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NAVELEX

TECHNICAL MANUAL

DESCRIPTION, OPERATION AND MAINTENANCE

RADIO SET AN/URC-9 ( )

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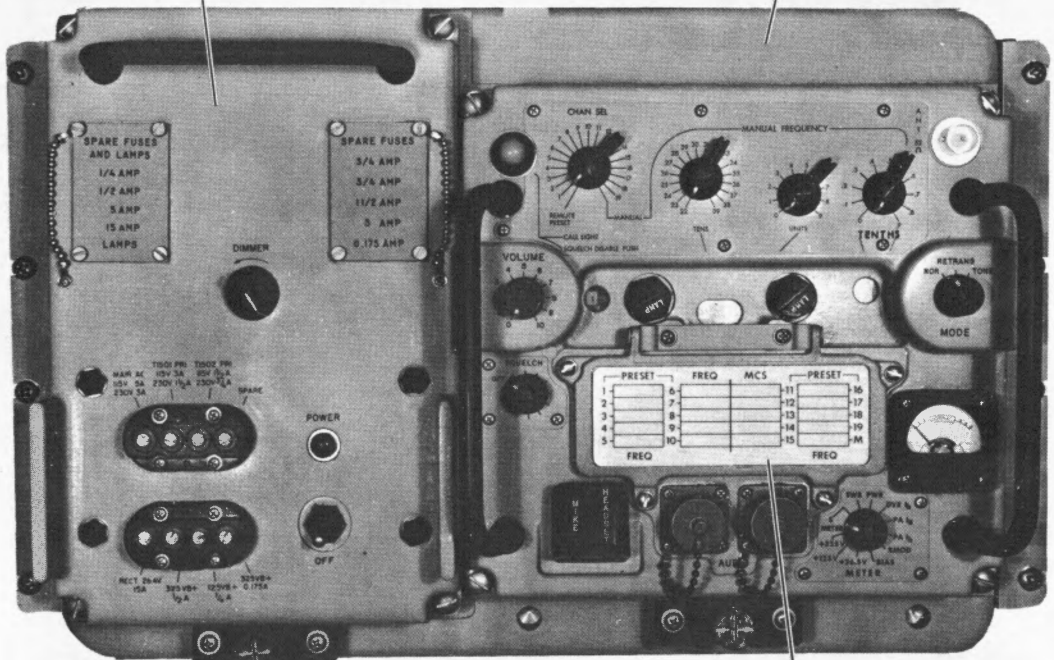
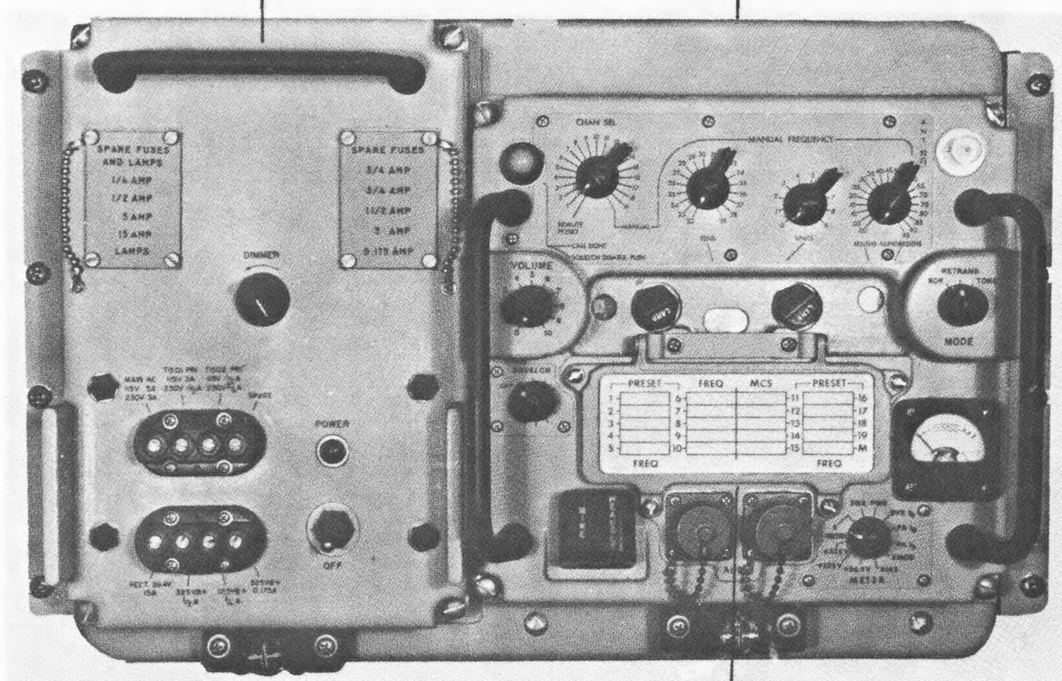
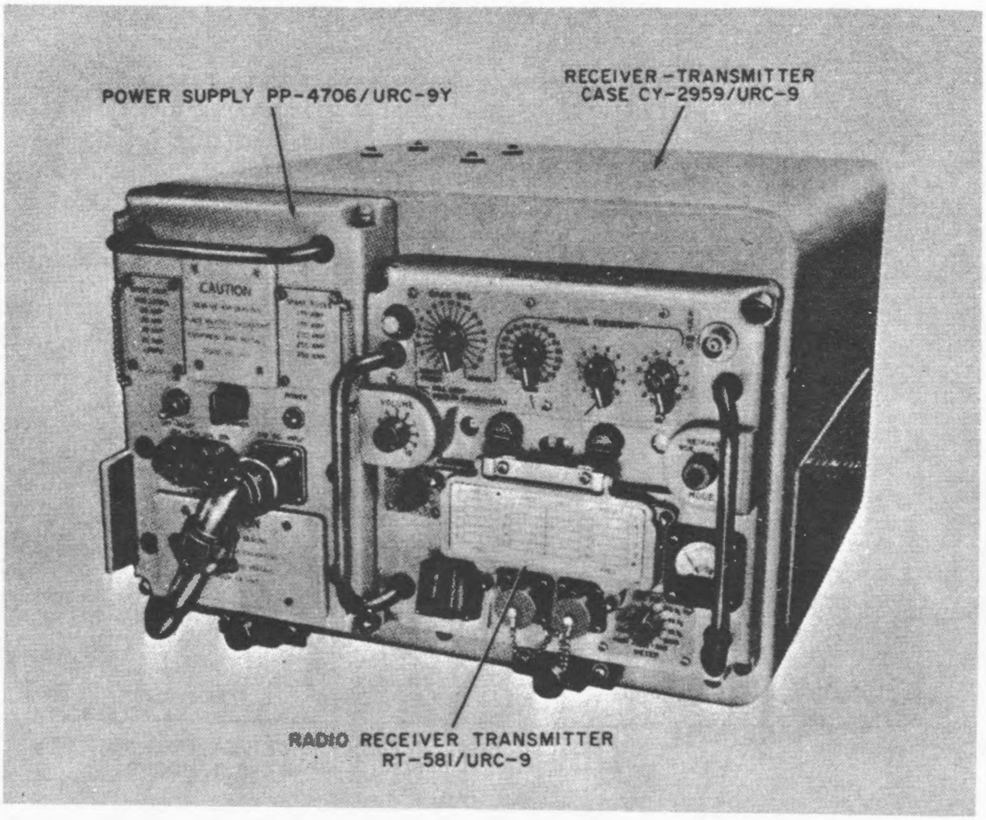


A - RADIO SET AN/URC-9

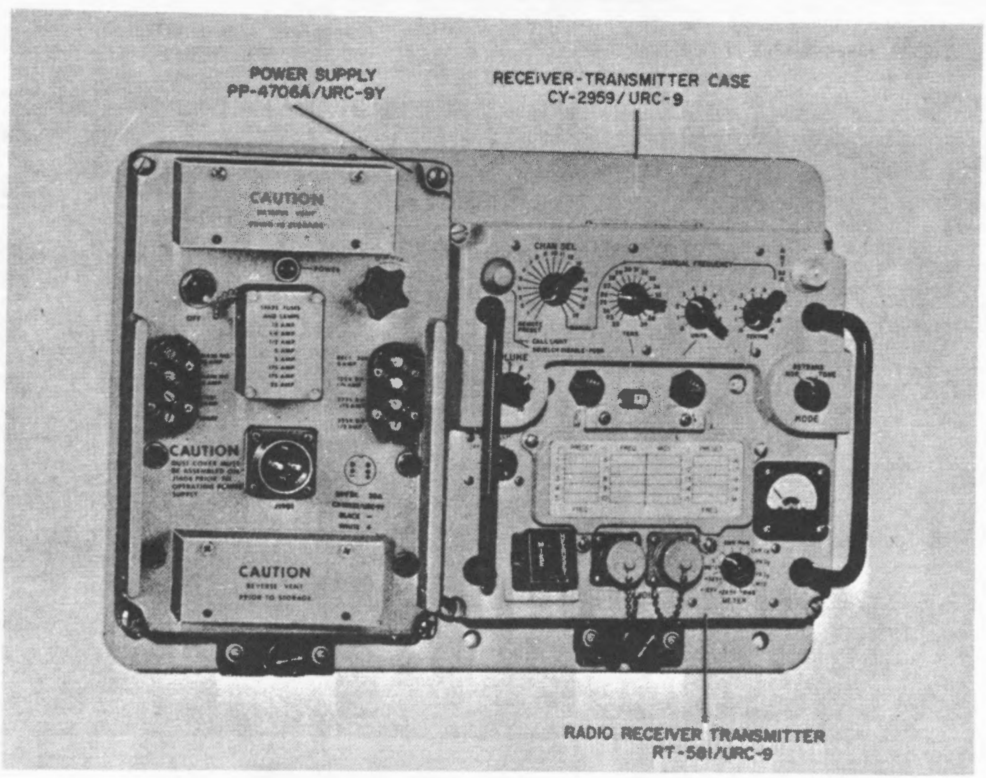


B - Radio Set AN/URC-9A

Figure 1-1. Radio Set AN/URC-9( ) (Sheet 1 of 2)



C - Radio Set AN/URC-9Y



D - Radio Set AN/URC-9AY

Figure 1-1. Radio Set AN/URC-9( ) (Sheet 2 of 2)

CHAPTER 1

GENERAL INFORMATION

1-1. SCOPE.

1-2. This technical manual contains installation and operating instructions, operating principles, maintenance procedures, and a parts list for Radio Sets AN/URC-9, 9A, 9Y, and 9AY. This manual is effective upon receipt. Extracts from this publication may be made to facilitate the preparation of other Department of Defense publications.

NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY except where noted.

1-3. GENERAL DESCRIPTION.

1-4. Radio Set AN/URC-9 (figure 1-2) is a transceiver designed for shipboard or fixed-station operation. The radio set provides transmission and reception of amplitude modulation (AM) voice and tone modulation (on MCW keying) on any of 3500 channels (AN/URC-9A) or 1750 channels (AN/URC-9, 9Y and 9AY). Nineteen of the channels can be preset for automatic frequency selection. Complete control of the radio set, including selection of the preset channels, can be exercised locally or from a remote control point. In addition, circuits are incorporated in the radio set to permit the connection of two AN/URC-9 equipments for two-way automatic retransmission. Broadband transmit and receive operation is also selectable from the transceiver.

1-5. Complete control of the radio set from a remote station requires connection be made to auxiliary equipment Radio Set Control C-2383/URC-9. The transmit-receive functions may be controlled from up to five remote stations through the standard 12-wire system using Control Adaptor MX-8430/URC-9 and Radio Set Control C-1138/UR or C-1207/UR.

1-6. RADIO SET AN/URC-9. Radio Set AN/URC-9 operates on any of 1750 channels spaced at 0.1 MHz intervals within the 225.0 to 399.9 MHz frequency range. Frequency selection is determined by the position of the CHAN SEL switch, which has 19 preset channel positions, a MANUAL position and a REMOTE PRESET position. The 19 preset channel frequencies can be set to any one of the 1750 available channels on a memory drum, accessible through a door in the front panel. When the CHAN SEL switch is in the MANUAL position, any one of the 1750 channels can be selected using the MANUAL FREQUENCY TENS, UNITS, and TENTHS controls on the front panel of the AN/URC-9. When the CHAN SEL switch is in REMOTE PRESET, channel selection is exercised from a fixed remote control station.

1-7. RADIO SET AN/URC-9A. Radio Set AN/URC-9A is functionally identical to the AN/URC-9 except that 3500 crystal-controlled channels spaced at 0.05 MHz intervals in the 225.00 to 399.95 MHz frequency range are provided.

1-8. RADIO SETS AN/URC-9Y AND AN/URC-9AY. Radio sets AN/URC-9Y and AN/URC-9AY are functionally identical to the AN/URC-9 differing only in the internal power supply (PP-4706 and PP-4706A, respectively) and in primary power requirements (24 vdc rather than 115 vac).

1-9. DESCRIPTION OF MAJOR ASSEMBLIES.

1-10. Radio Set AN/URC-9( ) is comprised of the assemblies listed in table 1-1.

1-11. RECEIVER-TRANSMITTER RT-581/URC-9. Receiver-Transmitter RT-581/URC-9 (which is commonly called the receiver-transmitter) performs the dual functions of a receiver and a transmitter. The receiver-transmitter operates in the frequency range of 225.0 to 399.9 MHz range spaced at 0.1 MHz intervals. During the non-transmitting intervals, the unit functions as a triple-conversion, superheterodyne receiver; when the microphone press-to-talk switch is actuated, the unit converts to a transmitter. Crystal-controlled oscillators provide stable RF and IF frequencies in both the transmit and receive sequences.

1-12. The receiver-transmitter consists of a main chassis upon which are mounted 14 subassemblies which make up the electronics of the unit. With the exception of the front panel, all assemblies may be removed at an early stage in troubleshooting either for repair or replacement.

1-13. RECEIVER-TRANSMITTER RT-581A/URC-9. Receiver-Transmitter RT-581A/URC-9 is functionally identical to RT-581/URC-9 except that 3500 crystal-controlled channels spaced at 0.05 MHz intervals in the 225.00 to 399.95 MHz frequency range are provided. The assemblies differ physically in that circuits and switching provide a hundredths position to the frequency spectrum.

1-14. POWER SUPPLY PP-2702/URC-9. Power Supply PP-2702/URC-9 provides all operating voltages required by the receiver-transmitter of Radio Sets AN/URC-9 and AN/URC-9A. The power supply operates on 115 or 230 volts, 50 or 60 cycle ac and provides outputs of +26.5, +325, +275, +125 and -11 volts dc. The power supply also provides 115 volts ac to blowers within Receiver-Transmitter Case CY-2959/URC-9 and the Receiver-Transmitter RT-581 ( )/URC-9.

1-15. POWER SUPPLY PP-4706/URC-9Y. Power Supply PP-4706/URC-9Y (commonly called the power supply) provides the operating voltages required by the receiver-transmitter of Radio Set AN/URC-9Y. The power supply operates from a nominal 24-volt dc supply and provides outputs of 115 volts ac, 6.7 volts ac, +26.5 volts dc, -11 volts dc, +125 volts dc, +325 volts dc, and +275 volts dc. The power supply is cooled by means of an internal centrifugal fan which circulates cooling air through louvered ports in the front panel. Plates, normally stored above the power transformer within the power supply, are used to seal the ports to make the radio set immersion-proof during storage and transmit.

1-16. POWER SUPPLY PP-4706A/URC-9Y. Power Supply PP-4706A/URC-9Y (commonly called the power supply) provides the operating voltages required by the receiver-transmitter of RADIO Set AN/URC-9AY. The power supply operates from a nominal 24-volt dc supply and provides outputs of 115 volts ac, -6.3 volts dc, +26.5 volts dc, -11 volts dc, +125 volts dc, +325 volts dc, and +275 volts dc. The power supply is cooled by means of an internal centrifugal fan which circulates cooling air through louvered ports in the front panel. Plates installed over the ports may be reversed to seal the ports to make the radio set immersion-proof during storage and transit.

1-17. RECEIVER-TRANSMITTER CASE CY-2959/URC-9. Receiver-Transmitter CY-2959/URC-9 (commonly called the radio case) provides the mounting facilities for the receiver-transmitter and the power supply. Cooling of the receiver-transmitter is accomplished by means of centrifugal fans within the case and the receiver-transmitter. Air to the Radio Set enters and exits through louvered ports at each side of the case. During transit, the ports are sealed with plates that make the radio set immersion-proof. When set up for operation, the plates are stored on the side of the radio case above the ports. The rear of the radio case provides mounting facilities for cable connectors, PLAIN-BROADBAND switch S1401, and pneumatic and safety relief valves.

1-18. REFERENCE DATA.

1-19. Detailed reference data are given in tables 1-2 and 1-3.

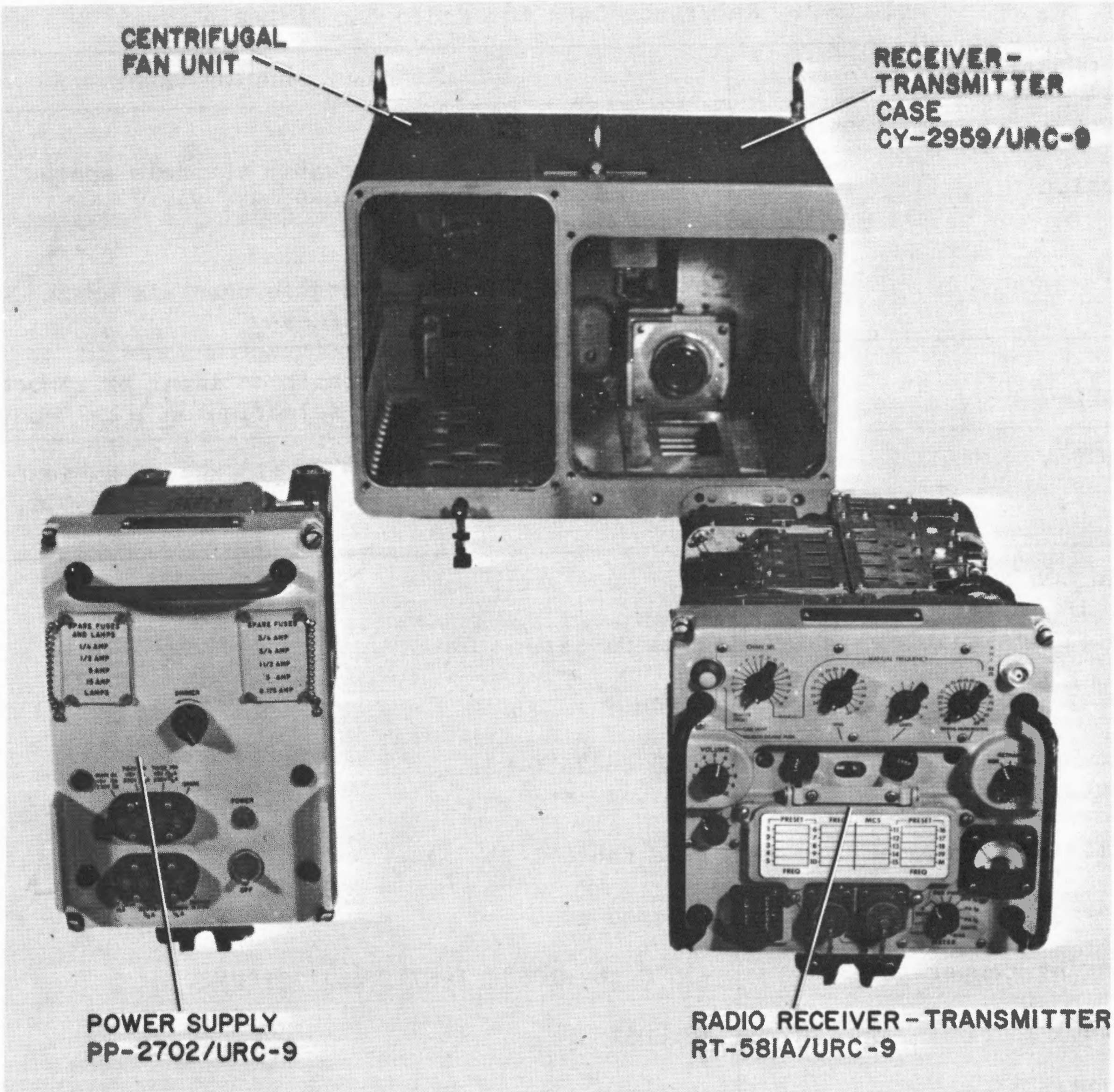


Figure 1-2. Units of Radio Set AN/URC-9( ), Typical

Table 1-1. Radio Set AN/URC-9( ), Major Assemblies

UNIT	RADIO SET AN/URC-9	RADIO SET AN/URC-9A	RADIO SET AN/URC-9Y	RADIO SET AN/URC-9AY
RECEIVER-TRANSMITTER	RT-581/URC-9	RT-581A/URC-9	RT-581/URC-9	RT-581/URC-9
POWER SUPPLY	PP-2702/URC-9	PP-2702/URC-9	PP-4706/URC-9Y	PP-4706A/URC-9Y
CASE	CY-2959/URC-9	CY-2959/URC-9	CY-2959/URC-9	CY-2959/URC-9

Table 1-2. Reference Data for Radio Set AN/URC-9

CHARACTERISTIC	NUMBER, RANGE, AND/OR VALUE
FREQUENCY: Range Selection	225.0 to 399.9 MHz 1750 automatically selectable channels spaced 0.1 MHz apart for AN/URC-9, 9Y, 9AY 225.00 to 399.95 MHz 3500 automatically selectable channels spaced 0.05 MHz apart for AN/URC-9A
CHANNEL PRESETTING	19 preset channels available on local or remote control, manual frequency selection on local control.
ACCURACY	At 150°F, ±12 kHz at 100°F, ±10 kHz at ambient temperature, ±10 kHz at -40°F, ±15 kHz at -65°F, ±20 kHz
CRYSTAL CONTROL:	
First IF Amplifier; crystal designation	Type CR-55/U
type of cut	AT-cut
frequency range of crystal circuit	17.0 to 26.0 MHz
oscillation frequency	(See table 1-3)
temperature coefficient	Classed as 0
operating temperature	-55°C to +105°C (-67°F to +221°F)
accuracy	±0.005%
stability	±0.0005% over temperature range
Second IF Amplifier; crystal designation	Type CR-18A/U for AN/URC-9, 9Y, 9AY Similar to type CR-18A/U, with two crystal circuits in each mounting for AN/URC-9A
type of cut	AT-cut
frequency range of crystal channel	3.0 to 3.9 MHz for AN/URC-9, 0Y, 9AY 3.00 to 3.95 MHz for AN/URC-9A
oscillation frequency	(See table 1-3)
temperature coefficient	Classed as 0
operating temperature	-55°C to +105°C (-67°F to +221°F)

Table 1-2. Reference Data for Radio Set AN/URC-9 (Continued)

CHARACTERISTIC	NUMBER, RANGE, AND/OR VALUE
Second IF Amplifier (cont) accuracy	±0.005%
stability	±0.0005% over temperature range
Frequency Multiplier Oscillator; crystal designation	Type CR-76/U
type of cut	AT-cut
Frequency range of crystal circuit	31.1 to 45.0 MHz
oscillation frequency	(See table 1-3)
temperature coefficient	Classed as 0
operating temperature	-55°C to +105°C (-67°F to +221°F)
accuracy	±0.0025%
stability	±0.0005%
RECEIVER CHARACTERISTICS: Type	Triple-conversion superheterodyne, with automatic noise limiting and carrier-operated squelch relay circuits
Input impedance	50 ohms
Sensitivity	6 uv or less for 10-db signal-plus-noise to noise ratio
Selectivity (third IF bandwidth)	80 Hz minimum at 6-db attenuation, 150 Hz maximum at 60-db attenuation
Intermediate frequencies	20.0 to 29.9 MHz (variable), 3.0 to 3.9 MHz (variable), 500 kHz (fixed) for AN/URC-9, 9Y, 9AY 20.00 to 29.95 MHz (variable), 3.00 to 3.95 MHz (variable), 500 kHz (fixed) for AN/URC-9A
AVC characteristics	Audio output constant within ±2 db from 10 uv to 0.25 v with 100 uv, modulated 30% at 1000 Hz 500 mw audio output level as reference
Frequency response; normal	300 Hz: ±5 db; 500 Hz: ±4 db; 1000 Hz: 0 db; 3500 Hz: ±4 db

Table 1-2. Reference Data for Radio Set AN/URC-9 (Continued)

CHARACTERISTIC	NUMBER, RANGE, AND/OR VALUE
Frequency response (cont)	
broadband	Within -3 db at 100 Hz to -7 db at 25,000 Hz 1000 Hz reference
Audio outputs;	
local output	2 watts, 600 ohms
remote output	2 watts, 600 ohms
audio distortion	10% maximum
Squelch;	
S+N/N squelch	3 db signal-plus-noise to noise ratio
carrier squelch	3 uv carrier level
TRANSMITTER CHARACTERISTICS:	
Power output	16 watts minimum into 50 ohm resistive load
Modulation	Amplitude modulation
Frequency response;	
normal	Within ±3 db from 300 to 3500 Hz, 1000 Hz reference
broadband	300 Hz = +0.0 to -3.0 db 1000 Hz = 0.0 (ref) 10,000 Hz = 1 ±1.0 db 25,000 Hz = +0 to -6 db
audio distortion	Less than 7.5 percent at 3 db below 80% modulation
broadband sidetone	175 mw, 300 to 3000 Hz into 600 ohms
Spurious radiation	All spurious radiation suppressed 60 db below carrier level from 245.0 to 380.0 MHz. On any frequency outside this range, not more than one spurious radiation which must be at least 30 db below carrier
Operating temperature	-54°C to +65°C (-67°F to +149°F)
Types of emission	Radio telephone (A3); tone (A2)
Audio inputs;	
microphone	0.08 volt, 82 ohms
retransmission	0.31 volt
broadband	1.55 volts peak-to-peak

Table 1-2. Reference Data for Radio Set AN/URC-9 (Continued)

CHARACTERISTIC	NUMBER, RANGE, AND/OR VALUE
Sidetone output	175 mw, 300 to 3500 Hz, from 600 ohm receiver audio output
Fidelity	Within ± 3 db from 300 to 3500 Hz, 100 Hz reference
Duty cycle	Continuous transmission with 80% modulation at +65°C (+149°F)
PRIMARY VOLTAGE REQUIREMENTS	115 vac 50/60 Hz single phase or 230 vac 50/60 Hz single phase for AN/URC-9, 9A 24 vdc for AN/URC-9Y, 9AY
POWER REQUIREMENTS	210 watts on receive for AN/URC-9, 9A 260 watts on receive for AN/URC-9Y, 9AY 360 watts on transmit

Table 1-3. Frequency of Control Crystals in Radio Set AN/URC-9

SUBUNIT	CRYSTAL	FREQUENCY (MHz)	
		AN/URC-9A	AN/URC-9
First IF Amplifier	Y301	17.00	17.0
	Y302	18.00	18.0
	Y303	19.00	19.0
20.00 to 29.95 MHz in AN/URC-9A	Y304	20.00	20.0
	Y305	21.00	21.0
	Y306	22.00	22.0
	Y307	23.00	23.0
20.0 to 29.9 MHz in AN/URC-9, 9Y, 9AY	Y308	24.00	24.0
	Y309	25.00	25.0
	Y310	26.00	26.0
Second IF Amplifier	Y401	3.00/3.05	3.0
	Y402	3.10/3.15	3.1
	Y403	3.20/3.25	3.2
3.00 to 3.95 MHz in AN/URC-9A	Y404	3.30/3.35	3.3
	Y405	3.40/3.45	3.4
	Y406	3.50/3.55	3.5
	Y407	3.60/3.65	3.6
3.0 to 3.9 MHz in AN/URC-9, 9Y, 9AY	Y408	3.70/3.75	3.7
	Y409	3.80/3.85	3.8
	Y410	3.90/3.95	3.9

Table 1-3. Frequency of Control Crystals in Radio Set AN/URC-9 (Continued)

SUBUNIT	CRYSTAL	FREQUENCY (MHz) AN/URC-9A	FREQUENCY (MHz) AN/URC-9
Frequency Multiplier-Oscillator	Y202	35.00000	35.00000
	Y204	38.33333	38.33333
	Y206	41.66666	41.66666
	Y207	43.33333	43.33333
200 to 370 MHz	Y208	45.00000	45.00000
	Y209	31.11111	31.11111
	Y210	32.22222	32.22222
	Y211	33.33333	33.33333
	Y212	34.44444	34.44444
	Y213	35.55555	35.55555
	Y214	36.66666	36.66666
	Y215	37.77777	37.77777
	Y216	38.88888	38.88888
	Y217	40.00000	40.00000
	Y218	41.11111	41.11111

1-20. EQUIPMENT SUPPLIED.

1-21. Table 1-4 lists all equipment supplied with Radio Set AN/URC-9( ).

1-22. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

1-23. A list of equipment required, but not supplied, for Radio Set AN/URC-9, is given in table 1-5. The major remote control equipments are shown in figures 1-3 and 1-4.

1-24. FIELD CHANGE INDEX.

1-25. Table 1-6 lists the field changes applicable to Radio Sets AN/URC-9, AN/URC-9A, AN/URC-9Y, and AN/URC-9AY. For the complete field change identification guide index, refer to Section 3 of the Electronics Installation and Maintenance Book (EIMB), NAVSHIPS 0967-000-0100.

Table 1-4. Equipment Supplied With Radio Set AN/URC-9( )

QTY PER EQUIP	NOMENCLATURE NAME	NOMENCLATURE DESIGNATION	DIMENSIONS (inches) HEIGHT	DIMENSIONS (inches) WIDTH	DIMENSIONS (inches) DEPTH	VOL. (cu. ft.)	WT (lb)
1	Radio Set including: Receiver-Transmitter Power Supply Receiver-Transmitter Case Installation Kit	AN/URC-9( ) RT-581/URC-9 or RT-581A/URC-9 PP-2702/URC-9 PP-4706/URC-9Y or PP-4706A/URC-9Y CY-2959/URC-9 MK-620/UR	13-13/16	19	19-1/2	3.1	157
1	Power Cable (AN/URC-9, 9A)	CX-7258/URC-9			10 ft lg		

Table 1-4. Equipment Supplied With Radio Set AN/URC-9( ) (Continued)

QTY PER EQUIP	NOMENCLATURE		DIMENSIONS (inches)			VOL. (cu. ft.)	WT (lb)
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
1	Power Cable (AN/URC-9Y, 9AY) Maintenance Cable RT-581/URC-9	CX-10332/URC-9Y CX-7260/URC-9			3ft lg		
1	Maintenance Cable Power Supply	CX-7300/URC-9			3ft lg		
1	Maintenance Cable Relay-Filter Unit	CX-8521/URC-9			2ft lg		
1	Retransmission Cable	CX-7259/URC-9			5ft lg		
2	Technical Manual	NAVELEX 0967-439-0010	11	8.5	1		
1	Reference Standards Book	NAVELEX 0967-439-0040	11	8.5	1/4		
1	Performance Standards Sheet	NAVELEX 0967-439-0030	11	8.5			
1	Operating Instruction Chart	NAVELEX 0967-439-0020	( )	( )			

Table 1-5. Equipment Required (Not Supplied)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	REQUIRED CHARACTERISTICS
	NAME	DESIGNATION		
1 and 1 or 1	Headset Microphone Handset	NT-49985-A M-58/U H-169/U	Local operation of AN/URC-9	600 ohms Carbon microphone 82 ohms, with push-to-walk button
1 or 1	*Radio Set Control Control Adaptor	C-2383/URC-9 MX-8430/URC-9	Remote Control of AN/URC-9 Remote Adaptor for use with up to 5 Radio Set Controls C-1138/UR or C-1207/UR	Refer to applicable technical manual Refer to applicable technical manual

* NOT USED IN ALL INSTALLATIONS

Table 1-5. Equipment Required (Not Supplied) (Continued)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	REQUIRED CHARACTERISTICS
	NAME	DESIGNATION		
1	RF Wattmeter	AN/URM-43( )	Power output check	(See table 5-1)
1	Electronic Multimeter	AN/USM-116	Voltage check	
1	Electronic Voltmeter	AN/USM-143	Voltage check	
1	Signal Generator	AN/USM-44A and AN/URM-25D	Signal generation for checking	
1	Audio Oscillator	AN/URM-127	Signal generation for checking	
1	Multimeter	AN/PSM-4	Trouble-shooting	
1	Frequency Counter	AN/USM-207	Trouble-shooting and alignment	
1	Oscilloscope	AN/USM-28	Trouble-shooting	

Table 1-6. Field Change Index For Radio Set AN/URC-9( )

FIELD CHANGE NO. RADIO SET AN/URC-				PURPOSE
9	9A	9Y	9AY	
3				Allows keying of tone for homing beacon on applicable equipment. (EIB -68 and EIB 682) (Cancelled by EIB 751)
1		1	1	Provides for hardening equipment against shock and vibration. (EIB 703) (EIB 724)
2		2	2	Reduces contact failure of Relay K601 through addition of a resistor & capacitor (EIB 723)
4		3	3	Protects RF and PA Assembly of RT-581/URC-9 from damage due to excessive heat. (Thermal switch) (EIB 749)

Table 1-6. Field Change Index For Radio Set AN/URC-9( ) (Continued)

FIELD CHANGE NO. RADIO SET AN/URC- 9	9A	9Y	9AY	PURPOSE
5	2			Reduces failure of contacts in Relay K-802 by the suppression of excessive arcing (EIB 756 and EIB 793)
6				Emission Control (not announced in EIB) (AN/SSQ-54 Equipped ships only)
7	2			Wiring Change, Elimination of Potential Safety Hazard (EIB 763)
8		4	4	Removes Voltage Regulator from FMO Oscillator (CR-201); Type II Class A, Routine Action: 1 Man-Hour (EIB 794)
9	2			Reduce coil failures of relay K601 and standardize the grid bias voltage of the power amplifier in the RT-581/URC-9
10	1	5	5	Prevents overheating of RT-581( )/URC-9 during operation

1-26. TRANSMISSION RANGE.

1-27. The transmission range of Radio Set AN/URC-9( ) is a function of the heights of the transmitting and receiving antennas. The monogram in table 1-7 provides the radio-path length and tangential distance for transmission between the transmitting and receiving equipment as a function of the heights of the antennas.

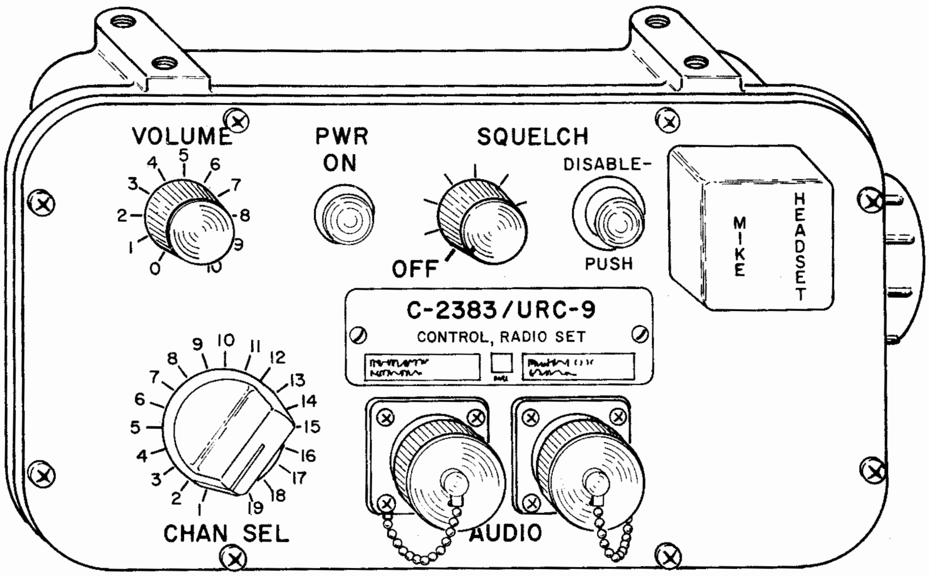
1-28. PREPARATION FOR RESHIPMENT.

1-29. The reshipment preparation of Radio Set AN/URC-9( ) does not require any extraordinary precautions. The equipment should be placed in an air-coil padded carton with a sufficient amount of silica-gel desiccant. This package should then be placed in water-resistant carton and sealed. For final packaging, the equipment is placed in a wooden crate which is nailed closed.

CAUTION

Whenever the radio is removed from service, the air-sealing plates must be placed over the louvers on the front of the power supply and on both sides of the radio case. During operation, the plates for the side ports are stored above the ports against the sides of the case, and the plates for the front panel are stored within the power supply behind the front panel.

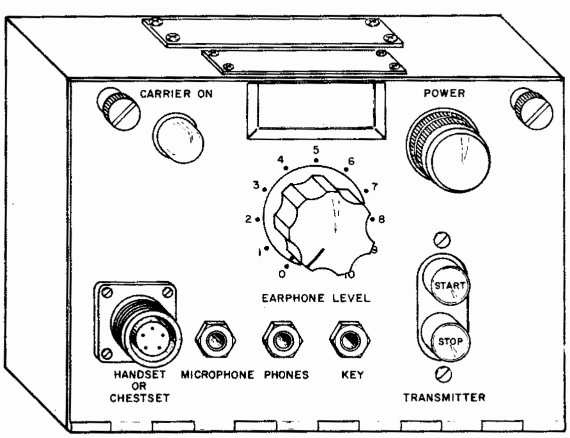
EQUIPMENT NOT SUPPLIED



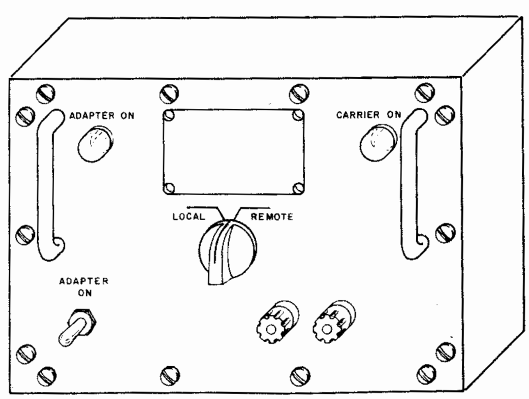
RADIO SET CONTROL C-2383/URC-9

Figure 1-3. Radio Set Control C-2383/URC-9, Hard Wired Remote Control

EQUIPMENT NOT SUPPLIED



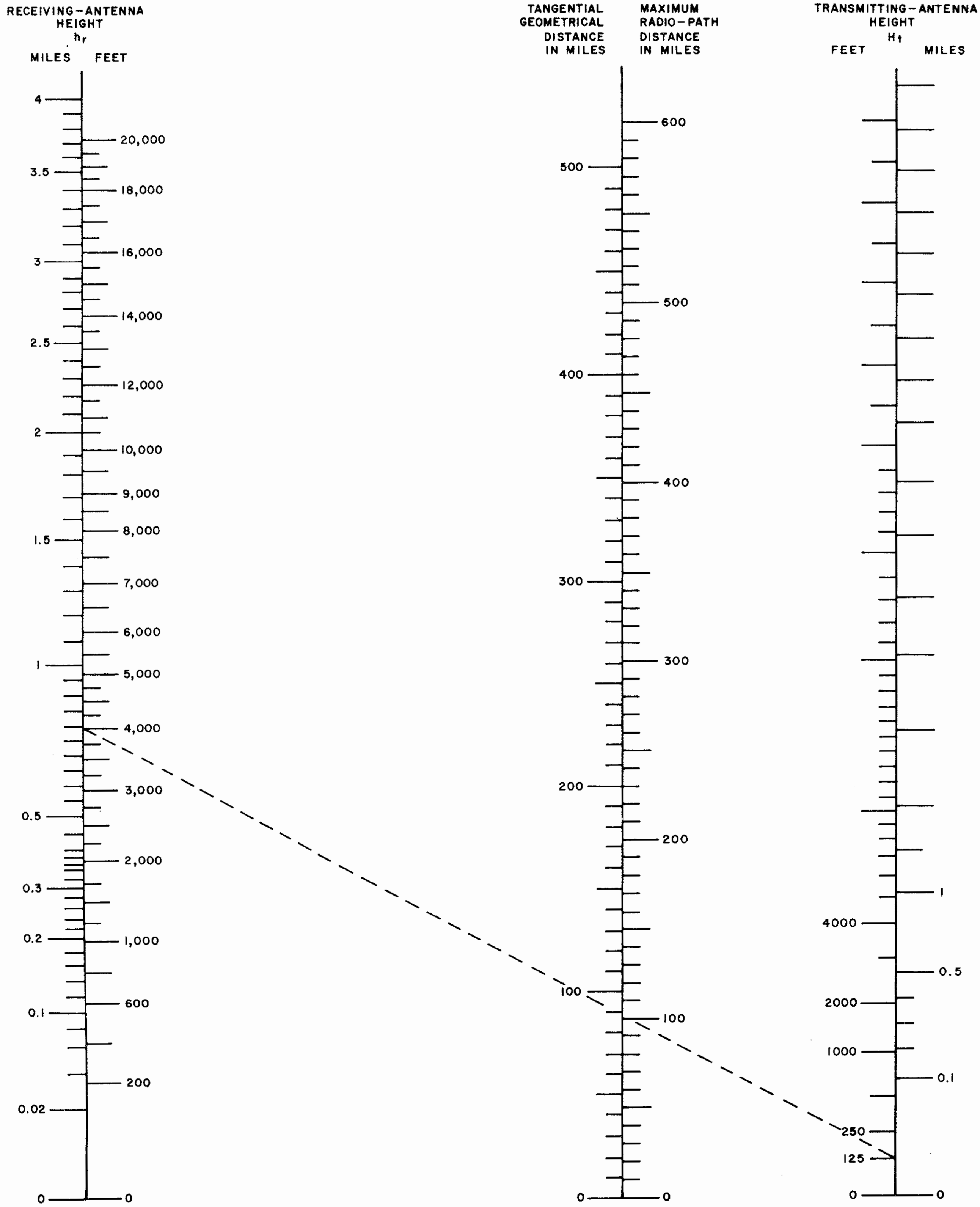
RADIO SET CONTROL
C-1138/UR



CONTROL, ADAPTOR
MX-8430/URC-9

Figure 1-4. Typical Transmit Receive Control in the Standard 12 Wire Remote Control System

Table 1-7. Radio-Path Transmission Distance As a Function of Antenna Height



EXAMPLE SHOWN: HEIGHT OF RECEIVING-ANTENNA AIRPLANE 4000 FEET (0.76 MILES), HEIGHT OF TRANSMITTING-ANTENNA 125 FEET (0.02); MAXIMUM RADIO-PATH DISTANCE = 100 MILES.

CHAPTER 2

OPERATION

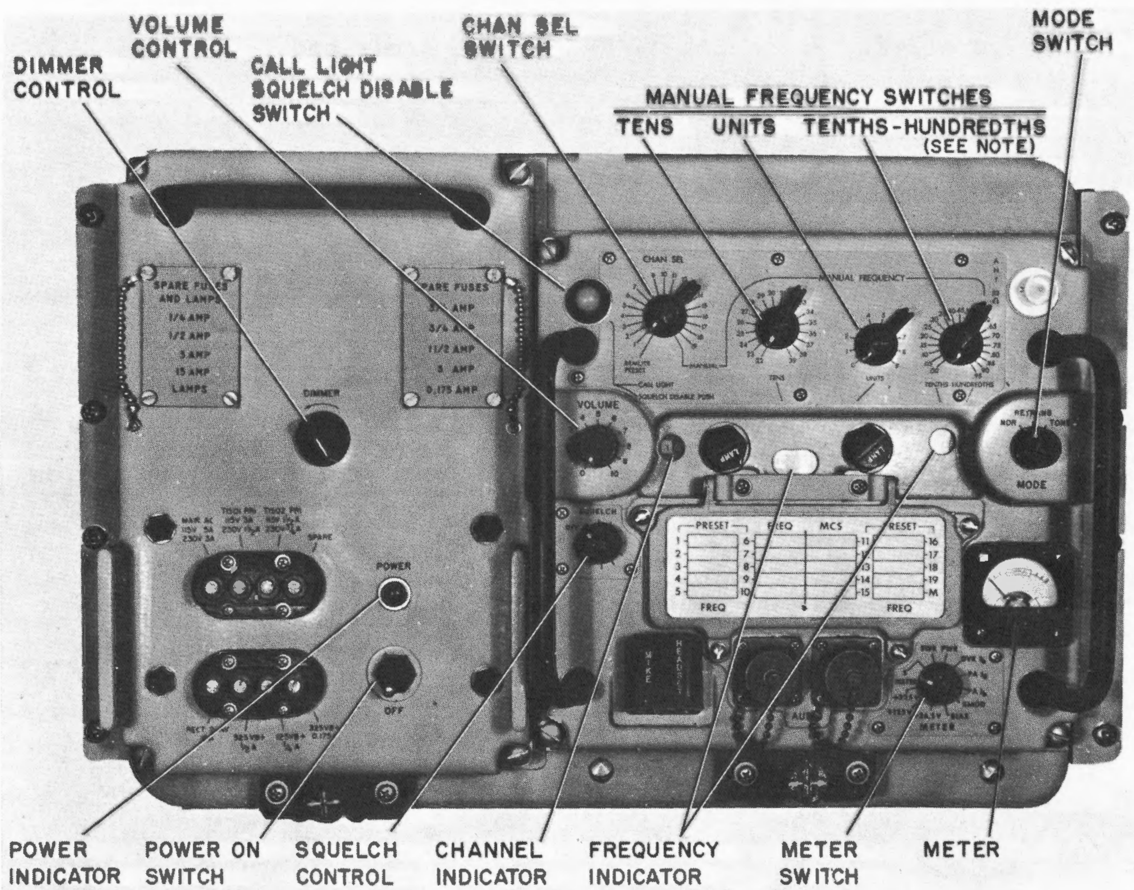
2-1. INTRODUCTION.

NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted.

2-2. Radio Set AN/URC-9( ) operates as a triple-conversion, superheterodyne receiver during non-transmitting conditions and operates as a transmitter when the microphone push-to-talk switch is actuated. Circuits are incorporated to permit the interconnection of two radio sets for two-way automatic retransmission and broadband transmit and receive operation. In addition, all operations, including the selection of preset channels, can be controlled from a remote station.

2-3. Radio Set AN/URC-9A (figure 2-1) operates in the frequency range from 225.00 to 399.95 MHz in discrete 0.05 MHz steps creating 3500 crystal-controlled channels. Radio Set AN/URC-9 is identical to the AN/URC-9A except that only 1750 channels spaced 0.1 MHz apart are provided in the 225.0 to 399.9 MHz frequency range. Radio Sets AN/URC-9Y (figure 2-2) and AN/URC-9AY (figure 2-3) are functionally identical to the AN/URC-9



NOTE: Graduated in .1 MHz increments on AN/URC-9

Figure 2-1. Radio Set AN/URC-9A (and -9), Controls and Indicators

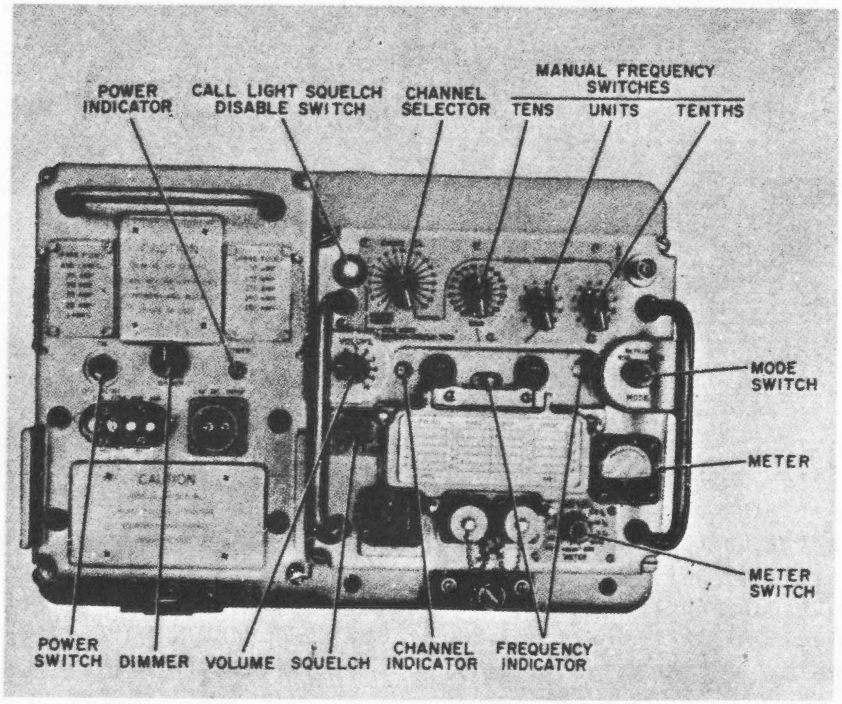


Figure 2-2. Radio Set AN/URC-9Y, Controls and Indicators

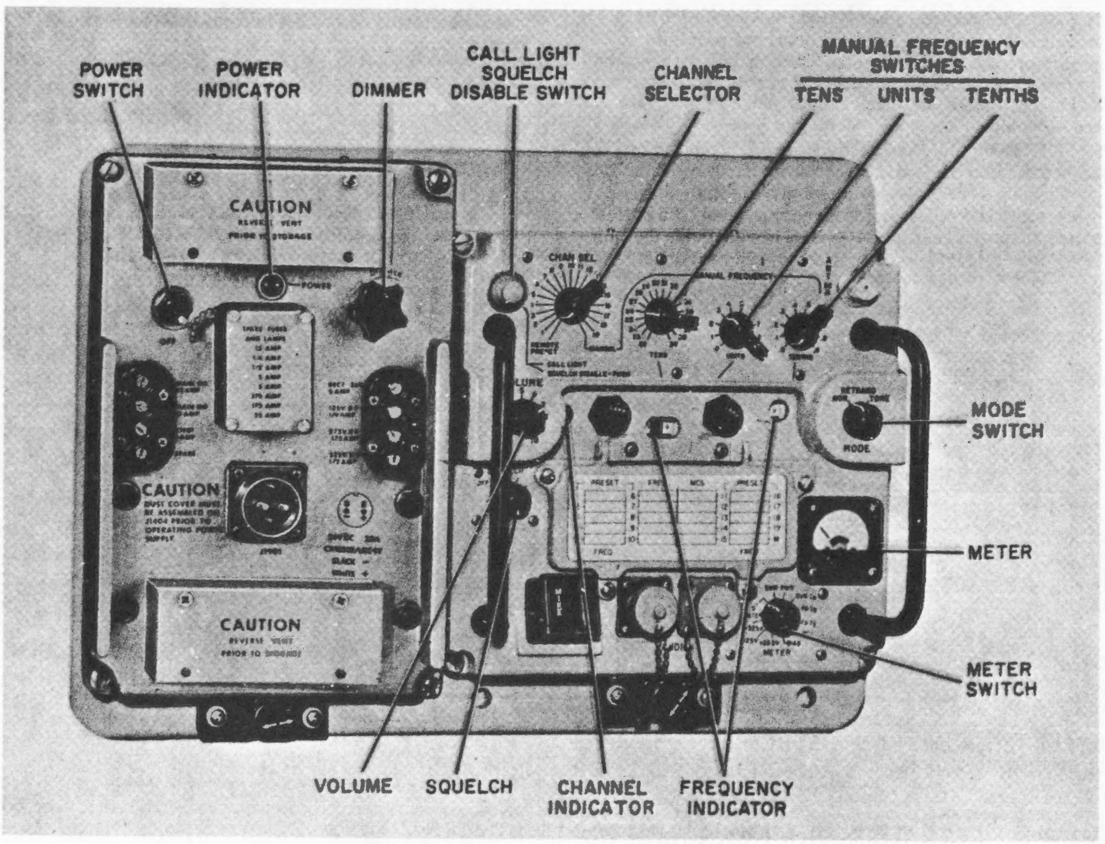


Figure 2-3. Radio Set AN/URC-9AY, Controls and Indicators

differing only in primary power requirement (24 volts dc rather than 115 volts ac) and internal power supplied (PP-4706 and PP-4706A, respectively).

2-4. REMOTE CONTROL (Figure 2-4). Radio Set AN/URC-9 may be completely or partially controlled from a remote station, depending on the auxiliary equipment used. Complete control, including channel and frequency selection, can be exercised by one hard-wired Radio Set Control C-2383/URC-9 (see figure 1-3).

2-5. Partial control, consisting of the transmit-receive operation, can be exercised from up to five remote control stations, through the standard 12 wire system in conjunction with Control Adapter MX-8430/URC-9 and Radio Set Control C-1138/UR or C-1207/UR (see figure 1-4). All other operations (i.e., channel and frequency selection, and squelch control) are controlled locally on the AN/URC-9.

2-6. RECEIVE OPERATION. Radio Set AN/URC-9 is in the receive condition whenever the microphone push-to-talk switch is not actuated. The audio output is controlled by the VOLUME control and audio signal strength is displayed on the meter when the switch is at the S METER position. In the absence of a signal, the squelch circuits eliminate noise in the audio circuits. Two basic types of squelch techniques are available: signal plus noise-to-noise (S+N/N) ratio and carrier squelch. The type of squelch in use is dependent on a link connection in the audio amplifier and modulator assembly of the AN/URC-9. Squelch may be controlled locally or remotely.

2-7. Local S+N/N Squelch Control. The Radio Set AN/URC-9 SQUELCH control is used to apply S+N/N squelch control when the AN/URC-9 CHAN SEL switch is set to MANUAL or one of the 19 preset channels. The local squelch circuit is disabled when the SQUELCH control is set to OFF, or when the SQUELCH DISABLE-PUSH switch is depressed. (The CALL LIGHT lamp lights when the squelch circuit is disabled or when a signal of sufficient strength to operate the circuit is received.)

2-8. Local Carrier Squelch Control. Local carrier squelch control action is the same as local S+N/N squelch control.

2-9. Remote S+N/N and Carrier Squelch Control. The remote squelch controls are the same as the local forms of squelch control except the AN/URC-9 CHAN SEL switch must be set to REMOTE PRESET and the Radio Set Control C-2383/URC-9 SQUELCH control utilized. Unless the C-2383/URC-9 is to be utilized the CHAN SEL switch should not be placed in the REMOTE PRESET position. The squelch lamp on the C-2383 may remain lit constantly when connected to some models of Radio Set AN/URC-9.

NOTE

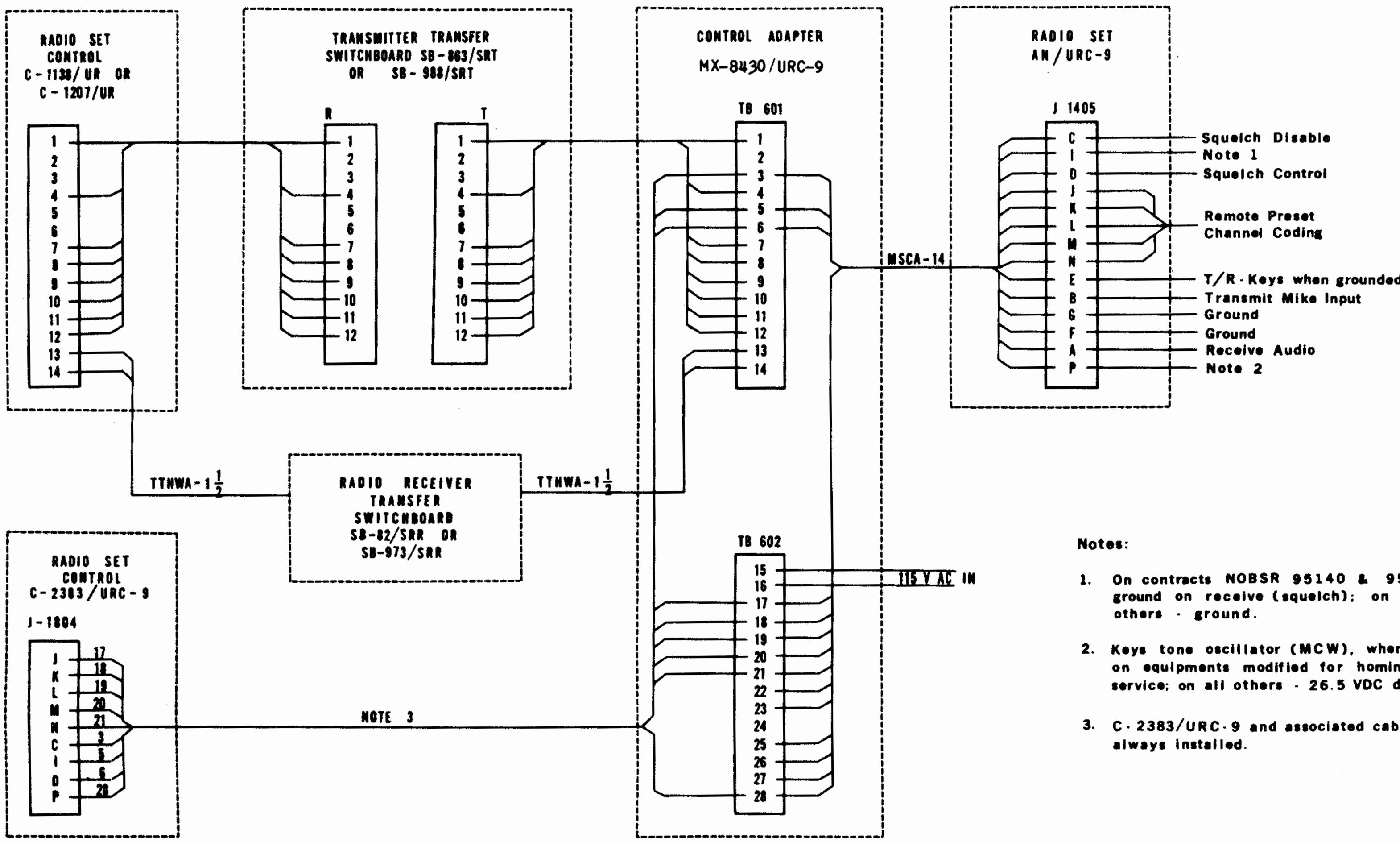
When the S+N/N squelch connection is made in the audio amplifier and modulator assembly of the AN/URC-9, the SQUELCH control must be adjusted when switching from NOR to RETRANS mode. This is necessitated since in RETRANS mode the carrier squelch is automatically connected.

For most applications it is recommended that the equipment be connected for carrier squelch operation. This connection allows one setting of the SQUELCH control for the normal, retransmit, and tone modes. In addition, this connection eliminates the problem of slow reaction time of the S+N/N squelch circuit.

2-10. TRANSMIT OPERATION. Radio Set AN/URC-9 is connected to a transmitter upon actuation of the microphone push-to-talk switch. Transmit operation can be performed in all modes of operation.

2-11. CONTROLS AND INDICATORS.

2-12. The operator controls and indicators are listed and described in table



Notes:

1. On contracts NOBSR 95140 & 95327, ground on receive (squelch); on all others - ground.

2. Keys tone oscillator (MCW), when grounded, on equipments modified for homing beacon service; on all others - 26.5 VDC dimmed.

3. C-2383/URC-9 and associated cabling not always installed.

Figure 2-4. Basic Communications Systems Interconnection Wiring Diagram

2-1 and are illustrated in figures 2-1, 2-2, 2-3, and 2-5 through 2-8. Except where noted, the controls and indicators listed in table 2-1 are applicable to Radio Sets AN/URC-9, 9A, 9Y, and 9AY.

Table 2-1. Controls and Indicators for Radio Set AN/URC-9

CONTROL NAME	FUNCTION
POWER Switch	Controls primary input to the AN/URC-9
POWER Indicator	Lights when primary power is applied to the AN/URC-9
DIMMER Control	Controls intensity of panel lights
CHAN SEL Switch	A 21-position switch with positions as follows: REMOTE PRESET — Transfers control to a remote channel selector Positions 1 through 19 — Selects preset channels 1 through 19 MANUAL — Transfers frequency selection to MANUAL FREQUENCY switches
MANUAL FREQUENCY Switches	Select operating frequency when CHAN SEL switch is in MANUAL position as follows: TENS switch — Selects first and second digits UNITS switch — Selects third digit TENTHS switch — Selects fourth digit on AN/URC-9, 9Y and 9AY TENTHS-HUNDREDTHS switch — Selects fourth and fifth digits on AN/URC-9A
Channel Indicator	Indicates preset channel (or manual, M) in use
Frequency Indicators	Indicates frequency in use
SQUELCH Control	Controls the ability to receive weak signals. Setting of SQUELCH control establishes the minimum strength of signal required to operate receiver. When SQUELCH control is in OFF position, squelch circuit is disabled, and receiver sensitivity is maximum. When SQUELCH control is at maximum a 100-microvolt signal is required to operate the squelch circuit. The SQUELCH control is inoperative when CHAN SEL switch is in REMOTE PRESET position.

Table 2-1. Controls and Indicators for Radio Set AN/URC-9 (Continued)

CONTROL NAME	FUNCTION	
SQUELCH DISABLE - PUSH switch	Disables squelch circuit when pressed. Switch is inoperative when CHAN SEL switch is in REMOTE PRESET position.	
CALL LIGHT	Lights when squelch is disabled or signal strong enough to operate the squelch is received.	
VOLUME Control	Adjusts audio level to local speaker or headset	
MODE Switch	Selects following modes of operation:	
	NOR	Normal operation
	RETRANS	Automatic relaying operation
	TONE	Modulates carrier with 1000 Hz tone
Meter and METER switch	The meter monitors any one of 11 functions selected by the METER switch as follows: (See table 2-2 for normal meter reading.)	
	OFF	Meter disconnected
	S METER	Indicates strength of rf power
	SWR	Indicates reflected rf power
	PWR	Indicates rf power output
	DVRI_b	Indicates plate current of transmit driver V105
	PAI_g	Indicates control grid current of transmit power amplifier V106
	PAI_b	Indicates plate current of transmit power amplifier V106
	% MOD	Indicates modulator output
	BIAS	Indicates voltage from -11 volt dc supply
	+26.5V	Indicates voltage from +26.5 volt dc supply

Table 2-1. Controls and Indicators For Radio Set AN/URC-9 (Continued)

CONTROL NAME	FUNCTION	
Meter and METER Switch (cont)	+125V	Indicates voltage from +125 volt dc supply
	+325V	Indicates voltage from +325 volt dc supply in transmit and voltage from +275 volt dc supply in receive
ANT 52 jack	Couples rf energy between AN/URC-9 and antenna	
AUDIO jacks	Provides local audio input, audio output and transmit-receive control	
MIKE/HEADSET jacks	Provides connections for microphone and headset	
Fuses	Protect circuits during overloads	
SPARE FUSES and LAMPS/SPARE LAMPS	Storage dispenser for spare fuses and lamps	
AIR SEALS/VENT	Seals or vents power supply (AN/URC-9Y, 9AY)	
24 VDC INPUT jack	Connects to external power source (AN/URC-9Y, 9AY)	

2-13. OPERATING PROCEDURES.

2-14. MODES OF OPERATION. Radio Set AN/URC-9 has four modes of operation: NOR (normal), RETRANS (retransmit), TONE, and BROADBAND. The operating mode is determined by the positions of the front panel MODE selector switch and the PLAIN-BROADBAND switch on the rear of the unit.

2-15. Normal Mode. With the front panel MODE switch in the NOR position and the PLAIN-BROADBAND switch on the rear of the AN/URC-9 in the PLAIN position, the radio set is in the normal receive condition. Squelch control is available from the front panel of the AN/URC-9 when the CHAN SEL switch is in MANUAL or one of the 19 preset positions. Squelch control is available at Radio Set Control C-2383/URC-9 when the CHAN SEL switch is in the REMOTE PRESET position. When the local or remote microphone push-to-talk button is keyed, the radio set is placed in the normal transmit condition.

2-16. Retransmit Mode. When the AN/URC-9 is properly connected to a similar set, automatic relaying is performed by setting the MODE selector on the front panel of each AN/URC-9 to RETRANS. The radio sets will then automatically relay signals in either direction. Both radio sets operate as receivers until one of the sets receives a signal strong enough to operate the carrier-controlled squelch circuit. The squelch circuit of the receiving set keys the other set to transmit, and the audio of the receiving set is applied to the transmit audio input of the transmitting set. During retransmit, a normal audio signal is heard in the headset of the receiving set and a sidetone audio signal is heard in the headset of the transmitting set. When the signal is no longer present, the transmitting set returns to receive operation. When the microphone push-to-talk switch on either set is actuated, both sets are keyed to transmit and the microphone audio signal is applied to both radio sets for simultaneous (duplex) transmission.

NOTE

When operating in the RETRANS mode, avoid using the same channel frequency on both sets, as coupling between the respective antennas will cause oscillation and prevent relaying of signals; a minimum of 5 MHz channel separation is recommended. Automatic keying of the radio sets also depends on proper adjustment of the squelch controls.

2-17. Tone Mode. With the MODE switch of Radio Set AN/URC-9 in the TONE position, a 1000 Hz (1 kHz) tone oscillator is connected in place of the normal microphone circuit. Keying the transmitter results in the emission of a carrier ulated at not less than 70 percent of 1 kHz. When the transmitter is keyed, a 1 kHz tone should be heard in the headset, and the meter indicator should read midscale in the percent-of-modulation (% MOD) position.

2-18. Broadband Mode. Broadband mode operation, selected by setting the PLAIN-BROADBAND switch at the rear of the Radio Set AN/URC-9 to BROADBAND, is similar to normal mode operation with the following exceptions. During receive, the detected audio signal is applied to auxiliary broadband equipment for decoding. The decoded signal is routed to the audio amplifier and modulator assembly in the AN/URC-9 where it is amplified and applied to the headsets as in the normal mode. The squelch function is not performed by the AN/URC-9 with this mode of operation. During transmit, the microphone signal is applied to the auxiliary broadband equipment, and the resultant coded output connected to the audio amplifier and modulator assembly; the signal is then transmitted in the normal manner. Normal side-tone can be replaced by un-encoded side-tone from the broadband equipment and amplified by the broadband sidetone amplifier in the AN/URC-9.

2-19. FREQUENCY SELECTION. The operating frequency can be selected locally or from a remote station. Both methods are described in the following paragraphs.

2-20. Manual Frequency Selection. Manual frequency selection is accomplished by locally setting the CHAN SEL switch on the AN/URC-9 to the MANUAL position, then selecting the desired frequency with the three MANUAL FREQUENCY switches as follows:

a. Set the CHAN SEL switch to MANUAL. Verify the letter M appears on the Channel Indicator.

b. Set the TENS MANUAL FREQUENCY switch to the first two digits of the required frequency. Verify the first two digits of the channel frequency appear on the Frequency Indicator.

c. Set the UNITS MANUAL FREQUENCY switch to the third digit of the required frequency. Verify the third digit of the channel frequency appears on the Frequency Indicator.

d. Set the TENTHS (AN/URC-9, 9Y, and 9AY) or TENTHS-HUNDREDTHS (AN/URC-9A) switch to the last digit(s) of the required frequency. Verify the full frequency value appears on the Frequency Indicator.

2-21. Local Selection of Preset Channels. Local selection of preset channels is accomplished by setting the CHAN SEL switch on Radio Set AN/URC-9 to the desired channel. Should the preset channel require initial setting or change of frequency setting, perform the applicable procedures in paragraph 2-31.

2-22. Remote Selection of Preset Channels. Remote selection of preset channels is accomplished by setting the CHAN SEL switch on the AN/URC-9 to the REMOTE PRESET position and selecting the desired channel from the remote station.

2-23. OPERATOR PROCEDURES. Table 2-2 is a summary of the normal procedures for operating Radio Set AN/URC-9 locally and from a remote station.

2-24. OPERATION UNDER INTERFERING CONDITIONS. When it appears that equipment is being jammed, a frequency at the extreme of the usable frequency range should be selected. For example, if jamming appears at 225.00 MHz, change the operating frequency to 399.9 MHz (or 399.95 on AN/URC-9A) and vice versa.

2-25. EMERGENCY OPERATION. Should operation of Radio Set AN/URC-9 become affected during emergency or battle condition, use the following procedures. After completing each step in sequence, attempt to resume normal operation of the equipment.

2-26. Remote Operation. For operation of the equipment from a remote station under emergency conditions, proceed as follows:

a. Select an alternate preset channel on the C-2383/URC-9 or switch to an alternate C-1138/UR.

b. Switch to local operation.

2-27. Local Operation. For operation of the equipment locally under emergency conditions, proceed as follows:

a. Set the CHAN SEL switch to MANUAL and select the desired frequency with the MANUAL FREQUENCY switches.

b. Switch to an alternate equipment, AN/URC-9 or equivalent.

2-28. EMERGENCY TURN-OFF. Equipment turn-off during an emergency (e.g. fire, water, smoke, hazard to personnel, etc.) is simply accomplished by setting the POWER switch to OFF.

2-29. OPERATOR MAINTENANCE.

2-30. OPERATOR CHECKS. The following should be performed periodically to ensure Radio Set AN/URC-9 is operating properly.

a. Perform steps for preliminary setting of table 2-2.

b. Connect Wattmeter AN/URM-43( ) (60 watt range) to the ANT jack on the AN/URC-9.

c. Set AN/URC-9 CHAN SEL switch to MANUAL.

d. Set the MANUAL FREQUENCY switches as indicated and at each setting, key to transmit. RF power output should be 16 watts or more.

1. On AN/URC-9, 9Y, or 9AY, rotate TENTHS switch to each position from 0.9 to 0.0. On AN/URC-9A, rotate TENTHS-HUNDREDTHS switch to each position from 0.95 to 0.00.

2. Rotate UNITS switch to each position from 9 to 0. After completing check, set UNITS switch to position 5.

3. Rotate TENS switch to each position from 39 to 22.

2-31. OPERATOR ADJUSTMENTS. Operator adjustments consist of setting the frequency for each of the 19 preset channels.

2-32. Presetting Channel Frequencies on AN/URC-9A. The following are to be performed as required:

a. Energize AN/URC-9A.

b. Set CHAN SEL switch so that the desired channel number on the memory drum appears directly above the chart (see figure 2-5). (The proper CHAN SEL switch position can be determined from the chart.)

c. To position the memory drum for presetting channel 4, set CHAN SEL switch to MANUAL, open memory drum access door and starting at the left, slide the pin for each digit of the assigned frequency to a position directly over the number corresponding to that digit. For example, if the assigned frequency AN/URC-9A for preset channel 4 is 312.45, set the left pin over number 3, the left-center pin over 1, the center pin over 2, the right-center pin over 4, and the right pin over 5.

d. Record the preset channel frequency on the front of the access door.

e. Repeat Steps (2) through (4) for each channel to be preset.

f. Set CHAN SEL switch in turn, to each preset channel, after the tuning cycle is complete, and ensure the proper frequency appears in the frequency indicator windows.

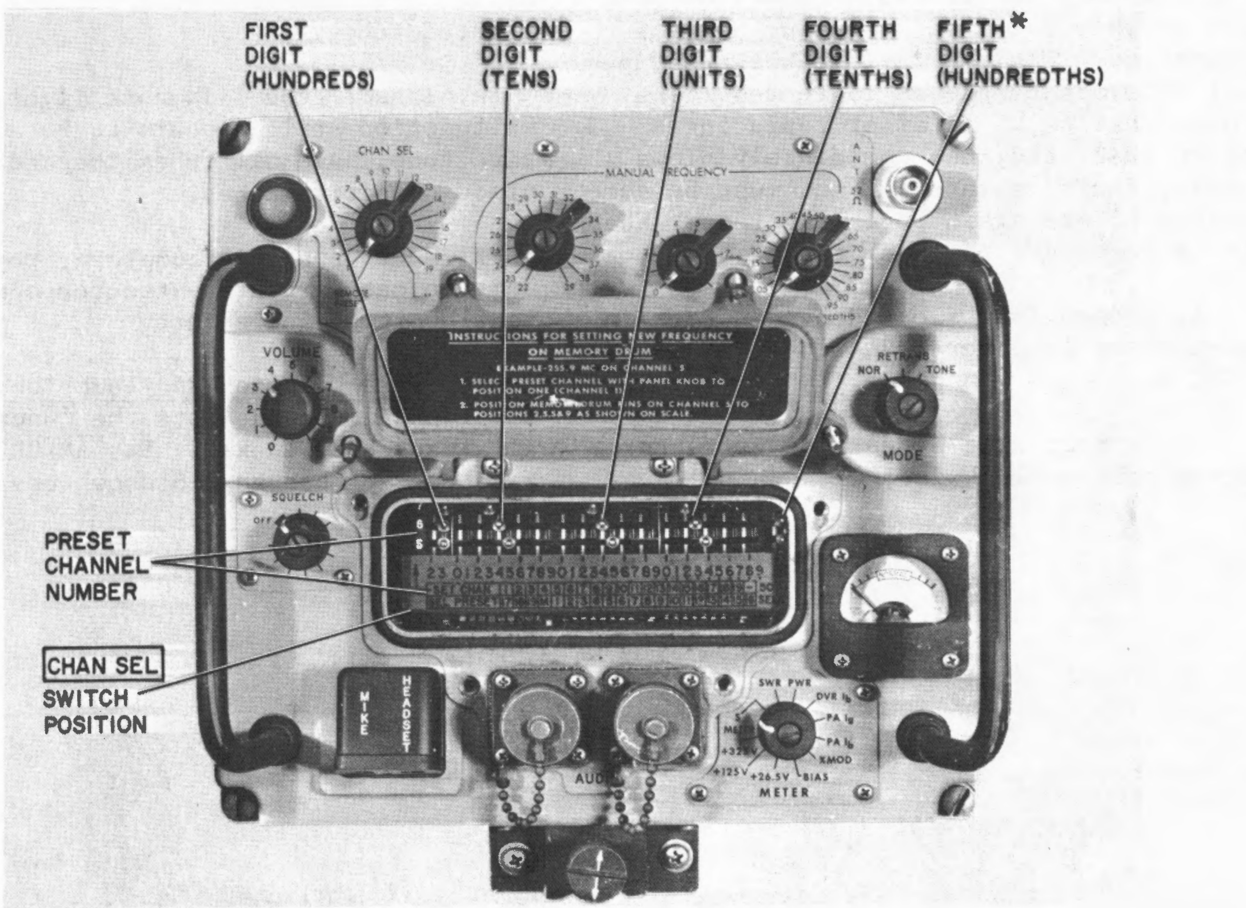
g. Close memory drum access door and secure with four slotted-head screws.

Table 2-2. Summary of Operating Procedures For Radio Set AN/URC-9

STEP	OPERATION		INDICATION
	PRELIMINARY SETTINGS		
1	POWER switch up (power on position)		POWER Indicator lights
2	MODE switch to NOR		
3	PLAIN-BROADBAND switch to PLAIN		
4	Check meter readings		
	CONDITION	METER SWITCH	
	Unkeyed	BIAS	In NORMAL range
		+26.5V	In NORMAL range
		+125V	In NORMAL range
		+325V	In NORMAL range
		S METER	Depends on signal strength
	Keyed	+325V	In NORMAL range
		$DVRI_b$	In NORMAL range
		PAI_g	Center of NORMAL range or above, but do not exceed meter range
		PAI_b	In NORMAL range
		PWR	Center of NORMAL range or above
		SWR	Low end of NORMAL range max.
		% MOD	Should deflect to center of NORMAL range with a strong microphone input
	LOCAL PRESET CHANNEL OPERATION		
1	SQUELCH control to minimum point where noise is squelched		
2	VOLUME control to desired level		
3	CHAN SEL switch to desired channel		
4	Press push-to-talk button and speak into microphone when transmission is desired		

Table 2-2. Summary of Operating Procedures
For Radio Set AN/URC-9 (Continued)

STEP	OPERATION	INDICATION
	REMOTE PRESET CHANNEL OPERATION	
1	CHAN SEL switch to REMOTE PRESET	
2	Repeat steps 1 through 4 for LOCAL PRESET CHANNEL OPERATION using controls of C-2383/URC.	
	REMOTE TRANSMIT-RECEIVE OPERATION	
1	SQUELCH control on AN/URC-9 to minimum point where noise is squelched	
2	CHAN SEL switch on AN/URC-9 to desired channel or to manual and select desired frequency with manual frequency switches	
3	Power switch ON and LOCAL-REMOTE switch to REMOTE on Adapter Control MX-8430/URC-9	ADAPTER on Indicator lights
4	Press push-to-talk button and speak into the microphone, when transmission is desired, at one of the C-1138/UR or C-1207/UR Radio Set Controls selected by the standard 12 wire remote control system.	



*Only on AN/URC-9A

Figure 2-5. Radio Set AN/URC-9, Preset Channel Memory Drum

2-33. Presetting Channel Frequencies on AN/URC-9, 9Y, and 9AY. The procedure for presetting channel frequencies is the same as for the AN/URC-9A given in 2-32 except no fifth digit (xx.x0-x.x5) is available.

2-34. EMERGENCY MAINTENANCE. While equipment is normally maintained by technicians it may be necessary for the operator to perform simple troubleshooting and repair during an emergency. The following information is presented for this purpose.

2-35. Procedure for Simple Repair. Emer-Emergency repair consists of locating and replacing a defective tube or blown fuse. In most cases these faults can be determined by observation. However, before any attempt is made to repair equipment, be sure that the fault is not due to improper control settings. Table 2-3 lists the symptoms and probable causes of trouble as they would occur during normal operation. Table 2-2 lists the front panel meter readings and table 2-4 lists fuse locations. If after replacing a blown fuse, the fuse immediately blows again, fault is internal and must be corrected before again replacing fuse. When it is necessary to check tubes:

a. Loosen four slotted-head screws in corners of Receiver-Transmitter RT-581( ) /URC-9.

b. Extract unit by turning extractor screw counterclockwise; when unit is as far forward as possible, rotate extractor clockwise until it falls free.

c. Pull unit out of case by handles. Electrically connect to case with maintenance Cable CX-7260/URC-9. Make sure that antenna system is connected to ANT jack.

WARNING

Before removing or replacing tubes, de-energize equipment by setting POWER switch to OFF, as many terminals contain high voltages that are dangerous to life.

CAUTION

Before touching any tube, permit the surrounding tubes to cool off.

d. Energize equipment and check that all tube filaments light; replace unlighted tubes.

e. If all tube filaments light, but malfunction still appears to be a defective tube, have all tubes checked; replace defective tubes.

f. When repair is complete, replace unit in case, return extractor screw and panel screws, and secure.

2-36. Fuse Location and Function. Table 2-4 identifies and lists the function of all fuses used in Radio Set AN/URC-9. Figures 2-6 through 2-8 show fuse locations.

Table 2-3. Operator Troubleshooting Procedures

SYMPTOM	PROBABLE CAUSE
NOTE As an initial step, always reset the POWER switch by placing it at OFF; then reapply POWER verifying that all operating controls are properly set.	
AN/URC-9, 9A	
POWER indicator does not light	Fuse F1501, F1502 or F1505 blown; or lamp DS1501 burned out
No BIAS (-11 volts dc) or +125 meter indication	Fuse F1503 or F1506 blown
No +325V meter indication in receive	Fuse F1504 or F1507 blown
No +325V meter indication in transmit	Fuse F1504 blown
Low % MOD meter indication	Tube(s) V802 through V808 defective
PWR meter indication abnormally low during transmit	Tube(s) V101 through V106, V201 through V205, V301 through V305, or V401 defective
Transmit operation is normal but receive operation is abnormal	Tube(s) V303 or V501 through V504 defective; or fuse F1507 blown
Squelch inoperative	Tube V801 defective
AN/URC-9Y, 9AY	
No voltage indications	Fuse 2A5F1 or 2A5F2 blown (PP-4706/URC-9Y) Fuse F1901 or F1902 blown (PP-4706A/URC-9Y)
POWER indicator does not light	Fuse 2A5F1 or 2A5F2 blown (PP-4706/URC-9Y) Fuse F1901 blown (PP-4706A/URC-9Y)
Power supply blower motor inoperative (PP-4706A/URC-9Y)	Fuse F1903 blown (PP-4706A/URC-9Y)
No +26.5V meter indication	Fuse F1907 blown (PP-4706A/URC-9Y)
No +125V meter indication	Fuse 2A5F4 blown (PP-4706/URC-9Y) Fuse F1906 blown (PP-4706A/URC-9Y)
No +325V meter indication	Fuse 2A5F3 blown (PP-4706/URC-9Y) Fuse F1904 blown (PP-4706A/URC-9Y)
Low % MOD meter indication	Tube(s) V802 through V808 defective

Table 2-3. Operator Troubleshooting Procedures (Continued)

SYMPTOM	PROBABLE CAUSE
No % MOD meter indication	Tube(s) V805 through V808 defective
PWR meter indication abnormally low during transmit	Tube(s) V101 through V106, V201 through V205, V301 through V305, or V401 defective
Transmit operation normal - receive operation abnormal	Tube(s) V303 or V501 through V504 defective
Squelch inoperative	Tube V801 defective

Table 2-4. Fuse Complement for Radio Set AN/URC-9

SYMBOL	RATING	FUNCTION
AN/URC-9, 9A		
F1501	3A, 5A	230 and 115 vac-Main primary ac power
F1502	1-1/2A, 3A	230 and 115 vac-Primary ac power to T1501
F1503	3/4A, 1-1/2A	230 and 115 vac-Primary ac power to T1502
F1504	1/2A	+325 vdc-Power supply output (receive-transmit)
F1505	15A	+26.5 vdc-Power supply output
F1506	1/4A	+125 vdc and -11 vdc-Power supply outputs
F1507	.175A	+325 vdc-Power supply output (receive only)
AN/URC-9Y		
2A5F1	20A	+24 vdc-Primary power
2A5F2	20A	-24 vdc-Primary power
2A5F3	.175A	+325 vdc-Power supply output (receive only)
2A5F4	.25A	+125 vdc-Power supply output
AN/URC-9AY		
F1901	25A	+24 vdc-Primary power
F1902	15A	+24 vdc-Primary power
F1903	5A	112 vac-Power supply blower
F1904	1/2A	+325 vdc-Power supply output
F1905	.175A	+325 vdc-Power supply output (receive only)
F1906	.25A	+125 vdc-Power supply output
F1907	5A	+26.5 vdc-Power supply output

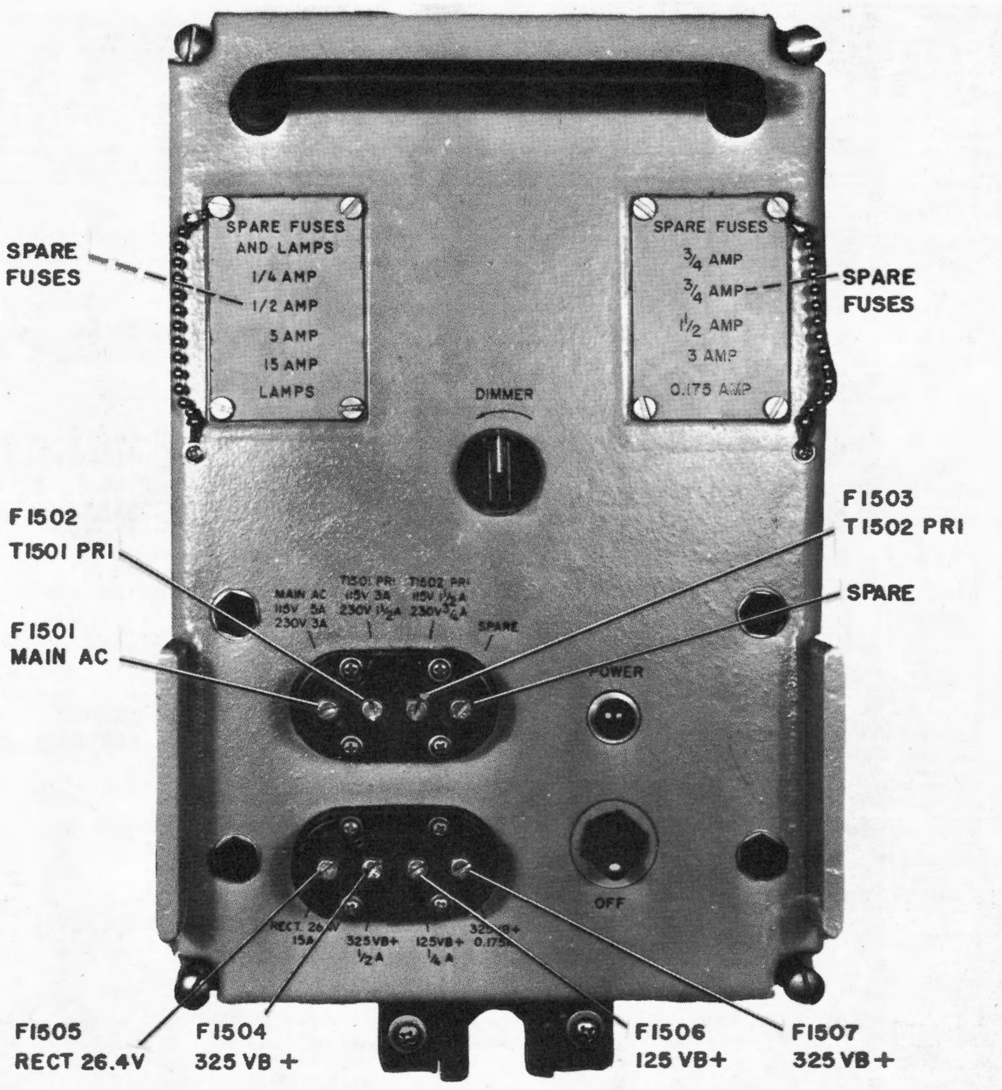


Figure 2-6. Radio Sets AN/URC-9 and 9A, Fuse Location

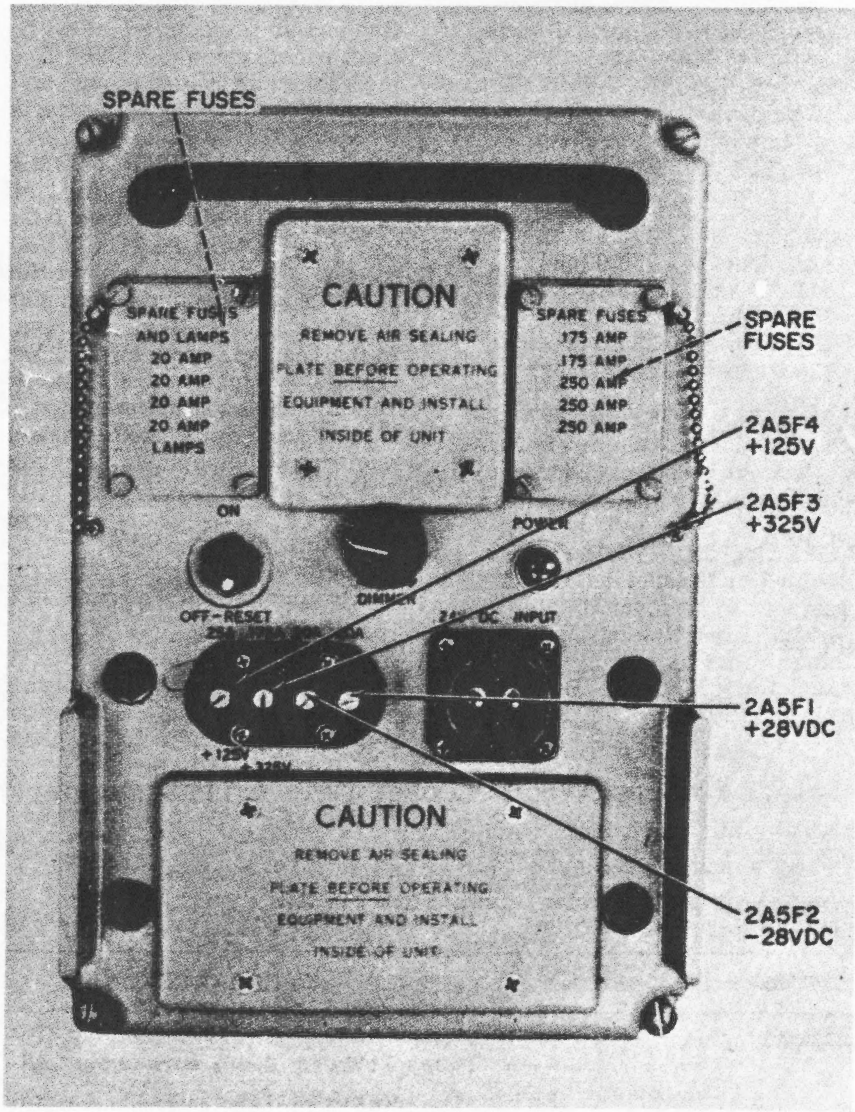


Figure 2-7. Radio Set AN/URC-9Y, Fuse Location

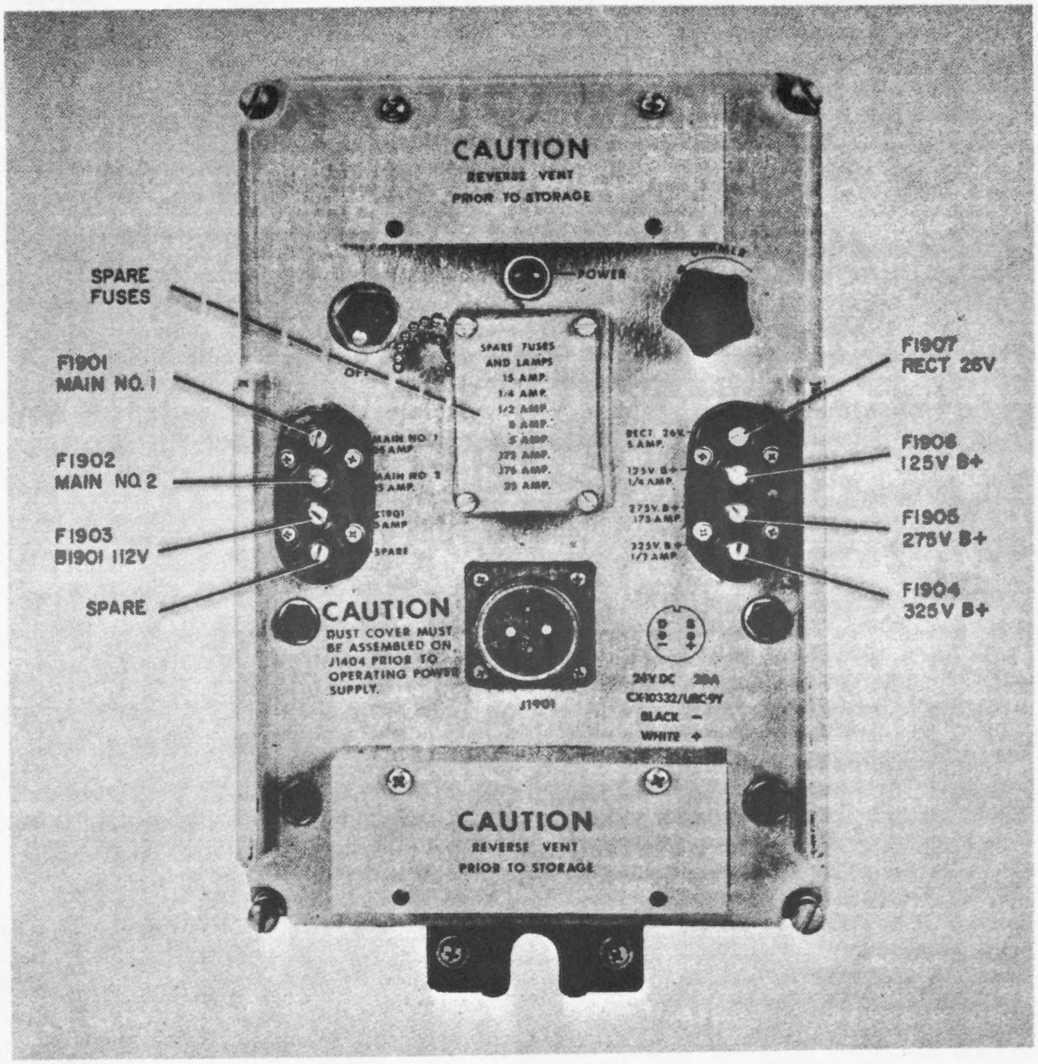


Figure 2-8. Radio Set AN/URC-9AY, Fuse Location

CHAPTER 3

FUNCTIONAL DESCRIPTION

3-1. OVERALL FUNCTIONAL DESCRIPTION.

3-2. Radio Set AN/URC-9( ) is a shipboard unit designed to operate in the ultra-high-frequency (UHF) range. The unit is a tranceiver capable of both transmitting and receiving amplitude-modulated (AM) telephone signals and tone signals. The overall block diagram of the radio set (figure 3-1) illustrates the relationship of the basic assemblies to each other and to external equipment. Refer to paragraph 1-9 for a description of the major assemblies comprising Radio Set AN/URC-9( ).

3-3. RADIO SET AN/URC-9. Radio Set AN/URC-9 operates on any of 1750 channels spaced at 0.1 MHz intervals within a frequency range of 225.0 to 399.9 MHz. Operating as a transmitter, the minimum carrier output is 16 watts, with a modulation capability of 80 percent.

3-4. RADIO SETS AN/URC-9Y AND AN/URC-9AY. Radio Sets AN/URC-9Y and 9AY are functionally identical to the AN/URC-9 differing only in internal power supplies. Refer to paragraph 1-9 for a description of the power supplies.

3-5. RADIO SET AN/URC-9A. Radio Set AN/URC-9A is functionally identical to the AN/URC-9 except that 3500 channels spaced at 0.05 MHz intervals in the 225.00 to 399.95 MHz frequency range are provided.

NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted.

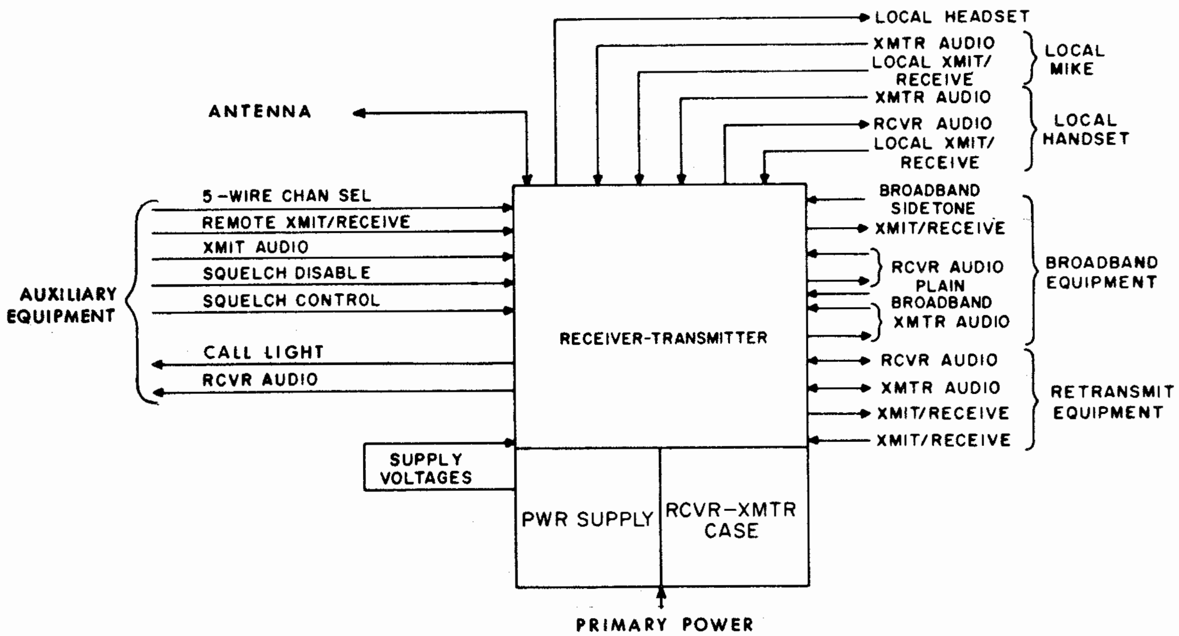


Figure 3-1. Radio Set AN/URC-9( ), Basic Block Diagram

3-6. MODES OF OPERATION. Radio Set AN/URC-9 has four modes of operation. These are normal, retransmit, tone, and broadband. The operating mode is determined by the position of the Receiver-Transmitter RT-581( )/URC-9 front panel MODE selector switch and the PLAIN-BROADBAND switch located at the rear of the unit.

3-7. Normal Mode. With the MODE switch on the receiver-transmitter front panel in the NOR (normal) position and PLAIN-BROADBAND switch on the rear of the unit in the PLAIN position, the radio set receives. Squelch control is available at the front panel of the receiver-transmitter when the CHAN SEL switch is in MANUAL or any of the 19 preset positions. Squelch control is available at Radio Set Control C-2383/URC-9 when the CHAN SEL switch is in the REMOTE PRESET position. Either signal-plus-noise to noise (S+N/N) or carrier-operated squelch may be selected by a wire link in the Audio Amplifier and Modulator of the AN/URC-9. The local audio output level is controlled by a front panel VOLUME control. When the local or remote microphone push-to-talk button is pressed, the radio set is keyed to transmit.

3-8. Retransmit Mode. When the AN/URC-9 is properly connected to a similar set, automatic relaying is performed by setting the MODE selector on the front panel of each receiver-transmitter to RETRANS (retransmit). The radio sets will then automatically relay signals in either direction. Both radio sets operate as receivers until one of the sets receives a signal strong enough to operate the carrier-controlled squelch circuit. The squelch circuit of the receiving set keys the other set to transmit, and the audio of the receiving set is applied to the transmit audio input of the transmitting set. A normal audio signal is present at the headset of the receiving set and a sidetone audio signal is present at the head-set of the transmitting set. When the signal is no longer present, the transmitting set returns to receive operation. When the microphone push-to-talk switch on either set is actuated, both sets are keyed to transmit and the microphone audio signal is applied to both radio sets for simultaneous (duplex) transmission.

NOTE

When operating in the RETRANS mode, the use of the same channel frequency on both sets should be avoided as feedback between the respective antennas will prevent relaying of signals; a 5 MHz channel separation is recommended. Automatic keying of the radio sets also depends on proper adjustment of the squelch controls.

3-9. Tone Mode. With the MODE switch in the TONE position, a 1000 Hz tone oscillator is connected in place of the normal microphone circuit. Keying the transmitter results in the emission of a carrier modulated not less than 70 percent at 1000 Hz. A 1000 Hz tone is audible in the headset, and the percent of modulation indicated on the meter should be at midscale.

3-10. Broadband Mode. Broadband operation, selected by setting the PLAIN-BROADBAND switch at the rear of the receiver-transmitter to BROADBAND, is similar to normal (NOR) operation except for the following:

a. During receive, the audio signals are rerouted through broadband equipment and the squelch function is not performed by the AN/URC-9. The decoded broadband audio is then applied to the headsets through the Audio Amplifier and Modulator.

b. During transmit, the microphone signal is applied to the broadband equipment, and the encoded output of the broadband equipment is connected to the Audio Amplifier and Modulator; the resultant signal is then transmitted in the normal manner.

c. Normal sidetone is replaced by unencoded sidetone from the broadband equipment and amplified by the Broadband Sidetone Amplifier in the AN/URC-9.

3-11. CHANNEL SELECTION. Local channel selection is accomplished by setting the CHAN SEL switch to the desired channel. Nineteen channel frequencies are preset on the channel memory drum which is accessible through a door on the receiver-transmitter front panel. When the CHAN SEL switch is in the MANUAL position, the frequency of operation is controlled by the MANUAL FREQUENCY switches on the front panel. When the CHAN SEL switch is in the REMOTE PRESET position, the channel preset information is received from Radio Set Control C-2383/URC-9.

3-12. TRANSMIT FUNCTION.

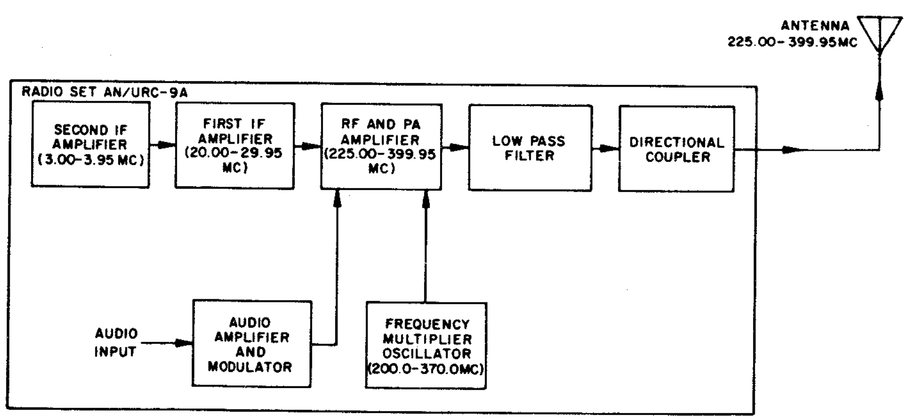
NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted.

NOTE

Frequencies in the following description are applicable to AN/URC-9A; frequencies for AN/URC-9, -9Y, and -9AY are the same less the hundredths position.

3-13. SIGNAL PATH. (Figure 3-2.) The transmit rf signal originates in a 3.00 to 3.95-MHz crystal-controlled oscillator in the Second IF Amplifier. This signal is amplified and sent to the First IF Amplifier where it is heterodyned with a 17 to 26-MHz signal from a crystal-controlled oscillator, producing a sum frequency of one of 200 frequencies in the 20.00 of 29.95-MHz range. This signal is amplified and passed to the Radio Frequency (RF) and Power Amplifier (PA) where it is mixed with one of 18 frequencies in the 200 to 370-MHz range as injected by the Frequency Multiplier-Oscillator (FMO). The resultant signal, in the range of 225.00 to 399.95 MHz, is applied to the power amplifier. The rf power output is modulated by an amplified audio signal from the Audio Amplifier and Modulator. The final signal is routed through a low-pass filter and a directional coupler to the antenna.



NOTE:
FREQUENCIES SHOWN ARE FOR AN/URC-9A. FREQUENCIES FOR AN/URC-9, 9Y, AND 9AY ARE THE SAME LESS THE HUNDREDTHS POSITION.

Figure 3-2. Transmitter Section, Block Diagram

3-14. DETAILED DESCRIPTION. The transmit function encompasses parts of all assemblies (except the Third IF Amplifier) in Receiver-Transmitter RT-581( )/URC-9 of Radio Set AN/URC-9.

3-15. The initial frequency, in the range of 3.00 to 3.95-MHz, is generated in the Second IF Amplifier (see figure 5-2). The signal is generated by third oscillator V401B and amplified by V401A, which functions as a buffer amplifier during transmit. The signal is then sent to first transmit mixer V304 in the First IF Amplifier where it is mixed with a frequency in the range of 17 to 26 MHz which is generated by second oscillator V305. The resultant sum frequency, in the 20.00 to 29.95-MHz range is then sent to if amplifiers V301 and V302 for amplifications.

3-16. After amplification, the signal passes to second transmit mixer V101 in the RF and PA Amplifier. Here it is heterodyned with the 200 to 370-MHz signal from the FMO (comprised of first oscillator-multiplier V201; frequency tripler V202; and injection amplifiers V203, V204, and V205) to produce a frequency in the range of 225.00 to 399.95 MHz. This signal is then sent to rf amplifiers V102, and V103, and V104. Following amplification, the 225.00 to 399.95-MHz signal is applied through transmit driver V105 to transmit power amplifier V106.

3-17. The audio input from the microphone (figure 5-3) is applied to audio amplifier V803 in the Audio Amplifier and Modulator through MODE switch S702 and microphone transformer T601. After amplification, the signal is routed through audio and modulator driver V804 and phase-splitting transformer T801 to audio output amplifiers V805 through V808. The amplified audio signal is then applied to the plate of transmit driver V105, and to the plate and screen grid of transmit power amplifier V106 where it modulates the 225.00 to 399.95-MHz rf carrier. The modulated rf output of V106 (figure 5-2), a minimum of 16 watts, passes through low-pass filter FL1101 and the directional coupler to the antenna.

3-18. STAGE AND SPECIAL CIRCUIT DESCRIPTION. The conventional transmitter electronic circuits are briefly described at the stage level; special and unique circuits are described in greater detail. Block diagrams and simplified schematics in this chapter and the maintenance schematic diagrams in Chapter 5 are used to support the descriptive text.

3-19. Functional Relationship of Assemblies. The overall functional relationship of the assemblies within Radio Set AN/URC-9 for both the transmit and receive functions are illustrated in figure 3-3. The Frequency Selector controls the tuning of the Second IF Amplifier, First IF Amplifier, RF and PA Amplifier, and FMO assemblies. The mode of operation (NOR, RETRANS, OR TONE) is selected by the MODE switch. When in the TONE position, the MODE switch substitutes the output of the 1 kHz tone oscillator in place of the normal microphone of retransmit audio inputs. Broadband or plain operation is selected by placing the BROADBAND-PLAIN switch (S1401) in the desired position. All operating voltages for the circuits within Receiver-Transmitter RT-581( )/URC-9 for Radio Sets AN/URC-9 and -9A, are furnished by Power Supply PP-2702/URC-9. Operating voltages for RT-581( )/URC-9 in Radio Set AN/URC-9Y are supplied by Power Supply PP-4706/URC-9Y. Power Supply PP-4706A/URC-9Y provides the RT-581( )/URC-9 operating voltages for Radio Set AN/URC-9AY.

3-20. Second IF Amplifier. The Second IF Amplifier generates the initial frequency that is eventually converted to the final rf carrier.

3-21. Radio Set AN/URC-9A. The Second IF Amplifier (figure 5-8) in Radio Set AN/URC-9A consists of third oscillator V401B and crystals Y401A through Y410A, and Y401B through Y410B that range from 3.00 to 3.95 MHz in 0.05-MHz steps.

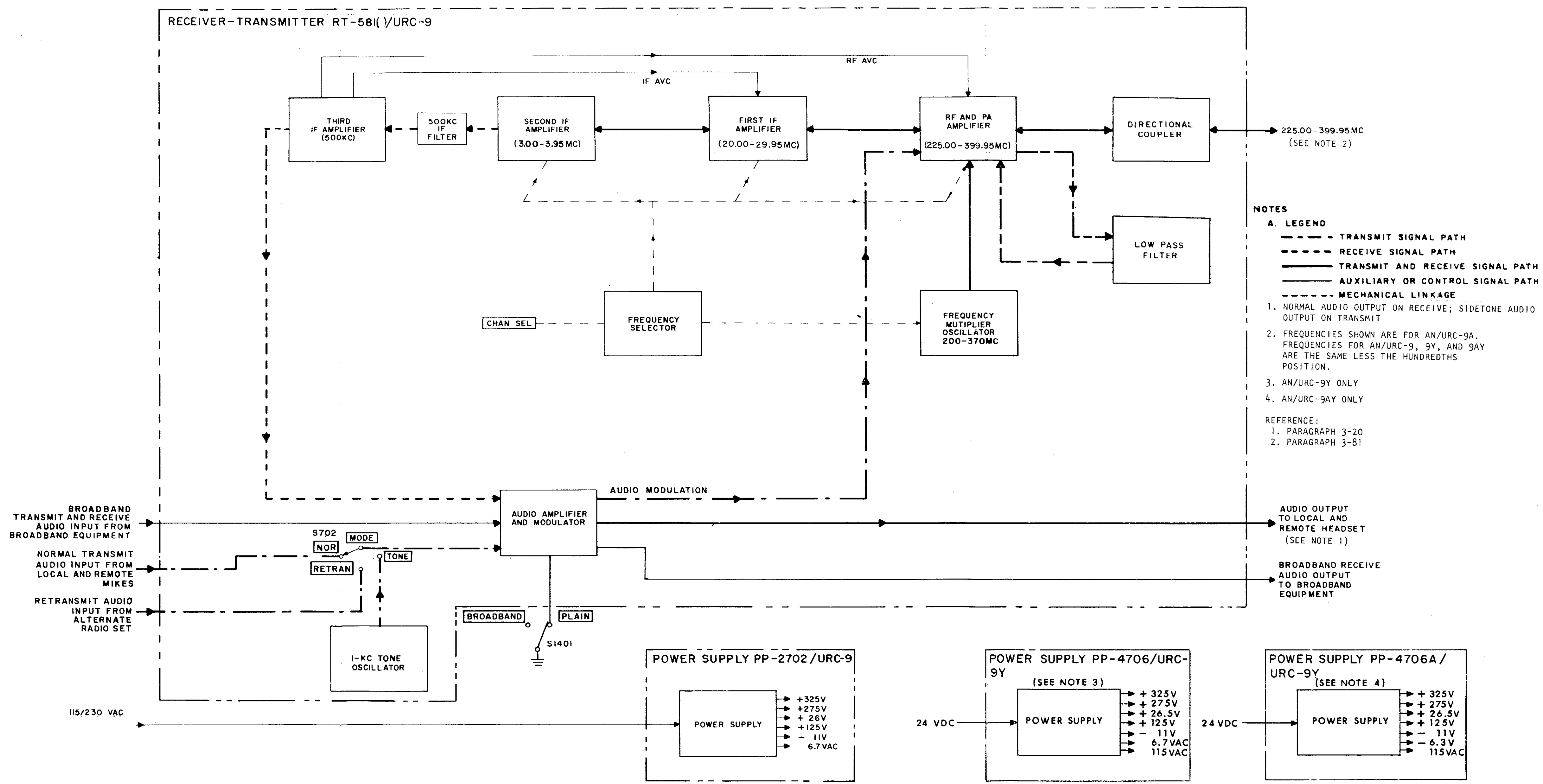


Figure 3-3. Radio Set AN/URC-9( ), Functional Block Diagram

Tube V401A, a buffer amplifier at transmit, functions as a mixer at receive. The tuning of all stages of this assembly is controlled by the 10-position, 0.1-MHz shaft of the Frequency Selector.

3-22. Refer to figure 5-114 during the following discussion. When the radio set is keyed to transmit, t/r relay K401 energizes and transfers the control grid circuit of third oscillator V401B from contact 8 to contact 4 of hundredths relay K402, thus enabling the selection of crystals relative to the frequency in use. (Refer to table 3-1). Relay K402 provides a connection through contacts 6 or 7 to S401 or S402, depending on whether the last digit of the frequency selected is x.x0 or x.x5, respectively. Switches S401 and S402, driven by the 10-position, 0.1-MHz shaft, select crystals corresponding to the next to the last digit of the frequency selected (x.0x through x.9x). For example, when the radio set is tuned to a frequency with the last digits of xxx.90, the 3.90-MHz crystal Y410A is connected between ground and the grid of V401B through contacts 6 and 5 of S401, contacts 6 and 4 of K402, and contacts 3 and 8 of K401 (energized on transmit).

Table 3-1. Second IF Amplifier RF Injection Chart, AN/URC-9A Only

	TRANSMIT		RECEIVE		
SELECTED CHANNEL FREQUENCY (MHz)	SELECTED CRYSTAL FREQUENCY (MHz)	INJECTION TO 1ST TRANSMIT MIXER (MHz)	SELECTED CRYSTAL FREQUENCY (MHz)	INJECTION TO 3RD RECEIVE MIXER (MHz)	INPUT FROM 1ST IF AMPL (MHz)
xxx.95	3.95	3.95	3.45	3.45	3.95
xxx.90	3.90	3.90	3.40	3.40	3.90
xxx.85	3.85	3.85	3.35	3.35	3.85
xxx.80	3.80	3.80	3.30	3.30	3.80
xxx.75	3.75	3.75	3.25	3.25	3.75
xxx.70	3.70	3.70	3.20	3.20	3.70
xxx.65	3.65	3.65	3.15	3.15	3.65
xxx.60	3.60	3.60	3.10	3.10	3.60
xxx.55	3.55	3.55	3.05	3.05	3.55
xxx.50	3.50	3.50	3.00	3.00	3.50
xxx.45	3.45	3.45	3.95	3.95	3.45
xxx.40	3.40	3.40	3.90	3.90	3.40
xxx.35	3.35	3.35	3.85	3.85	3.35
xxx.30	3.30	3.30	3.80	3.80	3.30
xxx.25	3.25	3.25	3.75	3.75	3.25
xxx.20	3.20	3.20	3.70	3.70	3.20
xxx.15	3.15	3.15	3.65	3.65	3.15
xxx.10	3.10	3.10	3.60	3.60	3.10
xxx.05	3.05	3.05	3.55	3.55	3.05
xxx.00	3.00	3.00	3.50	3.50	3.00

3-23. A voltage divider consisting of series-connected capacitors C412 and C413 determines the electrical position of the cathode of third oscillator V401B relative to the grid of V410B. The tuned circuit of the third oscillator consists of the selected crystal (Y401A in this case), capacitors C412 and C413, plus the grid-to-ground and cathode-to-ground capacitance of V401B. The third oscillator is a Colpitts type with the crystal acting as an inductance. The value of the total capacitance is such that oscillation is maintained at the fundamental frequency of the crystal. Cathode resistor R404 provides additional bias to protect V401B in case oscillation stops. Coil L407 isolates bias resistor R404 from the crystal circuit. Plate voltage is from the +125-vdc supply through R407 and filter FL404. Test point J404 provides for measuring the voltage developed across third oscillator grid resistor R403. Resistor R402 isolates J404 from the crystal circuit. Capacitor C417 couples the signal from the cathode of V401B to the control grid of V401A.

3-24. On transmit, V401A functioning as a buffer amplifier, amplifies the output of third oscillator V401B. Resistor R409 is disconnected from the plate circuit by contacts 4 and 6 of relay K401 (energized on transmit). This increases the plate voltage applied to V401A and, in turn, plate current and the level of the output signal developed across cathode load resistor R405. The output voltage, taken across cathode resistor R405 is coupled through C411, and bandpass filters Z403, Z402, and Z401 to first transmit mixer V304 of the First IF Amplifier. The three parallel-resonant tank circuits (Z403, Z402, and Z401) form a 3.00 to 3.95-MHz bandpass filter. Test point J402 provides for measuring the 3.00 to 3.95-MHz output signal and Resistor R406 provides the grid return for V401A.

3-25. Radio Sets AN/URC-9, -9Y, and -9AY. The Second IF Amplifier (figure 5-7) in Radio Sets AN/URC-9, -9Y, and -9AY consists of third oscillator V401B and crystals Y401 through Y410 which range from 3.0 to 3.9 MHz in 0.1-MHz steps. Tube V401A, a buffer amplifier at transmit, functions as a mixer a receive. The 10-position, 0.1 MHz shaft of the Frequency Selector controls the tuning of this assembly during both the receive and transmit functions.

3-26. Refer to figure 5-113 during the following discussion. When the radio set is keyed to transmit, t/r relay K401 energizes and transfers the control-grid circuit of third oscillator V401B from selector switch S401 to S402, thus enabling the selection of crystals relative to the frequency in use. (Refer to table 3-2.) Switch S402, driven by the 10-position, 0.1-MHz shaft, selects a crystal that corresponds to the frequency to which filter network Z401, Z402 and Z403 are tuned. Thus, when the radio set is tuned to xxx.9 MHz, the 3.9-MHz crystal (Y410) is connected across the grid of V401B through contacts 9 and 10 of switch S402 and contacts 3 and 2 of relay K401 (energized on transmit). The 3.9-MHz output of V401B is coupled through C417 and across R406 of the V401A grid circuit.

3-27. During transmit, resistor R409 is disconnected from the plate circuit of V401A by contacts 4 and 5 of relay K401. This action increases plate voltage, and, in turn, plate current thereby amplifying the output signal developed across cathode load resistor R405. The output signal is then coupled through C411 and bandpass filters Z403, Z402, and Z401 and applied to first transmit mixer V304 of the First IF Amplifier.

NOTE

The remaining components operate as described in paragraphs 3-24 and 3-25.

3-28. <u>First IF Amplifier</u>. The First IF Amplifier generates a signal in the 17 to 26-MHz range that is mixed with the input signal from the Second IF Amplifier. The resultant sum signal of 20.00 to 29.95 MHz is then amplified and applied to the RF and PA Amplifier (figure 5-6).

Tube V401A, a buffer amplifier at transmit, functions as a mixer at receive. The tuning of all stages of this assembly is controlled by the 10-position, 0.1-MHz shaft of the Frequency Selector.

3-22. Refer to figure 5-114 during the following discussion. When the radio set is keyed to transmit, t/r relay K401 energizes and transfers the control grid circuit of third oscillator V401B from contact 8 to contact 4 of hundredths relay K402, thus enabling the selection of crystals relative to the frequency in use. (Refer to table 3-1). Relay K402 provides a connection through contacts 6 or 7 to S401 or S402, depending on whether the last digit of the frequency selected is x.x0 or x.x5, respectively. Switches S401 and S402, driven by the 10-position, 0.1-MHz shaft, select crystals corresponding to the next to the last digit of the frequency selected (x.0x through x.9x). For example, when the radio set is tuned to a frequency with the last digits of xxx.90, the 3.90-MHz crystal Y410A is connected between ground and the grid of V401B through contacts 6 and 5 of S401, contacts 6 and 4 of K402, and contacts 3 and 8 of K401 (energized on transmit).

Table 3-1. Second IF Amplifier RF Injection Chart, AN/URC-9A Only

SELECTED CHANNEL FREQUENCY (MHz)	TRANSMIT		RECEIVE		INPUT FROM 1ST IF AMPL (MHz)
	SELECTED CRYSTAL FREQUENCY (MHz)	INJECTION TO 1ST TRANSMIT MIXER (MHz)	SELECTED CRYSTAL FREQUENCY (MHz)	INJECTION TO 3RD RECEIVE MIXER (MHz)	
xxx.95	3.95	3.95	3.45	3.45	3.95
xxx.90	3.90	3.90	3.40	3.40	3.90
xxx.85	3.85	3.85	3.35	3.35	3.85
xxx.80	3.80	3.80	3.30	3.30	3.80
xxx.75	3.75	3.75	3.25	3.25	3.75
xxx.70	3.70	3.70	3.20	3.20	3.70
xxx.65	3.65	3.65	3.15	3.15	3.65
xxx.60	3.60	3.60	3.10	3.10	3.60
xxx.55	3.55	3.55	3.05	3.05	3.55
xxx.50	3.50	3.50	3.00	3.00	3.50
xxx.45	3.45	3.45	3.95	3.95	3.45
xxx.40	3.40	3.40	3.90	3.90	3.40
xxx.35	3.35	3.35	3.85	3.85	3.35
xxx.30	3.30	3.30	3.80	3.80	3.30
xxx.25	3.25	3.25	3.75	3.75	3.25
xxx.20	3.20	3.20	3.70	3.70	3.20
xxx.15	3.15	3.15	3.65	3.65	3.15
xxx.10	3.10	3.10	3.60	3.60	3.10
xxx.05	3.05	3.05	3.55	3.55	3.05
xxx.00	3.00	3.00	3.50	3.50	3.00

3-23. A voltage divider consisting of series-connected capacitors C412 and C413 determines the electrical position of the cathode of third oscillator V401B relative to the grid of V410B. The tuned circuit of the third oscillator consists of the selected crystal (Y401A in this case), capacitors C412 and C413, plus the grid-to-ground and cathode-to-ground capacitance of V401B. The third oscillator is a Colpitts type with the crystal acting as an inductance. The value of the total capacitance is such that oscillation is maintained at the fundamental frequency of the crystal. Cathode resistor R404 provides additional bias to protect V401B in case oscillation stops. Coil L407 isolates bias resistor R404 from the crystal circuit. Plate voltage is from the +125-vdc supply through R407 and filter FL404. Test point J404 provides for measuring the voltage developed across third oscillator grid resistor R403. Resistor R402 isolates J404 from the crystal circuit. Capacitor C417 couples the signal from the cathode of V401B to the control grid of V401A.

3-24. On transmit, V401A functioning as a buffer amplifier, amplifies the output of third oscillator V401B. Resistor R409 is disconnected from the plate circuit by contacts 4 and 6 of relay K401 (energized on transmit). This increases the plate voltage applied to V401A and, in turn, plate current and the level of the output signal developed across cathode load resistor R405. The output voltage, taken across cathode resistor R405 is coupled through C411, and bandpass filters Z403, Z402, and Z401 to first transmit mixer V304 of the First IF Amplifier. The three parallel-resonant tank circuits (Z403, Z402, and Z401) form a 3.00 to 3.95-MHz bandpass filter. Test point J402 provides for measuring the 3.00 to 3.95-MHz output signal and Resistor R406 provides the grid return for V401A.

3-25. Radio Sets AN/URC-9, -9Y, and -9AY. The Second IF Amplifier (figure 5-7) in Radio Sets AN/URC-9, -9Y, and -9AY consists of third oscillator V401B and crystals Y401 through Y410 which range from 3.0 to 3.9 MHz in 0.1-MHz steps. Tube V401A, a buffer amplifier at transmit, functions as a mixer a receive. The 10-position, 0.1 MHz shaft of the Frequency Selector controls the tuning of this assembly during both the receive and transmit functions.

3-26. Refer to figure 5-113 during the following discussion. When the radio set is keyed to transmit, t/r relay K401 energizes and transfers the control-grid circuit of third oscillator V401B from selector switch S401 to S402, thus enabling the selection of crystals relative to the frequency in use. (Refer to table 3-2.) Switch S402, driven by the 10-position, 0.1-MHz shaft, selects a crystal that corresponds to the frequency to which filter network Z401, Z402 and Z403 are tuned. Thus, when the radio set is tuned to xxx.9 MHz, the 3.9-MHz crystal (Y410) is connected across the grid of V401B through contacts 9 and 10 of switch S402 and contacts 3 and 2 of relay K401 (energized on transmit). The 3.9-MHz output of V401B is coupled through C417 and across R406 of the V401A grid circuit.

3-27. During transmit, resistor R409 is disconnected from the plate circuit of V401A by contacts 4 and 5 of relay K401. This action increases plate voltage, and, in turn, plate current thereby amplifying the output signal developed across cathode load resistor R405. The output signal is then coupled through C411 and bandpass filters Z403, Z402, and Z401 and applied to first transmit mixer V304 of the First IF Amplifier.

NOTE

The remaining components operate as described in paragraphs 3-24 and 3-25.

3-28. First IF Amplifier. The First IF Amplifier generates a signal in the 17 to 26-MHz range that is mixed with the input signal from the Second IF Amplifier. The resultant sum signal of 20.00 to 29.95 MHz is then amplified and applied to the RF and PA Amplifier (figure 5-6).

Table 3-2. Second IF Amplifier RF Injection Chart, AN/URC-9, -9Y, and -9AY

SELECTED CHANNEL FREQUENCY (MHz)	TRANSMIT		RECEIVE		INPUT FROM 1ST IF AMPL (MHz)
	SELECTED CRYSTAL FREQUENCY (MHz)	INJECTION TO 1ST TRANSMIT MIXER (MHz)	SELECTED CRYSTAL FREQUENCY (MHz)	INJECTION TO 3RD RECEIVE MIXER (MHz)	
xxx.9	3.9	3.9	4.3	3.4	3.9
xxx.8	3.8	3.8	3.3	3.3	3.8
xxx.7	3.7	3.7	3.2	3.2	3.7
xxx.6	3.6	3.6	3.1	3.1	3.6
xxx.5	3.5	3.5	3.0	3.0	3.5
xxx.4	3.4	3.4	3.9	3.9	3.4
xxx.3	3.3	3.3	3.8	3.8	3.3
xxx.2	3.2	3.2	3.7	3.7	3.2
xxx.1	3.1	3.1	3.6	3.6	3.1
xxx.0	3.0	3.0	3.5	3.5	3.0

3-29. The First IF Amplifier, at transmit, consists of stages V301, V302, V304 and V305, and crystals Y301 through Y310 ranging from 17 to 26 MHz in 1-MHz steps. At transmit, the 3.00 to 3.95-MHz signal from the Second IF Amplifier is applied to the control grid of first transmit mixer V304. This input is mixed in V304 with the 17 to 26-MHz signal injected from second oscillator V305. The subsequent 20.00 to 29.95-MHz output (first IF signal) is amplified by V301 and V302 and then applied to the RF and PA Amplifier. The 100-position, 0.1-MHz shaft of the frequency selector controls the tuning of V301 and V302; the 10-position, 1-MHz shaft controls frequency selection and the tuning of V304 and V305.

3-30. Refer to figure 5-112 during the following discussion. On transmit, first transmit mixer V304 heterodynes the 3.00 to 3.95-MHz signal from the Second IF Amplifier with the 17 to 26-MHz output of second oscillator V305 to produce the first if signal between 20.00 to 29.95 MHz (see table 3-3).

Table 3-3. First IF Amplifier RF Injection Chart

SELECTED CHANNEL FREQUENCY (MHz)	17 to 26- MHz OSCILLATOR		INPUT/OUTPUT IF (MHz)
	SELECTED CRYSTAL FREQUENCY (MHz)	INJECTION TO SECOND RECEIVE MIXER OR TO FIRST TRANSMIT MIXER (MHz)	
xx9.xx	26	26	29.xx
xx8.xx	25	25	28.xx
xx7.xx	24	24	27.xx
xx6.xx	23	23	26.xx
xx5.xx	22	22	25.xx
xx4.xx	21	21	24.xx
xx3.xx	20	20	23.xx
xx2.xx	19	19	22.xx
xx1.xx	18	18	21.xx
xx0.xx	17	17	20.xx

Capacitor C339 couples the 3.00 to 3.95-MHz signal from the Second IF Amplifier to first transmit mixer V304. Test point J304 provides means for measuring the 3.00 to 3.95-MHz injection signal. Resistor R319 provides grid leak for V304, and inductors L318 and L319 are harmonic suppressors on the input line.

3-31. Second oscillator V305 is controlled by crystals Y301 through Y310. Crystal switches S301 and S302 select the proper crystal according to the setting of the Frequency Selector. One half (pins 6, 7, and 8) of tube V305A is a grounded-grid amplifier working into parallel-tuned tank Z307, which constitutes its plate load. The tank is ganged with the crystal switches driven by the 10-position, 1-MHz shaft of the frequency selector. Capacitor C343 couples the output from the plate (pin 6) of grounded-grid amplifier V305A to the control grid (pin 3) of cathode follower V305B, the other half of the tube. The crystal couples the output (pin 2) of the cathode follower to the cathode (pin 8) of the grounded-grid amplifier. The crystals operate at series resonance to provide low impedance coupling with zero phase shift. The phase shift through the cathode follower is also zero. Thus, an in-phase voltage is routed back to the cathode of the grounded-grid amplifier sustaining conditions for oscillation. Coil L311 resonates the crystal socket capacitance and prevents it from affecting the operation of the circuit. Resistors R321 and R322 provide the coupling impedance at the cathodes and bias for the two sections of the tube.

3-32. The 17 to 26-MHz output of second oscillator V305 is coupled to the cathode of V304 from oscillator plate load Z307 through capacitive voltage divider C337 and C338. Cathode resistor R317 provides bias for V304 and coupling impedance for the 17 to 26-MHz signals; inductors L314, and L315 and capacitor C348 form a harmonic suppression network. Plate and screen-grid voltages for the first transmit mixer are supplied from the +125-vdc supply via contacts 19 and 20 (closed on transmit) of t/r relay K602 in the Relay-Filter (see figure 5-100), and feed-through capacitor C334. Capacitors C334, C331, C341, and C342 provide a low-impedance path to ground for rf in the plate and screen-grid circuits.

3-33. The signal (between 20.00 and 29.95-MHz) developed across first transmit mixer plate load L309 is coupled to the control grid of if amplifier V301 through capacitors C335 and C305 and parasitic suppressor R324; inductors L316 and L317 are harmonic suppressors in the coupling path. Tube V301 grid circuit if avc bus is grounded by contacts 19 and 20 (closed on transmit) of t/r relay K802 in the Audio Amplifier and Modulator (see figure 5-116), and the ground is removed from V301 screen-grid voltage divider resistor R303 by contacts 15 and 16 (open on transmit) of t/r relay K602 in the Relay-Filter (see figure 5-118). The latter action causes the screen-grid voltage of V301 to rise to a value higher on transmit than on receive. Capacitor C319 grounds the cathode of V301 for rf. Series resistors R304, R305, and R303 form a voltage divider that provides proper plate and screen-grid voltages to V301. Resistor R304 is also connected to the +125-vdc supply.

3-34. Parallel-tuned tank Z303 is the plate load for V301. Capacitor C308 couples the if signal to the next parallel-tuned tank, Z304. Capacitor C311 couples the if signal to the control grid of second if amplifier V302 through parasitic suppressor R307. A similar network (Z305, C314, Z306 and C315) couples the amplified 20.00 to 29.95-MHz signal to V101 in the RF and PA Amplifier (see figure 5-110). Series resistors R309, R325, and R326 form a voltage divider that provides proper plate and screen-grid voltages to V302. The dc voltage developed across R308 is applied to the S meter circuit (figure 5-119) to provide an indication of the input signal strength. Parallel tank circuits Z303 and Z304 are tuned by the 100-position, 0.1-MHz shaft of the frequency selector.

Trimmer capacitors C306 and C309 are adjusted to set the inductance to capacitance ratio for proper tracking. Test jacks J301 and J302 provide a means for measuring the bias developed by the drive to the control grids of if amplifiers V301 and V302, respectively. Second receive mixer V303 is disabled on transmit by removing the +125 vdc plate voltage through the open contacts 18 and 19 of t/r relay K602 in the Relay-Filter (see figure 5-99).

3-35. Frequency Multiplier-Oscillator. The FMO (figure 5-5) generates frequencies in the 200 to 370-MHz range. These frequencies are injected into the RF and PA Amplifier during both transmit and receive operations. Operation of the FMO is identical during both transmit and receive operation. The 18-position, 10-MHz shaft of the Frequency Selector controls the tuning of all stages within this assembly.

3-36. First oscillator-multiplier V201 is a crystal-controlled, cathode-coupled oscillator especially designed for use with overtone crystals (see figure 5-111). The right half of the twin triode tube operates as a grounded-grid amplifier and is capacitively coupled to the left half, which acts as a cathode follower. Capacitor C207 couples the signal from the plate (pin 4) of the grounded-grid amplifier to the control grid (pin 7) of the cathode follower. The crystal, which couples the output of the cathode follower to the cathode (pin 2) of the amplifier, operates at series resonance to provide low impedance coupling with zero phase shift. The phase shift through the amplifier is also zero; thus, an in-phase signal is fed back to the grounded-grid amplifier satisfying the conditions required for sustained oscillation.

3-37. Crystals Y202, Y204, and Y206 through Y218 have one common side connected through C204 to pin 2 of V201. The grounded crystal cases produce a large capacitance to ground at pin 2 of V201; however, L219 resonates with this capacitance and cancels its effect on the circuit. In a similar manner, L220 resonates with the crystal socket capacitance, thereby cancelling its effect on the operation of the circuit. Trimmer coils L201 through L218, inclusive, are used with their respective crystals to tune the plate of the grounded-grid amplifier to resonance. Capacitor C201 prevents the plate voltage on pin 4 of V201 from being grounded through the trimmer coils. Capacitor C236 is a temperature-compensating capacitor. The grid (pin 3) of the grounded-grid amplifier is grounded through parasitic suppressor R202; resistors R203 and R204 provide the coupling impedances (and bias) at the cathodes for the two halves of V201.

3-38. Plate voltage for the cathode follower is supplied through step tuner Z201, trimmer coil L222, and parasitic suppressor R206. The step tuner in the oscillator output tank is tuned to the second harmonic of the crystal frequency by the 18-position, 10-MHz shaft of the frequency selector when the set operates in the 220 to 299.95-MHz range. When the radio set operates in the 300 to 399.95-MHz range, the tank circuit is tuned to the third harmonic. Thus, the output of the crystal oscillator is either two or three times the crystal frequency, depending upon the operating frequency of the set (see table 3-4). Capacitor C208 and coil L222 are trimmers for oscillator output tank Z201.

3-39. Capacitor C210 couples the first oscillator-multiplier output signal to the control grid of V202, which operates as a frequency tripler. The tripling action is accomplished by tuning plate tank Z202 to the third harmonic (200 to 370 MHz) of the signal applied to the grid. Thus, the signal in the plate tank is either six times or nine times that of the selected crystal frequency in first oscillator-multiplier V201. Test point J201 provides an indication of the drive to V202, and capacitor C211 bypasses rf signals to ground preventing them from interfering with dc measurements being made at J201. The cathode

Table 3-4. Frequency Multiplier-Oscillator UHF Injection Chart

CHANNEL FREQ (MHz)	FIRST OSCILLATOR MULTIPLIER V201			FREQ TRIPLER V202	INJECTION FREQ TO RF AND PA AMPLIFIER ASSEMBLY (MHz)
	CRYSTAL FREQ (MHz)	MULT FACTOR	OUTPUT FREQ (MHz)	MULT FACTOR	
39x.xx	41.11111	3	123.33333	3	370
38x.xx	*40.00000	3	120.00000	3	360
37x.xx	38.88888	3	116.66664	3	350
36x.xx	37.77777	3	113.33331	3	340
35x.xx	*36.66666	3	109.99998	3	330
34x.xx	35.55555	3	106.66665	3	320
33x.xx	34.44444	3	103.33332	3	310
32x.xx	*33.33333	3	99.99999	3	300
31x.xx	32.22222	3	96.66666	3	290
30x.xx	31.11111	3	93.33333	3	280
29x.xx	45.00000	2	90.00000	3	270
28x.xx	43.33333	2	86.66666	3	260
27x.xx	41.66666	2	83.33332	3	250
26x.xx	*40.00000	2	80.00000	3	240
25x.xx	38.33333	2	76.66666	3	230
24x.xx	*36.66666	2	73.33332	3	220
23x.xx	35.00000	2	70.00000	3	210
22x.xx	*33.33333	2	66.66666	3	200

*These crystals used for two frequencies each.

of V202 is grounded; therefore, the tube depends entirely upon the voltage developed across the grid-leak circuit for bias. Plate voltage of +125 vdc is supplied to V202 through R213 and L224. Capacitor C214 couples the rf signal to parallel-tuned plate tank Z202; trimmer C215 sets the minimum capacitance point of the plate tank circuit. Capacitor C216 couples the rf signal from the plate tank to the cathode of grounded-grid amplifier V203, the first of three injection amplifiers.

3-40. The cathode circuit of first injection amplifier V203 consists of resistor R215, which provides cathode bias. Plate voltage for V203 is supplied from the +125-vdc supply through R210 and L226. Capacitor C220 couples the rf signal from the plate of V203 to parallel-tuned tank circuit Z204. Capacitor C222 couples the signal to the cathode of second injection amplifier V204. Injection amplifiers V204 and V205 each provide a stage of amplification identical to that of V203. Capacitors C234 and C235 form a voltage divider from which the 200 to 370-MHz uhf signal is injected through J205 to contact 6 of injection relay K102 in the RF and PA Amplifier (see figure 5-110). Test points J202, J203, and J204 are used to measure the rf signals at the cathodes of the injection amplifiers during alignment or, during troubleshooting, to inject a signal to locate a defective stage. Tank circuits Z202, Z204, Z206, and Z208 are tuned by the 18-position, 10-MHz shaft of the Frequency Selector. (When the tank circuits are tuned, both capacitance and inductance are varied, improving stage gain by maintaining a good inductance to capacitance ratio.)

3-41. RF and PA Amplifier. The RF and PA Amplifier (figure 5-4) contains second transmit mixer V101; rf amplifiers V102, V103, and V104; transmit power amplifier V106 and its output load, resonant cavity

Z108. (Tube V104 functions as the first receive mixer during the receive function of the radio set). On transmit, injection relay K102 is energized and the 200 to 370-MHz signal from the FMO is injected into second transmit mixer V101 where it heterodynes with the 20.00 to 29.95-MHz signal from the First IF Amplifier. The output of the second transmit mixer, in the frequency range of 225.00 to 399.95 MHz, is coupled to V102, the first of three rf amplifiers. After amplification in V102, V103, and V104, the rf signal is applied through transmit driver V105 to transmit power amplifier V106. Audio modulation signals from the Audio Amplifier and Modulator are applied to V105 and V106; hence, the output from V106 is audio-modulated rf in the operating range of 225.00 to 399.95 MHz. This signal is coupled from resonant cavity Z108 through low-pass filter FL1101 (not part of the RF and PA Amplifier) and contacts 1 and 2 (closed on transmit) of antenna relay K101 to the directional coupler.

3-42. Refer to Figure 5-110 during the following discussion. The 200 to 370-MHz signal from the FMO is applied to the cathode of second transmit mixer V101 through contacts 6 and 8 (closed on transmit) of injection relay K102. Concurrently, the 20.00 to 29.95-MHz signal from the First IF Amplifier is applied to the plate of V101 through rf choke L102. Choke coil L102 presents a low impedance to the signal from the First IF Amplifier and high impedance to the mixer output frequency. Plate voltage for V101 is supplied from the +125-vdc supply through choke coils L102 and L103, feed-through capacitor C104, resistor R115, and contacts 19 and 20 (closed on transmit) of t/r relay K602 in the Relay-Filter (see figure 5-100).

3-43. Test jack J103 provides a means for measuring the plate voltage or the 20.00 to 29.95-MHz signal applied to the plate V101. The rf choke, L103 and C104, decouples the rf from the +125-vdc supply. Resistors R101 and R102 form grid-leak circuit to ground; J104 is a test point for measuring the grid bias on V101. Capacitors C101 and C102 ground rf at the grid. Cathode bias resistor R103 is wirewound and thereby also provides an rf choke in the cathode circuit. Resistor R114, in the cathode input line from the FMO, provides the correct termination for the injection cable.

3-44. The 200 to 370-MHz signal and the 20.00 to 29.95-MHz signal mix in V101 to produce sum frequencies, ranging from 225.00 to 399.95 MHz, in the plate circuit. Capacitor C105 couples the 225.00 to 399.95-MHz rf signal to a parallel-tuned tank, Z101, and capacitor C110 couples the rf signal developed across Z101 to the cathode of rf amplifier V102. The cathode of V102 consists of network Z102, which provides a high coupling impedance for the rf signal, and resistor R122, which provides cathode bias for the tube. On transmit, contacts 1 and 2 of injection relay K102 ground the control-grid rf avc bus. Plate voltage of +125 vdc is supplied through L105 and dropping resistor R116. Capacitor C113 isolates rf signal from the +125-vdc supply. Capacitor C114 couples the rf signal to plate tank Z103. Capacitor C117 couples the rf signal developed across Z103 to rf amplifier V103 which provides a stage of rf amplification similar to that of V102. Test jack J105 provides for measuring the bias developed by the rf input to V103, and test jack J110 allows for measuring the rf signal voltage on the cathode of V103.

3-45. After amplification in V103, the rf signal is coupled through C121, Z105, and C123 to the cathode of transmit rf amplifier V104. On transmit, V104 receives plate voltage from the +125-vdc supply through L109, L113, and contacts 5 and 4 (closed on transmit) of t/r relay K602 in the Relay-Filter (see figure 5-100). Coil L113 and capacitor C134 isolate rf signals from the +125-vdc supply. Output jack J102, used during receive, is disconnected from the plate circuit of V104 and grounded by contacts 3 and 4 (closed on transmit) of injection relay K102. Test jack J106 provides for measuring the grid bias developed by the rf drive to V104.

3-46. The amplified 225.00 to 399.95-MHz rf output of V104 is coupled by C126 to parallel-tuned network Z106 which offers a high impedance to the rf signal. Capacitor C127 is a trimmer for network Z106. The signal developed across Z106 is coupled through C139 to the cathode of transmitter driver V105, which functions as a grounded-grid amplifier. Coil L115 provides the cathode impedance for the input signal and R112 provides cathode bias for V105. Capacitor C129 is a cathode bypass capacitor. Capacitor C140 provides rf ground for the grid of V104, and R120 is the grid-return circuit to ground. Test point J114 is used to measure grid bias developed on V105 by the rf signal.

3-47. Transmit driver V105 (figure 3-4) receives audio-modulated plate voltage from the +325-vdc supply. The audio modulation is impressed on the plate-voltage line in the primary (pin 2) of output transformer T802 by audio power amplifiers V805 through V808 in the Audio Amplifier and Modulator. The amplified output of V105 is developed across tuned circuit Z107 which (in parallel with C145 and trimmer capacitor C141) is tuned to present a high impedance to rf signals in the 225.00 to 399.95-MHz range. Coil L119 and capacitor C142 are an rf choke which acts as a plate-decoupling network for V105. Resistor R121 is a meter shunt for metering the plate current of driver V105. The output of transmit driver V105, developed across Z107, is coupled by C128 to the grid of transmit power amplifier V106. An rf choke, L114, provides a high impedance for the rf driving signal. Resistor R108 and capacitor C146 provide grid-leak bias for V106; R108 provides a means for adjusting the fixed protective bias from the -11-vdc supply and grid-leak bias for the desired power amplifier grid current. Resistor R109 is a meter shunt for metering the grid current of transmit power amplifier V106. Test jack J111 provides a means for measuring the fixed bias of V106.

3-48. The screen-grid voltage for V106 is obtained from a variable bleeder circuit consisting of R601, R602, and R603 (in the Relay-Filter) connected between the +125 and +325-vdc supplies. Audio modulation is impressed on the screen-grid voltage line in the primary (pin 4) of output transformer T802 by audio power amplifiers V805 through V808 in the Audio Amplifier and Modulator. Capacitor C138 and coil L121 are a screen-grid rf decoupling network; C601 is a dc blocking capacitor. Power amplifier V106 receives modulated plate voltage through the insulated inner conductor of resonant cavity Z108 and feed-through rf bypass capacitor C133; the audio modulation is impressed on the plate voltage line in the primary (pin 1) of output transformer T802 in the Audio Amplifier and Modulator.

3-49. The output signal of power amplifier V106 (figure 5-110) is developed across plate tank Z108, coaxial resonant cavity. The rotor of the cavity tuning capacitor is ganged with the rf amplifier tank circuits and is tuned by the 1750-position, 0.1-MHz shaft of the Frequency Selector. Blocking capacitor C131 insulates the stator of the cavity tuning capacitor and prevents grounding at dc plate voltage on V106. Trimmer capacitor C132 sets the minimum capacitance point of Z108. Coupling loop L111 is adjusted and locked for optimum coupling at a frequency of 399.95 MHz.

3-50. The modulated 225.00 to 399.95-MHz rf signal coupled from Z108 by L111 is applied to low-pass filter FL1101 through J115-P11. Low-pass filter FL1101 attenuates all frequencies above 400 MHz to reduce harmonic output. After passing through the low-pass filter, the 225.00 to 399.95-MHz rf signal is returned through P1101-J108 to the RF and PA Amplifier where it is coupled through contacts 1 and 2 (closed on transmit) of antenna relay K101 to the directional coupler.

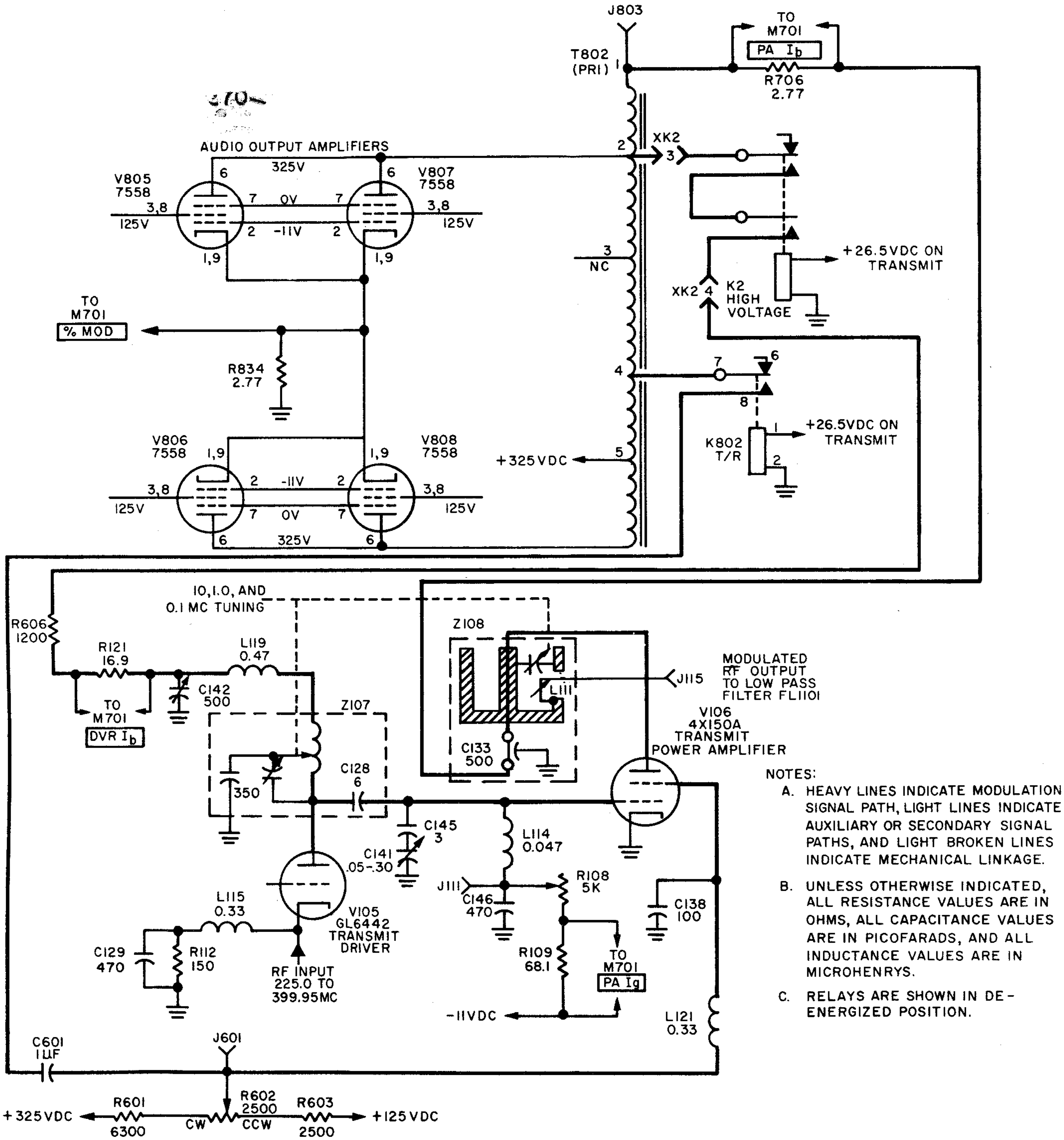


Figure 3-4. Modulation Circuits, Schematic Diagram

3-51. Audio Amplifier and Modulator. The Audio Amplifier and Modulator (figure 5-10) contains audio amplifier V803, audio modulator and driver V804, and audio output amplifiers V805 through V808 which provide audio-modulated B+ to the RF and PA Amplifier during the transmit function. In addition, the Audio Amplifier and Modulator contains compression rectifier V802B, broadband relay K803, and t/r relay K802 which are utilized during the normal transmit, retransmit, duplex transmit, and broadband transmit functions.

3-52. Normal Mode Transmit Audio Circuit. The audio signal during the normal (NOR) mode passes through parts of the Front Panel, the Relay-Filter, and the Audio Amplifier and Modulator. In addition, the audio modulation signal is applied to the transmit driver and power amplifier in the RF and PA Amplifier.

3-53. Refer to figure 5-3 during the following discussion. The normal transmit audio from the Front Panel passes through FL702 to contact 1 (NOR) of MODE switch S702A. (Remote transmit audio is applied to this same contact through pin U of P701.) The audio signal is routed through contact 4 of S702A to the 10-ohm primary winding of microphone transformer T601. The dc voltage for the operation of the microphone is obtained from the -11-vdc bias supply across R611 in the primary circuit of T601. The audio signal, transformer-coupled to the secondary of T601, is routed through R605, contacts 9 and 12 of S702B, pin F of P801, contacts 17 and 16 (closed on transmit) of t/r relay K802, contacts 3 and 8 (closed in PLAIN operation) of broadband relay K803 to the grid input circuit of audio amplifier V803 (see figure 5-116). The input is developed across resistor R826 and is coupled to the control grid of V803 through C809, the parallel combination of C817 and R847, and R854. Jack J805 is a test point used either to measure audio signals or to inject audio signals at the control grid of V803 during test and troubleshooting. Plate and screen voltages for V803 are obtained from the +125-vdc supply through a voltage divider consisting of resistors R828 and R829 of this assembly, and resistors R616, R617, and R618 of the Relay-Filter.

3-54. Audio and modulator driver V804 is a parallel-operated dual-triode. The cathode bias for both sections is obtained from R832 which is bypassed by C815. The V803 audio output is developed across resistor R830 and is coupled through C814 to potentiometer R831 which adjusts the input level to audio and modulator driver V804 during normal operation. The audio level determined by the setting of R831 is coupled to the parallel-connected grids of V804 through C818 and parasitic suppressors R855 and R856. Test point J802 is used to measure audio signals or to inject audio signals at the control grid of V804. Plate voltage for the stage is obtained from the +325-vdc supply through contacts 13 and 14 (closed on transmit) of t/r relay K802 and the primary of phase-splitting transformer T801.

3-55. Audio output amplifiers V805 through V808 are parallel-connected and push-pull operated. Tubes V805 and V807 comprise a parallel pair, as do tubes V806 and V808. The output signal of audio and modulator driver V804 is developed across T801 and applied to the control grids of the audio output amplifiers. The signal at pin 3 of the secondary winding is coupled directly to the parallel-connected grids of V805 and V807; and the signal at pin 5 of the transformer, which is 180 degrees out of phase with the pin 3 signal, is coupled directly to the control grids of V806 and V808. A fixed bias of -11 vdc is applied to the control grids through the transformer center tap, pin 4. Cathode resistor R834 of audio output amplifiers V805 through V808, in conjunction with the front panel meter, provides an indication of the percentage of modulation. Screen grid voltages for the output amplifiers are supplied from the +125-vdc supply through parasitic suppressors

R843 through R846. Test points J803 and J804 are used to measure the audio modulation and the input to V806, respectively. Modulation B+ voltages of transmit driver V105, and the plate and screen grid of transmit power amplifier V106 in the RF and PA Amplifier are obtained from the primary of modulation transformer T802. (The manner in which the audio signal is superimposed on the carrier and transmitted is described in paragraph 3-41). The transmit sidetone audio output is coupled from pin 8 of T802 (figure 5-3) through audio-level control network R610 and R609, and contacts 7 and 4 (closed in PLAIN operation) of broadband relay K803 to contacts 11 and 10 of t/r relay K602. From contact 10 of K602, the sidetone audio is then applied through FL17 to remote station headset or speakers; and through R3, R717 (VOLUME control), R705, and FL703 to HEADSET jack J702B and AUDIO jacks J703 and J704 on the front panel.

3-56. Compression Rectifier Circuit. During transmit, the compression circuit maintains 80 to 90 percent modulation by compensating for variations in voice level applied to the microphone. High voice levels, which cause over-modulation and distortion, are reduced while low voice levels are passed unchanged. During receive, the compression circuit compensates for variations in output loading caused by parallel operation of local and remote receive audio stations.

3-57. During transmit, a delay bias voltage from the +125-vdc supply is developed by R840 and CR803 (figure 5-116) and passed through R838 and the center tap of R839 to the cathode of compression rectifier V802B. During receive, the bias is reduced by applying a ground to R841 through contacts 3 and 4 of t/r relay K802. Reducing the bias allows the compression rectifier to operate at a lower level during receive.

3-58. During both transmit and receive, terminals 10 and 11 of T802 sample the output of the Audio Amplifier and Modulator and apply an audio voltage across compression control potentiometer R839. Capacitor C816 presents a low impedance to audio from terminal 11 to ground. Part of the sample audio, from the center tap of R839, is applied to the cathode of compression rectifier V802B. When the output of the Audio Amplifier and Modulator rises above a pre-determined level, the sample audio overcomes the delay bias and V802B developes a negative bias voltage across R824. The negative bias voltage is filtered by C811 and applied to the control grid of V803 which holds the output of the modulator nearly constant.

3-59. Retransmit Mode Circuit. (Figure 3-5.) Operation of the Audio Amplifier and Modulator in the retransmission (RETRANS) mode is the same as in the normal (NOR) transmit mode. However, operation in the retransmission mode requires that two radio sets be interconnected. The same channel frequency should not be used for each set as feedback between the respective antennas will prevent relaying of signals. A minimum of 5 MHz channel separation is recommended.

3-60. The following example describes the retransmission circuits. In this example radio set 1 (sheet 1) is the receiving set, and radio set 2 (sheet 2) is the transmitting set. Placing MODE switch S702 (on both sets) in the RETRANS position performs the following functions:

a. Connects the microphone push-to-talk switch to the solenoid of duplex relay K603 through contacts 6 and 8 of S702A. This permits duplex operation (see paragraph 3-64) of both radio sets.

b. Connects t/r control relay K601 key line to the retransmit key-in line through contacts 6 and 8 of S702B

c. Connects squelch dc amplifier V801 to the carrier squelch input from the audio detector load through contacts 2 and 4 of S702B.

d. Connects the Audio Amplifier and Modulator input to the retransmit audio input through contacts 10 and 12 of S702B.

3-61. In the quiescent state (no signal input) both sets operate as receivers. The purposes of explanation, assume that an rf signal is received by set 1; the signal is detected and amplified as described under the receive function. The carrier squelch from the detector load in the Third IF Amplifier is coupled through contacts 2 and 4 of S702B to squelch dc amplifier V801, causing V801 to conduct and energize squelch relay K801. When K801 energizes, contacts 5 and 12 couple the receive audio input to the grid of audio amplifier V803 where it is processed as the normal receive audio signal of set 1. Energized relay K801 also applies a ground (through contacts 6 and 13) to the retransmit key-out line of set 1 and the retransmit key-in line in set 2. The input to set 2 energizes t/r control relay K601 contacts 3 and 8 of K601 close and energize K602, K802, and K2 which, in turn, key set 2 to transmit.

3-62. The receiver audio signal of set 1 is routed from sidetone output pin 8 of T802 through R615, retransmit audio level control R608, contacts 12 and 13 of K602 and out on the retransmit audio output line. At set 2 (sheet 2), the signal is routed over the retransmit audio input line through contacts 10 and 12 of S702B, contacts 17 and 16 of K802, and contacts 3 and 8 of K803 to the Audio Amplifier and Modulator where it is processed as the normal transmit modulation signal of set 2. Thus, the receiver audio signal from set 1 modulates the transmitter output of set 2. Full receiver audio output is available at the headset jack of set 1 while sidetone output appears at the headset jack of set 2.

3-63. If the input signal is received first by set 2, then set 2 functions as the receiver and set 1 as the transmitter. The operation described in the foregoing paragraphs will be the same except that the carrier squelch and squelch relay of set 2 will key set 1 to transmit, and the received output of set 2 will modulate the rf carrier of set 1. Also, full receiver audio output will be available at the headset jack of set 2, and sidetone output will appear at the headset jack of set 1.

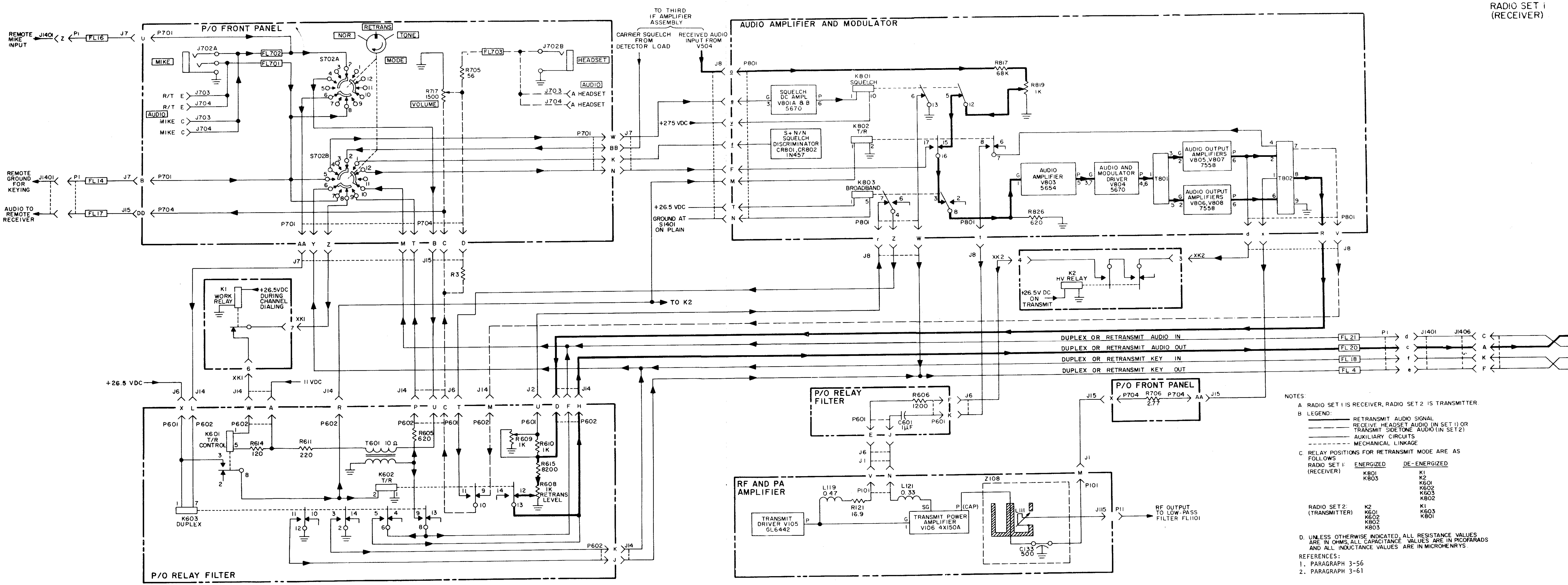
3-64. Duplex Transmission Circuit. (Figure 3-5). As in the retransmit mode, duplex operation requires that two radio sets be interconnected and the MODE switch of both radio sets be set to the RETRANS position. When the push-to-talk switch of either set is closed, both sets are keyed to transmit, and the microphone audio signal modulates the output of both sets. The microphone push-to-talk switch applies a ground to duplex relay K603 which, in turn, applies a ground to the retransmit key-in and retransmit key-out lines through contacts 2 and 3, and 12 and 11, respectively. This energizes t/r control relay K601 of both sets which, in turn, energizes relays K602, K802, and K2, thereby keying both sets to transmit.

3-65. The microphone input is fed to audio input amplifier V803 through contacts 2 and 4 of S702A, modulation transformer T601, contacts 9 and 8 of K603, contacts 10 and 12 of S702B, contacts 16 and 17 of K802, and contacts 3 and 8 of broadband relay K803. This same microphone signal is also routed through contacts 6 and 5 of K603, retransmit audio output line, retransmit audio input line, contacts 10 and 12 of S702B, contacts 17 and 16 of K802, and contacts 3 and 8 of K803, thus modulating set 2. Sidetone audio appears at the headset of both sets.

NOTE

Duplex relay K603 is energized during duplex operation only.

3-66. Broadband Transmit Circuit. For operation with the broadband equipment, relay K803 is deenergized by placing PLAIN-BROADBAND switch S1401 (on the rear of the receiver-transmitter case) to the BROADBAND position. During broadband transmit operation, the microphone output from contact 12 of S702B (figure



NOTES:

A. RADIO SET 1 IS RECEIVER, RADIO SET 2 IS TRANSMITTER.

B. LEGEND:

RETRANSMIT AUDIO SIGNAL
RECEIVE HEADSET AUDIO (IN SET 1) OR TRANSMIT SIDETONE AUDIO (IN SET 2)
AUXILIARY CIRCUITS
MECHANICAL LINKAGE

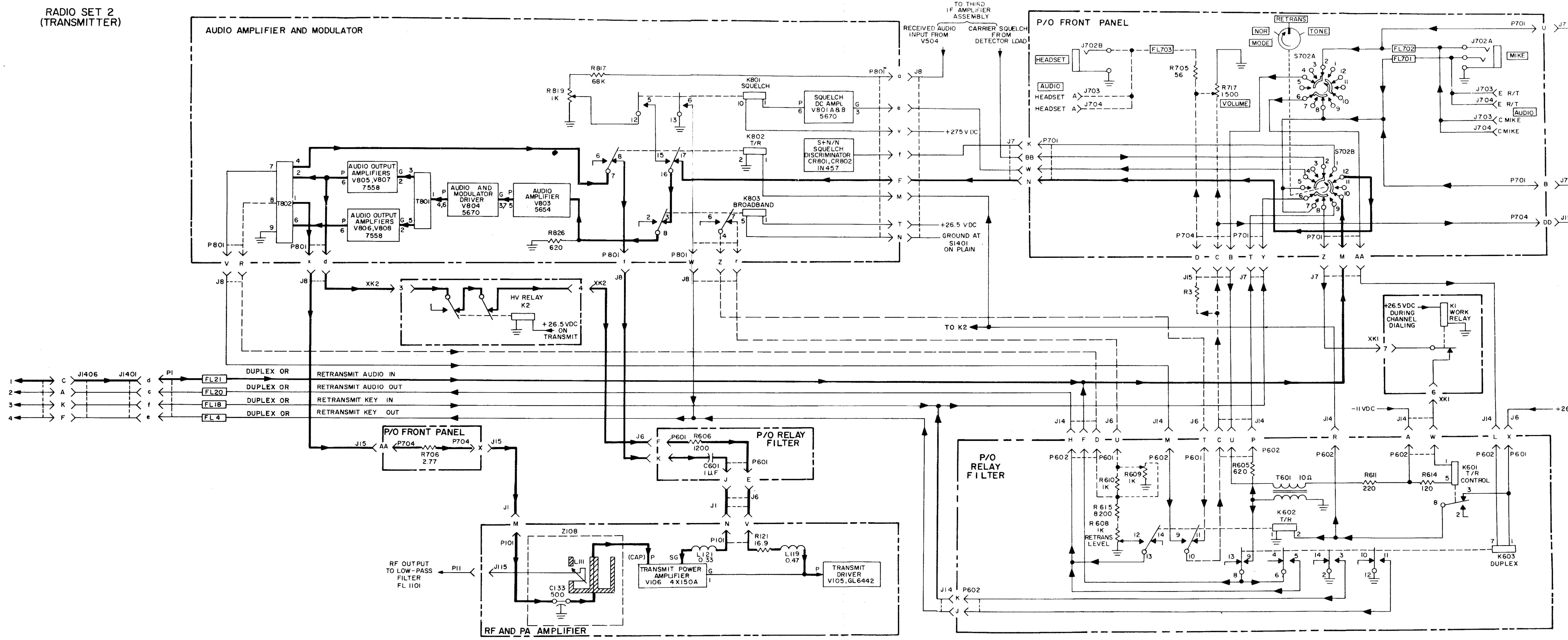
C. RELAY POSITIONS FOR RETRANSMIT MODE ARE AS FOLLOWS

	ENERGIZED	DE-ENERGIZED
RADIO SET 1: (RECEIVER)	K801 K803	K1 K2 K601 K602 K603 K802
RADIO SET 2: (TRANSMITTER)	K2 K601 K602 K802 K803	K1 K603 K801

D. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

REFERENCES:
1. PARAGRAPH 3-56
2. PARAGRAPH 3-61

Figure 3-5. Retransmission and Duplex Transmission Modes, Simplified Schematic Diagram (Sheet 1 of 2)



NOTES:

A. RADIO SET 1 IS RECEIVER, RADIO SET 2 IS TRANSMITTER.

B. LEGEND:

————	RETRANSMIT AUDIO SIGNAL
————	RECEIVE HEADSET AUDIO (IN SET 1) OR TRANSMIT SIDETONE AUDIO (IN SET 2)
— — —	AUXILIARY CIRCUITS
- - - -	MECHANICAL LINKAGE

C. RELAY POSITIONS FOR RETRANSMIT MODE ARE AS FOLLOWS:

	ENERGIZED	DE-ENERGIZED
RADIO SET 1 (RECEIVER)	K801 K803	K1 K2 K601 K602 K603 K802
RADIO SET 2 (TRANSMITTER)	K2 K601 K602 K802 K803	K1 K603 K801

D. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

REFERENCES:
1. PARAGRAPH 3-56
2. PARAGRAPH 3-61

Figure 3-5. Retransmission and Duplex Transmission Modes, Simplified Schematic Diagram (Sheet 2 of 2)

5-3) is connected to the input of the broadband transmit equipment through filter FL30 and pin j of P1. The transmit output of the broadband equipment is routed to audio amplifier V803 through pin k of P1, FL28, pin n of P801, resistor network R851, R852, and R853, contacts 10 and 11 (closed on transmit) of t/r relay K802, and contacts 2 and 8 (normally closed on BROADBAND) of K803. The remainder of the circuits in the Audio Amplifier and Modulator operate in the same manner as for normal transmit operation except that broadband sidetone is obtained from the broadband sidetone amplifier; this signal is coupled to the headset through contacts 4 and 6 (closed on BROADBAND) of broadband relay K803.

3-67. The broadband sidetone, supplied by the broadband equipment, is routed to the primary of T1601 via pin H of P1061, R1602, and potentiometer R1601 (see figure 5-117). The secondary of phase-splitting transformer T1601 is connected to the base of push-pull amplifier Q1601 and Q1602. The outputs of Q1601 and Q1602 are connected to the primary of T1602; the amplified signal is routed from the secondary of T1602 to the Audio Amplifier and Modulator via pin M of P1601. Transistor base bias voltage is supplied from the +26.5-vdc supply via R612 and CR601 in the Relay-Filter (figure 5-118), pin F of P1601, R1606, R1604, and R1603 to the center tap of T1601. Collector bias is supplied via the center tap of T1602. Resistor R1607 and thermistor RT1601 act as a voltage regulating circuit to maintain the voltage supplied to the bases of Q1601 and Q1602 at a fairly constant level. Capacitor C1603 filters the power supplied to the collectors of Q1601 and Q1602, and C1602 is used to filter transients. Resistor R1605 is the common load for the transistor emitters, and R1601 is used to vary the level of the input signal.

3-68. Tone Mode Circuit. Although the 1-kHz tone oscillator (Q701) is a part of the Front Panel Assembly (figure 5-119), its application is covered at this time in order to complete the discussion of the Audio Amplifier and Modulator during the transmit function of the equipment.

3-69. In the tone mode, the 1-kHz tone oscillator is substituted in place of the normal transmit microphone input (see figure 5-3). By setting MODE switch S702 to the TONE position, the collector of Q701 is grounded through contacts 5 and 4 (closed in transmit) of t/r relay K802. The 1-kHz tone output from the emitter of Q701 is routed to the grid of audio amplifier V803 through contacts 3 and 4 of S702A and over the same common audio line used on the normal transmit and retransmit modes of operation. The remainder of the circuits in the Audio Amplifier and Modulator operate as described in the normal transmit and retransmit modes.

3-70. In equipments modified for homing beacon operation, the ground for the collector of Q701 is not provided by t/r relay K802 but, instead, is routed to an external keyer which provides mcw keying.

3-71. <u>Directional Coupler</u>. (Figure 5-109.) Transmit and receive rf signals travel to and from the AN/URC-9 antenna jack J701 on a transmission line through the Directional Coupler. The Directional Coupler samples the incident waves of transmitter power (traveling toward the antenna) and the reflected waves of transmitter power (traveling toward the RF and PA Amplifier) and provides a front panel meter indication of power. (The SWR and PWR metering circuits are discussed in paragraphs 3-156 and 3-157). Both Directional Coupler circuits are identical except for reference symbols.

3-72. Current flowing in the short section of transmission line is a result of inductive and capacitive coupling with the main transmission line. The inductive current is reinforced in one direction and cancelled in the other by the capacitive current. In the swr directional coupler, R1302 terminates the transmitter end of the swr line in its characteristic impedance and absorbs the currents induced by the incident wave. Crystal diode CR1301, at the antenna end of the swr line, rectifies the currents induced by the reflected wave. The voltage developed across diode load resistor R1301 and applied to the metering circuits is proportional to the reflected power.

3-73. In the circuit used for the pwr measurement, R1301 terminates the antenna end of the pwr line in its characteristic impedance and absorbs the currents induced by the reflected wave. Diode CR1302, at the transmitter end of the pwr line, rectifies the currents induced by the incident wave. The voltage developed across load resistor R1304 coupled to the metering circuit is proportional to the power output. Capacitors C1301 and C1304 are rf filters. Capacitors C1302 and C1303 compensate for the variations in the output frequency which inherently varies directly with frequency and power.

3-74. <u>RECEIVE FUNCTION</u>.

NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted.

NOTE

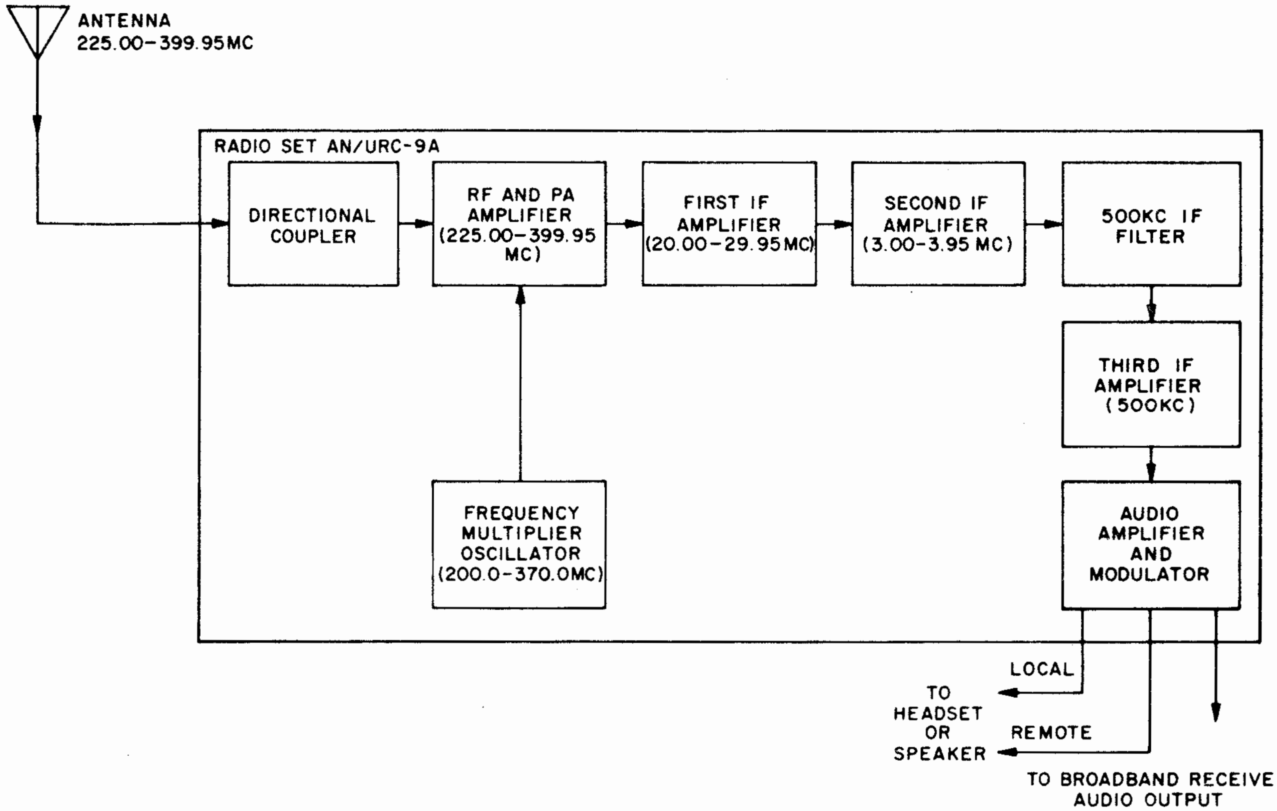
Frequencies in the following descriptions are applicable to AN/URC-9A; frequencies for AN/URC-9, -9Y, and -9AY are the same less the hundredths position.

3-75. SIGNAL PATH. (Figure 3-6.) During normal receive operation, the 225.00 to 399.95-MHz signal from the antenna passes through the Directional Coupler to the RF and PA Amplifier where it is amplified and mixed with a frequency in the 200 to 370-MHz range to obtain a difference frequency in the 20.00 to 29.95-MHz range. This latter signal is applied to the First IF Amplifier where it is amplified and mixed with a frequency in the range of 17 to 26 MHz. The difference frequency, in the range of 3.00 to 3.95 MHz, is then passed to the Second IF Amplifier where it is mixed with a crystal-controlled oscillator frequency which is removed 500 kHz from the difference frequency, thereby producing a 500-kHz output signal.

3-76. The 500-kHz output from the Second IF Amplifier is routed through a 500-kHz if filter to the Third IF Amplifier. The resulting signal is demodulated, passed through a noise limiter, amplified, and then applied to the Audio Amplifier and Modulator. The amplified audio signal is sent to the local and remote headsets (or speakers), or to the broadband audio output jack.

3-77. DETAILED DESCRIPTION. (Figure 5-1.) The received signal (225.00 to 399.95 MHz) is coupled from the antenna through the Directional Coupler to rf amplifiers V102 and V103 in the RF and PA Amplifier. The amplified signal, one of 3500 in the range of 225.00 to 399.95 MHz (see note in paragraph 3-74), is mixed in first receive mixer (V104) with one of the frequencies between 200 to 370 MHz which is injected by the FMO. The FMO is composed of first oscillator multiplier V201, frequency tripler V202, and injection amplifier comprised of V203, V204, and V205. The difference frequency output (in the range of 20.00 to 29.95 MHz) of first receive mixer V104 is applied through if amplifiers V301 and V302 in the First IF Amplifier to second receiver mixer V303. In V303, the signal is mixed with a frequency in the range of 17 to 26 MHz from second oscillator V305.

3-78. The resultant difference frequency output of second receive mixer V303 (in the range of 3.00 to 3.95 MHz) is then sent to the Second IF Amplifier, where the doubly converted signal is applied to the third receiver mixer, V401A. There, the signal is mixed with a selected frequency from third oscillator V401B. The selected frequency is based on the value of the received signal. For example, when the converted incoming



NOTE: Frequencies shown are for AN/URC-9A. Frequencies for AN/URC-9, 9Y, and 9AY are the same less the hundredths position.

Figure 3-6. Receiver Section, Block Diagram

signal is from 3.00 to 3.45 MHz, it is mixed with a frequency selected from the 3.50 to 3.95-MHz range; when the incoming signal is from 3.50 to 3.95 MHz, it is mixed with a frequency within the 3.00 to 3.45-MHz range. In either case, the resultant signal of 500 kHz is obtained at the output of the third receive mixer in the Second IF Amplifier.

3-79. The triple converted signal is sent through 500-kHz if filter FL901 to the Third IF Amplifier where the signal is amplified by if amplifiers V501, V502, and V503 and passed to detector CR501, series noise limiter CR503, and audio amplifier V504. The amplified audio-frequency signal is then applied to the Audio Amplifier and Modulator. Following amplification in V803, the signal is sent through audio and modulator driver V804 to phase-splitting transformer T801 where it it split and applied in push-pull to audio output amplifiers V805 through V808. The audio output signal is then transformer-coupled through output transformer T802 to the receiver-transmitter front panel headset or speaker jacks.

3-80. STAGE AND SPECIAL CIRCUIT DESCRIPTION. The conventional receiver electronic circuits are briefly described at the stage level; special and unique circuits are described in greater detail. Block diagrams and simplified schematics in this chapter and the maintenance schematic diagrams in Chapter 5 are used to support the descriptive text.

3-81. Relationship of Assemblies. The overall functional relationship of the assemblies within Radio Set AN/URC-9 for both the transmit and receive functions is illustrated in figure 3-3. The Frequency Selector controls the tuning of the Second IF Amplifier, First IF Amplifier, RF and PA Amplifier and FMO assemblies. Broadband or plain operation is selected by placing BROADBAND-PLAIN switch S1401 in the desired position. All operating voltages for the circuits within the receiver-transmitter for Radio Sets AN/URC-9 and -9A are furnished by Power Supply PP-2702/URC-9. Operating voltages for Radio Set AN/URC-9Y are supplied by Power Supply PP-4706/URC-9Y. Power Supply PP-4706A/URC-9Y provides the transmitter-receiver operating voltages for Radio Set AN/URC-9AY.

3-82. Directional Coupler. Since the major function of the Directional Coupler is to sample the incident and reflected waves of the transmitted rf power, the description of Directional Coupler operation is given in the discussion of transmitter operation in paragraph 3-79. During the receive function, the received rf signal is coupled from front-panel mounted antenna jack J701 through the Directional Coupler to input jack J109 on the RF and PA Amplifier.

3-83. RF and PA Amplifier. The RF and PA Amplifier active circuits during receive are rf amplifiers V102 and V103 and first receive mixer V104. (Refer to figure 5-4.) On receive, a signal in the 225.00 to 399.95-MHz range is applied to rf amplifiers V102 and V103 through deenergized relay K101. The first receive mixer, V104, heterodynes the amplified rf input signal with the 200 to 370-MHz injection frequency signal from the FMO. The result of this heterodyning action is the generation of the first if signal in the 20.00 to 29.95-MHz range which is coupled to the First IF Amplifier. The 1750-position 0.1-MHz shaft of Frequency Selector controls the tuning of the rf amplifiers and first receive mixer stages during the receive function. The remainder of the circuits in the RF and PA Amplifier are used during the transmit function; their operation is described in paragraph 3-41.

3-84. The signal from the Directional Coupler (in the 225.00 to 399.95-MHz range) is applied to J109 of the RF and PA Amplifier. (See figure 5-110.) Contacts 1 and 3 of the antenna relay K101 (deenergized in receive) couple the received signal to parallel-tuned rf input tank Z101 through a network consisting of capacitors C106 and C108. Resistor R117 provides a dc path to ground for static charges developed on the antenna. Capacitor C110 couples the signal voltage developed across Z101 to cathode of rf amplifier V102. The cathode circuit of V102 consists of; network Z102, which provides a high coupling impedance for the rf signal; and resistor R122, which provides cathode bias for the tube. Resistor R104 connects the control grid of V102 to the rf avc bus and, in conjunction with capacitor C109, isolates rf signals from the rf avc bus. Plate voltage of +125 vdc is supplied through L105 and dropping resistor R116. Capacitor C113 isolates rf signals from the +125-vdc supply. Capacitor C114 couples the rf signal to plate tank Z103. Capacitor C117 couples the rf signal developed across Z103 to rf amplifier V103 which provides a stage of rf amplification similar to that of V102.

3-85. The network (C121, Z105, and C123) between V103 and V104 couples the amplified rf signal to the cathode of first receive mixer V104. The cathode circuit of V104 consists of rf coupling choke L110; cathode bias resistor R111; and C125, the bypass capacitor for R111. Capacitor C137 grounds the control grid of V104 for rf and capacitor C144 provides additional filtering in the grid circuit.

3-86. The cathode of V104 also receives a signal in the 200 to 370-MHz range from the FMO through contacts 6 and 7 of injection relay K102 and capacitor C135. This signal mixes with the rf signal to produce a difference frequency in the range of 20.00 to 29.95 MHz. The difference frequency, developed at the plate of V104, is coupled to J102 through L109 and contacts 4 and 5 of injection relay K102 (deenergized in receive). First receive mixer V104 receives plate voltage from the +125-vdc supply through L109, L113 in the RF and PA Amplifier, and resistor R607 in the Relay-Filter (see figure 5-99).

3-87. When the tank circuits (Z101, Z103, and Z105) are tuned by the Frequency Selector, both capacitance and inductance are varied. This improves the sensitivity by maintaining a high tank efficiency over the 225.00 to 399.95-MHz frequency range. Trimmer capacitors C107, C115, and C122 set the minimum capacitance points of the tank circuits.

3-88. <u>Frequency Multiplier-Oscillator (FMO)</u>. The FMO (figure 5-5) generates frequencies in the 200 to 370-MHz range. These frequencies are injected into the RF and PA Amplifier during both receive and transmit operations. Operation of the FMO is identical during both receive and transmit operation. The 18-position, 10-MHz shaft of the frequency selector controls the tuning of all stages within this assembly.

3-89. First oscillator-multiplier V201 is a crystal-controlled, cathode-coupled oscillator especially designed for use with overtone crystals. (See figure 5-111). The right half of the twin triode tube operates as a grounded-grid amplifier and is capacitively coupled to the left half, which acts as a cathode follower. Capacitor C207 couples the signal from the plate (pin 4) of the grounded-grid amplifier to the control grid (pin 7) of the cathode follower. The crystal, which couples the output of the cathode follower to the cathode (pin 2) of the amplifier, operates at series resonance to provide low impedance coupling with zero phase shift. The phase shift through the amplifier is also zero; thus, an in-phase signal is fed back to the grounded-grid amplifier satisfying the conditions required for sustained oscillation.

3-90. Crystals Y202, Y204, and Y206 through Y218 have one common side connected through C204 to pin 2 of V201. The grounded crystal cases produce a large capacitance to ground at pin 2 of V201; however, L219 resonates with this capacitance and cancels its effect on the circuit. In a similar manner, L220 resonates with the crystal socket capacitance, thereby cancelling its effect on the operation of the circuit. Trimmer coils L201 through L218, inclusive, are used with their respective crystals to tune the plate of the grounded-grid amplifier to resonance. Capacitor C201 prevents the plate voltage on pin 4 of V201 from being grounded through the trimmer coils. Capacitor C236 is a temperature-compensating capacitor. The grid (pin 3) of the grounded-grid amplifier is grounded through parasitic suppressor R202; resistors R203 and R204 provide the coupling impedances (and bias) at the cathodes for the two halves of V201.

3-91. Plate voltage for the cathode follower is supplied through step tuner Z201, trimmer coil L222, and parasitic suppressor R206. The step tuner in the oscillator output tank is tuned to the second harmonic of the crystal frequency by the 18-position, 10-MHz shaft of the frequency selector when the set operates in the 220 to 299.95-MHz range. When the radio set operates in the 300 to 399.95-MHz range, the tank circuit is tuned to the third harmonic. Thus, the output of the crystal oscillator is either two or three times the crystal frequency, depending upon the operating frequency of the set (see table 3-4). Capacitor C208 and coil L222 are trimmers for oscillator output tank Z201.

3-92. Capacitor C210 couples the first oscillator-multiplier output signal to the control grid of V202, which operates as a frequency tripler. The tripling action is accomplished by tuning plate tank Z202 to the third harmonic (200 to 370 MHz) of the signal applied to the grid. Thus, the signal in the plate tank is either six times or nine times that of the selected crystal frequency in first oscillator-multiplier V201. Test point J201 provides an indication of the drive to V202, and capacitor C211 bypasses rf signals to ground preventing them from interfering with dc measurements being made at J201.

3-93. The cathode of V202 is grounded; therefore, the tube depends entirely upon the voltage developed across the grid-leak circuit for bias. Plate voltage of +125 vdc is supplied to V202 through R213 and L224. Capacitor C214 couples the rf signal to parallel-tuned plate tank Z202; trimmer C215 sets the minimum capacitance point of the plate tank circuit. Capacitor C216 couples the rf signal from the plate tank to the cathode of grounded-grid amplifier V203, the first of three injection amplifiers.

3-94. The cathode circuit of first injection amplifier V203 consists of resistor R215, which provides cathode bias. Plate voltage for V203 is supplied from the +125-vdc supply through R210 and L226. Capacitor C220 couples the rf signal from the plate of V203 to parallel-tuned tank circuit Z204. Capacitor C222 couples the signal to the cathode of second injection amplifier V204. Injection amplifiers V204 and V205 each provide a stage of amplification identical to that of V203. Capacitors C234 and C235 form a voltage divider from which the 200 to 370-MHz uhf signal is injected through J205 to contact 6 of injection relay K102 in the RF and PA Amplifier (see figure 5-110.)

3-95. Test points J202, J203, and J204 are used to measure the rf signals at the cathodes of the injection amplifiers, during alignment or, during troubleshooting, to inject a signal to locate a defective stage. Tank circuits Z202, Z204, Z206 and Z208 are tuned by the 18-position, 10-MHz shaft of the Frequency Selector. When the tank circuits are tuned, both capacitance and inductance are varied, improving stage gain by maintaining a good inductance to capacitance ratio.

3-96. First IF Amplifier. On receive, a signal in the 20.00 to 29.95-MHz range from the RF and PA Amplifier is applied to the control grid of V301 in the First IF Amplifier. (See figure 5-6). After amplification by V301 and V302, the 20.00 to 29.95-MHz signal is applied to the control grid of second receive mixer V303 where it is heterodyned with a 17 to 26-MHz signal injected from second oscillator V305. The output of the second receive mixer is a signal in the 3.00 to 3.95-MHz range which is coupled to the Second IF Amplifier. The 100-position, 0.1-MHz shaft of the Frequency Selector controls the tuning of if amplifiers V301 and V302 and second receive mixer V303 during the receive function; crystal selection and second oscillator V305 tuning are controlled by the 10-position, 1-MHz shaft.

3-97. Refer to figure 5-112 during the following discussion. The 20.00 to 29.95-MHz input signal from V104 in the RF and PA Amplifier is coupled through capacitor C301 to parallel tuned tank Z301. Capacitor C303 couples the if signal to the adjacent parallel-tuned tank, Z302 and avc blocking capacitor C302 couples the signal to the control grid of if amplifier V301 through parasitic suppressor R324. Resistor R301, in conjunction with bypass capacitor C326, isolates the if signal from the if avc bus. Capacitor C319 grounds the cathode of V301 for rf. Series resistors R304, R305, and R303 form a voltage divider that provides proper plate and screen-grid voltages to V301. Resistor R304 is connected to the +125-vdc supply, and R303 is grounded by contacts 15 and 16 of t/r relay K602 in the Relay-Filter (see figure 5-99).

3-98. Parallel-tuned tank Z303 is the plate load for V301. Capacitor C308 couples the if signal to the next parallel-tuned tank, Z304. Capacitor C311 couples the if signal to the control grid of second if amplifier V302 through parasitic suppressor R307. A similar network (Z305, C314, Z306, and C316) couples the amplified 20.00 to 29.95-MHz signal to the control grid of second receiver mixer V303. Series resistors R309, R325, and R326 form a voltage divider that provides proper plate and screen-grid voltages to V302. The dc voltage developed across R308 is applied to the S METER circuit (figure 5-119) to provide an indication of the input signal strength. Parallel tank circuits Z301 through Z306 are tuned by the 100 position, 0.1-MHz shaft of the Frequency Selector. Trimmer capacitors C302, C304, C305, C309, C312 and C317 are adjusted to set the inductance to capacitance ratio for proper tracking. Test points J301 and J302 provide for measuring if avc voltage at the control grids of V301 and V302, respectively. Test point J303 provides for measuring the bias developed by the 20.00 to 39.95-MHz signal on the control grid of V303.

3-99. Second oscillator V305 is controlled by crystals Y301 through Y310. Crystal switches S301 and S302 select the proper crystal according to the setting of the Frequency Selector. One half (pins 6, 7, and 8) of tube V305A is a grounded-grid amplifier working into parallel-tuned tank Z307, which constitutes its plate load. The tank is ganged with the crystal switches driven by the 10-position, 1.-MHz shaft of the Frequency Selector. Capacitor C343 couples the output from the plate (pin 6) of grounded-grid amplifier V305A to the control grid (pin 3) of cathode follower V305B, the other half of the tube. The crystal couples the output (pin 2) of the cathode follower to the cathode (pin 8) of the grounded-grid amplifier. The crystals operate at series resonance to provide low impedance coupling with zero phase shift. The phase shift through the cathode follower is also zero. Thus, an in-phase voltage is routed back to the cathode of the grounded-grid amplifier sustaining conditions for oscillation. Coil L311 resonates the crystal socket capacitance and prevents it from affecting the operation of the circuit. Resistors R321 and R322 provide the coupling impedance at the cathodes and bias for the two sections of the tube.

3-100. Test point J305 provides for measuring the dc bias developed across R320. Resistor R318 isolates J305 from the control grid (pin 3) of the cathode follower and prevents loading of the grid circuit by test instruments. The plate (pin 4) of the cathode follower receives voltage from the +125-vdc supply through isolation resistor R315. The plate (pin 6) of the grounded-grid amplifier receives voltage from the +125-vdc supply through R313 and L310.

3-101. The 17 to 26-MHz output of second oscillator V305 is taken from the cathode (pin 2) of the cathode follower section, V305B, and routed to the cathode of second receive mixer V303 through coupling capacitor C325. The 17 to 26-MHz oscillator signal mixes with the 20.00 to 29.95-MHz if signal applied to the grid of V303, producing a difference frequency in the range 3.00 to 3.95 MHz. This difference frequency is coupled to the Second IF Amplifier through plug P304. Plate voltage for V303 is supplied from the +125-vdc supply through L312, P304, J401, Z401, C406, and R401 in the Second IF Amplifier, and contacts 18 and 19 of t/r relay K602 in the Relay-Filter (see figure 5-99).

3-102. Table 3-3 shows how frequencies in the 17 to 26-MHz range are used with a particular channel frequency by the First IF Amplifier.

3-103. Second IF Amplifier. The Second IF Amplifier generates a signal at a frequency which, when mixed with the received signal, produces a signal having a frequency of 500 kHz.

3-104. Radio Set AN/URC-9A. The Second IF Amplifier (figure 5-8) in Radio Set AN/URC-9A consists of V401 and crystals Y401A through Y410A, and Y401B through Y410B which range from 3.00 to 3.95 MHz in 0.05-MHz steps. At receive, third oscillator V401B and its associated crystals provide frequencies which are mixed in third receive mixer V401A with the 3.00 to 3.95-MHz input signal from the First IF Amplifier. This mixing action produces a 500-kHz signal which is coupled through a 500-kHz if filter (FL901) to the Third IF Amplifier. The 10-position, 0.1-MHz shaft of the Frequency Selector controls the tuning of all stages during receive and transmit.

NOTE

The input frequency and the crystal-controlled oscillator frequency both range from 3.00 to 3.95 MHz. However, by displacing the two signals by 500 kHz at the third receiver mixer, a difference frequency of 500 kHz is obtained.

3-105. Refer to figure 5-114 during the following discussion. The 3.00 to 3.95-MHz signal is applied through J401 to parallel-resonant tank circuit Z401. This tank circuit is the plate load for second receive mixer V303 in the First IF Amplifier. The signal is coupled through two more parallel-resonant tank circuits (Z402 and Z403) by C403 and C407, respectively. The signal is then applied through C411 to the cathode of third receive mixer V401A. The three parallel-resonant tank circuits, Z401 through Z403, form a 3.00 to 3.95-MHz bandpass filter. The 10-position, 0.1-MHz shaft of the Frequency Selector tunes this filter by positioning powdered-iron cores in main tuning coils L401, L403, and L405. Trimmer coils L402, L404, and L406 are adjustable for proper tracking.

3-106. Third oscillator V401B is controlled by crystals Y401 (A or B) through Y410 (A or B). The t/r relay, K401 (deenergized at receive), connects the control grid of V401B to the proper crystal switching network. Switches S401 and S402 are driven by the 10-position, 0.1-MHz Frequency Selector shaft. Each switch selects one of ten crystals spaced in 0.10-MHz steps. At each switch position, the crystal frequency selected by S402 is 0.05 MHz (50 kHz) above that selected by S401. For example, when S401 is positioned to select the 3.40-MHz crystal, S402 is positioned to select the 3.45-MHz crystal so that there is always an 0.05 MHz difference in the frequency of the crystals selected. Hundredths relay K402 connects either switch S401 or S402 to the control grid of V401B (through the contacts of relay K401).

3-107. The crystal switching network selects crystals of a value that provides a 500 kHz (0.5 MHz) difference between the third oscillator frequency and the if signal (ranging from 3.00 to 3.95 MHz) applied to the cathode of V401A. For example, when the radio set is tuned to receive a frequency, the last two digits of which are xxx.95, the if signal is 3.95 MHz. Selector switches S401 and S402 are positioned by the 0.1-MHz tuning shaft so that they are making contact (through contacts 12 and 11 of each switch) with the 3.40 and 3.45-MHz crystals, respectively. Relay K402 is energized in this case to complete the circuit between S402 and the oscillator control grid (through contacts 3 and 8 of K401) so that the 500-kHz difference in frequency is maintained. Table 3-1 shows how frequencies in the 3.00 to 3.95-MHz range are used by the Second IF Amplifier.

3-108. A voltage divider consisting of series-connected capacitors C412 and C413 determines the electrical position of the cathode of third oscillator V401B relative to the grid of V401B. The tuned circuit of the third oscillator consists of the selected crystal (Y405A in this case), capacitors C412 and C413, plus the grid-to-ground and cathode-to-ground capacitance of V401B. The third oscillator is a Colpitts type with the crystal acting as an inductance. The value of the total capacitance is such that oscillation is maintained at the fundamental frequency of the crystal. Cathode resistor R404 provides additional bias to protect V401B in case oscillation stops. Coil L407 isolates bias resistor R404 from the crystal circuit.

3-109. Third oscillator V401B receives plate voltage from the +125-vdc supply through R407 and filter FL404. Test point J404 provides for measuring the voltage developed across third oscillator grid resistor R403. Resistor R402 isolates J404 from the crystal circuit. Coupling capacitor C417 couples the signal from the cathode of V401B to the control grid of V401A.

3-110. The incoming if and third oscillator signals mix in second receive mixer V401A to produce the 500-kHz difference frequency. Third receive mixer V401A receives plate voltage from FL404 and voltage dividers R410 and R409, via R408. Resistor R405 provides cathode bias and the coupling impedance for the injection signal from the 3.00 to 3.95-MHz bandpass filter (Z401, Z402, and Z403). Test point J402 provides for measuring the 3.00 to 3.95-MHz injection signal. Resistor R406 provides the grid return for V401A.

3-111. Radio Set AN/URC-9, -9Y, and -9AY. The Second IF Amplifier (figure 5-7) in Radio Sets AN/URC-9, -9Y, and -9AY consists of V401 and crystals Y401 through Y410 which range from 3.0 to 3.9 MHz in 0.1-MHz steps. At receive, V401A is used as the third receive mixer which produces a 500-kHz signal by mixing the input signal with the output of oscillator V401B. The 10-position, 0.1-MHz shaft of the Frequency Selector controls the tuning of all stages during both the receive and transmit conditions. V401A, which is a mixer at receive, functions as a buffer amplifier at transmit.

NOTE

The input frequency and the self-contained oscillator frequency both range from 3.0 to 3.9 MHz. However, by displacing the two signals by 500 kHz at the third receiver mixer, a difference frequency of 500 kHz is obtained.

3-112. Refer to figure 5-113 during the following discussion. The 3.0 to 3.9-MHz signal is applied to parallel-resonant tank circuit Z401 via J401. This tank circuit is the plate load for the second receive mixer in the First IF Amplifier. The signal is coupled through two more parallel-resonant tank circuits, Z402 and Z403, by C403 and C407, respectively. The signal is then applied to the cathode of third receive mixer V401A via C411. The three parallel-resonant tanks, Z401 through Z403, form a 3.0 to 3.9-MHz bandpass filter. The 10-position, 0.1-MHz shaft of the Frequency Selector tunes this filter by positioning powdered-iron cores in main tuning coils L401, L403 and L405. Trimmer coils L402, L404, and L406 are adjustable for proper tracking.

3-113. Third oscillator V401B is controlled by crystals Y401 through Y410. The t/r relay K401 (deenergized in receive), connects crystal selector switch S401 to the control grid of V401B. The switch, in turn, is driven by the 10-position, 0.1-MHz shaft of the Frequency Selector. The switch selects crystals of a value that provides a 500-kHz difference between the third oscillator frequency and the 3.0 to 3.9-MHz if input signal. For example, when the radio set is tuned to receive a frequency of xxx.9, the resultant if signal is 3.9 MHz. Selector switch S401 is positioned by the 0.1-MHz tuning shaft so that the rotor of S401 is in contact with terminal 4. With switch S401 in position and with relay K401 deenergized, the 3.4-MHz crystal, Y405, is connected through contacts 1 and 2 of the relay to the grid circuit of third oscillator V401B.

3-114. Table 3-2 illustrates frequency development for the Second IF Amplifier. When the 0.1-MHz frequency selector is set to a frequency in the x.0 to x.4-MHz range, the oscillator frequency during receive is in the 3.5 to 3.9-MHz range and the if signal is in the 3.0 to 3.4-MHz range (500 kHz difference). When the 0.1-MHz frequency selector is set to a frequency in the x.5 to x.9-MHz range, the oscillator frequency during receive is in the 3.0 to 3.4-MHz range and the if signal is in the 3.5 to 3.9-MHz frequency range (500 kHz difference).

3-115. A voltage divider consisting of series-connected capacitors C412 and C413 determines the electrical position of the cathode of third oscillator V401B relative to the grid of V401B. The tuned circuit of the third oscillator consists of the selected crystal, capacitors C412 and C413, plus the grid-to-ground and cathode-to-ground capacitance of V401B. The third oscillator is a Colpitts type with the crystal acting as an inductance. The value of the total capacitance is such that oscillation is maintained at the fundamental frequency of the crystal. Cathode resistor R404 provides additional bias to protect V401B in case oscillation stops. Coil L407 isolates bias resistor R404 from the crystal circuit.

3-116. Third oscillator V401B receives plate voltage from the +125-vdc supply through R407 and filter FL404. Test point J404 is used to measure the voltage developed across third oscillator grid resistor R403. Resistor R402 isolates J404 from the crystal circuit. Coupling capacitor C417 couples the signal from the cathode of V410B to the control grid of V401A.

3-117. The incoming if and third oscillator signals mix in second receive mixer V401A to produce the 500-kHz difference frequency. Third receive mixer V401A receives plate voltage from voltage dividers R410 and R409 via R408. Resistor R405 provides cathode bias and the coupling impedance for the injection signal from the 3.0 to 3.9-MHz bandpass filter (Z401, Z402, and Z403). Test point J402 is used to measure the 3.0 to 3.9-MHz injection signal. Resistor R406 provides the grid return for V401A.

3-118. <u>500-KHz IF Filter</u>. (Figure 3-7). The 500-kHz if filter provides the filtering in the Second IF Amplifier output that establishes the receiver selectivity; in turn, the filter output is applied to the Third IF Amplifier.

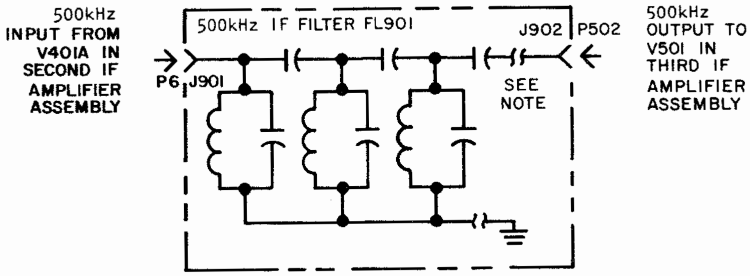
3-119. The filter consists of ten parallel-tuned, cascaded circuits which are capacitively coupled. (Since the circuits are identical, only three of the tuned-filter elements are shown in figure 3-7.) The filter is designed and factory-tuned to the bandpass characteristics shown in figure 3-7. At transmit, the filter is non-operational.

3-120. <u>Third IF Amplifier</u>. The Third IF Amplifier, operational only during receive operation, amplifies the final if signal and detects and amplifies the audio component. (See figure 5-9.)

3-121. The Third IF Amplifier consists of three stages of if amplification (V501 V502, and V503), diode detector CR501, a series noise filter, and first audio amplifier V504. In addition, the assembly contains an if avc gate, CR504, and an rf avc gate, CR505.

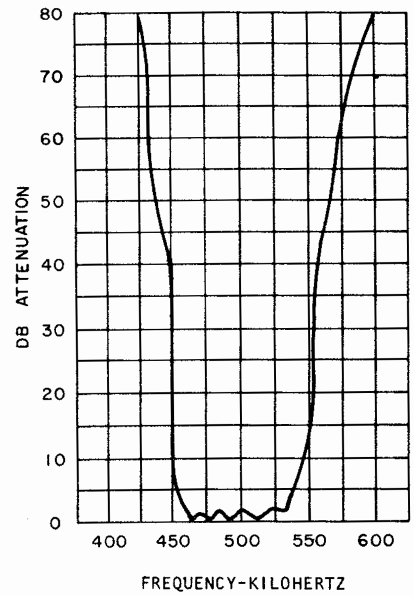
3-122. Input Stages. Refer to figure 5-115 during the following discussion. The 500-kHz if signal from the plate of second receive mixer V401A in the Second IF Amplifier is applied through filter FL901 to the control grid of First IF Amplifier V501. Resistor R501 connects the control grid of the stage to the if avc bus, and capacitor C504 provides a low impedance rf path from the screen grid to the cathode. The plate of V501 receives voltage through L501 and R504 from the +125-vdc supply. Capacitor C502 couples the 500-kHz if signal to the control grid of if amplifier V502. Resistor R505 connects the control grid of V502 to the if avc bus.

3-123. Capacitor C503 couples the 500-kHz if signal to the control grid of if amplifier V503. The control grid of V503 is connected to ground through grid-leak resistor R509. The if amplifier receives plate voltage through R512 and the primary of if output transformer T501 from the +125-vdc supply. The output of V503 is coupled through transformer T501 to



A. SCHEMATIC DIAGRAM

NOTE:
FL901 IS COMPOSED OF TEN SECTIONS OF FILTER ELEMENTS.



B. BANDPASS CHARACTERISTICS

Figure 3-7. 500-kHz Filter, Schematic Diagram and Bandpass Characteristics

detector CR501, series noise limiter CR503, and first audio amplifier V504. Test points J503 and J505 are used to inject a signal into V501 and V503, respectively, for troubleshooting.

3-124. Audio Detector CR501. (Figure 3-8). The if signal is coupled from V503 to detector CR501 by transformer T501. Capacitor C520 is an rf filter and resistor R539, connected across the secondary of T501, improves the frequency response of the transformer. Detector CR501 demodulates the input signal and produces an audio signal across load resistors R516, R517, and R518. The detected audio is coupled from the junction of resistors R518 and R517 through resistor R538, series noise limiter diode CR503, and capacitor C522 to the grid circuit of first audio amplifier V504. Capacitor C524 grounds the cathode of detector CR501 for audio and rf voltages. Resistor R538 and capacitor C521 filter any if residue from the audio signal.

3-125. The audio and dc voltage developed across the diode load is applied as the carrier squelch through resistors R515 and R541, and through MODE switch S702B to the squelch amplifier of the Audio Amplifier and Modulator; it is also applied to the broadband audio amplifier of the Audio Amplifier and Modulator, as the broadband audio output. Test point J508 is used to measure the detected audio as well as the broadband audio output. Resistor R532 prevents loading of the detector circuit by test instruments. A low-impedance path to ground for if residue is provided by C528 and L503.

3-126. Series Noise Limiter CR503. (Figure 3-8.) Series noise limiter CR503 clips audio peaks exceeding 60 percent modulation. The series noise limiter does not affect that part of the signal produced by modulation troughs.

3-127. The cathode of the noise limiter is connected to the negative end of the detector load (bottom of R516) through resistors R519 and R520. Resistor R519, in conjection with capacitor C523, filters the audio signal and produces, at the junction of resistors R519 and R520, a negative dc voltage proportional to the voltage at the negative end of the detector load. The peak audio signal voltage at the anode of CR503 is approximately 90 percent of the average (or dc) voltage at the negative end of the detector load. Thus, at modulation percentages up to approximately 60 percent, the cathode of series noise limiter CR503 is negative with respect to its anode, and the audio signal is faithfully reproduced across series noise-limiter load resistor R520. When the modulation peaks exceed a value representing 60 percent modulation, the anode of CR503 goes negative with respect to its cathode and the diode stops conducting. Thus, that part of the signal representing more than 60 percent modulation is clipped off.

3-128. IF AVC Circuit. (Figure 3-8.) During receive, approximately +4.5 vdc is applied to the cathode of audio detector CR501. This bias voltage delays the development of the avc voltage until the signal reaches an amplitude sufficient to overcome it. The bias voltage is obtained from the +275-vdc supply by way of a voltage divider which consists of Audio Amplifier and Modulator resistors R813, R814, and R816.

3-129. The voltage at the negative end of the audio detector load (bottom of R516) is the algebraic sum of the positive bias voltage and a negative voltage approximately equal to the average rms voltage of the if signal. Since the cathode of if avc gate diode CR504 is returned to the negative end of the audio detector load through R529, CR504 cannot conduct until the algebraic sum of the positive bias voltage and the negative voltage developed across the detector load results in a net negative voltage at its cathode. When the input signal amplitude causes the voltage at the bottom of R516 to become more negative than -4.5 volts, the cathode of if avc gate CR504 becomes negative; the diode conducts and developes a voltage across load resistor R531. This voltage controls the gain of if amplifiers V301 and V302 in the First IF Amplifier, and if amplifiers V501 and V502 in the Third IF Amplifier. Test point J504 is used to measure the if avc voltage developed by if avc gate CR504.

3-130. The if avc gate, CR504, isolates the if avc line from the positive bias voltage applied to the cathode of CR501. Resistors R529 and R530, in conjunction with capacitors C514 and C515, filter the audio signal from the if avc line. A bias voltage is applied to the if avc line through if avc gate load resistor R531 from the -11-vdc supply by a voltage divider consisting of R715 in series with R716 and SQUELCH control R702. In local operation, the bias level is set by SQUELCH control R702 (see figure 5-121). In remote control, S705C connects to the SQUELCH control in Radio Set Control C-2383/URC-9.

3-131. RF AVC Circuit. (Figure 3-8.) A portion of the audio signal developed across audio detector load resistors R516, R517, and R518 is coupled from the junction of R516 and R517 to the cathode of rf avc gate CR505 via R537. Although connected to a less negative voltage level (the top of R516), the rf avc gate serves the same purpose as the if avc gate.

3-132. The voltage appearing at the cathode of the rf avc gate is always more positive than the voltage at the cathode of if avc gate CR504. Thus, the signal amplitude must be higher to overcome the delay bias. This results in more delay for rf avc and improves the sensitivity of the radio set. Resistor R533 is the load resistor for rf avc gate CR505; resistor R537 with capacitor

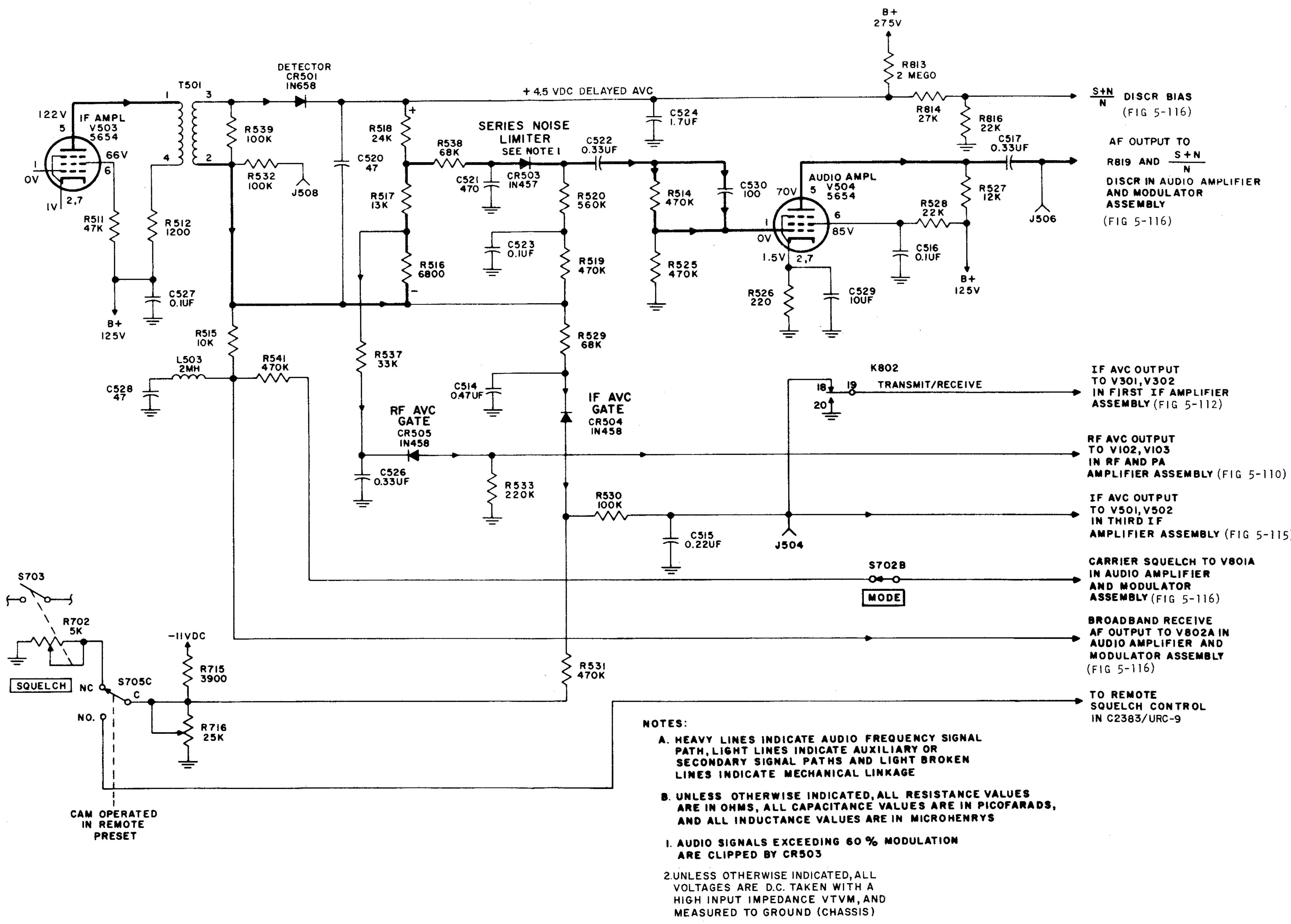


Figure 3-8. Radio Set AN/URC-9( ), Detector, Noise Limiter, and AVC Circuits, Simplified Schematic Diagram

C526 filters the audio signal from the rf avc line. The rf avc voltage developed across load resistor R533 is used to control the gain of rf amplifiers V102 and V103 in the RF and PA Amplifier.

3-133. Audio Amplifier V504. (Figure 3-8.) Audio signals developed across series noise-limiter load resistor R520 are coupled to the grid of audio amplifier V504 through coupling capacitors C522 and C530, and resistors R514 and R525. These resistors form a voltage divider which decreases the amplitude of the input signals to decrease distortion. Cathode resistor R526 is bypassed by capacitor C529. Capacitor C516 provides a low-impedance path to ground for audio signals on the screen grid. Plate and screen voltages are supplied from the +125-vdc supply through plate load resistor R527 and screen dropping resistor R528. The audio output is developed across R527 and coupled through C517 to normal receiver control R819 in the Audio Amplifier and Modulator (see figure 5-116).

3-134. Audio Amplifier and Modulator. During receive operation, tubes V803 through V808 amplify the received and detected audio signals to the level necessary to drive the headset; during transmit these stages are used to modulate the carrier in the RF and PA Amplifier. In addition to the basic amplifier and modulator circuits, the Audio Amplifier and Modulator contains dc squelch amplifiers V801A and V801B and squelch relay K801, signal-plus-noise to noise (S+N/N) squelch discriminator CR801 and CR802, broadband cathode follower V802A, and compression rectifier V802B. (See figure 5-100).

3-135. Audio Amplifier and Driver Circuits. (Figure 5-116.) The audio input from the Third IF Amplifier is applied to the control grid of audio amplifier V803. The signal is applied through closed contacts 12 and 5 of squelch relay K801, contacts 15 and 16 of t/r relay K802, and contacts 3 and 8 of broadband relay K803. (This latter relay is closed when the PLAIN-BROADBAND switch is in the PLAIN position). The input is developed across resistor R826 and is coupled to the control grid of V803 through C809, the parallel combination of C817 and R847, and R854. Jack J805 is a test point used either to measure audio signals or to inject audio signals at the control grid of V803 during test and troubleshooting. Plate and screen voltages for V803 are obtained from the +125-vdc supply through a voltage divider consisting of resistors R828 and R829 of this assembly, and resistors R616, R617, and R618 of the Relay-Filter.

3-136. Audio and modulator driver V804 is a parallel-operated dual-triode. The cathode bias for both sections is obtained from R832 which is bypassed by C815. The V803 audio output is developed across resistor R830 and is coupled through C814 to potentiometer R831 which adjusts the input level to audio and modulator driver V804 during normal operation. The audio level determined by the setting of R831 is coupled to the parallel-connected grids of V804 through C818 and parasitic suppressors R855 and R856. Test point J802 is used to measure audio signals or to inject audio signals at the control grid of V804. Plate voltage for the stage is obtained from the +275-vdc supply through the primary of phase-splitting transformer T801.

3-137. Audio output amplifiers V805 through V808 are parallel-connected and push-pull operated. Tubes V805 and V807 comprise a parallel pair, as do tubes V806 and V808. The output signal of audio and modulator driver V804 is developed across T801 and applied to the control grids of the audio output amplifiers. The signal at pin 3 of the secondary winding is coupled directly to the parallel-connected grids of V805 and V807; and the signal at pin 5 of the transformer, which is 180 degrees out of phase with the pin 3 signal, is coupled directly to the control grids of V806 and V808. A fixed bias of -11 vdc is applied to the control grids through the transformer center tap, pin 4. The cathodes of V805 through V808 are returned to ground through R834 which is a meter shunt. (The voltage developed across the resistor during transmit indicates the percentage of modulation.) Screen grid voltages for the output amplifiers are supplied from the +125-vdc supply through parasitic suppressors R843 through R846. Plate voltages are supplied from the +275-vdc supply through the primary of the output transformer. Test points J803 and J804 are used to measure the audio modulation (during transmit) and the input to V806, respectively.

3-138. The receive audio output signal is obtained from the tapped secondary winding (pins 7, 8, and 9) of T802 (see figure 3-5). The normal receive audio output is coupled from pin 7 of T802 to contacts 9 and 10 of t/r relay K602 of the Relay-Filter. The remote audio from pin 10 of K602 is coupled directly to the remote audio output jack; the local audio is routed through the parallel combination of resistor R3 and VOLUME control R117, and resistor R705 to local HEADSET J702B and AUDIO output jacks J703 and J704.

3-139. Squelch Circuit. The squelch circuit deenergizes the audio stages when the input signal level drops below the squelch threshold level. The front panel SQUELCH control enables the circuit and controls the gain of the receiver by applying a negative bias to the if avc line. Thus, the setting of the SQUELCH control determines the input signal level that deactivates the squelch circuit.

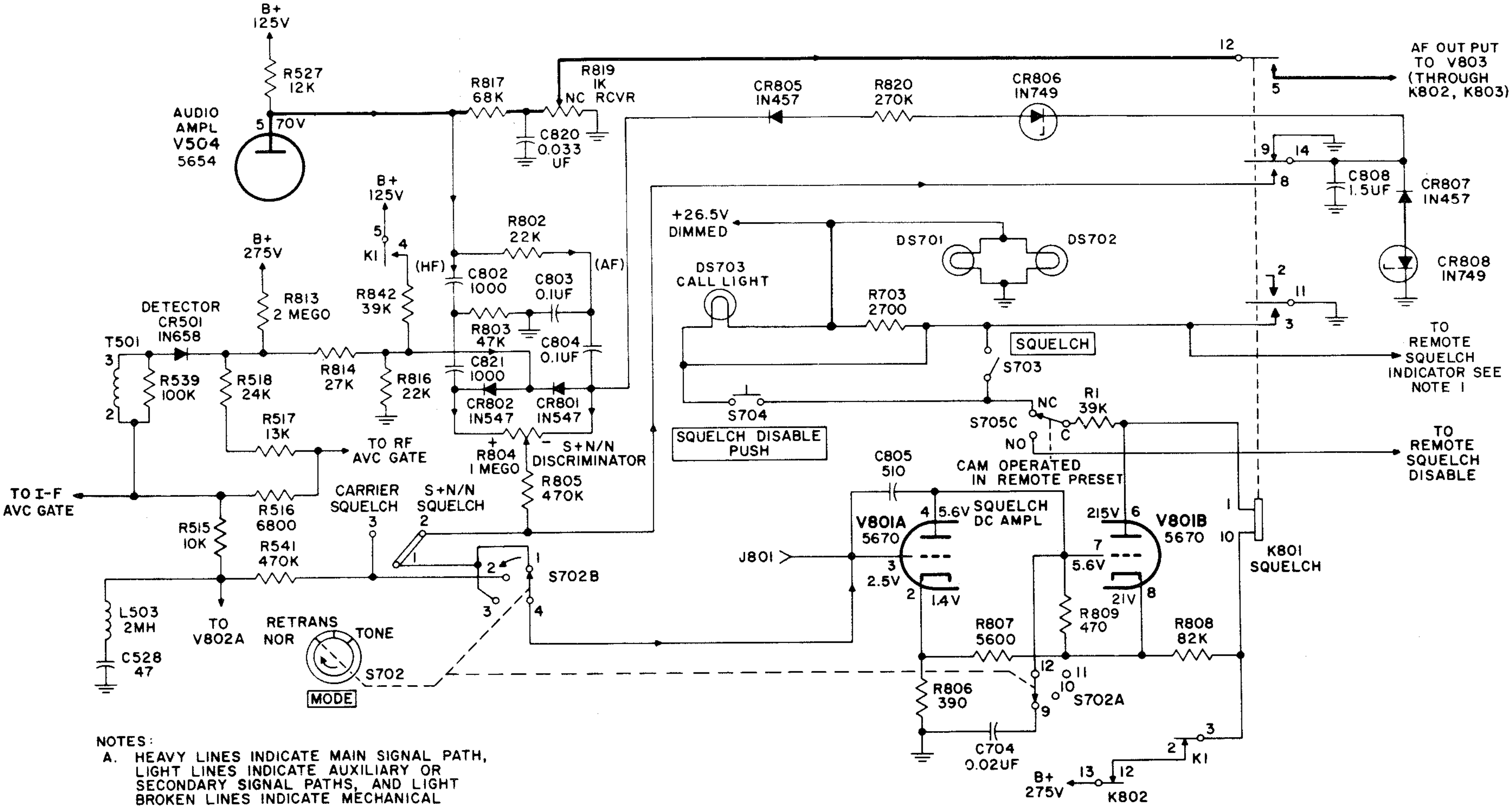
3-140. With reference to figure 3-9, note the MODE switch S702B is modified by link connections. When the link is connected across pins 1 and 2, the equipment is connected for S+N/N squelch; and when the link is connected across pins 1 and 3, the equipment is connected for carrier squelch. Thus, the squelch dc amplifiers receive a grid voltage from a route determined by the setting of MODE switch S702B and the squelch connections. At the NOR (normal) and TONE settings of the MODE switch, and with the link connected between 1 and 2, grid voltage is applied to V801A from S+N/N discriminator control R804 through R805 and contacts 1 or 3 of the MODE switch. In the RETRANS (retransmit) mode, the grid of V801A is connected to the negative side of audio detector load (R516, R517, and R518) through R515, R514, and contact 2 of the MODE switch.

NOTE

Regardless of the link connection, in RETRANS mode the equipment is set for carrier squelch; and when the link is connected between pins 1 and 3, the grid of V801A is always connected to the negative side of the detector load.

3-141. Resistors R806, R807, and R808 comprise a voltage divider that provides operating voltages for squelch dc amplifiers V801A and V801B. The cathode of V801B is connected to the junction of resistors R807 and R808. Thus, the cathode of V801B is at a much higher positive potential than the cathode of V801A. The control gird of V801B and the plate of V801A are connected to the cathode of V801B through resistor R809. The plate of V801B is connected to the +275-vdc supply through the coil of squelch relay K801, contacts 3 and 2 of work relay K1, and contacts 12 and 13 of t/r relay K802 (see figure 5-99).

3-142. With no received signal, there is a positive bias on the control grid of V801A. This bias is the result of the delay bias on the detector load provided by R813, R814, and R816 during carrier squelch operation and during S+N/N operation, it is the reference bias developed by sensing diodes CR801 and CR802. With conditions as stated, tube V801A conducts, drawing current through R809 which causes the control grid of V801B to go negative with respect to the cathode. Tube V801B cannot conduct because of the negative bias on its control grid. Squelch relay K801 is deenergized



NOTES:

A. HEAVY LINES INDICATE MAIN SIGNAL PATH, LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS, AND LIGHT BROKEN LINES INDICATE MECHANICAL LINKAGE.

B. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

C. SWITCHES ARE VIEWED FROM OPPOSITE DRIVEN END.

D. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

1. USED WITH THE C-2383/URC-9

2. UNLESS OTHERWISE INDICATED, ALL VOLTAGES ARE DC TAKEN WITH A HIGH IMPEDANCE VTVM, MEASURED TO GROUND (CHASSIS)

Figure 3-9. Radio Set AN/URC-9( ), Squelch Amplifier and Signal-Plus-Noise to Noise Discriminator, Simplified Schematic Diagram and the audio line from audio amplifier V504 to audio amplifier V803 is open because contacts 12 and 5 of the squelch relay are open.

3-143. When a signal is received, the negative voltage developed by the carrier across the detector load (carrier squelch), or the negative voltage developed in the sensing circuit (S+N/N squelch) biases V801A to cutoff. With no current through V801A, there is no voltage drop across plate load resistor R809, and the grid of V801B approaches the same potential as the cathode. This causes V801B to conduct and squelch relay K801 to energize, thereby completing the circuit from audio amplifier V504 to audio amplifier V803 through contacts 5 and 12 of K801.

3-144. SQUELCH control R702 is normally adjusted for threshold at the frequency of minimum received signal strength. Weak signals or noise may cause squelch relay K801 to operate intermittently; this intermittent operation will be indicated by CALL LIGHT DS703 which will flicker. SQUELCH DISABLE switch S704 may be used to determine whether noise or signals are causing the intermittent operation. When pressed, this switch provides a ground return for squelch relay K801, thus energizing K801. The audio output from the headset permits identification if the input signal.

3-145. When the radio set is operated from a remote station, through the use of auxiliary equipment, switch S705C transfers control from the local to the remote station.

3-146. Signal-Plus-Noise To Noise Squelch Discriminator Circuit. (Figure 3-9.) Signal-plus-noise to noise (S+N/N) squelch is put into operation automatically in the NOR (normal) and TONE modes when the grid of V801A is connected to the wiper arm of potentiometer R804. The voltage divider, consisting of resistors R816 and R814, provides a positive bias of approximately +2 vdc on receive, which is applied to the junction of diode rectifiers CR801 and CR802. The low-pass filter consisting of resistor R802 and capacitor C803 passes the audio signal to dc blocking capacitor C804 which couples the audio signal to CR801. Diode rectifier CR801 rectifies the signal and developes a negative voltage at the right end of R804. The high-pass filter consisting of capacitor C802 and resistor R803 passes the high frequency noise and developes a positive voltage at the left end of R804. Thus, the voltage distribution across R804 is dependent upon the ratio of the amplitude of the audio signal to the amplitude of the noise (S+N/N ratio).

3-147. The S+N/N ratio that will cut off V801A and open the squelch is determined by the setting of potentiometer R804. When squelch relay K801 is energized, contacts 8 and 14 connect C808 across the output of the S+N/N sensing circuit through R805. This switching of C808 provides a fast attack and slow release in the squelch operation. When C808 is not in the squelch circuit (i.e., K801 deenergized) it is discharged through contacts 9 and 14 of K801. Diode CR805 is a blocking diode used to prevent charge leakage on C808; zener diode CR806 controls the charging of C808. Diode CR807 prevents the charging voltage from being grounded, and zener CR808 limits the amount of charge across C808.

3-148. Carrier Squelch Circuit. When the link connection is made between 1 and 3 (figure 3-9) the control grid of squelch dc amplifier V801A is connected to the negative side of the diode detector load regardless of the setting of MODE switch S702B. Carrier squelch functions as previously described in paragraph 3-139.

3-149. Broadband Receive Circuit. Operation with broadband equipment requires broadband relay K803 to be maintained in the deenergized condition. By placing the PLAIN-BROADBAND switch at BROADBAND, the ground return is removed from K803 (see figure 5-3).

3-150. Refer to figures 5-3 and 5-116 during the following discussion. The control grid of broadband cathode follower V802A is supplied by the broadband receive audio signal from T501 in the Third IF Amplifier. Capacitor C801 couples the input signal to the grid of V802A, and capacitor C806 couples the output signal from the cathode of the stage to the broadband equipment. Broadband cathode follower V802A receives plate voltage from the +275-vdc supply through contacts 12 and 13 of t/r relay K802. Bias for the control grid is provided through R810 from the junction of cathode resistors R811 and R818.

3-151. The broadband receive audio input signal from the broadband equipment is applied to the grid of audio amplifier V803. The path of the input signal is through contacts 9 and 10 of t/r relay K802, contacts 2 and 8 of broadband relay K803, coupling capacitor C809, and the network consisting of C817, R847, and R854. The subsequent amplification of the broadband signals is provided by conventional amplifying circuits.

3-152. METERING CIRCUITS.

3-153. GENERAL. Meter M701, together with switch S701, permits measurement of critical current and voltage levels throughout Radio Set AN/URC-9( ). METER switch S701 selects the circuits to be monitored and conditions the meter circuits. The metering circuits are designed such that normal outputs of the monitored circuits register in the NORMAL range on the meter scale.

3-154. SWITCH POSITIONS. There are eleven active switch positions; the schematic of each position is shown in figure 3-10. The circuit for each switch position is described in the following paragraphs.

NOTE

Resistor R707 is connected in series with M701 in all switch positions (less SWR and PWR) to minimize the effect of temperature variations on meter accuracy.

3-155. S METER. With METER switch S701 in the S METER position, meter M701 indicates the strength of the received signal. Switch S701A connects the negative side of meter M701 to resistor R308 which is part of the cathode-bias circuit for if amplifier V302 in the First IF Amplifier. Switch S701B connects the positive side of the meter to a voltage divider comprised of resistors R710 and R712. Resistor R712 is adjusted to provide a voltage which balances the no-signal voltage developed across R308. Upon receipt of a signal, current flow through V302 is decreased through avc action. This results in a reduction of voltage across R308 that is proportional to the amplitude of the received signal.

3-156. SWR. With METER switch S701 in the SWR position, meter M701 indicates the reflected power on the transmission line from the antenna. Switch S701A connects the negative side of meter M701 to R1301 in the directional coupler; and switch S701B connects the positive side of the meter to ground. The rectified voltage drop across SWR detector load resistor R1301 causes current to flow through meter M701. Therefore, the applied voltage is proportional to the reflected power at the antenna.

3-157. PWR. With METER switch S701 in the PWR position, meter M701 indicates the power delivered to the antenna. Switch S701A connects the negative side of meter M701 to R1304 in the directional coupler; and switch S701B connects the positive side of the meter to ground. The rectified voltage drop across PWR detector load resistor R1304 causes a current to flow through the meter. The amount of current flow is controlled by the voltage across R1304 and is proportional to the power delivered to the antenna.

3-158. DVR I_b. With METER switch S701 in the DVR I_b position, meter M701

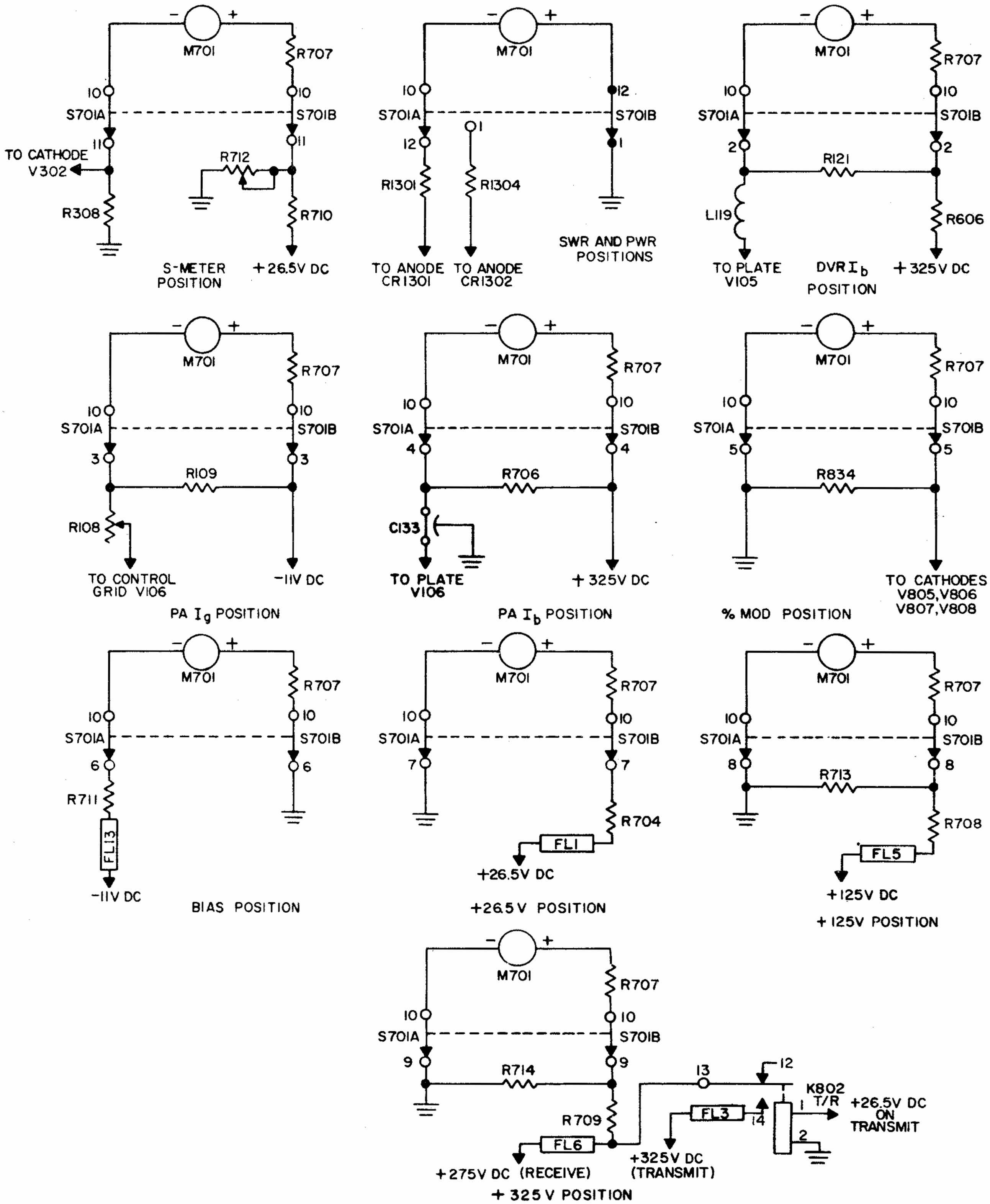


Figure 3-10. Metering Circuits, Simplified Schematic Diagram

indicates the plate current of transmit driver V105 in the RF and PA Amplifier. Switch S701 connects meter M701 across shunt resistor R121. The negative side of the meter is connected through S701A to the plate of transmit driver V105A; the positive side is connected through S701B to the +325-vdc supply. The flow of V105 plate current through R121 produces a voltage which is proportional to the amount of plate current.

3-159. PA I_g. With METER switch S701 in the PA I_g position, meter M701 indicates the grid current of transmit power amplifier V106 in the RF and PA Amplifier. Switch S701 connects the meter across shunt resistor R109, which is part of the grid-leak circuit for transmit power amplifier V106. Thus, the voltage developed across R109 is proportional to the power amplifier grid current. The negative side of the meter is connected through S701A to the control grid of V106; the positive side is connected through S701B to the -11-vdc bias supply. Resistor R108 provides a means for adjusting the plate current of V106.

3-160. PA I_b. With METER switch S701 in the PA I_b position, meter M701 indicates the plate current of transmit power amplifier V106 in the RF and PA Amplifier. Switch S701 connects the meter across shunt resistor R706. The plate current of transmit power amplifier V106 developes a voltage across R706 which is proportional to the current through the tube. The negative side of the meter is connected through S701A to the plate of V106; the positive side is connected through S701B to the +325-vdc supply.

3-161. % MOD. With METER switch S701 in the % MOD position, meter M701 indicates the percentage of modulation during transmit. Switch S701 connects meter M701 across shunt resistor R834, which is also the cathode return-to-ground for audio output amplifiers V805 through V808 in the Audio Amplifier and Modulator. The negative side of the meter is connected to ground through S701A, and the positive side of the meter is connected to shunt resistor R834 through S701B. Modulator cathode current developes a voltage across R834 which is proportional to the amount of current flow. The meter reading, therefore, is proportional to the modulation cathode current.

3-162. BIAS. With METER switch S701 in the BIAS position, meter M701 indicates the output voltage of the -11-vdc supply. The negative side of the meter is connected to the -11-vdc line through switch S701A, series resistor R711, and line filter FL13; the positive side is connected to ground through switch S701B.

3-163. +26.5V. With METER switch S701 in the +26.5V position, meter M701 indicates the output voltage of the +26.5-vdc supply. The negative side of the meter is connected to ground through switch S701A; the positive side is connected to the +26.5-vdc line through switch S701B, series resistor R704, and line filter FL1.

3-164. +125V. With METER switch S701 in the +125V position, meter M701 indicates the output voltage of the +125-vdc supply. The negative side of the meter is connected to ground through switch S701A; the positive side is connected to the junction of resistors R713 and R708 through switch S701B. Resistors R713 and R708 form a voltage divider that is series connected from the +125-vdc supply to ground through line filter FL5.

3-165. +325V. With METER switch S701 in the +325V position, meter M701 indicates the output voltage of the +325-vdc supply on transmit and the output voltage of the +275-vdc supply in receive. The negative side of the meter is connected to the ground through switch S701A; the positive side is connected to the junction of resistors R714 and R709 through switch S701B. In transmit, resistors R714 and R709 form a voltage divider that is series connected from the +325-vdc supply to ground through contacts 13 and

14 of energized t/r relay K802 and line filter FL3. In receive, resistors R714 and R708 are in series from the +275-vdc supply to ground through line filter FL6.

3-166. POWER DISTRIBUTION.

3-167. AC POWER DISTRIBUTION - AN/URC-9 AND -9A. Radio Sets AN/URC-9 and -9A operate from a primary power source of 115 or 230 vac 50 or 60 Hz, single phase. The primary windings of the power transformers are connected in parallel for 115 vac operation and in series for 230 vac operation. The radio set blowers also operate on 115 vac from the primary source, therefore, when the set is connected across a 230-volt line, a switching arrangement is used to limit the voltage to 115 volts. All power transformer lines are fused, as are the primary power lines. Refer to figure 5-98 during the following discussion.

3-168. Primary ac power is applied through input jack J1404, line filter FL1401, and pins 13 and 14 of J1402-P1501 to Power Supply PP-2702/URC-9. MAIN fuse F1501 provides protection for the radio set primary power circuit; T1501 PRI fuse F1502 provides protection for the primary circuit of power transformer T1501; and T1502 PRI fuse F1503 provides protection for the primary circuit of power transformer T1502.

3-169. When power switch S1503 on PP-2702/URC-9 is closed, primary ac power is applied to the primary windings of power transformers T1501 and T1502. Each transformer has two primary windings, which are connected in parallel for 115-volt operation (as shown in figure 5-98) or in series for 230-volt operation. The position of switch S1501 determines whether the primary windings of T1501 are connected in parallel or in series; switch S1502 connects the primary windings of T1502 in parallel or in series for 115-volt or 230-volt operation.

3-170. The primary ac power for operation of r/t centrifugal fan B1051 and case centrifugal fan B1401 are obtained from the primary windings of T1501. Fan B1401 is connected to primary winding 1-2 of T1502 through contacts C1-C2 of power switch S1503 and pins 14 and 6 of PL501. Fan B1051 is connected to primary winding 3-4 of T1501 through pins 13 and 16 of P1501, and line filters FL32 and FL33 in the receiver-transmitter.

3-171. The filament voltage supply for the receiver-transmitter is obtained from secondary winding 7-8 of power transformer T1502. Line filters FL22 through FL25 in the receiver-transmitter are in series with the transformer winding and the filaments. Although all tubes in the receiver-transmitter operate on 6.3 vac, the filament supply provides 6.7 vac to account for line drop. The filament voltage for transmit power amplifier V106 in the RF and PA Amplifier, is routed through a centrifugal sensing switch located on the B1051 centrifugal fan assembly (see note 4, figure 5-108), and thermal sensing switch S101 located on the rf and pa assembly (see figures 5-109 and 5-110). Switch S101 operates to remove filament voltages from V106 when the tube overheats; and the centrifugal sensing switch operates to remove V106 filament voltage when the fan is inoperative.

3-172. AC POWER DISTRIBUTION - AN/URC-9Y. Radio Set AN/URC-9Y contains Power Supply PP-4706/URC-9Y which operates from a 24-vdc supply. The power supply contains a dc to ac converter that supplies the required ac voltages to the receiver-transmitter and power supply rectifiers. The outputs of the receiver-transmitter include 115 vac used to drive the receiver-transmitter and radio case blowers and 6.7 vac used for the filament supply. In addition to providing inputs to internal rectifiers, the ac converter supplies the power to drive the power supply blower.

NOTE

Four different power supplies are used (see figures 5-101 through 5-104).

3-173. General. The negative input (figure 3-11) is regulated by the series regulators which, with the differential amplifier, provide a nominal -23-volt regulated output to the dc to ac converter. Trip amplifiers 2A5A1Q1 and 2A5A1Q2 comprise an overcurrent device which cuts off the differential amplifier and, therefore, the dc to ac converter during a current overload.

3-174. The dc to ac converter converts the regulated dc to an ac power source; the frequency of the ac output of the converter and the start up of the converter are controlled by frequency control stages 2A5A2Q1 and 2A5A2Q2. Power transformer 2A5T1 is a component part of the dc to ac converter; it supplied the ac voltages required by the receiver-transmitter as well as the ac voltages which drive the power supply rectifiers. Refer to figure 5-101 through 5-104 during the following discussion.

3-175. Regulator Input Circuits. When the front panel power switch (OFF-RESET) is closed, the negative input is applied to a pair of series regulators, each of which consists of a driver (2A5Q1 or 2A5Q3) and a regulator (2A5Q2 or 2A5Q4). The nominal -24-volt input is applied through current dividers 2A5R3 and 2A5R2. Diode 2A5CR1 prevents equipment damage if the polarity of the input is reversed.

3-176. Differential amplifiers 2A5A1Q3 and 2A5A1Q4 provide high-voltage regulation by comparing a voltage standard with a sample of the regulated voltage. The voltage standard is provided by zener diode 2A5A1CR4 which maintains a reference level at the base of 2A5A1Q3. The regulated voltage sample is taken across the common emitter outputs of regulators 2A5Q2 and 2A5Q4. The differential amplifier output is taken from the junction of 2A5A1R15 and 2A5A1R9 and provides forward bias for the drivers. This condition exists as long as operation is normal; that is, as long as no overload exists. However, when an overload does occur, the regulators are turned off by the differential amplifier which, in turn, is turned off by trip amplifiers 2A5A1Q1 and 2A5A1Q2.

3-177. Without an overload, both trip amplifiers are turned off: The bias for 2A5A1Q2 is developed by the forward voltage drop across 2A5A1CR3. The emitter of 2A5A1Q2 is, at approximately -10 volts; the base, because of the voltage drop across 2A5A1CR3, is at approximately -9 volts.

3-178. During an overload, the voltage drop across 2A5R2 and 2A5R3 increases and is coupled to the base of 2A5A1Q1. Thus, the reverse bias obtained from 2A5A1R1 is overcome and transistor 2A5A1Q1 is turned on. The subsequent 2A1A1Q1 collector current turns on 2A5A1Q2. Since the collector of each trip amplifier is fed back to the alternate base, the waveshape at the emitter of 2A5A1Q2 has a sharp leading edge which abruptly turns off the differential amplifier. Current continues to flow through the trip amplifiers until the POWER switch is set to OFF-RESET position.

3-179. Two identical resistor-diode networks are used in the 2A5A1Q1 amplifier circuit so that an overload in either series regulator circuit will turn on the trip amplifiers. Diodes are used in conjunction with the resistors to favor the regulator branch passing the most current; without the diodes, the amplifiers would react to an average overcurrent level.

3-180. Frequency Controlled DC to AC Converter. The frequency-controlled dc to ac converter operates from a nominal -23-vdc input to drive a push-pull oscillator. The output of the oscillator is a 60 hertz square wave which is coupled through 2A5T1 to the secondary circuits of the power supply. The core of frequency-control coil 2A5A2L1 is designed to saturate sooner than the transformer core; the coil, therefore, controls the frequency of the converter oscillation.

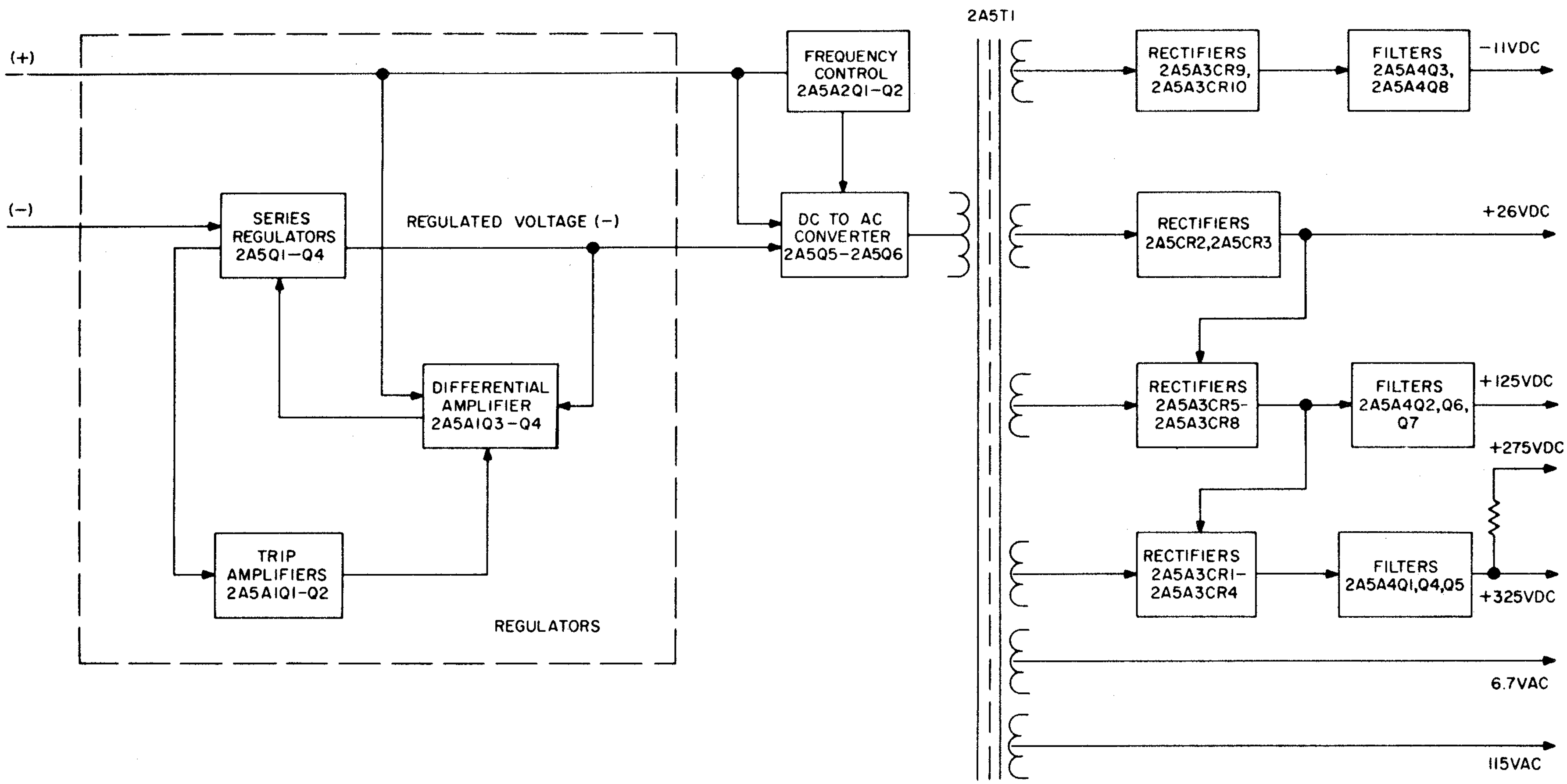


Figure 3-11. Power Supply PP-4706/URC-9Y, Block Diagram

3-181. Initially, one transistor is turned on and current is drawn through the transistor and the corresponding coil section. The on-off status of the transistors is maintained until the core of the coil saturates. At saturation, the impedance of the coil section drops and current is drawn through the resistor (2A5R1 and 2A5R6) to turn off the conducting transistor. Consequently, the voltage across the transformer windings reverses, current reverses, and the alternate transistor is turned on. The diodes prevent loading of one transistor when the alternate transistor is turned on. Feedback is provided by transformer coils 17 and 18, and 4 and 5, which alternately supply current to the base of the transistors.

3-182. Transistors 2A5A2Q1 and 2A5A2Q2 comprise a start-up circuit which ensures that the dc to ac converter will start oscillating every time power is applied. The start-up signal is a 1 hertz pulse that appears only when the converter is not oscillating. It is developed by transistor 2A5A2Q1 which is turned on by 2A5A2Q2.

3-183. When power is applied, capacitor 2A5A2C1 charges rapidly through unijunction transistor 2A5A2Q2 which turns on 2A5A2Q1. However, when charged, the current drawn by the capacitor and resistor 2A5A2R5 is not sufficient to maintain conduction through 2A5A2Q2. Both transistors, therefore, are turned off. This condition is maintained until the capacitor discharges sufficiently through the resistor. At this point, 2A5A2Q2 is again turned on, and the cycle is repeated. When the converter is oscillating, capacitor 2A5A2C1 is kept charged by the forward conduction through 2A5A2R1 and the upper base of 2A5A2Q2; this occurs during alternate half cycles of the oscillator frequency. The output is taken from 2A5A2A1 through 2A5A2R2 to dc to ac converter transistor 2A5Q6.

3-184. AC POWER DISTRIBUTION - AN/URC-9AY. Radio Set AN/URC-9AY contains Power Supply PP-4706A/URC-9Y which operates from a 24-vdc (nominal) source to provide an output of 115 vac 60 Hz single phase used to drive the receiver-transmitter and radio case blowers, and 115 vac 400 Hz single phase used to operate the power supply blower. The power supply also produces a 36 vac 1475 Hz supply for internal use.

3-185. General. The negative input (figure 3-12) is supplied to a dc to ac converter comprised of a differential amplifier consisting of Q1911 and Q1912. The dc to ac converter converts the regulated dc to an ac power source by supplying an alternately interrupted direct current of opposite polarity to the reactor. The frequency output of the dc to ac converter is controlled by the saturable reactor T1905. The output of T1905 provides 115 volts at 400 Hz to operate the power supply blower motor.

3-186. The positive input is supplied to a dc to ac converter and a series regulator. The dc to ac converter, comprised of Q1907 and Q1908, provides the voltage required by the low frequency saturable reactor T1904. The frequency controlled output of T1904 is applied to Q1909 and Q1910 which regulates and amplifies the input voltages to power amplifier T1903. The outputs of T1903 are 115 vac 60 Hz used to operate the case and receiver-transmitter blower motors, and 26.3 volts which is then rectified to provide the +26.5 vdc required to operate the receiver-transmitter centrifugal fan and associated components.

3-187. The series regulator, consisting of Q1903 through Q1906, is used to amplify any difference signal obtained from a comparison between a portion of output voltage and a reference source, and to develop a controlling voltage. The regulated voltage is applied to a dc to ac converter comprised of Q1901, Q1902 and power transformer T1901. Transformer T1901 is a component part of the dc to ac converter; it supplies the ac voltage which drive the power supply rectifiers.

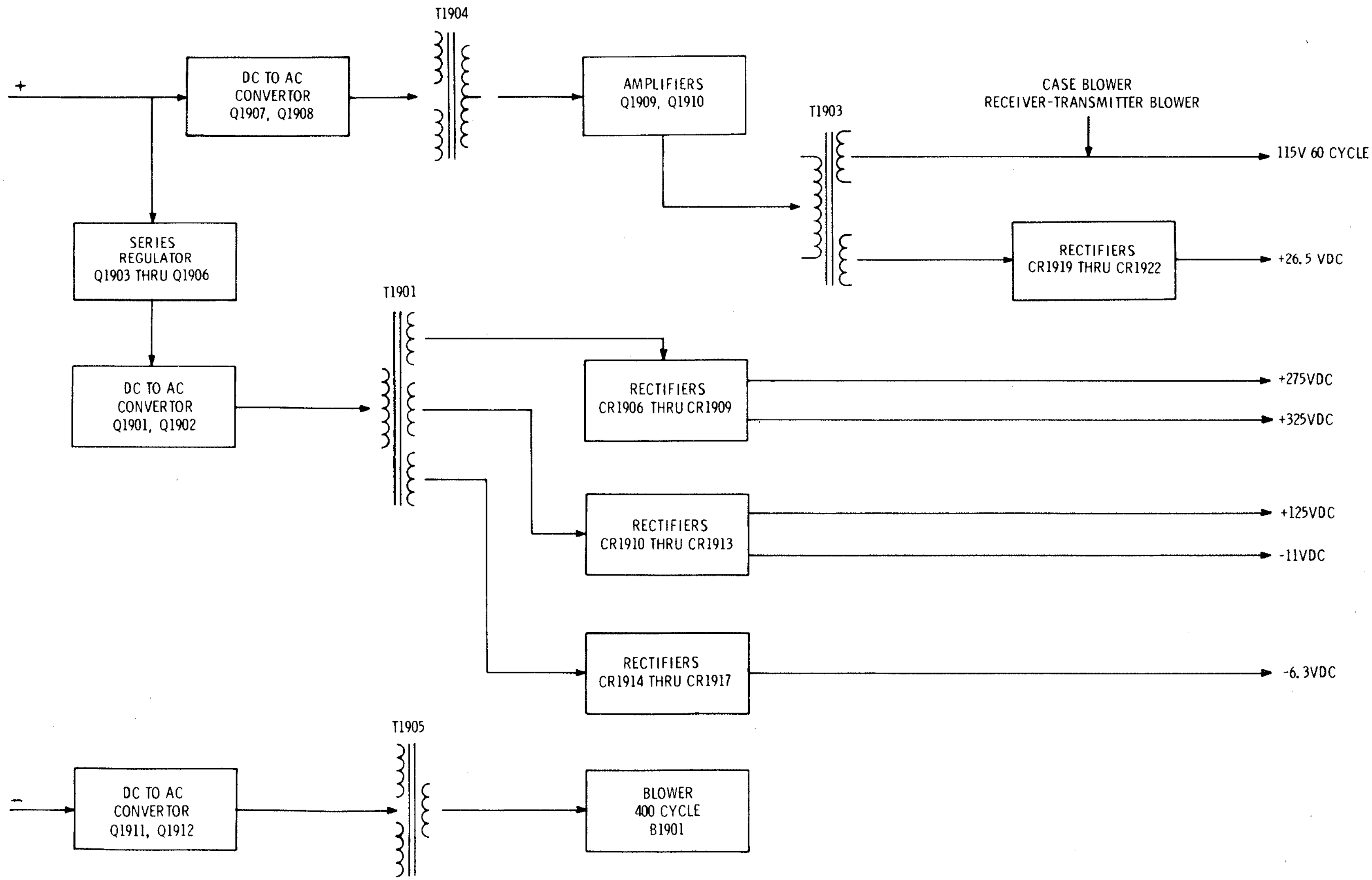


Figure 3-12. Power Supply PP-4706A/URC-9Y, Block Diagram

3-188. The power supply consists of three separate supplies: 112 volt 395 Hz; 110 volt 53 Hz; and 36 volt 1475 Hz. The ac frequencies specified in the following circuit description are dependent upon input voltage. When the primary input is 24 volts the frequencies are as specified; however, the frequencies are reduced when primary power drops below 24 volts and are increased when primary power exceeds 24 volts. Refer to the schematic diagram, figure 5-105, during the following circuit descriptions.

3-189. Primary Power Circuit. When the front panel power switch (S1901) is closed, 24-vdc (nominal) primary power is applied to the three supply circuits simultaneously. Diode CR1901 protects the power supply circuits against reversed polarity from the primary source, and two filters, FL1901 and FL1902, form radio frequency interference filter network to protect the primary source from any feedback generated in the power supply. All supply circuits are protected by fuses which are located on the front panel of the power supply; fuse F1901 protects the 36-volt 1475-Hz supply; fuse F1902 protects the 115-volt 53-Hz supply; and fuse F1903 protects the 112-volt 395-Hz supply.

3-190. 112-Volt 395-Hz Supply. The 112-volt 395-Hz supply is an inverter circuit comprised of Q1911, Q1912, saturable reactor T1905, and associated parts contained in Power Supply Module A1904. Input voltage is supplied to CR1905 to provide starting current for the differential amplifier which produces an alternately interrupted dc current of opposite polarity to the primary of T1905. The saturable reactor T1905 is a control device that uses small dc current inputs to control a large ac current by controlling core flux density. However, since the frequency output is directly affected by input voltage changes, the differential amplifier is used to ensure a stable frequency. The output at terminals 7 and 8 of saturable reactor T1905 is a 112-volt 395-Hz signal, filtered by C1905 and R1919, and supplied to the cooling fan motor, B1901. A start-run capacitor, C1907, is connected to the cooling fan motor for initial starting and proper directional operation.

3-191. 110-Volt 53-Hz and 26.5-Volt Supply. The 110-volt 53-Hz supply is comprised of an oscillator circuit and an inverter stage. The oscillator circuit consists of Q1907, Q1908, saturable reactor T1904, and associated parts. It serves as a starting mechanism for the inverter stage due to its high impedance loading. Resistor R1910, located in resistor and Capacitor Module A1902, provides the drop in base voltage necessary for starting, while R1909 is used as a current limiter. The oscillator output is filtered through C1902 to minimize feedback effects and to provide isolation between the stages. The square wave output of the oscillator is supplied to the inverter stage from terminals 7, 8, and 9 of T1904.

3-192. The inverter stage consisting of Q1909, Q1910, R1908, and zener diodes CR1923, and CR1924 is located in the Semiconductor Module A1901. Resistor R1908 is used as a base current limiter for Q1909 and Q1910. The zener diodes, CR1923 and CR1924, limit the peak voltage across transistors Q1909 and Q1910. The output of the inverter stage is applied to terminal 1 and 3 of power amplifier T1903. The output of T1903 at terminals 4 and 5 is 110 volts 53 Hz which is filtered through R1921 and C1904 to prevent any feedback from the receiver-transmitter or case blower motors. The output at terminals 6 and 7 of T1903 is 26.3 volts 53 Hz which is applied to a full wave bridge rectifier to produce a 26.5-vdc signal.

3-193. 36-Volt 1475-Hz Supply. The 36-volt 1475-Hz supply is comprised of a series regulator and an inverter circuit. The series regulator consists of Q1903 through Q1906 and associated parts. Zener diodes CR1903 and CR1904, in Semiconductor Module A1901, maintain the voltage level across the regulator output.

Capacitor C1906, located in Resistor and Capacitor Module A1902, provides regulation collector current to Q1903 through Q1906 by decreasing the reverse bias when any input frequency change is detected. Parallel pairs of resistors R1905, R1923 and R1906, R1922 are used to balance the outputs at the emitters of Q1903 and Q1904. Capacitor C1901, located in Resistor and Capacitor Module A1902, filters the regulator outputs.

3-194. The output from the components comprising the series regulator is applied to an inverter circuit consisting of saturable reactor T1902, Q1901, Q1902, the primary of power amplifier T1901 and associated parts. Resistor R1903, located in Resistor and Capacitor Module A1902, is used for starting base current; CR1902, located in Semiconductor Module A1901, provides the starting impedance, and resistor R1902 is the base current limiter for Q1901 and Q1902. The output of the inverter, 36 volts 1475 Hz, is applied to the primary of T1901 at terminals 1 and 3. Power amplifier T1901 outputs provide voltages to drive the power supply rectifiers.

3-195. DC POWER SUPPLY - AN/URC-9 and -9A. Power Supply PP-2702/URC-9 provides dc voltages for Receiver-Transmitter RT-581( )/URC-9 of Radio Sets AN/URC-9 and -9A. The power supply makes use of semiconduct diodes in a full-wave bridge rectifier circuit configuration; also, all of the output lines are fused for overload protection. The following paragraphs describe the dc power supplies and power distribution.

3-196. Power Supply PP-2702/URC-9 provides dc operating voltages of +26.5 volts, +325 volts, +275 volts, +125 volts, and -11 volts required by the receiver-transmitter. Althrough five different operating voltages are supplied, the power supply uses only three semiconductor-diode, full-wave, bridge-rectifier circuits to provide the voltages. Refer to figure 5-106 during the following discussion.

3-197. <u>+26.5-Volt DC Supply</u>. The +26.5-vdc supply consists of T1501 secondary windings 7 and 8 and diodes CR1505 through CR1508 which are connected in a conventional full wave bridge-rectifier circuit. Overload protection is provided by RECT 26.4V fuse F1505. In addition to the +26.5-vdc unfiltered output, a panel and indicator light output is provided through DIMMER control R1506. POWER indicator light DS1501 is illuminated (red) when power switch S1503 is set to on (up) position.

3-198. <u>+325-Volt and +275-Volt DC Supply</u>. The +325-and +275-vdc supplies are furnished by the same bridge-rectifier circuit. This circuit consists of T1501 secondary windings 5 and 6, full-wave bridge-rectifier diodes CR1501 through CR1504, and the +26.5-volt supply. The bridge-rectifier develops approximately 300 volts; the negative output of this circuit is connected to the positive output of the +26.5-volt supply, thus placing the positive output of the 300 volt rectifier at 325 volts above ground. The output of the +325-volt supply is filtered by choke-input filter L1501-C1501 and L1502-C1502. Diode CR1513 provides suppression of transient signals developed across L1502 when the radio set is changed from transmit to receive. Resistors R1501 through R1504 form a bleeder network for the rectifier. Overload protection for the +325-volt line is provided by 325V B+ fuse F1504 (on both transmit and receive). Resistor R1505 reduces the +325 volt-output to +275 volts in receive. Overload protection for the +275-volt line is provided by 325V B+ fuse F1507 (receive only).

3-199. <u>+125-Volt and -11-Volt DC Supply</u>. The +125-and -11-vdc supplies are furnished by the same bridge-rectifier circuit. This circuit consists of T1502 secondary windings 5 and 6 and full-wave bridge-rectifier diodes CR1509 through CR1515. The +125-volt and -11-volt outputs are filtered by double-section choke-input filter L1503-C1504 and

L1504-C1505. Capacitors C1503 and C1506 resonate with choke coils L1503 and L1504, respectively, to present a high impedance to the 120 Hz ripple. Resistor R1507 is the bleeder across the +125 volt output. The -11 volt output is obtained from the junction of R1508 and Zener diode CR1514. The Zener diode, which has a range of -9.1 to -11 volts, controls the -11 output. Overload protection is provided by +125V B+ fuse F1506.

3-200. DC POWER SUPPLY - AN/URC-9Y. Power Supply PP-4706/URC-9Y provides the dc voltages for Receiver-Transmitter RT-581/URC-9 of Radio Set AN/URC-9Y. The power supply is comprised of regulator input circuits, a frequency-controlled dc to ac converter, and rectifier/filter circuits. Operating from a 24-vdc source, the power supply provides separate outputs of 115 vac, +26.5 vdc, -11 vdc, +125 vdc, +325 vdc, and +275 vdc.

NOTE

Four different power supplies are used in the radio set; one is used with the radio set bearing an A serial number prefix, and three are used with the B serial number prefix. Refer to figures 5-101 through 5-104 which illustrate and identify the various power supplies.

3-201. Power transformer 2A5T1, a component part of the dc to ac converter, supplies the ac voltages which drive the power supply rectifiers (see figure 3-11). The rectifiers in turn, provide the following outputs: -11 volts and +26.5 volts which are taken from across respective full-wave rectifiers; +125 volts from a 100-volt full-wave bridge rectifier in series with the +26.5-volt supply; and +325 volts from a 200-volt full-wave bridge rectifier in series with the +125-volt supply. As shown in figure 3-11, the +275-volt source is taken from the +325-volt supply through a voltage dropping resistor. (Refer to paragraphs 3-175 and 3-180 for the description of the regulator input circuits and dc to ac converter circuits.) The following paragraphs describe the operation of the rectifier and filter circuits.

3-202. <u>-11 Volts DC</u>. This supply is derived from full-wave rectifier 2A5A3CR9 and 2A5A3CR10; the rectifier output, at a -18-volt level, is applied to filter transistors 2A5A4Q3 and 2A5A4Q8. Filtering is accomplished by the regulating action of these transistors. The -18 volts is applied to 2A5A4Q3, the output of which is -11 volts dc. Variations in the output are fed back through zener diode 2A5A4CR3 and the base of regulator 2A5A4Q8 which provides a compensating bias for 2A5A4Q3.

3-203. <u>+26.5 Volts DC</u>. This supply is derived from full-wave rectifiers 2A5CR3 and 2A5CR4 which are capacitively filtered by 2A5A3C2.

3-204. <u>+125 Volts DC</u>. This supply is derived from 100-volt bridge rectifiers 2A5A3CR5 through 2A5A3CR8, the output of which is taken in series with the +26.5-volt supply. The rectified output is applied through a pi filter to three cascaded amplifier stages. The output of the filter is taken through transistor 2A5A4Q2 which is sequentially driven by 2A5A4Q6 and 2A5A4Q7. The three transistors function in the same manner as a voltage regulator except that capacitor 2A5A4C3 acts as the voltage reference. The capacitor is charged through zener diode 2A5A4CR2 at the peak voltage input of the combined dc and ripple voltage.

3-205. <u>+325 Volts DC and +275 Volts DC</u>. This supply is derived from 200-volt bridge rectifiers 2A5A3CR1 through 2A5A3CR4, the output of which is taken in series with the +125-volt supply. The rectified output is applied through a filter and amplifier network that operates in the same manner as that described in the previous paragraph.

3-206. DC POWER SUPPLY - AN/URC-9AY. Power Supply PP-4706A/URC-9Y provides the dc voltages for Receiver-Transmitter RT-581/URC-9Y of Radio Set AN/URC-9AY. The power supply is comprised of regulator input circuits, frequency-controlled dc to ac converters, and rectifier and filter circuits. Operating from a 24-vdc source, the power supply provides outputs of 115 vac, +26.5 vdc, +325 vdc, +125 vdc, -11 vdc and -6.3 vdc.

3-207. Power transformer T1901, a component part of the dc to ac converter, supplies the ac voltages that drive the power supply rectifiers (see figure 3-12). The rectifiers, in turn, provide -11 volts and +125 volts from a full-wave bridge rectifier comprised of CR1910 through CR1913 and +325 volts from a full-wave bridge rectifier comprised of CR1906 through CR1909. The +275-volt output is taken from the +325-volt supply through a voltage dropping resistor. The -6.3-vdc supply, taken from rectifiers CR1914 through CR1917, provides filament voltage for the receiver-transmitter. (Refer to paragraphs 3-138 through 3-194 for the description of the primary power circuits and dc to ac converter circuits.) The following paragraphs describe the operation of rectifier and filter circuits, (see figure 5-105.)

3-208. <u>+26.5 Volts DC</u>. The 26.5-volt 53-Hz output at terminals 6 and 7 of power amplifier T1903 is rectified by full-wave bridge rectifier CR1919 through CR1922, located in Semiconductor Module A1901, to produce a +26.5-vdc signal. Resistor R1913 is a voltage divider for panel lighting control, and fuse F1907 protects the +26.5-vdc circuit against overloads and shorts.

3-209. <u>+325 Volts DC and +275 Volts DC</u>. Terminals 4 and 5 of T1901 provide a 340 volts rems which is rectified by a full-wave bridge comprised of CR1906 through CR1909 in Filter Bias Module A1903 to produce a +325-vdc output. Filtering is accomplished by a pi filter network comprised of C1910 (in Resistor Capacitor Module A1902), C1909, and L1901 (chassis-mounted). Overload protection is provided by fuse F1904. Resistor R1915, located in Filter Bias Module A1903 provides a high-voltage discharge path to ground when power is removed. The +325 vdc is passed through a voltage dropping resistor, R1916, located in module A1903, to provide +275 vdc. Capacitor C1911, located in Resistor and Capacitor Module A1902, filters the +275 vdc, and fuse F1905 protects the +275-vdc circuit.

3-210. <u>+125 Volts DC and -11 Volts DC</u>. Terminals 6 and 7 of power amplifier T1901 provide 150 volts rms which is rectified by a full-wave bridge, comprised of CR1910 through CR1913 in Filter Bias Module A1901, to provide +125 vdc. Capacitors C1912, C1913, C1915, and coil L1902 (in Power Supply Module A1904) filter the rectified dc. Resistor R1917, located in Filter Bias Module A1903, functions as a bleeder resistor when power is removed. The negative output of the rectifier is passed through voltage dropping resistor R1918 to reduce the negative voltage below the ground reference level. A zener diode, CR1918, maintains the negative level at -11 vdc. Both the +125 vdc and -11-vdc circuits are protected by fuse F1906.

3-211. <u>-6.3 Volts DC</u>. Terminals 7 and 8 of power amplifier T1901 provide 8.5 volts rms which is rectified by a full-wave bridge, comprised of CR1914 through CR1917, to provide -6.3 vdc for filament voltage. The output of the bridge rectifier is filtered by L1903 and C1903. Capacitor C1903, located in Resistor and Capacitor Module A1902, is connected in parallel with R1920 which serves as a bleeder resistor when power is removed.

3-212. DC POWER DISTRIBUTION - RECEIVE. The dc power distribution for the receive function of Radio Set AN/URC-9( ) is illustrated in figure 5-99. The power supply outputs are coupled to J1401-P1 of Receiver-Transmitter RT-581( )/URC-9. (The +325-vdc line is not used on receive.)

3-213. <u>+275-Volt DC Distribution.</u> The +275 vdc from pin G of P1 is routed through line filter FL6 to meter M701 on the front panel and voltage-divider resistors R813, R814, and R816 in the Audio Amplifier and Modulator. From the top of this voltage divider, the +275 vdc is applied to the parallel-connected plates of audio and modulator driver V804 and to the plates of audio output amplifiers V805 through V808.

3-214. Since t/r relay K802 is deenergized on receive, the +275 vdc is applied through normally closed contacts 12 and 13 directly to the plate of broadband cathode follower V802A, and through normally closed contacts 2 and 3 of work relay K1 (energized during channeling) to voltage-divider resistors R806 through R808 in squelch dc amplifier V801. The voltage on the plate of V801A and on the grid of V801B is obtained from the voltage divider through resistor R809; the voltage on the plate of V801B is obtained through the solenoid of squelch relay K801.

3-215. The dc voltage at the junction of +275 voltage-divider resistors R813 and R814 is applied as a delayed bias to the if and rf avc gates in the Third IF Amplifier. The dc voltage at the junction of voltage-divider resistors R814 and R816 biases the S+N/N squelch discriminator in the Audio Amplifier and Modulator.

3-216. <u>+125-Volt DC Distribution</u>. The +125 vdc from pin E of P1 is routed through line filter FL5 to voltage-divider resistors R616, R617, and R618 in the Relay-Filter. From the top of the voltage divider, the +125 vdc is coupled through resistor R607 as B+ for the plate of first receive mixer V104 in the RF and PA Amplifier. The +125 vdc is coupled directly from the top of the voltage divider to the following: meter M701 on the front panel; the cathode of compression rectifier V802B, and the screens of audio output amplifiers V805 through V808 in the Audio Amplifier and Modulator; through contacts 4 and 5 of work relay K1 (energized during channeling) to the S+N/N squelch discriminator in the Audio Amplifier and Modulator; the plates of first oscillator-multiplier V201 and injection amplifiers V203 through V205, and the plate and screen of frequency tripler V202 in the FMO; the plates of rf amplifiers V102 and V103 in the RF and PA Amplifier; the plates and screens of if amplifiers V301 and V302, and the plates of second oscillator V305 in the First IF Amplifier; the plate of third receive mixer V401A, and the plate of third oscillator V401B in the Second IF Amplifier; and to the plate and screen of audio amplifier V504 in the Third IF Amplifier.

3-217. The +125 vdc is coupled from the top of voltage divider R616, R617, and R618 in the Relay-Filter through normally closed (on receive) contacts 18 and 19 of t/r relay K602 as B+ for the plates and screens of if amplifier V501 through V503 in the Third IF Amplifier. The same +125-volt line also applies B+ to the plate and screen of second receive mixer V303 in the First IF Amplifier; this signal path is through line filter FL403, resistor R401, feedthrough capacitor C406, and impedance network Z401 in the Second IF Amplifier. The dc voltage at the junction of voltage-divider resistors R616 and R617 is applied as B+ to the plate and screen of V803 in the Audio Amplifier and Modulator.

3-218. <u>-11-Volt DC Distribution</u>. The -11 vdc from pin J of P1 is routed through line filter FL13 to meter M701 on the front panel and is used as a bias voltage for the control grids of audio output amplifiers V805 through V808 in the Audio Amplifier and Modulator. The -11 vdc is also applied directly to the control grid of transmit power amplifier V106; this circuit, however, is not shown since it is not used during the receive function.

3-219. <u>+26.5-Volt DC Distribution</u>. The +26.5 vdc from pin P of P1 is routed through line filter FL1 to meter M701 on the front panel and is used as an energizing voltage for broadband relay

K803 in the Audio Amplifier and Modulator. Relay K803 is energized by setting PLAIN-BROADBAND switch S1401 (on the equipment case) to the PLAIN position.

3-220. DC POWER DISTRIBUTION - TRANSMIT. The dc power distribution for the transmit function of Radio Set AN/URC-9( ) is illustrated in figure 5-100. The power supply outputs are coupled to J1401-P1 of Receiver-Transmitter RT-581( )/URC-9. (The +275 vdc output is not used on transmit.)

3-221. +325-Volt DC Distribution. The +325 vdc from pin C of P1 is routed from line filter FL3 through contacts 7 and 8 (closed on transmit) of t/r relay K602 to voltage-divider resistors R601, R602, and R603 in the Relay-Filter and through contacts 13 and 14 (closed on transmit) of t/r relay K802 to voltage-divider resistors R813, R814, and R816 in the Audio Amplifier and Modulator. The +325 volts across voltage divider R813, R814, and R816 is applied to meter M701 on the front panel. On transmit, closed contacts 13 and 14 of t/r relay K802 bypass fuse F1507 and resistor R1505 of the +275-vdc line. Front panel meter M701 indicates +275 vdc until the equipment is keyed to transmit; it then indicates +325 vdc.

3-222. The +325 volts across voltage divider R813, R814, and R816 is applied as B+ to the parallel-connected plate of audio and modulator driver V804, and to the plates of audio output amplifiers V805 through V808. Audio-modulated +325 vdc is coupled as B+ from the primary of transformer T802 as follows: from terminal 1 of T802 through meter-shunt resistor R706 of the Front Panel Assembly to the plate of transmit power amplifier V106 in the RF and PA Amplifier; and from terminal 2 of T802 through contacts 3 and 4 (closed on transmit) of high-voltage relay K2 and R606 in the Relay-Filter to the plate of transmit driver V105 in the RF and PA Amplifier.

3-223. Voltages from the voltage divider are also applied as delayed bias to the if and rf avc gates in the Third IF Amplifier and to the S+N/N squelch discriminator and the squelch dc amplifier in the Audio Amplifier and Modulator; these circuits, however, are not shown since they are not used during the transmit function.

3-224. Voltage divider R601, R602, and R603 in the Relay-Filter is connected between the +325 and +125-vdc power supplies. The voltage at the wiper arm of potentiometer R602 is modulated through C601 and applied as B+ to the screen grid of transmit power amplifier V106 in the RF and PA Amplifier.

3-225. +125-Volt DC Distribution. The +125 vdc from pin E of P1 is routed through line filter FL5 to the Relay-Filter, where it is applied directly across voltage-divider resistors R616, R617, and R618, and through contacts 19 and 20 (closed on transmit) of t/r relay K602 across voltage-divider resistors R601, R602, and R603. Since R601 is returned to +325 volts, voltage divider R601, R602, and R603 provides a voltage of less then +325 volts but greater than +125 volts. (The distribution of the dc voltage from the wiper arm of potentiometer R602 is described in the preceding paragraph). From the bottom of R603, the +125 vdc is applied as B+ to the plate of second transmit mixer V101 in the RF and PA Amplifier and to the plate and screen of first transmit mixer V304 in the First IF Amplifier.

3-226. From the top of voltage-divider resistors R616, R617, and R618, the +125 vdc is coupled directly to the following: meter M701 on the front panel; the plates of first oscillator-multiplier V201 and injection amplifiers V203 through V205, and the plate and screen of frequency tripler V202 in the FMOs, the plates of rf amplifiers V102 and V103 in the RF and PA Amplifier; the plates and the screens of if amplifiers V301 and V302 and the plates of second oscillator V305 in the First IF Amplifier; the plate of transmit buffer amplifier V401A and the plate of third oscillator V401B in the Second IF Amplifier; and to the cathode of compression rectifier V802B and the screens of audio output amplifiers V805 through V808 in the Audio Amplifier and Modulator. This +125-vdc line is also connected to the plate and screen of audio amplifier V504 in the Third IF Amplifier; this circuit, however, is not shown in figure 5-100 since it is not used during the transmit function.

3-227. The +125 vdc is coupled from the top of voltage divider R616, R617, and R618 in the Relay-Filter through contacts 4 and 5 (closed on transmit) of t/r relay K602 as B+ for transmit rf amplifier V104 in the rf and PA Amplifier. The dc voltage at the junction of voltage-divider resistors R616 and R617 is applied as B+ to the plate and screen of audio amplifier V803 in the Audio Amplifier and Modulator.

3-228. -11-Volt DC Distribution. The -11 vdc from pin J of P1 is routed through line filter FL13 to meter M701 on the front panel; to the control grid of transmit power amplifier V106 in the RF and PA Amplifier, as bias; and to the Relay-Filter, where it is further distributed throughout the equipment.

3-229. From the Relay-Filter, the -11 vdc is applied as bias directly to the control grids of audio output amplifiers V805 through V808 in the Audio Amplifier and Modulator. The -11 vdc is also routed through Relay-Filter resistor R611 and the microphone transformer T601, front panel MODE switch S702A (in NOR and RETRANS), and line filter FL702 to the MIKE jacks on the front panel. When the MODE switch is in the TONE position, the -11-vdc supply provides power for the 1-kHz tone generator. The -11 vdc is further routed to the remote microphone through line filter FL16 and pin Z of P1-J1401. In addition, the -11 vdc is applied through resistor R614 as the energizing voltage for t/r control relay K601 in the Relay-Filter.

3-230. +26.5-Volt DC Distribution. The +26.5 vdc from pin P of P1 is routed through line filter FL1 to meter M701 on the front panel and is used as the energizing voltage for all relays (except K601 and K801) in the RT-581( )/URC-9. The +26.5 vdc is applied to the solenoids of autopositioner relays K1201, K1202, K1203, and K1204 of the Frequency Selector (see figure 5-120 or 5-121), and through contacts 3 and 4 of these relays (closed during channel switching) to energize tuning motor B1201 and work relay K1. The same +26.5 volts is also applied as the energizing voltage for broadband relay K803 in the Audio Amplifier and Modulator; K803 is energized by setting PLAIN-BROADBAND switch S1401 (at the rear of the equipment case) to the PLAIN position. (For AN/URC-9A only, +26.5 vac is applied through contacts 3 and 5 of K1204 to the solenoid of K402 in the Second IF Amplifier when not channeling.) The +26.5 vdc is applied directly to the coil of duplex relay K603 in the Relay-Filter; K603 is energized through the microphone ground when the equipment is in the retransmit position.

3-231. When t/r control relay K601 in the Relay-Filter is energized, contacts 3 and 8 close and apply +26.5 vdc to the solenoids of the following relays: t/r relay K602 in the Relay-Filter; high voltage relay K2 and t/r relay K802 in the Audio Amplifier and Modulator; t/r relay K401 in the Second IF Amplifier; and antenna relay K101 and injection relay K102 in the RF and PA Amplifier. In addition, contacts 3 and 8 of relay K601 apply +26.5 vdc to the Broadband Sidetone Amplifier.

3-232. FREQUENCY SELECTION.

NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Set AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted.

NOTE
Frequencies in the following descriptions are applicable to AN/URC-9A; frequencies for AN/URC-9, -9Y, and -9AY are the same, less the hundredths position.

3-233. FREQUENCY CONVERSION. Frequency conversions during receive and transmit functions are described under the receive and transmit function headings in the preceding paragraphs. The following summary of frequency conversion requirements is presented as an introduction to the frequency selection descriptions in the subsequent paragraphs. Refer to figure 3-13 during the following discussion.

3-234. When operating in the receive condition, the uhf signal (225.00 to 399.95 MHz) received at the antenna is applied to rf amplifiers V102 and V103 in the RF and PA Amplifier. These amplifiers are tuned in 0.1-MHz steps to frequencies in the 225.00 to 399.95-MHz range. The FMO is tuned in 10-MHz steps in the frequency range of 200 to 370 MHz. Both the received and FMO frequencies are mixed in V104 to produce the first if in the range of 20.00 to 29.95 MHz.

3-235. The if amplifiers, V301 and V302 are tuned to one of 100 frequencies (between 20.00 and 29.95 MHz) spaced 0.1 MHz apart. Second oscillator V305 in the First IF Amplifier generates one of ten frequencies in the range of 17 to 26 MHz. These frequencies are then mixed in second receive mixer V303 with the output of the if amplifiers (20.00 to 29.95 MHz) to produce the second if in the range of 3.00 to 3.95 MHz.

3-236. For Radio Set AN/URC-9A, the Second IF Amplifier is tuned to one of 10 steps spaced 0.1 MHz apart. The hundredths relay K402 selects one of 2 crystals at each step, for a total of 20 available frequencies. Third oscillator V401B generates one of twenty frequencies in the 3.50 to 3.95-MHz range and 3.00 to 3.45-MHz range. When the second if frequency is between 3.00 and 3.45 MHz, V401B operates between 3.50 to 3.95 MHz to produce the third if of 500 kHz. When the second if is between 3.50 to 3.95 MHz, V401B operates between 3.00 to 3.45 MHz to produce the third if of 500 kHz.

3-237. For Radio Sets AN/URC-9, -9Y, and -9AY, the Second IF Amplifier is tuned to one of ten frequencies spaced 0.1 MHz apart. (See figure 3-14.) Third oscillator V401B generates one of ten frequencies in the 3.5 to 3.9-MHz range, and 3.0 to 3.4-MHz range. When the second if is between 3.0 and 3.4 MHz, V401B operates between 3.5 and 3.9 MHz to produce the third if of 500 kHz; and when the second if is between 3.5 and 3.9 MHz, V401B operates between 3.0 and 3.9 MHz.

NOTE
During the following discussion, refer to figure 3-13 for Radio Set AN/URC-9A and to figure 3-14 for Radio Sets AN/URC-9, -9Y, and -9AY.

3-238. For explanatory purposes, assume the receiver is tuned to 271.75 MHz. Since this frequency falls within 270.00 to 279.95-MHz range, the FMO crystal frequency is 41.66666 MHz and the FMO injection frequency is 250 MHz. The FMO generates the 250-MHz signal by multiplying the 41.66666 MHz crystal frequency by six (doubled in first oscillator-multiplier V201 and tripled in frequency tripler V202). The FMO injection frequency is applied to first receive mixer V104 in the RF and PA Amplifier where it is mixed with the incoming 271.75-MHz signal resulting in a first if of 21.75-MHz. Since this frequency falls in the 21.00 to 21.95-MHz range, the first if crystal frequency is 18 MHz. The 21.75-MHz and 18-MHz signals are applied to second receive mixer V303 in the First IF Amplifier which produces the second if of 3.75 MHz. This signal is coupled through a 3.00 to 3.95-MHz bandpass filter to third receiver mixer V401A in the second

IF Amplifier. In V401A, the 3.75-MHz signal is mixed with the 3.25-MHz second if crystal frequency to produce a 500-kHz if signal. This signal is then coupled through the 500-kHz if filter to the Third IF Amplifier.

3-239. At transmit, the operating frequency is obtained by generating low radio frequency and then hetrodyning it to the uhf operating frequency. In the hetrodyning process, all circuits except V401B of the Second IF Amplifier operate on the same frequency for transmit as for receive; the latter oscillator is shifted 500 kHz so that the transmit channel frequency is the same as receive. Thus, when the equipment is keyed to transmit, third oscillator V401B is switched from 3.25 to 3.75-MHz. This frequency is amplified and mixed in first transmit mixer V304 with an 18-MHz signal generated in the First IF Amplifier. The resulting 21.75-MHz signal is then amplified and routed to the RF and PA Amplifier where it is mixed in second transmit mixer V101 with a 250-MHz signal injection from the FMO. The resultant 271.75-MHz signal is then amplified and applied to the antenna for transmission.

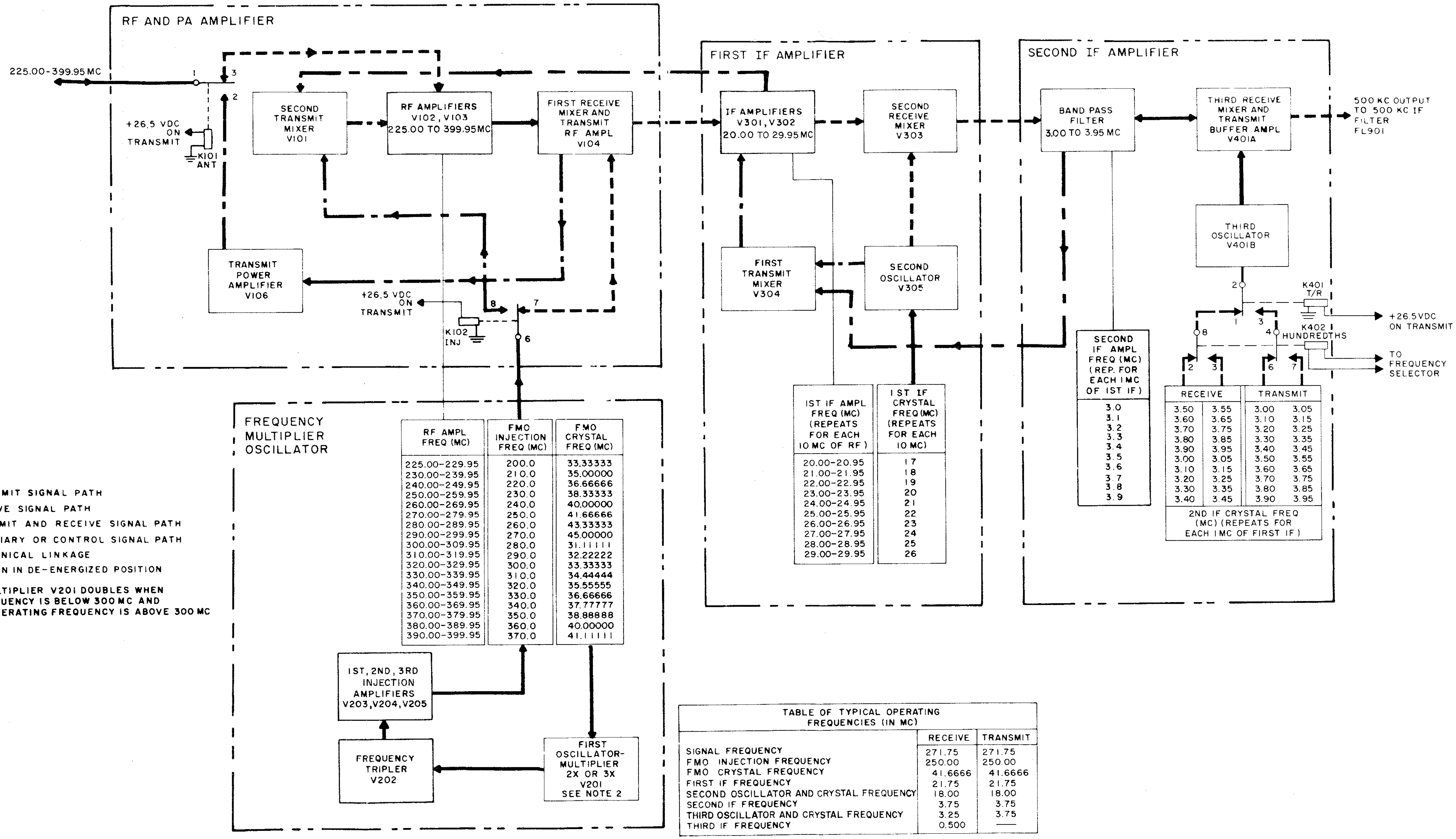
3-240. ELECTROMECHANICAL TUNING ELEMENTS. (Figure 5-121 for AN/URC-9A; Figure 5-120 for AN/URC-9, -9Y, and -9AY.) The frequency-conversion circuits are automatically tuned by electromechanical units called autopositioners. The autopositioner is a motor-driven, electrically controlled mechanism that comprises a motor and its gear-reduction train, a slip clutch that drives a rotating shaft fastened to a notched stop wheel (detent wheel), and a relay which controls a pawl for the stop wheel and also starts and stops the motor.

3-241. The control system for the autopositioner consists of the front panel selection switches and electrically similar seeking switches that are driven by the autopositioner shaft. The control system is the open-circuit-seeking type. Whenever the control and seeking switches are not set to the same physical position, the autopositioner energizes and drives its shaft to the proper position, at which point a pawl drops into a notch in the stop wheel and opens the motor control contacts.

3-242. All positioning assemblies, consisting of relay, notched stop wheel, and pawl, are adjusted to prevent opening of the contact supplying power to the motor unless the pawl is in a notch in the stop wheel. The tuning motor, B1201, drives the four autopositioners through slip clutches which permit the motor to run without damage to the gear train when any or all of the autopositioners are at rest.

3-243. The four autopositioners are part of the Frequency Selector (see figures 5-63 through 5-79) and are controlled by the front panel CHAN SEL switch. The following can be selected with the CHAN SEL switch: any one of 19 preset channels; REMOTE PRESET, which allows control of the 19 preset channels from a remote equipment; and MANUAL, which allows any one of the available frequencies (i.e. 3500 for AN/URC-9A and 1750 for AN/URC-9, -9Y, and -9AY) to be selected by the MANUAL FREQUENCY switches.

3-244. The shafts of the autopositioners are driven by tuning motor B1201. The three autopositioner output shafts associated with relays K1201, K1202, and K1203 correspond to the positions of the MANUAL FREQUENCY TENS AND UNITS switches, and to the 0.1 MHz increments of the TENTHS (or TENTHS-HUNDREDTHS) switch. For the AN/URC-9A only, the 0.05 MHz increments of the TENTHS-HUNDREDTHS switch are represented by electrical signals, rather than shaft positions. The 10-MHz shaft rotates in 18 incremental steps with each increment representing 10 MHz; the 1-MHz shaft rotates in 10 incremental steps with each increment representing 1 MHz; and the 0.1-MHz shaft also rotates in 10 incremental steps, with each increment representing 0.1 MHz. The Frequency Selector combines the 0.1-MHz and 1-MHz shaft positions



NOTES

A. LEGEND

— - — - TRANSMIT SIGNAL PATH

- - - - - RECEIVE SIGNAL PATH

——— TRANSMIT AND RECEIVE SIGNAL PATH

——— AUXILIARY OR CONTROL SIGNAL PATH

- - - - - MECHANICAL LINKAGE

B. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION

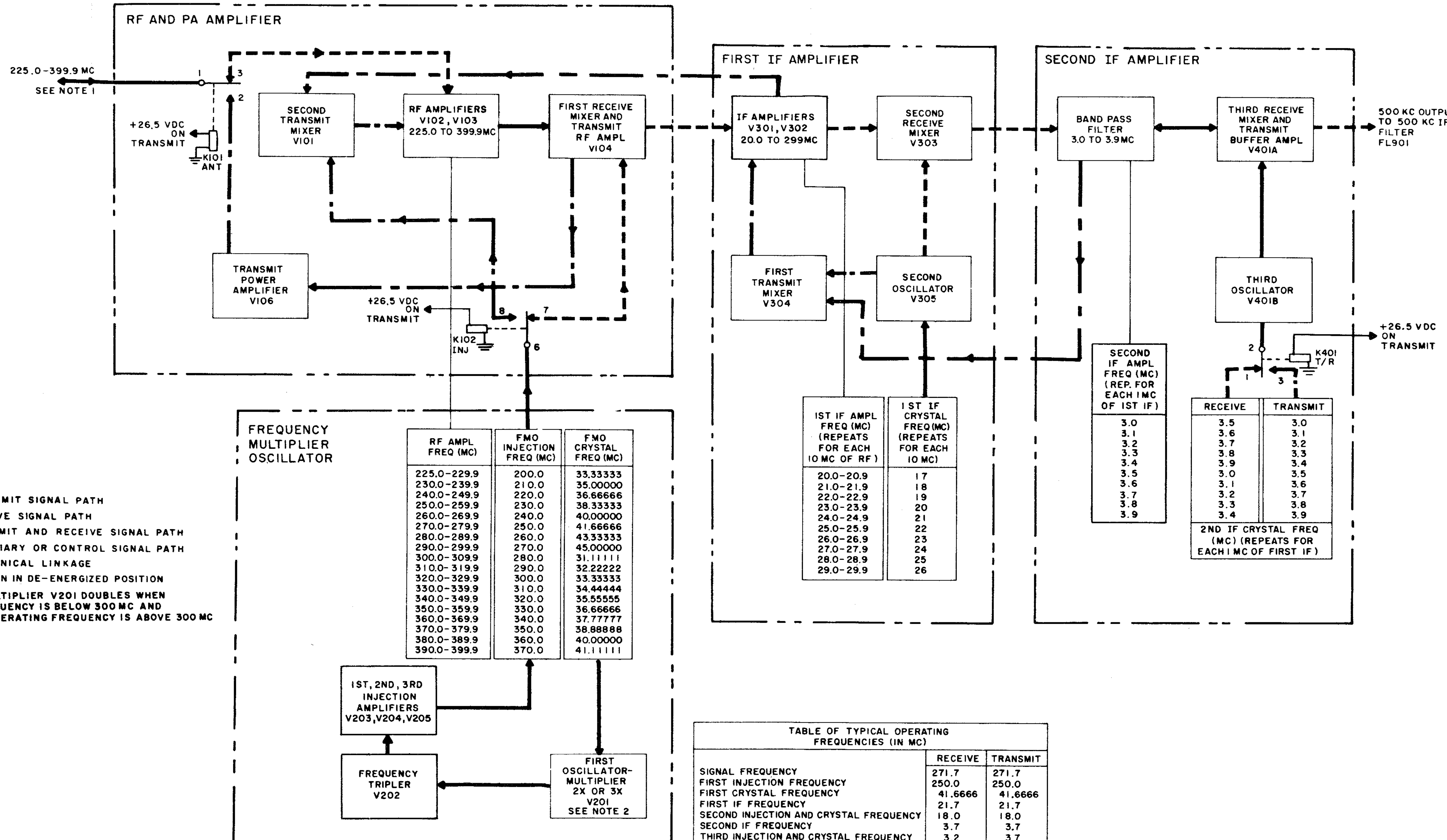
1. OSCILLATOR-MULTIPLIER V201 DOUBLES WHEN OPERATING FREQUENCY IS BELOW 300 MC AND TRIPLES WHEN OPERATING FREQUENCY IS ABOVE 300 MC

REFERENCE:
PARAGRAPH 3-233

TABLE OF TYPICAL OPERATING FREQUENCIES (IN MC)

	RECEIVE	TRANSMIT
SIGNAL FREQUENCY	271.75	271.75
FMO INJECTION FREQUENCY	250.00	250.00
FMO CRYSTAL FREQUENCY	41.6666	41.6666
FIRST IF FREQUENCY	21.75	21.75
SECOND OSCILLATOR AND CRYSTAL FREQUENCY	18.00	18.00
SECOND IF FREQUENCY	3.75	3.75
THIRD OSCILLATOR AND CRYSTAL FREQUENCY	3.25	3.75
THIRD IF FREQUENCY	0.500	—

Figure 3-13. Radio Set AN/URC-9A Frequency Conversion System, Functional Block Diagram



RF AMPL FREQ (MC)	FMO INJECTION FREQ (MC)	FMO CRYSTAL FREQ (MC)
225.0-229.9	200.0	33.33333
230.0-239.9	210.0	35.00000
240.0-249.9	220.0	36.66666
250.0-259.9	230.0	38.33333
260.0-269.9	240.0	40.00000
270.0-279.9	250.0	41.66666
280.0-289.9	260.0	43.33333
290.0-299.9	270.0	45.00000
300.0-309.9	280.0	31.11111
310.0-319.9	290.0	32.22222
320.0-329.9	300.0	33.33333
330.0-339.9	310.0	34.44444
340.0-349.9	320.0	35.55555
350.0-359.9	330.0	36.66666
360.0-369.9	340.0	37.77777
370.0-379.9	350.0	38.88888
380.0-389.9	360.0	40.00000
390.0-399.9	370.0	41.11111

1ST IF AMPL FREQ (MC) (REPEATS FOR EACH 10 MC OF RF)	1ST IF CRYSTAL FREQ (MC) (REPEATS FOR EACH 10 MC)
20.0-20.9	17
21.0-21.9	18
22.0-22.9	19
23.0-23.9	20
24.0-24.9	21
25.0-25.9	22
26.0-26.9	23
27.0-27.9	24
28.0-28.9	25
29.0-29.9	26

SECOND IF AMPL FREQ (MC) (REP. FOR EACH 1 MC OF 1ST IF)
3.0
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9

RECEIVE	TRANSMIT
3.5	3.0
3.6	3.1
3.7	3.2
3.8	3.3
3.9	3.4
3.0	3.5
3.1	3.6
3.2	3.7
3.3	3.8
3.4	3.9
2ND IF CRYSTAL FREQ (MC) (REPEATS FOR EACH 1 MC OF FIRST IF)	

NOTES

A. LEGEND

- — - — - TRANSMIT SIGNAL PATH
- - - - - - RECEIVE SIGNAL PATH
- ——— TRANSMIT AND RECEIVE SIGNAL PATH
- ——— AUXILIARY OR CONTROL SIGNAL PATH
- - - - - - MECHANICAL LINKAGE

B. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION

1. OSCILLATOR-MULTIPLIER V201 DOUBLES WHEN OPERATING FREQUENCY IS BELOW 300 MC AND TRIPLES WHEN OPERATING FREQUENCY IS ABOVE 300 MC

REFERENCE:
PARAGRAPH 3-27

TABLE OF TYPICAL OPERATING FREQUENCIES (IN MC)

	RECEIVE	TRANSMIT
SIGNAL FREQUENCY	271.7	271.7
FIRST INJECTION FREQUENCY	250.0	250.0
FIRST CRYSTAL FREQUENCY	41.6666	41.6666
FIRST IF FREQUENCY	21.7	21.7
SECOND INJECTION AND CRYSTAL FREQUENCY	18.0	18.0
SECOND IF FREQUENCY	3.7	3.7
THIRD INJECTION AND CRYSTAL FREQUENCY	3.2	3.7
THIRD FREQUENCY	0.500	—

Figure 3-14. Radio Set AN/URC-9, -9Y, -9AY, Frequency Conversion System, Functional Block Diagram

to obtain 100 incremental steps, each of which represents 0.1 MHz. By combining the outputs of the 10-MHz, 1-MHz, and 0.1-MHz shafts, 1750 incremental steps, each representing 0.1 MHz, are obtained.

3-245. The 0.1-MHz shaft tunes V401A and B in the Second IF Amplifier (Fig 5-113 or 5-114) in 10 increments of 0.1 MHz each. Crystal selection in the Second IF Amplifier of the AN/URC-9A depends on both the 0.1-MHz shaft position (for the 0.1 MHz increment) and an electrical signal (for the 0.05 MHz increment). For AN/URC-9, -9Y, and -9AY, crystal selection is dependent only on shaft position. The 10-MHz shaft tunes second oscillator V305 and first transmit mixer V304 in the First IF Amplifier (see figure 5-112) in 10 increments of 1 MHz each; the 0.1-MHz shaft tunes if amplifiers V301 and V302 and second receive mixer V303 in the First IF Amplifier in 100 increments of 0.1 MHz each. The 10 -MHz shaft selects one of 18 crystal and tunes the circuits in the FMO (see figure 5-111) in 18 increments of 10 MHz each. The RF and PA Amplifier is tuned in 1750 increments of 0.1 MHz each by a combination of 10-MHz, 1 -MHz and 0.1-MHz shafts (see figure 5-110). The tuned circuits of the RF and PA, First IF, and Second IF Amplifiers are tuned by the frequency selection system to the nearest 0.1 MHz increment of their operating frequency.

3-246. The fourth autopositioner is associated with channel selector relay K1204. This autopositioner converts the 5-wire channel information presented to local-seeking switch S1205 (or remote-seeking switch S1206) into mechanical rotation and positions the memory drum to the selected channel. The memory drum, in turn, supplies a ground or no-ground condition, as required, to the autopositioner associated with frequency-selection relays K1201, K1202, and K1203. Thus, the frequency-selection circuits convert the channel information into the frequency preset on the memory drum and position the shafts to the frequency that corresponds to the channel selected.

3-247. FREQUENCY SELECTOR. (Figure 5-121 for AN/URC-9A; Figure 5-120 for AN/URC-9, -9Y, and -9AY.) The Frequency Selector provides automatic channel selection on 19 preset channels which may be selected locally or from Radio Set Control C-2383/URC-9. In addition, the Frequency Selector provides for local manual frequency selection.

3-248. General. Information is electrically transferred from a channel-selector switch to the autopositioners at the Frequency Selector where it is converted to mechanical tuning information for the various oscillators and amplifiers in the radio set. Five accurately positioned tuning shafts, driven by the frequency-selector autopositioners, automatically tune the radio set to the desired frequency. This process requires from 1 to 5 seconds, the exact time depending upon the sequence of selection.

3-249. The autopositioners always rotate in the same direction, from a high to a lower frequency position. The channel selector autopositioner always rotates from a low-numbered channel to a higher-numbered channel. For this reason, tuning from a lower to a higher frequency takes longer than tuning in the opposite direction. Also, tuning from a higher numbered channel to a lower-numbered channel takes longer than when tuning in the opposite direction.

3-250. Local Preset Channel Selection. (Figure 5-121 for AN/URC-9A; Figure 5-120 for AN/URC-9, -9Y, and -9AY.) Any one of 19 preset channels can be selected by CHAN SEL switch S705. When the CHAN SEL switch is rotated, terminal 2 of channel selector autopositioner relay K1204 is grounded through the contacts of S705C (upper section), local-seeking switch S1205, and S705B. When energized, K1204 opens the circuit to autopositioner relays K1201, K1202, and K1203; applies +26.5 vdc to tuning motor B1201; and lifts the pawl from the notched stop wheel associated with K1204, thus permitting motor B1201 to rotate. The +26.5 vdc is also applied to the coil of work relay K1 which energizes to disable the key line.

3-251. Motor B1201 drives the channel indicator dial, preset memory drum, and local and remote-seeking switches S1205 and S1206, respectively, through a slip clutch. Although the motor is physically connected to the 10-MHz, 1 -MHz, and 0.1-MHz autopositioner notches stop wheels through the slip clutch, these wheels do not turn at this time because they are locked by pawls controlled by relays K1201, K1202, and K1203.

3-252. Local-seeking switch S1205, which is ganged to the memory drum, turns until the rotor finds the one position that opens the ground path to terminal 2 of K1204. When S1205 reaches this position, K1204 deenergizes and drops the pawl into a notch of the step wheel preventing further rotation of the channel indicator dial, preset memory drum, and local and remote-seeking switches. The memory drum is now positioned to the desired channel. When K1204 deenergizes, contacts 2 and 4 open and contacts 3 and 5 close; the +26.5 vdc is thus switched from the tuning motor to the coils of the autopositioned relays. Due to the applied voltage through contacts 3 and 4 of either K1201, K1202, or K1203, work relay K1 remains energized and the motor continues to rotate until the tuning sequence is completed.

3-253. Remote Preset Channel Selection. (Figure 5-121 for AN/URC-9A; Figure 5-120 for AN/URC-9, -9Y, and -9AY.) Any one of the 19 preset channels can be selected remotely from Radio Set Control C-2383/URC-9 (see figure 5-122). Remote control is established when CHAN SEL switch S705 of the radio set is set to REMOTE PRESET. Channel selection is accomplished by positioning the CHAN SEL switch of the C-2383/URC-9 to the desired preset channel. When the AN/URC-9( ) CHAN SEL switch is set to REMOTE PRESET, terminal 2 of channel-selector autopositioner relay K1204 is grounded through the normally open contacts of S705C (upper section), remote-seeking switch S1206, and the CHAN SEL switch of the C-2383/URC-9.

NOTE

The C-2383/URC-9 CHAN SEL switch is similar to S705B of the AN/URC-9( ).

Remote channel selection is then the same as described for local preset channel selection, except that remote-seeking switch S1206 is used in place of local-seeking switch S1205. (Refer to paragraph 3-254.)

3-254. Automatic Frequency Selection. (Figure 5-121 for AN/URC-9A; Figure 5-120 for AN/URC-9, -9Y, and -9AY.) The 19 channel frequencies are preset on the direct-reading memory drum which is acessible through the door in the front panel. Five pins, which open or close selected switch contacts, must be positioned for each preset channel on Radio Set AN/URC-9A. (Radio Sets AN/URC-9, -9Y and -9AY have only four pins for presetting channel frequencies.) Reference numbers adjacent to the pin tracks indicate the preset channel frequency.

NOTE

Frequencies in the following description are for AN/URC-9A. Frequencies for AN/URC-9, -9Y, and -9AY are the same, less the hundredths position.

3-255. When the preset channel memory drum has been positioned, the pins representing the selected preset channel frequency operate selected contacts on memory drum switch S1210. The left pin opens one of the two normally closed contacts of switch S1210A; the open contact represents the hundreds megahertz digit (2XX.XX MHz or 3XX.XX MHz) of the preset channel frequency. The left-center pin (second pin from the left) opens one of the ten normally closed contacts of switch S1210B; the open contact represents the tens megahertz digit (X0X.XX MHz, X1X.XX MHz, X2X.XX MHz, etc.)

of the preset channel frequency. Together, the contacts of switches S1210A and S1210B control the selection of the first two digits (22 through 39) of the preset frequency, as indicated by 10-MHz seeking switch S1201.

3-256. A combination of memory drum switches S1210A and S1210B, 10-MHz seeking switch S1201, and blanking switch S1202, allow the selection of 18 frequencies (22X.XX through 39X.XX) with 12 switch positions on S1210A and S1210B. On switch S1210A, the eight positions of 22 through 29 are in parallel with the eight positions of 32 through 39, respectively; these eight positions and the two positions of 30 and 31 effectively make S1201 a 10-position switch. To select the proper frequency, relay K1201 remains energized to allow motor B1201 to drive 10-MHz seeking switch S1201 and blanking switch S1202 until both switches are positioned to the open switch positions of S1210A and S1210B.

3-257. The third pin from the left closes one of the ten normally open contacts of switch S1210C; the closed contact represents the units megahertz digit (XX0.XX MHz, XX1.XX MHz, XX2.XX MHz, etc.) of the preset channel frequency, as indicated by 1 -MHz seeking switch S1203. The fourth pin from the left on AN/URC-9A (right hand pin on AN/URC-9, -9Y, and -9AY) closes one of the ten normally open contacts of switch S1210D; the closed contact represents the tenths megahertz digit (XXX.X MHz, XXX,1X MHz, etc.) of the preset channel frequency, as indicated by 0.1-MHz seeking switch S1204. The right hand pin on AN/URC-9A only, represents the hundredths megahertz digit and controls the single normally open contact of S1210E. When closed, (pin set in left track), 5 is selected as the hundredths megaherts digit (XXX.X5 MHz); the open contact represents a 0 as the hundredths megahertz digit (XXX.X0 MHz). Switch S1210E directly controls hundredths relay K402 in the Second IF Amplifier and does not affect the mechanical operation of the frequency selector.

3-258. The following is an example of the automatic frequency selection. Assume that a frequency of 399.95 MHz is preset on channel 19, that preset channel 19 is selected, and that the preset channel-selection cycle (described in paragraph 3-254) is complete. The left pin of the preset channel memory drum opens the normally closed contact of switch S1210A that represents the hundreds digit 3; this action removes the ground from contact 7 on blanking switch S1202 (front). The left-center pin of preset channel memory drum opens the normally closed contact of switch S1210B that represents the tens digit 9; this action removes the ground from the positions designated at 29 and 39 (these positions are in parallel) of switch S1201. The 10-MHz autopositioner relay, K1201, energizes because of the completed ground circuit through the normally closed contacts of S1210A, contacts 2 and 17 of phasing switch S1202 (rear), normally closed contacts 0 through 8 of S1210B, and switch S1201 and its permanent connection to contact 17 of S1202. When relay K1201 energizes, contacts 3 and 4 close, applying +26.5 vdc to tuning motor B1201, and the pawl is lifted away from the 10-MHz notched stop wheel. Through the slip-clutch arrangement, motor V1202 drives the 10-MHz indicator, notched stop wheel, switches S1201 and S1202, and the 18-position, 10-MHz shaft.

3-259. Since the first and second digits of the assigned frequency are 3 and 9. 10-MHz seeking switch S1201 must find 39, not 29. To prevent the seeking switch from stopping at contact 29, phasing switch S1202 (rear) returns terminal 2 of K1201 to ground when seeking switch S1201 reaches contact 29. Phasing switch S1202 rotates at one-half the speed of seeking switch S1201 because of a 2:1 gear reduction. At the instant the rotor contact on S1201 makes with ungrounded contact 29, the rotor contact of S1202 makes with fixed contact 2 which is returned to ground through the normally closed contact of S1210A; thus relay K1201 remains energized.

3-260. Tuning motor B1201 continues to drive the 10-MHz autopositioner until the rotor contact of seeking switch S1201 makes with ungrounded contact 39. At this instant, relay K1201 deenergizes and releases the pawl which drops into a notch of the 10-MHz stop wheel. Thus, further rotation of the 10-MHz indicator, notched stop wheel, seeking switch S1201, and phasing and blanking switch S1202 is prevented.

3-261. The front section of S1202 is a blanking switch that blanks out 180 degrees of rotation. This blanks out alternate cycles of 10-MHz seeking switch S1201 by grounding terminal 2 of K1201 when the uhf tuning elements are tuned below 225.00 MHz. During the blanked alternation of the tuning cycle, the tuning elements are returned to the 399.99 MHz position.

3-262. Concurrently with the operation of the 10-MHz autopositioner, the third pin from the left closes the normally open contact of switch S1210C that represents the units digit 9; this action completes the ground circuit for 1-MHz autopositioner relay K1202. When relay K1202 energizes, contacts 3 and 4 close and simultaneously apply power to tuning motor B1201 and lift the pawl from the 1-MHz notched stop wheel. Through the slip-clutch arrangement, motor B1201 drives the 1-MHz indicator, the notched stop wheel, seeking switch S1203, and the 10-position, 1-MHz shaft. Tuning motor B1201 continues to drive the 1-MHz autopositioner until the open position on the rotor of the front section of seeking switch S1203 makes with grounded contact 9 of switch S1210C. This opens the ground circuit to relay K1202 causing the relay to deenergize and release the pawl allowing it to drop into a notch in the 1-MHz stop wheel. Thus, further rotation of the 1-MHz indicator, the notched stop wheel, and seeking switch S1203 is prevented.

3-263. Pin 2 of the 10-MHz autopositioner relay K1201 is momentarily grounded (through switches S1201 or S1202) by the rear section of 1 -MHz seeking switch S1203 whenever this switch passes through the position designated as A. Thus, the 10-MHz autopositioner is recycled to prevent error in the 10-plus-1-MHz differential gear train output; the error may be introduced when the differential cam follower passes over the high point of the cam as the 1 -MHz autopositioner passes from 0 to 9.

3-264. Concurrently with the operation of the 10-MHz and 1-MHz autopositioners, the fourth pin from the left on AN/URC-9A (right hand pin on AN/URC-9, -9Y, and -9AY) closes the normally open contact of switch S1210D that represents the tenths digit 0.9. This action closes the ground circuit for the 0.1-MHz autopositioner relay, K1203. When relay K1203 energizes, the operation of the 0.1-MHz autopositioner is the same as that of 1 -MHz autopositioner described previously. Contact A of 0.1-MHz seeking switch S1204 is connected to the common contact of 1 -MHz seeking switch S1203; this applies a ground to 1 -MHz autopositioner relay K1202 whenever seeking switch S1204 passes through position A. Thus, relay K1202 is momentarily energized, causing the 1 -MHz autopositioner to recycle to the same frequency position and eliminate the possibility of error in the 1-plus-0.1-MHz differential gear train. Without this preventive cycle, an error could be introduced when the differential cam follower passes over the high point of the cam as the 0.1 MHz autopositioner passes from 0.0 to 0.9.

3-265. The right hand pin on AN/URC-9A only, being positioned in the left track, closes S1210E providing a ground path for hundredths relay K402 in the Second IF Amplifier. The +26.5-vdc energizing power is applied to relay K402 through contacts 3 and 5 of K1204 which supplies power to autopositioners K1201, K1202, and K1203 when the channel selection cycle is complete.

3-266. In summary, once the preset channel memory drum reaches the selected channel, channel selector relay K1204 deenergizes and the +26.5-vdc supply is reapplied to the 10, the 1, and the 0.1-MHz autopositioner relays with the selection of the individual digits of the preset channel occuring simultaneously. Tuning motor B1201 drives the autopositioners through a slip clutch that permits motor rotation when any or all of the autopositioners are at rest. When autopositioner relays K1201, K1202, and K1203 deenergize, the +26.5-vdc is removed from tuning motor B1201 and work relay K1. With the key-line disabled, the radio set is tuned to a new channel frequency, after which the key-line is again enabled.

3-267. Manual Frequency Selection. (Figure 5-121 for AN/URC-9A; Figure 5-120 for AN/URC-9, -9Y, and -9AY.) When CHAN SEL switch S705 is rotated to the MANUAL position, any one of the available channel frequencies can be selected by physically positioning the MANUAL FREQUENCY TENS, (S706), UNITS, (S707) and TENTHS (or TENTHS-HUNDREDTHS) (S708) switches, respectively.

3-268. When the CHAN SEL switch is positioned at manual, the preset channel drum rotates to position M. In this position, a nylon bar opens all contacts on memory drum switches S1210A and S1210B; all contacts on switches S1210C, S1210D, and S1210E are normally open. Switch S705A (both front and rear) is operated by a cam to connect TENS switch S706 to 10-MHz autopositioner seeking switch S1201 in place of memory drum switches S1210A and S1210B. UNITS switch S707 is connected to 1-MHz autopositioner seeking switch S1203 in place of memory drum switch S1210C. In a similar manner, TENTHS (or TENTHS-HUNDREDTHS) switch S708 (front) is connected to 0.1-MHz autopositioner seeking switch S1204 in place of memory drum switch S1210D. On AN/URC-9A only, switch S708 (rear) is connected to hundredths relay K402 in place of S1210E. The wafers of the TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS) switches, S706, S707, and S708 respectively, are grounded through contacts 20, 21, 24, and 26 of CHAN SEL switch S705A (front). Contact 26 of S705A is also used to ground both the front and rear sides of the S708 wafer so decoupling diodes CR701 and CR702 are included in both ground paths to prevent interaction that might otherwise occur.

3-269. Frequency selection is accomplished by setting the MANUAL FREQUENCY switches to the desired frequency. The Frequency Selector operates the same as for automatic frequency selection described in preceding paragraphs except the MANUAL FREQUENCY switches substitute for memory drum switches S1210A through S1210E.

3-270. KEYING IN THE NORMAL MODE.

3-271. The radio set is keyed by actuation of a microphone push-to-talk switch. The microphone can be connected directly to the radio set or during remote operations, to Radio Set Control C-2383/URC-9.

3-272. The local microphone and remote microphone (when used) are essentially connected in parallel and either may be used to key the radio set (see figure 5-100). When the microphone push-to-talk switch is actuated, a key-line ground is provided at contacts 5 and 8 of MODE switch S702B. The key-line ground is routed from the MODE switch S702B through normally closed contacts 7 and 6 of work relay K1 to the solenoid (terminal 1) of t/r control relay K601. Since K601 has -11 vdc applied to terminal 5 of its solenoid, the relay energizes when the ground is applied at terminal 1. When K601 energizes, +26.5 vdc is routed through contacts 3 and 8 to solenoids of the following relays: antenna relay K101 and injection relay K102 in the rf and pa amplifier; t/r relay K401 in the second if amplifier; t/r relay K602 in the relay-filter; t/r relay K802 in the audio amplifier and modulator; and high voltage relay K2. When the foregoing relays energize, keying of the radio set is complete.

3-273. During channeling, the key-line ground is disabled so the radio set cannot be keyed during a change of channel and frequency. During the frequency selection sequence, +26.5 vdc is applied to the solenoid of work relay K1 through contacts 2 and 4 of autopositioner relays K1201 through K1204. With K1 energized, normally closed contacts 6 and 7 are open, disabling the key-line ground circuit between MODE switch S702B and the solenoid of t/r control relay K601. With K601 deenergized, normally open contacts 3 and 8 present an open circuit to all keying relays, thus preventing the radio set from being keyed.

CHAPTER 4

SCHEDULED MAINTENANCE

4-1. INTRODUCTION.

4-2. This chapter contains the recommended periodic maintenance schedule for Radio Set AN/URC-9( ). The detailed procedures for performance of the maintenance actions listed are contained in Reference Standards Book for Radio Set AN/URC-9( ) NAVELEX 0967-439-0040.

4-3. MAINTENANCE SCHEDULE.

4-4. The recommended periodic maintenance schedule, table 4-1, includes those checks that are indicative of equipment performance levels (e.g., transmitter power output, receiver if bandwidth, receive sensitivity, etc) and the required lubrication and cleaning procedures. The schedule lists the maintenance actions required, the frequency at which they are to be performed (e.g., daily, weekly, etc.), and a reference to the detailed procedural steps in NAVELEX 0967-439-0040.

NOTE

The Naval Electronics System Command requirements for this schedule are cancelled when the Electronics Planned Maintenance System is implemented for this equipment.

4-5. IN-PORT PROCEDURES.

4-6. During periods in-port, the radio set should not be energized for the sole purpose of making daily checks. However, the equipment should be energized at least twice a week, and at least two days before getting underway.

Table 4-1. Recommended Periodic Maintenance Schedule

STEP NO.	ACTION REQUIRED	SECTION & STEP
DAILY		TIME REQD: 2 MIN
1	Check 325-volt B+ meter reading.	B1
2	Check 125-volt B+ meter reading.	B2
3	Check 26.5-volt meter reading.	B3
4	Check BIAS meter reading.	B4
5	Check % MOD meter reading.	B5
6	Check $DVRI_b$ meter reading.	B6
7	Check PAI_g meter reading.	B7
8	Check PAI_b meter reading.	B8
9	Check PWR meter reading.	B9
10	Check SWR meter reading.	B10
WEEKLY		TIME REQD. 1 MIN
1	Check AN/URC-9( ) automatic frequency selection time	C8

Table 4-1. Recommended Periodic Maintenance Schedule (Continued)

STEP NO.	ACTION REQUIRED	SECTION & STEP
MONTHLY		TIME REQD. 60 MIN
1	Clean interior and exterior of radio set and check general condition of component parts.	D1
2	Check receiver audio output.	B11
3	Check receiver sensitivity.	B23
4	Check AN/URC-9( ) power output.	C4
QUARTERLY		TIME REQD. 150 MIN
1	Check third if bandwidth.	B12
2	Check maximum signal-plus-noise to noise ratio.	B24
3	Check receiver audio frequency response.	B25
4	Check receiver audio frequency distortion.	B26
5	Check modulation gain.	C5
DURING MAJOR OVERHAUL OR EVERY 10,000 HOURS OF OPERATION		TIME REQD: 150 MIN
1	Lubricate receiver-transmitter RF and Power Amplifier subunit	D2
2	Lubricate receiver-transmitter RF and Power Amplifier subunit	D3
3	Lubricate receiver-transmitter Second IF Amplifier subunit	D4
4	Lubricate receiver-transmitter Frequency Multiplier-Oscillator	D5
5	Lubricate receiver-transmitter uhf injection unit	D6
6	Lubricate receiver-transmitter uhf injection unit	D7
7	Lubricate receiver-transmitter First IF Amplifier subunit	D8

CHAPTER 5

TROUBLESHOOTING AND CORRECTIVE MAINTENANCE

5-1. ORGANIZATIONAL MAINTENANCE RESPONSIBILITY.

NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted.

5-2. Organizational level maintenance responsibility has been defined by the Department of Defense as the responsibility of and performed by a using activity on its assigned equipment. For Radio Set AN/URC-9, the shipboard electronic technician has full responsibility for the maintenance of all units and assemblies of the radio set, except for the: RF and PA Amplifier Assembly, Frequency Multiplier-Oscillator (FMO) Assembly, First IF Amplifier Assembly and Frequency Selector Assembly of the RT-581/URC-9. In the case of these four, he has the full responsibility for complete mechanical and electrical alignment, physical servicing, such as cleaning and lubricating; but has limited responsibility for parts replacement. Those parts that are shipboard replaceable are as follows:

ASSEMBLY COLLOQUIAL NAME	PARTS REPLACEABLE BY ET
RF and PA amplifier	V-101, V-102, V-103, V-104, V-105, V-106, R-110, R-115, R-116, C-135, C-142, C-148, L-119, L-120, K-101, K-102, L-111, L-106, L-116, L-121, C-133, R-108, C-141, C-146, S-101, R-114, W-101, and Cable Harness.
Frequency Multiplier-Oscillator (FMO)	V-201, V-202, V-203, V-204, V-205, R-209, R-210, R-211, R-212, R-213, C-240, C-241, W-201, C-203, L-219, Y-202, Y-204, Y-206, and Y-207 through Y-218.
First IF Amplifier	V-301, V-302, V-303, V-304, V-305, Y-301, Y-302, Y-303, Y-304, Y-305, Y-306, Y-307, Y-308, Y-309, Y-310, O-301, O-302, O-303, O-304, O-305, O-306, O-307, W-301, W-302, W-303, W-304
Frequency Selector	K-1201, K-1202, K-1203, K-1204, S-1202, S-1203, S-1204, B-1201, J-1201, P-1201

5-3. For disposition of defective assemblies that are beyond the capability of maintenance personnel to restore to operational use, refer to the current Consolidated Repairable Item List (CRIL) NAVSUP 4102, and current NAVSUP Publication 485, Chapter 5, paragraphs 5090 and 5155. All procedures of this publication are keyed to the organization maintenance responsibilities stated in this Chapter.

5-4. GENERAL INFORMATION.

5-5. MAINTENANCE AND MATERIAL MANAGEMENT (3-M) SYSTEM. The 3-M system provides:

a. A method to attain and maintain maximum operational efficiency of all Fleet equipment at all times through the use of a Planned Maintenanced System (PMS).

b. A method to gather information as to the expenditure of resources of maintenance of equipments, failure data, and other data directly related to maintenance through the use of the Maintenance Data Collection System (MDCS). All failures of equipment shall be reported on MDCS forms in accordance with OPNAV 43P2 (NAVSHIPS 0420-049-0060).

5-6. REFERENCE STANDARDS. Reference standard tests for Radio Set AN/URC-9( ) are in NAVELEX 0967-439-0040.

5-7. LIST OF TABLES. The following list is provided for quick reference:

5-8. REFERENCE DATA. Although this chapter is primarily concerned with troubleshooting and maintenance, information included here may also be applied to other chapters of the manual. These data are in the form of troubleshooting and servicing block diagrams, equipment and subassembly photographs, interconnection diagrams and schematic diagrams which include tube voltage-resistance charts. The reference data are located at the rear of this chapter.

5-9. UHF MAINTENANCE. The nature of UHF radio requires special circuit designs. Similarly, the maintenance of UHF equipment requires special care, techniques and procedures as follows:

a. Circuit lead length and position of replacement parts must be the same as for the parts removed.

b. Vacuum tubes in uhf circuits are best tested by substitution and not by vacuum tube tester.

c. Vacuum tube shields, chassis covers, and plates with all securing hardware must be in place and tightened before rf alignments and adjustments are performed.

d. Intermittent operation in uhf circuits is generally the result of poor circuit grounds or poor rf connection in switches, rf tuners, and trimmer capacitors.

5-10. ALIGNMENT AND ADJUSTMENT PROCEDURE. When only one alignment procedure is performed, it is assumed that all other sections of the equipment are properly aligned. Read the complete alignment procedure to become familiar with the steps involved. Do not perform alignment of the equipment as a substitute for troubleshooting. Alignment should be performed only after electrical tests or troubleshooting procedures indicate the need for alignment.

NOTE

All adjustments and other pertinent circuit reference designations on illustrations are boxed.

5-11. TEST EQUIPMENT. Tables 5-1 through 5-3 list the test equipment and special tools required for maintenance. The following components are required for impedance matching and termination in conjunctions with the test equipment:

Resistor:	1000 ohms, 1/2 watt (2 required)
Resistor:	600 ohms, 5 watts
Resistor:	82 ohms, 1/2 watt (2 required)
Capacitor:	25 uf/50 vdc

Table 5-1. Test Equipment Required For Maintenance of Radio Set AN/URC-9( )

QTY	EQUIPMENT	MODEL	REQUIRED CHARACTERISTICS
1	Electronic Voltmeter	AN/USM-143 (Alternate: CAQI-400-A)	Voltage range.. 0.001 to 300 volts ac in 12 scales Decibel range.. -60 to +50 in 12 scales Freq response.. 10 Hz to 4 MHz Accuracy....... 20 Hz to 1 MHz, ±2% 1 MHz to 4 MHz, ±5%
1	Electronic Multimeter	AN/USM-116 (Alternate: CAQI-410-B)	Voltage range.. 0-300 volts ac in 6 scales; 0-1000 volts dc in 7 scales Ohmmeter range. 0.2-500 megohms in 7 ranges Freq range..... 20 Hz to 700 MHz Accuracy....... ±3%
1	Radio Frequency Wattmeter	TS-1771/U (Alternate: AN/URM-43( )*)	Power range.... 0 to 60 watts in 2 ranges Freq range..... 30 to 600 MHz Use............ CW, FM, TV, AM Impedance...... 51.5 ohms Accuracy....... ±5% of full scale
1	Radio Frequency Wattmeter	AN/URM-120 (Alternate: AN/URM-96)	25-watt plug-in element for through-line power readings over required frequency range

Table 5-1. Test Equipment Required For Maintenance of Radio Set AN/URC-9( ) (Continued)

QTY	EQUIPMENT	MODEL	REQUIRED CHARACTERISTICS
1	Audio Oscillator	AN/URM-127 (Alternate: TS-382( )/U)	Freq range..... 20 to 200,000 Hz on 4 bands Output impedance..... 1000 ohms Freq response.. 20 Hz; ±1 db, 150,000 Hz; ±1 db Freq accuracy.. ±6% Freq stability. ±2%
1	Oscilloscope	AN/USM-281 (Alternate: AN/USM-140)**	1 pulse per sec
1	RF Signal Generator Set	AN/URM-25D (Alternate: AN/URM-25( ))	Freq........... 10 kHz to 50 MHz in 8 bands Output impedance..... 53.5,500, or 0 to 90 kohms Modulation..... AM: 0 to 80% ±10% Internal: 400 Hz and 1 kHz External: 100 to 15,000 Hz
1	Signal Generator	AN/USM-44A (Alternate: CAQI-608C)	Freq range..... 10 to 420 MHz in five bands Generator impedance..... 50 ohms, swr 1.2:1 max Internal modulation.... 400 Hz ±10% and 1000 Hz ±10% External modulation.... 0 to 95%, 20 Hz to 20 kHz Output level... 0.1 microvolt to 0.5 volt into 50-ohm resistive load
1	Frequency Counter	AN/USM-207	100 MHz to 510 MHz plug-in unit for freq measurements over required freq range
1	Dummy Load	DA/412( )/U (Alternate: DA-91/U)	Input resistance.... 0.50 ohms Dissipation.... 500 watts over required freq range
1	RF Attenuator	CBSH-50-6	Freq range..... 225 to 400 MHz
1	Strobe Tachometer	CAG-1531A	Flashing Rate.. 110 to 25K F/min

* Symbol ( ) indicates any model may be used
** Required for use with AN/URC-9Y only

Table 5-2. Special Tools Required (Not Supplied)

COMMERCIAL PART NUMBER	DESCRIPTION	FSN
GC-2522	**Turret Tuner Tool	9Q5120-975-9478
None	*Bristol, Spline Type, Screwdriver .094"	9Q5120-288-8853
None	*Bristol, Spline Type, Screwdriver .110"	9Q5120-540-4359
None	Alignment Tool, Electronic Equipment	9Q5120-720-1908
None	Extractor, Electron Tube (part peculiar)	9Q5120-293-3539
	Size 4 Retaining Ring Pliers for Speed Increaser	9Q5120-024-9529
	Extractor, Electron Tube Puller	9Q5120-293-0808
	Thickness (Feeler gauge)	9Q5120-246-2303
	Steel Machinist Ruler 12"	9Q5120-234-5224
	Troubleshooting Light (locally made)	(bulb 6240-155-7857 #328 bulb-6V)
	1/8" Pencil Tip Soldering Iron-25 Watt w/extra angle tip	1H3439-204-3856
	1/4" Spin-Tite wrench	-----

* Both needed since all assemblies are not identical
** Orange manicure sticks may be used as substitute

Table 5-3. Test Equipment To Be Made Locally

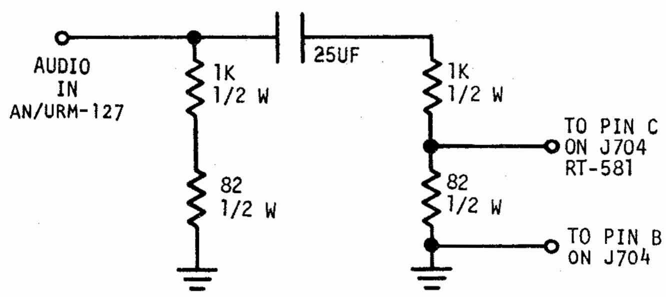
ITEM #	INSTRUMENT	DESCRIPTION AND USE
1.	Impedence Matching Network	 This Impedence Matching Network is used to match the output impedence of the URM-127 to the input of the RT-581. It is used in the RT-581 Modulator checks.

Table 5-3. Test Equipment To Be Made Locally (Continued)

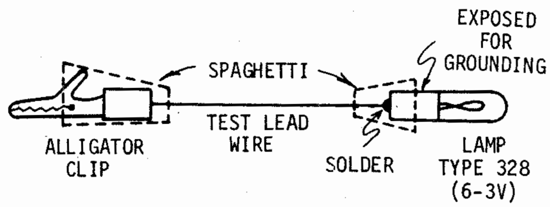
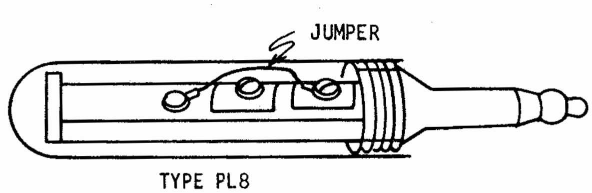
ITEM #	INSTRUMENT	DESCRIPTION AND USE
2.	Trouble-Shooting Light	 Connect Alligator clip to FL 201 on FMO Assembly. Ground side of lamp on Assembly being inspected. This Trouble Shooting light is used to illuminate the internal parts of each assembly while aligning the RT-581
3.	Transmit Key Plug	 This Transmitter Key Plug is used to key the RT-581 During the Trouble Shooting and Alignment Procedures.

Table 5-3. Test Equipment To Be Made Locally (Continued)

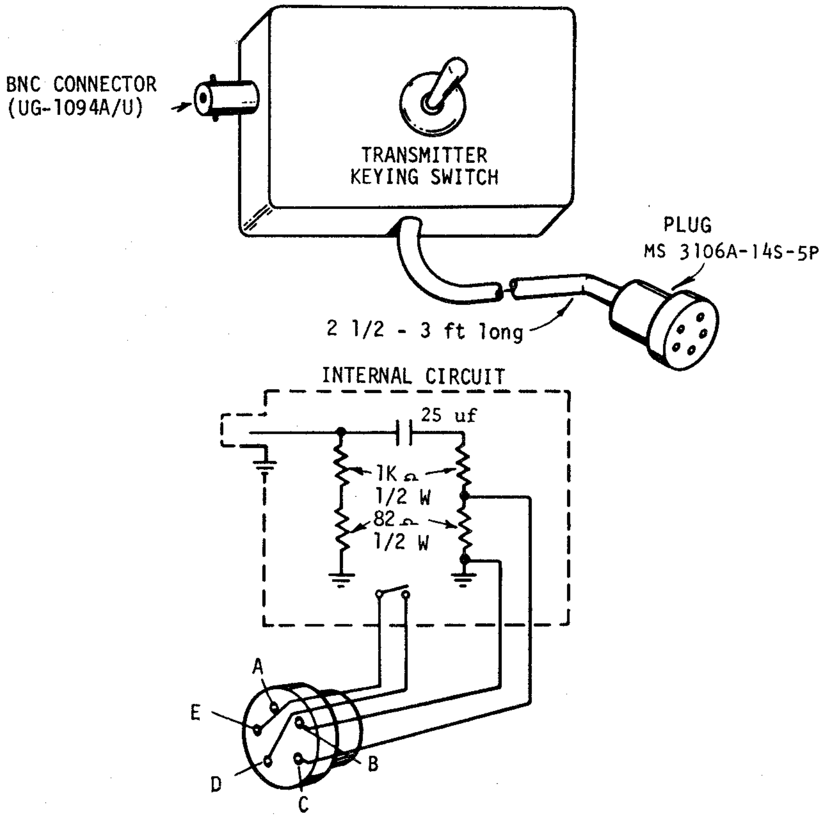
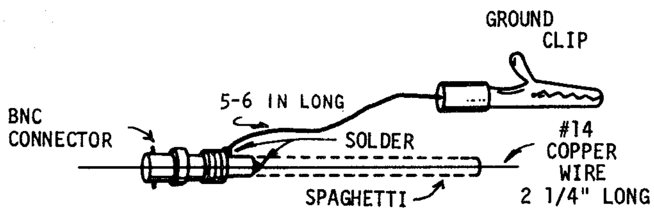
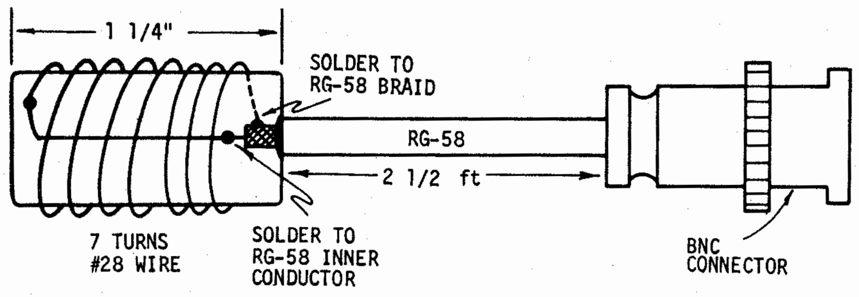
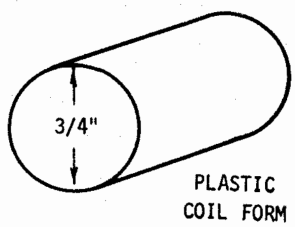
ITEM #	INSTRUMENT	DESCRIPTION AND USE
4.	Combining Alternate Method for Items I and 3.	
5.	Extender Probe	 FOR USE WITH USM-207 COUNTER TO PROBE HARD TO REACH TEST JACKS.

Table 5-3. Test Equipment To Be Made Locally (Continued)

ITEM #	INSTRUMENT	DESCRIPTION AND USE
6.	Oscillator Pickup Loop	





PLASTIC PILL BOX
CAN BE USED

This pick-up loop is used with electronic frequency counters to verify various frequencies generated in RT-581. It is particularly useful for coupling RF from V201 into AN/USM 207 frequency counter.

5-12. TEST POINTS. The test points in the assemblies of the radio set are color coded in accordance with the standard resistor color code. For example, in the First IF Assembly, test point J301 is brown; J302 is red; J303 is orange; J304 is yellow, etc. Some equipments contain a few white teflon test points which are exceptions to the color code system.

5-13. RF TUNERS. Special tuners are used in the last four stages of the FMO and six stages of the RF and PA Assembly. The tuners cover the frequency range by simultaneously changing both the capacitance and the inductance of their elements as they are positioned by the frequency selector.

5-14. Each section of the capacitors (with the exception of Z107 and Z108 in RF and PA Assembly) consists of two stator plates and three rotor plates. The two outside rotor plates are divided into segments (referred to as tabs). The capacitance can be changed (for tracking) by physically bending the tabs. The inductor consists of a fixed loop or ring and the inductor rotor arm.

5-15. Tracking of the rf tuners over the frequency range of the RT-581 is accomplished by bending the tabs of the outside rotor plates that are in half mesh with the stator plate at each of the tracking frequencies.

5-16. SAFETY. The attention of officers and operating personnel is directed to Chapter 9670 of the NAVSHIPS Technical Manual, or superseding instructions, for a description of applicable electronics safety precautions.

5-17. This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with this equipment. While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS
Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustments inside equipment with high voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties always remove power and discharge and ground circuits prior to touching them.

DON'T SERVICE OR ADJUST ALONE
Under no circumstances should any person reach within or enter the enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

DON'T TAMPER WITH INTERLOCKS
Do not depend upon door switches or interlocks for protection but always shut down motor generators or other power equipment. Under no circumstances should any access gate, door, or safety interlock switch be removed, short-circuited, or tampered with in any way, by other than authorized maintenance personnel, nor should reliance be placed upon the interlock switches for removing voltages from the equipment.

5-18. RADIO SET REFERENCE DESIGNATIONS. Radio Sets AN/URC-9 and 9A consists of Power Supply PP-2702/URC-9, Receiver-Transmitter RT-581( )/URC-9, and Receiver-Transmitter Case CY-2959/URC-9. Radio Sets AN/URC-9Y and 9AY are comprised of the same equipments as AN/URC-9 except for the power supplies. Tables 5-4 and 5-5 list the RT-581( ) and power supply assemblies and their identifying numerical designations.

Table 5-4. RT-581( )/URC-9 Assembly Numerical Designation

ASSEMBLY NAME	NUMERICAL DESIGNATION
RT-581( )/URC-9	1-99
Radio Frequency & Power Amplifier	101-199
Frequency Multiplier-Oscillator	201-299
First IF Amplifier	301-399
Second IF Amplifier	401-499
Third IF Amplifier	501-599
Relay-Filter	601-699
Front Panel	701-799
Audio Amplifier & Modulator	801-899
IF Filter	901-999
Centrifugal Fan	1001-1099
Low-Pass Filter	1101-1199
Frequency Selector	1201-1299
Directional Coupler	1301-1399
Broadband Side Tone Amplifier	1601-1699
Case CY-2959/URC-9	1401-1499

Table 5-5. Power Supply Assembly Numerical Designation

ASSEMBLY NAME	NUMERICAL DESIGNATION
AN/URC-9, 9A	
Power Supply PP-2702	1501-1599
AN/URC-9Y	
Power Supply PP-4706	2A5
AN/URC-9AY	
Power Supply PP-4706A	1901-1999

5-19. TROUBLESHOOTING PHILOSOPHY. Every indication of abnormal operation in a radio set has a specific and significant meaning when locating a fault in a non-operating or marginally operating set. If a logical sequence of action is followed, suspected units, assemblies or subassemblies may be eliminated, or pinpointed for further check to locate the trouble in a faulty component, a circuit discontinuity, or in a mechanical or electrical misalignment. Such action should lead to the isolation of the defective unit, initially through front panel indicators (lights and meters). Then the defective unit can be returned to its proper operating condition by: removing it from its case or main frame, if necessary; troubleshooting, repairing and aligning, both electrically and mechanically; replacing it in the case and again checking the entire radio set by means of the front panel indicators.

NOTE

All references to RT-581/URC-9 are applicable to RT-581A/URC-9 except where noted.

5-20. SPECIAL CABLES. Special cables include those used for maintenance and those used as intra-assembly connectors.

5-21. Maintenance. The following cables supplied with the radio set are used externally to energize and operate units and assemblies removed from their normal operation position:

a. Maintenance Cable, Power Supply, CX-7300/URC-9.

b. Maintenance Cable, Receiver-Transmitter RT-581, CX-7260/URC-9.

c. Maintenance Cable, Relay-Filter Assembly, CX-8521/URC-9.

5-22. Intra-assembly. The following intra-assembly cables MUST be RETAINED for use when installing replacement assemblies:

a. RF and PA Assembly - cables W101 and W8.

b. FMO Assembly - cable W4.

c. 2nd IF Amplifier - cable W5.

5-23. OVERALL CHECKOUT AND TROUBLESHOOTING PROCEDURE FOR RADIO SET AN/URC-9( ). The check out procedure verifies the proper operation of the radio set using the front panel meter. The first step in the procedure is to set all front panel controls as indicated in the Preliminary Control Settings (paragraph 5-24), with the equipment NOT energized. The equipment is then energized and checked out in a logical sequence to uncover any failure or marginal operation. The check out procedure in table 5-6 provides an expected indication and fault correction for each action. Table 5-6 also contains the most likely remedial measures to correct the improper indication. Table 5-7 lists the fuse complement for Radio Sets AN/URC-9, 9A, 9Y and 9AY. Fuse location is shown in figures 5-80 (AN/URC-9, 9A), 5-84 (AN/URC-9Y), and 5-91 (AN/URC-9AY)

NOTE

All front panel checks should be completed before beginning internal checks.

5-24. PRELIMINARY CONTROL SETTINGS. The following listed controls are all located on the front of the radio set except the PLAIN-BROADBAND switch is at the rear of the radio case.

a. Set RT-581 (figure 2-1) controls as follows:

1. SQUELCH control R702 to OFF.

2. VOLUME control R717 at desired level

3. CHAN SEL switch S705 to MANUAL.

4. MODE switch S702 to NOR.

5. PLAIN-BROADBAND switch S1401 to PLAIN (figure 5-61).

6. Handset HD169 connected to Audio Connector J704.

b. On Radio Set AN/URC-9 and 9A (figure 2-1), set PP-2702 controls as follows:

1. DIMMER control R1506 clockwise.

2. Power switch S1503 to OFF.

c. On Radio Set AN/URC-9Y (figure 2-2), set PP-4706 controls as follows:

1. DIMMER control 2A5R7 clockwise.

2. Power switch 2A5S1 to OFF-RESET.

d. On Radio Set AN/URC-9AY (figure 2-3), set PP-4706A controls as follows:

1. DIMMER control R1913 clockwise.

2. Power switch S1901 to OFF.

Table 5-6. Front Panel Checkout Procedure
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
	NOTE Every symptom of abnormal operation has a significant meaning. A suspected circuit is efficiently checked and either noted or eliminated as contributing to the cause of trouble when a logical procedure is followed.		
1	AN/URC-9, 9A		Refer to fig 5-106, 5-120, 5-121
	On Power Supply PP-2702: Set Power switch S-1503 to up position (fig. 5-80)	1. POWER indicator DS1501 lit (DIMMER control R1506 maximum clockwise position)	1. Check DS1501, DS701 and DS702, indicators
		2. Indicators DS701, DS702, and DS703 are lit	2. Check MAIN fuse F1501, T1501 PRI fuse F1502, and F1506 PP-2702
		3. Operating blower motor B1401 (PP-2702) and blower motor B1051 (RT-581) are audible	3. Check rectifiers CR1505 through CR1508; trace wiring and check for discontinuities
			4. Check S1505, S1503, and T1501; repair or replace as necessary in PP-2702
	AN/URC-9Y		Refer to fig 5-101 through 5-104, 5-120
	On Power Supply PP-4706/URC-9Y: Set power switch 2A5S1 to ON (fig 5-84)	1. POWER indicator 2A5I1 lit (DIMMER control 2A5R7 maximum clockwise position)	1. Check 2A5I1, DS701, and DS702 indicators
		2. Indicators DS701, DS702, and DS703 are lit	2. Check MAIN fuses 2A5F1 and 2A5F2
		3. Operating blower motor B1401 (CY-2959), blower motor B1051 (RT-581), and power supply blower motor 2A5B1 are audible	3. Check blower motors B1401, B1051, and 2A5B1

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
1 (cont)			4. Check series regulator transistors 2A5Q1 through 2A5Q4; Check amplifier transistors 2A5A1Q1 through 2A5A1Q4
			5. Check converter transistors 2A5Q5 and 2A5Q6
			6. Check frequency control transistors 2A5A2Q1, 2A5A2Q2, and associated circuit
			7. Check rectifiers 2A5CR3 and 2A5CR4; faulty components and wiring
			8. Check transformer 2A5T1
	AN/URC-9AY		Refer to fig 5-105, 5-120
	On Power Supply PP-4706A/URC-9Y: set power switch S1901 to up position (fig 5-91)	1. POWER indicator DS-1901 lit; (DIMMER control (R1913) maximum clockwise position	1. Check DS1901, DS701, and DS702 indicators
		2. Indicators DS701, DS702, and DS703 are lit	2. Check MAIN No. 2 fuse F1902; check RECT 26V fuse F1907
		3. Operating blower motor B1401 (CY-2959), and blower motor B1051 (RT-581) are audible	3. Check blower motors B1401 and B1051
		4. Power supply blower motor B1901 operating	4. Check converter transistors Q1907 and Q1908; check amplifier transistors Q1909 and Q1910
			5. Check rectifiers CR1919 through CR1922 (module A1901)
			6. Check transformers T1904 and T1903

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
1 (Cont)			7.Check blower motor B1901 8.Check B1901 fuse F1903 9.Check convertor transistors Q1911, Q1912, and associated circuit (module A1904)
2	AN/URC-9, 9A		Refer to fig 5-99, 5-100, 5-106
	On the RT-581: Set METER switch S701 to BIAS (fig 5-63)	Meter indicates within NORMAL range	1.Check T1502 PRI fuse F1503 and 125V B+ F1506 2.Check S1502 and T1502; repair or replace as necessary 3.Check rectifiers CR1509 through CR1512, and CR1514; trace wiring and check for discontinuities 4.Check filter and load circuits
	AN/URC-9Y		Refer to fig 5-99, 5-100, 5-101 thru 5-104
	On RT-581: Set METER switch S701 to BIAS (fig 5-63)	Meter indicates within NORMAL range	1.Check rectifiers 2A5A3CR9 and 2A5A3CR10 2.Check filter transistors 2A5A4Q3 and 2A5A4Q8 and associated circuit 3.Check transformer 2A5T1
	AN/URC-9AY		Refer to fig 5-99, 5-100, 5-105
	On RT-581: Set METER switch S701 to BIAS (fig 5-63)	Meter indicates within NORMAL range	1.Check MAIN No. 1 fuse F1901 2.Check regulator transistors Q1903 through Q1906 and associated circuit

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
2 (Cont)			3. Check convertor transistors Q1901, Q1902, and associated circuit 4. Check rectifiers CR1910 through CR1913 (module A1903) 5. Check transformers T1902 and T1901
3	AN/URC-9, 9A		Refer to fig 5-99, 5-100, 5-106
	On RT-581: Set METER switch S701 to +26.5V	Meter indicates within NORMAL range	Check METER switch S701 and associated circuits NOTE Step 1 discloses possible causes for +26.5-vdc supply failure
	AN/URC-9Y		Refer to fig 5-99, 5-100, 5-101 thru 5-104
	On RT-581: Set METER switch S701 to +26.5V	Meter indicates within NORMAL range	Check METER switch S701 and associated circuits NOTE Step 1 discloses possible causes for +26.5-vdc supply failure
	AN/URC-9AY		Refer to fig 5-99, 5-100, 5-105
	On RT-581: Set METER switch S701 to +26.5	Meter indicates within NORMAL range	Check METER switch S701 and associated circuits NOTE Step 1 discloses possible causes for +26.5 vdc supply failure

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
4	<u>AN/URC-9, 9A</u>		Refer to fig 5-99, 5-100, 5-106
	On RT-581: Set METER switch S701 to +125V	Meter indicates within NORMAL range	Check METER switch S701 and associated circuits NOTE Step 2 discloses possible causes for failure of +125 vdc supply
	<u>AN/URC-9Y</u>		Refer to fig 5-99, 5-100, 5-101 thru 5-104
	On RT-581: Set METER switch S701 to +125V	Meter indicates within NORMAL range	1. Check fuse 2A5F4 2. Check rectifiers 2A5A3CR5 through 2A5A3CR8 3. Check filter transistors 2A5A4Q2, 2A5A4Q6, 2A5A4Q7, and associated circuit 4. Check transformer 2A5T1
	<u>AN/URC-9AY</u>		Refer to fig 5-99, 5-100, 5-105
	On RT-581: Set METER switch S701 to +125V	Meter indicates within NORMAL range	1. Check 125V B+ fuse F1906 2. Check METER switch S701 and associated circuits NOTE Step 2 discloses possible causes for +125 vdc supply failure
5	<u>AN/URC-9, 9A</u>		Refer to fig 5-100, 5-106
	On the RT-581: Set METER switch S701 to +325V NOTE Voltage checked is +275-vdc power supply output	Meter indicates within NORMAL range	1. Check fuses F1504 (325V B+ 1/2A) and F1507 (325V B+ 0.175A) 2. Check rectifiers CR1501 through CR1504 3. Check filters and load circuits 4. Check for discontinuities

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
5 (Cont)	AN/URC-9Y		Refer to fig 5-99, 5-100 thru 5-104
	On RT-581: Set METER switch S701 to +325V NOTE Voltage checked is +275-vdc power supply circuit	Meter indicated within NORMAL range	1. Check fuse 2A5F3 2. Check rectifiers 2A5A3CR1 through 2A5A3CR4 3. Check filter transistors 2A5A4Q1, 2A5A4Q4, 2A5A4Q5, and associated circuit 4. Check transformer 2A5T1
	AN/URC-9AY		Refer to fig 5-100, 5-105
	On RT-581: Set METER switch S701 to +325V NOTE Voltage checked is +275-vdc power supply circuit	Meter indicates within NORMAL range	1. Check +325V fuse F1904 and +275V fuse F1905 2. Check rectifiers CR1906 through CR1909 (module A1903) 3. Check filter and load circuits
6	CAUTION ANT connector J701 must be terminated in a proper load Key to transmit NOTE Voltage checked is the +325-vdc power supply output NOTE Unkey at the end of each step where instructed "key to transmit"	1. Meter indicates slightly higher than in step 5 2. Distinctive sound as relays energize (key to transmit)	Refer to fig 5-100 1. Check load circuits for discontinuities 2. Check T/R relay K601 and keying circuit discontinuities
7	On the RT-581: Set METER switch S701 to S METER	Meter indication variable (indication is a function of noise or received signal when SQUELCH is OFF)	No action required

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
8	On the RT-581: Return SQUELCH to desired level NOTE This level will depend on operating conditions	No indication expected during checkout using preliminary control settings	No action required
9	On the RT-581: Set METER switch S701 to SWR; key to transmit	Meter indicated below NORMAL range	Refer to fig 5-2 Check discontinuities in RF signal path to wattmeter
10	On the RT-581: Set METER switch S701 to PWR; key to transmit	Meter indicates center of NORMAL range or above; wattmeter indicates 16 watts or greater	Refer to para 5-28 for checks and troubleshooting of RT-581. The sequence to be followed is: 1 2nd IF Amplifier 2 1st IF Amplifier 3 FMO 4 RF and PA 5 Directional Coupler
11	On the RT-581: Set METER switch S701 to $DVRI_b$; key to transmit	Meter indicates within NORMAL range	Check V105, K2 and circuit discontinuities
12	On the RT-581: Set METER switch S701 to PAI_g; key to transmit	Meter indicates center of NORMAL range or above	Same as step 10
13	On the RT-581: Set METER switch S701 to PAI_b; key to transmit	Meter indicates center of NORMAL range or above	Check V106 and circuit discontinuities
14	On the RT-581: Set METER switch S701 to % MOD; key to transmit and MODULATE with voice signal	Meter peaks within NORMAL range	Refer to para 5-63 Check handset

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
15	On the RT-581: Set MODE switch S702 to TONE; key to transmit NOTE Return MODE switch to NOR upon completion of this check	1. Meter indicates within lower portion of NORMAL range if FC 3 is not installed 2. Meter will not change relative indication when RT-581 is keyed if FC 3 is installed	Refer to fig 5-100, 5-119 1. Check MODE switch S702 2. Check tone oscillator circuits 3. Check T/R relay K802 4. Check Relay-Filter Assembly circuits
16	On the RT-581: Operate CHAN SEL switch S705 from 1 through 19	1. Channel indicator numbers follow selected channel 2. Frequency indicator numbers follow to preset frequency for selected channel	Refer to para 5-68 and fig 5-120, 5-121 1. Check K1204, B1201, S705 B&C, and S1205, in that order 2. Check K1201, S1202, S1201 A&B, K1202, S1203, S1201C, K1203, S1203, and S1210D, in that order 3. Check mechanical synchronization (para 5-70)
17	On the RT-581: Set CHAN SEL switch S705 to MANUAL; Set MANUAL FREQUENCY TENS, UNITS, and TENTHS (Or TENTHS-HUNDREDTHS on AN/URC-9A) switches S706, S707, and S708 to 399.9 (or 399.95); key to transmit	1. Channel indicator moves to M 2. Frequency indicators move to 399.9 (or 399.95) 3. Wattmeter indicates 16 watts minimum	Refer to fig 5-120, 5-121 1. Check S705A, (front and rear), S706, S707, and S708 2. Check circuit and parts described in step 16 3. Same as step 10

Table 5-6. Front Panel Checkout Procedure (Continued)
(Use PRELIMINARY CONTROL SETTINGS, paragraph 5-24)

STEP	INITIAL ACTION	NORMAL INDICATION	FAULTS AND CORRECTIVE ACTION
18	On the RT-581: Set METER switch S701 to PWR; key to transmit; Operate MANUAL FREQUENCY TENS switch S706 in steps from 39 to 22; return to 39	1. Meter indicates center of NORMAL range or above (16 watts min) 2. Frequency indicator TENS dial follows TENS switch position	Refer to para 5-28 1. Check 2nd IF Amplifier, 1st IF Amplifier, FMO, and RF and PA in that order 2. Check circuit and parts described in step 16
19	On the RT-581: Key to transmit; operate MANUAL FREQUENCY UNITS switch S707 in steps from 9 to 0; return to 9	1. Meter indicates within NORMAL range or above (16 watts min) 2. Frequency indicator UNITS dial follows UNITS switch position	Same as step 18
20	On the RT-581: Key to transmit; operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch S708 in steps from .9 to .0 (or .95 to .00); return to .9 (or .95)	1. Meter indicates center of NORMAL range of above (16 watts min) 2. Frequency indicator TENTHS (or TENTHS-HUNDREDTHS) dial follows TENTHS (or TENTHS-HUNDREDTHS) switch position	Same as step 18
21	NOTE Disregard this step unless RETRANS operation is used On the RT-581: Set MODE switch S702 to RETRANS	Refer to para 5-66 for operational check out	Refer to para 5-67 for troubleshooting

Table 5-7. Fuse Complement For Radio Set AN/URC-9( )

UNIT	SYMBOL	CURRENT RATING	CIRCUIT
AN/URC-9, 9A			
Power Supply PP-2702 (fig 5-80)	F1501	5A(115V) 3A(230V)	Main primary ac power
	F1502	3A(115V) 1-1/2A(230V)	Primary ac power to T1501
	F1503	1-1/2A(115V) 3/4A(230V)	Primary ac power to T1502
	F1504	1/2A	+325 vdc power supply output (receive and transmit)
	F1505	15A	+26.5 vdc power supply output
	F1506	1/4A	+125 vdc and -11vdc power supply outputs
	F1507	.175A	+275 vdc power supply output (receive only)
AN/URC-9Y			
Power Supply PP-4706 (fig 5-84)	2A5F1	20A(+24V)	Primary power
	2A5F2	20A(-24V)	Primary power
	2A5F3	.175A	+325 vdc power supply output (receive only)
	2A5F4	.25A	+125 vdc power supply output
AN/URC-9AY			
Power Supply PP-4706A (fig 5-91)	F1901	25A(+24V)	Primary power
	F1902	15A(+24V)	Primary power
	F1903	5A	112 vac power supply blower
	F1904	1/2A	+325 vdc power supply output
	F1905	.175A	+325 vdc power supply output (receive only)
	F1906	.25A	+125 vdc power supply output
	F1907	5A	+26.5 vdc power supply output

5-25. INITIAL SETUP FOR ALIGNMENT AND ADJUSTMENT OF RT-581.

NOTE

All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted

5-26. EQUIPMENT SETUP. Remove RT-581 from case and make equipment test connections as follows:

a. Remove connection at ANT connector (J701).

b. Loosen four captive screws in corners of front panel (fig 5-63).

c. Turn extractor knob (01408, fig 5-60) fully counterclockwise; reverse rotation for three turns and stop with knob slot horizontal; push extractor down.

d. Pull RT-581 out of cabinet.

e. Connect P1 (fig 5-15) on the rear of RT-581 to J1401 (fig 5-60) on case CY-2959; use Cable Assembly CX-7260.

f. Connect the input of RF Wattmeter AN/URM-43( ) (60 w scale) to ANT connector, (J701, fig 5-63) on RT-581.

g. Connect handset to AUDIO connector (J704, fig 5-63).

5-27. RADIO SET AN/URC-9 CONTROL SETTINGS. Set controls as follows:

a. CHAN SEL switch (S705) to MANUAL.

b. MANUAL FREQUENCY TENS, UNITS and TENTHS switches (S706, S707, and S708 on AN/URC-9, 9Y and 9AY) to 399.9 (fig 5-63). (On AN/URC-9A, switch S708 is calibrated in TENTHS-HUNDREDTHS; set S708 to 399.95).

NOTE

399.9 MHz is the mechanical and electrical reference frequency for the AN/URC-9, 9Y and 9AY. 399.95 MHz is the reference frequency for AN/URC-9A.

c. MODE selector (S702) to NOR.

d. SQUELCH control (R702) to OFF.

e. Power switch (S1503) on PP-2702 (AN/URC-9, 9A) to on (up); Power switch (2A5S1) on PP-4706 (AN/URC-9Y) to ON; or Power switch (S1901) on PP-4706A (AN/URC-9AY) to on (up).

f. PLAIN-BROADBAND switch (S1401), at rear of CY-2959 case, (fig 5-61) to PLAIN.

g. VOLUME control (R717) as required.

CAUTION

Do not transmit unless RT-581 is terminated in a proper load (wattmeter, antenna, etc).

5-28. RT-581 ALIGNMENT, ADJUSTMENT AND TROUBLESHOOTING PROCEDURES.

NOTE

All references to RT-581/URC-9 are applicable to RT-581A/URC-9 except where noted

5-29. The following alignment and adjustment procedures, due to the interdependency of the assemblies, must be performed in the sequence as presented. The electrical checks and alignments in paragraphs 5-30 through 5-70 are performed in a transmit condition. The electrical checks and alignments in paragraphs 5-71 through 5-90 are performed in a receive condition. When a check or alignment can be made in either transmit or receive, the check or alignment is made in transmit and is not repeated for receive. These procedures are to be performed at 399.9 MHz (or 399.95 MHz for AN/URC-9A), unless otherwise indicated. Troubleshooting procedures are performed as required.

WARNING

Voltages dangerous to life are present. Use care when making alignments or adjustments.

5-30. POWER SUPPLY CHECKS, ADJUSTMENTS AND TROUBLESHOOTING. No adjustments need be made to Power Supply PP-2702/URC-9 (AN/URC-9 and 9A) or to Power Supply PP-4706A/URC-9Y (AN/URC-9AY). The adjustment procedures that follow apply only to Power Supply PP-4706/URC-9Y (AN/URC-9Y). Troubleshooting indications are provided for Power Supplies PP-4706/URC-9Y and PP-4706A/URC-9Y.

5-31. Power Supply PP-4706/URC-9Y Electrical Check. To check out Power Supply PP-4706/URC-9Y, proceed as follows:

a. Remove PP-4706/URC-9Y from cabinet and connect to a 24-vdc power source.

b. Set power switch (2A5S1, fig 5-84) to ON and using Electronic Multimeter AN/USM-116, proceed as follows:

1. Set AN/USM-116 Multimeter for DC voltage, 30V range; connect + lead to 2A5A1TP3 and - lead to 2A5A1TP1 (fig 5-87).

2. Observe indication. If 23.5 vdc is present, check is complete; return PP-4706 to cabinet. If indication is incorrect, adjust in accordance with paragraph 5-32.

5-32. Power Supply PP-4706/URC-9Y Electrical Adjustment. To adjust Power Supply PP-4706/URC-9Y, proceed as follows:

a. Connect PP-4706/URC-9 to a 24-vdc power source.

b. Set power switch to ON. Using Electronic Multimeter AN/USM-116 and Electronic Voltmeter AN/USM-143, proceed as follows:

1. Set the AN/USM-116 Multimeter for DC voltage, 30V range; connect + lead to 2A5A1TP3 and - lead to 2A5A1TP1 (fig 5-87).

2. Adjust variable resistor 2A5A1R14 for meter indication of 23.5 vdc.

3. Connect the AN/USM-143 Electronic Voltmeter to 2A5A4TP1.

4. Adjust variable resistor 2A5A2R7 for a minimum meter indication.

NOTE

This ripple adjustment procedure is normally accomplished by a repair facility after the replacement of transistors 2A5Q5 or 2A5Q6. This adjustment is not available on equipments with serial numbers beginning with the prefix A and equipments with serial numbers B1 through B35).

5. Return PP-4706/URC-9Y to cabinet. This completes the power supply adjustment.

5-33. Power Supply PP-4706/URC-9Y Troubleshooting (AN/URC-9Y only). Troubleshoot Power Supply PP-4706/URC-9Y (fig 5-85 thru 5-90) in accordance with table 5-8.

5-34. Power Supply PP-4706A/URC-9Y Troubleshooting (AN/URC-9AY only). Troubleshoot Power Supply PP-4706A/URC-9Y (fig 5-92 thru 5-97) in accordance with table 5-9.

5-35. SECOND IF AMPLIFIER ALIGNMENT, ADJUSTMENT AND TROUBLESHOOTING. Alignment procedures need be performed only when indicated by unsatisfactory results received during checks. Troubleshooting is performed as required.

5-36. Second IF Amplifier Mechanical Check. Set up RT-581 as in paragraph 5-25. Use tuning tool FSN-9Q5120-720-1908 during following procedures:

a. Position RT-581 right side up (fig 5-12).

Table 5-8. Troubleshooting Guide, PP-4706/URC-9Y

TEST POINT	FUNCTION	CONDITION	INDICATION
POWER SUPPLY REGULATOR 2A5A1			
TP1	Regulator output	Transmit	-23.5 vdc, regulated
TP2	Input voltage	Transmit	Reference voltage
TP3	Regulator output	Transmit	-23.5 vdc, regulated
TP4	CR4 zener voltage	Transmit & receive	-10 vdc
POWER SUPPLY FREQUENCY CONTROL 2A5A2			
TP1	Oscillator drive	Transmit & receive	1 spike/second (scope)
POWER SUPPLY RECTIFIER 2A5A3			
TP1	+325 vdc	Transmit & receive	+330 vdc min
TP2	+125 vdc	Transmit & receive	+127 vdc min
TP3	+28 vdc	Transmit & receive	+23.5 vdc min
TP4	-16 vdc	Transmit & receive	-9 vdc min
POWER SUPPLY FILTER 2A5A4			
TP1	+325 vdc filtering	Transmit	0.5 ac, p-p, max
TP2	+125 vdc filtering	Transmit	0.5 ac, p-p, max
TP3	-11 vdc filtering	Transmit	0.5 ac, p-p, max

Table 5-9. Troubleshooting Guide PP-4706A/URC-9Y

TEST POINT	FUNCTION	CONDITION	INDICATION
POWER SUPPLY MODULE A1904			
TP1901	Input voltage	Transmit & receive	-24 vdc
TP1902	Input voltage	Transmit & receive	+24 vdc
TP1903	400 Hz output	Transmit & receive	115 vac
TP1904	400 Hz output	Transmit & receive	115 vac
POWER SUPPLY FILTER BIAS MODULE A1903			
TP1905	Unfiltered dc output	Transmit & receive	+325 vdc
TP1906	Unfiltered dc output	Transmit & receive	+125 vdc
TP1907	Zener voltage	Transmit & receive	-11 vdc
POWER SUPPLY RESISTOR AND CAPACITOR MODULE A1902			
TP1908	Input voltage	Transmit & receive	+24 vdc
TP1909	Input voltage	Transmit & receive	-24 vdc
POWER SUPPLY SEMICONDUCTOR MODULE A1901			
TP1910	Regulator output	Transmit & receive	-16.4 vdc
TP1911	DC output	Transmit & receive	+26.5 vdc

NOTE

When the observation is incorrect for a step, discontinue check at that point and perform mechanical alignment in accordance with paragraph 5-37.

b. Check that coupler (0405, fig 5-45) slot on end of the shaft is vertical and centered under the black guide post (fig 5-28); that the coupler keeper pin is in the upper right corner and in the open quadrant of frequency selector coupler half, (01295, fig 5-70), as viewed from the front of RT-581.

c. Insert tuning tool into coil L401 (fig 5-44).

d. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) counterclockwise to .0. (Tuning tool should rise.)

e. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) counterclockwise to .9 (or .95). (Tuning tool should fall.)

f. Repeat steps c through e for coils L403 and L405.

g. Remove tuning tool.

h. If mechanical check is satisfactory, proceed to Second IF Amplifier electrical check.

5-37. Second IF Amplifier Mechanical Alignment. Set up RT-581 as in paragraph 5-25. Use Bristol tool FSN-9Q5120-540-4359 or 9Q5120-288-8853 during the following procedures:

a. Position RT-581 right side up (fig 5-12).

b. Loosen locking collar on male coupler (01295, fig 5-70) on frequency selector assembly and center coupler mating element in vertical position under black guide post. The cutout on male coupler should be in upper right corner as viewed from front of RT-581. Coupler keeper pin of coupler 0405 should be in the open quadrant of male coupler 01295.

c. Tighten locking collar.

5-38. Second IF Amplifier Electrical Check. Set up RT-581 as in paragraph 5-25. Refer to figures 5-12, 5-29, 5-34, 5-45, 5-46, 5-113, and 5-114 for the physical and electrical location of test points. Use Electronic Multimeter AN/USM-116 and Electronic Frequency Counter AN/USM-207. If abnormal indications are observed, refer to 2nd IF Amplifier troubleshooting (paragraph 5-40) only after completing all electrical checks.

NOTE

Steps a through d verify 3.0 to 3.9 MHz (or 3.00 to 3.95 MHz for AN/URC-9A) third oscillator V401B operation. (Fig 5-113, 5-114).

a. Set AN/USM-116 for negative dc voltage, 10V range, and connect dc probe to yellow test point J404 (fig 5-44).

b. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) in steps from .9 to .0 (or .95 to .00) and observe indication (-6 vdc minimum) on AN/USM-116 at each step.

NOTE

A slow voltage rise indicates marginal crystal operation.

c. Key to transmit and repeat step b, observe indication on AN/USM-116 (-6 vdc minimum).

d. Unkey the transmitter and remove probe.

NOTE

Steps e through g verify transmit buffer amplifier V401A operation in transmit. (Fig 5-113, 5-114).

NOTE

Do not use a probe extension in steps e through g.

e. Set AN/USM-116 for dc voltage, 10V range, connect dc probe to red test point J402 (fig 5-44); and key to transmit.

f. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) in steps from .9 to .0 (or .95 to .00) and observe indication (3 to 3.8 vdc) on AN/USM-116.

g. Unkey the transmitter and remove dc probe.

h. Using probe extension, connect AN/USM-207 to yellow test point J404 (fig 5-44).

i. Key to transmit.

j. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) in steps from .9 to .0 (or .95 to .00) and observe that frequency indication on AN/USM-207 corresponds to those listed in table 5-10.

k. Unkey transmitter and remove AN/USM-207 probe.

l. Remove V304 on 1st IF Amplifier; set AN/USM-116 for AC voltage, 1V range; connect ac probe to pin 1 on tube socket (fig 5-39).

m. Key to transmit; operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) in steps from .9 to .0 (or .95 to .00) and observe for (.5 to .9 vac) indication on AN/USM-116 at each step.

n. Unkey transmitter; remove test probe.

o. Replace V304.

p. If electrical check is satisfactory, proceed to 1st IF Amplifier mechanical check.

Table 5-10. Second IF Amplifier Crystal Frequencies (Transmit)

TENTHS/ TENTHS-HUNDREDTHS SWITCH POSITION	AN/USM-207 INDICATION AND CRYSTAL FREQUENCY (MHz)	FREQUENCY TOLERANCE (±Hz)
AN/URC-9, 9Y, AND 9AY		
.9	3.9	195
.8	3.8	190
.7	3.7	185
.6	3.6	180
.5	3.5	175
.4	3.4	170
.3	3.3	165
.2	3.2	160
.1	3.1	155
.0	3.0	150
AN/URC-9A		
.95	3.95	197.5
.90	3.90	195.0
.85	3.85	192.5
.80	3.80	190.0

Table 5-10. Second IF Amplifier Crystal Frequencies (Transmit) (Continued)

TENTHS/ TENTHS- HUNDREDTHS SWITCH POSITION	AN/USM-207 INDICATION AND CRYSTAL FREQUENCY (MHz)	FREQUENCY TOLERANCE (±Hz)
AN/URC-9A (Cont)		
.75	3.75	187.5
.70	3.70	185.0
.65	3.65	182.5
.60	3.60	180.0
.55	3.55	177.5
.50	3.50	175.0
.45	3.45	172.5
.40	3.40	170.0
.35	3.35	167.5
.30	3.30	165.0
.25	3.25	162.5
.20	3.20	160.0
.15	3.15	157.5
.10	3.10	155.0
.05	3.05	152.5
.00	3.00	150.0

5-39. Second IF Amplifier Electrical Alignment. Set up RT-581 as in paragraph 5-25. Refer to figures 5-12, 5-39, 5-44, 5-45, 5-48, 5-113, and 5-114 for the physical and electrical locations of adjustments and test points. Use Electronic Multimeter AN/USM-116, Electronic Frequency Counter AN/USM-207, tuning tool FSN-9Q5120-720-1908, and steel ruler during following procedures:

NOTE

Mechanical alignment for 2nd IF Amplifier must be correct before proceeding.

NOTE

Make sure MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) is on .9 (or .95) before proceeding to step a.

a. Remove V304 on 1st IF Amplifier; set AN/USM-116 for AC voltage, 1V range; connect ac probe to pin 1 on tube socket (fig 5-39).

b. Key to transmit; then adjust L402, L404, and L406 (fig 5-44) for a peak indication (0.5 to 0.9 vac) on AN/USM-116.

c. Unkey transmitter.

NOTE

If no output is obtained in step b, adjust L401, L403, and L405 (fig 5-44) until tuning cores are 1-1/32 inches from top of can and repeat step b.

d. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) to .0.

e. Key to transmit; adjust L401, L403, and L405 (fig 5-44) for a peak on AN/USM-116.

f. Unkey transmitter and remove probe.

g. Repeat steps b through f until no further change is noted on AN/USM-116.

h. Replace V304.

i. This completes 2nd IF Amplifier Electrical Alignment.

5-40. Second IF Amplifier Troubleshooting (Transmit). (Figures 5-100, 5-113, 5-114, 5-2, 5-7, and 5-8). Troubleshoot the second IF Amplifier in accordance with procedures in table 5-11.

Table 5-11. Second IF Amplifier Troubleshooting Procedures (Transmit)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
1. Abnormal indication at yellow test point J404 (-6 vdc minimum normal indication) - Keyed	1. Faulty mechanical alignment	1. Check according to para 5-36, and 5-37
	2. Faulty tube V401	2. Replace tube V401
	3. Faulty operating voltages	3. Check supply voltages at M701 (+125 vdc) and pins 4 and 6 of XV401 (fig 5-100)
	4. Faulty components	4. Make circuit checks (fig 5-113, 5-114)
	5. Faulty switch (S401 and S402) contacts	5. Clean contacts with a cleaner/lubricant such as CRAMOLIN, FSN-9G6850-880-7007
	6. Faulty electrical alignment	6. Check according to para 5-39
2. Abnormal indication at red test point J402 (3 to 3.8 vdc normal) - Keyed	1. Same as for faulty indication 1	1. Same as for faulty indication 1
3. Abnormal indication at pin 1 of XV304 (.5 to .9 vac normal indication) - Keyed (V304 removed)	1. Same as for faulty indication 1	1. Same as for faulty indication 1
	2. Faulty intra-assembly cable or connection	2. Check cable and connectors J401/P304 (fig 5-2, 5-7, 5-8)

TUBE	PIN NUMBER (disconnect P401)								
	1	2	3	4	5	6	7	8	9
V401	0	10K	100K	105K	0	210K	100K	290	00

5-41. FIRST IF AMPLIFIER ALIGNMENT, ADJUSTMENT, AND TROUBLESHOOTING. Alignment procedures need be performed only when indicated by unsatisfactory results received during checks. Troubleshooting is performed as required.

5-42. First IF Amplifier Mechanical Check. Set up RT-581 as in paragraph 5-25. Use tuning tool FSN 9Q5120-720-1908 during following procedures:

a. Position RT-581 right side up (fig 5-12).

NOTE

When the observation is incorrect for a step, discontinue check at that point and perform mechanical alignment in accordance with paragraph 5-43.

b. Check that both coupler slots (0316, 0317, fig 5-42) are vertical and centered under the black guide posts; that the coupler keeper pins are in the upper right corner and in the open quadrant of the frequency selector coupler halves (01293, 01294 fig 5-70) as viewed from front of RT-581.

c. Insert tuning tool into coil L301 (fig 5-39).

d. Operate MANUAL FREQUENCY UNITS switch (S707) counterclockwise to 0. (Tuning tool should rise).

e. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) counterclockwise to .0 (Tuning tool should rise slightly further.)

f. Operate MANUAL FREQUENCY UNITS switch (S707) counterclockwise to 9. (Tuning tool should fall).

g. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) counterclockwise to .9 (or .95). (Tuning tool should fall slightly further.)

h. Repeat steps c through g for coils L302, L303, L304, L305, L306 and L310.

NOTE

L310 is driven by UNITS (1 MHz) shaft only.

i. Remove tuning tool.

j. If mechanical check is satisfactory, proceed to First IF Amplifier electrical check.

5-43. First IF Amplifier Mechanical Alignment. Set up RT-581 as in paragraph 5-25. Use Bristol tool FSN 9Q5120-540-4359 or FSN 9Q5120-288-8854 during the following procedures:

a. Position RT-581 right side up (fig 5-12).

b. Loosen locking collars on male couplers (01293, 01294 fig 5-70) on frequency selector; center coupler mating elements in vertical position under black guide posts. The cutouts on male couplers should be in upper right corner as viewed from the front of RT-581. Coupler keeper pins of couplers 0316 and 0317 should be in open quadrant of male couplers 01293 and 01294.

c. Tighten locking collar.

5-44. First IF Amplifier Electrical Check. Set up RT-581 as in paragraph 5-25. Refer to figures 5-12, 5-39 through 5-43, and 5-112 for the physical and electrical location of test points. Use Electronic Multimeter AN/USM-116 and Electronic Frequency Counter AN/USM-207. during the procedures that follow. If abnormal indications are observed, refer to 1st IF Amplifier troubleshooting (paragraph 5-48).

NOTE

The 2nd IF Amplifier electrical alignment (paragraph 5-39) must be correct before proceeding.

a. Set AN/USM-116 for negative DC voltage, 3V range, and connect dc probe to green test point J305 (fig 5-39).

b. Operate MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707 and S708) to 9.9 (or 9.95); key to transmit and observe indication (-1.0 vdc minimum) on AN/USM-116.

c. Operate MANUAL FREQUENCY UNITS switch (S707) from 9 to 0, in turn, and observe indication (-1.0 vdc minimum) on AN/USM-116 at each switch position. Unkey transmitter.

NOTE

A slow voltage rise indicates marginal crystal operation.

d. Remove dc probe from green test point J305.

e. Connect AN/USM-207 to green test point J305.

NOTE

The frequency counter read-out varies with the input signal level. Use minimum input signal by adjusting counter input attenuator.

f. Operate MANUAL FREQUENCY UNITS switch (S707) in steps from 9 to 0, in turn, and observe that frequency indications on AN/USM-207 correspond to those listed in table 5-12.

NOTE

Satisfactory results verify 17 to 26 MHz second oscillator V305 operation in receive and transmit.

g. Operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, S708) to 399.9 (or 399.95) and remove AN/USM-207 probe.

h. Set AN/USM-116 for AC voltage, 10V range, and connect ac probe to orange test point J103 on RF and PA (fig 5-25).

i. Key to transmit; observe indication (5 to 8 vac) on AN/USM-116.

j. Operate MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707 and S708) in steps from 9.9 to 0.0 (or 9.95 to 0.00), in turn, and observe indications (5 to 8 vac) on AN/USM-116 at each step.

k. Unkey transmitter and remove test probe.

NOTE

Steps l through p verify proper signal mixing of the 1st and 2nd IF Amplifiers in transmit.

l. Connect AN/USM-207 to orange test point J303 (fig 5-39).

m. Operate MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707 and S708) to 9.9 (or 9.95).

n. Key to transmit; observe indication of 29.9 MHz (or 29.95 MHz) on AN/USM-207.

o. Operate MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707 and S708) to 0.0; observe indication of 20.0 MHz (or 20.00 MHz) on AN/USM-207.

p. Unkey transmitter and remove test probe.

q. If electrical check is satisfactory, proceed to FMO mechanical check.

5-45. First IF Amplifier Electrical Alignment. Set up RT-581 as in paragraph 5-25. Refer to figures 5-12, 5-39 through 5-43, and 5-112 for the physical and electrical location of adjustments and test points. Use Electronic Multimeter AN/USM-116 and Electronic Frequency

Table 5-12. First IF Amplifier Crystal Frequencies (Transmit)

UNITS SWITCH POSITION	AN/USM-207 INDICATION AND CRYSTAL FREQUENCY (MHz)	FREQUENCY TOLERANCE (±Hz)
9	26	1300
8	25	1250
7	24	1200
6	23	1150
5	22	1100
4	21	1050
3	20	1000
2	19	950
1	18	900
0	17	850

Counter AN/USM-207 during following procedures:

NOTE
The 2nd IF Amplifier electrical alignment and the 1st IF Amplifier mechanical alignment must be correct before proceeding.

a. Position RT-581 right side up (fig 5-12).

b. Operate MANUAL FREQUENCY UNITS switch (S707) to 9.

c. Set AN/USM-116 for negative DC voltage, 1V range; connect dc probe to green test point J305 (fig 5-39).

d. Adjust C340 for maximum indication on AN/USM-116 (-1 vdc minimum).

e. Operate MANUAL FREQUENCY UNITS switch (S707) to 0.; adjust L310 (fig 5-39) for maximum indication on AN/USM-116 (-1 vdc minimum).

f. Repeat above steps until no further increase is observed on AN/USM-116.

g. Turn trimmer capacitors C304, C306, C309, C312, and C317 (fig 5-39) fully counterclockwise.

h. Set L302, L303, L304, L305, and L306 tuning cores (fig 5-39) for a depth of 1-3/32 inches from top of cover.

i. Operate MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707 and S708) to 9.9 (or 9.95).

j. Set AN/USM-116 for AC voltage, 1V range; connect ac probe to brown test point J301 (fig 5-39).

k. Key to transmit; adjust C304 for maximum indication on AN/USM-116.

l. Unkey transmitter; disconnect AN/USM-116 from test point J301.

m. Set AN/USM-116 to 3V range; connect ac probe to red test point J302.

WARNING
High voltages (B+) that are dangerous to life are present at trimmer shafts of capacitors C306 and C312. Use insulated tuning tool (FSN 9Q5120-720-1908).

n. Key to transmit; adjust C306 and C309 in small increments for maximum ac voltage indication on AN/USM-116. Unkey transmitter and disconnect AN/USM-116 from test point J302.

o. Connect AN/USM-207 to red test point J302; key to transmit; observe frequency 29.9 MHz (or 29.95 MHz for AN/URC-9A) on AN/USM-207; unkey transmitter and disconnect AN/USM-207 from test point J302.

p. Set AN/USM-116 for AC voltage, 10V range; connect ac probe to orange test point J103 on RF and PA (fig 5-25).

q. Key to transmit; adjust C312 and C317 in small increments for maximum ac voltage indication on AN/USM-116.

r. Unkey transmitter; remove ac probe.

s. Operate MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707 and S708) to 0.0.

t. Set AN/USM-116 to 1V range; connect ac probe to brown test point J301.

u. Key to transmit; adjust L302 for maximum ac voltage indication on AN/USM-116.

v. Unkey transmitter; disconnect AN/USM-116 from test point J301.

w. Set AN/USM-116 to 3V range; connect ac probe to red test point J302.

x. Key to transmit; adjust L303 and L304 in small increments for maximum ac voltage indication on AN/USM-116; unkey transmitter and disconnect AN/USM-116 from test point J302.

y. Connect AN/USM-207 to red test point J302; key to transmit; observe frequency of 20.0 MHz on AN/USM-207. Unkey transmitter and disconnect AN/USM-207 from test point J302.

z. Set AN/USM-116 for AC voltage; connect ac probe to orange test point J103 on RF and PA (fig 5-25).

aa. Key to transmit; adjust L305 and L306 in small increments for maximum ac voltage indication on AN/USM-116.

bb. Unkey transmitter and remove ac probe from test point J103.

cc. Repeat steps i through bb until no improvement is noted, and a level of 5 to 8 vac at test point J103 can be obtained for each position of the MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS) switches (S707 and S708).

dd. Adjust C302 clockwise until it is approximately the same physical position as C304.

ee. Adjust L301 until the depth of the tuning core from the top of the cover is approximately the same as L302.

NOTE

Final adjustment of C302 and L301 will be made in a receive condition.

5-46. S METER Zero Check. Set up RT-581 as in paragraph 5-25. Refer to figure 5-63. No tools or test equipments are required to perform following procedures:

a. Set METER switch (S701) to S METER position.

b. Operate MANUAL FREQUENCY TENS switch (S706) through complete range; check meter reading at each position.

c. Repeat step b, using MANUAL FREQUENCY UNITS switch (S707).

d. Repeat step b, using MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708).

e. Front panel meter should indicate zero, or slightly above, on all frequency channels.

5-47. S METER Zero Electrical Alignment. Set up RT-581 as in paragraph 5-25. Refer to figures 5-14 and 5-119. No tools or test equipments are required to perform following procedures:

a. Set METER switch (S701) to S METER position.

b. Adjust R712 (fig 5-14 and 5-119) so that indication on front panel meter is zero (first mark at left end of scale) with minimum noise throughout spectrum.

c. Operate MANUAL FREQUENCY TENS switch (S706) through complete range; at each position check meter reading. If meter reads down scale, reset R712 to zero the meter. Set MANUAL FREQUENCY TENS switch to position with lowest meter reading.

d. Repeat step c, using MANUAL FREQUENCY UNITS switch (S707).

e. Repeat step c, using MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708).

f. When adjustment is complete, front panel meter should read zero, or slightly above, on all frequency channels.

5-48. First IF Amplifier Troubleshooting (Transmit). (Figures 5-2, 5-6, 5-100, and 5-112). Troubleshoot 1st IF Amplifier in accordance with procedures in table 5-13.

Table 5-13. First IF Amplifier Troubleshooting Procedures (Transmit)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
1. Abnormal indication at green test point J305 (1.0 vdc minimum) - Keyed	1. Faulty mechanical alignment	1. Check according to para 5-42 and 5-43
	2. Faulty oscillator tube V305	2. Replace tube V305
	3. Faulty operating voltages	3. Check supply voltages at M701 (+125 vdc) and at pins 4 and 6 of XV305 (fig 5-100)
	4. Faulty components	4. Make circuit checks (fig 5-112)

TUBE	PIN NUMBER (disconnect P301)						
	1	2	3	4	5	6	7
V301	∞	240	∞	∞	90K	130K	240
V302	∞	320	∞	∞	89K	78K	320
V303	130K	960	∞	∞	∞	∞	960
V304	100K	1K	∞	∞	∞	∞	1K
V305	∞	115	5K	90K	0	91K	0
V305; Pin 8-115; Pin 9-∞							

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
	5. Faulty switch (S301 and S302) contacts	5. Clean contacts with a cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6. Faulty electrical alignment	6. Check according to para 5-46

Table 5-13. First IF Amplifier Troubleshooting Procedures (Transmit) (Continued)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
2. Abnormal indication at orange test point J103 (5 to 8 vac normal) - Keyed	1. Faulty mechanical alignment	1. Check according to para 5-42 and 5-43
	2. Faulty IF Amplifier tubes V302, V301, and V304	2. Replace tubes V302, V301, and V304, one at a time
	3. Faulty operating voltages	3. Check supply voltages at M701 and all tube sockets (fig 5-100)
	4. Faulty components	4. Make circuit checks
	5. Faulty switch (S301 and S302) contacts	5. Clean contacts with a cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6. Faulty electrical alignment; 2nd (V305) and 3rd (V401) oscillator may not be mixing in 1st transmit mixer (V304)	6. Check according to para 5-46
	7. Faulty cable (W304) or connectors P302/J101.	7. Repair/replace (fig 5-2, 5-6)

5-49. FREQUENCY MULTIPLIER OSCILLATOR (FMO) ALIGNMENT, ADJUSTMENT AND TROUBLESHOOTING. Alignment procedures need be performed only when indicated by unsatisfactory results received during checks. Troubleshooting is performed as required.

5-50. FMO Mechanical Check. Set up RT-581 as in paragraph 5-25. Refer to figures 5-29, 5-32, 5-35, and 5-70. No tools or test equipments are required to perform the following procedures:

a. Position RT-581 top side up (fig 5-11).

NOTE

If the observation is incorrect for a step, discontinue check at that point and perform mechanical alignment for FMO in accordance with paragraph 5-51.

b. Check that coupler (0220, fig 5-32) on the end of the shaft is vertical and centered under the black guide post (fig 5-70); that coupler keeper pin is in the upper right corner and in open quadrant of Frequency Selector coupler as viewed from front of RT-581.

c. Check that the position of the small tab on the front rotor plate of the main tuning capacitor (number 1 on front rotor plate, fig 5-29) is in full mesh with stator plates Z202, Z204, Z206, and Z208 (fig 5-35).

NOTE

Ensure that capacitor rotor plates do not touch the stator plates in any position (39 through 22) as the TENS switch (S706) is set.

d. Operate MANUAL FREQUENCY TENS switch (S706) to 34. Check that S201 coil selector switch rotor arm is centered on the contact nearest to the center of the viewing hole located at the top rear of the FMO (fig 5-32).

e. If mechanical check is satisfactory proceed to the FMO electrical check.

5-51. FMO Mechanical Alignment. Set up RT-581 as in paragraph 5-25. Refer to figures 5-11, 5-70, and 5-32. Bristol tools FSN 9Q5120-288-8853 and FSN 9Q5120-540-4359 are required during the following procedures:

a. Position RT-581 top side up (fig 5-11).

b. Loosen locking collar on male coupler (01291, fig 5-70) on Frequency Selector and center coupler mating element in vertical position under black guide post; cutout on male coupler must be in upper right corner as viewed from front of RT-581. Coupler keeper pin of coupler 0220 should be in open quadrant of male coupler 01291.

c. Make fine adjustment by rotating coupler so that small rotor tab on main tuning capacitor (tab 1 on front plate, fig 5-29). is in full mesh with the stator plates in Z202, Z204, Z206, and Z208 (fig 5-35).

d. Tighten locking collar on coupler of frequency selector.

e. Operate MANUAL FREQUENCY TENS switch (S706) to gain access to screw on locking collar of drive gear (0202) between the oscillator and amplifier of FMO (fig 5-32). Loosen locking screw.

f. Operate MANUAL FREQUENCY TENS switch (S706) to 34.

g. Hold coupler (01291) and rotate drive gear counterclockwise until rotor arm of switch S201 is centered on contact nearest to center of viewing hole in oscillator dust cover (fig 5-32).

NOTE

Drive gear should be rotated in the normal direction of rotation (counterclockwise), to account for any back lash in S201,

h. Hold coupler 01291 and tighten locking collar loosened in step e.

5-52. FMO Electrical Check. Set up RT-581 as in paragraph 5-25. Refer to figures 5-11, 5-13, 5-32, through 5-38, and 5-111 for the physical and electrical location of test points. Use Electronic Multimeter AN/USM-116 and Electronic Frequency Counter AN/USM-207 during the procedures that follow. If abnormal indications are observed, refer to FMO troubleshooting, paragraph 5-54.

NOTE

FMO mechanical alignment must be correct before proceeding.

a. Position RT-581 top side up (fig 5-11).

b. Set AN/USM-116 for AC voltage, 3V range; connect ac probe to oscillator output link (Y, fig 5-32).

c. Observe indication (1.0 vac minimum) on AN/USM-116.

d. Operate MANUAL FREQUENCY TENS switch (S706), in turn, from 39 to 22 and observe indication (1.0 vac minimum) on AN/USM-116 at each step (voltage level may increase at 29).

NOTE

A slow voltage rise indicates marginal crystal operation.

NOTE
Tube V201 operation must be correct before proceeding.

e. Set AN/USM-116 for negative DC voltage, 1V range; connect dc probe to white teflon test point J106 on RF and PA (fig 5-11 and 5-110).

NOTE
Incorrect setting of Z105 trimmer capacitor C122 will cause a low voltage indication at test point J106.

f. Operate MANUAL FREQUENCY TENS switch (S706), in turn, from 39 to 22 and observe indication (-1.0 vdc minimum) on AN/USM-116 at each switch position.

g. Remove tube V203 (fig 5-33) and observe that indication on AN/USM-116 decreases to approximately -0.25 vdc.

h. Remove dc probe; replace V203.

i. Connect AN/USM-207 to yellow test point J204 (fig 5-33).

j. Operate MANUAL FREQUENCY TENS switch (S706), in turn, from 39 to 22 and observe that frequency indication on AN/USM-207 corresponds to those listed in table 5-14.

NOTE
The indication on the AN/USM-207 is not a direct readout of the FMO output frequency, but is the result of heterodyning. (Refer to the AN/USM-207 Technical Manual).

k. Disconnect AN/USM-207.

NOTE
Steps e through j verify the FMO output frequency and level.

l. If electrical check is satisfactory proceed to the RF and PA mechanical check.

Table 5-14. FMO Frequencies at Test Point J204

TENS SWITCH POSITION	TEST POINT J204 FREQUENCY (MHz)	* AN/USM-207 TUNING FREQUENCY MC. SWITCH POSITION	AN/USM-207 INDICATION AND FREQUENCY TOLERANCE (MHz)	(±Hz)
39	370	350	20	9250
38	360	350	10	9000
37	350	300	50	8750
36	340	350	10	8500
35	330	350	20	8250
34	320	350	30	8000
33	310	350	40	7750
32	300	350	50	7500
31	290	300	10	7250
30	280	300	20	7000
29	270	300	30	6750
28	260	300	40	6500
27	250	300	50	6250
26	240	250	10	6000
25	230	250	20	5750
24	220	250	30	5500
23	210	250	40	5250
22	200	250	50	5000

* DIRECT-HETERODYNE switch must be in HETERODYNE

5-53. FMO Electrical Alignment. Set up RT-581 as in paragraph 5-25. Refer to figures 5-11, 5-13, 5-32 through 5-38, and 5-111 for the physical and electrical location of adjustments and test points. Electronic Multimeter AN/USM-116, Electronic Frequency Counter AN/USM-207, tuning tool FSN 9Q5120-720-1908, and capacitor tab bending tool FSN 9Q5120-975-9478 are required during the following procedures:

NOTE

Mechanical alignment of the FMO must be correct before proceeding. Tube shields and covers must be in place.

a. Position RT-581 top side up (fig 5-11).

b. Set AN/USM-116 for AC voltage, 3V range; connect ac probe to oscillator output link (Y, fig 5-32).

c. Operate MANUAL FREQUENCY TENS switch (S706) to 22.

d. Adjust C208 (fig 5-34) for maximum indication (1.0 vac minimum).

NOTE

At any point in step e that the minimum voltage cannot be obtained, replace V201 and V202 (one at a time) and readjust trimmers.

e. Operate MANUAL FREQUENCY TENS switch (S706), in turn, from 39 to 22, adjusting coils (L218 through L201, fig 5-15) at each step for a maximum indication (1.0 vac minimum) on AN/USM-116. (Adjustments are made through holes on rear plate of first oscillator.)

NOTE

Steps f through k should seldom be part of normal alignment.

f. Operate MANUAL FREQUENCY TENS switch (S706) to 22.

g. Readjust C208 for maximum indication on AN/USM-116.

h. Operate MANUAL FREQUENCY TENS switch (S706) to 39.

i. Adjust C208 slowly clockwise, then slowly counterclockwise (1 to 2 turns) from its position in step g; note changes on AN/USM-116. If indication increases with clockwise rotation, L222 must be compressed slightly; if indication increases with counterclockwise rotation, L222 must be spread slightly.

NOTE

To adjust L222 (fig 5-38), remove FMO from RT-581. (See paragraph 5-113).

j. Reinstall FMO assembly.

k. Repeat steps f through j until no further change is noted on AN/USM-116.

l. Remove V201 tube shield and place pickup loop (see table 5-3) over V201.

m. Connect pickup loop to AN/USM-207 plug-in unit.

n. Compare readout on AN/USM-207 for each switch position (39 through 22) of the MANUAL FREQUENCY TENS switch (S706) with those listed in table 5-15.

o. Disconnect AN/USM-207; remove pickup loop and replace tube shield.

p. Connect AN/USM-207 to red test point J202.

q. Operate MANUAL FREQUENCY TENS switch (S706) to 39.

NOTE

Ensure capacitor rotor plates do not touch the stator plates in any position (39 through 22) as TENS switch S706 is set.

r. Turn trimmer capacitors C215, C221, C227, and C233 fully counterclockwise.

Table 5-15. FMO Crystal Frequencies

TENS SWITCH POSITION	AN/USM-207 INDICATION AND FREQUENCY TOLERANCE (MHz)	(±Hz)
39	41.11111	1028
38	40.00000	1000
37	38.88888	972
36	37.77777	944
35	36.66666	916
34	35.55555	888
33	34.44444	860
32	33.33333	832
31	32.22222	804
30	31.11111	776
29	45.00000	1125
28	43.33333	1083
27	41.66666	1042
26	40.00000	1000
25	38.33333	958
24	36.66666	916
23	35.00000	875
22	33.33333	832

s. Adjust C215 clockwise (6 to 8 turns) for maximum indication on AN/USM-207 INPUT LEVEL METER.

t. Connect AN/USM-207 to orange test point J203.

u. Adjust C221 clockwise (6 to 8 turns) for maximum indication on AN/USM-207 INPUT LEVEL METER.

v. Connect AN/USM-207 to yellow test point J204.

w. Adjust C227 clockwise (6 to 8 turns) for maximum indication on AN/USM-207 INPUT LEVEL METER.

x. Disconnect AN/USM-207.

y. Set AN/USM-116 for negative DC voltage, 3V range; connect dc probe to white teflon test point J106 on RF and PA (fig 5-11 and 5-110).

NOTE

Incorrect setting of Z105 trimmer C122 will cause a low voltage indication at J106.

z. Adjust C233 clockwise (6 to 8 turns) for maximum indication (-1 vdc minimum) on AN/USM-116.

aa. Readjust C215, C221, and C227 for maximum indication (-1 vdc minimum on AN/USM-116; this completes FMO reference frequency alignment. Place pencil mark on the chassis cover next to trimmer capacitors C215, C221, C227, and C233 for reference during tracking procedure.

NOTE

Before proceeding with tracking steps bb through gg, steps 1 through aa MUST be accomplished. The voltage at J106 must not fall below -1.0 vdc during the following steps.

bb. Set AN/USM-116 for negative DC volts, 3V range; connect dc probe to white teflon test point J106 on RF and PA (fig 5-11).

cc. Operate MANUAL FREQUENCY TENS switch (S706) to 38.

NOTE

The need for tab bending must be determined prior to adjustment of any tabs. See table 5-16 for Frequency Selector switch position and associated tab.

CAUTION

Do not bend capacitor tabs beyond 20 degrees from the vertical, or short tabs to stators.

dd. To determine the need for tab bending, observe AN/USM-116 and adjust C215 as follows: (1) one-half to one turn counterclockwise from pencil mark, (2) reset to mark; (3) one-half to one full turn clockwise from pencil mark, (4) reset to mark. If the voltage dipped as C215 was turned in both ccw and cw directions, the circuit was in resonance and required NO tab bending. If the voltage increased as C215 was turned in a ccw direction, the capacitance must be decreased by bending WHITE rotor tab of Z202 away from the stator for peak voltage indication. If the voltage increased as C215 was turned in a cw direction, the capacitance must be increased by bending WHITE rotor tab of Z202 toward stator for peak voltage indication. Repeat this procedure for C221 and Z204, C227 and Z206, C233 and Z208, at switch position 38.

Table 5-16. FMO Tracking Tabs

FREQUENCY SELECTOR POSITION (MHz) (NOTE 1)	CAPACITOR ROTOR TAB NUMBER (NOTES 2, 3, & 4)	CAPACITOR ROTOR TAB COLOR
399.9(5)	1-Back	Black
389.9(5)	2-Front	White
379.9(5)	2-Back	Yellow
369.9(5)	3-Front	Orange
359.9(5)	3-Back	Blue
349.9(5)	4-Front	Brown
339.9(5)	4-Back	Green
329.9(5)	5-Front	Red
319.9(5)	5-Back	White
309.9(5)	6-Front	Blue
299.9(5)	6-Back	Red
289.9(5)	7-Front	Brown
279.9(5)	7-Back	Green
269.9(5)	8-Front	Yellow
259.9(5)	8-Back	White
249.9(5)	9-Front	Orange
239.9(5)	9-Back	Black
229.9(5)	10-Front	Yellow
225.0(0)	10-Back	Red

NOTES

1. Hundredths position ( ) applicable to AN/URC-9A only.
2. Front indicates rotor plate(s) facing Oldham coupling.
3. Back indicates rotor plate(s) facing away from Oldham coupling.
4. The rotor tab being adjusted at a given frequency should be in half mesh with stator plate.

ee. Operate MANUAL FREQUENCY TENS switch in steps from 38 to 30 and repeat step dd at each switch position.

NOTE

The voltage at test point J104 on the RF and PA must not fall below -.5 vdc during the following tracking procedure.

ff. Connect dc probe of AN/USM-116 to yellow test point J104 on RF and PA; Key to transmit.

gg. Operate MANUAL FREQUENCY TENS switch (S706) in steps from 29 to 22 and repeat step dd at each switch position. Remove probe.

h. Connect AN/USM-207 to test point J204.

i. Compare readout on AN/USM-207 for each position of the MANUAL FREQUENCY TENS switch (S706) 39 through 22 with those listed in table 5-14.

NOTE

In the event readings on AN/USM-207 are out of tolerance with those listed in table 5-14, adjust the corresponding trimmer coils (L201 through L218). This completes FMO alignment.

5-54. FMO Troubleshooting (Transmit). (Figures 5-2, 5-5, 5-100 and 5-111.) Troubleshoot the FMO in accordance with procedures in table 5-17.

5-55. FMO Intermittent Operation. (Figures 5-32 through 5-38.) To correct FMO intermittent operations, perform procedures in table 5-18.

Table 5-17. FMO Troubleshooting Procedures (Transmit)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
1. Abnormal indication at oscillator output link (Y, fig 5-32) (1 vac normal)	1. Faulty mechanical alignment	1. Check according to para 5-50 and 5-51
	2. Faulty tube V201	2. Replace tube V201 (several times if needed)
	3. Faulty operating voltage	3. Check supply voltage at M701 (+125 vdc) and at pins 4 & 6 of XV201 (fig 5-100)
	4. Faulty components	4. Make resistance checks (see tube chart)
	5. Faulty switch (S201 and S202) contacts	5. Clean contacts with a cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6. Faulty electrical alignment	6. Check according to para 5-53

Table 5-17. FMO Troubleshooting Procedures (Transmit) (Continued)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
2.Abnormal indication at red test point J202 (.38 to .43 vdc normal)	1.Faulty mechanical alignment	1.Check according to para 5-50 and 5-51
	2.Faulty tubes V202 and V203	2.Replace tubes V202 and V203, one at a time
	3.Faulty operating voltage	3.Check supply at R210, R213, R209, C212, C213, and pins 5 and 6 of XV202 (fig 5-111)
	4.Faulty components	4.Make resistance checks (see tube chart)
	5.Faulty rf tuner (Z201 and Z202) inductance rotor contacts	5.Clean contacts with a cleaner/lubricant such as CRAMOLIN, FSN-9G6850-880-7007
	6.Faulty electrical alignment	6.Check according to para 5-53
3.Abnormal indication at orange test point J203 (.8 to 1.1 vdc normal)	1.Faulty mechanical alignment	1.Check according to para 5-50 and 5-51
	2.Faulty tube V204	2.Replace tube V204
	3.Faulty operating voltages	3.Check supply at R211, C225 and pin 7 of XV204
	4.Faulty components	4.Make circuit checks
	5.Faulty rf tuner (Z204) inductance rotor contacts	5.Clean contacts with a cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6.Faulty electrical alignment	6.Check according to para 5-53
4.Abnormal indication at yellow test point J204 (1.1 to 2.1 vdc normal)	1.Faulty mechanical alignment	1.Check according to para 5-50 and 5-51
	2.Faulty tube V205	2.Replace tube V205
	3.Faulty operating voltages	3.Check supply at R212, C231 and pin 7 of XV205

Table 5-17. FMO Troubleshooting Procedures (Transmit) (Continued)

FAULT INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
	4. Faulty components	4. Make circuit checks
	5. Faulty rf tuner (Z206) inductance rotor contacts	5. Clean contacts with a cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6. Faulty electrical alignment	6. Check according to para 5-53
5. Abnormal indication at white teflon test point J106 (-1 vdc minimum) receive function	1. Faulty mechanical alignment	1. Check according to para 5-50, 5-51, 5-57, and 5-58
	2. Faulty tube V104	2. Replace tube V104
	3. Faulty operating voltages	3. Check supply (fig 5-100)
	4. Faulty components	4. Check cable W4, and connectors J204/P4 and J112/P3, and K102; make continuity checks (fig 5-2, 5-3)
	5. Faulty rf tuner (Z206 and Z105) inductance rotor contacts	5. Clean contacts with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6. Faulty electrical alignment	6. Check according to para 5-53 and 5-60

TUBE	PIN NUMBER (disconnect P201)								
	1	2	3	4	5	6	7	8	9
V201	∞	220	22	∞	0	∞	10K	220	∞
V202	140K	0	∞	∞	∞	∞	0	-	-
V203	0	100	∞	∞	0	0	∞	-	-
V204	0	100	∞	∞	0	0	∞	-	-
V205	0	100	∞	∞	0	0	∞	-	-

Table 5-18. FMO Intermittent Operations (Transmit)

CAUSE	CURE
Inadequate ground for C215, C221, C227, and C233	Remove FMO. Insert a small screwdriver into the bottom side of trimmer capacitors and rotate ccw until threaded portion clears slotted portion of mount. CAUTION Trimmer capacitor is glass foil. Carefully bend slotted portions of mount together. Insert small screwdriver into the bottom side of the trimmer capacitor and rotate cw until threaded screw entends above mount. Reinstall FMO.
Dirty contacts on S201, S202, and Z201	Remove FMO. Remove cover. Use cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007. Reinstall cover. Reinstall FMO.
Dirty wiper contacts on Z202, Z204, Z206, and Z208 inductors	Remove FMO. Remove covers. Clean inductor rings with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007. Reinstall covers. Reinstall FMO.
Dirty grounding contacts on main tuning capacitor shaft	Remove FMO. Remove covers. Clean shaft with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007. Reinstall covers. Reinstall FMO.

5-56. RF AND PA ALIGNMENT, ADJUSTMENT AND TROUBLESHOOTING. Alignment procedures need be performed only when indicated by unsatisfactory results received during checks. Troubleshooting is performed as required.

5-57. RF and PA Mechanical Check. Set up RT-581 as in paragraph 5-15. Refer to figures 5-4, 5-20 through 5-31 and 5-110. No tools or test equipments are required to perform the following procedures:

a. Position RT-581 top side up (fig 5-11).

NOTE

When the observation is incorrect for a step, discontinue check at that point and perform mechanical alignment for RF and PA in accordance with paragraph 5-58.

b. Check that coupler 0126 slot (fig 5-25) on the end of the shaft is vertical and centered under the black guide post (fig 5-28); that coupler keeper pin is in the upper right corner and in open quadrant of frequency selector coupler as viewed from the front of RT-581 (fig 5-70).

c. Check that the position of the small tab on the front rotor plate of the main tuning capacitor (number 1 on front rotor plate, fig 5-29) is in full mesh with the stator plate in Z101, Z103, Z105, Z106 and Z108 (fig 5-25).

NOTE

Ensure that capacitor rotor plates do not touch the stator plates in any position (39 through 22), as the TENS switch (S706) is set.

d. Operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, and S708) to 375.0 (or 375.00).

e. Check that yellow rotor tab (first tab) in Z107 is in full mesh with the stator (fig 5-30).

f. If mechanical check is satisfactory, proceed to RF and PA electrical check.

5-58. RF and PA Mechanical Alignment. Set up RT-581 as in para 5-25. Refer to figures 5-11, 5-25, 5-28, 5-30, 5-31 and 5-70. Use Bristol tools FSN 9Q5120-288-8853 and FSN 9Q5120-540-4359 during the following procedures:

a. Position RT-581 top side up (fig 5-11).

b. Loosen locking collar on male coupler (01292, fig 5-70) on frequency selector and center coupler mating element in vertical position under black guide post. The cutout of male coupler should be in upper right corner as viewed from front of RT-581. Coupler keeper pin of coupler 0126 should be in open quadrant of male coupler 01292.

c. Make fine adjustment by rotating coupler and shaft so that the small rotor tab on the main tuning capacitor (tab 1 on front plate, fig 5-28) is in full mesh with the stator plate in Z101, Z103, Z105, Z106 (fig 5-25).

d. Operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, and S708) to 375.0 (or 375.00).

e. Remove power from RT-581.

WARNING

High voltages that are dangerous to life are present at Z107 and Z108. Before performing alignment of Z107 and Z108, remove all electrical power from RT-581.

f. Remove the large cover plate from RF and PA Assembly for access to Z107.

CAUTION

Z107 is spring loaded. Care must be taken to maintain equal spring between capacitor stator and rotor plates.

g. Loosen Z107 locking collar; rotate rotor until yellow rotor tab (first tab) is in full mesh with the stator (fig 5-30).

h. Tighten locking collar.

i. Restore power to RT-581.

j. Operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, and S708) to 399.9 (or 399.95).

k. Remove small cover plate from PA stage (V106) for access to Z108.

CAUTION

Care must be taken to maintain equal spacing between capacitor stator and rotor plates.

l. Loosen Bristol screws holding rotor of Z108 to shaft (fig 5-31); position rotor of Z108 until small rotor tab is in full mesh with the stator and the rotor tab opposite it is in half mesh (fig 5-31).

m. Tighten Bristol screws.

n. Replace covers removed in steps f and k.

5-59. RF and PA Electrical Check. Set up RT-581 as in para 5-25. Refer to figures 5-11, 5-12, 5-20 through 5-32, and 5-110 for the physical and electrical location of test points. Use Power Meter AN/URM-43( ) and Electronic Multimeter AN/USM-116. If abnormal indications are observed, refer to RF and PA troubleshooting (paragraph 5-61).

a. Set AN/USM-116 for AC voltage, 10V range; connect ac probe to orange test point J103.

b. Key to transmit; observe indication (5 to 8 vac) on AN/USM-116.

NOTE

Step c verifies 1st and 2nd IF Amplifiers signal mixing.

c. Remove tube V401 from 2nd IF Amplifier (fig 5-44); observe that indication on AN/USM-116 decreases near to zero.

d. Unkey transmitter and reinstall V401.

e. Set AN/USM-116 for negative DC voltage, 3V range and connect dc probe to yellow test point J104.

f. Key to transmit; observe indication (-0.5 to -3 vdc) on AN/USM-116.

NOTE

Step g verifies FMO and 1st IF Amplifier signal mixing.

g. Remove tube V401 from 2nd IF Amplifier; observe that indication on AN/USM-116 decreases to near zero.

h. Unkey transmitter; reinstall V401.

i. Connect dc probe of AN/USM-116 to white teflon test point J106; observe indication (-1 vdc minimum). This is the FMO output signal in receive.

j. Key to transmit; observe indication (-1 vdc minimum); unkey transmitter.

k. Connect dc probe of AN/USM-116 to test point J114.

l. Key to transmit; observe indication (-2 vdc minimum) on AN/USM-116.

m. Unkey transmitter; set AN/USM-116 to 30V range; connect dc probe to brown test point J111 (fig 5-12); observe indication (-9.5 to -12 vdc) of V106 bias.

n. Key to transmit; observe indication (-12 vdc minimum) on AN/USM-116 and power indication (16-24 watts) on AN/URM-43( ).

o. Unkey transmitter; connect dc probe of AN/USM-116 to brown test point J601 on Relay-Filter Assembly (fig 5-15 and 5-118); set meter to 300V dc range.

p. Key to transmit; observe indication (+170 vdc) on AN/USM-116.

q. Unkey transmitter; remove probe.

5-60. RF and PA Electrical Alignment. Set up RT-581 as in paragraph 5-25. Refer to figures 5-11, 5-12, 5-20 through 5-32, and 5-110 for the physical and electrical location of adjustments and test points. Use Electronic Multimeter AN/USM-116, Power Meter AN/URM-43( ), Alignment Tool FSN 9G5120-720-1908 and capacitor tab bending tool during the following procedures:

CAUTION

Do not make any electrical adjustment to the RF and PA until the FMO and 1st IF Amplifier input signals have been verified for amplitude and frequency. Refer to FMO and 1st IF Amplifier electrical checks (paragraphs 5-52 and 5-44).

a. Turn C107 (Z101), C115 (Z103), C122 (Z105), and C127 (Z106) fully counterclockwise.

b. Remove tube V102.

c. Set AN/USM-116 for AC voltage, 3V range; connect ac probe to pin 2 of V102 tube socket (fig 5-22).

d. Key to transmit; adjust C107 slowly clockwise approximately 6 turns for the first maximum indication (approximately 3 vac) on AN/USM-116.

e. Remove ac probe; connect AN/USM-207 to pin 2 of tube socket.

f. Observe frequency readout on AN/USM-207 (399.9 MHz or 299.95 on AN/URC-9A); unkey transmitter. This verifies that 1st IF Amplifier and FMO are mixing properly.

g. Reinstall tube V102; remove tube V103.

h. Connect ac probe of AN/USM-116 to pin 2 of V103 tube socket.

i. Key to transmit; adjust C115 approximately 6 turns for maximum indication (approximately 9 vac) on AN/USM-116.

j. Readjust C107 for maximum indication on AN/USM-116.

k. Release key; reinstall tube V103.

l. Set AN/USM-116 for negative DC voltage 3V range; connect dc probe to J106.

m. Key to transmit; adjust C122 approximately 6 turns for maximum indication (-1 vdc minimum) on AN/USM-116.

n. Adjust C107, C115, and C122 for maximum indication (-1 vdc minimum) on AN/USM-116.

o. Unkey transmitter.

p. Connect dc probe of AN/USM-116 to J114.

q. Key to transmit.

r. Adjust C127 for maximum indication on AN/USM-116 (-2 vdc minimum).

s. Unkey transmitter; connect dc probe of AN/USM-116 to test point J111.

NOTE

Test probe at J111 may load circuit, requiring readjustment (in a later step) of C141 for maximum power with probe removed.

t. Key to transmit; adjust C141 (fig 5-12) for maximum indication (-12 vdc minimum) on AN/USM-116.

u. Adjust C132 (fig 5-11) for maximum power output on AN/URM-43( ).

v. Unkey transmitter; remove dc probe.

NOTE

Two Phillip screws must be loosened to adjust L111; L111 is attached to J115 (fig 5-12). Tighten screws upon completion of adjustment.

w. Key to transmit; rotate rf connectors P11 and J115 for maximum power on AN/URM-43( ).

x. Readjust C132 and C141 for maximum power on AN/URM-43.

y. Unkey transmitter.

z. Set AN/USM-116 for positive DC voltage, 300V range; connect dc probe to J601 on the Relay-Filter Assembly (fig 5-15 and 5-118).

aa. Set front panel METER switch to PAI_g.

bb. Key to transmit; adjust R602 on Relay-Filter Assembly for 170 vdc on AN/USM-116 (fig 5-15 and 5-118).

cc. Adjust R108 (fig 5-22) for indication in upper half of NORMAL range on meter (M701).

dd. Repeat steps bb and cc until indication at J601 is 170 vdc and front panel meter indicates in upper half of NORMAL range.

NOTE

Excessive voltage at J601 can cause the rf output signal to become distorted.

ee. Remove AN/USM-116 dc probe; adjust C141 and C132 for maximum power on AN/URM-43( ).

ff. Unkey transmitter; this completes RF and PA reference frequency alignment. Place pencil mark on chassis cover plate to mark position of trimmer capacitors C107, C115, C127, C141, and C132 for reference during tracking procedure.

NOTE

Before proceeding with tracking steps gg through pp, steps a through ee must be accomplished.

gg. Set AN/USM-116 for negative DC voltage, 30V range; connect dc probe to white teflon test point J114.

hh. Operate MANUAL FREQUENCY TENS switch (S706) to 38; key to transmit.

NOTE

The need for tab bending must be determined prior to adjustment of any tab. See table 5-19 for frequency selector switch position and associated tab.

CAUTION

Do not bend capacitor tabs beyond 20 degrees from the vertical or short tabs to stators.

ii. To determine the need for tab bending, observe AN/USM-116 and adjust C107 one-half to one turn counterclockwise from pencil mark; reset to mark then adjust C107 one-half to one turn clockwise from pencil mark; reset to mark. If the voltage dipped as C107 was turned, in both clockwise and counterclockwise directions, the circuit was in resonance and requires no tab bending. If the voltage increased as C107 was turned in a counterclockwise direction, the capacitance of Z101 must be decreased by bending WHITE rotor tab away from the stator for a peak voltage indication. If the voltage increased as C107 was turned in a clockwise direction the capacitance of Z101 must be increased by bending WHITE rotor tab toward the stator for a peak voltage indication. Repeat this procedure for C115 and Z103, C122 and Z105, C127 and Z106 at switch position 38.

jj. Operate MANUAL FREQUENCY TENS switch (S706) in steps from 37 to 22 repeating procedure in step ii for each switch position.

NOTE

Ensure that capacitor rotor plates do not touch the stator plates in any position (39 through 22), as the TENS switch (S706) is set.

kk. Operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, S708) to 255.0 (or 255.00) and repeat procedure in step ii.

NOTE

Z107 is tracked in 20 MHz steps beginning at 375.0 (or 375.00).

ll. Set MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, S708) to 375.0 (or 375.00).

mm. Connect AN/USM-116 dc probe to brown test point J111.

NOTE

Test probe at J111 may load circuit, requiring readjustment (in a later step) of C141 for maximum power with probe removed.

nn. Repeat procedures in step ii for C141 and Z107 to determine need for tab bending. Tab bending for Z107 is accomplished by bending rotor tabs that are meshed with the stator.

oo. Operate MANUAL FREQUENCY TENS switch (S706) in 20 MHz steps from 35 to 22, repeating procedure in step nn at each switch position.

pp. Operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, S708) in 10 MHz steps from 389.9 to 225.0 (or 389.95 to 225.00) and repeat procedures in step ii for C132 and Z108 at each switch position. Observe AN/URM-43( ) for changes in power out instead of observing AN/USM-116 for voltage changes.

qq. Remove AN/USM-116. This completes RF and PA alignment. Remove all test equipment.

Table 5-19. RF and PA Tracking Tabs

FREQUENCY SELECTOR POSITION MHz (Note 1)	CAPACITOR ROTOR TAB NUMBER (Notes 2, 3, & 4)	CAPACITOR ROTOR TAB COLOR
399.9(5)	1-Back	Black
389.9(5)	2-Front	White
379.9(5)	2-Back	Yellow
369.9(5)	3-Front	Orange
359.9(5)	3-Back	Blue
349.9(5)	4-Front	Brown
339.9(5)	4-Back	Green
329.9(5)	5-Front	Red
319.9(5)	5-Back	White
309.9(5)	6-Front	Blue
299.9(5)	6-Back	Red
289.9(5)	7-Front	Brown
279.9(5)	7-Back	Green
269.9(5)	8-Front	Yellow
259.9(5)	8-Back	White
249.9(5)	9-Front	Orange
239.9(5)	9-Back	Black
229.9(5)	10-Front	Yellow
225.0(0)	10-Back	Red

NOTES

1. Hundredths position ( ) applicable to AN/URC-9A only.
2. Front indicates rotor plate(s) facing Oldham coupling.
3. Back indicates rotor plate(s) facing away from Oldham coupling.
4. The rotor tab being adjusted at a given frequency should be in half mesh with stator plate.

5-61. <u>RF and PA Troubleshooting (Transmit)</u>. (Figures 5-2, 5-4, 5-17, 5-100 and 5-110.) Troubleshoot the RF and PA Assembly in accordance with procedures in table 5-20.

5-62. <u>RF and PA Intermittent Operation</u>. (Figures 5-20 through 5-27). To correct RF and PA intermittent operation, perform procedures in table 5-21.

Table 5-20. RF and PA Troubleshooting Procedures (Transmit)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
1. Abnormal indication at orange test point J103 (5 to 8 vac normal indication) - Keyed	1. Faulty input from 1st IF Amplifier	1. Check cable W302 and connector P302/J101 (fig 5-2, 5-4)
	2. Faulty 1st or 2nd IF Amplifiers	2. Use 1st or 2nd IF amplifier troubleshooting procedure
	3. Faulty tube V101	3. Replace tube V101
	4. Faulty FMO	4. Check FMO (para 5-49)
	5. Faulty components	5. Make circuit checks (fig 5-110)
2. Abnormal indication at yellow test point J104 (-.5 to -3 vdc normal indication) - Keyed	1. Faulty input from FMO	1. Check cable W101 and connectors P107/J107 and P103/J113, K102, R114, and cable W4; connector P3/J112 (fig 5-2)
	2. Faulty FMO	2. Use FMO troubleshooting procedures
	3. Faulty tube V101	3. Replace tube V101
	4. Faulty operating voltage	4. Check supply; +125 vdc at R115 and +26.5 vdc on M701 (fig 5-100)
	5. Faulty components	5. Make resistance checks
	6. Faulty rf tuner (Z101) inductance rotor contact; intermittent operation	6. Clean contacts with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007.
	7. Faulty mechanical alignment	7. Check according to para 5-57 and 5-58
	8. Faulty electrical alignment	8. Check according to para 5-60
3. Abnormal indication at green test point J105 (-0.07 vdc minimum normal indication) - Keyed	1. Faulty mechanical alignment	1. Check according to para 5-57 and 5-58
	2. Faulty tubes V102 & V103	2. Replaces tubes V102 and V103, one at a time
	3. Faulty operating voltage	3. Check supply at R116, C113 and C120 (fig 5-100)

Table 5-20. RF and PA Troubleshooting Procedures (Transmit) (Continued)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
	4. Faulty rf tuner (Z103) inductance rotor contact; intermittent operation	4. Clean contact with cleaner/ lubricant such as CRAMOLIN FSN 9G6850-880-7007
	5. Faulty components	5. Make circuit checks (fig 5-110)
	6. Faulty electrical alignment	6. Check according to para 5-60
4. Abnormal indication at white teflon test point J106 (-1.0 vdc minimum normal indication) - Keyed	1. Faulty tube V104	1. Replace tube V104
	2. Faulty operating voltage	2. Check supply (fig 5-110)
	3. Faulty mechanical alignment	3. Check according to para 5-57 and 5-58
	4. Faulty components	4. Make circuit check (fig 5-100)
	5. Faulty rf tuner (Z105) inductance rotor contact; intermittent operation	5. Clean contacts with cleaner/ lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6. Faulty electrical alignment	6. Check according to para 5-60

TUBE	PIN NO. (Disconnect P101)								
	1	2	3	4	5	6	7	8	9
V101	66K	10	0.6	0	66K	66K	∞	-	-
V102	∞	53	0	0.6	∞	∞	∞	-	-
V103	∞	96	0	0.6	∞	∞	∞	-	-
V104	(Filament) 0	(Filament) 0	(Cathode) 68	(Grid) 98K	(Plate) ∞	-	-	-	-
V105	(Filament) 0	(Filament) 0.7	(Cathode) 150	(Grid) 1K	(Plate) ∞	-	-	-	-
V106	∞	0	∞	0	0	0	0	0	-

Table 5-20. RF and PA Troubleshooting Procedures (Transmit) (Continued)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
5. Abnormal indication at test point J114 (-2 vdc minimum) - Keyed	1. Faulty mechanical alignment	1. Check according to para 5-57 and 5-58
	2. Faulty tube V105	2. Replace tube V105
	3. Faulty operating voltage	3. Check supply M701 (+325 vdc)
	4. Faulty rf tuner (Z106) inductance rotor contact; intermittent operation	4. Clean contacts with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-7007
	5. Faulty components	5. Make circuit check (fig 5-110)
	6. Faulty electrical alignment	6. Check according to para 5-60
6. Abnormal indication at test point J111 (-12 vdc minimum normal indication) - Keyed	1. Faulty mechanical alignment	1. Refer to para 5-57 and 5-58
	2. Faulty tube V105	2. Replace tube V105
	3. Faulty operating voltage	3. Check voltage supply
	4. Faulty components	4. Make resistance checks
	5. Faulty rf tuner (Z107) inductance rotor contact; intermittent operation	5. Clean contacts with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007
	6. Faulty electrical alignment	6. Check according to para 5-60
7. Power loss exceeds 5 watts between J115 and J701	1. Antenna transfer relay K101	1. Repair/replace (fig 5-2, 5-4)
	2. FL1101 defective	2. Replace
	3. Broken solder connections on direction coupler (input & output jack)	3. Repair/replace
	4. W7 defective (fig 5-17)	4. Repair/replace

Table 5-21. RF and PA Intermittent Operations (Transmit)

CAUSE	CURE
Inadequate ground for C107, C115, C122, C127, and C141	Remove RF & PA. Insert small screwdriver into the bottom side of trimmer capacitors and rotate ccw until threaded portion clears slotted portion of mount. CAUTION Trimmer capacitor is glass foil. Carefully bend slotted portions of mount together. Insert small screwdriver into the bottom side of trimmer capacitor and rotate cw until threaded screw extends above mount. Reinstall RF & PA.
Dirty wiper contacts on Z101, Z103, Z105, and Z106 inductors	Remove RF & PA. Remove cover. Clean inductor rings with a cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007. Reinstall covers. Reinstall RF & PA.
Dirty wiper surface on Z107; or poor contact	Remove RF & PA. Remove covers. Clean inductor surface with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007. Check centering of capacitor stator plate between rotor plates. Reinstall covers. Reinstall RF & PA.
Dirty grounding contacts on main tuning capacitor shaft	Remove RF & PA. Remove covers. Clean shaft with cleaner/lubricant such as CRAMOLIN, FSN 9G6850-880-7007. Reinstall covers. Reinstall RF & PA.

5-63. AUDIO AMPLIFIER AND MODULATOR CHECKS, ADJUSTMENTS, AND TROUBLESHOOTING. Alignment procedures need be performed only when indicated by unsatisfactory results received during checks. Troubleshooting is performed as required.

5-64. Modulator Audio Level Check. No mechanical checks or alignments are required. Set up RT-581 as in paragraph 5-25. Refer to figures 5-13, 5-50, 5-51, and 5-116 for the physical and electrical location of test points. Use Audio Oscillator AN/URM-127, Electronic Voltmeter AN/USM-143, Power Meter AN/URM-43( ) and Impedance Matching Network (illustrated in table 5-3) during the following procedures:

a. Remove tube V802 from Audio Amplifier and Modulator Assembly (fig 5-50).

b. Apply a 1000 Hz audio signal to terminals B and C of AUDIO connector J704 through the impedance matching network.

c. Set AN/USM-143 to .1 vac range and connect to green test point J805.

d. Key to transmit; set output level of AN/URM-127 for .08 vac indication on AN/USM-143.

e. Unkey transmitter.

WARNING
High voltage (+325 vdc) that is dangerous to life is present at test point J803.

f. Set AN/USM-143 to 300V ac range, and connect ac probe to orange test point J803.

g. Key to transmit and observe indication on AN/USM-143 (210 vac).

h. Unkey transmitter; reinstall V802.

i. Key to transmit; observe indication on AN/USM-143 (200 vac).

j. Unkey transmitter; remove test equipment.

5-65. Modulator Audio Level Adjustment. Set up for RT-581 as in paragraph 5-25. Refer to figures 5-13, 5-15, 5-50, 5-51, and 5-116 for the physical and electrical location of adjustments and test points. Use Audio Oscillator AN/URM-127, Electronic Voltmeter AN/USM-143, Power Meter AN/URM-43( ), and Impedance Matching Network (illustrated in table 5-3) during the following procedures.

NOTE
If indications are abnormal, refer to Audio Amplifier and Modulator troubleshooting (paragraph 5-67).

a. Remove tube V802 from Audio Amplifier and Modulator Assembly (fig 5-50).

b. Apply a 1000 Hz audio signal to terminals B and C of AUDIO connector J704 through the impedance matching network.

c. Set AN/USM-143 to .1V ac range and connect to green test point J805.

d. Key to transmit; set level on AN/URM-127 for .08 vac indication on AN/USM-143.

e. Unkey transmitter.

WARNING
High voltage (+325 vdc) that is dangerous to life in present at J803.

f. Set AN/USM-143 to 300V ac range; connect ac probe to orange test point J803.

g. Key to transmit; adjust R831 for 210 vac on AN/USM-143.

h. Unkey transmitter; reinstall V802.

i. Key to transmit; adjust R839 for 200 vac on AN/USM-143.

j. Unkey transmitter; remove all test equipment except AN/URM-43( ).

k. Connect handset to AUDIO connector J704.

l. Key to transmit; adjust R609 (fig 5-15) on Relay-Filter Assembly and set VOLUME control (R717) for desired level in handset earpiece while speaking into mouthpiece.

m. Unkey transmitter; remove test equipment.

5-66. Retransmit Audio Level Check And Adjustment.

NOTE
This check is to be made only if a companion AN/URC-9 is installed to provide retransmit operation.

Set up RT-581 as in paragraph 5-25, except as instructed below. Refer to figures 5-13, 5-15, 5-50, 5-52, and 5-116 for physical and electrical location of test points. Use RF Signal Generator AN/USM-44, Electronic Voltmeter AN/USM-143.

6db attenuator, and Power Meter AN/URM-43( ) during the following procedures:

NOTE

Identify AN/URC-9 as SET #1 and SET #2 for this procedure.

a. Connect AN/URM-43( ) to ANT connector J701 on AN/URC-9 designated SET #1.

b. Set MANUAL FREQUENCY SELECTOR TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, S708) to 390.0 (or 390.00) on SET #1.

c. Set MODE SELECTOR switch (S702) to RETRANS on SET #1.

d. Deenergize SET #2 and remove Relay-Filter, reconnect Relay-Filter, using extension cable CX-8521; reenergize SET #2.

e. Set MANUAL FREQUENCY SELECTOR TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, and S708) to 399.9 (or 399.95) on SET #2.

f. Remove V802 (fig 5-50) from SET #2.

g. Set AN/USM-143 to 1V ac range; connect to contact number 12 of K602 (fig 5-52).

h. Connect AN/USM-44 through 6db attenuator to ANT connector J701 on SET #2; adjust AN/USM-44 for an 8 microvolt, 1000 Hz, 30% modulated signal at 399.9 MHz (or 399.95 MHz).

i. Observe that SET #1 keys to transmit and level on AN/USM-143 is .1 vac.

j. Adjust R608 (fig 5-15) if .1 vac indication is not obtained in step i. This completes check and adjustment of retransmit audio level for SET #2. Reinstall V802.

k. To check SET #1, reverse designation and repeat steps a through j.

5-67. <u>Audio Amplifier and Modulator Troubleshooting (Transmit)</u>. (Figures 5-2, 5-3, 5-10, 5-100, and 5-116.) Troubleshoot the Audio Amplifier and Modulator in accordance with procedures in table 5-22.

Table 5-22. Audio Amplifier and Modulator Troubleshooting Procedures (Transmit)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
1. Abnormal indication at green test point J805 (.08 vac); V802 removed; using signal generator audio input	1. Microphone input circuitry	1. Make circuit checks (fig 5-116)
	2. Microphone transformer T601 or other component	2. Make resistance checks; replace if defective
	3. Excessive hum pick-up; improper shielding and grounding of matching network	3. Check shielding and grounding of matching network (fig 5-10)
2. Abnormal indication at orange test point J803 (210 vac normal with .08 vac input); V802 removed.	1. Faulty tubes V803 thru V808	1. Replace tubes V803 thru V808, one at a time
	2. Faulty operating voltage	2. Check supply at M701 (+125 and +325 vdc) and at tube sockets (fig 5-100)

Table 5-22. Audio Amplifier and Modulator Troubleshooting Procedures (Transmit) (Continued)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
	3. Faulty components	3. Make circuit checks (fig 5-116)
3. Abnormal indication at orange test point J803 (200 vac); V802 replaced	1. Faulty tube V802 2. Faulty components (compression circuit)	1. Replace tubes 2. Check compression circuit components

TUBE	PIN NUMBER (Disconnect P801)								
	1	2	3	4	5	6	7	8	9
V801	0	390	4M	400K	-	15K	400K	5.2K	0
V802	0	13K	340K	5K	-	210K	210K	14K	0
V803	47K	720	0	0	58K	40K	720	-	-
V804	0	820	200K	15K	-	15K	200K	820	0
V805	-	15K	12K	0	0	470	2.3	12K	2.3
V806	-	15K	12K	0	0	470	2.3	12K	2.3
V807	-	15K	12K	0	0	470	2.3	12K	2.3
V808	-	15K	12K	0	0	470	2.3	12K	2.3

5-68. FREQUENCY SELECTOR ALIGNMENT AND ADJUSTMENT. The frequency selector alignment and adjustments consist of mechanical checks and adjustments. No electrical checks are required.

5-69. Frequency Selector Mechanical Check. Set up RT-581 as in paragraph 5-25 and perform the following procedures:

NOTE

Steps a through h verify proper mechanical operation on the Frequency Selector from the RT-581 front panel. To verify operation from a remote frequency selecting (dialing) station, follow remote system checkout procedures.

a. Position RT-581 top side up (fig 5-11). Check that FMO male coupler 01291 (fig 5-70) and RF and PA male coupler 01292 (fig 5-70) mating elements are vertical, centered under black guide posts, and the cutout on each coupler is in the upper right corner as viewed from front of RT-581. Check that FMO coupler keeper pin and RF and PA coupler keeper pin are in same quadrant as the cutouts on the Frequency Selector couplers.

b. Position RT-581 right side up (fig 5-17). Check that 2nd IF Amplifier male coupler (01295, fig 5-70) and 1st IF Amplifier couplers (01293 and 01294, fig 5-70) mating elements are vertical, centered under black guide posts, and the cutout on each coupler is in the upper right corner as viewed from front of RT-581. Check that 2nd IF Amplifier and 1st IF Amplifier coupler keeper pins are in same quadrant as the cutouts on the Frequency Selector couplers.

NOTE

Check that couplers rotate 360° in steps c, d and e.

c. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) counterclockwise in steps from .9 to .0 (or .95 to .00). Allow Frequency Selector to come to a complete stop at each step. Return switch to the .9 (or .95) position.

d. Operate MANUAL FREQUENCY UNITS switch (S707) counterclockwise in steps from 9 to 0. Allow Frequency Selector to come to a complete stop at each step. Return switch to the 9 position.

e. Operate MANUAL FREQUENCY TENS switch (S706) counterclockwise in steps from 39 to 22. Allow Frequency Selector to come to a complete stop at each step. Return switch to the 39 position.

f. Check that the five male couplers (01291 through 01295) are centered under the black guide posts as noted in steps a and b. The Bristol head screws of the coupler locking collar should be accessible for adjustment at this position.

g. Operate CHAN SEL switch counterclockwise in steps from 19 to 1. At each step, check that channel and frequency indicators (I1201 through I1204, fig 5-68) indicate correct channel numbers and the preset frequency for that channel.

h. Set CHAN SEL SWITCH to MANUAL and operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S706, S707, S708) to 399.9 (or 399.95).

5-70. <u>Frequency Selector Mechanical Adjustment</u>. The Frequency Selector mechanical adjustment include synchronization of the autopositioners and relay and pawl adjustments.

a. Autopositioner Synchronization. These procedures must be performed when one or more of the couplers (01291 through 01295) operate in an abnormal manner.

1. Operate MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches through their range from high frequency to low frequency while observing the appropriate coupler. A smooth rotation of the coupler in one direction indicates normal operation. A momentary reversal of direction or wavering indicates abnormal operation.

2. Set the CHAN SEL switch to 1 and set the pins on memory drum to 220.0 (or 220.00). (This sets channel 5).

3. Set CHAN SEL switch to 5. Observe that channel 5 appears in channel window and 220.0 (or 220.00) appears in frequency windows.

4. Deenergize radio set. Remove front panel as in paragraph 5-143.

5. To synchronize the TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) autopositioner at .0 (or .00), locate cam 01297 and cam follower 01299.9 (fig 5-66).

6. Loosen clamp 01244 (fig 5-66) and set cam follower on the high point of the cam as indicated by scribe mark on cam. Tighten clamp 01244.

7. Loosen clamp 01238 (fig 5-69), center the notch in the rotor of S1204 over the clip with the black wire (fig 5-77).

8. Tighten clamp 01238.

9. To synchronize the UNITS autopositioner at 0.0, locate cam follower 01299.4 and cam 01299.26 (fig 5-66 and 5-67). The scribe mark on this cam and the cam follower roller are visible through an inspection hole located just above and to the left of UNITS indicator wheel I1203 (fig 5-67 and 5-68).

10. Loosen clamp 01242 (fig 5-66). As viewed through the inspection hole, set the cam follower on the high point of the cam as indicated by the scribe mark; tighten clamp 01242.

11. Loosen clamp 01243 (fig 5-66); center the notch in the rotor of switch S-1203 over the clip with the black wire (fig 5-77).

12. Tighten clamp 01243.

NOTE

Steps 5 through 12 complete synchronization of the TENTHS (or TENTHS-HUNDREDTHS) and UNITS autopositioners.

13. Synchronization of the TENS autopositioner requires extensive disassembly procedures which are not recommended for shipboard accomplishment. If TENS synchronization is indicated, replace the entire Frequency Selector and submit the defective one for depot repair.

b. Relay K1201, K1202, K1203, K1204 and Pawl Adjustments. These adjustments and observations should be made whenever the front panel is removed for other servicing or whenever relay adjustments are indicated. It is assumed that the front panel has been removed and the radio set is deenergized.

1. Locate relays K1201, K1202, K1203,and K1204 (fig 5-67 and 5-68). Note that the armature of each relay actuates a set of contacts. Note also that behind each relay coil is a notched stopwheel and that a pawl, actuated by the relay armature, engages or seats in the notches. Pawl action in the notches is directly observable on relays K1203 and K1204, therefore, make observations and adjustments first on these two relays.

2. Depress armature of K1203 with finger. Note that relay contacts close and that pawl is disengaged from notch.

3. Release armature of K1203 and note that pawl is fully seated in notch. Measure gap between relay contacts. Gap must be .030 inch minimum with armature released (deenergized) and pawl fully seated.

4. After gap adjustment, repeat step 2 to verify that contacts close and pawl disengages.

5. Repeat steps 2, 3, and 4 for relays K1204, K1201 and K1202.

6. Replace front panel and restore equipment to normal operation.

5-71. THIRD IF AMPLIFIER AND AUDIO AMPLIFIER AND MODULATOR CHECK AND TROUBLESHOOTING (RECEIVE). The 3rd IF Amplifier and Audio Amplifier and Modulator do not require any mechanical checks or mechanical alignments.

5-72. Third IF Amplifier and Audio Amplifier and Modulator Check (Receive). Set up RT-581 as in paragraph 5-25. Refer to figures 5-13, 5-14, 5-44, 5-47, 5-50, 5-51, 5-63, 5-115, and 5-116 for physical and electrical location of test points. Use Electronic Voltmeter AN/USM-143, Electronic Frequency Counter AN/USM-207, RF Signal Generator AN/URM-25, and 600 ohm 5 watt resistor during the procedures that follow. Refer to paragraph 5-73 in case of abnormal indications.

NOTE

Modulator audio level checks and adjustments (transmit function) in paragraph 5-64 and 5-65 must be made prior to making the receive function check.

a. Position RT-581 bottom side up (fig 5-14).

b. Connect 600 ohm resistor across terminals A and B of AUDIO connector J704 (fig 5-63).

c. Set SQUELCH control to OFF; VOLUME control to position 5 (fig 5-63); and R819 (fig 5-13) fully counterclockwise.

d. Set AN/USM-143 to +10db range and connect across 600 ohm resistor.

e. Set AN/URM-25( ) for 500 kHz (check frequency with AN/USM-207) unmodulated output and connect to orange test point J503.

f. Adjust R819 for zero db noise level reference setting (-10db indication on AN/USM-143).

g. Set AN/URM-25 for 30% modulation of 1000 Hz and adjust output until a 10db increase over the noise level reference setting of step f is obtained. This is a 10db S+N/N ratio.

h. Output voltage of AN/URM-25( ) should not exceed 16 uv.

i. Remove test equipment.

5-73. Third IF Amplifier and Audio Amplifier and Modulator Troubleshooting (Receive). (Figures 5-1, 5-9, 5-99, and 5-115). Perform 3rd IF Amplifier and Audio Amplifier and Modulator troubleshooting in accordance with procedures in table 5-23.

Table 5-23. Third IF Amplifier and Audio Amplifier and Modulator Troubleshooting Procedures (Receive)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
Unable to achieve 10db $\frac{S+N}{N}$ ratio with 16 uv signal injected at orange test point J503	1. Faulty test setup	1. Recheck test equipment connections and set-up
	2. Faulty tubes V501, V502, V503, or V504	2. Replace tubes one at a time
	3. Faulty operating voltages	3. Check supply at M701 (+125 and +275 vdc) and tube sockets (fig 5-99)
	4. Faulty audio amplifier	4. Refer to para 5-63
	5. Faulty components	5. Make circuit check and audio checks through: receive path of 3rd IF Amplifier; squelch relay K801; receive relay K802; and broadband relay K803 (fig 5-1, 5-9, 5-115)
	6. Faulty cables: from P501/J5 into J8/P801 (Modulator); J8 to J14 Relay-Filter; from Relay-Filter J14 to Front Panel J15; and VOLUME control to HEADSET	6. Repair/replace cable, connector and check audio path through Relay-Filter
	7. Faulty K602 in Relay-Filter	7. Repair/replace

5-74. SECOND IF AMPLIFIER CHECK AND TROUBLESHOOTING (RECEIVE). The 2nd IF Amplifier does not require any mechanical checks or mechanical adjustment.

5-75. Second IF Amplifier Electrical Check (Receive). Set up RT-581 as in paragraph 5-25. Refer to figures 5-12, 5-13, 5-39, 5-47, 5-63, 5-113, and 5-114 for the physical and electrical location of test points. Use Electronic Voltmeter AN/USM-143, RF Signal Generator AN/URM-25( ), Electronic Frequency Counter AN/USM-207, and 600 ohms 5 watt resistor during the procedures that follows. Refer to paragraph 5-76 in case of abnormal indication.

NOTE

The 2nd IF Amplifier checks and alignment in transmit (paragraphs 5-36 through 5-39) must be made prior to making this receive function check.

NOTE

The 3rd IF Amplifier and Audio Amplifier and Modulator must be operating satisfactorily before making this check.

a. Position RT-581 right side up (fig 5-12).

b. Connect 600 ohm resistor across pins A and B of AUDIO Connector J704 (fig 5-63).

c. Set SQUELCH control OFF; VOLUME control to position 5 (fig 5-63); and R819 (fig 5-13) fully counterclockwise.

d. Set AN/USM-143 to +10db range and connect across 600 ohm resistor.

e. Set AN/URM-25( ) for 3.9 MHz (check frequency with AN/USM-207) unmodulated output and connect to red test point J402.

NOTE

Injection of 3.9 MHz at J402 will mix at V401 to produce 500 kHz 3rd IF frequency.

f. Adjust R819 for a zero db noise level reference setting (-10db indication on AN/USM-143).

g. Set AN/URM-25( ) for 30% modulation at 1000 Hz and adjust output until a 10db increase over the noise level reference setting of step f is obtained. This is a 10db S+N/N ratio.

h. Output voltage of AN/URM-25( ) should not exceed 100 uv.

i. Repeat steps c through h using 3.0 MHz frequency as in step e, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) set to .0 (or .00).

j. Remove test equipment.

k. Connect AN/USM-207 to yellow test point J404.

l. Operate MANUAL FREQUENCY TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708) in steps from .9 to .0 (or .95 to .00); check that frequency indication on AN/USM-207 corresponds to table 5-24.

Table 5-24. Second IF Amplifier Frequencies at J404 Output

TENTHS/TENTHS-HUNDREDTHS SWITCH POSITION	AN/USM-207 INDICATION AND CRYSTAL FREQUENCY (MHz)	FREQUENCY TOLERANCE (±Hz)
AN/URC-9, 9Y and 9AY		
.9	3.4	170
.8	3.3	165
.7	3.2	160

Table 5-24. Second IF Amplifier Frequencies at J404 Output (Continued)

TENTHS/TENTHS-HUNDREDTHS SWITCH POSITION	AN/USM-207 INDICATION AND CRYSTAL FREQUENCY (MHz)	FREQUENCY TOLERANCE (±Hz)
AN/URC-9, 9Y and 9AY (Cont)		
.6	3.1	155
.5	3.0	150
.4	3.9	195
.3	3.8	190
.2	3.7	185
.1	3.6	180
.0	3.5	175
AN/URC-9A		
.95	3.45	172.5
.90	3.40	170.0
.85	3.35	167.5
.80	3.30	165.0
.75	3.25	162.5
.70	3.20	160.0
.65	3.15	157.5
.60	3.10	155.0
.55	3.05	152.5
.50	3.00	150.0
.45	3.95	197.5
.40	3.90	195.0
.35	3.85	192.5
.30	3.80	190.0
.25	3.75	187.5
.20	3.70	185.0
.15	3.65	182.5
.10	3.60	180.0
.05	3.55	177.5
.00	3.50	175.0

5-76. Second IF Amplifier Troubleshooting (Receive). (Figures 5-1, 5-7, 5-99, 5-113, and 5-114). Perform 2nd IF Amplifier Troubleshooting in accordance with procedures in table 5-25.

Table 5-25. Second IF Amplifier Troubleshooting Procedures (Receive)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
1. Unable to achieve 10db (S+N/N) ratio with 100 uv (max) signal (3.9 or 3.0 MHz) injected at red test point J402	1. Faulty test setup	1. Recheck test equipment and setup
	2. Faulty 3rd IF Amplifier	2. Check 3rd IF Amplifier (para 5-71)

Table 5-25. Second IF Amplifier Troubleshooting Procedures (Receive) (Continued)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
	3.Faulty 2nd IF Amplifier	3.Check 2nd IF Amplifier (Transmit) (para 5-35)
	4.Faulty 500 kHz filter FL901 or cables W5 and W502	4.Replace filter (fig 5-1, 5-7, 5-8)
2.Abnormal frequency indication at yellow test point J406 (see table 5-24)	1.Faulty crystals	1.Refer to crystal replacement (para 5-104)
	2.Faulty relay K401	2.Replace relay (fig 5-113, 5-114)
	3.Faulty relay K402 (AN/URC-9A only)	3.Replace relay (fig 5-114)

5-77. FIRST IF AMPLIFIER ALIGNMENT, ADJUSTMENT AND TROUBLESHOOTING (RECEIVE). The 1st IF Amplifier does not require any mechanical checks or adjustments.

5-78. First IF Amplifier Electrical Check (Receive). Set up RT-581 as in paragraph 5-25. Refer to figures 5-12, 5-13, 5-39, 5-63, and 5-112 for the physical and electrical location of test points. Use Electronic Voltmeter AN/USM-143, RF Signal Generator AN/USM-44, Electronic Frequency Counter AN/USM-207, and 600 ohm 5 watt resistor during the procedures that follow. Refer to paragraph 5-80 in case of abnormal indication.

NOTE

This check does not include coil assemblies Z301 and Z302. Z301 and Z302 are covered in 1st IF Amplifier alignment (receive) in paragraph 5-79.

NOTE

The 1st IF Amplifier checks and alignments in paragraphs 5-41 through 5-45 must be made prior to making this receive function check.

NOTE

The 2nd IF Amplifier and 3rd IF Amplifier and Audio Amplifier and Modulator must be operating satisfactorily before making this check.

a. Position RT-581 right side up (fig 5-12).

b. Connect 600 ohm resistor across terminals A and B of AUDIO connector J704 (fig 5-63).

c. Set SQUELCH control to OFF; VOLUME control to position 5 (fig 5-63); and R819 (fig 5-13) fully counterclockwise.

d. Set AN/USM-143 to +10db range and connect across 600 ohm resistor.

e. Set AN/USM-44 to 29.9 MHz (check frequency with AN/USM-207) unmodulated output and connect to brown test point J301 (fig 5-39).

f. Adjust R819 for a zero db noise level reference setting (-10db indication on AN/USM-143).

g. Set AN/USM-44 for 30% modulation at 1000 Hz and adjust output until a 10db increase over the noise level reference setting of step f is obtained. This is a 10db S+N/N ratio.

h. Output voltage of AN/USM-44 should not exceed 16 uv.

i. Repeat steps c through h using 20.0 MHz frequency as in step e, and UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707, S708) set to 0.0 (or 0.00).

j. Remove test equipment.

5-79. First IF Amplifier Electrical Alignment (Receive). Set up RT-581 as in paragraph 5-25. Refer to figures 5-11, 5-12, 5-39 through 5-43, 5-47, 5-112, and 5-115 for physical and electrical location of adjustments and test points. Use Electronic Multimeter AN/USM-116, RF Signal Generator AN/USM-44, Electronic Frequency Counter AN/USM-207, and Tuning Tool FSN 9Q5120-720-1908 during the following procedures:

NOTE

The 1st IF Amplifier checks and alignment in paragraphs 5-41 through 5-45 must be made prior to making this alignment.

NOTE

The 2nd IF Amplifier, 3rd IF Amplifier, FMO, and Audio Amplifier and Modulator must be operating satisfactorily before making this alignment.

a. Position RT-581 right side up (fig 5-12).

b. Set AN/USM-44 to 399.9 MHz (check frequency with AN/USM-207) modulated 30% at 1000 Hz and connect to green test point J105.

c. Set AN/USM-116 for DC voltage, 3V range; connect dc probe to yellow test point J504 on 3rd IF Amplifier (fig 5-47).

d. Adjust output of AN/USM-44 for an indication of -2 vdc on AN/USM-116.

e. Adjust C302 for maximum indication on AN/USM-116.

f. Set MANUAL FREQUENCY UNITS and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches (S707, S708) to 0.0 (or 0.00).

g. Set AN/USM-44 to 390.0 MHz (check frequency with AN/USM-207) modulated 30% at 1000 Hz. Adjust output for an indication of -2 vdc on AN/USM-116.

h. Adjust L301 for maximum indication on AN/USM-116.

i. Repeat procedure in steps b through h until no further improvement is noted.

j. Remove test equipment.

5-80. First IF Amplifier Troubleshooting (Receive). (Figures 5-1, 5-6, 5-99, and 5-112). Perform 1st IF Amplifier Trouble-shooting in accordance with procedures in table 5-26.

NOTE

Check transmit function of 1st IF Amplifier according to procedure given in paragraphs 5-41 through 5-45 before using procedures in Table 5-26. Refer to paragraph 5-48 for transmit troubleshooting procedures.

Table 5-26. First IF Amplifier Troubleshooting Procedures (Receive)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
1. Unable to achieve 10db S+N/N ratio with 16 uv (max) signal injected at brown test point J301	1. Faulty test setup	1. Recheck test equipment, connectors and setup
	2. Faulty 3rd IF or 2nd IF Amplifiers	2. Check 3rd and 2nd IF Amplifiers (Check 2nd IF Amplifier in transmit)
	3. Faulty relay contact K102	3. Repair/replace K102 (fig 5-112)
	4. Faulty adjustment of Z301 and Z302	4. Recheck alignment of Z301 and Z302
	5. Faulty cable W303 and connectors	5. Repair/replace cable and connectors (fig 5-1, 5-6)
	6. Faulty tubes V103 or V104	6. Replace tubes
	7. Faulty FMO output	7. Refer to para 5-49
2. Unable to adjust C302 or L301	Faulty Z301	Replace 1st IF Amplifier

5-81. FREQUENCY MULTIPLIER OSCILLATOR (FMO) ALIGNMENT AND ADJUSTMENT (RECEIVE). The FMO is checked and aligned in paragraphs 5-49 through 5-53. No further checks or adjustments are required.

5-82. RF AND PA CHECK AND TROUBLESHOOTING (RECEIVE). The RF and PA does not require any mechanical checks or adjustments.

5-83. <u>RF And PA Electrical Check (Receive)</u>. Set up RT-581 as in paragraph 5-25. Refer to figures 5-13, 5-14, 5-63, and 5-116 for physical and electrical location of test points. Use Electronic Voltmeter AN/USM-143, Electronic Frequency Counter AN/USM-207, RF Signal Generator AN/USM-44, 6db attenuator and 600 ohm 5 watt resistor during the procedures that follow. Refer to paragraph 5-84 in case of abnormal indications.

NOTE

The RF and PA checks and alignment in paragraphs 5-57 through 5-60 must be made prior to making this receive function check.

NOTE

The 1st IF Amplifier, 2nd IF Amplifier, 3rd IF Amplifier, FMO, and Audio Amplifier and Modulator must be operating satisfactorily before making this check.

<u>CAUTION</u>

Do not key to transmit.

a. Position RT-581 top side up (fig 5-14).

b. Connect 600 ohm resistor across pins A and B of AUDIO connector J704 (fig 5-63).

c. Set SQUELCH control to OFF; VOLUME control to position 5 (fig 5-63); and R819 (fig 5-13) fully counterclockwise.

d. Set AN/USM-143 to +10db range and connect across 600 ohm resistor.

e. Set AN/USM-44 for 399.9 MHz (check frequency with AN/USM-207) unmodulated output and connect to ANT connector J701 (fig 5-63) through 6db attenuator.

f. Adjust R819 (fig 5-13 and 5-116) for a zero db noise level reference setting (-10 db indication on AN/USM-143).

g. Set AN/USM-44 for 30% modulation at 1000 Hz and adjust output until a 10db increase over the noise level reference setting of step f is obtained. This is a 10db S+N/N ratio.

h. Output voltage of AN/USM-44 should not exceed 6 uv.

i. Set AN/USM-143 to +40db range.

j. Adjust AN/USM-44 for 6 uv output, 30% modulation at 1000 Hz.

k. Adjust R819 for -7db indication on AN/USM-143.

l. Remove test equipment.

NOTE
This check is also an overall receiver sensitivity check.

5-84. <u>RF and PA Troubleshooting (Receive)</u>. (Figures 5-1, 5-4, 5-99, and 5-110). Perform RF and PA troubleshooting in accordance with procedures in table 5-27.

Table 5-27. RF and PA Troubleshooting Procedures (Receive)

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
NOTE Check RF and PA according to paragraphs 5-57 through 5-60 before using this procedure. Refer to paragraph 5-61 for transmit troubleshooting procedures.		
Greater than 6 microvolts necessary to achieve 10db (S+N/N ratio)	1. Faulty relay contacts K101 and K102	1. Continuity check (fig 5-110); replace if necessary
	2. Faulty tubes V102 V103 and V104	2. Check tubes one at a time
	3. Faulty components	3. Refer to para 5-61; check cables and connectors; and directional coupler between J701 and K101 (fig 5-1)

5-85. SQUELCH LEVEL CHECK, ALIGNMENT AND TROUBLESHOOTING (RECEIVE). There are no mechanical squelch level checks and alignments.

5-86. <u>Carrier Squelch Level Check (Receive)</u>. Set up RT-581 as in paragraph 5-25. Use RF Signal Generator AN/USM-44( ) and a 6db attenuator during the following procedures:

CAUTION
Do not key transmitter.

a. Connect AN/USM-44( ) through 6db attenuator to ANT connector J701 (fig 5-63).

b. Set METER switch (S701) to S METER position; MODE switch (S702) to RETRANS; and SQUELCH control (R702) to OFF.

c. With no signal input, operate MANUAL FREQUENCY TENS switch (S706) through its range; set to position with highest S METER indication. Repeat with UNITS switch (S707); then with TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708).

d. Set AN/USM-44( ) to frequency indicated on MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches, and adjust output to 90 uv, 30% modulated at 1000 Hz. Adjust AN/USM-44( ) frequency slightly for maximum S METER reading.

e. Set SQUELCH control (R702) fully clockwise and observe that CALL LIGHT is off.

f. Increase AN/USM-44( ) output and observe that CALL LIGHT comes on at 100 uv.

5-87. Carrier Squelch Level Electrical Alignment (Receive). Set up RT-581 as in paragraph 5-25. Refer to figures 5-14, 5-63, 5-120, and 5-121 for physical and electrical location of adjustments and test points. Use RF Signal Generator AN/USM-44( ) and a 6 db attenuator during the procedures that follow. Refer to paragraph 5-90 in case of abnormal indications.

CAUTION

Do not key transmitter.

a. Connect AN/USM-44( ) through 6db attenuator to ANT connector J701 (fig 5-63).

b. Set METER switch (S701) to S METER position; MOD switch (S702) to RETRANS; and SQUELCH control (R702) to OFF.

c. With no signal input, operate MANUAL FREQUENCY TENS switch (S706) through its range and set to position with highest S METER reading. Repeat with UNITS switch (S707); then with TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switch (S708).

d. Set AN/USM-44( ) to frequency indicated on MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches, and adjust output to 100 uv, modulated 30% at 1000 Hz. Adjust AN/USM-44( ) frequency slightly for maximum S METER reading.

e. Set SQUELCH control (R702) fully clockwise.

f. Set R716 (fig 5-14, 5-120 and 5-121) counterclockwise until CALL LIGHT comes on.

g. Reduce AN/USM-44( ) output, and check that CALL LIGHT goes out. Slowly increase AN/USM-44( ) output and check that CALL LIGHT comes on at 100 uv.

5-88. Signal-Plus-Noise To Noise (S+N/N) Squelch Check (Receive). Set up RT-581 as in paragraph 5-25. Refer to figure 5-63. Use RF Signal Generator AN/USM-44( ), Electronic Voltmeter AN/USM-143, a 600 ohm 5 watt resistor, and a 6 db attenuator during the following procedures:

NOTE

Factory-wired equipment has S+N/N squelch set up on NOR position of MODE switch S702; equipment in the field may have been changed for carrier squelch operation.

CAUTION

Do not key transmitter.

a. Connect AN/USM-44( ) through 6db attenuator to ANT connector J701.

b. Connect 600 ohm 5 watt resistor to AUDIO Connector J704 pins A and B.

c. Set AN/USM-143 to ac range; connect probe across the 600 ohm resistor.

d. Set AN/USM-44( ) to 399.9 MHz, modulated 30% at 1000 Hz; adjust output of AN/USM-44( ) for an indication on S METER.

e. Fine tune AN/USM-44( ) frequency for maximum indication on S METER.

f. Decrease AN/USM-44( ) output to zero.

g. Set VOLUME control fully clockwise and set SQUELCH control to OFF.

h. Increase AN/USM-44( ) output from zero microvolts for an indication on AN/USM-143.

i. Continue increasing AN/USM-44( ) output while alternately switching MOD SELECTOR switch from 1000 Hz to CW until the ratio of audio output with modulation to the audio output without modulation is 10db. Observe AN/USM-44( ) output level required to produce the 10db S+N/N ratio.

j. Rotate squelch control clockwise until SQUELCH DISABLE switch (S703) clicks.

k. Reduce AN/USM-44( ) output until CALL LIGHT goes off. Slowly increase AN/USM-44( ) output to level observed in step i; CALL LIGHT should come on at this point. There should be 10db S+N/N ratio between level when the CALL LIGHT goes off and the level when the CALL LIGHT comes on.

5-89. Signal-Plus-Noise To Noise (S+N/N) Squelch Electrical Alignment (Receive). Set up RT-581 as in paragraph 5-25. Refer to figures 5-13, 5-63, and 5-116 for physical and electrical location of adjustments and test points. Use RF signal Generator AN/USM-44( ), Electronic Voltmeter AN/USM-143, 600 ohm 5 watt resistor, and a 6db attenuator during the following procedures:

NOTE

Factory-wired equipment has S+N/N squelch set up on NOR position of MODE switch S702; equipment in the field may have been changed for carrier squelch operation.

CAUTION

Do not key transmitter.

a. Connect AN/USM-44( ) through 6db attenuator to ANT connector J701.

b. Connect 600 ohm 5 watt resistor to AUDIO connector J704 terminals A and B.

c. Set AN/USM-143 to ac range; connect probe across the 600 ohm resistor.

d. Set AN/USM-44( ) to 399.9 MHz, modulated 30% at 1000 Hz, adjust output of AN/USM-44( ) for an indication on S METER.

e. Fine tune AN/USM-44( ) frequency for maximum indication on S METER.

f. Decrease AN/USM-44( ) output to zero.

g. Set VOLUME control fully clockwise and set SQUELCH control to OFF.

h. Increase AN/USM-44( ) output from zero microvolts for an indication on AN/USM-143.

i. Continue increasing AN/USM-44( ) output while alternately switching MOD SELECTOR switch from 1000 Hz to CW until the ratio of the audio output with modulation to the audio output without modulation of 10db. Observe AN/USM-44( ) output level required to produce the 10db S+N/N ratio.

j. Decrease AN/USM-44( ) output to zero.

k. Rotate R804 (fig 5-13 and 5-116) fully counterclockwise.

l. Rotate SQUELCH control (R702, fig 5-63) clockwise until SQUELCH DISABLE switch (S708) clicks.

m. Set AN/USM-44( ) to output level observed in step i.

n. Rotate R804 slowly clockwise until CALL LIGHT comes on.

o. Rotate AN/USM-44( ) output and check that CALL LIGHT goes out. Slowly increase AN/USM-44( ) output and check that CALL LIGHT comes on at output level observed in step i.

p. Adjust R804, while alternately switching AN/USM-44( ) MODE SELECTOR switch from 1000 Hz to CW until the ratio of the audio output with modulation to the audio output without modulation is 10db.

5-90. <u>Squelch Level Troubleshooting (Receive)</u>. (Figures 5-1, 5-10, 5-99 and 5-116). Perform squelch level troubleshooting in accordance with procedures in table 5-28.

Table 5-28. Squelch Level Troubleshooting Procedures (Receive)

FAULTY INDICATION	POSSIBLE CAUSES	ACTION-CORRECT AS REQUIRED
1. Abnormal carrier squelch	1. Faulty tube V801	1. Replace V801
	2. Faulty components	2. Check squelch controls R702 and R716; check cables and squelch relay K801 (fig 5-116)
2. Abnormal $\frac{S+N}{N}$ squelch setting	Faulty component on $\frac{S+N}{N}$ circuit board	Make circuit checks (fig 5-1, 5-10, 5-99)

5-91. R/T CENTRIFUGAL FAN STROBE CHECK AND TROUBLESHOOTING. The following procedure is performed on R/T centrifugal fans that are not equipped with electronic speed increaser assemblies.

5-92. <u>R/T Centrifugal Fan Strobe Check</u>. Refer to figure 5-13 for physical location of the centrifugal fan. Use Strobotac CAG-1531A, FSN 2Z6680-799-7616 or FSN 2Z6680-880-1844 during the following procedures:

a. Remove RT-581 from case as in paragraph 5-99.

b. Place RT-581 with rear facing foward (fig 5-15).

c. Attach a small piece of masking tape to one of the squirrel cage fan blades (01004, fig 5-59).

d. Turn on Strobotac and set controls to measure approximately 8000 rpm.

e. Energize RT-581.

f. Strobe the fan; rpm should be 7000 or more. If speed is less than 7000 rpm, perform lubrication of centrifugal fan (paragraph 5-135).

NOTE

Motor speed should be 2900 to 3200 rpm at 115 vac 60 Hz input. Four-bladed fan on motor end may be strobed to determine this speed.

g. Remove masking tape from squirrel cage fan blade.

5-93. <u>R/T Centrifugal Fan Troubleshooting</u>. (Figures 5-55 through 5-59). Perform R/T Centrifugal Fan troubleshooting procedures in accordance with procedures in table 5-29.

Table 5-29. R/T Centrifugal Fan Troubleshooting Procedures

FAULTY INDICATION	POSSIBLE CAUSE	ACTION-CORRECT AS REQUIRED
Fan speed less than 7000 rpm	1.Lubrication required	1.Lubricate according to para 5-135
	2.Faulty speed increaser	2a.If replaceable type (small bronze coupler), replace speed increaser FSN IN3020-201-6906
		2b.If non-replaceable type (large phenolic coupler), replace entire blower assembly

5-94. REPAIR PROCEDURES FOR RADIO SET AN/URC-9.

NOTE
All references to Radio Set AN/URC-9 are applicable to Radio Sets AN/URC-9A, AN/URC-9Y, and AN/URC-9AY, except where noted.

5-95. The following data is for removal, repair, and replacement of parts, assemblies, and units of Radio Set AN/URC-9. Deenergize equipment before removal.

5-96. POWER SUPPLIES PP-2702, PP-4706 and PP-4706A. These units are shipboard repairable. All parts are replaceable aboard ship.

5-97. Removal. Remove power supply as follows:

a. Loosen four captive screws in the corners of the power supply (fig 5-80, 5-84 or 5-91).

b. Turn extractor knob fully counterclockwise; reverse rotation for three turns, stop with knob slot horizontal, and push extractor down.

c. Pull the power supply from the case.

5-98. Replacement. Reverse the removal procedures.

5-99. RECEIVER-TRANSMITTER RT-581( )/URC-9.

CAUTION
Before removal of assemblies, set CHAN SEL switch to MANUAL and set MANUAL FREQUENCY TENS, UNITS, and TENTHS (or TENTHS-HUNDREDTHS on AN/URC-9A) switches to 399.9 (or 399.95). These settings must be made while power is applied to the equipment.

5-100. Removal. Remove RT-581 as follows:

a. Loosen four captive screws in corners of the front panel.

b. Turn extractor knob fully counterclockwise; reverse rotation for three turns, stop with knob slot horizontal, and push extractor down.

c. Pull the RT-581 from the case.

WARNING
This equipment contains high voltages that are dangerous to life. Make certain to remove all power from equipment before attempting to remove assemblies.

5-101. Replacement. Reverse the removal procedures.

5-102. SECOND IF AMPLIFIER. This assembly is shipboard repairable. All parts are replaceable aboard ship.

5-103. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-17, 5-44, 5-45, and 5-46 during the following procedures:

a. Position RT-581 right side up (fig 5-17).

b. Disconnect plugs P5, P304, and P401 from jacks J403, J401, and J4, respectively (fig 5-17).

c. Loosen three captive screws, two at front and one at rear (D, fig 5-17), that hold 2nd IF Amplifier.

d. Lift 2nd IF Amplifier from RT-581.

5-104. Crystal Replacement. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99).

a. Position RT-581 right side up (fig 5-17).

b. Remove 2nd IF Amplifier as in paragraph 5-103.

c. Remove two flathead machine screws from sides of cover.

d. Lift lip of dust cover straight out and away from tube V401.

e. Replace defective crystal.

f. Replace cover and screws; replace assembly.

g. Perform 2nd IF Amplifier mechanical alignment as in paragraph 5-37.

5-105. Selector Switch Replacement (S401 or S402). Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99).

a. Remove 2nd IF Amplifier as in paragraph 5-103.

b. Unsolder two wires from relay K401 and one ground wire routed to switches S401 and S402 (fig 5-44 and 5-45). For AN/URC-9A only, unsolder four additional wires from relay K402 and one additional ground wire routed to crystal socket XY401.

c. Remove the three screws holding switch assembly to tube chassis; slide units apart so that the slugs will slide out of L401, L403, and L405.

d. Scribe lines on shaft and coupler before removing, retaining pin from coupler and shaft.

e. Slide coupler from shaft.

f. Remove the two Phillips-head machine screws from switch bracket.

g. Remove the two small nuts holding switch to bracket.

h. Slip bracket from shaft. Remove the four corner crystals from crystal socket. (Note the positions of the crystals.)

i. Remove the four Phillips-head screws holding crystal socket to frame.

j. Unsolder wires from switch and slide wafer from shaft.

k. To reassembly, reverse order of foregoing disassembly.

l. Perform 2nd IF Amplifier mechanical alignment as in paragraph 5-37.

5-106. Lubrication. Lubrication of the unit is only required during servicing or cleaning. Lubricate unit as follows:

a. Lubricate cam face with a thin film of grease (MIL-G-23827A).

b. Lubricate cam followers with one drop of oil (MIL-L-6085A).

5-107. Replacement. Set coupler on assembly. Make sure the slot in the coupler is vertical and the keeper pin is in the upper right corner when viewed from the front. Reverse removal procedures.

5-108. FIRST IF AMPLIFIER. This assembly is partially repairable aboard ship. Refer to paragraph 5-3 for parts that are shipboard replaceable.

NOTE

Lubrication is only required during servicing or cleaning.

5-109. Removal. Remove RT-581 as in paragraph 5-100 (observing caution in paragraph 5-99) and proceed as follows:

a. Position RT-581 right side up (fig 5-17).

b. Disconnect plugs P301, P302, P303, and P304 from jacks J3, J101, J102, and J401, respectively (fig 5-17).

c. Remove cover plate H-4 (fig 5-12).

d. For convenience; disconnect plugs P6 and P502 (fig 5-17) from jacks J901 and J902, respectively. Slide cables W5 and W6 from under clip.

e. Loosen three captive screws (fig 5-17).

f. Lift 1st IF Amplifier from RT-581.

5-110. Tuning Core Replacement (0301 through 0307). Remove 1st IF Amplifier as in paragraph 5-109 and proceed as follows:

a. Position 1st IF Amplifier as in figure 5-42.

b. Rotate coupler 0317 clockwise (approximately 170°) to position tuning cores 0301, 0302, 0303, 0304, 0305, and 0306 to the highest position in the coils. Rotate coupler 0316 counterclockwise (approximately 170°) to position tuning core 0307 to the highest position in L310.

NOTE

Tuning cores 0301 through 0306 are identical. Tuning core 0307 is slightly shorter. Do not interchange tuning cores.

c. Remove defective tuning core(s) and clean core hole(s).

d. Replace defective tuning core(s). Ensure that threaded slot is projecting through core rack at bottom of assembly for all cores. Lubricate threads with one drop of oil (MIL-L-6085A).

e. Position assembly as in fig 5-42; set couplers 0316 and 0317 with slots vertical and coupler pin in upper right corner. Reverse removal procedure.

5-111. Crystal Replacement (Y301 through Y310). Remove 1st IF Amplifier as in paragraph 5-109 and proceed as follows:

a. Position 1st IF Amplifier as in fig 5-42.

b. Remove dust cover; location of crystal(s) is marked on dust cover (fig 5-42).

NOTE

Use a pencil type soldering iron (15 to 25 watts) to remove crystals. If access to rear (S302) crystal is difficult, remove screws from crystal bracket; slide bracket and switch assembly slightly forward. Avoid misaligning or disengaging switch rotor from shaft.

c. Install new crystal(s), avoiding use of excessive heat and solder.

d. Ensure that switch rotor arm is in the full contact with tab for Y310 (26.0 MHz) when coupler 0316 slot is vertical and coupler keeper pin is in upper right corner.

e. Replace dust cover.

5-112. Replacement. Set couplers 0316 and 0317 on assembly so that slots are vertical and keeper pins are in upper right corner (fig 5-42). Reverse removal procedures.

5-113. FREQUENCY MULTIPLIER-OSCILLATOR (FMO). The FMO is partially repairable aboard ship. Refer to paragraph 5-2 for those parts that are shipboard replaceable.

5-114. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99) and proceed as follows:

a. Position RT-581 top side up (fig 5-11).

b. Remove cover plate H-3 (fig 5-16).

c. Disconnect plug P4 from jack J205 (fig 5-16). Use a screwdriver to pull plug straight off.

d. Disconnect plug P201 from jack J2 (fig 5-18).

e. Loosen three captive screws. (B, fig 5-16).

f. Lift FMO from RT-581.

5-115. General Maintenance. These procedures contribute to the reduction and elimination of intermittent FMO operation. They should be done whenever the assembly is removed for repair.

NOTE

The FMO reference position in the following procedures is: coupler 0220 forward; slot vertical; keeper pin in upper right corner; and amplifier tubes pointing left.

a. RF Tuner Trimmer Capacitors. The following procedure is to ensure proper mounting and grounding of trimmer capacitors C215, C221, C227, and C233 (fig 5-32):

CAUTION

These capacitors are glass foil type. Use care to avoid damaging or breaking.

1. Remove covers from multiplier-amplifier section; retain all screws and washers.

2. Insert thin screwdriver or tuning tool into bottom of trimmer capacitors C215, C221, C227, and C233; rotate each capacitor counterclockwise until threaded portion clears the slotted portion of mount.

3. Check that capacitor mounting lock nuts are secure; do not over-tighten.

4. Bend slotted portions together slightly with long nose plier.

5. Insert screwdriver or tuning tool into bottom of capacitors and rotate clockwise until threaded portion extends above slotted portion of the mount.

b. RF Tuner Inductors. The following procedure is to ensure positive contact of the inductor rings and positive grounding of the main tuning shaft (fig 5-35):

1. Clean both sides of each of the four semicircular inductor rings with CRAMOLIN, FSN 9Q6850-880-7007. These inductor rings are a part of the stator assembly for Z202, Z204, Z206, and Z208.

2. Eight sets of finger contacts provide grounding for the main tuning shaft. Rotate the shaft and clean the surface under each of these contacts with CRAMOLIN.

3. Apply one small drop of MIL-L-6085A oil to each ball bearing (0208 and 0209, fig 5-35).

4. When no further servicing or repair in this section of the assembly is required, replace covers and install

all screws and washers previously removed.

c. Oscillator-Multiplier. The following procedure is to ensure positive contact of the wiper arm of S201, S202, and Z201 with the stationery contacts (fig 5-38).

1. Remove oscillator-multiplier cover; retain all screws and washers.

2. Remove tuning coil access plate.

3. Clean the contacting surfaces of S201, S202, and Z201 with CRAMOLIN, FSN 9Q6850-880-7007.

4. When no further servicing or repair in this section of the assembly is required, replace coil access cover, oscillator-multiplier cover and install all screws and washers previously removed.

5-116. Crystal Replacement. Crystals in the FMO may be replaced aboard ship. Disassembly of S201, S202, and Z201 (fig 5-38) is not recommended aboard ship. Careful techniques and the proper soldering tool will result in satisfactory crystal replacement without complicated disassembly. Replace crystals as follows:

a. Remove oscillator-multiplier cover; retain all screws and washers (fig 5-32).

b. Remove tuning coil access plate.

c. Refer to figure 5-34 for location of crystals.

NOTE

Use a pencil type soldering iron (15 to 25 watts) to remove crystal(s).

d. Install new crystal(s), avoiding use of excessive heat and solder.

e. Replace coil access plate. Ensure that spring wafer attached to plate properly grounds each crystal case.

f. Replace oscillator-multiplier cover and install all screws and washers previously removed.

5-117. Tube and Other Component Replacement. The following are general procedures for tube and miscellaneous parts replacements:

NOTE

Tube shields and tube shield liners must be in place during tests and normal operation.

a. Tubes in the FMO must be evaluated on a comparison basis. When a tube is suspect, set the AN/URC-9 to 399.9 MHz (or 399.95 MHz on AN/URC-9A). Locate a test point to which the stage is supplying output. Peak the input and output trimmers for that stage. Note the output level. Replace the tube under evaluation with a new tube. Repeak trimmers for maximum output. If the new tube shows improvement in output, retain the new tube. It may be necessary to repeat this procedure several times in order to select a satisfactory tube.

b. When replacing components in this assembly, the lead length and location of replacement part must be the same as the part removed.

5-118. Replacement. When replacing the FMO, set the assembly into the RT-581 with the slot in coupler O220 vertical and the keeper pin in the upper right corner as viewed from the front. Reverse removal procedures.

5-119. RF and PA ASSEMBLY. This assembly is partially repairable aboard ship. Refer to paragraph 5-2 for those parts which are shipboard replaceable. Replacement of components which require disassembly of the RF and PA into two sections or removal of V101, V102, and V103 tube chassis, is not recommended aboard ship.

5-120. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99) and proceed as follows:

a. Remove cover plates H-3 and H-5 (fig 5-12 and 5-16).

b. Disconnect plugs P3, P101, P10, P302, P303, P1101, and P1301 from jacks J112, J1, J1101, J101, J102, J108, and J109, respectively (fig 5-17).

c. Loosen three captive screws (A, fig 5-16).

d. Lift RF and PA up and to the right.

5-121. General Maintenance. These procedures contribute to the reduction and elimination of intermittent RF and PA operation. They should be performed whenever the assembly is removed for repair.

a. RF Tuner Trimmer Capacitors. The following procedure is to ensure proper mounting and grounding of trimmer capacitors C107, C115, C122, C127, and C141 (fig 5-27).

CAUTION

Trimmer capacitors are glass foil type. Use care to avoid damaging or breaking.

1. Remove side, bottom, and air manifold covers from assembly; retain all screws and washers.

2. Insert thin screwdriver or tuning tool into bottom of capacitors C107, C115, C122, C127, and C141 (fig 5-27); rotate each capacitor counterclockwise until the threaded portion clears the slotted portion of the mount.

3. Check that capacitor mounting locknuts are secure; do not over-tighten.

4. Bend slotted portions of each capacitor mount together slightly with long nose plier.

5. Insert screwdriver or tuning tool into bottom of capacitors and rotate clockwise until threaded portion extends above slotted portion of mount.

b. RF Tuner Inductors. The following procedure is to ensure positive contact of the inductor rings and positive grounding of the main tuning shaft (fig 5-21, 5-25, 5-27).

1. Clean both sides of the four semicircular inductor rings with CRAMOLIN, FSN 9Q6850-880-7007. These inductor rings are a part of the stator assembly Z101, Z103, Z105, and Z106 (fig 5-25).

2. Clean and lubricate the inductor ring surface of Z107 with CRAMOLIN. The Z107 inductor is a brass semicircular ring mounted on the ceramic plate of Z107 stator assembly (fig 5-25 and 5-30).

3. Eight sets of finger contacts provide grounding for the main tuning shaft. Rotate the shaft and clean the surface under each of these contacts with CRAMOLIN.

4. The rotor of Z108 is grounded by flange rings which bear on circular finger contacts (fig 5-25 and 5-31). Clean these surfaces with CRAMOLIN. Avoid bending or displacement of the finger contacts.

5. Remove tubes V104 and V105 (fig 5-25).

6. Inspect ceramic portions of tubes for imbedded metal particles or other foreign matter. (A pointed typewriter eraser may be used to remove foreign matter).

7. Clean metal portions of tubes with eraser.

8. Ensure tubes are clean and reinstall tubes.

9. If no further servicing in assembly is required, replace covers and install all screws and washers previously removed.

5-122. Tube and Other Component Replacement. The following are general procedures for tube and miscellaneous parts replacement.

NOTE

Tube shields and tube shield liners must be in place during all tests and when assembly is restored to normal operation.

a. Tubes in the RF and PA must be evaluated on a comparison basis. When a tube is suspect, set the AN/URC-9 to 399.9 MHz (or 399.95 MHz on AN/URC-9A). Locate a test point to which the stage is supplying output. Peak the input and output trimmers for that stage. Note the output level. Replace the tube under evaluation with a new tube. Repeak trimmers for maximum output. If the new tube shows improvement in output, retain the new tube. It may be necessary to repeat this procedure several times in order to select a satisfactory tube.

b. When replacing components in this assembly, the lead length and location of replacement part must be the same as for the part removed.

5-123. Replacement. When replacing the RF and PA, set the assembly into the RT-581 with the slot in coupler 0126 (fig 5-25) vertical and the keeper pin in the upper right corner when viewed from the front. Reverse removal procedure.

5-124. AUDIO AMPLIFIER AND MODULATOR. This assembly is shipboard repairable. All components are replaceable aboard ship.

5-125. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-13, 5-18, 5-50, and 5-51 during the following procedures:

a. Position RT-581 left side up (fig 5-18).

b. Disconnect plug P801 from jack J8 (fig 5-18).

c. Loosen five captive screws (F, fig 5-18).

d. Lift Audio Amplifier and Modulator from RT-581.

5-126. Replacement. Ensure that interconnecting cables are not damaged by pinching and chafing when replacing in case. Reverse removal procedures.

5-127. THIRD IF AMPLIFIER. This assembly is shipboard repairable. All components are replaceable aboard ship.

5-128. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-14, 5-19, and 5-47 through 5-49 during the following procedures:

a. Position RT-581 bottom side up (fig 5-19).

b. Disconnect plugs P502 and P501 from jacks J902 and J4, respectively (fig 5-14).

c. Loosen four captive screws (E, fig 5-19).

d. Lift 3rd IF Amplifier from RT-581.

5-129. Replacement. Ensure that interconnecting cables are not damaged by pinching and chafing when replacing in case. Cable W502 can be dressed and protected from damage by the installation of a nylon clamp. Instructions for installing this clamp are in EIB 731. Reverse removal procedures.

5-130. RELAY-FILTER. This assembly is shipboard repairable. All components are replaceable aboard ship.

5-131. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-15, 5-53, 5-54, and 5-55 during the following procedures:

a. Position RT-581 top side up and its rear facing the front (fig 5-15).

b. Loosen two captive screws that hold Relay-Filter to rear of chassis.

c. Pull Relay-Filter out of RT-581 with the handle provided (fig 5-15).

CAUTION

It may be necessary to energize Relay-Filter (with CX-8521 cable) to assist in fault location. Special attention is required in the use of test probes and tools to prevent damage to the assembly.

5-132. Replacement. Reverse the removal procedures.

CAUTION

After the Relay-Filter is replaced, check that blower hose is properly connected between blower outlet and the air duct for the RF and PA.

5-133. R/T CENTRIFUGAL FAN. Centrifugal fan assemblies with electronic speed increasers are not shipboard repairable.

5-134. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-12, 5-18, and 5-58 during the following procedures:

a. Position RT-581 left side up (fig 5-18).

b. Remove cover plate H-2 (fig 5-18).

c. Disconnect plug P1051 from jack J10 (fig 5-13).

d. Loosen four screws (H, fig 5-18).

e. Lift R/T Centrifugal Fan from RT-581 assembly; slide fan hose from the fan air outlet duct.

5-135. Lubrication and Repair. These procedures assume that the motor portion of the assembly is functioning properly. They should be performed whenever strobe measurement of the centrifugal fan speed is below standard (7000 rpm minimum at 115 vac input), or whenever there are other indications that the speed increaser requires lubrication or repair.

NOTE

Centrifugal fan assemblies with electronic speed increasers are not lubricated and are not shipboard repairable (fig 5-57, 5-58, and 5-59).

a. Remove R/T Centrifugal Fan as in paragraph 5-134.

b. Remove screws and front plate from centrifugal blower housing.

c. Loosen blower fan set screws; remove fan.

CAUTION

Care must be taken to prevent damage to electrical wiring.

d. Remove capacitor(s) retaining screws and swing capacitor(s) away from speed increaser.

e. Remove blower housing retaining screws; remove blower housing.

f. Remove speed increaser retaining screws; remove speed increaser.

NOTE

For all speed increasers which have the small bronze coupler-driver, a paper gasket is required between the speed increaser block and the motor end bell housing. If this gasket is missing or damaged during disassembly, a new one must be provided for reassembly. Make a gasket or order one by FSN 9Z5330-290-8495.

g. Remove the lock ring from the coupler-driver end of the speed increaser.

h. Gently tap the shaft of the speed increaser against a non-metallic surface until both bearings and the shaft can be lifted free of the speed increaser block. Use care that loose ball bearings do not drop out.

i. Use soft bristle brush and P-D-680 solvent to clean old lubricant from bearings and shaft. Clean inside of speed increaser block and coupler-driver with solvent.

j. Pack the space between the two bearings solid with grease to the diameter of the bearings. Use MIL-G-23827 grease for metal coupler-driver and MIL-C-15793 grease for phenolic coupler.

k. Reverse the procedure in steps b through i to reassemble. During reassembly, ensure that shim and compression washers inside the block are in proper position; that paper gasket is in place between speed increaser and motor housing; and that screws holding speed increaser to motor housing are tightened alternately to avoid misalignment of coupler-driver.

l. Reinstall assembly in RT-581 and perform fan speed measurement of paragraph 5-92.

m. Allow blower to run for 20 to 30 minutes and make another speed measurement (7000 rpm minimum).

n. If minimum speed requirement cannot be obtained after lubrication, and the speed increaser is of the metal coupler-driver type (fig 5-56), do not discard the assembly. Procure a replacement speed increaser FSN IN3020-201-6906, discard the old speed increaser and install new one. New speed increaser is pre-packed with grease. If speed increaser is a phenolic type coupler-driver, and minimum speed cannot be obtained, no further repair or replacement can be accomplished; this type may be discarded.

NOTE

As a further aid in identifying the type of assembly, figure 5-56 shows the repairable type. The repairable type has two motor capacitors and red lubrication decals. The non-repairable type has one motor capacitor and no lubrication decals.

5-136. Replacement. When replacing the R/T centrifugal fan, ensure that fan hose is properly connected between blower outlet and air duct to the RF and PA. If fan hose becomes cracked or otherwise damaged, procure a replacement (FSN IN4720-023-6753). Reverse the removal procedures.

5-137. 500 KHz FILTER (FL901) AND LOW-PASS FILTER (FL1101). These items are not shipboard repairable.

5-138. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-12 and 5-17 during the following procedures:

a. Position RT-581 right side up (fig 5-17).

b. Disconnect plugs P6, P502, P10 and P1101 from jacks J901, J902, J1101, and J108 respectively (fig 5-17).

c. Loosen three captive screws (I, fig 5-17).

d. Lift the Filter Assembly from RT-581.

e. Separate filters FL901 and FL1101 by removing the screws which fasten them together.

5-139. Replacement. Before replacing the Filter Assembly fasten FL901 and FL1101 together with the screws removed during step e above. Reverse the removal procedure.

5-140. BROADBAND SIDETONE AMPLIFIER. This assembly is shipboard repairable. All components are replaceable aboard ship.

5-141. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-12 and 5-17 during the following procedures:

a. Position RT-581 right side up (fig 5-17).

b. Disconnect plug P1601 from jack J9 (fig 5-17).

c. Loosen two captive screws (K, fig 5-17) that hold broadband sidetone assembly to RT-581.

d. Lift broadband sidetone assembly from RT-581.

5-142. Replacement. Reverse the removal procedures.

5-143. FRONT PANEL. This assembly is shipboard repairable. All components are replaceable aboard ship.

5-144. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-16 through 5-19, 5-63 and 5-64 during the following procedures:

a. Position RT-581 top side up (fig 5-16).

b. Remove four flat head and four round head screws, two of each are located on top and one of each is located on the right and left sides (J, fig 5-16, 5-17 and 5-18), that fasten shroud to RT-581 Front Panel.

c. Lift shroud straight up and off RT-581.

d. Disconnect plug P703 from jack J11 (fig 5-18).

e. Loosen coaxial connector P8 from jack J706 (fig 5-17).

f. Position RT-581 bottom side up; remove four roundhead screws (J, in fig 5-19) and lockwashers that fasten bottom of Front Panel to RT-581.

g. Carefully pull Front Panel straight off of RT-581, check that plug P8 disengages from jack J706.

5-145. Replacement. When replacing Front Panel, make certain that plug P8 mates with jack J706 as assembly is slid into position. Do not tighten any screws until all screws are in place. Reverse removal procedure.

5-146. FREQUENCY SELECTOR. This assembly is partially repairable aboard ship. Refer to paragraph 5-2 for those parts which are shipboard replaceable.

5-147. Removal. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99). Refer to figures 5-16 through 5-19 and 5-63 through 5-79 during the following procedures:

a. Remove Audio Amplifier and Modulator as in paragraph 5-125.

b. Remove R/T Centrifugal Fan as in paragraph 5-134.

c. Remove Front Panel as in paragraph 5-144.

d. Position RT-581 left side up (fig 5-18).

e. Remove two screws (K, fig 5-18) and lockwashers on the rear of the Frequency Selector adjacent to the space occupied by the R/T Centrifugal Fan.

f. Position RT-581 bottom side up. Remove three screws (L, fig 5-19) and lockwashers on the bottom of the chassis.

g. Remove hexhead screw (M, fig 5-18) on rear of Frequency Selector by inserting 1/4 inch Spin Tite wrench through cutout on chassis.

h. Disconnect plug P1201 from jack J12 (fig 5-18).

i. Position RT-581 top side up. Pull out plate mounting for jacks J7, J10, and J15 from clamp; remove two screws (N, fig 5-16) and lockwashers on the upper left corner.

j. Remove screws (P, fig 5-16) adjacent to the Directional Coupler in the upper right corner.

k. Remove two screws and lockwashers below and behind the memory drum; lift Frequency Selector from RT-581.

5-148. Component Replacement. Refer to figures 5-67, 5-68, 5-76, and 5-77 during the following procedures:

a. When relays K1201, K1202, K1203 or K1204 are replaced, refer to paragraph 5-70b for pawl action and gap adjustment procedures.

b. If drive motor B1201 requires replacement or repair, observe the dress of motor input leads and repeat this dress upon reassembly. Minor repairs (brushes & commutator) should be performed aboard ship.

c. Inspect wafer switch section S1202, S1203, and S1204 for broken wafers, loose contacts, and burned or pitted rotor or fixed contacts. Replace defective switch wafers as required. When replacing these switches, the rotor contacts must be in the correct position after replacement. Remove leads from defective switch one at a time; after each lead removal, solder that lead to the new switch. Position rotor of new switch exactly as the old rotor was positioned. Figure 5-67 (or 5-68) indicates correct position of switches when at rest on Channel M (399.9 MHz on AN/URC-9, 9Y, and 9AY; or 399.95 MHz on AN/URC-9A). Figure 5-77 indicates correct switch position when at rest on Channel 5 (220.0 MHz on AN/URC-9, 9Y, and 9AY; or 220.00 MHz on AN/URC-9A).

5-149. Lubrication. Lubrication of the Frequency Selector should be accomplished at least once a year but not more often than once every six months. Lubricate only those points which are accessible without disassembly of the gear plates.

CAUTION

Do not permit grease or oil to get into clutch assemblies. Oil or grease on clutch faces will cause operational failure of the Frequency Selector.

a. Lubricate teeth of all gears with a thin film of grease (MIL-G-23827A).

b. Lubricate cam faces with a thin film of grease (MIL-G-23827A).

c. Lubricate bore of cam follower 01299.4 (fig 5-71) with a thin film of grease (MIL-G-23827A).

d. Lubricate porous bronze bearings with one drop of oil (MIL-L-6085A).

e. Lubricate bores of differential planetary gears with one drop of oil (MIL-L-6085A).

f. Lubricate pawl pivot studs with one drop of oil (MIL-L-6085A).

5-150. Replacement. Adjust couplers of all assemblies to mate with Frequency Selector before replacing in RT-581. Do not tighten any screws until all screws are in place. Reverse the removal procedures.

5-151. RECEIVER-TRANSMITTER CASE CY-2959/URC-9. This assembly is shipboard repairable. All components are repairable aboard ship.

5-152. Removal Of Case CY-2959/URC-9 Centrifugal Fan. Remove power supply as in paragraph 5-97. Refer to figures 5-13, 5-60, and 5-62 during the following procedures:

a. While supporting the centrifugal fan, disconnect plug P1401 and loosen four screws and associated hardware that hold the fan to the case.

b. Remove the centrifugal fan.

5-153. Cleaning of Case and Fan. Cleaning of the case and fan must be accomplished at least once every six months. Cleaning of the filter is required at least once each month. Refer to figure 5-60 during the following procedures.

a. Remove power supply and centrifugal fan as in paragraph 5-152.

b. Remove RT-581 as in paragraph 5-100 (observing the caution in paragraph 5-99).

c. Cover the power supply and RT-581 with paper on thin plastic to avoid contamination by dirt and dust.

d. Remove the left louver screen and right exhaust grill from sides of case. If case is installed in cabinet type enclosure, it may be necessary to remove it from the enclosure before this step is performed.

e. Brush and vacuum all accumulated dirt and dust from both louver screen and exhaust grill.

f. Remove filter through opening created by removal of left louver screen. (Filter may also be removed from inside power supply cavity by removing 6 screws from front retainer clip.)

g. Vacuum or use clean compressed air to clean all accumulated dirt and dust from filter.

h. Brush and vacuum all accumulated dirt and dust from the fan blades and fan housing of the case centrifugal fan.

i. Brush and vacuum all dirt and dust from the space between the case walls and the corrugated likers.

j. Vacuum remaining dust and dirt from the power supply cavity and the receiver-transmitter cavity.

k. Reinstall filter.

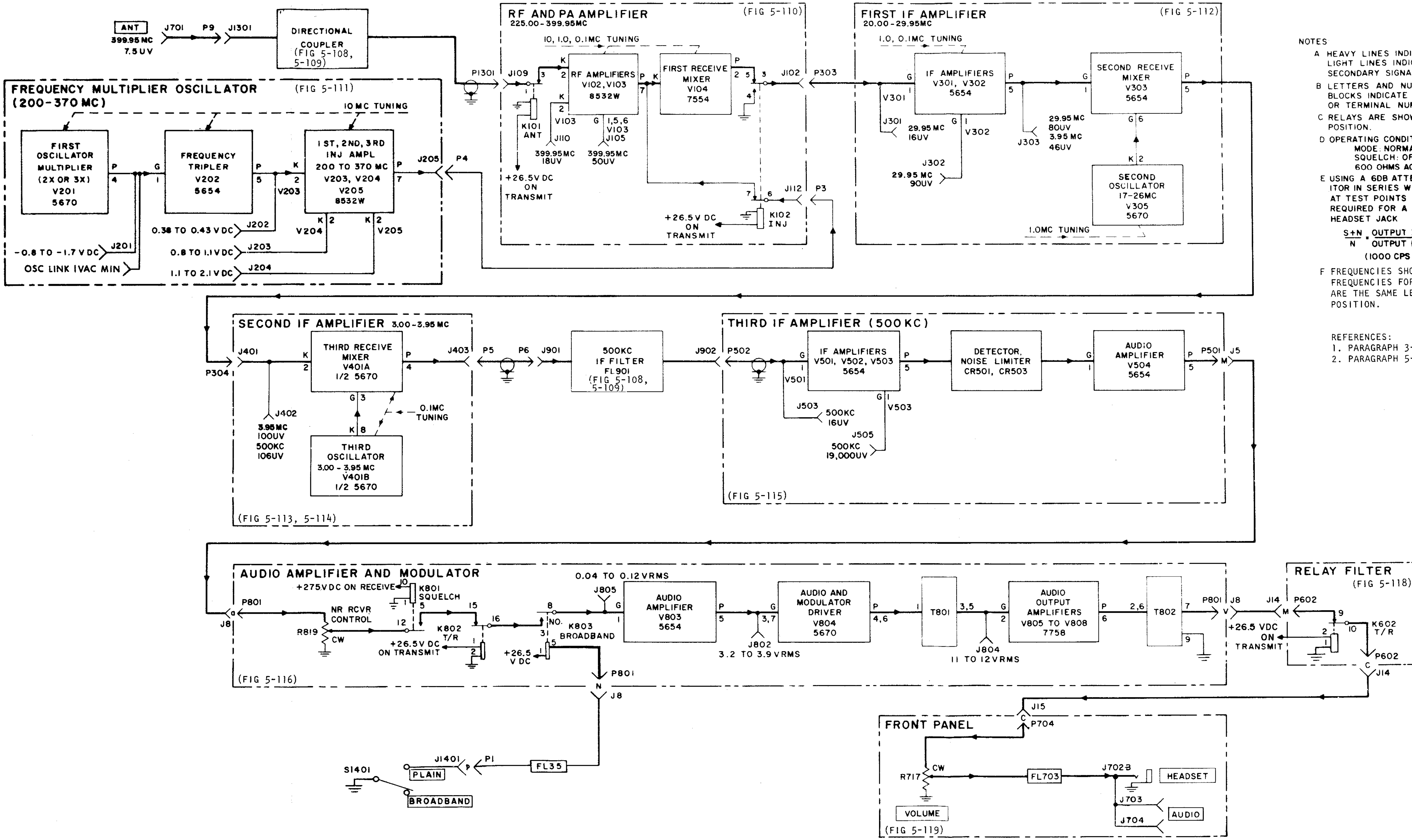
l. Reinstall left screen louver and right exhaust grill.

m. Reinstall fan.

n. Reinstall power supply and RT-581.

o. Restore AN/URC-9 to normal condition.

5-154. Replacement of Case Centrifugal Fan. Reverse the removal procedures.



NOTES

A HEAVY LINES INDICATE MAIN SIGNAL PATH, LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.

B LETTERS AND NUMBERS OUTSIDE TUBE BLOCKS INDICATE ELEMENT AND PIN OR TERMINAL NUMBERS.

C RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

D OPERATING CONDITIONS
MODE: NORMAL
SQUELCH: OFF
600 OHMS ACROSS HEADSET JACK

E USING A 6DB ATTENUATOR AND 0.01UF CAPACITOR IN SERIES WITH TEST EQUIPMENT, VALUES AT TEST POINTS ARE INJECTION LEVELS REQUIRED FOR A S+N/N RATIO OF 10DB AT HEADSET JACK

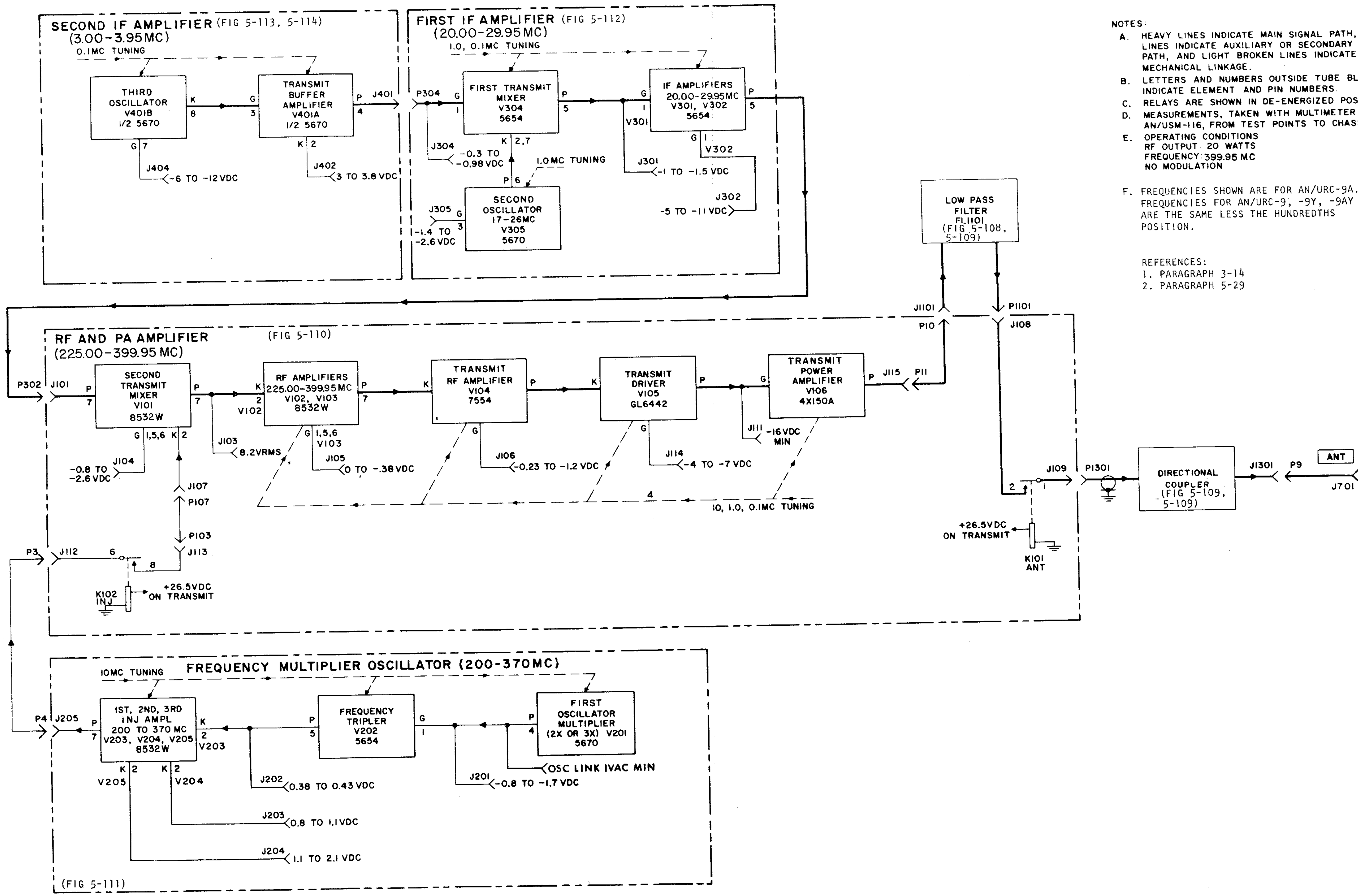
$$\frac{S+N}{N} = \frac{\text{OUTPUT 30\% MODULATED}}{\text{OUTPUT NOT MODULATED}}$$

(1000 CPS MODULATION)

F FREQUENCIES SHOWN ARE FOR AN/URC-9A. FREQUENCIES FOR AN/URC-9, 9Y, AND 9AY ARE THE SAME LESS THE HUNDREDTHS POSITION.

REFERENCES:
1. PARAGRAPH 3-77
2. PARAGRAPH 5-29

Figure 5-1. Radio Set AN/URC-9( ), Receive Function Troubleshooting Block Diagram



NOTES:

A. HEAVY LINES INDICATE MAIN SIGNAL PATH, LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATH, AND LIGHT BROKEN LINES INDICATE MECHANICAL LINKAGE.

B. LETTERS AND NUMBERS OUTSIDE TUBE BLOCKS INDICATE ELEMENT AND PIN NUMBERS.

C. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

D. MEASUREMENTS, TAKEN WITH MULTIMETER AN/USM-116, FROM TEST POINTS TO CHASSIS.

E. OPERATING CONDITIONS
RF OUTPUT: 20 WATTS
FREQUENCY: 399.95 MC
NO MODULATION

F. FREQUENCIES SHOWN ARE FOR AN/URC-9A. FREQUENCIES FOR AN/URC-9, -9Y, -9AY ARE THE SAME LESS THE HUNDREDTHS POSITION.

REFERENCES:
1. PARAGRAPH 3-14
2. PARAGRAPH 5-29

Figure 5-2. Radio Set AN/URC-9( ), Transmit RF Function Troubleshooting Block Diagram

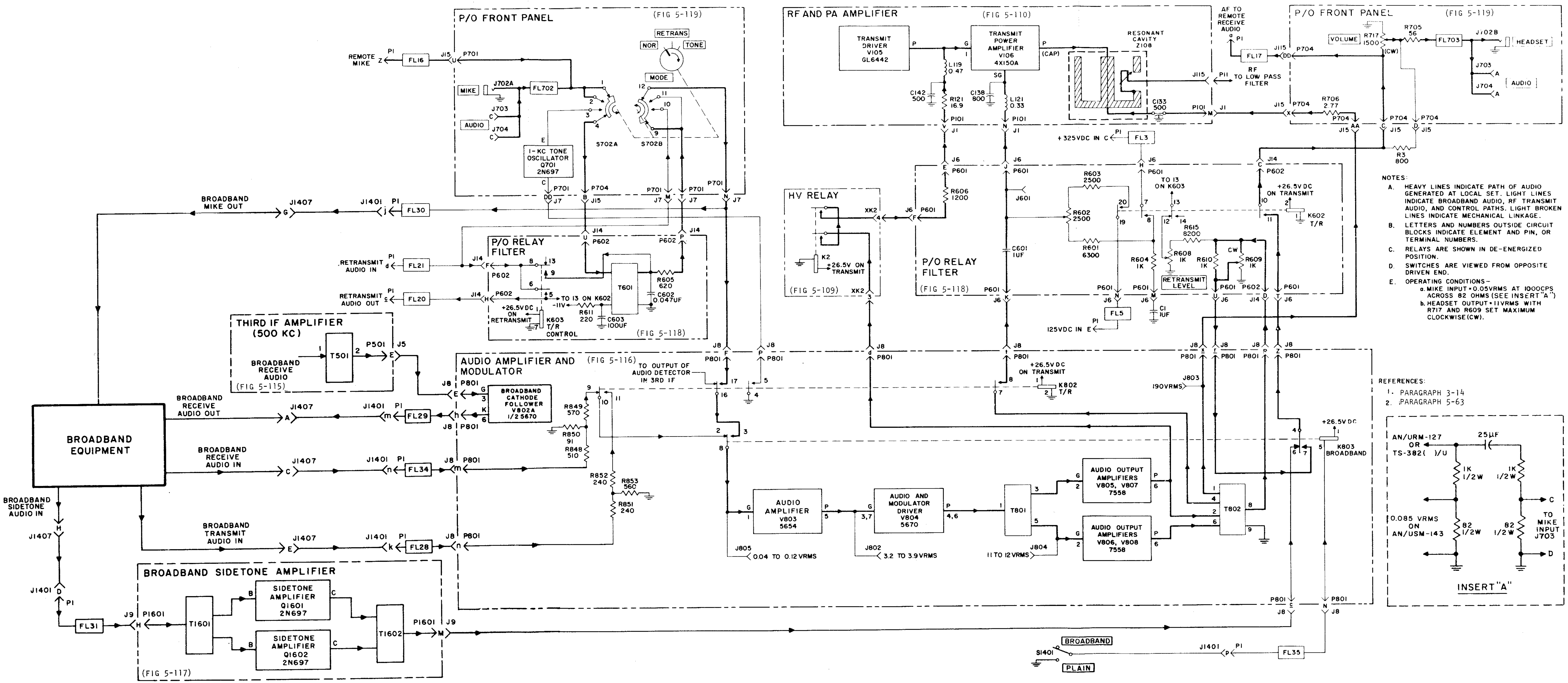
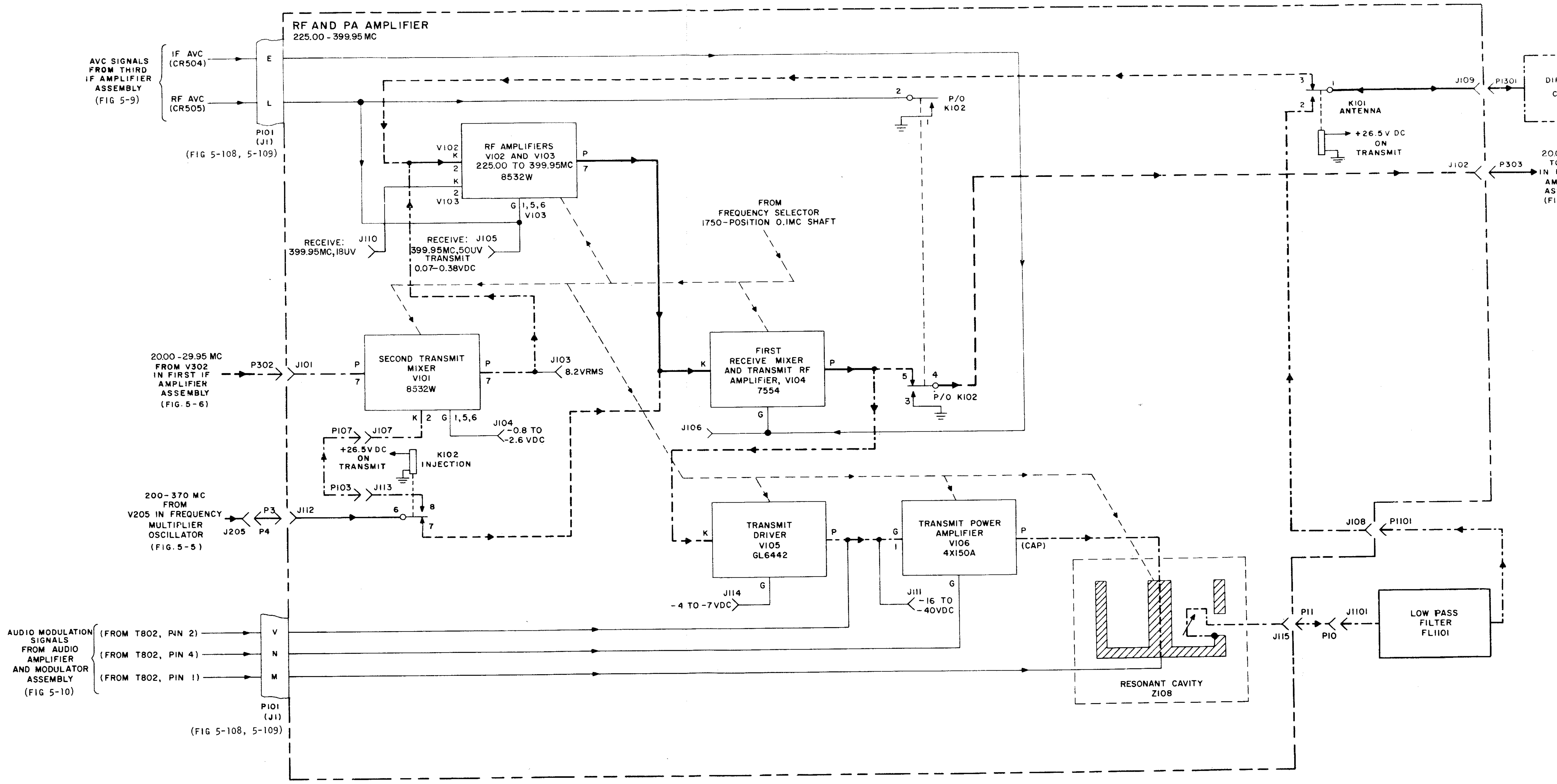


Figure 5-3. Radio Set AN/URC-9( ), Transmit Audio Function and Broadband Mode Troubleshooting Block Diagram



NOTES

A. LEGEND

- — · — · — TRANSMIT SIGNAL PATH
- – – – – RECEIVE SIGNAL PATH
- ━━━━━ TRANSMIT AND RECEIVE SIGNAL PATH
- ───── AUXILIARY OR CONTROL SIGNAL PATH
- - - - - - MECHANICAL LINKAGE

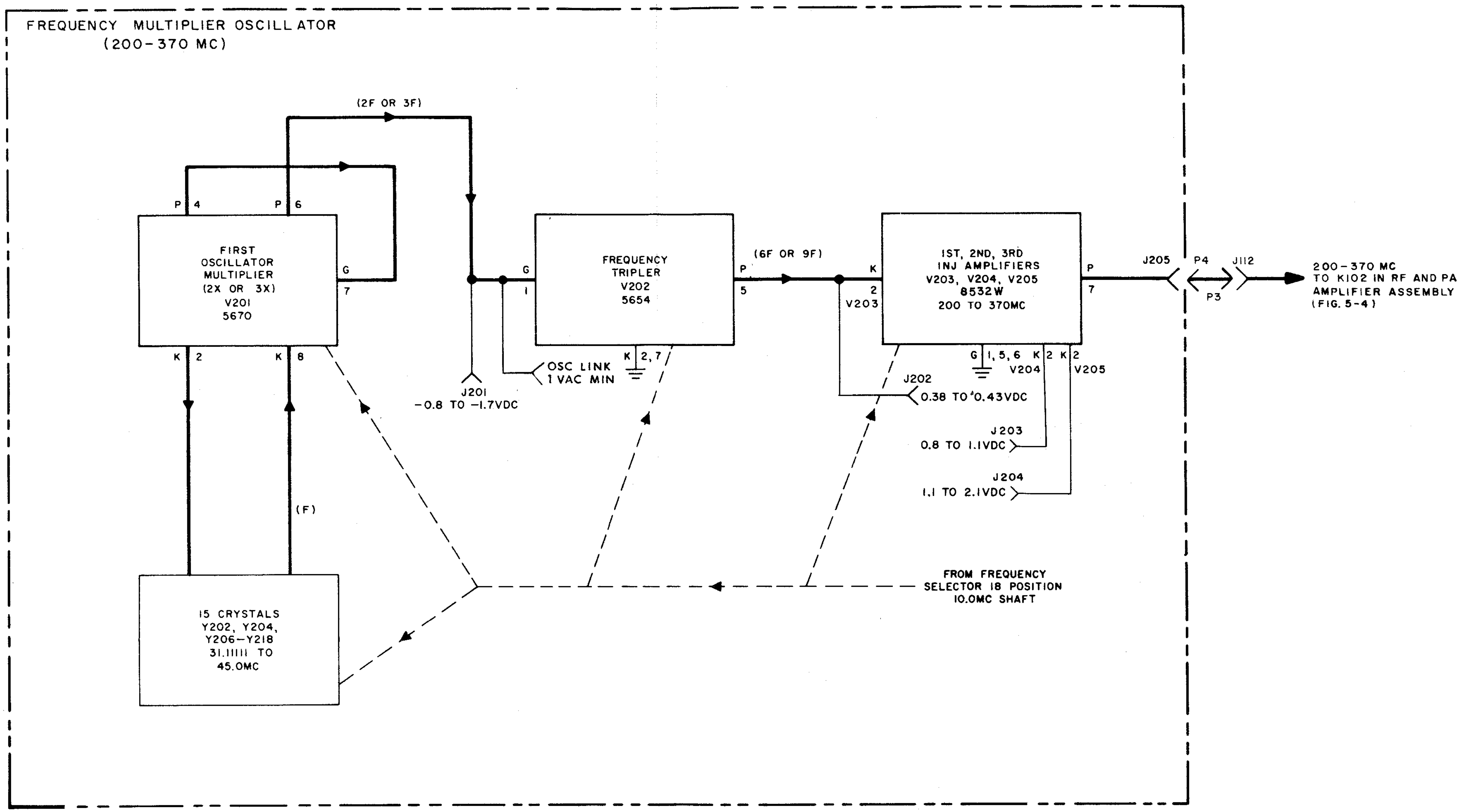
B. LETTERS AND NUMBERS OUTSIDE CIRCUIT OR TUBE BLOCKS INDICATE ELEMENT AND PIN OR TERMINAL NUMBERS.

C. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

D. FREQUENCIES SHOWN ARE FOR AN/URC-9A. FREQUENCIES FOR AN/URC-9, -9Y, AND -9AY ARE THE SAME LESS THE HUNDREDTHS POSITION.

REFERENCES:
1. PARAGRAPH 3-41
2. PARAGRAPH 3-83

Figure 5-4. RF and PA Amplifier Assembly, Servicing Block Diagram



NOTES:

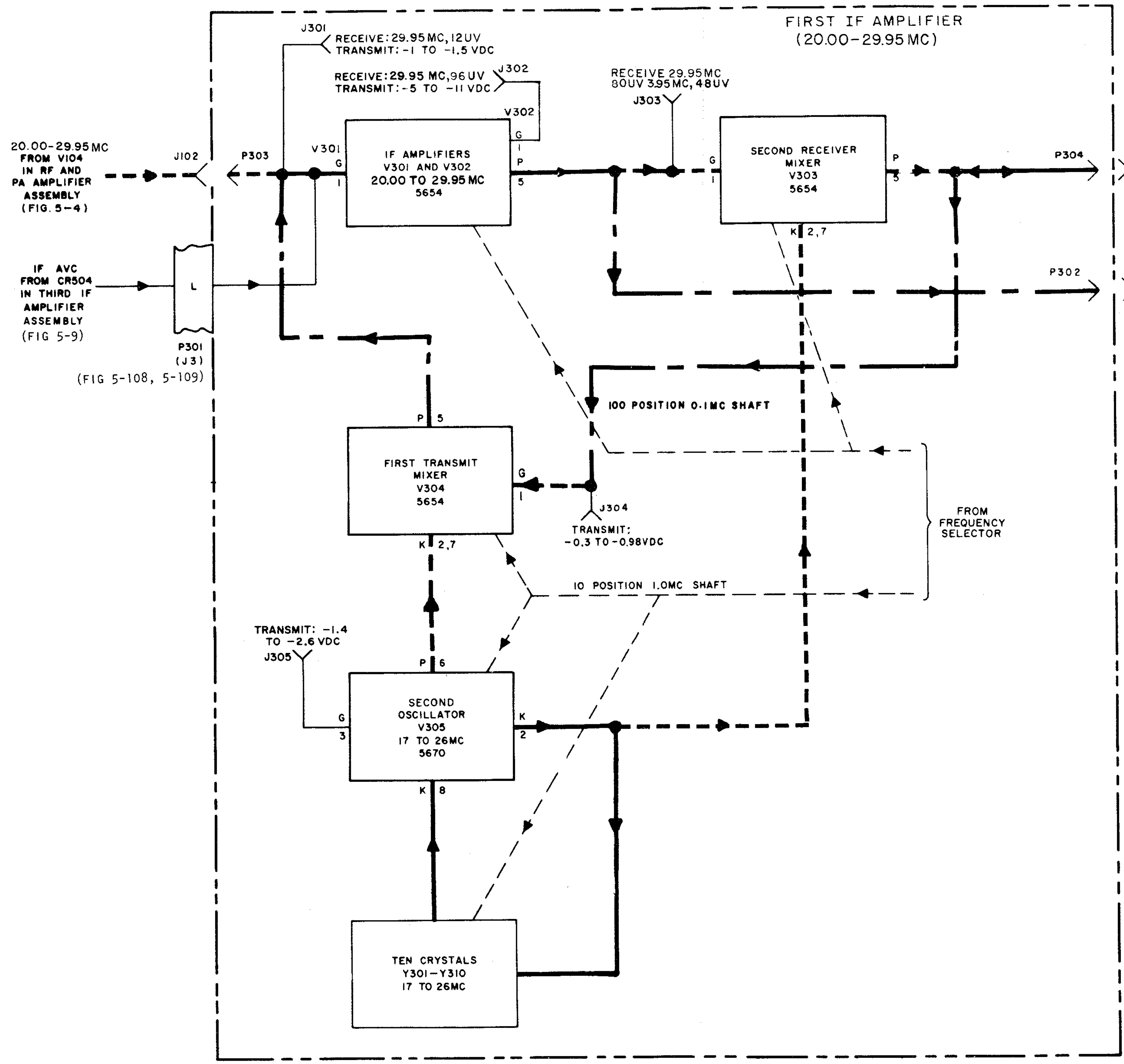
A. HEAVY LINES INDICATE SIGNAL PATH DURING TRANSMIT AND RECEIVE. LIGHT BROKEN LINES INDICATE MECHANICAL LINKAGE.

B. LETTERS AND NUMBERS OUTSIDE CIRCUIT BLOCKS INDICATE ELEMENT AND PIN NUMBER.

REFERENCE

PARAGRAPH 3-88

Figure 5-5. Frequency Multiplier-Oscillator Assembly, Servicing Block Diagram



NOTES

A. LEGEND

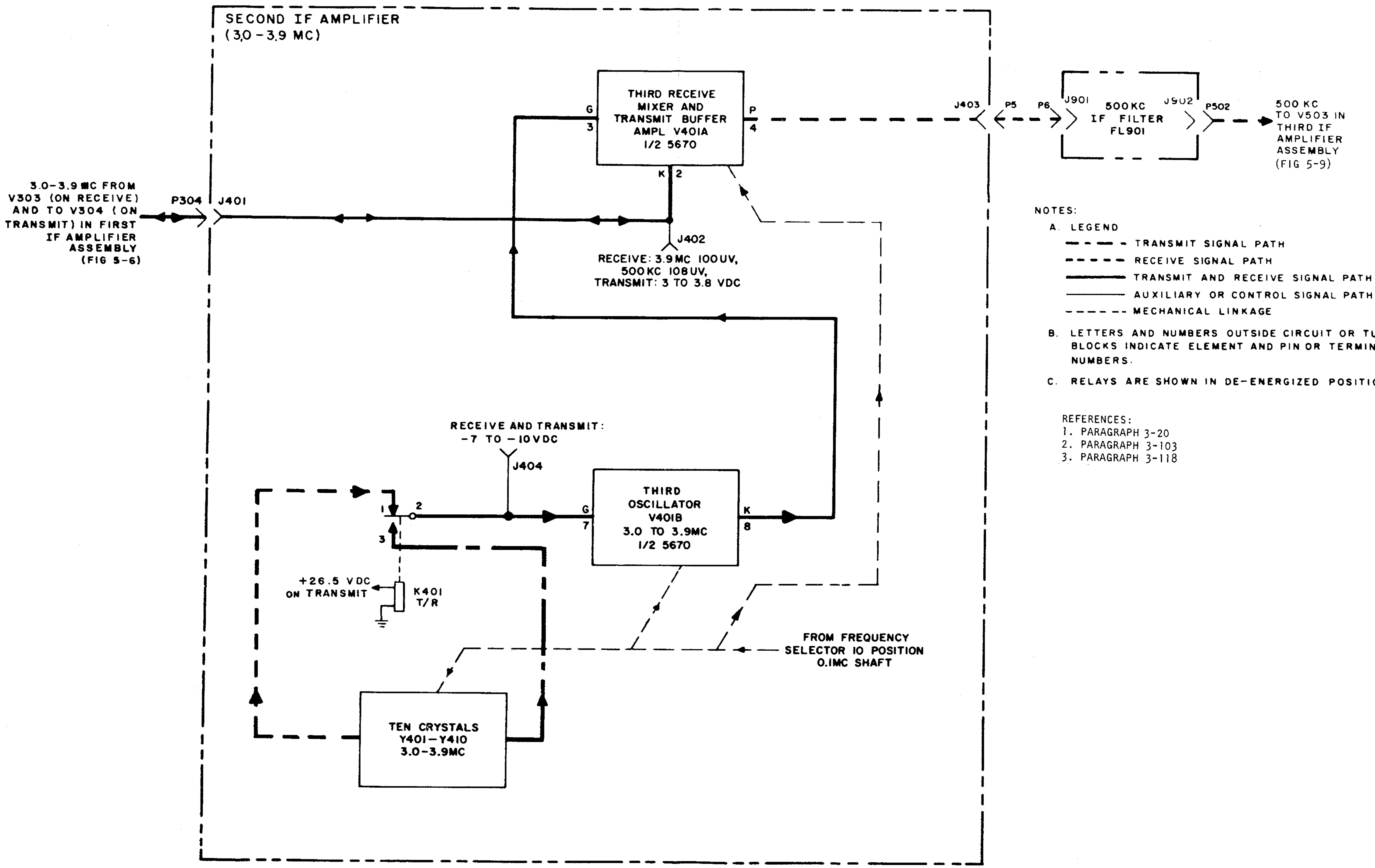
- TRANSMIT SIGNAL PATH
- RECEIVE SIGNAL PATH
- TRANSMIT AND RECEIVE SIGNAL PATH
- AUXILIARY OR CONTROL SIGNAL PATH
- MECHANICAL LINKAGE

B. LETTERS AND NUMBERS OUTSIDE CIRCUIT OR TUBE BLOCKS INDICATE ELEMENT AND PIN OR TERMINAL NUMBERS.

C. FREQUENCIES SHOWN ARE FOR AN/URC-9A. FREQUENCIES FOR AN/URC-9, 9Y, AND 9AY ARE THE SAME LESS THE HUNDREDTHS POSITION.

REFERENCES:
1. PARAGRAPH 3-28
2. PARAGRAPH 3-96

Figure 5-6. First IF Amplifier Assembly, Servicing Block Diagram



NOTES:

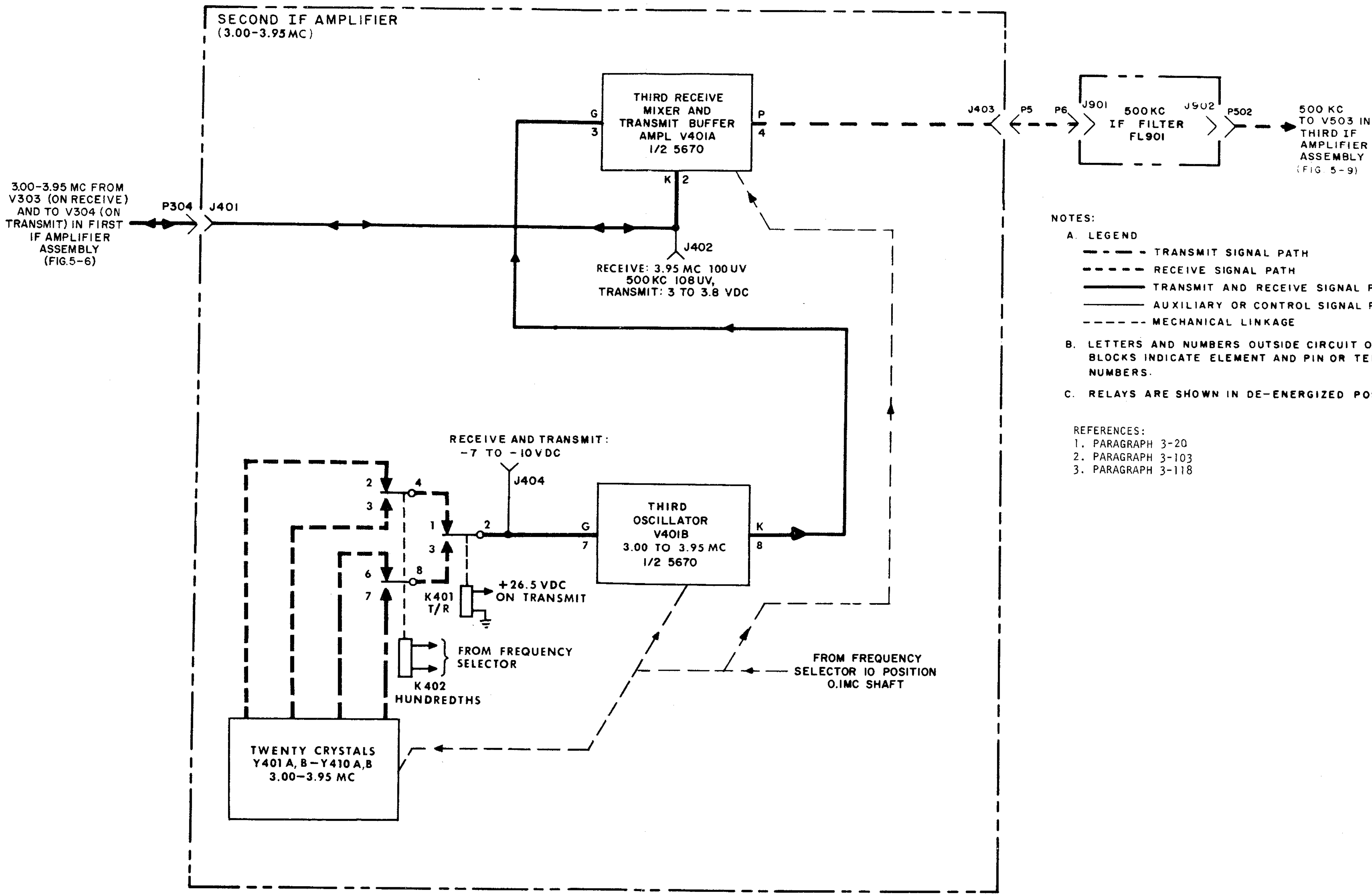
A. LEGEND
- TRANSMIT SIGNAL PATH
- RECEIVE SIGNAL PATH
- TRANSMIT AND RECEIVE SIGNAL PATH
- AUXILIARY OR CONTROL SIGNAL PATH
- MECHANICAL LINKAGE

B. LETTERS AND NUMBERS OUTSIDE CIRCUIT OR TUBE BLOCKS INDICATE ELEMENT AND PIN OR TERMINAL NUMBERS.

C. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

REFERENCES:
1. PARAGRAPH 3-20
2. PARAGRAPH 3-103
3. PARAGRAPH 3-118

Figure 5-7. Second IF Amplifier Assembly, Servicing Block Diagram (AN/URC-9, 9Y, 9AY)



NOTES:

A. LEGEND

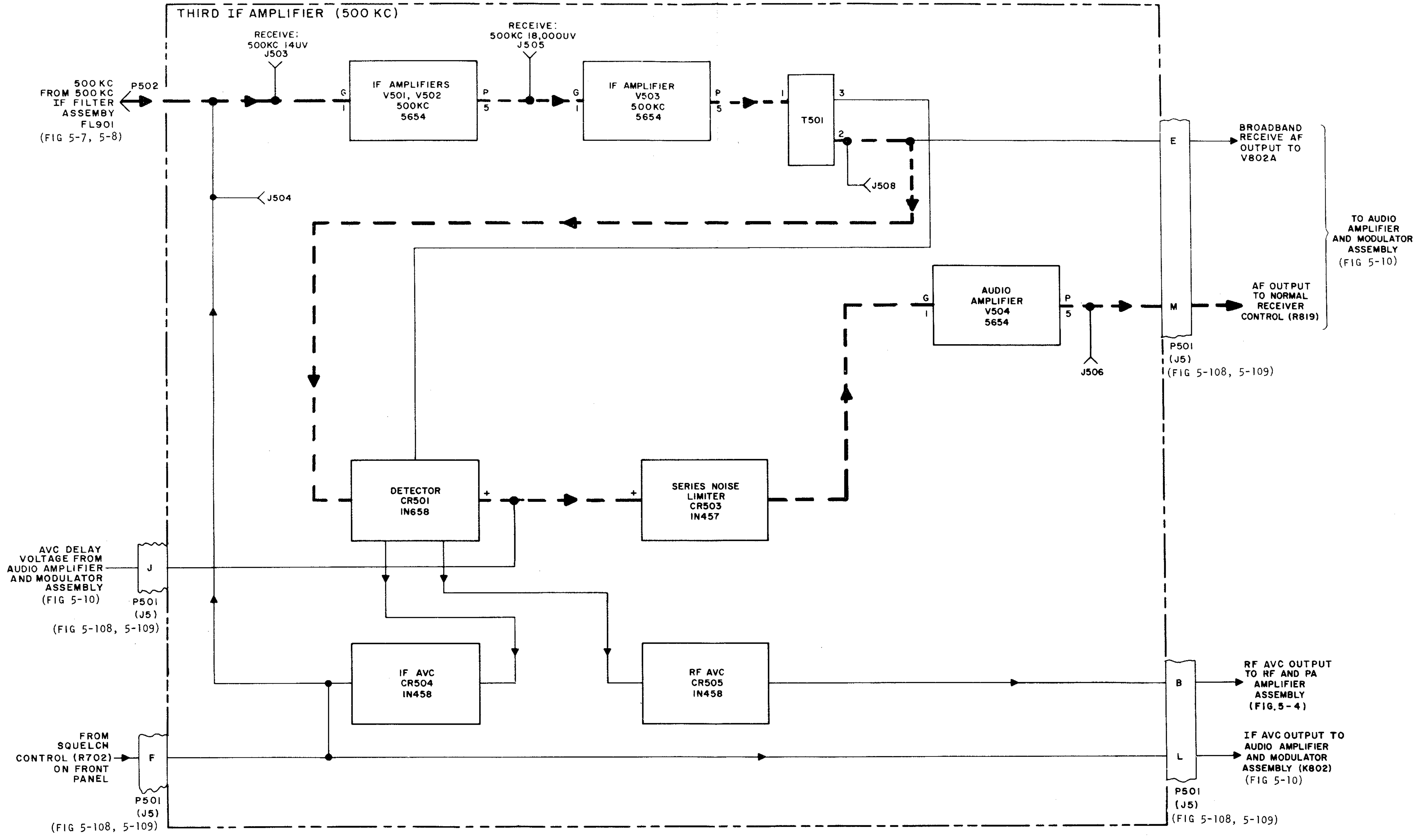
- TRANSMIT SIGNAL PATH
- RECEIVE SIGNAL PATH
- TRANSMIT AND RECEIVE SIGNAL PATH
- AUXILIARY OR CONTROL SIGNAL PATH
- MECHANICAL LINKAGE

B. LETTERS AND NUMBERS OUTSIDE CIRCUIT OR TUBE BLOCKS INDICATE ELEMENT AND PIN OR TERMINAL NUMBERS.

C. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

REFERENCES:
1. PARAGRAPH 3-20
2. PARAGRAPH 3-103
3. PARAGRAPH 3-118

Figure 5-8. Second IF Amplifier Assembly, Servicing Block Diagram (AN/URC-9A)



NOTES:

A. HEAVY BROKEN LINES INDICATE RECEIVE SIGNAL PATH; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.

B. LETTERS AND NUMBERS OUTSIDE CIRCUIT BLOCKS INDICATE ELEMENT AND PIN OR TERMINAL NUMBERS.

REFERENCE:

PARAGRAPH 3-120

Figure 5-9. Third IF Amplifier Assembly, Servicing Block Diagram

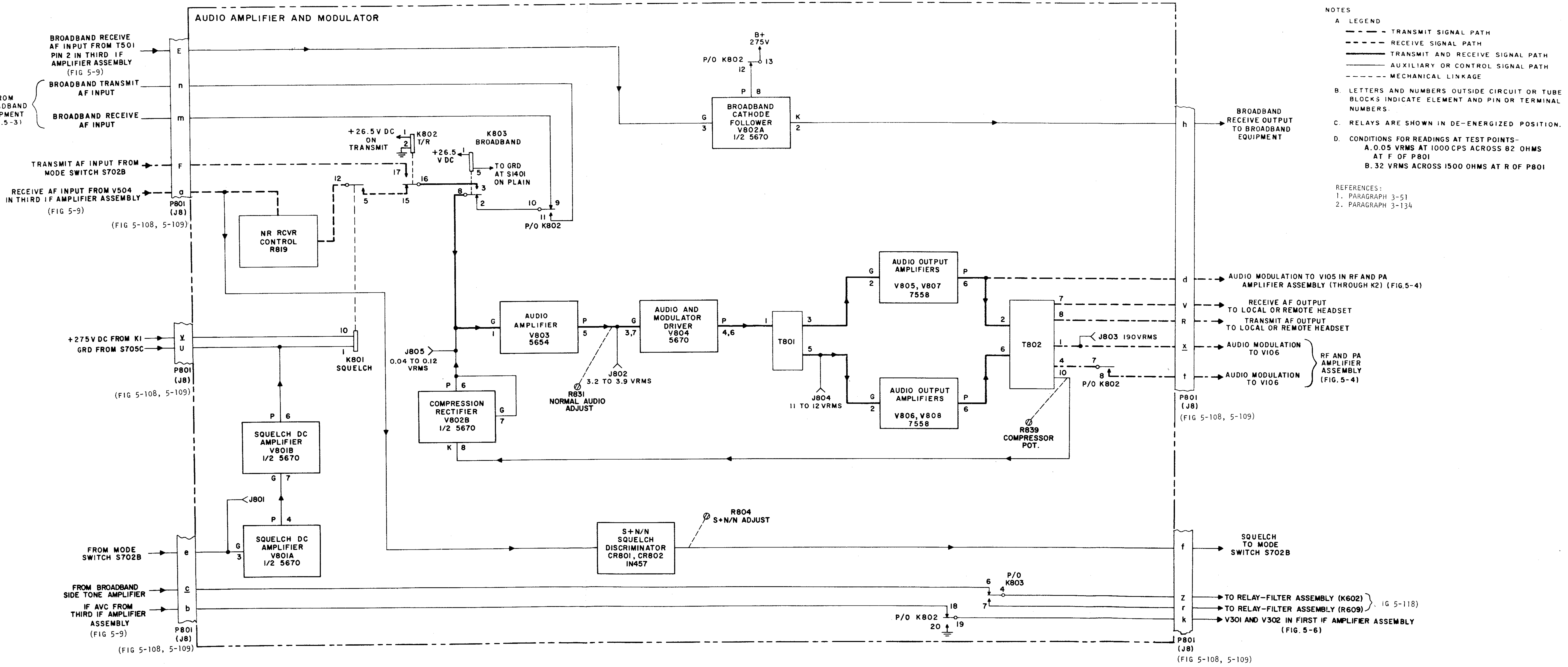


Figure 5-10. Audio Amplifier and Modulator Assembly, Servicing Block Diagram

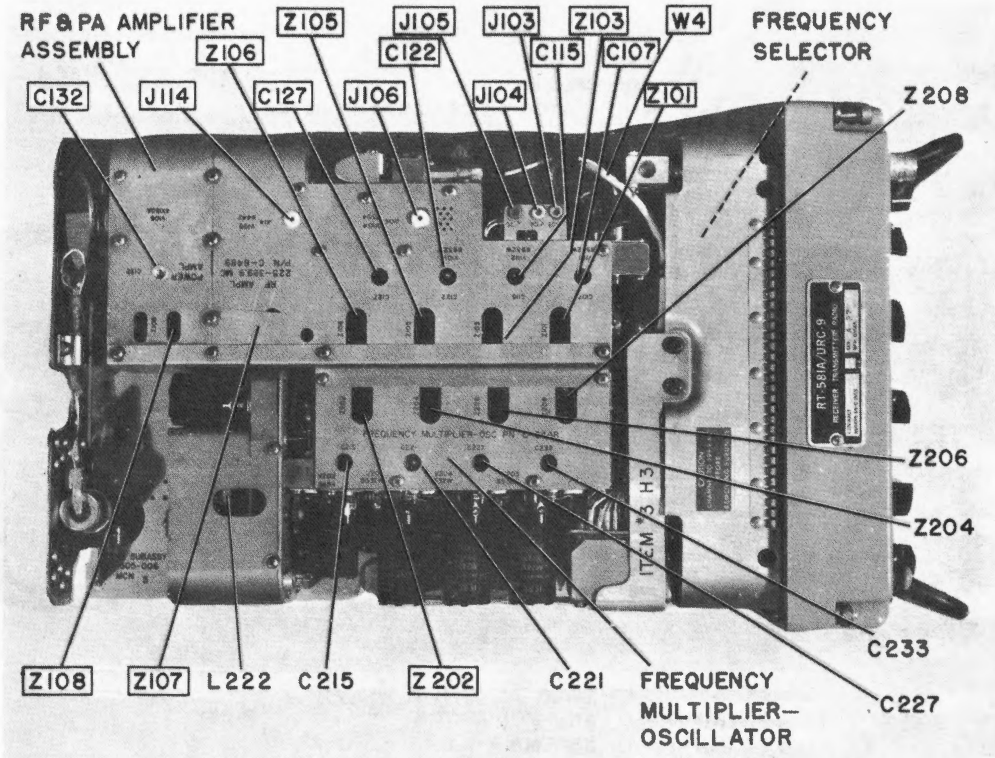


Figure 5-11. Receiver Transmitter RT-581( )/URC-9, Top View

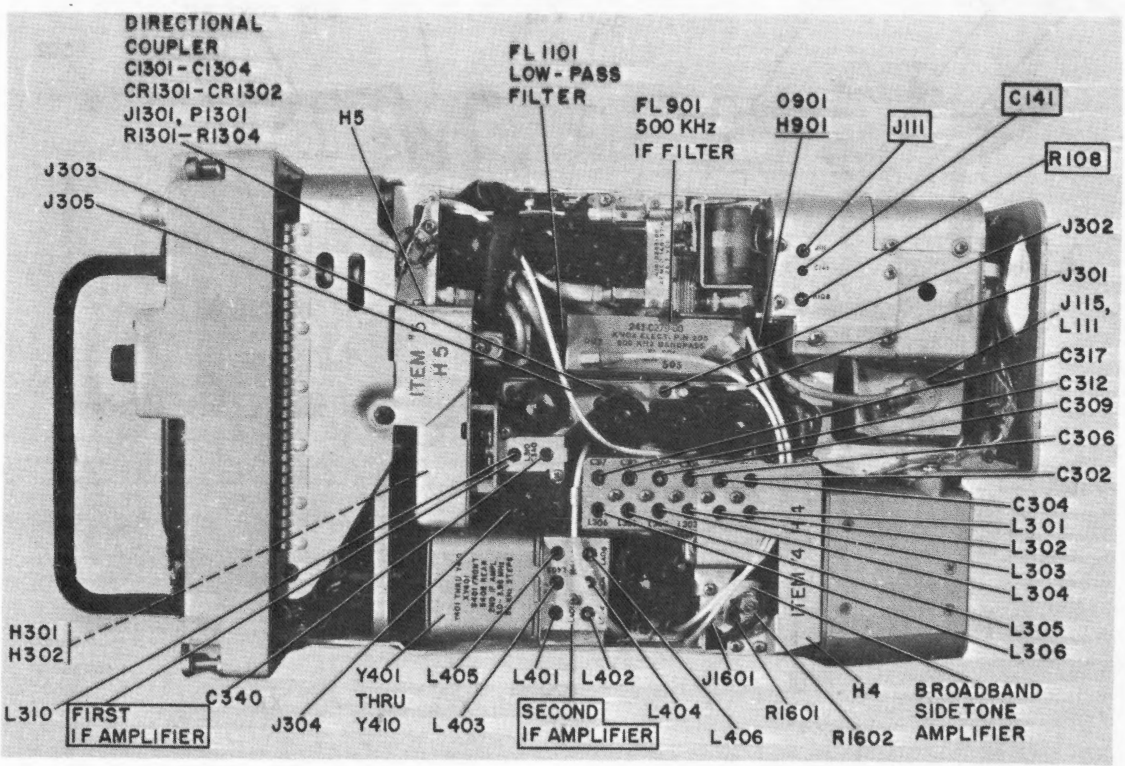


Figure 5-12. Receiver Transmitter RT-581( )/URC-9, Right Side

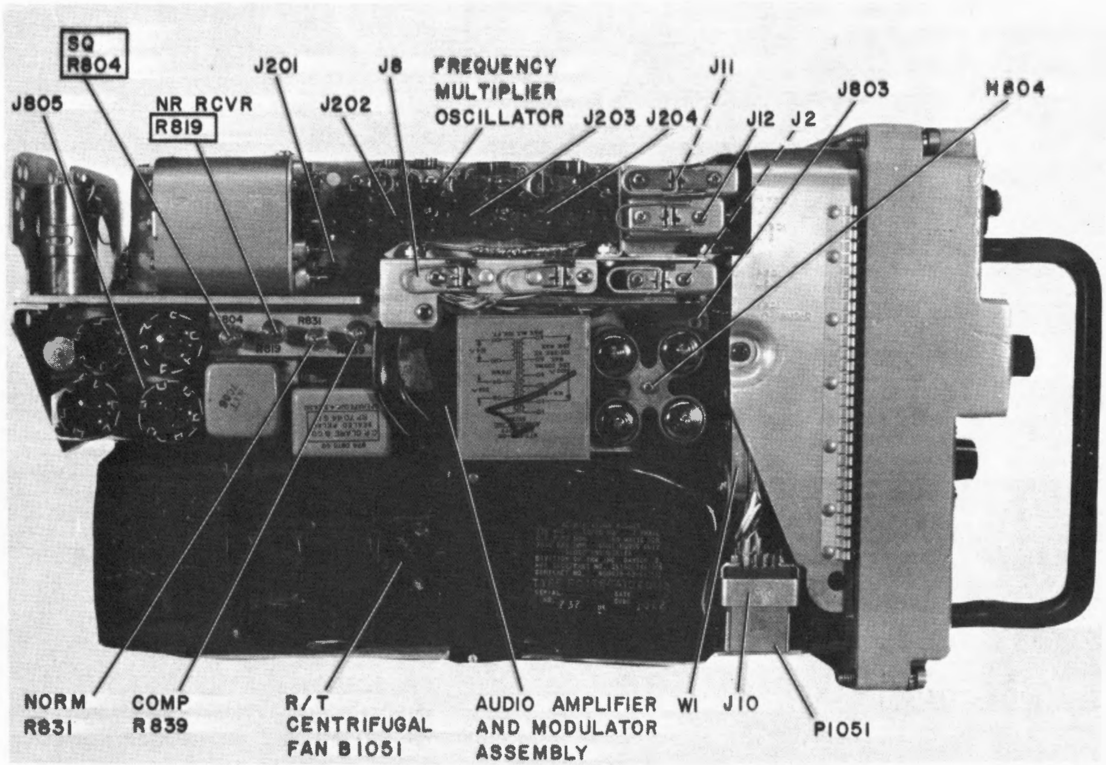


Figure 5-13. Receiver Transmitter RT-581( )/URC-9, Left Side

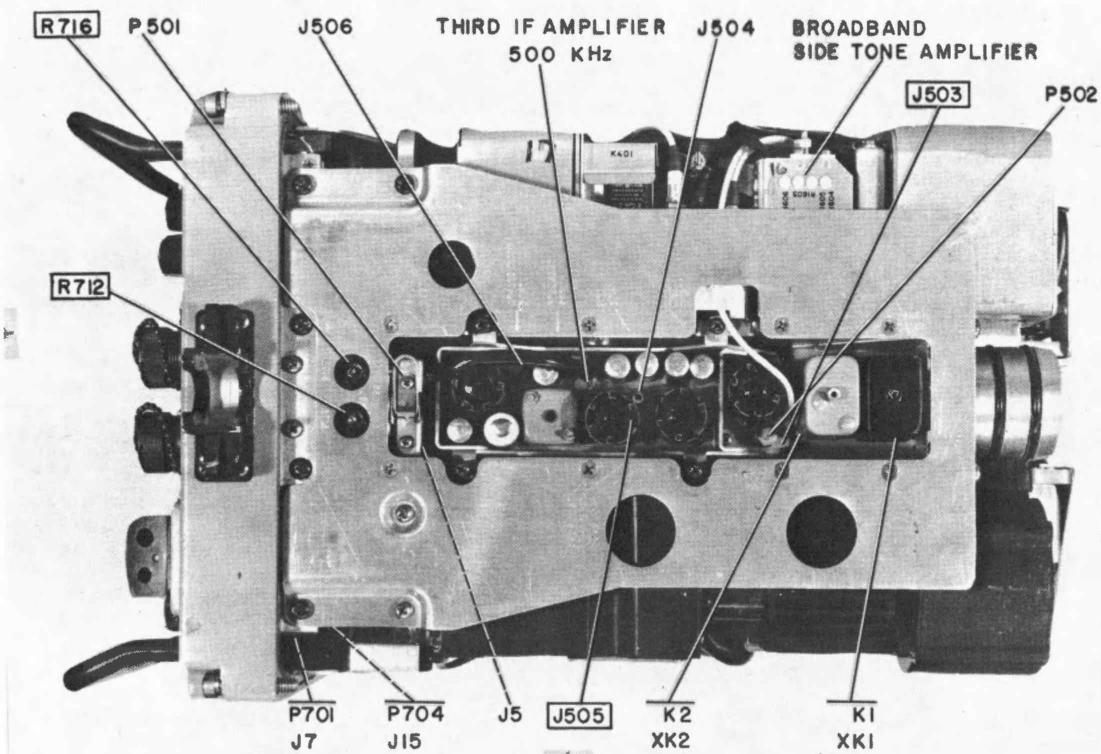


Figure 5-14. Receiver Transmitter RT-581( )/URC-9, Bottom View

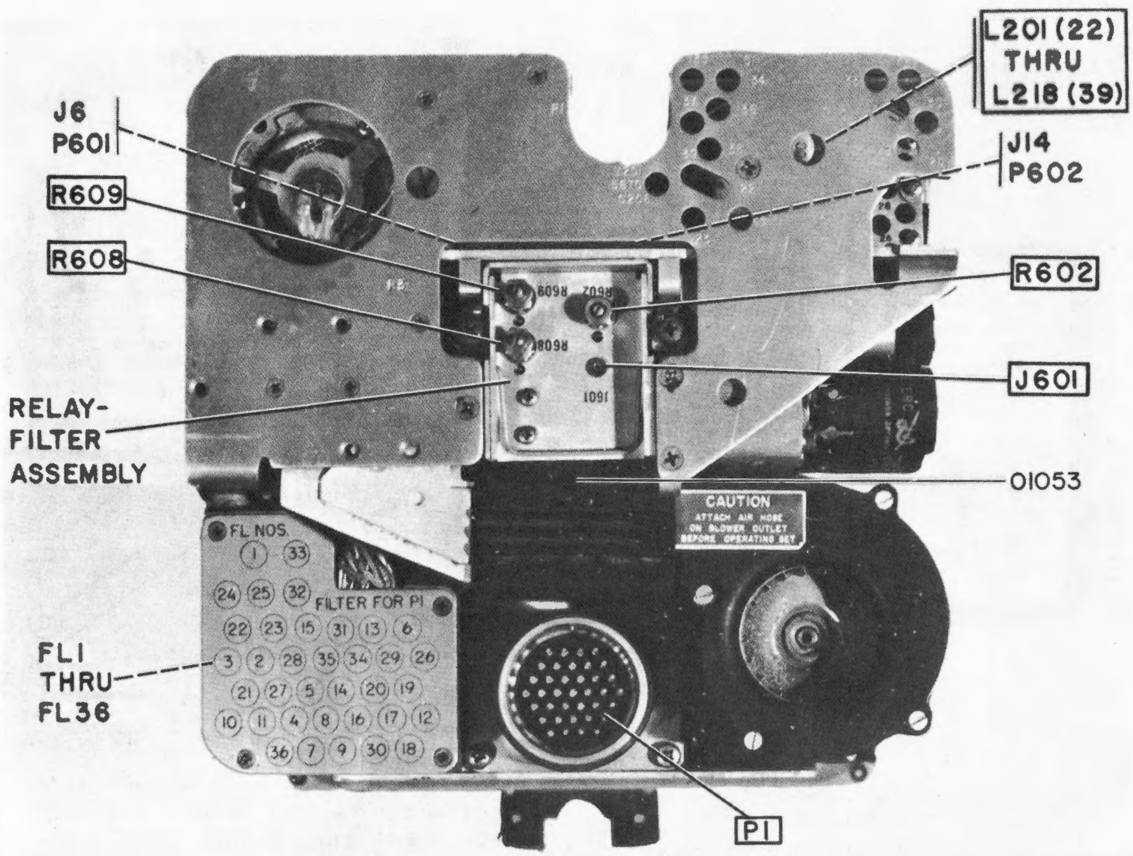


Figure 5-15. Receiver Transmitter RT-581( )/URC-9, Rear View

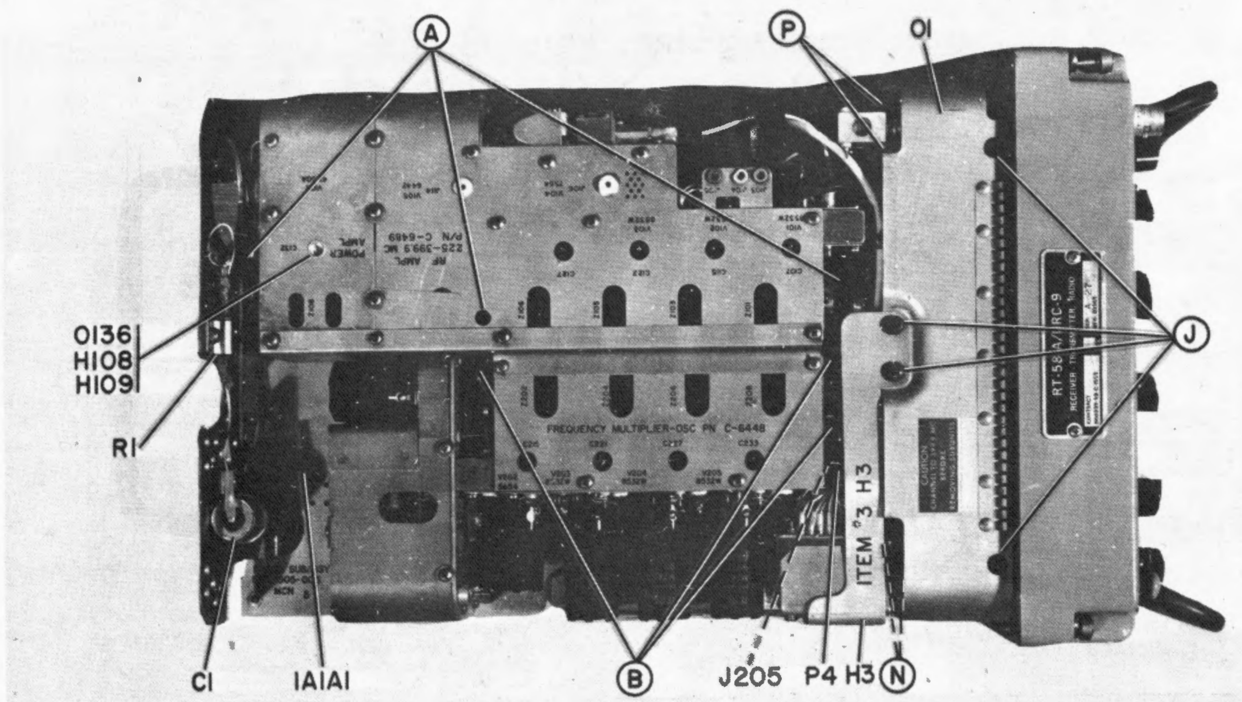


Figure 5-16. Receiver Transmitter RT-581( )/URC-9
Top View, Subassembly Removal

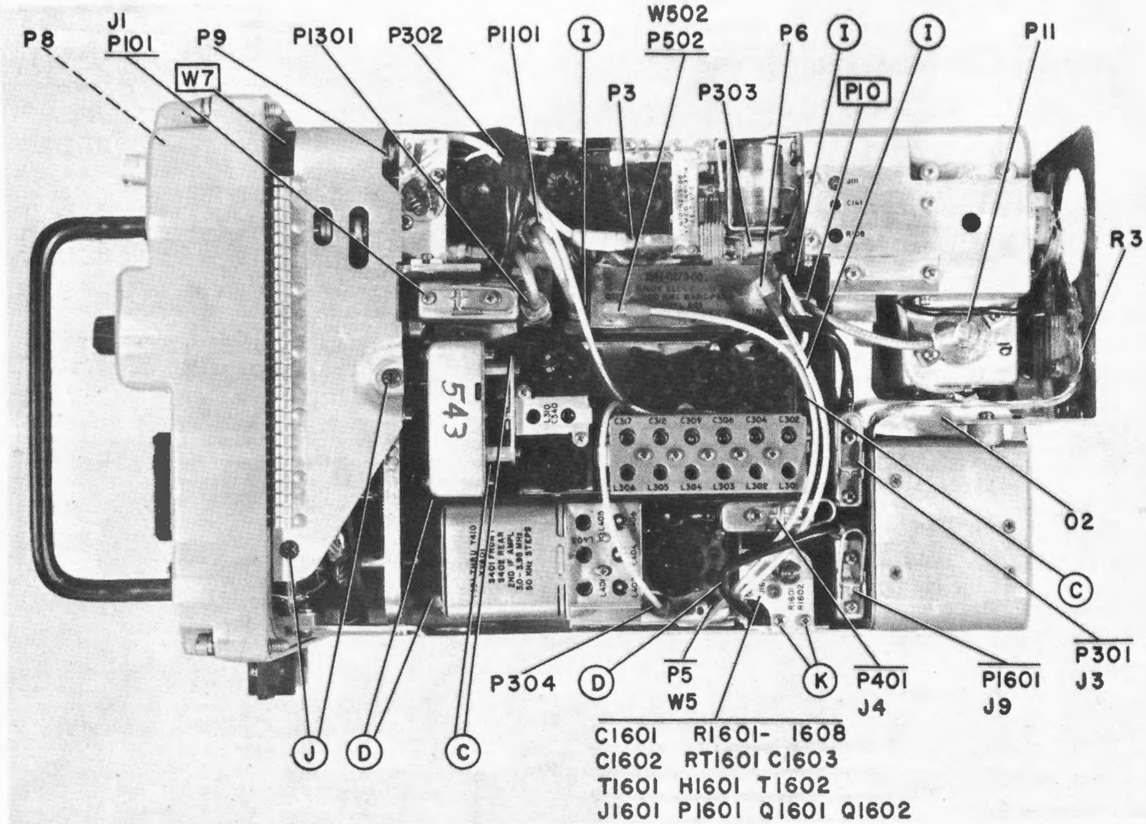


Figure 5-17. Receiver Transmitter RT-581( )/URC-9, Right Side, Subassembly Removal

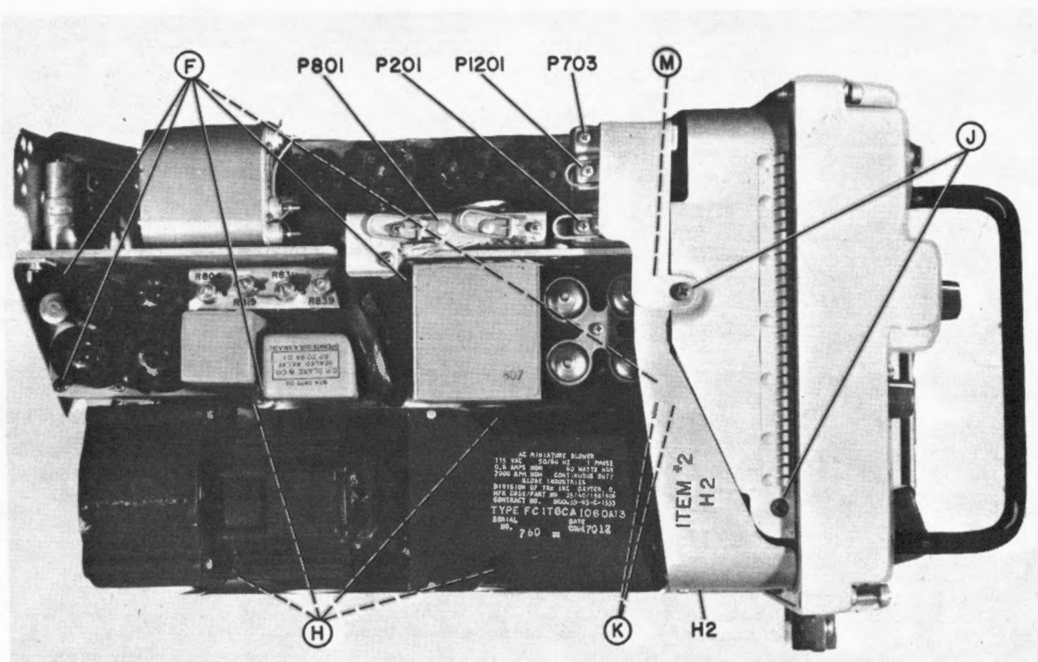


Figure 5-18. Receiver Transmitter RT-581( )/URC-9, Left Side, Subassembly Removal

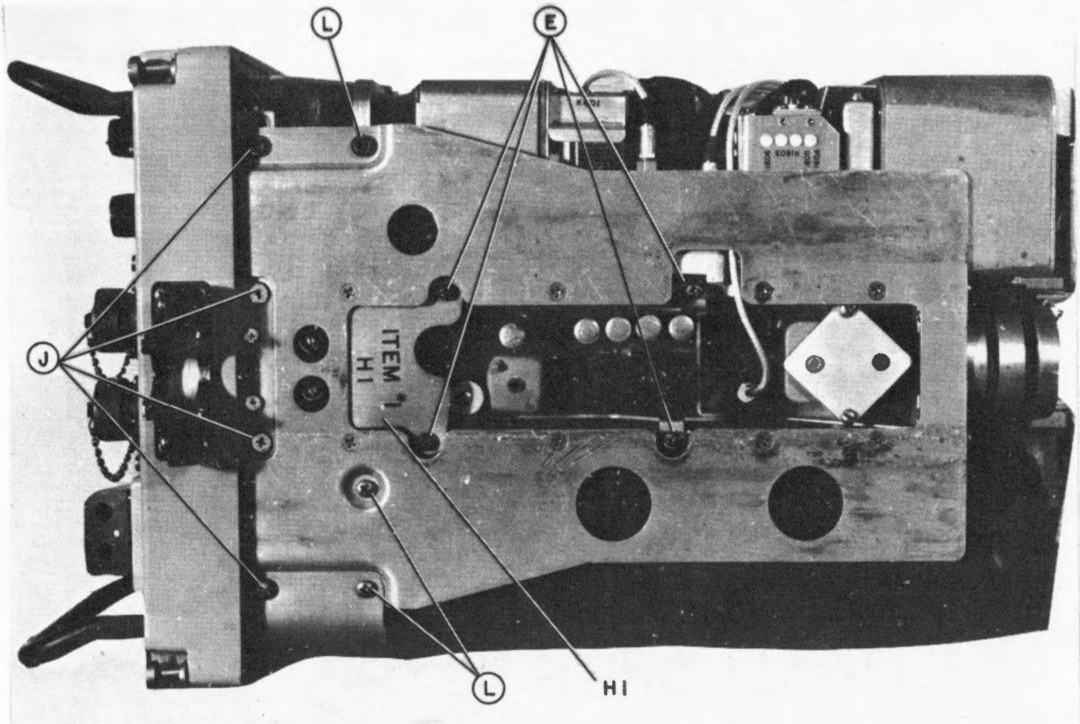


Figure 5-19. Receiver Transmitter RT-581( )/URC-9, Bottom View, Subassembly Removal

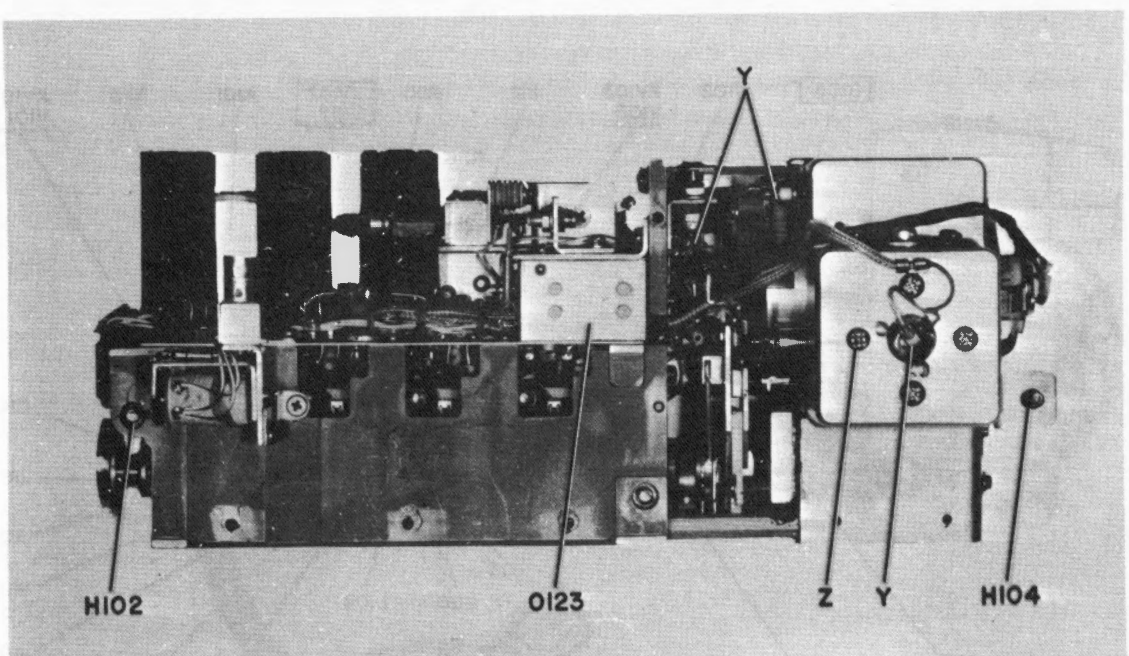


Figure 5-20. RF and PA Amplifier Assembly, Right Side, Disassembly Points

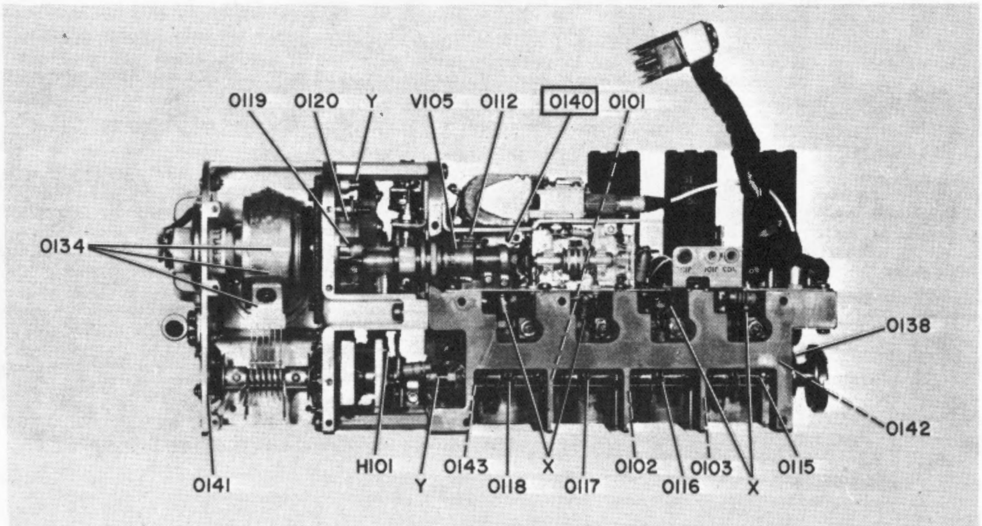


Figure 5-21. RF and PA Amplifier Assembly,
Left Side, Disassembly Points

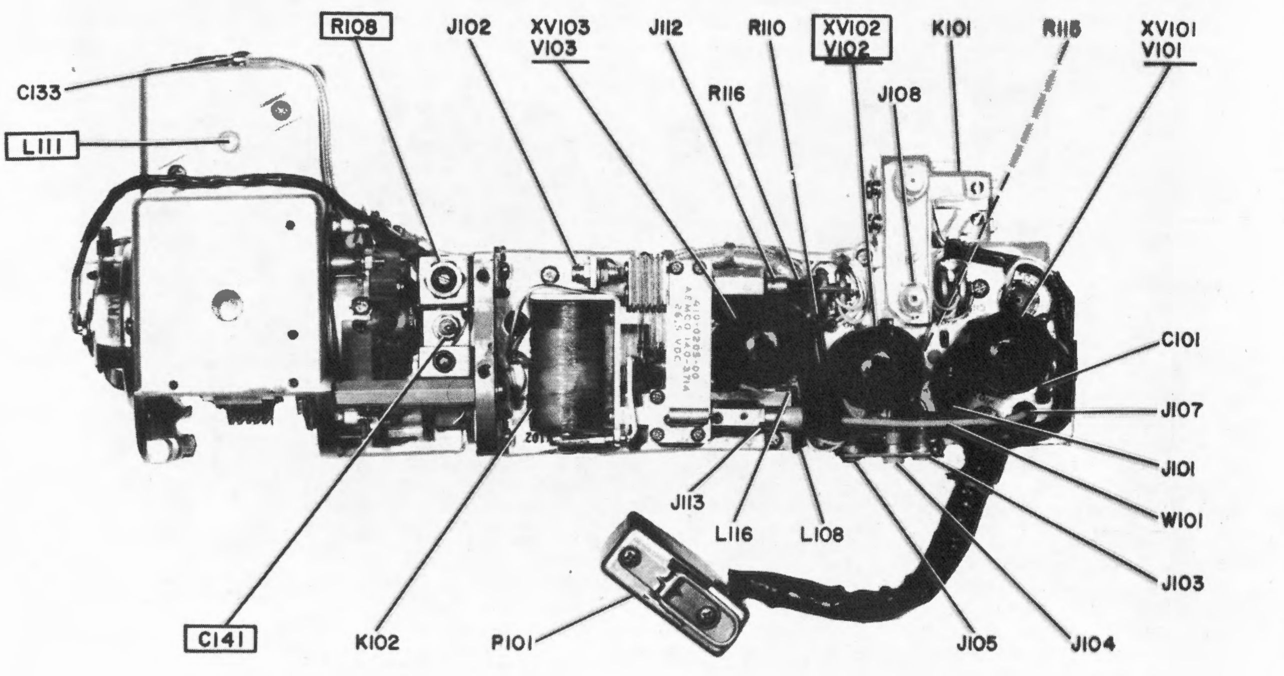


Figure 5-22. RF and PA Amplifier Assembly, Top View

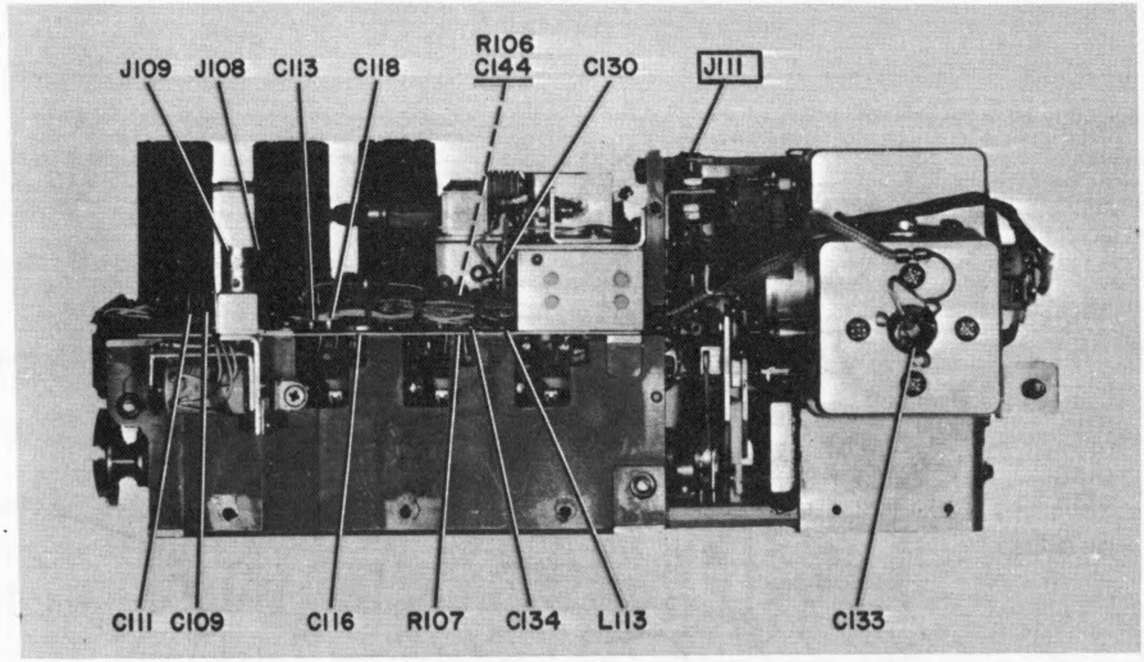


Figure 5-23. RF and PA Amplifier Assembly, Right Side

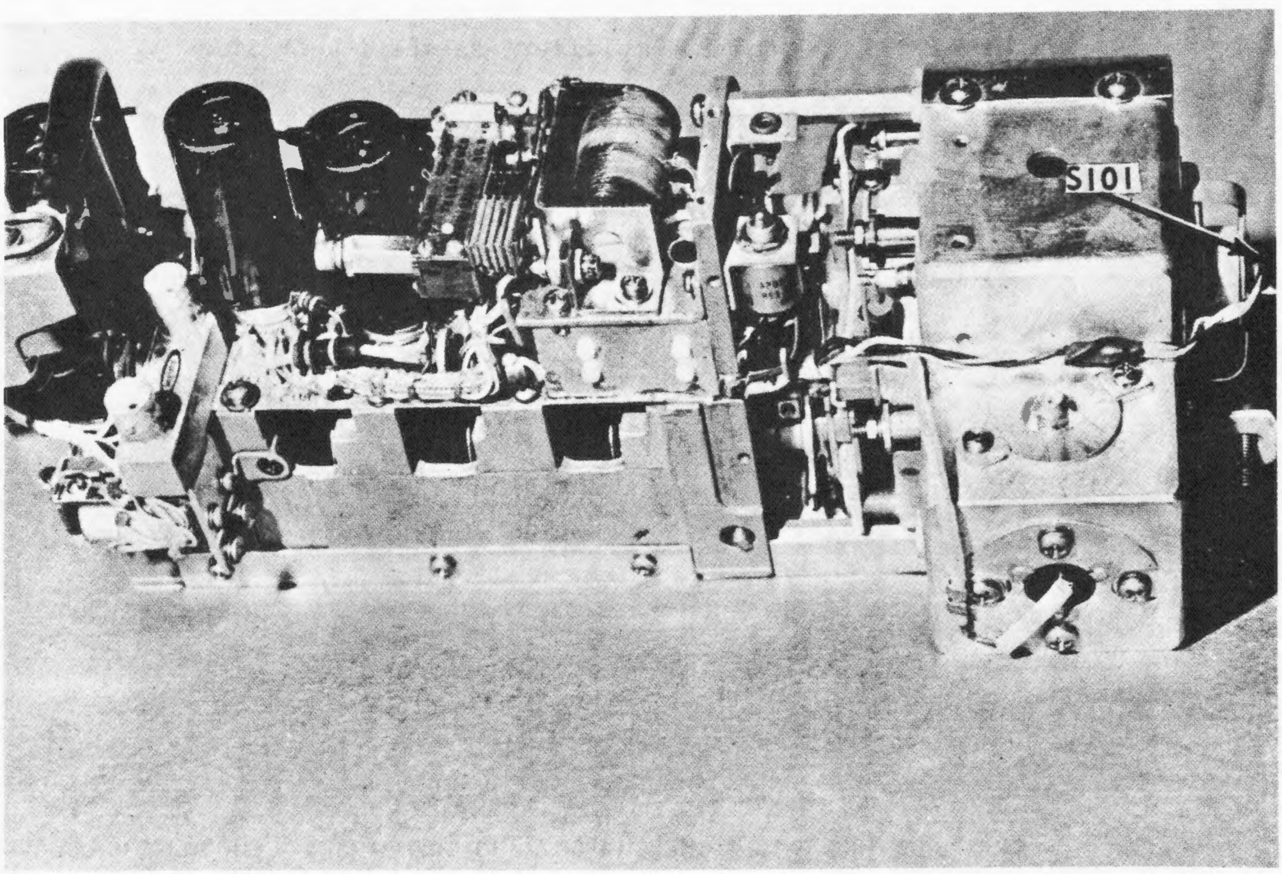


Figure 5-24. RF and PA Amplifier Assembly, Side View Showing Thermal Sensor

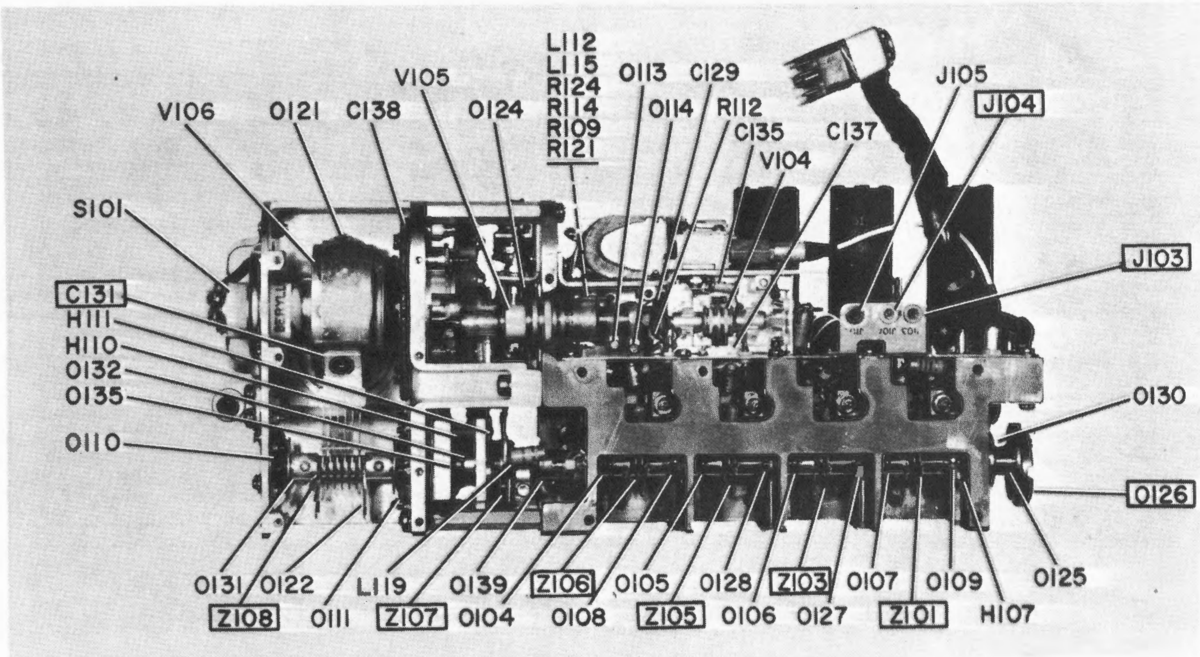


Figure 5-25. RF and PA Amplifier Assembly, Left Side

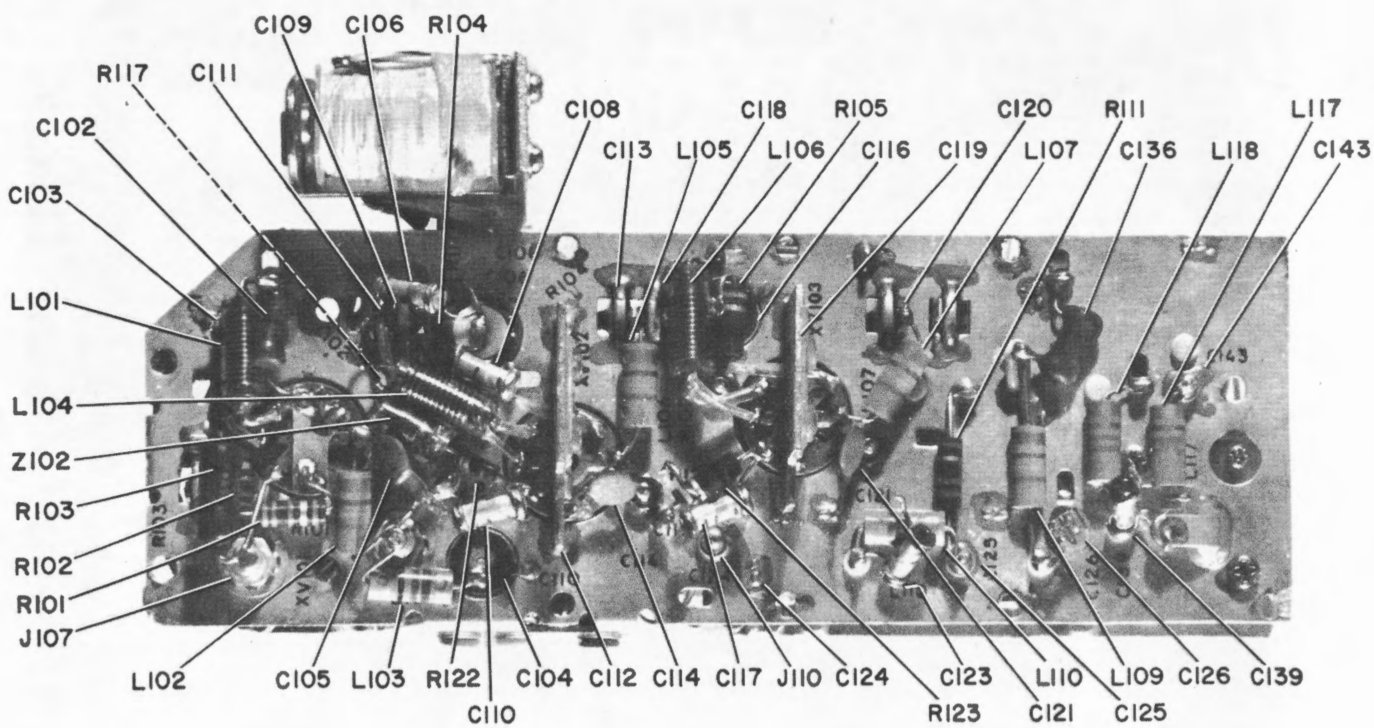


Figure 5-26. RF and PA Amplifier Assembly, Bottom View

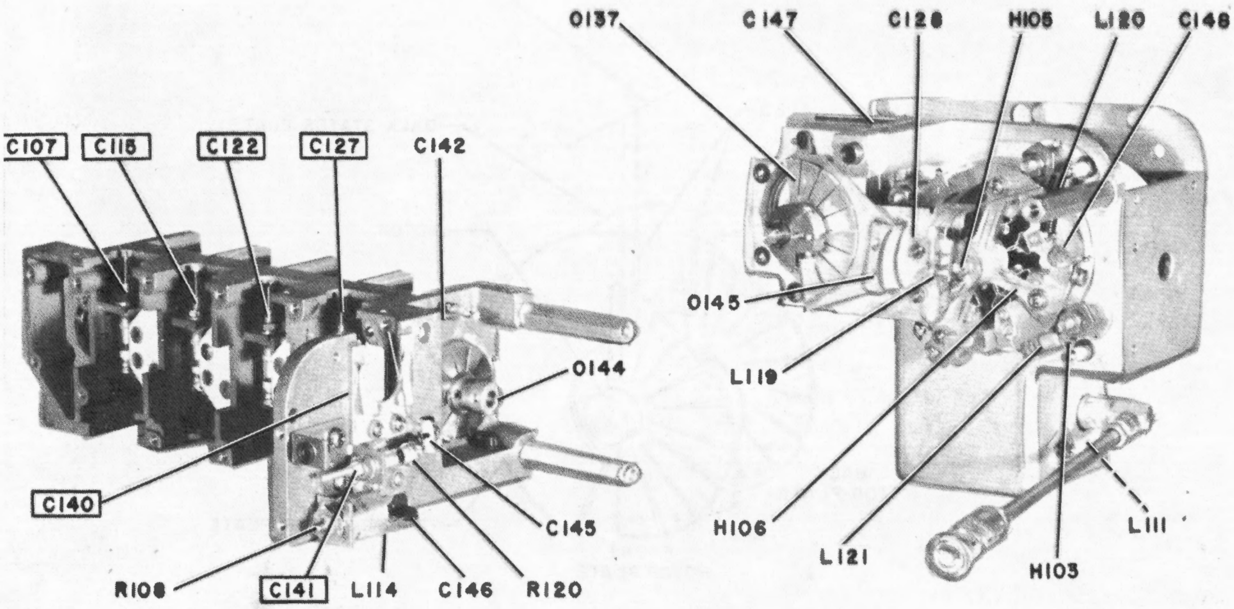


Figure 5-27. RF and PA Amplifier Assembly, Power Amplifier Stage Removed

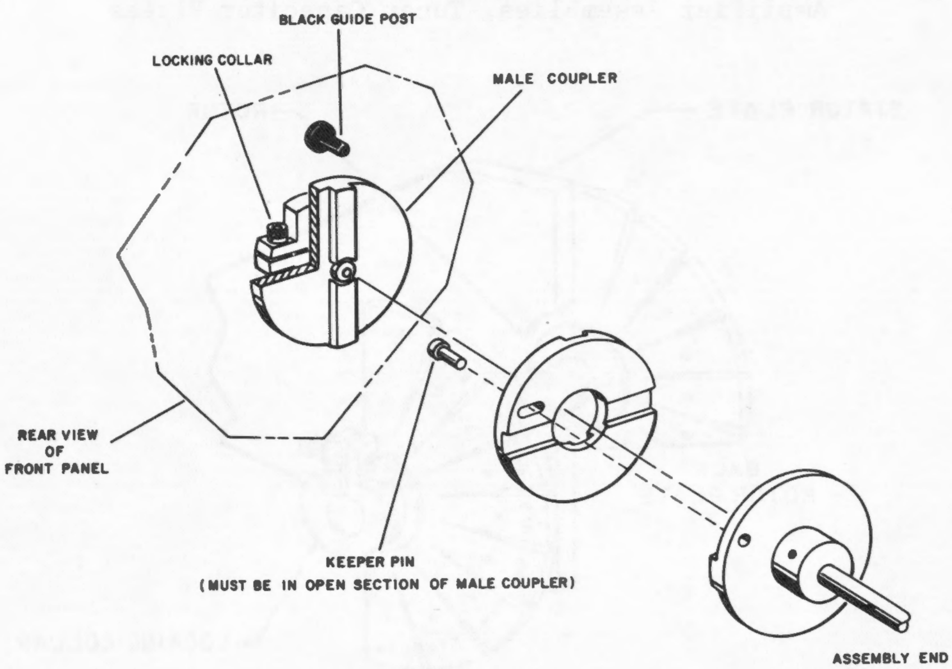


Figure 5-28. Oldham Coupler Alignment

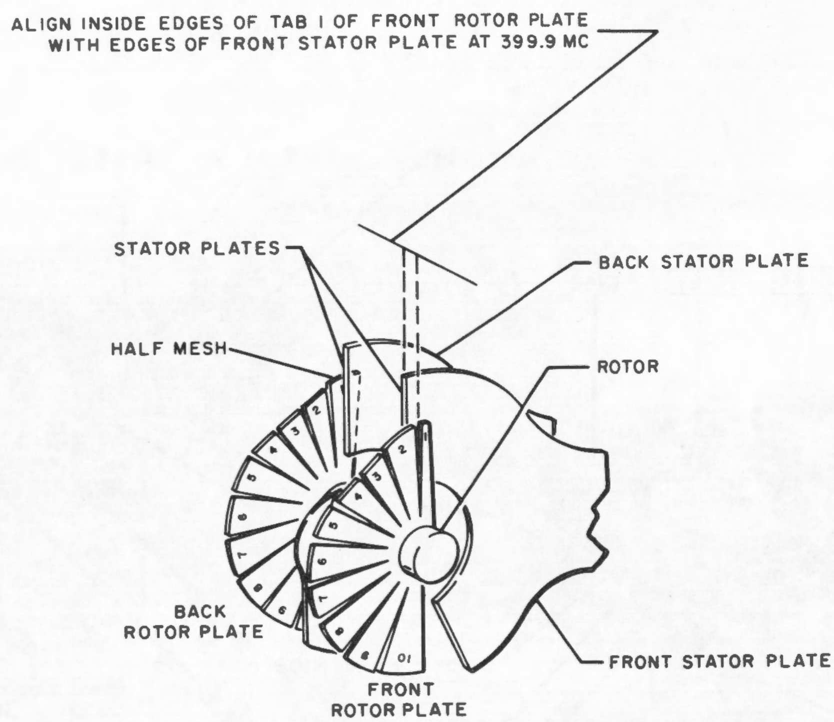


Figure 5-29. Frequency Multiplier-Oscillator, and RF and PA Amplifier Assemblies, Tuner Capacitor Plates

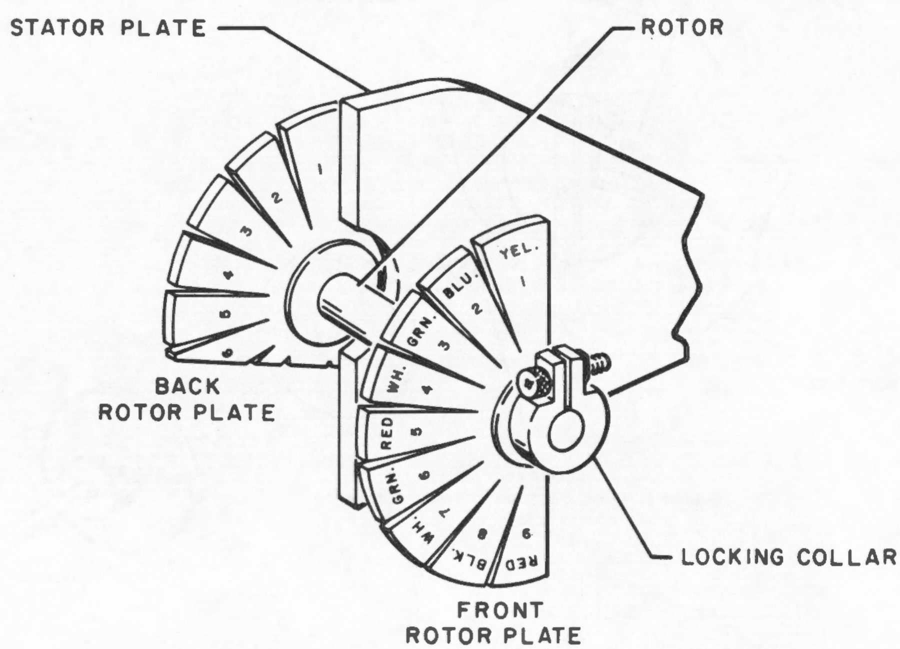


Figure 5-30. RF and PA Amplifier Assembly, Tuner Z107

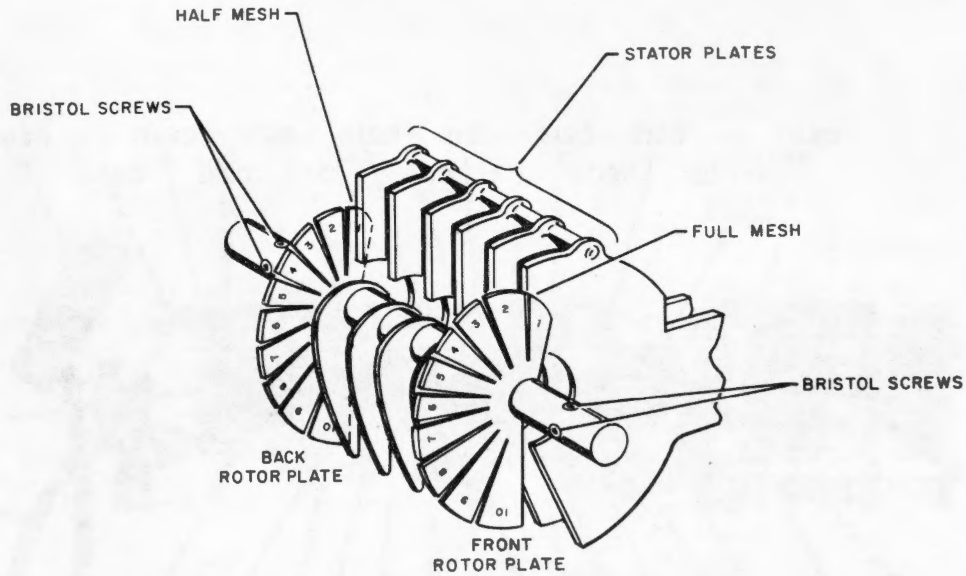


Figure 5-31. RF and PA Amplifier Assembly, Tuner Z108

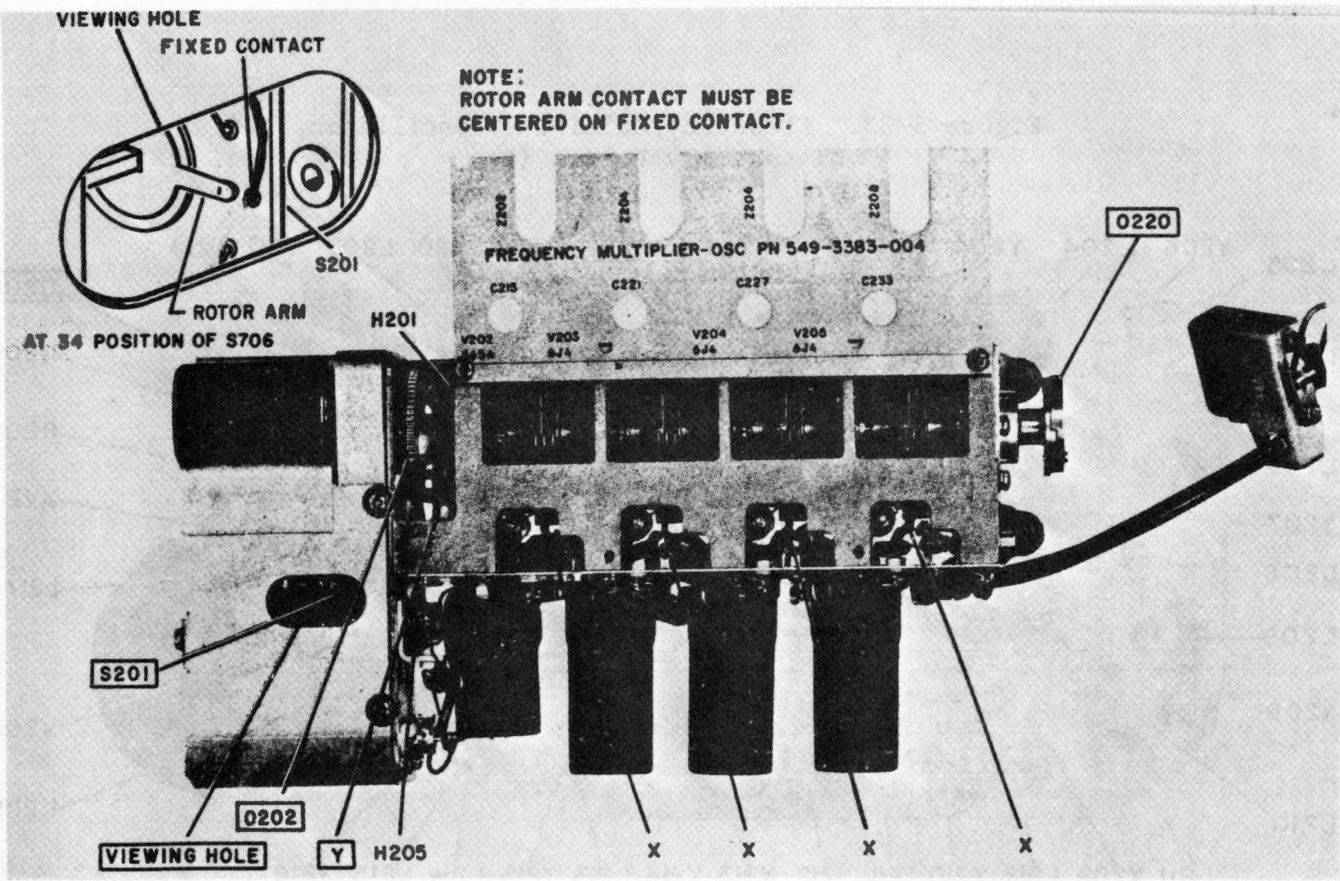


Figure 5-32. Frequency Multiplier-Oscillator,
Disassembly Points (A)

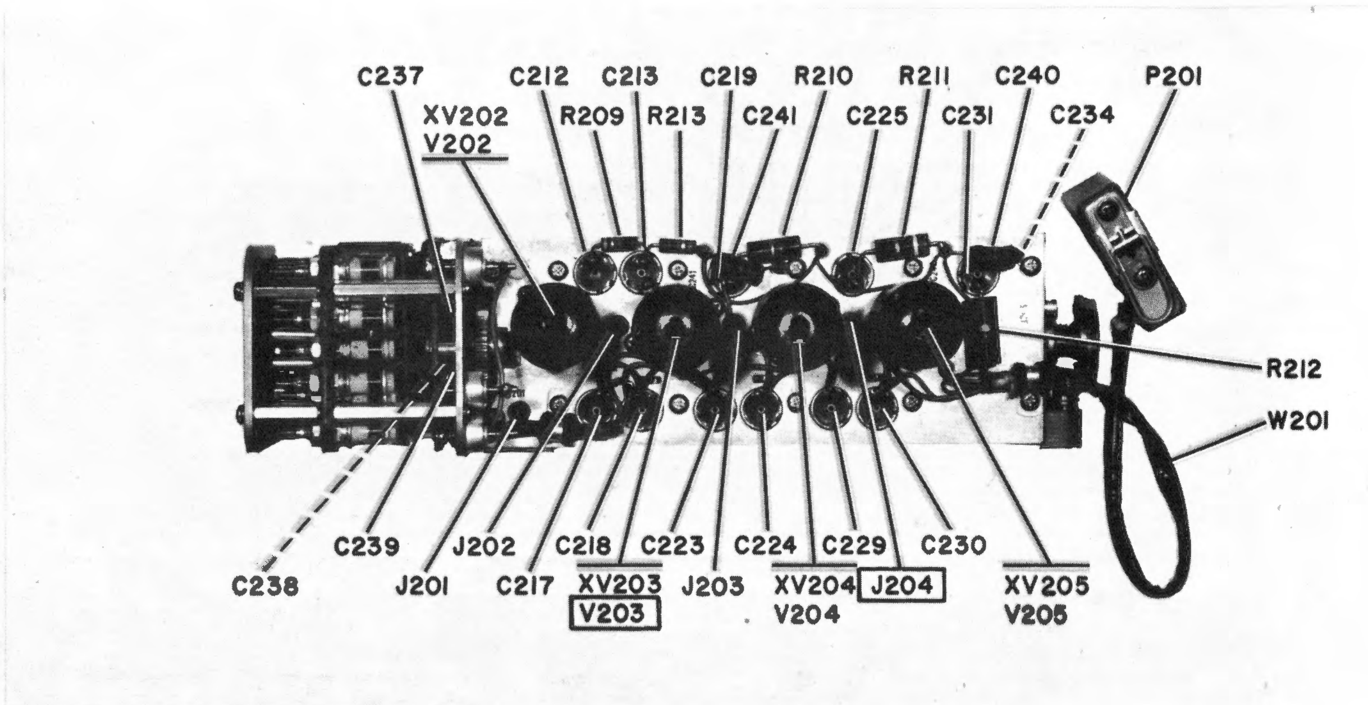


Figure 5-33. Frequency Multiplier-Oscillator,
Disassembly Points (B)

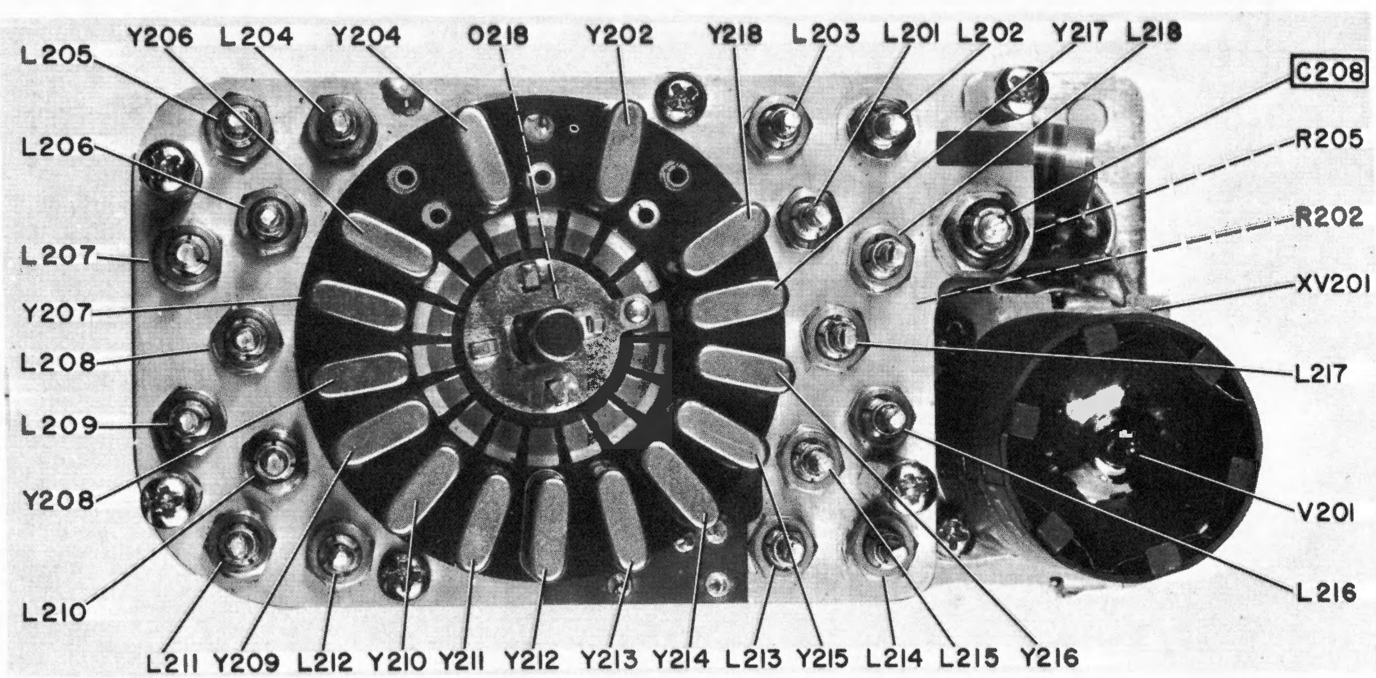


Figure 5-34. Frequency Multiplier-Oscillator,
Master Oscillator (V201), Rear View

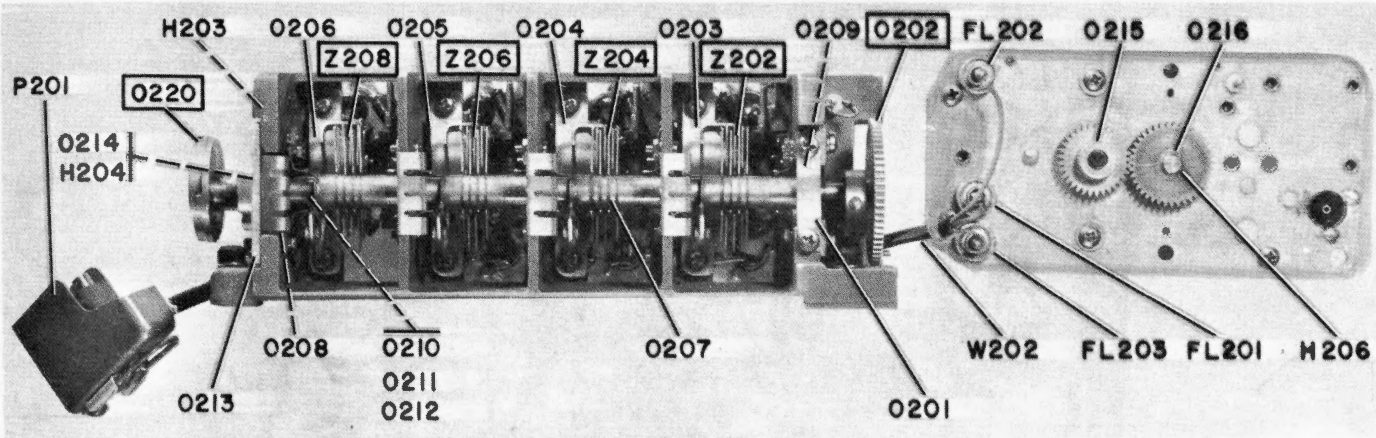


Figure 5-35. Frequency Multiplier-Oscillator, Bottom View, Master Oscillator Removed

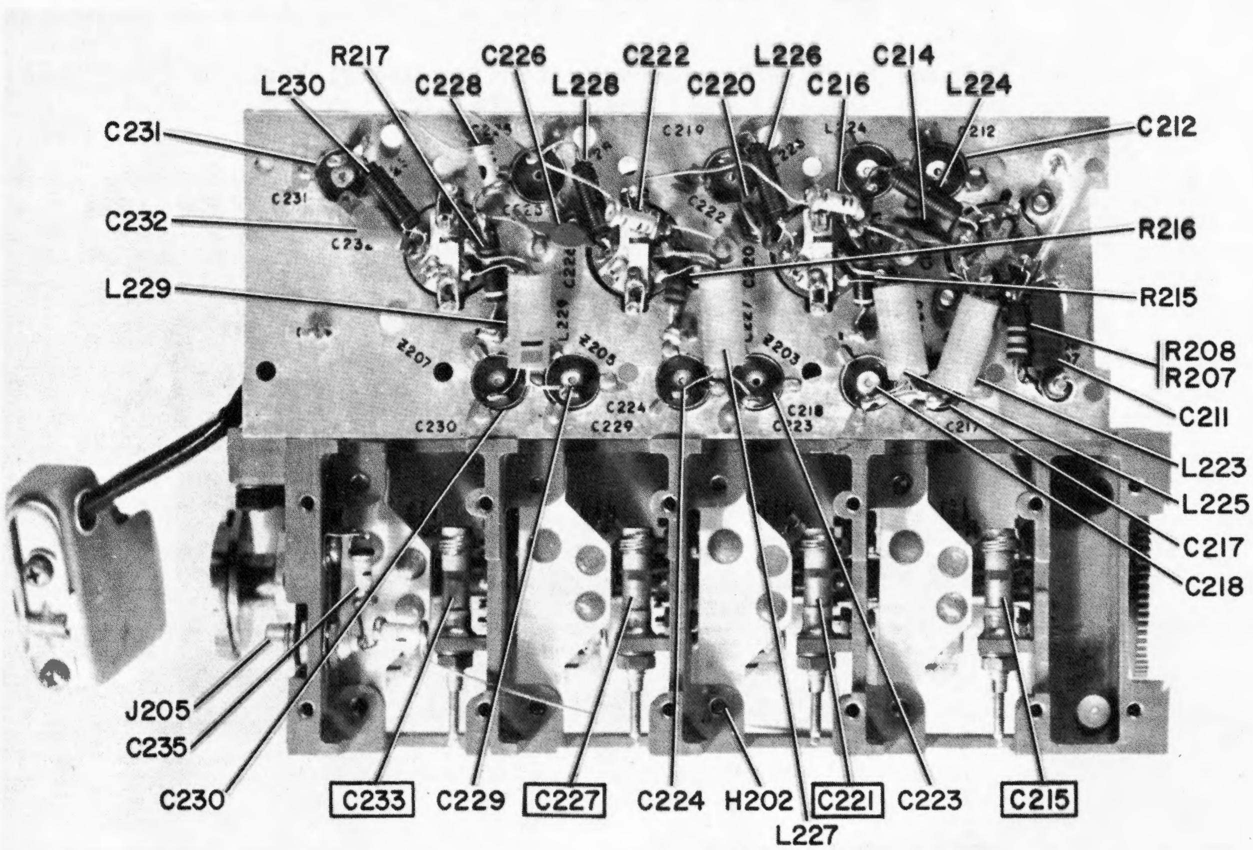


Figure 5-36. Frequency Multiplier-Oscillator, Chassis, Bottom View

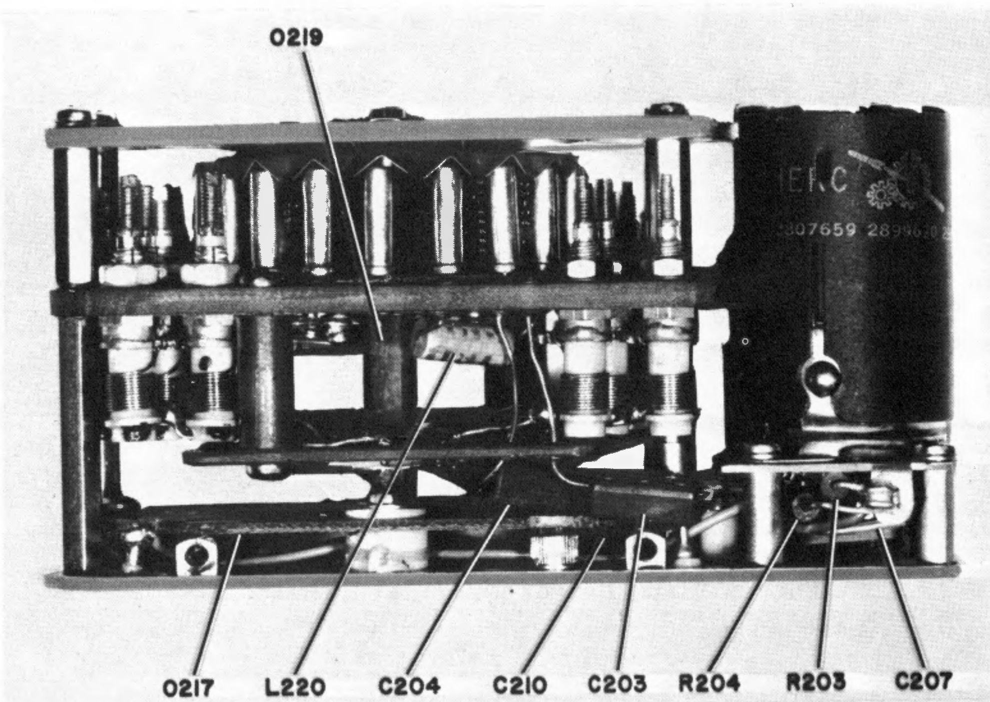


Figure 5-37. Frequency Multiplier-Oscillator, Master Oscillator, Left Side

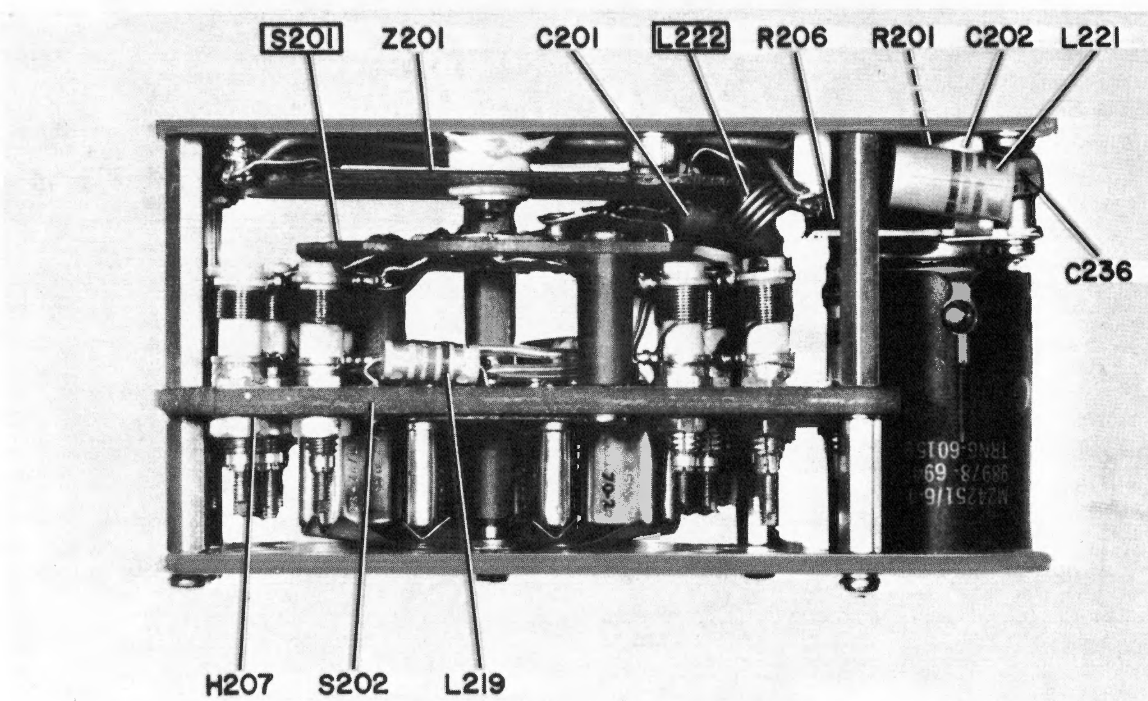


Figure 5-38. Frequency Multiplier-Oscillator, Master Oscillator, Right Side

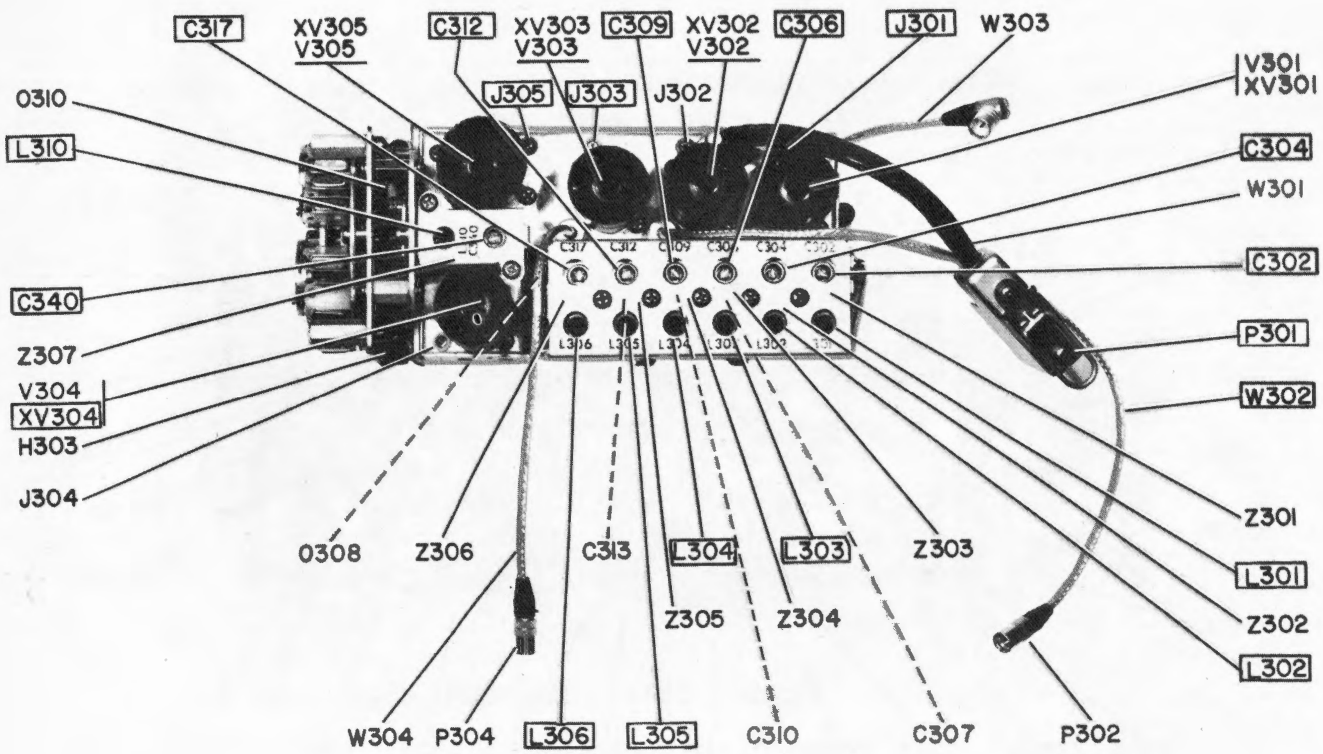


Figure 5-39. First IF Amplifier, Top View

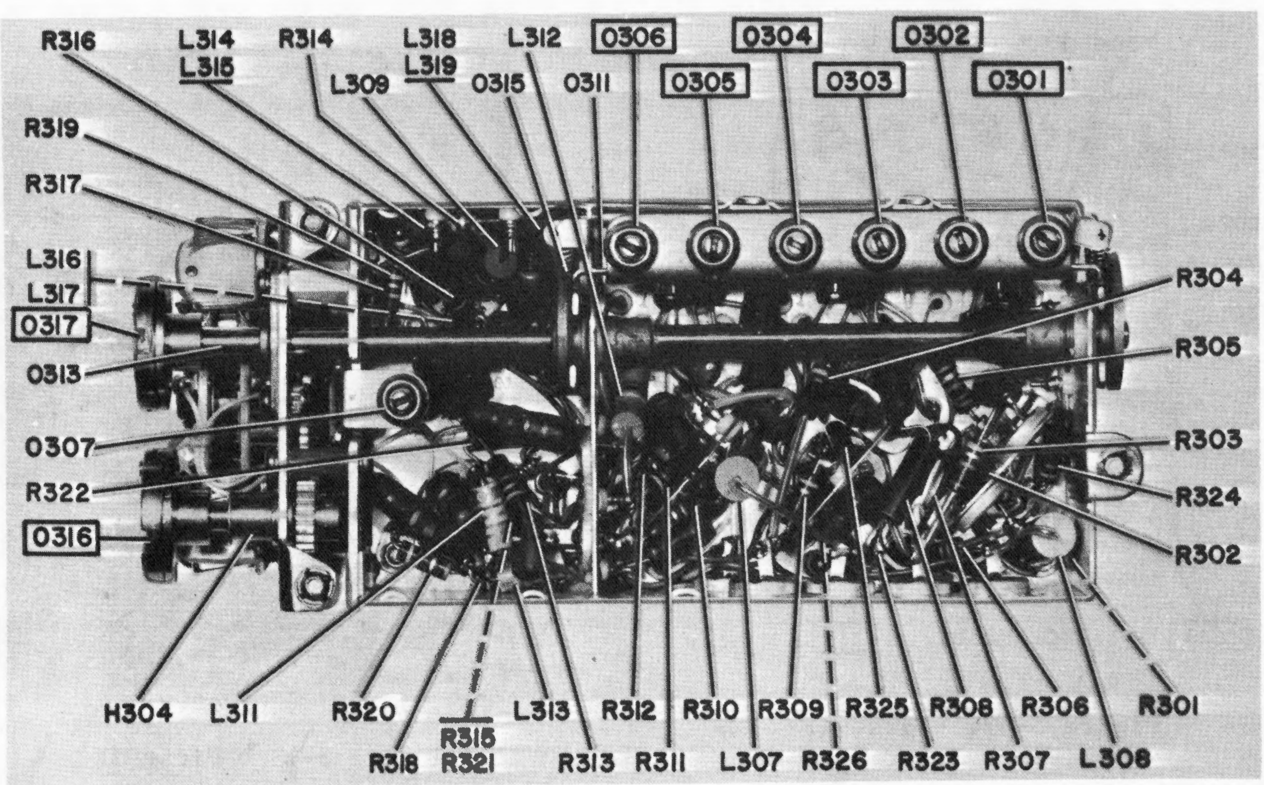


Figure 5-40. First IF Amplifier, Bottom View (A)

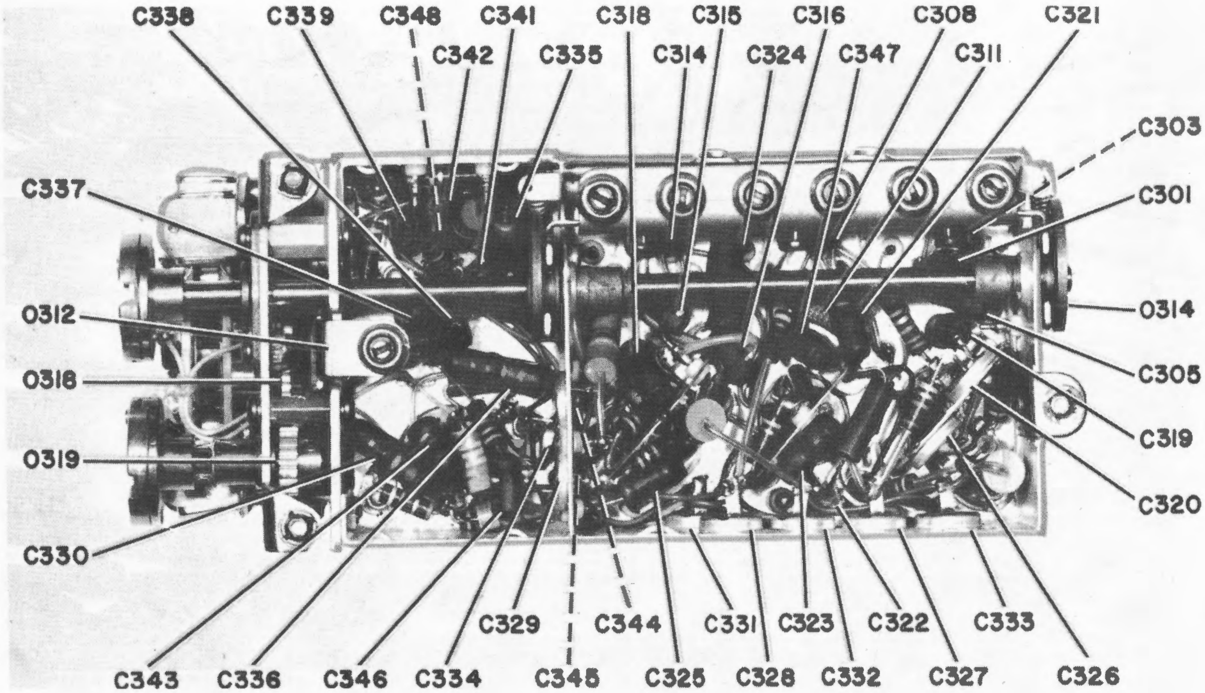


Figure 5-41. First IF Amplifier, Bottom View (B)

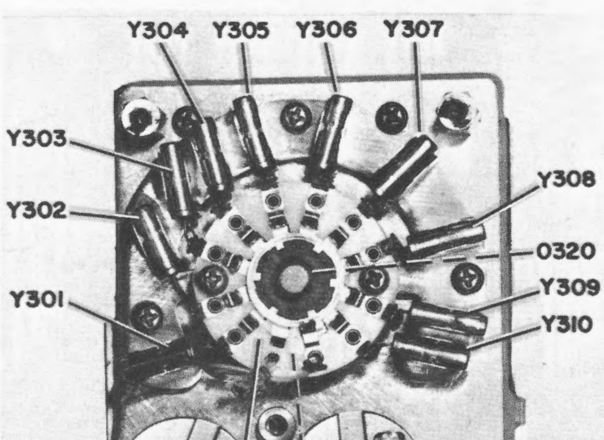


Figure 5-42. First IF Amplifier, Front View

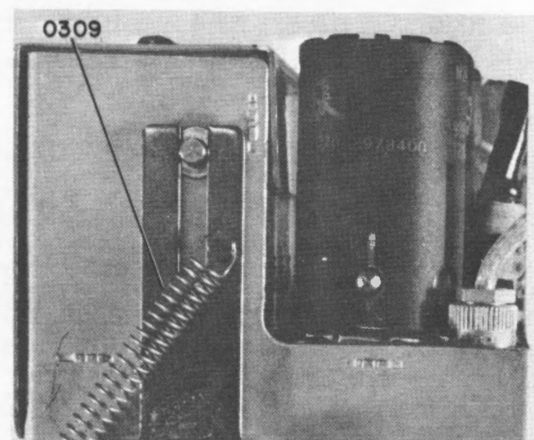


Figure 5-43. First IF Amplifier, Synchronization

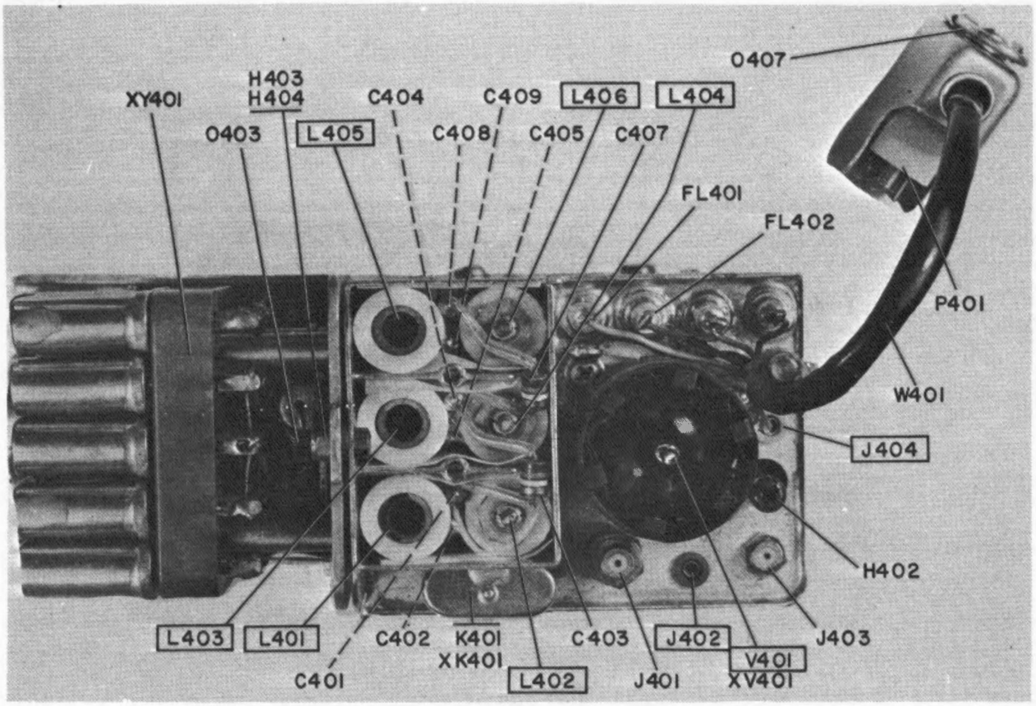


Figure 5-44. Second IF Amplifier, Top View

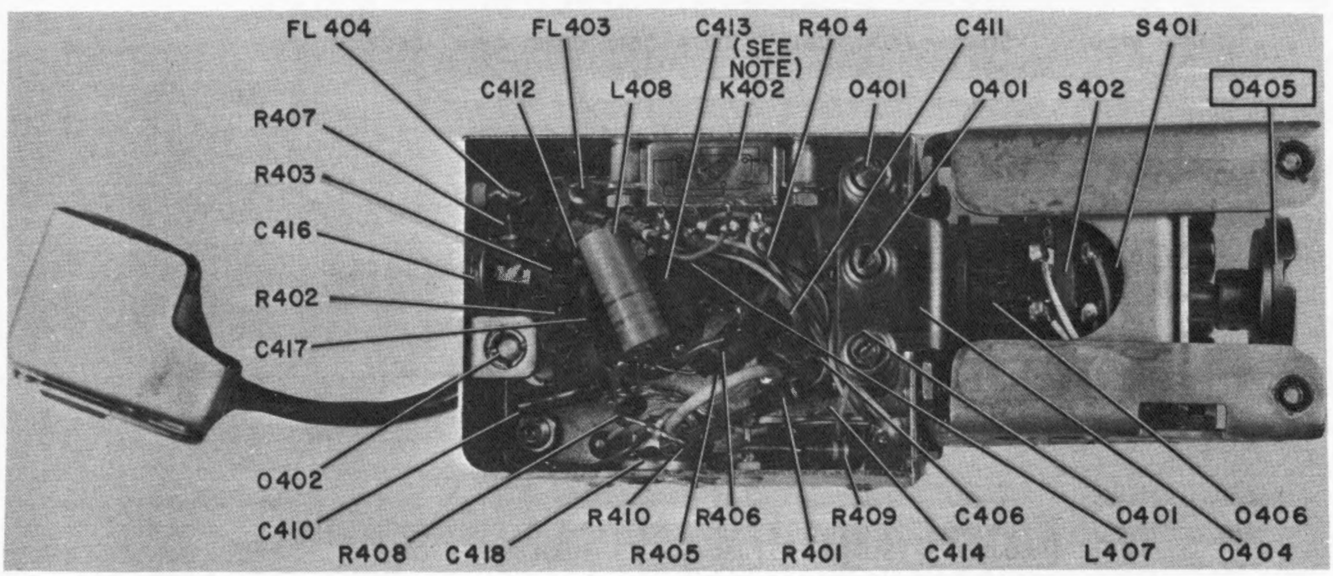


Figure 5-45. Second IF Amplifier, Bottom View

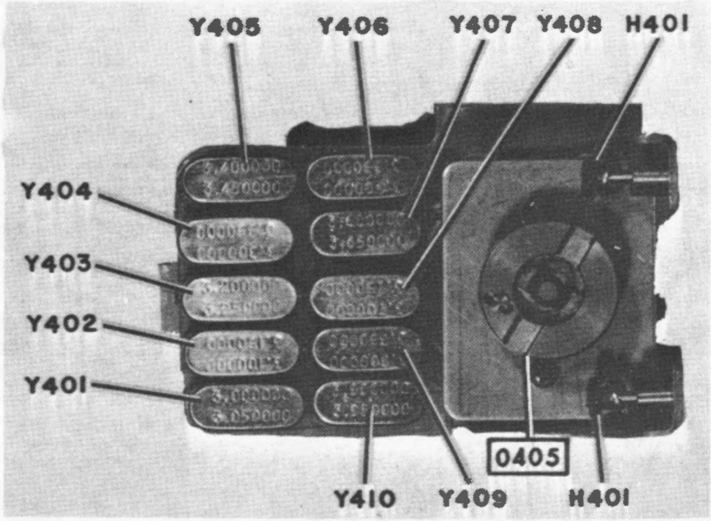


Figure 5-46. Second IF Amplifier, Front View

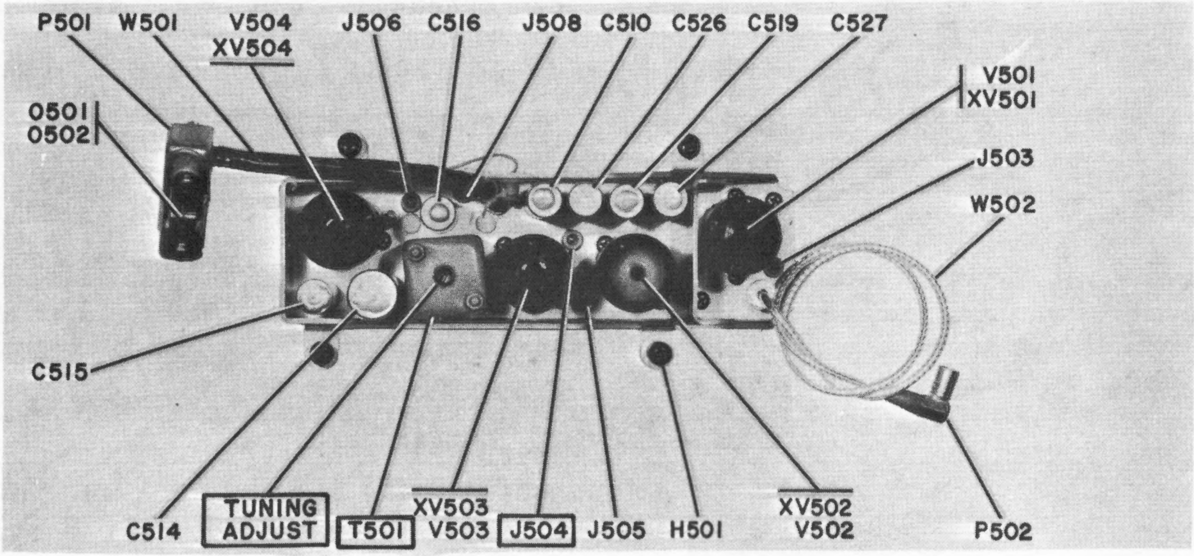


Figure 5-47. Third IF Amplifier, Top View

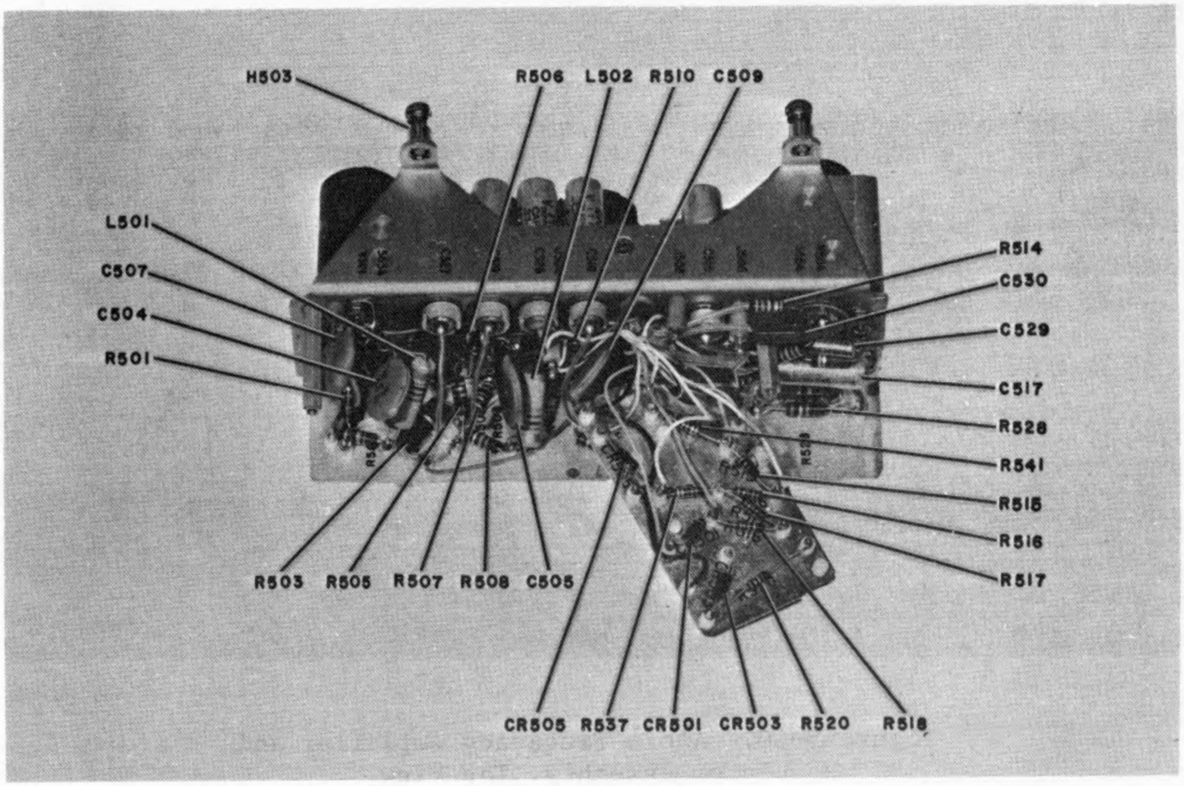


Figure 5-48. Third IF Amplifier, Bottom View (A)

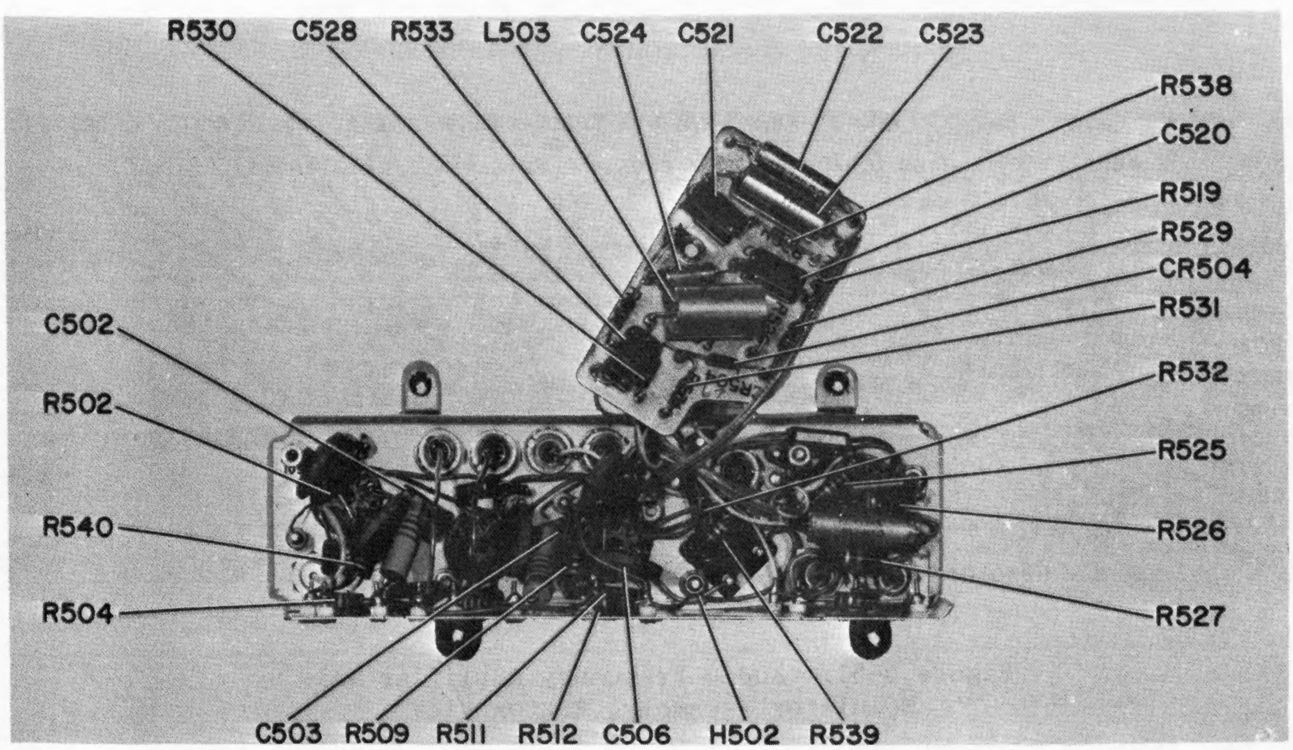


Figure 5-49. Third IF Amplifier, Bottom View (B)

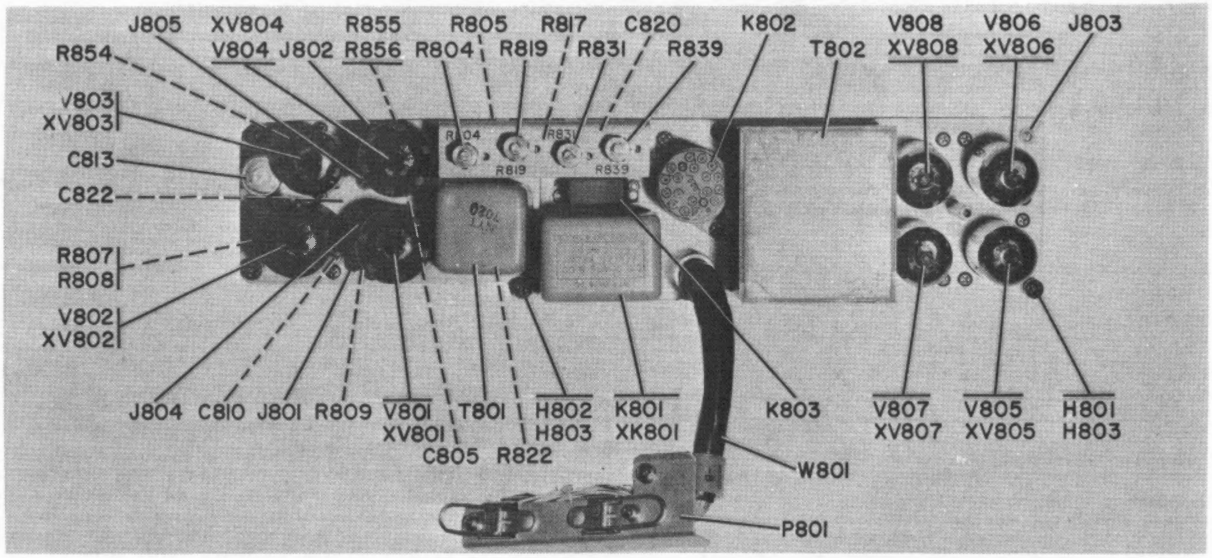


Figure 5-50. Audio Frequency Amplifier and Modulator Assembly, Top View

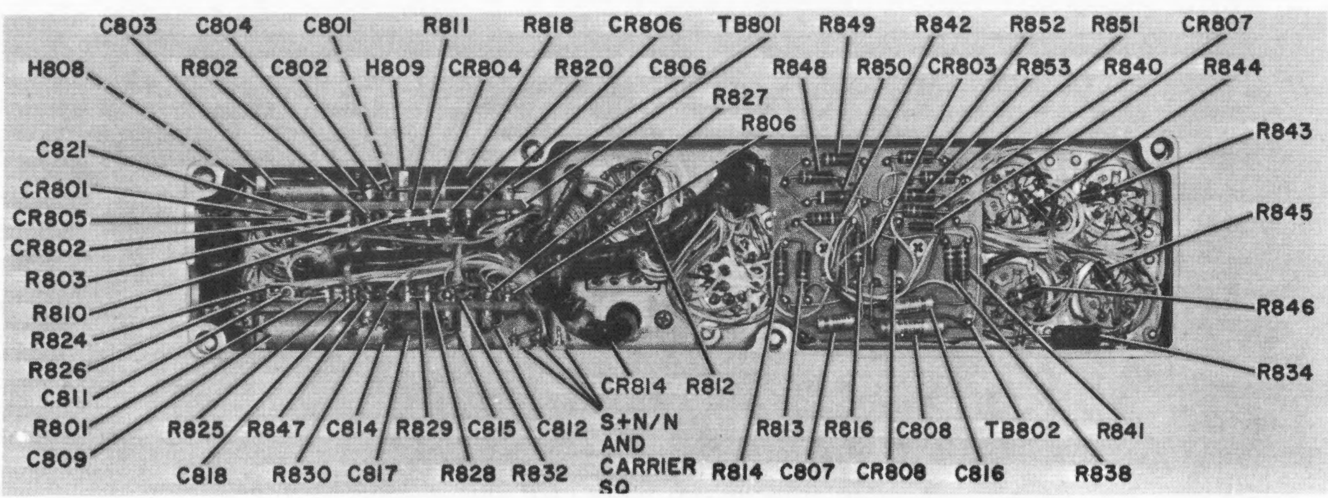


Figure 5-51. Audio Frequency Amplifier and Modulator Assembly, Bottom View

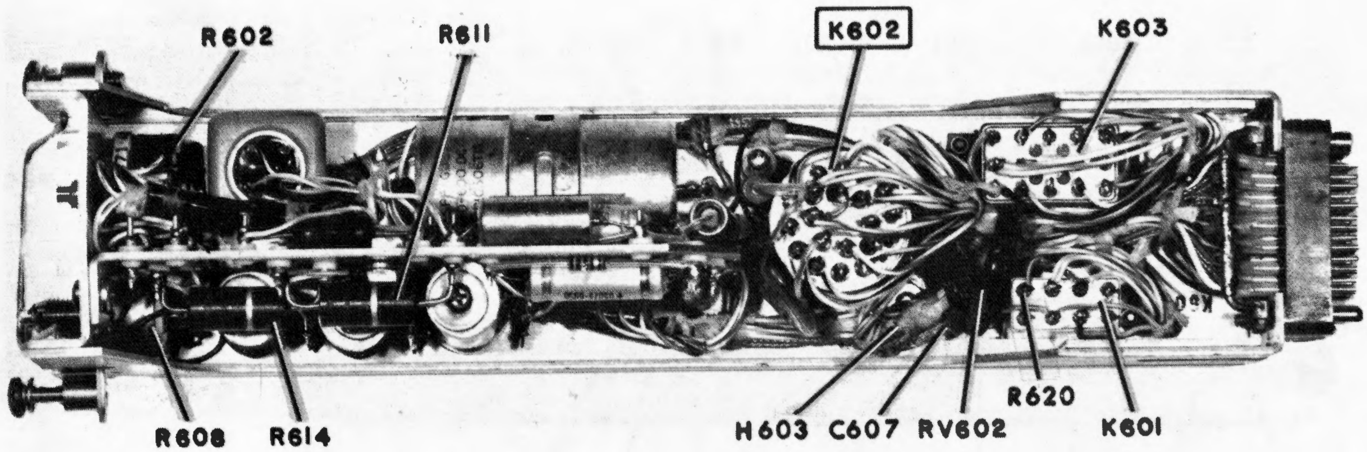


Figure 5-52. Relay-Filter Assembly, Top View

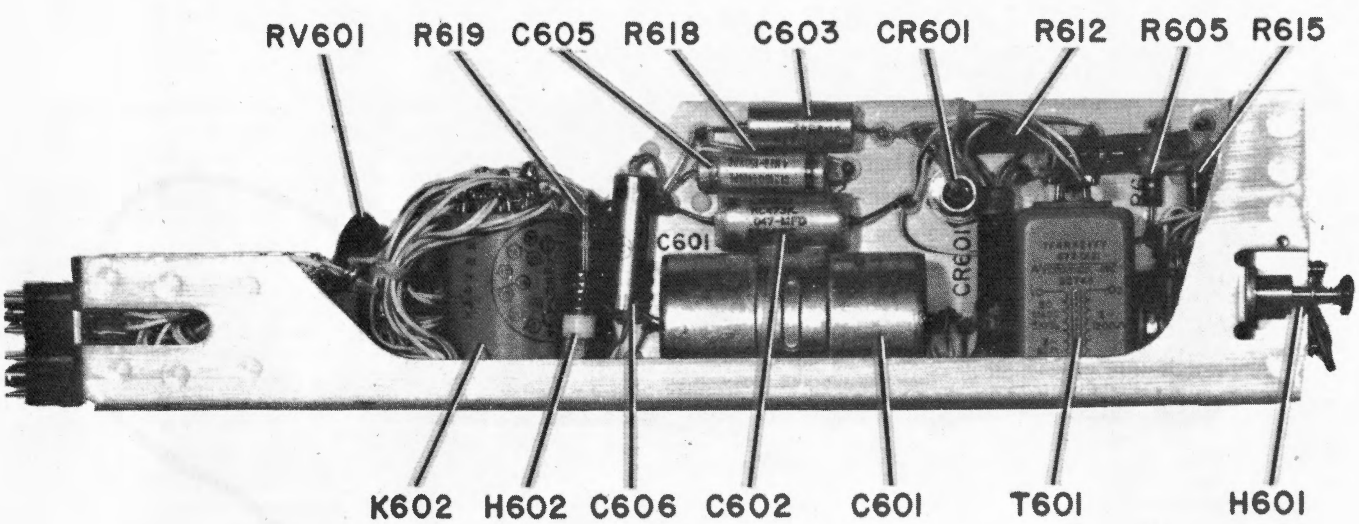


Figure 5-53. Relay-Filter Assembly, Left Side

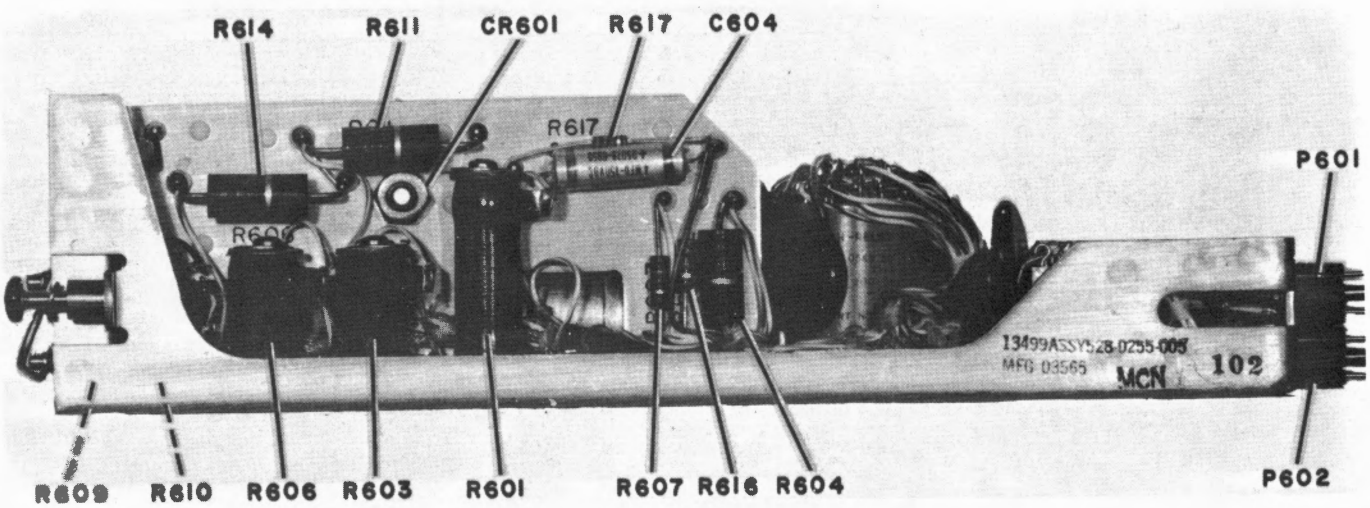


Figure 5-54. Relay-Filter Assembly, Right Side

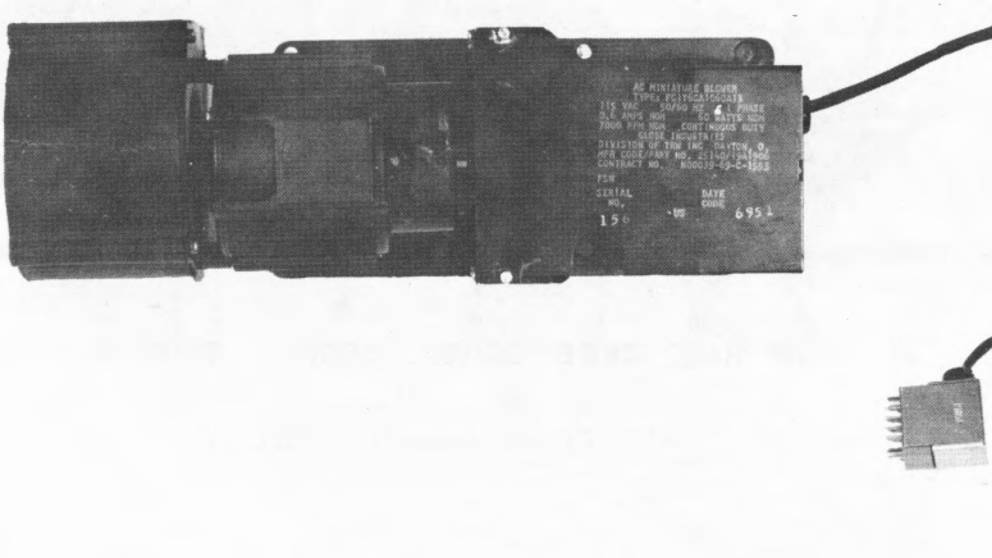
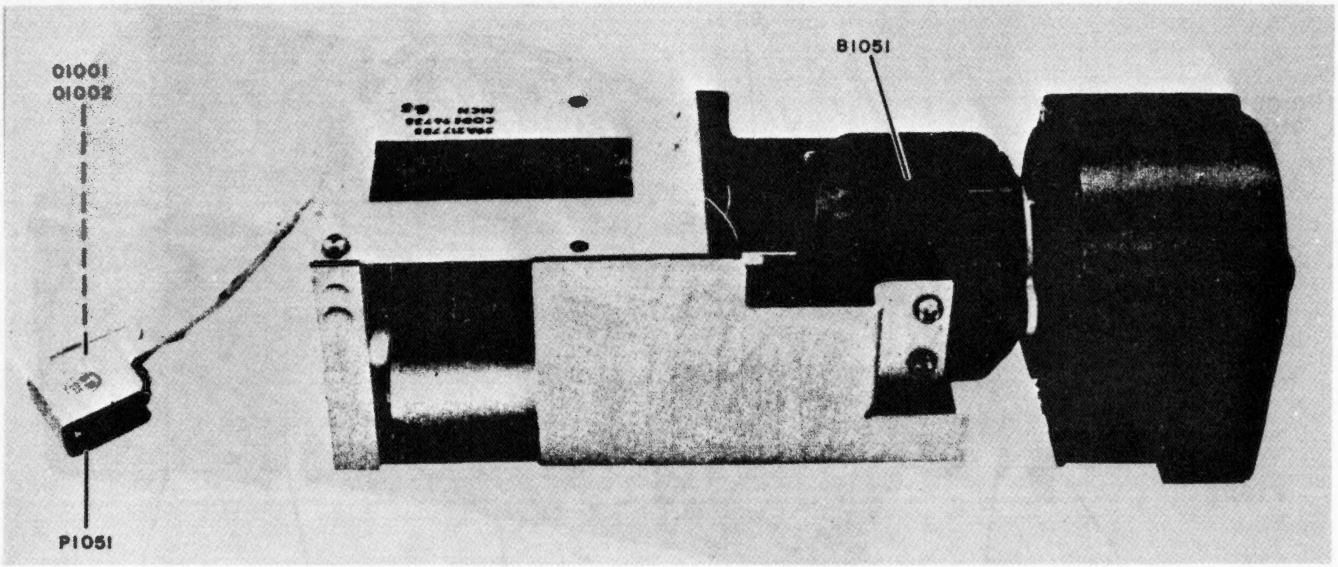
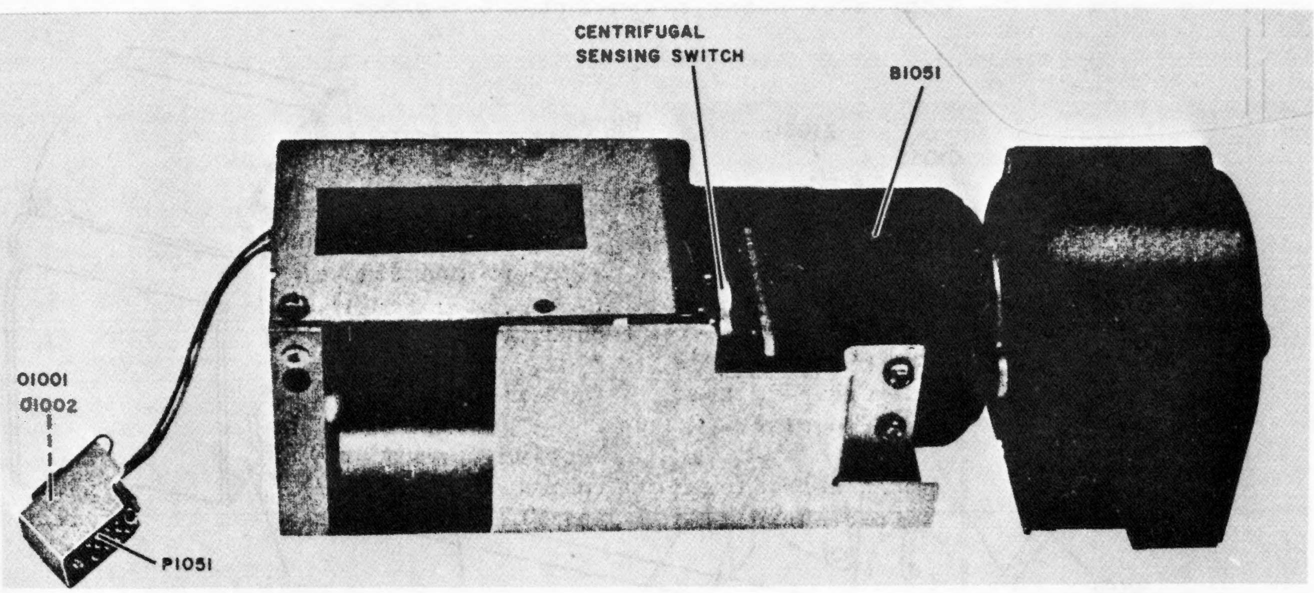


Figure 5-55. R/T Centrifugal Axial Fan (Globe Industries)



NOT SHIPBOARD REPAIRABLE

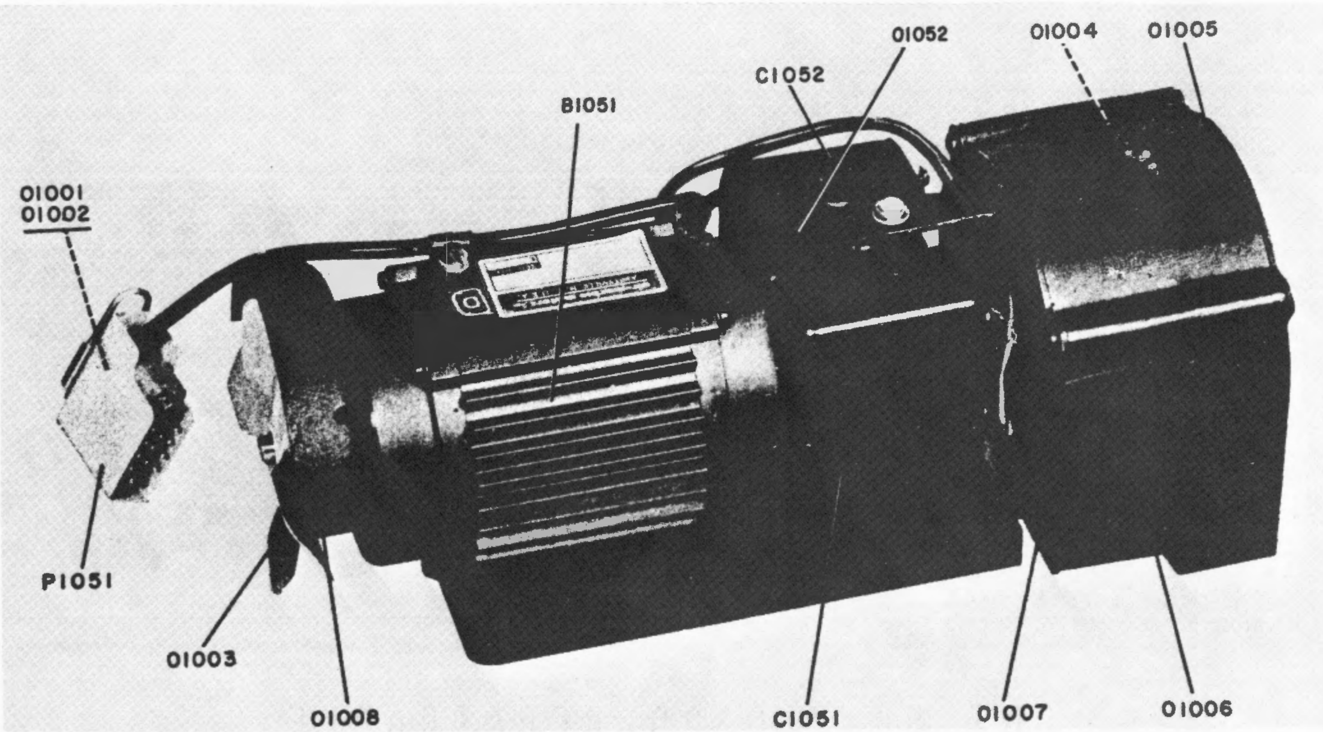
A. MCN 1 Through 185 Only



NOT SHIPBOARD REPAIRABLE

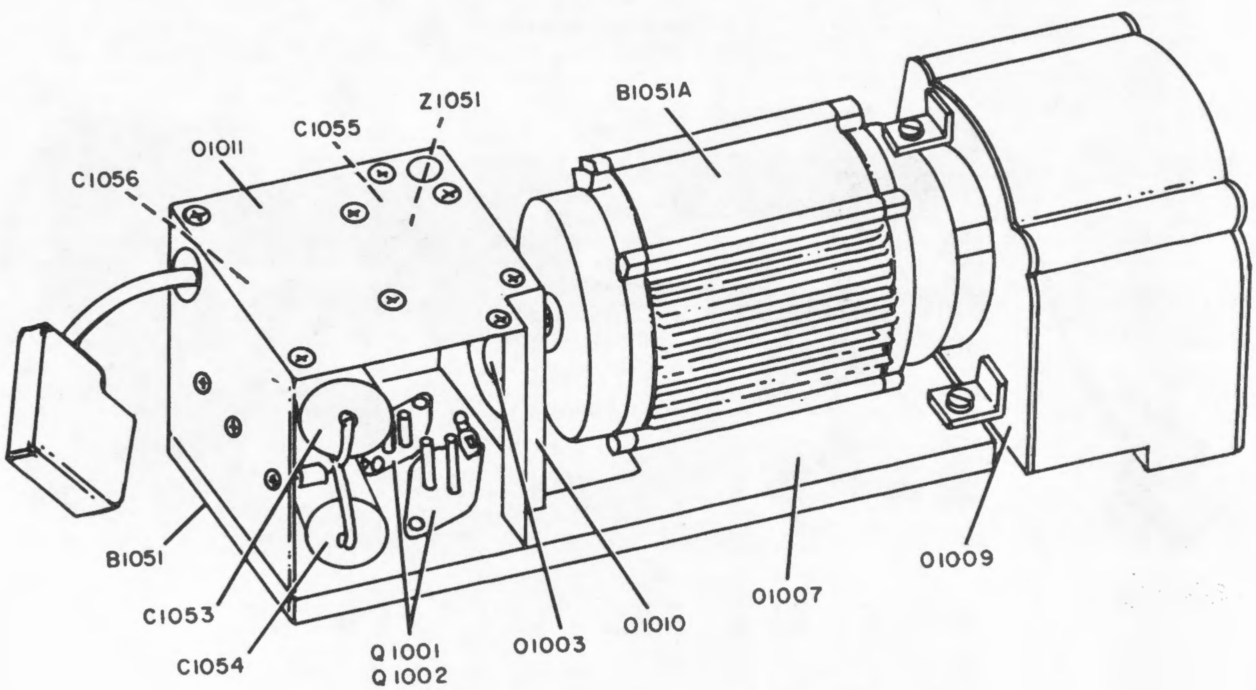
B. MCN 186 and Over

Figure 5-56. R/T Centrifugal Axial Fan (Stewart-Warner Electronics Contract NObsr 91068)



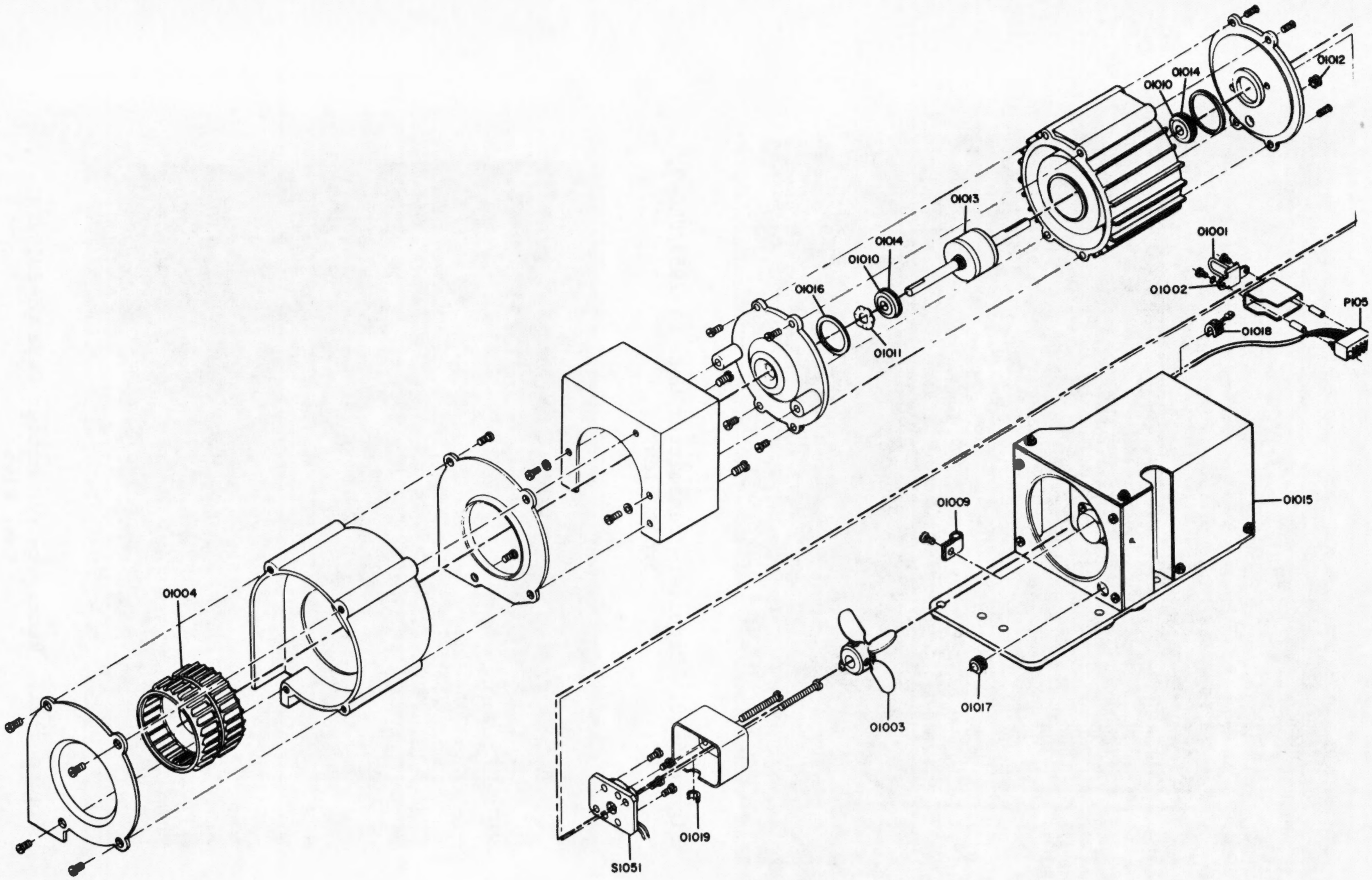
NOT SHIPBOARD REPAIRABLE

Figure 5-57. R/T Centrifugal Axial Fan (Collins Radio Company Contracts NObsr 87290 and NObsr 89509)



NOT SHIPBOARD REPAIRABLE

Figure 5-58. R/T Centrifugal Fan (Dubrow Electronics Industries Contracts NObsr 91149, 91284, and 93164)



NOT SHIPBOARD REPAIRABLE

Figure 5-59. R/T Centrifugal Axial Fan (Contract NObsr 95140)

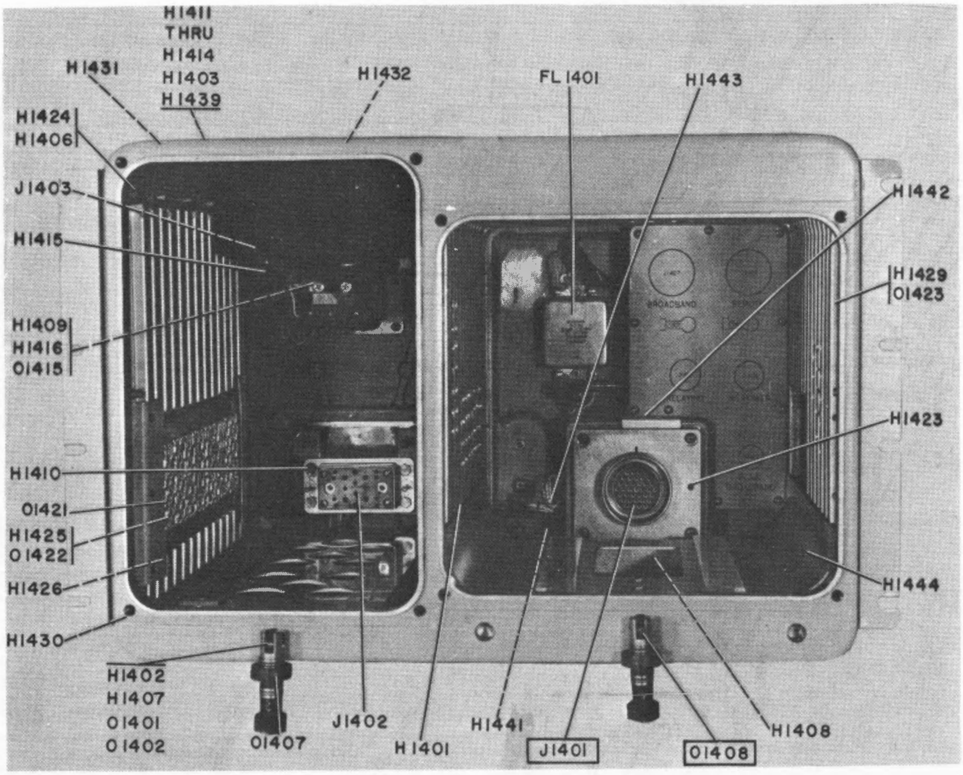


Figure 5-60. Receiver-Transmitter Case CY-2959/URC-9, Front View

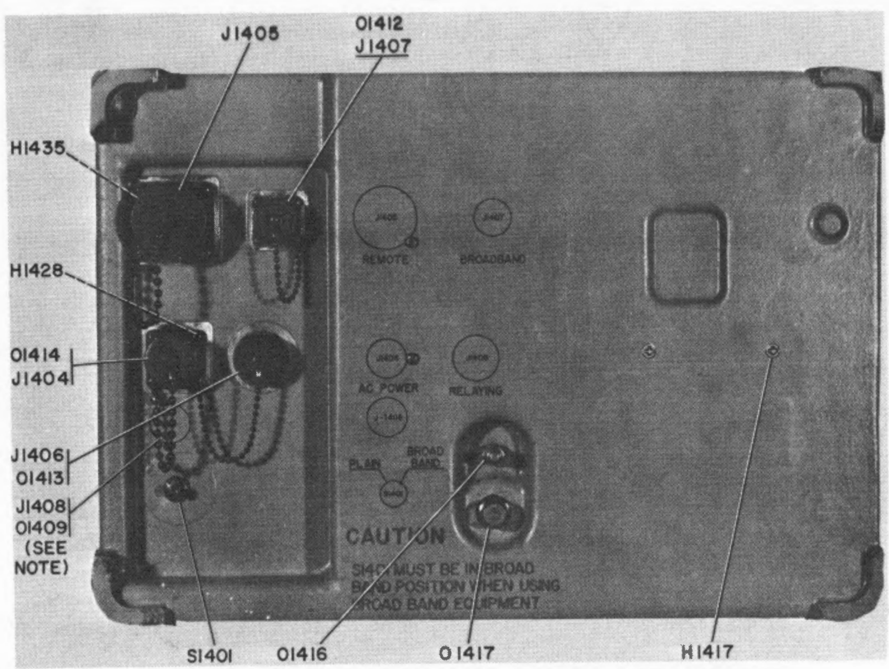


Figure 5-61. Receiver-Transmitter Case CY-2959/URC-9, Rear View

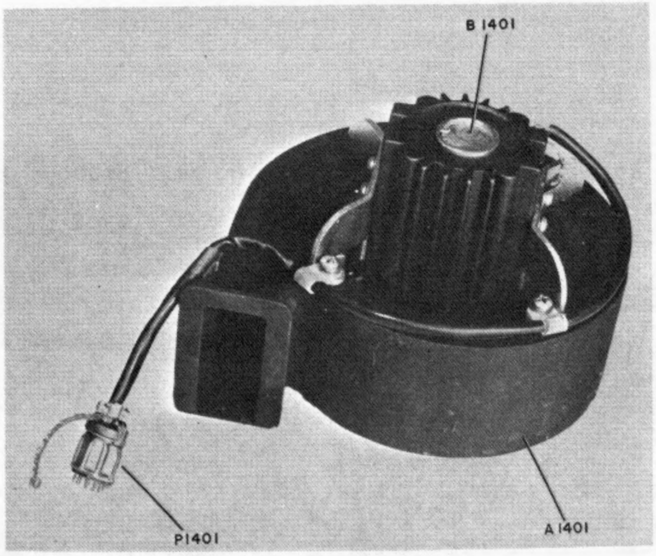
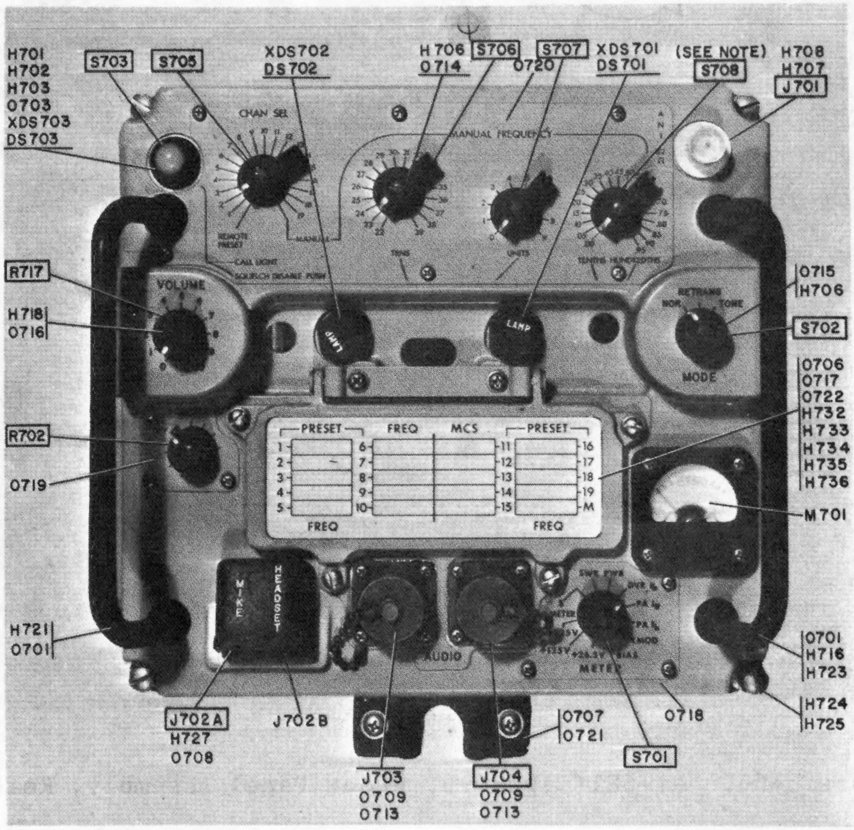


Figure 5-62. Receiver-Transmitter Case CY-2959/URC-9, Centrifugal Fan



NOTE: .1 MHz increments on AN/URC-9, 9Y, and 9AY

Figure 5-63. RT-581( )/URC-9, Front Panel Assembly, Front View

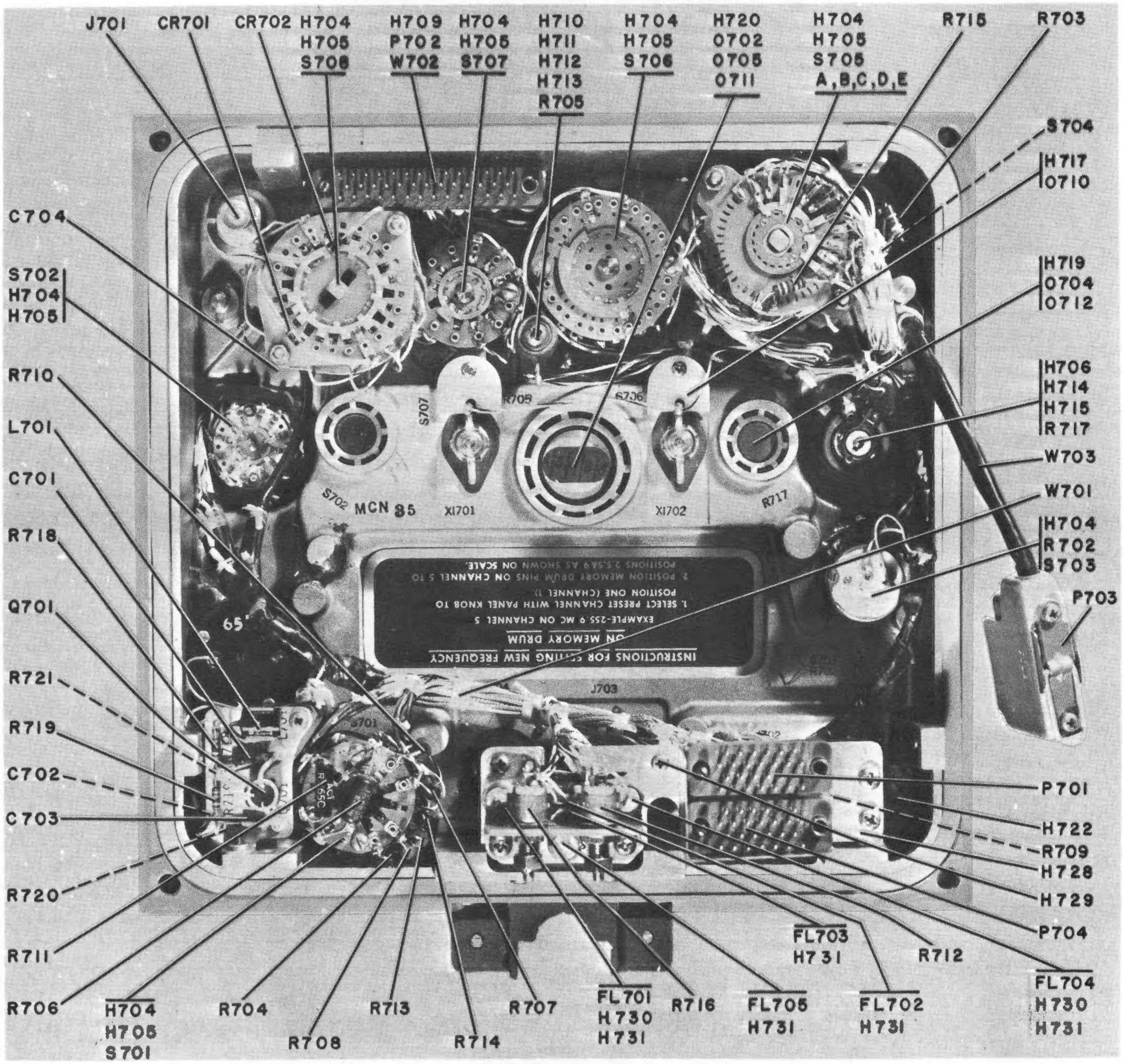


Figure 5-64. RT-581( )/URC-9, Front Panel Assembly, Rear View

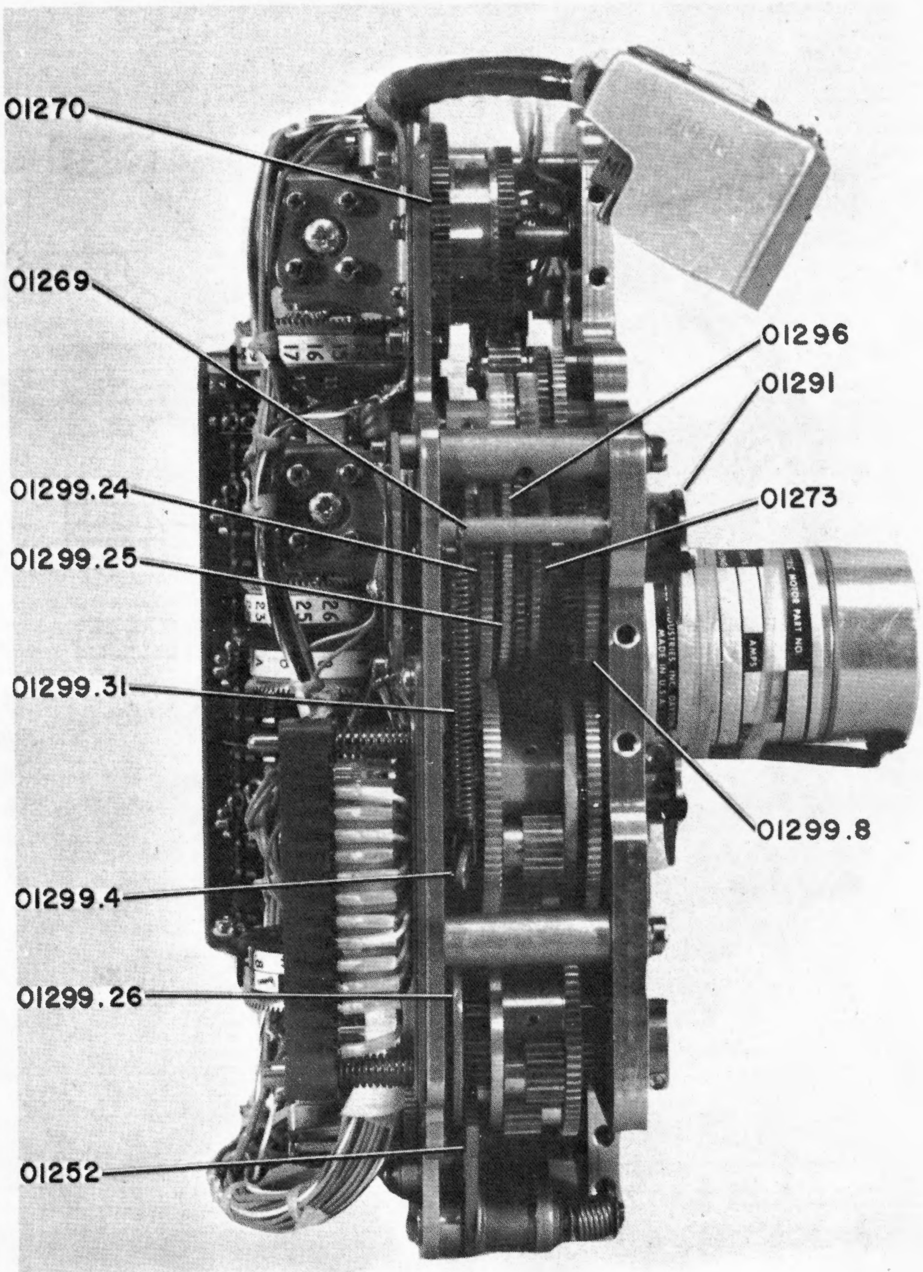


Figure 5-65. Frequency Selector, Top View

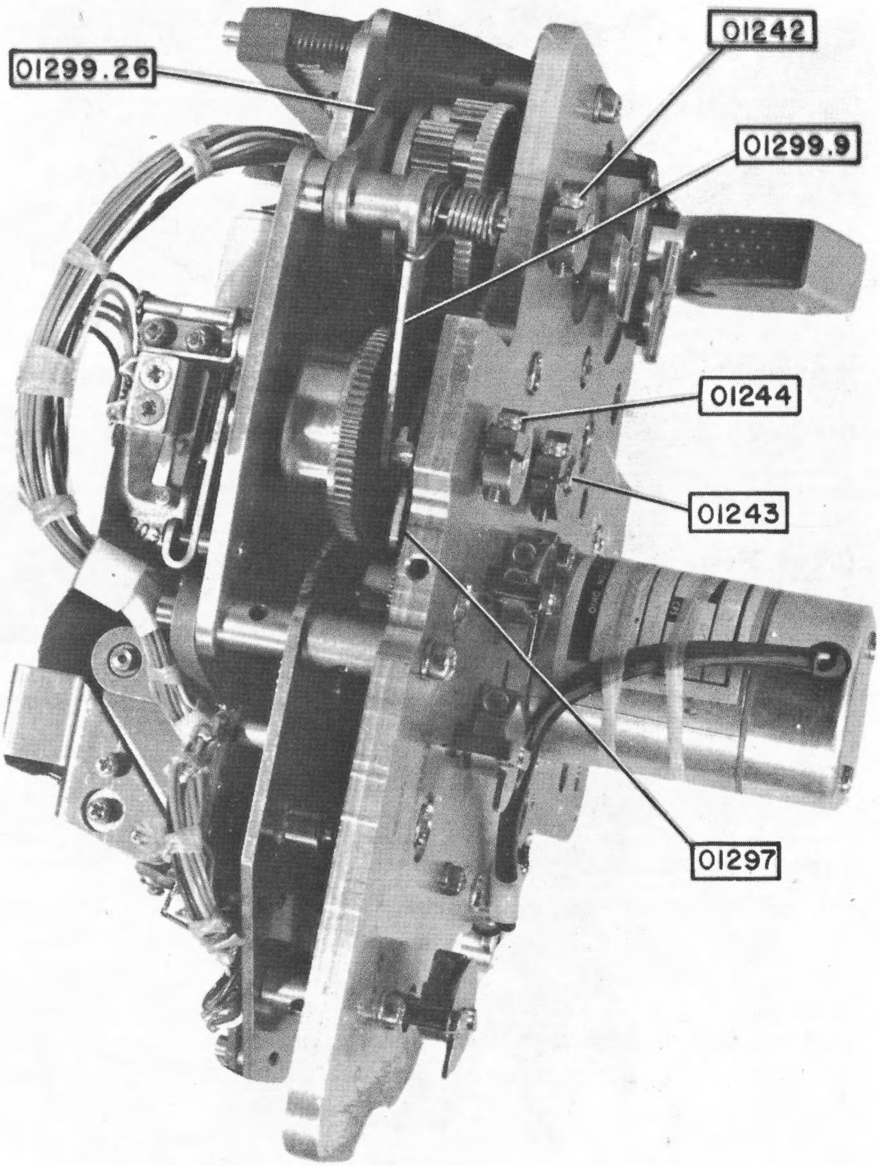


Figure 5-66. Frequency Selector, Right Rear View

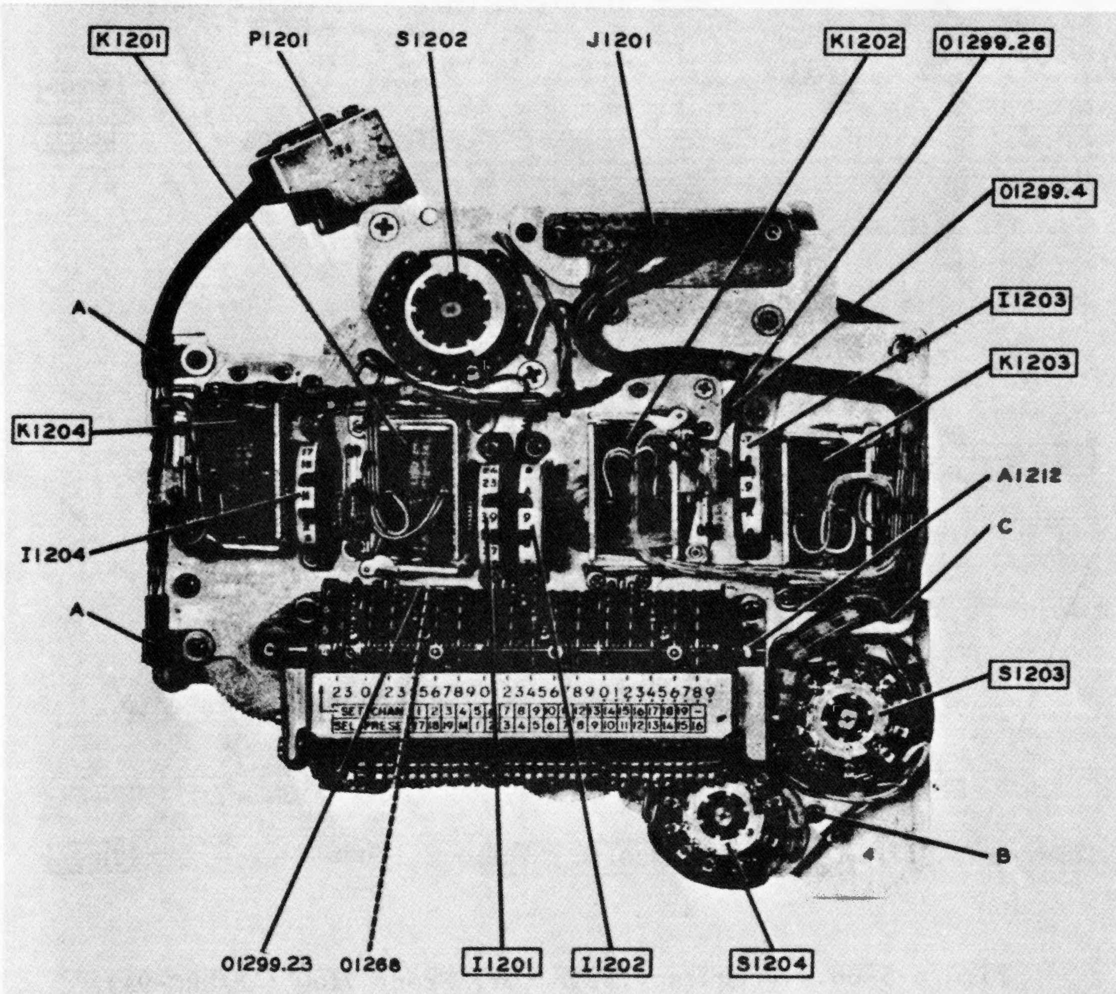


Figure 5-67. Frequency Selector, Front View (AN/URC-9, -9Y, -9AY)

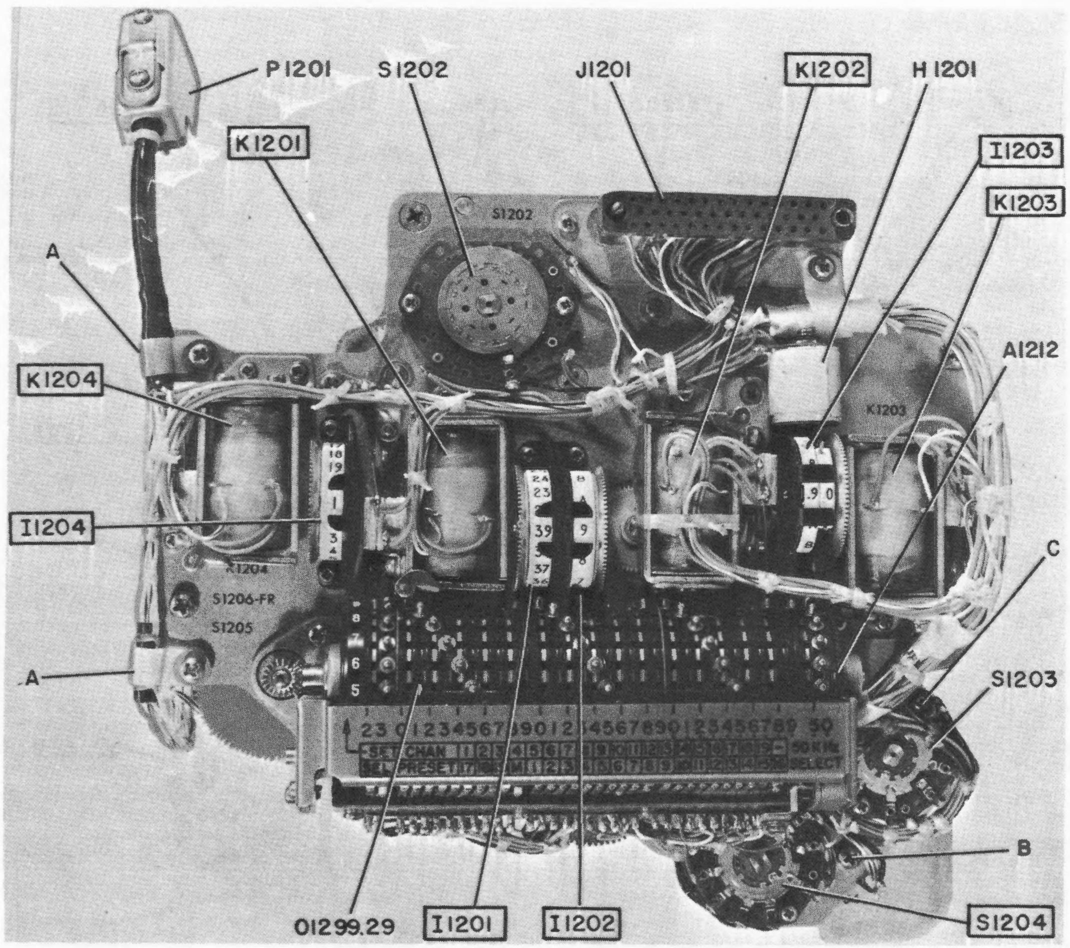


Figure 5-68. Frequency Selector, Front View (AN/URC-9A)

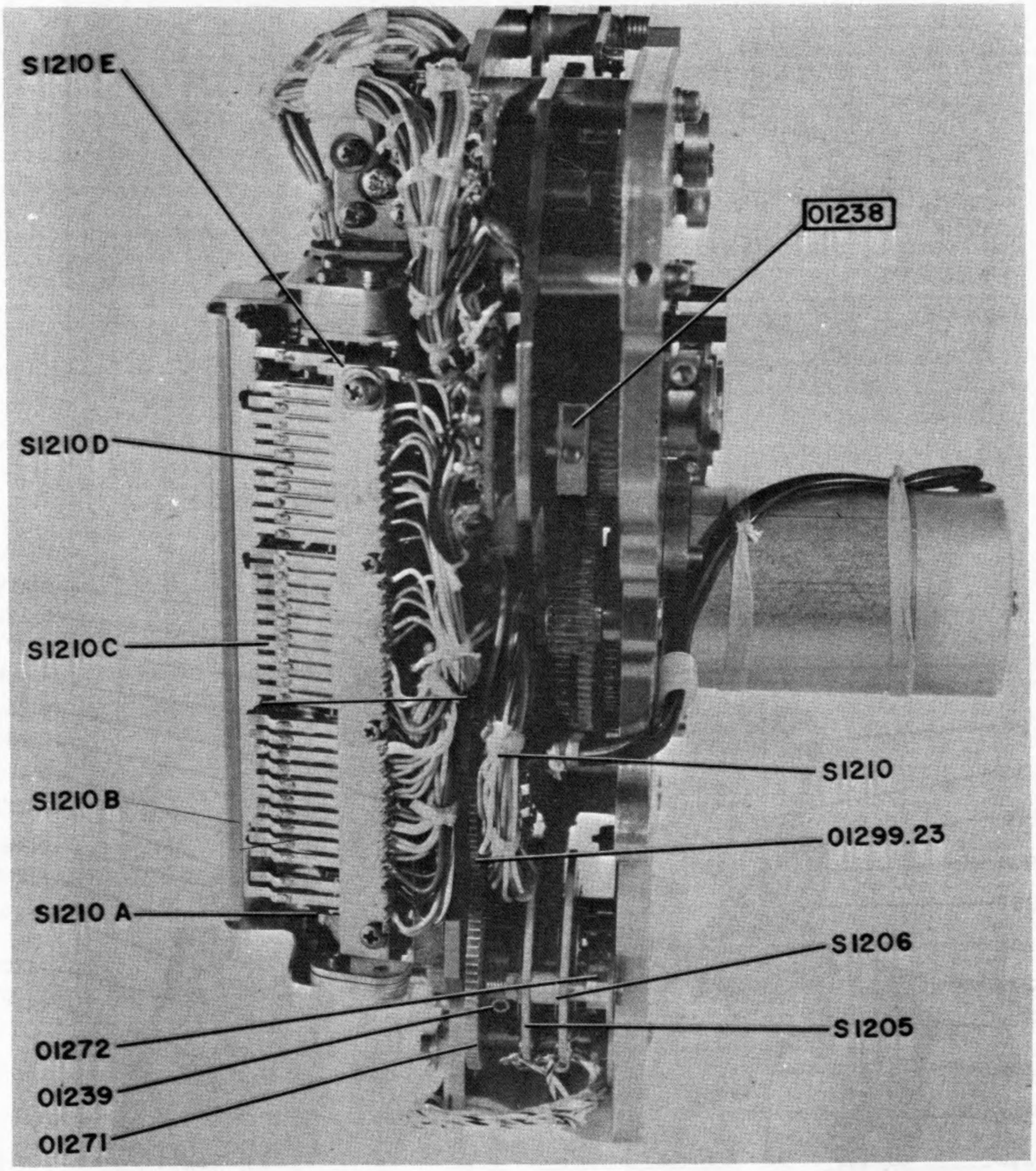


Figure 5-69. Frequency Selector, Bottom View

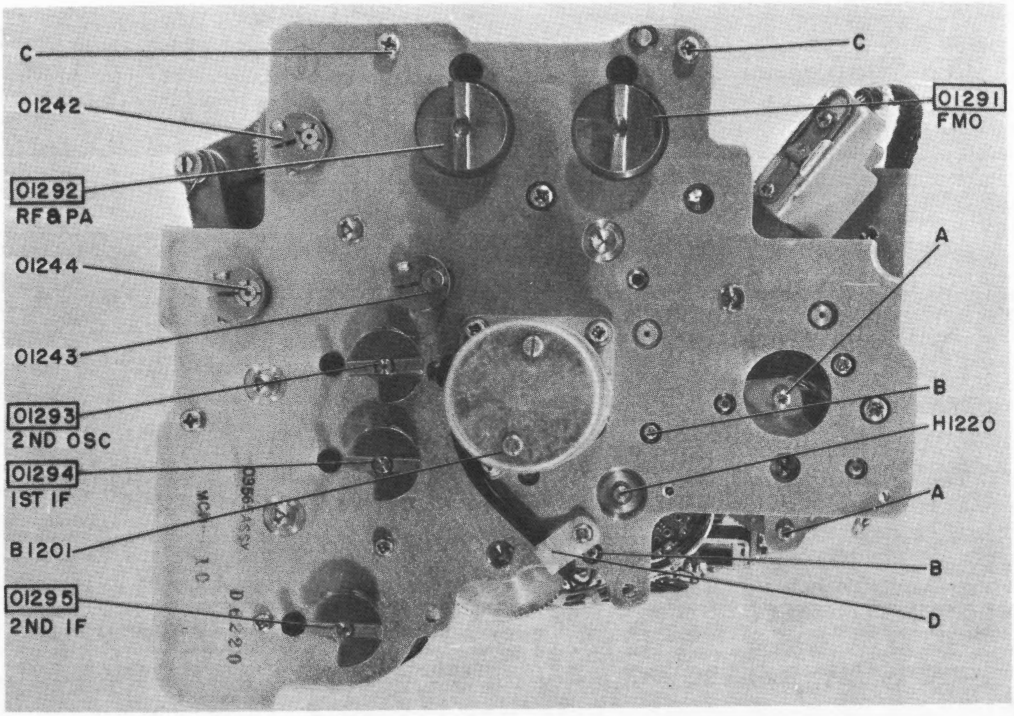


Figure 5-70. Frequency Selector, Rear View

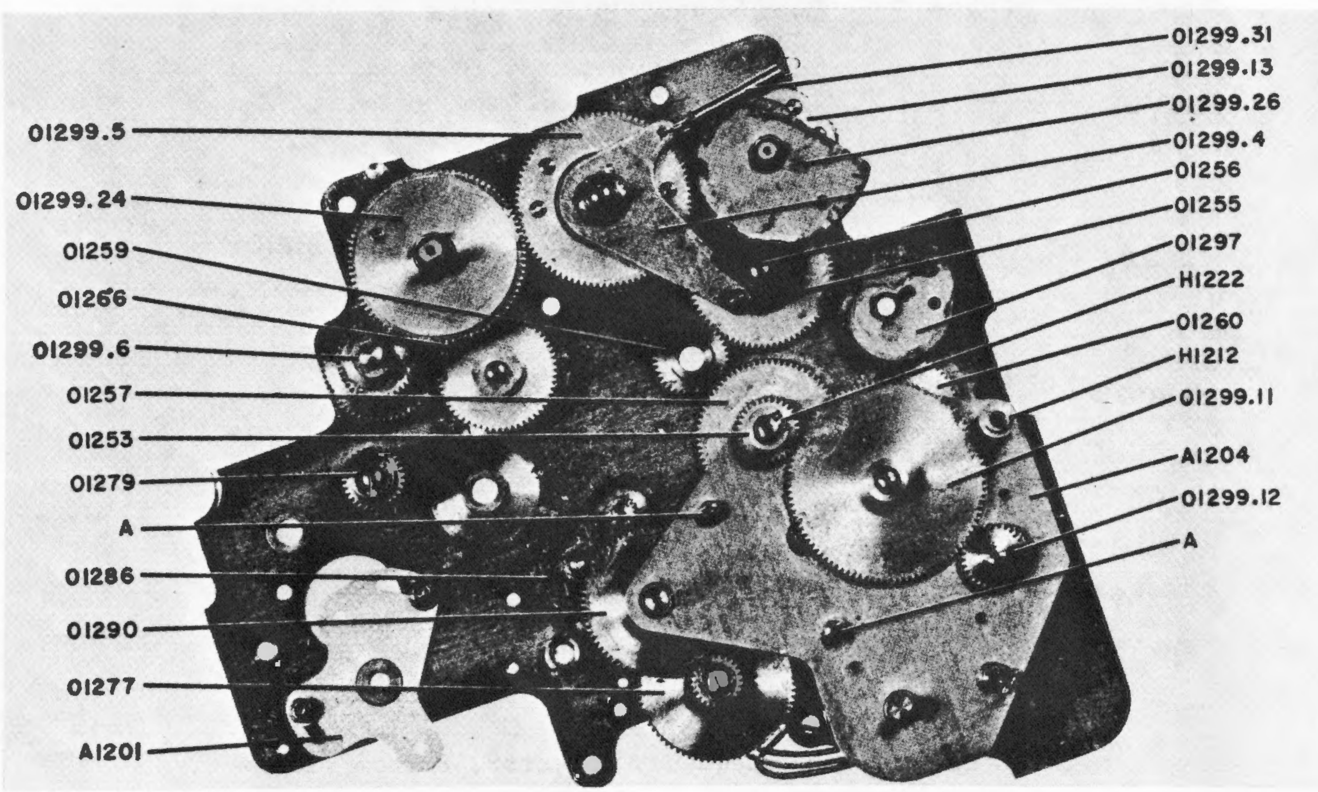


Figure 5-71. Frequency Selector, Front View of Rear Plate (AN/URC-9, -9Y, -9AY)

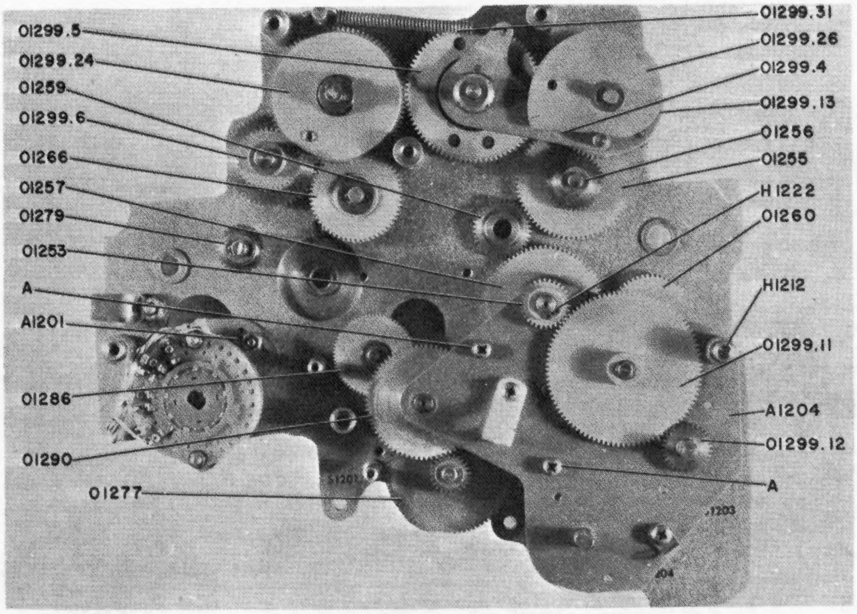


Figure 5-72. Frequency Selector, Front View of Rear Plate (AN/URC-9A)

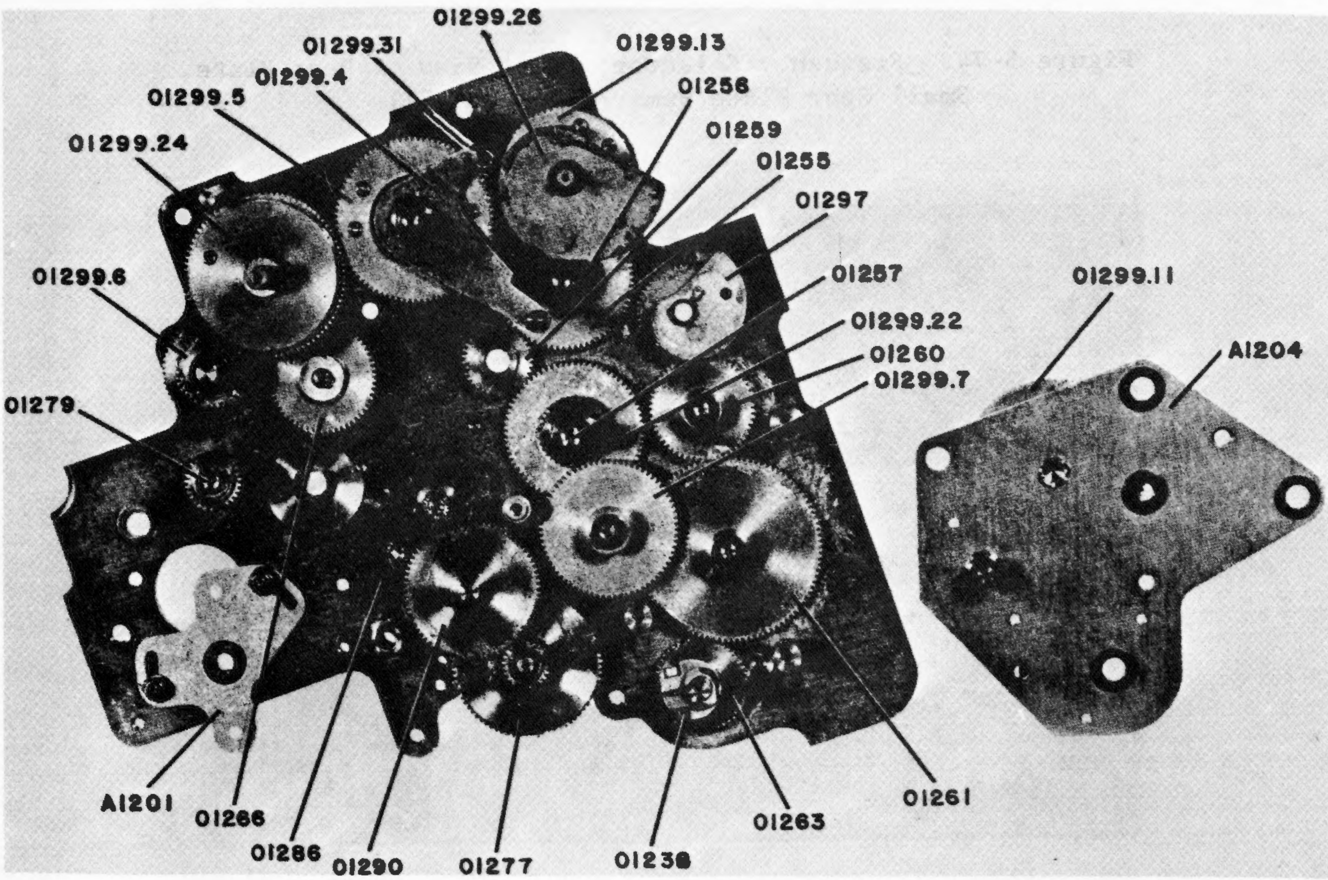


Figure 5-73. Frequency Selector, Front View of Rear Plate, Small Gear Plate Removed (AN/URC-9, -9Y, -9AY)

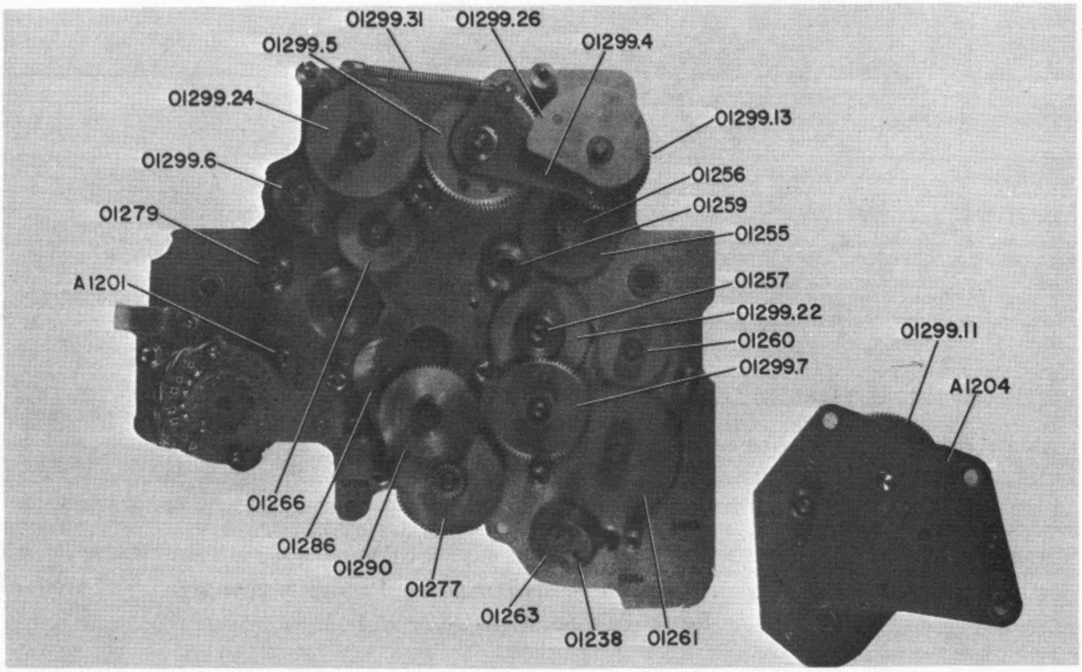


Figure 5-74. Frequency Selector, Front View of Rear Plate, Small Gear Plate Removed (AN/URC-9A)

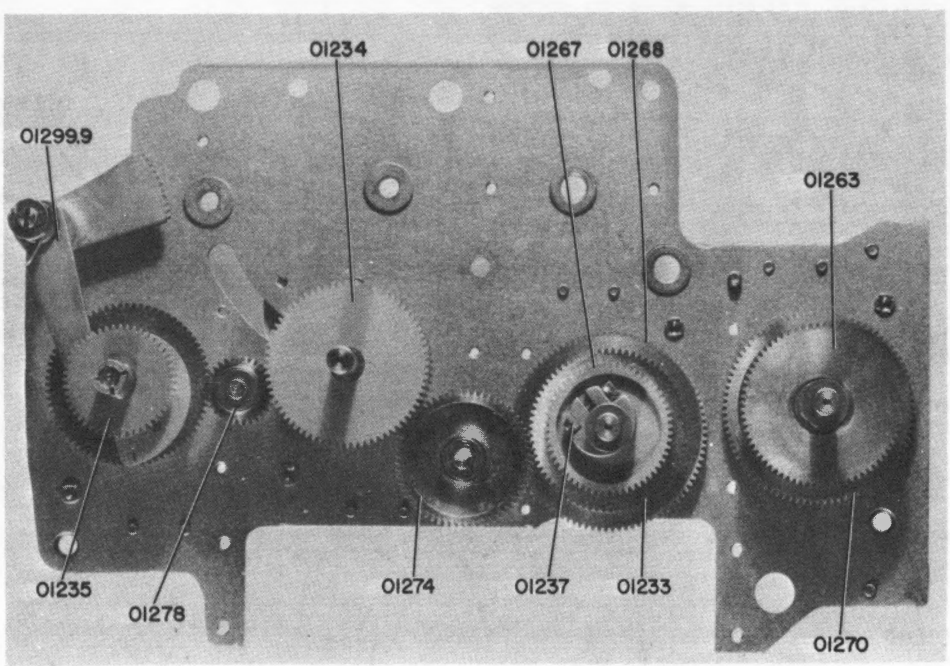


Figure 5-75. Frequency Selector, Rear View of Front Plate

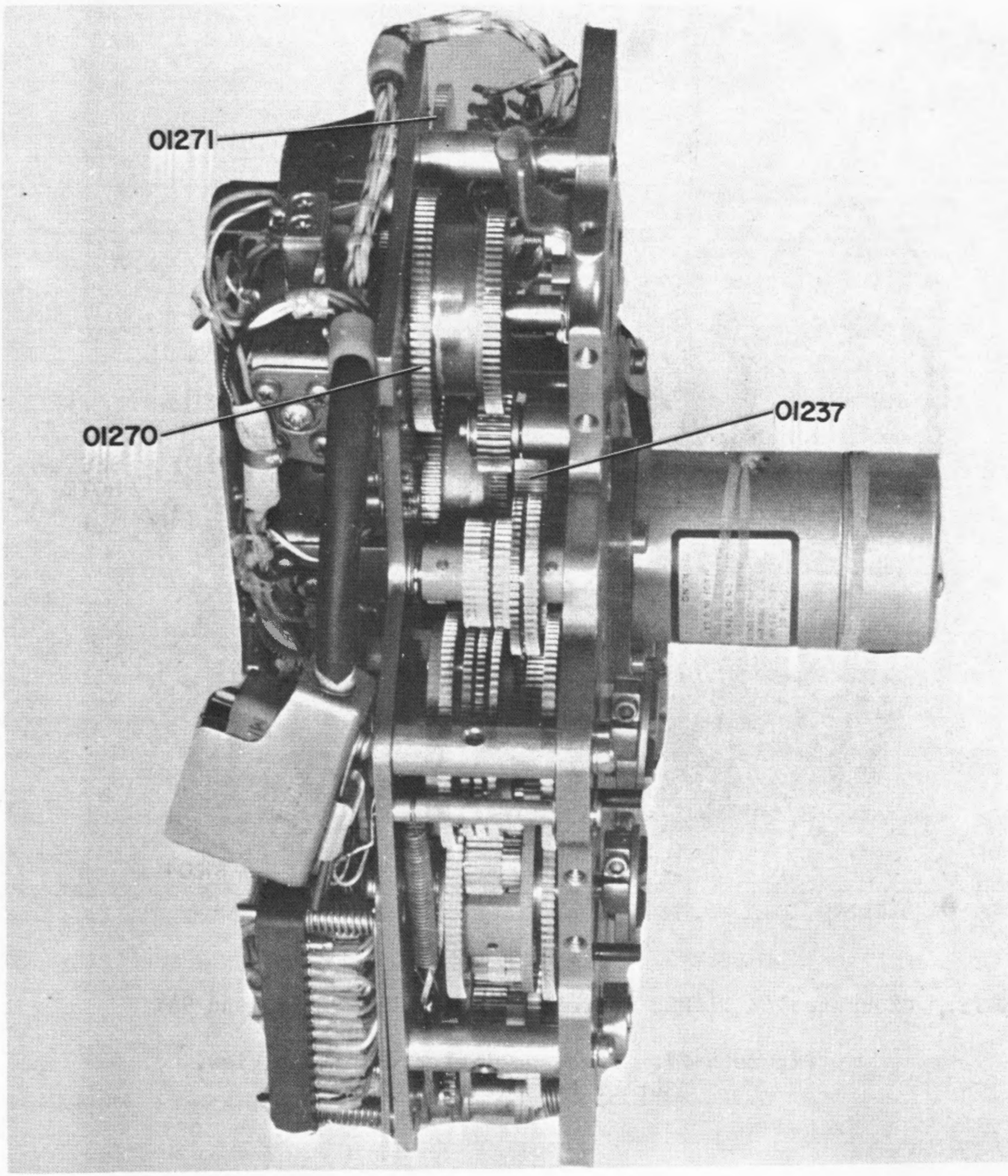
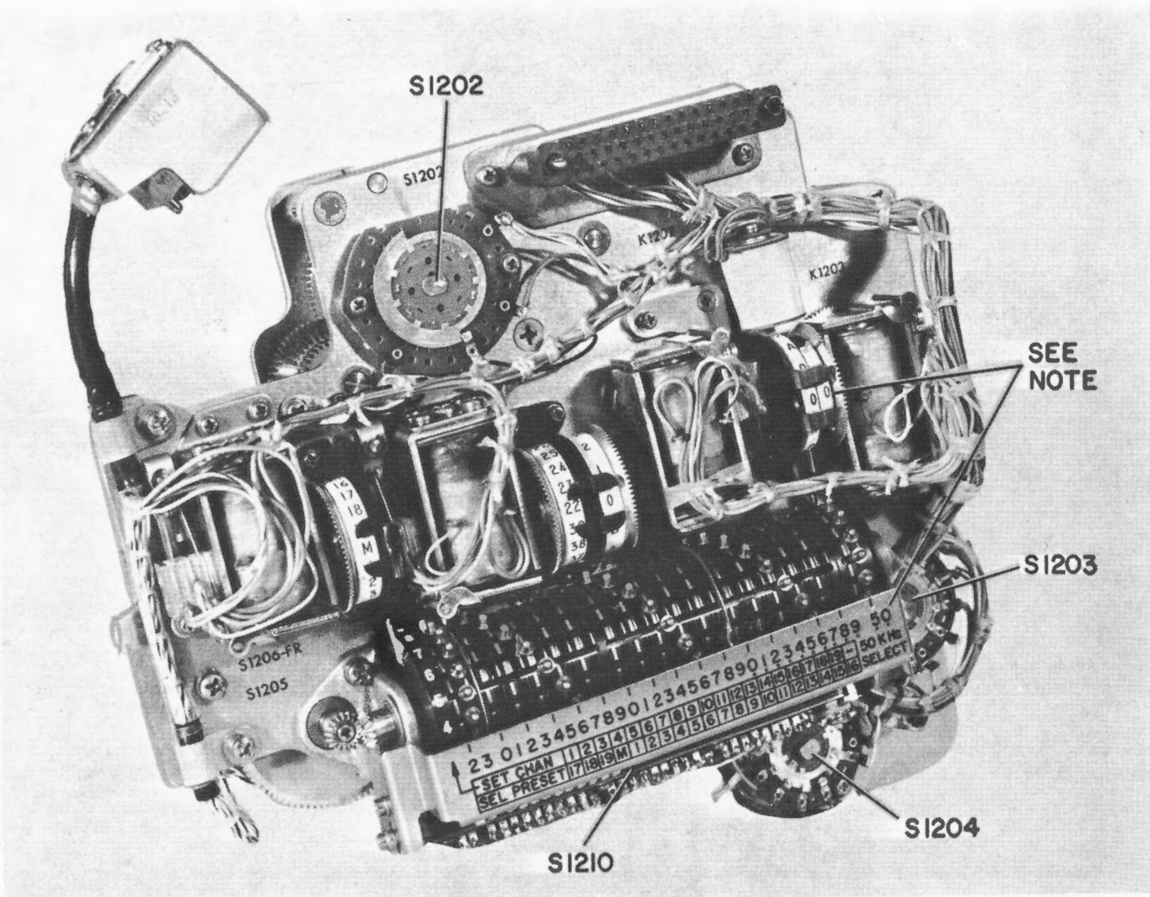


Figure 5-76. Frequency Selector, Left Top View



NOTE: Graduated in .1 MHz increments on AN/URC-9, 9Y, and 9AY

Figure 5-77. Frequency Selector, Front View, Set to Preselect 220 MHz

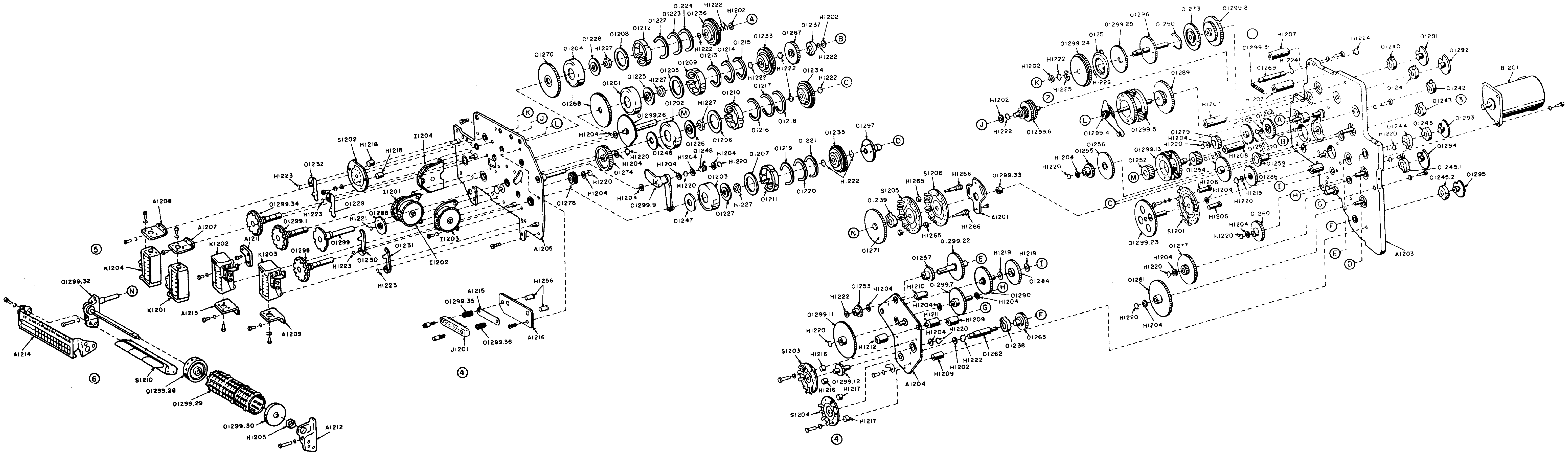


Figure 5-78. Frequency Selector, Exploded View
(AN/URC-9, -9Y, -9AY)

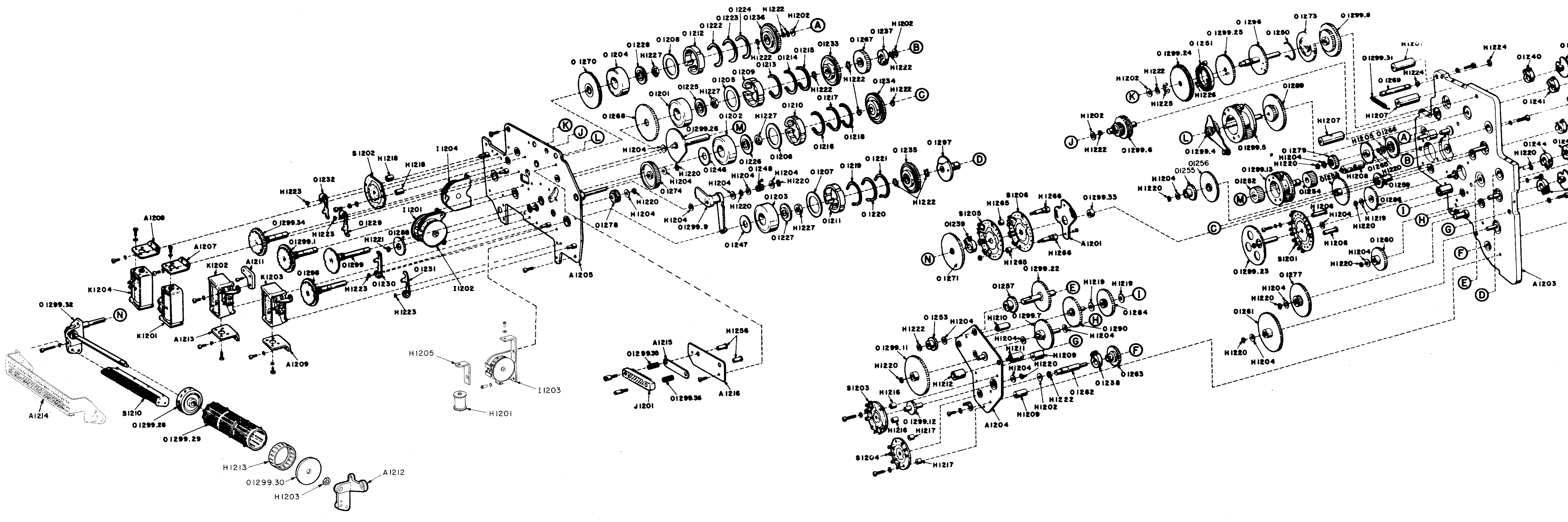


Figure 5-79. Frequency Selector,
Exploded View (AN/URC-9A)

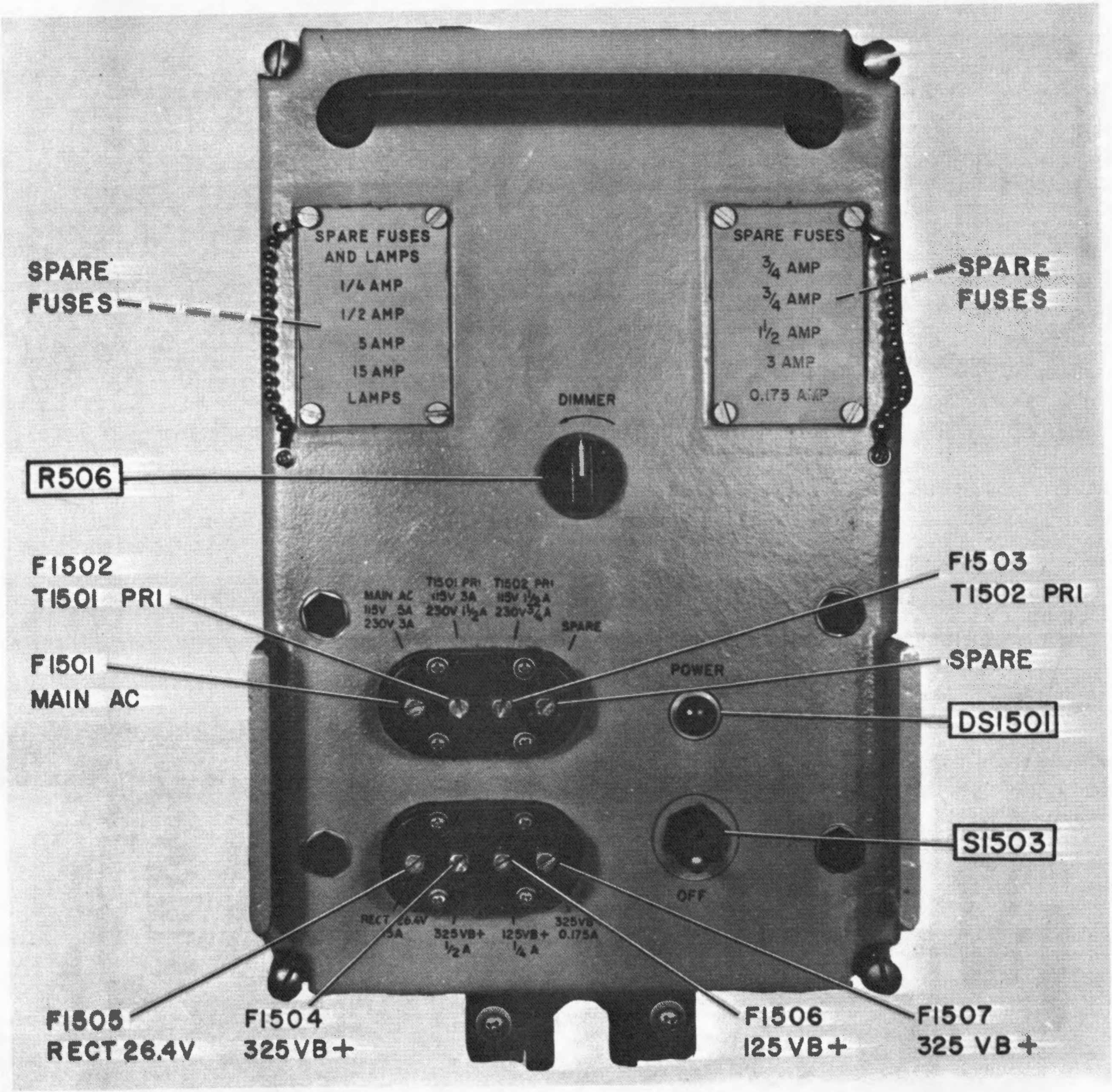


Figure 5-80. Power Supply PP-2702/URC-9, Front View

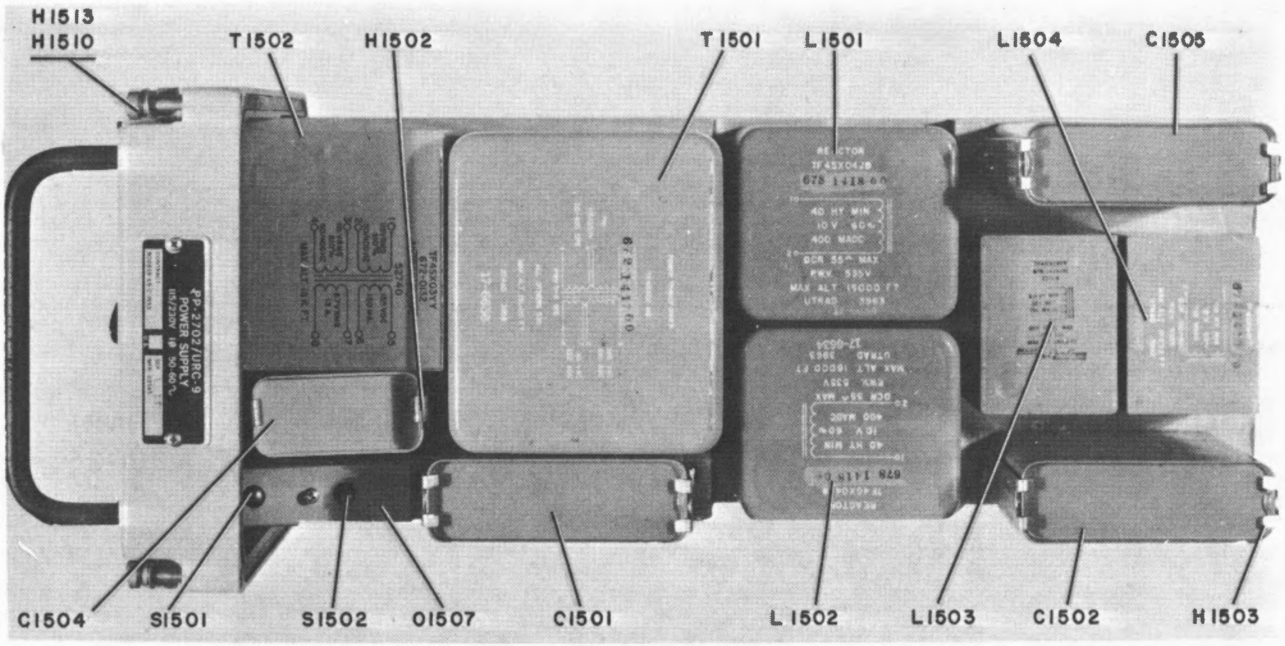


Figure 5-81. Power Supply PP-2702/URC-9, Top View

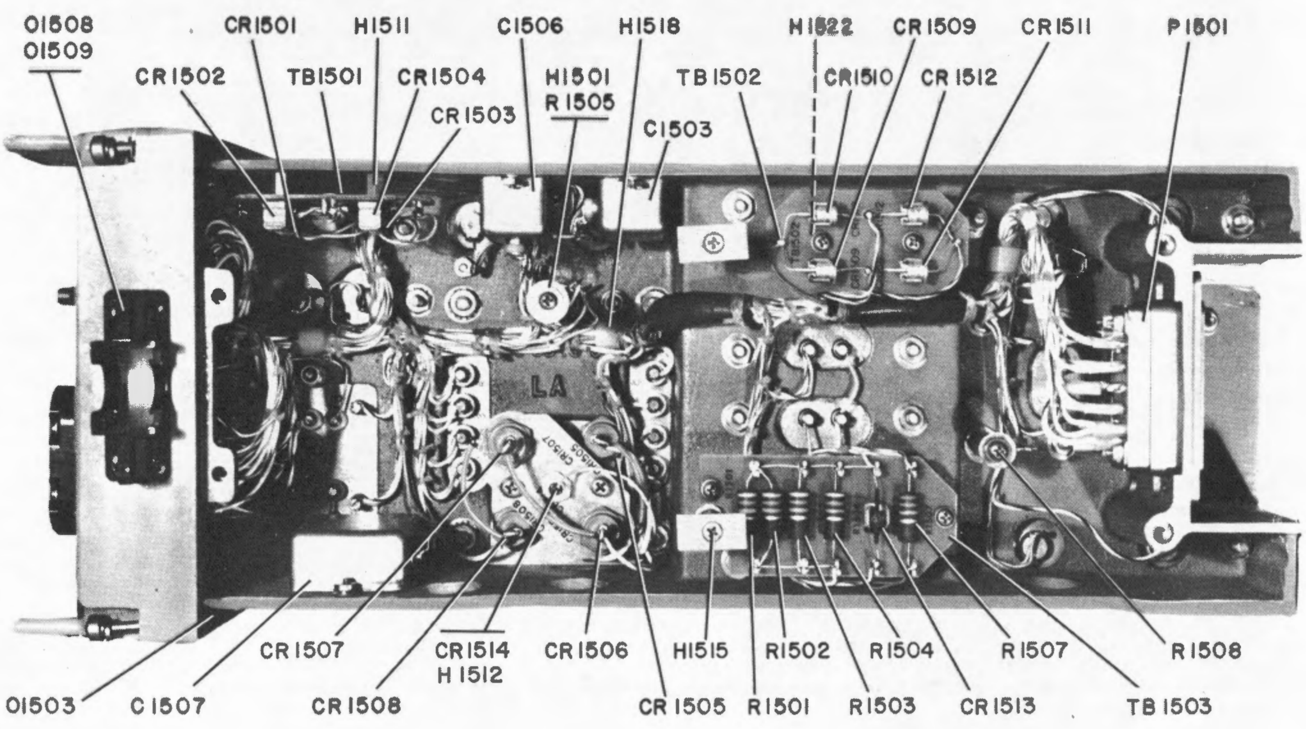


Figure 5-82. Power Supply PP-2702/URC-9, Bottom View

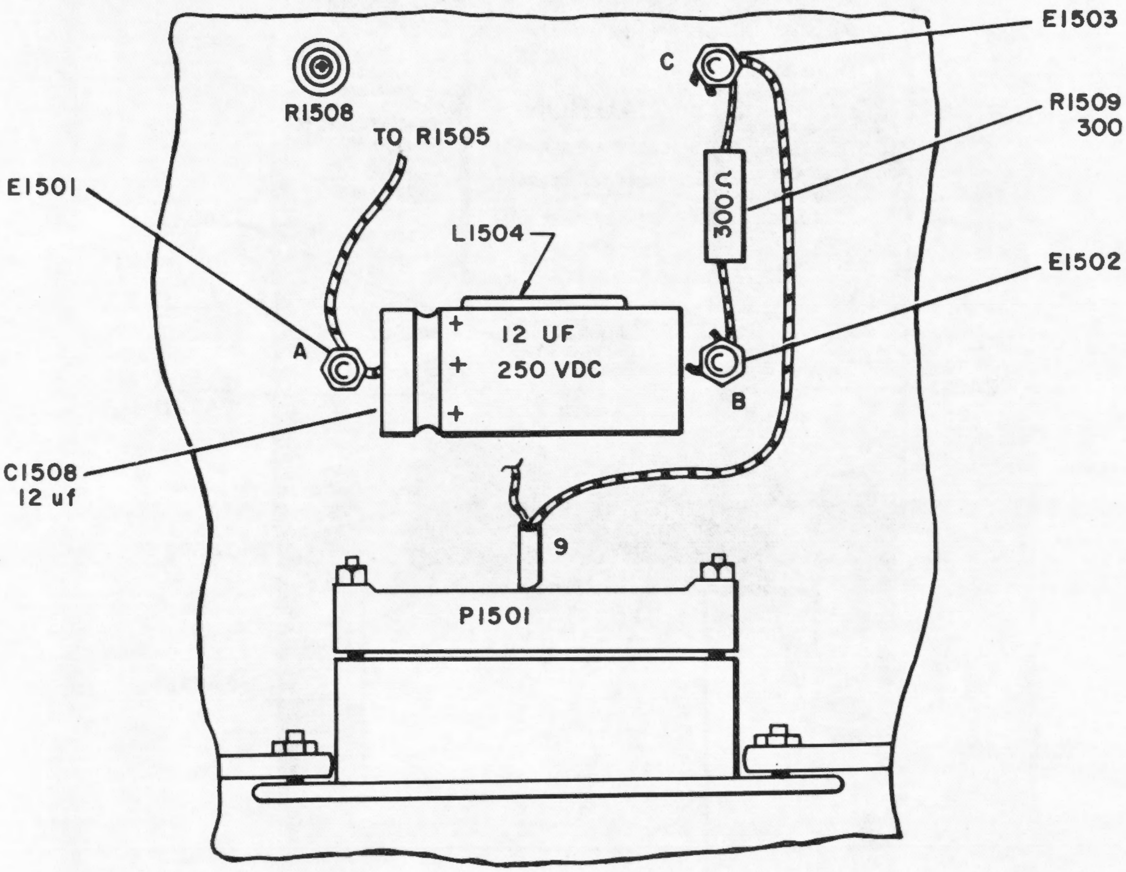


Figure 5-83. Power Supply PP2702/URC-9, R1509 and C1508 Location

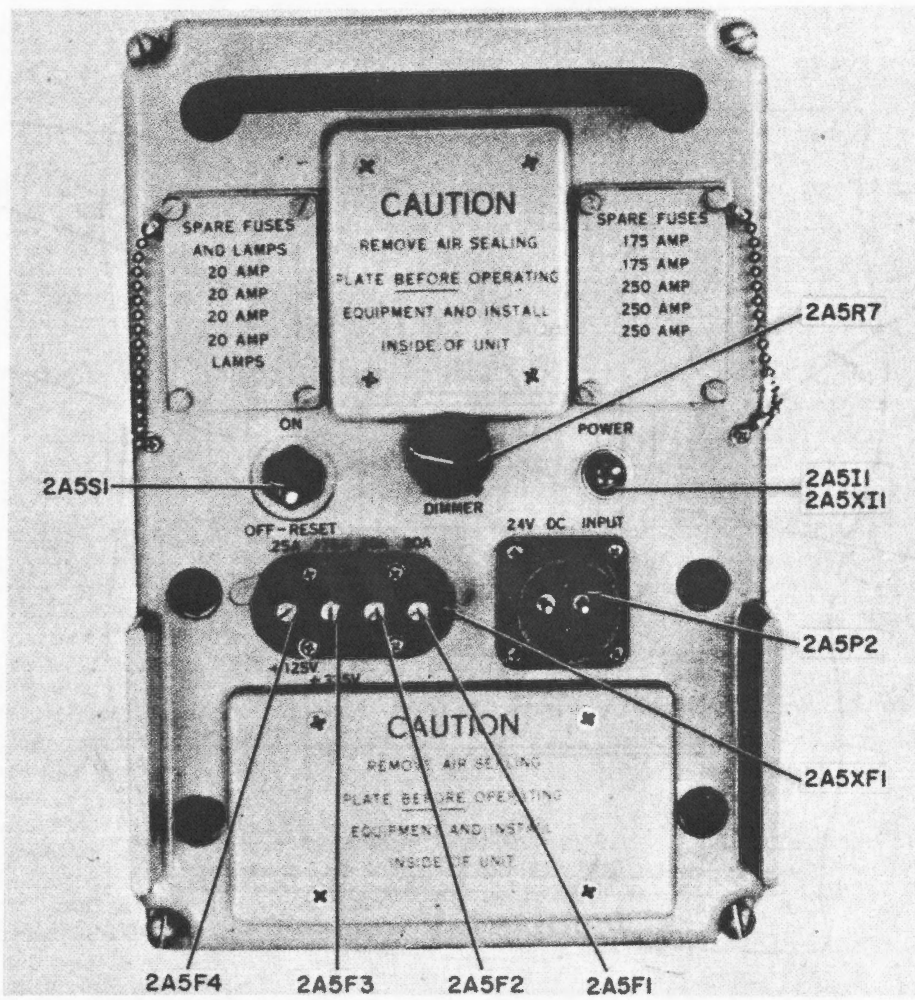


Figure 5-84. Power Supply PP-4706/URC-9Y, Front View

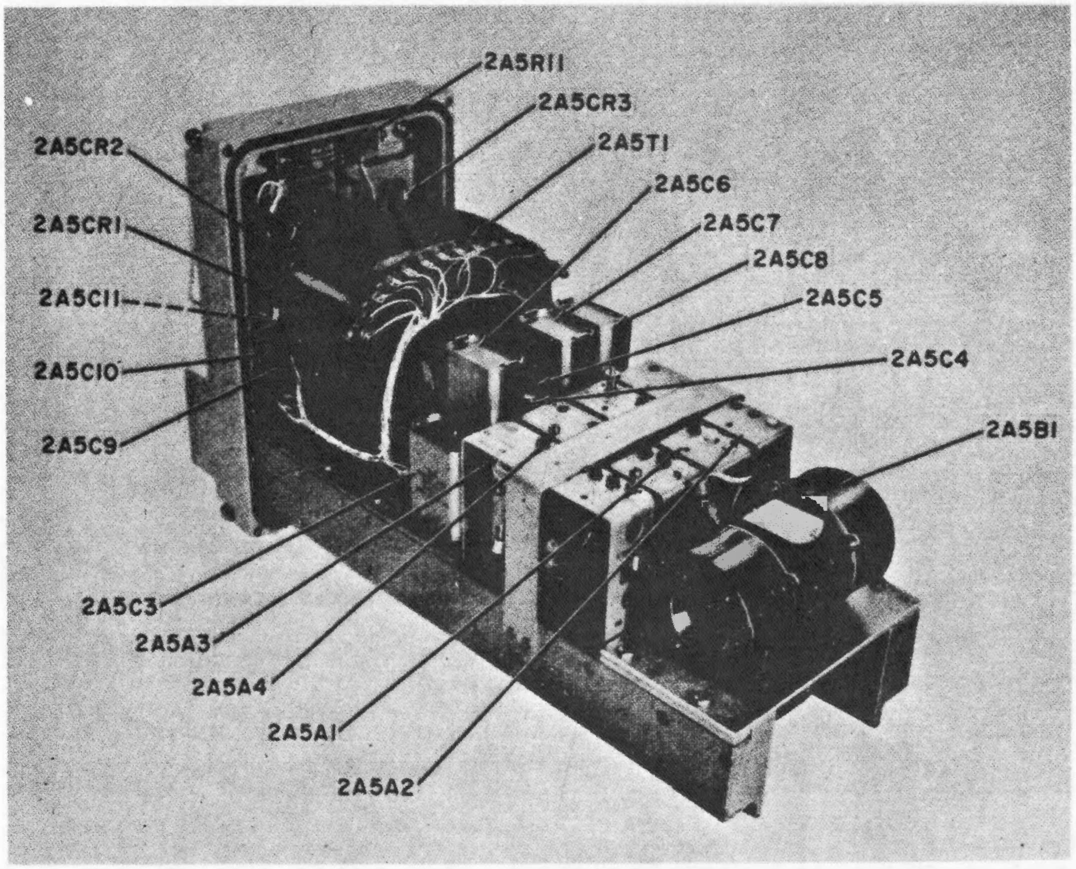


Figure 5-85. Power Supply PP-4706/URC-9Y, Top View

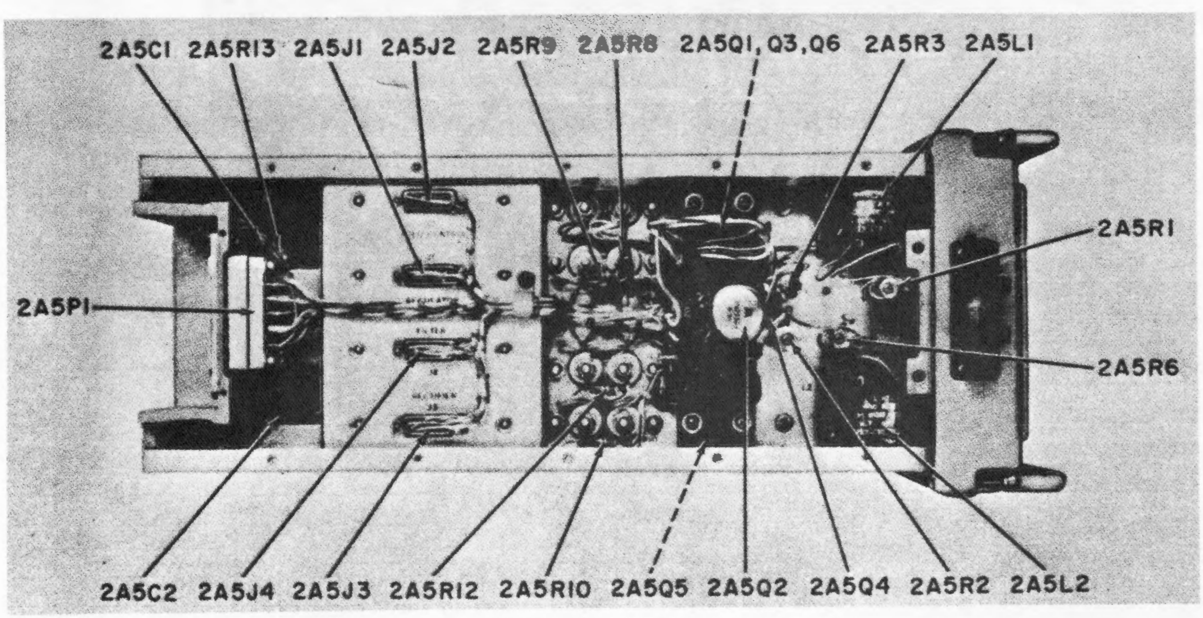


Figure 5-86. Power Supply PP-4706/URC-9Y, Bottom View

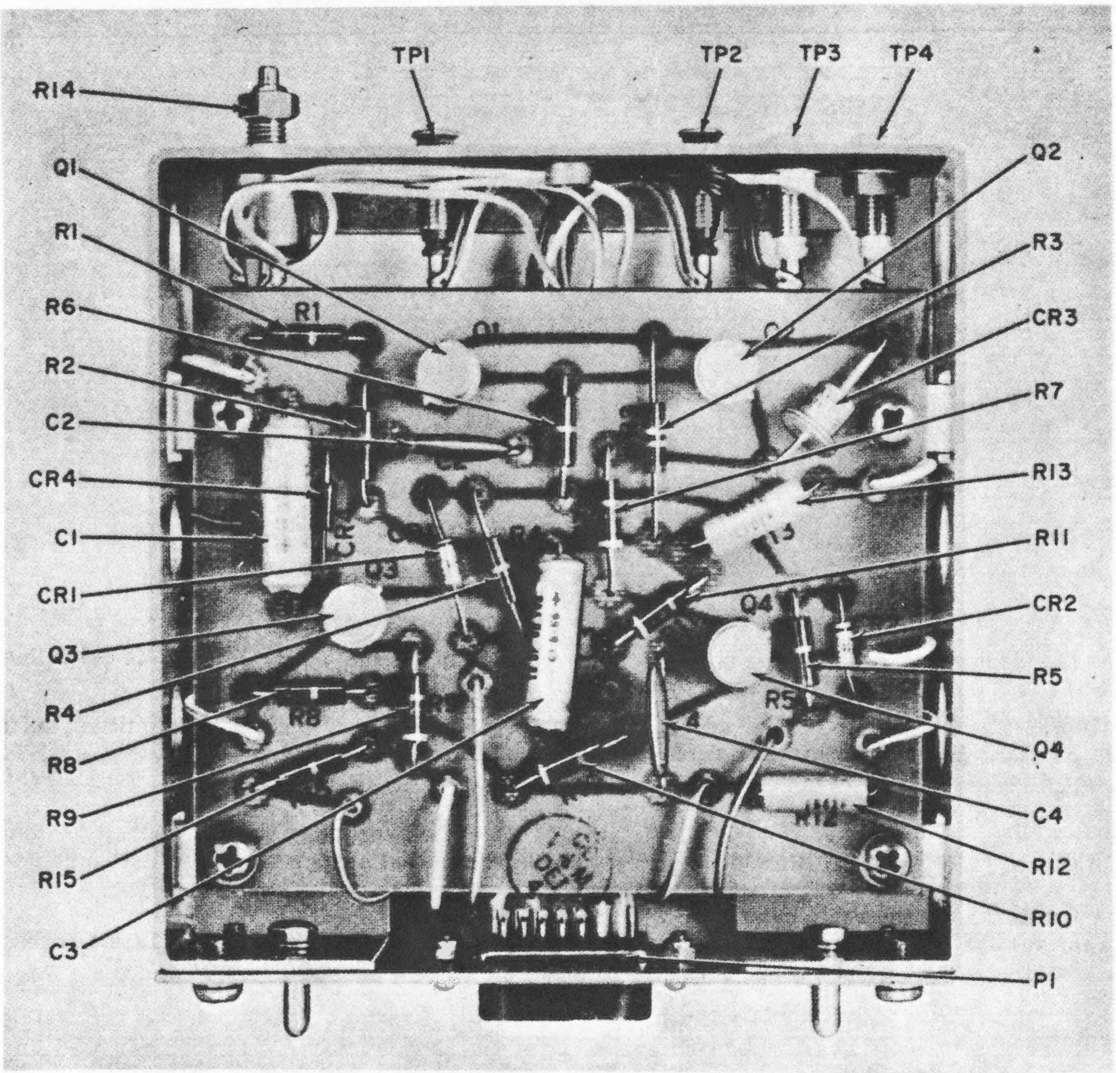


Figure 5-87. Power Supply PP-4706/URC-9Y,
Regulator Module 2A5A1

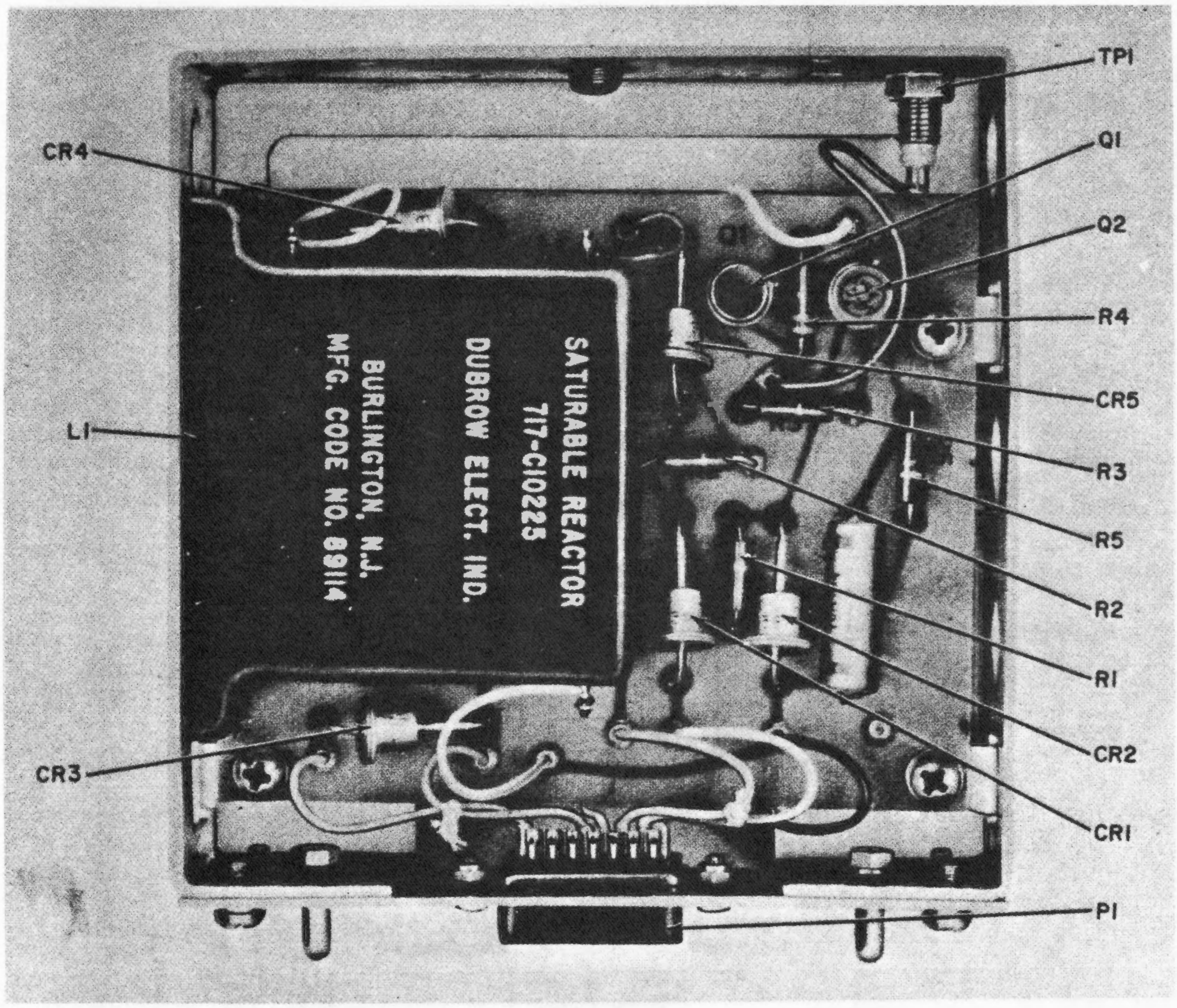


Figure 5-88. Power Supply PP-4706/URC-9Y,
Frequency Control Module 2A5A2

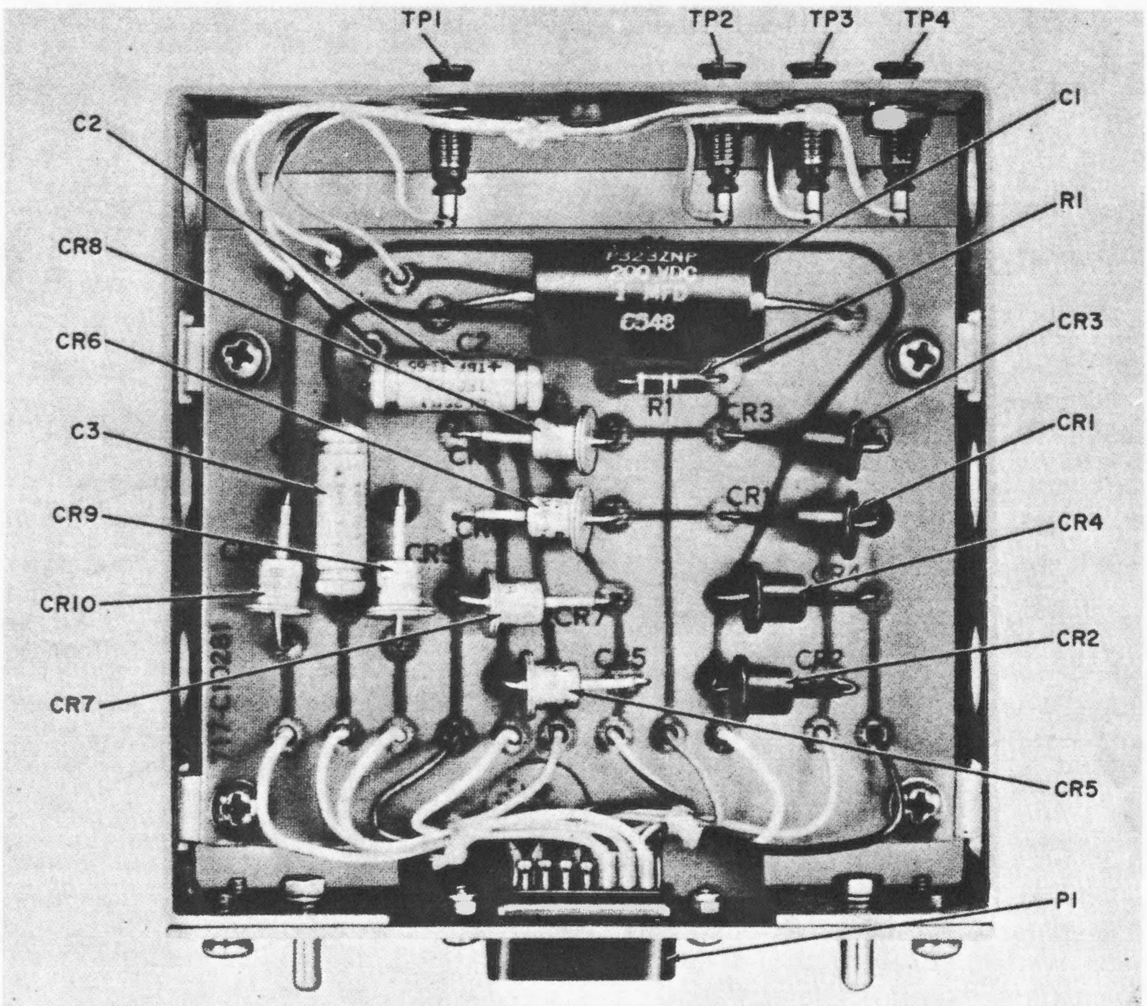


Figure 5-89. Power Supply PP-4706/URC-9Y, Rectifier Module 2A5A3

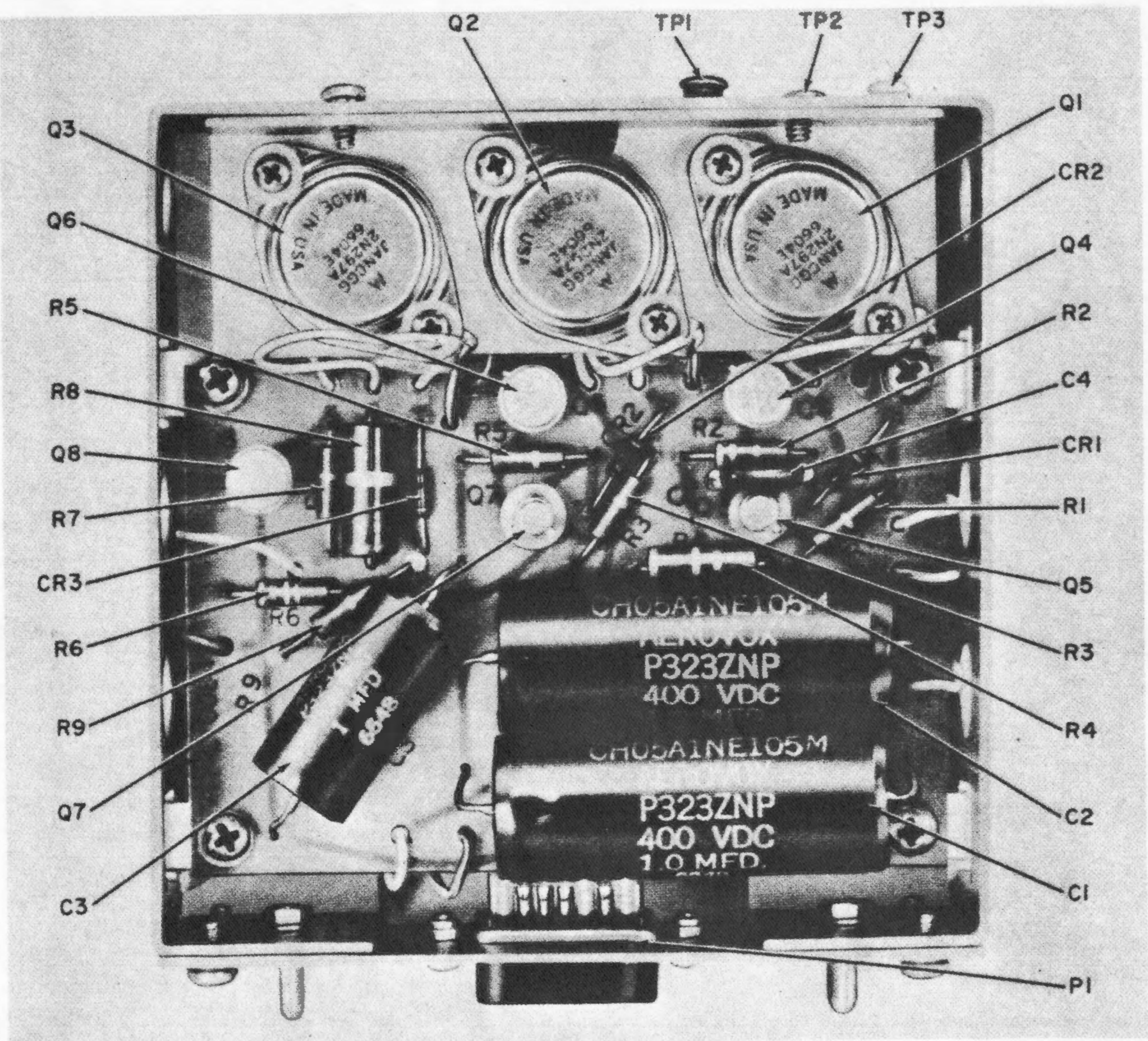


Figure 5-90. Power Supply PP-4706/URC-9Y, Filter Module 2A5A4

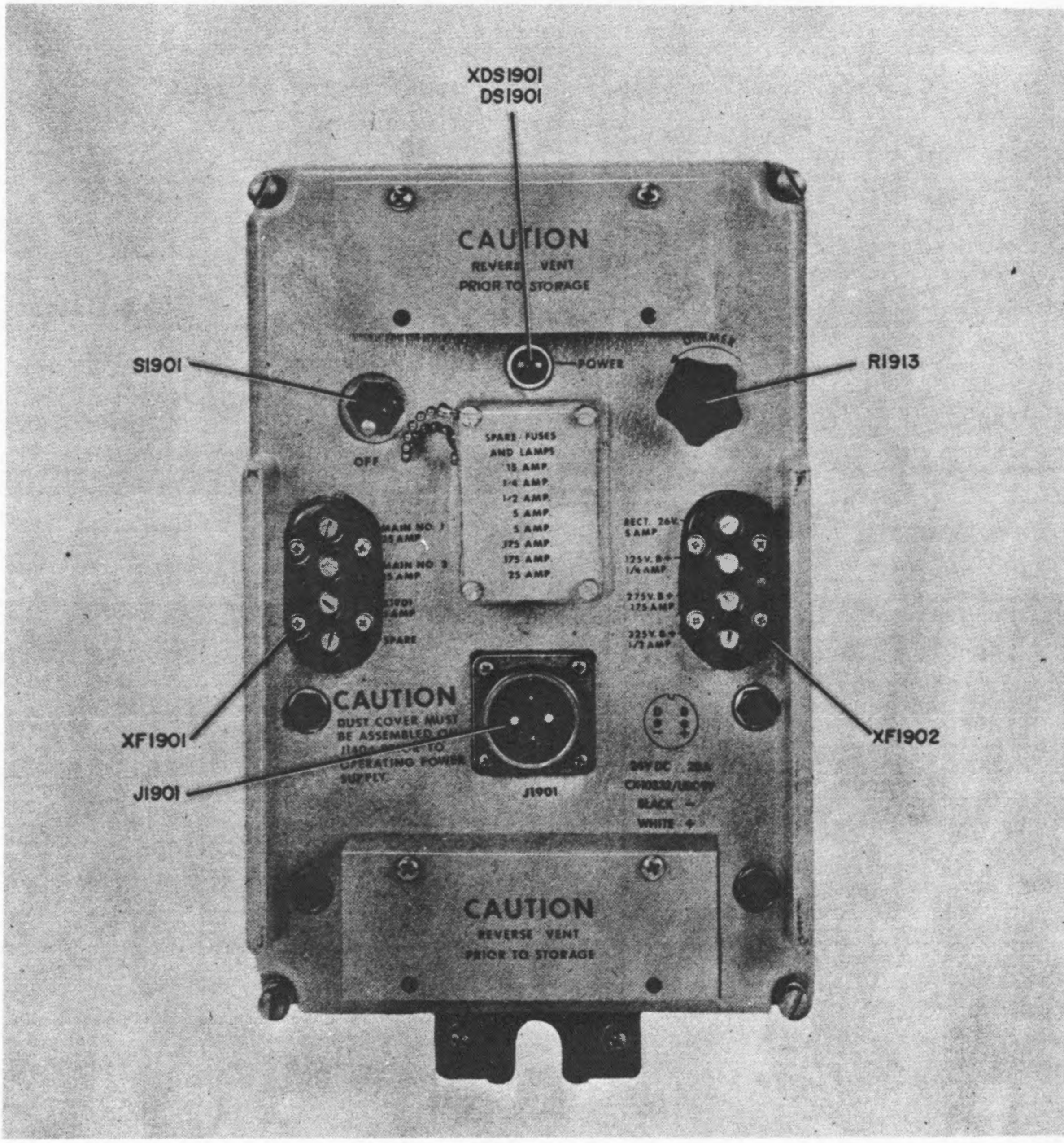


Figure 5-91. Power Supply PP-4706A/URC-9Y, Front View

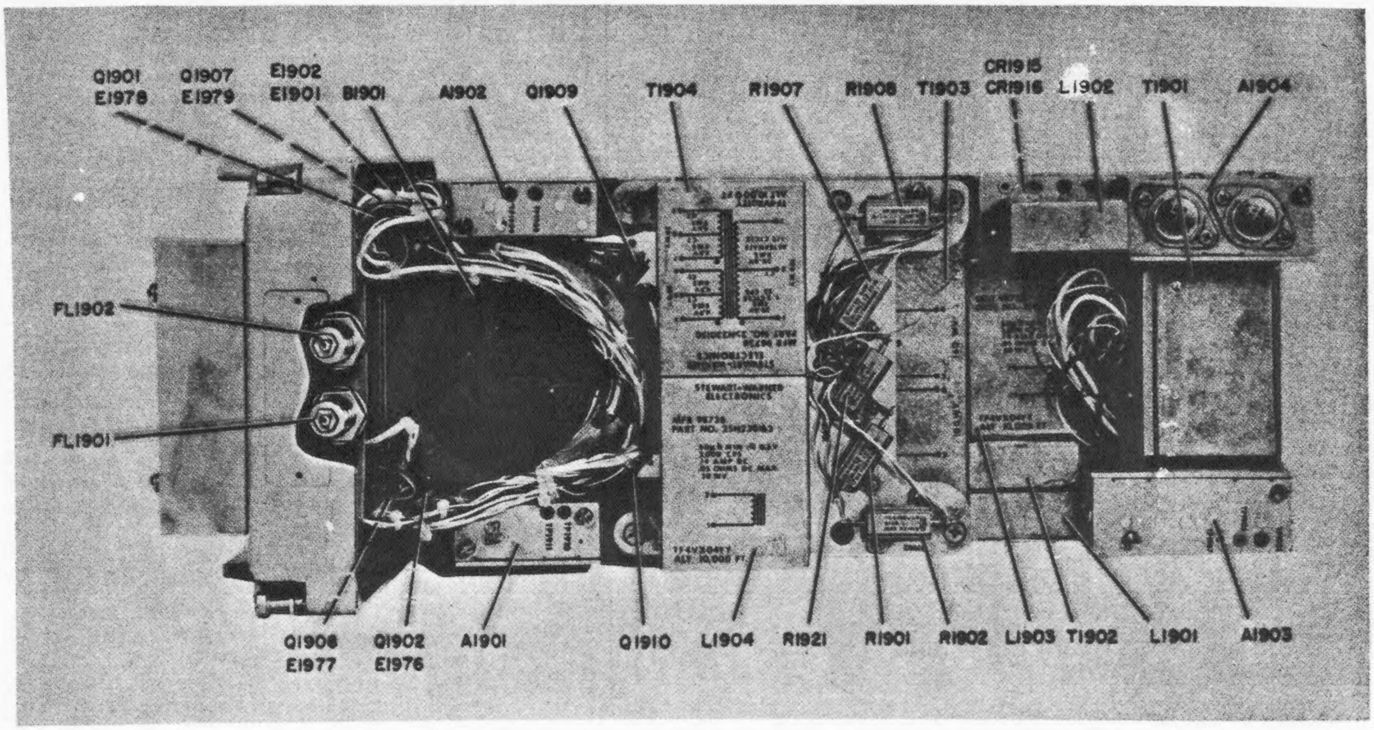


Figure 5-92. Power Supply PP-4706A/URC-9Y, Top View

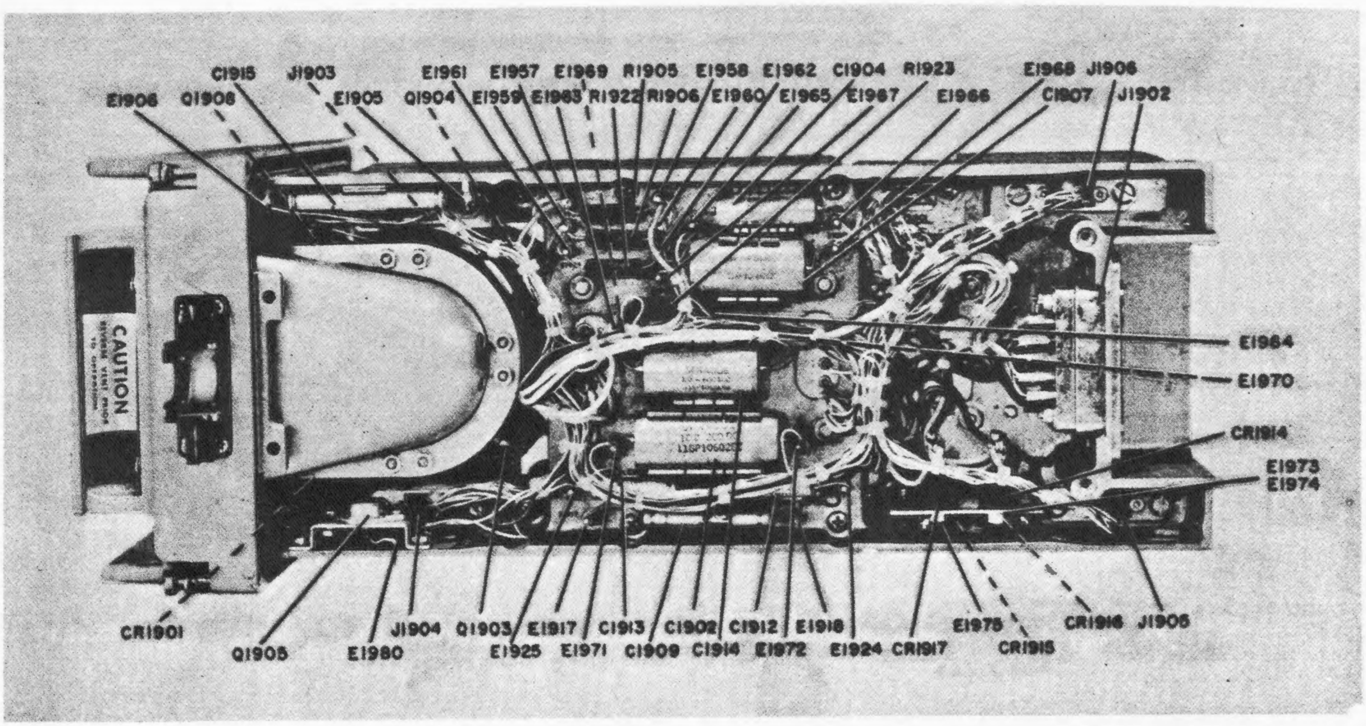


Figure 5-93. Power Supply PP-4706A/URC-9Y, Bottom View

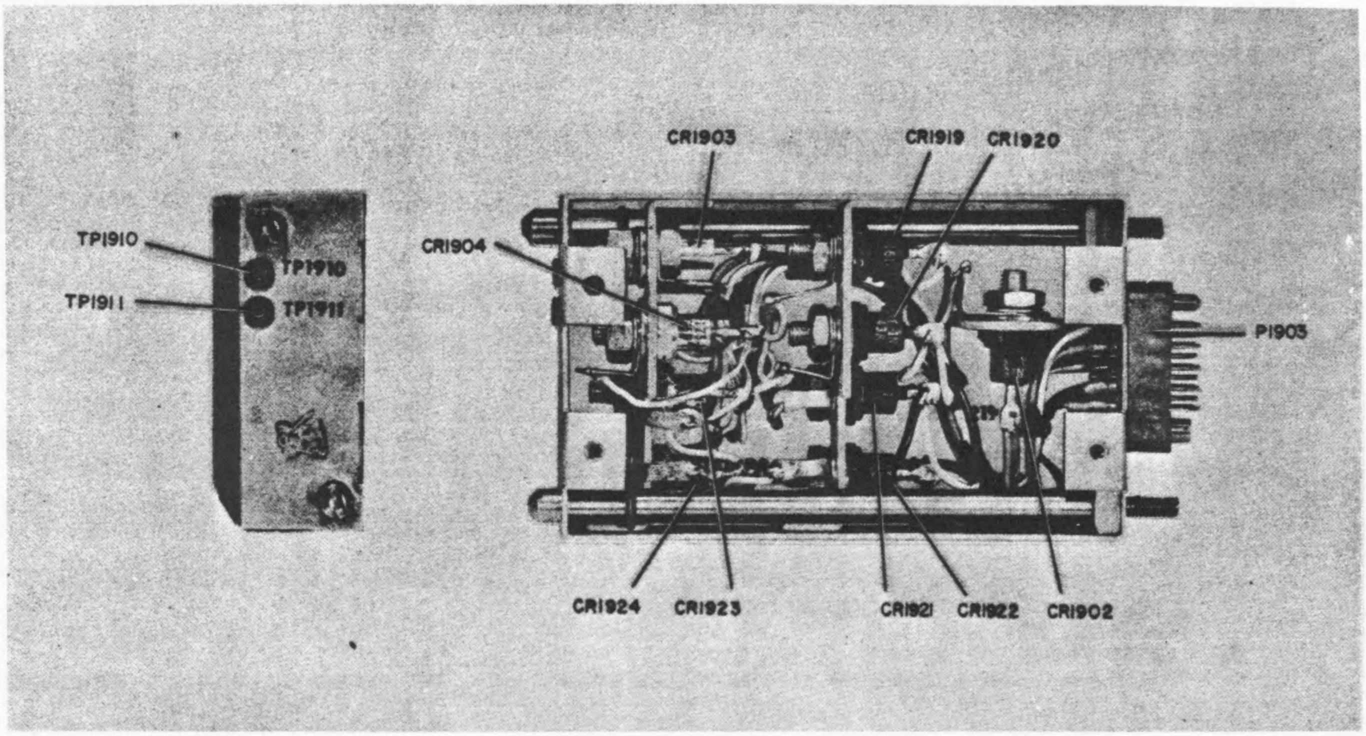


Figure 5-94. Power Supply PP-4706A/URC-9Y, Semiconductor Module (A1901)

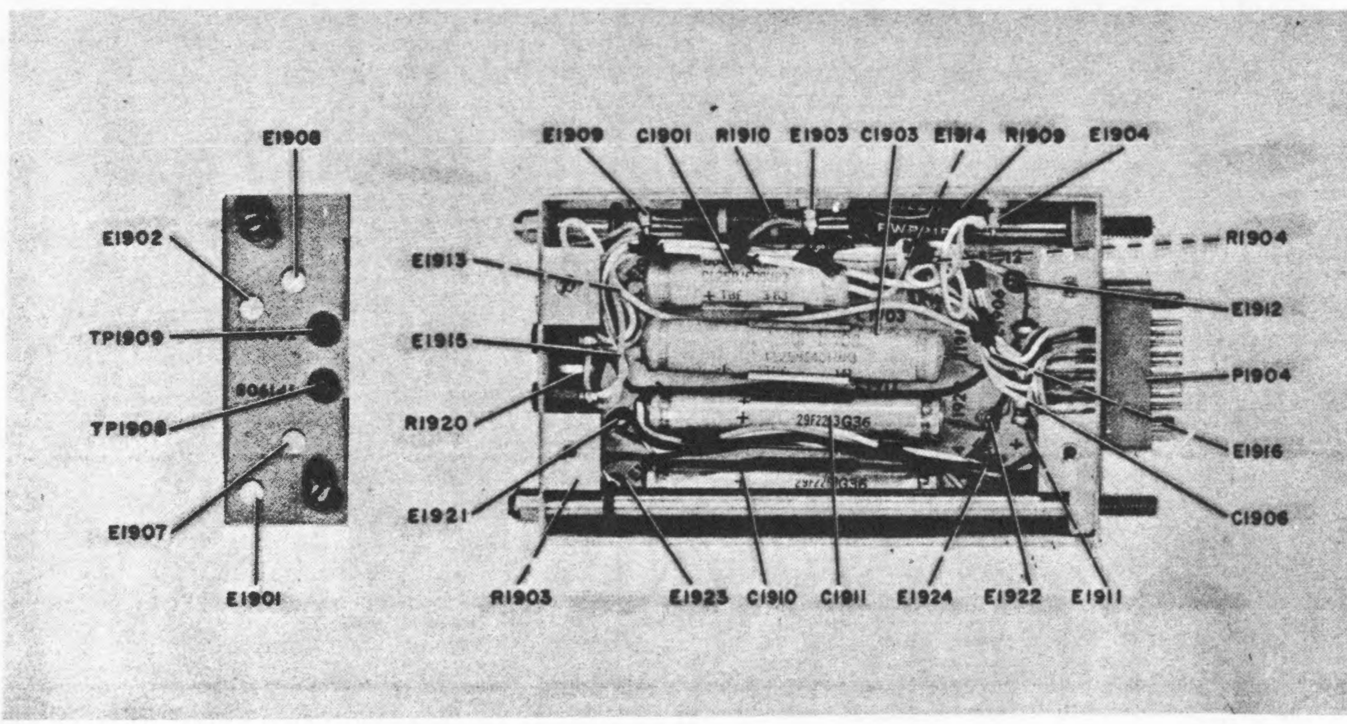


Figure 5-95. Power Supply PP-4706A/URC-9Y, Resistor and Capacitor Module (A1902)

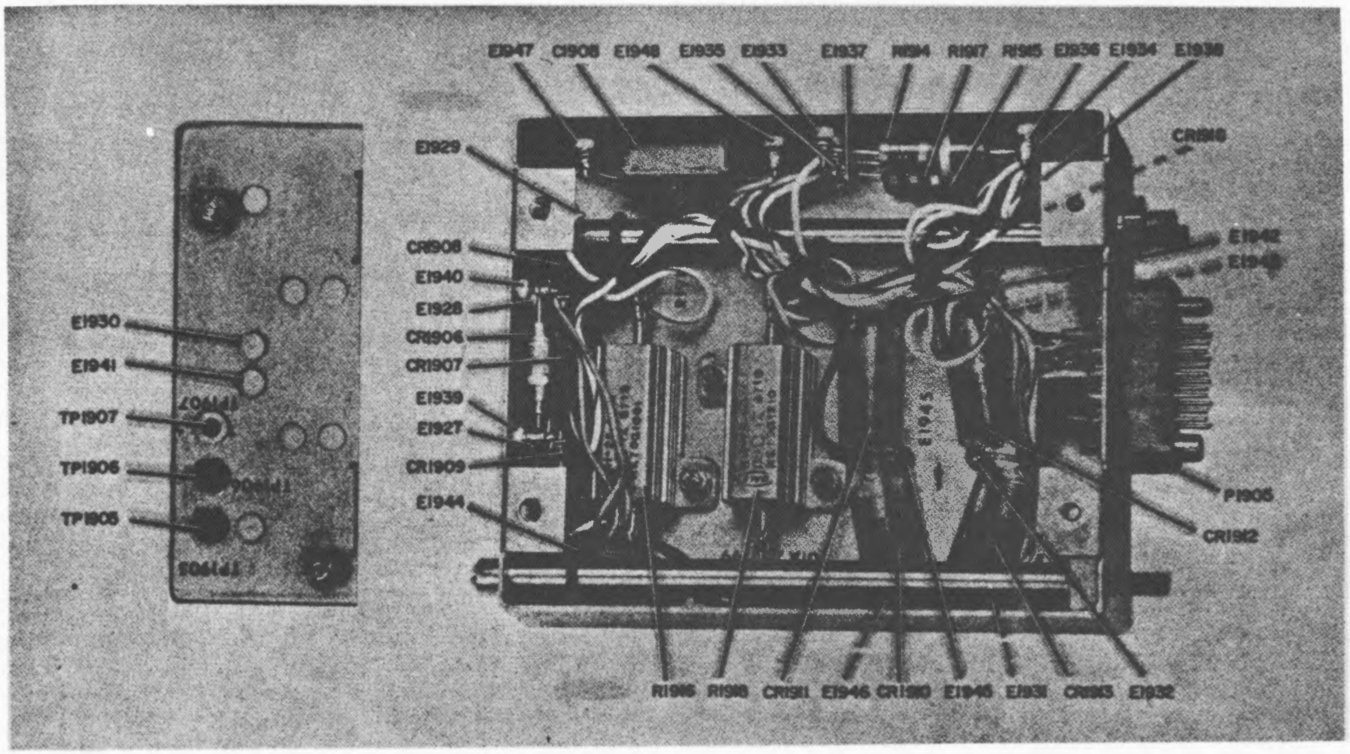


Figure 5-96. Power Supply PP-4706A/URC-9Y, Filter Bias Module (A1903)

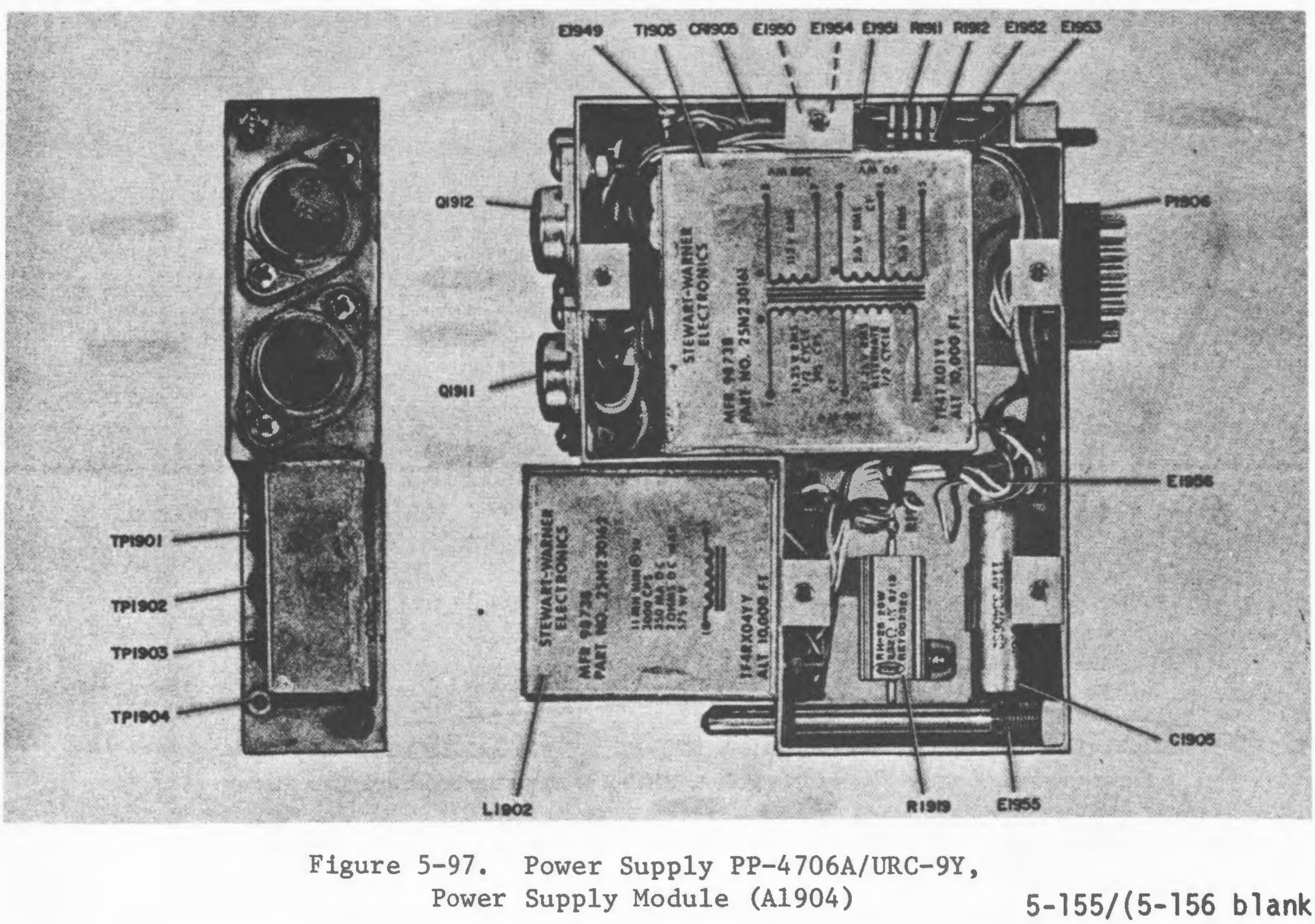
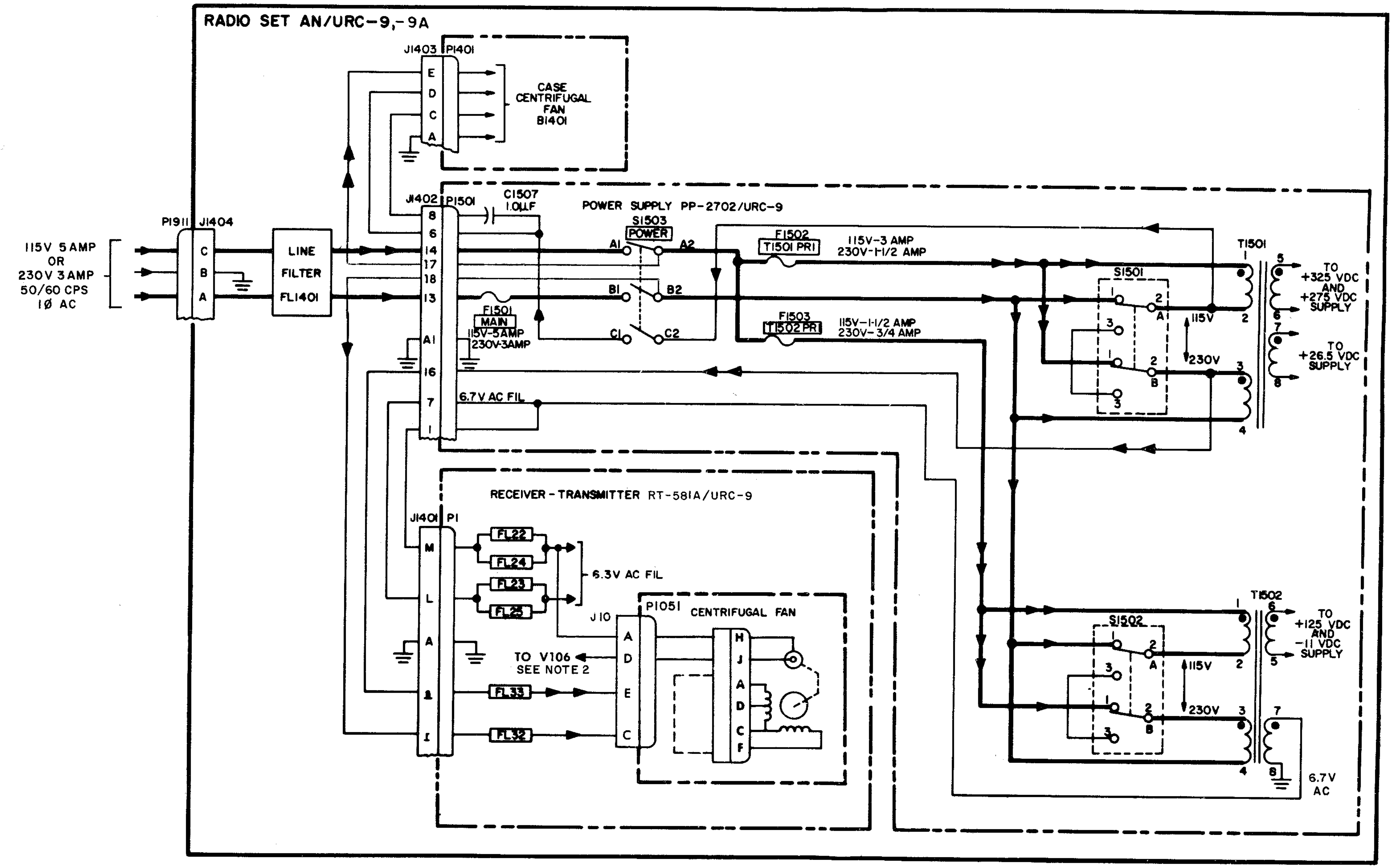


Figure 5-97. Power Supply PP-4706A/URC-9Y,
Power Supply Module (A1904)



NOTES:

A. HEAVY SOLID LINES INDICATE PRIMARY AC POWER DISTRIBUTION TO POWER TRANSFORMERS.

B. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS AND ALL CAPACITANCE VALUES ARE IN PICOFARADS.

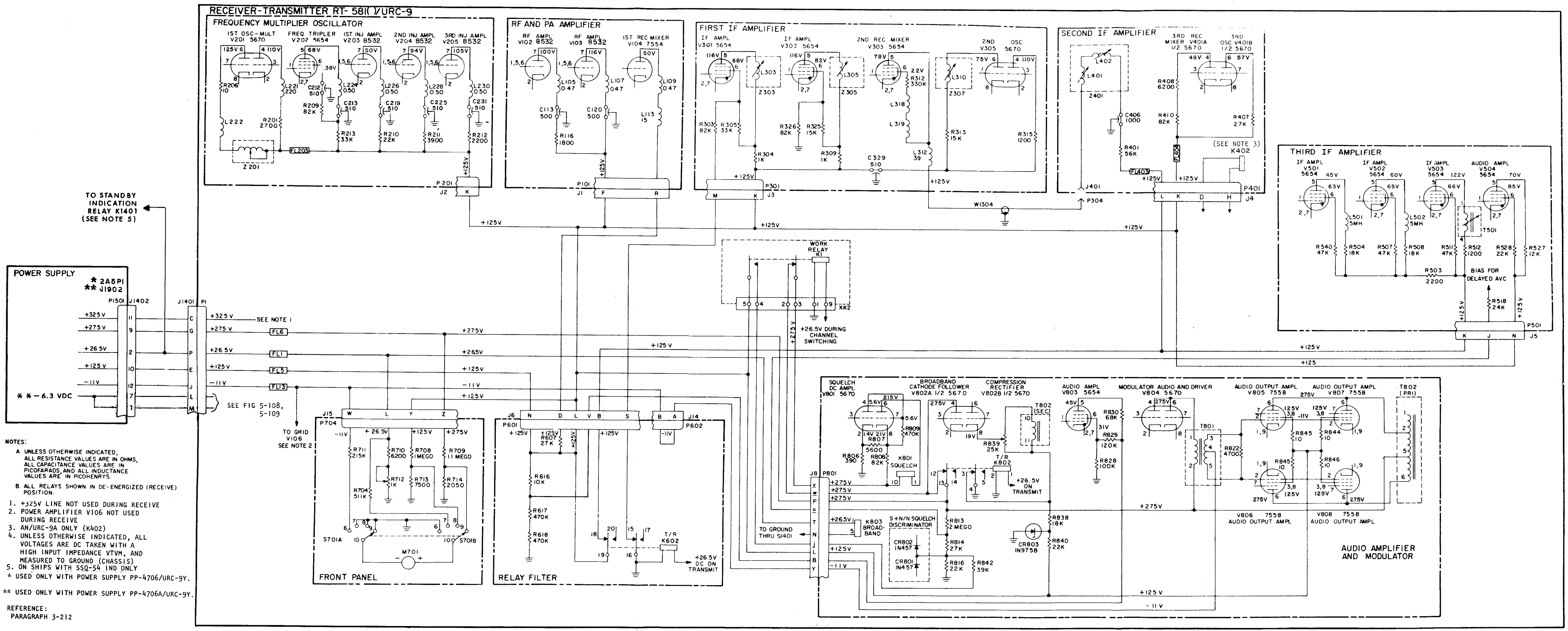
1. OTHER STYLE CENTRIFUGAL FANS MAY BE USED IN SOME EQUIPMENTS.

2. THE FILAMENT VOLTAGE FOR TRANSMIT POWER AMPLIFIER V106 IS ROUTED THROUGH THERMAL SENSING SWITCH S101

REFERENCE:

PARAGRAPH 3-167

Figure 5-98. AC Power Distribution, Schematic Diagram (AN/URC-9, -9A)



NOTES:

A. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN PICOHENRYS.

B. ALL RELAYS SHOWN IN DE-ENERGIZED (RECEIVE) POSITION.

1. +325V LINE NOT USED DURING RECEIVE
2. POWER AMPLIFIER V106 NOT USED DURING RECEIVE
3. AN/URC-9A ONLY (K402)
4. UNLESS OTHERWISE INDICATED, ALL VOLTAGES ARE DC TAKEN WITH A HIGH INPUT IMPEDANCE VTVM, AND MEASURED TO GROUND (CHASSIS)
5. ON SHIPS WITH SSQ-54 IND ONLY

* USED ONLY WITH POWER SUPPLY PP-4706/URC-9Y.

** USED ONLY WITH POWER SUPPLY PP-4706A/URC-9Y.

REFERENCE:
PARAGRAPH 3-212

Figure 5-99. DC Power Distribution, Receive Function, Schematic Diagram

Figure 5-100. DC Power Distribution, Transmit Function, Schematic Diagram

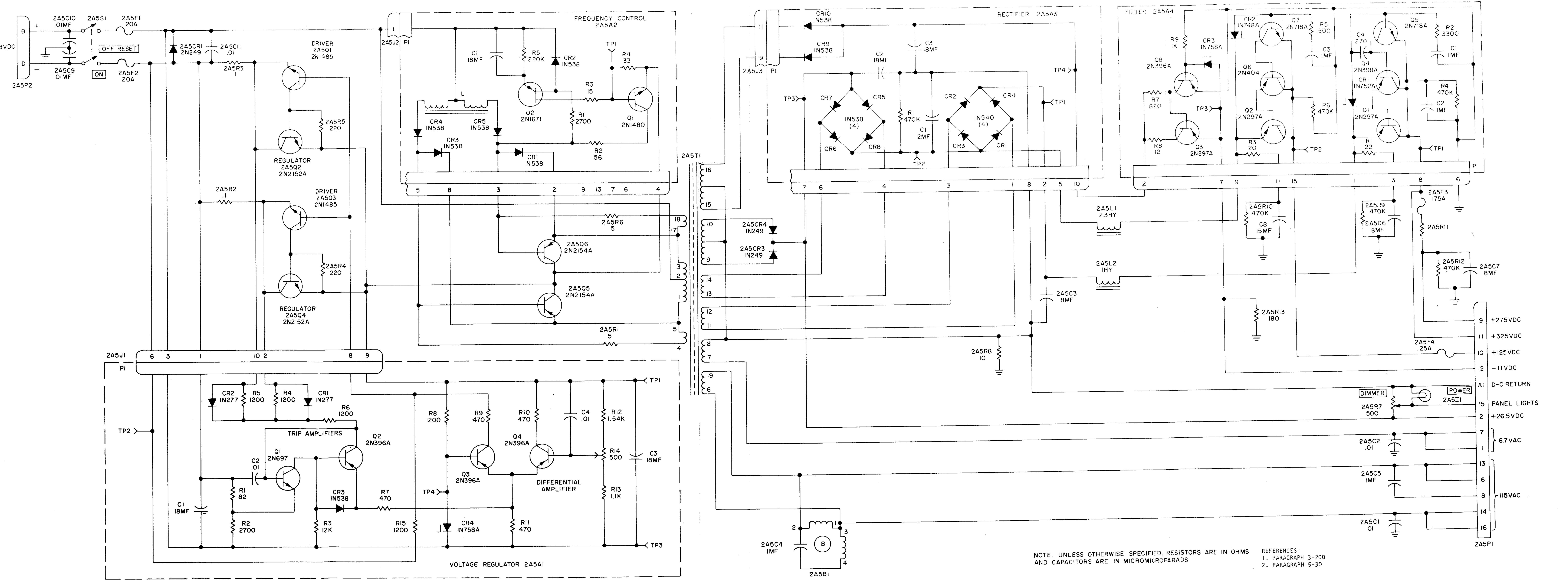


Figure 5-101. Power Supply PP-4706/URC-9Y, Schematic Diagram ("A" Serial No. Prefix)

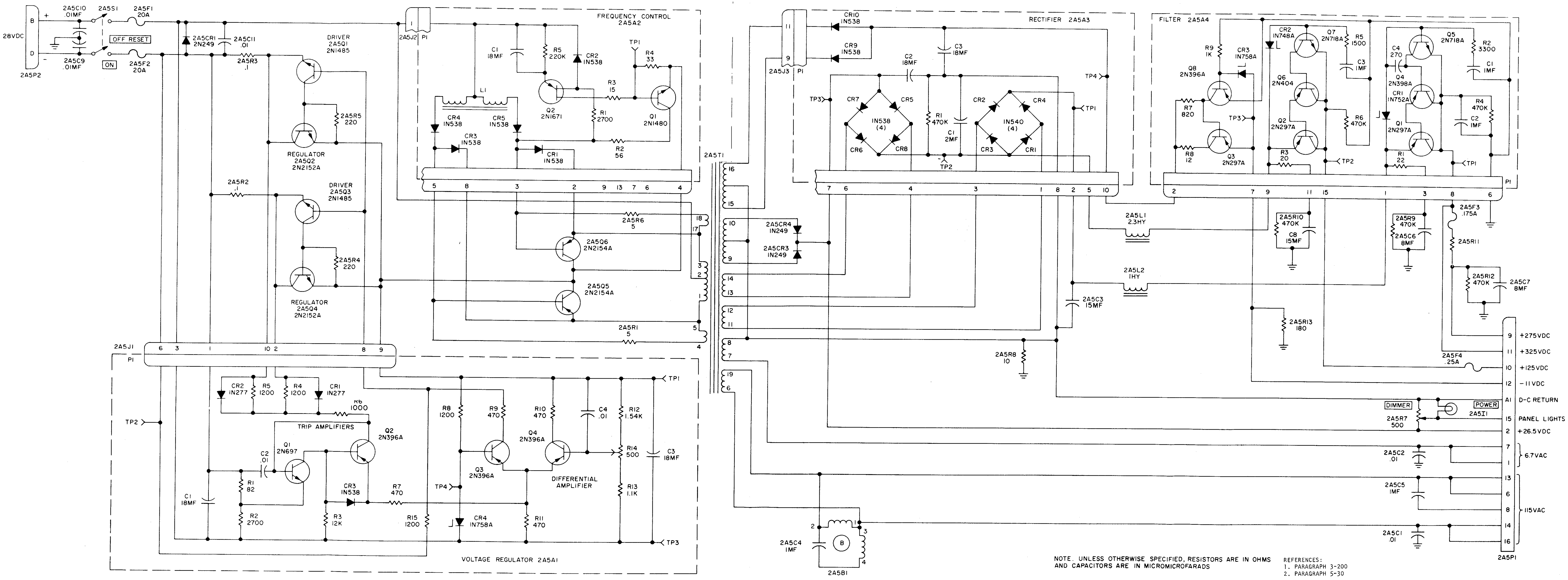


Figure 5-102. Power Supply PP-4706/URC-9Y, Schematic Diagram (Serial Nos. B1 Thru B3)

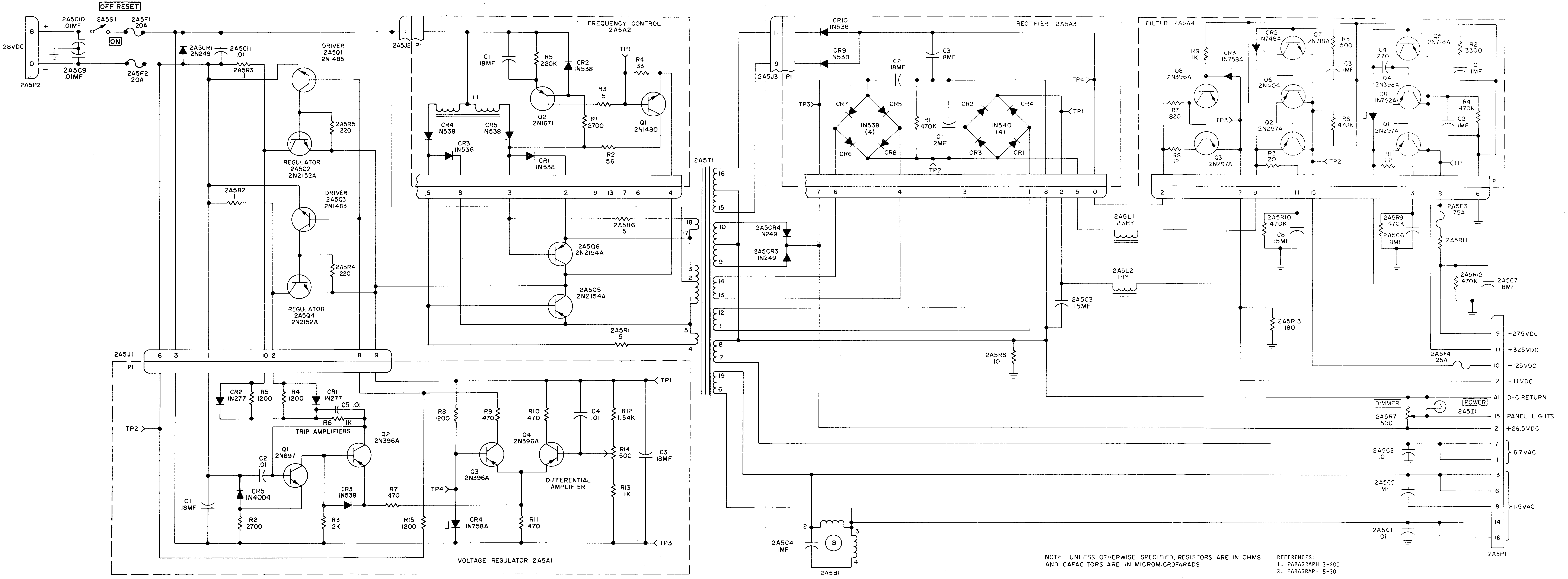


Figure 5-103. Power Supply PP-4706/URC-9Y, Schematic Diagram (Serial Nos. B4 Thru B35)

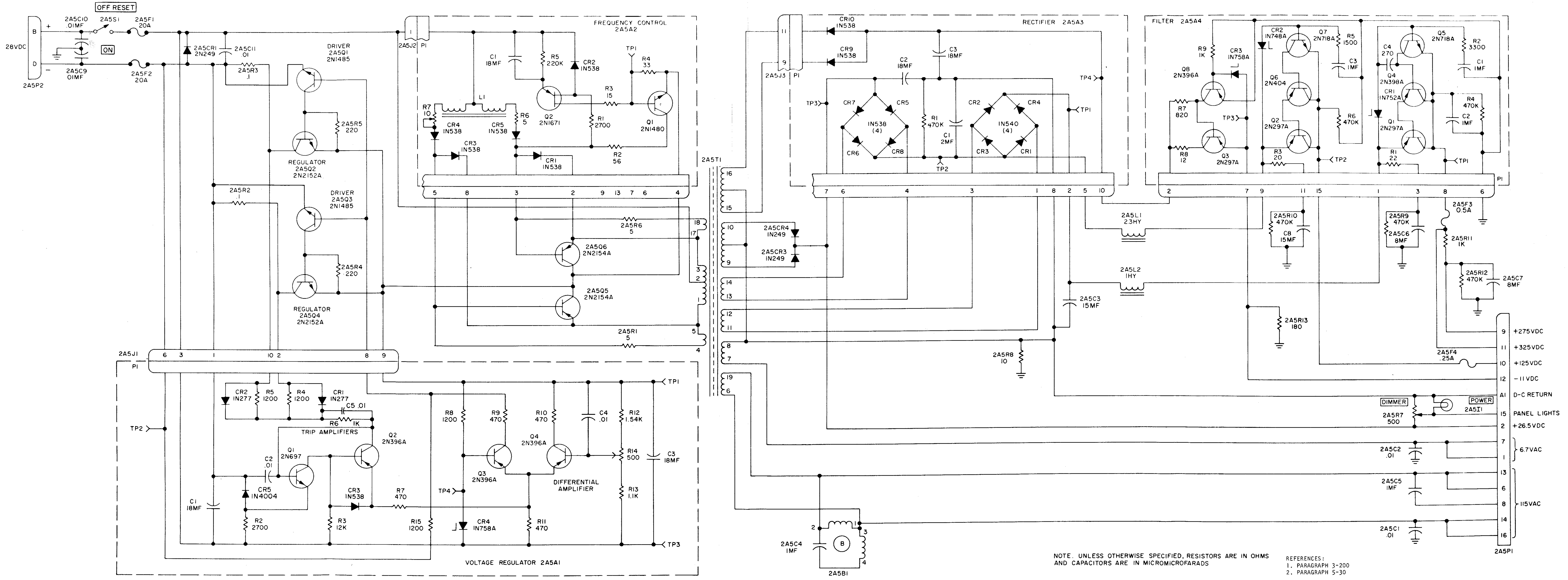
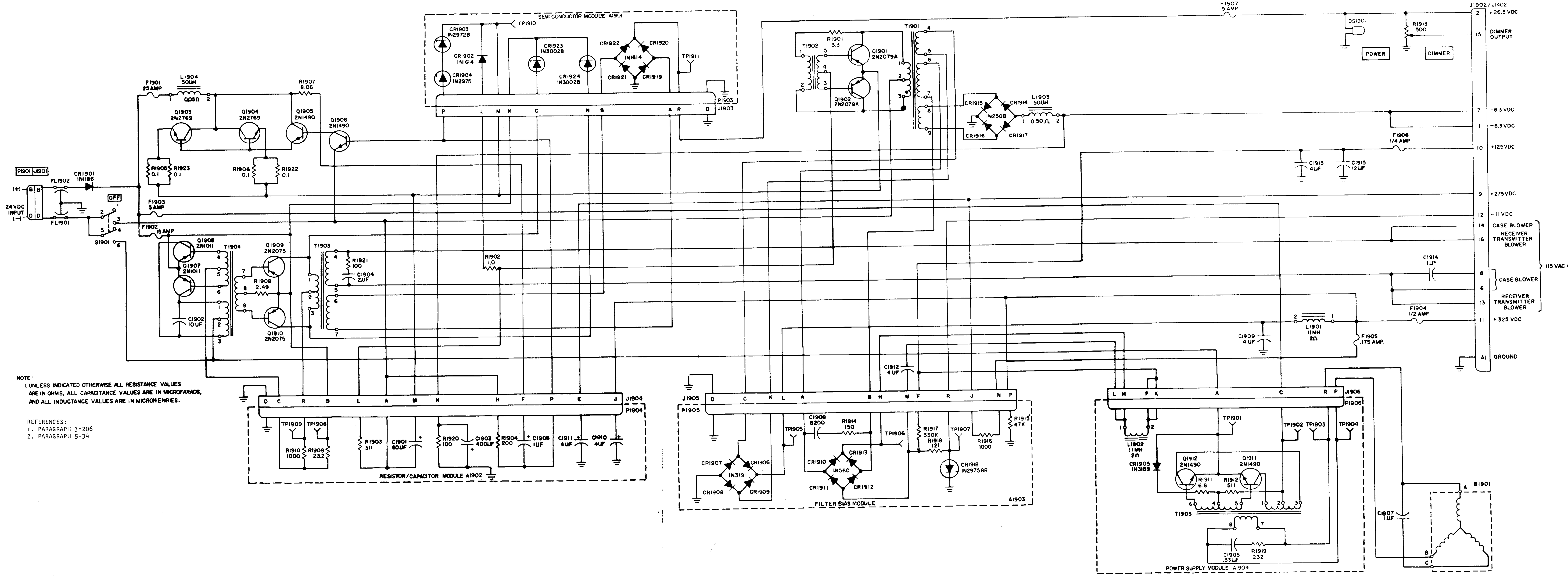


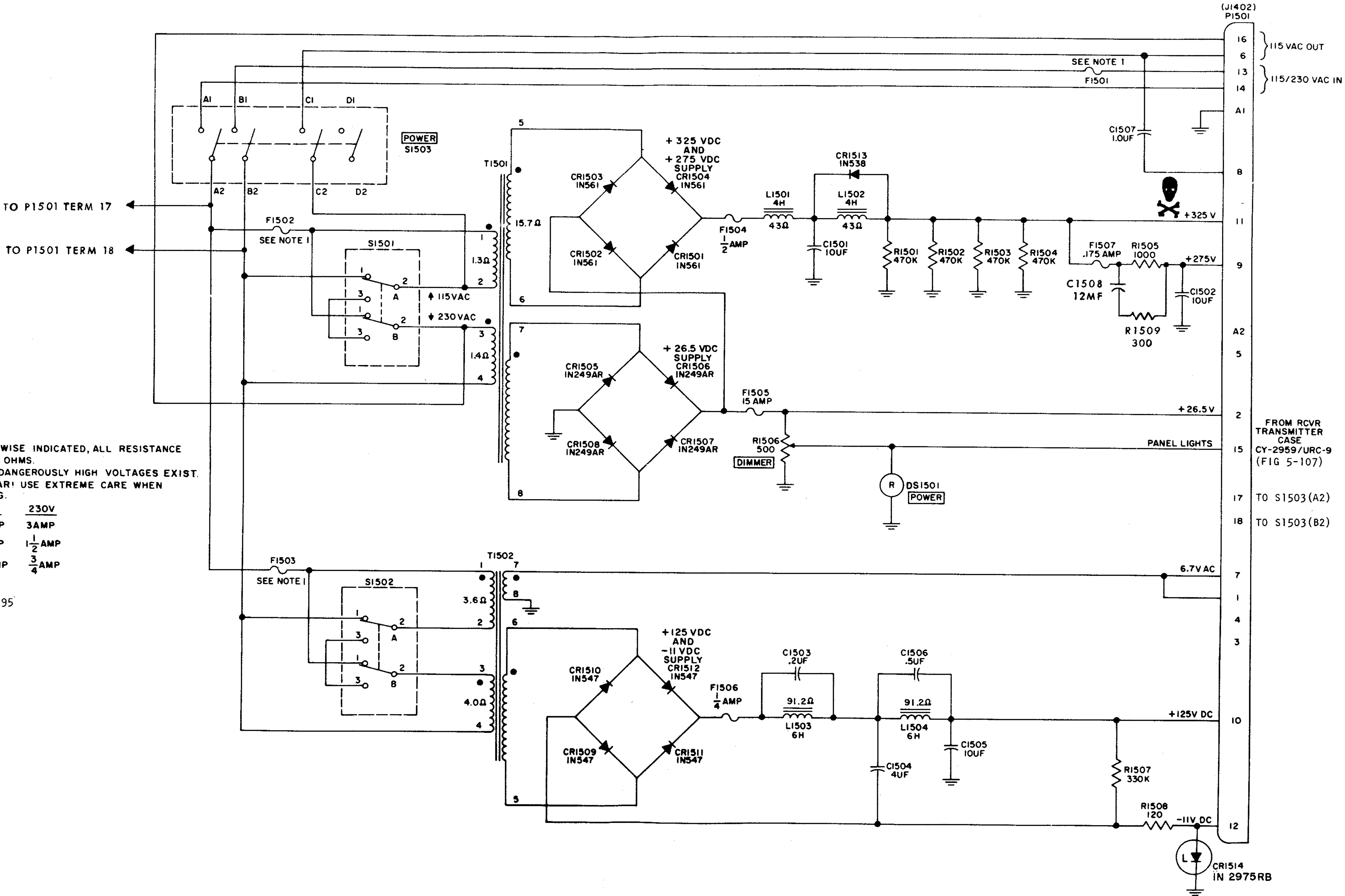
Figure 5-104. Power Supply PP-4706/URC-9Y, Schematic Diagram (Serial Nos. B36 and Over)



NOTE:
1. UNLESS INDICATED OTHERWISE ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.

REFERENCES:
1. PARAGRAPH 3-206
2. PARAGRAPH 5-34

Figure 5-105. Power Supply PP-4706A/URC-9Y, Schematic Diagram



NOTES:

A. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS.

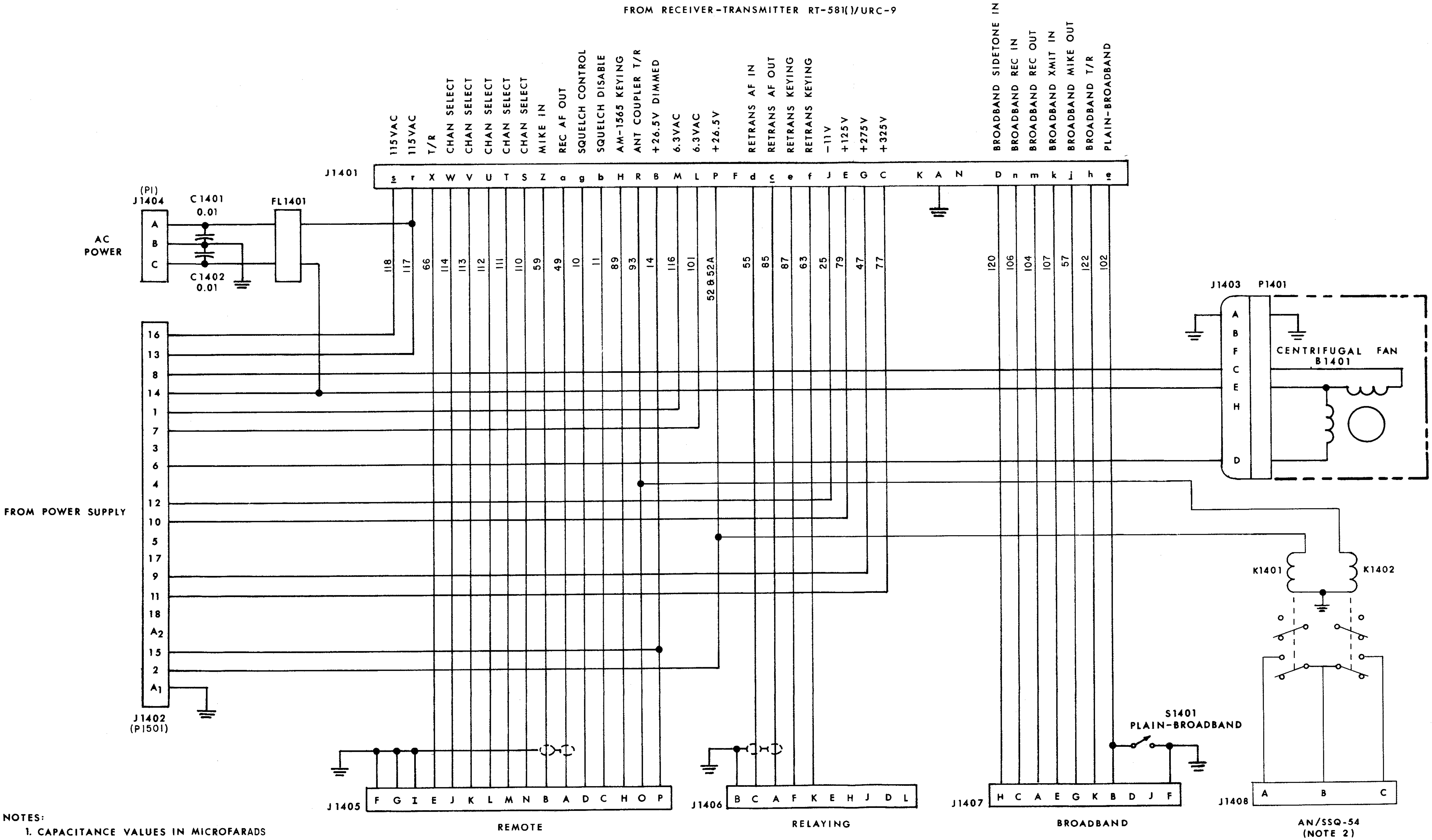
B. [skull and crossbones] SIGNIFIES DANGEROUSLY HIGH VOLTAGES EXIST. KEEP CLEAR! USE EXTREME CARE WHEN MEASURING.

1.

FUSE	115V	230V
F1501	5 AMP	3 AMP
F1502	3 AMP	$1\frac{1}{2}$ AMP
F1503	$1\frac{1}{2}$ AMP	$\frac{3}{4}$ AMP

REFERENCE
PARAGRAPH 3-195

Figure 5-106. Power Supply PP-2702/URC-9, Schematic Diagram



NOTES:
1. CAPACITANCE VALUES IN MICROFARADS
2. USED ON SHIPS WITH AN/SSQ-54 IND ONLY

Figure 5-107. Receiver-Transmitter Case CY-2959/URC-9, Schematic Diagram

NOTES:

1. USED ONLY ON COLLINS RADIO COMPANY CONTRACTS NObsr 87290 AND 89509 (115-VOLT AC OPERATION, SEE FIGURE 5-98, 5-101 - 5-105)
2. ON DUBROW ELECTRONIC INDUSTRIES CONTRACTS NObsr 91149, 91264, AND 93164 CENTRIFUGAL FAN B1051 CHANGED AS SHOWN BELOW (115-VOLT AC OPERATION, SEE FIGURE 5-98, 5-101 - 5-105)
3. ON STEWART-WARNER ELECTRONICS CONTRACT NObsr 91068 MCN 186 AND OVER CENTRIFUGAL FAN B1051 CHANGED AS SHOWN BELOW. IN MCN 1 THRU 185 ON THIS CONTRACT, CENTRIFUGAL SENSING SWITCH NOT IN CIRCUIT; A JUMPER WIRE IS CONNECTED BETWEEN PINS A AND D OF P1051. CONNECTIONS TO PINS L AND M OF J10-P1051 USED ONLY ON THIS CONTRACT (+24.5-VOLT DC OPERATION, SEE FIGURES 5-99 AND 5-100).

Figure 5-108. Receiver-Transmitter RT-581/URC-9, Interconnection Diagram and Directional Coupler Schematic (AN/URC-9, -9Y and 9AY)

Figure 5-109. Receiver-Transmitter RT-581A/URC-9, Interconnection Diagram and Directional Coupler Schematic (AN/URC-9A)

ROADMAP FOR FIGURE 5-110

RESISTORS

R101 - 3B
R102 - 2B
R103 - 3C
R104 - 7C
R105 - 10C
R106 - 14B
R107 - 14B
R108 - 21D
R109 - 21E
R110 - 10D
R111 - 13C
R112 - 18C
R114 - 11E
R115 - 5C
R116 - 8C
R117 - 4C
R120 - 19B
R121 - 20E
R122 - 7C
R123 - 11C
R124 - 9F
R125 -

CAPACITORS

C101 - 2B
C102 - 3B
C103 - 10F
C104 - 5A
C105 - 4B
C106 - 4B
C107 - 5B
C108 - 4C
C109 - 7D
C110 - 6B
C111 - 11F
C112 - 6B
C113 - 8C
C114 - 8B
C115 - 8C
C116 - 10C
C117 - 9B
C118 - 13F
C119 - 9B
C120 - 11C
C121 - 12B
C122 - 12C
C123 - 12B
C124 - 15F
C125 - 13C

CAPACITORS

C126 - 15A
C127 - 17B
C128 - 21B
C129 - 18C
C130 - 5F
C131 - 23B
C132 - 23C
C133 - 23C
C134 - 16C
C135 - 13D
C136 - 14A
C137 - 14B
C138 - 22E
C139 - 18B
C140 - 19B
C141 - 19B
C142 - 20D
C143 - 8F
C144 - 15B
C145 - 19B
C146-21D
C147-20B
C148-6F

COILS

L101-A - 9F
L101-B - 10F
L102 - 4A
L103 - 5A
L104-A - 11F
L104-B - 12F
L105 - 8C
L106-A - 12F
L106-B - 13F
L107 - 11C
L108 - 14F
L109 - 13A
L110 - 13C
L111 - 23C
L112 - 5F
L113 -16B
L114 - 21C
L115 - 18C
L116 - 15F
L117 - 8F
L118 - 7F
L119 - 20C
L120 - 5F
L121 - 22E

JACKS

J101 - 24A
J102 - 24A
J103 - 7A
J104 - 1B
J105 - 10C
J106 - 14B
J107 - 3C
J108 - 4D
J109 - 9A
J111 - 21C
J113 - 10E
J114 - 19B
J115 - 24C
J1109 - 2D

PLUGS

P101-5G, 15G, 23G
P103-10E
P107-3C
P1108-4D

NETWORKS

Z101 - 6C
Z102 - 7C
Z103 - 9C
Z105 - 12C
Z106 - 17C
Z107 - 20B
Z108 - 23C

TUBES

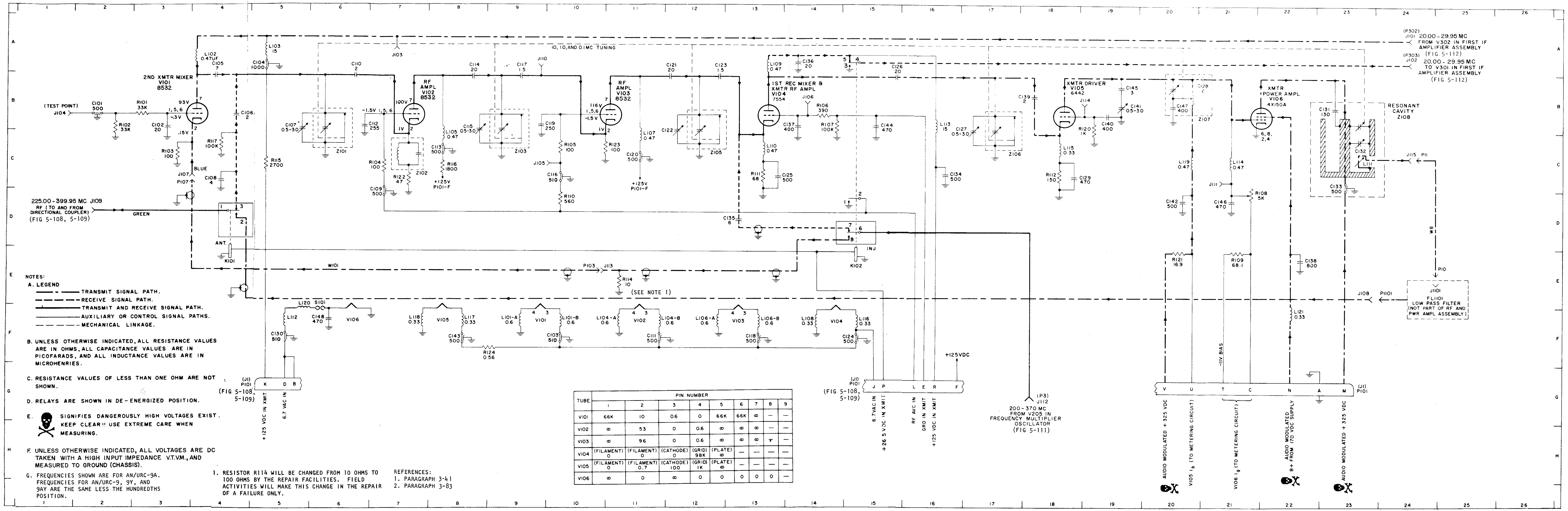
V101 - 4B
V102 - 7B
V103 - 11B
V104 -13B
V105 - 18B
V106 - 22B

RELAYS

K101(ANT REL)-4E
K102(INJ REL)-15E

SWITCHES

S101-6F



NOTES:

A. LEGEND

—— - —— TRANSMIT SIGNAL PATH.
— — — — RECEIVE SIGNAL PATH.
———— TRANSMIT AND RECEIVE SIGNAL PATH.
———— AUXILIARY OR CONTROL SIGNAL PATHS.
— — — — MECHANICAL LINKAGE.

B. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.

C. RESISTANCE VALUES OF LESS THAN ONE OHM ARE NOT SHOWN.

D. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

E. ☠ SIGNIFIES DANGEROUSLY HIGH VOLTAGES EXIST. KEEP CLEAR!! USE EXTREME CARE WHEN MEASURING.

F. UNLESS OTHERWISE INDICATED, ALL VOLTAGES ARE DC TAKEN WITH A HIGH INPUT IMPEDANCE V.T.V.M., AND MEASURED TO GROUND (CHASSIS).

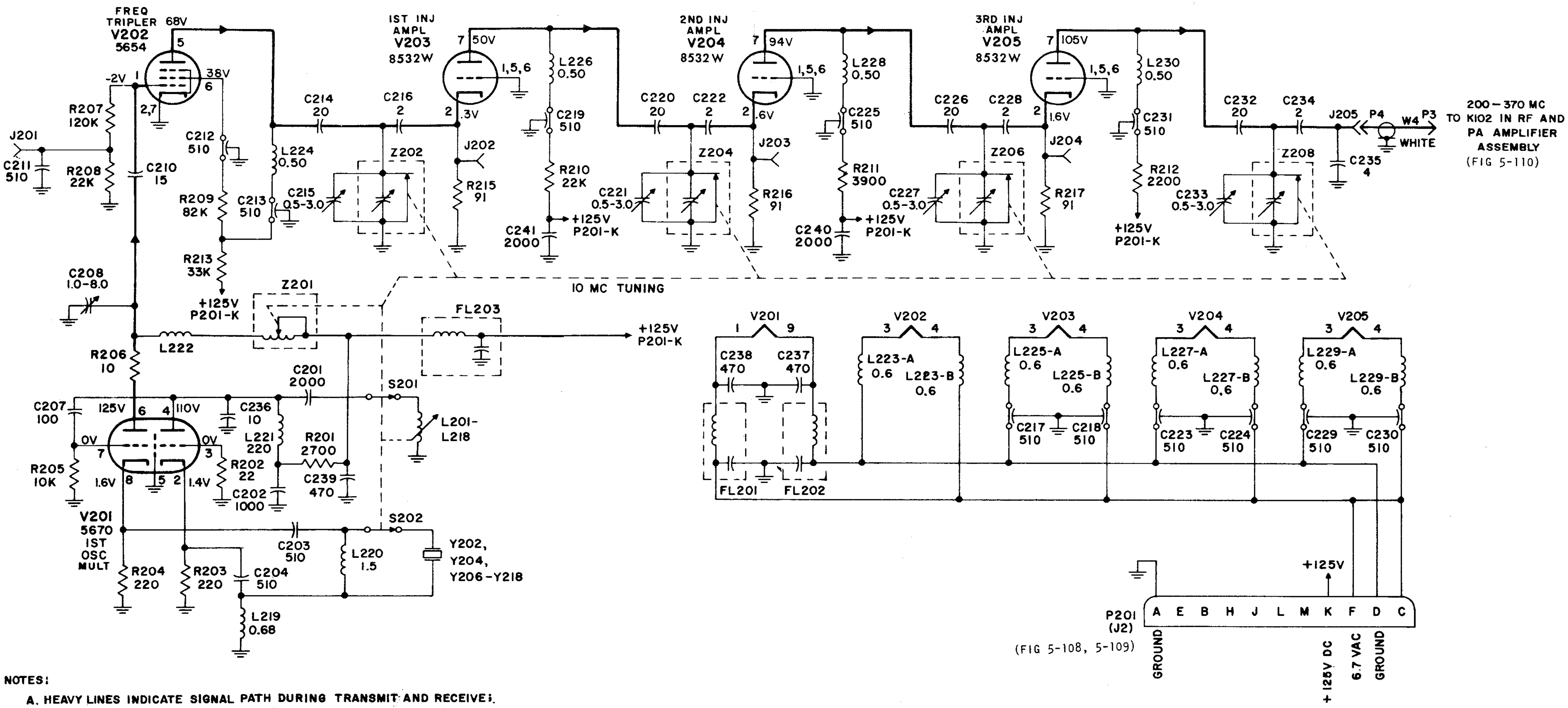
G. FREQUENCIES SHOWN ARE FOR AN/URC-9A. FREQUENCIES FOR AN/URC-9, 9Y, AND 9AY ARE THE SAME LESS THE HUNDREDTHS POSITION.

1. RESISTOR R114 WILL BE CHANGED FROM 10 OHMS TO 100 OHMS BY THE REPAIR FACILITIES. FIELD ACTIVITIES WILL MAKE THIS CHANGE IN THE REPAIR OF A FAILURE ONLY.

REFERENCES:
1. PARAGRAPH 3-41
2. PARAGRAPH 3-83

TUBE	PIN NUMBER								
	1	2	3	4	5	6	7	8	9
V101	66K	10	0.6	0	66K	66K	∞	—	—
V102	∞	53	0	0.6	∞	∞	∞	—	—
V103	∞	96	0	0.6	∞	∞	∞	[illegible]	—
V104	(FILAMENT) 0	(FILAMENT) 0	(CATHODE) 0	(GRID) 98K	(PLATE) ∞	—	—	—	—
V105	(FILAMENT) 0	(FILAMENT) 0.7	(CATHODE) 100	(GRID) 1K	(PLATE) ∞	—	—	—	—
V106	∞	0	∞	0	0	0	0	0	—

Figure 5-110. RF and PA Amplifier Assembly, Schematic Diagram



NOTES:

A. HEAVY LINES INDICATE SIGNAL PATH DURING TRANSMIT AND RECEIVE; LIGHT SOLID LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS, AND LIGHT BROKEN LINES INDICATE MECHANICAL LINKAGE.

B. UNLESS OTHERWISE INDICATED; ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

C. RESISTANCE VALUES OF LESS THAN ONE OHM ARE NOT SHOWN.

1. UNLESS OTHERWISE INDICATED, ALL VOLTAGES ARE DC TAKEN WITH A HIGH IMPEDANCE VTVM, AND MEASURED TO GROUND (CHASSIS).

REFERENCE:

PARAGRAPH 3-88

TUBE	PIN NUMBER								
	1	2	3	4	5	6	7	8	9
V201	∞	220	22	∞	0	∞	10K	220	∞
V202	140K	0	∞	∞	∞	∞	0	—	—
V203	0	100	∞	∞	0	0	∞	—	—
V204	0	94	∞	∞	0	0	∞	—	—
V205	0	94	∞	∞	0	0	∞	—	—

Figure 5-111. Frequency Multiplier-Oscillator Assembly, Schematic Diagram

ROAD MAP FOR FIGURE 5-112

RESISTORS

R301 - 5C
R302 - 6B
R303 - 6C
R304 - 7C
R305 - 7C
R306 - 10C
R307 - 9B
R308 - 9D
R309 - 11C
R310 - 13B
R311 - 14B
R312 - 14C
R313 - 6F
R314 - 4D
R315 - 9F
R316 - 4D
R317 - 5E
R318 - 8E
R319 - 5E
R320 - 8F
R321 - 9F
R322 - 8F
R323 - 10B
R324 - 5B
R325 - 11C
R326 - 11C

PLUGS

P301 - 1C
P302 - 1A
P303 - 1B
P304 - 15B

CAP

C301 - 2B
C302 - 2B
C303 - 3B
C304 - 4B
C305 - 5B
C306 - 7B
C307 - 7B
C308 - 8B

CAP

C309 - 8B
C310 - 9B
C311 - 9B
C312 - 11B
C313 - 11B
C314 - 12A
C315 - 13A
C316 - 13B
C317 - 13B
C318 - 14C
C319 - 6B
C320 - 6C
C321 - 7C
C322 - 10D
C323 - 10B
C324 - 11C
C325 - 14B
C326 - 5D
C327 - 6C
C328 - 11C
C329 - 6G
C330 - 9E
C331 - 3D
C332 - 2F
C333 - 2F
C334 - 2E
C335 - 5C
C336 - 6F
C337 - 6E
C338 - 6E
C339 - 6D
C340 - 6E
C341 - 4E
C342 - 4D
C343 - 8E
C344 - 3F
C345 - 3F
C346 - 14F
C347 - 10C
C348 - 5E

COILS

L301 - 3B
L302 - 4B

COILS

L303 - 7B
L304 - 8B
L305 - 12B
L306 - 12B
L307 - 2F
L308 - 2F
L309 - 4D
L310 - 7E
L311 - 8F
L312 - 14B
L313 - 10F
L314 - 5E
L315 - 5E
L316 - 5B
L317 - 5C
L318 - 14C
L319 - 14B

NETWORKS

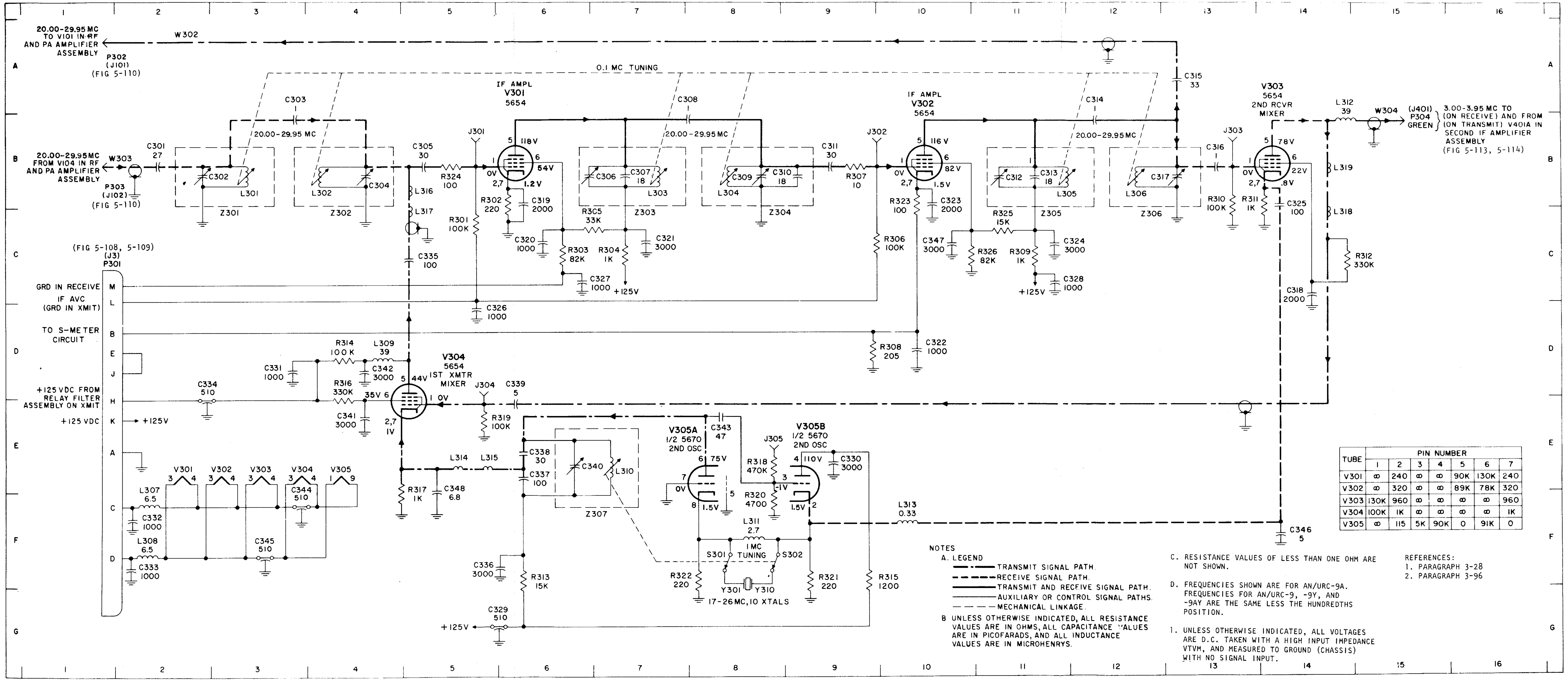
Z301 - 3B
Z302 - 4B
Z303 - 7B
Z304 - 8B
Z305 - 11B
Z306 - 12B
Z307 - 7E

JACKS

J301 - 5B
J302 - 9B
J303 - 13B
J304 - 5D
J305 - 8E

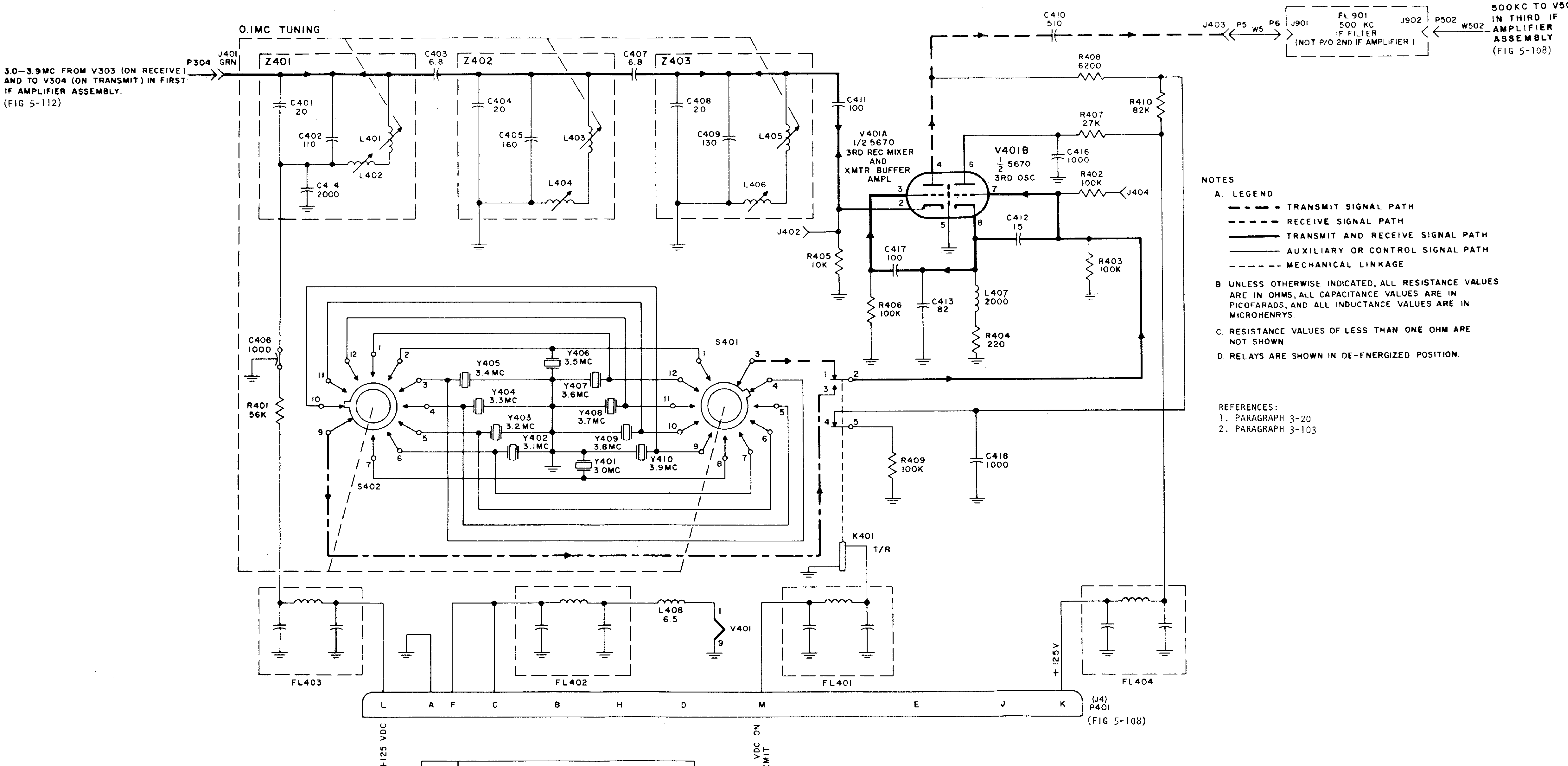
TUBES

V301 - 6B
V302 - 10B
V303 - 14B
V304 - 5E
V305A - 8E
V305B - 9E



TUBE	PIN NUMBER						
	1	2	3	4	5	6	7
V301	∞	240	∞	∞	90K	130K	240
V302	∞	320	∞	∞	89K	78K	320
V303	130K	960	∞	∞	∞	∞	960
V304	100K	1K	∞	∞	∞	∞	1K
V305	∞	115	5K	90K	0	91K	0

Figure 5-112. First IF Amplifier Assembly, Schematic Diagram



TUBE	PIN NUMBER								
	1	2	3	4	5	6	7	8	9
V401	0	10K	100K	105K	0	210K	100K	290	∞

NOTES

A. LEGEND
- — · — · — TRANSMIT SIGNAL PATH
- — — — — RECEIVE SIGNAL PATH
- ——— TRANSMIT AND RECEIVE SIGNAL PATH
- ——— AUXILIARY OR CONTROL SIGNAL PATH
- – – – – MECHANICAL LINKAGE

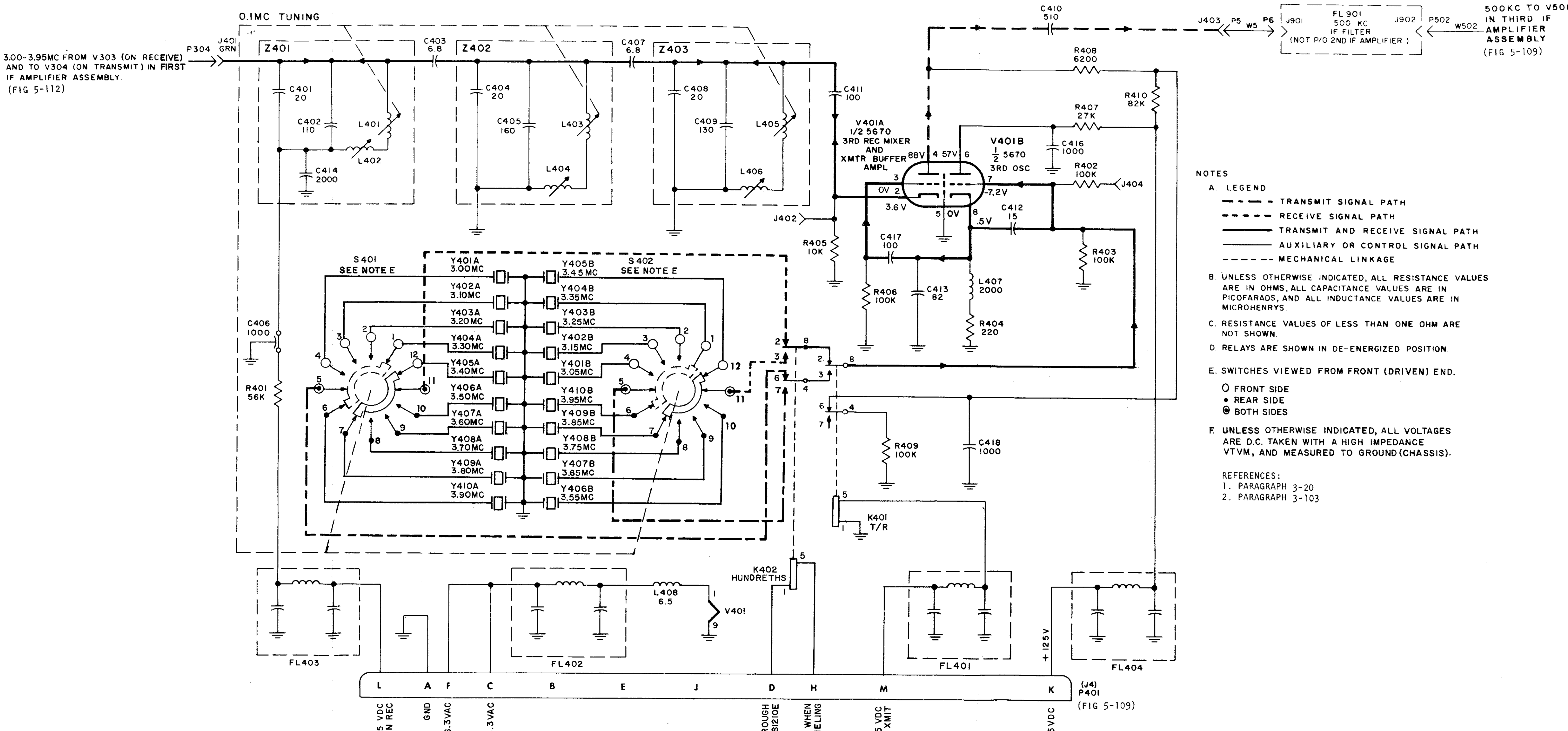
B. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

C. RESISTANCE VALUES OF LESS THAN ONE OHM ARE NOT SHOWN.

D. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

REFERENCES:
1. PARAGRAPH 3-20
2. PARAGRAPH 3-103

Figure 5-113. Second IF Amplifier Assembly, Schematic Diagram (AN/URC-9, -9Y, -9AY)



NOTES

A. LEGEND

- — - — - TRANSMIT SIGNAL PATH
- - - - - RECEIVE SIGNAL PATH
——— TRANSMIT AND RECEIVE SIGNAL PATH
——— AUXILIARY OR CONTROL SIGNAL PATH
- - - - - - MECHANICAL LINKAGE

B. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

C. RESISTANCE VALUES OF LESS THAN ONE OHM ARE NOT SHOWN.

D. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

E. SWITCHES VIEWED FROM FRONT (DRIVEN) END.

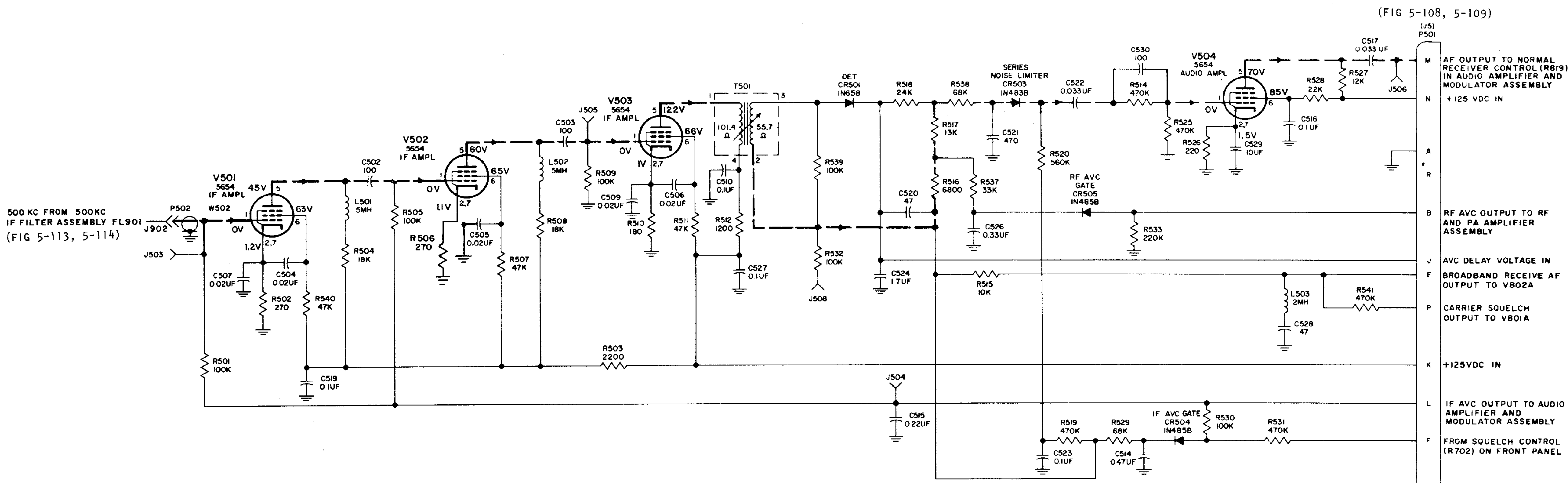
O FRONT SIDE
• REAR SIDE
◉ BOTH SIDES

F. UNLESS OTHERWISE INDICATED, ALL VOLTAGES ARE D.C. TAKEN WITH A HIGH IMPEDANCE VTVM, AND MEASURED TO GROUND (CHASSIS).

REFERENCES:
1. PARAGRAPH 3-20
2. PARAGRAPH 3-103

TUBE	PIN NUMBER								
	1	2	3	4	5	6	7	8	9
V401	0	10K	100K	105K	0	210K	100K	290	∞

Figure 5-114. Second IF Amplifier Assembly, Schematic Diagram (AN/URC-9A)



NOTES:

A. HEAVY BROKEN LINES INDICATE RECEIVE SIGNAL PATH; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.

B. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

C. RESISTANCE VALUES OF LESS THAN ONE OHM ARE NOT SHOWN.

D. UNLESS OTHERWISE INDICATED, ALL VOLTAGES ARE DC TAKEN WITH A HIGH INPUT IMPEDANCE VTVM, AND MEASURED TO GROUND (CHASSIS).

REFERENCE:

PARAGRAPH 3-120

TUBE	PIN NUMBER						
	1	2	3	4	5	6	7
V501	50M	270	0	0	30K	50K	270
V502	∞	270	0	0	30K	50K	270
V503	100K	180	0	0	15K	50K	180
V504	470K	230	0	0	25K	30K	230

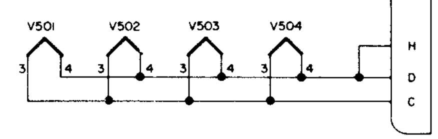


Figure 5-115. Third IF Amplifier Assembly, Schematic Diagram

ROADMAP FOR FIGURE 5-116

RESISTORS

R801 - 4A
R802 - 5F
R803 - 4F
R804 - 4E
R805 - 4E
R806 - 2B
R807 - 2B
R808 - 2B
R809 - 2B
R810 - 3B
R811 - 3B
R812
R813 - 9E
R814 - 7E
R815
R816 - 6F
R817 - 5F
R818 - 3B
R819 - 6F
R820 - 5E
R821
R822 - 11B
R823
R824 - 4B
R825 - 5B
R826 - 5C
R827 - 7B
R828 - 7B
R829 - 8B
R830 - 8A
R831 - 8B
R832 - 10B
R833
R834 - 12B
R835
R836
R837
R838 - 14C
R839 - 15B
R840 - 14C
R841 - 15C
R842 - 7F
R843 - 11A
R844 - 13A
R845 - 11B
R846 - 13B
R847 - 5B
R848 - 7F
R849 - 7F
R850 - 8F
R851 - 8F

RESISTORS

R852 - 8F
R853 - 8F
R854 - 6A
R855 - 9B
R856 - 10A

CAPACITORS

C801 - 3C
C802 - 4F
C803 - 5F
C804 - 5F
C805 - 1A
C806 - 3B
C807 - 6F
C808 - 4D
C809 - 5B
C810 - 6B
C811 - 5B
C812 - 6B
C813 - 7B
C814 - 8A
C815 - 9B
C816 - 15B
C817 - 5B
C818 - 8B
C819
C820 - 6G
C821 - 4F
C822 - 6B

INDUCTORS

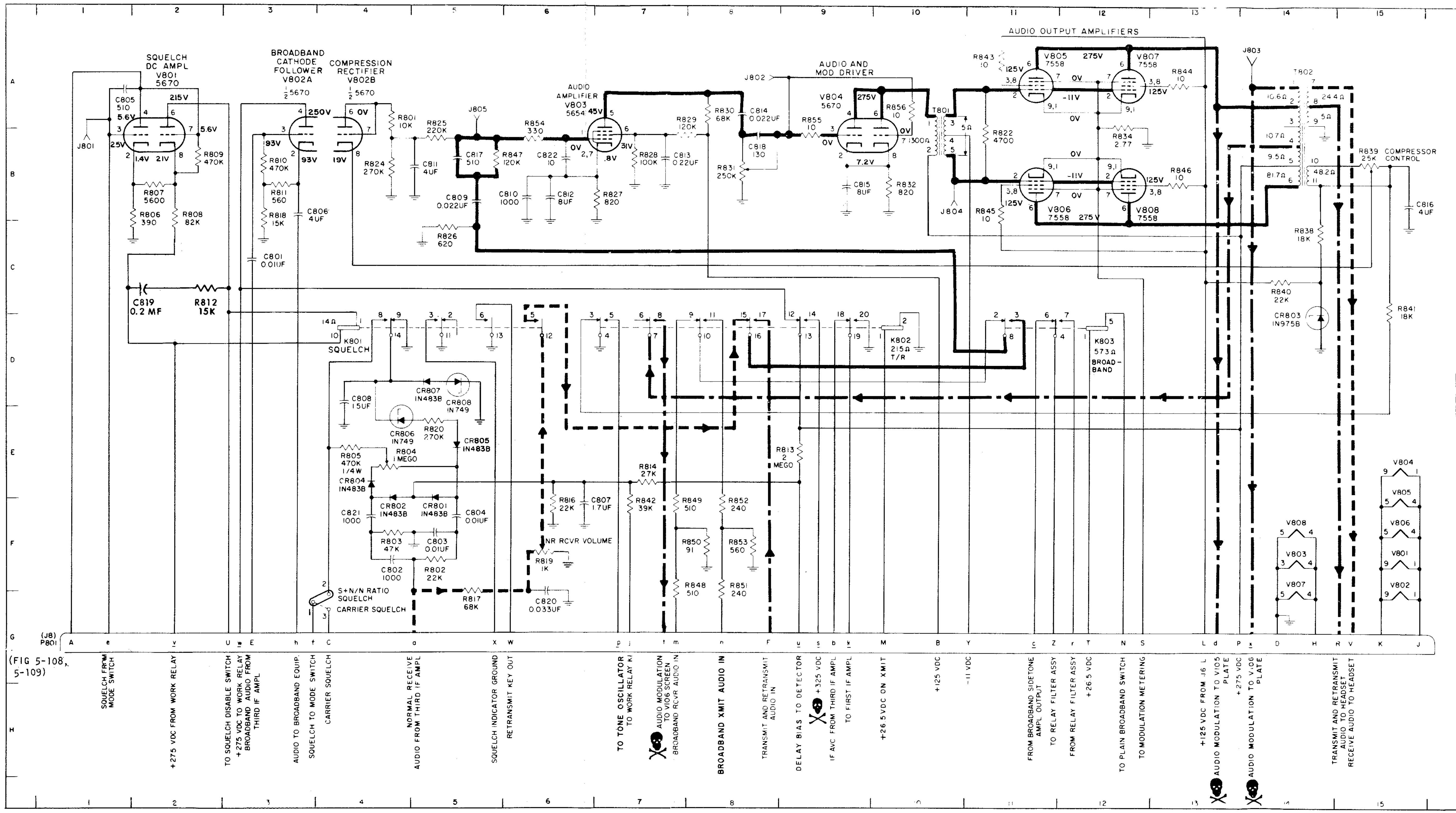
T801 - 10B
T802 - 14A

RELAYS

K801 - 4D
K802 - 10D
K803 - 12D

DIODES

CR801 - 5F
CR802 - 4F
CR803 - 14D
CR804 - 4E
CR805 - 5E
CR806 - 4E
CR807 - 5D
CR808 - 5D



NOTES

A LEGEND

- TRANSMIT SIGNAL PATH
- RECEIVE SIGNAL PATH
- TRANSMIT AND RECEIVE SIGNAL PATH
- AUXILIARY OR CONTROL SIGNAL PATH
- MECHANICAL LINKAGE

B. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS; ALL CAPACITANCE VALUES ARE IN PICOFARADS.

C. RESISTANCE VALUES OF LESS THAN ONE OHM ARE NOT SHOWN.

D. RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

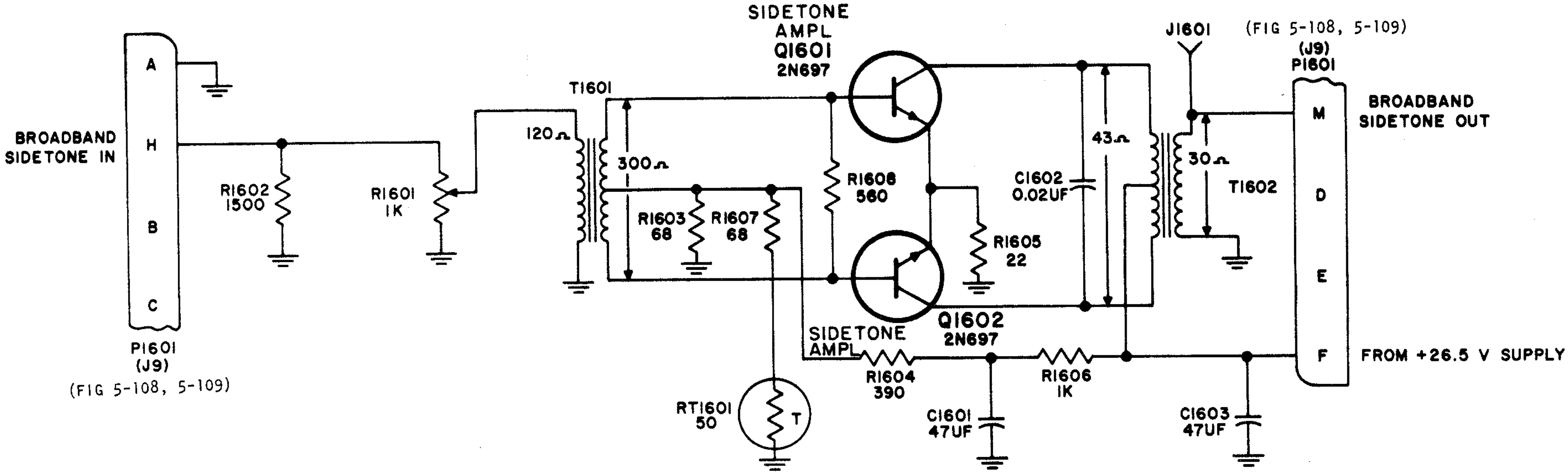
E. SIGNIFIES DANGEROUSLY HIGH VOLTAGES EXIST. KEEP CLEAR!! USE EXTREME CARE WHEN MEASURING.

I. UNLESS OTHERWISE INDICATED, ALL VOLTAGES ARE DC TAKEN WITH A HIGH INPUT IMPEDANCE VTVM. AND MEASURED TO GROUND (CHASSIS).

REFERENCES:
1. PARAGRAPH 3-51
2. PARAGRAPH 3-134

TUBE	PIN NUMBER								
	1	2	3	4	5	6	7	8	9
V801	0	390	4M	400K	—	15K	400K	5.2K	0
V802	0	13K	340K	5K	—	210K	210K	14K	0
V803	47K	720	0	0	58K	40K	720	—	—
V804	0	820	200K	15K	—	15K	200K	820	0
V805	—	15K	12K	0	0	470	2.3	12K	2.3
V806	—	15K	12K	0	0	470	2.3	12K	2.3
V807	—	15K	12K	0	0	470	2.3	12K	2.3
V808	—	15K	12K	0	0	470	2.3	12K	2.3

Figure 5-116. Audio Amplifier and Modulator Assembly, Schematic Diagram



NOTES:

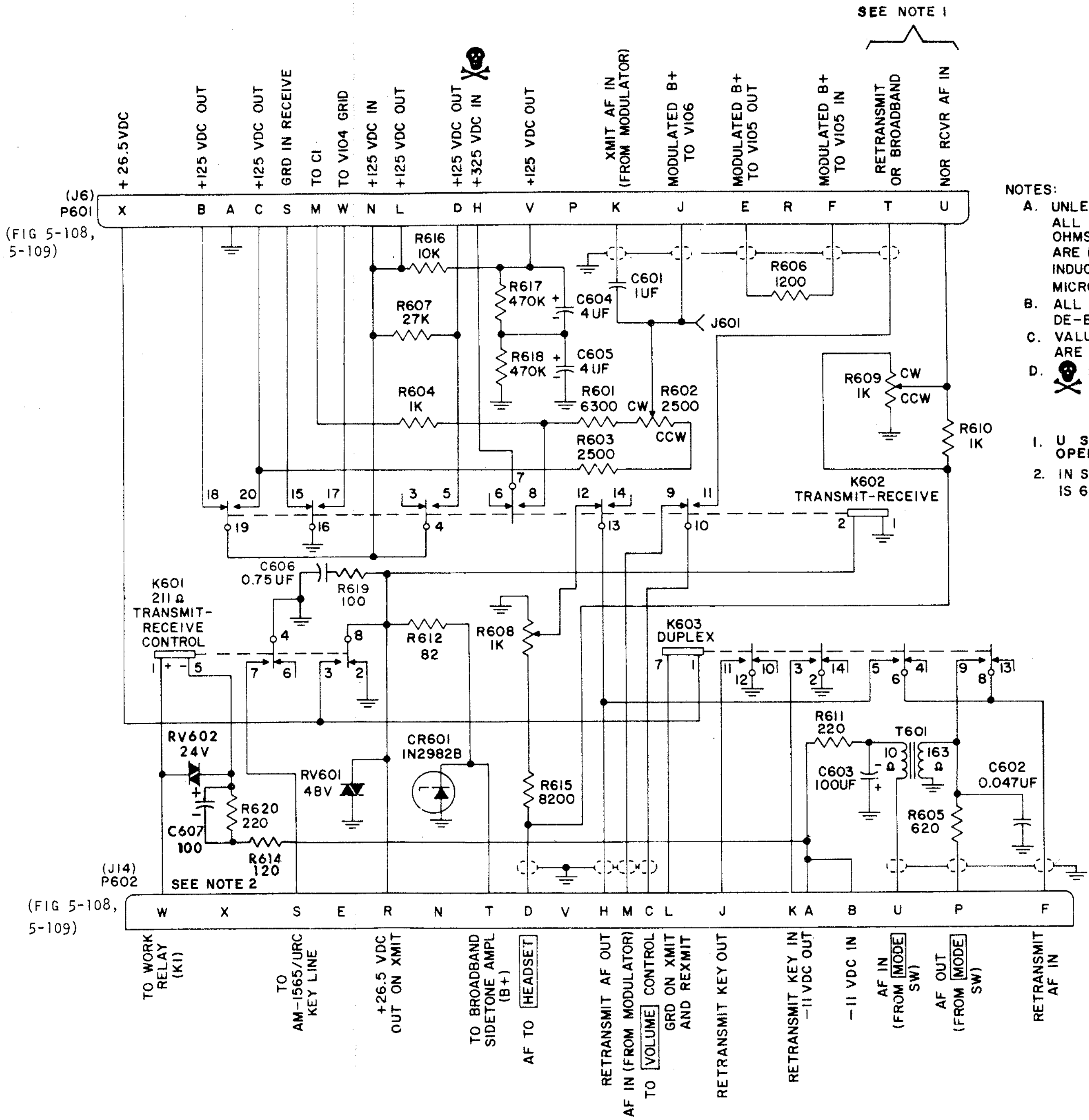
A. UNLESS OTHERWISE INDICATED; ALL RESISTANCE VALUES ARE IN OHMS, AND ALL CAPACITANCE VALUES ARE IN PICOFARADS.

B. RESISTANCES LESS THAN ONE OHM NOT SHOWN.

REFERENCE:

PARAGRAPH 3-64

Figure 5-117. Broadband Sidetone Amplifier Assembly, Schematic Diagram



NOTES:

A. UNLESS INDICATED OTHERWISE ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

B. ALL RELAYS ARE SHOWN IN DE-ENERGIZED POSITION.

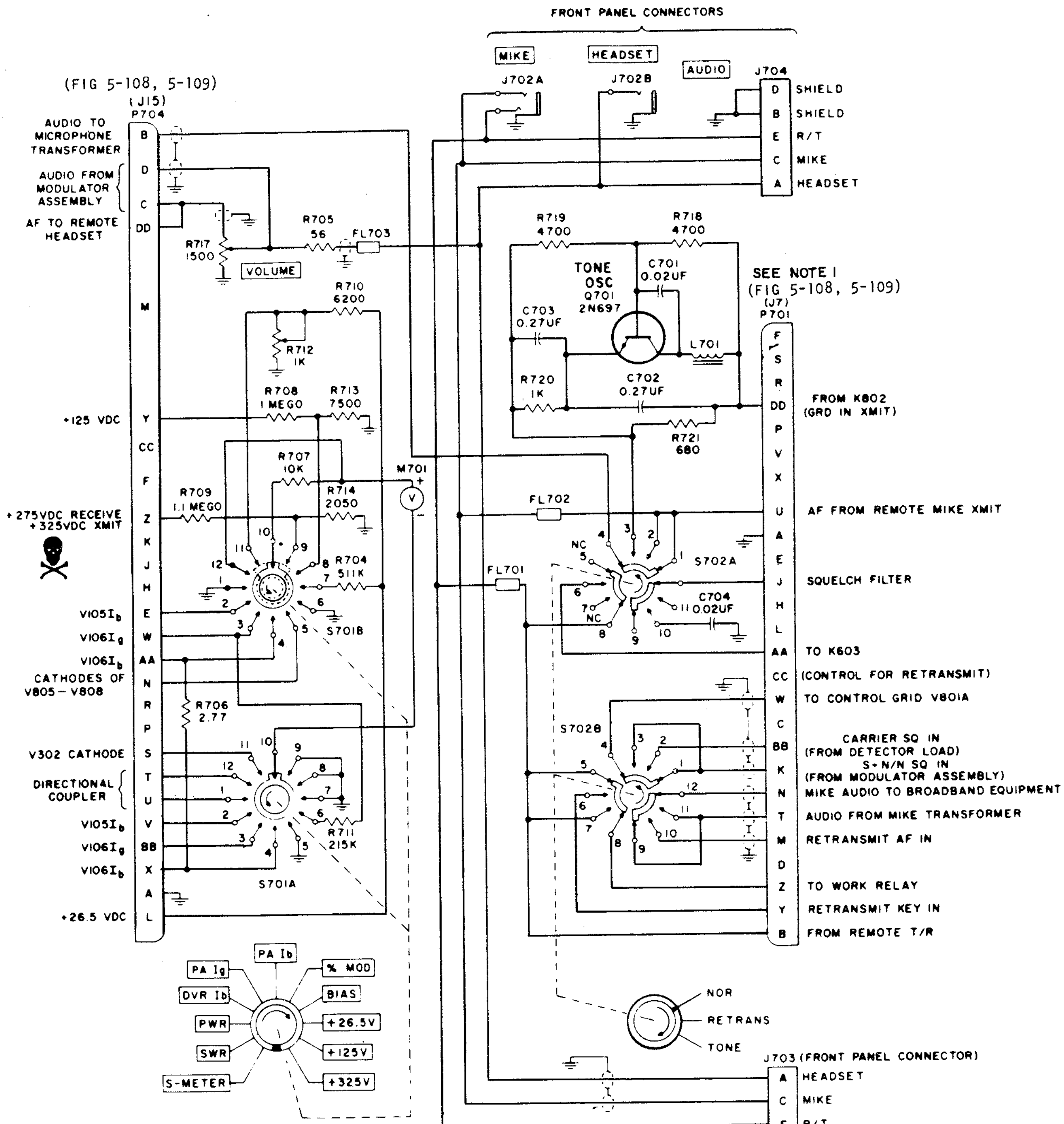
C. VALUES LESS THAN 1 OHM ARE NOT SHOWN.

D. ☠ SIGNIFIES DANGEROUSLY HIGH VOLTAGES EXIST. KEEP CLEAR! USE EXTREME CARE WHEN MEASURING.

1. U SHORTS TO T IN PLAIN OPERATION.

2. IN SOME EQUIPMENTS R614 IS 62 OHMS.

Figure 5-118. Relay-Filter Assembly, Schematic Diagram



NOTE

A. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

B. RESISTANCES LESS THAN ONE OHM NOT SHOWN.

C. SIGNIFIES DANGEROUSLY HIGH VOLTAGE EXIST KEEP CLEAR' USE EXTREME CARE WHEN MEASURING.

1. IN SOME EQUIPMENTS R718 AND R719 CHANGED TO MEET THE FREQUENCY REQUIREMENTS. ALSO C702 CHANGED TO .015uf

Figure 5-119. Part of Front Panel Assembly, Schematic Diagram (AN/URC-9( ))

NOTES:

A. UNLESS OTHERWISE INDICATED ALL RESISTANCE VALUES ARE IN OHMS.
B. NUMBERS ON SWITCHES INDICATE FUNCTION NUMBERS AND NOT SWITCH NUMBERS
C. A BLACK DOT ON SWITCH WAFERS INDICATES FRONT AND BACK WAFERS ARE CONNECTED ELECTRICALLY.
D. ALL SWITCHES ARE VIEWED FROM OPPOSITE DRIVEN END
- KNOB OR DRIVEN END.
- SIDE OPPOSITE KNOB OR DRIVEN END.
- BOTH SIDES.

1. CONTACTS OF MEMORY DRUM SWITCH S1210 SET FOR AUTOMATIC FREQUENCY SELECTION OF 399.9 MC.
2. SWITCH S705A SHOWN IN MANUAL POSITION.

REFERENCE:
PARAGRAPH 3-247

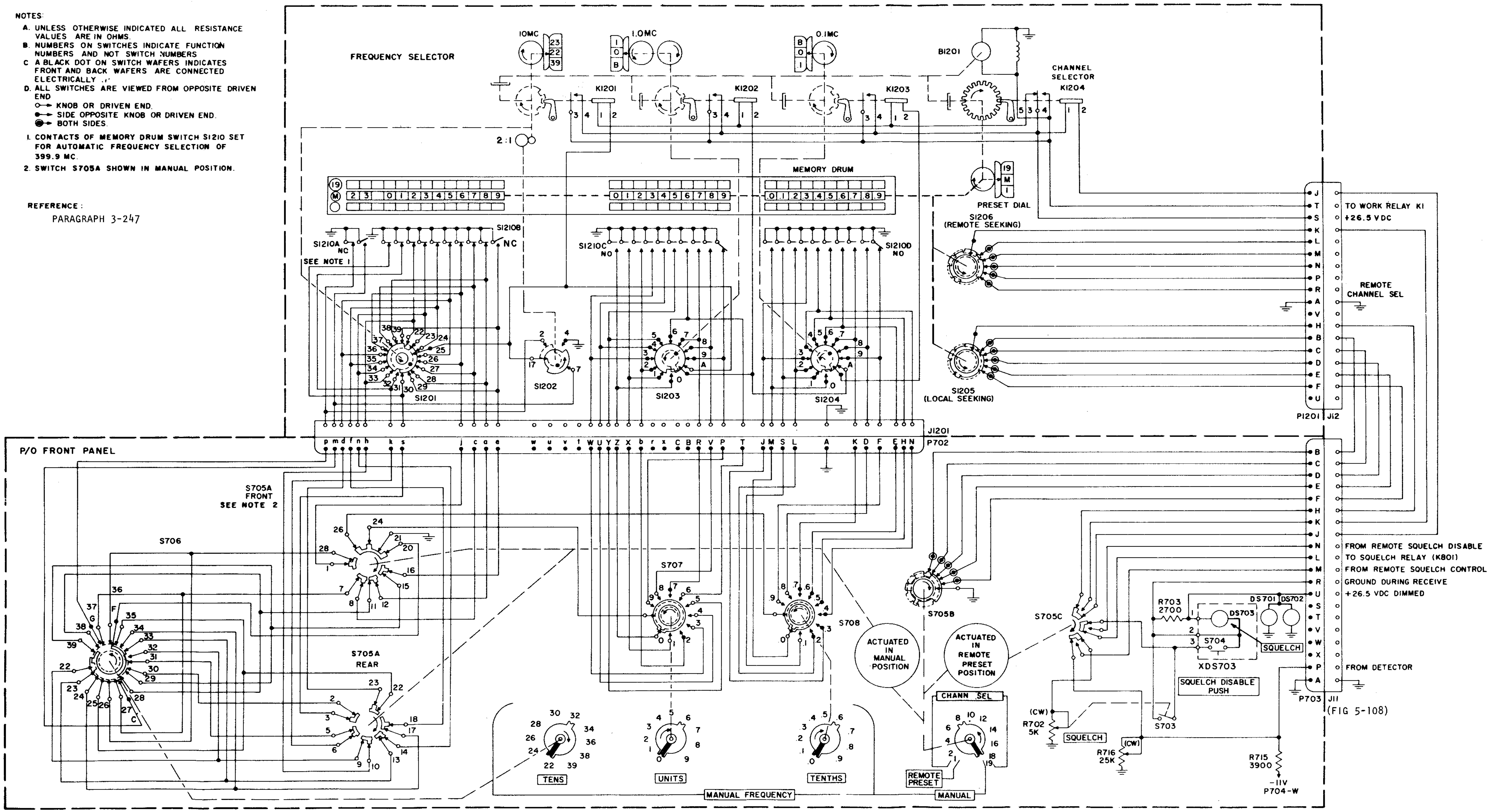


Figure 5-120. Part of Front Panel Assembly and Frequency Selector Assembly, Schematic Diagram (AN/URC-9, -9Y, -9AY)

NOTES:
A. UNLESS OTHERWISE INDICATED ALL RESISTANCE VALUES ARE IN OHMS.
B. NUMBERS ON SWITCHES INDICATE FUNCTION NUMBERS AND NOT SWITCH NUMBERS.
C. A BLACK DOT ON SWITCH WAFERS INDICATES FRONT AND BACK WAFERS ARE CONNECTED ELECTRICALLY.
D. ALL SWITCHES ARE VIEWED FROM OPPOSITE DRIVEN END.
KNOB OR DRIVEN END.
SIDE OPPOSITE KNOB OR DRIVEN END.
BOTH SIDES.
1. CONTACTS OF MEMORY DRUM SWITCH S1210 SET FOR AUTOMATIC FREQUENCY SELECTION OF 399.9 MC.
2. SWITCH S705A SHOWN IN MANUAL POSITION.

REFERENCE:
PARAGRAPH 3-247

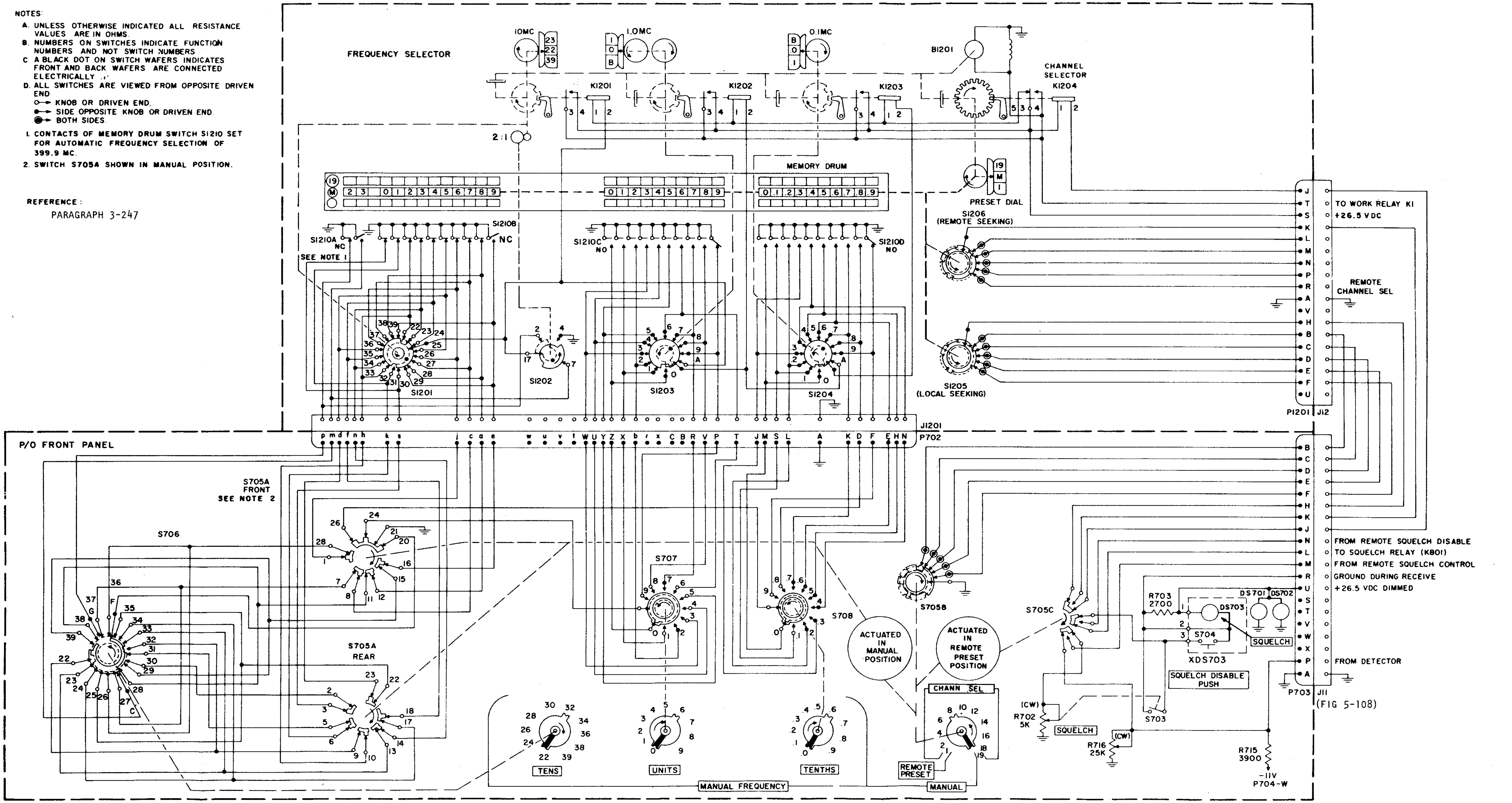


Figure 5-120. Part of Front Panel Assembly and Frequency Selector Assembly, Schematic Diagram (AN/URC-9, -9Y, -9AY)

NOTES:
A. UNLESS OTHERWISE INDICATED ALL RESISTANCE VALUES ARE IN OHMS.
B. NUMBERS ON SWITCHES INDICATE FUNCTION NUMBERS AND NOT SWITCH NUMBERS
C. A BLACK DOT ON SWITCH WAFERS INDICATES FRONT AND BACK WAFERS ARE CONNECTED ELECTRICALLY
D. ALL SWITCHES ARE VIEWED FROM OPPOSITE DRIVEN END
○→ KNOB OR DRIVEN END.
●→ SIDE OPPOSITE KNOB OR DRIVEN END.
◉→ BOTH SIDES.
1. CONTACTS OF MEMORY DRUM SWITCH S1210 SET FOR AUTOMATIC FREQUENCY SELECTION OF 399.90MC
2. SWITCH S705A SHOWN IN MANUAL POSITION.

REFERENCE:
PARAGRAPH 3-247

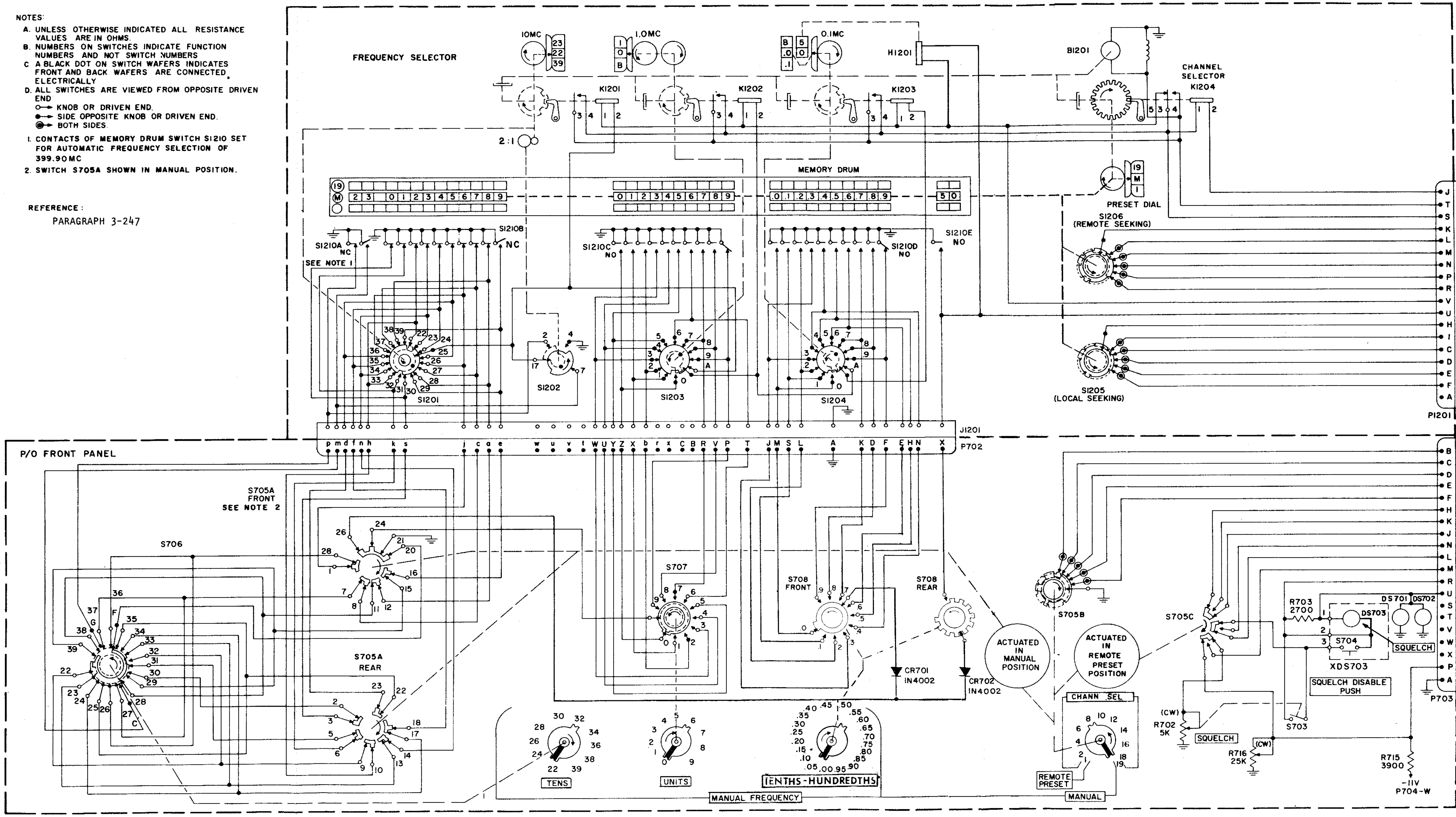
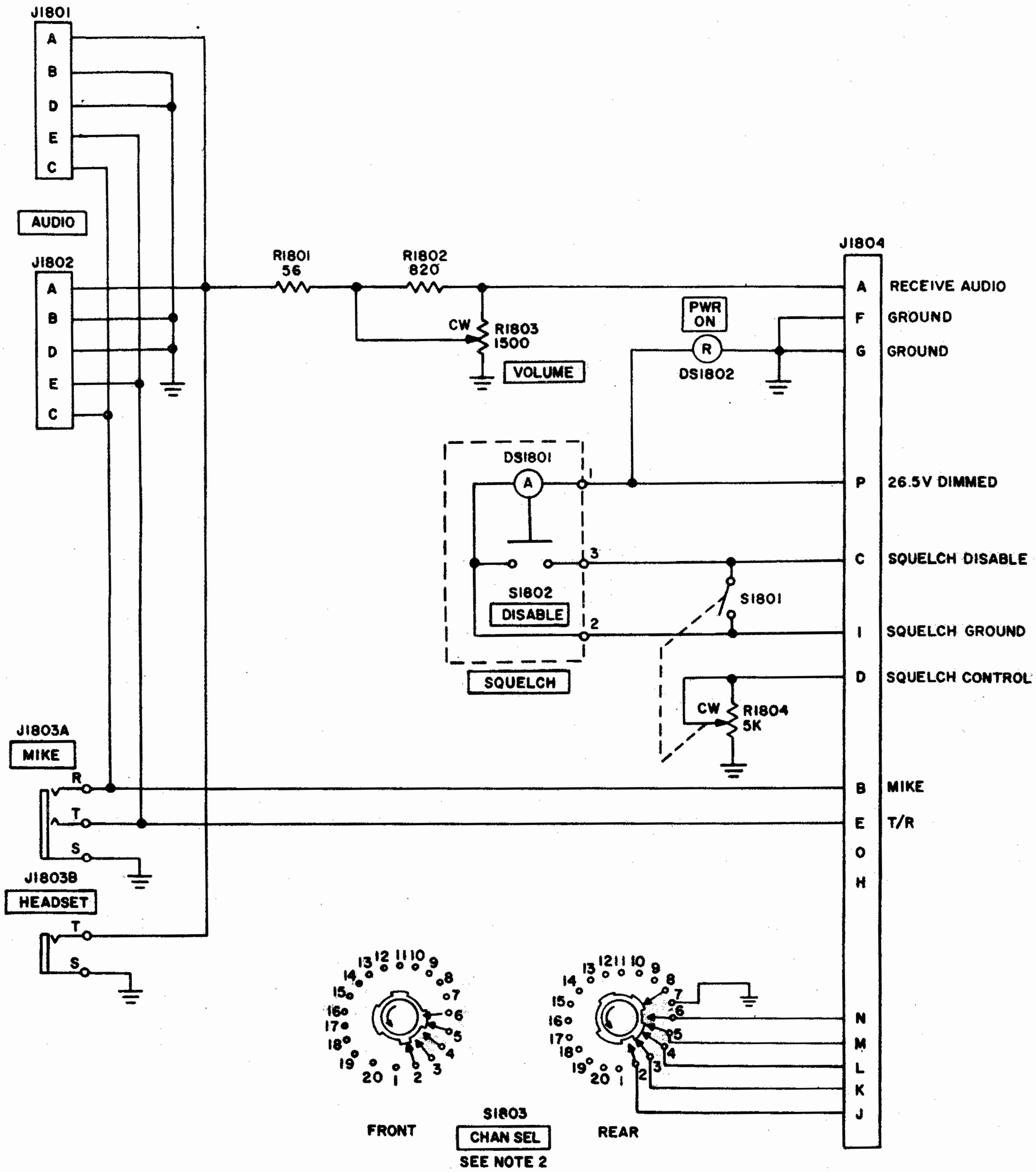


Figure 5-121. Part of Front Panel Assembly and Frequency Selector Assembly, Schematic Diagram (AN/URC-9A)



NOTES:
1. ALL RESISTANCE VALUES IN OHMS.
2. S1803 SHOWN IN POSITION 16 (CHAN SEL KNOB SET ON POSITION 16).
3. S1801 CLOSED WHEN R1804 IS IN EXTREME CCW POSITION.

Figure 5-122. Radio Set Control C-2383/URC-9, Schematic Diagram

CHAPTER 6

PARTS LIST

6-1. INTRODUCTION.

6-2. This section provides reference designation data used to identify the units, assemblies, and parts of Radio Set AN/URC-9( ). The following is an example of the referenced designations used:

EXAMPLE:

1A1	A1	FL2
Unit Designation	Assembly Designation	Item class and number

READ AS: Second (2) filter (FL) of frame assembly (A1) of receiver-transmitter (1A1).

The reference designation data is primarily in tabular form and is intended to supplement the troubleshooting, maintenance, and repair information presented in other chapters of the manual.

6-3. LIST OF UNITS.

6-4. The equipment units of Radio Set AN/URC-9, AN/URC-9A, AN/URC-9Y, and AN/URC-9AY are listed in numerical order, by unit number, in tables 6-1 through 6-4, respectively. Each table provides the following information for each unit: (1) quantity per equipment, (2) official name, (3) designation, (4) colloquial name, and (5) location of the first page of the unit maintenance parts listing.

6-5. MAINTENANCE PARTS LIST.

6-6. Table 6-5 lists all units and their maintenance parts. The table is arranged in the same unit numerical order as tables 6-1 through 6-4 and provides the following information; (1) complete reference designation of each unit, assembly, and part, (2) noun name and brief description, and (3) identification of the illustration which pictorially locates the part. Maintenance parts for each unit are arranged in alpha-numerical sequence by class (generic group). Unless otherwise indicated, referenced drawings apply to the equipment manufacturer, and all type numbers apply to the part manufacturer.

NOTE

Some units listed in table 6-5 are only contained in certain configurations of the radio set. These units are identified by a parenthetical suffix listing the specific radio set(s) that contain(s) the unit.

6-7. LIST OF MANUFACTURERS.

6-8. Table 6-6 lists the manufacturers of the parts used in the radio set and includes the manufacturers federal identification code referenced in table 6-5.

6-9. SUPPLY SUPPORT INFORMATION.

6-10. The Allowance Parts List (APL) issued by the Electronics Supply Office (ESO) includes federal stock numbers (FSN) and source maintenance and recoverability codes. Separate APL's are issued for each configuration (i.e., AN/URC-9, -9A, -9Y, and -9AY) of the radio set. Refer to the APL prepared for the applicable equipment to identify stock numbers and other pertinent information. The Consolidated Repairable Item List (NAV SUP Publications 4102), and the Mandatory Turn-in Repairable Material Policy and Procedures for Handling (NAV-SANDA Instruction 4440.117) contain information concerning the current modular classification and turn-in procedure; and ESO Instruction 4410 provides information relating to the addition of spare modules to the APL.

Table 6-1. Equipment Units of Radio Set AN/URC-9

UNIT NO.	QTY	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1	1	Radio Set	AN/URC-9	Radio Set	6-6
1A1	1	Receiver-Transmitter	RT-581/URC-9	R-T Unit	6-6
1A1A1	1	Main Frame	N/A	Main Frame	6-6
1A1A2	1	Amplifier Assembly	N/A	RF and PA	6-9
1A1A3	1	Frequency Multiplier	N/A	Frequency Multiplier	6-15
1A1A4	1	1st IF Amplifier	N/A	1st IF Amplifier	6-20
1A1A5	1	2nd IF Amplifier	N/A	2nd IF Amplifier	6-28
1A1A6	1	3rd IF Amplifier	N/A	3rd IF Amplifier	6-31
1A1A7	1	Relay Filter	N/A	Relay Filter	6-34
1A1A8	1	Front Panel	N/A	Front Panel	6-40
1A1A9	1	Audio Amplifier and Modulator Assembly	N/A	Audio Amplifier	6-45
1A1A10	1	Filter Assembly	N/A	Filter Assembly	6-48
1A1A11	1	Fan Centrifugal	N/A	Fan	6-49
1A1A12	1	Frequency Selector	N/A	Frequency Selector	6-59
1A1A13	1	Directional Coupler	N/A	Directional Coupler	6-67
1A1A14	1	Broadband Sidetone Amplifier	N/A	Broadband Amplifier	6-67
1A2	1	Case, Receiver-Transmitter	CY-2959/URC-9	Case	6-68
1A3	1	Power Supply	PP-2702/URC-9	Power Supply	6-71
1A4	1	Installation Kit	MK-620/UR	Installation Kit	6-84
1W1	1	Cable Assembly	CX-7258/U	Cable Assembly	6-84
1W2	1	Cable Assembly	CX-7259/U	Cable Assembly	6-84
1W3	1	Cable Assembly	CX-8521/URC-9	Cable Assembly	6-85
1W1605	1	Cable Assembly	CX-7300/URC-9	Cable Assembly	6-85
1W2202	1	Cable Assembly	CX-7260/URC-9	Cable Assembly	6-85

Table 6-2. Equipment Units of Radio Set AN/URC-9A

UNIT NO.	QTY	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1	1	Radio Set	AN/URC-9A	Radio Set	6-6
1A1	1	Receiver-Transmitter	RT-581A/URC-9	R-T Unit	6-6
1A1A1	1	Main Frame	N/A	Main Frame	6-6
1A1A2	1	Amplifier Assembly	N/A	RF and PA	6-9
1A1A3	1	Frequency Multiplier	N/A	Frequency Multiplier	6-15
1A1A4	1	1st IF Amplifier	N/A	1st IF Amplifier	6-20
1A1A5	1	2nd IF Amplifier	N/A	2nd IF Amplifier	6-25
1A1A6	1	3rd IF Amplifier	N/A	3rd IF Amplifier	6-31
1A1A7	1	Relay Filter	N/A	Relay Filter	6-34
1A1A8	1	Front Panel	N/A	Front Panel	6-35
1A1A9	1	Audio Amplifier and Modulator Assembly	N/A	Audio Amplifier	6-45
1A1A10	1	Filter Assembly	N/A	Filter Assembly	6-48
1A1A11	1	Fan Centrifugal	N/A	Fan	6-49
1A1A12	1	Frequency Selector	N/A	Frequency Selector	6-51
1A1A13	1	Directional Coupler	N/A	Directional Coupler	6-67
1A1A14	1	Broadband Sidetone Amplifier	N/A	Broadband Amplifier	6-67
1A2	1	Case, Receiver-Transmitter	CY-2959/URC-9	Case	6-68
1A3	1	Power Supply	PP-2702/URC-9	Power Supply	6-71
1A4	1	Installation Kit	MK-620/UR	Installation Kit	6-84
1W1	1	Cable Assembly	CX-7258/U	Cable Assembly	6-84
1W2	1	Cable Assembly	CX-7259/U	Cable Assembly	6-84
1W3	1	Cable Assembly	CX-8521/URC-9	Cable Assembly	6-85
1W1605	1	Cable Assembly	CX-7300/URC-9	Cable Assembly	6-85
1W2202	1	Cable Assembly	CX-7260/URC-9	Cable Assembly	6-85

Table 6-3. Equipment Units of Radio Set AN/URC-9Y

UNIT NO.	QTY	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1	1	Radio Set	AN/URC-9Y	Radio Set	6-6
1A1	1	Receiver-Transmitter	RT-581/URC-9	R-T Unit	6-6
1A1A1	1	Main Frame	N/A	Main Frame	6-6
1A1A2	1	Amplifier Assembly	N/A	RF and PA	6-9
1A1A3	1	Frequency Multiplier	N/A	Frequency Multiplier	6-15
1A1A4	1	1st IF Amplifier	N/A	1st IF Amplifier	6-20
1A1A5	1	2nd IF Amplifier	N/A	2nd IF Amplifier	6-28
1A1A6	1	3rd IF Amplifier	N/A	3rd IF Amplifier	6-31
1A1A7	1	Relay Filter	N/A	Relay Filter	6-34
1A1A8	1	Front Panel	N/A	Front Panel	6-40
1A1A9	1	Audio Amplifier and Modulator Assembly	N/A	Audio Amplifier	6-45
1A1A10	1	Filter Assembly	N/A	Filter Assembly	6-48
1A1A11	1	Fan Centrifugal	N/A	Fan	6-49
1A1A12	1	Frequency Selector	N/A	Frequency Selector	6-59
1A1A13	1	Directional Coupler	N/A	Directional Coupler	6-67
1A1A14	1	Broadband Sidetone Amplifier	N/A	Broadband Amplifier	6-67
1A2	1	Case, Receiver-Transmitter	CY-2959/URC-9	Case	6-68
2A5	1	Power Supply	PP-4706/URC-9Y	Power Supply	6-74
1A4	1	Installation Kit	MK-620/UR	Installation Kit	6-84
1W1	1	Cable Assembly	CX-10332/URC-9Y	Cable Assembly	6-84
1W2	1	Cable Assembly	CX-7259/U	Cable Assembly	6-84
1W3	1	Cable Assembly	CX-8521/URC-9	Cable Assembly	6-85
1W1605	1	Cable Assembly	CX-7300/URC-9	Cable Assembly	6-85
1W2202	1	Cable Assembly	CX-7260/URC-9	Cable Assembly	6-85

Table 6-4. Equipment Units of Radio Set AN/URC-9AY

UNIT NO.	QTY	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1	1	Radio Set	AN/URC-9AY	Radio Set	6-6
1A1	1	Receiver-Transmitter	RT-581/URC-9	R-T Unit	6-6
1A1A1	1	Main Frame	N/A	Main Frame	6-6
1A1A2	1	Amplifier Assembly	N/A	RF and PA	6-9
1A1A3	1	Frequency Multiplier	N/A	Frequency Multiplier	6-15
1A1A4	1	1st IF Amplifier	N/A	1st IF Amplifier	6-20
1A1A5	1	2nd IF Amplifier	N/A	2nd IF Amplifier	6-28
1A1A6	1	3rd IF Amplifier	N/A	3rd IF Amplifier	6-31
1A1A7	1	Relay Filter	N/A	Relay Filter	6-34
1A1A8	1	Front Panel	N/A	Front Panel	6-40
1A1A9	1	Audio Amplifier and Modulator Assembly	N/A	Audio Amplifier	6-45
1A1A10	1	Filter Assembly	N/A	Filter Assembly	6-48
1A1A11	1	Fan Centrifugal	N/A	Fan	6-49
1A1A12	1	Frequency Selector	N/A	Frequency Selector	6-59
1A1A13	1	Directional Coupler	N/A	Directional Coupler	6-67
1A1A14	1	Broadband Sidetone Amplifier	N/A	Broadband Amplifier	6-67
1A3	1	Case, Receiver-Transmitter	CY-2959/URC-9	Case	6-68
2A1900	1	Power Supply	PP-4706A/URC-9Y	Power Supply	6-78
1A4	1	Installation Kit	MK-620/UR	Installation Kit	6-84
1W1	1	Cable Assembly	CX-10332/URC-9Y	Cable Assembly	6-84
1W2	1	Cable Assembly	CX-7259/U	Cable Assembly	6-84
1W3	1	Cable Assembly	CX-8521/URC-9	Cable Assembly	6-85
1W1605	1	Cable Assembly	CX-7300/URC-9	Cable Assembly	6-85
1W2202	1	Cable Assembly	CX-7260/URC-9	Cable Assembly	6-85

Table 6-5. Maintenance Parts List

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RADIO SET AN/URC-9		
UNIT 1	RADIO SET: AN/URC-9; 225.0 to 399.9 MHz freq range, 115 vac single phase, 50 to 60 Hz; 16 watt radiated power; 13-13/16 in. by 19 in. by 19-1/2 in. o/a dim.; Mfr 13499 part no. 522-2974-004	1-1
UNIT 1A1	RECEIVER-TRANSMITTER, RADIO: RT-581/URC-9; 16 watts pwr output; 225.0 to 399.9 MHz; 1750 channels; 10 in. by 11-3/4 in. by 15-1/2 in. o/a dim.; Mfr 13499 part no. 593-8265-006	1-2
RADIO SET AN/URC-9A		
UNIT 1	RADIO SET: AN/URC-9A; 225.00 to 399.95 MHz freq range, 115 vac or 230 vac, single phase, 50 to 60 Hz; 16 watt radiated power; 13-13/16 in. by 19. in. by 19-1/2 in. o/a dim.; Mfr 03565 part no. D6299	1-1
UNIT 1A1	RECEIVER-TRANSMITTER, RADIO: RT-581A/URC-9; 16 watts pwr output; 225.00 to 399.95 MHz; 3500 channels; 10 in. by 11-3/4 in. by 15-1/2 in. o/a dim.; Mfr 03565 part no. D-6282	1-2
RADIO SETS AN/URC-9Y and AN/URC-9AY		
UNIT 1	RADIO SET: AN/URC-9Y (or -9AY); 225.0 to 399.9 MHz freq range, 24 vdc; 16 watt radiated power; 13-13/16 in. by 19 in. by 19-1/2 in. o/a dim.; Mfr 13499 part no. 522-2974-004	1-1
UNIT 1A1	RECEIVER-TRANSMITTER: Radio RT-581/URC-9; 16 watts pwr output, 225.0 to 399.9 MHz; 1750 channels; 10 in. by 11-3/4 in. by 15-1/2 in. o/a dim.; Mfr 13499 part no. 593-8265-006	1-2
RT-581( )/URC-9, FRAME ASSEMBLY (MAIN)		
1A1A1 (1-100)	FRAME ASSEMBLY (MAIN): Mfr 03565 part no. D6098	5-16
C1	CAPACITOR, FIXED, PAPER DIELECTRIC: 1.0 uf ±20% 400 vdc, Mfr 03565 part no. B6442	5-16
FL1	FILTER: MIL type CZ24BKB474	5-15
FL2	FILTER: 0.375 in. dia by 1.781 in. lg o/a dim.; excl end loops; Mfr 13499 part no. 553-2099-003	5-15
FL3	FILTER: Same as FL2	5-15
FL4	FILTER: 0.375 in. dia by 1.781 in. lg o/a dim.; excl end loops; Mfr 13499 part no. 553-2102-003	5-15
FL5	FILTER: Same as FL2	5-15
FL6	FILTER: Same as FL2	5-15
FL7	FILTER: Same as FL4	5-15
FL8	FILTER: Same as FL4	5-15
FL9	FILTER: Same as FL4	5-15

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FRAME ASSEMBLY (MAIN) (Continued)		
FL10	FILTER: Same as FL4	5-15
FL11	FILTER: Same as FL4	5-15
FL12	FILTER: Same as FL4	5-15
FL13	FILTER: Same as FL4	5-15
FL14	FILTER: Same as FL2	5-15
FL15	FILTER: MIL type CZ24BKB224	5-15
FL16	FILTER: Same as FL2	5-15
FL17	FILTER: Same as FL2	5-15
FL18	FILTER: Same as FL4	5-15
FL19	FILTER: Same as FL2	5-15
FL20	FILTER: Same as FL2	5-15
FL21	FILTER: Same as FL2	5-15
FL22	FILTER: Same as FL15	5-15
FL23	FILTER: Same as FL15	5-15
FL24	FILTER: Same as FL15	5-15
FL25	FILTER: Same as FL15	5-15
FL26	FILTER: Same as FL2	5-15
FL27	FILTER: Same as FL2	5-15
FL28	FILTER: Same as FL2	5-15
FL29	FILTER: Same as FL2	5-15
FL30	FILTER: Same as FL4	5-15
FL31	FILTER: Same as FL4	5-15
FL32	FILTER: MIL type CZ24BKF473	5-15
FL33	FILTER: Same as FL32	5-15
FL34	FILTER SUBASSEMBLY: Same as FL2	5-15
FL35	FILTER SUBASSEMBLY: Same as FL2	5-15
FL36	FILTER: Same as FL15	5-15
H1	CONNECTOR COVER PLATE: 3 in. by 2 in. by 0.032 in. thick; aluminum; retains P501; BuShips Dwg STD 404SK1659332/4	5-19
H2	CONNECTOR COVER PLATE: 6-7/32 in. by 2-3/4 in. by 0.032 in. thick; aluminum; retains P1051; BuShips Dwg STD 404/ 404SK1659332/5	5-18
H3	CONNECTOR COVER PLATE: 8-3/16 in. by 1-3/4 in. by 0.032 in. thick; aluminum; retains P201, P703, and P1201; BuShips Dwg STD 404SK1659332/6	5-16
H4	CONNECTOR COVER PLATE: 3-7/16 in. by 1-3/16 in. by 0.032 in. thick; aluminum; retains P301, P401, and P1601; BuShips Dwg STD 404SK1659332/7	5-12
H5	CONNECTOR COVER PLATE: 6-15/32 in. by 1-5/16 in. by 0.032 in. thick; aluminum, retains P101; BuShips Dwg STD 404SK1659332/8	5-12
J1	CONNECTOR, RECEPTACLE, ELECTRICAL: 18 female contacts, 7.5 amps; straight shape; p/o W1; Mfr 80586 part no. GM18F79	5-17
J2	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 female contacts, 7.5 amps; straight shape; p/o W1; Mfr 91491 part no. MS20-11DG030	5-13
J3	CONNECTOR, RECEPTACLE, ELECTRICAL: 14 female contacts, 7.5 amps; straight shape; p/o W1; Mfr 11453 part no. 1040-14S	5-17

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FRAME ASSEMBLY (MAIN) (Continued)		
J4	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J2 p/o W1	5-17
J5	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J3 p/o W1	5-14
J6	CONNECTOR, RECEPTACLE, ELECTRICAL: 20 female contacts, 7.5 amps; straight shape; p/o W1; Mfr 80586, P/N GM20F79	5-15
J7	CONNECTOR, RECEPTACLE, ELECTRICAL: 26 female contacts, arc resistant plastic dielectric, copper alloy contacts, silver plated; 500 v; 7.5 amps dc; p/o W1; Mfr 80586, P/N GM26F79	5-14
J8	CONNECTOR, RECEPTACLE, ELECTRICAL: 41 female contacts, 7.5 amps; straight shape; Mfr 80586 part no. GM41F79	5-13
J9	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J2 p/o W1	5-17
J10	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J2 p/o W1	5-13
J11	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J6 p/o W1	5-13
J12	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J1 p/o W1	5-13
J13	NOT USED	
J14	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J6 p/o W1	5-15
J15	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J7 p/o W1	5-14
K1	RELAY ARMATURE: 1A, 10 ma at 300 vdc, 1B, 10 ma at 125 vdc, 1B, 400 ma at 28 vdc inductive load; 28 vdc nom coil; 237 ohms ±10% at 25°C coil resistance; continuous duty; hermetically sealed; Mfr 77523 part no. 22320-1	5-14
K2	RELAY, ARMATURE: 1C, n.o. Side rated at 235 ma at 300 vdc +190 vac rms superimposed N.C. side 20 ma at 150 vac rms resistive; 1A, 500 ma at 50 vdc; 28 vdc nom coil; 237 ohms ±10% coil resistance; continuous duty; hermetically sealed; Mfr 77523 part no. 22320-0	5-14
O1	BRACKET ASSEMBLY: Aluminum Bracket; 2.062 in. by 7.393 in. by 8.849 in.; incl 3 gold plated springs; Mfr 13499 part no. 553-1415-003	5-16
O2	MANIFOLD ASSEMBLY: Brass manifold w/silicone rubber gasket; 2-1/2 in. by 3-1/64 in. by 4.265 in. approx; Mfr 03565 part no. B6619	5-17
P1	CONNECTOR, PLUG ELECTRICAL: 37 #16 male contacts; pressurized; 700 vdc, 500 vac, rms; Mfr 02660 part no. 7-8721	5-15
P2	NOT USED	
P3	P/O W4	5-17
P4	P/O W4	5-16
P5	P/O W5	5-17
P6	P/O W5	5-17
P7	NOT USED	
P8	CONNECTOR, PLUG, ELECTRICAL: Straight shape; low loss plastic dielectric; 5 amps; Mfr 94375 part no. 131B110-OA	5-17
P9	CONNECTOR, PLUG, ELECTRICAL: Low loss plastic dielectric; Mfr 13499 part no. 357-9739-00	5-17
P10	CONNECTOR, PLUG, ELECTRICAL: Same as P8	5-17
P11	CONNECTOR, PLUG, ELECTRICAL: Low loss plastic dielectric; 50 ohms, 500 vac rms; Mfr 94375 part no. 0722-50	5-17
R1	RESISTOR, FIXED, COMPOSITION: 39,000 ohms ±10%, 4W; Mfr 01121 part no. HM3931	5-16

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FRAME ASSEMBLY (MAIN) (Continued)		
R2	NOT USED	
R3	RESISTOR, FIXED, WIREWOUND: MIL type RE70GF8060	5-17
W1	WIRING HARNESS, BRANCHED: c/o J-1 through J-12, J-14, P3 and J-15; Mfr 03565 part no. D-6199	5-13
W4	CABLE ASSEMBLY RF: Mfr 98278 part no. 30-188-1	5-11
W5	CABLE ASSEMBLY RF: Mfr 98278 part no. 30-189-1	5-17
W7	CABLE ASSEMBLY RF: Mfr 13499 part no. 549-3376-002	5-17
W8	CABLE ASSEMBLY RF: Mfr 13499 part no. 549-3368-002	5-17
XK1	SOCKET, RELAY: MIL type M12883/09-03	5-14
XK2	SOCKET, RELAY: Same as XK1	5-14
RT-581( )/URC-9, RF and PA AMPLIFIER ASSEMBLY		
1A1A2 (101-199)	AMPLIFIER ASSEMBLY: RF and PA; Mfr 03565 part no. C-6489	5-20
C101	CAPACITOR, FIXED, MICA DIELECTRIC: 500 uuf ±20%, 500 vdc; Mfr 00853 part no. M79500500VEPORM20PCT	5-22
C102	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CC22CH200J	5-26
C103	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CB11RE511J	5-26
C104	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CB11RE102K	5-26
C105	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 7 uuf ±0.25 uuf 500 vdc; Mfr 90177 part no. CD8C070C	5-26
C106	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20B type CC20CK020C	5-26
C107	CAPACITOR, VARIABLE, GLASS DIELECTRIC: 1 section; 0.5 uuf to 3.0 uuf; 1-9/16 in. lg o/a, 1-5/32 in. body lg, 1/4 in. w across flats; Mfr 14674 part no. 680081	5-27
C108	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20B type CC20CH040C	5-26
C109	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C101	5-23
C110	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20D type CC20SK020C	5-26
C111	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C101	5-23
C112	CAPACITOR SHEET, MICA DIELECTRIC: 225 uuf; 0.718 in. by 0.796 in.; Mfr 13499 part no. 553-2035-002	5-26
C113	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C101	5-23
C114	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 20 uuf ±10% 500 vdc; Mfr 90177 part no. CD8R200K	5-26
C115	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C107	5-27
C116	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C103	5-23
C117	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20D type CC20SK1R5C	5-26
C118	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C101	5-23
C119	CAPACITOR, SHEET, MICA DIELECTRIC: Copper; 0.094 in. by 0.812 in. by 0.905 in.; Mfr 13499 part no. 553-2033-002	5-26
C120	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C101	5-26
C121	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C114	5-26
C122	CAPACITOR, VARIABLE GLASS DIELECTRIC: Same as C107	5-27
C123	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C117	5-26
C124	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 500 uuf, GMV, 300 vdc w; Mfr 71590 part no. DA718-001	5-16
C125	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C124	5-26

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG. NO.
RT-581( )/URC-9, RF and PA AMPLIFIER ASSEMBLY (Continued)		
C126	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C114	5-26
C127	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C107	5-27
C128	CAPACITOR ASSEMBLY: Brass, gold flash/silver plate finish; 0.107 in. by 3/8 in. by 1-1/8 in; p/o Z107; Mfr 13499 part no. 553-2287-003	5-27
C129	CAPACITOR, FIXED: MIL type CK61BX471K	5-25
C130	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C103	5-23
C131	CAPACITOR ASSEMBLY: Glass supported teflon, copper both sides, gold plate finish; 0.007 in. by 11/16 in. by 2-5/8 in. p/o 0/34; Mfr 13499 part no. 553-2057-002	5-25
C132	C/O 0-136; H-109; p/o Z108	5-11
C133	CAPACITOR, FIXED, MICA DIELECTRIC: 500 uuf ±10%, 1000 vdc; p/o Z108; Mfr 00853 part no. M4-500K	5-23
C134	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C101	5-23
C135	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20D type CC20CH060C	5-25
C136	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C102	5-26
C137	CAPACITOR: p/o 0123 Mfr 13499 part no. 553-2239-002	5-25
C138	CAPACITOR ASSEMBLY: Incl 2 capacitors, 4 plates and hardware; p/o Z108; Mfr 13499 part no. 553-2061-002	5-25
C139	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C106	5-26
C140	CAPACITOR: 400 uuf ±20%; 1000 vdc test voltage; Mfr 13499 part no. 553-2238-002	5-27
C141	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C107	5-27
C142	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 500 uuf ±20% 1000 vdc; Mfr 71590 part no. DD501	5-27
C143	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C124	5-26
C144	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C129	5-23
C145	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20B type CC20CJ030C	5-27
C146	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C129	5-27
C147	CAPACITOR, FIXED, MICA: 400 uuf ±20%; 1000 vdc test voltage; Mfr 13499 part no. 553-2240-002	5-27
C148	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C129	5-27
H101	WASHER, FLAT: Copper, bright alloy; 0.125 in. id, 0.250 in. od, 0.016 in thk; Mfr 13499 part no. 543-5575-003	5-21
H102	SCREW, MACHINE: Stainless steel, passivate finish; phillips recessed fillister head; 8-32 NC-2A thd, 1/2 in. lg; Mfr 13499 part no. 553-1853-002	5-20
H103	WASHER, FLAT: Cres; 0.127 in. id, 0.250 in. od, 0.033 in. thk; Mfr 13499 part no. 553-1854-002	5-27
H104	SCREW, MACHINE: Stainless steel, passivate finish; phillips cross-recessed fillister head; 8-32 NC-2A thd, 5/8 in. lg; Mfr 13499 part no. 553-1987-002	5-20
H105	NUT, PLAIN, HEXAGON: Brass; 3/8 in. w across flats by 1/16 in. thk; 4-40 thd; Mfr 13499 part no. 553-2006-002	5-27

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG. NO.
RT-581( )/URC-9, RF and PA AMPLIFIER ASSEMBLY (Continued)		
H106	BUMPER, PLASTIC: 0.093 in. by 0.250 in. by 0.312 in.; Mfr 13499 part no. 553-2004-002	5-27
H107	WASHER, FLAT: Cres; 0.255 in. id, 0.437 in. od, 0.012 in. thk; Mfr 13499 part no. 553-1421-002	5-27
H108	NUT, SLEEVE: Brass; 0.312 in. dia by 0.437 in. lg o/a; 8-32 internal thd, 0.276 in. lg; Mfr 13499 part no. 553-2247-002	5-16
H109	SCREW, EXTERNALLY RELIEVED BODY: Brass; 3/8 in. dia by 3/64 in. h head; 8-32 thd, 0.579 in. lg; 11/16 in lg o/a; Mfr 13499 part no. 553-2248-002	5-16
H110	WASHER, NONMETALLIC: Teflon; 0.187 in. id, 0.250 in. od, 0.095 in thk; Mfr 13499 part no. 553-2250-002	5-25
H111	WASHER, FLAT: Brass, bright alloy plate; 0.130 in. dia hole 0.245 in. dia, 0.016 in. thk outside dim.; Mfr 13499 part no 504-0736-002	5-25
J101	CONNECTOR, RECEPTACLE, ELECTRICAL: 850 v rms peak voltage; 70 ohms inpedance, low loss plastic dielectric; 5/8 in. lg; Mfr 94375 part no. R700	5-22
J102	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J101	5-22
J103	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps; Mfr 98291 part no. SKT5BCORANGE	5-25
J104	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps; continuous duty; Mfr 98291 part no. SKT5BCYELLOW	5-25
J105	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps; continuous duty; Mfr 98291 part no. SKT5BCGREEN	5-25
J106	CONNECTOR, BUSHING: Teflon; 3/32 in. id, 0.281 in. od, 0.133 in. lg; Mfr 13499 part no. 553-2023-002	5-11
J107	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J101	5-26
J108	P/O K101	5-22
J109	P/O K101	5-23
J110	TERMINAL, FEEDTHRU, INSULATED: Brass w/teflon insulation; 0.172 in. dia; 0.515 in. lg o/a; Mfr 98291 part no. FTSM1	5-26
J111	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps, continuous duty; Mfr 98291 part no. SKT5BCBROWN	5-23
J112	P/O K102	5-22
J113	P/O K102	5-22
J114	BUSHING, Teflon; 3/32 in. id, 0.281 in. od, 0.155 in. lg; Mfr 13499 part no. 553-2022-002	5-11
J115	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 rd male contact; 500 vdc; low loss plastic dielectric; straight shape; Mfr 94375 part no. 0750	5-12
K101	RELAY, ARMATURE: 1C contact, 30 w at max rated current; 1 inductive winding, 275 ohms dc coil resistance; 1.562 in. h, 1.750 in. w. 2.030 in. lg o/a; continuous duty; air arc quenching; Mfr 74868 part no. 304-11348	5-22

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG. NO.
RT-581( )/URC-9, RF and PA AMPLIFIER ASSEMBLY (Continued)		
K102	RELAY, ARMATURE: 2C contact; 500 vdc electrical rating; 1 inductive winding; 100 ohms dc coil resistance; 13/16 in. h., 2-3/4 in. lg; continuous duty; Mfr 04221 part no. 140-3714	5-22
L101	CHOKE ASSEMBLY: 13 turns close bifilar wound; 0.050 ohms ea winding; 0.192 in. dia by 0.547 in. lg; Mfr 13499 part no. 533-2282-002	5-26
L102	COIL, RADIO FREQUENCY: MIL type MS75008-24	5-26
L103	COIL, RADIO FREQUENCY: MIL type MS75008-42	5-26
L104	CHOKE ASSEMBLY: Same as L101	5-26
L105	COIL, RADIO FREQUENCY: Same as L102	5-26
L106	CHOKE ASSEMBLY: Same as L101	5-26
L107	COIL, RADIO FREQUENCY: Same as L102	5-26
L108	COIL, RADIO FREQUENCY: MIL-type MS75008-30	5-22
L109	COIL, RADIO FREQUENCY: Same as L102	5-26
L110	COIL, RADIO FREQUENCY: Same as L102	5-26
L111	LOOP, RADIO FREQUENCY COUPLING: Silver plated brass; 1 in. dia by 15/16 in. h o/a; Mfr 13499 part no. 549-3367-002 P/O Z108	5-27
L112	COIL, RADIO FREQUENCY: 21 turns of no. 22 AWG wire; 0.172 in. dia by 0.525 in. lg excl terminals; Mfr 13499 part no. 548-8643-002	5-25
L113	COIL, RADIO FREQUENCY: Same as L103	5-23
L114	COIL, RADIO FREQUENCY: Same as L102	5-27
L115	COIL, RADIO FREQUENCY: Same as L108	5-25
L116	COIL, RADIO FREQUENCY: Same as L108	5-22
L117	COIL, RADIO FREQUENCY: Same as L108	5-26
L118	COIL, RADIO FREQUENCY: Same as L108	5-26
L119	COIL, RADIO FREQUENCY: Same as L102	5-25
L120	COIL, RADIO FREQUENCY: Same as L112	5-27
L121	COIL, RADIO FREQUENCY: Same as L108	5-27
O101	SPRING ASSEMBLY: Gold plated copper clip and support; 1/4 in. by 0.593 in. by 0.750 in. o/a; Mfr 13499 part no. 553-1857-002	5-21
O102	SPRING ASSEMBLY: Same as O101	5-21
O103	SPRING ASSEMBLY: Same as O101	5-21
O104	SPRING ASSEMBLY: Silver alloy contact points on gold plated copper plate; 0.093 in. by 19/32 in. by 1 in.; Mfr 13499 part no. 553-1883-002	5-25
O105	SPRING ASSEMBLY: Same as O104	5-25
O106	SPRING ASSEMBLY: Same as O104	5-25
O107	SPRING ASSEMBLY: Same as O104	5-25
O108	SPRING ASSEMBLY: Same as O104	5-25
O109	SPRING ASSEMBLY: Silver alloy contact points on gold plated copper plate; 0.093 in. by 0.842 in. by 1.187 in.; Mfr 13499 part no. 553-1890-002	5-25
O110	SPRING: Silver alloy; 1-9/16 in. dia by 9/32 in. thk; Mfr 13499 part no. 553-1966-003	5-25

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG. NO.
RT-581( )/URC-9, RF and PA AMPLIFIER ASSEMBLY (Continued)		
0111	SPRING: Same as 0110	5-25
0112	SPRING: Copper; 0.063 in. by 0.437 in. by 0.718 in.; Mfr 13499 part no. 553-1969-002	5-21
0113	SPRING: Copper; 0.125 in. by 0.500 in. by 0.629 in.; Mfr 13499 part no. 553-1972-002	5-25
0114	SPRING: Same as 0113	5-25
0115	STATOR ASSEMBLY: 0.718 in. by 1-9/32 in. by 1-1/2 in approx o/a; Mfr 13499 part no. 553-1988-003 P/O Z101	5-21
0116	STATOR ASSEMBLY: Same as 0115; P/O Z103	5-21
0117	STATOR ASSEMBLY: Same as 0115; P/O Z105	5-21
0118	STATOR ASSEMBLY: Same as 0115; P/O Z106	5-21
0119	RING, HOUSING, Bronze; 2.125 in. dia by 0.475 in. thk; Mfr 13499 part no. 553-2002-003	5-21
0120	RING, INSULATOR: Plastic; 1.998 in. dia by 0.470 in. thk; Mfr 13499 part no. 553-2001-002	5-21
0121	CAVITY ASSEMBLY: 3.562 in. by 4.156 in. by 4.186 in. o/a; Mfr 13499 part no. 553-2010-002	5-25
0122	ROTOR ASSEMBLY: 0.687 in. by 1.375 in. by 1.375 in. approx o/a; Mfr 13499 part no. 553-2013-003 P/O C132	5-25
0123	WALL ASSEMBLY: Mfr 13499 part no. 553-2042-003	5-20
0124	SPRING: Copper; 0.094 in. by 0.812 in. by 0.905 in. o/a dim; Mfr 13499 part no. 553-2038-002	5-25
0125	SHAFT ASSEMBLY: 1.120 in. by 1.353 in. by 5.593 in. approx o/a dim.; Mfr 13499 part no. 553-2046-003 P/O 0144	5-25
0126	COUPLING ASSEMBLY: CRES; 1 in. dia by 7/16 in. lg o/a; Mfr 13499 part no. 553-1880-002 P/O 0144	5-25
0127	SPRING ASSEMBLY: Silver Alloy contact points on gold plated copper plate; 0.093 in. by 0.765 in. by 1-1/32 in; Mfr 13499 part no. 553-2058-002	5-25
0128	SPRING ASSEMBLY: Same as 0127	5-25
0129	NOT USED	
0130	SPRING: Copper, gold plated; 31/64 in. dia by 0.113 in. h o/a; Mfr 13499 part no. 553-2131-003	5-25
0131	SHAFT, SHOULDERED: Brass, gold plated; 0.155 in. dia by 2-5/16 in. lg o/a; Mfr 13499 part no. 553-2233-002	5-25
0132	SHAFT ASSEMBLY: Gold plated brass shaft, plastic sleeve; 0.375 in. dia by 2 in. lg; Mfr 13499 part no. 553-2009-002	5-25
0133	NOT USED	
0134	PA CAP ASSEMBLY: Mfr 89114 part no. 717SK113	5-21
0135	SPRING: Copper, gold plated; 1-1/16 in. dia by 7/32 in. h o/a; Mfr 13499 part no. 553-2241-002	5-25
0136	SPRING, LOCKING: Steel wire; 0.0300 in. dia; accommodates 0.250 in. dia component; Mfr 13499 part no. 502-6005-002	5-16
0137	ROTOR ASSEMBLY: 0.875 in. by 1.077 in. by 1.562 in.; Mfr 13499 part no. 553-2242-003	5-27

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, RF and PA AMPLIFIER ASSEMBLY (Continued)		
0138	FLANGE ASSEMBLY: Brass flange; 0.527 in. by 1.312 in. by 1.483 in.; Mfr 13499 part no. 553-2246-002	5-21
0139	COUPLER, SHAFT, RIGID: Brass, gold plated; 0.187 in. id, 0.375 in. od. 7/16 in. lg; Mfr 13499 part no. 553-2251-002	5-25
0140	ADAPTER ASSEMBLY: TEFLON LINER, brass cup; 0.390 in. dia by 1/8 in. lg; w/copper contact; brass post; Mfr 13499 part no. 553-1961-002 Plate Cap for V105	5-21
0141	BEARING, BALL, ANNULAR: Single row, radial; 0.125 in. bore dia. 0.375 in. od, 0.145 in. w o/a; 2 stainless steel shields; Mfr 21335 part no. AM33KDD3FS168	5-21
0142	BEARING, BALL, ANNULAR: Single row, radial; 0.250 in. bore dia; 0.625 in. od, 0.196 in. w o/a; 2 stainless steel shields; Mfr 21335 part no. AMS1KDD7FS168	5-21
0143	BEARING, BALL, ANNULAR: Single row, radial; 0.1875 in. bore dia, 0.500 in. od, 0.1960 in. w o/a; 2 stainless steel shields, Mfr 21335 part no. AM22KDD5FS227	5-21
0144	SHAFT ASSEMBLY: 1 in. dia by 6.601 in. lg approx.; Mfr 13499 part no. 553-2045-002 P/O Z101, Z103, Z105 and Z106	5-27
0145	PLATE ASSEMBLY: P/O Z107 Mfr 13499 part no. 553-2258-003	5-27
P101	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM18M79	5-22
R101	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF333K	5-26
R102	RESISTOR, FIXED, COMPOSITION: Same as R101	5-26
R103	RESISTOR, FIXED, WIREWOUND: 1 w, 100 ohms ±3%; Mfr 91637 part no. RS1A100ROG	5-26
R104	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF101K	5-26
R105	RESISTOR, FIXED, COMPOSITION: Same as R104	5-26
R106	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF391J	5-23
R107	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF104K	5-23
R108	RESISTOR, VARIABLE, WIREWOUND: 5000 ohms ±5%, 1.25 w; Mfr 02297 part no. AP05C554	5-27
R109	RESISTOR, FIXED, FILM: MIL type RN65B68R1F	5-25
R110	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF561K	5-22
R111	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF680K	5-23
R112	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF151K	5-25
R113	NOT USED	
R114	RESISTOR, FIXED, COMPOSITION: Same as R104	5-25
R115	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF272K	5-23
R116	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF182K	5-23
R117	RESISTOR, FIXED, COMPOSITION: Same as R107	5-23
R118	NOT USED	
R119	NOT USED	
R120	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF102K	5-27
R121	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B16R9F	5-25
R122	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF470K	5-26
R123	RESISTOR, FIXED, COMPOSITION: Same as R104	5-26

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9 RF and PA AMPLIFIER ASSEMBLY (Continued)		
R124	RESISTOR, FIXED, WIREWOUND: 0.56 ohm ±3%, 2.5 w; Mfr 44655 part no. 47683DETO-56	5-25
S101	SWITCH, THERMAL SENSING: SPST action type mi-340-190-122 encapsulated in ceramic cup fabricated from beryllium oxide (BEO) NAVSEC NORDIV Dwg 450SK2170029	5-25
V101	ELECTRON TUBE: MIL-E-1 type 8532	5-22
V102	ELECTRON TUBE: Same as V101	5-22
V103	ELECTRON TUBE: Same as V101	5-22
V104	ELECTRON TUBE: MIL-E-1 type 7554	5-25
V105	ELECTRON TUBE: MIL-E-1 type 6442	5-21
V106	ELECTRON TUBE: MIL-E-1 type 4X150A	5-25
W101	CABLE ASSEMBLY, RADIO FREQUENCY: Coaxial; 50 ohms nom impedance, 7 strands of 0.004 in. dia; teflon; single shield; Mfr 98728 part no. 30-187-1	5-22
XV101	SOCKET, ELECTRON TUBE: 7 contact miniature; 520 0.125 in. dia mtg. holes spaced 0.875 in. c to c; Mfr 80368 part no. V24-6034	5-22
XV102	SOCKET, ELECTRON TUBE: Same as XV101	5-22
XV103	SOCKET, ELECTRON TUBE: Same as XV101	5-22
Z101	C/O 0-115, 0-114, C-107	5-25
Z102	SUPPRESSOR: Single layer wound; 8 turns no. 30 AWG; Mfr 13499 part no. 553-1996-002	5-26
Z103	C/O 0-116, 0-144, C-115	5-25
Z104	NOT USED	
Z105	C/O 0-117, 0-114, C-122	5-25
Z106	C/O 0-118, 0-144, C-127	5-25
Z107	C/O 0-145, C-128, C-147, 0-137, 0-139, 0-135, 0-132	5-25
Z108	C/O C-131, C-132, C-133, L-111, 0-122, 0-131, 0-134	5-11
RT-581( )/URC-9, FREQUENCY MULTIPLIER-OSCILLATOR ASSEMBLY		
1A1A3 (201-299)	FREQUENCY MULTIPLIER: Mfr 03565 part no. C-1448	5-32
C201	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 2000 uf -20% +1000%, 350 vdc; Mfr 72982 part no. 2467001W5T0202A	5-38
C202	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CB11PE102M	5-38
C203	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15ED511G03	5-37
C204	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C203	5-37
C205	NOT USED	
C206	NOT USED	
C207	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15CD101J03	5-37
C208	CAPACITOR, VARIABLE, GLASS DIELECTRIC: 1.0 uuf to 8.0 uuf, 500 vdc; Mfr 73899 part no. VC3G	5-34
C209	NOT USED	
C210	CAPACITOR,FIXED, MICA DIELECTRIC: MIL type CM15ED150J03	5-37
C211	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C203	5-36
C212	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CB11RE511J	5-33

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FREQUENCY MULTIPLIER-OSCILLATOR ASSEMBLY		
C213	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C214	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 20 uuf ±10%, 500 vdc; Mfr 90177 part no. CD8R200K	5-36
C215	CAPACITOR, VARIABLE, GLASS DIELECTRIC: 1 section; 0.5 uuf to 3.0 uuf; 1-9/16 in. lg o/a, 1-5/32 in. body lg, 1/4 in. w across flats; Mfr 14674 part no. 680081	5-36
C216	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20D type CC20SK020C	5-36
C217	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C218	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C219	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C220	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C214	5-36
C221	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C215	5-36
C222	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C216	5-36
C223	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C224	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C225	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C226	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C214	5-36
C227	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C215	5-36
C228	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C216	5-36
C229	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C230	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C231	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C212	5-33
C232	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C214	5-36
C233	CAPACITOR, FIXED, GLASS DIELECTRIC: Same as C215	5-36
C234	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C216	5-33
C235	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C108	5-36
C236	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 10 uuf ±20% 500 vdc; Mfr 71590 part no. DA933-043	5-38
C237	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CK61BX471K	5-33
C238	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C237	5-33
C239	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C237	5-33
C240	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C201	5-33
C241	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C201	5-33
FL201	FILTER, RADIO INTERFERENCE: 500 vdc; 5 amp, 1000 uuf; 5/16 in. by 7/16 in. overall Mfr 01121 part no. FCS1	5-35
FL202	FILTER, RADIO INTERFERENCE: Same as FL201	5-35
FL203	FILTER, RADIO INTERFERENCE: Same as FL201	5-35
H201	SCREW, MACHINE: Stainless steel, passivate finish; phillips recessed fillister head; 8-32NC-2A thd; 1/2 in lg; Mfr 13499 part no. 553-1853-002	5-32
H202	WASHER, FLAT: Copper, bright alloy; 0.125 in. id, 0.250 in. od, 0.016 in. thk; Mfr 13499 part no. 553-1910-002	5-36
H203	WASHER, FLAT: Cres; 0.406 in. id, 0.600 in. od, 0.018 in. thk; Mfr 13499 part no. 553-1870-002	5-35
H204	WASHER, FLAT: Cres; 0.255 in. id, 0.437 in. od, 0.012 in. thk; Mfr. 13499 part no. 553-1421-002	5-35

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FREQUENCY MULTIPLIER_OSCILLATOR ASSEMBLY (Continued)		
H205	NOT USED	
H206	SHIM: Cres, passivate finish; 0.0190 in. id, 0.275 in. od, 0.003 in. thk; Mfr 13499 Part no. 544-8773-003	5-35
H207	SHIM: Copper, beryllium, bright alloy; 0.166 in. id, 0.250 in. od, 0.0126 in. thk; Mfr 13499 part no. 553-2072-002	5-38
J201	JACK, TIP: For use with 0.080 diameter male contact; Teflon; 5.5 amps continuous duty; Mfr 98291 part no. SKT5BCBROWN	5-33
J202	JACK, TIP: For use with 0.080 diameter male contact, 5.5 amps continuous duty; Mfr 98291 part no. SKT5BCRED	5-33
J203	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps continuous duty; Mfr 98291 part no. SKT5BCORANGE	5-33
J204	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps continuous duty; Mfr 98291 part no. SKT5BCYELLOW	5-33
J205	CONNECTOR, RECEPTACLE. 850 v peak voltage; 93 ohms impedance; low loss plastic dielectric; 0.710 in. lg; Mfr 98278 part no. 31-85	5-36
L201	COIL ASSEMBLY: Single layer wound; 12 turns no. 28 AWG; Mfr 13499 part no. 553-1944-002	5-34
L202	COIL ASSEMBLY: Same as L201	5-34
L203	COIL ASSEMBLY: Single layer wound; 11 turns no. 28 AWG; Mfr 13499 part no. 553-1943-002	5-34
L204	COIL ASSEMBLY: Single layer wound; 10 turns no. 28 AWG; Mfr 13499 part no. 553-1942-002	5-34
L205	COIL ASSEMBLY: Single layer wound; 9 turns, no 28 AWG; Mfr 13499 part no. 553-1941-002	5-34
L206	COIL ASSEMBLY: Same as L205	5-34
L207	COIL ASSEMBLY: Single layer wound; 8 turns no. 28 AWG; Mfr 13499 part no. 553-1940-002	5-34
L208	COIL ASSEMBLY: Same as L207	5-34
L209	COIL ASSEMBLY: Same as L201	5-34
L210	COIL ASSEMBLY: Same as L201	5-34
L211	COIL ASSEMBLY: Same as L201	5-34
L212	COIL ASSEMBLY: Same as L201	5-34
L213	COIL ASSEMBLY: Same as L203	5-34
L214	COIL ASSEMBLY: Same as L203	5-34
L215	COIL ASSEMBLY: Same as L204	5-34
L216	COIL ASSEMBLY: Same as L204	5-34
L217	COIL ASSEMBLY: Same as L205	5-34
L218	COIL ASSEMBLY: Same as L205	5-34
L219	COIL, RADIO FREQUENCY: MIL type MS75008-26	5-38
L220	COIL, RADIO FREQUENCY: MIL type LT4K036	5-37
L221	COIL, RADIO FREQUENCY: MIL type MS75053-2	5-38
L222	COIL: SINGLE Layer wound; 4 turns no. 20 AWG; Mfr 13499 part no. 553-1946-002	5-38
L223	COIL RADIO FREQUENCY: 38 turns, no. 26 AWG wire, 0.6 uh inductance, 0.9 amp current rating; 9/32 in. dia, 5/8 in. lg o/a; 4 wire lead type terminals; Mfr 90526 part no. P449A	5-36

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581( )/URC-9, FREQUENCY MULTIPLIER-OSCILLATOR ASSEMBLY (Continued)	
L224	COIL, RADIO FREQUENCY: 20 turns, no. 26 AWG wire; 0.5 uh inductance, 100 ma current rating; 11/64 in. dia, 1/2 in lg o/a; 2 wire lead type terminals; Mfr 99800 part no. BP866	5-36
L225	COIL, RADIO FREQUENCY: Same as L223	5-36
L226	COIL, RADIO FREQUENCY: Same as L224	5-36
L227	COIL, RADIO FREQUENCY: Same as L223	5-36
L228	COIL, RADIO FREQUENCY: Same as L224	5-36
L229	COIL, RADIO FREQUENCY: Same as L223	5-36
L230	COIL, RADIO FREQUENCY: Same as L224	5-36
0201	SPRING: Copper; 0.098 in. by 7/32 in. by 1.125 in; Mfr 13499 part no. 553-1856-002	5-35
0202	GEAR, SPUR: Aluminum; 66 teeth; 1.416 in. dia by 0.343 in. lg o/a; 0.187 in. dia bore; Mfr 13499 part no. 553-1861-002	5-35
0203	STATOR ASSEMBLY: 0.312 in. by 0.952 in. by 1.437 in.; Mfr 13499 part no. 553-1862-003 P/O Z202	5-35
0204	STATOR ASSEMBLY: Same as 0203 P/O Z204	5-35
0205	STATOR ASSEMBLY: Same as 0203 P/O Z206	5-35
0206	STATOR ASSEMBLY: Same as 0203 P/O Z208	5-35
0207	ROTOR ASSEMBLY: 1 in. by 1.062 in. by 6.401 in. approx o/a dim.; Mfr 13499 part no. 553-1868-003 P/O Z202, Z204, Z206, Z208	5-35
0208	BEARING, BALL, ANNULAR: Single row, radial; 0.250 in. bore dia, 0.625 in. od, 0.196 in. w o/a; 2 stainless steel shields; Mfr 21335 part no. AMS1KDD7FS168	5-35
0209	BEARING, BALL, ANNULAR: Same as 0208	5-35
0210	SPRING, HELICAL COMPRESSION: Steel; 0.075 in. id, 0.130 in. od, 0.165 in. compressed lg; 8 coils; Mfr 13499 part no. 553-1871-002	5-35
0211	SPRING, HELICAL, COMPRESSION: Same as 0210	5-35
0212	SPRING, HELICAL, COMPRESSION: Same as 0210	5-35
0213	FLANGE ASSEMBLY: Brass flange; 0.527 in. by 1.312 in. by 1.483 in; Mfr 13499 part no. 553-2246-002	5-35
0214	SPRING: Copper, gold plated; 31/64 in. dia by 0.113 in. h o/a; Mfr 13499 part no. 553-2131-003	5-35
0215	GEAR, SPUR: Aluminum; 33 teeth; 0.729 in. dia by 5/16 in. lg o/a; Mfr 13499 part no. 553-1902-002	5-35
0216	GEAR, SPUR: Bronze; 39 teeth; 0.854 in. dia by 0.125 in. lg; Mfr 13499 part no. 553-1903-002	5-35
0217	TUNER ASSEMBLY: 0.349 in. by 2.062 in. by 3.906 in. approx o/a dim.; Mfr 13499 part no. 553-1907-003	5-37
0218	SPRING: Copper; 1.812 in. dia by 0.250 in. thk; 15 fingers; Mfr 13499 part no. 553-1934-003	5-34
0219	SHAFT ASSEMBLY: Ceramic shaft, cres sleeve ea end; 0.187 in. dia by 2-9/16 in. lg o/a; Mfr 13499 part no. 553-1936-002	5-37
0220	SAME AS 0126 RF and PA Amplifier Assembly	5-32

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581( )/URC-9, FREQUENCY MULTIPLIER-OSCILLATOR ASSEMBLY (Continued)	
P201	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 male contacts; 5 amps; 7/16 in. dia, 1-3/32 in. lg; Mfr 80586 part no. GM11M79 P/O W201	5-33
R201	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF272K	5-38
R202	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF220K	5-34
R203	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF221K	5-37
R204	RESISTOR, FIXED, COMPOSITION: Same as R203	5-37
R205	RESISTOR, FIXED, COMPOSITION: MIL-R-11 RC20GF103K	5-34
R206	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF100K	5-38
R207	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF124K	5-36
R208	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF223K	5-36
R209	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF823K	5-33
R210	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF223K	5-33
R211	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF392K	5-33
R212	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF222K	5-33
R213	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF333K	5-33
R214	NOT USED	
R215	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF910J	5-36
R216	RESISTOR, FIXED, COMPOSITION: Same as R215	5-36
R217	RESISTOR, FIXED, COMPOSITION: Same as R215	5-36
S201	SWITCH, ASSEMBLY: 0.395 in. by 1-7/8 in. by 2-1/16 in. o/a dim.; Mfr 13499 part no. 553-1915-003	5-38
S202	SWITCH ASSEMBLY: 0.750 in. by 1.875 in. by 2.062 in. approx. o/a dim.; Mfr 13499 part no. 553-1924-003	5-38
V201	ELECTRON TUBE: MIL-E-1 type 5670	5-34
V202	ELECTRON TUBE: MIL-E-1 type 5654	5-33
V203	ELECTRON TUBE: MIL-E-1 type 8532	5-33
V204	ELECTRON TUBE: Same as V203	5-33
V205	ELECTRON TUBE: Same as V203	5-33
W201	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: 6 conductors; Mfr 03565 part no. C-6614 P/O P201	5-33
W202	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: 3 conductors; ends stripped and tinned; Mfr 13499 part no. 553-1897-003	5-35
XV201	SOCKET, ELECTRON TUBE: Phospher bronze, silver plated; Mfr 91662 part no. BRTL669SPHSPTD125	5-34
XV202	SOCKET, ELECTRON TUBE: 7 contact miniature; two 0.125 in. dia mtg holes spaced 0.875 in. c to c; Mfr 80368 part no. V24-6034	5-33
XV203	SOCKET, ELECTRON TUBE: Same as XV202	5-33
XV204	SOCKET, ELECTRON TUBE: Same as XV202	5-33
XV205	SOCKET, ELECTRON TUBE: Same as XV202	5-33
Y201	NOT USED	
Y202	CRYSTAL UNIT QUARTZ: MIL-C-3098/53 type CR76U35-00000 MHz	5-34
Y203	NOT USED	
Y204	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U38-33333 MHz	5-34
Y205	NOT USED	

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG. NO.
RT-581( )/URC-9, FREQUENCY MULTIPLIER-OSCILLATOR ASSEMBLY (Continued)		
Y206	CRYSTAL UNIT, QUARTS: MIL-C-3098/53 type CR76U41-66666 MHz	5-34
Y207	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U43-33333 MHz	5-34
Y208	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U45-00000 MHz	5-34
Y209	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U31-11111 MHz	5-34
Y210	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U32-22222 MHz	5-34
Y211	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U33-33333 MHz	5-34
Y212	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U34-44444 MHz	5-34
Y213	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U35-55555 MHz	5-34
Y214	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U36-66666 MHz	5-34
Y215	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U37-77777 MHz	5-34
Y216	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U38-88888 MHz	5-34
Y217	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U40-00000 MHz	5-34
Y218	CRYSTAL UNIT, QUARTZ: MIL-C-3098/53 type CR76U41-11111 MHz	5-34
Z201	TUNER, ASSEMBLY: Copper clad glass cloth, gold plated 0.00005/.00007 thk; 0.062 in. by 2-1/16 in. by 2.656 in. incl. 3 tubelets; Mfr 13499 part no. 553-1911-002	5-38
Z202	C/O 0-203, 0-207	5-35
Z203	NOT USED	
Z204	C/O 0-204, 0-207	5-35
Z205	NOT USED	
Z206	C/O 0-205, 0-207	5-35
Z207	NOT USED	
Z208	C/O 0-206, 0-207	5-35
RT-581( )/URC-9, FIRST IF AMPLIFIER ASSEMBLY		
1A1A4 (301-399)	FINAL ASSEMBLY: 1st IF AMPLIFIER: Mfr 03565 part no. C-6490	5-39
C301	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM05ED270J03	5-41
C302	CAPACITOR, VARIABLE, GLASS DIELECTRIC: 1.0 uuf to 8.0 uuf, 500 vdc; Mfr 73899 part no. VC3G1 P/O Z301	5-39
C303	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CC22CK010C	5-41
C304	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C302; P/O Z302	5-39
C305	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 30 uuf ±5%; 500 vdc at 85°C, 400 vdc at 100°C, 250 vdc at 125°C; Mfr 72982 part no. 338026COH0300J	5-41
C306	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C302 P/O Z303	5-39
C307	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL-C-20B type CC22CH180J P/O Z303	5-39
C308	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C303	5-41
C309	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C302; P/O Z304	5-39
C310	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: Same as C307; P/O Z304	5-39
C311	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C305	5-41
C312	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C302; P/O Z305	5-39
C313	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C307; P/O Z305	5-39

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581( )/URC-9, FIRST IF AMPLIFIER ASSEMBLY (Continued)	
C314	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C303	5-41
C315	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 33 uuf ±10%, 500 vdc; Mfr 13499 part no. 928-4013-00	5-41
C316	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C303	5-41
C317	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C302; P/O Z306	5-39
C318	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 2000 uuf -20%, +100%, 350 vdc; Mfr 04222 part no. 2467001W5T0202Z	5-41
C319	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C318	5-41
C320	CAPACITOR, FIXED, MICA DIELECTRIC: 100 uuf ±20%, 500 vdc; per MIL-C-10950 part no. CB11PE102M	5-41
C321	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 3,000 uuf -20 +100%, 350 vdc; Mfr 72982 part no. 2462000W5T0302Z	5-41
C322	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C320	5-41
C323	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C318	5-41
C324	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C321	5-41
C325	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 100 uuf ±2%, 500 vdc at 100°C; Mfr 72982 part no. 338026T2H0101G	5-41
C326	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C320	5-41
C327	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C320	5-41
C328	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C320	5-41
C329	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CB11RE511J	5-41
C330	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C321	5-41
C331	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C320	5-41
C332	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C320	5-41
C333	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C320	5-41
C334	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C329	5-41
C335	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C325	5-41
C336	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C321	5-41
C337	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C325	5-41
C338	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C305	5-41
C339	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CC22CH050C	5-41
C340	CAPACITOR, VARIABLE, GLASS DIELECTRIC: Same as C302 P/O Z307	5-39
C341	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C321	5-41
C342	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C321	5-41
C343	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 47 uuf ±5%, 500 vdc at 85°C, 400 vdc at 100°C, 250 vdc at 125°C; Mfr 72982 part no. 338026COH0470J	5-41
C344	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C329	5-41
C345	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C329	5-41
C346	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C339	5-41
C347	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C321	5-41
C348	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 6.8 uuf ±5%, 500 vdc Mfr 78488 part no. GA6-8UUFPORM5PCT	5-41
H301	SCREW, MACHINE: Cres; phillips fillister head; 6-32 NC-2A thd, 7/16 in. lg; Mfr 13499 part no. 553-1662-002	5-12

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581( )/URC-9, FIRST IF AMPLIFIER ASSEMBLY (Continued)	
H302	SCREW, MACHINE: Cres; phillips fillister head; 6-32NC-2A thd, 7/16 in. lg; Mfr 13499 part no. 553-1663-002	5-12
H303	SCREW, MACHINE: Cres; phillips pan head; 6-32NC-2A thd, 1/2 in. lg; Mfr 13499 part no. 553-1664-002	5-39
H304	WASHER, FLAT: Cres; 0.101 in. id, 0.375 in. od, 0.0156 in. thk; Mfr 13499 part no. 553-1431-002	5-40
J301	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amp continuous duty; Mfr 98291 part no. SKT5BCBROWN	5-39
J302	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps continuous duty; Mfr 98291 part no. SKT5BCRED	5-39
J303	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps; continuous duty; Mfr 98291 part no. SKT5BCORANGE	5-39
J304	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps; continuous duty; Mfr 98291 part no. SKT5BCYELLOW	5-39
J305	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps continuous duty, Mfr 98291 part no. SKT5BCGREEN	5-39
L301	COIL, RADIO FREQUENCY: 125 turns of no. 34 AWG wire; 0.406 in. by 0.936 in. by 1.500 in. o/a dim.; Mfr 13499 part no. 553-1701-003 P/O Z301, C/O 0-301	5-39
L302	COIL, RADIO FREQUENCY: Same as L301 P/O Z302, C/O 0-302	5-39
L303	COIL, RADIO FREQUENCY: Same as L301 P/O Z303, C/O 0-303	5-39
L304	COIL, RADIO FREQUENCY: Same as L301 P/O Z304, C/O 0-304	5-39
L305	COIL, RADIO FREQUENCY: Same as L301 P/O Z305, C/O 0-305	5-39
L306	COIL, RADIO FREQUENCY: Same as L301 P/O Z306, C/O 0-306	5-39
L307	COIL, RADIO FREQUENCY: Single layer wound, 46 turns, #25 AWG wire; 6.5 uh nominal inductance, 0.05 ohms dc resistance, 1.5 amps current rating; Mfr 99800 part no. BP868	5-40
L308	COIL, RADIO FREQUENCY: Same as L307	5-40
L309	COIL, RADIO FREQUENCY: Single layer wound; magnet wire; 39 uh inductance, 2.00 ohms dc; 500 ma current rating; Mfr 82142 part no. 4422-11-117	5-40
L310	COIL, RADIO FREQUENCY: 132 turns of no. 34 AWG wire; 0.406 in. by 0.936 in. by 1.500 in. o/a dim.; Mfr 13499 part no. 553-1697-003 P/O Z307, C/O 0-307	5-39
L311	COIL, RADIO FREQUENCY: MIL type MS75008-33	5-40
L312	COIL, RADIO FREQUENCY: Same as L309	5-40
L313	COIL, RADIO FREQUENCY: MIL type MS75008-23	5-40
L314	SUPPRESSOR, PARASITIC: Ferrite; 0.16 uh, 80 ohms; 0.047 in. id, 0.318 in. od by 0.118 in. lg; Mfr 02114 part no. 56-590-65-3B	5-40
L315	SUPPRESSOR, PARASITIC: Same as L314	5-40
L316	SUPPRESSOR, PARASITIC: Same as L314	5-40
L317	SUPPRESSOR, PARASITIC: Same as L314	5-40
L318	SUPPRESSOR, PARASITIC: Same as L314	5-40
L319	SUPPRESSOR, PARASITIC: Same as L314	5-40
0301	CORE ASSEMBLY: 0.200 in. dia by 2.208 in. lg o/a dim.; Mfr 13499 part no. 553-1674-002 P/O L301	5-40
0302	CORE ASSEMBLY: Same as 0301 P/O L302	5-40

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FIRST IF AMPLIFIER ASSEMBLY (Continued)		
0303	CORE ASSEMBLY: Same as 0301 P/O L303	5-40
0304	CORE ASSEMBLY: Same as 0301 P/O L304	5-40
0305	CORE ASSEMBLY: Same as 0301 P/O L305	5-40
0306	CORE ASSEMBLY: Same as 0301 P/O L306	5-40
0307	CORE ASSEMBLY: 0.200 in. dia by 2.083 in. o/a lg; Mfr 13499 part no. 553-1678-002 P/O L310	5-40
0308	SPRING, HELICAL, EXTENSION: Cres; 28, 0.017 in. dia wire coils, 0.825 ±0.032 in. free length inside loops; Mfr 13499 part no. 553-1690-002	5-39
0309	SPRING, HELICAL, EXTENSION: Cres; 24, 0.020 in. dia wire coils, 0.167 in. dia, 0.790 in. lg; Mfr 13499 part no. 553-1691-002	5-43
0310	SPRING, HELICAL, EXTENSION: Same as 0309	5-39
0311	TABLE ASSEMBLY: 0.800 in. by 2.437 in. by 3.796 in. o/a dim; Mfr 13499 part no. 553-1709-002	5-40
0312	TABLE ASSEMBLY: 0.656 in. by 0.748 in. by 2.718 in. o/a dim; Mfr 13499 part no. 553-1714-002	5-41
0313	SHAFT: Cres; 0.1870 in. dia, 6.250 in. lg; Mfr 13499 part no. 553-1719-002	5-40
0314	CAM ASSEMBLY: Brass cam, cres hub; 0.625 in. lg o/a; Mfr 13499 part no. 553-1720-002	5-41
0315	CAM ASSEMBLY: Brass cam, cres hub; 0.625 in. lg o/a; Mfr 13499 part no. 553-1723-002	5-40
0316	COUPLING ASSEMBLY: 0.875 in. dia by 0.483 in. lg o/a dim.; Mfr 13499 part no. 553-1724-002	5-42
0317	COUPLING ASSEMBLY: Same as 0316	5-42
0318	GEAR: Brass; 51 teeth, 48 diametral pitch; 1.104 in. dia by 0.125 in. lg o/a dim.; Mfr 03565 part no. B-6613	5-41
0319	SHAFT ASSEMBLY: 21 teeth, 48 diametral pitch; 0.479 in. dia by 1.125 in. lg o/a dim.; Mfr 13499 part no. 553-1741-002	5-41
0320	SHAFT ASSEMBLY: 21 teeth, 48 diametral pitch; 1.281 in. lg o/a dim; Mfr 13499 part no. 553-1744-002	5-42
P301	CONNECTOR, RECEPTACLE, ELECTRICAL: 14 male contacts, 5 amps, 300 vac, straight shape; Mfr 80586 part no. GM14M79	5-39
P302	P/O W302	5-39
P303	P/O W303	5-17
P304	P/O W304	5-39
R301	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF104K	5-40
R302	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF221K	5-40
R303	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF823K	5-40
R304	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF102J	5-40
R305	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF333K	5-40
R306	RESISTOR, FIXED, COMPOSITION: Same as R301	5-40
R307	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF100K	5-40
R308	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B2050F	5-40
R309	RESISTOR, FIXED, COMPOSITION: Same as R304	5-40
R310	RESISTOR, FIXED, COMPOSITION: Same as R301	5-40

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FIRST IF AMPLIFIER ASSEMBLY (Continued)		
R311	RESISTOR, FIXED, COMPOSITION: Same as R304	5-40
R312	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF334K	5-40
R313	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF153K	5-40
R314	RESISTOR, FIXED, COMPOSITION: Same as R301	5-40
R315	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF122K	5-40
R316	RESISTOR, FIXED, COMPOSITION: Same as R312	5-40
R317	RESISTOR, FIXED, COMPOSITION: Same as R304	5-40
R318	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF474K	5-40
R319	RESISTOR, FIXED, COMPOSITION: Same as R301	5-40
R320	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF472K	5-40
R321	RESISTOR, FIXED, COMPOSITION: Same as R302	5-40
R322	RESISTOR, FIXED, COMPOSITION: Same as R302	5-40
R323	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B1000F	5-40
R324	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF101K	5-40
R325	RESISTOR, FIXED, COMPOSITION: Same as R313	5-40
R326	RESISTOR, FIXED, COMPOSITION: Same as R303	5-40
S301	SWITCH SECTION, ROTARY: 1 circiut, 1 pole, 12 position; 2 moving and 11 fixed contacts; Mfr 76854 part no. 101165F	5-42
S302	SWITCH SECTION, ROTARY: 1 circuit; 1 pole, 12 position; 2 moving and 11 fixed contacts, Mfr 76854 part no. 100914F	5-42
V301	ELECTRON TUBE: MIL-E-1 type 5654	5-39
V302	ELECTRON TUBE: Same as V301	5-39
V303	ELECTRON TUBE: Same as V301	5-39
V304	ELECTRON TUBE: Same as V301	5-39
V305	ELECTRON TUBE: MIL-E-1 type 5670	5-39
W301	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL, BRANCHED: 9 conductors terminated on one end w/connector; 5.375 in. o/a lg excl wire leads; Mfr 13499 part no. 553-1766-003	5-39
W302	CABLE ASSEMBLY, RADIO FREQUENCY: Terminated one end w/connector 12.250 in. o/a lg; Mfr 13499 part no. 553-1765-002	5-39
W303	CABLE ASSEMBLY, RADIO FREQUENCY: Terminated one end w/connector 5.812 in. o/a lg; Mfr 13499 part no. 553-1763-002	5-39
W304	CABLE ASSEMBLY, RADIO FREQUENCY: Terminated one end w/connector 7.437 in. o/a lg; Mfr 13499 part no. 533-1764-002	5-39
XV301	SOCKET, ELECTRON TUBE: 7 contact miniature; two 0.125 in. dia mtg holes spaced 0.875 in. c to c; Mfr 13499 part no. 220-1273-00	5-39
XV302	SOCKET; ELECTRON TUBE: Same as XV301	5-39
XV303	SOCKET; ELECTRON TUBE: Same as XV301	5-39
XV304	SOCKET; ELECTRON TUBE: Same as XV301	5-39
XV305	SOCKET; ELECTRON TUBE: Phosphor bronze, silver plated; Mfr 13499 part no. 220-1359-00	5-39
Y301	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U17-00000 MHz	5-42
Y302	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U18-00000 MHz	5-42
Y303	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U19-00000 MHz	5-42
Y304	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U20-00000 MHz	5-42
Y305	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U21-00000 MHz	5-42

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FIRST IF AMPLIFIER ASSEMBLY (Continued)		
Y306	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U22-00000 MHz	5-42
Y307	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U23-00000 MHz	5-42
Y308	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U24-00000 MHz	5-42
Y309	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U25-00000 MHz	5-42
Y310	CRYSTAL UNIT, QUARTZ: MIL-C-3098 type CR55U26-00000 MHz	5-42
Z301	COIL ASSEMBLY: 0.437 in. by 0.912 in. by 1.500 in. o/a dim., excl wire leads; Mfr 13499 part no. 553-1702-004 C/O C302 & L301	5-39
Z302	COIL ASSEMBLY: Same as Z301 C/O C304 & L302	5-39
Z303	COIL ASSEMBLY: 0.437 in. by 0.912 in. by 1.500 in. o/a dim. excl wire leads; Mfr 13499 part no. 553-1700-004 C/O C306, C307, & L303	5-39
Z304	COIL ASSEMBLY: Same as Z303 C/O C309, C310 & L304	5-39
Z305	COIL ASSEMBLY: Same as Z303 C/O C313, L305, & C312	5-39
Z306	COIL ASSEMBLY: Same as Z301 C/O C317 & L306	5-39
Z307	COIL ASSEMBLY: 0.437 in. by 0.912 in. by 1.500 in. o/a dim. excl wire leads; Mfr 13499 part no. 553-1693-003 C/O C340 & L310	5-39
RT-581A/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9A ONLY)		
1A1A5 (401-499)	FINAL ASSEMBLY: 2nd IF AMPLIFIER: Mfr 03565 Part no. D-6239	5-44
C401	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 200 uuf ±20%, 500 vdc, Mfr 71590 part no. DA933-048 P/O Z401	5-44
C402	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM05FD111G03 P/O Z401	5-44
C403	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 6.8 uuf ±5%, 500 vdc; Mfr 78488 part no. GA6-8UUFPORM5PCT	5-44
C404	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C401, P/O Z402	5-44
C405	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM05FD161G03 P/O Z402	5-44
C406	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1,000 uuf -0% +100%, 500 vdc; Mfr 72982 part no. 2465-009W5T0102P	5-45
C407	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C403	5-44
C408	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C401, P/O Z403	5-44
C409	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM05FD131G03 P/O Z403	5-44
C410	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM06FD511G03	5-45
C411	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 100 uuf ±2%, 500 vdc at 85°C, 400 vdc at 100°C, 250 vdc at 125°C; Mfr 72982 part no. 338026T2H0101G	5-45
C412	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CC22H150G	5-45
C413	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 82 uuf ±2%, 500 vdc at 85°C, 400 vdc at 100°C, 250vdc at 125°C; Mfr 72982 part no. 338026U2J0820G	5-45

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG. NO.
RT-581A/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9A ONLY) (Continued)		
C414	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 2000 uuf - 20% +100%, 350 vdc; Mfr 72982 part no. 2467001W5T0202Z	5-45
C415	NOT USED	
C416	CAPACITOR, FIXED, MICA DIELECTRIC: 1000 uuf ±20%, 500 vdc, MIL type CB11PE102M	5-45
C417	CAPACITOR, FIXED CERAMIC DIELECTRIC: Same as C411	5-45
C418	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C416	5-45
FL401	FILTER, RADIO INTERFERENCE: 500 vdc, 5 amps; metal case; 2 feed thru type terminals; 21/32 in. lg, 21/64 in. dia o/a excluding wire leads; Mfr 01121 part no. FISA	5-44
FL402	FILTER, RADIO INTERFERENCE: Same as FL401	5-44
FL403	FILTER, RADIO INTERFERENCE: Same as FL401	5-45
FL404	FILTER, RADIO INTERFERENCE: Same as FL401	5-45
H401	SCREW, MACHINE: Cres; phillips pan head; 6-32NC-2A thd, 1/2 in. lg; Mfr 13499 part no. 553-1664-002	5-46
H402	SCREW: Cres; phillips fillister head; 6-32NC-2A thd, 1-9/16 in. lg; Mfr 13499 part no. 553-1824-002	5-44
H403	WASHER, FLAT: Brass; 0.125 in. id, 0.1875 in. od, 0.010 in. thk; Mfr 13499 part no. 553-1784-002	5-44
H404	WASHER, FLAT: Cres; 0.125 in. id, 0.250 in.od, 0.031 in. thk; Mfr. 13499 part no. 553-1785-002	5-44
J401	CONNECTOR, RECEPTACLE, ELECTRICAL: 850 v rms peak voltage; 70 ohms impedance; low loss plastic dielectric; 5/8 in. lg; Mfr 94375 part no. R700	5-44
J402	JACK, TIP: For use with 0.080 in. dia plug tip; 5.5 amps; Mfr 98291 part no. SKT10RED	5-44
J403	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J401	5-44
J404	JACK, TIP: For use with 0.080 diameter plug tip; part no. SKT10YELLOW Mfr 98291	5-44
K401	RELAY, ARMATURE: 1C, 30 UA at 50 mv dry circuit, 1C, 10 MA at 125 vdc resistive; 26.5 vdc nom coil, 552 ohms ±10% -20% at +25°C; continuous duty; hermetically sealed; Mfr 01526 part no. 3S2791G200A16C	5-44
K402	RELAY, ARMATURE: MIL type M5757/9-005	5-45
L401	COIL ASSEMBLY: 23 turns of no. 34 AWG wire; 0.406 in. by 0.906 in. by 1.500 in. o/a dim.; Mfr 13499 part no. 553-1970-002 P/O Z401	5-44
L402	COIL ASSEMBLY: 19 turns of no. 32 AWG wire; 0.250 in. w. across flats by 1.186 in. lg o/a dim.; excl terminals; Mfr 13499 part no. 553-1789-002 P/O Z401	5-44
L403	COIL ASSEMBLY: Same as L401 P/O Z402	5-44
L404	COIL ASSEMBLY: Same as L402 P/O Z402	5-44
L405	COIL ASSEMBLY: Same as L401 P/O Z403	5-44
L406	COIL ASSEMBLY: Same as L402 P/O Z403	5-44
L407	COIL, RADIO FREQUENCY: 3 universal wound pi sections, 225 turns ea section; 2.0 uh inductance, 35 ma current; Mfr 99800 part no. BP123	5-45

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581A/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9A ONLY) (Continued)	
L408	COIL, RADIO FREQUENCY: Single layer wound, 46 turns #25 AWG wire; 6.5 uh nominal inductance, 0.05 ohms dc resistance, 1.5 amps current rating; Mfr 99800 part no. BP868	5-45
0401	CORE ASSEMBLY: 0.200 in. dia by 1.942 in lg o/a dim., Mfr 13499 part no. 553-1778-002 U/W L401, L403, L405	5-45
0402	RETAINER, CRYSTAL HOLDER: Copper; 0.125 in. by 0.735 in. by 1.687 in. o/a dim.; Mfr 13499 part no. 553-1781-002	5-45
0403	SPRING, HELICAL, EXTENSION: Cres; 24, 0.020 in. dia wire coils, 0.167 in. dia, 0.790 in. lg; Mfr 13499 part no. 553-1691-002	5-44 5-44
0404	CAM FOLLOW, NEEDLE BEARING: 0.406 in. by 1.425 in. by 2.499 in. o/a dim.; Mfr 03565 part no. B-6181	5-45
0405	COUPLING ASSEMBLY: 0.875 in. dia by 0.483 in. lg o/a dim.; Mfr 13499 part no. 553-1724-002	5-45
0406	SHAFT ASSEMBLY: Brass cam, cres; shaft; 2.094 in. lg o/a, Mfr 13499 part no. 553-1812-003	5-45
0407	SPRING: Copper; 0.156 in. by 0.511 in. by 0.718 in. o/a dim.; Mfr 13499 part no. 553-1650-002	5-44
P401	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 male contacts; 5 amps; 7/16 in. dia, 13/32 in. lg; Mfr 80586 part no. GM11M79	5-44
R401	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF563K	5-45
R402	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF104K	5-45
R403	RESISTOR, FIXED, COMPOSITION: Same as R402	5-45
R404	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF221K	5-45
R405	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF103K	5-45
R406	RESISTOR, FIXED, COMPOSITION: Same as R402	5-45
R407	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF273K	5-45
R408	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF262J	5-45
R409	RESISTOR, FIXED, COMPOSITION: Same as R402	5-45
R410	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF823K	5-45
S401	SWITCH SECTION, ROTARY: 2 circuit, 2 pole, 12 position; Mfr 03565 part no. B-6241	5-45
S402	SWITCH SECTION, ROTARY: Same as S401	5-45
V401	ELECTRON TUBE: MIL-E-1 type 5670	5-44
W401	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL, BRANCHED: 8 conductors terminated one end w/connector; 5.075 in. lg o/a excl wire leads; Mfr 03565 part no. D-6206	5-44
XK401	SOCKET, RELAY: Copper base alloy contacts; silver plated; 8 contact position; 0.234 in. h, 0.291 in. w, 0.719 in. lg; Mfr 71785 part no. 54A20730	5-44
XV401	SOCKET, ELECTRON TUBE: Phosphor bronze, silver plated; Mfr 91662 part no. BRTL669SPHSPTC125	5-44
XY401	SOCKET, CRYSTAL: Copper base alloy contacts, silver plated; 20 contact position; 0.343 in. h, 1.5000 in. w, 1.725 in. lg; Mfr 03565 part no. B-6238	5-44
Y401	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-1	5-46
Y402	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-2	5-46

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9A ONLY) (Continued)		
Y403	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-3	5-46
Y404	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-4	5-46
Y405	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-5	5-46
Y406	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-6	5-46
Y407	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-7	5-46
Y408	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-8	5-46
Y409	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-9	5-46
Y410	CRYSTAL UNIT, QUARTZ: Mfr 03565 part no. B-6177-10	5-46
Z401	COIL ASSEMBLY: 0.468 in. by 0.718 in. by 1.875 in. o/a dim.; Mfr 13499 part no. 553-1793-003 C/O C401, C402, L401, L402, C414	
Z402	COIL ASSEMBLY: 0.937 in. by 0.406 in. by 1.812 in. o/a dim; Mfr 13499 part no. 553-1787-003 C/O C404, C405, L403, L404	
Z403	COIL ASSEMBLY: 0.468 in. by 0.718 in. by 1.875 in. o/a dim.; Mfr 13499 part no. 553-1848-004 C/O C408, C409, L405, L406	
RT-581/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY)		
1A1A5 (401-499)	FINAL ASSEMBLY - 2nd IF AMPLIFIER: Mfr 13499 part no. 553-1776-004	5-44
C401	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 200 uuf ±20%, 500 vdc, Mfr 71590 part no. DA933-048 P/O Z401	5-44
C402	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM05F111G03 P/O Z401	5-44
C403	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 6.8 uuf ±5%, 500 vdc; Mfr 78488 part no. GA6-8UUFPORM5PCT	5-44
C404	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C401 P/O Z402	5-44
C405	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM05FD161G03 P/O Z402	5-44
C406	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1,000 uuf -0%, +100% 500 vdc; Mfr 72982 part no. 2465-009W5T0102P	5-45
C407	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C403	5-44
C408	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C401 P/O Z403	5-44
C409	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM05F131G03 P/O Z403	5-44
C410	CAPACITOR, FIXED, MICA DIELECTRIC: 510 uuf ±2%, 300 vdc, Mfr 72136 part no. DM15F10G03	5-45
C411	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 100 uuf ±2%, 500 vdc at 85°C, 400 vdc at 100°C, 250 vdc at 125°C, Mfr 72982 part no. 338026T2H0101G	5-45
C412	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CC22CH150G	5-45
C413	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 82 uuf ±2%, 500 vdc at 85°C, 400 vdc at 100°C, 250 vdc at 125°C, Mfr 72982 part no. 338026U2J0820G	5-45
C414	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 2000 uuf -20% +100%, 350 vdc; Mfr 72982 part no. 2467001W5T02022	5-45
C415	NOT USED	

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
C416	CAPACITOR, FIXED, MICA DIELECTRIC: 1000 uuf ±20%, 500 vdc; Mfr 72982 part no. 650256A4102M	5-45
C417	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 100 uuf ±2%, 500 vdc at 85°C, 400 vdc at 100°C, 250 vdc at 25°C, Mfr 72982 part no. 338026T2H0101G	5-45
C418	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C416	5-45
FL401	FILTER, RADIO INTERFERENCE: 500 vdc, 5 amps; metal case; 2 feed thru type terminals; 21/32 in. lg, 21/64 in. dia o/a excluding wire leads; Mfr 01121, part no. FISA	5-44
FL402	FILTER, RADIO INTERFERENCE: Same as FL401	5-44
FL403	FILTER, RADIO INTERFERENCE: Same as FL401	5-45
FL404	FILTER, RADIO INTERFERENCE: Same as FL401	5-45
H401	SCREW, MACHINE, Cres; phillips pan head; 6-32NC-2A thd, 1/2 in. lg; Mfr 13499 part no. 553-1664-002	5-46
H402	SCREW: Cres; phillips fillister head; 6-32NC-2A thd, 1-9/16 in. lg; Mfr 13499 part no. 553-1824-002	5-44
H403	WASHER, FLAT: Brass; 0.125 in. id, 0.1875 in. od, 0.010 in. thk; Mfr 13499 part no. 553-1784-002	5-44
H404	WASHER, FLAT: Cres; 0.125 in. id, 0.250 in. od, 0.031 in. thk, Mfr 13499 part no. 553-1785-002	5-44
J401	CONNECTOR, RECEPTACLE, ELECTRICAL: 850 v rms peak voltage; 70 ohms impedance; low loss plastic dielectric; 5/8 in. lg; Mfr 94375 part no. R700	5-44
J402	JACK, TIP: For use with 0.080 in. dia plug tip; 5.5 amps; Mfr 98291 part no. SKT10RED	5-44
J403	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J401	5-44
J404	JACK, TIP: For use with 0.080 diameter plug tip; part no. SKT10 YELLOW, Mfr 98291	5-44
K401	RELAY, ARMATURE: 1C, 30 ua at 50 mv dry circuit, 1C, 10 ma at 125 vdc resistive; 26.5 vdc nom coil, 552 ohms ±10% - 20% at +25°C, continuous duty; hermetically sealed; Mfr 01526 part no. 3S2791G200A16C	5-44
L401	COIL ASSEMBLY: 23 turns of no. 34 AWG wire; 0.406 in. by 0.906 in. by 1.500 in. o/a dim.; Mfr 13499 part no. 553-1790-002 P/O Z401	5-44
L402	COIL ASSEMBLY: 19 turns of no. 32 AWG wire; 0.250 in. w across flats by 1.186 in. lg o/a dim., excl terminals; Mfr 13499 part no. 553-1789-002 P/O Z401	5-44
L403	COIL ASSEMBLY: Same as L401 P/O Z402	5-44
L404	COIL ASSEMBLY: Same as L402 P/O Z402	5-44
L405	COIL ASSEMBLY: Same as L401 P/O Z403	5-44
L406	COIL ASSEMBLY: Same as L402 P/O Z403	5-44
L407	COIL, RADIO FREQUENCY: 3 universal wound pi sections, 225 turns ea section; 2.0 uh inductance, 35 ma current; Mfr 99800 part no. BP123	5-45

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
L408	COIL, RADIO FREQUENCY: Single layer wound, 46 turns #25 AWG wire; 6.5 uh nominal inductance, 0.05 ohms dc resistance, 1.5 amps current rating; Mfr 99800 part no. BP868	5-45
0401	CORE ASSEMBLY: 0.200 in. dia by 1.942 in. lg o/a dim., Mfr 13499 part no. 553-1778-002 U/W L401, L403, L405	5-45
0402	SPRING: Copper; 0.125 in. by 0.735 in. by 1.687 in. o/a dim.; Mfr 13499 part no. 553-1781-002	5-45
0403	SPRING: HELICAL, EXTENSION: Cres; 24, 0.020 in. dia wire coils, 0.167 in. dia, 0.790 in. lg; Mfr 13499 part no. 553-1691-002	5-44
0404	TABLE ASSEMBLY, SHAFT: 0.406 in. by 1.425 in. by 2.499 in. o/a dim.; Mfr 13499 part no. 553-1809-002	5-45
0405	COUPLING ASSEMBLY: 0.875 in. dia by 0.483 in. lg o/a dim.; Mfr 13499 part no. 553-1724-002	5-45
0406	SHAFT ASSEMBLY: Brass cam, cres; shaft; 2.094 in. lg o/a, Mfr 13499 part no. 553-1812-003	5-45
0407	SPRING: Copper, 0.156 in. by 0.511 in. by 0.718 in. o/a dim.; Mfr 13499 part no. 553-1650-002	5-44
P401	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 male contacts; 5 amps; 7/16 in. dia, 13/32 in. lg; Mfr 80586 part no. GM11M79	5-44
R401	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF563K	5-45
R402	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF104K	5-45
R403	RESISTOR, FIXED, COMPOSITION: Same as R402	5-45
R404	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF221K	5-45
R405	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF103K	5-45
R406	RESISTOR, FIXED, COMPOSITION: Same as R402	5-45
R407	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF273K	5-45
R408	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF622J	5-45
R409	RESISTOR, FIXED, COMPOSITION: Same as R402	5-45
R410	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF823K	5-45
S401	SWITCH, SECTION ROTARY: 1 circuit, 1 pole, 12 position; 2 moving and 11 fixed contacts; Mfr 76854 part no. 217387FX	5-45
S402	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 12 position; 2 moving and 11 fixed contacts; Mfr 76854 part no. 218282FX	5-45
V401	ELECTRON TUBE: MIL-E-1 type 5670	5-44
W401	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL, BRANCHED: 6 conductors terminated one end w/connector; 5.075 in. lg o/a excl wire leads; Mfr 13499 part no. 553-1820-004	5-44
XK401	SOCKET, RELAY: Copper base alloy contacts; silver plated; 8 contact position; 0.234 in. h. 0.291 in. w, 0.719 in. lg; Mfr 71785 part no. 54A20730	5-44
XV401	SOCKET, ELECTRON TUBE: Phosphor bronze, silver plated; Mfr 91662 part no. BRTL669SPHSPTD125	5-44
XY401	SOCKET, CRYSTAL: Copper base alloy contacts, silver plated; 20 contact position; 0.343 in. h, 1.5000 in. w, 1.725 in. lg; Mfr 02660 part no. 33-819	5-44
Y401	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-000000 MHz	5-46

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, SECOND IF AMPLIFIER ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
Y402	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-100000 MHz	5-46
Y403	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-200000 MHz	5-46
Y404	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-300000 MHz	5-46
Y405	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-400000 MHz	5-46
Y406	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-500000 MHz	5-46
Y407	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-600000 MHz	5-46
Y408	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-700000 MHz	5-46
Y409	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-800000 MHz	5-46
Y410	CRYSTAL UNIT, QUARTZ: MIL-C-3098C type CR18AU3-900000 MHz	5-46
Z401	COIL ASSEMBLY: 0.468 in. by 0.718 in. by 1.875 in. o/a dim.; Mfr 13499 part no. 553-1793-003 C/O C401, C402, L401, L402	5-46
Z402	COIL ASSEMBLY: 0.937 in. by 0.406 in. by 1.812 in. o/a dim; Mfr 13499 part no. 553-1787-003 C/O C404, C405, L403, L404	5-46
Z403	COIL ASSEMBLY: 0.468 in. by 0.718 in. by 1.875 in. o/a dim; Mfr 13499 part no. 553-1848-004 C/O C408, C409, L405, L406	
RT-581( )/URC-9, THIRD IF AMPLIFIER ASSEMBLY		
1A1A6 (501-599)	THIRD IF AMPLIFIER: Mfr 03565 part no. C-6491	5-47
C501	NOT USED	
C502	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15CD101J03	5-49
C503	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C502	5-49
C504	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 0.02 uf -20% +100%, 500 vdc, Mfr 72982 part no. 841011W5V0203Z	5-48
C505	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C504	5-48
C506	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C504	5-49
C507	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C504	5-48
C508	NOT USED	
C509	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C504	5-48
C510	CAPACITOR, FIXED, PAPER DIELECTRIC: 0.1 uf ±20%, 300 vdc; Mfr 56289 part no. 186P10403S15	5-47
C511	NOT USED	
C512	NOT USED	
C513	NOT USED	
C514	CAPACITOR, FIXED, PAPER DIELECTRIC: 0.47 uf ±20%, 100 vdc; Mfr 56289 part no. 186P47401S15	5-47
C515	CAPACITOR, FIXED, PAPER DIELECTRIC: 220,000 uuf ±20%, 100 vdc, Mfr 56289 part no. 186P22401S15	5-47
C516	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C510	5-47
C517	CAPACITOR, FIXED, PAPER DIELECTRIC: MIL type CQ09A1KC333K3	5-48
C518	NOT USED	
C519	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C510	5-47
C520	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15CD470J03	5-49
C521	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15ED471G03	5-49

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, THIRD IF AMPLIFIER ASSEMBLY (Continued)		
C522	CAPACITOR, FIXED, PAPER DIELECTRIC: 0.033 uuf ±20%, 100 vdc; Mfr 14655 part no. TWU1S33-4P	5-49
C523	CAPACITOR, FIXED, PAPER DIELECTRIC: 0.10 uf ±20%, 100 vdc; Mfr 56289 part no. 86P10401S1	5-49
C524	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CL64BP1R7MPE	5-49
C525	NOT USED	
C526	CAPACITOR, FIXED, PAPER ELECTRIC: 0.33 ±20%, 100 vdc; Mfr 56289 part no. 86P33401T15	5-47
C527	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C510	5-47
C528	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C520	5-49
C529	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CSR13E106MP	5-48
C530	CAPACITOR, FIXED, MICA DIELECTRIC: Same as C502	5-48
CR501	SEMICONDUCTOR DEVICE, DIODE: MIL type IN658	5-48
CR502	NOT USED	
CR503	SEMICONDUCTOR DEVICE, DIODE: MIL type IN483B	5-48
CR504	SEMICONDUCTOR DEVICE, DIODE: MIL type IN485B	5-49
CR505	SEMICONDUCTOR DEVICE, DIODE: Same as CR504	5-48
H501	SCREW, MACHINE: Cres; phillips pan head; 6-32NC-2A thd, 1/2 in. lg; Mfr 13499 part no. 553-1664-002	5-47
H502	WASHER, FLAT: Cres; 0.127 in. id, 0.250 in. od, 0.033 in. thk; Mfr 13499 part no. 553-1854-002	5-49
H503	NUT, PLAIN, CLINCH: Cres; 6-32 thd; 0.250 in. dia by 0.281 in. lg o/a dim.; Mfr 13499 part no. 553-1671-002	5-48
J501	NOT USED	
J502	NOT USED	
J503	JACK, TIP: For use with 0.080 diameter plug tip; Mfr 98291 part no. SKT10ORANGE	5-47
J504	JACK, TIP: For use with 0.080 diameter plug tip; Mfr 98291 part no. SKT10YELLOW	5-47
J505	JACK, TIP: u/w 0.080 in. dia plug tip; 5.5 amps; Mfr 98291 part no. SKT10GREEN	5-47
J506	JACK, TIP: For u/w 0.080 in. dia plug tip; 5.5 amps; Mfr 98291 part no. SKT10BLUE	5-47
J507	NOT USED	
J508	JACK, TIP: For use with 0.080 diameter plug tip; 5.5 amps; Mfr 98291 part no. SKT10GRAY	5-47
L501	COIL, RADIO FREQUENCY: 500 MH non inductance, 48.3 ohms dc resistance, 82 ma current rating; Mfr 99800 part no. 2500-62	5-48
L502	COIL, RADIO FREQUENCY: Same as L501	5-48
L503	COIL, RADIO FREQUENCY: 2.0 mh nom inductance, 35 ma current rating, Mfr 13499 part no. 548-7661-002	5-49
0501	RING, CRES: Cres; 0.062 in. by 9.437 in. by 0.937 in. o/a dim.; Mfr 13499 part no. 553-1413-002	5-47
0502	SPRING, FAN: Copper. 0.156 in. by 0.511 in. by 0.718 in. o/a dim.; Mfr 13499 part no. 553-1650-002	5-47

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, THIRD IF AMPLIFIER ASSEMBLY (Continued)		
P501	CONNECTOR, RECEPTACLE, ELECTRICAL: 14 male contacts 5 amps, 300 vac, straight shape; Mfr 80586 part no. GM14M79 P/O W501	5-47
P502	CABLE ASSEMBLY, RADIO FREQUENCY: Stranded conductor, single shield, teflon jacket; 75 ohms impedance; terminated one end w/angle plug connector; 16.234 in. lg o/a; P/O W502; Mfr 98278 part no. 30-186-2	5-47
R501	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF104K	5-48
R502	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF271K	5-49
R503	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF222K	5-48
R504	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF183K	5-49
R505	RESISTOR, FIXED, COMPOSITION: Same as R501	5-48
R506	RESISTOR, FIXED, COMPOSITION: Same as R502	5-48
R507	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF473K	5-48
R508	RESISTOR, FIXED, COMPOSITION: Same as R504	5-48
R509	RESISTOR, FIXED, COMPOSITION: Same as R501	5-49
R510	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF181K	5-48
R511	RESISTOR, FIXED, COMPOSITION: Same as R507	5-49
R512	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF122K	5-49
R514	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF474K	5-48
R515	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF103J	5-48
R516	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF682J	5-48
R517	RESISTOR, FIXED, COMPOSITION: MIL type RC07GF133J	5-48
R518	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF243J	5-48
R519	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF474K	5-49
R520	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF564K	5-48
R525	RESISTOR, FIXED, COMPOSITION: Same as R514	5-49
R526	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF221K	5-49
R527	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF123K	5-49
R528	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF223K	5-48
R529	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF683K	5-49
R530	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF104K	5-49
R531	RESISTOR, FIXED, COMPOSITION: Same as R519	5-49
R532	RESISTOR, FIXED, COMPOSITION: Same as R501	5-49
R533	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF224K	5-49
R537	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF333K	5-48
R538	RESISTOR, FIXED, COMPOSITION: Same as R529	5-49
R539	RESISTOR, FIXED, COMPOSITION: Same as R501	5-49
R540	RESISTOR, FIXED, COMPOSITION: Same as R507	5-49
R541	RESISTOR, FIXED, COMPOSITION: Same as R519	5-48
T501	TRANSFORMER, INTERMEDIATE FREQUENCY: Glass tubing; 485KC-515 kHz frequency range; unshielded; 1.500 in. lg, 0.875 in. w, 0.875 in. h; two screw type terminals; Mfr 81815 part no. X144-1	5-47
V501	ELECTRON TUBE: MIL-E-1 type 5654	5-47
V502	ELECTRON TUBE: Same as V501	5-47
V503	ELECTRON TUBE: Same as V501	5-47
V504	ELECTRON TUBE: Same as V501	5-47

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, THIRD IF AMPLIFIER ASSEMBLY (Continued)		
W501	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: 11 conductors, terminated w/connector shield assy one end, other end stripped and tinned; Mfr 13499 part no. 549-3344-004	5-47
W502	CABLE ASSEMBLY, RADIO FREQUENCY: One end terminated w/connector; Mfr 13499 part no. 549-3372-002	5-17
XV501	SOCKET, ELECTRON TUBE: 7 contact miniature; two 0.125 in. dia mtg holes spaced 0.875 in. c to c; Mfr 80368 part no. V24-6034	5-47
XV502	SOCKET, ELECTRON TUBE: Same as XV501	5-47
XV503	SOCKET, ELECTRON TUBE: Same as XV501	5-47
XV504	SOCKET, ELECTRON TUBE: Same as XV501	5-47
RT-581( )/URC-9, RELAY-FILTER ASSEMBLY		
1A1A7 (601-699)	RELAY-FILTER: Mfr 13499 part no. 528-0255-005	5-52
C601	CAPACITOR, FIXED, PAPER DIELECTRIC: 1 uf ±20%, 600 vdc; Mfr 56289 part no. 118P10506T13	5-53
C602	CAPACITOR, FIXED, PAPER DIELECTRIC: MIL type CQ09A1KC473K3	5-53
C603	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CSR13E107MP	5-53
C604	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CL21BQ040SPE	5-54
C605	CAPACITOR, FIXED, ELECTROLYTIC: Same as C604	5-53
C606	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CL33BZR75LNG	5-53
C607	CAPACITOR, FIXED, ELECTROLYTIC: Same as C603	5-52
CR601	SEMICONDUCTOR DEVICE DIODE: MIL-S-19500/124 (SIG C) type IN2982B	5-53
H601	SCREW, MACHINE: Stainless steel, passivate finish; 8-32NC-2A thd, 5/8 in. lg; Mfr 13499 part no. 553-1847-002	5-53
H602	STUD, TERMINAL, INSULATED: 6 in. lg; 1/4 in. hex base with 6-32 threaded hole; diallyl phthalate or similar insulation	5-53
J601	JACK, TIP: For use on 0.080 diameter male contacts; 5.5 amps; Mfr 98291 part no. SKT5BCBROWN	5-15
K601	RELAY, ARMATURE: 2C, 2 amps at 28 vdc, or 120 vac resistive; 35 ma at 125°C coil current; 200 ohms ±10% at +125°C coil resistance; continuous duty cycle; hermetically sealed; Mfr 78277 part no. 95263	5-52
K602	RELAY, ARMATURE: 6C contact; 28 vdc; 1 amp resistive; 1 inductive winding; 200 ohms dc coil resistance; hermetically sealed; air arc quenching; Mfr 99699 part no. 26SJ18SD	5-53
K603	RELAY, ARMATURE: 4PDT; 2 amps at 28 vdc resistive circuit; 26.5 vdc coil voltage; 500 ±10% ohms at 25°C coil resistance; continuous duty cycle, micro-miniature; hermetically sealed; Mfr 01526 part no. 3SAH1072	5-52
P601	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM20M79	5-54
P602	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as P601	5-54
R601	RESISTOR, FIXED, WIREWOUND: MIL type RW31V632	5-54

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, RELAY-FILTER ASSEMBLY (Continued)		
R602	RESISTOR, VARIABLE: 2500 ohms ±10%, 12.5w; Mfr 44655 part no. E2500S1	5-52
R603	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RW30V252	5-54
R604	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF102K	5-54
R605	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF621J	5-53
R606	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RW30V122	5-54
R607	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF273K	5-54
R608	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA102B	5-52
R609	RESISTOR, VARIABLE, COMPOSITION: Same as R608	5-15
R610	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF102K	5-54
R611	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF221K	5-52
R612	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RW69V820	5-53
R613	NOT USED	
R614	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF121K	5-52
R615	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF822K	5-53
R616	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF103K	5-54
R617	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF474K	5-54
R618	RESISTOR, FIXED, COMPOSITION: Same as R617	5-53
R619	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF101K	5-53
R620	RESISTOR, FIXED, COMPOSITION: Same as R611	5-52
RV601	RESISTOR, VOLTAGE SENSITIVE: Silicon carbide body; 48 vdc nom; 42 to 56 vdc range; 7/8 in. dia. by 1/4 in. w; 2 wire leads, 1-1/2 in. lg; Mfr 04773 part no. RY57	5-53
RV602	RESISTOR, VOLTAGE, SENSITIVE: Zero ohms at 120 vdc, 5000 ohms at 80 vdc, 75,000 ohms at 40 vdc, 290,000 ohms at 25 vdc; 0.250 in. h, 0.875 in. w, 2.375 in. lg; Mfr 04773 part no. RY56	5-52
T601	TRANSFORMER, AUDIO FREQUENCY: 82 ohms, 50 ma ±10% primary; 1200 ohms secondary; 300 cps to 5000 cps frequency response; continuous duty cycle; Mfr 97965 part no. 31487	5-53
RT-581A/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9A ONLY)		
1A1A8 (701-799)	FRONT PANEL ASSEMBLY: Mfr 03565 part no. D-6218	5-63
C701	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CK14BX223M	5-64
C702	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CSR09G274KP	5-64
C703	CAPACITOR, FIXED, ELECTROLYTIC: Same as C702	5-64
C704	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 0.02 uf -20%, +100%, 500 vdc; Mfr 72982 part no. 841011W5V0203A	5-64
CR701	SEMICONDUCTOR, DIODE: MIL type IN4002	5-64
CR702	SEMICONDUCTOR, DIODE: Same as CR701	5-64
DS701	LAMP, INCANDESCENT: MIL-L-6363 type MS25237-327	5-63
DS702	LAMP, INCANDESCENT: Same as DS701	5-63
DS703	LAMP, INCANDESCENT: Same as DS701	5-63
FL701	FILTER, ASSEMBLY: 0.375 in. dia by 1.015 in. lg excl terminal; Mfr 13499 part no. 553-2124-003	5-64
FL702	FILTER, ASSEMBLY: Same as FL701	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9A ONLY) (Continued)		
FL703	FILTER, ASSEMBLY: Same as FL701	5-64
FL704	FILTER, ASSEMBLY: Same as FL701	5-64
FL705	FILTER, ASSEMBLY: Same as FL701	5-64
H701	WASHER, FLAT: Cres; 0.515 in. id, 0.828 in. od, 0.031 in. thk; Mfr 13499 part no. 553-2115-002	5-63
H702	WASHER, LOCK: Mfr 78189 part no. 1724-02	5-63
H703	NUT, PLAIN, ROUND: Cres; 0.687 in. dia by 0.125 in. thk; 1/2 - 32 thd; Mfr 13499 part no. 553-2119-002	5-63
H704	WASHER, LOCK: Mfr 78189 part no. 1220-02	5-64
H705	NUT, PLAIN, ROUND: Cres; 0.562 in. dia by 0.125 in. thk; Mfr 13499 part no. 553-2079-002	5-64
H706	SCREW, SELF-LOCKING: Stainless steel, chemical black finish; slotted head; 6-32NC-2A thd, 5/16 in. lg; Mfr 02615 part no. M36CR632-5BO	5-63
H707	WASHER, LOCK: Stainless steel, passivate finish; internal teeth; 0.659 in. id, 0.883 in. od, 0.022 in. thk; Mfr 78189 part no. 1728-02	5-63
H708	NUT, PLAIN, ROUND: Cres; 0.843 in. dia by 0.125 in. thk; 5/8 - 24 thd; Mfr 13499 part no. 553-2113-002	5-63
H709	POST: Cres; 1/4 in. h head; 4-40 thd, 0.258 in. lg; 23/32 in. lg o/a; Mfr 13499 part no. 593-4471-002	5-64
H710	STUD, CONTINUOUS THREAD: Stainless steel; 6-32NC-2 thd. 7/16 in. lg o/a; Mfr 13499 part no. 312-0074-00	5-64
H711	POST: Aluminum, chromate dip; open end type; hex. head; 6-32NC-2B thd, 0.922 in. lg; Mfr 13499 part no. 015-0552-00	5-64
H712	INSULATOR, WASHER: Mica; rd, flat, 0.4375 in. dia, 0.007 in. to 0.025 in. thk; 13/64 in. dia hole; Mfr 13499 part no. 302-0087-00	5-64
H713	WASHER, FLAT: Stainless steel, passivate finish; 0.0312 in. thk, 0.147 in. id, 0.437 in. od; Mfr 13499 part no. 310-0447-00	5-64
H714	WASHER, LOCK: Stainless steel, 0.267 in. id, 0.408 in. od, 0.018 in. thk; Mfr 78189 part no. 1714-05PLAIN	5-64
H715	NUT, PLAIN, ROUND: Cres; 0.437 in. dia by 0.125 in. thk; 1/4 - 32 thd; Mfr 13499 part no. 553-2116-002	5-64
H716	WASHER, LOCK: Stainless steel, cadmium plated; .018 in. thk; 0.267 in. id, 0.408 in. od; Mfr 78189 part no. 1214-05	5-63
H717	SCREW, MACHINE: Stainless steel, passivate finish; phillips recessed pan head; 3-48NC-2A thd, 7/16 in. lg; Mfr 13499 part no. 343-2717-00	5-64
H718	SETSCREW: Stainless steel, plain finish; multiple spline oval point; 4-40UNC-3A thd, 1/4 in. lg; Mfr 08664 part no. 4-40X1-4 6SPINEOVPT18-8SST	5-63
H719	WASHER, THRUST: Aluminum alloy; 0.437 in. id, 0.740 in. od, 0.0280 in. thk; Mfr 13499 part no. 553-2111-002	5-64
H720	WASHER, THRUST: Aluminum alloy; 0.812 in. id, 1.240 in. id, 0.280 in. thk; Mfr 13499 part no. 553-2112-002	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9A ONLY) (Continued)		
H721	NUT: Cres; 1/2 in. w across flat by 1-9/16 in. lg; 1/4-20 internal thd, 0.437 in. deep; Mfr 13499 part no. 593-4473-002	5-63
H722	POST: Cres; 1/4 in. w across flats by 0.266 in. h head; 6-32 thd, 0.421 in. lg o/a; Mfr 13499 part no. 553-2117-002	5-64
H723	NUT: Cres; 0.500 in. dia by 0.125 in. thk; 1/4 - 20 thd; Mfr 13499 part no. 548-8957-002	5-63
H724	SCREW: Cres; 0.406 in. dia by 0.218 in. h fillister head; 1/4 - 20 thd, 15/32 in. lg; 1.468 in. lg o/a; Mfr 13499 part no. 553-2114-002	5-63
H725	WASHER, STAINLESS steel, passivate finish; 0.250 in. thk; Mfr 13499 part no. 506-5173-002	5-63
H726	NOT USED	
H727	SCREW, MACHINE: Stainless steel, passivate finish; 4-40NC-2A thd, 9/16 in. lg; Mfr 13499 part no. 343-0282-00	5-63
H728	POST: 3/16 in. w across flats by 0.453 in. h head; 4-40 thd, 0.187 in. lg; 41/64 in. lg o/a; Mfr 13499 part no. 553-2123-002	5-64
H729	NUT, SELF-LOCKING, HEXAGON: Aluminum; 4-40UNC-3B thd, 0.190 in. hex., 0.110 in. h; Mfr 72962 part no. 68-1660-40	5-64
H730	WASHER, LOCK: Stainless steel, passivate finish; split helical ring; 0.397 in. od, 0.3125 in. screw size, 0.031 in. thk material; Mfr 13499 part no. 310-0421-00	5-64
H731	NUT: Brass, bright alloy; 0.281 in. id, 0.385 in. od, 0.156 in. thk; Mfr 13499 part no. 544-5050-002	5-64
H732	WASHER, SPRING TENSION: Phosphor bronze, cadmium plated; 0.203 in. id, 0.375 in. od, 0.0154 in. thk; 0.0625 in. h o/a; Mfr 13499 part no. 310-4780-00	5-63
H733	PIN, SPRING: MIL part no. MS16562-191	5-63
H734	SLEEVE, SPRING: Sleeve type, copper; 0.185 in. dia, for size 8 screw; Mfr 13499 part no. 340-0642-00	5-63
H735	WASHER: Cres; 0.187 in. id, 0.312 in. od, 0.020 in. thk; Mfr 13499 part no. 500-1099-003	5-63
H736	SCREW, MACHINE: Stainless steel, passivate finish; fillister head, slot drive; 8-32NC-2A thd, 9/16 in. lg; Mfr 13499 part no. 321-0388-00	5-63
J701	ADAPTER, CONNECTOR: Brass body, teflon insulation; two female contacts; 0.812 in. dia by 1.703 in. lg o/a dim; Mfr 94375 part no. 0991	5-63
J702A,B	JACK ASSEMBLY, TIP: Incl 2 tip jacks; 1.281 in. by 1.312 in. by 1.421 in.; Mfr 13499 part no. 593-4479-003	5-63
J703	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-5015D type MS3102R14S5S	5-63
J704	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J703	5-63
L701	REACTOR: Swinging inductance type; 0.3 hy to 0.15 hy, 0.020 amp, 25 ohms; 11/32 in. dia by 15/32 in. lg; Mfr 80223 part no. DOT28	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9A ONLY) (Continued)		
M701	METER, ARBITRARY SCALE: Dc panel type; 0 to 100 cw scale, 8 scale linear; scale marked "NORMAL" spaced 20° either side of center; 1 in.deep to mtg flange, 1.750 in. lg of flange, 1.750 in. w of flange, 1.510 in. dia body; Mfr 13499 part no. 476-0228-00	5-63
0701	GASKET: MIL-P-5516 type AN6227-5	5-63
0702	GASKET: MIL-P-5516 type AN6227-1	5-64
0703	GASKET: MIL-P-5516 type AN6227-10	5-63
0704	GASKET: MIL-P-5516 type AN6227-11	5-64
0705	GASKET: Synthetic rubber; 0.924 in. dia aperture, 1.130 in. od, 0.103 in. thk material; Mfr 86579 part no. 914-19-711-70	5-64
0706	GASKET: Synthetic rubber; 4.032 in. dia aperture, 4.282 in. od, 0.125 in. thk material; Mfr 13499 part no. 200-1572-00	5-63
0707	BRACKET: MOUNTING: Cres; 0.671 in. by 0.875 in. by 1-5/32 in.; black enamel finish; Mfr 13499 part no. 593-1404-002	5-63
0708	GASKET, JACK: Rubber; 1/32 in. by 1-5/16 in. by 1-11/32 in. o/a; Mfr 13499 part no. 593-4458-002	5-63
0709	GASKET CONNECTOR: Aluminum mesh cloth, neoprene impregnated; 0.020 in. by 1.187 in. by 1.187 in. o/a; Mfr 13499 part no. 593-4470-002	5-63
0710	LAMPHOLDER: Plastic; 5/16 in. by 11/16 in. by 23/32 in.; Mfr 13499 part no. 593-4463-002	5-64
0711	RING, RETAINING: Steel, cadmium or zinc plated; 0.938 in. id, 1.250 in. od, 0.015 in. thk; Mfr 79136 part no. 5005-125	5-64
0712	RING, RETAINING: Steel, cadmium or zinc plated; 0.500 in. id, 0.750 in. od, 0.015 in. thk; Mfr 79136 part no. 5005-75	5-64
0713	CAP, PROTECTIVE DUST AND MOISTURE SEAL: W/chain; 1-1/16 in. dia by 7/16 in. deep; 7/8-20 thd; Mfr 02660 part no. 9760-14	5-63
0714	KNOB: Aluminum body, black enamel finish; accommodates 0.150 in. dia shaft; 23/32 in. dia by 1.146 in. thk; Mfr 13499 part no. 593-4459-002	5-63
0715	KNOB: Aluminum alloy; 0.718 in. dia by 0.484 in. lg o/a dim.; Mfr 13499 part no. 593-4460-003	5-63
0716	KNOB: Aluminum alloy; 0.718 in. dia by 0.484 in. lg o/a dim; Mfr 13499 part no. 593-4461-003	5-63
0717	PIVOT DOOR: Cres; 5/16 in. dia by 23/64 in. lg o/a; Mfr 13499 part no. 593-1825-002	5-63
0718	PLATE, SWITCH: Brass, light gray enamel finish; 0.025 in. by 1-11/16 in. by 2-11/32 in.; Mfr 13499 part no. 593-4466-002	5-63
0719	PLATE, SQUELCH CONTROL: Brass, light gray enamel finish; 0.025 in. by 1-9/32 in. by 1-1/2 in. Mfr 13499 part no. 593-4468-002	5-63
0720	PLATE, CONTROL SWITCH: Brass, gray enamel finish; 0.025 in. by 2-5/8 in. by 7-15/32 in.; Mfr 03565 part no. C-6201	5-63
0721	BUSHING, EXTRACTOR: Beryllium copper; 0.875 in. by 1-1/8 in. by 2-5/8 in.; Mfr 13499 part no. 593-1429-003	5-63

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9A ONLY) (Continued)		
0722	DOOR, ACCESS: Aluminum door, 3/8 in. by 3.248 in. by 6.093 in.; incl. bracket, pivot and hardware; Mfr 13499 part no. 593-4486-003	5-63
P701	CONNECTOR, RECEPTACLE, ELECTRICAL: 26 male contacts; 5 amps; arc resistant plastic dielectric; Mfr 80586 part no. GM26M79 P/O W701	5-64
P702	CONNECTOR, RECEPTACLE, ELECTRICAL: 41 male contacts; 5 amps; 7/16 in. dia, 2-5/8 in. lg; Mfr 80586 part no. GM41M79 P/O W702	5-64
P703	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM20M79	5-64
P704	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as P701 P/O W701	5-64
Q701	TRANSISTOR: MIL type 2N697	5-64
R701	NOT USED	
R702	RESISTOR, VARIABLE, COMPOSITION: 5,000 ohms ±20% 1/2 w; Mfr 71450 part no. KQ22582	5-64
R703	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF272K	5-64
R704	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B5113F	5-64
R705	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RW30G560	5-64
R706	RESISTOR, FIXED; 2.77 ohms ±1%, 2.5w; Mfr 44655 part no. 47682DET2-77	5-64
R707	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B1002F	5-64
R708	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B1004F	5-64
R709	RESISTOR, FIXED, FILM: MIL-R-10509 type RN70B1104F	5-64
R710	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF622J	5-64
R711	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B2153F	5-64
R712	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA102B	5-64
R713	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B7501F	5-64
R714	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B2051F	5-64
R715	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF392K	5-64
R716	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA253B	5-64
R717	RESISTOR, WIREWOUND POWER: 1500 ohms ±10%, 125 w; Mfr 13499 part no. 749-4626-00	5-64
R718	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF472K	5-64
R719	RESISTOR, FIXED, COMPOSITION: Same as R718	5-64
R720	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF102K	5-64
R721	RESISTOR, FIXED; MIL-R-11 type RC07GF681K	5-64
S701	SWITCH, ROTARY: 3 circuit, 3 pole, 12 position, 2 section, 3 moving and 26 fixed contacts; Mfr 76854 part no. 221782F3	5-64
S702	SWITCH, ROTARY: 6 circuit, 6 pole, 3 position, 3 section; 6 moving and 24 fixed contacts; Mfr 76854 part no. 221781A2	5-64
S703	P/O R702	5-64
S704	LIGHT INDICATOR: Anodized aluminum; 28 vdc; plastic lens, translucent amber; Mfr 05402 part no. L20028AMI	5-64
S705	SWITCH, ROTARY: 15 circuit, 15 pole, 21 position; Mfr 82104 part no. B50244-724LR3	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9A ONLY) (Continued)		
S706	SWITCH, ROTARY: 20 position; "nonpile-up" type, 2 moving contacts, 21 fixed contacts, 1 pole, 19 throws; 230 vac or vdc; 0.25 amp current rating; Mfr 76854 part no. 221783RK1	5-64
S707	SWITCH, ROTARY: 12 position; "nonpile-up" type, 2 moving contacts, 11 fixed contacts, 1 pole, 11 throws; 230 vac or vdc at 0.25 amp nom current rating; Mfr 76854 part no. 227658F1	5-64
S708	SWITCH, ROTARY: Mfr 03565 part no. C-6124	5-64
W701	WIRING HARNESS BRANCHED: C/O P701, P704, Mfr 13499 part no. 593-4494-00	5-64
W702	WIRING HARNESS BRANCHED: C/O P702, Mfr 13499 part no. 593-4495-00	5-64
W703	CABLE ASSEMBLY SPECIAL PURPOSE ELECTRICAL: 20 conductors terminated w/plug connector and shield assembly one end, other end stripped and tinned; C/O P703, Mfr 13499 part no. 593-4497-00	5-64
XDS701	LIGHT, INDICATOR: Accommodates a T-1-3/4 midget flange base lamp; Mfr 72914 part no. A8630-1C	5-63
XDS702	LIGHT, INDICATOR: Same as XDS701	5-63
XDS703	P/O S704	5-63
RT-581/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY)		
1A1A8 (701-799)	FRONT PANEL ASSEMBLY: Mfr 13499 part no. 593-4492-005	5-63
C701	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CK15AX223M	5-64
C702	CAPACITOR, FIXED, ELECTROLYTIC: 0.27 uf ±10% 35 vdc; Mfr 56289 part no. 150D274X9035A2	5-64
C703	CAPACITOR, FIXED, ELECTROLYTIC: Same as C702	5-64
C704	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 0.02 uf -20% +100%, 500 vdc; Mfr 72982 part no. 841011W5V0203Z	5-64
DS701	LAMP, INCANDESCENT: MIL-L-6363 type MS25237-327	5-63
DS702	LAMP, INCANDESCENT: Same as DS701	5-63
DS703	LAMP, INCANDESCENT: Same as DS701	5-63
FL701	FILTER, ASSEMBLY: 0.375 in. dia by 1.015 in. lg excl terminal; Mfr 13499 part no. 553-2124-003	5-64
FL702	FILTER, ASSEMBLY: Same as FL701	5-64
FL703	FILTER, ASSEMBLY: Same as FL701	5-64
FL704	FILTER, ASSEMBLY: Same as FL701	5-64
FL705	FILTER, ASSEMBLY: Same as FL701	5-64
H701	WASHER, FLAT: Cres; 0.515 in. id, 0.828 in. od, 0.031 in. thk; Mfr 13499 part no. 553-2115-002	5-63
H702	WASHER, LOCK: Mfr 78189 part no. 1724-02	5-63
H703	NUT, PLAIN, ROUND: Cres; 0.687 in. dia by 0.125 in. thk; Mfr 13499 part no. 553-2119-002	5-63
H704	WASHER, LOCK: Mfr 78189 part no. 1220-02	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
H705	NUT, PLAIN, ROUND: Cres; 0.562 in. dia. by 0.125 in. thk; Mfr 13499 part no. 553-2079-002	5-64
H706	SCREW, SELF-LOCKING: Stainless steel, chemical black finish; slotted head; 6-32NC-2A thd, 5/16 in. lg; Mfr 02615 part No. M36CR632-5B0	5-63
H707	WASHER, LOCK: Stainless steel, passivate finish; internal teeth; 0.659 in. id, 0.883 in. od, 0.022 in. thk; Mfr 78189 part no. 1728-02	5-63
H708	NUT, PLAIN, ROUND: Cres; 0.843 in. dia by 0.125 in. thk; 5/8 - 24 thd; Mfr 13499 part no. 553-2113-002	5-63
H709	SPACER: Cres; 1/4 in. h head; 4-40 thd, 0.258 in. lg; 23/32 in. lg o/a; Mfr 13499 part no. 593-4471-002	5-64
H710	STUD, CONTINUOUS THREAD: Stainless steel; 6-32NC-2 thd, 7/16 in. lg o/a; Mfr 13499 part no. 312-0074-00	5-64
H711	NUT, SLEEVE: Aluminum, chromate dip; open end type; hex. head; 6-32NC-2B thd, 0.922 in. lg; Mfr 13499 part no. 015-0552-00	5-64
H712	INSULATOR, WASHER: Mica; rd, flat, 0.4375 in. dia, 0.007 in. to 0.025 in. thk; 13/64 in. dia hole; Mfr 13499 part no. 302-0087-00	5-64
H713	WASHER, FLAT: Stainless steel, passivate finish; 0.0312 in thk, 0.147 in. id, 0.437 in. od; Mfr 13499 part no. 310-0447-00	5-64
H714	WASHER, LOCK: Stainless steel, 0.267 in. id, 0.408 in. od, 0.018 in. thk; Mfr 78189 part no. 1714-05PLAIN	5-64
H715	NUT, PLAIN, ROUND: Cres; 0.437 in. dia by 0.125 in. thk; 1/4 - 32 thd; Mfr 13499 part no. 553-2116-002	5-64
H716	WASHER, LOCK: Stainless steel, cadmium plated; .018 in thk; 0.267 in. id, 0.408 in. od; Mfr 78189 part no. 1214-05	5-63
H717	SCREW, MACHINE: Stainless steel, passivate finish; phillips recessed pan head; 3-48NC-2A thd, 7/16 in. lg; Mfr 13499 part no. 343-2717-00	5-64
H718	SETSCREW: Stainless steel, plain finish; multiple spline oval point; 4-40UNC-3A thd, 1/4 in lg; Mfr 08664 part no. 4-40X1-4 6SPINEOVPT18-8SST	5-63
H719	WASHER, THRUST: Aluminum alloy; 0.437 in. id, 0.740 in. od, 0.0280 in. thk; Mfr 13499 part no. 553-2111-002	5-64
H720	WASHER, THRUST: Aluminum alloy; 0.812 in. id, 1.240 in. od, 0.280 in. thk; Mfr 13499 part no. 553-2112-002	5-64
H721	NUT: Cres; 1/2 in. w across flat by 1-9/16 in. lg; 1/4-20 internal thd. 0.437 in deep; Mfr 13499 part no. 593-4473-002	5-63
H722	SPACER: Cres; 1/4 in. w across flats by 0.266 in. h head; 6-32 thd, 0.421 in. lg o/a; Mfr 13499 part no. 553-2117-002	5-64
H723	NUT; Cres; 0.500 in. dia by 0.125 in. thk; 1/4 - 20 thd; Mfr 13499 part no. 548-8957-002	5-63
H724	SCREW: Cres; 0.406 in. dia by 0.218 in h fillister head; 1/4 - 20 thd, 15/32 in. lg; 1.468 in. lg o/a; Mfr 13499 part no. 553-2114-002	5-63

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
H725	WASHER: Stainless steel, passivate finish; 0.250 in. thk; Mfr 13499 part no. 506-5173-002	5-63
H726	NOT USED	
H727	SCREW, MACHINE: Stainless steel, passivate finish; 4-40NC-2A thd, 9/16 in. lg; Mfr 13499 part no. 343-0282-00	5-63
H728	STANDOFF: 3/16 in. w across flats by 0.453 in. h head; 4-40 thd, 0.187 in. lg; 41/64 in. lg o/a; Mfr 13499 part no. 553-2123-002	5-64
H729	NUT, SELF-LOCKING, HEXAGON: Aluminum; 4-40UNC-3B thd, 0.190 in. hex., 0.110 in. h; Mfr 72962 part no. 68-1660-40	5-64
H730	WASHER, LOCK: Stainless steel, passivate finish; split helical ring; 0.397 in. od, 0.3125 in. screw size. 0.031 in. thk material; Mfr 13499 part no. 310-0421-00	5-64
H731	NUT: Brass, bright alloy; 0.281 in. id, 0.385 in. od, 0.156 in. thk; Mfr 13499 part no. 544-5050-002	5-64
H732	WASHER, SPRING TENSION: Phosphor bronze, cadmium plated; 0.203 in, id, 0.375 in. od, 0.0154 in. thk; 0.0625 in. h o/a; Mfr 13499 part no. 310-4780-00	5-63
H733	PIN, SPRING: MIL part no. MS16562-191	5-63
H734	SLEEVE, SPRING: Sleeve type, copper; 0.185 in. dia. for size 8 screw; Mfr 91314 part no. 340-0642-00	5-63
H735	WASHER: Cres; 0.187 in. id, 0.312 in. od, 0.020 in. thk; Mfr 13499 part no. 500-1099-003	5-63
H736	SCREW, MACHINE: Stainless steel, passivate finish; fillister head, slot drive; 8-32NC-2A thd, 9/16 in. lg; Mfr 13499 part no. 321-0388-00	5-63
J701	ADAPTER, CONNECTOR: Brass body, teflon insulation; two female contacts; 0.812 in. dia by 1.703 in. lg o/a dim; Mfr 94375 part no. 0991	5-63
J702A,B	JACK ASSEMBLY, TIP: Incl 2 tip jacks; 1.281 in. by 1.312 in. by 1.421 in.; Mfr 13499 part no. 593-4479-003	5-63
J703	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-5015D type MS3102R14S5S	5-63
J704	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J703	5-63
L701	REACTOR: Swinging inductance type; 0.3 hy to 0.15 hy, 0.020 amp, 25 ohms; 11/32 in. dia by 15/32 in. lg; Mfr 80223 part no. DOT28	5-64
M701	METER, ARBITRARY SCALE: Dc panel type; 0 to 100 cw scale, 8 scale linear; scale marked "NORMAL" spaced 20^{o} either side of center; 1 in. deep to mtg flange, 1.750 in. lg of flange, 1.750 in. w of flange, 1.510 in. dia body; Mfr 13499 part no. 476-0228-00	5-63
O701	GASKET: MIL-P-5516 type AN6227-5	5-63
O702	GASKET: MIL-P-5516 type AN6227-1	5-64
O703	GASKET: MIL-P-5516 type AN6227-10	5-63
O704	GASKET: MIL-P-5516 type AN6227-11	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
0705	GASKET: Synthetic rubber; 0.924 in. dia aperture, 1.130 in. od, 0.103 in. thk material; Mfr 86579 part no. 914-19-711-70	5-64
0706	GASKET: Synthetic rubber; 4.032 in. dia aperture, 4.282 in. od, 0.125 in. thk material; Mfr 13499 part no. 200-1572-00	5-63
0707	BRACKET, MOUNTING: Cres; 0.671 in. by 0.875 in. by 1-5/32 in.; black enamel finish; Mfr 13499 part no. 593-1404-002	5-63
0708	GASKET: JACK: Rubber; 1/32 in. by 1-5/16 in. by 1-11/32 in. o/a; Mfr 13499 part no. 593-4458-002	5-63
0709	GASKET CONNECTOR: Aluminum mesh cloth, neoprene impregnated; 0.020 in. by 1.187 in. by 1.187 in. o/a; Mfr 13499 part no. 593-4470-002	5-63
0710	KEY, LAMP: Plastic; 5/16 in. by 11/16 in. by 23/32 in.; Mfr 13499 part no. 593-4463-002	5-64
0711	RING, RETAINING: Steel, cadmium or zinc plated; 0.938 in. id, 1.250 in. od, 0.015 in. thk; Mfr 89462 part no. 5005-125	5-64
0712	RING, RETAINING: Steel, cadmium or zinc plated; 0.500 in. id, 0.750 in. od, 0.015 in. thk; Mfr 89462 part no. 5005-75	5-64
0713	CAP, PROTECTIVE DUST AND MOISTURE SEAL: W/chain; 1-1/16 in. dia by 7/16 in. deep; 7/8-20 thd; Mfr 02660 part no. 9760-14	5-63
0714	KNOB: Aluminum body, black enamel finish; accommodates 0.150 in. dia shaft; 23/32 in. dia by 1.146 in. thk; Mfr 13499 part no. 593-4459-002	5-63
0715	KNOB: Aluminum alloy; 0.718 in. dia by 0.484 in. lg o/a dim.; Mfr 13499 part no. 593-4460-003	5-63
0716	KNOB: Aluminum alloy; 0.718 in. dia by 0.484 in. lg o/a dim.; Mfr 13499 part no. 593-4461-003	5-63
0717	PIVOT DOOR: Cres; 5/16 in. dia by 23/64 in. lg o/a; Mfr 13499 part no. 593-1825-002	5-63
0718	PLATE, SWITCH: Brass, light gray enamel finish; 0.025 in. by 1-11/16 in. by 2-11/32 in.; Mfr 13499 part no. 593-4466-002	5-63
0719	PLATE, SQUELCH CONTROL: Brass, light gray enamel finish; 0.025 in. by 1-9/32 in. by 1-1/2 in. Mfr 13499 part no. 593-4468-002	5-63
0720	PLATE, CONTROL SWITCH: Brass, gray enamel finish; 0.025 in. by 2-5/8 in. by 7-15/32 in.; Mfr 13499 part no. 593-448-003	5-63
0721	BUSHING, EXTRACTOR: Beryllium copper; 0.875 in. by 1-1/8 in by 2-5/8 in.; Mfr 13499 part no. 593-1429-003	5-63
0722	DOOR, ACCESS: Aluminum door, 3/8 in. by 3.248 in. by 6.093 in.; incl bracket, pivot and hardware; Mfr 13499 part no. 593-4486-003	5-63
P701	CONNECTOR, RECEPTACLE, ELECTRICAL: 26 male contacts; 5 amps; arc resistant plastic dielectric; Mfr 80586 part no. GM26M79 P/O W701	5-64
P702	CONNECTOR, RECEPTACLE, ELECTRICAL: 41 male contacts; 5 amps; 7/16 in. dia 2-5/8 in. lg; Mfr 80586 part no. GM41M79 P/O W702	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
P703	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM20M79 P/O W703	5-64
P704	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as P701 P/O W701	5-64
Q701	TRANSISTOR: MIL type 2N697	5-64
R701	NOT USED	
R702	RESISTOR, VARIABLE, COMPOSITION: 5,000 ohms ±20%, 1/2 w; Mfr 71450 part no. KQ22582	5-64
R703	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF272K	5-64
R704	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B5113F	5-64
R705	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RW30G560	5-64
R706	RESISTOR, FIXED: 2.77 ohms ±1%, 2.5 w; Mfr 44655 part no. 47682DET2-77	5-64
R707	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B1002F	5-64
R708	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B1004F	5-64
R709	RESISTOR, FIXED, FILM: MIL-R-10509 type RN70B1104F	5-64
R710	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF622J	5-64
R711	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B2153F	5-64
R712	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA102B	5-64
R713	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B7501F	5-64
R714	RESISTOR, FIXED, FILM: MIL-R-10509 type RN65B2051F	5-64
R715	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF392K	5-64
R716	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA253B	5-64
R717	RESISTOR, WIREWOUND POWER: 1500 ohms ±10%, 12 5w; Mfr 13499 part no. 749-4626-00	5-64
R718	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF472K	5-64
R719	RESISTOR, FIXED, COMPOSITION: Same as R718	5-64
R720	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF102K	5-64
R721	RESISTOR, FIXED: MIL-R-11 type RC07GF681K	5-64
S701	SWITCH, ROTARY: 3 circuit, 3 pole, 12 position, 2 section, 3 moving and 26 fixed contacts; Mfr 76854 part no. 221782F3	5-64
S702	SWITCH, ROTARY: 6 circuit, 6 pole, 3 position, 3 section; 6 moving and 24 fixed contacts; Mfr 76854 part no. 221781A2	5-64
S703	P/O R702	
S704	LIGHT INDICATOR: Anodized aluminum; 28 vdc; plastic lens, translucent amber; Mfr 05402 part no. L20028AMI	5-64
S705	SWITCH, ROTARY: 15 circuit, 15 pole, 21 position; Mfr 82104 part no. B50244-724LR3	5-64
S706	SWITCH, ROTARY: 20 position; "nonpile-up" type, 2 moving contacts, 21 fixed contacts, 1 pole, 19 throws, 230 vac or vdc, 0.25 amp current rating; Mfr 76854 part no. 221783RK1	5-64
S707	SWITCH ROTARY: 12 position; "nonpile-up" type, 2 moving contacts, 11 fixed contacts, 1 pole, 11 throws; 230 vac or vdc at 0.25 amp nom current rating; Mfr 76854 part no. 227658F1	5-64
S708	SWITCH, ROTARY: Same as S707	5-64
W701	WIRING HARNESS BRANCHED: C/O P701, P704, Mfr 13499 part no. 593-4494-00	5-64

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FRONT PANEL ASSEMBLY (AN/URC-9, -9Y, -9AY ONLY) (Continued)		
W702	WIRING HARNESS BRANCHED: C/O P702, Mfr 13499 part no. 593-4495-00	5-64
W703	CABLE ASSEMBLY SPECIAL PURPOSE ELECTRICAL: 20 conductors terminated w/plug connector and shield assy. one end, other end stripped and tinned; C/O P703, Mfr 13499 part no. 593-4497-00	5-64
XDS701	LIGHT, INDICATOR: Accommodates a T-1-3/4 midget flange base lamp; Mfr 72914 part no. A8630-1C	5-63
XDS702	LIGHT, INDICATOR: Same as XDS701	5-63
XDS703	P/O S704	5-63
RT-581( )/URC-9, AUDIO AMPLIFIER AND MODULATOR ASSEMBLY		
1A1A9 (801-899)	AUDIO AMPLIFIER AND MODULATOR ASSEMBLY: Mfr 03565 part no. C6492	5-50
C801	CAPACITOR, FIXED, PAPER DIELECTRIC: 0.01 uf ±20% 100 vdc; Mfr 53021 part no. SDB1K01103M	5-51
C802	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 uuf -20% 500 vdc up to 85°C, 200 vdc at 125°C; Mfr 72982 part no. 301633W5T0102A	5-51
C803	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C801	5-51
C804	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C801	5-51
C805	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15ED511G03	5-50
C806	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965 type CL21BQ040SPE	5-51
C807	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965B type CL64BP1R7MPE	5-51
C808	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CL23BL1R5TNE	5-51
C809	CAPACITOR, FIXED, PAPER DIELECTRIC: MIL type CQ09A1KF223K3	5-51
C810	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C802	5-50
C811	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965B type CL64BK040TPE	5-51
C812	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965B type CL64BH080TPE	5-51
C813	CAPACITOR, FIXED, PAPER DIELECTRIC: 0.22 uf ±20%, 200 vdc; Mfr 56289 part no. 186P22402S15	5-50
C814	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C809	5-51
C815	CAPACITOR, FIXED, ELECTROLYTIC: Same as C812	5-51
C816	CAPACITOR, FIXED, ELECTROLYTIC: Same as C811	5-51
C817	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15ED511G03	5-51
C818	CAPACITOR, FIXED, MICA DIELECTRIC: MIL type CM15CD131G03	5-51
C819	CAPACITOR, TANTALUM ELECTROLYTIC: 0.2 mfd, 375w vdc, ±20% tol; Mfr 56289 part no. 110D204X8375D; with revised lead length	5-52
C820	CAPACITOR, FIXED, PAPER DIELECTRIC: 100 vdc, 0.033 uf, ±20%; Mfr 14655 part no. TWU1S33-4P	5-50
C821	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C802	5-51
C822	CAPACITOR, FIXED: MIL type CM05CD100K03	5-50
CR801	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N483B	5-51
CR802	SEMICONDUCTOR DEVICE, DIODE: Same as CR801	5-51
CR803	SEMICONDUCTOR DEVICE: MIL type 1N975B	5-51
CR804	SEMICONDUCTOR DEVICE: Same as CR801	5-51
CR805	SEMICOMDUCTOR DEVICE: Same as CR801	5-51

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581( )/URC-9, AUDIO AMPLIFIER AND MODULATOR ASSEMBLY (Continued)	
CR806	SEMICONDUCTOR DEVICE: MIL type 1N749A	5-51
CR807	SEMICONDUCTOR DEVICE: Same as CR801	5-51
CR808	SEMICONDUCTOR DEVICE: Same as CR806	5-51
H801	SCREW, MACHINE: Stainless steel, passivate finish; phillips cross recessed fillister head; 8-32NC-2A thd, 1 in. lg; Mfr 13499 part no. 553-2077-002	5-50
H802	SCREW, MACHINE: Steel, cadmium plated; phillips cross recessed fillister head; 8-32NC-2A thd 1-5/8 in. lg; Mfr 13499 part no. 553-2078-002	5-50
H803	SLEEVE, SPRING: Sleeve type, copper; 0.185 in. dia, for size 8 screw; Mfr 91314 part no. 340-0642-00	5-50
H804	RETAINER: Beryllium copper, bright alloy; 4 holes; 11/16 in. id, 13/16 in. od; Mfr 13499 part no. 553-2303-002	5-13
H805	NOT USED	
H806	NOT USED	
H807	NOT USED	
H808	STANDOFF: Aluminum chromate dip; 4-40 UNC-2B thd, 0.375 in. lg; 0.187 in. w across flats; Mfr 13499 part no. 540-9037-003	5-51
H809	STANDOFF: Same as H808	5-51
J801	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps, continuous duty; Mfr 98291 part no. SKT5BCBROWN	5-50
J802	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps, continuous duty; Mfr 98291 part no. SKT5BCRED	5-50
J803	JACK, TIP: For use with 0.080 diameter male contacts; teflon; 5.5 amps, continuous duty; Mfr 98291 part no. SKT5BCORANGE	5-13
J804	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps, continuous duty; Mfr 98291 part no. SKT5BCYELLOW	5-50
J805	JACK, TIP: For use with 0.080 diameter male contact; teflon; 5.5 amps, continuous duty; Mfr 98291 part no. SKT5BCGREEN	5-50
K801	RELAY, ARMATURE: 1A, 30 u amps at 50 milliwatts (low level RF) 1A, 2C, 150 vdc, 0.5 amps; 14,000 ohms ±10% at +25°C; continuous duty cycle; hermetically sealed; Mfr 71482 part no. RP7044G1	5-50
K802	RELAY, ARMATURE: 6C, 1 amp at 28 vdc or 115 vac, and/or low level; 26 vdc coil voltage; 200 ohms ±10% at +25°C; continuous duty cycle; Mfr 99699 part no. 26TD18SA	5-50
K803	RELAY, ARMATURE: MIL type M5757/10-141	5-50
P801	CONNECTOR, RECEPTACLE, ELECTRICAL: 41 male contacts, 5 amps; 7/16 in. dia, 2-5/8 in. lg; Mfr 80586 P/O W801 part no. GM41M79	5-50
R801	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF103K	5-51
R802	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF223K	5-51
R803	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF473K	5-51
R804	RESISTOR, VARIABLE: MIL-R-94 type RV6LAYSA105B	5-50
R805	RESISTOR, FIXED, COMPOSITION: MIL type RC07GF474K	5-50
R806	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF391K	5-51
R807	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF562J	5-50
R808	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF823J	5-50

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, AUDIO AMPLIFIER AND MODULATOR ASSEMBLY (Continued)		
R809	RESISTOR, FIXED, COMPOSITION: Same as R805	5-50
R810	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF474K	5-51
R811	RESISTOR, FIXED: MIL-R-11 type RC20GF561K	5-51
R812	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF153J	5-52
R813	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF205J	5-51
R814	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF273K	5-51
R815	NOT USED	
R816	RESISTOR, FIXED, COMPOSITION: Same as R802	5-51
R817	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF683K	5-50
R818	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF153K	5-51
R819	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA102B	5-50
R820	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF274K	5-51
R821	NOT USED	
R822	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF472K	5-50
R823	NOT USED	
R824	RESISTOR, FIXED, COMPOSITION: Same as R820	5-51
R825	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF224K	5-51
R826	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF621J	5-51
R827	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF821K	5-51
R828	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF104K	5-51
R829	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF124K	5-51
R830	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF683K	5-51
R831	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA254B	5-50
R832	RESISTOR, FIXED, COMPOSITION: Same as R827	5-51
R833	NOT USED	
R834	RESISTOR, FIXED, WIREWOUND: 2.77 ohms ±1%, 2.5 w; Mfr 44655 part no. 47682DET2-77	5-51
R835	NOT USED	
R836	NOT USED	
R837	NOT USED	
R838	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF183K	5-51
R839	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA253B	5-50
R840	RESISTOR, FIXED, COMPOSITION: Same as R802	5-51
R841	RESISTOR, FIXED, COMPOSITION: Same as R838	5-51
R842	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF393K	5-51
R843	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF100K	5-51
R844	RESISTOR, FIXED, COMPOSITION: Same as R843	5-51
R845	RESISTOR, FIXED, COMPOSITION: Same as R843	5-51
R846	RESISTOR, FIXED, COMPOSITION: Same as R843	5-51
R847	RESISTOR, FIXED, COMPOSITION: Same as R829	5-51
R848	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF511J	5-51
R849	RESISTOR, FIXED, COMPOSITION: Same as R848	5-51
R850	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF910J	5-51
R851	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF241J	5-51
R852	RESISTOR, FIXED, COMPOSITION: Same as R851	5-51
R853	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF561J	5-51

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, AUDIO AMPLIFIER AND MODULATOR ASSEMBLY (Continued)		
R854	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF311K	5-50
R855	RESISTOR, FIXED, COMPOSITION: Same as R843	5-50
R856	RESISTOR, FIXED, COMPOSITION: Same as R843	5-50
T801	TRANSFORMER, AUDIO FREQUENCY: Driver and interstage; 32,000 ohms at 8 ma input, 900 ohms center tapped, 0 to 5 ma, secondary; 1-7/32 in. by 1-7/32 in. by 2.125 in. o/a; Mfr 97965 part no. 21917	5-50
T802	TRANSFORMER, AUDIO FREQUENCY: Modulation and output; 29 w power level; 2-1/8 in. by 2-5/16 in. by 2-3/8 in. Mfr 97965 part no. 29396	5-50
TB801	TERMINAL BOARD: Plastic; 0.093 in. by 1 in. by 3-5/32 in.; incl 23 terminals; Mfr 13499 part no. 593-7924-003	5-51
TB802	TERMINAL BOARD: Mfr 13499 part no. 593-7926-003	5-51
V801	ELECTRON TUBE: MIL-E-1 type 5670	5-50
V802	ELECTRON TUBE: Same as V801	5-50
V803	ELECTRON TUBE: MIL-E-1 type 5654	5-50
V804	ELECTRON TUBE: Same as V801	5-50
V805	ELECTRON TUBE: MIL-E-1 type 7558	5-50
V806	ELECTRON TUBE: Same as V805	5-50
V807	ELECTRON TUBE: Same as V805	5-50
V808	ELECTRON TUBE: Same as V805	5-50
W801	WIRING HARNESS, BRANCHED: Mfr 13499 part no. 593-7908-00 C/O P801	5-50
XK801	SOCKET, ELECTRON: MIL-S-12883 type TS1405P01	5-50
XK802	NOT USED	
XK803	NOT USED	
XV801	SOCKET, ELECTRON TUBE: Phosphor bronze, silver plated, Mfr 00614 part no. BRTL669SPHSPT0125	5-50
XV802	SOCKET, ELECTRON TUBE: Same as XV801	5-50
XV803	SOCKET, ELECTRON TUBE: 7 contact miniature; two 0.125 in. dia mtg holes spaced 0.875 in. c to c; Mfr 80368 part no. V24-6034	5-50
XV804	SOCKET, ELECTRON TUBE: Same as XV801	5-50
XV805	SOCKET, ELECTRON TUBE: 9 pin contact, copper; phenolic insulation; 1.125 in. lg, 15/16 in. w; 13/32 in. h; Mfr 94991 part no. 7490-0203	5-50
XV806	SOCKET, ELECTRON TUBE: Same as XV805	5-50
XV807	SOCKET, ELECTRON TUBE: Same as XV805	5-50
XV808	SOCKET, ELECTRON TUBE: Same as XV805	5-50
RT-581( )/URC-9, FILTER ASSEMBLY		
1A1A10 (901-999, 1101-1199)	FILTER ASSEMBLY, ELECTRICAL: C/O 1 radio interference filter w/500 kHz freq, and one low pass filter w/220 to 420 MHz pass band; incl mtg plate and hardware; Mfr 13499 part no. 549-3371-003	5-12

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FILTER ASSEMBLY (Continued)		
FL901	FILTER, BANDPASS: 6 db at 10 kHz, 60 db at 150 kHz; 5.6 ohms source impedance; 100 k ohms load impedance; 0.812 in. by 1.012 in. by 3.187 in. o/a dim.; excl terminals; Mfr 81815 part no. X005-2 C/O J901 and J902	5-12
FL902	NOT USED	
H901	SCREW, MACHINE: Phillips recessed fillister head; cres, green enamel finish; 6-32 thd, 1/2 in. lg; Mfr 13499 part no. 553-1956-002	5-12
J901	P/O FL901	
J902	P/O FL901	
0901	PLATE ASSEMBLY: Aluminum plate, 0.687 in. by 1.039 in. by 4.351 in. approx., Mfr 13499 part no. 553-1952-002	5-12
FL1101	FILTER, LOW PASS: 50 ohms nom impedance, 220 to 420 MHz pass band; Mfr 70998 part no. 5259 c/o J1101 and P1101	5-12
J1101	P/O FL1101	
P1101	P/O FL1101	
RT-581( )/URC-9 FAN CENTRIFUGAL (Globe Industries, Division of TRW, Contract N00039-69-C-1553.)		
1A1A11 (1001-1099)	FAN, CENTRIFUGAL: Per MIL-B-23071/13	5-55
B1051	FAN, CENTRIFUGAL: Per MIL-B-23071/13, Mfr 25140 part no. 19A1906	5-55
	NOT SHIPBOARD REPAIRABLE	
RT-581( )/URC-9 FAN, CENTRIFUGAL (Collins Radio Contracts NObsr 87290 and 89509.)		
1001-1099	FAN, CENTRIFUGAL: ac; 115 v, 50/60 cps; w/double ended blower and speed increaser; 8000 rpm, w/connector; Mfr 13499 part no. 553-2422-004	5-57
B1051	FAN, CENTRIFUGAL: 115 vac ±10%, 50/60 cps; 8000 rpm impeller speed continuous duty cycle; Mfr 17771 part no. E1321-300	5-57
C1051	CAPACITOR: 17771 part no. 2-635948-01	5-57

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9 FAN, CENTRIFUGAL (Collins Radio Contracts NObsr 87290 and 89509.) (Continued)		
C1052	Same as C1051	5-57
01001	RING, CRESS:	5-57
01002	SPRING, FAN: Copper, 0.156 in. by 0.511 in. by 0.718 in. o/a dim.; Mfr 13499 part no. 553-1650-002	5-57
01003	IMPELLER, FAN, CENTRIFUGAL: Anodized aluminum, 4 blades; ccw rotation; 0.250 in. dia bore; Mfr 60399 part no. 0-327-4	5-57
01004	IMPELLER, FAN, CENTRIFUGAL: 2 section; steel, cadmium plated; double inlet; cw rotation; Mfr 60399 part no. 200D119	5-57
01005	COVER: Aluminum alloy, anodized finish; 3/16 in. by 3.190 in. by 3.217 in. approx; Mfr 13499 part no. 553-2133-003	5-57
01006	SCROLL: Aluminum; 2 in. by 3.062 in. by 3.062 in. by 3.298 in. approx; Mfr 13499 part no. 553-2134-004	5-57
01007	PLATE, ALUMINUM: Anodized finish; 0.531 in. by 3.156 in. by 3.312 in.; Mfr 13499 part no. 553-2135-003	5-57
01008	GUARD: Aluminum; 11/16 in. by 1.875 in. by 3.750 in.; Mfr 13499 part no. 553-2138-002	5-57
01052	SPEED INCREASER: Mechanical; 3300-8000 rpm; Mfr 13499	5-57
P1051	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 male contacts; 5 amps; 7/16 in. dia; 1-3/32 in. lg; Mfr 80586 part no. GM11M79	5-57
RT-581( )/URC-9 FAN, CENTRIFUGAL (Stewart-Warner Electronics Contract NObsr 91068 MCN 1 thru 185 only.)		
1001-1099	FAN, CENTRIFUGAL: dc; +26.5 v ±10%; 7000 rpm nominal; w/connector; Mfr 98738 part no. 59A217785	5-56A
B1051	FAN, CENTRIFUGAL: Same as above, less connector; Mfr 82877 part no. AO-60500	5-56A
	NOT SHIPBOARD REPAIRABLE	
RT-581( )/URC-9 FAN, CENTRIFUGAL (Stewart-Warner Electronics Contract 91068 MCN 168 and over.)		
1001-1099	FAN, CENTRIFUGAL: dc; +26.5 v, ±10%; 7000 rpm nominal; w/connectors; Mfr 98738 part no. 59A217792	5-56B

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, FAN, CENTRIFUGAL (Stewart-Warner Electronics Contract 91068 MCN 168 and over.) (Continued)		
B1051	FAN, CENTRIFUGAL: Same as above, less connector; Mfr 82877 part no. AO-60500	5-56B
	NOT SHIPBOARD REPAIRABLE	
RT-581( )/URC-9 FAN, CENTRIFUGAL (DuBrow Electronic Industries Contracts NObsr 91149, 91284, and 93164.)		
1001-1099	FAN, CENTRIFUGAL: ac; 115 v, 50/60 cps; w/double-ended blower; 8000 rpm w/connector; Mfr 89114 part no. 717-C021	5-58
B1051	FAN, CENTRIFUGAL: 115 vac; ±10%, 50/60 cps; 8000 rpm impeller continuous duty cycle; Mfr 89114 part no. 717-D9900	5-58
	NOT SHIPBOARD REPAIRABLE	
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9A ONLY)		
1A1A12 (1201-1299)	FREQUENCY SELECTOR, FINAL ASSEMBLY: Mfr 03565 part no. D-6220	5-79
A1201	PLATE, MOUNTING: Aluminum; 0.040 in. by 2.162 in. by 2.185 in.; Mfr 13499 part no. 553-1458-002	5-79
A1202	NOT USED	
A1203	PLATE ASSEMBLY, BEARING: Aluminum plate; 0.250 in. by 8.093 in. by 8-11/16 in. excl components Mfr 13499 part no. 553-1583-004	5-79
A1204	PLATE ASSEMBLY, GEAR: Aluminum plate; 59/64 in. by 4.124 in. by 4.405 in.; includes 2 gears; Mfr 13499 part no. 553-1575-002	5-79
A1205	PLATE, ASSEMBLY, BEARING: Aluminum plate; 0.125 in. by 5.625 in. by 8-21/32 in. excl components; Mfr 13499 part no. 553-1592-004	5-79
A1206	NOT USED	
A1207	BRACKET, MOUNTING: Cres; 0.374 in. by 0.984 in. by 1-1/32 in.; Mfr 13499 part no. 553-1455-002	5-79
A1208	BRACKET, MOUNTING: Same as A1207	5-79
A1209	BRACKET, MOUNTING: Same as A1207	5-79
A1210	NOT USED	
A1211	PLATE, MOUNTING: Aluminum; 0.125 in. by 0.821 in. by 1.092 in.; Mfr 13499 part no. 553-1456-002	5-79

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9 FREQUENCY SELECTOR ASSEMBLY (AN/URC-9A ONLY) (Continued)		
A1212	BRACKET ASSEMBLY: Aluminum bracket; Mfr 03565 part no. B-6225	5-79
A1213	BRACKET, MOUNTING: Cres; 0.374 in. by 0.984 in. by 1.032 in.; Mfr 13499 part no. 553-1462-002	5-79
A1214	SCALE, MEMORY DRUM: Aluminum; 1.218 in. by 1.352 in. by 5.314 in.; Mfr 03565 part no. D-6207	5-79
A1215	PLATE, MOUNTING: Cres; 0.025 in. by 0.436 in. by 2.748 in.; Mfr 13499 part no. 553-1424-002	5-79
A1216	PLATE, MOUNTING: Cres; 0.050 in. by 25/32 in. by 3.133 in.; Mfr 13499 part no. 553-1425-002	5-79
B1201	MOTOR, DIRECT CURRENT: 0.044 hp at 7400 rpm; 30 vdc max voltage; 6 sec on 24 sec off duty cycle; Mfr 13499 part no. 553-1465-002	5-79
H1201	ELECTROMAGNETIC ACTUATOR COIL: Mfr 03565 pt no. B-6192	5-79
H1202	WASHER, FLAT: Cres; 0.251 in. id, 0.4375 in. od, 0.0156 in. thk; Mfr 13499 part no. 553-1429-002	5-79
H1203	NUT, SELF-LOCKING, HEXAGON: Steel; 1/4-28 thd; 7/16 in. w across flats by 0.110 in. thk; Mfr 77122 part no. 14L28	5-79
H1204	WASHER, FLAT: Cres; 0.191 in. id, 0.375 in. od, 0.0156 in. thk; Mfr 13499 part no. 553-1431-002	5-79
H1205	BRACKET, ANGLE: Mfr 03565 part no. B-6191	5-79
H1206	POST, ELECTRICAL, MECHANICAL, EQUIPMENT: Aluminum alloy; 0.250 in. hex, 0.187 in. dia. 0.718 in. lg; Mfr 13499 part no. 553-1445-002	5-79
H1207	POST, ELECTRICAL, MECHANICAL, EQUIPMENT: Aluminum; 0.375 in. dia, 1.156 in. lg; Mfr 13499 part no. 553-1447-002	5-79
H1208	POST, ELECTRICAL, MECHANICAL, EQUIPMENT: Aluminum. 0.312 in. dia small end, 0.375 in. dia large end, 1.250 in. lg; Mfr 13499 part no. 553-1448-002	5-79
H1209	POST, ELECTRICAL, MECHANICAL, EQUIPMENT: Aluminum. 0.312 in. dia. 0.562 in. lg; Mfr 13499 part no. 553-1449-002	5-79
H1210	POST, ELECTRICAL, MECHANICAL, EQUIPMENT: Aluminum. 0.312 in. dia, 0.640 in. lg; Mfr 13499 part no. 553-1450-002	5-79
H1211	POST, ELECTRICAL, MECHANICAL, EQUIPMENT: Aluminum; 0.375 in. dia, 0.640 in. lg; Mfr 13499 part no. 553-1451-002	5-79
H1212	POST, ELECTRICAL, MECHANICAL, EQUIPMENT: Aluminum; 0.375 in. dia, 0.583 in. lg; Mfr 13499 part no. 553-1452-002	5-79
H1213	SWITCH ACTUATOR: Mfr 03565 part no. C-6223	5-79
H1214	NOT USED	
H1215	NOT USED	
H1216	SPACER, SLEEVE: Aluminum; 0.113 in. id, 0.187 in. od, 0.156 in. lg; Mfr 13499 part no. 553-1459-002	5-79
H1217	SPACER, SLEEVE: Aluminum; 0.113 in. id, 0.187 in. od, 0.281 in. lg; Mfr 13499 part no. 553-1460-002	5-79
H1218	SPACER, SLEEVE: Aluminum; 0.135 in. id, 0.255 in. od, 0.125 in. lg; Mfr 13499 part no. 502-1664-001	5-79

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9A ONLY) (Continued)		
H1219	WASHER, FLAT: Cres; 0.158 in. id, 0.375 in. od, 0.156 in. thk; Mfr 13499 part no. 553-1430-002	5-79
H1220	RING, RETAINING: MIL type MS16624-18	5-79
H1221	RING, RETAINING: MIL type MS16624-15	5-79
H1222	RING, RETAINING: Beryllium copper; external type; 0.225 in. id, 0.025 in. thk material; Mfr 89462 part no. 5100-25-C	5-79
H1223	RING, RETAINING: Copper, type "E"; 0.094 in. id, 0.015 in. thk; Mfr 89462 part no. 5133-12-C	5-79
H1224	RING, RETAINING: Copper, type "E"; 0.145 in. id, 0.025 in. thk; Mfr 89462 part no. 5133-18-C	5-79
H1225	RING, RETAINING: Copper, type "E"; 0.207 in. id, 0.025 in. thk; Mfr 89462 part no. 5133-25-C	5-79
H1226	RING, RETAINING: Steel, type "E"; 0.051 in. id, 0.010 in. thk; Mfr 89462 part no. 5133-6-C	5-79
H1227	NUT, PLAIN, HEXAGON: Cres; 5/16-24 thd; 0.500 in. w across flats; by 0.103 in. thk; Mfr 13499 part no. 334-0249-00	5-79
H1228 thru H1255	NOT USED	
H1256	POST, MOUNTING: Cres; 0.310 in. dia by 0.609 in. lg; Mfr 13499 part no. 553-1422-002	5-79
H1257 thru H1264	NOT USED	
H1265	SPACER, SLEEVE: Aluminum; 0.196 in. id, 0.250 in. od, 0.218 in. lg; Mfr 13499 part no. 553-1651-002	5-79
H1266	STUD, MOUNTING: Aluminum; 1/4 in. w across flats by 29/32 in. lg; 5-40 thd, 9/32 in. lg; Mfr 13499 part no. 533-1652-002	5-79
I1201	INDICATOR, FREQUENCY: 0.453 in. by 1.343 in. by 1.812 in. o/a dim.; Mfr 13499 part no. 553-1627-002	5-79
I1202	INDICATOR, FREQUENCY: 0.453 in. by 1.343 in. by 1.812 in. o/a dim.; Mfr 13499 part no. 553-1625-002	5-79
I1203	INDICATOR, FREQUENCY: Mfr 03565 part no. C-6196	5-79
I1204	INDICATOR, CHANNEL: 0.453 in. by 1.343 in. by 1.812 in. o/a dim.; Mfr 13499 part no. 553-1629-002	5-79
J1201	CONNECTOR, RECEPTACLE, ELECTRICAL: 41 female sockets; arc resistant plastic dielectric; 5 amps; Mfr 80586 part no. GM41F79	5-79
K1201	RELAY, ARMATURE: 1A, 32 vdc, 5 amps, 1 inductive winding, 20 ohms dc coil resistance; Mfr 04221 part no. 41-3889	5-79
K1202	RELAY, ARMATURE: Same as K1201	5-79
K1203	RELAY, ARMATURE: Same as K1201	5-79
K1204	RELAY, ARMATURE: 1C, 32 vdc, 5 amps; 1 inductive winding, 20 ohms dc coil resistance; Mfr 04221 part no. 41-3608	5-79
O1201	HOUSING: Cres; 0.314 in. dia by 0.449 in. lg; Mfr 13499 part no. 553-1427-002	5-79

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9A ONLY) (Continued)		
01202 thru 01204	HOUSING: Same as 01201	5-79
01205	WASHER, NONMETALLIC: Plastic; 0.859 in. id, 1.187 in. od, 0.070 in. thk; Mfr 13499 part no. 502-1164-002	5-79
01206 thru 01208	WASHER, NONMETALLIC: Same as 01205	5-79
01209	CLUTCH, FRICTION: Consists of 4 clutch linings, 1 clutch shoe, and 1 solder strip; 1.252 in. dia by 0.375 in. lg; Mfr 13499 part no. 502-1825-002	5-79
01210 thru 01212	CLUTCH, FRICTION: Same as 01209	5-79
01213	RING, RETAINING: Stainless steel; 0.320 in. id, 1.156 in. od, 0.0418 in, thk; Mfr 13499 part no. 502-7031-002	5-79
01214 thru 01224	RING, RETAINING: Same as 01213	5-79
01225	WASHER, SHOULDERED: Cres; 0.313 in. id, 0.843 in. od, 0.093 in. thk; Mfr 13499 part no. 553-1428-002	5-79
01226 thru 01228	WASHER, SHOULDERED: Same as 01225	5-79
01229	PAWL: Copper; 0.250 in. by 0.250 in. by 1.247 in.; Mfr 13499 part no. 503-5079-002	5-79
01230 thru 01232	PAWL: Same as 01229	5-79
01233	GEAR, SPUR: Bronze; 72 teeth; incl bearing; 1.541 in. dia by 0.326 in. lg; Mfr 13499 part no. 504-7200-002	5-79
01234 thru 01236	GEAR, SPUR: Same as 01233	5-79
01237	CLAMP, LOOP: Stainless steel; accommodates 0.312 in. dia material; Mfr 03565 part no. B-6276	5-79
01238 thru 01244	CLAMP, LOOP: Same as 01237	5-79
01245	CLAMP, LOOP: Same as 01237	5-79
01245.1	CLAMP, LOOP: Same as 01237	5-79
01245.2	CLAMP, LOOP: Same as 01237	5-79
01246	WASHER, FLAT: Cres; 0.3140 in. id, 0.8125 in. od, 0.062 in. thk; Mfr 13499 part no. 553-1420-002	5-79
01247	WASHER, FLAT: Same as 01246	5-79

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY: (AN/URC-9A ONLY) (Continued)		
01248	SPRING, HELICAL, COMPRESSION: Cres; 6.5 coils; 0.040 in. dia wire; 0.330 in. dia by 0.491 in. lg. o/a dim; Mfr 13499 part no. 553-1432-002	5-79
01249	NOT USED	
01250	SPRING: Cres; 0.928 in. dia by 0.271 in. lg o/a dim.; Mfr 13499 part no. 553-1435-002	5-79
01251	SPRING, HELICAL, TORSION: Cres; 2.75 coils; 30 to 40 oz. in. torque at 135°; 8.500 in. lg o/a; Mfr 13499 part no. 553-1436-002	5-79
01252	GEAR, SPUR: 36 teeth; 20° pressure angle; 48 diametral pitch; 0.790 in. dia by 0.187 in. lg o/a dim.; Mfr 13499 part no. 553-1467-002	5-79
01253	GEAR, SPUR: 30 teeth; 20° pressure angle; 48 diametral pitch; 0.666 in. dia by 0.368 in. lg o/a dim.; Mfr 13499 part no. 553-1437-002	5-79
01254	GEAR, SPUR: Bronze; 36 teeth; 0.812 in. dia by 0.365 in. lg o/a; 0.3125 in. dia bore; with bearing; Mfr 13499 part no. 553-1469-003	5-79
01255	GEAR, SPUR: 36 teeth; 20° pressure angle; 48 diametral pitch; 0.790 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 553-1472-002	5-79
01256	GEAR, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 0.250 in. lg o/a dim.; Mfr 13499 part no. 553-1470-002	5-79
01257	GEAR, SPUR: 36 teeth 20° pressure angle; 48 diametral pitch; Mfr 13499 part no. 553-1474-002	5-79
01258	GEAR, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 0.312 in. lg o/a dim.; Mfr 13499 part no. 553-1504-002	5-79
01259	GEAR, SPUR: 36 teeth; 20° pressure angle; 48 diametral pitch; 0.790 in. dia by 0.687 in. lg o/a dim.; Mfr 13499 part no. 553-1438-002	5-79
01260	GEAR, SPUR: 54 teeth; 20° pressure angle; 48 diametral pitch; 1.166 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 533-1476-002	5-79
01261	GEAR, SPUR: 96 teeth; 20° pressure angle; 48 diametral pitch; 2.040 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 553-1478-002	5-79
01262	SHAFT, SHOULDERED: Cres; 0.248 in. by 1.656 in. o/a dim.; Mfr 13499 part no. 553-1433-002	5-79
01263	GEAR, SPUR: 48 teeth; 20° pressure angle; 48 diametral pitch; 1.040 in. dia by 0.437 in. lg o/a dim.; Mfr 13499 part no. 553-1439-002	5-79
01264	NOT USED	
01265	GEAR, SPUR: 57 teeth; 20° pressure angle; 48 diametral pitch; 1.229 in. dia by 0.156 in. lg o/a dim.; Mfr 13499 part no. 553-1442-002	5-79

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY: (AN/URC-9A ONLY (Continued)		
01266	GEAR, SPUR: 57 teeth; 20° pressure angle; 48 diametral pitch; 1.229 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 553-1480-002	5-79
01267	GEAR, SPUR: 57 teeth; 20° pressure angle; 48 diametral pitch; 1.229 in. dia by 0.444 in. lg o/a dim.; Mfr 13499 part no. 553-1443-002	5-79
01268	GEAR, SPUR: 90 teeth; 20° pressure angle; 48 diametral pitch; 1.916 in. dia by 0.140 in. lg o/a dim.; Mfr 13499 part no. 553-1444-002	5-79
01269	SHAFT, STRAIGHT: Aluminum alloy; 0.187 in. dia by 1.593 in. lg o/a dim.; Mfr 13499 part no. 553-1446-002	5-79
01270	GEAR, SPUR: 86 teeth; 20° pressure angle; 48 diametral pitch; 1.854 in. dia by 0.140 in. lg o/a dim.; Mfr 13499 part no. 553-1453-002	5-79
01271	GEAR, SPUR: 86 teeth; 20° pressure angle; 48 diametral pitch; 1.854 in. dia by 0.344 in. lg o/a dim.; Mfr 13499 part no. 553-1454-002	5-79
01272	NOT USED	
01273	GEAR, SPUR: 76 teeth; 20° pressure angle; 48 diametral pitch; 1.625 in. dia by 0.187 in. lg o/a dim.; Mfr 13499 part no. 553-1461-002	5-79
01274	GEAR, SPUR: 60 teeth; 20° pressure angle; 48 diametral pitch; 1.291 in. dia by 0.370 in. lg o/a dim.; Mfr 13499 part no. 553-1482-002	5-79
01275	NOT USED	
01276	NOT USED	
01277	GEAR, SPUR: Mfr 13499 part no. 553-1484-003	5-79
01278	GEAR, SPUR: 29 teeth; 20° pressure angle; 48 diametral pitch; 0.645 in. dia by 0.370 in. lg o/a dim.; Mfr 13499 part no. 553-1487-002	5-79
01279	GEAR, SPUR: Same as 01278	5-79
01280 thru 01283	NOT USED	
01284	GEAR CLUSTER, SPUR: two complements of 18 and 68 teeth; 20° pressure angle for both gears; 48 diametral pitch for both gears; 1.458 in. dia by 0.281 in. lg o/a dim.; Mfr 13499 part no. 553-1489-002	5-79
01285	NOT USED	
01286	GEAR CLUSTER, SPUR: two complements of 18 and 68 teeth; 20° pressure angle for both gears; 48 and 64 diametral pitches; 1.093 in. dia by 0.245 in. lg o/a dim.; Mfr 13499 part no. 553-1492-002	5-79
01287	NOT USED	
01288	GEAR, SPUR: 57 teeth; 20° pressure angle; 64 diametral pitch; 9.928 in. dia by 0.178 in. lg o/a dim.; Mfr 13499 part no. 553-1495-002	5-79

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9A ONLY) (Continued)		
01289	GEAR CLUSTER, SPUR: Two complements of 42 and 84 teeth; 20° pressure angle for both gears; 48 diametral pitch for both gears; 1.791 in. dia by 0.432 in. lg o/a dim.; Mfr 13499 part no. 553-1497-002	5-79
01290	GEARSHAFT, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 0.843 in. lg o/a dim.; Mfr 13499 part no. 553-1501-002	5-79
01291	COUPLING HALF, POSITIVE: Cres; 1 in. dia by 0.343 in. lg; 0.1875 in. dia bore; Mfr 13499 part no. 553-1463-003	5-79
01292	COUPLING HALF, POSITIVE: Same as 01291	5-79
01293 thru 01295	COUPLING HALF, POSITIVE: Cres; 0.875 in. dia by 0.343 in. o/a 0.187 in. dia bore; Mfr 13499 part no. 553-1464-003	5-79
01296	GEARSHAFT, SPUR: 76 teeth; 20° pressure angle; 48 diametral pitch; 1.625 in. dia by 2.093 in. lg o/a dim.; Mfr 13499 part no. 553-1522-002	5-79
01297	GEAR AND CAM ASSEMBLY: 48 teeth; 20° pressure angle; 48 diametral pitch; 0.828 in. o/a lg; Mfr 13499 part no. 553-1525-002	5-79
01298	GEARSHAFT, SPUR: 80 teeth; 20° pressure angle; 64 diametral pitch; 1.281 in. dia by 2.031 in. lg o/a dim.; Mfr 13499 part no. 553-1528-002	5-79
01299	GEARSHAFT, SPUR: 40 teeth; 20° pressure angle; 64 diametral pitch; 1.125 in. dia by 3.031 in. lg o/a dim.; Mfr 13499 part no. 553-1532-002	5-79
01299.1	GEARSHAFT, SPUR: 80 teeth; 20° pressure angle; 64 diametral pitch; 1.281 in. dia by 1.750 in. lg o/a dim.; Mfr 13499 part no. 553-1536-002	5-79
01299.2	NOT USED	
01299.3	NOT USED	
01299.4	ARM ASSEMBLY: Cres cam; 0.531 in. by 1.437 in. by 2.295 in. o/a dim. approx; Mfr 13499 part no. 553-1544-003	5-79
01299.5	GEAR ASSEMBLY: Aluminum gear with 84 teeth, bronze gear with 21 teeth; 1.791 in. dia by 0.656 in. lg; Mfr 13499 part no. 553-1550-003	5-79
01299.6	SHAFT AND GEAR ASSEMBLY: 1.229 in. dia by 1.500 in. lg o/a; Mfr 13499 part no. 553-1555-003	5-79
01299.7	GEARSHAFT, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 1.296 in. lg o/a dim.; Mfr 13499 part no. 553-1562-002	5-79
01299.8	GEAR CLUSTER, SPUR: Two complements of 57 and 84 teeth; 20° pressure angle for both gears; 48 diametral pitch for both gears; 1.791 in. dia by 0.380 in. lg o/a dim.; Mfr 13499 part no. 553-1565-002	5-79
01299.9	CAM FOLLOWER: Cres arm; includes brass gear with 108 teeth Mfr 13499 part no. 553-1568-002	5-79
01299.10	NOT USED	

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9A ONLY) (Continued)		
01299.11	GEAR, SPUR: Aluminum; 96 teeth; with bearing; 2.041 in. dia by 0.312 in. lg; Mfr 13499 part no. 553-1577-002	5-79
01299.12	GEARSHAFT, SPUR: Cres; 30 teeth; 0.666 in. dia by 59/64 in. lg o/a; Mfr 13499 part no. 553-1576-002	5-79
01299.13	GEAR CLUSTER, SPUR: Aluminum gear with 72 teeth, bronze gear with 18 teeth; 1.541 in. dia by 1.374 in. lg approx; Mfr 13499 part no. 553-1599-003	5-79
01299.14 thru 01299.21	NOT USED	
01299.22	GEARSHAFT, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 4.541 in. dia by 1.718 in. lg o/a dim.; Mfr 13499 part no. 553-1506-002	5-79
01299.23	GEARSHAFT, SPUR: 90 teeth; 20° pressure angle; 48 diametral pitch; 1.916 in. dia by 1.328 in. lg o/a dim.; Mfr 13499 part no. 553-1509-002	5-79
01299.24	GEAR, SPUR: 84 teeth; 20° pressure angle; 48 diametral pitch; 1.791 in. dia by 0.290 in. lg o/a dim.; Mfr 13499 part no. 553-1515-002	5-79
01299.25	GEAR, SPUR: 76 teeth; 20° pressure angle; 48 diametral pitch; 1.625 in. dia by 0.290 in. lg o/a dim.; Mfr 13499 part no. 533-1512-002	5-79
01299.26	SHAFT-CAM ASSEMBLY: Brass cam, cres shaft; irregular shape; Mfr 13499 part no. 553-1519-002	5-79
01299.27	NOT USED	
01299.28	HUB ASSEMBLY: Aluminum alloy; 1.625 in. dia by 0.359 in. lg o/a dim.; Mfr 13499 part no. 553-1617-002	5-79
01299.29	SWITCH ACTUATOR: Mfr 03565 part no. C-6221	5-79
01299.30	HUB: Aluminum; 0.254 in. id, 1.500 in. od, 0.093 in. lg; Mfr 13499 part no. 553-1611-002	5-79
01299.31	SPRING, HELICAL, EXTENSION: Cres; 40.75 coils; 0.023 in. wire dia.; 2.312 lb load at 2.656 in. total lg; 0.190 in. dia by 1.515 in. lg o/a dim.; Mfr 13499 part no. 553-1434-002	5-79
01299.32	DRIVE, CONSTANT SPEED, MECHANICAL: Mfr 03565 part no. C-6215	5-79
01299.33	HUB, SHAFT: Mfr 13499 part no. 553-1440-002	5-79
01299.34	GEARSHAFT,SPUR: 80 teeth; 20° pressure angle; 64 diametral pitch; 1.281 in. dia by 1.687 in. lg o/a dim.; Mfr 13499 part no. 553-1539-002	5-79
01299.35	SPRING, HELICAL, COMPRESSION: Cres; 12 coils; 0.032 in. wire dia; supports 5 lbs at 0.531 in.; 0.245 in. dia by 8.75 in. lg o/a dim.; Mfr 13499 part no. 553-1423-002	5-79
01299.36	SPRING, HELICAL, COMPRESSION: Same as 01299.35	5-79
P1201	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM18M79	5-79
S1201	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 18 position; 1 moving and 18 fixed contacts; Mfr 76854 part no. 190311LK	5-79

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581A/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9A ONLY) (Continued)		
S1202	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 18 position; 1 moving and 3 fixed contacts; Mfr 76854 part no. 190312LK	5-79
S1203	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 12 position; 1 moving and 10 fixed contacts; Mfr 76854 part no. 190313K	5-79
S1204	SWITCH SECTION, ROTARY: Same as S1203	5-79
S1205	SWITCH, SECTION, ROTARY: 1 section, 2 pole, 20 position; 2 moving and 10 fixed contacts; Mfr 76854 part no. 189665RK	5-79
S1206	SWITCH SECTION, ROTARY: Same as S1205	5-79
S1207 thru S1209	NOT USED	
S1210	SWITCH ASSEMBLY: 0.531 in. by 1.437 in. by 5.046 in. approx. o/a dim.; Mfr 03565 part no. D-6227	5-79
RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY)		
1A1A12 (1201-1299)	FREQUENCY SELECTOR, FINAL ASSEMBLY: Mfr 13499 part no. 553-1418-004	5-78
A1201	PLATE, MOUNTING: Aluminum; 0.040 in. by 2.162 in. by 2.185 in.; Mfr 13499 part no. 553-1458-002	5-78
A1202	NOT USED	
A1203	PLATE ASSEMBLY, BEARING: Aluminum plate; 0.250 in. by 8.093 in. by 8-11/16 in. excl components Mfr 13499 part no. 553-1583-004	5-78
A1204	PLATE ASSEMBLY, GEAR: Aluminum plate; 59/64 in. by 4.124 in. by 4.405 in.; includes 2 gears; Mfr 13499 part no. 553-1575-002	5-78
A1205	PLATE ASSEMBLY, BEARING: Aluminum plate; 0.125 in. by 5.625 in. by 5.625 in. by 8-21/32 in. excl components; Mfr 13499 part no. 553-1592-004	5-78
A1206	NOT USED	
A1207	BRACKET, MOUNTING: Cres; 0.374 in. by 0.984 in. by 1-1/32 in.; Mfr 13499 part no. 553-1455-002	5-78
A1208	BRACKET, MOUNTING: Same as A1207	5-78
A1209	BRACKET, MOUNTING: Same as A1207	5-78
A1210	NOT USED	
A1211	PLATE, MOUNTING: Aluminum; 0.125 in. by 0.821 in. by 1.092 in.; Mfr 13499 part no. 553-1456-002	5-78
A1212	BRACKET ASSEMBLY: Aluminum bracket; includes bearing; 0.375 in. by 1.062 in. by 2.005 in. o/a approx.; Mfr 13499 part no. 553-1542-002	5-78
A1213	BRACKET, MOUNTING: Cres; 0.374 in. by 0.984 in. by 1.032 in. Mfr 13499 part no. 553-1462-002	5-78
A1214	SCALE, MEMORY DRUM: Aluminum; 1.218 in. by 1.352 in. by 5.314 in.; Mfr 13499 part no. 553-1426-004	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)		
A1215	PLATE, MOUNTING: Cres; 0.025 in. by 0.436 in. by 2.748 in.; Mfr 13499 part no. 553-1424-002	5-78
A1216	PLATE, MOUNTING: Cres; 0.050 in. by 25/32 in. by 3.133 in.; Mfr 13499 part no. 553-1425-002	5-78
B1201	MOTOR, DIRECT CURRENT: 0.044 hp at 7400 rpm; 30 vdc max voltage; 6 sec on 24 sec off duty cycle; Mfr 13499 part no. 553-1465-002	5-78
H1201	NOT USED	
H1202	WASHER, FLAT: Cres; 0.251 in. id, 0.4375 in. od, 0.0156 in. thk; Mfr 13499 part no. 553-1429-002	5-78
H1203	NUT, SELF-LOCKING, HEXAGON: Steel; 1/4-28 thd; 7/16 in. w across flats by 0.110 in. thk; Mfr 77122 part no. 14L28	5-78
H1204	WASHER, FLAT: Cres; 0.191 in. id, 0.375 in. od, 0.0156 in. thk; Mfr 13499 part no. 553-1431-002	5-78
H1205	NOT USED	
H1206	NUT, SLEEVE: Aluminum alloy; 0.250 in. hex, 0.187 in. dia, 0.718 in. lg; Mfr 13499 part no. 553-1445-002	5-78
H1207	POST, MOUNTING: Aluminum; 0.375 in. dia, 1.156 in. lg; Mfr 13499 part no. 553-1447-002	5-78
H1208	POST, MOUNTING: Aluminum; 0.312 in. dia small end, 0.375 in. dia large end, 1.250 in. lg; Mfr 13499 part no. 553-1448-002	5-78
H1209	POST, MOUNTING: Aluminum; 0.312 in. dia, 0.562 in. lg; Mfr 13499 part no. 553-1449-002	5-78
H1210	POST, MOUNTING: Aluminum; 0.312 in. dia, 0.640 in. lg; Mfr 13499 part no. 553-1450-002	5-78
H1211	POST, MOUNTING: Aluminum; 0.375 in. dia, 0.640 in. lg; Mfr 13499 part no. 553-1451-002	5-78
H1212	POST, MOUNTING: Aluminum; 0.375 in. dia, 0.583 in. lg; Mfr 13499 part no. 553-1452-002	5-78
H1213 thru H1215	NOT USED	
H1216	SPACER, SLEEVE: Aluminum; 0.113 in. id, 0.187 in. od, 0.156 in. lg; Mfr 13499 part no. 553-1459-002	5-78
H1217	SPACER, SLEEVE: Aluminum; 0.113 in. id, 0.187 in. od, 0.281 in. lg; Mfr 13499 part no. 553-1460-002	5-78
H1218	SPACER, SLEEVE, Aluminum; 0.135 in. id, 0.255 in. od, 0.125 in. lg; Mfr 13499 part no. 502-1664-001	5-78
H1219	WASHER, FLAT: Cres; 0.158 in. id, 0.375 in. od, 0.156 in. thk; Mfr 13499 part no. 553-1430-002	5-78
H1220	RING, RETAINING: MIL type MS16624-18	5-78
H1221	RING, RETAINING: MIL type MS16624-15	5-78
H1222	RING, RETAINING: Beryllium copper; external type; 0.225 in. id, 0.025 in. thk material; Mfr 89462 part no. 5100-25-C	5-78
H1223	RING, RETAINING: Copper, type "E"; 0.094 in. id, 0.015 in. thk; Mfr 89462 part no. 5133-12-C	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)	
H1224	RING, RETAINING: Copper, type "E"; 0.145 in. id, 0.025 in. thk; Mfr 89462 part no. 5133-18-C	5-78
H1225	RING, RETAINING: Copper, type "E"; 0.207 in. id, 0.025 in. thk; Mfr 89462 part no. 5133-25-C	5-78
H1226	RING, RETAINING: Steel, type "E"; 0.051 in. id, 0.010 in. thk; Mfr 89462 part no. 5133-6-C	5-78
H1227	NUT, PLAIN, HEXAGON: Cres; 5/16-24 thd; 0.500 in. w across flats by 0.103 in. thk; Mfr 13499 part no. 334-0249-00	5-78
H1228 thru H1255	NOT USED	
H1256	POST, MOUNTING: Cres; 0.310 in. dia by 0.609 in. lg; Mfr 13499 part no. 553-1422-002	5-78
H1257 thru H1264	NOT USED	
H1265	SPACER, SLEEVE: Aluminum; 0.196 in. id, 0.250 in. od, 0.218 in. lg; Mfr 13499 part no. 553-1651-002	5-78
H1266	STUD, MOUNTING: Aluminum; 1/4 in. 2 across flats by 29/32 in. lg; 5-40 thd, 9/32 in. lg; Mfr 13499 part no. 553-1652-002	5-78
I1201	WHEEL ASSEMBLY, COUNTER: 0.453 in. by 1.343 in. by 1.812 in. o/a dim.; Mfr 13499 part no. 553-1627-002	5-78
I1202	WHEEL ASSEMBLY, COUNTER: 0.453 in. by 1.343 in. by 1.812 in. o/a dim.; Mfr 13499 part no. 553-1625-002	5-78
I1203	WHEEL ASSEMBLY, COUNTER: 0.453 in. by 1.343 in. by 1.812 in. o/a dim.; Mfr 13499 part no. 553-1603-002	5-78
I1204	WHEEL ASSEMBLY, COUNTER: 0.453 in. by 1.343 in. by 1.812 in. o/a dim.; Mfr 13499 part no. 553-1629-002	5-78
J1201	CONNECTOR, RECEPTACLE, ELECTRICAL: 41 female sockets; arc resistant plastic dielectric; 5 amps; Mfr 80586 part no. GM41F79	5-78
K1201	RELAY, ARMATURE: 1A, 32 vdc, 5 amps, 1 inductive winding, 20 ohms dc coil resistance; Mfr 04221 part no. 41-3889	5-78
K1202	RELAY ARMATURE: Same as K1201	5-78
K1203	RELAY ARMATURE: Same as K1201	5-78
K1204	RELAY ARMATURE: 1C, 32 vdc, 5 amps; 1 inductive winding, 20 ohms dc coil resistance; Mfr 04221 part no. 41-3608	5-78
01201	DRUM, CLUTCH: Cres; 0.314 in. dia by 0.449 in. lg; Mfr 13499 part no. 553-1427-002	5-78
01202 thru 01204	DRUM, CLUTCH: Same as 01201	5-78
01205	WASHER, NONMETALLIC: Plastic; 0.859 in. id, 1.187 in. od, 0.070 in. thk; Mfr 13499 part no. 502-1164-002	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)	
01206 thru 01208	WASHER, NONMETALLIC: Same as 01205	5-78
01209	CLUTCH, FRICTION: Consists of 4 clutch linings; 1 clutch shoe, and 1 solder strip; 1.252 in. dia by 0.375 in. lg; Mfr 13499 part no. 502-1825-002	5-78
01210 thru 01212	CLUTCH, FRICTION: Same as 01209	5-78
01213	RING, RETAINING: Stainless steel; 0.320 in. id, 1.156 in. od, 0.0418 in. thk; Mfr 13499 part no. 502-7031-002	5-78
01214 thru 01224	RING, RETAINING: Same as 01213	5-78
01225	WASHER, SHOULDERED: Cres; 0.313 in. id, 0.843 in. od, 0.093 in. thk; Mfr 13499 part no. 553-1428-002	5-78
01226 thru 01228	WASHER, SHOULDERED: Same as 01225	5-78
01229	PAWL: Copper; 0.250 in. by 0.250 in. by 1.247 in.; Mfr 13499 part no. 503-5079-002	5-78
01230 thru 01232	PAWL: Same as 01229	5-78
01233	GEAR, SPUR: Bronze; 72 teeth, incl bearings; 1.541 in. dia by 0.326 in. lg; Mfr 13499 part no. 504-7200-002	5-78
01234 thru 01236	GEAR, SPUR: Same as 01233	5-78
01237	CLAMP, LOOP: Aluminum; accommodates 0.312 in. dia material, Mfr 13499 part no. 553-1772-002	5-78
01238 thru 01244	CLAMP, LOOP: Same as 01237	5-78
01245	CLAMP, LOOP: Same as 01237	5-78
01245.1	CLAMP, LOOP: Same as 01237	5-78
01245.2	CLAMP, LOOP: Same as 01237	5-78
01246	WASHER, FLAT: Cres; 0.3140 in. id, 0.8125 in. od, 0.062 in. thk; Mfr 13499 part no. 553-1420-002	5-78
01247	WASHER, FLAT: Same as 01246	5-78
01248	SPRING, HELICAL, TORSION: Cres; 6.5 coils; 0.040 in. dia wire; 0.330 in. dia by 0.491 in. lg o/a dim.; Mfr 13499 part no. 553-1432-002	5-78
01249	NOT USED	
01250	SPRING: Cres; 0.928 in. dia by 0.271 in. lg o/a dim.; Mfr 13499 part no. 553-1435-002	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
	RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)	
01251	SPRING, HELICAL, TORSION: Cres; 2.75 coils; 30 to 40 oz. in. torque at 135°, 8.500 in. lg o/a; Mfr 13499 part no. 553-1436-002	5-78
01252	GEAR, SPUR: 36 teeth; 20° pressure angle; 48 diametral pitch; 0.790 in. dia by 0.187 in. lg o/a dim.; Mfr 13499 part no. 553-1467-002	5-78
01253	GEAR, SPUR: 30 teeth; 20° pressure angle; 48 diametral pitch; 0.666 in. dia by 0.368 in. lg o/a dim.; Mfr 13499 part no. 533-1437-002	5-78
01254	GEAR, SPUR: Bronze; 36 teeth; 0.812 in. dia by 0.365 in. lg o/a; 0.3125 in. dia bore; with bearing; Mfr 13499 part no. 553-1469-003	5-78
01255	GEAR, SPUR: 36 teeth; 20° pressure angle; 48 diametral pitch; 0.790 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 553-1472-002	5-78
01256	GEAR, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 0.250 in. lg o/a dim.; Mfr 13499 part no. 553-1470-002	5-78
01257	COUPLING HALF, SHAFT: Cres; 0.875 in. dia by 0.343 in. lg o/a; 0.187 in. dia bore; Mfr 13499 part no. 553-1464-003	5-78
01258	GEAR, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 0.312 in. lg o/a dim.; Mfr 13499 part no. 553-1504-002	5-78
01259	GEAR, SPUR: 36 teeth; 20° pressure angle; 48 diametral pitch; 0.790 in. dia by 0.687 in. lg o/a dim.; Mfr 13499 part no. 553-1438-002	5-78
01260	GEAR, SPUR: 54 teeth; 20° pressure angle; 48 diametral pitch; 1.166 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 533-1476-002	5-78
01261	GEAR, SPUR: 96 teeth; 20° pressure angle; 48 diametral pitch; 2.040 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 533-1478-002	5-78
01262	SHAFT, SHOULDERED: Cres; 0.248 in. by 1.656 in. o/a dim.; Mfr 13499 part no. 553-1433-002	5-78
01263	GEAR, SPUR: 48 teeth; 20° pressure angle; 48 diametral pitch; 1.040 in. dia by 0.437 in. lg o/a dim.; Mfr 13499 part no. 553-1439-002	5-78
01264	NOT USED	
01265	GEAR, SPUR: 57 teeth; 20° pressure angle; 48 diametral pitch; 1.229 in. dia by 0.156 in. lg o/a dim.; Mfr 13499 part no. 533-1442-002	5-78
01266	GEAR, SPUR: 57 teeth; 20° pressure angle; 48 diametral pitch; 1.229 in. dia by 0.375 in. lg o/a dim.; Mfr 13499 part no. 553-1480-002	5-78
01267	GEAR, SPUR: 57 teeth; 20° pressure angle; 48 diametral pitch; 1.229 in. dia by 0.444 in. lg o/a dim.; Mfr 13499 part no. 553-1443-002	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)		
01268	GEAR, SPUR: 90 teeth; 20° pressure angle; 48 diametral pitch; 1.916 in. dia by 0.140 in. lg o/a dim.; Mfr 13499 part no. 553-1444-002	5-78
01269	SHAFT, STRAIGHT: Aluminum alloy; 0.187 in. dia by 1.593 in. lg o/a dim.; Mfr 13499 part no. 553-1446-002	5-78
01270	GEAR, SPUR: 86 teeth; 20° pressure angle; 48 diametral pitch; 1.854 in. dia by 0.140 in. lg o/a dim.; Mfr 13499 part no. 553-1453-002	5-78
01271	GEAR, SPUR: 86 teeth; 20° pressure angle; 48 diametral pitch; 1.854 in. dia by 0.344 in. lg o/a dim.; Mfr 13499 part no. 553-1454-002	5-78
01272	NOT USED	
01273	GEAR SPUR: 76 teeth; 20° pressure angle; 48 diametral pitch; 1.625 in. dia by 0.187 in. lg o/a dim.; Mfr 13499 part no. 553-1461-002	5-78
01274	GEAR, SPUR: 60 teeth; 20° pressure angle; 48 diametral pitch; 1.291 in. dia by 0.370 in. lg o/a dim.; Mfr 13499 part no. 553-1482-002	5-78
01275	NOT USED	
01276	NOT USED	
01277	GEAR SPUR: Same as 01261	5-78
01278	GEAR, SPUR: 29 teeth, 20° pressure angle; 48 diametral pitch; 0.645 in. dia by 0.370 in. lg o/a dim.; Mfr 13499 part no. 553-1487-002	5-78
01279	GEAR, SPUR: Same as 01278	5-78
01280 thru 01283	NOT USED	
01284	GEAR, CLUSTER, SPUR: Two complements of 18 and 68 teeth; 20° pressure angle for both gears; 48 diametral pitch for both gears; 1.458 in. dia by 0.281 in. lg o/a dim.; Mfr 13499 part no. 553-1489-002	5-78
01285	NOT USED	
01286	GEAR, CLUSTER, SPUR: Two complements of 18 and 68 teeth; 20° pressure angle for both gears; 48 and 64 diametral pitches; 1.093 in. dia by 0.245 in. lg o/a dim.; Mfr 13499 part no. 553-1492-002	5-78
01287	NOT USED	
01288	GEAR, SPUR: 57 teeth; 20° pressure angle; 64 diametral pitch; 9.928 in. dia by 0.178 in. lg o/a dim.; Mfr 13499 part no. 553-1495-002	5-78
01289	GEAR, CLUSTER, SPUR: Two complements of 42 and 84 teeth; 20° pressure angle for both gears; 48 diametral pitch for both gears; 1.791 in. dia by 0.432 in. lg o/a dim.; Mfr 13499 part no. 553-1497-002	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)		
01290	GEARSHAFT, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 0.843 in. lg o/a dim.; Mfr 13499 part no. 553-1501-002	5-78
01291	COUPLING HALF, SHAFT: Cres; 1 in. dia by 0.343 in. lg; 0.1875 in dia bore; Mfr 13499 part no. 553-1463-003	5-78
01292	COUPLING HALF, SHAFT: Same as 01291	5-78
01293 thru 01295	COUPLING HALF, SHAFT: Same as 01257	5-78
01296	GEARSHAFT, SPUR: 76 teeth; 20° pressure angle; 48 diametral pitch; 1.625 in. dia by 2.093 in. lg o/a dim.; Mfr 13499 part no. 553-1522-002	5-78
01297	GEAR AND CAM ASSEMBLY: 48 teeth; 20° pressure angle; 48 diametral pitch; 0.828 in. o/a lg; Mfr 13499 part no. 553-1525-002	5-78
01298	GEARSHAFT, SPUR: 80 teeth; 20° pressure angle; 64 diametral pitch; 1.281 in. dia by 2.031 in. lg o/a dim.; Mfr 13499 part no. 553-1528-002	5-78
01299	GEARSHAFT, SPUR: 40 teeth; 20° pressure angle; 64 diametral pitch; 1.125 in. dia by 3.031 in. lg o/a dim.; Mfr 13499 part no. 553-1532-002	5-78
01299.1	GEARSHAFT, SPUR: 80 teeth; 20° pressure angle; 64 diametral pitch; 1.281 in. dia by 1.750 in. lg o/a dim.; Mfr 13499 part no. 553-1536-002	5-78
01299.2	NOT USED	
01299.3	NOT USED	
01299.4	ARM ASSEMBLY: Cres cam; 0.531 in. by 1.437 in. by 2.295 in. o/a dim. approx; Mfr 13499 part no. 553-1544-003	5-78
01299.5	GEAR ASSEMBLY: Aluminum gear with 84 teeth, bronze gear with 21 teeth; 1.791 in. dia by 0.656 in. lg; Mfr 13499 part no. 553-1550-003	5-78
01299.6	SHAFT AND GEAR ASSEMBLY: 1.229 in. dia by 1.500 in. lg o/a; Mfr 13499 part no. 553-1555-003	5-78
01299.7	GEARSHAFT, SPUR: 72 teeth; 20° pressure angle; 48 diametral pitch; 1.541 in. dia by 1.296 in. lg o/a dim.; Mfr 13499 part no. 553-1562-002	5-78
01299.8	GEAR CLUSTER, SPUR: Two complements of 57 and 84 teeth; 20° pressure angle for both gears; 48 diametral pitch for both gears; 1.791 in. dia by 0.380 in. lg o/a dim.; Mfr 13499 part no. 553-1565-002	5-78
01299.9	ARM ASSEMBLY: Cres arm; includes brass gear with 108 teeth; Mfr 13499 part no. 553-1568-002	5-78
01299.10	NOT USED	
01299.11	GEAR, SPUR: Aluminum; 96 teeth; with bearing; 2.041 in. dia by 0.312 in. lg; Mfr 13499 part no. 553-1577-002	5-78
01299.12	GEARSHAFT, SPUR: Cres; 30 teeth; 0.666 in. dia by 59/64 in. lg o/a; Mfr 13499 part no. 553-1576-002	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)		
01299.13	GEAR ASSEMBLY: Aluminum gear with 72 teeth; bronze gear with 18 teeth; 1.541 in. dia by 1.374 in. lg approx; Mfr 13499 part no. 553-1599-003	5-78
01299.14 thru 01299.21	NOT USED	
01299.22	GEARSHAFT, SPUR: 72 teeth; 20^{o} pressure angle; 48 diametral pitch; 4.541 in. dia by 1.718 in. lg o/a dim.; Mfr 13499 part no. 553-1506-002	5-78
01299.23	GEARSHAFT, SPUR: 90 teeth; 20^{o} pressure angle; 48 diametral pitch; 1.916 in. dia by 1.328 in. lg o/a dim.; Mfr 13499 part no. 553-1509-002	5-78
01299.24	GEAR, SPUR: 84 teeth; 20^{o} pressure angle; 48 diametral pitch; 1.791 in. dia by 0.290 in. lg o/a dim.; Mfr 13499 part no. 553-1515-002	5-78
01299.25	GEAR, SPUR: 76 teeth; 20^{o} pressure angle; 48 diametral pitch; 1.625 in. dia by 0.290 in. lg o/a dim.; Mfr 13499 part no. 553-1512-002	5-78
01299.26	SHAFT-CAM ASSEMBLY: Brass cam, cres shaft; irregular shape; Mfr 13499 part no. 553-1519-002	5-78
01299.27	NOT USED	
01299.28	HUB ASSEMBLY: Aluminum alloy; 1.625 in. dia by 0.359 in. lg o/a dim.; Mfr 13499 part no. 553-1617-002	5-78
01299.29	DRUM ASSEMBLY: Mfr 13499 part no. 553-1610-003	5-78
01299.30	HUB: Aluminum; 0.254 in. id, 1.500 in. od, 0.093 in. lg; Mfr 13499 part no. 553-1611-002	5-78
01299.31	SPRING, HELICAL, EXTENSION: Cres; 40.75 coils; 0.023 in. wire dia; 2.312 lb load at 2.656 in. total lg; 0.190 in. dia by 1.515 in. lg o/a dim.; Mfr 13499 part no. 553-1434-002	5-78
01299.32	DRUM ASSEMBLY: Mfr 13499 part no. 553-1612-003	5-78
01299.33	NOT USED	
01299.34	GEARSHAFT, SPUR: 80 teeth; 20^{o} pressure angle; 64 diametral pitch; 1.281 in. dia by 1.687 in. lg o/a dim.; Mfr 13499 part no. 553-1539-002	5-78
01299.35	SPRING, HELICAL, COMPRESSION: Cres; 12 coils; 0.032 in. wire dia; supports 5 lbs at 0.531 in.; 0.245 in. dia by 8.75 in. lg o/a dim.; Mfr 13499 part no. 553-1423-002	5-78
01299.36	SPRING, HELICAL, COMPRESSION: Same as 01299.35	5-78
P1201	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM18M79	5-78
S1201	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 18 position; 1 moving and 18 fixed contacts; Mfr 76854 part no. 190311LK	5-78
S1202	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 18 position; 1 moving and 3 fixed contacts; Mfr 76854 part no. 190312LK	5-78
S1203	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 12 position; 1 moving and 10 fixed contacts; Mfr 76854 part no. 190313K	5-78

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581/URC-9, FREQUENCY SELECTOR ASSEMBLY (AN/URC-9, -9Y, -9AY) (Continued)		
S1204	SWITCH SECTION, ROTARY: Same as S1203	5-78
S1205	SWITCH, SECTION, ROTARY: 1 section, 2 pole, 20 position; 2 moving and 10 fixed contacts; Mfr 76854 part no. 189665RK	5-78
S1206	SWITCH SECTION, ROTARY: Same as S1205	5-78
S1207 thru S1209	NOT USED	
S1210	SWITCH ASSEMBLY: 0.531 in. by 1.437 in. by 5.046 in. approx o/a dim.; Mfr 13499 part no. 553-1631-004	5-78
RT-581/URC-9, DIRECTIONAL COUPLER		
1A1A13 (1301-1399)	COUPLER, DIRECTIONAL: Mfr 13499 part no. 549-3352-004	5-12
C1301	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 500 uuf -0% +100%, 250 vdc; Mfr 71590 part no. DA718-001	5-12
C1302	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 9.1 uuf ±5%, 500 vdc; Mfr 78488 part no. GA9-1UUFPORM5PCT	5-12
C1303	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C1302	5-12
C1304	CAPACITOR, FIXED, CERAMIC DIELECTRIC: Same as C1301	5-12
CR1301	SEMICONDUCTOR DEVICE, DIODE: Mfr 07688 part no. 1N82A	5-12
CR1302	SEMICONDUCTOR DEVICE, DIODE: Same as CR1301	5-12
J1301	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 rd male contact, 500 vdc; low loss plastic dielectric; straight shape; Mfr 94375 part no. 0750	5-12
P1301	CONNECTOR, PLUG, ELECTRICAL: Straight shape; low loss plastic dielectric; 5 amps; Mfr 94375 part no. 131B1100	5-12
R1301	RESISTOR, FIXED, FILM: MIL-R-10509 type RN60B8251F	5-12
R1302	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF101K	5-12
R1303	RESISTOR, FIXED, COMPOSITION: Same as R1302	5-12
R1304	RESISTOR, FIXED, FILM: Same as R1301	5-12
RT-581( )/URC-9, BROADBAND SIDETONE AMPLIFIER		
1A1A14 (1601-1699)	AMPLIFIER, AUDIO FREQUENCY: Mfr 13499 part no. 549-6408-004	5-17
C1601	CAPACITOR, FIXED, ELECTROLYTIC: MIL type CSR13F476MP	5-17
C1602	CAPACITOR, FIXED, CERAMIC DIELECTRIC: MIL type CK14BX223M	5-17
C1603	CAPACITOR, FIXED, ELECTROLYTIC: Same as C1601	5-17
H1601	SHELL, ELECTRICAL CONNECTOR: Aluminum; for use w/DPD connectors; end bracket mtg w/bushings; 1.875 in. by 2.546 in. by 3.281 in. approx dim.; Mfr 71468 part no. DPD2-19941-2	5-17
J1601	JACK, TIP: For use with 0.080 diameter male contact; teflon insulation; 5.5 amps, continuous duty cycle; Mfr 98291 part no. SKT5BCBROWN	5-17

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
RT-581( )/URC-9, BROADBAND SIDETONE AMPLIFIER (Continued)		
P1601	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM11M79	5-17
P1602	NOT USED	
P1603	NOT USED	
P1604	NOT USED	
P1605	NOT USED	
P1606	NOT USED	
P1607	NOT USED	
Q1601	TRANSISTOR: MIL-S-19500 type 2N697	5-17
Q1602	TRANSISTOR: Same as Q1601	5-17
R1601	RESISTOR, VARIABLE, COMPOSITION: MIL-R-94 type RV6LAYSA102B	5-17
R1602	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF152K	5-17
R1603	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF820K	5-17
R1604	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF391K	5-17
R1605	RESISTOR, FIXED, COMPOSITION: MIL type RC20GF220K	5-17
R1606	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF102K	5-17
R1607	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF680K	5-17
R1608	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC07GF561K	5-17
RT1601	RESISTOR, THERMAL: 50 ohms ±10%, at 25° C, 1 w; Mfr 10646 part no. 763F92	5-17
T1601	TRANSFORMER, AUDIO FREQUENCY: Plate coupling type; 500 ohms center tapped at 5.5 ma, primary, 600 ohms secondary; 300 to 5000 cps, 500 mw; Mfr 70764 part no. A12808	5-17
T1602	TRANSFORMER, AUDIO FREQUENCY: 500 ohms ct primary; 300 ohms secondary; 200 cps to 4000 cps frequency response; continuous duty cycle; Mfr 80223 part no. DOT20	5-17
AN/URC-9( ) CASE, RECEIVER-TRANSMITTER CY2959/URC-9		
1A2 (1401-1499)	CASE, RECEIVER-TRANSMITTER GROUP - CY-2959/URC-9; Mfr 03365 part no. D-6434	1-2
A1401	FAN, CENTRIFUGAL: ac; direct connected; 115 v, 60 cps, single phase; 0.38 amps running, 0.6 amps stalled, current; 40 w; 3350 rpm; incl connector, gaskets and hdw; Mfr 13499 part no. 593-8140-004	5-62
B1401	FAN, CENTRIFUGAL: Single unit, direct drive; 115 vac, 60 cps, single phase motor 3350 rpm; Mfr 02598 part no. NBCM20B3	5-62
FL1401	FILTER, RADIO INTERFERENCE: Dual section; 130 vac, 5 amps, 60 cps per sect; 0.05 ohms dc res; Mfr 56289 part no. JN14-901A	5-60
H1401	GROMMET, RUBBER: Neoprene; black synthetic rubber; 7/16 in. id, 3/4 in. od, 1/4 in. thk; Mfr 79497 part no. G1161NEOPRENE45-55	5-60
H1402	NUT, SELF-LOCKING, HEXAGON: MIL type MS21044-D08	5-60
H1403	WASHER, SEALING: Bolt or stud seal (one piece); 0.234 in. id, 0.364 in. od, 0.041 in. thk; Mfr 86579 part no. 110-8	5-60

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
AN/URC-9( ) CASE, RECEIVER-TRANSMITTER CY-2959/URC-9 (Continued)		
H1404	NOT USED	
H1405	NOT USED	
H1406	SCREW, MACHINE: Cres; 0.279 in. dia by 0.500 in. lg o/a dim.; 6-32 thd, 1/4 in. lg; Mfr 13499 part no. 553-2178-002	5-60
H1407	PIN, STRAIGHT, HEADLESS: Cres; 0.093 in. dia by 0.515 in. lg o/a dim.; Mfr 13499 part no. 553-2168-002	5-60
H1408	NUT: Bronze; 0.368 in. by 0.718 in. by 0.937 in. o/a dim.; Mfr 13499 part no. 553-2170-002	5-70
H1409	NUT, PLAIN, HEXAGON: Nickel plated brass; 1/4-20UNF-2B thd, 0.5625 in. hex by 0.125 in. h overall; Mfr 13499 part no. 334-0260-00	5-60
H1410	SCREW, SHOULDERED: Cres; 0.312 in. w across flats by 0.500 in. lg o/a dim.; 6-32 thd; Mfr 13499 part no. 553-2172-002	5-60
H1411	WASHER, NONMETALLIC: 0.219 in. id, 0.4375 in. od, 0.125 in. thk; Mfr 13499 part no. 553-2174-002	5-60
H1412	WASHER, NONMETALLIC: Rubber; 0.250 in. id, 0.6875 in, od, 0.125 in. thk; Mfr 13499 part no. 553-2175-002	5-60
H1413	WASHER, THRUST: Cres; 0.171 in. id, 0.812 in. od, 0.062 in. thk; Mfr 13499 part no. 553-2176-002	5-60
H1414	SPACER, SLEEVE: Cres; 0.171 in. id, 0.250 in. od, 0.312 in. lg; Mfr 13499 part no. 553-2177-002	5-60
H1415	CLAMP, LOOP: MIL type MS25281-F3	5-60
H1416	WASHER, LOCK: Mfr 78189 part no. 1724-02	5-60
H1417	SCREW, MACHINE: Brass, black oxide, oil stain finish; cross recess drive pan head; 3-48NC-2A thd, 3/16 in. lg; Mfr 13499 part no. 343-1735-00	5-61
H1423	PIN, SPRING: MIL type MS16562-221	5-60
H1424	NUT, BLIND RIVET: Steel, cadmium plated; flat head, closed end, keyless; 0.010 in. to 0.075 in. thk; 0.625 in. lg; Mfr 25472 part no. S6B75	5-60
H1425	NUT, BLIND RIVET: Steel, cadmium plated; flat head, open end, keyless 4-40 thd size, 0.370 in. lg; Mfr 25472 part no. 4-60	5-60
H1426	RIVNUT: Steel, cadmium plated; flat head, closed end; keyless; 0.328 in. dia, 0.4695 in. lg; Mfr 06827 part no. 2R1083-1	5-60
H1428	INSERT, SCREW THREAD: MIL type MS21209C0420	5-61
H1429	INSERT, SCREW THREAD: MIL type MS124655	5-60
H1430	INSERT, SCREW THREAD: MIL type MS21209C4-15	5-60
H1431	INSERT, SCREW THREAD: MIL type MS122123	5-60
H1432	INSERT, SCREW THREAD: MIL type MS21209C0815	5-60
H1435	INSERT, SCREW THREAD: MIL type MS21209C0615	5-61
H1439	SCREW, MACHINE: Stainless steel, plain finish; 8-32NC-2A thd, 5/8 in. lg; Mfr 13499 part no. 553-220-002	5-60
H1441	SCREW, MACHINE: Brass; Mfr 13499 part no. 313-0140-00	5-60
H1442	SCREW, MACHINE: Stainless steel, passivate finish; 6-32NC-2A thd, 1/4 in. lg; Mfr 13499 part no. 330-2295-00	5-60
H1443	GROMMET, RUBBER: MIL type MS35489-9	5-60

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
AN/URC-9( ) CASE, RECEIVER-TRANSMITTER CY-2959/URC-9 (Continued)		
H1444	BED PLATE ASSEMBLY: 0.080 in. thk; aluminum with nylon slides attached; Mfr 03565 part no. C-6284	5-60
J1401	CONNECTOR, RECEPTACLE, ELECTRICAL: 37 female contacts 700 vdc; 500 vac rms; Mfr 02660 part no. 7-8720	5-60
J1402	CONNECTOR, RECEPTACLE, ELECTRICAL: Aluminum body, plastic insert, 20 female contacts; 1300 v; 1.249 in. by 1.687 in. by 1.687 in. by 3.375 in. o/a dim.; Mfr 71468 part no. DPDF20-33SICPOSNA101	5-60
J1403	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL type MS24039	5-60
J1404	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-5015 part no. MS3102R16-10P	5-61
J1405	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-5015 type MS3102R24-7S	5-61
J1406	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL-C-10544, type U79U	5-61
J1407	CONNECTOR, RECEPTACLE, ELECTRICAL: Mfr 13499 part no. 371-6645-00	5-61
01401	GASKET: MIL-P-5516 type AN6227-5	5-60
01402	GASKET: Same as 01401	5-60
01403	NOT USED	
01404	NOT USED	
01405	NOT USED	
01406	NOT USED	
01407	PIVOT ASSEMBLY: 0.938 in. by 2.250 in. o/a dim.; Mfr 13499 part no. 553-2189-002	5-60
01408	PIVOT ASSEMBLY: Same as 01407	5-60
01409	COVER, ELECTRICAL CONNECTOR: With chain, type MS25043-14C	5-61
01410	NOT USED	
01411	NOT USED	
J1408	CONNECTOR, RECEPTACLE, ELECTRICAL: 3 female contacts, type MS3102R14S-7S	5-61
K1401	RELAY, ARMATURE: 26 vdc coil, DPDT, miniature case; Mfr 82768 part no. MV2C600D13-26V, Mfr 70309 part no. KHYX41	
K1402	RELAY, ARMATURE: Same as K1401	
01412	COVER, ELECTRICAL CONNECTOR: Cadmium plated finish; 1.687 in. dia by 0.437 in. lg approx; incl chain; Mfr 02660 part no. 9760-24	5-61
01413	COVER, ELECTRICAL CONNECTOR: Same as 01412	5-61
01414	COVER, ELECTRICAL CONNECTOR: With rubber gasket and chain; 1-1/8 in. dia gasket, 4-5/8 in. lg chain; Mfr 02660 part no. 9760-16	5-61
01415	LOCK RING, CONNECTOR: Brass; 0.155 in. by 0.625 in. by 0.725 in. overall; 0.510 in. dia to accommodate connector; Mfr 02660 part no. 126-1069	5-60
01416	VALVE, PNEUMATIC TANK: Brass; 1/8-27 thd on outlet connection; 0.302-32 thd on inlet connection; 0.437 in. w across flats by 0.906 in. lg o/a dim.; Mfr 17875 part no. 26-20420BB655-13	5-61

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
AN/URC-9( ) CASE, RECEIVER-TRANSMITTER CY-2959/URC-9 (Continued)		
01417	VALVE, SAFETY RELIEF: Brass; 3.5 psi cracking pressure, 2.5 psi min reseating pressure; minus 80 to plus 400 deg F temperature; 0.630 in. w across flats by 1.200 in. lg o/a dim.; Mfr 91816 part no. 524B2M3-5	5-61
01418	NOT USED	
01419	NOT USED	
01420	NOT USED	
01421	FILTER, AIR-CONDITIONING: Aluminum mech., .5 in. by 3.25 in. by 10.75 in. approx. o/a dim.; Mfr 95347 part no. F-249	5-60
01422	GASKET: Rubber; 0.187 in. by 5.124 in. by 12.437 in. o/a dim.; Mfr 13499 part no. 553-2182-004	5-60
01423	GASKET: Same as 01422	5-60
P1402	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL type MS24040	5-62
S1401	SWITCH, ROTARY WAFER: 2 circuit, 2 pole, 2 position, 1 section; 2 moving and 4 fixed contact; Mfr 76854 part no. 225252F1	5-61
POWER SUPPLY, PP-2702/URC-9 (AN/URC-9, -9A ONLY)		
1A3 (1502-1599)	POWER SUPPLY: PP-2702/URC-9; metallic type rectification, full wave; 115 vac, 50 to 60 cps, single phase, operating power, 230 vac, 50 to 60 cps, single phase, alternate operating power; 7-1/32 in. by 11-13/16 in. by 19 in. o/a; Mfr 03565 part no. D-6441	5-80
C1501	CAPACITOR, FIXED, PAPER DIELECTRIC: 10 uf ±10%, 600 vdc; Mfr 56289 part no. P50816	5-81
C1502	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C1501	5-81
C1503	CAPACITOR, FIXED, PAPER DIELECTRIC: MIL-C-25 type CP53B4EF104V1	5-82
C1504	CAPACITOR, FIXED, PAPER DIELECTRIC: MIL-C-25 type CP70B1EF405K1	5-81
C1505	CAPACITOR, FIXED, PAPER DIELECTRIC: Same as C1501	5-81
C1506	CAPACITOR, FIXED, PAPER DIELECTRIC: MIL Type CP54B1KE504K1	5-82
C1507	CAPACITOR, FIXED, PAPER DIELECTRIC: 1 uf -10% +20%, 330 vac, 60 cps; Mfr 13499 part no. 931-1100-00	5-82
C1508	CAPACITOR, ELECTROLYTIC: 12 mfd 250w vdc, ±50%, -10% tol; MIL-C-62 type M62/02-045	5-83
CR1501	SEMICONDUCTOR DEVICE: MIL type 1N561	5-82
CR1502	SEMICONDUCTOR DEVICE: Same as CR1501	5-82
CR1503	SEMICONDUCTOR DEVICE: Same as CR1501	5-82
CR1504	SEMICONDUCTOR DEVICE: Same as CR1501	5-82
CR1505	SEMICONDUCTOR DEVICE, DIODE: Mfr 07688 type 1N249AR	5-82
CR1506	SEMICONDUCTOR DEVICE, DIODE: Same as CR1505	5-82
CR1507	SEMICONDUCTOR DEVICE, DIODE: Same as CR1505	5-82
CR1508	SEMICONDUCTOR DEVICE, DIODE: Same as CR1505	5-82

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY, PP-2702/URC-9 (AN/URC-9, -9A ONLY) (Continued)		
CR1509	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N547	5-82
CR1510	SEMICONDUCTOR DEVICE, DIODE: Same as CR1509	5-82
CR1511	SEMICONDUCTOR DEVICE, DIODE: Same as CR1509	5-82
CR1512	SEMICONDUCTOR DEVICE, DIODE: Same as CR1509	5-82
CR1513	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N538	5-82
CR1514	SEMICONDUCTOR DEVICE, DIODE: MIL type IN2975RB	5-82
F1501	FUSE, CARTRIDGE: Brass, nickel, or bright alloy plated; 5 amps rating; 125 v max; 1-1/4 in. lg o/a; Mfr 71400 part no. MDX5	5-80
F1502	FUSE, CARTRIDGE: MIL-F-15160 type F02B125V3AS	5-80
F1503	FUSE, CARTRIDGE: MIL-F-15160 type F02B125V1 1-2AS	5-80
F1504	FUSE, CARTRIDGE: MIL-F-15160 type F02A250V1-2AS	5-80
F1505	FUSE, CARTRIDGE: MIL type F03A250V15A	5-80
F1506	FUSE, CARTRIDGE: MIL-F-15160 type F02A250V1-4AS	5-80
F1507	FUSE, CARTRIDGE: 250 v, 0.175 amps; glass case, 0.250 in. dia by 1-1/4 in. lg; Mfr 71400 part no. AGC175-1000	5-80
F1508	FUSE, CARTRIDGE: MIL-F-15160 type F02B250V3-4AS (SPARE)	5-80
H1501	NUT, SLEEVE: Aluminum; tapped no. 6-32 thd. 0.375 in. lg ea end; 0.094 in. h head; 0.433 in. hex by 3.016 in. lg o/a dim.; Mfr 13499 part no. 015-0555-00	5-82
H1502	BRACKET, MOUNTING: Accommodate CP70 capacitors; MIL type CP07SB5	5-81
H1503	BRACKET, MOUNTING: Accommodate CP70 capacitors; MIL type CP07SB4	5-81
H1504	WASHER, KEY: For toggle switch, 0.484 in. id, 0.719 in. od, 0.032 in. thk; Mfr 13499 part no. 139-0261-00	5-80
H1505	BOOT, DUST AND MOISTURE SEAL: MIL type MILB5423-2	5-80
H1506	NOT USED	
H1507	NOT USED	
H1508	WASHER, FLAT: Cres 0.127 in. id, 0.250 in. od, 0.033 in. thk; Mfr 13499 part no. 553-1854-002	5-80
H1509	NUT, PLAIN, KNURLED: Brass, nickel plated; 3/8-32NF-2 thd; 0.094 in. h, 0.052 in. w, 0.515 in. od, 0.437 in. dia small end; Mfr 13499 part no. 503-8686-002	5-80
H1510	WASHER, FLAT: Stainless steel, passivate finish; 0.250 in. dia rd hole; 0.406 in. dia, 0.025 in. thk; Mfr 13499 part no. 506-5173-002	5-81
H1511	POST, SPACING: Aluminum; chromate dip; #6-32 thd; 0.375 in. lg; Mfr 13499 part no. 540-9205-003	5-82
H1512	POST: Aluminum, chromate dip. 0.375 in. od, 0.089 in. thk; 0.750 in. lg; no. 10 screw size; Mfr 13499 part no. 541-6141-002	5-82
H1513	SCREW, EXTERNALLY RELIEVED BODY: Cres; 0.406 in. dia by 0.218 in. h fillister head; 1/4-20 thd, 15/32 in. lg; 1.468 in. lg o/a; Mfr 13499 part no. 553-2114-002	5-81
H1514	NOT USED	

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY, PP-2702/URC-9 (AN/URC-9, -9A ONLY) (Continued)		
H1515	POST, ELECTRICAL-MECHANICAL EQUIPMENT: Aluminum alloy; 0.312 in. w across flats by 1.600 in. lg o/a dim.; Mfr 13499 part no. 553-2225-002	5-82
H1516	SCREW, CAP, HEXAGON HEAD: Cres; 1/4-20UNC-2A thd, 1-1/4 in. lg; Mfr 13499 part no. 553-2227-002	5-80
H1517	NOT USED	
H1518	CLAMP, LOOP: Nylon; accommodates 0.42 in. dia component; 0.38 in. w, 0.045 in. thk material; MIL type MS25281-7P	5-82
H1519	NOT USED	
H1520	COLLAR, SHAFT: Cres; 0.625 in. dia by 0.125 in. lg o/a dim.; Mfr 13499 part no. 553-2224-002	5-80
H1521	WASHER, SEALING: Synthetic rubber and steel; 0.280 in. id, 0.516 in. od, 0.054 in. thk; Mfr 86579 part no. 110 1-4CADPL	5-80
H1522	POST: Aluminum, chromate dipped; 6-32NC-2 thd; 1/4 in. w across flats, 5/8 in. h o/a; Mfr 13499 part no. 540-9213-003	5-82
I1501	LAMP, INCANDESCENT: MIL-L-6363 type MS25237-327	5-80
L1501	REACTOR: 4 henries inductance, 400 ma dc current, 55 ohms dc res, 150 v, 110 to 130 to 800 cps; 3.062 in. by 3.562 in. by 4.375 in. o/a dim; Mfr 97965 part no. 21913	5-81
L1502	REACTOR: Same as L1501	5-81
L1503	REACTOR: 6 henries inductance; 150 ma dc current; 100 ohms dc res, 75 v, 110 to 130 to 800 cps; 2.125 in. by 2.750 in. by 3.375 in. o/a dim.; Mfr 97965 part no. 21914	5-81
L1504	REACTOR: Same as L1503	5-81
01501	GASKET: MIL-P-5516 type AN6227-7	5-80
01502	GASKET: MIL-P-5516 type AN6227-5	5-80
01503	GASKET: Synthetic rubber; 10.142 in. dia aperture, 10.562 in. od, 0.210 in. thk; Mfr 13499 part no. 200-1600-00	5-82
01504	NOT USED	
01505	GASKET: Rubber; 0.062 in. by 1.093 in. by 2.156 in. o/a dim.; Mfr 13499 part no. 553-2108-002	5-80
01506	KNOB: Setscrew type; rd w/bar face, plain gripping surface; zinc alloy body; 15/16 in. od, 3/4 in. thk o/a; Mfr 81183 part no. 15015	5-80
01507	BRACKET, LOCK: Aluminum; 11/16 in. by 15/16 in. by 3 in.; including post; Mfr 13499 part no. 593-7793-002	5-81
01508	BRACKET, MOUNTING: Cres; 0.671 in. by 0.875 in. by 1-5/32 in.; black enamel finish; Mfr 13499 part no. 593-1404-002	5-82
01509	BUSHING, EXTRACTOR: Beryllium copper; 0.875 in. by 1-1/8 in. by 2-5/8 in.; Mfr 13499 part no. 593-1429-003	5-82
P1501	CONNECTOR, PLUG, ELECTRICAL: Aluminum body, plastic insert, 20 copper male contacts; 1300 v; 1.390 in. by 1.687 in. by 3.375 in. o/a dim.; Mfr 71468 part no. DPDF20-34PILPOSNA101	5-82
R1501	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF474K	5-82
R1502	RESISTOR, FIXED, COMPOSITION: Same as R1501	5-82
R1503	RESISTOR, FIXED, COMPOSITION: Same as R1501	5-82

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY, PP-2702/URC-9 (AN/URC-9, -9A ONLY) (Continued)		
R1504	RESISTOR, FIXED, COMPOSITION: Same as R1501	5-82
R1505	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RW33V102	5-82
R1506	RESISTOR, VARIABLE: Wirewound power type; 500 ohms ±10%, 25 w; Mfr 12697 part no. CM25550	5-80
R1507	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF334K	5-82
R1508	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RW29V121	5-82
R1509	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF301J	5-83
S1501	SWITCH, TOGGLE: MIL-S-3950A type SM35059-23	5-81
S1502	SWITCH, TOGGLE: Same as S1501	5-81
S1503	SWITCH, TOGGLE: 4 pst; lever up, off; lever down, on; Mfr 15605 part no. 7661K6	5-80
T1501	TRANSFORMER, POWER STEP-DOWN AND STEP-UP: 115 v; primary; 300 vdc, 26.5 vdc secondaries; 4 in. by 4.687 in. by 5.499 in. o/a dim.; Mfr 97965 part no. 24565	5-81
T1502	TRANSFORMER, POWER STEP-DOWN AND STEP-UP: 115 v primary; 155 vdc at 150 ma and 6.7 vac at 13 amps secondary, 50 to 60 to 400 cps; 3.062 in. by 3.562 in. by 4.500 in. o/a dim.; Mfr 97965 part no. 31793	5-81
TB1501	TERMINAL BOARD: 0.282 in. by 1.500 in. by 3.000 in. o/a dim.; incl 4 terminals; Mfr 13499 part no. 593-7804-002	5-82
TB1502	TERMINAL BOARD: 0.282 in. by 1.500 in. by 3.000 in. o/a dim.; incl 4 terminals; Mfr 13499 part no. 593-7805-002	5-82
TB1503	TERMINAL BOARD: 0.437 in. by 1.750 in. by 3.875 in. o/a dim.; incl 8 terminals; Mfr 13499 part no. 593-7800-002	5-82
XF1501	FUSEHOLDER: c/o four extractor post type fuseholders inclosed in phenolic; accommodates four cartridge type fuses, 1/4 in. dia by 1-1/4 in. lg; 300 vdc at 0.5 amps, 26 vdc at 30 amps; 1.125 in. by 2.093 in. by 2.280 in. o/a; Mfr 75915 part no. 340129	5-80
XF1502	FUSEHOLDER: Same as XF1501	5-80
XI1501	LIGHT, INDICATOR: Supplied with lens; 7/16 in. dia; nylon clear smooth face frosted back, flange mtd lens holder, nickel plated; Mfr 99707 part no. L1020R	5-80
POWER SUPPLY PP-4706/URC-9Y (AN/URC-9Y ONLY)		
2A5	POWER SUPPLY PP-4706/URC-9Y; Mfr 89114 part no. 717-D10050	5-84
2A5A1	REGULATOR MODULE: Mfr 89114, part no. 717-C10149	5-85
2A5A2	FREQUENCY CONTROL ASSEMBLY: Mfr 89114 part no. 717-C10214	5-85
2A5A3	RECTIFIER MODULE: Mfr 89114 part no. 717-C10280	5-85
2A5A4	FILTER MODULE: Mfr 89114 part no. 717-C10083	5-85
2A5B1	BLOWER: 115 volts, single phase, 50 to 60 Hz operation; 14.7 PSIA model ORFP, type DK1504, series 92AS; Prime Contractor 89114 part no. 717-B10480	5-85
2A5CR1	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N249B	5-85
2A5CR2	Same as 2A5CR1	5-85

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY PP-4706/URC-9Y (AN/URC-9Y ONLY) (Continued)		
2A5CR3	Same as 2A5CR1	5-85
2A5CR4	Same as 2A5CR1	5-85
2A5C1	CAPACITOR, FIXED: MIL type CK63AY103K	5-86
2A5C2	Same as 2A5C1	5-86
2A5C3	CAPACITOR, FIXED: MIL type CH70EINE805M	5-85
2A5C4	CAPACITOR, FIXED: MIL type CP69B1EF105K1	5-85
2A5C5	Same as 2A5C4	5-85
2A5C6	Same as 2A5C3	5-85
2A5C7	Same as 2A5C3	5-85
2A5C8	CAPACITOR, FIXED: MIL type CH70EIMV156M	5-85
2A5C9	Same as 2A5C1	5-85
2A5C10	Same as 2A5C1	5-85
2A5F1	FUSE, CARTRIDGE: MIL type F02A20ROAS	5-84
2A5F2	Same as 2A5F1	5-84
2A5F3	FUSE, CARTRIDGE: 0.175 amp, 250 v; Mfr 75915, part no. 3AG175MA250V	5-84
2A5F4	FUSE, CARTRIDGE: MIL type F02A250V1/4A	5-84
2A5I1	LAMP, INDICATOR: MIL Standard MS25237-327	5-84
2A5J1	CONNECTOR, RECEPTACLE, ELECTRICAL: 15 female contacts; Mfr 89114, part no. 717-B10484	5-86
2A5J2	Same as 2A5J1	5-86
2A5J3	Same as 2A5J1	5-86
2A5J4	Same as 2A5J1	5-86
2A5L1	COIL, FILTER: 1 hy; Mfr 89114 part no. 717-C10346-1	5-86
2A5L2	COIL, FILTER: 2.5 hy; Mfr 89114 part no. 717-C10346-2	5-86
2A5P1	CONNECTOR, PLUG, ELECTRICAL: Aluminum body, plastic insert, 20 copper male contacts; 1300 v; 1.390 in. by 1.687 in. by 3.375 in. o/a dim.; Mfr 71468 part no. DPDF20-34PILPOSNA101	5-86
2A5P2	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL Standard MS3102R20-24P	5-84
2A5Q1	TRANSISTOR: MIL type 2N1485	5-86
2A5Q2	TRANSISTOR: MIL type 2N2152A	5-86
2A5Q3	Same as 2A5Q1	5-86
2A5Q4	Same as 2A5Q2	5-86
2A5Q5	TRANSISTOR: MIL type 2N2154A	5-86
2A5Q6	Same as 2A5Q5	5-86
2A5R1	RESISTOR, FIXED: MIL type RC20GF050J	5-86
2A5R2	RESISTOR, FIXED: MIL type RW31VR10	5-86
2A5R3	Same as 2A5R2	5-86
2A5R4	RESISTOR, FIXED: MIL type RC20GF221K	5-86
2A5R5	Same as 4A5R4	5-86
2A5R6	Same as 2A5R1	5-86
2A5R7	RESISTOR, VARIABLE: 500 ohm +10%, 25w; Mfr 12697 part no. CM25550	5-84
2A5R8	RESISTOR, FIXED: MIL type RC32GF100K	5-86
2A5R9	RESISTOR, FIXED: MIL type RC32GF474K	5-86
2A5R10	Same as 2A5R9	5-86

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY PP-4706/URC-9Y (AN/URC-9Y ONLY) (Continued)		
2A5R11	RESISTOR, FIXED: MIL type RW33V102	5-85
2A5R12	RESISTOR, FIXED: MIL type RW59G181	5-86
2A5R13	Same as 2A5R12	5-86
2A5S1	SWITCH, TOGGLE: MIL Standard MS35059-22	5-84
2A5T1	TRANSFORMER: Mfr 89114 part no. 717-C10357	5-85
2A5XF1	FUSEHOLDER, EXTRACTOR: Mounts four 1-1/4 in. by 1/4 fuses (2A5F1 through 2A5F4); 300 vdc, 0.5 amp or 26 vdc, 30 amps; Mfr 75915 part no. 340129; Prime contractor 89114 part no. 717-B2730	5-84
2A5X11	LIGHT, INDICATOR: Panel mounting indicator light, freeze and oil resistant, "O" ring seal; red lens; Mfr 81640 part no. L1025R-GR	5-84
PP-4706/URC-9Y REGULATOR MODULE		
2A5A1		
CR1	SEMICONDUCTOR DEVICE: DIODE: JAN type 1N277	5-87
CR2	Same as CR1	5-87
CR3	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N538	5-87
CR4	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N758A	5-87
C1	CAPACITOR, FIXED: MIL type CL25BJ180TP3	5-87
C2	CAPACITOR, FIXED: MIL type CK63AY103K	5-87
C3	Same as C1	5-87
C4	Same as C2	5-87
P1	CONNECTOR, PLUG, ELECTRICAL: 15 male contacts; Mfr 71468, part no. DAM-15P	5-87
Q1	TRANSISTOR: JAN type 2N697	5-87
Q2	TRANSISTOR: JAN type 2N396A	5-87
Q3	Same as Q2	5-87
Q4	Same as Q2	5-87
R1	RESISTOR, FIXED: MIL type RC20GF161J	5-87
R2	RESISTOR, FIXED: MIL type RC20GF472J	5-87
R3	RESISTOR, FIXED: MIL type RC20GF123K	5-87
R4	RESISTOR, FIXED: MIL type RC20GF122K	5-87
R5	Same as R4	5-87
R6	Same as R4	5-87
R7	RESISTOR, FIXED: MIL type RC20GF391J	5-87
R8	Same as R4	5-87
R9	RESISTOR, FIXED: MIL type RC20GF471K	5-87
R10	Same as R9	5-87
R11	Same as R9	5-87
R12	RESISTOR, FIXED: MIL type RN65B1541F	5-87
R13	RESISTOR, FIXED: MIL type RN65B1101F	5-87
R14	RESISTOR, VARIABLE: MIL type RV6LAYSA501A	5-87
R15	Same as R4	5-87
TP1	TEST POINT: MIL Standard MS16108-2A (RED)	5-87

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
PP-4706/URC-9Y REGULATOR MODULE (Continued)		
TP2	TEST POINT: MIL Standard MS16108-5A (GREEN)	5-87
TP3	TEST POINT: MIL Standard MS16108-8A (YELLOW)	5-87
TP4	Same as TP3	5-87
PP-4706/URC-9Y FREQUENCY CONTROL ASSEMBLY		
2A5A2		
CR1	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N538	5-88
CR2	Same as CR1	5-88
CR3	Same as CR1	5-88
C1	CAPACITOR, FIXED: MIL type CL25BJ180TP3	5-88
P1	CONNECTOR, PLUG, ELECTRICAL: 15 male contacts; Mfr 71468 part no. DAM-15P	5-88
Q1	TRANSISTOR: JAN type 2N1480	5-88
Q2	TRANSISTOR: JAN type 2N1671	5-88
R1	RESISTOR, FIXED: MIL type RC20GF272J	5-88
R2	RESISTOR, FIXED: MIL type RC20GF560J	5-88
R3	RESISTOR, FIXED: MIL type RC20GF150J	5-88
R4	RESISTOR, FIXED: MIL type RC20GF330J	5-88
R5	RESISTOR, FIXED: MIL type RC20GF224J	5-88
TP1	TEST POINT: MIL Standard MS16108-2A (RED)	5-88
T1	TRANSFORMER: Mfr 89114 part no. 717-D70225	5-88
PP-4706/URC-9Y RECTIFIER MODULE		
2A5A3		
CR1	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N540	5-89
CR2	Same as CR1	5-89
CR3	Same as CR1	5-89
CR4	Same as CR1	5-89
CR5	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N538	5-89
CR6	Same as CR5	5-89
CR7	Same as CR5	5-89
CR8	Same as CR5	5-89
CR9	Same as CR5	5-89
CR10	Same as CR5	5-89
C1	CAPACITOR, FIXED: MIL type CH05A1NC205M	5-89
C2	CAPACITOR, FIXED: MIL type CL25BJ180TP3	5-89
C3	Same as C2	5-89
P1	CONNECTOR, PLUG, ELECTRICAL: 15 male contacts; Mfr 71468 part no. DAM-15	5-89
R1	RESISTOR, FIXED: MIL type RC20GF474K	5-89
TP1	TEST POINT: MIL Standard MS16108-2A (RED)	5-89
TP2	TEST POINT: MIL Standard MS16108-5A (GREEN)	5-89
TP3	Same as TP2	5-89
TP4	Same as TP2	5-89

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
PP-4706/URC-9Y FILTER MODULE		
2A5A4		
CR1	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N752A	5-90
CR2	SEMICONDUCTOR DEVICE, DIODE: JAN type 1N758A	5-90
CR3	Same as CR2	5-90
C1	CAPACITOR, FIXED: MIL type CH05A1NE105M	5-90
C2	Same as C1	5-90
C3	CAPACITOR, FIXED: MIL type CH05A1NC205M	5-90
C4	CAPACITOR, FIXED: MIL type CM05D271J3	5-90
P1	CONNECTOR, PLUG, ELECTRICAL: 15 male contacts; Mfr 71468 part no. DAM-15	5-90
Q1	TRANSISTOR: JAN type 2N297A	5-89
Q2	Same as Q1	5-90
Q3	Same as Q1	5-90
Q4	TRANSISTOR: JAN type 2N390A	5-90
Q5	TRANSISTOR: JAN type 2N718A	5-90
Q6	TRANSISTOR: JAN type 2N404	5-90
Q7	Same as Q5	5-90
Q8	TRANSISTOR: JAN type 2N396A	5-90
R1	RESISTOR, FIXED: MIL type RC20GF220K	5-90
R2	RESISTOR, FIXED: MIL type RC20GF332K	5-90
R3	RESISTOR, FIXED: MIL type RC20GF200K	5-90
R4	RESISTOR, FIXED: MIL type RC32GF474K	5-90
R5	RESISTOR, FIXED: MIL type RC20GF152K	5-90
R6	RESISTOR, FIXED: MIL type RC20GF474K	5-90
R7	RESISTOR, FIXED: MIL type RC20GF821K	5-90
R8	RESISTOR, FIXED: MIL type RC42GF120K	5-90
R9	RESISTOR, FIXED: MIL type RC20GF102K	5-90
TP1	TEST POINT: MIL Standard MS16108-2A (RED)	5-90
TP2	TEST POINT: MIL Standard MS16108-5A (GREEN)	5-90
TP3	TEST POINT: MIL Standard MS16108-8A (YELLOW)	5-90
POWER SUPPLY PP-4706A/URC-9Y (AN/URC-9AY ONLY)		
2A1900 (1901-1999)	POWER SUPPLY PP-4706A/URC-9Y: Mfr 98738 part no. 60A218475	5-91
A1901	SEMICONDUCTOR MODULE: Mfr 98738 part no. 48A232173	5-94
A1902	RESISTOR AND CAPACITOR MODULE: Mfr 98738 part no. 01A232182	5-95
A1903	FILTERING BIAS MODULE: Mfr 98738 part no. 08A233187	5-96
A1904	POWER SUPPLY MODULE: Mfr 98738 part no. 01A232203	5-97
B1901	BLOWER: 115 vac, 400 Hz, single phase, 11,000 rpm; continuous duty; Mfr 25140 part no. 19A1922	5-92
C1902	CAPACITOR, FIXED, PAPER DIELECTRIC: 10 uf ±20%, 200 vdc; Mfr 56289 part no. 118P10602S2	5-93
C1904	CAPACITOR, FIXED, PAPER DIELECTRIC: 2 uf ±20%, 200 vdc; Mfr 56289 part no. 118P10502S2	5-93

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY PP-4706A/URC-9Y (AN/URC-9AY ONLY) (Continued)		
C1907	CAPACITOR, FIXED, PAPER DIELECTRIC: 1 uf ±20%, 600 vdc; Mfr 56289 part no. 118P10506S2	5-93
C1909	CAPACITOR, FIXED, ELECTROLYTIC: 4 uf ±15%, 450 vdc; Mfr 01002 part no. 29F2263	5-93
C1912	Same as C1909	5-93
C1913	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965 type CL34BS040LP3	5-93
C1914	Same as C1907	5-93
C1915	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965 type CL34B120LP3	5-93
CR1901	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N1186	5-93
CR1914	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N250B	5-93
CR1915	Same as CR1914	5-93
CR1916	Same as CR1914	5-93
CR1917	Same as CR1914	5-93
DS1901	LAMP, INCANDESCENT: MIL type MS25237-327	5-91
E1905	INSULATOR, STANDOFF: Teflon insulated, brass, gold plated, terminal; Mfr 04867 part no. TS-231-8F	5-93
E1906	Same as E1905	5-93
E1917	Same as E1905	5-93
E1918	Same as E1905	5-93
E1924	Same as E1905	5-93
E1925	Same as E1905	5-93
E1957	Same as E1905	5-93
E1958	Same as E1905	5-93
E1959	Same as E1905	5-93
E1960	Same as E1905	5-93
E1961	Same as E1905	5-93
E1962	Same as E1905	5-93
E1963	Same as E1905	5-93
E1964	Same as E1905	5-93
E1965	Same as E1905	5-93
E1967	Same as E1905	5-93
E1968	Same as E1905	5-93
E1969	Same as E1905	5-93
E1970	Same as E1905	5-93
E1971	Same as E1905	5-93
E1972	Same as E1905	5-93
E1973	TERMINAL, STUD: Brass, Polytetrafluorathylene; Mfr 98291 part no. RST-SM-1B2-WHT	5-93
E1974	Same as E1973	5-93
E1975	Same as E1973	5-93
E1976	Same as E1973	5-92
E1977	TERMINAL LUG: Brass, Hot tin dip; Mfr 79663 part no. 29	5-92
E1978	Same as E1977	5-92
E1979	Same as E1977	5-92

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY PP-4706A/URC-9AY (AN/URC-9AY ONLY) (Continued)		
E1980	TERMINAL, LUG: Bronze; Mfr 78189 part no. 2104-06-00	5-93
F1901	FUSE, CARTRIDGE: Plastic or ceramic case, bright alloy plated ferrules, 125 vdc, 25 amps, 0.250 in. dia, 1.250 in. lg o/a; Mfr 71400 part no. ABC25AMP125V	5-91
F1902	FUSE, CARTRIDGE: MIL-F-15160 type F02A32V15A	5-91
F1903	FUSE, CARTRIDGE: MIL-F-15160 type F02A250V5AS	5-91
F1904	FUSE, CARTRIDGE: MIL-F-15160 type F02A250X1-2A	5-91
F1905	FUSE, CARTRIDGE: Silver plated ferrules, glass case; 250 vdc, 0.175 amps; 0.250 in. dia., 1-1/4 in. lg o/a, Mfr 71400 part no. AGC175-1000	5-91
F1906	FUSE, CARTRIDGE: MIL-F-15160 type F02A250V1-4A	5-91
F1907	FUSE, CARTRIDGE: MIL-F-15160 type F02B32V5A	5-91
FL1901	FILTER, RADIO, INTERFERENCE: 250 vac or 400 vdc; 50 amp max.; 0.22 uf; 3.188 in. by 0.875 in. o/a; Mfr 56289 part no. JN17-936B1	5-92
FL1902	Same as FL1901	5-92
J1901	CONNECTOR, RECEPTACLE, ELECTRICAL: MIL type MS3102R20-24P	5-91
J1092	CONNECTOR, RECEPTACLE, ELECTRICAL: Aluminum body; plastic insert, 20 male contacts, 1.390 in. by 1.687 in. by 3.375 in. o/a; Mfr 71468 part no. DPDF20-34PILPOSNA101	5-93
J1903	CONNECTOR, RECEPTACLE, ELECTRICAL: 14 male contacts, Polarizing pin and socket, 0.440 in. by 0.750 in. by 1.250 in. lg; Mfr 80586 part no. GM-14M-79	5-93
J1904	Same as J1903	5-93
J1905	Same as J1903	5-93
J1906	Same as J1903	5-93
L1901	REACTOR: 11 MH min at 5V, 3000 Hz, 350 MA DC, 2 ohms max DC resistance; Mfr 98738 part no. 25N231163	5-92
L1902	Same as L1901	5-92
L1903	REACTOR: 50 MH min at 5V, 3000 Hz, 14 amp DC, .05 ohms max DC resistance; Mfr 98738 part no. 25N231163	5-92
L1904	Same as L1903	5-92
Q1901	TRANSISTOR: EIA type 2N2079A	5-92
Q1902	Same as Q1901	5-92
Q1903	TRANSISTOR: EIA type 2N2769	5-92
Q1904	Same as Q1903	5-93
Q1905	TRANSISTOR: MIL-S-19500 type JAN 2N1490	5-93
Q1906	Same as Q1905	5-92
Q1907	TRANSISTOR: MIL-S-19500 type JAN 2N1011	5-92
Q1908	Same as Q1907	5-93
Q1909	TRANSISTOR: EIA type 2N2075	5-92
Q1910	Same as Q1907	5-92
R1901	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RE70G3R32	5-92
R1902	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RE70G1R00	5-92
R1905	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RWP21FR100F	5-93
R1906	Same as R1905	5-93

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
POWER SUPPLY PP-4706A/URC-9Y (AN/URC-9AY ONLY) (Continued)		
R1907	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RE70G8R06	5-92
R1908	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RC70G2R49	5-92
R1913	RESISTOR, VARIABLE, WIREWOUND: Power type, 500 ohms ±10%, 25 w; Mfr 12697 part no. CM25550	5-91
R1921	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RE70G100	5-92
R1922	Same as R1905	5-93
R1923	Same as R1905	5-93
S1901	SWITCH, TOGGLE: MIL type MS25307-222	5-91
T1901	TRANSFORMER, POWER, STEP-DOWN AND STEP-UP: Primary 36V rms, 7.8 amps, 1475 ±125 Hz sine wave input; secondary No. 1, 340V rms, 0.310 amp, secondary No. 2, 151V rms, .2 amp; secondary No. 3, 8.6V rms, 14.2 amps, continuous duty; Mfr 98738 part no. 25N230159	5-92
T1902	TRANSFORMER, POWER, STEP-DOWN; Primary 35V rms, 0.225 amp, 1475 ±125 Hz, sine wave input; secondary 10.6V rms. 0.71 amp; continuous duty; Mfr 98738 part no. 25N230160	5-92
T1903	TRANSFORMER, POWER, STEP-DOWN AND STEP-UP: Primary 41.2V rms, 4.75 amps, 53 (+12 -3) Hz, sine wave input; secondary No. 1, 110V rms, 1.4 amp, secondary No. 2, 25.4V rms, 0.88 amps; continuous duty; Mfr 98738 part no. 25N230157	5-92
T1904	TRANSFORMER, POWER, STEP-DOWN: Primary 41.2Vrms 0.55 amp max, 53 (+12 -3) Hz sine wave input; secondary No. 1, 9.8V rms, 0.85 amp, secondary No. 2, 9.1V rms, 0.80 amp, continuous duty; Mfr 98738 part no. 25N230158	5-92
XDS1901	LAMP HOLDER, Supplied with lens and mounting nut; brass, can. plated, grounding lug; internal tooth lock washer; 1-5/16 in. by 9/16 in. o/a; Mfr 81640 part no. L1025R-GR	5-91
XF1901	FUSE HOLDER: C/O four extractor post type fuse-holder inclosed in phenolic, accommodates four cartridge type fuses; 1.125 in. by 2.093 in. by 2.280 in. o/a; Mfr 75915 part no. 340129	5-91
XF1902	Same as XF1901	5-91
PP-4706A/URC-9Y SEMICONDUCTOR MODULE		
A1901		
CR1902	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N614	5-94
CR1903	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N2972B	5-94
CR1904	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N2975B	5-94
CR1919	Same as CR1902	5-94
CR1920	Same as CR1902	5-94
CR1921	Same as CR1902	5-94
CR1922	Same as CR1902	5-94
CR1923	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3002B	5-94
CR1924	Same as CR1923	5-94
P1903	CONNECTOR, PLUG, ELECTRICAL: 14 male contacts, polarizing pins and socket; 0.44 in. by 0.75 in. by 1.250 in. o/a; Mfr 97954 part no. M114MSDM40	5-94

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
PP-4706A/URC-9Y SEMICONDUCTOR MODULE (Continued)		
TP1910	JACK TIP: Mfr 98291 part no. SKT-5BC (RED)	5-94
TP1911	JACK TIP: Mfr 98291 part no. SKT-5BC (BRN)	5-94
PP-4706A/URC-9Y RESISTOR AND CAPACITOR MODULE		
A1902		
C1901	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965 type CL25BJ600UP3	5-95
C1903	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965 type CL25BE401UP3	5-95
C1906	CAPACITOR, FIXED, ELECTROLYTIC: MIL-C-3965 type CL25BQ010UP3	5-95
C1910	CAPACITOR, FIXED, ELECTROLYTIC: 4 uf ±15%, 450 vdc; Mfr 01002, part no. 29F2293	5-95
C1911	Same as C1910	5-95
E1901	TERMINAL, STUD: Brass, polytetraflourethylene; Mfr 98291 part no. RST-SM-1B2 WHT	5-95
E1902	Same as E1901	5-95
E1903	Same as E1901	5-95
E1904	Same as E1901	5-95
E1907	Same as E1901	5-95
E1908	Same as E1901	5-95
E1909	Same as E1901	5-95
E1911	Same as E1901	5-95
E1912	Same as E1901	5-95
E1913	Same as E1901	5-95
E1914	Same as E1901	5-95
E1915	Same as E1901	5-95
E1916	Same as E1901	5-95
E1921	Same as E1901	5-95
E1922	Same as E1901	5-95
E1923	Same as E1901	5-95
E1924	Same as E1901	5-95
P1904	CONNECTOR, PLUG, ELECTRICAL: 14 male contacts, polarizing pins and socket; 0.44 in. by 0.75 in. by 1.250 in o/a; Mfr 97954 part no. M114 MSDM40	5-95
R1903	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RWP21F3110F	5-95
R1904	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC20GF201K	5-95
R1909	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RWP21F23R2F	5-95
R1910	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF102J	5-95
R1920	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF101K	5-95
TP1908	JACK TIP: Mfr 98291 part no. SKT-5BC (BLK)	5-95
TP1909	JACK TIP: Mfr 98291 part no. SKT-5BC (RED)	5-95
PP-4706A/URC-9Y FILTER BIAS MODULE		
A1903		
C1908	CAPACITOR, FIXED, MICA DIELECTRIC: MIL-C-5 type CM35BC822J03	5-96
CR1906	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3191	5-96

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
PP-4706A/URC-9Y FILTER BIAS MODULE (Continued)		
CR1907	Same as CR1906	5-96
CR1908	Same as CR1906	5-96
CR1909	Same as CR1906	5-96
CR1910	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N560	5-96
CR1911	Same as CR1910	5-96
CR1912	Same as CR1910	5-96
CR1913	Same as CR1910	5-96
CR1918	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N2975BR	5-96
E1927	TERMINAL STUD: Brass, polytetrafluorethylene, Mfr 98291 part no. RST-SM-1B2 WHT	5-96
E1928	Same as E1927	5-96
E1929	Same as E1927	5-96
E1930	Same as E1927	5-96
E1931	Same as E1927	5-96
E1932	Same as E1927	5-96
E1933	Same as E1927	5-96
E1934	Same as E1927	5-96
E1935	Same as E1927	5-96
E1936	Same as E1927	5-96
E1937	Same as E1927	5-96
E1938	Same as E1927	5-96
E1939	Same as E1927	5-96
E1940	Same as E1927	5-96
E1941	Same as E1927	5-96
E1942	Same as E1927	5-96
E1944	Same as E1927	5-96
E1945	Same as E1927	5-96
E1946	Same as E1927	5-96
E1947	Same as E1927	5-96
E1948	Same as E1927	5-96
P1905	CONNECTOR, PLUG, ELECTRICAL: 14 male contacts, polarizing pins and socket; 0.44 in. by 0.75 in. by 1.250 in. o/a; Mfr 97954 part no. M114MSDM40	5-96
R1914	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC32GF151K	5-96
R1915	RESISTOR, FIXED, WIREWOUND: 47,000 ohms ±1%, 6.5 w; Mfr 91637 part no. RS5	5-96
R1916	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RE70G1001	5-96
R1917	RESISTOR, FIXED, COMPOSITION: MIL-R-11 type RC42GF334K	5-96
R1918	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RE70G1210	5-96
TP1905	JACK TIP: Mfr 98291 part no. SKT-5BC (BRN)	5-96
TP1906	JACK TIP: Mfr 98291 part no. SKT-5BC (BLU)	5-96
TP1907	JACK TIP: Mfr 98291 part no. SKT-5BC (YL)	5-96

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
PP-4706A/URC-9Y POWER SUPPLY MODULE		
A1904		
C1905	CAPACITOR, FIXED, PAPER DIELECTRIC: 33 uf ±20%, 600 vdc; Mfr 56289 part no. 118P33406S2	5-97
CR1905	SEMICONDUCTOR DEVICE, DIODE: MIL type 1N3189	5-97
E1949	TERMINAL, STUD: Brass, polytetrafluorethylene; Mfr 98291 part no. RST-SM-1B2 WHT	5-97
E1950	Same as E1949	5-97
E1951	Same as E1949	5-97
E1952	Same as E1949	5-97
E1953	Same as E1949	5-97
E1954	Same as E1949	5-97
E1955	Same as E1949	5-97
E1956	Same as E1949	5-97
L1902	REACTOR, 11 MH min. at 5V, 3000 Hz, 350 ma DC, 2 Ohms max DC; resistance; Mfr 98738 part no. 25N230162	5-97
P1906	CONNECTOR, PLUG, ELECTRICAL: 14 male contacts; polarizing pins and socket; 0.44 in. by 0.75 in. by 1.250 in. o/a; Mfr 97954 part no. M114MSDM40	5-97
Q1911	TRANSISTOR: MIL-S-19500 type JAN 2N1490	5-97
Q1912	Same as Q1911	5-97
R1911	RESISTOR, FIXED, COMPOSITION: MIL-R-26 type RC32GF6R8J	5-97
R1912	RESISTOR, FIXED, WIREWOUND: MIL-R-26 type RWP21F5110F	5-97
R1919	RESISTOR, FIXED, WIREWOUND: MIL-R-18546 type RE70G2320	5-97
T1905	TRANSFORMER, POWER, STEP-DOWN AND STEP-UP: Primary 42.5V rms, 0.86 amp, 395 (+55 -25) Hz sine wave input; secondary No. 1, 5.25V rms, 0.09 amp; secondary No. 2, 111.5V rms, 0.29 amp, continuous duty; Mfr 98738 part no. 25N230161	5-97
TP1901	JACK TIP: Mfr 98291 part no. SKT-5BC (BRN)	5-97
TP1902	JACK TIP: Mfr 98291 part no. SKT-5BC (RED)	5-97
TP1903	JACK TIP: Mfr 98291 part no. SKT-5BC (ORN)	
TP1904	JACK TIP: Mfr 98291 part no. SKT-5BC (YL)	5-97
AN/URC-9( ) CABLE ASSEMBLIES AND INSTALLATION KIT		Table
1A4	INSTALLATION KIT ELECTRONIC EQUIPMENT: MK-620/UR incl 2 mtg angles and 12 screws in bag; Mfr 13499 part no. 593-8149-00	1-4
1W1	CABLE ASSEMBLY, POWER ELECTRICAL (AN/URC-9, 9A ONLY); CX-7258/U (10 ft 6 in.) 3 conductors, No. 16 AWG; 600v; terminated ea end w/connector; 10 ft 6 in. lg o/a; C/O P1905, and P1906; Mfr 13499 part no. 593-7852-002	1-4
1W1	CABLE ASSEMBLY, POWER ELECTRICAL (AN/URC-9Y, -9AY ONLY): CX-10332/URC-9Y	1-4
1W2	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: CX-7259/U; 5 conductors, no. 22 awg, stranded, plastic insulation; terminated ea end w/connector; 5 ft lg o/a; C/O P1907 and P1908; Mfr 13499 part no. 593-7858-003	1-4

Table 6-5. Maintenance Parts List (Continued)

REF DESIG	NAME AND DESCRIPTION	FIG NO.
AN/URC-9( )	CABLE ASSEMBLIES AND INSTALLATION KIT (Continued)	Table
1W3	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: CX-8521/URC-9; 32 conductors, no. 26 AWG, 1 conductor, no. 22 AWG; rubber jacket; 25 ft 0.500 in. lg o/a; terminated one end w/2 plug connectors, other end w/2 jack connectors; C/O P-1, P-2, J-1, J-2, Mfr 13499 part no. 548-9031-004	1-4
1W1605	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: CX-7300/URC-9; 23 conductors, six no. AWG, twelve no. 18 AWG, five no. 22 AWG; 3 ft lg. excl terminations; C/O P1606 & C1607; Mfr 13499 part no. 593-1515-003	1-4
1W2202	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: CX-7260/URC-9; 40 conductors terminated ea end w/one connector and one adapter; 36 in. lg o/a; C/O items C462 & C463; Mfr 13499 pt. no. 549-3384-004	1-4
J1	CONNECTOR, RECEPTACLE, ELECTRICAL: 20 female contacts; 7.5 amps, straight shape; Mfr 80586 part no. GM20F79	
J2	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as J1	
P1	CONNECTOR, RECEPTACLE, ELECTRICAL: Arc resistant plastic dielectric; Mfr 80586 part no. GM20M79	
P2	CONNECTOR, RECEPTACLE, ELECTRICAL: Same as P1	
P1606	CONNECTOR, PLUG, ELECTRICAL: Aluminum body, plastic insert, 20 copper male contacts; 1300 v; 1.390 in. by 1.687 in. by 3.375 in. o/a dim.; Mfr 71468 part no. DPDF20-34PILPOSN P/O CX-7300/URC-9	
P1607	CONNECTOR, PLUG, ELECTRICAL: Aluminum body, plastic insert, 20 female contacts; 1300 v; 1.249 in. by 1.687 in. by 3.375 in. o/a dim.; Mfr 71468 part no. DPDF20-33SICPOSN	
P1905	CONNECTOR, PLUG, ELECTRICAL: MIL type MS3108R16-10S	
P1906	CONNECTOR, PLUG, ELECTRICAL: Female contacts, 1 connector mating end; synthetic rubber dielectric; straight shape; w/enclosing shell, 1-11/32 in. lg by 1-17/32 in. lg by 1-17/32 in. dia; Mfr 74545 part no. 7567	
P1907	CONNECTOR, PLUG, ELECTRICAL: 10 female contacts; 1-9/32 in. by 3-7/32 in. o/a; Mfr 09299 part no. U77U	
P1908	CONNECTOR, PLUG, ELECTRICAL: Same as P1907	
P2201	CONNECTOR, PLUG, ELECTRICAL: 37 female contacts, 22 amps; straight shape; Mfr 71468 part no. CA2631-2874	
P2202	CONNECTOR, PLUG, ELECTRICAL: 37 female contacts, 22 amps; straight shape; Mfr 71468 part no. CA301E28-21 PME	

Table 6-6. Manufacturers Code and Name

MFR CODE	NAME	ADDRESS
00614	Leach Corp.	Compton, California
00853	Sangamo Electric Co., Pickens Division	Pickens, S.C.
01002	Capacitor Department GECO	Hudson Falls, N.Y.
01121	Allen-Bradley Co.	Milwaukee, Wisc.
01471	Thomas Industries Inc.	Fort Atkinson, Wisc.
01526	General Electric Co. Specialty Control Dept. GECO	Waynesboro, VA
01561	Chassi-Trak Corp.	Indianapolis, Inc.
01881	Anaconda American Brass Co.	Waterbury, Conn.
01939	Sprague Electric Co. of Wisconsin	Grafton, Wisc.
02114	Ferroxcube Corp. of America	Saugerties, N.Y.
02297	Ace Electronics Associates Inc.	Somerville, Mass.
02615	Nylok Corp.	Paramus, N.J.
02660	Amphenol-Borg Electronics Corp.	Broadview (Chicago) Ill.
03565	Dayton Electronic Products Co., Inc.	Dayton, Ohio
04009	Arrow-Hart and Hegeman Electric Co.	Hartford, Conn.
04221	Anemco Inc.	Mankato, Minn.
04713	Motorola Inc. Semiconductor Products Division	Phoenix, Ariz.
04773	Automatic Electric Co.	Northlake, Ill.
04867	Jones, Hiram Electronics Co.	Burbank, Calif.
05402	Controls Co. of America	Schiller Park, Ill.
06827	Goodrich, B.F. Industrial Products Co. Div. of Goodrich, B.F. Co., Akron, Ohio	Marion, Ohio
06980	Eitel-McCullough Inc.	San Carlos, Calif.
07688	Joint Electron Device Engineering Council	Washington, D.C.

Table 6-6. Manufacturers Code and Name (Continued)

MFR CODE	NAME	ADDRESS
07707	United Shoe Machinery Corp. Fastener Division	Shelton, Conn.
08664	Bristol Co., The	Waterbury, Conn.
09299	Frank Industries Division of Franklin Research and Development Corp.	Worchester, Mass.
09922	Burndy Corp.	Norwalk, Conn.
10646	Carborundum Co.	Niagara Falls, N.Y.
11453	Precision Connectors Inc.	Jamaica, N.Y.
12697	Clarostat Mfg. Co., Inc.	Dover, N.H.
13499	Collins Radio Company	Cedar Rapids, Iowa
14655	Cornell-Dublier Electric Corp.	Newark, N.J.
14674	Corning Glass Works	Corning, N.Y.
15605	Culter-Hammer Inc.	Milwaukee, Wisc.
16688	Ideal Precision Meter Co. Inc. DeJer Meter Division	Brooklyn, N.Y.
17771	Singer Co. The Diehl Division Finderne Plant	Somerville, N.J.
17875	Diehl Mfg. Co., The	Cleveland, Ohio
18911	Durant Mfg. Co.	Milwaukee, Wisc.
21335	Fafnir Bearing Co., The	New Britain, Conn.
25117	Globe Co., The	Chicago, Ill.
25140	Globe Industries, Inc., Div. of TRW	Dayton, Ohio
25472	Goodrick, B.F. Co., The	Akron, Ohio
35344	Leach Corp. Leach Relay Co. Division	Los Angeles, Calif.
44655	Ohmite Mfg. Co.	Skokie, Ill.
49671	Radio Corp. of America	New York, N.Y.

Table 6-6. Manufacturers Code and Name (Continued)

MFR CODE	NAME	ADDRESS
49956	Raytheon Co.	Lexington, Mass.
53021	Sangamo Electric Co.	Springfield, Ill.
56289	Sprague Electric Co.	North Adams, Mass.
60399	Torrington Mfg. Co.	Torrington, Conn.
70417	Amplex Div. of Chrysler Corp.	Detroit, Mich.
70674	ADC Products Inc.	Minneapolis, Minn.
70764	Wilson Fastener	Cleveland, Ohio
70998	Bird Electronic Corp.	Cleveland, Ohio
71400	Bussmann Fuse Division of McGraw-Edison, Co.	St. Louis, Mo.
71450	C.T.S. Corp.	Elkhart, Ind.
71468	I.T.T. Cannon Electric Inc.	Los Angeles, Calif.
71482	Clare, C.P. and Co.	Chicago, Ill.
71590	Centralab Division of Globe-Union Inc.	Milwaukee, Wisc.
71785	Daval Rubber Co.	Providence, R.I.
72002	Eitel-McCullough	San Bruno, Calif.
72136	Electro Motive Mfg. Co.	Willimantic, Conn.
72914	Grimes Mfg. Co.	Urbana, Ohio
72962	Elastic Stop Nut Corp. of America	Union, N.J.
72982	Erie Technological Products Inc.	Erie, Pa.
73138	Helipot Division of Beckman Instruments, Inc.	Fullerton, Calif.
73899	J.F.D. Electronics Corp.	Brooklyn, N.Y.
78468	FXR Division of Amphenol-Borg Electronics Corp.	Danbury, Conn.
75915	Littlefuse, Inc.	Des Plaines, Ill.

Table 6-6. Manufacturers Code and Name (Continued)

MFR CODE	NAME	ADDRESS
76005	Lord Mfg. Co.	Erie, Pa.
76665	National Lock Washer Co.	Newark, N.J.
76854	Oak Mfg. Co.	Crystal Lake, Ill
77523	R.B.M. Mfg Co.	Fort Wayne, Inc.
78189	Shakeproof Division of Illinois Tool Works	Elgin, Ill
78277	Sigma Instruments Inc.	S. Braintree, Mass.
78488	Stackpole Carbon Co.	St. Marys, Pa.
79136	Waldes Kohinoor Inc.	Cambridge, Mass.
79497	Western Rubber Co.	Goshen, Ind.
80058	Joint Electronic Type Designation System	
80223	United Transformer Co.	New York, N.Y.
80294	Bourns Laboratories Inc.	Riverside, Calif.
80368	Sylvania Electric Products Inc.	New York, N.Y.
80586	Gorn Electric Co. Inc.	Stamford, Conn.
81183	Dohler Jarvis Corp. Division of National Lead Co.	Grand Rapids, Mich.
81312	Winchester Electronics Co. Inc.	Norwalk, Conn.
81349	Military Specifications Promulgated by Standardization Div. Directorate of Logistic Services D S A	
81350	Joint Army-Navy Specifications Promulgated by Standardization Div. Directorate of Logistic Services D S A	
81640	Control Switch Division of Controls of America	Folcroft, Pa.
81815	Communications Coil Co.	Chicago, Ill.
81860	Barry Controls Division of Barry	Watertown, Mass.

Table 6-6. Manufacturers Code and Name (Continued)

MFR CODE	NAME	ADDRESS
82104	Grigsby Co. Inc., The	Arlington Heights, Ill.
82142	Jeffers Electronics Div. of Speer Carbon Co.	DuBois, Pa.
82144	Jones M. C. Electronics	Bristol, Conn.
82227	Haydon A. W. Co.	Waterbury, Conn.
82805	Metal Textile Corp.	Rosell, N.J.
82877	Rotron Mfg. Co. Inc.	Woodstock, N.Y.
83827	Resistors, Inc.	Chicago, Ill.
86579	Precision Rubber Products Corp.	Dayton, Ohio
88044	Aeronautical Standards Group Dept. of Navy and Air Force	
88063	Collins Radio Company Components Div.	Santa Ana, Calif.
89114	Dubrow Electronic Industries Inc.	Burlington, N.J.
89462	Waldes Kohinoor Inc.	Cambridge, Mass.
90177	Solar Capacitor Sales Corp.	North Bergen, N.J.
90526	Clippard Instrument Laboratory Inc.	Cincinnati, Ohio
91314	Lewis Spring and Mfg. Co.	Chicago, Ill.
91491	Lionel Electronic Laboratories Division of Lionel Toy Corp.	Hillside, N.J.
91637	Dale Electronics Inc.	Columbus, Neb.
91662	Elco Corp.	Willow Grove, Pa.
91816	James-Pond-Clark Co.	Pasadena, Calif.
91929	Honeywell Inc. Micro Switch Division	Freeport, Ill.
94375	Automatic Metal Products Co.	Brooklyn, N.Y.
94991	Sylvania Electric Products Inc. Wire, Metal and Plastics Parts Div.	Warren, Pa.

Table 6-6. Manufacturers Name and Code (Continued)

MFR CODE	NAME	ADDRESS
95105	Collins Radio Company Information Science Center	Newport Beach, Calif.
95238	Continental Connector Corporation	Woodside, N.Y.
95347	George Evans Corp.	Moline, Ill.
96214	Texas Instruments Inc. Apparatus Division	Dallas, Texas
96906	Military Standard Promulgated by Standardization Div. Directorate of Logistic Services D S A	
97954	U. S. Components, Inc.	Bronx, N.Y.
97965	Stancor Electronics Inc.	Chicago, Ill.
98278	Microdot Inc.	South Pasadena, Calif.
98291	Selectro Corp.	Mamaroneck, N.Y.
98738	Stewart-Warner Electronics	Chicago, Ill.
99699	Filtors Inc.	East Northport, N.Y.
99707	Control Switch Division Controls Co. of America	El Segundo, Calif.
99800	Delevan Electronics Corp.	East Aurora, N.Y.

CHAPTER 7

INSTALLATION

7-1. UNPACKING AND HANDLING.

CAUTION

Handle the equipment with care; use adequate lifting and transport gear to avoid mechanical shock which might cause component damage.

7-2. GENERAL. The radio set is packed for shipment in a single crate. When it is received, select a convenient location where it may be unpacked without exposure to the elements. Set the crate in the position indicated by crate markings before opening.

CAUTION

When removing nails from the packing crate, use a nail puller. Never use a bar or other tool that may damage the equipment.

Open the crate, and slit the top of the water-vapor proof barrier bag that encloses the radio set.

NOTE

If possible, retain the original packing for possible storage or reshipment.

7-3. MECHANICAL CHECK. Check the equipment against the packing slip and list of equipment supplied (see table 1-4). Check equipment for internal damage; determine that all tubes are in place. Immediately report any shortage of material or damaged parts.

7-4. POWER REQUIREMENTS.

7-5. RADIO SETS AN/URC-9 AND AN/URC-9A. Radio Sets AN/URC-9 and AN/URC-9A can be operated from a primary power source of 115 or 230 volts 50 or 60 Hz, and require 210 watts at 0.8 power factor (263 volt-amperes in receive and 360 watts at 0.85 power factor (424 volt-amperes) in transmit. The power is applied to the AC POWER connector located at the back of Receiver-Transmitter Case CY-2959/URC-9. The connection is made via Power Cable CX-7258/URC-9. The radio sets are shipped ready for 115 volt operation. To operate the sets on 230 volts, it is necessary to change the primary power fuses and voltage selector switches (see paragraph 7-16).

7-6. RADIO SETS AN/URC-9Y and AN/URC-9AY. Radio Sets AN/URC-9Y and AN/URC-9AY require a 23 to 29-vdc primary power source. Power is applied to the 24V DC INPUT connector located at the front of the power supply. The connection is made via Power Cable CX-10332/URC-9Y.

NOTE

Ensure proper polarity is observed during cable connection.

7-7. SITE SELECTION.

7-8. Select a site that permits access to the front panels with sufficient space and light to operate and maintain the equipment. Allow sufficient room at the front of the radio set to withdraw the chassis; allow sufficient room at the sides for adequate ventilation; and allow sufficient room at the rear for cable access.

7-9. Limiting factors in the selection of a site are the cable run between the radio set and the antenna system, and the cable run between the radio set and the power source.

7-10. INSTALLATION REQUIREMENTS.

7-11. SHIP INSTALLATION. The latest approved ships installation plans should be used for installation of this equipment. Installing personnel should be familiar with the operation of the radio set before attempting installation.

7-12. EQUIPMENT MOUNTING. The outline and mounting dimensions for this installation are shown in Figure 7-1. The radio set may be rack mounted, using Installation Kit MK-620/UR (supplied with radio set), or mounted on a horizontal surface using Mounting Kit MT-2554/URC-9 (not supplied with radio set).

7-13. When a rack installation is available, slide the radio set into the rack and bolt the unit in place. When a deck or shelf mount is provided, install the radio set as follows:

a. Prepare the mounting surface by drilling four 0.406-inch diameter holes. Verify the spacing between the holes by reference to figure 7-1.

b. Remove the power supply from the radio case (Chapter 5).

c. Remove the receiver-transmitter from the radio case (Chapter 5).

d. Mount the radio case, and secure it to the mounting with four sets of 1/4 - 20 bolts, nuts and lockwashers.

e. Replace the power supply and the receiver-transmitter by reversing the removal procedures.

7-14. CABLE ASSEMBLIES. Cable assemblies required for the installation of the radio set are listed in table 1-4. Make the cable connections relative to the anticipated mode of operation. (See Chapter 2).

7-15. <u>INSPECTION AND ADJUSTMENT</u>.

7-16. POST INSTALLATION CHECK. Perform the following before applying power:

a. Remove the air-sealing plate on each side of the radio set, and attach them at the side of the case above the louvered ports. (See figure 7-1).

b. Check for proper primary voltage operation and proper fusing; fuses are located on the front panel with ratings marked adjacent to the fuse holders.

c. Radio Sets AN/URC-9 and AN/URC-9A are supplied ready for 115 volt 50 or 60 Hz operation. If 230 volt operation is required, perform the following:

1. Slide out Power Supply PP-2702/URC-9 from Radio Set AN/URC-9 (or AN/URC-9A) and set S1501 and S1502 (see figure 5-82) to the 230 volt position. Return unit to normal position in case.

2. On the front panel of the PP-2702/URC-9, change MAIN AC, T1501 PRI and T1502 PRI fuses to 230 volt ratings (fuses for 230 volt operation are in spare fuse holders).

d. Radio Sets AN/URC-9Y and AN/URC-9AY contain power supplies that require dc inputs. To prepare the dc power supplies, perform the following:

1. Check that the polarity of the primary power source is applied to the corresponding terminals of the power supply. Check that fuses of the proper ratings have been installed.

2. Remove and position the two front-mounted air sealing plates as per instructions marked thereon.

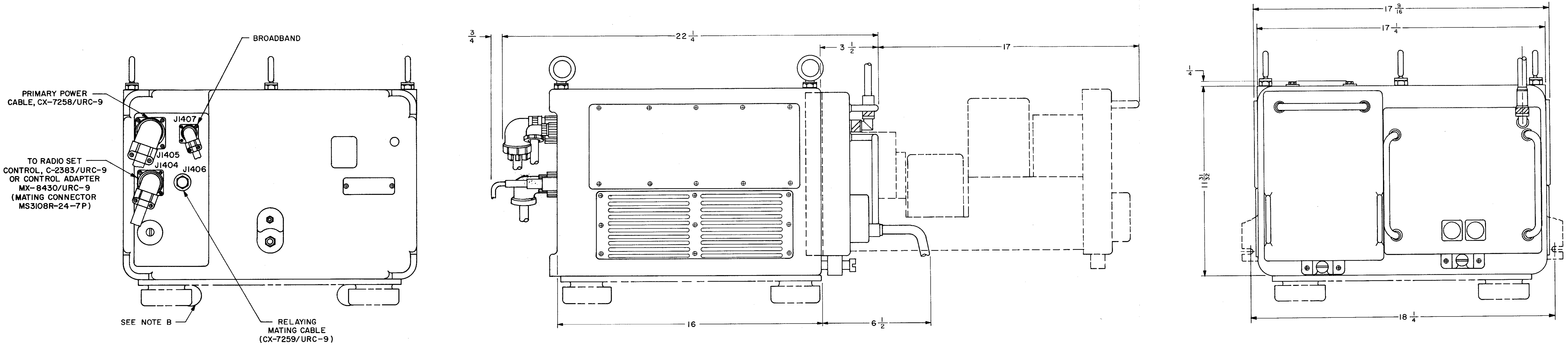
7-17. POWER APPLICATION. Apply power to the radio set by setting the Power switch to the on (up) position and perform the following:

<u>CAUTION</u>

Do not key transmitter unless J701 is connected to a proper antenna or dummy load.

a. Check that the POWER indicator lights, and adjust the DIMMER control for a convenient intensity level of the panel lamps.

b. Check the supply voltages of the radio set by rotating the METER switch



AN/URC-9, AN/URC-9A

TOTAL WEIGHT ------------------ 150 LBS
HEAT DISSIPATION -------------- 415 WATTS
115 OR 230 VOLTS, 50-60 CPS, SINGLE PHASE
210 WATTS ON RECEIVE, 360 WATTS ON TRANSMIT

AN/URC-9Y, AN/URC-9AY

TOTAL WEIGHT ---------------- 150 LBS
HEAT DISSIPATION ------------ 415 WATTS
24 VOLTS, DC
260 WATTS ON RECEIVE, 360 WATTS ON TRANSMIT

NOTES:

A. EXERCISE CARE IN UNPACKING TO PREVENT DAMAGE. USE ADEQUATE LIFTING AND TRANSPORT GEAR. SET IN THE POSITION INDICATED BY CRATE MARKINGS BEFORE OPENING. USE A NAIL PULLER TO REMOVE NAILS FROM CRATE, NOT A BAR OR OTHER TOOL THAT WILL DAMAGE EQUIPMENT. WHEN EQUIPMENT HAS BEEN UNCRATED, USE EYEBOLTS FOR LIFTING IF EQUIPMENT MUST BE MOVED.

B. USE A GROUNDING STRAP ON TWO SHOCKMOUNTS TO ASSURE AN ADEQUATE GROUND BETWEEN CHASSIS AND BASE.

Figure 7-1. Radio Set AN/URC-9( ), Outline and Mounting Dimensions through the BIAS, +26.5V, +125V and +325V positions. At all positions of the meter switch, the METER needle should register near the center mark of the meter scale.

7-18. PRESET FREQUENCY SELECTION. As required, set the 19 channels for automatic frequency selection. (See Chapter 2).

7-19. SQUELCH OPERATION. Two types of squelch circuits are incorporated in Radio Set AN/URC-9( ): carrier squelch and signal plus noise-to-noise squelch (S+N/N). The equipment is shipped connected for signal-plus-noise to noise squelch for normal (NOR) and TONE modes. (In the RETRANS mode, carrier squelch is selected regardless of the link connection.) When a radio set control is used for remote operation, it is recommended that the equipment be connected for carrier squelch operation. To reconnect the squelch linkage for carrier squelch, perform the following:

a. Remove power from equipment.

b. Remove Receiver-Transmitter RT-581 ( )/URC-9 from case (See Chapter 5).

c. Remove audio amplifier and modulator assembly from the RT-581( )/URC-9 (see Chapter 5).

d. Refer to figure 5-51 and instructions lettered on the right side of the audio amplifier and modulator assembly; make the squelch connection.

e. Reinstall the equipment removed in previous steps.

NOTE

For most applications, it is recommended that the equipment remain connected for carrier squelch, thereby eliminating the problem of slow reaction time of the S+N/N squelch circuits.

7-20. OVERALL PERFORMANCE CHECK. Check the overall performance of the radio set as described in OPERATOR MAINTENANCE, Chapter 2.

INDEX

Subject	Paragraph, Figure, Table, Number

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