 1A1A5R9	5-16
1A1A6R47		Same as 1A1A5R20	5-16
1A1A6R48		Same as 1A1A6R9	5-16
1A1A6R49		Same as 1A1A5R20	5-16
1A1A6R50 thru 1A1A6R53		Not used	
1A1A6R54		Same as 1A1A5R29	5-16
1A1A6R55A		Not used	
1A1A6R55B		Same as 1A1A5R29	5-16
1A1A6TP1		Same as 1A1A5TP1	5-16
1A1A6TP2		Same as 1A1A5TP2	5-16
1A1A6TP3		Same as 1A1A5TP3	5-16
1A1A6TP4		Same as 1A1A5TP4	5-16
1A1A7		Meter Resistor PCB Assembly: MFR 14304, PN 391-3400	5-8
1A1A7R1		Resistor, Fixed Composition: MIL type RC42GF393K	5-17
1A1A7R2		Same as 1A1A7R1	5-17
1A1A7R3		Same as 1A1A7R1	5-17
1A1A7R4 thru 1A1A7R6		Not used	

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A7R7		Resistor, Fixed Film: MIL type RL42S125G	5-17
1A1A7R8		Same as 1A1A7R7	5-17
1A1A7R9		Same as 1A1A7R7	5-17
1A1A7R10 thru 1A1A7R12		Not used	
1A1A7R13		Same as 1A1A7R7	5-17
1A1A7R14		Same as 1A1A7R7	5-17
1A1A7R15		Same as 1A1A7R7	5-17
1A1A7R16		Resistor, Fixed Film: MIL type RL32S474G	5-17
1A1A7R17		Resistor, Fixed Film: MIL type RL32S514G	5-17
1A1A7R18 thru 1A1A7R20		Same as 1A1A7R17	5-17
1A1A7R21		Same as 1A1A7R7	5-17
1A2		Case Assembly: MFR 14304, PN 391-2000	5-18
1A2C1		Same as 1A1C6	5-18
1A2C2		Same as 1A1C5	5-18
1A2FL1/J5		Filter, Input Line: MFR 14304, PN 391-2300	5-18
1A2J1		Connector, Receptacle: MIL type MS3102R28-17S	5-18
1A2J2		Not used	
1A2J3		Connector, Coaxial: MIL type UG-556B/U	5-18
1A2J4		Same as 1A2J3	5-18
1A2J5 thru 1A2J8		Not used	
1A2K1		Relay, Coaxial: 28 VDC, SPDT, MFR 00471, PN DK-137	5-18
1A2MP1		Shield, Filter: MFR 24558, PN 450-4301344	5-18
1A2MP2		Shield, Terminal Board: MFR 10216, PN 213-0118	5-18
1A2MP3		Shield, Interlock: MFR 10216, PN 213-0122	5-18
1A2MP4		Label, FL1 Bleeders: MFR 14304, PN 10044-1014	5-18

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A2P1		Same as 1A1A2P1	5-18
1A2P2		Not used	
1A2P3		Connector, Plug: MFR 14304, PN 391-2405	5-18
1A2P4 thru 1A2P7		Same as 1A1A2P1	5-18
1A2R1 thru 1A2R3		Resistor, carbon, 220K, 2W: MIL type RCR42G224JM	5-18
1A2S1		Switch, Interlock: MFR 91929, PN BA025V22T	5-18
1A2S2		Same as 1A2S1	5-18
1A2S3		Same as 1A2S1	5-18
1A2TB1		Terminal Board: MIL type 39TB3	5-18
1A2W1		Cable Assembly: MFR 14304, PN 391-2400	5-18
1A2A1		Filter Box Assembly: MFR 14304, PN 391-2100	5-18
1A2A1C1		Capacitor, Fixed Ceramic: MIL type CK70AW152M	5-18
1A2A1C2 thru 1A2A1C21		Same as 1A2A1C1	5-18
1A2A1C22		Same as 1A1C5	5-18
1A2A1CR1		Same as 1A1CR1	5-18
1A2A1CR2		Same as 1A1CR1	5-18
1A2A1J1		Not used	
1A2A1J2		Connector, Receptacle: MIL type MS3102R28-12S	5-18
1A2A1J3 thru 1A2A1J5		Not used	
1A2A1J6		Connector, Receptacle: MIL type MS3102R20-27S	5-18
1A2A1J7		Connector, Receptacle: MIL type MS3102R28-21S	5-18
1A2A1J8		Connector, Receptacle: MIL type MS3102R18-1S	5-18

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

POWER SUPPLY PP-3917/UR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A8	8	Power Supply PP-3917/UR: MFR 14304, PN 8948-9000	5-20
1A1A8C1		Capacitor, Fixed Paper: MIL type CP70B1EF106K1	5-20
1A1A8CR1		Diode Stack: Rectifier, Silicon, 3Ø Bridge, 3000 PIV, 3A, MFR 16753, PN 400000-001	5-20
1A1A8CR2		Same as 1A1A8CR1	5-20
1A1A8CR3		Diode Stack: Rectifier, Silicon, 3Ø Bridge, 1000 V PIV, 2A, MFR 14304, PN D22-5001-000	5-20
1A1A8P1		Fanning Strip: MFR 14304, PN 391-9038	5-20
1A1A8P2		Fanning Strip: MFR 14304, PN 391-9039	5-20
1A1A8T1		Transformer, Power: MFR 14304, PN 391-9015	5-20
1A1A8T2		Transformer, Power: MFR 14304, PN 391-9014	5-20
1A1A8A1		Inverter Assembly: MFR 14304, PN 391-9100	5-20
1A1A8A1C1		Capacitor, Fixed Electrolytic: MIL type CL25BJ151TP3	5-20
1A1A8A1C2		Capacitor, Fixed Paper: MIL type CP05A1KC223K3	5-20
1A1A8A1C3		Same as 1A1A8A1C2	5-20
1A1A8A1CR1		Same as 1A1CR1	5-20
1A1A8A1CR2		Same as 1A1CR1	5-20
1A1A8A1CR3		Same as 1A1CR1	5-20
1A1A8A1Q1		Transistor: MIL type 2N2290B, MFR 04713, PN 2N2290	5-20
1A1A8A1Q2		Same as 1A1A8A1Q1	5-20
1A1A8A1R1		Resistor, Fixed Composition: MIL type RC20GF560K	5-20
1A1A8A1R2		Resistor, Fixed Composition: MIL type RC32GF222K	5-20
1A1A8A1R3		Same as 1A1A8A1R1	5-20
1A1A8A1R4		Same as 1A1A8A1R2	5-20
1A1A8A1T1		Transformer, Toroid: MFR 14304, PN 391-9104	5-20
1A1A8A2		Bleeder Resistor Assembly: MFR 14304, PN 391-9200	5-20

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A8A2R6		Resistor, Fixed Composition: MIL type RC42GF683K	5-20
1A1A8A2R7		Same as 1A1A8A2R6	5-20

POWER SUPPLY PP-3916/UR

2	2	Power Supply PP-3916/UR: MFR 14304, PN 8948-6000	5-21
2A1		Chassis Panel Assembly: MFR 14304, PN 391-8100	5-21
2A1C1		Capacitor, Fixed Paper: 25 UF ± 10%, 600 BDCW, MFR 53021, PN 702012-5602	5-21
2A1C2		Capacitor, Fixed Electrolytic: MIL type CE71C142G	5-21
2A1C3		Same as 2A1C2	5-21
2A1CR1		Same as 1A1A8CR3	5-21
2A1CR2		Same as 1A1A8CR1	5-21
2A1CR3		Same as 1A1A8CR1	5-21
2A1CR4		Diode: MFR 04713, PN 1N4721	5-21
2A1CR5 thru 2A1CR7		Same as 2A1CR4	5-21
2A1CR8 thru 2A1CR11		Same as 1A1CR1	5-21
2A1DS1		Same as 1A1DS2	5-21
2A1E1 thru 2A1E6		Terminal, Standoff: MFR 14304, PN E35-0002-001	5-21
2A1F1		Fuse, Cartridge: MIL type F03A250V8AS	5-21
2A1F2		Fuse, Cartridge: MIL type FM03A250V 1/4A	5-21
2A1MP1		Air Filter: MFR 14304, PN Z16-0001-000	5-21
2A1MP2		Shield, Terminal Board: MFR 10216, PN 213-0120	5-21
2A1MP3		Shield, Interlock Switch: MFR 10216, PN 213-0122	5-21
2A1MP4		Plate, Panel Marking	5-21
2A1Q1		Transistor: MIL type 2N5884	5-21
2A1Q2		Same as 2A1Q1	5-21

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A1R1		Resistor, Fixed Composition: MIL type RC42GF100K	5-21
2A1R2		Same as 2A1R1	5-21
2A1R3		Resistor, Fixed Composition: MIL type RC20GF682K	5-21
2A1R4		Same as 2A1R3	5-21
2A1R5		Same as 2A1R1	5-21
2A1R6		Same as 2A1R1	5-21
2A1R7		Same as 1A1A8A2R6	5-21
2A1R8		Same as 1A1A8A2R6	5-21
2A1S1		Switch, Thermal: SPST, Open at 185° F (85°C) MFR 14304, PN S70-0002-000	5-21
2A1S2 thru 2A1S4		Same as 1A1S9	5-21
2A1T1		Transformer, Toroid: MFR 14304, PN 391-8405	5-21
2A1TB1		Terminal Board: MIL type 37TB24	5-21
2A1XDS1		Same as 1A1XDS1	5-21
2A1XF1		Same as 1A1XF6	5-21
2A1XF2		Same as 1A1XF4	5-21
2A2		Case Assembly: MFR 14304, PN 391-8700	5-21
2A2J1		Connector Receptacle: MIL type MS3102R28-17P	5-21
2A2MP1		Shield, Terminal Board: MFR 10216, PN 213-0119	5-21
2A2P1	5	Plug, 208V Jumper: MFR 14304, PN 391-8200	5-21
2A2P2		Plug, 440V Jumper: MFR 14304, PN 391-8300	5-21
2A2T1/T2		Case and Transformer Assembly: MFR 14304, PN 391-7200	5-21
2A2TB1		Same as 2A1TB1	5-21
2A3		Fan Package Assembly	5-21
2A3B1		Fan: 115V, 60 Hz, 1Ø, MFR 32284, PN SP2B2	5-21
2A3C1		Capacitor, Fixed Paper: 0.5 UF ± 10%, 3000 VDCW, MFR 93780, PN T30NP5	5-21

TABLE 6-2. MAINTENANCE PARTS LIST (Cont.)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A3A1		Bleeder and Surge Resistor PCB Assembly	5-21
2A3A1R1		Not used	
2A3A1R2 thru 2A3A1R6		Resistor, Fixed Composition: MIL type RC42GF224J	5-21
2A4			
2A4C1		Capacitor, 0.4 uF, 100V: MIL type CL33BN0R4MNE	5-21
2A4CR1		Diode, Silicon, 1A, 200V, JAN 1N3611	5-21
2A4E5		Standoff, insulated, MFR 14304, PN E35-0002-001	5-21
2A4K1		Relay: MFR 14304, PN 5757/23-001	5-21
2A4MP1		Bracket Assembly, Mounting: MFR 14304, PN 10044-1006	5-21
2A4R1, 2A4R2		Resistor, Fixed, Wirewound, 3.32 ohm, 10W: MIL type RER45F3R32M	5-21
2A4R3		Resistor, Fixed, Wirewound, 16.5 ohm, 5W: MIL type RER40F16R5M	5-21
2A4R4		Resistor, Fixed, Wirewound, 120 ohm, 20W: MIL type RER50F1200M	5-21
2A4R5		Resistor, Fixed, Carbon, 1.2K, 2W, 5%: MIL type RCR42G122JM	5-21
RADIO TRANSMITTER T-827( )/URT			
3	3	Radio Transmitter T-827( )/URT: GFE	3-1
BASE, SHOCK MOUNT, ELECTRICAL EQUIPMENT, MT-3399/U			
4	4	Base, Snock Mount, Electrical Equipment, MT-3399/U: MFR 14304, PN 391-0900	1-1
ANCILLARY ITEMS			
		Cable Assembly W1: MFR 14304, PN 399-0025 Cable Assembly W2: MFR 14304, PN 399-0026 Cable Assembly W3: MFR 14304, PN 399-0027 Connector, Plug, Electrical: MFR 12143, PN 10-109620-19S Connector, Plug, Electrical: MFR 12143, PN 10-109618-1P Connector, Plug, Electrical: MFR 12143, PN 10-19628-12P Connector, Coax, Electrical: MIL type UG-982/U UG/982/U Connector, Coax, Electrical: MIL type UG-941B/U Strap, Ground, PP-3916/UR to MT-3399/U: MFR 14304, PN 3948-0020 Strap, Ground, PP-3916/UR to AM-3924(P)/URT: MFR 14304, PN 3948-0019	

TABLE 6-3. SUPPLEMENTARY PARTS LIST FOR NEW 0082 SERIES 1A1A5/1A1A6 PC BOARDS

Reference Designation	Notes	Name and Description	Figure Number (Item)
1A1A5		DC POWER CONTROL PCB ASSEMBLY: 6.625 in. w x 4.065 in. h, mfr 14304, part no. 0082D-3360	5-15
1A1A5C1		CAPACITOR, FIXED, TANTALUM: 47 uF, ± 10%, 20 Vdc working, MIL type M39003/01-2055	5-15
1A1A5C2		CAPACITOR, FIXED, TANTALUM: 33 uF, + 10%, 20 Vdc working, MIL type M39003/01-2052	5-15
1A1A5C3		CAPACITOR, FIXED, CERAMIC: .0082 uF, ± 20%, 1500 Vdc working, MIL type CK62AW822M	5-15
1A1A5C4 and 1A1A5C5		CAPACITOR, FIXED, CERAMIC: .1 uF, ± 10%, 50 Vdc working, MIL type CK05BX104K	5-15
1A1A5C6		CAPACITOR, FIXED, TANTALUM: 1.0 uF, ± 10%, 50 Vdc working, MIL type M39003/01-2116	5-15
1A1A5C7		CAPACITOR, FIXED, CERAMIC: .1 uF, ± 10%, 50 Vdc working, MIL type CK05BX104K	5-15
1A1A5CR1 and 1A1A5CR2		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-15
1A1A5CR3 and 1A1A5CR4		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-15
1A1A5CR5		Not used	
1A1A5CR6		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-15
1A1A5CR7		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-15
1A1A5CR8		Not used	
1A1A5CR9 thru 1A1A5CR12		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-15
1A1A5CR13		Not used	
1A1A5CR14 thru 1A1A5CR16		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-15
1A1A5CR17 and 1A1A5CR18		Not used	
1A1A5CR19		SEMICONDUCTOR DEVICE, DIODE, ZENER: 12 Vdc, MIL type 1N759A	5-15
1A1A5CR20		Not used	
1A1A5CR21 thru 1A1A5CR29		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-15
1A1A5CR30 and 1A1A5CR31		SEMICONDUCTOR DEVICE DIODE, ZENER: 6.2 Vdc, MIL type 1N753A	5-15
1A1A5CR32		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-15
1A1A5CR33		SEMICONDUCTOR DEVICE, DIODE, ZENER: 10 Vdc, MIL type 1N758A	5-15
1A1A5CR34		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-15
1A1A5CR35		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-15
1A1A5CR36		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-15
1A1A5CR40		SEMICONDUCTOR DEVICE DIODE: MIL type 1N3611	5-15

TABLE 6-3. SUPPLEMENTARY PARTS LIST FOR NEW 0082 SERIES 1A1A5/1A1A6 PC BOARDS (Continued)

Reference Designation	Notes	Name and Description	Figure Number (Item)
1A1A5Q1		Not used	
1A1A5Q2		TRANSISTOR, PNP: MIL type 2N2905A	5-15
1A1A5Q3 and 1A1A5Q4		TRANSISTOR, NPN: MIL type 2N2219A	5-15
1A1A5Q5		TRANSISTOR, PNP: MIL type 2N2905A	5-15
1A1A5Q6		TRANSISTOR, PNP: MIL type 2N398A	5-15
1A1A5Q7		TRANSISTOR, NPN: MIL type 2N2219A	5-15
1A1A5Q8		TRANSISTOR, PNP: MIL type 2N2905A	5-15
1A1A5Q9 thru 1A1A5Q11		TRANSISTOR, NPN: MIL type 2N2219A	5-15
1A1A5Q12		TRANSISTOR, PNP: MIL type 2N2905A	5-15
1A1A5R1 and 1A1A5R2		Not used	
1A1A5R3		RESISTOR, FIXED, COMPOSITION: 4.7k, ± 10%, 1/4 watt, MIL type RC07GF472K	5-15
1A1A5R4		RESISTOR, FIXED, COMPOSITION: 1.5k, ± 10%, 1/4 watt, MIL type RC07GF152K	5-15
1A1A5R5		Not used	
1A1A5R6		RESISTOR, FIXED, FILM: 470 ohms, ± 2%, 1/4 watt, MIL type RL07S471G	5-15
1A1A5R7		RESISTOR, FIXED, FILM: 270 ohms, ± 2%, 1/4 watt, MIL type RL07S271G	5-15
1A1A5R8		RESISTOR, FIXED, COMPOSITION: 4.7k, ± 10%, 1/4 watt, MIL type RC07GF472K	5-15
1A1A5R9		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-15
1A1A5R10		RESISTOR, FIXED, COMPOSITION: 4.7k, ± 10%, 1/4 watt, MIL type RC07GF472K	5-15
1A1A5R11		RESISTOR, FIXED, COMPOSITION: 1.5k, ± 10%, 1/4 watt, MIL type RC07GF152K	5-15
1A1A5R12		RESISTOR, FIXED, COMPOSITION: 1.2k, ± 10%, 1/4 watt, MIL type RC07GF122K	5-15
1A1A5R13		RESISTOR, FIXED, COMPOSITION: 150 ohms, ± 10%, 1/4 watt, MIL type RC07GF151K	5-15
1A1A5R14		RESISTOR, FIXED, COMPOSITION: 470 ohms, ± 10%, 1/4 watt, MIL type RC07GF471K	5-15
1A1A5R15		RESISTOR, FIXED, COMPOSITION: 220 ohms, ± 10%, 1/4 watt, MIL type RC07GF221K	5-15
1A1A5R16		RESISTOR, FIXED, COMPOSITION: 820 ohms, ± 10%, 1/4 watt, MIL type RC07GF821K	5-15
1A1A5R17		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-15
1A1A5R18		Not used	
1A1A5R19		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/2 watt, MIL type RC20GF102K	5-15
1A1A5R20		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-15

TABLE 6-3. SUPPLEMENTARY PARTS LIST FOR NEW 0082 SERIES 1A1A5/1A1A6 PC BOARDS (Continued)

Reference Designation	Notes	Name and Description	Figure Number (Item)
1A1A5R21		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-15
1A1A5R22		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-15
1A1A5R23 and 1A1A5R24		Not used	
1A1A5R25		RESISTOR, FIXED, COMPOSITION: 680 ohms, ± 10%, 1/4 watt, MIL type RC07GF681K	5-15
1A1A5R26		RESISTOR, FIXED, COMPOSITION: 220 ohms, ± 10%, 2 watt, MIL type RC42GF221K	5-15
1A1A5R27		RESISTOR, FIXED, COMPOSITION: 120 ohms, ± 10%, 1/4 watt, MIL type RC07GF121K	5-15
1A1A5R28		RESISTOR, FIXED, COMPOSITION: 220 ohms, ± 10%, 1/4 watt, MIL type RC07GF221K	5-15
1A1A5R29 thru 1A1A5R33		RESISTOR, FIXED, COMPOSITION: 2.2k, ± 10%, 1/4 watt, MIL type RC07GF222K	5-15
1A1A5R34		RESISTOR, FIXED, COMPOSITION: 100 ohms, ± 10%, 1/2 watt, MIL type RC20GF101K	5-15
1A1A5R35		RESISTOR, FIXED, COMPOSITION: 390 ohms, ± 10%, 1/2 watt, MIL type RC20GF391K	5-15
1A1A5R36 and 1A1A5R37		Not used	
1A1A5R38 and 1A1A5R39		RESISTOR, FIXED, COMPOSITION: 4.7k, ± 10%, 1/4 watt, MIL type RC07GF472K	5-15
1A1A5R40		RESISTOR, FIXED, COMPOSITION: 3.3k, ± 10%, 1/2 watt, MIL type RC20GF332K	5-15
1A1A5R41		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-15
1A1A5R42		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-15
1A1A5TP1		TEST POINT: Brown, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-758, 15405 dwg J60-0001-008	5-15
1A1A5TP2		TEST POINT: Red, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-752, 14304 dwg J60-0001-002	5-15
1A1A5TP3		TEST POINT: Orange, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-756, 14304 dwg J60-0001-006	5-15
1A1A5TP4		TEST POINT: Yellow, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-757, 14304 dwg J60-0001-007	5-15
1A1A5TP5		TEST POINT: Green, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-754, 14304 dwg J60-0001-004	5-15
1A1A6		APC-PPC PCB ASSEMBLY: 6.625 in. w x 4.065 in. h, mfr 14304, part no. 0082D-3340	5-16
1A1A6C1		CAPACITOR, FIXED, TANTALUM: 15 uF, ± 10%, 50 Vdc working, MIL type M39003/01-2137	5-16
1A1A6C2		Not used	
1A1A6C3		CAPACITOR, FIXED, TANTALUM: 10 uF, ± 10%, 20 Vdc working, MIL type M39003/01-2046	5-16
1A1A6C4		CAPACITOR, FIXED, TANTALUM: 220 uF, ± 10%, 10 Vdc working, MIL type M39003/01-2025	5-16

TABLE 6-3. SUPPLENENTARY PARTS LIST FOR NEW 0082 SERIES 1A1A5/1A1A6 PC BOARDS (Continued)

Reference Designation	Notes	Name and Description	Figure Number (Item)
1A1A6C5		CAPACITOR, FIXED, CERAMIC: .001 uF, ± 20%, 1000 Vdc working, MIL type CK60AW102M	5-16
1A1A6C6		CAPACITOR, FIXED, CERAMIC: .0082 uF, ± 20%, 1500 Vdc working, MIL type CK62AW822M	5-16
1A1A6C7		CAPACITOR, FIXED, CERAMIC: .001 uF, ± 20%, 1000 Vdc working, MIL type CK60AW102M	5-16
1A1A6C8		CAPACITOR, FIXED, TANTALUM: 100 uF, ± 10%, 10 Vdc working, MIL type M39003/01-2021	5-16
1A1A6C9		CAPACITOR, FIXED, TANTALUM: 15 uF, ± 10%, 50 Vdc working, MIL type M39003/01-2137	5-16
1A1A6C10		CAPACITOR, FIXED, CERAMIC: .01 uF, ± 10%, 50 Vdc working, MIL type CK05BX103K	5-16
1A1A6CR1		SEMICONDUCTOR DEVICE, DIODE, ZENER: 30 Vdc, MIL type 1N972B	5-16
1A1A6CR2		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-16
1A1A6CR3 and 1A1A6CR4		SEMICONDUCTOR DEVICE, DIODE, ZENER: 36 Vdc, MIL type 1N3033B	5-16
1A1A6CR5		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6CR6 and 1A1A6CR7		Not used	
1A1A6CR8 thru 1A1A6CR13		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6CR14 thru 1A1A6CR17		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-16
1A1A6CR18 thru 1A1A6CR20		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6CR21		Not used	
1A1A6CR22		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6CR23 and 1A1A6CR24		Not used	
1A1A6CR25		SEMICONDUCTOR DEVICE, DIODE, ZENER: 10 Vdc, MIL type 1N758A	5-16
1A1A6CR26		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6CR27		SEMICONDUCTOR DEVICE, DIODE, ZENER: 39 Vdc, MIL type 1N975B	5-16
1A1A6CR28 and 1A1A6CR29		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6CR30		Not used	
1A1A6CR31 and 1A1A6CR32		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6CR33		Not used	
1A1A6CR34		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-16
1A1A6CR35 thru 1A1A6CR37		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N4148	5-16
1A1A6C40		SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3611	5-16
1A1A6Q1 and 1A1A6Q2		TRANSISTOR, NPN: MIL type 2N2219A	5-16
1A1A6Q3		TRANSISTOR, PNP: MIL type 2N398A	5-16
1A1A6Q4 thru 1A1A6Q6		Not used	
1A1A6Q7		TRANSISTOR, PNP: MIL type 2N2905A	5-16

TABLE 6-3. SUPPLEMENTARY PARTS LIST FOR NEW 0082 SERIES 1A1A5/1A1A6 PC BOARDS (Continued)

Reference Designation	Notes	Name and Description	Figure Number (Item)
1A1A6Q8		TRANSISTOR, NPN: MIL type 2N2219A	5-16
1A1A6Q9		TRANSISTOR, PNP: MIL type 2N2905A	5-16
1A1A6Q10 thru 1A1A6Q12		TRANSISTOR, NPN: MIL type 2N2219A	5-16
1A1A6Q13		TRANSISTOR, PNP: MIL type 2N2905A	5-16
1A1A6Q14 and 1A1A6Q15		TRANSISTOR, NPN: MIL type 2N2219A	5-16
1A1A6Q16 and 1A1A6Q17		TRANSISTOR, PNP: MIL type 2N2905A	5-16
1A1A6Q18		Not used	
1A1A6Q19 and 1A1A6Q20		TRANSISTOR, PNP: MIL type 2N398A	5-16
1A1A6Q21 thru 1A1A6Q24		TRANSISTOR, NPN: MIL type 2N2219A	5-16
1A1A6R1		RESISTOR, FIXED, COMPOSITION: 1.8k, ± 10%, 1/4 watt, MIL type RC07GF182K	5-16
1A1A6R2		RESISTOR, FIXED, COMPOSITION: 47k, ± 10%, 1/4 watt, MIL type RC07GF473K	5-16
1A1A6R3		RESISTOR, FIXED, COMPOSITION: 6.8k, ± 10%, 1/4 watt, MIL type RC07GF682K	5-16
1A1A6R4		RESISTOR, FIXED, COMPOSITION: 22k, ± 10%, 1/4 watt, MIL type RC07GF223K	5-16
1A1A6R5		Not used	
1A1A6R6		RESISTOR, FIXED, COMPOSITION: 68k, ± 10%, 1/2 watt, MIL type RC20GF683K	5-16
1A1A6R7		RESISTOR, FIXED, COMPOSITION: 4.7k, ± 10%, 1/4 watt, MIL type RC07GF472K	5-16
1A1A6R8		RESISTOR, FIXED, COMPOSITION: 27k, ± 10%, 1/4 watt, MIL type RC07GF273K	5-16
1A1A6R9		RESISTOR, FIXED, COMPOSITION: 33k, ± 10%, 1/4 watt, MIL type RC07GF333K	5-16
1A1A6R10		RESISTOR, FIXED, COMPOSITION: 6.8k, ± 10%, 1/4 watt, MIL type RC07GF682K	5-16
1A1A6R11		RESISTOR, FIXED, COMPOSITION: 270 ohms, ± 10%, 1/4 watt, MIL type RC07GF271K	5-16
1A1A6R12		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-16
1A1A6R13		RESISTOR, FIXED, COMPOSITION: 27k, ± 10%, 1/4 watt, MIL type RC07GF273K	5-16
1A1A6R14		RESISTOR, FIXED, COMPOSITION: 2.2k, ± 10%, 1/4 watt, MIL type RC07GF222K	5-16
1A1A6R15		RESISTOR, FIXED, COMPOSITION: 5.6k, ± 10%, 1/4 watt, MIL type RC07GF562K	5-16
1A1A6R16		RESISTOR, FIXED, COMPOSITION: 100 ohms, ± 10%, 1/4 watt, MIL type RC07GF101K	5-16
1A1A6R17		RESISTOR, FIXED, COMPOSITION: 47k, ± 10%, 1/4 watt, MIL type RC07GF473K	5-16
1A1A6R18		RESISTOR, FIXED, COMPOSITION: 820 ohms, ± 10%, 1/4 watt, MIL type RC07GF821K	5-16

TABLE 6-3. SUPPLEMENTARY PARTS LIST FOR NEW 0082 SERIES 1A1A5/1A1A6 PC BOARDS (Continued)

Reference Designation	Notes	Name and Description	Figure Number (Item)
1A1A6R19		RESISTOR, FIXED, COMPOSITION, 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-16
1A1A6R20		Not used	
1A1A6R21		RESISTOR, FIXED, COMPOSITION: 18k, ± 10%, 1/4 watt, MIL type RC07GF183K	5-16
1A1A6R22		RESISTOR, FIXED, COMPOSITION: 120k, ± 10%, 1/4 watt, MIL type RC07GF124K	5-16
1A1A6R23		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-16
1A1A6R24		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-16
1A1A6R25		RESISTOR, FIXED, COMPOSITION: 3.3k, ± 10%, 1/4 watt, MIL type RC07GF332K, See note 1 on figure 5-14	5-16
1A1A6R26		RESISTOR, FIXED, COMPOSITION: 2.7k, ± 10%, 1/4 watt, MIL type RC07GF272K	5-16
1A1A6R27		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-16
1A1A6R28		RESISTOR, FIXED, COMPOSITION: 12k, ± 10%, 1/4 watt, MIL type RC07GF123K	5-16
1A1A6R29		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-16
1A1A6R30		RESISTOR, FIXED, COMPOSITION: 330 ohms, ± 10%, 1/4 watt, MIL type RC07GF331K	5-16
1A1A6R31		RESISTOR, FIXED, COMPOSITION: 6.8k, ± 10%, 1/4 watt, MIL type RC07GF682K	5-16
1A1A6R32		RESISTOR, FIXED, COMPOSITION: 12k, ± 10%, 1/4 watt, MIL type RC07GF123K	5-16
1A1A6R33		RESISTOR, FIXED, COMPOSITION: 5.6k, ± 10%, 1/4 watt, MIL type RC07GF562K	5-16
1A1A6R34		Not used	
1A1A6R35		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-16
1A1A6R36		RESISTOR, FIXED, COMPOSITION: 39k, ± 10%, 1 watt, MIL type RC32GF393K	5-16
1A1A6R37		RESISTOR, FIXED, COMPOSITION: 18k, ± 10%, 1/4 watt, MIL type RC07GF183K	5-16
1A1A6R38		RESISTOR, FIXED, COMPOSITION: 1.2k, ± 10%, 1/4 watt, MIL type RC07GF122K	5-16
1A1A6R39		RESISTOR, FIXED, COMPOSITION: 2.2k, ± 10%, 1/4 watt, MIL type RC07GF222K	5-16
1A1A6R40		RESISTOR, FIXED, COMPOSITION: 22k, ± 10%, 1/4 watt, MIL type RC07GF223K	5-16
1A1A6R41		RESISTOR, FIXED, COMPOSITION: 2.2k, ± 10%, 1/4 watt, MIL type RC07GF222K	5-16
1A1A6R42		RESISTOR, FIXED, COMPOSITION: 6.8k, ± 10%, 2 watt, MIL type RC42GF682K	5-16
1A1A6R43 and 1A1A6R44		RESISTOR, FIXED, COMPOSITION: 2.2k, ± 10%, 1/4 watt, MIL type RC07GF222K	5-16
1A1A6R45		RESISTOR, FIXED, COMPOSITION: 100k, ± 10%, 1/4 watt, MIL type RC07GF104K	5-16

TABLE 6-3. SUPPLEMENTARY PARTS LIST FOR NEW 0082 SERIES 1A1A5/1A1A6 PC BOARDS (Continued)

Reference Designation	Notes	Name and Description	Figure Number (Item)
1A1A6R46		RESISTOR, FIXED, COMPOSITION: 1k, ± 10%, 1/4 watt, MIL type RC07GF102K	5-16
1A1A6R47		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-16
1A1A6R48		RESISTOR, FIXED, COMPOSITION: 33k, ± 10%, 1/4 watt, MIL type RC07GF333K	5-16
1A1A6R49		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-16
1A1A6R50 thru 1A1A6R53		Not used	
1A1A6R54		RESISTOR, FIXED, COMPOSITION: 2.2k, ± 10%, 1/4 watt, MIL type RC07GF222K	5-16
1A1A6R55		RESISTOR, FIXED, COMPOSITION: 47 ohms, ± 10%, 1/4 watt, MIL type RC07GF470K	5-16
1A1A6R56		RESISTOR, FIXED, COMPOSITION: 15k, ± 10%, 1/4 watt, MIL type RC07GF153K	5-16
1A1A6R57		RESISTOR, FIXED, COMPOSITION: 56k, ± 10%, 1/4 watt, MIL type RC07GF563K	5-16
1A1A6R58		RESISTOR, FIXED, COMPOSITION: 33k, ± 10%, 1/4 watt, MIL type RC07GF333K	5-16
1A1A6R59		RESISTOR, FIXED, COMPOSITION: 22k, ± 10%, 1/4 watt, MIL type RC07GF223K	5-16
1A1A6R60		RESISTOR, FIXED, COMPOSITION: 47 ohms, ± 10%, 1/4 watt, MIL type RC07GF470K	5-16
1A1A6R61		RESISTOR, FIXED, COMPOSITION: 100 ohms, ± 10%, 1/2 watt, MIL type RC20GF101K	5-16
1A1A6R62 and 1A1A6R63		RESISTOR, FIXED, COMPOSITION: 4.7k, ± 10%, 1/4 watt, MIL type RC07GF472K	5-16
1A1A6R64		RESISTOR, FIXED, COMPOSITION: 3.3k, ± 10%, 1/4 watt, MIL type RC07GF332K	5-16
1A1A6R65		RESISTOR, FIXED, COMPOSITION: 100k, ± 10%, 1/4 watt, MIL type RC07GF104K	5-16
1A1A6R66		RESISTOR, FIXED, COMPOSITION: 33k, ± 10%, 1/4 watt, MIL type RC07GF333K	5-16
1A1A6R67 and 1A1A6R68		RESISTOR, FIXED, COMPOSITION: 10k, ± 10%, 1/4 watt, MIL type RC07GF103K	5-16
1A1A6TP1		TEST POINT: Brown, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-758, 14304 dwg J60-0001-008	5-16
1A1A6TP2		TEST POINT: Red, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-752, 14304 dwg J60-0001-002	5-16
1A1A6TP3		TEST POINT: Orange, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-756, 14304 dwg J60-0001-006	5-16
1A1A6TP4		TEST POINT: Yellow, .460 in. lg x .156 in. w x .45 in. h, mfr 74970, part no. 105-757, 14304 dwg J60-0001-007	5-16

TABLE 6-4. LIST OF MANUFACTURERS

MFR CODE	NAME	ADDRESS
00471	Dow Key Co., Inc.	Warren, IN
02660	Amphenol-Borg Electronics Corp.	Broadview-Chicago. IL
04713	Motorola, Inc. Semiconductor Products Div.	Phoenix, AZ
08594	Eital McCullogh, Inc.	Salt Lake City, UT
10216	Control Laser	Orlando, FL
12143	Bendix Corp., Scintilla Division	Santa Ana, CA
14304	RF Communications, Inc.	Rochester, NY
16753	CNTR, Inc.	Rochester, NY
17117	Electric Moulding Corp.	Woonsocket, RI
18787	Electropac, Inc.	Peterborough, NH
32284	Rotron, Inc.	Woodstock, NY
44655	Ohmite Mfg. Co.	Skokie, IL
53021	Sangamo Electric Company	Springfield, IL
71590	Centralab Div. of Globe-Union, Inc.	Milwaukee, WI
73899	JFD Electronics Corp.	Brooklyn, NY
73905	ITT Jennings	San Jose, CA
74970	E. F. Johnson, Inc.	Waseca, MN
75382	Kulka Mfg. Company	Mt. Vernon, NY
77342	Potter and Brumfield Div. of American Machine and Foundry Co.	Princeton, IN
79089	Radio Corporation of America RCA Victor Television Division	Camden, NJ
82227	A. W. Haydon Co.	Waterbury, CT
89606	Voland Corporation	New Rochelle, NY
97390	Sprague	
98291	Sealectro Corporation	New Rochelle, NY