SPAWAR 0967-LP-428-2010

W/CHG. 1

TECHNICAL MANUAL

OPERATION AND MAINTENANCE INSTRUCTIONS WITH PARTS LIST

RADIO RECEIVER R-1051E/URR

PN 4031950-0501

SPAWAR (FCIP)
FIELD CHANGE INSTL PROGRAM

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4	-	-	1/25/72	
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J. H. Taylor
Bendix Senior Project Engineer
WRC-1 Project

Signature of Validating Officer:

J. H. Taylor

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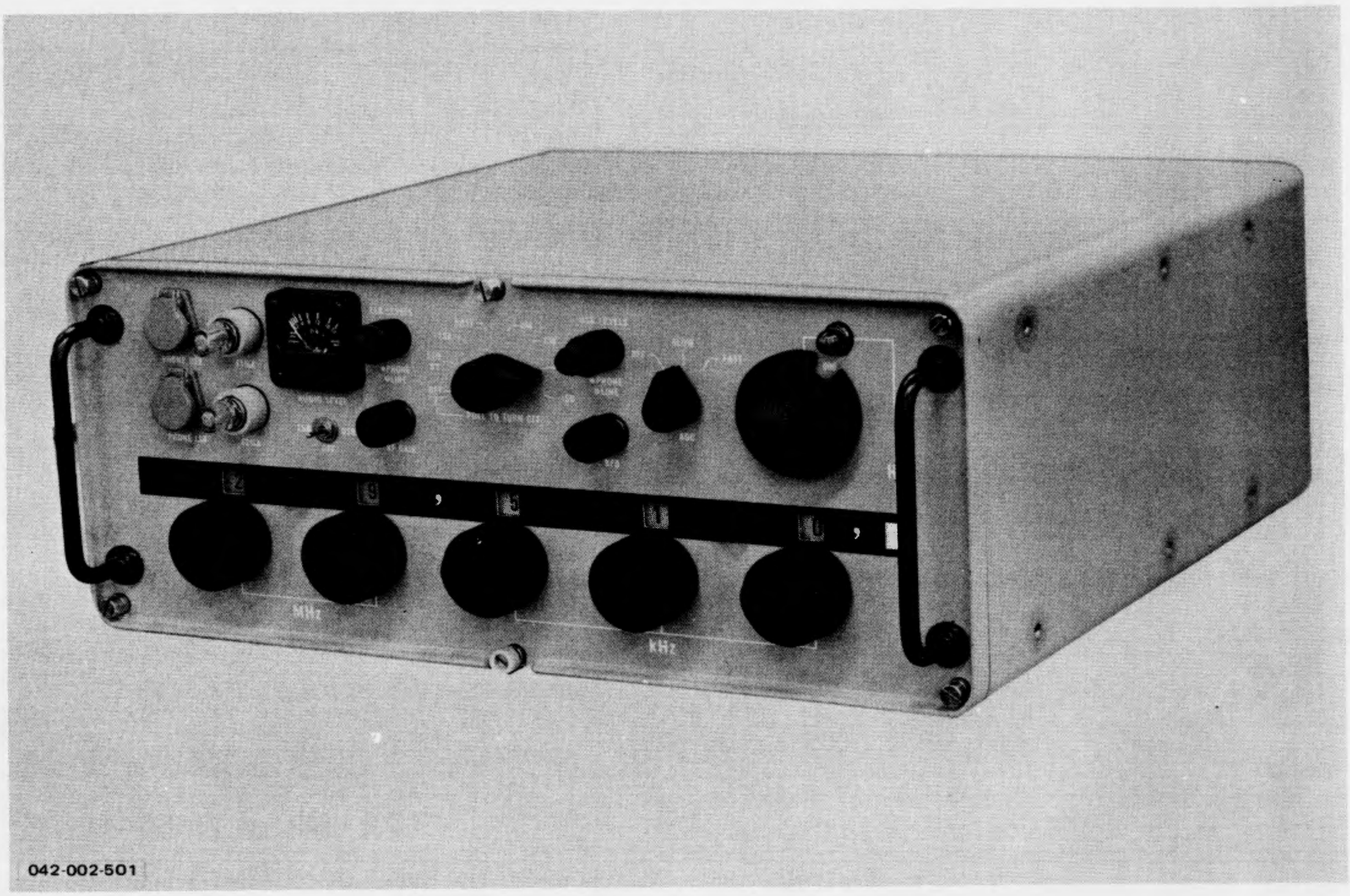

Figure 1-1. Radio Receiver R-1051E/URR

CHAPTER 1

GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. This Technical Manual describes Radio Receiver R-1051E/URR (hereafter also referred to as the R-1051E/URR or receiver), and includes operation; functional description; scheduled maintenance; troubleshooting, corrective maintenance and installation procedures; and a parts list for this unit. The R-1051E/URR is shown in figure 1-1.

1-3. EQUIPMENT DESCRIPTION.

1-4. GENERAL. The R-1051E/URR is a digitally tuned, superheterodyne receiver capable of receiving lower sideband (LSB), upper sideband (USB), independent sideband (ISB), radio teletype (RATT), amplitude modulated (AM), and continuous wave (CW) transmissions in the 2.0- to 30.0-MHz frequency range. The ISB mode of operation allows two different types of intelligence to be received simultaneously, one on the LSB channel and the other on the USB channel. RATT reception is obtained by using suitable ancillary equipment, such as Teletype Converter-Comparator AN/URA-17 or AN/URA-8. The R-1051E/URR may also receive tone-modulated continuous wave (MCW), compatible amplitude modulated (compatible AM), and, through the use of suitable ancillary equipment, facsimile (FAX) transmissions. The R-1051E/URR may be operated in conjunction with a transmitter as a transmitter-receiver in systems such as Radio Set AN/WRC-1. In this application, either simplex or duplex operation is possible. The R-1051E/URR may also be used as a separate, self-contained receiver requiring only a headset, antenna, and 115-Vac primary power source for full operation. The R-1051E/URR is intended for ship and shore installations. For either type of installation, the R-1051E/URR may be mounted in a standard 19-inch rack, or may be mounted to Shock Mount MT-3114/UR.

1-5. PHYSICAL CHARACTERISTICS. The R-1051E/URR is housed in a metal case. The chassis is mounted on roller-type slides (one on each side) and is secured to the case by six captive screws through the front panel. When fully extended from the case, the chassis may be tilted on the slides at a ±90-degree angle to expose the bottom or top for servicing. All operating controls and indicators are located on the front panel, and all power and signal input connections are made on the rear of the case. Handles are secured to the front panel to facilitate withdrawing the chassis and transporting the unit. The chassis contains the chain-drive mechanism for tuning, the receptacles for the plug-in electronic assemblies and a power supply, and various other electrical components.

1-6. ELECTRICAL CHARACTERISTICS. The R-1051E/URR employs a digital tuning scheme for automatically tuning to any one of 280,000 operating channels. Additional vernier tuning provides continuous tuning throughout the frequency range. All circuits (except two rf amplification stages) utilize solid-state devices. These circuits are assembled into plug-in electronic assemblies. The frequency generation circuits, which are referenced to an ultra-stable frequency standard, provide a stability of 1 part in 10^8 per day.

1-7. REFERENCE DESIGNATIONS. Reference designations and the functions of the electronic assemblies and subassemblies of the R-1051E/URR are listed in table 1-1. Figures 1-2 and 1-3 show the locations of electronic assemblies and subassemblies.

1-8. REFERENCE DATA.

1-9. Radio Receiver R-1051E/URR, manufactured by Bendix Communications Division (Part Number 4031950-0501), operates on 115 Vac, single phase, 48 to 450 Hz. Table 1-2 provides a summary of the electrical characteristics of the R-1051E/URR. The crystal complement is listed in table 1-3.

1-10. EQUIPMENT SUPPLIED.

1-11. Equipment supplied with the R-1051E/URR is listed in table 1-4.

1-12. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED.

1-13. Accessory and test equipment and publications required but not supplied with the R-1051E/URR are listed in table 1-5.

1-14. NONSTANDARD ABBREVIATIONS.

1-15. Nonstandard abbreviations (i.e., those not listed in MIL-STD-12C or USAS Y10.19) used in this technical manual are defined in table 1-6.

1-16. FACTORY AND FIELD CHANGES.

1-17. Factory and field changes made to the R-1051E/URR are listed in tables 1-7 and 1-8.

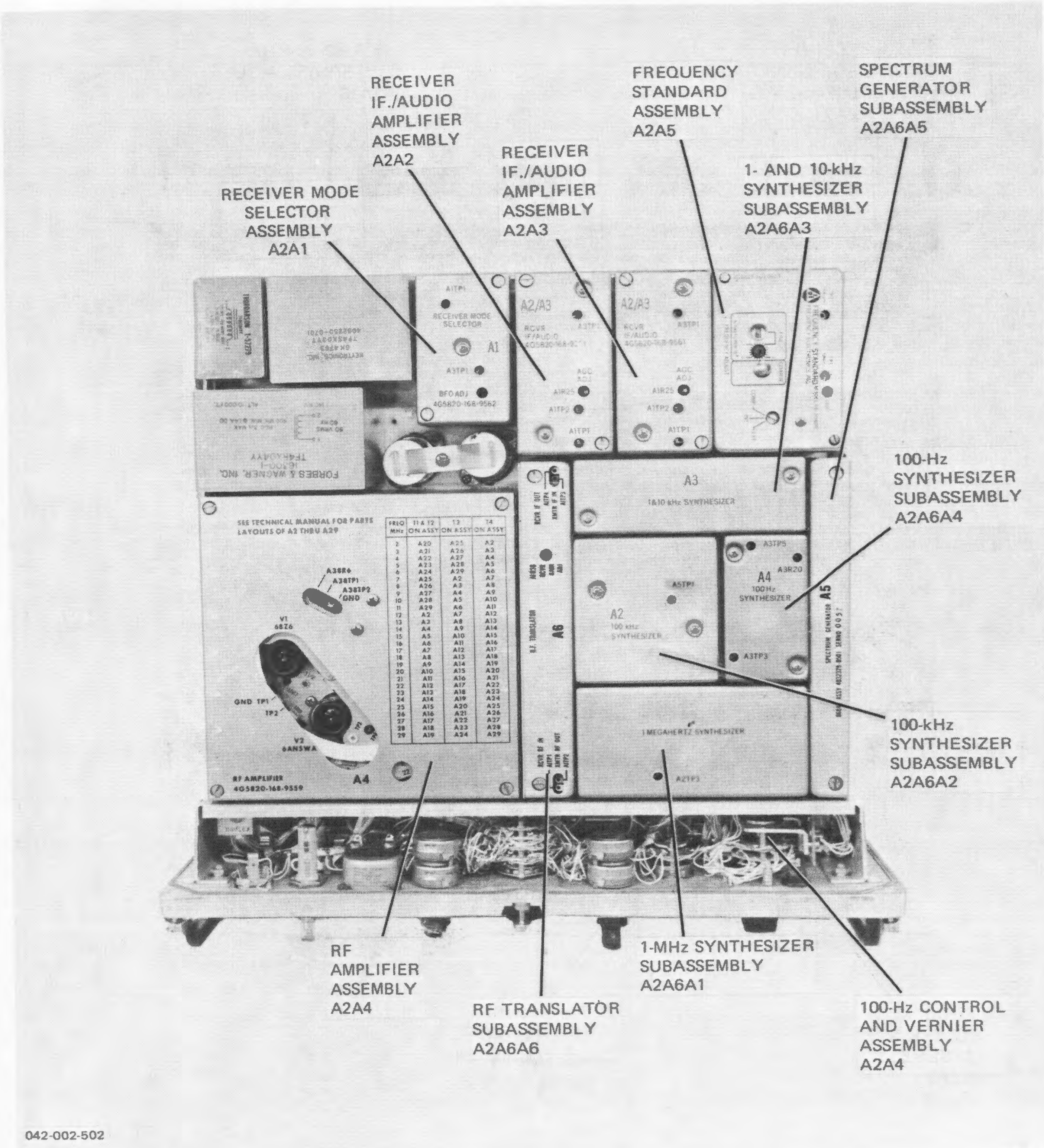

Figure 1-2. Radio Receiver R-1051E/URR, Top View, Case Removed

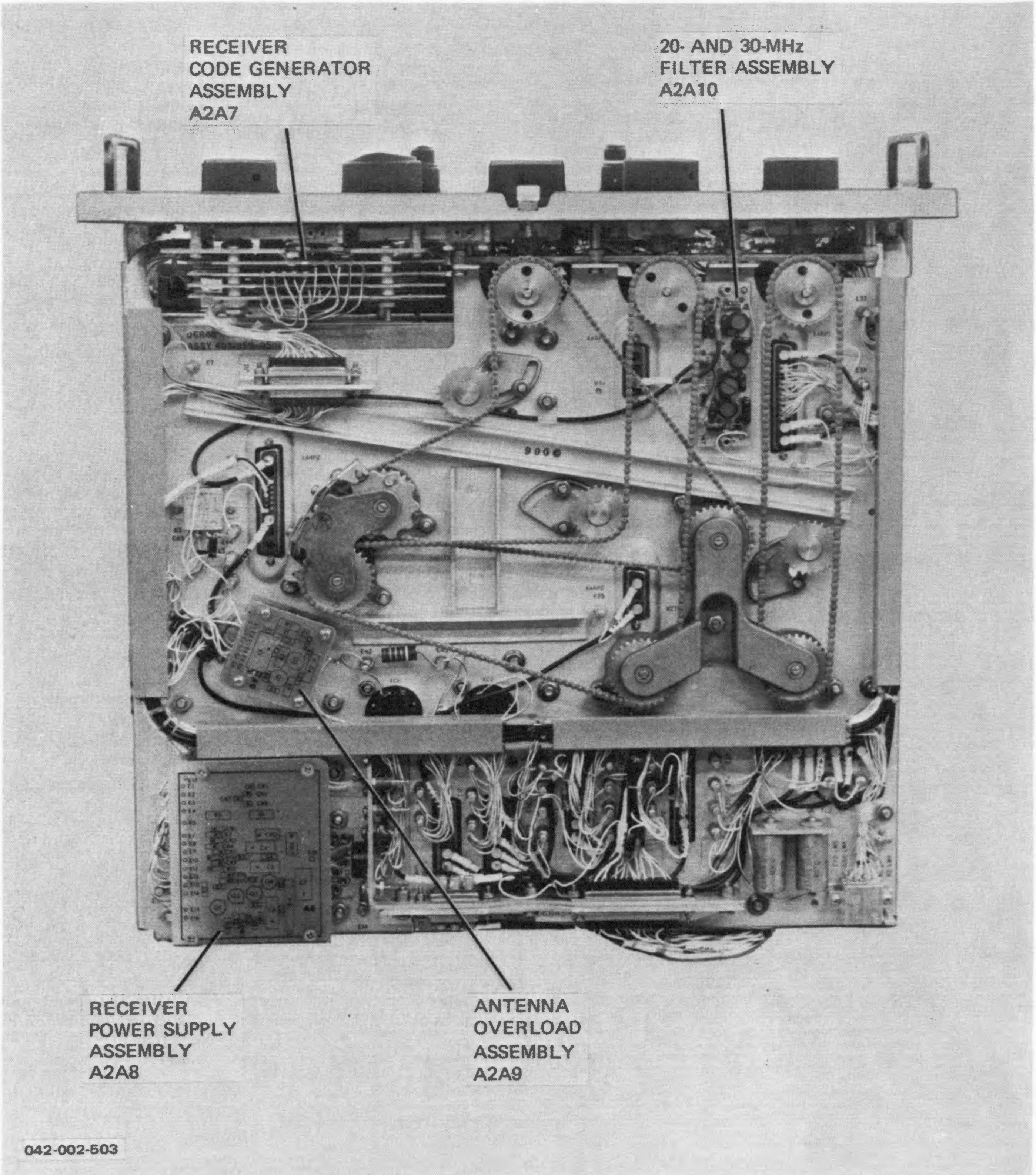

Figure 1-3. Radio Receiver R-1051E/URR, Bottom View, Case Removed

Table 1-1. Radio Receiver R-1051E/URR, Assemblies and Reference Designations

REFERENCE DESIGNATION	ASSEMBLY/SUBASSEMBLY NAME	FUNCTION
A1	Receiver Case	Houses Radio Receiver R-1051E/URR.
A1A1	Filter Box Assembly	Filters input and output lines to prevent rf transmission back on these lines.
A2	Receiver Main Frame	Provides mounting base for components.
A2A1	Receiver Mode Selector Assembly	Directs the passage of the if. signal to appropriate LSB and/or USB if./audio amplifiers. Provides a gating function for a 500-kHz carrier insertion signal. Contains a beat frequency oscillator (BFO) for use with CW signals.
A2A2 and A2A3	Receiver IF./Audio Amplifier Assemblies	Amplify if. signal, demodulate and amplifies intelligence, and provide agc voltages for use internally and in the rf amplifier.
A2A4	RF Amplifier Assembly	Provides tuned preamplification of signal received from antenna.
A2A5	Frequency Standard Assembly	Provides accurate standard frequencies to which all synthesized frequencies are referenced.
A2A6	Translator/Synthesizer Assembly	Receives basic oscillator frequencies from frequency standard and produces required frequency signals for triple-conversion mixers.
A2A6A1	1-MHz Synthesizer Subassembly	Produces required injection signal to first mixing circuits of rf translator.
A2A6A2	100-kHz Synthesizer Subassembly	Produces required injection signal to second mixing circuits of rf translator.
A2A6A3	1- and 10-kHz Synthesizer Subassembly	Generates required injection frequency signals for use by third mixer stages of rf translator.
A2A6A4	100-Hz Synthesizer Subassembly	Produces fine-tuning output to be applied to 100-kHz synthesizer to effect tuning in 100-Hz steps.
A2A6A5	Spectrum Generator Subassembly	Generates outputs to 100-kHz and 1- and 10-kHz synthesizer circuits, and supplies 1-kHz pulse to 100-Hz synthesizer.

Table 1-1. Radio Receiver R-1051E/URR, Assemblies and Reference Designations (Cont)

REFERENCE DESIGNATION	ASSEMBLY/SUBASSEMBLY NAME	FUNCTION
A2A6A6	RF Translator Subassembly	Converts the 2- to 30-MHz rf input to the desired 500-kHz if. signal.
A2A7	Receiver Code Generator Assembly	Produces control signals for automatic tuning of rf amplifier and 1-MHz synthesizer.
A2A8	Receiver Power Supply Assembly	Produces required ac and dc operating voltages from a 115-Vac power source.
A2A9	Antenna Overload Assembly	Provides protection from excessively high rf input signals.
A2A10	20- and 30-MHz Filter Assembly	Improves first if. and image rejection.
A2A11	100-Hz Control and Vernier Assembly	Generates control signals for the 100-Hz synthesizer.

Table 1-2. Radio Receiver R-1051E/URR, Functional Characteristics

Frequency range	2.0000 to 29.9999 MHz in 100-Hz increments, or 2.0 to 30.0 MHz with continuous vernier tuning between 1-kHz increments.
Receiver type	Triple-conversion superheterodyne: First if.: 20 or 30 MHz (depending upon receive frequency). Second if.: 2.85 MHz Third if.: 500 kHz Aggregate if. bandwidth: Single sideband (SSB) modes: 3.0 kHz; other modes: 6 kHz -75 dB off-channel rejection.
Frequency stability	1 part in 10^8 per day.
Type of frequency control	Crystal-controlled synthesizer referenced to a 5-MHz internal or external standard with 0.5- to 5-volt input level.
Modes of operation	LSB, USB, ISB, AM, CW, and RATT.

Table 1-2. Radio Receiver R-1051E/URR, Functional Characteristics (Cont)

Sensitivity	0.6 μV for 10 dB $\frac{S+N}{N}$ in SSB mode; 0.9 μV for CW and RATT modes; and 3.0 μV for compatible AM mode.
Recommended antenna	50-ohm impedance
Ambient temperature limitations	32° F to 122° F
Power consumption	70 watts
Primary power requirements	115 Vac ±10 percent, single phase, 48 to 450 Hz
Image rejection	90 dB
Audio output	60 mW (minimum) into 600-ohm balanced or unbalanced remote output load; 15 mW (minimum) into 1200-ohm unbalanced load (local headset).
Audio distortion	Less than 3 percent
Heat dissipation	59° F rise
Installation	Shock mounted for mobile use; table or rack mounted for fixed station use.

Table 1-3. Radio Receiver R-1051E/URR, Crystal Complement

REFERENCE DESIGNATION	TYPE OF CUT	CRYSTAL OSCILLATOR FREQUENCY (MHz)	OPERATING TEMPERATURE RANGE (DEGREES FAHRENHEIT)	TOLERANCE (PERCENT)
A2A4A9Y1	AT	21.000	-18 to 176	0.004
A2A4A10Y1	AT	19.000	-18 to 176	0.004
A2A4A19Y1	AT	28.500	-18 to 176	0.004
A2A5A1Y1	AT	5.000000	181 to 189	0.001
A2A6A1Y1	AT	2.499850	-18 to 167	0.003
A2A6A1Y2	AT	3.499720	-18 to 167	0.003
A2A6A1Y3	AT	4.499640	-18 to 167	0.003
A2A6A1Y4	AT	5.499560	-18 to 167	0.003
A2A6A1Y5	AT	7.499400	-18 to 167	0.003
A2A6A1Y6	AT	8.499320	-18 to 167	0.003
A2A6A1Y7	AT	9.499240	-18 to 167	0.003
A2A6A1Y8	AT	10.499160	-18 to 167	0.003
A2A6A1Y9	AT	11.499080	-18 to 167	0.003

Table 1-3. Radio Receiver R-1051E/URR, Crystal Complement (Cont)

REFERENCE DESIGNATION	TYPE OF CUT	CRYSTAL OSCILLATOR FREQUENCY (MHz)	OPERATING TEMPERATURE RANGE (DEGREES FAHRENHEIT)	TOLERANCE (PERCENT)
A2A6A1Y10	AT	12.499000	-18 to 167	0.003
A2A6A1Y11	AT	14.498840	-18 to 167	0.003
A2A6A1Y12	AT	15.498760	-18 to 167	0.003
A2A6A1Y13	AT	16.498680	-18 to 167	0.003
A2A6A1Y14	AT	17.498600	-18 to 167	0.003
A2A6A1Y15	AT	19.498440	-18 to 167	0.003
A2A6A1Y16	AT	20.498360	-18 to 167	0.003
A2A6A1Y17	AT	23.498120	-18 to 167	0.003
A2A6A2Y1	AT	4.553	-18 to 167	0.003
A2A6A2Y2	AT	4.653	-18 to 167	0.003
A2A6A2Y3	AT	4.753	-18 to 167	0.003
A2A6A2Y4	AT	4.853	-18 to 167	0.003
A2A6A2Y5	AT	4.953	-18 to 167	0.003
A2A6A2Y6	AT	5.053	-18 to 167	0.003
A2A6A2Y7	AT	5.153	-18 to 167	0.003
A2A6A2Y8	AT	5.253	-18 to 167	0.003
A2A6A2Y9	AT	5.353	-18 to 167	0.003
A2A6A2Y10	AT	5.453	-18 to 167	0.003
A2A6A2A3Y1	AT	17.845	-18 to 167	0.003
A2A6A2A3Y2	AT	27.845	-18 to 167	0.003
A2A6A3Y1	AT	5.25	-18 to 167	0.003
A2A6A3Y2	AT	5.24	-18 to 167	0.003
A2A6A3Y3	AT	5.23	-18 to 167	0.003
A2A6A3Y4	AT	5.22	-18 to 167	0.003
A2A6A3Y5	AT	5.21	-18 to 167	0.003
A2A6A3Y6	AT	5.20	-18 to 167	0.003
A2A6A3Y7	AT	5.19	-18 to 167	0.003
A2A6A3Y8	AT	5.18	-18 to 167	0.003
A2A6A3Y9	AT	5.17	-18 to 167	0.003
A2A6A3Y10	AT	5.16	-18 to 167	0.003
A2A6A3Y11	AT	1.850	-18 to 167	0.003

Table 1-3. Radio Receiver R-1051E/URR, Crystal Complement (Cont)

REFERENCE DESIGNATION	TYPE OF CUT	CRYSTAL OSCILLATOR FREQUENCY (MHz)	OPERATING TEMPERATURE RANGE (DEGREES FAHRENHEIT)	TOLERANCE (PERCENT)
A2A6A3Y12	AT	1.851	-18 to 167	0.003
A2A6A3Y13	AT	1.852	-18 to 167	0.003
A2A6A3Y14	AT	1.853	-18 to 167	0.003
A2A6A3Y15	AT	1.854	-18 to 167	0.003
A2A6A3Y16	AT	1.855	-18 to 167	0.003
A2A6A3Y17	AT	1.856	-18 to 167	0.003
A2A6A3Y18	AT	1.857	-18 to 167	0.003
A2A6A3Y19	AT	1.858	-18 to 167	0.003
A2A6A3Y20	AT	1.859	-18 to 167	0.003

Table 1-4. Radio Receiver R-1051E/URR, Equipment Supplied

QTY PER EQPT	NOMENCLATURE		UNIT NO.	OVERALL DIMENSIONS (IN.) (LESS CONNECTORS)			VOLUME (FT^3)	WEIGHT (LB)
	NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
1	Radio Receiver	R-1051E/URR	1	7.0	17.4	18.5	1.3	70
1	Connector Kit, Consisting of:	4032572-0502	1					
2	Plug Connector	MS3106A-10SL-4S						
1	Plug Connector	MS3106A-16S-5S						
1	Plug Connector	MS3116F20-39S						
2	Strain Relief Boots	4032585-0701						
2	Strain Relief Boots	4032608-0201						
1	Cable Clamp	MS3057-8A						
1	Coaxial Connector	M39012/16-0001						
1	Plug Connector	M39012/01/0025						
2	Technical Manual, Operation and Maintenance Instructions With Parts List, Radio Receiver R-1051E/URR	NAVELEX 0967-428-2010						
1	Operating Instructions, Radio Receiver R-1051E/URR	NAVELEX 0967-428-2040						
1	Technical Manual, Maintenance Standards Book, Radio Receiver R-1051E/URR	NAVELEX 0967-428-2050						
1	Performance Standards Sheet, Radio Receiver R-1051E/URR	NAVELEX 0967-428-2060						

Table 1-5. Radio Receiver R-1051E/URR, Equipment and Publications Required but Not Supplied

CATEGORY	RECOMMENDED EQUIPMENT	ALTERNATE	EQUIPMENT TEST PARAMETERS	APPLICATION
Speaker	LS-474/U (or equiv)			Audio monitoring
Antenna			Impedance: 50 ohms	Reception of rf signals
Cable Set				Interconnection
Headset				General operation, troubleshooting, and maintenance procedures
Teletype Converter-Comparator	AN/URA-8 or AN/URA-17 (or equiv)			RATT operation
Audio Amplifier	AM-4453/U (or equiv)			Speaker amplifier
Multimeter	AN/PSM-4( ) (or equiv)		Ranges: 0.5 to 150 Vdc, 20,000 ohms/volt 0.5 to 150 Vac, 5,000 ohms/volt 0 to 20 megohms, Accuracy: ±2%	Troubleshooting and maintenance procedures
RF Millivoltmeter	CCVO-91CA (or equiv)		Input impedance: 20,000 ohms/volt at 500 kHz Ranges 0 to 1 mV 0 to 10 mV 0 to 100 mV 0 to 300 mV 0 to 1000 mV 0 to 3000 mV	Troubleshooting and maintenance procedures
AC Voltmeter	ME-6( )/U (or equiv)		Frequency: 20 Hz to 5 kHz	Troubleshooting and maintenance procedures

Table 1-5. Radio Receiver R-1051E/URR, Equipment and Publications Required but Not Supplied (Cont)

CATEGORY	RECOMMENDED EQUIPMENT	ALTERNATE	EQUIPMENT TEST PARAMETERS	APPLICATION
AC Voltmeter (Cont)			Input impedance: 100,000 ohms/volt Range: 1 mV to 30V rms	
Electronic Multimeter	AN/USM-116( )		Voltage range: 15 mV to 150 Vdc 0.5 to 150 Vac Current range: 1.5 to 150 mA dc Resistance range: 0.2 ohm to 20 megohms Input impedance: Dc volts: 100 megohms Ac volts: 15 megohms at 20 Hz 5 megohms at 300 kHz Frequency range: 20 Hz to 700 MHz Accuracy: Voltage and current: 2% Resistance: 3% (over 10 megohms, ±1 degree of arc length)	Troubleshooting and maintenance procedures
Oscilloscope	AN/USM-281( ) (or equiv)		Frequency: Dc to 50 MHz Input impedance: X and Y axis: 1 megohm Input sensitivity: 5 mV/cm	Troubleshooting and maintenance procedures

Table 1-5. Radio Receiver R-1051E/URR, Equipment and Publications Required but Not Supplied (Cont)

CATEGORY	RECOMMENDED EQUIPMENT	ALTERNATE	EQUIPMENT TEST PARAMETERS	APPLICATION
Electronic Counter	AN/USM-207A (or equiv)		Frequency range: 1 Hz to 100 MHz Period: 0.0 to 1 MHz Time interval: 1 μs to 10^7s	Troubleshooting and maintenance procedures
RF Signal Generator	CAQI-606-B (or equiv)		Output impedance: 50 ohms Frequency range: 50 kHz to 65 MHz Output: 0 to 3 volts	Troubleshooting and maintenance procedures
Frequency Standard	AN/URQ-10( ) (or equiv)		Outputs: 100 kHz, 500 kHz, and 5 MHz Stability: 1 part in 10^9 Output: 0.5 volt	Troubleshooting and maintenance procedures
Semiconductor Device Test Set	AN/USM-206			Troubleshooting procedures
Analyzer Test Set	TS-1379A/U (or equiv)			Troubleshooting and maintenance procedures
Spectrum Analyzer	TS-1379A/U		Frequency: 2 to 30 MHz Resolution: 100 Hz Sensitivity: 2μV full scale Sweep width: 7 kHz	
Tuning Head	CPN-REC-1			
Two-Tone Audio Signal Generator	SG-376A/U		Frequency: 20 Hz to 5 kHz Output: 2V rms Output impedance: 600 ohms	

Table 1-5. Radio Receiver R-1051E/URR, Equipment and Publications Required but Not Supplied (Cont)

CATEGORY	RECOMMENDED EQUIPMENT	ALTERNATE	EQUIPMENT TEST PARAMETERS	APPLICATION
Audio Signal Generator	AN/URM-127 (or equiv)		Frequencies: 20 Hz to 5 kHz Output: 0 to 10 volts Output impedance: 600 ohms	Troubleshooting and maintenance procedures
Spectrum Analyzer[1]	Hewlett-Packard 8552A Spectrum Analyzer IF. Section 8553L Spectrum Analyzer RF Section 140S Display Unit		Center spectrum tuning 3 kHz to 30 MHz Display bandwidth: 2 kHz to 20 MHz If. bandwidth: 200 Hz to 30 kHz Dispersion: 2 kHz/cm to 2 MHz/cm	Testing and alignment of Translator/Synthesizer Assembly A2A6
HP 8552A, HP 8553L, HP 140S Technical Manual[1]				Alignment and test procedures
Differential Voltmeter	John Fluke 825 (or equiv)		Accuracy: 0.5% Range: 2 to 30 Vdc	Troubleshooting and maintenance procedures
Voltmeter Heterodyne[1]	CDAN 2006		450 kHz to 80 MHz $50\ \mu V$ to 50 mV rms	Troubleshooting and maintenance procedures
RF Amplifier Test Set[1]	TS-2132/WRC-1		Simulates actual operating conditions	Testing RF Amplifier Assembly A2A4

[1] Required for depot-level maintenance only.

Table 1-5. Radio Receiver R-1051E/URR, Equipment and Publications Required but Not Supplied (Cont)

CATEGORY	RECOMMENDED EQUIPMENT	ALTERNATE	EQUIPMENT TEST PARAMETERS	APPLICATION
Translator/ Synthesizer Test Set [1]	TS-2133/WRC-1		Simulates actual operating conditions	Testing Translator/ Synthesizer Assembly A2A6
Frequency Standard Test Set [1]	TS-2134/WRC-1		Simulates actual operating conditions	Testing Frequency Standard Assembly A2A5
Common Modules Test Set [1]	TS-2135/WRC-1		Simulates actual operating conditions	Testing unique receiver assemblies
Kit, Extender Test Cables	W1			Mates with P1 on Receiver IF./Audio Amplifier Assembly A2A2 or A2A3
	W2			Mates with P1 on Receiver Mode Selector Assembly A2A1
	W3			Mates with P2 on Receiver Mode Selector Assembly A2A1
Set, Extender Cables (fabricate locally)				Interconnect assemblies A2A4, A2A5, and A2A6 to main frame for test purposes
RF Insert Extractor Tool	ITT Cannon PN CET-06B			Maintenance
RF Insert Connector, Female	PN DM 53743-5008			Troubleshooting

[1] Required for depot-level maintenance only.

Table 1-5. Radio Receiver R-1051E/URR, Equipment and Publications Required but Not Supplied (Cont)

CATEGORY	RECOMMENDED EQUIPMENT	ALTERNATE	EQUIPMENT TEST PARAMETERS	APPLICATION
RF Insert Connector, Male	PN DM 53743-5014			Troubleshooting
Adapter, BNC-to-N	UG-201/U		Impedance: 50 ohms	Troubleshooting and maintenance procedures
Coaxial T-Connector BNC	UG-274A/U		Impedance: 50 ohms	Troubleshooting and maintenance procedures
AN/PSM-4( ) Technical Manual	NAVSHIPS 0967-911-6010			Troubleshooting and maintenance procedures
CCVO-91CA Technical Manual	NAVSHIPS 0969-231-1010			Troubleshooting and maintenance procedures
ME-6( )/U Technical Manual	NAVSHIPS 0967-091-0010			Troubleshooting and maintenance procedures
AN/USM-116B Technical Manual	NAVSHIPS 0967-871-3370			Troubleshooting and maintenance procedures
AN/USM-281( ) Technical Manual	NAVSHIPS 0969-244-3010 and 0969-244-3020			Troubleshooting and maintenance procedures
CAQI-606-B Technical Manual	NAVSHIPS 0967-107-7010			Troubleshooting and maintenance procedures
AN/URQ-10( ) Technical Manual	NAVSHIPS 0967-053-7010			Troubleshooting and maintenance procedures

Table 1-5. Radio Receiver R-1051E/URR, Equipment and Publications Required but Not Supplied (Cont)

CATEGORY	RECOMMENDED EQUIPMENT	ALTERNATE	EQUIPMENT TEST PARAMETERS	APPLICATION
AN/USM-207A Technical Manual	NAVSHIPS 0969-028-4010 and 0969-028-4020			Troubleshooting and maintenance procedures
AN/USM-206 Technical Manual	NAVSHIPS 0969-002-7020			Troubleshooting and maintenance procedures
TS-1379A/U Technical Manual	NAVSHIPS 0969-094-3010			Troubleshooting and maintenance procedures
AN/URM-127 Technical Manual	TO 33A1-8-176-11			Troubleshooting and maintenance procedures
TS-2132/WRC-1 Test Data Booklet Depot[1]	NAVSHIPS 0967-004-2000			Testing RF Amplifier Assembly A2A4
TS-2133/WRC-1 Test Data Booklet Depot[1]	NAVSHIPS 0967-004-3000			Testing Translator/ Synthesizer Assembly A2A6
TS-2134/WRC-1 Test Data Booklet Depot[1]	NAVSHIPS 0967-004-4000			Testing Frequency Standard Assembly A2A5
TS-2135/WRC-1 Test Data Booklet Depot[1]	NAVSHIPS 0967-004-5000			Testing receiver assemblies
CDAN 2006 Technical Manual [1]	NAVSHIPS 0969-247-2010			Troubleshooting and maintenance procedures

[1]Required for depot-level maintenance only.

Table 1-6. Nonstandard Abbreviations

ABBREVIATION	TERM
APC	Average power control
BFO	Beat frequency oscillator
FSK	Frequency shift keyed
ISB	Independent sideband
PEP	Peak envelope power
PPC	Peak power control
PTT	Push to talk
RATT	Radio teletypewriter
SSB	Single sideband

Table 1-7. Radio Receiver R-1051E/URR, Factory Changes

CHANGE NUMBER	NOMENCLATURE	DESCRIPTION

Table 1-8. Radio Receiver R-1051E/URR, Field Changes

CHANGE NUMBER	NOMENCLATURE	DESCRIPTION

CHAPTER 2

OPERATION

2-1. INTRODUCTION.

2-2. Radio Receiver R-1051E/URR is designed to receive upper sideband (USB), lower sideband (LSB), independent sideband (ISB), continuous wave (CW), tone modulated CW (MCW), compatible and standard amplitude modulated (AM), and radio teletype (RATT) transmissions in the 2- to 30-MHz frequency range. The R-1051E/URR contains a power supply and may be operated as an individual unit or as part of a system, such as Radio Set AN/WRC-1.

2-3. OPERATING CONTROLS AND INDICATORS.

2-4. All controls, indicators, and connectors required for normal operation of the R-1051E/URR are shown in figure 2-1 and listed in table 2-1.

2-5. NORMAL OPERATING PROCEDURES.

2-6. Normal operating procedures for each mode of operation of the R-1051E/URR are given in table 2-2.

2-7. MAINTENANCE CONTROLS AND CONNECTORS.

2-8. Those controls and connectors used primarily for maintenance of the R-1051E/URR are shown in figures 2-2, 2-3, and 2-4, and are described in table 2-3.

2-9. INTERFERENCE AND EMERGENCY OPERATION.

2-10. Operating procedures for interference conditions are given in table 2-4. There are no emergency operating procedures.

2-11. OPERATOR'S MAINTENANCE PROCEDURES.

2-12. Maintenance procedures which should be performed by the operator of the R-1051E/URR are given in table 2-5.

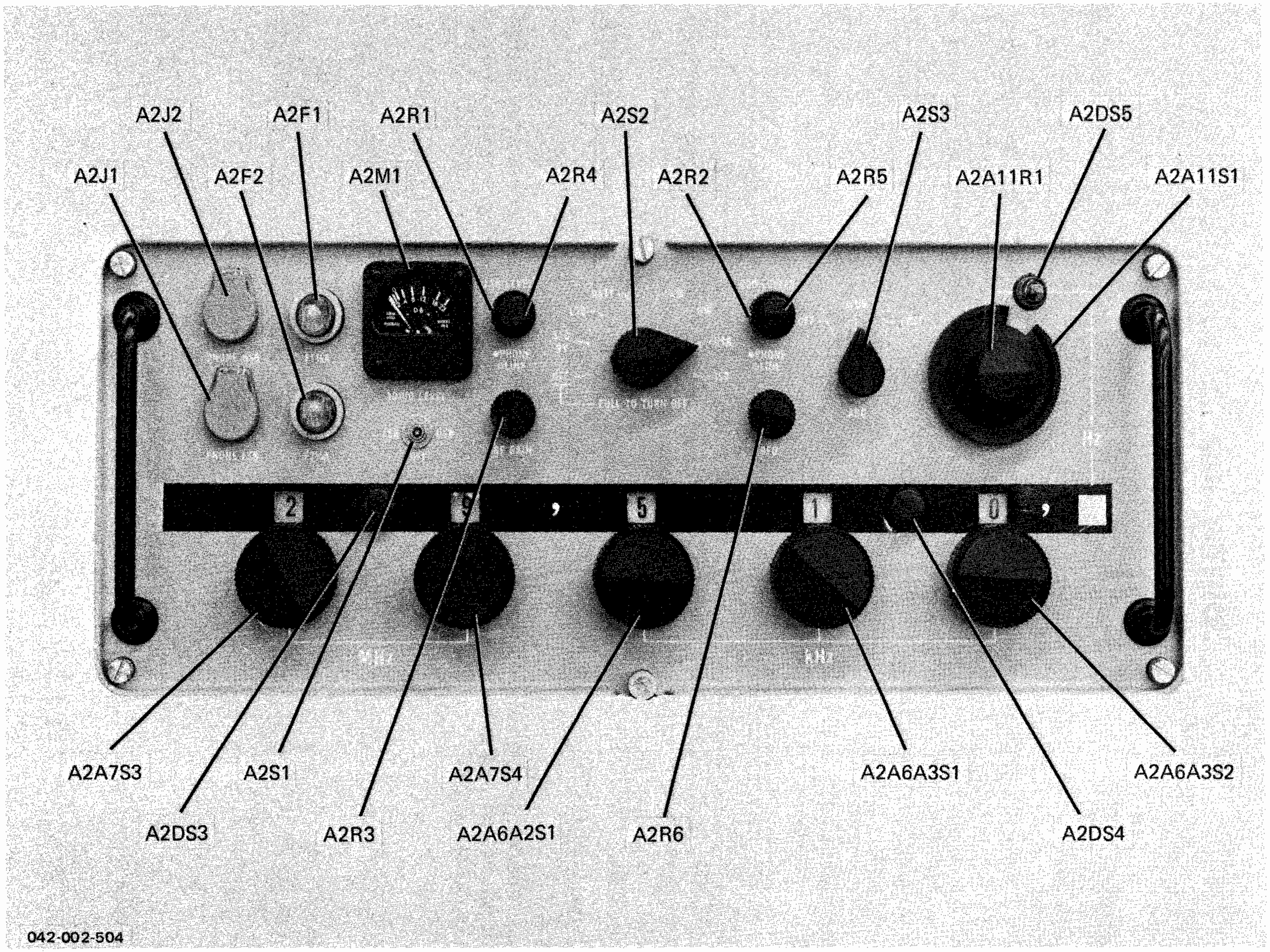

Figure 2-1. Radio Receiver R-1051E/URR, Operating Controls, Indicators, and Connectors

Table 2-1. Operating Controls, Indicators, and Connectors

REFERENCE DESIGNATION	NAME	POSITION	OPERATING FUNCTION
A2DS3	MHz indicator lamp		Lights the two windows above the MHz controls.
A2DS4	kHz indicator lamp		Lights the three windows above the kHz controls.
A2DS5	Hz vernier indicator		Flashes when Hz switch is in V (vernier) position; frequency stablity is not as great as in other positions.
A2F1	F1 3/4A fuse		Protects R-1051E/URR against overload; indicator glows when fuse is open.
A2F2	F2 3/4A fuse		Protects R-1051E/URR against overload; indicator glows when fuse is open.
A2J1	PHONE LSB jack		Used to connect headset to LSB receiver output.
A2J2	PHONE USB jack		Used to connect headset to USB receiver output.
A2M1	AUDIO LEVEL meter		Indicates LSB or USB audio supplied to remote lines.
A2R1	LSB LEVELS LINE control		Used to adjust volume of remote audio for LSB and ISB (LSB) operation.
A2R2	USB LEVELS LINE control		Used to adjust volume of remote audio for USB, ISB (USB), RATT, CW, and AM operation.
A2R3	RF GAIN control		Used to control gain of rf and if. amplifiers when AGC switch is OFF.
A2R4	LSB LEVELS PHONE control		Used to adjust volume of audio applied to headphone in LSB and ISB (LSB) operation.
A2R5	USB LEVELS PHONE control		Used to adjust volume of audio applied to headphone in USB, ISB (USB), RATT, CW, and AM operation.
A2R6	BFO control		Used to adjust pitch of audio output tone, when receiving CW signals, with mode selector switch in CW position.

Table 2-1. Operating Controls, Indicators, and Connectors (Cont)

REFERENCE DESIGNATION	NAME	POSITION	OPERATING FUNCTION
A2S1	Audio level switch		Used to activate AUDIO LEVEL meter A2M1 in LSB or USB mode to indicate audio level:
		LSB	Enables AUDIO LEVEL meter A2M1 to indicate LSB audio level supplied to remote lines.
		USB	Enables AUDIO LEVEL meter A2M1 to indicate USB audio level supplied to remote lines.
		OFF	Normal switch position; meter A2M1 disengaged.
A2S2	Mode selector switch		Used to select R-1051E/URR modes of operation:
		OFF	No power is applied.
		STD BY	Frequency standard and tube filaments energized.
		LSB	R-1051E/URR operates in lower sideband mode.
		RATT	R-1051E/URR operates in radio teletype mode.
		AM	R-1051E/URR operates in amplitude modulation mode.
		CW	R-1051E/URR operates in continuous wave mode.
		USB	R-1051E/URR operates in upper sideband mode.
		ISB	R-1051E/URR operates in independent sideband mode.
A2S3	AGC switch		Selects automatic gain control function for R-1051E/URR:
		OFF	Agc is disabled.
		SLOW	Agc responds slowly to changes in signal strength.
		FAST	Agc responds quickly to changes in signal strength.
A2A6A2S1	100 kHz control		Used to select 100-kHz digit of desired operating frequency; digit selected is displayed in window above control.

Table 2-1. Operating Controls, Indicators, and Connectors (Cont)

REFERENCE DESIGNATION	NAME	POSITION	OPERATING FUNCTION
A2A6A3S1	10 kHz control		Used to select 10-kHz digit of desired operating frequency; digit selected is displayed in window above control.
A2A6A3S2	1 kHz control		Used to select 1-kHz digit of desired operating frequency; digit selected is displayed in window above control.
A2A7S3 [1]	10 MHz control		Used to select 10-MHz digit of desired operating frequency; digit selected is displayed in window above control.
A2A7S4 [1]	1 MHz control		Used to select 1-MHz digit of desired operating frequency; digit selected is displayed in window above control.
A2A11R1	Hz vernier control		R-1051E/URR may be tuned continuously (with Hz switch in V) between any two 1-kHz steps.
A2A11S1	Hz switch	000	R-1051E/URR is tuned to frequency indicated on MHz and kHz indicators.
		100-900	R-1051E/URR is tuned, in LSB mode, 100 to 900 Hz above frequency indicated on MHz and kHz indicators; in USB mode, 100 to 900 Hz below frequency indicated on MHz and kHz indicators.
		V	Used to activate vernier control A2A11R1.

[1] These reference designations are for reference only in the text and schematic diagrams; they do not appear in the parts list.

Table 2-2. Normal Operating Procedures

MODE	CONTROLS AND SETTINGS	PROCEDURES	REMARKS
Turnon	Set mode selector switch to STD BY.	Allow a 60-minute warmup for general operation and at least a 96-hour warmup for optimum frequency stability.	

Table 2-2. Normal Operating Procedures (Cont)

MODE	CONTROLS AND SETTINGS	PROCEDURES	REMARKS
Preliminary Setup	Set mode selector switch to the desired mode of operation.	a. Using MHz, kHz, Hz, and vernier controls, select the desired operating frequency. b. Depending on mode of operation selected, connect headset to PHONE USB or LSB jack. c. Set AGC switch to required type of agc. If OFF is selected, rotate RF GAIN control fully clockwise. d. Set audio level meter switch to LSB or USB, depending on the mode previously selected. e. Set LSB or USB LEVELS LINE control for 0 dB, or as required initially for tuning purposes. After adjustment, set audio level meter switch to OFF. f. Set USB or LSB LEVELS PHONE control for desired headphone volume.	Frequency selected is displayed in windows above MHz and kHz controls.
CW	Set mode selector switch to CW.	a. Set AGC switch to OFF. b. Set frequency controls to the desired frequency. c. Adjust BFO control for the preferred beat note. d. Optimize sensitivity by rotating RF GAIN control to the position yielding best sensitivity (discernible by ear).	
Alternate CW	Set mode selector switch to either LSB or USB.	a. Set AGC switch to SLOW. b. Set frequency controls to 1.0 kHz below (USB) or 1.0 kHz above (LSB) the desired signal frequency. c. Set HZ switch to V, and then adjust Hz vernier control to obtain the preferred beat note.	

Table 2-2. Normal Operating Procedures (Cont)

MODE	CONTROLS AND SETTINGS	PROCEDURES	REMARKS
AM	Set mode selector switch to AM.	a. Set frequency controls to desired frequency. b. Set AGC switch to SLOW.	
Single Channel RATT	Set mode selector switch to RATT.	a. Set frequency controls to 2 kHz below the assigned frequency. b. Set AGC switch to SLOW.	The Hz V (vernier) position is not used.
Single Channel FAX (USB)	Set mode selector switch to USB.	a. Set frequency controls 2. 7 kHz below assigned frequency. b. Set AGC switch to SLOW.	
Single Channel FAX (LSB)	Set mode selector switch to LSB.	a. Set frequency controls 2. 7 kHz above the assigned frequency. b. Set AGC switch to SLOW.	
Composite Signal RATT and FAX in USB (for FAX)	Set mode selector switch to USB.	a. Set frequency controls 3. 1 kHz below assigned frequency. b. Set AGC switch to SLOW.	
Composite Signal RATT and FAX in USB (for RATT)	Set mode selector switch to USB.	a. Set frequency controls 1. 5 kHz below assigned frequency. b. Set AGC switch to SLOW.	If copy is not satisfactory, set Hz switch to V and adjust vernier control.
USB Voice	Set mode selector switch to USB.	a. Set frequency controls 1. 5 kHz below assigned frequency. b. Set AGC switch to SLOW.	
LSB Voice	Set mode selector switch to LSB.	a. Set frequency controls 1. 5 kHz above assigned frequency. b. Set AGC switch to SLOW.	
USB Multiplex	Set mode selector switch to USB.	a. Set frequency controls 1. 5 kHz below assigned frequency. b. Set AGC switch to SLOW.	

Table 2-2. Normal Operating Procedures (Cont)

MODE	CONTROLS AND SETTINGS	PROCEDURES	REMARKS
LSB Multiplex	Set mode selector switch to LSB.	a. Set frequency controls 1.5 kHz above assigned frequency. b. Set AGC switch to SLOW.	
ISB	Set mode selector switch to ISB.	Set frequency control switches to assigned frequency.	
Shutdown	Set mode selector switch to STD BY.	To eliminate required warmup period after start up, leave mode selector switch in STD BY.	
	Set mode selector switch to OFF.	Pull mode selector switch out to turn to OFF.	Completely shuts down R-1051E/URR.

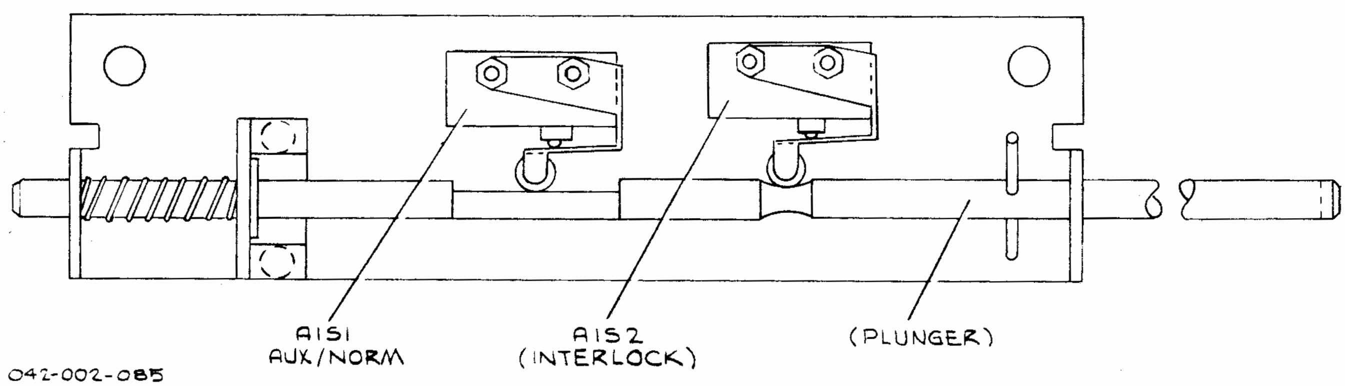

Figure 2-2. Detailed View of AUX/NORM and Interlock Switches

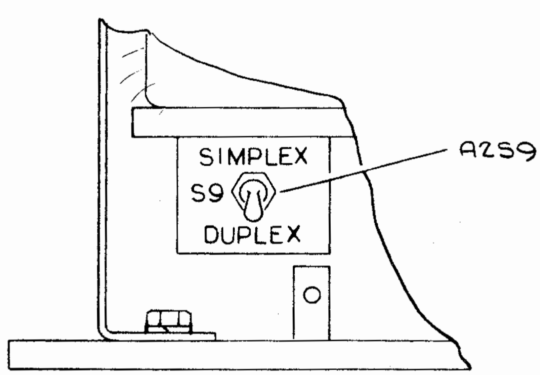

Figure 2-3. Detailed View of SIMPLEX/DUPLEX Switch

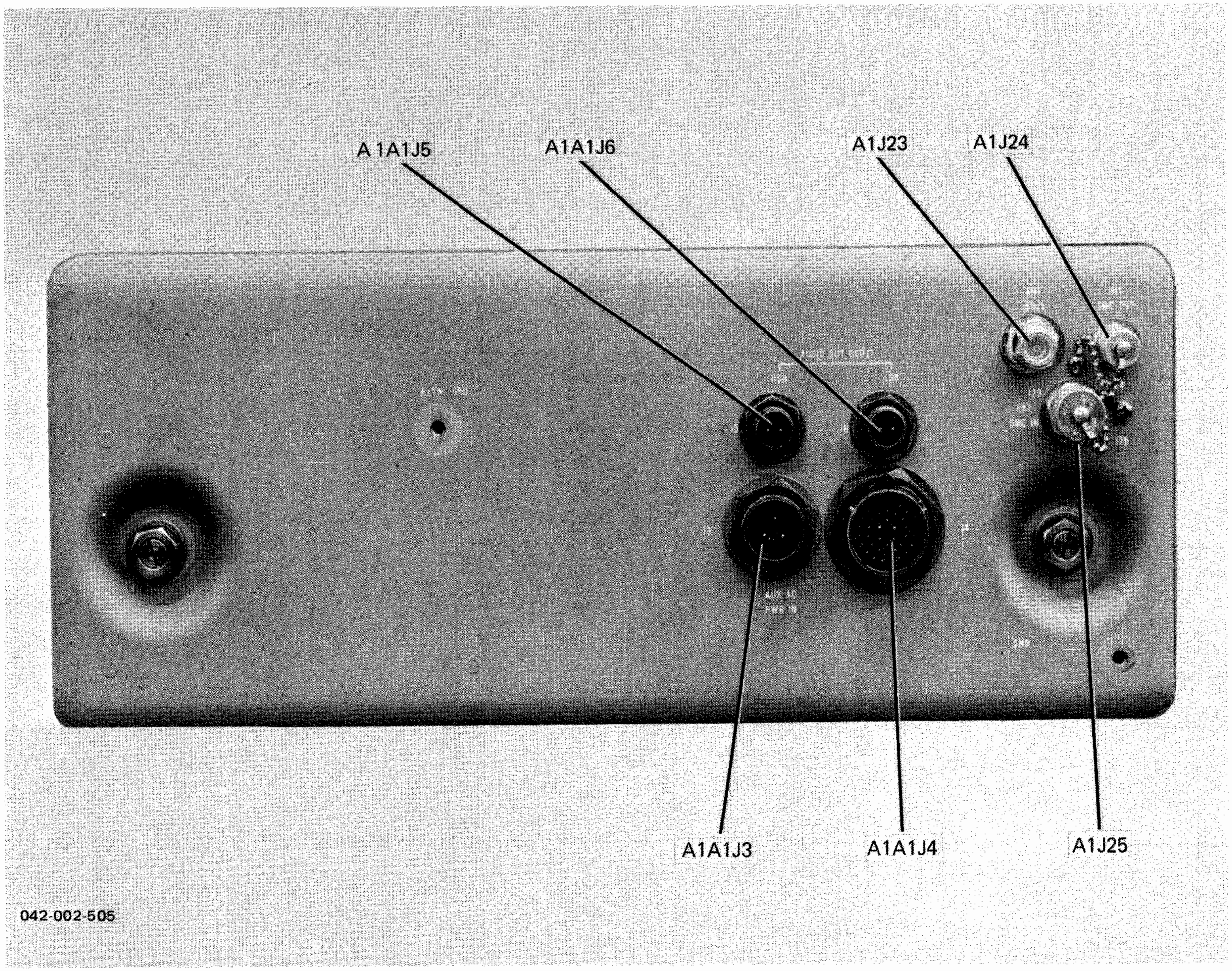

Figure 2-4. Radio Receiver R-1051E/URR, Rear Panel Connectors

Table 2-3. Maintenance Controls and Connectors

REFERENCE DESIGNATION	NAME	POSITION	OPERATING FUNCTION
A1J23	ANT connector		Connects antenna or antenna coupler.
A1J24	INT 5MC OUT connector		Distributes 5-MHz frequency from Frequency Standard Assembly A2A5 to external test equipment.
A1J25	EXT 5MC IN connector		Connects an external 5-MHz frequency standard to the R-1051E/URR.
A1S1	AUX/NORM switch		Selects ac power for R-1051E/URR operation by rotation of the interlock plunger:
		AUX	Selects a standard power source (normal).
		NORM	Selects power from remote equipment such as Interconnection Box J-1265/U.
A1S2	Interlock switch		Disconnects 115-Vac power from the R-1051E/URR when chassis is removed from case. The switch can be defeated by gripping the plunger and pulling outward.
A1A1J3	AUX AC PWR IN connector		Connects an ac power source for operation of the R-1051E/URR.
A1A1J4	Remote control connector		Connects remote controls and input to remote equipment, such as Interconnection Box J-1265/U.
A1A1J5	USB AUDIO OUT connector		Connects USB audio to external output equipment.
A1A1J6	LSB AUDIO OUT connector		Connects LSB audio to external output equipment.
A2S9	SIMPLEX/ DUPLEX switch		Provides for receiver muting by removing +110 Vdc from certain circuits when receiver is interconnected with a transmitter as part of a communication system.
		SIMPLEX	R-1051E/URR is automatically muted when interconnected with a transmitter and the transmitter is keyed.

Table 2-3. Maintenance Controls and Connectors (Cont)

REFERENCE DESIGNATION	NAME	POSITION	OPERATING FUNCTION
A2S9 (Cont)	SIMPLEX/ DUPLEX switch	DUPLEX	Permits simultaneous reception/ transmission when interconnected with a transmitter.
A2A5A2S1	COMP/INT/EXT switch		Determines use of the external and internal frequency standards:
		COMP	Enables comparison of the internal and external frequency standards.
		INT	Selects the internal Frequency Standard Assembly A2A5 for use in the receiver.
		EXT	Selects an external frequency standard connected through A1J25 for use in the receiver.

Table 2-4. Operating Procedures for Interference Conditions

INTERFERENCE CONDITION/ MODE	CONTROLS AND SETTINGS	PROCEDURES	REMARKS
All Modes		To counter interference, change operating mode and/or frequency, if possible.	Refer to table 2-2 for normal operating procedures.
CW Adjacent Channel Interference	Set mode selector switch to USB.	a. Set frequency controls 1 kHz below assigned frequency. b. Set Hz switch to V. c. Adjust vernier control for best reception. d. Set AGC switch to SLOW.	This mode provides sharper bandwidth than that used in CW mode. Sharper bandwidth is useful when adjacent channel interference becomes acute.
CW and USB Adjacent Channel Interference	Set mode selector switch to USB.	a. Set frequency controls 1 kHz above assigned frequency. b. Set Hz switch to V. c. Adjust vernier control for best reception. d. Set AGC switch to SLOW.	This mode may be used when adjacent channel interference is acute in CW and USB modes.

Table 2-4. Operating Procedures for Interference Conditions (Cont)

INTERFERENCE CONDITION/ MODE	CONTROLS AND SETTINGS	PROCEDURES	REMARKS
Single Channel RATT Adjacent Channel Interference	Set mode selector switch to USB.	a. Set frequency controls to 2 kHz below assigned frequency. b. Set AGC switch to SLOW.	This mode may be used for RATT when adjacent channel interference in the RATT mode is acute.
Single Channel RATT Adjacent Channel Interference	Set mode selector switch to LSB.	a. Set frequency controls to 2 kHz above assigned frequency. b. Set AGC switch to SLOW.	This mode may be used when adjacent channel interference is acute in the RATT and USB modes.

Table 2-5. Operator's Maintenance Procedures

EQUIPMENT STATUS/MODE	PROCEDURES	REMARKS
Preliminary	a. Clean exterior with soft, lint-free cloth. Clean interior with brush or clean cloth. b. Tighten all hardware. c. Repair or replace broken or frayed cables. d. Check that the AUX/NORM switch associated with the drawer interlock is in the proper position (normally AUX). e. Check that the SIMPLEX/ DUPLEX switch is in the proper position for the desired mode of operation (normally SIMPLEX). f. Check that the drawer is properly closed, engaging the drawer interlock	The drawer must be opened to check the AUX/NORM switch and the SIMPLEX/ DUPLEX switch.

Table 2-5. Operator's Maintenance Procedures (Cont)

EQUIPMENT STATUS/MODE	PROCEDURES	REMARKS
Turnon	a. Set mode selector switch to STD BY. Check all fuses; if any are defective, associated indicator lamp will light. Replace defective fuses.	
	b. Check all cables for breakage; check that all connectors are properly seated and in the right location.	
	c. Check that all switches and controls are properly set. (Refer to table 2-2 for operating instructions.)	Frequency is indicated in windows above MHz and kHz control knobs.
CW	a. Set mode selector switch to CW.	
	b. Set RF GAIN control fully clockwise.	
	c. Set Hz switch to 000.	
	d. Set AGC switch to OFF.	
	e. Tune the R-1051E/URR to WWV or WWVH at 5, 10, or 15 MHz.	
	f. Plug headset into PHONE USB jack.	
	g. Adjust USB LEVELS LINE control and USB LEVELS PHONE control for comfortable signal level.	
	h. Check that signal is received and signal tone varies when BFO control is varied.	
USB	a. Set mode selector switch to USB.	
	b. Set frequency controls 1 kHz lower than in the previous step. All other controls remain in the same position.	
	c. Check that signal can be heard in headset.	
LSB	a. Set mode selector switch to LSB.	
	b. Tune receiver 1 kHz above WWV carrier.	

Table 2-5. Operator's Maintenance Procedures (Cont)

EQUIPMENT STATUS/MODE	PROCEDURES	REMARKS
	c. Plug headset into PHONE LSB jack. d. Adjust LSB LEVELS LINE control and LSB LEVELS PHONE control for comfortable signal level. e. Check that signal can be heard in headset. f. Set Hz switch to V. g. Rotate vernier control and check that signal tone varies.	
AM	a. Set mode selector switch to AM. b. Plug headset into PHONE USB jack. c. Tune receiver to any known AM station such as Armed Forces frequency at 15.330 MHz. d. Check that signal can be heard in headset. e. Set AGC switch to SLOW and FAST positions. Note that signal is heard and that rotating the RF GAIN control has no effect. f. Set LSB and USB LEVELS LINE adjustments for required output on AUDIO LEVEL meter.	

CHAPTER 3

FUNCTIONAL DESCRIPTION

3-1. INTRODUCTION.

3-2. This chapter describes the principles of operation of the R-1051E/URR. The description is presented at three levels. The first level is an overall functional description of the receiver to the level of detail shown on the functional block diagram. The second level is a more detailed discussion of each of the functions, based on signal flow diagrams, and concentrating on the functional operation of the principal assemblies and subassemblies involved with each function. Power distribution and control functions are also described with reference to the appropriate power distribution and control diagrams. The third level, based on schematic diagrams, is a discussion of detailed circuit operation of all unconventional electronic circuits, differing substantially from those covered in NAVSHIPS 0967-000-0120.

3-3. OVERALL FUNCTIONAL DESCRIPTION.

3-4. An overall functional block diagram of the receiver is given in figure 3-1. Insofar as possible, the order of presentation in the figure and in the text below follows the main signal flow through the receiver from rf input to audio output.

3-5. The 2.0- to 29.9999-MHz rf input from the antenna first passes through Antenna Overload Assembly A2A9. The primary purpose of this assembly is to protect RF Amplifier Assembly A2A4 from any excessively high input signals received by the antenna. The antenna overload circuit also interrupts the rf input to the rf amplifier whenever the receiver is being retuned to a new frequency.

3-6. The received signal is amplified in the rf amplifier to provide the required signal level to RF Translator Subassembly A2A6A6. Gain of the rf amplifier stages is varied in response to automatic gain control (agc) voltage feedbacks derived from the if. signal level in Receiver IF./Audio Amplifier Assembly A2A2 or A2A3. In the rf amplifier stages, selection of circuit components appropriate for the frequency to which the receiver is tuned is accomplished in accordance with a tuning-control signal from Receiver Code Generator Assembly A2A7. The final amplified rf signal is filtered in 20- and 30-MHz Filter Assembly A2A10 before being passed to the rf translator.

3-7. Conversion of the received rf signal to the 500-kHz if. signal is performed in three mixing operations in the rf translator. In the 1-MHz mixer, the injection frequency from the 1-MHz synthesizer subassemblies (part of A2A6) will be in the range of frequencies from 2.5 to 23.5 MHz, to result in a first if. signal in the range of either 19.5 to 20.5 MHz or 29.5 to 30.5 MHz. This first if. signal will be gated through either a 20- or a 30-MHz bandpass filter, as determined by a hi-/lo-band control voltage from the code generator.

3-8. In the 100-kHz mixer, the injection frequency from the 100-kHz synthesizer will be either in the range from 22.4 to 23.3009 MHz (for use with the 20-MHz first if.) or in the range from 32.4 to 33.3009 MHz (for use with the 30-MHz first if.). Selection of the proper range for the second injection frequency is made in the frequency synthesizer in response to a hi-/lo-band control signal from the code generator. In either case, the resultant second if. signal is in the range of frequencies from 2.8 to 2.9 MHz.

3-9. In the 1- and 10-kHz mixer, the second if. signal will be combined with an injection signal from the 1-and 10-kHz synthesizer in the range of frequencies from 3.301 to 3.400 MHz. The resultant output will be the third and final if. frequency, 500 kHz.

3-10. Selection of the three specific mixing frequencies required for the translation process is accomplished in the frequency synthesizer subassemblies through the setting of the front-panel receiver tuning controls. Accuracy of these injection signals is, in all cases, a function of highly accurate standard frequencies (500 kHz, 1 MHz, and 10 MHz) generated in Frequency Standard Assembly A2A5, from a stable, temperature-controlled, 5-MHz crystal oscillator. (An external 5-MHz standard frequency may be used instead of the internal standard frequency to operate the receiver.)

3-11. The 500-kHz output from the rf translator is applied to Mode Gates Subassembly A2A1A1. Up to this point, the operation of the receiver is identical in all modes. From here on, however, the main signal-flow path varies in accordance with the selected operational mode. In response to gating control voltages, the mode gates direct the passage of the if. signal through the appropriate LSB, USB, or AM filters to one or both of the if./audio amplifiers. In the USB, RATT, AM, and CW modes of operating, only if./audio amplifier A2A2 is used, while in the LSB mode only if./audio amplifier A2A3 is used. During ISB operation, the if. signal is fed to both assemblies.

3-12. Each if./audio amplifier extracts the audio modulation from its if. signal and presents this information to a front-panel phone jack and to an output connector at the rear of the case. In the USB, RATT, LSB, and ISB modes of operation, the intelligence is demodulated (in either or both of the if./audio amplifiers, depending on the specific mode) in a balanced product detector. Carrier reinsertion is provided in these modes of operation by a 500-kHz signal obtained from the frequency standard via 500-kHz Gate Subassembly A2A1A2. In the AM and CW modes of operation, where only if./audio amplifier A2A2 is used, demodulation takes place in an AM detector. For CW signals, an adjustable beat frequency oscillator (BFO) signal from BFO Subassembly A2A1A3 is applied to the AM detector.

3-13. An automatic gain control (agc) feedback voltage is developed in the if./audio amplifiers for use in the if. amplifier chain and in the rf amplifier, as mentioned previously. If desired, the agc function may be disabled, and the gain of the rf and if. amplifiers is then controlled manually from the front panel. When the receiver is associated with a transmitter in a communications link, the appropriate transmitter sidetones may be fed into the audio amplifier chain through a connector mounted in the rear of the case.

3-14. Operating voltages for the receiver are produced by Power Supply Assembly A2A8. The 115-Vac input, from either a primary or auxiliary power source, is transformed to 6.3 Vac for vacuum-tube filaments, and is converted to +110 Vdc, +28 Vdc, and -30 Vdc. In addition, regulated +20 Vdc is derived from the +28-Vdc supply.

3-15. <u>MAJOR FUNCTIONAL DESCRIPTIONS.</u>

3-16. GENERAL. The R-1051E/URR performs 11 major functions in its operation:

a. Rf selection, tuning, and overload protection

b. Rf-to-if. conversion

c. If. amplification and control

d. 500-kHz gating

e. Beat frequency oscillation

f. Automatic gain control

g. Audio amplification

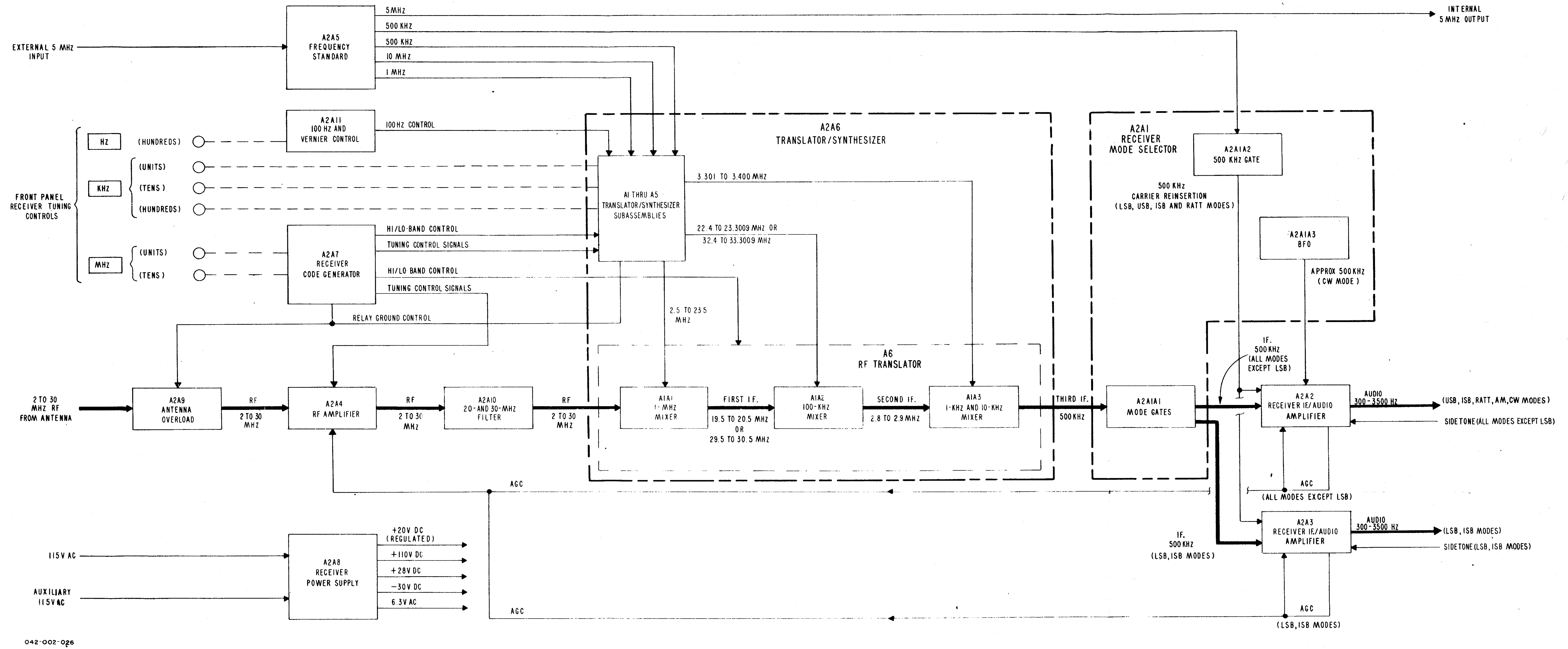

Figure 3-1. Radio Receiver R-1051E/URR, Overall Functional Block Diagram

h. Frequency synthesization

i. Standard frequency generation and distribution

j. Power distribution

k. Control.

The first nine of these functions are discussed below by functional descriptions of the operation of the various assemblies and subassemblies involved in the generation of each function. These descriptions are based on the signal flow diagrams in Chapter 5. As far as practicable, circuits in the main signal-flow path are discussed first (in signal-flow order). This is followed by discussions of the assemblies involved with frequency synthesization and frequency standardization. Power distribution is discussed with reference to the power distribution diagrams in Chapter 5 for the primary ac power and for each of the dc voltages in the receiver. The control function is described with reference to the tuning control diagram and some of the schematic diagrams in Chapter 5.

3-17. RF SELECTION,TUNING, AND OVERLOAD PROTECTION.

3-18. General. The rf selection, tuning, and overload protection function (figure 5-1) is performed by Antenna Overload Assembly A2A9, RF Amplifier Assembly A2A4, and 20- and 30-MHz Filter Assembly A2A10. The 2.0- to 29.9999-MHz rf input signal from the antenna is processed through these three assemblies and is output to RF Translator Subassembly A2A6A6.

3-19. Front-End Overload Protection. The rf signal from the antenna is fed to Antenna Overload Assembly A2A9, where it is connected to contact A1 on relay K1 (figure 5-1), and from contact A2 to RF Amplifier Assembly A2A4. A portion of the input rf signal is rectified by detector A2A9CR1, and is applied to the base of dc amplifier Q1. Biasing of amplifier Q1 is such that it will be near, or at, cutoff when the rf input is below the maximum safe level. As long as the safe condition exists, relay driver Q2 will be forward-biased to keep relay K1 energized. If the rf input level to the receiver should rise above the maximum safe level, amplifier Q1 will conduct, cutting off relay driver Q2, and deenergizing relay K1. When relay K1 is deenergized, contacts A1 and A2 will open, interrupting the signal path to the rf amplifier.

3-20. Interruption of the rf signal path to the rf amplifier will also occur when the receiver is being tuned to a new frequency. This is accomplished through application of a ground return to the cathode of diode CR2 which will disable relay driver Q2.

3-21. RF Amplification. The rf output from the antenna overload circuit is applied to RF Amplifier Assembly A2A4, where it first passes through contacts of relay A2A4A38K1 (figure 5-1). This relay is deenergized in the receiver, and its contacts are always in the closed position. The rf signal is then fed to one of 28 tunable 1-MHz bandpass coupling subassemblies mounted on a turret. The 28 coupling subassemblies cover the frequency range from 2.0 to 29.9999 MHz. Capacitors, mounted on a rotor within the turret, are connected in parallel with the transformers of the 1-MHz bandpass coupling subassemblies, in order to tune the subassemblies to discrete frequencies within the 1-MHz bandpass.

3-22. Transformer T1 and capacitor C2, in series with the capacitors of rotor subassemblies A30 and A31, constitute the antenna tuning circuit, while transformer T2 and capacitor C3, in series with the capacitors of rotor subassemblies A32 and A33, constitute the tuned grid circuit for rf amplifier V1. Coupling capacitor C1 couples the rf signal from the antenna tuning circuit to the tuned grid of V1. Parasitic filter FL1 suppresses the higher order frequencies in the grid circuit.

3-23. The output circuit of rf amplifier V1 consists of transformer T3 and capacitor C4 of subassemblies A2 through A29, and the capacitors of rotor subassemblies A34 and A35. After amplification in rf amplifier V1, the rf signal is coupled through capacitor C5 and parasitic suppressor FL2 to rf amplifier V2. The output circuit of rf amplifier V2 consists of transformer T4 and capacitor C5 of subassemblies A2 through A29 and the capacitors of rotor subassemblies A36 and A37.

3-24. The gain of rf amplifiers V1 and V2 is controlled either by the manual rotation of the front-panel RF GAIN control A2R3 (when the AGC switch A2S3 is in the OFF position), or by the output of the agc circuits in Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 (when the AGC switch A2S3 is in either the SLOW or the FAST position). Refer to paragraph 3-58 for a discussion of the agc circuits.

3-25. Filtering. The amplified rf output signals from rf amplifier A2A4V2 are coupled through transformer T4 in subassemblies A2 through A29 to output jack P2-A1 (figure 5-1). From here, the signals pass to 20- and 30-MHz Filter Assembly A2A10, where they are filtered and passed on to RF Translator Subassembly A2A6A6.

3-26. RF-TO-IF. CONVERSION.

3-27. General. The rf-to-if. conversion function (figure 5-2) takes place entirely within RF Translator Subassembly A2A6A6, which is part of Translator/Synthesizer Assembly A2A6. The function receives the 2.0- to 29.9999-MHz rf signal from 20- and 30-MHz Filter Assembly A2A10, converts it in three mixer stages to a final if. frequency of 500 kHz, and sends this output signal to Mode Selector A2A1. The conversion is effected in three stages, each of which is discussed below.

3-28. First IF. Conversion. Conversion of frequency (within the tuning range of the receiver) to the final if. frequency of 500 kHz is the result of a triple mixing process in RF Translator Subassembly A2A6A6 (figure 5-2). The signal from RF Amplifier Assembly A2A4 is received via 20- and 30-MHz Filter Assembly A2A10, and is applied across a signal limiter composed of diodes A2A6A6A1CR1 and CR2, and is then fed to 1-MHz Mixer and Automatic Level Control Subassembly A1A1, where conversion to the first if. takes place. Within subassembly A1A1, the signal passes through diode gate CR2 to transformer T1, from whose secondary a balanced signal is applied to the high-frequency mixer, integrated circuit module U1A. Diode gate CR2 is always forward-biased in the receiver.

3-29. The injection signal for high-frequency mixer U1A is fed to the rf translator from 1-MHz Synthesizer Subassembly A2A6A1 (refer to paragraph 3-83). In 1-MHz Mixer and Automatic Level Control Subassembly A2A6A6A1A1, the injection signal is applied to one input (pin 3) of dual-gate amplifier Q1. The second input to this stage is a feedback signal from dc amplifier U1B, which provides automatic level control (alc) of the injection signal applied to high-frequency mixer U1A from the emitter of amplifier Q2. The operation level for the injection signal is determined by the setting of agc adjustment potentiometer R27.

3-30. The frequency of the injection signal from the 1-MHz synthesizer is one of 17 discrete frequencies selected in accordance with the setting of the two front-panel MHz controls, as shown in table 3-1. Note that certain 1-MHz increments are designated as lo-band signals, while the remainder are designated as hi-band signals.

3-31. As a result of the mixing action, the first if. frequency for lo-band signals will be in the range from 19.5 to 20.5 MHz, and for hi-band signals will be in the range from 29.5 to 30.5 MHz. For example, a lo-band signal of 5.000 MHz is mixed with the 14.5-MHz injection signal to produce a sum frequency of 19.5 MHz (in addition to the applied frequencies and the difference frequency). As a second example, a lo-band signal of 5.9999 MHz (near the upper limit of the 1-MHz increment) is mixed with the 14.5-MHz injection signal to produce a sum frequency of 20.4999 MHz. Similar examples for hi-band signals would give first if. frequencies in the range from 29.5 to 30.5 MHz. For lo-band input signals in the ranges from 22 to 23 MHz and 27 to 30 MHz, the difference frequency resulting from the mixing process is the desired signal.

3-32. The signal from the high-frequency mixer is applied through transformer T2 to gate CR4, which is always forward-biased.

3-33. The first if. signal exits from the 1-MHz Mixer and Automatic Level Control

Table 3-1. Injection Frequencies from 1-MHz Synthesizer Subassembly A2A6A1 Used in the First IF. Mixer

MHz DIGIT (S) OF RF INPUT SIGNAL	INJECTION SIGNAL FREQUENCY (MHz)	BAND DESIGNATION
2	17.5	Lo
3	16.5	Lo
4	15.5	Lo
5	14.5	Lo
6	23.5	Hi
7	12.5	Lo
8	11.5	Lo
9	20.5	Hi
10	19.5	Hi
11	8.5	Lo
12	7.5	Lo
13	16.5	Hi
14	5.5	Lo
15	4.5	Lo
16	3.5	Lo
17	12.5	Hi
18	11.5	Hi
19	10.5	Hi
20	9.5	Hi
21	8.5	Hi
22	2.5	Lo
23	3.5	Lo
24	5.5	Hi
25	4.5	Hi
26	3.5	Hi
27	7.5	Lo
28	8.5	Lo
29	9.5	Lo

Subassembly A2A6A6A1A1 and passes through one channel of a two-channel filter network as determined by control voltages applied to gating diodes A2A6A6A1CR4 through CR7. For lo-band signals, +20 Vdc from hi-/lo-filter relay A2K2 is applied to the anodes of gating diodes CR4 and CR6 and to the cathodes of diodes CR5 and CR7. Diodes CR4 and CR6 will be forward-biased and diodes CR5 and CR7 will be back-biased. The if. signal is steered through 20-MHz filter FL1. For hi-band signals, a ground connection will be applied by relay A2K2 so that the signal will be steered through 30-MHz filter FL2. The filters remove all undesired frequencies (input signals and other mixer products) that appear at the output of the high-frequency mixer. Potentiometer R11, at the output of the 20-MHz filter, provides a means of equalizing the signals through the two filters.

3-34. Second IF. Conversion. After filtering, the first if. signal is fed to 100-kHz Mixer Subassembly A2A6A6A1A2, where conversion to the second if. takes place (figure 5-2). The signal first passes through forward-biased diode gate CR2, and is applied to mid-frequency mixer U1 through transformer T1.

3-35. The injection signal for the mid-frequency mixer is obtained from 100-kHz Synthesizer Subassembly A2A6A2 (refer to paragraph 3-89), and will be in the range from 22.4000 to 23.3009 MHz when a lo-band signal is being processed, or in the range from 32.4000 to 33.3009 MHz when a hi-band signal is being processed. Table 3-2 shows the specific ranges of injection frequencies for lo- and hi-band signals associated with the 100-kHz digit of the frequency to which the receiver is tuned. A range of frequencies (in 100-Hz steps) is given for each 100-kHz increment, since this second mixing action is also used to convert the hundreds of hertz portion of the rf input signal as well as the hundreds of kilohertz. Table 3-2 also shows slightly extended ranges of injection frequencies that may be obtained when the front-panel Hz vernier control A2A11R1 is in use.

3-36. As a result of the mixing action, both the lo-band and the hi-band signals will be converted to a second if. frequency falling within the range from 2.8 to 2.9 MHz. For example, the lo-band rf input signal of 5.0000 MHz, having been converted to a first if. signal of 19.5000 MHz (refer to paragraph 3-31), will then be mixed with an injection signal of 22.4000 MHz (refer to table 3-2) to produce a difference frequency of 2.9000 MHz. As a second example, the lo-band rf input signal of 5.9999 MHz, having been converted to a first if. signal of 20.4999 MHz, will then be mixed with an injection signal of 23.3009 MHz to produce a difference frequency of 2.8010 MHz.

3-37. The composite signal from the mid-frequency mixer A2A6A6A1A2U1 is applied through transformer T2 to gate CR4, which is always forward-biased. After exiting from 100-kHz Mixer Subassembly A2A6A6A1A2, the signal passes through 2.85-MHz filter A2A6A6A1FL3 to remove all undesired frequencies that appear at the output of the mid-frequency mixer.

3-38. Third IF. Conversion. The filtered second if. signal is fed to 1- and 10-kHz Mixer and Automatic Level Control Subassembly A2A6A6A1A3, where conversion to the third, and final, if. takes place (figure 5-2). Within subassembly A3, the signal passes through forward-biased diode gate CR1 to transformer T1. The balanced output from the secondary of transformer T1 is applied to the low-frequency mixer, integrated circuit module U1A.

3-39. The injection signal for the low-frequency mixer is obtained from 1- and 10-kHz Synthesizer Subassembly A2A6A3 (refer to paragraph 3-100). In the 1- and 10-kHz Mixer and Automatic Level Control Subassembly A2A6A6A1A3, the injection signal is applied to one input (pin 3) of dual-gate amplifier Q1. The second input to this stage is a feedback signal from dc amplifier U1B, which provides alc for the injection signal applied to low-frequency mixer U1A from the collector circuit of

Table 3-2. Injection Frequencies from 100-kHz Synthesizer Subassembly A2A6A2 Used in the Second IF. Mixer[1]

	LO-BAND SIGNALS		HI-BAND SIGNALS	
100-kHz DIGIT OF RF INPUT SIGNAL	INJECTION SIGNAL FREQUENCY IN 100-Hz STEPS (MHz)	INJECTION SIGNAL FREQUENCY WITH Hz VERNIER CONTROL A2A11R1 IN USE (MHz)	INJECTION SIGNAL FREQUENCY IN 100-Hz STEPS (MHz)	INJECTION SIGNAL FREQUENCY WITH Hz VERNIER CONTROL A2A11R1 IN USE (MHz)
0	22.4000 to 22.4009	22.3998 to 22.4012	32.4000 to 32.4009	32.3998 to 32.4012
1	22.5000 to 22.5009	22.4998 to 22.5012	32.5000 to 32.5009	32.4998 to 32.5012
2	22.6000 to 22.6009	22.5998 to 22.6012	32.6000 to 32.6009	32.5998 to 32.6012
3	22.7000 to 22.7009	22.6998 to 22.7012	32.7000 to 32.7009	32.6998 to 32.7012
4	22.8000 to 22.8009	22.7998 to 22.8012	32.8000 to 32.8009	32.7998 to 32.8012
5	22.9000 to 22.9009	22.8998 to 22.9012	32.9000 to 32.9009	32.8998 to 32.9012
6	23.0000 to 23.0009	22.9998 to 23.0012	33.0000 to 33.0009	32.9998 to 33.0012
7	23.1000 to 23.1009	23.0998 to 23.1012	33.1000 to 33.1009	33.0998 to 33.1012
8	23.2000 to 23.2009	23.1998 to 23.2012	33.2000 to 33.2009	33.1998 to 33.2012
9	23.3000 to 23.3009	23.2998 to 23.3012	33.3000 to 33.3009	33.2998 to 33.3012

[1] Since 100-kHz synthesizer injection signals carry error information relative to the 1- and 10-kHz synthesizer, observed frequencies may differ slightly from the exact values given in this table.

amplifier Q2. The operating level for the injection signal is determined by the setting of agc adjustment potentiometer R28.

3-40. The frequency of the injection signal for the low-frequency mixer will be in the overall range from 3.301 to 3.400 MHz, in 1-kHz steps, and is selected in accordance with the setting of the front-panel 1 and 10 kHz controls. Table 3-3 shows the specific ranges of injection frequencies associated with each 10-kHz digit of the rf input signal. Each range consists of 10 frequencies, in 1-kHz steps, to provide for the conversion of the 1-kHz digit.

3-41. As a result of the mixing action, the third if. frequency of 500 kHz will be obtained. For example, an rf input signal to the receiver of 5.0000 MHz, having been converted to a first if. of 19.5000 MHz and then to a second if. of 2.9000 MHz (refer to paragraphs 3-31 and 3-36), will then be mixed with an injection frequency of 3.400 MHz (refer to table 3-3). The difference frequency is the desired 500-kHz final if. As a second example, an rf input signal is 5.9999 MHz, which is converted to a first if. of 20.49999 MHz and then to a second if. of 2.8010 MHz. As indicated in table 3-3, a third mixer injection signal of 3.301 MHz is used to result in the third if. signal of 500 kHz.

3-42. The 500-kHz if. from the low-frequency mixer is applied through transformer A2A6A6A1A3T2 to gate CR3, which is always forward-biased. After exiting from 1- and 10-kHz Mixer and Automatic Level Control Subassembly A2A6A6A1A3, the signal is applied to potentiometer A2A6A6A1R16, which is used to adjust the output level of the rf translator. Final amplification and filtering is provided by amplifier A2A6A6A1Q1 and tuned inductor A2A6A6A1L15 before the 500-kHz if. signal is fed to Receiver Mode Selector Assembly A2A1.

3-43. IF. AMPLIFICATION AND CONTROL.

3-44. General. The if. amplification and control function consists of mode gating, if. amplification, and demodulation (figure 5-3). The function is performed primarily in Mode Gates Subassembly A2A1A1 and in Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3. The 500-kHz if. signal from RF Translator Subassembly A2A6A6 is gated according to the receiver mode of operation, and is then amplified and demodulated before being sent to the

Table 3-3. Injection Frequencies From 1- and 10-kHz Synthesizer Subassembly A2A6A3 Used in the Third IF. Mixer

10-kHz DIGIT OR RF INPUT SIGNAL	INJECTION SIGNAL FREQUENCY IN 1-kHz STEPS (MHz)
0	3.400 to 3.391
1	3.390 to 3.381
2	3.380 to 3.371
3	3.370 to 3.361
4	3.360 to 3.351
5	3.350 to 3.341
6	3.340 to 3.331
7	3.330 to 3.321
8	3.320 to 3.311
9	3.310 to 3.301

audio amplification circuits (refer to paragraph 3-67).

3-45. The amplification is controlled by agc voltages (refer to paragraph 3-58). The demodulation function uses a 500-kHz carrier reinsertion signal in all modes except AM and CW (refer to paragraph 3-52), and a 500-kHz BFO signal in the CW mode (refer to paragraph 3-54).

3-46. Mode Gating. The 500-kHz if. signal from RF Translator Subassembly A2A6A6 is fed to Mode Gates Subassembly A2A1A1, which is part of Receiver Mode Selector Assembly A2A1 (figure 5-3). Here the signal is applied to emitter follower A2A1A1Q1. The output of Q1 is divided equally, three ways, and fed to USB filter A2A1FL1, AM filter A2A1FL2 (via A2A1A1CR4) and LSB filter A2A1FL3. In the USB, ISB, and RATT modes, diode A2A1A1CR1 is enabled by application of +20 Vdc to the anode, via contacts on the front-panel mode selector switch A2S2, to overcome a +10-volt reverse bias at the cathode (derived from Zener diode A2A1A1CR3). At the same time, diode switches CR2 and CR4 are disabled by application of the appropriate control voltages from the mode selector switch A2S2. Thus, the output of USB filter A2A1FL1 is gated to emitter follower A2A1A1Q2 and then fed to Receiver IF./Audio Amplifier Assembly A2A2.

3-47. In the AM and CW modes, diode switches A2A1A1CR2 and CR4 are enabled while diode switch CR1 is disabled, by application of appropriate control voltages through the mode selector switch A2S2. Thus, the output of AM filter A2A1FL2 is gated to emitter follower Q2, and then fed to Receiver IF./Audio Amplifier Assembly A2A2.

3-48. In the LSB mode, the output from LSB filter A2A1FL3 is coupled directly to emitter follower A2A1A1Q3, without gating. However, the output of this filter will be used only when information is being carried in the LSB and ISB modes, because circuits in the lower sideband Receiver IF./Audio Amplifier Assembly A2A3 (which receives the output from emitter follower A2A1A1Q3) are disabled except during these two modes of operation (refer to paragraph 3-51). When operating in the LSB mode, both diode switches A2A1A1CR1 and CR2 are disabled.

3-49. IF. Amplification. In the ISB mode of operation, if. signals are presented to both Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 (figure 5-3). Since the two assemblies are identical, the following description of the if. amplifier stages applies to both assemblies.

3-50. Amplification of the if. signal is accomplished in transformer coupled stages A2Q1, Q4, Q5, and Q6. Agc voltage is received by dc amplifier Q2 and is further amplified by Q3. As a result of the agc action (refer to paragraph 3-58), the input to if. amplifier Q4 remains nearly constant over a wide range of input if. signal variations. The gain of if. amplifier Q6 may be set by means of potentiometer R22 to produce the desired signal level for the balanced output from transformer T4. The output of A2T4 is applied to the product detector A3Q1 and A3Q2, and to the AM detector A3CR2 (via amplifier A3Q3) in assembly A2A2 in the AM and CW modes. In all other modes of operation, the output of A2T4 is applied only to the product detector A3Q1 and A3Q2 in both assemblies A2A2 and A2A3.

3-51. Operating voltage (+20 Vdc) for transistors A2Q1 through A2Q6 is selectively applied to Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 through contacts of the front-panel mode selector switch A2S2. Thus, in the USB, RATT, AM, and CW modes, only assembly A2A2 is operational; while in the LSB mode, only assembly A2A3 is operational. In the ISB mode, both assemblies receive +20 Vdc, and are operational.

3-52. Demodulation. In the USB, LSB, ISB, and RATT modes of operation, the balanced if. output from the if. amplifier stages is demodulated in the product-detector portion of subassemblies A2A2A3 or A2A3A3 (figure 5-3). The product-detector transistors Q1 and Q2, connected in a balanced-mixer configuration, receive 180-degree out-of-phase modulated if.

signals at their bases, and a 500-kHz carrier reinsertion signal from Receiver Mode Selector Assembly A2A1 (refer to paragraph 3-55) at their emitters. As a result of the mixing, cancelling, and filtering action of these two transistors and their associated passive components, the audio intelligence is separated from the if. signal and appears across the secondary of transformer A2A2A3T1 or A2A3A3T1.

3-53. Control of the product detector is obtained by applying operating voltages and the 500-kHz injection only during the proper modes of operation. Thus, operating voltages are applied to the product detector in Receiver IF./Audio Amplifier Assembly A2A2 through contacts of the mode selector switch A2S2 only during the USB, ISB, and RATT modes, while operating voltages are supplied to the product detector in Receiver IF./Audio Amplifier A2A3 only in the LSB and ISB modes.

3-54. In the AM and CW modes of operation, only one of the two if. outputs from if. transformer A2A2A2T4 is demodulated in the AM detector A2A2A3CR2. (Receiver IF./ Audio Amplifier Assembly A2A3 is inoperative in these modes.) The modulated 500-kHz if. signal undergoes one further stage of amplification in transistor A2A2A3Q3, and is applied across the tuned circuit consisting of inductor L1 and capacitor C6. The resultant output of the tuned circuit is detected in diode CR2, which extracts the audio signal from the if. signal. In the CW mode of operation,the BFO signal is applied to the tuned circuit L1 and C6, and the normal 1000-Hz beat frequencies present when the transmitter is keyed are detected. Operating voltage for amplifier Q3 is provided to this stage through contacts of the mode selector switch A2S2 only during AM or CW modes. In all other modes, the circuit is inoperative.

3-55. 500-kHz GATING. Gating of the 500-kHz carrier reinsertion signal used in the product detectors (refer to paragraph 3-52) is accomplished in the 500-kHz Gate Subassembly A2A1A2, which is part of Receiver Mode Selector Assembly A2A1 (figure 5-4). A very accurate 500-kHz signal from Frequency Standard Assembly A2A5 (refer to paragraph 3-133) is applied to diode switch A2A1A2CR1. This diode is forward-biased only during the LSB, USB, ISB, and RATT modes of operation, when +20 Vdc is applied to the circuit through contacts of the front-panel mode selector switch A2S2. Two outputs are provided, one to Receiver IF./Audio Amplifier Assembly A2A2, and the other to Receiver IF./Audio Amplifier Assembly A2A3, where they are used in the demodulation of if. signals (refer to paragraph 3-52).

3-56. BEAT FREQUENCY OSCILLATION. The beat frequency oscillation (BFO) function is provided by the BFO and Amplifier Subassembly A2A1A3, which is part of the Receiver Mode Selector Assembly A2A1 (figure 5-8). This subassembly is only activated by +20 Vdc from the mode selector switch A2S2 when this switch is in the CW position. In all other modes of operation, the +20 Vdc is not supplied to the BFO and amplifier, and the assembly is inactive.

3-57. The beat frequency oscillator A2A1A3Q1 is aligned by variable inductor L1 to oscillate at a range of frequencies around 500 kHz. Adjustment of the beat frequency is accomplished by applying an adjustable dc voltage (from +8.5 to +20 Vdc) to voltage-variable capacitor CR1. This dc voltage is obtained from the front-panel BFO control A2R6. Buffer amplifier A2A1A3Q2 isolates the oscillator, and feeds the BFO signal to Receiver IF./Audio Amplifier Assembly A2A2, where it is used in the demodulation of CW signals (refer to paragraph 3-54).

3-58. AUTOMATIC GAIN CONTROL. Automatic gain control (agc) is provided by Receiver IF./Audio Amplifier Assembly A2A2 in the USB, RATT, AM, and CW modes of operation, by Receiver IF./Audio Amplifier Assembly A2A3 in the LSB mode, and by both assemblies in the ISB mode (figure 5-7). The agc voltage is used by dc amplifier A2Q2 within the if./audio amplifiers (refer to paragraph 3-49), and is also supplied to RF Amplifier Assembly A2A4 (refer to paragraph 3-21).

3-59. A portion of the 500-kHz if. signal is tapped from the secondary of if. transformer A2A2 or A2A3A2T2, and fed to if. amplifier A1Q8. The gain of this stage is varied by AGC control R25. When the front-panel AGC switch A2S3 is in the FAST or SLOW position, preamplifier A2A2 or A2A3A1Q12 and switch Q13 forward-bias if. amplifier Q7, applying the 500-kHz if. signal to transformer T1. Two in-phase outputs of different amplitudes are then taken from the secondary of transformer T1. The larger of these two signals is rectified by detector CR5 to provide a charging potential for capacitor C5, while the smaller signal is rectified by detector CR4 to provide a charging potential for capacitor C3. The dc voltages on capacitors C5 and C3 provide base bias and emitter bias, respectively, for coincidence detector Q6. A relatively steady rf signal will result in coincidence detector Q6 being cut off.

3-60. The voltage across capacitor C3 also serves as the base bias for emitter follower Q4. If the rf input signal level increases, the voltage across C3 will become more positive, and the resulting increased conduction of emitter follower Q4 will cause a more positive voltage to be applied to the base of dc amplifier Q3. The voltage of the emitter of dc amplifier Q3 will become more positive, and this positive voltage is applied to the base of dc amplifier A2Q2 (see figure 5-7). This amplifier, which acts as a variable resistor, develops less if. signal amplitude for application to the base of if. amplifier Q4. Conversely, a decrease in the rf input signal level results in an increase in the if. signal to the if. amplifier stages Q5 and Q6. The lower dc potential at the collector of dc amplifier Q2 is also applied to the base of agc amplifier Q3, which supplies a degenerative feedback signal to the emitter of if. amplifier Q1.

3-61. If the rf input signal should be interrupted (or suddenly drop to a much lower level), capacitors A1C5 and C3 discharge through resistance networks (see figure 5-7). The rates of discharge of the two capacitors are such that eventually coincidence detector Q6 will be forward-biased, at which time both transistors Q6 and Q15 will start to conduct. The time interval from the loss of signal to the turnon of Q6 provides the agc hang time (the hang time is of sufficient duration so that the charge across capacitor C3 remains relatively constant during the reception of intermittent voice signals). Capacitors C3 and C5 now discharge at a faster rate through conducting transistors Q6 and Q15. This portion of the discharge provides the agc decay time. If, during this process, the rf input is resumed, coincidence detector Q6 will be immediately reset as described in paragraph 3-59.

3-62. With front-panel AGC switch A2S3 in the SLOW position, preamplifier A2A2 or A2A3A1Q11 is cut off, forward-biasing switch Q10. This action connects capacitor C14 in parallel with capacitor C3, to increase greatly the agc hang and decay times. In FAST agc operation, preamplifier Q11 is forward-biased, and will cause switch Q10 to be cut off.

3-63. When AGC switch A2S3 is in the OFF position, ground potential is applied to the base of preamplifier A2A2 or A2A3A1Q12, cutting it off. This allows switch Q13 to be biased off, disabling amplifier Q7 and, therefore, the entire agc function.

3-64. The agc voltage applied to RF Amplifier Assembly A2A4 is generated through the action of dc amplifiers A2A2 or A2A3A1Q2 and Q1. As the result of an increase in rf input signal level, conduction of dc amplifier Q3 will increase, causing an increase in the forward-biasing voltage on the base of dc amplifier Q2. This, in turn, will raise the base voltage on dc amplifier Q1, and the resulting decreased conduction of this stage will cause the collector to go to a more negative dc voltage. The collector voltage of dc amplifier Q1 is fed through diode CR1 to the rf amplifier assembly, where the application of the more negative agc voltage to the grids of the two rf amplifier stages will reduce their gain. Conversely, a decrease in the rf input signal level will result in a less negative agc voltage to raise the gain of the rf amplifiers. Diode CR1 prevents any positive dc levels from being applied to the rf amplifier circuits. When operating in the FAST agc mode, +20 Vdc is applied through front-panel AGC switch A2S3 to switch A2A2 or A2A3A1Q5. This action grounds capacitor C1 and prevents oscillations in the rf-if.-agc loop.

3-65. When an extremely low rf input signal at or near the threshold of receiver sensitivity is being received, dc amplifier Q1 will be at maximum conduction. Under this condition of extremely low input signal, it is undesirable to apply any agc control to the rf amplifiers until a more favorable signal-to-noise ratio occurs. The desired delay in applying any agc to the rf amplifiers is introduced by adding diodes CR2 and CR3 in series with the emitter of dc amplifier Q2. Therefore, the rf input signal level must increase to a level where the forward-bias voltage applied to the base of Q2 overcomes the forward-bias requirement of the two diodes, in addition to that required for dc amplifier Q2 itself.

3-66. Manual control of rf and if. gain is provided when front-panel AGC switch A2S3 is in the OFF position, by application of a variable dc voltage to the base of dc amplifier A2A2 or A2A3A1Q3 from RF GAIN control A2R3 on the front panel.

3-67. AUDIO AMPLIFICATION.

3-68. General. Audio amplification of the intelligence obtained from the demodulators (refer to paragraph 3-52) takes place in Receiver IF./Audio Amplifier A2A2 in the USB, RATT, AM, CW, and ISB modes of operation, and in Receiver IF./Audio Amplifier A2A3 in the LSB and ISB modes. In any mode, the final, amplified, 300- to 3500-Hz audio signal is filtered in Filter Box Assembly A1A1 and applied to rear-panel output connectors for use with primary or auxiliary audio equipment, and to a front-panel jack for monitoring by means of a headset. When the receiver is associated with a transmitter in a communications link, the transmitter sidetones may be fed back to the receiver to control the audio amplification. The audio amplification signal flow is discussed separately below for the two if./audio amplifiers, and is depicted on two separate signal flow diagrams (figures 5-5 and 5-6). Note that the ISB mode is processed in both assemblies, and is discussed and depicted twice.

3-69. USB, RATT, AM, CW, and ISB Modes (figure 5-5). In the USB and RATT modes of operation, and for the upper sideband signal in the ISB mode, the audio output from the product detector A2A2A3Q1 and Q2 is applied through transformer T1 to the front-panel USB LEVELS LINE control A2R2 without amplification. In the AM and CW modes, the audio output from the AM detector A2A2A3CR2 is applied through audio amplifiers A1Q9 and Q14 to the USB LEVELS LINE control A2R2. If present, upper sideband sidetone signals (from an associated transmitter) are capacitively coupled to the USB LEVELS LINE control A2R2 through capacitor A2A2A2C24.

3-70. The audio signal tapped from the USB LEVELS LINE control A2R2 is applied to the base of audio amplifier A2A2A2Q7. The amplified signal from the collector of Q7 is directly coupled to the base of emitter follower Q8, which serves to isolate amplifier Q7 and to provide impedance matching to the push-pull emitter follower Q9 and Q10 through transformer T5. The output of the push-pull emitter follower is applied to the primary of transformer A2A2T1. A small portion of the audio signal is returned from the secondary of this transformer to the emitter of audio amplifier A2A2A2Q7 as degenerative feedback to reduce distortion and increase the stability of the amplifier stages.

3-71. Operating voltages for the audio amplifiers A2A2A1Q9, Q14, and A2Q7 and emitter followers Q8, Q9, and Q10 are obtained from the front-panel mode selector switch A2S2 only when the stage is actually required.

3-72. One output from the secondary of transformer A2A2T1 is a balanced, 600-ohm, two-wire output connected to A1A1J4-d and e, and in parallel A1A1J5-A and B, for operation of primary and auxillary equipments, respectively. The audio level of this output signal may be monitored on AUDIO LEVEL meter A2M1 by placing the front-panel audio level meter switch A2S1 in the USB position. The second output is an unbalanced output connected to USB LEVELS PHONE control A2R5. Rotation of A2R5 permits the adjustment of the audio signal level on the PHONE USB jack A2J2, and to connector A1A1J4-b at the rear of the receiver. The wiper arm of A2R5 is also connected to front-panel mode selector switch A2S2B-F4 and 5, which provides earphone audio in the USB, RATT, AM, and CW modes to connector A1A1J4-H at the rear of the receiver.

3-73. LSB and ISB Modes (figure 5-6). In the LSB mode and for the lower sideband signal in the ISB mode, the audio output from the product detector A2A3A3Q1 and Q2 is applied through transformer T1 to the LSB LEVELS LINE control A2R1 on the front panel without amplification. Lower sideband sidetone signals from all associated transmitter are capacitively coupled to the LSB LEVELS LINE control A2R1. through capacitor A2A3A2C24.

3-74. The signal flow of the audio signal tapped from LSB LEVELS LINE control A2R1 through the audio amplifier portion of subassembly A2A3A2 is identical to the USB signal flow discussed in paragraphs 3-70 and 3-71 above.

3-75. One output from the secondary of transformer A2A3T1 is a balanced, 600-ohm, two-wire output connected to A1A1J4-n and m and in parallel A1A1J6-A and B, for operation of primary and auxillary equipments, respectively. The audio level of this output signal may be monitored on AUDIO LEVEL meter A2M1 by placing the front-panel audio level meter switch A2S1 in the LSB position. The second output is an unbalanced output connected to LSB LEVELS PHONE control A2R4. Rotation of A2R4 permits the adjustment of audio signal level on the PHONE LSB jack A2J1, and to connector A1A1J4-a at the rear of the receiver. The wiper arm of A2R4 is also connected to the front-panel mode selector switch A2S2B-F-1, which provides earphone audio in the LSB mode to connector A1A1J4-H at the rear of the receiver.

3-76. FREQUENCY SYNTHESIZATION (figure 3-2 and Appendix A).

3-77. General. Injection frequencies for the three frequency mixers of RF Translator Subassembly A2A6A6 (refer to paragraph 3-26) are generated within the following subassemblies of Translator/Synthesizer Assembly A2A6:

a. 1-MHz Synthesizer Subassembly A1

b. 100-kHz Synthesizer Subassembly A2

c. 1- and 10-kHz Synthesizer Subassembly A3

d. 100-Hz Synthesizer Subassembly A4

e. Spectrum Generator Subassembly A5.

All of the injection frequencies are developed using the highly stable reference frequencies from Frequency Standard Assembly A2A5. Tuning control is provided by the 10 and 1 MHz controls on the front panel via Receiver Code Generator Assembly A2A7. the 100, 10, and 1 kHz front-panel controls directly, and the front-panel Hz vernier control via 100-Hz Control and Vernier Assembly A2A11. A combination of error-cancelling loops and phase-locked loops ensures that the output injection frequencies are correct.

3-78. The 1-MHz Synthesizer Subassembly A2A6A1 accepts a 1-MHz reference frequency from Frequency Standard Assembly A2A5 and tuning code from Receiver Code Generator Assembly A2A7, and provides as an output the injection frequency for the high-frequency mixer circuits of the rf translator. The setting of the front-panel MHz controls (tens and units of MHz) determines the tuning code from the code generator. The 1-MHz synthesizer is in the frequency range from 2.5 to 23.5 MHz. It uses a phase-locked loop to ensure the accuracy of the MHz injection frequencies. Using the 1-MHz output from the frequency standard as a reference, the 1-MHz synthesizer detects any error in the output frequency from the 1-MHz oscillator, and produces an error

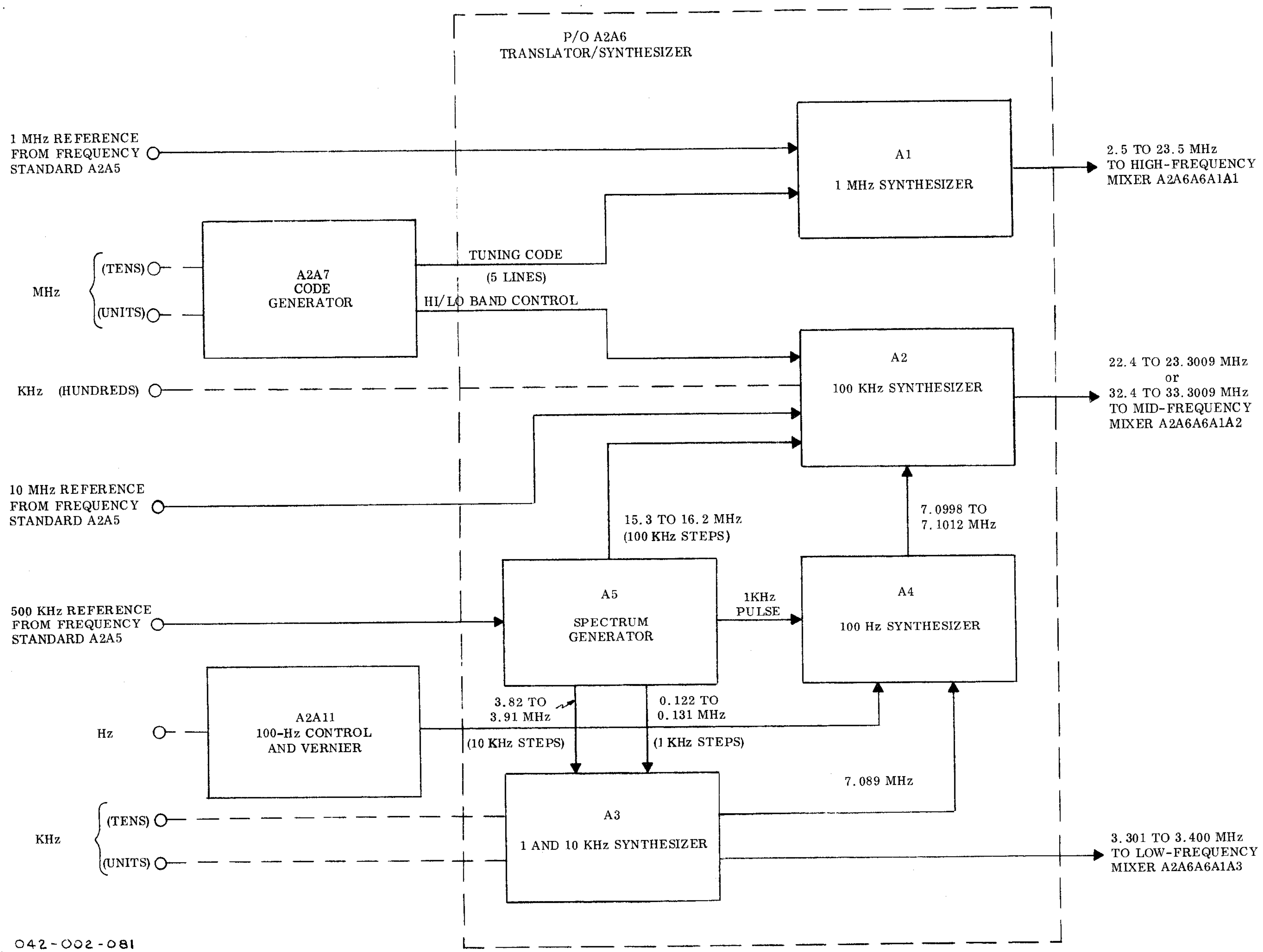

Figure 3-2. Frequency Synthesization, Functional Block Diagram

voltage, which is applied to the 1-MHz oscillator to lock it to the correct frequency. The accuracy of the 1-MHz oscillator is then the same as that of the frequency standard.

3-79. The injection frequencies used in the mid-frequency mixer circuits of the rf translator are generated within 100-kHz Synthesizer Subassembly A2A6A2. This subassembly contains a crystal oscillator, the output of which is one of 10 frequencies in the range from 4.553 to 5.453 MHz, spaced at 100-kHz intervals. The oscillator output frequency is determined by the setting of the front-panel 100 kHz control. If a lo-band injection frequency is required, the output of a 17.847-MHz mixer is additively mixed in a lo-band mixer with the output of the 100-kHz oscillator to provide a mid-frequency injection signal in the range from 22.4 to 23.3009 MHz to the mid-frequency mixer. Should a hi-band injection frequency be required, the output of a 27.847-MHz mixer is additively mixed in the hi-band mixer with the output of the 100-kHz oscillator to provide a mid-frequency mixer injection signal in the range from 32.4 to 33.3009 MHz. The hi-/lo-control line from the code generator determines the specific output frequency range of the 100-kHz synthesizer. The output from the 100-Hz synthesizer (A2A6A4) is added into the injection frequency in the 100-kHz synthesizer.

3-80. The injection frequencies used in the third frequency conversion are generated within the 1- and 10-kHz Synthesizer Subassembly A2A6A3. Two crystal oscillators, each of which has 10 possible output frequencies, are subtractively mixed to produce 1 of 100 possible frequencies spaced at 1-kHz intervals between 3.301 and 3.400 MHz. The output is applied to the low-frequency mixer. The frequency of the 1-kHz oscillator, whose output is 1.850 to 1.859 MHz in 1-kHz steps, is determined by the setting of the front-panel 1-kHz control. The output of the 10-KHz oscillator is in the frequency range from 5.16 to 5.25 MHz in 10-kHz steps, as determined by the setting of the front-panel 10 kHz control. Frequency errors in the 1- and 10-kHz oscillators are cancelled by error-cancelling loops.

3-81. The 100-Hz Synthesizer Subassembly A2A6A4 generates a 7.0998 to 7.1012 MHz signal used in the 100-kHz synthesizer receives a four-line control code from the front-panel Hz switch (via 100-Hz Control and Vernier Assembly A2A11), which is applied to the 100-Hz oscillator. This oscillator is phase-locked by a 1-kHz input from the spectrum generator, which is derived from the frequency standard. The 1-kHz pulse input is applied to a phase detector to derive a control voltage for phase-locking the 100-Hz oscillator. The accuracy of the oscillator output is then the same as that of the frequency standard.

3-82. Spectrum Generator Subassembly A2A6A5 accepts the 500-kHz output of the frequency standard and produces spectra of frequencies to the 1- and 10-kHz synthesizer and the 100-kHz synthesizer, and a 1-kHz pulse to the 100-Hz synthesizer. These bands of frequencies are then used to provide accurate frequency translation in the synthesizer subassemblies. Frequency error is cancelled in the mixing process to maintain frequency accuracy equal to the accuracy of the frequency standard. The 1-kHz reference pulse is used to phase-lock the 100-Hz oscillator. The various output spectra of the spectrum generator are shown in figure 3-2. Notice that the 1-MHz synthesizer does not receive an input from the spectrum generator, but does accept a 1-MHz reference frequency from the frequency standard. The 1-MHz synthesizer uses the reference frequency input from the frequency standard in its own spectrum generator, together with a phase-locking arrangement, to produce an accurate output frequency.

3-83. 1-MHz Synthesizer Subassembly A2A6A1 (figure 5-11). The 1-MHz synthesizer generates the 2.5- to 23.5-MHz injection frequency used in the high-frequency mixer circuits of RF Translator Subassembly A2A6A6. The 1-MHz synthesizer comprises three subassemblies: 1-MHz oscillator A1, if./dc amplifier A2, and spectrum generator/mixer A3.

3-84. Variable crystal oscillator A1Q1 produces one of 17 possible output frequencies, as selected by the 1-and 10-MHz front-panel controls. Frequency selection is accomplished by switching crystals A2A6A1A1Y1 through A1Y17 and capacitors A2A6A1A1C1 through A1C17. The specific injection frequency depends on the frequency of the 1 and 10 MHz controls. Voltage-variable capacitor A2A6A1A1CR3 is controlled by an error-correcting dc voltage obtained from the comparison of the 1-MHz oscillator frequency and the 1- to 25-MHz spectrum. Diodes A1CR1 and A1CR2 limit the output of the variable crystal oscillator A1Q1. The signal is amplified in wideband amplifier A1Q2 and is fed to cascaded, direct-coupled, emitter followers A1Q3 and A1Q4. The output from emitter follower A1Q4 is fed externally to the rf translator, and is used internally in the error-correcting loop.

3-85. In the error-correcting loop, the output of emitter follower A1Q4 is fed to isolation amplifier A3Q5, and then through emitter follower A3Q6 to mixer A3Q4. The second input to mixer A3Q4 is a spectrum of frequencies from 1 to 25 MHz in 1-MHz steps, derived from the accurate 1-MHz reference frequency supplied by Frequency Standard Assembly A2A5. Generation of the required spectrum is accomplished by the action of shaper amplifiers A2A6A1A3Q1, A3Q2, and A3Q3, and their associated components. The sinusoidal 1-MHz signal across inductor A3L2 is applied to diode clipper A3CR3, which allows only the negative portion of the waveform to appear at the base of shaper amplifier A3Q1. The negative-going peaks drive amplifier A3Q1 into saturation, to produce positive-going pulses with a fast rise time at its collector. In turn, shaper amplifier A3Q2 is driven into saturation by the positive-going pulses, and produces negative-going pulses at its collector. The negative-going pulses are fed to the base circuit of shaper amplifier A3Q3, where the time constant is such that the waveform will be differentiated. The negative portion of the differentiated signal drives amplifier A3Q3 into saturation, and the resultant output at the collector is differentiated by resistor A3R15 and inductor A3L3. Only the positive-going portion of the signal across inductor A3L3 is passed through diode A3CR5 to become a train of narrow, positive-going pulses having a repetition frequency of 1 MHz and providing a uniform spectrum of frequencies in 1-MHz increments over the range of interest from 1 to 25 MHz.

3-86. The combination of signals to mixer A3Q4 (the signal from 1-MHz oscillator subassembly A1 at the emitter, and the 1-MHz spectrum at the base) produces a wide range of sum and difference frequencies. However, since coil A3L4 and transformer collector A3T1 in the circuit form a band-pass filter tuned to 1.5 MHz, only those mixer products at or near 1.5 MHz will appear at the secondary of transformer A3T1.

3-87. The output of transformer A3T1 is fed to if./dc amplifier subassembly A2, where it is amplified in stages A2Q1 and A2Q2. The output circuits of each of these if. amplifiers is tuned by transformers A2T1, and A2T2 to 1.5 MHz, while potentiometer A2R6, between the stages, serves as the gain adjustment for the error-correcting loop. Detector A2CR1 and the low-pass filter network consisting of inductors A2L1, L2, L3, and L4, and capacitors A2C13, C7, C8, and C9 produce a dc error-correcting voltage from the envelope of 1.5-MHz error signals which is amplified in dc amplifier A2Q3 before being applied to voltage-variable capacitor A1CR3. Response of voltage-variable capacitor A1CR3 to the applied error-correcting voltage (which is proportional to the frequency error) will shift the frequency of crystal oscillator A1Q1 and cause it to lock onto the frequency required in the high-frequency mixer of the rf translator.

3-88. With the 1-MHz oscillator at exactly 11.5 MHz, the oscillator output will mix with the 10- and 13-MHz components of the frequency spectrum to produce the difference frequency of exactly 1.5 MHz. If the 1-MHz oscillator output is 11.499 kHz, mixing with the 10 and 13 MHz would produce difference frequencies of 1.499 and 1.501 MHz. The error-correcting voltage applied to the voltage-variable capacitor A1CR3 is the result of the vector sum of the frequency difference signals.

3-89. 100-kHz Synthesizer Subassembly A2A6A2 (figure 5-12). The 100-kHz synthesizer produces the injection frequency of 22.4000 to 23.3009 MHz (lo band) or 32.4000 to 33.3009 MHz (hi band) used in the mid-frequency mixer circuits of RF Translator Subassembly A2A6A6. Generally, signal flow through the 100-kHz synthesizer is directly in order through its five subassemblies:

a. 4.553- to 5.453-MHz oscillator A1

b. 10.747-MHz mixer A2

c. 17.847-MHz/27.847-MHz mixer A3

d. Hi-band/lo-band mixer amplifier A4

e. Automatic gain control (agc) A5.

3-90. Crystal-controlled oscillator A1Q1 produces one of 10 possible frequencies between 4.553 and 5.453 MHz, in increments of 100 kHz. Selection of the desired crystal (Y1 through Y10) is determined by the setting of the 100 kHz control on the front panel. Diodes A1CR1 and A1CR2 provide negative and positive peak limiting to control the peak-to-peak amplitude of the oscillator signal. Emitter follower A1Q2 provides isolation and feeds the oscillator signal to the 10.747-MHz mixer subassembly A2, and to the hi-band/lo-band mixer amplifier subassembly A4.

3-91. The oscillator signal from subassembly A1 passes through isolation amplifier A2Q2, and is then transformer-coupled through A2T1 to the emitter of mixer A2Q1. A spectrum of accurate frequencies in the range from 15.3 to 16.2 MHz, in 100-kHz increments, is obtained from Spectrum Generator Subassembly A2A6A5, and is applied to the base of mixer A2A6A2A2Q1.

3-92. The sum and difference of the original frequencies are produced, but the output circuit, consisting of filter A2FL1 and transformer A2T2, is tuned to 10.747 kHz, so that only this difference frequency appears across transformer A2T3 and at the output of the 10.747-MHz mixer subassembly A2.

3-93. The gain of mixer A2Q1 is automatically controlled by application of an agc voltage to the emitter of this stage. This agc voltage is obtained from the automatic gain control subassembly A5 within the 100-kHz synthesizer itself (refer to paragraph 3-99).

3-94. The output of the 10.747-MHz mixer subassembly A2 is fed to 17.847-MHz mixer A3Q1, where it is mixed with the 7.1000- to 7.1009-MHz from 100-Hz Synthesizer Subassembly A2A6A4. Only the summation signal from the output of the 17.847-MHz mixer A2A6A2A3Q1 is of interest in the synthesization scheme. This signal, ranging from 17.847 to 17.8479 MHz, is passed by the crystal-filter circuit A3Y1, A3T1, and A3T2 to the hi-band/lo-band mixer subassembly A4, and is applied internally to the base of the 27.847-MHz mixer A3Q2. This mixer is disabled by application of +20 Vdc from the hi-/lo-band control circuit when lo-band rf signals are being processed.

3-95. In the lo-band mixer A4U1, the 17.847- to 17.8479-MHz signal from subassembly A3 and the 4.553- to 5.453-MHz signal from subassembly A1 are mixed to produce the 22.4000- to 23.3009-MHz output, which is transformer-coupled by A4T2 to the 22.4- to 23.3009-MHz bandpass filter.

3-96. The filtered signal is amplified by A4Q1, and is coupled through A4CR1 and A4C19 to the base of emitter follower A5Q1 in the agc subassembly. The output of emitter follower A5Q1 is fed to the mid-frequency mixer in the rf translator.

3-97. With the hi-/lo-band control in the hi position (ground), gate A4CR1 is disabled, inhibiting the output of the lo-band section of the hi-band/lo-band mixer amplifier subassembly A4. The same control signal enables gate A3CR1 and A4CR2, allowing the 10 MHz from the frequency standard to be fed to the emitter of the 27.847-MHz mixer A3Q2, and allowing the hi-band output of subassembly A4 to be fed to A5Q1. The control signal is also applied to the base of the 27.847-MHz mixer A3Q2 through resistor A3R6, allowing the mixer to function. The sum of the two input frequencies is filtered by the 27.847-MHz filter, consisting of A3T3, A3Y2, and A3T4.

3-98. The output signal, which is within the range from 27.847 to 27.8479 MHz, is transformer-coupled through A4T7 to the hi-band mixer A4U2, where it is mixed with the 4.553- to 5.453-MHz signal from subassembly A1. The summation signal of the hi-band mixer A4U2 is transformer-coupled to the 32.4- to 33.3009-MHz bandpass filter. The filtered signal is amplified by A4Q2 and passes through enabled gate A4CR2 and A4C19 to the emitter follower A5Q1.

3-99. The output of emitter follower A5Q1 in the hi band is 32.4000 to 33.3009 MHz, which is supplied to the mid-frequency mixer in the rf translator. A secondary output from emitter follower A5Q1 is coupled through A5C4 to the base of agc amplifier A5Q2, which is frequency-compensated to provide a uniform output for both hi- and lo-band mixing frequencies. The output of this stage is coupled to agc amplifier A5Q3, which includes potentiometer A5R13 to control the agc loop gain. Detector A5Q4 is biased so that it is conducting only on the positive portions of the input signal from agc amplifier A5Q3. This signal is filtered to produce a positive dc level which is applied as an agc voltage to the 10.747-MHz mixer A2Q1.

3-100. 1- and 10-kHz Synthesizer Subassembly A2A6A3 (figure 5-13). The 1- and 10-kHz synthesizer produces the 3.301- to 3.400-MHz injection signal used in the low-frequency mixer circuits of RF Translator Subassembly A2A6A6. In addition, its error-mixer circuits mix internal frequencies with 1- and 10-kHz spectra from Spectrum Generator Subassembly A2A6A5, and output a 7.089-MHz error signal to 100-Hz Synthesizer Subassembly A2A6A4. The 1- and 10-kHz synthesizer consists of four subassemblies:

a. 5.16- to 5.25-MHz oscillator A1

b. 1.850- to 1.859-MHz oscillator A2

c. 1- and 10-kHz output and blanker A3

d. 1- and 10-kHz error mixer A4.

3-101. Crystal-controlled oscillator A1Q1 produces one of 10 possible frequencies between 5.16 and 5.25 MHz, in 10-kHz increments. Selection of the desired crystal (Y1 through Y10) is determined by the setting of the 10 kHz control on the front panel. Diodes A1CR1 and A1CR2 provide negative and positive peak limiting to control the peak-to-peak amplitude of the oscillator signal, which is coupled to the base of buffer amplifier A1Q2. This amplifier isolates oscillator A1Q1 from load variations, and develops the signal across transformer A1T1. Two outputs are taken from the secondary of transformer A1T1; one is fed to 1- and 10-kHz output and blanker subassembly A3, and the other is fed to 1- and 10-kHz error mixer subassembly A4.

3-102. Similarly, crystal-controlled oscillator A2Q1 produces one of 10 possible frequencies between 1.850 and 1.859 MHz, in 1-kHz increments. Selection of the desired crystal (Y11 through Y20) is determined by the setting of the 1 kHz control on the front panel. Functional operation of the circuits in this subassembly is identical to that of the 5.16- to 5.25-MHz oscillator described in paragraph 3-101. The two outputs from transformer A2T1 are also fed to 1- and 10-kHz output and blanker subassembly A3 and 1- and 10-kHz error mixer subassembly A4.

3-103. The combined 5.16- to 5.25-MHz and 1.850- to 1.859-MHz signals are applied to the base of mixer A3Q1. As a result of the mixing action in transistor A3Q1, a difference frequency, falling in the range from 3.301 to 3.400 MHz, in 1-kHz steps, is produced. Only this band of frequencies is passed by filter components A3L1, L2, L3, A3C5, and A3C7 in the collector circuit of mixer A3Q1; all other mixer products and the original signals will be attenuated. The signal developed across the secondary of transformer A3T1 is fed to the rf translator, where it is used as the injection frequency to the 1- and 10-MHz mixer subassembly A2A6A6A3 (refer to paragraph 3-38). A complete list of injection frequencies produced by the 1- and 10-kHz synthesizer is given in table 3-3. If used, noise blanker A3Q2 functions as a switch that gates the output from subassembly A3 at a rate and for a duration determined by a negative-going control pulse. When this control pulse is applied to the base of blanker A3Q2, the transistor will essentially short the main signal flow path to ac ground for the duration of the pulse.

3-104. The 5.16- to 5.25-MHz and 1.850- to 1.859-MHz signals that are fed to 1- and 10-kHz error mixer subassembly A4 are subjected to a two-stage mixing process to produce a composite error signal. This composite error signal is used to provide error cancellation for the 1- and 10-kHz lo-band injection signal. Prior to any mixing, each of the two input signals is coupled to the emitter of its respective isolation amplifier; 10-kHz isolation amplifier A4Z3Q1 for the 5.16- to 5.25-MHz signal, and 1-kHz isolation amplifier A4Z2Q1 for the 1.850- to 1.859-MHz signal. These identical grounded-base amplifiers provide a high reverse attenuation to the spectrum and mixer products present in the mixer stages that follow, to prevent them from feeding back into the lo-band injection signal flow path.

3-105. Considering first the 5.16- to 5.25-MHz signal, the output from isolation amplifier A4Z3Q1 is applied to inductor A4L3, which provides the proper impedance match to the emitter-input circuit of 10-kHz error mixer A4Q8. A spectrum of accurate frequencies covering the range from 3.82 to 3.91 MHz in 10-kHz increments is obtained from the spectrum generator, and is applied to the base of mixer A4Q8. As a result of the mixing process, a wide range of sum and difference frequencies is produced; however, only the sum signal of 9.07 MHz will be passed by filter A4FL1.

3-106. The 1.850- to 1.859-MHz signal is processed in essentially the same manner as described for the 5.16- to 5.25-MHz signal. Here, the output from isolation amplifier A4Z2Q1 is applied to 1-kHz error mixer A4Z1Q1 through inductor A4L4, where it is mixed with a spectrum of frequencies covering the range from 0.122 to 0.131 MHz in 1-kHz increments. This frequency spectrum is obtained from the spectrum generator. The desired sum frequency in this case is nominally 1.981 MHz, and all other frequencies are attenuated in filter A4FL2.

3-107. The final mixing process which takes place in 1- and 10-kHz error mixer subassembly A4 is accomplished in mixer A4Q9. The 9.07 and 1.981-MHz inputs to this stage produce the desired difference frequency of 7.089 MHz, which is separated from all other mixer outputs by the selectively tuned transformer A4T1. Note that the output signal appearing across the secondary of transformer A4T1 carries composite error information relating back to the initial signal sources of the 1- and 10-kHz synthesizer; namely, the 5.16- to 5.25-MHz oscillator A1 and the 1.850- to 1.859-MHz oscillator A2. This 7.089-MHz error signal is fed to the 100-Hz synthesizer, where it is mixed with the 11.0- to 11.9-kHz signal, and the sum is fed to 100-kHz Synthesizer Subassembly A2A6A2.

3-108. 100-Hz Synthesizer Subassembly A2A6A4 (figure 5-14). The 100-Hz synthesizer produces an output whose frequency is variable from 7.1000 to 7.1009 MHz in 100-Hz increments. The specific frequency of the output is determined by the positioning of the front-panel Hz switch via 100-Hz Control and Vernier Assembly A2A11. Error cancellation is effected under control of 1-kHz reference pulses from Spectrum Generator Subassembly A2A6A5 and a 7.089-MHz error signal from 1- and 10-kHz Synthesizer Subassembly A2A6A3. The output is fed to 100-kHz Synthesizer Subassembly A2A6A2, where it is used to effect 100-Hz incremental changes in the equipment tuning. The main signal flow through the 100-Hz synthesizer is through oscillator subassembly A2, preset counter subassembly A1, and 7.1-MHz mixer subassembly A3.

3-109. The simplified logic diagram of the 100-Hz synthesizer in figure 3-3 will be helpful in understanding the functional operation of this subassembly. Basically, the 100-Hz synthesizer consists of a phase-locked loop oscillator (oscillator subassembly A2A6A4A2 and preset counter subassembly A1), the frequency of which is controlled to oscillate at 110 to 119 kHz, in 1-kHz increments, and the mixer circuit (7.1-MHz mixer subassembly A3). The selected output from the 110- to 119-kHz oscillator is divided down, and the resultant 11.0- to 11.9-kHz signal is then additively mixed with a 7.089-MHz signal to produce the final 7.1000- to 7.1009-MHz output required from the 100-Hz synthesizer.

3-110. The 110- to 119-kHz oscillator stage A2A6A4A2Q2 feeds its output through buffer amplifier A2Q3 to pulse shaper A1Q5 and A1Q6, which converts its sinusoidal input signal into square-wave pulse outputs. The pulse output from A1Q5 and A1Q6 is fed to decade counters A1U1 and A1U3 of the preset counter subassembly A1.

3-111. Preset counter subassembly A1 contains decade counter and modified (preset) decade counter circuits. Consider first the modified (preset) decade counter circuits, consisting of decade dividers A1U3 and A1U2, and their associated gating/pulsing circuits. If divider A1U3 in cascade with A1U2 were used without modification (presetup), the division ratio would be 100:1. This would mean that for every 100 pulses received from pulse shaper A1Q5/A1Q6, the decade divider circuits would produce one pulse output from their associated reset pulser stage (A1Q3 and A1Q4). If oscillator A2Q2 were oscillating at a 100-kHz rate, it would produce input pulses (via pulse shaper A1Q5 and A1Q6) at the rate of 100 kHz, to decade divider A1U3. Output from the decade divider circuits would then be pulses at the rate of 1 kHz (100-kHz input rate, divided by 100) from the reset pulser A1Q3 and A1Q4 stage. These 1-kHz pulses would then be fed through emitter follower A1Q9 to one input of phase detector A2U1. The second input to A2U1 is 1-kHz reference pulses from the spectrum generator. The phase detector determines the phase relation between its two 1-kHz pulse inputs, and produces a dc output proportional to the phase of its inputs. If the phase relation of the two inputs is constant, the output of phase detector A2U1 is a steady dc voltage.

3-112. The dc output from phase detector A2U1 is fed through dc amplifier A2Q1 and dc filter A2FL1, to the tuning circuits of oscillator A2Q2. Oscillator A2Q2 is a voltage-controlled oscillator, whose frequency is controlled by the dc voltage it receives from phase detector A2U1. The required closed loop is formed by the oscillator output, through pulse shaper A1Q1, through the decade counters of A1, through phase detector A2U1, and back to the input circuits oscillator A2Q1. The closed loop will reach a state of equilibrium only when the output frequency of oscillator A2Q1 is that which causes 1-kHz output pulses from the decade divider output from emitter follower A1Q9. For the assumed case of A2Q1 oscillating at 100 kHz, and the decade dividers dividing-down by 100 to 1, the required 1-kHz pulse output from A1Q9 is achieved and the oscillator loop balances. Should oscillator A2Q1 output tend to vary (from the assumed 100-kHz rate), the decade-divider circuits will produce output pulses at a rate less than, or more than, 1 kHz. Such outputs, when compared to the 1-kHz reference pulses in phase detector A2U1, cause a change in the dc output from A2U1. The direction and the amount of output change in A2U1 will be just sufficient to return the frequency of oscillator A2Q1 to 100 kHz (assumed case), when that output change in A2U1 is applied to the tuning circuits of A2Q1.

3-113. In reality, oscillator A2Q1 is adjusted to oscillate at 110 kHz, while there is no input from the Hz frequency control switch. In this condition, the decade-divider circuits A1U3 and A1U2 perform a division ratio of 110:1 (rather than the 100:1 division assumed previously in the discussion). Hence, the 110-kHz pulses resulting

DECADE COUNTERS A1U1, A1U2 & A1U3
OUTPUT STATES

COUNT H = HIGH L = LOW

	0	1	2	3	4	5	6	7	8	9
2^0	H	L	H	L	H	L	H	L	H	L
2^1	H	H	L	L	H	H	L	L	H	H
2^2	H	H	H	H	L	L	L	L	H	H
2^3	H	H	H	H	H	H	H	H	L	L

A1U3 DECADE PROGRAM SEQUENCE

DESIRED COUNT	BIT ENABLE = 1			
	2^3	2^2	2^1	2^0
DIVIDE BY 110	0	0	0	0
111	0	0	0	1
112	0	0	1	0
113	0	0	1	1
114	0	1	0	0
115	0	1	0	1
116	0	1	1	0
117	0	1	1	1
118	1	0	0	0
119	1	0	0	1

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Figure 3-3. 100-Hz Synthesizer Subassembly A2A6A4, Simplified Logic Diagram from pulse shaper A1Q5 and A1Q6, divided by a ratio of 110:1, result in a 1-kHz pulse from emitter-follower A1Q9 to one input of phase detector A2U1. The loop then balances to maintain oscillator A2Q1 at the 110-kHz rate.

3-114. The 110:1 division ratio in the decade-divider circuits A1U3 and A1U2 is achieved by essentially presetting (preloading) the counter circuits with a -10 count. After each such preloading, the counter circuits must then receive 110 input pulses from A1Q5 and A1Q6 before they produce an output pulse from A1Q9. Each time an output pulse occurs from A1Q9, it again preloads the -10 count into the decade dividers, which again require 110 input pulses to produce the next output pulse from A1Q9.

3-115. To change the output of oscillator A2Q1 to another of its 10 possible frequencies, the Hz frequency control switch is placed in a different position (from the 000 position assumed for a 110-kHz output from A2Q1. The Hz control switch then applies gating voltages to gating stages A1CR3 through A1CR10, and causes presetting (preloading) the counter stages with a count differing from the -10 count required for a 110-kHz output from A2Q1. For example, if a +100-Hz increment of tuning is desired, the Hz control switch will be placed in the 100 Hz position. This then gates stages A1CR3 through A1CR10 such that a -11 count is preset into the decade-divider stages A1U3 and A1U2 at the beginning of each counting cycle. The decade dividers will then perform a 111:1 division, which will result in 1-kHz pulses from emitter-follower A1Q9, and the loop will balance. The output of A2Q1 is now maintained (or controlled) at 111 kHz. In the same manner, positioning of the Hz control switch will gate the decade-divider circuits so that they perform division ratios from 110:1 to 119:1. Hence, the output of oscillator will be controlled (loop-balanced) at 110 kHz, 111 kHz, etc., to 119 kHz.

3-116. The 110- to 119-kHz pulses from pulse shaper A1Q5 and A1Q6, in addition to being fed to the input of decade divider A1U3, are also fed to the input of decade divider A1U1. This divider performs a conventional 10:1 division countdown, regardless of what specific rate of pulses arrives at its input. Hence, the 110- to 119-kHz input pulses to A1U1 are converted to 11.0- to 11.9-kHz output pulses from A1U1. The specific output rate of A1U1 is now variable in increments of 100 Hz, and is determined by the setting of the Hz frequency control switch.

3-117. The decade divider A1U1 output pulses are fed through amplifier A1Q7, and emitter follower A3Q1, to one input of mixer A3Q2. The second input to mixer A3Q2 is a constant, stable 7.089-MHz signal received from the 1- and 10-kHz synthesizer. In mixer A3Q2, the stable 7.089-MHz signal is additively mixed with the 11.0- to 11.9-kHz signal to produce outputs from 7.1000 to 7.1009 MHz. This sum frequency signal is then fed through 7.1-MHz filter A3FL1, emitter follower A3Q3, and amplifier A3Q4, to the 100-Hz synthesizer output at P1-A1. Gain of amplifier A3Q4 is adjustable by means of gain adjust control A3R20, to set the 100-Hz synthesizer output to required levels.

3-118. Spectrum Generator Subassembly A2A6A5 (figure 5-10). The spectrum generator produces accurate frequency spectra upon which the error-correction processes in the other subassemblies of Translator/Synthesizer Assembly A2A6 are based. Operating with a highly stable 500-kHz input signal from Frequency Standard Assembly A2A5, it generates the following outputs:

a. 15.3 to 16.2 MHz in 100-kHz steps to 100-kHz Synthesizer Subassembly A2A6A2.

b. 3.82 to 3.91 MHz in 10-kHz steps, and 0.122 to 0.131 MHz in 1-kHz steps, to 1- and 10-kHz Synthesizer Subassembly A2A6A3.

c. A 1-kHz pulse to 100-Hz Synthesizer Subassembly A2A6A4. Signal flow proceeds from the 500-kHz standard through each of the subassemblies in order: 100-kHz spectrum A1, 10-kHz spectrum A2, 1-kHz spectrum A3, and 1-kHz pulse inverter A4. Outputs are taken from each of the subassemblies.

3-119. In 100-kHz spectrum subassembly A1, an accurate 500-kHz sinusoidal input from the frequency standard is coupled to the base of trigger amplifier A1Q1 through tuned inductor A1L2. The negative half of the 500-kHz signal drives trigger amplifier A1Q1 into saturation, and the resultant positive output pulses are differentiated by capacitor A1C4 to trigger divide-by-five multivibrator A1Q2 and A1Q3. Recovery time of the multivibrator is set by means of count adjust potentiometer A1R5 to divide by five. The 100-kHz output of the divide-by-five multivibrator (positive pulses approximately 0.8-μs wide) is applied to gate amplifier A1Q4, and also is fed to 10-kHz spectrum subassembly A2.

3-120. Gate amplifier A1Q4, normally in saturation and therefore heavily loading the tank circuit of transistor A1Q5 to prevent it from oscillating, is cut off by the 100-kHz pulses. Keyed oscillator A1Q5 then oscillates for the duration of each pulse to produce a spectrum of frequencies, centered around the natural resonant frequency of the oscillator and separated by exactly 100 kHz. The natural resonant frequency of the oscillator, approximately 16 MHz, is not critical, since the spectral frequencies are dependent only on the accurate 100-kHz keying frequency. Of course, the relative amplitudes of those harmonics closest to the natural resonant frequency are greater than those farther removed. Amplifier A1Q6 isolates the oscillator from load variations and drives the output-filtering circuit, which passes only spectrum frequencies in the desired range (15.3 to 16.2 MHz) to the 100-kHz synthesizer (refer to paragraph 3-89).

3-121. In 10-kHz spectrum subassembly A2, the 100-kHz pulses from the 100-kHz spectrum subassembly A1 trigger a conventional divide-by-two multivibrator A2Q1 and A2Q2. The resulting 50-kHz square wave is differentiated, and triggers divide-by-five multivibrator A2Q3 and A2Q4. Recovery time is set by means of count adjust potentiometer A2R11 to divide by five. The 10-kHz output of the divide-by-five multivibrator is applied to gate amplifier A2Q5, and is also fed to 1-kHz spectrum subassembly A3.

3-122. Gate amplifier A2Q5 and keyed oscillator A2Q6 operate in a manner similar to that described for stages A1Q4 and A1Q5, except that the portion of the output spectrum of interest is in the range from 3.82 to 3.91 MHz, in 10-kHz steps. This output is fed to the 1- and 10-kHz synthesizer (refer to paragraph 3-100).

3-123. In 1-kHz spectrum subassembly A3, the 10-kHz pulse signal from the 10-kHz spectrum subassembly A2 is processed in a manner identical to that just described for the 100-kHz pulses. The desired output in this case, however, is the spectrum of frequencies in the range from 0.122 to 0.131 MHz, in 1-kHz steps. This output is also fed to the 1- and 10-kHz synthesizer.

3-124. The 1-kHz pulses from the divide-by-five multivibrator A3Q3 and A3Q4 in 1-kHz spectrum generator subassembly A3 are also coupled to 1-kHz pulse inverter subassembly A4. Pulse inverter stage A4Q1 is driven into saturation by the input pulses to improve pulse shape and provide uniform pulse amplitude. The output of pulse inverter A4Q1, 1.4-volt negative pulses of approximately 80 μs duration, is used as a reference frequency in the phase detector circuit of the 100-Hz synthesizer (refer to paragraph 3-108).

3-125. Error Cancellation and Accuracy Control. An important and vital consideration in any frequency synthesization process is that the synthesized frequencies must be stable and accurate. Within the circuits of Translator/Synthesizer Assembly A2A6, frequency stability and accuracy are ensured by use of comparison of the generated (synthesized) frequencies with the highly accurate standard frequencies supplied by Frequency Standard Assembly A2A5. Additionally, the mixing processes of the frequency synthesizer subassemblies contain frequency-error cancellation for synthesized frequencies that have not been directly derived from, or compared with, the frequency standard outputs.

3-126. The 1-MHz Synthesizer Subassembly A2A6A1 employs a phase-locked loop to ensure the accuracy of the synthesized MHz frequencies. The standard 1-MHz from the frequency standard is applied to the 1-MHz spectrum circuit of Spectrum Generator Subassembly A2A6A5, to produce a spectrum of frequencies spaced at 1-MHz intervals between 1 and 25 MHz. Frequency accuracy of these spectral lines is dependent upon the standard 1-MHz signal. Outputs from the 1-MHz spectrum generator circuit and the output from the 1-MHz oscillator circuit are mixed. Any error in the 1-MHz oscillator output is detected, and an error voltage is applied to the 1-MHz oscillator to lock it to the correct frequency. Therefore, the accuracy of the 1-MHz oscillator output is ensured.

3-127. The 100-kHz Synthesizer Subassembly A2A6A2 employs an error-cancelling loop to ensure the accuracy of its 100-kHz output frequencies. The standard 500-kHz from the frequency standard is applied to the 100-kHz spectrum generator circuit to produce a spectrum of frequencies spaced at 100-kHz intervals between 15.3 and 16.2 MHz. The output from the 100-kHz oscillator stage (4.553 to 5.453 MHz in 100-kHz steps) is mixed with that 100-kHz spectrum frequency which results in an output of 10.747 MHz. The 10.747-MHz signal is additively mixed with 7.1-MHz from the 7.1-MHz mixer to produce a 17.847-MHz signal, which is used in one of two mixing processes. It is mixed with the 100-kHz oscillator output to cancel any oscillator frequency error and produce the lo-band injection frequencies, or it is mixed with the standard 10-MHz from the frequency standard. This produces a 27.847-MHz signal, which is mixed with the 100-kHz oscillator output to cancel any oscillator frequency error, and to produce the hi-band injection frequencies.

3-128. Because the 100-kHz oscillator output is additively mixed in the high- or lo-band mixer, but subtractively mixed in the 10.747-MHz mixer, any 100-kHz oscillator error is cancelled. As an example, assume that the output from the oscillator should be 4.553 MHz but is 200 Hz high (4.5532 MHz), and that the desired frequency output is 22.4 MHz (in the lo band). Subtractive mixing of the 4.5532 MHz with the 100-kHz spectrum point (15.3 MHz) results in a 10.7468-MHz output (15.3 MHz - 4.5532 MHz = 10.7468 MHz, which is close to 10.747 MHz). This signal is then additively mixed with the 7.1-MHz signal, producing a 17.8468-MHz output which is then additively mixed with the oscillator output (17.8468 MHz + 4.5532 MHz = 22.4 MHz), resulting in the desired 22.4-MHz output (with the assumed 200-Hz error now cancelled).

3-129. Any frequency error in the oscillator output of 1- and 10-kHz Synthesizer Subassembly A2A6A3 is cancelled in the following manner. The 100-kHz pulses from the spectrum generator are applied to the 10-kHz spectrum generator circuits, producing an output from 3.82 to 3.91 MHz in 10-kHz increments. The spectrum generator also produces 10-kHz pulses, which are applied to the 1-kHz spectrum generator circuits to produce a spectrum of frequencies spaced at 1-kHz intervals between 0.122 and 0.131 MHz. The output from the 10-kHz oscillator (5.25 to 5.16 MHz in 10-kHz steps) is additively mixed with whichever spectrum point of the 10-kHz spectrum results in a frequency of 9.07 MHz. Output from the 1-kHz oscillator (1.850 to 1.859 MHz in 1-kHz steps) is additively mixed with whichever spectrum point of the 1-kHz spectrum results in a frequency of 1.981 MHz. The 1.981-MHz and the 9.07-MHz signals are then subtractively mixed, producing the 7.089-MHz signal, which contains the errors of both oscillators.

3-130. For the purpose of error-cancellation discussion, assume that the front-panel Hz switch is in the 000 position. The 100-Hz phase-locked oscillator output (110 kHz) is divided by 10, and the resulting 11.0 kHz is applied to the 7.1-MHz mixer, where it is additively mixed with 7.089 MHz to produce 7.1-MHz signal. The resulting 7.1-MHz signal is then applied to the error loop of the 100-kHz synthesizer. Therefore, if an error exists in the 1- or 10-kHz oscillators, the same error will exist in the 100-kHz injection frequencies. This error is then cancelled in the low- and mid-frequency mixers of RF Translator Subassembly A2A6A6.

3-131. Assume that the output from the 10-kHz oscillator should be 5.25 MHz but is actually 5.2502 MHz. Also, assume that the output from the 1-kHz oscillator should be 1.852 MHz but is actually 1.8521 MHz. Subtractively mixing these frequencies results in an injection frequency to the low-frequency mixer of 3.3981 MHz rather than the desired 3.3980 MHz. Therefore, a 100-Hz error exists in the injection signal. The additive mixing the 5.2502-MHz signal and the 10-kHz spectrum point (3.82 MHz) results in a frequency of 9.0702 MHz. The additive mixing of the 1.8521-MHz signal and the 1-kHz spectrum point (0.129 MHz) results in a frequency of 1.9811 MHz. Subtractively mixing the 9.0702-MHz and the 1.9811-MHz signals results in a frequency of 7.0891 MHz. The 7.0891-MHz signal is mixed with the 11.0-kHz signal (from the divide-by-ten circuits of A2A6C4), resulting in a frequency of 7.1001 MHz, which is mixed with the 10.747-MHz signal to produce a frequency of 17.8471 MHz. If the output from the 100-kHz oscillator is assumed to be 4.553 MHz, then the 100-kHz injection frequency would be 22.4001 MHz. The 100-kHz injection is then also 100 Hz high. This 22.4001-MHz injection frequency is subtractively mixed in the second mixer stage, with a first if. signal that is lower than 22.4001 MHz, resulting in a second if. that is 100 Hz high (the 100-Hz high error in the 100-kHz injection signals). For this discussion, assuming the first if. is 19.502 MHz, the second if. output of the second mixer will be 2.8981 MHz (22.4001-19.502), or 100 Hz higher than it should be. The 1- and 10-kHz injection frequency of 3.3981 MHz (which is 100 Hz high) is now subtractively mixed in the low-frequency mixer with the 2.8981 MHz second if. (which is also 100 Hz high). The output from the low-frequency mixer is then exactly 500 kHz (the difference of the 3.3981 MHz 1- and 10-kHz injection frequency, and the 2.8981 MHz second if. signal). Notice that since any error in the 1- and 10-kHz injection also exists in the 100-kHz injection, the error is present in the second if. signal (in the same amount and direction) and is thus cancelled during the subtractive third mixer.

3-132. Frequency stability of the 100-Hz Synthesizer Subassembly A2A6A4 utilizes a preset feedback-loop divider and a binary phase detector. This 100-Hz oscillator is locked from 110 to 119 kHz in 1-kHz increments (with the divider preset to divide by a factor of 110 to 119, respectively). Output from the preset divider is, therefore, 1 kHz, which is compared in the binary phase detector with the 1-kHz pulses from the spectrum generator. The voltage from the phase detedtor then keeps the oscillator locked to the correct 110- to 119-kHz frequency. The 11.0- to 11.9-kHz (from the 100-Hz oscillator circuits) is mixed with the 7.089-MHz error frequency from the 1- and 10-kHz synthesizer before being sent on to the 100-kHz synthesizer. Since the 100-Hz step displacements in the resulting nominal 7.1-MHz error frequency signal are injected into only one path of the error-cancellation loop previously described, no cancellation of the 100-Hz displacements takes place, and the equipment is tuned in 100-Hz increments.

3-133. STANDARD FREQUENCY GENERATION AND DISTRIBUTION (figure 5-9.)

3-134. General. Accurate reference frequencies for the R-1051E/URR are provided by Frequency Standard Assembly A2A5. The basic frequency from which all other reference signals are obtained is produced by crystal-controlled 5-MHz oscillator in Oscillator and Oven Control Subassembly A2A5A1, and is divided into the various, highly stable, output frequencies in Divider/Amplifier Subassembly A2A5A2. The amplified outputs of the frequency standard are:

a. 1 MHz (to 1-MHz Synthesizer Subassembly A2A6A1)

b. 10 MHz (to 100-kHz Synthesizer Subassembly A2A6A2)

c. 500 kHz (to Spectrum Generator Subassembly A2A6A5 and 500-kHz Gate Subassembly A2A1A2)

d. 5 MHz (to external equipment via a rear-panel connector).

The temperature of the oven housing the 5-MHz oscillator is regulated by Oven Body Subassembly A2A5A3.

3-135. A ship's or other external frequency standard may be used instead of Oscillator and Oven Control Subassembly A2A5A1. In this case, the flow through Divider/Amplifier Subassembly A2A5A2 and the final frequency distribution are the same as when the internal oscillator is used. The choice of the internal or external oscillator for the standard frequency is made by the COMP/INT/EXT switch A2A5A2S1, on top of the frequency standard assembly.

3-136. Frequency Generation and Control. Crystal-controlled oscillator A2A5A1Q1 produces a standard 5-MHz frequency from which all other reference signals are derived when the use of the internal oscillator is selected. Coarse and fine frequency adjustments are provided by capacitors A1C2 and A1C4, respectively. The 5-MHz signal is amplified in stages A1Q2 and A1Q3, and is fed to COMP/INT/EXT switch A2S1.

3-137. The oscillator circuitry is mounted in an oven whose temperature is controlled to 187°F (86°C), for maximum frequency stability. If the oven temperature varies from the desired value, the changing resistance of sensor A3RT205 will unbalance a bridge circuit, and the amount and polarity of the imbalance will be detected and amplified by amplifiers A1Q201 through A1Q204. The resultant change in base bias on emitter follower A1Q205 will, in turn, be felt at the base of power amplifier A3Q206. Thus, current flows in the collector circuit of power amplifier A3Q206, which will increase or decrease, changing the temperature of heater A3R214 as required.

3-138. Frequency Division and Amplification. The 5 MHz obtained internally from oscillator A1Q1 or from an external source is amplified in 5-MHz amplifiers A2Q9 and A2Q10, and developed across the primary of transformer A2T3. Variable capacitor A2C27 tunes the output circuit of amplifier A2Q10 to 5 MHz. One of the secondary windings of transformer A2T3 couples the 5-MHz signal to COMP/INT/EXT switch A2S1, to make the 5-MHz output signal available at a rear-panel connector in the external and compare modes of operation.

3-139. Another secondary winding of transformer A2T3 feeds the 5-MHz signal to divide-by-five synchronized oscillator A2Q5, whose resonant frequency is 1 MHz. Two 1-MHz output signals are provided by the oscillator. One is taken from the collector tank circuit; the second is the 1-MHz output signal tapped from the emitter of the oscillator. This latter signal is coupled to amplifier A2Q6 which drives the 1-MHz reference signal to the 1-MHz synthesizer (refer to paragraph 3-83).

3-140. The 1-MHz signal taken from the collector tank circuit of divide-by-five oscillator A2Q5 is coupled to divide-by-two synchronized oscillator A2Q7, whose resonant frequency is 500 kHz. The 500-kHz signal appearing at the emitter of transistor A2Q7 is amplified in 500-kHz amplifier A2Q8, and the output is fed, via transformer A2T2, to the spectrum generator (refer to paragraph 3-118), and to the 500-kHz gate in Receiver Mode Selector Assembly A2A1 (refer to paragraph 3-55).

3-141. The third secondary winding of transformer A2A5A2T3 feeds the 5-MHz signal to times-two multiplier Q11, CR6, and CR7. The 10-MHz signal output from that stage is filtered to remove spikes and transients, and is fed to the 17.847- to 27.847-MHz mixer in the 100-kHz synthesizer (refer to paragraph 3-89).

3-142. The 5-MHz output from the third secondary of transformer A2T3 is also applied to the base of transistor A2Q4 (part of a visual-comparator circuit). When COMP/INT/EXT switch A2S1 is in the compare position, an external 5-MHz reference frequency that may be fed to the receiver through a rear-panel connector will be applied to the base circuit of transistor A2Q3. When the two 5-MHz signals are exactly the same frequency, indicator lamp A2DS1 will not flash. However, if the two input frequencies to the comparator circuit are not identical, transistors A2Q3 and A2Q4 will alternately conduct, and indicator lamp A2DS1 will flash at a rate relative to the frequency difference between the internal and external oscillators.

3-143. POWER DISTRIBUTION.

3-144. AC Power Distribution (figure 5-15). All primary power for the receiver is from a nominal 115-Vac power source connected to receptable A1A1J3, mounted on the rear of the case. AUX/NORM switch A1S1 selects the A1A1J3 input power. Primary ac power is then applied through safety interlock switch A1S2, mode selector switch A2S2, and fuses A2F1 and A2F2 to the primary of power transformer A2T1. Indicator lamps which are an integral part of fuse holders A2XF1 and A2XF2 will light if their associated fuse is open. The primary winding of power transformer A2T1 has several taps to accommodate various input line voltages.

3-145. Four secondary windings are provided on transformer A2T1, from which the internal operating voltages for the receiver are derived. Terminals 13 and 14 furnish 6.3 Vac for vacuum-tube filaments in RF Amplifier Assembly A2A4. Terminal pairs 7 and 8, 9 and 10, and 11 and 12 furnish ac voltages to bridge-rectifier circuits in Power Supply Assembly A2A8, from which +110 Vdc, +28 Vdc, and -30 Vdc, respectively, are obtained.

3-146. +28-VDC Distribution (figure 5-16). The output of the +28-Vdc bridge rectifier A2A8CR5 through A2A8CR8 is applied to a choke input filter consisting of choke A2L2, capacitor A2C2,and bleeder resistor A2R8. The filtered +28 Vdc is applied to Frequency Standard Assembly A2A5 through noise filter A2FL2, and to front-panel lamps A2DS3 and A2DS4, via A2A8R1 and R2, to illuminate the frequency display windows above the MHz and kHz controls. When mode selector switch A2S2 is in any position other than OFF or STD BY, the +28 Vdc will also be applied through contacts of A2S2 section C to RF Amplifier Assembly A2A4, Antenna Overload Assembly A2A9, Translator/Synthesizer Assembly A2A6, tune relay A2K1, and transmit/receive relay A2K3 (if SIMPLEX/DUPLEX switch A2S9 is in the DUPLEX position). Additionally, as long as tune relay A2K1 is deenergized, the +28 Vdc will be applied to hi-/lo-filter relay A2K2, to the +20-Vdc regulating circuit, and to section D of mode selector switch A2S2. This switch wafer selectively applies the +28 Vdc to either or both IF./Audio Amplifier Assemblies A2A2 and A2A3, depending on the mode of receiver operation. Tune relay A2K1 can be energized by contacts in the RF Amplifier Assembly A2A4, 1-MHz Synthesizer Subassembly A2A6A1, or Code Generator Assembly A2A7.

3-147. +20-VDC Distribution (figure 5-17). The +28-Vdc voltage is applied to the collector of series regulator A2Q1 and to the power supply circuitry that controls the series regulator. The regulated +20 Vdc which is output from A2Q1 is applied to resistor A2A8R6, A2A8R16, to RF GAIN control A2R3 in series. With AGC switch A2S3 in OFF position, from A2R3 a voltage is fed to noise filter A2FL1, to Frequency Standard Assembly A2A5, Translator/Synthesizer Assembly A2A6, rear contacts 4 and 6 of section A of mode selector switch A2S2, and to contact A2 of transmit/receive relay A2K3. As long as transmit/receive relay A2K3 is deenergized, the +20 VDC will be distributed to: section B rear contacts 3 and 6; section C front contacts 2 and 11, and rear contacts 3 and 10; and section D rear contact 12 of mode selector switch A2S2; and to contact B3 of hi-/lo-filter relay A2K2. Mode selector switch A2S2 selectivity applies the +20 Vdc to Receiver Mode Selector Assembly A2A1, and to Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3, according to the mode of receiver operation. In the CW mode, +20 Vdc is also applied to BFO control A2R6, via section C rear contact 4 of mode selector switch A2S2.

3-148. As long as hi-/lo-filter relay A2K2 remains deenergized, the +20 Vdc from contact B2 will be distributed to subassemblies A2 and A6 of Translator/Synthesizer Assembly A2A6. The +20 Vdc distributed to the 100-Hz Synthesizer Subassembly A2A6A4 is further distributed to 100-Hz Control and Vernier Assembly A2A11 for application to the 4-Vdc Power Supply Subassembly A2A11A1.

3-149. +110-VDC Distribution (figure 5-18). The output of the 110-Vdc bridge rectifier A2A8CR1 through A2A8CR4 is applied to a choke input filter consisting of choke A2L1, capacitor A2C1, and resistor A2R20. The filtered +110 Vdc is used to supply plate and screen voltage to rf amplifiers V1 and V2 in RF Amplifier Assembly A2A4, through section B contacts 9 and 11 of mode selector switch A2S2 and the normally closed contacts (B2-B3) of transmit/receive relay A2K3. The +110 Vdc is also applied to one side of the Hz vernier indicator lamp A2DS5 when Hz switch A2A11S1 is in the vernier (V) position, and mode selector switch A2S2 is in a mode other than standby or off.

3-150. -30-VDC Distribution (figure 5-19). The output of the -30-Vdc bridge rectifier A2A8CR9 through A2A8CR12 is applied to a filter network consisting of resistor A2A8R3 and capacitor A2A8C3. The output from this network is applied through resistor A2A8R4 to the series-connected 15-volt zener diodes A2A8CR13 and A2A8CR14, and capacitor A2A8C4, to provide a regulated -30-Vdc source.

3-151. The -30 Vdc is used as the negative supply for the Hz vernier indicator A2DS5, and is selectively applied to either or both Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 through front-panel mode selector switch A2S2, depending on the mode of operation. The -30 Vdc is used in the rf agc direct-coupled amplifier A1Q1 of assemblies A2A2 and A2A3.

3-152. CONTROL.

3-153. Overall Receiver Tuning Control. The R-1051E/URR tuning control circuit consists of Receiver Code Generator Assembly A2A7; switch S1, motor B1, and relay K1 in RF Amplifier Assembly A2A4; switch S1, motor B1, and relay K1 in 1-MHz Synthesizer Subassembly A2A6A1; and hi-/lo-filter relay A2K2 (figure 5-20). The tuning circuit switches form two parallel, open-seeking, tuning circuits, each employing a five-wire coding scheme. The code generator, in response to the manual positioning of the front-panel MHz tuning controls, generates a tuning code for positioning the turret assembly in the rf amplifier, and the crystal switch in the 1-MHz synthesizer. A third circuit (one code line) controls the hi-/lo-band relay A2K2. The following paragraphs describe the tuning circuits for the receiver in detail.

3-154. Switches A2A7S1 and S2 are positioned by the 10 and 1 MHz controls on the front panel (see figure 5-47 for the schematic diagram of these switches). The tuning code generated by the switches (table 3-4) is one of 28 possible series of opens and grounds. Each series represents one of the 28 positions of turret switch A2A4S1 (terminals 1 through 5), one of the 17 positions of crystal switch A2A6A1S1 (terminals 1 through 5), and one position of hi-/lo-filter relay A2K2 (terminal 6). The turret motor relay A2A4K1 is energized when a ground path through the common contact of switch A2A4S1-A to terminal 7 of relay A2A4K1 is established, since +28 Vdc is applied to the relay terminal 3. When relay A2A4K1 energizes, turret motor A2A4B1 is energized by application of +28 Vdc through contacts 5 and 2 of relay A2A4K1. When energized, motor A2A4B1 rotates the rf tuning turret and turret motor switch A2A4S1 until the complement of the code is reflected by switch A2A4S1. Whenever the codes are complementary, the ground path to turret motor relay A2A4K1 is broken, causing it to deenergize.

3-155. In a similar manner, crystal switch relay A2A6A1K1 is energized to rotate crystal switch motor A2A6A1B1 and crystal switch A2A6A1S1 to the position established by the 1 and 10 MHz front-panel controls.

3-156. The code generator also generates the hi-/lo-band control line codes. When a ground is present at A2A7P1-6, hi-/lo-filter relay A2K2 is energized and ground is placed on the hi-/lo-band control line; when relay A2K2 is deenergized, +20 Vdc is applied to the control line.

3-157. Whenever turret motor relay A2A4K1 or crystal switch relay A2A6A1K1 is energized while tuning is in process, a ground connection is provided to tune relay A2K1. The tune relay is then energized, and those circuits that receive +28 Vdc through the contacts of this relay (refer to paragraph 3-146) are disabled until the tuning cycle is completed. In addition, tune relay A2K1 is energized by a ground connection from the code generator whenever the MHz controls are set to 00 or 01

3-158. Simplex/Duplex Operation Control. Provisions are made on pins J and K of connector A1A1J4 on the rear panel of the R-1051E/URR to receive +28 Vdc and a ground keyline, respectively, from a transmitter used with the R-1051E/URR (figure 5-35).

3-159. When SIMPLEX/DUPLEX switch A2S9 is in SIMPLEX, +28 Vdc is routed through contacts 3 and 2 to coil contact X2 of transmit/receive relay A2K3. When the transmitter is energized, a ground is routed through contacts 6 and 5 of switch A2S9 and contacts A3 and A2 of tune relay A2K1 to coil contact X1 of transmit/receive relay A2K3, thereby energizing it. When transmit/

Table 3-4. Tuning Code Chart

MHz CONTROLS SETTINGS	TUNING CODE[1]										
	CODE GENERATOR PLUG A2A7P1 TERMINALS[2]										
	-1	-2	-3	-4	-5	-6	-21	-22	-23	-24	-25
02	G	O	G	O	O	O	G	G	G	O	G
03	O	G	O	O	O	O	G	O	G	G	G
04	G	O	O	O	G	O	G	G	O	G	G
05	O	O	O	G	G	O	O	G	G	O	G
06	O	O	G	G	O	G	O	G	O	O	O
07	O	G	G	O	G	O	G	O	O	G	G
08	G	G	O	G	G	O	G	G	O	O	G
09	G	O	G	G	O	G	G	O	G	O	O
10	O	G	G	O	O	G	G	G	O	G	O
11	G	G	O	O	O	O	O	O	G	G	G
12	G	O	O	O	O	O	O	O	O	G	G
13	O	O	O	O	G	G	G	O	G	G	G
14	O	O	O	G	O	O	O	G	G	G	O
15	O	O	G	O	G	O	O	O	G	G	O
16	O	G	O	G	G	O	G	G	G	G	O
17	G	O	G	G	G	G	G	O	O	G	G
18	O	G	G	G	G	G	G	G	O	O	G
19	G	G	G	G	O	G	G	G	G	O	O
20	G	G	G	O	O	G	O	G	G	G	G
21	G	G	O	O	G	G	O	O	G	G	G
22	G	O	O	G	O	O	O	O	O	O	G
23	O	O	G	O	O	O	G	G	G	G	O
24	O	G	O	O	G	G	O	G	G	G	O
25	G	O	O	G	G	G	O	O	G	G	O
26	O	O	G	G	G	G	G	G	G	G	O
27	O	G	G	G	O	O	O	O	O	G	G
28	G	G	G	O	G	O	O	O	G	G	G
29	G	G	O	G	O	O	O	G	G	G	G

[1] G = Ground; O = Open.

[2] Terminals A2A7P1-1 through -5 connect to RF Amplifier Assembly A2A4; terminal A2A7P1-6 connects to hi-/lo-filter relay A2K2; terminals A2A7P1-21 through -25 connect to 1-MHz Synthesizer Subassembly A2A6A1.

receive relay A2K3 is energized, the 110-Vdc path through contacts B2 and B3 of A2K3 is broken (see figure 5-18), and the 20-Vdc path through contacts A2 and A3 of relay A2K3 is broken (see figure 5-17).

3-160. When SIMPLEX/DUPLEX switch A2S9 is in the DUPLEX position, transmit/receive relay A2K3 is energized during tuning by +28 Vdc routed through contacts 1 and 2 of switch A2S9 to coil contact X2 of relay A2K3, and by a ground routed through contacts A1 and A2 of tune relay A2K1 to coil contact X1 of relay A2K3.

3-161. 100-Hz Synthesizer Tuning Control. 100-Hz Control and Vernier Assembly A2A11 provides: +3 to +11.5 volts variable dc for vernier tuning of the 100-Hz Synthesizer Subassembly A2A6A4; +4-volt loop-control voltage as B+ voltage for the 100-Hz synthesizer phase detector; +4 Vdc for generation of a four bit ("0" = 0 volt, "1" = +4 volts) binary coded decimal (BCD) number for digital tuning of the 100-Hz synthesizer; and +4 Vdc B+ voltage for the 100-Hz synthesizer circuits.

3-162. The +3-volt bias for the front-panel Hz vernier control A2A11R1 is obtained from the +20 Vdc through series resistor A2A11A1R4 and is regulated by zener diode A2A11A1CR2. Potentiometer A2A11A1R2 affords adjustment of the voltage gradient of the Hz vernier control. The variable dc (+3 to +11.5 volts) output from the wiper of the Hz vernier control is connected to Hz switch terminal A2A11S1A-F-10. When the Hz switch is in the vernier (V) position, the variable dc is applied to the 100-Hz synthesizer via A2A11S1A-F-11 and A2XA6P1-14. Also, when the Hz switch is in the vernier position, the 100-Hz synthesizer phase detector does not receive the +4-volt loop-control voltage from terminal A2A11S1A-R-5.

3-163. The preset counter of the 100-Hz synthesizer receives the BCD levels from contacts of the Hz switch. Refer to table 3-5 for identification of the switch contacts which supply the logic "1" levels (+4 volts).

The +4 Vdc is supplied to switch contacts A2A11S1B-F-1 and R-1 from 4-Vdc power supply terminal A2A11A1E6.

3-164. When the Hz switch is set to any other position other than V, +4-Vdc loop-control voltage is applied to the phase detector of the 100-Hz synthesizer from A2A11S1A-R-5 via A2XA6P1-19. The +4 Vdc for the BCD generation and loop control is obtained by applying +20 Vdc from Power Supply Assembly A2A8 through Translator Synthesizer Assembly A2A6 to resistor A2A11A1R5 and zener diode A2A11A1CR1.

3-165. When Hz switch A2A11S1 is in the V position, +110 Vdc and -30 Vdc from the power supply are applied to a sawtooth oscillator network consisting of charging resistor A2A11A1R7, capacitor A2A11A1C4, discharge current-limiting resistor A2A11A1R6, and neon lamp A2DS5 on the front panel. The front-panel indicator lamp A2DS5 will flash when the positive charge on A2A11A1C4 and the -30 Vdc exceed the striking potential of A2DS5. Capacitor A2A11A1C4 will then discharge through the -30-Vdc supply and indicator A2DS5, until the lamp extinguishes.

3-166. TUNING MECHANISM DESCRIPTION.

3-167. In operation, tuning of the R-1051E/URR is accomplished by setting the front-panel MHz, kHz, and Hz frequency controls to indicate the desired received signal, the frequency of which is displayed in digital form in the windows above the controls. Positioning the front-panel controls tunes the equipment circuits by electrical means (refer to paragraph 3-152) and by mechanical means.

3-168. The mechanical tuning mechanisms consist of chain drives between the individual front-panel controls and the shafts of controls within the individual plug-in subassemblies of the main frame A2. Figure 5-40 indicates which subassemblies of Translator/Synthesizer Assembly A2A6 are mechanically tuned. The chain-drive mechanisms and the shaft couplers of the tuning system are adjusted to obtain precise tuning tracking for all tuning control positions.

Table 3-5. Preset Counter Logic Codes (BCD)

BIT	SWITCH A2A11S1-B CONTACTS	
	FRONT	REAR
20	-	2, 8, 10 or 12
21	-	3 or 4
22	11	-
23	4	-

3-169. CIRCUIT LEVEL DISCUSSIONS.

3-170. GENERAL. The following paragraphs refer to the maintenance schematic diagrams of individual assemblies and subassemblies of the equipment, and discuss the circuits contained in each assembly. The discussions are ordered by reference designation. Discussion is brief for those circuits that are conventional, and whose theory is covered in NAVSHIPS 0967-000-0120. Full discussion is provided for unconventional circuits, or for peculiar applications of any conventional circuits. If necessary, for full information on conventional circuits, refer to the appropriate sections in NAVSHIPS 0967-000-0120 for the specific type of circuit involved.

3-171. RECEIVER CASE A1 (figure 5-35). The Receiver Case A1 houses the slide-out Receiver Main Frame A2, Filter Box Assembly A1A1, and miscellaneous electronic components. Discussion of the circuits of the case is included in that of the main frame (refer to paragraph 3-175).

3-172. FILTER BOX ASSEMBLY A1A1 (figure 5-35). Filter Box Assembly A1A1, mounted at the rear of the Receiver Case A1, houses a number of capacitors used to filter incoming and outgoing signals; four jacks are used to connect ac power and the USB and LSB audio to remote equipment. Discussion of the circuits of the filter box is included in that of the Receiver Main Frame A2 (refer to paragraph 3-185).

3-173. RECEIVER MAIN FRAME A2 (figure 5-35).

3-174. General. The Receiver Main Frame A2 includes the receiver front panel and the chassis on which the plug-in electronic assemblies are mounted, as well as miscellaneous electronic components. Figure 5-35 shows the wiring, control, and hard-wired assemblies of the main frame. The hard-wired assemblies for which schematic information is shown in figure 5-35 include Receiver Power Supply Assembly A2A8, Antenna Overload Assembly A2A9, 20- and 30-MHz Filter Assembly A2A10, and 100-Hz Control and Vernier Assembly A2A11 (which includes 4-VDC Power Supply Subassembly A2A11A1).

3-175. In addition, the main frame schematic diagram also shows the Receiver Case A1, including electrical schematics for Filter Box Assembly A1A1, the AUX/NORM switch A1S1, the interlock switch A1S2, and interface jacks and connectors which are mounted on the rear of the case.

3-176. Since the operating controls, indicators, and connectors are mounted on the front-panel portion of the main frame, the schematic information for those items also appears in figure 5-35. Operation and usage of the various segments of multisection controls are discussed in conjunction with the signal flow diagram discussions earlier in this chapter. Figure 5-35 identifies the input and output signals/voltages for this equipment, at their respective entry or exit connectors. Full discussion of the main and secondary signal flows between assemblies of the main frame is covered by means of the receiver overall functional block diagram (figure 3-1), the signal flow diagrams (figures 5-1 through 5-14), and the power distribution diagrams (figures 5-15 through 5-19); the schematic diagram shows all interconnection and wiring information on main frame interconnections, and may be used when following a signal or wiring through several functional sections of the equipment.

3-177. Power Control and Distribution. Sheet 1 of figure 5-35 shows the primary power control circuits and Receiver Power Supply Assembly A2A8. This power supply contains several separate rectifier/filter circuits, and most of the +20-volt regulator circuits. Rectifier circuit A2A8CR1 through CR4 produces the +110-Vdc output from A2A8; filtering of this +110 Vdc is accomplished by A2L1 and A2C1, on the main frame. Rectifier A2A8CR5 through CR8 produces the +28-Vdc output, which, after filtering through A2L2, is connected through A2S2C-F-6/7 to terminal A2E15 in all positions of mode selector switch A2S2 except OFF. From A2E15, the +28 Vdc is fed through contacts B2/B3 of tune relay A2K1, to the +20-volt series regulator A2Q1, and to A2A8E14 (to the +20-volt regulator circuits).

3-178. The +20-volt regulator circuits of power supply A2A8 consist of A2A8Q1 through Q4, which form a conventional type voltage-comparator circuit, controlling conduction through a series-dropping stage (A2Q1). Initial level of the +20-volt regulator output (at terminal A2A8E15) is set by means of output voltage control A2A8R14. Any variation in the +20-Vdc output (due to load changes or variation of the +28-Vdc input of the regulator circuits) is then counteracted by varying conduction through the series-dropping stage A2Q1.

3-179. The third conventional, full-wave, bridge-rectifier circuit of power supply A2A8 consists of A2A8CR9 through CR12. This circuit produces a negative dc output that is zener-regulated by diodes A2A8CR13 and A2A8CR14, to produce the -30-Vdc output at terminal A2A8E10.

3-180. The remaining circuits of power supply A2A8 consist of dropping resistors A2A8R1 and R2, and voltage divider A2A8R6 and R16. Resistors A2A8R1 and R2 are connected in series with front-panel lamps A2DS3 and A2DS4, to drop the +28-Vdc (at A2A8E5) to the voltage required for the panel lamps. Voltage divider A2A8R6 and R16 provides a positive output (adjustable by R16) at A2A8E16, for use by the manual RF GAIN control A2R3 when the internal agc circuits are turned off.

3-181. Front-End Protection. On sheet 2 of figure 5-35, the circuits of Antenna Overload Assembly A2A9 are shown. Operation of this circuit is discussed as part of the rf selection and tuning signal flow diagram and discussion (refer to paragraph 3-17).

3-182. 20- and 30-MHz Filtering. Also shown in figure 5-35, sheet 2, is the 20- and 30- MHz Filter Assembly A2A10. This assembly receives the output signal of RF Amplifier Assembly A2A4 at its A2A10C1 input, and also receives diode-gating control voltages from A2A6P1-10 and A2A6P1-20 of the Translator/Synthesizer Assembly A2A6. The input from A2A6P1-10 is +20-Vdc, which is applied through A2A10R3 to zener reference voltage diode A2A10CR5, to produce a positive voltage at the junction of A2A10R2 and CR5. During hi-band operation, the input from A2A6P1-20 is a ground, and diodes A2A10CR2 and CR4 conduct to allow the rf input signal to pass through the hi-band filter (A2A10L3, C4, L5, C6). During lo-band operation, the input from A2A6P1-20 is +20-Vdc, which causes diodes A2A10CR1 and CR3 to conduct; the rf input signal then pass through the lo-band filter (A2A10C3, L2, L4, C5). Rf signals, after passing through the filter circuits of A2A10, are fed through A2A10C7 to A2A6P3-A1 of the Translator/Synthesizer Assembly A2A6.

3-183. Tuning Code Generation. Although, from sheet 2 of figure 5-35, Receiver Code Generator Assembly A2A7 appears to be a plug-in assembly, it is unlike the other plug-in electronic assemblies of the mainframe. Because of the mechanical connections between front-panel controls and the switch shafts of A2A7, this assembly requires a more complex removal procedure than do the other plug-connected assemblies of the main frame.

3-184. Hz Tuning Control. Sheet 3 of figure 5-35, among other wiring, shows the schematic diagram of 100-Hz Control and Vernier Assembly A2A11. The sections of Hz switch A2A11S1, when in positions other than V (vernier), connect gating-control voltage to combinations of the 2^0, 2^1, 2^2, and 2^3 control output lines; these gating-control voltages then select different counting ratios in the 100-Hz Synthesizer Subassembly A2A6A4, to effect 100-Hz incremental tuning changes (refer to paragraph 3-108). With the Hz switch A2A11S1 in the V (vernier) position as shown in figure 5-35, voltage derived from the 4-VDC Power Supply Subassembly A2A11A1 is fed from Hz control A2A11R1, through contacts A2A11S1-A-F-10/11, to the vernier control-line input to the 100-Hz Synthesizer Subassembly A2A6A4. Continuous variation of the A2A11R1 voltage then permits continuous tuning variation over a 1000-Hz range. Whenever the Hz switch A2A11S1 is in the V (vernier) position; the +110 Vdc is fed through A2A11S1B-F-6/7 to terminal A2A11A1E9. This voltage, when fed through A2A11A1R6 and R7 to A2A11A1E8, causes the front-panel vernier indicator A2DS5 to light. This lamp then alerts the equipment operator that vernier tuning is in play. Also the receiver is not locked to the internal frequency standard.

3-185. Input and Output Filtering. Sheet 3 of figure 5-35 shows the exit lines and connectors on the Filter Box Assembly A1A1, through which output signals are fed to associated external equipments, and ac power is received. Filtering is applied to signal inputs and outputs.

3-186. RECEIVER MODE SELECTOR ASSEMBLY A2A1 (figure 5-36).

3-187. General. The Receiver Mode Selector Assembly A2A1 contains three separate and relatively unrelated subassemblies. These are Mode Gates Subassembly A2A1A1, Beat Frequency Oscillator and Amplifier Subassembly A2A1A3, and 500-kHz Gate Subassembly A2A1A2.

3-188. Mode Gates Subassembly A2A1A1. Input to the mode gates consists of the if. signal from RF Translator Subassembly A2A6A6 (part of Translator/Synthesizer Assembly A2A6). This input, at a 500-kHz frequency, passes through emitter follower A2A1A1Q1, the inputs of two separately gated filter circuits, and one ungated filter circuit. During modes of operation when USB audio is required, and a USB signal is being received, the input to E14 will be +20 Vdc; this will then gate diode CR1 into conduction, and allows the if. signal to pass through the USB filter A2A1FL1, to output emitter follower A2A1A1Q2. From the output of Q2, the if. signal passes through A2A1P1-A3 to the input of Receiver IF./Audio Amplifier Assembly A2A2. During the USB mode of operation, the input to terminal A2A1A1E12 will be a ground input, and diode CR2 will be back-biased. Simultaneously, the +20-Vdc input at E14, coupled with the ground input from E12, back-biases diode CR4. Together, the two back-biased diodes (CR2 and CR4) prevent the if. input signal from passing through AM filter A2A1FL2.

3-189. During the AM mode of operation, the inputs to terminals E12 and E14 are reversed from that for USB modes. In the AM mode, then, diode CR1 will be back-biased, and diodes CR2 and CR4 will be forward-biased. The if. signal then passes through AM filter A2A1FL2, to the output emitter follower Q2, and out to the input of IF./Audio Amplifier Assembly A2A2.

3-190. For LSB signals, and their intelligence information, the if. input signal to A2A1A1 passes through LSB filter A2A1FL3, which passes only the LSB components of the composite if. input signal. This LSB if. signal is then passed through the LSB output emitter follower Q3, and A2A1P1-A2, to the input of Receiver IF./Audio Amplifier Assembly A2A3. This LSB if. signal is used only during modes of operation in which LSB components exist; there is no need of gating within the mode gates circuit, since following assemblies receiving the LSB if. signal are gated into operation only during LSB modes.

3-191. Beat Frequency Oscillator and Amplifier Subassembly A2A1A3. The BFO and amplifier subassembly contains a variable-frequency Colpitts-type oscillator A2A1A3Q1, whose center frequency output is at 500 kHz. This output is fed from the emitter of Q1, through buffer amplifier Q2, to output jack A2A1P2-A4, from where it is fed to Receiver IF./Audio Amplifier Assembly A2A2. The BFO signal is fed to only this one if./audio amplifier (A2A2), since this is the assembly which receives the if. signal during CW modes of operation.

3-192. Initially, the center frequency of oscillator A2A1A3Q1 is adjusted to 500 kHz by means of BFO frequency adjust coil L1, while applying a midrange voltage to input E1 from the BFO control A2R6 on the front panel. During CW operation, the voltage to A2A1A3E1 is varied between +7.5 and +20 Vdc. This voltage, applied through R1 to the voltage-variable capacitor CR1, changes the tuning of oscillator Q1. Operational adjustment of BFO control A2R6 is made to suit the individual operator receiving the CW signal.

3-193. 500-kHz Gate Subassembly A2A1A2. The third circuit of the mode selector, the 500-kHz gate, enables or disables the 500-kHz carrier-reinsertion signal to the demodulation circuits during SSB modes of operation. A 500-kHz stable-frequency signal from Frequency Standard Assembly A2A5 enters the 500-kHz mode gates circuit at terminal A2A1A2E6. During SSB modes, input to E5 will be +20 Vdc; this will then forward-bias diode CR1, and allows the 500-kHz input signal to pass through the gating circuits to outputs A2A1P2-A3 and A1. From this jack, the 500-kHz is fed to the carrier-reinsertion inputs of both Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3, which contain the demodulation circuits. During any mode not requiring carrier reinsertion, the input to A2A1A2E5 will be a ground input, and diode CR1 will then be back-biased. This prevents the 500-kHz signal from passing through to output jack A2A1P2-A1 and A3 during those modes.

3-194. RECEIVER IF./AUDIO AMPLIFIER ASSEMBLIES A2A2 AND A2A3 (figure 5-37).

3-195. General. Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 are identical in their circuitry; the only differences are in the specific inputs received, and therefore the specific outputs produced by each assembly. Assembly A2A2 receives the if. signal during USB modes of operation, whereas assembly A2A3 receives LSB if. signals during any mode for which LSB intelligence exists. In general, only assembly A2A2 is discussed below. Each if./audio amplifier contains four types of circuits: if. signal amplifiers, audio amplifiers, demodulation circuits, and automatic gain control (agc) circuits. Circuit operation for the first three types is discussed separately for the SSB modes of operation, the AM mode, and the CW mode. The agc circuits, which are relatively independent of the others, are discussed by themselves.

3-196. SSB Modes of Operation. The main 500-kHz if. input signal to Receiver IF./Audio Amplifier Assembly A2A2 is from the Receiver Mode Selector Assembly A2A1 gating circuits, and enters the if./audio amplifier at A2A2P1-A3. From this point, it passes through four tuned if. amplifiers (A2Q1, Q4, Q5, and Q6), and is converted to a balanced, two-line output from A2Q6. The balanced if. output from the secondary of transformer A2T4 is fed to terminals A3E12 and A3E10, which are the inputs to the demodulation circuits. For SSB-type signals (all modes of operation other than AM and CW), the balanced if. signal is applied to the bases of product-detector stages A3Q1 and Q2, as the push-pull input. The carrier-reinsertion signal for the product-detector stages is a 500-kHz signal from input P1-A2; this input is supplied from the gating stage of the mode selector, during those modes requiring such carrier reinsertion. This signal is applied through A3R1 and R3, and A3C1 and C4, to the emitters of the product-detector stages; note that this input is in-phase to both sections of the product detector.

3-197. The audio output from product detectors A3Q1 and Q2, representing the demodulated intelligence information, is fed from A3T1 to output point P1-4. From this point, the audio is applied to the front-panel USB LEVELS LINE control A2R2 (from assembly A2A2) or LSB LEVELS

LINE control A2R1 (from A2A3), which allows adjustment of the ultimate output signal from the equipment. From the line-level control, the audio is fed back into the if./audio amplifier at A2A2P1-6. This audio input is then fed to audio amplifier A2Q7. Output from A2Q7 is fed through emitter follower A2Q8, which produces a push-pull output audio signal to the bases of output emitter-follower states A2Q9 and Q10. The amplified audio output signal resulting from the secondary of transformer A2T1 is then fed to two places. A push-pull balanced line audio output is fed from A2T1-4/6, through P1-12/14, and through the wiring of the main frame and Filter Box Assembly A1A1, to output connectors on the rear of the equipment. This output is then connected to external equipments. The second output from A2A2A2T1 is from terminal 7, and is fed through P1-3 and through main-frame wiring to PHONE USB jack A2J2 (from assembly A2A2) or PHONE LSB jack A2J1 (from A2A3) on the equipment front panel; this audio is for local operators' usage.

3-198. AM Mode of Operation. During the AM mode of operation, the if. input signal to the if./audio amplifier enters as before, and passes through the if. amplifier stages A2A2A2Q1, Q4, Q5, and Q6. However, during the AM mode, the product-detector stages A3Q1 and Q2 will not be operating, by virtue of having no +20-Vdc input from P1-18 during this mode. The if. signal input to A3E10 will at this time be fed through additional if. amplifier stage A3Q3, to the input of AM demodulation diode A3CR2. This stage detects (demodulates) the AM intelligence in conventional manner, and feeds the resulting audio signal to the base of audio amplifier A1Q9. Output audio from cascaded audio amplifiers A1Q9 and Q14 is fed through P1-4, to the same front-panel line-level control as was used for the SSB audio output previously discussed. The audio path from the line-level control is identical to that discussed for the SSB modes of operation.

3-199. Note that during the AM mode of operation, the appropriate if. amplifier A3Q3, and audio amplifiers A1Q9 and Q14, are made operative by +20 Vdc received from P1-17 during the AM mode. For SSB modes, this +20 Vdc is not applied through P1-17, and the AM demodulation stages are not operating.

3-200. CW Mode of Operation. During the CW mode of operation, the AM demodulation stages are also used for demodulation; however, for CW mode, a beat frequency oscillator (BFO) signal is necessary. This BFO signal is fed into the if./audio amplifier A2A2 only, at P1-A1. From this point, the BFO signal (about 500 kHz, but variable by means of the front-panel BFO control A2R6) is fed into the AM detector diode A3CR2, through A3C8. In the diode detector, the BFO signal mixes with the CW if. signal, to produce the audible beat frequency required. This audio beat frequency is then fed through the audio amplifier stages A1Q9 and Q14, as for the AM audio previously discussed. Notice that Receiver IF./Audio Amplifier Assembly A2A3 does not receive the BFO input signal at P1-A1, nor do the AM detector/amplifier stages of A2A3 ever receive the enabling +20 Vdc from P1-17. This is because assembly A2A3 is used only during LSB and ISB modes, during which only its product-detector circuits are required.

3-201. Automatic Gain Control Circuits. The agc circuits of the Receiver IF./Audio Amplifier Assembly A2A2 or A2A3 produce agc voltages which are applied to if. stages within this same assembly, and agc voltages which are fed to stages of the RF Amplifier Assembly A2A4, to control gain of those stages. The majority of the agc circuits are contained on AGC Audio Amplifier Subassembly A2A2A1 (or A2A3A1). The remaining agc stages are A2A2A2Q2 and Q3 (or A2A3A2Q2 and Q3). Since the agc circuits operate similarly in both assemblies, only assembly A2A2 is discussed below.

3-202. The 500-kHz if. signal from the output of if. amplifier A2A2A2Q4 is fed to if. amplifier A1Q8, the input stage to the agc circuits; the gain of this if. stage is controlled by AGC ADJ potentiometer A1R25. Further amplification of the 500-kHz input takes place in transistor A1Q7, if this stage is receiving emitter voltage via switch A1Q13. Switch A1Q13 will be in conduction, as controlled by preamplifier A1Q12, when the front-panel AGC switch A2S3 is in either the FAST or SLOW position. When the AGC switch is in the OFF position, ground potential is applied to the base of preamplifier A2A2A1Q12, cutting it off. This allows switch A1Q13 to be biased off, disabling amplifier A1Q7 and, therefore, the entire agc function.

3-203. When the agc function is in use, two if. outputs of the same polarity but different amplitudes will be taken from the secondary of transformer A1T1. The larger of these two signals is rectified by detector A1CR5 to provide a charging potential for capacitor A1C5. The smaller signal is rectified by detector A1CR4 to provide a charging potential for capacitor A1C3. The dc voltages on capacitors A1C5 and A1C3 provide base bias and emitter bias, respectively, for coincidence detector A1Q6. When a relatively steady rf signal is being received, coincidence detector A1Q6 will be back-biased.

3-204. If the rf input signal should be interrupted (or suddenly drop to a much lower level), capacitor A1C5 begins to discharge through resistor A1R19, while capacitor A1C3 begins to discharge through resistor A1R13. The rates of discharge of the two capacitors are such that eventually coincidence detector A1Q6 will be forward-biased. At this time, both transistors A1Q6 and A1Q15 start to conduct. The time interval from the loss of signal to the turnon of A1Q6 provides the agc hang time. (The hang time is of sufficient duration so that the charge across capacitor A1C3 remains relatively constant during the reception of intermittent voice signals.) Capacitors A1C3 and A1C5 now discharge together at a faster rate through the conducting transistors A1Q6 and A1Q15. This portion of the discharge provides the agc decay time. If, during this process, the rf input is resumed, coincidence detector A1Q6 will be immediately reset as described.

3-205. With front-panel AGC switch A2S3 in the SLOW position, preamplifier A2A2A1Q11 will be cut off, thereby allowing switch A1Q10 to be forward-biased from the +20-Vdc supply voltage. This action connects capacitor A1C14 in parallel with capacitor A1C3, to increase greatly the agc hang and decay time. In FAST agc operation, preamplifier A1Q11 is forward-biased and its conduction through resistor A1R38 causes switch A1Q10 to be cut off.

3-206. The voltage across capacitor A1C3 (or the parallel combination of capacitors A1C3 and A1C14) also serves as the base bias for emitter follower A1Q4. As the rf input signal level increases, this voltage will tend to become more positive, and the resulting increased conduction of emitter follower A1Q4 will cause a more positive dc voltage to be applied to the base of dc amplifier A1Q3. Thus, the output of the emitter of dc amplifier A1Q3, which is applied to the IF. Amplifier Subassembly A2 as its agc control voltage, becomes more positive. The result of applying this increasingly positive agc voltage is to reduce the gain of the if. amplifier chain, to maintain a nearly constant if. signal level to the demodulating circuits. Conversely, a decrease in the rf input signal level will result in a decrease in the if. agc voltage to raise the gain of the if. amplifier chain.

3-207. The agc voltage applied to RF Amplifier Assembly A2A4 is generated through the action of dc amplifiers A2A2A1Q2 and A1Q1. As a result of an increase in rf input signal level, conduction of dc amplifier A1Q3 will increase, causing an increase in the forward-biasing voltage on the base of dc amplifier A1Q2. This, in turn, will raise the base voltage on dc amplifier A1Q1, and the resulting decreased conduction of this stage will cause the collector to go to a more negative dc voltage. The emitter voltage of dc amplifier A1Q1 is fed through diode A1CR1 to RF Amplifier Assembly A2A4, where the application of the more negative agc voltage to the grids of the two rf amplifier stages reduces their gain. Conversely, a decrease in the rf input signal level will result in a less negative agc voltage, to raise the gain of the rf amplifiers. Diode A2A2A1CR1 prevents any positive dc levels from being applied to the rf amplifier circuits. When operating in FAST agc mode, +20 Vdc is applied through the AGC switch A2S3 to switch A2A2A1Q5. This action grounds capacitor A1C1 and prevents oscillations in the rf-if.-agc loop.

3-208. When an extremely low rf input signal (at or near the threshold of receiver sensitivity) is being received, dc amplifier A1Q2 will be slightly back-biased and dc amplifier A1Q1 will be at maximum conduction. Under this condition of extremely low input signal, it is undesirable to apply any agc control to the rf amplifiers until a more favorable signal-to-noise ratio occurs. The desired delay in applying any agc to the rf amplifiers is introduced by adding diodes A1CR2 and A1CR3 in series with the emitter of dc amplifier A1Q2. Therefore, the rf input signal level must increase to a level where the forward-bias voltage applied to the base of A1Q2 overcomes the forward-bias requirement of the two diodes, in addition to that required for dc amplifier A1Q2 itself.

3-209. Manual control of rf and if. gain is provided when the front-panel AGC switch A2S3 is in the OFF position, by application of a variable dc voltage (at A2A2P1-21) to the base of amplifier A2A2A1Q3. This input, from the RF GAIN control A2R3, controls conduction of dc amplifier A2A2A1Q3, and thereby controls the if. signal level to A2Q4.

3-210. RF AMPLIFIER ASSEMBLY A2A4 (figure 5-38). The rf amplifiers V1 and V2 of RF Amplifier Assembly A2A4 are conventional tuned circuits, capable of tuning over the range from 2.0 to 29.9999 MHz. As indicated in chart 3 on figure 5-38, portions of three of the 28 turret subassemblies A2 through A29 are used to tune a 1-MHz band (e.g., for 2-MHz tuning, subassemblies A20, A25, and A2 are involved). Selection of the appropriate portions of each of these turret subassemblies is accomplished mechanically by rotation of the MHz controls on the front panel.

3-211. In order to tune to the desired frequency within the 1-MHz band, the 100 and 10 kHz controls are used to select grid and plate tank-capacitor subassemblies, as shown in charts 2 and 1 on figure 5-38. For example, in tuning to 550 kHz within any MHz band, capacitors C15 and C16 of subassemblies A30, A33, A34, and A37 tune the 100-kHz increment (0.xx MHz), and capacitor C6 of subassemblies A31, A32, A35, and A36 tunes the 10-kHz increments (0.0x MHz).

3-212. The selection of the desired 1-MHz band is accomplished by rotating the front-panel MHz controls to the desired frequency. These controls are not mechanically connected to the turret; instead, the controls rotate switch wipers in Receiver Code Generator Assembly A2A7. This results in an output from the code generator of a five-line code consisting of circuit grounds and opens.

3-213. One such five-line combination for each frequency band is applied through contacts 1 through 5 of A2XA4P1, and from there to the turret decoder S1. The decoder connects the ground(s) from the code generator to relay K1, which, when energized, applies +28 Vdc to motor B1 (via relay contacts 2 and 5). As the motor drives the turret and the turret decoder, relay K1 remains energized until the decoder reaches a position where its contacts are the complement of the code generator contacts (e.g., if the code generator output is 10000, where "1" represents a ground, and "0" an open circuit, the decoder will rotate until its contacts reflect the code 01111). Since the ground for relay K1 is supplied by a "1" bit of the code generator output, the decoder switch is rotated until its contacts are open. At this time, turret rotation ceases, and the turret assemblies are positioned as required to connect the tuning elements that will tune the rf amplifier stages to the selected frequency band.

3-214. FREQUENCY STANDARD ASSEMBLY A2A5 (figure 5-39). Reference to the schematic diagram of Frequency Standard Assembly A2A5, and the stage names thereon, shows the same signal flows and outputs as are described in paragraph 3-133. The basic temperature-controlled 5-MHz oscillator and the divider circuits are conventional-type circuits.

3-215. A unique circuit within the frequency standard is located at the output of times-two multiplier A2A4A2Q11. The

5-MHz signal from the collector of A2Q11 is applied to full-wave rectifier circuit A2CR6 and A2CR7. The ripple frequency from these full-wave rectifiers is at 10 MHz. This 10-MHz signal (ripple) is then filtered through the 10-MHz bandpass filter circuits, and is fed to the 100-kHz Synthesizer Subassembly A2A6A2 (via A2XA5P1-A5 output).

3-216. TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6 (figure 5-40).

3-217. General. The chassis of Translator/Synthesizer Assembly A2A6 serves only as a base and an interconnection/interface mount for the six individual subassemblies (A2A6A1 through A2A6A6) which perform the synthesization of mixer frequencies and the frequency translation required for tuning. Subassemblies A2A6A1 through A2A6A5 perform the frequency synthesization, and subassembly A2A6A6 performs the frequency translation. Figure 5-40 identifies the inputs/outputs and signal origins/destinations for connections between the translator/synthesizer and other assemblies of the equipment. This schematic diagram should be used in conjunction with the schematic diagrams for subassemblies A2A6A1 through A2A6A6 (figures 5-41 through 5-46) when tracing an input or output signal to or from these subassemblies.

3-218. The translator/synthesizer chassis contains no controls. However, when the subassemblies are mounted on the chassis and the entire assembly is installed in Receiver Main Frame A2, the front-panel kHz controls mechanically connect (by means of chain-drive mechanisms) to various frequency selection controls of subassemblies A2A6A2 and A2A6A3. These mechanical connections are indicated in figure 5-40.

3-219. 1-MHz Synthesizer Subassembly A2A6A1 (figure 5-41). Reference to the schematic diagram and to the signal flow discussion for the 1-MHz Synthesizer Subassembly A2A6A1 (refer to paragraph 3-83) will enable easy tracing of signals and identification of specific stages of this assembly, which are for the most part conventional circuits.

3-220. A somewhat unconventional circuit within the 1-MHz synthesizer is the voltage-controlled variable crystal-oscillator circuit (A2A6A1A1 stages). The dc error-correction voltage developed in the labelled stages of A2A6A1 is applied to the variable-capacitance diodes of the A2A6A1A1 circuits, to make the oscillator output exactly at the desired frequency.

3-221. Another unconventional circuit within the 1-MHz synthesizer is that which develops a spectrum of frequencies to lock the output of the assembly to exact harmonics of 1 MHz. Operation of these circuits is described below.

3-222. Generation of the required spectrum is accomplished by the action of shaper amplifiers A2A6A1A3Q1 through A3Q3 and their associated components. The sinusoidal 1-MHz signal across inductor A3L2 is applied to diode clipper A3CR3, which allows only the negative portion of the waveform to appear at the base of shaper amplifier A3Q1. The negative-going peaks drive amplifier A3Q1 into saturation, to produce positive-going pulses (with a fast rise time) at its collector. In turn, shaper amplifier A3Q2 is driven into saturation by the positive-going pulses, and produces negative-going pulses at its collector. The negative pulses are fed to the base circuit of shaper amplifier A3Q3, where the time constant is such that the waveform will be differentiated. The negative portion of the differentiated signal drives amplifier A3Q3 into saturation, and the resultant output is differentiated by resistor A3R15 and inductor A3L3. Only the positive-going portion of the signal across inductor A3L3 is passed through diode A3CR5 to become a train of narrow, positive-going pulses, having a repetition frequency of 1 MHz and providing a uniform spectrum of frequencies in 1-MHz increments over the range of interest from 1 to 25 MHz.

3-223. The combination of signals applied to mixer A3Q4 (the signal from 1-MHz oscillator subassembly A1 at the emitter, and the 1-MHz spectrum at the base) produces a wide range of sum and difference frequencies. However, since the components in the output (collector) circuit form a bandpass filter tuned to 1.5 MHz, only those mixer products at or near 1.5 MHz appear at the output of A3T1. These signals are then fed to the error-voltage stages, which develop the required dc correction voltage to apply to the stages of 1-MHz oscillator subassembly A1.

3-224. 100-kHz Synthesizer Subassembly A2A6A2 (figure 5-42). The stages of the 100-kHz Synthesizer Subassembly A2A6A2 are conventional-type oscillators, followed by integrated-circuit (IC) mixing stages. Reference to the schematic diagram and the functional description in paragraph 3-89 will enable tracing of the signals through this subassembly, and identification of the stages. Unusual features associated with the IC mixing stages are described in the following paragraphs.

3-225. Mixer stages A2A6A2A4U1 and U2 utilize type 911CE integrated circuits. These are rf/if. amplifiers, which provide rf mixing or amplification at frequencies up to 250 MHz. The 10-kilohm resistances connected between pins 1 and 7, and 8 and 10, provide correct impedance matching between the IC input/output points and the tuned rf transformer circuits of A4T1, T2, T7, and T8. The capacitors between pins 1 and 7, and 8 and 10, tune the input/output transformers to the frequency bands appropriate to the input/output frequencies.

3-226. The 51-ohm resistors between pins 4 and 6 of the IC's provide correct termination for the 4.553- to 5.453-MHz signal fed to mixers A4U1 and U2. In order to operate, each IC requires a positive voltage at pin 2 and a simultaneous ground at pin 5. Capacitors A4C7 and C26, connected at pin 9 of the IC's, provide rf bypassing for the internal biasing circuits of each IC.

3-227. Only half of the circuits of hi-band/lo-band mixer/amplifier subassembly A4 are operative at any one time, depending on whether the hi band (32.4 to 33.3 MHz) or lo band (22.4 to 23.3 MHz) is required in RF Translator Subassembly A2A6A6. The lo-band circuits are discussed first.

3-228. The 27.847-MHz output from the 17.847-/27.847-MHz mixer subassembly A2A6A2A3 is coupled to IC mixer A4U1 by transformer A4T1. The signal from the 4.553- to 5.553-MHz oscillator subassembly A1 is coupled to mixer A4U1 through capacitor A4C5. When the hi-/lo-band control input at P1-4 is +20 Vdc, mixer A4U1 and trap amplifier A4Q1 are made operative. Mixer A4U1 receives positive voltage at pin 2 (through A4R5) and amplifier A4Q1 receives positive emitter voltage (through A4R11). At the same time, mixer A4U2 and trap amplifier A4Q2 are made inoperative by the positive potentials applied to their circuits by this input. The output of mixer A4U1 is in the 22.4- to 23.3-MHz band. All other products of the mixer, except for a small amount of the 17.847-MHz component, are eliminated by the triple-tuned filter composed of A4T2 and T3, transformer A4T4, and capacitors A4C9, C10, and C11. From the triple-tuned filter, the signal is coupled through capacitor A4C12 to the base of amplifier A4Q1. The collector circuit of trap amplifier A4Q1 is parallel-tuned to 17.847 MHz, which provides attenuation and effectively eliminates the 17.847-MHz component from the output signal. The output of trap amplifier A4Q1 is coupled through transformer A4T6, gating diode A4CR1, and capacitor A5C2 to emitter follower A5Q1, the output of which is fed out through P1-A2, and is also fed to agc amplifier A5Q2. Note that diode A4CR1 is conducting by virtue of the positive lo-band control voltage it receives through resistor A4R14.

3-229. The hi-band circuits are similar to the lo-band circuits. When the hi-/lo-band control input at P1-4 is at ground, mixer A4U2 and trap amplifier A4Q2 are enabled, and mixer A4U1 and trap amplifier A4Q1 are rendered inoperative. Diode A4CR1 is gated off during the hi-band operation. The 27.847-MHz output from the 27.847-MHz mixer A3 is coupled to mixer A4U2 at pins 1 and 7, and the 4.555- to 5.453-MHz signal from oscillator A1Q1 is coupled to mixer A4U2 at pin 6. The output of mixer A4U2 is a frequency in the 32.4- to 33.3-MHz band. All other products of the mixer, except for a small amount of the 27.847-MHz component, are eliminated by the triple-tuned filter composed of transformer A4T8, T9, and T10, and capacitors A4C31, C32, and C33. From the triple-tuned filter, the signal is coupled to the base of trap amplifier A4Q2, the collector circuit of which is parallel-tuned to 27.847 MHz to eliminate the 27.847-MHz signal. The output of trap amplifier A4Q2 is coupled through capacitor A4C39, transformer A4T12, and diode A4CR2 (conducting when the ground input is at P1-4) to the base of emitter-follower A5Q1, via capacitor A5C2.

3-230. The agc subassembly A5 consists of agc amplifiers A5Q2 and Q3 and detector A5Q4. These circuits produce an agc voltage to control the gain of mixer A2Q1. The 22.4- to 23.2-MHz or 32.4- to 33.3-MHz output from the hi-band/lo-band mixer amplifier A4 is coupled to the base of agc, amplifier A5Q2 via emitter follower A5Q1. Inductor A5L2, a peaking coil, compensates for high-frequency roll-off and provides for uniform agc output for both hi- and lo-band operation.

3-231. With no input signal from A5C8, detector A5Q4 would be conducting, and capacitors A5C10 and C11 would be uncharged. Diode A5CR1 clamps the positive voltage at the base of A5Q4 to prevent excessive emitter-base current flow. The negative halves of the rf input through A5C8 cause cutoff of A5Q4, and capacitors A5C10 and C11 charge to a positive value that is proportional to the amplitude of the rf input. This is the positive agc voltage.

3-232. 1- and 10-kHz Synthesizer Subassembly A2A6A3 (figure 5-43). This subassembly contains mixing and filtering circuits very much like those used in 1-MHz Synthesizer Subassembly A2A6A1 and 100-kHz Synthesizer Subassembly A2A6A2. Reference to paragraph 3-100 in conjunction with the schematic diagram of the subassembly will enable easy identification of stages and their signals.

3-233. A unique feature of the 1- and 10-kHz synthesizer is that its output signal (7.089 MHz at A4T1) carries composite frequency-error information relating back to signals from the 5.16- to 5.25-MHz oscillator A1 and the 1.850- to 1.859-MHz oscillator A2. This 7.089-MHz error signal is applied to the 100-Hz Synthesizer Subassembly A2A6A4 in such a manner as to cancel frequency errors of other signals within the synthesization circuits. Refer to the frequency stability and error cancellation discussions (paragraph 3-133 and 3-125) for detailed information on error cancellation.

3-234. 100-Hz Synthesizer Subassembly A2A6A4 (figure 5-44). The 100-Hz Synthesizer Subassembly A2A6A4 receives a 7.089-MHz error-signal input from 1- and 10-kHz Synthesizer A2A6A3 (at A2A6XA4P1-A2), and additively mixes it with a 11.0- to 11.9-kHz internally-generated signal to produce output signals from 7.1000 to 7.1009 MHz (variable in 100-Hz increments). In the receiver application only, when vernier tuning is available, the 100-Hz synthesizer produces a 7.0998- to 7.1012-MHz output at A2A6XA4P1-A1: this signal frequency is continuously variable between the noted limits. For either receiver or transmitter application, the output signal from A2A6XA4P1-A1 is fed to 100-kHz Synthesizer Subassembly A2A6A2, where it is applied to mixer circuits to effect 100-Hz incremental (or continuously variable) tuning changes.

3-235. Referring first to sheet 1 of figure 5-44, the basic internal oscillator, which produces (indirectly) the required 11.0- to 11.9-kHz signal, is A2A6A4A2Q2. This stage is a voltage-variable, loop-controlled oscillator, which produces a 110- to 119-kHz output at the secondary of transformer A2T1. The specific frequency of A2Q1 oscillation is controlled by the variable tuning elements A2CR6 through A2CR8. These elements receive their controlling dc voltage from phase detector A2U1 and dc amplifier A2Q1 (when under 100-Hz incremental tuning control), or from the variable dc voltage input at P1-5 (for receiver application only, when under vernier tuning control).

3-236. The 110- to 119-kHz signal from oscillator A2Q2 is fed through transformer A2T1, to limiter diodes A2CR4 and A2CR5, to buffer amplifier A2Q3. The sinusoidal output of buffer amplifier A2Q3 is fed to the base of pulse shaper A1Q6. Stages A1Q6 and A1Q5 are connected in a Schmitt-trigger configuration, and convert the sinusoidal input to A1Q6 into square pulses output at the collector of amplifier A1Q5; this squared output signal (at a 110- to 119-kHz rate) is then suitable as the input to the digital decade-divider stages (integrated circuits A1U1 and A1U3).

3-237. The decade-divider stages perform normal 10/1 division of the input signal rate, except as modified by the count-altering gate-control signals received at A1E4 through A1E7. These gate-control voltages applied are positive voltages to four lines of a six-line AND circuit. The output from the six-input AND circuits (A1CR3 through A1CR14) will be a positive voltage until all of its six inputs are simultaneously at ground potential; at this condition only, the AND circuit output changes to a 0-volt level.

3-238. For illustration, assume that a 113-kHz output is desired from oscillator A2Q1 (as determined by the Hz tuning control). For this Hz control position, circuit tracing will reveal that positive voltages from the Hz frequency control are received at terminals A1E4, E5, and E7. Next, assume that the reset pulse (from A1Q9) occurs; this reset pulse is applied to pin 6 of the decade dividers A1U3 and A1U2 to cause them to reset to their 0-count states. Simultaneously, the reset pulse is applied to pin 6 of flip-flop A1U4, causing it to produce a positive voltage level output at its pin 7. Analysis of the decade-divider outputs would show that the outputs at pins 3, 2, 1, and 8 are all simultaneously ground levels at the 0-count. The decade-divider 0-volt (ground) outputs cause a 0-volt potential at the junctions of their associated connected-pair decoder diodes (A1CR5/CR8, A1CR4/CR7, etc.). However, at this 0-count state, the positive pin 7 output from A1U4 to A1CR13 causes cutoff of A1CR13. This allows the +4 Vdc, through A1R37 and A1CR14, to produce a positive voltage level on the common AND circuit output line; this voltage is fed to the base of pulse amplifier A1Q1 and keeps that stage cut off.

3-239. Now consider the input pulses (at the assumed 113-kHz rate) into pin 5 of decade divider A1U3. The dividers A1U3 and A1U2 will count the first 100 pulses (following the reset pulse) and will again be at their 0-count (all ground-level outputs) condition. On the 100th count, however, a transition from a positive level to a ground level occurs from A1U2, pin 8. This transition is fed through inverter amplifier A1Q8 to flip-flop A1U4, which now produces a ground-level output from pin 7. A1CR13 is now forward-biased, resulting in 0 Vdc at the cathode of A1CR14. However, since the input pulses to decade divider A1U3 are continuing while A1U4 is changing its state, there will continue to be at least one positive voltage input to the six-input AND circuit, and pulse amplifier A1Q1 will continue to receive a positive-level output from the AND circuit. Thirteen pulses after the 100th (i.e., at the 113th pulse), the count lines (at pins 3 and 2 of A1U3, and at pin 3 of A1U2) will all simultaneously produce ground-level outputs. This now permits the voltage at the base of A1Q1 (AND circuit output) to change from a positive level to a ground level. Pulse amplifier A1Q1 is now pulsed on; the resulting output pulse from A1Q1 momentarily pulses buffer amplifier A1Q2 on, and the negative pulse from the A1Q2 collector triggers the reset one-shot multivibrator A1Q3/Q4.

3-240. The resulting positive pulse from the collector of A1Q4 is fed through emitter-follower A1Q9; this output is the reset pulse, which is applied as described to pin 6 of decade dividers A1U3 and A1U2, and to pin 6 of flip-flop A1U4, to reset these circuits to the 0-count condition. The next counting cycle of 113 pulses is then begun. In response to the assumed Hz switch setting, one reset pulse occurs for each 113 cycles of oscillator A2Q2, which will be oscillating at a 113-kHz rate; therefore, the reset pulses occur at a 1-kHz rate (113 kHz/113).

3-241. The reset pulses are compared in phase detector A2U1 with 1-kHz reference pulses (P1-A3 input). As long as A2Q2 oscillates at 113 kHz, the phase detector output dc voltage (fed through A2Q1 and A2FL1 to the variable tuning elements for A2Q2) will maintain A2Q2 oscillation at that rate. Any variation of A2Q2 output frequency causes reset pulses at other than the 1-kHz rate; phase detector A2U1 then produces an output whose magnitude and direction of change are such as to retune oscillator A2Q2 to 113 kHz (the assumed selected frequency). In this way, by dividing the A2Q2 frequency by ratios of 110/1 to 119/1 (as controlled by the Hz frequency control switch), the counter and phase-detector circuits maintain A2Q2 oscillation at the selected frequency (of its 110- to 119-kHz range).

3-242. Now, consider the input to decade divider A1U1 (from pulse shaper A1Q5). This 110- to 119-kHz input is divided by 10, in normal decade-counting manner, to produce a 11.0- to 11.9-kHz signal to amplifier A1Q7. Output from A1Q7 is fed through emitter follower A3Q1, as the 11.0- to 11.9-kHz input to the emitter of mixer A3Q2. This stage receives the 7.089-MHz signal from P1-A2, and additively mixes its two inputs to produce the desired 7.1000- to 7.1009-MHz output. The mixer output is filtered and fed through stages A3Q3 and A3Q4 to P1-A1 output. Gain of A1Q4 is adjustable by means of A3R20, to set the amplitude of the 7.1000- to 7.1009-MHz output signal.

3.243. In the receiver application, where continuous vernier tuning is available, the frequency of oscillator A2Q2 is controlled by a variable dc voltage received at P1-5 from the Hz vernier frequency control. The A2Q2 frequency in this mode is 108 to 122 kHz. During vernier tuning, phase detector A2U1 is disabled by removal of the +4 Vdc at P1-2. Only decade divider A1U1 is operating during the vernier tuning mode. All stages following A1U1 perform as described for 100-Hz incremental tuning changes.

3-244. Spectrum Generator Subassembly A2A6A5 (figure 5-45). Spectrum Generator Subassembly A2A6A5 generates accurate spectra (frequencies) upon which the frequency error-correction processes in the tuning circuits are based. As shown in the schematic diagram, the spectrum generator contains four subassemblies, individually concerned with generation of 100-kHz, 10-kHz, and 1-kHz spectra, and with 1-kHz pulse generation. The single basic input, from which all outputs are derived, is the stable 500-kHz signal (at A2A6XA5A1J1) from Frequency Standard Assembly A2A5.

3-245. The 500-kHz sinusoidal input is applied through A2A6A5A1L2 and A1C3, to normally nonconducting trigger amplifier A1Q1. The negative portions of the 500-kHz input cause 500-kHz positive output pulses from A1Q1, which trigger the divide-by-five multivibrator A1Q2/Q3. The initial oscillation rate of the A1Q2/Q3 circuit is adjusted by count adjust potentiometer A1R5, so that it operates as a synchronized divide-by-five circuit, producing 100-kHz output pulses from the collector of A1Q3. The time constants within the A1Q2/Q3 circuit are such that the 100-kHz pulses from A1Q3 are approximately 0.8 μs in duration.

3-246. The 100-kHz, 0.8-μs pulses are fed to gate amplifier A1Q4, and cut that stage off. When conducting, A1Q4 swamps the A1T1 winding of keyed oscillator A1Q5. This stage functions as a swamped blocking oscillator. When A1Q4 is cut off, keyed oscillator A1Q5 oscillates to produce a spectrum of frequencies centered around its natural resonant 16-MHz frequency, and which are spaced exactly 100 kHz apart. This output (spectrum) is fed through load-isolating amplifier A1Q6, through the broadband-filter circuit A1L3, C17, C18, C19, R22, R25, and T2,to A1J2. The broadband-filter circuit passes only the spectrum frequencies in the desired range of 15.3 to 16.2 MHz.

3-247. The remaining divider and keyed oscillators operate in the same manner as that described this far. The outputs produced are (1) a spectrum of frequencies centered around 3.86 MHz, spaced 10 kHz apart (from oscillator A2Q6); and (2) a spectrum of frequencies from 0.122 to 0.131 MHz, spaced 1 kHz apart (from A3J1). Output from pulse inverter A4Q1 consists of 1-kHz pulses, which are fed to the 100-Hz Synthesizer Subassembly A2A6A4.

3-248. RF Translator Subassembly A2A6A6 (figure 5-46). The RF Translator Subassembly A2A6A6 contains the frequency translation (mixing) circuits, where the frequency down-conversion (receiver application) or up-conversion (transmitter application, occurs. Assemblies within the rf translator are subassembly A1, and the cordwood-type mixer subassemblies mounted thereon. The mixer subassemblies are (1) 1-MHz mixer and alc subassembly A1A1, which contains the highest frequency translation stage; (2) 100-kHz mixer subassembly A1A2, which contains the midrange frequency translation stages; and (3) the 1- and 10-kHz mixer subassembly A1A3, which contains the lowest frequency translation.

3-249. To facilitate use of the same frequency translation circuits in both a receiver application (requiring down-conversion) and a transmitter application (requiring up-conversion), the rf translator contains gating diode circuits which control the signal-flow directions to suit each application. In the receiver application, the main rf signal from RF Amplifier Assembly A2A4 is directed into the 1-MHz mixer A1A1 (highest frequency translation circuits), where down-conversion to a first if. occurs. This first if. signal is then directed to the 100-kHz mixer A1A2, where a second down-conversion occurs. The resultant second-if. signal is then directed to the 1- and 10-kHz mixer A1A3, where the third (and final) down-conversion occurs to produce the 500-kHz final if. signal. It is this 500-kHz signal which is demodulated to extract the voice, CW, or teletype intelligence signals.

3-250. In the transmitter application of the rf translator, the main input signal consists of a 500 kHz signal from the Transmitter IF. Amplifier Assembly A2A12, which has been modulated by the CW, voice, and/or teletype inputs to the transmitter. This modulated 500-kHz signal is directed to the 1- and 10-kHz mixer A2A6A6A1A3, where up-conversion occurs, to produce a first if. signal. The modulated first if. signal is then directed to the input of the 100-kHz mixer A1A2, where a second up-conversion occurs to produce a second if. output. From the 100-kHz mixer stages, the second if. output is directed to the input of the 1-MHz mixer and alc A1A1, where a third up-conversion produces the final transmitter output frequency signal which is then directed to the RF Amplifier Assembly A2A4 for amplification.

3-251. To follow the signal flow through the rf translator circuits, first consider the gating diodes and their conditions of conduction (passing rf signals) or cutoff (blocking passage of rf signals). The dc voltages or grounds received at A1J1, J2, and J4 determine the gating-diode biasing. For the receiver application, the A1J2 input is at ground, and the A1J4 input is +20 Vdc. The A1J1 input may be either +20 Vdc or ground, as controlled by the main-frame hi-/lo-band relay A2K2. When the mixing processes require use of lo-band filter A2A6A6A1FL1, the A1J1 input is +20 Vdc; this input then biases diodes A1CR4 and A1CR6 into conduction, and directs the rf signals to flow through 20-MHz filter A1FL1. For hi-band operation, the A1J1 input is a ground, causing forward-biasing of diodes A1CR5 and A1CR7, to direct rf signal flow through 30-MHz filter A1FL2.

3-252. When the rf translator is employed in a receiver, the A1J2 and A1J4 inputs cause forward-biasing of the following gating diodes: A1A1CR2 and CR4, A1A2CR2 and CR4, and A1A3CR1 and CR3. The input rf signal from the rf amplifier then enters at A1E1 and is fed to mixer A1A1U1A. This mixer receives the injection signal at pin 2, and performs the first down-conversion. The first if. signal from the A1A1U1A output is fed through A1A1CR4 to the inputs of the 30-MHz and 20-MHz filters A1FL2, and A1FL1. Depending upon the hi-band/lo-band input from A1J1, the first if. signal passes through one of the filters, through A1A2CR2, to the input of mixer A1A2U1.

3-253. In mid-frequency integrated circuit mixer A1A2U1, the signal from A1A2CR2 is mixed with a local oscillator injection signal received from A1E7 (from 100-kHz Synthesizer Subassembly A2A6A2) to perform the second frequency down-conversion. The resulting second if. signal from A2A6A6A1A2U1 passes through A1A2CR4, through 2.85-MHz filter A1A3FL3 and A1A3CR1, to the input of mixer A1A3U1A. The local oscillator injection signal to A1A3U1A is received from the output of amplifier A1A3Q2, whose input is a controlled-level signal.

Subassembly A2A6A3. Stage A2A6A6A1A3U1A performs the third frequency translation, and produces the 500-kHz if. signal in the receiver application. This 500-kHz if. signal passes through A1A3CR3, through A1A3Q1, to the output jack P2-A1. RCVR GAIN ADJ control A1R16 permits setting the 500-kHz if. output to a desired amplitude.

3-254. Notice that both the highest frequency translation mixer circuits (A1A1U1A) and the lowest translation frequency circuits (A1A3U1A) contain circuits which maintain the local oscillator injection signals to those mixers at preset amplitudes, to ensure constant-level mixer outputs. In the highest frequency stages (of 1-MHz mixer A1A1), this injection signal agc is developed by rectifying an rf output from amplifier A1A1Q2 (via A1A1CR5) and applying the resulting dc voltage (after amplification in stage A1A1U1B) to one input of dual-input FET amplifier A1A1Q1. The dc input at pin 2 of A1A1Q1 controls the gain of that stage, thereby controlling the rf signal level from A1A1Q1 to A1A1Q2 input. Since stages A1A1Q1, Q2, and U1B form a closed loop, any change in output rf level from A1A1Q1 will cause a change in the A1A1Q2 output. This change will vary the dc level to (and therefore from) A1A1U1B. The direction and amplitude of the A1A1U1B output change, when applied to A1A1Q1 input 2, then increases or decreases the A1A1Q1 gain as necessary to return the A1A1Q1 rf signal output level to its correct preset level.

3-255. In the lowest frequency mixer stage (1- and 10-kHz mixer and alc A1A3), stages A1A3Q1, Q2, and U1B perform the same type injection-signal level control as did stages A1A1Q1, Q2, and U1B in the 1-MHz mixer and alc subassembly A1A1.

3-256. When the rf translator is used in a transmitter, the various subassemblies still receive signals in the same ranges (as for receiver application), but now perform frequency up-conversion in each mixer. Analysis of the inputs to A1J4 and A1J2 for transmitter application will show that the following diodes are now forward-biased, to pass rf signals: A1A1CR1 and CR3, A1A2CR1 and CR3, and A1A3CR2 and CR4.

3-257. Tracing the modulated 500-kHz signal received from the Transmitter IF. Amplifier Assembly A2A12 (received at input A2A6A6P2-A2), it will be found that the signal flows first to the 1- and 10-kHz mixer and alc subassembly A1A3, where frequency up-conversion occurs. The output from A1A3U1A is then directed through A1A3CR4, through 2.85-MHz filter A1FL3, through gating diode A1A2CR1, to the input of mixer A1A2U1. The up-converted output from A1A2U1 then passes through A1A2CR1, through filter A1FL1 or A1FL2 (as directed by the lo-band/hi-band input to A1J1), through A1A1CR1. to the input of the 1-MHz mixer A1A1U1A. The up-converted output from A1A1U1A will be the final frequency to be transmitted.

3-258. The A1A1U1A output signal passes through gating diode A1A1CR3, to output jack P3-A2, which feeds the signal to RF Amplifier Assembly A2A4. The mixer alc circuits operate as described for the receiver application, to maintain constant injection signal levels to the lowest and highest frequency mixers.

3-259. In both receiver and transmitter applications, the specific injection signal frequencies to the mixers are determined by the synthesizing circuits of RF Translator/Synthesizer Assembly A2A6. These frequencies will automatically be corrected, to combine and mix to produce the final output frequencies required.

3-260. RECEIVER CODE GENERATOR ASSEMBLY A2A7 (figure 5-47). Receiver Code Generator Assembly A2A7 consists of two multiple-section switch assemblies, whose jumper contacts are positioned by operation of the MHz controls on the front panel. These switch assemblies provide grounding or open-circuit connections on sets of input wires, which are connected to 1-MHz Synthesizer Subassembly A2A6A1, RF Amplifier Assembly A2A4, and hi-/lo-filter relay A2K2. In response to the specific open/ground combinations (codes) they receive, the 1-MHz synthesizer circuits are autotuned to produce the desired MHz-range frequencies. In a like manner, the rf amplifier circuits are autotuned to the tuning code received, to operate at the specific frequencies generated by the synthesizing circuits. The hi-/lo-filter relay responds to its one-wire code by activating those circuits required for hi- or lo-band operation, as instructed.

3-261. Through use of the schematic diagram, and by mentally rotating the jumper bars to any specific positions of the MHz controls, it is possible to determine the exact paths through the printed-circuit switch sections, in their grounding or open-circuiting functions.

3-262. RECEIVER POWER SUPPLY ASSEMBLY A2A8 (figure 5-35, sheet 1). Receiver Power Supply Assembly A2A8 is a hard-wired assembly mounted in the Receiver Main Frame A2. Discussion of the circuits of the power supply is included in the description of the main frame (refer to paragraph 3-177).

3-263. ANTENNA OVERLOAD ASSEMBLY A2A9 (figure 5-35, sheet 2). Antenna Overload Assembly A2A9 is a hard-wired assembly mounted in the Receiver Main Frame A2. Its circuits are discussed along with those of the main frame (refer to paragraph 3-181).

3-264. 20- AND 30-MHz FILTER ASSEMBLY A2A10 (figure 5-35, sheet 3). The 20- and 30-MHz Filter Assembly A2A10 is hard-wired into the Receiver Main Frame A2. The circuits of the 20- and 30-MHz filter are included in the circuit discussion of the main frame (refer to paragraph 3-182).

3-265. 100-Hz CONTROL AND VERNIER ASSEMBLY A2A11 (figure 5-35, sheet 3). The 100-Hz Control and Vernier Assembly is hard-wired into the Receiver Main Frame A2. Its electronic circuits are discussed as part of the main frame circuit discussions (refer to paragraph 3-184).

CHAPTER 4

SCHEDULED MAINTENANCE

4-1. INTRODUCTION.

4-2. This chapter contains preventive maintenance procedures and performance test instructions for Radio Receiver R-1051E/URR to be accomplished on a scheduled basis. Included are a scheduled maintenance action index; procedures required to inspect and clean the equipment; and step-by-step procedures necessary to verify that the equipment is operating satisfactorily within standards in all modes of operation.

NOTE

The scheduled maintenance instructions in this manual are cancelled when the Planned Maintenance System (PMS) is implemented for this equipment aboard your ship or station.

4-3. SCHEDULED MAINTENANCE ACTION INDEX.

4-4. Table 4-1 includes all scheduled preventive maintenance procedures and performance tests. The periodicity column gives the scheduled interval between performance of these procedures. The periodicity symbols are as follows:

Interval	Symbols
Weekly	W
Monthly	M
Quarterly	Q
Annually	A

The maintenance action column lists the maintenance action which corresponds to the periodicity symbol in column 1, and the reference column states the number of the table that contains the procedure listed in column 2.

4-5. PREVENTIVE MAINTENANCE PROCEDURES.

4-6. Table 4-2 gives all procedures required to inspect and clean the receiver. No lubrication is required on this equipment.

4-7. SCHEDULED PERFORMANCE TESTS.

4-8. PROCEDURES. Tables 4-3 through 4-6 contain detailed procedures for accomplishing the performance tests scheduled on a weekly, monthly, quarterly, and annual basis, respectively. The title and description of the test, safety precautions, the minimum rating of the technician expected to perform the test, preliminary procedures, and references to troubleshooting or corrective actions are given with each of the detailed maintenance test procedures. It is recommended that each test procedure be read through to its completion before the test is begun.

4-9. SAFETY PRECAUTIONS. The attention of officers and operating personnel is directed to Chapter 67 of the Bureau of Ships Manual or superseding instructions on the subject of Electronic Safety precautions to be observed. While every practicable safety precaution has been incorporated into this equipment, the rules in the following paragraphs must be strictly observed.

WARNING

Failure to comply with the instructions in the following paragraphs may result in severe electrical shock. Maintenance personnel must at all time observe all safety regulations.

Table 4-1. Scheduled Maintenance Action Index

PERIODICITY	MAINTENANCE ACTION	REFERENCE
W	1. Check receiver overall operation.	Table 4-3
M	1. Clean front panel.	Table 4-2
	2. Check power supply outputs.	Table 4-4
	3. Check automatic gain control performance.	Table 4-4
	4. Check receiver sensitivity.	Table 4-4
	5. Check frequency, locking action, and vernier operation.	Table 4-4
Q	1. Clean receiver interior.	Table 4-2
	2. Clean and inspect chain-drive mechanism.	Table 4-2
	3. Check performance of Frequency Standard Assembly A2A5.	Table 4-5
	4. Check performance of RF Amplifier Assembly A2A4.	Table 4-5
	5. Check performance of Translator/ Synthesizer Assembly A2A6.	Table 4-5
	6. Check performance of Receiver Mode Selector Assembly A2A1.	Table 4-5
	7. Check performance of Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3.	Table 4-5
A	1. Check mechanical synchronization of chassis.	Table 4-6

4-10. Make sure you are not grounded whenever making measurements or adjustments. For example, hand rails, exposed metal decks, or equipment frames may provide inadvertent ground contacts.

4-11. Ground case of test equipment whenever possible, and before starting measurements where test equipment must be held or adjusted during the measurements.

4-12. Do not change tubes or make adjustments inside equipment with high-voltage supply on. To avoid casualties, always remove power from set and connect a ground first. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position, due to charges retained by capacitors.

4-13. Be careful even when measuring low voltages. Do not forget that high voltages may be present across terminals which are normally low voltage.

4-14. Interlock switches are safety devices for removing hazardous voltages from equipment, and should be operated only by authorized maintenance personnel. Use these switches whenever you are working inside equipment cabinets or on exposed circuits. Never completely rely on any door or safety interlock to remove voltage from the equipment: always measure or test to ensure that voltages are not present. Where possible, shut down motor/generators or other power equipment to ensure your protection.

Table 4-2. Preventive Maintenance Procedures

TYPE MAINTENANCE	TOOLS/ TEST EQUIP/ MATERIAL PARTS REQUIRED	LEVEL PERSONNEL	PROCEDURES
Exterior cleaning (M)	Clean cloth Approved cleaning solvent	RMSN	Dampen cloth with cleaning solvent and wipe front panel.

WARNING

Do not tamper with interlock switch when main-frame chassis is extended from case for cleaning or inspection.

TYPE MAINTENANCE	TOOLS/ TEST EQUIP/ MATERIAL PARTS REQUIRED	LEVEL PERSONNEL	PROCEDURES
Interior cleaning (Q)	Tank-type vacuum cleaner Sash brush	RMSN	Set mode selector switch A2S2 to OFF. Disconnect cables to connectors A1A1J3 and A1A1J4 on back panel of receiver. Loosen front-panel screws and slide main-frame chassis out of case. Clean interior with vacuum cleaner and a clean sash brush. Slide chassis back into case and tighten front-panel screws. When finished reconnect cables disconnected above.

CAUTION

Hand-guide main-frame cable at reat of chassis over edge of case when rotating main frame to vertical position.

TYPE MAINTENANCE	TOOLS/ TEST EQUIP/ MATERIAL PARTS REQUIRED	LEVEL PERSONNEL	PROCEDURES
Chain-drive inspection and cleaning (Q)	Clean cloth	RMSN	Set mode selector switch A2S2 to OFF. Loosen front-panel screws and slide main-frame chassis out of case. Tilt receiver 90 degrees to expose bottom. Rotate each kHz control on front panel through all positions. Check drive chains for excessive play in control. Check that gears rotate evenly, without slipping, from one position to another. Check that all screws and hardware on gear assemblies are securely tightened. Inspect gears and drive chains for damage or noticeable wear. Wipe dust from all parts with clean cloth. Return chassis to horizontal, slide it back into case, and tighten front-panel screws.

Table 4-3. Weekly Scheduled Maintenance Tests

TEST NO.	REFERENCES AND PROCEDURES
W1	Check Receiver Overall Operation DESCRIPTION: Test for proper reception in CW, USB, LSB, and AM modes of operation. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: Headset PRELIMINARY SETUPS: Ensure antenna is connected to ANT jack A1J23. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: CW b. RF GAIN control A2R3: Fully clockwise c. USB LEVELS LINE control A2R2: Fully counterclockwise d. Audio level meter switch A2S1: USB e. AGC switch A2S3: SLOW f. Hz switch A2A11S1: 000 2. Tune receiver to WWV or WWVH at 5, 10, or 15 MHz. Plug headset into PHONE USB jack A2J2. Adjust USB LEVELS LINE control A2R2 and USB LEVELS PHONE control A2R5 for a comfortable signal level. 3. Check that signal is received, and that BFO tone varies when BFO frequency control A2R6 is varied, both audibly in headset, and as indicated on AUDIO LEVEL meter A2M1. 4. Set mode selector switch A2S2 to USB. Tune receiver 1 kHz lower, and check that signal is heard in headset. 5. Set mode selector switch A2S2 and audio level meter switch A2S1 to LSB. Tune receiver 1 kHz higher than WWV carrier, plug headset into PHONE LSB jack A2J1, and set LSB LEVELS LINE control A2R1 and LSB LEVELS PHONE control A2R4 for a comfortable signal level. 6. Check that signal is heard in headset. 7. Set Hz switch A2A11S1 to V (vernier). Rotate Hz vernier control A2A11R1, and check that signal tone varies both audibly in headset, and as indicated on AUDIO LEVEL meter A2M1. Return Hz switch A2A11S1 to 000. 8. Set mode selector switch A2S2 to AM. Plug headset into PHONE USB jack A2A2. Tune receiver to a known AM station such as Armed Forces frequency at 15.330 MHz. Check that signal is heard in headset. TROUBLESHOOTING REFERENCE: Table 5-4

Table 4-4. Monthly Scheduled Maintenance Tests

TEST NO.	REFERENCES AND PROCEDURES
M2	Check Power Supply Outputs. DESCRIPTION: Measure the output voltages and ripple voltages of Receiver Power Supply Assembly A2A8. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: Multimeter AN/PSM-4( ) Differential Voltmeter, John Fluke 825 AC Voltmeter ME-6( )/U PRELIMINARY SETUPS: 1. At rear of case, apply 115 Vac at pins A and C of AUX AC PWR IN jack A1A1J3. 2. Loosen front-panel screws and slide main frame out of the case. Defeat interlock switch A1S2 by pulling forward on the interlock plunger rod. CAUTION Hand-guide main-frame cable at rear of chassis over edge of case when rotating main frame to vertical position. 3. Tilt receiver main frame 90 degrees upwards, to provide access to bottom of chassis. TEST PROCEDURE: 1. Set the mode selector switch A2S2 to STD BY. 2. Connect multimeter to A2E11, set mode selector switch A2S2 to LSB, and observe that meter indicates approximately +20 Vdc. If the meter reads approximately +28 Vdc or 0 Vdc, immediately turn the mode selector switch to OFF, and correct the faulty condition before proceeding. 3. Set mode selector switch A2S2 to ISB. 4. Measure voltages (using multimeter) and ripple (using ac voltmeter with 1:1 probe) between the following tie points and ground: TIE POINT — VOLTAGE — RIPPLE VOLTAGE A2A8E10 — -28.5 to -31.5 Vdc — 15 mV rms max A2E12 — +24 to +32 Vdc — 320 mV rms max A2E17 — +103 to +123 Vdc — 90 mV rms max

Table 4-4. Monthly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
M2 (Cont)	5. Connect the differential voltmeter to measure positive voltage (+20 Vdc with respect to ground) at A2E11. Observe that the voltage is +20 ±0.1 Vdc. 6. Connect the ac voltmeter with 1:1 probe to measure the ripple at A2E11, and set the mode selector switch A2S2 to LSB. Observe that the ripple voltage is equal to or less than 2 mV rms. 7. Pull mode selector switch A2S2 out and rotate to OFF. 8. Disconnect all test equipment and power applied. 9. Tilt chassis back to horizontal, slide it into case, and secure it. TROUBLESHOOTING REFERENCE: Figures 5-15 through 5-19
M3	Check AGC Performance. DESCRIPTION: Measure performance of automatic gain control circuits in USB and LSB modes. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: Headset RF Signal Generator CAQI-606-B BNC-to-N Adapter UG-201A/U Coaxial cable, 50 ohms Resistive loads, 600 ohms (2 required) PRELIMINARY SETUPS: 1. Disconnect the cables from connectors A1A1J4, A1A1J5 and A1A1J6 on rear of receiver. 2. Connect 600-ohm loads between pins A and B of USB AUDIO OUT connector A1A1J5 and LSB AUDIO OUT connector A1A1J6. 3. Connect rf signal generator to ANT jack A1J23 at rear of receiver, using a BNC-to-N adapter and 50-ohm coaxial cable. Set rf signal generator for 2.011 MHz, continuous wave, with a 0.5-μV output. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: USB b. Audio level meter switch A2S1: USB c. USB LEVELS LINE control A2R2: Fully clockwise d. LSB LEVELS LINE control A2R1: Fully clockwise e. Hz switch A2A11S1: 000 f. Frequency controls: 2.010 MHz g. AGC switch A2S2: SLOW

Table 4-4. Monthly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
M3 (Cont)	2. Tune rf signal generator for a peak reading on receiver AUDIO LEVEL meter A2M1 (+8 dB or greater, upscale). If peak was obtained but not within limits, perform agc and if. gain loop adjustment in table 6-1. 3. Set audio level meter switch A2S1 and mode selector switch A2S2 to LSB, and repeat procedure of step 2. 4. Set audio level meter switch A2S1 and mode selector switch A2S2 to USB. Peak rf signal generator, and adjust USB LEVELS LINE control A2R2 for an indication of +8 dB on AUDIO LEVEL meter A2M1. Increase the rf signal generator output to 2.5 μV. AUDIO LEVEL meter A2M1 should indicate between +8 and +14 dB. Note the reading for later reference. 5. Increase the rf signal generator output to 50 mV. AUDIO LEVEL meter A2M1 should indicate not more than 3 dB above the reading noted in step 4. 6. Set audio level meter switch A2S1 and mode selector switch A2S2 to LSB. Reset rf signal generator output for 0.5 μV, peak it, and adjust LSB LEVELS LINE control A2R1 for an indication of +8 dB on AUDIO LEVEL meter A2M1. Increase the rf signal generator output to 2.5 μV. AUDIO LEVEL meter A2M1 should indicate between +8 and +14 dB. Note the reading for later reference. 7. Increase the rf signal generator output to 50 mV. AUDIO LEVEL meter A2M1 should indicate not more than 3 dB above the reading noted in step 6. 8. Disconnect test equipment, and return to operating condition. TROUBLESHOOTING REFERENCE: Table 5-4
M4	Check Receiver Sensitivity DESCRIPTION: Measure receiver sensitivity in USB, LSB, AM, and CW modes of operation. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: RF Signal Generator CAQI-606-B AC Voltmeter ME-6( )/U Electronic Counter AN/USM-207A BNC-to-N Adapter UG201A/U Coaxial cable, 50 ohms Resistive load, 600 ohms

Table 4-4. Monthly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
M4 (Cont)	PRELIMINARY SETUPS: 1. Disconnect the cables from connectors A1A1J4, A1A1J5 and A1A1J6 on rear of receiver. 2. Connect ac voltmeter and 600-ohm resistor to pins A and B of USB AUDIO OUT connector A1A1J5. 3. Connect rf signal generator to ANT jack A1J23 at rear of receiver, using a BNC-to-N adapter and 50-ohm coaxial cable. Set rf signal generator for a frequency approximately 20 kHz away from receiver frequency (2.010 MHz), continuous wave. NOTE The sensitivity measurements can also be made (but to a lesser degree of accuracy) using the AUDIO LEVEL meter A2M1 on the receiver front panel, setting the audio level meter switch A2S1 to USB or LSB as appropriate. If this is done, substitute AUDIO LEVEL meter A2M1 readings of -2 dB and +8 dB for the ac voltmeter readings of -10 dB and 0 dB given in the test procedure below. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: USB b. AGC switch A2S3: OFF c. Hz switch A2A11S1: 000 d. USB LEVELS LINE control A2R2: Midrange e. LSB LEVELS LINE control A2R1: Midrange f. RF GAIN control A2R3: Fully clockwise g. Frequency controls: 2.010 MHz 2. Adjust USB LEVELS LINE control A2R2 for -10 dB noise-reference level as read on the ac voltmeter. Adjust rf signal generator frequency and output attenuator for a peak on-scale indication of +0.0 dB on ac voltmeter. The output level of the rf signal generator (USB sensitivity) should be not more than 0.6 μV. Note this reading for later reference. 3. Set mode selector switch A2S2 to LSB. Disconnect ac voltmeter and 600-ohm load from connector A1A1J5, and reconnect to pins A and B of LSB AUDIO OUT connector A1A1J6. Starting with the rf signal generator set at least 20 kHz away from 2.010 MHz. Repeat procedure in step 2, substituting the LSB LEVELS LINE control A2R1 for the USB LEVELS LINE control A2R2, and observe that LSB sensitivity is not more than 0.6 μV. Note this reading for later reference.

Table 4-4. Monthly Scheduled Maintenance Tests (Cont)

<table>
<tr><th>TEST NO.</th><th>REFERENCES AND PROCEDURES</th></tr>
<tr><td>M4 (Cont)</td><td>
4. Set mode selector switch A2S2 to mode for the sideband having the poorest sensitivity, as determined by the larger of the sensitivity readings measured in steps 2 and 3. Connect ac voltmeter and 600-ohm load to the appropriate connector (A1A1J5 for USB or A1A1J6 for LSB). Set frequency controls for 3.101 MHz.
5. Measure receiver sensitivity at each frequency listed below. Set rf signal generator frequency approximately 20 kHz away from the receiver frequency under test. Adjust the appropriate USB or LSB LEVELS LINE control A2R2 or A2R1 for -10 dB noise-reference level as read on the ac voltmeter. Adjust rf signal generator frequency and output attenuator for a peak on-scale indication of 0.0 dB on the ac voltmeter. Record output level of rf signal generator (sensitivity) for each frequency and check that each output level is not more than 0.6 μV.
FREQUENCY TABLE (MHz)
<table>
<tr><td>3.101</td><td>12.010</td><td>21.010</td></tr>
<tr><td>4.222</td><td>13.010</td><td>22.010</td></tr>
<tr><td>5.333</td><td>14.010</td><td>23.010</td></tr>
<tr><td>6.444</td><td>15.010</td><td>24.010</td></tr>
<tr><td>7.555</td><td>16.010</td><td>25.010</td></tr>
<tr><td>8.666</td><td>17.010</td><td>26.010</td></tr>
<tr><td>9.777</td><td>18.010</td><td>27.010</td></tr>
<tr><td>10.898</td><td>19.010</td><td>28.010</td></tr>
<tr><td>11.989</td><td>20.010</td><td>29.010</td></tr>
</table>
NOTE
It is important to test all frequencies in table to ensure that receiver meets reference standard at all selected combinations of digits.
6. Set receiver frequency controls for 2.010 MHz, and mode selector switch A2S2 to AM. Connect ac voltmeter and 600-ohm resistor to pins A and B of connector A1A1J5. Set rf signal generator to 2.010 MHz, with 1000 Hz at 30 percent modulation.
7. Adjust rf signal generator frequency and output attenuator and USB LEVELS LINE control A2R2 for a peak on-scale indication of 0.0 dB on the ac voltmeter.
8. Switch rf signal generator to continuous wave, and adjust USB LEVELS LINE control A2R2 for an indication of -10.0 dB on the ac voltmeter. Switch rf signal generator to 1000 Hz at 30 percent modulation, and adjust rf signal generator attenuator to 0.0 dB on the ac voltmeter.
</td></tr>
</table>

Table 4-4. Monthly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
M4 (Cont)	9. Repeat step 8 until the ac voltmeter reads -10.0 dB and 0.0 dB respectively for signal generator in continuous wave and 1000 Hz (30 percent) modulation modes with no further adjustment of the USB LEVELS LINE control A2R2 or the signal generator attenuator. Output level of rf signal generator (AM sensitivity) should be not more than 3.0 μV. 10. Set mode selector switch A2S2 to CW, and BFO control A2R6 to midrange. 11. Set rf signal generator for 2.010 MHz, continuous wave, using the electronic counter. Adjust signal generator output to 0.9 μV. 12. Set BFO control A2R6 for a peak reading on the ac voltmeter. Adjust USB LEVELS LINE control A2R2 to measure 0.0 dB on the ac voltmeter. Turn RF GAIN control A2R3 to reduce ac voltmeter reading by 3.0 dB. 13. Set rf signal generator to approximately 20 kHz off frequency, and adjust USB LEVELS LINE control A2R2 for -10.0 dB on ac voltmeter. 14. Retune rf signal generator for a peak indication on ac voltmeter, and readjust rf signal generator attenuator for 0.0 dB reading on the ac voltmeter. The output level of the rf signal generator (CW sensitivity) should be not more than 0.9 μV. 15. Disconnect test equipment, and return to operating condition. TROUBLESHOOTING REFERENCE: Table 5-4
M5	Check Frequency, Locking Action, and Vernier Operation DESCRIPTION: Measure frequency in USB and LSB modes of operation, and check locking action and vernier operation of receiver. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: Frequency Standard AN/URQ-10( ) Electronic Counter AN/USM-207A PRELIMINARY SETUPS: 1. Connect 5-MHz output of Frequency Standard AN/URQ-10( ) to EXT 5MC IN jack A1J25 on rear panel of receiver. 2. Loosen front-panel screws and slide receiver chassis out fully on slides. Defeat interlock switch A1S2 by gripping plunger and pulling forward.

Table 4-4. Monthly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
M5 (Cont)	TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: USB b. Audio level meter switch A2S1: USB c. AGC switch A2S3: SLOW d. Hz switch A2A11S1: 500 e. USB LEVELS LINE control A2R2: Fully counterclockwise f. LSB LEVELS LINE control A2R1: Fully counterclockwise g. USB LEVELS PHONE control A2R5: Fully clockwise h. LSB LEVELS PHONE control A2R4: Fully clockwise i. RF GAIN control A2R3: Fully clockwise j. Frequency controls: 4.996 MHz 2. For this measurement, Frequency Standard Assembly A2A5 must be temperature stabilized (mode selector switch A2S2 in a position other than OFF) for at least 96 hours. On top of Frequency Standard Assembly A2A5, rotate COMP/INT/EXT switch A2A5A2S1 to COMP. Observe that the comparator indicator DS1 fades out and lights not more than once in 20 seconds (maximum through minimum to maximum, or minimum through maximum to minimum). If the indicator flickers rapidly or stays on longer than 4 minutes, refer to the frequency standard adjustment procedure in table 6-1. Disconnect the frequency standard from jack A1J25. 3. Connect rear-panel INT 5MC OUT jack A1J24 to ANT jack A1J23. Connect electronic counter to front-panel PHONE USB jack A2J2. Adjust USB LEVELS LINE control A2R2 so that the signal level displayed on AUDIO LEVEL meter A2M1 is +8 dB. Observe that electronic counter reads 3500 Hz. Change receiver frequency to 4997.5, 4998.5, and 4999.5 kHz, and note that electronic counter reads 2500, 1500, and 500 Hz, respectively. 4. Set mode selector switch A2S2 and audio level meter switch A2S1 to LSB, and set frequency controls for 5003.500 kHz. Connect electronic counter to PHONE LSB jack A2J1, and adjust LSB LEVELS LINE control A2R1 so that the signal level displayed on AUDIO LEVEL meter A2M1 is +8 dB. Observe that electronic counter reads 3500 Hz. Change receiver frequency to 5002.5, 5001.5, and 5000.5 kHz, and observe that electronic counter reads 2500, 1500, and 500 Hz, respectively. 5. Change receiver frequency to 5001.000 kHz, and observe that electronic counter reads 1000 Hz. Rotate Hz switch A2A11S1 from 000 through 900, observing that electronic counter increases in 100-Hz steps to 1900 Hz.

Table 4-4. Monthly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
M5 (Cont)	6. Set receiver frequency to 5.001 MHz. Rotate Hz switch A2A11S1 to V (vernier) position. Turn Hz vernier control A2A11R1 fully counterclockwise, and note that electronic counter reads 980 Hz or lower. 7. Turn Hz vernier control A2A11R1 fully clockwise, and note that electronic counter reads 2020 Hz or higher. NOTE If the readings in steps 6 and 7 are not correct, refer to the vernier frequency adjustment procedure in table 6-1. 8. Set Hz switch A2A11S1 to 000, and note that electronic counter reading is 1000 Hz. Rotate MHz controls from 02 to 29 MHz, observing 1000 Hz on electronic counter at each MHz step. Remove electronic counter from PHONE LSB jack A2J1. 9. Set receiver frequency to 5.000 MHz. Set mode selector switch A2S2 to CW. Connect headset to PHONE USB jack A2J2. Vary BFO frequency control A2R6 from one extreme to the other, observing a zero-beat note near midrange of control. If zero beat is not near midrange, set BFO control A2R6 to midrange, and adjust BFO ADJ control A2A1A3L1 on top of Mode Selector Assembly A2A1 for zero beat. 10. Set COMP/INT/EXT switch A2A5A2S1 on Frequency Standard Assembly A2A5 to the desired operating position. 11. Slide receiver chassis into case and secure front-panel screws. 12. Remove test cable between jacks A1J23 and A1J24 on rear of receiver, and reconnect antenna cable to ANT jack A1J23. TROUBLESHOOTING REFERENCE: Table 5-4

Table 4-5. Quarterly Scheduled Maintenance Tests

TEST NO.	REFERENCES AND PROCEDURES
Q3	Check Performance of Frequency Standard Assembly A2A5 DESCRIPTION: Measure standard 5-MHz and 500-kHz output frequencies of Frequency Standard Assembly A2A5. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3

Table 4-5. Quarterly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
Q3 (Cont)	TOOLS AND TEST EQUIPMENT REQUIRED: Electronic Counter AN/USM-207A RF Millivoltmeter CCVO-91CA Frequency Standard AN/URQ-10( ) NOTE For this check, Frequency Standard Assembly A2A5 must be temperature stabilized by having had power applied and the mode selector switch A2S2 in any position other than OFF for at least 96 hours. PRELIMINARY SETUPS: 1. Connect 5-MHz output of Frequency Standard AN/URQ-10( ) to EXT 5MC IN jack A1J25 on rear of receiver. 2. Connect 50-ohm termination to INT 5MC OUT jack A1J24 on rear of receiver. 3. Loosen front-panel screws and slide chassis out fully from case. Defeat interlock switch A1S2 by gripping plunger and pulling forward. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: ISB b. Hz switch A2A11S1: 000 c. Frequency controls: 2.010 MHz 2. On top of Frequency Standard Assembly A2A5, rotate COMP/INT/EXT switch A2A5A2S1 to COMP. 3. Observe that the comparator indicator DS1 fades out and lights not more than once in 20 seconds (maximum through minimum to maximum, or minimum through maximum to minimum). If the indicator flickers rapidly or stays on longer than 4 minutes, refer to the frequency standard adjustment procedure in table 6-1. Disconnect the frequency standard from jack A1J25. 4. Connect rf millivoltmeter to A2A5A2TP1. Rf millivoltmeter should indicate 0.5V rms minimum for the 5-MHz output signal. Reset COMP/INT/EXT switch A2A5A2S1 to INT. 5. Connect rf millivoltmeter to A2A5A2TP2. Rf millivoltmeter should indicate 150 to 250 mV rms for the 500-kHz output signal. 6. Connect electronic counter to A2A5A2TP2 and observe a reading of 500 kHz. 7. Disconnect test equipment. 8. Slide receiver chassis into case and secure it. TROUBLESHOOTING REFERENCE: Figure 5-9

Table 4-5. Quarterly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
Q4	Check Performance of RF Amplifier Assembly A2A4. DESCRIPTION: Checks performance and measures output level of RF Amplifier Assembly A2A4. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: RF Signal Generator CAQI-606-B RF Millivoltmeter CCVO-91CA PRELIMINARY SETUPS: 1. Connect rf signal generator to receiver ANT jack A1J23. Set rf signal generator to 2.011 MHz, continuous wave, at 1000 μV. 2. Loosen front-panel screws and slide chassis out fully from case. Defeat interlock switch A1S2 by grasping plunger and pulling forward. 3. Connect rf millivoltmeter to test point A2A4TP3 on RF Amplifier Assembly A2A4. Connect meter ground lead to test point A2A4TP4. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: USB b. AGC switch A2S3: OFF c. Hz switch A2A11S1: 000 d. USB LEVELS LINE control A2R2: Midrange e. RF GAIN control A2R3: Fully clockwise f. Frequency controls: 2.010 MHz 2. Tune rf signal generator for a maximum indication on rf millivoltmeter. (The minimum acceptable rf millivoltmeter reading is 40 mV). Record the dB reading for later reference. 3. Without changing frequency, connect rf millivoltmeter to test point A2A6A6A1TP1 on RF Translator Subassembly A2A6A6. The meter reading should not be more than 6 dB lower than that measured in step 2. 4. Repeat step 2 for measurement at test point A2A4TP3 on RF Amplifier Assembly for each of the frequencies listed below, to verify that all readings are above 40 mV rms.

Table 4-5. Quarterly Scheduled Maintenance Tests (Cont)

<table>
<tr><th>TEST NO.</th><th>REFERENCES AND PROCEDURES</th></tr>
<tr><td>Q4 (Cont)</td><td>
FREQUENCY CHART (MHz)
3.101   12.010   21.010
4.222   13.010   22.010
5.333   14.010   23.010
6.444   15.010   24.010
7.555   16.010   25.010
8.666   17.010   26.010
9.777   18.010   27.010
10.898   19.010   28.010
11.989   20.010   29.010
5. Disconnect test equipment.
6. Slide receiver chassis into case and secure it.
TROUBLESHOOTING REFERENCE: Figure 5-1
</td></tr>
<tr><td>Q5</td><td>
Check Performance of Translator/Synthesizer Assembly A2A6
DESCRIPTION: Measure output of RF Translator Subassembly A2A6A6.
SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9).
MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3
TOOLS AND TEST EQUIPMENT REQUIRED:
RF Signal Generator CAQI-606-B
RF Millivoltmeter CCVO-91CA
PRELIMINARY SETUPS:
1. Connect rf signal generator to ANT jack A1J23 on rear of receiver. Set rf signal generator for a continuous wave output of approximately 100 μV at 2.010 MHz.
2. Loosen front-panel screws and slide chassis out fully from case. Defeat interlock switch A1S2 by grasping plunger and pulling forward.
3. Connect rf millivoltmeter to test point A2A6A6A1TP4 on RF Translator Subassembly A2A6A6.
TEST PROCEDURE:
1. Set the following controls to noted positions:
a. Mode selector switch A2S2: USB
b. AGC switch A2S3: OFF
</td></tr>
</table>

Table 4-5. Quarterly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
Q5 (Cont)	c. Hz switch A2A11S1: 000 d. USB LEVELS LINE control A2R2: Midrange e. RF GAIN control A2R3: Fully clockwise f. Frequency controls: 2.010 MHz 2. Tune the rf signal generator for a maximum indication on the rf millivoltmeter. 3. Connect rf millivoltmeter to A2A6A6A1TP1 and then adjust the rf signal generator output level to obtain a reading of 5 mV on the rf millivoltmeter. 4. Connect the rf millivoltmeter to test point A2A6A6A1TP4 on RF Translator Subassembly A2A6A6. Minimum acceptable rf millivoltmeter reading is 35 mV rms. 5. Repeat the procedures in steps 2, 3 and 4 at each of the frequencies listed below, to verify that all readings are above 35 mV rms. FREQUENCY CHART (MHz) 3.101 12.555 21.555 4.222 13.555 22.555 5.333 14.555 23.555 6.444 15.555 24.555 7.555 16.555 25.555 8.666 17.555 26.555 9.777 18.555 27.555 10.898 19.555 28.555 11.989 20.555 29.555 6. Disconnect test equipment. 7. Slide receiver chassis into case and secure it. TROUBLESHOOTING REFERENCE: Figure 5-2
Q6	Check Performance of Receiver Mode Selector Assembly A2A1 DESCRIPTION: Measures output level of Receiver Mode Selector Assembly A2A1 in CW and AM, USB, and LSB modes of operation, and checks beat frequency oscillator output. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: RF Signal Generator CAQI-606-B RF Millivoltmeter CCVO-91CA Electronic Counter AN/USM-207A Coaxial Cable RG-58C/U

Table 4-5. Quarterly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
Q6 (Cont)	PRELIMINARY SETUPS: 1. Connect rf signal generator with 50-ohm coaxial cable to ANT jack A1J23 on rear of receiver. Set rf signal generator to 2010 kHz, continuous wave, with a 100-μV output. 2. Loosen front-panel screws and slide chassis out fully from case. Defeat interlock switch A1S2 by grasping plunger and pulling forward. 3. Remove both IF./Audio Amplifier Assemblies A2A2 and A2A3 from receiver chassis. Note the positions of the two assemblies so that they may be reinstalled in the same location. 4. Connect rf millivoltmeter to terminal A3 of jack A2XA2P1. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: CW b. AGC switch A2S3: OFF c. Hz switch A2A11S1: 000 d. USB LEVELS LINE control A2R2: Midrange e. LSB LEVELS LINE control A2R1: Midrange f. RF GAIN control A2R3: Fully clockwise g. Frequency controls: 2.010 MHz 2. Adjust rf signal generator frequency for a peak signal on the rf millivoltmeter. 3. Connect rf millivoltmeter to test point A2A1A1TP1, and adjust rf signal generator output level for 100 mV on the rf millivoltmeter. 4. Connect rf millivoltmeter to terminal A3 of jack A2XA2P1 and observe that the reading is greater than 4 mV when the mode selector switch A2S2 is in the CW and AM positions. (Disregard readings in other modes.) 5. Set mode selector switch A2S2 to USB. Adjust rf signal generator frequency for a peak signal on the rf millivoltmeter. Observe that the reading is greater than 4 mV when the mode selector switch A2S2 is in the USB, ISB, and RATT positions. 6. Set mode selector switch A2S2 to LSB. Connect rf millivoltmeter to terminal A3 of jack A2XA3P1. Adjust the signal generator frequency for a peak signal on the rf millivoltmeter. Observe that the reading is greater than 4 mV when the mode selector switch A2S2 is in the LSB and ISB positions. 7. Connect rf millivoltmeter to terminal A2 on jack A2XA2P1. Observe that reading is greater than 100 mV in the USB, LSB, ISB, and RATT positions of mode selector switch A2S2, and 0 mV in the AM and CW positions. Repeat this test with the rf millivoltmeter connected to terminal A2 of jack A2XA3P1. 8. Reinstall Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 in the chassis, in the same positions. Disconnect all test equipment.

Table 4-5. Quarterly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
Q6 (Cont)	9. Connect electronic counter to test point A2A1A3TP1 on the Receiver Mode Selector Assembly A2A1. 10. Set mode selector switch A2S2 to CW, and RF GAIN control A2R3 fully counterclockwise. Rotate BFO frequency control A2R6 fully counterclockwise, and observe that the reading on the electronic counter is between 494.5 and 497 kHz. Rotate BFO frequency control A2R6 fully clockwise, and observe that the reading on the electronic counter is between 503 and 505.5 kHz. If readings are incorrect,perform BFO adjustment procedure in table 6-1. 11. Disconnect the test equipment. 12. Slide receiver chassis into case and secure it. TROUBLESHOOTING REFERENCE: Figures 5-3 and 5-8
Q7	Check Performance of Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 DESCRIPTION: Measure the LSB and USB audio outputs from Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9). MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: RF Signal Generator CAQI-606-B AC Voltmeter ME-6( )/U PRELIMINARY SETUPS: 1. Connect rf signal generator to ANT jack A1J23 on rear of receiver. Set rf signal generator to 2.010 MHz, continuous wave, with a 0.5-μV output. 2. Connect ac voltmeter to USB AUDIO OUT jack A1A1J5 on rear of receiver. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: USB b. Audio level meter switch A2S1: USB c. AGC switch A2S3: SLOW d. Hz switch A2A11S1: 000 e. USB LEVELS LINE control A2R2: Midrange

Table 4-5. Quarterly Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
Q7 (Cont)	f. LSB LEVELS LINE control A2R1: Midrange g. RF GAIN control A2R3: Fully clockwise h. Frequency controls: 2.010 MHz 2. Adjust rf signal generator frequency for a peak on ac voltmeter; then set rf signal generator output level to 500 μV. 3. Rotate USB LEVELS LINE control A2R2 fully clockwise (adjust the ac voltmeter range as required). Ac voltmeter reading should be between 6.0 and 10.0 Vac. 4. Set mode selector switch A2S2 to AM. Set rf signal generator for 1000 Hz, 30 percent modulation, 1.0 μV, and adjust its frequency for a peak on the ac voltmeter. Set rf signal generator output level to 500 μV rms. Peak reading should be between 6.0 and 10.0 Vac. 5. Set ac voltmeter to 0-dB scale. Adjust USB LEVELS LINE control A2R2 for +15 dB on ac voltmeter. Observe that AUDIO LEVEL meter A2M1 indicates +15 ±2 dB. Adjust USB LEVELS LINE control for 0 dB on ac voltmeter. Reconnect audio cable to jack A1A1J5 on rear of receiver. 6. Connect ac voltmeter to LSB AUDIO OUT jack A1A1J6 on rear of receiver. Set mode selector switch A2S2 and audio level meter switch A2S1 to LSB. Set rf signal generator for continuous wave at 0.5 μV rms and adjust its frequency for a peak on the ac voltmeter. Then set rf signal generator gain to 500 μV rms. 7. Rotate LSB LEVELS LINE control A2R1 fully clockwise (adjust the ac voltmeter range as required), and observe that ac voltmeter reading is between 6.0 and 10.0 Vac. 8. Set ac voltmeter to 0-dB scale. Adjust LSB LEVELS LINE control A2R1 for +15 dB on ac voltmeter. Observe that AUDIO LEVEL meter A2M1 indicates +15 ±2 dB. Adjust LSB LEVELS LINE control for 0 dB on ac voltmeter. 9. Disconnect all test equipment and reconnect audio cable to jack A1A1J6 on rear of receiver. TROUBLESHOOTING REFERENCE: Figure 5-3

Table 4-6. Annual Scheduled Maintenance Tests

TEST NO.	REFERENCES AND PROCEDURES
A1	Check Mechanical Synchronization of Chassis DESCRIPTION: Test the synchronization of the chain-drive mechanisms in the receiver chassis. SAFETY PRECAUTIONS: Observe standard safety precautions (refer to paragraph 4-9).

Table 4-6. Annual Scheduled Maintenance Tests (Cont)

TEST NO.	REFERENCES AND PROCEDURES
A1 (Cont)	MINIMUM TECHNICIAN RATING REQUIRED FOR TEST: ET3 TOOLS AND TEST EQUIPMENT REQUIRED: None PRELIMINARY SETUP: Loosen front-panel screws and slide chassis out fully from case. TEST PROCEDURE: 1. Set the following controls to noted positions: a. Mode selector switch A2S2: OFF b. Frequency controls: 11.111 MHz 2. Remove RF Amplifier Assembly A2A4 and Translator/Synthesizer Assembly A2A6 from the main frame. Observe the coupling disks on the bottom of these assemblies are all set to 1. 3. Set the frequency controls for 00.000 MHz, and observe that the three mechanical coupler keyways for the translator/synthesizer are towards the rear of the receiver. 4. Set the frequency controls for 00.660 MHz, and observe that the two keyways for the rf amplifier are towards the rear of the receiver. 5. Set the MHz controls to 00 and then to 29, and observe that the dial numbers appear centered in the dial windows above the MHz controls at both positions. 6. Observe that the spring washer under each coupling disk on the main frame has not been flattened enough to prevent engagement of the coupler when the rf amplifier and translator/synthesizer are installed. 7. Set frequency controls to 11.111 MHz, and reinstall RF Amplifier Assembly A2A4 and Translator/Synthesizer Assembly A2A6 in the receiver chassis. To ensure engagement of mechanical couplers, rotate each of the three kHz controls through all settings (0 through 9). NOTE Before performing the operational test in the next step, allow at least one hour warmup time. 8. Check receiver sensitivity by performing maintenance test M4, using the first ten frequencies listed in step 5 of test M4, and the sideband mode having poorest sensitivity (per M4). This will verify operational capability and proper mating of all mechanical couplers. 9. Slide receiver chassis into case and secure it. 10. Set mode selector switch A2S2 to STD BY or desired operational mode position. TROUBLESHOOTING REFERENCE: Figures 7-17 and 7-64

CHAPTER 5

TROUBLESHOOTING

5-1. INTRODUCTION.

5-2. This chapter contains data, procedures and diagrams to aid the maintenance technician in identifying the analyzing malfunctions, localizing troubles to the malfunctioning assembly or subassembly, and isolating faults to a stage or circuit within that assembly. A procedure is provided which gives instructions for receiver turn-on, initial checks, control settings, and test setups. From this procedure, overall equipment operability can be ascertained and inoperative functions can be identified. Signal flow diagrams provided for each equipment function, together with an overall receiver troubleshooting procedure, serve to localize trouble to the malfunctioning assembly or subassembly. Fault logic diagrams help to identify faulty circuits. Schematic diagrams and troubleshooting tables are provided for independently troubleshooting the suspect assemblies, subassemblies and circuits.

NOTE

Connectors used in this equipment sometimes contain coaxial rf contacts, in addition to their normal dc type contacts. These coaxial contacts are separable from their connector shells, and are independently replaceable. Removal or reinsertion of these contacts (rf inserts) is accomplished using the special RF Insert Extractor Tool; refer to paragraph 6-20A of Chapter 6. Each such rf insert (coaxial contact) is reference designated as a contact (e.g., A1, A2, etc.) of the connector in which it is inserted, and also is reference designated as a P1 or P2 of the individual cable assembly to which the insert is connected (whether in place, or removed from the connector). For parts replacement, the rf inserts are listed under their cable-assembly designations.

An example is as follows; refer to figure 5-40, the Translator/Synthesizer Assembly A2A6 schematic diagram. At the 100-Hz Synthesizer Assembly A2A4 block, note coaxial contact A2 of connector XA4P1 (mating with A2A4P1-A2). While in place in connector XA4P1, the full reference designator of the contact is XA4P1-A2. However, this rf insert is also W8P1, as part of the cable W8. For the part number and information on the rf insert, refer to A2A6W8P1 in the parts listings.

NOTE

Because of the specific circuits used within the equipment, signal levels at various internal points may vary over fairly large ranges, while the associated circuits are operating normally within their design specifications. Whenever a fault is detected for an assembly therefore, you should first attempt to align that assembly (in accord with its applicable alignment/adjustment procedures of Chapter 6). If this attempted alignment fails, then troubleshoot the circuits, using the diagrams and test information of this chapter.

On the troubleshooting diagrams, at those points of test where the signal level can vary widely without necessarily being faulty, nominal signal levels or measured signal extreme values are given. These noted signal values were determined from measurements on several equipments, and serve as rough guides during trouble analysis, rather than as specific values to be measured. However, specific equipment measurements may be outside the "extremes" values shown, without necessarily indicating a faulty circuit. It is only necessary that an assembly, when provided with its specified inputs, delivers the specified output, within the tolerances given in the alignment procedures.

5-3. TROUBLESHOOTING INDEX.

5-4. Table 5-1 lists the receiver functional areas in alphabetical order, and cross-references the appropriate paragraphs and illustrations to be used in trouble analysis of each faulty function.

5-5. RELAY AND LAMP INDEX.

5-6. Table 5-2 provides the maintenance technician with the item reference designation, functional name, energizing voltage, and a reference to the troubleshooting diagram for each receiver relay and lamp.

5-7. PROTECTIVE DEVICES INDEX.

5-8. Table 5-3 lists all receiver protective devices in alphanumerical sequence according to reference designation, with the front-panel markings of each device given in the adjacent column. In addition, the electrical

Table 5-1. Troubleshooting Index

FUNCTIONAL AREA	TROUBLE-SHOOTING PARAGRAPH	TROUBLE-SHOOTING DIAGRAMS	FUNCTIONAL DESCRIPTION PARAGRAPH	ALIGNMENT/ ADJUST TABLE
Ac Power Distribution	5-9	5-15, 5-34	3-144	Para. 8-9
Audio Amplification (USB)	5-9	5-5, 5-24	3-67	6-3
Audio Amplification (LSB)	5-9	5-6, 5-25	3-67	6-3
Automatic Gain Control	5-9	5-7, 5-26	3-58	6-3
Beat Frequency Oscillator	5-9	5-8, 5-27	3-56	6-2
Control	5-9	5-20	3-152	6-1
500-kHz Gating	5-9	5-4	3-55	-
Frequency Standard	5-9	5-9, 5-39	3-133	6-5
Frequency Synthesization	5-11	Table 5-5	3-76	6-13
IF. Amplification and Control	5-9	5-3, 5-23	3-43	6-2, 6-3
1- and 10-kHz Synthesization	5-11	5-13, 5-32	3-100	6-8
+110-Vdc Distribution	5-11	5-18, 5-34	3-149	-
100-Hz Synthesization	5-11	5-14, 5-33	3-108	6-9
100-kHz Synthesization	5-11	5-12, 5-31	3-89	6-7
1-MHz Synthesization	5-11	5-11, 5-30	3-83	6-6
RF Selection, Tuning, and Overload Protection	5-9	5-1, 5-21	3-17	6-4
RF-to-IF. Conversion	5-11	5-2, 5-22	3-26	6-11
Spectrum Generation	5-11	5-10, 5-29	3-118	6-10
-30-Vdc Distribution	5-9	5-19, 5-34	3-149	-
+28-Vdc Distribution	5-9	5-16, 5-34	3-146	-
+20-Vdc Distribution	5-9	5-17, 5-34	3-147	6-1, 6-12

rating of the device, the circuit protected by the device, and a reference to the applicable troubleshooting diagram are provided in adjacent columns.

5-9. MAINTENANCE TURNON PROCEDURE.

5-10. The receiver maintenance turnon procedure given in table 5-4 energizes the receiver in steps from the fully deenergized condition to full operation. Perform the receiver turnon in sequence. Apply input power to the following electronic test equipments below or equivalents, and allow a 30-minute warmup period before beginning, turnon:

Multimeter AN/PSM-4( )
AC Voltmeter ME-6( )/U
Oscilloscope AN/USM-281( )
Electronic Multimeter AN/USM-116( )
Electronic Counter AN/USM-207A
RF Signal Generator CAQI-606-B
RF Millivoltmeter CCVO-91CA

5-11. TROUBLESHOOTING PROCEDURES.

5-12. Table 5-5 contains depot-level procedures for troubleshooting Translator/ Synthesizer Assembly A2A6. The translator/synthesizer is the only receiver assembly covered by a troubleshooting table; troubles existing in other assemblies can be localized to the malfunctioning module through use of the maintenance turnon

Table 5-2. Relay and Lamp Index

REFERENCE DESIGNATION	FUNCTIONAL NAME	ENERGIZING VOLTAGE	TROUBLE-SHOOTING DIAGRAM (FIG. NO.)
A2DS3	Dial Lamps for MHz Indicators	28 Vdc	5-35
A2DS4	Dial Lamps for kHz Indicators	28 Vdc	5-35
A2DS5	100-Hz Vernier Indicator	110 Vdc	5-35
A2K1	Tune Relay	28 Vdc	5-35
A2K2	Hi-/Lo-Filter Relay	28 Vdc	5-35
A2K3	Transmit/Receive Relay	28 Vdc	5-35
A2A4K1	Turret Tuning Relay	28 Vdc	5-38
A2A4A38K1	Transmit/Receive Relay	28 Vdc	5-38
A2A5A2DS1	Frequency Standard Visual Comparator Lamp	20 Vdc	5-39
A2A6A1K1	Turret Tuning Relay	28 Vdc	5-41
A2A9K1	Antenna Overload Relay	28 Vdc	5-35

Table 5-3. Protective Devices Index

REFERENCE DESIGNATION	FRONT-PANEL MARKING	RATING		CIRCUIT PROTECTED	TROUBLE-SHOOTING DIAGRAM (FIG. NO.)
		VOLTS	AMPERES		
A1S2	(Interlock)	125	15.0	Primary Power	5-35
A2F1	F1 3/4 A	125	0.75	Primary Power	5-35
A2F2	F2 3/4 A	125	0.75	Primary Power	5-35

procedure (table 5-4), which also references the applicable signal flow diagram and fault logic diagram to be used in isolation of a defective component part. The table facilitates trouble localization to the faulty plug-in subassembly. Translator/Synthesizer Test Set TS-2133/WRC-1 can be used, or the assembly can be connected to the receiver main frame. Extender cables are used to connect individual subassemblies one at a time to the translator/synthesizer, so that subassembly test points will be accessible when the cover is removed. The procedures of table 5-5 check individual crystals used in the translator/synthesizer.

5-13. TROUBLESHOOTING DIAGRAMS.

5-14. GENERAL. The troubleshooting diagrams included in this chapter consist of signal flow diagrams, power distribution diagrams, a control diagram, fault logic diagrams, a maintenance dependency chart, and maintenance schematic diagrams. These diagrams aid the technician in troubleshooting by enabling consecutive narrowing down of a fault to a specific component.

5-15. SIGNAL FLOW DIAGRAMS. Signal flow diagrams (figures 5-1 through 5-14), provided for each major equipment function, are the main troubleshooting tool. These diagrams show signal paths, connectors, test points, terminals, adjustments, indicators, and circuit stages - all the information necessary to isolate a malfunctioning circuit quickly.

5-16. Included with each signal flow diagram are the test data required to obtain the measurements to be made at various points on the diagram. The data include test equipment required, reference to other areas of the manual which may furnish additional information, preliminary setup instructions, and a number of test steps which give step-by-step procedures for obtaining the indication shown at each of the test points indicated on the signal flow diagram.

5-17. The following general notes should be observed when performing any of the tests for the signal flow diagrams:

a. Signal levels and frequencies measured in an assembly connected on an extender cable may differ from the same measurements made when the module is plugged into the main frame without the extender cable.

b. The AUX/NORM switch A1S1 should always be in the AUX position.

c. The SIMPLEX/DUPLEX A2S9 switch may be in either position when R-1051E/URR is not connected into a system.

d. Be certain that the rf signal generator and the electronic counter are connected to Frequency Standard AN/URQ-10 whenever they are used for testing, to ensure accuracy of all frequency measurements.

5-18. POWER DISTRIBUTION DIAGRAMS. The power distribution diagrams (figures 5-15 through 5-19) aid in troubleshooting the circuits involved in primary power, +28-Vdc, +20-Vdc, +110-Vdc, and -30-Vdc distribution in the receiver. These diagrams depict the distribution of each voltage from its source, through control circuits, and to the final assemblies or subassemblies which use them.

5-19. CONTROL DIAGRAM. The tuning control diagram (figure 5-20) shows all circuits involved in the tuning of the receiver to the desired frequency. The signal flow is shown from the front-panel frequency controls to the assemblies and subassemblies that tune the receiver.

5-20. FAULT LOGIC DIAGRAMS. Supplementing each signal flow diagram is a fault logic diagram (figure 5-21 through 5-33), which provides a logical troubleshooting procedure with normal and abnormal indications and values at each test point.

5-21. MAINTENANCE DEPENDENCY CHART. The power distribution maintenance dependency chart (figure 5-34) shows the functional dependency of output signals or indications upon circuit elements, circuits, etc., in the form of a grid. In this grid, each vertical column is annotated to represent a circuit element, etc., while the horizontal rows are annotated to represent a procedural step which reaults in an observable output or indication. Symbols are used in the body of the grid to show the relationship between circuits elements, circuits, etc., and the observable output or indication.

5-22. MAINTENANCE SCHEMATIC DIAGRAMS. Maintenance schematic diagrams (figures 5-35 through 5-47) are provided for the overall receiver and for each of the major assemblies and subassemblies within the receiver, providing complete schematic coverage of the equipment. The diagrams are drawn so that all circuit elements are included and all circuits can be traced from assembly to assembly. Major signal paths are shown by heavier line weights. These diagrams enable isolation of a fault to a defective component part.

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure

STEP	OBSERVE	REFERENCE
1. Preliminary Procedure		
NOTE Perform the preliminary procedure before applying power to the R-1051E/URR.		
a. Loosen front-panel screws and slide chassis out fully on slides.		
b. Position front-panel switches as indicated: Switch — Position Mode selector A2S2 — OFF AGC A2S3 — OFF 10 MHz A2A7S3 — 0 MHz 1 MHz A2A7S4 — 2 MHz	Mode selector switch A2S2 must be pulled out to turn to OFF. Digits 0 and 2 viewed at 10- and 1-MHz windows on front panel.	
c. At rear of receiver front panel, set the SIMPLEX/DUPLEX switch A2A9 to SIMPLEX.		
d. On Frequency Standard Assembly A2A5, set COMP/INT/EXT switch A2A5A2S1 to INT.		
e. Momentarily remove fuses A2F1 and A2F2 and check for proper value. Reinsert fuses.	A2F1 and A2F2 are 3/4-ampere slo-blo fuses.	Schematic, figure 5-35.
f. Visually check for any positive indications of electrical or mechanical failures. Ensure that assemblies are properly mated to the main-frame chassis.	No visual indication of electrical or mechanical failure, and assemblies are properly mated to the main-frame chassis.	
g. At the top-right corner of the receiver case, defeat interlock switch A1S2 by gripping plunger and pulling forward.	Plunger extends forward of receiver case. Operation of the interlock switch is noted by an audible click.	

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
1. Preliminary Procedure (Cont)		
h. Set AUX/NORM switch A1S1 to AUX position by rotating plunger of interlock switch A1S2 to the fully clockwise position.	Plunger rotates approximately 90 degrees. Operation of the AUX/NORM switch is noted by an audible click.	
CAUTION Hand-guide main-frame cable at rear of chassis over edge of case when rotating main frame to vertical position.		
i. Tilt the receiver chassis 90 degrees to expose bottom.		
2. Overall AC and DC Voltage Application.		
a. At rear of the case, apply 115 Vac at pins A and C of AUX AC PWR IN jack A1A1J3.		
b. On front panel, remove fuses A2F1 and A2F2 and replace the fuse caps.		
c. Turn mode selector switch A2S2 from OFF to STD BY.	Fuse indicators for A2F1 and A2F2 illuminate.	Schematic, figure 5-35.
d. Pull mode selector switch A2S2 out, and turn from STD BY to OFF. Reinstall fuses A2F1 and A2F2 and replace indicator caps.		
e. Set mode selector switch A2S2 to STD BY.	Fuse indicators for A2F1 and A2F2 do not illuminate. MHz and kHz dial lights A2DS3 and A2DS4 illuminate, indicating that 115 Vac is now applied to Receiver Power Supply Assembly A2A8 via power transformer A2T1, and +28 Vdc is available at the output	Schematic, figure 5-35.

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
2. Overall AC and DC Voltage Application (Cont)		
e. (Cont)	of the power supply. Filaments of tubes A2A4V1 and V2 in RF Amplifier Assembly A2A4 illuminate.	
f. Check operation of the AUX/NORM switch A1S1 by momentarily rotating plunger 90 degrees counterclockwise. Return to the AUX position.	MHz and kHz dial lights A2DS3 and A2DS4 extinguish, as input power is removed from the power supply.	Schematic, figure 5-35.
g. On Receiver Power Supply Assembly A2A8, locate tie point A2A8E10. On bottom of receiver chassis, in lower left-hand corner and to right of power supply printed circuit board A2A8, locate tie points A2E11, A2E12, and A2E17.		

CAUTION

Regulated 20 Vdc is generated in Receiver Power Supply Assembly A2A8 and applied to the proper receiver assemblies when the mode selector switch A2S2 is set to any position other than OFF or STD BY. If the 20-volt series regulator is shorted, the 20-Vdc line will carry 28 Vdc, which will drastically reduce the life span of all assemblies using the regulated 20 Vdc. One or more assemblies may fail immediately.

STEP	OBSERVE	REFERENCE
h. Connect Multimeter AN/PSM-4( ) to A2E11, set mode selector switch A2S2 to LSB, and observe multimeter.	Approximately +20 Vdc. If multimeter indicates approximately +28 Vdc or 0 Vdc, immediately turn mode selector switch A2S2 to OFF and troubleshoot Power Supply Assembly A2A8.	Schematic, figure 5-35.
i. Set mode selector switch A2S2 to ISB.		

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
2. Overall AC and DC Voltage Application (Cont)		
j. Using multimeter on appropriate dc scale, measure voltage between the following tie points and ground:		
Tie Point / Nominal Voltage		
A2A8E10 -30 Vdc	-28.5 to -31.5 Vdc	Schematic, figure 5-35.
A2E12 +28 Vdc	+24 to +32 Vdc	
A2E17 +110 Vdc	+103 to +123 Vdc	
	If any voltage is not within tolerance, set mode selector switch A2S2 to OFF and troubleshoot Receiver Power Supply Assembly A2A8. If all voltages are out of tolerance, check ac line voltage and setting of power transformer A2T1 primary winding tap.	
k. Adjust Differential Voltmeter (John Fluke 825) to measure +20 Vdc with respect to ground and connect to A2E11.	20 ±0.1 Vdc	Schematic, figure 5-35.
l. Using AC Voltmeter ME-6( )/U with a 1:1 probe, measure ac ripple at the following tie points:		Schematic, figure 5-35.
Tie Point / Nominal Voltage		
A2E17 +110 Vdc	90 mV rms maximum	
A2E12 +28 Vdc	320 mV rms maximum	
A2E11 +20 Vdc	2 mV rms maximum	
A2A8E10 -30 Vdc	15 mV rms maximum	

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
2. Overall AC and DC Voltage Application (Cont)		
m. Rotate chassis to horizontal position and check for presence of 28 Vdc at RF Amplifier Assembly A2A4, by rotating MHz controls on receiver front panel between 02 and 29, while viewing rf amplifier digit window.	Rf amplifier tuning motor drives as MHz controls are rotated.	Schematic, figure 5-35.
n. Rotate the front-panel MHz controls from 02 through 29, and compare the digits viewed through the digit window on top of RF Amplifier Assembly A2A4 with those viewed at front-panel MHz windows.	The digits viewed in the rf amplifier window should be centered in the window and agree with the digits viewed through the front-panel MHz windows.	
o. Set front-panel Hz switch A2A11S1 to V, and view the vernier indicator A2DS5.	Lamp flashes in vernier indicator A2DS5.	Schematic, figure 5-35.
3. Frequency Standard Check. CAUTION Do not adjust Frequency Standard Assembly A2A5 unless power has been applied and mode selector switch A2S2 has been in a position other than OFF for at least 24 hours. Most drift will occur during the first 60 minutes of warmup; thereafter, the error should be less than ±1 part per 10^7 (±0.5 Hz at 5 MHz).		
a. On Frequency Standard Assembly A2A5, set COMP/INT/EXT switch A2A5A2S1 to COMP. Place 50-ohm load at INT 5MC OUT jack A1J24 at rear of case.		
b. Connect Electronic Counter AN/USM-207A to the following test points and measure frequency: Test Point — Frequency A2A5A2TP1 — 5 MHz A2A5A2TP2 — 500 kHz	5 MHz ±0.5 Hz 500 kHz ±0.1 Hz	Fault Logic Diagram, figure 5-28. Schematic, figure 5-39.

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
3. Frequency Standard Check (Cont)		
c. Remove counter and connect RF Millivoltmeter CCVO-91CA, in turn, to A2A5A2TP1 and A2A5A2TP2. Measure output level and remove rf millivoltmeter.	0.5V rms minimum at TP1 (5 MHz), and 150-250 mV rms at TP2 (500 kHz).	Fault Logic Diagram, figure 5-28. Schematic, figure 5-39.
d. Set COMP/INT/EXT switch A2A5A2S1 to INT and disconnect test equipment.		
4. 1-MHz Synthesizer Check.		
a. On 1-MHz Synthesizer Subassembly A2A6A1, connect vertical input of Oscilloscope AN/USM-281( ) (dc doupled) to A2A6A1A2TP3.		
b. Set mode selector switch A2S2 to LSB, and Hz switch A2A11S1 to 000. Set frequency controls to 02.000 MHz.		
c. Position the MHz controls, in turn, from 02 (2 MHz) through 29 (29 MHz). Note oscilloscope display for each frequency selected.	Oscilloscope presentation has a ringing effect and then stabilizes at a dc level between 5 and 17 Vdc.	Fault Logic Diagram, figure 5-30. Schematic, figure 5-41.
d. Disconnect test equipment.		
5. RF Amplifier Signal Flow Check.		
a. Position receiver front-panel controls as follows: Control — Position Mode selector A2S2 — USB RF GAIN A2R3 — Fully clockwise Hz A2A11S1 — 000		

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
5. RF Amplifier Signal Flow Check. (Cont) Control — Position AGC A2S3 — OFF USB LEVELS LINE A2R2 — Midrange Audio level meter A2S1 — OFF		
b. Connect RF Signal Generator CAQI-606B to the receiver ANT jack A1J23. Set for a 1000-μV continuous-wave signal, at 2.011 MHz.		
c. On RF Amplifier Assembly A2A4, connect RF Millivoltmeter CCVO-91CA to A2A4TP3. Ensure that probe is connected to measure at A2A4TP3, not ground test point located next to it. Set RF GAIN control A2R3 fully clockwise.		
d. On the receiver front panel, set the MHz and kHz controls for 2.010 MHz.		
e. Tune the signal generator for maximum indication on rf millivoltmeter. Note dB reading for use in next step.	40 mV minimum	Fault Logic Diagram, figure 5-21. Schematic figure 5-38.
f. Remove rf millivoltmeter from A2A4TP3 and connect to A1TP1 on RF Translator Subassembly A2A6A6. Note dB reading.	Reading to be not more than 6 dB lower than the measurement made in step 5.e. If difference is more than 6 dB, troubleshoot interface between RF Amplifier Assembly A2A4 and RF Translator Subassembly A2A6A6.	Schematic figure 5-35.
g. Reconnect rf millivoltmeter to A2A4TP3.		
h. Set the rf signal generator and the receiver MHz and kHz controls to the following positions, tuning the rf signal generator for a maximum indication on the rf millivoltmeter:	40 mV minimum for each frequency selected.	Schematic figure 5-38.

Table 5-4. Radio Receiver R-1051/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
5. RF Amplifier Signal Flow Check (Cont) h. (Cont)		

Signal Generator MHz	Receiver MHz
3.102	3.101
4.223	4.222
5.334	5.333
6.445	6.444
7.556	7.555
8.667	8.666
9.778	9.777
10.899	10.898
11.990	11.989
12.011	12.010
13.011	13.010
14.011	14.010
15.011	15.010
16.011	16.010
17.011	17.010
18.011	18.010
19.011	19.010
20.011	20.010
21.011	21.010
22.011	22.010
23.011	23.010
24.011	24.010
25.011	25.010
26.011	26.010
27.011	27.010
28.011	28.010
29.011	29.010

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
6. Translator/Synthesizer RF-to-IF. Signal Flow Check		
a. Maintain receiver front-panel control settings, except set MHz and kHz controls for 2.010 MHz and AGC control A2S3 to SLOW.		
b. Connect RF Millivoltmeter CCVO-91CA to A1TP4 on RF Translator Subassembly A2A6A6. Set to measure 30 mV.		
c. Tune RF Signal Generator CAQI-606-B to 2.011 MHz (1000 μV rms output) and note rf millivoltmeter indication.	10 mV rms minimum	Troubleshooting Procedures, table 5-5. Schematic, figure 5-40.
d. Repeat steps a and c above with signal generator and receiver MHz and kHz controls set at the following frequencies: Signal Generator MHz — Receiver MHz 3.102 — 3.101 4.223 — 4.222 5.334 — 5.333 6.445 — 6.444 7.556 — 7.555 8.667 — 8.666 9.778 — 9.777 10.899 — 10.898 11.990 — 11.989 12.556 — 12.555 13.556 — 13.555 14.556 — 14.555 15.556 — 15.555 16.556 — 16.555 17.556 — 17.555	10 mV rms minimum for each frequency selected	Troubleshooting Procedures, table 5-5. Schematic, figure 5-40.

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
6. Translator/Synthesizer RF-to-IF. Signal Flow Check (Cont) d. (Cont) Signal Generator MHz — Receiver MHz 18.556 — 18.555 19.556 — 19.555 20.556 — 20.555 21.556 — 21.555 22.556 — 22.555 23.556 — 23.555 24.556 — 24.555 25.556 — 25.555 26.556 — 26.555 27.556 — 27.555 28.556 — 28.555 29.556 — 29.555		
7. IF. Signal Flow Check a. Maintain same test setup, except set mode selector switch to STD BY and remove IF/Audio Amplifier Assemblies A2A2 and A2A3 from main frame. b. Set receiver MHz and kHz controls to 2.010 MHz. c. Set rf signal generator for 2.010 MHz continuous wave. d. Connect rf millivoltmeter to terminal A3 of jack A2XA2P1, set mode selector switch to USB, and adjust the rf signal generator frequency and output level for a 4-mV peak signal.		

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
7. IF. Signal Flow Check (Cont)		
e. Connect rf millivoltmeter to A1TP1 on Mode Selector Assembly A2A1, and observe meter indication. Then position the mode selector switch A2S2, in turn, to USB, RATT and ISB.	100 mV rms maximum at USB, RATT, and ISB positions.	Fault Logic Diagram, figure 5-23. Schematic, figure 5-35. Schematic figure 5-36.
f. Set mode selector switch A2S2 to AM. Connect rf millivoltmeter to terminal A3 of jack A2XA2P1, and adjust the rf signal generator frequency and output level for a 4-mV peak signal.		
g. Connect rf millivoltmeter to A1TP1 on Mode Selector Assembly A2A1 and observe meter indication with mode selector switch A2S2 in AM, then CW.	100 mV rms maximum at AM and CW positions.	Fault Logic Diagram, figure 5-23. Schematic, figure 5-35. Schematic, figure 5-36.
h. Set mode selector switch A2S2 to LSB. Connect rf millivoltmeter to terminal A3 of jack A2XA3P1, and adjust the rf signal generator frequency and output level for a 4-mV peak signal.		
i. Connect the rf millivoltmeter to A1TP1 on Mode Selector Assembly A2A1 and observe meter indication with mode selector switch A2S2 in LSB, then ISB.	100 mV rms maximum at LSB and ISB positions.	Fault Logic Diagram figure 5-23. Schematic, figure 5-35. Schematic, figure 5-36.

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
7. IF. Signal Flow Check (Cont)		
j. Set mode selector switch A2S2 to STD BY and reinsert both Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3.		
k. Disconnect test equipment		
8. IF.-to-Audio Signal Flow Check		
a. Position receiver controls as follows: Control — Position Mode selector A2S2 — USB MHz and kHz controls — 02.010 MHz Hz A2A11S1 — 000 RF GAIN A2R3 — Fully clockwise USB LEVELS PHONE A2R5 — Midrange AGC A2S3 — SLOW		
b. Set RF Signal Generator CAQI-606-B for 2.011 MHz, continuous wave. Connect to ANT jack A1J23, at rear of receiver.		
c. Connect AC Voltmeter ME-6( )/U to USB AUDIO OUT jack A1A1J5 at rear of receiver, and set to measure 10 Vac.		

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
8. IF-to-Audio Signal Flow Check (Cont)		
d. Adjust rf signal generator frequency for peak indication on ac voltmeter with 1-μV rms signal level from the rf signal generator; then set the rf signal generator level to 1 mV rms. Rotate USB LEVELS LINE control A2R2 fully clockwise, and note ac voltmeter indication.	6 to 10 Vac	Fault Logic Diagram, figure 5-24. Schematic, figure 5-37.
e. Set mode selector switch A2S2 to AM.		
f. Adjust the rf signal generator to 1000 Hz, 30-percent modulation. Tune for peak indication on ac voltmeter with a 1-μV rms signal level on rf signal generator; then set the rf signal generator level to 1 mV rms. Note ac voltmeter indication.	6 to 10 Vac	Fault Logic Diagram, figure 5-24. Schematic, figure 5-37.
g. Remove ac voltmeter from receiver jack A1A1J5 and connect to LSB AUDIO OUT jack A1A1J6.		
h. Adjust the rf signal generator for 2.009 MHz, continuous wave, at 1 μV rms.		
i. Set mode selector switch A2S2 to LSB, and rotate LSB LEVELS LINE A2R1 control fully clockwise.		

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
8. IF. to Audio Signal Flow Check (Cont)		
j. Adjust rf signal generator for peak indication on ac voltmeter; then set rf signal generator level to 1 mV rms. Note ac voltmeter indication.	6 to 10 Vac	Fault Logic Diagram, figure 5-25. Schematic, figure 5-37.
k. Disconnect external test equipment. Maintain all other conditions.		
9. Overall Operational Procedure.		
a. Position receiver controls as follows: Control — Position Mode selector A2S2 — USB MHz and kHz controls — 04.999 MHz Hz A2A11S1 — 000 RF GAIN A2R3 — Clockwise USB and LSB LEVELS PHONE A2R5 and A2R4 — Clockwise USB and LSB LEVELS LINE A2R2 and A2R1 — Clockwise Audio level meter A2S1 — USB AGC A2S3 — SLOW		
b. Connect INT 5 MC OUT jack A1J24 to ANT jack A1J23.		

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
9. Overall Operational Procedure (Cont)		
c. Connect Electronic Counter AN/USM-207 or equivalent to PHONE USB jack A2J2 on the receiver front panel. Ensure that COMP/INT/EXT switch A2A5A2S1 on Frequency Standard Assembly A2A5 is set to COMP.		
d. Adjust the USB LEVELS LINE control A2R2 for an indication of +10 dB on AUDIO LEVEL meter A2M1, and note the electronic counter indication.	1000 Hz	
e. Change receiver frequency, in turn, to 4.998 and 4.997 MHz; note electronic counter indication for each selected frequency.	Receiver Frequency Selected (MHz) / Electronic Counter Indication (Hz) 4.998 — 2000 4.997 — 3000	
f. Change receiver frequency to 5.000 MHz. Set mode selector switch A2S2 to CW. Ensure Hz switch A2A11S1 is at 000 position.		
g. Rotate BFO control A2R6 fully counterclockwise, and adjust the USB LEVELS PHONE and LINE controls A2R5 and A2R2 for a stable indication on the electronic counter.	3 kHz minimum	Fault Logic Diagram, figure 5-24.
h. Rotate BFO control A2R6 fully clockwise, and observe electronic counter.	3 kHz minimum	Fault Logic Diagram, figure 5-24.
i. Set mode selector and audio level meter switches A2S2 and A2S1 to LSB.		
j. Connect electronic counter to PHONE LSB jack A2J1.		

Table 5-4. Radio Receiver R-1051E/URR, Maintenance Turnon Procedure (Cont)

STEP	OBSERVE	REFERENCE
9. Overall Operational Procedure (Cont)		
k. Set receiver frequency to 5.001 MHz, and adjust the LSB LEVELS LINE control A2R1 for +10 dB indication on the AUDIO LEVEL meter A2M1, and observe electronic counter.	1000 Hz	
l. Rotate the Hz switch A2A11S1 from 000 through 900, and then return to 000 position, while observing electronic counter.	1100 Hz through 1900 Hz in 100-Hz increments.	
m. Change the receiver frequency, in turn, to 5.002 and 5.003 MHz, and then return frequency to 5.001 MHz.	Receiver Frequency Selected (MHz) / Electronic Counter Indication (Hz) 5.002 / 2000 5.003 / 3000	
n. Set Hz switch A2A11S1 to V (vernier position), and rotate Hz vernier control A2A11R1 from fully counterclockwise to fully clockwise position, while observing electronic counter. Return Hz switch A2A11S1 to 000.	980 Hz or less in fully counterclockwise position, and 2020 Hz or more in fully clockwise position.	
10. Conclusion		
a. On Frequency Standard Assembly A2A5, set COMP/INT/EXT switch A2A5A2S1 to INT.		
b. Remove all test equipment and test cable between A1J23 and A1J24 on rear of receiver cabinet.		
c. Pull mode selector switch A2S2 out, and set to OFF.		
d. Slide receiver chassis into case. Secure with front-panel screws.		

Table 5-5. Translator/Synthesizer Assembly A2A6, Depot Troubleshooting Procedures

STEP AND SYMPTOM	PROCEDURES	OBSERVATIONS	TROUBLE-SHOOTING DIAGRAM
1. 100-Hz Synthesizer Subassembly A2A6A4 Checkout	a. Set Hz switch at 000. Using Electronic Counter AN/USM-207A and AC Voltmeter ME-6( )/U, measure frequency and amplitude at A2A6A4A3TP3.	11.000 kHz 240 mV rms nominal	
	b. Measure frequency and amplitude at A2A6A4A3TP5. (Use the Heterodyne Voltmeter CDAN-2006 for amplitude measurement while rotating the 1- and 10-kHz crystal switches through all combinations to find the lowest amplitude.) If correct, proceed to step 2.	7.100 MHz 10 mV rms minimum	
	c. Remove A2A6A4, and reconnect via extender cable. Measure amplitude and frequency of 1-kHz pulse at A2A6A4A2E4.	1 Vp minimum 1000 Hz	5-10
	d. Measure frequency and amplitude of 7.089-MHz input at A2A6A4A3TP1 with the 1- and 10-kHz crystal switches set to the positions giving the lowest amplitude in step b.	1.5 mV rms minimum 7.089 MHz	5-13 5-14
	e. Reconnect the Heterodyne Voltmeter CDAN-2006 to A2A6A4A3TP5 and adjust A2A6A4A3R20 for 15 mV rms at 7.1 MHz. If this signal level can be obtained, proceed to step 2.	7.1 MHz output is adjustable to 15 mV rms.	5-14
2. 1- and 10-kHz Synthesizer Subassembly A2A6A3 Checkout	a. Set kHz controls at 000. Using Electronic Counter AN/USM-207A and RF Millivoltmeter CCVO-91CA, measure frequency and amplitude of mixed 1- and 10-kHz output at A2A6A6A1E9. If correct, proceed to step 3.	3.400 MHz 90 to 170 mV	
	b. Using Heterodyne Voltmeter CDAN-2006, measure amplitude of 10-kHz-spectrum end-point frequencies 3.82 MHz and 3.91 MHz at A2A6A3A4E4.	Between 2 to 4 mV rms and balanced within 2 dB.	5-10
	c. Using Heterodyne Voltmeter CDAN-2006, measure amplitude of 1-kHz-spectrum end-point frequencies 122 kHz and 131 kHz at A2A6A3A4E9.	Between 6 to 12 mV rms and balanced within 2 dB.	5-10 5-13
3. 100-kHz Synthesizer Subassembly A2A6A2 Checkout	a. Set frequency controls for 2.0 MHz. Using RF Millivoltmeter CCVO-91CA and Electronic Counter AN/USM-207A, measure amplitude and frequency at A2A6A2A5TP1.	100 to 135 mV rms 22.400 MHz	
	b. Set frequency controls for 6.000 MHz, and measure amplitude and frequency at A2A6A2A5TP1. If correct, proceed to step 4.	100 to 135 mV rms 32.400 MHz	

Table 5-5. Translator/Synthesizer Assembly A2A6, Depot Troubleshooting Procedures (Cont)

STEP AND SYMPTOM	PROCEDURES	OBSERVATIONS	TROUBLE-SHOOTING DIAGRAM
3. 100-kHz Synthesizer Subassembly A2A6A2 Checkout (Cont)	c. Disconnect A2A6A2 and reconnect via extender cable. Using the Heterodyne Voltmeter CDAN-2006, measure the amplitude of 100-kHz-spectrum end-point frequencies 15.3 MHz and 16.2 MHz at A2A6A2A2E1.	Between 18 to 44 mV rms and balanced within 2 dB	
	d. Using the Heterodyne Voltmeter CDAN-2006, measure the amplitude of the 7.1 MHz at A2A6A2A3E12.	7.1 MHz signal 10 mV rms minimum	5-14
	e. Using the Heterodyne Voltmeter CDAN-2006, measure the amplitude of the 10-MHz signal at A2A6A2A3E7.	10 MHz signal 20 to 40 mV rms	
	f. With the RF Millivoltmeter CCVO-91CA connected to A2A6A2A5TP1, adjust A2A6A2A5R13 for 110 mV rms.	32.4 MHz output is adjustable to 110 mV rms	5-12
	g. Rotate the 100-kHz crystal switch and measure the 32.4-MHz signal at each switch position.	100 to 135 mV rms at all ten switch positions	5-12
4. 1-MHz Synthesizer Subassembly A2A6A1 Checkout	a. With the RF Millivoltmeter CCVO-91CA connected to A2A6A1A1E2, measure the output signal level for each position of the MHz frequency controls listed below; then connect the Electronic Counter AN/USM-207A to A2A6A1A1E2 and measure the output frequency for each listed position of the MHz frequency controls. If correct, proceed to step 5.	Signal amplitude 80 to 240 mV rms at each listed setting of MHz controls Output frequency as listed for each setting of MHz controls	5-11

Table 5-5. Translator/Synthesizer Assembly A2A6, Depot Troubleshooting Procedures (Cont)

<table>
<tr><th>STEP AND SYMPTOM</th><th>PROCEDURES</th><th>OBSERVATIONS</th><th>TROUBLE-SHOOTING DIAGRAM</th></tr>
<tr><td>4. 1-MHz Synthesizer Subassembly A2A6A1 Checkout (Cont)</td><td>
<table>
<tr><th>MHz Frequency Control Position</th><th>Output Frequency (MHz)</th><th>MHz Frequency Control Position</th><th>Output Frequency (MHz)</th></tr>
<tr><td>2</td><td>17.5</td><td>11</td><td>8.5</td></tr>
<tr><td>3</td><td>16.5</td><td>12</td><td>7.5</td></tr>
<tr><td>4</td><td>15.5</td><td>14</td><td>15.5</td></tr>
<tr><td>5</td><td>14.5</td><td>15</td><td>4.5</td></tr>
<tr><td>6</td><td>23.5</td><td>16</td><td>3.5</td></tr>
<tr><td>7</td><td>12.5</td><td>19</td><td>10.5</td></tr>
<tr><td>8</td><td>11.5</td><td>20</td><td>9.5</td></tr>
<tr><td>9</td><td>20.5</td><td>22</td><td>2.5</td></tr>
<tr><td>10</td><td>19.5</td><td></td><td></td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td></td><td>b. Using the Heterodyne Voltmeter CDAN-2006, measure the 1-MHz input signal at A2A6A1A3E1.</td><td>350 to 550 mV rms</td><td></td></tr>
<tr><td>5. RF Translator Subassembly A2A6A6 Checkout</td><td>a. With the MHz and kHz controls set for 22.550, adjust the input signal source from RF Signal Generator CAQI-606-B to the receiver (22.550 MHz ±1 kHz) to obtain 5.0 mV rms at A2A6A6A1TP1, as indicated on RF Millivoltmeter CCVO-91CA. Set test set controls for receive mode of operation.</td><td></td><td></td></tr>
<tr><td></td><td>b. Using rf millivoltmeter, measure amplitude at A2A6A6A1TP4. (Tune signal generator frequency for peak indication on rf millivoltmeter.)</td><td>70 mV rms nominal</td><td>5-2</td></tr>
<tr><td></td><td>c. Repeat a. and b. at 21.550 MHz. If steps b. and c. are correct, no further tests are required in the rf translator.</td><td>70 mV rms nominal</td><td>5-2</td></tr>
</table>

Table 5-5. Translator/Synthesizer Assembly A2A6, Depot Troubleshooting Procedures (Cont)

STEP AND SYMPTOM	PROCEDURES	OBSERVATIONS	TROUBLE-SHOOTING DIAGRAM
5. RF Translator Subassembly A2A6A6 Checkout (Cont)	d. Using the RF Millivoltmeter CCVO-91CA, measure the 1- and 10-kHz injection signal at A2A6A6A1E9.	90 to 170 mV rms	5-13
	e. Using the RF Millivoltmeter CCVO-91CA, measure the 100-kHz injection signal at A2A6A6A1E7.	100 to 135 mV rms	5-12
	f. Using the RF Millivoltmeter CCVO-91CA, measure the 1-MHz injection signal at A2A6A6A1E5.	80 to 240 mV rms	5-11

TEST DATA FOR FIGURE 5-1

GENERAL

A. Test Equipment Required:
RF Millivoltmeter CCVO-91CA or equivalent
RF Signal Generator CAQI-606-B or equivalent
RF Amplifier Test Set TS-2132/WRC-1 (depot only)
Electronic Multimeter AN/USM-116( )
Electronic Counter AN/USM-207A

B. References. If necessary, make the following references:
Functional Description, paragraph 3-17
Troubleshooting sequence, figure 5-21
Corrective maintenance, paragraph 6-25
Physical location of test points, figures 7-18 and 7-58

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	USB
	AGC switch A2S3	OFF
	RF gain control A2R3	Fully clockwise
	Hz switch A2A11S1	000
	USB LEVELS LINE control A2R2	Midrange
	Frequency controls	2.100 MHz

D. Test Setup. Connect rf signal generator to ANT jack A1J23, and set its output for a CW frequency of 2.101 MHz, at 500 μV rms.

SPECIFIC

Test Steps:

TS-1 — Refer to notes C and D before performing test. Using rf millivoltmeter, measure the rf input voltage to the antenna overload assembly from jack A1J23 to be as indicated at A2A9E1. Ensure the probe ground lead is connected to A2A9E2.

TS-2 — Using the rf millivoltmeter, measure the rf output voltage from the antenna overload assembly to be as indicated at A2A9E3. Ensure the probe ground lead is connected to A2A9E2.

TEST DATA FOR FIGURE 5-1 (Cont)

TS-3	Ground the rf millivoltmeter test probe at A2A4TP1, and measure rf signal voltage in the rf amplifier at the output of filter A2A4FL2 to be as indicated at A2A4TP2.
TS-4	Ground the rf millivoltmeter test probe at A2A4TP4, and measure rf output voltage from the rf amplifier to be as indicated at A2A4TP3. Note the dB reading for use in test step 5.
TS-5	Measure the rf input voltage to the rf translator to be as indicated at A2A6A6TP1 on rf millivoltmeter.
TS-6	Using the electronic multimeter, measure the dc control voltage to relay A2A9K1 in the antenna overload assembly to be as indicated at A2A9E4.
* TS-7	Using the rf amplifier test set and the rf millivoltmeter, measure the rf signal voltage in the rf amplifier at the output of A2A4A38 to be as indicated at A2A4A20E1-3. Ensure the probe ground lead is connected to A20E1-4.
* TS-8	Using the rf amplifier test set and the electronic multimeter, measure the dc voltage at the grid (pin 1) of rf amplifier tube A2A4V1 to be as indicated.

* Measurement made at depot only.

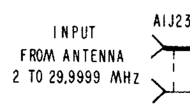

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Figure 5-1. RF Selection, Tuning, and Overload Protection, Signal Flow Diagram

DEPOT TEST DATA FOR FIGURE 5-2

NOTE

These test procedures are to be performed at a depot only, and not aboard ship.

GENERAL

A. Test Equipment Required:
RF Signal Generator CAQI-606-B or equivalent
RF Millivoltmeter CCVO-91CA or equivalent
Extender cables for Translator/Synthesizer Assembly A2A6 (3 required)
Electronic Counter AN/USM-207A or equivalent
Heterodyne Voltmeter CDAN 2006 or equivalent

B. References. If necessary, make the following references:
Functional description, paragraph 3-26
Troubleshooting sequence, figure 5-22
Corrective maintenance, paragraph 6-37
Physical location of test points, figures 7-86, 7-87, and 7-89

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	AGC switch A2S3	OFF
	RF gain control A2R3	Fully clockwise
	Hz switch A2A11S1	000
	Frequency controls	22.550 MHz
	USB LEVELS LINE control A2R2	Midrange

D. Test Setup.

(1) Connect rf signal generator to ANT jack A1J23, and set its output for a CW frequency of 22.551 MHz, at 350 μV rms.

(2) Remove Translator/Synthesizer Assembly A2A6 from receiver, and reconnect via the three extender cables.

(3) Loosen six screws and remove cover from RF Translator Subassembly A2A6A6.

DEPOT TEST DATA FOR FIGURE 5-2 (Cont)

SPECIFIC

Test Steps:

TS-1	Refer to notes C and D before performing test. Set mode selector switch A2S2 to USB. Adjust the rf signal generator for the level indicated, with the rf millivoltmeter at the input of the rf translator at test point A2A6A6A1TP1.
TS-2	Measure the 1-MHz synthesizer injection signal at A2A6A6A1E5 to be as indicated on the rf millivoltmeter.
TS-3	Measure the 1-MHz synthesizer injection signal at A2A6A6A1A1TP1 to be as indicated on the rf millivoltmeter.
TS-4	Measure the first if. signal at the output of the 1-MHz and alc subassembly at A2A6A6A1CR5 cathode to be as indicated on the heterodyne voltmeter tuned to 20.05 MHz.
TS-5	Measure the first if. output signal of the hi-band/lo-band filter subassembly at A2A6A6A1CR7 cathode to be as indicated on the heterodyne voltmeter tuned to 20.05 MHz. Momentarily change receiver frequency to 21.550 MHz and rf signal generator frequency to 21.551 MHz. Repeat the measurement using the heterodyne voltmeter tuned to 30.05 MHz. Reset receiver frequency to 22.550 MHz and rf signal generator frequency to 22.551 MHz.
TS-6	Measure the 100-kHz synthesizer injection signal to the mid-frequency mixer at A2A6A6A1E7 to be as indicated on the rf millivoltmeter.
TS-7	Measure the 1- and 10-kHz synthesizer injection signal to the low-frequency mixer at A2A6A6A1E9 to be as indicated on the rf millivoltmeter.
TS-8	Measure the 1- and 10-kHz synthesizer injection signal to the low-frequency mixer at A2A6A6A1A3TP1 to be as indicated on the rf millivoltmeter.
TS-9	Measure the 500-kHz third if. output signal of the rf translator at A2A6A6A1TP4 to be as indicated on the rf millivoltmeter.

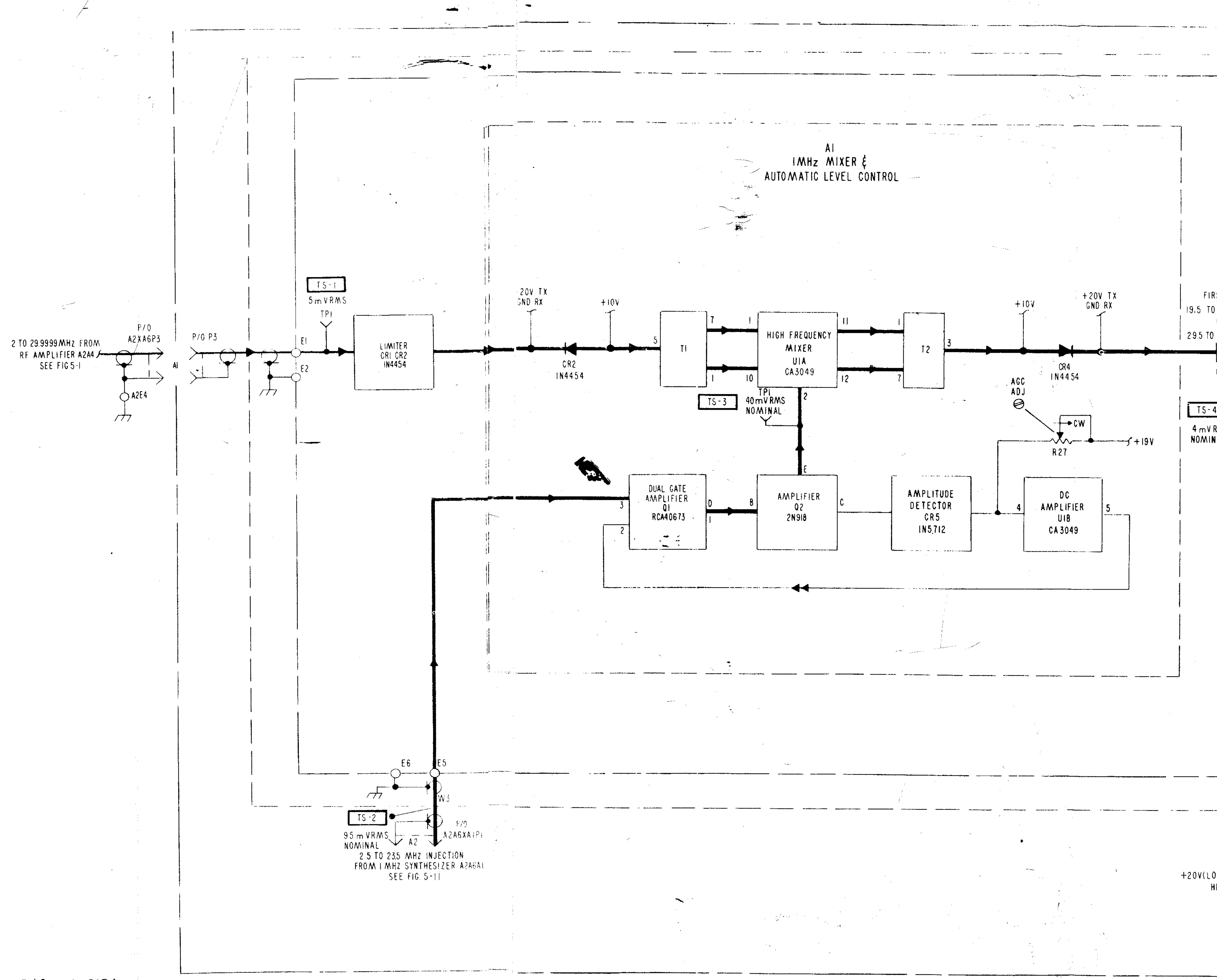

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Figure 5-2. RF-to-IF. Conversion, Signal Flow Diagram

TEST DATA FOR FIGURE 5-3

GENERAL

A. Test Equipment Required:
RF Signal Generator CAQI-606-B or equivalent
AC Voltmeter ME-6( )/U or equivalent (2 required)
Oscilloscope AN/USM-281( ) or equivalent
Extender cable set for Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3
Resistor, 600 ohms
RF Millivoltmeter CCVO-91CA

B. References. If necessary, make the following references:
Functional description, paragraph 3-43
Troubleshooting sequence, figure 5-23
Corrective maintenance, paragraph 6-20
Physical location of test points, figures 7-8, 7-10, 7-12, and 7-14

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	AGC switch A2S3	OFF
	RF GAIN control A2R3	Maximum clockwise
	USB LEVELS LINE control A2R2	Midrange
	LSB LEVELS LINE control A2R1	Midrange
	Hz switch A2A11S1	000
	Frequency controls	2.100 MHz

D. Test Setup

(1) Apply the rf output from the rf signal generator to the receiver ANT jack A1J23. Set the signal generator output for a frequency of 2.101 MHz, at 500 μV.

NOTE

The mode selector input signal as measured at rf translator test point A2A6A6A1TP4 drops to 5 mV when the AGC switch A2S3 is set to SLOW.

(2) Remove receiver if./audio amplifiers A2A2 and A2A3 from receiver, and reconnect via the extender cables.

(3) Loosen the screws and remove covers from both if./audio amplifiers.

(4) Connect a 600-ohm terminating resistor between pins A and B of USB AUDIO OUT jack A1A1J5. Connect vertical input of oscilloscope and ac voltmeter input to pins A and B of jack A1A1J5; connect pin B to low side of ac voltmeter. Set mode selector switch A2S2 to USB.

TEST DATA FOR FIGURE 5-3 (Cont)

NOTE

Adjust the rf signal generator for optimum frequency output by adjusting its vernier frequency control for maximum audio output as observed on the ac voltmeter at A1A1J5.

SPECIFIC

Test Steps:

TS-1 Refer to notes C and D before performing test. Adjust RF GAIN control A2R3 to obtain the 500-kHz input signal to the USB if./audio amplifier at A2A2A2E1 to be as indicated on the rf millivoltmeter.

TS-2 Measure the 500-kHz if. input signal level to the mode selector to be as indicated on the rf millivoltmeter.

TS-3 Measure the 500-kHz input signal to the USB product detector A2A2A3Q1 at A2A2A2E15 to be as indicated on the rf millivoltmeter.

TS-4 Measure the 500-kHz if. injection signal to the emitter of the USB product detectors to be as indicated on the rf millivoltmeter at A2A2A3TP1.

TS-5 Measure the audio output signal of the USB if./audio amplifier to be as indicated on the ac voltmeter at A2A2A1E6.

TS-6 Set up rf signal generator for an accurate frequency output of 2.100 MHz by adjusting its vernier control for a zero-beat audio output as observed at the oscilloscope. Modulate the rf signal generator output with 1000 Hz at 30 percent. Set mode selector switch A2S2 to AM, and make the measurements at the test points for TS-1 and TS-2, observing the same indications on the rf millivoltmeter. Measure the if. input signal to the base of the USB product detector A2A2A3Q2 to be as indicated on the rf millivoltmeter at A2A2A2E17.

TS-7 Measure the audio output voltage of the AM detector to be as indicated on the ac voltmeter at A2A2A1E5.

TS-8 Remove the modulation from the output signal of the rf signal generator. Set the mode selector switch A2S2 to CW. Measure the BFO input signal to the anode of the AM detector to be as indicated on the rf millivoltmeter at A2A1A3TP1. Vary the receiver BFO frequency control A2R6 to show zero beat on the oscilloscope (should occur at approximate midrange of BFO control A2R6).

| TS-9 |

Disconnect test equipment from jack A1A1J5. Connect a 600-ohm load resistor across pins A and B of LSB AUDIO OUT jack A1A1J6. Connect vertical input of oscilloscope and ac voltmeter input across pins A and B of jack A1A1J6; connect pin B to low side of ac voltmeter. Set mode selector switch A2S2 to LSB. Adjust rf signal generator output frequency for 2.099 MHz by peaking audio output of receiver as observed on ac voltmeter by adjusting the signal generator frequency control. Adjust RF GAIN control A2R3 to obtain the 500-kHz if. input signal to the LSB if./ audio amplifier to be as indicated on the rf millivoltmeter at A2A3A2E1. Make the measurement at the test point for TS-2 to be as indicated on the rf millivoltmeter.

| TS-10 |

Measure the 500-kHz if. signal to the LSB product detector A2A3A3Q1 to be as indicated on the rf millivoltmeter at A2A3A2E15.

| TS-11 |

Measure the 500-kHz if. signal to the LSB product detector A2A3A3Q2 to be as indicated on the rf millivoltmeter at A2A3A2E17.

| TS-12 |

Measure the 500-kHz if. injection signal to the product detectors to be as indicated on the rf millivoltmeter at A2A3A3TP1.

| TS-13 |

Measure the audio output signal of the LSB if./audio amplifier to be as indicated on the ac voltmeter at A2A3A1E6.

Figure 5-3. IF. Amplification and Control, Signal Flow Diagram

TEST DATA FOR FIGURE 5-4

GENERAL

A. Test Equipment Required:
Multimeter AN-PSM-4( ) or equivalent
RF Millivoltmeter CCVO-91CA or equivalent
Extender cable for Receiver Mode Selector Assembly A2A1

B. References. If necessary, make the following references:
Functional description, paragraph 3-55
Corrective maintenance, paragraph 6-14
Physical location of test points, figures 7-57, 7-9, and 7-10

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	Frequency controls	2.100 MHz

D. Test Setup.

(1) Remove Receiver Mode Selector Assembly A2A1 from receiver, and reconnect via the extender cable.

(2) Loosen the screws and remove cover from mode selector.

SPECIFIC

Test Steps:

TS-1 Refer to notes C and D before performing test. Set mode selector switch A2S2 to ISB. Using rf millivoltmeter, measure the 500-kHz output from the frequency standard at A2A5TP2 to be as indicated.

TS-2 Using the multimeter, measure the operating voltage input to the 500-kHz gate subassembly at A2A1A2E5 to be as indicated for ISB. Set the mode selector switch consecutively to RATT, AM, CW, USB, and LSB, and verify that the voltage amplitude at A2A1A2E5 is as indicated. Reset the mode selector switch to LSB.

TS-3 Using the rf millivoltmeter, measure the 500-kHz output signal from the 500-kHz gate subassembly at A2A1A2E2 to be as indicated.

TS-4 Measure the gated 500-kHz input signal to the USB if./audio amplifier at A2A2A3TP1 to be as indicated on the rf millivoltmeter.

TS-5 Measure the gated 500-kHz input signal to the LSB if./audio amplifier at A2A3A3TP1 to be as indicated on the rf millivoltmeter.

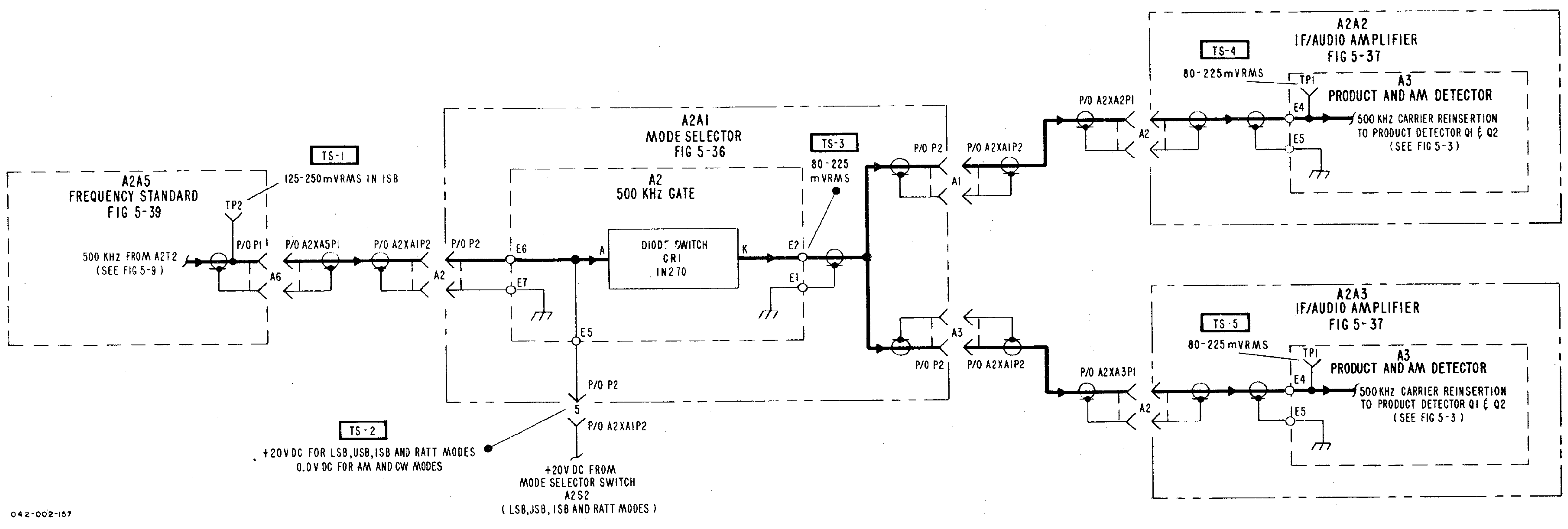


Figure 5-4. 500 kHz Gating, Signal Flow Diagram

TEST DATA FOR FIGURE 5-5

GENERAL

A. Test Equipment Required:
RF Signal Generator CAQI-606-B or equivalent
Audio Signal Generator AN/URM-127 or equivalent
AC Voltmeter ME-6( )/U or equivalent (2 required)
Oscilloscope AN/USM-281( ) or equivalent
Earphone headset
Extender cable for Receiver IF./Audio Amplifier Assembly A2A2
Resistor, 600 ohms

B. References. If necessary, make the following references:
Functional description, paragraph 3-67
Troubleshooting sequence, figure 5-24
Corrective maintenance, paragraph 6-20
Physical location of test points, figures 7-12 and 7-14

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	AGC switch A2S3	SLOW
	Audio level meter switch A2S1	USB
	Hz switch A2A11S1	000
	Frequency controls	2.100 MHz

D. Test Setup.

(1) Apply the rf output from the rf signal generator to the receiver ANT jack A1J23. Set the rf signal generator output for a frequency of 2.101 MHz, at 500 μV.

(2) Remove Receiver IF./Audio Amplifier Assembly A2A2 from receiver, and reconnect via the extender cable.

(3) Loosen the screws and remove cover from if./audio amplifier A2A2.

(4) Connect a 600-ohm terminating resistor between pins A and B of USB AUDIO OUT jack A1A1J5. Connect vertical input of oscilloscope and ac voltmeter input to pins A and B of A1A1J5; connect pin B to low side of ac voltmeter. Set the mode selector switch A2S2 to USB.

NOTE

Adjust the rf signal generator for optimum output frequency by adjusting its vernier frequency control for maximum audio output as observed on the ac voltmeter at A1A1J5.

TEST DATA FOR FIGURE 5-5 (Cont)

E. Mode Selector Switch Contacts.

SWITCH A2S2B - FRONT

FUNCTION	TERMINAL
OFF	NO CONNECTION
STD BY	NO CONNECTION
RATT	2 TO 4
AM	3 TO 5
CW	4 TO 6
USB	5 TO 7

SPECIFIC

Test Steps:

TS-1 — Refer to notes C and D before performing test. Using the ac voltmeter, measure the product detector output audio signal level to be as indicated at A2A2A1E6.

TS-2 — Measure the signal level at A2A2A2E8 to be as indicated; ac voltmeter indication depends on setting of USB LEVELS LINE control A2R2.

TS-3 — Measure the audio signal level between A2E26 and A2E23 to be as indicated; ac voltmeter indication depends on setting of USB LEVELS LINE control A2R2. The ac voltmeter connected across pins A and B of A1A1J5 gives the same indication as TS-3. Disconnect 600-ohm load from pins A and B of A1A1J5, and connect between pins e and d of A1A1J4. Connect ac voltmeter to pins e and d of A1A1J4, with low side of meter connected to pin e. Ac voltmeter shows same indication as in TS-3.

TS-4 — The indication of the AUDIO LEVEL meter A2M1 varies with the setting of the USB LEVELS LINE control A2R2: the minimum meter indication for a fully counterclockwise position of the control is less than -8 dB; the maximum meter indication for a fully clockwise position of the control is 20 ± 2 dB. Set USB LEVELS LINE control A2R2 for 0.77 volt on ac voltmeter; AUDIO LEVEL meter A2M1 should indicate 0 ±2 dB.

TS-5 — With earphones connected to the PHONE USB jack A2J2, the audio level should follow the variation of the USB LEVELS PHONE control A2R5. With USB LEVELS LINE control A2R2 set so that AUDIO LEVEL meter A2M1 indicates 0 dB, the USB phone level should vary in intensity of tone at the earphones from an adequate audible level at a fully clockwise setting of USB LEVELS PHONE control A2R5 to no tone at a fully counterclockwise setting.

TEST DATA FOR FIGURE 5-5 (Cont)

TS-6 Connect ac voltmeter between pin b of connector A1A1J4 and ground. The test point measurement on the ac voltmeter is as shown for the AUDIO LEVEL meter A2M1 indication of 0 dB, as adjusted by USB LEVELS LINE control A2R2, and with USB LEVELS PHONE control A2R5 adjusted fully clockwise.

TS-7 Connect the ac voltmeter between pin H of connector A1A1J4 and ground. Set the mode selector switch A2S2 to RATT, then USB, and measure the voltage indicated on the ac voltmeter. Set the mode selector switch A2S2 to CW, adjust the BFO control to obtain approximately 1000-Hz tone, and measure the voltage to be as indicated on the ac voltmeter. Set the mode selector switch A2S2 to AM, modulate the rf signal generator with 1000 Hz at 30 percent, and measure the voltage indicated on the ac voltmeter. Adjust USB LEVELS LINE control A2R2 as necessary to maintain a reading of 0 dB on AUDIO LEVEL meter A2M1 during each of these measurements.

TS-8 Using the ac voltmeter, make the signal measurement at A2A2A1E5 to be as indicated.

TS-9 Measure the signal voltage at A2A2A1E6 to be as indicated on the ac voltmeter.

TS-10 Disconnect the rf signal generator from the ANT jack A1J23. Connect audio signal generator to pins Y and Z (ground) of connector A1A1J4. Set USB LEVELS LINE control A2R2 fully clockwise. Connect the ac voltmeter to terminal A2A2A2E7, and adjust the audio signal generator for 1000 Hz, 130 mV rms.

TS-11 Measure the signal voltage at A2A2A2E5 to be as indicated on the ac voltmeter. A 1000-Hz tone should be heard at earphones connected to the PHONE USB jack A2J2 with the appropriate settings of USB LEVELS LINE and PHONE controls A2R2 and A2R5.

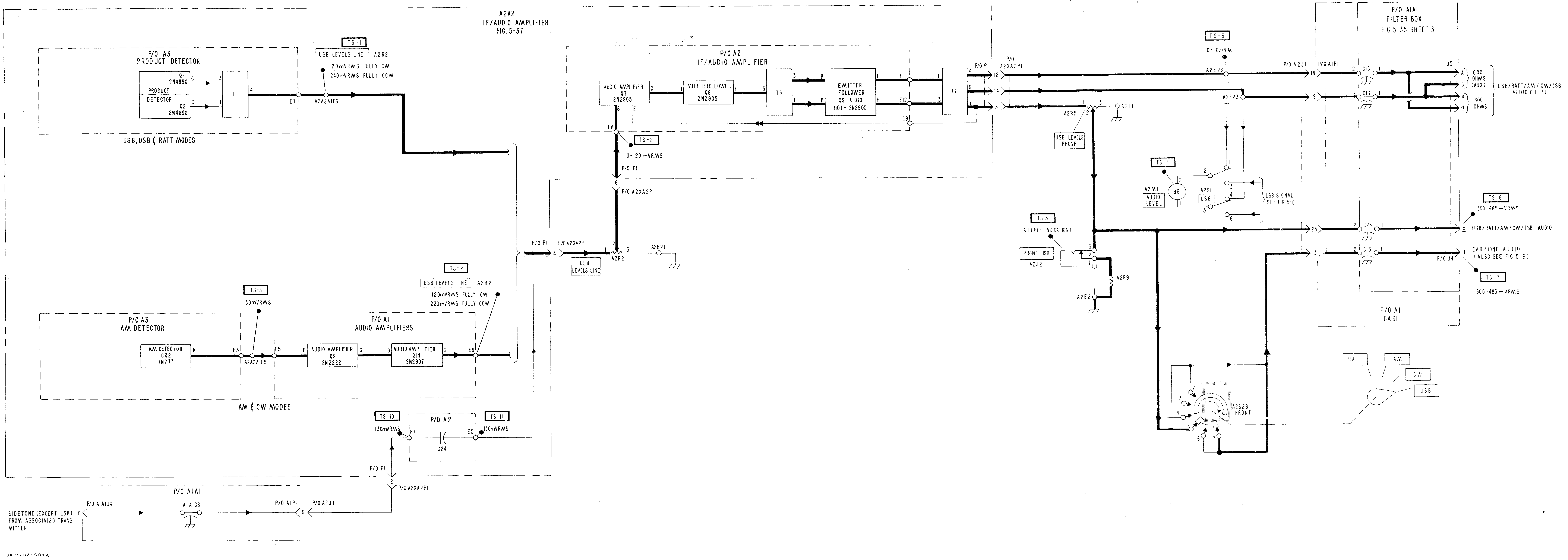


Figure 5-5. Audio Amplification (USB, RATT, AM and CW Modes), Signal Flow Diagram

TEST DATA FOR FIGURE 5-6

GENERAL

A. Test Equipment Required:
RF Signal Generator CAQI-606-B or equivalent
Audio Signal Generator AN/URM-127 or equivalent
AC Voltmeter ME-6( )/U or equivalent (2 required)
Oscilloscope AN/USM-281( ) or equivalent
Earphone headset
Extender cable for Receiver IF./Audio Amplifier Assembly A2A3
Resistor, 600 ohms

B. References. If necessary, make the following references:
Functional description, paragraph 3-67
Troubleshooting sequence, figure 5-25
Corrective maintenance, paragraph 6-20
Physical location of test points, figures 7-12 and 7-14

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	AGC switch A2S3	SLOW
	Audio level meter switch A2S1	LSB
	Hz switch A2A11S1	000
	Frequency controls	2.100 MHz

D. Test Setup.

(1) Apply the rf output from the signal generator to the receiver ANT jack A1J23. Set the signal generator output for a frequency of 2.099 MHz, at 500 μV.

(2) Remove Receiver IF./Audio Amplifier Assembly A2A3 from receiver, and reconnect via the extender cable.

(3) Loosen the screws and remove cover from if./audio amplifier A2A3.

(4) Connect a 600-ohm terminating resistor between pins A and B of LSB AUDIO OUT jack A1A1J6. Connect vertical input of oscilloscope and ac voltmeter input to pins A and B of jack A1A1J6; connect pin B to low side of ac voltmeter. Set the mode selector switch A2S2 to LSB.

NOTE

Adjust the rf signal generator for optimum frequency output by adjusting its vernier frequency control for maximum audio output as observed on the ac voltmeter at A1A1J6.

TEST DATA FOR FIGURE 5-6 (Cont)

SPECIFIC

Test Steps:

TS-1 Refer to notes C and D before performing test. Measure the audio signal level at the output of the product detector at A2A3A1E6 to be as indicated on the ac voltmeter.

TS-2 Measure the signal level at A2A3A2E8 to be as indicated; ac voltmeter indication depends on setting of LSB LEVELS LINE control A2R1.

TS-3 Measure the audio signal level between A2E36 and A2E33 to be as indicated; ac voltmeter indication depends on setting of LSB LEVELS LINE control A2R1. Connect A2E33 to low side of ac voltmeter. The ac voltmeter connected across pins A and B of A1A1J6 shows the same indication as TS-3. Disconnect 600-ohm load from pins A and B of A1A1J6, and connect between pins m and n of connector A1A1J4. Connect ac voltmeter to pins m and n of A1A1J4, with low side of meter connected to pin n. Ac voltmeter shows same indication as TS-3.

TS-4 Indication of AUDIO LEVEL meter A2M1 varies with setting of LSB LEVELS LINE control A2R1: the minimum meter indication for a fully counterclockwise position of A2R1 is less than -8 dB; the maximum indication for a fully clockwise position of A2R1 is 20 ±2 dB. Set the LSB LEVELS LINE control A2R1 for 0.77 volt on ac voltmeter. AUDIO LEVEL meter A2M1 should indicate 0 ±2 dB.

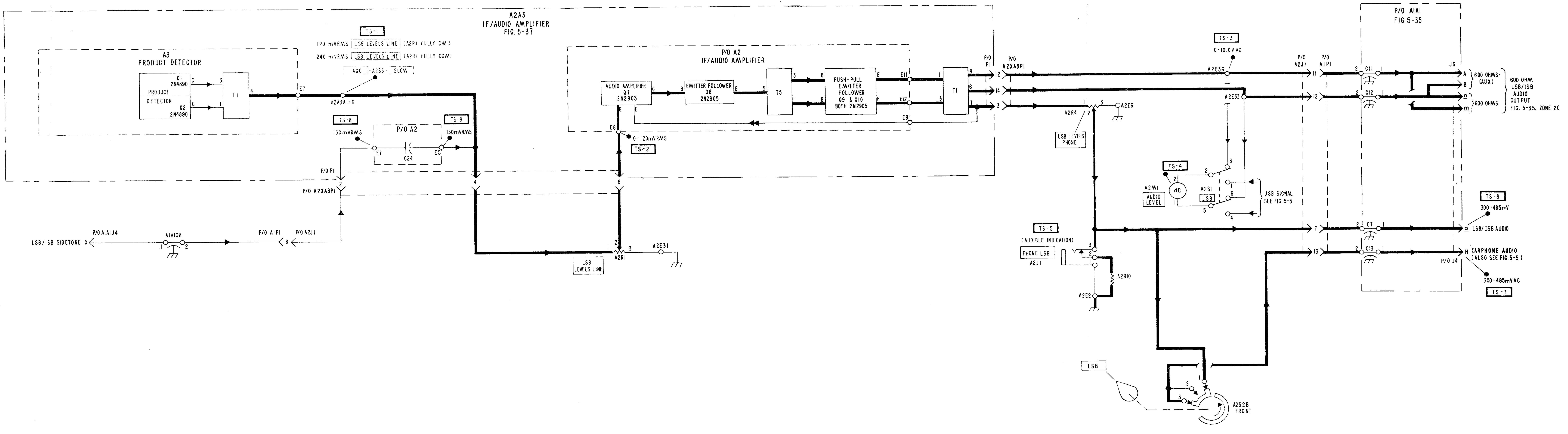
TS-5 With earphones connected to PHONE LSB jack A2J1, the audio level should follow the level of the LSB LEVELS PHONE control A2R4. With the LSB LEVELS LINE control A2R1 set at 0 dB on AUDIO LEVEL meter A2M1, the LSB phone level should vary in intensity of tone at the earphones from an adequate audible level at a fully clockwise setting of LSB LEVELS PHONE control A2R4 to no tone at a fully counterclockwise setting of A2R4.

TS-6 Connect ac voltmeter between pin a of connector A1A1J4 and ground. The test point measurement is as shown for an AUDIO LEVEL meter A2M1 indication of 0 dB, as adjusted by LSB LEVELS LINE control A2R1, and with LSB LEVELS PHONE control A2R4 adjusted fully clockwise.

TS-7 Connect the ac voltmeter between pin H of connector A1A1J4 and ground. The indication is as shown for LSB.

TS-8 Disconnect the rf signal generator from ANT jack A1J23, and connect the audio signal generator to the LSB sidetone input at pins X and Z (ground) of connector A1A1J4. Set the LSB LEVELS LINE control A2R1 fully clockwise. Connect the ac voltmeter to terminal A2A3A2E7. Set audio signal generator for 1000 Hz, 130 mV rms.

TS-9 Measure the signal at A2A3A2E5 to be as indicated on the ac voltmeter. A 1000-Hz tone should be heard at the PHONE LSB jack A2J1 with the appropriate settings of the LSB LEVELS LINE and PHONE controls A2R1 and A2R4.



042-002-011

Figure 5-6. Audio Amplification (LSB Mode), Signal Flow Diagram

TEST DATA FOR FIGURE 5-7

GENERAL

A. Test Equipment Required:
Electronic Multimeter AN/USM-116( ) or equivalent
RF Signal Generator CAQI-606-B or equivalent
Extender cables for Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3

B. References: If necessary, make the following references:
Functional description, paragraph 3-58
Troubleshooting sequence, figure 5-26
Corrective maintenance, paragraph 6-21
Physical location of test points, figures 7-12 and 7-14

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	Frequency controls	2.100 MHz

D. Test Setup.

(1) Apply the input from the rf signal generator to the receiver ANT jack A1J23. Set the signal generator output for a frequency of 2.101 MHz, at 500 μV rms.

(2) Remove Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3 from receiver, and reconnect them via the extender cables.

(3) Loosen screws and remove covers from if./audio amplifiers.

SPECIFIC

NOTE

This test procedure requires making measurements at each of seven test points with the mode selector switch A2S2 at USB and the AGC switch A2S3 each of its three positions when testing Receiver IF./Audio Amplifier Assembly A2A2 (a total of 21 measurements). The entire procedure is then repeated with the mode selector switch A2S2 at LSB when testing Receiver IF./Audio Amplifier Assembly A2A3. The input frequency from the rf signal generator is set at 2.101 MHz for A2A2, and at 2.099 MHz for A2A3. The procedure given below tests each test point individually on both assemblies and in all positions of AGC switch A2S3. However, it may be more convenient to test each of the assemblies separately, or to perform the testing in order by the positions of AGC switch A2A3. Therefore, the entire test procedure is summarized in the chart which follows the test steps.

TEST DATA FOR FIGURE 5-7 (Cont)

Test Steps:

TS-1 Refer to notes C and D before performing test. Set mode selector switch A2S2 to USB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure dc control input to agc/audio amplifier at A2A2A1E3 to be as indicated on electronic multimeter. Set rf signal generator output for 2.099 MHz. Set mode selector switch A2S2 to LSB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure dc control input to agc/audio amplifier at A2A3A1E3 to be as indicated on electronic multimeter.

TS-2 Set rf signal generator output for 2.101 MHz. Set mode selector switch A2S2 to USB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure dc control input to agc/audio amplifier at A2A2A1E10 to be as indicated on electronic multimeter. Set rf signal generator output for 2.099 MHz. Set mode selector switch A2S2 to LSB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure dc control input to agc/audio amplifier at A2A3A1E10 to be as indicated on electronic multimeter.

TS-3 Set rf signal generator output for 2.101 MHz. Set mode selector switch A2S2 to USB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the voltage level at A2A2A1R13 to be as indicated on electronic multimeter. Set rf signal generator output for 2.099 MHz. Set mode selector switch A2S2 to LSB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the voltage level at A2A3A1R13 to be as indicated on electronic multimeter.

TS-4 Set signal generator output for 2.101 MHz. Set mode selector switch A2S2 to USB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position measure the voltage level at A2A2A1R18 to be as indicated on electronic multimeter. Set rf signal generator output for 2.099 MHz. Set mode selector switch A2S2 to LSB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the voltage level at A2A3A1R18 to be as indicated on electronic multimeter.

TS-5 Set signal generator output for 2.101 MHz. Set mode selector switch A2S2 to USB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the voltage level at A2A2A1C1 to be as indicated on electronic multimeter. Set rf signal generator output for 2.099 MHz. Set mode selector switch A2S2 to LSB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the voltage level at A2A3A1C1 to be as indicated on electronic multimeter.

TS-6 Set signal generator output for 2.101 MHz. Set mode selector switch A2S2 to USB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the voltage level at A2A2A1TP1 to be as indicated on electronic multimeter. Set rf signal generator output for 2.099 MHz. Set mode selector switch A2S2 to LSB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the voltage level at A2A3A1TP1 to be as indicated on electronic multimeter.

TEST DATA FOR FIGURE 5-7 (Cont)

CAUTION

Observe minus voltages at test step TS-7.

TS-7

Set signal generator output for 2.101 MHz. Set mode selector switch A2S2 to USB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the USB if./audio amplifier output level at A2A2A1TP2 to be as indicated on electronic multimeter. Set rf signal generator output for 2.099 MHz. Set mode selector switch A2S2 to LSB, and AGC switch A2S3 consecutively to OFF, SLOW, and FAST. At each position, measure the LSB if./audio amplifier output level at A2A3A1TP2 to be as indicated on electronic multimeter.

TEST DATA FOR FIGURE 5-7 (Cont)

AGC TEST MEASUREMENT SUMMARY CHART

When testing assembly A2A2, set mode selector switch A2S2 to USB, and set rf signal generator output for 2.101 MHz. When testing assembly A2A3, set mode selector switch A2S2 to LSB, and set rf signal generator output for 2.099 MHz.

TEST STEP	TEST POINT (A2A2 OR A3A2)	AGC SWITCH A2S3 OFF	AGC SWITCH A2S3 SLOW	AGC SWITCH A2S3 FAST
TS-1	A1E3	0 Vdc	+1.5 Vdc (Nominal)	+20 Vdc
TS-2	A1E10	+1.0 to +2.0 Vdc*	0 Vdc	0 Vdc
TS-3	A1R13	0 Vdc	+2.1 Vdc (Nominal)	+2.1 Vdc (Nominal)
TS-4	A1R18	+4 Vdc (Nominal)	+20 Vdc	+20 Vdc
TS-5	A1C1	-0.26 to +6.6 Vdc	+3.2 to +3.5 Vdc	0 Vdc (Nominal)
TS-6	A1TP1	+0.4 to +1.2 Vdc *(Nominal)	+0.9 Vdc (Nominal)	+0.9 Vdc (Nominal)
		CAUTION		
		Observe minus voltages at test step TS-7.		
TS-7	A1TP2	0 to -23 Vdc *(Nominal)	-9.3 to -7.5 Vdc	-9.3 to -7.5 Vdc

* Voltage indication varies between these limits for the fully clockwise to fully counterclockwise position of RF GAIN control A2R3.

Note: Refer to paragraph 5-1 "NOTE", regarding nominal values and ranges of measurements shown in this figure.

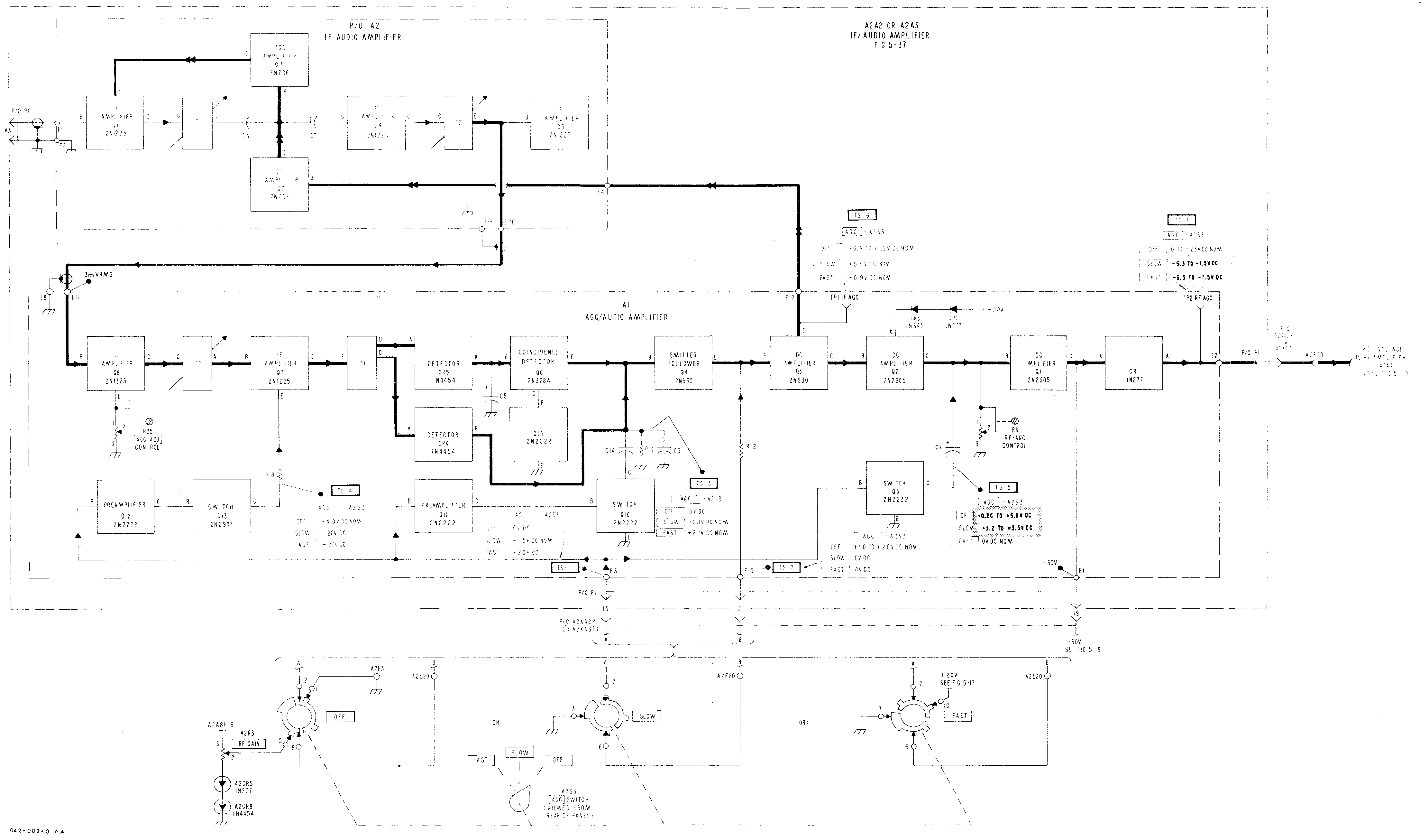


Figure 5-7. Automatic Gain Control, Signal Flow Diagram

TEST DATA FOR FIGURE 5-8

GENERAL

A. Test Equipment Required:
Electronic Multimeter AN/USM-116( ) or equivalent
RF Millivoltmeter CCVO-91CA or equivalent
AC Voltmeter ME-6( )/U or equivalent
Oscilloscope AN/USM-281( ) or equivalent
RF Signal Generator CAQI-606-B or equivalent
Earphone headset
Extender cables for Receiver Mode Selector Assembly A2A1 (2 required)
Resistor, 600 ohms

B. References. If necessary, make the following references:
Functional description, paragraph 3-56
Troubleshooting sequence, figure 5-27
Corrective maintenance, paragraph 6-15
Physical location of test points, figures 7-8 and 7-10

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	AGC switch A2S3	SLOW
	Hz switch A2A11S1	000
	Frequency controls	2.100 MHz

D. Test Setup.

(1) Remove Receiver Mode Selector Assembly A2A1 from receiver, and reconnect it via extender cables.

(2) Loosen screws and remove cover of mode selector.

(3) Connect a 600-ohm resistor across pins A and B of USB AUDIO OUT jack A1A1J5. Connect oscilloscope and ac voltmeter across pins A and B of A1A1J5, with the low side of ac voltmeter at pin B.

TEST DATA FOR FIGURE 5-8 (Cont)

SPECIFIC

Test Steps:

TS-1 Refer to notes C and D before performing test. Set mode selector switch A2S2 to CW. Using electronic multimeter, measure the BFO frequency control voltage from BFO frequency control A2R6 at A2A1A3E1 with A2R6 set fully counterclockwise and then fully clockwise. The voltage indications should be within the levels shown.

TS-2 Using rf millivoltmeter, measure the BFO output voltage at the emitter of variable frequency BFO A2A1A3Q1 to be as indicated at junction of resistors A2A1A3R5 and R6.

TS-3 Using rf millivoltmeter, measure the BFO output level from the output of buffer amplifier A2A2A3Q2 to be as indicated at A2A1A3TP1.

Connect rf signal generator to ANT jack A1J23, and adjust the output for a frequency of 2.100 MHz, at 500 μV. Connect headset to PHONE USB jack A2J2. With the USB LEVELS LINE control A2R2 at midrange and USB LEVELS PHONE control A2R5 at the fully clockwise position, vary BFO frequency control A2R6. An audible tone should be heard in the earphones with a zero beat near the midrange of BFO control A2R6.

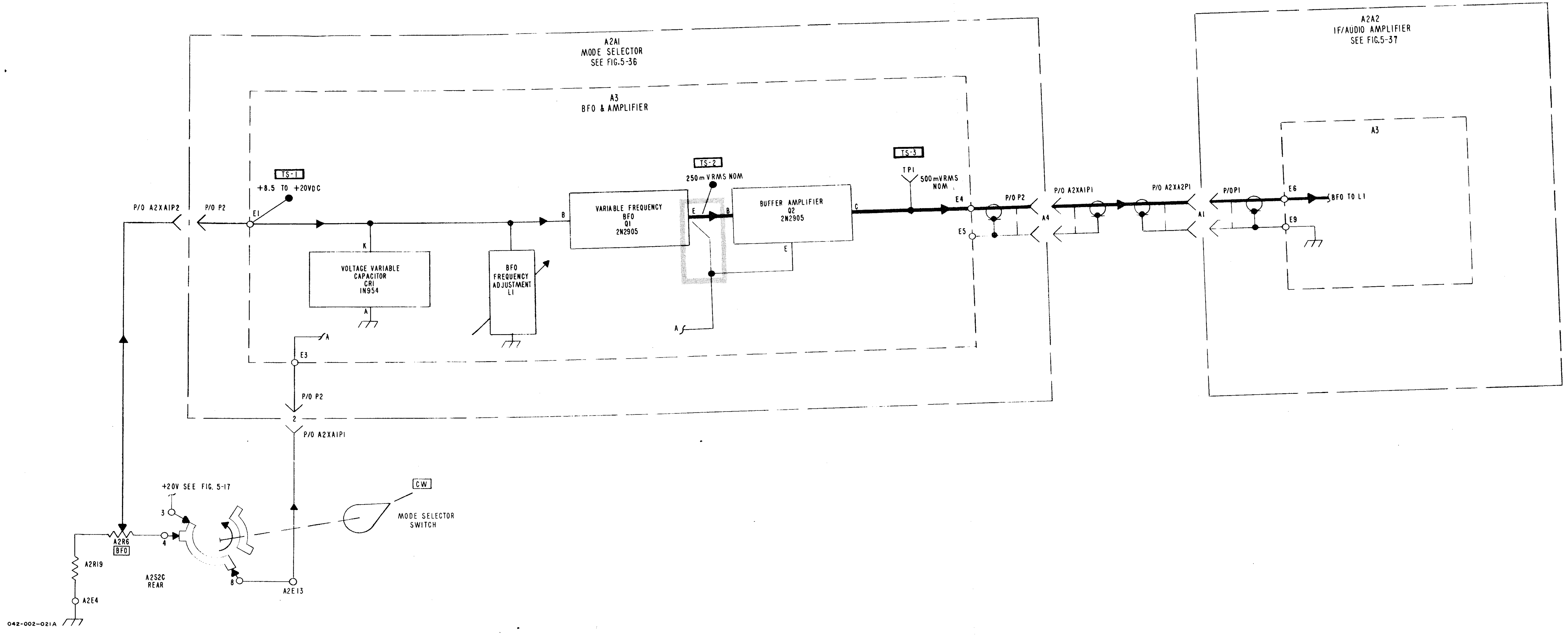


Figure 5-8. Beat Frequency Oscillator, Signal Flow Diagram

TEST DATA FOR FIGURE 5-9

NOTE

These test procedures are to be performed at a depot only, and not aboard ship.

GENERAL

A. Test Equipment Required:
RF Millivoltmeter CCVO-91CA or equivalent
Dummy Load DA-91A/U or equivalent
Extender cable for Frequency Standard Assembly A2A5

B. References. If necessary, make the following references:
Functional description, paragraph 3-133
Troubleshooting sequence, figure 5-28
Correction maintenance, table 6-5
Physical location of test points, figures 7-59 and 7-62

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	COMP/INT/EXT switch A2A5A2S1	INT
	Frequency controls	2.100 MHz

D. Test Setup.

(1) Remove Frequency Standard Assembly A2A5 from receiver, and reconnect it via extender cable.

(2) Loosen screws and remove cover from frequency standard.

E. COMP/INT/EXT Switch Contacts.

SWITCH A2A5A2S1

FUNCTION	CONTACTS
COMP	3-4, 7-8, 11-12
INT *	2-4, 6-8, 10-12
EXT	1-4, 5-8, 9-12

* Position Shown

TEST DATA FOR FIGURE 5-9 (Cont)

SPECIFIC

Test Steps:

TS-1	Refer to notes C and D before performing test. Set mode selector switch A2S2 to ISB. Using the rf millivoltmeter, measure the 5-MHz oscillator output signal at A2A5A2CR4 to be as indicated.
TS-2	Attach dummy load to INT 5 MC OUT jack A1J24. Set COMP/INT/EXT switch A2A5A2S1 to COMP. Measure the 5-MHz signal level at A2A5A2TP1 to be as indicated on rf millivoltmeter.
TS-3	Measure the 5-MHz standard output frequency level at A1J24 to be as indicated on rf millivoltmeter.
TS-4	Return COMP/INT/EXT switch A2A5A2S1 to INT. Measure the 500-kHz signal level at A2A5A2R26 to be as indicated on rf millivoltmeter.
TS-5	Measure the 500-kHz signal level at A2A5A2TP2 to be as indicated on rf millivoltmeter.
TS-6	Measure the 1-MHz signal level at A2A5A2R17 to be as indicated on rf millivoltmeter.
TS-7	Measure the 1-MHz output signal level at A2A5A2T1, accessible at A2A5A2R20, to be as indicated on rf millivoltmeter.
TS-8	Measure the 10-MHz output signal level at resistor A2A5A2R55 to be as indicated on rf millivoltmeter.

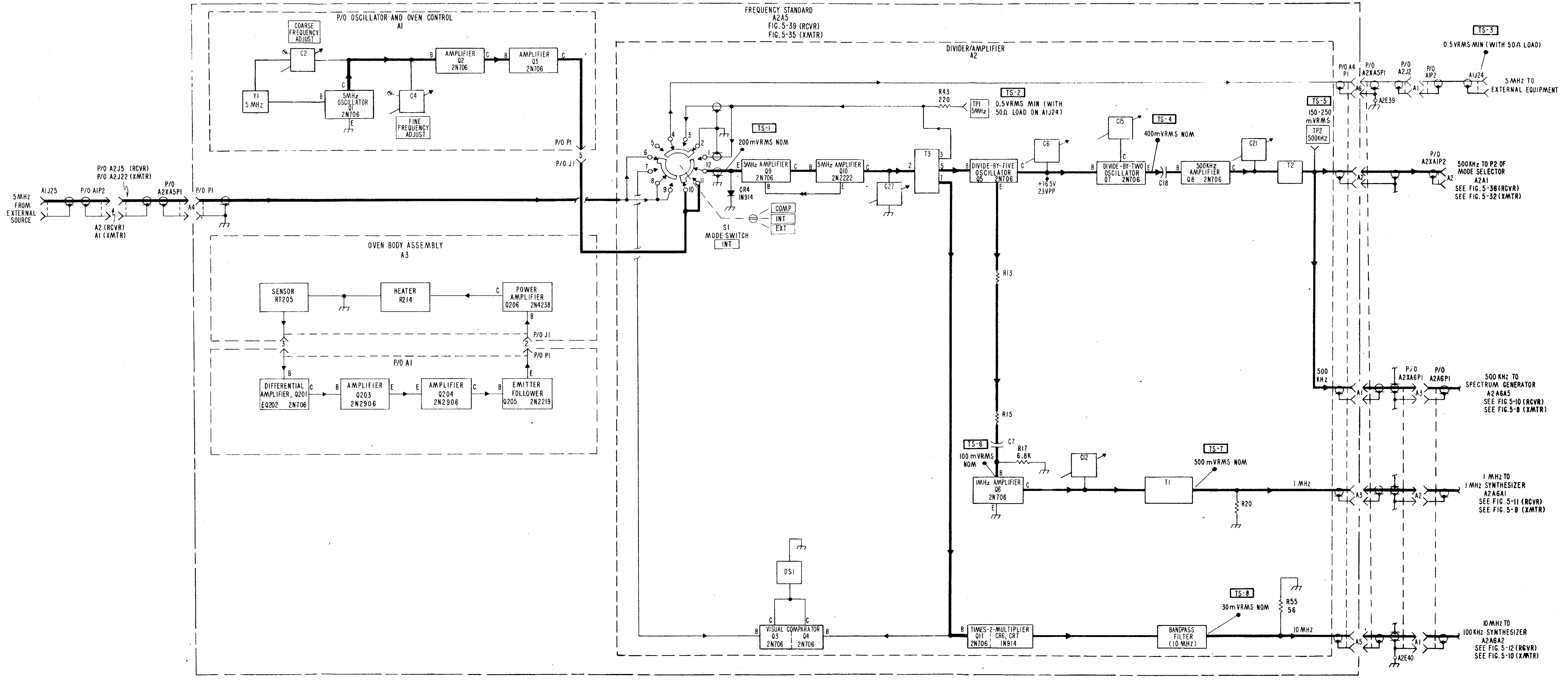


Figure 5-9. Standard Frequency Generation and Distribution, Signal Flow Diagram

TEST DATA FOR FIGURE 5-10

NOTE

These test procedures are to be performed at a depot only, and not aboard ship.

GENERAL

A. Test Equipment Required:
RF Signal Generator CAQI-606-B or equivalent
Oscilloscope AN/USM-281( ) or equivalent
Spectrum Analyzer HP-8552A/8553L/140S or equivalent
Translator/Synthesizer Test Set TS-2133/WRC-1
Power Supply, +20 Vdc
Extender cables

B. References. The waveforms mentioned in this procedure are shown in figure 5-45. If necessary, make the following references:
Functional description, paragraph 3-118
Troubleshooting sequence, figure 5-29
Corrective maintenance, table 6-10
Physical location of test points, figures 7-80 through 7-82

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	Frequency controls	2.100 MHz minimum
	Hz switch A2A11S1	000

D. Test Setup.

(1) Remove translator/synthesizer from receiver chassis, and use extender cables to connect it into receiver or install in the Translator/Synthesizer Test Set TS-2133/WRC-1.

(2) Loosen screws and remove cover from Spectrum Generator Subassembly A2A6A5.

(3) If the test procedure is being performed with the translator/synthesizer connected to a receiver chassis, set the mode selector switch A2S2 to LSB.

(4) If the test procedure is being performed in the test set, and 500 kHz and +20 Vdc are not supplied by the test set, make the following additional connections:

(a) Connect the rf signal generator to spectrum generator jack A2A6A5A1J1, and set it for an output of 500 kHz ±100 Hz, 175 mV rms.

(b) Connect +20-Vdc to spectrum generator jack A2A6A5A3J2.

TEST DATA FOR FIGURE 5-10 (Cont)

SPECIFIC

NOTE

While the waveform observations required in the following test steps may be made with a 1:1 probe on the oscilloscope, it is preferable to use a 10:1 probe.

Test Steps:

TS-1	Refer to notes C and D before performing test. Using the oscilloscope, observe the waveform at A2A6A5A1J1 to be the same as A of figure 5-45.
TS-2	Using the oscilloscope, observe the waveform at A2A6A5A1TP4 to be the same as E of figure 5-45.
TS-3	Using the oscilloscope, observe the waveform at A2A6A5A2TP1 to be the same as J of figure 5-45.
TS-4	Using the oscilloscope, observe the waveform at A2A6A5A2TP4 to be the same as M of figure 5-45.
TS-5	Using the oscilloscope, observe the waveform at A2A6A5A3TP1 to be the same as R of figure 5-45.
TS-6	Using the oscilloscope, observe the waveform at A2A6A5A3TP3 to be the same as T of figure 5-45.
TS-7	Using the oscilloscope, observe the waveform at A2A6A5A4J1 to be the same as Y of figure 5-45.
TS-8	Using the oscilloscope, observe the waveform at A2A6A5A3J1 to be the same as X of figure 5-45. Using the spectrum analyzer at A2A6A5A3J1, observe the spectrum display to be as AB of figure 5-45.
TS-9	Using the oscilloscope, observe the waveform at A2A6A5A2J1 to be the same as Q of figure 5-45. Using the spectrum analyzer at A2A6A5A2J1, observe the spectrum display to be as AA of figure 5-45.
TS-10	Using the oscilloscope, observe the waveform at A2A6A5A1J2 to be the same as H of figure 5-45. Using the spectrum analyzer at A2A6A5A1J2, observe the spectrum display to be as Z of figure 5-45.

NOTE

While the oscilloscope waveforms observed at test steps TS-8, TS-9, and TS-10 indicate that the spectrum generator outputs are satisfactory, it may be conclusively determined that the outputs are acceptable and that the spectrum generator is properly tuned only after examination of these outputs on a spectrum analyzer.

NOTE

Refer to paragraph 5-1 "NOTE", regarding signal measurements and waveforms indicated for this figure.

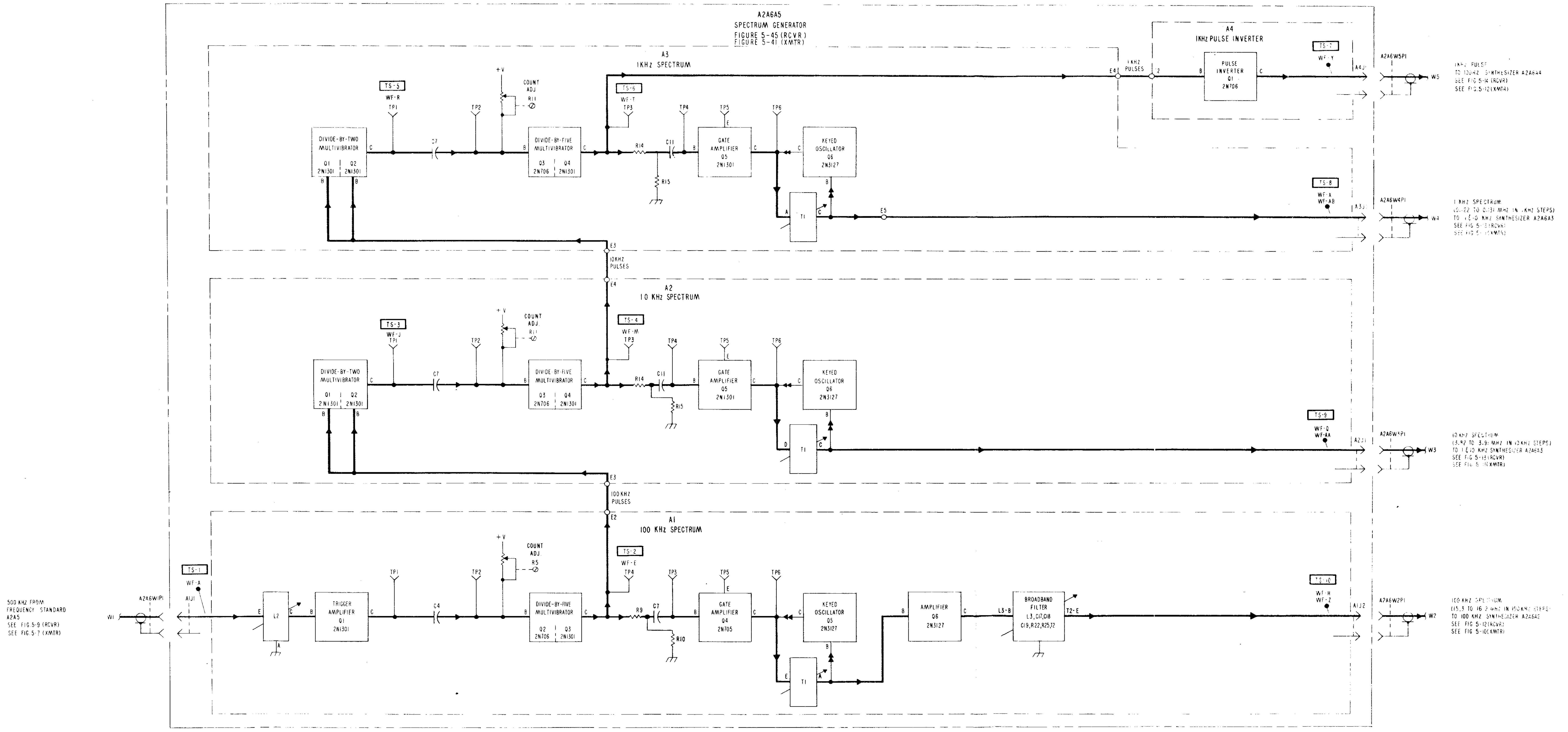


Figure 5-10. Spectrum Generator, Signal Flow Diagram

TEST DATA FOR FIGURE 5-11

GENERAL

A. Test Equipment Required:
RF Millivoltmeter CCVO-91CA or equivalent
Oscilloscope AN/USM-281( ) or equivalent
Electronic Counter AN/USM-207A or equivalent
Heterodyne Voltmeter CDAN-2006 or equivalent (w/60-dB attenuator pad)
Frequency Standard AN/URQ-10( ) or equivalent
Extender cable for 1-MHz Synthesizer Subassembly A2A6A1

B. References. If necessary, make the following references:
Functional description, paragraph 3-83
Troubleshooting sequence, figure 5-30
Corrective maintenance, table 6-6
Physical location of test points, figures 7-68 and 7-69
Frequency synthesization functional block diagram, figure 3-2

C. Preliminary Setup. Make primary power available to the equipment or test set by placing system circuit breaker at ON. If in the equipment, loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	LSB
	Frequency controls	2.100 MHz
	Hz switch A2A11S1	000

D. Test Setup:

(1) Connect a lead from the frequency standard to the appropriate input to the electronic counter, to lock it to Frequency Standard AN/URQ-10( ).

NOTE

To ensure proper accuracy of injection frequency measurement, use a Frequency Standard Assembly A2A5 that has operated for at least three days and is set to the specified 5-MHz output frequency in accordance with the alignment procedures of table 6-5.

(2) Connect oscilloscope (ac coupled) to test point A2A6A1A2TP3 on top of the 1-MHz synthesizer cover. Set oscilloscope controls for 0.1V/cm and 1 ms/cm.

TEST DATA FOR FIGURE 5-11 (Cont)

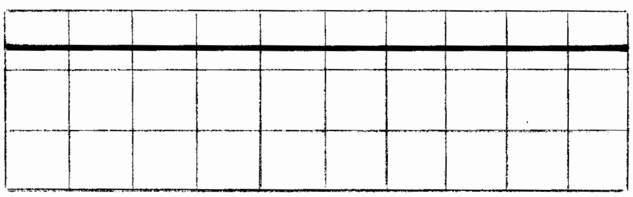
SPECIFIC

Test Steps:

TS-1

Observe 0.2 division of noise on oscilloscope. A horizontal line with no noise indicates failure of 1 MHz from Frequency Standard Assembly A2A5. A waveform with periodic amplitude variation indicates a failure in the 1-MHz synthesizer, and the AFC is searching. With oscilloscope still connected at A2A6A1A2TP3, adjust its controls for a dc input, 5 V/cm, 2 ms/cm, and observe 5 to 17 Vdc on oscilloscope. With 5 to 17 Vdc shown on oscilloscope, this indicates that the 1-MHz synthesizer is in the locked condition. The unlocked condition is indicated by a waveform varying in amplitude by approximately 6 volts, at about a 6-ms rate. See the following typical waveforms.

UNLOCKED CONDITION



LOCKED CONDITION

Position MHz controls, in turn, from 03 (3 MHz) to 29 (29 MHz). Observe that oscilloscope presentation has a ringing effect, and then stabilizes at a dc level between 5 and 17 Vdc.

* TS-2

Remove the translator/synthesizer from the main frame and then remove the 1-MHz synthesizer from the translator/synthesizer. Replace the translator/synthesizer in the main frame, and reconnect the 1-MHz synthesizer using the extender cable. Connect the electronic counter to terminal A2A6A1A1E2 in the 1-MHz synthesizer; set counter to 0.1-volt scale and observe that it indicates 17,500.000 kHz ±1.0 Hz. Rotate the receiver MHz controls from 2 through 29 MHz, and observe the frequency indication on the electronic counter as shown in the following chart:

TEST DATA FOR FIGURE 5-11 (Cont)

MHz DIGIT(S) OF RF INPUT SIGNAL	INJECTION SIGNAL FREQUENCY (kHz)	MHz DIGIT(S) OF RF INPUT SIGNAL	INJECTION SIGNAL FREQUENCY (kHz)
2	17,500 ±1.0 Hz	16	3,500 ±1.0 Hz
3	16,500 ±1.0 Hz	17	12,500 ±1.0 Hz
4	15,500 ±1.0 Hz	18	11,500 ±1.0 Hz
5	14,500 ±1.0 Hz	19	10,500 ±1.0 Hz
6	23,500 ±1.0 Hz	20	9,500 ±1.0 Hz
7	12,500 ±1.0 Hz	21	8,500 ±1.0 Hz
8	11,500 ±1.0 Hz	22	2,500 ±1.0 Hz
9	20,500 ±1.0 Hz	23	3,500 ±1.0 Hz
10	19,500 ±1.0 Hz	24	5,500 ±1.0 Hz
11	8,500 ±1.0 Hz	25	4,500 ±1.0 Hz
12	7,500 ±1.0 Hz	26	3,500 ±1.0 Hz
13	16,500 ±1.0 Hz	27	7,500 ±1.0 Hz
14	5,500 ±1.0 Hz	28	8,500 ±1.0 Hz
15	4,500 ±1.0 Hz	29	9,500 ±1.0 Hz

NOTE

Some injection frequencies appear at more than one position of the MHz controls (e.g., 8.5 MHz appears at frequencies of 11, 21, and 28 MHz). If any one frequency indication is missing or incorrect, first check to see if that frequency appears at all required settings of the receiver MHz controls using the chart above. Failure of the same frequency measurement at all required settings of the MHz frequency controls indicates crystal failure. Failure at only one setting indicates coding failure in Receiver Code Generator Assembly A2A7, or faulty positioning of the MHz switch A2A6A1S1 in the MHz synthesizer. The indicator dial for the A2A6A1S1 switch is located on the bottom of the 1-MHz synthesizer and uses a notch (keyway) on the end of the switch shaft as a pointer.

TEST DATA FOR FIGURE 5-11 (Cont)

To determine correct coding of MHz switch A2A6A1S1, observe the key-way on the bottom of the switch shaft. Rotate the receiver MHz controls from 02 (2 MHz) through 29 (29 MHz), and observe that the notch on the A2A6A1S1 switch shaft points to the appropriate injection frequency on the indicator dial (refer to the frequency chart, above). Failure of switch A2A6A1S1 to align to the correct frequency indicates a coding failure. Using the rf millivoltmeter, measure the signal amplitude at A2A6A1A1E2 to be as indicated.

NOTE

Refer to paragraph 5-1 "NOTE", regarding signal values indicated in this figure and its test steps.

* TS-3 Using a 10:1 probe on the oscilloscope, observe the 1-MHz input reference signal at the anode of A2A6A1A3CR2 to be as indicated by waveform A.

* TS-4 Using a 10:1 probe on the oscilloscope, measure the 1-MHz signal at the case (collector)of A2A6A1A3Q3 to be as indicated by waveform D.

* TS-5 Set the frequency controls to 2.100 MHz. Install the 60-dB pad in the heterodyne voltmeter probe and set the BANDWIDTH switch to NARROW. Connect the heterodyne voltmeter to A2A6A1A3TP1 and measure the signal level with the meter tuned to 1.5 MHz to be as indicated.

* TS-6 Connect the heterodyne voltmeter (set up as in test step 5) to A2A6A1A3E5 and measure the signal level with the meter tuned to 1.5 MHz to be as indicated.

* TS-7 Set MHz controls to 22 (22 MHz). Using a 10:1 probe on the oscilloscope, observe the feedback signal at A2A6A1A3E7 to be a 2.5-MHz signal as indicated.

* TS-8 Using a 10:1 probe on the oscilloscope, observe the 1.5-MHz signal at A2A6A1A2TP1 to be as indicated.

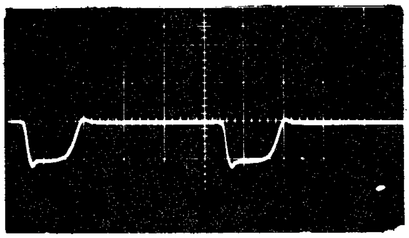
* TS-9 Using the oscilloscope (dc coupled), measure the dc voltage from the output of the low-pass filter at A2A6A1A2TP2 to be as indicated.

* TS-10 Using a 10:1 probe on the oscilloscope, observe the 2.5-MHz signal at the case (collector) of A2A6A1A1Q2 to be as indicated.

*Measurement made at depot only.

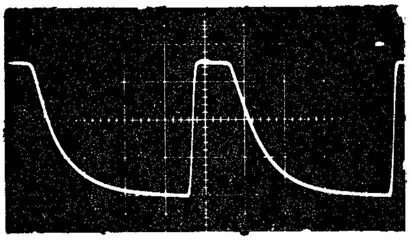
TEST DATA FOR FIGURE 5-11 (Cont)

A



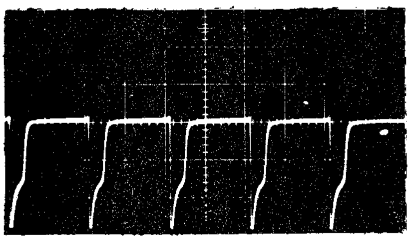
A3CR2 ANODE
0.2 μSEC/CM
0.5V/CM

B



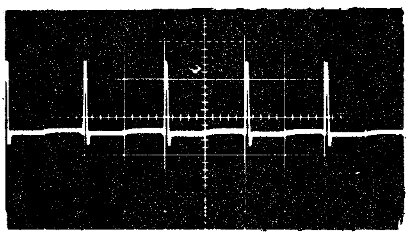
A3 Q1-C
0.2 μSEC/CM
2V/CM

C



A3 Q2-C
0.5 μSEC/CM
2V/CM

D



A3 Q3-C
0.5 μSEC/CM
2V/CM

Figure 5-11. 1-MHz Synthesizer, Signal Flow Diagram

TEST DATA FOR FIGURE 5-12

GENERAL

A. Test Equipment Required:
Electronic Multimeter AN/USM-116( ) or equivalent
RF Millivoltmeter CCVO-91CA or equivalent
Electronic Counter AN/USM-207A or equivalent
Frequency Standard AN/URQ-10( )
Extender cables for Translator/Synthesizer Assembly A2A6 (3 required)
Extender cable for 100-kHz Synthesizer Subassembly A2A6A2

B. References. If necessary, make the following references:
Functional description, paragraph 3-89
Troubleshooting sequence, figure 3-31
Corrective maintenance, table 6-7
Physical location of test points, figures 7-71 thru 7-74

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	Hz switch A2A11S1	000
	Frequency controls	5.000 MHz
	Aux/Normal switch	AUX

D. Test Setup.

(1) Connect rf millivoltmeter to 100-kHz Synthesizer Assembly A2A6A2A5TP1.

(2) Connect output of external frequency standard to external standard frequency input of electronic counter, to ensure accuracy of frequency measurements.

SPECIFIC

NOTE

Refer to paragraph 5-1 "NOTE", regarding signal values indicated in these test steps and the figure.

Test Steps:

TS-1 Refer to notes C and D before performing test. Set mode selector switch A2S2 to LSB. Rotate the 100-kHz frequency control through all 10 positions (0 through 9), while observing the rf millivoltmeter. The output level of the 100-kHz synthesizer is to be as indicated, at all positions of the 100-kHz frequency control.

Set the MHz frequency controls to 06, and again rotate the 100-kHz frequency control through all 10 positions, while observing the rf millivoltmeter. The output signal of the 100-kHz synthesizer is to be as indicated.

TEST DATA FOR FIGURE 5-12 (Cont)

Set the frequency controls to 6.000 MHz, and connect the electronic counter to A2A6A2A5TP1 in place of the rf millivoltmeter. Observe that the counter indicates nominally 32.400000 MHz and note the actual reading (the actual reading may differ from 32.400000 MHz by a few tens of Hertz due to crystal tolerances in the translator/synthesizer). Rotate the 100-kHz frequency control one digit at a time through all 10 positions, while observing the electronic counter at each switch position. As the 100-kHz frequency control is advanced from one position to the next, the 100-kHz digit displayed on the electronic counter must advance in increments of 100 kHz. All other digits displayed on the electronic counter should remain unchanged.

Set the frequency controls to 5.000 MHz, and again rotate the 100-kHz frequency control through all 10 positions, while observing the electronic counter. (At the beginning of this part of the test, the counter should indicate a nominal frequency of 22.400000 MHz.) As the 100-kHz frequency control is advanced, the 100-kHz digit on the electronic counter must change accordingly in 100-kHz increments while all other digits remain unchanged. Return the frequency controls to 5.000 MHz.

NOTE

The following test step measurements are to be made at depot-level only, using Translator/Synthesizer Test Set TS-2133/WRC-1.

* TS-2 — Set mode to LSB. Measure the 4.553- to 5.453-MHz oscillator output at A2A6A2A1E3 for all 10 positions of crystal selector switch A2A6A2S1 to be as indicated on the rf millivoltmeter.

* TS-3 — Measure the 4.553- to 5.453-MHz oscillator output at A2A6A2A1E6 for any position of crystal selector switch A2A6A2S1 to be as indicated on the rf millivoltmeter.

* TS-4 — Measure the agc input voltage at A2A6A2A2E6 for all positions of crystal selector switch A2A6A2S1 to be as indicated on the electronic multimeter.

* TS-5 — Measure the 100-kHz spectrum input at A2A6A2A2E1 to be as indicated on the rf millivoltmeter.

* TS-6 — Measure the output of the 10.747-MHz mixer at A2A6A2A2TP1 to be as indicated on the rf millivoltmeter.

* TS-7 — Measure the input from the 100-Hz Synthesizer Assembly A2A6A4 at A2A6A2A3TP1 to be as indicated on the rf millivoltmeter.

* TS-8 — Verify that the frequency controls are set to 5.000 MHz, and measure the 17.847-MHz output at A2A6A2A3TP2 to be as indicated on the rf millivoltmeter.

* TS-9 — Set the frequency controls to 6.000 MHz, and measure the standard 10-MHz input at A2A6A2A3TP3 to be as indicated on the rf millivoltmeter

TEST DATA FOR FIGURE 5-12 (Cont)

* TS-10 — Verify that the frequency controls are set to 6.000 MHz, and measure the 27.847-MHz output at A2A6A2A3TP4 to be as indicated on the rf millivoltmeter.

* TS-11 — Measure the hi-lo-band control voltage at A2A6A2A3C3 to be as indicated on the electronic multimeter as the frequency controls are switched between 6.000 MHz (hi-band frequency) and 5.000 MHz (lo-band frequency).

* TS-12 — Set the frequency controls to 5.000 MHz, and measure the output of the lo-band mixer at A2A6A2A4TP1 to be as indicated on the rf millivoltmeter.

* TS-13 — Set the frequency controls to 6.000 MHz, and measure the output of the hi-band mixer at A2A6A2A4TP2 to be as indicated on the rf millivoltmeter.

* Measurement made at depot only.

Figure 5-12. 100-kHz Synthesizer, Signal Flow Diagram

TEST DATA FOR FIGURE 5-13

NOTE

Phase test procedures are to be performed at a depot only, and not aboard ship.

GENERAL

A. Test Equipment Required:
RF Millivoltmeter CCVO-91CA or equivalent
Electronic Counter AN/USM-207A or equivalent
Frequency Standard AN/URQ-10( ) or equivalent
Extender cables for Translator/Synthesizer Assembly A2A6 (3 required)
Heterodyne Voltmeter CDAN-2006 (depot only)
Translator/Synthesizer Test Set TS-2133/WRC-1 (depot only)

B. References. If necessary, make the following references:
Functional description, paragraph 3-100
Troubleshooting sequence, figure 5-32
Corrective maintenance, table 6-8
Physical location of test points, figures 7-75 thru 7-78.

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	Hz switch A2A11S1	000
	Frequency controls	2.100 MHz
	Aux/Norm switch	AUX

D. Test Setup.

(1) Remove Translator/Synthesizer Assembly A2A6 from receiver, and reconnect via the three extender cables.

(2) Loosen screws and remove cover from RF Translator Subassembly A2A6A6.

(3) Connect output of frequency standard to external standard frequency input of electronic counter, to ensure accuracy of frequency measurements.

(4) Connect electronic counter to test point A2A6A6A1E9 on rf translator.

TEST DATA FOR FIGURE 5-13 (Cont)

SPECIFIC

Test Steps:

NOTE

Instructions are given in the following steps to switch crystals in the 1- and 10-kHz Synthesizer Subassembly A2A6A3 by manually operating the appropriate couplers in the base of the translator/synthesizer. The 10-kHz coupler is located adjacent to connector A2A6P2, directly under the 1- and 10-kHz synthesizer, and determines the position of crystal selector switch A2A6A3S1. The 1-kHz coupler, which determines the position of crystal selector switch A2A6A3S2, is the other coupler under the 1- and 10-kHz synthesizer. An index arrow for each coupler is stenciled on the base cover plate of the translator/synthesizer, and on the base of the 1- and 10-kHz synthesizer.

TS-1

Refer to notes C and D before performing test. Set mode selector switch A2S2 to LSB. Verify that the 10-kHz and 1-kHz couplers are set to 0. Manually step the 10-kHz coupler through positions 0 to 9, and observe the frequency at A2A6A6A1E9 to be as follows on the electronic counter:

Position of 10-kHz Coupler	Output Frequency from 1- and 10-kHz Synthesizer
0	3,400.000 kHz ±210 Hz
1	3,390.000 kHz ±210 Hz
2	3,380.000 kHz ±210 Hz
3	3,370.000 kHz ±210 Hz
4	3,360.000 kHz ±210 Hz
5	3,350.000 kHz ±210 Hz
6	3,340.000 kHz ±210 Hz
7	3,330.000 kHz ±210 Hz
8	3,320.000 kHz ±210 Hz
9	3,310.000 kHz ±210 Hz

TEST DATA FOR FIGURE 5-13 (Cont)

Return the 10-kHz coupler to 0 and then manually step the 1-kHz coupler through positions 0 to 9, and observe frequency at A2A6A6A1E9 to be as follows on the electronic counter:

Position of 1-kHz Coupler	Output Frequency from 1- and 10-kHz Synthesizer
0	3,400.000 kHz ±210 Hz
1	3,399.000 kHz ±210 Hz
2	3,398.000 kHz ±210 Hz
3	3,397.000 kHz ±210 Hz
4	3,396.000 kHz ±210 Hz
5	3,395.000 kHz ±210 Hz
6	3,394.000 kHz ±210 Hz
7	3,393.000 kHz ±210 Hz
8	3,392.000 kHz ±210 Hz
9	3,391.000 kHz ±210 Hz

Connect the rf millivoltmeter to A2A6A6E9 in place of the electronic counter, and measure the rf output voltage from the 1- and 10-kHz synthesizer to be as indicated for coupler settings as follows. With the 1-kHz coupler set to 0, rotate the 10-kHz coupler through positions 0 through 9. Record the meter reading at each coupler position, and set the 10-kHz coupler to the position having the lowest reading. Then rotate the 1-kHz coupler through positions 0 through 9.

CAUTION

The following test step measurements are to be made with depot Translator/Synthesizer Test Set TS-2133/WRC-1 and Heterodyne Voltmeter CDAN-2006 with BANDWIDTH switch set to NARROW. Use a 60-dB probe attenuator on the heterodyne voltmeter for all measurements over 50 mV rms.

NOTE

Refer to paragraph 5-1 "NOTE", regarding signal values indicated for these test steps and in the figure.

* TS-2 Set the 10-kHz and 1-kHz couplers to 0. Measure the 5.25-MHz oscillator output signal at A2A6A3A1E5 to be as indicated on the heterodyne voltmeter.

* TS-3 Measure the 1.850-MHz oscillator output signal at A2A6A3A2E4 to be as indicated on the heterodyne voltmeter.

* TS-4 Measure the 1- and 10-kHz output and blanker signal at A2A6A3A3TP1, TP2, and TP3 to be as indicated on the heterodyne voltmeter.

TEST DATA FOR FIGURE 5-13 (Cont)

* TS-5 Measure the 5.25-MHz input to the 10-kHz isolation amplifier at A2A6A3A4E2 to be as indicated on the heterodyne voltmeter.

* TS-6 Measure the 5.25-MHz input to the 10-kHz error mixer at A2A6A3A4L3-B (see sketch showing relative position of terminal B) to be as indicated on the heterodyne voltmeter.

* TS-7 Measure the 1.85-MHz input to the 1-kHz isolation amplifier at A2A6A3A4E13 to be as indicated on the heterodyne voltmeter.

* TS-8 Measure the 1.85-MHz input to the 1-kHz error mixer at A2A6A3A4L4-B (see sketch showing relative position of terminal B) to be as indicated on the heterodyne voltmeter.

* TS-9 Measure the 10-kHz error signal at the output terminal of 9.07-MHz filter A2A6A3A4FL1 to be as indicated on the heterodyne voltmeter.

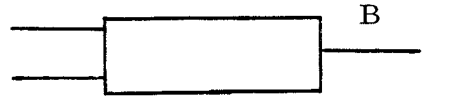
* TS-10 Measure the 1-kHz error signal at the output terminal of 1.981-MHz filter A2A6A3A4FL2 to be as indicated on the heterodyne voltmeter.

* TS-11 Measure the 7.089-MHz composite error signal at A2A6A3A4E6 to be as indicated on the heterodyne voltmeter.

*Depot level measurements only.

NOTE

Relative position of terminal B on A2A6A3A4L3 and A2A6A3A4L4.



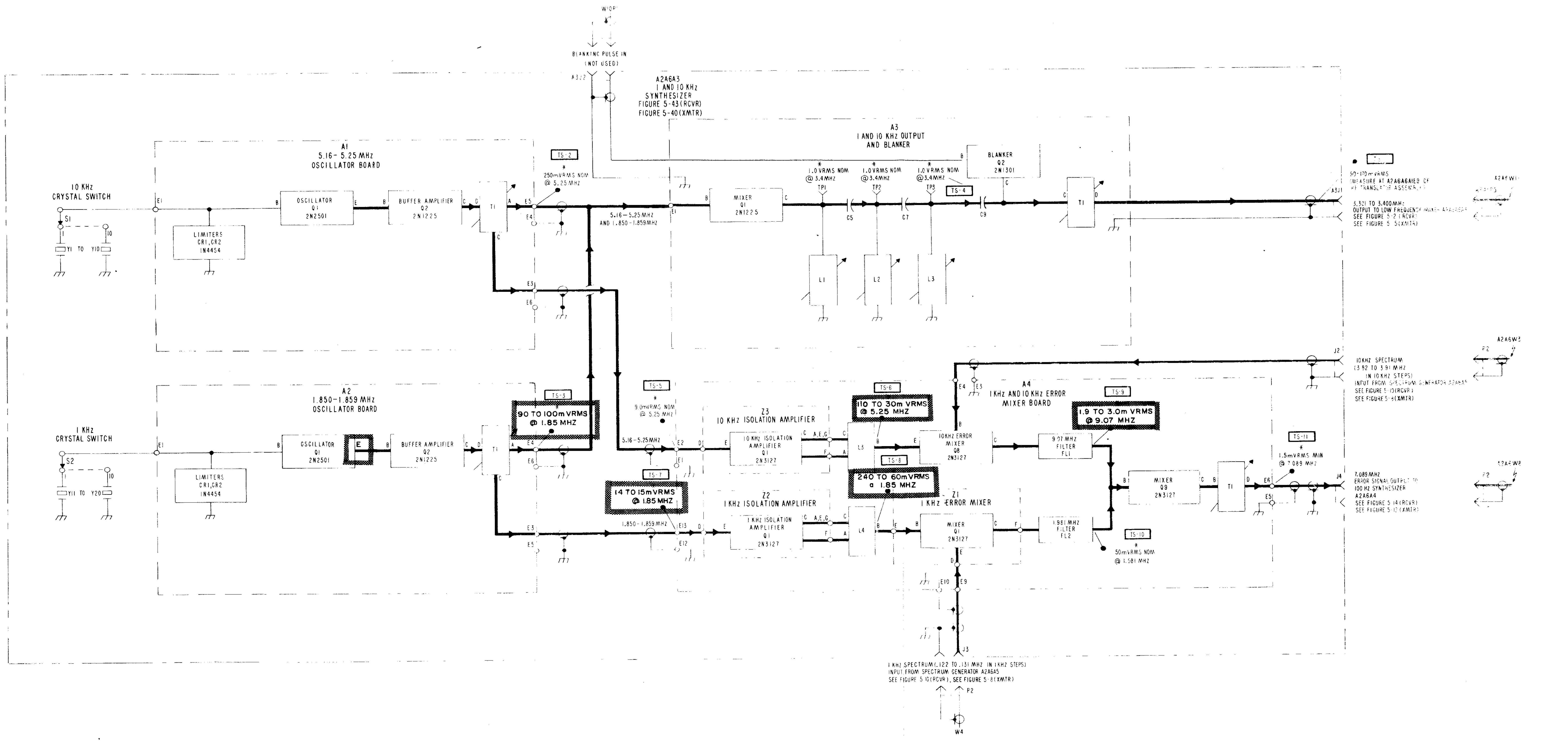


Figure 5-13. 1- and 10-kHz Synthesizer, Signal Flow Diagram

TEST DATA FOR FIGURE 5-14

GENERAL

A. Test Equipment Required:
Oscilloscope AN/USM-281( ) or equivalent
RF Millivoltmeter CCVO-91CA or equivalent
Electronic Multimeter AN/USM-116( ) or equivalent
Multimeter AN/PSM-4( ) or equivalent
Frequency Standard AN/URQ-10 or equivalent
Electronic Counter AN/USM-207 or equivalent
Heterodyne Voltmeter CDAN-2006 (depot only)
Translator/Synthesizer Test Set TS-2133/WRC-1 (depot only)

B. References. If necessary, make the following references:
Functional description, paragraph 3-108
Troubleshooting sequence, figure 5-33
Corrective maintenance, table 6-9
Physical location of test points, figures 7-79, 7-80, and 7-81
Waveforms, figure 5-45.

C. Preliminary Setup. Make primary power available to the equipment by placing system circuit breaker to on. Loosen front-panel screws and slide main-frame chassis out of case. Defeat interlock switch A1S2 by pulling shaft out, so that plunger extends forward of case. Make the following preliminary control settings before beginning the test procedure:

UNIT	CONTROL	POSITION
Radio Receiver R-1051E/URR	Mode selector switch A2S2	STD BY
	Hz switch A2A11S1	000
	Frequency controls	2.000 MHz

D. Test Setup.

(1) Connect rf millivoltmeter to test point A2A6A4A3TP5 on cover of 100-Hz Synthesizer Subassembly A2A6A4.

(2) Connect output of frequency standard to external standard frequency input of electronic counter to ensure accuracy of frequency measurements.

SPECIFIC

Test Steps:

TS-1

Refer to notes C and D before performing test. Set mode selector switch A2S2 to LSB. Rotate the 10-kHz and 1-kHz frequency controls through all frequency combinations, while observing the rf millivoltmeter. The output signal of the 100-Hz synthesizer is to be as indicated.

Set 10-kHz and 1-kHz frequency controls to 0, and rotate the Hz switch A2A11S1 through all positions from 000 through 900, while observing the rf millivoltmeter. The output signal of the 100-Hz synthesizer is to be as indicated.

TEST DATA FOR FIGURE 5-14 (Cont)

TS-2

Connect the frequency counter to test point A2A6A4A3TP3. Rotate the Hz switch A2A11S1 through all positions from 000 through 900, and observe frequency of input signal to 7.1-MHz mixer to be as follows:

Position of Hz Switch	Frequency (kHz)
000	11.000
100	11.100
200	11.200
300	11.300
400	11.400
500	11.500
600	11.600
700	11.700
800	11.800
900	11.900

Set the Hz switch A2A11S1 to the V (vernier) position. Observe a frequency of 11.000 kHz or lower with the Hz vernier control A2A11R1 in the extreme counterclockwise position.

With the Hz switch A2A11S1 still in the V position, observe a frequency of 12.000 kHz or higher with the Hz vernier control A2A11R1 in the extreme clockwise position.

Disconnect electronic counter and connect electronic multimeter to test point A2A6A4A3TP3. Reset the Hz switch A2A11S1 to 000. Measure the input signal level to the 7.1-MHz mixer to be as indicated on the electronic multimeter.

NOTE

Refer to paragraph 5-1 "NOTE", regarding signal values indicated for these test steps and in the figure.

NOTE

The following test step measurements are to be made with Translator/Synthesizer Test Set TS-2133/WRC-1, at depot level only.

* TS-3

Using the oscilloscope, observe the 1-kHz input pulses from the spectrum generator at A2A6A4A2E4 to be as shown in waveform Y of figure 5-45.

* TS-4

With the Hz switch A2A11S1 set to 000, measure the average dc voltage at A2A6A4A2TP1 to be as indicated on the multimeter AN/PSM-4( ).

* TS-5

With the Hz switch A2A11S1 set to 000, measure the output of the 110- to 119-kHz oscillator at A2A6A4A2TP2 to be as indicated, using the oscilloscope to measure the amplitude and the electronic counter to measure frequency.

* TS-6

Measure the 110-kHz squarewave waveform at the output of the pulse shaper at A2A6A4A1TP3 to be as indicated, using the oscilloscope and electronic counter.

* TS-7

Measure the signal at A2A6A4A1TP4 to be as indicated, using the oscilloscope and electronic counter.

TEST DATA FOR FIGURE 5-14 (Cont)

*	TS-8	Measure the 7.089-MHz error signal from the 1- and 10-kHz synthesizer at A2A6A4A3TP1 to be as indicated on the heterodyne voltmeter.
*	TS-9	Using the heterodyne voltmeter (narrow band) measure the 7.1-MHz signal at A2A6A4A3TP2 as indicated.
*	TS-10	Measure the 7.1-MHz signal at A2A6A4A3TP4 to be as indicated on the heterodyne voltmeter.
*	TS-11	Observe the 1-kHz pulse at A2A6A4A1TP5 to be as indicated on the oscilloscope (Waveform G, Figure 5-44).
*	TS-12	Observe the 1-kHz pulse at A2A6A4A1TP1 on the oscilloscope as indicated (Waveform H, Figure 5-44).
*	TS-13	Observe the 1-kHz pulse at A2A6A4A1TP2 to be as indicated on the oscilloscope (Waveform A, Figure 5-44).

* Measurement made at depot only.

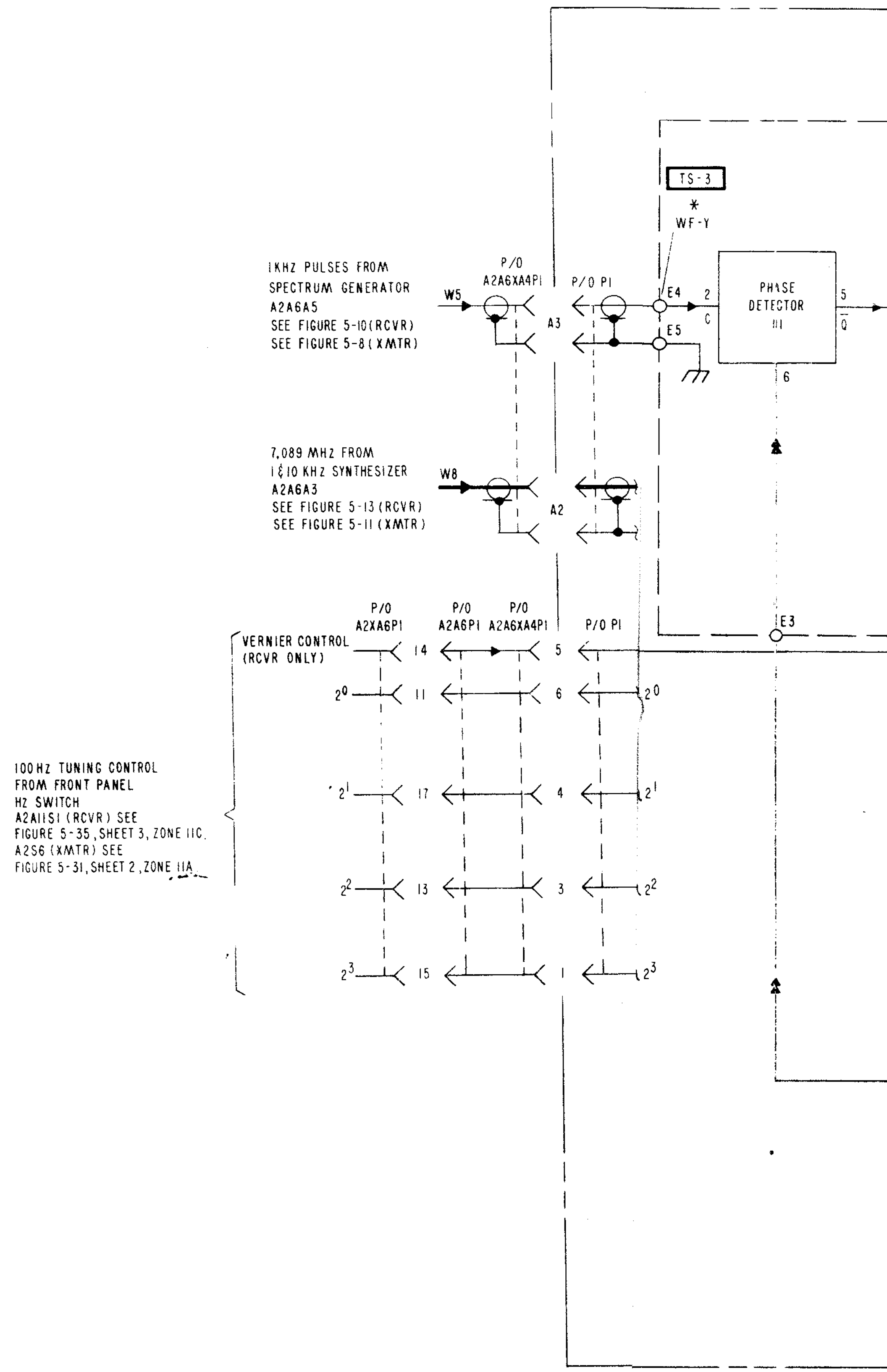


Figure 5-14. 100-Hz Synthesizer, Signal Flow Diagram

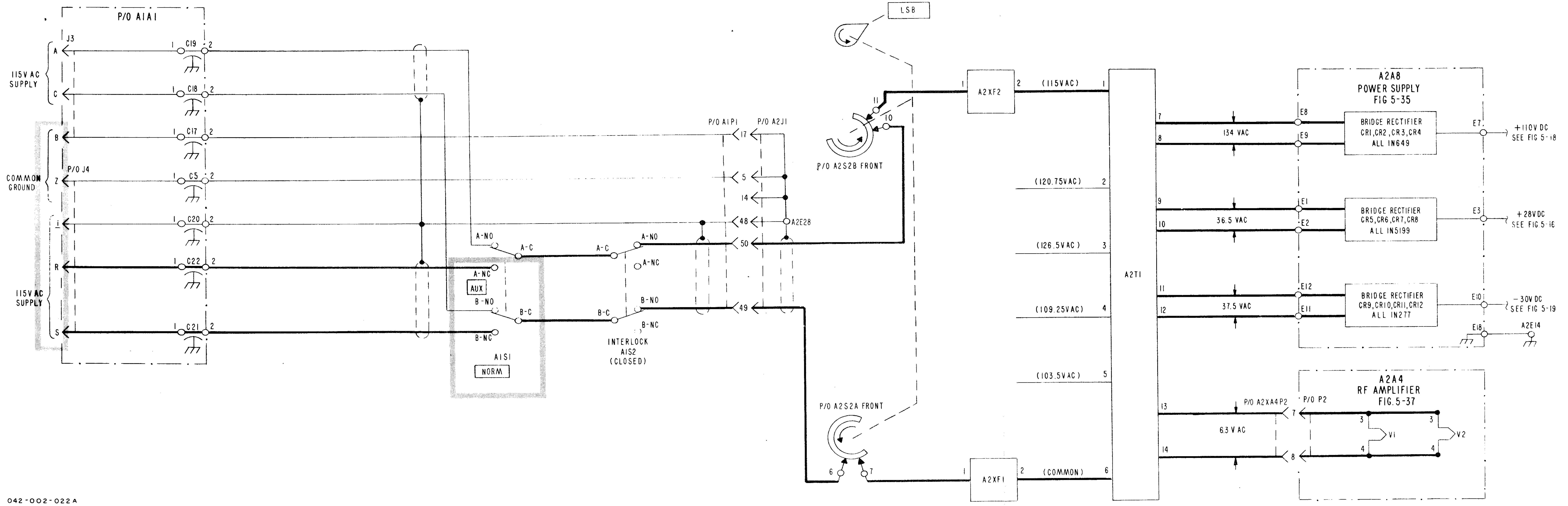


Figure 5-15. AC Power Distribution Diagram

NOTES FOR FIGURE 5-16

GENERAL NOTES

A. ALL RELAYS SHOWN IN NORMAL OPERATING POSITION.

SPECIFIC NOTES

1. CHART 1 GIVES THE CONTACTS FOR MODE SELECTOR SWITCH A2S2 IN EACH OF ITS POSITIONS.

CHART 1

A2S2D (REAR)	
FUNCTION	TERMINAL
OFF	4 TO 5
STD BY	6 TO 5
LSB (SHOWN)	4 TO 3
RATT	4 TO 5
AM	4 TO 5
CW	6 TO 5
USB	4 TO 5
ISB	4-3-5

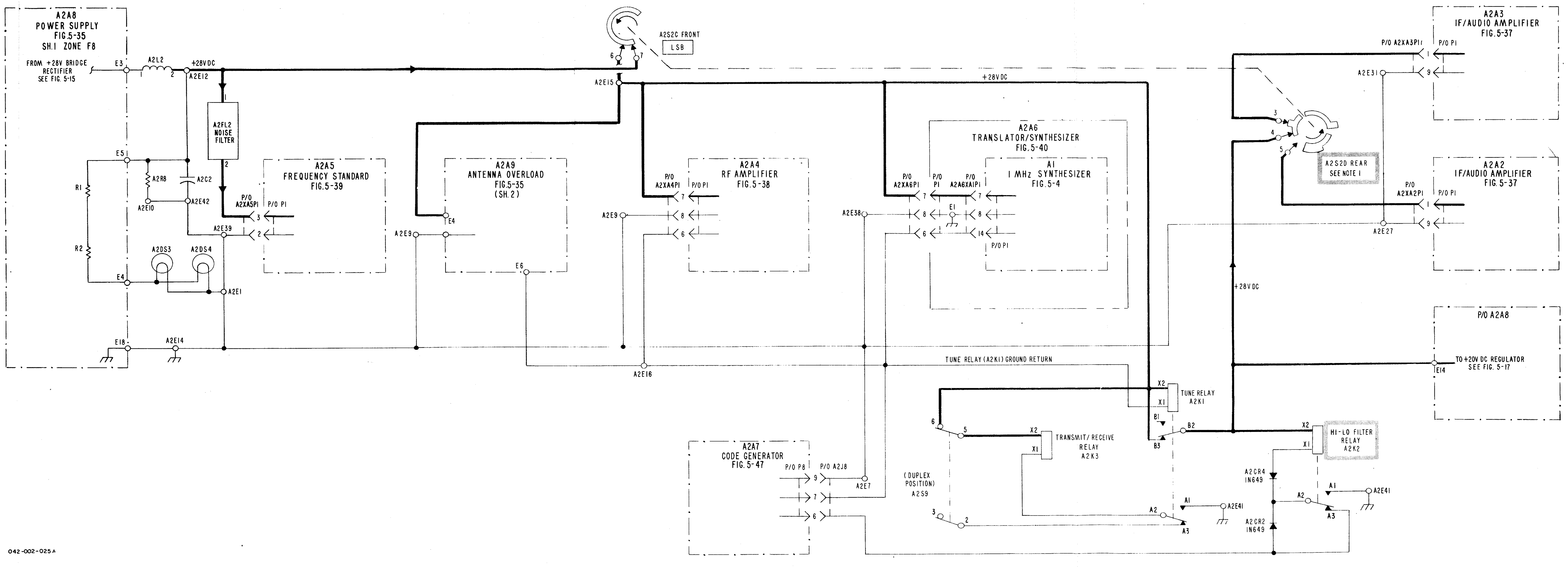


Figure 5-16. +28-Vdc Distribution Diagram

NOTES FOR FIGURE 5-17

GENERAL NOTES

A. ALL RELAYS SHOWN IN NORMAL OPERATING POSITION.

SPECIFIC NOTES

1. CHARTS 1 THRU 6 GIVE THE CONTACTS FOR MODE SELECTOR SWITCH A2S2 IN EACH OF ITS POSITIONS.

CHART 1

A2S2A (FRONT)	
FUNCTION	TERMINAL
OFF	NO CONNECTION
STD BY	NO CONNECTION
LSB (SHOWN)	9 TO 11
RATT	12 TO 10
AM	NO CONNECTION
CW	NO CONNECTION
USB	3 TO 1
ISB	2 TO 4

CHART 2

A2S2A (REAR)	
OFF	6-5-10
STD BY	8 TO 10
LSB (SHOWN)	8 TO 10, 4 TO 2
RATT	4 TO 5
AM	11 TO 10, 4 TO 5
CW	11 TO 10, 4 TO 5
USB	6 TO 5
ISB	4-5-2

CHART 3

A2S2B (REAR)	
OFF	NO CONNECTION
STD BY	NO CONNECTION
LSB (SHOWN)	3 TO 2
RATT	NO CONNECTION
AM	NO CONNECTION
CW	NO CONNECTION
USB	NO CONNECTION
ISB	6 TO 8

NOTES FOR FIGURE 5-17 (Cont)

CHART 4

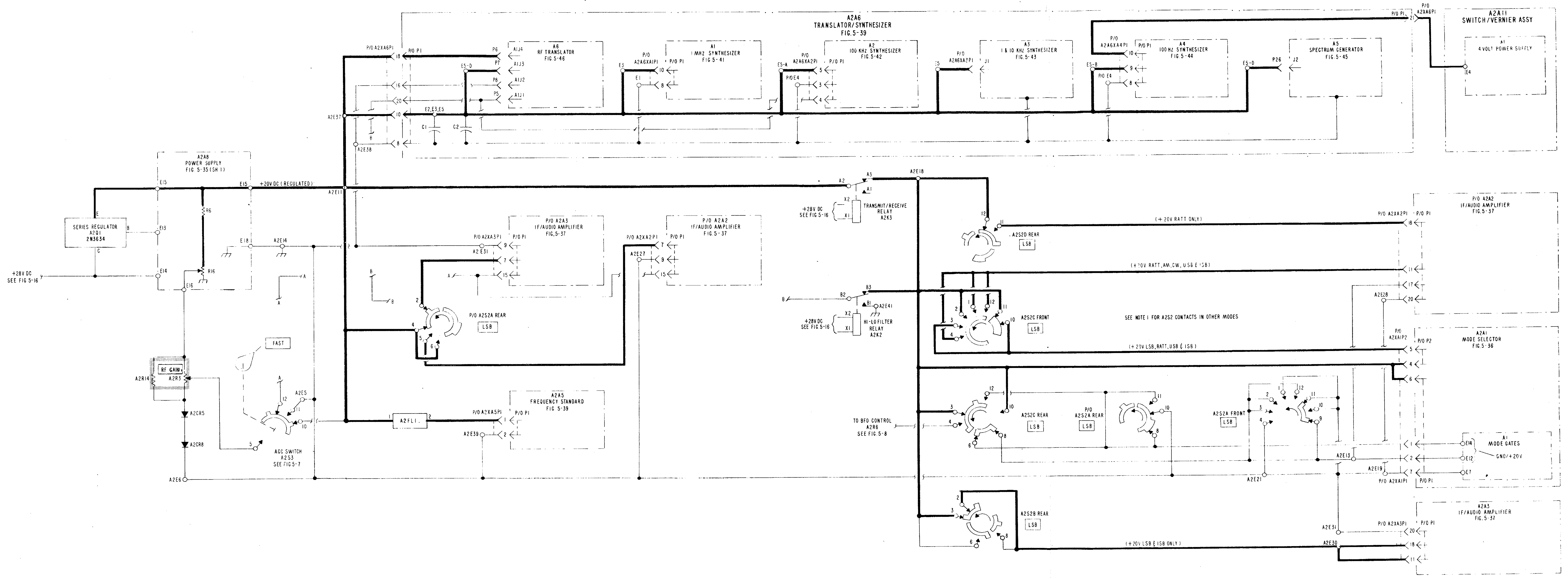
A2S2C (FRONT)	
FUNCTION	TERMINAL
OFF	NO CONNECTION
STD BY	NO CONNECTION
LSB (SHOWN)	11 TO 10
RATT	11-10-12
AM	11-12-1
CW	2-1-12
USB	2-1-3
ISB	2-3-4

CHART 5

A2S2C (REAR)	
OFF	4 TO 6
STD BY	3-4-12
LSB (SHOWN)	6 TO 8
RATT	3 TO 6
AM	10 TO 8
CW	3-4-8
USB	10 TO 12
ISB	10 TO 6

CHART 6

A2S2D (REAR)	
OFF	NO CONNECTION
STD BY	NO CONNECTION
LSB (SHOWN)	NO CONNECTION
RATT	12 TO 11
AM	NO CONNECTION
CW	NO CONNECTION
USB	12 TO 11
ISB	12 TO 11



042-002-036A

Figure 5-17. +20-Vdc Distribution Diagram

NOTES FOR FIGURE 5-18

GENERAL NOTES

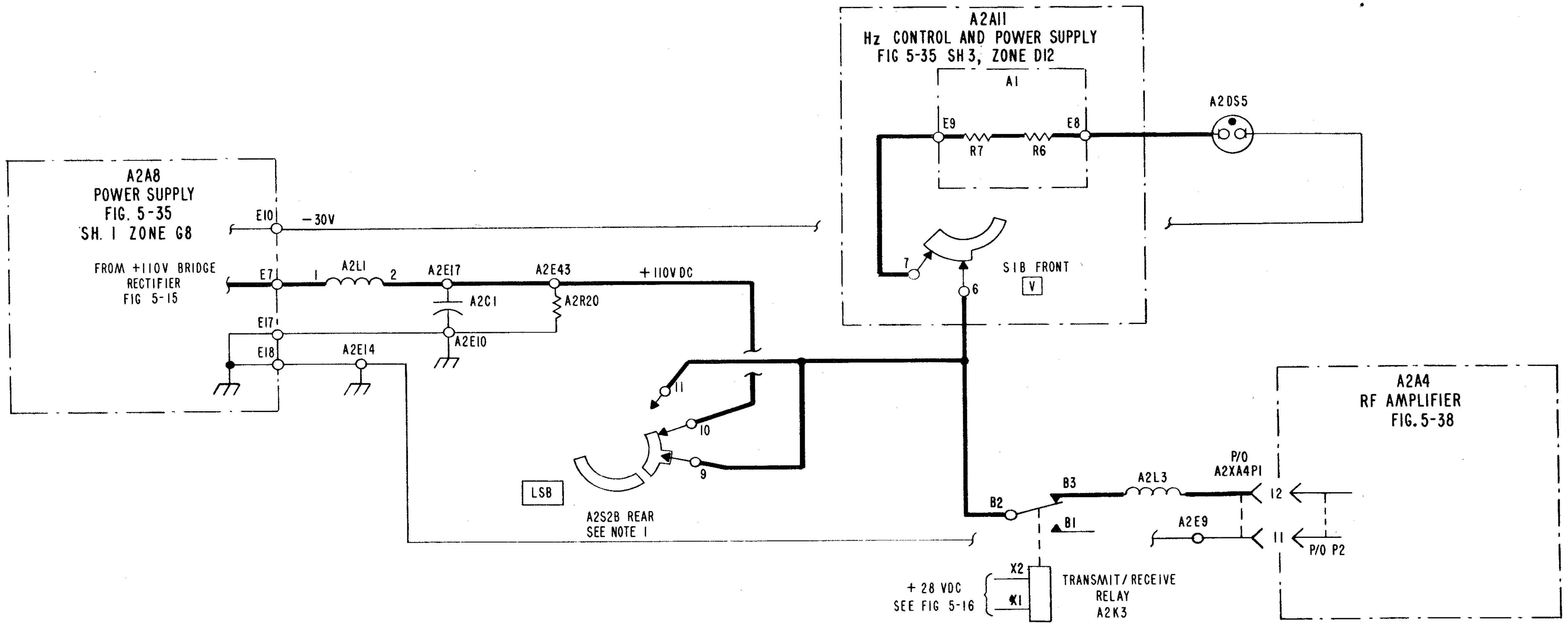
A. ALL RELAYS SHOWN IN NORMAL OPERATING POSITION.

SPECIFIC NOTES

1. CHART 1 GIVES THE CONTACTS FOR MODE SELECTOR SWITCH A2S2 IN EACH OF ITS POSITIONS.

CHART 1

A2S2B (REAR)	
FUNCTION	TERMINAL
OFF	NO CONNECTION
STD BY	NO CONNECTION
LSB (SHOWN)	10 TO 9
RATT	10 TO 9
AM	10 TO 11
CW	10 TO 9
USB	10-9-11
ISB	10 TO 9



042-002-024

Figure 5-18. +110-Vdc Distribution Diagram

NOTES FOR FIGURE 5-19

SPECIFIC NOTES

1. CHART 1 GIVES THE CONTACTS FOR MODE SELECTOR SWITCH A2S2 IN EACH OF ITS POSITIONS.

CHART 1

A2S2D (FRONT)	
FUNCTION	TERMINAL
OFF	11 TO 10
STD BY	NO CONNECTION
LSB (SHOWN)	12 TO 2
RATT	11 TO 10
AM	11 TO 10
CW	11 TO 10
USB	11 TO 10
ISB	7-6, 11-10

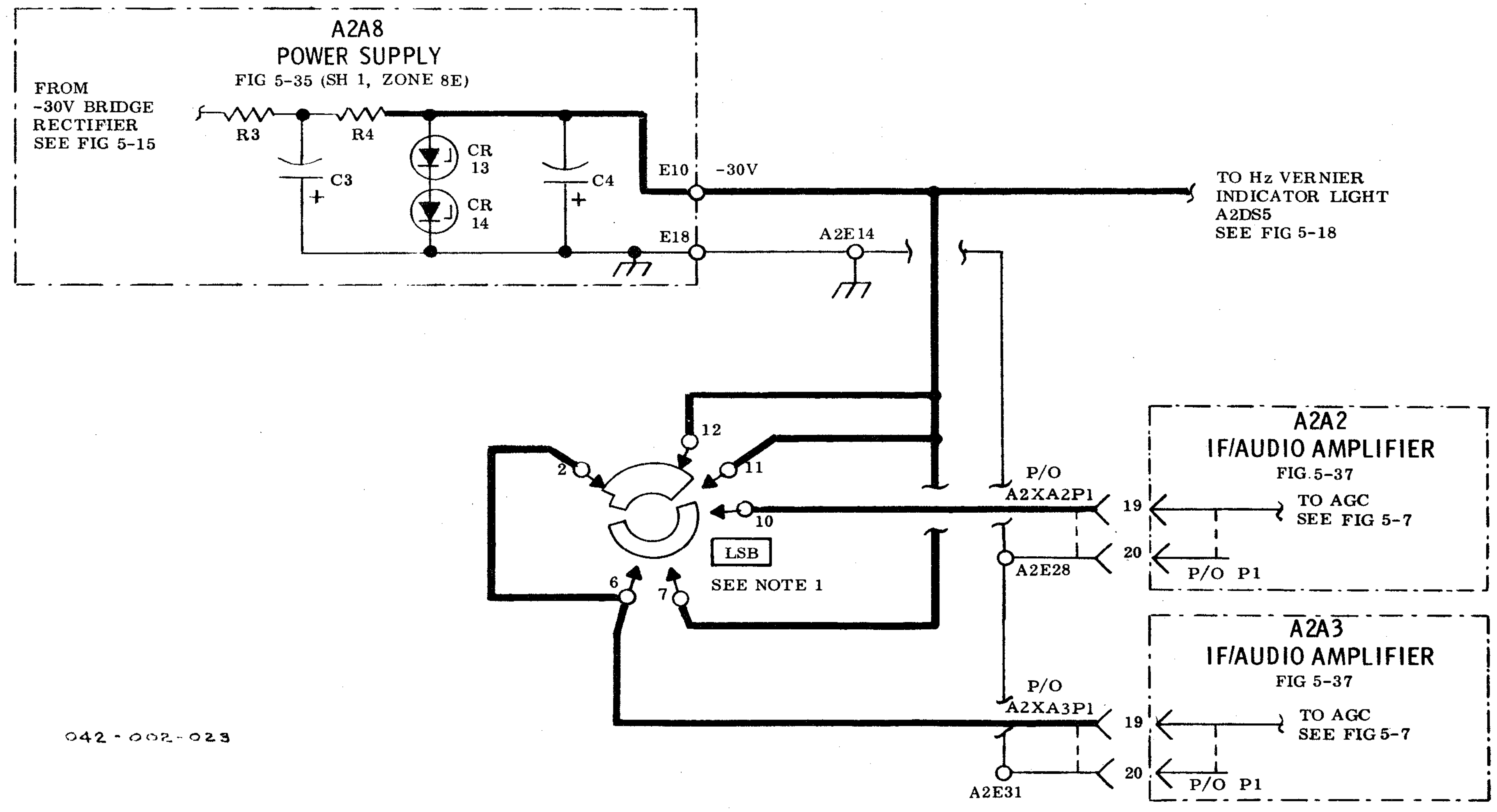
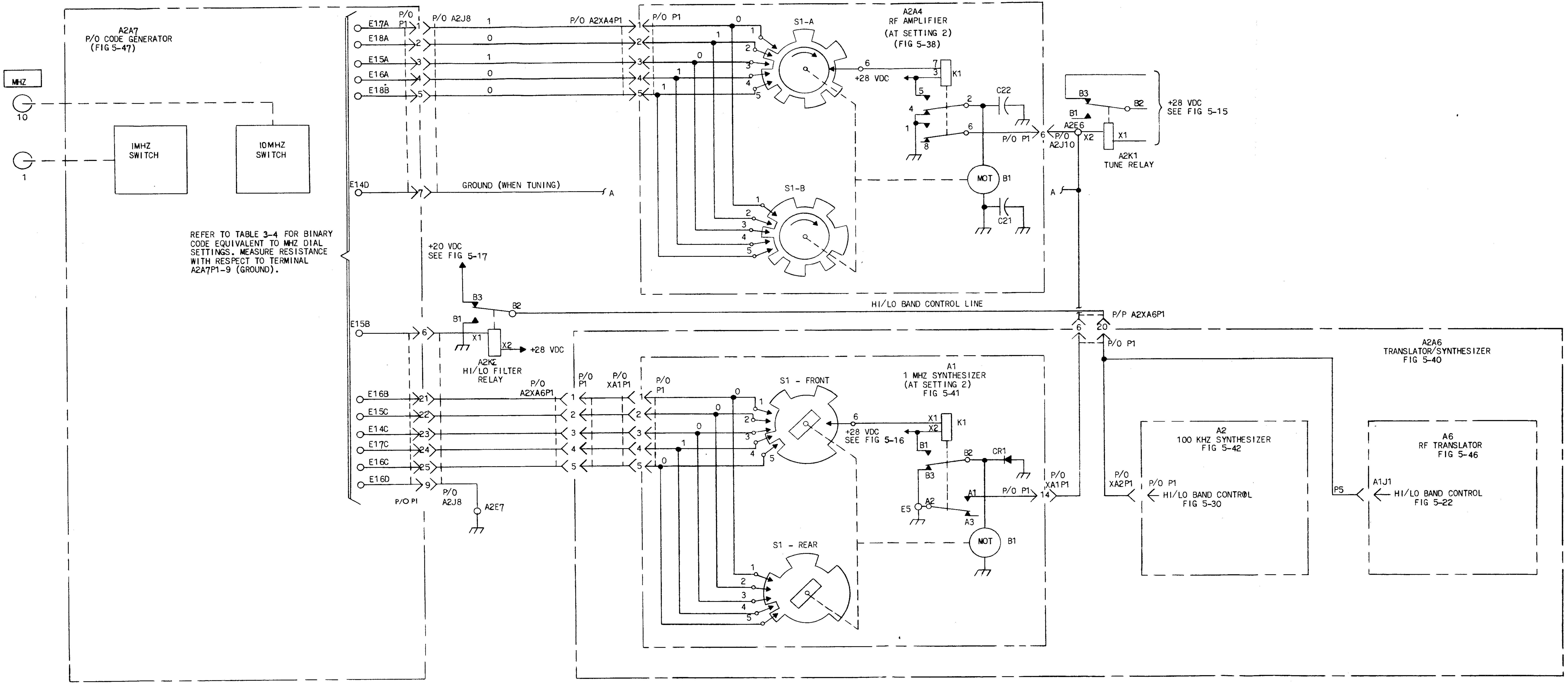


Figure 5-19. -30-Vdc Distribution Diagram



042-002-124

Figure 5-20. Tuning Control Diagram

NOTES FOR FIGURE 5-21

GENERAL NOTES

A. ENSURE THAT THE PROPER POWER SUPPLY VOLTAGES ARE APPLIED TO ASSEMBLIES UNDER TEST.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-1.

C. REFER TO SCHEMATIC DIAGRAMS, FIGURES 5-35 AND 5-38.

D. ALL AC VOLTAGES IN RMS.

E. LEGEND:

YES ____________

NO _ _ _ _ _ _ _ _

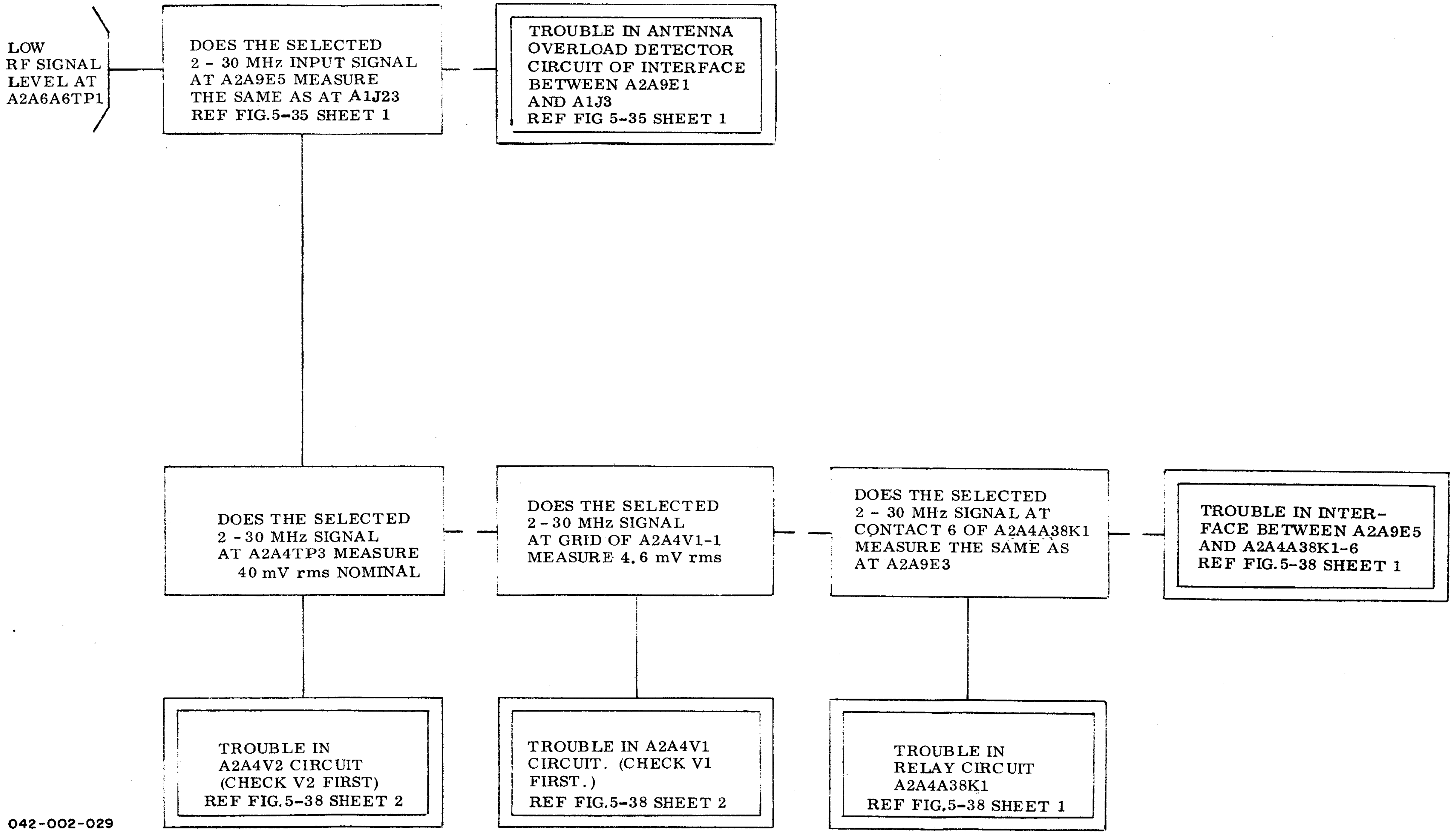


Figure 5-21. RF Selection, Tuning, and Overload Protection, Fault Logic Diagram

NOTES FOR FIGURE 5-22

GENERAL NOTES

A. ENSURE THAT PROPER POWER SUPPLY AND GATING VOLTAGES ARE APPLIED.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-2.

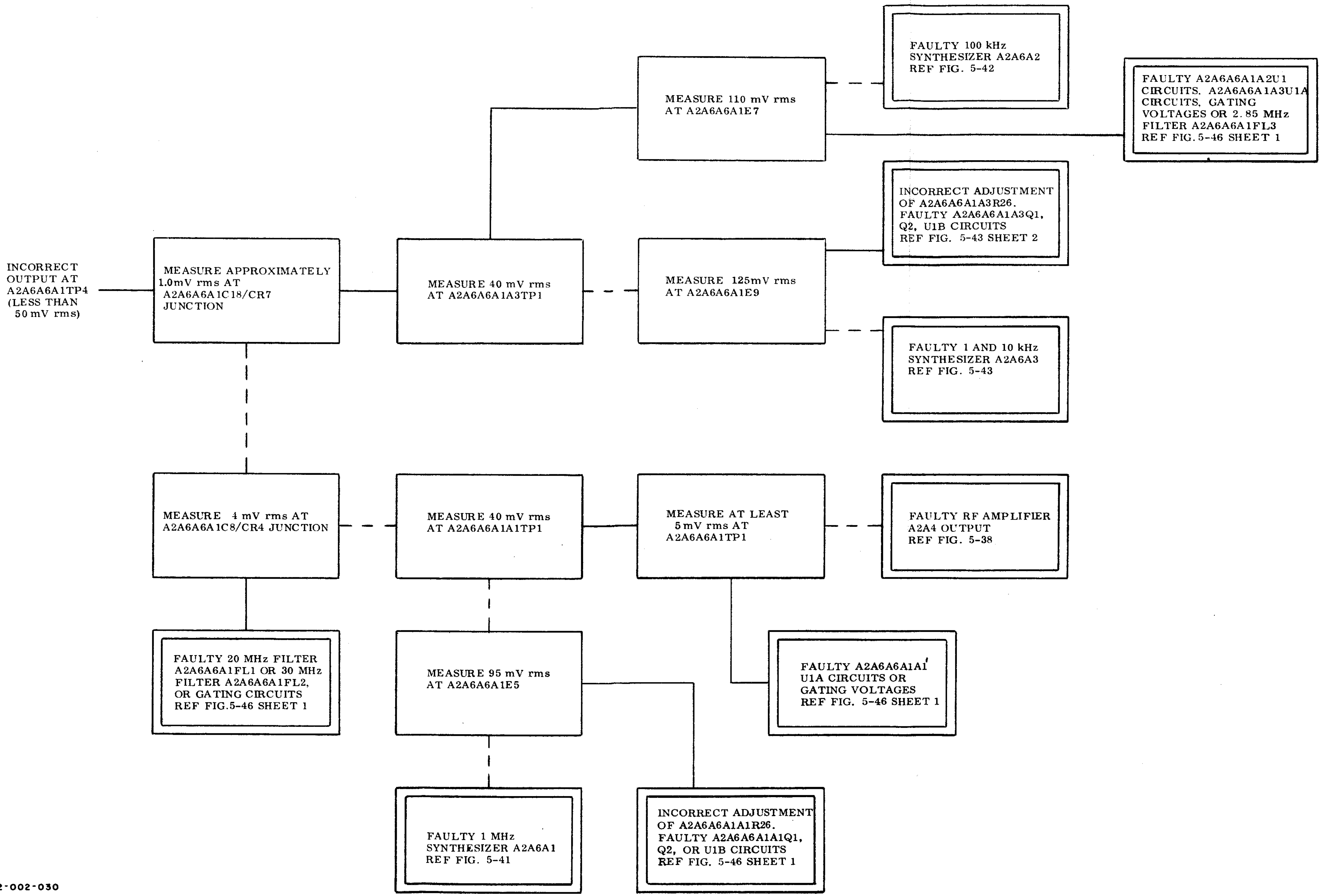
C. REFER TO SCHEMATIC DIAGRAM, FIGURE 5-46.

D. ALL AC VOLTAGES IN RMS.

E. LEGEND:

YES ____________

NO _ _ _ _ _ _ _ _ _



042-002-030

Figure 5-22. RF-to-IF. Conversion, Fault Logic Diagram

NOTES FOR FIGURE 5-23

GENERAL NOTES

A. ENSURE THAT THE PROPER POWER SUPPLY AND GATING VOLTAGES ARE APPLIED TO THE CIRCUIT UNDER TEST.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-3.

C. REFER TO SCHEMATIC DIAGRAMS, FIGURES 5-36 AND 5-37.

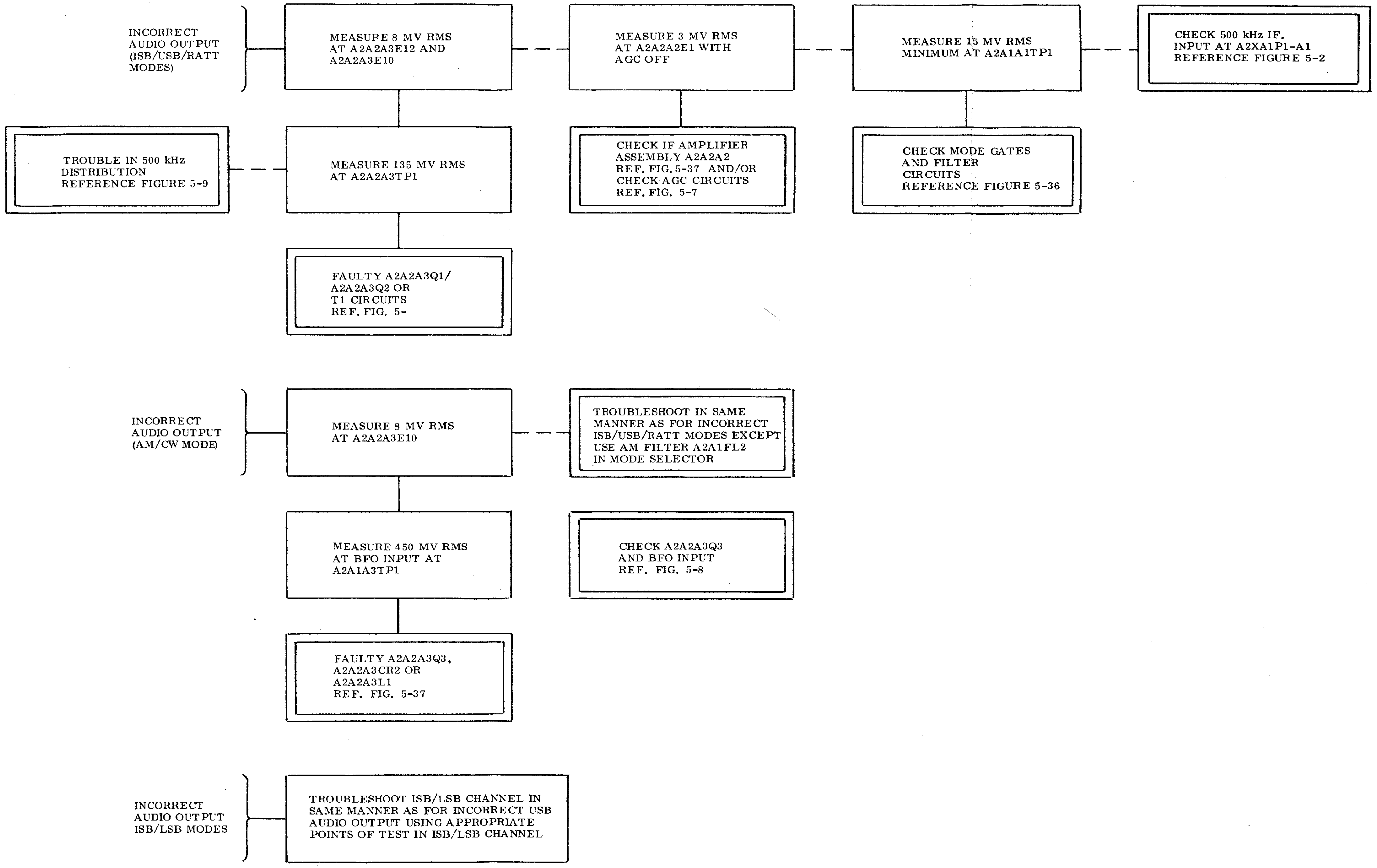
D. ALL AC VOLTAGES IN RMS.

E. MEASUREMENTS ARE TYPICAL IN-OPERATION VALUES.

F. LEGEND:

YES ______________

NO _ _ _ _ _ _ _ _ _



042-002-031

Figure 5-23. IF, Amplification and Control, Fault Logic Diagram

NOTES FOR FIGURE 5-24

GENERAL NOTES

A. ENSURE THAT PROPER POWER SUPPLY AND GATING VOLTAGES ARE APPLIED TO THE CIRCUIT UNDER TEST.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-5.

C. REFER TO SCHEMATIC DIAGRAMS, FIGURES 5-35 AND 5-37.

D. ALL AC VOLTAGES IN RMS.

E. LEGEND:

YES ______________

NO _ _ _ _ _ _ _ _ _

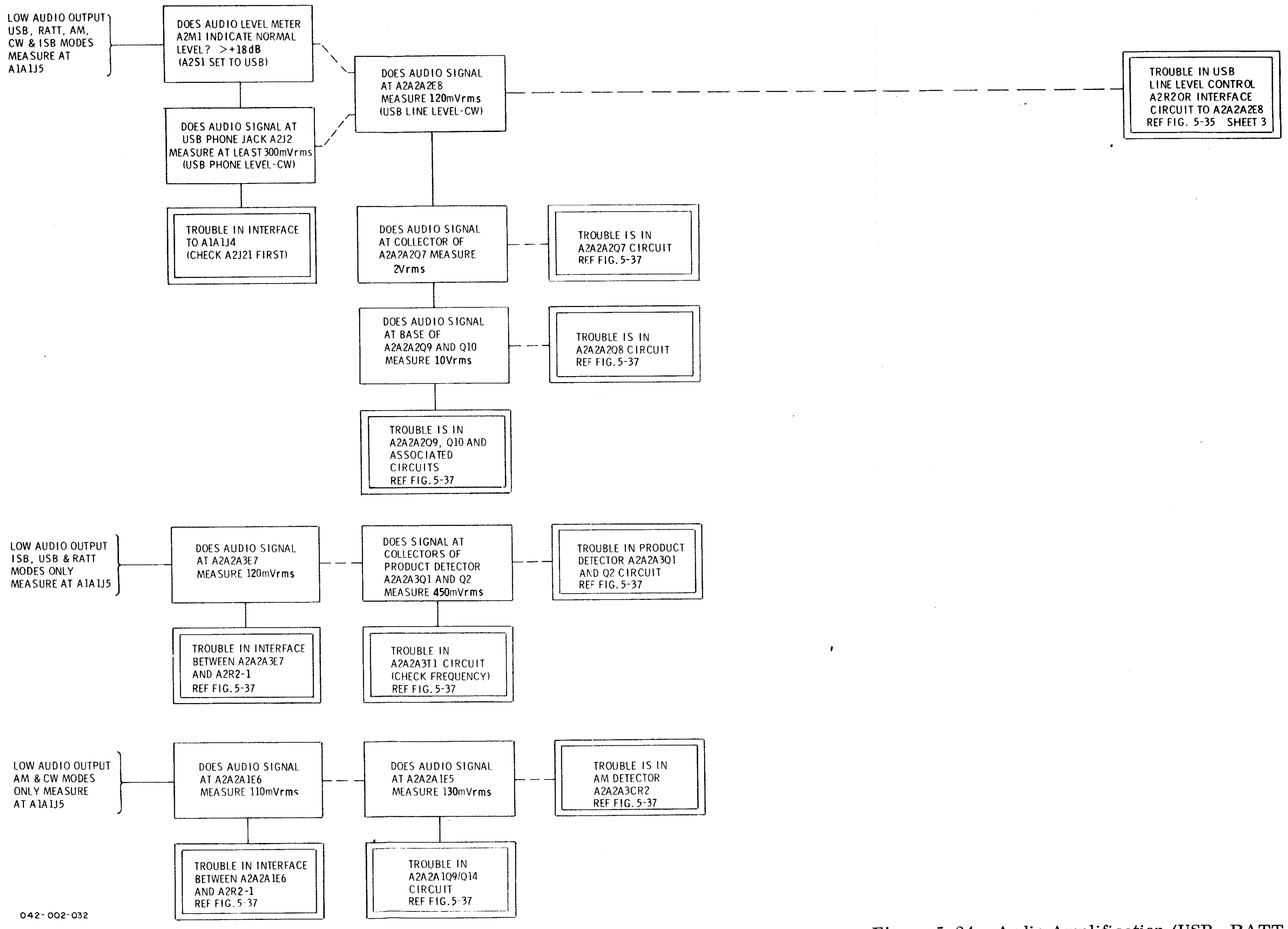


Figure 5-24. Audio Amplification (USB, RATT, AM and CW Modes), Fault Logic Diagram

NOTES FOR FIGURE 5-25

GENERAL NOTES

A. ENSURE THAT THE PROPER POWER SUPPLY AND GATING VOLTAGES ARE APPLIED TO THE CIRCUIT UNDER TEST.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-6.

C. REFER TO SCHEMATIC DIAGRAMS, FIGURES 5-35 AND 5-37.

D. ALL AC VOLTAGES IN RMS.

E. LEGEND

YES ____________

NO - - - - - - - - - - -

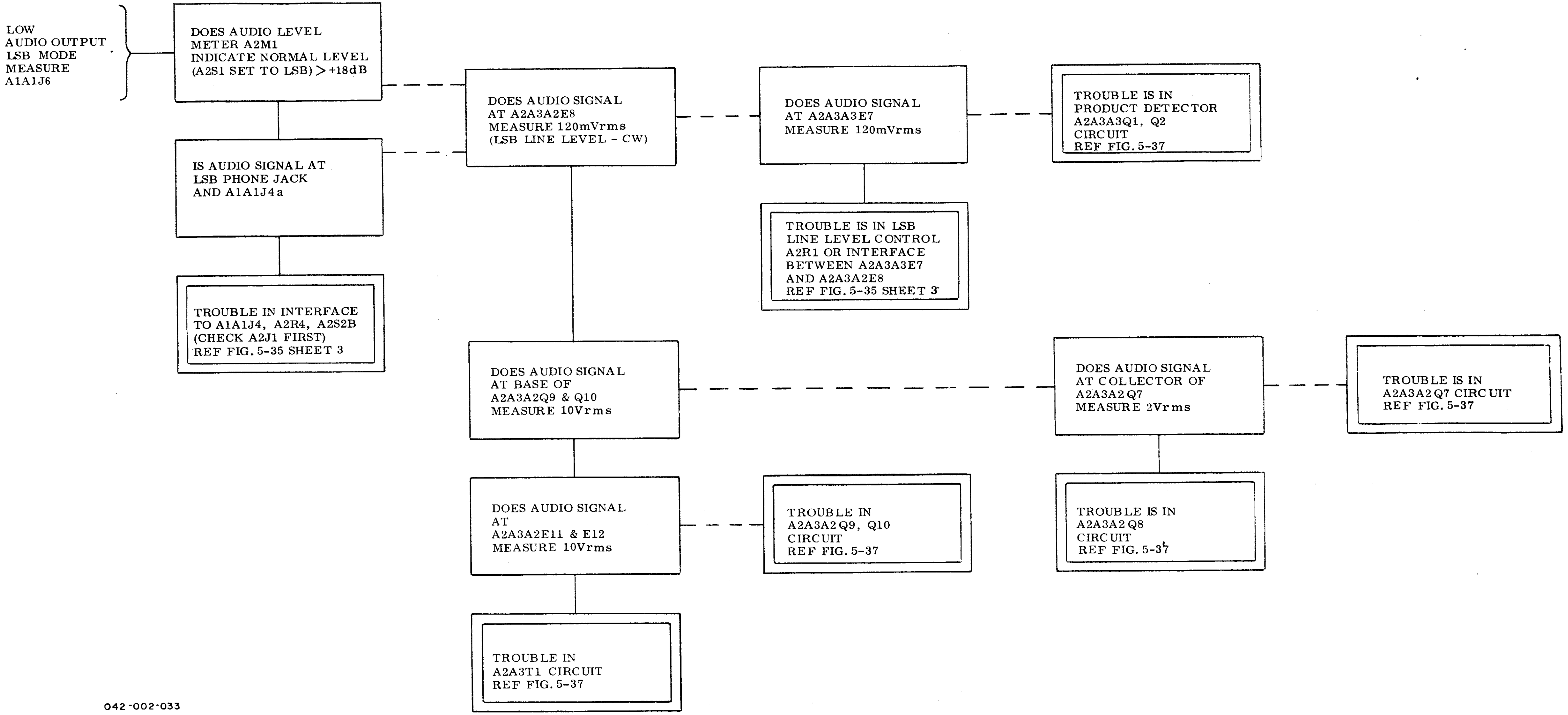


Figure 5-25. Audio Amplification (LSB Mode), Fault Logic Diagram

NOTES FOR FIGURE 5-26

GENERAL NOTES

A. ENSURE THAT THE PROPER POWER SUPPLY AND GATING VOLTAGES ARE APPLIED TO THE CIRCUIT UNDER TEST.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-7.

C. REFER TO SCHEMATIC DIAGRAM, FIGURE 5-37.

D. ALL AC VOLTAGES IN RMS.

E. LEGEND:
YES ____________
NO _ _ _ _ _ _ _ _

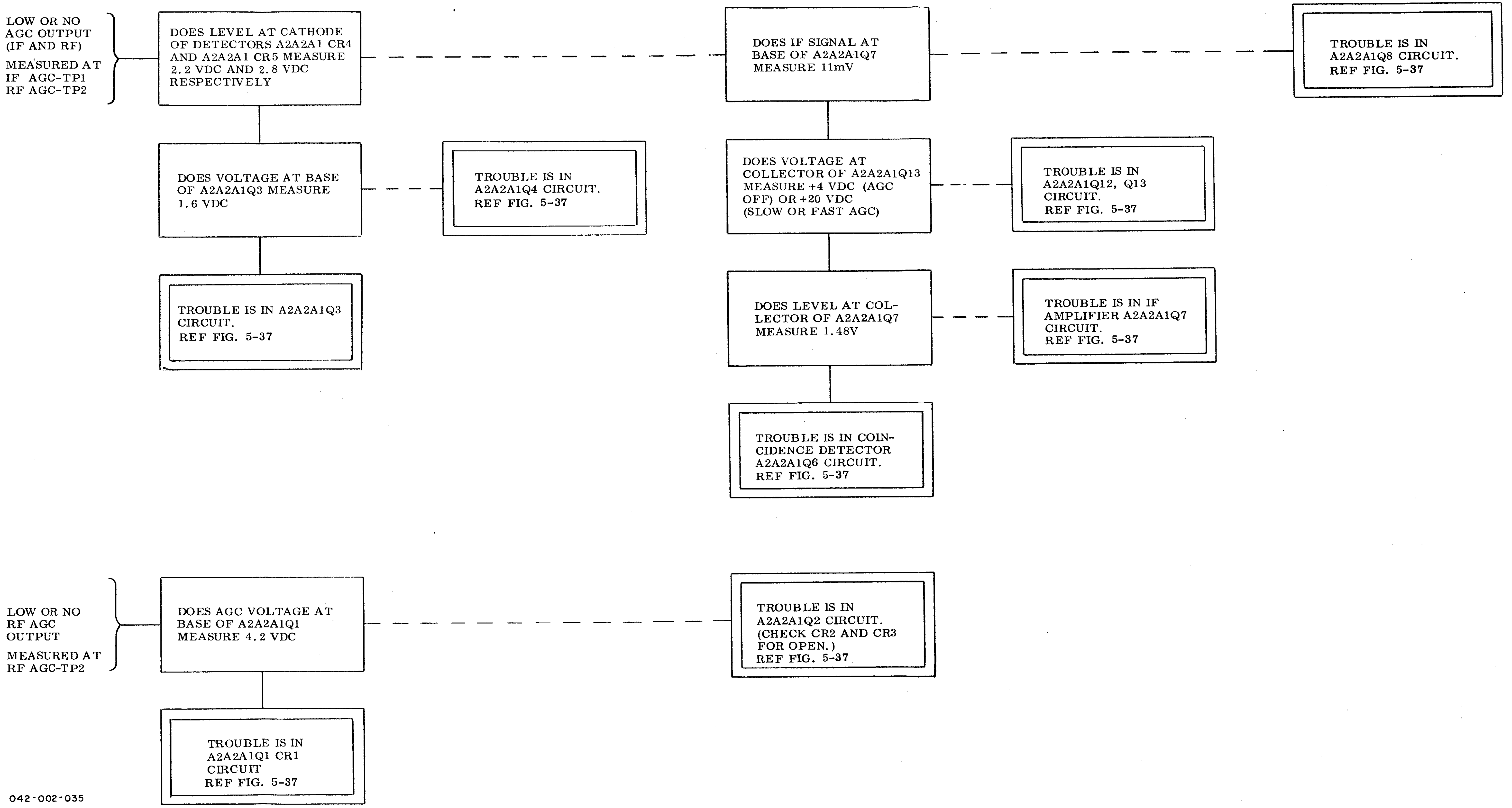


Figure 5-26. Automatic Gain Control, Fault Logic Diagram

NOTES FOR FIGURE 5-27

GENERAL NOTES

A. ENSURE THAT THE PROPER POWER SUPPLY AND GATING VOLTAGES ARE APPLIED TO THE CIRCUIT UNDER TEST.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-8.

C. REFER TO SCHEMATIC DIAGRAMS, FIGURES 5-35, 5-36, AND 5-37.

D. ALL AC VOLTAGES IN RMS.

E. LEGEND:

YES ____________

NO _ _ _ _ _ _ _ _ _ _

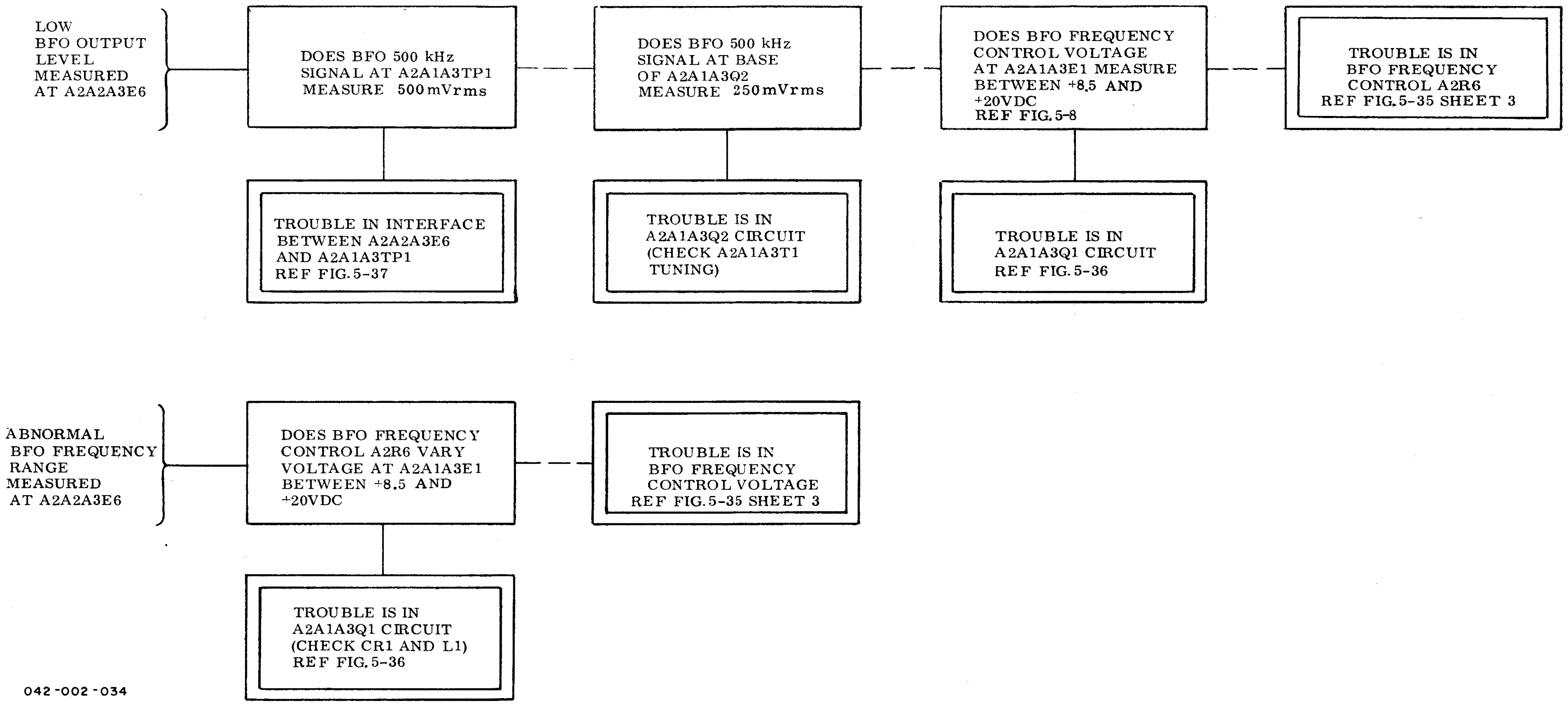


Figure 5-27. Beat Frequency Oscillator, Fault Logic Diagram

NOTES FOR FIGURE 5-28

GENERAL NOTES

A. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-9.

B. REFER TO SCHEMATIC DIAGRAM, FIGURE 5-39.

C. ALL AC VOLTAGES ARE PEAK-TO-PEAK.

D. LEGEND:

YES ______________

NO - - - - - - - - - -

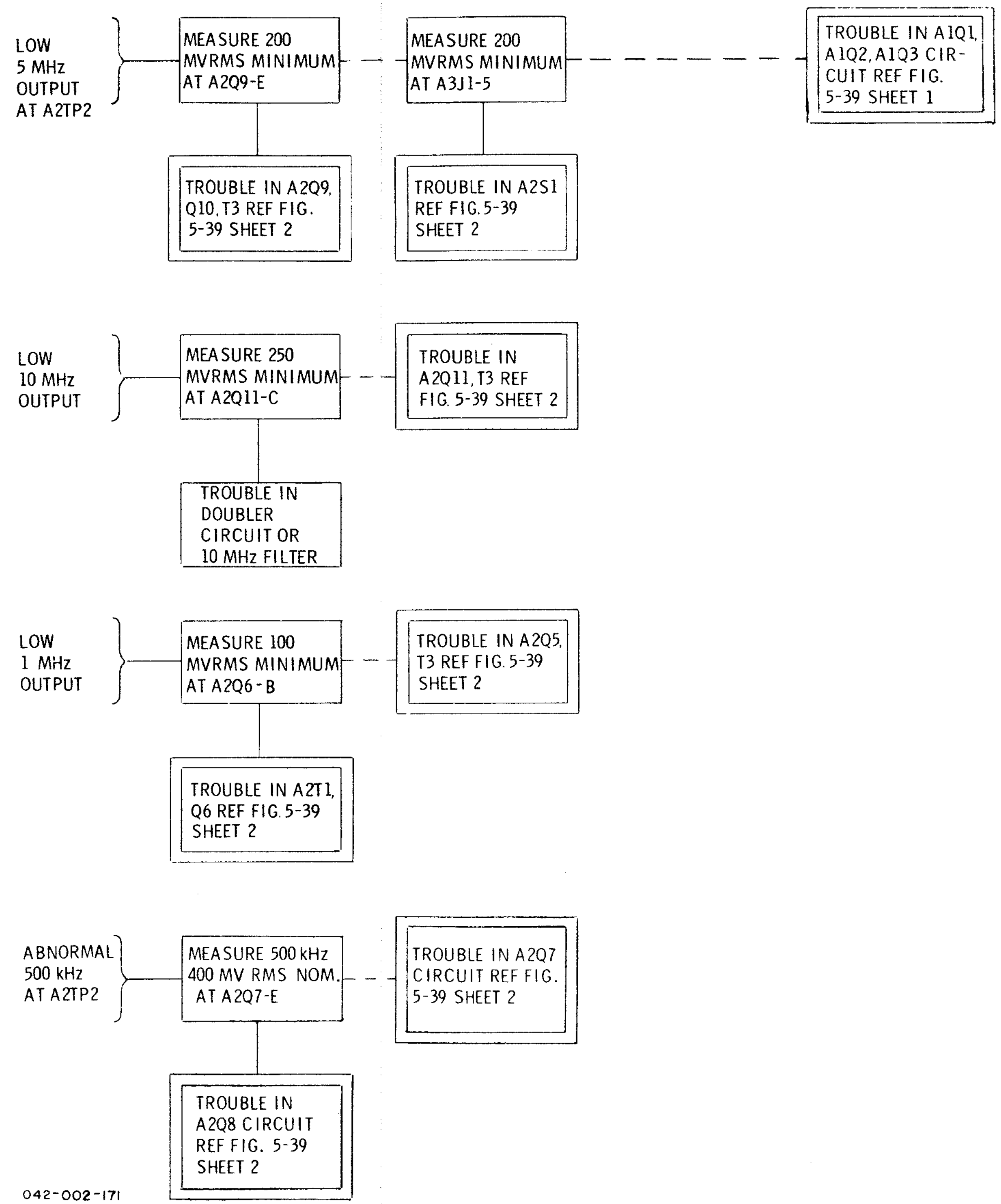


Figure 5-28. Standard Frequency Generation and Distribution, Fault Logic Diagram

NOTES FOR FIGURE 5-29

GENERAL NOTES

A. ENSURE THAT PROPER POWER AND GATING VOLTAGES ARE APPLIED.

B. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-10.

C. REFER TO SCHEMATIC DIAGRAM, FIGURE 5-45.

D. ALL AC VOLTAGES ARE IN RMS, UNLESS OTHERWISE NOTED.

E. LEGEND:

YES ______________

NO - - - - - - - - -

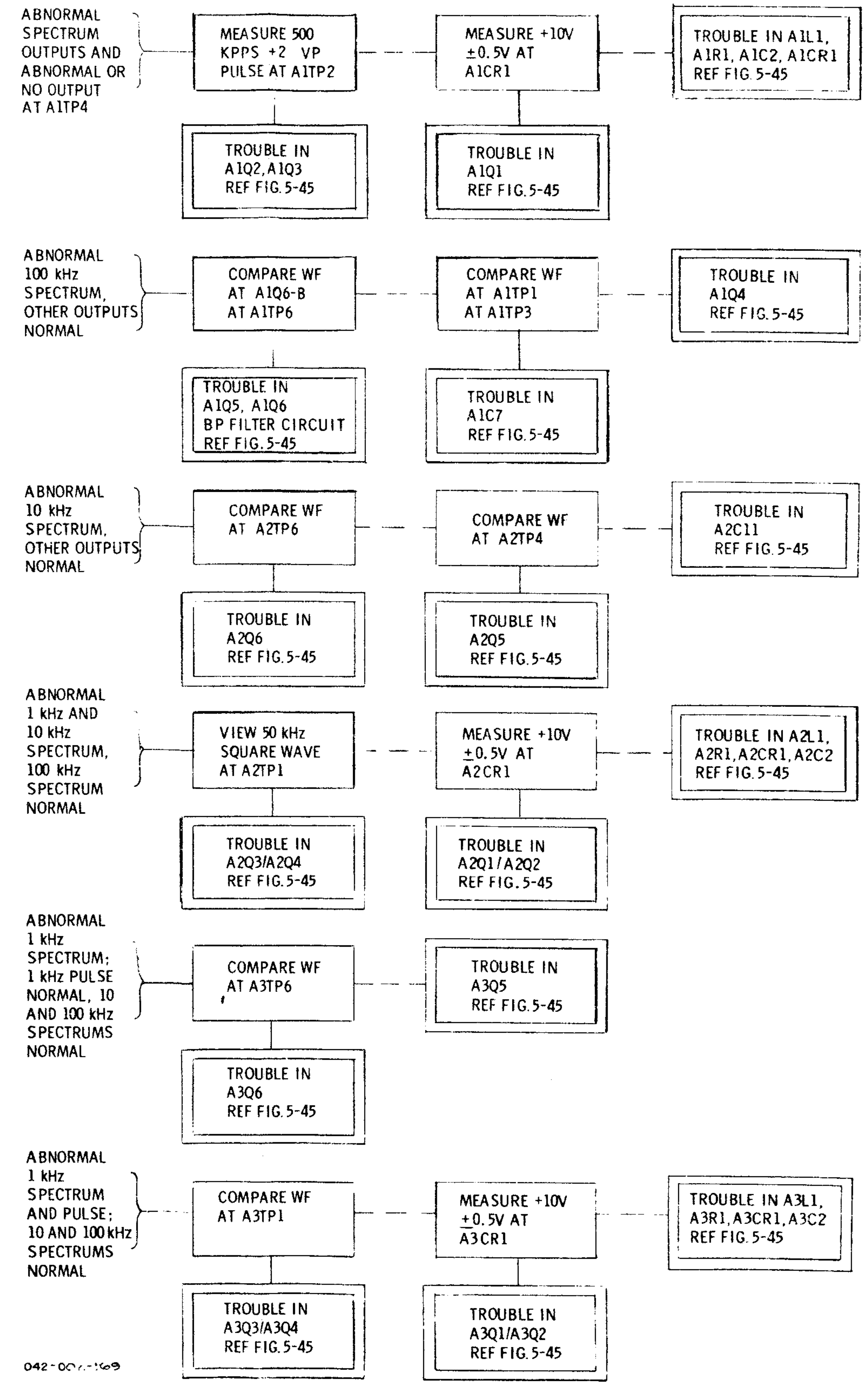


Figure 5-29. Spectrum Generator, Fault Logic Diagram

NOTES FOR FIGURE 5-30

GENERAL NOTES

A. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-11.

B. REFER TO SCHEMATIC DIAGRAM, FIGURE 5-41.

C. LEGEND:

YES ____________

NO \- - - - - - - - - - -

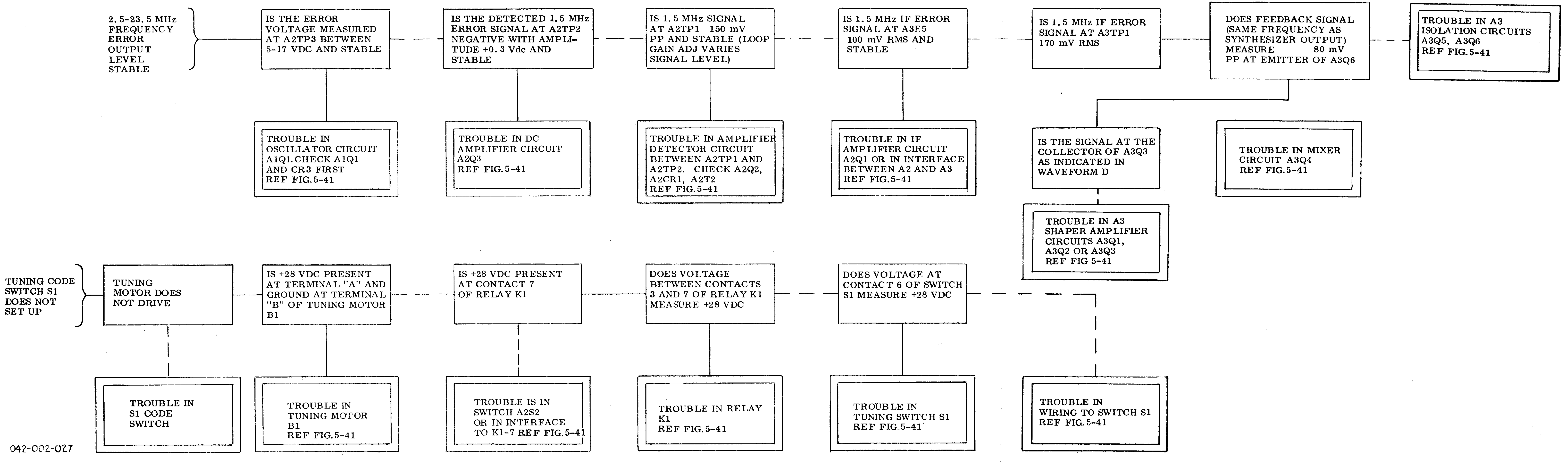


Figure 5-30. 1-MHz Synthesizer, Fault Logic Diagram

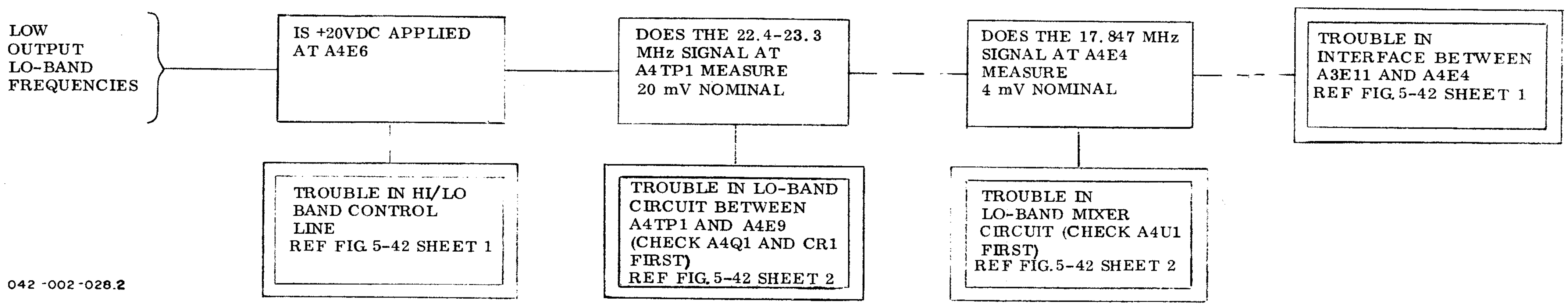


Figure 5-31. 100-kHz Synthesizer, Fault Logic Diagram (Sheet 2 of 2)

NOTES FOR FIGURE 5-32

GENERAL NOTES

A. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-13.

B. REFER TO SCHEMATIC DIAGRAM, FIGURE 5-43.

C. ALL AC VOLTAGES ARE RMS.

D. LEGEND:

YES ___________

NO - - - - - - - - - -

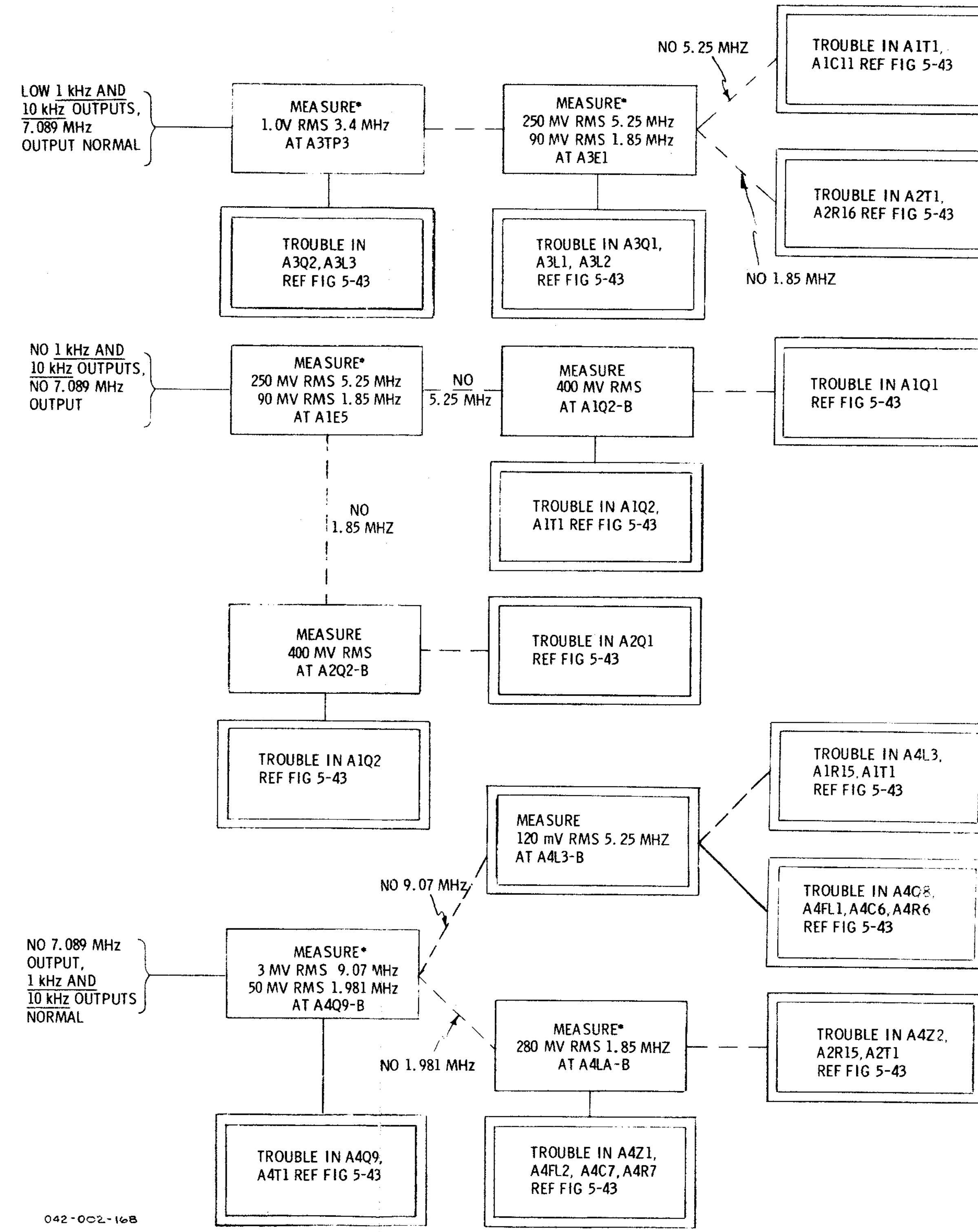


Figure 5-32. 1- and 10-kHz Synthesizer, Fault Logic Diagram

NOTES FOR FIGURE 5-33

GENERAL NOTES

A. TEST SETUP:
REFER TO SIGNAL FLOW DIAGRAM, FIGURE 5-14.

B. REFER TO SCHEMATIC DIAGRAM, FIGURE 5-44.

C. ALL AC VOLTAGES ARE EITHER PEAK-TO-PEAK OR RMS, AS NOTED.

D. LEGEND:

YES ______________

NO _ _ _ _ _ _ _ _ _ _

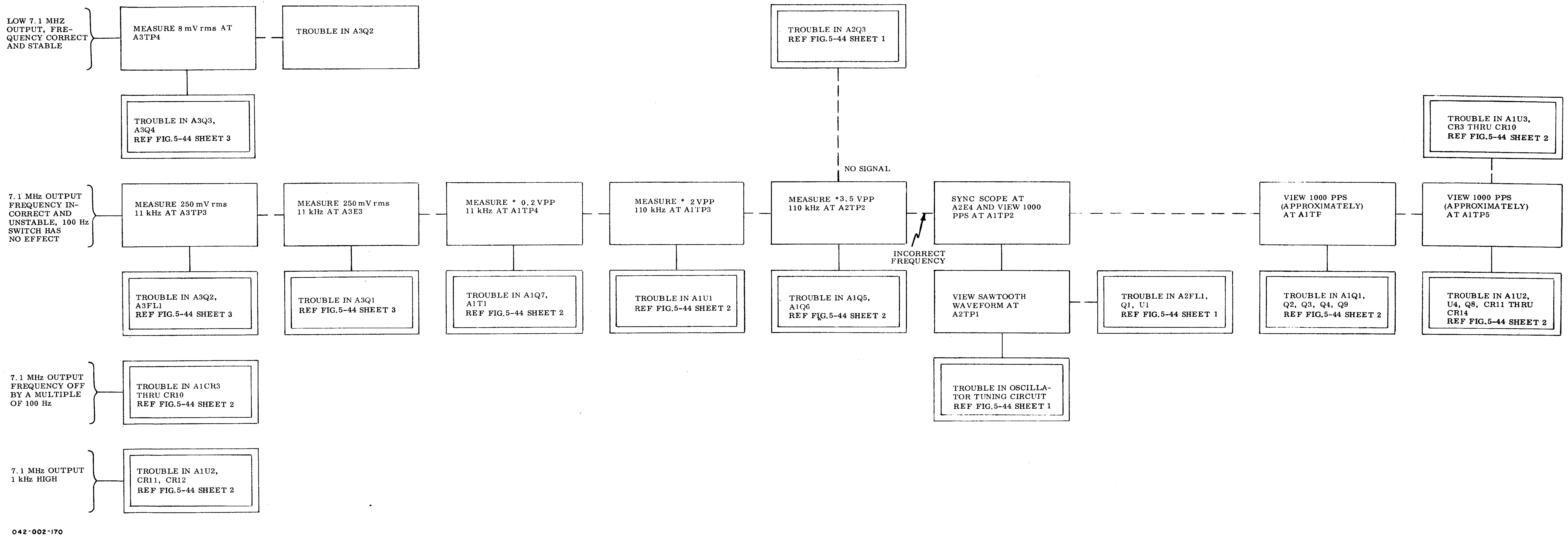


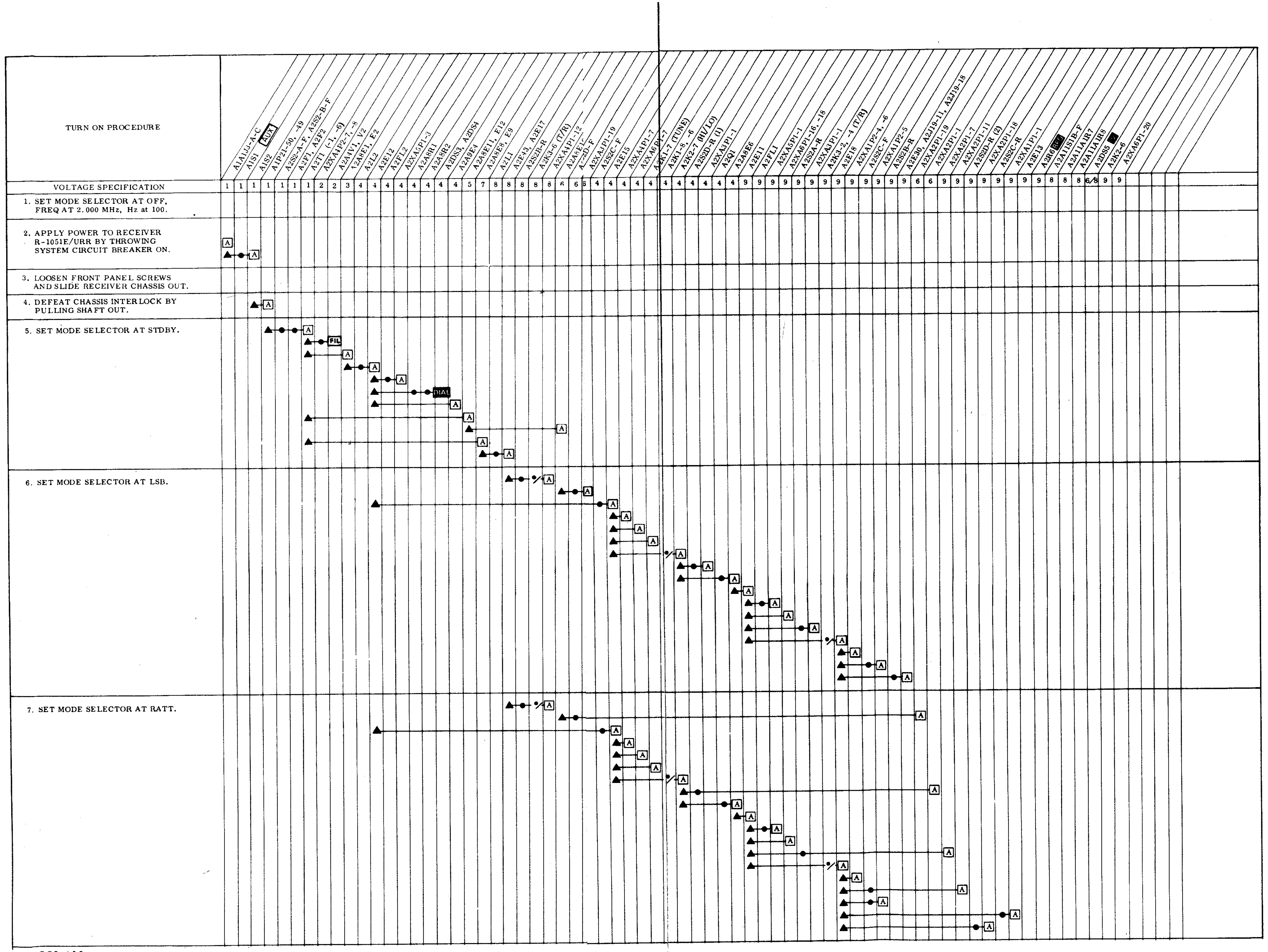
Figure 5-33. 100-Hz Synthesizer, Fault Logic Diagram

NOTES FOR FIGURE 5-34

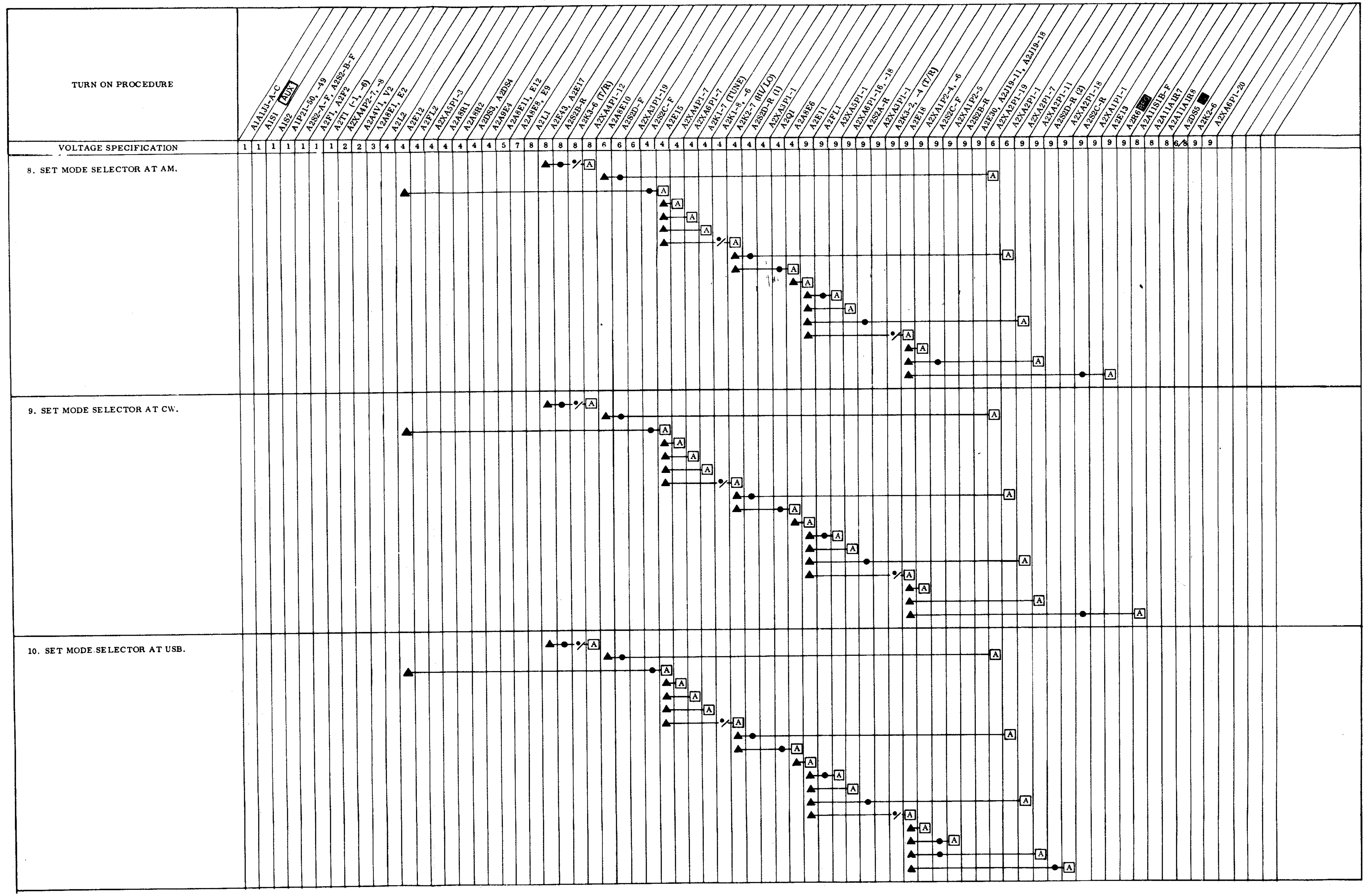
GENERAL NOTES

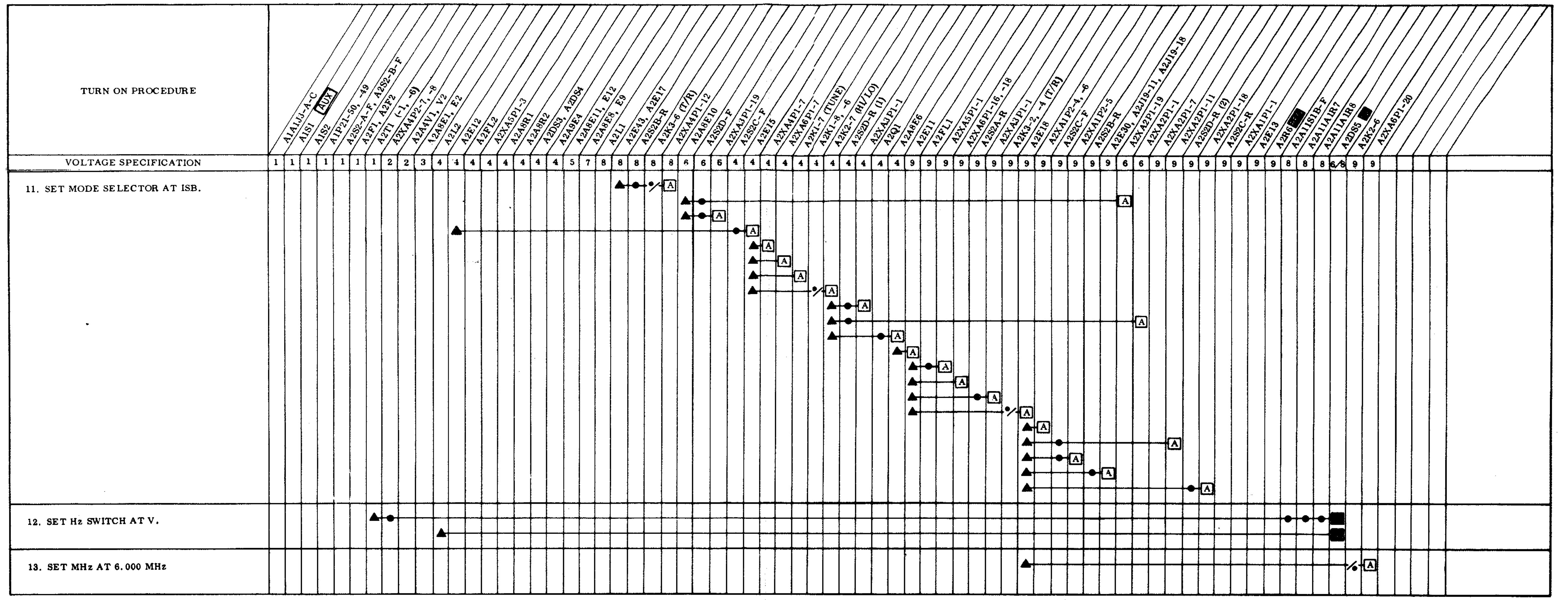
A. MULTIMETER AN/PSM-4( ) REQUIRED.

B. VOLTAGE SPECIFICATION NO. 9 (+20V) REQUIRES A PRECISION METER (0.5% ACCURACY) DIFFERENTIAL VOLTMETER (JOHN FLUKE 825).



047-002-144





LEGEND:

$\boxed{A}$	POWER AVAILABLE
▲	DEPENDENT ON ABOVE PREVIOUS EVENT
—●—	CIRCUIT POINT OF COMPONENT IN DEPENDENCY CHAIN
$\boxed{FIL}$	A2A4V1 AND A2A4V2 FILAMENTS LIT
▬	FRONT PANEL DIAL ILLUMINATED
●/	INDICATES RELAY CONTACT SET THAT PROVIDES CONTINUITY IN THE DE-ENERGIZED STATE
/●	INDICATES RELAY CONTACT SET THAT PROVIDES CONTINUITY IN THE ENERGIZED STATE
■	VERNIER INDICATOR; ALSO A POSITION OF A2A11S1

SIGNAL SPECIFICATIONS

1.	115V ± 10%	50 - 450 Hz
2.	6.3V ± 10%	50-450 Hz
3.	36V ± 3V	50-450 Hz
4.	+ 28V ± 3V	
5.	37.5V ± 10%	50-450 Hz
6.	-30V ± 1.5V	
7.	134V ± 10%	50-450 Hz
8.	+110V ± 7V	
9.	+ 20V ± 0.1V	

Figure 5-34. Power Distribution Maintenance Dependency Chart

NOTES FOR FIGURE 5-35

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF HIGHER ASSEMBLIES.

B. ALL RESISTANCE VALUES IN OHMS, UNLESS OTHERWISE NOTED.

C. ALL CAPACITANCE VALUES IN MICROFARADS, UNLESS OTHERWISE NOTED.

D. RESISTANCES OF COILS, RELAYS AND TRANSFORMER WINDINGS SHOWN WHEN GREATER THAN ONE OHM.

E. SWITCHES A2S2 AND A2S3 ARE SHOWN AS VIEWED FROM REAR OF FRONT PANEL. A BLACK SWITCH TERMINAL INDICATES A LONG CLIP AT THAT POINT.

NOTES FOR FIGURE 5-35, SHEET 1

PART LOCATION INDEX

REF DES	ZONE
A1P1-1	
thru	*
P1-4	
P1-5	11H
P1-6	12D
P1-7	*
P1-8	12C
P1-9	
thru	*
P1-16	
P1-17	12G
P1-18	
thru	*
P1-22	
P1-23	12C
P1-24	12D
P1-25	
thru	*
P1-47	
P1-48	11E
P1-49	*
P1-50	11F
A1A1C1	
thru	*
C4	
C5	13H
C6	13D
C7	*
C8	13C
C9	
thru	*
C16	
C17	13G
C18	13F
C19	13G
C20	13E
C21	13E
C22	13F

REF DES	ZONE
A1A1C23	13C
C24	13D
E1	13G
J3-A	13G
J3-B	13G
J3-C	13F
J4-J	13D
J4-K	13C
J4-R	13F
J4-S	13E
J4-Z	13H
J4-i	13E
A1A2S1-A-C	12F
S1-A-NC	12F
S1-A-NO	12F
S1-B-C	12E
S1-B-NC	12E
S1-B-NO	12E
S2-A-C	12F
S2-A-NC	12F
S2-A-NO	12F
S2-B-C	12E
S2-B-NC	12E
S2-B-NO	12E
A2C1	5G
C2	4F
C3	9D
CR1	10C
CR2	*
CR3	11D
CR4	*
CR5	6B
DS1	*
DS2	*
DS3	5F
DS4	5F
E1	5F

REF DES	ZONE
A2E2	
thru	*
E4	
E5	4C
E6	
thru	*
E9	
E10	4E,5G
E11	6E
E12	5F
E13	*
E14	6F
E15	*
E16	*
E17	5G
E18	*
E19	*
E20	4C
E21	4C
E22	4C
E23	
thru	*
E26	
E27	4C
E28	4C,11E,11G
E29	*
E30	*
E31	5C
E32	*
E33	*
E34	5C
E35	5C
E36	
thru	*
E41	
E42	4E
E43	5G
F1	10E

* Not Used

NOTES FOR FIGURE 5-35, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2F2	10G	A2K3-B1	11B	A2S2B-R-1	
J1-1		K3-B2	11B	thru	*
thru	*	K3-B3	11B	S2B-R-8	
J1-4		L1	6G	S2B-R-9	5G
J1-5	11H	L2	6F	S2B-R-10	5G
J1-6	12D	Q1	9D	S2B-R-11	5G
J1-7	*	R1	*	S2C-F-1	
J1-8	12C	R2	*	thru	*
J1-9		R3	6B	S2C-F-5	
thru	*	R4		S2C-F-6	4F
J1-13		thru	*	S2C-F-7	4F
J1-14	11H	R7		S2D-F-1	*
J1-15	*	R8	4F	S2D-F-2	4E
J1-16	*	R9		S2D-F-3	
J1-17	11H	thru	*	thru	*
J1-18		R13		S2D-F-5	
thru	*	R14	7B	S2D-F-6	4D
J1-22		R15		S2D-F-7	4D
J1-23	12C	thru	*	S2D-F-8	*
J1-24	12D	R19		S2D-F-9	*
J1-25		R20	5G	S2D-F-10	4E
thru	*	S1	*	S2D-F-11	4E
J1-47		S2-F-1		S2D-F-12	4E
J1-48	11E	thru	*	S2D-R-1	*
J1-49	11E	S2-F-5		S2D-R-2	*
J1-50	11F	S2-F-6	11E	S2D-R-3	8B
K1	10C	S2-F-7	11E	S2D-R-4	8B
K1-A1	10D	S2A-R-1	*	S2D-R-5	8B
K1-A2	10D	S2A-R-2	5E	S2D-R-6	8B
K1-A3	10D	S2A-R-3	*	S3-1	*
K1-B1	10D	S2A-R-4	5E	S3-2	*
K1-B2	10D	S2A-R-5	5E	S3-3	5B
K1-B3	10D	S2A-R-6	5D	S3-4	*
K2	*	S2B-F-1		S3-5	5B
K3	11D	thru	*	S3-6	5B
K3-A1	11B	S2B-F-9		S3-7	*
K3-A2	11B	S2B-F-10	10G	S3-8	5B
K3-A3	11B	S2B-F-11	10G	S3-9	*

* Not Used

NOTES FOR FIGURE 5-35, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2S3-10	5B	A2P1-13	4C	A2A8CR5	8F
S3-11	5B	P1-14	*	CR6	8F
S3-12	5B	P1-15	4C	CR7	8F
S4		P1-16	*	CR8	8F
thru	*	P1-17	*	CR9	8E
S8		P1-18	*	CR10	8E
S9-1	12C	P1-19	4C	CR11	8E
S9-2	12C	P1-20	4C	CR12	8E
S9-3	12C	P1-21	4C	CR13	7E
S9-4	12D	A2A3P1-1	5C	CR14	7E
S9-5	12D	P1-2		CR15	8D
S9-6	12D	thru	*	CR16	8C
T1-1	9G	P1-6		CR17	8C
T1-2	9G	P1-7	5C	E1	9F
T1-3	9G	P1-8	*	E2	9F
T1-4	9F	P1-9	5C	E3	6F
T1-5	9F	P1-10 thru	*	E4	6F
T1-6	9E	P1-12		E5	6F
T1-7	9G	P1-13	5C	E6	*
T1-8	9G	P1-14	*	E7	6G
T1-9	9F	P1-15	5C	E8	9G
T1-10	9F	P1-16	*	E9	9G
T1-11	9F	P1-17	*	E10	6E
T1-12	9E	P1-18	*	E11	9E
T1-13	9H	P1-19	5C	E12	9F
T1-14	9H	P1-20	5C	E13	9D
XF1	10F	P1-21	5C	E14	9C
XF2	10G	A2A8C1	*	E15	6E
A2A2P1-1	3C	C2	*	E16	6C
P1-2		C3	8E	E17	6G
thru	*	C4	7E	E18	6F
P1-6		C5	*	Q1	8D
P1-7	3C	C6	7D	Q2	8D
P1-8	*	C7	6D	Q3	8D
P1-9	4C	CR1	8G	Q4	7D
P1-10	*	CR2	8G	R1	7F
P1-11	*	CR3	8G	R2	7F
P1-12	*	CR4	8G	R3	8E

* Not Used

NOTES FOR FIGURE 5-35, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A8R4	8E	A2XA2P1-7	3C	A2XA3P1-3 thru P1-6	*
R5	9D	P1-8	*	P1-7	5C
R6	6C	P1-9	4C	P1-8	*
R7	8C	P1-10	*	P1-9	5C
R8	8D	P1-11	*	P1-10	*
R9	8D	P1-12	*	P1-11	*
R10	7D	P1-13	4C	P1-12	*
R11	7D	P1-14	*	P1-13	5C
R12	7C	P1-15	4C	P1-14	*
R13	7D	P1-16	*	P1-15	5C
R14	7D	P1-17	*	P1-16	*
R15	7C	P1-18	*	P1-17	*
R16	6C	P1-19	3C	P1-18	*
A2XA2P1-1	3C	P1-20	4C	P1-19	5C
P1-2 thru P1-6	*	P1-21	4C	P1-20	5C
		A2XA3P1-1	5C	P1-21	5C
		P1-2	*		

* Not Used

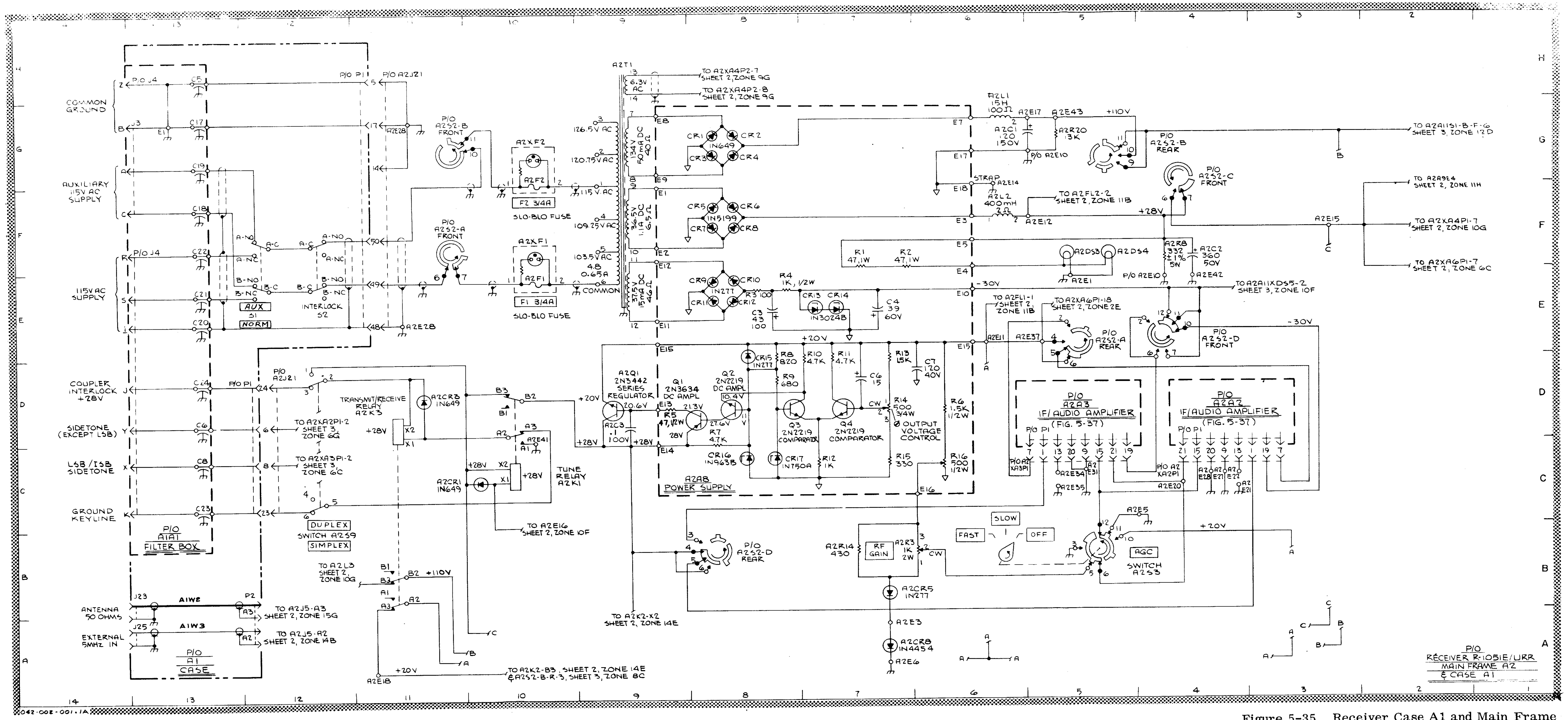


Figure 5-35. Receiver Case A1 and Main Frame A2, Maintenance Schematic Diagram (Sheet 1 of 3)

NOTES FOR FIGURE 5-35, SHEET 2

PART LOCATION INDEX

REF DES	ZONE
A2C1	
thru	*
C12	
C13	2B
CR1	*
CR2	14E
CR3	*
CR4	14E
E1	*
E2	*
E3	2B
E4	*
E5	*
E6	*
E7	13D
E8	*
E9	9G, 14G
E10	
thru	*
E15	
E16	10F
E17	
thru	*
E37	
E38	6D
E39	9C, 9C
E40	8C, 9D
FL1	11B
FL2	11C
J2-A1	*
J2-A2	15B
J2-A3	15G
J2	
thru	*
J7	
J8-1	12E
J8-2	12E
J8-3	12E

REF DES	ZONE
A2J8-4	12E
J8-5	12E
J8-6	13E
J8-7	13E
J8-8	*
J8-9	13D
J8-10	
thru	*
J8-20	
J8-21	12E
J8-22	12E
J8-23	11E
J8-24	11E
J8-25	11E
K1	*
K2	14E
K2-A1	14E
K2-A2	14E
K2-A3	14E
K2-B1	14E
K2-B2	14E
K2-B3	14E
L1	
thru	*
L26	
L27	10E
P1	
thru	*
P7	
P8-1	12E
P8-2	12E
P8-3	*
P8-4	12E
P8-5	12E
J8-6	13E
P8-7	13E
P8-8	*
P8-9	13D

REF DES	ZONE
A2P8-10	
thru	*
P8-20	
P8-21	12E
P8-22	12E
P8-23	11E
P8-24	11E
P8-25	11E
A2A4P1-1	10G
P1-2	10G
P1-3	10G
P1-4	10G
P1-5	9G
P1-6	10G
P1-7	10G
P1-8	9G
P2-1	9G
P2-2	
thru	*
P2-6	
P2-7	9G
P2-8	9G
P2-9	10G
P2-10	*
P2-11	*
P2-12	10G
P2-A1	8H
P2-A2	9G
P2-A3	11H
A2A5P1-1	10C
P1-2	9C
P1-3	10C
P1-A1	9D
P1-A2	9C
P1-A3	10D
P1-A4	9C
P1-A5	9D
P1-A6	9C

* Not Used

NOTES FOR FIGURE 5-35, SHEET 2 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6P1-1	6F	A2A9E5	14G	A2A10L6	7G
P1-2	6F	E6	14H	R1	8F
P1-3	6F	K1	12G	R2	7G
P1-4	6E	K1-A1	12H	R3	6G
P1-5	6E	K1-A2	11H	A2XA4P1-1	10G
P1-6	6F	Q1	12G	P1-2	10G
P1-7	6C	Q2	12G	P1-3	10G
P1-8	6D	R1	13G	P1-4	10G
P1-9	*	R2	13G	P1-5	9G
P1-10	2E, 6G	R3	13G	P1-6	10G
P1-11	2B	R4	12H	P1-7	10G
P1-12	4A	R5	12G	P1-8	9G
P1-13	4A	R6	12G	P1-9	10G
P1-14	3A	R7	12G	P1-10	*
P1-15	3A	R8	11G	P1-11	*
P1-16	6D	R9	12G	P1-12	10G
P1-17	2C	A2A10C1	8H	P2-1	9G
P1-18	2F	C2	8F	P2-2	
P1-19	4A	C3	7H	thru	*
P1-20	2D, 6E	C4	7G	P2-6	
P1-21	3A	C5	7G	P2-7	9G
P1-A1	6E	C6	7F	P2-8	9G
P1-A2	6E	CR1	8H	P2-A1	8H
P1-A3	6D	CR2	8G	P2-A2	9G
P2-A1	2H	CR3	7H	P2-A3	11H
P2-A2	2G	CR4	7G	A2XA5P1-1	10C
P2-A3	2C	CR5	7F	P1-2	9C
P3-A1	6G	E1	6G	P1-3	10C
A2A9C1	14G	E2	8F	P1-A1	9D
C2	13G	E3	6G	P1-A2	9C
C3	13G	E4	6G	P1-A3	10D
C4	13G	E5	8H	P1-A4	9C
CR1	13G	E6	8H	P1-A5	9D
CR2	13H	L1	8G	P1-A6	9C
E1	14G	L2	7H	A2AX6P1-1	6F
E2	11H, 14H	L3	7G	P1-2	6F
E3	11H	L4	7H	P1-3	6F
E4	11H	L5	7G	P1-4	6E

* Not Used

NOTES FOR FIGURE 5-35, SHEET 2 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2AX6P1-5	6E	A2AX6P1-13	4A	A2XA6P1-21	3A
P1-6	6F	P1-14	3A	P1-A1	6E
P1-7	6C	P1-15	3A	P1-A2	6E
P1-8	6D	P1-16	6D	P1-A3	6D
P1-9	*	P1-17	2C	P2-A1	2H
P1-10	2E, 6G	P1-18	2F	P2-A2	*
P1-11	2C	P1-19	4A	P2-A3	2C
P1-12	4A	P1-20	2D, 6E	P3-A1	6G

* Not Used

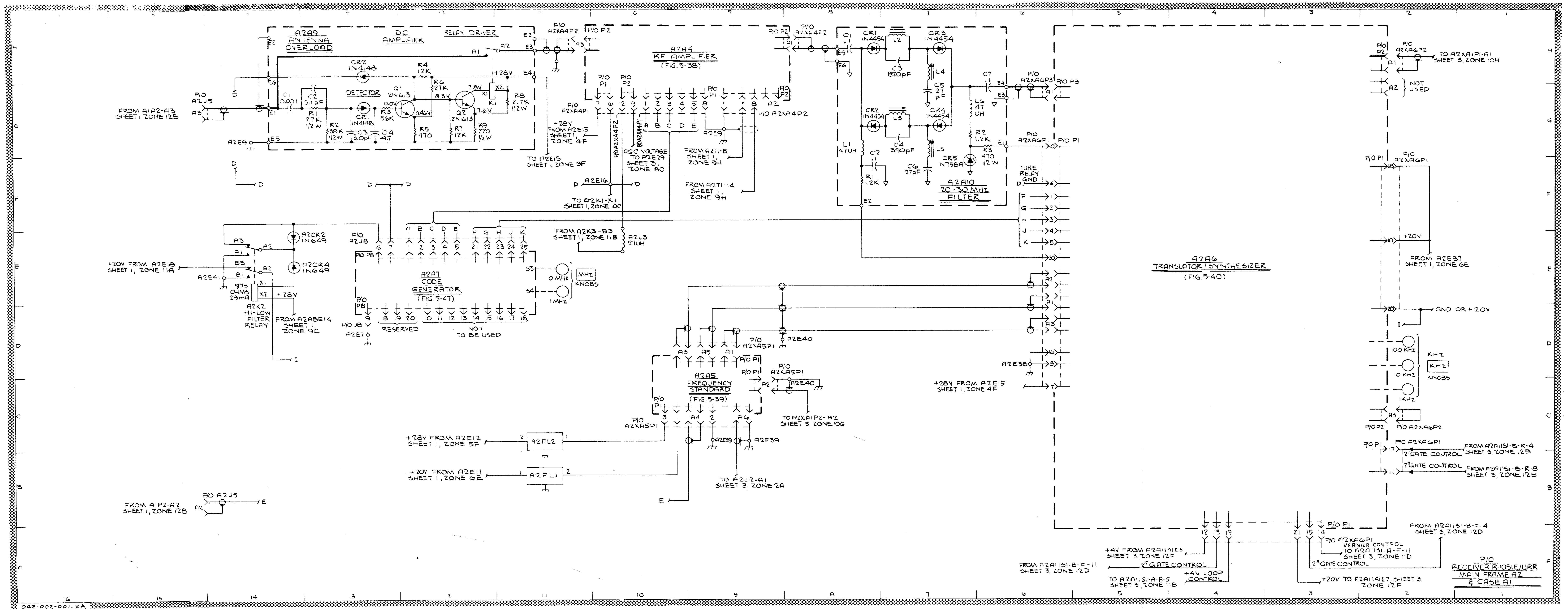


Figure 5-35. Receiver Case A1 and Main Frame A2, Maintenance Schematic Diagram (Sheet 2 of 3)

NOTES FOR FIGURE 5-35, SHEET 3

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A1J24	2B	A1A1J4-n	2C	A2E29	8C
P1-1		J5-A	2H	E30	7B
thru	*	J5-B	2H	E31	5D
P1-6		J5-H	2E	E32	3E, 4G
P1-7	3D	J5-a	2D	E33	3C
P1-8		J5-b	2G	E34	5C
thru	*	J5-e	2H	E35	5C
P1-10		J5-m	2D	E36	3D
P1-11	3D	J6-A	2C	J1	5E
P1-12	3C	J6-B	2C	J1-1	5E
P1-13	3E	A2DS1		J1-2	5E
P1-14		thru	*	J1-3	5E
thru	*	DS4		J1-4	*
P1-17		DS5	1F	J1-5	*
P1-18	3H	E1	*	J1-6	*
P1-19	3H	E2	5F	J1-7	3D
P1-20		E3	*	J1-8	*
thru	*	E4	10D	J1-9	*
P1-24		E5	*	J1-10	*
P2-A1	2B	E6	5D	J1-11	3D
A1A1C1		E7		J1-12	3C
thru	*	thru	*	J1-13	3E
C6		E12		J1-14	
C7	2D	E13	6F, 8E	thru	*
C8	*	E14		J1-17	
C9	*	thru	*	J1-18	3H
C10	2G	E17		J1-19	3H
C11	2D	E18	9D, 9F	J1-20	
C12	2C	E19	9G	thru	*
C13	2E	E20	*	J1-24	
C14	*	E21	6D, 10G, 5H	J1-25	3G
C15	2H	E22	5H	J2	5F
C16	2H	E23	3H	J2-1	5F
C17		E24	*	J2-2	5F
thru	*	E25	*	J2-3	5F
C24		E26	3H	J2-A1	2B
C25	2G	E27	*	M1	4F
J4-d	2H	E28	*	R1	7C

* Not Used

NOTES FOR FIGURE 5-35, SHEET 3 (Cont)

PART LOCATION INDEX

REF DES	ZONE
A2R2	7G
R3	*
R4	5D
R5	5G
R6	9D
R7	*
R8	*
R9	5F
R10	5E
R11 thru R18	*
R19	10D
R23	11G
S1	3F
S1-1	3F
S1-2	3F
S1-3	3F
S1-4	3E
S1-5	3E
S1-6	3E
S2A-F-1	6F
S2A-F-2	6F
S2A-F-3	6F
S2A-F-4	6E
S2A-F-5 thru S2A-F-8	*
S2A-F-9	6E
S2A-F-10	6F
S2A-F-11	6F
S2A-F-12	6F
S2A-R-1 thru S2A-R-7	*
S2A-R-8	7D
S2A-R-9	*
S2A-R-10	7D
S2A-R-11	7E

REF DES	ZONE
A2S2B-F-1	4F
S2B-F-2	4F
S2B-F-3	4F
S2B-F-4	4E
S2B-F-5	4E
S2B-F-6	4E
S2B-F-7	4E
S2B-F-8	4E
S2B-R-1	*
S2B-R-2	8D
S2B-R-3	8D
S2B-R-4	*
S2B-R-5	*
S2B-R-6	8C
S2B-R-7	*
S2B-R-8	8C
S2C-F-1	7F
S2C-F-2	7F
S2C-F-3	7F
S2C-F-4	7E
S2C-F-5 thru S2C-F-9	*
S2C-F-10	7F
S2C-F-11	7F
S2C-F-12	7F
S2C-R-1	*
S2C-R-2	8E
S2C-R-3	8E
S2C-R-4	8D
S2C-R-5	*
S2C-R-6	8D
S2C-R-7	*
S2C-R-8	8D
S2C-R-9	*
S2C-R-10	8D
S2C-R-11	*
S2C-R-12	8E

REF DES	ZONE
A2S2D-R-1 thru S2D-R-10	*
S2D-R-11	8F
S2D-R-12	8F
A2A1P1-1	9G
P1-2	9G
P1-3	*
P1-4	*
P1-5	*
P1-6	9G
P1-7	9G
P1-A1	10H
P1-A2	8H
P1-A3	8H
P2-1	9G
P2-2	9G
P2-3	10G
P2-4	9G
P2-5	9G
P2-A1	10G
P2-A2	10G
P2-A3	8G
P2-A4	8G
A2A2P1-1	*
P1-2	6G
P1-3	6G
P1-4	7G
P1-5	*
P1-6	7G
P1-7 thru P1-10	*
P1-11	6G
P1-12	6H
P1-13	6H
P1-14	6G
P1-15	*

* Not Used

NOTES FOR FIGURE 5-35, SHEET 3 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A2P1-16	*	A2A11S1-A-F-10	11D	A2A11A1E2	12E
P1-17	6G	S1-A-F-11	11D	E3	12E
P1-18	6G	S1-A-F-12	11D	E4	12F
P1-19	*	S1-A-R-1	*	E5	11E
P1-20	*	S1-A-R-2	*	E6	12F
P1-21	*	S1-A-R-3	11B	E7	*
P1-22	6G	S1-A-R-4	*	E8	11F
P1-A1	7G	S1-A-R-5	11B	E9	11E
P1-A2	6G	S1-B-F-1	12D	R1	12F
P1-A3	7H	S1-B-F-2	*	R2	12E
A2A3P1-1	*	S1-B-F-3	*	R3	12E
P1-2	6C	S1-B-F-4	13C	R4	12E
P1-3	6D	S1-B-F-5	*	R5	*
P1-4	7C	S1-B-F-6	12C	R6	11F
P1-5	*	S1-B-F-7	12C	R7	11E
P1-6	7C	S1-B-F-8	*	A2XA1P1-1	9G
P1-7		S1-B-F-9	*	P1-2	9G
thru	*	S1-B-F-10	*	P1-3	*
P1-10		S1-B-F-11	12D	P1-4	*
P1-11	7C	S1-B-R-1	12B	P1-5	*
P1-12	6C	S1-B-R-2	12B	P1-6	9G
P1-13	6C	S1-B-R-3	13B	P1-7	9G
P1-14	6C	S1-B-R-4	13B	P1-A1	10H
P1-15	*	S1-B-R-5	*	P1-A2	8H
P1-16	*	S1-B-R-6	*	P1-A3	8H
P1-17	*	S1-B-R-7	*	P2-1	9G
P1-18	6C	S1-B-R-8	12B	P2-2	9G
P1-19	*	S1-B-R-9	*	P2-3	10G
P1-20	*	S1-B-R-10	12B	P2-4	9G
P1-21	*	S1-B-R-11	*	P2-5	9G
P1-22	7C	S1-B-R-12	12B	P2-A1	10G
P1-A1	*	A2A11A1C1	12F	P2-A2	10G
P1-A2	6C	C2	11E	P2-A3	8G
P1-A3	7D	C3	*	P2-A4	8G
A2A11R1	13E	C4	11E	A2XA2P1-1	6G
S1-A-F-1		CR1	*	P1-2	6G
thru	*	CR2	12E	P1-3	5G
S1-A-F-9		E1	12E	P1-4	7G

* Not Used

NOTES FOR FIGURE 5-35, SHEET 3 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2XA2P1-5	*	A2XA2P1-21	*	A2XA3P1-12	5D
P1-6	7G	P1-22	6G	P1-13	5D
P1-7 thru P1-10	*	P1-A1	7G	P1-14	5C
P1-11	6G	P1-A2	6G	P1-15	*
P1-12	5H	P1-A3	7H	P1-16	*
P1-13	5H	A2XA3P1-1	*	P1-17	*
P1-14	5H	P1-2	6C	P1-18	6C
P1-15	*	P1-3	5D	P1-19	*
P1-16	*	P1-4	7C	P1-20	*
P1-17	6G	P1-5	*	P1-21	8
P1-18	6G	P1-6	7C	P1-22	7C
P1-19	*	P1-7 thru P1-10	*	P1-A1	*
P1-20	*	P1-11	7C	P1-A2	6C
				P1-A3	7D

ot Used

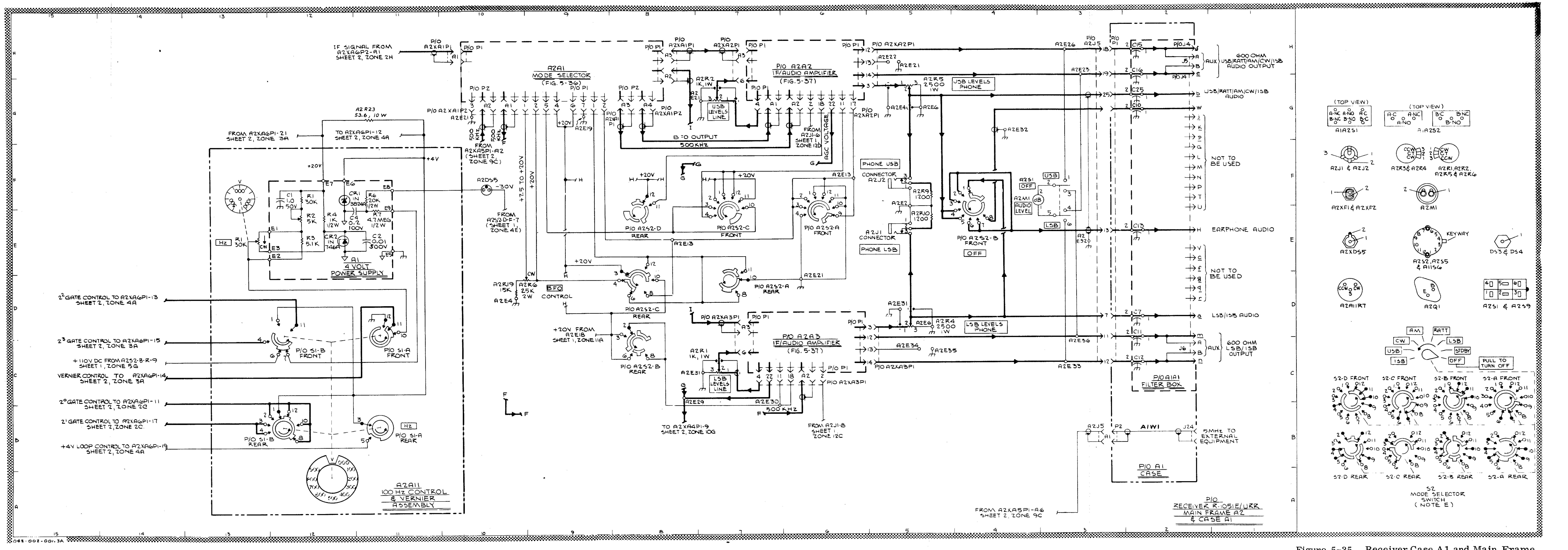


Figure 5-35. Receiver Case A1 and Main Frame A2, Maintenance Schematic Diagram (Sheet 3 of 3)

NOTES FOR FIGURE 5-36

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLY.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT, ±5%.
2. ALL CAPACITANCE IS IN PICOFARADS, UF = MICROFARADS.
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENT AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

SPECIFIC NOTES

1. CAPACITANCE TO BE SELECTED ACCORDING TO COLOR DOT ON FILTERS.

   ORANGE - 130 pF ± 2%
   YELLOW - 142 pF ± 2%
   GREEN - 150 pF ± 2%

CHART 1

PIN	LSB	RATT	AM	CW	USB	ISB
P1-1	GND	+20V	GND	GND	+20V	+20V
P1-2	GND	GND	+20V	+20V	GND	GND
P2-2	-	-	-	+20V	-	-
P2-5	+20V	+20V	-	-	+20V	+20V

NOTES FOR FIGURE 5-36 (Cont)

VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE
A1Q1-E	2.1V
A1Q1-B	2.8V
A1Q1-C	19.8V
A1Q2-E	2.2V
A1Q2-B	2.8V
A1Q2-C	19.8V
A1Q3-E	2.2V
A1Q3-B	2.8V
A1Q3-C	19.8V
A3Q1-E	16.9V
A3Q1-B	16.7V
A3Q1-C	0V
A3Q2-E	12.7V
A3Q2-B	12.0V
A3Q2-C	0V

NOTE: VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4( ).

NOTES FOR FIGURE 5-36 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A1C1	5G	A2A1A1C9	6E	A2A1A1Q1	8H
C2	5F	C10	8D	Q2	3G
E1	5F, 5G	C11	7D	Q3	3E
E2	5G	C12	5E	R1	8G
E3	5G	C13	4G	R2	8H
E4	5E	C14	4E	R3	8G
E5	5F	C15	4G	R4	8F
E6	5F	C16	3G	R5	8E
FL1	6G	C17	4E	R6	7G
FL2	6F	C18	3E	R7	7G
FL3	6E	C19	7G	R8	7F
P1-1	9F	CR1	4G	R9	7E
P1-2	9E	CR2	4F	R10	8E
P1-3	*	CR3	8D	R11	8F
P1-4	*	CR4	7F	R12	8E
P1-5	*	E1	6G	R13	5H
P1-6	9D	E2	6G	R14	4E
P1-7	9E	E3	7G	R15	3G
P1-A1	9G	E4	6F	R16	3G
P1-A2	2E	E5	6F	R17	3G
P1-A3	2G	E6	7F	R18	3E
P2-1	9D	E7	6E,9E	R19	3E
P2-2	9C	E8	7E	R20	3G
P2-3	9C	E9	6E	R21	3E
P2-4	9A	E10	9G	R22	3E
P2-5	9B	E11	9H	R23	8H
P2-A1	2B	E12	9E	R24	8G
P2-A2	9B	E13	9D	R25	8F
P2-A3	2B	E14	9F		
P2-A4	2C	E15	2E,5E	TP1	8H
A2A1A1C1	8G	E16	5G	A2A1A2C1	7A
C2	8F	E17	5F	C2	8B
C3	8E	E18	5E	C3	8A
C4	7H	E19	5E	C4	6B
C5	6G	E20	2G	CR1	7B
C6	8F	E21	2G	E1	6A
C7	6F	E22	2E	E2	6B
C8	8E	E23	5F, 5G	E3	9A

* Not Used

NOTES FOR FIGURE 5-36 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A1A2E4	9A	A2A1A3C5	6C	A2A1A3R1	7C
E5	9B	C6	6C	R2	7C
E6	9B	C7	5C	R3	6C
E7	9A	C8	4C	R4	6C
R1	9A	C9	4C	R5	6C
R2	7B	CR1	7C	R6	6C
R3	7B	E1	9D	R7	5D
R4	7A	E2	9C	R8	5C
R5	6A	E3	9C	R9	4D
R6	6B	E4	2C	R10	3C
A2A1A3C1	8C	E5	2C	R11	4C
C2	7C	L1	7C	R12	9C
C3	7C	Q1	6C	T1	3C
C4	7C	Q2	4C	TP1	3C

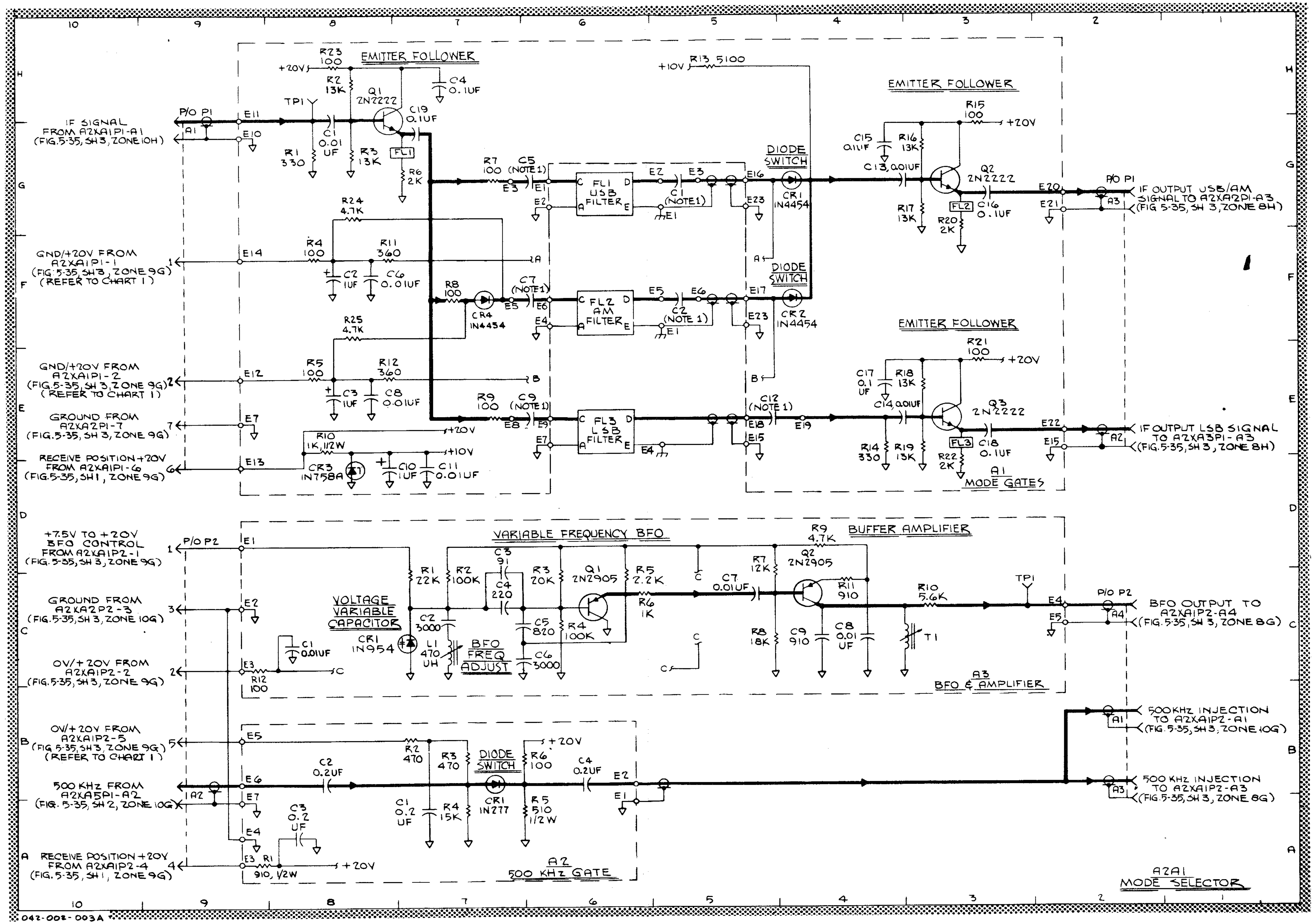


Figure 5-36. Receiver Mode Selector Assembly A2A1, Maintenance Schematic Diagram

NOTES FOR FIGURE 5-37

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLY.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
ALL RESISTORS ARE 1/4 WATT, ±5%.

2. ALL CAPACITANCE IS IN MICROFARADS, pF = PICOFARAD.

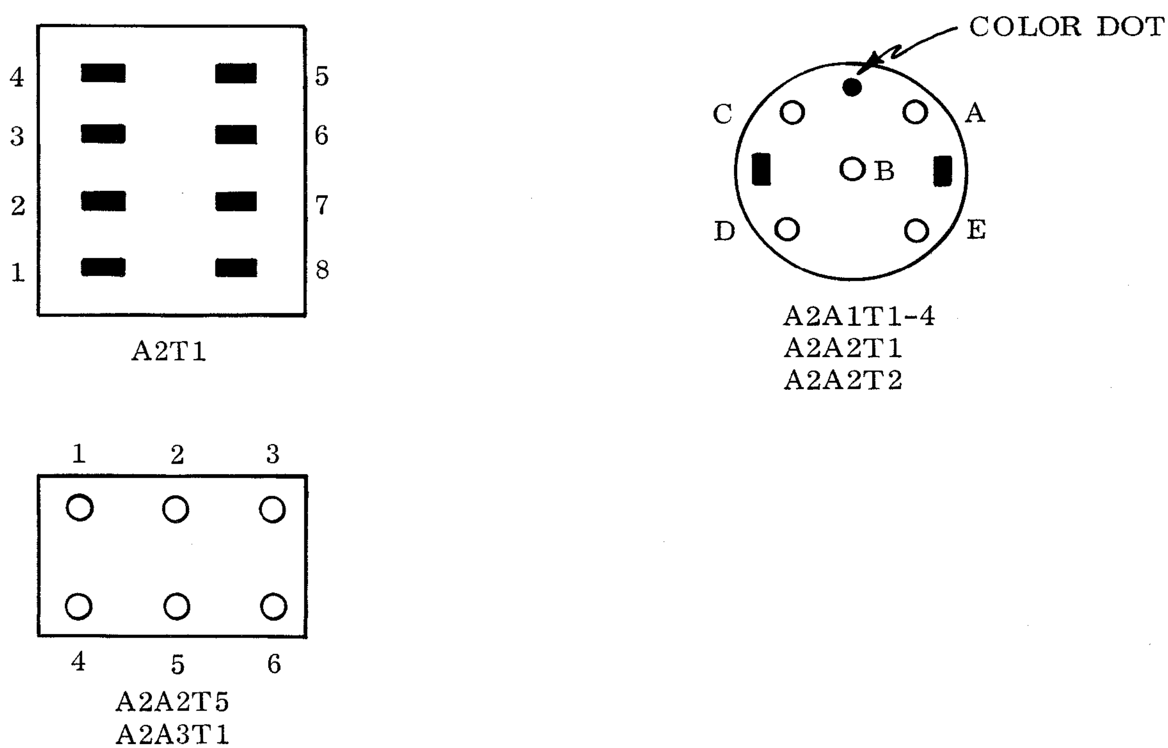
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENT AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

E. REFER TO BASING DIAGRAMS FOR TRANSFORMER ORIENTATION.

F. ALL AC VOLTAGE MEASUREMENTS TAKEN WITH RF VOLTMETER.



TRANSFORMER BASING DIAGRAMS

NOTES FOR FIGURE 5-37 (Cont)

VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
A1Q1-E	4.8V	A1Q13-E	20V
A1Q1-B	4.2V	A1Q13-B	19V
A1Q1-C	*	A1Q13-C	20V
A1Q2-E	8.6V	A1Q14-E	18V
A1Q2-B	8V	A1Q14-B	*
A1Q2-C	4.2V	A1Q14-C	0.2V
A1Q3-E	1V	A1Q15-E	0V
A1Q3-B	1.6V	A1Q15-B	*
A1Q3-C	8V	A1Q15-C	2.3V
A1Q4-E	1.6V	A2Q1-E	7.6V
A1Q4-B	2.2V	A2Q1-B	7.2V
A1Q4-C	18.5V	A2Q1-C	0V
A1Q5-E	0V	A2Q2-E	0.15V
A1Q5-B	0.1V	A2Q2-B	0.8V
A1Q5-C	0V	A2Q2-C	13.0V
A1Q6-E	2.2V	A2Q3-B	0.6V
A1Q6-B	2.8V	A2Q3-B	0.6V
A1Q6-C	2.8V	A2Q3-C	0V
A1Q7-E	5V	A2Q4-E	7.8V
A1Q7-B	4.7V	A2Q4-B	7.2V
A1Q7-C	0V	A2Q4-C	0V
A1Q8-E	*	A2Q5-E	7.7V
A1Q8-B	7.7V	A2Q5-B	7.2V
A1Q8-C	0V	A2Q5-C	0V
A1Q9-E	*	A2Q6-E	*
A1Q9-B	1.4V	A2Q6-B	7V
A1Q9-C	*	A2Q6-C	0V
A1Q10-E	0V	A2Q7-E	18V
A1Q10-B	0.6V	A2Q7-B	17V
A1Q10-C	0V	A2Q7-C	11.2V
A1Q11-E	0V	A2Q8-E	*
A1Q11-B	0.1V	A2Q8-B	11.2V
A1Q11-C	0.6V	A2Q8-C	5.4V
A1Q12-E	0V	A2Q9-E	25.9V
A1Q12-B	*	A2Q9-B	25.5V
A1Q12-C	*	A2Q9-C	0V

NOTES FOR FIGURE 5-37 (Cont)

TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
A2Q10-E	25.9V	A3Q2-E	16.8V
A2Q10-B	25.5V	A3Q2-B	16.2V
A2Q10-C	0V	A3Q2-C	*
A3Q1-E	16.8V	A3Q3-E	*
A3Q1-B	16.2V	A3Q3-B	16.2V
A3Q1-C	0V	A3Q3-C	0V

TEST POINT	MEASUREMENT
A2E10	+20 Vdc
A2E3	+20 Vdc
A2E19	0V
A1E10	1-3 Vdc
A1TP2	-12 Vdc
A1TP1	1 Vdc
A3E7	20 Vdc
A2A2/A2A3 T1 - 4	8 Vac
5	4 Vac
6	0 Vac

NOTES:

1 VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AND/PSM-4().

* MEASUREMENTS NOT MADE AT THIS POINT DUE TO INACCESSABILITY.

NOTES FOR FIGURE 5-37 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A2P1-1	20H	A2A2A1C13	*	A2A2A1R3	19D
P1-2	4E	C14	15C	R4	19C
P1-3	4F	C15	19C	R5	19C
P1-4	4F	C16	3B	R6	19C
P1-5	20E	CR1	19D	R7	18D
P1-6	20G	CR2	17D	R8	17D
P1-7	20H	CR3	17D	R9	17C
P1-8	20E	CR4	12C	R10	16D
P1-9	20F	CR5	12D	R11	16D
P1-10	20E	E1	20D	R12	16D
P1-11	20A	E2	19E	R13	15C
P1-12	4G	E3	20C	R14	18B
P1-13	4G	E4	20C	R15	12C
P1-14	4G	E5	4B	R16	12C
P1-15	20B	E6	3E	R17	18B
P1-16	20E	E7	3E	R18	11D
P1-17	4E	E8	9E	R19	12C
P1-18	20B	E9	20B	R20	10D
P1-19	20D	E10	20D	R21	10C
P1-20	20C	E11	8E	R22	9D
P1-21	20D	E12	17E	R23	9D
P1-22	4E	Q1	19D	R24	4B
P1-A1	20A	Q2	17C	R25	9D
P1-A2	20B	Q3	16C	R26	9C
P1-A3	20G	Q4	15C	R27	4C
T1	6G	Q5	17C	R28	3C
A2A2A1C1	18C	Q6	12D	R29	3C
C2	16C	Q7	10C	R30	4B
C3	15C	Q8	9C	R31	15D
C4	*	Q9	3B	R32	14C
C5	12C	Q10	14C	R33	14C
C6	20B	Q11	14C	R34	14C
C7	11D	Q12	13C	R35	13C
C8	11C	Q13	13D	R36	14D
C9	10C	Q14	3B	R37	14D
C10	9C	Q15	12D	R38	14C
C11	9D	R1	20D	R39	3B
C12	*	R2	19D	R40	3B

* Not Used

NOTES FOR FIGURE 5-37 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A2A1R41	12D	A2A2A2E6	20F	A2A2A2R13	15F
RT1	12C	E7	6F	R14	14G
T1	11C	E8	20G	R15	14F
T2	10C	E9	6F	R16	14G
TP1	16D	E10	20H	R17	14G
TP2	19D	E11	6G	R18	13F
A2A2A2C1	19G	E12	6F	R19	12G
C2	19G	E13	6G	R20	12F
C3	19G	E14	20H	R21	12G
C4	18G	E15	11E	R22	12G
C5	18G	E16	11E	R23	11F
C6	17F	E17	11E	R24	11G
C7	17G	E18	12E	R25	11F
C8	16F	E19	15E	R26	10G
C9	15G	E20	14E	R27	10G
C10	14G	L1	20F	R28	10F
C11	14F	Q1	19G	R29	10F
C12	14G	Q2	17F	R30	9G
C13	13G	Q3	17G	R31	9G
C14	12F	Q4	16G	R32	9G
C15	10G	Q5	14G	R33	8F
C16	11F	Q6	12G	R34	8G
C17	10G	Q7	10G	R35	7G
C18	10G	Q8	8G	R36	7G
C19	9F	Q9	7G	R37	6G
C20	9F	Q10	7F	R38	17G
C21	8G	R1	19G	R39	17G
C22	8F	R2	19F	R40	7G
C23	7G	R3	19G	T1	19G
C24	6F	R4	*	T2	15F
C25	19F	R5	18G	T3	14F
C26	10F	R6	18F	T4	12F
CR1	17F	R7	17F	T5	8G
E1	20G	R8	18G	A2A2A3C1	7D
E2	20G	R9	17F	C2	7C
E3	20F	R10	16G	C3	7C
E4	18E	R11	16F	C4	7B
E5	6F	R12	16G	C5	5C

* Not Used

NOTES FOR FIGURE 5-37 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A2A3C6	5B	A2A2A3E7	6C	A2A2A3R1	7D
C7	5B	E8	*	R2	6D
C8	6A	E9	8A	R3	7B
CR1	5C	E10	8C	R4	6B
CR2	5B	E11	8C	R5	5C
E1	5E	E12	8D	R6	4B
E2	8B	E13	8C	R7	5C
E3	4B	L1	5B	T1	6C
E4	8B	Q1	7D	TP1	7D
E5	8B	Q2	7C	A2A3's	Identical to A2A2's
E6	8A	Q3	5B		

* Not Used

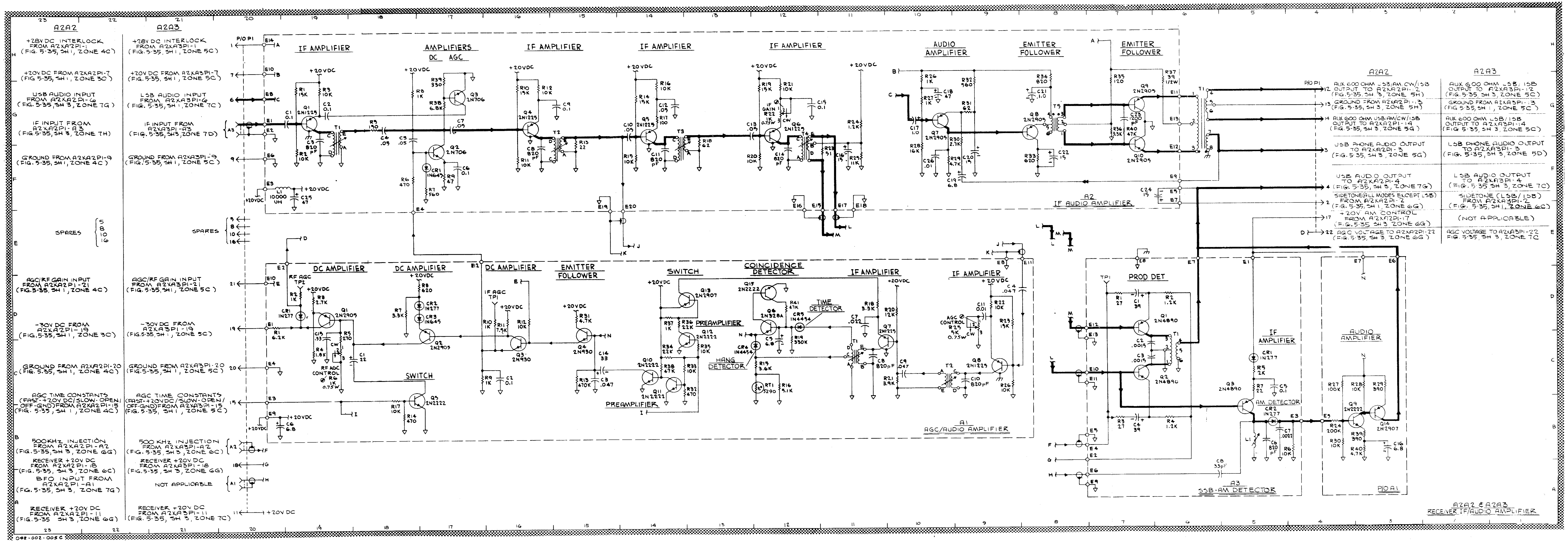


Figure 5-37. Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3, Maintenance Schematic Diagram

NOTES FOR FIGURE 5-38

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATION PREFIX WITH NUMBERS OF HIGHER ASSEMBLIES.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT, ±5%.
2. ALL CAPACITANCE IS IN PICOFARADS, UF = MICROFARADS
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENT AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

E. THIS UNIT IS COMMON TO BOTH THE TRANSMITTER AND RECEIVER.REFERENCES TO RECEIVER LOCATIONS ETC IN THE TRANSMITTER MANUAL AND VICE VERSA DO NOT APPLY.

F. UNLESS OTHERWISE INDICATED, GROUNDING OF PCB'S OCCURS BY MEANS OF THEIR MOUNTING SCREWS.

SPECIFIC NOTES

1. CRYSTAL Y1 USED ONLY ON ASSEMBLIES A9, A10 AND A19. REFER TO CHART 4 FOR FREQUENCY.
2. SEE CHARTS NUMBER 5, 6, AND 7 FOR TERMINAL IDENTIFICATION OF T1 THROUGH T4 OF ASSEMBLIES A2A4A2 THROUGH A2A4A29.

CHART 1

FREQ IN MHz	CAPACITOR REF DESIG	A31	A32	A35	A36
.00	C1	250	260	260	260
.01	C2	215	224	224	224
.02	C3	183	190	190	190
.03	C4	153	158	158	158
.04	C5	124	128	128	128
.05	C6	96	99	99	99
.06	C7	70	72	72	72
.07	C8	45	47	47	47
.08	C9	22	23	23	23
.09	NONE	OPEN	OPEN	OPEN	OPEN

NOTES FOR FIGURE 5-38 (Cont)

CHART 2

FREQ IN MHz	CAPACITOR REF DESIG	A30	A33	A34	A37
.00	C1	545	517	517	517
	C10	253	257	257	257
.10	C2	426	405	405	405
	C11	219	222	222	222
.20	C3	332	316	316	316
	C12	190	193	193	193
.30	C4	257	245	245	245
	C13	165	167	167	167
.40	C5	195	186	186	186
	C14	144	146	146	146
.50	C6	143	137	137	137
	C15	125	127	127	127
.60	C7	99	95	95	95
	C16	109	110	110	110
.70	C8	61	59	59	59
	C17	95	96	96	96
.80	C9	29	28	28	28
	C18	83	83	83	83
.90	NONE	OPEN	OPEN	OPEN	OPEN
	C19	74	74	74	74

NOTES FOR FIGURE 5-38 (Cont)

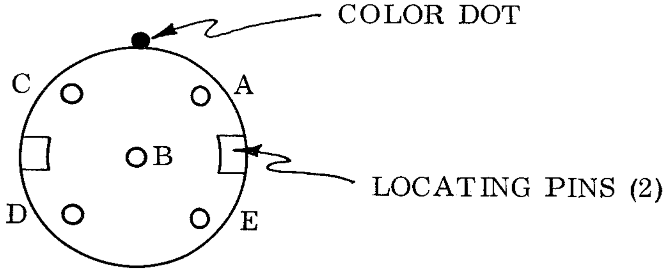
CHART 3

FREQ IN MHz	ON ASSY	C1	C2	C3	C6	L1 mH	Y1 MHz	ASSY	C4	ASSY	C5
2	A20	2.0	SHORT	SHORT	.068 UF	-	-	A25	SHORT	A2	SHORT
3	A21	2.0	1247	1253	.047 UF	-	-	A26	1247	A3	1253
4	A22	4.7	623	629	-	-	-	A27	623	A4	629
5	A23	3.9	416	422	-	-	-	A28	416	A5	422
6	A24	3.3	312	318	-	-	-	A29	312	A6	318
7	A25	3.0	250	256	-	-	-	A2	250	A7	256
8	A26	3.0	208	214	-	-	-	A3	208	A8	214
9	A27	2.7	179	185	-	-	-	A4	179	A9	185
10	A28	2.4	157	163	-	-	-	A5	157	A10	163
11	A29	2.0	140	146	-	-	-	A6	140	A11	146
12	A2	2.0	126	132	-	-	-	A7	126	A12	132
13	A3	2.0	115	120	-	-	-	A8	115	A13	120
14	A4	2.0	105	111	-	-	-	A9	105	A14	111
15	A5	1.5	97	103	-	-	-	A10	97	A15	103
16	A6	2.0	91	96	-	-	-	A11	91	A16	96
17	A7	2.0	85	90	-	-	-	A12	85	A17	90
18	A8	1.8	80	85	-	-	-	A13	80	A18	85
19	A9	1.8	75	80	-	-	21.0	A14	75	A19	80
20	A10	1.8	71	76	-	-	19.0	A15	71	A20	76
21	A11	2.0	67	73	-	-	-	A16	67	A21	73
22	A12	7.0	64	68	-	8.2	-	A17	64	A22	68
23	A13	3.9	61	66	-	8.2	-	A18	61	A23	66
24	A14	2.0	58	63	-	-	-	A19	58	A24	63
25	A15	2.2	56	61	-	-	-	A20	56	A25	61
26	A16	2.2	54	59	-	-	-	A21	54	A26	59
27	A17	2.4	52	57	-	-	-	A22	52	A27	57
28	A18	2.4	50	55	-	-	-	A23	50	A28	55
29	A19	2.4	48	53	-	-	-	A24	48	A29	53

CHART 4

FREQUENCY MHz	CRYSTAL
21.000	A9 Y1
19.000	A10 Y1
28.500	A19 Y1

NOTES FOR FIGURE 5-38 (Cont)



BASE VIEW "A" FOR FOLLOWING TRANSFORMERS

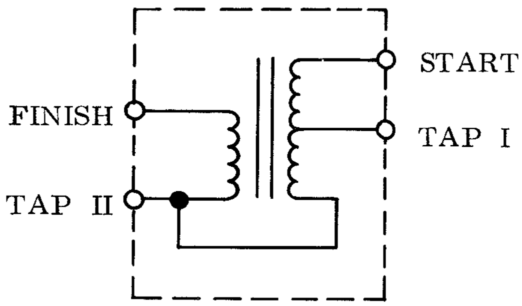
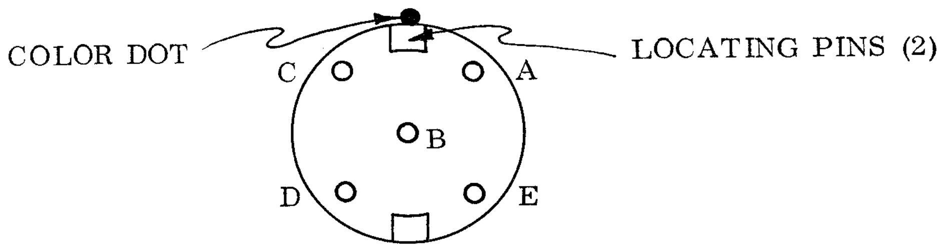


CHART 5

REF DES	START	TAP I	TAP II	FINISH
A2T1	A	E	C	D
A3T1	A	E	C	D
A4T1	D	C	E	A
A6T1	D	C	E	A
A7T1	D	C	E	A
A9T1	A	E	C	D
A10T1	A	E	C	D
A11T1	A	E	C	D
A12T1	A	E	C	D
A13T1	A	E	C	D
A14T1	D	C	E	A
A15T1	A	E	C	D
A16T1	A	E	C	D
A17T1	D	C	E	A
A22T1	D	C	E	A
A23T1	A	E	C	D
A26T1	A	E	C	D

NOTES FOR FIGURE 5-38 (Cont)



BASE VIEW "B" FOR ALL
T2, T3 AND FOLLOWING
TRANSFORMERS

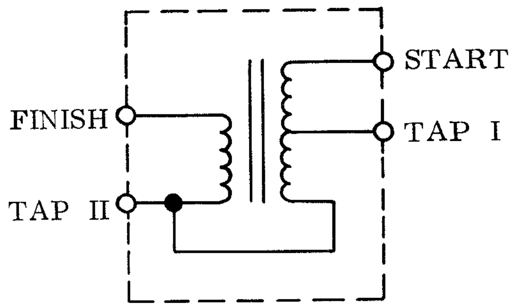
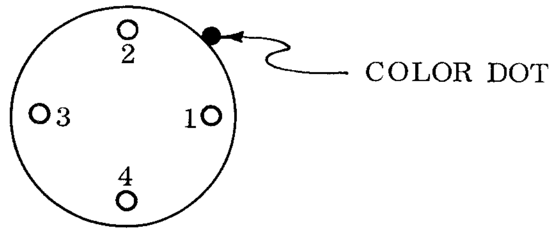


CHART 6

REF DES	START	TAP I	TAP II	FINISH
A5T1	E	D	A	C
A8T1	E	D	A	C
A18T1	C	A	D	E
A19T1	E	D	A	C
A24T1	C	A	D	E
A25T1	C	A	D	E
A27T1	C	A	D	E
A28T1	C	A	D	E
A29T1	E	D	A	C

NOTES FOR FIGURE 5-38 (Cont)



BASE VIEW "C"
FOR ALL T4 AND FOLLOWING
CHART 7 TRANSFORMERS

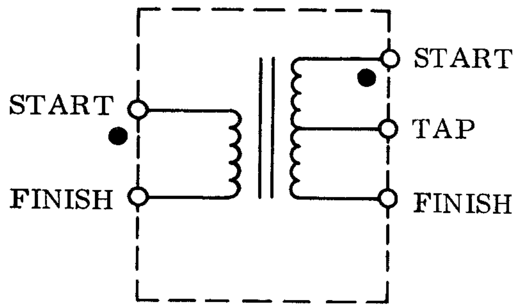


CHART 7

REF DES	PRIMARY			SECONDARY	
	START	TAP	FINISH	START	FINISH
A20T1 A21T1	C E	A D	D A	B B	E C

NOTES FOR FIGURE 5-38 (Cont)

TRANSMITTER VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
V1-1	0V	*Q1-E	+17.0V
V1-2	+5.4V	Q1-B	+16.3V
V1-5	+105V	Q1-C	+ 0.6V
V1-6	+105V	*Q2-E	+13.0V
V1-7	0V	Q2-B	+12.3V
V2-1	0V	Q2-C	+ 4.5V
V2-2	+4.8V	*Q3-E	+16.1V
V2-5	+110V	Q3-B	+15.4V
V2-6	+110V	Q3-C	+ 6.4V †
V2-7	+4.8V		

RECEIVER VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
V1-1	3.8 VDC	V2-1	12 VDC
V1-2	0.66 VDC	V2-2	0.45 VDC
V1-3	6.3 VAC	V2-3	6.3 VAC
V1-4	6.3 VAC	V2-4	6.3 VAC
V1-5	110 VDC	V2-5	110 VDC
V1-6	110 VDC	V2-6	110 VDC
V1-7	0 VDC	V2-7	0.45 VDC

NOTES:

1. VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4().
2. MEASUREMENTS MADE AT 2.0 MHz.
3. USE EXTENDERS TO MEASURE TUBE VOLTAGES.

† AT 2 AND 3 MHz, 0V AT ALL OTHER FREQUENCIES.
* TRANSMIT ONLY.

NOTES FOR FIGURE 5-38, SHEET 1

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4B1	9D	A2A4E9-2	*	A2A4Y1	9B
C1		E9-3	*	Y2	9B
thru	*	E9-4	6D	A2A4A2C1	3F
C7		E10-1	6B	C2	3F
C8	6B	E10-2	*	C3	2F
C9	6B	E10-3	*	T1	3F
C10		E10-4	6B	T2	3F
thru	*	K1	8C	Y1	2F
C14		K1-1	8D	A2A4A3	Identical
C15	10B	K1-2	8D	All	to
C16	10B	K1-3	*	Elements	A2A4A2
C17	9B	K1-4	8D	A2A4A4	Identical
C18	9B	K1-5	8D	All	to
C19	6D	K1-6	8E	Elements	A2A4A2
C20	6C	K1-7	*	A2A4A5	Identical
C21	9D	K1-8	8E	All	to
C22	9D	P1-1	10C	Elements	A2A4A2
CR1	9D	P1-2	10C	A2A4A6	Identical
E1-1	3E	P1-3	10C	All	to
E1-2	4F	P1-4	10C	Elements	A2A4A2
E1-3	4F	P1-5	10C	A2A4A7	Identical
E1-4	4E	P1-6	10E	All	to
E2-1	3E	P1-7	10C	Elements	A2A4A2
E2-2	2F	P1-8	10D	A2A4A8	Identical
E2-3	2E	P1-A1	*	All	to
E3	*	P2-A2	10A	Elements	A2A4A2
E4	*	P2-A3	10F	A2A4A9	Identical
E5	*	P2-1	10B	All	to
E6-1	5D	P2-2		Elements	A2A4A2
E6-2	7D	thru	*	A2A4A10	Identical
E6-3	5C	P2-6		All	to
E6-4	7C	P2-7	10B	Elements	A2A4A2
E7-1	7A	P2-8	10B	A2A4A11	Identical
E7-2	5A	P2-9	10A	All	to
E7-3	7B	P2-10	*	Elements	A2A4A2
E7-4	5B	P2-11	*	A2A4A12C1	3D
E8	*	P2-12	10A	C2	3D
E9-1	6D	S1	9C	C3	2D

* Not Used

NOTES FOR FIGURE 5-38, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A12 L1	3D	A2A4A24	Identical	A2A4A38 C3	9G
T1	3D	All	to	C4	8F
T2	3D	Elements	A2A4A2	C5	8G
A2A4A13	Identical	A2A4A25	Identical	C6	7G
All	to	All	to	C7	6F
Elements	A2A4A12	Elements	A2A4A2	C8	7G
A2A4A14	Identical	A2A4A26	Identical	C9	6G
All	to	All	to	C10	5G
Elements	A2A4A2	Elements	A2A4A2	C11	8G
A2A4A15	Identical	A2A4A27	Identical	C12	7G
All	to	All	to	C13	5G
Elements	A2A4A2	Elements	A2A4A2	E1	10F
A2A4A16	Identical	A2A4A28	Identical	E2	10F
All	to	All	to	E3	10G
Elements	A2A4A2	Elements	A2A4A2	E4	10G
A2A4A17	Identical	A2A4A29	Identical	E5	10E
All	to	All	to	E6	10F
Elements	A2A4A2	Elements	A2A4A2	FL1	9G
A2A4A18	Identical	A2A4A30 C1		FL2	7G
All	to	thru	5D	FL3	5G
Elements	A2A4A2	C9		K1	5E
A2A4A19	Identical	C10		K1-1	5F
All	to	thru	5C	K1-2	5F
Elements	A2A4A2	C19		K1-3	*
A2A4A20 C1	3H	A2A4A31 C1		K1-4	5F
C2	3H	thru	7D	K1-5	5F
C3	2H	C9		K1-6	5F
C4	3G	A2A4A32 C1		K1-7	*
T1	3H	thru	7B	K1-8	5F
T2	3H	C9		L1	9E
A2A4A21	Identical	A2A4A33 C1		Q1	9G
All	to	thru	5B	Q2	7G
Elements	A2A4A20	C9		Q3	5G
A2A4A22	Identical	C10		R1	9G
All	to	thru	5B	R2	9H
Elements	A2A4A2	C19		R3	9G
A2A4A23	Identical	A2A4A38 C1	9G	R4	9H
All	to	C2	9H	R5	9G
Elements	A2A4A2				

* Not Used

NOTES FOR FIGURE 5-38, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A38R6	9G	A2A4A38R12	7G	A2A4A38R18	5H
R7	8H	R13	7F	R19	5G
R8	9F	R14	6H	R20	5F
R9	7H	R15	7G	R21	8F
R10	7F	R16	6H	TP1	9G
R11	7H	R17	6F	TP2	

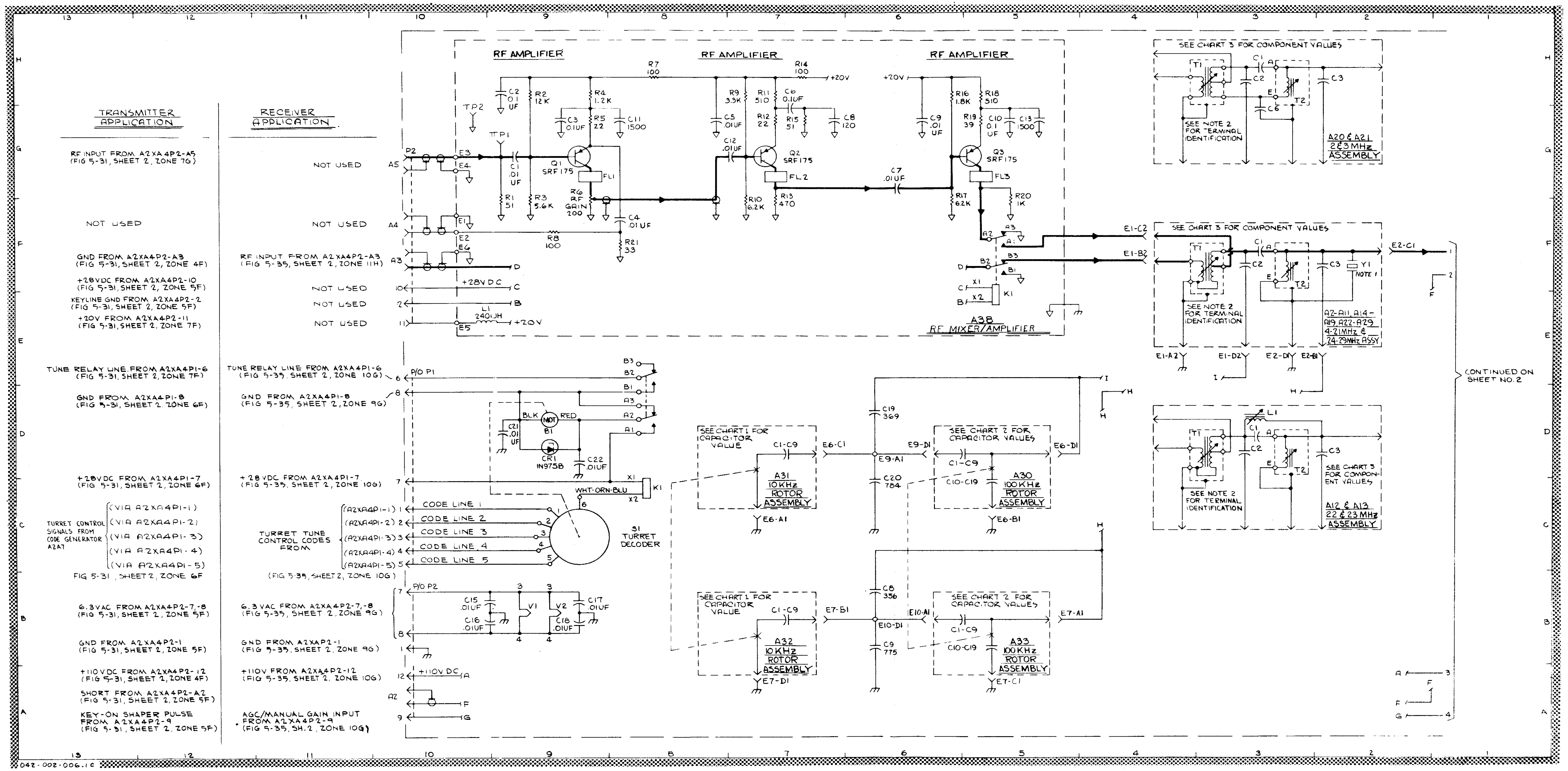


Figure 5-38. RF Amplifier Assembly A2A4, Maintenance Schematic Diagram (Sheet 1 of 2)

NOTES FOR FIGURE 5-38, SHEET 2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4C1	9F	A2A4E11-3	4C	A2A4A1R2	9E
C2	*	E11-4	6C	R3	8E
C3	7F	E12-1	5B	R4	7C
C4	7E	E12-2	*	R5	5F
C5	6F	E12-3	*	R6	7A
C6	5F	E12-4	4B	A2A4A2C4	
C7	5F	E13-1	6A	thru	3E
C8	*	E13-2	4A	A2A4A29C4	
C9	*	E13-3	5B	A2A4A2C5	
C10	*	E13-4	3B	thru	3G
C11	5D	FL1	9F	A2A4A29C5	
C12	5C	FL2	6F	A2A4A2T3	
C13	5B	P1	*	thru	3E
C14	5B	P2-A1	2F	A2A4A29T3	
E1	*	R1	8F	A2A4A2T4	
E2	*	R2	8F	thru	3F
E3-1	4E	R3	6F	A2A4A29T4	
E3-2	4E	TP1	*	A2A4A34C1	
E3-3	3E	TP2	*	thru	4C
E3-4	4D	TP3	6G	C9	
E4-1	*	TP4	3B	C10	
E4-2	*	V1	8F	thru	4C
E4-3	*	V2	5F	C19	
E4-4	3F	A2A4A1C1	8E	A2A4A35C1	
E5-1	3F	C2	8E	thru	5C
E5-2	4F	C3	5F	C9	
E5-3	4G	C4	9E	A2A4A36C1	
E5-4	3G	E1	9E	thru	5B
E6	*	E2	8E	C9	
E7	*	E3	7C	A2A4A37C1	
E8-1	4C	E4	5F	thru	4B
E8-2	*	E5	9E	C9	
E8-3	*	E6	7A	C10	
E8-4	5C	E7	5E	thru	4B
E9	*	E8	7A, 7C	C19	
E10	*	E9	8E		
E11-1	3C	E10	8E		
E11-2	5C	R1	8E		

* Not Used

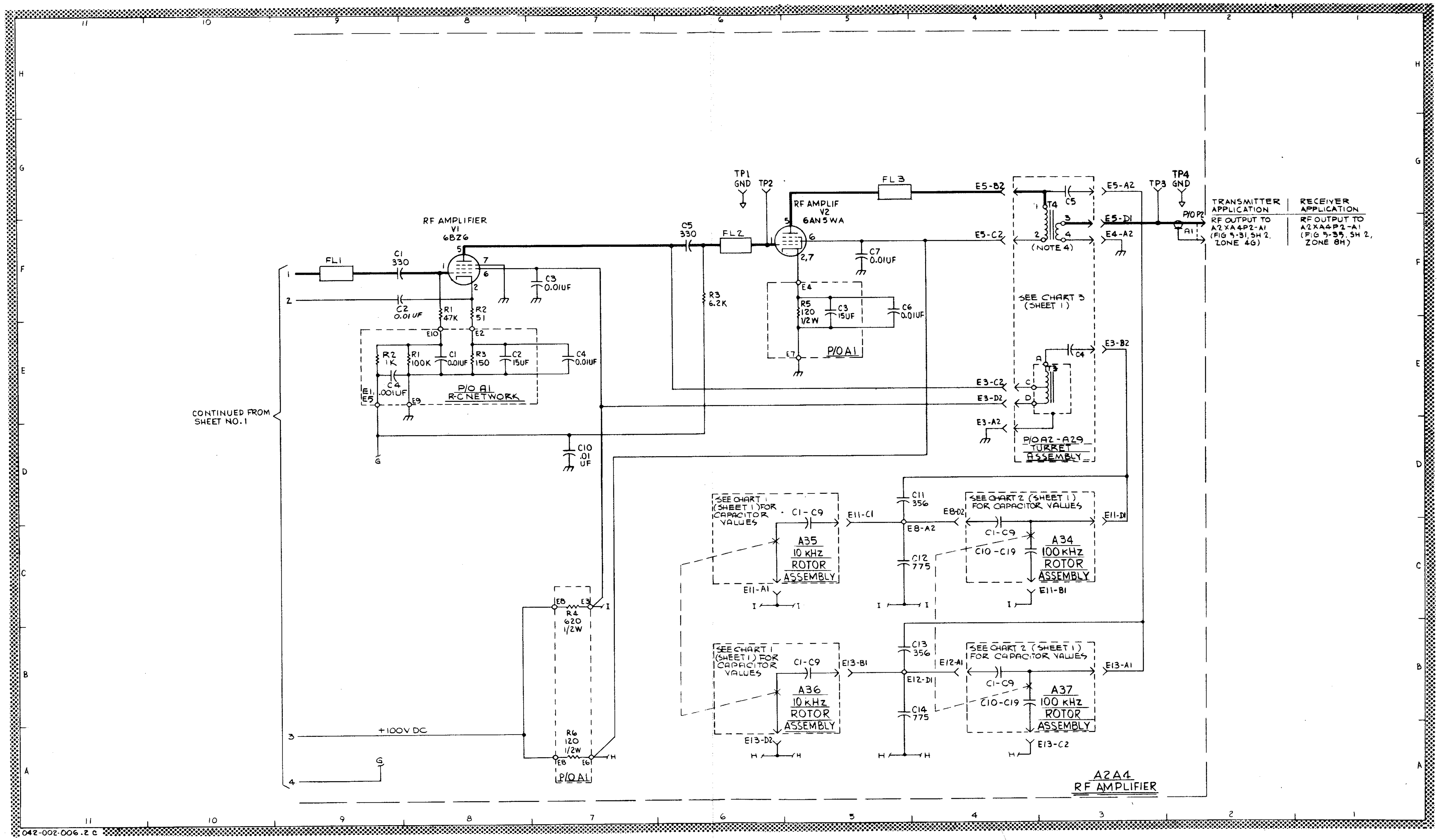


Figure 5-38. RF Amplifier Assembly A2A4, Maintenance Schematic Diagram (Sheet 2 of 2)

NOTES FOR FIGURE 5-39

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLIES.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, RESISTORS ARE 1/4 WATT, ±10%
   K = 1000
   M = 1,000,000
2. ALL CAPACITANCE IS IN pF, μF = MICROFARADS.
3. ALL INDUCTANCE IS IN MICROHENRIES.

C. WHEN MAKING RESISTANCE MEASUREMENTS AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

*D. INDICATES SELECTED VALUE. INITIAL VALUES MAY BE SHOWN.

SPECIFIC NOTES

1. VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4.

SWITCH S1 TABLE

PINS	FUNCTION
3, 7, 11	COMPARATOR
2, 6, 10	INTERNAL
1, 5, 9	EXTERNAL

2. PARTS VALUE RANGES AND SELECTION CRITERIA FOR SELECTED-VALUE PARTS (NOTE D).

REF DES		SELECTION RANGE	NOMINAL VALUE	SELECTION CRITERIA
A1	C1	15-56 pF	47 pF	Select for frequency adjust range of +2 Hz -10 Hz.
	L1	Short to 47 μH	*	Select for frequency of 5 MHz ±1 Hz.
	R2	15K to 33K	22K	Select for crystal current drive to 200 μA ±20 μA.
	R203	Per Chart (Sheet 2)	4.7K	Select for oven temperature to match the crystal turn-over temperature as required.
	R204	Per Chart (Sheet 2)	*	Select for oven temperature to match the crystal turn-over temperature as required.
	R210	220K to 1.2M	1.2M	Select for oven loop gain.

NOTES FOR FIGURE 5-39 (Cont)

REF DES		SELECTION RANGE	NOMINAL VALUE	SELECTION CRITERIA
A2	C5	22 pF-51 pF	39 pF	Selection for oscillation free running at 1 MHz ±5 kHz.
	C9	180 pF-330 pF	220 pF	Select for oscillation free running at 1 MHz ±5 kHz.
	C26	100 pF-470 pF	270 pF	Select for amplifier Q10 turn to 5 MHz.
	C32	Open to 360 pF	100 pF	Select for amplifier Q11 turn to 5 MHz.
	R15	330 to 1K	1K	Select for amplifier Q6 to reach minimum output requirement (460 mV).
	R20	47 to Open	Open	Select if 1-MHz output is too high.
	R32	22 to 150	68	Select for amplifier Q8 to reach minimum output requirement (185 mV).
	R33	47 to Open	Open	Select if 500-kHz output is too high.
	R42	47 to Open	Open	Select if 5-MHz output is too high.
	R53	22 to 56	47	Select for amplifier Q11 gain.
	R54	10 to 56	47	Select for 10-MHz output requirement (30 mV).

*Selected — no nominal value used.

3. R203 AND R204 VALUES VS. OVEN TEMPERATURE.

OVEN TEMPERATURE	R203	R204
73°C	6.8K	750
74°C	6.2K	Jumper
75°C	6.2K	180
76°C	6.2K	390
77°C	5.6K	Jumper
78°C	5.6K	240
79°C	5.1K	Jumper
80°C	5.1K	120
81°C	5.1K	300
82°C	4.7K	82
83°C	4.7K	240
84°C	4.7K	390

OVEN TEMPERATURE	R203	R204
85°C	4.7K	560
86°C	4.7K	680
87°C	4.7K	820
88°C	4.7K	1000
89°C	4.7K	1100
90°C	4.7K	1200
91°C	4.7K	1300
92°C	4.7K	1500
93°C	4.7K	1600
94°C	4.7K	1600
95°C	4.7K	1800
96°C	4.7K	1800

Resistance values in ohms.

NOTES FOR FIGURE 5-39, SHEET 1

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2XA5P1-1	29C	A2A5A1Q4		A2A5A3J1-1	*
P1-2	29A	thru	*	J1-2	*
P1-3	29B	Q200		J1-3	25C
P1-A1	*	Q202	22C	J1-4	25B
P1-A2	*	Q203	22C	RT1	
P1-A3	*	Q204	21C	thru	*
P1-A4	29D	Q205	20C	RT204	
A2A5A1C1	23F	R1	22F	RT205	25B
C2	23E	R2	22E	A2A5A4C1	
C3	23E	R3	22F	thru	*
C4	22E	R4	22E	C34	
C5	22E	R5	21D	C35	27B
C6	21E	R6	21F	C36	28B
C7	20D	R7	21E	C37	28B
C8	20E	R8	20F	C38	28C
C9	24B	R9	20E	C39	28C
C10	23B	R10	20F	CR1	27B
C11		R11	20F	L1	*
thru	*	R12		L2	*
C200		thru	*	L3	*
C201	23B	R200		L4	28C
C202	21B	R201	23C	P1-1	29C
CR1	20E	R202	23B	P1-2	29A
L1	22E	R203	23C	P1-3	25C
L2	22F	R204	24C	P1-A1	*
P1-1	19B	R205	*	P1-A2	*
P1-2	19C	R206	22C	P1-A3	*
P1-3	29B	R207	22B	P1-A4	29D
P1-4	25B	R208	22C	Q1	27B
P1-5	19F	R209	21C	Q2	27A
Q1	22E	R210	22B	R1	27A
Q2	21E	R211	21B	R2	27B
Q3	20E	R212	20C	R3	28B
		R213	20B		
		Y1	23E		

* Not Used

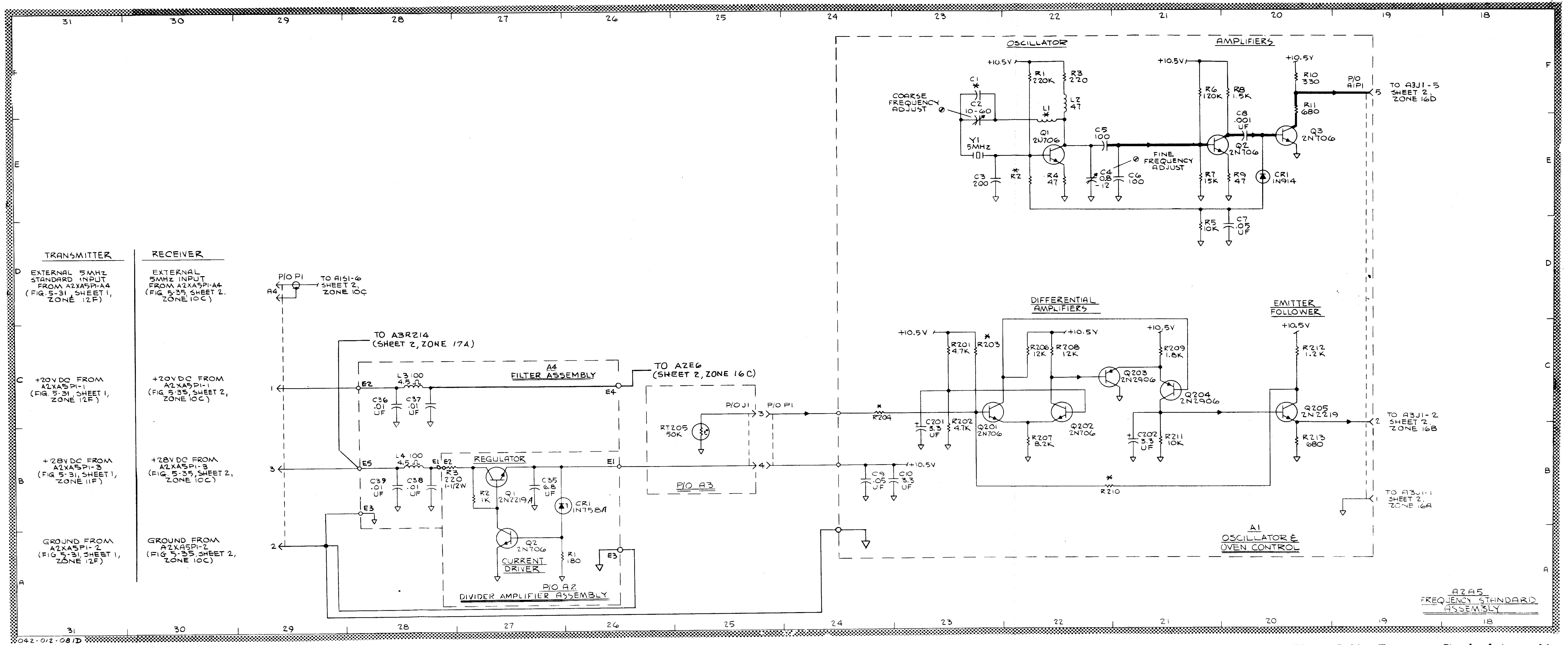


Figure 5-39. Frequency Standard Assembly A2A5, Maintenance Schematic Diagram (Sheet 1 of 2)

NOTES FOR FIGURE 5-39, SHEET 2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A5P1-A1	3E	A2A5A2C40	13D	A2A5A2R10	15E
P1-A2	3E	C41	9D	R11	15F
P1-A3	3F	C42	5B	R12	15E
P1-A4	*	C43	5B	R13	15E
P1-A5	3B	C44	4B	R14	15D
P1-A6	3C	C45	4B	R15	15E
C1	9B	CR1	*	R16	13F
C2	8B	CR2	10A	R17	13D
C3	15E	CR3	10A	R18	12F
C4	15E	CR4	14A	R19	12D
C5	14E	CR5	13A	R20	12F
C6	14E	CR6	6B	R21	11E
C7	14E	CR7	6B	R22	11E
C8	14F	DS1	9A	R23	11E
C9	14E	L1	15E	R24	10E
C10	13F	L2	10E	R25	10E
C11	12F	L3	*	R26	10D
C12	12F	L4	*	R27	10E
C13	11E	L5	5B	R28	10F
C14	11E	L6	5B	R29	8F
C15	10E	L7	4B	R30	8D
C16	10F	Q1	8E	R31	8F
C17	10E	Q2	*	R32	8D
C18	9E	Q3	9B	R33	7F
C19	9F	Q4	8B	R34	7E
C20	8F	Q5	15E	R35	13B
C21	8F	Q6	12E	R36	13A
C22	14B	Q7	10E	R37	13B
C23	13B	Q8	*	R38	13A
C24	13A	Q9	13B	R39	12A
C25	12A	Q10	12B	R40	12B
C26	12A	Q11	7B	R41	12A
C27	12A	R1	*	R42	11B
C28	7B	R2	*	R43	11B
C29	7B	R3	*	R44	7B
C30	7A	R4	9B	R45	7A
C31	6A	R5	9A	R46	7C
C32	6A	R6	2B	R47	6A
C33 thru C39	*	R7	8B	R48	5B
		R8	8A	R49	*
		R9	15E	R50	*

* Not Used

NOTES FOR FIGURE 5-39, SHEET 2 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A5A2R51	12B	A2A5A2T4	7B	A2A5A3Q1 thru Q205	*
R52	10C	TP1	11B	Q206	15B
R53	7A	TP2	7E	R1 thru R213	*
R54	6B	A2A5A3J1-1	16A	R214	15A
R55	4B	J1-2	16B	R215	15B
S1	10C	J1-3	*	R216	15B
T1	12A	J1-4	*		
T2	8F	J1-5	16D		
T3	11B				

* Not Used

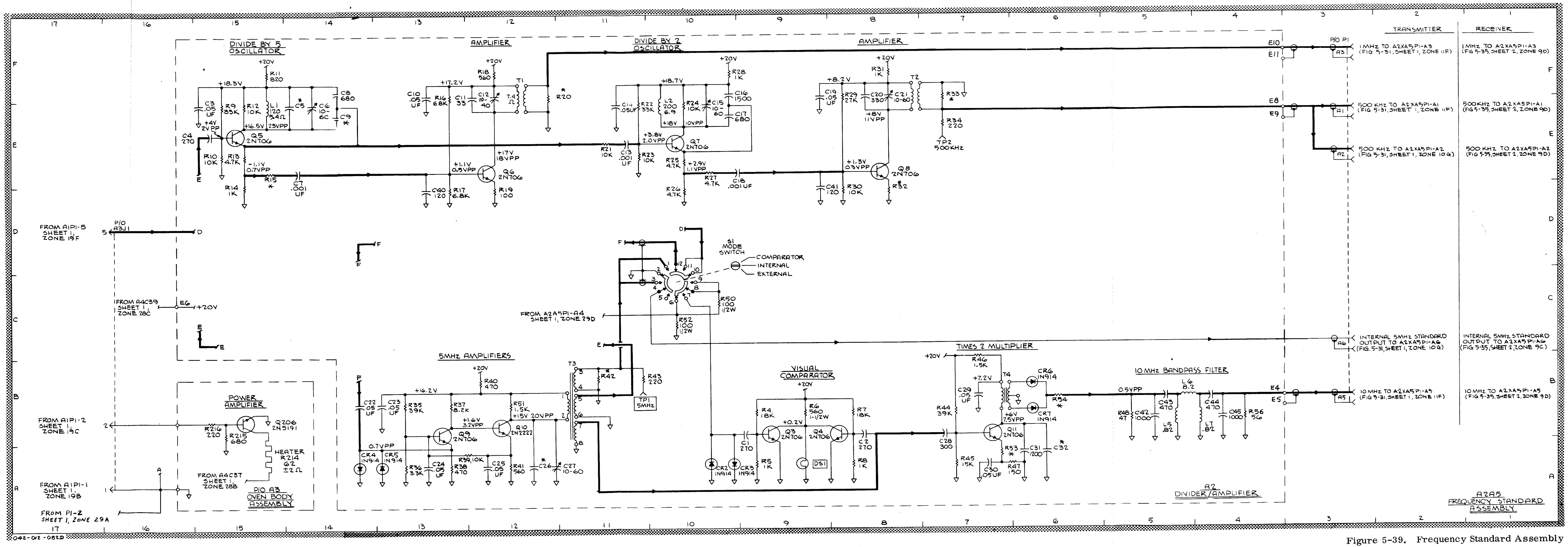


Figure 5-39. Frequency Standard Assembly A2A5, Maintenance Schematic Diagram (Sheet 2 of 2)

NOTES FOR FIGURE 5-40

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLY.

B. THE A2A6 TRANSLATOR/SYNTHESIZER IS COMMON TO BOTH TRANSMITTER AND RECEIVER, REFERENCES APPLY ONLY AS INDICATED TO EITHER THE TRANSMITTER (T) OR RECEIVER (R) UNIT.

NOTES FOR FIGURE 5-40 (Cont)

PART LOCATION INDEX

REF DES	ZONE
A2E42	4B
A2XA6P1-1 thru P1-5	2C
P1-6	2D
P1-7	2C
P1-8	2D
P1-9	*
P1-10	2F
P1-11	5B
P1-12	5B
P1-13	4B
P1-14	4B
P1-15	4B
P1-16	2E
P1-17	5B
P1-18	2E
P1-19	5B
P1-20	2E
P1-21	5B
P1-A1	2F,8F
P1-A2	3B
P1-A3	8D
P2-A1	8G
P2-A2	8G
P2-A3	3B
P3-A1	*
P3-A2	2G
A2A6C1	2F
C2	6F
E1	2C,2D
E2	2F
E3	2F
E4	4B, 6E
E5	2F
E5-A	6E
E5-B	4B
E5-C	5D
E5-D	6F,7B

REF DES	ZONE
A2A6P1-1 thru P1-5	2C
P1-6	2D
P1-7	2C
P1-8	2D
P1-9	*
P1-10	2F
P1-11	5B
P1-12	5B
P1-13	4B
P1-14	4B
P1-15	4B
P1-16	2E
P1-17	5B
P1-18	2E
P1-19	5B
P1-20	2E
P1-21	5B
P1-A1	8E
P1-A2	3B
P1-A3	8D
P2-A1	2F
P2-A2	8G
P2-A3	3B
P3-A1	8G
P3-A2	2G
P4	7B
P5 thru P8	*
P9	5D
W1P1	7D
W2P1	7D
W3P1	7D
W3P2	6D
W4P1	7C
W4P2	6C
W5P1	7C

REF DES	ZONE
A2A6W6	*
W7	*
W8P1	*
W8P2	4C
W9	*
W10P1	4D
P1-1 thru P1-5	2C
P1-6	*
P1-7	2C
P1-8	2C
P1-9	*
P1-10	2D
P1-11	*
P1-12	*
P1-13	*
P1-14	2D
A2A6XA1P1-A1	3B
P1-A2	3D
A2A6XA2P1-1	*
P1-2	*
P1-3	6E
P1-4	6E
P1-5	6E
P1-A1	6E
P1-A2	7F
P1-A3	7E
P1-A4	7E
A2A6XA4P1-1	4B
P1-2	5B
P1-3	4B
P1-4	5B
P1-5	4B
P1-6	5B
P1-7	5B
P1-8	4B
P1-9	4B
P1-10	5B

* Not Used

NOTES FOR FIGURE 5-40 (Cont)

PART LOCATION INDEX

REF DES	ZONE
A2A6XA4P1-A1	6C
P1-A2	3C
P1-A3	6C
A2A6A1P1-1	2C, 4B
P1-2 thru P1-5	2C
P1-6	*
P1-7	2C
P1-8	2C
P1-9	*
P1-10	2D
P1-11	*
P1-12	*
P1-13	*
P1-14	2D
P1-A1	3B
P1-A2	3D
A2A6A2P1-1	*
P1-2	*
P1-3	6E
P1-4	6E
P1-5	6E
P1-A1	6E
P1-A2	7F
P1-A3	7E
P1-A4	7E

REF DES	ZONE
A2A6A2S1	7E
A2A6A3J1	5D
J2	6D
J3	6C
J4	4C
S1	6D
S2	6D
A2A6A3A3J1	5D
J2	4D
A2A6A4P1-1	*
P1-2	5B
P1-3	4B
P1-4	5B
P1-5	4B
P1-6	5B
P1-7	5B
P1-8	4B
P1-9	4B
P1-10	5B
P1-A1	6C
P1-A2	4C
P1-A3	6C
A2A6A5A1J1	7D
J2	7D
A2A6A5A2J1	7D
A2A6A5A3J1	7C
J2	7B

REF DES	ZONE
A2A6A5A4J1	7C
A2A6A6P1 thru P4	*
P5	4F
P6	4F
P7	6F
P8	4F
A2A6A6A1P5	5D
A2A6A6A1A1E1	7G
E2	7F
E3	2G
E4	2G
E5	3F
E6	3F
E7	7F
E8	7F
E9	5F
E10	5F
E11	3F
E12	3F, 7G
E13	7G
J1	4F
J2	4F
J3	6F
J4	4F

* Not Used

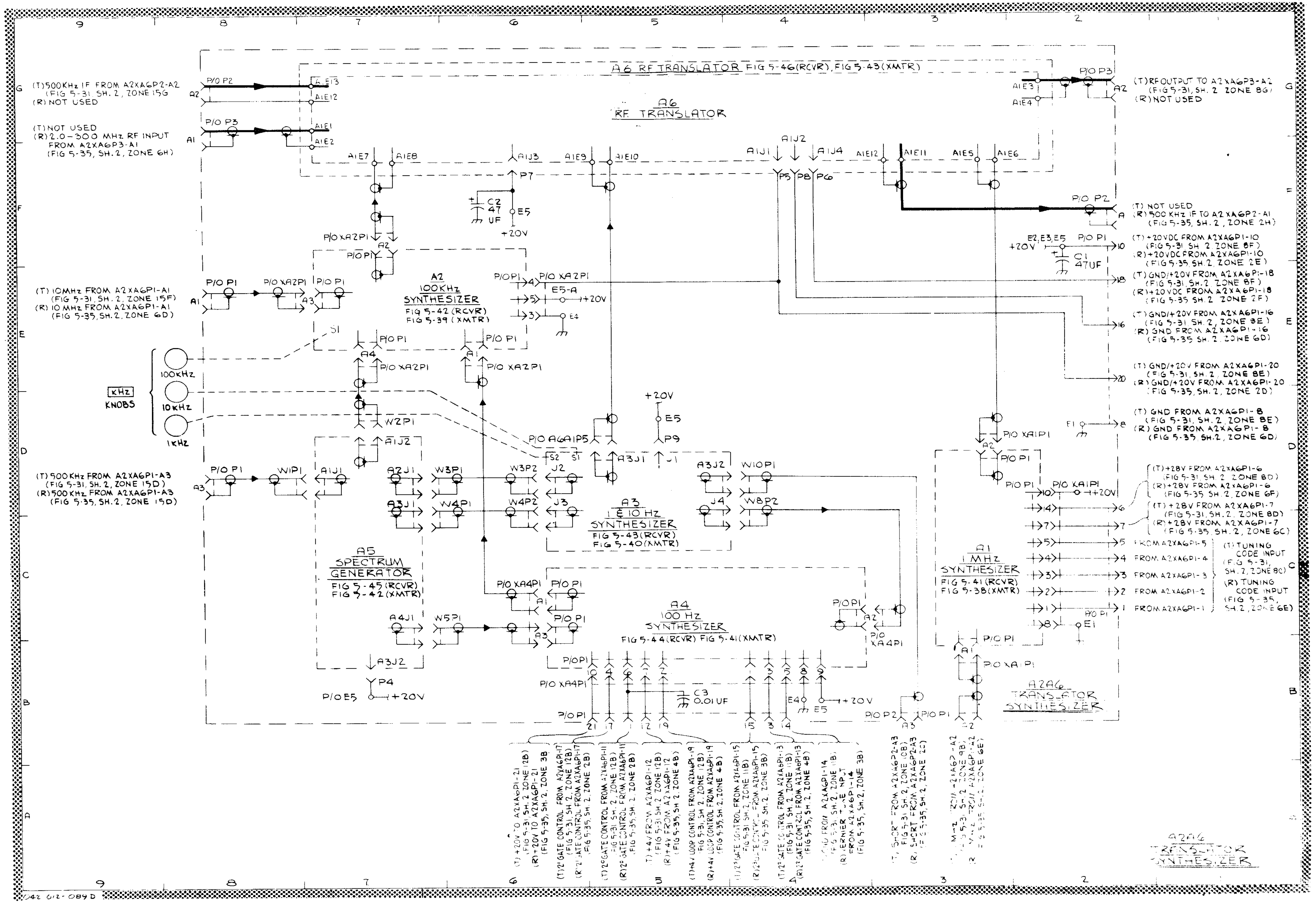


Figure 5-40. Translator/Synthesizer Assembly A2A6, Maintenance Schematic Diagram

NOTES FOR FIGURE 5-41

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBER OF NEXT HIGHER ASSEMBLIES.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT ±5%.
2. ALL CAPACITANCE IS IN PICOFARADS, UF = MICROFARADS.
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.
4. ALL INDUCTANCE IS IN MICROHENRIES.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENTS AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

E. THE 1 MHz SYNTHESIZER IS COMMON TO BOTH TRANSMITTER AND RECEIVER REFERENCES APPLY ONLY AS INDICATED TO EITHER THE TRANSMITTER OR RECEIVER UNIT.

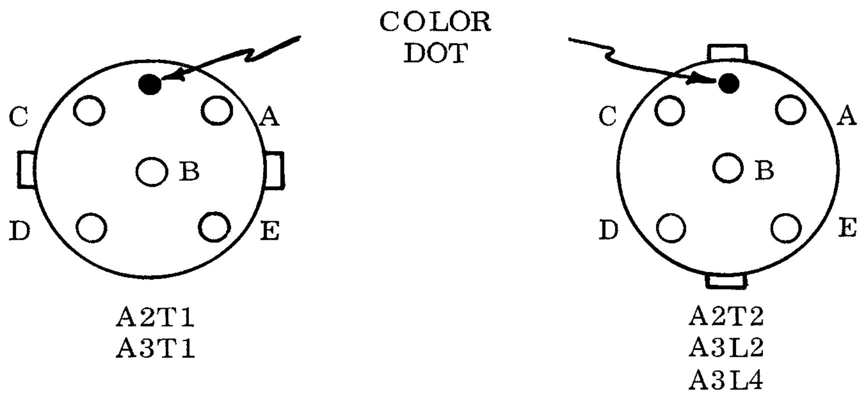
CHART 1

SYN FREQ	XTAL NO.	XTAL FREQ	CAP. NO.	CAPACITANCE
2.5	Y1	2.499850	C1	1300 pF
3.5	Y2	3.499720	C2	1000 pF
4.5	Y3	4.499640	C3	820 pF
5.5	Y4	5.499560	C4	820 pF
7.5	Y5	7.499400	C5	500 pF
8.5	Y6	8.499320	C6	430 pF
9.5	Y7	9.499240	C7	360 pF
10.5	Y8	10.499160	C8	300 pF
11.5	Y9	11.499080	C9	270 pF
12.5	Y10	12.499000	C10	240 pF
14.5	Y11	14.498840	C11	200 pF
15.5	Y12	15.498760	C12	180 pF
16.5	Y13	16.498680	C13	160 pF
17.5	Y14	17.498600	C14	160 pF
19.5	Y15	18.498440	C15	115 pF
20.5	Y16	20.498360	C16	110 pF
23.5	Y17	23.498120	C17	75 pF

NOTES FOR FIGURE 5-41 (Cont)

SPECIFIC NOTES

1. TRANSFORMER AND CHOKE BASING DIAGRAMS.



NOTES FOR FIGURE 5-41 (Cont)

VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
A1Q1-E	+13.8V	A3Q1-E	+ 8.0V
A1Q1-B	+14.6V	A3Q1-B	+ 8.1V
A1Q1-C	+20.0V	A3Q1-C	+ 3.0V
A1Q2-E	+ 5.8V	A3Q2-E	+ 0.1V
A1Q2-B	+ 6.5V	A3Q2-B	- 3.1V
A1Q2-C	+15.0V	A3Q2-C	+ 5.7V
A1Q3-E	+14.3V	A3Q3-E	+ 4.3V
A1Q3-B	+15.0V	A3Q3-B	+ 4.2V
A1Q3-C	+20.0V	A3Q3-C	+ 2.6V
A1Q4-E	+13.5V	A3Q4-E	+ 8.4V
A1Q4-B	+14.3V	A3Q4-B	+ 8.1V
A1Q4-C	+20.0V	A3Q4-C	0V
A2Q1-E	+ 8.4V	A3Q5-E	+ 7.4V
A2Q1-B	+ 8.1V	A3Q5-B	+ 7.1V
A2Q1-C	0V	A3Q5-C	+ 0.3V
A2Q2-E	+12.2V	A3Q6-E	+19.0V
A2Q2-B	+11.9V	A3Q6-B	+ 8.6V
A2Q2-C	0V	A3Q6-C	+ 9.3V
A2Q3-E	+ 0.24V		
A2Q3-B	+ 0.36V		
A2Q3-C	+10.3V		

NOTE: VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4().

NOTES FOR FIGURE 5-41 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A1B1	18A	A2A6A1P1-12	*	A2A6A1A1E7	*
C1		P1-13	*	E8	9C
thru	5B,6B	P1-14	18B	E9	8B
C17		P1-A1	19G	E10	6B
C18	19F	P1-A2	2D	FL1	5D
C19	18C	S1	6B,8B,15A,16A	FL2	5D
CR1	18A	S1-1	15A,16A	L1	9C
E1	19F	S1-2	15A,16A	L2	6D
E2	19F	S1-3	15A,16A	L3	6C
E3	18C	S1-4	15A,16A	Q1	6D
E4	19C	S1-5	15A,16B	Q2	4D
E5	18A,19E	S1-6	16B	Q3	4D
E6	19F	Y1		Q4	3D
E7	18C	thru	8B	R1	9C
E8	18E	Y17		R2	9D
K1	17A	A2A6A1A1C1		R3	8D
K1-A1	17A	thru	*	R4	8D
K1-A2	17A	C17		R5	8D
K1-A3	17A	C18	9C	R6	7D
K1-B1	17A	C19	9D	R7	6D
K1-B2	17A	C20	8D	R8	7D
K1-B3	17A	C21	7C	R9	6D
K1-X1	17B	C22	*	R10	6C
K1-X2	17A	C23	7D	R11	4D
L1	19F	C24	6C	R12	4D
L2	19C	C25	8C	R13	4C
P1	10C	C26	5D	R14	4C
P1-1	18B	C27	9C	R15	3C
P1-2	18B	C28	3D	R16	3C
P1-3	18B	CR1	8D	R17	3D
P1-4	18B	CR2	8D	R18	2D
P1-5	18B	CR3	8C	RT1	8D
P1-6	*	E1	2D	A2A6A1A2C1	18D
P1-7	18A	E2	2D	C2	17D
P1-8	19E	E3	3E	C3	17C
P1-9	*	E4	3E	C4	18C
P1-10	19F	E5	9C	C5	14D
P1-11	*	E6	9C	C6	15C

* Not Used

NOTES FOR FIGURE 5-41 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A1A2C7	12C	A2A6A1A2R15	11E	A2A6A1A3E1	18G
C8	12D	R16	11D	E2	18G
C9	11C	R17	10D	E3	18E
C10	11D	R18	11D	E4	*
C11	10D	R19	11C	E5	10E
C12	15D	R20	11C	E6	18F
C13	13C	R21	11C	E7	5G
C14	17D	R22	18D	E8	*
CR1	13D	RT1	11C	E9	5G
E1	*	T1	12D	FL1	6G
E2	10C	T2	14D	FL2	6G
E3	18C	TP1	15D	L1	18F
E4	18E	TP2	11D	L2	18G
J1	10C	TP3	11D	L3	12F
J2	11D	A2A6A1A3C1	17F	L4	9F
L1	12D	C2	17G	Q1	17G
L2	12D	C3	18G	Q2	15F
L3	12D	C4	16G	Q3	12G
L4	12C	C5	15F	Q4	10F
P1	*	C6	14F	Q5	5G
P2	11C	C7	14G	Q6	7G
Q1	18D	C8	13G	R1	18E
Q2	15D	C9	11F	R2	17H
Q3	11D	C10	12F	R3	16H
R1	18D	C11	18F	R4	16G
R2	18D	C12	8G	R5	17G
R3	17D	C13	8G	R6	17F
R4	17D	C14	6F	R7	15F
R5	17D	C15	9F	R8	14F
R6	16C	C16	9F	R9	14G
R7	15D	C17	10F	R10	14G
R8	15D	C18	5G	R11	14G
R9	15D	C19	6G	R12	13G
R10	15D	C20	6G	R13	12G
R11	14D	CR1	17F	R14	13F
R12	13C	CR2	17G	R15	12F
R13	11D	CR3	17G	R16	12F
R14	11D	CR4	12G	R17	12F
		CR5	12F		

* Not Used

NOTES FOR FIGURE 5-41 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A1A3R18	10G	A2A6A1A3R24	7G	A2A6A1A3R30	5H
R19	10G	R25	7G	R31	7H
R20	10G	R26	5G	R32	9F
R21	10F	R27	5G	R33	18G
R22	12F	R28	5G	T1	10F
R23	7G	R29	5F	TP1	9F

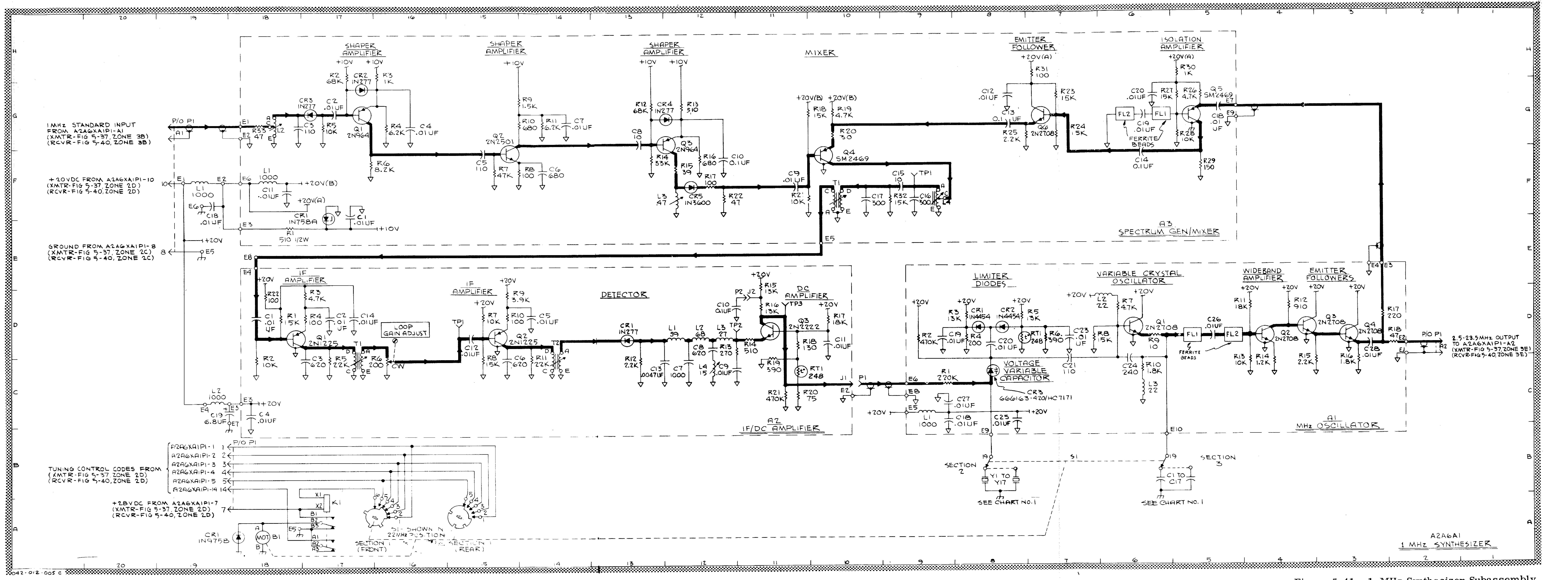


Figure 5-41. 1-MHz Synthesizer Subassembly A2A6A1, Maintenance Schematic Diagram

NOTES FOR FIGURE 5-42

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLIES.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT, ±5%.
2. ALL CAPACITANCE IS IN MICROFARADS, pF = PICOFARADS.
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENTS AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

E. THE 100 kHz SYNTHESIZER UNIT IS COMMON TO BOTH THE TRANSMITTER AND RECEIVER. REFERENCES APPLY ONLY AS INDICATED TO EITHER THE TRANSMITTER OR RECEIVER UNIT.

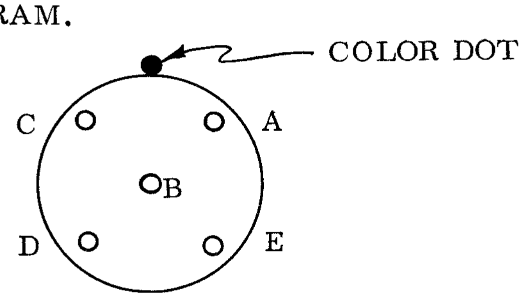
F. GROUND CONNECTION THROUGH UNIT MOUNTING SCREWS.

CHART 1

FREQUENCY (MHz)	CRYSTAL	100 kHz POS.
4.553	Y1	0
4.653	Y2	1
4.753	Y3	2
4.853	Y4	3
4.953	Y5	4
5.053	Y6	5
5.153	Y7	6
5.253	Y8	7
5.353	Y9	8
5.453	Y10	9

SPECIFIC NOTES

1. TRANSFORMER BASING DIAGRAM.



NOTES FOR FIGURE 5-42 (Cont)

VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
A1Q1-E	+ 8.0V	A1Q2-E	+ 8.0V
A1Q1-B	+ 8.6V	A1Q2-B	+ 8.6V
A1Q1-C	+18.0V	A1Q2-C	+18.0V
A2Q1-E	+13.3V	A2Q2-E	+ 8.7V
A2Q1-B	+13.9V	A2Q2-B	+ 8.4V
A2Q1-C	0V	A2Q2-C	0V
A3Q1-E	+ 8.4V	A3Q2-E	+20.0V
A3Q1-B	+ 8.1V	A3Q2-B	+20.0V
A3Q1-C	0V	A3Q2-C	0V
A4Q1-E	+14.0V	A4Q2-E	+14.0V
A4Q1-B	+13.7V	A4Q2-B	+13.7V
A4Q1-C	0V	A4Q2-C	0V
A5Q1-E	+ 7.0V	A5Q2-E	+ 7.2V
A5Q1-B	+ 6.6V	A5Q2-B	+ 7.9V
A5Q1-C	0V	A5Q2-C	+17.5V
A5Q3-E	+ 7.3V	A5Q4-E	+ 0.03V
A5Q3-B	+ 8.0V	A5Q4-B	+ 0.5V
A5Q3-C	+18.0V	A5Q4-C	+13.4V
A4U1-1	+ 2.2V	A4U2-1	+ 2.2V
A4U1-2	+ 8.6V	A4U2-2	+ 8.6V
A4U1-3	+ 2.2V	A4U2-3	+ 2.2V
A4U1-4	+ 0.72V	A4U2-4	+ 0.72V
A4U1-5	0V	A4U2-5	0V
A4U1-6	+ 0.72V	A4U2-6	+ 0.72V
A4U1-7	+ 2.2V	A4U2-7	+ 2.2V
A4U1-8	+ 8.6V	A4U2-8	+ 8.6V
A4U1-9	+ 5.3V	A4U2-9	+ 5.3V
A4U1-10	+ 8.6V	A4U2-10	+ 8.6V

NOTE: VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4( ).

NOTES FOR FIGURE 5-42, SHEET 1

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2P1-1	*	A2A6A2A1R7	24G	A2A6A2A2T1	20G
P1-2	*	R8	23G	T2	19F
P1-3	27A	R9	23G	T3	18F
P1-4	27B	R10	23G	TP1	18F
P1-5	27B	R11	23G	A2A6A2A3C1	25C
P1-A1	27D	R12	23G	C2	25B
P1-A2	*	R13	22G	C3	25B
P1-A3	27E	R14	22G	C4	25B
P1-A4	27F	RT1	25G	C5	25D
S1	26G	A2A6A2A2C1	21G	C6	25C
Y1 thru Y10	26G	C2	21F	C7	24C
		C3	20G	C8	23C
		C4	20F	C9	22C
A2A6A2A1C1	25G	C5	19F	C10	21C
C2	25G	C6	19G	C11	20B
C3	24G	C7	18G	C12	20B
C4	24G	C8	18F	C13	19C
C5	24G	C9	18F	C14	19C
C6	24G	E1	21F	C15	18C
C7	23G	E2	21F	C16	18C
C8	23G	E3	17F	C17	17B
C9	23G	E4	17F	C18	17C
C10	22G	E5	17G	C19	16C
CR1	25G	E6	17G	C20	16C
CR2	24G	E7	21E	CR1	19C
E1	22G	E8	17G	CR2	19B
E2	25G	E9	17G	CR3	18C
E3	22G	FL1	19F	E1	26C
E4	22G	Q1	21F	E2	26C
E5	22G	Q2	19G	E3	26B
E6	22G	R1	20F	E4	24A
Q1	23G	R2	20F	E5	16D
Q2	23G	R3	20F	E6	16D
R1	25F	R4	20G	E7	18D
R2	25G	R5	19G	E8	19D
R3	24G	R6	19G	E9	20D
R4	24G	R7	19G	E10	22D
R5	24G	R8	18G	E11	22D
R6	23G	R9	20G	E12	25D

* Not Used

NOTES FOR FIGURE 5-42, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2A3E13	25D	A2A6A2A3R8	20C	A2A6A2A3T1	22C
Q1	25C	R9	20C	T3	17D
Q2	20C	R10	19C	T4	16D
R1	25C	R11	18C	TP1	24C
R2	25C	R12	18B	TP2	22C
R3	25C	R13	18C	TP3	20C
R4	25C	R14	18C	TP4	15D
R5	22C	R15	15C	Y1	23C
R6	20C	R16	25D	Y2	16D
R7	20C	T1	24C		

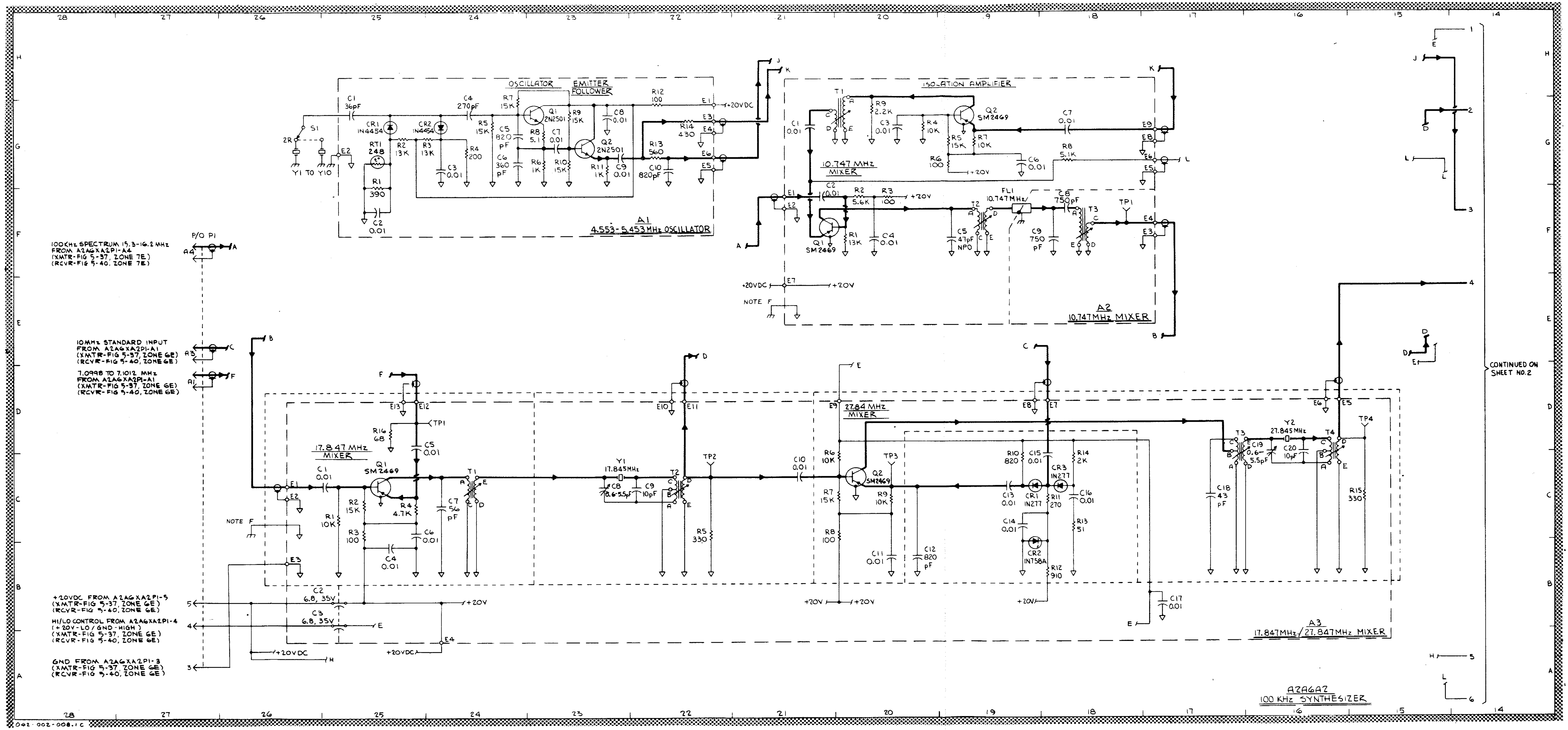


Figure 5-42. 100-kHz Synthesizer Subassembly A2A6A2, Maintenance Schematic Diagram (Sheet 1 of 2)

NOTES FOR FIGURE 5-42, SHEET 2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2C1	12A	A2A6A2A4C33	7E	A2A6A2A4R16	10E
L1	12A	C34	6E	R17	9F
P1-A1	*	C35	5E	R18	9E
P1-A2	5A	C36	5F	R19	8F
A2A6A2A1 thru A2A6A2A3	*	C37	4F	R20	8E
		C38	4E	R21	6E
		C39	4E	R22	5E
A2A6A2A4C1	12G	C40	4E	R23	5F
C2	10G	C41	2G	R24	5F
C3	10G	CR1	2G	R25	5F
C4	9G	CR2	2E	R26	4E
C5	10F	E1	12D	R27	2E
C6	9F	E2	12F	R28	2G
C7	9G	E3	12F	T1	11G
C8	8F	E4	12G	T2	8G
C9	7G	E5	12G	T3	7G
C10	7G	E6	1F	T4	6G
C11	7G	E7	12E	T5	5G
C12	6G	E8	12E	T6	3G
C13	4F	E9	1H	T7	11E
C14	5H	E10	1G	T8	8E
C15	5H	FL1	10E	T9	7E
C16	4G	Q1	5G	T10	6E
C17	4G	Q2	5E	T11	5E
C18	4G	R1	12G	T12	3E
C19	2H	R2	10G	TP1	8G
C20	*	R3	9G	TP2	8E
C21	10F	R4	9G	U1	10G
C22	12E	R5	8F	A2A6A2A5C1	*
C23	10E	R6	8G	C2	12B
C24	10E	R7	6G	C3	10C
C25	9E	R8	5G	C4	9B
C26	9E	R9	5H	C5	10B
C27	8F	R10	5H	C6	8B
C28	7F	R11	5G	C7	8B
C29	9F	R12	4G	C8	6C
C30	2E	R13	2G	C9	7B
C31	7E	R14	2G	C10	6B
C32	7E	R15	12E	C11	5B

*Not Used

NOTES FOR FIGURE 5-42, SHEET 2 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2A5CR1	6B	A2A6A2A5Q1	11B	A2A6A2A5R8	9B
E1	5A	Q2	9B	R9	8C
E2	12D	Q3	7B	R10	8B
E3	12B	Q4	6C	R11	7C
E4	12B	R1	11B	R12	7B
E5	5C	R2	11C	R13	7B
E6	5C	R3	11C	R14	7B
E7	5A	R4	9C	R15	6C
L1	10C	R5	9B	R16	6C
L2	9C	R6	9C	R17	6B
L3	6B	R7	9B	TP1	10B

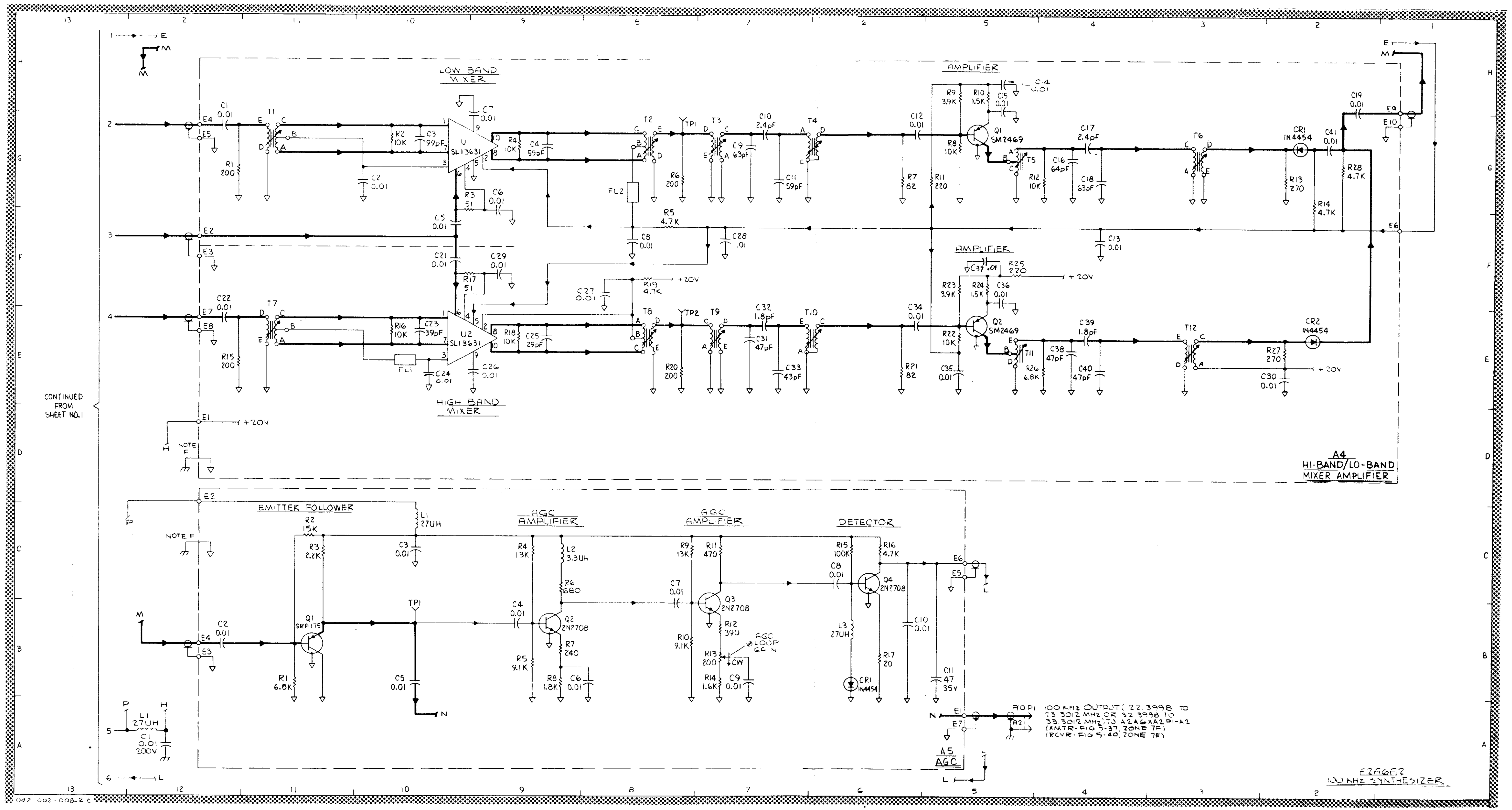


Figure 5-42. 100-kHz Synthesizer Subassembly A2A6A6, Maintenance Schematic Diagram (Sheet 2 of 2)

NOTES FOR FIGURE 5-43

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLIES.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT, ±5%
2. ALL CAPACITANCE IS IN PICOFARADS, μF = MICROFARADS
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENTS AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

E. THE 1 AND 10 MHz SYNTHESIZER IS COMMON TO BOTH TRANSMITTER AND RECEIVER APPLICATION; REFERENCES APPLY ONLY TO THE UNIT SPECIFIED.

F. A2A6A3A3R3 IS SELECTED AT THE TIME OF MANUFACTURE TO LIMIT THE OUTPUT OF A3J1 to 90 - 160 mV MEASURED INTO AN OPEN CIRCUIT. RANGE OF VALUES FOR R3 is 12.0 TO 39.0 OHMS.

G. GROUND CONNECTS THRU MOUNTING SCREWS, CABLE SHIELDS.

H. A2A6A3A4R30 IS SELECTED AT MANUFACTURE TO LIMIT OUTPUT OF J4 TO 1.[illegible] TO 16 mV, MEASURED INTO A 510-OHM LOAD. RANGE OF VALUES FOR R30 IS 15 TO 47 OHMS.

I. CAPACITOR A2A6A3A3C12 USED ONLY IN TRANSLATOR/SYNTHESIZER ASSEMBLIES AFFECTED BY ECP BCD-5. REPLACEMENT/REPAIR INTERMIXES THESE ASSEMBLIES AMONG THEIR EQUIPMENTS/UNITS. PHYSICALLY CHECK ANY SPECIFIC ASSEMBLY FOR THE NOTED PART PRESENCE/ABSENCE TO DETERMINE IF IT HAS BEEN AFFECTED, AND CHOOSE REPLACEMENT PARTS ACCORDINGLY.

CHART 1

FREQUENCY (MHz)	CRYSTAL
5.25	Y1
5.24	Y2
5.23	Y3
5.22	Y4
5.21	Y5
5.20	Y6
5.19	Y7
5.18	Y8
5.17	Y9
5.16	Y10

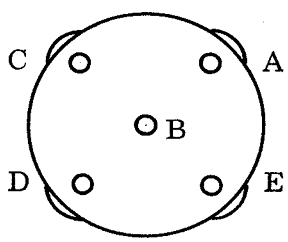
NOTES FOR FIGURE 5-43 (Cont)

CHART 2

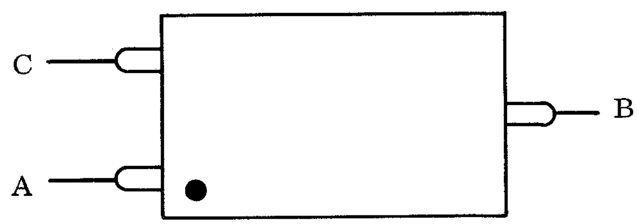
FREQUENCY (MHz)	CRYSTAL
1.850	Y11
1.851	Y12
1.852	Y13
1.853	Y14
1.854	Y15
1.855	Y16
1.856	Y17
1.857	Y18
1.858	Y19
1.859	Y20

SPECIFIC NOTES

1. TRANSFORMER BASING DIAGRAMS.



A1T1
A2T1
A3T1
A4T1



A4L3
A4L4

NOTES FOR FIGURE 5-43 (Cont)

VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
A1Q1-E	+10.8V	A3Q1-E	+ 7.8V
A1Q1-B	+11.6V	A3Q1-B	+ 7.7V
A1Q1-C	+19.0V	A3Q1-C	0V
A1Q2-E	+11.7V	A3Q2-E	+19.0V
A1Q2-B	+11.5V	A3Q2-B	+19.0V
A1Q2-C	0V	A3Q2-C	+18.0V
A2Q1-E	+10.7V	A4Q8-E	+ 8.7V
A2Q1-B	+11.4V	A4Q8-B	+ 8.3V
A2Q1-C	+19.0V	A4Q8-C	+ 1.6V
A2Q2-E	+11.6V	A4Q9-E	+ 8.5V
A2Q2-B	+11.3V	A4Q9-B	+ 8.2V
A2Q2-C	0V	A4Q9-C	0V

NOTES (FOR VOLTAGE MEASUREMENTS):

1. VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4( ).

2. CONNECT JUMPER FROM MODULE CHASSIS TO A2A6 FRAME.

NOTES FOR FIGURE 5-43 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A3C1	18A	A2A6A3R3	17G	A2A6A3A2R2	3H
C2	18A	R4	17I	R3	2G
J1	19A	R5	14I	R4	3I
J2	19B	R6	15I	R5	6I
J3	19E	R7	17H	R6	5I
J4	5B	R8	15H	R7	3H
S1	19G	R9	14H	R8	5H
S2	1G	R10	14H	R9	6H
Y1		R11	17F	R10	6H
thru	19G	R12	17G	R11	3F
Y10		R13	16F	R12	3G
Y11		R14	16G	R13	4F
thru	1G	R15	14H	R14	4G
Y20		R16	13H	R15	6H
A2A6A3A1C1	18G	RT1	18G	R16	7H
C2	18H	T1	14I	RT1	2G
C3	17I	A2A6A3A2C1	2G	T1	6I
C4	17H	C2	2H	A2A6A3A3C1	12H
C5	17G	C3	3I	C2	12G
C6	15H	C4	3H	C3	11G
C7	14G	C5	3G	C4	11H
C8	16G	C6	5H	C5	11H
C9	14H	C7	6G	C6	11I
C10	14I	C8	4G	C7	11I
C11	13H	C9	6H	C8	10I
CR1	18G	C10	6I	C9	9I
CR2	17G	CR1	2G	C10	8I
E1	18G	CR2	3G	C11	9G
E2	18F	E1	2G	CR1	8G
E3	14F	E2	7F	E1	12H
E4	13G	E3	6F	E2	12F
E5	13H	E4	7F	J1	*
E6	14F	E5	6F	J2	*
E7	18F	E6	7F	J3	1I
Q1	17H	E7	7G	L1	11H
Q2	14H	Q1	3H	L2	11H
R1	17H	Q2	5H	L3	10H
R2	17H	R1	2H	Q1	12H

* Not Used

NOTES FOR FIGURE 5-43 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A3A3Q2	9H	A2A6A3A4E10	9E	A2A6A3A4Z1-E	*
R1	12H	E11	*	Z1-F	11D
R2	12G	E12	6E	Z1-H	10C
R3	12H	E13	6E	Z1C1	10D
R4	12G	FL1	15B	Z1C2	10D
R5	12F	FL2	12D	Z1Q1	10D
R6	8H	L1	*	Z1R1	11D
R7	9G	L2	*	Z1R2	11D
T1	8H	L3	16D	Z1R3	10D
TP1	12H	L4	9D	Z1R4	10D
TP2	11I	Q1		Z2-A,E,G	8E
TP3	10I	thru	*	Z2-D	7D
A2A6A3A4C1	17B	Q7		Z2-F	8D
C2	17B	Q8	17B	Z2-H	8C
C3	17A	Q9	12B	Z2C1	7D
C4	15B	R1	17B	Z2C2	7D
C5	14B	R2	17A	Z2Q1	8D
C6	14B	R3	16A	Z2R1	8D
C7	12D	R4	17A	Z2R2	8D
C8	12D	R5	15B	Z2R3	7D
C9	11D	R6	13B	Z2R4	7D
C10	12C	R7	13C	Z3-A,E,G	16E
C11	13A	R8	13B	Z3-D	15D
C12	12A	R9	13B	Z3-H	15C
C13	10C	R10	12B	Z3C1	15D
E1	14E	R11	12A	Z3C2	
E2	14E	R12	10C	thru	*
E3	17B	R13		Z3C26	
E4	17B	thru	*	Z3C27	15D
E5	6B	R29		Z3Q1	16D
E6	6B	R30	12B	Z3R1	16D
E7	17A	R31	16B	Z3R2	16D
E8	*	T1	12C	Z3R3	15D
E9	9E	Z1-A,G	11E	Z3R4	15D
		Z1-D	*		

* Not Used

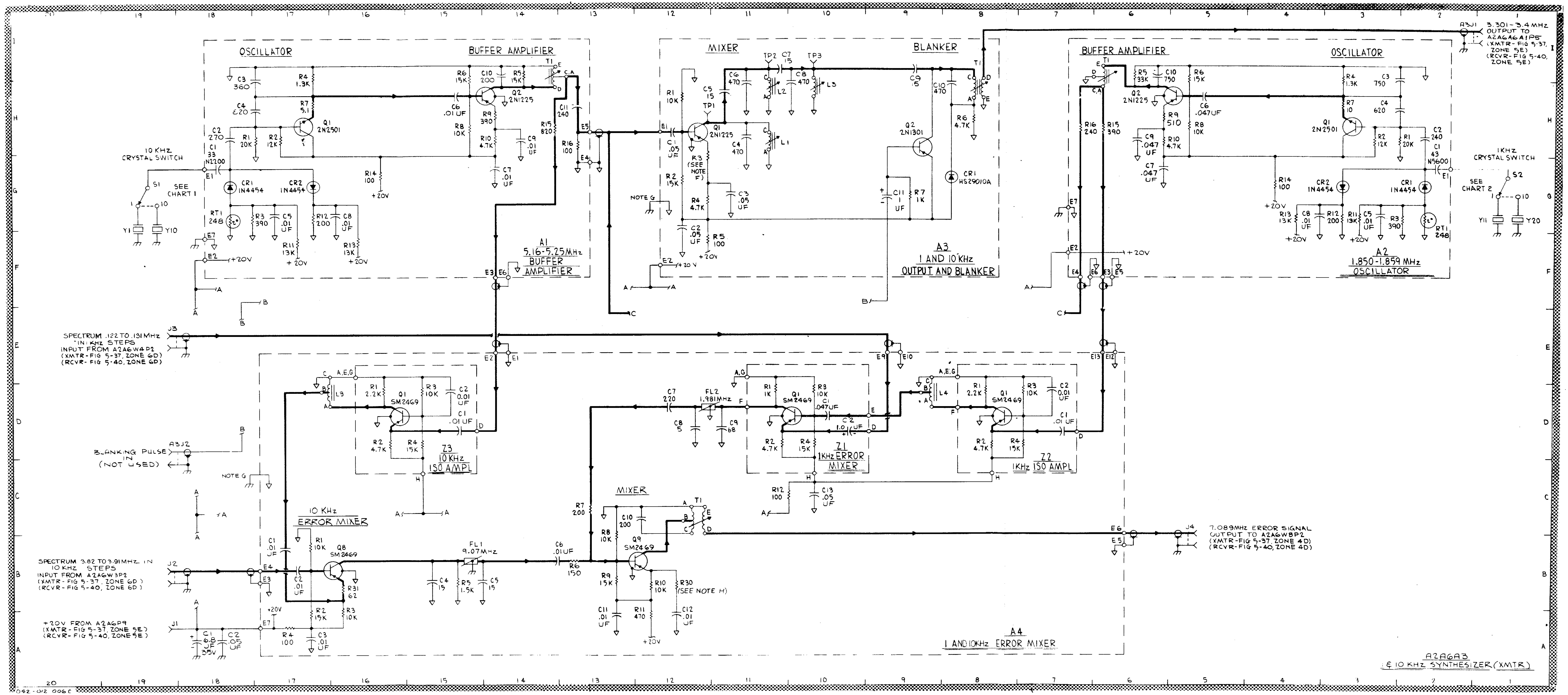


Figure 5-43. 1- and 10-kHz Synthesizer Subassembly A2A2A3, Maintenance Schematic Diagram

NOTES FOR FIGURE 5-44

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN,FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBER OF NEXT HIGHER ORDER ASSEMBLY.

B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT, ± 5%.
2. ALL CAPACITANCE IS IN MICROFARADS, pF = PICOFARADS.
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENT AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

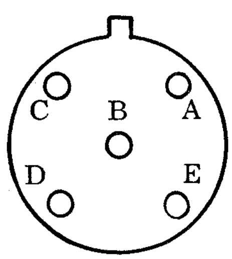
E. GROUND CONNECTION THROUGH MOUNTING SCREWS.

SPECIFIC NOTES

1. RESISTOR A1R9 (SHEET 2 ZONE 10A) SELECTED TO PROVIDE A RESET PULSE WIDTH OF 5 TO 7 MICROSECONDS. RESISTOR VALUE BETWEEN 270 AND 2700 OHMS (10% ACCURACY).

2. BASING DIAGRAMS

A1T1
A2T1 A3T1



3. FL2 AND FL3 ARE FERRITE BEADS.

4. VALUE OF A2A6A4A2R7 IS SELECTED TO OBTAIN AT LEAST 3.0 V P-P OUTPUT AT A2A6A4A2E11. USE LARGEST VALUE (BETWEEN 150 AND 68 OHMS) THAT YIELDS THE 3.0 V P-P OUTPUT.

NOTES FOR FIGURE 5-44 (Cont)

VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE
A1Q1-E	+1.1V
A1Q1-B	+2.4V
A1Q1-C	0V
A1Q2-E	0V
A1Q2-B	0V
A1Q2-C	+3.7V
A1Q3-E	0V
A1Q3-B	0V
A1Q3-C	+3.6V
A1Q4-E	0V
A1Q4-B	+0.8V
A1Q4-C	+0.3V
A1Q5-E	+0.4V
A1Q5-B	+0.8V
A1Q5-C	+1.4V
A1Q6-E	+0.4V
A1Q6-B	-0.2V
A1Q6-C	+2.2V
A1Q7-E	+15.0V
A1Q7-B	+14.6V
A1Q7-C	0V
A1Q8-E	0V
A1Q8-B	+0.6V
A1Q8-C	+0.5V
A1Q9-E	+0.4V
A1Q9-B	+0.3V
A1Q9-C	+3.9V
A2Q1-E	0V
A2Q1-B	+0.55V
A2Q1-C	+2.4V
A2Q2-E	+3.7V
A2Q2-B	+4.4V
A2Q2-C	+9.6V
A2Q3-E	+0.5V
A2Q3-B	+1.2V
A2Q3-C	+3.2V

TEST POINT	VOLTAGE
A3Q1-E	+10.5V
A3Q1-B	+11.2V
A3Q1-C	+19.0V
A3Q2-E	+ 8.5V
A3Q2-B	+ 8.2V
A3Q2-C	+ 1.6V
A3Q3-E	+ 8.2V
A3Q3-B	+ 7.8V
A3Q3-C	0V
A3Q4-E	+ 4.6V
A3Q4-B	+ 4.3V
A3Q4-C	0V
A2U1-1	0V
A2U1-2	+1.4V
A2U1-3	0V
A2U1-4	0V
A2U1-5	+2.1V
A2U1-6	+0.04V
A2U1-7	0V
A2U1-8	+3.7V
A1U1-1	+1.2V
A1U1-2	+1.1V
A1U1-3	+1.0V
A1U1-4	0V
A1U1-5	+1.4V
A1U1-6	+0.6V
A1U1-7	+3.0V
A1U1-8	+1.6V
A1U2-1	+1.3V
A1U2-2	+1.2V
A1U2-3	+1.1V
A1U2-4	0V
A1U2-5	+1.6V
A1U2-6	0V
A1U2-7	+3.9V
A1U2-8	+1.6V
A1U3-1	+1.3V
A1U3-2	+1.2V
A1U3-3	+1.1V
A1U3-4	0V

NOTES FOR FIGURE 5-44 (Cont)

TEST POINT	VOLTAGE
A1U3-5	+1.4V
A1U3-6	0V
A1U3-7	+3.9V
A1U3-8	+1.6V
A1U4-1	0V
A1U4-2	+0.5V
A1U4-3	0V
A1U4-4	0V
A1U4-5	+1.9V
A1U4-6	0V
A1U4-7	+1.9V
A1U4-8	+3.9V

NOTES:

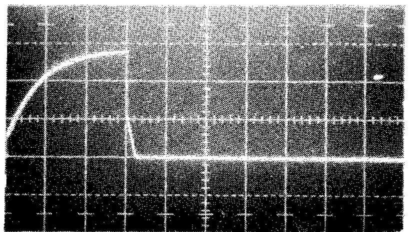
1. VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH VOLTMETER AND/PSM-4( ).

2. SET kHz AT FREQUENCY PROVIDING LEAST OUTPUT.

NOTES FOR FIGURE 5-44

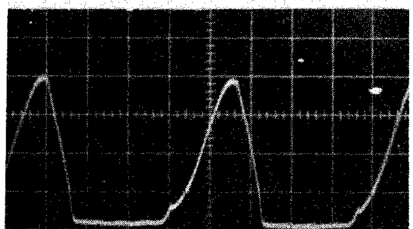
WAVEFORMS

A



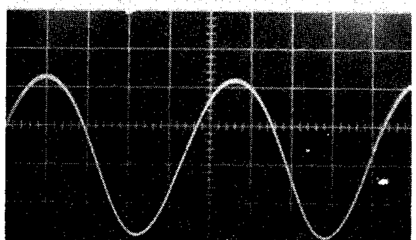
A1TP2
2 μSEC/CM
1V/CM

B



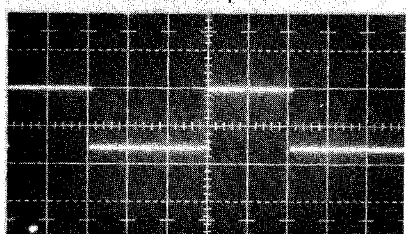
A2TP2
2 μSEC/CM
1V/CM

C



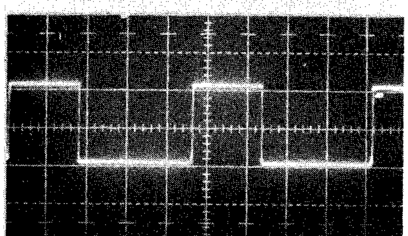
A2C15
2 μSEC/CM
2V/CM

D



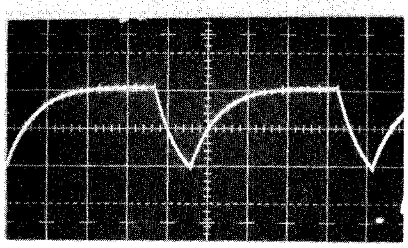
A2 U1-5
200 μSEC/CM
2V/CM

E



A1TP3
2 μSEC/CM
1V/CM

F

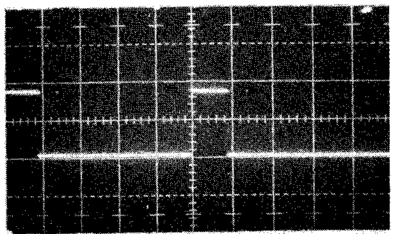


A1TP4
20 μSEC/CM
0.1V/CM

NOTES FOR FIGURE 5-44 (Cont)

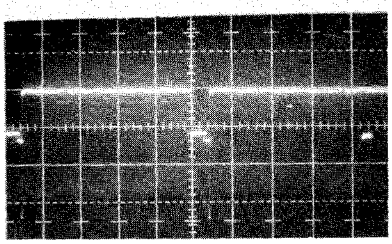
WAVEFORMS

G



A1TP5
200 μSEC/CM
1V/CM

H



A1TP1
200 μSEC/CM
0.5V/CM

NOTES FOR FIGURE 5-44, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A4P1-1	21C	A2A6A4A2C12	18D	A2A6A4A2Q1	20F
P1-2	21G	C13	18E	Q2	17D
P1-3	21D	C14	18F	Q3	16F
P1-4	21D	C15	17E	R1	21B
P1-5	21E	CR1	20B	R2	20F
P1-6	21D	CR2	19F	R3	19F
P1-7	21A	CR3	18C	R4	19E
P1-8	21A	CR4	17E	R5	18F
P1-9	21B	CR5	16E	R6	16E
P1-10	21B	CR6	18F	R7	16E
P1-A1	*	CR7	18F	R8	17C
P1-A2	*	CR8	18E	R9	16F
P1-A3	*	E1	16F	R10	17D
A2A6A4A2C1	21B	E2	21E	R11	17D
C2	20F	E3	16B	R12	18D
C3	20F	E4	21F	R13	18D
C4	19E	E5	21F	R14	18E
C5	18E	E6	21A	R15	17D
C6	16F	E7	21B	R16	16F
C7	18C	E8	21B	T1	17F
C8	17C	E9	21A	TP1	18F
C9	17D	E10	21G	TP2	16F
C10	17D	FL1	19F	U1	20F
C11	17D	L1	17C		

* Not Used

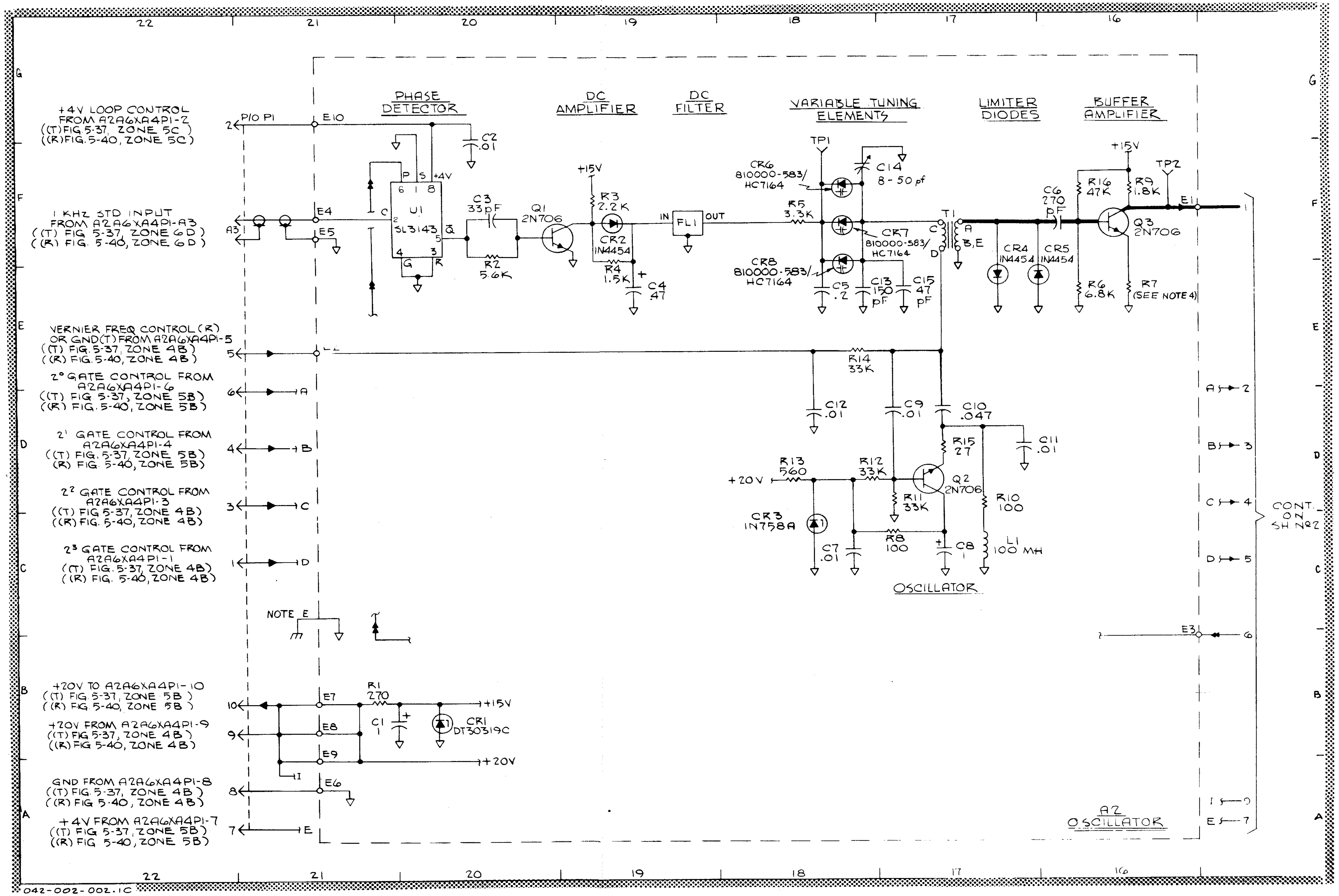


Figure 5-44. 100-Hz Synthesizer Subassembly A2A6A4, Maintenance Schematic Diagram (Sheet 1 of 3)

NOTES FOR FIGURE 5-44, SHEET 2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A4A1C1	13B	A2A6A4A1E4	14D	A2A6A4A1R19	13C
C2	13B	E5	14D	R20	13C
C3	11A	E6	14D	R21	12C
C4	10B	E7	14C	R22	14E
C5	10B	E8	14A	R23	14E
C6	13C	E9	14B	R24	14F
C7	13D	E10	14F	R25	14F
C8	13D	Q1	12B	R26	13F
C9	13C	Q2	11B	R27	14F
C10	11F	Q3	11B	R28	12F
C11	14F	Q4	9B	R29	12F
C12	14F	Q5	13F	R30	10F
C13	14F	Q6	14F	R31	11G
C14	10F	Q7	10F	R32	10G
C15	11F	Q8	11E	R33	10F
C16	11F	Q9	10C	R34	10F
C17	10G	R1	13B	R35	11E
CR1	10A	R2	13B	R36	11E
CR2	10A	R3	12A	R37	11C
CR3	12D	R4	12A	R38	10F
CR4	12D	R5	11B	R39	14E
CR5	13E	R6	11B	R40	10C
CR6	12C	R7	11B	T1	10F
CR7	12D	R8	9B	TP1	12B
CR8	13D	R9	10A	TP2	10C
CR9	12C	R10	10A	TP3	13F
CR10	12C	R11	10B	TP4	12F
CR11	11C	R12	9A	TP5	10E
CR12	11C	R13	13D	U1	12F
CR13	11C	R14	13C	U2	11E
CR14	11C	R15	13D	U3	12E
E1	14B	R16	13D	U4	10E
E2	14A	R17	13D		
E3	9F	R18	13D		

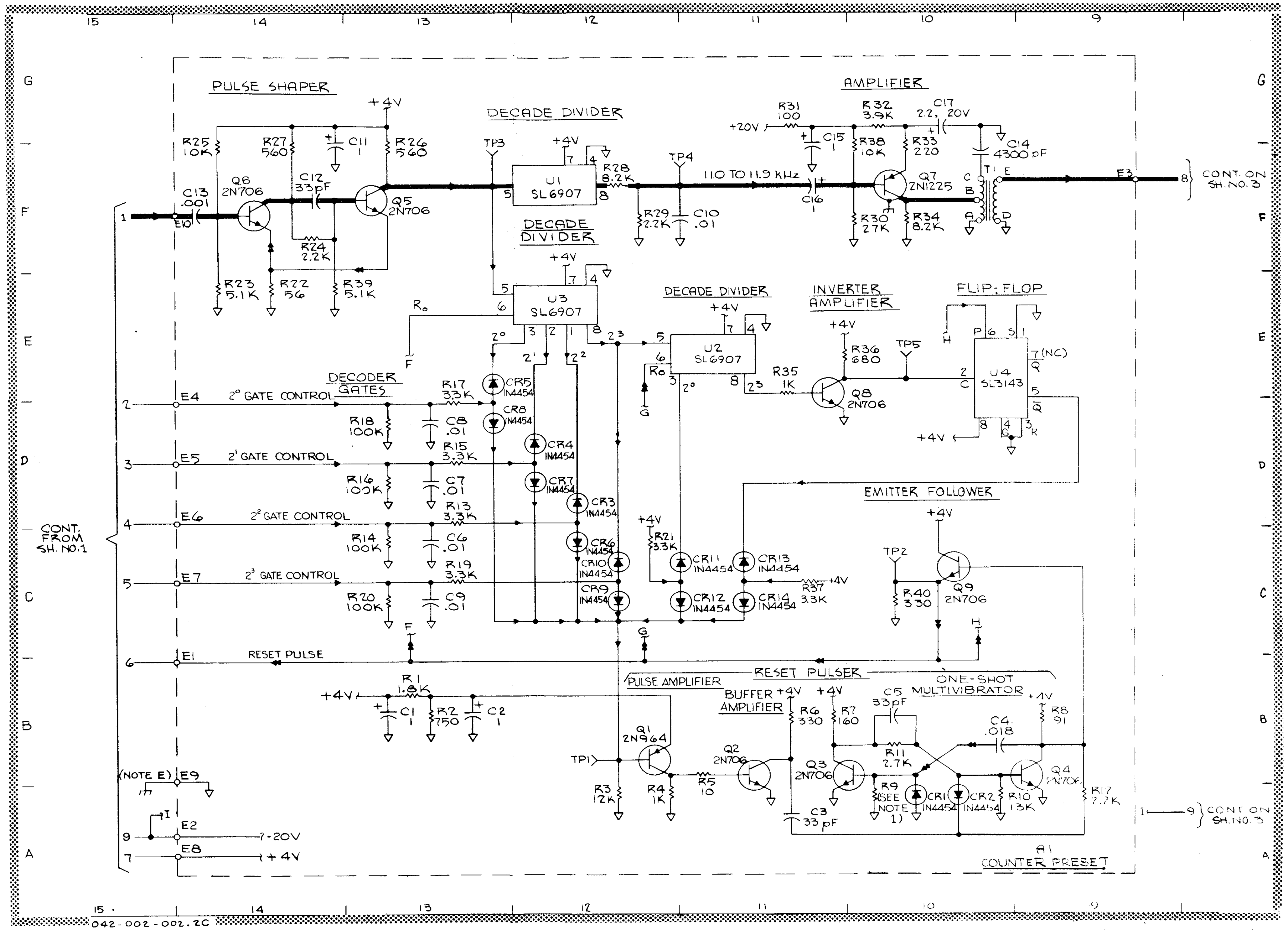


Figure 5-44. 100-Hz Synthesizer Subassembly A2A6A4, Maintenance Schematic Diagram (Sheet 2 of 3)

NOTES FOR FIGURE 5-44, SHEET 3

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A4P1-A1	1D	A2A6A4A3E2	6E	A2A6A4A3R9	5D
P1-A2	6F	E3	8E	R10	4D
A2A6A4A3C1	7E	E4	8D	R11	4D
C2	7D	E5	2D	R12	4E
C3	6D	E6	2D	R13	4E
C4	6E	FL1	5D	R14	3E
C5	5E	L1	7D	R15	3E
C6	7D	Q1	7E	R16	3E
C7	5D	Q2	5E	R17	3E
C8	4D	Q3	4D	R18	3D
C9	4E	Q4	3D	R19	3E
C10	3E	R1	7E	R20	2E
C11	3E	R2	7E	R21	6E
C12	3E	R3	7D	T1	2D
C13	2D	R4	7D	TP1	6E
C14	2E	R5	6E	TP2	5E
C15	7E	R6	6D	TP3	7D
C16	4D	R7	6E	TP4	4E
E1	5E	R8	5E		

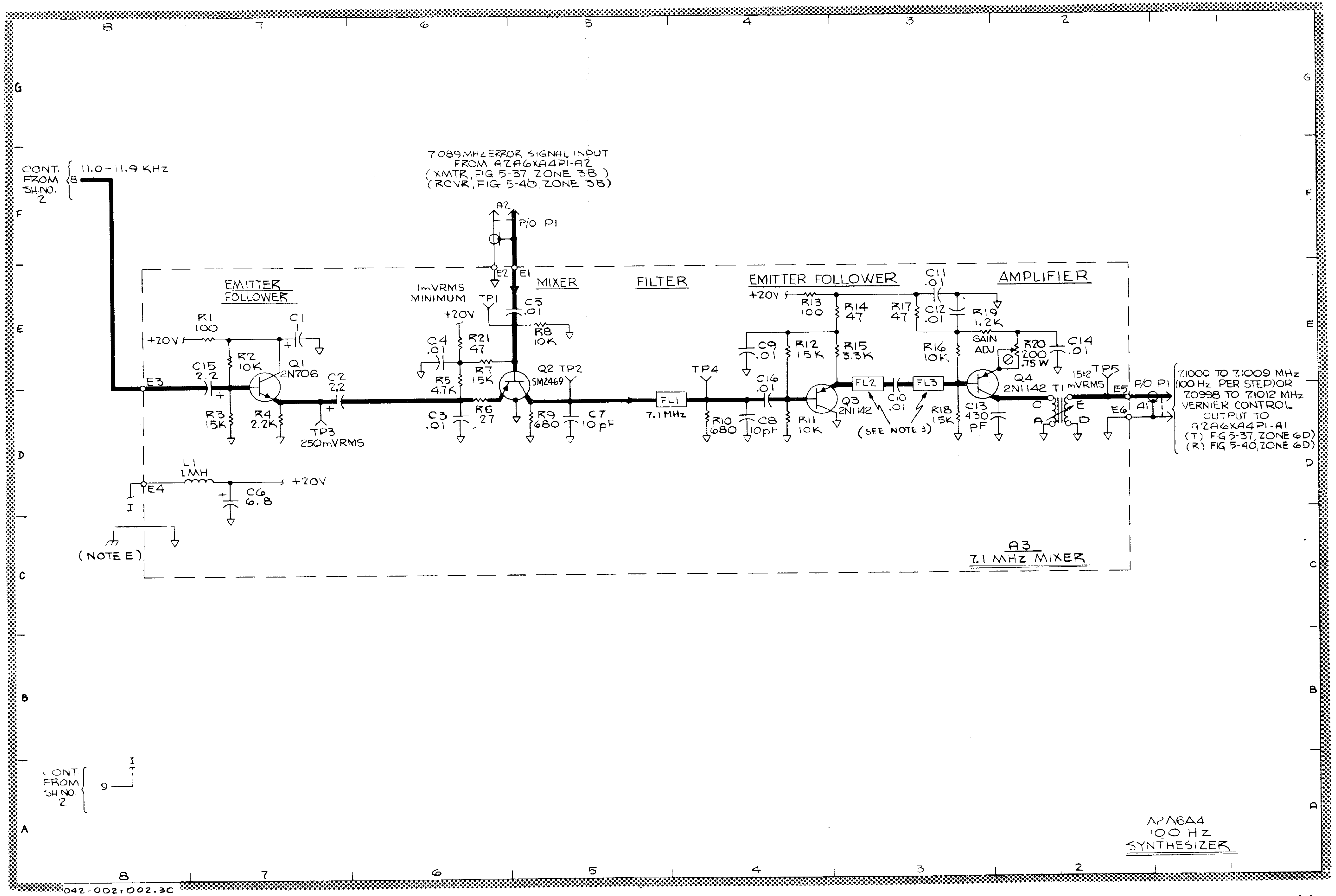


Figure 5-44. 100-Hz Synthesizer Subassembly A2A6A4, Maintenance Schematic Diagram (Sheet 3 of 3)

NOTES FOR FIGURE 5-45

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATIONS PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLIES.

B. UNLESS OTHERWISE SPECIFIED:

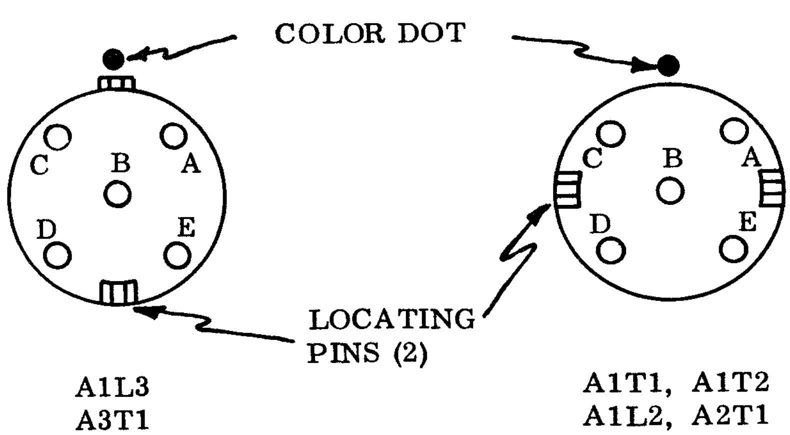
1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT, ±5%.
2. ALL CAPACITANCE IS IN PICOFARADS, UF = MICROFARADS.
3. ALL COIL RESISTANCES ARE LESS THAN 1 OHM.

C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENT AT TRANSISTOR POINTS, USE HIGHEST POSSIBLE OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

E. THIS UNIT IS COMMON TO BOTH THE TRANSMITTER AND RECEIVER. REFERENCES TO RECEIVER LOCATIONS ETC.IN THE TRANSMITTER MANUAL AND VICE VERSA DO NOT APPLY.

F. RESISTORS A1R24, A2R24 AND A3R24 ARE SELECTED (BETWEEN 1-K AND 18-K OHMS) DURING ALIGNMENT; REFER TO TABLE 6-10.



TRANSFORMER & INDUCTOR
BASE DIAGRAMS

NOTES FOR FIGURE 5-45 (Cont)

VOLTAGE MEASUREMENTS

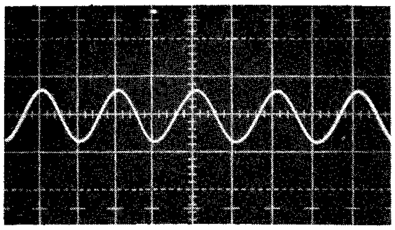
TEST POINT	VOLTAGE	TEST POINT	VOLTAGE
A1Q1-E	+ 4.2V	A2Q5-E	+ 8.9V
A1Q1-B	+10.0V	A2Q5-B	+ 8.7V
A1Q1-C	+ 9.3V	A2Q5-C	+ 8.1V
A1Q2-E	+ 7.1V	A2Q6-E	+ 8.9V
A1Q2-B	+ 6.1V	A2Q6-B	+ 8.6V
A1Q2-C	+ 9.8V	A2Q6-C	+ 8.1V
A1Q3-E	+ 9.3V	A3Q1-E	+ 8.1V
A1Q3-B	+ 9.8V	A3Q1-B	+ 8.5V
A1Q3-C	+ 1.4V	A3Q1-C	+ 4.2V
A1Q4-E	+10.5V	A3Q2-E	+ 8.1V
A1Q4-B	+10.3V	A3Q2-B	+ 8.5V
A1Q4-C	+10.2V	A3Q2-C	+ 4.6V
A1Q5-E	+10.4V	A3Q3-E	+ 6.6V
A1Q5-B	+10.1V	A3Q3-B	+ 7.1V
A1Q5-C	+10.2V	A3Q3-C	+ 9.6V
A1Q6-E	+ 8.5V	A3Q4-E	+ 9.2V
A1Q6-B	+ 8.2V	A3Q4-B	+ 9.6V
A1Q6-C	0V	A3Q4-C	+ 1.5V
A2Q1-E	+ 8.5V	A3Q5-E	+10.3V
A2Q1-B	+ 8.9V	A3Q5-B	+10.1V
A2Q1-C	+ 4.2V	A3Q5-C	+ 9.4V
A2Q2-E	+ 8.5V	A3Q6-E	+10.3V
A2Q2-B	+ 8.8V	A3Q6-B	+10.0V
A2Q2-C	+ 4.4V	A3Q6-C	+ 9.4V
A2Q3-E	+ 7.8V	A4Q1-E	0V
A2Q3-B	+ 7.3V	A4Q1-B	+ 0.3V
A2Q3-C	+ 9.9V	A4Q1-C	+ 1.4V
A2Q4-E	+ 9.5V		
A2Q4-B	+ 9.9V		
A2Q4-C	+ 1.5V		

NOTE: VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4( ).

NOTES FOR FIGURE 5-45 (Cont)

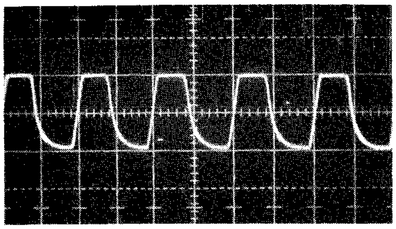
WAVEFORMS

A



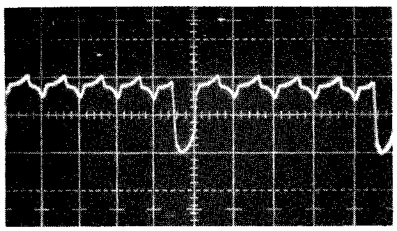
A1J1
500 kHz INPUT
1 μSEC/CM
0.5V/CM

B



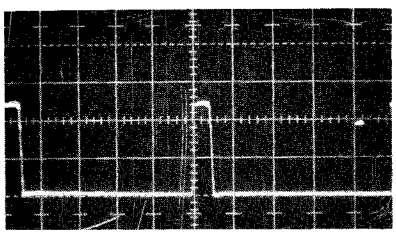
A1TP1
1 μSEC/CM
5V/CM

C



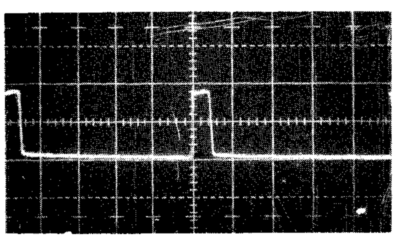
A1TP2
2 μSEC/CM
1V/CM

D



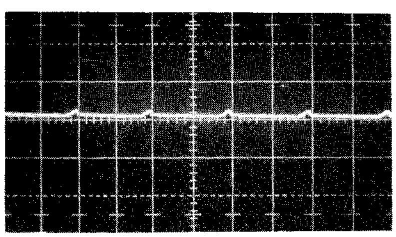
A1TP3
2 μSEC/CM
0.5V/CM

E



A1TP4
2 μSEC/CM
5V/CM

F

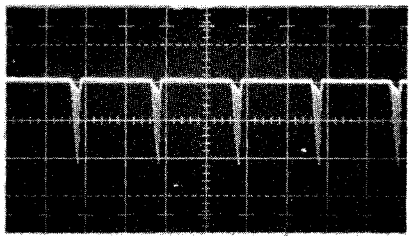


A1TP5
5 μSEC/CM
.05V/CM

NOTES FOR FIGURE 5-45 (Cont)

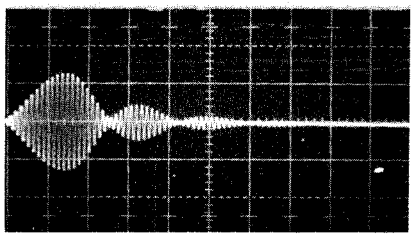
WAVEFORMS

G



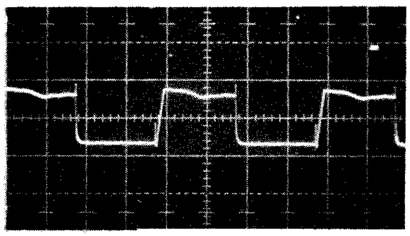
A1TP6
5 μSEC/CM
2V/CM

H



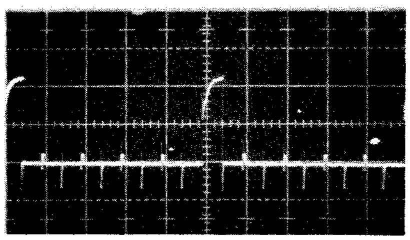
A1J2
A1 OUTPUT
0.5 μSEC/CM
0.5V/CM

J



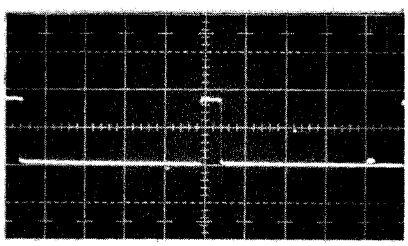
A2TP1
5 μSEC/CM
5V/CM

K



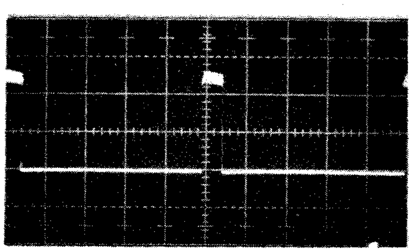
A2TP2
20 μSEC/CM
1V/CM

L



A2TP3
20 μSEC/CM
5V/CM

M

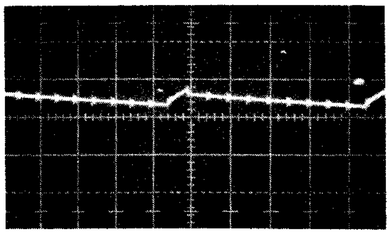


A2TP4
20 μSEC/CM
0.5V/CM

NOTES FOR FIGURE 5-45 (Cont)

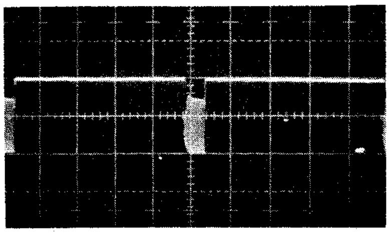
WAVEFORMS

N



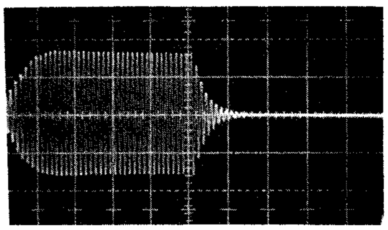
A2TP5
20 μSEC/CM
.05V/CM

P



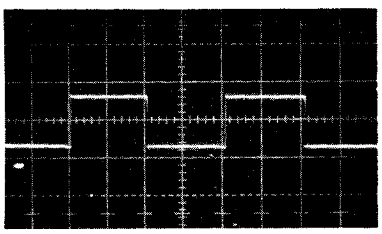
A2TP6
20 μSEC/CM
5V/CM

Q



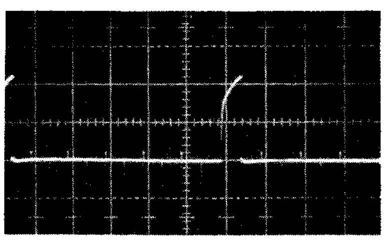
A2J1
A2 OUTPUT
2 μSEC/CM
.05V/CM

R



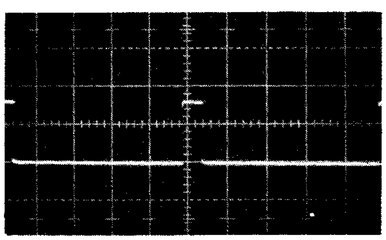
A3TP1
50 μSEC/CM
5V/CM

S



A3TP2
200 μSEC/CM
1V/CM

T

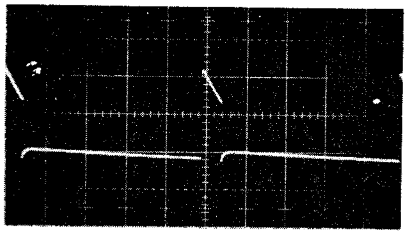


A3TP3
200 μSEC/CM
5V/CM

NOTES FOR FIGURE 5-45 (Cont)

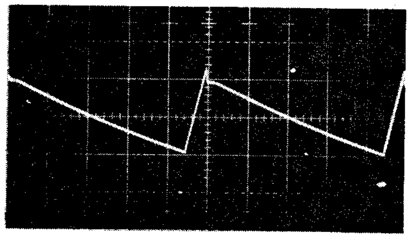
WAVEFORMS

U



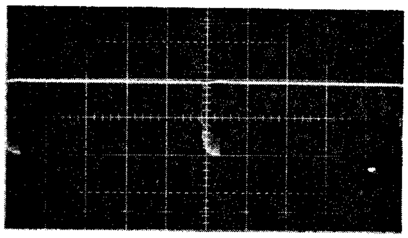
A3TP4
200 μSEC/CM
0.5V/CM

V



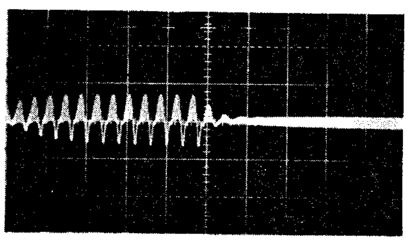
A3TP5
100 μSEC/CM
0.05V/CM

W



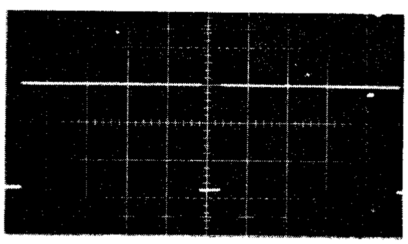
A3TP6
200 μSEC/CM
10V/CM

X



A3J1
20 μSEC/CM
0.5V/CM

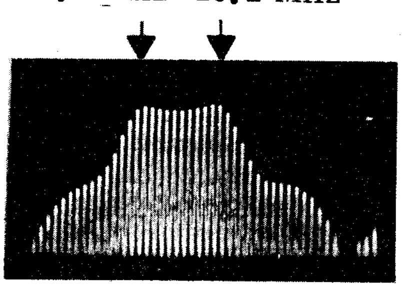
Y



A4J1
200 μSEC/CM
0.5V/CM

15.3 MHz 16.2 MHz

Z

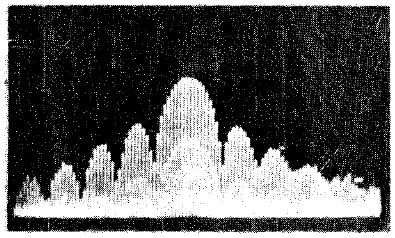


A1J2
100 kHz SPECTRUM

NOTES FOR FIGURE 5-45 (Cont)

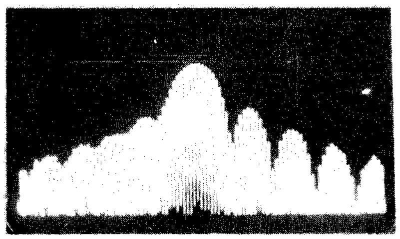
WAVEFORMS

AA



A2J1
10 kHz SPECTRUM
CENTER SPECTRAL
LINE = 3.86 MHz

AB



A3J1
1 kHz SPECTRUM
CENTER SPECTRAL
LINE = 126 kHz

NOTES FOR FIGURE 5-45 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A5E1	13C	A2A6A5A1Q5	6B	A2A6A5A2C5	10D
E2	8C	Q6	5B	C6	10E
E3	13E	R1	12A	C7	9D
E4	8E	R2	11B	C8	9D
E5	3E	R3	11B	C9	8D
E6	3F	R4	10B	C10	8E
A2A6A5A1C1	12A	R5	10B	C11	7D
C2	12A	R6	9B	C12	6D
C3	11B	R7	10B	C13	5D
C4	10B	R8	9A	C14	5D
C5	10B	R9	10A	C15	5D
C6	9A	R10	10A	C16	5D
C7	8A	R11	8B	CR1	12C
C8	9B	R12	7B	CR2	11D
C9	6B	R13	8A	CR3	10D
C10	6A	R14	7A	CR4	8E
C11	7A	R15	6B	E1	13D
C12	6A	R16	6A	E2	13D
C13	6B	R17	6B	E3	8C
C14	5B	R18	6A	E4	8E
C15	5B	R19	5B	J1	2D
C16	5A	R20	5A	L1	13D
C17	4B	R21	5B	Q1	11D
C18	3B	R22	4B	Q2	10D
C19	3B	R23	4B	Q3	8D
CR1	12A	R24	4A	Q4	8D
CR2	11B	R25	3B	Q5	7D
CR3	9B	T1	6B	Q6	5D
E1	13A	T2	3B	R1	12C
E2	8C	TP1	11B	R2	11E
J1	13B	TP2	10B	R3	11E
J2	2B	TP3	8B	R4	11D
L1	13A	TP4	9B	R5	11D
L2	11B	TP5	7B	R6	10D
L3	4B	TP6	6A	R7	10E
Q1	11B	A2A6A5A2C1	12C	R8	10D
Q2	9B	C2	12C	R9	10D
Q3	9B	C3	11D	R10	*
Q4	8B	C4	10C	R11	9E

* Not Used

NOTES FOR FIGURE 5-45 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A5A2R12	9D	A2A6A5A3C11	7F	A2A6A5A3R11	9G
R13	9D	C12	6F	R12	9G
R14	9D	C13	5G	R13	9F
R15	9D	C14	5F	R14	9F
R16	8E	C15	13F	R15	9F
R17	*	C16	5F	R16	8G
R18	8D	C17	4F	R17	8G
R19	7D	CR1	12F	R18	8F
R20	7D	CR2	11F	R19	7G
R21	6D	CR3	10F	R20	7F
R22	6E	CR4	9F	R21	6F
R23	5E	CR5	8G	R22	6G
R24	5E	E1	4E	R23	5G
R25	5D	E2	13E	R24	5G
R26	4E	E3	8E	R25	5F
R27	4D	E4	4F	R26	4G
R28	4D	E5	4F	R27	4F
R29	4D	J1	2F	T1	5F
R30	8D	J2	13F	TP1	10F
T1	5D	L1	12F	TP2	9G
TP1	10D	L2	4F	TP3	8F
TP2	9D	Q1	11G	TP4	7F
TP3	8D	Q2	10G	TP5	7G
TP4	7D	Q3	8F	TP6	5F
TP5	7E	Q4	8G	A2A6A5A4C1	2E
TP6	5D	Q5	7F	E1	3E
A2A6A5A3C1	12F	Q6	5F	E2	3F
C2	11F	R1	12F	J1	2F
C3	11F	R2	11G	Q1	3F
C4	10F	R3	11G	R1	3E
C5	10F	R4	11F	R2	2E
C6	10G	R5	11F	R3	2F
C7	9F	R6	10F	R4	3F
C8	9F	R7	10G	R5	3E
C9	8F	R8	10F		
C10	8G	R9	10F		
		R10	10F		

* Not Used

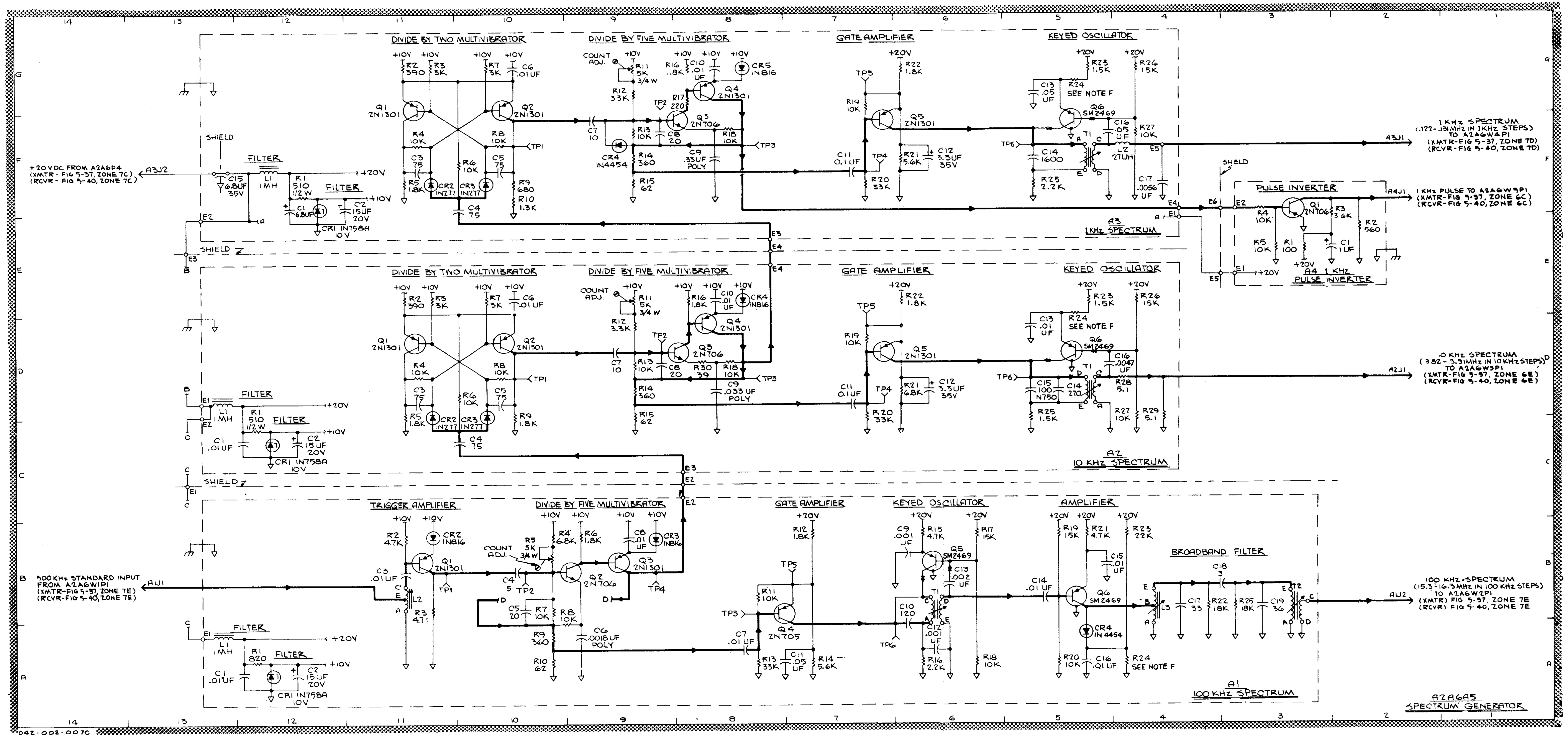


Figure 5-45. Spectrum Generator Subassembly A2A6A5, Maintenance Schematic Diagram

NOTES FOR FIGURE 5-46

GENERAL NOTES

A. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATION PREFIX WITH NUMBERS OF NEXT HIGHER ASSEMBLY.

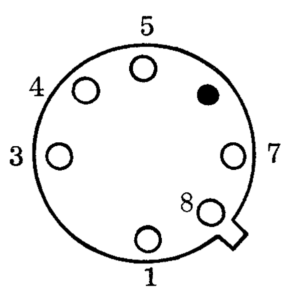
B. UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCE IS IN OHMS, K = 1000
   ALL RESISTORS ARE 1/4 WATT, ±5%.
2. ALL CAPACITANCE IS IN PICOFARADS, UF = MICROFARADS.
3. ALL COIL REISTANCES ARE LESS THAN 1 OHM.
4. ALL INDUCTANCE IS IN MICROHENRIES.

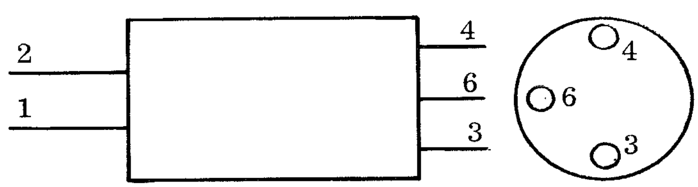
C. CW ON POTENTIOMETERS INDICATES DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

D. WHEN MAKING RESISTANCE MEASUREMENTS AT TRANSISTOR POINTS USE HIGHEST OHMMETER RANGE TO PREVENT DAMAGE TO TRANSISTORS.

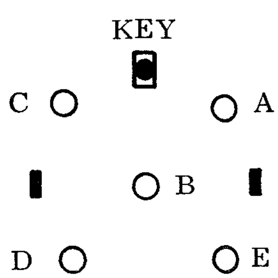
E. TRANSFORMERS AND CHOKES ARE MOUNTED AS PER DIAGRAMS.



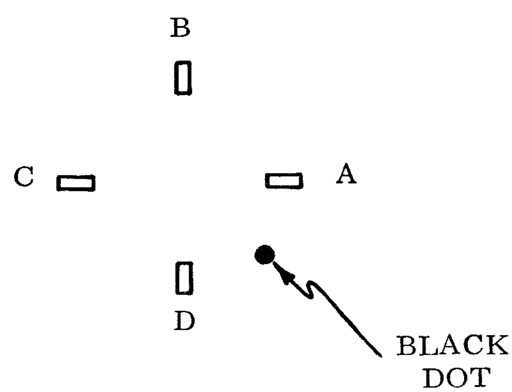
1



2



3



4

NOTES FOR FIGURE 5-46 (Cont)

TRANSFORMER/CHOKE	BASE DIAGRAM
A2A6A6A1A1T1	1
A1T2	1
A2T1	1
A2T2	1
A3T1	2
A3T2	2
A1L15	3
A1A3L1	4
A1A3L2	4

F. UNIT IS COMMON TO BOTH RECEIVER AND TRANSMITTER APPLICATION, REFERENCES TO FIGURES OF BOTH RECEIVER AND TRANSMITTER MANUALS ARE INDICATED BUT APPLY ONLY TO THE MANUAL REFERENCED.

G. GROUND CONNECTED THROUGH MOUNTING SCREWS.

NOTES FOR FIGURE 5-46 (Cont)

VOLTAGE MEASUREMENTS

TEST POINT	VOLTAGE	
A1Q1-1	+10.6V	
A1Q1-2	+ 4.8V	
A1Q1-3	+ 4.8V	
A1Q1-4	+ 4.7V	
A1Q2-E	+ 9.6V	
A1Q2-B	+10.4V	
A1Q2-C	+16.0V	
A1U1-1, 10	+ 9.7V	
A1U1-2	+ 5.6V	
A1U1-3	+ 4.9V	
A1U1-4	+ 2.7V	
A1U1-5	+ 4.8V	
A1U1-6	+11.7V	
A1U1-7	+ 2.7V	
A1U1-8	+ 1.2V	
A1U1-9	+ 0.47V	
A1U1-11	+13.4V	
A1U1-12	+13.4V	
Q1-E	+10.8V	RECEIVER ONLY
Q1-B	+10.1V	RECEIVER ONLY
Q1-C	0V	RECEIVER ONLY

NOTE: VOLTAGE MEASUREMENTS TAKEN TO GROUND WITH MULTIMETER AN/PSM-4( ).

NOTES FOR FIGURE 5-46, SHEET 1

PART LOCATION INDEX

REF DES	ZONE
A2A6A6J1	17H
J2	17H
J3	17A
P1	*
P2	*
P3-A1	17F
P3-A2	1B
W1	17F
W2	1B
W3	17C
W4	17D
XA1P1-A1	*
XA1P1-A2	17C
XA2P1-A1	*
XA2P1-A2	17D
A2A6A6A1C1	15F
C2	2B
C3	2B
C4	3B
C5	2B
C6	10H
C7	11A
C8	9F
C9	9G
C10	8H
C11	8F
C12	8G
C13	7F
C14	7G
C15	12A
C16	16H
C17	7H
C18	6F
C19	6G
C20	2H
C21	13A
C22	2F
C23	2G

REF DES	ZONE
A2A6A6A1C24 thru C32	*
C33	16A
C34	16A
C35	14A
C36	13A
CR1	17F
CR2	16F
CR3	2B
CR4	8F
CR5	8G
CR6	6F
CR7	6G
CR8	15A
E1	17F
E2	17F
E3	1B
E4	1B
E5	17C
E6	17C
E7	17D
E8	17D
FL1	8F
FL2	8G
L1	2B
L2	10H
L3	8F
L4	8G
L5	17H
L6	12A
L7	7F
L8	7G
L9	12A
L10	11H
L11	17A
L12	13A
R1	16F

REF DES	ZONE
A2A6A6A1R2	15F
R3	2C
R4	2B
R5	16D
R6	15C
R7	9H
R8	9H
R9	6H
R10	6H
R11	7E
R12	6D
R13	6D
R14 thru R21	*
R22	15A
TP1	17F
TP2	1C
A2A6A6A1A1C1	13G
C2	13B
C3	13F
C4	12F
C5	11F
C6	12F
C7	11B
C8	11G
C9	12F
C10	14C
C11	14C
C12	14C
C13	13D
C14	12C
C15	12D
C16	12C
C17	10D
C18	14A
CR1	13G
CR2	13F
CR3	11G
CR4	11F
CR5	12D

* Not Used

NOTES FOR FIGURE 5-46, SHEET 1 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A6A1A1 CR6	11C	A2A6A6A1A1 R23	13C	A2A6A6A1A2 C6	3F
CR7	11C	R24	12D	C7	3C
CR8	10D	R25	12C	C8	3G
Q1	14D	R26	12C	C9	4E
Q2	12D	R27	11D	CR1	5G
R1	14G	R28	11D	CR2	5F
R2	14G	R29	11C	CR3	3F
R3	14G	R30	11D	CR4	3F
R4	13F	R31	11D	R1	5G
R5	14B	R32	11C	R2	5G
R6	13G	R33	11C	R3	5G
R7	13F	R34	10D	R4	5F
R8	12F	R35	10D	R5	5C
R9	12F	R36	10C	R6	4G
R10	12G	R37	10D	R7	4E
R11	14B	R38	10D	R8	4E
R12	11F	R39	14B	R9	3E
R13	10G	T1	13F	R10	3G
R14	11G	T2	11F	R11	5C
R15	10G	TP1	12F	R12	3F
R16	14D	U1A	12F	R13	2G
R17	14C	U1B	10D	R14	2G
R18	14C	A2A6A6A1A2 C1	5G	R15	2G
R19	14D	C2	4C	R16	4E
R20	14D	C3	4E	T1	4F
R21	14C	C4	4F	T2	3F
R22	13D	C5	3E	U1	4F

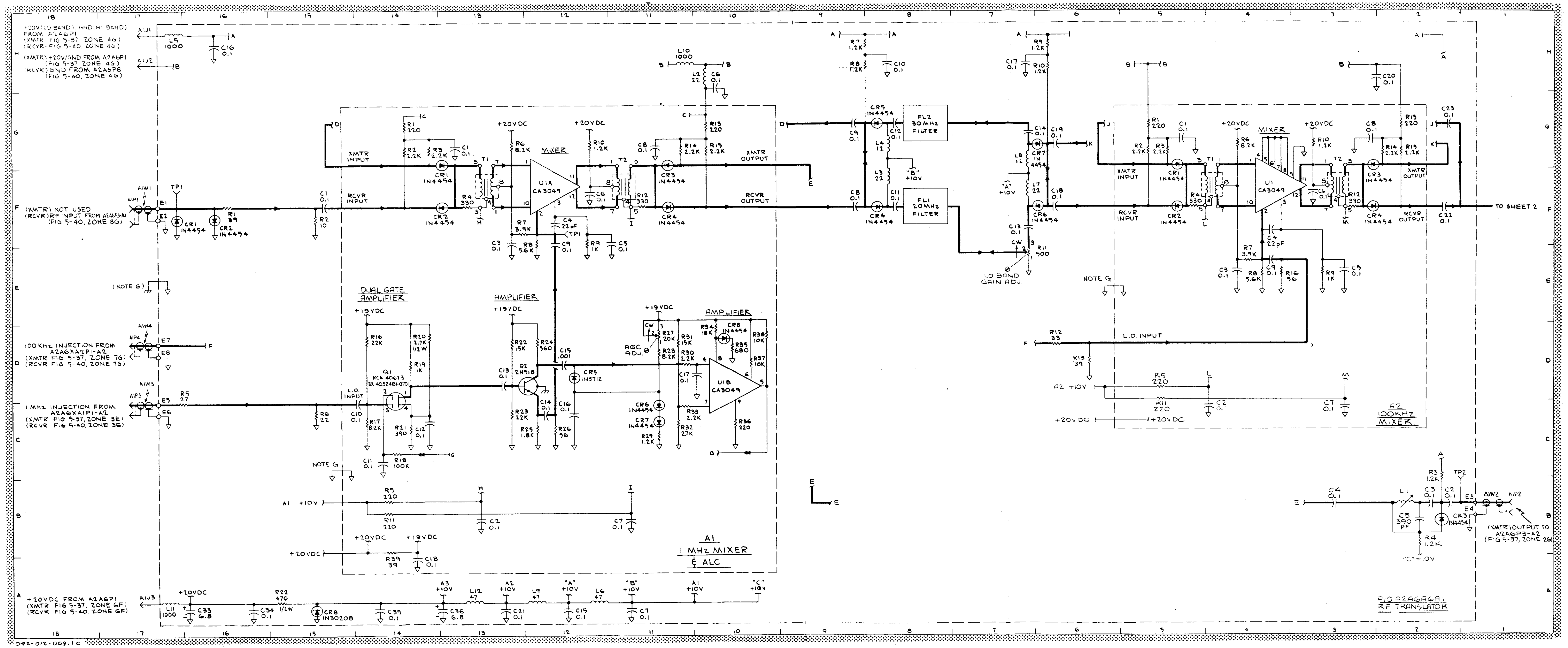


Figure 5-46. RF Translator Subassembly A2A6A6, Maintenance Schematic Diagram (Sheet 1 of 2)

NOTES FOR FIGURE 5-46, SHEET 2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A6P1	*	A2A6A6A1J3	*	A2A6A6A1A3C14	8C
P2-A1	2F	J4	13H	C15	9D
P2-A2	13E	L1 thru L12	*	C16	8D
P3	*	L13	13H	C17	8C
P4	*	L14	4G	C18	8D
P5	13C	L15	3F	C19	7C
P6	2F	Q1	3F	C20	6D
P7	2E	R1 thru R13	*	C21	10A
W1 thru W4	*	R14	11C	CR1	9F
W5	13C	R15	11C	CR2	9F
W6	2F	R16	3F	CR3	7F
W7	13E	R17	3G	CR4	7F
A2A6A6A1C1 thru C23	13E	R18	3F	CR5	7D
C24	11F	R19	3G	CR6	6C
C25	5F	R20	3G	CR7	6C
C26	3G	R21	2F	CR8	6D
C27	5G	TP1	*	L1	8D
C28	4F	TP2	*	L2	8C
C29	3F	TP3	13E	Q1	10C
C30	3G	TP4	2F	Q2	9D
C31	3F	A2A6A6A1A1	*	R1	10G
C32	12E	A2	*	R2	10G
E1 thru E8	*	A2A6A6A1A3C1	9G	R3	9G
E9	13C	C2	9B	R4	9F
E10	13C	C3	8F	R5	10B
E11	2F	C4	8F	R6	8F
E12	2F, 13B	C5	7F	R7	8F
E13	13E	C6	8F	R8	8E
FL1	*	C7	7B	R9	8F
FL2	*	C8	7G	R10	8F
FL3	12F	C9	8E	R11	10B
J1	*	C10	11C	R12	7F
J2	*	C11	10C	R13	6G
		C12	10C	R14	7G
		C13	9D	R15	6G
				R16	10D
				R17	10C
				R18	10C
				R19	10D

* Not Used

NOTES FOR FIGURE 5-46, SHEET 2 (Cont)

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A6A1A3R20	10D	A2A6A6A1A3R29	6D	A2A6A6A1A3R38	5D
R21	10C	R30	6C	R39	5D
R22	9D	R31	6D	R40	10A
R23	9C	R32	6D	T1	9F
R24	9C	R33	6C	T2	7F
R25	9C	R34	6C	TP1	8F
R26	8C	R35	6D	U1A	8F
R27	8C	R36	5D	U1B	6D
R28	6D	R37	5C		

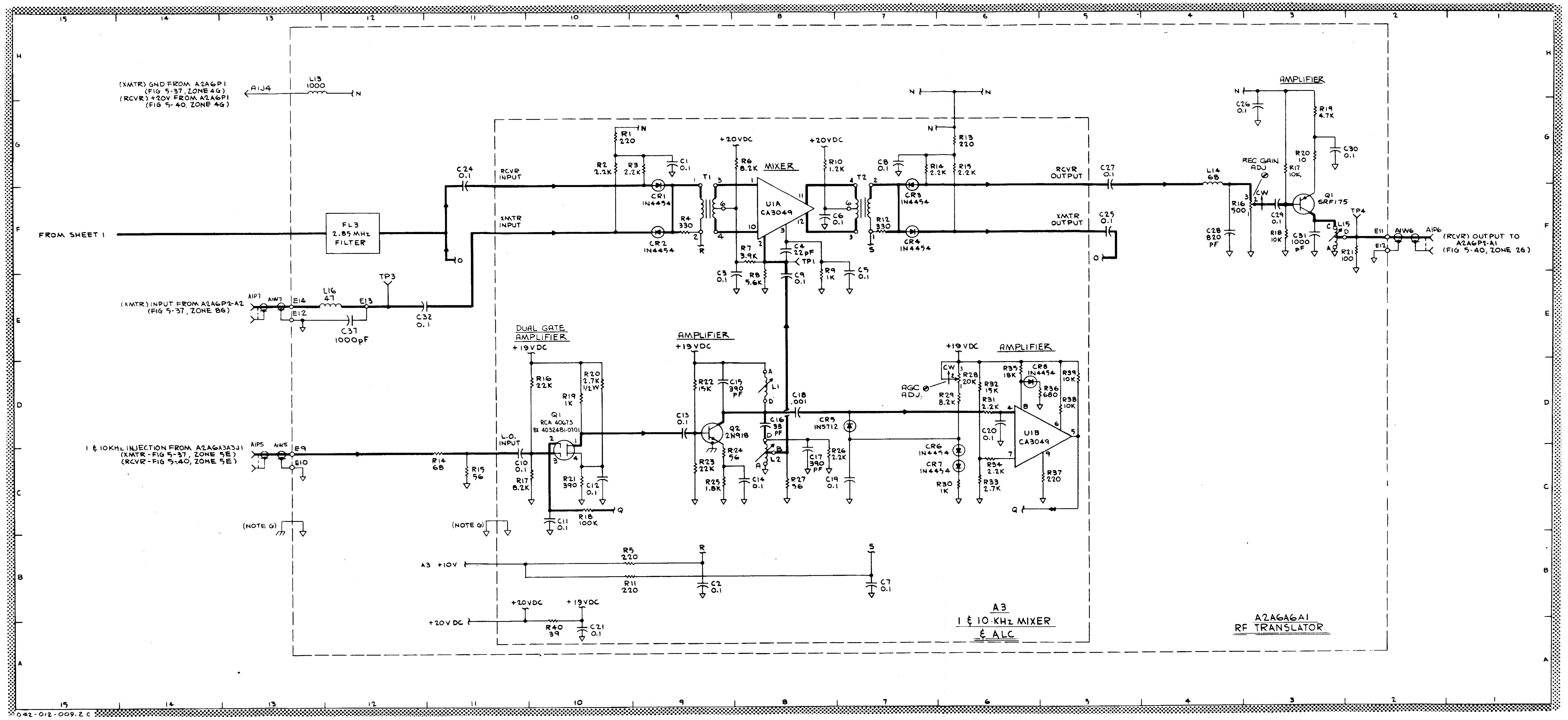


Figure 5-46. RF Translator Subassembly A2A6A6, Maintenance Schematic Diagram (Sheet 2 of 2)

NOTES FOR FIGURE 5-47

GENERAL NOTES

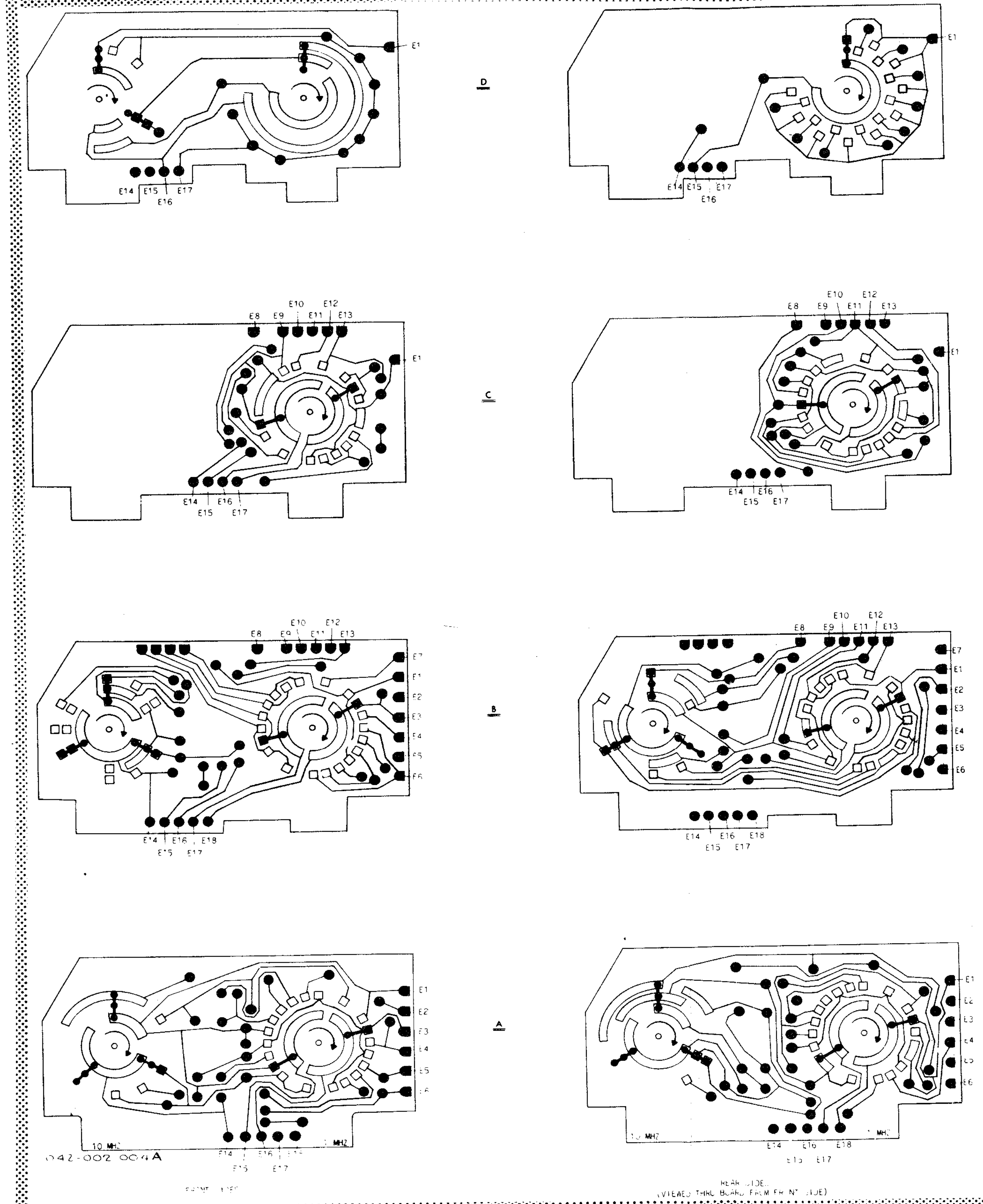
A. SOLID CIRCLE INDICATES FRONT AND REAR OF PC BOARD ARE CONNECTED TOGETHER AT THAT POINT.

B. SWITCH WIPERS SHOWN IN 00 MHz POSITION.

C. BOARD "A" IS LOCATED CLOSEST TO FRONT PANEL.

D. P1 CONNECTS TO A2J8 (FIGURE 5-35, SHEET 2, ZONE 11E/12E).

E. MHz TUNING CONTROLS THROUGH LEFT- AND RIGHT-HAND SWITCH ROTORS MOVE ALL 10MHz OR 1 MHz WIPERS IN UNISON.



INTER-BOARD AND PLUG P1 WIRING DATA

FROM	TO	FUNCTION
E17A E18A E15A E16A E18B	P1-1 P1-2 P1-3 P1-4 P1-5	RF TURRET CONTROL
E16B E15C E14C E17C E16C	P1-21 P1-22 P1-23 P1-24 P1-25	MC SYNTHESIZER CONTROL
E16D E15B E14D	P1-9 P1-6 P1-7	GROUND HI LO GROUND TUNE RELAY GROUND
E15D E14A E14B E17B	P1-8 P1-19 P1-20 P1-17	RESERVED RESERVED RESERVED NOT TO BE USED

E1 OF BOARD A, B, C, AND D ARE CONNECTED TOGETHER
E2 OF BOARD A, AND B ARE CONNECTED TOGETHER
E3 OF BOARD A AND B ARE CONNECTED TOGETHER
E4 OF BOARD A AND B ARE CONNECTED TOGETHER
E5 OF BOARD A AND B ARE CONNECTED TOGETHER
E6 OF BOARD A AND B ARE CONNECTED TOGETHER

E8 OF BOARD B AND C ARE CONNECTED TOGETHER
E9 OF BOARD B AND C ARE CONNECTED TOGETHER
E10 OF BOARD B AND C ARE CONNECTED TOGETHER
E11 OF BOARD B AND C ARE CONNECTED TOGETHER
E12 OF BOARD B AND C ARE CONNECTED TOGETHER
E13 OF BOARD B AND C ARE CONNECTED TOGETHER

Figure 5-47. Receiver Code Generator Assembly A2A7, Maintenance Schematic Diagram

CHAPTER 6

CORRECTIVE MAINTENANCE

6-1. INTRODUCTION.

6-2. This chapter contains all instructions required to align and adjust the R-1051E/URR and its major assemblies and subassemblies, and to remove, repair, and test repairable assemblies and subassemblies. This chapter is divided into two sections. Section I contains information and procedures for alignment and adjustment of electronic circuits and mechanical assemblies; Section II contains repair instructions, which cover disassembly, means of access, parts removal, and complex repair actions.

6-3. Most of the procedures in this chapter can be accomplished aboard ship. However, the RF Amplifier Assembly A2A4, Frequency Standard Assembly A2A5, and Translator/Synthesizer Assembly A2A6 are designated as depot-repairable only. Therefore no corrective maintenance should be performed on these assemblies at shipboard/station level.

SECTION I

ADJUSTMENTS AND ALIGNMENTS

6-4. GENERAL.

6-5. This section contains all information and procedures required to perform all necessary alignments and adjustments of the R-1051E/URR, both at shipboard/station and depot level. Included are alignment and adjustment procedures for electronic assemblies and adjustment procedures for mechanical assemblies. Test equipment setup drawings are provided where necessary to support the procedures.

6-6. ELECTRONIC ALIGNMENTS AND ADJUSTMENTS.

6-7. PROCEDURES. Overall alignment and adjustment procedures for the R-1051E/URR are given in table 6-1; procedures for the individual assemblies and subassemblies within the receiver are given in tables 6-2 through 6-13. Each alignment and adjustment table gives the test equipment requirements, step-by-step procedures, adjustment values, and references to supporting illustrations showing the necessary test setups.

NOTE

Tables 6-4 through 6-11 and 6-13, covering alignment and adjustment of the RF Amplifier Assembly A2A4, Frequency Standard Assembly A2A5, and Translator/Synthesizer Assembly A2A6, contain procedures which are to be accomplished at depot level only, and not aboard ship.

6-8. SAFETY PRECAUTIONS. Observe all standard safety precautions whenever performing any of the alignments and adjustments in this section. Refer to paragraph 4-9.

6-9. TEST EQUIPMENT REQUIRED. All alignment and adjustment procedures in this chapter use the approved test equipments listed in table 1-5. All equipments are shipboard types with the exception of the special depot-type test sets required for the rf amplifier, frequency standard, and translator/synthesizer.

6-10. MECHANICAL ADJUSTMENTS.

6-11. DRIVE-CHAIN ADJUSTMENT. To obtain proper positioning of the front-panel kHz controls with respect to the full, or seated, position of the detent springs, adjust the position of the drive chain as follows: Set mode selector switch A2S2 to OFF. Remove front-panel screws and slide receiver chassis fully out of case. Ensure that the RF Amplifier Assembly A2A4 and the Translator/Synthesizer Assembly A2A6 are correctly installed, and that all couplers are properly engaged, with kHz dials in "0" position. For each kHz control, take the slack out of the associated drive chain by holding the associated chain-tension idler gear against the chain. If the dial digit is centered in the tuning-dial window, tighten the chain-tension idler gear in that position and proceed to the coupler adjustments. If the digit is not centered in the window, release the chain-tension idler gear and slide away from chain. Next, lift drive chain away from gears and shift the entire chain to a position where front-panel control (and digit in window above control) remain fairly stationary as the chain is tightened. Final centering of the digit in the window can also be done by loosening the dial setscrews and rotating same. Use staking compound. In most cases, a trial-and-error method must be used to determine this proper chain position. When the drive chain is properly positioned, tighten the chain-tension idler gear securely against the chain.

6-12. The dual-sprocket assembly provides means for making finer adjustment for the 100 and 10 kHz controls. To make this fine adjustment, proceed as follows. Rotate 100 and 10 kHz controls, and observe detent action of the dual-sprocket assembly. The proper detent action is relatively smooth rotation of the controls, with full detent or seating action. If necessary, remove the spacer from under the detent spring (to increase spring tension) or add another spacer (to reduce spring tension). If the digit is still not fully centered in window when the detent spring is fully seated, loosen the two hex-head screws on the wheel index (engaged with detent spring). The wheel index provides the seating position for detent spring. Press firmly on the detent spring above the roller. Do not allow the wheel index to rotate. Rotate the front-panel control until the digit is exactly centered in the window. Release the front-panel control and detent spring. If the digit moves from the center of the window, repeat the last three actions until the digit remains centered exactly in window when the roller is released. Tighten hex-head screws on the wheel index.

6-13. COUPLER ADJUSTMENT. Once the drive chains have been adjusted to provide optimum detent positioning, the sprocket assembly couplers (operated by the kHz controls) must be adjusted for proper mechanical alignment between the electronic assemblies and the chain-drive mechanism. To adjust the couplers, proceed as outlined below.

6-14. Remove the RF Amplifier Assembly A2A4 and Translator/Synthesizer Assembly A2A6 from the chassis. Set 100 and 10 kHz controls to 1. Loosen hub-clamp screws. Insert a screwdriver in the coupler-adjustment slot in the dual-sprocket assembly, and rotate the couplers so that the slot in each coupler points toward, and is perpendicular to, the front panel. Tighten the hub-clamp screws on the dual-sprocket assembly.

6-15. Next, set all three kHz controls to 0. Loosen hub-clamp screws. Insert a screwdriver in the respective coupler-adjustment slots in the triple-sprocket assembly, and rotate the couplers so that each coupler slot points toward, and is perpendicular to, the rear edge of the main frame. Tighten the hub-clamp captive screws on the triple-sprocket assembly. Set the kHz controls to 1.

6-16. When the adjustment is accomplished replace the rf amplifier and translator/synthesizer, ensuring that their tuning couplers are positioned to engage the couplers correctly in the main frame. Slide chassis into case and secure it by tightening the front-panel screws. Set mode selector switch A2S2 to STD BY or desired operating mode.

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
		NOTE The receiver overall alignment and adjustment procedures are best performed in their entirety. However, if it is desired to perform an individual test step (e.g., BFO adjustment) as a result of performance or troubleshooting tests, it is necessary to perform the preliminary procedure in step 2 before beginning the adjustment procedure, and to perform the terminal procedure in step 10 at the the conclusion of each adjustment procedure. In addition, those procedural steps that are unnecessary if the entire overall alignment and adjustment procedure is being performed are enclosed in brackets, so that they may be omitted, and done only when an individual test step is being performed separately.		
1. Mechanical Check		Operate front-panel frequency controls and check that digits center in windows; if they do not, adjust and align the chain-drive/coupler mechanisms.		
2. Preliminary Procedure		a. Set mode selector switch A2S2 to OFF, and set frequency controls to 2,000,000. b. Loosen front-panel screws and slide chassis from case. c. Defeat interlock switch A1S2 by gripping plunger and pulling forward.		
3. Power Supply Check	Electronic Multimeter AN/USM-116( )			6-1

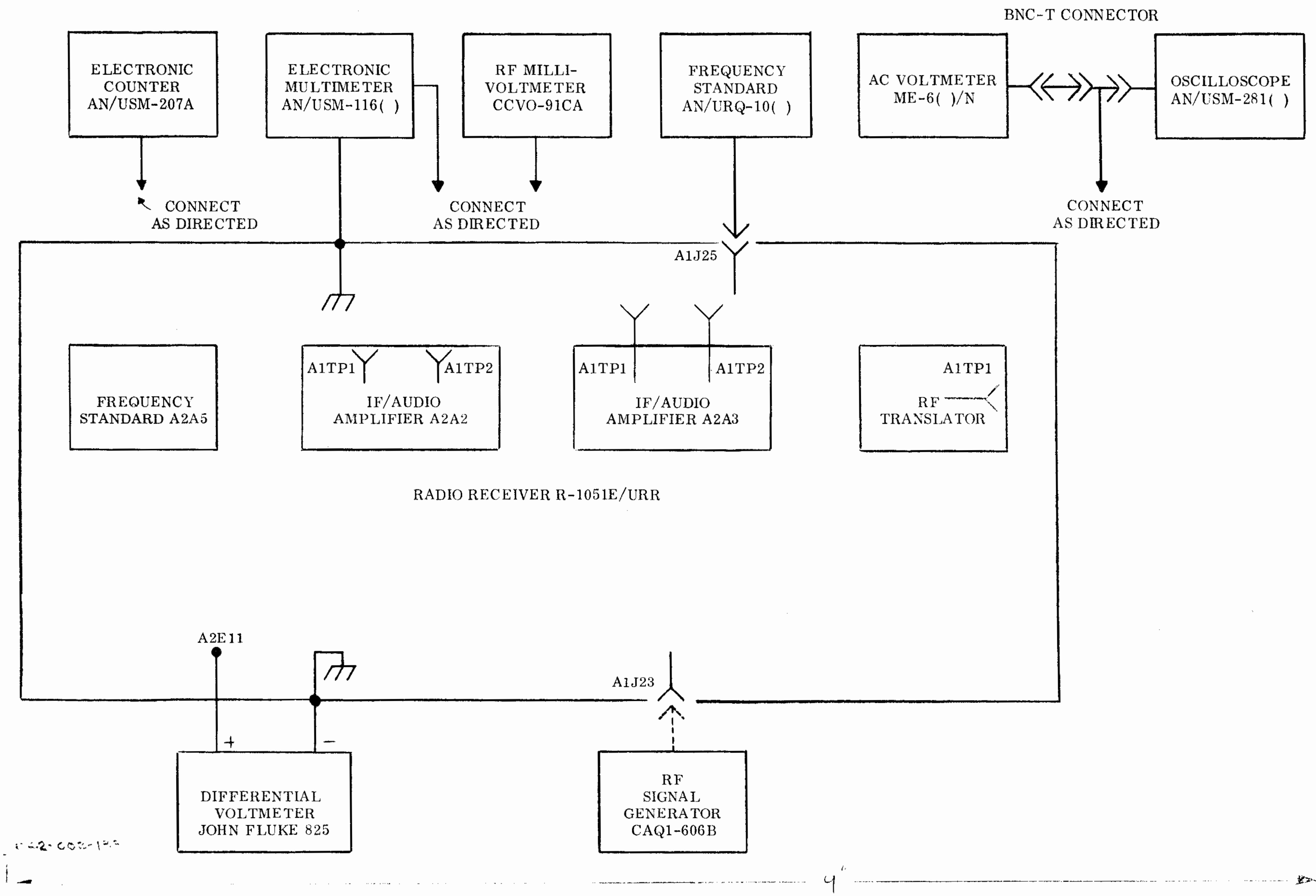


Figure 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Bench Test Setup

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
3. Power Supply Check (Cont)		CAUTION Hand-guide main-frame cable at rear of chassis over edge of case when rotating main frame to vertical position. a. Tilt the receiver chassis vertically 90 degrees to expose the underside. b. Connect electronic multimeter between terminal A2E11 (+) and chassis (-). c. Set mode selector switch A2S2 to LSB. d. Check that electronic multimeter indicates approximately +20 Vdc. CAUTION If electronic multimeter indicates either +28 Vdc or 0 volt, return mode selector switch to OFF, and troubleshoot the Power Supply Assembly A2A8 and Receiver Main Frame A2. If voltage is not 20 Vdc nominal, as required, but within the range of approximately 14 to 23 Vdc, refer to table 6-12 for adjustment procedure. e. Tilt chassis back to horizontal position.		
4. Frequency Standard Adjustment	Frequency Standard AN/URQ-10			6-1

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. Frequency Standard Adjustment (Cont)		CAUTION The 5-MHz oscillator circuit of Frequency Standard Assembly A2A5 must not be adjusted until it has been determined that the 5-MHz output frequency is in error. Unnecessary adjustment will cause poor equipment operation, that is not only difficult to correct, but which requires lengthy maintenance time. a. Set mode selector switch A2S2 to STD BY. Allow at least a 3-day warmup period before proceeding with the final adjustment. If immediate adjustment is necessary, allow at least a 60-minute warmup period. b. Connect 5-MHz output of external frequency standard to EXT 5MC IN jack A1J25 on rear of receiver. c. Set COMP/INT/EXT switch A2A5A2S1 top of frequency standard assembly A2A5 to COMP. d. Set mode selector switch A2S2 to AM. e. Observe comparator lamp A2A5A2DS1 on top of frequency standard assembly A2A5. Lamp will flicker at a rate equal to error frequency. Measure from time lamp is just visibly increasing in brilliance, until again just visibly increasing in brilliance. Continue with the following steps only if time measured is less than 20 seconds.		

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. Frequency Standard Adjustment (Cont)		f. Rotate FINE FREQUENCY ADJUST control on top of frequency standard assembly A2A5 one rotation at a time until comparator lamp changes brilliance as slowly as possible.	Lamp flickers slower than once in 20 seconds.	
		g. If lamp flickers more than once in 20 seconds, return FINE FREQUENCY ADJUST control to midrange (40). Then rotate COARSE FREQUENCY ADJUST a small amount and repeat step f.		
		h. Repeat steps f. and g. until time measured is in excess of 20 seconds over a 5-minute observation period.		
		i. Disconnect external frequency standard from jack A1J25.		
		[j. Set COMP/INT/EXT switch A2A5A2S1 to INT.]		
		[k. Set mode selector switch A2S2 to STD BY.]		
5. Vernier Frequency Adjustment	Electronic Counter AN/USM-207A	[a. Set COMP/INT/EXT switch A2A5A2S1 on top of frequency standard assembly A2A5 to COMP.]		6-1
		b. Set mode selector switch A2S2 to LSB, Hz switch A2A11S1 to 000, RF GAIN control A2R3 fully clockwise, frequency controls to 5.001 MHz, audio level meter switch A2S1 at LSB, LSB LEVELS		

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
5. Vernier Frequency Adjustment (Cont)		PHONE control A2R4 fully clockwise, and AGC switch A2S2 to SLOW.		
		c. Connect INT 5MC OUT jack A1J24 to ANT jack A1J23 at rear of receiver.		
		d. Adjust LSB LEVELS LINE control A2R4 for +10 dB on AUDIO LEVEL meter A2M1.		
		e. Connect electronic counter to PHONE LSB jack A2J1. Frequency counter should read 1000 Hz.		
		f. Set Hz switch A2A11S1 to V (vernier) position.		
		g. Rotate Hz vernier control A2A11R1 fully counterclockwise.		
		h. Adjust potentiometer A2A11A1R2 on 100-Hz Control and Vernier Assembly A2A11 for not more than 980 Hz as indicated on electronic counter.	980 Hz or lower	
		i. Remove jumper between jacks A1J23 and A1J24 at rear of receiver. Disconnect frequency counter.		
		[j. Set COMP/INT/EXT switch A2A5A2S1 to INT, and return mode selector switch A2S2 to STD BY.]		

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. BFO Frequency Adjustment	Electronic Counter AN/USM-207A	a. Set mode selector switch A2S2 to CW, AGC switch A2S3 to SLOW, frequency controls to 5.000 MHz, and Hz switch A2A11S1 to 000.		6-1
		[b. Rotate COMP/INT/EXT switch A2A5A2S1 on Frequency Standard Assembly A2A5 to COMP.]		
		c. Connect INT 5MC OUT jack A1J24 to ANT jack A1J23, using BNC-to-N adapter UG-201/U.		
		d. Connect input of electronic counter to PHONE USB jack A2J2.		
		e. Rotate BFO frequency control A2R6 fully counterclockwise, and note frequency on electronic counter. If no reading is obtained, increase USB LEVELS PHONE and USB LEVELS LINE controls A2R5 and A2R2 until a stable reading is obtained.		
		f. Rotate BFO frequency control A2R6 fully clockwise, and note frequency on electronic counter.		
		g. Adjust BFO ADJ inductor A2A1A3L1 on top of Receiver Mode Selector Assembly A2A1, so that electronic counter reads at least 3 kHz when BFO frequency control A2R6 is at extreme clockwise and counter clockwise positions.	3 kHz minimum at extreme clockwise and counterclock-wise positions.	

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. BFO Frequency Adjustment (Cont)		h. Observe that frequency passes through zero beat as BFO frequency control is slowly rotated from fully counter-clockwise to fully clockwise. i. Remove jumper between jacks A1J23 and A1J24 at rear of receiver. Disconnect frequency counter. j. Set COMP/INT/EXT switch A2A5A2S1 to INT, [and return mode selector switch A2S2 to STD BY.]		
7. 20- and 30-MHz Filter Adjustment	RF Signal Generator CAQI-606-B AC Voltmeter ME-6( )/U Resistor, 600 ohms	a. Connect rf signal generator to ANT jack A1J23 at rear of receiver. b. Disconnect cables from connectors A1A1J4, J5, and J6 at rear of receiver case. c. Connect ac voltmeter and 600-ohm resistor between terminals A2E23 and A2E26. d. Remove two screws and cover from 20- and 30-MHz Filter Assembly A2A10. e. Set mode selector switch A2S2 to USB and AGC switch A2S3 to OFF. Set frequency controls to 27.1000 MHz. Set RF GAIN control A2R3 fully clockwise. f. Set output level of rf signal generator to 1.0V rms, and tune the frequency around 19.601 MHz to obtain a peak indication on		6-1

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
7. 20- and 30-MHz Filter Adjustment (Cont)		the ac voltmeter. (Adjust the USB LEVELS LINE control A2R2 for an on-scale reading and maintain throughout test).		
		g. Adjust A10L4 for minimum indication on the ac voltmeter.	Minimum	
		h. Set the receiver frequency controls to 27.9000 MHz.		
		i. Tune the signal generator frequency around 20.401 MHz to obtain a peak indication on the ac voltmeter.		
		j. Adjust A10L2 for minimum indication on the ac voltmeter.	Minimum	
		k. Set the receiver frequency controls to 26.1000 MHz.		
		l. Tune the signal generator frequency around 29.601 MHz to obtain a peak indication on the ac voltmeter.		
		m. Adjust A10L5 for a minimum indication on ac voltmeter.	Minimum	
		n. Set the receiver frequency controls to 26.9000 MHz.		
		o. Tune the signal generator frequency around 30.401 MHz to obtain a peak indication on the ac voltmeter.		

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP.	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
7. 20- and 30-MHz Filter Adjustment (Cont)		p. Adjust A10L3 for a minimum indication on ac voltmeter. q. Set mode selector switch A2S2 to OFF. r. Reinstall cover on 20- and 30-MHz Filter Assembly A2A10. s. Disconnect all test equipment.	Minimum	
8. AGC and IF. Gain Loop Adjustment	RF Signal generator CAQI-606B RF Millivoltmeter CCVO-91CA Oscilloscope AN/USM-281( ) AC Voltmeter ME-6( )/U Extender Cable	a. Connect rf signal generator to ANT jack A1J23 at rear of receiver. b. Disconnect cables from connectors A1A1J4, J5, and J6 at rear of receiver case. c. Loosen two screws and remove dust cover from Receiver IF./Audio Amplifier Assembly A2A2. d. Connect ac voltmeter, oscilloscope, and 600-ohm load resistor between terminals A2E23 and A2E26. e. Set mode selector switch A2S2 to USB, AGC switch A2S3 to OFF, and RF GAIN control A2R3 fully clockwise. f. Adjust potentiometers on Receiver IF./Audio Amplifier Assembly A2A2 as follows: Remove A2A2 for adjusting, and then replace it in the main frame. A2A2A1R25 (if. agc) - fully counterclockwise A2A2A1R6 (rf agc) - fully clockwise A2A2A2R22 (if. gain) - fully clockwise		6-1

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
8. AGC and IF. Gain Loop Adjustment (Cont)		g. Set Hz switch A2A11S1 to 000, and frequency controls to 2.000 MHz		
		h. Set rf signal generator for a 2.000-MHz, 0.5-μV, continuous-wave output.		
		i. Retune rf signal generator for peak audio output as observed on ac voltmeter and oscilloscope.		
		j. Adjust USB LEVELS LINE control A2R2 for 1.4V rms on ac voltmeter.		
		k. Advance the MHz controls through each increment from 3.000 to 29.000 MHz, and retune rf signal generator for peak audio output on ac voltmeter and oscilloscope; at each, then verify rf signal generator is set for 0.5 μV. Note that frequency at which lowest audio output is obtained, and return MHz controls to that frequency.		
		l. Advance 100 kHz control through all positions. Retune rf signal generator for peak audio output at each position, verifying that rf signal generator output is 0.5 μV. Return 100 kHz control to that frequency producing lowest output.		
		m. Advance 10 kHz dial through all positions. Retune rf signal generator for peak audio output at each, verifying		

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
8. AGC and IF. Gain Loop Adjustment (Cont)		that rf signal generator output is 0.5 μV. Return 10 kHz control to that frequency producing lowest output, and reset rf signal generator output for 0.5 μV.		
		n. With frequency controls set for lowest output as determined above, verify that signal generator is set for 0.5 μV rms output, and retune for peak audio on ac voltmeter and oscilloscope.		
		o. Set AGC switch A2S3 at SLOW.		
		p. Adjust USB LEVELS LINE control A2R2 for 1.4V rms on ac voltmeter.	1.4V rms	
		q. Increase rf signal generator output to 2.5 μV. Adjust potentiometer A2A2A1R25 for 2.3V rms on ac voltmeter.	2.3V rms	
		r. Increase rf signal generator output to 50 mV.		
		s. Connect rf millivoltmeter to test point A2A6A6TP1. Adjust potentiometer A2A2A1R6 for 5 mV on rf millivoltmeter.		
		t. Reduce rf signal generator output to 500 μV.		
		u. Set USB LEVELS LINE control A2R2 fully clockwise.		

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
8. AGC and IF. Gain Loop Adjustment (Cont)		v. Using the extender cable to connect the if./audio amplifier assembly to the main frame, adjust potentiometer A2A2A2R22 for 9V rms audio output on ac voltmeter.	9V rms	
		w. Reinstall dust cover on Receiver IF./Audio Amplifier Assembly A2A2, and reinstall assembly in main frame.		
		x. Remove dust cover from Receiver IF./Audio Amplifier Assembly A2A3.		
		y. Connect ac voltmeter, oscilloscope, and 600-ohm resistor between terminals A2E33 and A2E36.		
		z. Repeat steps o through w, substituting A2A3 for A2A2 and LSB for USB.		
		[aa. Disconnect test equipment and return mode selector switch A2S2 to STD BY.]		
9. RF Gain Adjustment	RF Signal Generator CAQI-606B AC Voltmeter ME-6( )/U	a. Set the receiver controls as follows: Mode selector switch A2S2 to USB AGC switch A2S3 to OFF RF GAIN control A2R3 fully clockwise Frequency controls to 2.100 MHz.		6-1
		[b. Connect rf signal generator to ANT jack A1J23 on rear of receiver.]		
		c. Set the rf signal generator for continuous wave, and adjust its output level to 0.7 μV.		

Table 6-1. Radio Receiver R-1051E/URR, Overall Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
9. RF Gain Adjustment (Cont)		d. Connect a 600-ohm resistor and the ac voltmeter between pins A and B of USB AUDIO OUT jack A1A1J5.		
		e. Tune the rf signal generator for a peak audio output on the ac voltmeter.		
		f. Adjust the USB LEVELS LINE control A2R2 for a 0-dB indication on the 3-volt scale of the ac voltmeter.		
		g. Rotate the RF GAIN control A2R3 to the fully counterclockwise position.		
		h. Increase the rf signal generator output level by 130 dB, and then adjust potentiometer A2A8R16 for a 0-dB indication on the ac voltmeter.	130 dB of attenuation	
		i. Disconnect all test equipment.		
10. Terminal Procedure		a. Ensure that all test equipment is disconnected.		
		b. Slide receiver chassis back into case, and secure it by tightening front-panel screws.		
		c. Set mode selector switch A2S2 to STD BY or desired operating mode.		

Table 6-2. Receiver Mode Selector Assembly A2A1, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. BFO Frequency Adjustment	Electronic Multimeter AN/USM-116( )	a. Connect test equipment as shown in figure 6-2.		6-2
	Electronic Counter AN/USM-207A	b. Set electronic multimeter to read on 20-volt scale.		
	Power Supply, 20 Vdc	c. Set BFO control voltage at pin 1 of P2 to +8.0 Vdc.		
	Resistor, 15 kΩ, 2W	d. Connect electronic counter to pin A4 of P2.		
	Resistor, 3.9kΩ, 1/2W			
	Potentiometer, 25 kΩ, 2W	e. Adjust A3L1 for an indication of 496 kHz on electronic counter.	496 kHz with +8.0-Vdc input	
		f. Set BFO control voltage at pin 1 of P2 to +20 Vdc.		
		g. Measure frequency at pin A4 of P2. If frequency is not between 503.5 and 505.0 kHz, readjust A3L1 to bring within limits.	503.5 to 505.0 kHz with +20-Vdc input	
		h. Set BFO control voltage at pin 1 of P2 back to +8.0 Vdc.		
		i. Measure frequency at pin A4 of P2 on electronic counter.	495 to 496.5 kHz, with +8.0-Vdc input	
2. BFO Level Adjustment	Same as step 1.	a. Adjust BFO control voltage at pin 1 of P2 to obtain an indication of 500 kHz on electronic counter; then disconnect electronic counter.		6-2

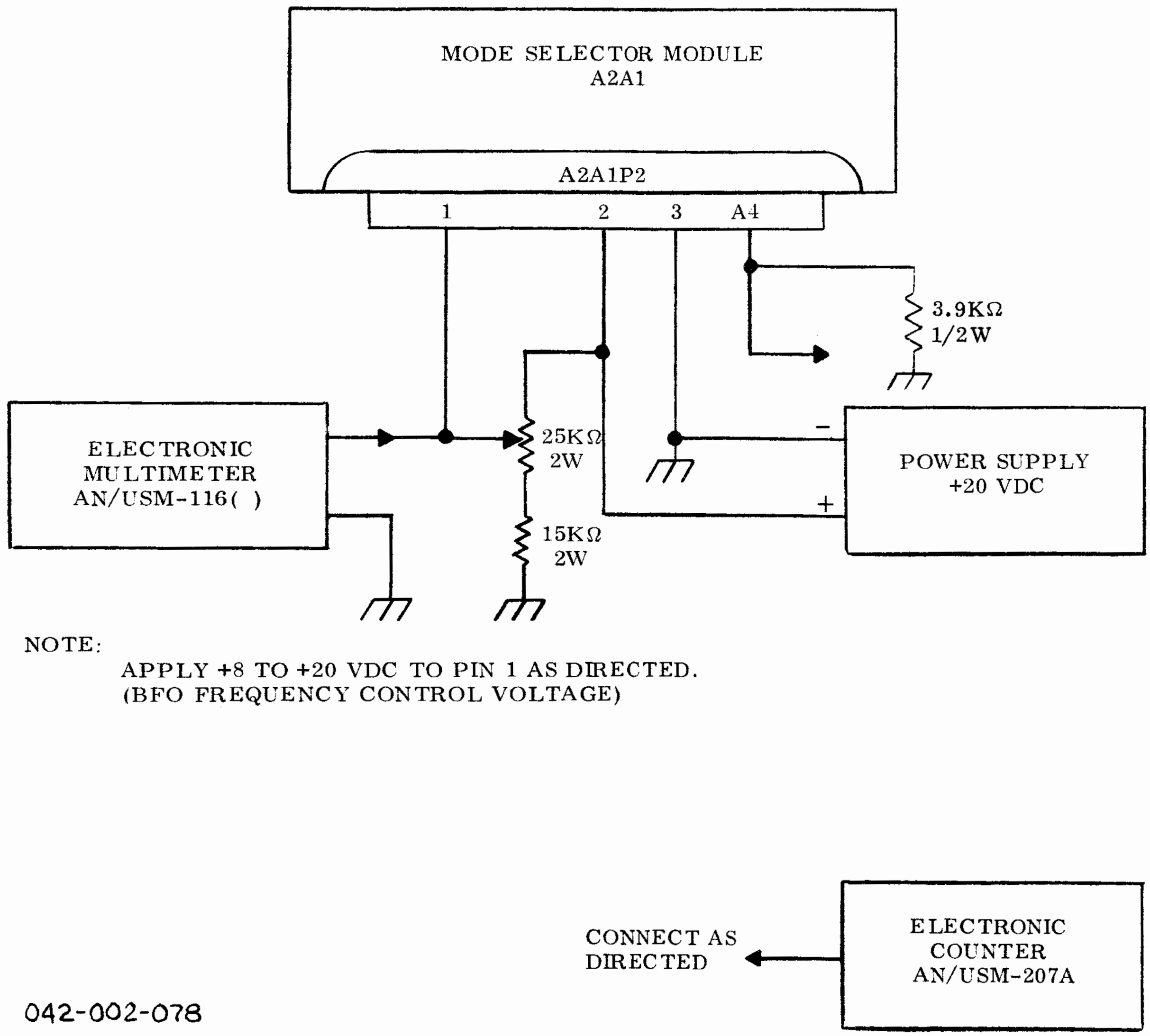


Figure 6-2. Receiver Mode Selector Assembly A2A1, Alignment and Adjustment Bench Test Setup

Table 6-2. Receiver Mode Selector Assembly A2A1, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
2. BFO Level Adjustment (Cont)		b. Set electronic multimeter to measure a signal level of 1.0V rms, and connect to pin A4 of P2.		
		c. Tune transformer A3T1 for a peak indication on electronic multimeter.	Greater than 250 mV rms	
		d. Set BFO control voltage at pin 1 of P2 to +8.0 Vdc.		
		e. Measure BFO output level at low end of frequency range on electronic multimeter.	Greater than 250 mV rms	
		f. Set BFO control voltage to pin 1 of P2 to +20 Vdc.		
		g. Measure BFO output level at high end of frequency range on electronic multimeter.	Greater than 250 mV rms	
		h. Disconnect test equipment.		

Table 6-3. Receiver IF./Audio Amplifier Assemblies A2A2/A2A3, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. IF. Alignment	Electronic Multimeter AN/USM-116( ) RF Signal Generator CAQI-606-B	a. Connect test equipment as shown in figure 6-3.		6-3
		b. Set line level control fully clockwise (direction that provides maximum signal level at pin 6 of plug P1), and the agc switch to off (ground).		
		c. Set if./audio amplifier controls as follows: AGC ADJ control A1R25 — fully counterclockwise. Rf agc control A1R6 — fully clockwise. CW if. gain control A2R22 — fully clockwise.		
		d. Adjust electronic multimeter to measure a 3-volt signal level, and connect to pin 12 of P1.		
		e. Connect the rf signal generator to pin A3 of P1; adjust control to provide output of 500 kHz, modulated 30 percent at 1000 Hz, with sufficient level to give a 3-volt indication on electronic multimeter.	3 volts	
		f. Tune A2T1, A2T2, A2T3, A2T4 and A3L1 for peak indication on electronic multimeter.	3 volts with rf signal generator output level of 30 mV or less.	

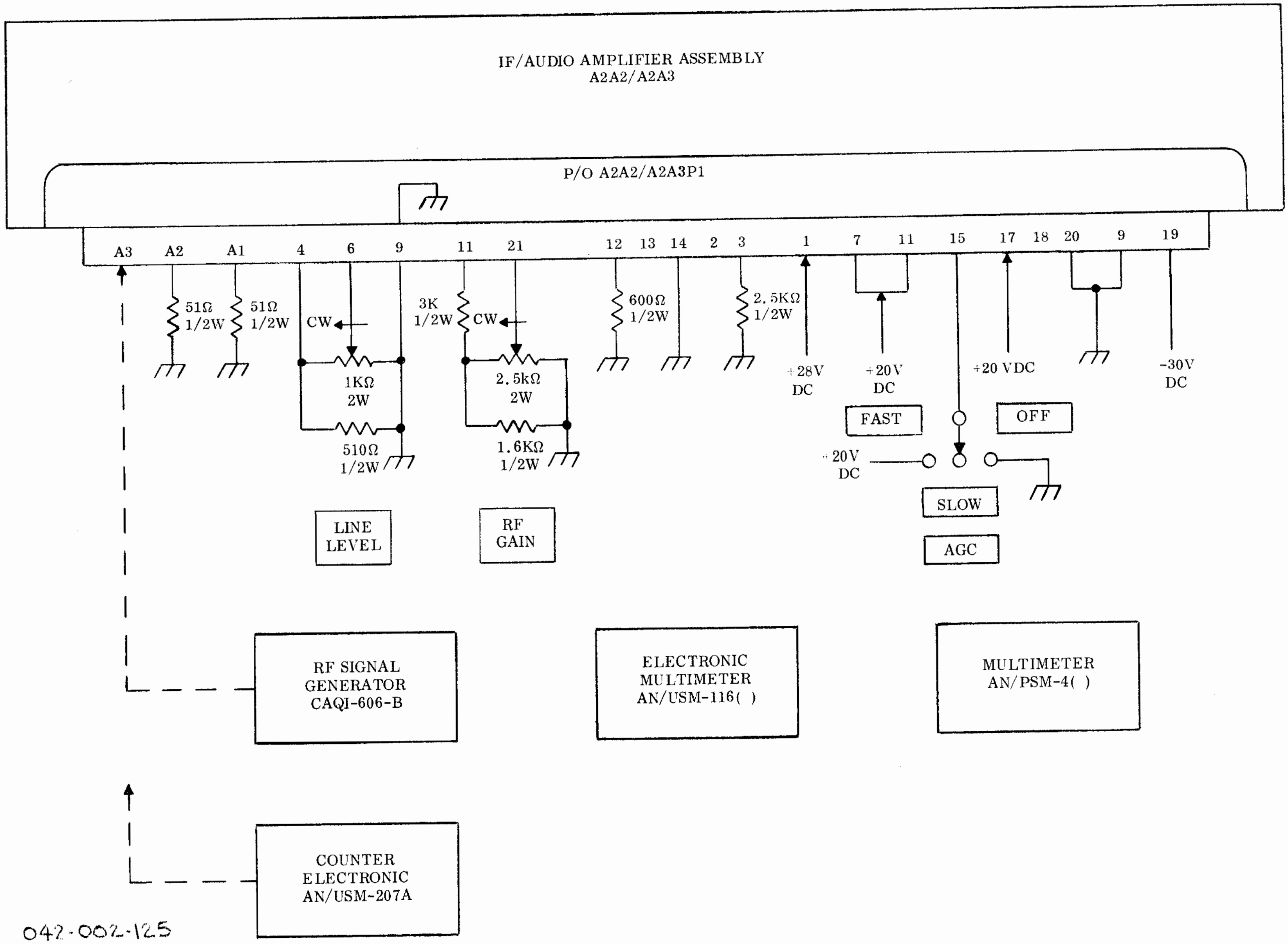


Figure 6-3. Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3, Alignment and Adjustment Bench Test Setup

Table 6-3. Receiver IF./Audio Amplifier Assemblies A2A2/A2A3, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. IF. Alignment (Cont)		NOTE Decrease rf signal generator input signal level as required to maintain an indication of 3 volts on electronic multimeter.		
		g. Set agc switch to fast (+20 Vdc).		
2. AGC Alignment	RF Signal Generator CAQI-606-B Electronic Multimeter AN/USM-116( )	a. Adjust rf signal generator output for 300 μV.	300 μV	6-3
		b. Connect electronic multimeter to A1TP1 to measure dc voltage.		
		c. Set AGC ADJ control A1R25 of if./audio amplifier ccw to obtain a reading of 250 mV dc on the electronic multimeter.	250 mV dc	
		d. Tune A1T1 for maximum indication on electronic multimeter.	Maximum indication	
		NOTE Adjust A1R25 and/or input signal level from rf signal generator as required to retain indication of 250 millivolts on electronic multimeter.		
		e. Tune A1T2 for maximum indication on electronic multimeter.	Maximum indication	

Table 6-3. Receiver IF./Audio Amplifier Assemblies A2A2/A2A3, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
3. AGC ADJ Control Adjustment	Electronic Multimeter AN/USM-116( )	a. Adjust rf signal generator output for 20 μV.		
	RF Signal Generator CAQI-606-B	b. Adjust AGC ADJ control A1R25 for a 0.5-Vdc indication on electronic multimeter.	+0.5 ±0.05 Vdc	
4. RF AGC Control Adjustment	RF Signal Generator CAQI-606-B	a. Remove electronic multimeter from A1TP1, position controls to measure -10 Vdc, and connect it to A1TP2.		6-3
	Electronic Multimeter AN/USM-116( )	b. Set rf signal generator for 500 kHz, modulated 30 percent at 1000 Hz, with 1 mV output level.		
		c. Adjust A1R6 (rf agc control) for -10 Vdc on the electronic multimeter.	-10 Vdc ±1.0 Vdc	
5. IF. Gain Adjustment	RF Signal Generator CAQI-606-B	a. Adjust electronic multimeter to measure an 8-volt ac signal and connect to pin 12 of P1.		
	Electronic Multimeter AN/USM-116( )	b. Adjust A2R22 to obtain an audio output level of 7 Vac indicated on the electronic multimeter.	7 ±1 Vac	
		c. Disconnect test equipment.		

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. A2T4 Adjustment	RF Amplifier Test Set TS-2132/WRC-1 RF Signal Generator CAQI-606-B Electronic Counter AN/USM-207A RF Millivoltmeter CCVO-91CA Dummy Load DA-91A/U BNC T-Connector UG-274/( )	a. Connect test equipment as shown in figure 6-4. b. Set rf amplifier test set power switch to OPERATE. c. Set test set mode selector switch to RECEIVE and AGC voltage to 0 Vdc. d. Set rf signal generator for 2.005 MHz measured on electronic counter. Disconnect electronic counter and adjust rf signal generator output level to approximately 10 mV rms. e. Set test set frequency controls for 02.000 MHz. f. Detune A2T4 (top coil on strip A2), A25T3 (second coil from top on strip A25), A20T2, and A20T1 (bottom two coils on strip A20).		6-4
	NOTE In the following procedures, disconnect the electronic counter from the test setup except when setting the rf signal generator to a new frequency. Also, reduce rf signal generator output as required to keep rf millivoltmeter indication on scale.			
		g. Adjust A2T4 (top coil on strip A2) for maximum indication on rf millivoltmeter.	Maximum output	
2. A25T3 Adjustment	Same as step 1.	Adjust A25T3 (2nd coil from top) for maximum indication on rf millivoltmeter.	Maximum output	6-4

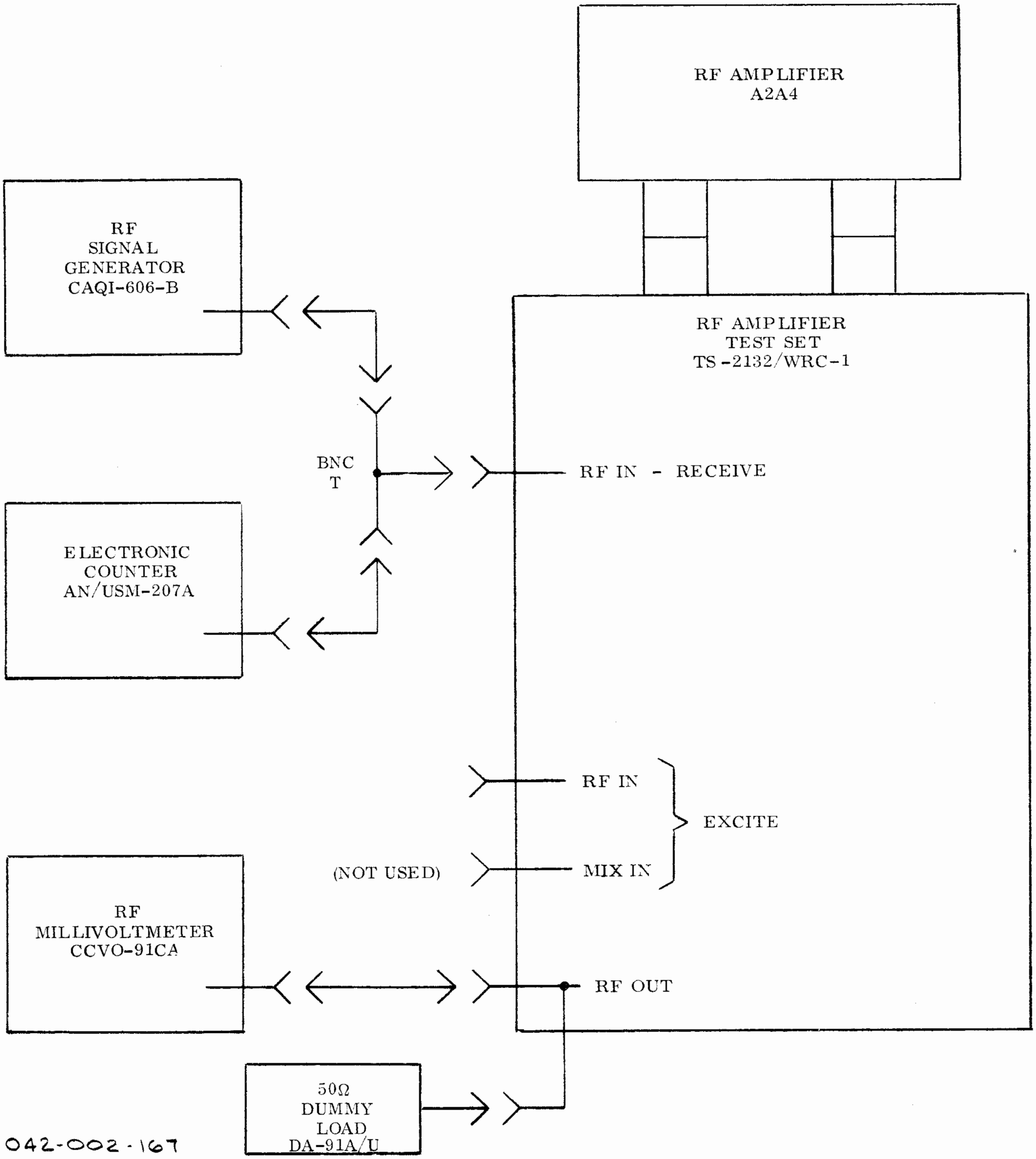


Figure 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Bench Test Setup

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
3. A20T2 and A20T1 Adjustment	Same as step 1.	a. Adjust A20T2 (2nd coil from bottom) for maximum indication on rf millivoltmeter.	Maximum output	6-4
		b. Adjust A20T1 (bottom coil) for maximum indication on rf millicoltmeter.	Maximum output	
4. Gain Check and Adjustment	Same as step 1.	a. Set rf signal generator output level to 1 mV.		6-4
		b. Output signal level indicated on rf millivoltmeter should be between 40 and 250 mV; if not, retune T4 through T1.	40 to 250 mV	
		NOTE Excessive repeated tuning for a peak output may cause regeneration.		
5. Gain Variation Check and Adjustment	Same as step 1.	a. Rotate the 100-kHz and 10-kHz test set frequency controls through all combinations to find the lowest and highest outputs indicated on the rf millivoltmeter. Note the dB readings.		6-4
		b. If the gain variation is greater than 9 dB, touch up the adjustment of T4, T3, T2, and T1 to reduce the gain variation to less than 9 dB.	Less than 9 dB gain variation over the band	
6. A3 through A29 Adjustment	Same as step 1.	Set rf signal generator for approximately 10-mV output at each of the frequencies listed below, and set test set frequency controls to 5 kHz less. At		6-4

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. A3 through A29 Adjustment (Cont)		each test frequency, detune the associated T4, T3, T2, and T1 coils as listed below; then adjust the coils in the indicated sequence and repeat steps 4 and 5.		
		3.005 MHz A3T4 (top coil) A26T3 (2nd coil from top) A21T2 (3rd coil from top) A21T1 (bottom coil)	Maximum output at 3.005 MHz	
		4.005 MHz A4T4 A27T3 A22T2 A22T1	Maximum output at 4.005 MHz	
		5.005 MHz A5T4 A28T3 A23T2 A23T1	Maximum output at 5.005 MHz	
		6.005 MHz A6T4 A29T3 A24T2 A24T1	Maximum output at 6.005 MHz	

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. A3 through A29 Adjustment (Cont)		7.005 MHz A7T4 (top coil) A2T3 (2nd coil from top) A25T2 (3rd coil from top) A25T1 (bottom coil)	Maximum output at 7.005 MHz	
		8.005 MHz A8T4 A3T3 A26T2 A26T1	Maximum output at 8.005 MHz	
		9.005 MHz A9T4 A4T3 A27T2 A27T1	Maximum output at 9.005 MHz	
		10.005 MHz A10T4 A5T3 A28T2 A28T1	Maximum output at 10.005 MHz	
		11.005 MHz A11T4 A6T3 A29T2 A29T1	Maximum output at 11.005 MHz	
		12.005 MHz A12T4 A7T3 A2T2 A2T1	Maximum output at 12.005 MHz	
		13.005 MHz A13T4 A8T3 A3T2 A3T1	Maximum output at 13.005 MHz	

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES		ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. A3 through A29 Adjustment (Cont)		14.005 MHz	A14T4 (top coil) A9T3 (2nd coil from top) A4T2 (3rd coil from top) A4T1 (bottom coil)	Maximum output at 14.005 MHz	
		15.005 MHz	A15T4 A10T3 A5T2 A5T1	Maximum output at 15.005 MHz	
		16.005 MHz	A16T4 A11T3 A6T2 A6T1	Maximum output at 16.005 MHz	
		17.005 MHz	A17T4 A12T3 A7T2 A7T1	Maximum output at 17.005 MHz	
		18.005 MHz	A18T4 A13T3 A8T2 A8T1	Maximum output at 18.005 MHz	
		19.005 MHz	A19T4 A14T3 A9T2 A9T1	Maximum output at 19.005 MHz	
		20.005 MHz	A20T4 A15T3 A10T2 A10T1	Maximum output at 20.005 MHz	

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. A3 through A29 Adjustment (Cont)		21.005 MHz A21T4 (top coil) A16T3 (2nd coil from top) A11T2 (3rd coil from top) A11T1 (bottom coil)	Maximum output at 21.005 MHz	
		NOTE Before tuning the 22-MHz band, adjust the cores of T1 through T4 fully clockwise. Set the test set frequency controls to 22.00 MHz and the rf signal generator to 20.000 MHz. Locate A12T5 (between A12T1 and A12T2) and adjust trap for minimum output. It may be necessary to increase the rf signal generator output during this adjustment. After adjusting T5, set the rf signal generator to 22.005 MHz and proceed with normal tuning of T1 through T4.		
		22.005 MHz A22T4 A17T3 A12T2 A12T1	Maximum output at 22.005 MHz	
		NOTE Before tuning the 23-MHz band, adjust the cores of T1 through T4 fully clockwise. Set the test set frequency controls to 23.00 MHz and the rf signal generator to 19.205 MHz. Locate A13T5 (between A13T1 and A13T2) and adjust trap for minimum output. If may be necessary to increase the rf signal generator output during this adjustment. After adjusting T5, set the rf signal generator to 23.005 MHz and proceed with normal tuning of T1 through T4.		
		23.005 MHz A23T4 A18T3 A13T2 A13T1	Maximum output at 23.005 MHz	

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES		ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. A3 through A29 Adjustment (Cont)		24.005 MHz	A24T4 (top coil) A19T3 (2nd coil from top) A14T2 (3rd coil from top) A14T1 (bottom coil)	Maximum output at 24.005 MHz	
		25.005 MHz	A25T4 A20T3 A15T2 A15T1	Maximum output at 25.005 MHz	
		26.005 MHz	A26T4 A21T3 A16T2 A16T1	Maximum output at 26.005 MHz	
		27.005 MHz	A27T4 A22T3 A17T2 A17T1	Maximum output at 27.005 MHz	
		28.005 MHz	A28T4 A23T3 A18T2 A18T1	Maximum output at 28.005 MHz	
		29.005 MHz	A29T4 A24T3 A19T2 A19T1	Maximum output at 29.005 MHz	

Table 6-4. RF Amplifier Assembly A2A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
7. Overall Gain Adjustment	Same as step 1.	NOTE A38R6 is not used in Radio Receiver R-1051E/URR.		6-4
		a. Connect the rf signal generator to the RF IN EXCITE jack.		
		b. Set test set mode selector switch to EXCITE.		
		c. Set rf amplifier test set frequency controls for 22.000 MHz.		
		d. Set signal generator for 22.005 MHz and adjust output level to obtain 3.5 mV rms at A2A4A38TP1 using the rf millivoltmeter to measure the level.		
		e. Connect rf millivoltmeter to A2A4TP3.		
		f. Adjust A38R6.	2.5 Vrms	
		g. Disconnect test equipment.		

Table 6-5. Frequency Standard Assembly A2A5, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. Initial Test Setup and Frequency Check	Frequency Standard Test Set TS-2134/ WRC-1 Electronic Counter AN/USM-207A Frequency Standard AN/URQ-10( )	a. Connect Frequency Standard Assembly A2A5 to frequency standard test set. Set POWER switch to ON, and allow a 96-hour (minimum) warmup. b. Set frequency standard mode switch A2S1 to INT. Ensure that the external 5-MHz standard is connected to the frequency standard test set (figure 6-5). c. Connect electronic counter to A2TP1 (5 MHz), which is located at the top of the frequency standard housing. d. Monitor the electronic counter, with time base set for a 10-second gate, to be 5 MHz ±2 PP 10^{8}. If within limits, proceed to step 4.		6-5
2. Fine Frequency Adjustment	Same as step 1.	a. If the reading taken in step 1 is not within 5 MHz ±2 PP 10^{8}, adjust the FINE FREQUENCY ADJUST control A1C4 with a screwdriver until a reading of 5,000,000.0 Hz is observed on electronic counter. Do not adjust A1C4 past the end calibration marks (0 or 80). b. If within limits, log the dial reading on the logging chart which is on the housing of the frequency standard assembly, and proceed with step 4.	5,000,000.0 Hz	6-5

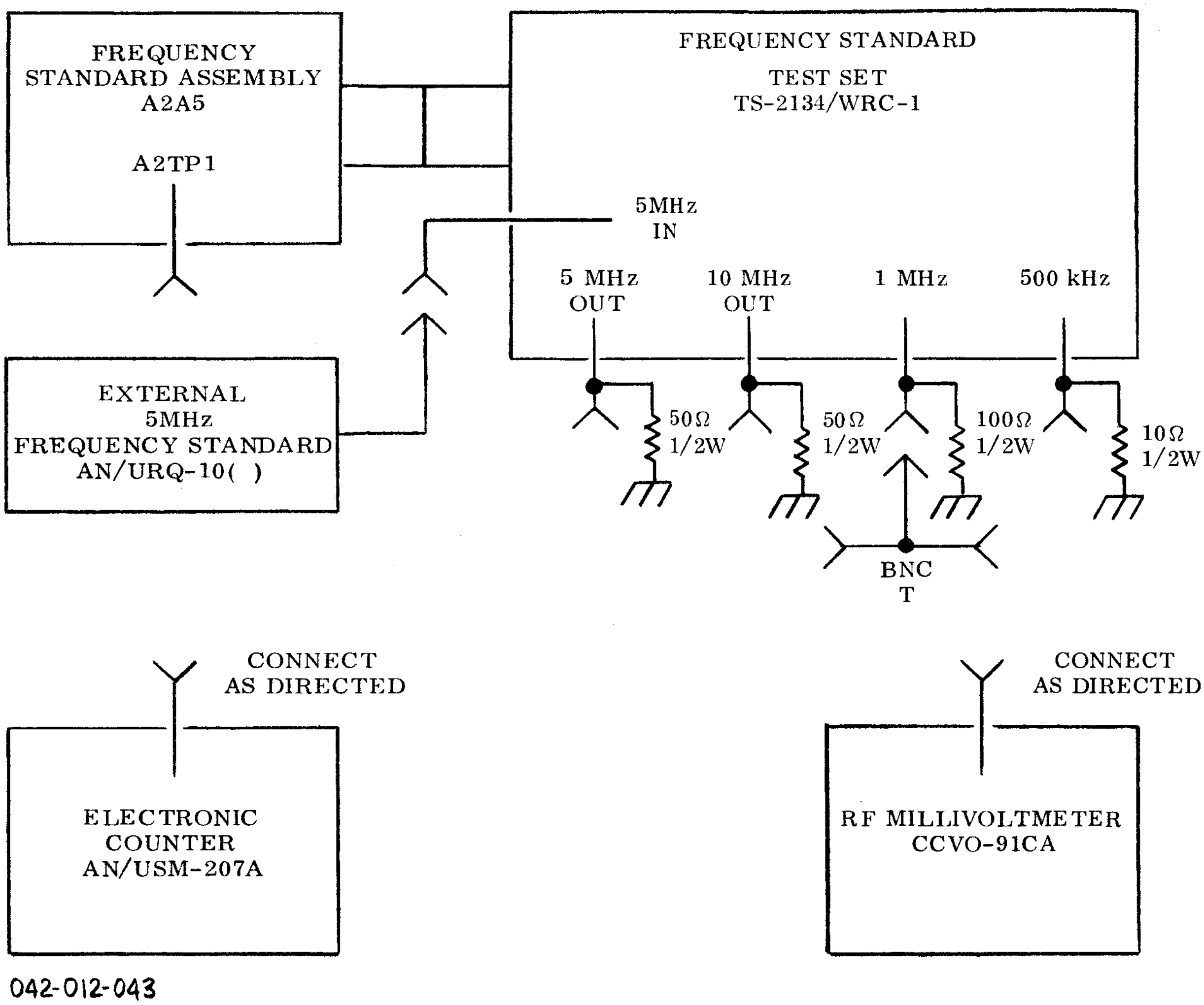


Figure 6-5. Frequency Standard Assembly A2A5, Alignment and Adjustment Bench Test Setup

Table 6-5. Frequency Standard Assembly A2A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
3. Coarse Frequency Adjustment	Same as step 1.	a. If the fine frequency adjustment does not bring the standard's frequency into range, the calibration dial will read 0 or 80. When the calibration dial reads 0 or 80, adjust the FINE FREQUENCY ADJUST control A1C4 until the calibration dial reads 40. Then, remove the COARSE FREQUENCY ADJUST plug and adjust the COARSE FREQUENCY ADJUST control A1C2, using a screwdriver with insulated shaft, until the electronic counter reads 5, 000, 000. 0 Hz ±1. 0 Hz.	5, 000, 000. 0 Hz	6-5
		b. Replace the COARSE FREQUENCY ADJUST plug and repeat step 2.		
4. 5-MHz Amplifier Alignment	Frequency Standard Test Set TS-2134/WRC-1 RF Millivoltmeter CCVO-91CA	a. Set frequency standard mode switch A2S1 to COMP. and remove cover from Frequency Standard Assembly A2A5.		6-5
		b. Monitor the 5-MHz signal at A2TP1, using the rf millivoltmeter.		
		c. Adjust A2C27 for maximum meter deflection.	Maximum indication (0.5V rms minimum)	
5. 1-MHz Divider Alignment	Frequency Standard Test Set TS-2134/WRC-1 Electronic Counter AN/USM-207A	a. Connect BNC T-connector, electronic counter, and rf millivoltmeter to the 1-MHz output jack on the test set.		6-5
		b. Set frequency standard mode switch A2S1 to INT.		

Table 6-5. Frequency Standard Assembly A2A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
5. 1-MHz Divider Alignment (Cont)	RF Millivoltmeter CCVO-91CA BNC T-Connector	c. Adjust A2C6 for maximum indication on the rf millivoltmeter, and note the voltmeter indication for future reference. The electronic counter may or may not indicate 1 MHz.	Maximum indication	
		d. Turn A2C6 counterclockwise until the electronic counter indicates 1 MHz, and note the rf millivoltmeter indication for future reference.	1 MHz	
		e. Turn A2C6 further counterclockwise until the electronic counter indicates at least 100 Hz away from 1 MHz, and note the rf millivoltmeter indication for future reference.		
		f. Adjust A2C6 clockwise for rf millivoltmeter indication midway between indications obtained in d. and e. above. Electronic counter should now indicate 1 MHz. NOTE If the electronic counter indicates a frequency of 1 MHz through the entire range of A2C6, then adjust A2C6 for maximum indication on the rf millivoltmeter.	1,000,000.0 Hz	
		g. Remove electronic counter from 1-MHz output jack.		

Table 6-5. Frequency Standard Assembly A2A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
5. 1-MHz Divider Alignment (Cont)		h. Adjust A2C12 for a maximum indication on rf millivoltmeter. Proceed with step 6. if maximum indication is within specified adjustment value.	Maximum indication (450 ±100 mV rms)	
		i. Select and install values for A2R19 and A2R20 as required to adjust the output voltage to 450 ±100 mV rms. In some cases, A2R20 may not be required.		
		j. Readjust A2C12 for maximum indication on the rf millivoltmeter.	Maximum indication (450 ±100 mV rms)	
6. 500-kHz Divider Alignment	Same as step 5.	a. Connect BNC T-connector, electronic counter, and rf millivoltmeter to the 500-kHz jack on the test set.		6-5
		b. Adjust A2C15 for a maximum indication on the rf millivoltmeter and note the indication for future reference. The electronic counter may or may not indicate 500 kHz.	Maximum indication	
		c. Adjust A2C15 counterclockwise until the electronic counter indicates 500 kHz, and note the rf millivoltmeter indication for future reference.	500 kHz	

Table 6-5. Frequency Standard Assembly A2A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. 500-kHz Divider Alignment (Cont)		d. Turn A2C15 further counterclockwise until the electronic counter indicates at least 50 Hz away from 500 kHz, and note the rf millivoltmeter indication for future reference.		
		e. Adjust A2C15 clockwise for rf millivoltmeter indication midway between indications obtained in c. and d. above. Electronic counter should now indicate 500 kHz. NOTE If the electronic counter indicates a frequency of 500 kHz through the entire range of A2C15, then adjust A2C15 for maximum indication on the rf millivoltmeter.	500,000.0 Hz	
		f. Remove electronic counter from 500-kHz output jack.		
		g. Adjust A2C21 for a maximum indication on the rf millivoltmeter. Proceed with step 7 if maximum indication is within specified adjustment value.	Maximum indication (175 ±25 mV rms)	
		h. Select and install values for A2R32 and A2R33 as required to adjust the output voltage to 175 ±25 mV rms. In some cases, A2R33 may not be required.		

Table 6-5. Frequency Standard Assembly A2A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. 500-kHz Divider Alignment (Cont)		i. Readjust A2C21 for maximum indication on the rf millivoltmeter.	Maximum indication (175 ±25 mV rms)	
7. 10-MHz Output Check	Frequency Standard Test Set TS-2134/WRC-1 RF Millivoltmeter CCVO-91CA	Connect rf millivoltmeter to the 10-MHz output jack on the test set. The 10-MHz output level should be 20 to 40 mV rms.		6-5
8. Final Check	Electronic Counter AN/USM-207A	a. Remove rf millivoltmeter probe, replace cover on Frequency Standard, connect counter (with time base set for a 10-second gate) to A2TP1 (5 MHz), and recheck 5-MHz output to be 5 MHz ±2 PP 10^8. If not, set within 5 MHz ±2 PP 10^8 by repeating step 2 above. b. Disconnect test equipment.		6-5

Table 6-6. 1-MHz Synthesizer Subassembly A2A6A1, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. Waveform Shape and Amplitude Adjustment	Translator/Synthesizer Test Set TS-2133/ WRC-1 Oscilloscope AN/USM-281( ) Extender Cable for 1-MHz Synthesizer	a. Connect translator/synthesizer in test set. Remove dust cover from 1-MHz Synthesizer Subassembly A1 and connect via extender cable to translator/synthesizer. All adjustments are made to this subassembly only.		6-6
		b. Disconnect A2P1 and A2P2 from their associated jacks (A2J1 and A2J2) on the A1A2 board. Ground A2P1.		
		c. Connect oscilloscope to A2TP3. Set MHz selector to 2 MHz.		
		d. Set coil A3L2 fully clockwise. Adjust A2R6 so there is no bottom-clipping of the waveform seen on the oscilloscope. (If A2L4 was replaced, adjust its slug until it is even with the top of the coil form.)	No bottom-clipping (flattening) on waveform.	
		e. Tune A3T1 and A3L4 for maximum peak-to-peak signal viewed on oscilloscope. Adjust A2R6 as necessary to prevent any bottom-clipping of the waveform during these adjustments.	Maximum PP signal, without any bottom-clipping of waveform.	
		f. Adjust A2T1 and A2T2 for maximum peak-to-peak signal on oscilloscope. Adjust A2R6 to prevent bottom-clipping of waveform during these adjustments.	Maximum PP signal, without any bottom-clipping of waveform.	

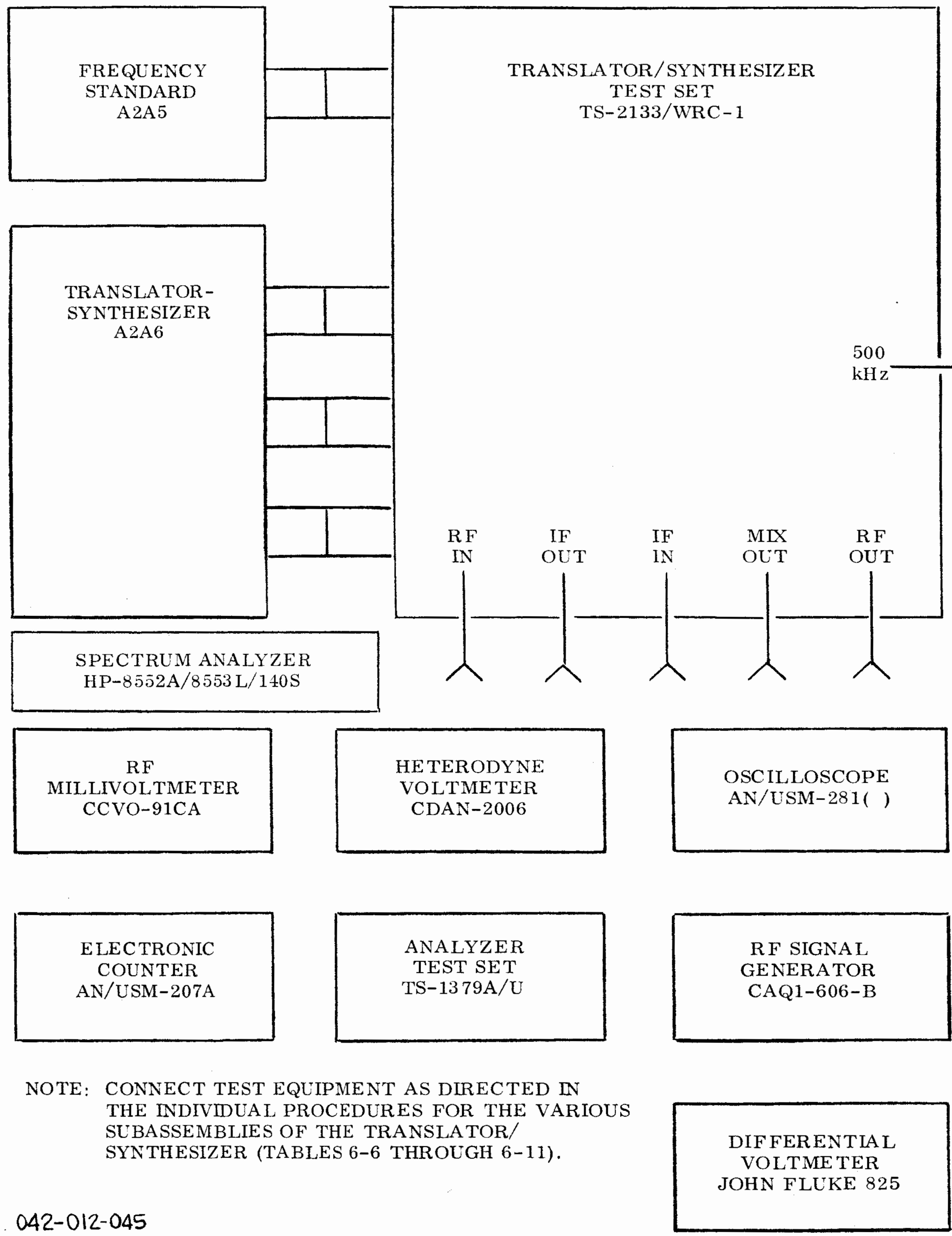


Figure 6-6. Translator/Synthesizer Assembly A2A6, Alignment and Adjustment Bench Test Setup

Table 6-6. 1-MHz Synthesizer Subassembly A2A6A1, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. Waveform Shape and Amplitude Adjustment (Cont)		g. Adjust A2R6 until the negative limit of the waveform (on oscilloscope) is between +5 and +6 volts.	Negative peak of waveform; limit is +5 to +6 volts above ground.	
		h. Disconnect ground to A2P1 and reconnect A2P1 and A2P2 to their associated jacks (A2J1 and A2J2).		
		i. Observe a locked-in condition on the oscilloscope at A2TP3.	Steady dc voltage, between 5 and 17 Vdc.	
		j. Disconnect oscilloscope.		
2. Output Frequency and Amplitude Check	Translator/Synthesizer Test Set TS-2133/WRC-1	a. Connect rf millivoltmeter and electronic counter to terminal A1E2 or P1A2.		6-6
	RF Millivoltmeter CCVO-91CA Electronic Counter AN/USM-207A Extender cable for 1-MHz Synthesizer	b. Cycle test set MHz frequency controls through all of their positions, and check that the frequency and amplitude of the 1-MHz synthesizer output are correct for all positions.	Amplitude: 90 to 220 mV in all positions	
		NOTE For this test the electronic counter and the translator/synthesizer test set frequencies must be locked to the same standard frequency source. Should this condition not be met, the error of each measured frequency will be proportional to the counter frequency error and to the translator/synthesizer test set frequency source error.		

Table 6-6. 1-MHz Synthesizer Subassembly A2A6A1, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
2. Output Frequency and Amplitude Check (Cont)		Front Panel MHz Control Setting — 1 MHz Synthesizer Output Freq. (MHz) 2 — 17.500000 3 — 16.500000 4 — 15.500000 5 — 14.500000 6 — 23.500000 7 — 12.500000 8 — 11.500000 9 — 20.500000 10 — 19.500000 11 — 8.500000 12 — 7.500000 14 — 5.500000 15 — 4.500000 16 — 3.500000 19 — 10.500000 20 — 9.500000 22 — 2.500000 c. Disconnect test equipment and reinstall dust cover on 1-MHz synthesizer, and reinstall in translator/synthesizer.		

Table 6-7. 100-kHz Synthesizer Subassembly A2A6A2, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. 10.747-MHz Mixer Alignment	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Millivoltmeter CCVO-91CA Resistor, 120 ohm, 1/2 watt Extender cable for 100-kHz synthesizer	a. Connect translator/synthesizer in test set. Remove dust cover from 100-kHz Synthesizer Subassembly A2 and connect to translator/synthesizer via extender cable. All adjustments are made to this subassembly only. b. Connect a 120-ohm, 1/2 watt resistor from ground to the base of A5Q4 to disable agc, and set A2T1 one-half turn from full clockwise. c. Set MHz selector to 2 MHz (lo band), and 100-kHz selector to 5.		6-6
		d. Connect rf millivoltmeter to A2TP1 and adjust A2T2 and A2T3 for maximum indication. (If maximum indication is less than 50 mV rms, A2T1 may be readjusted.)	Maximum indication (50 mV rms minimum)	
		e. Rotate the 100-kHz selector through all 10 positions, and observe that the rf millivolt-meter indicates 50 mV rms minimum for each position. Retune A2T1, A2T2, and A2T3 if necessary.		
2. IF. and Output Adjustment	Same as step 1.	a. Preset the following adjustments: A3C8 and A3C19 to midrange A3T2 and A3T4 one turn from maximum clockwise		6-6

Table 6-7. 100-kHz Synthesizer Subassembly A2A6A2, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
2. IF. and Output Adjustment (Cont)		b. Set the MHz selector to 2 (lo band) and the 100-kHz selector to 5.		
		c. Connect rf millivoltmeter to A5TP1 and adjust A3T1 and A4T1 through A4T6 for maximum indication.	Maximum indication (150 mV rms minimum)	
		d. Rotate the 100-kHz selector to positions 0 and 9 and note the rf millivoltmeter readings. Adjust A4T4, A4T5, and A4T6 to balance the 0 and 9 readings to within 2 dB or less.	0 and 9 readings balanced within 2 dB or less. 135 mV rms minimum.	
		e. Rotate the 100-kHz selector through all 10 positions, and observe that the rf millivoltmeter indicates 135 mV rms minimum at each position. Retune A4T4, A4T5, and A4T6 if necessary. (As a last resort, A4T1, A4T2, and A4T3 may be adjusted.)	135 mV rms minimum at each frequency. 0 and 9 readings within 2 dB.	
		f. Set the MHz selector to 6 MHz (hi band) and set the 100 kHz selector to 5.		
		g. Connect rf millivoltmeter to A5TP1 and adjust A3T3 and A4T7 through A4T12 for maximum indication.	Maximum indication (150 mV rms minimum)	
		h. Rotate the 100-kHz selector to positions 0 and 9 and note the rf millivoltmeter readings. Adjust A4T10, A4T11, and A4T12 to balance the 0 and 9 readings to within 2 dB or less.	0 and 9 readings balanced within 2 dB or less. 135 mV rms minimum.	

Table 6-7. 100-kHz Synthesizer Subassembly A2A6A2, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
2. IF. and Output Adjustment (Cont)		i. Rotate the 100-kHz selector through all 10 positions and observe that the rf millivoltmeter indicates 135 mV rms minimum at each position. Retune A4T10, A4T11, and A4T12 if necessary. (As a last resort, A4T7, A4T8, and A4T9 may be adjusted.)	135 mV rms minimum at each frequency. 0 and 9 readings within 2 dB.	
		j. Remove the 120-ohm resistor attached to the base of A5Q4.		
3. AGC Adjustment	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Millivoltmeter CCVO-91CA Extender cable for 100-kHz synthesizer	a. Set the MHz selector to 6 (hi band), and set the 100-kHz selector to 5.		6-6
		b. Connect the rf millivoltmeter to A5TP1.		
		c. Adjust A5R13 for an output level of approximately 108 mV rms as indicated on the rf millivoltmeter.	Approximately 108 mV rms	
		d. Rotate the 100-kHz selector through all 10 positions, and observe that the rf millivoltmeter indicates 100 to 135 mV rms at each position. If necessary, readjust A5R13 to ensure all readings are within limits.	100 to 135 mV rms at each frequency.	
		e. Set the MHz selector to 2 MHz (lo band).		
		f. Rotate the 100-kHz selector through all 10 positions, and observe that the rf millivoltmeter indicates 100 to 135 mV rms at each position.	100 to 135 mV rms at each frequency.	

Table 6-7. 100-kHz Synthesizer Subassembly A2A6A2, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. Reduction of Spurious Outputs	Translator/Synthesizer Test Set TS-2133/ WRC-1 Spectrum Analyzer part of Analyzer Test Set TS-1379A/U with Hi-Z probe Extender cable for 100-kHz synthesizer	a. Set the MHz selector to 2 (lo band) and the 100-kHz selector to 0. b. Connect the spectrum analyzer through the Hi-Z probe to A5TP1, and adjust the analyzer for a center frequency of 22.4 MHz. c. Examine the analyzer display out to 1 MHz on each side of the center frequency for evidence of spurious signals having an amplitude less than 50 dB down from the reference center frequency. If any out-of-tolerance spurious signals are observed, note the approximate frequency for later reference. d. Repeat parts a, b, and c for 100-kHz selector positions 1 through 9 with the spectrum analyzer tuned to the appropriate center frequency listed below:		6-6

100-kHz SELECTOR POSITION	ANALYZER CENTER FREQUENCY (MHz)
0	22.4
1	22.5
2	22.6
3	22.7
4	22.8
5	22.9
6	23.0
7	23.1
8	23.2
9	23.3

Table 6-7. 100-kHz Synthesizer Subassembly A2A6A2, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. Reduction of Spurious Outputs (Cont)		e. Repeat parts a, b, and c with the MHz selector set to 6 (hi band) and the 100-kHz selector stepped through all positions 0 through 9. Tune the spectrum analyzer to the appropriate center frequency listed below: 100-kHz SELECTOR POSITION — ANALYZER CENTER FREQUENCY (MHz) 0 — 32.4 1 — 32.5 2 — 32.6 3 — 32.7 4 — 32.8 5 — 32.9 6 — 33.0 7 — 33.1 8 — 33.2 9 — 33.3		
		f. If any out-of-tolerance spurious signals have been located during the search outlined above, touch up the hi-band or lo-band adjustments of the hi-band/lo-band mixer amplifier board A4. (Adjustment of capacitors A3C8 and/or A3C19 may also be useful in reducing spurious outputs on the low side of center frequency for 100-kHz selector settings 8 and 9.)	Spurious outputs, 50 dB or more below reference	

Table 6-7. 100-kHz Synthesizer Subassembly A2A6A2, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. Reduction of Spurious Outputs (Cont)		g. If retuning was required, recheck the output levels in accordance with step 3. (If extensive tuning was performed, realignment in accordance with steps 1 and 2 is advised.) h. Repeat parts a. through e. above to verify that any spurious outputs are within limits. i. Disconnect all test equipment and reinstall dust cover on 100-kHz synthesizer, and reinstall 100-kHz synthesizer in translator/synthesizer.		

Table 6-8. 1- and 10-kHz Synthesizer Subassembly A2A6A3, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. 1-kHz Oscillator Adjustment	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Millivoltmeter CCVO-91CA	a. Connect translator/synthesizer test set, and remove dust cover from 1- and 10-kHz Synthesizer Subassembly A3. All adjustments are made to this subassembly only. b. Connect rf millivoltmeter to A4E13. c. Set 1-kHz coupler (S2) at 0 and then at 9, and note rf millivoltmeter indications, in dB, at each frequency.		6-6
		d. If difference in levels between 0 and 9 kHz exceeds 1.0 dB, adjust A2T1 (clockwise if 0 is lower than 9) for balanced readings on the rf millivoltmeter.	Balanced output levels at 0 and 9 positions.	
2. 10-kHz Oscillator Adjustment	Same as step 1.	a. Connect rf millivoltmeter to A4E2. b. Set 10-kHz coupler (S1) at 0 and then at 9, and note rf millivoltmeter indications, in dB, at each frequency.		6-6
		c. If difference in levels between 0 and 9 exceeds 1.0 dB, adjust A1T1 (clockwise if 9 is lower than 0) for balanced readings on rf millivoltmeter.	Balanced output levels at 0 and 9 positions.	
		d. Disconnect rf millivoltmeter.		

Table 6-8. 1- and 10-kHz Synthesizer Subassembly A2A6A3, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
3. 1- and 10-kHz Error Mixer Output Adjustment	Translator/Synthesizer Test Set TS-2133/ WRC-1 Heterodyne Voltmeter CDAN 2006	a. Set 1-kHz coupler (S2) at 5. Set 10-kHz coupler (S1) at 4.		6-6
		b. Connect heterodyne voltmeter to A4E6.		
		c. Tune heterodyne voltmeter for peak reading at 7.089 MHz.		
		d. Adjust A4T1 for maximum.	1.5 mV rms minimum	
		e. Disconnect heterodyne voltmeter.		
4. 1- and 10-kHz Output and Blanker Output Adjustment	Translator/Synthesizer Test Set TS-2133/ WRC-1 RF Millivoltmeter CCVO-91CA Set extender cables for translator/ synthesizer	a. Connect rf millivoltmeter to RF Translator Subassembly A6A1E9.		6-6
		b. Set 1-kHz coupler (S2 at 5; set 10-kHz coupler (S1) at 0.		
		c. Turn slugs of A3L1, A3L2, A3L3, and A3T1 clockwise to bottom.		
		d. Adjust A3L1, A3L2, A3L3, and A3T1 for maximum output on rf millivoltmeter.	Maximum output	

Table 6-8. 1- and 10-kHz Synthesizer Subassembly A2A6A3, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. 1- and 10-kHz Output and Blanker Output Adjustment (Cont)		e. Adjust A3L1 clockwise for 120-125 mV rms.	120-125 mV rms	
		f. Set 10-kHz coupler (S1) at 9.		
		g. Adjust A3L2 counterclockwise for maximum output on rf millivoltmeter.	Maximum output	
		h. Switch 10-kHz coupler (S1) between 0 and 9 while adjusting A3L3 for balanced readings (within 1.0 dB) on rf millivoltmeter.	Balanced output levels at 0 and 9 positions.	
		i. Rotate the 10-kHz and 1-kHz couplers through various positions while monitoring the rf millivoltmeter to obtain the highest reading.		
		j. If output at any combination of coupler positions exceeds 160 mV rms, set the couplers for the highest reading and adjust A3L2 for 150 mV rms. If no reading exceeds 160 mV rms, proceed to step m.	150 mV rms	
		k. Set 1-kHz coupler to 5.		
		l. Repeat step h.	Balanced output levels at 0 and 9 positions.	
		m. Rotate the 10- and 1-kHz couplers through various positions while monitoring the rf millivoltmeter to obtain the lowest reading.		

Table 6-8. 1- and 10-kHz Synthesizer Subassembly A2A6A3, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. 1- and 10-kHz Output and Blanker Output Adjustment (Cont)		n. If output at any combination of coupler positions is less than 100 mV rms, set the couplers for the lowest reading and adjust A3L1 for 110 mV rms. If no reading is less than 100 mV, no further adjustments are required.	110 mV rms	
		o. Set 1-kHz coupler to 5.		
		p. Repeat step h.	Balanced output levels at 0 and 9 positions.	
		NOTE If, after repeating above procedure several times, output at all frequencies is still not 100 to 160 mV rms, substitute a different value resistor for A3R3 (between 12 and 39 ohms).		
		q. Disconnect all test equipment and reinstall dust cover on 1- and 10-kHz synthesizer.		

Table 6-9. 100-Hz Synthesizer Subassembly A2A6A4, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. Adjustment of Oscillator Frequency	Translator/Synthesizer Test Set TS-2133/WRC-1 Electronic Counter AN/USM-207A Differential Voltmeter John Fluke 825	a. Connect translator/synthesizer in test set, and remove dust cover from 100-Hz Synthesizer Subassembly A4. All adjustments are made to this subassembly only.		6-6
		b. On the test set, set the Hz control switch to the vernier position, and set the vernier control clockwise to obtain 3.3 ±0.05 Vdc at A2E2, as indicated on the differential voltmeter.	3.3 ±0.05 Vdc	
		c. Connect the electronic counter to A2TP2, and measure the oscillator frequency. If frequency is not 120.500 kHz ±200 Hz, adjust A2C14.	120.400 to 120.600 kHz	
2. Reset Pulse-width	Translator/Synthesizer Test Set TS-2133/WRC-1 Oscilloscope AN/USM-281( )	a. Set the test set Hz control switch to 000.		6-6
		b. Connect the oscilloscope to A1TP2, and measure the reset pulsewidth and amplitude. The pulsewidth should be 5.0 to 7.5 μsec and the amplitude should be greater than 2.0 Vpp. If pulsewidth is not 5.0 to 7.5 μsec, replace A1R9 with a lower value to decrease pulsewidth or a higher value to increase pulsewidth (permissible range of resistance: 910 to 2700 ohms).	5.0 to 7.5 μsec	
3. Output Adjustments	Translator/Synthesizer Test Set TS-2133/WRC-1 Heterodyne Voltmeter CDAN-2006	a. Set the test set Hz control switch to 000.		6-6
		b. Connect the heterodyne voltmeter to A3TP1 and tune the meter to 7.089 MHz (narrow band). Adjust test set to obtain 5 mV rms.		

Table 6-9. 100-Hz Synthesizer Subassembly A2A6A4, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
3. Output Adjustments (Cont)		c. Connect the heterodyne voltmeter to A3TP5, and tune the meter for a maximum indication between 7.0 and 7.2 MHz. (If the meter indication is less than 25 mV rms, set A3R20 to obtain a reading above 25 mV rms.)	25 mV rms	
		d. Adjust A3T1 for maximum indication on the heterodyne voltmeter.	Maximum indication	
		e. Adjust A3R20 to obtain a heterodyne voltmeter indication of 15.0 ±0.5 mV rms.	15.0 ±0.5 mV rms	
		f. Rotate the Hz control switch from 000 to 900 (retune the heterodyne voltmeter for each switch position), and note that the meter indication is not less than 10 mV rms at any switch position.	10 mV rms minimum	
		g. Disconnect all test equipment and reinstall dust cover on 100-Hz synthesizer. NOTE The final adjustment of A3R20 is to be performed with the 100-Hz synthesizer installed in the fully assembled translator/synthesizer (part no. 4031963-0501).		

Table 6-10. Spectrum Generator Subassembly A2A6A5, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. 500-kHz Input	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Millivoltmeter CCVO-91CA	a. Connect translator/synthesizer in test set, and remove dust cover from Spectrum Generator Subassembly A5. All adjustments are made to this subassembly only. b. Connect rf millivoltmeter to A1J1 and adjust test set to provide 150 mV rms. c. Connect rf millivoltmeter to A1TP1, and adjust A1L2 for maximum indication on rf millivoltmeter.	 Maximum indication (3V rms minimum)	6-6
2. Adjust 100-kHz Spectrum Generator Divide-by-Five Multivibrator	Translator/Synthesizer Test Set TS-2133/WRC-1 Oscilloscope AN/USM-281( )	a. Connect oscilloscope to A1TP4. b. Adjust A1R5 for 100-kHz prf (10-μsec period), midway between points where time jitter begins to occur on oscilloscope presentation. (See waveform E, figure 5-45.)	 100 kHz prf	6-6
3. Adjust 10-kHz Spectrum Generator Divide-by-Five Multivibrator	Same as step 2.	a. Connect oscilloscope to A2TP3. b. Adjust A2R11 for 10-kHz prf (100-μsec period), midway between points where time jitter begins to occur on oscilloscope presentation. (See waveform L, figure 5-45.)	 10-kHz prf	6-6
4. Adjust 1-kHz Spectrum Generator Divide-by-Five Multivibrator	Same as step 2.	a. Connect oscilloscope to A3TP3. b. Adjust A3R11 for 1-kHz prf (1-msec period), midway between points where time jitter begins to occur on oscilloscope presentation. (See waveform T, figure 5-45).	 1-kHz prf	6-6

Table 6-10. Spectrum Generator Subassembly A2A6A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
5. Adjust 100-kHz Spectrum Generator Output	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Millivoltmeter CCVO-91CA	a. Connect the output of the 100-kHz spectrum generator at A1J2, through an isolation amplifier, to three filters tuned to 15.3 MHz, 15.7 MHz, and 16.2 MHz, respectively.		6-6
		b. With the rf millivoltmeter connected to the output of the 15.7-MHz filter, tune A1T1, A1L3, and A1T2 for maximum meter indication.		
		c. Alternately connect the rf millivoltmeter to the outputs of the 15.3-MHz and 16.2-MHz filters. If the levels at these two end-point frequencies are not equal, readjust A1T1, A1L3, and A1T2 as necessary to meet this requirement.	Balanced output at 15.3 MHz and 16.2 MHz	
		d. When the output levels at the two end-point frequencies are balanced, the meter reading obtained must be equivalent to 18 - 44 mV rms at A1J2, and the meter reading at the center frequency must be equivalent to 18 - 50 mV rms. If these conditions are not met, change A1R24 to another value within the range from 1 kilohm to 18 kilohms and repeat the tuning procedure for A1T1, A1L3, and A1T2.	Balanced output at 15.3 MHz and 16.2 MHz 18 - 44 mV rms at 15.3 MHz and 16.2 MHz 18 - 50 mV rms at 15.7 MHz	

Table 6-10. Spectrum Generator Subassembly A2A6A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
6. Adjust 10-kHz Spectrum Generator Output	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Millivoltmeter CCVO-91CA	a. Connect the output of the 10-kHz spectrum generator at A2J1, through an isolation amplifier, to three filters tuned to 3.82 MHz, 3.86 MHz, and 3.91 MHz, respectively.		6-6
		b. With the rf millivoltmeter connected to the output of the 3.86-MHz filter, tune A2T1 for maximum meter indication.		
		c. Alternately connect the rf millivoltmeter to the outputs of the 3.82-MHz and 3.91-MHz filters. If the levels at these two end-point frequencies are not equal, readjust A2T1 as necessary to meet this requirement.	Balanced output at 3.82 MHz and 3.91 MHz	
		d. When the output levels at the two end-point frequencies are balanced, the meter reading obtained must be equivalent to 2-4 mV rms at A2J1. If not, change A2R24 to another value within the range from 1 kilohm to 18 kilohms and repeat the tuning procedure for A2T1.	Balanced output at 3.82 MHz and 3.91 MHz 2-4 mV rms	
7. Adjust 1-kHz Spectrum Generator Output	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Millivoltmeter CCVO-91CA	a. Connect the output of the 1-kHz spectrum generator at A3J1, through an isolation amplifier, to three filters tuned to 122 kHz, 126 kHz, and 131 kHz, respectively.		6-6

Table 6-10. Spectrum Generator Subassembly A2A6A5, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
7. Adjust 1-kHz Spectrum Generator Output (Cont)		b. With the rf millivoltmeter connected to the output of the 126-kHz filter, tune A3T1 for maximum meter indication.		
		c. Alternately connect the rf millivoltmeter to the outputs of the 122-kHz and 131-kHz filters. If the levels at these two end-point frequencies are not equal, readjust A3T1 as necessary to meet this requirement.	Balanced output at 122 kHz and 131 kHz	
		d. When the output levels at the two end-point frequencies are balanced, the meter reading obtained must be equivalent to 6 - 12 mV rms at A3J1. If not, change A3R24 to another value within the range from 1 kilohm to 18 kilohms and repeat the tuning procedure for A3T1.	Balanced output at 122 kHz and 131 kHz 6 - 12 mV rms	

Table 6-11. RF Translator Subassembly A2A6A6, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. Adjust Injection Signal Levels	Translator/Synthesizer Test Set TS-2133/ WRC-1 RF Millivoltmeter CCVO-91CA	a. Connect RF Translator Subassembly A6 to test set as for receiver useage.		6-6
		b. Set test set frequency controls to 21.550 MHz.		
		c. With the rf millivoltmeter connected to A1E9, set the 1- and 10-kHz injection signal level to 90 mV rms.		
		d. With the rf millivoltmeter connected to A1E7, set the 100-kHz injection signal level to 117 mV rms.		
		e. With the rf millivoltmeter connected to A1E5, set the 1-MHz injection signal level to 80 mV rms.		
		f. Connect the rf millivoltmeter to A1A3TP1 and adjust A1A3L1 and A1A3L2 for a maximum indication. (L1 and L2 are accessible only if the cover is removed from subassembly A1A3, and normally should not have to be adjusted unless repairs have been made in this sub-assembly. Replace the cover on A1A3 before proceeding to the next step.)	Maximum indication	
		g. Adjust A1A3R28 to obtain an indication of 40 mV rms at A1A3TP1.	40 mV rms	
		h. Connect the rf millivoltmeter to A1A1TP1 and adjust A1A1R27 to obtain an indication of 40 mV rms.	40 mV rms	

Table 6-11. RF Translator Subassembly A2A6A6, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
2. Gain Adjust and Filter Balance	Translator/Synthesizer Test Set TS-2133/WRC-1 RF Signal Generator CAQI-606-B Electronic Counter AN/USM-207A RF Millivoltmeter CCVO-91CA	a. Connect the electronic counter to the output of the rf signal generator and set the signal generator frequency to 21.550 MHz ±1 kHz.		6-6
		b. Connect the rf signal generator output to the receive input of rf translator subassembly, P3A1.		
		c. Connect the rf millivoltmeter to A1TP1 and adjust the rf signal generator output level to obtain 5.0 mV rms.		
		d. Connect the rf millivoltmeter to A1TP4 and adjust A1L15 for a maximum indication.	Maximum indication	
		e. Adjust RCVR GAIN ADJ A1R16 for an indication of 70 mV rms on the rf millivoltmeter.	70 mV rms	
		f. Set test set frequency controls to 22.550 MHz.		
		g. Set the rf signal generator frequency to 22.550 MHz ±1 kHz as indicated on the frequency counter.		
		h. Reconnect the rf signal generator to the rf translator receive input, P3A1, and adjust the signal generator output level to obtain 5.0 mV rms at A1TP1.		
		i. Connect the rf millivoltmeter to A1TP4 and adjust A1R11 for a meter indication of 70 mV rms.	70 mV rms	

Table 6-11. RF Translator Subassembly A2A6A6, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
3. Adjust 19.6-MHz Trap	Translator/Synthesizer Test Set TS-2133/ WRC-1 Heterodyne Voltmeter CDAN-2006 RF Signal Generator CAQI-606-B	a. Connect rf translator to test set as for transmitter usage. b. Feed a 500-kHz signal into the transmit input of the rf translator subassembly, P2A2. c. Connect the heterodyne voltmeter to A1TP3 and adjust the 500-kHz input level to obtain 1.0 mV rms. d. Set test set frequency controls to 7.100 MHz. e. Connect the heterodyne voltmeter to A1TP2 and tune the voltmeter to 19.6 MHz. f. Adjust A1L1 for a minimum indication at 19.6 MHz as observed on the heterodyne voltmeter.	 Minimum indication	6-6
4. Final Adjustment of Filter Balance	Translator/Synthesizer Test Set TS-2133/ WRC-1 Heterodyne Voltmeter CDAN-2006	a. Set test set frequency controls to 6.550 MHz. b. Connect heterodyne voltmeter to A1TP2, and tune the meter to 6.550 MHz. Note the meter indication (dB scale) for reference in the next step. c. Set test set frequency controls to 7.550 MHz, tune the heterodyne voltmeter to 7.550 MHz, and note the dB indication on the meter. If this reading is more than ±1.5 dB from the		6-6

Table 6-11. RF Translator Subassembly A2A6A6, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. Final Adjustment of Filter Balance (Cont)		reading noted in step b, adjust A1R11 for a meter reading midway between the two previous values. d. Disconnect all test equipment and reinstall all covers removed.		

Table 6-12. Receiver Power Supply Assembly A2A8, Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
1. Preliminary	None	a. Set receiver controls as follows: Mode selector switch to OFF MHz, kHz, and Hz controls to 2,000,000 b. Slide chassis from case and defeat interlock by pulling the switch shaft forward to the cheated position. CAUTION Hand-guide main-frame cable at rear of chassis over edge of case when rotating main frame to vertical position. c. Tilt the chassis vertically to expose the underside.		
2. +20 Vdc Adjustment	Differential Voltmeter, John Fluke 825	a. Connect differential voltmeter between A2E11 (+) and chassis (-). b. Set mode selector switch to LSB. c. Set AGC switch A2S3 to SLOW. d. Check that voltmeter reading is in the range of approximately 14 to 23 Vdc.		

Table 6-12. Receiver Power Supply Assembly A2A8, Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
2. +20 Vdc Adjustment (Cont)		CAUTION If meter indicates either +28 or 0 Vdc, return mode selector switch to OFF, and troubleshoot the power supply (A2A8) and main frame (A2).		
		e. Set mode selector switch to ISB.		
		f. Adjust A2A8R14.	+20.0 ±0.1 Vdc	
3. R16 Adjustment	Differential Voltmeter John Fluke 825	a. Connect differential voltmeter between A2A8E16(+) and chassis (-).		
		b. Adjust A2A8R16.	+2.0 ±0.1 Vdc	
		c. Perform step 9 of table 6-1.		
		d. Tilt chassis back to horizontal, slide into case, and secure.		

Table 6-13. Translator/Synthesizer Assembly A2A6, Alignment and Adjustment Procedures

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
		NOTE This alignment procedure is to be performed on a fully assembled translator/synthesizer after one or more subassemblies have been repaired and/or aligned, and before the translator/synthesizer assembly is returned to service.		
1. Preliminary	Translator/Synthesizer Test Set TS-2133/ WRC-1 RF Millivoltmeter CCVO-91CA	a. Remove the cover plate from the rf translator subassembly, remove the dust cover from the 100-kHz synthesizer subassembly, and then install the translator/synthesizer assembly in the test set. b. Set the test set controls for receive mode of operation. c. Adjust the test set to provide the following standard frequency input levels to the translator/synthesizer assembly: 500 kHz 175 mV rms nominal 1 MHz 450 mV rms nominal 10 MHz 30 mV rms nominal		6-6
2. Final Adjustment of 100-Hz Synthesizer	Translator/Synthesizer Test Set TS-2133/ WRC-1 Heterodyne Voltmeter CDAN-2006	a. Connect the heterodyne voltmeter to A2A6A4A3TP5 and tune the meter to 7.1 MHz. b. Set the 100-Hz switch to 000 and set the 1-kHz and 10-kHz switches to the positions giving the lowest output indication on the heterodyne voltmeter.		6-6

Table 6-13. Translator/Synthesizer Assembly A2A6, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
2. Final Adjustment of 100-Hz Synthesizer (Cont)		c. Adjust A2A6A4A3R20 to obtain a 7.1-MHz output of 15 mV rms.	15 mV rms	
3. Final Adjustment of 100-kHz Synthesizer	Translator/Synthesizer Test Set TS-2133/ WRC-1 RF Millivoltmeter CCVO-91CA	a. Leaving the 1-kHz and 10-kHz switches in the positions determined in step 2.b. above, set the MHz and 100-kHz switches to 21.0 MHz.		6-6
		b. Connect the rf millivoltmeter to A2A6A2A5TP1 and set the 100-kHz switch to the position giving the lowest meter indication.		
		c. Adjust A2A6A2A5R13 to obtain an output of 110 mV rms.	110 mV rms	
		d. Set the MHz switches to 22 and note that the rf millivoltmeter still indicates 110 mV rms.		
4. Final Adjustment of RF Translator	Translator/Synthesizer Test Set TS-2133/ WRC-1 RF Millivoltmeter CCVO-91CA RF Signal Generator CAQI-606-B	a. Set the test set frequency controls to 21.550 MHz.		6-6
		b. Connect the rf signal generator to the test set and set it for a continuous-wave output frequency of 21.551 MHz.		

Table 6-13. Translator/Synthesizer Assembly A2A6, Alignment and Adjustment Procedures (Cont)

STEP	TEST EQUIPMENT	PROCEDURES	ADJUSTMENT VALUE	TEST SETUP FIG. NO.
4. Final Adjustment of RF Translator (Cont)		c. Connect the rf millivoltmeter to A2A6A6A1TP1 and adjust the rf signal generator output level to obtain a meter indication of 5 mV rms.	5 mV rms	
		d. Connect the rf millivoltmeter to A2A6A6A1TP4 and adjust A2A6A6A1R16 for an output signal level of 75 mV rms.	75 mV rms	
		e. Set the test set frequency controls to 22.550 MHz and the rf signal generator to 22.551 MHz.		
		f. Connect the rf millivoltmeter to A2A6A6A1TP1 and adjust the rf signal generator output level to obtain a meter indication of 5 mV rms.	5 mV rms	
		g. Connect the rf millivoltmeter to A2A6A6A1TP4 and adjust A2A6A6A1R11 for an output signal level of 75 mV rms.	75 mV rms	
		h. Disconnect test equipment, and reinstall all assemblies and covers in place.		

SECTION II

REPAIR

6-17. GENERAL.

6-18. This section contains information on the repair of the Receiver Main Frame A2 and its hard-wired assemblies; removal, disassembly, repair and reassemblies of the R-1051E/URR electronic assemblies and major subassemblies; and repair of the mechanical assemblies. It is assumed that a fault has been isolated to an assembly by the scheduled maintenance procedures in Chapter 4 or the troubleshooting procedures in Chapter 5. Following repair of any electronic assembly, align or adjust the assembly in accordance with the applicable procedures of Section I of this chapter.

NOTE

Disassembly of the RF Amplifier Assembly A2A4, Frequency Standard Assembly A2A5, and Translator/Synthesizer Assembly A2A6 is to be accomplished at depot level only, and not aboard ship.

6-19. SAFETY PRECAUTIONS.

6-20. Observe all standard safety precautions whenever performing any of the repair procedures in this section. Refer to paragraph 4-9.

6-20A. REMOVAL/INSERTION OF RF INSERT (COAXIAL) CONTACTS IN CONNECTORS.

6-20B. The rf insert (coaxial) contacts of the connectors of this equipment are removable and independently replaceable from their associated connectors. However, removal of these type contacts requires a special tool (RF Insert Extraction Tool, ITT Cannon PN CET-06B). This tool depresses the locking tab of this type rf insert contact, to enable the contact to then be pushed out of its connector. Use the tool as follows:

a. With the plunger of the tool in its withdrawn position, slip the tube of the tool down over the contact to be removed (tool inserted from the mating side of the connector).

b. Be sure that the tube is fully inserted into the connector, far enough to depress the rf insert contact locking tab. Rock or twist the extraction tool as it is inserted over the rf insert contact, to accomplish full insertion.

c. Using slight force, push the extraction tool plunger in, to now push the rf insert contact out of the connector (contact will come out of the rear side of the connector). If contact does not push out of the connector with only slight force on the tool plunger, repeat step b. to insure that the tool tube has been inserted far enough to depress the locking tab on the rf insert contact.

6-20C. Insertion of the rf insert contact in any connector is accomplished by pushing the contact into its assigned hole, from the rear (non-mating) side of the connector. Be sure to push the contact into the connector until the contact-locking tab seats properly and thereby locks the contact in place. This insertion can be done without use of any special tool, applying pressure by hand.

6-21. REPAIR OF RECEIVER MAIN FRAME A2 AND HARD-WIRED ASSEMBLIES.

6-22. Repair of the main-frame mounted parts, and the hard-wired assemblies thereon, is accomplished using conventional tools and procedures. The procedure for removal of parts from the main-frame chassis or mounting brackets is obvious upon physical inspection. When removing mechanical parts of the chain drive and sprocket mechanisms, refer to the appropriate illustrations of Chapter 7, for identification and order of assembly of multipiece items.

WARNING

Always ensure that primary power is off, before working on the circuits or mechanical items.

6-23. Reassembly for items on the main frame is generally the reverse of the removal procedure. Whenever replacing or reinstalling a hard-wired assembly in the main frame, ensure that all electrical leads are dressed or positioned to clear the tuning chain drives, or other moving mechanical parts. Reinstall all cover plates over assemblies, such as those on the Receiver Power Supply Assembly A2A8, Antenna Overload Assembly A2A9, and 20- to 30-MHz Filter Assembly A2A10. Whenever any assembly is removed or uncovered for repair always clean dust from the assembly and parts before reassembling or reinstalling the assembly. After reassembly, check for proper operation by performing the maintenance turnon procedure in table 5-4.

6-24. REPAIR OF PLUG-IN ELECTRONIC ASSEMBLIES.

6-25. GENERAL. The following procedures discuss removal of the plug-in electronic assemblies and major subassemblies, and include precautions and procedures involved in the disassembly and repair. For removal of any assembly, the main frame is first slid forward on its drawer slides. Also, always ensure that primary power is removed, either by opening the power interlock switch or by placing the mode selector switch A2S2 to OFF, before removing (or replacing) any electronic plug-in assembly.

CAUTION

To avoid damage to the equipment, observe the precautions in the following two paragraphs in making any repairs.

NOTE

Mounting screws for assemblies on main frame A2 are captive screws and may be useful when extracting any assembly (as pull-holds).

6-26. Always use care and gentle force when removing assemblies, dust covers, or other parts, to prevent physical damage to leads, terminals, or other components during the disassembly or reassembly actions.

6-27. When unsoldering or resoldering leads or parts during repair, use the minimum heat necessary and/or heat-sink clips to prevent excessive heat from being applied to the solid-state components of this equipment.

6-28. RECEIVER MODE SELECTOR ASSEMBLY A2A1 REPAIR. Remove the Receiver Mode Selector Assembly A2A1 from its position on the main frame by loosening the two corner-fastening screws, and gently pulling the assembly upwards. Next, remove the dust cover by removing the two screws on top of the assembly, and carefully slide the dust cover off. Removal of any subassembly of the mode selector consists of unfastening its mounting screws, and unsoldering the leads to the subassembly.

6-29. When replacing or reinstalling any subassembly, be sure to connect all leads correctly and dress all leads in the same positions as they were before removal of the subassembly. After repair, adjust the assembly in accordance with the Section I procedures; then secure the dust cover and reinstall the assembly in the main frame.

6-30. RECEIVER IF./AUDIOAMPLIFIER ASSEMBLIES A2A2 AND A2A3 REPAIR. Remove this assembly from its position in the main frame by unfastening the two mounting screws located in the corners of the chassis. Then gently pull the assembly upward and out of the main frame. Remove the two screws in top of the assembly (holding the dust cover in place), and gently slide the dust cover off. Further disassembly and removal of subassemblies consist of removing the mounting screws for the desired subassembly, unsoldering all leads to it, and carefully removing it from the assembly.

6-31. After repair, readjust the if./audio amplifier by means of Section I procedures, secure the dust cover, and reinstall the assembly into the proper position in the main frame.

6-32. RF AMPLIFIER ASSEMBLY A2A4 REPAIR.

6-33. General. Shipboard/station repair of RF Amplifier Assembly A2A4 is limited to replacement of the vacuum tubes A2A4V1 and A2A4V2. Further repair and adjustment of this assembly is made only at depot-type facilities.

6-34. Replacement of the vacuum tubes is accomplished by reaching through the tube slot in the top of the rf amplifier cover, and pulling the tube shield involved upwards and off of the tube. The tube is then withdrawn from its socket, through the same slot. Replace the tube with a new one, being careful to align the tube pins to match the socket orientation. Reinstall the tube shield.

6-35. If it has been determined that a malfunction other than a faulty tube exists within the rf amplifier, loosen the four corner mounting screws, and carefully pull the entire assembly out of its position in the main frame. Replace it with a spare rf amplifier assembly, ensuring that the tuning couplers on the bottom of the spare assembly engage properly with the couplers in the main frame. To ensure proper alignment (mating) of the tuning couplers, set the kHz frequency controls on the front panel to 111. Note that the coupler slots in the rf amplifier position on the main frame are perpendicular to the front panel (viewed from the top of the main-frame chassis). On the spare rf amplifier assembly, position its couplers to their 1 positions (index pins pointing toward the front panel, when the assembly is in its normal position of mounting). Then carefully insert the spare rf amplifier into position on the main frame, and press it firmly into place to ensure proper coupler connections. Refasten the four mounting screws in the corners of the assembly.

6-36. Disassembly, repair, and reassembly procedures for the RF Amplifier Assembly A2A4 are described in the following paragraphs. These procedures are performed only at depot facilities.

6-37. Disassembly. Major mechanical parts are identified in the parts location illustrations in Chapter 7; the reference designation numbers and part names are given in table 7-2. See figure 6-7, 6-8, and 6-9 for general identification of parts to be disassembled. The disassembly procedure is as follows:

NOTE

Disassemble only as much of the electronic assembly as is necessary for repair.

a. With the assembly placed on a work bench, remove the six dust-cover screws and lift off cover.

b. Remove the four corner screws that are used to secure the assembly to the main frame. Remove teflon ring.

c. Loosen the three screws securing the turret assembly drive motor A2A4B1 to the base. Slide motor to one side to disengage motor gear assembly from the turret drive gear. Secure motor in this position.

d. Rotate the complete turret assembly until the contacts of adjacent megahertz strips are located at either side of the contacts of the outer stator contact strips attached to the rf section. One set of the three outer contact strips is located to the right of the ground test point on the top plate. Hold the turret assembly in this position and remove the four screws securing top turret ring. Carefully lift off ring and remove all megahertz strips. It may be necessary to slightly rotate the turret when removing the

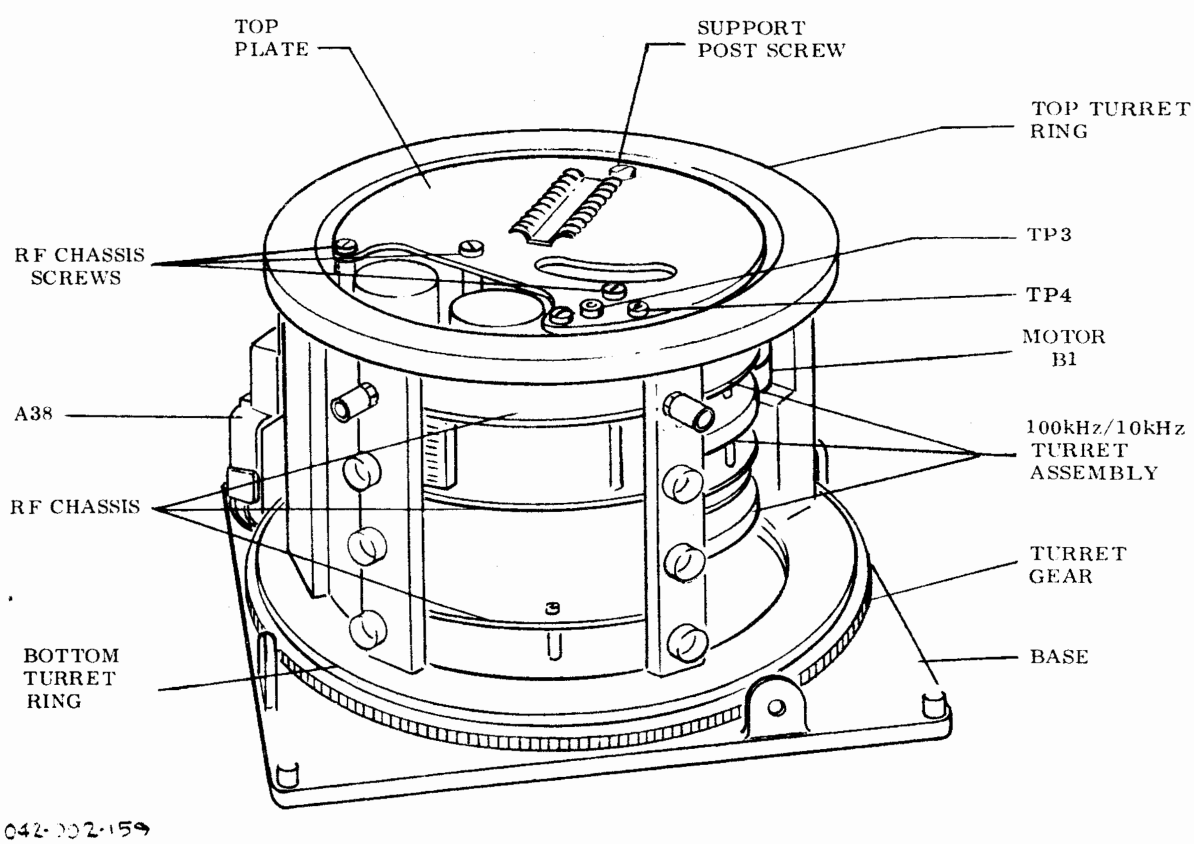


Figure 6-7. RF Amplifier Assembly A2A4, Disassembly Parts Identification

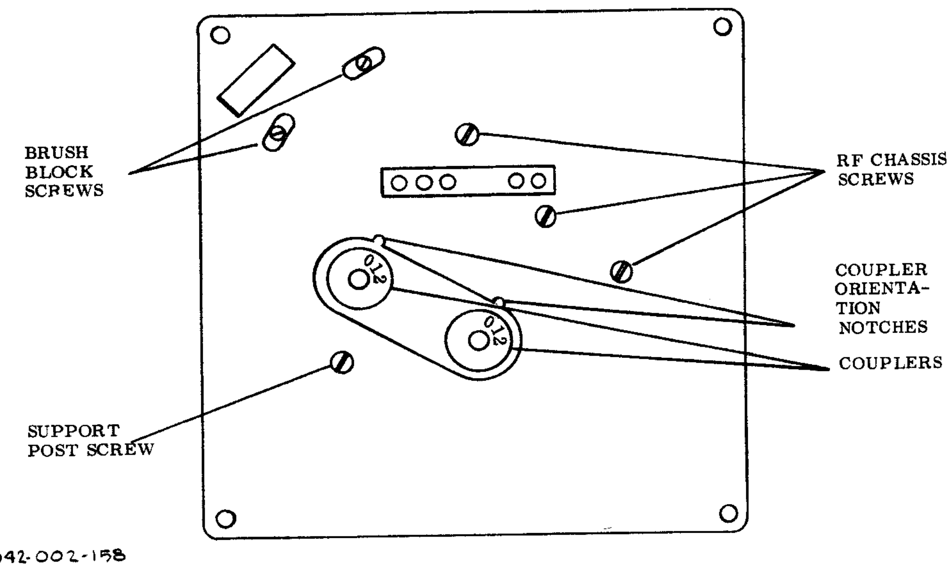


Figure 6-8. RF Amplifier Assembly A2A4, Bottom View, Disassembly Screw Locations

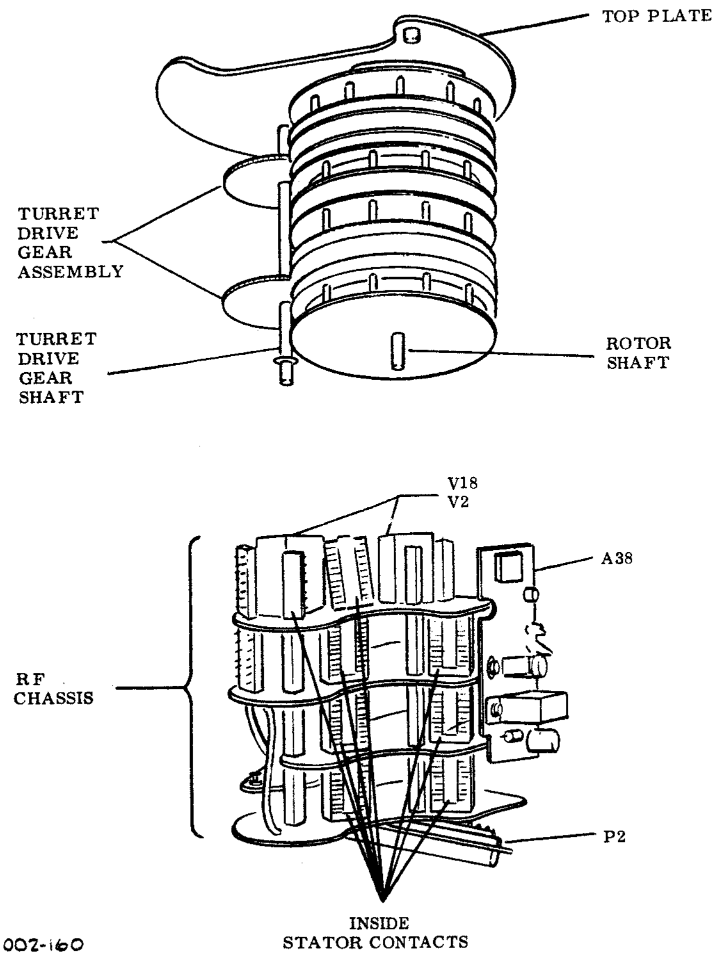


Figure 6-9. RF Amplifier Assembly A2A4, RF Chassis and Turret Assembly Parts Disassembly Location

megahertz strips near or in contact with the outer stator contacts.

e. Remove the two screws securing connector P2 to base.

f. Loosen setscrews on each of the couplers (on bottom of base). Note coupler location for future replacement, and slide couplers from rotor shafts.

g. Carefully remove the locating pin from each shaft.

h. Remove the three screws securing the rf chassis to the base.

i. Remove the screw securing support post to base.

j. To remove the 100/10-kHz turret assembly, the rf chassis, and the top plate, proceed as follows:

(1) While holding the base, begin lifting the top plate. When the two sections have cleared the base, lift them with both hands and place them on the bench.

CAUTION

Hold the 100/10-kHz turret assembly and rf chassis together, to avoid damaging contacts and wafers. Do not move or separate sections until the combined sections have been placed on a workbench.

(2) Remove the screw securing the support post to top plate and remove post.

(3) Unsolder wires connecting TP3 and TP4 (ground test point). Remove the three screws securing rf chassis to top plate and carefully separate the top plate from the rf chassis 100/10-kHz turret assembly, and turret-drive gear assembly. Now separate the turret-drive gear assembly from the 100/10-kHz turret assembly. Carefully separate the 100/10-kHz turret assembly from inside stator strips on rf chassis.

(4) To disassemble rf chassis, proceed as follows (see figure 6-9).

(a) Remove the top tube shields and tubes.

(b) Remove screws securing component board A38 to rf chassis, and pull board away slightly from mounting brackets. Unsolder wires to free board for complete removal. Tag each unsoldered lead to ensure proper replacement.

(c) Starting from top, separate shields of rf chassis by unscrewing spacers between shields and unsoldering interconnecting wires. Do not disassemble unless the component to be replaced is not accessible without disassembly. If bottom shield is to be removed or replaced, remove two screws securing component board A1, and unsolder wires as necessary to free the board.

(5) To disassemble the 100/10-kHz turret assembly, proceed as follows:

NOTE

Do not disassemble 100/10-kHz turret assembly unless a component on the assembly is to be replaced. Remove only those parts necessary to replace the component.

(a) Remove the E-ring from the bottom of the shaft.

(b) Remove the top and bottom rotor assemblies by punching out the roll pin (located in each respective hub) out from each assembly.

(c) Remove the next upper and lower gear rotor assemblies by removing the E-ring located on either side of each assembly on the turret shaft.

(d) Remove the center rotor assembly by punching out the roll pin (located in the hub).

(6) To remove the gears from the turret-drive gear assembly, punch out the roll pin from each gear, and slide gears from shaft. If only the bottom gear is to be removed, remove the E-ring from the shaft and slide the gear off from the bottom of the shaft.

NOTE

Do not remove the turret-gear assembly from the base except specifically for replacing assembly or block brushes. Each time the gear assembly is removed, the brushes are exposed to dirt as well as possible damage.

6-38. Repair. This paragraph provides instructions for making necessary repairs to the RF Amplifier Assembly A2A4. Information required to aid in determining whether or not a component or part should be replaced is also included. The inspection and repair procedures are as follows:

a. Inspect the entire assembly for damaged or burned electrical components. Replace as necessary.

b. Inspect all wiring and solder connections. Replace broken wires; resolder loose solder connections.

c. Inspect stator contact strips. Replace strip if contacts are badly bent and cannot be straightened to accept tabs properly. All contacts should close with sufficient tension to ensure proper electrical contact.

d. Clean all mechanical parts with dry, lint-free cloth.

e. Inspect gears for damaged teeth. Replace if teeth are broken or chipped.

f. Inspect code ring on underside of gear assembly. Replace gear if code ring is broken or scratched to the extent that continuity is broken.

g. Inspect brush blocks and replace if visibly worn or chipped, or if contacts are badly bent.

h. To remove the turret gear from the base, remove six screws securing bearing retainers to the base, and remove six bearing retainers. Carefully lift turret-gear assembly with bottom turret ring from the base.

CAUTION

When handling the gear, be extremely careful not to scratch or otherwise damage the surface of the code ring. Always place the gear on bench with code ring facing up.

i. Remove the four nuts securing bottom ring to turret-gear assembly and lift off turret ring. Separate ring bearing from gear.

j. Remove four turret posts only if necessary. To remove posts, unscrew each post.

NOTE

Do not remove brush block assembly from base unless the brushes are to be replaced. If brush block assembly must be replaced, remove the two screws securing the brush block assembly to the base and unsolder the six code leads (five at P1 and one at the motor relay). Normally, the leads soldered to the contact pins 1 through 13 of connector P2 and the coaxial connectors A1 through A5 (snapped into connector P2) need not be removed. Should damage beyond repair occur to any of the contact pins 1 through 12, connector P2 must be replaced. Should damage beyond repair occur to any of the coaxial connectors A1 through A5, only the damaged one should be replaced. To remove the coaxial connectors from connector P2, use a cannon CET-C6A tool. To reinsert connectors, simply snap them into place.

k. Replace turret motor and motor relay as complete units if they are known to be defective. These components are not normally repaired.

l. Check that tubes seat properly in respective tube sockets. Replace tubes or tube sockets as necessary.

6-39. Reassembly. Basically, reassembly of the rf amplifier is the reverse of disassembly. See figures 6-7 , 6-8 , and 6-9 during reassembly. However, there are many precautions and slight variations involved in the reassembly process, as follows:

a. Reassemble all mechanical and electrical components of rf section. Resolder all wire connections.

b. Reassemble 100/10-kHz turret assembly, using new E-rings where applicable. Ensure that all alignment holes are aligned on the right side of the flat on shaft, when viewed from coupler end of shaft with flat facing down.

c. Reassembly turret-drive gear assembly. Do not replace E-ring on shaft at this time.

d. Press ring bearing into code ring and gear assembly. Replace the four turret posts. Position bottom turret ring onto gear assembly by mating roll pin on gear assembly with hole in the bottom turret ring (hole is between megahertz assembly positions A24 and A25). Secure bottom turret ring to gear assembly. Reassemble gear assembly onto the base, using the six bearing retainers.

e. Mesh 100/10-kHz turret assembly wafers with inside stator contact strips of rf chassis as follows:

CAUTION

In following steps, do not spread contacts any more than required to slide wire through.

(1) Thread one 5-inch length of AWG. 16, single-strand, insulated wire through each row of horizontal contacts on the inner stator contact strips to force contacts open slightly (in order to engage 100/10-kHz turret assembly wafers).

(2) Carefully mesh wafers of the 100/10-kHz turret assembly with all contacts. The two inner stator contact strips on the upper rf chassis are not secured until the top plate is secured. These contact strips should be positioned in a vertical plane, and then meshed with the wafers. Ensure that the shields of the rf chassis extend over the wafers, and that the grounding springs attached to shields 2, 3, and 4 are positioned on the top side of the 100/10-kHz turret assembly.

(3) Slide the AWG-16 wires out of the contacts. Visually check that all contacts of stator contact blocks close sufficiently on wafers.

f. Mesh turret-drive gear assembly with gears on 100/10-kHz turret assembly. Hold the three assemblies (turret-drive gear assembly, 100/10-kHz turret assembly, and rf chassis assembly) intact, and attach the top plate to the proper ends of the three assemblies. Ensure that the tabs of the upper inner stator contact strips, and the outer stator contact strips, are positioned within the rectangular holes in the top plate. Secure the top plate with the three original screws to the rf chassis.

g. Resolder the two wires to TP3 and TP4 (ground test point) under the top shield.

h. Align the two flat washers with the two bearings in the base. Carefully lift the assemblies and place in position on base. Set support post in position between top shield and base. Secure support post to top shield. Secure rf chassis and support post to base.

i. Reinsert locating pins into shafts of 100/10-kHz turret assembly and turret-drive gear assembly.

j. Slide coupler onto 100/10-kHz turret assembly shaft. Ensure that the hub of the coupler is not beyond the bottom surface of the base. Tighten setscrew on the coupler against flat of the 100/10-kHz rotor shaft.

k. Rotate the coupler so that 0 on coupler is opposite notch in base. Insert 4-inch, 0.125-inch diameter rod in top alignment hole on top shield. Rod should then pass through all wafers to base. If the upper or lower rotor assembly has been rotated from the position established in step b, reposition either or both assemblies to allow the rod to pass through freely.

l. Slide coupler onto turret-drive gear assembly shaft and tighten setscrew. Rotate coupler without engaging gears on 100/10-kHz turret assembly, so that 0 is opposite notch in base. Push shaft up so that gears engage, and place new E-ring onto turret drive gear assembly shaft. Remove the rod.

m. Push connector P2 through slot in base and secure to base with two screws.

n. Insert any one of the 28 megahertz strips into the bottom turret ring. Position the top turret ring over the megahertz strip. Ensure that the A designation on the top turret ring corresponds to the A designation on the bottom turret ring. Secure the top turret ring using the four screws. Carefully rotate the turret assembly so that the megahertz strip contacts pass through the three sets of outer stator strip contacts. Ensure that there is an equal distance between each set of outer stator strips and the megahertz strip. If the dimensions are not equal, or should any interference exist between any one of the outer stator strips and the megahertz strip, loosen the three rf chassis screws and the support post screw. Adjust the rf chassis until the spacing is equal or the interference is eliminated. Tighten the four screws to secure the rf chassis and support post. Remove the four screws securing the top turret ring and remove the ring. Remove the megahertz strip.

o. Rotate turret-gear assembly until two adjacent rectangular slots in the bottom turret ring are located at either side of the contacts on the bottom set of outer stator strips. Hold the gear assembly in this position and insert all megahertz strips. (Prior to inserting the megahertz strips in their respective rectangular slots, inspect all contacts to ensure that they are not bent or misaligned.) Also ensure that each megahertz strip is in its correct position.

p. Position the top turret ring over the megahertz strips, and snug with the four fastening screws. Ensure that the A designation on the top turret ring corresponds to the A designations on the megahertz strips and the A designations on the bottom turret ring. Ensure that all megahertz strips are properly mated into the rectangular slots in both the top and bottom turret rings. Secure top turret ring, using the four original screws.

q. Loosen screws securing turret assembly drive motor and engage the gears with the gear assembly. Tighten screws. Replace the tubes and tube shields, and teflon ring.

r. Replace dust cover unless adjustments are to be made. If adjustments are to be made, leave dust cover off and proceed to alignment procedures of Section I of this chapter.

6-40. FREQUENCY STANDARD ASSEMBLY A2A5 REPAIR. Repair of the Frequency Standard Assembly A2A5 at shipboard/station level is limited to replacement of the assembly. Once a fault has been isolated to this assembly, it must be sent to a depot-level facility for repair.

6-41. To replace the frequency standard, remove the assembly from the main frame by loosening the two screws located diagonally across the top of the housing. Next, lift the assembly straight up, being careful not to damage the mating connectors. Install a spare frequency standard by the reverse of the removal procedure. Set the COMP/INT/EXT switch A2A5A2S1 to the proper position as required for the specific equipment in which it is operating.

6-42. Disassembly, repair and reassembly procedures for the Frequency Standard Assembly A2A5 are described in the following paragraphs.

6-43. Disassembly. Refer to figures 7-59 through 7-63. Remove dust cover from the assembly A5 removing the five screws (two each side, one on top) fastening it to the base. Gently lift the dust cover from the base. For easier access during repair, remove the two captivated unit mounting screws (in two diagonal corners of the base).

Also, remove the two screws fastening the filter board A4 to the base, and swing this board aside for access to wires/components connected to A2A5P1.

6-44. To remove the divider and output amplifier assembly A2A5A2, remove the cable straps, unsolder and tag its connecting wires, and remove the four A2 board mounting screws (two along edge near the base, two near top edge of A2 board). This also makes switch S1 available for servicing (on bracket on A2 board).

6-45. After removing A2 board, the oven assembly A3 may be removed by unsoldering its attaching wires and removing the screw fastening A3 to the base. To remove the oscillator and oven control A1 from oven assembly A3, first remove the FINE FREQ ADJ dial MP2 (one center fastening screw). Then lift up the foam insulation pad, to expose the oven assembly cover. Loosen the two Phillips-head cover fastening screws (one each side of oven cover) and lift oven cover off to expose the A1 assembly inside oven. Gently but firmly pull A1 out of the oven assembly A3 (from its connector in A3). Further repair of oven assembly A3 (for A5A5A3Q206, A3J1, A3RT205, A3R215, A3R216, or heater A3R214) requires cutting away from insulation from the outside of the oven assembly A3.

6-46. Replacement of any part on the assembly boards A2, A1, or A4 is accomplished using normal replacement/repair procedures for printed circuit boards. Removal of unit connector A2A5P1 requires removing the A2, A3, and A4 subassemblies as described and unsoldering of wires/components on the connector. Unfasten two screws holding P1 to the base, and remove it.

6-47. Reassembly. Reassemble the frequency standard A2A5 (reverse of the disassembly), and align the assembly in accordance with the Section I procedures.

6-48. Calibration Dial Replacement. The frequency standard calibration dial (marked 0 to 80 in steps of 4) is removed simply by loosening and removing the hold-down screw. After removal of the calibration dial, however, the following procedure must be followed before putting the new dial in place. Turn fine frequency adjust trimmer A1C4 to the fully clockwise position, and set calibration dial in place so that the dial reads 0. Replace attaching hardware and tighten screw.

CAUTION

When replacing the calibration dial, never replace it with the 80 marking oriented with the maximum clockwise position of the fine frequency adjust trimmed; always use the 0 position.

6-49. TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6 REPAIR.

6-50. General. Repair of the Translator/Synthesizer Assembly A2A6 at shipboard/station level is limited to replacement of the entire assembly. Further repair is to be accomplished only at depot facilities. Once a fault has been isolated to the translator/synthesizer circuits, remove the assembly by first loosening the four fastening screws at the corners of the assembly. Carefully lift the assembly upwards and out of its position in the main frame.

6-51. When installing a spare translator/synthesizer, ensure that the tuning couplers of the assembly mate correctly with the tuning couplers in its position on the main frame. To do this, first place the kHz frequency controls on the front panel to their 000 positions. Note that the coupler slots in the main frame are perpendicular to the rear edge of the main frame. Next, position the couplers on the spare assembly at their 0 positions, and check that their index pins are positioned perpendicular to the main frame rear edge, when the assembly is installed in its normal mounting position in the main frame. Carefully place the assembly into position, and press firmly down on it to ensure proper coupler connections. Refasten the four fastening screws at the corners of the assembly to hold it securely in place.

6-52. Further disassembly, repair, and reassembly procedures for the Translator/Synthesizer Assembly A2A6 are described in the following paragraphs. These procedures are performed only at depot facilities.

6-53. 1-MHz Synthesizer Subassembly A2A6A1 Repair. To disassemble the major mechanical parts of the 1-MHz synthesizer, proceed as follows (see figures 6-10 and 6-11):

a. Turn Translator/Synthesizer Assembly A2A6 upside-down. Remove six screws securing bottom plate to translator/synthesizer base and remove bottom plate. Remove four screws securing 1-MHz synthesizer to the base of the translator/synthesizer.

b. Separate 1-MHz synthesizer from the base of the translator/synthesizer. Remove two screws securing dust cover to the assembly and remove the dust cover.

c. Unsolder all wires (marking all wires for identification) attached to the coding switch.

d. Unsolder coaxial cable at A1 terminals 1 and 2 (mark the two leads).

e. Disconnect P1 (at end of the coaxial cable) from J1 and A2 (see dust cover). Unsolder coaxial cable shield lead from A2 terminal 2.

f. Unsolder coaxial cable leads from A3 terminals 7 and 9 (mark the two leads).

g. Unsolder lead from A1 terminal 5 (mark wire).

h. Remove screw securing ground strap to bracket.

i. Unsolder motor leads. One lead is soldered to a ground lug located above and to the right of the connector J1, and the other lead is soldered to K1-B2.

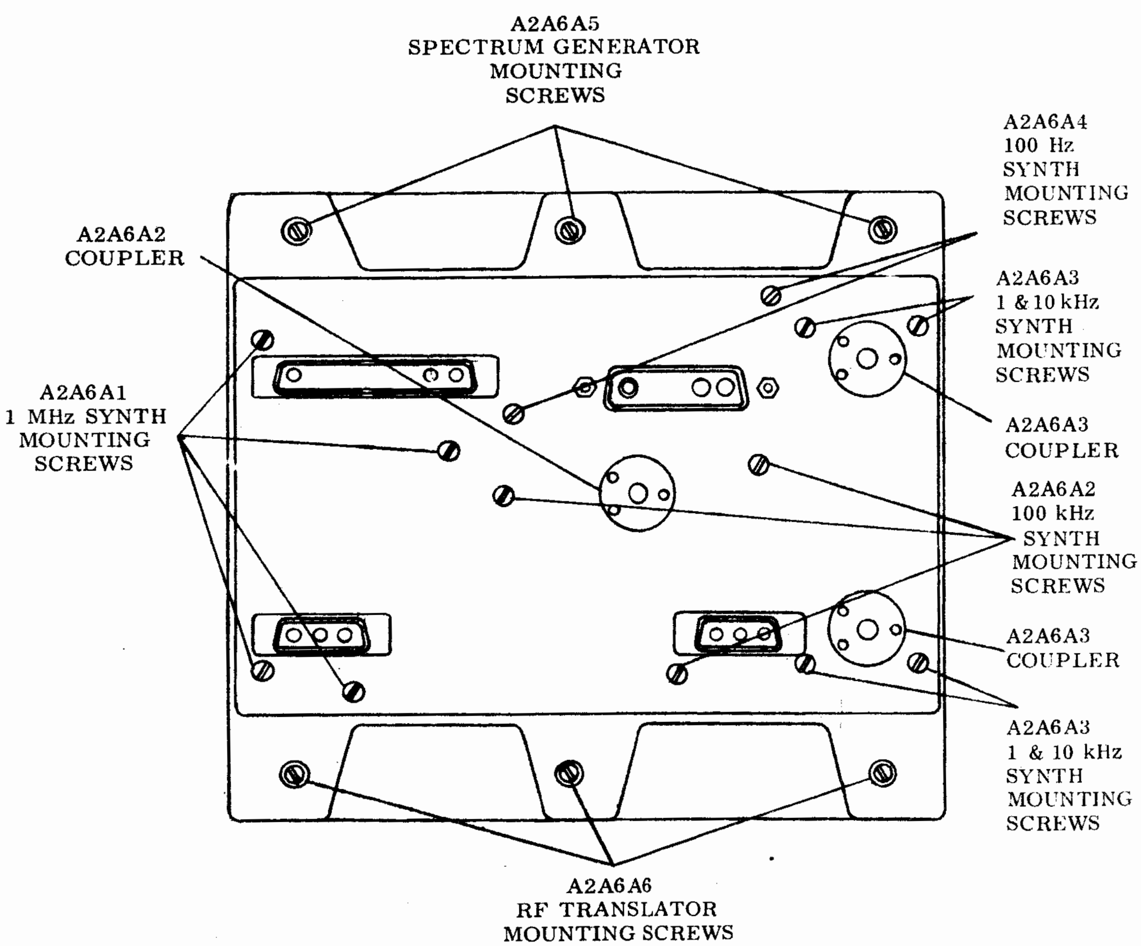


Figure 6-10. Translator/Synthesizer Assembly A2A6, Bottom View, Mounting Screws Identification

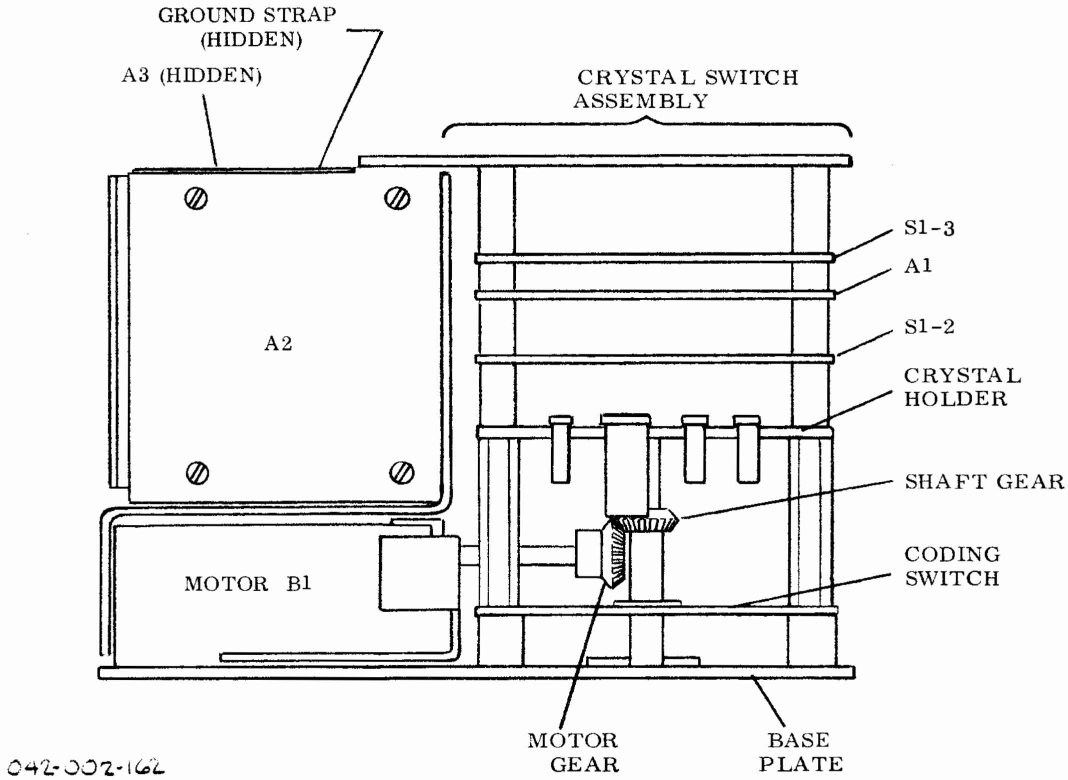


Figure 6-11. 1-MHz Synthesizer Subassembly A2A6A1, Disassembly Parts Location

j. Remove two screws and two nuts securing connector J1 to the base plate.

k. Remove the screws securing the bracket assembly to the base plate. The bracket assembly contains A2, A3, and the motor relay. Slide the bracket assembly away from the crystal switch assembly until the two locating pins on the base plate are cleared. Carefully remove the bracket. Connector J1 will come off with bracket assembly.

l. Loosen the two setscrews securing the motor gear to the motor shaft. Since these setscrews have been lock-tited, the application of heat from a soldering iron will aid in loosening these setscrews.

CAUTION

Do not lay soldering iron against any of the crystal cans.

m. Remove the two screws securing motor to base plate. Slide motor away from the crystal assembly. The motor gear will slide off the motor shaft as the motor shaft passes through and out of the pilot bearings.

n. Remove the four screws securing the crystal switch assembly to the base plate. Remove the crystal switch assembly from the base plate.

NOTE

Do not disassemble crystal switch assembly unless a component on the assembly is to be replaced. Remove only those parts necessary to replace the component.

6-54. To disassemble the crystal switch assembly, proceed as follows (see figure 6-12):

a. Loosen the two setscrews securing the switch collar to the shaft. Remove the switch collar.

b. Remove coding switch wafer.

c. Remove shaft from crystal switch assembly. Ensure that the nylon washer

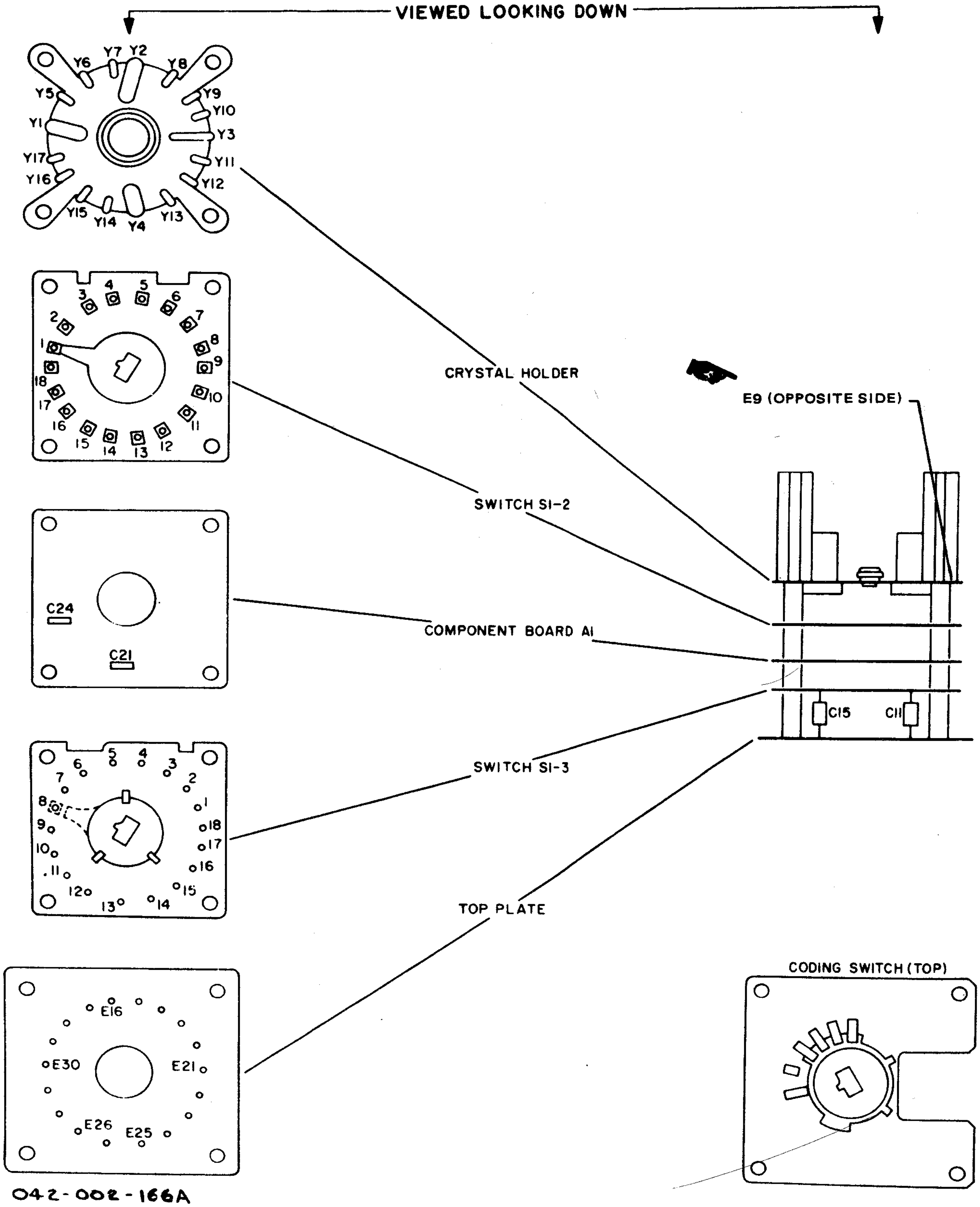


Figure 6-12. 1-MHz Synthesizer Subassembly A2A6A1, Crystal Switch Assembly, Component Orientation

between the crystal holder bearing and the large E-ring remains on the switch shaft. The removal of the switch shaft gear is only necessary if it needs replacement. Should its replacement become necessary due to damage, the switch shaft gear and the motor gear, which are a matched set, should be replaced as such.

d. Unsolder the two leads soldered to E9 on the crystal holder assembly. These two leads are sleeved with teflon tubing.

e. Unsolder the lead soldered to E32 on the grounding plate.

f. Remove four spacer nuts that are secured to four long screws which extend through the grounding plate, S1-3, A1, S1-2, the crystal holder assembly, and the unthreaded spacers between each section.

g. Remove the four long screws and the spacers between the sections.

NOTE

The crystal holder assembly and S1-2 are interconnected by the leads of the crystals. The grounding plate and S1-3 are interconnected by the leads of the capacitors. A lead interconnects S1-2 and A1 and a second lead interconnects S1-3 and A1.

h. Carefully spread the combination of the crystal holder and S1-2 from A1. Unsolder lead interconnecting S1-2 and A1 at S1-2. Carefully spread the combination of the grounding plate and S1-3 from A1. Unsolder lead interconnecting S1-3 to A1 at S1-3.

6-55. After the subassembly has been disassembled, standard parts replacement techniques may be used to replace a defective component.

6-56. Basically, the reassembly of the 1-MHz synthesizer is the reverse of the disassembly. However, there are a few precautions that must be exercised and a few additional procedures that must be performed as follows:

a. Ensure that crystal assembly components are oriented as shown in figure 6-12.

b. Ensure that the switch shaft E-ring is seated against the nylon washer and the crystal holder bearing.

c. Ensure that the coding switch collar flats are totally inserted in the coding switch rotor.

d. After the crystal switch assembly and the coding switch have been secured to the base plate, measure the torque at the grounding plate end of the switch shaft. Torque measurement should not exceed 15 inch-ounces. Should torque measurements exceed 15 inch-ounces, slightly loosen the four screws securing the crystal switch assembly/coding switch to the base plate and the four screws through the grounding plate. Slightly rotate the combination of the grounding plate/S1-3 and the combination of the crystal holder/S1-2 clockwise and then counterclockwise. Secure all eight screws and retake torque measurement. This process may have to be repeated several times for the proper torque measurement. When the proper measurement has been obtained, apply glyptol to the head of the screws to lock them in position.

e. Apply a small amount of silicon grease MIL-G-3278 in pilot bearing prior to insertion of motor shaft.

f. Secure the motor to the base plate by positioning the securing screws approximately at the midpoint of the elongated slots on the base plate.

g. Slide motor gear forward until it meshes with the shaft gear. The peripheries of the two gears should be at a 90-degree alignment. Tighten the setscrews in the motor gear.

h. Break the motor B1 lead A, and series-connect Multimeter AN/PSM-4( ) (to indicate current) in the positive lead of a 28-Vdc power source, and connect to the positive terminal of the motor. Connect the negative lead of the power source to the negative terminal of the motor.

i. As the motor and the switch shaft rotate, observe multimeter indication. An indication of 180 mA or greater will necessitate the repositioning of the motor. Loosen the two securing screws and slide motor in the direction that decreases the current.

CAUTION

A loose meshing of the two gears may cause skipping.

6-57. 100-kHz Synthesizer Subassembly A2A6A2. To disassemble the major mechanical parts of the 100-kHz synthesizer, proceed as follows (see figure 6-13):

a. Remove three screws securing the 100-kHz synthesizer to the translator/synthesizer base.

b. Tilt out subassembly. Remove the two screws securing dust cover and lift off dust cover.

c. Loosen two setscrews on shaft coupler and slide coupler from shaft.

d. Remove hex nut and lock washer securing detent assembly to bottom plate.

e. Unsolder lead C2 at switch wafer. Remove three screws securing the A1 board, and unsolder lead at A1 terminal 2 (see dust cover).

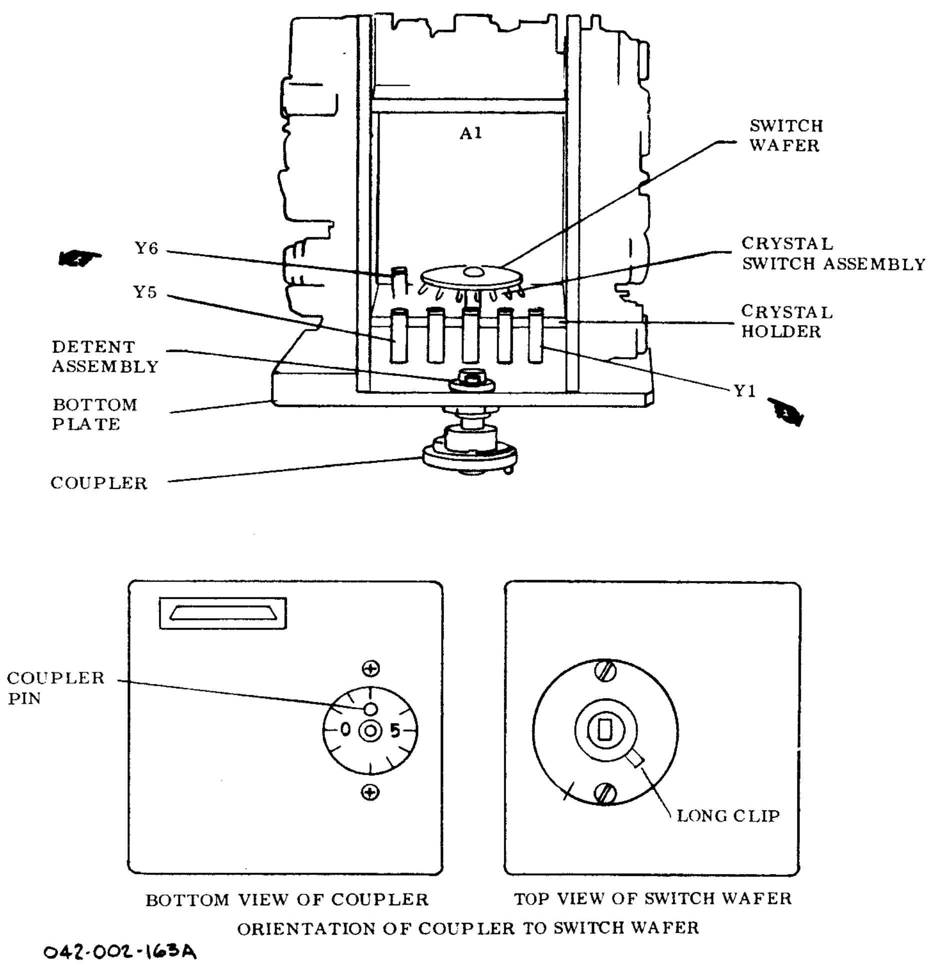


Figure 6-13. 100-kHz Synthesizer Subassembly A2A6A2, Disassembly/Reassembly Parts Identification

f. Tilt crystal switch assembly away from A1 and lift out the assembly to remove crystal holder from assembly. Unsolder all wires interconnecting the switch wafer and the crystal holder (mark each wire to ensure proper replacement). Remove screws and spacers securing wafer to crystal holder.

6-58. After the subassembly has been disassembled, standard parts replacement techniques may be used to replace a defective component.

6-59. Generally, reassembly of the 100-kHz synthesizer is the reverse of disassembly. However, when the crystal switch assembly is replaced, it is important to align the coupler correctly (with respect to the switch contacts) (see figure 6-13). To be sure switch rotor is properly positioned, check continuity between long clip (wiper arm) and Y-6 (see figure 7-96).

6-60. After repair and reassembly of the 100-kHz synthesizer, align or adjust the assembly in accordance with the procedures in Section I of this chapter.

6-61. 1- and 10-kHz Synthesizer Subassembly A2A6A3. To disassemble the major mechanical parts of the 1- and 10-kHz synthesizer, proceed as follows (see figures 6-14 and 6-15):

a. Disconnect the five coaxial cables and one control lead interconnecting the 1- and 10-kHz synthesizer to the translator/synthesizer base.

b. Remove the four screws securing the 1- and 10-kHz synthesizer to the translator/synthesizer base. Lift out the subassembly. Remove the two screws securing the dust cover and lift off the dust cover.

c. Remove the hex nuts and washers securing J2, J3, and J4 to the bottom plate. Mark coaxial cables to ensure proper replacement.

d. Unsolder the following leads (mark leads/cables to ensure proper replacement):

(1) Two leads at E1B.

(2) One lead at E1A interconnecting E1A and A1.

(3) One lead at A1 terminal 7 interconnecting A1 and crystal holder.

(4) One lead at A1 terminal 1 interconnecting A1 and switch wafer.

(5) One lead at A2 terminal 7 interconnecting A2 and crystal holder.

(6) One lead at A2 terminal 1 interconnecting A2 and switch wafer.

(7) The coaxial cable leads at A1 terminals 3 and 6 interconnecting A1 and A4.

(8) The coaxial leads at A1 terminals 4 and 5 interconnecting A1 and A3.

(9) Two coaxial cable leads at A2 terminals 4 and 6 interconnecting A2 and A3.

(10) Two coaxial cable leads at A2 terminals 3 and 5 interconnecting A2 and A4.

(11) Disconnect lead at A4-7.

e. Remove screw and hex nut securing filter shield to housing bracket.

f. Remove four sleeve nuts and washers secured to the four long screws. Do not remove the four long screws at this time.

g. Remove the combination of A4 and the filter shield. The coaxial cables (with the exception of two) and one lead will be removed with the combination. Ensure that no damage is done to the coaxial cables or the connectors attached to them. The four spacers are also removed with the combination.

NOTE

Disassembly should now be restricted to that portion of the 1- and 10-kHz synthesizer that requires repair or replacement.

h. Remove the long spacers.

i. Remove the crystal holder screw, washer, and the spacers.

j. Remove the combination of crystal holder assembly and switch wafer.

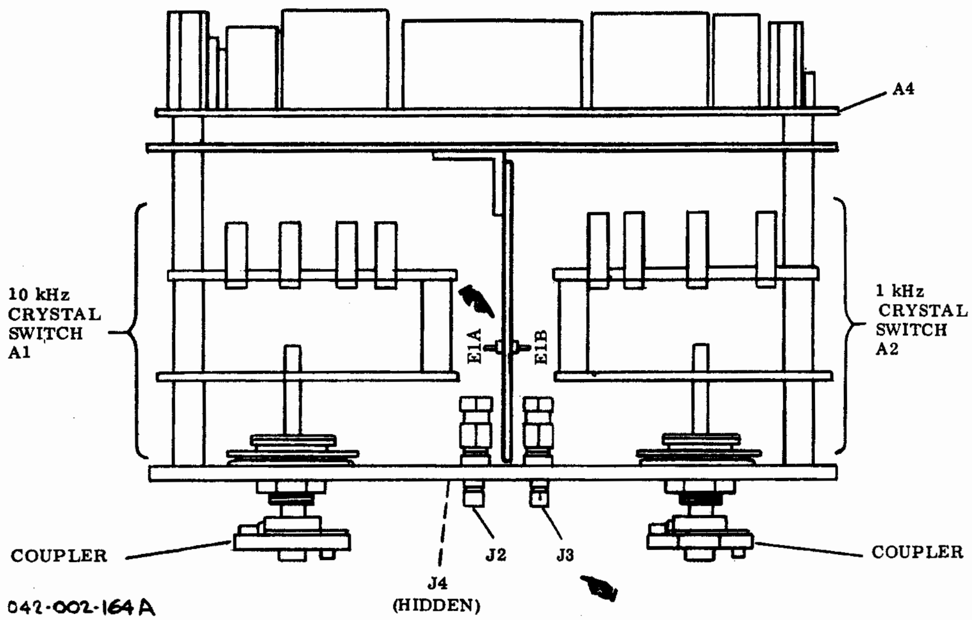


Figure 6-14. 1- and 10-kHz Synthesizer Subassembly A2A6A3, Disassembly Parts Location

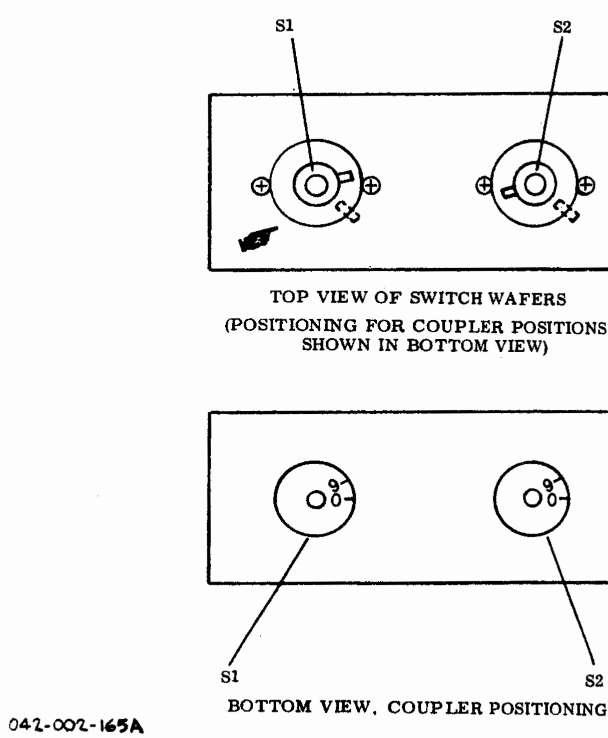


Figure 6-15. 1- and 10-kHz Synthesizer Subassembly A2A6A3, Switch Rotors and Tuning Couplers, Orientation

k. To disassemble the crystal switch assembly, proceed as follows:

(1) Unsolder the crystal leads from the switch wafer (mark all leads).

(2) Remove screws and washers securing the switch wafer to the bracket.

l. Remove the medium length spacers.

m. Remove A1 and/or A2.

n. Remove the long screws and the remaining spacers.

o. Loosen setscrews securing couplers to the shafts and remove the couplers.

p. Remove the hex nuts and washers from the detent and remove the detent.

6-62. After the subassembly has been disassembled, standard parts-replacement techniques may be used to replace a defective component.

6-63. Reassembly of the 1- and 10-kHz synthesizer is generally the reverse of the disassembly procedures. However, it is important when replacing the crystal switch assemblies to position the tuning couplers correctly (with respect to the actual switch contacts. Figure 6-15 shows the correct positions of the couplers, for both switch assemblies.

6-64. 100-Hz Synthesizer Subassembly A2A6A4. To remove the 100-Hz synthesizer from the Translator/Synthesizer Assembly A2A6, loosen its mounting screws (holding it to the translator/synthesizer base), and carefully pull the subassembly upward and out of its position. Remove the screws holding the 100-Hz synthesizer dust cover, and gently slide the dust cover off. Further disassembly consists of removing printed circuit boards or piece parts in a conventional manner.

6-65. After the subassembly has been disassembled, standard parts-replacement techniques may be used to replace a defective component. Reassembly of the 100-Hz Synthesizer Subassembly A2A6A4 is accomplished by reversing the disassembly procedures.

6-66. Spectrum Generator Subassembly A2A6A5. For repair of the Spectrum Generator Subassembly A2A6A5, it is not always necessary to remove the subassembly from the translator/synthesizer base. Access to most parts can be obtained by removal of the dust cover on the side of the subassembly. Removal of the entire subassembly is accomplished by removing the three screws holding the subassembly to the translator/synthesizer base. Then disconnect the rf cables and unplug leads from the spectrum generator.

6-67. After the subassembly has been disassembled, standard parts-replacement techniques may be used to replace a defective component. Reassembly of the spectrum generator is accomplished by reversing the disassembly procedure. After repair, align and adjust the spectrum generator in accordance with the procedures in Section I of this chapter.

6-68. RF Translator Subassembly A2A6A6. Disassembly of the RF Translator Subassembly A2A6A6 consists of first removing the three screws that hold the subassembly to the translator/synthesizer base. Then loosen connectors in the main base casting enough so that the rf cable plug can be extracted from the connector bodies. The colored jacks with exposed soldered connections are then pulled off of pins on the motherboard, to allow removal of the rf translator.

6-69. After the disassembly has been accomplished, standard parts-replacement techniques may be used to replace a defective component. Reassembly of the subassembly is the reverse of its disassembly. After repair, align and adjust the rf translator in accordance with the procedures in Section I of this chapter.

6-70. RECEIVER CODE GENERATOR A2A7 REPAIR. Removal of the Receiver Code Generator Assembly A2A7 is accomplished by first tilting the main frame upwards on its drawer slides, to expose the bottom of the main frame to access. First disconnect the plug on the code generator from the main frame connecting jack. Next, unfasten the three screws holding the code generator to the front-panel mounting spacers. (Remove the RF Amplifier Assembly A2A4 to gain access to the screw located behind the main wiring harness.) Now gently and carefully push the code generator towards the rear of the main frame, to separate its couplers from the MHz frequency controls on the front panel. Carefully work the assembly out of the main-frame position.

6-71. Repair of the code generator consists of first isolating the fault, by use of the schematic diagram for this assembly, and ohmmeter measurements between the plug A2A7P1 and the individual PCB switch sections, and between sections and points on those switch sections. Once the faulty switch PCB section has been isolated, unfasten the screws holding all sections of the assembly together, unsolder the necessary leads, and replace the faulty switch section with a spare. Be sure that the correct spare is inserted for the faulty switch section, since these sections are not identical. Replace the screws to hold all sections together, and resolder the leads removed.

6-72. Reinstall the repaired code generator by reversing the procedures used for removal from the main frame. Reconnect the plug to its mating connector on the main frame. During reinstallation, ensure that the couplers on the code generator correctly engage with the MHz frequency control couplers of the front panel. Move the frequency tuning controls or the rotors of the code generator as required to obtain correct engagement during reinstallation.

6-73. RECEIVER POWER SUPPLY ASSEMBLY A2A8 REPAIR. Removal and replacement of the Receiver Power Supply Assembly A2A8 from the underside of the main frame are straightforward and obvious. Hand-guide main-frame cable at rear of chassis over edge, and tilt the main frame on its drawer slides to gain access to its underside. Locate the power supply, remove the four screws to remove its cover plate, and then loosen the four hex fastener studs holding the power supply assembly board A2A8A1 to the standoff spacers on the main frame. Unsolder all leads if you desire to completely remove the power supply. Reassembly is accomplished in the reverse order of disassembly.

6-74. ANTENNA OVERLOAD ASSEMBLY A2A9 REPAIR. Removal of the Antenna Overload Assembly A2A9 is obvious upon inspection of the underside of the main frame; it consists of loosening the screws holding the cover plate, and then loosening the hex studs holding the antenna overload board to the spacers on the main frame underside. Reassembly is the reverse of disassembly.

6-75. 20- AND 30-MHz FILTER ASSEMBLY A2A10 REPAIR. Removal, repair, and reassembly of the 20- and 30-MHz Filter Assembly A2A10 are obvious, upon inspection of the underside of the main frame.

6-76. 100-Hz CONTROL AND VERNIER ASSEMBLY A2A11 REPAIR. Removal of the 100-Hz Control and Vernier Assembly A2A11 from the front panel requires first that the two knobs (Hz switch and vernier control) be removed from the switch shaft. Then unfasten the hex nut holding the assembly to the front panel, and carefully work the assembly out of the front panel, from the rear of the panel. Removal of the 4-volt power supply subassembly A2A11A1 from the switch is accomplished by loosening the screws holding the A2A11A1 board to the switch bracket. Reassembly, after repair, is accomplished by the reversal of the disassembly procedure.

6-77. REPAIR OF TUNING CHAIN-DRIVE MECHANISM.

6-78. REMOVAL. This paragraph provides instructions for repair of the tuning drive chains and the sprocket assemblies on the bottom of the Receiver Main Frame A2. Removal of these components can be accomplished with the chassis in place but tilted on the slide mechanisms. When removing or repairing the drive chains and sprocket assemblies, refer to the Chapter 7 illustrations of the main frame and these tuning mechanisms.

6-79. Turn off power to R-1051E/URR and disconnect cables to A1A1J3 and A1A1J4 on the rear of the case. Loosen front-panel screws and slide chassis out from case. Remove RF Amplifier Assembly A2A4 and Translator/Synthesizer Assembly A2A6 from the main frame. Hand-guide main-frame cable at rear of chassis over edge and tilt the chassis 90 degrees to expose bottom.

6-80. To remove drive chains, proceed as follows. Loosen three chain-tension idler gears and slide away from chains. Locate keeper clip on each drive chain. Carefully remove keeper clips and unthread the chains.

6-81. To remove the sprocket assemblies, remove four nuts securing dual-and triple-sprocket assemblies to the main-frame chassis, and lift the sprocket assemblies out of the main frame. To disassemble sprocket assemblies, remove two retaining rings located inside assembly housing (and secured around shaft). Loosen the coupler hub-clamp set screw and punch out the shaft (from end opposite coupler). Separate the sprocket assembly parts as they clear the shaft.

NOTE

Always note the positions of all shims adjacent to the retaining rings and replace them in the same positions, to achieve a shaft end-play of less than 0.025-inch. If necessary, use more or less shims as required.

6-82. REPAIR. To repair a defective sprocket assembly, proceed as follows. First wipe all disassembled parts with a dry, lint-free cloth. Inspect all parts for damage, and replace worn parts. Replace the metal springs which provide proper tension between associated parts. Replace both coupler and shaft if shaft is scored. Replace the detent springs if bent. Replace the hub clamp if it was evident during equipment operation that proper clamping action was not being maintained.

6-83. REASSEMBLY. To reassemble the sprocket assemblies, and to install the sprocket assemblies and drive chains onto bottom of the main frame after repair, proceed as follows. Reassemble the sprocket assemblies using new retaining rings in place of those that were removed. Do not tighten hub-clamp set screws at this time. Secure the sprocket assemblies in their respective positions on the main frame with four nuts. Thread drive chains onto gears. Fasten ends of each chain together with its keeper clip.

6-84. ADJUSTMENTS. After reassembly, the chain-drive mechanism must be adjusted to ensure proper relationship between the front-panel kHz controls, the couplers, and their respective detent spring position in the sprocket assemblies, in accordance with the procedures in Section I of this chapter.

6-85. Reconnect cables to A1A1J3 and A1A1J4 (on rear of case) when all adjustments are completed.

CHAPTER 7

PARTS LIST

7-1. INTRODUCTION.

7-2. LIST OF ASSEMBLIES. Table 7-1 is a listing of the assemblies included in Radio Receiver R-1051E/URR. These are listed by reference designations in numerical order. Thus, when the complete reference designation of a part is known, this table will furnish the identification of the assembly in which the part is located, since the first number of a complete reference designation provides the following information for each assembly listed: (1) official name, (2) designation, and (3) location of the first page of its parts listing in table 7-2.

7-3. REFERENCE DESIGNATIONS. The numbering method of assigning reference designations has been used to identify assemblies, subassemblies, and parts. This method has been expanded as necessary to cover adequately the various degrees of subdivision of the equipment. Examples of this numbering method and typical expansions of the same are illustrated by the following:

a. Example 1:

A1 R1

Assembly Designation — Class and No. of item

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

b. Example 2:

A1 A2 R1

Assembly designation — Subassembly designation — Class and No. of item

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

7-4. Partial reference designations are used on the equipment and illustrations. The partial reference designations consist of the class letter (s) and the identifying item number. The complete reference designations may be obtained by placing the proper prefix before the partial reference designations. Prefixes are provoded on illustrations following the notation "REF DESIG PREFIX".

7-5. MAINTENANCE PARTS LISTING.

7-6. PARTS LIST. Table 7-2 lists all assemblies and their maintenance parts, in numerical sequence by reference designation. Maintenance parts for each assembly are listed alphanumerically by class of part following the assembly designation. Thus, the parts for each assembly are grouped together. Table 7-2 provides the following information: (1) complete reference designation of each assembly, subassembly, and part, (2) reference to explanatory notes, (3) noun name and brief description, and (4) identification of the parts location illustration which pictorially locates the part:

a. Column 1, Reference Designation. The parts list is divided and arranged by major assemblies in numerical sequence (e.g., assembly A1 with its subassemblies, parts, etc., precedes assembly A2 with its parts). All parts attached to the assembly are listed first in alphanumerical order, followed by subassemblies with parts, and additional subassemblies with parts, also listed in alphanumerical order, as follows:

Assembly	A1
(Assembly parts)	A1AT1
	A1B1
	A1C1

Table 7-1. Radio Receiver R-1051E/URR, List of Major Assemblies

REFERENCE DESIGNATION	NOMENCLATURE	PAGE NO.
A1	Receiver Case	7-4
A1A1	Filter Box Assembly	7-5
A2	Receiver Main Frame	7-5
A2A1	Receiver Mode Selector Assembly	7-14
A2A2	Receiver IF. /Audio Amplifier Assembly	7-16
A2A3	Receiver IF. /Audio Amplifier Assembly	7-22
A2A4	RF Amplifier Assembly	7-22
A2A5	Frequency Standard Assembly	7-50
A2A6	Translator/Synthesizer Assembly	7-63
A2A7	Receiver Code Generator Assembly	7-94I
A2A8	Receiver Power Supply Assembly	7-94I
A2A9	Antenna Overload Assembly	7-94J
A2A10	20- and 30-MHz Filter Assembly	7-97K
A2A11	100-Hz Control and Vernier Assembly	7-94K

Assembly (Assembly parts)	A1 A1AT1 A1B1 A1C1 A1CR1 A1R1 Etc.
Subassembly (Subassembly parts)	A1A1 A1A1AT1 A1A1B1 A1A1C1 A1A1CR1 A1A1R1

b. Column 2, Notes. Parts variations within each article are identified by a letter symbol in the Notes column of table 7-2. The absence of a letter symbol in the Notes column indicates that the part is used on all articles covered by this technical manual. Note 1 designates parts whose specific values (in their circuits) are selected during repair/alignment/testing. The possible multiple values of these parts are listed by means of suffix letters (A, B, C, etc.) following the basic reference designator. In some cases, the suffixed reference designations list only the unique portions of the part description, following the basic part description.

c. Column 3, Name and Description. This column contains the name, including descriptive data and military type number of the item. Those parts not having a military type number include physical characteristics. Identical parts that are used more than five times are referenced to the List of Common Item Descriptions (table 7-3). Following the description are the manufacturer's part number and the contractor's part number. Attaching hardware, with quantity, is identified by the assigned letter code; e.g., C(4) would be the third listed piece of attaching hardware in which four pieces are used.

d. Column 4, Figure Reference Number. This column lists the figure number and item number (enclosed in parenthesis) of the parts location illustration (located at end of the chapter), which shows the physical location of the part.

7-6A. SUPPLEMENTARY PARTS LIST. Table 7-2 (Parts List) has been corrected by means of table 7-2A, Supplementary Parts List. For any given item, always refer first to table 7-2A, since it completely supersedes any corresponding listing in table 7-2. If no information is shown for a given item, refer to the basic parts list table for the required information. For an explanation of general format, refer to paragraph 7-6.

7-7. LIST OF COMMON ITEM DESCRIPTIONS. Table 7-3 contains the description of all multiple used parts (over five application). The description contains the same information as in column 3 of table 7-2.

7-8. LIST OF ATTACHING HARDWARE. Table 7-4 contains a list of standard attaching hardware used in five or more applications.

7-9. LIST OF MANUFACTURERS. Table 7-5 contains the name, address, and code number of all manufacturers supplying items for equipment as referenced in the parts list. This list is in numerical sequence by code number. Code numbers are in accordance with Handbooks H4-1 and H4-2.

7-10. PARTS LOCATION ILLUSTRATIONS.

7-11. Parts location illustrations (figures 7-1 through 7-104) are located at the end of this chapter. Their purpose is to provide positive and rapid location of parts. Column 4 of table 7-2 references the appropriate illustration which pictorially locates the part in the equipment.

Table 7-2A. Radio Receiver R-1051E/URR, Supplementary Parts List

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
RECEIVER CASE A1			
A1W1		CABLE, RF: 50 OHM, DBL-SHLD; 06845 DWG 4031936-0501	5-35
A1W2		CABLE, RF: 50 OHM, DBL-SHLD: 06845 DWG 4031936-0502	5-35
A1W3		CABLE, RF: 50 OHM, DBL-SHLD; 06845 DWG 4031936-0503	5-35
RECEIVER MODE SELECTOR ASSEMBLY A2A1			
A2A1A2CR1		SEMICONDUCTOR DEVICE, DIODE: ITEM 98.	7-9
RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A2			
A2A2MP3 AND A2A2MP4		SCREW, CAPTIVE: 10-32 X 4.84 IN.; MFR 06845 PART NUMBER 4030521-0001.	7-11
A2A2P1		CONNECTOR, RECEPTACLE, ELECTRICAL: 2.729 IN. LG X 0.494 IN. W X 0.426 IN. THK: MFR 91146 PART NUMBER DCMME25W3P, 06845 DWG 4032484-0716.	7-11
A2A2A1		AGC AUDIO AMPLIFIER SUBASSEMBLY: 3.68 IN. LG X 2.57 IN. W X 0.63 IN. THK; MFR 06845 PART NUMBER 4031932-0501. (ATTACHING PARTS)F(4), W(4), AE(4)	7-12
A2A2A1C4		CAPACITOR, FIXED, CERAMIC: ITEM 36.	7-12
A2A2A1C15		CAPACITOR, FIXED, CERAMIC: 0.33 UF PORM 20% 100WVDC, MIL TYPE CK06BX334M.	7-12
A2A2A2		IF./AUDIO AMPLIFIER SUBASSEMBLY: 4.08 IN. LG X 2.845 IN. W X 0.80 IN. THK; MFR 06845 PART NUMBER 4031930-0501. (ATTACHING PARTS)F(4), W(4), AE(4)	7-13
A2A2A2C4		CAPACITOR: ITEM 13.	7-13
A2A2A2L1		COIL: 10,000 UH, PORM 10%, 49 MA RATED DC CURRENT; MIL TYPE MS90537-61.	7-13
A2A2A2R36		RESISTOR, FIXED, COMPOSITION: 3.3K OHMS PORM 5%, 1/2W; MIL TYPE RCR20G332JS.	7-13
A2A2A3		SSB-AM DETECTOR: 2.40 IN. LG X 1.38 IN. W X 0.78 IN. THK; MFR 06845, PART NUMBER 4031927-0501. (ATTACHING PARTS)F(3), W(3), AE(3)	7-14

Table 7-2A. Radio Receiver R-1051E/URR, Supplementary Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4C1		CAPACITOR, FIXED, MICA: 330 PF PORM 5%, 500WVDC; MIL TYPE CM05FD331JP3.	7-18
A2A4C2		CAPACITOR: ITEM 3.	7-18
A2A4C21 AND A2A4C22		CAPACITOR: ITEM 5.	7-15
A2A4K1		RELAY, ELECTRICAL: DPDT; 2 AMP; MIL TYPE M5757-10-039.	7-15
A2A4MP41		MOUNTING BASE, ELECTRICAL EQUIPMENT: 7.322 IN. X 7.322 IN.; AL ALY; CHEM FILM; MFR 06845, PART NUMBER 4032516-0501.	7-15
A2A4MP51		ROTOR, TOP: 2.982 IN. DIA X 0.52 IN.; MFR 06845, PART NUMBER 4030949-0501.	7-20
A2A4MP72 THRU A2A4MP75		SCREW, CAPTIVE: 10-32 X 4.84 IN.; MFR 06845, PART NUMBER 4030521-0001.	7-17
A2A4P1		CONNECTOR, ELECTRICAL, SUB-MINIATURE: 1.54 IN. X 0.494 IN. X 0.422 IN.; STEEL SHELL, COPPER INSULATOR; CADMIUM PLATED SHELL, GOLD PLATED CONTACTS; 15 PIN CONTACTS; MFR 60007, PART NUMBER DAMM15P; 06845 DWG 4032484-0703.	7-15
A2A4P2		CONNECTOR, ELECTRICAL, SUB-MINIATURE: 2.729 IN. X 0.494 IN. X 0.426 IN.; STEEL SHELL, COPPER ALY CONTACTS, GLASS FILLED DIALLYL INSULATOR; CADMIUM PLATED SHELL, GOLD PLATED CONTACTS, 5 PIN CONTACTS; MFR 60007, PART NUMBER DCMME17W5P; 06845 DWG 4032484-0703.	7-15
A2A4XV1 AND A2A4XV2		SOCKET, TUBE: MFR 91662, PART NUMBER 05071503; 06845 DWG 4032578-0701.	7-18
A2A4A1		RF AMPLIFIER: 1.90 IN. X 2.38 IN.; MFR 06845, PART NUMBER 4032175-0501. (ATTACHING PARTS)G(2), W(2), Y(2)	7-21
A2A4A2T2		COIL, RF VARIABLE: 0.422 IN. DIA X 0.490 IN.; 12 MHZ, CAPACITY 135 PF PORM 5%; MFR 93292, PART NUMBER 500-2501; 06845 DWG 4032521-0711.	7-22
A2A4A3T2		COIL, RF VARIABLE: 0.422 IN. DIA X 0.490 IN.; 13 MHZ, CAPACITY 126.7 PF PORM 5%; MFR 93292, PART NUMBER 500-2512; 06845 DWG 4032521-0712.	7-23
A2A4A5T2		COIL, RF VARIABLE: 0.422 IN. DIA X 0.490 IN.; 15 MHZ, CAPACITY 113 PF PORM 5%; MFR 93292, PART NUMBER 500-2514; 06845 DWG 4032521-0714.	7-25
A2A4A9Y1		CRYSTAL UNIT, QUARTZ: 0.515 IN. LG X 0.418 IN. W X 0.166 IN. THK; FREQUENCY 21.000 MHZ; MFR 00136, PART NUMBER 4032119-0702; 06845 DWG 4032119-0702.	7-29
A2A4A10T2		COIL, RF VARIABLE: 0.422 IN. DIA X 0.490 IN.; 20 MHZ, CAPACITY 90.3 PF PORM 5%; MFR 93292, PART NUMBER 500-2519; 06845 DWG 4032521-0719.	7-30
A2A4A12L1		COIL, RF VARIABLE: 0.435 IN. DIA X 0.400 IN.; 20.0 MHZ, CAPACITY 7.0 PF PORM 5%; MFR 93292, PART NUMBER 500-2349; 06845 DWG 4032547-0701.	7-32

Table 7-2A. Radio Receiver R-1051E/URR, Supplementary Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A13C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.260 IN.; 3.9 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-3.9 PF -5%; 06845 DWG 4031973-0732.	7-33
A2A4A13L1		COIL, RF VARIABLE: 0.435 IN. DIA X 0.400 IN.; 20 MHZ, CAPACITY 3.9 PF; MFR 93292, PART NUMBER 500-2350; 06845 DWG 4032547-0702.	7-33
A2A4A15C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.240 IN.; 2.2 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-2.2 PF - 5%; 06845 DWG 4031973-0726.	7-35
A2A4A16C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.240 IN.; 2.2 PF PORM 5%, 500WVDC; MFR 78488 PART NUMBER GA-2.2 PF - 5%; 06845 DWG 4031973-0726.	7-36
A2A4A19Y1		CRYSTAL UNIT, QUARTZ: 0.515 IN. LG X 0.418 IN. W X 0.166 IN. THK; FREQUENCY 28.500 MHZ; MFR 99136, PART NUMBER 4032119-0703; 06845 DWG 4032119-0703.	7-39
A2A4A20C6		CAPACITOR, FIXED, PLASTIC: 0.531 IN. LG X 0.500 IN. W X 0.218 IN. THK; 0.068 UF PORM 5%, 50WVDC; MFR 84411, PART NUMBER 601PE683.50W; 06845 DWG 2027530-0704.	7-40
A2A4A21C6		CAPACITOR, FIXED, MICA: 0.531 IN. LG X 0.453 IN. W X 0.203 IN. THK; 0.047 UF PORM 5%, 50WVDC; MFR 84411, PART NUMBER 601PE473.50W; 06845 DWG 2027530-0703.	7-41
A2A4A22C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.250 IN.; 4.7 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-4.7 PF - 5%; 06845 DWG 4031973-0734.	7-42
A2A4A23C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.260 IN.; 3.9 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-3.9 PF - 5%; 06845 DWG 4031973-0732.	7-43
A2A4A24C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.260 IN.; 3.3 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-3.3 PF - 5%; 06845 DWG 4031973-0730.	7-44
A2A4A25C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.260 IN.; 3.0 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-3.0 PF - 5%; 06845 DWG 4031973-0729.	7-45
A2A4A26C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.260 IN.; 3.0 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-3.0 PF - 5%; 06845 DWG 4031973-0729.	
A2A4A27C1		CAPACITOR, FIXED, CERAMIC: 0.160 IN. DIA X 0.240 IN.; 2.7 PF PORM 5%, 500WVDC; MFR 78488, PART NUMBER GA-2.7 PF - 5%; 06845 DWG 4031973-0728.	7-47
A2A4A38FL1 THRU A2A4A38FL3		SHIELDING BEAD, FERRITE: 0.138 IN. OD X 0.047 IN. ID, X 0.118 IN. LG; MFR 78488, PART NUMBER 57-0180; 06845 DWG 2053852-0701.	7-58

Table 7-2A. Radio Receiver R-1051E/URR, Supplementary Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A38Q1 THRU A2A4A38Q3		TRANSISTOR, SILICON, PNP: 0.209 IN. DIA X 0.21 IN.; MFR 04713, PART NUMBER SRF 175; 06845 DWG 4018638-0701.	7-58
A2A4A38R2		RESISTOR: ITEM 51.	7-58
A2A4A38R3		RESISTOR: ITEM 70.	7-58
A2A4A38R4		RESISTOR: ITEM 50.	7-58
A2A4A38TP1		CONNECTOR, ELECTRICAL: 1500 VOLTS RMS, 60 CPS; MIL TYPE M39024-11-01.	7-58
A2A4A38TP2		CONNECTOR, ELECTRICAL: 1500 VOLTS RMS, 60 CPS; MIL TYPE M39024-11-03.	7-58
TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6			
A2A6XA1P1	2	CONNECTOR, RECEPTACLE, ELECTRICAL: 2.088 IN. LG X 0.494 IN. W X 0.429 IN. THK; MFR 91146, PART NUMBER DBMMR17W2S; 06845 DWG 4032484-0714.	7-65
A2A6XA2P1	2	CONNECTOR, RECEPTACLE, ELECTRICAL: 2.088 IN.LG X 0.494 IN.W X 0.429 IN.THK;MFR 91146,PART NUMBER DMBBR9W4S; 06845 DWG 4032484-0715.	7-65
A2A6XA4P1	2	CONNECTOR, RECEPTACLE, ELECTRICAL: 2.088 IN. LG X 0.494 IN. W X 0.429 IN. THK; MFR 91146, PART NUMBER DBMMR13W3S; 06845 DWG 4032484-0713.	
A2A6A1C4		CAPACITOR, FIXED, MICA: 680 PF PORM 1%, 500WVDC, MIL TYPE CM06FD681FP3.	7-105
A2A6A1K1		RELAY, ELECTRICAL: DPDT; 2 AMP; MIL TYPE M5757-01-039.	7-66
A2A6A1P1		CONNECTOR, RECEPTACLE, ELECTRICAL: 2.088 IN. LG X 0.494 IN. W X 0.429 IN. THK; MFR 91146, PART NUMBER DBMM17W2P; 06845 DWG 4032484-0709.	7-66
A2A6A1A1C22		NOT USED.	
A2A6A1A1CR1 AND A2A6A1A1CR2		SEMICONDUCTOR DEVICE, DIODE: ITEM 99.	7-67
A2A6A1A1CR3		SEMICONDUCTOR DEVICE, DIODE: VOLTAGE VARIABLE CAPACITOR; 0.125 IN. DIA X 0.30 IN., 30WVDC, -65 TO +150 DEG C; MFR 73293, PART NUMBER 666163-420/HC7171; 06845 DWG 4030791-0701.	7-67
A2A6A1A1FL1 AND A2A6A1A1FL2		SHIELDING BEAD, FERRITE: 0.138 IN. OD X 0.047 IN. ID X 0.118 IN. LG; MFR 78488, PART NUMBER 57-0180; 06845 DWG 2053852-0701.	
A2A6A1A1MP1 AND A2A6A1A1MP2		BEAD, GLASS: 0.10 IN. OD X 0.020 IN. ID X 0.06 IN. THK; MFR 99941, PART NUMBER 723, 06845 DWG 2054239-0701.	7-67
A2A6A1A2L3		COIL, RF: 300 UH; 11.8 OHMS DC, 39 MA; MIL TYPE MS90537-30.	7-68
A2A6A1A2L4		COIL, RF VARIABLE, MINIATURE: 0.290 IN. DIA X 0.438 IN.; NOM. 15 UH, MAX DC RES 5 OHMS; DC CURRENT 260 MA; MFR 03550, PART NUMBER 64215-22; 06845 DWG 4030811-0702.	7-68
A2A6A1A3CR5		SEMICONDUCTOR DEVICE, DIODE: MIL TYPE 1N3600.	7-69

Table 7-2A. Radio Receiver R-1051E/URR, Supplementary Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A1A3L3		COIL, RF VARIABLE, MINIATURE: 0.290 IN. DIA X 0.438 IN.; NOM 0.47 UH; MAX DC RES 0.21 OHMS; DC CURRENT 1200 MA; MFR 03550, PART NUMBER 64047-22; 06845 DWG 4030811-0701.	7-69
A2A6A1A3MP1 AND A2A6A1A3MP2		BEAD, FERRITE: 0.138 IN. OD X 0.047 IN. ID X 0.118 IN. THK; MFR 78488, PART NUMBER 57-0180, 06845 DWG 2053852-0701.	7-69
A2A6A1A3R1		RESISTOR, FIXED, FILM: 510 OHMS PORM 5%, 1/2W; MIL TYPE RLR20C511JR.	7-69
A2A6A1A3R10		RESISTOR, FIXED, COMPOSITION: 680 OHMS, PORM 5%, 1/4W; MIL TYPE RCR07G681JS.	7-69
A2A6A1A3R33		RESISTOR: ITEM 57.	7-69
A2A6A2P1		CONNECTOR, RECEPTACLE, ELECTRICAL: 2.088 IN. LG X 0.494 IN. W X 0.426 IN. THK; MFR 60007, PART NUMBER DBMM9W4P; 06845 DWG 4032484-0711.	7-96
A2A6A2A1R8		RESISTOR, FIXED, COMPOSITION: 5.1 OHMS PORM 5%, 1/4W; MIL TYPE RCR07G5R1JS.	7-70
A2A6A2A2C5		CAPACITOR, FIXED, CERAMIC: 0.320 IN. LG X 0.320 IN. W X 0.120 IN. THK; 47 PF PORM 5%, 150WVDC; MFR 86335, PART NUMBER CC64CG470K; 06845 DWG 4031972-0701.	7-71
A2A6A2A4C25		CAPACITOR, FIXED, MICA: 0.450 IN. LG X 0.360 IN. W X 0.170 IN. THK; 29 PF PORM 5%, 500WVDC; MFR 72136, PART NUMBER DM15; 06845 DWG 4031978-0705.	7-73
A2A6A2A4C26 THRU A2A6A2A4C30		CAPACITOR: ITEM 3	7-73
A2A6A2A4FL1 AND A2A6A2A4FL2		SHIELDING BEAD, FERRITE: 0.138 IN. OD X 0.047 IN. ID X 0.118 IN. LG; MFR 78488, PART NUMBER 57-0180; 06845 DWG 2053852-0701.	7-73
A2A6A2A4R26		RESISTOR: ITEM 71.	7-73
A2A6A2A4T1 AND A2A6A2A4T2		TRANSFORMER: ITEM 111.	7-73
A2A6A2A5L1		COIL, RF: 300 UH; 11.8 OHMS RES; 39 MA; MIL TYPE MS90537-30.	7-74
A2A6A2A5L3		COIL, RF: 300 UH; 11.8 OHMS RES; 39 MA; MIL TYPE MS90537-30.	7-74
A2A6A3MP4		COVER: 5.224 IN.LG X 1.818 IN. W X 3.680 IN. H; AL ALY; CHEM FILM; MFR 06845 PART NUMBER 4032183-0001.	7-97
A2A6A3MP5 AND A2A6A3MP6		COUPLING ASSY: 0.875 IN. DIA X 0.382 IN.; MFR 06845, PART NUMBER 4032209-0501.	7-97
A2A6A3MP7		MOUNTING BASE: 5.134 IN. LG X 1.728 IN. W X 0.125 IN. THK; MFR 06845, PART NUMBER 4032458-0501.	7-97
A2A6A3MP8		COUPLING: 0.875 IN. DIA X 0.382 IN.; MFR 06845, PART NUMBER 4030874-0001.	7-97
A2A6A3MP9		PIN: 0.0936 IN. DIA X 0.225 IN. LG; MFR 06845, PART NUMBER 4032181-0001.	7-97
A2A6A3MP10		SPRING, HOLD DOWN: 0.720 IN. X 0.800 IN. X 0.015 IN. THK; MFR 06845 PART NUMBER 4032183-0001.	7-97
A2A6A3A1MP1 AND A2A6A3A1MP2		BEAD, GLASS: 0.10 IN. OD X 0.020 IN. ID X 0.06 IN. THK; MFR 99941, PART NUMBER 723; 06845 DWG 2054239-0701.	7-75
A2A6A3A1R7		RESISTOR, FIXED, COMPOSITION: 5.1 OHMS PORM 5%, 1/4W; MIL TYPE RCR07G5R1JS.	7-75

Table 7-2A. Radio Receiver R-1051E/URR, Supplementary Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A3A2MP1 AND A2A6A3A2MP2		BEAD, GLASS: 0.10 IN. OD X 0.020 IN. ID X 0.06 IN. THK; MFR 99941, PART NUMBER 723; 06845 DWG 2054239-0701.	7-76
A2A6A3A3C12*		CAPACITOR, FIXED, CERAMIC: 0.01 UF ; PORM 20%, 100WVDC; MIL TYPE CK05BX103M.	
A2A6A3A4R4		RESISTOR: ITEM 93.	7-78
A2A6A3A4R12		RESISTOR: ITEM 93.	7-78
A2A6A3A4R13 THRU A2A6A3A4R29		NOT USED	
A2A6A3A4R30	1	RESISTOR, FIXED, COMPOSITION: PORM 5%, 1/4W, MIL TYPE RCR07G.	7-78
A2A6A3A4R30A	1	RESISTOR: ITEM 57.	7-78
A2A6A3A4R30B	1	33 OHMS, MIL TYPE RCR07G330JS.	7-78
A2A6A3A4R30C	1	RESISTOR: ITEM 89.	7-78
A2A6A3A4R30D	1	15 OHMS, MIL TYPE RCR07G150JS.	
A2A6A4MP2		BASE: 3.464 IN. LG X 1.76 IN. W X 2.75 IN. H; MFR 06845, PART NUMBER 4032408-0501.	7-98
A2A6A4A1Q2 THRU A2A6A4A1Q6		TRANSISTOR: ITEM 113.	7-79
A2A6A4A1Q7		TRANSISTOR: ITEM 114.	7-79
A2A6A4A1Q8		TRANSISTOR: ITEM 113.	7-79
A2A6A4A1R3		RESISTOR: ITEM 51.	7-79
A2A6A4A1R6		RESISTOR: ITEM 51.	7-79
A2A6A4A1U1 THRU A2A6A4A1U3		INTEGRATED CIRCUIT, DECADE COUNTER: 0.370 IN. DIA X 0.185 IN. H; MFR 07263, PART NUMBER SL6907; 06845 DWG 4013371-0702.	7-79
A2A6A4A2C10		CAPACITOR: ITEM 36.	7-80
A2A6A4A2CR1		SEMICONDUCTOR DEVICE, DIODE: 0.140 IN. DIA X 0.300 IN. LG; MFR 12954, PART NUMBER DT30319C; 06845 DWG 4031985-0701.	7-80
A2A6A4A2R6		RESISTOR: ITEM 71.	7-80
A2A6A4A3FL2 AND A2A6A4A3FL3		BEAD, FERRITE: 0.138 IN. OD X 0.118 IN. LG; CERAMAG 7D; MFR 78488, PART NUMBER 57-0180; 06845 DWG 2053852-0701.	7-81
A2A6A5MP2		BASE: 8.187 IN. LG X 4.33 IN. H X 0.887 IN.W; MFR 06845, PART NUMBER 4032405-0501.	7-99
A2A6A5A1C6		CAPACITOR, FIXED, DIELECTRIC: 0.0018 UF PORM 10%; MFR 99515, PART NUMBER EP36557; 06845 DWG 4030796-0701.	7-82
A2A6A5A1C11		CAPACITOR, FIXED, MYLAR: 0.05 UF PORM 20%, 100WVDC; MFR 99519, PART NUMBER EP36D2; 06845 DWG 4032429-0702.	7-82
A2A6A5A2R11		RESISTOR, VARIABLE, WIREWOUND: 5K OHMS, 3/4W; MIL TYPE RT22C2W502.	7-83
A2A6A5A2R14		RESISTOR, FIXED, FILM: 360 OHMS PORM 5%, 1/4W; MIL TYPE RLR07C361JR.	7-83
A2A6A5A2R15		RESISTOR, FIXED, FILM: 62 OHMS PORM 5%, 1/4W; MIL TYPE RLR07C620JR.	7-83
A2A6A5A2R24B	1	RESISTOR: ITEM 50.	7-83
A2A6A5A2R24C	1	RESISTOR: ITEM 62.	7-83
A2A6A5A2R24D	1	RESISTOR: ITEM 52.	7-83
A2A6A5A2R24E	1	RESISTOR: ITEM 53.	7-83
A2A6A5A2R24F	1	RESISTOR: ITEM 66.	7-83
A2A6A5A2R24G	1	RESISTOR: ITEM 55.	7-83
A2A6A5A2R24H	1	RESISTOR: ITEM 67.	7-83
A2A6A5A2R24J	1	RESISTOR: ITEM 47.	7-83

*USED ONLY IN ASSEMBLIES AFFECTED BY ECP BCD-5. REFER TO NOTES ON SCHEMATIC DIAGRAM, FIGURE 5-43.

Table 7-2A. Radio Receiver R-1051E/URR, Supplementary Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A5A2R24K	1	RESISTOR: ITEM 70.	7-83
A2A6A5A2R24L	1	RESISTOR: ITEM 71.	7-83
A2A6A5A2R24M	1	RESISTOR: ITEM 73.	7-83
A2A6A5A2R24N	1	RESISTOR: ITEM 94.	7-83
A2A6A5A2R24P	1	RESISTOR: ITEM 51.	7-83
A2A6A5A2R24Q	1	RESISTOR: ITEM 46.	7-83
A2A6A5A2R24R	1	RESISTOR: ITEM 63.	7-83
A2A6A5A2R28 AND A2A6A5A2R29		RESISTOR, FIXED, COMPOSITION: 5.1 OHMS PORM 5%, 1/4W; MIL TYPE RCR07G	7-83
A2A6A6MP2		BASE : 8.187 IN. LG X 4.33 IN. H X 1.14 IN. W; MFR 06845, PART NUMBER 4032467-0501.	7-100
A2A6A6A1C37		CAPACITOR, FIXED, CERAMIC: 1000 PF, PORM 10%, 100 WVDC; MIL TYPE CK05BX102K.	7-86
A2A6A6A1L16		COIL: 47.0 UH PORM 10%, 400 MA RATED DC CURRENT; MIL TYPE MS90537-33.	7-86
A2A6A6A1R22		RESISTOR, FIXED, COMPOSITION: 470 OHMS PORM 5%, 1/2W; MIL TYPE RCR20G471JS.	7-86
A2A6A6A1A1R2 AND A2A6A6A1A1R3		RESISTOR: ITEM 53.	7-87
A2A6A6A1A1R4		RESISTOR: ITEM 54.	7-87
A2A6A6A1A1R19		RESISTOR: ITEM 60.	7-87
A2A6A6A1A1R20		RESISTOR, FIXED, COMPOSITION: 2.7K OHMS PORM 5%, 1/2W; MIL TYPE RCR20G272JS.	7-87
A2A6A6A1A3R2		RESISTOR, FIXED, COMPOSITION: 2.7K OHMS PORM 5%, 1/2W; MIL TYPE RCR20GF272JS.	7-89

Table 7-2. Radio Receiver R-1051E/URR, Parts List

RADIO RECEIVER R-1051E/URR

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
		RECEIVER,RADIO,R-1051E/URR:MFR 06845 PART NUMBER 4031950-0501.	1-1

RECEIVER CASE A1

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A1		RECEIVER CASE:MFR 06845 PART NUMBER 4032286-0501.	7-1
A1J23		CONNECTOR,RECEPTACLE,ELECTRICAL:1 CONTACT, COAXIAL,0.812IN.DIA.X1.625IN.THK;MFR 95712 PART NUMBER 33417,06845 DWG 4030755-07C1.	7-1
A1J24		CONNECTOR,RECEPTACLE,ELECTRICAL:1 CONTACT, COAXIAL,0.687IN.X0.687IN.X1.250IN.THK; MFR 91737 PART NUMBER 15808,06845 DWG 4030754-0703.	7-1
A1J25		CONNECTOR,RECEPTACLE,ELECTRICAL:1 CONTACT, COAXIAL,0.812IN.DIA.X1.625IN.THK;MFR 95712 PART NUMBER 33417,06845 DWG 4030755-07C1.	7-1
A1MP1		CAP,CONNECTOR:FOR J24;MIL TYPE M39012-25-00	7-1
A1MP2		CAP,CONNECTOR:FOR J25;MIL TYPE MX913U.	7-1
A1MP3		SLIDE,DRAWER,EXTENSION:RIGHT HAND;MFR 83508 06845 DWG 4032393-0702.	7-1
A1MP4		SLIDE,DRAWER,EXTENSION:LEFT HAND;MFR 83508, 06845 DWG 4032393-0701.	7-1
A1MP5 THRU A1MP8		BRACKET,SLIDE:5.26IN.X2.00IN.;AL ALY;MFR 06845 PART NUMBER 4032497-0501.	7-1
A1MP9		SHAFT,INTERLOCK:0.187IN.DIA X1759IN.LG;CRES PASSIVATION;MFR 06845 PART NUMBER 4031910-0C01.	7-2
A1MP10		SPRING,COMPRESSION:0.268IN.OD,0.218IN.ID X 1.25IN.LG;12 TURNS;CRES,PASSIVATION;MFR 06845 PART NUMBER 4031911-0001.	7-2
A1MP11 AND A1MP12		ADAPTER,SWITCH ACTUATOR;MFR 91929 PART NUMBER JS31,06845 DWG 4031919-0701.	7-2
A1MP13		PIN:MIL TYPE MS171439.	7-2
A1P1		CONNECTOR,RECEPTACLE,ELECTRICAL:25 CONTACTS, PIN INSERT;1.213IN.X0.494IN.X0.641IN.THK; MFR 91146 PART NUMBER DDMAM50S,06345 DWG 4032279-0704.	7-1
A1P2		CONNECTOR,RECEPTACLE,ELECTRICAL:3 COAXIAL CONTACTS,1.541IN.X0.494IN.X0.663IN.THK; MFR 91146 PART NUMBER DAMMF3W3S,06845 DWG 4032484-0704.	7-1
A1P2A1 THRU A1P2A3		CONNECTOR,RECEPTACLE,ELECTRICAL:ITEM 44	7-1
A1S1A		SWITCH:MIL TYPE MS25085-2.	7-2
A1S1B		SWITCH:MIL TYPE MS25085-2.	7-2
A1S2A		SWITCH:MIL TYPE MS25085-2.	7-2
A1S2B		SWITCH:MIL TYPE MS25085-2:	7-2

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FILTER BOX ASSEMBLY A1A1

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A1A1		FILTER BOX ASSEMBLY:MFR 06845 PART NUMBER	7-3
A1A1		4032289-0501.	
A1A1C1 THRU A1A1C26		CAPACITOR:ITEM 4	7-3
A1A1J1 AND A1A1J2		NOT USED.	
A1A1J3		CONNECTOR,RECEPTACLE,ELECTRICAL:3 CONTACTS, PIN.INSERT;1.375IN.X1.375IN.X0.968IN.THK; MFR 77820 PART NUMBER 71-74116-5P,06845 DWG 4032476-0703.	7-3
A1A1J4		CONNECTOR,RECEPTACLE,ELECTRICAL:39 CONTACTS, PIN INSERT;1.812IN.X1.812IN.X1.040IN.THK; MFR 77820 PART NUMBER PT07A20-39,06845 DWG 4032477-0701.	7-3
A1A1J5 AND A1A1J6		CONNECTOR,RECEPTACLE,ELECTRICAL:2 CONTACTS, PIN INSERT;1.000IN.X1.000IN.X0.968IN.THK; MFR 77820 PART NUMBER 71-74111-4P,06845 DWG 4032476-0701.	7-3

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2		RECEIVER MAIN FRAME:MFR 06845 PART NUMBER 4032353-0501. (ATTACHING PARTS)C(5)H(1)	
A2C1		CAPACITOR,FIXED,ELECTROLYTIC:1.280IN.DIA X 2.500IN.LG;120 UF +75 -10%,150WVDC;MFR 56289 PART NUMBER D11791,06845 DWG 4031976-0701.	7-94
A2C2		CAPACITOR,FIXED,ELECTROLYTIC:360 UF +100 -10%,50WVDC;MIL TYPE CE51C361G.	7-94
A2C3		CAPACITOR:ITEM 21.	7-94
A2CR1 THRU A2CR4		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N649.	7-94
A2CR5		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-4
A2CR6 AND A2CR7		NOT USED.	
A2CR8		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-4
A2DS1 AND A2DS2		NOT USED.	
A2DS3 AND A2DS4		LAMP:MIL TYPE MS18209-387.	7-4
A2DS5		LAMP:MIL TYPE MS25252C9A.	7-4
A2E1 AND A2E2		TERMINAL:ITEM 104.	7-4
A2E3		TERMINAL:ITEM 101.	7-4
A2E4 THRU A2E8		TERMINAL:ITEM 104.	7-4
A2E9		TERMINAL:ITEM 101.	7-94
A2E10		TERMINAL:ITEM 104.	7-94

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2E11 THRU A2E20		TERMINAL:ITEM 101.	7-94
A2E21		TERMINAL:ITEM 102.	7-94
A2E22 AND A2E23		TERMINAL:ITEM 101.	7-94
A2E24		NOT USED.	
A2E25		TERMINAL:ITEM 104.	7-94
A2E26		TERMINAL:ITEM 101.	7-94
A2E27		TERMINAL:ITEM 104.	7-94
A2E28		TERMINAL:ITEM 102.	7-94
A2E29 AND A2E30		TERMINAL:ITEM 101.	7-94
A2E31 AND A2E32		TERMINAL:ITEM 102.	7-94
A2E33 AND A2E34		TERMINAL:ITEM 101.	7-94
A2E35		TERMINAL:ITEM 104.	7-94
A2E36 AND A2E37		TERMINAL:ITEM 101.	7-94
A2E38 AND A2E39		TERMINAL:ITEM 102.	7-94
A2E40 AND A2E41		TERMINAL:ITEM 104.	7-94
A2E42		TERMINAL:ITEM 102.	7-94
A2E43		TERMINAL:ITEM 101.	7-94
A2F1 AND A2F2		FUSE:3/4 AMP;MIL TYPE F02B250V3-4AS.	7-4
A2FL1 AND A2FL2		FILTER,R F:0.670IN.DIA X1.250IN.LG;60 HZ MFR 56289 PART NUMBER 1JX97,06845 DWG 4032365-0701.	7-94
A2J1 AND A2J2		CONNECTOR:MIL TYPE M641-12-1.	7-4
A2J3 AND A2J4		NOT USED.	
A2J8		CONNECTOR,RECEPTACLE,ELECTRICAL:25 CONTACTS, 1.213IN.X0.494IN.X0.648IN.THK;MFR 91146 PART NUMBER DBMAM25S,06845 DWG 4032279-0702.	7-4
A2J21		CONNECTOR,RECEPTACLE,ELECTRICAL:50 CONTACTS, PIN INSERT;1.541IN.X0.494IN.X0.641IN.THK; MFR 91146 PART NUMBER DDMAM50P,06845 DWG 4032779-0703.	7-4
A2J22		CONNECTOR,ELECTRICAL:1.541IN.LG X0.494IN.W X0.422IN.H;MFR 91146 PART NUMBER DAM3W3P, 06845 DWG 4032484-0701.	7-94
A2K1 THRU A2K3		RELAY,ELECTRICAL:DPDT,2 AMP;MIL TYPE M5757-10-35.	7-94

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2L1		REACTOR:2.625IN.LG X1.688IN.W X4.500IN.H; INDUCTANCE 15 H,175 VOLTS;MFR 70674 PART NUMBER A14514,06845 DWG 4032364-0701.	7-94
A2L2		REACTOR:4.125IN.LG X2.500IN.W X4.375IN.H; INDUCTANCE 400 MILLIHENRYS,140 VOLTS;MFR 93928 PART NUMBER 16300,06845 DWG 4030645-0701.	7-94
A2L3		COIL, RF : MIL TYPE MS90537-30	7-94
A2M1		METER,ELECTRICAL INDICATING,SPECIAL DECIBEL: MFR 81030 PART NUMBER 9-0163-049,06845 DWG 4010016-0701.	7-4
A2MP1 AND A2MP2		KNOB ASSEMBLY:1.500IN.DIA X1.090IN.THK; PLASTIC;MFR 06845 PART NUMBER 2058802-0501.	7-4
A2MP3 THRU A2MP5		KNOB ASSEMBLY:1.500IN.DIA X1.090IN.THK; PLASTIC;MFR 06845 PART NUMBER 2058802-0502.	7-4
A2MP6 AND A2MP7		KNOB:MIL TYPE MS91528-1D2BC.	7-4
A2MP8 AND A2MP9		KNOB,CONTROL:PLASTIC;MODIFIED MS91528-1D2B; MFR 06845 PART NUMBER 2058965-0001.	7-4
A2MP10		KNOB ASSEMBLY:MFR 06845 PART NUMBER 4032100-0501.	7-4
A2MP11		KNOB:MIL TYPE MS91528-1K2B.	7-4
A2MP12 AND A2MP13		DIAL ASSEMBLY,MC:MFR 06845 PART NUMBER 4032374-0501.	7-4
A2MP14		SPROCKET ASSEMBLY,TRIPLE:MFR 06845 PART NUMBER 4032177-0501.	7-5
A2MP14A		BRACKET,SPROCKET:AL ALY,CHEM FILM;MFR 06845 PART NUMBER 4032198-0001.	7-5
A2MP14B THRU A2MP14G		BEARING:ITEM 1.	7-5
A2MP14H THRU A2MP14J		SPROCKET WHEEL:1.463IN.DIA X0.094IN.THK; CRES,PASSIVATE;30 TEETH;MFR 06845 PART NUMBER 4030801-0701.	7-5
A2MP14K THRU A2MP14M		DISK:ITEM 45.	7-5
A2MP14N THRU A2MP14Q		WASHER:ITEM 116.	7-5
A2MP14R THRU A2MP14W		RING;RETAINING:ITEM 95.	7-5
A2MP14X AND A2MP14Y		SHAFT,COUPLING:0.1874IN.DIA X1.115IN.LG; CRES,PASSIVATION;MFR 06845 PART NUMBER 4032196-0501.	7-5
A2MP14Z THRU A2MP14AB		RING,RETAINING:0.472IN.OD,0.382IN.ID X0.025 IN.THK;CS,CD PL;MFR 76665 PART NUMBER TRC320,06845 DWG 4032150-0701.	7-5
A2MP14AC THRU A2MP14AE		CLAMP:ITEM 37	7-5

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2MP14AF		SHAFT,COUPLING:0.1874IN.DIA X1.38IN.LG;CRES PASSIVATION;MFR 06845 PART NUMBER 4032197-0501.	7-5
A2MP15		SPROCKET ASSEMBLY,DUAL:MFR 06845 PART NUMBER 4032178-0501.	7-6
A2MP15A		BRACKET,SPROCKET:AL ALY,CHEM FILM;MFR 06845 PART NUMBER 4030872-0501.	7-6
A2MP15B AND A2MP15C		SHAFT,COUPLING:0.1874IN.DIA X1.38IN.LG;CRES PASSIVATION;MFR 06845 PART NUMBER 4032197-0501.	7-6
A2MP15D AND A2MP15E		SPROCKET WHEEL:1.463IN.DIA X0.281IN.THK;30 TEETH;CRES,PASSIVATION;MFR 06845 PART NUMBER 4030777-0701.	7-6
A2MP15F AND A2MP15G		WASHER:ITEM 116.	7-6
A2MP15H THRU A2MP15L		BEARING:ITEM 1.	7-6
A2MP15M AND A2MP15N		DISK:ITEM 45.	7-6
A2MP15P THRU A2MP15S		SPACER:0.188IN.OD,0.120IN.ID X0.250IN.LG; AL ALY,CHEM FILM;MFR 06845 PART NUMBER 4030905-0006.	7-6
A2MP15T AND A2MP15U		BEARING,ROLLER,NEEDLE:0.34IN.OD,0.19IN.ID X 0.25IN.THK;STEEL;MFR 60380 PART NUMBER B34,06845 DWG 4032157-0701.	7-6
A2MP15V AND A2MP15W		PIN,ROLLER:0.1875IN.DIA X0.400IN.LG;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032132-0002.	7-6
A2MP15X AND A2MP15Y		ARM:2.14IN.LG X0.300IN.W X0.050IN.THK;BE CUP,NP;MFR 06845 PART NUMBER 4030879-0001	7-6
A2MP15Z AND A2MP15AA		WHEEL,INDEX:1.500IN.DIA X0.062IN.THK;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032201-0001.	7-6
A2MP15AB AND A2MP15AC		NOT USED	
A2MP15AD AND A2MP15AE		CLAMP:ITEM 37	7-6
A2MP16		BLOCK ASSEMBLY,ADJUSTABLE IDLER:MFR 06845 PART NUMBER 4032373-0501.	7-94
A2MP16A		SHAFT,SPROCKET IDLER:0.500IN.DIA,0.1875IN. DIA,0.1268IN.DIA X0.64IN.LG;CRES, PASSIVATION;MFR 06845 PART NUMBER 4030371-0001.	7-94
A2MP16B		SPROCKET WHEEL:1.152IN.DIA X0.268IN.THK; CRES,PASSIVATION;MFR 72625 PART NUMBER 06845 DWG 4030779-0701.	7-94
A2MP16C		BEARING,ROLLER,NEEDLE:0.34IN.OD,0.19IN.ID X 0.25IN.THK;STEEL;MFR 60380 PART NUMBER B34,06845 DWG 4032157-0701.	7-94
A2MP17		BLOCK ASSEMBLY,ADJUSTABLE IDLER:MFR 06845 PART NUMBER 4032373-0501.	7-94

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2MP17A		SHAFT,SPROCKET IDLER:0.500IN.DIA,0.187IN. DIA,0.1263IN.DIA X0.64IN.LG;CRES, PASSIVATION;MFR 06845 PART NUMBER 4030871-0001.	7-94
A2MP17B		SPROCKET WHEEL:1.182IN.DIA X0.268IN.THK; CRES,PASSIVATION;MFR 72625 PART NUMBER 06845 DWG 4030779-0701.	7-94
A2MP17C		BEARING,ROLLER,NEEDLE:0.34IN.OD,0.19IN.ID X 0.25IN.THK;STEEL;MFR 60380 PART NUMBER B34,06845 DWG 4032157-0701.	7-94
A2MP18		BLOCK ASSEMBLY,ADJUSTABLE IDLER:MFR 06845 PART NUMBER 4032373-0502.	7-94
A2MP18A		SHAFT,SPROCKET IDLER:0.500IN.DIA,0.1875IN. DIA,0.1263IN.DIA X0.64IN.LG;CRES, PASSIVATION;MFR 06845 PART NUMBER 4030871-0001.	7-94
A2MP18B		SPROCKET WHEEL:1.182IN.DIA X0.268IN.THK; CRES,PASSIVATION;MFR 72625 PART NUMBER 06845 DWG 4030779-0701.	7-94
A2MP18C		BEARING,ROLLER,NEEDLE:0.34IN.OD,0.19IN.ID X 0.25IN.THK;STEEL;MFR 60380 PART NUMBER B34,06845 DWG 4032157-0701.	7-94
A2MP19		CHAIN,ROLLER:20.064IN.LG:SST,PASSIVATE;MFR 72625 PART NUMBER 06845 DWG 4032155-0701.	7-94
A2MP20		CHAIN,ROLLER:30.385IN.LG:SST,PASSIVATE;MFR 72625 PART NUMBER 06845 DWG 4032155-0703.	7-94
A2MP21		CHAIN,ROLLER:23.600IN.LG:SST,PASSIVATE;MFR 72625 PART NUMBER 06845 DWG 4032155-0702.	7-94
A2MP22 AND A2MP23		NOT USED.	
A2MP24 AND A2MP25		SPRING,DETENT SUB ASSEMBLY:MFR 06845 PART NUMBER 4032225-0501.	7-4
A2MP26 AND A2MP27		PIN,ROLLER:0.1562IN.DIA X0.40IN.LG;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032132-0001.	7-4
A2MP28 AND A2MP29		BEARING,ROLLER,NEEDLE:0.28IN.OD,0.16IN.ID X 0.25IN.THK;STEEL;MFR 60380 PART NUMBER B2-1-2-4,06845 DWG 4032157-0702.	7-4
A2MP30 THRU A2MP32		GEAR SET,BEVEL MATCHED:CRES,PASSIVATION, 32 TEETH;MFR 00141 PART NUMBER N2-1,06845 DWG 4030781-0701.	7-4
A2MP33 THRU A2MP35		SPROCKET WHEEL:1.463IN.DIA X0.269IN.THK; CRES,PASSIVATION;MFR 06845 PART NUMBER 4030778-0702.	7-4
A2MP36 THRU A2MP38		SHAFT,SUPPORT BRACKET GEAR:0.1874IN.DIA X 2.062IN.LG;CRES,PASSIVATION:MFR 06845 PART NUMBER 4030873-0001.	7-4
A2MP39 AND A2MP40		NOT USED.	
A2MP41		DETENT,SHAFT:1.25IN.DIA,0.539IN.DIA X2.328 IN.LG;MFR 76854 TYPE "H"BASE FRAME,06845 DWG 4032354-0701.	7-4

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2MP42 AND A2MP43		SHAFT,FEED THRU:0.625IN.DIA X2.296IN.LG; CRES;MFR 06845 PART NUMBER 4030788-0701.	7-4
A2MP44 THRU A2MP46		DIAL:2.55IN.DIA X0.804IN.THK;CELLULOSE ACETATE BUTYRATE;MFR 06845 PART NUMBER 4010034-0001.	7-4
A2MP47 THRU A2MP49		BEARING,BALL,ANNULAR:0.422IN.OD,0.1875IN.ID X0.125IN.THK;SST,PASSIVATE;MFR 40920 PART NUMBER B972,06845 DWG 4018589-0701.	7-4
A2MP50 THRU A2MP55		BEARING:ITEM 1	7-4
A2MP56		PLATE:0.912IN.LG X0.624IN.W X0.094IN.THK; CRES,PASSIVATE;MFR 06845 PART NUMBER 4013364-0001.	7-4
A2MP57		PLATE:0.960IN.LG X0.531IN.W X0.094IN.THK; CRES,PASSIVATE;MFR 06845 PART NUMBER 4013365-0001.	7-4
A2MP58		INDICATOR LIGHT:MIL TYPE LC13YN2.	7-4
A2MP59		PANEL,LIGHT:12.44IN.LG X0.860IN.W0.150IN. THK;PLASTIC;MFR 06845 PART NUMBER 40100004-0001.	7-4
A2MP60		KNOB:MFR 06845 PART NUMBER 2058804-0001.	7-4
A2MP61		KNOB,CONTROL:2.05IN.DIA X0.38IN.THK;PLASTIC MFR 06845 PART NUMBER 2058964-0701.	7-4
A2MP62 THRU A2MP65		NOT USED.	
A2MP66 AND A2MP67		BUSHING,SHAFT,PANEL:0.688IN.OD,0.2502IN.ID X0.500IN.LG;BRONZE,CAD PL;MFR 06845 PART NUMBER 2058974-0001.	7-4
A2MP68 AND A2MP69		COVER,JACK:1.125IN.LG X0.880IN.W X0.440IN. THK;CRES,GRAY ENAMEL;MFR 82389 PART NUMBER 520,06845 DWG 4031933-0701.	7-4
A2MP70 AND A2MP71		KNOB:MIL TYPE MS91528-0N1B.	7-4
A2MP72 AND A2MP73		BOOT:MIL TYPE MS423-09-02.	7-4
A2MP74		DIAL,SCALE:2.55IN.DIA X0.22IN.THK;CELLULOSE ACETATE BUTYRATE;MFR 06845 PART NUMBER 2058967-0001.	7-4
A2MP75		SPRING CLAMP:1.88IN.LG X0.62IN.W X0.0149IN. THK;STEEL,CAD PL;MFR 06845 PART NUMBER 4030898-0001.	7-94
A2Q1		TRANSISTOR:MIL TYPE 2N3442.	7-94
A2R1/R4		RESISTOR,VARIABLE,DUAL:1K OHMS,2W;2.5 OHMS 0.83W;MFR 01121 PART NUMBER JJC96513, 06845 DWG 4010009-0701.	7-4
A2R2/R5		RESISTOR,VARIABLE,DUAL:1K OHMS,2W;2.5 OHMS 0.83W;MFR 01121 PART NUMBER JJC96513, 06845 DWG 4010009-0701.	7-4
A2R3		RESISTOR,VARIABLE:1K OHMS,2W;MIL TYPE RV4SAYSD102A.	7-4
A2R6		RESISTOR,VARIABLE:25K OHMS,2W;MIL TYPE RV4SAYSD253A.	7-4
A2R7		NOT USED.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2R8		RESISTOR,FIXED,WIRE WOUND:332 OHMS PORM 1%, 5W;MIL TYPE RER60F3320M.	7-94
A2R9 AND A2R10		RESISTOR:ITEM 50.	7-4
A2R11 THRU A2R13		NOT USED.	
A2R14		RESISTOR,FIXED,FILM:430 OHMS PORM 5%,1/4W; MIL TYPE RLR07C431JR.	7-4
A2R15 THRU A2R18		NOT USED.	
A2R19		RESISTOR:ITEM 46.	7-4
A2R20		RESISTOR,FIXED,FILM:13K OHMS PORM 5%,2W; MIL TYPE RL42S133J.	7-94
A2R21 AND A2R22		NOT USED.	
A2R23		RESISTOR,FIXED,WIRE WOUND:64.9 OHMS PORM 1% 10W;MIL TYPE RER65F64R9M.	7-94
A2S1		SWITCH:MIL TYPE MS24656-211.	7-4
A2S2		SWITCH,ROTARY:1.500IN.DIA X1.738IN.LG; 4 SECTIONS,8 POSITION;2 AMPS AT 28VOLTS DC,1 AMP AT 110 VOLTS AC;MFR 76854 PART NUMBER 276779K4,06845 DWG 4030821-0701.	7-4
A2S3		SWITCH,ROTARY:1.438IN.DIA X0.375IN.LG; 1 SECTION,3 POSITION;MFR 76854 PART NUMBER 5-21342-211,06845 DWG 4010003-0701.	7-4
A2S4 THRU A2S8		NOT USED.	
A2S9		SWITCH:MIL TYPE MS24656-231.	7-94
A2T1		TRANSFORMER,POWER STEP DOWN AND STEP UP: 2.75IN.X3.438IN.X4.50IN.;WORKING VOLTAGE 215;MFR 28994 PART NUMBER BE2484,06845 DWG 4032250-0701.	7-94
A2W1 THRU A2W18		NOT USED	
A2W19	2	CABLE ASSEMBLY,R F:12.25IN.LG;MFR 06845 PART NUMBER 4010040-0501.	7-94
A2W19P1 AND A2W19P2	2	CONNECTOR:ITEM 44.	7-94
A2W20	2	CABLE ASSEMBLY,R F:9.50IN.;MFR 06845 PART NUMBER 4010040-0502.	7-94
A2W20P1 AND A2W20P2	2	CONNECTOR:ITEM 44.	7-94
A2W21	2	CABLE ASSEMBLY,R F:12.25IN.LG;MFR 06845 PART NUMBER 4010040-0503.	7-94
A2W21P1 AND A2W21P2	2	CONNECTOR:ITEM 44.	7-94
A2W22	2	CABLE ASSEMBLY,R F:9.75IN.LG;MFR 06845 PART NUMBER 4010040-0504.	7-94
A2W22P1	2	CONNECTOR:ITEM 44.	7-94

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2W22P2	2	CONNECTOR,PLUG,RIGHT ANGLE:0.734IN.X0.492IN. MFR 91146 PART NUMBER 318-11-99-285,06845 DWG 4032484-0731.	7-94
A2W23	2	CABLE ASSEMBLY,R F:12.25IN.LG;MFR 06845 PART NUMBER 4010040-0505.	7-94
A2W23P1 AND A2W23P2	2	CONNECTOR:ITEM 44.	7-94
A2W24	2	CABLE ASSEMBLY,R F:9.00IN.LG;MFR 06845 PART NUMBER 4010040-0506.	7-94
A2W24P1	2	CONNECTOR:ITEM 44.	7-94
A2W24P2		CONNECTOR,PLUG,RIGHT ANGLE:0.734IN.X0.492IN. MFR 91146 PART NUMBER 318-11-99-285,06845 DWG 4032484-0731.	7-94
A2W25	2	CABLE ASSEMBLY,R F:14.88IN.LG;MFR 06845 PART NUMBER 4032533-0508.	7-94
A2W25P1	2	CONNECTOR:ITEM 44.	7-94
A2W26	2	CABLE ASSEMBLY,R F:3.82IN.LG;MFR 06845 PART NUMBER 4032533-0509.	7-94
A2W26P1	2	CONNECTOR:ITEM 44.	7-94
A2W27	2	CABLE ASSEMBLY,R F:7.00IN.LG;MFR 06845 PART NUMBER 4010040-0507.	7-94
A2W27P1 AND A2W27P2	2	CONNECTOR:ITEM 44.	7-94
A2W28	2	CABLE ASSEMBLY,R F:7.12IN.LG;MFR 06845 PART NUMBER 4010040-0508.	7-94
A2W28P1 AND A2W28P2	2	CONNECTOR:ITEM 44.	7-94
A2W29	2	CABLE ASSEMBLY,R F:5.00IN.LG;MFR 06845 PART NUMBER 4010040-0509	7-94
A2W29P1 AND A2W29P2	2	CONNECTOR:ITEM 44.	7-94
A2W30	2	CABLE ASSEMBLY,R F:5.12IN.LG;MFR 06845 PART NUMBER 4010040-0510.	7-94
A2W30P1 AND A2W30P2	2	CONNECTOR:ITEM 44.	7-94
A2W31	2	CABLE ASSEMBLY,R F:4.12IN.LG;MFR 06845 PART NUMBER 4010040-0511.	7-94
A2W31P1 AND A2W31P2	2	CONNECTOR:ITEM 44.	7-94
A2W32	2	CABLE ASSEMBLY,R F:3.75IN.LG;MFR 06845 PART NUMBER 4010040-0512.	7-94
A2W32P1 AND A2W32P2	2	CONNECTOR:ITEM 44.	7-94
A2W33	2	CABLE ASSEMBLY,R F:4.18IN.LG;MFR 06845 PART NUMBER 4032533-0510.	7-94
A2W33P1	2	CONNECTOR,PLUG,RIGHT ANGLE:0.734IN.X0.492IN MFR 91146 PART NUMBER 318-11-99-285,06845 DWG 4032484-0731.	7-94
A2W34	2	CABLE ASSEMBLY,R F:9.75IN.LG;MFR 06845 PART NUMBER 4032533-0511.	7-94
A2W34P1	2	CONNECTOR:ITEM 44.	7-94

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MAIN FRAME A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2XA1P1		CONNECTOR,RECEPTACLE,ELECTRICAL:13 CONTACTS INCL.3 COAX,2.088IN.X0.494IN.X0.663IN.THK; MFR 91146 PART NUMBER DBMMR13W3S,06845 DWG 4032484-0713.	
A2XA1P2		CONNECTOR,RECEPTACLE,ELECTRICAL:9 CONTACTS INCL.4 COAX,2.088IN.X0.494IN.X0.663IN.THK; MFR 91146 PART NUMBER DBMMR9W4S,06845 DWG 4032484-0715.	7-94
A2XA2P1 AND A2XA3P1		CONNECTOR,RECEPTACLE,ELECTRICAL:25 CONTACTS INCL.3 COAX,2.729IN.X0.663IN.X0.663IN.THK; MFR 91146 PART NUMBER DCMMR25W3S,06845 DWG 4032484-0720.	7-94
A2XA4P1		CONNECTOR,RECEPTACLE,ELECTRICAL:15 CONTACTS, 1.541IN.X0.494IN.X0.648IN.THK;MFR 91146 PART NUMBER DAMAMR15S,06845 DWG 4032279-0706.	7-94
A2XA4P2		CONNECTOR,RECEPTACLE,ELECTRICAL:17 CONTACTS INCL.5 COAX,2.729IN.X0.494IN.X0.663IN.THK; MFR 91146 PART NUMBER DCMMR17W5S,06845 DWG 4032484-0721.	7-94
A2XA5P1		CONNECTOR,ELECTRICAL:2.729IN.LG X0.494IN.W X0.429IN.H;MFR 91146 PART NUMBER DCMF13W6S2,06845 DWG 4032484-0719.	7-94
A2XA6P1		CONNECTOR,RECEPTACLE,ELECTRICAL:25 CONTACTS INCL.3 COAX,2.729IN.X0.663IN.X0.663IN.THK; MFR 91146 PART NUMBER DCMMR25W3S,06845 DWG 4032484-0720.	7-94
A2XA6P2 AND A2XA6P3		CONNECTOR,ELECTRICAL:1.541IN.LG X0.494IN.W X0.429IN.H;MFR 91146 PART NUMBER DAMF3W3S2,06845 DWG 4032484-0705.	7-94
A2XC1 AND A2XC2		SOCKET,TUBE:MIL TYPE M12883-01-02.	7-94
A2XDS1 AND A2XDS2		NOT USED	
A2XDS3 AND A2XDS4		LIGHT,PANEL:1.125IN.LG X0.641IN.DIA;25VDC; MFR 72914 PART NUMBER A4921-4,06845 DWG 4032385-0701.	7-4
A2XDS5		LAMPHOLDER:MIL TYPE LH74-2.	7-4
A2XF1 AND A2XF2		FUSEHOLDER:MIL TYPE FHL17G1.	7-4

RECEIVER MODE SELECTOR ASSEMBLY A2A1

A2A1		RECEIVER MODE SELECTOR ASSEMBLY:MFR 06845 PART NUMBER 4031967-0501. (ATTACHING PARTS)J(2)	7-7
A2A1C1A	1	CAPACITOR:ITEM 9.	7-7
A2A1C1B	1	CAPACITOR:ITEM 10.	7-7
A2A1C1C	1	CAPACITOR:ITEM 12.	7-7
A2A1C2A		CAPACITOR:ITEM 9.	7-7
A2A1C2B	1	CAPACITOR:ITEM 10.	7-7
A2A1C2C	1	CAPACITOR:ITEM 12.	7-7
A2A1FL1 THRU A2A1FL3		FILTER,BAND PASS:0.437IN.DIA X2.250IN.LG; 500 KHZ;MFR 95105 PART NUMBER 526-9420-010,06845 DWG 4030784-0702.	7-7

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MODE SELECTOR ASSEMBLY A2A1

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A1MP1		CHASSIS ELECTRICAL EQUIPMENT:4.38IN.LG X 3.275IN.W X2.078IN.H;MFR 06845 PART NUMBER 4032471-0501.	7-7
A2A1MP2		COVER:4.406IN.LG X3.588IN.W;STEEL,CAP PL; MFR 06845 PART NUMBER 4032395-0501. (ATTACHING PART)E(1)	7-7
A2A1P1		CONNECTOR,PLUG,ELECTRICAL:2.088IN.LG X0.494 IN.W X0.426IN.THK;MFR 91146 PART NUMBER DBM13W3PF115,06845 DWG 4032484-0708.	7-7
A2A1P2		CONNECTOR,PLUG,ELECTRICAL:2.088IN.LG X0.494 IN.W X0.426IN.THK;MFR 91146 PART NUMBER DBM9W4PF115,06845 DWG 4032484-0712.	7-7
A2A1A1		MODE GATES SUBASSEMBLY:3.34IN.X3.80IN.;MFR 06845 PART NUMBER 4031947-0501.	7-8
A2A1A1C1		CAPACITOR:ITEM 7.	7-8
A2A1A1C2 AND A2A1A1C3		CAPACITOR:ITEM 11.	7-8
A2A1A1C4		CAPACITOR:ITEM 8.	7-8
A2A1A1C5A	1	CAPACITOR:ITEM 10.	7-8
A2A1A1C5B	1	CAPACITOR:ITEM 12.	7-8
A2A1A1C5C	1	CAPACITOR:ITEM 9.	7-8
A2A1A1C6		CAPACITOR:ITEM 7.	7-8
A2A1A1C7A	1	CAPACITOR:ITEM 12.	7-8
A2A1A1C7B	1	CAPACITOR:ITEM 9.	7-8
A2A1A1C7C	1	CAPACITOR:ITEM 10.	7-8
A2A1A1C8		CAPACITOR:ITEM 7.	7-8
A2A1A1C9A	1	CAPACITOR:ITEM 10.	7-8
A2A1A1C9B	1	CAPACITOR:ITEM 9.	7-8
A2A1A1C9C	1	CAPACITOR:ITEM 12.	7-8
A2A1A1C10		CAPACITOR:ITEM 11.	7-8
A2A1A1C11		CAPACITOR:ITEM 7.	7-8
A2A1A1C12A	1	CAPACITOR:ITEM 12.	7-8
A2A1A1C12B	1	CAPACITOR:ITEM 9.	7-8
A2A1A1C12C	1	CAPACITOR:ITEM 10.	7-8
A2A1A1C13 AND A2A1A1C14		CAPACITOR:ITEM 7.	7-8
A2A1A1C15 THRU A2A1A1C19		CAPACITOR:ITEM 8.	7-8
A2A1A1CR1 AND A2A1A1CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-8
A2A1A1CR3		SEMICONDUCTOR DEVICE,DIODE: MIL TYPE 1N758A	7-8
A2A1A1CR4		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-8
A2A1A1FL1 THRU A2A1A1FL3		SHIELDING BEAD, FERRITE: 0.138IN.OD x 0.047IN.ID x 0.118IN.LG; MFR 78488 PART NUMBER 57-0180, 06845 DWG 2053852-0701	7-8
A2A1A1Q1 THRU A2A1A1Q3		TRANSISTOR:ITEM 115.	7-8
A2A1A1R1		RESISTOR:ITEM 54.	7-8
A2A1A1R2 AND A2A1A1R3		RESISTOR:ITEM 49.	7-8
A2A1A1R4 AND A2A1A1R5		RESISTOR:ITEM 93.	7-8

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MODE SELECTOR ASSEMBLY A2A1

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A1A1R6		RESISTOR,FIXED,FILM:2K OHMS PORM 5%,1/4W; MIL TYPE RLR07C202JR.	7-8
A2A1A1R7 THRU A2A1A1R9		RESISTOR:ITEM 44.	7-8
A2A1A1R10		RESISTOR:ITEM 60.	7-8
A2A1A1R11		RESISTOR:ITEM 74.	7-8
A2A1A1R12			
A2A1A1R13		RESISTOR:FIXED,FILM:5.1K OHMS PORM 5%,1/4W; MIL TYPE RLR07C512JR.	7-8
A2A1A1R14		RESISTOR:ITEM 54.	7-8
A2A1A1R15		RESISTOR:ITEM 93.	7-8
A2A1A1R16 THRU A2A1A1R19		RESISTOR:ITEM 49.	7-8
A2A1A1R20		RESISTOR,FIXED,FILM:2K OHMS PORM 5%,1/4W; MIL TYPE RLR07C202JR.	7-8
A2A1A1R21		RESISTOR:ITEM 93.	7-8
A2A1A1R22		RESISTOR,FIXED,FILM:2K OHMS PORM 5%,1/4W; MIL TYPE RLR07C202JR.	7-8
A2A1A1R23		RESISTOR:ITEM 93.	
A2A1A1R24 AND A2A1A1R25		RESISTOR:ITEM 47.	7-8 7-8
A2A1A1TP1		CONNECTOR:ITEM 41.	7-8
A2A1A2		GATE,500 KHZ SUBASSEMBLY:3.44IN.LG X1.58IN.W X0.40IN. THK;MFR 06845 PART NUMBER 4032338-0501.	7-9
A2A1A2C1 THRU A2A1A2C4		CAPACITOR:ITEM 23.	7-9
A2A1A2CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 93.	7-9
A2A1A2R1		RESISTOR,FIXED,FILM:910 OHMS PORM 5%,1/2W; MIL TYPE RLR20C911JR.	7-9
A2A1A2R2 AND A2A1A2R3		RESISTOR:ITEM 58.	7-9
A2A1A2R4		RESISTOR:ITEM 46.	7-9
A2A1A2R5		RESISTOR,FIXED,FILM:510 OHMS PORM 5%,1/2W; MIL TYPE RLR20C511JR.	7-9
A2A1A2R6		RESISTOR:ITEM 93.	7-9
A2A1A3		BEAT FREQUENCY OSCILLATOR SUBASSEMBLY: 3.44IN.LG X1.58 IN.W X0.80IN.THK; MFR 06845 PART NUMBER 4031949-0501.	7-10
A2A1A3C1		CAPACITOR,FIXED,DIELECTRIC:0.42IN.LG X0.29 IN.W X0.17IN.THK;0.01 UF PCRM 20%,100WVDC MFR 99515 PART NUMBER EP36D1,06845 DWG 4032429-0701.	7-10
A2A1A3C2		CAPACITOR,FIXED,MICA:3000 PF PORM 2%,500 WVDC;MIL TYPE CM06FD302GP3.	7-10
A2A1A3C3		CAPACITOR,FIXED,CERAMIC:91 PF PORM 5%,500 WVDC;MIL TYPE CC52TH910J.	7-10
A2A1A3C4		CAPACITOR,FIXED,MICA:220 PF PORM 1%,500WVDC MIL TYPE CM05FD221FP3.	7-10
A2A1A3C5		CAPACITOR,FIXED,MICA:820 PF PORM 1%,500WVDC MIL TYPE CM06FD821FP3.	
A2A1A3C6		CAPACITOR,FIXED,MICA:3000 PF PORM 2%,500 WVDC;MIL TYPE CM06FD302GP3.	7-10

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER MODE SELECTOR ASSEMBLY A2A1

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A1A3C7 AND A2A1A3C8		CAPACITOR,FIXED,DIELECTRIC:0.42IN.LG X0.29 IN.W X0.17IN.THK;0.01 UF PCRM 20%,100WVDC MFR 99515 PART NUMBER EP36D1,06845 DWG 4032429-0701.	7-10
A2A1A3C9		CAPACITOR,FIXED,MICA:910 PF PORM 2%,500WVDC MIL TYPE CM06FD911GP3.	7-10
A2A1A3CR1		SEMICONDUCTOR DEVICE,DIODE,VARACTOR:MFR 04713 PART NUMBER 1N954,06845 DWG 4031991-0701.	7-10
A2A1A3L1		COIL,R F VARIABLE:0.400IN.DIA X0.500IN.H; 470 UH;MFR 72259 PART NUMBER V1H470,06845 DWG 4030767-0701.	7-10
A2A1A3Q1 AND A2A1A3Q2		TRANSISTOR:ITEM 106.	7-10
A2A1A3R1		RESISTOR:ITEM 64.	7-10
A2A1A3R2		RESISTOR:ITEM 61.	7-10
A2A1A3R3		RESISTOR,FIXED,FILM:20K OHMS PORM 5%,1/4W; MIL TYPE RLR07C203JR.	7-10
A2A1A3R4		RESISTOR:ITEM 61.	7-10
A2A1A3R5		RESISTOR:ITEM 53.	7-10
A2A1A3R6		RESISTOR:ITEM 60.	7-10
A2A1A3R7		RESISTOR:ITEM 51.	7-10
A2A1A3R8		RESISTOR:ITEM 63.	7-10
A2A1A3R9		RESISTOR:ITEM 47.	7-10
A2A1A3R10		RESISTOR:ITEM 70.	7-10
A2A1A3R11		RESISTOR,FIXED,FILM:910 OHMS PORM 5%,1/4W; MIL TYPE RLR07C911JR.	7-10
A2A1A3R12		RESISTOR:ITEM 93.	7-10
A2A1A3T1		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.H; 0.500 MHZ;CAP 927 PF PORM 5%;MFR 93292 PART NUMBER 500-2384,06845 DWG 4032522-0701.	7-10
A2A1A3TP1		CONNECTOR:ITEM 41.	7-10

RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A2		RECEIVER IF/AUDIO ASSEMBLY: 4.42IN.LG X2.17IN.W X4.40 IN.H;MFR 06845 PART NUMBER 4031968-0501. (ATTACHING PARTS)J(2)	7-11
A2A2MP1		CHASSIS ELECTRICAL EQUIPMENT:4.350IN.LG X 4.327IN.W X2.078IN.H;MFR 06845 PART NUMBER 4032415-0501.	7-11
A2A2MP2		COVER:4.337IN.LG X2.088IN.W;AL ALY;CHEM FILM;MFR 06845 PART NUMBER 4032414-0501. (ATTACHING PARTS)E(2)	7-11
A2A2P1		CONNECTOR,RECEPTACLE,ELECTRICAL:2.729IN.LG X0.494IN.W X0.426IN.THK;MFR 91146 PART NUMBER DCM25W3P,06845 DWG 4032484-0716.	7-11
A2A2T1		TRANSFORMER,AUDIO FREQUENCY:1.187IN.LG X 0.875IN.W X1.000IN.H;MFR 01961 PART NUMBER PE9333,06845 DWG 4032121-0701.	7-11
A2A2A1		AGC AUDIO AMPLIFIER SUBASSEMBLY:3.68IN.LG X2.57IN.W X0.63IN.THK;MFR 06845 PART NUMBER 4031932-0501.	7-12
A2A2A1C1		CAPACITOR,FIXED,ELECTROLYTIC:22 UF PCRM 20% 15WVDC;MIL TYPE M39003-01-2032.	7-12

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A2A1C2		CAPACITOR:ITEM 14.	7-12
A2A2A1C3		CAPACITOR,FIXED,CERAMIC:47000 PF PORM 10%, 200WVDC;MIL TYPE CK06BX473K.	7-12
A2A2A1C4		CAPACITOR,FIXED,CERAMIC:47000 PF PORM 20%, 200WVDC;MIL TYPE CK06BX473M.	7-12
A2A2A1C5		CAPACITOR,FIXED,ELECTROLYTIC:6.8 UF PORM 10%,6WVDC;MIL TYPE M39003-01-2002.	7-12
A2A2A1C6		CAPACITOR:ITEM 20.	7-12
A2A2A1C7		CAPACITOR,FIXED,CERAMIC:22000 PF PORM 20%, 200WVDC;MIL TYPE CK06BX223M.	7-12
A2A2A1C8		CAPACITOR:ITEM 18.	7-12
A2A2A1C9		CAPACITOR,FIXED,CERAMIC:47000 PF PORM 20%, 200WVDC;MIL TYPE CK05BX473M.	7-12
A2A2A1C10		CAPACITOR:ITEM 18.	7-12
A2A2A1C11		CAPACITOR:ITEM 3.	7-12
A2A2A1C12 AND A2A2A1C13		NOT USED	
A2A2A1C14		CAPACITOR,FIXED,ELECTROLYTIC:33 UF PORM 20% 10WVDC;MIL TYPE M39003-01-2018.	7-12
A2A2A1C15		CAPACITOR,FIXED,CERAMIC: 0.33 UF PORM 20%, 100WVDC;MIL TYPE CK06BX334M.	7-12
A2A2A1C16		CAPACITOR:ITEM 20.	7-12
A2A2A1CR1 AND A2A2A1CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-12
A2A2A1CR3		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N645.	7-12
A2A2A1CR4 AND A2A2A1CR5		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-12
A2A2A1Q1 AND A2A2A1Q2		TRANSISTOR:ITEM 106.	7-12
A2A2A1Q3 AND A2A2A1Q4		TRANSISTOR:MIL TYPE 2N930.	7-12
A2A2A1Q5		TRANSISTOR:ITEM 115.	7-12
A2A2A1Q6		TRANSISTOR:MIL TYPE 2N328A.	7-12
A2A2A1Q7 AND A2A2A1Q8		TRANSISTOR:ITEM 114.	7-12
A2A2A1Q9 THRU A2A2A1Q12		TRANSISTOR:ITEM 115.	7-12
A2A2A1Q13 AND A2A2A1Q14		TRANSISTOR:MIL TYPE 2N2907.	7-12
A2A2A1Q15		TRANSISTOR:ITEM 115.	7-12
A2A2A1R1		RESISTOR:ITEM 92.	7-12
A2A2A1R2		RESISTOR:ITEM 60.	7-12
A2A2A1R3		RESISTOR:ITEM 66.	7-12
A2A2A1R4		RESISTOR:ITEM 52.	7-12
A2A2A1R5		RESISTOR:ITEM 85.	7-12
A2A2A1R6		RESISTOR,VARIABLE,WIRE WOUND:1K OHMS,3/4W; MIL TYPE RT22C2X102.	7-12
A2A2A1R7		RESISTOR:ITEM 55.	7-12
A2A2A1R8		**RESISTOR,FIXED,FILM:620 OHMS PORM 5%,1/4W; MIL TYPE RLR07C621JR.**	**7-12**

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A2A1R9 AND A2A2A1R10		RESISTOR:ITEM 60.	7-12
A2A2A1R11		RESISTOR,FIXED,FILM:7.5K OHMS PORM 5%,1/4W; MIL TYPE RLR07C752JR.	7-12
A2A2A1R12		RESISTOR:ITEM 94.	7-12
A2A2A1R13		RESISTOR,FIXED,COMPOSITION:470K OHMS PORM 5%,1/4W;MIL TYPE RCR07G474JR.	7-12
A2A2A1R14		RESISTOR:ITEM 58.	7-12
A2A2A1R15		RESISTOR,FIXED,FILM:3.6K OHMS PORM 5%,1/4W; MIL TYPE RLR07C362JR.	7-12
A2A2A1R16		RESISTOR:ITEM 83.	7-12
A2A2A1R17		RESISTOR:ITEM 94.	7-12
A2A2A1R18		RESISTOR:ITEM 55.	7-12
A2A2A1R19		RESISTOR,FIXED,COMPOSITION:330K OHMS PORM 5%,1/4W;MIL TYPE RCR07G334JS.	7-12
A2A2A1R20		RESISTOR:ITEM 51.	7-12
A2A2A1R21		RESISTOR:ITEM 67.	7-12
A2A2A1R22		RESISTOR:ITEM 94.	7-12
A2A2A1R23		RESISTOR:ITEM 46.	7-12
A2A2A1R24		RESISTOR,FIXED,FILM:200K OHMS PORM 5%,1/4W; MIL TYPE RLR07C204JR.	7-12
A2A2A1R25		RESISTOR,VARIABLE,WIRE WOUND:5K OHMS,3/4W; MIL TYPE M39015-1-006PM.	7-12
A2A2A1R26		RESISTOR:ITEM 94.	7-12
A2A2A1R27		RESISTOR:ITEM 61.	7-12
A2A2A1R28		RESISTOR:ITEM 94.	7-12
A2A2A1R29		RESISTOR:ITEM 48.	7-12
A2A2A1R30		RESISTOR:ITEM 94.	7-12
A2A2A1R31		RESISTOR:ITEM 47.	7-12
A2A2A1R32		RESISTOR:ITEM 58.	7-12
A2A2A1R33		RESISTOR:ITEM 94.	7-12
A2A2A1R34		RESISTOR:ITEM 64.	7-12
A2A2A1R35		RESISTOR:ITEM 94.	7-12
A2A2A1R36		RESISTOR:ITEM 64.	7-12
A2A2A1R37		RESISTOR:ITEM 60.	7-12
A2A2A1R38		RESISTOR:ITEM 68.	7-12
A2A2A1R39		RESISTOR:ITEM 48.	7-12
A2A2A1R40		RESISTOR:ITEM 47.	7-12
A2A2A1R41		RESISTOR:ITEM 68.	7-12
A2A2A1RT1		RESISTOR,THERMAL:0.270IN.DIA X0.100IN.THK; 5290 OHMS PORM 5% AT 25 DEG C;MFR 75263 PART NUMBER RL2006-2930-120S12,06845 DWG 4032273-0701	7-12
A2A2A1T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;500KHZ,CAPACITY NOT RATED:MFR 06845 PART NUMBER 4032348-0705.	7-12
A2A2A1T2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;500KHZ,CAPACITY 840 PF:MFR 06845 PART NUMBER 4032348-0706.	7-12
A2A2A1TP1 AND A2A2A1TP2		CONNECTOR:ITEM 41.	7-12
A2A2A2		IF/AUDIO AMPLIFIER SUBASSEMBLY:4.08IN.LG X2.845IN.W X0.80IN.THK;MFR 06845 PART NUMBER 4031930-0501.	7-13

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A2A2C1 AND A2A2A2C2		CAPACITOR:ITEM 21.	7-13
A2A2A2C3 AND A2A2A2C4		CAPACITOR:ITEM 18.	7-13
A2A2A2C5		CAPACITOR:ITEM 13.	7-13
A2A2A2C6		CAPACITOR:ITEM 21.	7-13
A2A2A2C7		CAPACITOR:ITEM 13.	7-13
A2A2A2C8		CAPACITOR:ITEM 18.	7-13
A2A2A2C9		CAPACITOR:ITEM 21.	7-13
A2A2A2C10		CAPACITOR:ITEM 13.	7-13
A2A2A2C11		CAPACITOR:ITEM 18.	7-13
A2A2A2C12 AND A2A2A2C13		CAPACITOR:ITEM 13.	7-13
A2A2A2C14		CAPACITOR:ITEM 18.	7-13
A2A2A2C15		CAPACITOR:ITEM 21.	7-13
A2A2A2C16		CAPACITOR,FIXED,ELECTROLYTIC:15 UF PORM 10% 50WVDC;MIL TYPE M39003-01-2137.	7-13
A2A2A2C17		CAPACITOR,FIXED,ELECTROLYTIC:1 UF PORM 10%, 50WVDC;MIL TYPE M39003-01-2116.	7-13
A2A2A2C18		CAPACITOR:ITEM 22.	7-13
A2A2A2C19		CAPACITOR:ITEM 20.	7-13
A2A2A2C20		CAPACITOR,FIXED,ELECTROLYTIC:15 UF PORM 10% 50WVDC;MIL TYPE M39003-01-2137.	7-13
A2A2A2C21		CAPACITOR,FIXED,ELECTROLYTIC:1 UF PORM 10%, 50WVDC;MIL TYPE M39003-01-2116.	7-13
A2A2A2C22		CAPACITOR:ITEM 19.	7-13
A2A2A2C23		CAPACITOR,FIXED,MICA:1200 PF PORM 5%,500 WVDC;MIL TYPE CM06FD122JP3.	7-13
A2A2A2C24		CAPACITOR:ITEM 19.	7-13
A2A2A2C25		CAPACITOR:ITEM 22.	7-13
A2A2A2C26		CAPACITOR:ITEM 3.	7-13
A2A2A2CR1		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N645.	7-13
A2A2A2L1		COIL:MIL TYPE MS90537-61.	7-13
A2A2A2Q1		TRANSISTOR:ITEM 114.	7-13
A2A2A2Q2 AND A2A2A2Q3		TRANSISTOR:ITEM 113.	7-13
A2A2A2Q4 THRU A2A2A2Q6		TRANSISTOR:ITEM 114.	7-13
A2A2A2Q7 THRU A2A2A2Q10		TRANSISTOR:ITEM 106.	7-13
A2A2A2R1		RESISTOR:ITEM 46.	7-13
A2A2A2R2 AND A2A2A2R3		RESISTOR:ITEM 94.	7-13
A2A2A2R4		NOT USED	
A2A2A2R5		RESISTOR:ITEM 88.	7-13
A2A2A2R6		RESISTOR:ITEM 58.	7-13
A2A2A2R7		RESISTOR:ITEM 69.	7-13
A2A2A2R8		RESISTOR:ITEM 60.	7-13
A2A2A2R9		RESISTOR:ITEM 57.	7-13
A2A2A2R10		RESISTOR:ITEM 46.	7-13

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A2A2R11 AND A2A2A2R12		RESISTOR:ITEM 94.	7-13
A2A2A2R13		RESISTOR:ITEM 89.	7-13
A2A2A2R14		RESISTOR:ITEM 46.	7-13
A2A2A2R15 AND A2A2A2R16		RESISTOR:ITEM 94.	7-13
A2A2A2R17		RESISTOR:ITEM 93.	7-13
A2A2A2R18		RESISTOR:ITEM 75.	7-13
A2A2A2R19		RESISTOR:ITEM 46.	7-13
A2A2A2R20 AND A2A2A2R21		RESISTOR:ITEM 94.	7-13
A2A2A2R22		RESISTOR,VARIABLE,WIRE WOUND:1K OHMS,3/4W; MIL TYPE RT22C2W102.	7-13
A2A2A2R23		RESISTOR:ITEM 90.	7-13
A2A2A2R24		RESISTOR:ITEM 50.	7-13
A2A2A2R25		RESISTOR,FIXED,FILM:11K OHMS PORM 5%,1/4W; MIL TYPE RLR07C113JR.	7-13
A2A2A2R26 AND A2A2A2R27		RESISTOR:ITEM 60.	7-13
A2A2A2R28		RESISTOR,FIXED,FILM:16K OHMS PORM 5%,1/4W; MIL TYPE RLR07C163JR.	7-13
A2A2A2R29		RESISTOR:ITEM 47.	7-13
A2A2A2R30		RESISTOR:ITEM 66.	7-13
A2A2A2R31		RESISTOR:ITEM 75.	7-13
A2A2A2R32		RESISTOR:ITEM 69.	7-13
A2A2A2R33		RESISTOR,FIXED,FILM:620 OHMS PORM 5%,1/4W; MIL TYPE RLR07C621JR.	7-13
A2A2A2R34		RESISTOR:ITEM 72.	7-13
A2A2A2R35		RESISTOR,FIXED,COMPOSITION:120 OHMS PORM 5%,1/4W;MIL TYPE RCR07G121JS.	7-13
A2A2A2R36		RESISTOR,FIXED,COMPOSITION:3.2K OHMS PORM 5%,1/2W;MIL TYPE RCR20G332JS.	7-13
A2A2A2R37		RESISTOR,FIXED,COMPOSITION:39 OHMS PORM 5%, 1/2W;MIL TYPE RCR20G390JS.	7-13
A2A2A2R38		RESISTOR:ITEM 71.	7-13
A2A2A2R39		RESISTOR:ITEM 54.	7-13
A2A2A2R40		RESISTOR:ITEM 68.	7-13
A2A2A2T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.H;500 KHZ,CAP 845 PF PORM 5%,MFR 93292 PART NUMBER 500-2352,06845 DWG 4032348-0701.	7-13
A2A2A2T2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.H;500 KHZ,CAP 850 PF PORM 5%,MFR 93292 PART NUMBER 500-2353,06845 DWG 4032348-0702.	7-13
A2A2A2T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.49/ IN.H;500 KHZ,CAP 830 PF PORM 5%,MFR 93292 PART NUMBER 500-2391,06845 DWG 4032348-0703.	7-13
A2A2A2T4		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.H;500 KHZ,CAP 840 PF PORM 5%,MFR 93292 PART NUMBER 500-2392,06845 DWG 4032348-0704.	7-13

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A2

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A2A2T5		TRANSFORMER,AUDIO FREQUENCY:MFR 01961 PART NUMBER PE9334,06845 DWG 4030818-0701.	7-13
A2A2A3		SSB-AM DETECTOR:2.40IN.LG X1.38IN.W X0.78 IN.THK;MFR 06845 PART NUMBER 4031927-0501	7-14
A2A2A3C1		CAPACITOR,FIXED,ELECTROLYTIC:39 UF PORM 10% 10WVDC;MIL TYPE M39003-01-2019.	7-14
A2A2A3C2 AND A2A2A3C3		CAPACITOR:ITEM 35.	7-14
A2A2A3C4		CAPACITOR,FIXED,ELECTROLYTIC:39 UF PORM 10% 10WVDC;MIL TYPE M39003-01-2019.	7-14
A2A2A3C5		CAPACITOR:ITEM 14.	7-14
A2A2A3C6		CAPACITOR:ITEM 18.	7-14
A2A2A3C7		CAPACITOR,FIXED,CERAMIC:2200 PF PORM 20%, 200WVDC;MIL TYPE CK06BX222M.	7-14
A2A2A3C8		CAPACITOR,FIXED,MICA:33 PF PORM 10%,500WVDC MIL TYPE CK05BX330K.	7-14
A2A2A3CR1 AND A2A2A3CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-14
A2A2A3L1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.H;500 KHZ,CAP 863 PF PORM 5%;MFR 93292 PART NUMBER 500-2360,06845 DWG 4032540-0701.	7-14
A2A2A3Q1 THRU A2A2A3Q3		TRANSISTOR:ITEM 97.	7-14
A2A2A3R1		RESISTOR:ITEM 65.	7-14
A2A2A3R2		RESISTOR:ITEM 50.	7-14
A2A2A3R3		RESISTOR:ITEM 65.	7-14
A2A2A3R4		RESISTOR:ITEM 50.	7-14
A2A2A3R5		RESISTOR:ITEM 82.	7-14
A2A2A3R6		RESISTOR:ITEM 94.	7-14
A2A2A3R7		RESISTOR:ITEM 89.	7-14
A2A2A3T1		TRANSFORMER,AUDIO FREQUENCY:0.875IN.LG X 0.781IN.W X0.531IN.H;MFR 01961 PART NUMBER PE9335,06845 DWG 4030818-0702.	7-14
A2A2A3TP1		CONNECTOR:ITEM 41.	7-14

RECEIVER IF./AUDIO AMPLIFIER ASSEMBLY A2A3

A2A3		SAME AS A2A2	

RF AMPLIFIER ASSEMBLY A2A4

A2A4		R.F.AMPLIFIER ASSEMBLY:7.332IN.X7.432IN. X4.430IN.;MFR 06845 PART NUMBER 4031959-0501. (ATTACHING PARTS)L(4)	7-15
A2A4B1		MOTOR ASSEMBLY: MFR 06845 PART NUMBER 4032216-0501.	7-15
A2A4C1A		CAPACITOR,FIXED,MICA:10000 PF PORM 10%,500 WVDC; MIL TYPE CK05BX103K.	7-18
A2A4C1B		CAPACITOR,FIXED,MICA:330 PF PORM 5%,500 WVDC; MIL TYPE CM05FD331JP3.	7-18
A2A4C2A		CAPACITOR,FIXED,MICA:10000 PF PORM 10%,500 WVDC; MIL TYPE CK05BX103K.	7-18

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4C23	1	CAPACITOR:ITEM 3.	7-18
A2A4C3		CAPACITOR,FIXED,CERAMIC:0.01 UF PORM 20%, 1000WVDC;MIL TYPE CK63AW103M.	7-18
A2A4C4		CAPACITOR:ITEM 3.	7-18
A2A4C5		CAPACITOR,FIXED,MICA:330 PF PORM 5%,500 WVDC; MIL TYPE CM05FD331JP3.	7-18
A2A4C6		CAPACITOR:ITEM 3.	7-18
A2A4C7		CAPACITOR,FIXED,CERAMIC:0.01 UF PORM 20%, 1000WVDC;MIL TYPE CK63AW103M.	7-18
A2A4C8		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;356 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0748.	7-18
A2A4C9		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.230IN.THK;775 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0758.	7-18
A2A4C10		CAPACITOR:ITEM 3.	7-18
A2A4C11		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;356 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0748.	7-18
A2A4C12		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.230IN.THK;775 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0758.	7-18
A2A4C13		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;356 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0748.	7-18
A2A4C14		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.230IN.THK;775 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0758.	7-18
A2A4C15 THRU A2A4C18		CAPACITOR:ITEM 3.	7-18
A2A4C19		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;369 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0749.	7-18
A2A4C20		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.230IN.THK;784 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0759.	7-18
A2A4CR1		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N975B.	7-15
A2A4FL1 THRU A2A4FL3		SUPPRESSOR,PARASITIC:0.200IN.OD,0.100IN.ID, X0.250IN.LG;MFR 08832 PART NUMBER F754, 06845 DWG 4032581-0701.	7-18
A2A4K1		RELAY,ELECTRICAL:DPDT;2AMP;MIL TYPE M5757-01-039.	7-15
A2A4MP1		GEAR,TURRET DRIVE:7.06IN.DIA X0.265IN.THK; MFR 06845 PART NUMBER 4032438-0501.	7-17
A2A4MP2 AND A2A4MP3		GEAR,SPUR:1.792IN.DIA X0.281IN.;170 TEETH; MFR 06845 PART NUMBER 4030615-0701.	7-20
A2A4MP4		SHAFT,ROTOR:0.1874IN.DIA X4.22IN.LG;CRES; PASSIVATION;MFR 06845 PART NUMBER 4030639-0001.	7-20
A2A4MP5		BEARING,BALL,ANNULAR:5.5000IN.DIA ODX5.0000 IN.DIA IDX0.250IN.THK;STEEL WITH BRONZE SEPARATOR;CROME FLASH:MFR 32828 PART NUMBER 6905-1,06845 DWG 4030764-0701.	7-17
A2A4MP6 AND A2A4MP7		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;2 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0516.	7-18

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4MP8 AND A2A4MP9		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;4 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0515.	7-18
A2A4MP10		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;3 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0517.	7-18
A2A4MP11 AND A2A4MP12		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;4 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0504.	7-18
A2A4MP13		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;4 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0515.	7-18
A2A4MP14		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;2 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0511.	7-18
A2A4MP15		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;4 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0503.	7-18
A2A4MP16		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;4 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0502.	7-18
A2A4MP17		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;2 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0516.	7-18
A2A4MP18		PLATE,STATOR:0.980IN.X0.60IN.X0.126IN.; PHTHALATE;1 ELECTRICAL CONTACTS;MFR 06845 PART NUMBER 4032215-0518.	7-18
A2A4MP19		COUPLING,TOP:MFR 06845 PART NUMBER 4032236-0501.	7-17
A2A4MP22		RING,TURRET TOP:6.80IN.DIA OD,5.28IN.DIA ID 0.125IN.THK;AL ALY;MFR 06845 PART NUMBER 4032294-0001.	7-17
A2A4MP23		RING,TURRET BOTTOM:6.80IN.DIA OD,5.28IN.DIA ID,0.125IN.THK;DIALLYL PHTHALATE;MFR 06845 PART NUMBER 4030947-0001.	7-17
A2A4MP24		MOUNTING BASE ASSEMBLY:7.322IN.X7.322IN.X 0.462IN.THK;MFR 06845 PART NUMBER 4032451-0501.	7-17
A2A4MP25		BRUSH SET,ELECTRICAL CONTACT:3.58IN.R,3.04 IN.R;MOLDED EPOXY,STAINLESS STEEL;MFR 06845 PART NUMBER 4032432-0701.	7-15
A2A4MP26		COUPLING,TOP:MFR 06845 PART NUMBER 4032236-0501.	7-17
A2A4MP27		RING,SPACER:5.544IN.DIA X0.231IN.THK; POLYTETRAFLUOROETHYLENE;MFR 06845 PART NUMBER 4032531-0001.	7-17
A2A4MP28 AND A2A4MP29		BEARING,FLANGED PRECISION:0.422IN.DIA X 0.375IN.DIA X0.1094IN.THK;SINTERED METAL OIL IMPREGNATED;MFR 12639 PART NUMBER 127-100,06845 DWG 4030759-0701.	7-15
A2A4MP30		TUNING ROTOR:3.00IN.DIA X4.22IN.LG;MFR 06845 PART NUMBER 4032238-0501.	7-17
A2A4MP31		ROTOR DRIVE:MFR 06845 PART NUMBER 4032239-0501.	7-17
A2A4MP32		COVER:7.432IN.X7.332IN.X4.430IN.;AL ALY; MFR 06845 PART NUMBER 4032452-0501. (ATTACHING PARTS)E(4)W(4)AE(4)	7-17

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4MP33 THRU A2A4MP38		CLAMP:ITEM 38.	7-17
A2A4MP39 AND A2A4MP40		SHIELD,ELECTRON TUBE:0.875IN.DIA X1.875IN. LG;AL ALY,COPPER LINER;ANODIC COATING ON SHELL,CADMIUM PLATE ON LINER;MFR 98978 PART NUMBER TR5-5020-21B,06845 DWG 4032212-0701.	7-18
A2A4MP41		MOUNTING BASE,ELECTRICAL EQUIPMENT:7.322IN. X7.322IN.;AL ALY;CHEM FILM;MFR 06845 PART NUMBER 4032515-0501.	7-15
A2A4MP42 AND A2A4MP43		CLAMP:0.25IN.X0.178IN.;CRES,PASSIVATION; MFR 06845 PART NUMBER 4032184-0001.	7-15
A2A4MP44		SPRING,GROUNDING:1.661IN.X1.16IN.X0.005IN.; 1/2H COPPER;MFR 06845 PART NUMBER 4030892-0001.	7-18
A2A4MP45		FASTENER:0.36IN.X0.187IN.X0.187IN.;CRES; PASSIVATION;MFR 06845 PART NUMBER 4032145-0001.	7-18
A2A4MP46 AND A2A4MP47		BEARING,FLANGED PRECISION:0.422IN.DIA X 0.375IN.DIA X0.1094IN.THK;SINTERED METAL OIL IMPREGNATED;MFR 12639 PART NUMBER 127-100,06845 DWG 4030759-0701.	7-17
A2A4MP48		HUB,TOP ROTOR:1.00IN.DIA,0.38IN.DIA X0.40 IN.LG;CRES,PASSIVATION;MFR 06845 PART NUMBER 4032233-0001.	7-20
A2A4MP49		HUB,BOTTOM ROTOR:1.00IN.DIA,0.38IN.DIA X 0.40IN.LG;CRES;PASSIVATION;MFR 06845 PART NUMBER 4032234-0001.	7-20
A2A4MP50		GEAR,SPUR:1.792IN.DIA X0.380IN.;170 TEETH; MFR 06845 PART NUMBER 4030616-0502.	7-20
A2A4MP51		ROTOR,TOP:2.982IN.DIA X0.52IN.;MFR 06845 PART NUMBER 4030949-0502.	7-20
A2A4MP52		ROTOR,UPPER GEAR:2.982IN.DIA X0.380IN.;MFR 06845 PART NUMBER 4030701-0502.	7-20
A2A4MP53		ROTOR,CENTER:2.982IN.DIA X1.155IN.;MFR 06845 PART NUMBER 4030702-0502.	7-20
A2A4MP54		ROTOR,LOWER GEAR:2.982IN.DIA X0.380IN.;MFR 06845 PART NUMBER 4030703-0502.	7-20
A2A4MP55		ROTOR,BOTTOM:2.982IN.DIA X0.40IN.;MFR 06845 PART NUMBER 4030950-0502.	7-20
A2A4MP56		SHAFT,ROTOR:0.1874IN.DIA X4.22IN.LG;CRES, PASSIVATION;MFR 06845 PART NUMBER 4030622-0001.	7-20
A2A4MP57		ROTOR,ELECTRICAL SWITCH:2.982IN.DIA X0.135 IN.THK;1/2H COPPER;MFR 06845 PART NUMBER 4032221-0001.	7-20
A2A4MP58		SHIELD,TUBE SOCKET:1.24IN.X1.10IN.;1/2H BRS;SILVER PLATING MFR 06845 PART NUMBER 4032213-0502.	7-18
A2A4MP59		SHIELD,TUBE SOCKET:1.24IN.X1.10IN.;1/2H BRS;SILVER PLATING;MFR 06845 PART NUMBER 4032213-0501.	7-18
A2A4MP60		GEAR,SPUR:1.0833IN.DIA X0.343IN.;50 TEETH; MFR 57533 PART NUMBER E21-50,06845 DWG 4032171-0701.	7-15

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4MP61		SPRING,GROUNDING:1.661IN.X1.16IN.X0.005IN.; 1/2H COPPER;MFR 06845 PART NUMBER 4030892-0001.	7-18
A2A4MP62		FASTENER:0.36IN.X0.187IN.X0.187IN.;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032145-0001.	7-18
A2A4MP63		GEAR,SPUR:1.792IN.DIA X0.380IN.;170 TEETH; MFR 06845 PART NUMBER 4030616-0502.	7-20
A2A4MP64		HUB,CENTER ROTOR:1.79IN.DIA X0.74IN.;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032232-0001.	7-20
A2A4MP65		GEAR:7.2083IN.DIA X0.265IN.THK;AL ALY; ANODIC COATING;344 TEETH;MFR 06845 PART NUMBER 4030614-0001.	7-19
A2A4MP66		GEAR:1.792IN.DIA X0.380IN.THK;CRES, PASSIVATION;MFR 06845 PART NUMBER 4030616-0001.	7-20
A2A4MP67		GEAR,SPUR:2083IN.DIA X0.265IN.THK;AL ALY; ANODIC COATING;344 TEETH;MFR 06845 PART NUMBER 4030614-0502.	7-19
A2A4MP68		CODING RING:(.06IN.DIA X0.062IN.THK; LAMINATED THERMOSETTING EPOXY RESIN, COPPER FOIL ONE SIDE,RODIUM PLATE OVER NICKEL PLATE;MFR 06845 PART NUMBER 4032447-0001.	7-19
A2A4MP69		COUPLING,TOP:0.875IN.DIA X0.382IN.THK;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032568-0001.	7-16
A2A4MP70		PIN,DRIVE:0.936IN.DIA X0.225IN.;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032181-0001.	7-16
A2A4MP71		SPRING,HOLD DOWN:C.860IN.DIA X0.15IN.THK; 1/2H COPPER;MFR 06845 PART NUMBER 4032183-0001.	7-16
A2A4P1		CONNECTOR,ELECTRICAL,SUB-MINIATURE:1.541IN. X0.494IN.X0.422IN.;STEEL SHELL,COPPER INSULATOR;CADMIUM PLATED SHELL,GOLD PLATED CONTACTS;15 PIN CONTACTS;MFR 60007 PART NUMBER DAM15P;06845 DWG 4032484-0703	7-15
A2A4P2		CONNECTOR,ELECTRICAL,SUB-MINIATURE:2.729IN. X0.494IN.X0.426IN.;STEEL SHELL,COPPER ALY CONTACTS,GLASS FILLED DIALLYL INSULATOR;CADMIUM PLATED SHELL,GOLD PLATED CONTACTS;5 PIN CONTACTS:MFR 60007 PART NUMBER DCM17W5PF115,06845 DWG 4C32484-0718.	7-15
A2A4R1		RESISTOR,FIXED,COMPOSITION:47K OHMS PORM 5% 1/4W;MIL TYPE RCR07G473JS.	7-18
A2A4R2		RESISTOR:ITEM 90.	7-18
A2A4R3		RESISTOR:ITEM 92.	7-18
A2A4TP1		JACK,TIP:0.218IN.DIA X0.437IN.LG;BERYLLIUM COPPER,SILVER PLATE WITH GOLD FLASH, POLYTETRAFLUOROETHYLENE INSULATION;MFR 98291 PART NUMBER SKT2BC BLACK,06845 DWG 2C43782-0708.	7-18

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4TP2 AND A2A4TP3		JACK,TIP:0.218IN.DIA X0.437IN.LG;BERYLLIUM COPPER,SILVER PLATE WITH GOLD FLASH, POLYTETRAFLUOROETHYLENE INSULATION;MFR 98291 PART NUMBER SKT2BC WHITE,06845 DWG 2043782-0704.	7-18
A2A4TP4		JACK,TIP:0.218IN.DIA X0.437IN.LG;BERYLLIUM COPPER,SILVER PLATE WITH GOLD FLASH, 98291 PART NUMBER SKT2BC BLACK,06845 DWG 2043782-0708.	7-18
A2A4V1		TUBE,ELECTRON:MIL TYPE 6BZ6.	7-18
A2A4V2		TUBE,ELECTRON:MIL TYPE 6AN5WA.	7-18
A2A4XV1 AND A2A4XV2		SOCKET,TUBE:MIL TYPE M12883-02-01.	7-18
A2A4A1		R F AMPLIFIER:1.90IN.X2.38IN.;MFR 06845 ATTACHING PARTS. G(2),W(2),Y(2)	7-21
A2A4A1C1		CAPACITOR:ITEM 3.	7-21
A2A4A1C2 AND A2A4A1C3		CAPACITOR:ITEM 19.	7-21
A2A4A1C4		CAPACITOR,FIXED,CERAMIC:1000 PF PORM 10%, 200WVDC,MIL TYPE CK05BX102K.	7-21
A2A4A1E1 THRU A2A4A1E10		TERMINAL:ITEM 105.	7-21
A2A4A1R1		RESISTOR:ITEM 61.	7-21
A2A4A1R2		RESISTOR:ITEM 60.	7-21
A2A4A1R3		RESISTOR:ITEM 83.	7-21
A2A4A1R4		RESISTOR,FIXED,FILM:620 OHMS PORM 5%,1/2W; MIL TYPE RLR20C621JR.	7-21
A2A4A1R5 AND A2A4A1R6		RESISTOR,FIXED,COMPOSITION:120 OHMS PORM 5% 1/2W;MIL TYPE RCR20G121JS.	7-21
A2A4A2		12 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032295-0501.	7-22
A2A4A2C1		CAPACITOR:ITEM 27.	7-22
A2A4A2C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;126 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0710.	7-22
A2A4A2C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;132 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0713.	7-22
A2A4A2C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;250 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0739.	7-22
A2A4A2T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;12 MHZ,CAPACITY 118 PF PORM 5%;MFR 93292 PART NUMBER 500-2411, 06845 DWG 4032167-0711.	7-22
A2A4A2T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 12 MHZ,CAPACITY 135 PF PORM 5%;MFR 93292 PART NUMBER 500-2510, 06845 DWG 4032521-0711.	7-22
A2A4A2T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;7 MHZ,CAPACITY 196.0 PF;MFR 93292 PART NUMBER 500-2606, 06845 DWG 4032522-0706.	7-22

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A2T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;2 MHZ,CAPACITY 754 PF;MFR 93292 PART NUMBER 500-2701,06845 DWG 4032523-0701.	7-22
A2A4A3		13MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032296-0501.	7-23
A2A4A3C1		CAPACITOR:ITEM 27.	7-23
A2A4A3C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;115 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0706.	7-23
A2A4A3C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;120 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0707.	7-23
A2A4A3C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;208 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0732.	7-23
A2A4A3C5		CAPACITOR,FIXED,MICA:0.750IN.LG X0.510IN.W X0.200IN.THK;1253 PF PORM 1/2%,300WVDC; MFR 72136 TYPE DM20F,06845 DWG 4031979-0701.	7-23
A2A4A3T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;13 MHZ,CAPACITY 109 PF PORM 5%;MFR 93292 PART NUMBER 500-2412, 06845 DWG 4032167-0712.	7-23
A2A4A3T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 13 MHZ,CAPACITY 126.7 PF PORM 5%,MFR 93292 PART NUMBER 06845 DWG 4032521-0712.	7-23
A2A4A3T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;8 MHZ,CAPACITY 170.0 PF;MFR 93292 PART NUMBER 500-2627, 06845 DWG 4032522-0727.	7-23
A2A4A3T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;3 MHZ,CAPACITY 482 PF;MFR 93292 PART NUMBER 500-2702,06845 DWG 4032523-0702.	7-23
A2A4A4		14 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032297-0501	
A2A4A4C1		CAPACITOR:ITEM 27.	7-24
A2A4A4C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;105 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0702.	7-24
A2A4A4C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;111 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0705.	7-24
A2A4A4C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;179 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0725.	7-24
A2A4A4C5		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;629 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0757.	7-24
A2A4A4T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;14 MHZ,CAPACITY 101 PF PORM 5%;MFR 93292 PART NUMBER 500-2413,06845 DWG 4032167-0713.	7-24
A2A4A4T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 14 MHZ,CAPACITY 119.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2513, 06845 DWG 4032521-0713.	7-24 7-24

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A4T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;9 MHZ,CAPACITY 152.0 PF ;MFR 93292 PART NUMBER 500-2607, 06845 DWG 4032522-0707.	7-24
A2A4A4T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;4 MHZ,CAPACITY 358 PF;MFR 93292 PART NUMBER 500-2703,06845 DWG 4032523-0703.	7-24
A2A4A5		15 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032298-0501.	7-25
A2A4A5C1		CAPACITOR:ITEM 26.	7-25
A2A4A5C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;97 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0738.	7-25
A2A4A5C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;103 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0701.	7-25
A2A4A5C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;157 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0720.	7-25
A2A4A5C5		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;422 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0752.	7-25
A2A4A5T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;15 MHZ,CAPACITY 94.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2414, 06845 DWG 4032167-0714.	7-25
A2A4A5T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 15 MHZ,CAPACITY 113 PF PORM 5%;MFR 06845 DWG 4032521-0714.	7-25
A2A4A5T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;10 MHZ,CAPACITY 137.0 PF ;MFR 93292 PART NUMBER 500-2608, 06845 DWG 4032522-0708.	7-25
A2A4A5T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;5 MHZ,CAPACITY 286 PF;MFR 93292 PART NUMBER 500-2704,06845 DWG 4032523-0704.	7-25
A2A4A6		16 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032299-0501.	7-26
A2A4A6C1		CAPACITOR:ITEM 26.	7-26
A2A4A6C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;91 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0735.	7-26
A2A4A6C3		CAPACITOR:ITEM 33.	7-26
A2A4A6C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;137 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0715.	7-26
A2A4A6C5		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;318 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0746.	7-26
A2A4A6T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;16 MHZ,CAPACITY 89. PF PORM 5%;MFR 93292 PART NUMBER 500-2415, 06845 DWG 4032167-0715.	7-26
A2A4A6T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 16 MHZ,CAPACITY 107.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2515, 06845 DWG 4032521-0715.	7-26

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A6T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;11 MHZ,CAPACITY 125.0 PF;MFR 93292 PART NUMBER 500-2609, 06845 DWG 4032522-0709.	7-26
A2A4A6T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;6 MHZ,CAPACITY 240 PF;MFR 93292 PART NUMBER 500-2705,06845 DWG 4032523-0705.	7-26
A2A4A7		17 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032300-0501.	7-27
A2A4A7C1		CAPACITOR:ITEM 26.	7-27
A2A4A7C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;85 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0733.	7-27
A2A4A7C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;90 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0734.	7-27
A2A4A7C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;126 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0710.	7-27
A2A4A7C5		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;256 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0741.	7-27
A2A4A7T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;17 MHZ,CAPACITY 83.8 PF PORM 5%;MFR 93292 PART NUMBER 500-2416, 06845 DWG 4032167-0716.	7-27
A2A4A7T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 17 MHZ,CAPACITY 102.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2516, 06845 DWG 4032521-0716.	7-27
A2A4A7T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;12 MHZ,CAPACITY 115.0 PF;MFR 93292 PART NUMBER 500-2610, 06845 DWG 4032522-0710.	7-27
A2A4A7T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;7 MHZ,CAPACITY 208 PF;MFR 93292 PART NUMBER 500-2706,06845 DWG 4032523-0706.	7-27
A2A4A8		18 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032301-0501.	7-28
A2A4A8C1		CAPACITOR:ITEM 26.	7-28
A2A4A8C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;80 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0731.	7-28
A2A4A8C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.130IN.THK;85 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0733.	7-28
A2A4A8C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;115 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0706.	7-28
A2A4A8C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;214 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0733.	7-28
A2A4A8T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;18 MHZ,CAPACITY 79.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2417, 06845 DWG 4032167-0717.	7-28

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A8T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 18 MHZ,CAPACITY 98.5 PF PORM 5%,MFR 93292 PART NUMBER 500-2517, 06845 DWG 4032521-0717.	7-28
A2A4A8T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;13 MHZ,CAPACITY 107.0 PF;MFR 93292 PART NUMBER 500-2611, 06845 DWG 4032522-0711.	7-28
A2A4A8T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;8 MHZ,CAPACITY 185 PF;MFR 93292 PART NUMBER 500-2707,06845 DWG 4032523-0707.	7-28
A2A4A9		19 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032302-0501.	7-29
A2A4A9C1		CAPACITOR:ITEM 26.	7-29
A2A4A9C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;75 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0729.	7-29
A2A4A9C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;80 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0731.	7-29
A2A4A9C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;105 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0702	7-29
A2A4A9C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;185 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0727.	7-29
A2A4A9T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;19 MHZ,CAPACITY 75.0 PF PORM 5%;MFR 93292 PART NUMBER 500-2418, 06845 DWG 4032167-0718.	7-29
A2A4A9T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 19 MHZ,CAPACITY 96.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2518, 06845 DWG 4032521-0718.	7-29
A2A4A9T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;14 MHZ,CAPACITY 101.0 PF;MFR 93292 PART NUMBER 500-2612, 06845 DWG 4032522-0712.	7-29
A2A4A9T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;9 MHZ,CAPACITY 166 PF;MFR 93292 PART NUMBER 500-2708,06845 DWG 4032523-0708.	7-29
A2A4A9Y1		CRYSTAL UNIT,QUARTZ:0.515IN.LG X0.418IN.W X0.166IN.THK;FREQUENCY 21.000 MCS;MFR 00136 PART NUMBER 06845 DWG 4032119-0702.	7-29
A2A4A10		20 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032303-0501.	7-30
A2A4A10C1		CAPACITOR:ITEM 26.	7-30
A2A4A10C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;71 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0725.	7-30
A2A4A10C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;76 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0730.	7-30
A2A4A10C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;97 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0738.	7-30

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A10C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;163 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0722.	7-30
A2A4A10T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;20 MHZ,CAPACITY 73.3 PF PORM 5%;MFR 93292 PART NUMBER 500-2419, 06845 DWG 4032167-0719.	7-30
A2A4A10T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 20 MHZ,CAPACITY 90.3 PF PORM 5%;MFR 93292 PART NUMBER 500-25191 06845 DWG 4032521-0719.	7-30
A2A4A10T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;15 MHZ,CAPACITY 95.0 PF;MFR 93292 PART NUMBER 500-2613, 06845 DWG 4032522-0713.	7-30
A2A4A10T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;10 MHZ,CAPACITY 152 PF;MFR 93292 PART NUMBER 500-2709,06845 DWG 4032523-0709.	7-30
A2A4A10Y1		CRYSTAL UNIT,QUARTZ:0.515IN.LG X0.418IN.W X0.166IN.THK;FREQUENCY 19.000 MCS;MFR 00136 PART NUMBER 4032119-0701, 06845 DWG 4032119-0701.	7-30
A2A4A11		21 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032304-0501.	7-31
A2A4A11C1		CAPACITOR:ITEM 26.	7-31
A2A4A11C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;67 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0722.	7-31
A2A4A11C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;73 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0727.	7-31
A2A4A11C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;91 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0735.	7-31
A2A4A11C5		CAPACITOR:ITEM 29.	7-31
A2A4A11T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;21 MHZ,CAPACITY 70.2 PF PORM 5%,MFR 93292 PART NUMBER 500-2420, 06845 DWG 4032167-0720.	7-31
A2A4A11T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 21 MHZ,CAPACITY 88 PF PORM 5%;MFR 93292 PART NUMBER 500-2520, 06845 DWG 4032521-0720.	7-31
A2A4A11T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;16 MHZ,CAPACITY 90.0 PF;MFR 93292 PART NUMBER 500-2614, 06845 DWG 4032522-0714.	7-31
A2A4A11T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;11 MHZ,CAPACITY 140 PF;MFR 93292 PART NUMBER 500-2710,06845 DWG 4032523-0710.	7-31
A2A4A12		22 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4010045-0501.	7-32
A2A4A12C1		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;7 PF PORM 0.5 PF,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0742.	7-32
A2A4A12C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;64 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0720.	7-32

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A12C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;68 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0723.	7-32
A2A4A12C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;85 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0733.	7-32
A2A4A12C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;132 PF PCRM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0713.	7-32
A2A4A12T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;22 MHZ,CAPACITY 67.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2421, 06845 DWG 4032167-0721.	7-32
A2A4A12T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 22 MHZ,CAPACITY 86.0 PF PORM 5%;MFR 93292 PART NUMBER 500-2521, 06845 DWG 4032521-0721.	7-32
A2A4A12T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;17 MHZ,CAPACITY 85.2 PF;MFR 93292 PART NUMBER 500-2615, 06845 DWG 4032522-0715.	7-32
A2A4A12T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;12 MHZ,CAPACITY 130 PF;MFR 93292 PART NUMBER 500-2711,06845 DWG 4032523-0711.	7-32
A2A4A12T5		COIL,R F VARIABLE:0.435IN.DIA X0.400IN.; 20.0 MHZ,CAPACITY 7.0 PF;MFR 93292 PART NUMBER 500-2349,06845 DWG 4032547-0701.	7-32
A2A4A13		23 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4010045-0502.	7-33
A2A4A13C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.260 IN.;3.9 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA3R9UUFPORM5PCT,06845 DWG 4031973-0732.	7-33
A2A4A13C2		CAPACITOR:ITEM 32.	7-33
A2A4A13C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;66 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0721.	7-33
A2A4A13C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;80 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0731.	7-33
A2A4A13C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;120 PF PCRM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0707.	7-33
A2A4A13T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;23 MHZ,CAPACITY 65.0 PF PORM 5%;MFR 93292 PART NUMBER 500-2422, 06845 DWG 4032167-0722.	7-33
A2A4A13T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 23 MHZ,CAPACITY 83.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2522, 06845 DWG 4032521-0722.	7-33
A2A4A13T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;18 MHZ,CAPACITY 81.0 PF;MFR 93292 PART NUMBER 500-2616, 06845 DWG 4032522-0716.	7-33
A2A4A13T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;13 MHZ,CAPACITY 122 PF;MFR 93292 PART NUMBER 500-2712,06845 DWG 4032523-0712.	7-33

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A13T5		COIL,R F VARIABLE:0.435IN.DIA X0.400IN.; 20.0 MHZ,CAPACITY 3.9 PF;MFR 93292 PART NUMBER 500-2350,06845 DWG 4032547-0702.	7-33
A2A4A14		24 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032305-0501.	7-34
A2A4A14C1		CAPACITOR:ITEM 27.	7-34
A2A4A14C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;58 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0716.	7-34
A2A4A14		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;63 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0719.	7-34
A2A4A14C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;75 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0729.	7-34
A2A4A14C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;111 PF PCRM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0705.	7-34
A2A4A14T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;24 MHZ,CAPACITY 62.5 PF PCRM 5%;MFR 93292 PART NUMBER 500-2423, 06845 DWG 4032167-0723.	7-34
A2A4A14T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 24 MHZ,CAPACITY 82.0 PF PORM 5%;MFR 93292 PART NUMBER 500-2523, 06845 DWG 4032521-0723.	7-34
A2A4A14T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;19 MHZ,CAPACITY 77.4 PF;MFR 93292 PART NUMBER 500-2617, 06845 DWG 4032522-0717.	7-34
A2A4A14T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;14 MHZ,CAPACITY 115 PF;MFR 93292 PART NUMBER 500-2713,06845 DWG 4032523-0713.	7-34
A2A4A15		25 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032306-0501.	7-35
A2A4A15C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.240 IN.;2.2 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA2R2UUFPCRM5PCT,06845 DWG 4031973-0726.	7-35
A2A4A15C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;56 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0714.	7-35
A2A4A15C3		CAPACITOR:ITEM 32.	7-35
A2A4A15C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;71 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0725	7-35
A2A4A15C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;103 PF PCRM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0701.	7-35
A2A4A15T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;25 MHZ,CAPACITY 60.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2424, 06845 DWG 4032167-0724.	7-35
A2A4A15T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.;25 MHZ,CAPACITY 80.0 PF PORM 5%;MFR 93292 PART NUMBER 500-2524,06845 DWG 4032521-0724	7-35

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A15T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;20 MHZ,CAPACITY 74.3 PF;MFR 93292 PART NUMBER 500-2618,06845 DWG 4032522-0718.	7-35
A2A4A15T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;15 MHZ,CAPACITY 109 PF;MFR 93292 PART NUMBER 500-2714,06845 DWG 4032523-0714.	7-35
A2A4A16		26 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032307-0501	7-36
A2A4A16C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.240 IN.;2.2 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA2R2UUFPORM5PCT,06845 DWG 4031973-0726.	7-36
A2A4A16C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;54 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0712.	7-36
A2A4A16C3		CAPACITOR:ITEM 31.	7-36
A2A4A16C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;67 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0722.	7-36
A2A4A16C5		CAPACITOR:ITEM 33.	7-36
A2A4A16T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;26 MHZ,CAPACITY 58.8 PF PORM 5%,MFR 93292 PART NUMBER 500-2425, 06845 DWG 4032167-0725.	7-36
A2A4A16T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.;26 MHZ,CAPACITY 78.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2525,06845 DWG 4032521-0725.	7-36
A2A4A16T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;21 MHZ,CAPACITY 71.7 PF;MFR 93292 PART NUMBER 500-2619,06845 DWG 4032522-0719.	7-36
A2A4A16T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;16 MHZ,CAPACITY 103 PF;MFR 93292 PART NUMBER 500-2715,06845 DWG 4032523-0715.	7-36
A2A4A17		27 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032308-0501.	7-37
A2A4A17C1		CAPACITOR:ITEM 28.	7-37
A2A4A17C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;52 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0710.	7-37
A2A4A17C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;57 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0715.	7-37
A2A4A17C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W XC.180IN.THK;64 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0720.	7-37
A2A4A17C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W XC.180IN.THK;90 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0734.	7-37
A2A4A17T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;27 MHZ,CAPACITY 57.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2426, 06845 DWG 4032167-0726.	7-37
A2A4A17T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 27 MHZ,CAPACITY 77.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2526, C6845 DWG 4032521-0726.	7-37

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A17T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;22 MHZ,CAPACITY 69.4 PF;MFR 93292 PART NUMBER 500-2620,06845 DWG 4032522-0720.	7-37
A2A4A17T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;17 MHZ,CAPACITY 98.8 PF;MFR 93292 PART NUMBER 500-2716,06845 DWG 4032523-0716.	7-37
A2A4A18		28 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032309-0501.	7-38
A2A4A18C1		CAPACITOR:ITEM 28.	7-38
A2A4A18C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;50 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0709.	7-38
A2A4A18C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;55 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0713.	7-38
A2A4A18C4		CAPACITOR:ITEM 32.	7-38
A2A4A18C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;85 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0733.	7-38
A2A4A18T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;28 MHZ,CAPACITY 56.6 PF PORM 5%;MFR 93292 PART NUMBER 500-2427, 06845 DWG 4032167-0727.	7-38
A2A4A18T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 28 MHZ,CAPACITY 76.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2527,06845 DWG 4032521-0727.	7-38
A2A4A18T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;23 MHZ,CAPACITY 67.2 PF;MFR 93292 PART NUMBER 500-2621,06845 DWG 4032522-0721.	7-38
A2A4A18T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;18 MHZ,CAPACITY 94.6 PF;MFR 93292 PART NUMBER 500-2717,06845 DWG 4032523-0717.	7-38
A2A4A19		29 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032310-0501.	7-39
A2A4A19C1		CAPACITOR:ITEM 28.	7-39
A2A4A19C2		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;48 PF PORM 5 PF,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0708.	7-39
A2A4A19C3		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;53 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0711.	7-39
A2A4A19C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;58 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0716.	7-39
A2A4A19C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;80 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0731.	7-39
A2A4A19T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;29 MHZ,CAPACITY 55.1 PF PORM 5%;MFR 93292 PART NUMBER 500-2428, 06845 DWG 4032167-0728.	7-39

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A19T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 29 MHZ,CAPACITY 78.5 PF PORM 5%;MFR 93292 PART NUMBER 500-2528,06845 DWG 4032521-0728.	7-39
A2A4A19T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;24 MHZ,CAPACITY 65.9 PF;MFR 93292 PART NUMBER 500-2628,06845 DWG 4032522-0728.	7-39
A2A4A19T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;19 MHZ,CAPACITY 90.9 PF;MFR 93292 PART NUMBER 500-2718,06845 DWG 4032523-0718.	7-39
A2A4A19Y1		CRYSTAL UNIT,QUARTZ:0.515IN.LG X0.418IN.W X0.166IN.THK;FREQUENCY 28.500 MCS;MFR 00136 PART NUMBER 06845 DWG 4032119-0703.	7-39
A2A4A20		2 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4010044-0501.	7-40
A2A4A20C1		CAPACITOR:ITEM 27.	7-40
A2A4A20C2 AND A2A4A20C3		NOT USED	
A2A4A20C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;56 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0714.	7-40
A2A4A20C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN. X0.180IN.THK;76 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0730.	7-40
A2A4A20C6		CAPACITOR,FIXED,PLASTIC:0.531IN.LG X0.500 IN.W X0.218IN.THK;0.068 UF PORM 5%,50WVDC MFR 84411 PART NUMBER 601PE683R50W,06845 DWG 2027530-0704.	7-40
A2A4A20T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;2 MHZ,CAPACITY 767 PF PORM 5%,MFR 93292 PART NUMBER 500-2401, 06845 DWG 4032167-0701.	7-40
A2A4A20T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 2 MHZ,CAPACITY 772 PF PORM 5%;MFR 93292 PART NUMBER 500-2501,06845 DWG 4032521-0701.	7-40
A2A4A20T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;25 MHZ,CAPACITY 65.0 PF;MFR 93292 PART NUMBER 500-2622,06845 DWG 4032522-0722.	7-40
A2A4A20T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;20 MHZ,CAPACITY 87.6 PF;MFR 93292 PART NUMBER 500-2719,06845 DWG 4032523-0719.	7-40
A2A4A21		3 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4010044-0502.	7-41
A2A4A21C1		CAPACITOR:ITEM 27.	7-41
A2A4A21C2		CAPACITOR,FIXED,MICA:0.750IN.LG X0.510IN.W X0.200IN.THK;1247 PF PORM 1/2%,300WVDC; MFR 72136 TYPE DM20F,06845 DWG 4031979-0702.	7-41
A2A4A21C3		CAPACITOR,FIXED,MICA:0.750IN.LG X0.510IN.W X0.200IN.THK;1253 PF PORM 1/2%,300WVDC; MFR 72136 TYPE DM20F,06845 DWG 4031979-0701.	7-41

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A21C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W 0.170IN.THK;54 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0712.	7-41
A2A4A21C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W 0.180IN.THK;73 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0727.	7-41
A2A4A21C6		CAPACITOR,FIXED,MICA:0.531IN.LG X0.453IN.W X0.203IN.THK;0.047 PF PORM 5%,50WVDC;MFR 84411 PART NUMBER 601PEA73R50W,06845 DWG 2027530-0703.	7-41
A2A4A21T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;3 MHZ,CAPACITY 485 PF PORM 5%;MFR 93292 PART NUMBER 500-2402, 06845 DWG 4032167-0702.	7-41
A2A4A21T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 3 MHZ,CAPACITY 490 PF PORM 5%;MFR 93292 PART NUMBER 500-2502,06845 DWG 4032521-0702.	7-41
A2A4A21T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;26 MHZ,CAPACITY 64.4 PF;MFR 93292 PART NUMBER 500-2623,06845 DWG 4032522-0723.	7-41
A2A4A21T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;21 MHZ,CAPACITY 84.6 PF;MFR 93292 PART NUMBER 500-2720,06845 DWG 4032523-0720.	7-41
A2A4A22		4 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4010046-0501.	7-42
A2A4A22C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.250 IN.;4.7 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA4R7UUFPORM5PCT,06845 DWG 4031973-0734.	7-42
A2A4A22C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;623 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0756.	7-42
A2A4A22C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;629 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0757.	7-42
A2A4A22C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;52 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0710.	7-42
A2A4A22C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;68 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0723.	7-42
A2A4A22T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;4 MHZ,CAPACITY 352.0 PF PORM 5%;MFR 93292 PART NUMBER 500-2403, 06845 DWG 4032167-0703.	7-42
A2A4A22T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 4 MHZ,CAPACITY 370 PF PORM 5%;MFR 93292 PART NUMBER 500-2503,06845 DWG 4032521-0703.	7-42
A2A4A22T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;27 MHZ,CAPACITY 67.0 PF;MFR 93292 PART NUMBER 500-2624,06845 DWG 4032522-0724.	7-42
A2A4A22T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;22 MHZ,CAPACITY 81.8 PF;MFR 93292 PART NUMBER 500-2721,06845 DWG 4032523-0721.	7-42

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A23		5 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032311-0501.	7-43
A2A4A23C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.260 IN.;3.9 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA3R9UUFPORM5PCT,06845 DWG 4031973-0732.	7-43
A2A4A23C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;416 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0751.	7-43
A2A4A23C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;422 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0752.	7-43
A2A4A23C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;50 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0709.	7-43
A2A4A23C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;66 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0721.	7-43
A2A4A23T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;5 MHZ,CAPACITY 284 PF PORM 5%;MFR 93292 PART NUMBER 500-2404, 06845 DWG 4032167-0704.	7-43
A2A4A23T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 5 MHZ,CAPACITY 298 PF PORM 5%;MFR 93292 PART NUMBER 500-2504,06845 DWG 4032521-0704.	7-43
A2A4A23T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;28 MHZ,CAPACITY 66.8 PF;MFR 93292 PART NUMBER 500-2625,06845 DWG 4032522-0725.	7-43
A2A4A23T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;23 MHZ,CAPACITY 79.3 PF;MFR 93292 PART NUMBER 500-2722,06845 DWG 4032523-0722.	7-43
A2A4A24		6 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032312-0501.	7-44
A2A4A24C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.260 IN.;3.3 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA3R3UUFPORM5PCT,06845 DWG 4031973-0730.	7-44
A2A4A24C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;312 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0744.	7-44
A2A4A24C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;318 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0746.	7-44
A2A4A24C4		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;48 PF PORM 5 PF,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0708.	7-44
A2A4A24C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;63 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0719.	7-44
A2A4A24T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;6 MHZ,CAPACITY 230 PF PORM 5%;MFR 93292 PART NUMBER 500-2405, 06845 DWG 4032167-0705.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A24T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 6 MHZ,CAPACITY 250 PF PORM 5%;MFR 93292 PART NUMBER 500-2505,06845 DWG 4032521-0705.	7-44
A2A4A24T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;29 MHZ,CAPACITY 66.6 PF;MFR 93292 PART NUMBER 500-2626,06845 DWG 4032522-0726.	7-44
A2A4A24T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;24 MHZ,CAPACITY 77.0 PF;MFR 93292 PART NUMBER 500-2723,06845 DWG 4032523-0723.	7-44
A2A4A25		7 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032486-0501.	7-45
A2A4A25C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.260 IN.;3.0 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA3ROUUFPORM5PCT,06845 DWG 4031973-0729.	7-45
A2A4A25C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;250 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0739.	7-45
A2A4A25C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;256 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0741.	7-45
A2A4A25C4		NOT USED	
A2A4A25C5		CAPACITOR:ITEM 32.	7-45
A2A4A25T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;7 MHZ,CAPACITY 196 PF PORM 5%;MFR 93292 PART NUMBER 500-2406, 06845 DWG 4032167-0706.	7-45
A2A4A25T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 7 MHZ,CAPACITY 216 PF PORM 5%;MFR 93292 PART NUMBER 500-2506,06845 DWG 4032521-0706.	7-45
A2A4A25T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;2 MHZ,CAPACITY 754 PF;MFR 93292 PART NUMBER 500-2601,06845 DWG 4032522-0701.	7-45
A2A4A25T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;25 MHZ,CAPACITY 74.9 PF;MFR 93292 PART NUMBER 500-2724,06845 DWG 4032523-0724.	7-45
A2A4A26		8 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032485-0501.	7-46
A2A4A26C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.260 IN.;3.0 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA3ROUUFPORM5PCT,06845 DWG 4031973-0729.	7-46
A2A4A26C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;208 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0732.	7-46
A2A4A26C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK.214 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0733.	
A2A4A26C4		CAPACITOR,FIXED,MICA:0.750IN.LG X0.510IN.W X0.200IN.THK;1247 PF PORM 1/2%,300WVDC; MFR 72136 TYPE DM20F,06845 DWG 4031979-0702.	7-46

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A26C5		CAPACITOR:ITEM 31.	7-46
A2A4A26T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;8 MHZ,CAPACITY 172 PF PORM 5%;MFR 93292 PART NUMBER 500-2407, 06845 DWG 4032167-0707.	7-46
A2A4A26T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 8 MHZ,CAPACITY 191 PF PORM 5%;MFR 93292 PART NUMBER 500-2507,06845 DWG 4032521-0707.	7-46
A2A4A26T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;3 MHZ,CAPACITY 474 PF:MFR 93292 PART NUMBER 500-2602,06845 DWG 4032522-0702.	7-46
A2A4A26T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;26 MHZ,CAPACITY 72.9 PF;MFR 93292 PART NUMBER 500-2725,06845 DWG 4032523-0702.	7-46
A2A4A27		9 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032442-0501.	7-47
A2A4A27C1		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.240 IN.;2.7 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA2R7UUFPORM5PCT,06845 DWG 4031973-0728.	7-47
A2A4A27C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;179 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0725.	7-47
A2A4A27C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;185 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0727.	7-47
A2A4A27C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;623 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0756.	7-47
A2A4A27C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;57 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0715.	7-47
A2A4A27T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;9 MHZ,CAPACITY 154 PF PORM 5%;MFR 93292 PART NUMBER 500-2408, 06845 DWG 4032167-0708.	7-47
A2A4A27T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 9 MHZ,CAPACITY 173 PF PORM 5%;MFR 93292 PART NUMBER 500-2508,06845 DWG 4032521-0708.	4-47
A2A4A27T3		TRANSFORMER,R F VARIABLE,0.422IN.DIA X0.490 IN.;4 MHZ,CAPACITY 350 PF;MFR 93292 PART NUMBER 500-2603,06845 DWG 4032522-0703.	7-47
A2A4A27T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;27 MHZ,CAPACITY 71.0 PF;MFR 93292 PART NUMBER 500-2726,06845 DWG 4032523-0726.	7-47
A2A4A28		10 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032314-0501.	7-48
A2A4A28C1		CAPACITOR:ITEM 28.	7-48
A2A4A28C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;157 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0720.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A28C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;163 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0722.	7-48
A2A4A28C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;416 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0751.	7-48
A2A4A28C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;55 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0713.	7-48
A2A4A28T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;10 MHZ,CAPACITY 140 PF PORM 5%;MFR 93292 PART NUMBER 500-2409, 06845 DWG 4032167-0709.	7-48
A2A4A28T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 10 MHZ,CAPACITY 158 PF PORM 5%;MFR 93292 PART NUMBER 500-2509, 06845 DWG 4032521-0709.	7-48
A2A4A28T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;5 MHZ,CAPACITY 275 PF;MFR 93292 PART NUMBER 500-2604,06845 DWG 4032522-0704.	7-48
A2A4A28T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;28 MHZ,CAPACITY 69.5 PF;MFR 93292 PART NUMBER 500-2727,06845 DWG 4032523-0727.	7-48
A2A4A29		11 MHZ SUBASSEMBLY:0.625IN.X3.90IN.X1.12IN.; MFR 06845 PART NUMBER 4032315-0501.	7-49
A2A4A29C1		CAPACITOR:ITEM 27.	7-49
A2A4A29C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;140 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0715.	7-49
A2A4A29C3		CAPACITOR:ITEM 29.	7-49
A2A4A29C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;312 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0744.	7-49
A2A4A29C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;53 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0711.	7-49
A2A4A29T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;11 MHZ,CAPACITY 128 PF PORM 5%;MFR 93292 PART NUMBER 500-2410, 06845 DWG 4032167-0710.	7-49
A2A4A29T2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 11 MHZ,CAPACITY 145 PF PORM 5%;MFR 93292 PART NUMBER 500-2510, 06845 DWG 4032521-0710.	7-49
A2A4A29T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;6 MHZ,CAPACITY 228 PF;MFR 93292 PART NUMBER 500-2605,06845 DWG 4032522-0705.	7-49
A2A4A29T4		TRANSFORMER,R F VARIABLE:0.390IN.DIA X0.531 IN.;29 MHZ,CAPACITY 67.8 PF;MFR 93292 PART NUMBER 500-2728,06845 DWG 4032523-0728.	7-49
A2A4A30		100 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.40IN.THK;MFR 06845 PART NUMBER 4032316-0501. (ATTACHING PARTS) A(3)	7-50

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A30C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;545 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0755.	7-50
A2A4A30C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;426 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0753.	7-50
A2A4A30C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;332 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0747.	7-50
A2A4A30C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W C.210IN.THK;257 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0742.	7-50
A2A4A30C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;195 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0731.	7-50
A2A4A30C6		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;143 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0716.	
A2A4A30C7		CAPACITOR:ITEM 34.	7-50
A2A4A30C8		CAPACITOR:ITEM 32.	7-50
A2A4A30C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;29 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0705.	7-50
A2A4A30C10		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;253 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0740.	7-50
A2A4A30C11		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;219 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0735.	7-50
A2A4A30C12		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;190 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0729.	7-50
A2A4A30C13		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;165 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0723.	7-50
A2A4A30C14		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;144 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0717.	7-50
A2A4A30C15		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;125 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0709.	7-50
A2A4A30C16		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;109 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0703.	7-50
A2A4A30C17		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;95 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0736.	7-50
A2A4A30C18		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;83 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0732.	7-50
A2A4A30C19		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;74 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0728.	7-50
A2A4A31		10 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.031IN.THK;MFR 06845 PART NUMBER 4032317-0501. (ATTACHING PARTS) B(3)	7-51

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A31C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;250 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0739.	7-51
A2A4A31C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;215 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0734.	7-51
A2A4A31C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;183 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0726.	7-51
A2A4A31C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;153 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0719.	7-51
A2A4A31C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;124 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0708.	7-51
A2A4A31C6		CAPACITOR:ITEM 33.	7-51
A2A4A31C7		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;70 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0724.	7-51
A2A4A31C8		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;45 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0706.	7-51
A2A4A31C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;22 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0702.	7-51
A2A4A32		10 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.031IN.THK;MFR 06845 PART NUMBER 4032318-0501 (ATTACHING PARTS) B(3)	7-52
A2A4A32C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;260 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0743.	7-52
A2A4A32C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;224 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0737.	7-52
A2A4A32C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;190 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0729.	7-52
A2A4A32C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;158 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0721.	7-52
A2A4A32C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;128 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0712.	7-52
A2A4A32C6		CAPACITOR:ITEM 34.	7-52
A2A4A32C7		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;72 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0726.	7-52
A2A4A32C8		CAPACITOR:ITEM 30.	7-52
A2A4A32C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;23 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0703.	7-52
A2A4A33		100 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.442IN.THK;MFR 06845 PART NUMBER 4032319-0501. (ATTACHING PARTS) B(3)	7-53

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A33C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;517 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0754.	7-53
A2A4A33C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;405 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0750.	7-53
A2A4A33C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;316 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0745.	7-53
A2A4A33C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;245 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0738.	7-53
A2A4A33C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;186 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0728.	7-53
A2A4A33C6		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;137 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0714.	7-53
A2A4A33C7		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;95 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0736.	7-53
A2A4A33C8		CAPACITOR:ITEM 31.	7-53
A2A4A33C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;28 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0704.	7-53
A2A4A33C10		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;257 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0742.	7-53
A2A4A33C11		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;222 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0736.	7-53
A2A4A33C12		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;193 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0730.	7-53
A2A4A33C13		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;167 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0724.	7-53
A2A4A33C14		CAPACITOR:ITEM 29.	7-53
A2A4A33C15		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;127 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0711.	7-53
A2A4A33C16		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;110 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0704.	7-53
A2A4A33C17		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;96 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0737.	7-53
A2A4A33C18		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;83 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0732.	7-53
A2A4A33C19		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;74 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4032978-0728.	7-53
A2A4A34		100 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.432IN.THK;MFR 06845 PART NUMBER 4032320-0501.	7-54

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A34C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;517 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0754.	7-54
A2A4A34C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;405 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0750.	7-54
A2A4A34C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;316 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0745.	7-54
A2A4A34C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;245 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0738.	7-54
A2A4A34C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;186 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0728.	7-54
A2A4A34C6		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;137 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0714.	7-54
A2A4A34C7		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;95 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0736.	7-54
A2A4A34C8		CAPACITOR:ITEM 31.	7-54
A2A4A34C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;28 PF PORM 0.5 PF;500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0704.	7-54
A2A4A34C10		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;257 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0742.	7-54
A2A4A34C11		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;222 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0736.	7-54
A2A4A34C12		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;193 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0730.	7-54
A2A4A34C13		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;167 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0724.	7-54
A2A4A34C14		CAPACITOR:ITEM 29.	7-54
A2A4A34C15		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;127 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0711.	7-54
A2A4A34C16		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;110 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0704.	7-54
A2A4A34C17		CAPACITOR:ITEM 33.	7-54
A2A4A34C18		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;83 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0732.	7-54
A2A4A34C19		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;74 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0728.	7-54
A2A4A35		10 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.291IN.THK;MFR 06845 PART NUMBER 4032321-0501. (ATTACHING PARTS) B(3)	7-55
A2A4A35C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;260 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0743.	7-55

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A35C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;224 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0737.	7-55
A2A4A35C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;190 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0729.	7-55
A2A4A35C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;158 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0721.	7-55
A2A4A35C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;128 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0712.	7-55
A2A4A35C6		CAPACITOR:ITEM 34.	7-55
A2A4A35C7		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;72 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0726.	7-55
A2A4A35C8		CAPACITOR:ITEM 30.	7-55
A2A4A35C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;23 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0703.	7-55
A2A4A36		10 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.291IN.THK;MFR 06845 PART NUMBER 4032322-0501. (ATTACHING PARTS) B(3)	7-56
A2A4A36C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;260 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0743.	7-56
A2A4A36C2		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;224 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0737.	7-56
A2A4A36C3		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;190 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0729.	7-56
A2A4A36C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;158 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0721.	7-56
A2A4A36C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;128 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0712.	7-56
A2A4A36C6		CAPACITOR:ITEM 34.	7-56
A2A4A36C7		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;72 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0726.	7-56
A2A4A36C8		CAPACITOR:ITEM 30.	7-56
A2A4A36C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;23 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0703.	7-56
A2A4A37		100 KHZ ROTOR SUBASSEMBLY:2.982IN.DIA X 0.291IN.THK;MFR 06845 PART NUMBER 4032323-0501. (ATTACHING PARTS) A(3)	7-57
A2A4A37C1		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;517 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0754.	7-57
A2A4A37C2		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;405 PF PORM 1/2%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0750.	7-57

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A37C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;316 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0745.	7-57
A2A4A37C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;245 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0738.	7-57
A2A4A37C5		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;186 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0728.	7-57
A2A4A37C6		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;137 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0714.	7-57
A2A4A37C7		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;95 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0736.	7-57
A2A4A37C8		CAPACITOR:ITEM 31.	7-57
A2A4A37C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;28 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0704.	7-57
A2A4A37C10		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;257 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0742.	7-57
A2A4A37C11		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;222 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0736.	7-57
A2A4A37C12		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.190IN.THK;193 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0730.	7-57
A2A4A37C13		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.190IN.THK;167 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0724.	7-57
A2A4A37C14		CAPACITOR:ITEM 29.	7-57
A2A4A37C15		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;127 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0711.	7-57
A2A4A37C16		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;110 PF PORM 1/2%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031977-0704.	
A2A4A37C17		CAPACITOR:ITEM 33.	7-57
A2A4A37C18		CAPACITOR,FIXED,MICA:0.460IN.LG X0.360IN.W X0.180IN.THK;83 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0732.	7-57
A2A4A37C19		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;74 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0728.	7-57
A2A4A38		TRANSLATOR/MIXER SUBASSEMBLY:3.375IN.LG X1.078IN.W X1.08IN.THK;MFR 06845 PART NUMBER 4010048-0501. (ATTACHING PARTS) E(3) W(3) Y(3)	
A2A4A38C1 AND A2A4A38C2		CAPACITOR:ITEM 3.	7-58
A2A4A38C3		CAPACITOR:ITEM 14.	7-58
A2A4A38C4 AND A2A4A38C5		CAPACITOR:ITEM 3.	7-58
A2A4A38C6		CAPACITOR:ITEM 14.	7-58

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RF AMPLIFIER ASSEMBLY A2A4

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A4A38C7		CAPACITOR:ITEM 3.	7-58
A2A4A38C8		CAPACITOR,FIXED,MICA:120 PF PORM 1%,500WVDC MIL TYPE CM05FD121FP3.	7-58
A2A4A38C9		CAPACITOR:ITEM 3.	7-58
A2A4A38C10		CAPACITOR:ITEM 14.	7-58
A2A4A38C11		CAPACITOR,FIXED,CERAMIC:1500 PF PORM 20%, 500 WVDC,MIL TYPE CK05BX152M.	7-58
A2A4A38C12		CAPACITOR:ITEM 3.	7-58
A2A4A38C13		CAPACITOR,FIXED,CERAMIC:1500 PF PORM 20%, 500WVDC;MIL TYPE CK05BX152M.	7-58
A2A4A38E5 AND A2A4A38E6		TERMINAL STUD:SWAGE MOUNTING;MIL TYPE SE23XC02.	7-58
A2A4A38FL1 THRU A2A4A38FL3		SAME AS A2A1A1FL1	7-58
A2A4A38K1		RELAY,ELECTRICAL:DPDT;0 TO 0.100 AMP AT 50 MVDC;MIL TYPE M5757-10-017.	7-58
A2A4A38L1		COIL,R F:INDUCTANCE 240 UH PORM 5%,DC RESISTANCE 7.80 OHMS;MIL TYPE MS90538-21.	7-58
A2A4A38Q1 THRU A2A4A38Q3		TRANSISTOR,SILICON,PNP:0.209IN.DIA X0.21IN. MFR 04713 PART NUMBER 2N4959,06845 DWG 4018638-0701.	7-58
A2A4A38R1		RESISTOR:ITEM 90.	7-58
A2A4A38R2		RESISTOR:ITEM 60.	7-58
A2A4A38R3		RESISTOR:ITEM 51.	7-58
A2A4A38R4		RESISTOR:ITEM 88.	7-58
A2A4A38R5		RESISTOR,FIXED,COMPOSITION:22 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G220JS.	7-58
A2A4A38R6		RESISTOR,VARIABLE,NON WIREWOUND:200 OHMS, 1/2W;MIL TYPE RJ24CP201.	7-58
A2A4A38R7 AND A2A4A38R8		RESISTOR:ITEM 93.	7-58
A2A4A38R9		RESISTOR:ITEM 55.	7-58
A2A4A38R10		RESISTOR:ITEM 92.	7-58
A2A4A38R11		RESISTOR:ITEM 91.	7-58
A2A4A38R12		RESISTOR,FIXED,COMPOSITION:22 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G220JS.	7-58
A2A4A38R13		RESISTOR:ITEM 58.	7-58
A2A4A38R14		RESISTOR:ITEM 93.	7-58
A2A4A38R15		RESISTOR:ITEM 90.	7-58
A2A4A38R16		RESISTOR:ITEM 52.	7-58
A2A4A38R17		RESISTOR:ITEM 92.	7-58
A2A4A38R18		RESISTOR:ITEM 91.	7-58
A2A4A38R19		RESISTOR:ITEM 79.	7-58
A2A4A38R20		RESISTOR:ITEM 60.	7-58
A2A4A38R21		RESISTOR,FIXED,COMPOSITION:33 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G330JS.	7-58
A2A4A38TP1		CONNECTOR,ELECTRICAL:1500 VOLTS RMS,60 CPS; MIL TYPE M39024-11-1.	7-58
A2A4A38TP2		CONNECTOR,ELECTRICAL:1500 VOLTS RMS,60 CPS; MIL TYPE M39024-11-3.	7-58

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5		FREQUENCY STANDARD: PROVIDES 500 KHZ, 1 MHZ, 5 MHZ AND 10 MHZ STANDARD FREQUENCIES; MFR 14844 PART NUMBER FE2040B, 06845 DWG 4010015-0701. (ATTACHING PARTS)K(2)	
A2A5MP1		BASE: MFR 14844 PART NUMBER 11215-3069.	
A2A5MP2		COVER: MFR 14844 PART NUMBER 11065-3069.	
A2A5MP3		DRIVER, GEAR, FREQUENCY ADJUST: MFR 14844 PART NUMBER 10956-3069.	
A2A5MP4		GEAR, INDICATOR: MFR 14844 PART NUMBER 11154-3069.	
A2A5MP5 AND A2A5MP6		SCREW, CAPTIVE: MFR 14844 PART NUMBER 5227-946.	
A2A5P1		CONNECTOR: MFR 71468 PART NUMBER DCMME13W6P.	
A2A5P1A1 THRU A2A5P1A6		CONNECTOR, INSERT, STRAIGHT: MFR 91146 PART NUMBER DM53740-5008.	
A2A5A1		OSCILLATOR AND OVEN CONTROL SUBASSEMBLY: MFR 14844 PART NUMBER 10966-3069; 06845 DWG 4031938-0701. (ATTACHING PARTS)L(1)	7-61
A2A5A1C1	1	CAPACITOR, FIXED, MICA: PORM 5%, 500 VDCW, MIL TYPE CM05CD.	
A2A5A1C1A	1	CAPACITOR: ITEM 6.	
A2A5A1C1B	1	18 PF, MIL TYPE CM05CD180JP3.	
A2A5A1C1C	1	20 PF, MIL TYPE CM05ED200JP3.	
A2A5A1C1D	1	22 PF, MIL TYPE CM05ED220JP3.	
A2A5A1C1E	1	24 PF, MIL TYPE CM05ED240JP3.	
A2A5A1C1F	1	27 PF, MIL TYPE CM05ED270JP3.	
A2A5A1C1G	1	30 PF, MIL TYPE CM05ED300JP3.	
A2A5A1C1H	1	33 PF, MIL TYPE CM05ED330JP3.	
A2A5A1C1I	1	36 PF, MIL TYPE CM05ED360JP3.	
A2A5A1C1J	1	39 PF, MIL TYPE CM05ED390JP3.	
A2A5A1C1K	1	43 PF, MIL TYPE CM05ED430JP3.	
A2A5A1C1L	1	47 PF, MIL TYPE CM05ED470JP3.	
A2A5A1C1M	1	50 PF, MIL TYPE CM05ED500JP3.	
A2A5A1C1N	1	51 PF, MIL TYPE CM05ED510JP3.	
A2A5A1C1O	1	56 PF, MIL TYPE CM05ED560JP3.	
A2A5A1C2		CAPACITOR, VARIABLE: 10 TO 60 PF, 875WVDC; MFR 14844 PART NUMBER D5559-946-2; 06845 DWG 4017513-0702.	7-61
A2A5A1C3		CAPACITOR, FIXED, MICA: 200 PF PORM 5%, 500WVDC, MIL TYPE CM05FD201JP3.	7-61
A2A5A1C4		CAPACITOR, VARIABLE: 0.8 TO 12 PF; MFR 14844 PART NUMBER C5217-946, 06845 DWG 2031003-0701.	7-61
A2A5A1C5 AND A2A5A1C6		CAPACITOR, FIXED, MICA: 100 PF PORM 5%, 500WVDC MIL TYPE CM05FD101JP3.	7-61
A2A5A1C7		CAPACITOR: ITEM 25.	7-61
A2A5A1C8		CAPACITOR, FIXED, CERAMIC: 0.001UF PORM 20%, 1000WVDC; MIL TYPE CK60AW102M.	7-61
A2A5A1C9		CAPACITOR; ITEM 25.	7-61
A2A5A1C10		CAPACITOR, FIXED, TANTALUM: 3.3UF PORM 20%, 15WVDC; MIL TYPE M39003-01-2029.	7-61
A2A5A1C201		CAPACITOR, FIXED, TANTALUM: 3.3UF PORM 20%, 15WVDC; MIL TYPE M39003-01-2029.	7-61

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A1C202		CAPACITOR, FIXED, TANTALUM: 3.3UF PORM 20%, 15WVDC; MIL TYPE M39003-01-2029.	7-61
A2A5A1CR1		SEMICONDUCTOR DEVICE, DIODE: ITEM 96.	7-61
A2A5A1L1	1	COIL: PORM 5%; MIL TYPE MS90538.	
A2A5A1L1A	1	36UH, 180 MA; MIL TYPE MS90538-01.	
A2A5A1L1B	1	39UH, 176 MA; MIL TYPE MS90538-02.	
A2A5A1L1C	1	43UH, 172 MA; MIL TYPE MS90538-03.	
A2A5A1L1D	1	47UH, 240 MA; MIL TYPE MS90538-04.	
A2A5A1L2		COIL: 47UH PORM 5%, 240 MA; MIL TYPE MS90538-04.	7-61
A2A5A1P1		CONNECTOR, MALE: MFR 91662 PART NUMBER 02-005-111-5-200.	
A2A5A1Q1 THRU A2A5A1Q3		TRANSISTOR: ITEM 113.	7-61
A2A5A1Q201 AND A2A5A1Q202		TRANSISTOR: ITEM 113.	7-61
A2A5A1Q203 AND A2A5A1Q204		TRANSISTOR, PNP: MIL TYPE 2N2906.	7-61
A2A5A1Q205		TRANSISTOR: ITEM 109.	7-61
A2A5A1R1		RESISTOR, FIXED, COMPOSITION: 220K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G224KS.	7-61
A2A5A1R2	1	RESISTOR, FIXED, COMPOSITION: PORM 10%, 1/4W; MIL TYPE RCR07G.	7-61
A2A5A1R2A	1	RESISTOR: ITEM 87.	7-61
A2A5A1R2B	1	12K OHMS, MIL TYPE RCR07G153KS.	7-61
A2A5A1R2C	1	15K OHMS, MIL TYPE RCR07G183KS.	
A2A5A1R2D	1	18K OHMS, MIL TYPE RCR07G183KS.	
A2A5A1R2E	1	22K OHMS, MIL TYPE RCR07G223KS.	
A2A5A1R3		RESISTOR, FIXED, COMPOSITION: 220 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G221KS.	7-61
A2A5A1R4		RESISTOR, FIXED, COMPOSITION: 47 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G470KS.	7-61
A2A5A1R5		RESISTOR: ITEM 87.	7-61
A2A5A1R6		RESISTOR, FIXED, COMPOSITION: 120K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G124KS.	7-61
A2A5A1R7		RESISTOR, FIXED, COMPOSITION: 15K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G153KS.	7-61
A2A5A1R8		RESISTOR, FIXED, COMPOSITION: 1.5K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G152KS.	7-61
A2A5A1R9		RESISTOR, FIXED, COMPOSITION: 47 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G470KS.	7-61
A2A5A1R10		RESISTOR, FIXED, COMPOSITION: 330 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G331KS.	7-61
A2A5A1R11		RESISTOR, FIXED, COMPOSITION: 680 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G681KS.	7-61
A2A5A1R201 THRU A2A5A1R202		RESISTOR, FIXED, FILM: 4.7K OHMS PORM 5%, 1/4W; MIL TYPE RLR07C472JS.	7-61
A2A5A1R203	1	RESISTOR, FIXED, FILM: PORM 5%, 1/4W; MIL TYPE RLR07C.	7-61
A2A5A1R203A	1	4.7K OHMS, MIL TYPE RLR07C472JS.	
A2A5A1R203B	1	5.1K OHMS, MIL TYPE RLR07C512JS.	
A2A5A1R203C	1	5.6K OHMS, MIL TYPE RLR07C562JS.	
A2A5A1R203D	1	6.2K OHMS, MIL TYPE RLR07C622JS.	
A2A5A1R203E	1	6.8K OHMS, MIL TYPE RLR07C682JS.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A1R204	1	RESISTOR, FIXED, FILM: PORM 5%, 1/4W; MIL TYPE RLR07C.	7-61
A2A5A1R204A	1	82 OHMS, MIL TYPE RLR07C820JS.	
A2A5A1R204B	1	120 OHMS, MIL TYPE RLR07C121JS.	
A2A5A1R204C	1	180 OHMS, MIL TYPE RLR07C181JS.	
A2A5A1R204D	1	240 OHMS, MIL TYPE RLR07C241JS.	
A2A5A1R204E	1	390 OHMS, MIL TYPE RLR07C391JS.	
A2A5A1R204F	1	560 OHMS, MIL TYPE RLR07C561JS.	
A2A5A1R204G	1	680 OHMS, MIL TYPE RLR07C681JS.	
A2A5A1R204H	1	750 OHMS, MIL TYPE RLR07C751JS.	
A2A5A1R204I	1	300 OHMS, MIL TYPE RLR07C301JS.	
A2A5A1R204J	1	820 OHMS, MIL TYPE RLR07C821JS.	
A2A5A1R204K	1	1K OHM, MIL TYPE RLR07C102JS.	
A2A5A1R204L	1	1.1K OHM, MIL TYPE RLR07C112JS.	
A2A5A1R204M	1	1.2K OHM, MIL TYPE RLR07C122JS.	
A2A5A1R204N	1	1.3K OHM, MIL TYPE RLR07C132JS.	
A2A5A1R204O	1	1.5K OHM, MIL TYPE RLR07C152JS.	
A2A5A1R204P	1	1.6K OHM, MIL TYPE RLR07C162JS.	
A2A5A1R204Q	1	1.8K OHM, MIL TYPE RLR07C182JS.	
A2A5A1R205		NOT USED	
A2A5A1R206		RESISTOR, FIXED, COMPOSITION: 12K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G123KS.	7-61
A2A5A1R207		RESISTOR, FIXED, COMPOSITION: 8.2K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G822KS.	7-61
A2A5A1R208		RESISTOR, FIXED, COMPOSITION: 12K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G123KS.	7-61
A2A5A1R209		RESISTOR, FIXED, COMPOSITION: 1.8K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G182KS.	7-61
A2A5A1R210	1	RESISTOR, FIXED, COMPOSITION: PORM 10%, 1/4W, MIL TYPE RCR07G.	
A2A5A1R210A	1	220K OHMS, MIL TYPE RCR07G224KS.	
A2A5A1R210B	1	270K OHMS, MIL TYPE RCR07G274KS.	
A2A5A1R210C	1	330K OHMS, MIL TYPE RCR07G334KS.	
A2A5A1R210D	1	390K OHMS, MIL TYPE RCR07G394KS.	
A2A5A1R210E	1	470K OHMS, MIL TYPE RCR07G474KS.	
A2A5A1R210F	1	560K OHMS, MIL TYPE RCR07G564KS.	
A2A5A1R210G	1	680K OHMS, MIL TYPE RCR07G684KS.	
A2A5A1R210H	1	820K OHMS, MIL TYPE RCR07G824KS.	
A2A5A1R210I	1	1 MEGOHM, MIL TYPE RCR07G105KS.	
A2A5A1R210J	1	1.2 MEGOHM, MIL TYPE RCR07G125KS.	
A2A5A1R211		RESISTOR: ITEM 87.	7-61
A2A5A1R212		RESISTOR, FIXED, COMPOSITION: 1.2K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G122KS.	7-61
A2A5A1R213		RESISTOR, FIXED, COMPOSITION: 680 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G681KS.	7-61
A2A5A1Y1		CRYSTAL: 5 MHZ; MFR 14844 PART NUMBER 11331-3069, 06845 DWG 4032504-0701.	7-61
A2A5A2		DIVIDER/AMPLIFIER SUBASSEMBLY: MRF 14844 PART NUMBER 10981-3069, 06845 DWG 4031940-0701. (ATTACHING PARTS)L(2),E(2)	7-59,60
A2A5A2C1 AND A2A5A2C2		CAPACITOR, FIXED, MICA: 270 PF PORM 5%, 500WVDC; MIL TYPE CM05FD271JP3.	7-62
A2A5A2C3		CAPACITOR: ITEM 25.	7-62
A2A5A2C4		CAPACITOR, FIXED, MICA: 270 PF PORM 5%, 500WVDC; MIL TYPE CM05FD271JP3.	7-62
A2A5A2C5	1	CAPACITOR, FIXED, MICA: PORM 5%, 500VDCW, MIL TYPE CM05ED.	7-62
A2A5A2C5A	1	22 PF, MIL TYPE CM05ED220JP3.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2C5B	1	24 PF, MIL TYPE CM05ED240JP3.	7-62
A2A5A2C5C	1	27 PF, MIL TYPE CM05ED270JP3.	
A2A5A2C5D	1	30 PF, MIL TYPE CM05ED300JP3.	
A2A5A2C5E	1	33 PF, MIL TYPE CM05ED330JP3.	
A2A5A2C5F	1	36 PF, MIL TYPE CM05ED360JP3.	
A2A5A2C5G	1	39 PF, MIL TYPE CM05ED390JP3.	
A2A5A2C5H	1	43 PF, MIL TYPE CM05ED430JP3.	
A2A5A2C5I	1	47 PF, MIL TYPE CM05ED470JP3.	
A2A5A2C5J	1	50 PF, MIL TYPE CM05ED500JP3.	
A2A5A2C5K	1	51 PF, MIL TYPE CM05ED510JP3.	
A2A5A2C6		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 0.275 IN.LG X 0.375 IN.DIA, 15-60 PF MFR 14844 PN D5559-946-1, 06845 DWG 4017513-0701.	7-62
A2A5A2C7		CAPACITOR, FIXED, CERAMIC: 0.001 UF PORM 20%, 1000WVDC; MIL TYPE CK60AW102M.	7-62
A2A5A2C8		CAPACITOR, FIXED, MICA: 680 PF PORM 5%, 500WVDC; MIL TYPE CM06FD681JP3.	7-62
A2A5A2C9	1	CAPACITOR, FIXED, MICA: PORM 5%, 500VDCW; MIL TYPE CM05FD.	7-61
A2A5A2C9A	1	180 PF, MIL TYPE CM05FD181JP3.	
A2A5A2C9B	1	200 PF, MIL TYPE CM05FD201JP3.	
A2A5A2C9C	1	220 PF, MIL TYPE CM05FD221JP3.	
A2A5A2C9D	1	240 PF, MIL TYPE CM05FD241JP3.	
A2A5A2C9E	1	250 PF, MIL TYPE CM05FD251JP3.	
A2A5A2C9F	1	270 PF, MIL TYPE CM05FD271JP3.	
A2A5A2C9G	1	300 PF, MIL TYPE CM05FD301JP3.	
A2A5A2C9H	1	330 PF, MIL TYPE CM05FD331JP3.	
A2A5A2C10		CAPACITOR: ITEM 25.	7-62
A2A5A2C11		CAPACITOR, FIXED, MICA: 33 PF PORM 5%, 500WVDC; MIL TYPE CM05ED330JP3.	7-62
A2A5A2C12		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 0.275 IN.LG X 0.375 IN. DIA, 9-35 PF MFR 14844 PN D5559-946-3, 06845 DWG 4017513-0703.	7-62
A2A5A2C13		CAPACITOR, FIXED, CERAMIC: 0.001 UF PORM 20%, 1000WVDC; MIL TYPE CK60AW102M.	7-62
A2A5A2C14		CAPACITOR: ITEM 25.	7-62
A2A5A2C15		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 0.275 IN.LG X 0.375 IN. DIA, 15-60 PF MFR 14844 PN D5559-946-1, 06845 DWG 4017513-0701.	7-62
A2A5A2C16		CAPACITOR, FIXED, MICA: 1500 PF PORM 5%, 500WVDC; MIL TYPE CM06FD152JP3.	7-62
A2A5A2C17		CAPACITOR, FIXED, MICA: 680 PF PORM 5%, 500WVDC; MIL TYPE CM06FD681JP3.	7-62
A2A5A2C18		CAPACITOR, FIXED, CERAMIC: 0.001 UF PORM 20%, 1000WVDC; MIL TYPE CK60AW102M.	7-62
A2A5A2C19		CAPACITOR: ITEM 25.	7-62
A2A5A2C20		CAPACITOR, FIXED, MICA: 330 PF PORM 5%, 500WVDC; MIL TYPE CM05FD331JP3.	7-62
A2A5A2C21		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 0.275 IN.LG X 0.375 IN. DIA, 15-60 PF MFR 14844 PN D5559-946-1, MFR 06845 DWG 4017513-0701.	7-62
A2A5A2C22 THRU A2A5A2C25		CAPACITOR: ITEM 25.	7-62
A2A5A2C26	1	CAPACITOR, FIXED, MICA: PORM 5%, 500VDCW; MIL TYPE CM05FD.	
A2A5A2C26A		100 PF, MIL TYPE CM05FD101JP3.	
A2A5A2C26B	1	110 PF, MIL TYPE CM05FD111JP3.	
A2A5A2C26C	1	120 PF, MIL TYPE CM05FD121JP3.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2C26D	1	130 PF, MIL TYPE CM05FD131JP3.	
A2A5A2C26E	1	150 PF, MIL TYPE CM05FD151JP3.	
A2A5A2C26F	1	160 PF, MIL TYPE CM05FD161JP3.	
A2A5A2C26G	1	180 PF, MIL TYPE CM05FD181JP3.	
A2A5A2C26H	1	200 PF, MIL TYPE CM05FD201JP3.	
A2A5A2C26I	1	220 PF, MIL TYPE CM05FD221JP3.	
A2A5A2C26J	1	240 PF, MIL TYPE CM05FD241JP3.	
A2A5A2C26K	1	270 PF, MIL TYPE CM05FD271JP3.	
A2A5A2C26L	1	300 PF, MIL TYPE CM05FD301JP3.	
A2A5A2C26M	1	330 PF, MIL TYPE CM05FD331JP3.	
A2A5A2C26N	1	360 PF, MIL TYPE CM05FD361JP3.	
A2A5A2C26O	1	390 PF, MIL TYPE CM05FD391JP3.	
A2A5A2C26P	1	430 PF, MIL TYPE CM05FD431JP3.	
A2A5A2C26Q	1	470 PF, MIL TYPE CM05FD471JP3.	
A2A5A2C27		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 0.275 IN.LG X 0.375 IN.DIA, 15-60 PF, MFR 14844 PN D5559-946-1, 06845 DWG 4017513-0701.	7-62
A2A5A2C28		CAPACITOR, FIXED, MICA: 300 PF PORM 5%, 500WVDC; MIL TYPE CM05FD301JP3.	7-62
A2A5A2C29 AND A2A5A2C30		CAPACITOR: ITEM 25.	7-62
A2A5A2C31		CAPACITOR, FIXED, MICA: 1200 PF PORM 5%, 500WVDC; MIL TYPE CM06FD122JP3.	7-62
A2A5A2C32	1	CAPACITOR, FIXED, MICA: PORM 5 PF, 500VDCW; MIL TYPE CM05CD.	7-62
A2A5A2C32A	1	1 PF, MIL TYPE CM05CD010D03.	
A2A5A2C32B	1	2 PF, MIL TYPE CM05CD020D03.	
A2A5A2C32C	1	3 PF, MIL TYPE CM05CD030D03.	
A2A5A2C32D	1	4 PF, MIL TYPE CM05CD040D03.	
A2A5A2C32E	1	5 PF, MIL TYPE CM05CD050D03.	
A2A5A2C32F	1	6 PF, MIL TYPE CM05CD060K03.	
A2A5A2C32G	1	7 PF, MIL TYPE CM05CD070K03.	
A2A5A2C32H	1	8 PF, MIL TYPE CM05CD080K03.	
A2A5A2C32I	1	10 PF, MIL TYPE CM05CD100JP3.	
A2A5A2C32J	1	12 PF, MIL TYPE CM05CD120JP3.	
A2A5A2C32K	1	CAPACITOR: ITEM 6.	
A2A5A2C32L	1	18 PF, MIL TYPE CM05CD180JP3.	
A2A5A2C32M	1	20 PF, MIL TYPE CM05ED200JP3.	
A2A5A2C32N	1	22 PF, MIL TYPE CM05ED220JP3.	
A2A5A2C32O	1	24 PF, MIL TYPE CM05ED240JP3.	
A2A5A2C32P	1	27 PF, MIL TYPE CM05ED270JP3.	
A2A5A2C32Q	1	30 PF, MIL TYPE CM05ED300JP3.	
A2A5A2C32R	1	33 PF, MIL TYPE CM05ED330JP3.	
A2A5A2C32S	1	36 PF, MIL TYPE CM05ED360JP3.	
A2A5A2C32T	1	39 PF, MIL TYPE CM05ED390JP3.	
A2A5A2C32U	1	43 PF, MIL TYPE CM05ED430JP3.	
A2A5A2C32V	1	47 PF, MIL TYPE CM05ED470JP3.	
A2A5A2C32W	1	50 PF, MIL TYPE CM05ED500JP3.	
A2A5A2C32X	1	51 PF, MIL TYPE CM05ED510JP3.	
A2A5A2C32Y	1	56 PF, MIL TYPE CM05ED560JP3.	
A2A5A2C32Z	1	62 PF, MIL TYPE CM05ED620JP3.	
A2A5A2C32AA	1	68 PF, MIL TYPE CM05ED680JP3.	
A2A5A2C32AB	1	75 PF, MIL TYPE CM05ED750JP3.	
A2A5A2C32AC	1	82 PF, MIL TYPE CM05ED820JP3.	
A2A5A2C32AD	1	91 PF, MIL TYPE CM05FD910JP3.	
A2A5A2C32AE	1	100 PF, MIL TYPE CM05FD101JP3.	
A2A5A2C32AF	1	110 PF, MIL TYPE CM05FD111JP3.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2C32AG	1	120 PF, MIL TYPE CM05FD121JP3.	
A2A5A2C32AH	1	130 PF, MIL TYPE CM05FD131JP3.	
A2A5A2C32AI	1	150 PF, MIL TYPE CM05FD151JP3.	
A2A5A2C32AJ	1	160 PF, MIL TYPE CM05FD161JP3.	
A2A5A2C32AK	1	180 PF, MIL TYPE CM05FD181JP3.	
A2A5A2C32AL	1	200 PF, MIL TYPE CM05FD201JP3.	
A2A5A2C32AM	1	220 PF, MIL TYPE CM05FD221JP3.	
A2A5A2C32AN	1	240 PF, MIL TYPE CM05FD241JP3.	
A2A5A2C32AO	1	250 PF, MIL TYPE CM05FD251JP3.	
A2A5A2C32AP	1	270 PF, MIL TYPE CM05FD271JP3.	
A2A5A2C32AQ	1	300 PF, MIL TYPE CM05FD301JP3.	
A2A5A2C32AR	1	330 PF, MIL TYPE CM05FD331JP3.	
A2A5A2C32AS	1	360 PF, MIL TYPE CM05FD361JP3.	
A2A5A2C33 AND A2A5A2C34		NOT USED.	
A2A5A2C35		CAPACITOR: ITEM 20.	7-62
A2A5A2C36 THRU A2A5A2C39		NOT USED.	
A2A5A2C40 AND A2A5A2C41		CAPACITOR, FIXED, MICA: 120 PF PORM 5%, 500WVDC; MIL TYPE CM05ED121JP3.	7-62
A2A5A2C42		CAPACITOR, FIXED, MICA: 1000 PF PORM 5%, 500WVDC; MIL TYPE CM06FD102JP3.	7-62
A2A5A2C43 AND A2A5A2C44		CAPACITOR, FIXED, MICA: 470 PF PORM 5%, 500WVDC; MIL TYPE CM06FD471JP3.	7-62
A2A5A2C45		CAPACITOR, FIXED, MICA: 1000 PF PORM 5%, 500WVDC; MIL TYPE CM06FD102JP3.	7-62
A2A5A2CR1		SEMICONDUCTOR DEVICE, DIODE: ITEM 100.	7-62
A2A5A2CR2 THRU A2A5A2CR7		SEMICONDUCTOR DEVICE, DIODE: ITEM 96.	7-62
A2A5A2DS1		LAMP: MFR 14844 PART NUMBER A5220-946.	7-59
A2A5A2L1		COIL; 120 UH PORM 5%, 75 MA; MIL TYPE MS90538-14.	7-62
A2A5A2L2		COIL: 200 UH PORM 5%, 150 MA; MIL TYPE MS90538-19.	7-62
A2A5A2L3 AND A2A5A2L4		NOT USED.	
A2A5A2L5		COIL: 0.82 UH PORM 10%, 900 MA; MIL TYPE MS18130-080.	7-62
A2A5A2L6		COIL: 8.2 UH PORM 10%, 545 MA; MIL TYPE MS18130-092.	7-62
A2A5A2L7		COIL: 0.82 UH PORM 10%, 900 MA; MIL TYPE MS18130-080.	7-62
A2A5A2Q1		TRANSISTOR: ITEM 109.	7-62
A2A5A2Q2 THRU A2A5A2Q9		TRANSISTOR: ITEM 113.	7-62
A2A5A2Q10		TRANSISTOR, NPN: MIL TYPE 2N2222.	7-62
A2A5A2Q11		TRANSISTOR: ITEM 113.	7-62
A2A5A2R1		RESISTOR, FIXED, COMPOSITION: 180 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G181KS.	7-62
A2A5A2R2		RESISTOR: ITEM 86.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2R3		RESISTOR, FIXED, WIREWOUND: 220 OHMS PORM 1%, 1-1/2W; MIL TYPE RW70U220RF.	7-62
A2A5A2R4		RESISTOR, FIXED, COMPOSITION: 18K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G183KS.	7-62
A2A5A2R5		RESISTOR: ITEM 86.	7-62
A2A5A2R6		RESISTOR, FIXED, WIREWOUND: 560 OHMS PORM 1%, 1-1/2W; MIL TYPE RW70U560RF.	7-62
A2A5A2R7		RESISTOR, FIXED, COMPOSITION: 18K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G183KS.	7-62
A2A5A2R8		RESISTOR: ITEM 86.	7-62
A2A5A2R9		RESISTOR, FIXED, COMPOSITION: 33K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G333KS.	7-62
A2A5A2R10		RESISTOR: ITEM 87.	7-62
A2A5A2R11		RESISTOR, FIXED, COMPOSITION: 820 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G821KS.	7-62
A2A5A2R12		RESISTOR: ITEM 87.	7-62
A2A5A2R13		RESISTOR, FIXED, COMPOSITION: 4.7K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G472KS.	7-62
A2A5A2R14		RESISTOR: ITEM 86	7-62
A2A5A2R15	1	RESISTOR, FIXED, COMPOSITION: PORM 10%, 1/4W; MIL TYPE RCR07G.	
A2A5A2R15A		330 OHMS, MIL TYPE RCR07G331KS.	
A2A5A2R15B	1	390 OHMS, MIL TYPE RCR07G391KS.	
A2A5A2R15C	1	470 OHMS, MIL TYPE RCR07G471KS.	
A2A5A2R15D	1	560 OHMS, MIL TYPE RCR07G561KS.	
A2A5A2R15E	1	680 OHMS, MIL TYPE RCR07G681KS.	
A2A5A2R15F	1	820 OHMS, MIL TYPE RCR07G821KS.	
A2A5A2R15G	1	RESISTOR: ITEM 86.	
A2A5A2R16		RESISTOR, FIXED, COMPOSITION: 68K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G683KS.	7-62
A2A5A2R17		RESISTOR, FIXED, COMPOSITION: 6.8K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G682KS.	7-62
A2A5A2R18		RESISTOR, FIXED, COMPOSITION: 560 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G561KS.	7-62
A2A5A2R19		RESISTOR, FIXED, COMPOSITION: 100 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G101KS.	7-62
A2A5A2R20	1	RESISTOR, FIXED, COMPOSITION: PORM 10%, 1/4W; MIL TYPE RCR07G.	7-62
A2A5A2R20A	1	47 OHMS, MIL TYPE RCR07G470KS.	
A2A5A2R20B	1	56 OHMS, MIL TYPE RCR07G560KS.	
A2A5A2R20C	1	68 OHMS, MIL TYPE RCR07G680KS.	
A2A5A2R20D	1	82 OHMS, MIL TYPE RCR07G820KS.	
A2A5A2R20E	1	100 OHMS, MIL TYPE RCR07G101KS.	
A2A5A2R20F	1	120 OHMS, MIL TYPE RCR07G121KS.	
A2A5A2R20G	1	150 OHMS, MIL TYPE RCR07G151KS.	
A2A5A2R20H	1	180 OHMS, MIL TYPE RCR07G181KS.	
A2A5A2R20I	1	220 OHMS, MIL TYPE RCR07G221KS.	
A2A5A2R20J	1	270 OHMS, MIL TYPE RCR07G271KS.	
A2A5A2R20K	1	330 OHMS, MIL TYPE RCR07G331KS.	
A2A5A2R20L	1	390 OHMS, MIL TYPE RCR07G391KS.	
A2A5A2R20M	1	470 OHMS, MIL TYPE RCR07G471KS.	
A2A5A2R20N	1	560 OHMS, MIL TYPE RCR07G561KS.	
A2A5A2R20O	1	680 OHMS, MIL TYPE RCR07G681KS.	
A2A5A2R20P	1	820 OHMS, MIL TYPE RCR07G821KS.	
A2A5A2R20Q	1	RESISTOR: ITEM 86.	
A2A5A2R20R	1	1.2K OHMS, MIL TYPE RCR07G122KS.	
A2A5A2R20S	1	1.5K OHMS, MIL TYPE RCR07G152KS.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2R20T		NOT USED	
A2A5A2R20U	I	1.8K OHMS, MIL TYPE RCR07G182KS.	
A2A5A2R20V	I	2.2K OHMS, MIL TYPE RCR07G222KS.	
A2A5A2R20W	I	2.7K OHMS, MIL TYPE RCR07G272KS.	
A2A5A2R20X	I	3.3K OHMS, MIL TYPE RCR07G332KS.	
A2A5A2R20Y	I	3.9K OHMS, MIL TYPE RCR07G392KS.	
A2A5A2R20Z	I	4.7K OHMS, MIL TYPE RCR07G472KS.	
A2A5A2R20AA	I	5.6K OHMS, MIL TYPE RCR07G562KS.	
A2A5A2R20AB	I	6.8K OHMS, MIL TYPE RCR07G682KS.	
A2A5A2R20AC	I	8.2K OHMS, MIL TYPE RCR07G822KS.	
A2A5A2R20AD	I	RESISTOR: ITEM 87.	
A2A5A2R20AE	I	12K OHMS, MIL TYPE RCR07G123KS.	
A2A5A2R20AF	I	15K OHMS, MIL TYPE RCR07G153KS.	
A2A5A2R20AG	I	18K OHMS, MIL TYPE RCR07G183KS.	
A2A5A2R20AH	I	22K OHMS, MIL TYPE RCR07G223KS.	
A2A5A2R20AI		NOT USED	
A2A5A2R20AJ	I	27K OHMS, MIL TYPE RCR07G273KS.	
A2A5A2R20AK	I	33K OHMS, MIL TYPE RCR07G333KS.	
A2A5A2R20AL	I	39K OHMS, MIL TYPE RCR07G393KS.	
A2A5A2R20AM	I	47K OHMS, MIL TYPE RCR07G473KS.	
A2A5A2R20AN	I	56K OHMS, MIL TYPE RCR07G563KS.	
A2A5A2R20AO	I	68K OHMS, MIL TYPE RCR07G683KS.	
A2A5A2R20AP	I	82K OHMS, MIL TYPE RCR07G823KS.	
A2A5A2R20AQ	I	100K OHMS, MIL TYPE RCR07G104KS.	
A2A5A2R20AR	I	120K OHMS, MIL TYPE RCR07G124KS.	
A2A5A2R20AS	I	150K OHMS, MIL TYPE RCR07G154KS.	
A2A5A2R20AT	I	180K OHMS, MIL TYPE RCR07G184KS.	
A2A5A2R20AU	I	220K OHMS, MIL TYPE RCR07G224KS.	
A2A5A2R20AV	I	270K OHMS, MIL TYPE RCR07G274KS.	
A2A5A2R20AW	I	330K OHMS, MIL TYPE RCR07G334KS.	
A2A5A2R20AX	I	390K OHMS, MIL TYPE RCR07G394KS.	
A2A5A2R20AY	I	470K OHMS, MIL TYPE RCR07G474KS.	
A2A5A2R20AZ	I	560K OHMS, MIL TYPE RCR07G564KS.	
A2A5A2R20BA	I	680K OHMS, MIL TYPE RCR07G684KS.	
A2A5A2R20BB	I	820K OHMS, MIL TYPE RCR07G824KS.	
A2A5A2R20BC	I	1 MEGOHM, MIL TYPE RCR07G105KS.	
A2A5A2R20BD	I	1.2 MEGOHMS, MIL TYPE RCR07G125KS.	
A2A5A2R20BE	I	1.5 MEGOHMS, MIL TYPE RCR07G155KS.	
A2A5A2R20BF	I	1.8 MEGOHMS, MIL TYPE RCR07G185KS.	
A2A5A2R20BG	I	2.2 MEGOHMS, MIL TYPE RCR07G225KS.	
A2A5A2R20BH	I	2.7 MEGOHMS, MIL TYPE RCR07G275KS.	
A2A5A2R20BI	I	3.3 MEGOHMS, MIL TYPE RCR07G335KS.	
A2A5A2R20BJ	I	3.9 MEGOHMS, MIL TYPE RCR07G395KS.	
A2A5A2R20BK	I	4.7 MEGOHMS, MIL TYPE RCR07G475KS.	
A2A5A2R20BL	I	5.6 MEGOHMS, MIL TYPE RCR07G565KS.	
A2A5A2R20BM	I	6.8 MEGOHMS, MIL TYPE RCR07G685KS.	
A2A5A2R20BN	I	8.2 MEGOHMS, MIL TYPE RCR07G825KS.	
A2A5A2R20BO	I	10 MEGOHMS, MIL TYPE RCR07G106KS.	
A2A5A2R20BP	I	12 MEGOHMS, MIL TYPE RCR07G126KS.	
A2A5A2R20BQ	I	15 MEGOHMS, MIL TYPE RCR07G156KS.	
A2A5A2R20BR	I	18 MEGOHMS, MIL TYPE RCR07G186KS.	
A2A5A2R20BS	I	22 MEGOHMS, MIL TYPE RCR07G226KS.	
A2A5A2R21		RESISTOR: ITEM 87.	7-62
A2A5A2R22		RESISTOR, FIXED, COMPOSITION: 33K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G333KS.	7-62
A2A5A2R23 AND A2A5A2R24		RESISTOR: ITEM 87.	7-62

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2R25 THRU A2A5A2R27		RESISTOR, FIXED, COMPOSITION: 4.7K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G472KS.	7-62
A2A5A2R28		RESISTOR: ITEM 86.	7-62
A2A5A2R29		RESISTOR, FIXED, COMPOSITION: 27K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G273KS.	7-62
A2A5A2R30		RESISTOR: ITEM 87.	7-62
A2A5A2R31		RESISTOR: ITEM 86.	7-62
A2A5A2R32	1	RESISTOR, FIXED, COMPOSITION: PORM 10%, 1/4W; MIL TYPE RCR07G.	7-62
A2A5A2R32A	1	22 OHMS, MIL TYPE RCR07G220KS.	
A2A5A2R32B	1	27 OHMS, MIL TYPE RCR07G270KS.	
A2A5A2R32C	1	33 OHMS, MIL TYPE RCR07G330KS.	
A2A5A2R32D	1	39 OHMS, MIL TYPE RCR07G390KS.	
A2A5A2R32E	1	47 OHMS, MIL TYPE RCR07G470KS.	
A2A5A2R32F	1	56 OHMS, MIL TYPE RCR07G560KS.	
A2A5A2R32G	1	68 OHMS, MIL TYPE RCR07G680KS.	
A2A5A2R32H	1	82 OHMS, MIL TYPE RCR07G820KS.	
A2A5A2R32I	1	100 OHMS, MIL TYPE RCR07G101KS.	
A2A5A2R32J	1	120 OHMS, MIL TYPE RCR07G121KS.	
A2A5A2R32K	1	150 OHMS, MIL TYPE RCR07G151KS.	
A2A5A2R33	1	RESISTOR, FIXED, COMPOSITION: PORM 10%, 1/4W; MIL TYPE RCR07G.	7-62
A2A5A2R33A	1	47 OHMS, MIL TYPE RCR07G470KS.	
A2A5A2R33B	1	56 OHMS, MIL TYPE RCR07G560KS.	
A2A5A2R33C	1	68 OHMS, MIL TYPE RCR07G680KS.	
A2A5A2R33D	1	82 OHMS, MIL TYPE RCR07G820KS.	
A2A5A2R33E	1	100 OHMS, MIL TYPE RCR07G101KS.	
A2A5A2R33F	1	120 OHMS, MIL TYPE RCR07G121KS.	
A2A5A2R33G	1	150 OHMS, MIL TYPE RCR07G151KS.	
A2A5A2R33H	1	180 OHMS, MIL TYPE RCR07G181KS.	
A2A5A2R33I	1	220 OHMS, MIL TYPE RCR07G221KS.	
A2A5A2R33J	1	270 OHMS, MIL TYPE RCR07G271KS.	
A2A5A2R33K	1	330 OHMS, MIL TYPE RCR07G331KS.	
A2A5A2R33L	1	390 OHMS, MIL TYPE RCR07G391KS.	
A2A5A2R33M	1	470 OHMS, MIL TYPE RCR07G471KS.	
A2A5A2R33N	1	560 OHMS, MIL TYPE RCR07G561KS.	
A2A5A2R33O	1	680 OHMS, MIL TYPE RCR07G681KS.	
A2A5A2R33P	1	820 OHMS, MIL TYPE RCR07G821KS.	
A2A5A2R33Q	1	RESISTOR: ITEM 86	
A2A5A2R33R	1	1.2K OHMS, MIL TYPE RCR07G122KS.	
A2A5A2R33S	1	1.5K OHMS, MIL TYPE RCR07G152KS.	
A2A5A2R33T	1	1.8K OHMS, MIL TYPE RCR07G182KS.	
A2A5A2R33U	1	2.2K OHMS, MIL TYPE RCR07G222KS.	
A2A5A2R33V	1	2.7K OHMS, MIL TYPE RCR07G272KS.	
A2A5A2R33W	1	3.3K OHMS, MIL TYPE RCR07G332KS.	
A2A5A2R33X	1	3.9K OHMS, MIL TYPE RCR07G392KS.	
A2A5A2R33Y	1	4.7K OHMS, MIL TYPE RCR07G472KS.	
A2A5A2R33Z	1	5.6K OHMS, MIL TYPE RCR07G562KS.	
A2A5A2R33AA	1	6.8K OHMS, MIL TYPE RCR07G682KS.	
A2A5A2R33AB	1	8.2K OHMS, MIL TYPE RCR07G822KS.	
A2A5A2R33AC	1	RESISTOR: ITEM 87.	
A2A5A2R33AD	1	12K OHMS, MIL TYPE RCR07G123KS.	
A2A5A2R33AE	1	15K OHMS, MIL TYPE RCR07G153KS.	
A2A5A2R33AF	1	18K OHMS, MIL TYPE RCR07G183KS.	
A2A5A2R33AG	1	22K OHMS, MIL TYPE RCR07G223KS.	
A2A5A2R33AH	1	27K OHMS, MIL TYPE RCR07G273KS.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2R33AI	I	33K OHMS, MIL TYPE RCR07G333KS.	
A2A5A2R33AJ	I	39K OHMS, MIL TYPE RCR07G393KS.	
A2A5A2R33AK	I	47K OHMS, MIL TYPE RCR07G473KS.	
A2A5A2R33AL	I	56K OHMS, MIL TYPE RCR07G563KS.	
A2A5A2R33AM	I	68K OHMS, MIL TYPE RCR07G683KS.	
A2A5A2R33AN	I	82K OHMS, MIL TYPE RCR07G823KS.	
A2A5A2R33AO	I	100K OHMS, MIL TYPE RCR07G104KS.	
A2A5A2R33AP	I	120K OHMS, MIL TYPE RCR07G124KS.	
A2A5A2R33AQ	I	150K OHMS, MIL TYPE RCR07G154KS.	
A2A5A2R33AR	I	180K OHMS, MIL TYPE RCR07G184KS.	
A2A5A2R33AS	I	220K OHMS, MIL TYPE RCR07G224KS.	
A2A5A2R33AT	I	270K OHMS, MIL TYPE RCR07G274KS.	
A2A5A2R33AU	I	330K OHMS, MIL TYPE RCR07G334KS.	
A2A5A2R33AV	I	390K OHMS, MIL TYPE RCR07G394KS.	
A2A5A2R33AW	I	470K OHMS, MIL TYPE RCR07G474KS.	
A2A5A2R33AX	I	560K OHMS, MIL TYPE RCR07G564KS.	
A2A5A2R33AY	I	680K OHMS, MIL TYPE RCR07G684KS.	
A2A5A2R33AZ	I	820K OHMS, MIL TYPE RCR07G824KS.	
A2A5A2R33BA	I	I MEGOHM, MIL TYPE RCR07G105KS.	
A2A5A2R33BB	I	1.2 MEGOHMS, MIL TYPE RCR07G125KS.	
A2A5A2R33BC	I	1.5 MEGOHMS, MIL TYPE RCR07G155KS.	
A2A5A2R33BD	I	1.8 MEGOHMS, MIL TYPE RCR07G185KS.	
A2A5A2R33BE	I	2.2 MEGOHMS, MIL TYPE RCR07G225KS.	
A2A5A2R33BF	I	2.7 MEGOHMS, MIL TYPE RCR07G275KS.	
A2A5A2R33BG	I	3.3 MEGOHMS, MIL TYPE RCR07G335KS.	
A2A5A2R33BH	I	3.9 MEGOHMS, MIL TYPE RCR07G395KS.	
A2A5A2R33BI	I	4.7 MEGOHMS, MIL TYPE RCR07G475KS.	
A2A5A2R33BJ	I	5.6 MEGOHMS, MIL TYPE RCR07G565KS.	
A2A5A2R33BK	I	6.8 MEGOHMS, MIL TYPE RCR07G685KS.	
A2A5A2R33BL	I	8.2 MEGOHMS, MIL TYPE RCR07G825KS.	
A2A5A2R33BM	I	10 MEGOHMS, MIL TYPE RCR07G106KS.	
A2A5A2R33BN	I	12 MEGOHMS, MIL TYPE RCR07G126KS.	
A2A5A2R33BO	I	15 MEGOHMS, MIL TYPE RCR07G156KS.	
A2A5A2R33BP	I	18 MEGOHMS, MIL TYPE RCR07G186KS.	
A2A5A2R33BQ		NOT USED	
A2A5A2R33BR	I	22 MEGOHMS, MIL TYPE RCR07G226KS.	
A2A5A2R34		RESISTOR, FIXED, COMPOSITION: 220 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G221KS.	7-62
A2A5A2R35		RESISTOR, FIXED, COMPOSITION: 39K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G393KS.	7 62
A2A5A2R36		RESISTOR, FIXED, COMPOSITION: 3.3K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G332KS.	7-62
A2A5A2R37		RESISTOR, FIXED, COMPOSITION: 8.2K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G822KS.	7-62
A2A5A2R38		RESISTOR, FIXED, COMPOSITION: 470 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G471KS.	7-62
A2A5A2R39		RESISTOR: ITEM 87.	7-62
A2A5A2R40		RESISTOR, FIXED, COMPOSITION: 470 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G471KS.	7-62
A2A5A2R41		RESISTOR, FIXED, COMPOSITION: 560 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G561KS.	7-62
A2A5A2R42	I	RESISTOR, FIXED, COMPOSITION: PORM 10%, 1/4W; MIL TYPE RCR07G.	7-62
A2A5A2R42A	I	47 OHMS, MIL TYPE RCR07G470KS.	
A2A5A2R42B	I	56 OHMS, MIL TYPE RCR07G560KS.	
A2A5A2R42C	I	68 OHMS, MIL TYPE RCR07G680KS.	
A2A5A2R42D	I	82 OHMS, MIL TYPE RCR07G820KS.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2R42E	1	100 OHMS, MIL TYPE RCR07G101KS.	
A2A5A2R42F	1	120 OHMS, MIL TYPE RCR07G121KS.	
A2A5A2R42G	1	150 OHMS, MIL TYPE RCR07G151KS.	
A2A5A2R42H	1	180 OHMS, MIL TYPE RCR07G181KS.	
A2A5A2R42I	1	220 OHMS, MIL TYPE RCR07G221KS.	
A2A5A2R42J	1	270 OHMS, MIL TYPE RCR07G271KS.	
A2A5A2R42K	1	330 OHMS, MIL TYPE RCR07G331KS.	
A2A5A2R42L	1	390 OHMS, MIL TYPE RCR07G391KS.	
A2A5A2R42M	1	470 OHMS, MIL TYPE RCR07G471KS.	
A2A5A2R42N	1	560 OHMS, MIL TYPE RCR07G561KS.	
A2A5A2R42O	1	680 OHMS, MIL TYPE RCR07G681KS.	
A2A5A2R42P	1	820 OHMS, MIL TYPE RCR07G821KS.	
A2A5A2R42Q	1	RESISTOR: ITEM 86.	
A2A5A2R42R	1	1.2K OHMS, MIL TYPE RCR07G122KS.	
A2A5A2R42S	1	1.5K OHMS, MIL TYPE RCR07G152KS.	
A2A5A2R42T	1	1.8K OHMS, MIL TYPE RCR07G182KS.	
A2A5A2R42U	1	2.2K OHMS, MIL TYPE RCR07G222KS.	
A2A5A2R42V	1	2.7K OHMS, MIL TYPE RCR07G272KS.	
A2A5A2R42W	1	3.3K OHMS, MIL TYPE RCR07G332KS.	
A2A5A2R42X	1	3.9K OHMS, MIL TYPE RCR07G392KS.	
A2A5A2R42Y	1	4.7K OHMS, MIL TYPE RCR07G472KS.	
A2A5A2R42Z	1	5.6K OHMS, MIL TYPE RCR07G562KS.	
A2A5A2R42AA	1	6.8K OHMS, MIL TYPE RCR07G682KS.	
A2A5A2R42AB	1	8.2K OHMS, MIL TYPE RCR07G822KS.	
A2A5A2R42AC	1	RESISTOR: ITEM 87.	
A2A5A2R42AD	1	12K OHMS, MIL TYPE RCR07G123KS.	
A2A5A2R42AE	1	15K OHMS, MIL TYPE RCR07G153KS.	
A2A5A2R42AF	1	18K OHMS, MIL TYPE RCR07G183KS.	
A2A5A2R42AG	1	22K OHMS, MIL TYPE RCR07G223KS.	
A2A5A2R42AH	1	27K OHMS, MIL TYPE RCR07G273KS.	
A2A5A2R42AI	1	33K OHMS, MIL TYPE RCR07G333KS.	
A2A5A2R42AJ	1	39K OHMS, MIL TYPE RCR07G393KS.	
A2A5A2R42AK	1	47K OHMS, MIL TYPE RCR07G473KS.	
A2A5A2R42AL	1	56K OHMS, MIL TYPE RCR07G563KS.	
A2A5A2R42AM	1	68K OHMS, MIL TYPE RCR07G683KS.	
A2A5A2R42AN	1	82K OHMS, MIL TYPE RCR07G823KS.	
A2A5A2R42AO	1	100K OHMS, MIL TYPE RCR07G104KS.	
A2A5A2R42AP	1	120K OHMS, MIL TYPE RCR07G124KS.	
A2A5A2R42AQ	1	150K OHMS, MIL TYPE RCR07G154KS.	
A2A5A2R42AR	1	180K OHMS, MIL TYPE RCR07G184KS.	
A2A5A2R42AS	1	220K OHMS, MIL TYPE RCR07G224KS.	
A2A5A2R42AT	1	270K OHMS, MIL TYPE RCR07G274KS.	
A2A5A2R42AU	1	330K OHMS, MIL TYPE RCR07G334KS.	
A2A5A2R42AV	1	390K OHMS, MIL TYPE RCR07G394KS.	
A2A5A2R42AW	1	470K OHMS, MIL TYPE RCR07G474KS.	
A2A5A2R42AX	1	560K OHMS, MIL TYPE RCR07G564KS.	
A2A5A2R42AY	1	680K OHMS, MIL TYPE RCR07G684KS.	
A2A5A2R42AZ	1	820K OHMS, MIL TYPE RCR07G824KS.	
A2A5A2R42BA	1	1 MEGOHM, MIL TYPE RCR07G105KS.	
A2A5A2R42BB	1	1.2 MEGOHMS, MIL TYPE RCR07G125KS.	
A2A5A2R42BC	1	1.5 MEGOHMS, MIL TYPE RCR07G155KS.	
A2A5A2R42BD	1	1.8 MEGOHMS, MIL TYPE RCR07G185KS.	
A2A5A2R42BE	1	2.2 MEGOHMS, MIL TYPE RCR07G225KS.	
A2A5A2R42BF	1	2.7 MEGOHMS, MIL TYPE RCR07G275KS.	
A2A5A2R42BG	1	3.3 MEGOHMS, MIL TYPE RCR07G335KS.	
A2A5A2R42BH	1	3.9 MEGOHMS, MIL TYPE RCR07G395KS.	
A2A5A2R42BI	1	4.7 MEGOHMS, MIL TYPE RCR07G475KS.	
A2A5A2R42BJ	1	5.6 MEGOHMS, MIL TYPE RCR07G565KS.	

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2R42BK	1	6.8 MEGOHMS, MIL TYPE RCR07G685KS.	
A2A5A2R42BL	1	8.2 MEGOHMS, MIL TYPE RCR07G825KS.	
A2A5A2R42BM	1	10 MEGOHMS, MIL TYPE RCR07G106KS.	
A2A5A2R42BN	1	12 MEGOHMS, MIL TYPE RCR07G126KS.	
A2A5A2R42BO	1	15 MEGOHMS, MIL TYPE RCR07G156KS.	
A2A5A2R42BP	1	18 MEGOHMS, MIL TYPE RCR07G186KS.	
A2A5A2R42BQ	1	22 MEGOHMS, MIL TYPE RCR07G226KS.	
A2A5A2R43		RESISTOR, FIXED, COMPOSITION: 220 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G221KS.	7-62
A2A5A2R44		RESISTOR, FIXED, COMPOSITION: 39K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G393KS.	7-62
A2A5A2R45		RESISTOR, FIXED, COMPOSITION: 15K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G153KS.	7-62
A2A5A2R46		RESISTOR, FIXED, COMPOSITION: 1.5K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G152KS.	
A2A5A2R47		RESISTOR, FIXED, COMPOSITION: 150 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G151KS.	7-62
A2A5A2R48		RESISTOR, FIXED, COMPOSITION: 47 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G470KS.	7-62
A2A5A2R49		NOT USED.	
A2A5A2R50		RESISTOR, FIXED, COMPOSITION: 100 OHMS PORM 10%, 1/2W; MIL TYPE RCR20G101KS.	7-60
A2A5A2R51		RESISTOR, FIXED, COMPOSITION: 1.5K OHMS PORM 10%, 1/4W; MIL TYPE RCR07G152KS.	7-62
A2A5A2R52		RESISTOR, FIXED, COMPOSITION: 100 OHMS PORM 10%, 1/2W; MIL TYPE RCR20G101KS.	7-60
A2A5A2R53	1	RESISTOR, FIXED, COMPOSITION: PORM 10% 1/4W; MIL TYPE RCR07G.	7-62
A2A5A2R53A	1	22 OHMS, MIL TYPE RCR07G220KS.	
A2A5A2R53B	1	27 OHMS, MIL TYPE RCR07G270KS.	
A2A5A2R53C	1	33 OHMS, MIL TYPE RCR07G330KS.	
A2A5A2R53D	1	39 OHMS, MIL TYPE RCR07G390KS.	
A2A5A2R53E	1	47 OHMS, MIL TYPE RCR07G470KS.	
A2A5A2R53F	1	56 OHMS, MIL TYPE RCR07G560KS.	
A2A5A2R54	1	RESISTOR, FIXED, COMPOSITION: PORM 10% 1/4W; MIL TYPE RCR07G.	7-62
A2A5A2R54A	1	10 OHMS, MIL TYPE RCR07G100KS.	
A2A5A2R54B	1	12 OHMS, MIL TYPE RCR07G120KS.	
A2A5A2R54C	1	15 OHMS, MIL TYPE RCR07G150KS.	
A2A5A2R54D	1	18 OHMS, MIL TYPE RCR07G180KS.	
A2A5A2R54E	1	22 OHMS, MIL TYPE RCR07G220KS.	
A2A5A2R54F	1	27 OHMS, MIL TYPE RCR07G270KS.	
A2A5A2R54G	1	33 OHMS, MIL TYPE RCR07G330KS.	
A2A5A2R54H	1	39 OHMS, MIL TYPE RCR07G390KS.	
A2A5A2R54I	1	47 OHMS, MIL TYPE RCR07G470KS.	
A2A5A2R54J	1	56 OHMS, MIL TYPE RCR07G560KS.	
A2A5A2R55		NOT USED.	
A2A5A2R56		RESISTOR, FIXED, COMPOSITION: 56 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G560KS.	7-62
A2A5A2S1		SWITCH, ROTARY: MFR 14844 PART NUMBER 4962-946, 06845 DWG 2058857-0701.	7-59,60 7-62
A2A5A2T1		TRANSFORMER, FIXED: MFR 14844 PART NUMBER 5210-946-1.	7-62
A2A5A2T2		TRANSFORMER, FIXED: MFR 14844 PART NUMBER 5210-946-2.	7-62
A2A5A2T3		TRANSFORMER, FIXED: MFR 14844 PART NUMBER 11135-3069, 06845 DWG 4032505-0701.	7-62
A2A5A2T4		TRANSFORMER, FIXED: MFR 14844 PART NUMBER 11136-3069, 06845 DWG 4032505-0702.	7-62

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

FREQUENCY STANDARD ASSEMBLY A2A5

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A5A2TP1		CONNECTOR, ELECTRICAL: 1500 VOLTS RMS, 60 CPS; MIL TYPE M39024-11-01.	7-59,60
A2A5A2TP2		CONNECTOR, ELECTRICAL: 1500 VOLTS RMS, 60 CPS; MIL TYPE M39024-11-02.	7-59,60
A2A5A3		OVEN BODY SUBASSEMBLY; MFR 14844 PART NUMBER 11141-3069.	7-59
A2A5A3J1		CONNECTOR: MFR 14844 PART NUMBER 11139-3069.	7-63
A2A5A3Q206		TRANSISTOR, NPN: MIL TYPE 2N5191.	7-63
A2A5A3R214		RESISTOR, HEATER: 56 OHMS PORM 5 OHMS;MFR 14844 PART NUMBER 5550-946.	
A2A5A3R215		RESISTOR, FIXED, COMPOSITION: 680 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G681KS.	7-60
A2A5A3R216		RESISTOR, FIXED, COMPOSITION: 220 OHMS PORM 10%, 1/4W; MIL TYPE RCR07G221KS.	7-60
A2A5A3RT205		RESISTOR, THERMISTOR, SENSOR: 50K OHMS; MFR 90634 PART NUMBER 45TF2.	
A2A5A4		FILTER ASSEMBLY: MFR 14844 PART NUMBER 11704-3069; 06845 DWG 4031939-0701.	
A2A5A4C1 THRU A2A5A4C35		NOT USED.	
A2A5A4C36 THRU A2A5A4C39		CAPACITOR, FIXED, CERAMIC: 0.1 UF PORM 10%, 50WVDC; MFR 08988 PART NUMBER TDY7-30K.	7-60
A2A5A4L3 AND A2A5A4L4		COIL: 100 UH PORM 5%, 185 MA; MIL TYPE MS90538-12.	7-60

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6		TRANSLATOR-SYNTHESIZER ASSEMBLY: 8.19 IN. X 7.40 IN.X 4.50 IN.;MFR 06845 PART NUMBER 4031963-0501. (ATTACHING PARTS)J(4)	7-64
A2A6C1 AND A2A6C2		CAPACITOR: ITEM 22.	7-65
A2A6C3		CAPACITOR: ITEM 7	7-65
A2A6E1		TERMINAL, LUG: MIL TYPE MS77068-1.	7-65
A2A6E2 AND A2A6E3		TERMINAL, STUD: 0.146 IN.DIA X 0.390 IN.LG; MFR 71279 PART NUMBER 4884-1-0516, 06845 DWG 4030653-0701.	7-65
A2A6E4		TERMINAL, LUG: MIL TYPE MS77068-1.	7-65
A2A6E5		TERMINAL BOARD: 1.50 IN.LG X 0.28 IN.W; MFR 06845 PART NUMBER 4032243-0501.	7-65
A2A6MP1		MOUNTING BASE, ELECTRICAL EQUIPMENT: 8.188 IN.LG X 7.26 IN.W X 0.750 IN.H; MFR 06845, PART NUMBER 4032334-0501.	7-65
A2A6MP1A		MOUNTING BASE: 8.188 IN.LG X 7.26 IN.W X 0.750 IN.H; MFR 06845,PART NUMBER 4032479-0501.	7-65
A2A6MP2		COVER, BASE: 7.946 IN.LG X 5.04 IN.W X 0.081 IN.THK, AL ALY, CHEM FILM FINISH; MFR 06845, PART NUMBER 4030880-0001.	7-65
A2A6P1		CONNECTOR,RECEPTACLE,ELECTRICAL: 2.729 IN.LG X 0.494 IN.W X 0.426 IN.THK; MFR 91146 PART NUMBER DCMM25W3P, 06845 DWG 4032484-0716.	7-65
A2A6P2		CONNECTOR,ELECTRICAL: 1.541 IN.LG X 0.494 IN. W X 0.422 IN.H; MFR 91146 PART NUMBER DAMM3W3P, 06845 DWG 4032484-0701. (ATTACHING PARTS)F(2)AG(2)	7-65
A2A6P3		CONNECTOR,ELECTRICAL: 1.541 IN.LG X 0.494 IN. W X 0.422 IN.H;MFR 91146 PART NUMBER DAMM3W3P, 06845 DWG 4032484-0701. (ATTACHING PARTS)F(2)AG(2)	7-65

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6P4	2	JACK,TIP:0.172IN.DIA X0.345IN.LG;0.035 MMF; BERYLLIUM COPPER,GOLD FLASH; POLYTETRAFLUOROETHYLENE;MFR 98291 PART NUMBER SKT14RED,06845 DWG 2043782-0712.	7-65
A2A6P5	2	JACK,TIP:0.172IN.DIA X0.345IN.LG;0.035 MMF; BERYLLIUM COPPER,GOLD FLASH; POLYTETRAFLUOROETHYLENE;MFR 98291 PART NUMBER SKT14GREEN,06845 DWG 2043782-0709.	7-65
A2A6P6	2	JACK,TIP:0.172IN.DIA X0.345IN.LG;0.035 MMF; BERYLLIUM COPPER,GOLD FLASH; POLYTETRAFLUOROETHYLENE;MFR 98291 PART NUMBER SKT14ORANGE,06845 DWG 2043782-0711.	7-65
A2A6P7	2	JACK,TIP:0.172IN.DIA X0.345IN.LG;0.035 MMF; BERYLLIUM COPPER,GOLD FLASH; POLYTETRAFLUOROETHYLENE;MFR 98291 PART NUMBER SKT14RED,06845 DWG 2043782-0712.	7-65
A2A6P8	2	JACK,TIP:0.172IN.DIA X0.345IN.LG;0.035 MMF; BERYLLIUM COPPER,GOLD FLASH; POLYTETRAFLUOROETHYLENE;MFR 98291 PART NUMBER SKT14GRAY,06845 DWG 2043782-0710.	7-65
A2A6P9	2	JACK,TIP:0.172IN.DIA X0.345IN.LG;0.035 MMF; BERYLLIUM COPPER,GOLD FLASH; POLYTETRAFLUOROETHYLENE;MFR 98291 PART NUMBER SKT14RED,06845 DWG 2043782-0712.	7-65
A2A6W1	2	CABLE ASSEMBLY,R F:2.90IN.LG;MFR 06845 PART NUMBER 4032433-0501.	7-65
A2A6W1P1	2	CONNECTOR:ITEM 44A	7-65
A2A6W1P2	2	CONNECTOR,PLUG,ELECTRICAL:1 CONTACT,COAXIAL, RIGHT ANGLE,MFR 91146 PART NUMBER 318-11-99-284,06845 DWG 4032484-0731.	7-65
A2A6W2	2	CABLE ASSEMBLY,R F:6.12IN.LG;MFR 06845 PART NUMBER 4032433-0502.	7-65
A2A6W2P1	2	CONNECTOR:ITEM 44A	7-65
A2A6W2P2	2	CONNECTOR:ITEM 44	7-65
A2A6W3	2	CABLE ASSEMBLY,R F:6.00IN.LG;MFR 06845 PART NUMBER 4032433-0503.	7-65
A2A6W3P1	2	CONNECTOR:ITEM 44A	7-65
A2A6W3P2	2	CONNECTOR:ITEM 44A	7-65
A2A6W4	2	CABLE ASSEMBLY,R F:2.90IN.LG;MFR 06845 PART NUMBER 4032433-0504.	7-65
A2A6W4P1	2	CONNECTOR:ITEM 44A	7-65
A2A6W4P2	2	CONNECTOR:ITEM 44A	7-65
A2A6W5	2	CABLE ASSEMBLY,R F:2.50IN.LG;MFR 06845 PART NUMBER 4032433-0505.	7-65
A2A6W5P1	2	CONNECTOR:ITEM 44A	7-65
A2A6W5P2	2	CONNECTOR:ITEM 44	7-65
A2A6W6	2	CABLE ASSEMBLY,R F:4.02IN.LG;MFR 06845 PART NUMBER 4032433-0506.	7-65
A2A6W6P1	2	CONNECTOR,PLUG,ELECTRICAL:1 CONTACT,COAXIAL, RIGHT ANGLE,MFR 91146 PART NUMBER 318-11-99-284,06845 DWG 4032484-0731.	7-65
A2A6W6P2	2	CONNECTOR:ITEM 44	7-65
A2A6W7	2	CABLE ASSEMBLY,R F:3.30IN.LG;MFR 06845 PART NUMBER 4032433-0507.	7-65
A2A6W7P1	2	CONNECTOR,PLUG,ELECTRICAL:1 CONTACT,COAXIAL, RIGHT ANGLE,MFR 91146 PART NUMBER 318-11-99-284,06845 DWG 4032484-0731.	7-65
A2A6W7P2	2	CONNECTOR:ITEM 44	7-65

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6W8	2	CABLE ASSEMBLY,RF:3.40IN.LG;MFR 06845 PART NUMBER 4032433-0508.	7-65
A2A6W8P1	2	CONNECTOR:ITEM 44	7-65
A2A6W8P2	2	CONNECTOR:ITEM 44A	7-65
A2A6W9	2	CABLE ASSEMBLY,RF:3.56IN.LG;MFR 06845 PART NUMBER 4032433-0509.	7-65
A2A6W9P1	2	CONNECTOR:ITEM 44	7-65
A2A6W9P2	2	CONNECTOR:ITEM 44	7-65
A2A6W10	2	CABLE ASSEMBLY,RF:3.06IN.LG;MFR 06845 PART NUMBER 4032433-0510.	7-65
A2A6W10P1	2	CONNECTOR:ITEM 44A	7-65
A2A6W10P2	2	CONNECTOR,PLUG,ELECTRICAL:1 CONTACT,COAXIAL, RIGHT ANGLE,MFR 91146 PART NUMBER 318-11-99-284,06845 DWG 4032484-0731.	7-65
A2A6XA1P1	2	CONNECTOR,RECEPTACLE,ELECTRICAL:2.088IN.LG X0.494IN.W X0.429IN.THK;MFR 91146 PART NUMBER DBMF17W2S2,06845 DWG 4032484-0714.	7-65
A2A6XA2P1	2	CONNECTOR,RECEPTACLE,ELECTRICAL:2.088IN.LG X0.494IN.W X0.429IN.THK;MFR 91146 PART NUMBER DBMF9W4S2,06845 DWG 4032484-0715.	7-65
A2A6XA4P1	2	CONNECTOR,RECEPTACLE,ELECTRICAL:2.088IN.LG X0.494IN.W X0.429IN.THK;MFR 91146 PART NUMBER DBMF13W3S2,06845 DWG 4032484-0713.	7-65
A2A6A1		1 MHZ SYNTHESIZER SUBASSEMBLY:5.22IN.LG X3.72IN.W X2.062IN.H;MFR 06845 PART NUMBER 4032332-0501. (ATTACHING PARTS)L(4)X(4)	7-64,66
A2A6A1B1		MOTOR,DIRECT CURRENT,1MC:2.289IN.X0.883IN.X 0.883IN.;26 VOLTS,0.5 AMP,15 RPM;MFR 25140 PART NUMBER 49A351,06845 DWG 4030532-0701. (ATTACHING PARTS) R(2)Y(2)	7-66
A2A6A1C1		CAPACITOR,FIXED,MICA:1300 PF PORM 2%,500 WVDC;MIL TYPE CM06FC132GP3.	7-105
A2A6A1C2		CAPACITOR,FIXED,MICA:1000 PF PORM 1%,500 WVDC;MIL TYPE CM06FD102FP3.	7-105
A2A6A1C3 AND A2A6A1C4		CAPACITOR,FIXED,MICA:820 PF PORM 1%,500WVDC MIL TYPE CM06FD821FP3.	7-105
A2A6A1C5		CAPACITOR,FIXED,MICA:0.470IN.LG X0.380IN.W X0.200IN.THK;500 PF PORM 1%,300WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0741.	7-105
A2A6A1C6		CAPACITOR,FIXED,MICA:430 PF PORM 2%,500WVDC MIL TYPE CM06FD431GP3.	7-105
A2A6A1C7		CAPACITOR,FIXED,MICA:360 PF PORM 2%,500WVDC MIL TYPE CM05FD361GP3.	7-105
A2A6A1C8		CAPACITOR,FIXED,MICA:300 PF PORM 2%,500WVDC MIL TYPE CM05FD301GP3.	7-105
A2A6A1C9		CAPACITOR,FIXED,MICA:270 PF PORM 1%,500WVDC MIL TYPE CM05FD271FP3.	7-105
A2A6A1C10		CAPACITOR,FIXED,MICA:240 PF PORM 2%,500WVDC MIL TYPE CM05FD241GP3.	7-105
A2A6A1C11		CAPACITOR,FIXED,MICA:200 PF PORM 2%,500WVDC MIL TYPE CM05FD201GP3.	7-105
A2A6A1C12		CAPACITOR,FIXED,MICA:180 PF PORM 1%,500WVDC MIL TYPE CM05FD181FP3.	7-105
A2A6A1C13 AND A2A6A1C14		CAPACITOR,FIXED,MICA:160 PF PORM 2%,500WVDC MIL TYPE CM05FD161GP3.	7-105

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A1C15		CAPACITOR,FIXED,MICA:0.460IN.LG X0.370IN.W X0.180IN.THK;115 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0740.	7-105
A2A6A1C16		CAPACITOR,FIXED,MICA:110 PF PORM 2%,500WVDC MIL TYPE CM05FD111GP3.	7-105
A2A6A1C17		CAPACITOR:ITEM 17.	
A2A6A1C18		CAPACITOR:ITEM 3.	7-66
A2A6A1C19		CAPACITOR:ITEM 20.	7-66
A2A6A1CR1		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N975B.	7-66
A2A6A1K1		RELAY	7-66
A2A6A1L1 AND A2A6A1L2		COIL:ITEM 39.	7-66
A2A6A1MP1		MOUNTING BASE:5.039IN.X2.613IN.X1.060IN.; MFR 06845 PART NUMBER 4032223-0501.	7-66
A2A6A1MP2		COVER:5.144IN.LG X2.623IN.W X3.68IN.H;AL ALY;CHEM FILM;MFR 06845 PART NUMBER 4032506-0501. (ATTACHING PARTS)AH(2)	7-66
A2A6A1MP3		SHAFT,SWITCH:2.96IN.LG X0.430IN.DIA;CRES; MFR 06845 PART NUMBER 4030581-0001.	7-66
A2A6A1MP4		GEAR SET,BEVEL,MATCHED:NORMAL DIAMETRAL PITCH 64,TEETH 32:32,PITCH DIAMETER 0.500 :0.500 CRES:MFR 06845 PART NUMBER 4030681-0701.	7-66
A2A6A1MP5		BEARING,MOTOR SHAFT:0.375IN.X0.50IN.;BRS; MFR 06845 PART NUMBER 4030897-0001.	7-66
A2A6A1MP6		RING,RETAINING:MIL TYPE MS3215-4050.	7-66
A2A6A1MP7		NOT USED.	
A2A6A1MP8		COLLAR,SWITCH:0.4375IN.DIA X0.26IN.;CRES; MFR 06845 PART NUMBER 4030580-0001.	7-66
A2A6A1P1		CONNECTOR,RECEPTACLE,ELECTRICAL:2.088IN.LG X0.494IN.W X0.429IN.THK;MFR 91146 PART NUMBER DBM17W2P,06845 DWG 4032484-0709.	7-66
A2A6A1Y1		CRYSTAL UNIT,QUARTZ:0.757IN.LG X0.775IN.H X 0.352IN.THK;2499.850 KC;MFR 00136,06845 DWG 4032123-0701.	7-105
A2A6A1Y2		CRYSTAL UNIT,QUARTZ:0.757IN.LG X0.775IN.H X 0.352IN.THK;3499.720 KC;MFR 00136,06845 DWG 4032123-0702.	7-105
A2A6A1Y3		CRYSTAL UNIT,QUARTZ:0.757IN.LG X0.775IN.H X 0.352IN.THK;4499.640 KC;MFR 00136,06845 DWG 4032123-0703.	7-105
A2A6A1Y4		CRYSTAL UNIT,QUARTZ:0.757IN.LG X0.775IN.H X 0.352IN.THK;5499.560 KC;MFR 00136,06845 DWG 4032123-0704.	7-105
A2A6A1Y5		CRYSTAL UNIT,QUARTZ:0.435IN.LG X0.530IN.H X 0.183IN.THK;7499.400 KC;MFR 00136,06845 DWG 4032123-0705.	7-105
A2A6A1Y6		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;8499.320 KC;MFR 00136,06845 DWG 4032123-0706.	7-105
A2A6A1Y7		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;9499.240 KC;MFR 00136,06845 DWG 4032123-0707.	7-105
A2A6A1Y8		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;10499.160 KC;MFR 00136,06845 DWG 4032123-0708.	7-105

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A1Y9		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;11499.080 KC;MFR 00136,06845 DWG 4032123-0709.	7-105
A2A6A1Y10		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;12499.000 KC;MFR 00136,06845 DWG 4032123-0710.	7-105
A2A6A1Y11		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;14498.840 KC;MFR 00136,06845 DWG 4032123-0711.	7-105
A2A6A1Y12		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;15498.760 KC;MFR 00136,06845 DWG 4032123-0712.	7-105
A2A6A1Y13		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;16498.680 KC;MFR 00136,06845 DWG 4032123-0713.	7-105
A2A6A1Y14		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;17498.600 KC;MFR 00136,06845 DWG 4032123-0714.	7-105
A2A6A1Y15		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;19498.440 KC;MFR 00136,06845 DWG 4032123-0715.	7-105
A2A6A1Y16		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;20498.360 KC;MFR 00136,06845 DWG 4032123-0716.	7-105
A2A6A1Y17		CRYSTAL UNIT,QUARTZ:0.436IN.LG X0.530IN.H X 0.183IN.THK;23498.120 KC;MFR 00136,06845 DWG 4032123-0717.	7-105
A2A6A1A1		1 MHZ OSCILLATOR:2.375IN.X2.375IN.X0.50IN. THK;MFR 06845 PART NUMBER 4032344-0501. (ATTACHING PARTS) Q(4)	7-67
A2A6A1A1C1 THRU A2A6A1A1C17		NOT USED	
A2A6A1A1C18 THRU A2A6A1A1C20		CAPACITOR:ITEM 5.	7-67
A2A6A1A1C21		CAPACITOR,FIXED,MICA:110 PF PORM 2%,500WVDC; MIL TYPE CM05FD111GP3.	7-67
A2A6A1A1C23		CAPACITOR:ITEM 5.	7-67
A2A6A1A1C24		CAPACITOR,FIXED,MICA:240 PF PORM 2%,500WVDC; MIL TYPE CM05FD241GP3.	7-67
A2A6A1A1C25 THRU A2A6A1A1C28		CAPACITOR:ITEM 5.	7-67
A2A6A1A1CR1 AND A2A6A1A1CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 94.	7-67
A2A6A1A1CR3		SEMICONDUCTOR DEVICE,DIODE:VOLTAGE VARIABLE CAPACITOR;0.125IN.DIA X0.30IN.,30WVDC,-65 TO +150DEG C; MFR 73293 PART NUMBER 666163-420/JC7171,06845 DWG 4030791-0701.	7-67
A2A6A1A1FL1 AND A2A6A1A1FL2		SAME AS A2A1A1FL1	7-67
A2A6A1A1L1		COIL:ITEM 39.	7-67
A2A6A1A1L2 AND A2A6A1A1L3		COIL,RF,MINIATURE:22.00UH PORM 10%,RATED CURRENT 335VDC,DC RESISTANCE 2.20 OHMS; MIL TYPE MS75008-44.	7-67

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A1A1Q1 THRU A2A6A1A1Q4		TRANSISTOR:ITEM 112.	7-67
A2A6A1A1R1		RESISTOR,FIXED,COMPOSITION:220K OHMS PORM 5%,1/4W; MIL TYPE RCR07G224JS.	7-67
A2A6A1A1R2		RESISTOR,FIXED,COMPOSITION:470K OHMS PORM 5%,1/4W; MIL TYPE RCR07G474JS.	7-67
A2A6A1A1R3		RESISTOR:ITEM 49.	7-67
A2A6A1A1R4		RESISTOR:ITEM 81.	7-67
A2A6A1A1R5		RESISTOR:ITEM 49.	7-67
A2A6A1A1R6		RESISTOR:ITEM 48.	7-67
A2A6A1A1R7		RESISTOR:ITEM 47.	7-67
A2A6A1A1R8		RESISTOR:ITEM 46.	7-67
A2A6A1A1R9		RESISTOR:ITEM 77.	7-67
A2A6A1A1R10		RESISTOR:ITEM 52.	7-67
A2A6A1A1R11		RESISTOR:ITEM 63.	7-67
A2A6A1A1R12		RESISTOR,FIXED,FILM:910 OHMS PORM 5%,1/4W; MIL TYPE RLR07C911JR.	7-67
A2A6A1A1R13		RESISTOR:ITEM 94.	7-67
A2A6A1A1R14		RESISTOR:ITEM 50.	7-67
A2A6A1A1R15		RESISTOR:ITEM 53.	7-67
A2A6A1A1R16		RESISTOR:ITEM 52.	7-67
A2A6A1A1R17		RESISTOR:ITEM 78.	7-67
A2A6A1A1R18		RESISTOR:ITEM 57.	7-67
A2A6A1A1RT1		THERMISTOR:ITEM 84.	7-67
A2A6A1A2		AMPLIFIER:2.180IN.X2.30IN.X0.970IN.THK;MFR 06845 PART NUMBER 4032327-0501.	7-68
A2A6A1A2C1 AND A2A6A1A2C2		CAPACITOR:ITEM 3.	7-68
A2A6A1A2C3		CAPACITOR,FIXED,MICA:0.470IN.X0.390IN.X 0.210IN.,620 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0725.	7-68
A2A6A1A2C4 AND A2A6A1A2C5		CAPACITOR:ITEM 3.	7-68
A2A6A1A2C6		CAPACITOR,FIXED,MICA:0.470IN.X0.390IN.X 0.210IN.,620 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0725.	7-68
A2A6A1A2C7		CAPACITOR,FIXED,MICA:1000 PF PORM 1%,500 WVDC; MIL TYPE CM06FD102FP3.	7-68
A2A6A1A2C8		CAPACITOR,FIXED,MICA:0.470IN.X0.390IN.X 0.210IN.,620 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0725.	7-68
A2A6A1A2C9		CAPACITOR:ITEM 3.	7-68
A2A6A1A2C10		CAPACITOR,FIXED,CERAMIC:0.1 UF PORM 20%, 100WVDC; MIL TYPE CK14BR104M.	7-68
A2A6A1A2C11 AND A2A6A1A2C12		CAPACITOR:ITEM 3.	7-68
A2A6A1A2C13		CAPACITOR,FIXED,CERAMIC:4700 PF PORM 20%, 200WVDC; MIL TYPE CK06BX472M.	7-68
A2A6A1A2C14		CAPACITOR:ITEM 3.	7-68
A2A6A1A2CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-68

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A1A2J1 AND A2A6A1A2J2		CONTACT,ELECTRICAL:0.93IN.DIA,0.020IN.DIA X 0.155IN.;15AMP,120VAC;MFR 06776 PART NUMBER NS430-20,06845 DWG 4014741-0701.	7-68
A2A6A1A2L1		COIL:39.0UH PORM 10%,RATED DC CURRENT 410, DC RESISTANCE 2.11 OHMS;MIL TYPE MS90537-32.	7-68
A2A6A1A2L2		COIL:68.0UH PORM 10%,RATED DC CURRENT 370, DC RESISTANCE 2.70 OHMS;MIL TYPE MS90537-35.	7-68
A2A6A1A2L3		SAME AS A2L3	7-68
A2A6A1A2L4		COIL,R.F.VARIABLE,MINIATURE:0.290IN.DIA X 0.438IN.,NOMINAL INDUCTANCE 15 UH,MAX DC RES 5 OHMS,DC CURRENT 260MA; MFR 25159 PART NUMBER 545-15UH;06845 DWG 4030811-0702.	7-68
A2A6A1A2MP1		PLUG,TIP:0.062IN.DIA X0.235IN.,MFR 06776 PART NUMBER CP19,06845 DWG 4032160-0701.	7-68
A2A6A1A2Q1 AND A2A6A1A2Q2		TRANSISTOR:ITEM 114.	7-68
A2A6A1A2Q3		TRANSISTOR:ITEM 115.	7-68
A2A6A1A2R1		RESISTOR:ITEM 46.	7-68
A2A6A1A2R2		RESISTOR:ITEM 94.	7-68
A2A6A1A2R3		RESISTOR:ITEM 47.	7-68
A2A6A1A2R4		RESISTOR:ITEM 93.	7-68
A2A6A1A2R5		RESISTOR:ITEM 64.	7-68
A2A6A1A2R6		RESISTOR,VARIABLE,WIRE WOUND:200 OHMS,3/4W; MIL TYPE RT22C2W201.	7-68
A2A6A1A2R7		RESISTOR:ITEM 94.	7-68
A2A6A1A2R8		RESISTOR:ITEM 46.	7-68
A2A6A1A2R9		RESISTOR:ITEM 67.	7-68
A2A6A1A2R10		RESISTOR:ITEM 93.	7-68
A2A6A1A2R11		RESISTOR:ITEM 64.	7-68
A2A6A1A2R12		RESISTOR:ITEM 53.	7-68
A2A6A1A2R13		RESISTOR:ITEM 85.	7-68
A2A6A1A2R14		RESISTOR:ITEM 91.	7-68
A2A6A1A2R15 AND A2A6A1A2R16		RESISTOR:ITEM 49.	7-68
A2A6A1A2R17		RESISTOR:ITEM 63.	7-68
A2A6A1A2R18		RESISTOR,FIXED,FILM:130 OHMS PORM 5%,1/4W; MIL TYPE RLR07C131JR.	7-68
A2A6A1A2R19		RESISTOR:ITEM 48.	7-68
A2A6A1A2R20		RESISTOR,FIXED,FILM:75 OHMS PORM 5%,1/4W; MIL TYPE RLR07C750JR.	7-68
A2A6A1A2R21		RESISTOR,FIXED,COMPOSITION:470K OHMS PORM 5%,1/4W; MIL TYPE RCR07G474JS.	7-68
A2A6A1A2R22		RESISTOR:ITEM 93.	7-68
A2A6A1A2RT1		THERMISTOR:ITEM 84.	7-68
A2A6A1A2T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;1.5 MHZ,CAPACITY 626 PF:MFR 06845 PART NUMBER 4032541-0703.	7-68
A2A6A1A2T2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;1.5 MHZ,CAPACITY 628 PF:MFR 06845 PART NUMBER 4032541-0704.	7-68

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A1A2TP3		CONNECTOR,ELECTRICAL,TEST POINT TYPE:1500 VOLTS RMS,60CPS AT SEA LEVEL; MIL TYPE M39024-11-07.	7-68
A2A6A1A3		SPECTRUM GENERATOR/MIXER:2.375IN.X2.425IN.X 0.78IN.THK;MFR 06845 PART NUMBER 4032342-0501.	7-69
A2A6A1A3C1 AND A2A6A1A3C2		CAPACITOR:ITEM 3.	7-69
A2A6A1A3C3		CAPACITOR,FIXED,MICA:110 PF PORM 2%,500WVDC; MIL TYPE CM05FD111GP3.	7-69
A2A6A1A3C4		CAPACITOR:ITEM 3.	7-69
A2A6A1A3C5		CAPACITOR,FIXED,MICA:110 PF PORM 2%,500WVDC; MIL TYPE CM05FD111GP3.	7-69
A2A6A1A3C6		CAPACITOR,FIXED,MICA:0.470IN.X0.390IN.X 0.210IN.,680 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0726.	7-69
A2A6A1A3C7		CAPACITOR:ITEM 3.	7-69
A2A6A1A3C8		CAPACITOR:ITEM 15.	7-69
A2A6A1A3C9		CAPACITOR:ITEM 3.	7-69
A2A6A1A3C10		CAPACITOR,FIXED,CERAMIC:0.1 UF PORM 20% 100WVDC; MIL TYPE CK14BR104M.	7-69
A2A6A1A3C11 AND A2A6A1A3C12		CAPACITOR:ITEM 3.	7-69
A2A6A1A3C13 AND A2A6A1A3C14		CAPACITOR,FIXED,CERAMIC:0.1 UF PORM 20% 100WVDC; MIL TYPE CK14BR104M.	7-69
A2A6A1A3C15		CAPACITOR:ITEM 15.	7-69
A2A6A1A3C16 AND A2A6A1A3C17		CAPACITOR,FIXED,MICA:300 PF PORM 2%,500WVDC; MIL TYPE CM05FD301GP3.	7-69
A2A6A1A3C18 THRU A2A6A1A3C20		CAPACITOR:ITEM 3.	7-69
A2A6A1A3CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 100.	7-69
A2A6A1A3CR2 THRU A2A6A1A3CR4		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-69
A2A6A1A3L1		COIL:ITEM 39.	7-69
A2A6A1A3L2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;1.0MHZ,CAPACITY 127 PF:MFR 06845 PART NUMBER 4032550-0706.	7-69
A2A6A1A3L3		COIL,R.F.VARIABLE,MINIATURE:0.290IN.DIA X 0.438IN.,NOMINAL INDUCTANCE 0.47 UH,MAX DC RES 0.21 OHMS,DC CURRENT 1200 MA: MFR 25159 PART NUMBER 544-.47UH,06845 DWG 4030811-0701.	7-69
A2A6A1A3L4		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;1.5MHZ,CAPACITY 308 PF:MFR 06845 PART NUMBER 4032550-0708.	7-69
A2A6A1A3Q1		TRANSISTOR:MIL TYPE 2N964.	7-69
A2A6A1A3Q2		TRANSISTOR:ITEM 108.	7-69
A2A6A1A3Q3		TRANSISTOR:MIL TYPE 2N964.	7-69
A2A6A1A3Q4		TRANSISTOR:ITEM 107	7-69
A2A6A1A3Q5		TRANSISTOR:ITEM 107	7-69
A2A6A1A3Q6		TRANSISTOR:ITEM 112.	7-69

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A1A3R1		RESISTOR:ITEM 91.	7-69
A2A6A1A3R2		RESISTOR,FIXED,COMPOSITION:68K OHMS PORM 5% 1/4W; MIL TYPE RCR07G83JS.	7-69
A2A6A1A3R3		RESISTOR:ITEM 60.	7-69
A2A6A1A3R4		RESISTOR:ITEM 92.	7-69
A2A6A1A3R5		RESISTOR:ITEM 94.	7-69
A2A6A1A3R6		RESISTOR:ITEM 73.	7-69
A2A6A1A3R7		RESISTOR:ITEM 68.	7-69
A2A6A1A3R8		RESISTOR:ITEM 93.	7-69
A2A6A1A3R9		RESISTOR:ITEM 62.	7-69
A2A6A1A3R10		RESISTOR,FIXED,COMPOSITION:630 OHMS PORM 5%, 1/4W; MIL TYPE RCR07G631JS.	7-69
A2A6A1A3R11		RESISTOR:ITEM 92.	7-69
A2A6A1A3R12		RESISTOR,FIXED,COMPOSITION:68K OHMS PORM 5%, 1/4W; MIL TYPE RCR07G683JS.	7-69
A2A6A1A3R13		RESISTOR:ITEM 91.	7-69
A2A6A1A3R14		RESISTOR:ITEM 56.	7-69
A2A6A1A3R15		RESISTOR:ITEM 79.	7-69
A2A6A1A3R16		RESISTOR,FIXED,COMPOSITION:630 OHMS PORM 5%, 1/4W; MIL TYPE RCR07G631JS.	7-69
A2A6A1A3R17		RESISTOR:ITEM 93.	7-69
A2A6A1A3R18		RESISTOR:ITEM 46.	7-69
A2A6A1A3R19		RESISTOR:ITEM 47.	7-69
A2A6A1A3R20		RESISTOR,FIXED,FILM:30 OHMS PORM 5%,1/4W; MIL TYPE RLR07C300JR.	7-69
A2A6A1A3R21		RESISTOR:ITEM 94.	7-69
A2A6A1A3R22		RESISTOR:ITEM 57.	7-69
A2A6A1A3R23 AND A2A6A1A3R24		RESISTOR:ITEM 46.	7-69
A2A6A1A3R25		RESISTOR:ITEM 53.	7-69
A2A6A1A3R26		RESISTOR:ITEM 47.	7-69
A2A6A1A3R27		RESISTOR:ITEM 46.	7-69
A2A6A1A3R28		RESISTOR:ITEM 94.	7-69
A2A6A1A3R29		RESISTOR:ITEM 88.	7-69
A2A6A1A3R30		RESISTOR:ITEM 60.	7-69
A2A6A1A3R31		RESISTOR:ITEM 93.	7-69
A2A6A1A3R32		RESISTOR:ITEM 46.	7-69
A2A6A1A3R33		RESISTOR:ITEM 56.	7-69
A2A6A1A3T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;1.5MHZ,CAPACITY 311 PF:MFR 06845 PART NUMBER 4032550-C707.	7-69
A2A6A2		100 KHZ SYNTHESIZER SUBASSEMBLY:3.27IN.LG X4.44IN.W X3.55IN.H;MFR 06845 PART NUMBER 4032331-0501. (ATTACHING PARTS)N(2)M(1)	7-64
A2A6A2C1		CAPACITOR:ITEM 3.	7-96
A2A6A2L1		SAME AS A2L3	7-96
A2A6A2MP1		COUPLING,TOP:0.875IN.DIA X0.382IN.;CRES, PASSIVATE;MFR 06845 PART NUMBER 4C3C874-0001.	7-95
A2A6A2MP2		PIN:0.0936IN.DIA X0.225IN.LG;CRES, PASSIVATION;MFR 06845 PART NUMBER 4032181-0001.	7-95
A2A6A2MP3		SPRING,HOLD DOWN:0.860IN.DIA X0.015IN.THK; 1/2 H BE COP;MFR 06845 PART NUMBER 4032183-0001.	7-95

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A2MP4		CHASSIS,ELECTRICAL EQUIPMENT:3.66IN.LG X 3.18IN.W X3.464IN.H;AL ALY DIE CASTING; MFR 06845 PART NUMBER 4032409-0501.	7-96
A2A6A2MP5		BUSHING-SHAFT,PANEL INDEXING:0.154IN.DIA SHAFT,0.938IN.DIA X1.82IN.LG;MFR 76854 PART NUMBER 06845 DWG 4030756-0702.	7-96
A2A6A2MP6		COVER:3.190IN.LG X3.640IN.W X3.474IN.H; AL ALY;CHEMICAL FILM PER MIL-C-5541;MFR 06845 PART NUMBER 4032406-0501. (ATTACHING PARTS)AJ(2)W(2)Y(2)	7-96
A2A6A2MP7		COUPLING ASSEMBLY:0.875IN.DIA X0.382IN.; MFR 06845 PART NUMBER 4032209-0501.	7-96
A2A6A2P1		CONNECTOR,RECEPTACLE,ELECTRICAL:2.088IN.LG X0.494IN.W X0.426IN.THK;MFR 60007 PART NUMBER DBM9W4P,06845 DWG 4032484-0711.	7-96
A2A6A2S1		SWITCH SECTION,ROTARY:0.937IN.DIA;1 SECTION 1 POLE,10 POSITION,SHORTING TYPE;1 AMP AT 28 VOLTS DC,0.5 AMP AT 115 VOLTS AC;MFR 76854 PART NUMBER 276782BA,06845 DWG 4030793-0701.	7-96
A2A6A2Y1		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;4.553 MC;MFR 00136,06845 DWG 4030769-0701.	7-96
A2A6A2Y2		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;4.653 MC;MFR 00136,06845 DWG 4030769-0702.	7-96
A2A6A2Y3		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;4.753 MC;MFR 00136,06845 DWG 4030769-0703.	7-96
A2A6A2Y4		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;4.853 MC;MFR 00136,06845 DWG 4030769-0704.	7-96
A2A6A2Y5		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;4.953 MC;MFR 00136,06845 DWG 4030769-0705.	7-96
A2A6A2Y6		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.053 MC;MFR 00136,06845 DWG 4030769-0706.	7-96
A2A6A2Y7		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.153 MC;MFR 00136,06845 DWG 4030769-0707.	7-96
A2A6A2Y8		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.253 MC;MFR 00136,06845 DWG 4030769-0708.	7-96
A2A6A2Y9		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.353 MC;MFR 00136,06845 DWG 4030769-0709.	7-96
A2A6A2Y10		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.453 MC;MFR 00136,06845 DWG 4030769-0710.	7-96
A2A6A2A1		OSCILLATOR,4.553-5.453 MHZ:1.55IN.X1.64IN.X 0.72IN.THK;MFR 06845 PART NUMBER 4032335-0501. (ATTACHING PARTS)F(3)W(3)AC(3)	7-70
A2A6A2A1C1		CAPACITOR,FIXED,MICA:36 PF PORM 2%,500WVDC; MIL TYPE CM05ED360GP3.	7-70

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A2A1C2 AND A2A6A2A1C3		CAPACITOR:ITEM 3.	7-70
A2A6A2A1C4		CAPACITOR,FIXED,MICA:270 PF PORM 1%,500WVDC MIL TYPE CM05FD271FP3.	7-70
A2A6A2A1C5		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400W X 0.230IN.THK;820 PF PORM 2%,300WVDC;MFR C6845 PART NUMBER 4030802-0729.	7-70
A2A6A2A1C6		CAPACITOR,FIXED,MICA:360 PF PORM 2%,500WVDC MIL TYPE CM05FD361GP3.	7-70
A2A6A2A1C7 THRU A2A6A2A1C9		CAPACITOR:ITEM 3.	7-70
A2A6A2A1C10		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400W X 0.230IN.THK;820 PF PORM 2%,300WVDC;MFR 06845 PART NUMBER 4030802-0729.	7-70
A2A6A2A1CR1 AND A2A6A2A1CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-70
A2A6A2A1Q1 AND A2A6A2A1Q2		TRANSISTOR:ITEM 108.	7-70
A2A6A2A1R1		RESISTOR:ITEM 48.	7-70
A2A6A2A1R2 AND A2A6A2A1R3		RESISTOR:ITEM 49.	7-70
A2A6A2A1R4		RESISTOR:ITEM 81.	7-70
A2A6A2A1R5		RESISTOR:ITEM 46.	7-70
A2A6A2A1R6		RESISTOR:ITEM 60.	7-70
A2A6A2A1R7		RESISTOR:ITEM 46.	7-70
A2A6A2A1R8		RESISTOR,FIXED,COMPOSITION:5 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G5R1JS.	7-70
A2A6A2A1R9 AND A2A6A2A1R10		RESISTOR:ITEM 46.	7-70
A2A6A2A1R11		RESISTOR:ITEM 60.	7-70
A2A6A2A1R12		RESISTOR:ITEM 93.	7-70
A2A6A2A1R13		RESISTOR:ITEM 69.	7-70
A2A6A2A1R14		RESISTOR,FIXED,FILM:430 OHMS PORM 5%,1/4W; MIL TYPE RLR07C431JR.	7-70
A2A6A2A1RT1		RESISTOR:ITEM 84.	7-70
A2A6A2A2		10.747 MHZ MIXER:2.52IN.X1.64IN.;MFR 06845 PART NUMBER 4031906-0501. (ATTACHING PARTS)G(4)W(4)AC(4)	7-71
A2A6A2A2C1 THRU A2A6A2A2C4		CAPACITOR:ITEM 3.	7-71
A2A6A2A2C5		CAPACITOR,FIXED,CERAMIC:0.320IN.LG X0.320IN W.X0.120IN.THK;47 PF PORM 5%,150WVDC;MIL TYPE CC64CG470K.	7-71
A2A6A2A2C6 AND A2A6A2A2C7		CAPACITOR:ITEM 3.	7-71
A2A6A2A2C8 AND A2A6A2A2C9		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;750 PF PORM 2%,300WVDC;06845 PART NUMBER 4030802-0728.	7-71

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A2A2FL1		FILTER,BAND PASS:1.500IN.LG X0.750IN.W X 0.750IN.H;10.747 MHZ,3.0 V RMS AT INPUT TO FILTER;MFR 19057 PART NUMBER 1387, 06845 DWG 4030813-0701.	7-71
A2A6A2A2Q1 AND A2A6A2A2Q2		TRANSISTOR:ITEM 107.	7-71
A2A6A2A2R1		RESISTOR:ITEM 49.	7-71
A2A6A2A2R2		RESISTOR:ITEM 70.	7-71
A2A6A2A2R3		RESISTOR:ITEM 93.	7-71
A2A6A2A2R4		RESISTOR:ITEM 94.	7-71
A2A6A2A2R5		RESISTOR:ITEM 46.	7-71
A2A6A2A2R6		RESISTOR:ITEM 93.	7-71
A2A6A2A2R7		RESISTOR:ITEM 94.	7-71
A2A6A2A2R8		RESISTOR:ITEM 83.	7-71
A2A6A2A2R9		RESISTOR:ITEM 53.	7-71
A2A6A2A2T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032541-0706.	7-71
A2A6A2A2T2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032541-0707.	7-71
A2A6A2A2T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;10.747 MHZ;MFR 93292 PART NUMBER 06845 DWG 4032549-0703.	7-71
A2A6A2A3		MIXER,17.847-27.847 MHZ:3.08IN.X2.68IN.X 0.62IN.THK;MFR 06845 PART NUMBER 4031922-0501. (ATTACHING PARTS)F(4)W(4)AC(4)	7-72
A2A6A2A3C1		CAPACITOR:ITEM 3.	7-72
A2A6A2A3C2 AND A2A6A2A3C3		CAPACITOR,FIXED,ELECTROLYTIC:0.312IN.DIA X 0.689IN.;6.8 UF PORM 20%,35WVDC;MFR 56289 PART NUMBER 180D685X0035,06845 DWG 4031982-0701.	7-72
A2A6A2A3C4 THRU A2A6A2A3C6		CAPACITOR:ITEM 3.	7-72
A2A6A2A3C7		CAPACITOR,FIXED,MICA:56 PF PORM 1%,500WVDC; MIL TYPE CM05ED560FP3.	7-72
A2A6A2A3C8		CAPACITOR,VARIABLE:0.6 TO 5.5 PF,750WVDC; MIL TYPE PC51J5R5.	7-72
A2A6A2A3C9		CAPACITOR:ITEM 15.	7-72
A2A6A2A3C10 AND A2A6A2A3C11		CAPACITOR:ITEM 3.	7-72
A2A6A2A3C12		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400W X 0.230IN.THK;820 PF PORM 2%,300WVDC;MFR 06845 PART NUMBER 4030802-0729.	7-72
A2A6A2A3C13 THRU A2A6A2A3C17		CAPACITOR:ITEM 3.	7-72
A2A6A2A3C18		CAPACITOR,FIXED,MICA:43 PF PORM 2%,500WVDC; MIL TYPE CM05ED430GP3.	7-72
A2A6A2A3C19		CAPACITOR,VARIABLE:0.6 TO 5.5 PF,750WVDC; MIL TYPE PC51J5R5.	7-72
A2A6A2A3C20		CAPACITOR:ITEM 15.	7-72
A2A6A2A3CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-72
A2A6A2A3CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 100.	7-72

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A2A3CR3		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-72
A2A6A2A3Q1 AND A2A6A2A3Q2		TRANSISTOR:ITEM 107.	7-72
A2A6A2A3R1		RESISTOR:ITEM 94.	7-72
A2A6A2A3R2		RESISTOR:ITEM 46.	7-72
A2A6A2A3R3		RESISTOR:ITEM 93.	7-72
A2A6A2A3R4		RESISTOR:ITEM 47.	7-72
A2A6A2A3R5		RESISTOR:ITEM 54.	7-72
A2A6A2A3R6		RESISTOR:ITEM 94.	7-72
A2A6A2A3R7		RESISTOR:ITEM 46.	7-72
A2A6A2A3R8		RESISTOR:ITEM 93.	7-72
A2A6A2A3R9		RESISTOR:ITEM 94.	7-72
A2A6A2A3R10		RESISTOR:ITEM 72.	7-72
A2A6A2A3R11		RESISTOR:ITEM 85.	7-72
A2A6A2A3R12		RESISTOR,FIXED,FILM:910 OHMS PORM 5%,1/4W; MIL TYPE RLR07C911JR.	7-72
A2A6A2A3R13		RESISTOR:ITEM 90.	7-72
A2A6A2A3R14		RESISTOR:ITEM 82.	7-72
A2A6A2A3R15		RESISTOR:ITEM 54.	7-72
A2A6A2A3R16		RESISTOR,FIXED,COMPOSITION:68 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G680JS.	7-72
A2A6A2A3T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032541-0710.	7-72
A2A6A2A3T2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;17.847 MHZ;MFR 93292 PART NUMBER 500-2372,06845 DWG 4032549-0705.	7-72
A2A6A2A3T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;17.847 MHZ,CAP 99 PF PORM 5%,MFR 93292 PART NUMBER 500-2373, 06845 DWG 4032549-0706.	7-72
A2A6A2A3T4		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;27.847 MHZ;MFR 93292 PART NUMBER 500-2374,06845 DWG 4032549-0707.	7-72
A2A6A2A3Y1		CRYSTAL UNIT,QUARTZ:0.402IN.LG X0.530IN.H X0.183IN.THK;17.845 MHZ;MFR 00136,06845 DWG 4030794-0701.	7-72
A2A6A2A3Y2		CRYSTAL UNIT,QUARTZ:0.402IN.LG X0.530IN.H X0.183IN.THK;27.845 MHZ;MFR 00136,06845 DWG 4030794-0702.	7-72
A2A6A2A4		HIGH BAND/LOW BAND MIXER AMPLIFIER:3.46IN. X2.68IN. X0.64IN.THK;MFR 06845 PART NUMBER 4031917-0501. (ATTACHING PARTS)F(4)W(4)AC(4)	7-73
A2A6A2A4C1 AND A2A6A2A4C2		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C3		CAPACITOR:ITEM 34.	7-73
A2A6A2A4C4		CAPACITOR:ITEM 31.	7-73
A2A6A2A4C5 THRU A2A6A2A4C8		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C9		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;63 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0719.	7-73
A2A6A2A4C10		CAPACITOR:ITEM 28.	7-73
A2A6A2A4C11		CAPACITOR:ITEM 31.	7-73

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A2A4C12 THRU A2A6A2A4C15		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C16		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;64 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0720.	7-73
A2A6A2A4C17		CAPACITOR:ITEM 28.	7-73
A2A6A2A4C18		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.180IN.THK;63 PF PORM 1%,500WVDC;MFR 72136 TYPE DM15,06845 DWG 4031978-0719.	7-73
A2A6A2A4C19		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C20		NOT USED	
A2A6A2A4C21 AND A2A6A2A4C22		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C23		CAPACITOR,FIXED,MICA:39 PF PORM 2%,500WVDC; MIL TYPE CM05ED390GP3.	7-73
A2A6A2A4C24		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C25		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;28 PF PORM 0.5 PF,500WVDC; MFR 72136 TYPE DM15,06845 DWG 4031978-0704.	7-73
A2A6A2A4C26		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C30 THRU A2A6A2A4C31		CAPACITOR:ITEM 30.	7-73
A2A6A2A4C32		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.290 IN.LG;1.8 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA1R8UUFPCRM5PCT,06845 DWG 4031973-0724.	7-73
A2A6A2A4C33		CAPACITOR,FIXED,MICA:43 PF PORM 2%,500WVDC; MIL TYPE CM05ED430GP3.	7-73
A2A6A2A4C34 THRU A2A6A2A4C37		CAPACITOR:ITEM 3.	7-73
A2A6A2A4C38		CAPACITOR:ITEM 30.	7-73
A2A6A2A4C39		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.290 IN.LG;1.8 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA1R8UUFPCRM5PCT,06845 DWG 4031973-0724.	7-73
A2A6A2A4C40		CAPACITOR:ITEM 30.	7-73
A2A6A2A4C41		CAPACITOR:ITEM 3.	7-73
A2A6A2A4CR1 AND A2A6A2A4CR2		SEMICONDUCTOR DEVICE,DIODE:99.	7-73
A2A6A2A4FL1 AND A2A6A2A4FL2		SAME AS A2A1A1FL1	7-73
A2A6A2A4Q1 AND A2A6A2A4Q2		TRANSISTOR:ITEM 107.	7-73
A2A6A2A4R1		RESISTOR:ITEM 81.	7-73
A2A6A2A4R2		RESISTOR:ITEM 94.	7-73
A2A6A2A4R3		RESISTOR:ITEM 90.	7-73
A2A6A2A4R4		RESISTOR:ITEM 94.	7-73
A2A6A2A4R5		RESISTOR:ITEM 47.	7-73

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A2A4R6		RESISTOR:ITEM 81.	7-73
A2A6A2A4R7		RESISTOR,FIXED,COMPOSITION:82 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G820JS.	7-73
A2A6A2A4R8		RESISTOR:ITEM 94.	7-73
A2A6A2A4R9		RESISTOR:ITEM 67.	7-73
A2A6A2A4R10		RESISTOR:ITEM 62.	7-73
A2A6A2A4R11		RESISTOR:ITEM 78.	7-73
A2A6A2A4R12		RESISTOR:ITEM 94.	7-73
A2A6A2A4R13		RESISTOR:ITEM 85.	7-73
A2A6A2A4R14		RESISTOR:ITEM 47.	7-73
A2A6A2A4R15		RESISTOR:ITEM 81.	7-73
A2A6A2A4R16		RESISTOR:ITEM 94.	7-73
A2A6A2A4R17		RESISTOR:ITEM 90.	7-73
A2A6A2A4R18		RESISTOR:ITEM 94.	7-73
A2A6A2A4R19		RESISTOR:ITEM 47.	7-73
A2A6A2A4R20		RESISTOR:ITEM 81.	7-73
A2A6A2A4R21		RESISTOR,FIXED,COMPOSITION:82 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G820JS.	7-73
A2A6A2A4R22		RESISTOR:ITEM 94.	7-73
A2A6A2A4R23		RESISTOR:ITEM 67.	7-73
A2A6A2A4R24		RESISTOR:ITEM 62.	7-73
A2A6A2A4R25		RESISTOR:ITEM 78.	7-73
A2A6A2A4R26		RESISTOR:ITEM 59.	7-73
A2A6A2A4R27		RESISTOR:ITEM 85.	7-73
A2A6A2A4R28		RESISTOR:ITEM 47.	7-73
A2A6A2A4T1 AND A2A6A2A4T2		TRANSFORMER:ITEM 101.	7-73
A2A6A2A4T3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;22.9 MHZ,CAP 66 PF PORM 5%;MFR 93292 PART NUMBER 500-2370,06845 DWG 4032549-0702.	7-73
A2A6A2A4T4		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;22.85MHZ,CAPACITY 62 PF:MFR 93292 PART NUMBER 500-2395,06845 DWG 4032436-0701.	7-73
A2A6A2A4T5		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 06845 DWG 4032550-0704.	7-73
A2A6A2A4T6		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;22.9 MHZ,CAP 66 PF PORM 5%;MFR 93292 PARTNUMBER 500-2370,06845 DWG 4032549-0702.	7-73
A2A6A2A4T7 AND A2A6A2A4T8		TRANSFORMER:ITEM 111.	7-73
A2A6A2A4T9		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;32.9 MHZ,CAP 50 PF PORM 5%;MFR 93292 PART NUMBER 500-2369,06845 DWG 4032549-0701.	7-73
A2A6A2A4T10		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;32.85MHZ,CAPACITY 46 PF:MFR 93292 PART NUMBER 500-2396,06845 DWG 4032436-0702.	7-73
A2A6A2A4T11		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 06845 DWG 4032550-0701.	7-73
A2A6A2A4T12		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;32.9 MHZ,CAP 50 PF PORM 5%;MFR 93292 PART NUMBER 500-2369,06845 DWG 4032549-0701.	7-73

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A2A4U1 AND A2A6A2A4U2		INTEGRATED CIRCUIT,R F-I F AMPLIFIER:MFR 27014 PART NUMBER SL13631,06845 DWG 2031036-0701.	7-73
A2A6A2A5		AUTOMATIC GAIN CONTROL:2.76IN.X1.64IN.X 0.59IN.THK;MFR 06845 PART NUMBER 4031904-0501. (ATTACHING PARTS)F(3)W(3)AC(3)	7-74
A2A6A2A5C1		NOT USED	
A2A6A2A5C2 THRU A2A6A2A5C10		CAPACITOR:ITEM 3.	7-74
A2A6A2A5C11		CAPACITOR:ITEM 22.	7-74
A2A6A2A5CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-74
A2A6A2A5L1		SAME AS A2L3	7-74
A2A6A2A5L2		COIL:3.30 UH PORM 10%,500 RATED DC CURRENT; MIL TYPE MS90537-19.	7-74
A2A6A2A5L3		SAME AS A2L3	7-74
A2A6A2A5Q1		TRANSISTOR,SILICON,PNP:0.209IN.DIA X0.210 IN.H;MFR 04713 PART NUMBER SRF175,06845 DWG 4018638-0701.	7-74
A2A6A2A5Q2 THRU A2A6A2A5Q4		TRANSISTOR:ITEM 112.	7-74
A2A6A2A5R1		RESISTOR:ITEM 71.	7-74
A2A6A2A5R2		RESISTOR:ITEM 46.	7-74
A2A6A2A5R3		RESISTOR:ITEM 53.	7-74
A2A6A2A5R4		RESISTOR:ITEM 49.	7-74
A2A6A2A5R5		RESISTOR,FIXED,FILM:9.1K OHMS PORM 5%,1/4W; MIL TYPE RLRC7C912JR.	7-74
A2A6A2A5R6		RESISTOR:ITEM 59.	7-74
A2A6A2A5R7		RESISTOR,FIXED,FILM:240 OHMS PORM 5%,1/4W; MIL TYPE RLR07C241JR.	7-74
A2A6A2A5R8		RESISTOR:ITEM 52.	7-74
A2A6A2A5R9		RESISTOR:ITEM 49.	7-74
A2A6A2A5R10		RESISTOR,FIXED,FILM:9.1K OHMS PORM 5%,1/4W; MIL TYPE RLRC7C912JR.	7-74
A2A6A2A5R11		RESISTOR:ITEM 58.	7-74
A2A6A2A5R12		RESISTOR:ITEM 48.	7-74
A2A6A2A5R13		RESISTOR,VARIABLE:200 OHMS,3/4W;MIL TYPE RT24C2W201.	7-74
A2A6A2A5R14		RESISTOR,FIXED,FILM:1.6K OHMS PORM 5%,1/4W; MIL TYPE RLR07C162JR.	7-74
A2A6A2A5R15		RESISTOR:ITEM 61.	7-74
A2A6A2A5R16		RESISTOR:ITEM 47.	7-74
A2A6A2A5R17		RESISTOR,FIXED,FILM:20 OHMS PORM 5%,1/4W; MIL TYPE RLRC7C200JR.	7-74
A2A6A2A5TP1		JACK,TIP,TEST POINT:0.19IN.DIA X0.43IN.LG; 1500 VOLTS RMS,5 AMP;74970 PART NUMBER 105-851;06845 DWG 4032546-0701.	
A2A6A3		SYNTHESIZER SUBASSEMBLY,1 AND 10 KHZ: 5.25IN.W X4.38IN.LG X1.81IN.H;MFR 06845 PART NUMBER 4032333-0501. (ATTACHING PARTS)T(4)Z(4)	
A2A6A3C1		CAPACITOR:ITEM 20.	7-97
A2A6A3C2		CAPACITOR:ITEM 13.	7-97
A2A6A3J1		TERMINAL,FEED-THRU:MIL TYPE FT032B03.	7-97

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A3J2 THRU A2A6A3J4		CONNECTOR,RECEPTACLE,ELECTRICAL:1 CONTACT, 0.25IN.DIA X0.940IN.LG;MFR 98291 PART NUMBER 51-310-3196,06845 DWG 4032527-07C1.	7-97
A2A6A3MP1		COUPLING,TOP:0.875IN.DIA X0.382IN.;CRES, PASSIVATE;MFR 06845 PART NUMBER 4030874-0001.	7-95
A2A6A3MP2		PIN:0.0936IN.DIA X0.225IN.LG;CRES; PASSIVATION;MFR 06845 PART NUMBER 4032181-0001.	7-95
A2A6A3MP3		SPRING,HOLD DOWN:0.860IN.DIA X0.015IN.THK; 1/2 H BE COP;MFR 06845 PART NUMBER 4032183-0001.	7-95
A2A6A3MP4		COVER:5.224IN.LG X1.818IN.W X3.680IN.H; AL ALY;CHEM FILM;MFR 06845 PART NUMBER 4032154-0001. (ATTACHING PARTS)F(2)	7-97
A2A3A3S1		SWITCH SECTION,ROTARY:0.937IN.DIA;1 SECTION 1 POLE,10 POSITION,SHORTING TYPE;1 AMP AT 28 VOLTS DC,0.5 AMP AT 115 VOLTS AC;MFR 76854 PART NUMBER 276782BA,06845 DWG 4030793-0701.	7-104
A2A6A3S2		SWITCH SECTION,ROTARY:0.937IN.DIA;1 SECTION 1 POLE,10 POSITION,SHORTING TYPE;1 AMP AT 28 VOLTS DC,0.5 AMP AT 115 VOLTS AC;MFR 76854 PART NUMBER 276782BA,06845 DWG 4030793-0701.	7-103
A2A6A3Y1		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.25 MC;MFR 00136,06845 DWG 4030769-0720.	7-104
A2A6A3Y2		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.24 MC;MFR 00136,06845 DWG 4030769-0719.	7-104
A2A6A3Y3		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.23 MC;MFR 00136,06845 DWG 4030769-0718.	7-10
A2A6A3Y4		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.22 MC;MFR 00136,06845 DWG 4030769-0717.	7-104
A2A6A3Y5		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.21 MC;MFR 00136,06845 DWG 4030769-0716.	7-104
A2A6A3Y6		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.2 MC;MFR 00136,06845 DWG 4030769-0715.	7-104
A2A6A3Y7		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.19 MC;MFR 00136,06845 DWG 4030769-0714.	7-104
A2A6A3Y8		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.18 MC;MFR 00136,06845 DWG 4030769-0713.	7-104
A2A6A3Y9		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.17 MC;MFR 00136,06845 DWG 4030769-0712.	7-104
A2A6A3Y10		CRYSTAL UNIT,QUARTZ:0.435IN.X0.183IN.X0.530 IN.;5.16 MC;MFR 00136,06845 DWG 4030769-0711.	7-104
A2A6A3Y11		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.850 MC;MFR 00136,06845 DWG 4030770-0701.	7-103

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A3Y12		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.851 MC;MFR 00136,06845 DWG 4030770-0702.	7-103
A2A6A3Y13		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.852 MC;MFR 00136,06845 DWG 4030770-0703.	7-103
A2A6A3Y14		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.853 MC;MFR 00136,06845 DWG 4030770-0704.	7-103
A2A6A3Y15		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.854 MC;MFR 00136,06845 DWG 4030770-0705.	7-103
A2A6A3Y16		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.855 MC;MFR 00136,06845 DWG 4030770-0706.	7-103
A2A6A3Y17		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.856 MC;MFR 00136,06845 DWG 4030770-0707.	7-103
A2A6A3Y18		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.857 MC;MFR 00136,06845 DWG 4030770-0708.	7-103
A2A6A3Y19		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.858 MC;MFR 00136,06845 DWG 4030770-0709.	7-103
A2A6A3Y20		CRYSTAL UNIT,QUARTZ:0.530IN.X0.200IN.X0.641 IN.;1.859 MC;MFR 00136,06845 DWG 4030770-0710.	7-103
A2A6A3A1		OSCILLATOR,5.16 -5.25 MHZ:2.18IN.X1.64IN.X 0.56IN.THK;MFR 06845 PART NUMBER 4032337-0501. (ATTACHING PARTS)S(2)P(1)	7-75
A2A6A3A1C1		CAPACITOR,FIXED,CERAMIC:0.200IN.DIA X0.400 IN.LG;33 PF PCRM 3%,500WVDC;MFR 72982 PART NUMBER 301N2200-33,06845 DWG 4030814-0704.	7-75
A2A6A3A1C2		CAPACITOR,FIXED,MICA:270 PF PORM 1%,500WVDC MIL TYPE CM05FD271FP3.	7-75
A2A6A3A1C3		CAPACITOR,FIXED,MICA:360 PF PORM 2%,500WVDC MIL TYPE CM05FD361GP3.	7-75
A2A6A3A1C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.230IN.THK;820 PF PORM 2%,300WVDC;MFR 06845 PART NUMBER 4030802-0729.	7-75
A2A6A3A1C5 THRU A2A6A3A1C9		CAPACITOR:ITEM 3.	7-75
A2A6A3A1C10		CAPACITOR,FIXED,MICA:200 PF PORM 2%,500WVDC MIL TYPE CM05FD201GP3.	7-75
A2A6A3A1C11		CAPACITOR,FIXED,MICA:240 PF PORM 2%,500WVDC MIL TYPE CM05FD241GP3.	7-75
A2A6A3A1CR1 AND A2A6A3A1CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-75
A2A6A3A1Q1		TRANSISTOR:ITEM 108.	7-75
A2A6A3A1Q2		TRANSISTOR:ITEM 114.	
A2A6A3A1R1		RESISTOR,FIXED,FILM:20K OHMS PORM 5%, 1/4W;MIL TYPE RLR07C203JR.	7-75
A2A6A3A1R2		RESISTOR:ITEM 51.	7-75
A2A6A3A1R3		RESISTOR:ITEM 48.	7-75

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A3A1R4		RESISTOR,FIXED,FILM:1.3K OHMS PORM 5%,1/4W; MIL TYPE RLR07C132JR.	7-75
A2A6A3A1R5 AND A2A6A3A1R6		RESISTOR:ITEM 46.	7-75
A2A6A3A1R7		RESISTOR,FIXED,COMPOSITION:5 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G5R1JS.	7-75
A2A6A3A1R8		RESISTOR:ITEM 94.	7-75
A2A6A3A1R9		RESISTOR:ITEM 48.	7-75
A2A6A3A1R10		RESISTOR:ITEM 47.	7-75
A2A6A3A1R11		RESISTOR:ITEM 49.	7-75
A2A6A3A1R12		RESISTOR:ITEM 81.	7-75
A2A6A3A1R13		RESISTOR:ITEM 49.	7-75
A2A6A3A1R14		RESISTOR:ITEM 93.	7-75
A2A6A3A1R15		RESISTOR:ITEM 72.	7-75
A2A6A3A1R16		RESISTOR:ITEM 93.	7-75
A2A6A3A1RT1		RESISTOR:ITEM 84.	
A2A6A3A1T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032541-0705.	7-75
A2A6A3A2		OSCILLATOR,1.850-1.859 MHZ:2.18IN.X1.65IN.X 0.56IN.THK;MFR 06845 PART NUMBER 4032346-0501. (ATTACHING PARTS)S(2)P(1)	7-76
A2A6A3A2C1		CAPACITOR,FIXED,CERAMIC:0.200IN.DIA X0.400 IN.LG;43 PF PORM 3%,500WVDC;MFR 72982 PART NUMBER 301N5600-43,06845 DWG 4030814-0701.	7-76
A2A6A3A2C2		CAPACITOR,FIXED,MICA:240 PF PORM 2%,500WVDC MIL TYPE CM05FD241GP3.	7-76
A2A6A3A2C3		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;750 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0728.	7-76
A2A6A3A2C4		CAPACITOR,FIXED,MICA:0.470IN.LG X0.390IN.W X0.210IN.THK;620 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0725.	7-76
A2A6A3A2C5		CAPACITOR:ITEM 3.	7-76
A2A6A3A2C6 AND A2A6A3A2C7		CAPACITOR,FIXED,CERAMIC:0.047 UF PORM 10%, 100WVDC;MIL TYPE CK14BX473K.	7-76
A2A6A3A2C8		CAPACITOR:ITEM 3.	7-76
A2A6A3A2C9		CAPACITOR,FIXED,CERAMIC:0.047 UF PORM 10%, 100WVDC;MIL TYPE CK14BX473K.	7-76
A2A6A3A2C10		CAPACITOR,FIXED,MICA:0.470IN.LG X0.400IN.W X0.220IN.THK;750 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0728.	7-76
A2A6A3A2CR1 AND A2A6A3A2CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-76
A2A6A3A2Q1		TRANSISTOR:ITEM 108.	7-76
A2A6A3A2Q2		TRANSISTOR:ITEM 114.	7-76
A2A6A3A2R1		RESISTOR,FIXED,FILM:20K OHMS PORM 5% 1/4W;MIL TYPE RLR07C203JR.	7-76
A2A6A3A2R2		RESISTOR:ITEM 51.	7-76
A2A6A3A2R3		RESISTOR:ITEM 48.	7-76

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A3A2R4		RESISTOR,FIXED,FILM:1.3K OHMS PORM 5%,1/4W; MIL TYPE RLR07C132JR.	7-76
A2A6A3A2R5		RESISTOR:ITEM 56.	7-76
A2A6A3A2R6		RESISTOR:ITEM 46.	7-76
A2A6A3A2R7		RESISTOR:ITEM 77.	7-76
A2A6A3A2R8		RESISTOR:ITEM 94.	7-76
A2A6A3A2R9		RESISTOR:ITEM 91.	7-76
A2A6A3A2R10		RESISTOR:ITEM 47.	7-76
A2A6A3A2R11		RESISTOR:ITEM 49.	7-76
A2A6A3A2R12		RESISTOR:ITEM 81.	7-76
A2A6A3A2R13		RESISTOR:ITEM 49.	7-76
A2A6A3A2R14		RESISTOR:ITEM 93.	7-76
A2A6A3A2R15		RESISTOR:ITEM 48.	7-76
A2A6A3A2R16		RESISTOR,FIXED,FILM:240 OHMS PORM 5%,1/4W; MIL TYPE RLR07C241JR.	7-76
A2A6A3A2RT1		RESISTOR:ITEM 84.	7-76
A2A6A3A2T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032541-0708.	7-76
A2A6A3A3		OUTPUT AND BLANKER,1 AND 10 KHZ:3.28IN.X 1.240IN.X0.84IN.THK;MFR 06845 PART NUMBER 4032325-0501. (ATTACHING PARTS)E(3)AE(3)W(3)	7-77
A2A6A3A3C1 THRU A2A6A3A3C3		CAPACITOR:ITEM 13.	7-77
A2A6A3A3C4		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;470 PF PORM 1%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0722.	7-77
A2A6A3A3C5		CAPACITOR:ITEM 6.	7-77
A2A6A3A3C6		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;470 PF PORM 1%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0722.	7-77
A2A6A3A3C7		CAPACITOR:ITEM 6.	7-77
A2A6A3A3C8		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;470 PF PORM 1%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0722.	7-77
A2A6A3A3C9		CAPACITOR:ITEM 6.	7-77
A2A6A3A3C10		CAPACITOR,FIXED,MICA:0.460IN.LG X0.380IN.W X0.200IN.THK;470 PF PORM 1%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0722.	7-77
A2A6A3A3C11		CAPACITOR:ITEM 11.	7-77
A2A6A3A3CR1		SEMICONDUCTOR DEVICE,DIODE:0.125IN.DIA X 0.300IN.LG;MFR 73292 PART NUMBER HS29010A 06845 DWG 4030787-0701.	7-77
A2A6A3A3E1		TERMINAL,FEEDTHRU:MIL TYPE FT039B02.	7-77
A2A6A3A3J1 AND A2A6A3A3J2		CONNECTOR,ELECTRICAL,RIGH ANGLE:0.547IN.X 0.609IN.X0.25IN.SQ;1.5 AMP;MFR 98291 PART NUMBER 51-053-0000;06845 DWG 4032526-0701.	7-77
A2A6A3A3L1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032550-0711.	7-77

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A3A3L2 AND A2A6A3A3L3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;3.345 MHZ,488 PF PORM 5%;MFR 93292 PART NUMBER 500-2383,06845 DWG 4032550-0712.	7-77
A2A6A3A3Q1		TRANSISTOR:ITEM 114.	7-77
A2A6A3A3Q2		TRANSISTOR:ITEM 110.	7-77
A2A6A3A3R1		RESISTOR:ITEM 94.	7-77
A2A6A3A3R2		RESISTOR:ITEM 46.	7-77
A2A6A3A3R3A	1	RESISTOR,FIXED,COMPOSITION:12 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G120JS.	7-77
A2A6A3A3R3B	1	RESISTOR,FIXED,COMPOSITION:15 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G150JS.	7-77
A2A6A3A3R3C	1	RESISTOR,FIXED,COMPOSITION:18 OHMS PORM 5% 1/4W;MIL TYPE RCR07G180JS.	7-77
A2A6A3A3R3D	1	RESISTOR,FIXED,COMPOSITION:27 OHMS PORM 5% 1/4W;MIL TYPE RCR07G270JS.	7-77
A2A6A3A3R3E	1	RESISTOR,FIXED,COMPOSITION:33 OHMS PORM 5% 1/4W;MIL TYPE RCR07G330JS.	7-77
A2A6A3A3R3F	1	RESISTOR:ITEM 79.	7-77
A2A6A3A3R3G	1	RESISTOR,FIXED,FILM:20 OHMS PORM 5%,1/4W; MIL TYPE RLRC7C200JR.	7-77
A2A6A3A3R3H	1	RESISTOR,FIXED,FILM:22 CHMS PORM 5%,1/4W; MIL TYPE RLR07C220JR.	7-77
A2A6A3A3R3J	1	RESISTOR,FIXED,FILM:24 OHMS PORM 5%,1/4W; MIL TYPE RLR07C240JR.	7-77
A2A6A3A3R3K	1	RESISTOR,FIXED,FILM:30 OHMS PORM 5%,1/4W; MIL TYPE RLR07C300JR.	7-77
A2A6A3A3R3L	1	RESISTOR,FIXED,FILM:36 OHMS PORM 5%,1/4W; MIL TYPE RLR07C360JR.	7-77
A2A6A3A3R4		RESISTOR:ITEM 47.	7-77
A2A6A3A3R5		RESISTOR:ITEM 93.	7-77
A2A6A3A3R6		RESISTOR:ITEM 47.	7-77
A2A6A3A3R7		RESISTOR:ITEM 60.	7-77
A2A6A3A3T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;3.35 MHZ;CAP 490 PF PORM 5%;MFR 93292 PART NUMBER 06845 DWG 4032549-0708.	7-77
A2A6A3A4		ERROR MIXER,1 AND 10 KHZ SYNTHESIZER:5.10 IN.X1.690IN.X1.40IN.THK;MFR 06845 PART NUMBER 4032284-0501.	7-78
A2A6A3A4C1 THRU A2A6A3A4C3		CAPACITOR:ITEM 3.	7-78
A2A6A3A4C4 AND A2A6A3A4C5		CAPACITOR:ITEM 6.	7-78
A2A6A3A4C6		CAPACITOR:ITEM 3.	7-78
A2A6A3A4C7		CAPACITOR,FIXED,MICA:220 PF PORM 1%,500WVDC MIL TYPE CM05FD221FP3.	7-78
A2A6A3A4C8		CAPACITOR,FIXED,MICA:5 PF PORM 0.5 PF,500 WVDC;MIL TYPE CM05CD050DP3.	7-78
A2A6A3A4C9		CAPACITOR,FIXED,MICA:68 PF PORM 1%,500WVDC; MIL TYPE CM05ED680FP3.	7-78
A2A6A3A4C10		CAPACITOR,FIXED,MICA:200 PF PORM 2%,500WVDC MIL TYPE CM05FD201GP3.	7-78
A2A6A3A4C11 AND A2A6A3A4C12		CAPACITOR:ITEM 3.	7-78

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A3A4C13		CAPACITOR:ITEM 13.	7-78
A2A6A3A4FL1		FILTER,BAND PASS,CRYSTAL:1.500IN.LG X0.750 IN.W X0.750IN.H;9.07 MHZ;MFR 19057 PART NUMBER 790900,06845 DWG 4032129-0701.	7-78
A2A6A3A4FL2		FILTER,BAND PASS,CRYSTAL:1.625IN.LG X0.875 IN.W X0.750IN.H;1.981 MHZ;MFR 19057 PART NUMBER 1385,06845 DWG 4030810-0701.	7-78
A2A6A3A4L1 AND A2A6A3A4L2		NOT USED	
A2A6A3A4L3		COIL,R F FIXED:0.22IN.DIA X0.410IN.LG;2.5 MHZ;MFR 93292 PART NUMBER 06845 DWG 4032439-0701.	7-78
A2A6A3A4L4		COIL,R F FIXED:0.22IN.DIA X0.410IN.LG;790 MHZ;MFR 93292 PART NUMBER 06845 DWG 4032439-0702.	7-78
A2A6A3A4Q1 THRU A2A6A3A4Q7		NOT USED	
A2A6A3A4Q8 AND A2A6A3A4Q9		TRANSISTOR:ITEM 107.	7-78
A2A6A3A4R1		RESISTOR:ITEM 94.	7-78
A2A6A3A4R2		RESISTOR:ITEM 46.	7-78
A2A6A3A4R3		RESISTOR:ITEM 94.	7-78
A2A6A3A4R4		RESISTOR:ITEM 46.	7-78
A2A6A3A4R5		RESISTOR:ITEM 62.	7-78
A2A6A3A4R6		RESISTOR:ITEM 88.	7-78
A2A6A3A4R7		RESISTOR:ITEM 81.	7-78
A2A6A3A4R8		RESISTOR:ITEM 94.	7-78
A2A6A3A4R9		RESISTOR:ITEM 46.	7-78
A2A6A3A4R10		RESISTOR:ITEM 94.	7-78
A2A6A3A4R11		RESISTOR:ITEM 58.	7-78
A2A6A3A4R12		RESISTOR:ITEM 46.	7-78
A2A6A3A4R30		RESISTOR,FIXED,COMPOSITION:15 OHMS PCRM 5%, 1/4W;MIL TYPE RCR07G150JS.	7-78
A2A6A3A4R31		RESISTOR,FIXED,COMPOSITION:62 OHMS PCRM 5%, 1/4W;MIL TYPE RCR07G620JS.	7-78
A2A6A3A4T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;7.9 MHZ,CAP 159.5 PF PORM 5%;93292 PART NUMBER 06845 DWG 4032549-0704.	7-78
A2A6A3A4Z1		ERROR MIXER,1 KHZ:0.78IN.LG X0.38IN.W X0.82 IN.H;MFR 06845 PART NUMBER 4032461-0501.	7-78
A2A6A3A4Z2 AND A2A6A3A4Z3		ISOLATION AMPLIFIER,1 KHZ OR 10 KHZ:0.78IN. LG X0.38IN.W X0.82IN.H;MFR 06845 PART NUMBER 4032462-0501.	7-78
A2A6A4		SYNTHESIZER SUBASSEMBLY,100 HZ:3.58IN. X3.73IN.X1.90IN.;MFR 06845 PART NUMBER 4032330-0501. (ATTACHING PARTS)((2)	7-64
A2A6A4MP1		COVER:3.564IN.LG X1.880IN.W X3.656IN.H; AL ALY;CHEM FILM;MFR 06845 PART NUMBER 4032407-0501. (ATTACHING PARTS)F(2)W(2)AE(2)	7-98
A2A6A4P1		CONNECTOR,RECEPTACLE,ELECTRICAL:2.088IN.LG X0.494IN.W X0.426IN.THK;MFR 60007 PART NUMBER DBM13W3P,06845 DWG 4032484-0707.	7-98

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A4A1		COUNTER PRESET:3.25IN.LG X2.35IN.W X0.73IN. THK;MFR 06345 PART NUMBER 4010022-0501. (ATTACHING PARTS)AA(1)D(1)V(1)AB(1)	7-79
A2A6A4A1C1 AND A2A6A4A1C2		CAPACITOR:ITEM 11.	7-79
A2A6A4A1C3		CAPACITOR:ITEM 16.	7-79
A2A6A4A1C4		CAPACITOR,FIXED,CERAMIC:18000 PF PORM 10%, 200WVDC;MIL TYPE CK06BX183K.	7-79
A2A6A4A1C5		CAPACITOR:ITEM 16.	7-79
A2A6A4A1C6 THRU A2A6A4A1C10		CAPACITOR:ITEM 7.	7-79
A2A6A4A1C11		CAPACITOR:ITEM 11.	7-79
A2A6A4A1C12		CAPACITOR:ITEM 16.	7-79
A2A6A4A1C13		CAPACITOR,FIXED,MICA:1000 PF PORM 20%,500 WVDC;MIL TYPE CK05BX102M.	7-79
A2A6A4A1C14		CAPACITOR,FIXED,MICA:4300 PF PORM 1%,500 WVDC;MIL TYPE CM06FD432FP3.	7-79
A2A6A4A1C15 AND A2A6A4A1C16		CAPACITOR:ITEM 11.	7-79
A2A6A4A1C17		CAPACITOR,FIXED,ELECTROLYTIC:2.2 UF PORM 20%,50WVDC;MIL TYPE M39003-01-2123.	7-79
A2A6A4A1CR1 THRU A2A6A4A1CR14		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-79
A2A6A4A1Q1		TRANSISTOR:MIL TYPE 2N964.	
A2A6A4A1Q2 THRU A2A6A4A1Q9		TRANSISTOR:ITEM 113.	7-79
A2A6A4A1R1		RESISTOR:ITEM 52.	7-79
A2A6A4A1R2		RESISTOR,FIXED,FILM:750 OHMS PORM 5%,1/4W; MIL TYPE RLR07C751JR.	7-79
A2A6A4A1R3		RESISTOR:ITEM 54.	7-79
A2A6A4A1R4		RESISTOR:ITEM 60.	7-79
A2A6A4A1R5		RESISTOR:ITEM 77.	7-79
A2A6A4A1R6		RESISTOR:ITEM 54.	7-79
A2A6A4A1R7		RESISTOR,FIXED,FILM:160 OHMS PORM 5%,1/4W; MIL TYPE RLR07C161JR.	7-79
A2A6A4A1R8		RESISTOR,FIXED,FILM:91 OHMS PORM 5%,1/4W; MIL TYPE RLR07C910JR.	7-79
A2A6A4A1R9A	1	RESISTOR:ITEM 60.	7-79
A2A6A4A1R9B	1	RESISTOR:ITEM 50.	7-79
A2A6A4A1R9C	1	RESISTOR:ITEM 62.	7-79
A2A6A4A1R9D	1	RESISTOR:ITEM 52.	7-79
A2A6A4A1R9E	1	RESISTOR:ITEM 53.	7-79
A2A6A4A1R9F	1	RESISTOR:ITEM 85.	7-79
A2A6A4A1R9G	1	RESISTOR:ITEM 66.	7-79
A2A6A4A1R9H	1	RESISTOR:ITEM 54.	7-79
A2A6A4A1R9J	1	RESISTOR:ITEM 48.	7-79
A2A6A4A1R9K	1	RESISTOR:ITEM 58.	7-79
A2A6A4A1R9L	1	RESISTOR:ITEM 69.	7-79
A2A6A4A1R9M	1	RESISTOR:ITEM 59.	7-79
A2A6A4A1R9N	1	RESISTOR:ITEM 72.	7-79
A2A6A4A1R10		RESISTOR:ITEM 49.	7-79
A2A6A4A1R11		RESISTOR:ITEM 66.	7-79
A2A6A4A1R12		RESISTOR:ITEM 53.	7-79

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A4A1R13		RESISTOR:ITEM 55.	7-79
A2A6A4A1R14		RESISTOR:ITEM 61.	7-79
A2A6A4A1R15		RESISTOR:ITEM 55.	7-79
A2A6A4A1R16		RESISTOR:ITEM 61.	7-79
A2A6A4A1R17		RESISTOR:ITEM 55.	7-79
A2A6A4A1R18		RESISTOR:ITEM 61.	7-79
A2A6A4A1R19		RESISTOR:ITEM 55.	7-79
A2A6A4A1R20		RESISTOR:ITEM 61.	7-79
A2A6A4A1R21		RESISTOR:ITEM 55.	7-79
A2A6A4A1R22		RESISTOR:ITEM 80.	7-79
A2A6A4A1R23		RESISTOR:ITEM 83.	7-79
A2A6A4A1R24		RESISTOR:ITEM 53.	7-79
A2A6A4A1R25		RESISTOR:ITEM 94.	7-79
A2A6A4A1R26 AND A2A6A4A1R27		RESISTOR:ITEM 69.	7-79
A2A6A4A1R28		RESISTOR:ITEM 73.	7-79
A2A6A4A1R29		RESISTOR:ITEM 53.	7-79
A2A6A4A1R30		RESISTOR,FIXED,COMPOSITION:27K OHMS PORM 5% 1/4W;MIL TYPE RCR07G273JS.	7-79
A2A6A4A1R31		RESISTOR:ITEM 93.	7-79
A2A6A4A1R32		RESISTOR:ITEM 67.	7-79
A2A6A4A1R33		RESISTOR:ITEM 78.	7-79
A2A6A4A1R34		RESISTOR:ITEM 73.	7-79
A2A6A4A1R35		RESISTOR:ITEM 60.	7-79
A2A6A4A1R36		RESISTOR:ITEM 59.	7-79
A2A6A4A1R37		RESISTOR:ITEM 55.	7-79
A2A6A4A1R38		RESISTOR:ITEM 94.	7-79
A2A6A4A1R39		RESISTOR:ITEM 83.	7-79
A2A6A4A1R40		RESISTOR:ITEM 54.	7-79
A2A6A4A1T1		TRANSFORMER,R F:0.630IN.DIA X0.60IN.;11.5 KC,CAP 4300 PF PORM 2%;MFR 93292 PART NUMBER 500-2274,06845 DWG 4030763-0701.	7-79
A2A6A4A1U1 THRU A2A6A4A1U3		INTEGRATED CIRCUIT,DECADE COUNTER:0.370IN. DIA X0.185IN.H.;MFR 07263 PART NUMBER SL3144,06845 DWG 4013371-0702.	7-79
A2A6A4A1U4		INTEGRATED CIRCUIT,JK FLIP-FLOP:0.370IN.DIA X0.185IN.H;MFR 07263 PART NUMBER SL3143, 06845 DWG 4013373-0701.	7-79
A2A6A4A2		OSCILLATOR:3.275IN.LG X2.34IN.W X0.75IN.THK MFR 06845 PART NUMBER 4010030-0501. (ATTACHING PARTS)F(2)W(2)AE(2)	7-98
A2A6A4A2C1		CAPACITOR:ITEM 11.	7-80
A2A6A4A2C2		CAPACITOR:ITEM 7.	7-80
A2A6A4A2C3		CAPACITOR:ITEM 16.	7-80
A2A6A4A2C4		CAPACITOR,FIXED,ELECTROLYTIC:0.47 UF PORM 20%,50WVDC;M39003-01-2111.	7-80
A2A6A4A2C5		CAPACITOR:ITEM 23.	7-80
A2A6A4A2C6		CAPACITOR,FIXED,MICA:270 PF PORM 10%,500 WVDC;MIL TYPE CK05BX271K.	7-80
A2A6A4A2C7		CAPACITOR:ITEM 7.	7-80
A2A6A4A2C8		CAPACITOR:ITEM 11.	7-80
A2A6A4A2C9		CAPACITOR:ITEM 7.	7-80
A2A6A4A2C10		CAPACITOR,FIXED,CERAMIC:47000 PF PORM 20%, 200WVDC;MIL TYPE CK05BX473M.	7-80
A2A6A4A2C11 AND A2A6A4A2C12		CAPACITOR:ITEM 7.	7-80

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A4A2C13		CAPACITOR:ITEM 10.	7-80
A2A6A4A2C14		CAPACITOR,VARIABLE,CERAMIC:0.531IN.DIA X 0.594IN.H;8 TO 50 PF,350WVDC;MFR 72982 PART NUMBER 557-043-8-50E,06845 DWG 4032124-0701.	7-80
A2A6A4A2C15		CAPACITOR,FIXED,CERAMIC:0.200IN.DIA X0.400 IN.LG,47 PF PORM 20%,500WVDC;MFR 72982 PART NUMBER 301-011S3B0-470M,06845 DWG 4032272-0701.	7-80
A2A6A4A2CR1		SEMICONDUCTOR DEVICE,DIODE:0.140IN.DIA X 0.300IN.LG;MFR 12954 PART NUMBER DT30319C 06845 DWG 4031985-070.	7-80
A2A6A4A2CR2		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-80
A2A6A4A2CR3		SEMICONDUCTOR DEVICE,DIODE:ITEM 100.	7-80
A2A6A4A2CR4 THRU A2A6A4A2CR5		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-80
A2A6A4A2CR6 THRU A2A6A4A2CR8		SEMICONDUCTOR DEVICE,DIODE:0.125IN.DIA X 0.300IN.LG;MFR 73293 PART NUMBER 810000-583/HC7164, 06845 DWG 4030816-0701.	7-80
A2A6A4A2FL1		FILTER,LOW PASS:2.22IN.LG X0.78IN.W X0.600 IN.H;600 OHMS,20VDC;MFR 19057 PART NUMBER 1378,06845 DWG 4013370-0701.	7-80
A2A6A4A2L1		COIL:100000 UH PORM 10%,22 RATED CURRENT DC MIL TYPE MS90537-73.	
A2A6A4A2Q1 THRU A2A6A4A2Q3		TRANSISTOR:ITEM 113.	7-80
A2A6A4A2R1		RESISTOR:ITEM 85.	7-80
A2A6A4A2R2		RESISTOR:ITEM 70.	7-80
A2A6A4A2R3		RESISTOR:ITEM 53.	7-80
A2A6A4A2R4		RESISTOR:ITEM 62.	7-80
A2A6A4A2R5		RESISTOR:ITEM 55.	7-80
A2A6A4A2R6		RESISTOR:ITEM 73.	7-80
A2A6A4A2R7A	1	RESISTOR:ITEM 93.	7-80
A2A6A4A2R7B	1	RESISTOR,FIXED,COMPOSITION:120 OHMS PORM 5%, 1/4 W;MIL TYPE RCR07G121JS.	7-80
A2A6A4A2R7C	1	RESISTOR:ITEM 88.	7-80
A2A6A4A2R7D	1	RESISTOR,FIXED,COMPOSITION:68 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G680JS.	7-80
A2A6A4A2R7E	1	RESISTOR,FIXED,COMPOSITION:82 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G820JS.	7-80
A2A6A4A2R8		RESISTOR:ITEM 93.	7-80
A2A6A4A2R9		RESISTOR:ITEM 52.	7-80
A2A6A4A2R10		RESISTOR:ITEM 93.	7-80
A2A6A4A2R11 AND A2A6A4A2R12		RESISTOR:ITEM 56.	7-80
A2A6A4A2R13		RESISTOR:ITEM 69.	7-80
A2A6A4A2R14		RESISTOR:ITEM 56.	7-80
A2A6A4A2R15		RESISTOR,FIXED,COMPOSITION:27 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G270JS.	7-80
A2A6A4A2R16		RESISTOR,FIXED,COMPOSITION:47K OHMS PORM 5% 1/4W;MIL TYPE RCR07G473JS.	7-80
A2A6A4A2T1		TRANSFORMER,R F:0.630IN.DIA X0.315IN.H; 110 KC;CAP 23 PF +5-11 PF;MFR 93292 PART NUMBER 500-2351,06845 DWG 4032459-0701.	7-80

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A4A2U1		INTEGRATED CIRCUIT,JK FLIP-FLOP:0.370IN.DIA X0.185IN.H;MFR 07263 PART NUMBER SL3143, 06845 DWG 4013373-0701.	7-80
A2A6A4A3		MIXER,7.1 MHZ:3.35IN.LG X1.750IN.W X1.00IN. THK;MFR 06845 PART NUMBER 4010024-0501. (ATTACHING PARTS)F(2)W(1)A(3)AC(1)U(3)	7-98
A2A6A4A3C1		CAPACITOR:ITEM 11.	7-81
A2A6A4A3C2		CAPACITOR,FIXED,ELECTROLYTIC:2.2 UF PORM 20%,50WVDC;MIL TYPE M39003-01-2123.	7-81
A2A6A4A3C3 THRU A2A6A4A3C5		CAPACITOR:ITEM 7.	7-81
A2A6A4A3C6		CAPACITOR:ITEM 20.	7-81
A2A6A4A3C7 AND A2A6A4A3C8		CAPACITOR:ITEM 15.	7-81
A2A6A4A3C9 THRU A2A6A4A3C12		CAPACITOR:ITEM 7.	7-81
A2A6A4A3C13		CAPACITOR,FIXED,MICA:430 PF PORM 1%,500WVDC MIL TYPE CM06FD431FP3.	7-81
A2A6A4A3C14		CAPACITOR:ITEM 7.	7-81
A2A6A4A3C15		CAPACITOR,FIXED,ELECTROLYTIC:2.2 UF PORM 20%,50WVDC;MIL TYPE M39003-01-2123.	7-81
A2A6A4A3C16		CAPACITOR:ITEM 7.	7-81
A2A6A4A3FL1		FILTER,BAND PASS CRYSTAL:1.500IN.LG X0.875 IN.W X0.750IN.H;7.1 MHZ,500 OHMS;MFR 19057 PART NUMBER 1388,06845 DWG 4030820-0701.	7-81
A2A6A4A3L1		COIL:ITEM 39.	7-81
A2A6A4A3Q1		TRANSISTOR:ITEM 113.	7-81
A2A6A4A3Q2		TRANSISTOR:ITEM 107.	7-81
A2A6A4A3Q3 AND A2A6A4A3Q4		TRANSISTOR:MFR 07688 PART NUMBER 2N1142, 06845 DWG 4032551-0701.	7-81
A2A6A4A3R1		RESISTOR:ITEM 93.	7-81
A2A6A4A3R2		RESISTOR:ITEM 94.	7-81
A2A6A4A3R3		RESISTOR:ITEM 46.	7-81
A2A6A4A3R4		RESISTOR:ITEM 53.	7-81
A2A6A4A3R5		RESISTOR:ITEM 47.	7-81
A2A6A4A3R6		RESISTOR,FIXED,COMPOSITION:27 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G270JS.	7-81
A2A6A4A3R7		RESISTOR:ITEM 46.	7-81
A2A6A4A3R8		RESISTOR:ITEM 94.	7-81
A2A6A4A3R9 AND A2A6A4A3R10		RESISTOR:ITEM 59.	7-81
A2A6A4A3R11		RESISTOR:ITEM 94.	7-81
A2A6A4A3R12		RESISTOR:ITEM 46.	7-81
A2A6A4A3R13		RESISTOR:ITEM 93.	7-81
A2A6A4A3R14		RESISTOR:ITEM 57.	7-81
A2A6A4A3R15		RESISTOR:ITEM 55.	7-81
A2A6A4A3R16		RESISTOR:ITEM 94.	7-81
A2A6A4A3R17		RESISTOR:ITEM 57.	7-81
A2A6A4A3R18		RESISTOR:ITEM 46.	7-81
A2A6A4A3R19		RESISTOR:ITEM 50.	7-81
A2A6A4A3R20		RESISTOR,VARIABLE,WIRE WOUND:200 OHMS,3/4W; MIL TYPE RT24C2W201.	7-81

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A4A3R21		RESISTOR:ITEM 57.	7-81
A2A6A4A3T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292, 06845 DWG 4032541-0709.	7-81
A2A6A4A3TP1 AND A2A6A4A3TP2		NOT USED	
A2A6A4A3TP3		JACK,TIP,TEST POINT:0.19IN.DIA X0.43IN.LG; 1500 VOLTS,5 AMP;MFR 74970 PART NUMBER 105-851,06845 DWG 4032546-0701.	7-81
A2A6A4A3TP4		NOT USED	
A2A6A4A3TP5		JACK,TIP,TEST POINT:0.19IN.DIA X0.43IN.LG; 1500 VOLTS,5 AMP;MFR 74970 PART NUMBER 105-851,06845 DWG 4032546-0701.	7-81
A2A6A5		SPECTRUM GENERATOR SUBASSEMBLY:7.447IN.LG X 439IN.X0.937IN.THK;MFR 06845 PART NUMBER 4032329-0501. (ATTACHING PARTS)I(3)	7-64
A2A6A5E1 THRU A2A6A5E6		TERMINAL:ITEM 103.	
A2A6A5MP1		COVER:8.187IN.LG X4.330IN.W X0.050IN.THK; AL ALY;CHEM FILM;MFR 06845 PART NUMBER 4032154-0001. (ATTACHING PARTS)AK(6)	7-99
A2A6A5A1		SPECTRUM,100 KHZ:4.12IN.LG X2.03IN.W X0.94 IN.THK;MFR 06845 PART NUMBER 4031961-0501 (ATTACHING PARTS)E(4)W(4)AC(4)	7-82
A2A6A5A1C1		CAPACITOR:ITEM 3.	7-82
A2A6A5A1C2		CAPACITOR:ITEM 19.	7-82
A2A6A5A1C3		CAPACITOR:ITEM 3.	7-82
A2A6A5A1C4		CAPACITOR,FIXED,MICA:5 PF PORM 0.5 PF,500 WVDC;MIL TYPE CM05CD050DP3.	7-82
A2A6A5A1C5		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;20 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0701.	7-82
A2A6A5A1C6		CAPACITOR,FIXED,DIELECTRIC:0.0018 UF PORM 10%,100WVDC;MFR 96733 PART NUMBER 94K1182 06845 DWG 4030796-0701.	7-82
A2A6A5A1C7 AND A2A6A5A1C8		CAPACITOR:ITEM 3.	7-82
A2A6A5A1C9		CAPACITOR,FIXED,MICA:1000 PF PORM 20%,500 WVDC;MIL TYPE CK05BX102M.	7-82
A2A6A5A1C10		CAPACITOR,FIXED,CERAMIC:0.320IN.LG X0.320 IN.H.X0.120IN.THK;120 PF PORM 2%,150 OR 200WVDC;MFR 86335 PART NUMBER CC64UH121G, 06845 DWG 4030806-0701.	7-82
A2A6A5A1C11		CAPACITOR:ITEM 4.	7-82
A2A6A5A1C12		CAPACITOR,FIXED,MICA:1000 PF PORM 20%,500 WVDC;MIL TYPE CK05BX102M.	7-82
A2A6A5A1C13		CAPACITOR,FIXED,CERAMIC:2200 PF PORM 10%, 200WVDC;MIL TYPE CK06BX222K.	7-82
A2A6A5A1C14 THRU A2A6A5A1C16		CAPACITOR:ITEM 3.	7-82
A2A6A5A1C17		CAPACITOR:ITEM 16.	7-82

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A5A1C18		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.260 IN.LG;3.0 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA3ROUUFPCRM5PCT,06845 DWG 4031973-0729.	7-82
A2A6A5A1C19		CAPACITOR,FIXED,MICA:36 PF PORM 2%,500WVDC; MIL TYPE CM05ED360GP3.	7-82
A2A6A5A1CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 100	7-82
A2A6A5A1CR2 AND A2A6A5A1CR3		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N816.	7-82
A2A6A5A1CR4		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-82
A2A6A5A1J1 AND A2A6A5A1J2		CONNECTOR:ITEM 42.	7-82
A2A6A5A1L1		COIL:ITEM 39.	7-82
A2A6A5A1L2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032550-0709.	7-82
A2A6A5A1L3		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032541-0702.	7-82
A2A6A5A1Q1		TRANSISTOR:ITEM 110.	7-82
A2A6A5A1Q2		TRANSISTOR:ITEM 113.	7-82
A2A6A5A1Q3		TRANSISTOR:ITEM 110.	7-82
A2A6A5A1Q4		TRANSISTOR:MIL TYPE 2N705.	7-82
A2A6A5A1Q5 AND A2A6A5A1Q6		TRANSISTOR:ITEM 107.	7-82
A2A6A5A1R1		RESISTOR:ITEM 72.	7-82
A2A6A5A1R2 AND A2A6A5A1R3		RESISTOR:ITEM 47.	7-82
A2A6A5A1R4		RESISTOR:ITEM 71.	7-82
A2A6A5A1R5		RESISTOR,VARIABLE,WIRE WOUND:5K OHMS,3/4W; MIL TYPE RT22C2W502.	7-82
A2A6A5A1R6		RESISTOR:ITEM 52.	7-82
A2A6A5A1R7 AND A2A6A5A1R8		RESISTOR:ITEM 94.	7-82
A2A6A5A1R9		RESISTOR,FIXED,FILM:360 OHMS PORM 5%,1/4W; MIL TYPE RLR07C361JR.	7-82
A2A6A5A1R10		RESISTOR,FIXED,FILM:62 OHMS PORM 5%,1/4W; MIL TYPE RLR07C620JR.	7-82
A2A6A5A1R11		RESISTOR:ITEM 94.	7-82
A2A6A5A1R12		RESISTOR,FIXED,COMPOSITION:1.8K OHMS PORM 5%,1/4W;MIL TYPE RCR07G182JS.	7-82
A2A6A5A1R13		RESISTOR:ITEM 56.	7-82
A2A6A5A1R14		RESISTOR:ITEM 70.	7-82
A2A6A5A1R15		RESISTOR:ITEM 47.	7-82
A2A6A5A1R16		RESISTOR:ITEM 53.	7-82
A2A6A5A1R17		RESISTOR:ITEM 46.	7-82
A2A6A5A1R18		RESISTOR:ITEM 94.	7-82
A2A6A5A1R19		RESISTOR:ITEM 46.	7-82
A2A6A5A1R20		RESISTOR:ITEM 94.	7-82
A2A6A5A1R21		RESISTOR:ITEM 47.	7-82
A2A6A5A1R22		RESISTOR:ITEM 63.	7-82
A2A6A5A1R23		RESISTOR:ITEM 64.	7-82

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A5A1R24A	1	RESISTOR:ITEM 60.	7-82
A2A6A5A1R24B		RESISTOR:ITEM 94.	7-82
A2A6A5A1R24C	1	RESISTOR:ITEM 50.	7-82
A2A6A5A1R24D	1	RESISTOR:ITEM 51.	7-82
A2A6A5A1R24E	1	RESISTOR:ITEM 62.	7-82
A2A6A5A1R24F	1	RESISTOR:ITEM 46.	7-82
A2A6A5A1R24G	1	RESISTOR:ITEM 52.	7-82
A2A6A5A1R24H	1	RESISTOR:ITEM 63.	7-82
A2A6A5A1R24J	1	RESISTOR:ITEM 53.	7-82
A2A6A5A1R24K	1	RESISTOR:ITEM 66.	7-82
A2A6A5A1R24L	1	RESISTOR:ITEM 55.	7-82
A2A6A5A1R24M	1	RESISTOR:ITEM 67.	7-82
A2A6A5A1R24N	1	RESISTOR:ITEM 47.	7-82
A2A6A5A1R24P	1	RESISTOR:ITEM 70.	7-82
A2A6A5A1R24Q	1	RESISTOR:ITEM 71.	7-82
A2A6A5A1R24R	1	RESISTOR:ITEM 73.	7-82
A2A6A5A1R25		RESISTOR:ITEM 63.	7-82
A2A6A5A1T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032550-0710.	7-82
A2A6A5A1T2		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;MFR 93292 PART NUMBER 06845 DWG 4032541-0701.	7-82
A2A6A5A2		SPECTRUM,10 KHZ:4.12IN.LG X2.200IN.W X0.94 IN.THK;MFR 06845 PART NUMBER 4031971-0501 (ATTACHING PARTS)E(4)W(4)AC(4)	7-83,99
A2A6A5A2C1		CAPACITOR:ITEM 3.	7-83
A2A6A5A2C2		CAPACITOR:ITEM 19.	7-83
A2A6A5A2C3 THRU A2A6A5A2C5		CAPACITOR:ITEM 17.	7-83
A2A6A5A2C6		CAPACITOR:ITEM 3.	7-83
A2A6A5A2C7		CAPACITOR:ITEM 15.	7-83
A2A6A5A2C8		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;20 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0701.	7-83
A2A6A5A2C9		CAPACITOR,FIXED,DIELECTRIC:0.312IN.DIA X 0.906IN.LG;0.033 UF PORM 10%,100WVDC;MFR 96733 PART NUMBER A94K1333,06845 DWG 4030796-0702.	7-83
A2A6A5A2C10		CAPACITOR:ITEM 3.	7-83
A2A6A5A2C11		CAPACITOR:ITEM 21.	7-83
A2A6A5A2C12		CAPACITOR,FIXED,ELECTROLYTIC:3.3 UF PORM 20%,50WVDC;MIL TYPE M39003-01-2126.	7-83
A2A6A5A2C13		CAPACITOR:ITEM 3.	7-83
A2A6A5A2C14		CAPACITOR,FIXED,MICA:270 PF PORM 1%,500WVDC MIL TYPE CM05FD271FP3.	7-83
A2A6A5A2C15		CAPACITOR,FIXED,CERAMIC:0.320IN.X0.320IN.X 0.120IN.;100 PF PORM 5%,150 OR 200WVDC; MFR 86335 PART NUMBER CC65UH101J,06845 DWG 4030806-0702.	7-83
A2A6A5A2C16		CAPACITOR,FIXED,CERAMIC:4700 PF PORM 20%, 200WVDC;MIL TYPE CK06BX472M.	7-83
A2A6A5A2CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 100.	7-83
A2A6A5A2CR2 AND A2A6A5A2CR3		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-83

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A5A2CR4		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N816.	7-83
A2A6A5A2J1		CONNECTOR,RECEPTACLE,ELECTRICAL:0.59IN.THK; 1.5 AMP;MFR 98291 PART NUMBER 51-043-4300 06845 DWG 4032529-0701.	7-83
A2A6A5A2L1		COIL:ITEM 39.	7-83
A2A6A5A2Q1 AND A2A6A5A2Q2		TRANSISTOR:ITEM 110.	7-83
A2A6A5A2Q3		TRANSISTOR:ITEM 113.	7-83
A2A6A5A2Q4 AND A2A6A5A2Q5		TRANSISTOR:ITEM 110.	7-83
A2A6A5A2Q6		TRANSISTOR:ITEM 107.	7-83
A2A6A5A2R1		RESISTOR,FIXED,FILM:510 OHMS PORM 5%,1/2W; MIL TYPE RLR20C511JR.	7-83
A2A6A5A2R2		RESISTOR:ITEM 48.	7-83
A2A6A5A2R3		RESISTOR,FIXED,FILM:3K OHMS PORM 5%,1/4W; MIL TYPE RLR07C302JR.	7-83
A2A6A5A2R4		RESISTOR:ITEM 94.	7-83
A2A6A5A2R5		RESISTOR:ITEM 52.	7-83
A2A6A5A2R6		RESISTOR:ITEM 94.	7-83
A2A6A5A2R7		RESISTOR,FIXED,FILM:3K OHMS PORM 5%,1/4W; MIL TYPE RLR07C302JR.	7-83
A2A6A5A2R8		RESISTOR:ITEM 94.	7-83
A2A6A5A2R9		RESISTOR:ITEM 52.	7-83
A2A6A5A2R10		NOT USED	
A2A6A5A2R11 A2A6A5A2R11		RESISTOR,VARIABLE,WIRE WOUND:5K OHMS,3/4W; MIL TYPE RT22C2W502.	
A2A6A5A2R12		RESISTOR:ITEM 55.	7-83
A2A6A5A2R13		RESISTOR:ITEM 94.	7-83
A2A6A5A2R14 A2A6A5A2R14		RESISTOR,FIXED,FILM:360 OHMS PORM 5%,1/4W; MIL TYPE RLR07C361JR.	
A2A6A5A2R15 A2A6A5A2R15		RESISTOR,FIXED,FILM:62 OHMS PORM 5%,1/4W; MIL TYPE RLR07C620JR.	
A2A6A5A2R16		RESISTOR:ITEM 52.	7-83
A2A6A5A2R17		NOT USED	
A2A6A5A2R18 AND A2A6A5A2R19		RESISTOR:ITEM 94.	7-83
A2A6A5A2R20		RESISTOR:ITEM 56.	7-83
A2A6A5A2R21		RESISTOR:ITEM 71.	7-83
A2A6A5A2R22		RESISTOR:ITEM 52.	7-83
A2A6A5A2R23		RESISTOR:ITEM 62.	7-83
A2A6A5A2R24A	1	RESISTOR:ITEM 60.	7-83
A2A6A5A2R24B	1	RESISTOR:ITEM 94.	7-83
A2A6A5A2R24C	1	RESISTOR:ITEM 50.	7-83
A2A6A5A2R24D	1	RESISTOR:ITEM 51.	7-83
A2A6A5A2R24E	1	RESISTOR:ITEM 62.	7-83
A2A6A5A2R24F	1	RESISTOR:ITEM 46.	7-83
A2A6A5A2R24G	1	RESISTOR:ITEM 52.	7-83
A2A6A5A2R24H	1	RESISTOR:ITEM 63.	7-83
A2A6A5A2R24J	1	RESISTOR:ITEM 53.	7-83
A2A6A5A2R24K	1	RESISTOR:ITEM 66.	7-83
A2A6A5A2R24L	1	RESISTOR:ITEM 55.	7-83
A2A6A5A2R24M	1	RESISTOR:ITEM 67.	7-83
A2A6A5A2R24N	1	RESISTOR:ITEM 47.	7-83
A2A6A5A2R24P	1	RESISTOR:ITEM 70.	7-83
A2A6A5A2R24Q	1	RESISTOR:ITEM 71.	7-83

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A5A2R24R	1	RESISTOR:ITEM 73.	7-83
A2A6A5A2R25		RESISTOR:ITEM 62.	7-83
A2A6A5A2R26		RESISTOR:ITEM 46.	7-83
A2A6A5A2R27		RESISTOR:ITEM 94.	7-83
A2A6A5A2R28 AND A2A6A5A2R29		RESISTOR,FIXED,COMPOSITION:5 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G5R1JS.	7-83
A2A6A5A2R30		RESISTOR:ITEM 79.	7-83
A2A6A5A2T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;7.90 MHZ;MFR 93292 PART NUMBER 06845 DWG 4032536-0701.	7-83
A2A6A5A3		SPECTRUM,1 KHZ:4.12IN.LG X2.200IN.W X0.90IN THK;MFR 06845 PART NUMBER 4031988-0501. (ATTACHING PARTS)E(4)W(4)AC(4)	7-84,99
A2A6A5A3C1		CAPACITOR:ITEM 20.	7-84
A2A6A5A3C2		CAPACITOR:ITEM 19.	7-84
A2A6A5A3C3 THRU A2A6A5A3C5		CAPACITOR:ITEM 17.	7-84
A2A6A5A3C6		CAPACITOR:ITEM 3.	7-84
A2A6A5A3C7		CAPACITOR:ITEM 15.	7-84
A2A6A5A3C8		CAPACITOR,FIXED,MICA:0.450IN.LG X0.360IN.W X0.170IN.THK;20 PF PORM 2%,300WVDC;MFR 72136 PART NUMBER 06845 DWG 4030802-0701.	7-84
A2A6A5A3C9		CAPACITOR,FIXED,DIELECTRIC:0.72IN.W X0.56IN H X1.438IN.LG;0.33 UF PORM 10%,100WVDC; MFR 99515 PART NUMBER EP36574,06845 DWG 4031974-0701.	7-84
A2A6A5A3C10		CAPACITOR:ITEM 3.	7-84
A2A6A5A3C11		CAPACITOR:ITEM 21.	7-84
A2A6A5A3C12		CAPACITOR,FIXED,ELECTROLYTIC:3.3 UF PORM 20%,50WVDC;MIL TYPE M39003-01-2126.	7-84
A2A6A5A3C13		CAPACITOR:ITEM 13.	7-84
A2A6A5A3C14		CAPACITOR,FIXED,MICA:1600 PF PORM 2%,500 WVDC;MIL TYPE CM06FD162GP3.	7-84
A2A6A5A3C15		CAPACITOR,FIXED,ELECTROLYTIC:0.312IN.DIA X 0.689IN.LG;6.8 UF PORM 20%,35WVDC;MFR 56289 PART NUMBER 180D685X0035,06845 DWG 4031982-0701.	7-84
A2A6A5A3C16		CAPACITOR:ITEM 13.	7-84
A2A6A5A3C17		CAPACITOR,FIXED,MICA:5600 PF PORM 10%,200 WVDC;MIL TYPE CK05BX562K.	7-84
A2A6A5A3CR1		SEMICONDUCTOR DEVICE,DIODE:ITEM 100.	7-84
A2A6A5A3CR2 AND A2A6A5A3CR3		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-84
A2A6A5A3CR4		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-84
A2A6A5A3CR5		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N816.	7-84
A2A6A5A3J1		CONNECTOR,RECEPTACLE,ELECTRICAL:0.59IN.THK; 1.5 AMP;MFR 98291 PART NUMBER 51-043-4300 06845 DWG 4032529-0701.	7-84
A2A6A5A3L1		COIL:ITEM 39.	7-84
A2A6A5A3L2		COIL,R F:27.00 UH PORM 10%,300 RATED DC CURRENT;MIL TYPE MS75008-45	7-84
A2A6A5A3Q1 AND A2A6A5A3Q2		TRANSISTOR:ITEM 110.	7-84

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A5A3Q3		TRANSISTOR:ITEM 113.	7-84
A2A6A5A3Q4 AND A2A6A5A3Q5		TRANSISTOR:ITEM 110.	7-84
A2A6A5A3Q6		TRANSISTOR:ITEM 107.	7-84
A2A6A5A3R1		RESISTOR:ITEM 76.	7-84
A2A6A5A3R2		RESISTOR:ITEM 48.	7-84
A2A6A5A3R3		RESISTOR,FIXED,FILM:3K OHMS PORM 5%,1/4W; MIL TYPE RLR07C302JR.	7-84
A2A6A5A3R4		RESISTOR:ITEM 94.	7-84
A2A6A5A3R5		RESISTOR:ITEM 52.	7-84
A2A6A5A3R6		RESISTOR:ITEM 94.	7-84
A2A6A5A3R7		RESISTOR,FIXED,FILM:3K OHMS PORM 5%,1/4W; MIL TYPE RLR07C302JR.	7-84
A2A6A5A3R8		RESISTOR:ITEM 94.	7-84
A2A6A5A3R9		RESISTOR:ITEM 59.	7-84
A2A6A5A3R10		RESISTOR,FIXED,FILM:1.3K OHMS PORM 5%,1/4W; MIL TYPE RLR07C132JR.	7-84
A2A6A5A3R11		RESISTOR,VARIABLE,WIRE WOUND:5K OHMS,3/4W; MIL TYPE RT22C2W502.	7-84
A2A6A5A3R12		RESISTOR:ITEM 55.	7-84
A2A6A5A3R13		RESISTOR:ITEM 94.	7-84
A2A6A5A3R14		RESISTOR,FIXED,FILM:360 OHMS PORM 5%,1/4W; MIL TYPE RLR07C361JR.	7-84
A2A6A5A3R15		RESISTOR,FIXED,FILM:62 OHMS PORM 5%,1/4W; MIL TYPE RLR07C620JR.	7-84
A2A6A5A3R16		RESISTOR:ITEM 52.	7-84
A2A6A5A3R17		RESISTOR:ITEM 78.	7-84
A2A6A5A3R18 AND A2A6A5A3R19		RESISTOR:ITEM 94.	7-84
A2A6A5A3R20		RESISTOR:ITEM 56.	7-84
A2A6A5A3R21		RESISTOR:ITEM 70.	7-84
A2A6A5A3R22		RESISTOR:ITEM 52.	7-84
A2A6A5A3R23		RESISTOR:ITEM 62.	7-84
A2A6A5A3R24A	1	RESISTOR:ITEM 60.	7-84
A2A6A5A3R24B	1	RESISTOR:ITEM 94.	7-84
A2A6A5A3R24C	1	RESISTOR:ITEM 50.	7-84
A2A6A5A3R24D	1	RESISTOR:ITEM 80.	7-84
A2A6A5A3R24E	1	RESISTOR:ITEM 62.	7-84
A2A6A5A3R24F	1	RESISTOR:ITEM 46.	7-84
A2A6A5A3R24G	1	RESISTOR:ITEM 52.	7-84
A2A6A5A3R24H	1	RESISTOR:ITEM 63.	7-84
A2A6A5A3R24J	1	RESISTOR:ITEM 53.	7-84
A2A6A5A3R24K	1	RESISTOR:ITEM 66.	7-84
A2A6A5A3R24L	1	RESISTOR:ITEM 55.	7-84
A2A6A5A3R24M	1	RESISTOR:ITEM 67.	7-84
A2A6A5A3R24N	1	RESISTOR:ITEM 47.	7-84
A2A6A5A3R24P	1	RESISTOR:ITEM 70.	7-84
A2A6A5A3R24Q	1	RESISTOR:ITEM 71.	7-84
A2A6A5A3R24R	1	RESISTOR:ITEM 73.	7-84
A2A6A5A3R25		RESISTOR:ITEM 53.	7-84
A2A6A5A3R26		RESISTOR:ITEM 46.	7-84
A2A6A5A3R27		RESISTOR:ITEM 94.	7-84
A2A6A5A3T1		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;0.25 MHZ;MFR 93292 PART NUMBER 500-2359, 06845 DWG 4032539-0701.	7-84

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A5A4		1 KHZ PULSE INVERTER:4.06IN.LG X1.080IN.W X0.69 IN.THK;06845 PART NUMBER 4032340-0501. (ATTACHING PARTS)E(3)W(3)AC(3)	7-85,99
A2A6A5A4C1		CAPACITOR:ITEM 11.	7-85
A2A6A5A4J1		CONNECTOR:ITEM 42.	7-85
A2A6A5A4Q1		TRANSISTOR:ITEM 113.	7-85
A2A6A5A4R1		RESISTOR:ITEM 93.	7-85
A2A6A5A4R2		RESISTOR:ITEM 69.	7-85
A2A6A5A4R3		RESISTOR,FIXED,FILM:3.6K OHMS PORM 5%,1/4W; MIL TYPE RLR07C362JR.	7-85
A2A6A5A4R4 AND A2A6A5A4R5		RESISTOR:ITEM 94.	7-85
A2A6A6		TRANSLATOR,R F SUBASSEMBLY:8.187IN.LG X4.84IN.H X1.25IN.W;MFR 06845 PART NUMBER 4032328-0501. (ATTACHING PARTS)L(3)	
A2A6A6MP1		COVER:8.178IN.LG X4.330IN.W X0.07IN.THK; AL ALY;CHEM FILM;MFR 06845 PART NUMBER 4032466-0001. (ATTACHING PARTS)AL(6)AD(6)W(6)	7-100
A2A6A6A1		TRANSLATOR,R F MTG BASE:8.03IN.LG X3.44IN.W X1.17IN.THK;MFR 06845 PART NUMBER 4031998-0501. (ATTACHING PARTS)E(6)AD(6)W(6)	7-100
A2A6A6A1C1 THRU A2A6A6A1C4		CAPACITOR:ITEM 8.	7-86
A2A6A6A1C5		CAPACITOR,FIXED,MICA:390 PF PORM 5%,500WVDC MIL TYPE CM05FD391JP3.	7-86
A2A6A6A1C6 THRU A2A6A6A1C27		CAPACITOR:ITEM 8.	7-86
A2A6A6A1C28		CAPACITOR,FIXED,MICA:820 PF PORM 10%,500 WVDC;MIL TYPE CK05BX821K.	7-86
A2A6A6A1C29 AND A2A6A6A1C30		CAPACITOR:ITEM 8.	7-86
A2A6A6A1C31		CAPACITOR,FIXED,MICA:1000 PF PORM 1%,500 WVDC;MIL TYPE CM06FD102FP3.	7-86
A2A6A6A1C32		CAPACITOR:ITEM 8.	7-86
A2A6A6A1C33		CAPACITOR:ITEM 20.	7-86
A2A6A6A1C34 AND A2A6A6A1C35		CAPACITOR:ITEM 8.	7-86
A2A6A6A1C36		CAPACITOR:ITEM 20.	7-86
A2A6A6A1CR1 THRU A2A6A6A1CR7		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-86
A2A6A6A1CR8		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N3020B	7-86
A2A6A6A1FL1		FILTER,BANDPASS:3IN.LG X1IN.W X0.75IN.H; 20 MHZ;MFR 19057 PART NUMBER 1651,06845 DWG 4031908-0701.	7-86
A2A6A6A1FL2		FILTER,BANDPASS:3IN.LG X1IN.W X0.75IN.H; 30 MHZ;MFR 19057 PART NUMBER 1652,06845 DWG 4031909-0701.	7-86

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A6A1FL3		FILTER,BANDPASS:3IN.LG X1IN.W X0.75IN.H; 2.85 MHZ;MFR 19057 PART NUMBER 1653,06845 DWG 4031907-0701.	7-86
A2A6A6A1L1		COIL,R F VARIABLE:0.435IN.DIA X0.400IN.; 19.70 MHZ,CAP 400 PF;MFR 93292 PART NUMBER 06845 DWG 4032548-0701.	7-86
A2A6A6A1L2 AND A2A6A6A1L3		COIL:22.0 UH PORM 10%,600 RATED DC CURRENT; MIL TYPE MS90537-29.	7-86
A2A6A6A1L4		COIL:12.0 UH PORM 10%,400 RATED DC CURRENT; MIL TYPE MS90537-26.	7-86
A2A6A6A1L5		COIL:ITEM 39.	7-86
A2A6A6A1L6		COIL:47.0 UH PORM 10%,400 RATED DC CURRENT; MIL TYPE MS90537-33.	7-86
A2A6A6A1L7		COIL:22.0 UH PORM 10%,600 RATED DC CURRENT; MIL TYPE MS90537-29.	7-86
A2A6A6A1L8		COIL:12.0 UH PORM 10%,400 RATED DC CURRENT; MIL TYPE MS90537-26.	7-86
A2A6A6A1L9		COIL:47.0 UH PORM 10%,400 RATED DC CURRENT; MIL TYPE MS90537-33.	7-86
A2A6A6A1L10 AND A2A6A6A1L11		COIL:ITEM 39.	7-86
A2A6A6A1L12		COIL:47.0 UH PORM 10%,400 RATED DC CURRENT; MIL TYPE MS90537-33.	7-86
A2A6A6A1L13		COIL:ITEM 39.	7-86
A2A6A6A1L14		COIL:68.0 UH PORM 10%,370 RATED DC CURRENT; MIL TYPE MS90537-35.	7-86
A2A6A6A1L15		TRANSFORMER,R F VARIABLE:0.422IN.DIA X0.490 IN.;0.5 MHZ,CAP 1000 PF PORM 5%;MFR 93292 PART NUMBER 500-2385,06845 DWG 4032553-0701.	7-86
A2A6A6A1Q1		TRANSISTOR,SILICON,PNP:0.209IN.DIA X0.210IN. H;MFR 04713 PART NUMBER SRF175,06845 DWG 4018638-0701.	7-86
A2A6A6A1R1		RESISTOR:ITEM 79.	7-86
A2A6A6A1R2		RESISTOR:ITEM 77.	7-86
A2A6A6A1R3 AND A2A6A6A1R4		RESISTOR:ITEM 50.	7-86
A2A6A6A1R5		RESISTOR,FIXED,COMPOSITION:27 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G270JS.	7-86
A2A6A6A1R6		RESISTOR,FIXED,COMPOSITION:22 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G220JS.	7-86
A2A6A6A1R7 THRU A2A6A6A1R10		RESISTOR:ITEM 50.	7-86
A2A6A6A1R11		RESISTOR,VARIABLE,WIRE WOUND:500 OHMS,1/4W; MIL TYPE RJ50CP501.	7-86
A2A6A6A1R12		RESISTOR,FIXED,COMPOSITION:33 OHMS PORM 5%, 1/4W;MIL TYPE RCR07G330JS.	7-86
A2A6A6A1R13		RESISTOR:ITEM 79.	7-86
A2A6A6A1R14		RESISTOR,FIXED,COMPOSITION:68 OHMS PORM 5%; 1/4W;MIL TYPE RCR07G680JS.	7-86
A2A6A6A1R15		RESISTOR:ITEM 80.	7-86
A2A6A6A1R16		RESISTOR,VARIABLE,NON-WIRE WOUND:500 OHMS, 1/2W;MIL TYPE RJ24CX501.	7-86

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A6A1R17 AND A2A6A6A1R18		RESISTOR:ITEM 94.	7-86
A2A6A6A1R19		RESISTOR:ITEM 47.	7-86
A2A6A6A1R20		RESISTOR:ITEM 77.	7-86
A2A6A6A1R21		RESISTOR:ITEM 93.	7-86
A2A6A6A1R22		RESISTOR:ITEM 58.	7-86
A2A6A6A1TP1		CONNECTOR,ELECTRICAL:MIL TYPE M39024-11-08.	7-86
A2A6A6A1TP2		CONNECTOR,ELECTRICAL:MIL TYPE M39024-11-06.	7-86
A2A6A6A1TP3		CONNECTOR,ELECTRICAL:MIL TYPE M39024-11-02.	7-86
A2A6A6A1TP4		CONNECTOR,ELECTRICAL:MIL TYPE M39024-11-01.	7-86
A2A6A6A1A1		1 MHZ MIXER AND ACL:2.71IN.LG X1.50IN.W X0.77IN.THK;MFR 06845 PART NUMBER 4031954-0501.	7-87
A2A6A6A1A1C1 THRU A2A6A6A1A1C3		CAPACITOR:ITEM 8.	7-87
A2A6A6A1A1C4		CAPACITOR,FIXED,CERAMIC:22 PF PCRM 10%, 200WVDC MIL TYPE CK05BX220K.	7-87
A2A6A6A1A1C5 THRU A2A6A6A1A1C14		CAPACITOR:ITEM 8.	7-87
A2A6A6A1A1C15		CAPACITOR,FIXED,CERAMIC:1000 PF PORM 10%, 200 WVDC;MIL TYPE CK05BX102K.	7-87
A2A6A6A1A1C16 THRU A2A6A6A1A1C18		CAPACITOR:ITEM 8.	7-87
A2A6A6A1A1CR1 THRU A2A6A6A1A1CR4		SEMICONDUCTOR DEVICE,DIODE ITEM 99.	7-87
A2A6A6A1A1CR5		SEMICONDUCTOR DEVICE,DIODE,SILICON: SWITCHING;MFR 28480 PART NUMBER 1N5712, 06845 DWG 4032480-0701.	7-87
A2A6A6A1A1CR6 THRU A2A6A6A1A1CR8		SEMICONDUCTOR DEVICE,DIODE ITEM 99.	7-87
A2A6A6A1A1Q1		TRANSISTOR:0.230IN.DIA X0.210IN.H;MFR 86684 PART NUMBER 40673,06845 DWG 4032481-0701.	7-87
A2A6A6A1A1Q2		TRANSISTOR:MIL TYPE 2N918.	7-87
A2A6A6A1A1R1		RESISTOR:ITEM 78.	7-87
A2A6A6A1A1R2 THRU A2A6A6A1A1R4		RESISTOR:ITEM 53.	7-87
A2A6A6A1A1R5		RESISTOR:ITEM 78.	7-87
A2A6A6A1A1R6		RESISTOR:ITEM 73.	7-87
A2A6A6A1A1R7		RESISTOR:ITEM 67.	7-87
A2A6A6A1A1R8		RESISTOR:ITEM 70.	7-87
A2A6A6A1A1R9		RESISTOR:ITEM 60.	7-87
A2A6A6A1A1R10		RESISTOR:ITEM 50.	7-87
A2A6A6A1A1R11		RESISTOR:ITEM 78.	7-87
A2A6A6A1A1R12		RESISTOR:ITEM 54.	7-87
A2A6A6A1A1R13		RESISTOR:ITEM 78.	7-87
A2A6A6A1A1R14 AND A2A6A6A1A1R15		RESISTOR:ITEM 53.	7-87
A2A6A6A1A1R16		RESISTOR:ITEM 64.	7-87
A2A6A6A1A1R17		RESISTOR:ITEM 73.	7-87
A2A6A6A1A1R18		RESISTOR:ITEM 61.	7-87

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A6A1A1R19		RESISTOR:ITEM 50.	7-87
A2A6A6A1A1R20		RESISTOR:ITEM 66..	7-87
A2A6A6A1A1R21		RESISTOR:ITEM 48.	7-87
A2A6A6A1A1R22		RESISTOR:ITEM 46.	7-87
A2A6A6A1A1R23		RESISTOR:ITEM 64.	7-87
A2A6A6A1A1R24		RESISTOR:ITEM 69.	7-87
A2A6A6A1A1R25		RESISTOR:ITEM 52.	7-87
A2A6A6A1A1R26		RESISTOR:ITEM 80.	7-87
A2A6A6A1A1R27		RESISTOR,VARIABLE,NON WIRE WOUND:20K OHMS, 1/2W;MIL TYPE RJ24CW203.	7-87
A2A6A6A1A1R28		RESISTOR:ITEM 73.	7-87
A2A6A6A1A1R29		RESISTOR:ITEM 50.	7-87
A2A6A6A1A1R30		RESISTOR:ITEM 53.	7-87
A2A6A6A1A1R31		RESISTOR:ITEM 46.	7-87
A2A6A6A1A1R32		RESISTOR:ITEM 66.	7-87
A2A6A6A1A1R33		RESISTOR:ITEM 53.	7-87
A2A6A6A1A1R34		RESISTOR:ITEM 63.	7-87
A2A6A6A1A1R35		RESISTOR:ITEM 59.	7-87
A2A6A6A1A1R36		RESISTOR:ITEM 78.	7-87
A2A6A6A1A1R37 AND A2A6A6A1A1R38		RESISTOR:ITEM 94.	7-87
A2A6A6A1A1R39		RESISTOR:ITEM 79.	7-87
A2A6A6A1A1T1 AND A2A6A6A1A1T2		TRANSFORMER,R F:0.370IN.DIA X0.290IN.H; INPUT 1WATT,1 TO 50 MHZ;MFR 27956 PART NUMBER BT8C,06845 DWG 2031024-0702.	7-87
A2A6A6A1A1TP1		TERMINAL,STUD:0.125IN.DIA X0.198IN.LG;BRS; MFR 71279 PART NUMBER 2755-1,06845 DWG 4032152-0701.	7-87
A2A6A6A1A1U1		SEMICONDUCTOR DEVICE SET:DUAL DIFFERENTIAL AMPLIFIER;0.375IN.DIA X0.180IN.H;MFR 86684 PART NUMBER CA3049,06845 DWG 4032496-0701.	7-87
A2A6A6A1A2		100 KHZ MIXER:1.98IN.LG X0.75IN.W X0.70IN. THK;MFR 06845 PART NUMBER 4010033-0501.	7-88
A2A6A6A1A2C1 THRU A2A6A6A1A2C3		CAPACITOR:ITEM 8.	7-88
A2A6A6A1A2C4		CAPACITOR,FIXED,MICA:22 PF PORM 10%,500WVDC MIL TYPE CK05BX220K.	7-88
A2A6A6A1A2C5 THRU A2A6A6A1A2C9		CAPACITOR:ITEM 8.	7-88
A2A6A6A1A2CR1 THRU A2A6A6A1A2CR4		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-88
A2A6A6A1A2R1		RESISTOR:ITEM 78.	7-88
A2A6A6A1A2R2 AND A2A6A6A1A2R3		RESISTOR:ITEM 53.	7-88
A2A6A6A1A2R4		RESISTOR:ITEM 54.	7-88
A2A6A6A1A2R5		RESISTOR:ITEM 78.	7-88
A2A6A6A1A2R6		RESISTOR:ITEM 73.	7-88
A2A6A6A1A2R7		RESISTOR:ITEM 67.	7-88
A2A6A6A1A2R8		RESISTOR:ITEM 70.	7-88
A2A6A6A1A2R9		RESISTOR:ITEM 60.	7-88
A2A6A6A1A2R10		RESISTOR:ITEM 50.	7-88
A2A6A6A1A2R11		RESISTOR:ITEM 78.	7-88

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A6A1A2R12		RESISTOR:ITEM 54.	7-88
A2A6A6A1A2R13		RESISTOR:ITEM 78.	7-88
A2A6A6A1A2R14 AND A2A6A6A1A2R15		RESISTOR:ITEM 53.	7-88
A2A6A6A1A2R16		RESISTOR:ITEM 80.	7-88
A2A6A6A1A2T1 AND A2A6A6A1A2T2		TRANSFORMER,R F:0.370IN.DIA X0.290IN.H; INPUT 1WATT,1 TO 50 MHZ;MFR 27956 PART NUMBER 8T8C,06845 DWG 2031024-0702.	7-88
A2A6A6A1A2U1		SEMICONDUCTOR DEVICE SET:DUAL DIFFERENTIAL AMPLIFIER;0.375IN.DIA X0.180IN.H;MFR 86684 PART NUMBER CA3049,06845 DWG 4032496-0701.	7-88
A2A6A6A1A3		1 AND 10 KHZ MIXER AND ALC:3.10IN.LG X1.50IN.W X0.77IN.THK;06845 PART NUMBER 4031956-0501.	7-89
A2A6A6A1A3C1 THRU A2A6A6A1A3C3		CAPACITOR:ITEM 8.	7-89
A2A6A6A1A3C4		CAPACITOR,FIXED,MICA:22 PF PORM 10%,500WVDC MIL TYPE CK05BX220K.	7-89
A2A6A6A1A3C5 THRU A2A6A6A1A3C14		CAPACITOR:ITEM 8.	7-89
A2A6A6A1A3C15		CAPACITOR,FIXED,MICA:390 PF PORM 5%,500WVDC MIL TYPE CM05FD391JP3.	
A2A6A6A1A3C16		CAPACITOR,FIXED,MICA:33 PF PORM 5%,500WVDC; MIL TYPE CM05ED330JP3.	7-89
A2A6A6A1A3C17		CAPACITOR,FIXED,MICA:390 PF PORM 5%,500WVDC MIL TYPE CM05FD391JP3.	7-89
A2A6A6A1A3C18		CAPACITOR,FIXED,MICA:1000 PF PORM 20%,500 WVDC;MIL TYPE CK05BX102K.	7-89
A2A6A6A1A3C19 THRU A2A6A6A1A3C21		CAPACITOR:ITEM 8.	7-89
A2A6A6A1A3CR1 THRU A2A6A6A1A3CR4		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-89
A2A6A6A1A3CR5		SEMICONDUCTOR DEVICE,DIODE,SILICON: SWITCHING;MFR 28480 PART NUMBER 1N5712, 06845 DWG 4032480-0701.	7-89
A2A6A6A1A3CR6 THRU A2A6A6A1A3CR8		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-89
A2A6A6A1A3L1		COIL,R F VARIABLE:0.435IN.DIA X0.400IN.; 3.35 MHZ,CAP 400 PF;MFR 93292 PART NUMBER 06845 DWG 4032548-0702.	7-89
A2A6A6A1A3L2		TRANSFORMER,R F VARIABLE:0.435IN.DIA X0.400 IN.H;3.35 MHZ;MFR 93292 PART NUMBER 06845 DWG 4032554-0701.	7-89
A2A6A6A1A3Q1		TRANSISTOR:0.230IN.DIA X0.210IN.H;MFR 86684 PART NUMBER 40673,06845 DWG 4032481-0701.	7-89
A2A6A6A1A3Q2		TRANSISTOR:MIL TYPE 2N918.	7-89
A2A6A6A1A3R1		RESISTOR:ITEM 78.	7-89
A2A6A6A1A3R2 AND A2A6A6A1A3R3		RESISTOR:ITEM 53.	7-89
A2A6A6A1A3R4		RESISTOR:ITEM 54.	7-89

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

TRANSLATOR/SYNTHESIZER ASSEMBLY A2A6

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A6A6A1A3R5		RESISTOR:ITEM 78.	7-89
A2A6A6A1A3R6		RESISTOR:ITEM 73.	7-89
A2A6A6A1A3R7		RESISTOR:ITEM 67.	7-89
A2A6A6A1A3R8		RESISTOR:ITEM 70.	7-89
A2A6A6A1A3R9		RESISTOR:ITEM 60.	7-89
A2A6A6A1A3R10		RESISTOR:ITEM 50.	7-89
A2A6A6A1A3R11		RESISTOR:ITEM 78.	7-89
A2A6A6A1A3R12		RESISTOR:ITEM 54.	7-89
A2A6A6A1A3R13		RESISTOR:ITEM 78.	7-89
A2A6A6A1A3R14 AND A2A6A6A1A3R15		RESISTOR:ITEM 53.	7-89
A2A6A6A1A3R16		RESISTOR:ITEM 64.	7-89
A2A6A6A1A3R17		RESISTOR:ITEM 73.	7-89
A2A6A6A1A3R18		RESISTOR:ITEM 61.	7-89
A2A6A6A1A3R19		RESISTOR:ITEM 60.	7-89
A2A6A6A1A3R20		RESISTOR:ITEM 66.	7-89
A2A6A6A1A3R21		RESISTOR:ITEM 48.	7-89
A2A6A6A1A3R22		RESISTOR:ITEM 46.	7-89
A2A6A6A1A3R23		RESISTOR:ITEM 64.	7-89
A2A6A6A1A3R24		RESISTOR:ITEM 80.	7-89
A2A6A6A1A3R25		RESISTOR:ITEM 52.	7-89
A2A6A6A1A3R26		RESISTOR:ITEM 53.	7-89
A2A6A6A1A3R27		RESISTOR:ITEM 80.	7-89
A2A6A6A1A3R28		RESISTOR,VARIABLE,NON WIRE WOUND:20K OHMS, 1/2W;MIL TYPE RJ24CW203.	7-89
A2A6A6A1A3R29		RESISTOR:ITEM 73.	7-89
A2A6A6A1A3R30		RESISTOR:ITEM 60.	7-89
A2A6A6A1A3R31		RESISTOR:ITEM 53.	7-89
A2A6A6A1A3R32		RESISTOR:ITEM 46.	7-89
A2A6A6A1A3R33		RESISTOR:ITEM 66.	7-89
A2A6A6A1A3R34		RESISTOR:ITEM 53.	7-89
A2A6A6A1A3R35		RESISTOR:ITEM 63.	7-89
A2A6A6A1A3R36		RESISTOR:ITEM 59.	7-89
A2A6A6A1A3R37		RESISTOR:ITEM 78.	7-89
A2A6A6A1A3R38 AND A2A6A6A1A3R39		RESISTOR:ITEM 94.	7-89
A2A6A6A1A3R40		RESISTOR:ITEM 79.	7-89
A2A6A6A1A3T1		TRANSFORMER,R F:0.285IN.DIA X0.430IN.LG; 200 KHZ TO 5 MHZ;1/2W;MFR 06978 PART NUMBER 65-2186,06845 DWG 2031023-0701.	7-89
A2A6A6A1A3T2		TRANSFORMER,R F:0.285IN.DIA X0.430IN.LG; 200 KHZ TO 5 MHZ;1/2W;MFR 06978 PART NUMBER 65-2186,06845 DWG 2031023-0701.	7-89
A2A6A6A1A3TP1		TERMINAL,STUD:0.125IN.DIA X0.198IN.LG;BRS; MFR 71279 PART NUMBER 2755-1,06845 DWG 4032152-0701.	7-89
A2A6A6A1A3U1		SEMICONDUCTOR DEVICE SET:DUAL DIFFERENTIAL AMPLIFIER;0.375IN.DIA X0.180IN.H;MFR 86684 PART NUMBER CA3049,06845 DWG 4032496-0701.	7-89

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER CODE GENERATOR ASSEMBLY A2A7

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A7		RECEIVER CODE GENERATOR ASSEMBLY:MFR 06845 PART NUMBER 4031969-0501. (ATTACHING PARTS)L(3)X(3)	
A2A7MP1 AND A2A7MP2		SHAFT,SWITCH:0.249IN.DIA X1.76IN.LG;MFR 06845 PART NUMBER 4032242-0501.	7-101
A2A7MP3 AND A2A7MP4		DISK,COUPLING:0.750IN.DIA X0.284IN.THK;CRES PASSIVATION;MFR 06845 PART NUMBER 4032200-0001.	7-101
A2A7MP5 AND A2A7MP6		BEARING,FLANGED:0.547IN.DIA X0.125IN.THK; BRONZE;MFR 11558 PART NUMBER 127-120, 06845 DWG 4032153-0701.	7-101
A2A7MP7 AND A2A7MP8		WASHER,SPRING TENSION:0.510IN.OD,0.257IN.ID X0.010IN.THK;PH BRZ;MFR 78189 PART NUMBER 3202-14-47,06845 DWG 4032104-0701.	7-101
A2A7P1		CONNECTOR,RECEPTACLE,ELECTRICAL:2.088IN.LG X0.494IN.W X0.422IN.THK;MFR 91146 PART NUMBER DBMA25P,06845 DWG 4032279-0701.	7-101

RECEIVER POWER SUPPLY ASSEMBLY A2A8

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A8		RECEIVER POWER SUPPLY:4.06IN.LG X3.00IN.W X0.62IN.THK;MFR 06845 PART NUMBER 4031915-0501. (ATTACHING PARTS)AM(4)	7-90
A2A8C1 AND A2A8C2		NOT USED.	
A2A8C3		CAPACITOR,FIXED,ELECTROLYTIC:43 UF PCRM 20% 100WVDC;MIL TYPE CL67BN430MPG.	7-90
A2A8C4		CAPACITOR,FIXED,ELECTROLYTIC:39 UF PCRM 20% 60WVDC;MIL TYPE CL67BK390MPG.	7-90
A2A8C5		NOT USED.	
A2A8C6		CAPACITOR,FIXED,ELECTROLYTIC:15 UF PCRM 20% 50WVDC;MIL TYPE M39003-01-2138.	7-90
A2A8C7		CAPACITOR,FIXED,ELECTROLYTIC:0.375IN.DIA X 0.858IN.LG;120 UF +75% -15%,40WVDC;MFR 26769 PART NUMBER TC314,06845 DWG 4031980-0701.	7-90
A2A8CR1 THRU A2A8CR4		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N649.	7-90
A2A8CR5 THRU A2A8CR8		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N5199.	7-90
A2A8CR9 THRU A2A8CR12		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-90
A2A8CR13 AND A2A8CR14		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N3024B	7-90
A2A8CR15		SEMICONDUCTOR DEVICE,DIODE:ITEM 98.	7-90
A2A8CR16		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N963B.	7-90
A2A8CR17		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N750A.	7-90
A2A8Q1		TRANSISTOR: MIL TYPE 2N3634	7-90
A2A8Q2 THRU A2A8Q4		TRANSISTOR:ITEM 109.	7-90

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

RECEIVER POWER SUPPLY ASSEMBLY A2A8

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A8R1 AND A2A8R2		RESISTOR,FIXED,COMPOSITION:47 OHMS PORM 5%, 1W;MIL TYPE RCR32G470JS.	7-90
A2A8R3		RESISTOR:ITEM 93.	7-90
A2A8R4		RESISTOR:ITEM 60.	7-90
A2A8R5		RESISTOR,FIXED,COMPOSITION:1K OHMS PORM 5%, 1/2W;MIL TYPE RCR20G102JS.	7-90
A2A8R6		RESISTOR,FIXED,COMPOSITION:1.5K OHMS PORM 5%,1/2W;MIL TYPE RCR20G152JS.	7-90
A2A8R7		RESISTOR:ITEM 47.	7-90
A2A8R8		RESISTOR:ITEM 72.	7-90
A2A8R9		RESISTOR:ITEM 59.	7-90
A2A8R10 AND A2A8R11		RESISTOR:ITEM 47.	7-90
A2A8R12		RESISTOR:ITEM 60.	7-90
A2A8R13		RESISTOR:ITEM 46.	7-90
A2A8R14		RESISTOR,VARIABLE,WIRE WOUND:500 OHMS,3/4W; MIL TYPE M39015-1-003PM.	7-90
A2A8R15		RESISTOR:ITEM 54.	7-90
A2A8R16		RESISTOR,VARIABLE,NON WIRE WOUND:500 OHMS, 1/2W;MIL TYPE RJ24CX501.	7-90

ANTENNA OVERLOAD ASSEMBLY A2A9

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A9		ANTENNA CUTOUT ASSEMBLY:1.86IN.LG X1.80IN.W X0.53IN.W;MFR 06845 PART NUMBER 4032347-0501. (ATTACHING PARTS)F(4)W(4)Y(4)	7-91
A2A9C1		CAPACITOR:ITEM 24.	7-91
A2A9C2		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.250 IN.LG;5.1 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA5R1UUFPCRM5PCT,06845 DWG 4031973-0735.	7-91
A2A9C3		CAPACITOR,FIXED,CERAMIC:0.160IN.DIA X0.260 IN.LG;3.0 PF PORM 5%,500WVDC;MFR 78488 PART NUMBER GA3R0UUFPCRM5PCT,06845 DWG 4031973-0729.	7-91
A2A9C4		CAPACITOR,FIXED,ELECTROLYTIC:4.7 UF PORM 20%,50WVDC;MIL TYPE M39003-01-2129.	7-91
A2A9CR1		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N4148.	7-91
A2A9CR2		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N4148.	7-91
A2A9K1		RELAY,ELECTRICAL:DPDT;2AMP;MIL TYPE M5757-9-004.	7-91
A2A9Q1 AND A2A9Q2		TRANSISTOR:MIL TYPE 2N1613.	7-91
A2A9R1		RESISTOR,FIXED,COMPOSITION:27K OHMS PORM 5% 1/2W;MIL TYPE RCR20G273JS.	7-91
A2A9R2		RESISTOR,FIXED,COMPOSITION:39K OHMS PORM 5% 1/2W;MIL TYPE RCR20G393JS.	7-91
A2A9R3		RESISTOR,FIXED,COMPOSITION:56K OHMS PORM 5% 1/4W;MIL TYPE RCR07G563JS.	7-91
A2A9R4		RESISTOR:ITEM 51.	7-91
A2A9R5		RESISTOR:ITEM 58.	7-91
A2A9R6		RESISTOR,FIXED,COMPOSITION:27K OHMS PORM 5% 1/4W;MIL TYPE RCR07G273JS.	7-91

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

ANTENNA OVERLOAD ASSEMBLY A2A9

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A9R7		RESISTOR:ITEM 51.	7-91
A2A9R8		RESISTOR:ITEM 66.	7-91
A2A9R9		RESISTOR,FIXED,COMPOSITION:220 OHMS PORM 5% 1/2W;MIL TYPE RCR20G221JS.	7-91

20- AND 30-MHz FILTER ASSEMBLY A2A10

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A10		FILTER ASSEMBLY,20 TO 30 MHZ:3.45IN.LG X1.10IN.W X0.70IN.THK;MFR 06845 PART NUMBER 4032465-0501. (ATTACHING PARTS)AN(2)Y(2)W(2)	7-92
A2A10C1 AND A2A10C2		CAPACITOR:ITEM 14.	7-92
A2A10C3		CAPACITOR,FIXED,MICA:820 PF PORM 1%,500WVDC MIL TYPE CM06FD821FP3.	7-92
A2A10C4		CAPACITOR,FIXED,MICA:390 PF PORM 1%,500WVDC MIL TYPE CM05FD391FP3.	7-92
A2A10C5		CAPACITOR,FIXED,MICA:27 PF PORM 2%,500WVDC; MIL TYPE CM05ED270GP3.	7-92
A2A10C6		CAPACITOR,FIXED,MICA:27 PF PORM 2%,500WVDC; MIL TYPE CM05ED270GP3.	7-92
A2A10C7		CAPACITOR:ITEM 14.	7-92
A2A10CR1 THRU A2A10CR4		SEMICONDUCTOR DEVICE,DIODE:ITEM 99.	7-92
A2A10CR5		SEMICONDUCTOR DEVICE,DIODE:ITEM 100.	7-92
A2A10L1		COIL:ITEM 40.	7-92
A2A10L2		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 21.500MHZ,CAPACITY 822 PF:MFR 93292 PART NUMBER 500-2397,06845 DWG 4032440-0701.	7-92
A2A10L3		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 31.100MHZ,CAPACITY 393 PF:MFR 93292 PART NUMBER 500-2431,06845 DWG 4032440-0702.	7-92
A2A10L4		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 19.600MHZ,CAPACITY 28 PF:MFR 93292 PART NUMBER 500-2432,06845 DWG 4032440-0703.	7-92
A2A10L5		COIL,R F VARIABLE:0.422IN.DIA X0.490IN.; 29.000MHZ,CAPACITY 28.8 PF:MFR 93292 PART NUMBER 500-2398,06845 DWG 4032440-0704.	7-92
A2A10L6		COIL:ITEM 40.	7-92
A2A10R1 AND A2A10R2		RESISTOR,FIXED,COMPOSITION:1.2K OHMS PORM 5%,1/4W;MIL TYPE RCR07G122JS.	7-92
A2A10R3		RESISTOR,FIXED,COMPOSITION:470 OHMS PORM 5% 1/2W;MIL TYPE RCR20G471JS.	7-92

100-Hz CONTROL AND VERNIER ASSEMBLY A2A11

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A11		100 HZ CONTROL AND VERNIER ASSEMBLY:MFR 06845 PART NUMBER 4032204-0501.	7-102
A2A11R1		RESISTOR,VARIABLE,WIRE WOUND:1.062IN.DIA X 2.250IN.LG;30K OHMS PORM 5%,2W;MFR 11534 PART NUMBER 1300-882,06845 DWG 4032127-0701.	7-102

Table 7-2. Radio Receiver R-1051E/URR, Parts List (Cont)

100-Hz CONTROL AND VERNIER ASSEMBLY A2A11

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	FIGURE NUMBER
A2A11S1		SWITCH,ROTARY:1.531IN.DIA X1.404IN.LG;MFR 76854 PART NUMBER 5-26313-310,06845 DWG 4010008-0701.	7-102
A2A11A1		POWER SUPPLY SUBASSEMBLY,4 VOLT:2.001N.LG X1.525IN.W;MFR 06845 PART NUMBER 4010013-0501.	7-93
A2A11A1C1		CAPACITOR:ITEM 11.	7-93
A2A11A1C2		CAPACITOR,FIXED,MICA:10000 PF PORM 20%,500 WVDC;MIL TYPE CK05BX103M.	7-93
A2A11A1C4		CAPACITOR:ITEM 23.	7-93
A2A11A1CR1		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N3824A	7-93
A2A11A1CR2		SEMICONDUCTOR DEVICE,DIODE:MIL TYPE 1N746A.	7-93
A2A11A1R1		RESISTOR,FIXED,FILM:30K OHMS PORM 5%,1/4W; MIL TYPE RLR07C303JR.	7-93
A2A11A1R2		RESISTOR,VARIABLE,WIRE WOUND:5K OHMS,3/4W; MIL TYPE M39015-2-006PM.	7-93
A2A11A1R3		RESISTOR:ITEM 83.	7-93
A2A11A1R4		RESISTOR,FIXED,COMPOSITION:1K OHMS PORM 5%, 1/2W;MIL TYPE RCR20G102JS.	7-93
A2A11A1R5		NOT USED.	
A2A11A1R6		RESISTOR,FIXED,FILM:20K OHMS PORM 5%,1/2W; MIL TYPE RLR20C203JR.	7-93
A2A11A1R7		RESISTOR,FIXED,COMPOSITION:4700K OHMS PORM 5%,1/2W;MIL TYPE RCR20G475JS.	7-93
		CONNECTOR KIT:MFR 06845 PART NUMBER 4032572-0501 CONSISTING OF: 2 EA CONNECTOR,PLUG:MIL TYPE MS3106A10SL4S 1 EA CONNECTOR,PLUG:MIL TYPE MS3116F20-39S 1 EA CONNECTOR,PLUG:MIL TYPE MS3106A16S5S 2 EA BOOT:06845 PART NUMBER 4032585-0701 1 EA CLAMP,CABLE:MIL TYPE MS3057-8A 1 EA CONNECTOR:MIL TYPE M39012-16-0001 1 EA CONNECTOR:MIL TYPE M39012-01-0025	

Table 7-3. List of Common Item Descriptions

ITEM NUMBER	DESCRIPTION
1	BEARING, SLEEVE: 0.4 in. dia, 0.140 in. thk, sintered metal, oil impregnated; mfr 06845 part number 2031154-0002.
2	NOT USED.
3	CAPACITOR, FIXED, CERAMIC: 0.01 uF porm 20%, 200 VdcW; mil type CK06BX103M.
4	CAPACITOR, FIXED, CERAMIC: 1000 pF porm 20%, 500 VdcW; mil type CK70AW102M.
5	CAPACITOR, FIXED, CERAMIC: 0.230 in. W, 0.15 in. H, 0.100 in. thk; 0.01 uF porm 10%, 100 VdcW; mil type CK05BX103K.
6	CAPACITOR, FIXED, MICA: 15 pF porm 5%, 500 VdcW, mil type CM05CD150JP3.
7	CAPACITOR, FIXED, CERAMIC: 0.01 uF porm 10%, 200 VdcW; mil type CK06BX103K.
8	CAPACITOR, FIXED, CERAMIC: 0.1 uF porm 10%, 100 VdcW; mil type CK06BX104K.
9	CAPACITOR, FIXED, MICA: 130 pF porm 2%, 500 VdcW; mil type CM05FD131GP3.
10	CAPACITOR, FIXED, MICA: 150 pF porm 1%, 500 VdcW; mil type CM05FD151FP3.
11	CAPACITOR, FIXED, ELECTROLYTIC: 1.0 uF porm 20%, 50 VdcW; mil type M39003-01-2117.
12	CAPACITOR, FIXED, MICA: 0.45 in. x 0.358 in. x 0.172 in. 140 pF porm 2%, 300 VdcW; mfr 72136 type DM15, mfr 06845 dwg 4030786-0704.
13	CAPACITOR, FIXED, MYLAR DIELECTRIC: 0.222 in. dia, 0.500 in. l, 0.05 uF porm 20%, 100 VdcW; mfr 99515 part number EP36D2, mfr 06845 dwg 4032429-0702.
14	CAPACITOR, FIXED, CERAMIC: 0.1 uF porm 20%, 100 VdcW; mil type CK06BX104M.
15	CAPACITOR, FIXED, MICA: 10 pF porm 0.5pF, 500 VdcW; mil type CM05CD100DP3.
16	CAPACITOR, FIXED, MICA: 33 pF porm 2%, 500 VdcW; mil type CM05ED330GP3.
17	CAPACITOR, FIXED, MICA: 75 pF porm 2%, 500 VdcW; mil type CM05ED750GP3.
18	CAPACITOR, FIXED, MICA: 820 pF porm 5%, 500 VdcW; mil type CM06FD821JP3.
19	CAPACITOR, FIXED, ELECTROLYTIC: 15.0 uF porm 20%, 20 VdcW; mil type M39003-01-2050.

Table 7-3. List of Common Item Descriptions (Cont)

ITEM NUMBER	DESCRIPTION
20	CAPACITOR, FIXED, ELECTROLYTIC: 6.8 uF porm 20%, 35 VdcW; mil type M39003-01-2065.
21	CAPACITOR, FIXED, MYLAR, DIELECTRIC: 0.42 in. x 0.29 in. x 0.17 in., 0.10 uF porm 20%, 100 VdcW; mfr 99515 part number EP36D3, 06845 dwg 4032429-0703.
22	CAPACITOR, FIXED, ELECTROLYTIC: 47.0 uF porm 20%, 35 VdcW; mil type M39003-01-2073.
23	CAPACITOR, FIXED, MYLAR DIELECTRIC: 0.55 in. x 0.36 in. x 0.23 in., 0.20 uF porm 20%, 100 VdcW; mfr 99515 part number EP36D4, mfr 06845 dwg 4032429-0704.
24	CAPACITOR, FIXED, CERAMIC: 1000 pF porm 20%, 1000 VdcW; mil type CK60AW102M.
25	CAPACITOR, FIXED, CERAMIC: 0.5 uF +80 -20%, 20 VdcW; mfr 71590 part number UK20-503.
26	CAPACITOR, FIXED, CERAMIC: 0.160 in. dia x 0.330 in. lg; 1.5 pF porm 5%, 500 VdcW; mfr 78488 part number GA-1.5 pF-5%, mfr 06845 dwg 4031973-0722.
27	CAPACITOR, FIXED, CERAMIC: 0.160 in. dia x 0.290 in. lg; 2.0 pF porm 5%, 500 VdcW; mfr 78488 part number GA-2.0 pF-5%, mfr 06845 dwg 4031973-0725.
28	CAPACITOR, FIXED, CERAMIC: 0.160 in. dia x 0.240 in. lg; 2.4 pF porm 5%, 500 VdcW; mfr 78488 part number GA-2.4 pF-5%, mfr 06845 dwg 4031973-0727.
29	CAPACITOR, FIXED, MICA: 0.460 in. lg x 0.370 in. w x 0.190 in. thk; 146 pF porm 1/2%, 500 VdcW; mfr 72136 type DM15, mfr 06845 dwg 4031977-0718.
30	CAPACITOR, FIXED, MICA: 0.045 in. lg x 0.360 in. w x 0.170 in. thk; 47 pF porm 0.5 pF, 500 VdcW; mfr 72136 type DM15, mfr 06845 dwg 4031978-0707.
31	CAPACITOR, FIXED, MICA: 0.450 in. lg x 0.360 in. w x 0.170 in. thk; 59 pF porm 1%, 500 VdcW; mfr 72136 type DM15, mfr 06845 dwg 4031978-0717.
32	CAPACITOR, FIXED, MICA: 0.450 in. lg x 0.360 in. w x 0.170 in. thk; 61 pF porm 1%, 500 VdcW; mfr 72136 type DM15, mfr 06845 dwg 4031978-0718.
33	CAPACITOR, FIXED, MICA: 0.460 in. lg x 0.360 in. w x 0.180 in. thk; 96 pF porm 1%, 500 VdcW; mfr 72136 type DM15, mfr 06845 dwg 4031978-0737.
34	CAPACITOR, FIXED, MICA: 0.460 in. lg x 0.360 in. w x 0.180 in. thk; 99 pF form 1%, 500 VdcW; mfr 72136 type DM15, mfr 06845 dwg 4031978-0739.
35	CAPACITOR, FIXED, CERAMIC: 1500 pF porm 20%, 100 VdcW; mil type CK05BX152M.

Table 7-3. List of Common Item Descriptions (Cont)

ITEM NUMBER	DESCRIPTION
36	CAPACITOR, FIXED, CERAMIC: 0.47 uF porm 20%, 100 VdcW; mil type CK06BX473M.
37	CLAMP, SPROCKET: 0.436 in. x 0.59 in. x 0.234 in., cres passivation; mfr 06845 part number 4031925-0001.
38	CLAMP, RETAINER: 0.34 in. x 0.28 in. x 0.20 in.; cres, finish passivation; mfr 06845 dwg 4032108-0001.
39	COIL: 1000 uH porm 10%, 135 rated dc current; mil type MS90537-49.
40	COIL: 47.0 uH porm 10%, 400 rated dc current; mil type MS90537-33.
41	CONNECTOR, ELECTRICAL: 1500 volts; mil type M39024-11-01.
42	CONNECTOR, RECEPTACLE, ELECTRICAL: 0.144 in. dia x 0.59 in. lg; 1.5 amp; mfr 98291 part number 51-043-4300, mfr 06845 dwg 4032529-0701.
43	NOT USED.
44	CONNECTOR, RECEPTACLE, ELECTRICAL: right angle coaxial; 0.734 in. lg; female contact; mfr 91146 part number 318-11-99-283; 06845 dwg 4032484-0729.
44A	CONNECTOR, PLUG, ELECTRICAL: right angle coaxial; 0.62 in. lg; female contact; mfr 98291 part number 51-020-0000; mfr 06845 dwg 4032528-0701.
45	DISK, COUPLING, FLANGED: 0.875 in. dia, 0.406 in. dia x 0.390 in. thk, powdered metal; mfr 06845 part number 4030895-0001.
46	RESISTOR, FIXED, COMPOSITION: 15K ohms porm 5%, 1/4W; mil type RCR07G153JS.
47	RESISTOR, FIXED, COMPOSITION: 4.7K ohms porm 5%, 1/4W; mil type RCR07G472JS.
48	RESISTOR, FIXED, COMPOSITION: 390 ohms porm 5%, 1/4W; mil type RCR07G391JS.
49	RESISTOR, FIXED, FILM: 13K ohms porm 5%, 1/4W; mil type RLR07C133JR.
50	RESISTOR, FIXED, COMPOSITION: 1.2K ohms porm 5%, 1/4W; mil type RCR07G122JS.
51	RESISTOR, FIXED, COMPOSITION: 12K ohms porm 5%, 1/4W; mil type RCR07G123JS.
52	RESISTOR, FIXED, COMPOSITION: 1.8K ohms porm 5%, 1/4W; mil type RCR07G182JS.
53	RESISTOR, FIXED, COMPOSITION: 2.2K ohms porm 5%, 1/4W; mil type RCR07G222JS.
54	RESISTOR, FIXED, COMPOSITION: 330 ohms porm 5%, 1/4W; mil type RCR07G331JS.

Table 7-3. List of Common Item Descriptions (Cont)

ITEM NUMBER	DESCRIPTION
55	RESISTOR, FIXED, COMPOSITION: 3.3K ohms porm 5%, 1/4W; mil type RCR07G332JS.
56	RESISTOR, FIXED, COMPOSITION: 33K ohms porm 5%, 1/4W; mil type RCR07G333JS.
57	RESISTOR, FIXED, COMPOSITION: 47 ohms porm 5%, 1/4W; mil type RCR07G470JS.
58	RESISTOR, FIXED, COMPOSITION: 470 ohms porm 5%, 1/4W; mil type RCR07G471JS.
59	RESISTOR, FIXED, COMPOSITION: 680 ohms porm 5%, 1/4W; mil type RCR07G681JS.
60	RESISTOR, FIXED, COMPOSITION: 1K ohms porm 5%, 1/4W; mil type RCR07G102JS.
61	RESISTOR, FIXED, COMPOSITION: 100K ohms porm 5%, 1/4W; mil type RCR07G104JS.
62	RESISTOR, FIXED, COMPOSITION: 1.5K ohms porm 5%, 1/4W; mil type RCR07G152JS.
63	RESISTOR, FIXED, COMPOSITION: 18K ohms porm 5%, 1/4W; mil type RCR07G183JS.
64	RESISTOR, FIXED, COMPOSITION: 22K ohms porm 5%, 1/4W; mil type RCR07G223JS.
65	RESISTOR, FIXED, COMPOSITION: 27 ohms porm 5%, 1/4W; mil type RCR07G270JS.
66	RESISTOR, FIXED, COMPOSITION: 2.7K ohms porm 5%, 1/4W; mil type RCR07G272JS.
67	RESISTOR, FIXED, COMPOSITION: 3.9K ohms porm 5%, 1/4W; mil type RCR07G392JS.
68	RESISTOR, FIXED, COMPOSITION: 47K ohms porm 5%, 1/4W; mil type RCR07G473JS.
69	RESISTOR, FIXED, COMPOSITION: 560 ohms porm 5%, 1/4W; mil type RCR07G561JS.
70	RESISTOR, FIXED, COMPOSITION: 5.6K ohms porm 5% 1/4W; mil type RCR07G562JS.
71	RESISTOR, FIXED, COMPOSITION: 6.8K ohms porm 5%, 1/4W; mil type RCR07G682JS.
72	RESISTOR, FIXED, COMPOSITION: 820 ohms porm 5%, 1/4W; mil type RCR07G821JS.
73	RESISTOR, FIXED, COMPOSITION: 8.2K ohms porm 5%, 1/4W; mil type RCR07G822JS.
74	RESISTOR, FIXED, FILM: 360 ohms porm 5%, 1/4W, mil type RLR07C361JR.

Table 7-3. List of Common Item Descriptions (Cont)

ITEM NUMBER	DESCRIPTION
75	RESISTOR, FIXED, FILM: 62 ohms porm 5%, 1/4W; mil type RLR07C620JR.
76	RESISTOR, FIXED, FILM: 510 ohms porm 5%, 1/2W; mil type RLR20C511JR.
77	RESISTOR, FIXED, COMPOSITION: 10 ohms porm 5%, 1/4W; mil type RCR07G100JS.
78	RESISTOR, FIXED, COMPOSITION: 220 ohms porm 5%, 1/4W; mil type RCR07G221JS.
79	RESISTOR, FIXED, COMPOSITION: 39 ohms porm 5%, 1/4W; mil type RCR07G390JS.
80	RESISTOR, FIXED, COMPOSITION: 56 ohms porm 5%, 1/4W; mil type RCR07G560JS.
81	RESISTOR, FIXED, FILM: 200 ohms porm 5%, 1/4W; mil type RLR07C201JR.
82	RESISTOR, FIXED, FILM: 2K ohms porm 5%, 1/4W; mil type RLR07C202JR.
83	RESISTOR, FIXED, FILM: 5.1K ohms porm 5%, 1/4W; mil type RLR07C512JR.
84	RESISTOR, THERMAL: disk type, 0.270 in. dia x 0.100 in. thk; 248 ohms porm 10% at 37.8 deg c, 4.0 volts max, 0.005 amp min; mfr 75263 part number RL2012-248-73S3, 06845 dwg 4032276-0701.
85	RESISTOR, FIXED, COMPOSITION: 270 ohms porm 5%, 1/4W; mil type RCR07G271JS.
86	RESISTOR, FIXED, COMPOSITION: 1K ohms porm 10%, 1/4W; mil type RCR07G102KS.
87	RESISTOR, FIXED, COMPOSITION: 10K ohms porm 10%, 1/4W; mil type RCR07G103KS.
88	RESISTOR, FIXED, COMPOSITION: 150 ohms porm 5%, 1/4W; mil type RCR07G151JS.
89	RESISTOR, FIXED, COMPOSITION: 22 ohms porm 5%, 1/4W; mil type RCR07G220JS.
90	RESISTOR, FIXED, FILM: 51 ohms porm 5%, 1/4W; mil type RLR07C510JR.
91	RESISTOR, FIXED, FILM: 510 ohms porm 5%, 1/4W; mil type RLR07C511JR.
92	RESISTOR, FIXED, FILM: 6.2K ohms porm 5%, 1/4W; mil type RLR07C622JR.
93	RESISTOR, FIXED, COMPOSITION: 100 ohms porm 5%, 1/4W; mil type RCR07G101JS.

Table 7-3. List of Common Item Descriptions (Cont)

ITEM NUMBER	DESCRIPTION
94	RESISTOR, FIXED, COMPOSITION: 10K ohms porm 5%, 1/4W; mil type RCR07G103JS.
95	RING, RETAINING: mil type MS16633-4018.
96	SEMICONDUCTOR DEVICE, DIODE SWITCHING: mil type 1N914.
97	SEMICONDUCTOR DEVICE, DIODE, PNP: 0.370 in. dia x 0.260 in.; mfr 04713 part number 2N4890, 06845 dwg 4017647-0701.
98	SEMICONDUCTOR DEVICE, DIODE: germanium, mil type 1N277.
99	SEMICONDUCTOR DEVICE, DIODE: silicon, voltage regulator; mil type 1N4454.
100	SEMICONDUCTOR DEVICE, DIODE: silicon, voltage regulator; mil type 1N758A.
101	TERMINAL, STUD: mil type SE206D1.
102	TERMINAL, STUD: 0.250 in. x 0.719 in. lg; brass; mfr 71279 part number 2381-1, 06845 dwg 4032159-0702.
103	TERMINAL, FEED-THRU: mil type FT039B01.
104	TERMINAL STUD: 0.250 in. x 0.593 in.; brass; mfr 71279 part number 2380-1, 06845 dwg 4032159-0701.
105	TERMINAL, STUD: mil type SE12XC01.
106	TRANSISTOR: mil type 2N2905.
107	TRANSISTOR, GERMANIUM, PNP: 0.230 in. dia x 0.210 in. h; mfr 04713 part number 2N3127, 06845 dwg 4030817-0701.
108	TRANSISTOR, NPN: case style TO-18; mfr 04713 part number 2N2501, 06845 dwg 4031995-0701.
109	TRANSISTOR, NPN: mil type 2N2219.
110	TRANSISTOR, PNP: mfr 86684 part number 2N1301, 06845 dwg 4031996-0701.
111	TRANSFORMER, RF, VARIABLE: 0.422 in. dia x 0.490 in., 17.847 MHz, porm 5% cp pF, mfr 93293 part number - - -, 06845 dwg 4032549-0706.
112	TRANSISTOR, NPN: mfr 04713 part number 2N2708, 06845 dwg 4031993-0701.
113	TRANSISTOR, NPN: mil type 2N706.
114	TRANSISTOR: mil type 2N1225.
115	TRANSISTOR: mil type 2N2222.
116	WASHER, SPRING TENSION: 0.563 in. dia od, 0.195 in. dia id, 0.008 in. thk; mfr 78189 part number 3502-10-53, 06845 dwg 4032104-0703.

Table 7-4. List of Attaching Hardware

ITEM LETTER	DESCRIPTION
A	RIVET, TUBULAR, OVAL-HEAD: 0.089 in. dia x 0.156 in. lg, brass, nickel plate finish, mil std part number MS16535-65N.
B	RIVET, TUBULAR, OVAL-HEAD: 0.089 in. dia x 0.438 in. lg, brass, nickel plate finish, mil std part number MS16535-73N.
C	SCREW, CAPTIVE: 10-32 x 0.98 in.; mfr 06845, part number 4030574-0001.
D	SCREW, MACHINE, PAN HEAD: 2-56 unc thd x 0.500 in. lg, cres, mil std part number MS51957-7.
E	SCREW, MACHINE, PAN HEAD: 4-40 unc thd x 0.250 in. lg, cres, mil std part number MS51957-13.
F	SCREW, MACHINE, PAN HEAD: 4-40 unc thd x 0.312 in. lg, cres, mil std part number MS51957-14.
G	SCREW, MACHINE, PAN HEAD: 4-40 unc thd x 0.438 in. lg, cres, mil std part number MS51957-16.
H	SCREW, CAPTIVE: 10-32 x 1.07 in. with plastic cap; mfr 06845, part number 4032255-0501.
I	SCREW, MACHINE, PAN HEAD: 6-32 unc thd x 0.188 in. lg, cres, mil std part number MS51957-25.
J	SCREW, CAPTIVE: 10-32 x 4.84 in.; mfr 06845, part number 4030521-0001.
K	SCREW, CAPTIVE: 14844, part number 5227-946.
L	SCREW, MACHINE, PAN HEAD: 6-32 unc thd x 0.312 in. lg, cres, mil std part number MS51957-27.
M	SCREW, MACHINE, FLAT COUNTERSUNK HEAD: 6-32 unc thd x 0.625 in. lg, cres, mil std part number MS51959-31.
N	SCREW, MACHINE, FLAT COUNTERSUNK HEAD: 6-32 unc thd x 0.438 in. lg, cres, mil std part number MS51959-29.
P	SCREW, MACHINE, FLAT COUNTERSUNK HEAD: 6-32 unc thd x 0.250 in. lg, cres, mil std part number MS51959-26.
Q	SCREW, MACHINE: No. 6-32 x 2.25 in.; mfr 06845, part number 4032133-0001.
R	SCREW, MACHINE: No. 3-48 x 0.188 in.; mfr 83355, mfr 06845 part number 4031928-0701.
S	SCREW, MACHINE: No. 6-32 x 3.12 in.; mfr 06845, part number 4030635-0002.
T	SCREW, MACHINE, PAN HEAD: 6-32 unc thd x 0.375 in. lg, cres, mil std part number MS51957-28.
U	WASHER, LOCK, FLAT-EXTERNAL TOOTH: 0.260 in. od x 0.123 in. id x 0.019 in. thk, cres, passivate finish, mil std part number MS35335-57.

Table 7-4. List of Attaching Hardware (Cont)

ITEM LETTER	DESCRIPTION
V	WASHER, LOCK: 0.172 in. od x 0.094 in. id x 0.020 in. thk, cres, mil std part number MS35338-134.
W	WASHER, LOCK: 0.209 in. od x 0.121 in. id x 0.025 in. thk, cres, mil std part number MS35338-135.
X	WASHER, LOCK: 0.250 in. od x 0.148 in. id x 0.031 in. thk, cres, mil std part number MS35338-136.
Y	WASHER, FLAT: 0.250 in. od x 0.125 in. id x 0.022 in. thk, cres, mil std part number MS15795-803.
Z	WASHER, LOCK: 0.250 in. od x 0.148 in. id x 0.031 in. thk, cres, mil std part number MS35338-136 .
AA	WASHER, INSULATING: 0.250 in. od x 0.089 in. id x 0.062 in. thk; mfr 06845, part number 4032114-0004.
AB	WASHER, FLAT: 0.089-0.094 in. id x 0.218 in. od x 0.031 in. thk; mfr 06845, part number 4031924-0001.
AC	WASHER, FLAT: 0.118-0.122 in. id x 0.185-0.189 in. od x 0.022 in. thk; mfr 06845, part number 4031924-0002.
AD	WASHER, FLAT: 0.120 in. id x 0.218 in. od x 0.015 in. thk; mfr 06845, part number 4031924-0005.
AE	WASHER, FLAT: 0.125 in. id x 0.250 in. od x 0.022 in. thk; mfr 06845, part number 4031924-0007.
AF	WASHER, NONMETALLIC: paper, moisture and fungus proof; 0.125 in. id x 0.223 in. od x 0.031 in. thk; mfr 06845, part number 2074908-2309.
AG	WASHER, FLAT: 0.562 in. od x 0.375 in. id x 0.012 in. thk; mfr 06845, part number 4031924-0014.
AH	SCREW, MACHINE, FLAT, COUNTERSUNK HEAD: 4-40 thd x 0.312 in. lg, cres, passivate finish, mil std part number MS24693C3.
AJ	SCREW, MACHINE, PAN HEAD: 4-40 unc thd x 0.625 in. lg, cres, mil std part number MS51957-18.
AK	SCREW, MACHINE, FLAT, COUNTERSUNK HEAD: 4-40 thd x 0.625 in. lg, cres, passivate finish, mil std part number MS24693C7.
AL	SCREW, MACHINE, PAN HEAD: 4-40 unc thd x 0.750 in. lg, cres, mil std part number MS51957-19.
AM	SCREW, MACHINE, FLAT,COUNTERSUNK HEAD: 6-32 thd x 0.312 in. lg, cres, passivate finish, mil std part number MS24693C25.
AN	STUD, EXTENSION: No. 4-40 UNC-2 internal and external thd; 0.93 in. lg x 0.187 in. w across flats; cres with passivate finish; mfr 06845, part number 4032189-0005.

Table 7-5. List of Manufacturers

CODE NUMBER	MANUFACTURER'S NAME AND ADDRESS
00136	McCoy Electronics Co. Watts-Chestnut St. Mt. Holly Springs, PA 17065
00141	PIC Design Corp. P. O. Box 335 Benrus Center Ridgefield, CT 06877
01121	Allen-Bradley Co. 1201 S. 2nd St. Milwaukee, WI 53204
01961	Pulse Engineering, Inc. 560 Robert Ave. Santa Clara, CA 95050
04713	Motorola, Inc. Semiconductor Products Div. 5005 E. McDowell Rd. Phoenix, AZ 85008
06776	Robinson Nugent, Inc. P. O. Box 470 800 E. 8th St. New Albany, IN 47150
06845	The Bendix Corp. Communications Division E. Joppa Rd. Baltimore, MD 21204
07263	Fairchild Semiconductor A Div. of Fairchild Camera and Instrument Corp. 464 Ellis St. Mountain View, CA 94040
07688	Joint Electron Device Engineering Council
08832	Schroeder Brothers Corp. Box 72 Nichol Ave. McKees Rocks, PA 15136
08988	Scottie Electronics Line St. Archbald, PA 18403
11534	Duncan Electronics, Inc. 2865 Fairview Rd. Costa Mesa, CA 92626
12639	Northfield Precision Instrument Corp. 4400 Austin Blvd. Island Park, NY 11558
14844	Frequency Electronics, Inc. 3 Delaware Drive New Hyde Park, NY 11040
19057	Filtech Corp. 10103 W. Pacific Ave. Franklin Park, IL 60131
25140	Globe Industries Division of TRW, Inc. 2275 Stanley Ave. Dayton, OH 45404
25159	Inductive Components, Inc. 149 Sullivan Lane Westbury, NY 11590
26769	NCI 5900 Voss Rd. P. O. Box 8205 West Palm Beach, FL 33407
27014	National Semiconductor Corp. 2950 San Ysidro Way Santa Clara, CA 95051
27956	Relcom 2329 Charleston Rd. Mountain View, CA 94040
28480	Hewlett Packard Co. 1501 Page Mill Rd. Palo Alto, CA 94103
28994	Gladdingkeystone Corp. 179 River St. Oneonta, NY 13820
32828	Keene Corp. Kaydon Bearing Div. 2860 McCracken St. Muskegon, MI 49443

Table 7-5. List of Manufacturers (Cont)

CODE NUMBER	MANUFACTURER'S NAME AND ADDRESS
40920	Miniature Bearing Division, MPB Corp. Optical Ave. Precision Park Keene, NH 03431
56289	Sprague Electric Co. North Adams, MA 01247
57533	Sterling Precision Corp. 103 Park Ave. New York, NY 10017
60007	Tidewater Supply Co., Inc. P.O. Box 839 Norfolk, VA 23501
60380	Torrington Co. Subsidiary of Ingersoll-Rand Corp. 59 Field St. Torrington, CT 06790
70674	ADC Products Division of Magnetic Controls Company 4900 West 78th St. Minneapolis, MN 55435
71279	Cambridge Thermionic Corp. 445 Concord Ave. Cambridge, MA 02138
71468	ITT Cannon Electric 666 E. Dyer Rd. Santa Ana, CA 92702
72136	The Electro Motive Mfg. Co., Inc. South Park and John Sts. Willimantic, CT 06226
72259	Nytronics, Inc. 10 Pelham Parkway Pelham Manor, NY 10803
72625	Amsted Industries, Inc. Diamond Chain Co., Inc. 402 Kentucky Ave. Indianapolis, IN 46225
72914	Grimes Mfg. Co. 515 N. Russell Urbana, OH 43078
72982	Erie Technological Products, Inc. 944 W. 12th St. Erie, PA 16512
73292	Hudson American Corp. New York, NY
73293	Hughes Aircraft Co. Electron Dynamics Div. P.O. Box 2999 Torrance, CA 90509
74970	Johnson EF Co. 299 10th Ave., S.W. Waseca, MI 56093
75263	Keystone Carbon Co. 1935 State St. St. Marys, PA 15857
76665	National Lock Washer Div. Charter Wire 40 Haynes Somerville, NJ 08876
76854	Oak Mfg. Co. Div. Oak Electro Metics Corp. 5 Main St. Crystal Lake, IL 60014
77820	Bendix Corp. Electrical Components Div. Sherman Ave. Sidney, NY 13838
78189	Illinois Tool Works, Inc. Shakeproof Division St. Charles Rd. Elgin, IL 60126
78488	Stackpole Carbon Co. St. Marys, PA 15858

Table 7-5. List of Manufacturers (Cont)

CODE NUMBER	MANUFACTURER'S NAME AND ADDRESS
81030	International Instruments Div. Sigma Instruments, Inc. 88 Marsh Hill Rd. Orange, CT 06477
82389	Switchcraft, Inc. 5555 N. Elston Ave. Chicago, IL 60630
83508	Grant Pulley and Hardware Co. High St. West Nyack, NY 10994
84411	TRW Capacitor Division 112 W. First St. Ogallala, NB
86335	Glenco Corp. 212 Durham Ave. Metuchen, NJ 08841
86684	RCA Corp. Electronic Components 415 S. Fifth St. Harrison, NJ 07029
90634	Gulton Industries, Inc. Gulton St. Metuchen, NJ 08840
91146	ITT Cannon Electric Salem Div. Salem, MA
91662	Elco Corp. Maryland Rd. and Computer Ave. Willow Grove, PA 19090
91737	Gremar, Inc. Woburn, MA
91929	Honeywell, Inc. Micro Switch Division Chicago and Spring Sts. Freeport, IL 61032
93292	Central Coil Co., Inc. Box 348A RR2 Camby, IN 46113
93928	Forbes and Wagner, Inc. 345 Central Ave. Silver Creek, NY 14136
95105	Collins Radio Co. Newport Beach, CA
95712	The Bendix Corp. Microwave Devices Division Hurricane Rd. Franklin, IN 46131
96733	San Fernando Electric Mfg. Co. 1501 First Street San Fernando, CA 91341
98291	Sealectro Corp. 225 Hoyt Mamaroneck, NY 10599
98978	International Electronic Research Corp. 135 W. Magnolia Ave. Burbank, CA 91502
99515	Marshall Industries Capacitor Division 1960 Walker Ave. Monrovia, CA 91016

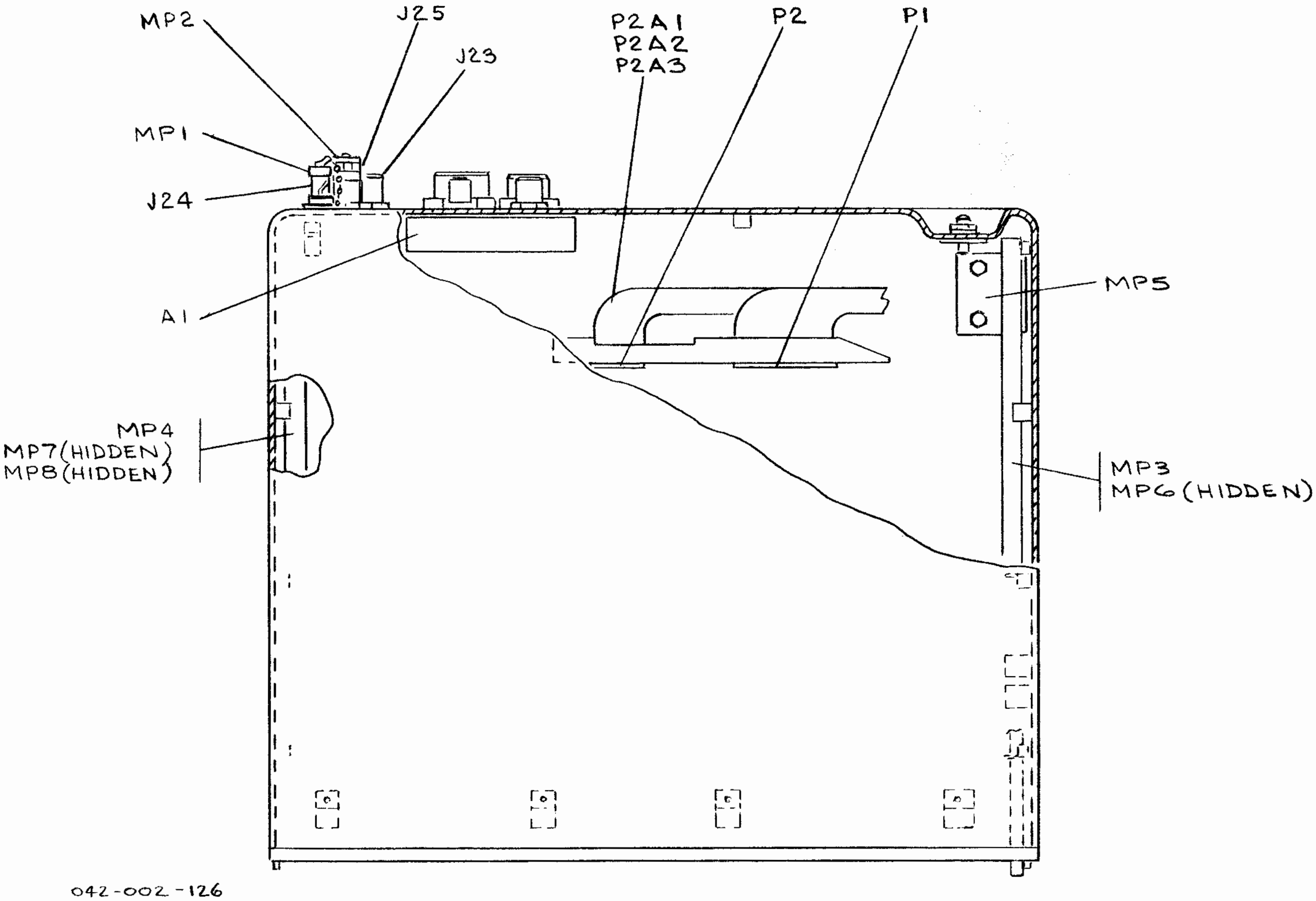


Figure 7-1. Receiver Case A1

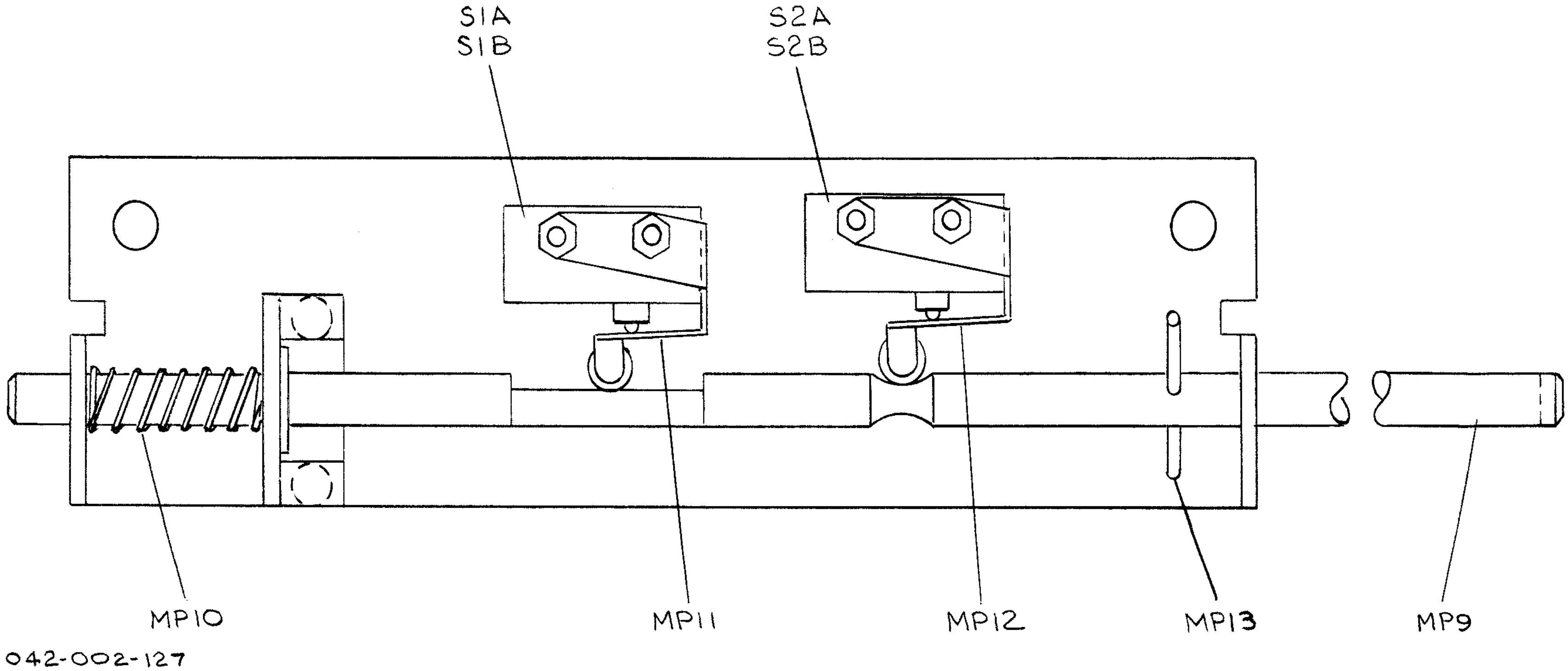


Figure 7-2. Switch Interlock Assembly (P/O A1)

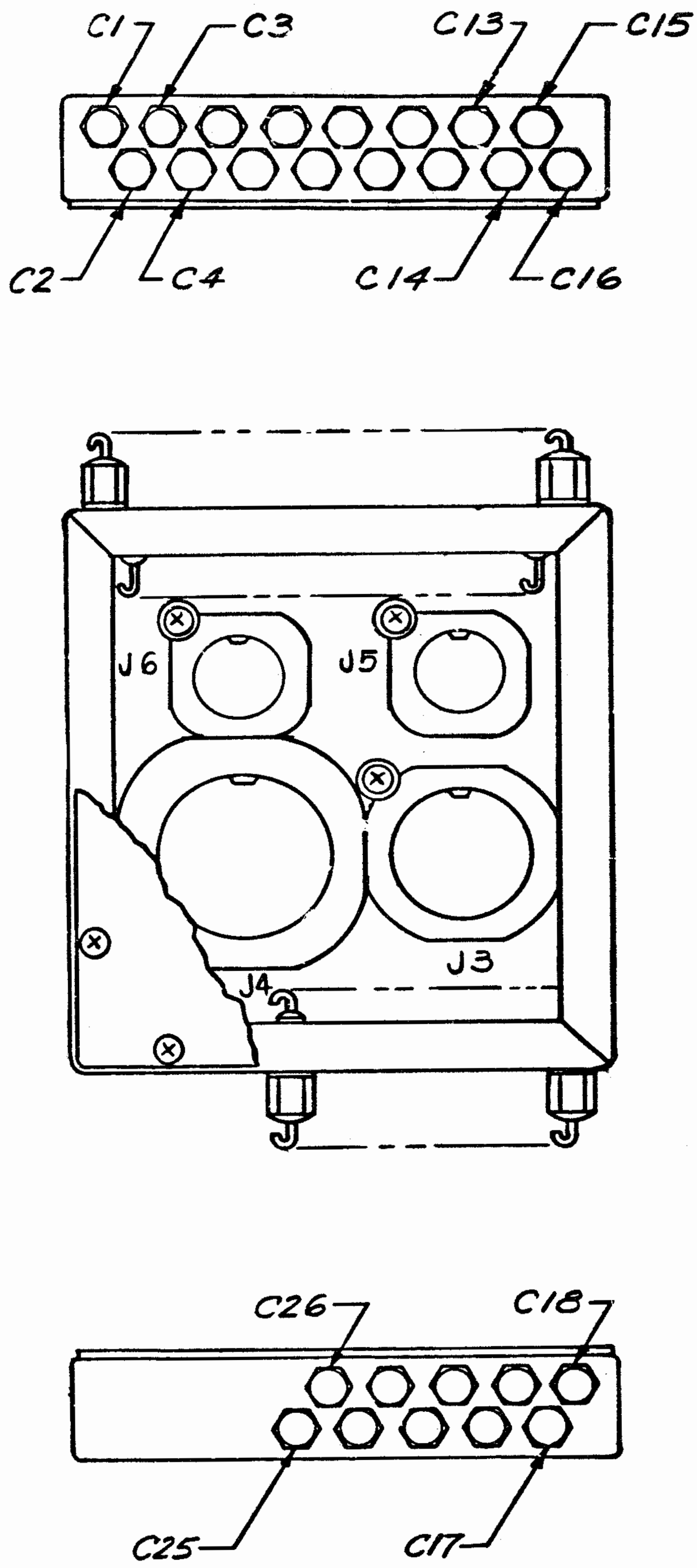


Figure 7-3. Filter Box Assembly A1A1

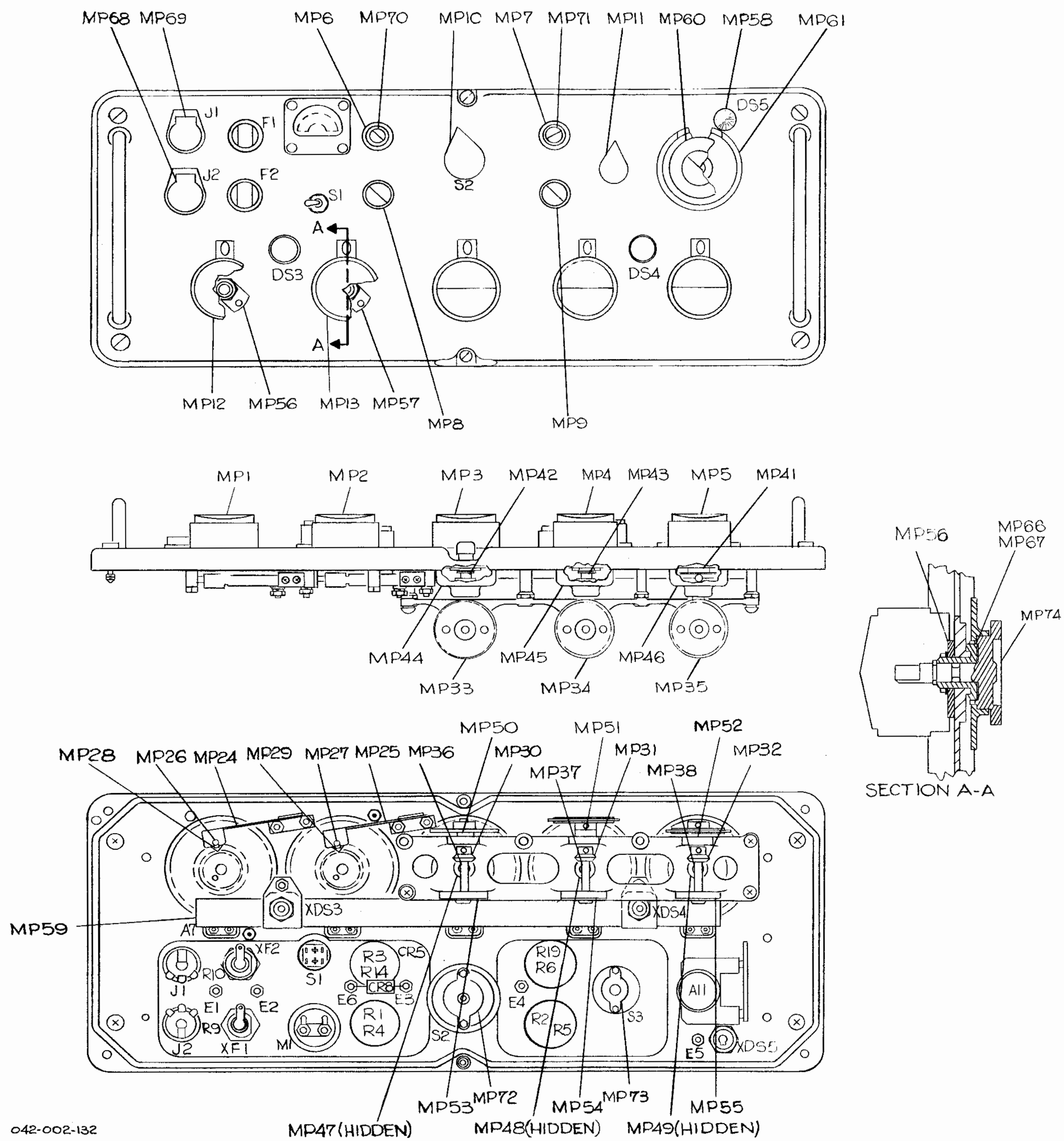


Figure 7-4. Front-Panel Assembly (P/O A2)

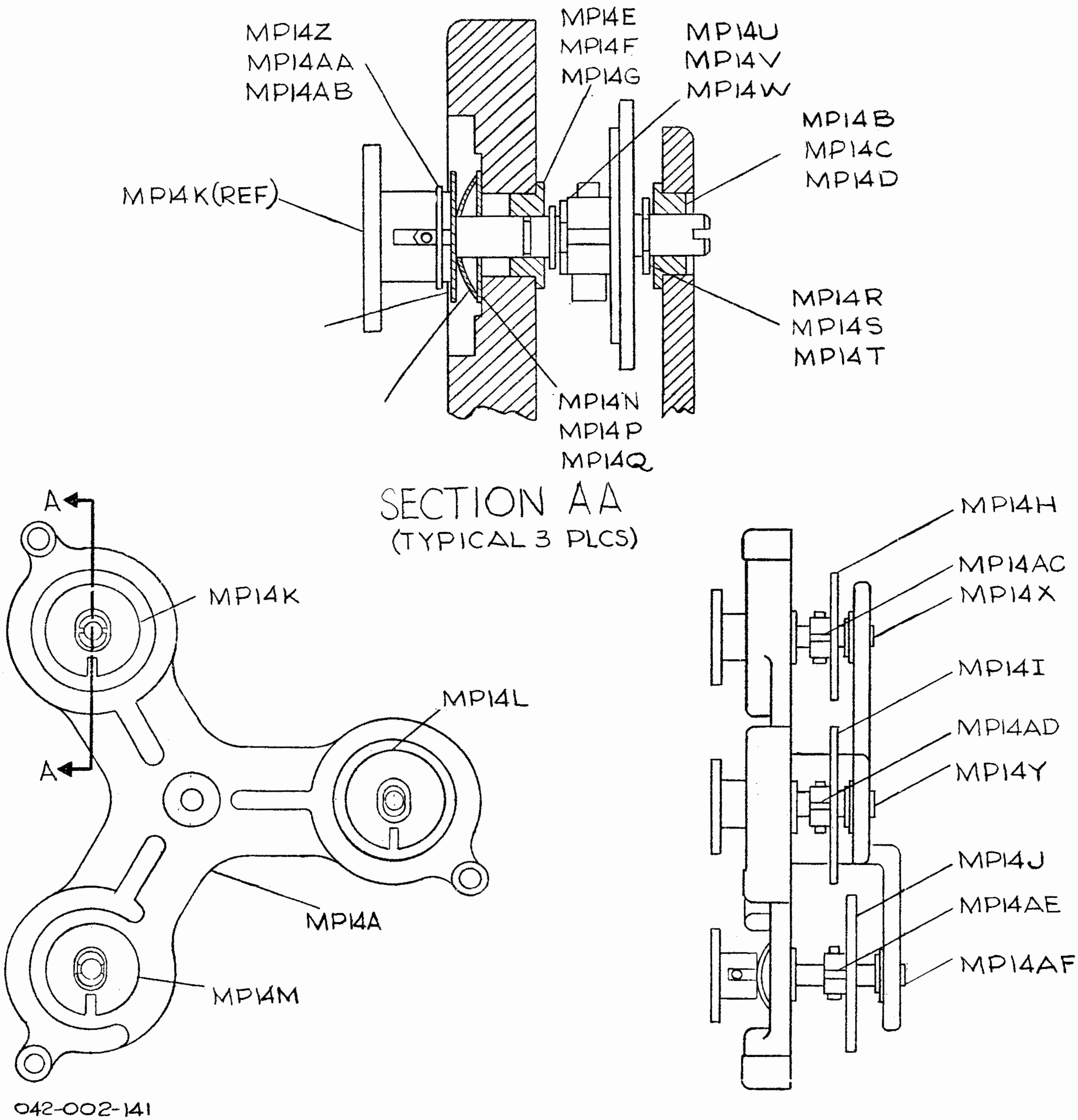


Figure 7-5. Triple-Sprocket Assembly (P/O A2)

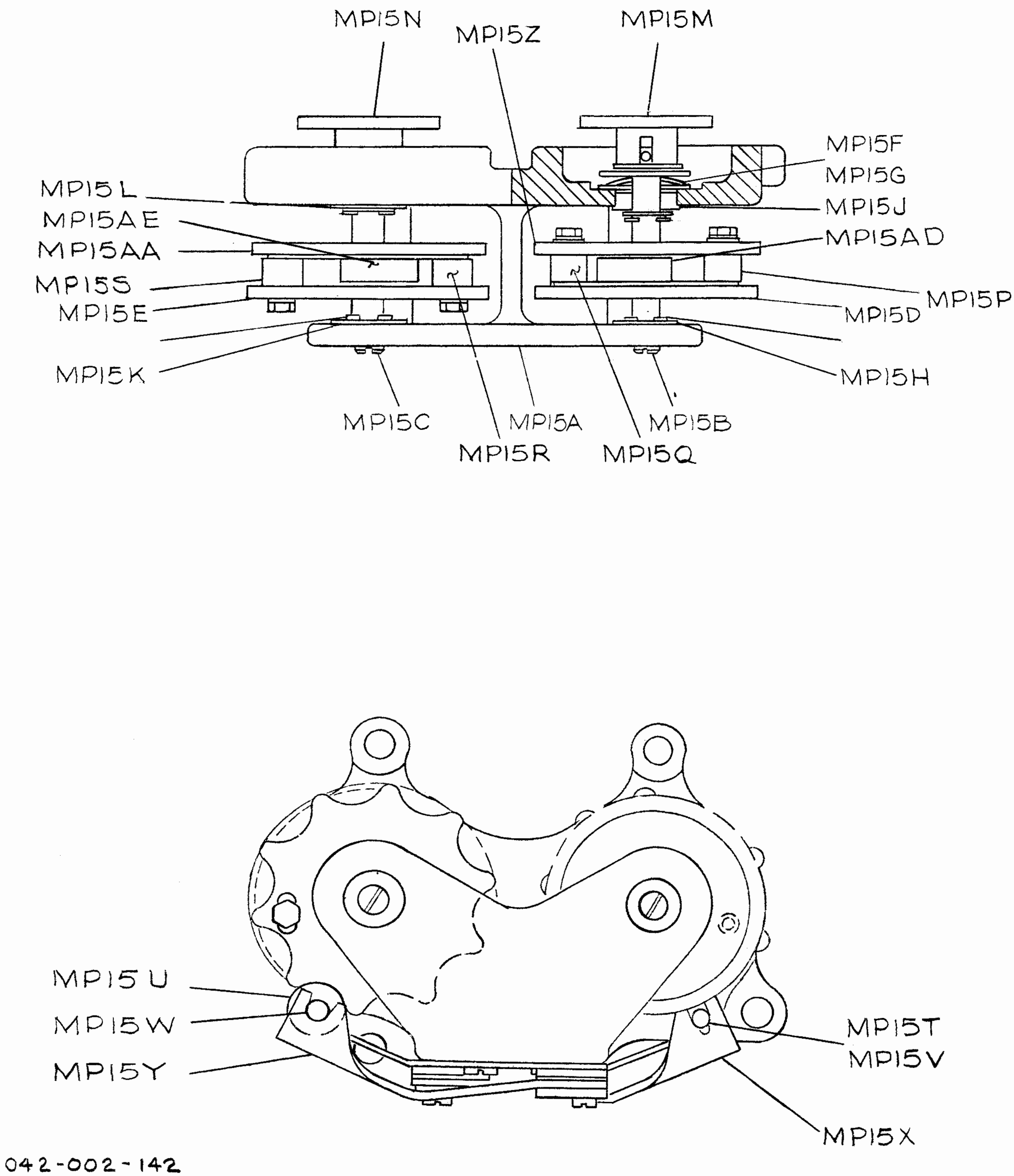


Figure 7-6. Dual-Sprocket Assembly (P/O A2)

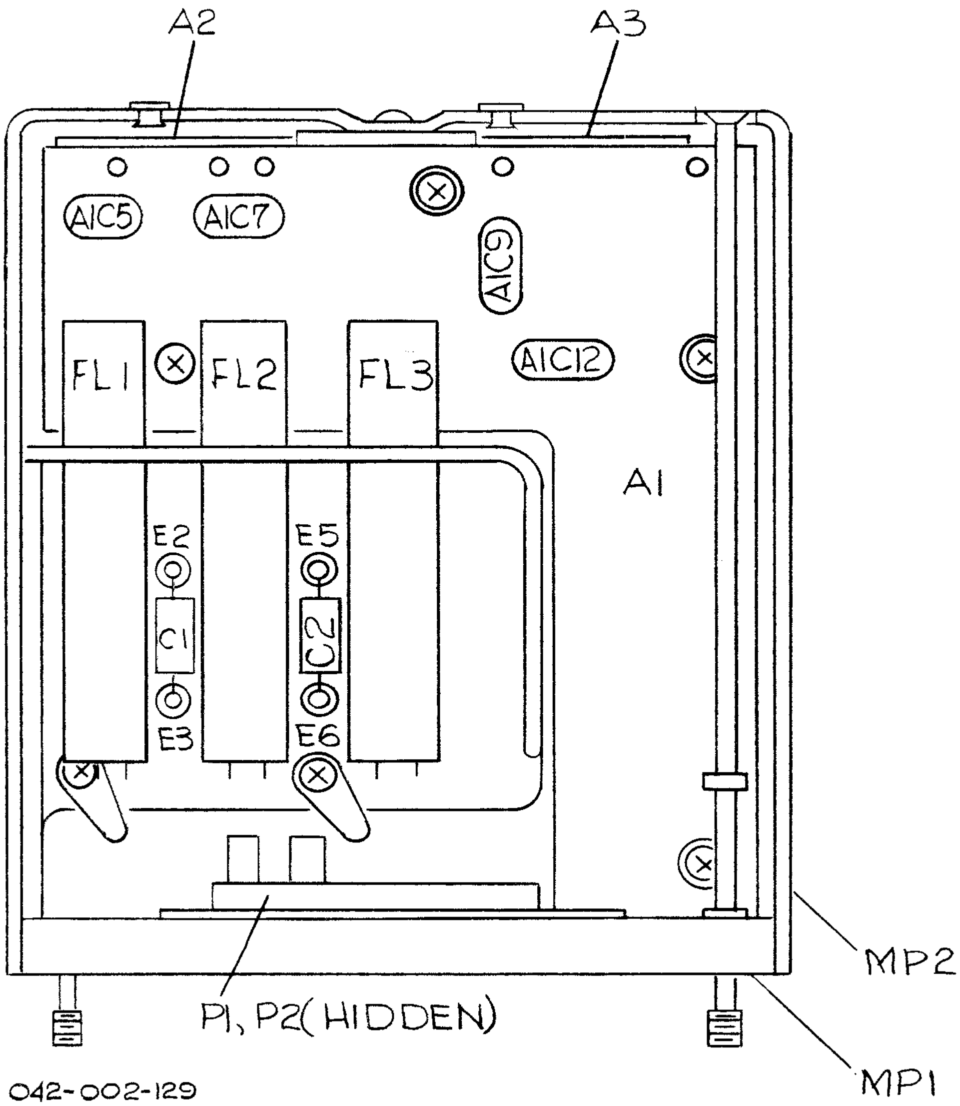
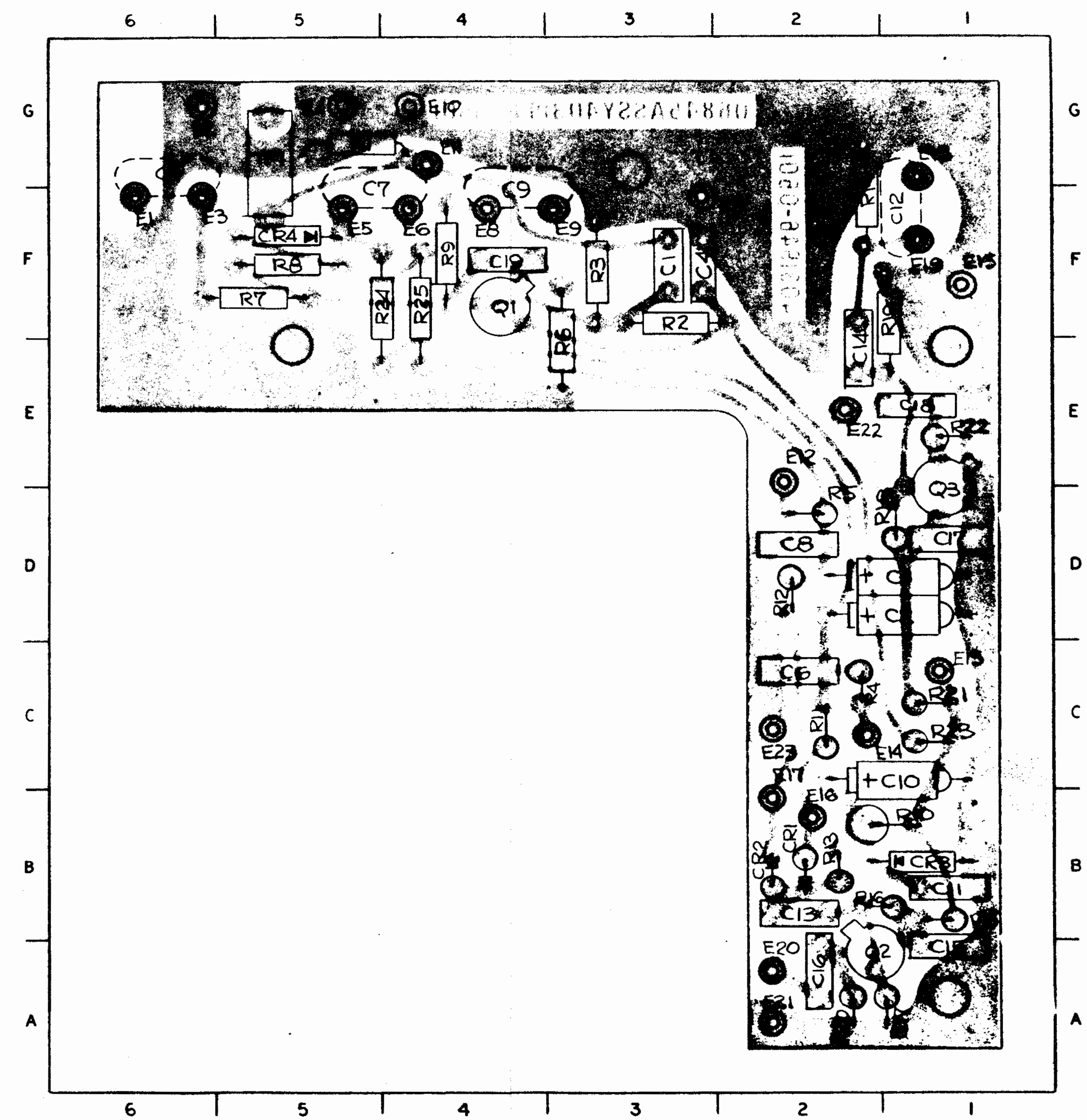


Figure 7-7. Receiver Mode Selector Assembly A2A1

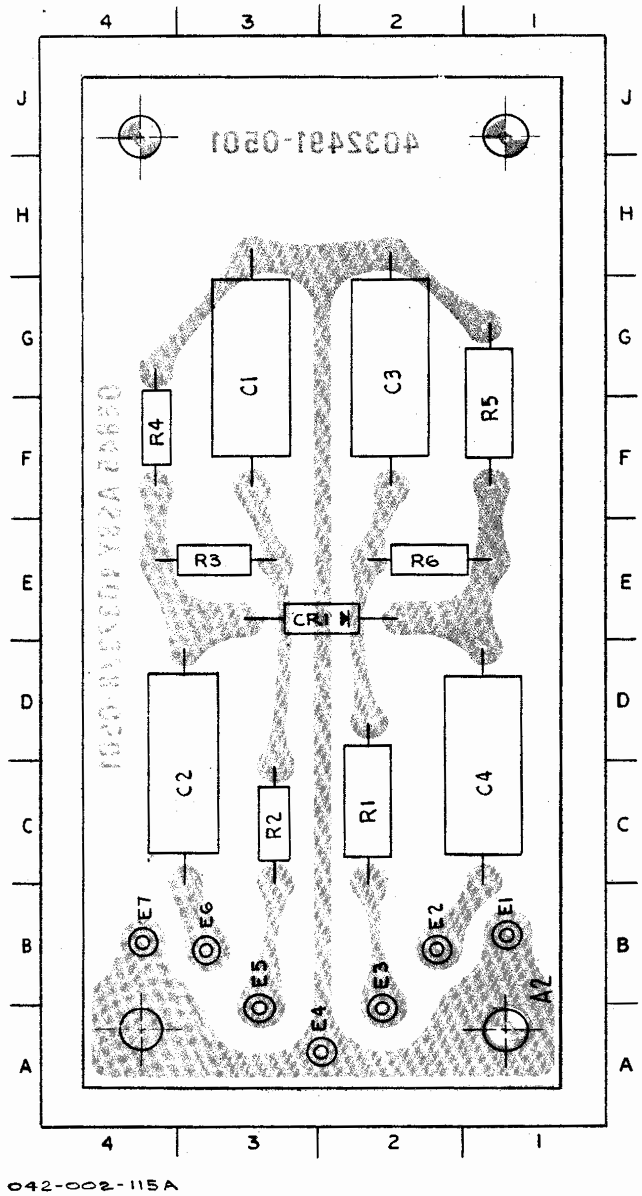
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A1A1C1	3F	A2A1A1E3	6F	A2A1A1R2	3F
C2	1D	E4	5G	R3	3F
C3	1D	E5	5F	R4	2C
C4	3F	E6	4F	R5	2D
C5	6G	E7	3F	R6	3E
C6	2C	E8	4F	R7	5F
C7	5F	E9	3F	R8	5F
C8	2D	E10	4G	R9	4F
C9	4F	E11	4G	R10	2B
C10	1C	E12	2E	R11	2C
C11	1B	E13	1C	R12	2D
C12	1F	E14	2C	R13	2B
C13	2B	E15	1F	R14	2F
C14	2E	E16	2B	R15	1B
C15	1A	E17	2B	R16	1B
C16	2A	E18	1G	R17	1A
C17	1D	E19	1F	R18	1D
C18	1E	E20	2A	R19	1F
C19	4F	E21	2A	R20	2A
CR1	2B	E22	2E	R21	1C
CR2	2B	E23	1C	R22	1E
CR3	1B	Q1	4F	R23	1C
CR4	5F	Q2	2A	R24	4F
E1	6F	Q3	1D	R25	4F
E2	6G	R1	5G	TP1	5G



042-002-114

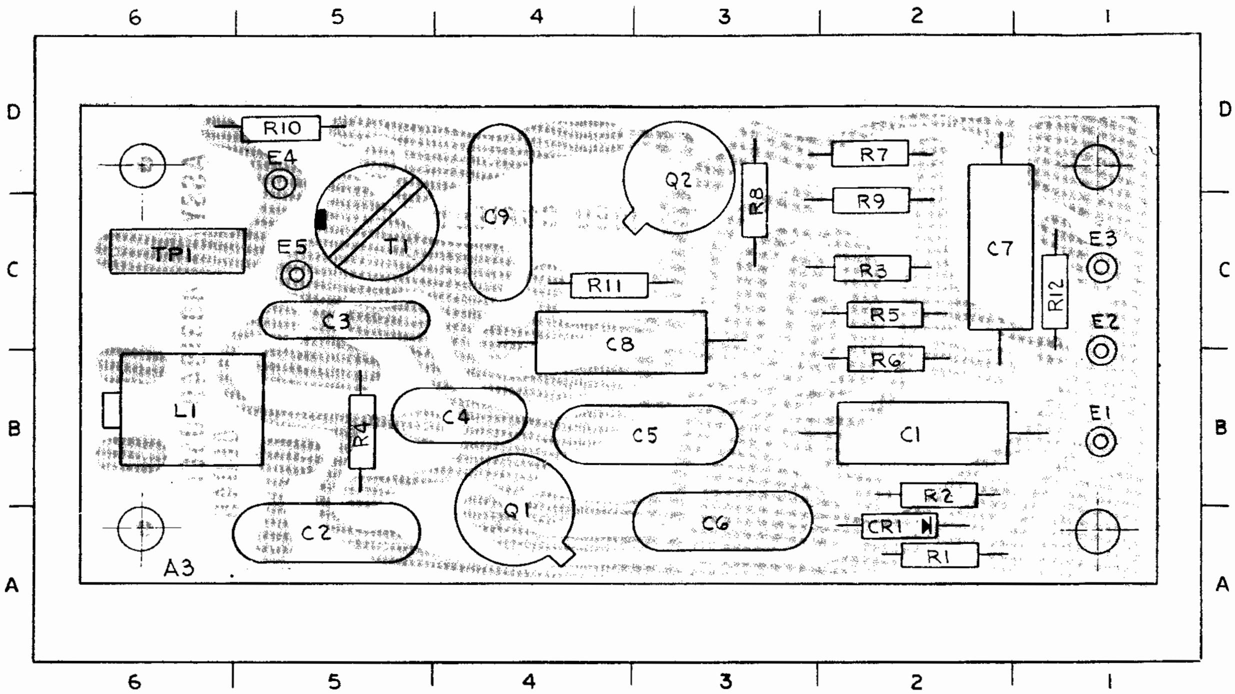
Figure 7-8. Mode Gates Subassembly A2A1A1



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A1A2C1	3G	A2A1A2E2	2B	A2A1A2R1	2C
C2	3C	E3	2A	R2	3C
C3	2G	E4	2A	R3	3E
C4	1C	E5	3A	R4	4F
CR1	2E	E6	3B	R5	1F
E1	1B	E7	4B	R6	2E

Figure 7-9. 500-kHz Gate Subassembly A2A1A2



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PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A1A3C1	2B	A2A1A3E2	1B	A2A1A3R5	2C
C2	5A	E3	1C	R6	2B
C3	5C	E4	5D	R7	2D
C4	4B	E5	5C	R8	5C
C5	3B	L1	6B	R9	2C
C6	3A	Q1	4A	R10	5D
C7	2C	Q2	3D	R11	4C
C8	4C	R1	2A	R12	1C
C9	4C	R2	2B	T1	5C
CR1	2A	R3	2B	TP1	6C
E1	1B	R4	5B		

Figure 7-10. Beat Frequency Oscillator And Amplifier Subassembly A2A1A3

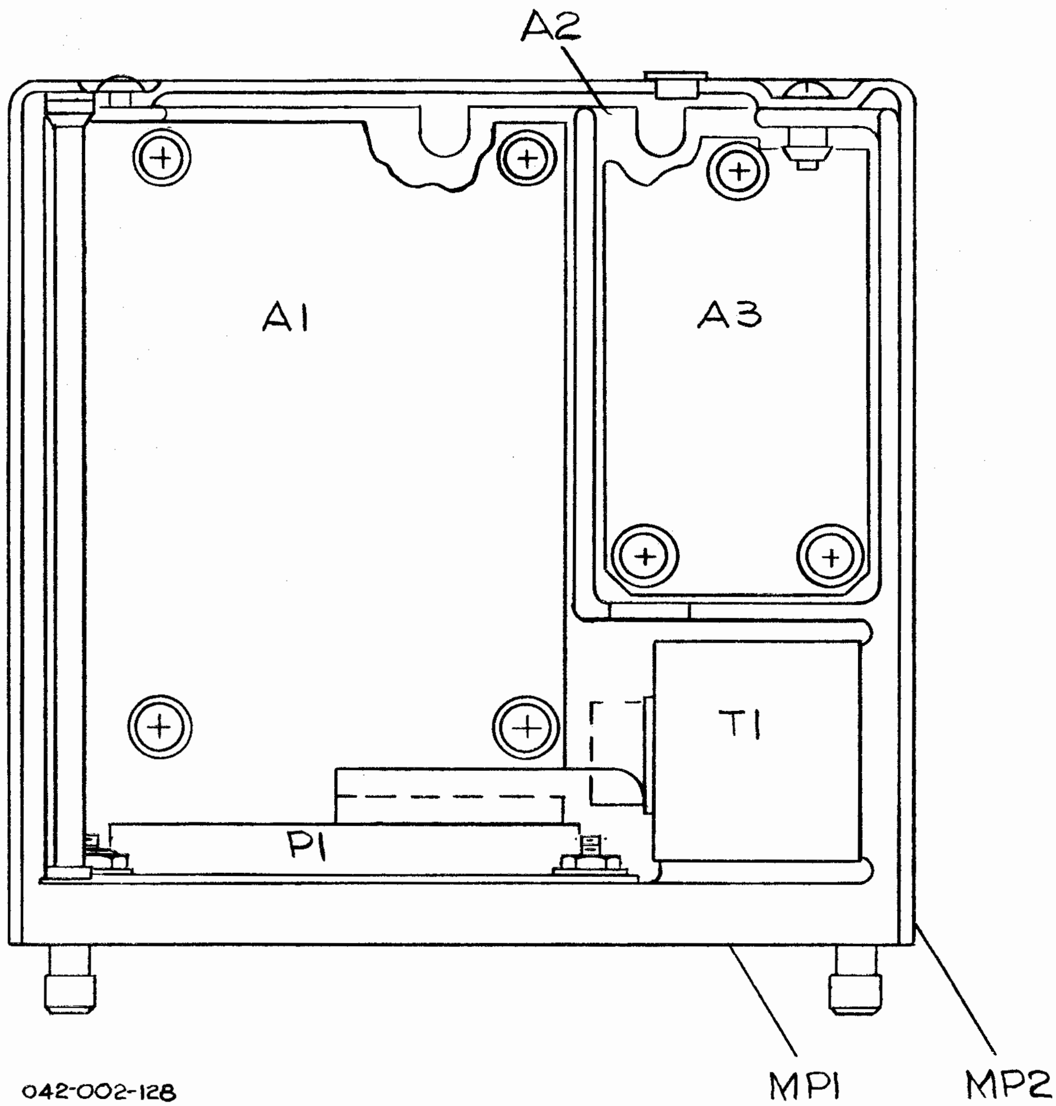
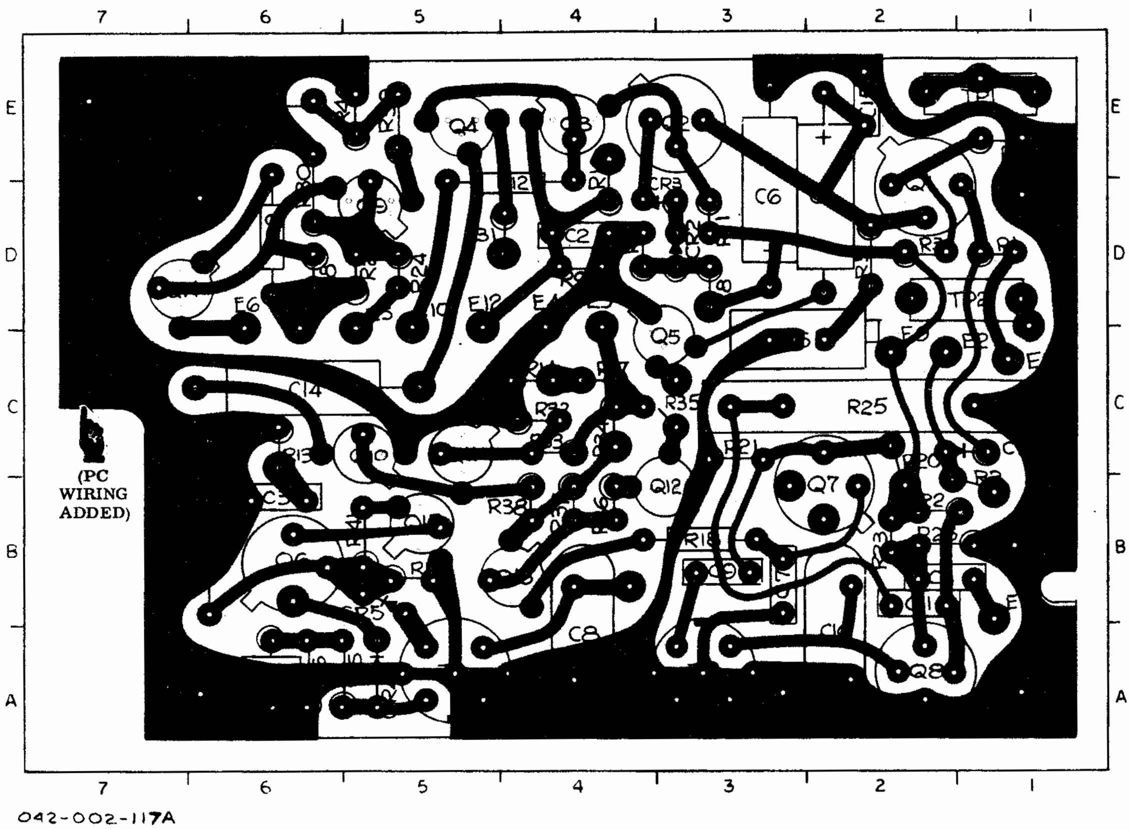


Figure 7-11. Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A2A1 C1	2D	A2A2A1 E4	4D	A2A2A1 R1	1D	A2A2A1 R25	2C
C2	4D	E5	5D	R2	2B	R26	1B
C3	6B	E6	6D	R3	2D	R27	5D
C4	2B	E7	6D	R4	1E	R28	6D
C5	6B	E8	1B	R5	2D	R29	6D
C6	3D	E9	2C	R6	3C	R30	6D
C7	3B	E10	5D	R7	4D	R31	4D
C8	4A	E11	1B	R8	3D	R32	4C
C9	3B	E12	5D	R9	4D	R33	4C
C10	2A	Q1	2D	R10	4D	R34	4C
C11	2B	Q2	2E	R11	3D	R35	3C
C12	*	Q3	4E	R12	4D	R36	4B
C13	*	Q4	5E	R13	6C	R37	4B
C14	6C	Q5	3C	R14	4C	R38	4B
C15	2E	Q6	6B	R15	6A	R39	5E
C16	6E	Q7	2B	R16	6A	R40	5E
CR1	1C	Q8	2A	R17	4C	R41	5B
CR2	3D	Q9	5D	R18	3B	RT1	6A
CR3	3D	Q10	5C	R19	5B	T1	5A
CR4	5A	Q11	5C	R20	2C	T2	3A
CR5	5B	Q12	5B	R21	3C	TP1	1E
E1	1C	Q13	5B	R22	1B	TP2	1D
E2	1C	Q14	7D	R23	2B	A2A3A1's	Identical
E3	4D	Q15	5B	R24	5D		to A2A2A1's

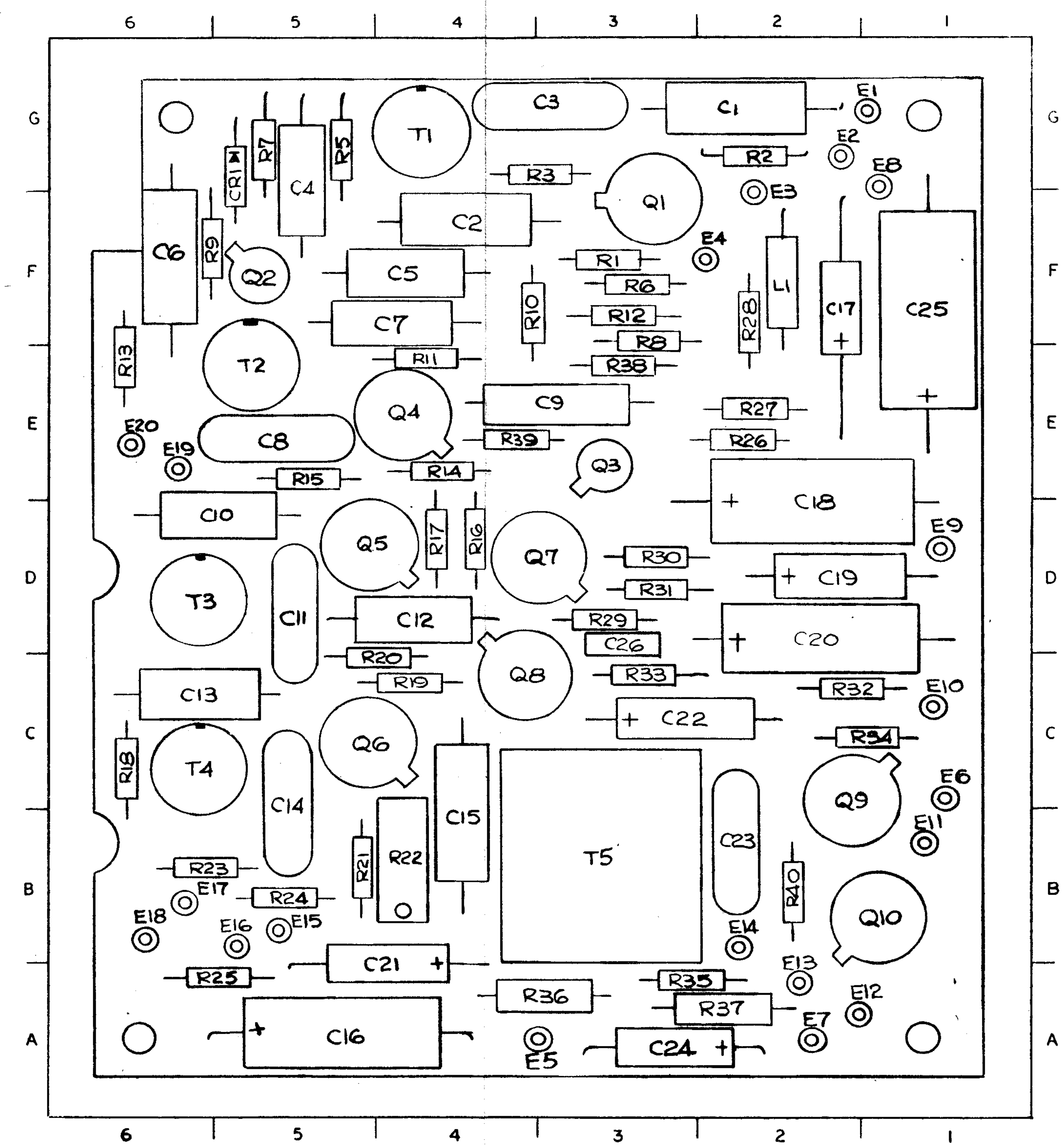
*Not Used

Figure 7-12. AGC Audio Amplifier Subassemblies A2A2A1 and A2A3A1

PART LOCATION INDEX

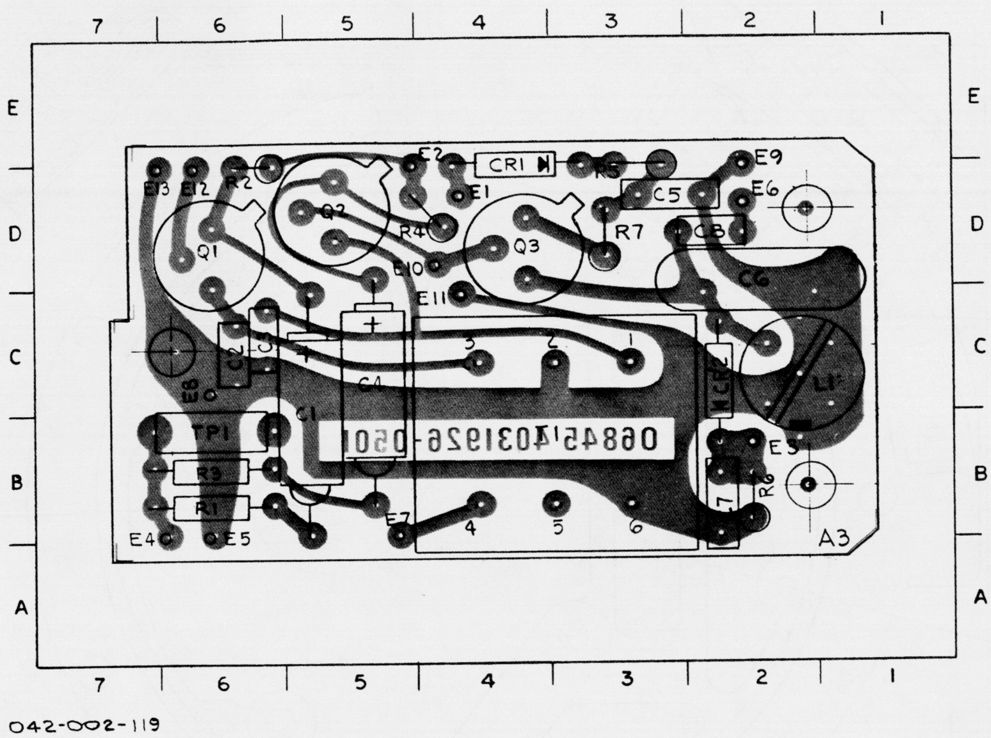
REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A2A2C1	1G	A2A2A2E9	1D	A2A2A2R12	3F
C2	4F	E10	1C	R13	6E
C3	3G	E11	1B	R14	4E
C4	5G	E12	2A	R15	5E
C5	4F	E13	2A	R16	4D
C6	6F	E14	2B	R17	4D
C7	4F	E15	5B	R18	6C
C8	5E	E16	5B	R19	4C
C9	3E	E17	6B	R20	4C
C10	5D	E18	6B	R21	5B
C11	5D	E19	6E	R22	4B
C12	4D	E20	6E	R23	6B
C13	6C	L1	2F	R24	5B
C14	5C	Q1	3F	R25	5A
C15	4B	Q2	5F	R26	2E
C16	5A	Q3	3E	R27	2E
C17	2F	Q4	4E	R28	2F
C18	2D	Q5	5D	R29	3D
C19	2D	Q6	5C	R30	3D
C20	2D	Q7	3D	R31	3D
C21	4B	Q8	4C	R32	2C
C22	3C	Q9	2C	R33	3C
C23	2B	Q10	1B	R34	1C
C24	3A	R1	3F	R35	3A
C25	1F	R2	2G	R36	3A
C26	3D	R3	3G	R37	2A
CR1	5G	R4	*	R38	3E
E1	1G	R5	5G	R39	4E
E2	2G	R6	3F	R40	2B
E3	2F	R7	5G	T1	4G
E4	2F	R8	3F	T2	5E
E5	3A	R9	6F	T3	6D
E6	1C	R10	4F	T4	6C
E7	2A	R11	4E	T5	3B
E8	1G				

* Not Used



042-002-118

Figure 7-13. IF./Audio Amplifier Subassemblies A2A2A2 and A2A3A2

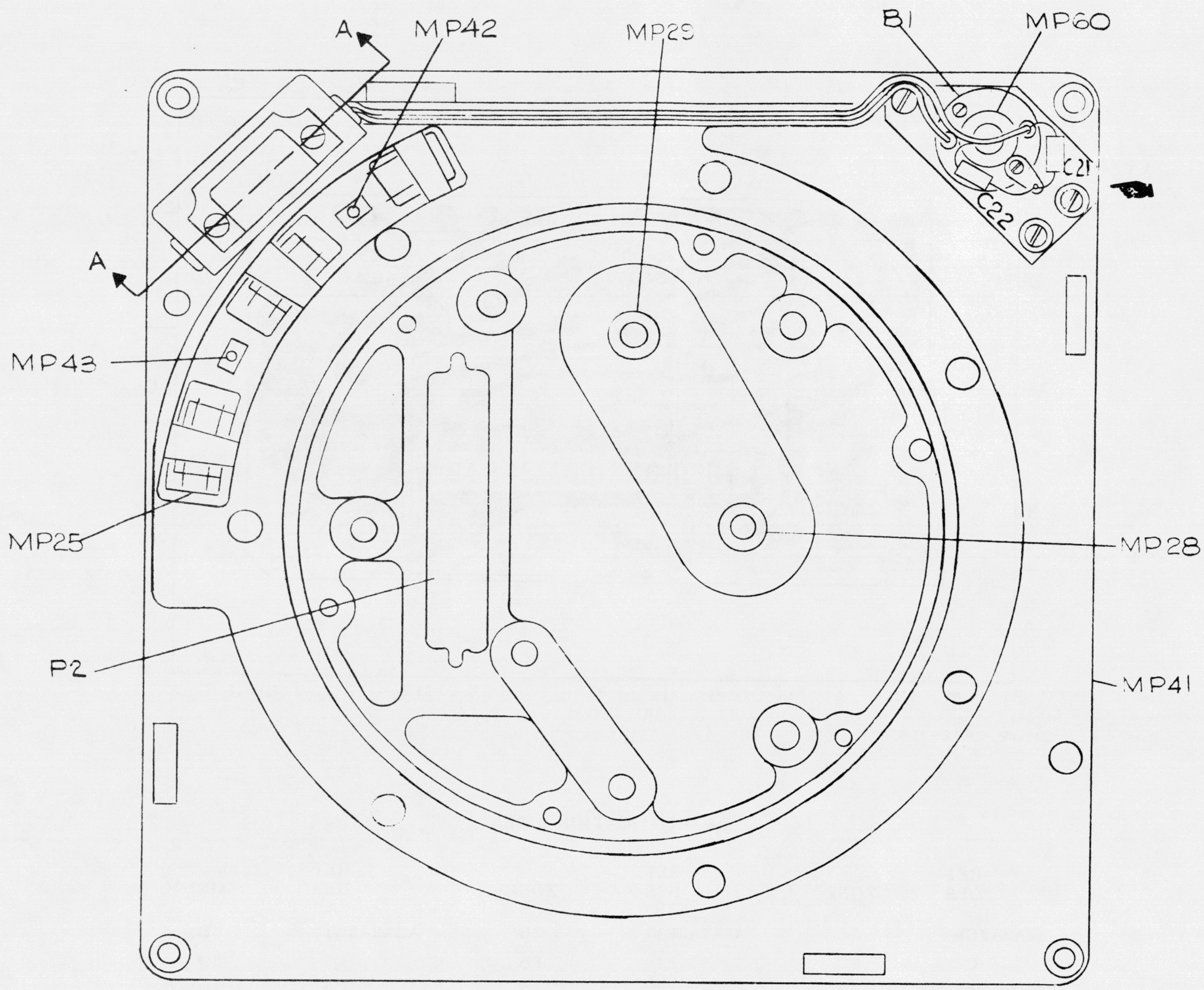


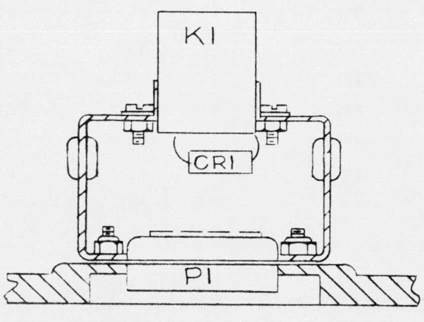
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A2A3C1	5C	A2A2A3E3	2B	A2A2A3Q1	6D
C2	6C	E4	6B	Q2	5D
C3	6C	E5	6B	Q3	4D
C4	5C	E6	2D	R1	6B
C5	3D	E7	5B	R2	6D
C6	2D	E8	6C	R3	6B
C7	2B	E9	2D	R4	4D
C8	2D	E10	4D	R5	3D
CR1	4D	E11	4C	R6	2B
CR2	2C	E12	6D	R7	3D
E1	4D	E13	7D	T1	3B
E2	5D	L1	2C	TP1	6B

A2A3 identical to A2A2

Figure 7-14. SSB-AM Detector Subassemblies A2A2A3 and A2A3A3





C42-002-140A

Figure 7-15. Mounting Base Assembly (P/O A2A4)

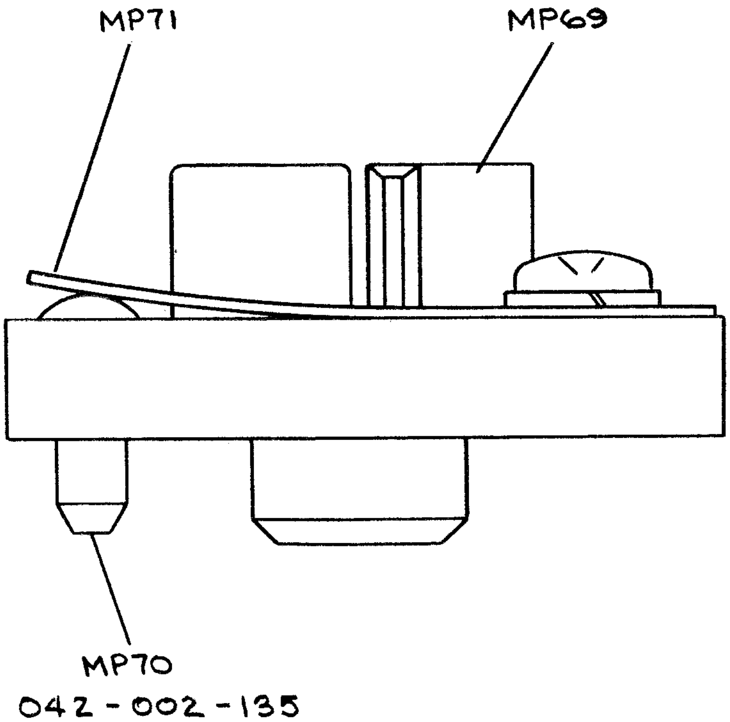


Figure 7-16. Top Coupling Assembly (P/O A2A4)

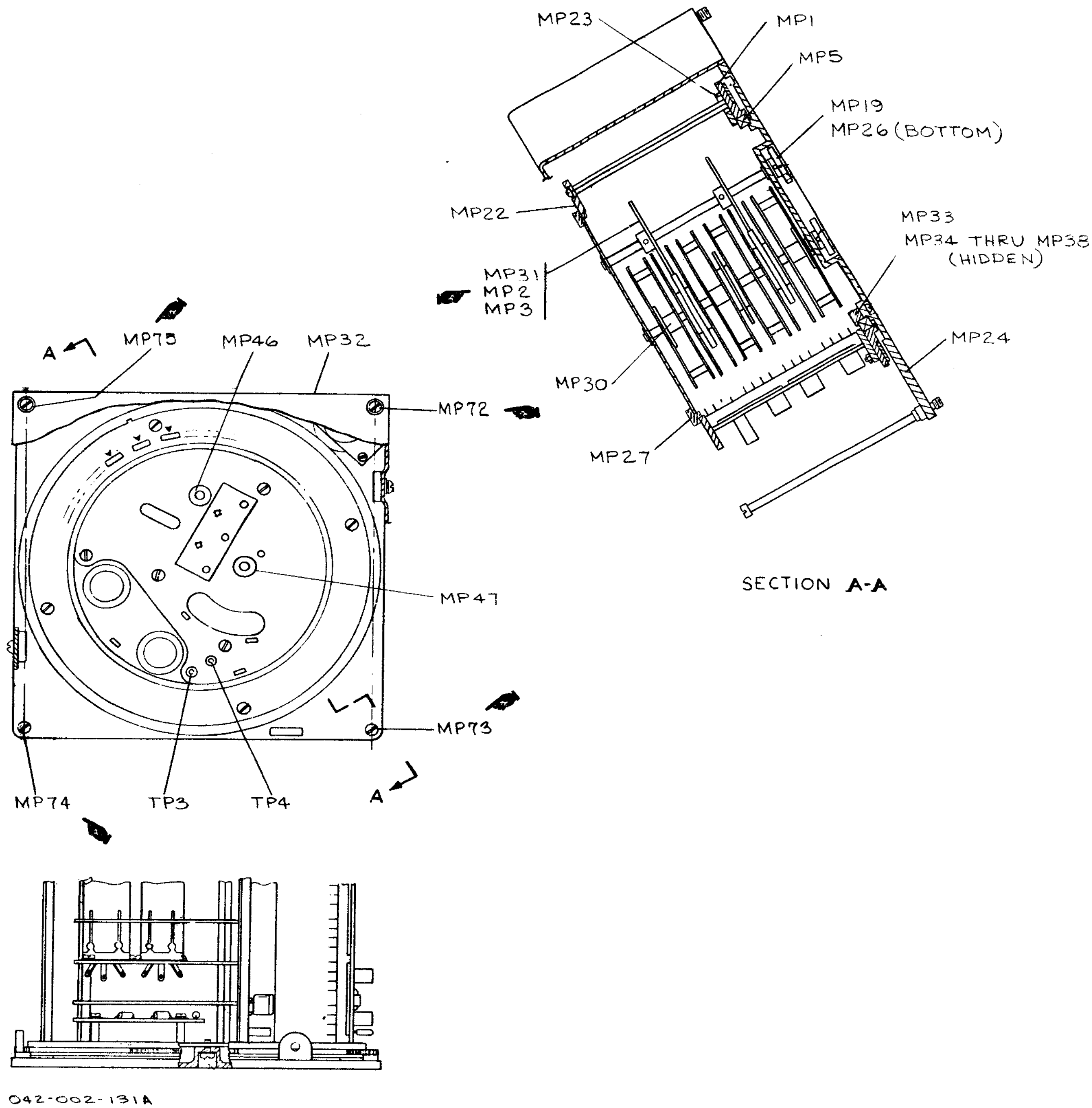


Figure 7-17. RF Amplifier Assembly A2A4

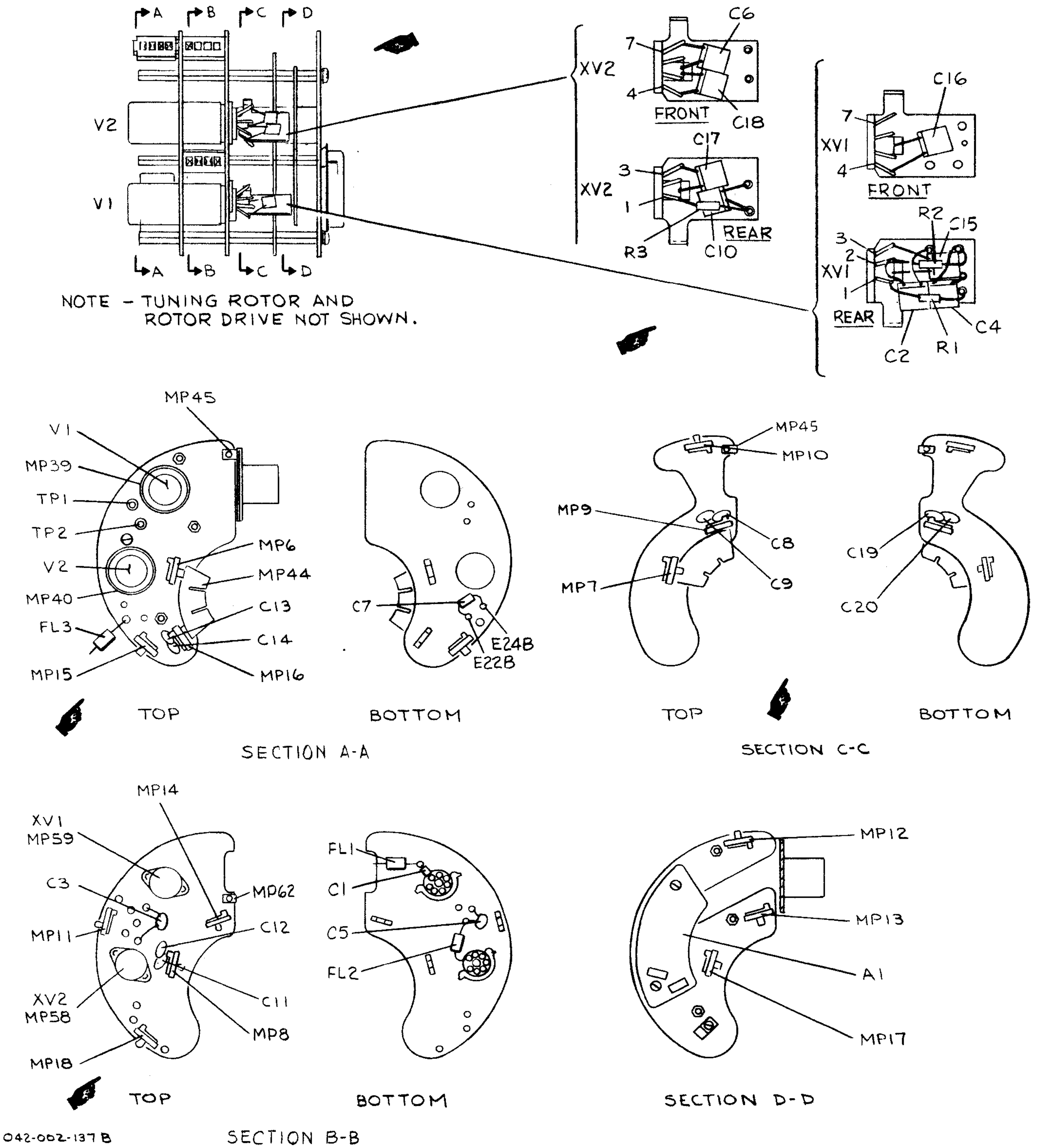


Figure 7-18. RF Chassis Assembly (P/O A2A4)

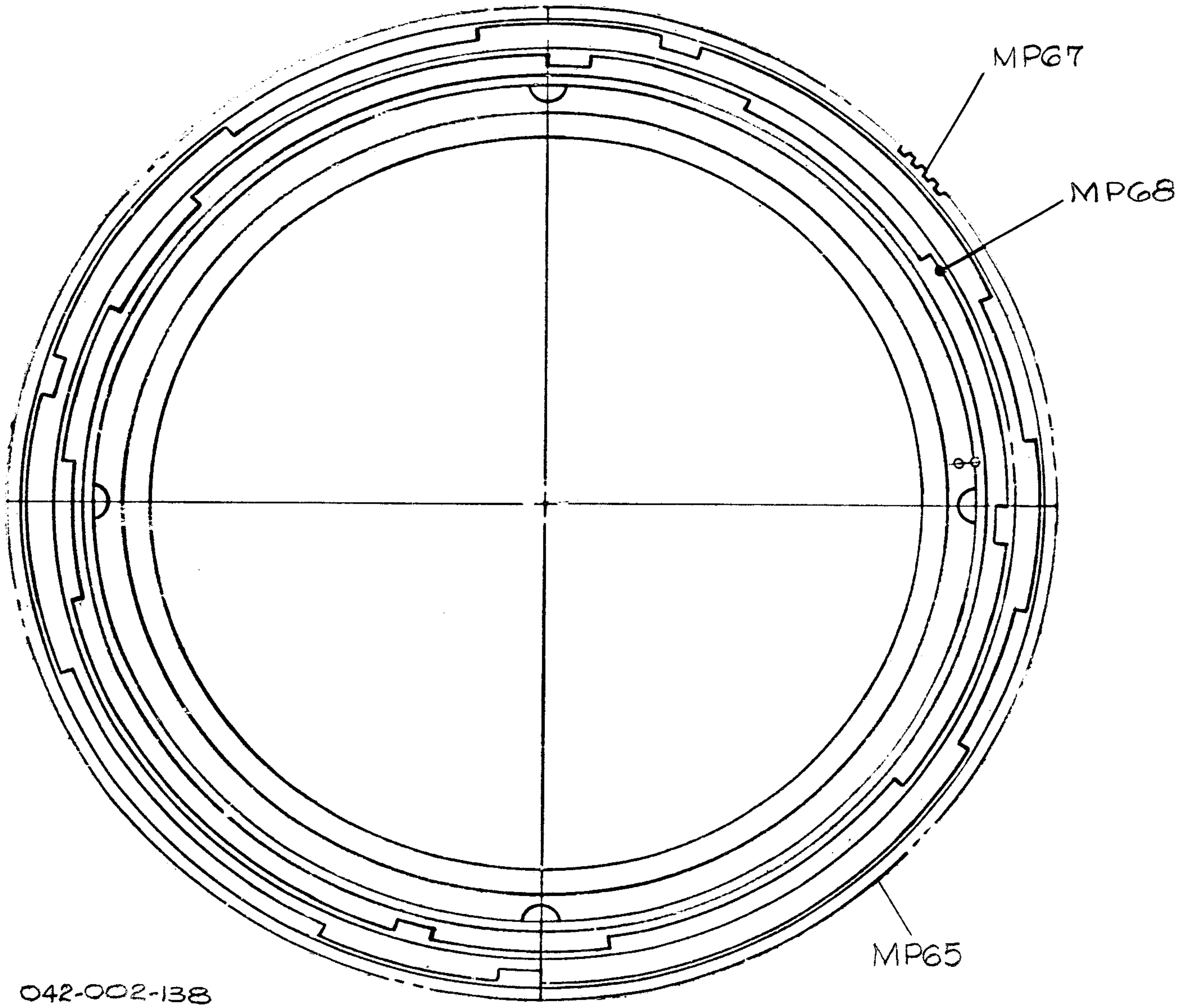


Figure 7-19. Turret Drive Gear Assembly (P/O A2A4)

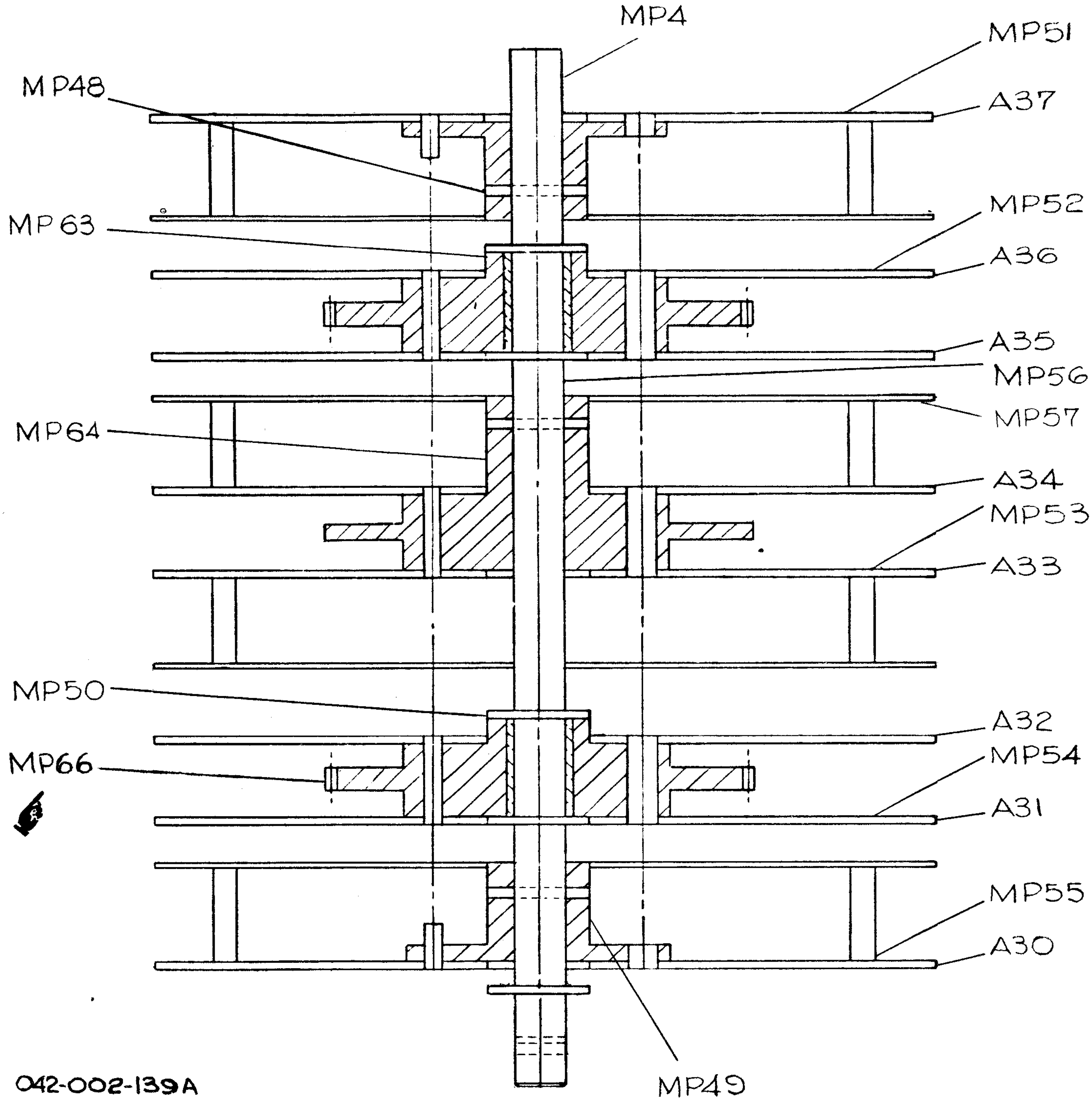
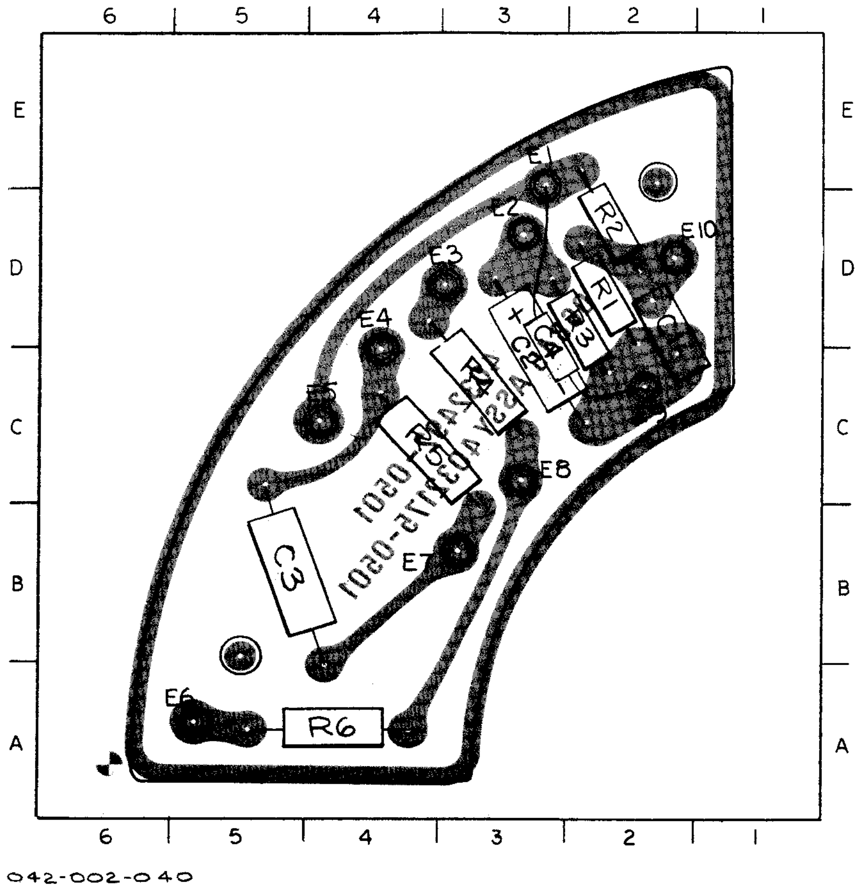


Figure 7-20. Tuning Rotor Assembly (P/O A2A4)



PART LOCATION INDEX

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A2A4A1C1	2D	A2A4A1E4	4D	A2A4A1R1	2D
C2	3D	E5	4C	R2	2D
C3	5B	E6	5A	R3	2D
C4	2D	E7	3B	R4	3C
E1	3E	E8	3C	R5	4C
E2	3D	E9	2C	R6	4A
E3	3D	E10	2D		

Figure 7-21. RF Amplifier Subassembly A2A4A1

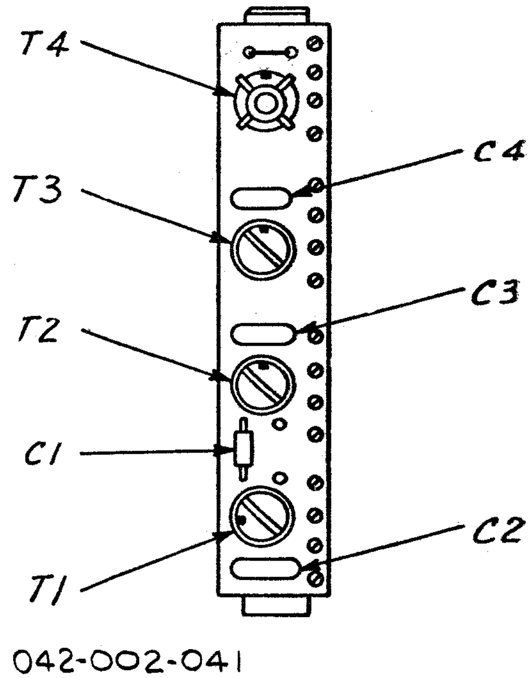


Figure 7-22. 12-MHz Subassembly A2A4A2

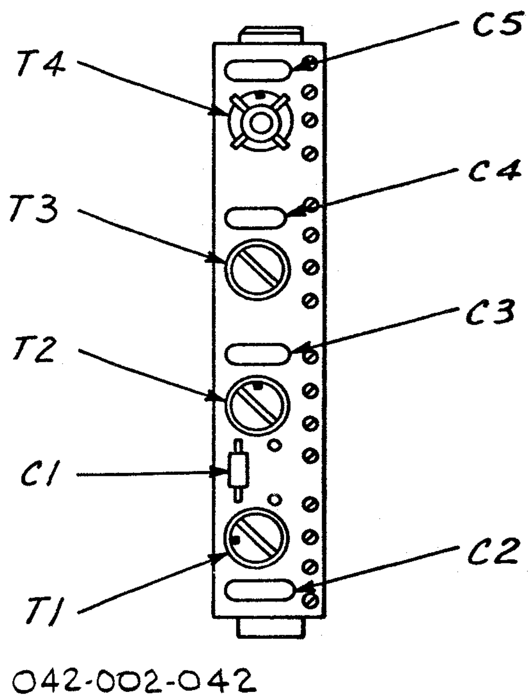


Figure 7-23. 13-MHz Subassembly A2A4A3

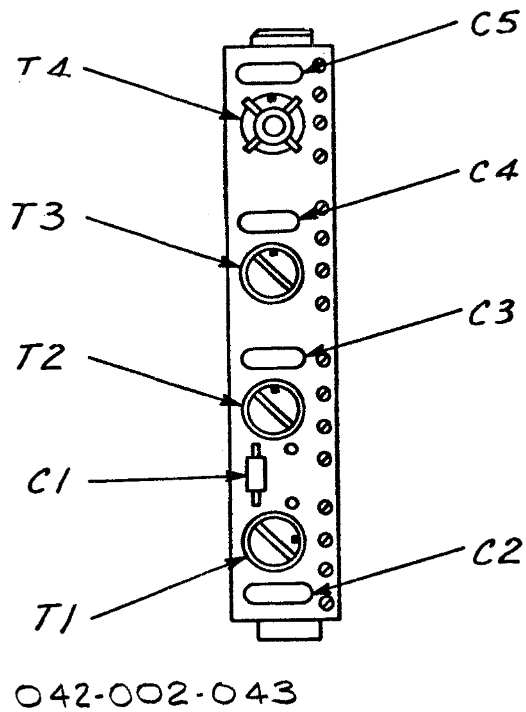


Figure 7-24. 14-MHz Subassembly A2A4A4

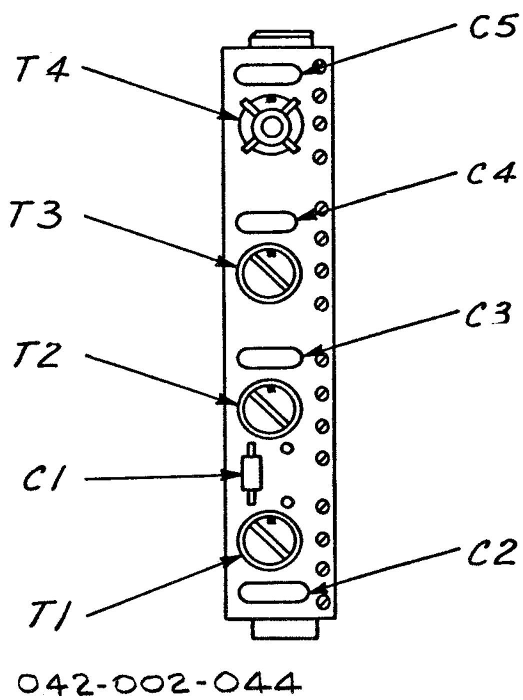


Figure 7-25. 15-MHz Subassembly A2A4A5

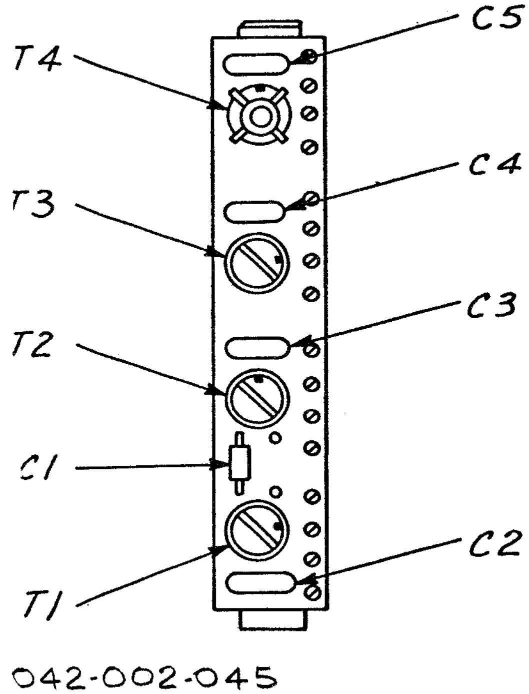


Figure 7-26. 16-MHz Subassembly A2A4A6

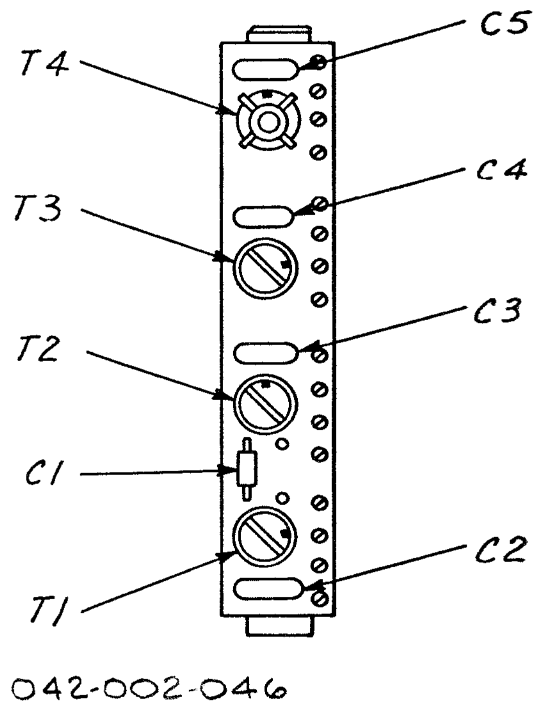


Figure 7-27. 17-MHz Subassembly A2A4A7

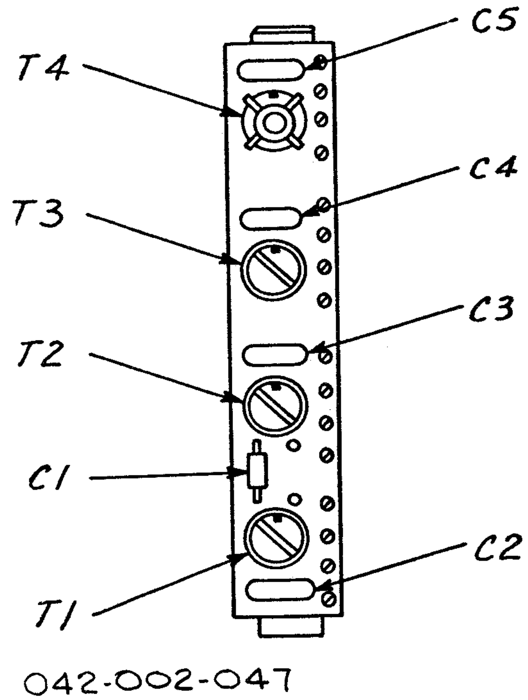


Figure 7-28. 18-MHz Subassembly A2A4A8

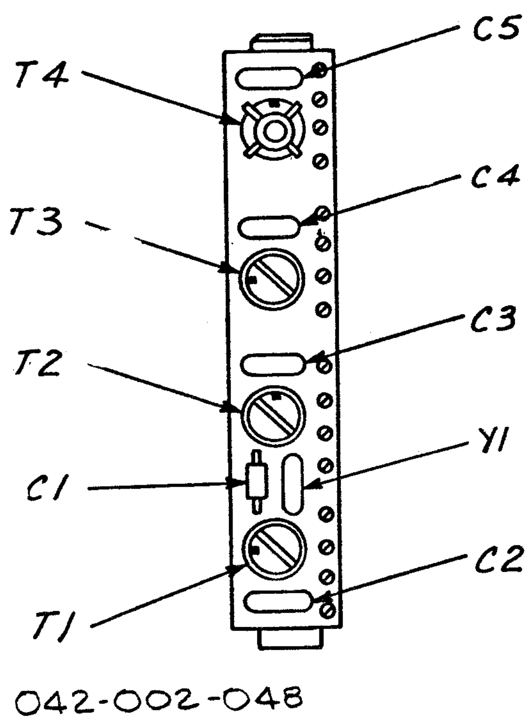


Figure 7-29. 19-MHz Subassembly A2A4A9

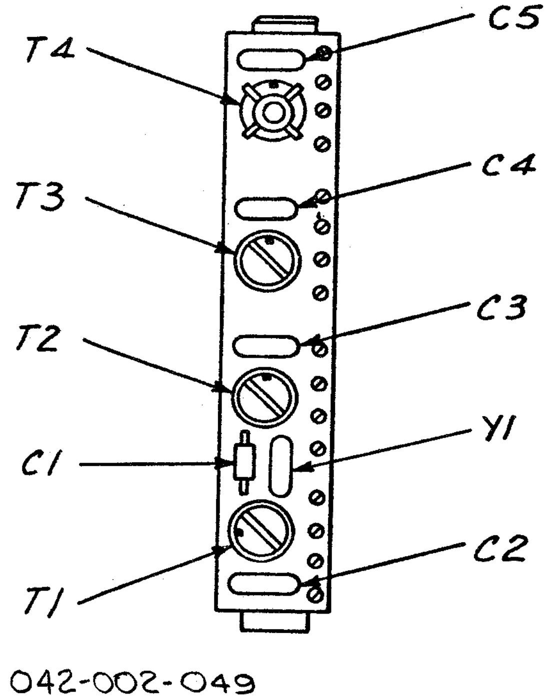


Figure 7-30. 20-MHz Subassembly A2A4A10

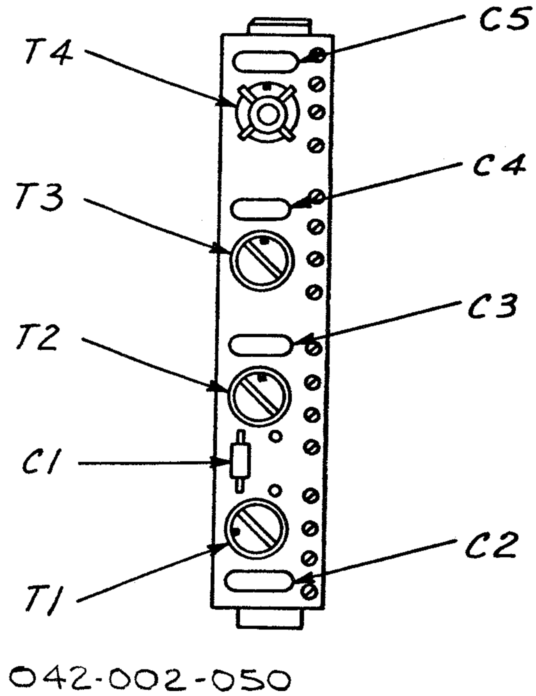


Figure 7-31. 21-MHz Subassembly A2A4A11

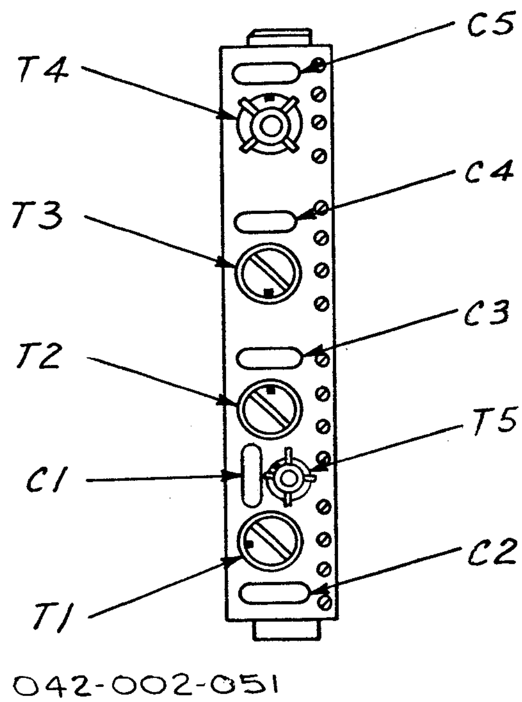


Figure 7-32. 22-MHz Subassembly A2A4A12

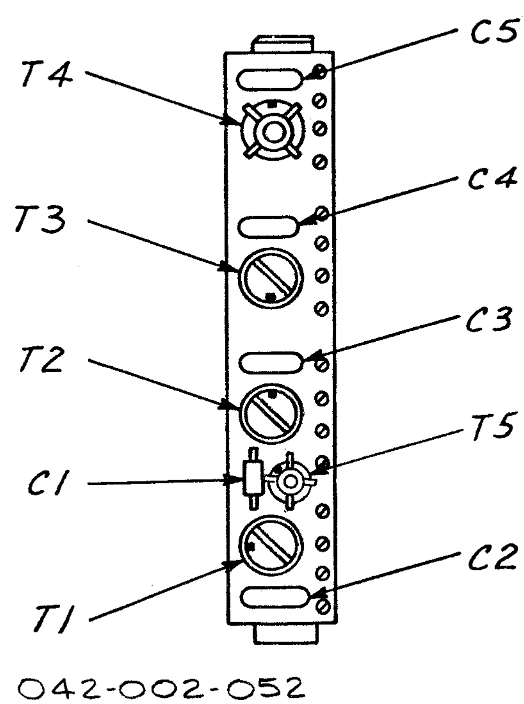


Figure 7-33. 23-MHz Subassembly A2A4A13

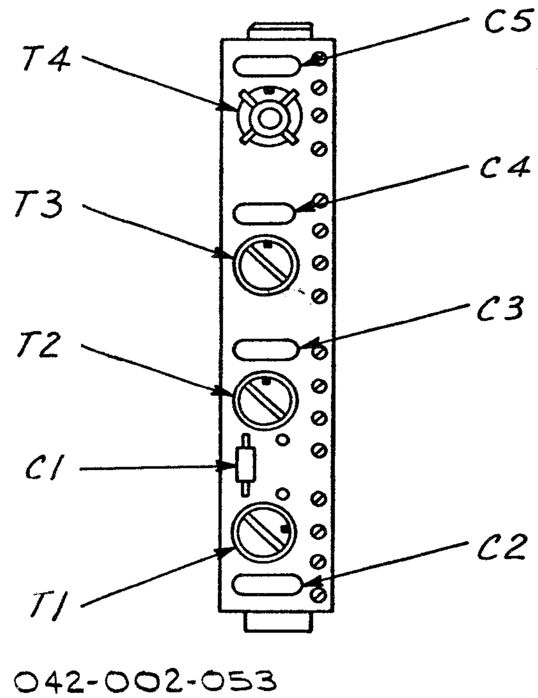


Figure 7-34. 24-MHz Subassembly A2A4A14

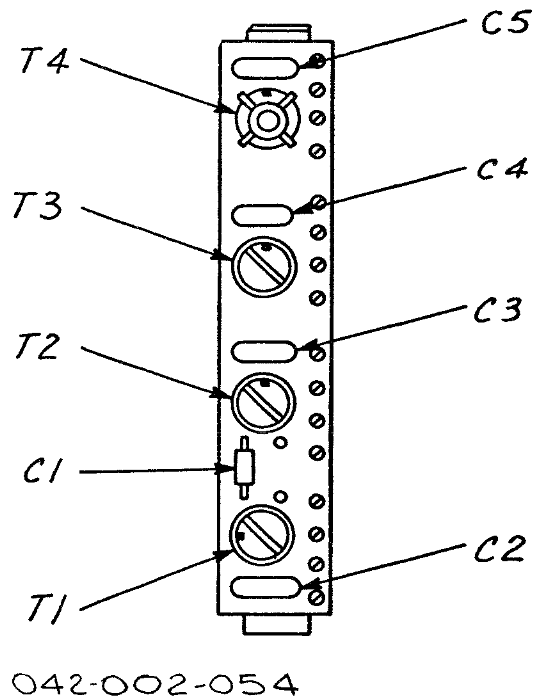


Figure 7-35. 25-MHz Subassembly A2A4A15

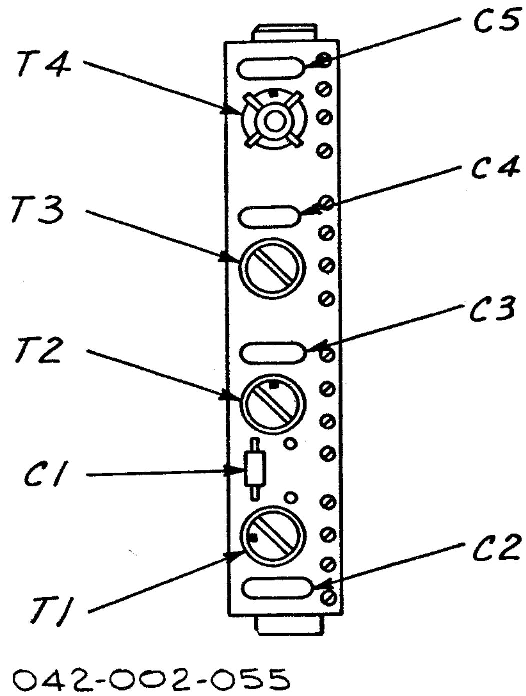


Figure 7-36. 26-MHz Subassembly A2A4A16

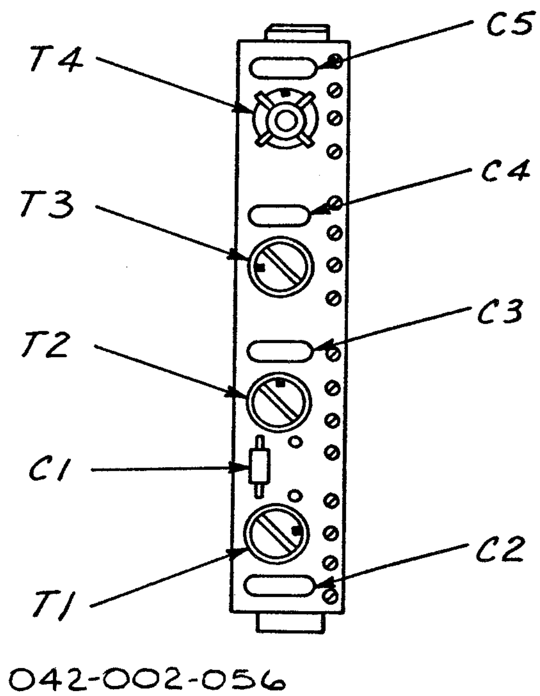
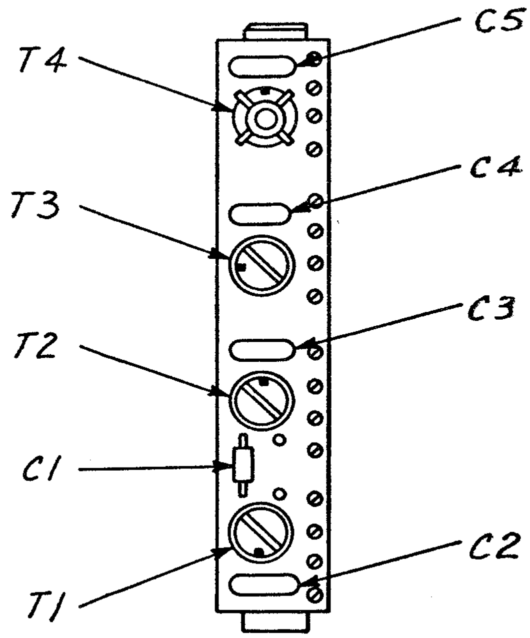
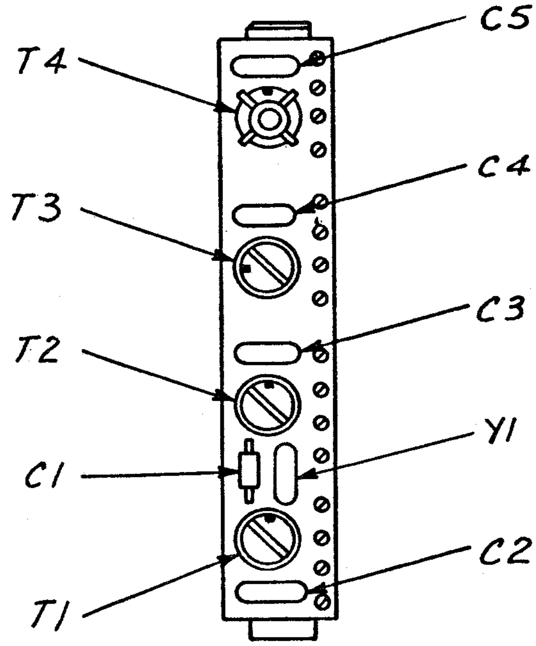


Figure 7-37. 27-MHz Subassembly A2A4A17



042-002-057

Figure 7-38. 28-MHz Subassembly A2A4A18



042-002-058

Figure 7-39. 29-MHz Subassembly A2A4A19

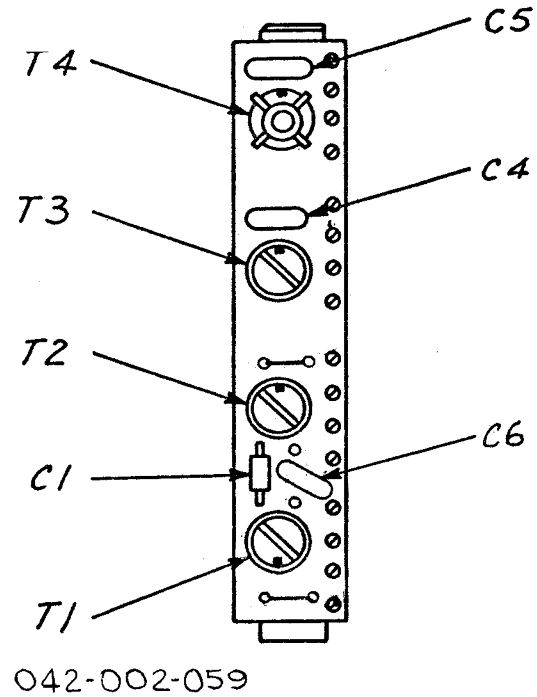


Figure 7-40. 2-MHz Subassembly A2A4A20

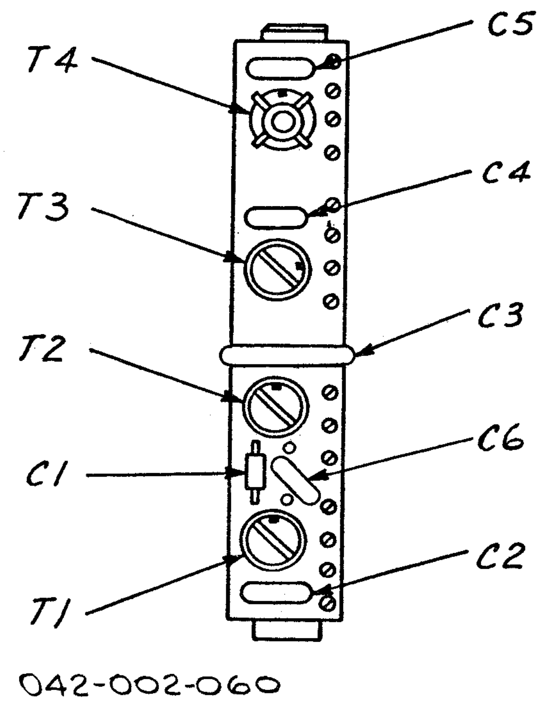


Figure 7-41. 3-MHz Subassembly A2A4A21

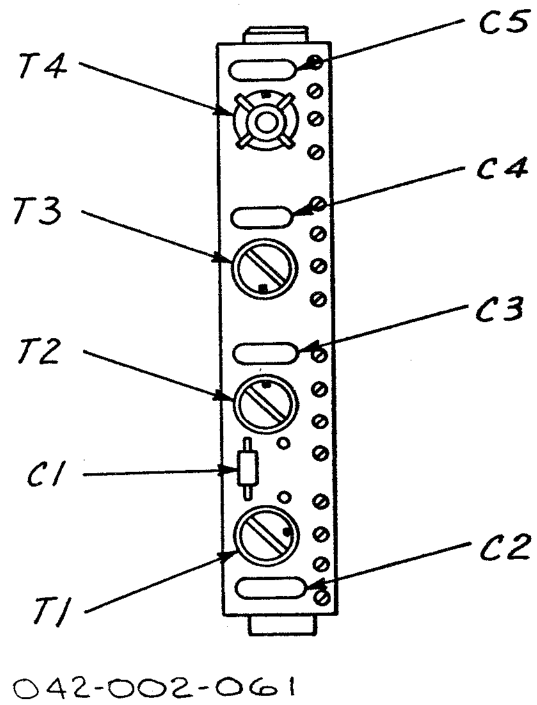


Figure 7-42. 4-MHz Subassembly A2A4A22

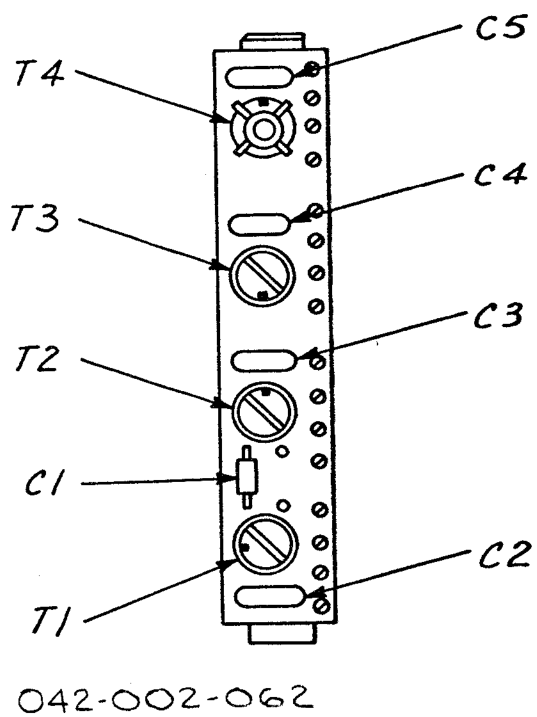


Figure 7-43. 5-MHz Subassembly A2A4A23

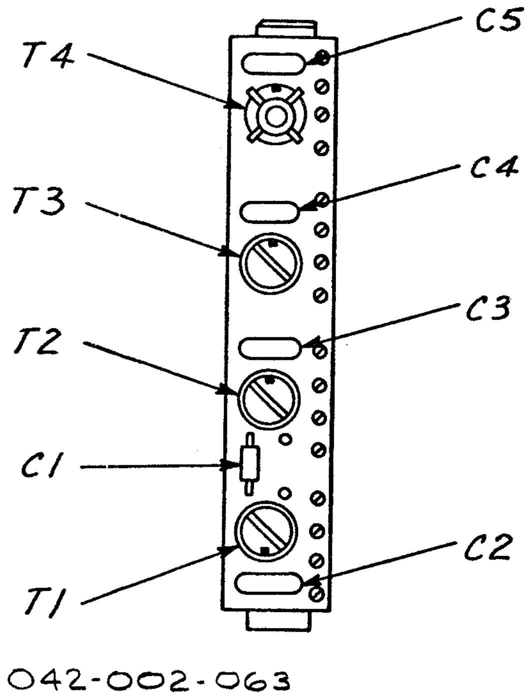


Figure 7-44. 6-MHz Subassembly A2A4A24

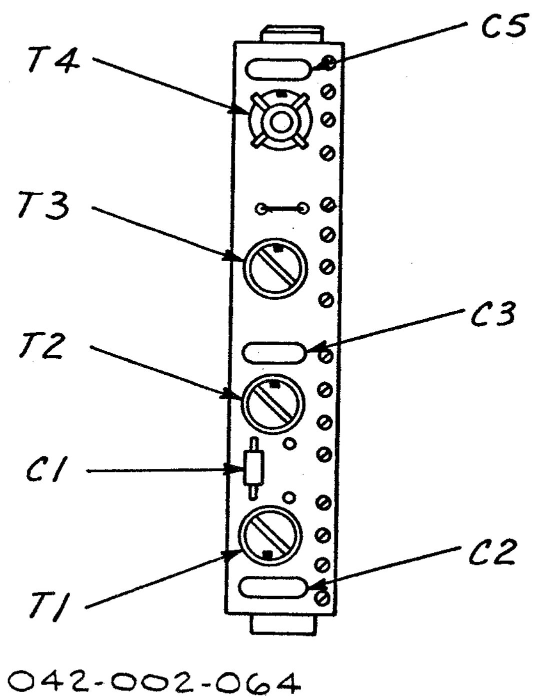


Figure 7-45. 7-MHz Subassembly A2A4A25

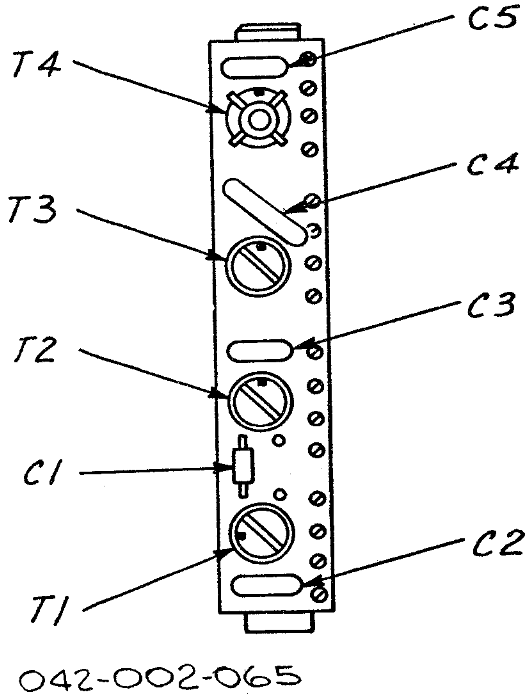


Figure 7-46. 8-MHz Subassembly A2A4A26

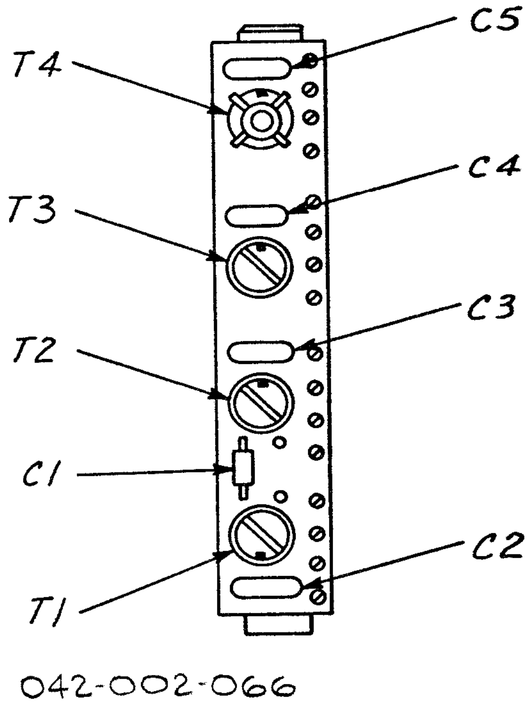


Figure 7-47. 9-MHz Subassembly A2A4A27

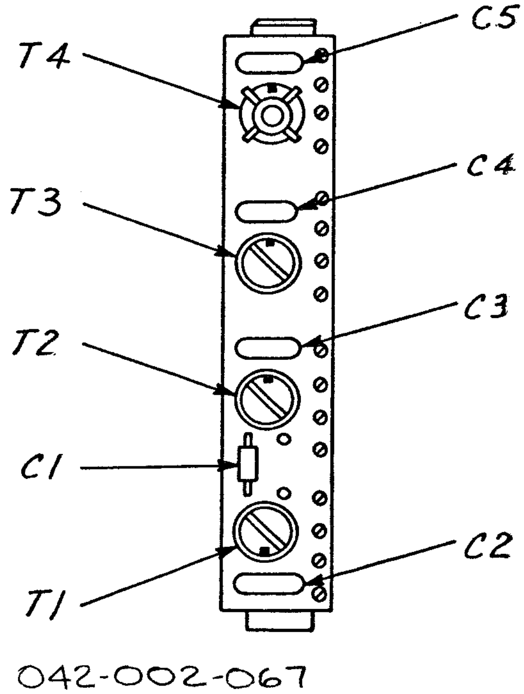


Figure 7-48. 10-MHz Subassembly A2A4A28

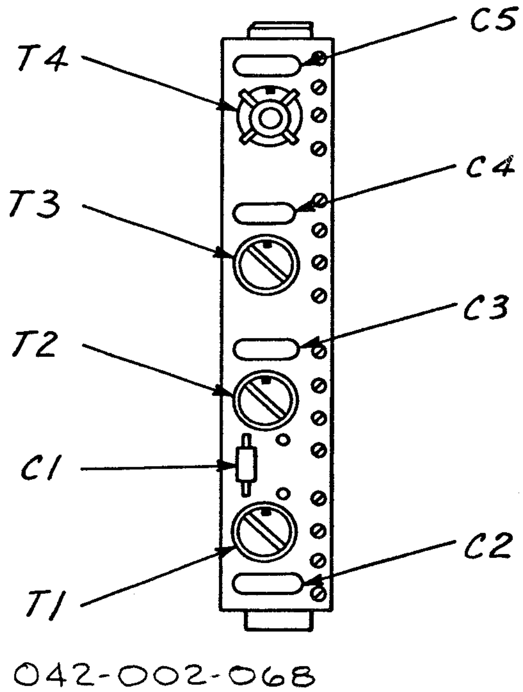
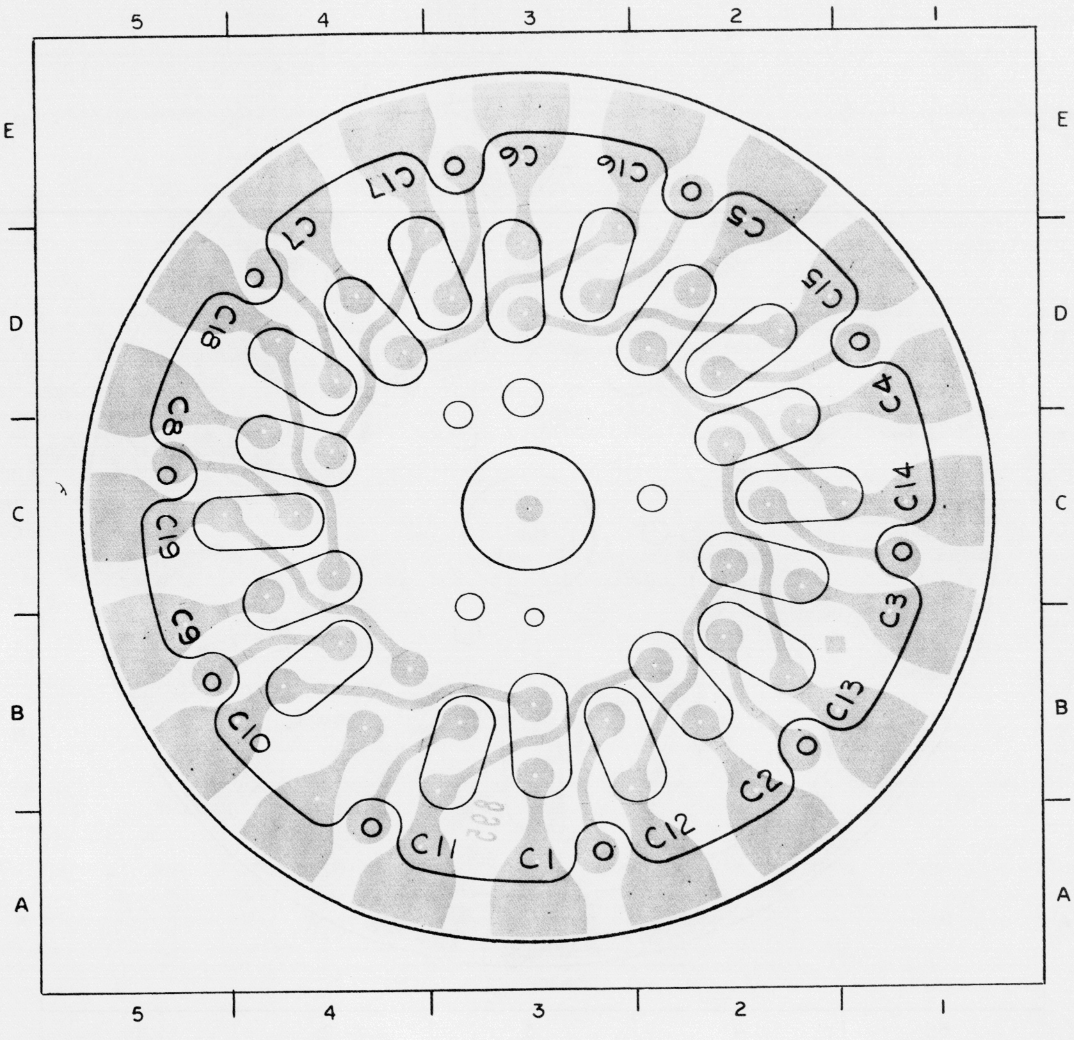


Figure 7-49. 11-MHz Subassembly A2A4A29



PART LOCATION INDEX

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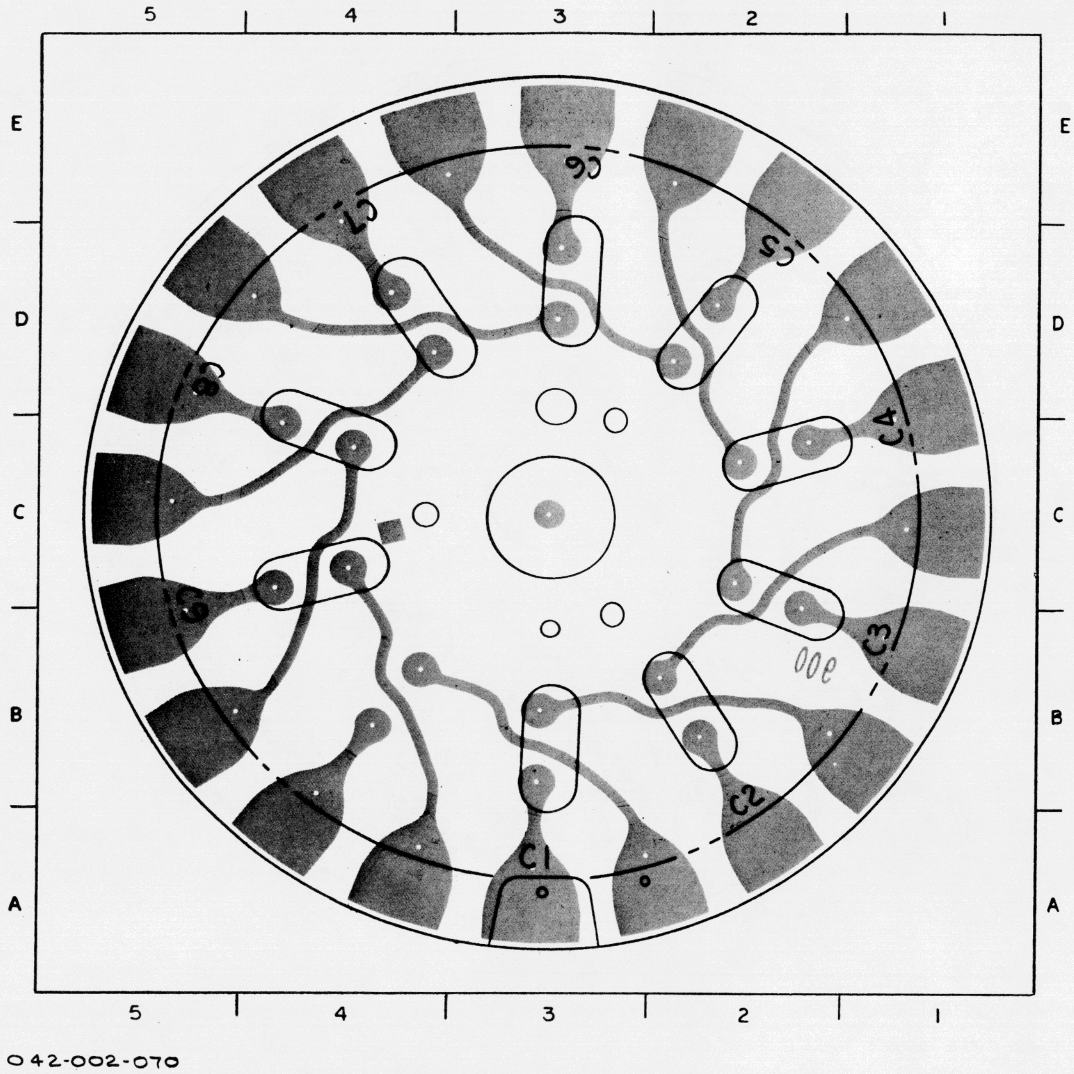
A2A4A30C1	3B	A2A4A30C8	4C	A2A4A30C14	2C
C2	2B	C9	4C	C15	2D
C3	2C	C10	4B	C16	3D
C4	2C	C11	3B	C17	4D
C5	2D	C12	2B	C18	4D
C6	3D	C13	2B	C19	4C
C7	4D				

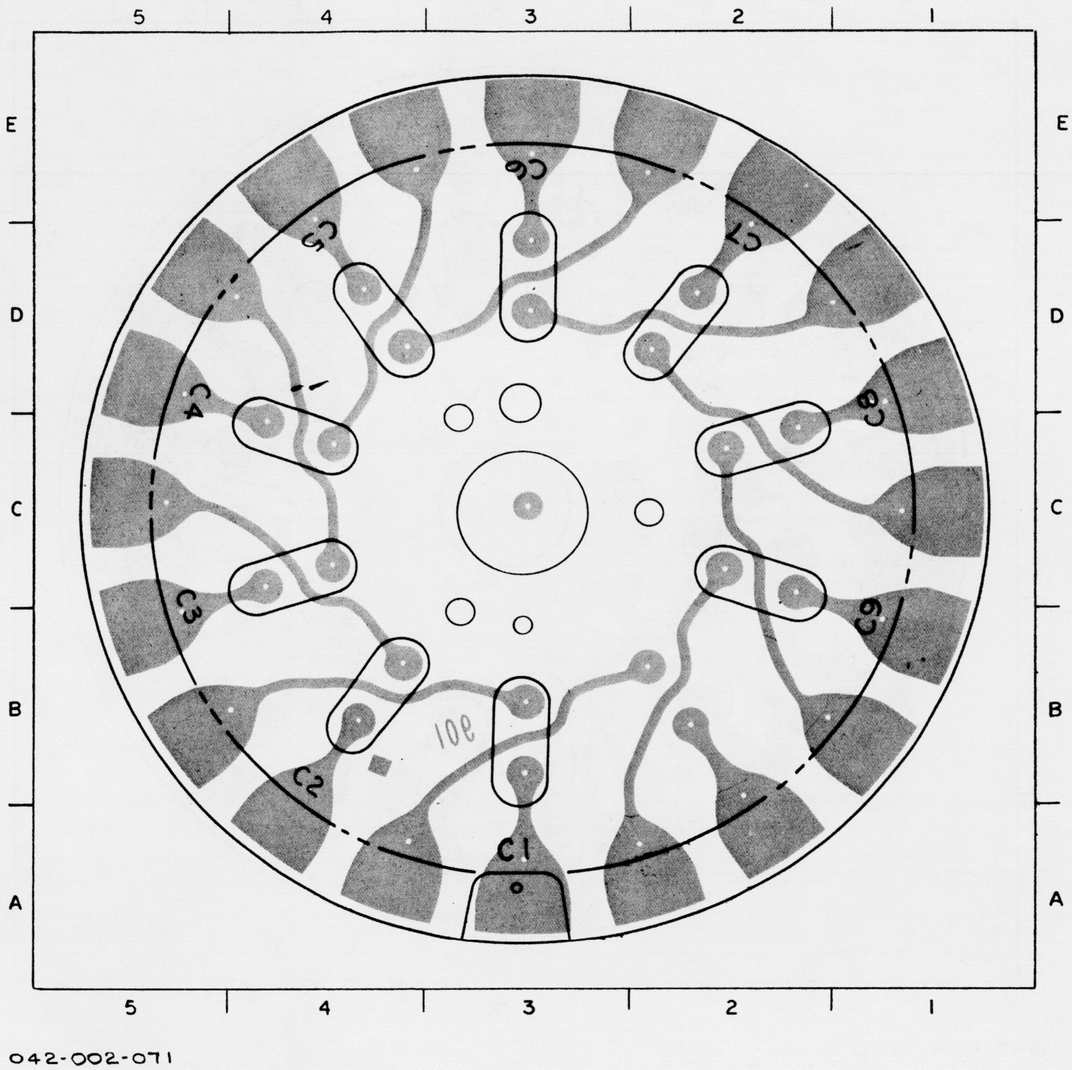
Figure 7-50. 100-kHz Rotor Subassembly A2A4A30



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A31C1	3B	A2A4A31C4	2C	A2A4A31C7	4D
C2	2B	C5	2D	C8	4C
C3	2C	C6	3D	C9	4C

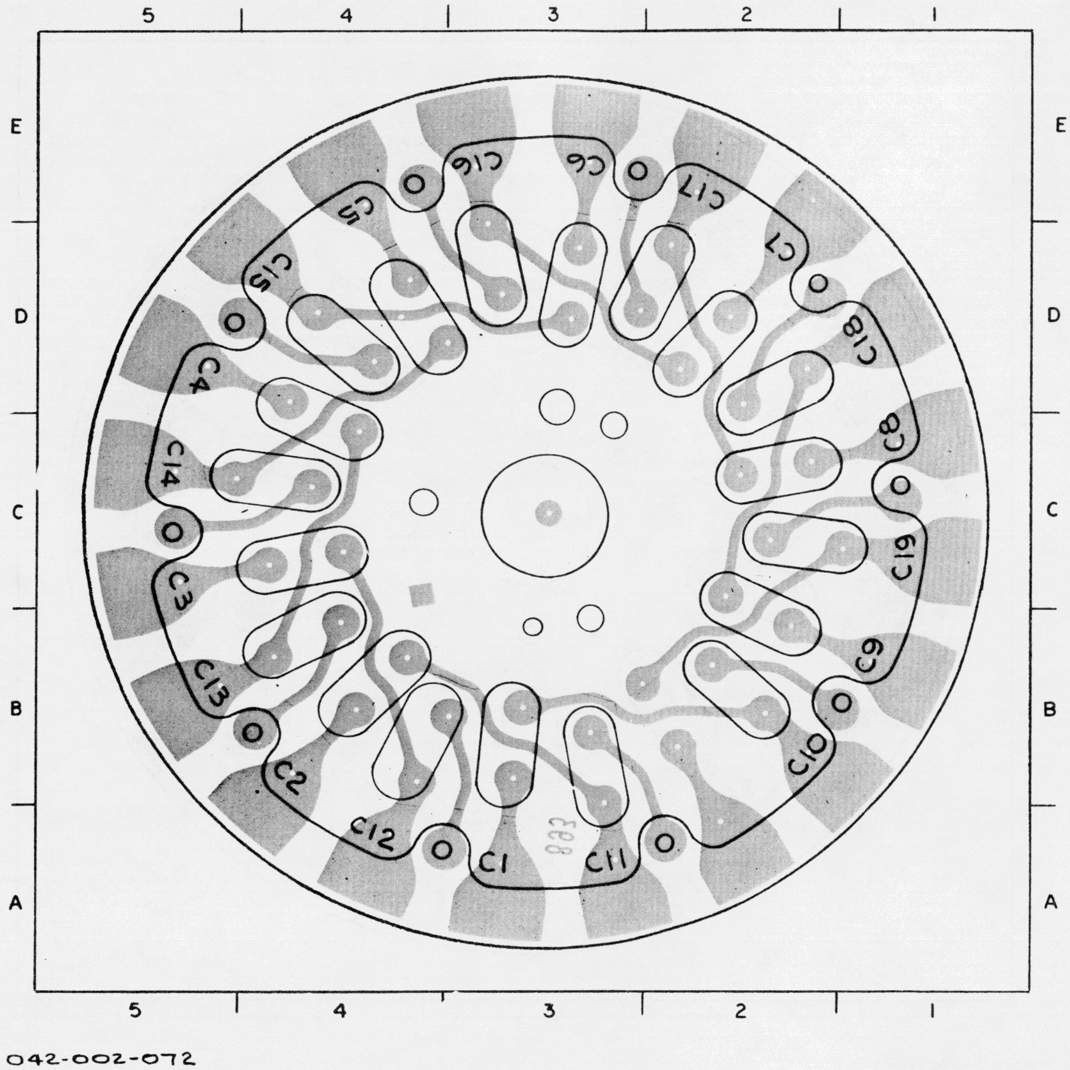
Figure 7-51. 10-kHz Rotor Subassembly A2A4A31



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A32C1	3B	A2A4A32C4	4C	A2A4A32C7	2D
C2	4B	C5	4D	C8	2C
C3	4C	C6	3D	C9	2C

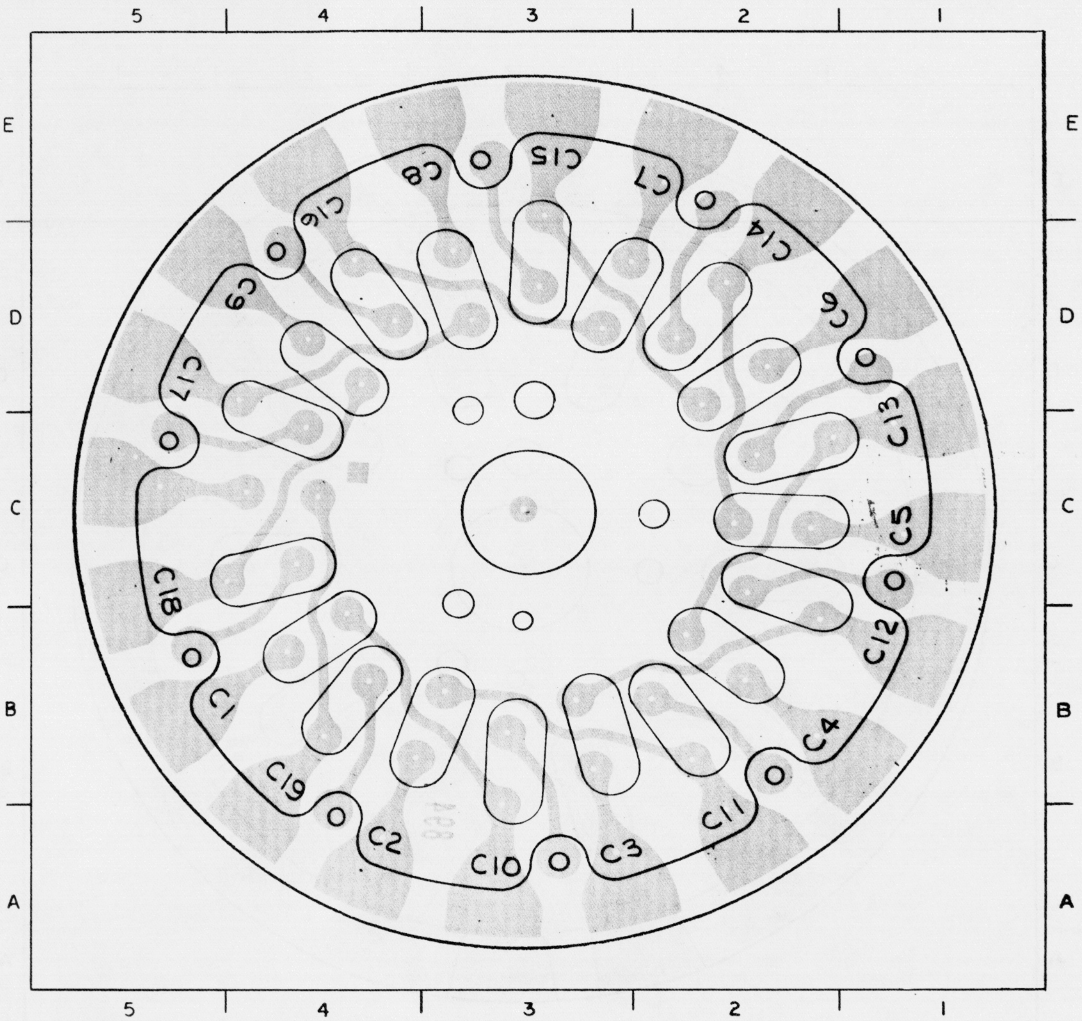
Figure 7-52. 10-kHz Rotor Subassembly A2A4A32



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A33C1	3B	A2A4A33C8	2C	A2A4A33C14	4C
C2	4B	C9	2B	C15	4D
C3	4C	C10	2B	C16	3D
C4	4C	C11	3B	C17	2D
C5	4D	C12	4B	C18	2D
C6	3D	C13	4B	C19	2C
C7	2D				

Figure 7-53. 100-kHz Rotor Subassembly A2A4A33



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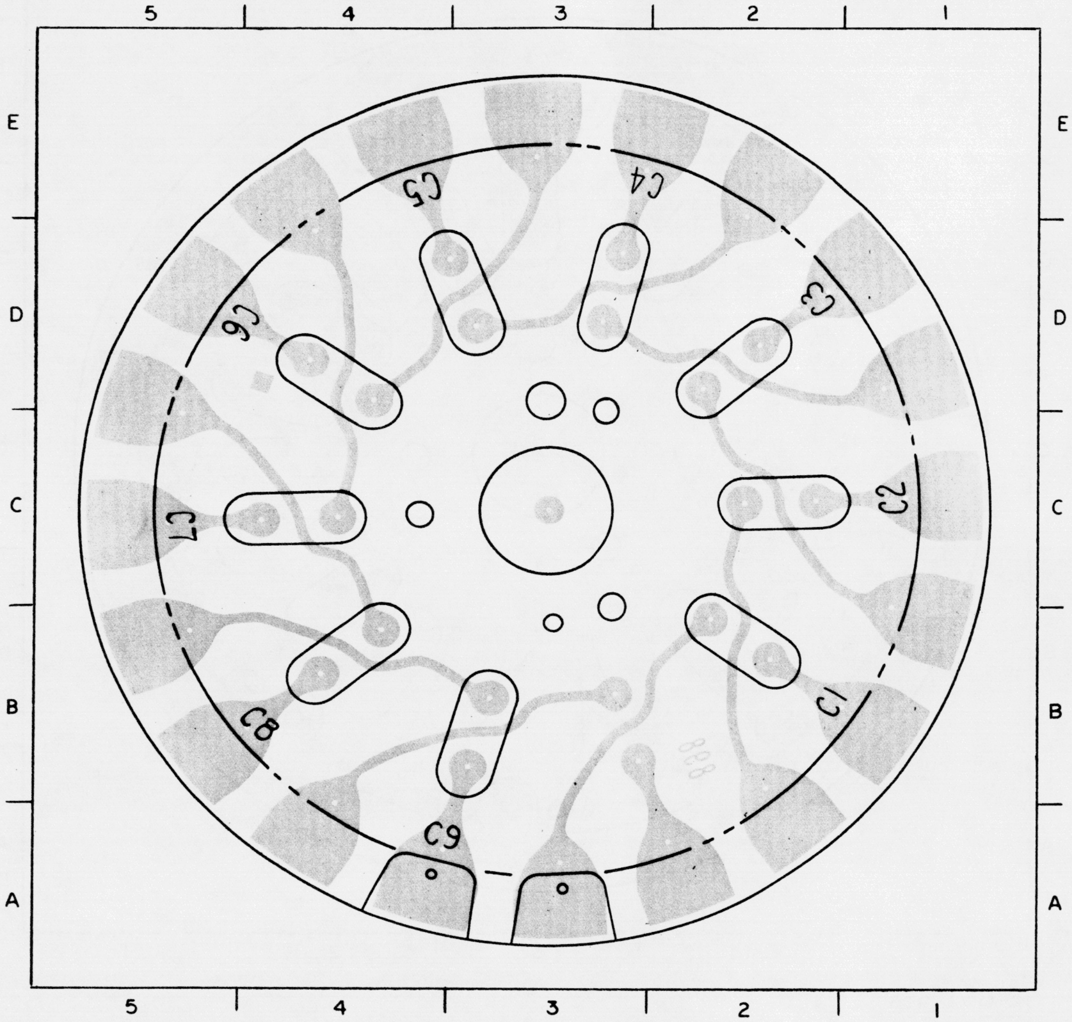
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A34C1	4B	A2A4A34C8	3D	A2A4A34C14	2D
C2	4B	C9	4D	C15	3D
C3	3B	C10	3B	C16	4D
C4	2B	C11	2B	C17	4C
C5	2C	C12	2C	C18	4C
C6	2D	C13	2C	C19	4B
C7	3D				

Figure 7-54. 100-kHz Rotor Subassembly A2A4A34



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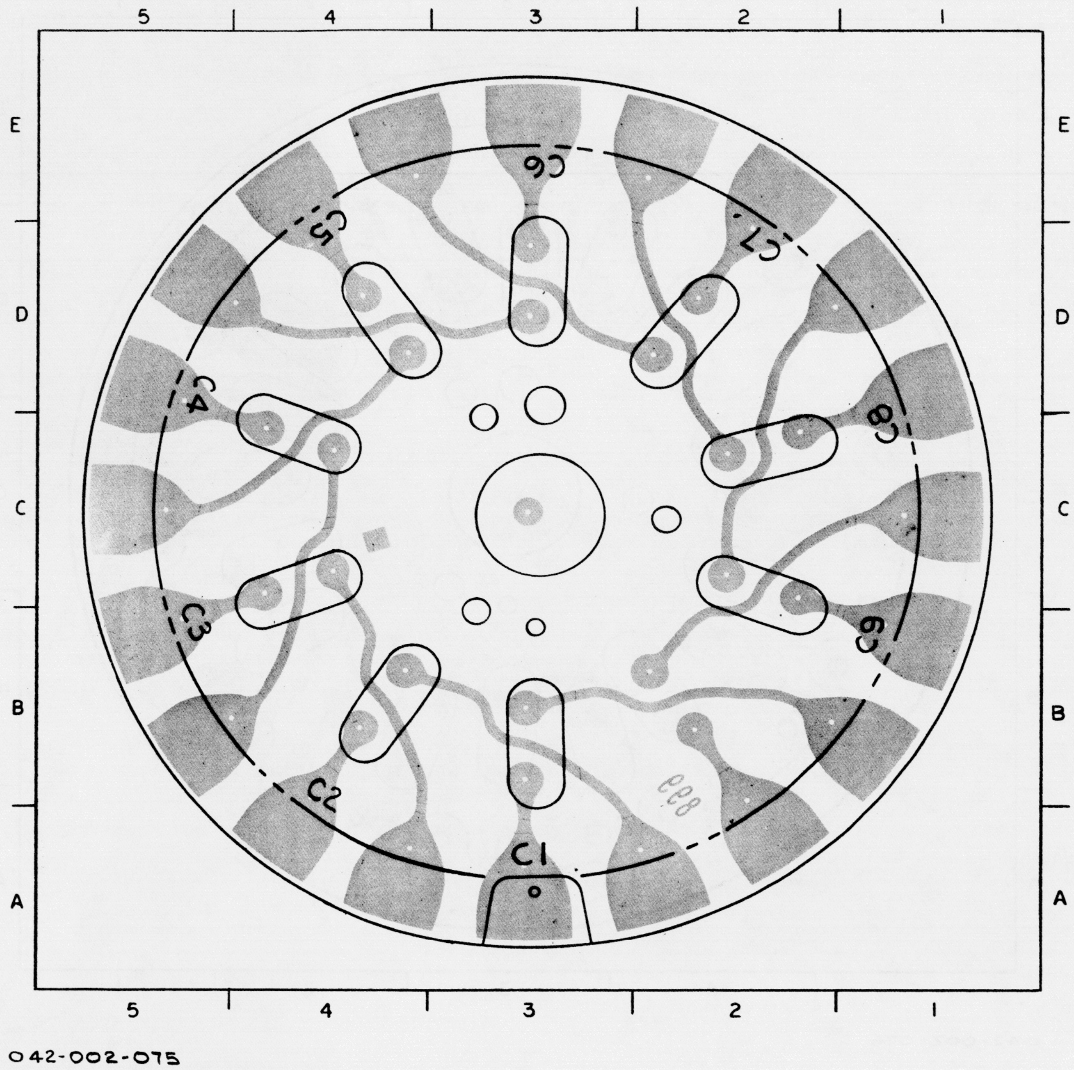
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A35C1	2B	A2A4A35C4	3D	A2A4A35C7	4C
C2	2C	C5	3D	C8	4B
C3	2D	C6	4D	C9	3B

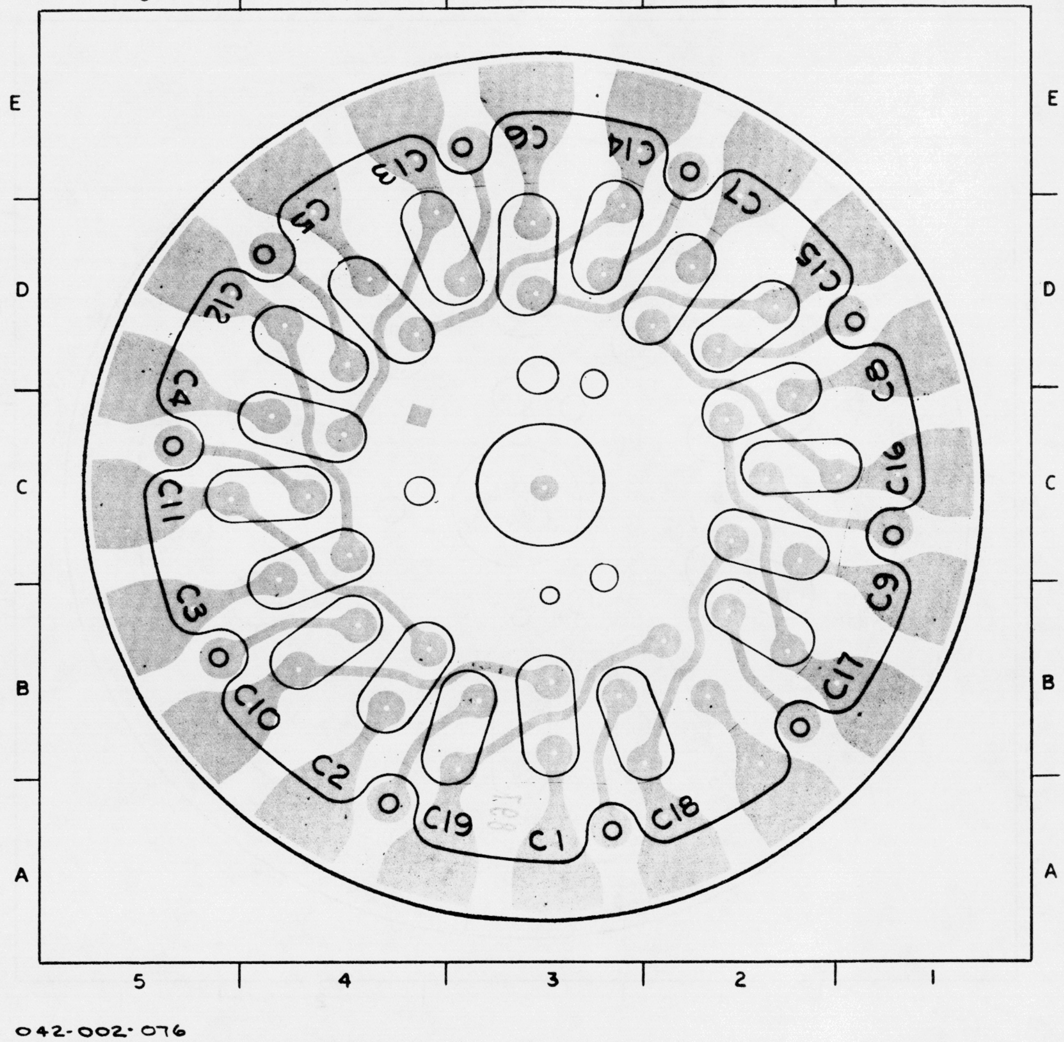
Figure 7-55. 10-kHz Rotor Subassembly A2A4A35



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A36C1	3B	A2A4A36C4	4C	A2A4A36C7	2D
C2	4B	C5	4D	C8	2C
C3	4C	C6	3D	C9	2C

Figure 7-56. 10-kHz Rotor Subassembly A2A4A36



PART LOCATION INDEX

REF DES	ZONE	REF	ZONE	REF DES	ZONE
A2A4A37C1	3B	A2A4A37C7	2D	A2A4A37C13	4D
C2	4B	C8	2D	C14	3D
C3	4C	C9	2C	C15	2D
C4	4C	C10	4B	C16	2C
C5	4D	C11	4C	C17	2B
C6	3D	C12	4D	C18	2B
				C19	4B

Figure 7-57. 100-kHz Rotor Subassembly A2A4A37

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A4A38C1	3G	A2A4A38E5	4E	A2A4A38R8	1H
C2	2F	E6	2C	R9	3F
C3	2H	FL1	2G	R10	3F
C4	2H	FL2	3F	R11	3F
C5	4F	FL3	3D	R12	2F
C6	2E	K1	3C	R13	3F
C7	3E	L1	3E	R14	3E
C8	2F	Q1	2G	R15	1F
C9	3E	Q2	2F	R16	2E
C10	2E	Q3	2D	R17	3E
C11	1G	R1	3G	R18	2E
C12	3F	R2	2G	R19	2D
C13	2E	R3	2G	R20	3D
E1	1G	R4	2G	R21	1H
E2	2H	R5	2H	TP1	3H
E3	3G	R6	3H	TP2	4H
E4	4G	R7	2F		

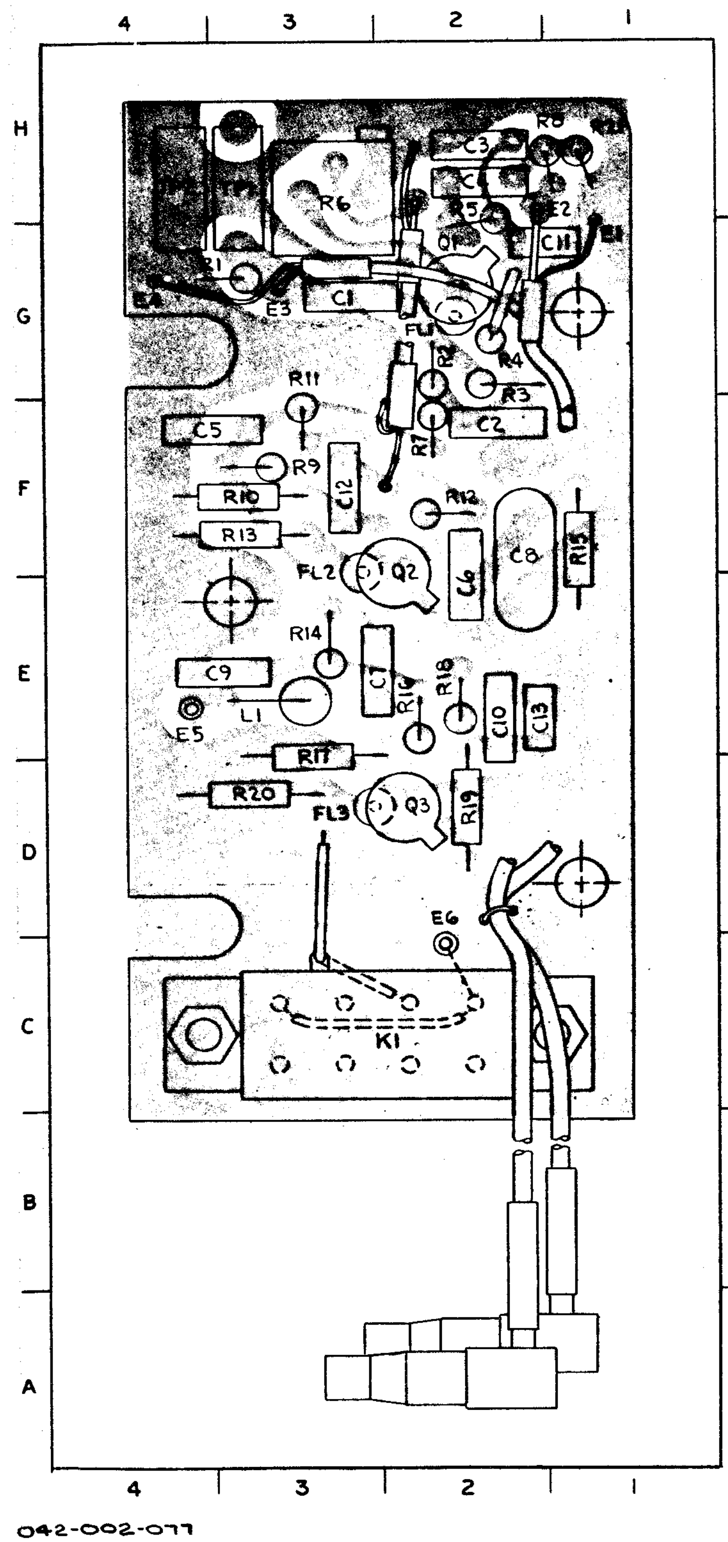


Figure 7-58. Translator/Mixer Subassembly A2A4A38

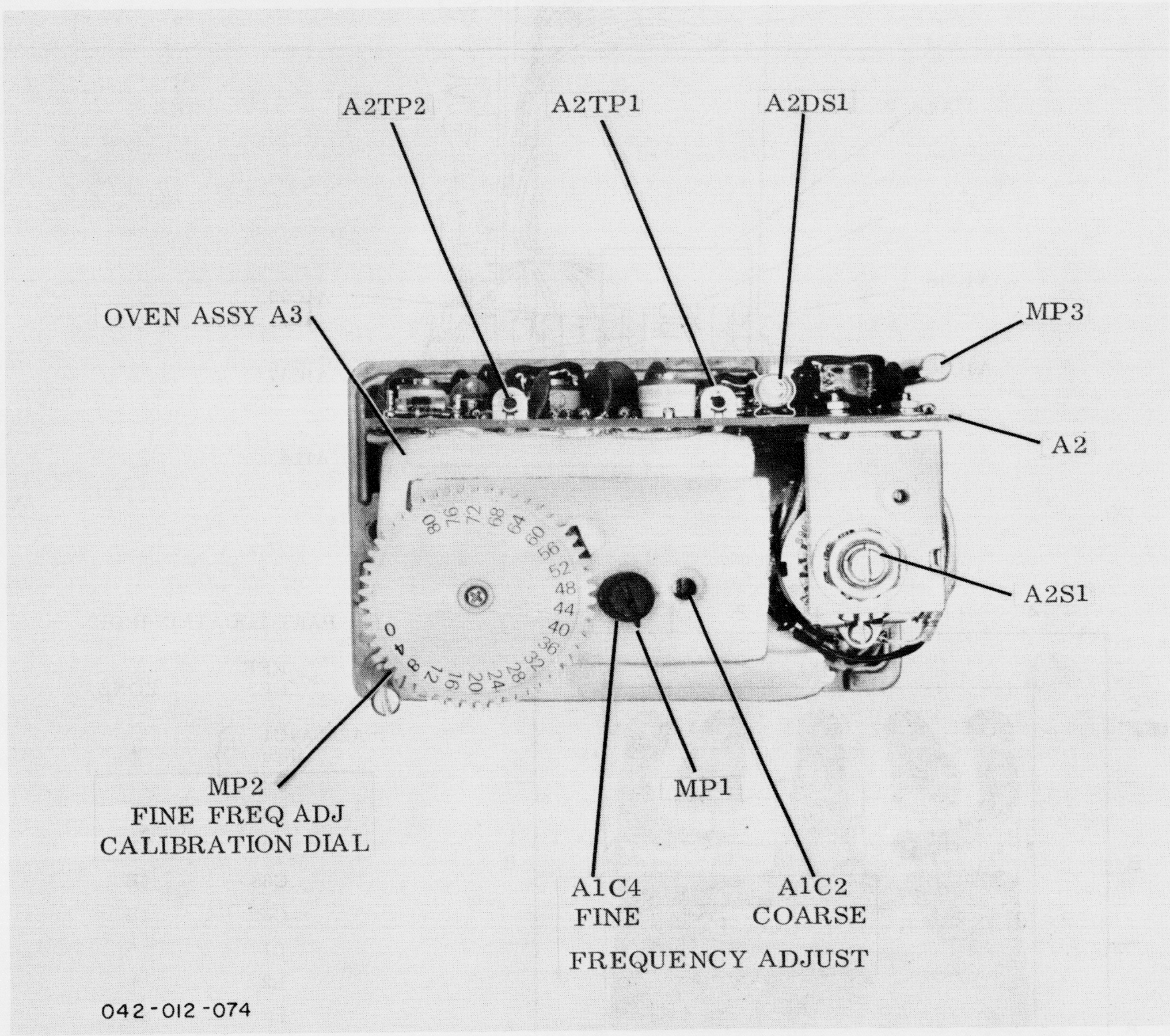
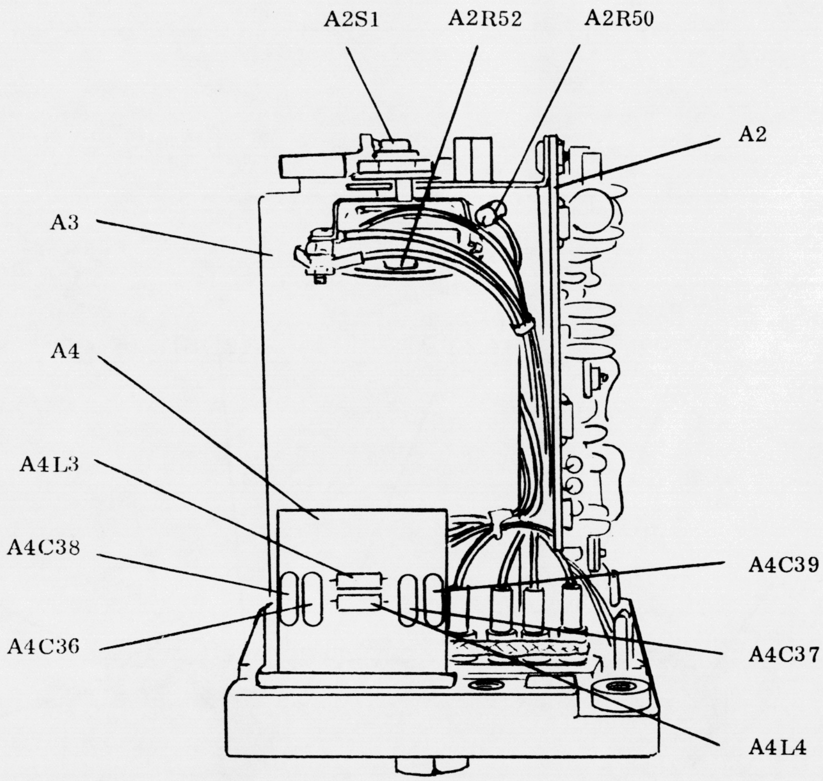
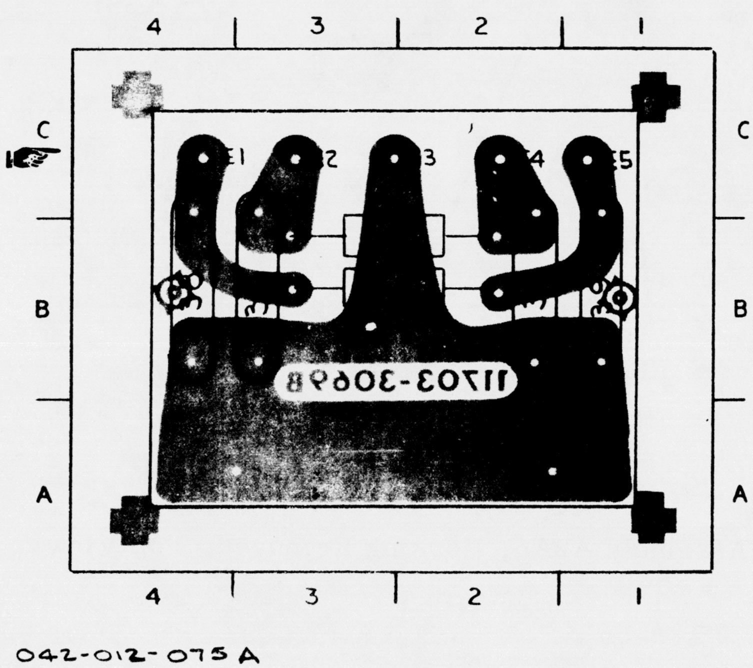


Figure 7-59. Frequency Standard Assembly A2A5, Housing Removed, Top View



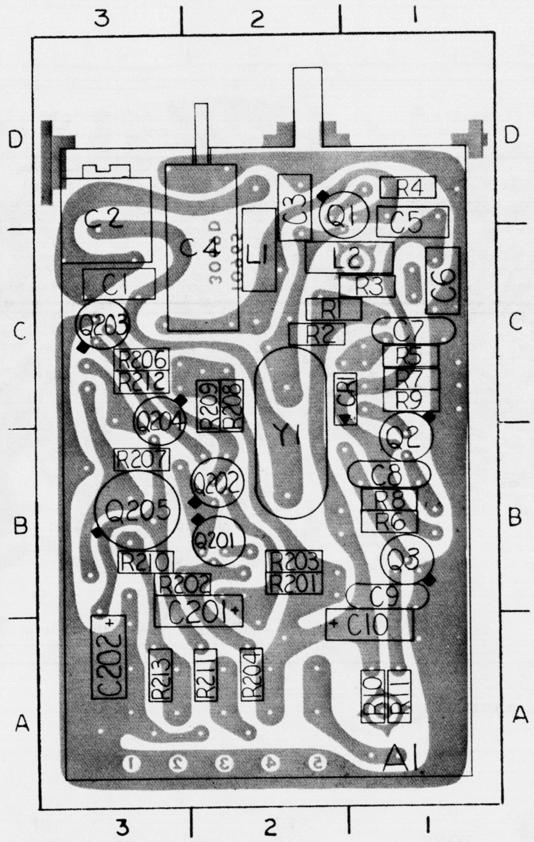


PART LOCATION INDEX

REF DES	ZONE
A2A5A4C1 thru C35	*
C36	3B
C37	2B
C38	4B
C39	1B
L1	*
L2	*
L3	3B
L4	3B

* Not used.

Figure 7-60. Frequency Standard Assembly A2A5, Housing Removed, Side View



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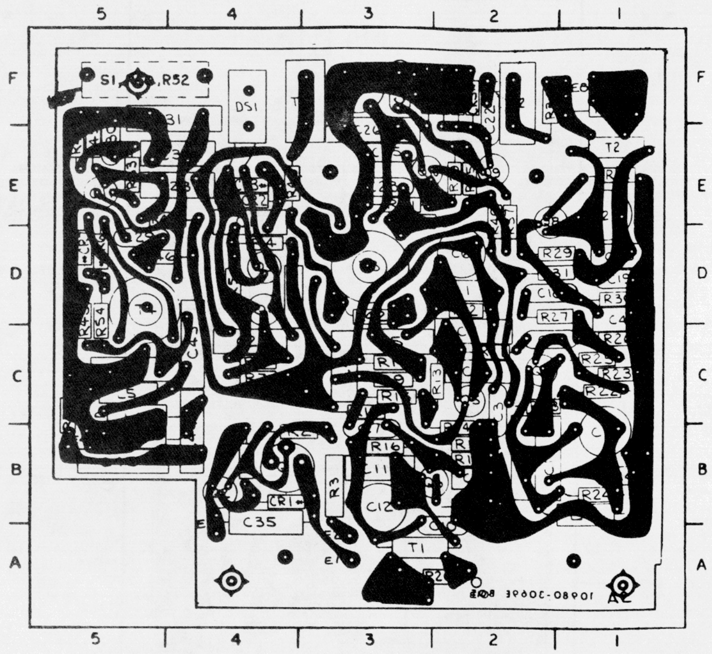
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A5A1C1	3C	A2A5A1Q2	1B	A2A5A1R10	1A
C2	3D	Q3	1B	R11	1A
C3	2D	Q4		R12	
C4	2C	thru	*	thru	*
C5	1D	Q200		R200	
C6	1C	Q201	2B	R201	2B
C7	1C	Q202	2B	R202	3B
C8	1B	Q203	3C	R203	2B
C9	1B	Q204	3C	R204	2A
C10	1A	Q205	2B	R205	*
C11		R1	*	R206	3C
thru	*	R2	2C	R207	2B
C200		R3	1C	R208	2C
C201	2B	R4	1D	R209	2C
C202	3A	R5	1C	R210	2B
CR1	1C	R6	1B	R211	2A
L1	3C	R7	1C	R212	3C
L2	1C	R8	1B	R213	3A
Q1	1D	R9	1C	Y1	2B

* Not Used

Figure 7-61. Oscillator and Oven Control Subassembly A2A5A1



042-012-0778

PART LOCATION INDEX

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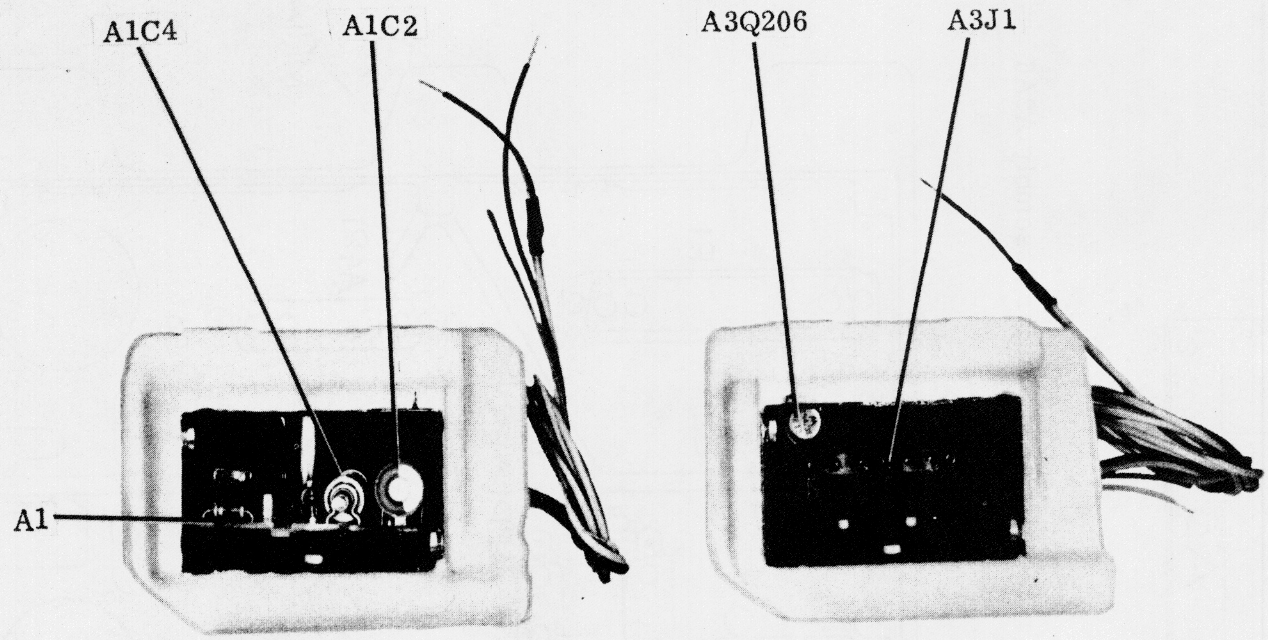
A2A5A2C1	4E	A2A5A2C28	4E	A2A5A2L3	*	A2A5A2R11	3C	A2A5A2R37	2E
C2	4C	C29	5D	L4	*	R12	2D	R38	2F
C3	2C	C30	5E	L5	5C	R13	2C	R39	2E
C4	3C	C31	4F	L6	5C	R14	2C	R40	2E
C5	3C	C32	4E	L7	5B	R15	3C	R41	3E
C6	2D	C33	*	Q1	4B	R16	3B	R42	3D
C7	3C	C34	*	Q2	4B	R17	2B	R43	4E
C8	2C	C35	4B	Q3	4D	R18	3C	R44	4E
C9	2C	C36		Q4	4D	R19	2B	R45	5E
C10	2B	thru	*	Q5	2C	R20	2A	R46	5D
C11	3B	C39		Q6	2B	R21	2C	R47	5E
C12	3B	C40	2B	Q7	2C	R22	1C	R48	5D
C13	2C	C41	1D	Q8	2E	R23	1C	R49	*
C14	1B	C42	5C	Q9	2E	R24	1B	R50	5F
C15	1C	C43	4C	Q10	3E	R25	1C	R51	3E
C16	2B	C44	4B	Q11	5E	R26	1C	R52	5F
C17	2B	C45	5B	R1	4B	R27	2D	R53	5E
C18	2D	CR1	4B	R2	4B	R28	2C	R54	5D
C19	1D	CR2	4E	R3	3B	R29	2D	R55	*
C20	1D	CR3	4E	R4	4D	R30	1D	R56	5C
C21	1E	CR4	2F	R5	4D	R31	2D	S1	5F
C22	2F	CR5	2F	R6	4D	R32	1E	T1	3A
C23	3E	CR6	5D	R7	4C	R33	1F	T2	1E
C24	3F	CR7	5D	R8	4C	R34	2F	T3	3D
C25	3E	DS1	4F	R9	3C	R35	2E	T4	5D
C26	3E	L1	2D	R10	2B	R36	3F	TP1	3F
C27	3F	L2	1B					TP2	2F

* Not Used

Figure 7-62. Divider/Amplifier Subassembly A2A5A2



OVEN BODY ASSY A3
WITH
OSCILLATOR AND OVEN CONTROL ASSY A1
IN PLACE

OVEN BODY ASSY A3
WITH
OSCILLATOR AND OVEN CONTROL ASSY A1
REMOVED

042-012-078

Figure 7-63. Oven Body Subassembly A2A5A3

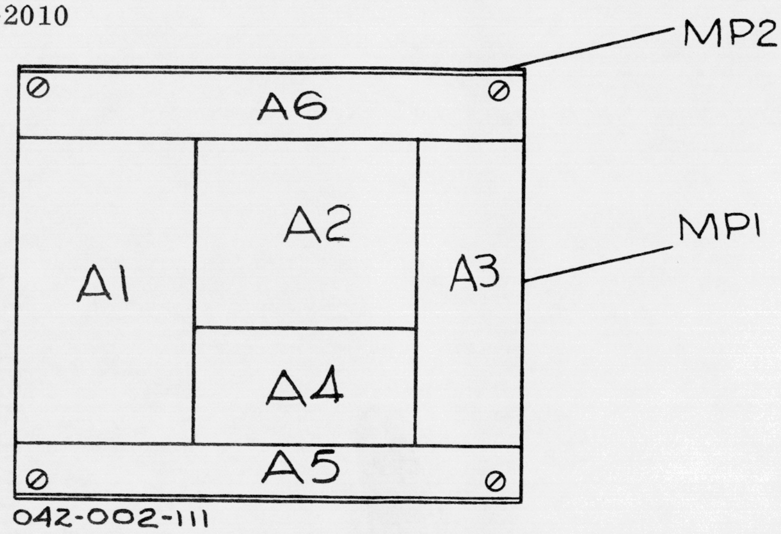


Figure 7-64. Translator/Synthesizer Assembly A2A6

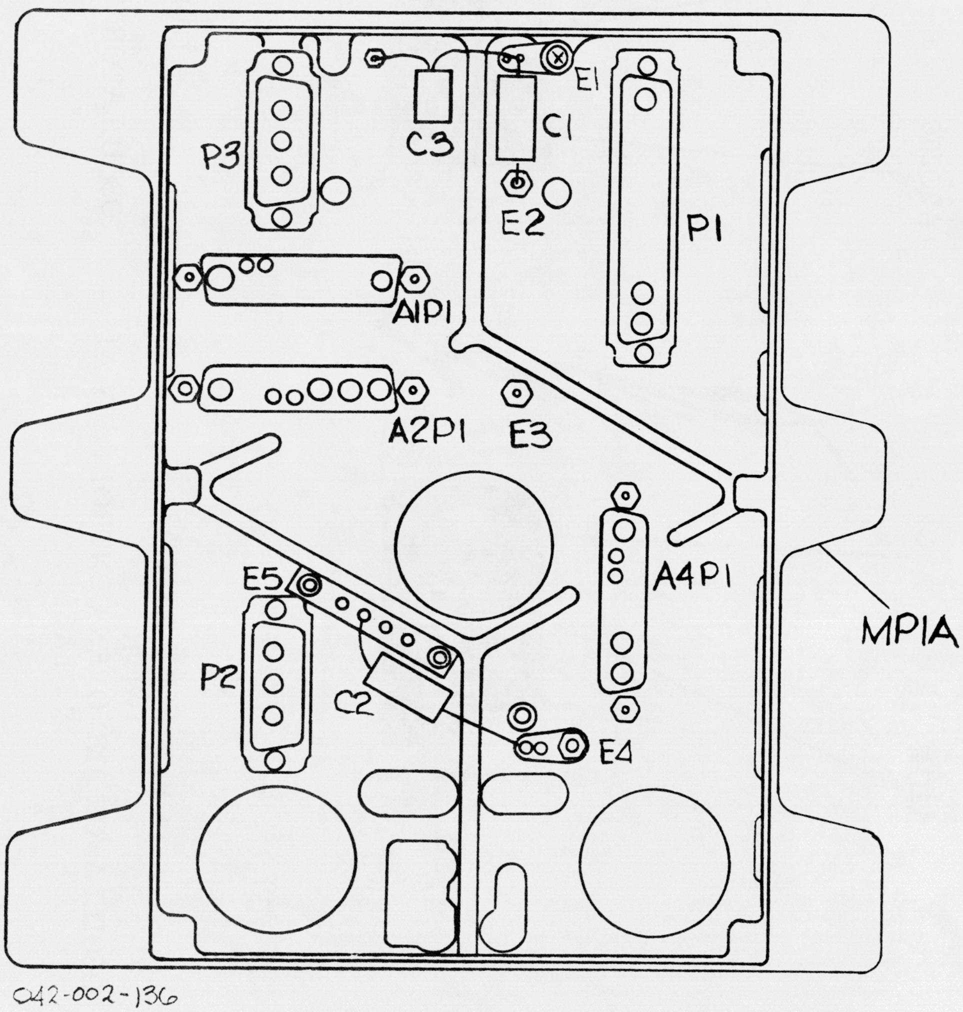


Figure 7-65. Mounting Base Assembly (P/O A2A6)

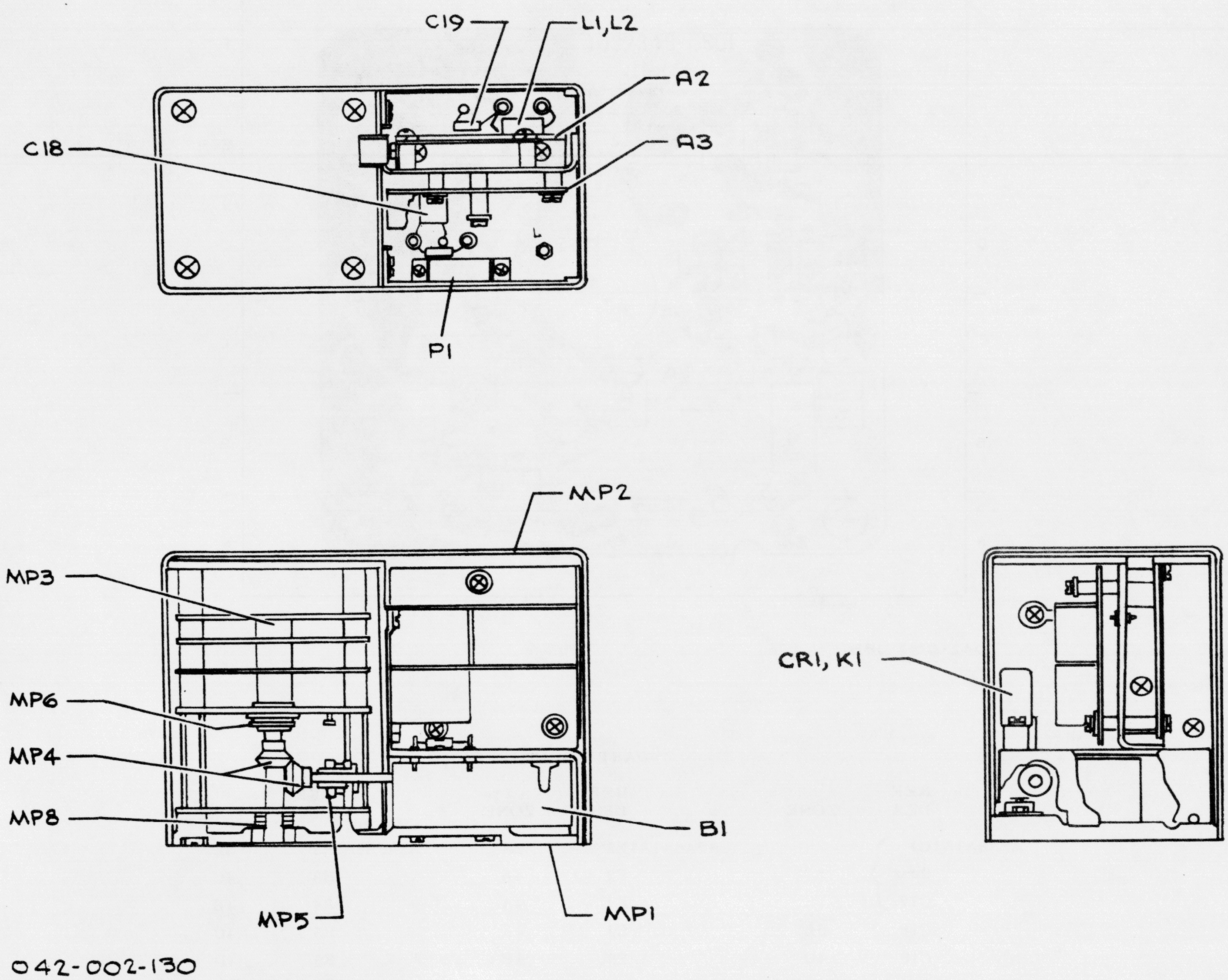
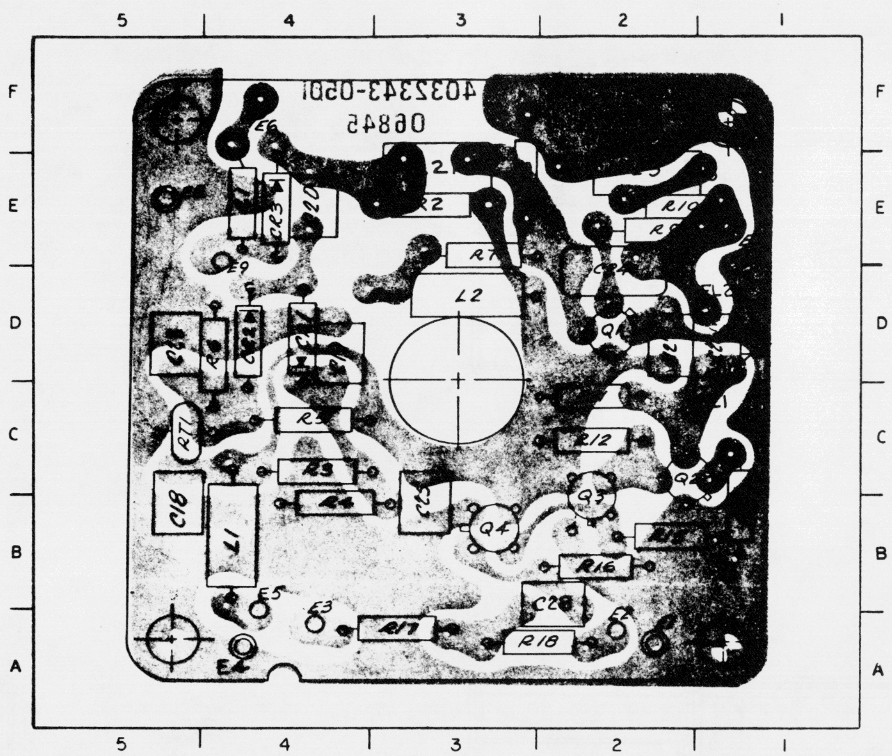


Figure 7-66. 1-MHz Synthesizer Subassembly A2A6A1



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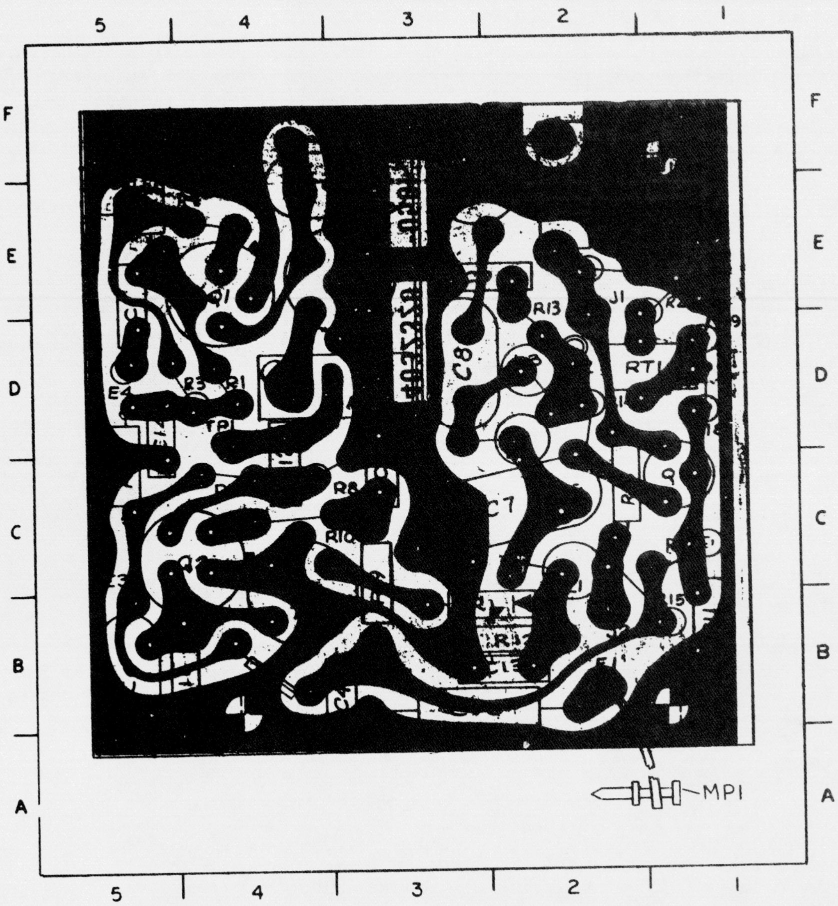
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A1A1C1		A2A6A1A1E2	2A	A2A6A1A1R2	3E
thru	*	E3	4A	R3	4C
C17		E4	4A	R4	4B
C18	5B	E5	4A	R5	4C
C19	4D	E6	4F	R6	4D
C20	4E	E8	5E	R7	3E
C21	3E	E9	4E	R8	3E
C22	*	E10	1E	R9	2E
C23	5D	FL1	1D	R10	2E
C24	2D	FL2	1D	R11	2C
C25	3B	L1	4B	R12	2C
C26	1D	L2	3D	R13	1D
C27	2D	L3	2E	R14	1B
C28	2B	Q1	2D	R15	2B
CR1	4D	Q2	2C	R16	2B
CR2	4D	Q3	2B	R17	3A
CR3	4E	Q4	3B	R18	2A
E1	2A	R1	4E	RT1	5C

* Not Used

Figure 7-67. 1-MHz Oscillator A2A6A1A1



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PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A1A2C1	5E	A2A6A1A2J1	2E	A2A6A1A2R10	3C
C2	5F	J2	2B	R11	4B
C3	3E	L1	2C	R12	2B
C4	3B	L2	2D	R13	2E
C5	3C	L3	2D	R14	2D
C6	5B	L4	3F	R15	1B
C7	2C	MP1	1A	R16	2C
C8	3D	Q1	4E	R17	1C
C9	3E	Q2	4C	R18	1D
C10	3B	Q3	1C	R19	1D
C11	1B	R1	4D	R20	1E
C12	4C	R2	5E	R21	2E
C13	2B	R3	4D	R22	5C
C14	5D	R4	4E	RT1	1D
CR1	3B	R5	4F	T1	3E
E1	2B	R6	3D	T2	4B
E2	1E	R7	4C	TP1	4D
E3	5B	R8	4C	TP2	2D
E4	5D	R9	3C	TP3	2E

Figure 7-68. IF. DC Amplifier A2A6A1A2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A1A3C1	4E	A2A6A1A3E2	5E	A2A6A1A3R9	3E
C2	4D	E3	1E	R10	3E
C3	5C	E4	*	R11	3D
C4	3D	E5	5B	R12	2D
C5	3D	E6	2A	R13	2E
C6	3C	E7	5B	R14	2D
C7	3D	E8	*	R15	2D
C8	2D	E9	5B	R16	1D
C9	2C	L1	1A	R17	1C
C10	1E	L2	5D	R18	2C
C11	1B	L3	2C	R19	1B
C12	2B	L4	4C	R20	2B
C13	1B	Q1	4D	R21	2C
C14	3B	Q2	3D	R22	1C
C15	4B	Q3	1D	R23	3A
C16	3C	Q4	3C	R24	3A
C17	4C	Q5	4B	R25	2B
C18	5B	Q6	2B	R26	4A
C19	5A	R1	2E	R27	4A
C20	4A	R2	4D	R28	5A
CR1	4E	R3	3E	R29	4B
CR2	4D	R4	3D	R30	3A
CR3	4D	R5	4C	R31	2A
				R32	5B
CR4	2D	R6	4D	R33	5E
CR5	2C	R7	2D	T1	5C
E1	5E	R8	3C	TP1	4B

* Not Used

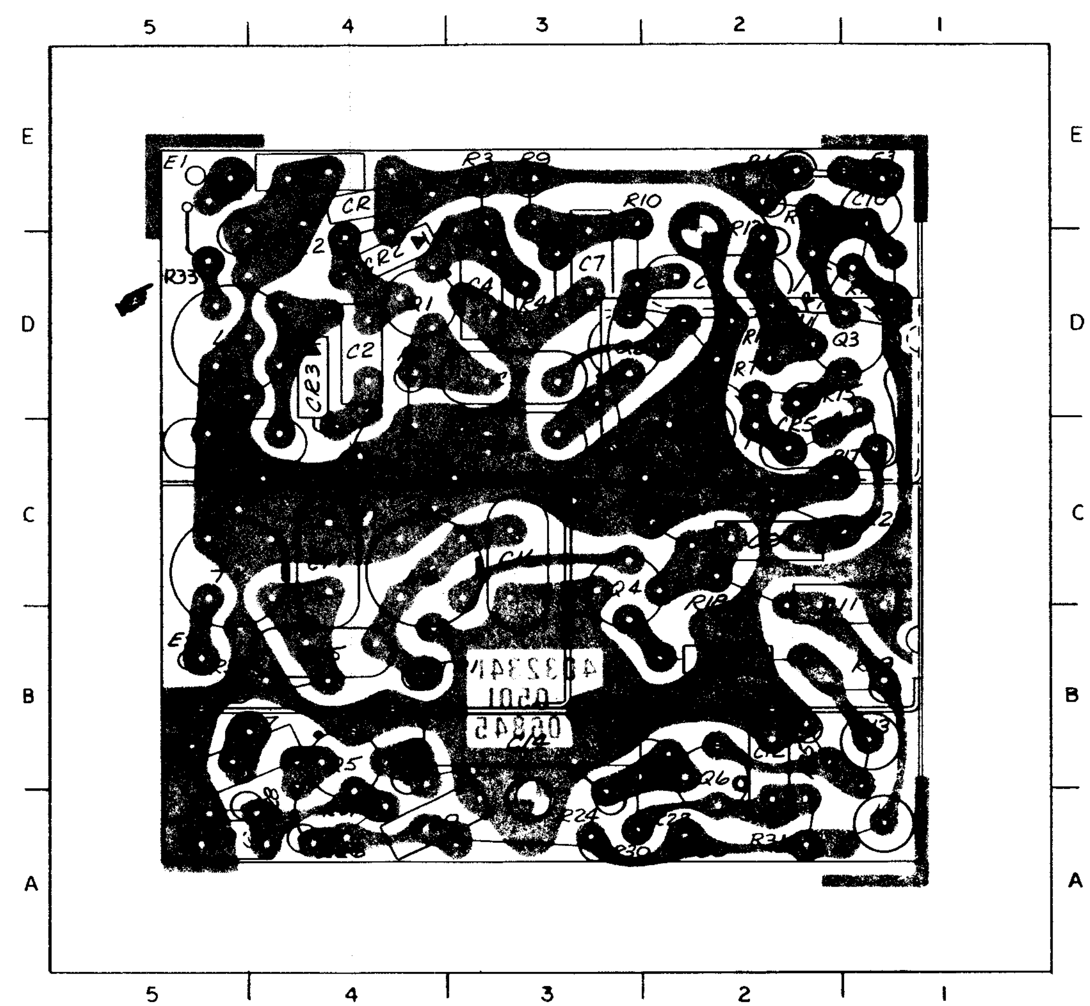

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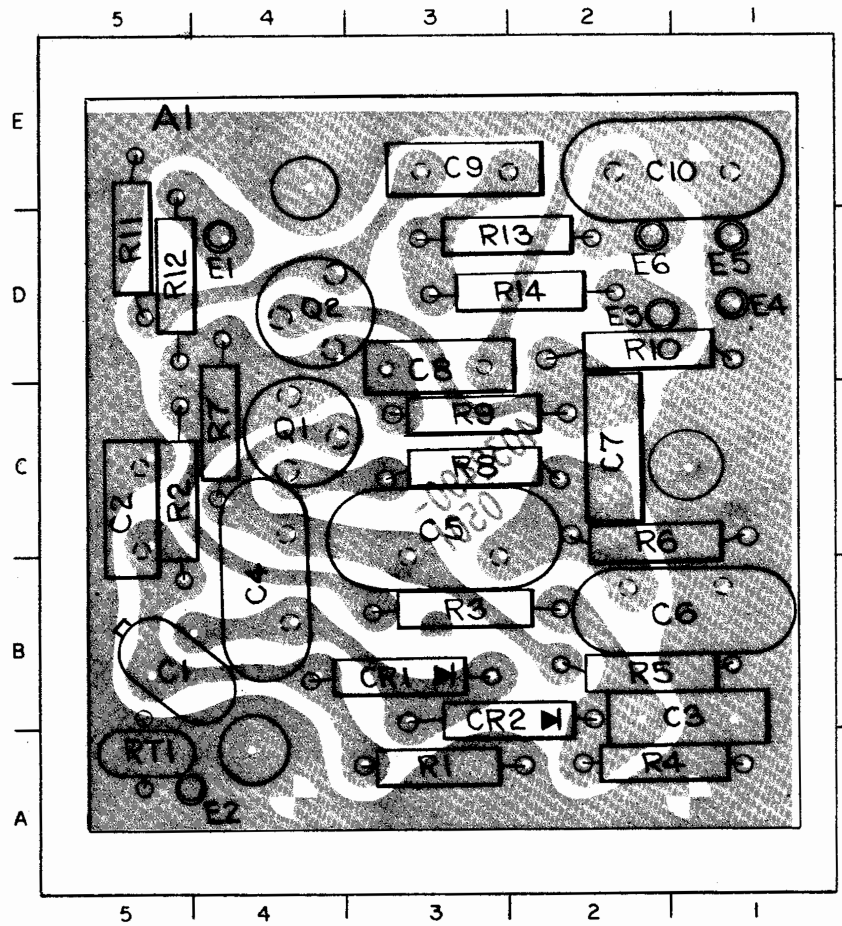
Figure 7-69. Spectrum Generator/Mixer A2A6A1A3



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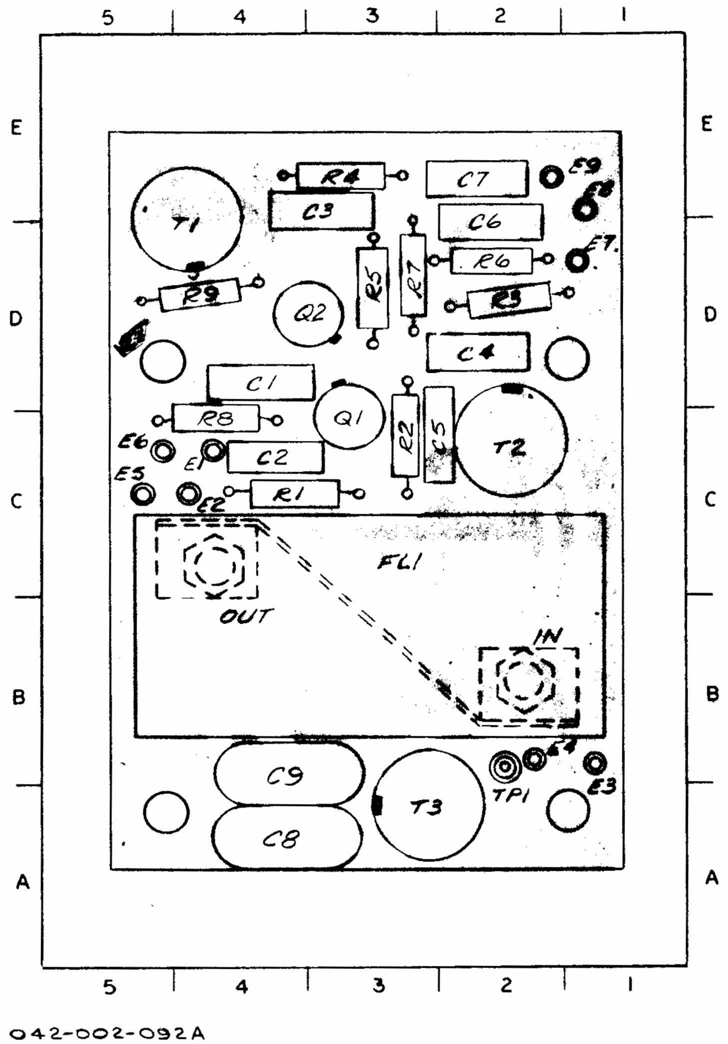
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2A1C1	5B	A2A6A2A1E1	4D	A2A6A2A1R5	2B
C2	5C	E2	4A	R6	2C
C3	1B	E3	2D	R7	4C
C4	4B	E4	1D	R8	3C
C5	3C	E5	1D	R9	3C
C6	1B	E6	2D	R10	2D
C7	2C	Q1	4C	R11	5D
C8	3D	Q2	4D	R12	5D
C9	3E	R1	3A	R13	2D
C10	1E	R2	5C	R14	2D
CR1	3B	R3	3B	RT1	5A
CR2	2B	R4	2A		

Figure 7-70. 4.553- to 5.453-MHz Oscillator A2A6A2A1



PARTS LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2A2C1	4D	A2A6A2A2E4	2B	A2A6A2A2R3	2D
C2	4C	E5	5C	R4	3E
C3	3E	E6	5C	R5	3D
C4	2D	E7	1D	R6	2D
C5	2C	E8	1E	R7	3D
C6	2D	E9	2E	R8	4C
C7	2E	FL1	3C	R9	4D
C8	4A	Q1	3C	T1	4D
C9	4B	Q2	3D	T2	2C
E1	4C	R1	4C	T3	3A
E2	4C	R2	3C	TP1	2B
E3	1B				

Figure 7-71. 10.747-MHz Mixer A2A6A2A2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2A3C1	5C	A2A6A2A3CR3	3D	A2A6A2A3R7	3C
C2	1D	E1	5C	R8	3C
C3	2D	E2	5C	R9	2C
C4	4D	E3	1E	R10	3C
C5	5E	E4	1D	R11	4D
C6	4E	E5	2C	R12	4D
C7	4C	E6	1C	R13	3D
C8	5B	E7	3D	R14	2D
C9	4A	E8	2E	R15	1C
C10	4C	E9	1C	R16	4F
C11	1C	E10	3A	T1	4C
C12	4C	E11	3A	T2	4A
C13	3C	E12	5E	T3	3B
C14	3D	E13	5F	T4	1B
C15	3D	Q1	5D	TP1	5E
C16	3D	Q2	3B	TP2	4B
C17	1C	R1	5E	TP3	2B
C18	3A	R2	5E	TP4	2B
C19	2A	R3	4D	Y1	1B
C20	1B	R4	5D	Y2	2B
CR1	3D	R5	4B		
CR2	3D	R6	3C		

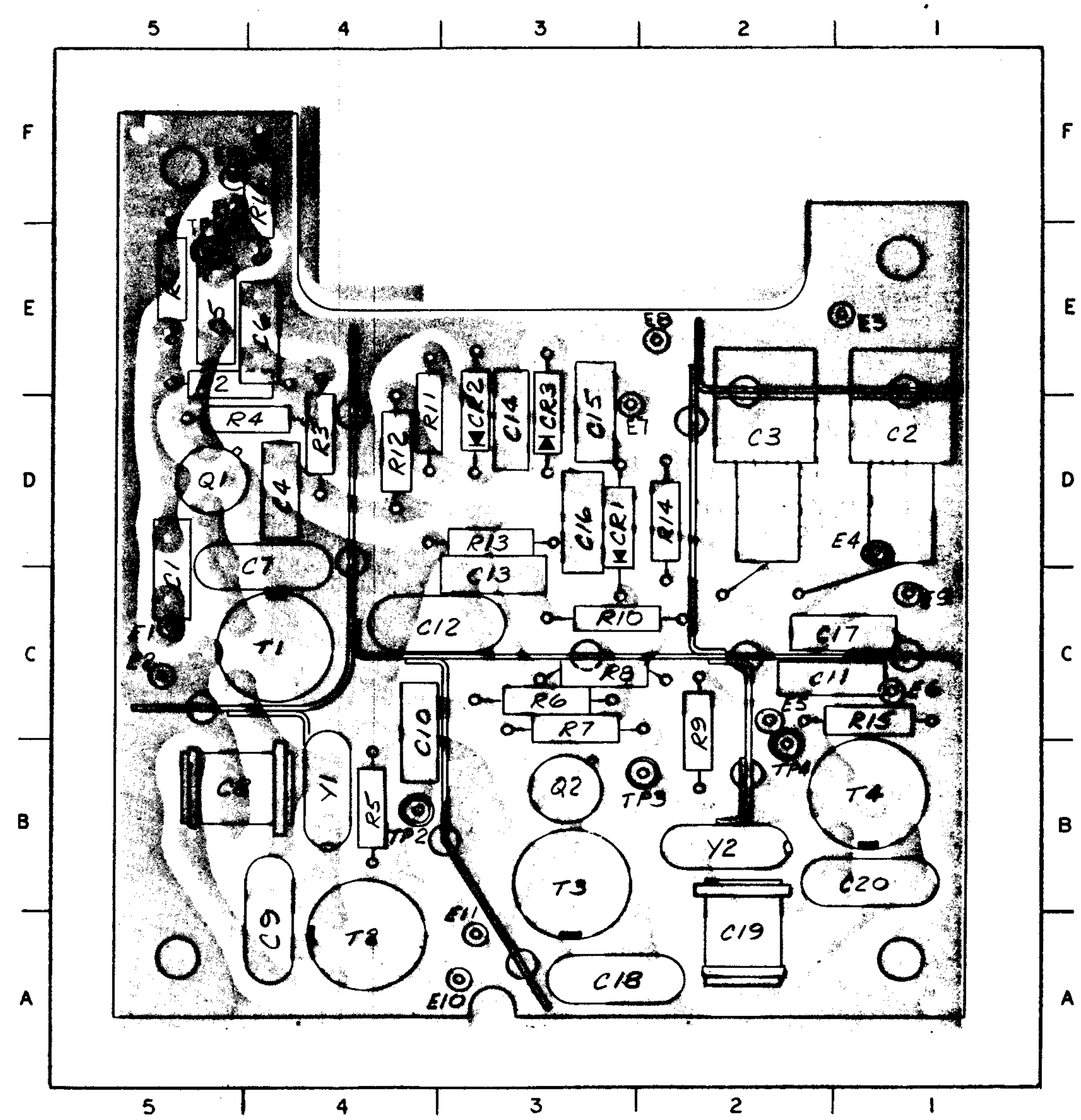


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Figure 7-72. 17.847- to 27.847-MHz Mixer A2A6A2A3

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2A4C1	1C	A2A6A2A4C35	4F	A2A6A2A4R12	5C
C2	3C	C36	4E	R13	4C
C3	2B	C37	4D	R14	4B
C4	1C	C38	5D	R15	1D
C5	3B	C39	4D	R16	2D
C6	3B	C40	4D	R17	3E
C7	1C	C41	3C	R18	2D
C8	3C	CR1	4C	R19	3F
C9	2A	CR2	3D	R20	2F
C10	3A	E1	4E	R21	4F
C11	3A	E2	3D	R22	4F
C12	4B	E3	2D	R23	4E
C13	4B	E4	1C	R24	4E
C14	4B	E5	1C	R25	4E
C15	4A	E6	3C	R26	5D
C16	5C	E7	1D	R27	3D
C17	5C	E8	1D	R28	3C
C18	5C	E9	3C	T1	2C
C19	3C	E10	3C	T2	1B
C20	*	FL1	3D	T3	2A
C21	3D	FL2	2B	T4	3A
C22	1D	Q1	5B	T5	5B
C23	2D	Q2	5E	T6	4C
C24	3E	R1	1C	T7	2D
C25	1D	R2	2C	T8	1E
C26	1D	R3	3B	T9	2F
C27	1F	R4	2B	T10	4F
C28	3E	R5	3C	T11	5E
C29	3E	R6	1A	T12	4D
C30	4E	R7	4A	TP1	2B
C31	2F	R8	4A	TP2	2E
C32	3F	R9	4B	U1	2B
C33	3F	R10	4B	U2	2E
C34	4F	R11	4B		

* Not Used

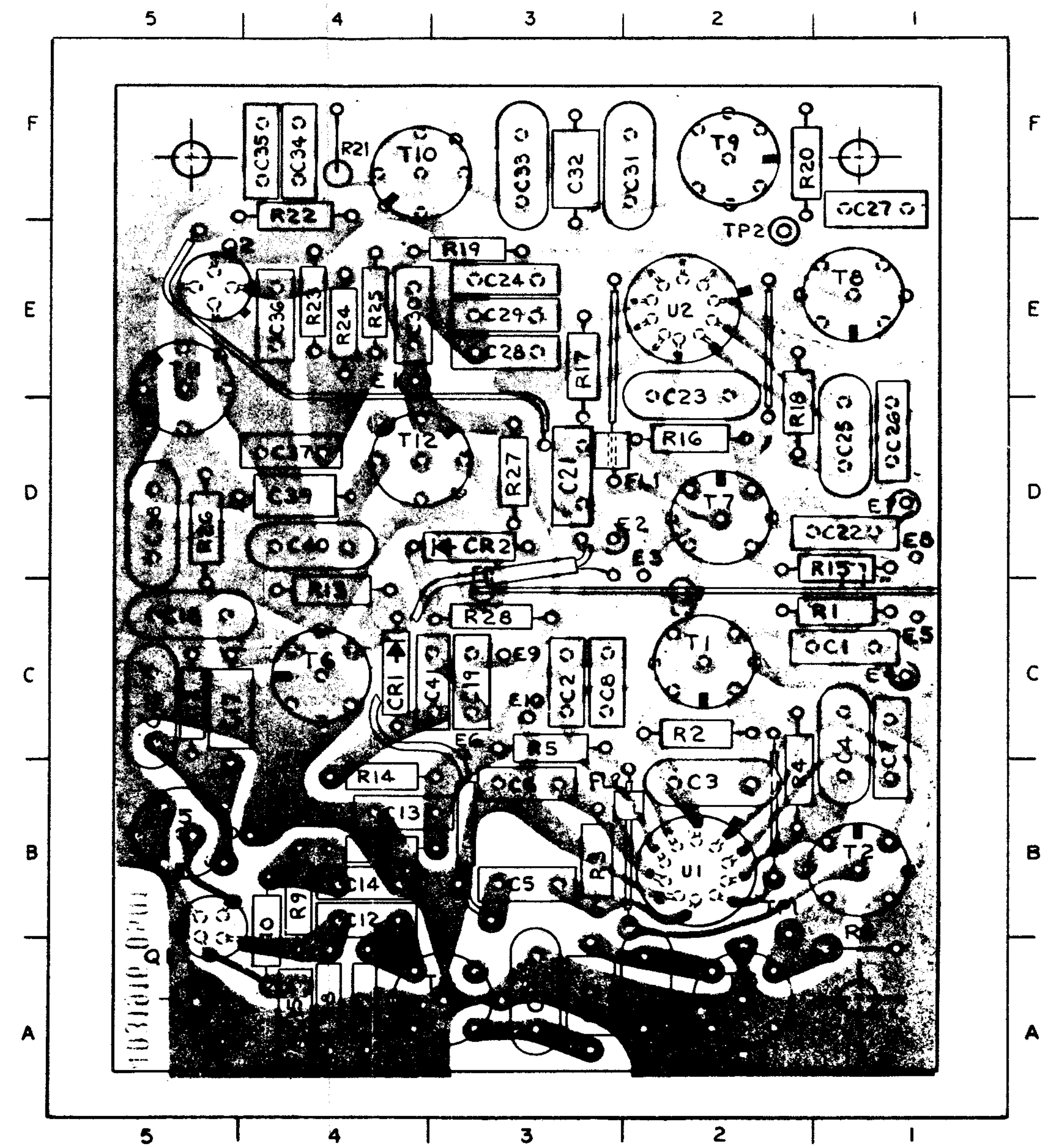

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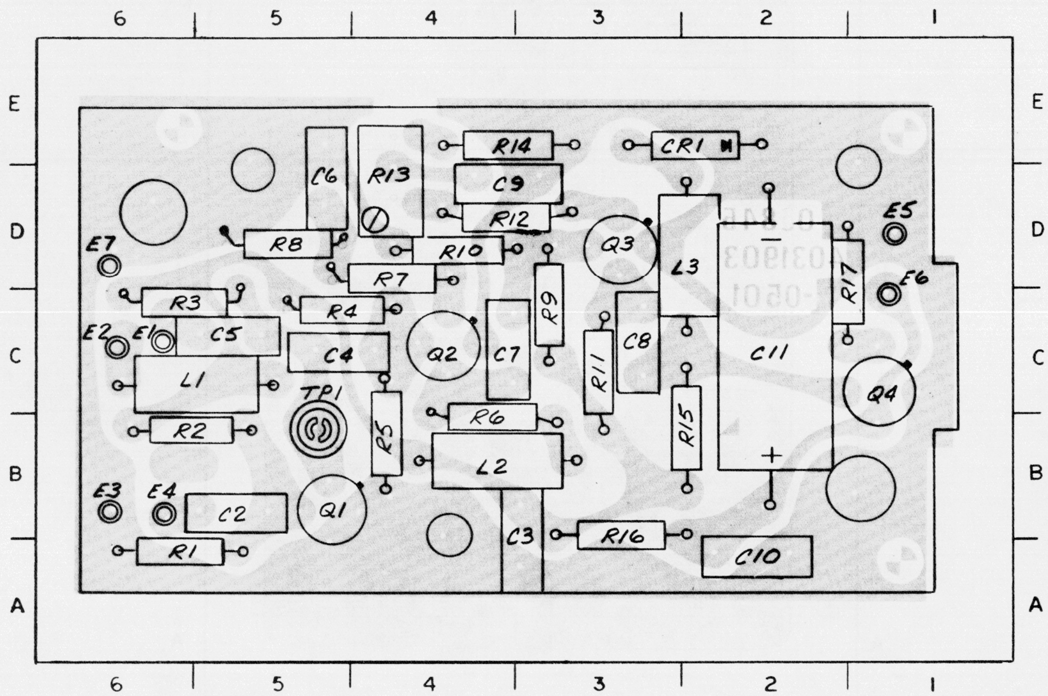
Figure 7-73. Hi-Band/Lo-Band Mixer Amplifier A2A6A2A4



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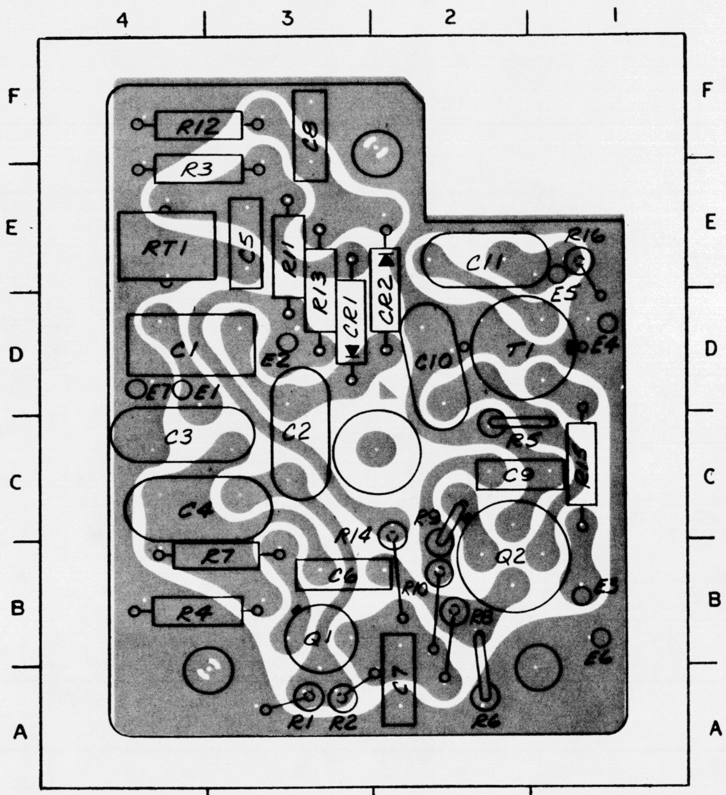
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A2A5C1	*	A2A6A2A5E4	6B	A2A6A2A5R5	4B
C2	5B	E5	1D	R6	4B
C3	3B	E6	1C	R7	4D
C4	5C	E7	6D	R8	5D
C5	5C	L1	6C	R9	3D
C6	5D	L2	4B	R10	4D
C7	4C	L3	2D	R11	3C
C8	3C	Q1	5B	R12	4D
C9	4D	Q2	4C	R13	4D
C10	2A	Q3	3D	R14	4E
C11	2C	Q4	1C	R15	2B
CR1	2E	R1	6A	R16	3B
E1	6C	R2	6B	R17	1C
E2	6C	R3	6C	TP1	5B
E3	6B	R4	5C		

* Not Used

Figure 7-74. Automatic Gain Control A2A6A2A5



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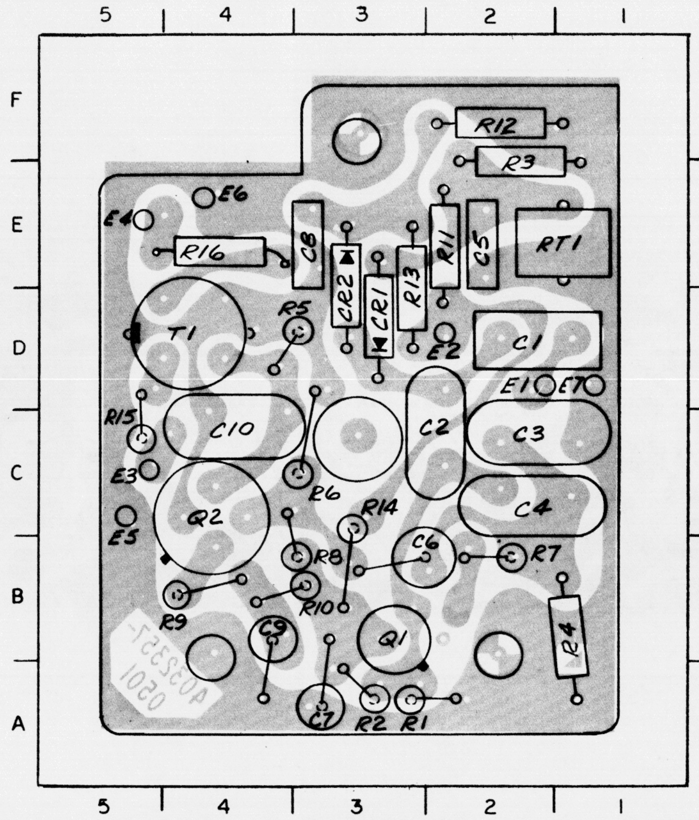
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A3A1C1	4D	A2A6A3A1E2	3D	A2A6A3A1R6	2A
C2	3C	E3	1B	R7	3B
C3	4C	E4	1D	R8	2B
C4	4C	E5	1E	R9	2B
C5	3E	E6	1B	R10	2B
C6	3B	E7	4D	R11	3E
C7	2A	Q1	3B	R12	4F
C8	3F	Q2	2B	R13	3D
C9	2C	R1	3A	R14	2C
C10	2D	R2	3A	R15	1C
C11	2E	R3	4E	R16	1E
CR1	3D	R4	4B	RT1	4E
CR2	2D	R5	2C	T1	2D
E1	4D				

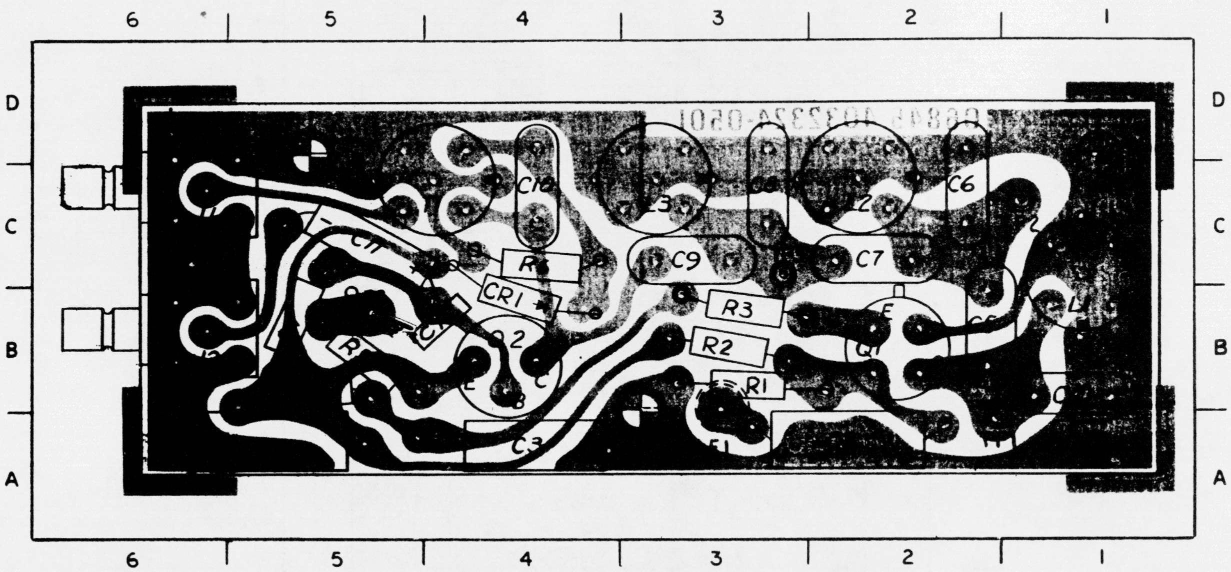
Figure 7-75. 5.16- to 5.25-MHz Oscillator A2A6A3A1



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A3A2C1	2D	A2A6A3A2E2	2D	A2A6A3A2R6	3C
C2	2C	E3	5C	R7	2B
C3	2C	E4	5E	R8	3B
C4	2C	E5	5C	R9	4B
C5	2E	E6	4E	R10	3B
C6	3B	E7	1D	R11	2E
C7	3A	Q1	3B	R12	2F
C8	3E	Q2	4C	R13	3D
C9	4B	R1	3A	R14	3C
C10	4C	R2	3A	R15	5C
CR1	3D	R3	2E	R16	4E
CR2	3D	R4	1B	RT1	1E
E1	2D	R5	3D	T1	4D

Figure 7-76. 1.850- to 1.859-MHz Oscillator A2A6A3A2



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PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A3A3C1	2A	A2A6A3A3CR1	4B	A2A6A3A3R2	3B
C2	5A	E1	3B	R3	3B
C3	4A	E2	5B	R4	5B
C4	1B	J1	6C	R5	5B
C5	2B	J2	6B	R6	4C
C6	2C	L1	1C	R7	5B
C7	2C	L2	2C	T1	4C
C8	3C	L3	3C	TP1	2A
C9	3C	Q1	2B	TP2	1C
C10	4C	Q2	4B	TP3	3C
C11	5C	R1	3B		
C12	4B				

Figure 7-77. 1- and 10-kHz Output and Blanker A2A6A3A3

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A3A4C1	J3	A2A6A3A4E8	4F	A2A6A3A4R4	3H
C2	4H	E9	5B	R5	4H
C3	3J	E10	5A	R6	3F
C4	4H	E11	*	R7	3E
C5	4F	E12	1A	R8	3F
C6	3F	E13	1B	R9	3E
C7	3E	FL1	3G	R10	4E
C8	4D	FL2	3C	R11	4D
C9	4B	L1	*	R12	3A
C10	4E	L2	*	R13	
C11	5D	L3	3J	thru	*
C12	4D	L4	3B	R29	
C13	3A	Q1		R30	3H
E1	1J	thru	*	R31	3H
E2	2H	Q7		T1	4E
E3	5J	Q8	4H	Z1	4B
E4	5H	Q9	4E	Z2	2B
E5	5F	R1	4H	Z3	2H
E6	5F	R2	4H		
E7	5D	R3	3H		

* Not Used

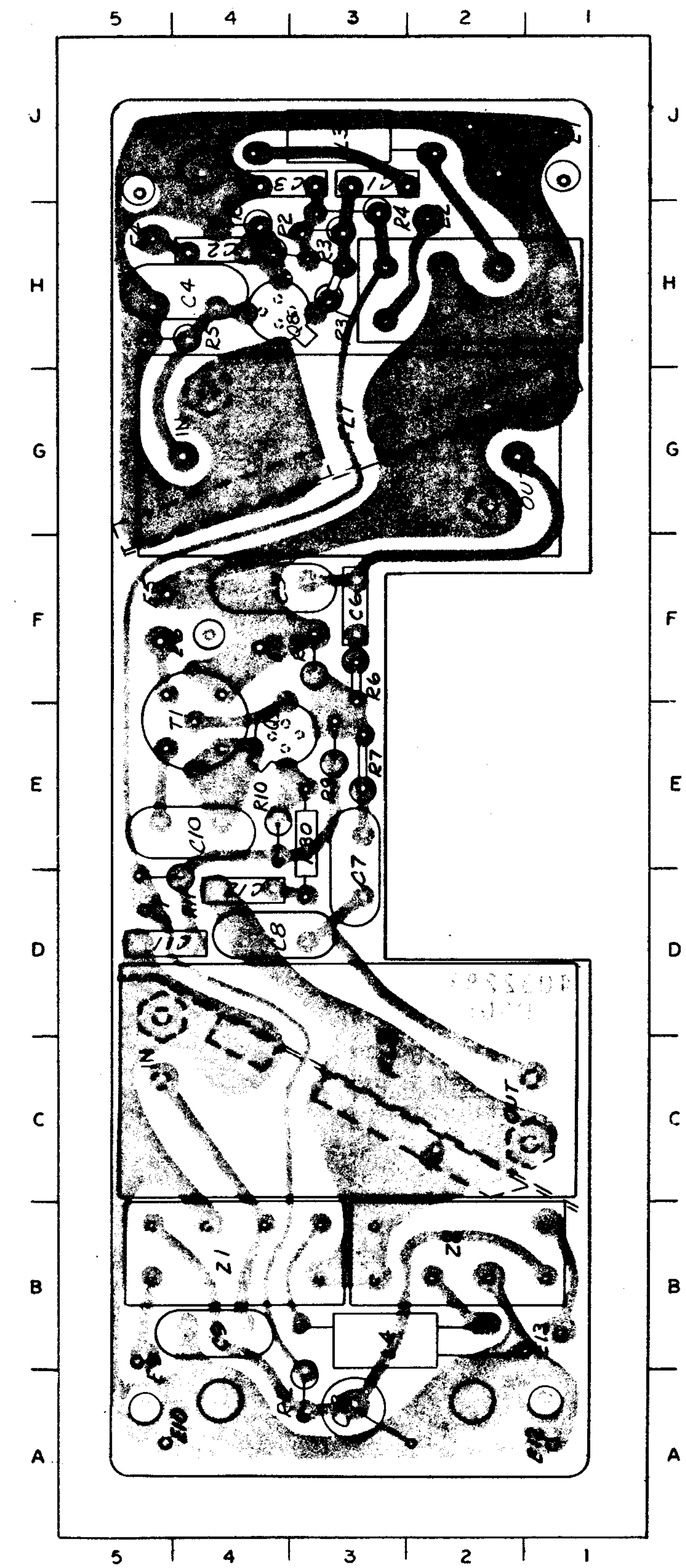

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Figure 7-78. 1- and 10-kHz Error Mixer A2A6A3A4

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A4A1C1	4B	A2A6A4A1E4	3E	A2A6A4A1R19	4C
C2	4B	E5	4E	R20	4B
C3	5B	E6	3A	R21	5C
C4	6B	E7	3A	R22	3C
C5	5A	E8	3C	R23	3B
C6	3B	E9	3E	R24	3C
C7	3C	E10	3A	R25	2B
C8	3C	Q1	4A	R26	2D
C9	4B	Q2	4B	R27	2C
C10	2D	Q3	5B	R28	2D
C11	3B	Q4	6B	R29	2D
C12	2C	Q5	2D	R30	2D
C13	3B	Q6	2C	R31	1B
C14	2B	Q7	1E	R32	1D
C15	1B	Q8	6D	R33	1D
C16	2D	Q9	5D	R34	2C
C17	2A	R1	4B	R35	5C
CR1	5B	R2	4B	R36	5D
CR2	6A	R3	4A	R37	6E
CR3	4D	R4	4A	R38	1D
CR4	4D	R5	4B	R39	3D
CR5	3D	R6	5B	R40	4E
CR6	4C	R7	5C	T1	1C
CR7	4C	R8	5C	TP1	2A
CR8	3D	R9	5B	TP2	5D
CR9	5C	R10	6B	TP3	4E
CR10	4D	R11	5A	TP4	2E
CR11	5C	R12	6B	TP5	6C
CR12	6C	R13	3B	U1	2D
CR13	6E	R14	3B	U2	5D
CR14	6E	R15	3D	U3	4D
E1	5D	R16	3C	U4	5D
E2	1B	R17	3D		
E3	2A	R18	3D		

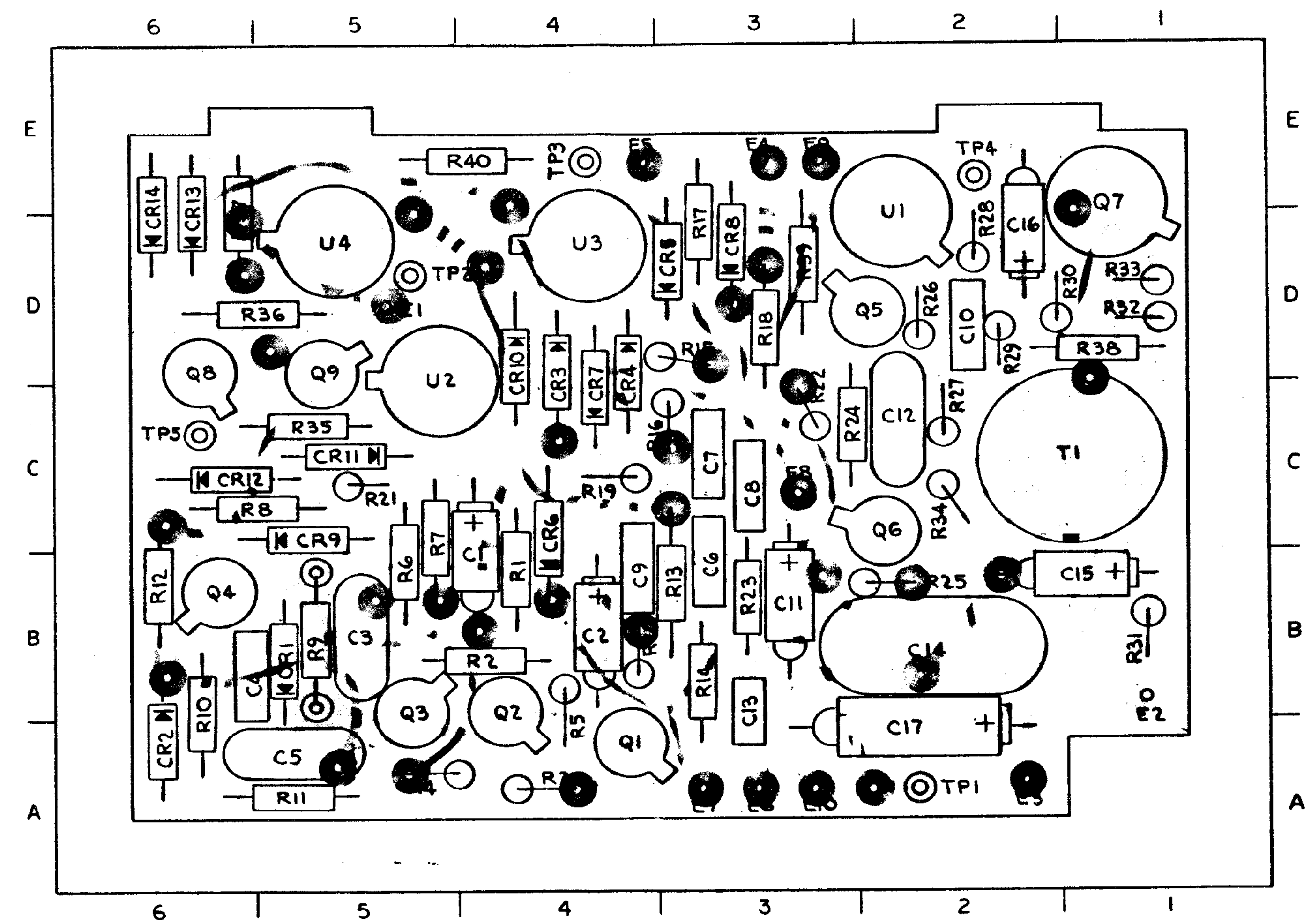

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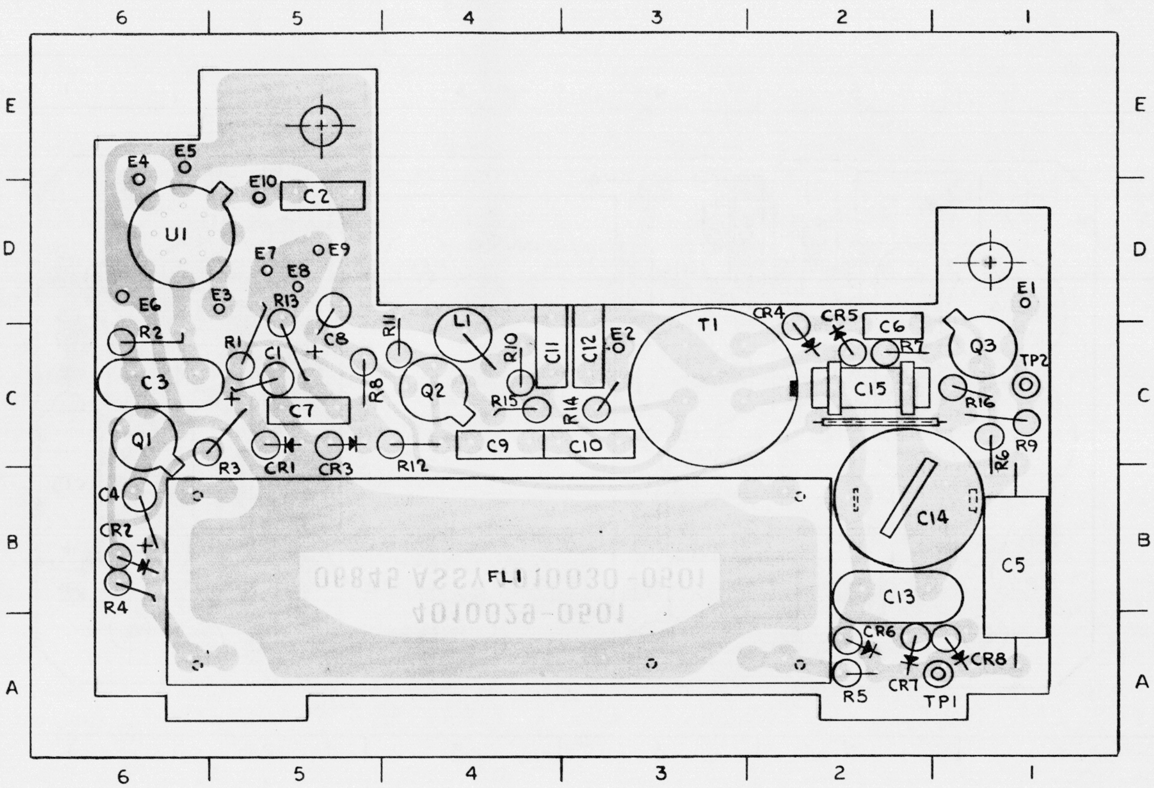
Figure 7-79. Preset Counter A2A6A4A1



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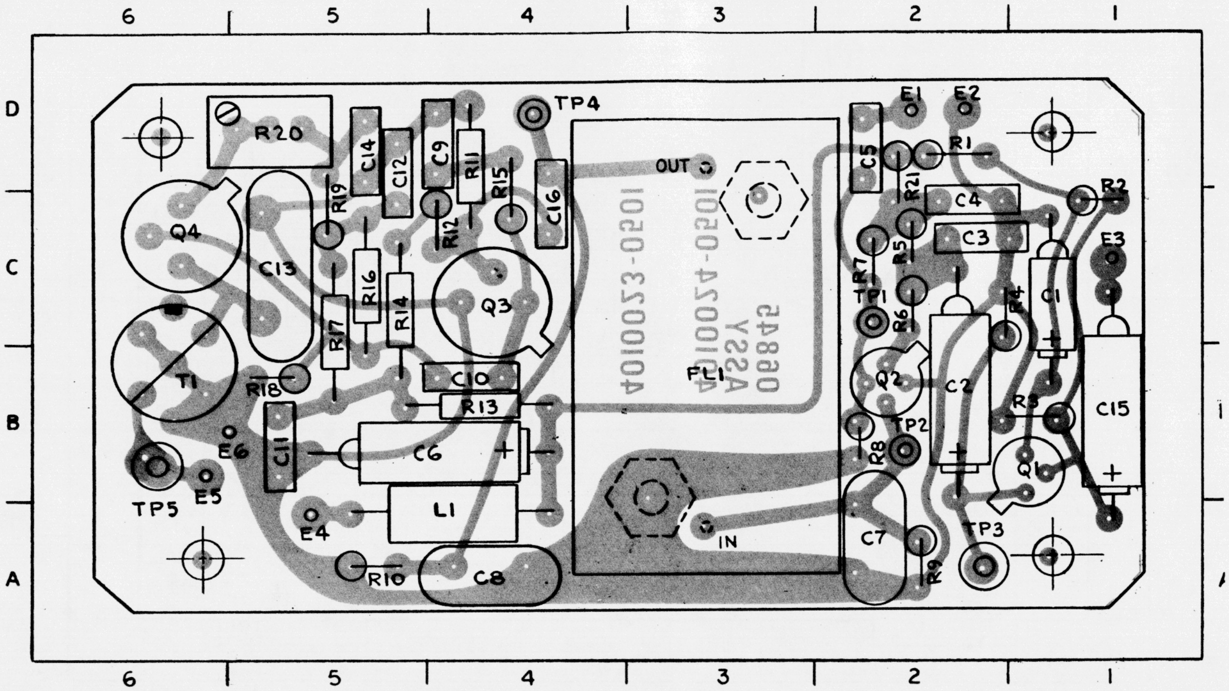
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A4A2C1	5C	A2A6A4A2CR6	2A	A2A6A4A2R2	6C
C2	5D	CR7	2A	R3	5C
C3	6C	CR8	1A	R4	6B
C4	6B	E1	1D	R5	2A
C5	1B	E2	3C	R6	1C
C6	2C	E3	5D	R7	2C
C7	5C	E4	6E	R8	5C
C8	5D	E5	6E	R9	1C
C9	4C	E6	6D	R10	4C
C10	3C	E7	5D	R11	4C
C11	4C	E8	5D	R12	4C
C12	3C	E9	5D	R13	5D
C13	2B	E10	5D	R14	3C
C14	2B	FL1	4B	R15	4C
C15	2C	L1	4C	R16	1C
CR1	5C	Q1	6C	T1	3C
CR2	6B	Q2	4C	TP1	1A
CR3	5C	Q3	1C	TP2	1C
CR4	2C	R1	5C	U1	6D
CR5	2C				

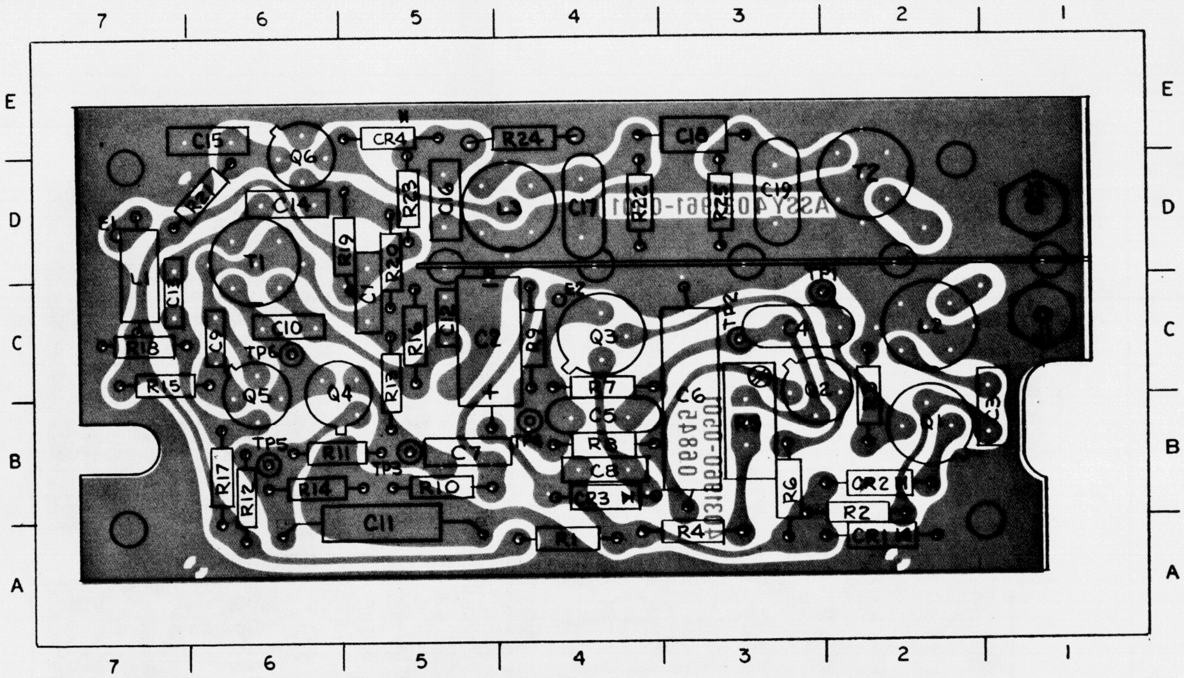
Figure 7-80. Oscillator A2A6A4A2



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A4A3C1	1C	A2A6A4A3E3	1C	A2A6A4A3R10	5A
C2	2B	E4	5A	R11	4D
C3	2C	E5	6B	R12	4C
C4	2C	FL1	3B	R13	4B
C5	2D	L1	4A	R14	5C
C6	4B	Q1	1B	R15	4C
C7	2A	Q2	2B	R16	5C
C8	4A	Q3	4C	R17	5C
C9	4D	Q4	6C	R18	5B
C10	4B	R1	2D	R19	5C
C11	5B	R2	1C	R20	5D
C12	5D	R3	1B	R21	2D
C13	5C	R4	2C	T1	6B
C14	5D	R5	2C	TP1	2C
C15	1B	R6	2C	TP2	2B
C16	4C	R7	2C	TP3	2A
E1	2D	R8	2B	TP4	4D
E2	2D	R9	2A	TP5	6B

Figure 7-81. 7.1-MHz Mixer A2A6A4A3



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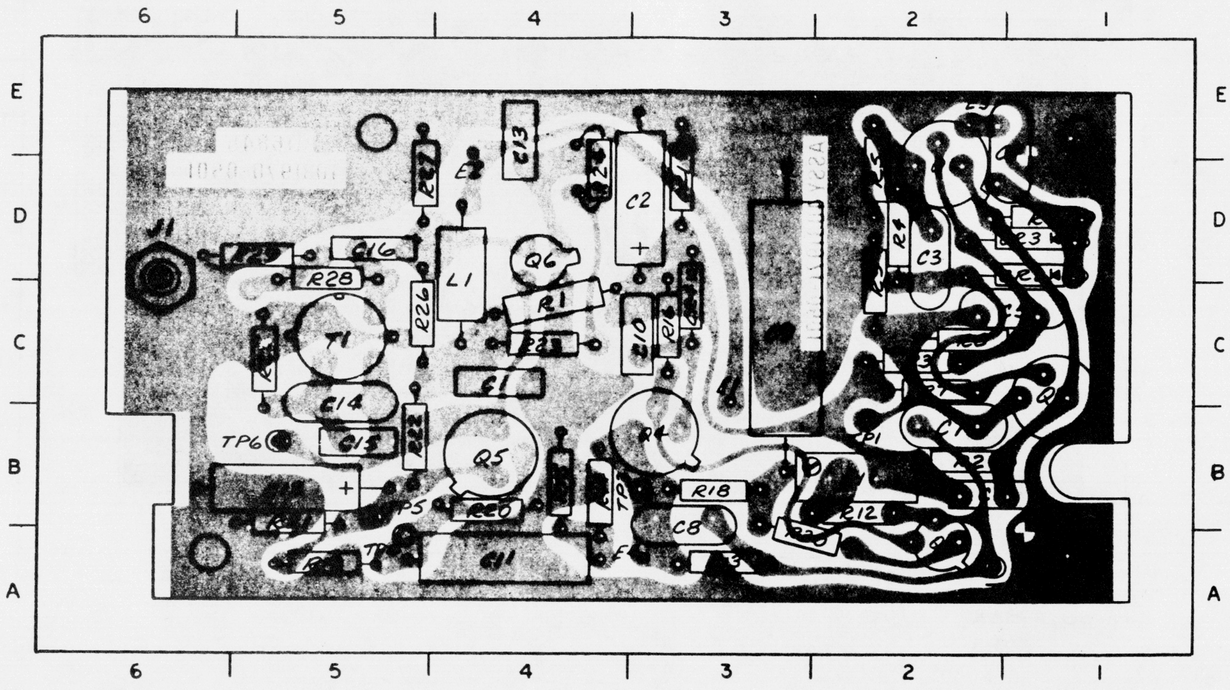
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A5A1C1	5C	A2A6A5A1E1	7D	A2A6A5A1R11	6B
C2	5C	E2	4C	R12	6B
C3	1B	J1	1C	R13	5C
C4	3C	J2	1D	R14	6B
C5	4B	L1	7D	R15	7C
C6	3C	L2	2C	R16	5C
C7	5B	L3	4D	R17	6B
C8	4B	Q1	2B	R18	7C
C9	6C	Q2	3C	R19	5D
C10	6C	Q3	4C	R20	5D
C11	5A	Q4	6C	R21	6D
C12	5C	Q5	6C	R22	4D
C13	7C	Q6	6E	R23	5D
C14	6D	R1	4A	R24	4E
C15	6E	R2	2B	R25	3D
C16	5D	R3	2B	T1	6D
C17	4D	R4	3A	T2	2D
C18	3E	R5	3B	TP1	2C
C19	3D	R6	3B	TP2	3C
CR1	2A	R7	4C	TP3	5B
CR2	2B	R8	4B	TP4	4B
CR3	4B	R9	4C	TP5	6B
CR4	5E	R10	5B	TP6	6C

Figure 7-82. 100-kHz Spectrum A2A6A5A1



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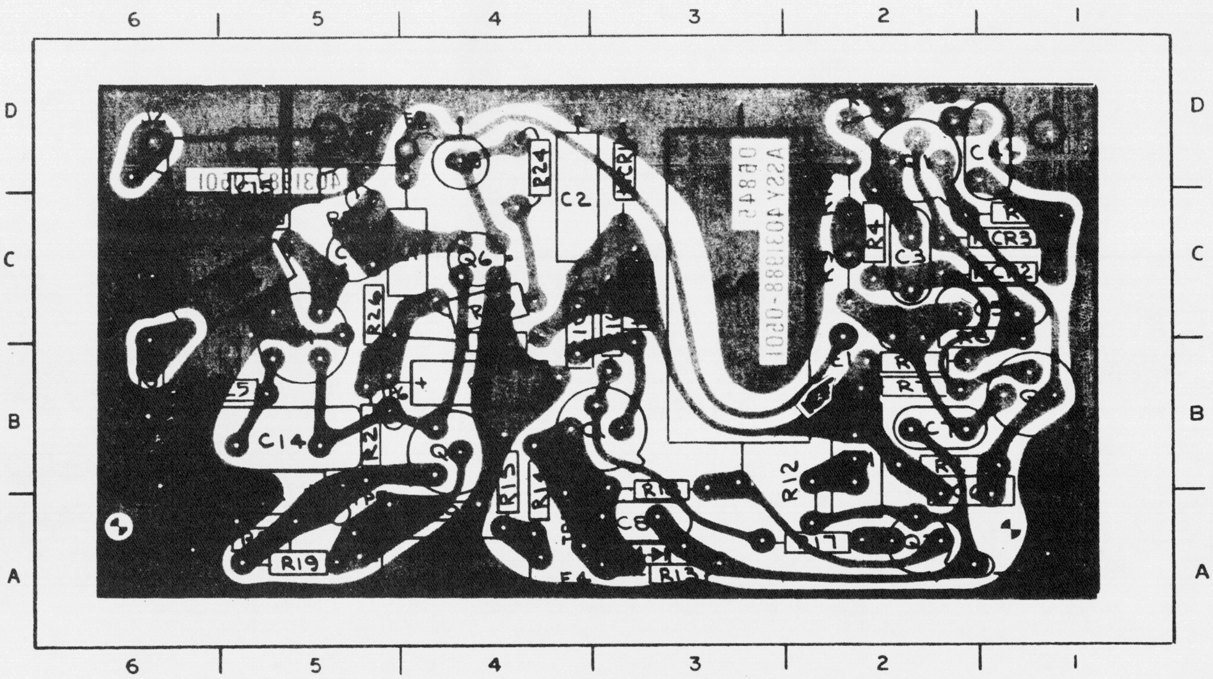
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A5A2C1	4C	A2A6A5A2E4	3A	A2A6A5A2R15	4B
C2	3D	J1	6D	R16	3C
C3	2D	L1	4C	R17	*
C4	1E	Q1	2D	R18	3B
C5	1C	Q2	1C	R19	5A
C6	2B	Q3	2A	R20	4B
C7	2B	Q4	3B	R21	5B
C8	3B	Q5	4B	R22	5B
C9	3C	Q6	4D	R23	4C
C10	3C	R1	4C	R24	4D
C11	4A	R2	2B	R25	5C
C12	5B	R3	2C	R26	5C
C13	4E	R4	2D	R27	5D
C14	5C	R5	2D	R28	5C
C15	5B	R6	1D	R29	5D
C16	5D	R7	2C	R30	3A
CR1	3D	R8	2C	T1	5C
CR2	1D	R9	2C	TP1	2B
CR3	1D	R10	*	TP2	2A
CR4	3C	R11	2B	TP3	3B
E1	3C	R12	2B	TP4	5A
E2	4E	R13	3A	TP5	5B
E3	2E	R14	4B	TP6	5B

* Not Used

Figure 7-83. 10-kHz Spectrum A2A6A5A2



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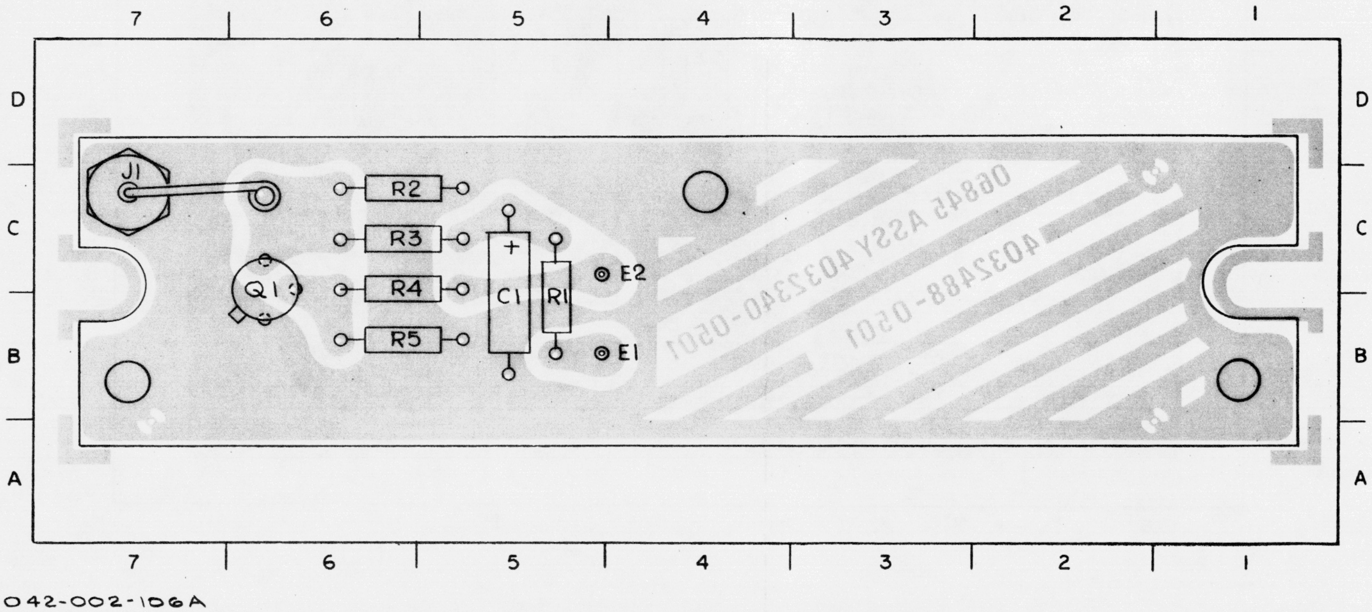
PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A5A3C1	4B	A2A6A5A3E3	2D	A2A6A5A3R12	2B
C2	4C	E4	3A	R13	3A
C3	2C	J1	6C	R14	4A
C4	1D	J2	6D	R15	4B
C5	1C	L1	4C	R16	3C
C6	2A	L2	5C	R17	2A
C7	2B	Q1	2D	R18	3B
C8	3A	Q2	1B	R19	5A
C9	3C	Q3	2A	R20	4A
C10	4C	Q4	3B	R21	5A
C11	4A	Q5	4B	R22	5
C12	5B	Q6	4C	R23	4C
C13	4D	R1	4C	R24	4D
C14	5B	R2	2B	R25	5B
C15	5D	R3	2B	R26	5C
C16	5C	R4	2C	R27	5D
C17	6C	R5	2D	T1	5C
CR1	3D	R6	C1	TP1	2C
CR2	1C	R7	2B	TP2	1A
CR3	1C	R8	2C	TP3	4A
CR4	3A	R9	2C	TP4	5A
CR5	3C	R10	2C	TP5	5A
E1	3B	R11	2B	TP6	5B
E2	4D				

Figure 7-84. 1-kHz Spectrum A2A6A5A3



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A5A4C1	5B	A2A6A5A4Q1	6C	A2A6A5A4R3	6C
E1	5B	R1	5B	R4	6C
E2	5C	R2	6C	R5	6B
J1	7C				

Figure 7-85. 1-kHz Pulse Inverter A2A6A5A4

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A6A1C1	1D	A2A6A6A1CR4	2E	A2A6A6A1L15	5F
C2	F1	CR5	3E	P1	2A
C3	1E	CR6	4D	P2	2A
C4	1E	CR7	4D	P3	2A
C5	1E	CR8	7D	P4	4A
C6	2C	E1	1D	P5	6A
C7	2D	E2	1D	P6	6A
C8	2E	E3	1F	P7	6A
C9	2E	E4	1E	Q1	5F
C10	4E	E5	2B	R1	1D
C11	2E	E6	3B	R2	1D
C12	3D	E7	4C	R3	1F
C13	4E	E8	4C	R4	1E
C14	3C	E9	7C	R5	2C
C15	4C	E10	7C	R6	3C
C16	4E	E11	7F	R7	4E
C17	4E	E12	7E	R8	3E
C18	4E	E13	7F	R9	4E
C19	4D	FL1	3F	R10	4E
C20	3C	FL2	3D	R11	4E
C21	4E	FL3	5D	R12	4D
C22	4C	J1	5C	R13	4C
C23	4C	J2	5C	R14	7C
C24	6E	J3	5C	R15	7C
C25	6E	J4	5C	R16	5F
C26	6D	L1	1F	R17	5E
C27	6F	L2	3C	R18	5F
C28	6F	L3	2D	R19	6E
C29	5F	L4	3D	R20	5F
C30	5F	L5	5C	R21	5F
C31	4F	L6	4D	R22	7D
C32	6F	L7	4D	TP1	1F
C33	4C	L8	4D	TP2	1F
C34	4C	L9	4C	TP3	7F
C35	7E	L10	4C	TP4	7F
C36	7D	L11	5C	A1	2D
CR1	1D	L12	6F	A2	4D
CR2	1D	L13	6C	A3	6D
CR3	1E	L14	6F		

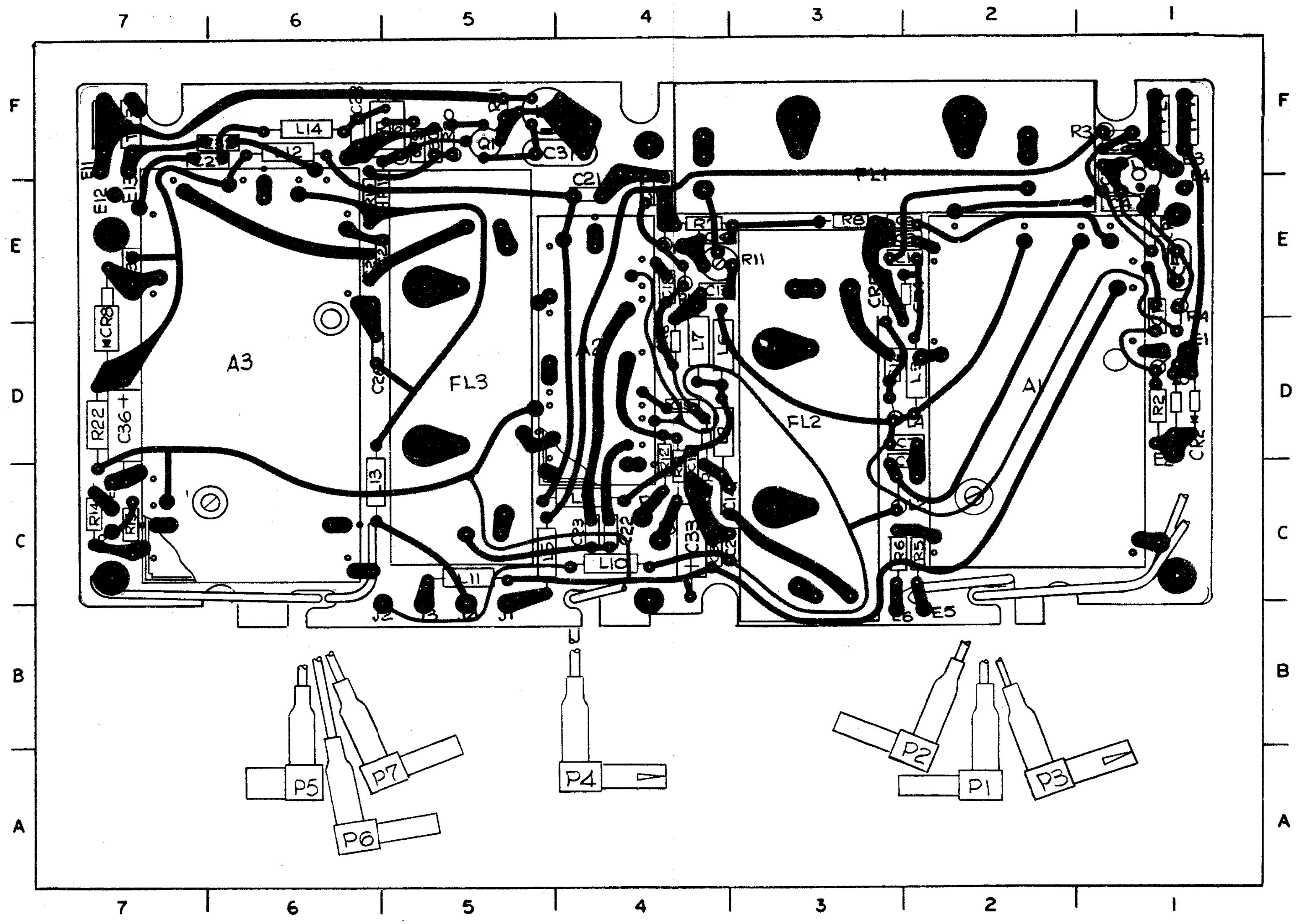


Figure 7-86. RF Translator Mounting Base A2A6A6A1

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A6A1A1C1	2G	A2A6A6A1A1CR7	6B	A2A6A6A1A1R21	6J
C2	2G	CR8	5D	R22	6J
C3	4J	Q1	7B	R23	6J
C4	5B	Q2	6B	R24	6J
C5	5J	R1	2G	R25	6J
C6	4D	R2	2G	R26	6J
C7	2F	R3	2G	R27	6F
C8	2F	R4	4B	R28	6A
C9	5B	R5	2G	R29	6J
C10	7D	R6	4J	R30	5B
C11	7D	R7	5J	R31	5D
C12	7J	R8	5J	R32	5D
C13	6B	R9	5J	R33	5A
C14	6B	R10	4D	R34	5D
C15	6B	R11	2F	R35	5D
C16	5J	R12	4A	R36	5D
C17	5J	R13	2F	R37	6D
C18	6G	R14	2F	R38	6D
A2A6A6A1A1CR1	4J	R15	2F	R39	6D
CR2	4J	R16	6D	T1	4B
CR3	4D	R17	6D	T2	4A
CR4	4D	R18	6A	TP1	5J
CR5	5B	R19	7J	U1	5B
CR6	6B	R20	6B		

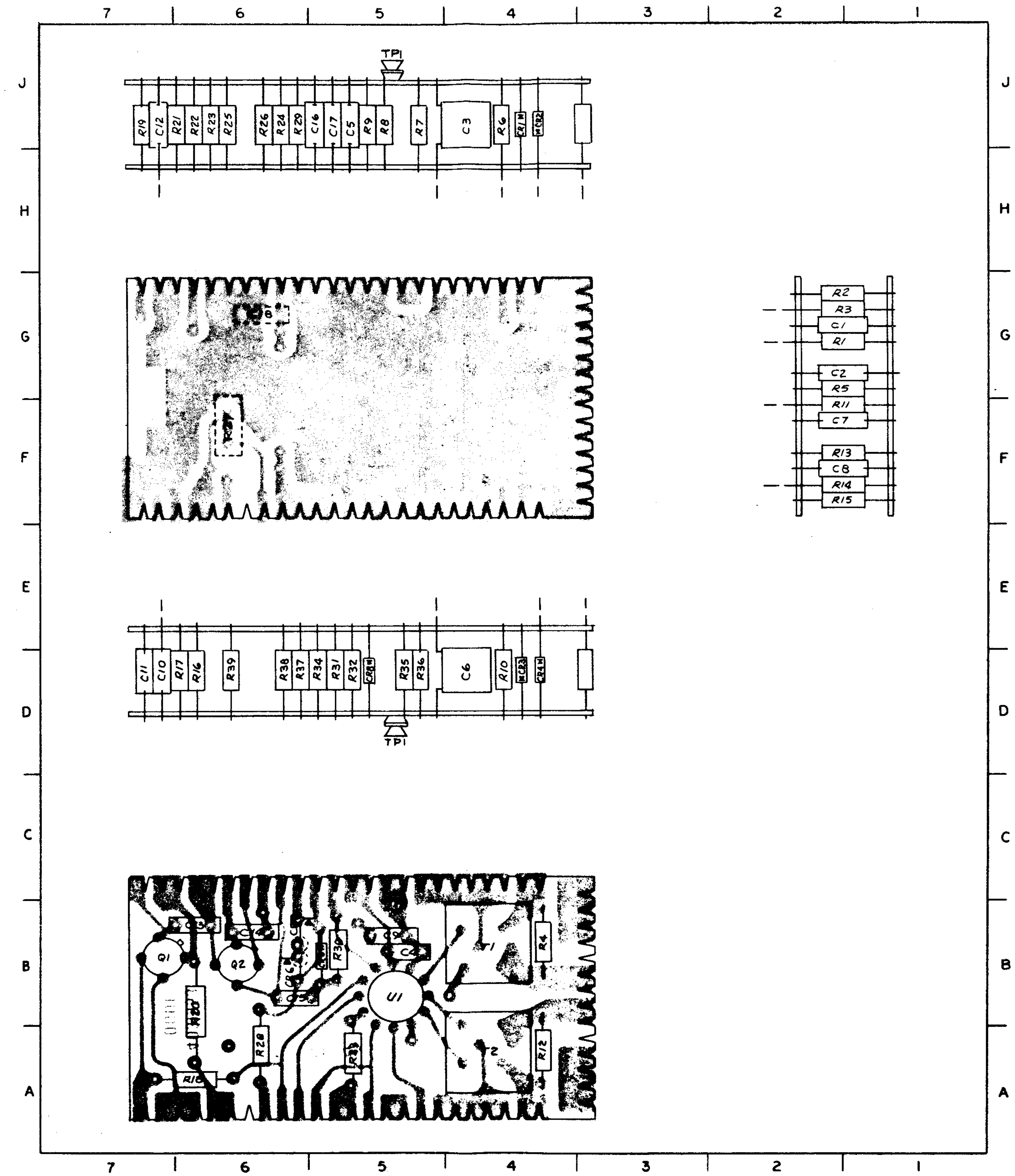


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Figure 7-87. 1-MHz Mixer and ALC A2A6A6A1A1

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A6A1A2C1	4C	A2A6A6A1A2CR3	2C	A2A6A6A1A2R10	2G
C2	5G	CR4	2C	R11	1G
C3	4G	R1	4D	R12	1B
C4	3B	R2	4C	R13	2C
C5	4G	R3	4D	R14	2C
C6	2G	R4	5B	R15	2C
C7	1G	R5	5G	R16	3C
C8	2C	R6	3G	T1	4B
C9	3E	R7	3G	T2	2B
CR1	*	R8	3G	U1	3B
CR2	4C	R9	3G		

* Not Used

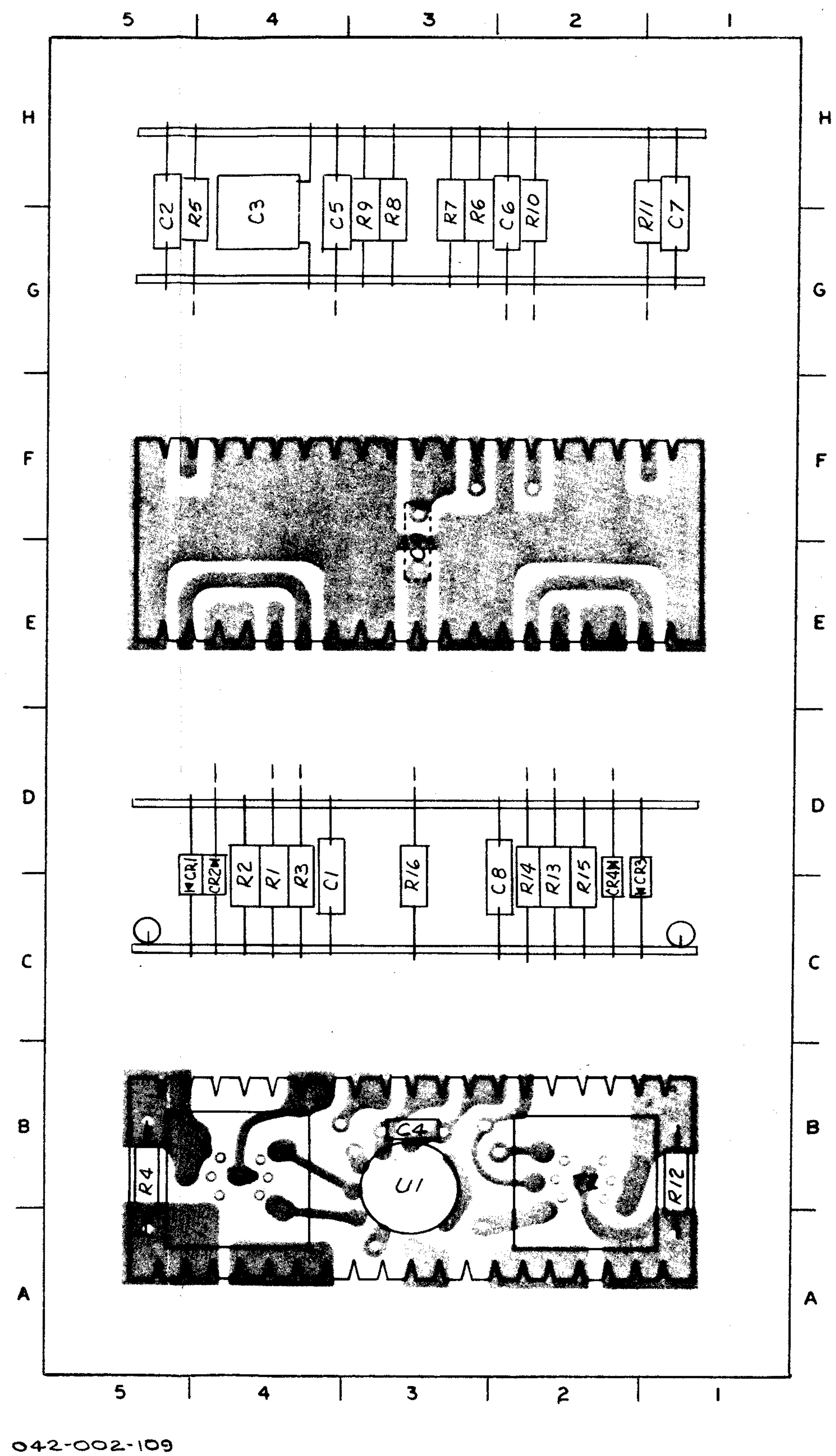

Figure 7-88. 100-kHz Mixer A2A6A6A1A2

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A6A6A1A3C1	1G	A2A6A2A1A3CR6	5B	A2A6A6A1A3R20	7A
C2	1G	CR7	5B	R21	7J
C3	4J	CR8	5D	R22	6J
C4	5B	L1	6A	R23	6J
C5	5J	L2	6B	R24	6B
C6	4D	Q1	7B	R25	6J
C7	1F	Q2	6B	R26	6J
C8	1F	R1	1G	R27	6J
C9	5B	R2	1G	R28	6F
C10	7D	R3	1G	R29	6A
C11	7D	R4	3B	R30	5J
C12	7J	R5	1G	R31	5B
C13	6B	R6	4J	R32	5D
C14	6J	R7	4J	R33	5D
C15	5A	R8	5J	R34	5A
C16	6B	R9	5J	R35	5D
C17	6B	R10	4D	R36	4D
C18	5B	R11	1F	R37	4D
C19	5J	R12	3A	R38	5D
C20	5J	R13	1F	R39	5D
C21	6D	R14	1F	R40	6D
CR1	3J	R15	1F	T1	4B
CR2	3J	R16	6D	T2	4A
CR3	3D	R17	7D	TP1	4J
CR4	3D	R18	7A	U1	5B
CR5	5B	R19	7J		

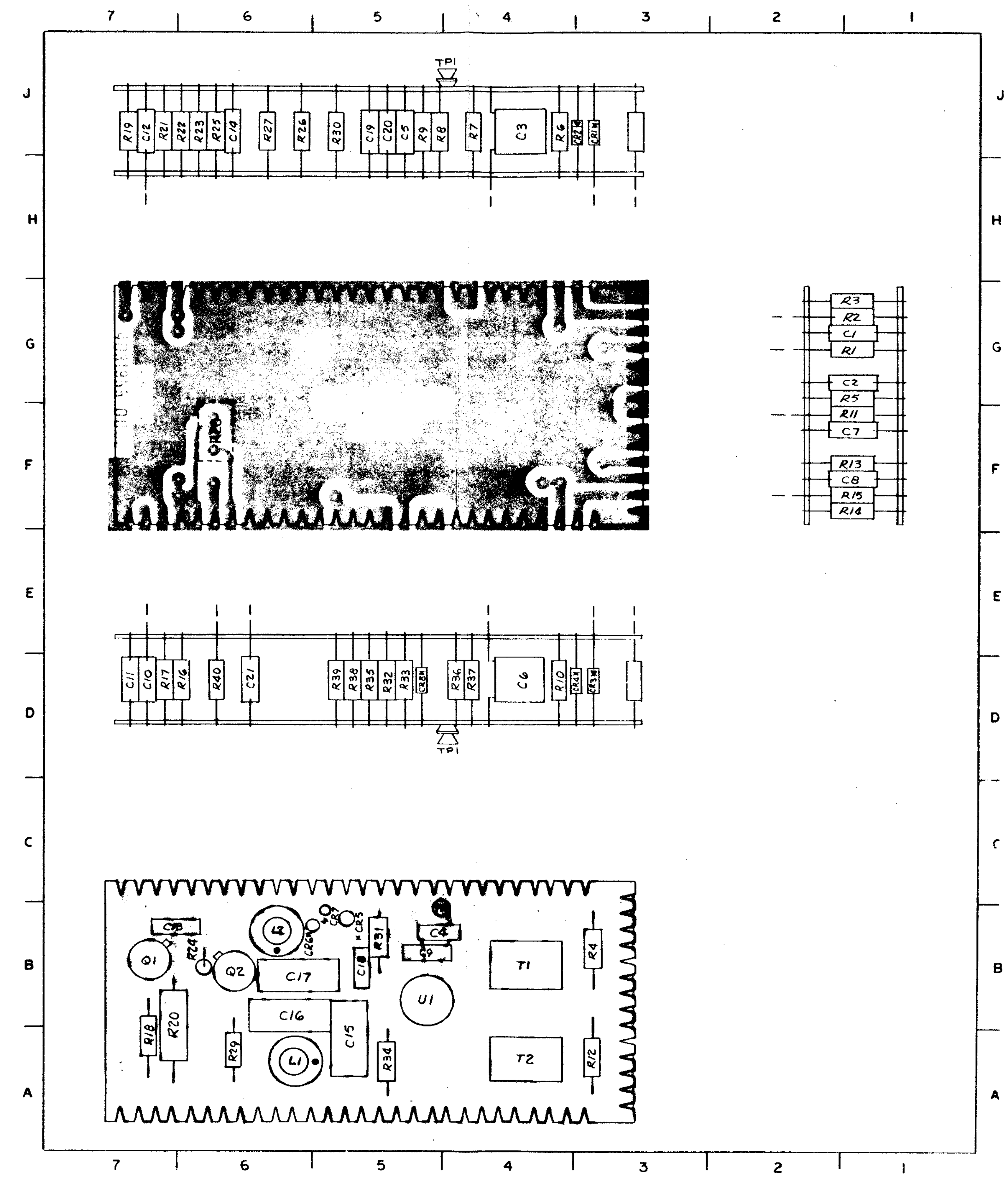

Figure 7-89. 1- and 10-kHz Mixer and ALC A2A6A6A1A3

PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A8C1	*	A2A8CR16	3B	A2A8Q1	2B
C2	*	CR17	3B	Q2	2C
C3	4D	E1	7A	Q3	2C
C4	4D	E2	6A	Q4	3D
C6	2D	E3	6A	R1	*
C7	3E	E4	6A	R2	*
CR1	5B	E5	5A	R3	4C
CR2	5B	E6	5A	R4	4D
CR3	5B	E7	4A	R5	3A
CR4	4B	E8	4A	R6	1C
CR5	7C	E9	4A	R7	3B
CR6	6C	E10	4A	R8	1C
CR7	6C	E11	3A	R9	2C
CR8	6C	E12	3A	R10	2C
CR9	4B	E13	3A	R11	*
CR10	4B	E14	*	R12	3C
CR11	4B	E15	2A	R13	2D
CR12	4B	E16	2A	R14	2F
CR13	5D	E17	7A	R15	3E
CR14	4E	E18	4F	R16	1B
CR15	2C				

* Not Used

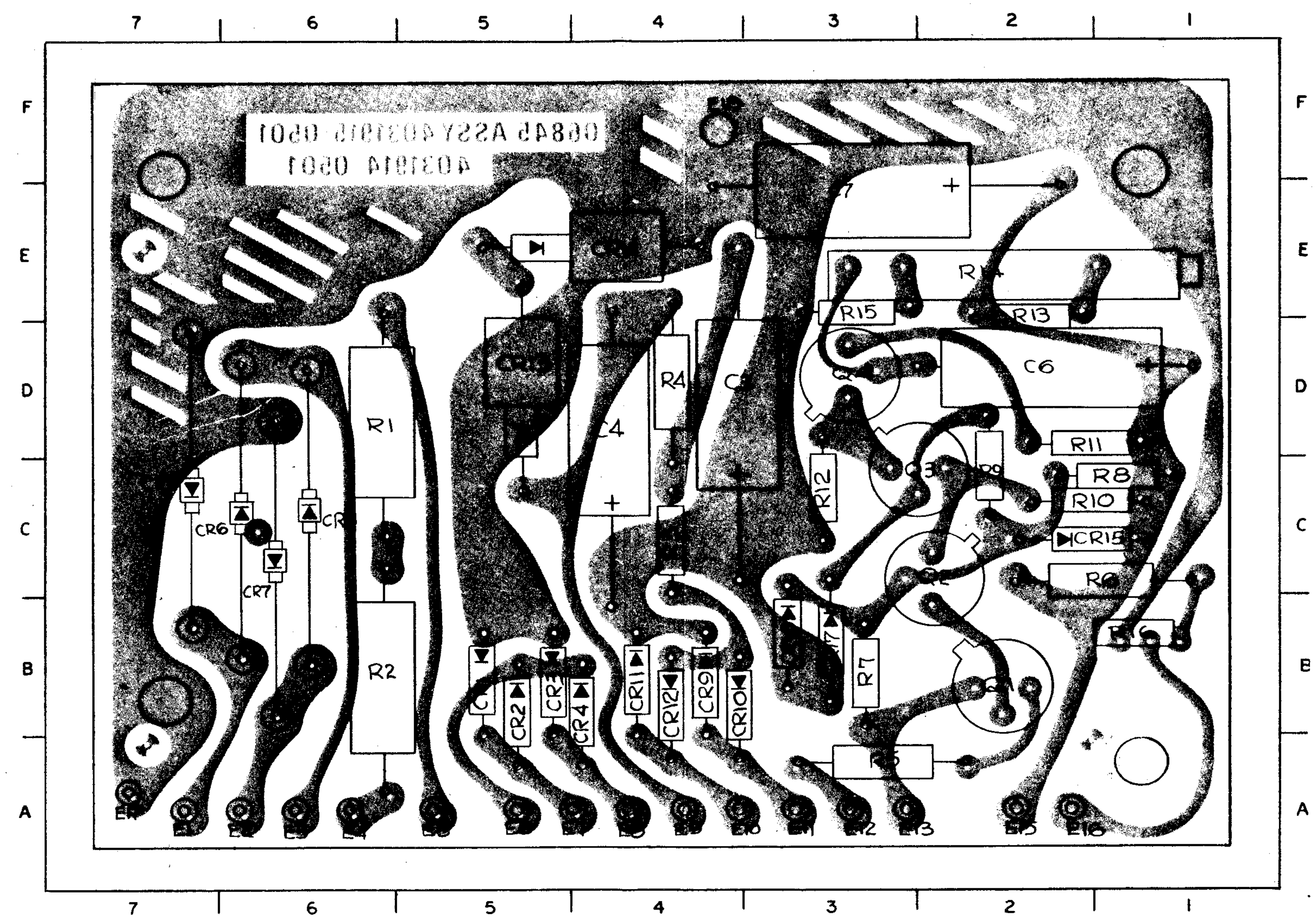

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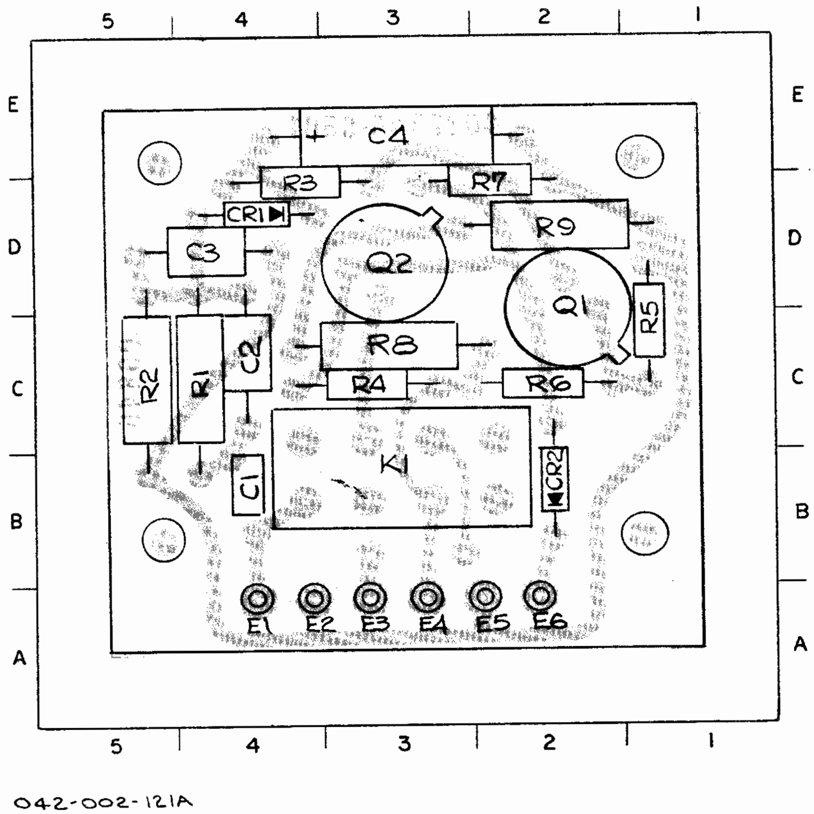
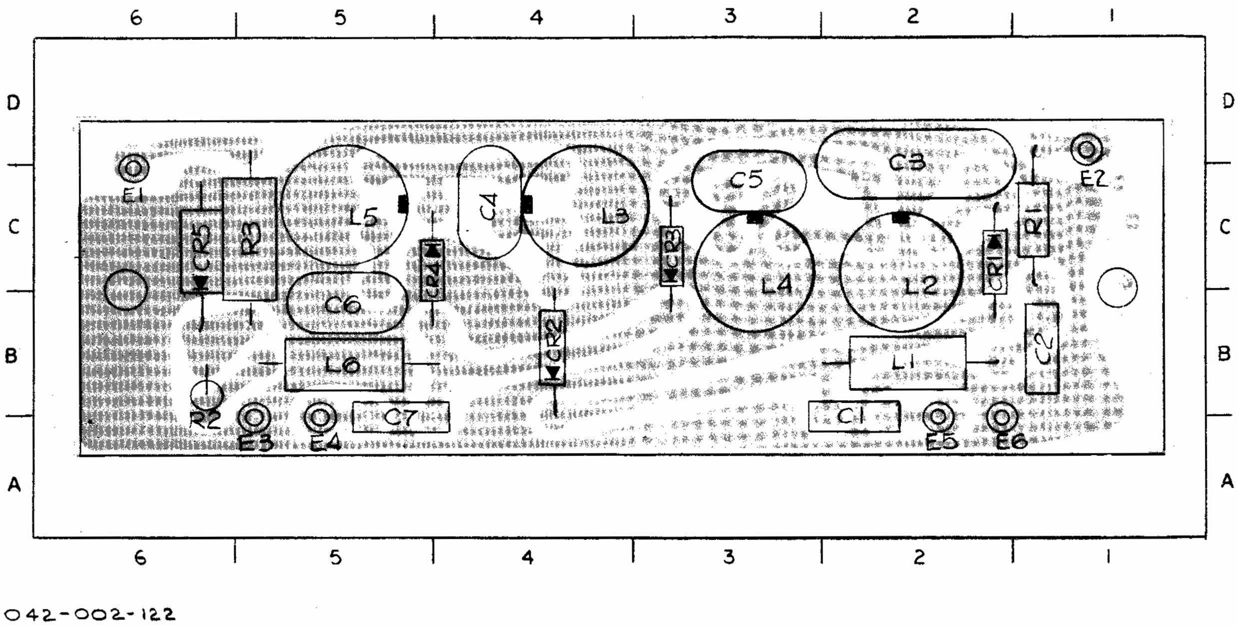
Figure 7-90. Receiver Power Supply Assembly A2A8



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A9C1	4B	A2A9E3	3A	A2A9R2	5C
C2	4C	E4	3A	R3	4D
C3	4D	E5	2A	R4	3C
C4	3E	E6	2A	R5	1C
CR1	4D	K1	3B	R6	2C
CR2	2B	Q1	2C	R7	2D
E1	4A	Q2	3D	R8	3C
E2	4A	R1	4C	R9	2D

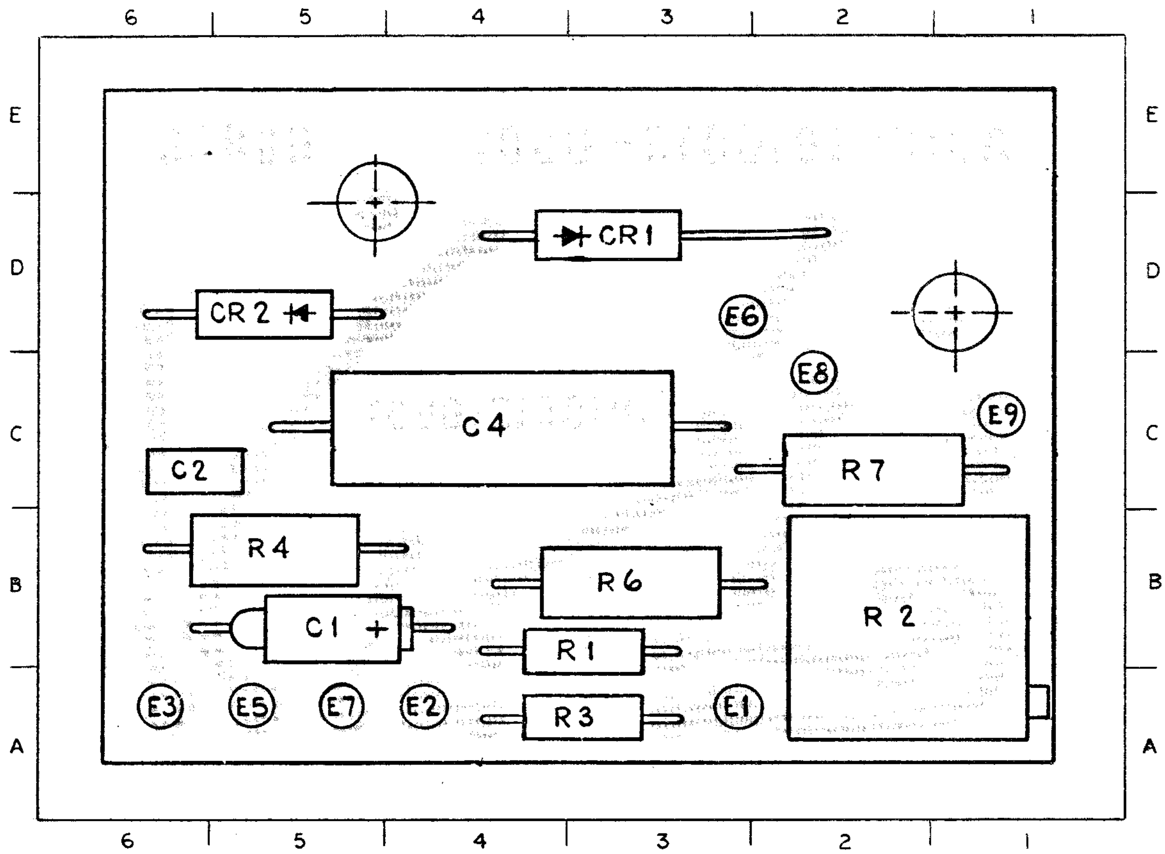
Figure 7-91. Antenna Overload Assembly A2A9



PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A10C1	2A	A2A10CR3	3C	A2A10L1	2B
C2	1B	CR4	5C	L2	2C
C3	2C	CR5	6C	L3	4C
C4	4C	E1	6C	L4	3C
C5	3C	E2	1D	L5	5C
C6	5B	E3	5A	L6	5B
C7	5A	E4	5A	R1	1C
CR1	2C	E5	2A	R2	6B
CR2	4B	E6	2A	R3	5C

Figure 7-92. 20- and 30-MHz Filter Assembly A2A10



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PART LOCATION INDEX

REF DES	ZONE	REF DES	ZONE	REF DES	ZONE
A2A11A1C1	5B	A2A11A1E3	6A	A2A11A1R1	3B
C2	6C	E4	*	R2	2B
C3	*	E5	5A	R3	3A
C4	4C	E6	3D	R4	5B
CR1	3D	E7	5A	R5	*
CR2	5D	E8	2C	R6	3B
E1	3A	E9	1C	R7	2C
E2	4A				

* Not Used

Figure 7-93. 4-Volt Power Supply Subassembly A2A11A1

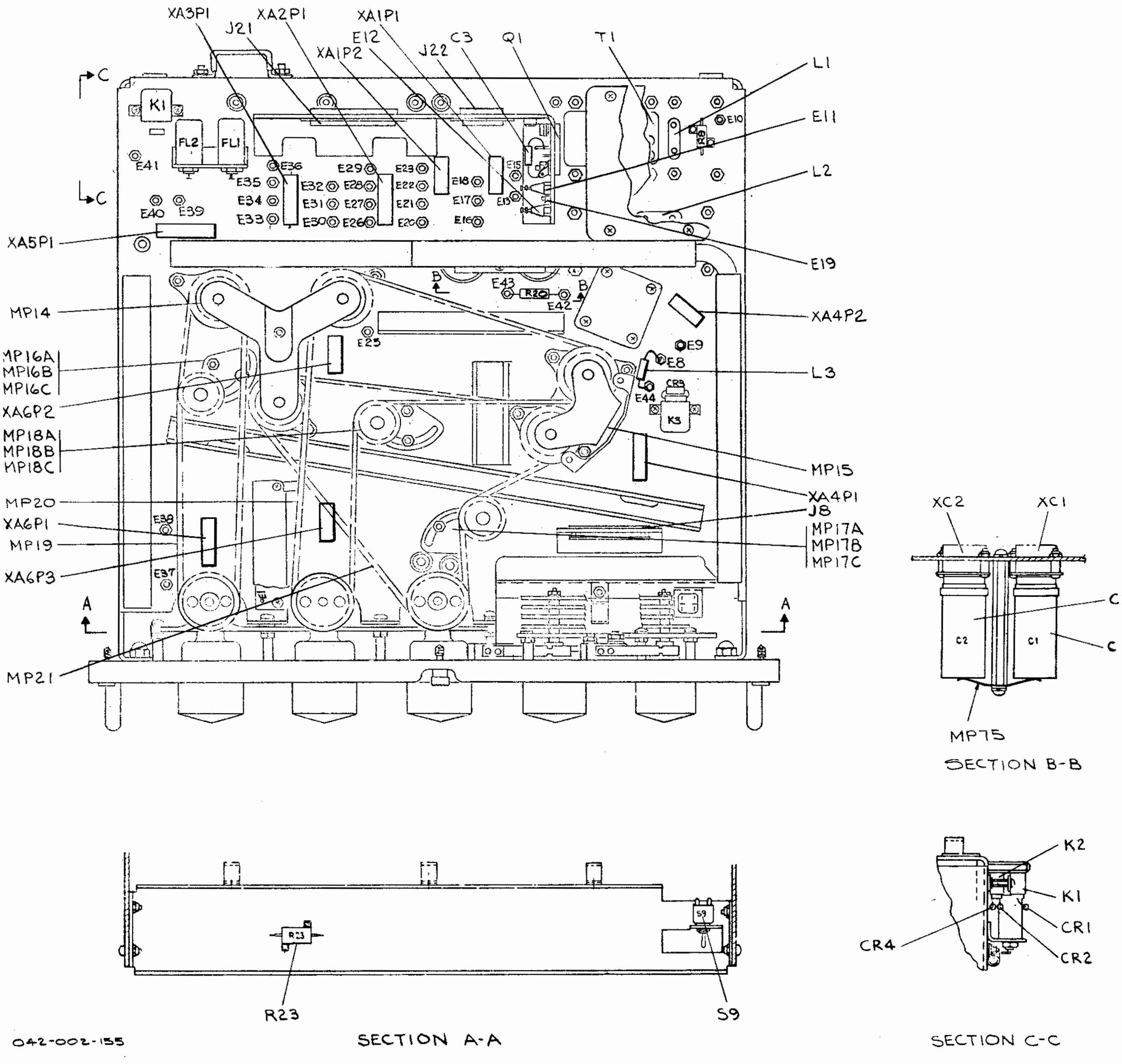

Figure 7-94. Receiver Main Frame A2

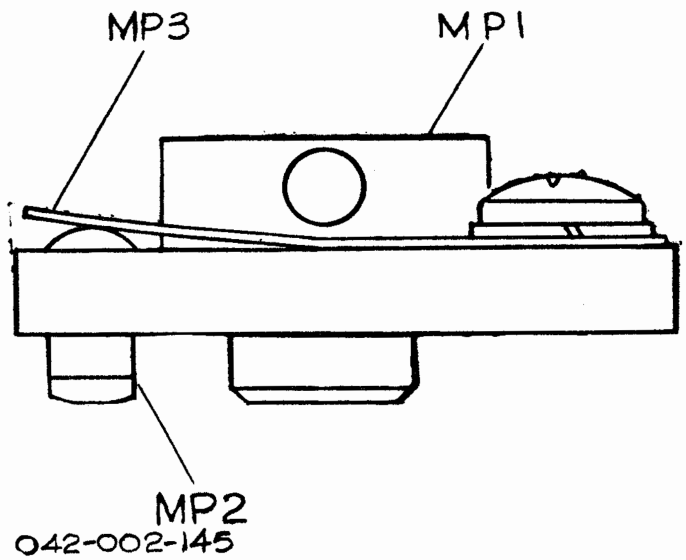

Figure 7-95. Coupling Assembly (P/O A2A6A2, A2A6A3)

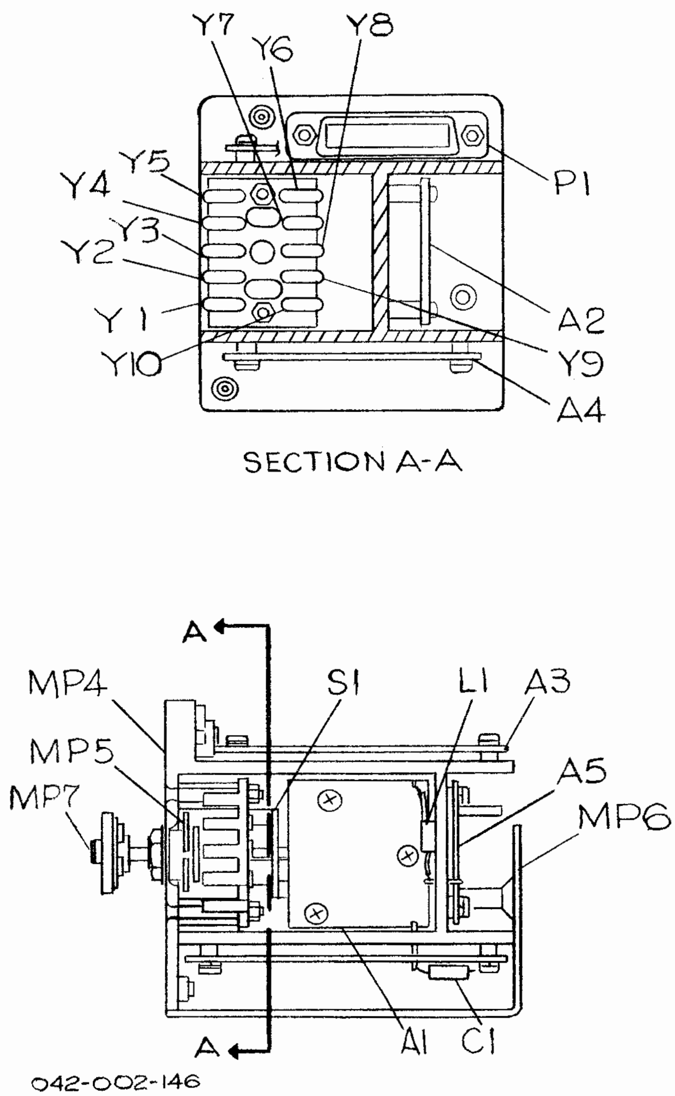

Figure 7-96. 100-kHz Synthesizer Subassembly A2A6A2

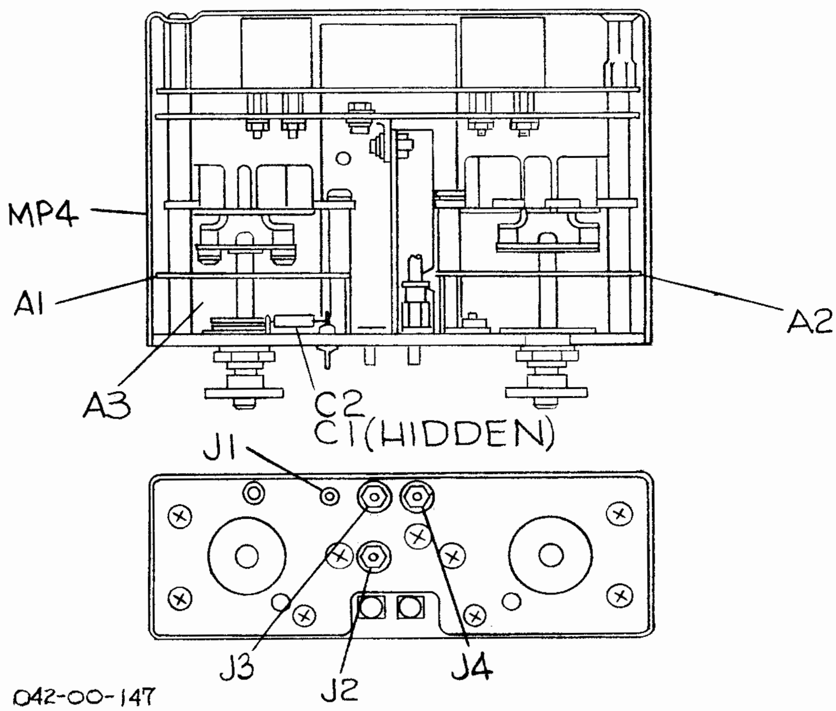

Figure 7-97. 1- and 10-kHz Synthesizer Subassembly A2A6A3

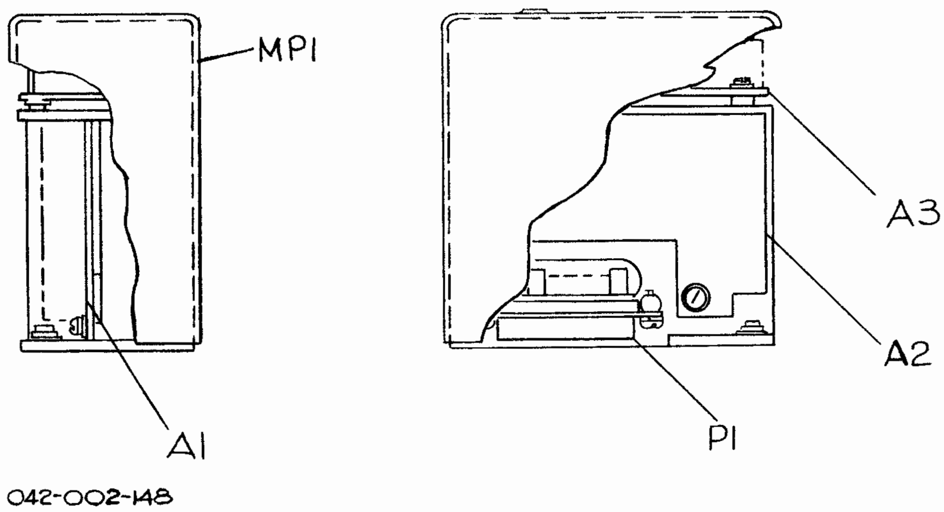

Figure 7-98. 100-Hz Synthesizer Subassembly A2A6A4

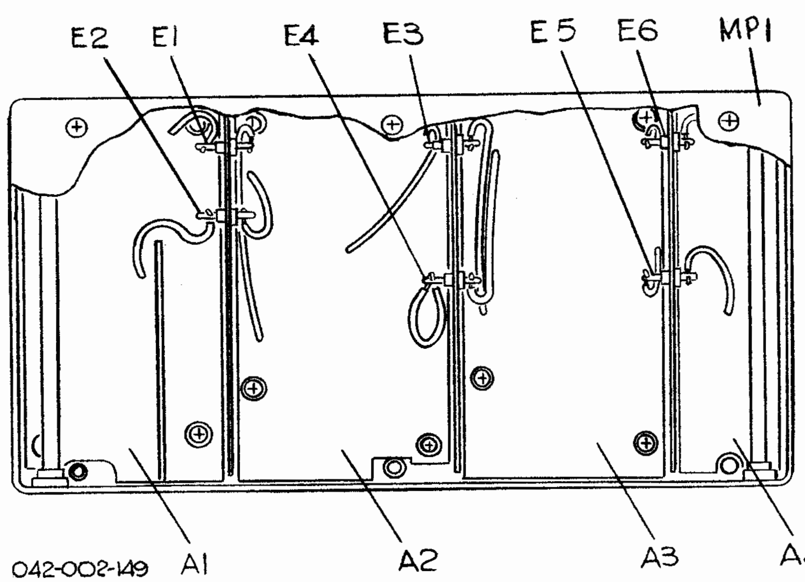

Figure 7-99. Spectrum Generator Subassembly A2A6A5

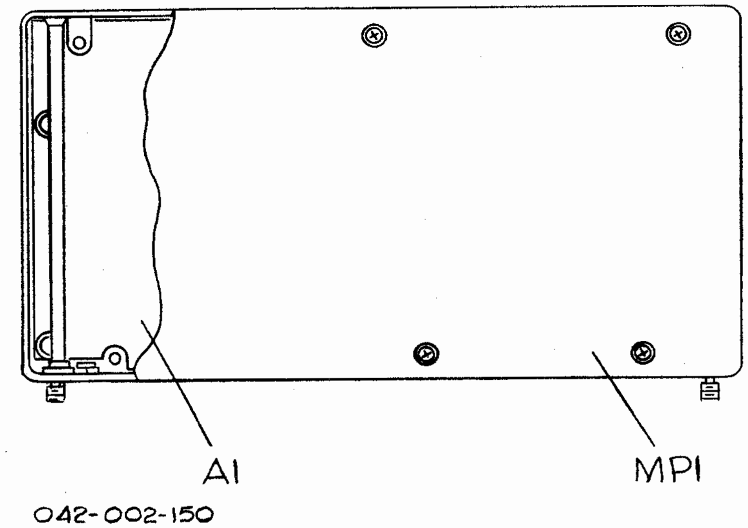

Figure 7-100. RF Translator Subassembly A2A6A6

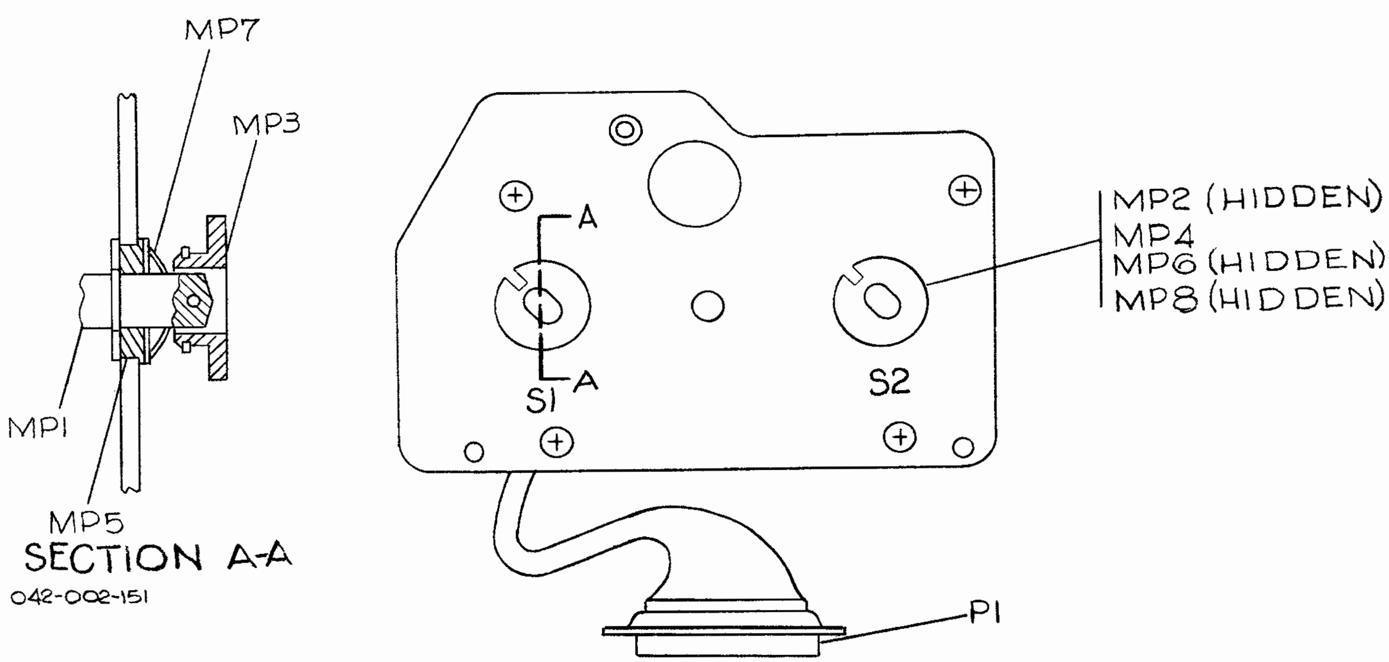

Figure 7-101. Receiver Code Generator Assembly A2A7

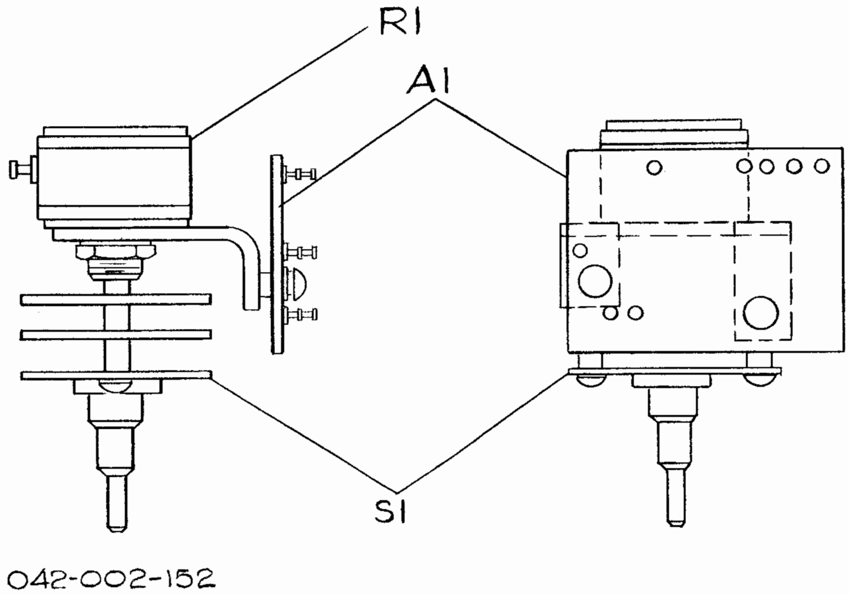

Figure 7-102. 100-Hz Control and Vernier Assembly A2A11

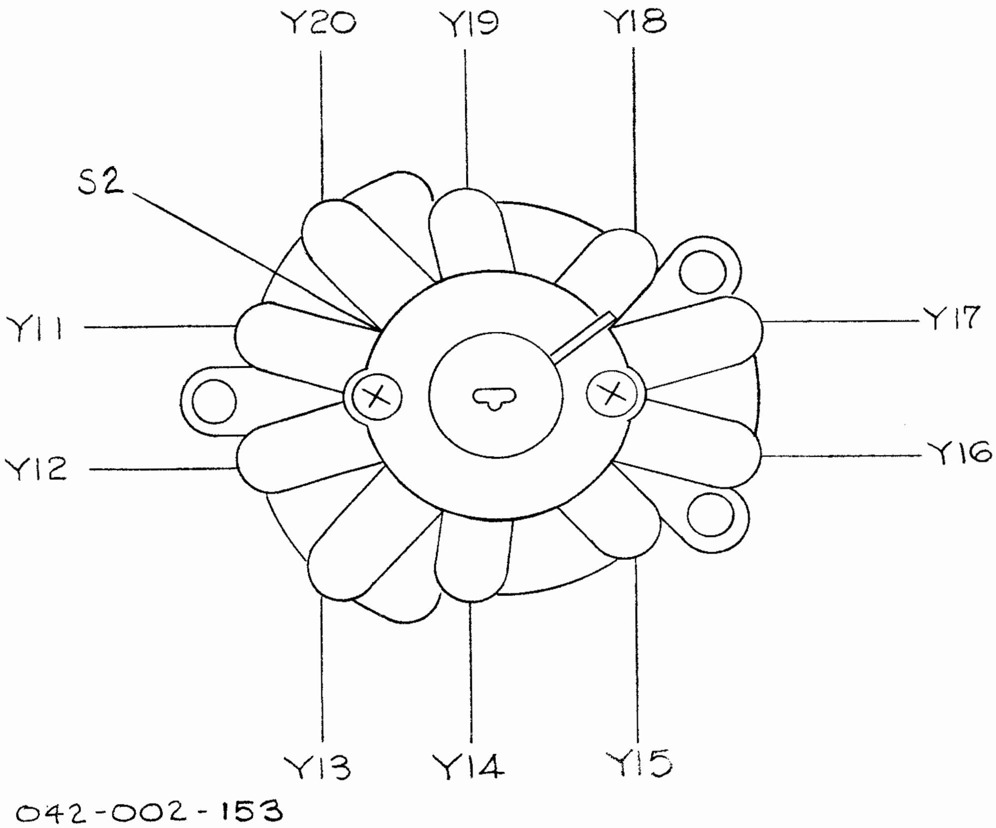

Figure 7-103. 1-kHz Crystal Switch (P/O A2A6A3)

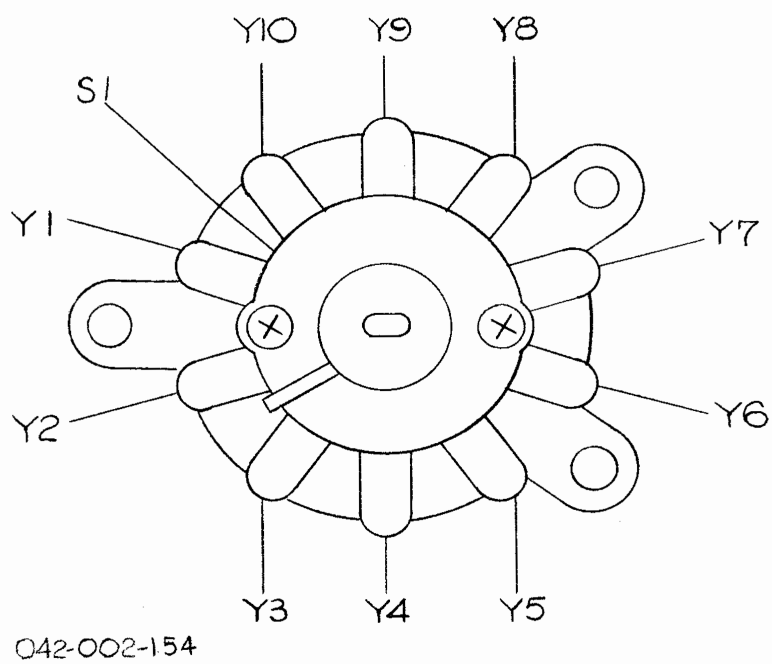

Figure 7-104. 10-kHz Crystal Switch (P/O A2A6A3)

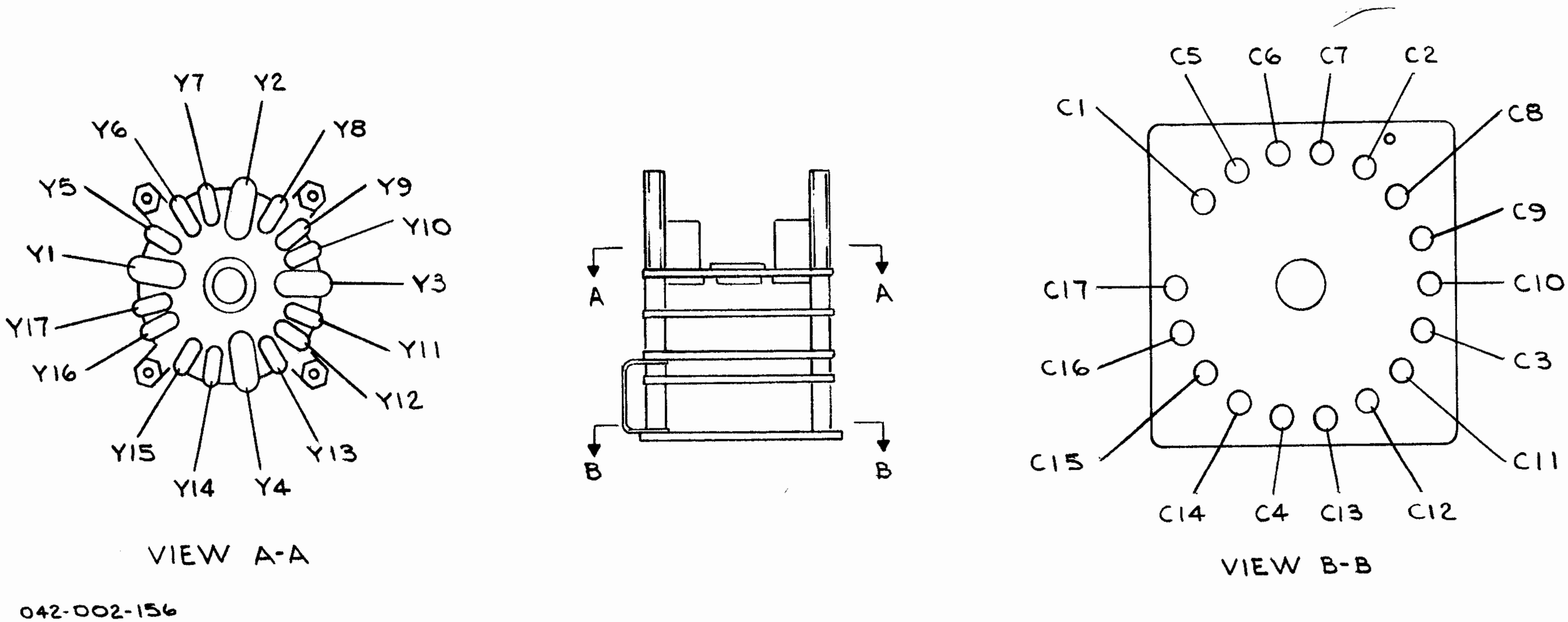

Figure 7-105. Switch Assembly (P/O A2A6A1)

CHAPTER 8

INSTALLATION

8-1. INTRODUCTION.

8-2. This chapter provides the information necessary for the installation of Radio Receiver R-1051E/URR. Dimensions of the receiver and clearance requirements are illustrated in figure 8-1. There are no special procedures required for unpacking the receiver, and no special tools are required to install the R-1051E/URR. The unit is designed to operate with a normal 115-Vac, single-phase, 48- to 450-Hz source.

8-3. UNPACKING AND REPACKING.

8-4. Unpacking the receiver is accomplished by carefully removing it from its shipping container. Extreme caution should be used in unpacking to prevent damage to controls and connectors.

8-5. INSTALLATION PROCEDURES.

8-6. SITE SELECTION. In selecting an installation site, adequate consideration must be given to the space requirements. These requirements include space for servicing the slide-mounted equipment when extended from the case, shock-mount deflection (when shock mounts are used), and cable bends, as well as considerations of proximity to associated equipment. See figure 8-1 for the dimensions of the R-1051E/URR.

8-7. CABLE ASSEMBLIES. Cable assemblies required for installation of the R-1051E/URR are described in table 8-1.

8-7A. INSTALLATION OF STRAIN RELIEF BOOTS. Strain relief boots (pn 4032608-0201) are installed over the TTHFWA-1-1/2 cables and their associated connector backshells, in the following manner.

a. Remove 0.88-inch of armor from the end of the TTHFWA-1-1/2 cable and proceed to install the applicable connector (listed in table 8-1).

b. Slide the strain relief boot over the connector (small end of boot goes over the connector first) onto the cable behind the connector.

c. Position the strain relief boot over the connector back shell.

d. Using a heat gun (with air deflector to localize the air stream), shrink the boot onto the connector backshell and cable. At least 175-degree Centigrade heat is required.

e. Continue heating boot until tight seal is obtained over connector shell and cable jacket.

8-8. PRIMARY POWER CONNECTION. To connect primary power to the R-1051E/URR, proceed as follows:

a. Connect 115-Vac power to AUX AC PWR IN connector A1A1J3 on rear of the receiver.

b. Set front-panel mode selector switch A2S2 to OFF.

c. Loosen front-panel screws and slide receiver chassis from case.

d. Set AUX/NORM switch A1S1 to AUX (vertical). This switch is located just behind front panel at center right, inside of case. It is part of interlock.

e. Slide chassis back into case and secure it.

8-9. POWER SUPPLY ADAPTATION. The R-1051E/URR is designed to operate from a nominal 115-Vac supply. The power input is connected to the 115-volt tap on the primary side of power transformer A2T1 in the receiver when shipped. If the supply voltage is not 115 Vac, the

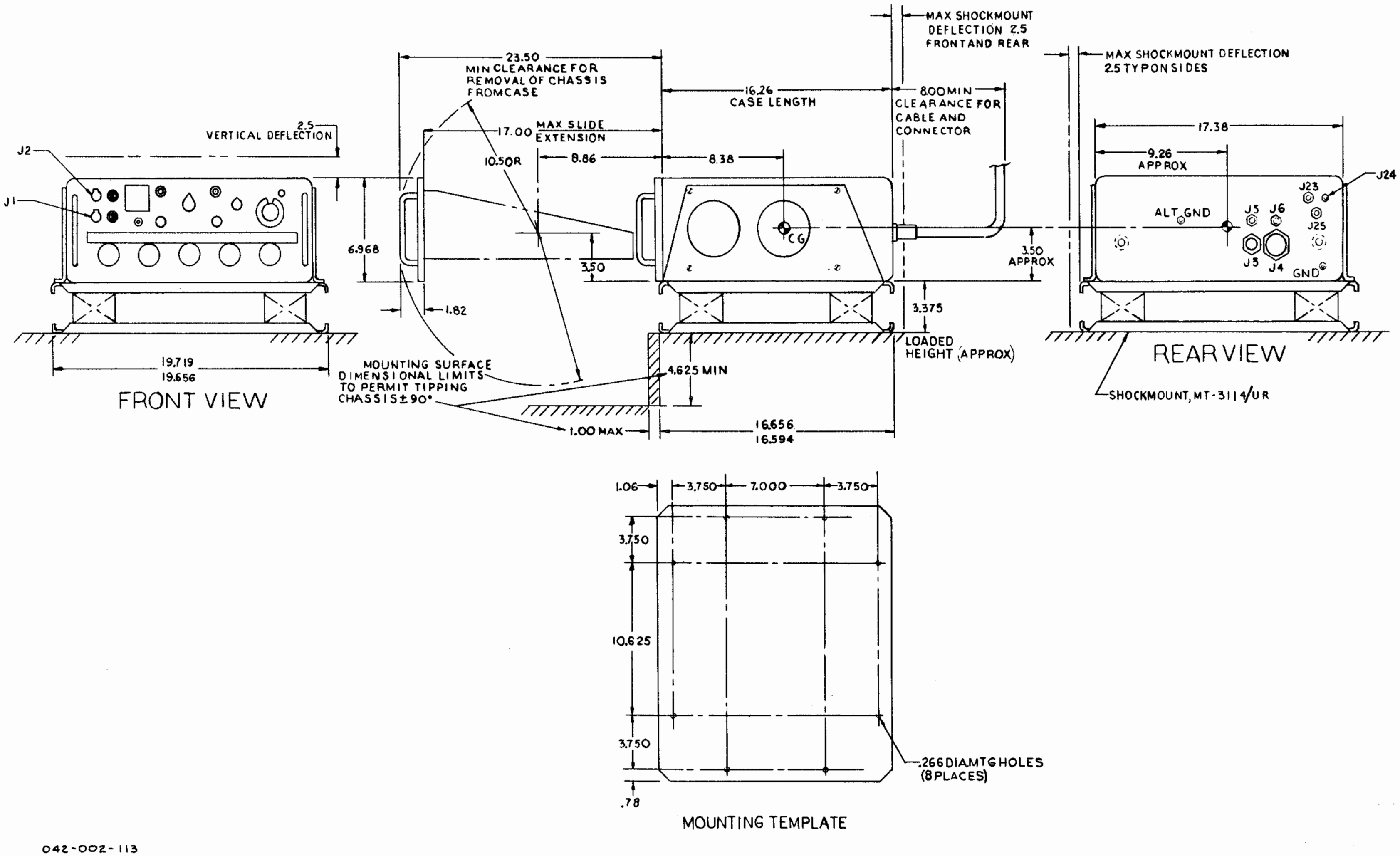

Figure 8-1. Radio Receiver R-1051E/URR, Installation Diagram

input connection must be changed to the appropriate tap (see figure 5-35). To change the transformer tap connection, proceed as follows:

a. Set mode selector switch A2S2 to OFF, and disconnect cables to connectors A1A1J3 and A1A1J4 on rear panel of receiver.

b. Loosen front-panel screws and slide receiver chassis out from case until slides lock.

CAUTION

Hand-guide main-frame cable at rear of chassis over edge of case when rotating main frame to vertical position.

c. Tilt chassis up 90 degrees to expose bottom. Remove four flat-head machine screws fastening protective plate of power supply component board A2A8A1 in lower left-hand corner of chassis. Remove protective plate, unscrew four hex spacers, and swing component board up to expose bottom of power transformer.

Table 8-1. Radio Receiver R-1051E/URR, Interconnecting Cable Assemblies

CABLE TYPE	NUMBER OF CABLE CONDUCTORS	FROM		TO UNIT
		CONNECTOR PART NO.	CONNECTOR REF DES	
TSGA-3	3	MS-3106E16S-5S	A1A1J3 (AUX AC PWR IN)	External primary power source
MIL-C-27072-41[1]	41	MS-3116J-20-39S	A1A1J4 (remote controls and output)	Remote control unit, such as Interconnection Box J1265/U, when used as part of a set
TTHFWA1-1/2	2	MS-3106E10SL-4S and strain relief boot 4032608-0201	A1A1J5 (USB AUDIO OUT)	Remote audio output equipment
TTHFWA1-1/2	2	MS-3106E10SL-4S and strain relief boot 4032608-0201	A1A1J6 (LSB AUDIO OUT)	Remote audio output equipment
RG-215/U	Coaxial	UG-88E/U	A1J23 (ANT)	Antenna or antenna coupler (antenna lead-in)
RG-215/U	Coaxial	UG-88E/U	A1J24 (INT 5MC OUT)	External remote or test equipment
RG-215/U	Coaxial	UG-941B/U	A1J25 (EXT 5MC IN)	Optional external frequency standard

[1]Used only when part of the AN/WRC-1 or a similar system.

d. Unsolder wire connected to terminal 1 of power transformer and resolder to appropriate tap (terminal 2, 3, 4, or 5). Do not unsolder common lead (connected to terminal 6).

e. Replace power supply component board, threaded hex spacers, component board protective plate, and flat-head screws.

f. Tilt chassis back to horizontal, release slide locks, slide chassis back into case, and secure it.

g. Reconnect cables that were disconnected in step a. above.

8-10. TRANSFORMERS IN BALANCED, GROUNDED, CENTER-TAP CIRCUIT. The audio transformers as supplied in the R-1051E/URR (located in Receiver IF./Audio Amplifier Assemblies A2A2 and A2A3) do not have grounded center taps. If it is required that these transformers work into a balanced, grounded, center-tap circuit, proceed as follows:

CAUTION

Do not ground center taps if working into an unbalanced circuit.

a. Set mode selector switch A2S2 to OFF.

b. Loosen front-panel screws and slide receiver chassis from case.

CAUTION

Hand-guide main-frame cable at rear of chassis over edge of case when rotating main frame to vertical position.

c. Tilt chassis up 90 degrees to expose bottom.

d. Jumper A2E22 to A2E21 and A2E34 to A2E35.

e. Tilt chassis back to horizontal, release slide locks, slide chassis back into case, and secure it.

f. Set mode selector switch A2S2 to desired operating mode.

8-11. MOUNTING. The R-1051E/URR may be installed independently in any convenient location, using a shock mount aboard ship, or may be mounted in a standard 19-inch rack by means of adapter plates. For all required installation dimensions, see figure 8-1. Figure 8-2 illustrates the mounting bracket used for mounting the receiver in a standard rack.

WARNING

To avoid injury to personnel, do not overstress mounting bolts, since shock may cause them to shear.

8-12. INTERCONNECTIONS. All connections are made at the rear of the unit, with the exception of the receiver headset. An rf input is obtained by mating a type UG-941B/U connector and the necessary length of RG-215/U coaxial cable with ANT connector A1J23, when the R-1051E/URR is installed separately.

8-13. OPERATION AS A REMOTE UNIT. When the R-1051E/URR is to be operated as a remote unit, connection is made as follows:

a. Connect the antenna input to ANT connector A1J23 on the rear panel of the receiver, using an RG-215/U cable.

b. Connect receiver switchboard remote audio lines to USB AUDIO OUT connector A1A1J5 and LSB AUDIO OUT connector A1A1J6 on rear of receiver, using type MS-3106E10SL-4S connectors.

8-14. OPERATION AS AN INDEPENDENT UNIT. To operate the R-1051E/URR as an independent unit, proceed as follows:

a. Connect TTHFWA1-1/2 cable to USB AUDIO OUT connector A1A1J5 and LSB AUDIO OUT connector A1A1J6 on rear panel of receiver.

b. Connect headset to PHONE USB jack A2J2 or PHONE LSB jack A2J1 on rear panel of receiver.

c. Connect the antenna to ANT connector A1J23 on the rear panel of receiver using an RG-215/U cable.

d. Further instructions depend upon equipment to be used with the R-1051E/URR, and are therefore beyond the scope of this publication. Refer to the technical manuals for the associated equipments.

8-15. OPERATION USING INTERNAL FREQUENCY STANDARD. For operation with the R-1051E/URR internal frequency standard, proceed as follows:

a. Set mode selector switch A2S2 to STDBY.

b. Loosen the front-panel screws and slide chassis out of the case.

c. Check that COMP/INT/EXT switch A2A5A2S1 on top of Frequency Standard Assembly A2A5 is set to the INT position.

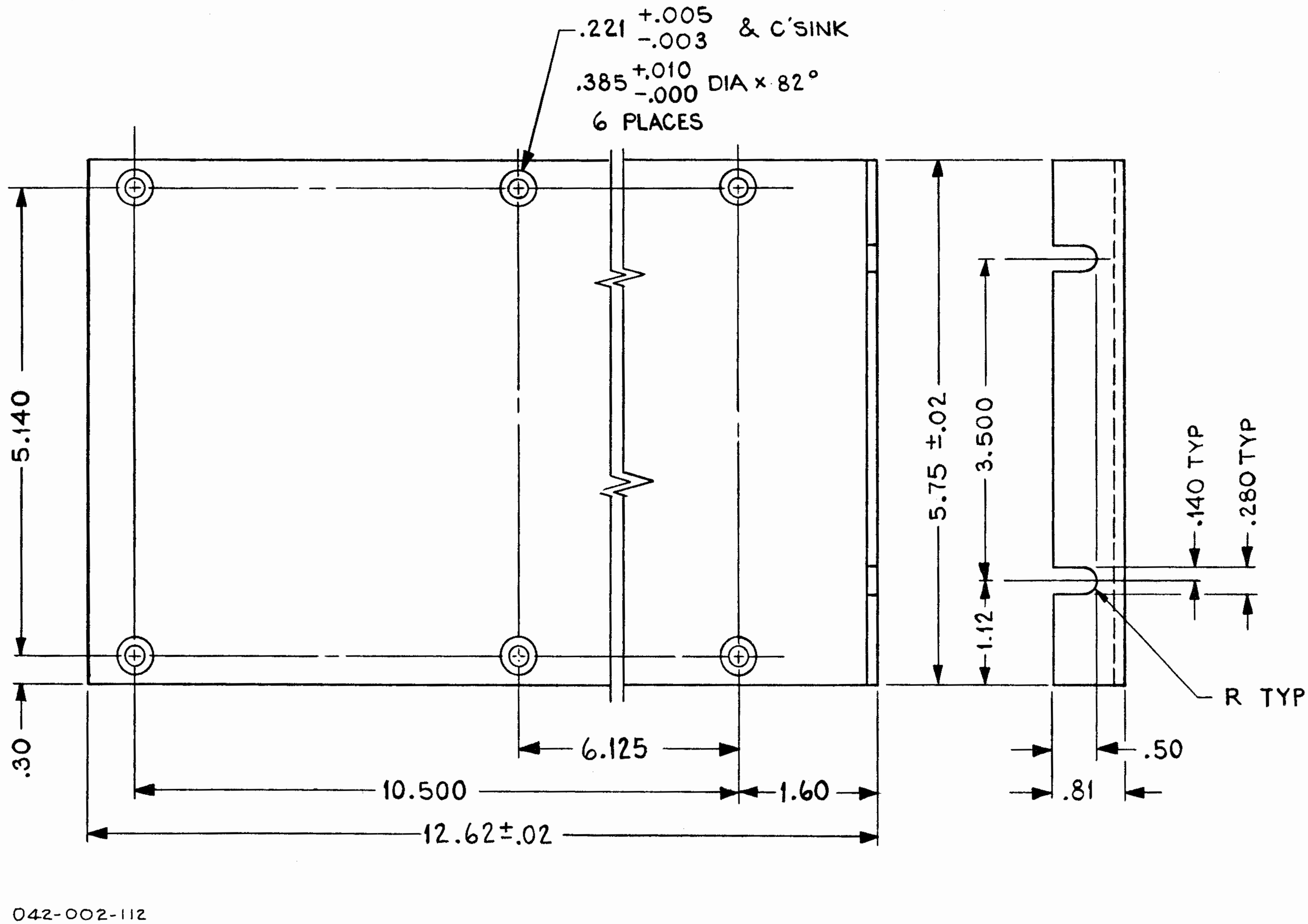

Figure 8-2. Radio Receiver R-1051E/URR, Mounting Bracket for Rack Mounting

This electronic assembly is located at right rear of chassis.

d. Slide chassis back into case and secure it.

e. Set mode selector switch A2S2 to desired operating mode.

8-16. OPERATION USING EXTERNAL FREQUENCY STANDARD. If it is required to use an external frequency standard for operation of the R-1051E/URR, proceed as follows:

a. Connect external frequency standard output to EXT 5MC IN connector A1J25 on the rear of the receiver.

b. Set mode selector switch A2S2 to STDBY.

c. Loosen front-panel screws and slide chassis out from case.

d. Set COMP/INT/EXT switch A2A5A2S1 on top of Frequency Standard Assembly A2A5 to EXT.

e. Slide chassis back into case and secure it.

f. Set mode selector switch A2S2 to desired operating mode.

8-17. OPERATION OF ANOTHER UNIT USING FREQUENCY STANDARD OUTPUT. If it is required to use the output from the internal frequency standard of the R-1051E/URR to operate another unit, proceed as follows:

a. Set mode selector switch A2S2 to STDBY.

b. Loosen front-panel screws and slide receiver chassis out from case.

c. Set COMP/INT/EXT switch A2A5A2S1 on top of Frequency Standard Assembly A2A5 to COMP.

d. Slide chassis back into case and secure it.

e. Connect cable between INT 5MC OUT connector A1J24 on rear of receiver and frequency standard input connector of other unit.

f. Set mode selector switch A2S2 to desired operating mode.

8-18. USE OF EXTERNAL FREQUENCY STANDARD FOR CALIBRATION. If it is required to use an external frequency standard for calibration of the R-1051E/URR, proceed as follows:

CAUTION

Do not adjust Frequency Standard Assembly A2A5 unless power has been applied and mode selector switch A2S2 has been in a position other than OFF for at least 24 hours. Most drift will occur during the first 60 minutes of warm-up; thereafter, the error should be less than ±1 part per 10^7 (0.5 Hz at 5 MHz).

a. Connect external frequency standard to EXT 5MC IN connector A1J25 on the rear of the receiver.

b. Set mode selector switch A2S2 to STDBY.

c. Loosen front-panel screws and slide receiver chassis out from case.

d. Set COMP/INT/EXT switch A2A5A2S1 on top of Frequency Standard Assembly A2A5 to COMP.

e. Close chassis and set mode selector switch A2S2 to desired operating mode, or calibrate and adjust the frequency standard in accordance with the procedures in table 6-5.

f. After calibration, set mode selector switch A2S2 to STANDBY, and slide chassis out of case.

g. Ensure that cables are reconnected as they were initially, and that all switches are in the proper positions.

h. Set COMP/INT/EXT switch A2A5A2S1 to desired position.

i. Slide chassis back into case and secure it.

j. Set mode selector switch A2S2 to desired operating mode.

8-19. SIMPLEX/DUPLEX OPERATION. If the R-1051E/URR is to be used in simplex operation, proceed as follows:

a. Set mode selector switch A2S2 to OFF.

b. Loosen front-panel screws and slide receiver chassis from case.

c. Set SIMPLEX/DUPLEX switch A2S9 to SIMPLEX. This switch is located just behind front panel on the left.

d. For duplex operation, set SIMPLEX/DUPLEX switch A2S9 to DUPLEX.

e. Slide chassis back into case and secure it.

f. Set mode selector switch A2S2 to desired operating mode.

8-20. INSTALLATION CHECKOUT.

8-21. PHASE 1 - INSTALLATION INSPECTION AND PREENERGIZING PROCEDURES. The R-1051E/URR should be carefully checked for damage to indicators and switches, and for loose hardware and knobs. Make sure that all electronic assemblies are firmly seated and that tubes are properly secured in tube sockets. Check connectors for dirt, damage to pins, and broken insulators. Replace or repair as necessary. Check that all cables are properly connected and that all fuses are in place.

8-22. PHASE 2 - INITIAL TURNON AND PRELIMINARY TEST. When energizing the receiver for the first time following installation, perform the maintenance turnon procedure of table 5-4. Should any adjustments be found necessary, refer to the applicable procedures in Chapter 6 of this manual. After initial turnon, refer to Chapter 2 of this manual and perform the operating procedures outlined therein to ensure proper operation of the receiver.

8-23. PHASE 3 - INSTALLATION VERIFICATION TEST. In order to verify proper installation of the receiver, refer to the performance checks for the unit given in Chapter 4 of this manual.

8-24. INSTALLATION STANDARDS SUMMARY SHEET. This sheet is provided for the purpose of recording the results of all installation verification tests and is located at the end of this chapter. Each space is identified by the test and step numbers which provide the instructions for accomplishment.

RADIO RECEIVER R-1051E/URR

INSTALLATION STANDARDS SUMMARY

Input Voltage ____________ Vac
Input Frequency ____________ Hz
(When reference standard tests are made)

Date ____________
Serial No. ____________
Install in (Ship or Station)

Record on this summary sheet the test indications which have been obtained during the installation verification tests in tables 4-3, 4-4, and 4-5.

Table	Test No.	Step	Ref. Std.
4-3	W1	3	____ Check
		4	____ Check
		6	____ Check
		7	____ Check
		8	____ Check
4-4	M2	4	(A2A8E10) ____ Vdc
			(A2E12) ____ Vdc
			(A2E17) ____ Vdc
			(A2A8E10) ____ mV
			(A2E12) ____ mV
			(A2E17) ____ mV
		5	____ Vdc
		6	____ mV
4-4	M3	2	____ dB
		3	____ dB
		4	____ dB
		5	____ dB
		6	____ dB
		7	____ dB
4-4	M4	2	____ μV
		3	____ μV
		5	____ Check
		9	____ μV
		14	____ μV
4-4	M5	2	____ s
		3	____ Check
		4	____ Check
		5	____ Check
		6	____ Hz
		7	____ Hz
		8	____ Check
		9	____ Check

Table	Test No.	Step	Ref. Std.
4-5	Q3	3	____ s
		4	____ mV
		5	____ mV
		6	____ kHz
4-5	Q4	2	____ mV
		3	____ Check
		4	____ Check
4-5	Q5	4	____ mV
		5	____ Check
4-5	Q6	4	____ mV
		5	____ mV
		6	____ mV
		7	____ Check
		10	____ Check
4-5	Q7	3	____ Vac
		4	____ Vac
		5	____ dB
		7	____ Vac
		8	____ dB
4-6	A1	2	____ Check
		3	____ Check
		4	____ Check
		5	____ Check
		6	____ Check
		7	____ Check
		8	____ Check

APPENDIX A

COMPREHENSIVE FREQUENCY TRANSLATION CHART

A-1. The comprehensive frequency translation chart (table A-1) shows the 1-MHz, 100-kHz, and 1- and 10-kHz injection frequencies corresponding to the settings of the receiver front-panel frequency controls. Ranges of frequencies are given for the 100-kHz injection signal as determined by the setting of the Hz switch in 100-Hz steps or in the vernier position. Ranges of frequencies are given for the 1- and 10-kHz injection signal as determined by the combination of 1-kHz and 10-kHz control settings.

Table A-1. Comprehensive Frequency Translation Chart[1]

MHz CONTROL SETTING	1-MHz INJECTION (1-MHz OSCILLATOR)		100-kHz CONTROL SETTING	100-kHz OSCILLA-TOR	100-kHz INJECTION				10-kHz CONTROL SETTING	10-kHz OSCILLA-TOR	1- AND 10-kHz INJECTION	1-kHz CONTROL SETTING	1-kHz OSCILLA-TOR
					LO		HI						
	LO	HI			000 Hz TO 900 Hz IN 100 Hz STEPS[2]	VERNIER[2]	000 Hz TO 900 Hz IN 100 Hz STEPS[2]	VERNIER[2]					
2	17.5		0	4.553	22.4000 to 22.4009	22.3998 to 22.4012	32.4000 to 32.4009	32.3998 to 32.4012	0	5.25	3.400 to 3.391	0	1.850
3	16.5		1	4.653	22.5000 to 22.5009	22.4998 to 22.5012	32.5000 to 32.5009	32.4998 to 32.5012	1	5.24	3.390 to 3.381	1	1.851
4	15.5		2	4.753	22.6000 to 22.6009	22.5998 to 22.6012	32.6000 to 32.6009	32.5998 to 32.6012	2	5.23	3.380 to 3.371	2	1.852
5	14.5		3	4.853	22.7000 to 22.7009	22.6998 to 22.7012	32.7000 to 32.7009	32.6998 to 32.7012	3	5.22	3.370 to 3.361	3	1.853
6		23.5	4	4.953	22.8000 to 22.8009	22.7998 to 22.8012	32.8000 to 32.8009	32.7998 to 32.8012	4	5.21	3.360 to 3.351	4	1.854
7	12.5		5	5.053	22.9000 to 22.9009	22.8998 to 22.9012	32.9000 to 32.9009	32.8998 to 32.9012	5	5.20	3.350 to 3.341	5	1.855
8	11.5		6	5.153	23.0000 to 23.0009	22.9998 to 23.0012	33.0000 to 33.0009	32.9998 to 33.0012	6	5.19	3.340 to 3.331	6	1.856
9		20.5	7	5.253	23.1000 to 23.1009	23.0998 to 23.1012	33.1000 to 33.1009	33.0998 to 33.1012	7	5.18	3.330 to 3.321	7	1.857
10		19.5	8	5.353	23.2000 to 23.2009	23.1998 to 23.2012	33.2000 to 33.2009	33.1998 to 33.2012	8	5.17	3.320 to 3.311	8	1.858
11	8.5		9	5.453	23.3000 to 23.3009	23.2998 to 23.3012	33.3000 to 33.3009	33.2998 to 33.3012	9	5.16	3.310 to 3.301	9	1.859
12	7.5												
13		16.5											
14	5.5												
15	4.5												
16	3.5												
17		12.5											
18		11.5											
19		10.5											
20		9.5											
21		8.5											
22	2.5												
23	3.5												
24		5.5											
25		4.5											
26		3.5											
27	7.5												
28	8.5												
29	9.5												

1. All frequencies in MHz unless otherwise specified.
2. 100-kHz injection frequencies may be displaced slightly, to compensate for frequency errors in 10-kHz and 1-kHz oscillators.

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