

NAVELEX 0967-385-0010

VOLUME 1 OF 2

TECHNICAL MANUAL

FOR

RADIO RECEIVING SETS

AN/URR-64 (V) 1 AN/URR-64 (V) 2 AN/URR-64 (V) 3

VOLUME 1

**DEPARTMENT OF THE NAVY
NAVAL ELECTRONIC SYSTEMS COMMAND**

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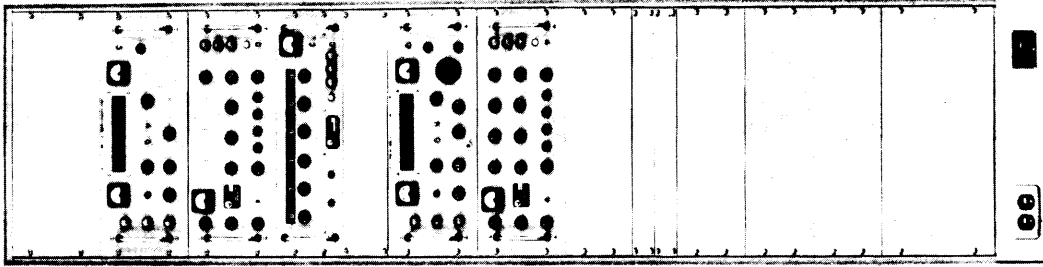
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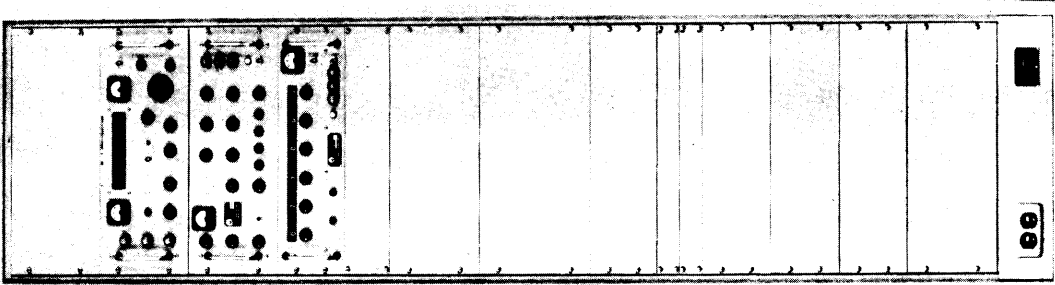
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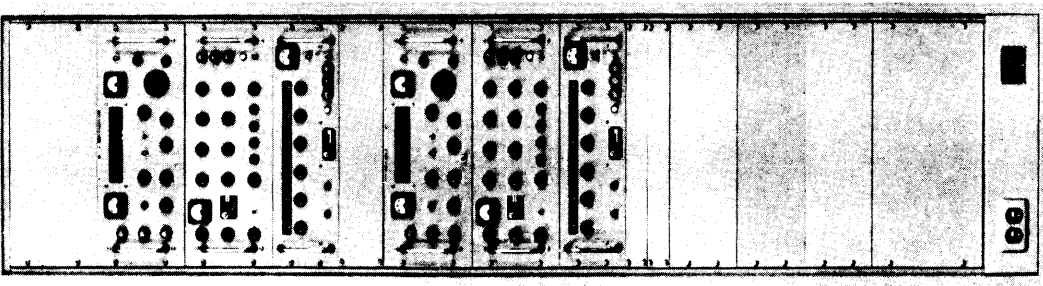
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AN/URR-64(V)3



AN/URR-64(V)2



AN/URR-64(V)1

Figure 1-0. AN/URR-64(V) Series Radio Receiving Set

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SECTION 1

GENERAL INFORMATION

1-1. SCOPE.

This Technical Manual is in effect upon receipt. Extracts from this publication may be made to facilitate the preparation of other Department of Defense publications.

The context of this manual covers Radio Receiving Sets AN/URR-64(V)1, AN/URR-64(V)2 and AN/URR-64(V)3. Receiving Set AN/URR-64(V)2 is a non-diversity receiver with four channel capability; AN/URR-64(V)1 is a dual diversity receiver essentially employing the circuitry of two AN/URR-64(V)2 single receivers; AN/URR-64(V)3 is a dual space diversity receiver. Except as otherwise indicated, text in this manual refers to the single Receiving Set, AN/URR-64(V)2.

1-2. GENERAL DESCRIPTION (see figures 1-1, 1-2, and 1-3).

Each Receiving Set is superheterodyne independent sideband receiver, manually tunable over a 2 to 32 mc frequency range in four bands. Reception is for four 3 kc ISB (independent sideband) channels consisting of direct channels (A1 and B1) and translated channels (A2 and B2) in the upper and lower sidebands (see figure 1-4). In lieu of sideband reception, the receiver includes a reception channel for a 2.5 or 6.0 kc bandwidth, symmetrical about the carrier, for CW, MCW or AM transmissions (see figure 1-5). Controls for this channel include an adjustable (± 3 kc) BFO for CW receptions.

Each of the four ISB channels may contain voice, a combination of voice frequency tone telegraph channels, FAX (facimile) channels, data transmission or any type of information that may be contained within 250 to 3040 cps (direct channels) and 350 to 3040 cps (translated channels).

There are three frequency stabilization control modes: (1) LOCAL (local oscillator), (2) SYN (synthesized) and (3) AFC (automatic frequency control); the receiver may be set for any of the three. LOCAL oscillator frequency control provides continuous tuning throughout the 2 to 32 mc range with the frequency stability referenced to the local oscillator. In synthesized frequency control, tuning is 100 cps steps and the stability is maintained by locking to an internal 1 mc frequency standard, stable to within one part in 1×10^8 per day; there is a connection for an external 1 mc standard of higher stability if preferred, with automatic switching between the two. For relatively unstable transmissions with a full or partial carrier, the AFC circuitry locks to the carrier and corrects injection frequencies

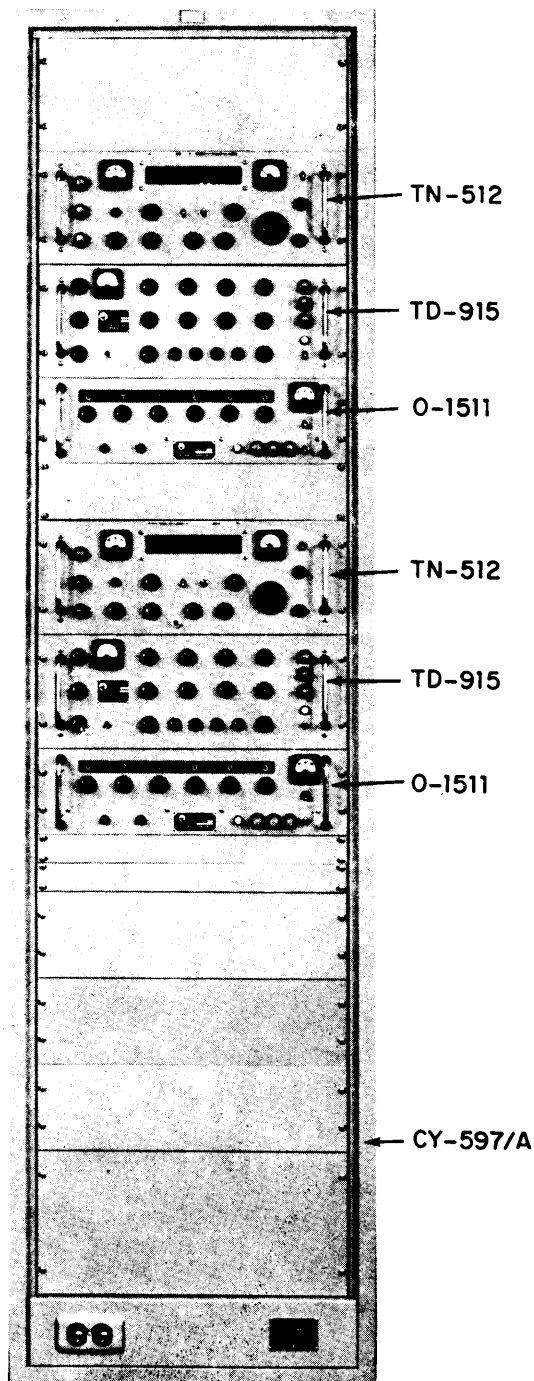


Figure 1-1. Radio Receiving Set AN/URR-64(V)1

for the drifting signal from the transmitter.

Receiver gain may be controlled either manually or by AGC (automatic gain control). In AGC, source and attack-and-decay time may be set individually for each channel. The AGC system maintains a constant audio output level through an antenna input

range of 1.0 uv to 1 volt.

The frequency to which the receiver is tuned is displayed in a six-digit (02.0000 to 32.0000) mc frequency counter on the front panel. This display represents an actual count of the receiver tuned frequency and is also referenced to a 1 mc standard.

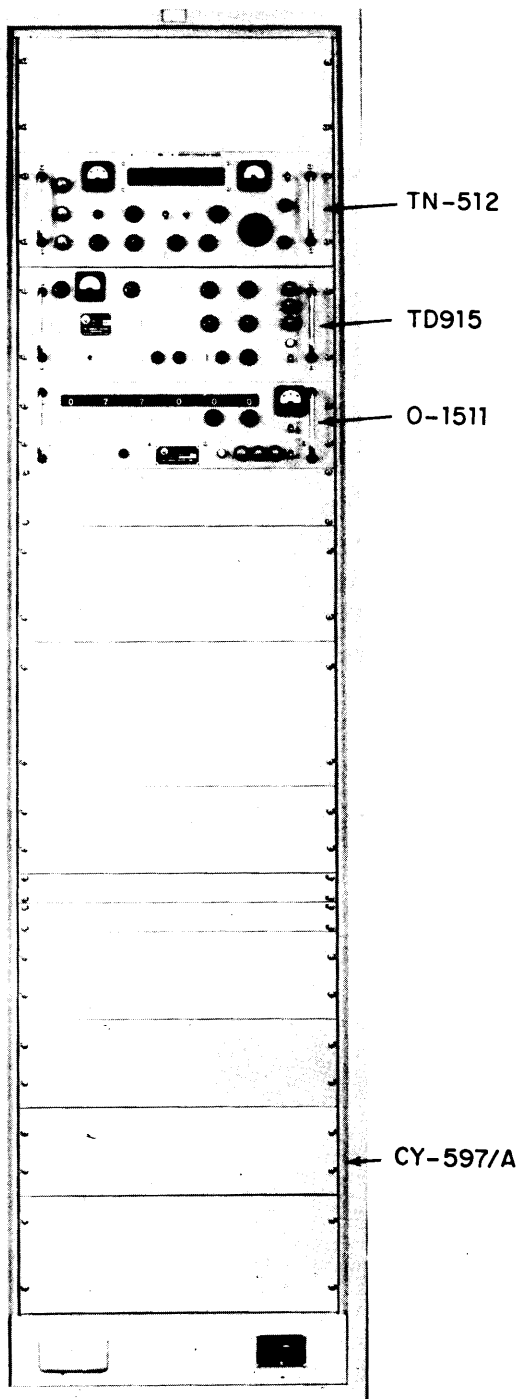


Figure 1-2. Radio Receiving Set AN/URR-64(V)2

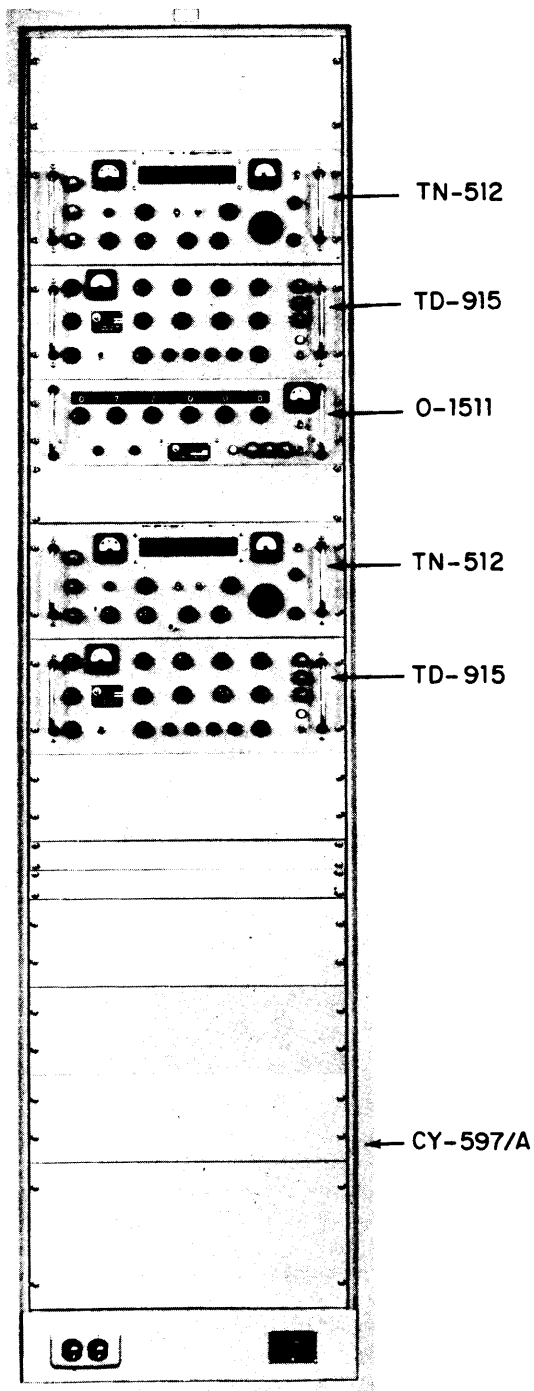


Figure 1-3. Radio Receiving Set AN/URR-64(V)3

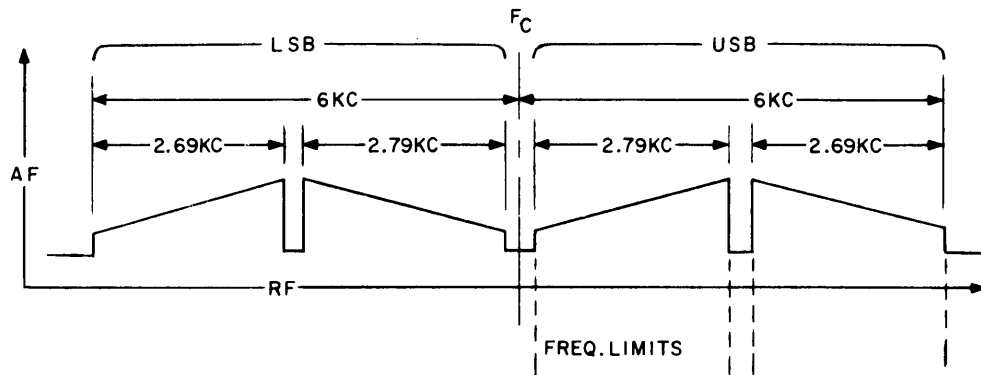


Figure 1-4. Input Signal Spectrum, 4-Channel ISB

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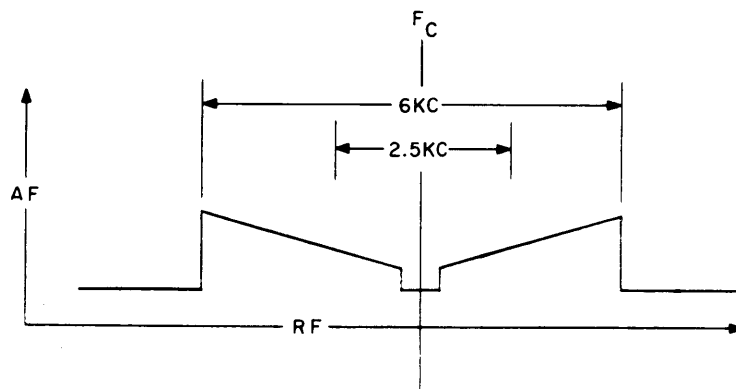


Figure 1-5. Input Signal Spectrum, Symmetrical Channel

A front panel jack and switch permits use of the counter for measuring an external 0.1 mc to 35 mc frequency. The counter then indicates the external input frequency.

In addition, the two receivers in Receiving Set AN/URR-64(V)1 may be operated in either space or frequency diversity; and Receiving Set AN/URR-64 (V)3 as a space diversity receiver.

1-3. DESCRIPTION OF UNITS.

a. GENERAL. - Each Receiving Set is comprised of modular units and interconnecting cabling, mounted in a single cabinet as shown in figures 1-1, 1-2 and 1-3. All unit circuitry is solid state design, with printed circuit plug-in boards throughout. All units are on tilt-lock slides and lock in the up or down position for servicing; each unit contains its own power supply and includes forced air cooling

systems, with removable air filters, where required. Unit panels are finished in light gray enamel. Text in paragraphs 1-3b through 1-3d describe individual units and their functions. Block diagrams (figure 1-6 and 1-7) show unit functioning in the various receiver modes.

b. RADIO FREQUENCY TUNER, TN-512/URR. - The TN-512/URR tunes the 2 to 32 mc input into four bands and displays the tuned frequency on a digital indicator driven by a computer-type decade counter, to the .001 mc increment. The tuner is a super-heterodyne type employing a local oscillator and two i-f circuits, a 4-band selector switch and a continuous tuning knob. Within the first i-f there is a separate i-f strip for each band to minimize mixer crossings. The TN-512/URR includes circuitry for receiver AFC operation. In all modes of operation the bands are electrically selected.

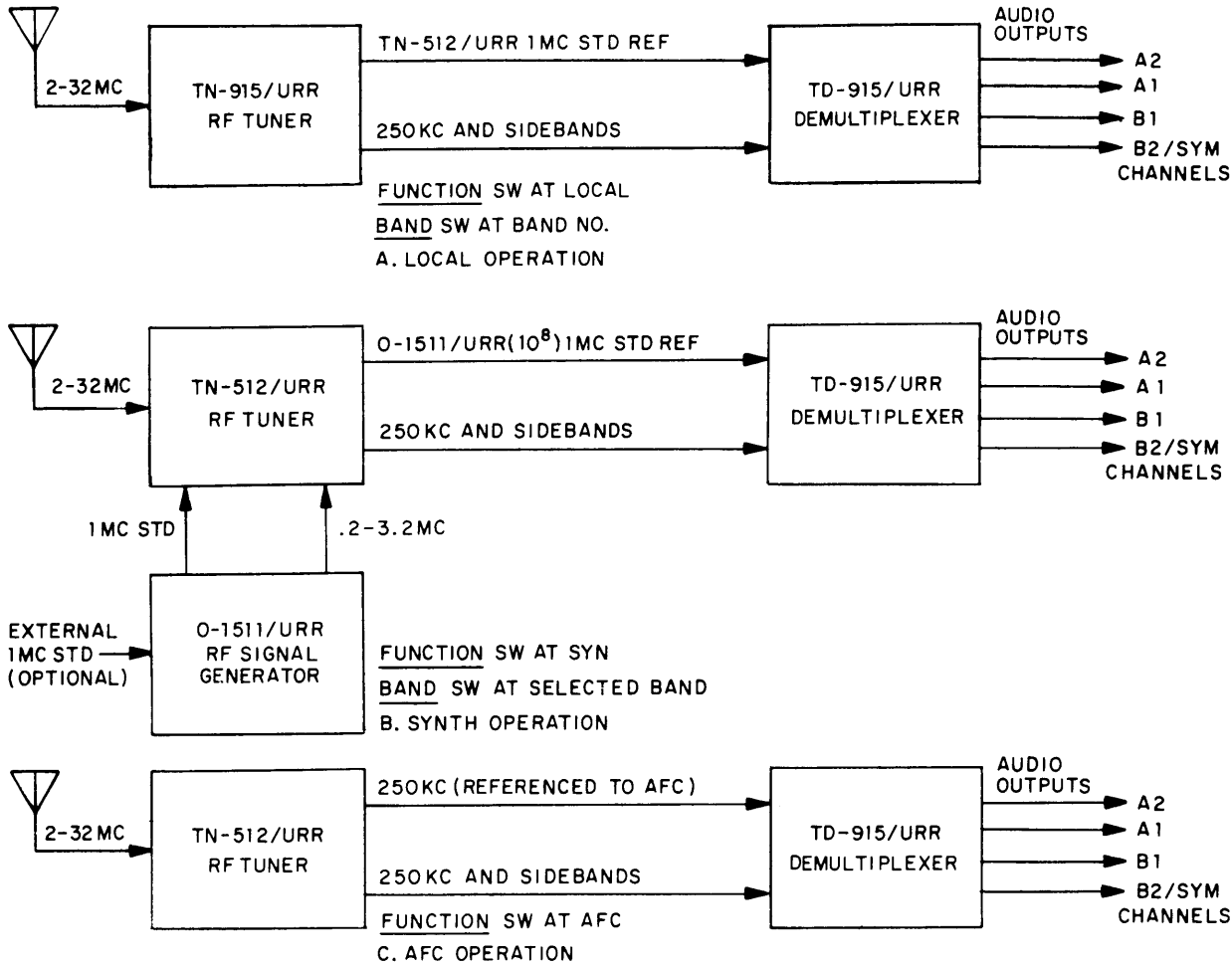


Figure 1-6. Simplified Block Diagram, Single Receiver Functions

c. DEMULTIPLEXER, TD-915/URR. - The TD-915/URR converts the 250 kc signal from the TN-512/URR into audio in isolated channels. Demultiplexing of the two translated sideband channels occurs within this unit. AGC channel source selection and attack-and-decay speed are selected by front panel control. The TD-915/URR receives the carrier re-supply source frequency from the TN-512/URR for the sideband product detectors.

d. REFERENCE SIGNAL GENERATOR, O-1511/URR. - The O-1511/URR provides a 0.2 to 3.2 mc stabilized frequency (referenced to its stable 1 mc standard) to the TN-512/URR in synthesized operation of the receiver. It supplies the 1 mc standard

output to the TN-512/URR as reference for synthesized frequencies. The stabilized 0.2 to 3.2 mc is used to lock the TN-512/URR local oscillator. The O-1511/URR includes the 1 mc standard and automatic switching circuitry for internal/external standards. A meter is included to check phase and frequency differences between the two standard sources.

1-4. REFERENCE DATA.

Table 1-1 lists quick-reference technical data on Receiving Set AN/URR-64(V)2 and includes the nominal specification figures defining the receiver.

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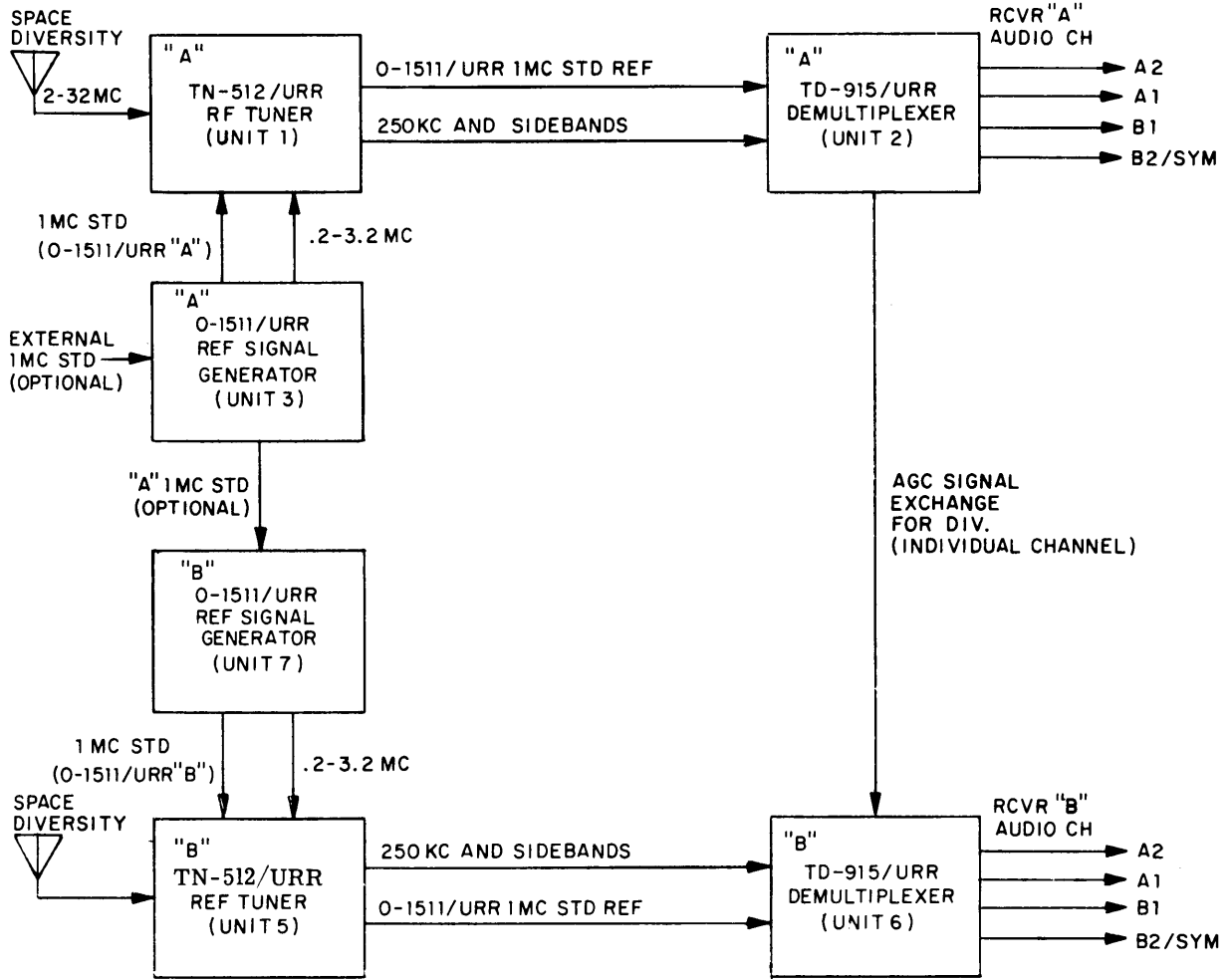


Figure 1-7. Simplified Block Diagram, Diversity Receiver

TABLE 1-1. TECHNICAL SPECIFICATIONS,
AN/URR-64(V)2

Frequency range:	2 to 32 mc in four bands			
Modes of reception:	SSB (USB, LSB), 2-channel ISB, 4-channel ISB, or symmetrical channel (CW, MCW and AM symmetrical about carrier)			
Modes of reception with suitable terminal equipments:	FSK, FAX			
Channel widths (nominal):	CW or AM: 2.5/6.0 kc			
Sideband:	CH A1, B1, 250 to 3040 cps at 1 db points, CH A2, B2, 350 to 3040 cps at 1 db points			
Tuning:	Local/synthesized: In 100 cps steps over 4 bands; Local/non-synthesized: Continuous over 4 bands			
Band divisions:	<u>Band</u>	<u>Freq</u>	<u>1st IF</u>	<u>2nd IF</u>
	1	2 to 4 mc	.625 mc	250 kc
	2	4 to 8 mc	1.25 mc	250 kc
	3	8 to 16 mc	2.50 mc	250 kc
	4	16 to 32 mc	5.00 mc	250 kc

TABLE 1-1. TECHNICAL SPECIFICATIONS,
AN/URR-64(V)2 (Cont)

IF Selectivity (250 kc):	AM and CW at 3 db pts, 2.5 kc \pm 10 % on 6.0 kc \pm 10 % on side-band inboard (A1/B1) 350 to 3040 cps (outboard (A2/B2) (at 1.0 db points).
AFC:	For non-synthesized reception of signal with full or partial carrier, drift compensator circuit reduces error in audio to within \pm 1 cps. Operates to maximum drift of \pm 1000 cps and to maximum drift rate of 10 cps per second. Minimum partial carrier in signal to be -30 db below PEP (peak envelope power) with a 1 microvolt carrier input signal at the antenna, above noise.
Antenna input impedance:	50 ohms (nominal), unbalanced. VSWR does not exceed 2.5-to-1.
Sensitivity vs. noise:	The receiver produces a signal plus noise to average noise ratio at the output of 10 db in a 3 kc bandwidth with a single frequency input signal level of -113 dbm or less.
Intermodulation (in-channel)	Down at least 55 db with composite 2 tone rf input of 200,000 uv rms.
Channel cross-talk:	The adjacent channel at least 60 db down from 0 db in desired channel.
Signal-to-hum ratio in output:	At least 40 db.
Unwanted frequencies from conversion oscillators:	Will not create an output greater than that produced by a 0.2 microvolt input with receiver at maximum rf gain. Up to 10 unwanted frequencies are permissible, if they are at least 12 kc apart, and do not exceed the equivalent of 1 uv in-band signal.
Image rejection:	A minimum of 100 db when referenced to a 1.0 uv input signal.
IF rejection:	At least 100 db when referenced to a 1.0 uv input signal.
Translated channel sub-carrier:	250 kc \pm 6.29 kc.
Gain Control:	Panel control rf unit provides a variation of 125 db for rf and if stages.
AGC:	Maintains output within \pm 1.5 db with input at antenna varying from 1.0 uv to 1 volt. Individual control for each channel.
	AGC TIME CONSTANTS:
	FAST 20 milliseconds attack 20 milliseconds decay
	MEDIUM 20 milliseconds attack 100 milliseconds decay
	SLOW 40 milliseconds attack 2 seconds decay
BFO:	BFO adjustment range for CW reception is \pm 3 kc.
IF monitor outputs:	One -47 dbm, 250 kc signal spectrum output for 50 ohm load. Five channel -47 dbm outputs at 250 kc stage for 50 ohm loads. Type BNC connectors.
HFO frequency range:	21 to 37 mc.

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TABLE 1-1. TECHNICAL SPECIFICATIONS,
AN/URR-64(V)2 (Cont)

DESENSITIZATION:	With an inband signal of 1 microvolt at the antenna, an interfering signal 70 db above 1 microvolt and 1 cps outside the passband will not compress the desired signal by more than 3 db.						
Audio outputs:	<p>a. Four audio output channels, providing 4 sideband or one symmetrical channel. Each channel delivers 0 dbm into a 600 ohm load. MS3102A24-28S connector. Balanced or unbalanced.</p> <p>b. One output for a 4 ohm speaker. MS3102A14S-1S connector. May be switched to monitor any channel.</p> <p>c. One output to a headphone jack mounted on front panel. Suitable for mating with a standard type PJ-055B plug. May be switched to monitor any channel.</p>						
Audio level adjustments:	<p>a. Each sideband or symmetrical channel is continuously adjustable between -40 dbm and +12 dbm (0 dbm = 1 mw into a 600 ohm load).</p> <p>b. Speaker and headphone output continuously adjustable by front panel knob. Adjustment over complete range has negligible effect over 4 channel outputs.</p>						
Frequency stability:	For synthesized reception, receiver frequency stability is within 1 part 10^8 for a change in ambient temperature of 15°C within the limits of 0° to 50°C over a 24-hr. period; 5 parts in 10^8 per month.						
Envelope Delay:	The overall envelope delay (from rf input to audio output) of each of the four independent channels does not exceed 500 microseconds between 380 and 2920 cps and does not exceed 1000 microseconds between 2930 and 3020 cps.						
Power supply requirements:	115/230 vac, 50/60 cps, single phase.						
	AN/URR-64(V)						
	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>1</u></td> <td style="text-align: center;"><u>2</u></td> <td style="text-align: center;"><u>3</u></td> </tr> <tr> <td style="text-align: center;">10 watts</td> <td style="text-align: center;">95 watts</td> <td style="text-align: center;">160 watts</td> </tr> </table>	<u>1</u>	<u>2</u>	<u>3</u>	10 watts	95 watts	160 watts
<u>1</u>	<u>2</u>	<u>3</u>					
10 watts	95 watts	160 watts					
Ambient temperature and humidity:	0 to 50°C and up to 95% relative humidity.						
Storage temperature and humidity:	-62°C to +75°C, and up to 95% relative humidity.						
Frequency Counter input: (used as test counter)	0.1 to 35.0 mc at 250 mv rms (minimum). Jack on front panel suitable for mating with a standard BNC type plug.						

1-5. EQUIPMENT SUPPLIED.

Tables 1-2 through 1-4 list all major components in Receiving Sets AN/URR-64(V)1, AN/URR-64(V)2 and AN/URR-64(V)3 and include accessories and technical data supplied with each receiver.

1-6. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

Refer to Table 1-5.

1-7. FACTORY OR FIELD CHANGES.

No changes have been made to effect the equipment as of the publication date of this manual. For changes after publication date, refer to NAVSHIPS 0967-000-0010, Electronics Installation and Maintenance Book (EIMB), for complete field change information. Record all changes on Table 1-6.

1-8. EQUIPMENT SIMILARITIES.

Radio Receiving Set AN/URR-64(V)2 is a single

receiver. Radio Receiving Set AN/URR-64(V)1 is a space or frequency diversity receiver. Radio Receiving Set AN/URR-64(V)3 is a space diversity receiver. Radio Receiving Set AN/URR-64 series is similar to Radio Receiving Set AN/URR-63 series except that AN/URR-64 series cannot be operated remotely. This manual describes installation, operation and maintenance of the single receiver with particular references to the other receivers where applicable.

1-9. PREPARATION FOR RESHIPMENT.

To prepare the AN/URR-64 series receivers for reshipment, proceed as follows:

a. Ensure that all electronic and mechanical assemblies of each unit are securely fastened and/or inserted fully into their proper sockets; set all switches to the OFF or neutral position. Be certain that all top and bottom covers are properly mounted and securely fastened in place by their Dzus fasteners.

b. If not already removed, disconnect all cables from the rear of each unit (first ensuring that cable markers are still intact), and remove the unit from the rack. Replace and secure cables carefully in rack, avoiding extreme bends or snags.

WARNING

Remove topmost unit first, and work downward in rack. Otherwise rack may topple due to high center of gravity, and may cause extremely serious injury.

c. For reshipment, use individual containers and packing material similar to those used for original shipment of the AN/URR-64. Mark containers "FRAGILE--ELECTRONIC EQUIPMENT".

CAUTION

Do not reship without adequate packing material between unit and container walls, on all sides.

TABLE 1-2. EQUIPMENT SUPPLIED, AN/URR-64(V)1

QTY PER EQUIP	NOMENCLATURE		UNIT NO.	*OVERALL DIMENSIONS(IN.)			*VOLUME (CU FT)	*WEIGHT (LB)
	NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
2	Radio Frequency Tuner	TN-512/URR	1, 4	7	19	19.38	1.43	51
2	Demultiplexer	TD-915/URR	2, 5	7	19	19	1.46	40
2	Reference Signal Generator	O-1511/URR	3, 6	5.25	19	18.50	1.42	40
1	Interconnecting Cable Harness, and Relay Rack Cabinet**	CY-597A/G	7	87-9/16	22-3/8	24	20.2	-
1	Maintenance Standards Book for AN/URR-64 Radio Receiving Set Series	NAVELEX 0967-385-0040	-	11	8.5	-	-	-
1	Operating Instruction Chart for Receiving Set AN/URR-64(V)1	NAVELEX 0967-385-0050	-	9	6	-	-	-

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TABLE 1-2. EQUIPMENT SUPPLIED, AN/URR-64(V)1 (Cont)

QTY PER EQUIP	NOMENCLATURE		UNIT NO.	*OVERALL DIMENSIONS (IN.)			*VOLUME (CU FT)	*WEIGHT (LB)
	NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
2	Technical Manual for AN/URR-64(V) Radio Receiving Set Series	NAVELEX 0967-385-0010 and 0967-385-0020	-	11	8.5	-	-	-
2	Operators Handbook	NAVELEX 0967-385-0030	-	11	8.5	-	-	-

*Includes mounting materials.

**Cabinet is a modified CY-597A/G (GFE).

TABLE 1-3. EQUIPMENT SUPPLIED, AN/URR-64(V)2

QTY PER EQUIP	NOMENCLATURE		UNIT NO.	*OVERALL DIMENSIONS (IN.)			*VOLUME (CU FT)	*WEIGHT (LB)
	NAME	DESCRIPTION		HEIGHT	WIDTH	DEPTH		
1	Radio Frequency Tuner	TN-512/URR	1	7	19	19.38	1.43	51
1	Dumulti-plexer	TD-915/URR	2	7	19	19	1.46	40
1	Reference Signal Generator	O-1511/URR	3	5.25	19	18.50	1.42	40
1	Interconnecting Cable Harness, and Relay Rack Cabinet**	CY-597A/G	4	87-9/16	22-3/8	24	20.2	-
1	Maintenance Standards Book for AN/URR-64 Radio Receiving Set Series	NAVELEX 0967-385-0040	-	11	8.5	-	-	-
1	Operating Instruction Chart for Receiving Set AN/URR-64(V) 2	NAVELEX 0967-385-0050	-	9	6	-	-	-

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TABLE 1-3. EQUIPMENT SUPPLIED, AN/URR-64(V)2 (Cont)

QTY PER EQUIP	NOMENCLATURE		UNIT NO.	*OVERALL DIMENSIONS (IN.)			*VOLUME (CU FT)	*WEIGHT (LB)
	NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
2	Technical Manual for AN/URR-64(V) Radio Receiving Set Series	NAVELEX 0967-385-0010; 0967-385-0020;	-	11	8.5	-	-	-
	Operator's Handbook for AN/URR-64(V) Receiving Set Series	NAVELEX 0967-385-0030	-	11	8.5	-	-	-

*Includes mounting materials.

**Cabinet is a modified CV-597A/G (GFE).

TABLE 1-4. EQUIPMENT SUPPLIED, AN/URR-64(V)3

QTY PER EQUIP	NOMENCLATURE		UNIT NO.	*OVERALL DIMENSIONS (IN.)			*VOLUME (CU FT)	*WEIGHT (LB)
	NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
2	Radio Frequency Tuner	TN-512/URR	1, 4	7	19	19.38	1.43	51
2	Demultiplexer	TD-915/URR	2, 5	7	19	19	1.46	40
2	Reference Signal Generator	O-1511/URR	3	5.25	19	18.50	1.42	40
1	Interconnecting Cable Harness, and Relay Rack Cabinet**	CY-597A/G	7	87-9/16	22-3/8	24	20.2	-
1	Maintenance Standards Book for AN/URR-64 Radio Receiving Set Series	NAVELEX 0967-385-0040	-	11	8.5	-	-	-
1	Operating Instruction Chart for Receiving Set AN/URR-64(V)1	NAVELEX 0967-385-0050	-	9	6	-	-	-

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TABLE 1-4. EQUIPMENT SUPPLIED, AN/URR-64(V)3 (Cont)

QTY PER EQUIP	NOMENCLATURE		UNIT NO.	*OVERALL DIMENSIONS (IN.)			*VOLUME (CU FT)	*WEIGHT (LB)
	NAME	DESIGNATION		HEIGHT	WIDTH	DEPTH		
2	Technical Manual for AN/URR-64(V) Radio Receiving Set Series	NAVELEX 0967-385-0010 and 0967-385-0020	-	11	8.5	-	-	-
2	Operators Handbook	NAVELEX 0967-385-0030	-	11	8.5	-	-	-

*Includes mounting materials.

**Cabinet is a modified CY-597A/G (GFE).

TABLE 1-5. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Electronic Voltmeter	ME-303/U	Troubleshooting and maintenance procedures	DC: Range: ± 15 mv to ± 1500 v full scale Accuracy: $\pm 2\%$ full scale Input Resistance: 10 megohms or greater AC (rms): Range: 0.5 v to 300 v full scale Frequency: 20 cps to 700 mc Accuracy: $\pm 3\%$ full scale at 400 cps sinusoidal Input Impedance: 10 megohms at low frequencies, shunted by 1.5 pf.
1	AC VTVM	AN/USM-106A	Troubleshooting and maintenance procedures	Range: 0.01 v to 1000 v. Frequency Response: 10 cps to 6 mc Input Impedance: 2 megohms (no probe); 10 megohms (with probe) Shunt Capacitance: No probe; approx 25 pf; With probe: approx 75 pf
1	Frequency Standard	AN/URQ-9	1. Troubleshooting and maintenance procedures 2. External high-stability standard 3. Operation	Frequency: 1 mc Stability: 1 part in 10^9 per 24-hour period; better than 1 part in 10^8 per 60-day period. Output: 1 volt rms.
1	Squarewave Generator	SG-299C (HP-211A)	Troubleshooting and maintenance procedures	Freq. Range: 1 cps to 1 mc continuous

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TABLE 1-5. EQUIPMENT AND PUBLICATIONS REQUIRED
BUT NOT SUPPLIED (Cont)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Square-wave Generator (Cont)			Output: 3.5 v peak at 75 ohm, 7.0 v peak at open ckt, 27 v peak at 600 ohm, 55 v peak at open ckt Sync Input: Positive going pulse or sinewave, minimum 5 v Rise Time: 0.02 microsecond Symmetry Control: Allows exact squarewave balance
1	Oscilloscope	AN/USM-281A	Troubleshooting and maintenance procedures	Horizontal Amp.: Response: Dc to 5 mc Sensitivity: 0.1 v/div. Max input: 600 vdc Input impedance: 1 megohm, shunted by approx. 30 pf Vertical Amp: Dual Channel: Response: DC: dc-50 mc AC: 2 cps-50 mc Rise time: 7 nsec. Sensitivity: .005 volt/div. Max input: AC: ±600 v DC: at least ±150 v Input impedance: 1 megohm, shunted by approx 25 pf Time Base: Range: 0.05 us/div thru 2 sec/div.
2	High Frequency Signal Generator	HP-606B	Troubleshooting and maintenance procedures	Freq Range: 50 kc to 65 mc Accuracy: ±1% Stability: 5×10^8 /min., 2×10^7 / 10 min., 2×10^6 /day Resetability: 10×10^6 Output Level: 0.1 uv to 3.0 v at 50 ohms in 10 db steps and continuously adjustable by Vernier Control
1	Frequency Counter	AN/USM-207	Troubleshooting and maintenance procedures	Freq Range: dc to 50 mc Input: 0.1 v rms, min. 120 v rms, max. Input Impedance: 1 megohm nominal, shunted by approx 25 pf
1	Multimeter	AN/PSM-4C	Troubleshooting and maintenance procedures	Voltages: 0-5000 vdc 0-5000 vac Circuit Loading: DC: 20,000 ohms/volt AC: 5000 ohms/volt Resistances: 0 to infinity ohms
1	Audio Generator	AN/URM-127	Troubleshooting and maintenance procedures	Frequency Range: 20 cps to 20 kc Output: +15 dbm at 50, 150, 600 ohms Distortion: Less than 0.1%
1	Attenuator	HP-355 C and D	Troubleshooting and maintenance procedures	Attenuation: 120 db in 1 db steps Frequency Response: dc to 1 gc

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TABLE 1-5. EQUIPMENT AND PUBLICATIONS REQUIRED
BUT NOT SUPPLIED (Cont)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Attenuator (Cont)			Overall Accuracy: ± 0.3 db to 120 db at 1000 cps Input and Output Impedance: 50 ohms Max Power Dissipation: 0.5 watt average, 350 volts peak
1	Instruction Book for Oscillo- scope AN/ USM-281A	NAVSHIPS 0969-125-0110 (Vol. I) 0969-125-0120 (Vol. II)		
1	Instruction Book for HF Signal Gen- erator HP- 606B	Applicable com- mercial manual		
1	Instruction Book for Frequency Counter AN/USM- 207	NAVSHIPS 0969-028-4010 (Vol. I) 0969-028-4020 (Vol. II)		
1	Instruction Book for Multimeter AN/PSM-4C	NAVSHIPS 0280-250-8004		
1	Instruction Book for Electronic Voltmeter ME-303/U	U.S. Army Manual TM11-6625-1614-15		
1	Instruction Book for AC VTVM AN/USM- 106A	NAVSHIPS 0967-905-7010		
1	Instruction Book for Frequency Standard AN/URQ-9	NAVSHIPS 0967-077-8010		
1	Instruction Book for HP355C and D	Applicable com- mercial manual		
1	Instruction Book for Squarewave Generator SG-299C	NAVSHIPS		

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TABLE 1-5. EQUIPMENT AND PUBLICATIONS REQUIRED
BUT NOT SUPPLIED (Cont)

QTY PER EQUIP	NOMENCLATURE		REQUIRED USE	EQUIPMENT CHARACTERISTICS
	NAME	DESIGNATION		
1	Instruction Book for Audio Gen- erator AN/ URM-127	NAVSHIPS		

TABLE 1-6. FIELD CHANGES

FIELD CHANGE NUMBER	FIELD CHANGE TITLE AND PURPOSE	SERIAL NO. AFFECTED	INDICATION OF ACCOMPLISHMENT

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SECTION 2
INSTALLATION

2-1. UNPACKING AND HANDLING.

Inspect the AN/URR-64(V) packing cases for possible damage when they arrive at the installation site. With respect to damage to equipment for which the carrier is liable, the Technical Materiel Corporation will assist in describing methods of repair and the furnishing of replacement parts.

2-2. POWER REQUIREMENTS.

Each Receiving Set leaves the factory wired to operate from a 115 vac, 50/60 cps single phase power source. The receiver can be rewired for operation from a 220 vac, 50/60 cps single phase source by changing transformer primary winding jumper leads in each rack modular unit (TN-512/URR, TD-915/URR etc.). Figures 5-88 through 5-90 are ac power distribution diagrams for Receiving Sets AN/URR-64(V)1, AN/URR-64(V)2 and AN/URR-64(V)3 respectively; these figures may be referred to in planning an overall system current-draw and for conversion to a 220 vac line. In units including a blower ensure that the 115 vac is maintained across the motor's input, as shown in figures 5-88 through 5-90.

2-3. SITE SELECTION.

The Receiving Set (figures 2-1 through 2-3) may be located in any enclosure (room, deck or van) with sufficient clearances as depicted in figures 2-4 through 2-6. Allow a minimum of two feet above the rack for adequate heat dissipation and to prevent back pressure in the cooling air exhaust stream. The Receiving Set is designed for fixed station, transportable or ship installation.

2-4. INSTALLATION REQUIREMENTS.

a. ASSEMBLY OF RECEIVING SET. - Install modular units and blank panels into the rack as shown in figure 2-1 for the AN/URR-64(V)1, figure 2-2 for the AN/URR-64(V)2 and figure 2-3 for AN/URR-64(V)3. Connect modular unit interconnecting cabling within the rack as shown in figure 5-1 for the AN/URR-64(V)1, figure 5-2 for the AN/URR-64(V)2, and figure 5-3 for AN/URR-64(V)3. Refer to tables 2-1 through 2-3 for summary list of installation materials for AN/URR-64(V)1 through (V)3 respectively.

All modular units are slide-mounted on tilt-lock drawer slide. The external part of the slide mount arrives pre-installed in the rack; the internal part arrives pre-installed on the modular unit. To install a unit, refer to figure 2-7 and proceed as follows:

CAUTION

If rack is not yet bolted to the floor during this phase, start by installing bottom units first in order to avoid rack tipping over from extended center of gravity.

(1) Pull the center section of the rack-mounted (external) portion of the slide-mount out until it locks in an extended position.

(2) Position the unit-mounted (internal) portion of the slide-mount in the tracks of the external portion and ease the modular unit into the rack until the release buttons engage the holes in the track.

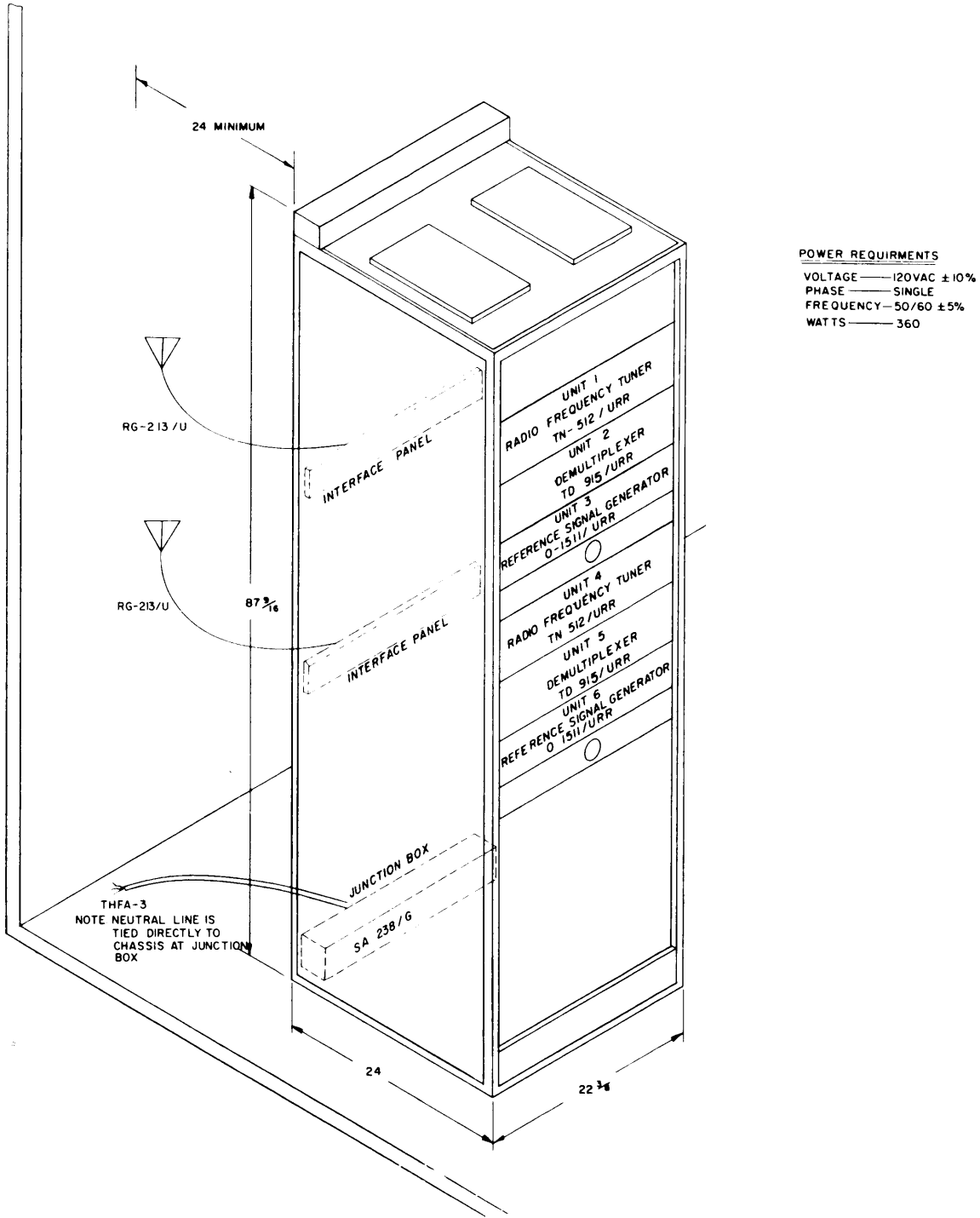
(3) Depress the release buttons and slide the modular unit completely into the rack.

(4) Secure the modular unit front panel to the rack flange with machine screws and fiber washers supplied in the shipment. In the diversity receivers (AN/URR-64(V)1 and (V)3) there are duplications of some modular units (see figures 2-1 and 2-3), these units are interchangeable. Unit numbers (example: 1 or 4 for Radio Frequency Tuner TN-512/URR) are marked on the rack front and rear facings adjacent to the modular unit bay location but are not marked on the modular units themselves. When locating these units, either one may be mounted in either bay.

Unit numbers form the prefixes for receptacle "J" reference symbol numbers as they appear on figures 5-1 through 5-3; these prefixes, however, are not marked on the modular unit chassis. This arrangement is to preserve interchangeability of units. The rack cabling is assigned prefix number "7" in the AN/URR-64(V)1, "4" in the AN/URR-64(V)2 and "6" in the AN/URR-64(V)3. Plug reference symbol numbers (part of the cabling) contain these prefixes as they appear in figures 5-1 through 5-3 but cable markers (adjacent to the plugs) do not contain them. Cable destination markers, however, do not contain the unit prefixes (example: "1J1" for 6W1P1) in the same way as they appear in figures 5-1 through 5-3.

b. EXTERNAL WIRING CONNECTIONS. - All system wiring shall be connected to the Receiving Set at an interface panel (or panels) located at the rear of the rack* (see figures 5-1 through 5-3). Paragraph 2-5, Cable Assemblies, contains wire-run information for constructing individual cables to each connector on the interface panel. Since the Receiving Sets are designed to function in a variety of systems, an analysis should be made as to necessary connections before proceeding to make up the cables. This analysis may be made from information contained in the following sub-paragraphs.

*Except for the audio monitor PHONE jack, located on the TD-915/URR front panel.



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Figure 2-1. Pictorial System Diagram, AN/URR-64(V)1

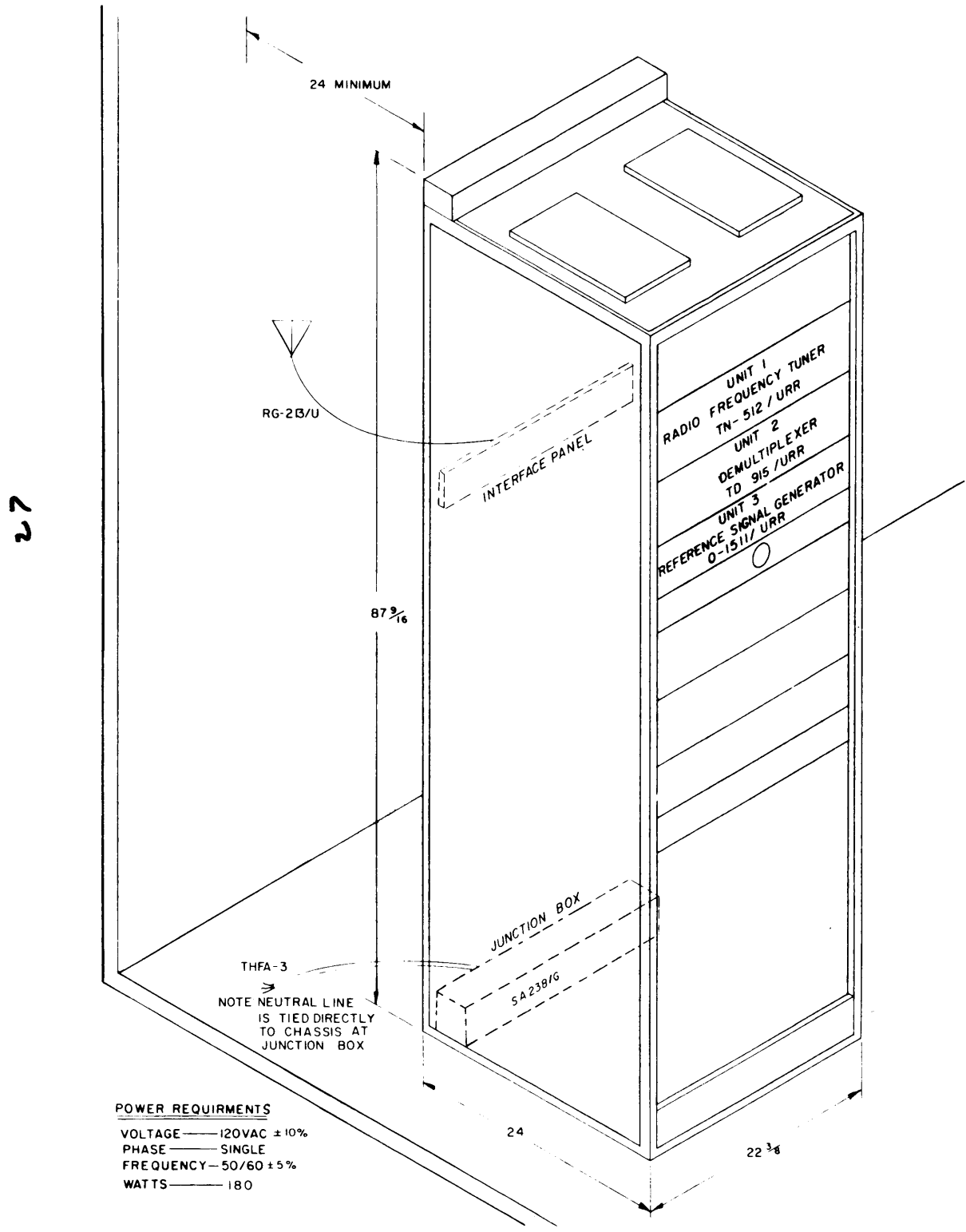


Figure 2-2. Pictorial System Diagram, AN/URR-64(V)2

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(1) AN/URR-64(V)2, SINGLE INSTALLATION. - Necessary connections for a single AN/URR-64(V)2 installation are: antenna input, and 4-channel audio output. In addition, a monitor speaker output may be used; this is optional, however, since a headset connection (the PHONE jack on the front panel of Demultiplexer TD-915/URR) is available for monitoring the audio output. If it is preferred to use a 1 mc standard of higher stability than the receiver's 1 mc standard (with 1 part in 1×10^8 stability), a 1-mc external standard connection must be made. In this case, there is an automatic switching feature, built into the receiver, that switches in the alternate standard (internal or external) upon the failure of one of them.

(2) AN/URR-64(V)2, ARRAY. - Necessary connections for two or more Receiving Sets are: individual antenna inputs, and individual 4-channel audio outputs. Individual monitor speaker outputs may be used; these are optional, however, since they parallel the TD-915/URR front panel headset PHONE jack. If it is preferred to use a 1 mc standard of higher stability than the receiver's 1 mc standard connection must be used. As in the single receiver installation, the automatic 1 mc switching feature will be in each receiver.

(3) AN/URR-64(V)1 AND AN/URR-64(V)3, SINGLE INSTALLATION. - There are two interface panels in a diversity rack: an "A" (upper) panel for receiver half "A", and a "B" (lower) panel for receiver half "B". Necessary connections for a single AN/URR-64(V)1 and AN/URR-64(V)3 installation are: individual receiver-half antenna inputs and individual receiver-half 4-channel audio outputs. Individual receiver-half monitor speaker outputs may be used; these are optional; however, since they parallel the two TD-915/URR front panel headset PHONE jacks. If it is preferred to use a 1 mc standard of a higher stability than that in the receiver (with 1 part in 1×10^8 stability) a 1 mc external standard connection must be used. In this case, the external standard shall be attached at receiver half "A" and "B" interface panels. Should the external standard fail, the internal "A" half or "B" half standard will switch in automatically. If it is preferred, the standard in (or applied to) receiver "A" may be used for both "A" and "B". A diversity quieting system is built into the receiver by AGC signal exchange between individual channels of each receiver half. If it is elected to use an audio combiner at the two AUDIO outputs in lieu of the diversity quieter, remove rack cable 7W11 (see figure 5-1) for the AN/URR-64(V)1; and rack cable 6W10 (see figure 5-3) for the AN/URR-64(V)3.

(4) AN/URR-64(V)1 AND AN/URR-64(V)3 ARRAY. - Necessary connections for two or more dual-diversity Receiving Sets are: individual "A" and "B" antenna input pairs and individual "A" and "B" 4-channel audio output pairs. Individual "A" and "B" monitor speaker output pairs may be used in lieu of the TD-915/URR PHONE jacks, if preferred. If an external 1 mc standard is to be used, each standard (or a common standard) shall be attached at the receiver half interface panel. As in the single AN/URR-64(V)1 and (V)3 installation, using an audio combiner requires the removal of

cable 7W11 and 6W10, respectively.

2-5. CABLE ASSEMBLIES.

Wire individual external cables in accordance with wire-run information in tables 2-3 through 2-6 for AN/URR-64(V)1 through (V)3 respectively.

2-6. INSPECTION AND ADJUSTMENT.

a. Prior to releasing the equipment to operating personnel, a 4 hour warm-up period must elapse; refer to table 3-3 for warm-up procedure the initial switch and control setting for energizing equipment the first time.

b. No adjustments are required after installation. Performance checking of the receivers can be done by making reference to the Maintenance Standards Book for AN/URR-64 Series receivers, or by performing operation of the equipment in accordance with procedures in table 3-4.

c. Checkout Procedure. Initial checkout will encompass a single receiver section only; repeat the procedure for the diversity receiver section if applicable.

Checkout will ascertain ac power input to each unit by means of visual pilot lamp and readout indications, and will verify signal flow through the receiver.

Refer to figures 3-1 through 3-3, and proceed as follows:

(1) Place all POWER switches on all units to the ON position.

(2) Ascertain that pilot lamps (marked POWER, ON, or similar notation) on all units except the TN-512/URR are lighted; the TN-512 unit has no pilot lamp, but the frequency readout indicator will illuminate, indicating ac power input.

NOTES

- a. IF NOT POWER INDICATIONS ARE LIT; ensure that ac power connections have been made to the entire equipment rack. Check such areas as main wall-mounted power switches, circuit breakers, and/or fuses at the installation site itself. Be certain that power mains into the receiver carry 50/60 cps ac, at the proper voltage (115/230 vac, dependent upon internal power transformer wiring).
- b. IF SOME POWER INDICATORS ARE LIT: equipment rack itself, is receiving supply voltage. If an ac input wiring change was made, ensure that all units have been properly modified to operate on the same ac input is actually present at all power receptacles at the rear of the rack. Check to see that all units are plugged into the rack's ac power strip, and that all POWER switches are set to on.
- c. IF NEITHER OF THE ABOVE CASES: check all fuse indicators on all units;

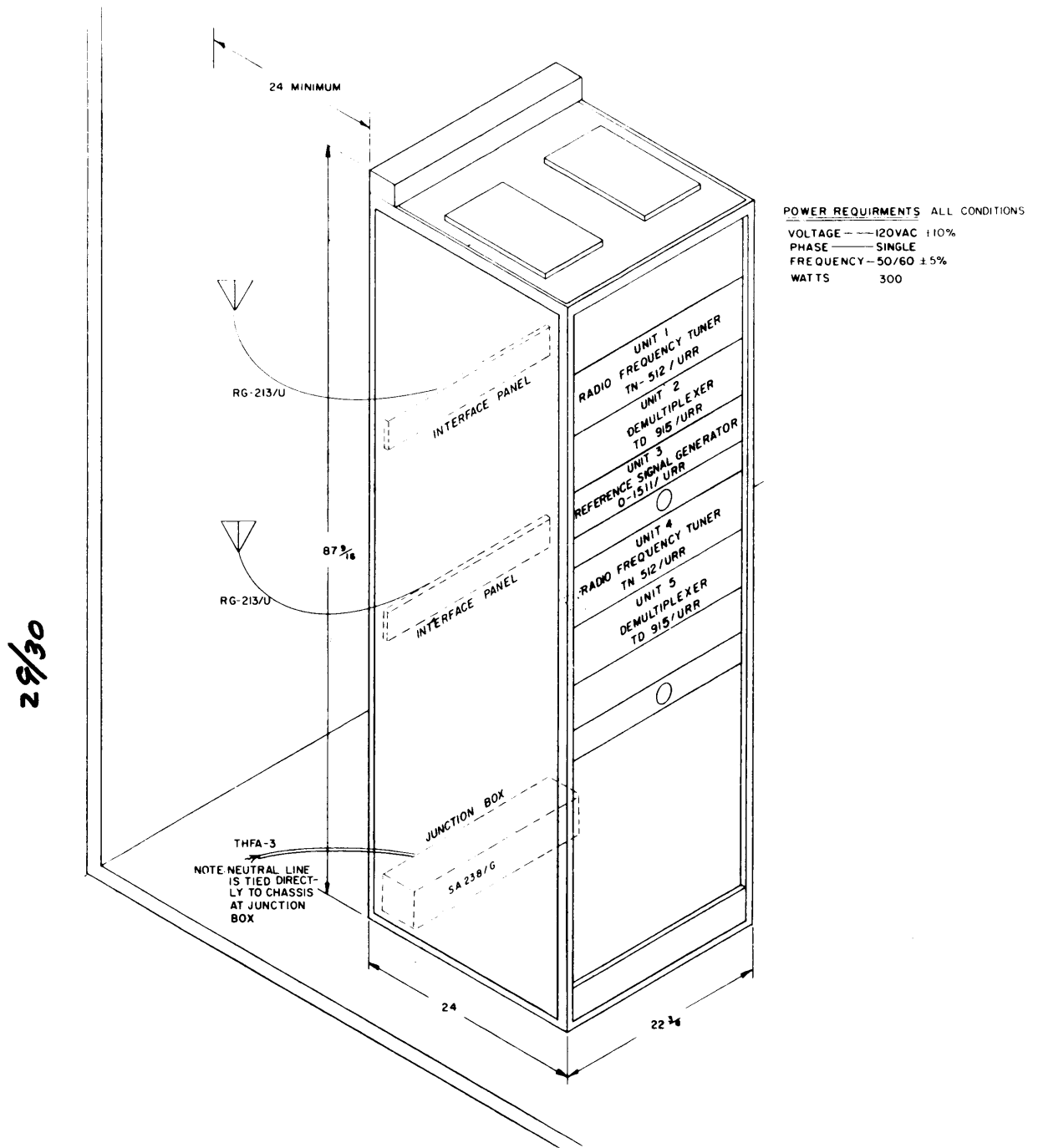


Figure 2-3. Pictorial System Diagram, AN/URR-64(V)3

ORIGINAL

2-5, 2-6

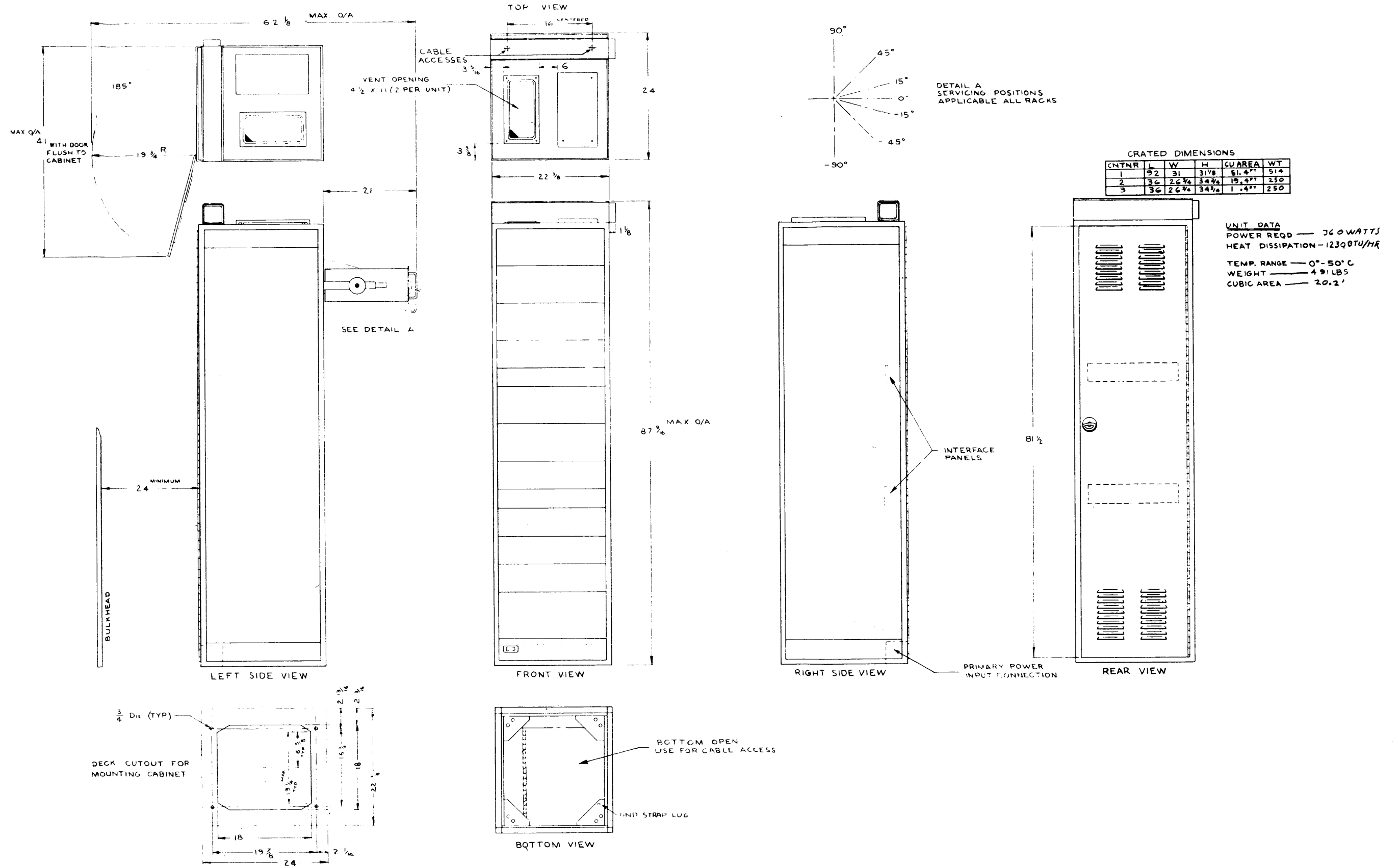


Figure 2-4. Outline and Dimensions, AN/URR-64(V)1 Rack

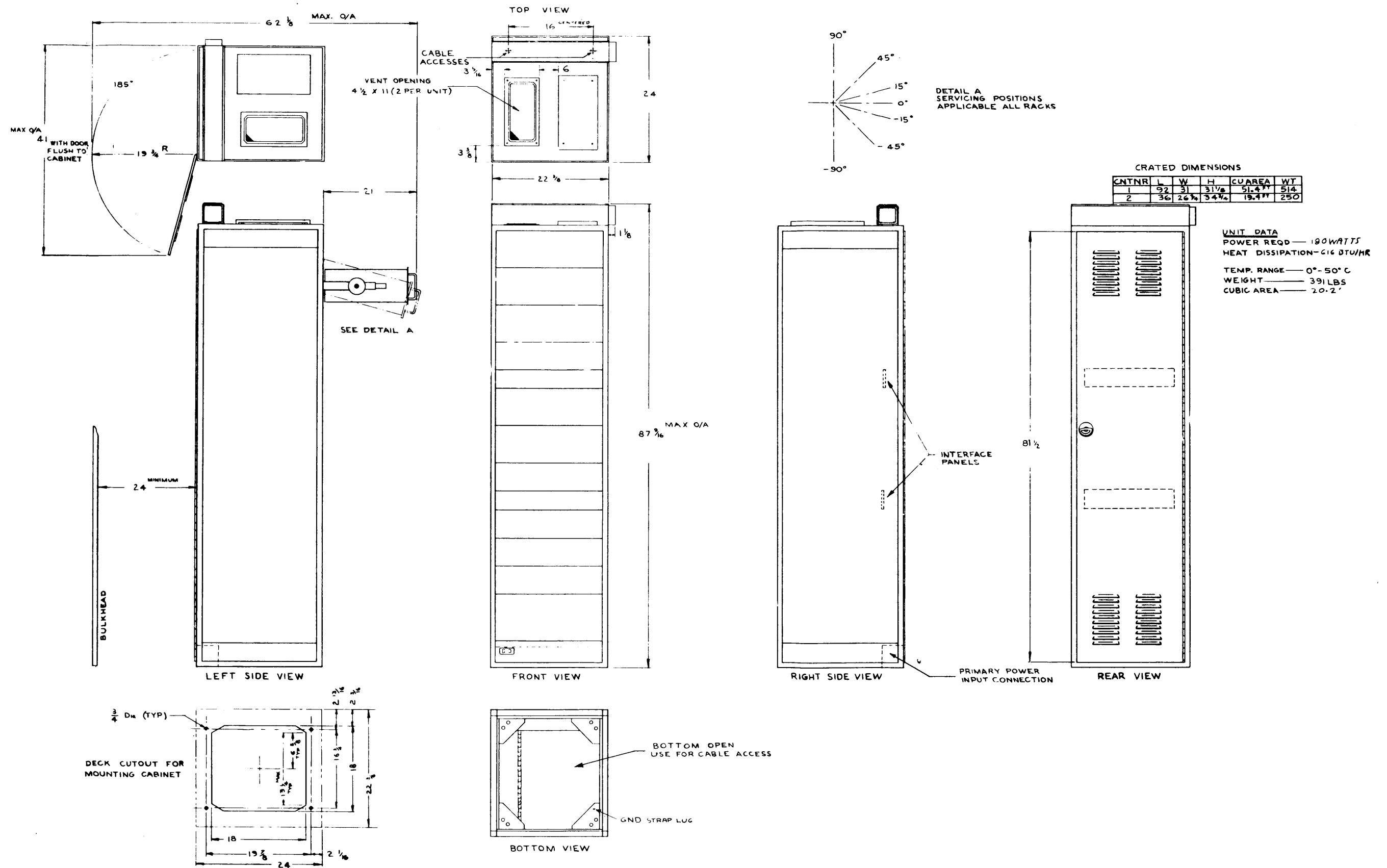
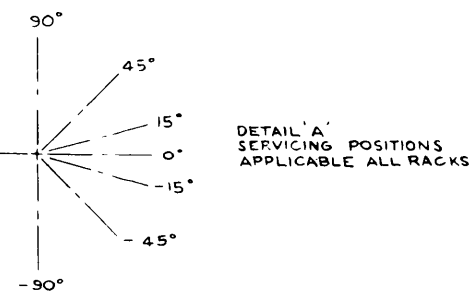
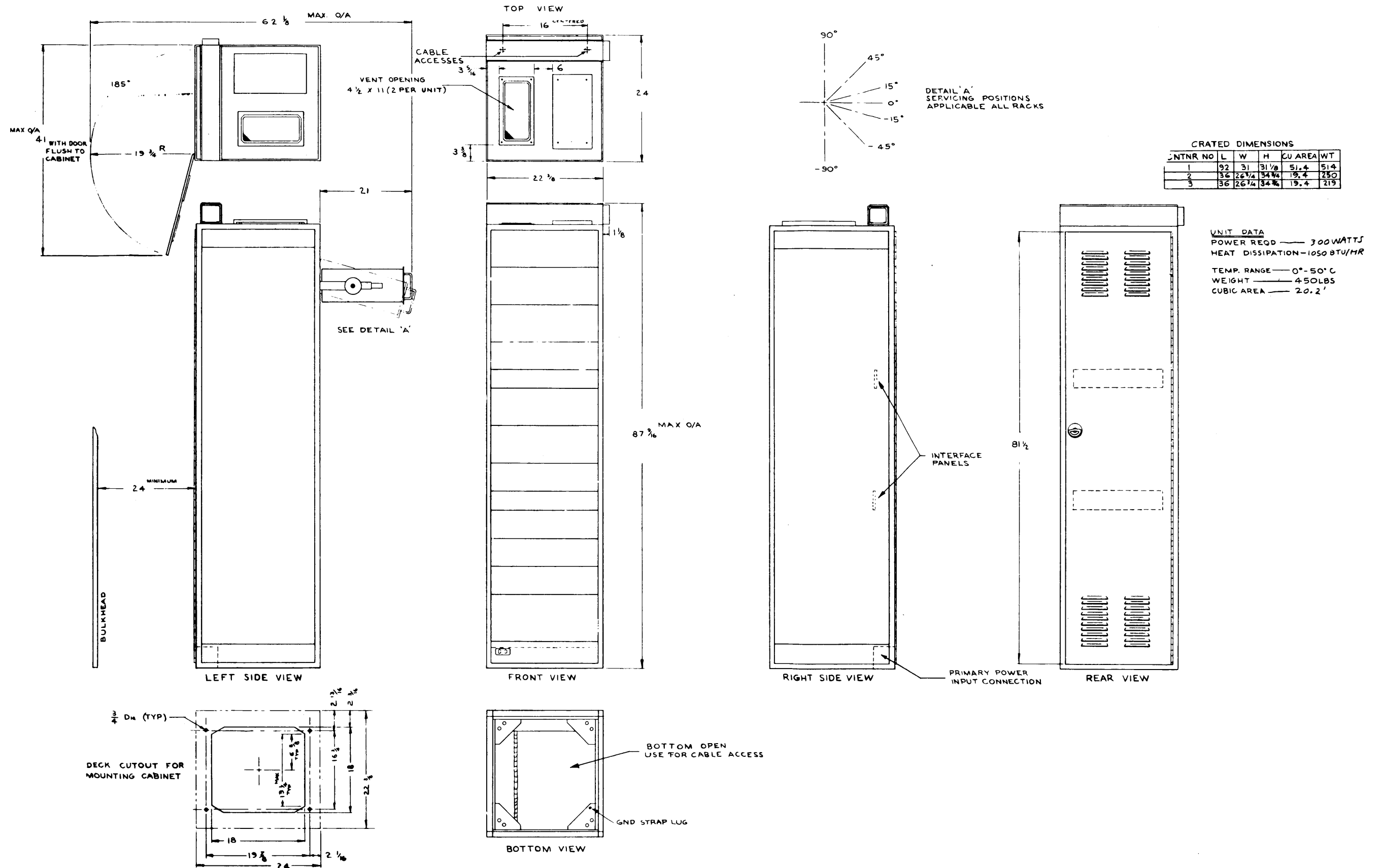


Figure 2-5. Outline and Dimensions, AN/URR-64(V)2 Rack



if an indicator is lit, replace the associated fuse (fuses are located directly behind indicators: twist indicator CCW and pull straight out; replace fuse, reinsert indicator/holder, and twist CW to lock.) If fuses continue to open-circuit, STOP: a troubleshooting procedure is indicated. Do not replace further, until the trouble has been remedied. NEVER replace with fuses of a higher current rating than indicated on the open fuse.

- (3) Set the O-1511/URR to 10.0000 mc.
- (4) Set TN-512/URR controls as follows:

<u>CONTROL</u>	<u>POSITION</u>
POWER FUNCTION	ON
COUNTER MODE	SYN
BANDSWITCH	REC
METER FUNCTION	8-16
SILENCER OFF	RF - HIGH
RF GAIN	down
INPUT ATTENUATOR	AGC
	OUT (down)

- (5) Set TD-915/URR controls as follows:

<u>CONTROL</u>	<u>POSITION</u>
METER SENSITIVITY	0
MONITOR SELECTOR	SYM
LOCAL GAIN	full CCW
AGC TIME CONSTANT (SYM-B2)	FAST
MODE	AM-6 kc

- (6) Rotate TUNE knob so frequency readout approaches 10.000 mc. As the TN-512 reaches 10 mc, SYNC INDICATOR lamp shall light.

- (7) Advance TD-915 LOCAL GAIN control CW to a comfortable listening level, depending

upon location, propagation conditions, and time of day, station WWV (U.S. National Bureau of Standards official station) may be heard; even if WWV is not being received, background noise should be apparent. This will indicate signal flow through the receiver.

- (8) If WWV is being received well, an additional (AFC) check may be made: rotate TN-512 FUNCTION switch clockwise to AFC position, and depress AFC TUNE switch; if SYNC INDICATOR lamp does not light, hold down AFC TUNE switch, and slowly adjust FINE TUNE control until sync indication is achieved. Immediately release AFC TUNE switch; continued reception of WWV indicates AFC operability. AFC corrective action can be observed on the TN-512 PHASE DIFFERENCE meter.

2-7. INTERFERENCE REDUCTION.

Ensure that all chassis are completely within the rack enclosure, and that all chassis fastening screws have been tightened. If any units are yet extended from the rack, check that their top and bottom covers are fastened; slide these units into the equipment rack, and tighten all rack mounting screws.

The AN/URR-64 should be operated in the most electrically-quiet-location possible, consistent with adequate servicing and ventilation space requirements. Especially to be avoided are such noise producing equipment as: dc motors or generators, thermostats, flashers, or other intermittent-contact electrical equipment, neon signs, unshielded fluorescent lamps, or other high-voltage discharge gear (arc lamps, arc welders, automotive ignition systems, horizontal sweep oscillators in television receivers or other CRT equipment, X-ray machines). In situations where such noise sources are unavoidable, the TN-512's noise silencer will either effectively eliminate, or greatly reduce, the apparent intensity of many types of impulse noise. RFI shielding is on all cabinet openings, units, and blank panels. This shielding should be checked periodically to insure that it is fastened properly.

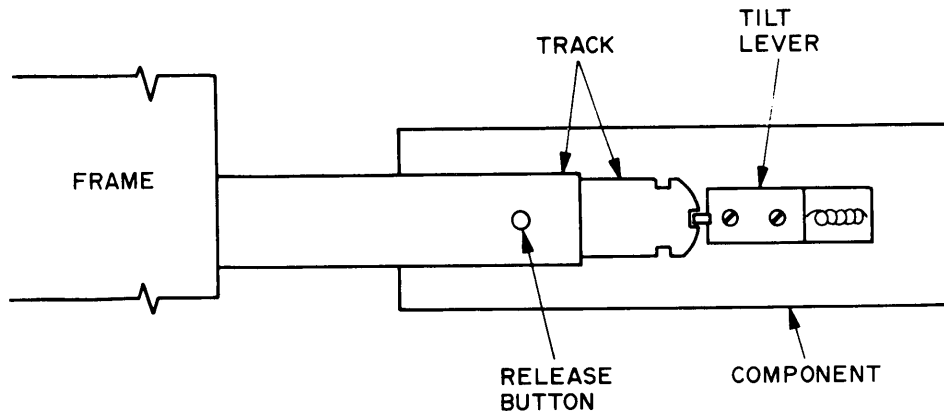


Figure 2-7. Slide Mount Details

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TABLE 2-1. SUMMARY LIST OF INSTALLATION MATERIAL AN/URR-64(V)1

QUANTITY	NOMENCLATURE	PART, TYPE OR MODEL NUMBER	MANUFACTURERS NAME OR FEDERAL SUPPLY CODE	REMARKS	SIZE		
					LENGTH	HEIGHT	WIDTH
2	TUNER, RADIO FREQUENCY	TN-512/URR		UNITS 1 AND 4	19.38	7	19
2	DEMULTIPLEXER	TD-915/URR		UNITS 2 AND 5	19	7	19
2	GENERATOR, REFERENCE SIGNAL	0-1511/URR		UNITS 3 AND 6	18.5	5.25	19
1	INTRA-UNIT CABLING	SEE DWG NO CK1624		UNIT 7			
	CABINET, RELAY RACK	MODIFIED CY-597A/G		UNIT 8	24	87.56	22.38
	CABLE, RF COAXIAL	RG213/U		"A" & "B" ANTENNA INPUTS			
	CABLE	TTRS-4		"A" & "B" 4-CHANNEL AUDIO OUTPUTS			
	CABLE, RF COAXIAL	RG-58/U		EXT 1Mc STD INPUT REC A & REC B (OPTIONAL)			
	CABLE	TTRS-2 (1)		"A" & "B" MONITOR SPEAKER OUTPUTS (OPTIONAL)			
	CABLE, AC POWER	THFA-3		AC POWER INPUT			
1	CABLE			DIVERSITY INTERCONNECT (P/O ITEM 4)			
	CABLE, RF COAXIAL	RG-58/U		1Mc STD INTERCONNECT (OPTIONAL)			
1	BLANK PANELS SET	P/O UNIT 8					
1	GROUNDING STRAP	WL100-1 #10 AWG					
36	SCREW, MACHINE	SCBP1032BN8		UNIT MTG			
36	WASHER, FIBER	WA101-11		UNIT MTG			
2	CONNECTOR, PLUG COAXIAL	UG-536 /U		FOR ITEM 6 (MATES WITH 7W1J8 & 7W5J8)			
2	CONNECTOR, PLUG	MS3106B24-28P		FOR ITEM 7 (MATES WITH 7W1J7 & 7W5J7)			
1	CONNECTOR, PLUG COAXIAL	UG-88C		FOR ITEM 8 (MATES WITH 7W1J10)			
2	CONNECTOR, PLUG	MS3106B14S-2P		FOR ITEM 9 (MATES WITH 7W1J5 & 7W5J5)			
2	CONNECTOR, PLUG TELEPHONE	PJ055		FOR HEADSET (OPTIONAL) MATES WITH 2J20 & 5J20 "PHONE" JACKS			

ITEM NUMBER	QUANTITY		NOMENCLATURE	PART, TYPE OR MODEL NUMBER	MANUFACTURERS NAME OR FEDERAL SUPPLY CODE
	GFM	CFM			
1		2	TUNER, RADIO FREQUENCY	TN-512/URR	
2		2	DEMULTIPLEXER	TD-915/URR	
3		2	GENERATOR, REFERENCE SIGNAL	0-1511/URR	
4		1	INTRA-UNIT CABLING	SEE DWG NO CK1624	
5	1		CABINET, RELAY RACK	MODIFIED CY-597A/G	
6	2		CABLE, RF COAXIAL	RG213/U	
7	2		CABLE	TTRS-4	
8	2		CABLE, RF COAXIAL	RG-58/U	
9	2		CABLE	TTRS-2 (1)	
10	1		CABLE, AC POWER	THFA-3	
11		1	CABLE		
12	1		CABLE, RF COAXIAL	RG-58/U	
13		1	BLANK PANELS SET	P/O UNIT 8	
14		1	GROUNDING STRAP	WL100-1 #10 AWG	
15		36	SCREW, MACHINE	SCBP1032BN8	
16		36	WASHER, FIBER	WA101-11	
17 (NOT USED)					
18		2	CONNECTOR, PLUG COAXIAL	UG-536 /U	
19		2	CONNECTOR, PLUG	MS3106B24-28P	
20		1	CONNECTOR, PLUG COAXIAL	UG-88C	
21		2	CONNECTOR, PLUG	MS3106B14S-2P	
22		2	CONNECTOR, PLUG TELEPHONE	PJ055	

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TABLE 2-2. SUMMARY LIST OF INSTALLATION
MATERIAL AN/URR-64(V)2

QUANTITY CFM	NOMENCLATURE	PART, TYPE OR MODEL NUMBER	MANUFACTURERS NAME OR FEDERAL SUPPLY CODE	REMARKS	SIZE		
					LENGTH	HEIGHT	WIDTH
1	TUNER, RADIO FREQUENCY	TN-512/URR		UNIT 1	19.38	7	19
1	DEMULTIPLEXER	TD-915/URR		UNIT 2	19	7	19
1	GENERATOR, REFERENCE SIGNAL	0-1511/URR		UNIT 3	18.5	5.25	19
1	INTRA-UNIT CABLING	SEE DWG NO CK1622		UNIT 4			
	CABINET, RELAY RACK	MODIFIED CY-597/A		UNIT 5	24	87.56	22.38
	CABLE, RF COAXIAL	RG-213/U		ANTENNA INPUT			
	CABLE	TTRS-4		4-CHANNEL AUDIO OUTPUT			
	CABLE, RF COAXIAL	RG-58/U		EXT 1Mc STD INPUT (OPTIONAL)			
	CABLE	TTRS-2 (1)		MONITOR SPEAKER OUTPUT (OPTIONAL)			
	CABLE, AC POWER	THFA-3		AC POWER INPUT			
1	BLANK PANELS SET	P/O UNIT 5					
1	GROUNDING STRAP	WL100-1 #10 AWG					
20	SCREW, MACHINE	SCBP1032BN8		UNIT MTG			
20	WASHER, FIBER	WA101-11		UNIT MTG			
1	CONNECTOR, PLUG COAXIAL	UG-536*/U		FOR ITEM 8 (MATES WITH 4W1J8)			
1	CONNECTOR, PLUG	MS3106B24-28P		FOR ITEM 9 (MATES WITH 4W1J7)			
1	CONNECTOR, PLUG COAXIAL	UG-88-C		FOR ITEM 10 (MATES WITH 4W1J10)			
1	CONNECTOR, PLUG	MS3106B14S-2P		FOR ITEM 11 (MATES WITH 4W1J8)			
1	CONNECTOR, PLUG TELEPHONE	PJ055		FOR HEADSET (OPTIONAL) MATES WITH 2J20 "PHONE" JACK			

ITEM NUMBER	QUANTITY		NOMENCLATURE	PART, TYPE OR MODEL NUMBER	MANUFACTURERS NAME OR FEDERAL SUPPLY CODE
	GFM	CFM			
1		1	TUNER, RADIO FREQUENCY	TN-512/URR	
2		1	DEMULTIPLER	TD-915/URR	
3		1	GENERATOR, REFERENCE SIGNAL	0-1511/URR	
4		1	INTRA-UNIT CABLING	SEE DWG NO CK1622	
5	1		CABINET, RELAY RACK	MODIFIED CY-597/A	
6	1		CABLE, RF COAXIAL	RG-213/U	
7	1		CABLE	TTRS-4	
8	1		CABLE, RF COAXIAL	RG-58/U	
9	1		CABLE	TTRS-2 (1)	
10	1		CABLE, AC POWER	THFA-3	
11		1	BLANK PANELS SET	P/O UNIT 5	
12		1	GROUNDING STRAP	WL100-1 #10 AWG	
13		20	SCREW, MACHINE	SCBP1032BN8	
14		20	WASHER, FIBER	WA101-11	
15		1	CONNECTOR, PLUG COAXIAL	UG-536*/U	
16		1	CONNECTOR, PLUG	MS3106B24-28P	
17		1	CONNECTOR, PLUG COAXIAL	UG-88-C	
18		1	CONNECTOR, PLUG	MS3106B14S-2P	
19		1	CONNECTOR, PLUG TELEPHONE	PJ055	

ORIGINAL

TABLE 2-3. SUMMARY LIST OF INSTALLATION
MATERIAL AN/URR-64(V)3

M	ANTITY CFM	NOMENCLATURE	PART, TYPE OR MODEL NUMBER	MANUFACTURERS NAME OR FEDERAL SUPPLY CODE	REMARKS	SIZE		
						LENGTH	HEIGHT	WIDTH
	2	TUNER, RADIO FREQUENCY	TN-512/URR		UNITS 1 AND 4	19.38	7	19
	2	DEMULTIPLEXER	TD-915/URR		UNITS 2 AND 5	19	7	19
	1	GENERATOR, REFERENCE SIGNAL	0-1511/URR		UNIT 3	18.5	5.25	19
	1	INTRA-UNIT CABLING	SEE DWG NO CK1623 MODIFIED CY-597A/G		UNIT 6			
		CABINET, RELAY RACK			UNIT 7			
		CABLE, RF COAXIAL	RG-213/U		"A" & "B" ANTENNA INPUTS			
		CABLE	TTRS-4		"A" & "B" 4-CHANNEL AUDIO OUTPUTS			
		CABLE, RF COAXIAL	RG-58/U		EXT 1Mc STD INPUT (OPTIONAL)			
		CABLE	TTRS-2		"A" & "B" MONITOR SPEAKER OUTPUTS (OPTIONAL)			
	1	CABLE, AC POWER	THFA-3		AC POWER INPUT			
		CABLE			DIVERSITY INTERCONNECT (OPTIONAL)			
	1	BLANK PANELS SET	P/O UNIT 7					
		GROUNDING STRAP	WL100-1 #10 AWG					
	36	SCREW, MACHINE	SCBP1032BN8		UNIT MTG			
	36	WASHER, FIBER	WA101-11		UNIT MTG			
	2	CONNECTOR, PLUG COAXIAL	UG-536*/U		FOR ITEM 6 (MATES WITH 6W1J8 & 6W4J8)			
	2	CONNECTOR, PLUG	MS3106B24-28P		FOR ITEM 7 (MATES WITH 6W1J7 & 6W4J7)			
	1	CONNECTOR, PLUG COAXIAL	UG-88C		FOR ITEM 8 (MATES WITH 6W1J10)			
	2	CONNECTOR, PLUG	MS3106B14S-2P		FOR ITEM 9 (MATES WITH 6W1J15)			
	2	CONNECTOR, PLUG TELEPHONE	PJ055		FOR HEADSET (OPTIONAL) MATES WITH 2J20 "PHONE" JACKS	24	87.56	22.38

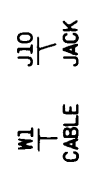
ITEM NUMBER	QUANTITY		NOMEN CLATURE	PART, TYPE OR MODEL NUMBER	MANUFACTURERS NAME OR FEDERAL SUPPLY CODE
	GFM	CFM			
1		2	TUNER, RADIO FREQUENCY	TN-512/URR	
2		2	DEMULTIPLEXER	TD-915/URR	
3		1	GENERATOR, REFERENCE SIGNAL	0-1511/URR	
4		1	INTRA-UNIT CABLING	SEE DWG NO CK1623	
5	1		CABINET, RELAY RACK	MODIFIED CY-597A/G	
6	2		CABLE, RF COAXIAL	RG-213/U	
7	2		CABLE	TTRS-4	
8	1		CABLE, RF COAXIAL	RG-58/U	
9	2		CABLE	TTRS-2	
10	1		CABLE, AC POWER	THFA-3	
11		1	CABLE		
12					
13		1	BLANK PANELS SET	P/O UNIT 7	
14			GROUNDING STRAP	WL100-1 #10 AWG	
15		36	SCREW, MACHINE	SCBP1032BN8	
16		36	WASHER, FIBER	WA101-11	
17		2	CONNECTOR, PLUG COAXIAL	UG-536*/U	
18		2	CONNECTOR, PLUG	MS3106B24-28P	
19		1	CONNECTOR, PLUG COAXIAL	UG-88C	
20		2	CONNECTOR, PLUG	MS3106B14S-2P	
21		2	CONNECTOR, PLUG TELEPHONE	PJ055	

ORIGINAL

TABLE 2-4. WIRE RUN LIST, EXTERNAL CABLING, AN/URR-64(V)1

MFGR CODE	NAVY CABLE DESIGNATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	TO	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	FUNCTION	CURRENT IN AMPS	MAX ALLOW VOLT DROP	SUPPLIED BY
		RG213/U	1		INTERFACE PANEL, RCVR "A"	7M1J8 "ANTENNA"		ANTENNA, RCVR "A"			ANTENNA INPUT RCVR "A"			GFM
		RG213/U	1		INTERFACE PANEL, RCVR "B"	7M5J8 "ANTENNA"		ANTENNA, RCVR "B"			ANTENNA INPUT RCVR "B"			GFM
	TTRS-4		8		INTERFACE PANEL, RCVR "A"	7M1J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "A" SYM/B2 CH LINE B1 CH LINE A1 CH LINE A2 CH LINE			4-CHANNEL AUDIO OUTPUT, RCVR "A" 6000 CT SYM/B2 6000 GND 6000 CT B1 6000 GND 6000 CT A1 6000 GND 6000 CT A2 6000 GND			GFM
	TTRS-4		8		INTERFACE PANEL, RCVR "B"	7M5J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "B" SYM/B2 CH LINE B1 CH LINE A1 CH LINE A2 CH LINE			4-CHANNEL AUDIO OUTPUT, RCVR "B" 6000 CT SYM/B2 6000 GND 6000 CT B1 6000 GND 6000 CT A1 6000 GND 6000 CT A2 6000 GND			GFM
		RG-58/U	1		INTERFACE PANEL, RCVR "A"	7M1J10 IMC EXT STD		EXT IMC STD SOURCE			EXT IMC STD INPUT RCVR "A"			GFM
	TTRS-2		2		INTERFACE PANEL, RCVR "A"	7M1J5 "SPEAKER"	A B C	SPEAKER RCVR "A"			MONITOR SPEAKER OUTPUT, RCVR "A" AUDIO PAIR SHLD			GFM
	TTRS-2		2		INTERFACE PANEL, RCVR "B"	7M3J5 "SPEAKER"	A B C	SPEAKER, RCVR "B"			MONITOR SPEAKER OUTPUT, RCVR "B" AUDIO PAIR SHLD GND			GFM
		RG-58/U	1		INTERFACE PANEL, RCVR "B"	7M2J10 "IMC EXT STD"		IMC EXT STD SOURCE			EXT IMC STD INPUT RCVR "B"			GFM
	THFA-3		2		POWER SOURCE	FIG. 2-1		JUNCTION BOX SA238G			POWER			GFM
		RG-58/U	1		INTERFACE PANEL, RCVR "A"	7W1J9 IMC MON		INTERFACE PANEL "B"			IMC STD INTERCONNECT (OPTIONAL)			GFM

REFERENCE DESIGNATIONS



MFGR CODE	NAVY CABLE DESIGNATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	TO
		RG213/U	1		INTERFACE PANEL, RCVR "A"	7W1J8 "ANTENNA"		ANTENNA, RCVR "A"
		RG213/U	1		INTERFACE PANEL, RCVR "B"	7W5J8 "ANTENNA"		ANTENNA, RCVR "B"
	TTRS-4		8		INTERFACE PANEL, RCVR "A"	7W1J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "A" SYM/B2 CH LINE B1 CH LINE A1 CH LINE A2 CH LINE
	TTRS-4		8		INTERFACE PANEL, RCVR "B"	7W5J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "B" SYM/B2 CH LINE B1 CH LINE A1 CH LINE A2 CH LINE
		RG-58/U	1		INTERFACE PANEL, RCVR "A"	7W1J10 1Mc EXT STD		EXT 1Mc STD SOURCE
	TTRS-2		2		INTERFACE PANEL, RCVR "A"	7W1J5 "SPEAKER"	A B C	SPEAKER RCVR "A"
	TTRS-2		2		INTERFACE PANEL, RCVR "B"	7W3J5 "SPEAKER"	A B C	SPEAKER, RCVR "B"
		RG-58/U	1		INTERFACE PANEL, RCVR "B"	7W2J10 "1Mc EXT STD"		1Mc EXT STD SOURCE
	THFA-3		2		POWER SOURCE	FIG. 2-1		JUNCTION BOX SA238G
		RG-58/U	1		INTERFACE PANEL, RCVR "A"	7W1J9 1Mc MON		INTERFACE PANEL "B"

LEGEND FOR REFERENCE DESIGNATIONS

$\frac{7}{7}$ UNIT
 $\frac{W1}{7}$ CABLE
 $\frac{J10}{7}$ JACK

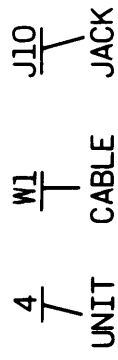
CONTRACT NUMBER: N600(65133)65805
 NOTE: DRAWING IN ACCORDANCE WITH MIL-D-23410 (SHIPS)
 DATED 17 JANUARY 1962

ORIGINAL

TABLE 2-5. WIRE RUN LIST, EXTERNAL
CABLING AN/URR-64(V)2

LOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	TO	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	FUNCTION	CURRENT IN AMPS	MAX ALLOW VOLT DROP	SUPPLIED BY
	INTERFACE PANEL	4W1J8 "ANTENNA"		ANTENNA			ANTENNA INPUT			GFM
	INTERFACE PANEL	4W1J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	} SYM/32 CH } LINE } B1 CH LINE } A1 CH LINE } A2 CH LINE			4-CHANNEL AUDIO OUTPUT 600Ω CT } SYM/B2 600Ω GND } 600Ω CT } B1 600Ω GND } 600Ω CT } A1 600Ω GND } 600Ω CT } A2 600Ω GND }			GFM
	INTERFACE PANEL	4W1J10 "1Mc EXT STD"		EXT 1Mc STD SOURCE			EXT 1Mc STD INPUT			GFM
	INTERFACE PANEL	4W1J5 "SPEAKER"	A B C	SPEAKER			MONITOR SPEAKER OUTPUT AUDIO PAIR			GFM
	POWER SOURCE	FIG. 2-2		JUNCTION BOX SA238G	WHT & BLK PIG TAIL		SHLD GND POWER			GFM

LEGEND FOR REFERENCE DESIGNATIONS



MFGR CODE	NAVY CABLE DESIGNATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	TO	TERMINAL BOARD PLUG OR JACK
		RG213/U	1		INTERFACE PANEL	4WIJ8 "ANTENNA"		ANTENNA	
	TTRS-4		8		INTERFACE PANEL	4WIJ7 "AUDIO"	A B C D E F G H K L M N W X Y Z	} SYM/B2 CH LINE } B1 CH LINE } A1 CH LINE } A2 CH LINE	
		RG-58/U	1		INTERFACE PANEL	4WIJ10 "1Mc EXT STD"		EXT 1Mc STD SOURCE	
	TTRS-2		2		INTERFACE PANEL	4WIJ5 "SPEAKER"	A B C	SPEAKER	
	THFA-3		2		POWER SOURCE	FIG. 2-2		JUNCTION BOX SA238G	WHT & BLK PIGTAIL

LEGEND FOR REFERENCE DESIGNATIONS

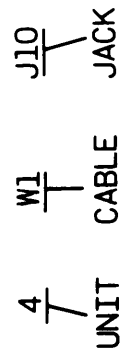


TABLE 2-6. WIRE RUN LIST, EXTERNAL CABLING, AN/URR-64(V)3

MFGR CODE	NAVY CABLE DESIGNATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD OR JACK PLUG OR JACK	TERMINAL OR PIN DESIGNATION	TO	TERMINAL BOARD OR JACK PLUG OR JACK	TERMINAL OR PIN DESIGNATION	FUNCTION	CURRENT IN AMPS	MAX ALLOW VOLT DROP	SUPPLIED BY
		RG213/U	1		INTERFACE PANEL, RCVR "A"	6W1J8 "ANTENNA"		ANTENNA, RCVR "A"			ANTENNA INPUT RCVR "A"			GFM
		RG213/U	1		INTERFACE PANEL, RCVR "B"	6W5J8 "ANTENNA"		ANTENNA, RCVR "B"			ANTENNA INPUT RCVR "B"			GFM
	TTRS-4		8		INTERFACE PANEL, RCVR "A"	6W1J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "A" } SYM/B2 CH LINE } B1 CH LINE } A1 CH LINE } A2 CH LINE			4-CHANNEL AUDIO OUTPUT, RCVR "A" 6000 CT } SYM/B2 6000 GND } 6000 CT } B1 6000 GND } 6000 CT } A1 6000 GND } 6000 CT } A2 6000 GND }			GFM
	TTRS-4		8		INTERFACE PANEL, RCVR "B"	6W5J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "B" } SYM/B2 CH LINE } B1 CH LINE } A1 CH LINE } A2 CH LINE			4-CHANNEL AUDIO OUTPUT, RCVR "B" 6000 CT } SYM/B2 6000 GND } 6000 CT } B1 6000 GND } 6000 CT } A1 6000 GND } 6000 CT } A2 6000 GND }			GFM
	TTRS-2		2		INTERFACE PANEL, RCVR "B"	6W3J5 "SPEAKER"	A B C	SPEAKER, RCVR "B"			MONITOR SPEAKER OUTPUT, RCVR "B" AUDIO PAIR SHLD GND			GFM
		RG 58/U	1		INTERFACE PANEL, RCVR "A"	6W1J9 "IMC EXT STD"		EXT IMC SOURCE			IMC STD EXTERNAL INPUT			GFM
	TTRS-2		2		INTERFACE PANEL, RCVR "A"	6W1J5 "SPEAKER"	A B C	SPEAKER RCVR "A"			MONITOR SPEAKER OUTPUT, RCVR "A" AUDIO PAIR SHLD GND			GFM
	THFA-3		2		POWER SOURCE	FIG. 2-3		JUNCTION BOX SA238-G	WHT & BLK PIGTAIL		POWER INPUT			GFM

SIGNATIONS

410(SHIPS)

MFGR CODE	NAVY CABLE DESIGNATION	CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	TO	PL
		RG213/U	1		INTERFACE PANEL RCVR "A"	6W1J8 "ANTENNA"		ANTENNA, RCVR "A"	
		RG213/U	1		INTERFACE PANEL RCVR "B"	6W5J8 "ANTENNA"		ANTENNA, RCVR "B"	
	TTRS-4		8		INTERFACE PANEL RCVR "A"	6W1J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "A" } SYM/B2 CH LINE } B1 CH LINE } A1 CH LINE } A2 CH LINE	
	TTRS-4		8		INTERFACE PANEL, RCVR "B"	6W5J7 "AUDIO"	A B C D E F G H K L M N W X Y Z	AUDIO LINES RCVR "B" } SYM/B2 CH LINE } B1 CH LINE } A1 CH LINE } A2 CH LINE	
	TTRS-2		2		INTERFACE PANEL, RCVR "B"	6W3J5 "SPEAKER"	A B C	SPEAKER, RCVR "B"	
		RG 58/U	1		INTERFACE PANEL, RCVR "A"	6W1J9 "IMC EXT STD"		EXT IMC SOURCE	
	TTRS-2		2		INTERFACE PANEL, RCVR "A"	6W1J5 "SPEAKER"	A B C	SPEAKER RCVR "A"	
	TIFA-3		2		POWER SOURCE	FIG. 2-3		JUNCTION BOX SA238-G	WH P

LEGEND FOR REFERENCE DESIGNATIONS



CONTRACT NO.: 14-000-5313-265805

NOTE: DRAWING IN ACCORDANCE WITH MIL-D-23410(SHIPS)
DATED 17 JANUARY 1962

ORIGINAL

SECTION 4
TROUBLESHOOTING

4-1. LOGICAL TROUBLESHOOTING PROCEDURE.

a. INTRODUCTION. - The procedure described in this section is aimed at directing the troubleshooter to the faulty component, connection or wire in as few steps as possible. The basis for the steps is the structure of the receiver. Each receiver is divided electrically into functional sections, and mechanically into rack-mounted modular units. Each modular unit is divided into removable subassemblies and plug-in P/C boards. In the troubleshooting procedure, a faulty subassembly can be removed and replaced quickly, placing the Receiving Set back in operation. Troubleshooting (and repair) of the removed subassembly can then be continued at a different time or locality if necessary. When troubleshooting a Receiving Set, there are seven basic steps to be taken. These are:

- (1) Symptom recognition.
- (2) Symptom elaboration.
- (3) Listing probable faulty functional sections.
- (4) Localizing the faulty functional section.
- (5) Localizing the faulty modular unit within the functional section.
- (6) Localizing the faulty subassembly within the modular unit.
- (7) Localizing the faulty component within the subassembly.

b. SYMPTOM RECOGNITION. - At the first sign of trouble in the receiver, it is important to determine whether or not it is the Receiving Set that is giving the trouble or some associated equipment (the remote control site, teletype linkage, audio loads, rf transmission lines, etc.).

c. SYMPTOM ELABORATION. - After it has been determined that the Receiving Set is at fault, the symptom should be examined more closely. Use front panel controls and/or the remote control site key-board to emphasize the trouble. Table 3-2, Control Functions, will be useful in this step. Note also that there are several modes of operation possible (see paragraph 3-1), involving tuning, frequency control, channel reception, and diversity/single receiver operation. It is particularly important in this step to note in which operating mode or modes the trouble is encountered.

d. LISTING PROBABLE FAULTY FUNCTIONAL SECTIONS. - Paragraph 4-2, Overall Functional Description, lists and describes the seven functional sections of the receiver (see figure 4-1) and includes a Troubleshooting Chart. The table lists symptoms-vs.-functional sections. On the basis of observations made in the previous step, and by referring to paragraph 4-2, it should be possible to pick out two or three of the sections that may be

the cause of the trouble.

e. LOCALIZING THE FAULTY FUNCTIONAL SECTION. - To determine more exactly the faulty functional section from the list made in the previous step, refer to paragraph 4-3, Functional Section Descriptions, under the sub-paragraph headings of the sections. Each of these sub-paragraphs are further divided into Overall Functional Sectional Description (relating to a servicing block diagram of the section) and Overall Functional Section Test Data (relating to test procedure and to waveform/voltage test data found on the servicing block diagram). By using the preliminary input-vs-output test points on each functional section, the faulty section can be located. Test setups and control positions (for the specific test data given on the servicing block diagram) are included to the left of the diagram.

f. LOCALIZING THE FAULTY MODULAR UNIT WITHIN THE FUNCTIONAL SECTION. - In some cases it may be required to remove the faulty rack modular unit and replace it with an overhauled unit, continuing the faulty unit troubleshooting at a different time or locality such as a bench test operation. For this reason, input-vs-output test points and values for each modular unit within a functional section are included in the servicing block diagram for the section.

g. LOCALIZING THE FAULTY SUBASSEMBLY OR AREA WITHIN THE MODULAR UNIT. - When the modular unit has been discovered, it may be left in the rack for the purposes of system troubleshooting or it may be removed for bench test troubleshooting. In either case, reference to paragraph 4-3 sub-paragraphs Overall Functional Section Description and Overall Functional Section Test Data should reveal the faulty subassembly, P/C board, or wiring connection area. Subassemblies may be located by referring to major component location diagrams for each modular unit in Section 5. Note that a quick check can be performed in this step by using spare plug-in subassemblies for a substitution check to reveal the faulty one.

h. LOCALIZING THE FAULTY COMPONENT WITHIN THE SUBASSEMBLY OR AREA. When the faulty subassembly has been discovered, it is generally most expeditious to replace it from the spares supply. Further troubleshooting of the subassembly may then be performed in a modular unit at a different site or time. For this latter purpose, the technician may refer to paragraph 4-4 Subassembly Description. The text in sub-paragraphs of 4-4 is divided into subassemblies and these are presented in the reference symbol order of a single receiver. The text refers to sub-assembly schematics in Section 5 and these also include test points. Test data given is based on the same test setup and control position arrangement

given on the functional section diagram. Before starting subassembly troubleshooting, the technician should check the Notes column opposite its listing in Section 6, Parts List. Some subassemblies have been categorized by the provisioning agency as non-repairable from a practical or costwise point of view. In addition, some are recommended to be returned to the factory for repair. In both cases, there should be spare subassemblies available for replacement, eliminating the necessity for any further troubleshooting procedure.

4-2. OVERALL RECEIVER FUNCTIONAL DESCRIPTION.

a. INTRODUCTION. - Radio Receiving Set AN/URR-64(V)2 consists of six functional sections (see figure 4-1, Overall Functional Block Diagram). Paragraph 4-2, d. description of Diversity Quieter Section is applicable to Radio Receiving Sets AN/URR-64(V)1 and 3 only. These sections are described briefly in the following paragraphs.

b. SIGNAL DETECTION SECTION. - The signal detection section functions as a basic receiver. A 2 to 32 mc rf signal, and associated sidebands, AM or CW transmission, is received at the antenna input. Audio appears at the output in the form of a symmetrical channel for AM or CW, or up to four demultiplexed channels (B2, B1, A1 and A2) in a four-channel sideband transmission.

c. GAIN CONTROL SECTION. - The gain control section adjusts amplifier gain at the rf and if stages. It may be set manually, at the front panel, or it may be set for the AGC mode. In AGC mode, a level sensing signal from the 250 kc IF stage measures the level of the incoming signal, and a corresponding dc voltage is applied to keep the receiver output constant through a wide range of signal input levels.

d. DIVERSITY QUIETER SECTION. - The diversity quieter section may be utilized only in a diversity operation (AN/URR-64(V)1 and 3 only). In space or frequency diversity mode, the two receivers are tuned and operated to receive the same signal. The diversity quieter in each receiver samples an individual channel AGC output and compares it with like samples from the same channel of the associated receiver. The sample representing the receiver with the weaker signal initiates a quieting signal back to that receiver's channel audio amplifier stage from its own quieter.

e. SYNTHESIZER/PHASE LOCK SECTION. - This section sets the receiver for synthesized operation by locking all receiver frequencies to a 1 mc standard. It has two inputs: (1) a 21 to 37 mcs frequency from the receiver's hf oscillator and (2) a signal from the receiver's BAND selector setting. The output is a dc correction voltage to the hf oscillator from a phase locking section that automatically locks the receiver to the standard in the final phase of fine tuning. When phase locking has occurred, it sends a "sync" signal to the SYNC INDICATOR section.

The synthesizer/phase lock section contains its own 1-mc standard, stable to within one part in 10^8 for a 24-hour period. If a higher external 1-mc

standard is available, this standard may be used to control the internal one. An electronic automatic switching circuit switches in the external standard in case of the failure of the internal.

When an external 1 mc signal is connected and its amplitude is greater than 0.7 vrms, the PHASE COMPARATOR/FREQ DIFFERENCE switch must be in the PHASE COMPARATOR position. The internal 1 mc will then be phase locked to the external standard.

If the external standard fails or falls below 0.7 vrms the external red lamp on the front of the unit will light, indicating loss of the external 1 mc, and the electronic circuit will hold the internal 1-mc to its frequency and phase prior to the loss of the external 1 mc.

When the internal 1 mc is lost with a external 1 mc connected, electronic switching will cause the internal red lamp to light on the front panel, indicating loss of internal 1 mc, and the external 1 mc will be used for receiver operation.

f. DIGITAL COUNTER SECTION. - The digital counter section is a lighted numeric display unit, representing the 2 to 32 mc frequency to which the receiver is tuned. It displays the frequency to four places beyond the decimal point and works by an actual frequency count derived from the receiver's hf 21 to 37 mc oscillator.

g. AFC SECTION. - The AFC (automatic frequency control) section compensates for signal drift from a relatively unstable (or non-synthesized) transmitter. The AFC section, when properly tuned, locks onto the incoming carrier at the 250 kc intermediate frequency. Any deviation in the carrier frequency alters a 250 kc injection frequency in a control loop and (by dc correction voltage control) alters the rf oscillator frequency in the signal processing section by means of a second control loop to produce fidelity of audio output. When the AFC section has locked to a carrier, it sends a sync signal to the sync indicator section. In order to allow the second loop to act first, the first loop is momentarily opened by the AFC TUNE switch.

h. SYNC INDICATOR SECTION. - The sync indicator section functions for either AFC or synthesized frequency control mode, since only one mode is employed at a time.

The sync indicator section receives dc voltages from the synthesizer/phase lock and the AFC sections to indicate, by the use of a meter (1M1) and light (1DS1), the phase lock of the hf oscillator in the synthesize mode and the dc voltage locking of the hf oscillator in the AFC mode. The system is locked up when the meter indicates and the SYNC INDICATOR lamp light is on.

i. TYPICAL SYMPTOMS VS. FUNCTIONAL SECTIONS. - Table 4-1 presents indicated faulty functional sections from typical symptoms encountered.

4-3. FUNCTIONAL SECTION DESCRIPTIONS.

a. SERVICING BLOCK DIAGRAMS. - Figures 4-2 through 4-11 are servicing block diagrams for the seven functional sections of the AN/URR-64 series. Included in all diagrams are pertinent

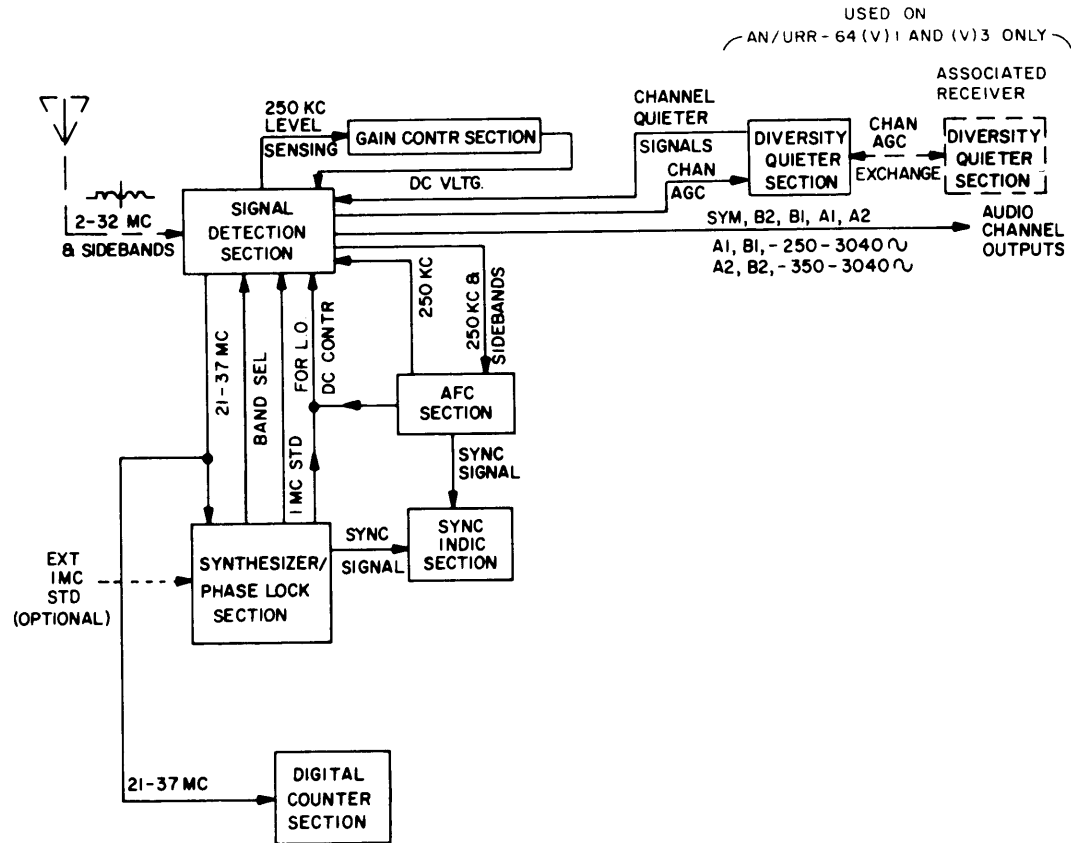


Figure 4-1. Overall Functional Block Diagram

front panel controls to relate their effects on each functional section in the troubleshooting study.

Test points are symbolized throughout figures 4-2 through 4-11 in accordance with the phase of troubleshooting to be performed. These phases are: (1) input/output checks of functional sections; (2) input/output checks of modular units; and (3) input/output checks of subassemblies. The test point symbol legend is shown in notes on each diagram.

Test data for the Receiving Set falls into two categories: for binary logic circuitry, and for communications circuitry. Test data for the former is

in dc volt-change format, and data for the latter are in the form of pertinent waveforms, voltages and frequencies. Waveforms, voltages and frequencies are shown directly on servicing block diagrams, and are referenced to the test points shown on the servicing block diagrams.

In all cases, the text in the following paragraphs under the sub-headings of test data should be referred to before taking measurements. The text contains specific control positions and test setup requirements to obtain the specific readings.

b. TEST EQUIPMENT REQUIRED. - Refer to table 1-5 for test equipment required.

TABLE 4-1. TROUBLESHOOTING CHART

SYMPTOM	PROBABLE FUNCTIONAL SECTION INDICATED
With signal input indicated on TN-512/URR RF/AFC LEVEL meter, no audio output can be detected.	Signal Detection.
With TN-512/URR RF GAIN knob AGC, variations in signal input strength as indicated by RF/AFC LEVEL meter produce volume variations at audio output.	Gain Control.
Varying TN-512/URR RF GAIN knob does not produce audio level variations.	Gain Control.

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TABLE 4-1. TROUBLESHOOTING CHART (Cont)

SYMPTOM	PROBABLE FUNCTIONAL SECTION INDICATED
In diversity operation, audio from the identical channels of receivers A and B cut out at the same time.	Diversity Quieter.
In synthesized tuning the correct figure comes up on the MEGACYCLES display but it is not possible to obtain a sync indication.	Synthesizer/Phase Lock or sync indicator.
In synthesized tuning, a sync indication is reached but the correct figure is not displayed on the TN-512/URR MEGACYCLES display.	Digital Counter.
The receiver has been successfully tuned and synchronized for synthesized tuning. However repeated subsequent AFC tuning procedures fail to give a sync indication (capture of transmitted carrier).	AFC.
After a successful synthesized tuning, monitoring the receiver indicates a loss of sync.	Synthesizer/Phase Lock of Sync Indicator.
After a successful AFC tuning, monitoring the receiver reveals a loss of sync.	AFC or Sync Indicator.

c. SIGNAL DETECTION SECTION. (See figure 4-2).

(1) OVERALL FUNCTIONAL SECTION DESCRIPTION. - Heavied lines indicate path of intelligence. RF Tuner TN-512/URR processes the signal from its 2 to 32 mc stage to a 250 kc if output. The 2 to 32 mc carrier and sidebands from the antenna are directed to four rf amplifier band circuits (1A10A3A1 through 1A10A3A4) in tuner assembly 1A10 via input/ attenuator 1A11. Tunable bandpass ranges are in octave steps: 2-4 mc, 4-8 mc, 8-16 mc, and 16-32 mc. During local tuning all four bands are simultaneously gang tuned with 21 to 37 mc local oscillator (1A10A1) for the incoming frequency by means of the front panel TUNE control. Band separation is further accomplished in first if printed circuit board 1A9 by using four separate if mixers and stages at this point (rather than one mixer and one if). The outputs of the difference mixers (.625, 1.25, 2.5, and 5.0 mc) are fed to four separate if stages. Each stage contains an amplifier chain and a crystal-symmetrical bandpass filter; an appreciable degree of selectivity occurs in this area. The front panel BAND SWITCH (in positions 1 through 4) serves to (a) select one of four bandpaths from input/attenuator assembly 1A11 through tuner assembly 1A10, (b) select the proper division ratio on local oscillator divider printed circuit board 1A8 to produce the appropriate first mixer injection frequency and (c) energize subsynthesizer printed circuit board 1A6 to produce an appropriate mixer injection frequency. Second if printed circuit board 1A7 functions to convert the selected band frequencies to the second if of 250 kc. A further degree of selectivity is gained in a crystal filter (not shown) in the mixer output. Output of the 250 kc carrier and sidebands is then routed to Demultiplexer TD-915/URR.

Demultiplexer TD-915/URR may be operated for ISB (independent sideband) mode (figure 4-2) or for symmetrical channel mode (figure 4-3) by positioning the MODE selector switch. In the AM or CW positions the TD-915/URR will pass the symmetrical channel only; in the ISB position it will pass the four sideband channels only. In the symmetrical mode (figure 4-3), a further selection of audio detection and channel bandwidth may be made by the MODE switch. When the switch is in one of the AM width positions (2.5 kc or 6.0 kc), the carrier and sidebands are processed in an envelope detector to produce audio the width selected. When the switch is in one of the CW width positions (2.5 kc or 6.0 kc), the tone frequency in a sideband (or the carrier itself) is processed in a product detector, with adjustable BFO injection, to produce audio at the filtered width selected.

In the symmetrical mode, the signal path through the TD-915/URR then, proceeds through symmetrical IF/AGC P/C board 2A5, where width is selected (at the if stage), and over to symmetrical demodulator P/C board 2A4, where a detector is selected. The audio derived from the detector is adjusted in level by the SYM/B2 LINE LEVEL ADJUST knob and routed out of the receiver via the B2 audio/demod P/C board 2A6. The section of the 2A6 board thus used is made to double for the symmetrical channel and the B2 channel, since only one channel will be coming through at any given time, in accordance with the mode selected by the MODE switch.

In the ISB mode (figure 4-2), the carrier (suppressed or partial) and both sidebands are applied simultaneously to B2, B1, A1, and A2 channel IF/AGC boards (2A7, 2A9, 2A11, and 2A13, respectively). A crystal filter at the input of each board picks out and passes the appropriate band of

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frequencies on to the appropriate channel audio/demod card opposite it. These boards (2A6, 2A8, 2A10, and 2A12) process the 250 kc sideband channels through product detectors to produce four audio channel outputs from the receiver. Product detectors for the two direct channels (A1 and B1) use a 250 kc injection frequency; detectors for the translated channels (A2 and B2) use 243.71 kc and 256.29 kc injection frequencies to produce the required audio. These four injection frequencies are obtained from subcarrier generator P/C board 2A3.

Printed circuit board 2A3 derives the injection frequencies by using the receiver's basic 1 mc frequency source (from RF Tuner TN-512/URR, see next paragraph). The 1 mc is divided by 100 to produce 10kcs into a keyed oscillator. A 6.29 mcs harmonic from the oscillator, selected by a crystal filter, is divided by 1000 to produce 6.29kc. This 6.29kc is used as a common injection frequency for a difference mixer and a sum mixer. The other common injection frequency is 250kc, derived by dividing the 1 mc standard by four. The difference mixer then produces 243.71 kc; the sum mixer produces 256.29 kcs.

The position of the RF Tuner TN-512/URR FUNCTION switch 1A12 acts on a gate in phase detector driver board 1A1A2 to select the receiver's 1 mc basic frequency from two possible sources: (1) a highly stable 1 mc standard from Reference Signal Generator 0-1511/URR (see paragraph 4-3f, synthesizer/phase lock section) or (2) a 1 mc standard of lesser stability located in input/standard board 1A1A1. The latter source is used in tuning for AFC (see paragraph 4-3h) and tuning for local frequency control.

Tuning circuits for local frequency control are all contained in the basic signal detection section of the receiver. In this mode, the local oscillator (1A10A1) in RF Tuner TN-512/URR is disconnected from any control by the AFC section or the synthesizer/phase lock section.

LINE-DBM meter 2M1, in Demultiplexer TD-915/URR, together with MONITOR SELECTOR switch 2S2 and METER SENSITIVITY switch 2S8 are used to adjust and monitor the receiver audio output level for each channel. Adjustment is made by LINE LEVEL ADJUST potentiometers 2R2, 2R3, 2R4, and 2R5. A 0 dbm reading on the meter indicates a 1mw output into a 600 ohm line. The METER SENSITIVITY switch extends the reading range on the meter for low or high outputs.

The front panel PHONE jack (2J2) on Demultiplexer TD-915/URR and LOCAL GAIN potentiometer 2R1 are used for headset or speaker sound monitoring. In this mode, MONITOR SELECTOR switch 2S2 selects the audio channel, to the speaker or headset and the LOCAL GAIN knob regulates the volume.

(2) OVERALL FUNCTIONAL SECTION TEST DATA.

- (a) TEST EQUIPMENT REQUIRED.
 - HP-606B, Signal Generator
 - AN/USM-281A, Oscilloscope
 - AN/USM-207, Frequency

Counter

- AN/PSM-4C, VOM
- ME-303/U, RF VTVM

- (b) PROCEDURE. - To test the signal detection section for ISB mode, attach the

rf signal generator to the antenna input jack, J8 on the rear interface panel, and terminate audio channels A1, A2, B1 and B2 with 600 ohm dummy loads. Set the receiver controls and signal generator frequencies and amplitudes as shown in the table on figure 4-2. Perform tests A, B, C and D at 3, 6, 12 and 24 megacycles respectively, referring to the Signal Frequencies Table for points which vary for each test. Use an rf VTVM, sensitive wide band oscilloscope, frequency counter and dc VOM as required. Since the TN-512/URR COUNTER MODE selector switch is in the REC position, the frequency to which the receiver is tuned will be indicated on the receiver counter. Whenever possible, test points on the servicing block diagrams have been used; when test points are not available, extender card pin numbers have been identified. Readings which depend on AFC action should not be hurried; a finite time is required for voltages to stabilize. In general, internally generated injection frequencies should be exact, while signal frequencies dependent on the external signal generator will depend on the care with which the signal generator is tuned.

To test the signal detection section in the symmetrical mode, first perform the test of the signal detection section ISB mode. Then refer to figure 4-3. For the test of the symmetrical mode, the signal generator at the antenna input is modulated externally by either a 1 kc audio signal or a 2 kc audio signal, depending on the bandpass being tested, or, for the test of the CW function, the signal generator is unmodulated. The carrier frequency is specified as 18 mc, but any other frequency in the range of the receiver may be used. Test A refers to 1 kc modulation bandwidth 2.5 kc, Test B refers to 2 kc modulation, bandwidth 6 kc. Test C refers to the CW mode; the signal generator is unmodulated and the internal beat frequency oscillator determines the output audio frequency.

d. GAIN CONTROL SECTION. (See figure 4-4.)

- (1) OVERALL FUNCTIONAL SECTION DESCRIPTION. - The gain control section encompasses a manually adjusted gain control, an AGC (automatic gain control) and a level meter working from AGC samplings.

The AGC system falls into two main sections: a high-level section in RF Tuner TN-512/URR and a low-level section in Demultiplexer TD-915/URR. When used together the two sections keep the output of the receiver constant for a total range of antenna input from 1.0 uv to 1 volt. Attack points are arranged so that for an antenna signal level in the range of 1.0 uv to 500 uv, the TD-915/URR AGC system is active and the TN-512/URR AGC system is inactive. When the antenna signal strength increases above 500 uv, the TN-512/URR AGC system becomes active and joins that of the TD-915/URR in keeping the audio output constant. At 30 mv antenna input, an AGC overload sensing circuit, in TN-512/URR, second IF P/C board 1A7 switches in a 20 db attenuator in input attenuator assembly 1A11, thereby placing additional control on the signal. The INPUT ATTENUATOR switch (1S2) controls the attenuator when the

signal at the antenna is less than 30 mv. In the up position the attenuator is switched in; in the down position, automatic switching at 30 mv takes place.

The AGC system in RF Tuner TN-512/URR is switched in by setting RF GAIN potentiometer 1R2 to AGC position, actuating a built-in switch. The AGC system in Demultiplexer TD-915/URR is switched in by setting the AGC SOURCE knobs to a position other than MANUAL.

TD-915/URR AGC circuits are isolated for each channel and AGC SOURCE control switches are arranged to select channel feedback source and AGC attack and decay speeds (AGC TIME CONSTANT switches) individually for each sideband channel. Each sideband channel may receive its feedback from its own output or from one of the other three sideband channels. AGC controls for the symmetrical channel (see figure 4-5) selects attack and decay speed only, since this channel can only receive AGC feedback from its own output.

The manually controlled gain for both TN-512/URR and TD-915/URR modular units is adjusted by the TN-512/URR RF GAIN knob, first setting the TD-915/URR AGC SOURCE switches at MANUAL so as to substitute the adjustment from RF GAIN potentiometer 1R2 for the AGC inputs into the individual channels.

RF/AFC LEVEL meter 1M2 in RF Tuner TN-512/URR (with METER FUNCTION switch 1S2 in an RF position) functions to assist the RF GAIN knob adjustment setting by indicating incoming signal strength. In the RF LOW position of the switch, the meter derives the signal level for a relatively weak signal from a summing of AGC levels from the four separate channel AGC feedbacks in the

TD-915/URR. In the RF HIGH switch position, a relatively strong signal is measured from the AGC output in the TN-512/URR rf stage. The AFC CARRIER switch position monitors the level of the captured carrier component in AFC operation (see paragraph 4-3h, AFC Section).

(2) OVERALL FUNCTIONAL SECTION TEST DATA.

(a) TEST EQUIPMENT REQUIRED.

HP-606B, Signal Generator
ME-303/U, RF VTVM
AN/PSM-4C, VOM
AN/USM-281A, Oscilloscope

(b) PROCEDURE. - To test the gain control section for ISB mode, attach signal generator and loads to rear interconnect panel as shown in Test Setup diagram included in figure 4-4. Set receiver controls as listed in the diagram. Test AGC system by performing test A, B, and C for the three variations in antenna input signal strength indicated (minimum, maximum, and overload). Test manual gain control system by performing test D and E (for minimum and maximum gain settings of the TN-512/URR RF GAIN knob); the minimum setting is the extreme counterclockwise position (just short of AGC switch-in) and the maximum is the extreme clockwise position. Refer to Signal Variations Table for points that vary with each test. Use an RF VTVM for rf measurements and a VOM for the dc measurements.

The AGC time constant circuits should be tested after the gain control test have been completed. The procedure for the AGC time constant test is included in Table 4-2. Test setup for the AGC time constant test and AGC waveforms are included in figure 4-12.

TABLE 4-2. TEST OF AGC TIME CONSTANT CIRCUITS

<p>A. Test Equipment Required:</p> <ol style="list-style-type: none"> 1. Square Wave Generator: SG-299L, or equivalent 2. Signal Generator: HP-606B, or equivalent 3. Oscilloscope: AN/USM-281A <p>B. Preliminary Control Settings:</p> <ol style="list-style-type: none"> 1. Square Wave Generator: SG-299L <ol style="list-style-type: none"> a) Adjust the Square Wave Generator of an output frequency of 1 CPS. b) Adjust Square Wave Generator amplitude for approximately 1 volt peak. 2. Signal Generator: HP-606B <ol style="list-style-type: none"> a) Put RANGE switch in 165-560 KC position. b) Adjust frequency to approximately 250 kc. c) Place MODULATION SELECTOR control to EXT DC. d) Place ATTENUATOR control in .03 volts position. e) Adjust MODULATION AMPLITUDE control and ATTENUATOR VERNIER control until rf output meter swings between .3 and 3. Do not heed the % MODULATION meter. 3. TD-915 URR: <ol style="list-style-type: none"> a) Place all AGC TIME CONSTANT switches to FAST. b) Place A1 AGC source switch to A1, B1 AGC source switch to B1, etc. c) Place MODE switch to the ISB position. <p>C. Test Procedures:</p> <ol style="list-style-type: none"> 1. Remove external modulating signal from the MODULATION INPUT/OUTPUT jack on the signal generator. 2. Tune the signal generator until the output frequency of the card under test, measured with scope and counter at TP 9 is:
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TABLE 4-2. TEST OF AGC TIME CONSTANT CIRCUITS (Cont)

- a) 252 kc for A1 channel, 2A11 card
- b) 255 kc for A2 channel, 2A11 card
- c) 248 kc for B1 channel, 2A9 card
- d) 245 kc for B2 channel, 2A7 card
- e) 250 kc for SYM channel, 2A5 card
3. Adjust LINE LEVEL ADJUST control for channel under test for 0 dbm, indicated on the LINE DBM meter. An audible indication from a monitor speaker may be used.
4. Reconnect modulation to HP-606B signal generator.
5. With scope time base, scope sync (+) and scope vertical attenuator controls properly set, the waveform on figure 4-12A AGC Attack and Decay Time should be observed.
6. With scope sync control set at (+), use trigger level vertical attenuator and vernier, and horizontal time base control so that the waveform of the signal during time period A (as presented in figure 4-12B) is expanded (as presented in figure 4-12C)
7. Record the attack time, in milliseconds, for signal to fall from initial peak to approximately 63%. The attack time, with TIME CONSTANT switches on FAST position, should be 20 milliseconds.
8. With scope sync control set at (-) use trigger level, vertical attenuator and vernier, and horizontal time base control so that the waveform of the signal during time period B (as presented in figure 4-12B) is expanded (as presented in figure 4-12D).
9. Record the decay time, in milliseconds, for signal to rise from initial value to approximately 63%. The time, with TIME CONSTANT SWITCHES in FAST position, should be 20 milliseconds.
10. Repeat the tests for MED and SLOW TIME CONSTANT switch positions.
 - a) MED attack time 20 ms; decay time 100 ms.
 - b) SLOW: attack time 40 ms; decay time 2 seconds.

NOTE

The square wave frequency may be varied between 1 and 5 cycles, as necessary for waveform display.

11. Repeat the test for all channels, changing the HP-606B signal generator frequency as required.

To test the gain control section for symmetrical mode, first perform test for ISB up to the TD-915/URR unit, then refer to figure 4-5 for the remainder of the test. Attach signal generator and loads as shown in Test Setup diagram included in figure 4-5. Set receiver controls as listed under the diagram. For test of symmetrical AGC time constant circuits, see table 4-2.

e. DIVERSITY QUIETER SECTION. (See figure 4-6.)

(1) OVERALL FUNCTIONAL SECTION DESCRIPTION. - The diversity quieter section may be used in diversity operation of two receivers (AN/URR-64(V)1 and (V)3 Receiving Set only). All circuitry is located in the Demultiplexer TD-915/URR.

Inputs to the diversity quieter system are the five individual channel AGC signals described in paragraph 4-3d. The signals are fed from each channel's AGC TIME CONSTANT switch to monitor/diversity P/C board 2A2 similarly, AGC signals are fed from each channel's AGC TIME CONSTANT switch to monitor diversity P/C board in the second Demultiplexer TD-915/URR of the diversity receiver. The dc outputs of both monitor/diversity P/C boards (representing the signal strength of each receiver) are directly connected and form a comparator circuit. If for example, channel B1 in receiver A is receiving a stronger signal than is channel B1 in receiver B, the dc output voltage from 2A2 will be fed to both receiver halves A and B as the AGC source for the gain control section.

The diversity quieting feature is not required when the AN/URR-64(V)1 and (V)3 are operated in diversity with an external combiner at the audio output. The exchange of AGC signals between receivers is through an interconnecting cable running between the two DIVERSITY connectors on the upper and lower interface panels at the rear of the rack (see figures 5-1 and 5-3); this cable is removed when the AN/URR-64 (V)1 is operated with a combiner. When the receiver is operated in diversity using AGC comparisons, however, the TD-915/URR AGC SOURCE switches (see paragraph 4-3d, Gain Control Section) must be positioned so that each channel receives its own AGC feedback.

(2) OVERALL FUNCTIONAL SECTION TEST DATA.

- (a) Test Equipment Required
AN/PSM-4C, VOM
AN/USM-106A, VTVM
Two HP-606B, Signal Generators

(b) PROCEDURE. - To test the diversity quieter section, attach a signal generator and loads to receiver A and B (upper and lower) rear interface panels as shown in the Test Setup diagram included in figure 4-6. Set receiver controls as listed under the diagram. Test system by performing A and B tests (for the two combinations of receiver A and B relative input strength) as indicated. Refer to Signal Variations table for points that vary with each test. Use a VOM to measure vdc points.

f. SYNTHESIZER/PHASE LOCK SECTION. (See figure 4-7.)

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(1) OVERALL FUNCTIONAL SECTION DESCRIPTION.

(a) SINGLE RECEIVER OPERATION. - The synthesizer/phase lock section involves RF Tuner TN-512/URR and Reference Signal Generator O-1511/URR.

In tuning, the operator sets the TN-512/URR FUNCTION switch at SYN position and the BAND SWITCH at the appropriate band. He then sets the six O-1511/URR digital frequency switches 10, 1, .1, .01, .001 and .0001 MEGACYCLES for the desired 2 to 32 mc frequency. (The example shown in figure 4-7 is for 13.4567 mc; frequencies obtained throughout are shown in parentheses.) The tuning is then completed by adjusting the TN-512/URR TUNE and FINE TUNE knobs until the 21 to 37 mc frequency of the local oscillator 1A10A1 is correct for the desired 2 to 32 mc frequency as displayed on the digital counter (see paragraph 4-3h.) Illumination of the SYNC INDICATOR lamp on TN-512/URR indicates synchronization.

In the final stages of tuning a phase locking circuit takes over to automatically capture and lock oscillator 1A10A1 frequency to the stability of the 1 mc standard in Reference Signal Generator O-1511/URR.

A monitor/logic circuit (included in 1 mc distributor P/C board 3A3) functions to supply the 1 mc reference frequency, derived either from the internal 1 mc standard (fi) in the O-1511/URR or an external standard (fe). The 1 mc is applied at three points: (1) phase detector driver P/C board 1A1A2, (2) 100kc selector P/C board 3A5 and (3) 1 mc selector P/C board 3A4. In 3A5 the 1 mc is divided by ten to produce 100 kc and its harmonics. A harmonic selector in 3A5 selects nine of these harmonics, 16.1 mc through 16.9 mc separated by 0.1 mc steps. 16.0 and 17.0 mc are selected in 3A4 from the harmonics present in the 1 mc input. These 16.0 to 17.0 (eleven) frequencies (from 3A4 and 3A5) are routed to five matrix distributors (contained in 3A6, 3A7, and 3A8) each controlled by one of the front panel MEGACYCLES switches (1, .1, .01, .001, and .0001 mc) 3A14S1 through 3A18S1). Positioning each switch in a 0 through 9 position has selected (by binary code input) one frequency as indicated by a Test notation (see switch 3A14) on the diagram. Meanwhile, 1 mc and its harmonics are applied to a 3 to 6 mc selector in board 3A4. The selector output is controlled by the 10 MEGACYCLES switch (3A19S1) by means of a binary code input. Positioning this switch in a 0, 1, 2, or 3 position selects a 3, 4, 5, or 6 mc output, respectively, from the selector. 1.4 mc and 11 mc are also derived from the 1 mc frequency in 3A4 to serve as additional injection frequencies for four mixer/amplifier stages (3A9, 3A10, 3A11 and 3A12). The output from the four stages (14.04567 in this example) is brought into a sum mixer on 3A13 along with the output from the 3A4 (4 mc). The sum (18.04567 mc) is combined in a difference mixer with the output (16.7 mc) from 3A8 1 mc matrix distributor and the difference frequency (1.34567 mc) is routed to phase detector driver P/C board 1A1A2 in the TN-512/URR.

(In this manner, the O-1511/URR may be tuned to put out a 0 to 3.99999 mc range; however, due to the TN-512/URR 2 to 32 mc tuning range, it is only used here to put out .20000 to 3.20000 mc.) In addition to this, phase detector driver P/C board 1A1A2 also receives the basic 1 mc standard reference from the O-1511/URR, as previously mentioned. With the TN-512/URR FUNCTION switch in SYN position, this 1 mc passes through a gate in phase detector driver P/C board 1A1A2 and over to a frequency divider in phase detector P/C board 1A5, converting this reference frequency into 1 mc/16, or 62.5 kc. Meanwhile, the 21 to 37 mc frequency from local oscillator divider 1A8 and input/std 1A1A1, besides going to the digital counter also gets divided by 80 producing a 262.5 to 462.5 kc frequency in phase detector driver P/C board 1A1A2 and this frequency serves to represent the oscillator setting when fed to the phase detector P/C board 1A5. At the same time, the previously mentioned 0.2 to 3.2 mc frequency, which serves to represent switch settings in the O-1511/URR is divided into a 200 to 400 kc frequency in 1A1A2 and this is routed to a difference mixer which also receives the oscillator-representative 262.5 to 462.5 kc. The output of the difference mixer, 62.5 kc (representative of the O-1511/URR frequency switch settings) and the 62.5 kc (representative of the local oscillator) are compared in two phase detectors, #1 and #2. Phase detector #1 produces a small dc output as long as there is a phase difference. When the phase difference is exactly 90° (produced by a 90° shifter), the detector output goes to zero volts. This 0 to dc volts (a) corrects local oscillator 1A10A1 in an electrical correction loop, and (b) brings PHASE DIFFERENCE meter 1M1 (in Sync Indicator Section see paragraph 4-3i) to a zero center scale reading. The 90° phase shifter acts on phase detector #2 to cause its output to go to a maximum voltage when a null (0 volts) is issuing from phase detector #1. When phase detector #2's output voltage is maximum, the relay driver will cause 1A5K1 to de-energize, lighting SYNC INDICATOR lamp 1DS1 (1A5K1 is initially energized when there is a depleted voltage being fed to the relay driver; the relay driver then causes 1A5K1 to be energized in a "no sync" condition).

A frequency comparator and a gate in phase detector driver card 1A1A2 prevent a false lock. Due to the wide tuning range on each band there are instances in which the local oscillator, moving towards the correct frequency, can issue a frequency 62.5 kc below the 200 to 400 kc derived from the synthesizer; this would also produce a 62.5 kc output to the phase detectors in phase detector P/C board 1A5. The frequency comparator, therefore, compares the 200 to 400 kc (synthesizer) frequency (f2) and the 262.5 to 462.5 kc (oscillator) frequency (f1) and closes the gate when f2 is greater than f1.

In Reference Signal Generator O-1511/URR, 1 mc distributor board 3A3 contains circuitry for automatic alternating of 1 mc standard sources (external and internal) in the event of failure of one of them. When the external standard is used, it is connected at rear interface panel jack (4W1J10) and the initial effect is that the output of the internal

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standard 3A1 is phase locked to the external standard. Phase locking occurs as the 1 mc (fe) from the external standard is brought to a phase detector for comparison with the 1 mc (fi) from the internal standard. The dc error from the detector is brought to the internal 1 mc oscillator circuit to correct it (via a temporary memory section, functioning in an external standard failure). The corrected output of the internal standard is then routed to a 1 mc switching logic section. This section is a level sensing and logic system that ensures a 1 mc output through two basic conditions: (1) failure of internal standard and (2) failure of external standard or no external standard used. Working with the 1 mc switching circuitry is a front panel alarm: the STANDARD FAILURE lamps (3DS1 and 3DS2). A signal from the fi or fe level detector lights the INTERNAL or EXTERNAL lamp, respectively, when failure occurs.

FREQ DIFFERENCE / PHASE COMPARATOR meter 3M1 and switch 3S1 are for checking the internal standard against the external standard. With the switch in the PHASE COMPARATOR position, the dc (representing difference in phase) registers on the meter. With the switch in the FREQ DIFFERENCE position, the dc correction voltage is disconnected from the internal standard and replaced by a fixed reference voltage, thereby freezing the standard. The difference between the two standards is then read as the frequency difference on the meter.

(b) DIVERSITY OPERATION. - In the space or frequency diversity operation of two synthesized frequency control receivers (AN/URR-64(V)1 and (V)3 Receiving Sets) it is necessary to have a common 1 mc standard for stability reference; however, in frequency diversity, two separate (and different) 0.2 to 3.2 mc frequencies are utilized from separate reference signal generators. By attaching at the interface panel the 1 mc MON output (J9) of receiver A to the IMC EXT (J10) of receiver B (see figures 5-1 and 5-3, Rack Cabling Diagram) a common standard is obtained from receiver A with a spare (in receiver B) that will be switched in automatically in the event of the A standard failure. If an external standard is then attached at jack J10 on the interface panel of receiver A, the external standard becomes the common standard with two spares.

(2) OVERALL FUNCTIONAL SECTION TEST DATA. (See figure 4-7.)

(a) TEST EQUIPMENT REQUIRED.

HP-606B, Signal Generator
AN/USM-281A, Oscilloscope
AN/USM-207, Frequency

Counter

AN/PSM-4C, VOM

(b) PROCEDURE. - To test the synthesizer/phase lock section, ensure that loads are attached at J7 and J6 on the rear interface panel as shown in the Test Setup diagram included in figure 4-7. Set receiver controls as listed under the diagram. Perform test A using the internal 1 mc standard and with no input connection at J10 on the rear interface panel.

Test B checks the functioning of the 1 mc switching logic and meter 3M1. Attach the signal generator to J10 on the rear interface panel and set

it for 1.000005 mc. Set the PHASE COMPARTOR/FREQ DIFFERENCE switch at FREQ DIFFERENCE and measure test points 3, 3A, and 3B. Set the switch at PHASE COMPARTOR and slowly bring the signal generator frequency to 1.0000 mc. The meter needle should return to the center of the dial. Attach the oscilloscope at J9 on the rear interface panel and, observing the EXTERNAL and INTERNAL STANDARD FAILURE lamps, remove the signal generator; the EXTERNAL lamp should light and there should be no interruption of the 1 mc output as indicated on the oscilloscope. Test C checks the pull-in functioning of the phase detector.

An external frequency counter should be used to measure all frequencies presented with figures beyond the decimal point. Measure amplitudes and waveforms of these frequencies with the oscilloscope. Other frequencies may be checked only with the oscilloscope; use the VTVM to measure vdc points.

g. DIGITAL COUNTER SECTION. (See figure 4-8.)

(1) OVERALL FUNCTIONAL DESCRIPTION. - The digital counter section is entirely contained as a part of frequency readout assembly 1A1 of RF Tuner TN-512/URR. The counter section involves part of input/standard board 1A1A1, offset board 1A1A3, gate generator/counter board 1A1A4, BCD decoders 1A1A5Z1 through 1A1A5Z6 and front panel digital display tubes 1A1DS1 through 1A1DS6. There are two basic modes for operating the counter: (1) the receiver count mode, in which the counter is used to read out the receiver's tuned frequency as an aid in tuning and (2) the external count mode, an auxiliary usage in which the counter will read out a direct count of some external frequency. In the first mode, the counter output also acts as an input for the automatic tuning system.

(a) RECEIVER COUNT MODE. - Figure 4-8 represents subassembly functioning in the receiver count mode; this results from setting the COUNTER MODE switch (not shown) at REC position. The input to this section is the 21 to 37 mc (Fo) from the local oscillator divider 1A8. The 21 to 37 mc range is repeated for each of the four bands. This frequency (representing the frequency for which the receiver is tuned) becomes divided by two and by ten in input/standard 1A1A1 to produce a 1.05 to 1.85 mc frequency (or Fo/20) at the input of a gate (Z15B) in offset 1A1A3. The control for gate Z15B originates from inverted gate pulses from a gate generator in P/C board 1A1A4; timing from the generator opens the gate (Z15B) for a period of 200 milliseconds (one fifth of a second) and closes it for a period of 20 milliseconds. This results in a gate (Z15B) output consisting of 200 ms bursts of pulses (or the 1.05 to 1.85 million pulses divided by five) alternating with 20 ms intervals of no pulses. This division by five produces a gated output of Fo/100 pulses, which then goes: (a) to the second gate (Z15C) and (b) to an offset network. Control of the second gate (Z15C) is from the offset network. After the first 50,000 pulses pass, the offset network disables gate (Z15C) and the next 50,000 pulses are cut off. The output from the second gate

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goes to a series of band dividers and gates (controlled by the BAND SWITCH) and through a NAND gate to a decade counter in 1A1A4.

The arrangement of the offset network and band dividers in 1A1A3 results in a 20,000 to 320,000 pulse count representing the 2 to 32 mc frequency to which the receiver is tuned. The offset network counts off the first 50,000 pulses of $f_o/100$ pulses and then its output cuts off gate (Z15C) for the next 50,000 pulses. The closing of the second gate (Z15C) results in a total pulse output from this gate of $f_o/100$ pulses minus 50,000 pulses. Time durations for opening and closing the second gate vary with the incoming 1.05 to 1.85 mc frequency; the higher frequencies result in shorter time durations. The resulting pulse count output is passed on to the band dividers and their output gates every 220 milliseconds. Outputs from the dividers are controlled by the setting of the BAND SWITCH (a ground enables the divider output gate). A 2-4 setting divides them by four; an 8-16 setting divides by two; a 16-32 setting bypasses the dividers entirely.

The decade counter in gate generator/counter 1A1A4 transforms the 20,000 to 320,000 pulses into individual BCD outputs representing the six component digits in the receiver's 02.0000 to 32.0000 mc frequency. The counter is made up of six DCUs (decade counter units) and six BCD storage units. Each DCU counts pulses 1 through 9 issuing a BCD (binary coded digit) code (for 1 through 9) at each pulse to a BCD storage unit. At the tenth count it issues a 0 BCD to its storage unit and a carry pulse to the next DCU; that DCU then issues the BCD for 1 to its BCD storage unit. When the second DCU counts ten, carry pulse results in a 0 BCD to its storage unit and a carry pulse to the third BCD. This is repeated until all of the 20,000 to 320,000 pulses are counted and stored.

The gate generator in 1A1A4 transfers readouts, at intervals, to the six digital readout tubes. The generator, referenced to the 1 mc standard from phase detector driver 1A1A2 (see paragraph 4-3c, Signal Detection Section) paces off one count/read cycle with each inverted gate signal. This 220 ms signal (consisting of the 200 ms count pulse and the 20 ms off pulse) is the duration of one count/read cycle. During the 20 ms pulse, two more pulses issue from the gate generator: a read pulse and a reset pulse. The read pulse instantly transfers all the BCD codes in the six storage units over to the six BCD decoders. Each decoder then issues a ground signal to an appropriate pin on its associated digital readout tube and a 0 through 9 digit lights up, heated by the current drawn through it from a +200V supply. The reset pulse resets the offset in 1A1A3 and the six DCU's in 1A1A4 for a new count/read cycle. The BCD code is held on each of the BCD decoders (and the 0 through 9 digit remains lighted in the tube) until the next read pulse in the next count/read cycle. Because the number of pulses entering 1A1A4 are equal to the cps count in the receiver tuned frequency (F_x) divided by one hundred, the resulting display represents f_x down through the 0.1 kc (100 cps) component.

(b) EXTERNAL COUNT MODE. - Figure 4-9 represents subassembly functioning in

the external count mode; this results from setting the COUNTER MODE switch at one of the external count positions (HIGH or LOW). The HIGH position presents the count on the digital display to four places beyond the decimal point; the LOW position shifts the entire display to the left, revealing the fifth digit beyond the decimal point.

In the normal external count mode (HIGH), the frequency takes the same path as does the frequency in the receiver count mode with two exceptions: the offset and band dividers in 1A1A3 are disabled, and the external frequency (f_x) to be measured is connected at TN-512/URR front panel COUNTER MODE INPUT jack 1J13, becomes divided by twenty in 1A1A1 and divided by five by the 200 ms pulse coming into 1A1A3. The frequency (now divided by one hundred) is counted in 1A1A4 in the same manner as is the receiver count mode frequency. It represents the count down through the 0.1 kc component. In either external count mode (HIGH or LOW), a ground is extended from COUNTER MODE switch 1S3 to 1A1A1 and 1A1A3, blocking the receiver count signal, disabling the offset and disabling the band dividers.

When the COUNTER MODE switch is set at LOW the frequency into 1A1A4 becomes f_x divided by ten rather than f_x divided by one hundred. This is accomplished by extending a ground connection at pin 22 of 1A1A1, thereby bypassing the divide-by-ten circuit. The switch in LOW also transfers a ground connection from the decimal point light in the 10 mc digital readout tube to a decimal point light in the 1 mc tube. This causes the decimal point indication to shift one place to the left in the display. Because the number of pulses entering 1A1A4 are equal to the cps count in the input frequency (f_x) divided by ten, the resulting display represents f_x down through the 0.01 kc (or 10 cps) component. Since there are only six counting and display units, however, the extreme left hand digit (representing the seventh digit) does not become counted or displayed.

(2) OVERALL FUNCTIONAL SECTION TEST DATA.

(a) TEST EQUIPMENT REQUIRED.

AN/PSM-4C, VOM
AN/USM-281A, Oscilloscope
AN/USM-207, Frequency

Counter

HP-606B, Signal Generator

(b) PROCEDURE. - To test the digital counter section for receiver count mode, refer to figure 4-8, servicing block diagram. Set receiver controls as listed under "control positions" for test in figure 4-8. Tests A, B, C and D test the counter for each of the four bands. Use the oscilloscope to measure frequency amplitudes, the digital counter to read frequency and pulse counts and a VOM to read ground and open points.

To test for external count mode, refer to figure 4-9, servicing block diagram. Set receiver controls as listed under "control positions" for test in figure 4-9. Tests A and B test the counter for HIGH and LOW modes.

h. AFC SECTION. (See figure 4-10.)

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standard 3A1 is phase locked to the external standard. Phase locking occurs as the 1 mc (fe) from the external standard is brought to a phase detector for comparison with the 1 mc (fi) from the internal standard. The dc error from the detector is brought to the internal 1 mc oscillator circuit to correct it (via a temporary memory section, functioning in an external standard failure). The corrected output of the internal standard is then routed to a 1 mc switching logic section. This section is a level sensing and logic system that ensures a 1 mc output through two basic conditions: (1) failure of internal standard and (2) failure of external standard or no external standard used. Working with the 1 mc switching circuitry is a front panel alarm: the STANDARD FAILURE lamps (3DS1 and 3DS2). A signal from the fi or fe level detector lights the INTERNAL or EXTERNAL lamp, respectively, when failure occurs.

FREQ DIFFERENCE / PHASE COMPARATOR meter 3M1 and switch 3S1 are for checking the internal standard against the external standard. With the switch in the PHASE COMPARATOR position, the dc (representing difference in phase) registers on the meter. With the switch in the FREQ DIFFERENCE position, the dc correction voltage is disconnected from the internal standard and replaced by a fixed reference voltage, thereby freezing the standard. The difference between the two standards is then read as the frequency difference on the meter.

(b) DIVERSITY OPERATION. - In the space or frequency diversity operation of two synthesized frequency control receivers (AN/URR-64(V)1 and (V)3 Receiving Sets) it is necessary to have a common 1 mc standard for stability reference; however, in frequency diversity, two separate (and different) 0.2 to 3.2 mc frequencies are utilized from separate reference signal generators. By attaching at the interface panel the 1 mc MON output (J9) of receiver A to the IMC EXT (J10) of receiver B (see figures 5-1 and 5-3, Rack Cabling Diagram) a common standard is obtained from receiver A with a spare (in receiver B) that will be switched in automatically in the event of the A standard failure. If an external standard is then attached at jack J10 on the interface panel of receiver A, the external standard becomes the common standard with two spares.

(2) OVERALL FUNCTIONAL SECTION TEST DATA. (See figure 4-7.)

(a) TEST EQUIPMENT REQUIRED.

HP-606B, Signal Generator
AN/USM-281A, Oscilloscope
AN/USM-207, Frequency

Counter

AN/PSM-4C, VOM

(b) PROCEDURE. - To test the synthesizer/phase lock section, ensure that loads are attached at J7 and J6 on the rear interface panel as shown in the Test Setup diagram included in figure 4-7. Set receiver controls as listed under the diagram. Perform test A using the internal 1 mc standard and with no input connection at J10 on the rear interface panel.

Test B checks the functioning of the 1 mc switching logic and meter 3M1. Attach the signal generator to J10 on the rear interface panel and set

it for 1.000005 mc. Set the PHASE COMPARTOR/FREQ DIFFERENCE switch at FREQ DIFFERENCE and measure test points 3, 3A, and 3B. Set the switch at PHASE COMPARTOR and slowly bring the signal generator frequency to 1.0000 mc. The meter needle should return to the center of the dial. Attach the oscilloscope at J9 on the rear interface panel and, observing the EXTERNAL and INTERNAL STANDARD FAILURE lamps, remove the signal generator; the EXTERNAL lamp should light and there should be no interruption of the 1 mc output as indicated on the oscilloscope. Test C checks the pull-in functioning of the phase detector.

An external frequency counter should be used to measure all frequencies presented with figures beyond the decimal point. Measure amplitudes and waveforms of these frequencies with the oscilloscope. Other frequencies may be checked only with the oscilloscope; use the VTVM to measure vdc points.

g. DIGITAL COUNTER SECTION. (See figure 4-8.)

(1) OVERALL FUNCTIONAL DESCRIPTION. - The digital counter section is entirely contained as a part of frequency readout assembly 1A1 of RF Tuner TN-512/URR. The counter section involves part of input/standard board 1A1A1, offset board 1A1A3, gate generator/counter board 1A1A4, BCD decoders 1A1A5Z1 through 1A1A5Z6 and front panel digital display tubes 1A1DS1 through 1A1DS6. There are two basic modes for operating the counter: (1) the receiver count mode, in which the counter is used to read out the receiver's tuned frequency as an aid in tuning and (2) the external count mode, an auxiliary usage in which the counter will read out a direct count of some external frequency. In the first mode, the counter output also acts as an input for the automatic tuning system.

(a) RECEIVER COUNT MODE. - Figure 4-8 represents subassembly functioning in the receiver count mode; this results from setting the COUNTER MODE switch (not shown) at REC position. The input to this section is the 21 to 37 mc (Fo) from the local oscillator divider 1A8. The 21 to 37 mc range is repeated for each of the four bands. This frequency (representing the frequency for which the receiver is tuned) becomes divided by two and by ten in input/standard 1A1A1 to produce a 1.05 to 1.85 mc frequency (or Fo/20) at the input of a gate (Z15B) in offset 1A1A3. The control for gate Z15B originates from inverted gate pulses from a gate generator in P/C board 1A1A4; timing from the generator opens the gate (Z15B) for a period of 200 milliseconds (one fifth of a second) and closes it for a period of 20 milliseconds. This results in a gate (Z15B) output consisting of 200 ms bursts of pulses (or the 1.05 to 1.85 million pulses divided by five) alternating with 20 ms intervals of no pulses. This division by five produces a gated output of Fo/100 pulses, which then goes: (a) to the second gate (Z15C) and (b) to an offset network. Control of the second gate (Z15C) is from the offset network. After the first 50,000 pulses pass, the offset network disables gate (Z15C) and the next 50,000 pulses are cut off. The output from the second gate

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goes to a series of band dividers and gates (controlled by the BAND SWITCH) and through a NAND gate to a decade counter in 1A1A4.

The arrangement of the offset network and band dividers in 1A1A3 results in a 20,000 to 320,000 pulse count representing the 2 to 32 mc frequency to which the receiver is tuned. The offset network counts off the first 50,000 pulses of $f_o/100$ pulses and then its output cuts off gate (Z15C) for the next 50,000 pulses. The closing of the second gate (Z15C) results in a total pulse output from this gate of $f_o/100$ pulses minus 50,000 pulses. Time durations for opening and closing the second gate vary with the incoming 1.05 to 1.85 mc frequency; the higher frequencies result in shorter time durations. The resulting pulse count output is passed on to the band dividers and their output gates every 220 milliseconds. Outputs from the dividers are controlled by the setting of the BAND SWITCH (a ground enables the divider output gate). A 2-4 setting divides them by four; an 8-16 setting divides by two; a 16-32 setting bypasses the dividers entirely.

The decade counter in gate generator/counter 1A1A4 transforms the 20,000 to 320,000 pulses into individual BCD outputs representing the six component digits in the receiver's 02.0000 to 32.0000 mc frequency. The counter is made up of six DCUs (decade counter units) and six BCD storage units. Each DCU counts pulses 1 through 9 issuing a BCD (binary coded digit) code (for 1 through 9) at each pulse to a BCD storage unit. At the tenth count it issues a 0 BCD to its storage unit and a carry pulse to the next DCU; that DCU then issues the BCD for 1 to its BCD storage unit. When the second DCU counts ten, carry pulse results in a 0 BCD to its storage unit and a carry pulse to the third BCD. This is repeated until all of the 20,000 to 320,000 pulses are counted and stored.

The gate generator in 1A1A4 transfers readouts, at intervals, to the six digital readout tubes. The generator, referenced to the 1 mc standard from phase detector driver 1A1A2 (see paragraph 4-3c, Signal Detection Section) paces off one count/read cycle with each inverted gate signal. This 220 ms signal (consisting of the 200 ms count pulse and the 20 ms off pulse) is the duration of one count/read cycle. During the 20 ms pulse, two more pulses issue from the gate generator: a read pulse and a reset pulse. The read pulse instantly transfers all the BCD codes in the six storage units over to the six BCD decoders. Each decoder then issues a ground signal to an appropriate pin on its associated digital readout tube and a 0 through 9 digit lights up, heated by the current drawn through it from a +200V supply. The reset pulse resets the offset in 1A1A3 and the six DCU's in 1A1A4 for a new count/read cycle. The BCD code is held on each of the BCD decoders (and the 0 through 9 digit remains lighted in the tube) until the next read pulse in the next count/read cycle. Because the number of pulses entering 1A1A4 are equal to the cps count in the receiver tuned frequency (F_x) divided by one hundred, the resulting display represents f_x down through the 0.1 kc (100 cps) component.

(b) EXTERNAL COUNT MODE. - Figure 4-9 represents subassembly functioning in

the external count mode; this results from setting the COUNTER MODE switch at one of the external count positions (HIGH or LOW). The HIGH position presents the count on the digital display to four places beyond the decimal point; the LOW position shifts the entire display to the left, revealing the fifth digit beyond the decimal point.

In the normal external count mode (HIGH), the frequency takes the same path as does the frequency in the receiver count mode with two exceptions: the offset and band dividers in 1A1A3 are disabled, and the external frequency (f_x) to be measured is connected at TN-512/URR front panel COUNTER MODE INPUT jack 1J13, becomes divided by twenty in 1A1A1 and divided by five by the 200 ms pulse coming into 1A1A3. The frequency (now divided by one hundred) is counted in 1A1A4 in the same manner as is the receiver count mode frequency. It represents the count down through the 0.1 kc component. In either external count mode (HIGH or LOW), a ground is extended from COUNTER MODE switch 1S3 to 1A1A1 and 1A1A3, blocking the receiver count signal, disabling the offset and disabling the band dividers.

When the COUNTER MODE switch is set at LOW the frequency into 1A1A4 becomes f_x divided by ten rather than f_x divided by one hundred. This is accomplished by extending a ground connection at pin 22 of 1A1A1, thereby bypassing the divide-by-ten circuit. The switch in LOW also transfers a ground connection from the decimal point light in the 10 mc digital readout tube to a decimal point light in the 1 mc tube. This causes the decimal point indication to shift one place to the left in the display. Because the number of pulses entering 1A1A4 are equal to the cps count in the input frequency (f_x) divided by ten, the resulting display represents f_x down through the 0.01 kc (or 10 cps) component. Since there are only six counting and display units, however, the extreme left hand digit (representing the seventh digit) does not become counted or displayed.

(2) OVERALL FUNCTIONAL SECTION TEST DATA.

(a) TEST EQUIPMENT REQUIRED.

AN/PSM-4C, VOM
AN/USM-281A, Oscilloscope
AN/USM-207, Frequency

Counter

HP-606B, Signal Generator

(b) PROCEDURE. - To test the digital counter section for receiver count mode, refer to figure 4-8, servicing block diagram. Set receiver controls as listed under "control positions" for test in figure 4-8. Tests A, B, C and D test the counter for each of the four bands. Use the oscilloscope to measure frequency amplitudes, the digital counter to read frequency and pulse counts and a VOM to read ground and open points.

To test for external count mode, refer to figure 4-9, servicing block diagram. Set receiver controls as listed under "control positions" for test in figure 4-9. Tests A and B test the counter for HIGH and LOW modes.

h. AFC SECTION. (See figure 4-10.)

(1) OVERALL FUNCTIONAL SECTION DESCRIPTION. - The AFC section functions in two stages: tuning and operating. In the tuning stage, the operator, having previously tuned and locked the receiver to a specified frequency in synthesized mode (if a synthesizer is not available, tune the TN-512/URR to the frequency to be locked by AFC) switches to AFC and allows the AFC circuit to lock onto the carrier component in the signal. If the transmitted signal is outside the AFC capture range, it may be necessary to de-tune the receiver for capture. In the operating stage, the AFC circuit, having been tuned, commences to track any subsequent drifts in the transmitted signal.

In the tuning stage, the input to the AFC section is the incoming intelligence signal, consisting of a partial or complete carrier component accompanied by upper and lower sidebands. Each sideband contains intelligence. (See Signal Detection Section, paragraph 4-3c.) This signal is sampled at AFC P/C board 1A3 by analyzing the carrier component; the sidebands are stripped off by a narrow bandpass filter (the filter passes 249.925 to 250.075 kc) and the 250 kc carrier component is applied to two phase detectors. The output of a 250 kc variable oscillator is also applied to the detectors via $\pm 45^\circ$ phase shift circuits; the phase shift creates a phase difference of 90° between the oscillator frequency applied to phase detector #1 and that applied to phase detector #2. When there is a frequency error in the 250 kc from the narrow bandpass filter, as compared to the 250 kc from the oscillator, phase detector #1 issues a dc voltage (dc correction loop). This voltage contains amplitude and polarity representing the amount and direction of the error, respectively, and this is read on PHASE DIFFERENCE meter 1M1. As the receiver is re-tuned, (by tuning the local oscillator) the error becomes progressively smaller until it reaches zero volts and this is indicated by a zero center scale reading on the meter (or sync). The 90° phase difference in phase detector #2, meanwhile causes its dc output to increase as the output of phase detector #1 decreases. When a null is reached in phase detector #1, phase detector #2 is putting out its maximum voltage and this voltage is sufficient to energize lockup relay 1A3K1. The energized 1A3K1 (a) energizes and lock up sync relay 1A3K3 which, in turn, lights SYNC INDICATOR lamp 1DS1 and (b) completes a correction loop (fast dc loop) back to the 250kc oscillator and a correction loop via a delay circuit (slow dc loop) back to the local oscillator via ac filter 1A13 (see paragraph 4-3c, Signal Detection Section). Thereafter, any frequency deviations in the incoming carrier will be copied by the oscillator, and the AFC circuit is said to be tuned or in sync. During the tuning, front panel AFC TUNE switch is held down, momentarily grounding out the slow dc loop back to the local oscillator in order to prevent counteraction by that loop while tuning the local oscillator. When sync has occurred, the switch is released, so that both loops may act.

In the operating stage, the 250 kc from the oscillator (containing the same frequency deviations as that of the incoming carrier) is applied to sub-carrier generator 2A3, to be used as the reference frequency for generating the 250 kc, 243.71 kc and 256.29 kc injection frequencies to the product

detectors (see paragraph 4-3c, Signal Detection Section). The AFC position of the FUNCTION switch, by means of gate control, blocks the 250 kc derived from the 1 mc source and a divide-by-four circuit. As the injection frequency deviations track with the sidebands entering the product detectors, the resulting audio remains undistorted through transmitter drifts. The fast and slow dc loops work together to keep the incoming carrier within the limits of the AFC hold-in range (± 1 kc). The slow dc loop functions to minimize the excursions of the local oscillator in order that the carrier component entering 1A3 may pass through the narrow bandpass filter (or ± 75 cps pull-in range). Attack times for the fast and slow dc loops are designed to keep AFC tracking up to a maximum transmitter drift rate of 10 cps.

(2) OVERALL FUNCTIONAL SECTION TEST DATA. (See figure 4-10.)

(a) TEST EQUIPMENT REQUIRED.

HP-606B, Signal Generator
AN/USM-281A, Oscilloscope
AN/PSM-4C, VOM

(b) PROCEDURE. - To test the AFC section, refer to figure 4-10, servicing block diagram. The signal generator, unmodulated, is connected at the antenna input to represent an incoming carrier. Test A checks the overall operation of AFC. With the AFC lock up as indicated in test A, figure 4-10, various measurements are taken. Test B checks the range over which the AFC will remain locked in.

i. SYNC INDICATOR SECTION. (See figure 4-11.)

(1) OVERALL FUNCTIONAL SECTION DESCRIPTION. - The sync indicator section is made up of TN-512/URR PHASE DIFFERENCE meter 1M1 and SYNC INDICATOR lamp 1DS1. The meter and lamp are shared by the synthesizer/phase lock section (paragraph 4-3f) and the AFC section (paragraph 4-3h). Only one of these sections are operative at a given time; the FUNCTION switch in SYN or AFC position supplies the +24 vdc power to phase detector 1A5 or AFC 1A3, respectively.

The signals to the meter and to the light are similar for SYN or AFC modes. The signal to the meter is an isolated sample of the polarized dc correction loop going to the local oscillator and at zero volts when synchronization has been obtained, reads center scale. The triggering signal to the lamp is +24 vdc and appears when the capture range has been entered (just before synchronization).

Meter dial calibrations are in colors to indicate status of synchronization. A reading in the green (center) zone indicates synchronization within the hold-in range. A yellow range reading is a warning that the phase-locking hold-in range is about to be exceeded. A red range indicates a loss of phase lock and, in operating conditions, the phase detector dc output disappears, the meter needle returns to zero center scale and the SYNC INDICATOR lamp loses the +24 vdc and extinguishes.

(2) OVERALL FUNCTIONAL SECTION TEST DATA. (See figure 4-11.)

- (a) TEST EQUIPMENT REQUIRED.
HP-606B, Signal Generator
ME-303/U, VTVM
- (b) PROCEDURE. - This section

prescribes two separate tests: one for SYN (synthesized) mode and one for AFC mode. Complete directions for the tests are given on figure 4-11.

4-4. SUBASSEMBLY DESCRIPTIONS.

Introduction. - The following information (4-5 thru 4-7) is to be used in troubleshooting to locate the faulty component or area within a subassembly. Those subassemblies categorized as non-repairable or factory repairable in the parts list (Section 6) are not described.

Generally, a subassembly functions in one specific receiver functional section and the circuit description is in terms of that functional section. Sometimes, however, a subassembly becomes involved in more than one receiver functional section. In this case, the description is divided into sections.

4-5. UNIT 1 SUBASSEMBLY DESCRIPTIONS.

a. 1A1A1 INPUT/STANDARD.

(1) CIRCUIT DESCRIPTION. (See figure 5-12.)

(a) SIGNAL DETECTION SECTION. - The 1 mc standard Z6 is used as the receiver's basic 1 mc source when the receiver is operated in a local frequency control mode (see figure 4-2 and paragraph 4-3c). In this mode, a ground is presented to pin 15 allowing Q6 to conduct and thus apply B+ to Z6. Amplifier Q7 presents the 1 mc (stable to within 1×10^6) at pin 14.

(b) SYNTHESIZER/PHASE LOCK SECTIONS. - Shaping amplifier Q5 and inverter Z1A function to clip the local oscillator 21 to 37 mc frequency (fed in at pin 17) in preparation for introduction to an external frequency comparator circuit. The output appears at pin 21.

(c) DIGITAL COUNTER. - The greater portion of the circuitry appearing on this board is utilized by the receiver's digital counter sections (see figure 4-8 and paragraph 4-3g). The digital counter is operable in three modes: receiver, external high and external low. In the receiver mode, the same 21 to 37 mc appearing at the output of A (in the synthesizer/phase lock section) is routed through a gated amplifier Z1B amplified through NANDGATES Z2A and Z2B to become divided by two (Z3) and then by ten (Z4). The output (21 to 37 mc divided by twenty) is routed through gates Z5d and Z5c and appears at pin D. In the external high mode, an external .1 to 35 mc frequency (to be counted) is introduced at pin 25, amplified through Q1, Q2, Q3 and Q4 and appears at the input of gated amplifier Z2c. In the external high mode, a ground is presented at pin 18 and a high at pin 22; this causes the output of Z1C to go high, opening the gated amplifier (Z2C) and closing the gated amplifier Z1B thereby blocking the local oscillator 21 to 37 mc. The .1 to 35 mc then progresses via a NANDgate Z2D to the same divide-by-20 route used by the 21 to 37 mc, in the receiver mode. In the external low mode, the .1 to 35 mc is routed in the same manner as in external

high, except that divide-by-10 circuit Z4 is bypassed. In this mode, a ground appears at pin 22 blocking gated amplifier Z5D and opening gated amplifier (Z5b) bypassing the divider.

(2) TEST DATA. - Test data is given for inputs and outputs of each of the described receiver functional sections in servicing block diagrams figures 4-2, 4-7 and 4-8. Pertinent tests and measurements are presented in paragraph 5-7.

b. 1A1A2 PHASE DETECTOR DRIVER.

(1) CIRCUIT DESCRIPTION. (See figure 5-14.)

(a) SIGNAL DETECTION SECTION. - The receiver's basic 1 mc source is introduced at pin J amplified through Q6, Q7 and Q8, and the output appears at pins 10, F and P.

(b) SYNTHESIZER/PHASE LOCK. - The greater portion of the circuitry appearing on this P-C board is utilized by the receiver's synthesizer/phase lock section (see figure 4-7 and paragraph 4-3f). This falls into four categories: a 1 mc selection, a local oscillator divider, a .2 to 3.2 mc divider, and a frequency comparator.

In the 1 mc selection, two 1 mc sources (external and internal) are introduced at pins 5 and J, respectively; ground extensions from an external switch make the selection. When the receiver is in a synthesized frequency control mode, a ground is presented at pin S, enabling Q3; Q3 applies B+ to Q4 and Q5, allowing the 1 mc from pin 5, Q4 and Q5 to proceed to Q6, Q7 and Q8. (When the receiver is in a local frequency control mode, the ground is removed from pin S blocking this passage and allowing the 1 mc appearing at pin J to proceed through Q6, Q7, and Q8.) The selected external 1 mc then issues from pins P, F and 10.

The local oscillator divider consists essentially of Z1, Z2 and Z3; these integrated circuits divide the receiver's 21 to 37 mc local oscillator frequency by 80 and pass it on to an external phase detector via pin W.

The .2 to 3.2 mc divider consists essentially of transistor Q9, and integrated circuits Z7, Z8, Z9, Z10 and Z11; this section divides a reference .2 to 3.2 mc (appearing at pin 2) into an appropriate frequency within the 200 to 400 kc range for use in the external phase detector. Each sequential divider (one in Z9 and two in Z10) divides by two. The final division is selected by the position of the receiver band selector switch; this 4-position switch presents a ground at one of the band selection pins (A, B, C or D). The ground works through a system of inverters and gated amplifiers to disable the output of one divider, for bands 2, 3 or 4. For band 1, all the dividers are disabled and the frequency remains undivided. The resulting frequency travels through three gated amplifiers and a filter network to pin 3.

The frequency comparator consists mainly of Q1, Z4, Z5, Z6 and Q2. There are two inputs to the comparator: f1 and f2. Frequency f1 is the 21 to 37 mc/80 (or 262.5 to 462.5 kc) frequency from the local oscillator divider section and appears at pin 9 of Z3 and the base of Q1; f2 is the 200 to 400 kc frequency from the .2 to 3.2 mc divider section and appears at pin 14 of Z11 and the base of Q2. A logic system of inverters in Z4 and NANDgates in Z6

controls the polarity of the pin 8 output of Z5 to pin 1 of the gated amplifier (200 to 400 kc control gate) in Z11. If $f_1 > f_2$, this output goes positive, opening the control gate and allowing the 200 to 400 kc to proceed to the phase detector; if $f_1 < f_2$, the output goes negative and the 200 to 400 kc is blocked.

(2) TEST DATA. - Test data is given for inputs and outputs of each of the described receiver functional sections in servicing block diagrams: figure 4-2, 4-7 and 4-8. Pertinent tests and measurements are presented in paragraph 5-8.

c. 1A1A3 OFFSET.

(1) CIRCUIT DESCRIPTION. (See figure 5-16.) - The entire offset circuit functions only in the receiver's digital counter section (see figure 4-8 and paragraph 4-3g). It should be noted that the "Fast Count In" function (input on pin 8) is not used in this RF Tuner TN-512/URR. The purpose of this circuit (in the receiver mode of operation) is to convert the $F_o/20$ input into an output of $F_r/100$ pulses, where F_o is the 21 to 37 mc of the local oscillator and F_r is the 2 to 32 mc of the receiver. The relationship of F_o to F_r is dependent upon the receiver's 4-position band-switch and the formulae are shown in figure 4-8. The $f_o/20$ (a 1.05 to 1.85 mc frequency) is introduced at pin D and pin 5 of Z15B, a gated amplifier. Controlling the gate is an inverted gate, positive logic level pulse lasting for 200 ms (or 1/5 second). During this pulse, pulses that number 1/5 of the normal cps are allowed through the gate and this, in effect, divides the $F_o/20$ by five. The result, $F_o/100$ pulses counted by an offset circuit, consisting of dividers Z16, Z17, Z8, Z7 and Z6, which are arranged in series so as to present one pulse at the end of a count of 50,000 pulses. The pulse, issuing from Z6, works through Z14, Z13, and Z5 to control a gated amplifier (Z15C) at the output of the first gated amplifier (Z15B). This results in an output from Z15C which is equal to $F_o/100$ pulses minus 50,000 pulses. This is introduced to a section composed of nand-gates, inverters and divide-by-two circuits in Z10, 11, 12, Z2 and 3 integrated circuits. Depending on the position of a 4-position band-switch in the receiver, a ground is presented at pin P, 13, 12 or 11. This closes the paths of all but one of the four to a nandgate in Z4. For band 4, the $F_o/100$ minus 50,000 pulses are divided by eight; for band 3 they are divided by four; for band 2 they are divided by two and for band 1, the dividers are bypassed and there is no division. The resulting output appears at pin N.

At the end of each count cycle, a negative pulse appearing at pin M resets the offset via Z13D.

For the external high count mode, the input at pin D is $F_x/20$, where F_x equals the external frequency being measured. The inverted gate pulse succeeds in dividing the $F_x/20$ by five, making it $F_x/100$ at pin 6 of Z15. In the external count mode (high or low), a ground is presented at pin 9, disabling the offset section and the band divider section. The disabled offset section holds the second gated amplifier (Z15C) continually open and the $F_x/100$ proceeds through output nandgate Z4.

In the external low count mode, the path of the signal is the same as that of the external high

mode, except that the input frequency at pin D is $F_x/2$. This results in an $F_x/10$ at the output of the first gated amplifier and it is this frequency that appears at pin N.

(2) TEST DATA. - Test data is given for inputs and outputs of Pertinent tests and measurements are presented in paragraph 5-10.

d. 1A1A4 GATE GENERATOR AND COUNTING REGISTER.

(1) CIRCUIT DESCRIPTION. (See figure 5-18). - The entire gate generator and counting register circuit functions only in the receiver's digital counter section (see figure 4-8 and paragraph 4-3g). It is composed of a gate generator and a decade counter (paced by the gate generator). It should be noted that the Fast Count Input function on pin J is not used in this RF Tuner, TN-512/URR.

The gate generator, using a 1 mc standard frequency as a reference, generates an inverted gate pulse, a reset pulse, and a read pulse at different intervals during one count cycle; it consists of shaping amplifier Q2 and integrated circuits Z1 through Z6, Z19 through Z22 and shaping transistor Q1. The 1 mc reference is brought in at pin 3. The inverted gate pulse appears at pin 9, the reset pulse at pin 3 of Z20A and pin 11, the read pulse at the collector output of Q1.

The decade counter consists of six divide-by-ten circuits (or decade counter units) Z7 through Z12, and six BCD storage units (latching memories) Z13 through Z18. In the receiver count mode, the function of the counter is to translate the 20,000 to 320,000 pulse input at pin N (representing the receiver's 2 to 32 mc frequency) into BCD codes for the six digital components in the 02,0000 to 32,0000 mc figure. This is accomplished during one count cycle. The pulses from pin N enter the row of series-connected dividers and, at the end of the count cycle, each divider presents the 0-9 count, in BCD code, to the latching memories. The memories immediately present the same BCD codes at their outputs, and these outputs are maintained until the end of the next count cycle.

In the external count modes, the incoming pulses (1,000 to 350,000, representing the external .1 to 35 mc frequency) take the same course as that of the receiver count mode.

(2) TEST DATA. - Test data is given for inputs and outputs of the gate generator and the decade counter in servicing block diagram figure 4-8. Pertinent tests and measurements are included in paragraph 5-9.

e. 1A1A5 FREQUENCY READOUT ASSEMBLY.

(1) CIRCUIT DESCRIPTION. (See figure 5-9.) - Figure 5-9 depicts the entire frequency readout assembly (1A1) and shows the schematic wiring of 1A1A5. 1A1A5 is a P/C (printed circuit) board assembly supplying printed connections between P/C boards 1A1A1, 1A1A2, 1A1A3 and 1A1A4 and providing P/C receptacles (1A1A5) XA1, (1A1A5) XA2, (1A1A5) XA3 and (1A1A5) XA4 for the four boards. Also included in the 1A1A5 assembly are (1A1A5) J1 and (1A1A5) J2 receptacles, (1A1A5) Z1 through (1A1A5) Z6 BCD decoders and (1A1A5) XDS1 through (1A1A5) XDS6 sockets

for digital indicators (1A1) DS1 through (1A1) DS6. (1A1) A5J1 and (1A1) A5J2 are receptacles for connections external to frequency readout assembly 1A1.

1A1A5 is of a universal design for compatibility with different requirements; therefore, notations "used on GPR-10 only" are for card pin numbers and conductors not used on RF Tuner, TN-512/URR do not apply to the AN/URR-64. It should be noted that the "Fast Count Input" function (notations appearing on figure 5-9) is not used in this RF Tuner, TN-512/URR.

Each BCD decoder takes the BCD code output for a digit of the count from 1A1A4 and transforms it into a ground signal for one of the 0 to 9 pins on a digital indicator, lighting that numeral for the period of one count cycle. In 1A1DS1 and 1A1DS2 indicators, there is a decimal point light, to the right of the numeral display. Normally the point in DS2 is lit, from a ground presented at pin 25 of 1A1A5J1; however, in the external low count mode, the ground is transferred over to pin 50, lighting the DS1 point.

(2) TEST DATA. - Test data is given for inputs and outputs of 1A1A5 for each of the receiver functional sections involved in servicing block diagrams figures 4-2, 4-7 and 4-8.

f. 1A2 POWER SUPPLY.

(1) CIRCUIT DESCRIPTION. (See figure 5-20.) - Power supply 1A2 converts 35 vac, 13.5 vac, 26 vac and 220 vac into +24 vdc, +5 vdc, -24 vdc and +200 vdc, respectively. The dc output voltages are used to supply several of the receiver's functional sections (in part and in whole) as checked:

FUNCTIONAL SECTION	SUPPLY			
	+24 VDC	+5 VDC	-24 VDC	+200 VDC
Signal Detection	X		X	
Gain Control	X		X	
Synthesizer/Phase Lock	X	X	X	
Digital Counter (Rec & Ext)		X		X
Digital Counter (Ext only)	X			
Diversity Quieter			X	

In the +24 vdc supply, the 35 vac is rectified through full wave bridge rectifier CR1. This is followed by a series voltage regulator section and a current limiter section. The voltage regulator consists of transistors Q1 and Q2 followed by an externally mounted transistor 1Q3, transistor Q4, and resistors R3, R7, R8 and R9. The output voltage is sampled in the network formed of R7, R8 and R9 and fed to the base of amplifier Q4. This is amplified in Q4. A reference voltage is developed across R3. The output from Q4 is a correction voltage and this fed back to the base of 1 Q3, through Q2. Q1 is a voltage amplifier and is used to correct for a change in the ac input voltage after it is rectified.

This change is amplified and dc coupled to the base of Q2 which controls the series regulator 1Q3, keeping the voltage at +24 vdc. The current limiter consists of transistor 1Q3, resistors R4 and R5, and transistor Q3. The current limiter (or short-proof feature) is in the common current line in such a way that the base of 1Q3 can only draw a certain amount of current. When the +24 vdc output is shorted, the voltage drop across R4 and R5 turns on switching transistor Q3. Q3 then draws current off the common line, this being the current limiting action. The maximum current may be set by potentiometer R4.

The +5 vdc and -24 vdc supplies are essentially of the same circuit design, with a voltage regulator and a current limiter in each. The -24 vdc supply has a half-wave rectifier (CR7) in the input, in place of the full-wave type.

The +200 vdc supply only consists of a half-wave rectifier (CR10) in the input, followed by a ripple filter (C19, R28 and R29).

(2) TEST DATA. - Test data for the 1A2 assembly is included in paragraph 5-4.

g. 1A3 AFC.

(1) CIRCUIT DESCRIPTION. (See figure 5-22.) - The greater part of the receiver's AFC section is housed in P/C board 1A3 (see figure 4-10 and paragraph 4-3h). The 250 kc carrier and sidebands enter at pin 4 and narrow bandpass filter FL1. Transistors Q1 through Q4 form a limiter amplifier chain for the 250 kc carrier from the filter to the two phase detectors. Phase detector No. 1 is composed of transformer T1, diodes CR9 and CR10, capacitors C36, and C40, and potentiometer R44; phase detector No. 2 consists of transformer T2, diodes CR11 and CR12, capacitors C44, C62 and C46, and potentiometer R57. The 250 kc oscillator is completely contained in assembly Z4; voltage regulators VR1 and VR2, temperature-stabilizing diodes CR16 and CR17, potentiometer R34 and capacitor C26 form its fine tuner. The 250 kc output goes to the external demultiplexer via amplifier Q7, and it is also coupled to the two phase detectors via +45° and -45° phase shifters, to produce the 90° phase difference required. The +45° phase shifter is made up of capacitors C37 and C38 and resistors R43 and R45; -45° shifter also is made up of C41 and C42 and resistors R50 and R52. The limiter amplifier input to each phase detector is at the potentiometer wiper. The output of phase detector No. 1 appears at TP9 and is brought over to a normally open contact of AFC tune relay K2, via differential amplifier Z2. The output of phase detector No. 2 appears at TP11; during sync, this maximum voltage output triggers differential amplifier Z1, and Z1's output appears at the base of relay driver Q10. Q10 provides a ground for the coil of lockup relay K1, causing it to energize. The energized K1 then supplies a ground to the coil of sync relay K3; K3 then connects +24 vdc to the external SYNC INDICATOR lamp. Closed contacts on the energized K1 also supply continuity for the dc correction loop back to 250 kc oscillator Z4 (E MOD input) via source follower Q12 and, eventually, to the receiver's local oscillator via an R-C time constant network. When the external

AFC TUNE switch is used, the ground appearing at pin 7 of 1A3 causes relay driver transistor Q11 to conduct, energizing tune relay K2. During this interval, the closed contacts of K2 ground out the dc correction loop towards the local oscillator. The time delay circuit for this slow loop is composed of capacitors C52, C53 and C54 and resistors R54 and R69. When AFC is lost, relays K1 and K3 de-energize: K3 then extinguishes the SYNC INDICATOR lamp and its alarm contacts go into alarm position.

(2) TEST DATA. - Test data is given for inputs and outputs of the 1A3 circuitry in servicing block diagram figure 4-10. Pertinent tests and measurements are presented in paragraph 5-15.

h. 1A5 PHASE DETECTOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-24.) - The greater part of circuitry appearing in 1A5 is utilized by the receiver's synthesizer/phase lock section (see figure 4-7 and paragraph 4-3f). The receiver's 1 mc reference enters at pin B, is amplified through transistors Q8 and Q9 and divided by 16 through integrated circuit Z2. The resulting 62.5 kc is brought over to the two phase detectors via driver Q7 and via a 90° phase shifter section. This 90° section is composed of 45° phase shifters. The +45° shifter is made up of capacitors C31 and C32 and resistors R38 and R40; the -45° shifter is made up of capacitors C29 and C30 and resistors R35 and R36. The two 62.5 kc signals, now 90°'s apart in phase, drive phase detectors No. 1 and No. 2 via Q6 and Q5, respectively. Phase detector No. 2 is composed of transformer T4, diodes CR5 and CR6, capacitors C34 and C60, resistor R43 and potentiometer R61. Phase detector No. 1 is composed of transformer T3, diodes CR1 and CR2, capacitors C27 and C59, resistor R32 and potentiometer R20. The 62.5 kc input from the difference mixer into each of the phase detectors is at the potentiometer wiper. The difference mixer is made up of transistors Q2 and Q18, transformer T2, resistors R4, R5, R6 and R8, potentiometer R7 and capacitors C61 and C8. The .2 to .4 mc input to the mixer enters at pin 10 and is brought over to the bases of Q2 and Q18. The .2625 to .4625 mc input enters the mixer via pin 12 driver Q1 and coupling transformer T1. The output is amplified through transistor Q3 and brought to the potentiometer-wiper inputs of the two phase detectors via rf amplifiers Q4 and Q10. The dc correction output from phase detector No. 1 is brought out to pins J and M via a low-pass filter consisting of capacitors C17, C18, C19 and C20 and resistors R21 and R22. The output from phase detector No. 2 (appearing across potentiometer R61) is brought through a high gain dc amplifier consisting of Q11, Q12, Q13 and Q14 to drive sync relay K1 via relay driver Q17. At the sync point, the maximum voltage across R61 causes Q17 to provide a return for +24 vdc through K1, thereby energizing K1. K1 then connects +24 vdc to the external SYNC INDICATOR lamp via pin 3.

(2) TEST DATA. - Test data is given for inputs and outputs of the 1A5 circuitry in servicing block diagram figure 4-7. Pertinent tests and measurements are presented in paragraph 5-16.

i. 1A6 SUBSYNTHESIZER.

(1) CIRCUIT DESCRIPTION. (See

figure 5-26.) - The subsynthesizer functions only in the receiver's signal detection section (see figure 4-2 and paragraph 4-3c). The receiver's basic 1 mc enters at pin R of 1A6 and becomes amplified through Q13 and Q14. Integrated circuit Z1 divides the 1 mc in half and the resulting 500 kc (and harmonics) are routed to four band divider sections. Each section has a fine tune circuit to select a harmonic, a divider and a band logic signal input. The receiver's BAND SWITCH provides a ground (for the band selected) at one of the band logic inputs (a switching transistor), enabling that band-divider section and disabling the other three. In the band 1 section, the harmonic selected is 7 mc. Z6 divides the signal by four (into 1.75 mc) and Z5 divides the 1.75 mc by two (or into .875 mc). In band 2, the harmonic is 3 mc, the division (through Z4) is by two and the result is 1.5 mc. In band 3, the harmonic is 5.5 mc, the division (through Z3) is by two and the result is 2.75 mc. In band 4, the harmonic is 10.5 mc, the division (through Z2) is by two and the result is 5.25 mc. The common output from 1A6 appears at pin 10, via emitter-follower Q27.

(2) TEST DATA. - Test data is given for inputs and outputs of the 1A6 circuitry in servicing block diagram figure 4-2. Pertinent tests and measurements are presented in paragraph 5-11.

j. 1A7 SECOND IF.

(1) CIRCUIT DESCRIPTION. (See figure 5-28.)

(a) SIGNAL DETECTION SECTION. - The upper portion of figure 5-28 schematic is used in the receiver's signal detection section (see figure 4-2 and paragraph 4-3c). The balanced difference mixer is made up of field effect transistors Q1 and Q2, resistors R3, R5 and potentiometer R4. The input from the subsynthesizer pin 12 is coupled to the mixer via transformer T1, resistors R1 and R2 and capacitors C2 and C3. The input from the first if amplifier pin 14 is coupled via capacitor C1. The mixer output is the difference frequency of 250 kc and sidebands. This is routed through band-pass filter FL1 to an amplifier chain composed of transistors Q3, Q4, Q7, Q9, Q10 and Q11 and out of 1A7 at pin J.

The middle row of transistors work for noise suppression. When an external switch is set for noise suppressions, the +24 vdc is connected to pin 15 of 1A7; this activates a noise detector circuit. The circuit, composed of transistors Q12, Q13, Q14, Q15, Q16, and Q17, samples the mixer output via resistor R8 and capacitor C30. The output is coupled through transformer T4 to the noise gate section. This section is composed of transistors Q18, Q19, Q21, Q23 and Q24. The gating output (TP14) is fed to the center tap of T2, in such a way as to cut out the signal during the brief interval of a noise spike.

The noise detector gate triggering level is adjustable to various conditions that may exist in an environment. A sample of the detector output is taken from the emitter of Q17 and brought, through potentiometer R74, to dc amplifiers Q20 and Q22. The output of Q22 is fed back to the input of the noise detector transistor bases.

This furnishes an adjustment at R74 for the operating level of the detector.

(b) GAIN CONTROL SECTION. -

The bottom row of transistors on figure 5-28 functions as a major part of the receiver's high level automatic gain control section (see figure 4-4 and paragraph 4-3d). The AGC detector is composed of transistors Q32, Q33, Q34, Q35 and Q36. The signal sampling is brought into the base of Q32 from the signal detection section output via buffer amplifiers Q29 and Q30. The detector feedback output is switched into the system via the receiver's AGC switch which closes pins C and N on 1A7. With this closure, the feedback is connected (a) to the IF amplifier chain via Q8 and (b) to the external rf amplifier section through pin H of 1A7.

The AGC attenuator sensing section is composed of transistors Q41, Q38, Q39 and Q40. Its input is from the AGC detector output and its output is to the receiver's attenuator insertion relay in the rf section, via pin E of 1A7. When triggered at its input (at the base of Q41) the output goes to ground, energizing the external relay located in 1A11.

The AGC detector also furnishes the input for the receiver's RF/AFC LEVEL meter (for a RF HIGH level signal). This is taken off of the detector output and routed to the external meter via transistor Q37 and pin B of 1A7.

Manual gain control of the receiver is accomplished by a front panel adjustment of a potentiometer external to 1A7. This is a 3 section potentiometer connected to 1A7 in such a way as to adjust the gain setting of two points in the signal detection section amplifier chain and to adjust the gain setting of the external demultiplexer. The positive dc voltage at pin 10 of 1A7 is adjusted through the first section of the potentiometer and brought back through pin M to regulate the amplifier chain via emitter bypass attenuator Q5. The positive and negative voltages at pins 3 and 2, respectively, are brought out to the third section of the potentiometer and the wiper is connected to pin N. This manually adjusted gain voltage input then takes the same path as the aforementioned AGC detector output (to the amplifier chain via Q8). The positive voltage at pin 4 is brought out to the second section of the potentiometer and brought back in at pin F and then to dc amplifier Q31 to furnish the manually adjusted gain for the demultiplexer, via pin 6 of 1A7.

(c) AFC SECTION. - A sample of the output of the signal detection section's 250 kc amplifier chain is brought out for the AFC section of the receiver. This output is buffered through transistors Q27 and Q28.

(2) TEST DATA. - Test data is given for inputs and outputs of 1A7 in servicing block diagrams figures 4-2, 4-4 and 4-10. Pertinent test and measurements are presented in paragraph 5-14.

k. 1A8 LOCAL OSCILLATOR DIVIDER.

(1) CIRCUIT DESCRIPTION. (See figure 5-30.)

(a) SIGNAL DETECTION SECTION. - The circuitry in 1A8 functions primarily in the receiver's signal detection section (see figure 4-2

and paragraph 4-3c). The 21 to 37 mc signal input from the receiver's local oscillator enters at pin 4 of 1A8. Amplification takes place through transistors Q1, Q2 and Q3. The signal then proceeds through a NAND gate combination in Z1 that functions as a distribution amplifier. From there it is routed to four band divider sections, each with its own output. Each section has a band logic signal input. The receiver's BAND SWITCH provides a ground (for the band selected) at one of the band logic inputs enabling that band divider section and disabling the other three. Z2, Z3 and Z4 are divide-by-two integrated circuits. Z4 is in the input of band 1, Z3 is in the input of band 2 and Z2 is for band 3. Z1 is in the input of band 4 and used for coupling.

When, for example, band 1 is selected by the BAND SWITCH, the 21 to 37 mc is divided through all three dividers (or divided by 8) to become a frequency in the 2.4625 to 4.625 mc range. The inputs to the output band sections for bands 2, 3 and 4 are blocked and all three dividers are enabled. If band 2 is selected, the ground signal at pin M of 1A8 disables divider Z4 so that only Z2 and Z3 dividers are operating; the same signal enables the band 2 output circuitry only. The 21 to 37 mc is divided by four to become a frequency in the 5.25 to 9.25 mc range. For band 3, in the same manner, the 21 to 37 mc is divided by two to become a frequency in the 10.5 to 18.5 mc range. When band 4 is selected, all 3 dividers are disabled and there is no division of the 21 to 37 mc at the band 4 output.

(b) DIGITAL COUNTER SECTION. - The amplified 21 to 37 mc from transistor Q3 is also utilized by the receiver's digital counter section. This output appears at pin 2 via distribution amplifier Z1.

(2) TEST DATA. - Test data is given for inputs and outputs of 1A8 in servicing block diagrams figures 4-2 and 4-7. Pertinent tests and measurements are presented in paragraph 5-12.

l. 1A9 FIRST IF AMPLIFIER.

(1) CIRCUIT DESCRIPTION. (See figure 5-32.) - The entire circuitry of 1A9 is used only in the receiver's signal detection section (see figure 4-2 and paragraphs 4-3c). There is separate circuitry for each of the receiver's four bands; however only one band circuitry is enabled at one time. This is dependent upon the position of the receiver's BAND SWITCH. A selected band places a ground on one of the band logic input pins (P, N, E or J); this enables that band circuitry. All bands share a common output path at pin 5 of 1A9.

Taking band 1 as a typical example, the frequency in the 2 to 4 mc range from 1A9A3A1 comes into the balanced difference mixer at pin 15 of 1A9; the injection frequency (from the local oscillator divider) 1A8 comes in at pin 14. The difference mixer consists of transformer T1, transistors Q3 and Q4, resistors R4, R5, R6, R7, R8 and R10, potentiometer R9, and capacitors C6 and C7. The difference output, always .625 mc is passed through a highly selective crystal-centered bandpass filter FL1, with a width of approximately 12 kc. The .625 mc signal is then amplified through transistors Q5 and Q6.

(2) TEST DATA. - Test data is

given for inputs and outputs of 1A9 in servicing block diagram figure 4-2. Pertinent tests and measurements are presented in paragraph 5-13.

m. 1A13, AC FILTER.

(1) **CIRCUIT DESCRIPTION.** (See figure 5-36.) - AC filter card 1A13 improves reliability of the dc loop produced in the synthesizer/phase lock section, by eliminating the possibility of oscillator instability due to stray ac pickup.

1A13 has four inputs: (1) +24 vdc (terminal E1) sync trigger signal which is applied upon successful phase lock; (2) +24 vdc B+ (terminal E4); (3) dc loop input (terminal E5); (4) dc loop common (terminal E2). Inputs (3) and (4) are also the only outputs of 1A13, appearing at terminals E6 and E3, respectively.

Consider the conditions before and after achievement of phase lock:

Before phase lock is achieved, the following inputs are presented to 1A13: E1, no input; E2, common side of dc loop; E4, +24 vdc B+; E5, a positive or negative correction voltage of variable amplitude, depending upon direction and magnitude of frequency error.

With no input at terminal E1, transistor Q1 is biased off; consequently, there is no path to ground for +24 vdc on the coil of relay K1, and the relay is de-energized. In the de-energized state, K1 does the following: (1) places a short circuit across the RC filter network consisting of C2, C3, and R3; (2) places a short circuit across loop series resistor R4. The filter network is not enabled at this time, because to do so would significantly impair loop response speed.

Upon achieving phase lock, however, +24 vdc sync trigger appears at terminal E1; simultaneously, loop voltage (terminal E5) goes to zero. All other inputs remain as they were before phase lock.

The application of +24 vdc to terminal E1 begins charging capacitor C1 through resistor R1: the time constant of this RC pair is approximately two seconds. After two seconds, the voltage across C1 is sufficient to saturate transistor Q1, thereby providing a path to ground for the coil of relay K1, allowing it to energize.

When K1 energizes, it: (1) removes the short circuit from resistor R4, placing it in series with the dc loop, between terminals E5 and E6; (2) removes the short circuit from the RC filter network of C2, C3 and R3, placing this filter network across the dc loop, immediately after series resistor R4. R4 raises the loop impedance to a value suitable for use by the filter network.

Note that once the filter is connected to the loop, response speed of the loop drops somewhat. Although response speed was critical during the tuning process, once the tuner has achieved and maintained phase lock such speed is no longer necessary.

Should phase lock be lost, the +24 vdc sync trigger will disappear from terminal E1, and diode CR1 will effectively short circuit timing resistor R1, allowing capacitor C1 to discharge almost immediately. Transistor Q1 will quickly cease conduction, de-energizing relay K1 and removing the filter network from the loop, and retuning the loop

to full response speed. The purpose of the two second time delay in relay activation is to prevent relay chattering under marginal phase lock conditions.

(2) **TEST DATA.** - Test data for 1A13 is contained within figure 4-7.

4-6. UNIT 2 SUBASSEMBLY DESCRIPTIONS.

a. 2A1 POWER SUPPLY.

(1) **CIRCUIT DESCRIPTION.** (See figure 5-51.) - Power supply 2A1 converts 35 vac, 21 vac, 13.5 vac and 26 vac into +24 vdc, +15 vdc, +5 vdc and -24 vdc, respectively. The dc output voltages are used to supply several of the receiver's functional sections (in part and in whole) as checked:

FUNCTIONAL SECTION	SUPPLY			
	+24 VDC	+15 VDC	+5 VDC	-24 VDC
Signal Detection	X	X	X	
Gain Control	X			X
Diversity Quieter	X			

In the +24 vdc supply, the 35 vac is rectified through full-wave bridge receiver CR1. This is followed by a series voltage regulator section and a current limiter section. The voltage regulator consists of transistor Q2 followed by an externally mounted transistor, 2Q1, Q4, diode CR3 and resistors R7, R8 and R9. The output of transistor 2Q1 is sampled in the network formed by R7, R8 and R9 and fed to the base of Q4. A reference voltage is developed across diode CR3. The output from Q4 is a correction voltage and this is fed to the base of Q2. By adjusting potentiometer R8 the dc output voltage may be set. The current limiter consists of resistors R4 and R5 and transistor Q3. The current limiter (or short-proof feature) is in the common current line, in such a way that the base of 2Q1 can only draw a certain amount of current. When the +24 vdc output is shorted, the voltage drop across R4 and R5 turns on switching transistor Q3. Q3 then draws current off the common line, and this being the current limiting action. By setting potentiometer R4, the maximum current may be set; here it is shown for a 600 ma output.

The +15 vdc, +5 vdc and -24 vdc supplies are essentially of the same circuit design, with a voltage regulator and a current limiter in each.

(2) **TEST DATA.** - Test data for the 2A1 assembly is included in figure 5-51 and paragraph 5-18.

b. 2A2 MONITOR/DIVERSITY.

(1) **CIRCUIT DESCRIPTION.** (See figure 5-53.)

(a) **SIGNAL DETECTION SECTION.** - The amplifier section for receiver audio monitoring is included in the 2A2 circuitry (see figure 4-2 and paragraph 4-2b). This section is

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isolated from the receiver audio line output so that the monitoring will have no effect on the signal output. The audio is brought in at pin 14 to amplifier circuitry consisting of Q1 through Q6. The output at pins 12 and 13 drives the speaker.

(b) GAIN CONTROL SECTION. - Signals from the receiver's low level AGC system are used to obtain the receiver's low-level signal strength reading (see figure 4-4 and paragraph 4-3d). Samples of AGC feedback from IF channels SYM, B2, B1, A1 and A2 are brought into a level summing network at pins 3, 4, 5, 6 and 7, respectively. The summing network consists of transistors Q12, Q13, Q14, Q15 and Q16. The output, through diodes CR19 and CR20, is amplified through operational amplifier integrated circuit Z5 and appears at pin S of 2A2.

(c) DIVERSITY QUIETER SECTION. - The AGC comparison circuitry for the receiver's diversity quieter section are included in P/C board 2A2 (see figure 4-6 and paragraph 4-3e). AGC feedback samples from each of the receiver's five IF channels (SYM, B2, B1, A1 and A2) are brought into 2A2 at pins B, C, D, E and F, and routed through emitter followers Q7, Q8, Q9, Q10 and Q11. These signals are then fed to five steering diodes CR5, CR8, CR11, CR14 and CR17 and brought out at pins 8, M, 9, 10 and 11. These five AGC signals (at pins 8, M, 9, 10 and 11) are for the associated receiver's comparison. If, in any one of the comparisons, a receiver's channel IF level (as indicated by the AGC level) is greater than that of the associated receiver, the comparator (which is made up of both receiver steering diodes) will send out a quieting signal to the IF channel in the associated receiver; and the IF channel in the associated receiver will remain inoperative.

(2) TEST DATA. - Test data is given for inputs and outputs of 2A2 in servicing block diagrams figures 4-2, 4-4 and 4-6. Pertinent test and measurements are presented in paragraph 5-24.

c. 2A3 SUBCARRIER GENERATOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-55.)

(a) SIGNAL DETECTION SECTION. - The greater part of the circuitry in 2A3 is utilized in the receiver's signal detection section (see figure 4-2 and paragraph 4-3c). The basic 1 mc reference signal enters at pin 4 and is amplified through transistors Q1 and Q2. The divide-by-100 section is made up of two decade counters, Z1 and Z2, each one dividing the frequency by 10. The resulting 10 kc is then brought over to the base of Q3. The output of Q2 is also brought to a divide-by-4 circuit Z6, which divides the signal by 2, twice. The resulting 250 kc is amplified separately through Q9 and Q10 and brought out at pins L and 8 of 2A3 to be used at the receiver's A1 and B1 product detectors. The 250 kc signal is also applied (via Q11 and Q12 to the emitters of Q13 and Q14.

The 10 kc and the 250 kc are used to produce the 243.71 kc and 256.29 kc required for the receiver's B2 and A2 product detectors. The 10 kc applied to the base of Q3 (a keyed oscillator) causes Q3 to produce harmonics and these, amplified through Q4, are brought to a narrow bandpass filter FL1.

FL1 is centered at 6.29 mc. The 6.29 mc output is applied via Q5 and Q6 to a divide-by-1000 section, consisting of decade counters Z3, Z4 and Z5, each of which divide the signal by ten. The resulting 6.29 kc is passed through a low-pass filter consisting of capacitors C24 and C25 and coil L7 and then applied to the bases of Q13 and Q14. This causes Q13 and Q14 to act as mixers, producing sum and difference frequencies from the 6.29 kc and the 250 kc. At the output of Q13 a filter, FL2 passes out the sum frequency 256.29 kc; at the output of Q14, FL3 picks out the difference frequency 243.71 kc. These two frequencies are brought out (the 256.29 kc via Q15 and Q17 and the 243.71 kc via Q16 and Q18) to pin S and P, respectively, to be used in the receiver's A2 and B2 product detectors.

(b) AFC SECTION. - Transistors Q7 and Q8 are used in the receiver's AFC section (see figure 4-10 and paragraph 4-3h). When the receiver's controls are set for AFC mode, a ground appears at pin A and the 250 kc drift-tracking signal appears at pin 6. The ground signal acts through diode CR3 to disable divider Z6, thereby blocking the 1 mc derived, 250 kc; the same ground signal acts through diode CR4 and switching transistor Q7 to enable amplifier Q8. The drift-tracking 250 kc is then substituted for the stable 1 mc derived 250 kc, as the basis for the product detector injection frequencies.

(2) TEST DATA. - Test data is given for inputs and outputs of 2A3 in servicing block diagrams figures 4-2 and 4-10. Pertinent tests and measurements are presented in paragraph 5-19.

d. 2A4 SYMMETRICAL DEMODULATOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-57.)

(a) SIGNAL DETECTION SECTION, SYMMETRICAL CHANNEL. - The greater part of 2A4 circuitry is involved in the receiver's symmetrical channel signal detection (see figure 4-3 and paragraph 4-3c). The 250 kc signal enters at pins 10 and then through a low-pass filter consisting of coils L1, L2 and L3 and capacitors C1, C2 and C3. From there it divides in two directions: to the envelope detector via Q1 and Q2 and to the product detector via Q4. The envelope detector consists of diode CR1 and its associated components. The product detector consists of transformers T1 and T2, diodes CR2, CR3, CR4 and CR5, and their associated components. Both detectors share a common audio output amplifier chain, consisting of transistors Q9, Q10, Q11, Q12 and Q13 and their associated components. Only one detector is operative at a time and this depends on the position of the demultiplexer's MODE switch which controls AM/CW selection. A ground from this selector at pin N enables the envelope detector in the AM modes a ground at pin L enables the product detector in the CW mode.

The 247 to 253 kc BFO (beat frequency oscillator) for the product detector is made up of transistor Q5, diodes CR6, CR7, CR8, CR9 and CR10, capacitors C15, C16, C17, C18, C19 and C20, coil L4, resistors R25, R26, R27, R28, and

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R29, potentiometers R23 and R24 and an external associated potentiometer (SYM BFO) on the front panel of the demultiplexer. The latter is connected across pins F and J with the wiper connected to pin 6. Varying this potentiometer adjusts the BFO through its frequency range. BFO output is at the emitter of Q8 and is coupled to the product detector via transformer T2.

(b) SIGNAL DETECTION SECTION, METER AMPLIFIER. - The signal for the receiver's output level meter, for all modes, is included in 2A4 (see figure 4-2 and paragraph 4-3c). The audio signal comes in at pin 14, becomes amplified through transistors Q14, Q15 and Q16 and rectified into a dc value by diodes CR11 and CR12. The dc value is brought to pins 12 and 13 for the external meter, (LINE DBM meter, 2M1).

(2) TEST DATA. - Test data is given for inputs and outputs of 2A4 in servicing block diagrams, figures 4-2 and 4-3. Pertinent tests and measurements are presented in paragraph 5-23.

e. 2A5 SYMMETRICAL IF/AGC.

(1) CIRCUIT DESCRIPTIONS. (See figure 5-59.)

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(a) SIGNAL DETECTION SECTION. - The larger portion of 2A5 circuitry is involved in the receiver's symmetrical signal detection section (see figure 4-3 and paragraph 4-3c). The 250 kc IF signal enters 2A5 at pin 14 and splits in two directions to a 6 kc bandpass filter FL2, and to a 2.5 kc bandpass filter FL1. The 6 kc filter is driven by Q1 and drives Q3; the 2.5 kc filter is driven by Q2 and drives Q4. Only one filter circuit is operative at a time and this depends on the position of the demultiplexer MODE switch, which controls 6 kc/2.5 kc selection. When the control is in the 6 kc position, a ground at pin 13 enables Q1 and Q3; when the control is in the 2.5 kc position, a ground at pin 12 enables Q2 and Q4. The two filter outputs share a common IF amplifier chain consisting of transistors Q5, Q6, Q7, Q8, Q10, Q11, Q12 and Q13. The signal output to the associated demodulator is via pin 6. A monitor IF is taken out at pin 4.

(b) GAIN CONTROL SECTION. - Gain control for the symmetrical channel is included in 2A5 (see figure 4-5 and paragraph 4-3d). A sample of the signal level is taken at Q12 and routed to the AGC IF amplifiers. The sample is amplified by Q15 and Q16. Collector voltages are regulated by a +12 volt zener diode CR7; rectification to a dc voltage occurs at diodes CR2, and CR3. The dc voltage is amplified by Q17 and Q18. The receiver's SLOW/MED/FAST, AGC TIME CONSTANT selector switch selects an output from pin 10, 9 or 8, respectively. The slow time constant circuit is determined by resistors R97 and R98 and capacitor C62 and CR6 diode; the medium by R95, R96 and C61 and CR 5; the fast by R93, R94, C60 and CR4. After the selection has been made, the AGC is fed back to the amplifier chain via pin 11, Q14, Q9 and CR1. Instead of AGC, a manually adjusted gain may be brought in at pin 11. Q19, Q20 and Q21 are temperature compensating devices for Q5, Q6 and Q9 respectively.

(2) TEST DATA. - Test data is given for inputs and outputs of 2A5 in servicing block diagrams figures 4-3 and 4-5. Pertinent tests

and measurements are presented in paragraph 5-21.
f. 2A6, 8, 10, 12 AUDIO/DEMODULATOR, ISB.

(1) CIRCUIT DESCRIPTION. (See figure 5-61.)

(a) SIGNAL DETECTION SECTION. - The greater part of this circuitry is used in the receiver's signal detection section (see figure 4-2 and paragraph 4-3c). The 250 kc IF signal enters the board at pin 12 and passes through a low-pass filter; the filter consists of coils L1, L2 and L3 and capacitors C1, C2 and C3. From there the signal goes via emitter follower Q1 to the product detector. The product detector consists of transformers T1 and T2, diodes CR1, CR2, CR3 and CR4, and their associated components. The injection frequency is brought in at pin 15; the frequency of this input varies. For 2A6 it is 243.71 kc; for 2A8 and 10 it is 250 kc; for 2A12 it is 256.29 kc. The injection frequency is amplified through Q2 and Q3 and brought into the product detector at transformer T2. The audio output from the product detector is fed through a low-pass filter (C13, C14, C15 and L5) amplified through Q4, Q5, Q6, Q7 and Q8. The audio signal is brought out to an audio monitoring line via pin M and to the demultiplexer LINE LEVEL ADJUST via pin R. After the level control, the audio signal re-enters the P/C board at pin 9. Further amplification occurs through Q9, Q10, Q11, Q12 and Q13. The signal is then coupled to the audio output via transformer T3 to pins 6, 7 and 8. A sample of audio is taken before the coupling transformer (T3) and isolated through Q15 for the demultiplexer LINE-DBM meter (pins 4 and 5). The "squelch" input at pin B is not used in the Demultiplexer, TD-915/URR.

(2) TEST DATA. - Test data is given for inputs and outputs of 2A6, 8, 10 and 12 in servicing block diagram figure 4-2. Pertinent tests and measurements are presented in paragraph 5-22.

g. 2A7, 9, 11, 13 IF/AGC, ISB.

(1) CIRCUIT DESCRIPTION. (See figure 5-63.)

(a) SIGNAL DETECTION SECTION. - The greater part of the circuitry is used in the receiver's signal detection section (see figure 4-2 and paragraph 4-3c). The 250 kc carrier and sidebands enter at pin 14 and are amplified through Q1. FL1 is a crystal sideband 3 kc channel filter and differs in the center frequency in 2A7, 9, 11 and 13. The band for 2A7 is centered at 245.405 kc for 2A9 at 248.355 kc, 2A11 at 251.645 kc, for 2A13 at 254.595 kc. The selected channel frequencies are amplified through Q2 and delay equalizer FL2. The output of FL2 is then coupled to the IF amplifier chain, consisting of Q3, Q4, Q5, Q6, Q8, Q9, Q10 and Q11. Output is at pin 6. A monitor output is taken out at pin 4.

(b) GAIN CONTROL SECTION. - Gain control for the ISB channel is included in the circuitry (see figure 4-4 and paragraph 4-3d). A sample of signal level is taken at Q10 and routed to an AGC detector. The detector consists of amplifiers Q13, Q14, Q15 and Q16 whose collector voltages are regulated by VR1; rectification to a dc voltage occurs at diodes CR2 and CR3. The

receiver's SLOW/MED/FAST AGC TIME CONSTANT selector switch selects an output from pin 10, 9 or 8, respectively. The slow time constant circuit is determined by resistors R84 and R85, diode CR6, and capacitor C52; the medium by R82, R83, C51; the fast by R86, R81, CR4 and C50. After the selection has been made, the AGC is fed back to the amplifier chain via pin 11, Q12 and CR1. Instead of AGC, a manually adjusted gain may be brought in at pin 11. Q17, Q18 and Q19 act as temperature compensating devices for Q3, Q4, and Q7.

(2) TEST DATA. - Test data is given for inputs and outputs of 2A7, 9, 11, and 13 in servicing block diagrams figures 4-2 and 4-4. Pertinent tests and measurements are presented in paragraph 5-20.

4-7. UNIT 3 SUBASSEMBLY DESCRIPTIONS.

a. 3A2 POWER SUPPLY.

(1) CIRCUIT DESCRIPTION. (See figure 5-70.) - Power supply 3A2 converts 15 vac, 25 vac and 35 vac into 5.4 vdc, +16 vdc and +25 vdc, respectively. The dc output voltages are used to supply the receiver's synthesizer/phase lock section.

In the +5.4 vdc supply, the 15 vac is rectified through full-wave bridge rectifier CR3. This is followed by a series voltage regulator section and a current limiter section. The voltage regulator consists of transistor Q9 followed by an externally mounted transistor 3Q3 transistor Q12, diode VR6 and resistors R24, R25 and R26. The output of the 3Q3 transistor is sampled in the network formed by R24, R25 and R26 and fed to the base of comparator Q12. A reference voltage is developed across diode VR6. The output from Q12 is a correction voltage and this is fed to the base of series regulator 3Q3 via Q10. Q9 is a voltage amplifier and is used to correct for a change in the ac input voltage after it is rectified. This change is amplified and dc coupled to the base of Q10 which controls the series regulator 3Q3, keeping the voltage at +5.4 vdc. The current limiter consists of resistors R21 and R22 and transistor Q11. The current limiter (or shortproof feature) is in the common current line, in such a way that the base of 3Q3 can only draw a certain amount of current. When the +5.4 vdc output is shorted, the voltage drop across R21 and R22 turns on switching transistor Q11. Q11 then draws current off the common line, this being the current limiting action. By adjusting potentiometer R22, the maximum current may be set; here it is shown for a 1.3 amp output. The +16 vdc and +25 vdc supplies are essentially of the same circuit design, with a voltage regulator and a current limiter in each.

(2) TEST DATA. - Test data for the 3A2 assembly is included in paragraph 5-26.

b. 3A3 1 MC DISTRIBUTOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-72.) - Circuitry in 3A3 is used in the receiver's synthesizer/phase lock section only (see figure 4-7 and paragraph 4-3f).

When using a 1 mc standard source external to the receiver, the internal 1 mc standard in O-1511/URR becomes phase-locked to the external

standard. The external standard (fe) comes in at pin 21; the internal standard (fi) enters at pin 2. Amplification takes place for fe through Q1, Q2 and Q3 and for fi through Q4, Q5 and Q6. NAND-gates Z1D and Z2D function as clippers. The 1 mc fe and fi are each divided by two through the two halves of Z6; the two resulting 500 kc signals are then brought over to NAND-gate Z5A. The output of Z5A is 500 kc exactly, with a maximum voltage amplitude, when the two inputs are exactly in phase. When the inputs are out of phase, the output amplitude diminishes. This is changed into dc voltage through a filter, consisting of coil L5 and capacitors C12 and C13, and brought over to pin 3 of offset amplifier Z8. The pin 2 input of Z8 receives a positive dc voltage. Z8 functions as a differential amplifier, providing an offset of the error voltage produced by the filter (C12, C13, L5) to a value suitable for use by 1 mc standard 3A1. The output of Z8, an offset dc voltage is brought over to Q8 and Q27. Q8 functions as a switch and Q27 as a high impedance source follower and memory, when input from Q8 is absent. From Q27, the dc output is brought out to pin 17 of 3A3 and used to correct the 1 mc standard (fi) in 3A1. The corrected 1 mc then enters at pin 2 of 3A3 to close the correction loop. The dc error output from the junction of L5 and C13 is also brought over to pin 3 of meter amplifier Z7. Pin 2 of Z7 receives a positive dc voltage. Z7 compares the error output of the filter (C12, C13 and L5) with a reference voltage, and functions as a differential amplifier, whose output is the difference between the reference signals. The output of Z7 is brought out to pin M of 3A3 to operate an external meter, the dial of which is used to indicate phase differences between fi and fe.

A steady positive voltage of approximately +4 vdc is brought out at pin 15. A frequency difference reading (between fi and fe) will be indicated on the same meter. The PHASE COMPARATOR/FREQ DIFFERENCE switch on the front panel of the O-1511/URR is set to the FREQ DIFFERENCE position for this reading. This switch disconnects the correction voltage to the 3A1 1 mc standard and replaces it with a steady voltage. The 1 mc (fi), now entering pin 2 of 3A3, will not be corrected, since the phase-lock loop is disabled. The frequency difference voltage appears at the same spot as does the phase difference voltage (at the output of Z5A). The resulting dc voltage from the filter then takes the same path to the external meter; the meter includes calibration markings for both frequency difference and phase difference.

Level sensing circuits are used for warning signals of EXTERNAL/INTERNAL STANDARD FAILURE. A sample of fe is taken from the output of Q1 and of fi from the output of Q4; these samples are fed into two separate level sensing circuits. The fe circuit consists of Q9, Q10, Q11, Q12, Q13, Z1A, Q14 and Q15; the fi circuit consists of Q16, Q17, Q18, Q19, Q20, Z2A, Q21 and Q22. Failure of fe causes the collector of Q14 and Q15 to switch to ground and this warning signal is brought out at pin 20 of 3A3; when fi fails, Q21 and Q22 collectors and pin 4 switch to ground.

Information from the level sensing

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circuits is also used in the 1 mc switching logic output. Level sensing signals for fe are brought through Z1B to Z1C gate. Level sensing signals for fi are brought through Z2B to Z2C gate. Fe is applied to pin 10 of Z1C gate and fi is applied to pin 10 of Z2C gate. If fe fails or if its amplitude at input pin 21 falls below .7 volts rms Z1C gate will close and fe will not appear at pin 8 of Z1C. The failure of fe also causes the output of Z3C to go high, opening Z3D and allowing fi to proceed through Z3D. If fi fails or if its amplitude decreases below .7 volts rms, the fi level sensing signal at

Z2C will block fi from proceeding. The failure of fi also causes a high logic level at pin 13 of Z3D, which will allow fe to proceed to the output.

In the event of either fe or fi failure, the phase-lock loop is disabled. When failure occurs, either Z1B or Z2B causes output of Z3A to go high, cutting off the operation of Q8 and Q27 via Z5D and Q7. The following truth table illustrates various gate actions under conditions of internal standard operation, external standard operation, and operation when both standards are functioning:

<u>OUTPUT OF:</u>	<u>INTERNAL STD OPERATION</u>	<u>EXTERNAL STD OPERATION</u>	<u>INTERNAL AND EXTERNAL STD OPERATION</u>
Z1C	H (high logic level)		fe
Z1B	L (low logic level)	H	H
Z2B	H	L	H
Z3A	H	H	L
Z3B	L	fe	H
Z3C	H	fe	H
Z3D	fi	fe	fi
Z2C and Z4	fi	H	fi

The 1 mc output from the 1 mc logic switching circuits is applied to Q23 via potentiometer R89. The emitter output Q23 feeds three separate 1 mc stages: Q24, Q25 and Q26. The output of Q25, at pin 9, is applied to card 1A1A2 in the counter section of the TN-512/URR via 3J6, 1 mc out jack. The output of Q24, at pin 7, is applied to MONITOR jack 3J7. The output of Q26, at pin 12, is applied to 3A4 pin 12 and 3A5 pin 13.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A3 in servicing block diagram figure 4-7. Pertinent test and measurements are presented in paragraph 5-27.

c. 3A4 1 MC SELECTOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-74.) - The circuitry of 3A4 is used only in the receiver's synthesizer/phase lock section. (See figure 4-7 and paragraph 4-3f). A 1 mc signal is introduced at pin 12 and is applied to three stages: Q1, Q2 and Q3. The signal appearing at the emitter of Q3 has been purposely distorted to provide an output rich in harmonics of the one mc input. This output is applied simultaneously to six crystal-amplifier circuits: Y1 at 11 mc, Y3 at 14 mc, Y5 at 10 mc, Y7 at 12 mc, Y9 at 16 mc, Y11 at 17 mc. The crystals act as high Q bandpass filters, allowing only the desired harmonics of 1 mc to be amplified. Y1 frequency, 11 mc utilizes tuned amplifiers Q4, Q5, Q6 and Q7. Crystal Y2 is used to insure a clean 11 mc output at pin 19. Y3 frequency, 14 mc utilizes tuned amplifiers Q8, Q9, Q10, Q11, and Q12. Y4, is used to insure a clean 14 mc output to Z2. The 14 mc is then divided by ten through decade counter Z2, becoming 1.4 mc and this frequency is brought out at pin 17 via emitter follower Q13. Y9 frequency, 16 mc, utilizes tuned amplifiers Q24, Q25, Q26, Q27 and Q28. Crystal Y10, is used to insure a clean 16 mc output at pin 5. Y11 frequency,

17 MHz, utilizes tuned amplifiers Q29, Q30, Q31, and Q32. Crystal, Y12, is used to insure a clean 17 mc output at pin 21.

The 16 mc from Q28, together with similarly generated 10 mc and 12 mc serve to produce the 3, 4, 5 or 6 mc as selected by a two bit code from 10 MEGACYCLES crystals on front of 0-1511/URR. The 10 mc from cycles Y5 and Y6 and tuned amplifiers Q14, Q15, Q16, Q17 and Q18 is fed via Z3 to Z5, where it is divided by two (to become 5 mc). If the 0-1511/URR's 10 MEGACYCLES switch is set at 2, the two-bit code at pins A and B of 3A4 will be 0 and 1 (or ground and open), respectively. These pins lead to binary decoder Z1. Outputs from Z1 lead to the two quadruple nandgate circuits, Z3 and Z4. The code for 2 will then produce the proper signal to the nandgates, from Z1, to cause 5 mc to be issued from 3A4 pin 2; the code for 3 will cause 12 mc to become divided by 2 in Z5, causing 6 mc to be issued from 3A4 pin 2. In like manner, the 16 mc from Q28 is brought over to Z6 via Z4. Z6 will divide its input signal by four. The input signal to Z6 is controlled by Z3 and Z4. The 4 mc is derived at pin 2 by the appropriate code at pins A and B, working through Z1 to control Z3 and Z4 and allowing Z6 to divide the 16 mc by four. The 3 mc is likewise derived from a 12 mc.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A4 in servicing block diagram figure 4-7. Pertinent test and measurements are presented in paragraph 5-28.

d. 3A5 100 KC SELECTOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-76.) - Circuitry in 3A5 is used in the receiver's synthesizer/phase lock section only (see figure 4-7 and paragraph 4-3f). The 1 mc, used to derive the 16.1 through 16.9 mc frequencies, enters 3A5 at pin 13 and is amplified by Q1 and Q2.

The 1 mc is then divided by ten through decade counter Z1 and the resulting 100 kc is distributed through emitter-follower Q3 to the nine tuned amplifier chains. The 100 kc output of Q3 is rich in harmonics; the resonant frequency of the crystal at the input of each chain selects its harmonic. For instance, in the case of the 16.1 mc chain, 16.1 mc crystal Y9, in the input of tuned amplifier Q20, selects that frequency. Further products are eliminated by additional tuned stages in Q21, Q22 and Q23 and 16.1 mc crystal Y10. The output appears at pin 10 of 3A5.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A5 in servicing block diagram figure 4-7. Pertinent test and measurements are presented in paragraph 5-29.

e. 3A6, 7 MATRIX DISTRIBUTOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-78.) - Circuitry in 3A6 and 3A7 is used in the receiver's synthesizer/phase lock section only (see figure 4-7 and paragraph 4-3f). From the input signals (16.0 through 16.9) two frequency outputs are selected. The outputs appear at pin Z and B. The frequencies selected at each output is controlled by a separate four-bit code input from the O-1511/URR's MEGACYCLES selector switches (pins C, D, E and F and pins U, V, W and X).

A typical selection is described for the 16.1 mc frequency with a code input at pins C, D, E and F. The 16.1 mc frequency, appearing at pin 4, becomes amplified through Q3 and Q4 and brought to pin 9 of Z25C, pin 2 of positive nandgates Z6A. If the other input to either gate is positive at this time, the gate will open and the 16.1 mc will pass through. Assuming that the code is correct at pins C, D, E and F, binary decoder Z1 will send a positive charge to pin 10 of Z5C opening the gate. The frequency then passes through another gate Z58 (with its input wired to function as an amplifier), and similarly through an amplifier Z15B. Q21 is an additional amplifier and Q22 functions as an emitter-follower to drive the next stage. The selection of the two output frequencies from 3A6 (pins Z and B) is controlled by the four-bit code inputs from the 00.0001 and 00.0010 MEGACYCLES selector switches, respectively. The selection of the two output frequencies from 3A7 (pins B and Z) is controlled by the four-bit code inputs from the 00.0100 and 00.1000 MEGACYCLES selector switches, respectively.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A6 and 3A7 in servicing block diagram figure 4-7. (paragraph 5-30 and 5-31)

f. 3A8 MATRIX DISTRIBUTOR.

(1) CIRCUIT DESCRIPTION. (See figure 5-80.) - Circuitry in 3A8 is used in the receiver's synthesizer/phase lock section only (see figure 4-7 and paragraph 4-3f). From the input signals (16.9 through 17.0) a single output frequency selected is for the common output (pin M). The frequency selected is controlled by a four-bit code input from the O-1511/URR'S 1.0 MEGACYCLES selector switch (pins F, H, L and K).

A typical selection is described for the 16.1 mc frequency. The 16.1 mc, appearing at pin 16, becomes amplified through Q21 and Q20 and brought over to pin 12 of a positive nandgate Z4D. If the code at pins F, H, L and K is correct for 16.1 mc, binary decoder Z12 will place a positive charge

at pin 13 of Z4D and the gate will open, allowing the 16.1 mc to pass through. The two inputs to gate Z4A (pins 1 and 2) are wired together and Z4A then performs as an amplifier. This is followed by a 16.1 mc crystal, Y7, and amplifier Q19. Here the 16.1 mc signal comes out on a common line to emitter follower Q31 and then to output pins M and 10.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A8 in servicing block diagram figure 4-7. Pertinent test and measurements are presented in paragraph 5-32.

g. 3A9, 10, 11 MIXER/AMPLIFIER.

(1) CIRCUIT DESCRIPTION. (See figure 5-82.) - Circuitry in 3A9, 3A10 and 3A11 is used in the receiver's synthesizer/phase lock section only (see figure 4-7 and paragraph 4-3f). The 11 mc enters the + (sum) mixer via pin 3 and amplifiers Q8 and Q9; the injection frequency enters at pin 2. The injection frequency for 3A9 enters via pin 2 and amplifiers Q1 and Q2 and is 1.4 mc; for 3A10, 1.400 to 1.409 mc and for 3A11 1.4000 to 1.4099 mc. The mixer consists of field-effect transistors Q3 and Q4 with tuned transformer T1 in the output to select the sum frequency. Additional tuned circuits follow with amplifiers Q5, Q6 and Q7, and the signal is applied to a second sum mixer. This mixer is made up of Q10, Q11 and transformer T2. The injection frequency for the second mixer 16.0 through 16.9 mc is selected by a MEGACYCLES switch. This frequency is brought in at pin 7, amplified through Q18 and Q19, divided by ten through decade counter Z1 and applied to the mixer via emitter-follower Q20. The sum frequency appearing at the output of T2 becomes amplified through Q12, Q13, Q14, Q15 and Q16, divided by ten through decade counter Z2 and leaves the circuit at output pin 18 via emitter-follower Q17.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A9, 3A10 and 3A11 in servicing block diagram figure 4-7. The output frequency ranges will be: for 3A9 1400 mc to 1.409 mc; for 3A10 1.4000 mc to 1.4099 mc, for 3A11 1.40000 mc to 1.40999 mc. Pertinent test and measurements are presented in paragraphs 5-33 (3A9), 5-34 (3A10), 5-35 (3A11).

h. 3A12 MIXER/AMPLIFIER.

(1) CIRCUIT DESCRIPTION. (See figure 5-84.) - Circuitry in 3A12 is used in the receiver's synthesizer/phase lock section only (see figure 4-7 and paragraph 4-3f). The 11 mc enters the (sum) mixer via pin 3 and amplifiers Q8 and Q9. The injection frequency (1.40000 to 1.40999 mc) enters the sum mixer via pin 2 and amplifiers Q1 and Q2. The mixer consists of field-effect transistors Q3 and Q4 with tuned transformer T1 in the output to select the sum frequency. Additional tuned circuits follow with amplifiers Q5, Q6 and Q7 and the signal is applied to a second sum mixer. This mixer is made up of Q10, Q11 and transformer T2. The injection frequency (16.0 through 16.9 mc) is selected by a MEGACYCLES switch. This frequency is brought in at pin 7 amplified through Q18 and Q19, divided by ten through decade counter Z1 and applied to the mixer via emitter-follower Q20. The sum frequency appearing at the output of T2 becomes amplified through Q12, Q13, Q14 Q15 and Q16, and applied to positive nandgate assembly

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Z2. Z2 standardizes and limits the output. The signal is then brought over to 3A12 output pin 18, via emitter follower Q17, the output frequency range will be 14.00000 to 14.09999 mc.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A12 in servicing block diagram figure 4-7. Pertinent test and measurements are presented in paragraphs 5-36.

i. 3A13 FINAL MIXER/OUTPUT.

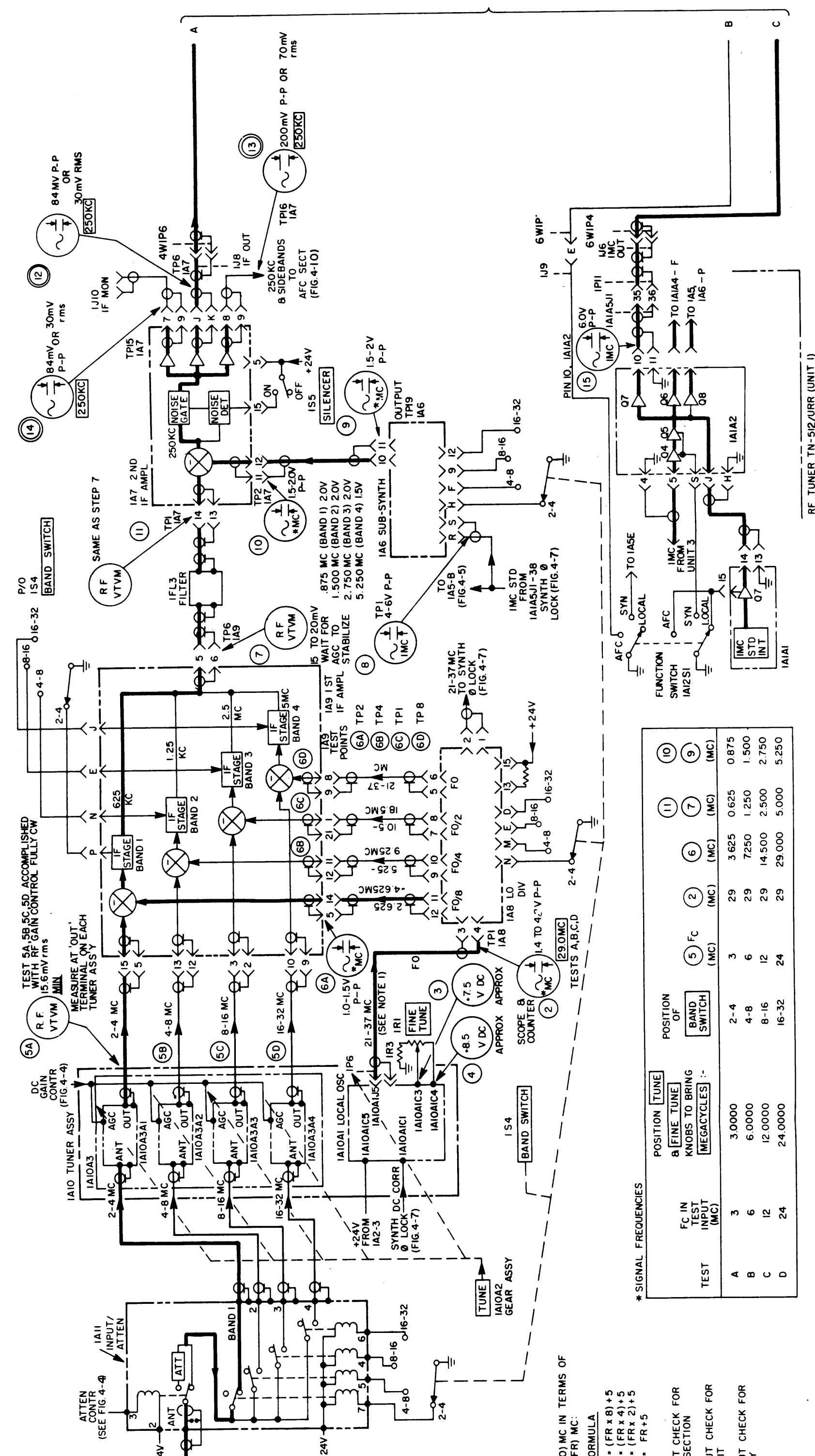
(1) CIRCUIT DESCRIPTION. (See figure 5-86.) - Circuitry in 3A13 is used in the receiver's synthesizer/phase lock section only (see figure 4-7 and paragraph 4-3f). The 3, 4, 5 or 6 mc selected by 3A4 enters the + sum mixer via pin 3 and amplifiers Q1 and Q2; the injection frequency (14.00000 to 14.09999 mc enters the sum mixer via pin 7 and amplifiers Q5 and Q6. The mixer consists of field-effect transistors Q3 and Q4 with tuned transformer T1 in the output to select the sum frequency. In the output of T1 is a voltage tuned circuit composed of capacitors C14, C15, C16, C17, C18 and C19, coil L3, diodes VC1 and VC2, and resistors R14 and R15.

The voltage tuned circuit is tuned for four possible frequency ranges, by a two-bit code entering at pins 15 and 16 of 3A13. The four ranges are (1) 17.00000 to 17.09999 mc (2) 18.00000 to 18.09999 mc (3) 19.00000 to 19.09999 mc and (4) 20.00000 to 20.09999 mc the four 2-bit codes are selected by the ten MEGACYCLES switch. A code is applied to binary decoders Z1 and Z2. The output is applied to positive NAND gate assembly Z3. The output of Z3 works through switching transistors.

Q24 and Q25; the output of Z2 works through Q26. The switching transistor (Q24, Q25 and Q26) control the selection of VC bias being fed to the voltage tuned circuits. A +25 vdc enters 3A13 at pin 2, and is routed via series regular Q22 to two voltage divider circuits. The output of Q22 is sampled in the network formed by R79, R80 and R81 and this sample is fed to the base of Q23. Q23 senses any output voltage change and acts to correct for it by controlling the conduction of Q22. Q21 senses a change in the input voltage and acts to correct for it by controlling the conduction of Q22. The four voltages (VC bias) change the voltage tuned circuit's capacitance value and frequency range. The resulting frequency is then amplified through Q7, Q8 and Q9 and brought to the difference mixer Q10. The other input into Q10 (16.1 to 17.0 mc) selected by the 1.0 MEGACYCLES switch. This frequency is brought in via pin 17 and amplifiers Q27 and Q28. The 0.200000 to 3.200000 mc difference frequency is then amplified through Q11, Q12, Q13, Q14, Q15 and Q16 and is brought to output pin 21. A second output is brought out via amplifiers Q17 and Q18 to pin 19. A sample of the signal is taken from the base of Q18 amplified through Q19 rectified by CR3 and fed to dc emitter follower Q20. The output of Q2 (AGC) is used to control Q27, keeping the output of 3A13 at a constant amplitude.

(2) TEST DATA. - Test data is given for inputs and outputs of 3A13 in servicing block diagram figure 4-7. Pertinent test and measurements are presented in paragraph 5-37.

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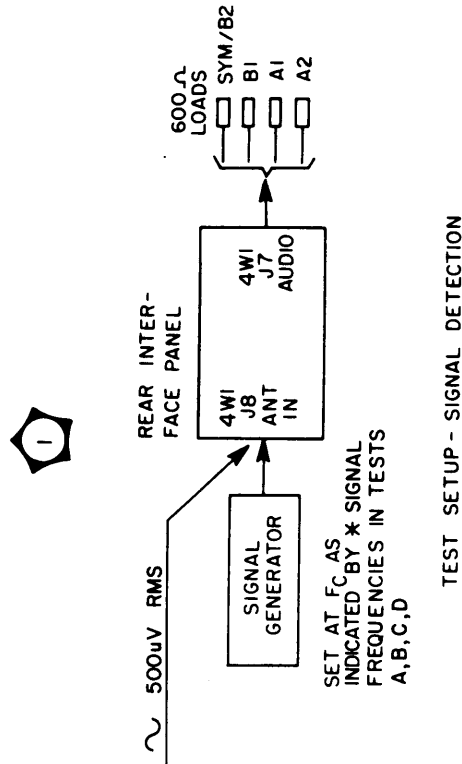
SC FREQ (FO) MC IN TERMS OF
TUNED FREQ (FR) MC:

TEST	FC IN TEST INPUT (MC)	POSITION OF BAND SWITCH	POSITION OF FINE TUNE & KNOBS TO BRING MEGACYCLES
A	3	2-4	3.0000
B	6	4-8	6.0000
C	12	8-16	12.0000
D	24	16-32	24.0000

* SIGNAL FREQUENCIES

TEST	FC IN TEST INPUT (MC)	POSITION OF BAND SWITCH	POSITION OF FINE TUNE & KNOBS TO BRING MEGACYCLES
A	3	2-4	3.0000
B	6	4-8	6.0000
C	12	8-16	12.0000
D	24	16-32	24.0000

Figure 4-2. Servicing Block Diagram, Signal Detection Section, ISB Mode (Sheet 1 of 2)



CONTROL POSITIONS FOR TEST

MODULAR UNIT	CONTROL	POSITION
TN-512/URR	ATTENUATOR SWITCH	DOWN
	RF GAIN KNOB	#AGC
	SILENCER SWITCH	DOWN
	POWER SWITCH	ON
	FUNCTION SWITCH	LOCAL
	COUNTER MODE SWITCH	REC
	BAND SWITCH	AS SHOWN IN TEST
	TUNE KNOB	MAX CCW
TD-915/URR	FINE TUNE KNOB	0
	METER SENSITIVITY SWITCH	B2
	SYM/B2 AGC SOURCE	B1
	AGC TIME CONSTANT SWITCHES (211)	A1 A2
	MODE SWITCH	MED
	POWER SWITCH	ON
O-1511/URR	LINE LEVEL ADJ KNOBS	**
	POWER SWITCH	OFF

** ADJUST EACH KNOB FOR "0 DBM" ON LINE-DBM METER USING MONITOR SELECTOR SWITCH

EXCEPT FULLY CW FOR TEST 5 ONLY

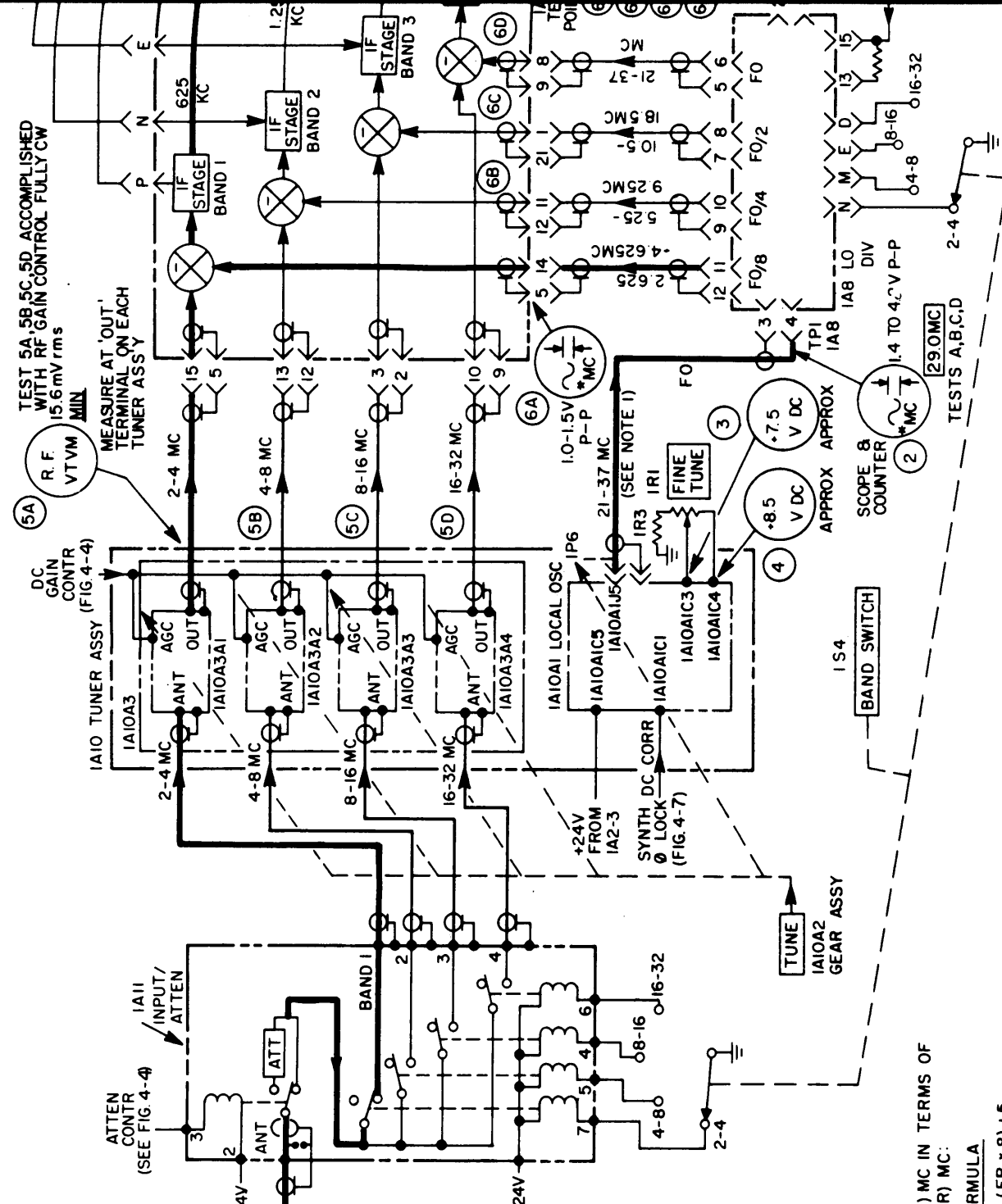
POWER SUPPLY VOLTAGES

VOLTS	SOURCE	TO: -
+24	IA2-3	IA1A1-26 IA1A2-21 IA6-14 IA7-5 IA8-13 IA8-15 IA9-A IA10A1 IA10A3A1 IA10A3A2 IA10A3A3 IA10A3A4 IA11
+24	2A1-3	2A2-1, 2A3-1 2A7-1, 2A9-1 2A11-1, 2A13-1
-24	IA2-10	IA7-A
+15	2A1-13	2A2-15
+5	2A1-E	2A3-2

NOTES: 1. LOCAL OSC FREQ (FO) MC IN TERMS OF RCVR TUNED FREQ (FR) MC:

BAND (MC)	FORMULA
2-4	FO = (FR x 8) + 5
4-8	FO = (FR x 4) + 5
8-16	FO = (FR x 2) + 5
16-32	FO = FR + 5

- 1. LOCAL OSC FREQ (FO) MC IN TERMS OF RCVR TUNED FREQ (FR) MC:
- 2. INPUT/OUTPUT CHECK FOR FUNCTIONAL SECTION
- 3. INPUT/OUTPUT CHECK FOR MODULAR UNIT
- 4. INPUT/OUTPUT CHECK FOR SUBASSEMBLY



* SIGNAL FREQUENCIES

TEST	FC IN TEST INPUT (MC)	POSITION OF BAND SWITCH	POSITION OF TUNE KNOBS TO BRING MEGACYCLES
A	3	2-4	30000
B	6	4-8	60000
C	12	8-16	120000
D	24	16-32	240000

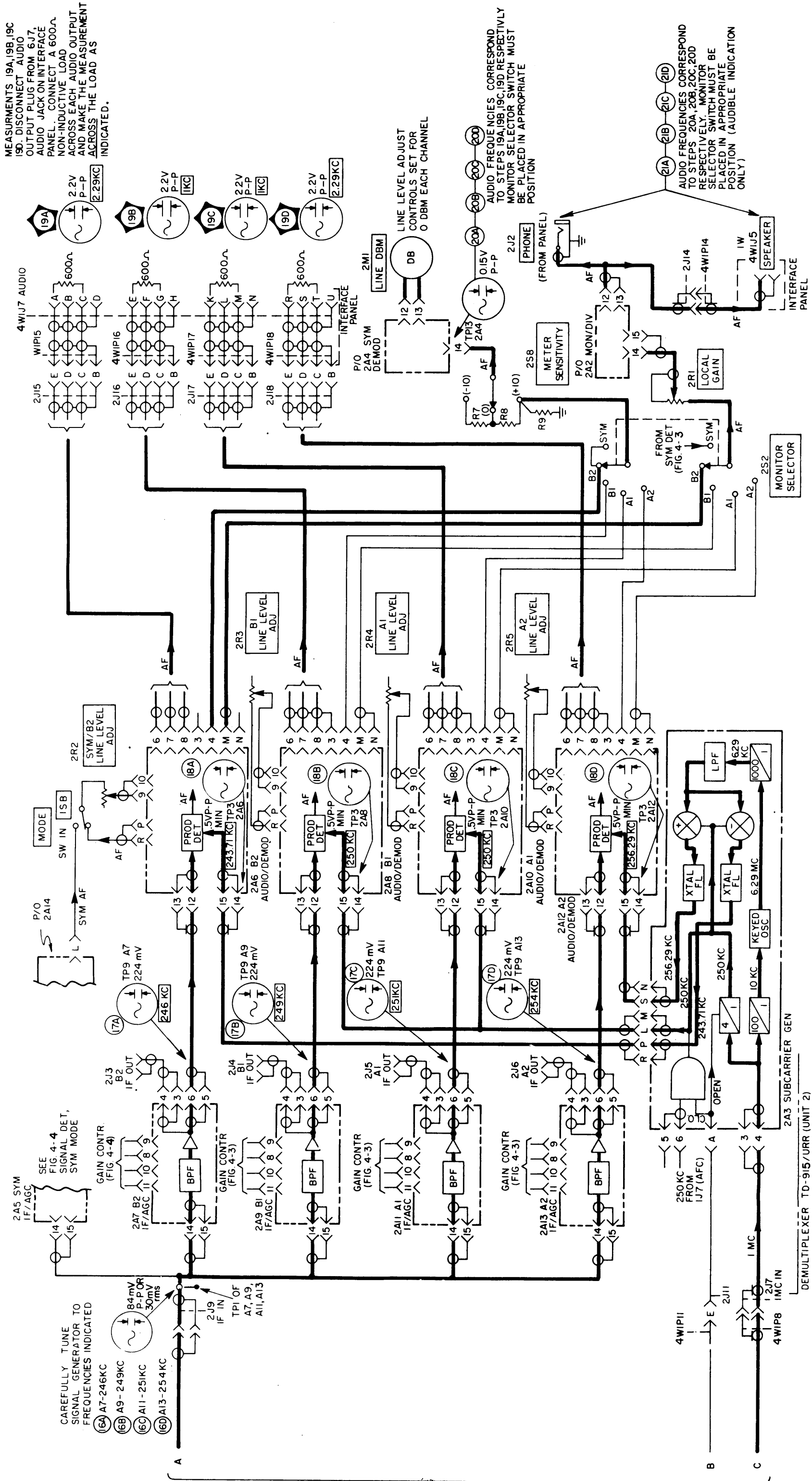


Figure 4-2. Servicing Block Diagram, Signal Detection Section, ISB Mode (Sheet 2 of 2)

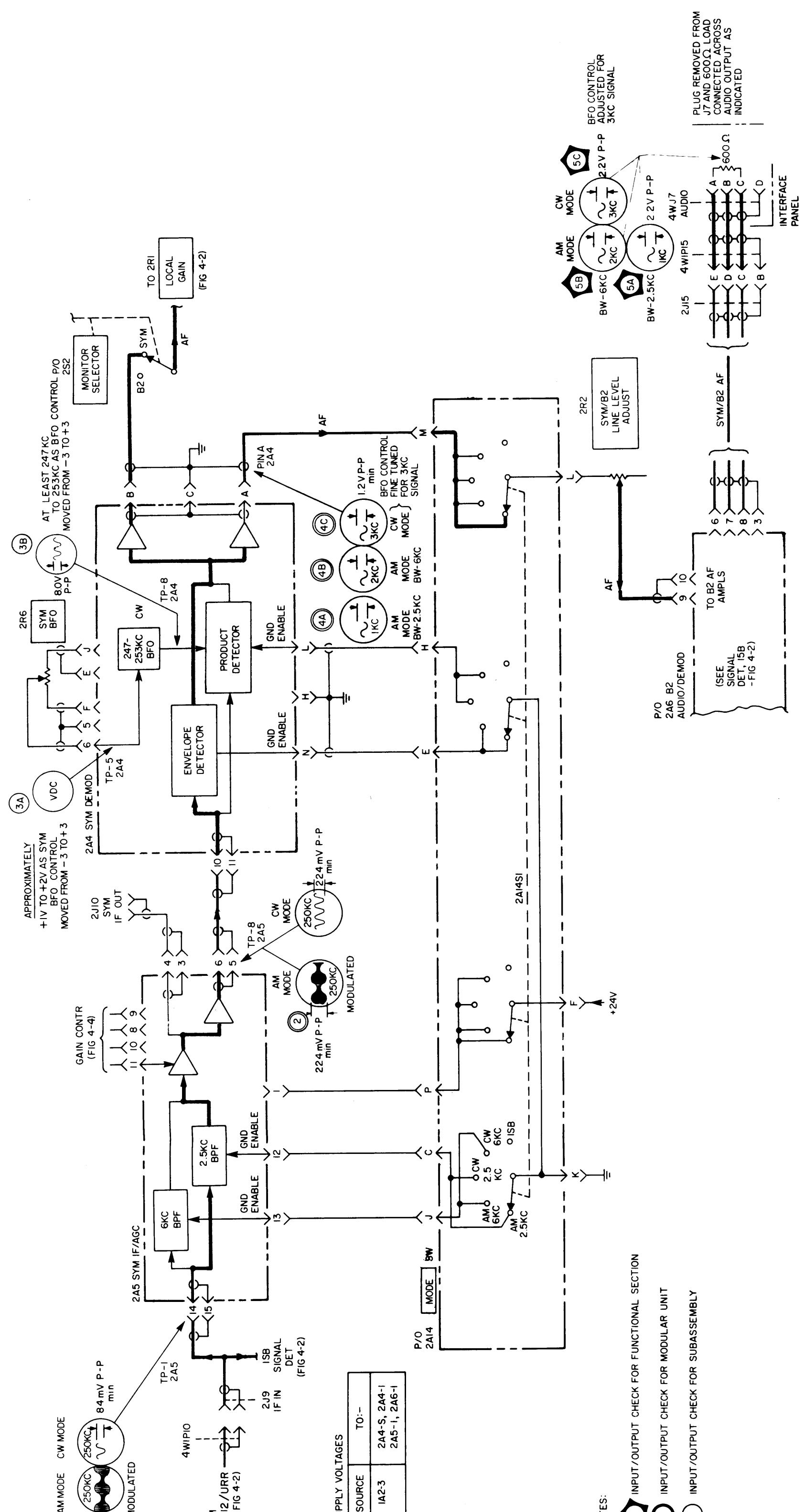
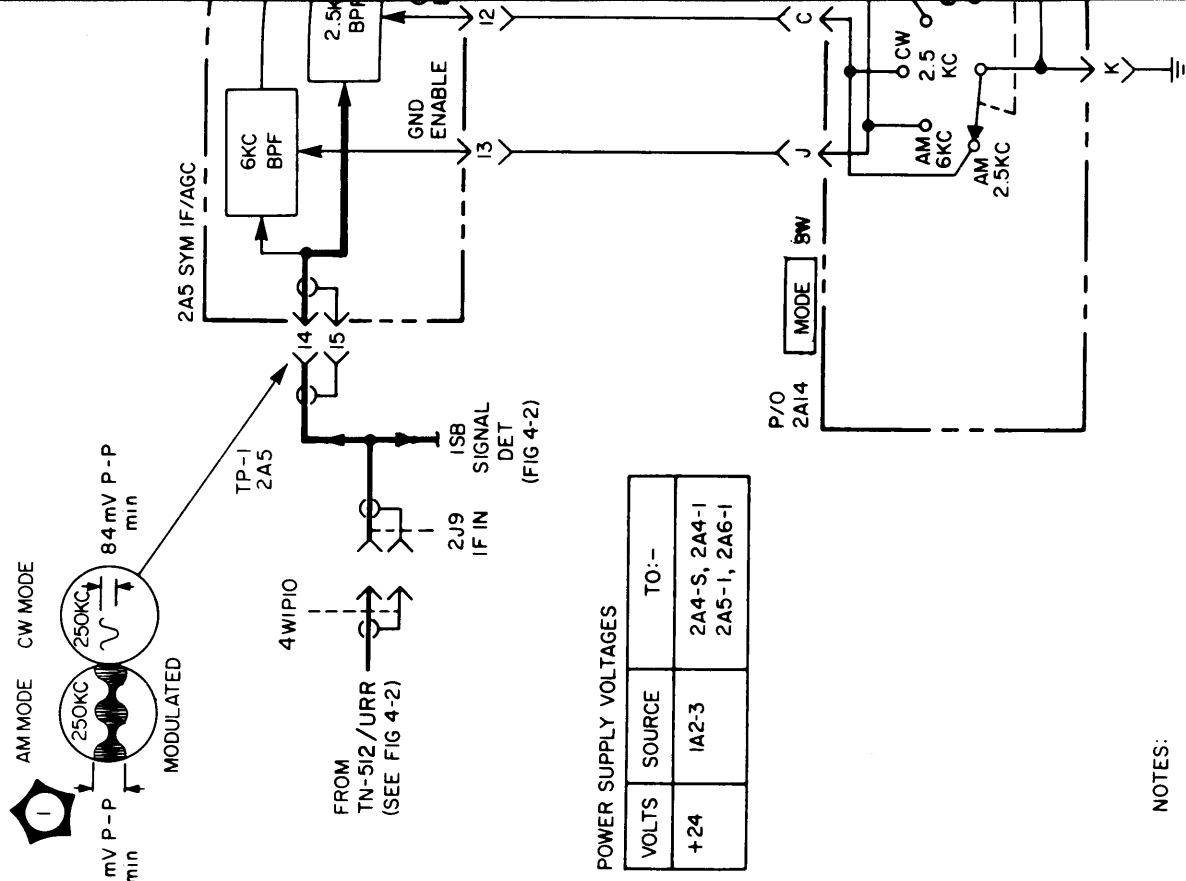


Figure 4-3. Servicing Block Diagram, Signal Detection Section, Symmetrical Mode

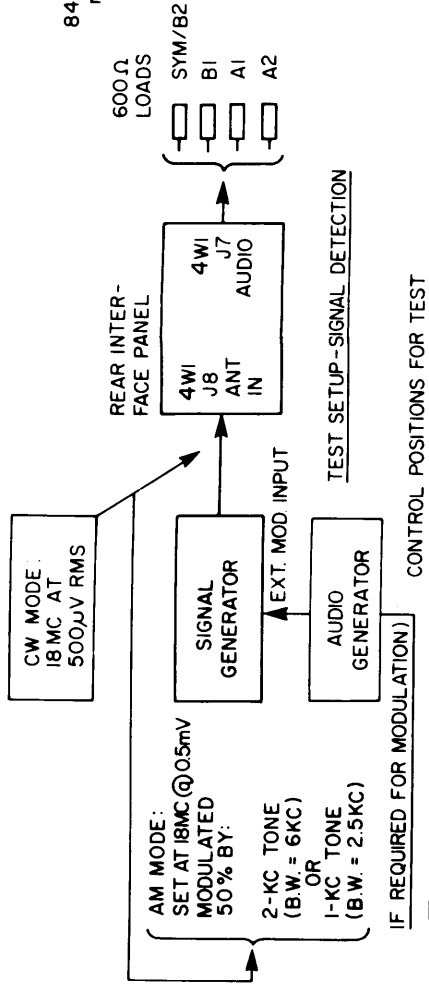


POWER SUPPLY VOLTAGES

VOLTS	SOURCE	TO:-
+24	1A2-3	2A4-S, 2A4-1 2A5-1, 2A6-1

NOTES:

- INPUT/OUTPUT CHECK FOR FUNCTIONAL SECTION
- INPUT/OUTPUT CHECK FOR MODULAR UNIT
- INPUT/OUTPUT CHECK FOR SUBASSEMBLY



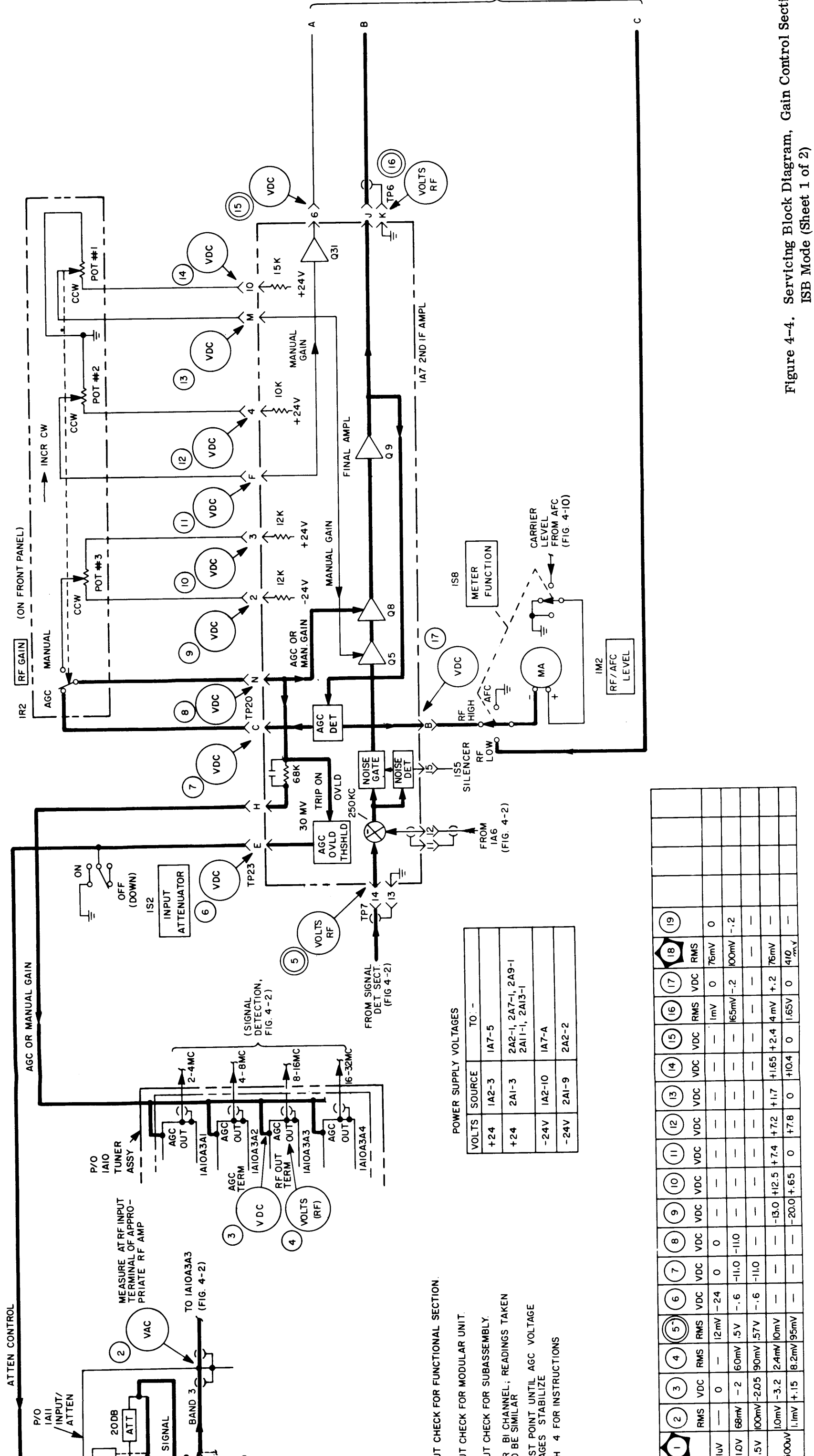
CONTROL POSITIONS FOR TEST

MODULAR UNIT	CONTROL	POSITION
TN-512/URR	ATTENUATOR SWITCH	DOWN
"	RF GAIN KNOB	AGC
"	SILENCER SWITCH	DOWN
"	POWER SWITCH	ON
"	FUNCTION SWITCH	LOCAL
"	COUNTER MODE SWITCH	REC
"	BAND SWITCH	16-32
"	TUNE KNOB	} TO OBTAIN 18.0000 ON MEGACYCLES DISPLAY
"	FINE TUNE KNOB	
TD-915/URR	METER SENSITIVITY SWITCH	0
"	SYM/B2 AGC SOURCE SWITCH	B2
"	SYM/B2 AGC TIME	{
"	CONSTANT SWITCH	
"	MODE SWITCH	AM 6KC (FOR AM) CW 2.5KC (FOR CW)
"	POWER SWITCH	ON
"	SYM/B2 LINE LEVEL	*
"	ADJ KNOB	+3KC
"	SYM BFO KNOB	OFF
O-1511/URR	POWER SWITCH	OFF

* ADJUST THIS KNOB FOR "ODBM" ON LINE-DBM METER, WITH MONITOR SELECTOR SWITCH AT SYM POSITION

ORIGINAL

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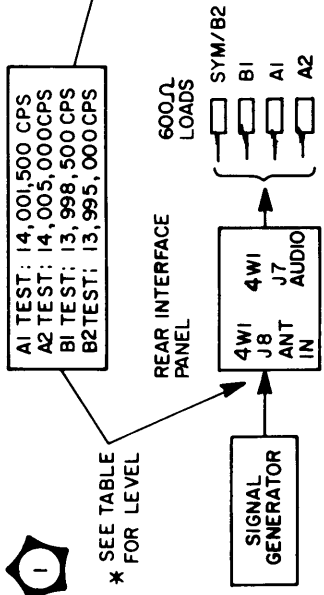


POWER SUPPLY VOLTAGES

VOLTS	SOURCE	TO -
+24	1A2-3	1A7-5
+24	2A1-3	2A2-1, 2A7-1, 2A9-1 2A11-1, 2A13-1
-24V	1A2-10	1A7-A
-24V	2A1-9	2A2-2

1	10V	1.0V	1.5V	500uV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV
2	1uV	1.0V	1.5V	500uV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV	1.1mV	8.2mV	95mV
3	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
4	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS
5	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS
6	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
7	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
8	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
9	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
10	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
11	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
12	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
13	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
14	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
15	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
16	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS
17	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC
18	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS	RMS
19	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC	VDC

Figure 4-4. Servicing Block Diagram, Gain Control Section, ISB Mode (Sheet 1 of 2)



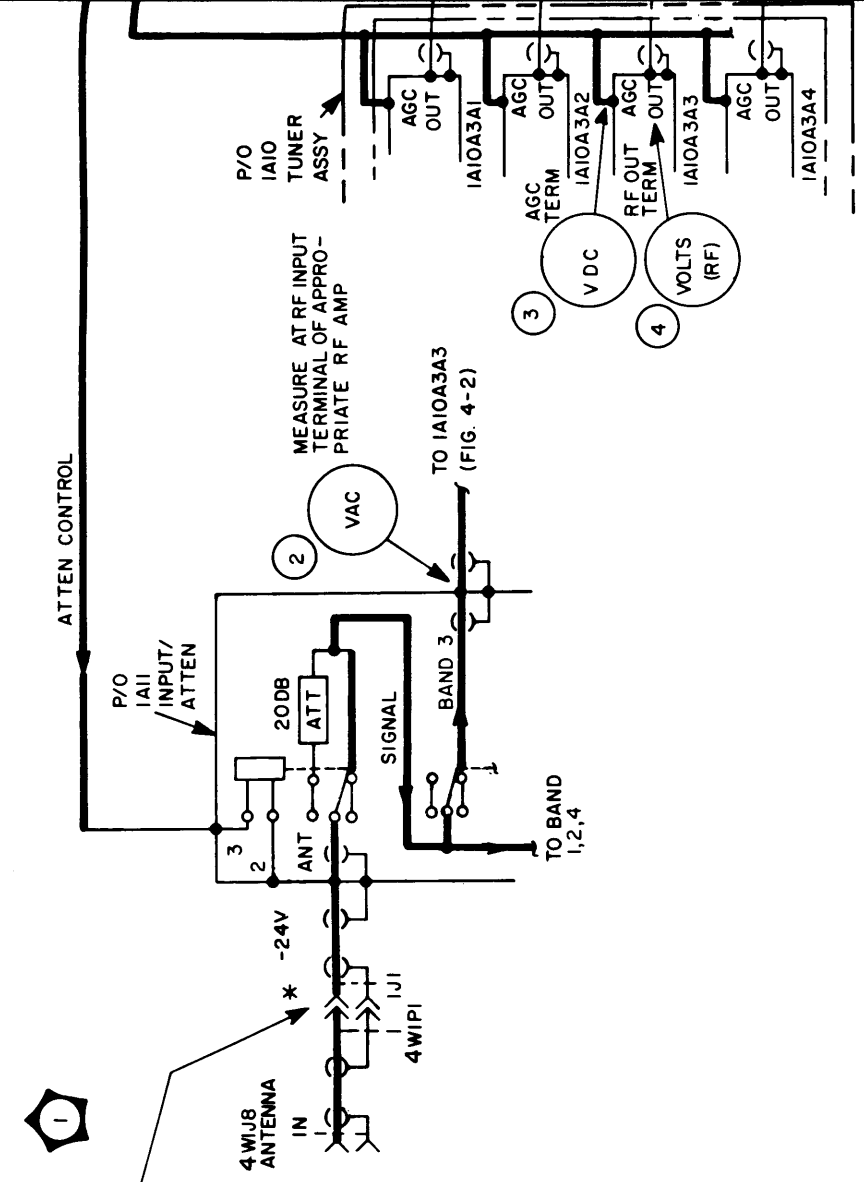
TEST SETUP - GAIN CONTROL

CONTROL POSITIONS FOR TEST

MODULAR UNIT	CONTROL	POSITION
TN-512/URR	ATTENUATOR SWITCH	OFF (DOWN)
"	RF GAIN KNOB (TESTS A, B, C)	AGC
"	" (TEST D)	FULLY CCW
"	" (TEST E)	FULLY CW
"	SILENCER SWITCH	OFF (DOWN)
"	POWER SWITCH	ON
"	FUNCTION SWITCH	SYN
"	COUNTER MODE SWITCH	REC
"	BAND SWITCH	AUTO
"	TUNE AND FINE TUNE KNOBS	WILL SERVO TUNE TO OBTAIN 14.0000 ON MEGACYCLES DISPLAY
"	METER FUNCTION SWITCH	RF HIGH
TD-915/URR	METER SENSITIVITY SWITCH	0
"	SYM/82 AGC SOURCE SWITCH	B2
"	"	B1
"	"	A1
"	"	A2
"	AGC TIME CONSTANT SWITCHES	FAST
"	MODE SWITCH	ISB
"	POWER SWITCH	ON
"	LINE LEVEL ADJ KNOBS	**
O-1511/URR	POWER SWITCH	ON
"	FREQUENCY SELECTORS	14.0000

** ADJUST EACH KNOB FOR "0 DBM" ON LINE-DBM METER, USING MONITOR SELECTOR SWITCH.

ORIGINAL



- NOTES:
- INPUT/OUTPUT CHECK FOR FUNCTIONAL SECTION.
 - INPUT/OUTPUT CHECK FOR MODULAR UNIT.
 - INPUT/OUTPUT CHECK FOR SUBASSEMBLY.
 - READINGS TAKEN FOR B1 CHANNEL; READINGS TAKEN FOR A2, A1, A3 SHOULD BE SIMILAR.
 - LEAVE METER AT TEST POINT UNTIL AGC VOLTAGE AND/OR SIGNAL VOLTAGES STABILIZE.
 - REFER TO PARAGRAPH 4 FOR INSTRUCTIONS.

* SIGNAL VARIATIONS

TEST	1	2	3	4	5	6	7	8	9	10	11	12	13
A AGC (MIN SIGNAL)	1μV	0	0	12mV	-24	0	0	0	0	0	0	0	0
B AGC (MAX SIGNAL)	1.0V	68mV	-2	60mV	.5V	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0
C AGC OVERLOAD	1.5V	100mV	-2.05	90mV	.57V	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0
D MANUAL GAIN (MIN)	500mV	1.0mV	-3.2	2.4mV	10mV	0	0	0	0	0	0	0	0
E MANUAL GAIN (MAX)	500mV	1.1mV	+1.15	8.2mV	95mV	0	0	0	0	0	0	0	0

VOLTS	SOURCE
+24	IA2-
+24	2A1-
-24V	IA2-
-24V	2A1-

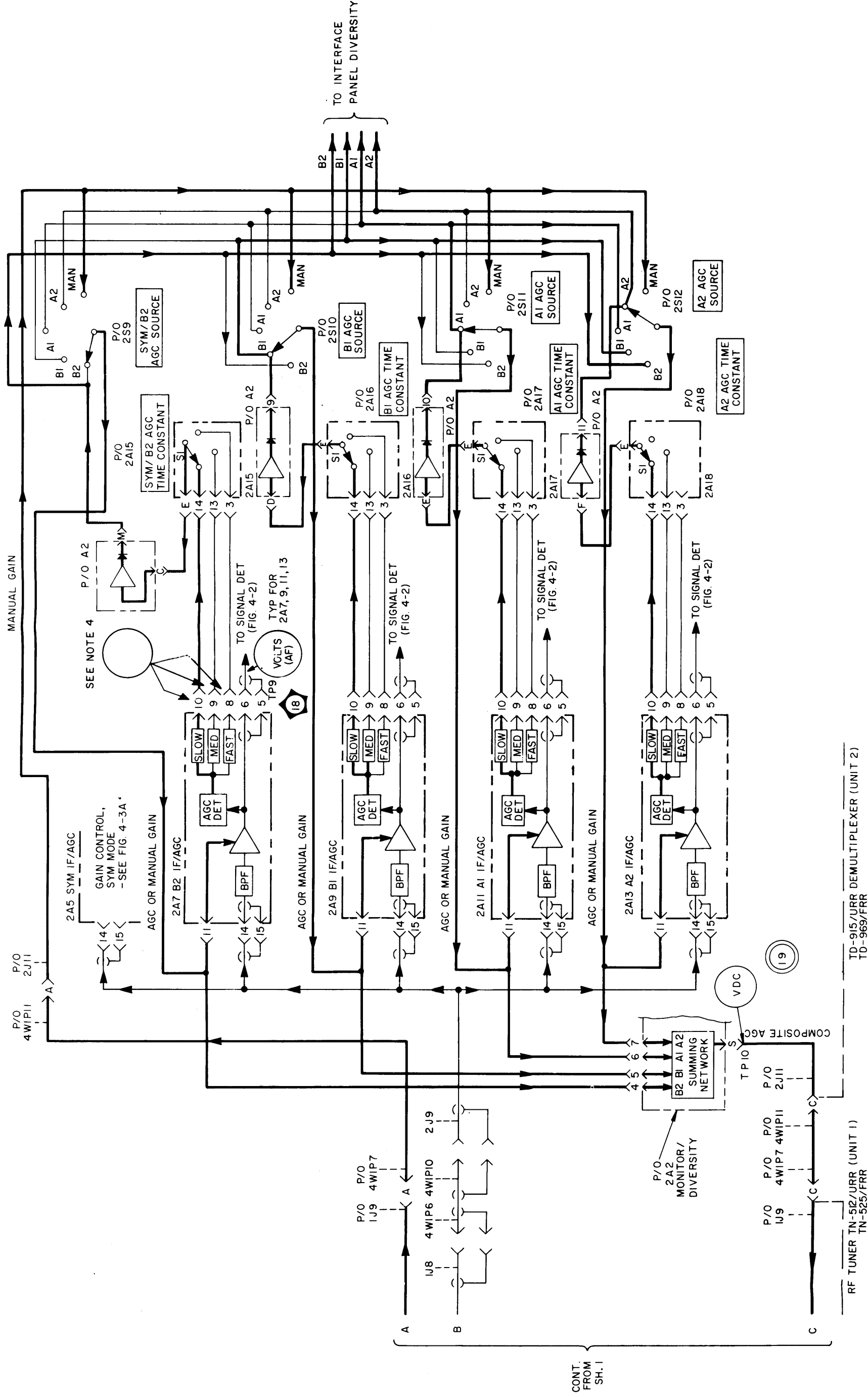


Figure 4-4. Servicing Block Diagram, Gain Control Section, ISB Mode (Sheet 2 of 2)

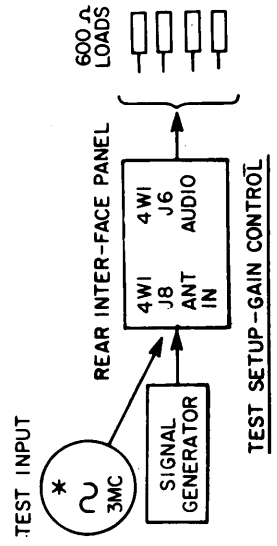
ORIGINAL

4-33, 4-34

ID-915/URR DEMULTIPLEXER (UNIT 2)
TD-969/FRR

RF TUNER TN-512/URR (UNIT 1)
TN-525/FRR

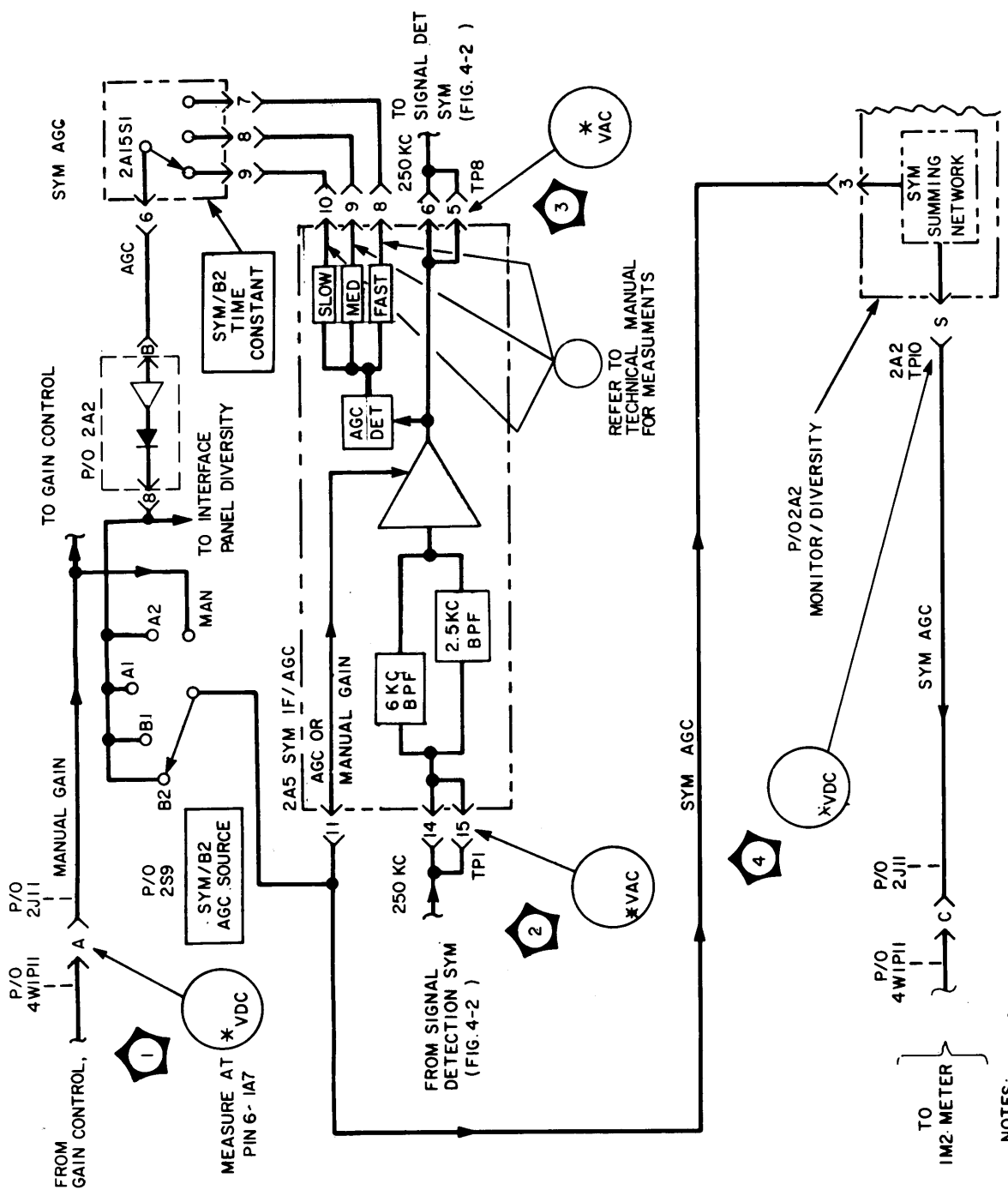
CONT. FROM SH. 1



TEST SETUP - GAIN CONTROL

MODULAR UNIT	CONTROL	POSITION
TN-512/URR	ATTENUATOR SWITCH	OFF(DOWN)
(OR TN-525/FRR)	RF GAIN KNOB(TESTS A,B)	AGC
"	" (TEST C)	FULLY CCW
"	" (TEST D)	FULLY CW
"	SILENCER SWITCH	OFF (DOWN)
"	POWER SWITCH	ON
"	FUNCTION SWITCH	LOCAL
"	COUNTER MODE SWITCH	REC
"	BAND SWITCH	2-4
"	TUNE AND FINE TUNE	
"	KNOBS	TO OBTAIN 3.0000 ON MEGACYCLES DISPLAY
"	METER FUNCTION SWITCH	R F LOW
TD-915/URR	METER SENSITIVITY SWITCH	0
(OR TD-969/FRR)	SYM/B2 AGC SOURCE	(TESTS A,B)---B2 (TESTS C,D)---MAN
"	B,A1,A2,AGC SOURCE SWITCH	OPTIONAL
"	MODE SWITCH	AM6KC
"	POWER SWITCH	ON
"	SYM/B2 LINE LEVEL ADJ	*
"	KNOB	*
"	B1,A1,A2,LINE LEVEL ADJ	*
"	KNOBS	OPTIONAL
"	SYM/B2 AGC TIME CONSTANT	
"	SWITCH	SLOW
"	B1,A1,A2,AGC TIME CONSTANT	
"	SWITCHES	OPTIONAL
O-1511/URR	POWER SWITCH	OFF

* * SET MONITOR SELECTOR SWITCH AT SYM AND ADJUST KNOB FOR "0 DBM" ON LINE-DBM METER.



NOTES:
1. INPUT/OUTPUT CHECK FOR FUNCTIONAL SECTION.
2. INPUT/OUTPUT CHECK FOR SUBASSEMBLY.

* SIGNAL VARIATIONS

TEST	3M C TEST INPUT (MV)	1 VDC	2 RMS	3 VDC	4 VDC
A AGC (MIN SIGNAL)	1uV	—	1mV	76mV	0V
B AGC (MAX SIGNAL)	IV	—	200mV	100mV	-.2V
C MANUAL GAIN (MIN)	500uV	+2.4V	5mV	76mV	—
D MANUAL GAIN (MAX)	500uV	0V	2V	410mV	—

VOLTS SOURCE	TO
+24	2A1-3
	2A5-1

Figure 4-5. Servicing Block Diagram, Gain Control Section, Symmetrical Mode

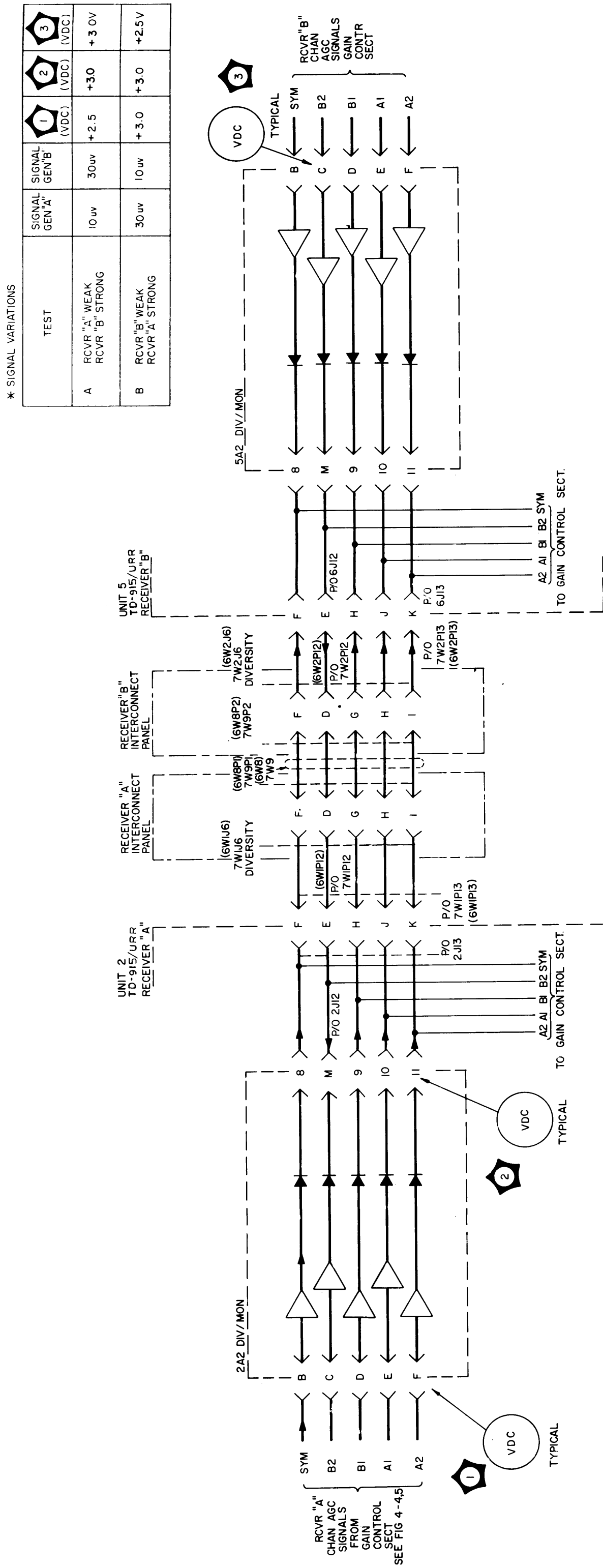
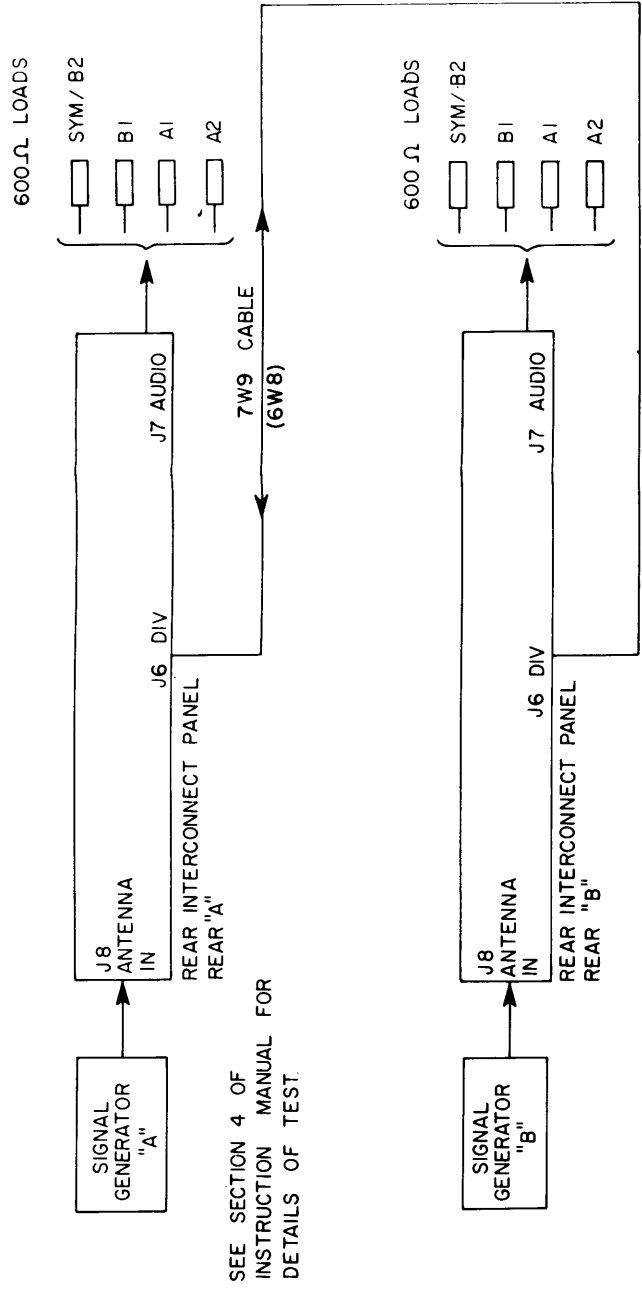


Figure 4-6. Servicing Block Diagram, Diversity Quieter Section

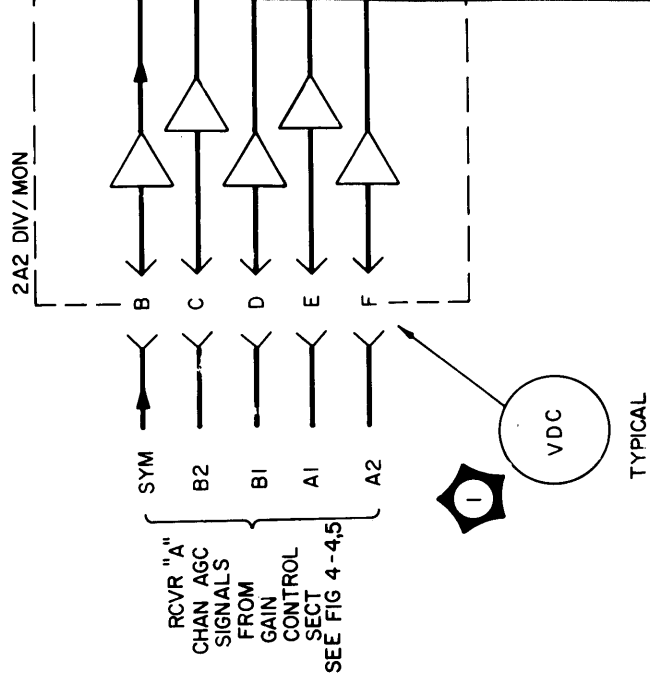


SEE SECTION 4 OF
INSTRUCTION MANUAL FOR
DETAILS OF TEST.

TEST SETUP-DIVERSITY QUIETER
CONTROL POSITION FOR TEST

MODULAR UNIT	CONTROL	POSITION
TN-512/URR	ATTENUATOR SWITCH	OFF (DOWN)
	RF GAIN - KNOB	AGC
	SILENCER SWITCH	OFF (DOWN)
	POWER SWITCH	ON
	FUNCTION SWITCH	LOCAL
	COUNTER MODE SWITCH	REC
	BAND SWITCH	2-4
	TUNE AND FINE TUNE KNOBS	TO OBTAIN 3.0000 ON MEGACYCLES DISPLAY
	METER FUNCTION SWITCH	RF HIGH
	METER SENSITIVITY SWITCH	0
	SYM/B2 AGC SOURCE SWITCH	B2
TD-915/URR	BI AGC SOURCE SWITCH	B1
	A1 " " "	A1
	A2 " " "	A2
	AGC TIME CONSTANT SWITCH (ALL)	FAST
O-1511/URR	MODE SWITCH	ISB
	POWER SWITCH	ON
	LINE LEVEL ADJ KNOBS (ALL)	* *
	POWER SWITCH	OFF

* * ADJUST EACH KNOB FOR "0" dbm ON LINE DBM METER USING MONITOR SELECTOR SWITCH
CONNECTIONS FOR AN/URR-64 (V)3 SHOWN IN PARENTHESIS



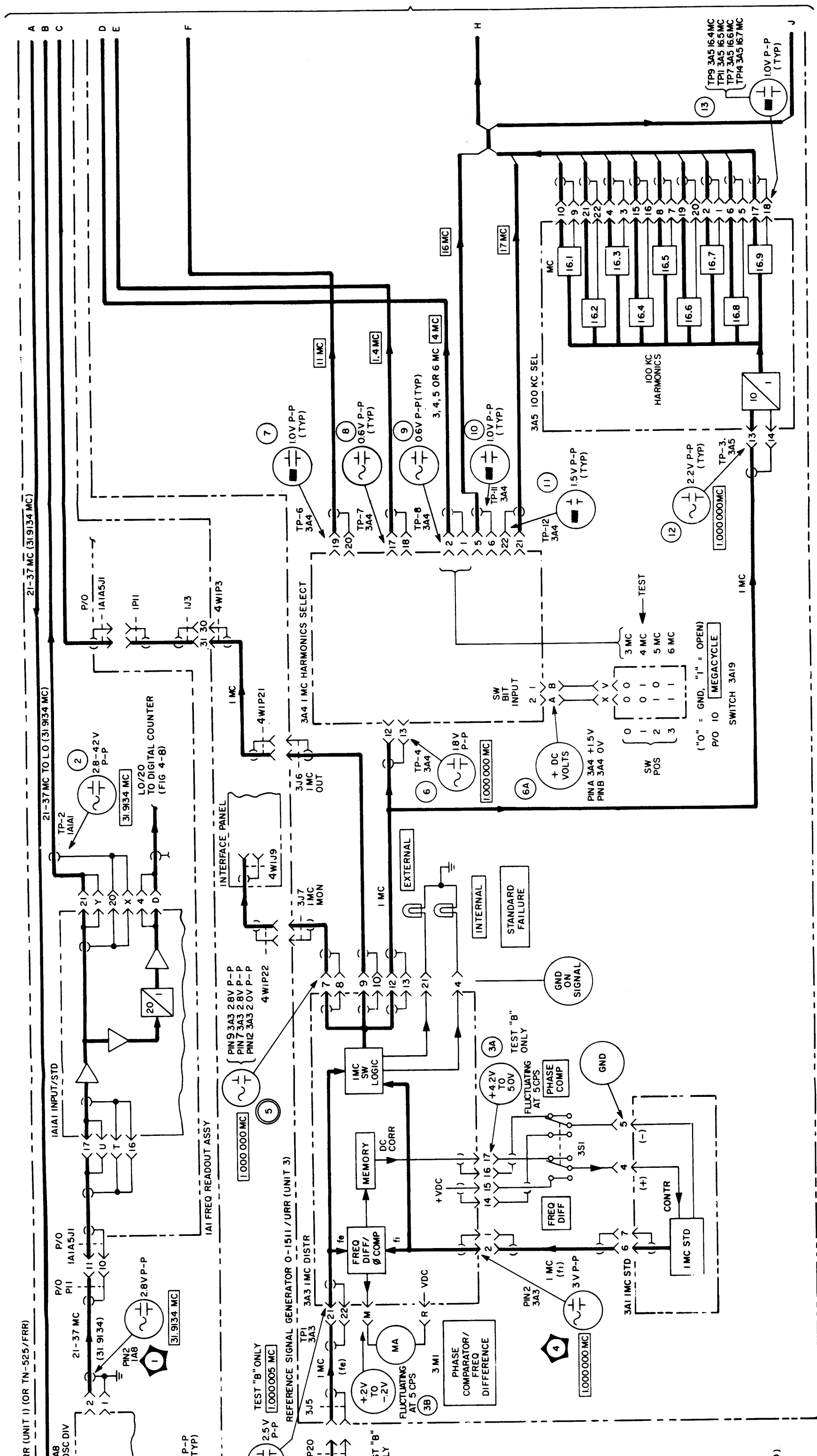
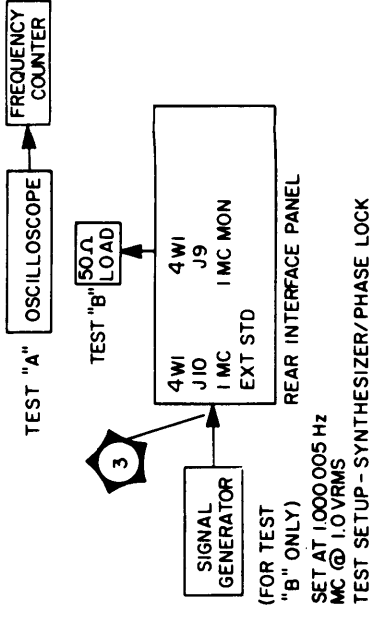
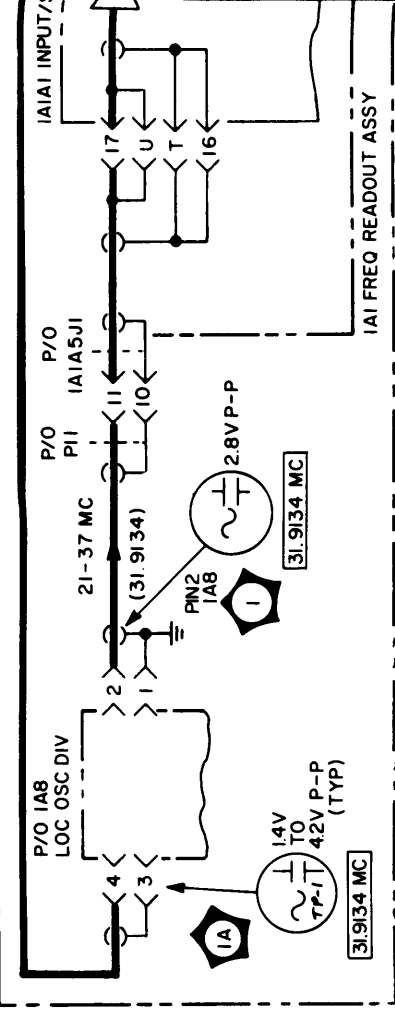


Figure 4-7. Servicing Block Diagram, Synthesizer/Phase Lock Section (Sheet 1 of 3)

RF TUNER TN-512/URR (UNIT 1) (OR TN-525/FRR)



(FOR TEST "B" ONLY)
SET AT 1000.005 Hz
MC @ 1.0 VRMS
TEST SETUP - SYNTHESIZER/PHASE LOCK

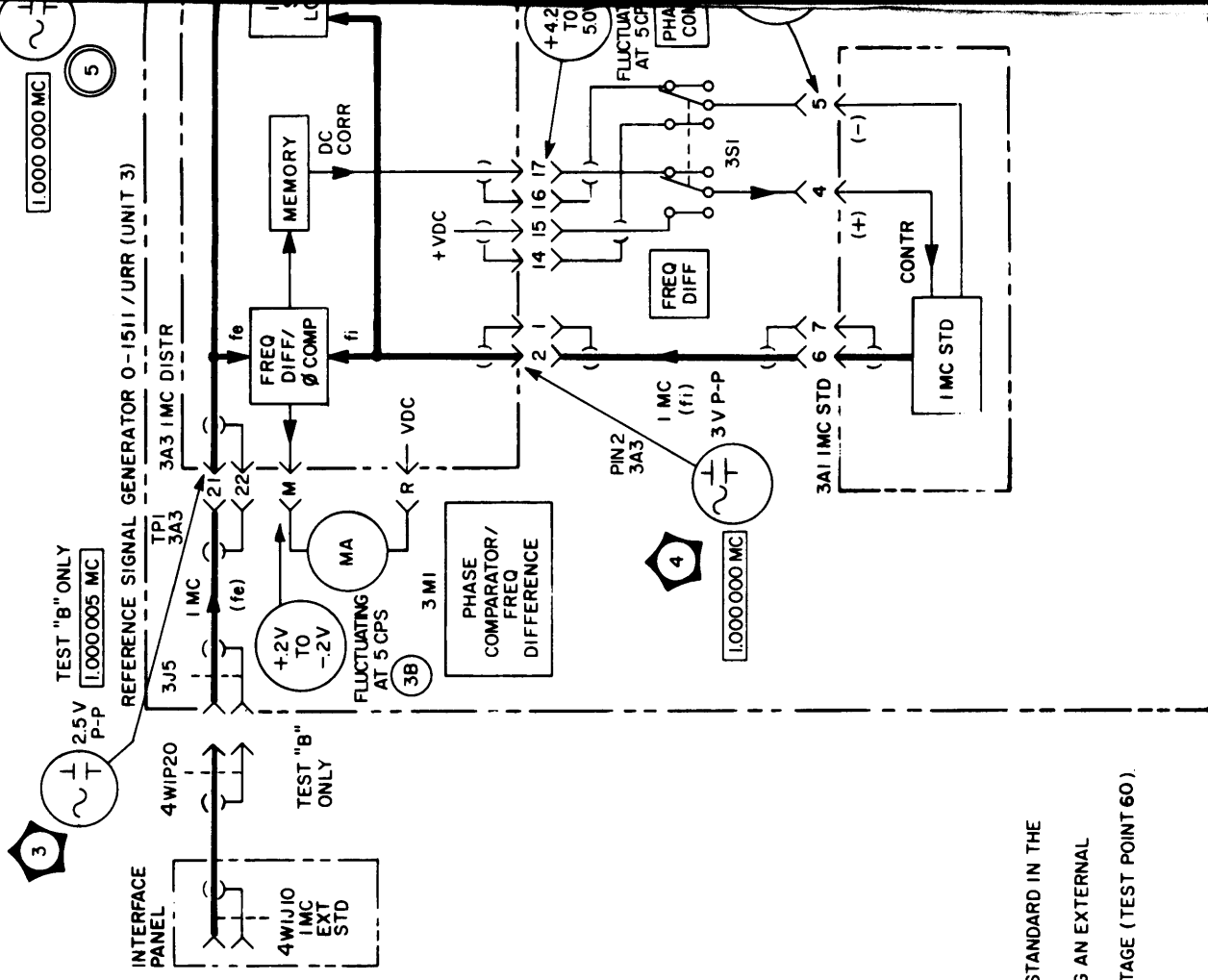
CONTROL POSITIONS FOR TEST *

MODULAR UNIT	CONTROL	POSITION
TN-512/URR	POWER SWITCH	ON
"	FUNCTION SWITCH	SYN
"	COUNTER MODE SWITCH	REC 8-16
0-1511/URR	BAND SWITCH	1
"	10 MEGACYCLE SWITCH	3
"	"	4
"	"	5
"	"	6
"	"	7
"	PHASE COMPARATOR/ FREQ DIFFERENCE SW (TEST "A") COMPAR- "B" "C" ATOR	{ PHASE COMPAR- ATOR
"	FREQ DIFFERENCE SW (TEST "B")	{ FREQ DIFFER- ENCE
"	POWER SWITCH	ON

* POSITIONS OF CONTROLS NOT LISTED ARE OPTIONAL

NOTES

- 1 INPUT/OUTPUT CHECKS FOR FUNCTIONAL SECTION
 ○ INPUT/OUTPUT CHECKS FOR MODULAR UNITS
 ○ INPUT/OUTPUT CHECKS FOR SUBASSEMBLIES
- 2 TEST "A" IS A GENERAL OVERALL TEST USING THE INTERNAL 1 MC STANDARD IN THE 0-1511/URR AND SYNCHRONIZING THE RECEIVER ON 13.4567 MC.
 TEST "B" TESTS THE 1-MC AUTOMATIC TRANSFER SWITCHING, USING AN EXTERNAL 1 MC STANDARD (TEST POINTS 3, 3A, B, 3B).
 TEST "C" TESTS THE PULL-IN FUNCTIONING OF THE PHASE LOCK STAGE (TEST POINT 60).



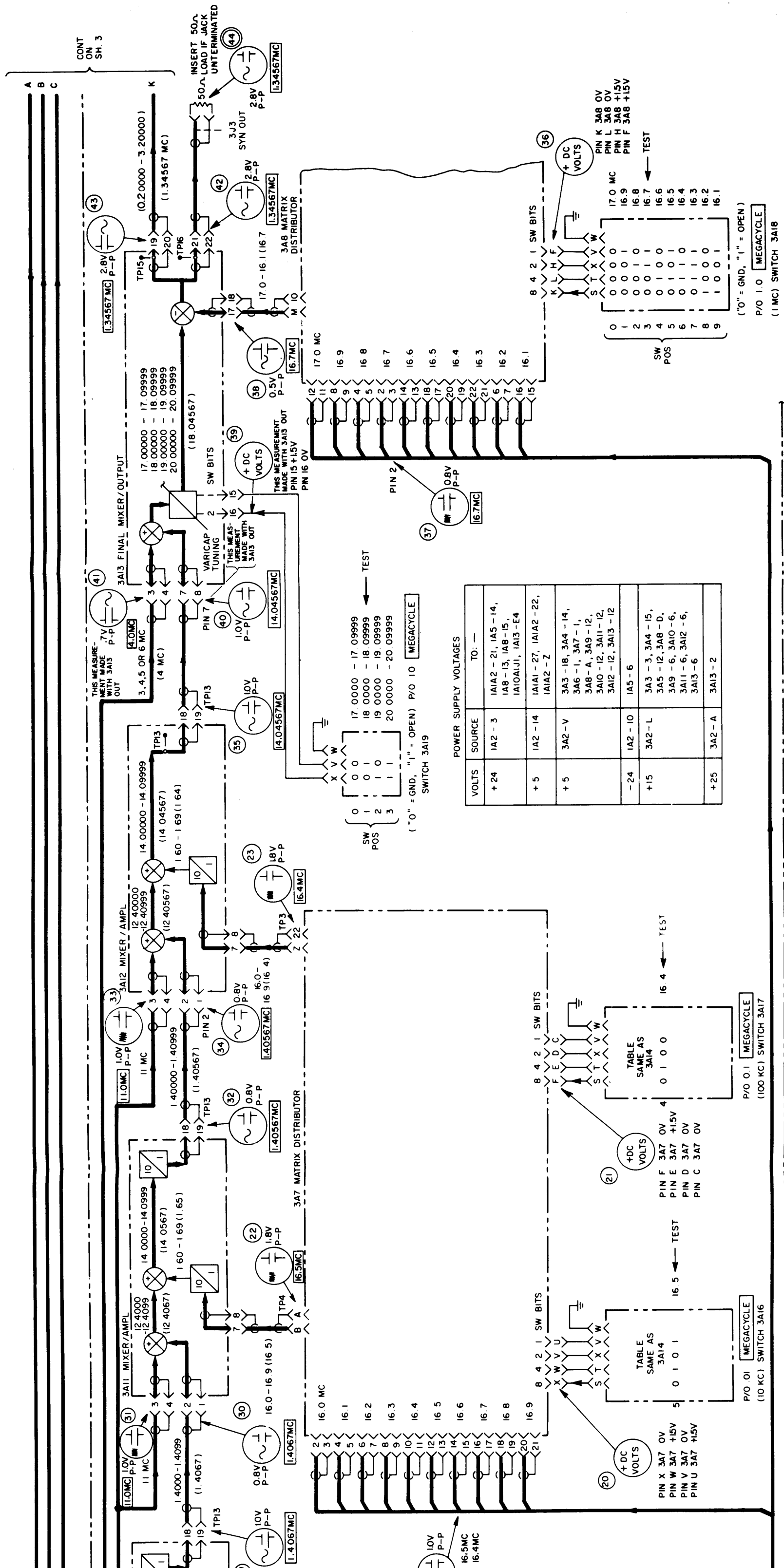


Figure 4-7. Servicing Block Diagram, Synthesizer/Phase Lock Section (Sheet 2 of 3)

SW POS

0	0	0	17 0000 - 17 09999
1	0	1	18 0000 - 18 09999
2	1	0	19 0000 - 19 09999
3	1	1	20 0000 - 20 09999

("0" = GND, "1" = OPEN) P/O 10 MEGACYCLE
SWITCH 3A19

POWER SUPPLY VOLTAGES

VOLTS	SOURCE	TO:
+24	IA2-3	IAIA2-21, IA5-14, IAB-13, IAB-15, IAIOAIJ1, IA13-E4
+5	IA2-14	IAIA1-27, IAIA2-22, IAIA2-Z
+5	3A2-V	3A3-18, 3A4-14, 3A6-1, 3A7-1, 3A8-A, 3A9-12, 3A10-12, 3A11-12, 3A12-12, 3A13-12
-24	IA2-10	IA5-6
+15	3A2-L	3A3-3, 3A4-15, 3A5-12, 3A8-D, 3A9-6, 3A10-6, 3A11-6, 3A12-6, 3A13-6
+25	3A2-A	3A13-2

8 4 2 1 SW BITS
F E D C
S T X V W

TABLE SAME AS 3A14
0 1 0 0

P/O 0.1 MEGACYCLE
(100 KC) SWITCH 3A17

+DC VOLTS
PIN F 3A7 OV
PIN E 3A7 +15V
PIN D 3A7 OV
PIN C 3A7 OV

8 4 2 1 SW BITS
X W V U
S T X V W

TABLE SAME AS 3A14
0 1 0 1

P/O 0.1 MEGACYCLE
(10 KC) SWITCH 3A16

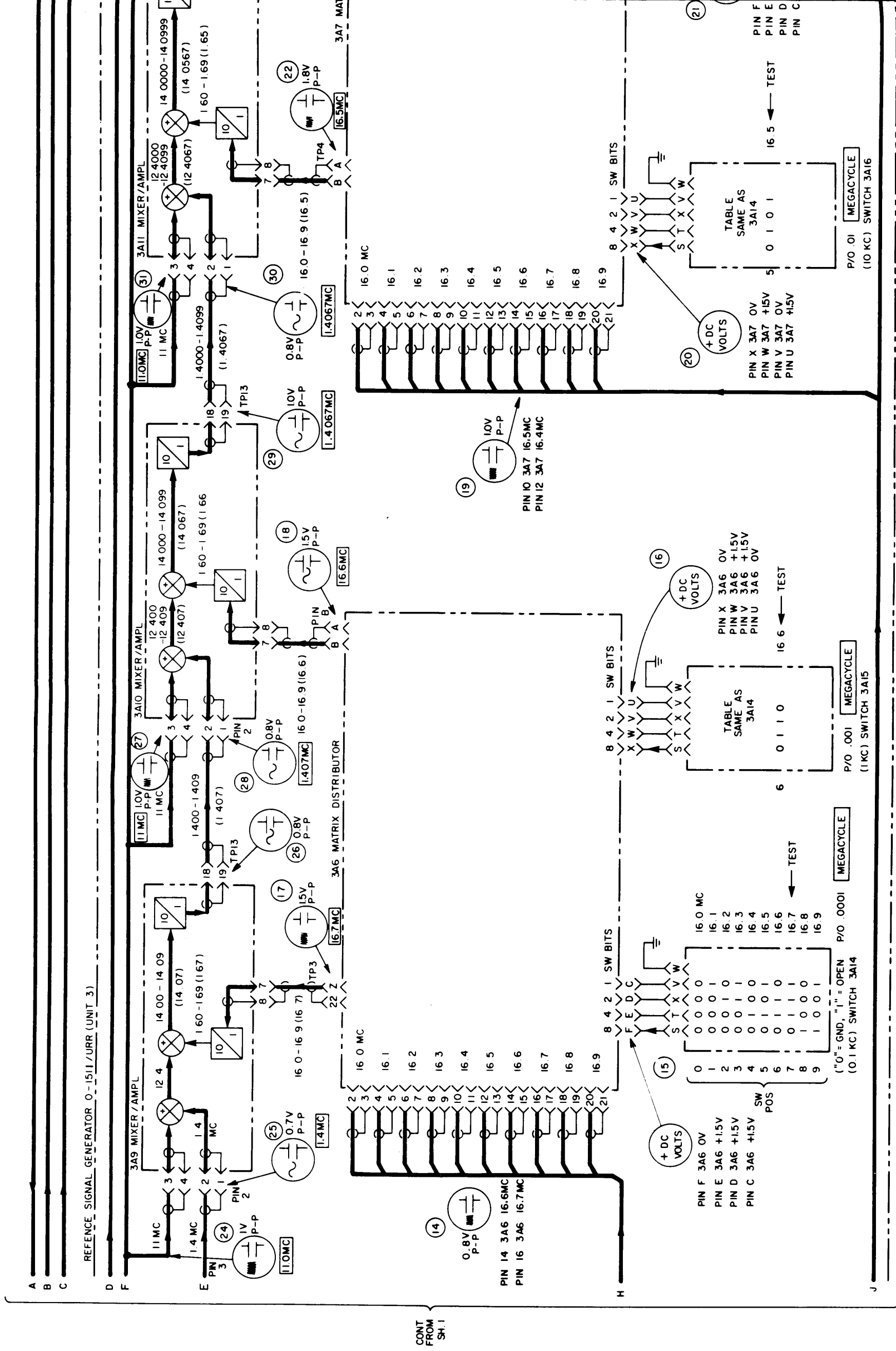
+DC VOLTS
PIN X 3A7 OV
PIN W 3A7 +15V
PIN V 3A7 OV
PIN U 3A7 +15V

8 4 2 1 SW BITS
K L H F
S T X V W

TABLE TEST
0 0 0 0
0 0 0 1
0 0 1 0
0 0 1 1
0 1 0 0
0 1 0 1
0 1 1 0
0 1 1 1
1 0 0 0
1 0 0 1
1 0 1 0
1 0 1 1
1 1 0 0
1 1 0 1

P/O 1.0 MEGACYCLE
(1 MC) SWITCH 3A18

+DC VOLTS
PIN K 3A8 OV
PIN L 3A8 OV
PIN H 3A8 +15V
PIN F 3A8 +15V



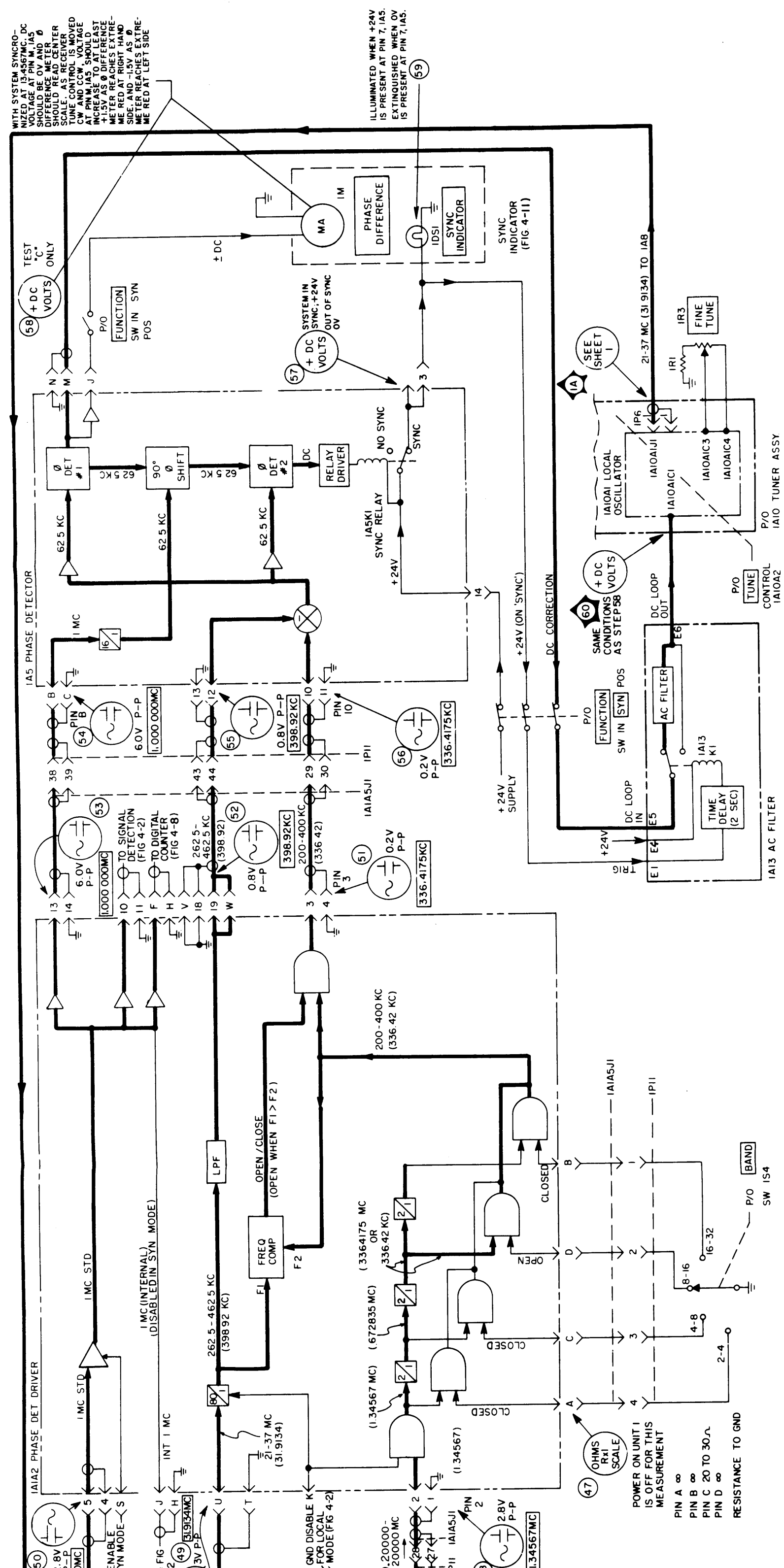
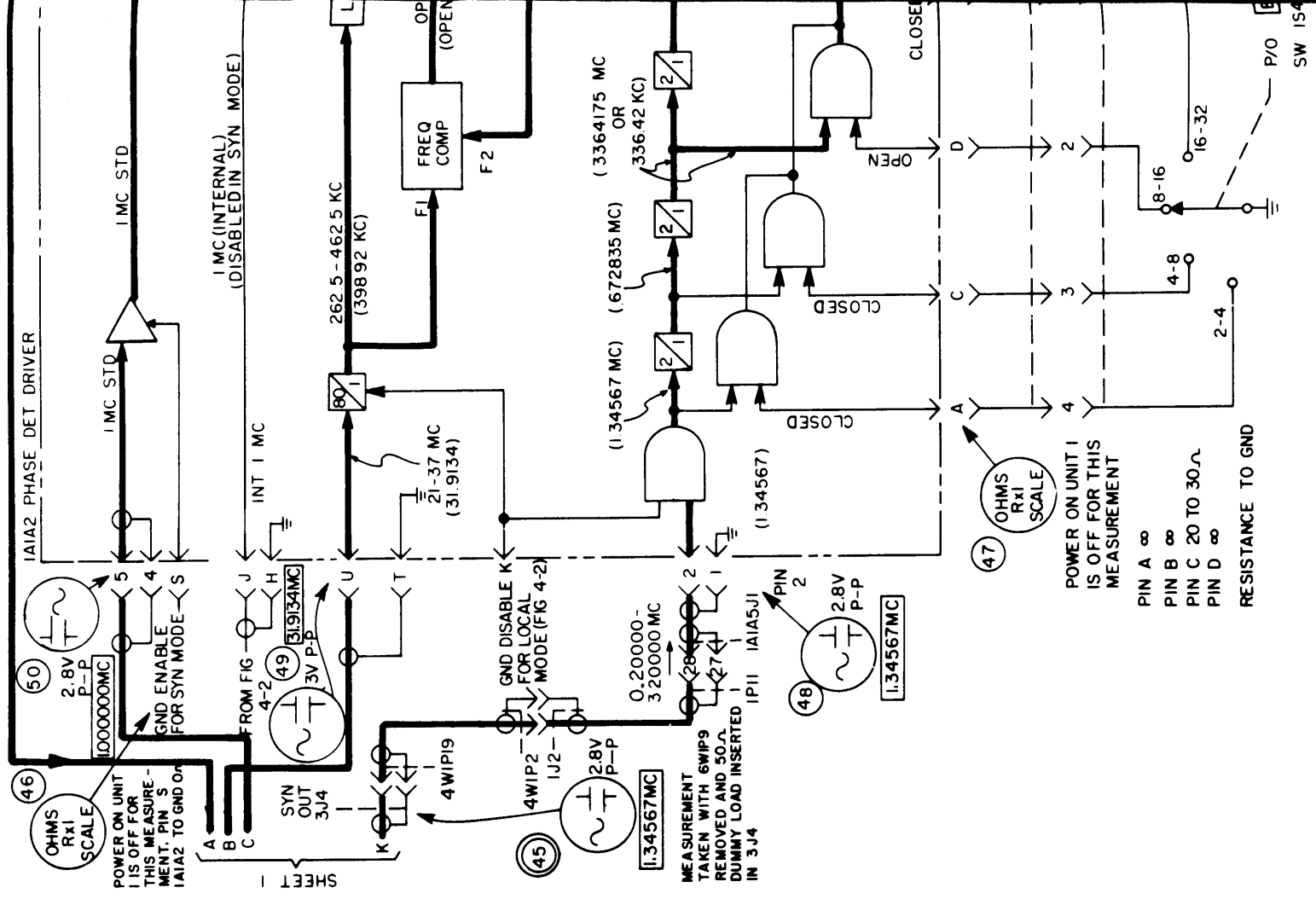


Figure 4-7. Servicing Block Diagram, Synthesizer/Phase Lock Section (Sheet 3 of 3)



46/E6

ORIGINAL

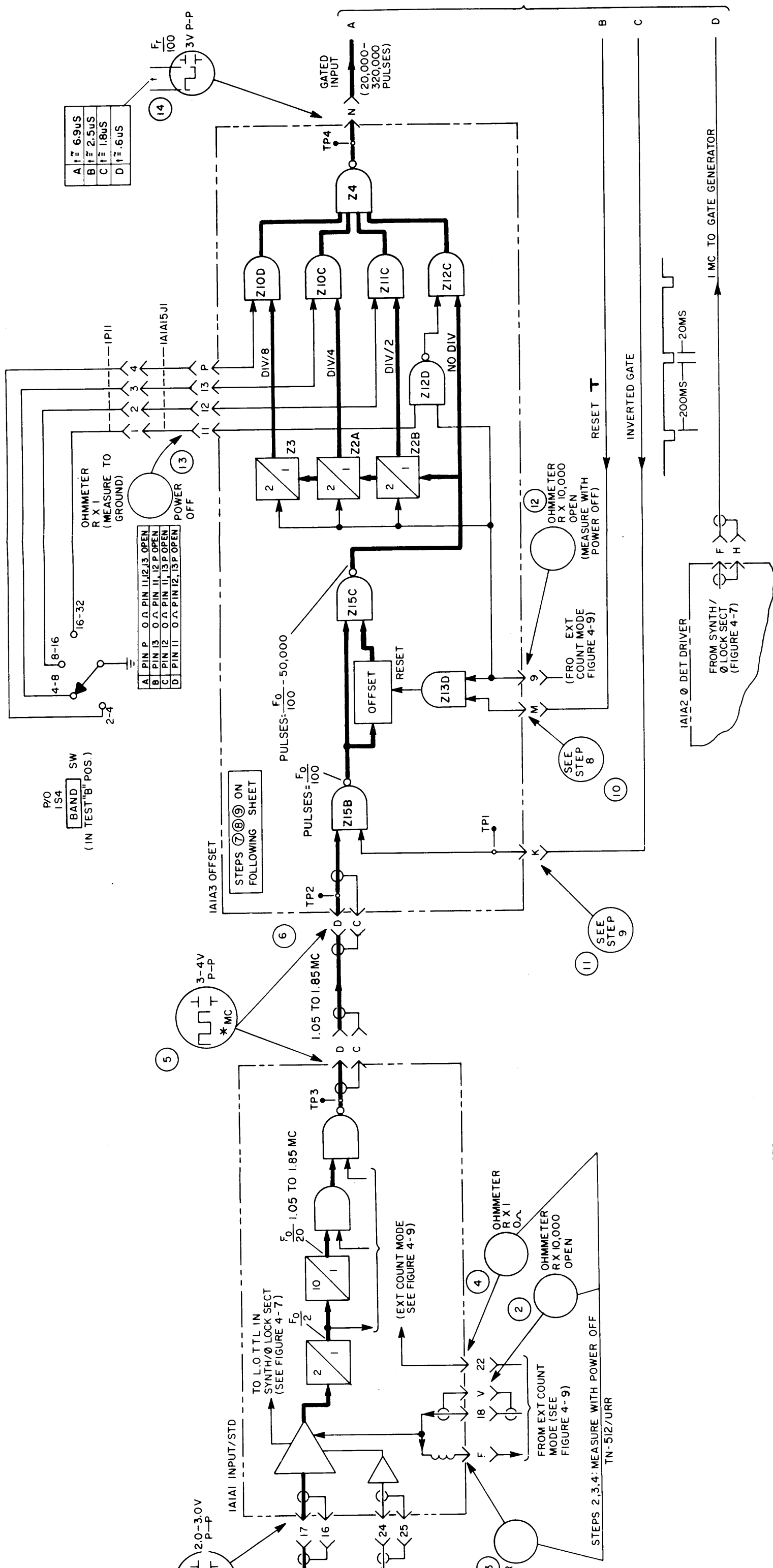


Figure 4-8. Servicing Block Diagram, Digital Counter Section, Receiver Mode (Sheet 1 of 2)

DIGITAL COUNT SECTION		
RECEIVING MODE	TEST	
MODULAR UNIT	CONTROL	POSITION
TN-512/URR	POWER SWITCH	ON
	FINE TUNE	MID POSITION
	LOCK	OFF
	TUNE	ADJUST FOR FREQUENCY INDICATED IN TEST TABLE
O-1511/URR	BAND SWITCH	SEE TEST TABLE
	FUNCTION	SYN
	COUNTER MODE	REC
	OTHER CONTROLS	OPTIONAL
TD-915/URR	POWER SWITCH	ON
	FREQUENCY/SELECTOR OTHER CONTROLS	SEE TEST TABLE OPTIONAL
TD-915/URR	POWER SWITCH	OFF

1. SET 0-1511/URR FREQUENCY SELECTORS TO TEST FREQUENCY

2. ON RF TUNER, SET BANDSWITCH TO APPROPRIATE POSITION AND ADJUST TUNE CONTROL FOR EXTERNAL COUNTER READING SPECIFIED IN TEST TABLE. SYNCHRONIZE RECEIVER.

3. CARRY OUT TESTS A,B,C AND D AT EACH TEST POINT (IF APPROPRIATE) BEFORE PROCEEDING TO NEXT STEP.

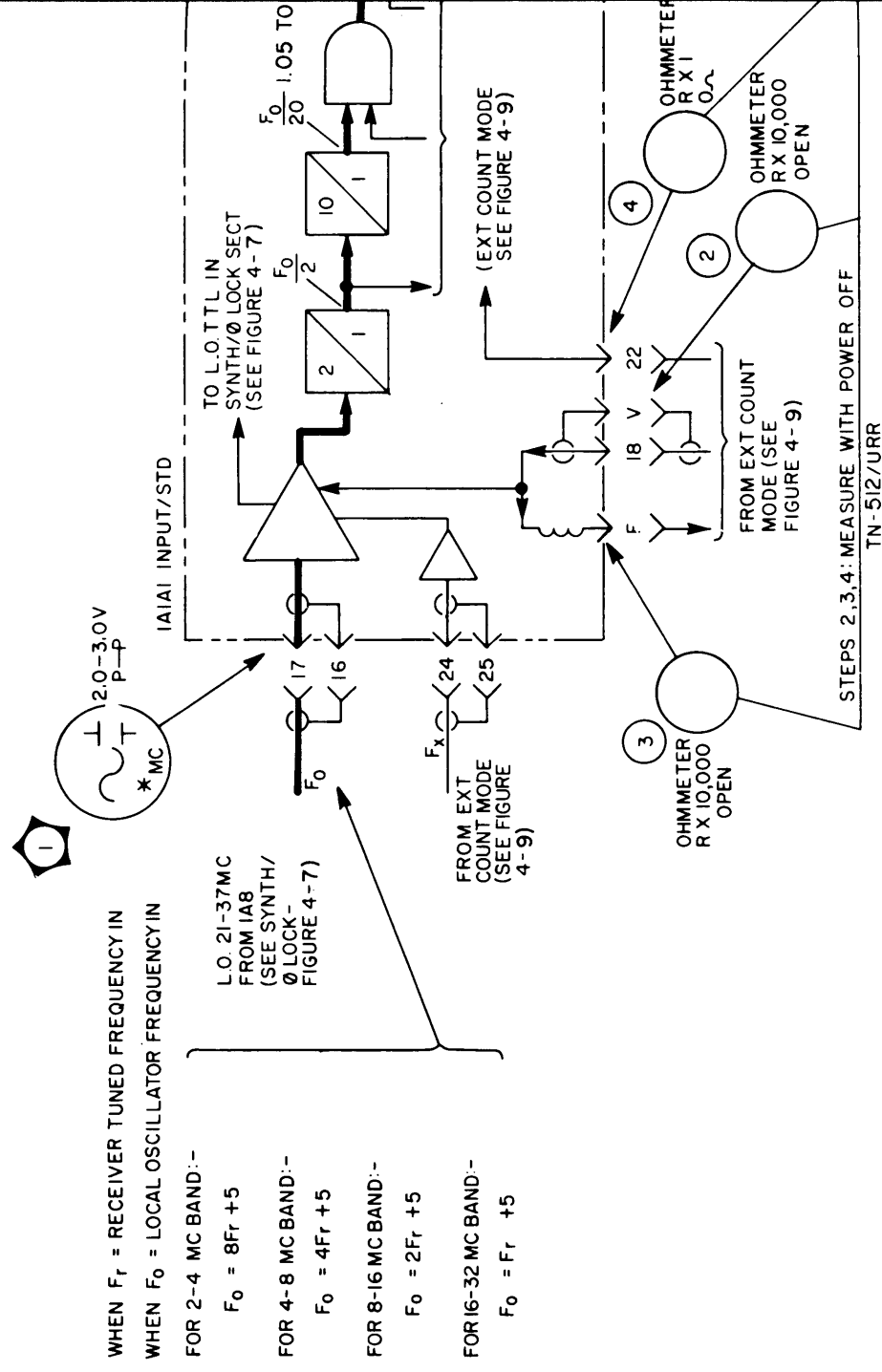
* SIGNAL VARIATIONS

TEST TABLE

TEST	IS4 BAND SWITCH	F ₀ INPUT (MC)	F ₀ (MC)	MEGACYCLE DISPLAY	(4)	(16)
A	2-4	23.1424	1.15712	2.2678	SEE TABLE AT TEST POINT (14)	SEE INSTRUCTIONS AT STEP (16) AND TABLE (18) AT (18)
B	4-8	32.5048	1.62524	6.8762	SEE TABLE AT TEST POINT (14)	SEE INSTRUCTIONS AT STEP (16) AND TABLE (18) AT (18)
C	8-16	22.4572	1.12286	8.7286	SEE TABLE AT TEST POINT (14)	SEE INSTRUCTIONS AT STEP (16) AND TABLE (18) AT (18)
D	16-32	32.6827	1.63414	27.6827	SEE TABLE AT TEST POINT (14)	SEE INSTRUCTIONS AT STEP (16) AND TABLE (18) AT (18)

NOTES:

- INPUT/OUTPUT CHECKS FOR FUNCTIONAL SECTION
- INPUT/OUTPUT CHECKS FOR SUBASSEMBLIES
- HEAVY LINES INDICATE PATH OF COUNT SIGNAL



POWER SUPPLY VOLT	
VOLTS	SOURCE
+5	IA2-14
+200	IA2-M

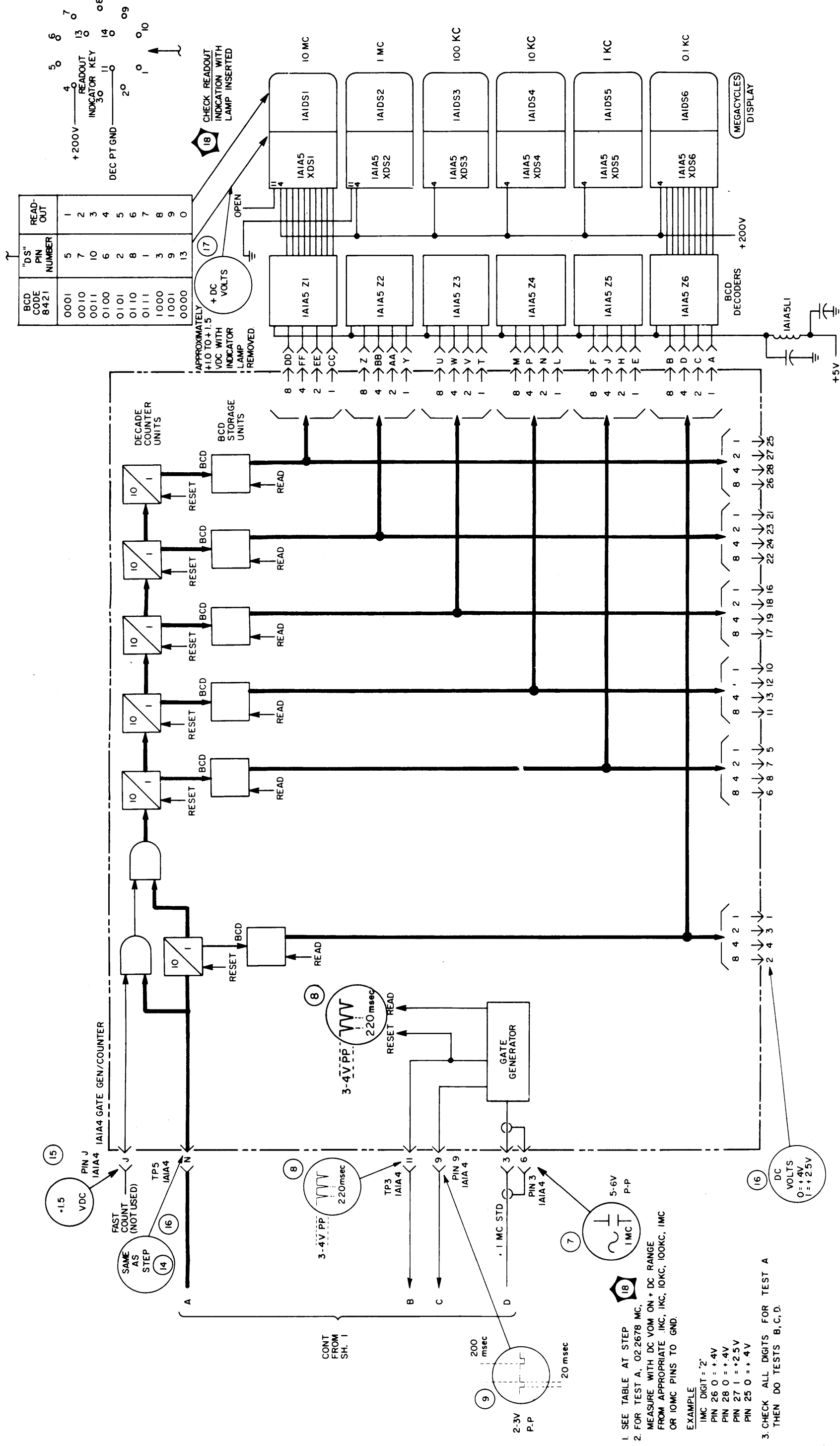


Figure 4-8. Servicing Block Diagram, Digital Counter Section Receiver Mode, (Sheet 2 of 2)

ORIGINAL

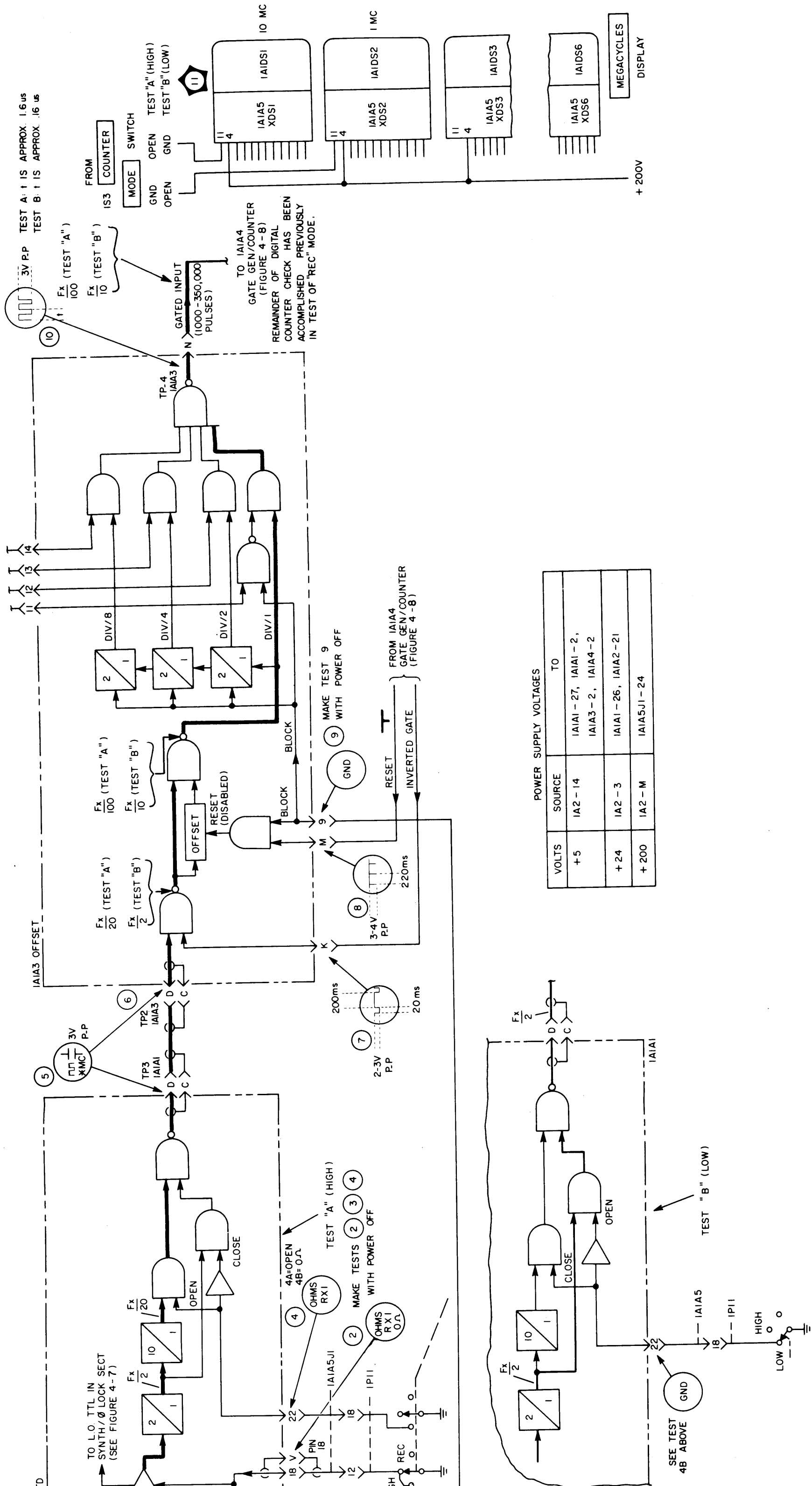
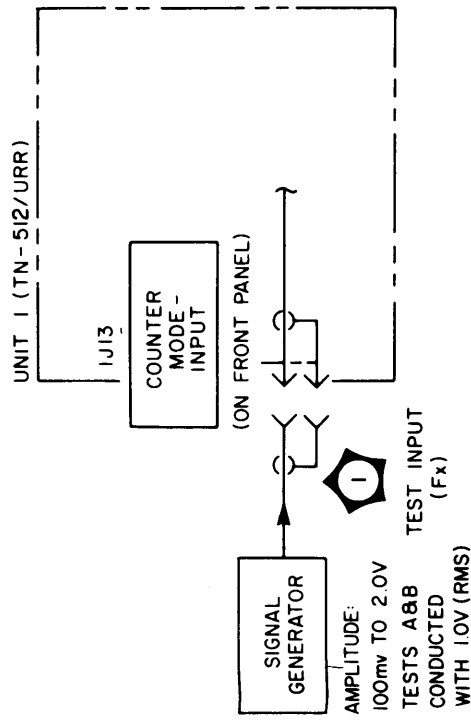


Figure 4-9. Servicing Block Digital Counter Section, External Count Mode



TEST SETUP - DIGITAL COUNTER
(EXTERNAL MODE)

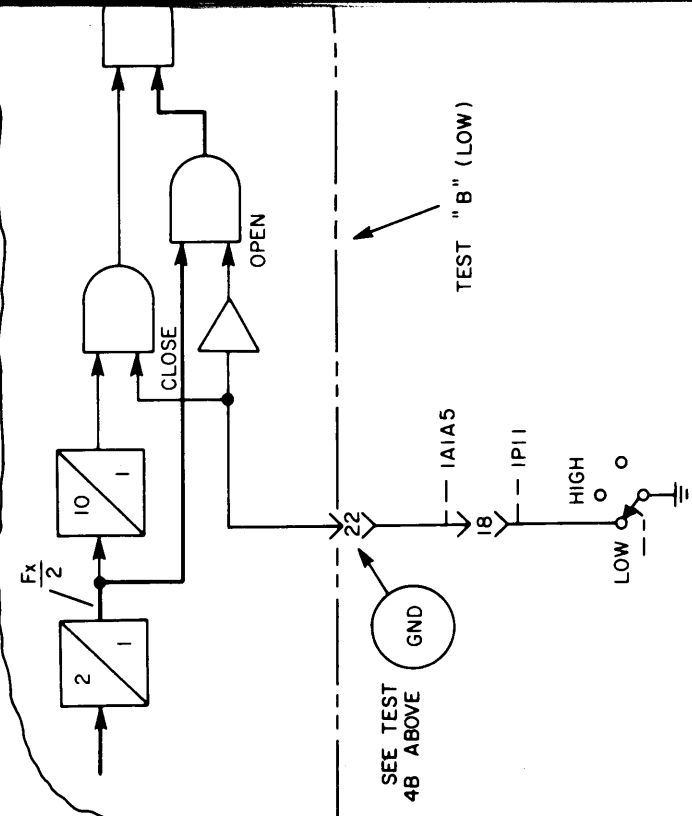
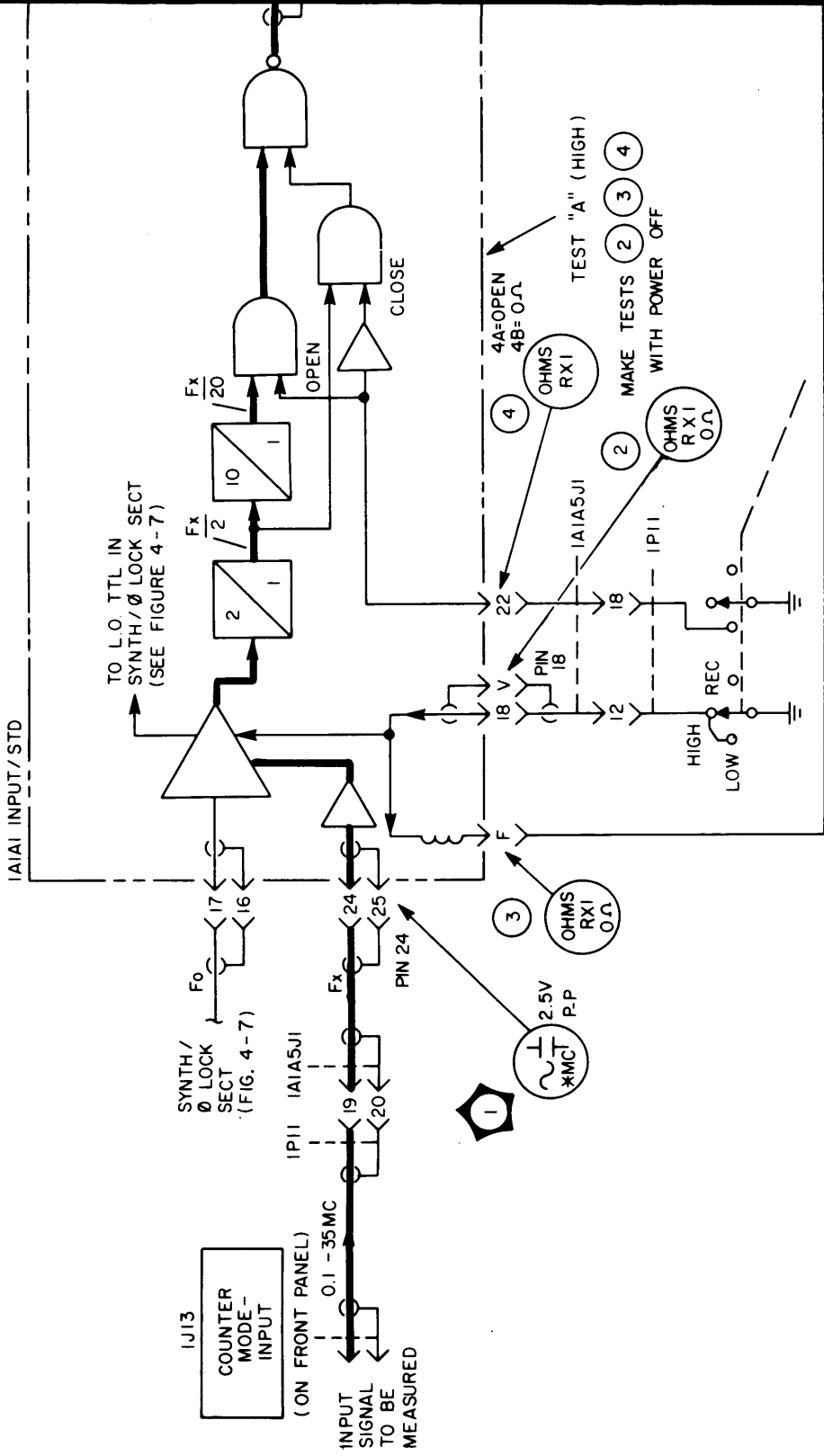
CONTROL POSITIONS FOR TEST **

MODULAR UNIT	CONTROL	POSITION
TN-512/URR	POWER SWITCH	ON
"	FUNCTION SWITCH	SYN
"	COUNTER MODE SW	AS SHOWN IN TEST
0-1511/URR	POWER SWITCH	ON

** POSITIONS OF CONTROLS NOT SHOWN ARE OPTIONAL

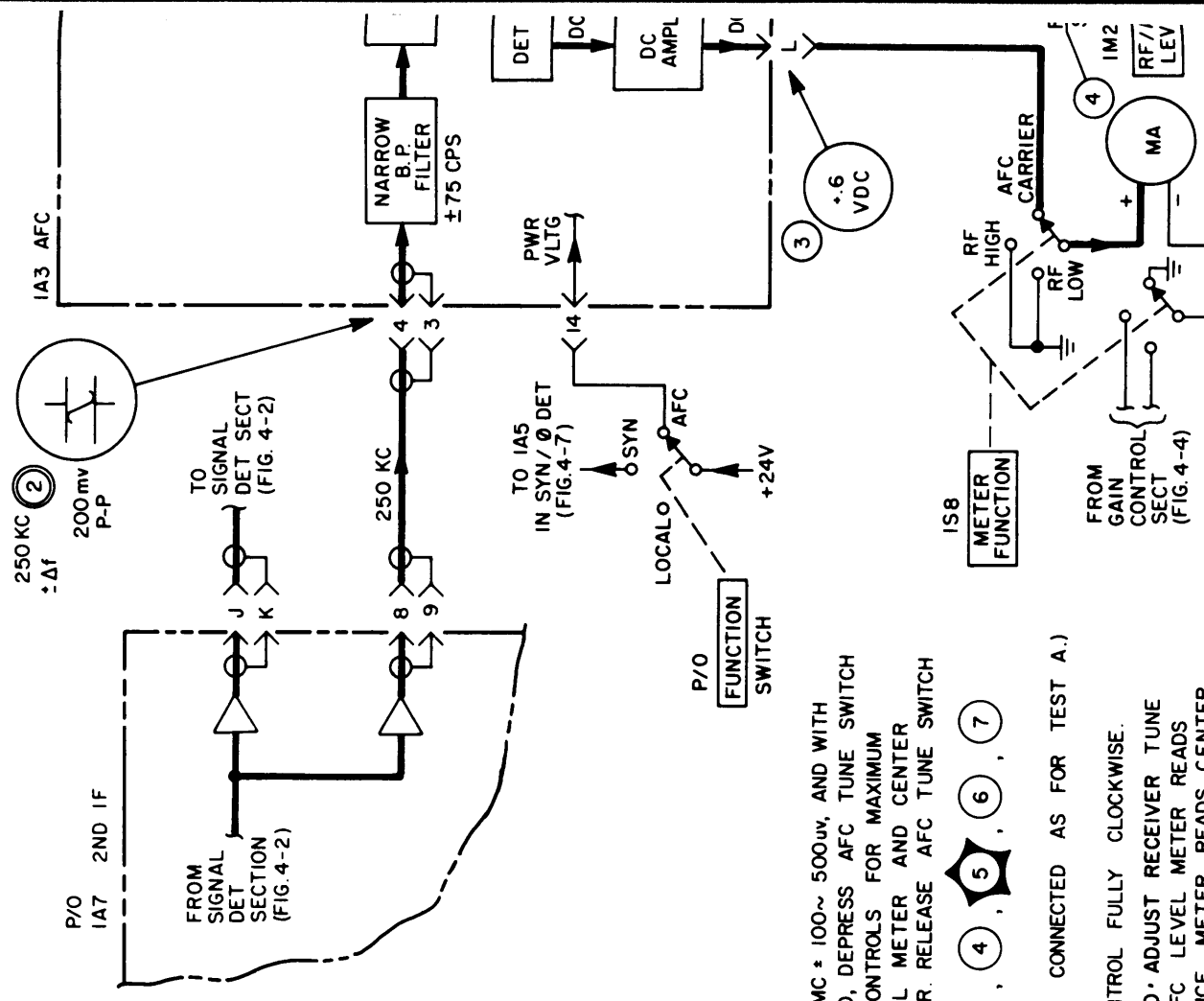
NOTES:

- INPUT/OUTPUT CHECKS FOR FUNCTIONAL SECTION
- INPUT/OUTPUT CHECKS FOR SUBASSEMBLIES
- HEAVY LINES INDICATE PATH OF COUNT SIGNAL
- THE CHECK OF THE DIGITAL COUNTER SECTION IN THE "REC" MODE SHOULD BE CONDUCTED PRIOR TO THIS TEST



* SIGNAL VARIATIONS

TEST	IS3 COUNTER MODE SW POS	1 FX TEST INPUT (MC)	5 (MC) 6	11 MEGACYCLES DISPLAY
A	HIGH	12.34567	0.61728	12.3456
B	LOW	12.34567	6.17283	2.34567



FROM SIGNAL DET SECTION (FIG. 4-2)

TO SIGNAL DET SECT (FIG. 4-2)

TO IA5 IN SYN/Ø DET (FIG. 4-7)

LOCALO

P/O FUNCTION SWITCH

ISB METER FUNCTION

FROM GAIN CONTROL SECT (FIG. 4-4)

TEST A

WITH SIGNAL GENERATOR SET AT 3MC ± 100~500uv, AND WITH OTHER CONTROLS SET AS INDICATED, DEPRESS AFC TUNE SWITCH AND ADJUST TUNE / FINE TUNE CONTROLS FOR MAXIMUM INDICATION ON AFC CARRIER LEVEL METER AND CENTER SCALE ON PHASE DIFFERENCE METER. RELEASE AFC TUNE SWITCH PROCEED WITH STEPS 2, 3, 4, 5, 6, 7

TEST B (WITH SIGNAL GENERATOR CONNECTED AS FOR TEST A.)

1. MOVE RECEIVER FINE TUNE CONTROL FULLY CLOCKWISE.
2. DEPRESS AFC TUNE SWITCH AND ADJUST RECEIVER TUNE CONTROL CAREFULLY UNTIL RF/AFC LEVEL METER READS IN THE GREEN, PHASE DIFFERENCE METER READS CENTER SCALE AND SYNC LAMP IS LIGHTED. RELEASE AFC TUNE SWITCH, AFTER RECORDING RECEIVER COUNTER INDICATION.
3. CAREFULLY AND SLOWLY, IN SMALL INCREMENTS, MOVE THE RECEIVER FINE TUNE CONTROL COUNTERCLOCKWISE, ALLOWING THE PHASE DIFFERENCE METER TO STABILIZE AFTER EACH MOVEMENT, UNTIL THE SYNC LAMP GOES OUT.
4. DEPRESS AFC TUNE SWITCH AND RECORD RECEIVER COUNTER INDICATION. THE SECOND READING SHOULD BE AT LEAST ONE KILOCYCLE BELOW THE FIRST READING.
5. REPEAT STEPS 2, 3, AND 4 EXCEPT THAT THE RECEIVER FINE TUNE CONTROL SHOULD BE MOVED CLOCKWISE DURING THE MEASUREMENTS. THE SECOND COUNTER READING SHOULD BE AT LEAST ONE KILOCYCLE HIGHER THAN THE FIRST READING.

CONTROL POSITIONS FOR TEST

MODULAR UNIT	CONTROL	POSITION
0-151/URR	POWER SWITCH	OFF
TD-915/URR	POWER SWITCH	OFF
TN-512/URR	POWER SWITCH	ON
	BAND SWITCH	2-4
	COUNTER MODE	REC
	RF GAIN	FULL CCW (AGC)
	FUNCTION	AFC
	SILENCER	OFF (DOWN)
	METER FUNCTION	AFC CARRIER
	FINE TUNE	MID POSITION
	INPUT ATTENUATOR	OUT (DOWN)
	TUNE	ADJUST FOR 03.0000 ON RCVR COUNTER

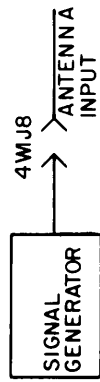
- INPUT/OUTPUT CHECKS FOR FUNCTIONAL SECTION.
- INPUT/OUTPUT CHECKS FOR MODULE UNIT.
- INPUT/OUTPUT CHECKS FOR SUBASSEMBLIES.

INITIAL SWITCH POSITIONS	SWITCH POSITION
UNIT	
TO-915/URR	POWER OFF
TN-512/URR	POWER ON
O-1511/URR	POWER ON

TEST OF SYNTHESIZED MODE

1. SET FREQUENCY SELECTORS ON 0-1511/URR TO 0900000
2. SET TUNER FUNCTION SWITCH TO SYN
3. SET TUNER BANDSWITCH TO 8-16 POSITION
4. SET COUNTER MODE SWITCH TO REC
5. SET TUNER FINE TUNE CONTROL TO MID POSITION
6. ADJUST TUNE CONTROL FOR 09.0000 ON RECEIVER COUNTER, AND CAUSE SYNC INDICATOR TO LIGHT
7. CONNECT DC VOLTMETER TO TP9, IA5
8. CAREFULLY MOVE TUNE CONTROL IN SMALL INCREMENTS TO CAUSE VOLTAGE READINGS AT TP9, IA5 AS INDICATED IN THE TABLE. THE METER POINTER SHOULD APPROXIMATE THE POSITIONS INDICATED
9. MOVE THE DC VOLTMETER TO PIN 3, IA5. WHEN THE SYSTEM IS IN SYNC, THE SYNC LAMP SHOULD BE LIT AND THE VOLTAGE READING SHOULD BE +2.4 VOLTS. WHEN THE SYSTEM IS OUT OF SYNC, THE SYNC LAMP SHOULD BE OUT AND THE VOLTAGE READING SHOULD BE 0 VOLTS.

TEST OF AFC MODE



SET AT 09.0000 MC ± 200 CPS
AT 1mV, UNMODULATED

1. SET TUNER FUNCTION SWITCH TO AFC
2. SET METER FUNCTION SWITCH ON TUNER TO AFC
3. SET INPUT ATTENUATOR SWITCH DOWN (OUT)
4. CONNECT SIGNAL GENERATOR TO ANTENNA INPUT AT 9MC, ± OR - 200 CPS, AT 1mV, UNMODULATED
5. DEPRESS AFC TUNE SWITCH AND ADJUST FINE TUNE AND TUNE CONTROLS FOR MAXIMUM INDICATION ON AFC LEVEL METER AND CENTER SCALE INDICATION ON THE PHASE DIFFERENCE METER. RELEASE THE AFC TUNE SWITCH
6. CONNECT DC VOLTMETER TO PIN B, IA3
7. CAREFULLY MOVE THE TUNE CONTROL IN SMALL INCREMENTS TO CAUSE VOLTAGE READINGS AT PIN B, IA3, AS INDICATED IN THE TABLE. THE METER POINTER SHOULD APPROXIMATE THE POSITIONS INDICATED
8. MOVE THE DC VOLTMETER TO PIN 8, IA3
9. WHEN THE SYSTEM IS IN SYNC, THE SYNC LAMP SHOULD BE LIT AND THE VOLTAGE READING SHOULD BE +2.4 VOLTS. WHEN THE SYSTEM IS OUT OF SYNC, THE SYNC LAMP SHOULD BE OUT AND THE VOLTAGE READING SHOULD BE 0 VOLTS.

NOTES

- 1. INPUT/OUTPUT CHECK FOR FUNCTIONAL SECTION
- 2. INPUT/OUTPUT CHECK FOR SUBASSEMBLY

* VOLTAGE VARIATIONS

TEST			DIAL PT
A METER-LOW RED			DIAL PT 1
B METER-LOW YELLOW			DIAL PT 2
C METER-SYNC		0V	DIAL PT 3
D METER-HIGH YELLOW		+ .03V	DIAL PT 4
E METER-HIGH RED.		+ .06V	DIAL PT 5

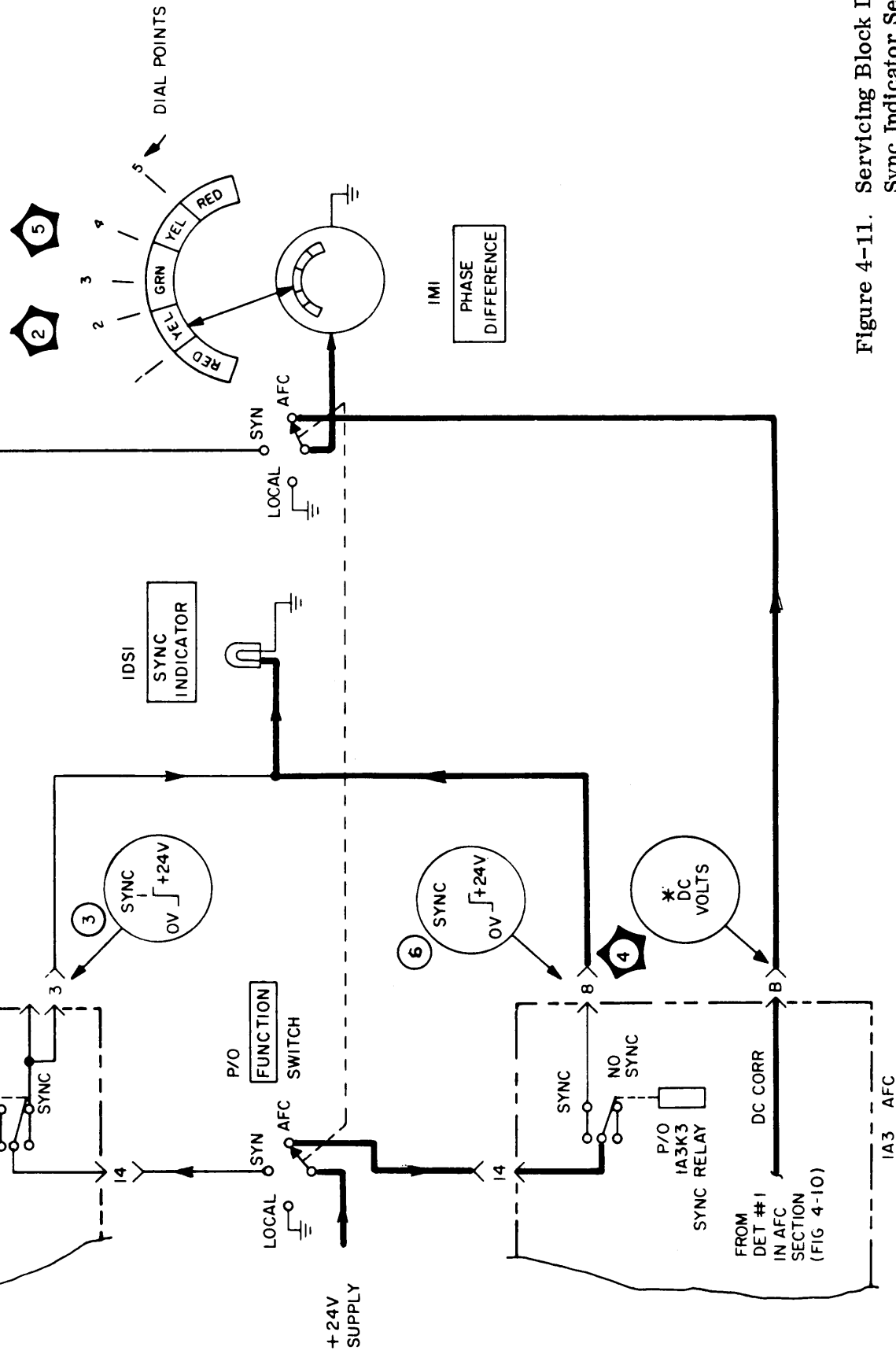
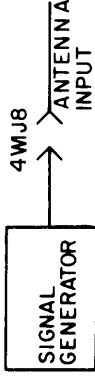


Figure 4-11. Servicing Block Diagram, Sync Indicator Section

INITIAL SWITCH POSITIONS	
UNIT	SWITCH POSITION
TD-915/URR	POWER OFF
TN-512/URR	POWER ON
O-1511/URR	POWER ON

- TEST OF SYNTHESIZED MOD
1. SET FREQUENCY SELECTORS
 2. SET TUNER FUNCTION SWITCH
 3. SET TUNER BANDSWITCH TO
 4. SET COUNTER MODE SWITCH
 5. SET TUNER FINE TUNE CONTROL
 6. ADJUST TUNE CONTROL FOR COUNTER, AND CAUSE SYNC
 7. CONNECT DC VOLT METER TO
 8. CAREFULLY MOVE TUNE CONTROL TO CAUSE VOLTAGE READING INDICATED IN THE TABLE. THE APPROXIMATE POSITIONS
 9. MOVE THE DC VOLT METER TO SYSTEM IS IN SYNC, THE SYNC AND THE VOLTAGE READING SHOULD BE 0 AND THE V0 SHOULD BE 0 VOLTS.

TEST OF AFC MODE



SET AT 09.0000MC \pm 200 CPS
AT 1mV, UNMODULATED

1. SET TUNER FUNCTION SWITCH
2. SET METER FUNCTION SWITCH
3. SET INPUT ATTENUATOR SWITCH
4. CONNECT SIGNAL GENERATOR AT 9MC, +OR - 200 CPS, AT
5. DEPRESS AFC TUNE SWITCH TUNE AND TUNE CONTROLS INDICATION ON AFC LEVEL METER. RELEASE THE AFC METER. RELEASE THE AFC METER. RELEASE THE AFC METER.
6. CONNECT DC VOLT METER TO
7. CAREFULLY MOVE THE TUNE INCREMENTS TO CAUSE VOLTAGE READING INDICATED IN TABLE. METER POINTER SHOULD BE IN POSITIONS INDICATED
8. MOVE THE DC VOLT METER TO
9. WHEN THE SYSTEM IS IN SYNC SHOULD BE LIT AND THE VOLTAGE READING SHOULD BE +24 VOLTS. WHEN OUT OF SYNC THE SYNC LAMP AND THE VOLTAGE READING SHOULD BE 0 VOLTS.

NOTES

- 1.  INPUT/OUTPUT CHECK FUNCTIONAL SECTION
- 2.  INPUT/OUTPUT CHECK SUBASSEMBLY

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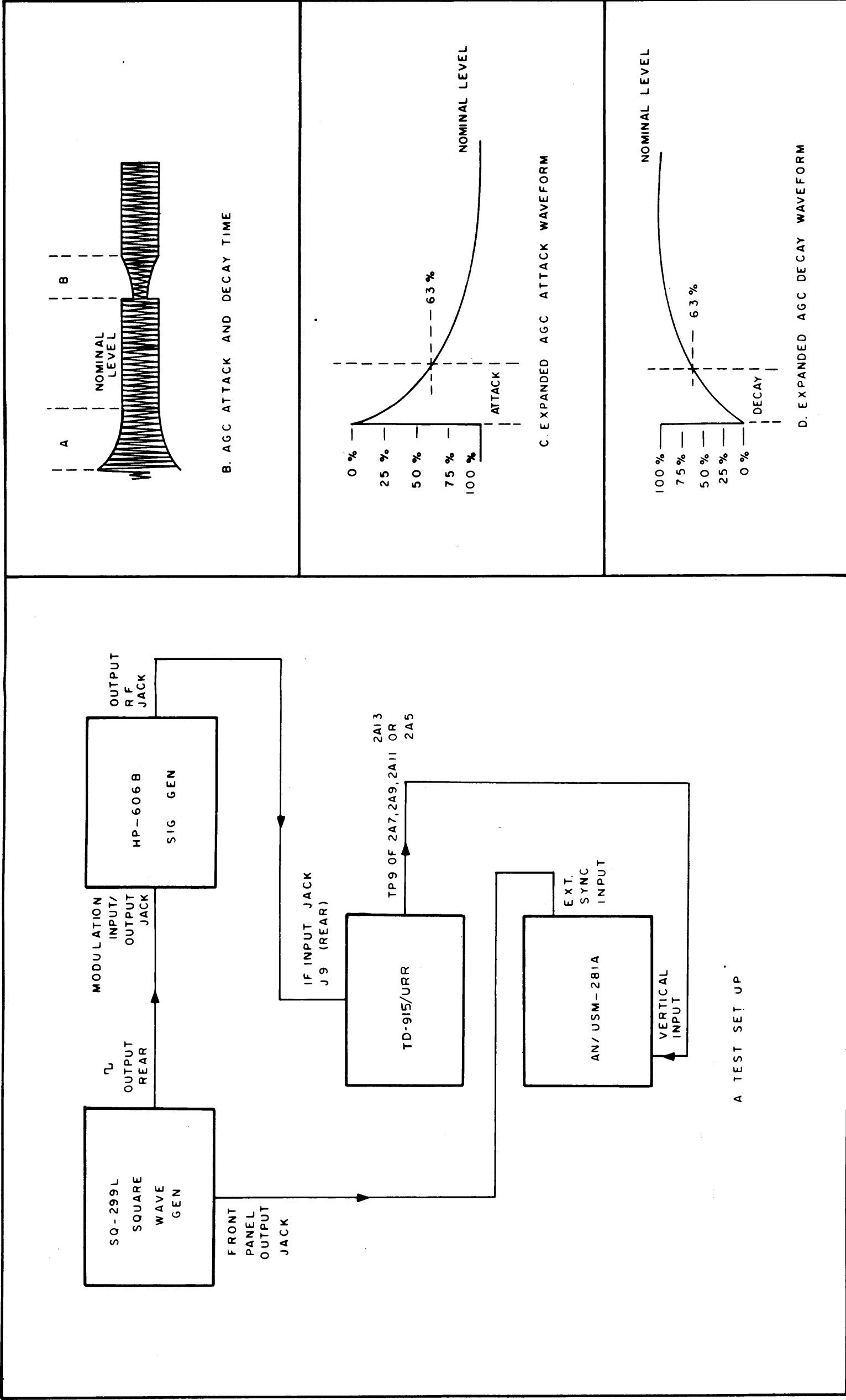


Figure 4-12. Test and Waveforms of AGC Time Constants

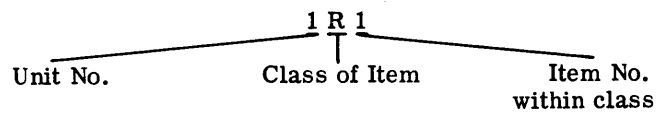
SECTION 6

PARTS LIST

6-1. INTRODUCTION.

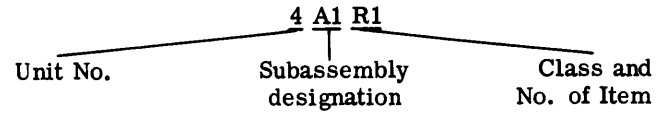
a. REFERENCE DESIGNATIONS - The unit numbering method of assigning reference designations has been used to identify units, assemblies, sub-assemblies and parts of the AN/URR-64(V)1, AN/URR-64(V)2 and AN/URR-64(V)3 Radio Receiving Sets. This method has been expanded as much as necessary to adequately cover the various degrees of subdivision of the equipment. Examples of this unit numbering method and typical expansions of the same are illustrated by the following, using AN/URR-63(V)1 as an example:

Example 1:



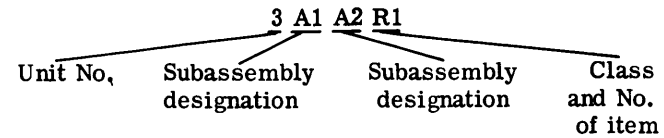
Read as: First (1) resistor (R) of first unit (1) of AN/URR-64(V)1 Receiving Set.

Example 2:



Read as: First (1) resistor (R) of first (1) sub-assembly (A) of fourth (4) unit of AN/URR-64(V)1 Receiving Set.

Example 3:



Read as: First (1) resistor (R) of second (2) sub-assembly (A) of first (1) subassembly (A) of third (3) unit of AN/URR-64(V)1 Receiving Set.

b. REFERENCE DESIGNATION PREFIX. - Partial reference designations are used on the equipment and illustrations. The partial reference designations consist of the class letter (s) and the identifying item number. The complete reference designations may be obtained by placing the proper prefix

before the partial reference designation. Prefixes are provided on illustrations following the notation 'REF DESIG PREFIX'.

6-2. LIST OF UNITS.

Tables 6-1 through 6-3 are listings of the modular units comprising Radio Receiving Sets AN/URR-64(V)1, AN/URR-64(V)2, and AN/URR-64(V)3 respectively. The units are listed by unit numbers in numerical order for each Set. Thus when the complete reference designation of a part is known, each table will furnish the identification of the unit in which the part is located, since the first number of a complete reference designation identifies the unit. The tables also provide the following information for each unit listed: (1) quantity per equipment, (2) official name, (3) designation, (4) colloquial name, and (5) location of the first page of its listing.

6-3. MAINTENANCE PARTS LIST.

Parts are listed in unit number order. Where an identical unit is used more than once, one table serves for all units. The complete reference designations are listed in the REF DESIG column, with the omission of the unit prefix number. The unit prefix number/s are shown at the head of each unit list.

Some small subassemblies are recommended by the manufacturer as non-reparable from a labor or re-alignment cost analysis comparison to the cost of replacing the subassembly. These subassemblies are so noted in the NAME AND DESCRIPTION column and their parts are not included in the list. Other subassemblies are partially reparable, from this point of view. Partially reparable subassemblies are symbolized as "PR" in the NOTES column: their parts are included in the list. Parts that are replaceable are symbolized "R"; parts that are not replaceable are symbolized "NR".

In some cases, subassemblies are recommended as factory reparable (example: 1A10 tuner) from a re-alignment consideration. For these a "factory reparable" notation is included in the NAME AND DESCRIPTION column and their parts are not included in the list.

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TABLE 6-1. LIST OF UNITS, AN/URR-64(V)2

UNIT	QTY	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1	1	Tuner, Radio Frequency	TN-512/URR	RF Tuner, Model HFR-4	6-6
2	1	Demultiplexer	TD-915/URR	IF Unit, Model MSA-4	6-58
3	1	Generator, Reference Signal	O-1511/URR	Synthesizer Model HFS-4	6-91

TABLE 6-2. LIST OF UNITS, AN/URR-64(V)1

UNIT	QTY	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1 and 4	2	Tuner, Radio Frequency	TN-512/URR	RF Tuner, Model HFR-4	6-6
2 and 5	2	Demultiplexer	TD-915/URR	IF Unit, Model MSA-4	6-58
3 and 6	2	Generator, Reference Signal	O-1511/URR	Synthesizer, Model MFS-4	6-91

TABLE 6-3. LIST OF UNITS, AN/URR-64(V)3

UNIT	QTY	NAME OF UNIT	DESIGNATION	COLLOQUIAL NAME	PAGE
1 and 4	2	Tuner, Radio Frequency	TN-512/URR	RF Tuner, Model HFR-4	6-6
2 and 5	2	Demultiplexer	TD-915/URR	IF Unit, Model MSA-4	6-58
3	1	Generator, Reference Signal	O-1511/URR	Synthesizer, Model HFS-4	6-91

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1		HFR-4 TUNER, RADIO FREQUENCY: TN-512/URR. Tuning unit for the IF and RF stages of a superheterodyne receiver in the 2-32 mc frequency range.	5-5
1A1		FREQUENCY READOUT ASSEMBLY: Has 5 plug-in circuit card assemblies. 82679 P/N AX5003.	5-7
1A1A1		CIRCUIT CARD ASSEMBLY: 27 resistors, 33 capacitors. 6 integrated circuits, 8 coils, 7 transistors, 5 semiconductors, plug-in item, P/O AX5003; 10.312 in. lg by 2.132 in. wd by 0.812 in. hg. 82679 P/N A4658.	5-7
1A1A2		CIRCUIT CARD ASSEMBLY: 38 resistors, 45 capacitors, 14 coils, 11 integrated circuits, 9 transistors, 10 semiconductors, plug-in item, P/O AX5003; 10.312 in. lg by 5.312 in. wd by 0.500 in. hg. 82679 P/N A4659.	5-7
1A1A3		CIRCUIT CARD ASSEMBLY: 13 capacitors, 4 coils, 17 integrated circuits, plug-in item; P/O AX5003; 10.312 in. lg by 2.312 in. wd by 0.375 in. hg. 82679 P/N A4660.	5-7
1A1A4		CIRCUIT CARD ASSEMBLY: 6 resistors, 7 capacitors, 4 coils, 23 integrated circuits, 2 transistors, 1 semiconductor, plug-in item, P/O AX5003; 10.312 in. lg by 2.312 in. wd by 0.500 in. hg. 82679 P/N A4661.	5-7
1A1A5		CIRCUIT CARD ASSEMBLY: Non-repairable item, P/O AX5003; 10.312 in. lg by 4.062 in. wd by 0.875 in. hg. 82679 P/N A4662.	5-7
1A2		POWER SUPPLY ASSEMBLY: 82679 P/N AX5060.	5-7
1A2A1		CIRCUIT CARD ASSEMBLY: 26 resistors, 19 capacitors, 12 transistors, 17 semiconductors, plug-in item; 10.031 in. lg by 5.060 in. wd by 1.000 in. hg. 82679 P/N A4662.	5-7
1A3		CIRCUIT CARD ASSEMBLY W/SIELDS: 82679 P/N AX5061.	5-7
1A3A1		CIRCUIT CARD ASSEMBLY: 78 resistors, 62 capacitors, 8 coils, 1 oscillator, 1 filter, 3 integrated circuits, 3 relays, 12 transistors, 19 semiconductors, 2 transformers, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4664.	5-7
1A4		NOT USED.	
1A5		CIRCUIT CARD ASSEMBLY W/SIELDS: 82679 P/N AX5062.	5-7
1A5A1		CIRCUIT CARD ASSEMBLY: 81 resistors, 62 capacitors, 8 coils, 4 transformers, 1 relay, 2 integrated circuits, 18 transistors, 11 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4668.	5-7
1A6		CIRCUIT CARD ASSEMBLY W/SIELDS: 82679 P/N AX5063.	5-7
1A6A1		CIRCUIT CARD ASSEMBLY: 117 resistors, 127 capacitors, 32 coils, 3 crystals, 6 integrated circuits, 31 transistors, 18 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4669.	5-7
1A7		CIRCUIT CARD ASSEMBLY W/SIELDS: 82679 P/N AX5064.	5-7
1A7A1		CIRCUIT CARD ASSEMBLY: 147 resistors, 91 capacitors, 15 coils, 4 transformers, 1 filter, 40 transistors, 11 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4670.	5-7
1A8		CIRCUIT CARD ASSEMBLY: 55 resistors, 75 capacitors, 21 coils, 4 integrated circuits, 19 transistors, 13 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4671.	5-7

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A9		CIRCUIT CARD ASSEMBLY W/SIELDS: 82679 P/N AX5066.	5-7
1A9A1		CIRCUIT CARD ASSEMBLY: 102 resistors, 71 capacitors, 11 coils, 4 transformers, 4 filters, 24 transistors, 8 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4672.	5-7
1A10		TUNER, RADIO FREQUENCY: Factory Repairable Item, 2-32 mc, with motor driven tuning section and circuit cards A4673, A4674, A4675, A4676; 16.50 in. lg by 6.500 in. wd by 6.500 in. hg. 82679 P/N AX5005.	5-7
1A11		ATTENUATOR ASSEMBLY: Non-repairable item; 3.526 in. lg by 2.000 in. wd by 1.125 in. hg. 82679 P/N AX5007.	5-7
1A12		SWITCH ASSEMBLY: 82679 P/N AX5116-2.	5-7
1A13		CIRCUIT CARD ASSEMBLY: 3 capacitors, 4 resistors, 1 relay, 1 semiconductor, 1 transistor, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4794.	5-7
1B1		FAN, AXIAL: 115 vac, 50/60 cps, 3300 rpm; plastic blade, aluminum housing with black enamel finish; housing size; 3.625 in. sq by 1.500 in. thk. 82679 P/N BL131.	5-7
1C1 thru 1C9		CAPACITOR, FIXED, CERAMIC: Feed-thru type, 2300 pf, +50, -20% to 1.500 wvdc. 0.625 in. lg by 0.203 dia. Dwg CC118-5, 71590 P/N FT-2300.	5-7
1C10 thru 1C27		CAPACITOR, FIXED, CERAMIC: 1000,000 pf, ±20%, 50 wvdc, 0.335 in. dia, 0.125 in. thk, 0.250 lead spacing. 82679 P/N CC100-42.	5-7
1CR1		SEMICONDUCTOR DEVICE: MIL type 1N914.	5-7
1DS1		LAMP, INCANDESCENT: Single contact, T-1-3/4 base, 14 vac or vdc, 0.08 amps. Dwg BI110-10, 08806 P/N 382.	5-7
1F1		FUSE, CARTRIDGE TYPE: 1.5 amps, 125 v, 0.250 in. dia, 1.250 in. lg. Dwg FU102-1.5, 71400 P/N MDX-1-1/2.	5-8
1F2		SAME AS 1F1.	5-8
1FL1		FILTER, RADIO INTERFERENCE: Current, 1 amp; voltage rating, 600 vac at 60 cps, 1.000 in. dia, 2.688 in. lg. Dwg FI105-1, 80183 P/N 1JX130.	5-8
1FL2		CONNECTOR: MIL type UG58/U.	5-8
1J1		CONNECTOR: MIL type UG58/U.	5-6
1J2		CONNECTOR: MIL type UG625B/U.	5-6
1J3		SAME AS 1J1.	5-6
1J4		CONNECTOR: MIL type MS3102A28-21P.	5-6
1J5		CONNECTOR: MIL type MS3102A14S1P.	5-6
1J6		SAME AS 1J2.	5-6
1J7		SAME AS 1J2.	5-6
1J8		SAME AS 1J2.	5-6
1J9		CONNECTOR, RECEPTACLE, ELECTRICAL: 9 sockets; contacts rated at 7.5 amps; 0.718 in. dia by 0.718 in. lg. Dwg JJ193-9S, 07497, P/N. 126-221.	5-6
1J10		SAME AS 1J2.	5-6
1J11		CONNECTOR: MIL type MS3102A32-414P.	5-6
1J12		NOT USED.	
1J13		CONNECTOR: MIL type UG657/U.	5-6
1J14		CONNECTOR, RECEPTACLE, ELECTRICAL: Sub-miniature female, 14 contacts, screw-lock. 0.340 in. wd, 1.000 in. lg, 0.530 in. thk o/a. Dwg no. JJ242-5S, 11453 P/N 5040-14SS.	5-6
1L1		COIL, RF, FIXED: 100 uh, ±10%, 3.12 ohms max dc res, 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-101.	5-7
1M1		METER, SPECIAL SCALE: 500 microamp movement, 0 center; case; molded phenolic, 1.750 inc. by 1.750 in by 1.500 in. deep. 82679 P/N MR206.	5-7

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1M2		METER, SPECIAL SCALE: 500 microamp movement; case; molded phenolic, 1.750 in. by 1.750 in. by 1.500 in. deep. 82679 P/N MR205.	5-7
1MP1		KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 set screws and white filled indicator. 0.750 in. dia by 0.438 in. hg. 82679 P/N MP123-1FB.	5-7
1MP2		KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 set screws and white filled indicator depression. 0.750 in. dia by 0.438 in. hg. 82679 P/N MP123-3FB.	5-7
1MP3 thru 1MP6 1MP7		SAME AS 1MP2. KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 set screws, and white filled indicator lines. 0.750 in. dia, 0.438 in. high. 82679 P/N MP123-3DB.	5-7 5-7
1MP8		KNOB, INSTRUMENT TYPE: Molded phenolic body with brass insert and set screws. 0.750 in. dia by 0.563 in. hg. 82679 P/N MP125-1.	5-7
1MP9		KNOB, INSTRUMENT TYPE: Molded phenolic body with brass insert and set screws. 2.0 in. dia, 0.875 in. high. 82679 P/N MP123-9NB.	5-7
1P1 thru 1P11 1P12		NOT USED. CONNECTOR, PLUG, ELECTRICAL: Miniature female, panel mount, 50 contacts, 3.13 in. lg, 0.37 in. wd, 1.18 in. thk o/a. 82679 P/N DL257-42-50S.	5-7
1Q1 1Q2 1Q3		TRANSISTOR: MIL type 2N3442. NOT USED.	5-8
1R1 1R2		SAME AS 1Q1. RESISTOR: MIL type RV4NAYSA103A.	5-8
1R3 1R4 1R5		RESISTOR, VARIABLE: 3 sections with SPDT switch; each section 10 ohms, 0.938 in. dia by 2.500 in. lg. 82679 P/N RV128. RESISTOR: MIL type RC07GF154J. RESISTOR: MIL type RE65G1500. RESISTOR: MIL type RC42GF181J.	5-8 5-8 5-8
1S1		SWITCH, ROTARY: Two sections, 3 positions, 30° angle of throw, 6 poles; non-shorting contacts; bakelite insulation. 0.250 in. dia shaft by 0.750 in. lg from mounting surface. 3/8-32 thd bushing mounted. 82679 P/N SW450.	5-8
1S2 1S3		NOT USED. SWITCH, ROTARY: Single section, 3 positions, 30° angle of throw, 3 poles; non-shorting type contacts; bakelite insulation. 0.250 in. dia shaft by 0.750 in. from mounting surface. 3/8-32 thd bushing mounted. 82679 P/N SW456.	5-8
1S4		SWITCH, ROTARY: Two sections, 5 positions, 30° angle of throw, 4 poles; non-shorting contacts; bakelite insulation. 0.250 in. dia shaft by 0.750 in. lg from mounting surface. 3/8-32 thd bushing mounted. 82679 P/N SW457.	5-8
1S5 1S6 1S7		SWITCH: MIL type ST124. SWITCH: MIL type ST40G. SWITCH, ROTARY: Single section, 3 positions, 30° angle of throw, 1 pole; non-shorting contacts; bakelite insulation. 0.250 in. dia shaft by 0.750 in. lg from mounting surface. 3/8032 thd bushing mounted. 82679 P/N SW449.	5-8 5-8 5-8
1S8		SAME AS 1S5.	5-8

TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1T1		TRANSFORMER, POWER, STEP UP-STEP DOWN: Primary; 115/230 v, 50/60 cps, 1 phase; secondary; 37.8 v, 14.8 v, 14.8 v, 28.4 v, 240 v; hermetically sealed metal case, stud mtd; 11 solder stud terminals, 4.625 in. lg by 4.750 in. wd by 2.625 in. hg. 82679 P/N TF362.	5-8
1XA1 1XA2 thru 1XA9		NOT USED. CONNECTOR, RECEPTACLE, ELECTRICAL: 15 double sided female contacts rated at 5 amps and 1800 volts rms. Phenolic housing with floating bushing and eyelet terminals. Accepts printed circuit board thickness of 0.954 to 0.071 in. 82679 P/N JJ319A15DFE.	5-8
1XDS1		LIGHT, INDICATOR: Green lens; 1.35 to 28 v; T=1-3/4 lamp base 2 terminals; 0.437 in. dia by 1.500 in. lg. Dwg TS153-9. 72619 P/N 162-8430-1472-502.	5-8
1XF1		FUSEHOLDER, LAMP INDICATING: 90-250 v, 15 amps, neon lamp, clear knob, accommodates 1/4 in. dia by 1-1/4 in. lg fuse. Dwg FH104-3. 71400 P/N HKL-X.	5-8
1XF2		SAME AS 1XF1.	5-8
1A1		FREQUENCY READOUT ASSEMBLY: 5 circuit card assemblies plug-into a non-repairable circuit card, item is electrically connected by 2 connectors, 8 screws for mounting to chassis, bracket enclosed; 10.500 in. lg by 3.000 in. hg by 4.250 in. wd. 82679 P/N AX5003.	5-10
1A1DS1		INDICATOR, DIGITAL DISPLAY: Displays numerals 0 thru 9, min. supply voltage 170 vdc; decimal point to right of numeral. 14 pin-type terminals. 0.750 in. dia by 1.800 in. high from mtg surface. 82679 P/N BI117-2.	5-10
1A1DS2		SAME AS 1DS1.	5-10
1A1DS3 thru 1A1DS6		INDICATOR, DIGITAL DISPLAY: Displays numerals 0 thru 9, min supply voltage 170 vdc. 14 pin-type terminals. 0.750 in. dia by 1.800 in. high from mtg surface. 82679 P/N BI117-1.	5-13
1A1A1		CIRCUIT CARD ASSEMBLY: 27 resistors, 33 capacitors, 8 coils, 6 integrated circuits, 7 transistors, 5 semiconductors, plug-in item; p/o AX5003; 10.312 in. lg by 2.312 in. wd by 0.812 in. hg. 82679 P/N A4658.	5-13
1A1A1C1		CAPACITOR, FIXED, CERAMIC: 10,000 pf $\pm 20\%$, 100 wvdc, 0.344 in. dia by 0.125 in. thk by 0.250 in. lead spacing. 82679 P/N CC100-43.	5-13
1A1A1C2		SAME AS 1A1A1C1.	5-13
1A1A1C3		CAPACITOR: MIL type CS13BE225K.	5-13
1A1A1C4		SAME AS 1A1A1C1.	5-13
1A1A1C5		CAPACITOR: MIL type CS13BE476K.	5-13
1A1A1C6		SAME AS 1A1A1C1.	5-13
1A1A1C7		CAPACITOR, FIXED, MICA: 390 pf $\pm 2\%$ tol, 100 wvdc, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F391G1S.	5-13
1A1A1C8		SAME AS 1A1A1C3.	5-13
1A1A1C9		SAME AS 1A1A1C1.	5-13
1A1A1C10		SAME AS 1A1A1C1.	5-13
1A1A1C11		SAME AS 1A1A1C5.	5-13
1A1A1C12		SAME AS 1A1A1C1.	5-13
1A1A1C13		SAME AS 1A1A1C1.	5-13

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN512 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A1C14		SAME AS 1A1A1C1.	5-13
1A1A1C15		SAME AS 1A1A1C5.	5-13
1A1A1C16		SAME AS 1A1A1C1.	5-13
1A1A1C17		CAPACITOR, FIXED, CERAMIC: 1,000 pf, gmV. 500 wvdc, 0.310 in. dia by 0.156 in. thk. 82679 P/N CC100-29.	5-13
1A1A1C18		CAPACITOR, FIXED, MICA: 10 pf, 5% tol, 500 wvdc, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F100J5S.	5-13
1A1A1C19 thru			
1A1A1C26		SAME AS 1A1A1C1.	5-13
1A1A1C27		CAPACITOR, FIXED, MICA: 820 pf, ±2% tol, 300 wvdc, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM111F821G3S.	5-13
1A1A1C28		SAME AS 1A1A1C1.	5-13
1A1A1C29		SAME AS 1A1A1C1.	5-13
1A1A1C30		SAME AS 1A1A1C1.	5-13
1A1A1C31		SAME AS 1A1A1C3.	5-13
1A1A1C32		SAME AS 1A1A1C1.	5-13
1A1A1C33		SAME AS 1A1A1C1.	5-13
1A1A1CR1		SEMICONDUCTOR DEVICE: MIL type 1N914.	5-13
1A1A1CR2		SAME AS 1A1A1CR1.	5-13
1A1A1CR3		SAME AS 1A1A1CR1.	5-13
1A1A1CR4		SAME AS 1A1A1CR1.	5-13
1A1A1L1		COIL, RF, FIXED: 22 uh, Q=46 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-220.	5-13
1A1A1L2		SAME AS 1A1A1L1.	5-13
1A1A1L3		SAME AS 1A1A1L1.	5-13
1A1A1L4		COIL, RF, FIXED: 220 uh, Q=58 at 0.79 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-221.	5-13
1A1A1L5		SAME AS 1A1A1L4.	5-13
1A1A1L6		SAME AS 1A1A1L4.	5-13
1A1A1L7		COIL, RF, FIXED: 33 uh, Q=46 at 25 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-330.	5-13
1A1A1L8		SAME AS 1A1A1L7.	5-13
1A1A1Q1 thru			
1A1A1Q5		TRANSISTOR: MIL type 2N918.	5-13
1A1A1Q6		TRANSISTOR: MIL type 2N2907.	5-13
1A1A1Q7		TRANSISTOR: MIL type 2N706.	5-13
1A1A1R1		RESISTOR: MIL type RC42GF221J.	5-13
1A1A1R2		RESISTOR: MIL type RC07GF470J.	5-13
1A1A1R3		RESISTOR: MIL type RC07GF103J.	5-13
1A1A1R4		RESISTOR: MIL type RC07GF222J.	5-13
1A1A1R5		RESISTOR: MIL type RC07GF681J.	5-13
1A1A1R6		RESISTOR: MIL type RC07GF101J.	5-13
1A1A1R7		SAME AS 1A1A1R4.	5-13
1A1A1R8		RESISTOR: MIL type RC07GF151J.	5-13
1A1A1R9		RESISTOR: MIL type RC07GF331J.	5-13
1A1A1R10		RESISTOR: MIL type RC07GF100J.	5-13
1A1A1R11		RESISTOR: MIL type RC07GF471J.	5-13
1A1A1R12		SAME AS 1A1A1R11.	5-13
1A1A1R13		RESISTOR: MIL type RC07GF472J.	5-13
1A1A1R14		SAME AS 1A1A1R11.	5-13
1A1A1R15		SAME AS 1A1A1R11.	5-13
1A1A1R16		SAME AS 1A1A1R11.	5-13
1A1A1R17		RESISTOR: MIL type RC07GF104J.	5-13
1A1A1R18		SAME AS 1A1A1R3.	5-13
1A1A1R19		SAME AS 1A1A1R11.	5-13

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A1R20		RESISTOR: MIL type RC07GF102J.	5-13
1A1A1R21		RESISTOR: MIL type RC07GF153J.	5-13
1A1A1R22		RESISTOR: MIL type RC07GF332J.	5-13
1A1A1R23		SAME AS 1A1A1R13.	5-13
1A1A1R24		SAME AS 1A1A1R6.	5-13
1A1A1R25		SAME AS 1A1A1R20.	5-13
1A1A1R26		SAME AS 1A1A1R4.	5-13
1A1A1R27		SAME AS 1A1A1R22.	5-13
1A1A1VR1		SEMICONDUCTOR DEVICE: MIL type 1N7594.	5-13
1A1A1Z1		INTEGRATED CIRCUIT, NAND/NOP GATE: 14 pins, plastic case; supply voltage 7 v, 0.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW169.	5-13
1A1A1Z2		SAME AS 1A1A1Z1.	5-13
1A1A1Z3		INTEGRATED CIRCUIT, INPUT J-K FLIP FLOP: 14 pins, plastic case; supply voltage 7.0 v, 0.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW168.	5-13
1A1A1Z4		INTEGRATED CIRCUIT, DECADE DIVIDER: 8 pins, plastic case; digital input dc to 30 mc, analog input 5 cps to 30 mc; 0.438 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW171.	5-13
1A1A1Z5		INTEGRATED CIRCUIT, NAND GATE: 14 pins, plastic case; 4.75 to 5.25 supply volts. 0.770 in. lg by 0.250 in. wd by 0.220 in. hg. 82679 P/N NW176.	5-13
1A1A1Z6		OSCILLATOR, RADIO FREQUENCY: 1000 kc freq, +24 vdc $\pm 5\%$, 5 ma osc supply; output: 200 mv to 200 ohm load; steel case, stud mtg. 3.000 in. lg by 1.600 in. wd by 0.750 in. hg. 82679 P/NAO122.	5-13
1A1A2		CIRCUIT CARD ASSEMBLY: 38 resistors, 45 capacitors, 14 coils, 11 integrated circuits, 9 transistors, 10 semiconductors, plug-in item; p/o AX5003, 10.312 in. lg by 5.312 in. wd by 0.500 in. hg. 82679 P/N A4659.	5-15
1A1A2C1		CAPACITOR: MIL type CS13BE106K.	5-15
1A1A2C2		SAME AS 1A1A1C1.	5-15
1A1A2C3		SAME AS 1A1A1C17.	5-15
1A1A2C4		SAME AS 1A1A1C1.	5-15
1A1A2C5		SAME AS 1A1A1C17.	5-15
1A1A2C6		SAME AS 1A1A1C1.	5-15
1A1A2C7		SAME AS 1A1A1C1.	5-15
1A1A2C8		CAPACITOR, FIXED, MICA: 430 pf, $\pm 2\%$ tol, 500 wvdc, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F431G5S.	5-15
1A1A2C9		CAPACITOR, FIXED, MICA: 1500 pf, $\pm 1\%$ tol, 500 wvdc, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM112F152F5S.	5-15
1A1A2C10		SAME AS 1A1A2C8.	5-15
1A1A2C11		CAPACITOR, FIXED, MICA: 100 pf, $\pm 5\%$ tol, 500 wvdc; 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F101J5S.	5-15
1A1A2C12		CAPACITOR, FIXED, MICA: 1,000 pf, $\pm 1\%$ tol, 100 wvdc, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM111F102F1S.	5-15
1A1A2C13		SAME AS 1A1A1C5.	5-15
1A1A2C14		SAME AS 1A1A2C12.	5-15
1A1A2C15		SAME AS 1A1A2C11.	5-15
1A1A2C16 thru			
1A1A2C22		SAME AS 1A1A1C1.	5-15
1A1A2C23		SAME AS 1A1A1C27.	5-15
1A1A2C24 thru			
1A1A2C35		SAME AS 1A1A1C1.	5-15
1A1A2C36		SAME AS 1A1A2C1.	5-15
1A1A2C37		SAME AS 1A1A1C1.	5-15

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A2C38		CAPACITOR, FIXED, MICA: 330 pf, $\pm 2\%$ tol, 100 wvdc, 0.440 in. lg by 0.473 in. wd. 0.170 in. thk. 82679 P/N CM111F331G1S.	5-15
1A1A2C39		CAPACITOR, FIXED, MICA: 620 pf, $\pm 2\%$ tol, 300 wvdc, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM111F621G3S.	5-15
1A1A2C40		SAME AS 1A1A2C38.	5-15
1A1A2C41		CAPACITOR, FIXED, CERAMIC: 100,000 pf, $+80\% - 20\%$, 100 wvdc, 0.690 in. dia by 0.156 in. thk by 0.375 in. lead spacing. 82679 P/N CC100-28.	5-15
1A1A2C42		CAPACITOR, FIXED, MICA: 560 pf $\pm 2\%$ tol, 300 wvdc, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM111F561G3S.	5-15
1A1A2C43		SAME AS 1A1A1C1.	5-15
1A1A2C44		SAME AS 1A1A1C1.	5-15
1A1A2C45		SAME AS 1A1A2C17.	5-15
1A1A2CR1		RECTIFIER, SEMICONDUCTOR DEVICE: Forward voltage, 1.0 v; breakdown voltage, 10 v. 0.170 in. lg by 0.076 in. dia, wire lead mtd. 82679 P/N DD137.	5-15
1A1A2CR2		SAME AS 1A1A1CR1.	5-15
1A1A2CR3		SAME AS 1A1A2CR1.	5-15
1A1A2CR4		SAME AS 1A1A2CR1.	5-15
1A1A2CR5		SAME AS 1A1A1CR1.	5-15
1A1A2CR6		SAME AS 1A1A2CR1.	5-15
1A1A2CR7			
thru			
1A1A2CR10		SAME AS 1A1A1CR1.	5-15
1A1A2L1		COIL, RF, FIXED: 10 uh, Q=49 at 7.9 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-100.	5-15
1A1A2L2		SAME AS 1A1A1L1.	5-15
1A1A2L3		SAME AS 1A1A1L4.	5-15
1A1A2L4		SAME AS 1A1A1L4.	5-15
1A1A2L5		SAME AS 1A1A2L1.	5-15
1A1A2L6		COIL, RF, FIXED: 330 uh, Q=54 at 0.79 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-331.	5-15
1A1A2L7		SAME AS 1A1A1L7.	5-15
1A1A2L8		SAME AS 1A1A1L4.	5-15
1A1A2L9		SAME AS 1A1A2L6.	5-15
1A1A2L10		SAME AS 1A1A2L6.	5-15
1A1A2L11		COIL, RF, FIXED: 100 uh, Q=52 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-101.	5-15
1A1A2L12		SAME AS 1A1A2L1.	5-15
1A1A2L13		SAME AS 1A1A2L6.	5-15
1A1A2L14		SAME AS 1A1A2L1.	5-15
1A1A2Q1		SAME AS 1A1A1Q1.	5-15
1A1A2Q2		SAME AS 1A1A1Q1.	5-15
1A1A2Q3		TRANSISTOR: MIL type 2N1132.	5-15
1A1A2Q4			
thru			
1A1A2Q9		SAME AS 1A1A1Q7.	5-15
1A1A2R1		SAME AS 1A1A1R5.	5-15
1A1A2R2		SAME AS 1A1A1R11.	5-15
1A1A2R3		SAME AS 1A1A1R9.	5-15
1A1A2R4		SAME AS 1A1A1R3.	5-15
1A1A2R5		SAME AS 1A1A1R11.	5-15
1A1A2R6		SAME AS 1A1A1R9.	5-15
1A1A2R7		RESISTOR: MIL RC07GF221J.	5-15
1A1A2R8		SAME AS 1A1A2R7.	5-15
1A1A2R9		SAME AS 1A1A1R9.	5-15

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A2R10		SAME AS 1A1A1R11.	5-15
1A1A2R11		SAME AS 1A1A1R3.	5-15
1A1A2R12		SAME AS 1A1A2R7.	5-15
1A1A2R13		SAME AS 1A1A1R21.	5-15
1A1A2R14		SAME AS 1A1A1R17.	5-15
1A1A2R15		SAME AS 1A1A1R20.	5-15
1A1A2R16		SAME AS 1A1A1R20.	5-15
1A1A2R17		SAME AS 1A1A1R21.	5-15
1A1A2R18		SAME AS 1A1A1R3.	5-15
1A1A2R19		SAME AS 1A1A1R20.	5-15
1A1A2R20		SAME AS 1A1A1R3.	5-15
1A1A2R21		SAME AS 1A1A1R21.	5-15
1A1A2R22		SAME AS 1A1A1R13.	5-15
1A1A2R23		SAME AS 1A1A1R11.	5-15
1A1A2R24		SAME AS 1A1A1R20.	5-15
1A1A2R25		SAME AS 1A1A1R22.	5-15
1A1A2R26		SAME AS 1A1A1R13.	5-15
1A1A2R27		SAME AS 1A1A1R3.	5-15
1A1A2R28		SAME AS 1A1A1R4.	5-15
1A1A2R29		SAME AS 1A1A1R7.	5-15
1A1A2R30		SAME AS 1A1A2R7.	5-15
1A1A2R31		SAME AS 1A1A1R4.	5-15
1A1A2R32		SAME AS 1A1A2R7.	5-15
1A1A2R33		SAME AS 1A1A1R4.	5-15
1A1A2R34		SAME AS 1A1A120.	5-15
1A1A2R35		SAME AS 1A1A1R4.	5-15
1A1A2R36		SAME AS 1A1A1R5.	5-15
1A1A2R37		SAME AS 1A1A1R13.	5-15
1A1A2R38		SAME AS 1A1A1R5.	5-15
1A1A2Z1		SAME AS 1A1A1Z3.	5-15
1A1A2Z2		INTEGRATED CIRCUIT, DECADE DIVIDER: 8 pins, plastic case; digital input dc to 30 mc, analog input 5 cps to 30 mc. 0.438 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW170.	5-15
1A1A2Z3		INTEGRATED CIRCUIT, MASTER-SLAVE FLIP FLOP: 14 pins, plastic case; supply voltage 4.75 v to 5.25 v, 0.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW159.	5-15
1A1A2Z4		SAME AS 1A1A1Z5.	5-15
1A1A2Z5			
thru			
1A1A2Z8		SAME AS 1A1A2Z4.	5-15
1A1A2Z9		INTEGRATED CIRCUIT, J-K FLIP FLOP: 14 pins, plastic case; supply voltage 4.75 to 5.25 v. 0.750 in. lg by 0.188 in. wd by 0.125 in. hg. 82679 P/N NW157.	5-15
1A1A2Z10		SAME AS 1A1A2Z3.	5-15
1A1A2Z11		INTEGRATED CIRCUIT, DUAL POSITIVE NANDGATE: 14 pins, plastic case; supply voltage 4.75 v to 5.25 v. 0.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW166.	5-15
1A1A3		CIRCUIT CARD ASSEMBLY: 13 capacitors, 4 coils, 17 integrated circuits, plug-in item, p/o AX5003; 10.312 in. lg by 2.312 in. wd by 0.375 in. hg. 82679 P/N A4660.	5-17
1A1A3C1			
thru			
1A1A3C5		SAME AS 1A1A1C1.	5-17
1A1A3C6		NOT USED.	
1A1A3C7		NOT USED.	
1A1A3C8			
thru			
1A1A3C13		SAME AS 1A1A1C1.	5-17

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A1A3L1		COIL, RF, FIXED: 1,000 uh. Q-65 at 0.79 mc. 0.157 in. dia by 0.396 in. lg. 82679 P/N CL433-102.	5-17
1A1A3L2		SAME AS 1A1A3L1.	5-17
1A1A3L3		SAME AS 1A1A3L1.	5-17
1A1A3L4		SAME AS 1A1A3L1.	5-17
1A1A3Z1		SAME AS 1A1A2Z3.	5-17
1A1A3Z2		SAME AS 1A1A2Z3.	5-17
1A1A3Z3		SAME AS 1A1A2Z9.	5-17
1A1A3Z4		INTEGRATED CIRCUIT, POSITIVE NANDGATE: 14 pins, plastic case; supply voltage 4.75 v to 5.25 v. 0.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW164.	5-17
1A1A3Z5		SAME AS 1A1A2Z3.	5-17
1A1A3Z6		INTEGRATED CIRCUIT, POSITIVE NANDGATE: 14 pins, plastic case; supply voltage 4.75 v to 5.25 v case; 0.770 in. lg by 0.250 in. wd by 0.200 in. hg. 82679 P/N NW134.	5-17
1A1A3Z7		SAME AS 1A1A3Z6.	5-17
1A1A3Z8		SAME AS 1A1A3Z6.	5-17
1A1A3Z10			
thru			
1A1A3Z15		SAME AS 1A1A1Z5.	5-17
1A1A3Z16		SAME AS 1A1A3Z6.	5-17
1A1A3Z17		SAME AS 1A1A3Z6.	5-17
1A1A4		CIRCUIT CARD ASSEMBLY: 6 resistors, 7 capacitors, 4 coils, 23 integrated circuits, 2 transistors, 1 semiconductor, plug-in item, p/o AX5003; 10.312 in. lg by 2.312 in. wd by 0.500 in. hg. 82679 P/N A4661.	5-19
1A1A4C1			
thru			
1A1A4C7		SAME AS 1A1A1C1.	5-19
1A1A4CR1		SAME AS 1A1A1CR1.	5-19
1A1A4L1			
thru			
1A1A4L4		SAME AS 1A1A2L1.	5-19
1A1A4Q1		TRANSISTOR: MIL type 2N2222.	5-19
1A1A4Q2		SAME AS 1A1A1Q7.	5-19
1A1A4R1		SAME AS 1A1A1R20.	5-19
1A1A4R2		SAME AS 1A1A1R20.	5-19
1A1A4R3		SAME AS 1A1A1R11.	5-19
1A1A4R4		SAME AS 1A1A1R11.	5-19
1A1A4R5		SAME AS 1A1A1R11.	5-19
1A1A4R6		SAME AS 1A1A1R4.	5-19
1A1A4Z1		SAME AS 1A1A3Z6.	5-19
1A1A4Z2		SAME AS 1A1A2Z3.	5-19
1A1A4Z3			
thru			
1A1A4Z12		SAME AS 1A1A3Z6.	5-19
1A1A4Z13		INTEGRATED CIRCUIT, QUADRUPLE BISTABLE LATCH: 16 pins, plastic case. 0.438 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW177.	5-19
thru			
1A1A4Z18			
1A1A4Z19			
thru			
1A1A4Z23		SAME AS 1A1A2Z5.	5-19
1A1A5		CIRCUIT CARD ASSEMBLY: Non-repairable item, p/o AX5003; 10.312 in. lg by 4.062 in. wd by 0.875 in. hg. 82679 P/N A4662.	

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A2		POWER SUPPLY ASSEMBLY: Circuit card assembly and shields. 82679 P/N AX5060.	5-21
1A2CR1		RECTIFIER, SEMICONDUCTOR DEVICE: 140 v input, dc output, 125 v res load, 200 v cap. load; plastic case. 0.900 in. lg by 0.670 in. hg by 0.260 in. wd. 82679 P/N DD144-6.	5-21
1A2CR2		NOT USED.	
1A2CR3		NOT USED.	
1A2CR4		SAME AS 1A2CR1.	5-21
1A2E1		SHIELD, CIRCUIT CARD ASSEMBLY: 82679 P/N MS5288.	5-21
1A2E2		SHIELD, CIRCUIT CARD ASSEMBLY: 82679 P/N MS5479.	5-21
1A2R1 thru 1A2R4		NOT USED.	
1A2R5		RESISTOR: MIL type RW69V1R2J.	5-21
1A2R6 thru 1A2R13		NOT USED.	
1A2R14		RESISTOR: MIL type RW69V1R0J.	5-21
1A2R15 thru 1A2R27		NOT USED.	
1A2R28		RESISTOR: MIL type RW67V222J.	5-21
1A2A1		CIRCUIT CARD ASSEMBLY: 26 resistors, 19 capacitors, 12 transistors, 17 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4663.	5-21
1A2A1C1		CAPACITOR, FIXED, ELECTROLYTIC: 350 uf, 75 wvdc, 0.750 in. dia by 2.125 in. lg. Dwg CE119-350-75. 80183 P/N 39D357C075GV4	5-21
1A2A1C2		CAPACITOR, FIXED, ELECTROLYTIC: 200 uf, -10% + 150% at 125 cps, 25°C, 15 wvdc, 0.437 in. dia by 1.625 in. lg. Dwg CE105-200-15. 14655 P/N NW200-15.	5-21
1A2A1C3		SAME AS 1A1A2C41.	5-21
1A2A1C4		CAPACITOR, FIXED, ELECTROLYTIC: 10 uf, -10% + 150% at 125 cps, 25°C wvdc, 0.312 in. dia by 0.750 in lg. Dwg CE105-10-25. 14655 P/N NLW10-25.	5-21
1A2A1C5		SAME AS 1A1A2C41.	5-21
1A2A1C6		SAME AS 1A1A1C5.	5-21
1A2A1C7		CAPACITOR, FIXED, ELECTROLYTIC: 1,000 uf, 25 wvdc, 0.813 in. dia by 2.250 in. lg. Dwg CE119-1000-25. 80183 P/N 39D108G025GL4.	5-21
1A2A1C8		SAME AS 1A2A1C2.	5-21
1A2A1C9		SAME AS 1A1A2C41.	5-21
1A2A1C10		SAME AS 1A2A1C4.	5-21
1A2A1C11		SAME AS 1A1A2C41.	5-21
1A2A1C12		CAPACITOR: MIL type CS13BC227K.	5-21
1A2A1C13		CAPACITOR, FIXED, ELECTROLYTIC: 500 uf, 50 wvdc, 0.875 in. dia by 2.125 in. lg. Dwg CE119-500-50. 80183 P/N 39D507G050HL4.	5-21
1A2A1C14		SAME AS 1A2A1C2.	5-21
1A2A1C15		SAME AS 1A1A2C41.	5-21
1A2A1C16		SAME AS 1A2A1C4.	5-21
1A2A1C17		SAME AS 1A1A2C41.	5-21
1A2A1C18		SAME AS 1A1A1C5.	5-21
1A2A1C19		CAPACITOR, FIXED, ELECTROLYTIC: 12 uf, 350 wvdc, 0.562 in. dia by 2.250 in. lg. Dwg CE119-12-350. 80183 P/N 39D126F350E14.	5-21
1A2A1CR1 thru 1A2A1CR6		NOT USED.	

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A2A1CR7		SEMICONDUCTOR DEVICE: MIL type 1N649.	5-21
1A2A1CR8		NOT USED.	
1A2A1CR9		NOT USED.	
1A2A1CR10		SAME AS 1A2A1CR7.	5-21
1A2A1CR11			
thru			
1A2A1CR14		SAME AS 1A1A1CR1.	5-21
1A2A1Q1		TRANSISTOR: MIL type 2N4036.	5-21
1A2A1Q2		TRANSISTOR: MIL type 2N2631.	5-21
1A2A1Q3		SAME AS 1A1A1Q7.	5-21
1A2A1Q4		TRANSISTOR: MIL type 2N1711.	5-21
1A2A1Q5		SAME AS 1A2A1Q1.	5-21
1A2A1Q6		SAME AS 1A2A1Q2.	5-21
1A2A1Q7		SAME AS 1A1A1Q7.	5-21
1A2A1Q8		SAME AS 1A1A1Q7.	5-21
1A2A1Q9		SAME AS 1A2A1Q2.	5-21
1A2A1Q6		SAME AS 1A2A1Q1.	5-21
1A2A1Q11		SAME AS 1A1A12Q3.	5-21
1A2A1Q12		SAME AS 1A2A1Q1.	5-21
1A2A1R1		RESISTOR: MIL type RC20GF682J.	5-21
1A2A1R2		SAME AS 1A1A1R9.	5-21
1A2A1R3		SAME AS 1A1A1R8.	5-21
1A2A1R4		RESISTOR, VARIABLE, WIRE WOUND: 100 ohms, $\pm 20\%$ tol; 0.250 in. dia by 0.250 in. hg. P. C. type mounting pins. Dwg RV126-61P101, 80740 P/N 61P101.	5-21
1A2A1R5		NOT USED	5-21
1A2A1R6		RESISTOR: MIL type RC07GF162J.	5-21
1A2A1R7		SAME AS 1A1A1R13.	5-21
1A2A1R9		SAME AS 1A2A1R6.	5-21
1A2A1R10		SAME AS 1A2A1R6.	5-21
1A2A1R11		SAME AS 1A1A1R8.	5-21
1A2A1R12		SAME AS 1A1A1R6.	5-21
1A2A1R13		SAME AS 1A2A1R4.	5-21
1A2A1R14		NOT USED.	
1A2A1R15		SAME AS 1A1A1R6.	5-21
1A2A1R16		SAME AS 1A1A1R6.	5-21
1A2A1R17		SAME AS 1A2A1R4.	5-21
1A2A1R18		RESISTOR: MIL type RC07GF2R7J.	5-21
1A2A1R19		RESISTOR: MIL type RC20GF472J.	5-21
1A2A1R20		SAME AS 1A1A2R7.	5-21
1A2A1R21		SAME AS 1A1A1R8.	5-21
1A2A1R22		SAME AS 1A2A1R8.	5-21
1A2A1R23		RESISTOR: MIL type RC07GF150J.	5-21
1A2A1R24		SAME AS 1A1A1R22.	5-21
1A2A1R25		SAME AS 1A1A1R21.	5-21
1A2A1R26		RESISTOR, VARIABLE, WIRE WOUND: 5,000 ohms, $\pm 20\%$ tol; 0.250 in. dia by 0.250 in. hg. P. C. type mounting pins. Dwg RV126-61P502. 80740 P/N 61P502.	5-21
1A2A1R27		RESISTOR: MIL type RC07GF682J.	5-21
1A2A1R28		NOT USED.	
1A2A1R29		RESISTOR: MIL type RC20GF224J.	5-21
1A2A1VR1		NOT USED.	
1A2A1VR2		SEMICONDUCTOR DEVICE: MIL type 1N4370A.	5-21
1A2A1VR3		SEMICONDUCTOR DEVICE: MIL type 1N754A.	5-21
1A2A1VR4		NOT USED.	
1A2A1R7		SAME AS 1A1A1R13	5-21

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A2A1VR5		SAME AS 1A2A1VR2.	5-21
1A2A1VR6		SAME AS 1A2A1VR2.	5-21
1A2A1VR7		NOT USED.	5-21
1A2A1VR8		SAME AS 1A2A1VR2.	5-21
1A2A1VR9		SAME AS 1A2A1VR3.	5-21
1A3		CIRCUIT CARD ASSEMBLY W/SHIELDS: 82679 P/N AX5061.	5-23
1A3E1		SHIELD, CIRCUIT CARD ASSEMBLY: 82679 P/N 5288.	5-23
1A3E2		SHIELD, CIRCUIT CARD ASSEMBLY: 82679 P/N MS5289.	5-23
1A3A1		CIRCUIT CARD ASSEMBLY: 78 resistors, 62 capacitors, 8 coils, 2 transformers, 1 oscillator, 1 filter, 3 integrated circuits, 3 relays, 12 transistors, 19 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4664.	5-23
1A3A1C1		SAME AS 1A1A2C41.	5-23
1A3A1C2		SAME AS 1A1A2C41.	5-23
1A3A1C3		CAPACITOR, FIXED, MICA: 22 uuf, ±5% tol, 500 wvdc, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111E220J5S.	5-23
1A3A1C4		SAME AS 1A1A2C41.	5-23
1A3A1C5		SAME AS 1A1A1C17.	5-23
1A3A1C6		SAME AS 1A1A2C41.	5-23
1A3A1C7		CAPACITOR, FIXED, MICA: 2,700 uuf, ±5% tol, 500 wvdc, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM 112F272J5S.	5-23
1A3A1C8		SAME AS 1A1A2C41.	5-23
1A3A1C9		SAME AS 1A1A1C17.	5-23
1A3A1C10		SAME AS 1A1A2C41.	5-23
1A3A1C11		SAME AS 1A3A1C7.	5-23
1A3A1C12		SAME AS 1A1A2C41.	5-23
1A3A1C13		SAME AS 1A1A1C17.	5-23
1A3A1C14		SAME AS 1A1A2C41.	5-23
1A3A1C15		SAME AS 1A3A1C7.	5-23
1A3A1C16		SAME AS 1A1A2C41.	5-23
1A3A1C17		SAME AS 1A1A1C17.	5-23
1A3A1C18		SAME AS 1A1A2C41.	5-23
1A3A1C19		SAME AS 1A3A1C7.	5-23
1A3A1C20			
thru			
1A3A1C26		SAME AS 1A1A2C41.	5-23
1A3A1C27		CAPACITOR, FIXED, MICA: 3,900 uuf, ±1% tol, 500 wvdc. 0.680 in. lg by 0.540 in. wd by 0.270 in. thk. 82679 P/N CM112F392F5S.	5-23
1A3A1C28			
thru			
1A3A1C31		SAME AS 1A1A2C41.	5-23
1A3A1C32		CAPACITOR, FIXED, MICA: 470 uuf, ±2% tol, 500 wvdc, 0.440 in. wd by 0.170 in. thk. 82679 P/N CM111E471G5S.	5-23
1A3A1C33		CAPACITOR, FIXED, CERAMIC: 10,000 uuf, gm, 600 wvdc, 0.600 in. dia by 0.156 in. thk by 0.375 in. lead spacing. 82679 P/N CC100-16.	5-23
1A3A1C34		SAME AS 1A3A1C3.	5-23
1A3A1C35		SAME AS 1A1A2C41.	5-23
1A3A1C36		CAPACITOR, FIXED, MICA: 3,300 uuf, ±2% tol, 500 wvdc, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F332G5S.	5-23
1A3A1C37		SAME AS 1A1A2C41.	5-23
1A3A1C38		SAME AS 1A1A2C39.	5-23
1A3A1C39		SAME AS 1A1A2C41.	5-23
1A3A1C40		SAME AS 1A1A2C41.	5-23

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A3A1C41		SAME AS 1A1A2C39.	5-23
1A3A1C42		SAME AS 1A1A2C41.	5-23
1A3A1C43		SAME AS 1A1A2C41.	5-23
1A3A1C44		SAME AS 1A3A1C36.	5-23
1A3A1C45		SAME AS 1A1A2C41.	5-23
1A3A1C46		SAME AS 1A1A2C41.	5-23
1A3A1C47		SAME AS 1A3A1C32.	5-23
1A3A1C48		SAME AS 1A3A1C3.	5-23
1A3A1C49		SAME AS 1A3A1C33.	5-23
1A3A1C50		SAME AS 1A1A2C41.	5-23
1A3A1C51		SAME AS 1A1A2C41.	5-23
1A3A1C52		SAME AS 1A1A2C41.	5-23
1A3A1C53		SAME AS 1A2A1C12.	5-23
1A3A1C54		SAME AS 1A2A1C12.	5-23
1A3A1C55			
thru			
1A3A1C58		SAME AS 1A1A2C41.	5-23
1A3A1C59		SAME AS 1A3A1C32.	5-23
1A3A1C60		SAME AS 1A1A2C41.	5-23
1A3A1C61		SAME AS 1A1A2C41.	5-23
1A3A1C62		CAPACITOR: MIL type CL33CE200MN3.	5-23
1A3A1CR1			
thru			
1A3A1CR12		SAME AS 1A1A1CR1.	5-23
1A3A1CR13		NOT USED.	
1A3A1CR14		NOT USED.	
1A3A1CR15		NOT USED.	
1A3A1CR16		SAME AS 1A1A1CR1.	5-23
1A3A1CR17		SAME AS 1A1A1CR1.	5-23
1A3A1CR18		SAME AS 1A1A1CR1.	5-23
1A3A1FL1		FILTER, BANDPASS: 250 kc nom center freq; output imp 510 ohms; hermetically sealed steel case, 3.480 in. lg by 0.660 in. hg by 1.100 in. wd. 82679 P/N FX256.	5-23
1A3A1K1		RELAY, ARMATURE, DC: Dpdt, 400 milliwatt sensitivity; coil data; 6.0 milliamps, 2,500 ohms; operate time; 15 milliseconds; release time; 10 milliseconds; hermetically sealed metal case 1.281 in. hg by 0.800 in. wd by 0.400 in. thk; bracket mounted. 82679 P/N RL178-U6D4R0.	5-23
1A3A1K1		SAME AS 1A3A1K1.	5-23
1A3A1K2		SAME AS 1A3A1K1.	5-23
1A3A1L1		SAME AS 1A1A2L11.	5-23
1A3A1L2			
thru			
1A3A1L5		COIL, RF, FIXED: 150 uh, Q=50 at .79 mc, 0.400 in. dia by 0.500 in. lg. Dwg CL430-4. 72259 P/N VIV-150.0.	5-23
1A3A1L6		COIL, RF, FIXED: 4,700 uh, Q=44 at 0.25 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-472.	5-23
1A3A1L7		SAME AS 1A3A1L6.	5-23
1A3A1L8		SAME AS 1A1A2L11.	5-23
1A3A1Q1			
thru			
1A3A1Q4		TRANSISTOR: MIL type 2N4221.	5-23
1A3A1Q5			
thru			
1A3A1Q9		SAME AS 1A1A1Q7.	5-23
1A3A1Q10		SAME AS 1A2A1Q4.	5-23
1A3A1Q11		SAME AS 1A1A2Q3.	5-23

TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A3A1Q12		TRANSISTOR: MIL type 3N128.	5-23
1A3A1R1		RESISTOR: MIL type RC02GF681.	5-23
1A3A1R2		SAME AS 1A3A1R1.	5-23
1A3A1R3		RESISTOR, VARIABLE, WIRE WOUND: 500 ohms, $\pm 50\%$ tol, 200 wvdc. 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-501.	5-23
1A3A1R4		SAME AS 1R3.	5-23
1A3A1R5		RESISTOR: MIL type RC07GF474J.	5-23
1A3A1R6		SAME AS 1A1A1R13.	5-23
1A3A1R7		RESISTOR: MIL type RC07GF473J.	5-23
1A3A1R8		SAME AS 1A1A1R13.	5-23
1A3A1R9		SAME AS 1A1A1R13.	5-23
1A3A1R10		SAME AS 1A3A1R5.	5-23
1A3A1R11		SAME AS 1R3.	5-23
1A3A1R12		SAME AS 1A3A1R7.	5-23
1A3A1R13		SAME AS 1A1A1R2.	5-23
1A3A1R14		SAME AS 1A1A1R13.	5-23
1A3A1R15		SAME AS 1R3.	5-23
1A3A1R16		SAME AS 1A3A1R5.	5-23
1A3A1R17		SAME AS 1A1A1R13.	5-23
1A3A1R18		SAME AS 1A3A1R7.	5-23
1A3A1R19		SAME AS 1A1A1R2.	5-23
1A3A1R20		SAME AS 1A1A1R13.	5-23
1A3A1R21		SAME AS 1A3A1R5.	5-23
1A3A1R22		SAME AS 1R3.	5-23
1A3A1R23		SAME AS 1A1A1R3.	5-23
1A3A1R24		SAME AS 1A1A1R2.	5-23
1A3A1R25		SAME AS 1A1A1R13.	5-23
1A3A1R26		SAME AS 1A1A1R13.	5-23
1A3A1R27		SAME AS 1A1A2R7.	5-23
1A3A1R28		SAME AS 1A1A1R11.	5-23
1A3A1R29		SAME AS 1A1A1R11.	5-23
1A3A1R30		SAME AS 1A1A1R22.	5-23
1A3A1R31		SAME AS 1A1A2R7.	5-23
1A3A1R32		SAME AS 1A1A1R13.	5-23
1A3A1R33		SAME AS 1A1A1R4.	5-23
1A3A1R34		RESISTOR, VARIABLE, WIRE WOUND: 5,000 ohms $\pm 5\%$ tol, 0.500 in. by 0.500 in. by 0.220 in.; gold plated nickel 0.028 in. dia p. c. pins. Dwg RV125-P502. 80294 P/N 3250P502.	5-23
1A3A1R35		SAME AS 1A1A1R3.	5-23
1A3A1R36		SAME AS 1A1A1R3.	5-23
1A3A1R37		SAME AS 1A1A1R20.	5-23
1A3A1R38		SAME AS 1A1A1R20.	5-23
1A3A1R39		SAME AS 1A1A1R3.	5-23
1A3A1R40		SAME AS 1A2A1R6.	5-23
1A3A1R41		SAME AS 1A1A1R3.	5-23
1A3A1R42		SAME AS 1A1A1R3.	5-23
1A3A1R43		SAME AS 1A1A1R20.	5-23
1A3A1R44		RESISTOR, VARIABLE, WIRE WOUND: 10,000 ohms, $\pm 30\%$ tol, 200 wvdc, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-103.	5-23
1A3A1R45		SAME AS 1A1A1R3.	5-23
1A3A1R46		SAME AS 1A1A1R3.	5-23
1A3A1R47		SAME AS 1A1A1R11.	5-23
1A3A1R48		SAME AS 1A1A2R7.	5-23
1A3A1R49		SAME AS 1A1A1R13.	5-23
1A3A1R50		SAME AS 1A1A1R20.	5-23
1A3A1R51		SAME AS 1A1A1R3.	5-23
1A3A1R52		SAME AS 1A1A1R3.	5-23

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A3A1R53		SAME AS 1A1A1R13.	5-23
1A3A1R54		SAME AS 1A1A1R17.	5-23
1A3A1R55		SAME AS 1A1A2R7.	5-23
1A3A1R56		SAME AS 1A1A1R13.	5-23
1A3A1R57		SAME AS 1A3A1R44.	5-23
1A3A1R58		SAME AS 1A2A1R6.	5-23
1A3A1R59		SAME AS 1A1A1R11.	5-23
1A3A1R60		SAME AS 1A1A1R3.	5-23
1A3A1R61		SAME AS 1A1A1R17.	5-23
1A3A1R62		SAME AS 1A3A1R7.	5-23
1A3A1R63		SAME AS 1A1A1R20.	5-23
1A3A1R64		RESISTOR: MIL type RC07GF223J.	5-23
1A3A1R65		SAME AS 1A2A1R6.	5-23
1A3A1R66		SAME AS 1A3A1R7.	5-23
1A3A1R67		SAME AS 1A3A1R7.	5-23
1A3A1R68		SAME AS 1A3A1R6.	5-23
1A3A1R69		SAME AS 1A1A1R2.	5-23
1A3A1R70		SAME AS 1A1A1R2.	5-23
1A3A1R71		SAME AS 1A3A1R7.	5-23
1A3A1R72		SAME AS 1A1A1R11.	5-23
1A3A1R73		SAME AS 1A3A1R7.	5-23
1A3A1R74		SAME AS 1A3A1R7.	5-23
1A3A1R75		SAME AS 1A2A1R6.	5-23
1A3A1R76		SAME AS 1A1A1R3.	5-23
1A3A1R77		RESISTOR: MIL type RC07GF333J.	5-23
1A3A1R78		SAME AS 1A3A1R44.	5-23
1A3A1T1		TRANSFORMER, RADIO FREQUENCY, ADJUSTABLE: 50 min Q at 795 kc test frequency; metal case 0.614 in. dia by 0.532 in. hg. 82679 P/N TT300.	5-23
1A3A1T2		SAME AS 1A3A1T1.	5-23
1A3A1VR1		SEMICONDUCTOR DEVICE: MIL type 1N756A.	5-23
1A3A1VR2		SAME AS 1A3A1VR1.	5-23
1A3A1VR3		SEMICONDUCTOR DEVICE: MIL type 1N758A.	5-23
1A3A1VR4		SAME AS 1A3A1VR3.	5-23
1A3A1Z1		INTEGRATED CIRCUIT, OPERATIONAL AMPLIFIER: 8 pins, metal case; supply voltage ± 18 v, 0.375 in. dia by 0.187 in. hg. 82679 P/N NW156.	5-23
1A3A1Z2		SAME AS 1A3A1Z1.	5-23
1A3A1Z3		SAME AS 1A3A1Z1.	5-23
1A3A1Z4		OSCILLATOR, RADIO FREQUENCY: 250 kc freq, +24 vdc + 5%, 20 ma osc supply; output, 1 v rms into 500 ohm load; steel case, stud mtd. 3,000 in. lg by 1.600 in. wd by 0.750 in. hg. 82679 P/N A0124.	5-23
1A4		NOT USED	
1A5		CIRCUIT CARD ASSEMBLY W/SIELDS. 82679 P/N AX5062.	5-25
1A5E1		SAME AS 1A2E1.	5-25
1A5E2		SAME AS 1A3E2.	5-25
1A5A1		CIRCUIT CARD ASSEMBLY: 81 resistors, 62 capacitors, 8 coils, 4 transformers, 1 relay, 2 integrated circuits, 18 transistors, 11 semiconductors, plug-in item; 10.031 in. by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4668.	5-25

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A5A1C2 1A5A1C3 thru 1A5A1C7 1A5A1C8		CAPACITOR: MIL type CS13BF106K.	5-25
1A5A1C9 1A5A1C10 1A5A1C11		SAME AS 1A1A2C41. CAPACITOR, FIXED, MICA: 2,700 uuf, ±5% tol, 300 wvdc. 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM112F272J3S. SAME AS 1A1A2C41. SAME AS 1A1A2C41.	5-25 5-25 5-25
1A5A1C12 1A5A1C13 1A5A1C14 1A5A1C15 1A5A1C16 1A5A1C17		CAPACITOR, FIXED, MICA: 6,800 uuf, ±5% tol, 100 wvdc. 0.690 in. lg by 0.560 in. wd by 0.320 in. thk. 82679 P/N CM112F682J1S. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A5A1C11. SAME AS 1A1A2C41. SAME AS 1A1A2C41.	5-25 5-25 5-25 5-25 5-25 5-25
1A5A1C18 1A5A1C19 1A5A1C20 1A5A1C21 1A5A1C22		CAPACITOR, FIXED, MICA: 10,000 uuf, ±1% tol, 100 wvdc. 0.790 in. lg by 0.570 in. wd by 0.340 in. thk. 82679 P/N CM112F103F1S. SAME AS 1A5A1C17. SAME AS 1A1A2C12. SAME AS 1A3A1C36. SAME AS 1A1A2C41.	5-25 5-25 5-25 5-25 5-25
1A5A1C23 1A5A1C24 1A5A1C25 1A5A1C26 1A5A1C27 1A5A1C28 1A5A1C29 1A5A1C30		CAPACITOR, FIXED, MICA: 4,700 uug, ±5% tol, 500 wvdc. 0.665 in. lg, 0.625 in. wd, 0.240 in. thk. 82679 P/N CM112F472J5S. SAME AS 1A1A2C12. SAME AS 1A3A1C33. SAME AS 1A5A1C2. SAME AS 1A1A2C41. SAME AS 1A5A1C11. SAME AS 1A1A2C41. SAME AS 1A1A2C41.	5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25
1A5A1C31 1A5A1C32 1A5A1C33 1A5A1C34 1A5A1C35 thru 1A5A1C38 1A5A1C39 1A5A1C40 1A5A1C41 1A5A1C42 1A5A1C43 1A5A1C44 1A5A1C45 1A5A1C46 1A5A1C47 1A5A1C48 1A5A1C49 1A5A1C50 1A5A1C51 1A5A1C52		CAPACITOR, FIXED, MICA: 8,200 uuf, ±1% tol, 100 wvdc. 0.790 in. lg by 0.570 in. wd by 0.340 in. thk. 82679 P/N CM112F822F1S. SAME AS 1A5A1C30. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A5A1C11. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A3A1C33. SAME AS 1A3A1C33. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A5A1C17. SAME AS 1A5A1C2. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A5A1C11. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A5A1C17. SAME AS 1A3A1C36.	5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25 5-25
1A5A1C56 1A5A1C57 1A5A1C58		SAME AS 1A1A2C41. SAME AS 1A5A1C2. NOT USED.	5-25 5-25

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A5A1C59			
thru			
1A5A1C62		SAME AS 1A1A2C41.	5-25
1A5A1C63		SAME AS 1A1A1C17.	5-25
1A5A1CR1			
thru			
1A5A1CR7		SAME AS 1A1A1CR1.	5-25
1A5A1K1		SAME AS 1A3A1K1.	5-25
1A5A1L1		SAME AS 1A1A1L4.	5-25
1A5A1L2		NOT USED.	
1A5A1L3		SAME AS 1A1A3L1.	5-25
1A5A1L4		SAME AS 1A1A3L1.	5-25
1A5A1L5		SAME AS 1A1A1L1.	5-25
1A5A1L6		COIL, RF, FIXED: 680 uh, Q=60 at 0.79 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-681.	5-25
1A5A1L7		SAME AS 1A1A1L4.	5-25
1A5A1L8		SAME AS 1A1A3L1.	5-25
1A5A1L9		SAME AS 1A1A1L4.	5-25
1A5A1Q1			
thru			
1A5A1Q15		SAME AS 1A1A1Q7.	5-25
1A5A1Q16		SAME AS 1A2A1Q4.	5-25
1A5A1Q17		SAME AS 1A2A1Q4.	5-25
1A5A1Q18		SAME AS 1A1A1Q7.	5-25
1A5A1R1		SAME AS 1A1A1R3.	5-25
1A5A1R2		SAME AS 1A1A1R21.	5-25
1A5A1R3		SAME AS 1A1A1R22.	5-25
1A5A1R4		SAME AS 1A3A1R77.	5-25
1A5A1R5		SAME AS 1A2A1R27.	5-25
1A5A1R6		SAME AS 1A1A1R2.	5-25
1A5A1R7		SAME AS 1A3A1R44.	5-25
1A5A1R8		SAME AS 1A1A1R2.	5-25
1A5A1R9		SAME AS 1A2A1R27.	5-25
1A5A1R10		SAME AS 1A1A1R21.	5-25
1A5A1R11		SAME AS 1A2A1R6.	5-25
1A5A1R12		SAME AS 1A1A1R5.	5-25
1A5A1R13		SAME AS 1A2A1R6.	5-25
1A5A1R14		SAME AS 1A1A1R21.	5-25
1A5A1R15		SAME AS 1A1A1R3.	5-25
1A5A1R16		SAME AS 1A2A1R6.	5-25
1A5A1R17		SAME AS 1A1A1R5.	5-25
1A5A1R18		SAME AS 1A1A1R13.	5-25
1A5A1R19		SAME AS 1A1A2R7.	5-25
1A5A1R20		SAME AS 1A3A1R44.	5-25
1A5A1R21		RESISTOR: MIL type RC07GF272J.	5-25
1A5A1R22		SAME AS 1A1A1R20.	5-25
1A5A1R23		SAME AS 1A3A1R77.	5-25
1A5A1R24		SAME AS 1A2A1R6.	5-25
1A5A1R25		SAME AS 1A3A1R77.	5-25
1A5A1R26		RESISTOR: MIL type RC07GF683J.	5-25
1A5A1R27		SAME AS 1A2A1R6.	5-25
1A5A1R28		SAME AS 1A2A1R6.	5-25
1A5A1R29		SAME AS 1A3A1R5.	5-25
1A5A1R30		SAME AS 1A1A1R22.	5-25
1A5A1R31		SAME AS 1A1A1R21.	5-25
1A5A1R32		SAME AS 1A1A1R13.	5-25
1A5A1R33		SAME AS 1A1A1R6.	5-25

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A5A1R34		SAME AS 1A1A1R22.	5-25
1A5A1R35		SAME AS 1A1A1R3.	5-25
1A5A1R36		SAME AS 1A1A1R9.	5-25
1A5A1R37		NOT USED.	
1A5A1R38		SAME AS 1A1A1R9.	5-25
1A5A1R39		SAME AS 1A1A1R21.	5-25
1A5A1R40		SAME AS 1A1A1R3.	5-25
1A5A1R41		SAME AS 1A1A1R6.	5-25
1A5A1R42		SAME AS 1A1A1R22.	5-25
1A5A1R43		SAME AS 1A1A1R13.	5-25
1A5A1R44		SAME AS 1A1A1R22.	5-25
1A5A1R45		SAME AS 1A1A1R3.	5-25
1A5A1R46		SAME AS 1A1A1R21.	5-25
1A5A1R47		SAME AS 1A1A1R9.	5-25
1A5A1R48		SAME AS 1A2A1R6.	5-25
1A5A1R49		SAME AS 1A1A1R21.	5-25
1A5A1R50		SAME AS 1A1A1R13.	5-25
1A5A1R51		SAME AS 1A1A2R7.	5-25
1A5A1R52		SAME AS 1A1A1R22.	5-25
1A5A1R53		SAME AS 1A1A1R5.	5-25
1A5A1R54		SAME AS 1A2A1R6.	5-25
1A5A1R55		SAME AS 1A2A1R6.	5-25
1A5A1R56		RESISTOR: MIL type RC52GF471J.	5-25
1A5A1R57		SAME AS 1A1A1R20.	5-25
1A5A1R58		SAME AS 1A1A2R7.	5-25
1A5A1R59		SAME AS 1A1A1R5.	5-25
1A5A1R60		SAME AS 1A2A1R6.	5-25
1A5A1R61		SAME AS 1A3A1R44.	5-25
1A5A1R62		SAME AS 1A1A1R21.	5-25
1A5A1R63		SAME AS 1A5A1R26.	5-25
1A5A1R64		RESISTOR, VARIABLE, WIRE WOUND: 50,000 ohms, $\pm 30\%$ tol, 200 wvdc. 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-503.	5-25
1A5A1R65		SAME AS 1A1A1R17.	5-25
1A5A1R66		SAME AS 1A1A1R17.	5-25
1A5A1R67		SAME AS 1A1A1R21.	5-25
1A5A1R68		SAME AS 1A1A1R4.	5-25
1A5A1R69		SAME AS 1A5A1R26.	5-25
1A5A1R70		SAME AS 1A3A1R7.	5-25
1A5A1R71		SAME AS 1A1A1R13.	5-25
1A5A1R72		SAME AS 1A3A1R7.	5-25
1A5A1R73		SAME AS 1A1A1R13.	5-25
1A5A1R74		SAME AS 1A1A1R4.	5-25
A15A1R75		SAME AS 1A1A1R20.	5-25
1A5A1R76		SAME AS 1A1A1R13.	5-25
1A5A1R77		SAME AS 1A1A1R13.	5-25
1A5A1R78		SAME AS 1A1A1R17.	5-25
1A5A1R79		RESISTOR: MIL type RC07GF223J.	5-25
1A5A1R80		RESISTOR, VARIABLE, WIRE WOUND: 1,000 ohms, $\pm 30\pm$ tol, 200 wvdc. 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-102.	5-25
1A5A1R81		SAME AS 1A1A1R20.	5-25
1A5A1R82		RESISTOR: MIL type RC20GF100J.	5-25
1A5A1T1		TRANSFORMER, PULSE: 2,500 uh, $\pm 20\%$ tol, wire leads. 0.500 in. lg by 0.350 in. wd by 0.250 in. hg. Dwg TF374-5. 90095 P/N 21PHA	5-25
1A5A1T2		SAME AS 1A5A1T1.	5-25
1A5A1T3		TRANSFORMER, RF, ADJUSTABLE: Q=100 at 252.5 kc test fre- quency. 0.614 in. dia by 0.532 in. hg. 82679 P/N TT299.	5-25
1A5A1T4		SAME AS 1A5A1T3.	5-25

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A5A1VR1 1A5A1VR2 1A5A1VR3 1A5A1VR4 1A5A1Z1 1A5A1Z2		SEMICONDUCTOR DEVICE: MIL type 1N751A. SAME AS 1A5A1VR1. SAME AS 1A3A1VR3. SAME AS 1A3A1VR3. SAME AS 1A3A1Z1. INTEGRATED CIRCUIT, 4 BIT BINARY COUNTER: Supply voltage 4.5 to 5.5 v, 14 pins, plastic case. 6.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW174.	5-25 5-25 5-25 5-25 5-25 5-25
1A6		CIRCUIT CARD ASSEMBLY W/SHIELDS: 82679 P/N AX5063.	5-27
1A6E1 1A6E2 1A6A1		SAME AS 1A2E1. SAME AS 1A3E2. CIRCUIT CARD ASSEMBLY: 117 resistors, 127 capacitors, 32 coils, 3 crystals, 6 integrated circuits, 31 transistors, 18 semi-conductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4669.	5-27 5-27 5-27
1A6A1C1 1A6A1C2 1A6A1C3 1A6A1C4 1A6A1C5 1A6A1C6 1A6A1C7 1A6A1C8 1A6A1C9		SAME AS 1A1A2C41. CAPACITOR: MIL type CS13BF476K. SAME AS 1A1A2C41. SAME AS 1A6A1C2. SAME AS 1A1A2C41. SAME AS 1A6A1C2. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A1A2C41. CAPACITOR, VARIABLE, CERAMIC: 9-35 uuf, 100 wvdc, min Q=500 at mc. 0.375 in. dia by 0.375 in. hg. 82679 P/N CV112-8.	5-27 5-27 5-27 5-27 5-27 5-27 5-27 5-27 5-27
1A6A1C10 1A6A1C11 1A6A1C12		SAME AS 1A1A1C1. SAME AS 1A1A1C1. CAPACITOR, FIXED, MICA: 15 uuf, ±5% tol, 500 wvdc, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C150J5S.	5-27 5-27 5-27
1A6A1C13 1A6A1C14		SAME AS 1A1A2C11. CAPACITOR, FIXED, MICA: 220 uuf, ±2% tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F221G5S.	5-27 5-27
1A6A1C15 thru 1A6A1C18 1A6A1C19		SAME AS 1A1A1C1. CAPACITOR, FIXED, MICA: 200 uuf, ±2% tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F201G5S.	5-27 5-27
1A6A1C20 1A6A1C21 1A6A1C22 1A6A1C23 1A6A1C24		SAME AS 1A1A1C1. SAME AS 1A1A1C1. SAME AS 1A1A1C1. SAME AS 1A6A1C19. CAPACITOR, FIXED, MICA: 10 uuf, ±5% tol, 300 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C100J3S.	5-27 5-27 5-27 5-27 5-27
1A6A1C25 1A6A1C26		SAME AS 1A6A1C19. CAPACITOR, FIXED, MICA: 10 uuf, ±5% tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C100J5S.	5-27 5-27
1A6A1C27 1A6A1C28 1A6A1C29 1A6A1C30 1A6A1C31 1A6A1C32		SAME AS 1A6A1C19. SAME AS 1A1A1C1. SAME AS 1A1A1C1. SAME AS 1A1A2C41. SAME AS 1A1A2C41. SAME AS 1A6A1C9.	5-27 5-27 5-27 5-27 5-27 5-27

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A6A1C33		SAME AS 1A1A1C1.	5-27
1A6A1C34		SAME AS 1A1A1C1.	5-27
1A6A1C35		CAPACITOR, FIXED, MICA: 27 uuf, $\pm 10\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. hg. 82679 P/N CM111E270K5S.	5-27
1A6A1C36		SAME AS 1A1A2C11.	5-27
1A6A1C37		SAME AS 1A1A1C7.	5-27
1A6A1C38			
thru			
1A6A1C41		SAME AS 1A1A1C1.	5-27
1A6A1C42		CAPACITOR, FIXED, MICA: 69 uuf, $\pm 1\%$ tol, 300 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111E680F5S.	5-27
1A6A1C43		SAME AS 1A1A1C1.	5-27
1A6A1C44		SAME AS 1A1A1C1.	5-27
1A6A1C45		SAME AS 1A1A1C1.	5-27
1A6A1C46		SAME AS 1A1A2C38.	5-27
1A6A1C47		SAME AS 1A6A1C26.	5-27
1A6A1C48		SAME AS 1A1A2C38.	5-27
1A6A1C49		SAME AS 1A6A1C26.	5-27
1A6A1C50		SAME AS 1A1A2C38.	5-27
1A6A1C51		SAME AS 1A1A1C1.	5-27
1A6A1C52		SAME AS 1A1A1C1.	5-27
1A6A1C53		SAME AS 1A1A2C41.	5-27
1A6A1C54		SAME AS 1A1A2C41.	5-27
1A6A1C55		CAPACITOR, FIXED, MICA: 2,700 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F272G5S.	5-27
1A6A1C56		SAME AS 1A1A2C41.	5-27
1A6A1C57		SAME AS 1A1A2C41.	5-27
1A6A1C58		SAME AS 1A1A2C41.	5-27
1A6A1C59		SAME AS 1A1A1C27.	5-27
1A6A1C60		SAME AS 1A1A1C1.	5-27
1A6A1C61		SAME AS 1A1A1C1.	5-27
1A6A1C62		CAPACITOR, FIXED, MICA: 910 pf, $\pm 2\%$ tol, 500 wvdc. 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM111F911G5S.	5-27
1A6A1C63		SAME AS 1A6A1C26.	5-27
1A6A1C64		SAME AS 1A6A1C62.	5-27
1A6A1C65		SAME AS 1A1A1C1.	5-27
1A6A1C66		SAME AS 1A6A1C26.	5-27
1A6A1C67		SAME AS 1A1A1C1.	5-27
1A6A1C68		SAME AS 1A1A1C1.	5-27
1A6A1C69		CAPACITOR, FIXED, MICA: 510 uuf, $\pm 2\%$ tol, 500 wvdc, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F511G5S.	5-27
1A6A1C70		SAME AS 1A1A1C1.	5-27
1A6A1C71		SAME AS 1A1A1C1.	5-27
1A6A1C72		SAME AS 1A1A1C1.	5-27
1A6A1C73		SAME AS 1A6A1C69.	5-27
1A6A1C74		CAPACITOR, FIXED, MICA: 47 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F470G5S.	5-27
1A6A1C75		SAME AS 1A6A1C69.	5-27
1A6A1C76		SAME AS 1A6A1C74.	5-27
1A6A1C77		SAME AS 1A6A1C69.	5-27
1A6A1C78			5-27
1A6A1C79			5-27
1A6A1C80		SAME AS 1A1A1C1.	5-27
1A6A1C81		CAPACITOR, FIXED, MICA: 150 uuf, $\pm 1\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F151F5S.	5-27
1A6A1C82		SAME AS 1A6A1C26.	5-27

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A6A1C83		CAPACITOR, FIXED, MICA: 120 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F121G5S.	5-27
1A6A1C84		SAME AS 1A6A1C83.	5-27
1A6A1C85		SAME AS 1A6A1C81.	5-27
1A6A1C86		SAME AS 1A1A1C1.	5-27
1A6A1C87			
thru			
1A6A1C90		SAME AS 1A1A2C41.	5-27
1A6A1C91		SAME AS 1A6A1C9.	5-27
1A6A1C92		SAME AS 1A1A1C1.	5-27
1A6A1C93		CAPACITOR, FIXED, MICA: 22 uuf, $\pm 5\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C220J5S.	5-27
1A6A1C94		SAME AS 1A1A1C1.	5-27
1A6A1C95		SAME AS 1A1A2C11.	5-27
1A6A1C96			
thru			
1A6A1C99		SAME AS 1A1A1C17.	5-27
1A6A1C100		SAME AS 1A1A1C1.	5-27
1A6A1C101		SAME AS 1A6A1C14.	5-27
1A6A1C102		SAME AS 1A1A1C1.	5-27
1A6A1C103		SAME AS 1A1A1C1.	5-27
1A6A1C104		SAME AS 1A1A1C1.	5-27
1A6A1C105		SAME AS 1A1A2C12.	5-27
1A6A1C106		SAME AS 1A1A1C1.	5-27
1A6A1C107		SAME AS 1A1A1C1.	5-27
1A6A1C108		SAME AS 1A1A1C1.	5-27
1A6A1C109		SAME AS 1A1A2C12.	5-27
1A6A1C110		CAPACITOR, FIXED, MICA: 56 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111E560G5S.	5-27
1A6A1C111		SAME AS 1A1A2C12.	5-27
1A6A1C112		SAME AS 1A6A1C110.	5-27
1A6A1C113		SAME AS 1A1A1C17.	5-27
1A6A1C114		SAME AS 1A1A2C12.	5-27
1A6A1C115			
thru			
1A6A1C123		SAME AS 1A1A1C1.	5-27
1A6A1C124			
thru			
1A6A1C126		SAME AS 1A1A1C17.	5-27
1A6A1C127		SAME AS 1A1A2C11.	5-27
1A6A1CR1			
thru			
1A6A1CR13		SAME AS 1A1A1CR1.	5-27
1A6A1L1		SAME AS 1A1A2L11.	5-27
1A6A1L2		SAME AS 1A1A2L11.	5-27
1A6A1L3		COIL, RF, FIXED: 12 uf, Q=55 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-120.	5-27
1A6A1L4		COIL, RF, FIXED: 1.0 uh, Q=47 at 25 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N C1433-1R0.	5-27
1A6A1L5		COIL, RF, FIXED: 4.7 uh, Q=44 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82579 P/N CL433-4R7.	5-27
1A6A1L6		SAME AS 1A6A1L5.	5-27
1A6A1L7		SAME AS 1A6A1L5.	5-27
1A6A1L8		SAME AS 1A6A1L5.	5-27
1A6A1L9		COIL, RF, FIXED: 27 uh, Q=47 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-270.	5-27

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A6A1L10		COIL, RF, FIXED: 2.2 uh, Q=47 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-2R2.	5-27
1A6A1L11		COIL, RF, FIXED: 47 uh, Q=52 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-470.	5-27
1A6A1L12 thru			
1A6A1L15		SAME AS 1A1A2L1.	5-27
1A6A1L16		COIL, RF, FIXED: 3.3 uh, Q=44 at 7.9 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-3R3.	5-27
1A6A1L17		SAME AS 1A6A1L16.	5-27
1A6A1L18 thru			
1A6A1L22		SAME AS 1A1A1L1.	5-27
1A6A1L23		SAME AS 1A6A1L10.	5-27
1A6A1L24 thru			
1A6A1L27		SAME AS 1A1A1L7.	5-27
1A6A1L28		SAME AS 1A1A2L11.	5-27
1A6A1L29		SAME AS 1A6A1L16.	5-27
1A6A1L30		SAME AS 1A6A1L11.	5-27
1A6A1L31		SAME AS 1A1A1L7.	5-27
1A6A1L32		COIL, RF, FIXED: 6.8 uh, Q=50 at 7.9 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-6R8.	5-27
1A6A1Q1		SAME AS 1A1A2Q3.	5-27
1A6A1Q2		SAME AS 1A1A1Q7.	5-27
1A6A1Q3		SAME AS 1A3A1Q12.	5-27
1A6A1Q4		SAME AS 1A1A1Q7.	5-27
1A6A1Q5		SAME AS 1A1A1Q7.	5-27
1A6A1Q6		SAME AS 1A1A1Q7.	5-27
1A6A1Q7		SAME AS 1A1A2Q3.	5-27
1A6A1Q8		SAME AS 1A1A1Q7.	5-27
1A6A1Q9		SAME AS 1A3A1Q12.	5-27
1A6A1Q10 thru			
1A6A1Q19		SAME AS 1A1A1Q7.	5-27
1A6A1Q20		SAME AS 1A1A2Q3.	5-27
1A6A1Q21		SAME AS 1A1A2Q3.	5-27
1A6A1Q22		SAME AS 1A1A1Q7.	5-27
1A6A1Q23		SAME AS 1A3A1Q12.	5-27
1A6A1Q24		SAME AS 1A1A1Q7.	5-27
1A6A1Q25		SAME AS 1A1A1Q7.	5-27
1A6A1Q26		SAME AS 1A1A1Q7.	5-27
1A6A1Q27		SAME AS 1A2A1Q4.	5-27
1A6A1Q28 thru			
1A6A1Q31		SAME AS 1A1A1Q7.	5-27
1A6A1R1		SAME AS 1A1A1R3.	5-27
1A6A1R2		SAME AS 1A3A1R7.	5-27
1A6A1R3		SAME AS 1A1A1R20.	5-27
1A6A1R4		SAME AS 1A1A1R3.	5-27
1A6A1R5		SAME AS 1A1A1R20.	5-27
1A6A1R6		SAME AS 1A1A1R20.	5-27
1A6A1R7		SAME AS 1A1A1R20.	5-27
1A6A1R8		SAME AS 1A3A1R64.	5-27
1A6A1R9		SAME AS 1A3A1R64.	5-27
1A6A1R10		SAME AS 1A1A1R13.	5-27
1A6A1R11		SAME AS 1A1A1R6.	5-27
1A6A1R12		SAME AS 1A1A1R20.	5-27

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A6A1R13		RESISTOR: MIL type RC32GF102J.	5-27
1A6A1R14		SAME AS 1A1A1R20.	5-27
1A6A1R15		SAME AS 1A1A1R13.	5-27
1A6A1R16		SAME AS 1A1A1R3.	5-27
1A6A1R17		SAME AS 1A1A1R3.	5-27
1A6A1R18		SAME AS 1A1A1R20.	5-27
1A6A1R19		SAME AS 1A1A1R13.	5-27
1A6A1R20		SAME AS 1A5A1R80.	5-27
1A6A1R21		SAME AS 1A1A1R13.	5-27
1A6A1R22		SAME AS 1A1A1R3.	5-27
1A6A1R23		SAME AS 1A1A1R3.	5-27
1A6A1R24		SAME AS 1A1A2R7.	5-27
1A6A1R25		SAME AS 1A1A1R22.	5-27
1A6A1R26		SAME AS 1A1A1R3.	5-27
1A6A1R27		SAME AS 1A3A1R7.	5-27
1A6A1R28		SAME AS 1A1A1R20.	5-27
1A6A1R29		SAME AS 1A1A1R3.	5-27
1A6A1R30		SAME AS 1A1A1R20.	5-27
1A6A1R31		SAME AS 1A1A1R20.	5-27
1A6A1R32		SAME AS 1A3A1R64.	5-27
1A6A1R33		SAME AS 1A1A1R20.	5-27
1A6A1R34		SAME AS 1A1A1R13.	5-27
1A6A1R35		SAME AS 1A1A1R13.	5-27
1A6A1R36		SAME AS 1A1A1R6.	5-27
1A6A1R37		SAME AS 1A1A1R20.	5-27
1A6A1R38		SAME AS 1A6A1R13.	5-27
1A6A1R39		SAME AS 1A1A1R20.	5-27
1A6A1R40		SAME AS 1A1A1R13.	5-27
1A6A1R41		SAME AS 1A1A1R3.	5-27
1A6A1R42		SAME AS 1A1A1R3.	5-27
1A6A1R43		SAME AS 1A1A1R20.	5-27
1A6A1R44		SAME AS 1A1A1R13.	5-27
1A6A1R45		SAME AS 1A5A1R80.	5-27
1A6A1R46		SAME AS 1A1A1R13.	5-27
1A6A1R47		SAME AS 1A1A1R3.	5-27
1A6A1R48		SAME AS 1A1A1R3.	5-27
1A6A1R49		SAME AS 1A1A1R11.	5-27
1A6A1R50		SAME AS 1A1A1R22.	5-27
1A6A1R51		SAME AS 1A1A1R22.	5-27
1A6A1R52		SAME AS 1A1A1R20.	5-27
1A6A1R53		SAME AS 1A3A1R64.	5-27
1A6A1R54		SAME AS 1A1A1R20.	5-27
1A6A1R55		SAME AS 1A3A1R64.	5-27
1A6A1R56		SAME AS 1A1A1R6.	5-27
1A6A1R57		SAME AS 1A1A1R4.	5-27
1A6A1R58		SAME AS 1A1A1R4.	5-27
1A6A1R59		SAME AS 1A6A1R13.	5-27
1A6A1R60		SAME AS 1A1A1R20.	5-27
1A6A1R61		SAME AS 1A1A1R20.	5-27
1A6A1R62		SAME AS 1A1A1R3.	5-27
1A6A1R63			5-27
thru			
1A6A1R66		SAME AS 1A1A1R20.	5-27
1A6A1R67		SAME AS 1A3A1R64.	5-27
1A6A1R68		SAME AS 1A3A1R64.	5-27
1A6A1R69		SAME AS 1A1A1R6.	5-27

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A6A1R70		SAME AS 1A1A1R4.	5-27
1A6A1R71		SAME AS 1A1A1R4.	5-27
1A6A1R72		SAME AS 1A6A1R13.	5-27
1A6A1R73		SAME AS 1A1A1R20.	5-27
1A6A1R74		SAME AS 1A1A1R3.	5-27
1A6A1R75		SAME AS 1A1A1R3.	5-27
1A6A1R76		SAME AS 1A1A1R3.	5-27
1A6A1R77		SAME AS 1A1A1R20.	5-27
1A6A1R78		SAME AS 1A1A1R13.	5-27
1A6A1R79		SAME AS 1A5A1R80.	5-27
1A6A1R80		SAME AS 1A1A1R13.	5-27
1A6A1R81		SAME AS 1A1A1R3.	5-27
1A6A1R82		SAME AS 1A1A1R11.	5-27
1A6A1R83		SAME AS 1A1A1R22.	5-27
1A6A1R84		NOT USED.	5-27
1A6A1R85		SAME AS 1A1A1R3.	5-27
1A6A1R86		NOT USED.	
1A6A1R87		SAME AS 1A1A1R20.	5-27
1A6A1R88		SAME AS 1A1A1R22.	5-27
1A6A1R89		SAME AS 1A1A1R3.	5-27
1A6A1R90		SAME AS 1A3A1R7.	5-27
1A6A1R91		SAME AS 1A1A1R3.	5-27
1A6A1R92		SAME AS 1A3A1R7.	5-27
1A6A1R93		SAME AS 1A1A1R3.	5-27
1A6A1R94		SAME AS 1A1A1R20.	5-27
1A6A1R95		SAME AS 1A1A1R20.	5-27
1A6A1R96		SAME AS 1A1A1R20.	5-27
1A6A1R97		SAME AS 1A3A1R64.	5-27
1A6A1R98		SAME AS 1A3A1R64.	5-27
1A6A1R99		SAME AS 1A1A1R20.	5-27
1A6A1R100		SAME AS 1A1A1R6.	5-27
1A6A1R101		SAME AS 1A1A1R13.	5-27
1A6A1R102		SAME AS 1A5A1R56.	5-27
1A6A1R103		SAME AS 1A1A1R20.	5-27
1A6A1R104		SAME AS 1A1A1R20.	5-27
1A6A1R105		SAME AS 1A1A1R3.	5-27
1A6A1R106		SAME AS 1A1A1R3.	5-27
1A6A1R107		SAME AS 1A1A1R13.	5-27
1A6A1R108		SAME AS 1A1A1R3.	5-27
1A6A1R109		SAME AS 1A1A1R20.	5-27
1A6A1R110		SAME AS 1A5A1R80.	5-27
1A6A1R111		SAME AS 1A1A1R13.	5-27
1A6A1R112		SAME AS 1A1A1R11.	5-27
1A6A1R113		SAME AS 1A1A1R22.	5-27
1A6A1R114			
thru			
1A6A1R117		SAME AS 1A1A1R3.	5-27
1A6A1R118		NOT USED.	
1A6A1R119		SAME AS 1A1A1R11.	5-27
1A6A1R120		RESISTOR: MIL type RC07GF221J.	5-27
1A6A1VR1			
thru			
1A6A1VR5		SAME AS 1A5A1VR1.	5-27
1A6A1Y1		CRYSTAL UNIT, QUARTZ: 10.5 mc, 0.510 in. hg by 0.400 in. wd by 0.150 in. thk. 82679 P/N CR109-153.	5-27
1A6A1Y2		CRYSTAL UNIT, QUARTZ: 5.5 mc, 0.510 in. hg by 0.440 in. wd by 0.150 in. thk. 82679 P/N CR109-151.	5-27

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A7A1L5 thru 1A7A1L8 1A7A1L9 thru 1A7A1L14 1A7A1L15		COIL, RF, FIXED: 2, 200 uh, Q=50 at 0.25 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-222.	5-29
1A7A1Q1		SAME AS 1A7A1L1.	5-29
1A7A1Q2		COIL, RF, FIXED: 3, 300 uh, Q=43 at 0.25 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-332.	5-29
1A7A1Q3		SAME AS 1A3A1Q12.	5-29
1A7A1Q4		SAME AS 1A3A1Q12.	5-29
1A7A1Q5		SAME AS 1A3A1Q1.	5-29
1A7A1Q6		SAME AS 1A1A1Q7.	5-29
1A7A1Q7		SAME AS 1A3A1Q1.	5-29
1A7A1Q8		SAME AS 1A1A1Q7.	5-29
1A7A1Q9		SAME AS 1A2A1Q4.	5-29
1A7A1Q10		SAME AS 1A2A1Q4.	5-29
1A7A1Q11		SAME AS 1A2A1Q4.	5-29
1A7A1Q12		NOT USED.	
1A7A1Q16		SAME AS 1A1A1Q7.	5-29
1A7A1Q17		SAME AS 1A3A1Q1.	5-29
1A7A1Q18		SAME AS 1A2A1Q4.	5-29
1A7A1Q19		SAME AS 1A3A1Q1.	5-29
1A7A1Q20		SAME AS 1A2A1Q4.	5-29
1A7A1Q21		SAME AS 1A2A1Q4.	5-29
1A7A1Q22		SAME AS 1A2A1Q4.	5-29
1A7A1Q23		SAME AS 1A1A2Q3.	5-29
1A7A1Q31		SAME AS 1A3A1Q1.	5-29
1A7A1Q32		SAME AS 1A2A1Q4.	5-29
1A7A1Q33		SAME AS 1A1A1Q7.	5-29
1A7A1Q34		SAME AS 1A1A1Q7.	5-29
1A7A1Q35		SAME AS 1A1A1Q7.	5-29
1A7A1Q36		SAME AS 1A2A1Q4.	5-29
1A7A1Q41		SAME AS 1A1A2Q3.	5-29
1A7A1R1		SAME AS 1A1A1R13.	5-29
1A7A1R2		SAME AS 1A1A1R13.	5-29
1A7A1R3		SAME AS 1A1A1R6.	5-29
1A7A1R4		RESISTOR, VARIABLE: 5,000 ohms, ±30% tol, 200 wvdc. 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-502.	5-29
1A7A1R5		SAME AS 1A1A1R6.	5-29
1A7A1R6		SAME AS 1A1A1R11.	5-29
1A7A1R7		SAME AS 1A1A1R20.	5-29
1A7A1R8		SAME AS 1A1A1R3.	5-29
1A7A1R9		NOT USED.	
1A7A1R10		SAME AS 1A1A1R20.	5-29
1A7A1R11		RESISTOR: MIL type RC07GF224J.	5-29
1A7A1R12		SAME AS 1A1A1R17.	5-29
1A7A1R13		SAME AS 1A1A1R13.	5-29
1A7A1R14		SAME AS 1A1A1R3.	5-29
1A7A1R15		SAME AS 1A1A1R20.	5-29
1A7A1R16		SAME AS 1A1A1R3.	5-29
1A7A1R17		SAME AS 1A1A1R3.	5-29

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A7A1R18		SAME AS 1A2A1R27.	5-29
1A7A1R19		SAME AS 1A1A1R6.	5-29
1A7A1R20		SAME AS 1A1A1R13.	5-29
1A7A1R21		SAME AS 1A3A1R64.	5-29
1A7A1R22		SAME AS 1A1A1R20.	5-29
1A7A1R23		SAME AS 1A1A1R3.	5-29
1A7A1R24		SAME AS 1A1A1R3.	5-29
1A7A1R25		SAME AS 1A1A1R20.	5-29
1A7A1R26		SAME AS 1A1A1R6.	5-29
1A7A1R27		RESISTOR: MIL type RC07GF562J.	5-29
1A7A1R28		SAME AS 1A3A1R64.	5-29
1A7A1R29		SAME AS 1A1A1R3.	5-29
1A7A1R30		SAME AS 1A1A1R17.	5-29
1A7A1R31		SAME AS 1A1A1R20.	5-29
1A7A1R32		SAME AS 1A2A1R6.	5-29
1A7A1R33		SAME AS 1A5A1R80.	5-29
1A7A1R34		SAME AS 1A1A1R3.	5-29
1A7A1R35		SAME AS 1A1A1R4.	5-29
1A7A1R36		SAME AS 1A1A1R13.	5-29
1A7A1R37		SAME AS 1A1A1R13.	5-29
1A7A1R38		SAME AS 1A1A1R11.	5-29
1A7A1R39		SAME AS 1A1A1R3.	5-29
1A7A1R40		SAME AS 1A5A1R80.	5-29
1A7A1R41		RESISTOR: MIL type RC07GF330J.	5-29
1A7A1R42		SAME AS 1A1A1R20.	5-29
1A7A1R43		SAME AS 1A1A1R17.	5-29
1A7A1R44		SAME AS 1A1A1R3.	5-29
1A7A1R45		SAME AS 1A1A1R21.	5-29
1A7A1R46		SAME AS 1A7A1R11.	5-29
1A7A1R47		SAME AS 1A1A1R20.	5-29
1A7A1R48		SAME AS 1A1A1R13.	5-29
1A7A1R49		SAME AS 1A1A1R21.	5-29
1A7A1R50		SAME AS 1A1A1R13.	5-29
1A7A1R51		SAME AS 1A1A2R7.	5-29
1A7A1R52		SAME AS 1A1A1R4.	5-29
1A7A1R53		SAME AS 1A1A1R13.	5-29
1A7A1R54		SAME AS 1A1A2R7.	5-29
1A7A1R55		SAME AS 1A1A1R4.	5-29
1A7A1R56		SAME AS 1A1A1R21.	5-29
1A7A1R57		SAME AS 1A1A2R13.	5-29
1A7A1R58		SAME AS 1A1A2R7.	5-29
1A7A1R59		SAME AS 1A1A1R4.	5-29
1A7A1R60		SAME AS 1A1A1R21.	5-29
1A7A1R61		SAME AS 1A1A1R13.	5-29
1A7A1R62		SAME AS 1A1A2R7.	5-29
1A7A1R63		SAME AS 1A1A1R4.	5-29
1A7A1R64		SAME AS 1A3A1R64.	5-29
1A7A1R65		SAME AS 1A3A1R64.	5-29
1A7A1R66		SAME AS 1A1A1R20.	5-29
1A7A1R67		SAME AS 1A1A1R4.	5-29
1A7A1R68		SAME AS 1A7A1R11.	5-29
1A7A1R69		SAME AS 1A1A1R22.	5-29
1A7A1R70		SAME AS 1A1A1R13.	5-29
1A7A1R71		SAME AS 1A7A1R11.	5-29
1A7A1R72		SAME AS 1A5A1R26.	5-29
1A7A1R73		SAME AS 1A1A1R4.	5-29
1A7A1R74		SAME AS 1A5A1R64.	5-29

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A7A1R75		SAME AS 1A1A1R13.	5-29
1A7A1R76		SAME AS 1A1A1R3.	5-29
1A7A1R77		SAME AS 1A1A1R21.	5-29
1A7A1R78		SAME AS 1A3A1R7.	5-29
1A7A1R79		SAME AS 1A7A1R4.	5-29
1A7A1R80		SAME AS 1A1A1R22.	5-29
1A7A1R81		SAME AS 1A3A1R7.	5-29
1A7A1R82		SAME AS 1A1A1R21.	5-29
1A7A1R83		SAME AS 1A3A1R5.	5-29
1A7A1R84		SAME AS 1A3A1R7.	5-29
1A7A1R85		SAME AS 1A1A1R20.	5-29
1A7A1R86		SAME AS 1A1A1R21.	5-29
1A7A1R87		RESISTOR: MIL type RC07GF105J.	5-29
1A7A1R88		SAME AS 1A1A1R13.	5-29
1A7A1R89		SAME AS 1A1A1R13.	5-29
1A7A1R90		SAME AS 1A1A1R20.	5-29
1A7A1R91		NOT USED.	
1A7A1R92		SAME AS 1A1A1R4.	5-29
1A7A1R93		SAME AS 1A1A1R20.	5-29
1A7A1R94		SAME AS 1A1A1R20.	5-29
1A7A1R95		SAME AS 1A1A1R20.	5-29
1A7A1R96		SAME AS 1A7A1R41.	5-29
1A7A1R97		SAME AS 1A7A1R41.	5-29
1A7A1R98		RESISTOR: MIL type RC07GF183J.	5-29
1A7A1R99		NOT USED.	
1A7A1R100		SAME AS 1A1A1R4.	5-29
1A7A1R101		SAME AS 1A3A1R77.	5-29
1A7A1R102		RESISTOR: MIL type RC07GF392J.	5-29
1A7A1R103		SAME AS 1A1A1R9.	5-29
1A7A1R104		SAME AS 1A1A1R20.	5-29
1A7A1R105		SAME AS 1A1A1R22.	5-29
1A7A1R106		SAME AS 1A5A1R80.	5-29
1A7A1R107		SAME AS 1A1A1R20.	5-29
1A7A1R108		SAME AS 1A3A1R7.	5-29
1A7A1R109		SAME AS 1A3A1R7.	5-29
1A7A1R110		SAME AS 1A1A1R22.	5-29
1A7A1R111		SAME AS 1A1A2R7.	5-29
1A7A1R112		SAME AS 1A1A1R3.	5-29
1A7A1R113		SAME AS 1A3A1R7.	5-29
1A7A1R114		SAME AS 1A3A1R7.	5-29
1A7A1R115		SAME AS 1A1A1R20.	5-29
1A7A1R116		SAME AS 1A1A1R22.	5-29
1A7A1R117		SAME AS 1A1A2R7.	5-29
1A7A1R118		SAME AS 1A1A1R3.	5-29
1A7A1R119		SAME AS 1A3R7.	5-29
1A7A1R120		SAME AS 1A3R7.	5-29
1A7A1R121		SAME AS 1A1A1R20.	5-29
1A7A1R122		SAME AS 1A1A1R22.	5-29
1A7A1R123		SAME AS 1A1A1R3.	5-29
1A7A1R124		RESISTOR: MIL type RC20GF220J.	5-29
1A7A1R125		SAME AS 1A1A1R17.	5-29
1A7A1R126		SAME AS 1A3A1R5.	5-29
1A7A1R127		NOT USED.	
1A7A1R128		SAME AS 1A3A1R5.	5-29
1A7A1R129		SAME AS 1A1A1R13.	5-29
1A7A1R130		SAME AS 1A7A1R4.	5-29
1A7A1R131		SAME AS 1A3A1R44.	5-29

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A7A1R132		SAME AS 1A1A1R3.	5-29
1A7A1R133		SAME AS 1A3A1R77.	5-29
1A7A1R134		SAME AS 1A3A1R7.	5-29
1A7A1R135		SAME AS 1A1A1R9.	5-29
1A7A1R136		SAME AS 1A1A1R13.	5-29
1A7A1R137		SAME AS 1A1A1R3.	5-29
1A7A1R138		SAME AS 1A3A1R77.	5-29
1A7A1R139 thru			
1A7A1R142		SAME AS 1A1A1R10.	5-29
1A7A1R143 thru			
1A7A1R146		SAME AS 1A3A1R64.	5-29
1A7A1R147		SAME AS 1A1A1R10.	5-29
1A7A1R148		SAME AS 1A1A1R4.	5-29
1A7A1R149		SAME AS 1A1A1R17.	5-29
1A7A1R150		NOT USED.	
1A7A1R151		RESISTOR: MIL type RC07GF821J.	5-29
1A7A1T1		TRANSFORMER, PULSE: 0.5 uh, ±20% tol, wire leads. 0.650 in. lg by 0.425 in. wd by 0.350 in. hg. Dwg TF374-3, 90095 P/N 11KGB.	5-29
1A7A1T2		TRANSFORMER, PULSE: 750 uh ±20% tol, wire leads. 0.650 in. lg by 0.425 in. wd by 0.350 in. hg. Dwg TF374-1, 90095 P/N 21LHA.	5-29
1A7A1T3		SAME AS 1A7A1T2.	5-29
1A7A1T4		SAME AS 1A7A1T2.	5-29
1A7A1VR1		SAME AS 1A2A1VR2.	5-29
1A7A1VR2		SAME AS 1A5A1VR1.	5-29
1A7A1VR3		SAME AS 1A3A1VR1.	5-29
1A8		CIRCUIT CARD ASSEMBLY W/SHIELDS: 82679 P/N AX5065.	5-31
1A8E1		SAME AS 1A2E1.	5-31
1A8E2		SAME AS 1A3E2.	5-31
1A8A1		CIRCUIT CARD ASSEMBLY: 55 resistors, 75 capacitors, 21 coils, 4 integrated circuits, 19 transistors, 13 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4671.	5-31
1A8A1C1		SAME AS 1A1A1C17.	5-31
1A8A1C2		SAME AS 1A1A1C17.	5-31
1A8A1C3		SAME AS 1A1A1C17.	5-31
1A8A1C4		CAPACITOR, FIXED, MICA: 5 uuf, ±1/2% tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C050D5S.	5-31
1A8A1C5		SAME AS 1A6A1C26.	5-31
1A8A1C6		SAME AS 1A1A1C17.	5-31
1A8A1C7		SAME AS 1A1A1C17.	5-31
1A8A1C8		SAME AS 1A1A1C17.	5-31
1A8A1C9		CAPACITOR, FIXED, MICA: 100 pf, ±5% tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C101J5S.	5-31
1A8A1C10		SAME AS 1A3A1C33.	5-31
1A8A1C11		SAME AS 1A1A1C17.	5-31
1A8A1C12		CAPACITOR, FIXED, MICA: 2 uuf, ±1/2% tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C020D5S.	5-31

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A8A1C13		SAME AS 1A1A1C17.	5-31
1A8A1C14		SAME AS 1A1A1C17.	5-31
1A8A1C15		SAME AS 1A3A1C33.	5-31
1A8A1C16		SAME AS 1A1A1C17.	5-31
1A8A1C17			
thru			
1A8A1C20		SAME AS 1A3A1C33.	5-31
1A8A1C21		SAME AS 1A1A1C17.	5-31
1A8A1C22		SAME AS 1A1A1C17.	5-31
1A8A1C23		SAME AS 1A1A1C17.	5-31
1A8A1C24			
thru			
1A8A1C33		SAME AS 1A3A1C33.	5-31
1A8A1C34		SAME AS 1A6A1C26.	5-31
1A8A1C35		CAPACITOR, FIXED, MICA: 33 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111E330G5S.	5-31
1A8A1C36		SAME AS 1A3A1C33.	5-31
1A8A1C37		CAPACITOR, FIXED, MICA: 68 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F680G5S.	5-31
1A8A1C38		SAME AS 1A1A1C17.	5-31
1A8A1C39		SAME AS 1A3A1C33.	5-31
1A8A1C40		SAME AS 1A8A1C35.	5-31
1A8A1C41		SAME AS 1A6A1C26.	5-31
1A8A1C42		SAME AS 1A3A1C33.	5-31
1A8A1C43		SAME AS 1A6A1C19.	5-31
1A8A1C44		SAME AS 1A3A1C33.	5-31
1A8A1C45		SAME AS 1A3A1C33.	5-31
1A8A1C46		SAME AS 1A8A1C35.	5-31
1A8A1C47		SAME AS 1A6A1C26.	5-31
1A8A1C48		SAME AS 1A3A1C33.	5-31
1A8A1C49		SAME AS 1A3A1C32.	5-31
1A8A1C50		SAME AS 1A3A1C33.	5-31
1A8A1C51		SAME AS 1A3A1C33.	5-31
1A8A1C52		SAME AS 1A6A1C110.	5-31
1A8A1C53		CAPACITOR, FIXED, MICA: 18 uuf, $\pm 5\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111G180J5S.	5-31
1A8A1C54			
thru			
1A8A1C62		SAME AS 1A3A1C33.	5-31
1A8A1C63		SAME AS 1A6A1C26.	5-31
1A8A1C64			
thru			
1A8A1C67		NOT USED.	
1A8A1C68			
thru			
1A8A1C70		SAME AS 1A3A1C33.	5-31
1A8A1C71		SAME AS 1A6A1C26.	5-31
1A8A1C72		SAME AS 1A3A1C33.	5-31
1A8A1C73		SAME AS 1A6A1C26.	5-31
1A8A1C74		SAME AS 1A3A1C33.	5-31
1A8A1C75		SAME AS 1A8A1C53.	5-31
1A8A1C76		SAME AS 1A3A1C33.	5-31
1A8A1CR1		NOT USED.	
1A8A1CR2		SAME AS 1A1A1CR1.	5-31
1A8A1CR3		NOT USED.	
1A8A1CR4			
thru			
1A8A1CR13		SAME AS 1A1A1CR1.	5-31

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A8A1L1		SAME AS 1A1A2L1.	5-31
1A8A1L2		SAME AS 1A6A1L10.	5-31
1A8A1L3		SAME AS 1A1A2L1.	5-31
1A8A1L4		SAME AS 1A1A2L1.	5-31
1A8A1L5		SAME AS 1A1A1L1.	5-31
1A8A1L6		SAME AS 1A6A1L11.	5-31
1A8A1L7		COIL, RF, FIXED: 0.47 uh, Q=44 at 25 mc. 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-0R47.	5-31
1A8A1L8		SAME AS 1A8A1L7.	5-31
1A8A1L9		COIL, RF, FIXED: 1.0 uh, Q=47 at 25 mc. 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-1R0.	5-31
1A8A1L10		SAME AS 1A8A1L9.	5-31
1A8A1L11		COIL, RF, FIXED: 0.68 uh, Q=42 at 25 mc. 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-0R68.	5-31
1A8A1L12		SAME AS 1A6A1L5.	5-31
1A8A1L13		SAME AS 1A6A1L5.	5-31
1A8A1L14		SAME AS 1A1A1L1.	5-31
1A8A1L15		SAME AS 1A1A1L1.	5-31
1A8A1L16		SAME AS 1A6A1L11.	5-31
1A8A1L17		SAME AS 1A6A1L11.	5-31
1A8A1L18		SAME AS 1A1A2L1.	5-31
1A8A1L19		SAME AS 1A6A1L10.	5-31
1A8A1L20		SAME AS 1A6A1L10.	5-31
1A8A1L21			
thru			
1A8A1L24		NOT USED.	
1A8A1L25		SAME AS 1A6A1L10.	5-31
1A8A1Q1		SAME AS 1A1A1Q1.	5-31
1A8A1Q2		SAME AS 1A1A1Q1.	5-31
1A8A1Q3		SAME AS 1A1A1Q1.	5-31
1A8A1Q4			
thru			
1A8A1Q7		SAME AS 1A1A2Q3.	5-31
1A8A1Q8		SAME AS 1A1A1Q1.	5-31
1A8A1Q9		SAME AS 1A1A1Q1.	5-31
1A8A1Q10		SAME AS 1A1A1Q1.	5-31
1A8A1Q11		SAME AS 1A1A1Q7.	5-31
1A8A1Q12		SAME AS 1A1A1Q1.	5-31
1A8A1Q13		SAME AS 1A1A1Q1.	5-31
1A8A1Q14		SAME AS 1A1A1Q1.	5-31
1A8A1Q15		SAME AS 1A1A1Q7.	5-31
1A8A1Q16		SAME AS 1A1A1Q7.	5-31
1A8A1Q17		SAME AS 1A1A1Q7.	5-31
1A8A1Q18		NOT USED.	
1A8A1Q19		SAME AS 1A1A1Q7.	5-31
1A8A1Q20		SAME AS 1A1A1Q7.	5-31
1A8A1R1		SAME AS 1A1A1R13.	5-31
1A8A1R2		SAME AS 1A1A1R22.	5-31
1A8A1R3		SAME AS 1A1A1R9.	5-31
1A8A1R4		SAME AS 1A1A1R2.	5-31
1A8A1R5		SAME AS 1A1A1R11.	5-31
1A8A1R6		SAME AS 1A1A1R11.	5-31
1A8A1R7		SAME AS 1A1A1R20.	5-31
1A8A1R8		NOT USED.	
1A8A1R9		NOT USED.	
1A8A1R10		SAME AS 1A1A1R9.	5-31
1A8A1R11		RESISTOR: MIL type RC32GF3R3J.	5-31

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A8A1R12		SAME AS 1A1A1R17.	5-31
1A8A1R13		SAME AS 1A1A1R21.	5-31
1A8A1R14		SAME AS 1A1A1R17.	5-31
1A8A1R15		SAME AS 1A3A1R64.	5-31
1A8A1R16		SAME AS 1A1A1R17.	5-31
1A8A1R17		SAME AS 1A3A1R64.	5-31
1A8A1R18		SAME AS 1A1A1R17.	5-31
1A8A1R19		SAME AS 1A3A1R64.	5-31
1A8A1R20		SAME AS 1A1A1R21.	5-31
1A8A1R21		NOT USED.	
1A8A1R22		SAME AS 1A1A1R20.	5-31
1A8A1R23		NOT USED.	
1A8A1R24		SAME AS 1A1A1R20.	5-31
1A8A1R25		SAME AS 1A1A1R6.	5-31
1A8A1R26		SAME AS 1A1A1R13.	5-31
1A8A1R27		SAME AS 1A1A1R21.	5-31
1A8A1R28		NOT USED.	
1A8A1R29		SAME AS 1A1A1R4.	5-31
1A8A1R30		SAME AS 1A1A1R5.	5-31
1A8A1R31		SAME AS 1A1A1R20.	5-31
1A8A1R32		SAME AS 1A1A1R13.	5-31
1A8A1R33		SAME AS 1A1A1R6.	5-31
1A8A1R34		SAME AS 1A1A1R21.	5-31
1A8A1R35		NOT USED.	
1A8A1R36		SAME AS 1A1A1R4.	5-31
1A8A1R37		SAME AS 1A2A1R6.	5-31
1A8A1R38		SAME AS 1A2A1R6.	5-31
1A8A1R39		SAME AS 1A1A1R13.	5-31
1A8A1R40		SAME AS 1A1A1R6.	5-31
1A8A1R41		SAME AS 1A1A1R21.	5-31
1A8A1R42		NOT USED.	
1A8A1R43		SAME AS 1A1A1R4.	5-31
1A8A1R44		SAME AS 1A2A1R6.	5-31
1A8A1R45		SAME AS 1A2A1R6.	5-31
1A8A1R46		SAME AS 1A1A1R13.	5-31
1A8A1R47		SAME AS 1A1A1R6.	5-31
1A8A1R48		SAME AS 1A1A1R11.	5-31
1A8A1R49		SAME AS 1A1A1R13.	5-31
1A8A1R50		SAME AS 1A1A1R20.	5-31
1A8A1R51		SAME AS 1A1A1R4.	5-31
1A8A1R52		SAME AS 1A1A1R4.	5-31
1A8A1R53		SAME AS 1A1A1R6.	5-31
1A8A1R54			
thru			
1A8A1R57		SAME AS 1A1A1R6.	5-31
1A8A1R58		SAME AS 1A1A1R5.	5-31
1A8A1R59		SAME AS 1A1A1R20.	5-31
1A8A1R60		SAME AS 1A1A1R20.	5-31
1A8A1VR1		NOT USED.	
1A8A1VR2		NOT USED.	
1A8A1VR3		SAME AS 1A5A1VR1.	5-31
1A8A1Z1		SAME AS 1A1A1Z1.	5-31
1A8A1Z2		SAME AS 1A1A1Z3.	5-31
1A8A1Z3		SAME AS 1A1A2Z9.	5-31
1A8A1Z4		SAME AS 1A1A2Z9.	5-31

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A9		CIRCUIT CARD ASSEMBLY W/SHIELDS: 82679 P/N AX5066.	5-33
1A9E1		SAME AS 1A2E1.	5-33
1A9E2		SAME AS 1A3E2.	5-33
1A9A1		CIRCUIT CARD ASSEMBLY: 102 resistors, 71 capacitors, 11 coils, 4 transformers, 4 filters, 24 transistors, 8 semiconductors, plug-in item; 10.031 in. lg by 5.969 in. wd by 1.000 in. hg. 82679 P/N A4672.	5-33
1A9A1C1		SAME AS 1A6A1C93.	5-33
1A9A1C2 thru			
1A9A1C10		SAME AS 1A1A2C41.	5-33
1A9A1C11		SAME AS 1A1A1C1.	5-33
1A9A1C12		SAME AS 1A1A2C39.	5-33
1A9A1C13		CAPACITORS, FIXED, MICA: 24 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111E240G5S.	5-33
1A9A1C14		SAME AS 1A1A2C41.	5-33
1A9A1C15		SAME AS 1A1A2C39.	5-33
1A9A1C16		SAME AS 1A1A1C1.	5-33
1A9A1C17 thru			
1A9A1C26		SAME AS 1A1A2C41.	5-33
1A9A1C27		SAME AS 1A1A1C1.	5-33
1A9A1C28		SAME AS 1A1A2C12.	5-33
1A9A1C29		CAPACITOR, FIXED, MICA: 100 uuf, $\pm 2\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111E101G5S.	5-33
1A9A1C30		SAME AS 1A1A2C41.	5-33
1A9A1C31		SAME AS 1A1A2C12.	5-33
1A9A1C32		SAME AS 1A1A1C1.	5-33
1A9A1C33		SAME AS 1A1A2C41.	5-33
1A9A1C34		SAME AS 1A1A2C41.	5-33
1A9A1C35		SAME AS 1A1A2C41.	5-33
1A9A1C36 thru			
1A9A1C42		SAME AS 1A1A1C1.	5-33
1A9A1C43		SAME AS 1A1A2C41.	5-33
1A9A1C44		SAME AS 1A1A2C41.	5-33
1A9A1C45		SAME AS 1A1A1C1.	5-33
1A9A1C46		SAME AS 1A1A2C38.	5-33
1A9A1C47		CAPACITOR, FIXED, MICA: 12 uuf, $\pm 5\%$ tol, 500 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C120J5S.	5-33
1A9A1C48		SAME AS 1A1A2C41.	5-33
1A9A1C49		SAME AS 1A1A2C38.	5-33
1A9A1C50 thru			
1A9A1C60		SAME AS 1A1A1C1.	5-33
1A9A1C61		SAME AS 1A1A2C41.	5-33
1A9A1C62		SAME AS 1A1A1C1.	5-33
1A9A1C63		CAPACITOR, FIXED, MICA: 680 uuf, $\pm 2\%$ tol, 300 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F681G3S.	5-33
1A9A1C64		CAPACITOR, FIXED, MICA: 33 uuf, $\pm 2\%$ tol, 100 wvdc. 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F330G1S.	5-33
1A9A1C65		SAME AS 1A1A2C41.	5-33
1A9A1C66		SAME AS 1A9A1C63.	5-33

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A9A1C67 thru 1A9A1C70 1A9A1C71 1A9A1CR1 thru 1A9A1CR8 1A9A1FL1		SAME AS 1A1A1C1. SAME AS 1A6A1C93. SAME AS 1A1A1CR1. FILTER, BANDPASS: 0.625 mc nom center frequency type; symmetrical, bal input, single ended output; hermetically sealed steel case, 3.500 in. lg by 0.670 in. hg by 1.100 in. wd. 82679 P/N FX271-0.625.	5-33 5-33 5-33 5-33
1A9A1FL2		FILTER, BANDPASS: 1.250 mc nom center frequency type; symmetrical, bal input, single ended output; hermetically sealed steel case, 3.500 in. lg by 0.670 in. hg by 1.100 in. wd. 82679 P/N FX271-1.250.	5-33
1A9A1FL3		FILTER, BANDPASS: 2.500 mc nom center frequency type; symmetrical, bal input, single ended output; hermetically sealed steel case, 3.500 in. lg by 0.670 in. hg by 1.100 in. wd. 82679 P/N FX271-2.500.	5-33
1A9A1FL4		FILTER, BANDPASS: 5.000 mc nom center frequency type; symmetrical, bal input, single ended output; hermetically sealed steel case, 2.300 in. lg by 0.670 in. hg by 1.000 in. wd. 82679 P/N FX271-5.000.	5-33
1A9A1L1		SAME AS 1L1.	5-33
1A9A1L2		SAME AS 1L1.	5-33
1A9A1L3		SAME AS 1L1.	5-33
1A9A1L4		COIL, RF, FIXED: 15 uh, Q=65 at 2.5 mc, 0.400 in. dia by 0.500 in. lg. Dwg CL430-3, 72259 P/N VIV-15.0.	5-33
1A9A1L5		SAME AS 1A9A1L4.	5-33
1A9A1L6		COIL, RF, FIXED: 3.30 uh, Q=45 at 7.9 mc, 0.400 in. dia by 0.500 in. lg. Dwg CL430-7, 72259 P/N VIV-3.30.	5-33
1A9A1L7		SAME AS 1A9A1L6.	5-33
1A9A1L8		COIL, RF, FIXED: 6.80 uh, Q=80 at 7.9 mc, 0.400 in. dia by 0.500 in. lg. Dwg CL430-5, 72259 P/N VIV-6.80.	5-33
1A9A1L9		SAME AS 1A9A1L8.	5-33
1A9A1L10		SAME AS 1L1.	5-33
1A9A1L11		COIL, RF, FIXED: 47 uh, ±10% tol, 10 ohms max dc res. 0.157 in. dia by 0.450 in. lg. 82679 P/N CL-275-470.	5-33
1A9A1Q1		SAME AS 1A1A1Q6.	5-33
1A9A1Q2		SAME AS 1A1A1Q7.	5-33
1A9A1Q3		SAME AS 1A3A1Q12.	5-33
1A9A1Q4		SAME AS 1A3A1Q12.	5-33
1A9A1Q5		SAME AS 1A3A1Q12.	5-33
1A9A1Q6		SAME AS 1A1A1Q7.	5-33
1A9A1Q7		SAME AS 1A1A1Q6.	5-33
1A9A1Q8		SAME AS 1A1A1Q7.	5-33
1A9A1Q9		SAME AS 1A3A1Q12.	5-33
1A9A1Q10		SAME AS 1A3A1Q12.	5-33
1A9A1Q11		SAME AS 1A3A1Q12.	5-33
1A9A1Q12		SAME AS 1A1A1Q7.	5-33
1A9A1Q13		SAME AS 1A1A1Q6.	5-33
1A9A1Q14		SAME AS 1A1A1Q7.	5-33
1A9A1Q15		SAME AS 1A3A1Q12.	5-33
1A9A1Q16		SAME AS 1A3A1Q12.	5-33
1A9A1Q17		SAME AS 1A3A1Q12.	5-33
1A9A1Q18		SAME AS 1A1A1Q7.	5-33

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A9A1Q19		SAME AS 1A1A1Q6.	5-33
1A9A1Q20		SAME AS 1A1A1Q7.	5-33
1A9A1Q21		SAME AS 1A3A1Q12.	5-33
1A9A1Q22		SAME AS 1A3A1Q12.	5-33
1A9A1Q23		SAME AS 1A3A1Q12.	5-33
1A9A1Q24		SAME AS 1A1A1Q7.	5-33
1A9A1R1		SAME AS 1A3A1R7.	5-33
1A9A1R2		SAME AS 1A1A1R3.	5-33
1A9A1R3		SAME AS 1A1A1R3.	5-33
1A9A1R4		SAME AS 1A1A1R20.	5-33
1A9A1R5		SAME AS 1A1A1R20.	5-33
1A9A1R6		SAME AS 1A1A1R10.	5-33
1A9A1R7		SAME AS 1A1A1R10.	5-33
1A9A1R8		SAME AS 1A1A1R6.	5-33
1A9A1R9		SAME AS 1A2A1R6.	5-33
1A9A1R10		SAME AS 1A1A1R6.	5-33
1A9A1R11		SAME AS 1A1A1R10.	5-33
1A9A1R12		SAME AS 1A1A1R10.	5-33
1A9A1R13		SAME AS 1A1A1R13.	5-33
1A9A1R14		SAME AS 1R3.	5-33
1A9A1R15		SAME AS 1R3.	5-33
1A9A1R16		SAME AS 1A1A1R6.	5-33
1A9A1R17		SAME AS 1A1A1R13.	5-33
1A9A1R18		RESISTOR: MIL type RC07GF182J.	5-33
1A9A1R19		SAME AS 1A1A1R20.	5-33
1A9A1R20		SAME AS 1A1A1R6.	5-33
1A9A1R21		SAME AS 1A3A1R77.	5-33
1A9A1R22		SAME AS 1A1A1R3.	5-33
1A9A1R23		SAME AS 1A1A1R4.	5-33
1A9A1R24		RESISTOR, VARIABLE, WIRE WOUND: 2,000 ohms \pm 20 tol; 0.250 in. dia by 0.250 in. hg. p.c. type mounting pins. Dwg RV126-61P202, 80740 P/N 61P202.	5-33
1A9A1R25		RESISTOR: MIL type RC07GF823J.	5-33
1A9A1R26		SAME AS 1A1A1R3.	5-33
1A9A1R27		SAME AS 1A1A1R3.	5-33
1A9A1R28		SAME AS 1A1A1R11.	5-33
1A9A1R29		SAME AS 1A1A1R11.	5-33
1A9A1R30		SAME AS 1A1A1R10.	5-33
1A9A1R31		SAME AS 1A1A1R10.	5-33
1A9A1R32		SAME AS 1A1A1R6.	5-33
1A9A1R33		SAME AS 1A2A1R26.	5-33
1A9A1R34		SAME AS 1A1A1R6.	5-33
1A9A1R35		SAME AS 1A1A1R10.	5-33
1A9A1R36		SAME AS 1A1A1R10.	5-33
1A9A1R37		SAME AS 1A1A1R13.	5-33
1A9A1R38		SAME AS 1R3.	5-33
1A9A1R39		SAME AS 1R3.	5-33
1A9A1R40		SAME AS 1A1A1R6.	5-33
1A9A1R41		SAME AS 1A1A1R13.	5-33
1A9A1R42		SAME AS 1A1A1R20.	5-33
1A9A1R43		SAME AS 1A1A1R6.	5-33
1A9A1R44		SAME AS 1A3A1R77.	5-33
1A9A1R45		SAME AS 1A1A1R3.	5-33
1A9A1R46		SAME AS 1A1A1R4.	5-33
1A9A1R47		SAME AS 1A9A1R24.	5-33
1A9A1R48		SAME AS 1A9A1R25.	5-33
1A9A1R49		SAME AS 1A3A1R7.	5-33
1A9A1R50		SAME AS 1A1A1R3.	5-33

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A9A1R51		SAME AS 1A1A1R3.	5-33
1A9A1R52		SAME AS 1A3A1R7.	5-33
1A9A1R53		SAME AS 1A1A1R11.	5-33
1A9A1R54		SAME AS 1A1A1R11.	5-33
1A9A1R55		SAME AS 1A1A1R10.	5-33
1A9A1R56		SAME AS 1A1A1R10.	5-33
1A9A1R57		SAME AS 1A1A1R6.	5-33
1A9A1R58		SAME AS 1A2A1R26.	5-33
1A9A1R59		SAME AS 1A1A1R6.	5-33
1A9A1R60		SAME AS 1A1A1R10.	5-33
1A9A1R61		SAME AS 1A1A1R10.	5-33
1A9A1R62		SAME AS 1A1A1R13.	5-33
1A9A1R63		SAME AS 1R3.	5-33
1A9A1R64		SAME AS 1R3.	5-33
1A9A1R65		SAME AS 1A7A1R41.	5-33
1A9A1R66		SAME AS 1A1A1R13.	5-33
1A9A1R67		SAME AS 1A1A1R20.	5-33
1A9A1R68		SAME AS 1A1A1R6.	5-33
1A9A1R69		SAME AS 1A3A1R77.	5-33
1A9A1R70		SAME AS 1A1A1R3.	5-33
1A9A1R71		SAME AS 1A1A1R4.	5-33
1A9A1R72		SAME AS 1A9A1R24.	5-33
1A9A1R73		SAME AS 1A9A1R25.	5-33
1A9A1R74		SAME AS 1A1A1R3.	5-33
1A9A1R75		SAME AS 1A1A1R3.	5-33
1A9A1R76		SAME AS 1A3A1R7.	5-33
1A9A1R77		SAME AS 1A1A1R11.	5-33
1A9A1R78		SAME AS 1A1A1R11.	5-33
1A9A1R79		SAME AS 1A1A1R10.	5-33
1A9A1R80		SAME AS 1A1A1R10.	5-33
1A9A1R81		SAME AS 1A1A1R6.	5-33
1A9A1R82		SAME AS 1A2A1R26.	5-33
1A9A1R83		SAME AS 1A1A1R6.	5-33
1A9A1R84		SAME AS 1A1A1R10.	5-33
1A9A1R85		SAME AS 1A1A1R10.	5-33
1A9A1R86		SAME AS 1A1A1R13.	5-33
1A9A1R87		SAME AS 1R3.	5-33
1A9A1R88		SAME AS 1R3.	5-33
1A9A1R89		SAME AS 1A1A1R6.	5-33
1A9A1R90		SAME AS 1A1A1R13.	5-33
1A9A1R91		SAME AS 1A1A1R20.	5-33
1A9A1R92		SAME AS 1A1A1R6.	5-33
1A9A1R93		SAME AS 1A3A1R77.	5-33
1A9A1R94		SAME AS 1A1A1R3.	5-33
1A9A1R95		SAME AS 1A1A1R4.	5-33
1A9A1R96		SAME AS 1A9A1R24.	5-33
1A9A1R97		SAME AS 1A9A1R25.	5-33
1A9A1R98		SAME AS 1A9A1R18.	5-33
1A9A1R99		SAME AS 1A2A1R6.	5-33
1A9A1R100		SAME AS 1A2A1R6.	5-33
1A9A1R101		SAME AS 1A2A1R27.	5-33
1A9A1R102		SAME AS 1A7A1R27.	5-33
1A9A1T1		SAME AS 1A7A1T1.	5-33
1A9A1T2		SAME AS 1A7A1T1.	5-33
1A9A1T3		TRANSFORMER, PULSE: 0.12 uh, ±20% tol, wire leads. 0.650 in. lg by 0.425 in. wd by 0.350 in. hg. Dwg TF374-2, 90095 P/N 11GGA.	5-33
1A9A1T4		SAME AS 1A9A1T3.	5-33

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

RADIO FREQUENCY TUNER, TN-512/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
1A10		TUNER, RADIO FREQUENCY: Factory repairable; item 2-32 mc, with motor driven tuning section and circuit cards A4673, A4674, A4675, A4676; 16.500 in. lg by 6.500 in. wd by 6.500 in. hg. 82679 P/N AX5005-2.	5-35
1A10A1		OSCILLATOR ASSEMBLY: Non-repairable item, factory replaceable. 82679 P/N A0128.	5-35
1A10A3A1		CIRCUIT CARD ASSEMBLY: Non-repairable item, P/O AX5005; 5.062 in. lg by 2.375 in. wd by 0.750 in. hg. 82679 P/N A4673.	5-35
1A10A3A2		CIRCUIT CARD ASSEMBLY: Non-repairable item, P/O AX5005; 5.062 in. lg by 2.375 in. wd by 0.750 in. hg. 82679 P/N A4674.	5-35
1A10A3A3		CIRCUIT CARD ASSEMBLY: Non-repairable item, P/O AX5005; 5.062 in. lg by 2.375 in. wd by 0.750 in. hg. 82679 P/N A4675.	5-35
1A10A3A4		CIRCUIT CARD ASSEMBLY: Non-repairable item, P/O AX5005; 5.062 in. lg by 2.375 in. wd by 0.750 in. hg. 82679 P/N A4676.	5-35
1A11		ATTENUATOR ASSEMBLY: Non-repairable item; 3.526 in. lg by 2.000 in. wd by 1.125 in. hg. 82679 P/N AX5007.	5-35A
1A13		CIRCUIT CARD ASSEMBLY: 3 capacitors, 4 resistors, 1 relay, 1 semiconductor, 1 transistor, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4794.	5-37
1A13C1		CAPACITOR, FIXED, ELECTROLYTIC: 40 uf, -10% + 150% at 125 cps, 25°C, 15 wvdc. 0.312 in. dia by 0.750 in. lg. Dwg CE105-40-15. 14655 P/N NLW 40-15.	5-37
1A13C2		CAPACITOR, FIXED, ELECTROLYTIC: 200 uf, -10% + 150% at 125 cps, 24°C, 15 wvdc. 0.312 in. dia by 0.750 in. lg. Dwg CE105-200-15, 14655 P/N NLW CE105-200-15.	5-37
1A13C3		SAME AS 1A13C2.	5-37
1A13CR1		SEMICONDUCTOR DEVICE: MIL type 1N4245.	5-37
1A13K1		RELAY, ARMATURE, DC: DPDT, 40 milliwatt sensitivity; coil data, 6.0 milliamps, 250 ohms; operate time, 10 milliseconds; hermetically sealed metal case, 1.281 in. hg by 0.800 in. wd by 0.400 in. thk; bracket mounted. 82679 P/N RL178-U6D4R0.	5-37
1A13Q1		TRANSISTOR: MIL type 2N697.	5-37
1A13R1		SAME AS 1A1A1R17.	5-37
1A13R2		SAME AS 1A1A1R20.	5-37
1A13R3		SAME AS 1A1A1R20.	5-37
1A13R4		RESISTOR: MIL type RC07GF123J.	5-37

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2		MSAR-4, DEMULTIPLEXER, TD-914/URR. A combined demultiplexer and ISB detector that converts a 250 kc composite IF signal to four independent sideband audio channels (A1, A2, B1, B2) or a symmetrical channel; demultiplexing of each independent sideband channel is accomplished with the aid of 250 kc and 1 mc injection frequencies.	5-47
2A1		CIRCUIT CARD ASSEMBLY: 36 resistors, 24 capacitors, 17 transistors, 16 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4627.	5-49
2A2		CIRCUIT CARD ASSEMBLY: 37 resistors, 13 capacitors, 1 integrated circuit, 16 transistors, 17 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4628.	5-49
2A3		CIRCUIT CARD ASSEMBLY: 79 resistors, 62 capacitors, 11 coils, 3 filters, 6 integrated circuits, 18 transistors, 4 semiconductors, plug-in item; 9.031 in. lg by 9.969 in. wd by 0.750 in. hg, 82679 P/N A4629.	5-49
2A4		CIRCUIT CARD ASSEMBLY: 77 resistors, 48 capacitors, 6 coils, 2 transformers, 16 transistors, 11 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4630.	5-49
2A5		CIRCUIT CARD ASSEMBLY: 99 resistors, 64 capacitors, 6 coils, 2 filters, 21 transistors, 7 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4631.	5-49
2A6		CIRCUIT CARD ASSEMBLY: 51 resistors, 34 capacitors, 5 coils, 3 transformers, 15 transistors, 6 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4632.	5-49
2A7		CIRCUIT CARD ASSEMBLY: 84 resistors, 53 capacitors, 6 coils, 2 filters, 19 transistors, 7 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4633.	5-49
2A8		SAME AS 2A6.	5-49
2A9		CIRCUIT CARD ASSEMBLY: 84 resistors, 53 capacitors, 6 coils, 2 filters, 19 transistors, 7 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4635.	5-49
2A10		SAME AS 2A6.	5-49
2A11		CIRCUIT CARD ASSEMBLY: 84 resistors, 53 capacitors, 6 coils, 2 filters, 19 transistors, 7 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4637.	5-49
2A12		SAME AS 2A6.	5-49
2A13		CIRCUIT CARD ASSEMBLY: 84 resistors, 53 capacitors, 6 coils, 2 filters, 19 transistors, 7 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg, 82679 P/N A4638.	5-49
2A14		STEPPING SWITCH ASSEMBLY: 82679 P/N AX5002.	5-49
2A15		STEPPING SWITCH ASSEMBLY: 82679 P/N AX5000.	5-49
2A16		SAME AS 2A15.	5-49
2A17		SAME AS 2A15.	5-49
2A18		SAME AS 2A15.	5-49
2DS1		LAMP, INCANDESCENT: Single contact, T-1-3/4 base, 14 vac or vdc, 0.68 amps. Dwg BI110-10, 0.806 P/N 382.	5-47
2F1		FUSE, CARTRIDGE TYPE: 0.5 amp, 125 v, 0.250 in. dia by 1.250 in. lg, Dwg FU102, 71400 P/N MDL-1/2.	5-47
2F2		SAME AS 2F1.	5-47
2FL1		FILTER, RADIO INTERFERENCE: 1 amp current rating, 600 vdc, 250 vac at 60 cps, 1.000 in. dia by 2.688 in. lg. Dwg FI105-1, 80183 P/N 1JX130.	5-47

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2FL2		SAME AS 2FL1.	5-47
2J1		NOT USED.	5-48
2J2		CONNECTOR: MIL type MS3102A14S1P.	5-48
2J3		CONNECTOR: MIL type UG625B/U.	5-48
2J4			
thru			
2J10		SAME AS 2J3.	5-48
2J11		CONNECTOR, RECEPTACLE, ELECTRICAL: 9 sockets, contacts rated at 7.5 amps, 0.718 in. dia by 0.781 in. lg, Dwg JJ193-9S, 07497 P/N 126-221.	5-48
2J12			
thru			
2J18		SAME AS 2J11.	5-48
2J19		CONNECTOR: MIL type MS3102A28-21P.	5-48
2J20		CONNECTOR, RECEPTACLE, ELECTRICAL: MIL type JJ034.	5-48
2M1		METER, SPECIAL SCALE: 500 microamp movement, molded phenolic case 1.750 in. by 1.750 in. by 1.500 in, 82679 P/N MR204.	5-47
2MP1		KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 setscrews and white filled indicators, 0.750 in. dia by 0.438 in. hg, 82679 P/N MP123-1FB.	5-47
2MP2			
thru			
2MP4		SAME AS 2MP1.	5-47
2MP5		KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 setscrews and white filled indicator depression, 0.750 in. dia by 0.438 in. hg, 82679 P/N MP123-3FB.	5-47
2MP6			
thru			
2MP12		SAME AS 2MP5.	5-47
2MP13		KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 setscrews and white filled indicator lines, 0.750 in. dia by 0.438 in. hg, 82679 P/N MP123-3DB.	5-47
2MP14			
thru			
2MP16		SAME AS 2MP13.	5-47
2MP17		KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 setscrews and white filled indicator line, 0.750 in. dia by 0.438 in. hg, 82679 P/N MP123-3SB.	5-47
2Q1		TRANSISTOR: MIL type 2N3442.	5-50
2Q2		SAME AS 2Q1.	5-50
2R1		RESISTOR, VARIABLE, COMPOSITION: 5000 ohms, $\pm 10\%$ tol, linear taper "A"; w/switch; bushing mounted, 1.094 in. dia, by 0.781 in. behind panel; 0.625 in. shaft length, 82679 P/N RV4NAYSA502AYY.	5-50
2R2		RESISTOR, VARIABLE, COMPOSITION: 5000 ohms, $\pm 10\%$ tol, "C" taper; w/switch; bushing mounted, 1.094 in. dia, by 0.781 in. behind panel; 0.625 in. shaft length, 82679 P/N RV4NATSC502CY.	5-50
2R3			
thru			
2R5		SAME AS 2R2.	5-50
2R6		SAME AS 2R1.	5-50
2R7		RESISTOR: MIL type RN60C6810F.	5-50
2R8		RESISTOR: MIL type RN60C2150F.	5-50
2R9		RESISTOR: MIL type RN60C1000F.	5-50
2R10		RESISTOR: MIL type RC42GF181J.	5-50

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2S1 2S2		NOT USED. SWITCH, ROTARY: 2 sections, 6 positions, 30° angle of throw, 2 poles. Non shorting contacts. Bakelite insulation. 0.250 in. dia shaft 0.750 in. lg from mtg surface. 3/8-32 and bushing mtd. 82679 P/N SW452.	5-50
2S3 thru 2S6 2S7 2S8		NOT USED. SWITCH: MIL type ST22K. SWITCH, ROTARY: Single section, 3 position, 30° angle of throw, 1 pole. Non shorting contacts. Bakelite insulation. 0.250 in. dia shaft 0.750 in. lg from mounting surface. 3/8-32 thd bushing mounted. 82679 P/N SW449.	5-50 5-50
2S9		SWITCH, ROTARY: 1 section, 5 positions, 30° angle of throw, 2 poles. Non shorting contacts. Bakelite insulation. 0.250 in. dia shaft 0.750 in. lg from mtg surface. 3/8-32 thd bushing mtd. 82679 P/N SW454.	5-50
2S10		SWITCH, ROTARY: 1 section, 5 positions, 30° angle of throw, 1 pole. Non shorting contacts. Bakelite insulation. 0.250 in. dia shaft 0.750 in. lg from mtg surface. 3/8-32 thd bushing mtd. 82679 P/N SW455.	5-50
2S11 2S12 2T1		SAME AS 2S10. SAME AS 2S10. TRANSFORMER, STEP DOWN: Primary, 115/230 v, 50/60 cps, 1 phase. Secondary, 33.0 v, 22.8 v, 14.5 v, 28.2 v. Potted frame, solder type terminals. 3.562 in. lg by 3.000 in. wd by 2.625 in. hg. 82679 P/N TF363.	5-50 5-50 5-50
2XA1		CONNECTOR, RECEPTACLE, ELECTRICAL: 15 double sided female contacts rated at 5 amps and 1800 volts rms. Phenolic housing with floating bushing and eyelet terminals. Accepts printed circuit board thickness of 0.054 to 0.071 in. 82679 P/N JJ319A15DFE.	5-50
2XA2 thru 2XA13 2XA14		SAME AS 2XA1. CONNECTOR, RECEPTACLE, ELECTRICAL: 30 phospher bronze gold plated contacts, solder lug terminals, phenolic body. 2.045 in. lg by 0.410 in. wd by 0.530 in. hg. 82679 P/N JJ340.	5-50 5-50
2XA15 2XA16		SAME AS 2XA14. CONNECTOR, RECEPTACLE, ELECTRICAL: 30 gold plated phospher bronze contacts. 2.370 in. lg by 0.419 in. wd by 0.530 in. hg. Hole mounted. 82679 P/N JJ336.	5-50 5-50
2XA17 2XA18 2XDS1		SAME AS 2XA16. SAME AS 2XA16. LIGHT INDICATOR: Translucent white lens, 1.350 to 28 v, T-1-3/4 lamp base, 2 terminals. 0.437 in. dia by 1.500 in. lg. Dwg TS153-5. 72619 P/N 162-8430-0975-502.	5-50 5-50 5-50
2XF1		FUSEHOLDER, LAMP INDICATING: 90-250 v, 15 amps, neon lamp, clear knob, accommodates 1/2 in. dia x 1-1/4 in. lg fuse. Dwg FH104-3. 71400 P/N HKL-X.	5-50
2XF2		SAME AS 2XF1.	5-50

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A1		CIRCUIT CARD ASSEMBLY: 36 resistors, 24 capacitors, 17 transistors, 16 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4627.	5-52
2A1C1		CAPACITOR, FIXED, ELECTROLYTIC: 150 uf, 75 vdcw, 0.625 in. dia by 1.625 in. lg. Dwg CE119-150-75. 80183 P/N 39D157G075FJ4.	5-52
2A1C2		CAPACITOR, FIXED, ELECTROLYTIC: 200 uf, -10% +150% at 125 cps, 25°C, 15 vdcw, 0.437 in. dia by 1.625 in. lg. Dwg CE105-200-15. 14655 P/N NLW200-15.	5-52
2A1C3		CAPACITOR, FIXED, CERAMIC: 100,000 uuf, +80% -20% 100 vdcw, 0.690 in. dia by 0.156 in. thk, 0.375 in. lead spacing. 82679 P/N CC100-28.	5-52
2A1C4		CAPACITOR, FIXED, ELECTROLYTIC: 10 uf, -10% +150% at 125 cps, 25°C, 25 vdcw, 0.312 in. dia by 0.750 in. lg. Dwg CE105-10-25. 14655 P/N NLW10-25.	5-52
2A1C5		SAME AS 2A1C3.	5-52
2A1C6		CAPACITOR: MIL type CS13BE476K.	5-52
2A1C7		CAPACITOR, FIXED, ELECTROLYTIC: 350 uf, 75 vdcw, 0.750 in. dia by 2.125 in. lg. Dwg CE119-350-75. 80183 P/N 39D157G075FJ4.	5-52
2A1C8		SAME AS 2A1C2.	5-52
2A1C9		SAME AS 2A1C3.	5-52
2A1C10		SAME AS 2A1C4.	5-52
2A1C11		SAME AS 2A1C3.	5-52
2A1C12		SAME AS 2A1C6.	5-52
2A1C13		CAPACITOR, FIXED, ELECTROLYTIC: 150 uf, 30 vdcw, 0.500 in. dia by 1.625 in. lg. Dwg CE119-150-30. 80183 P/N 39D157G030EJ4.	5-52
2A1C14		SAME AS 2A1C2.	5-52
2A1C15		SAME AS 2A1C3.	5-52
2A1C16		SAME AS 2A1C4.	5-52
2A1C17		SAME AS 2A1C3.	5-52
2A1C18		CAPACITOR: MIL type CS13BC227K.	5-52
2A1C19		CAPACITOR, FIXED, ELECTROLYTIC: 500 uf, 50 vdcw, 0.875 in. dia by 2.125 in. lg. Dwg CE119-500-50. 80183 P/N 39D507G050HL4.	5-52
2A1C20		SAME AS 2A1C2.	5-52
2A1C21		SAME AS 2A1C3.	5-52
2A1C22		SAME AS 2A1C4.	5-52
2A1C23		SAME AS 2A1C3.	5-52
2A1C24		SAME AS 2A1C6.	5-52
2A1CR1		RECTIFIER, SEMICONDUCTOR DEVICE: 140 v input, dc output, 124 v resistive load, 200 v capacitive load. Wire leads. Corrosion resistant plastic case. 0.900 in. lg by 0.670 in. hg by 0.260 in. wd. 82679 P/N DD144-6.	5-52
2A1CR2		SEMICONDUCTOR DEVICE: MIL type 1N4370.	5-52
2A1CR3		SEMICONDUCTOR DEVICE: MIL type 1N754A.	5-52
2A1CR4		SAME AS 2A1CR1.	5-52
2A1CR5		SAME AS 2A1CR2.	5-52
2A1CR6		SAME AS 2A1CR3.	5-52
2A1CR7		SAME AS 2A1CR1.	5-52
2A1CR8		SAME AS 2A1CR2.	5-52
2A1CR9		SAME AS 2A1CR2.	5-52
2A1CR10		SAME AS 2A1CR1.	5-52
2A1CR11		SAME AS 2A1CR2.	5-52
2A1CR12		SAME AS 2A1CR3.	5-52
2A1CR13		SEMICONDUCTOR DEVICE: MIL type 1N914.	5-52

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A1CR14 thru 2A1CR16		SAME AS 2A1CR13.	5-52
2A1Q1		TRANSISTOR: MIL type 2N4036.	5-52
2A1Q2		TRANSISTOR: MIL type 2N2631.	5-52
2A1Q3		TRANSISTOR: MIL type 2N706.	5-52
2A1Q4		TRANSISTOR: MIL type 2N1711.	5-52
2A1Q5		SAME AS 2A1Q1.	5-52
2A1Q6		SAME AS 2A1Q2.	5-52
2A1Q7		SAME AS 2A1Q3.	5-52
2A1Q8		SAME AS 2A1Q4.	5-52
2A1Q9		TRANSISTOR: MIL type 2N1132.	5-52
2A1Q10		SAME AS 2A1Q4.	5-52
2A1Q11		SAME AS 2A1Q2.	5-52
2A1Q12		SAME AS 2A1Q3.	5-52
2A1Q13		SAME AS 2A1Q3.	5-52
2A1Q14		SAME AS 2A1Q2.	5-52
2A1Q15		SAME AS 2A1Q1.	5-52
2A1Q16		SAME AS 2A1Q9.	5-52
2A1Q17		SAME AS 2A1Q1.	5-52
2A1R1		RESISTOR: MIL type RC07GF682J.	5-52
2A1R2		RESISTOR: MIL type RC07GF331J.	5-52
2A1R3		RESISTOR: MIL type RC07GF151J.	5-52
2A1R4		RESISTOR, VARIABLE, WIREWOUND: 100 ohms, $\pm 20\%$ tol, 0.250 in. dia by 0.250 in. hg. PC type mounting pins. Dwg RV126-61P101. 80740 P/N 61P101.	5-52
2A1R5		RESISTOR: MIL type RW69V1R2J.	5-52
2A1R6		RESISTOR: MIL type RC07GF332J.	5-52
2A1R7		RESISTOR: MIL type RC07GF472J.	5-52
2A1R8		RESISTOR, VARIABLE, WIREWOUND: 1000 ohms, $+20\%$ tol, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-102.	5-52
2A1R9		RESISTOR: MIL type RC07GF152J.	5-52
2A1R10		SAME AS 2A1R6.	5-52
2A1R11		RESISTOR: MIL type RC07GF681J.	5-52
2A1R12		SAME AS 2A1R3.	5-52
2A1R13		SAME AS 2A1R4.	5-52
2A1R14		RESISTOR: MIL type RC20GF3R9J.	5-52
2A1R15		SAME AS 2A1R9.	5-52
2A1R16		RESISTOR: MIL type RC07GF682J.	5-52
2A1R17		SAME AS 2A1R8.	5-52
2A1R18		SAME AS 2A1R16.	5-52
2A1R19		RESISTOR: MIL type RC07GF222J.	5-52
2A1R20		SAME AS 2A1R11.	5-52
2A1R21		SAME AS 2A1R3.	5-52
2A1R22		SAME AS 2A1R4.	5-52
2A1R23		RESISTOR: MIL type RC07GF100J.	5-52
2A1R24		RESISTOR: MIL type RC07GF101J.	5-52
2A1R25		SAME AS 2A1R24.	5-52
2A1R26		SAME AS 2A1R4.	5-52
2A1R27		RESISTOR: MIL type RC07GF2R7J.	5-52
2A1R28		SAME AS 2A1R7.	5-52
2A1R29		RESISTOR: MIL type RC07GF221J.	5-52
2A1R30		SAME AS 2A1R3.	5-52
2A1R31		SAME AS 2A1R8.	5-52
2A1R32		RESISTOR: MIL type RC07GF150J.	5-52
2A1R33		SAME AS 2A1R6.	5-52
2A1R34		RESISTOR: MIL type RC07GF153J.	5-52

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A1R35		RESISTOR, VARIABLE, WIREWOUND: 5000 ohms, $\pm 20\%$ tol. 0.250 in. dia, by 0.250 in. hg. 82679 P/N RV124-1-502.	5-52
2A1R36		SAME AS 2A1R16.	5-52
2A2		CIRCUIT CARD ASSEMBLY: 37 resistors, 13 capacitors, 1 inte- grated circuit, 16 transistors, 17 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4628.	5-54
2A2C1		CAPACITOR: MIL type CS13BE106K.	5-54
2A2C2			
thru			
2A2C4		SAME AS 2A2C1.	5-54
2A2C5		CAPACITOR: MIL type CS13BE225K.	5-54
2A2C6		SAME AS 2A2C5.	5-54
2A2C7		CAPACITOR, FIXED, CERAMIC: 10,000 uuf, $\pm 20\%$, 100 vdcw, 0.344 in. dia by 0.125 in. thk, 0.250 in. lead spacing. 82679 P/N CC100-43.	5-54
2A2C8		SAME AS 2A2C7.	5-54
2A2C9		SAME AS 2A1C18.	5-54
2A2C10			
thru			
2A2C21		NOT USED.	
2A2C22		SAME AS 2A1C3.	5-54
2A2C23		CAPACITOR, FIXED, MICA: 100 uuf, $\pm 5\%$ tol, 500 vdcw, 0.400 in. lg by 0.403 in. wd by 0.170 in. thk. 82679 P/N CM111F101J5S.	5-54
2A2C24		CAPACITOR, FIXED, MICA: 3 uuf, $\pm 1/2\%$ tol, 500 vdcw, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C030D5S.	5-54
2A2C25		SAME AS 2A1C3.	5-54
2A2CR1			
thru			
2A2CR5		SAME AS 2A1CR13.	5-54
2A2CR6		NOT USED.	
2A2CR7		NOT USED.	
2A2CR8		SAME AS 2A1CR13.	5-54
2A2CR9		NOT USED.	
2A2CR10		NOT USED.	
2A2CR11		SAME AS 2A1CR13.	5-54
2A2CR12		NOT USED.	
2A2CR13		NOT USED.	
2A2CR14		SAME AS 2A1CR13.	5-54
2A2CR15		NOT USED.	
2A2CR16		NOT USED.	
2A2CR17		SAME AS 2A1CR13.	5-54
2A2CR18		NOT USED.	
2A2CR19		SAME AS 2A1CR13.	5-54
2A2CR20		SAME AS 2A1CR13.	5-54
2A2CR21		SAME AS 2A1CR13.	5-54
2A2Q1		SAME AS 2A1Q3.	5-54
2A2Q2		SAME AS 2A1Q3.	5-54
2A2Q3		SAME AS 2A1Q4.	5-54
2A2Q4		SAME AS 2A1Q9.	5-54
2A2Q5		TRANSISTOR: MIL type 2N3766.	5-54
2A2Q6		TRANSISTOR: MIL type 2N3740.	5-54
2A2Q7			
thru			
2A2Q16		SAME AS 2A1Q3.	5-54
2A2R1		RESISTOR: MIL type RC07GF103J.	5-54

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A2R2		SAME AS 2A1R16.	5-54
2A2R3		SAME AS 2A1R6.	5-54
2A2R4		RESISTOR: MIL type RC07GF102J.	5-54
2A2R5		SAME AS 2A2R1.	5-54
2A2R6		SAME AS 2A1R34.	5-54
2A2R7		SAME AS 2A2R1.	5-54
2A2R8		SAME AS 2A1R19.	5-54
2A2R9		SAME AS 2A1R29.	5-54
2A2R10		SAME AS 2A1R9.	5-54
2A2R11		SAME AS 2A1R34.	5-54
2A2R12		SAME AS 2A1R7.	5-54
2A2R13			
thru			
2A2R16		NOT USED.	
2A2R17		RESISTOR: MIL type RC07GF471J.	5-54
2A2R18			
thru			
2A2R26		NOT USED.	
2A2R27		SAME AS 2A2R17.	5-54
2A2R28			
thru			
2A2R39		NOT USED.	
2A2R40		SAME AS 2A2R17.	5-54
2A2R41			
thru			
2A2R52		NOT USED.	
2A2R53		SAME AS 2A2R17.	5-54
2A2R54			
thru			
2A2R64		NOT USED.	
2A2R65		RESISTOR, VARIABLE: 25k ohms, $\pm 30\%$, 200 vdcw, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-253.	5-54
2A2R66		SAME AS 2A1R7.	5-54
2A2R67		SAME AS 2A1R7.	5-54
2A2R68		SAME AS 2A1R7.	5-54
2A2R69		SAME AS 2A1R7.	5-54
2A2R70		SAME AS 2A2R65.	5-54
2A2R71		RESISTOR: MIL type RC07GF223J.	5-54
2A2R72		RESISTOR: MIL type RC07GF224J.	5-54
2A2R73		SAME AS 2A1R7.	5-54
2A2R74		SAME AS 2A1R24.	5-54
2A2R75		SAME AS 2A2R65.	5-54
2A2R76		SAME AS 2A1R24.	5-54
2A2R77		RESISTOR: MIL type RC07GF474J.	5-54
2A2R78		SAME AS 2A1R9.	5-54
2A2R79		SAME AS 2A1R24.	5-54
2A2R80		SAME AS 2A2R1.	5-54
2A2R81		SAME AS 2A2R4.	5-54
2A2R82		SAME AS 2A1R9.	5-54
2A2R83		RESISTOR: MIL type RC20GF102J.	5-54
2A2R84		SAME AS 2A2R83.	5-54
2A2R85		NOT USED.	
2A2R86		NOT USED.	
2A2R87		SAME AS 2A2R17.	5-54
2A2VR1		NOT USED.	
2A2VR2		NOT USED.	
2A2VR3		SEMICONDUCTOR DEVICE: MIL type 1N759A.	5-54
2A2VR4		SAME AS 2A2VR1.	5-54

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A2Z1 thru 2A2Z4 2A2Z5		NOT USED. INTEGRATED CIRCUIT, OPERATIONAL AMPLIFIER: 8 pins, metal case. Supply voltage ± 18 v. 0.375 in. dia by 0.187 in. hg. 82679 P/N NW156.	5-54
2A3		CIRCUIT CARD ASSEMBLY: 79 resistors, 62 capacitors, 11 coils, 3 filters, 6 integrated circuits, 18 transistors, 4 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4629.	5-56
2A3C1		SAME AS 2A1C3.	5-56
2A3C2		CAPACITOR: MIL type CS13BF106K.	5-56
2A3C3		SAME AS 2A1C3.	5-56
2A3C4		SAME AS 2A2C23.	5-56
2A3C5		NOT USED.	
2A3C6		SAME AS 2A1C3.	5-56
2A3C7		CAPACITOR, FIXED, CERAMIC: 10,000 uuf, gm, 600 vdcw, 0.600 in. dia by 0.156 in. thk, 0.375 in. lead spacing. 82679 P/N CC100-16.	5-56
2A3C8		SAME AS 2A1C3.	5-56
2A3C9		SAME AS 2A2C1.	5-56
2A3C10		SAME AS 2A1C3.	5-56
2A3C11		CAPACITOR, VARIABLE, CERAMIC: 5.5-18 uuf, 200 vdcw, min Q=500 at 1 mc. 0.375 in. dia by 0.375 in. hg. 82679 P/N CV112-7.	5-56
2A3C12		CAPACITOR, FIXED, MICA: 180 uuf, $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F181G5S.	5-56
2A3C13		CAPACITOR, FIXED, MICA: 150 uuf, $\pm 1\%$ tol, 500 vdcw. 0.400 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F121F5S.	5-56
2A3C14		CAPACITOR, FIXED, MICA: 10 uuf, $\pm 5\%$ tol, 500 vdcw, 0.400 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111C100J5S.	5-56
2A3C15 thru 2A3C18		SAME AS 2A3C7.	5-56
2A3C19		SAME AS 2A3C12.	5-56
2A3C20		SAME AS 2A3C7.	5-56
2A3C21		SAME AS 2A3C7.	5-56
2A3C22		SAME AS 2A1C3.	5-56
2A3C23		SAME AS 2A2C1.	5-56
2A3C24		CAPACITOR, FIXED, MICA: 10,000 uuf, $\pm 1\%$ tol, 500 vdcw, 0.790 in. lg by 0.570 in. wd by 0.340 in. thk. 82679 P/N CM112F103F1S.	5-56
2A3C25		SAME AS 2A3C24.	5-56
2A3C26		SAME AS 2A1C3.	5-56
2A3C27		SAME AS 2A3C7.	5-56
2A3C28		SAME AS 2A1C3.	5-56
2A3C29		SAME AS 2A3C7.	5-56
2A3C30		SAME AS 2A1C3.	5-56
2A3C31		SAME AS 2A3C7.	5-56
2A3C32		SAME AS 2A1C3.	5-56
2A3C33		SAME AS 2A3C7.	5-56
2A3C34		CAPACITOR, FIXED, MICA: 3300 uuf, $\pm 2\%$ tol, 500 vdcw, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM112F332G5S.	5-56
2A3C35		SAME AS 2A3C7.	5-56
2A3C36		SAME AS 2A3C7.	5-56

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A3C37 thru 2A3C40 2A3C41 2A3C42 thru 2A3C45 2A3C46 2A3C47 2A3C48 2A3C49 2A3C50 2A3C51		SAME AS 2A1C3. SAME AS 2A2C1. SAME AS 2A1C3. NOT USED. SAME AS 2A2C1. SAME AS 2A1C3. SAME AS 2A1C3. SAME AS 2A1C3. SAME AS 2A1C3. CAPACITOR, FIXED, MICA: 1800 uuf, $\pm 2\%$ tol, 500 vdcw, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM112F182G5S.	5-56 5-56 5-56 5-56 5-56 5-56 5-56 5-56
2A3C52 2A3C53 2A3C54 2A3C55 2A3C56 2A3C57 thru 2A3C62 2A3C63 2A3C64 2A3CR1 thru 2A3CR4 2A3FL1		SAME AS 2A1C3. SAME AS 2A1C3. SAME AS 2A3C51. SAME AS 2A3C7. SAME AS 2A3C7. SAME AS 2A1C3. SAME AS 2A1C6. SAME AS 2A2C1. SAME AS 2A1CR13.	5-56 5-56 5-56 5-56 5-56 5-56 5-56 5-56
2A3FL2		FILTER, BANDPASS: 6.290 mc center frequency; 3 v rms signal input. Wire leads, hermetically sealed metal case. 2.300 in. lg by 1.000 in. wd by 0.670 in. hg. 82679 P/N FX272-6.290.	5-56
2A3FL3		FILTER, BANDPASS: 0.24371 mc center frequency; 3 v rms signal input. Wire leads, hermetically sealed metal case. 2.300 in. lg by 1.000 in. wd by 0.670 in. hg. 82679 P/N FX272-.25692.	5-56
2A3L1		COIL, RF, FIXED: 100 uh, Q=52 at 2.5 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-101.	5-56
2A3L2		COIL, RF, FIXED: 330 uh, Q=54 at 0.79 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-331.	5-56
2A3L3		COIL, RF, FIXED: 7.3 uh, Q=120 min at 7.9 mc, 0.530 in. dia by 0.220 in. lg. 82679 P/N CL436.	5-56
2A3L4		COIL, RF, FIXED: 2200 uh, Q=50 at 0.25 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-222.	5-56
2A3L5		COIL, RF, FIXED: 3.3 uh, Q=44 at 7.9 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-3R3.	5-56
2A3L6		SAME AS 2A3L2.	5-56
2A3L7		COIL, RF, FIXED: 100,000 uh, Q=18 at 0.79 mc, 0.157 in. dia 0.395 in. lg. 82679 P/N CL433-104.	5-56
2A3L8		COIL, RF, FIXED: 680 uh, Q=60 at 0.79 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-681.	5-56
2A3L9		COIL, RF, FIXED: 120 uh, Q=57 at 0.79 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-121.	5-56
2A3L10		COIL, RF, FIXED: 220 uh, Q=58 at 0.79 mc, 0.157 in. dia by 0.395 in. lg. 82679 P/N CL433-221.	5-56
2A3L11 2A3Q1 thru 2A3Q6		SAME AS 2A3L10. SAME AS 2A1Q3.	5-56 5-56

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A3Q7		SAME AS 2A1Q9.	5-56
2A3Q8		SAME AS 2A1Q4.	5-56
2A3Q9			
thru			
2A3Q14		SAME AS 2A1Q3.	5-56
2A3Q15		SAME AS 2A1Q4.	5-56
2A3Q16		SAME AS 2A1Q4.	5-56
2A3Q17		SAME AS 2A1Q3.	5-56
2A3Q18		SAME AS 2A1Q3.	5-56
2A3R1		RESISTOR: MIL type RC020GF680J.	5-56
2A3R2		SAME AS 2A1R34.	5-56
2A3R3		NOT USED.	
2A3R4		SAME AS 2A1R7.	5-56
2A3R5		SAME AS 2A1R2.	5-56
2A3R6		SAME AS 2A2R4.	5-56
2A3R7		SAME AS 2A1R19.	5-56
2A3R8		SAME AS 2A2R4.	5-56
2A3R9		SAME AS 2A2R4.	5-56
2A3R10		SAME AS 2A1R11.	5-56
2A3R11		SAME AS 2A1R6.	5-56
2A3R12		SAME AS 2A2R1.	5-56
2A3R13		SAME AS 2A1R7.	5-56
2A3R14		SAME AS 2A2R17.	5-56
2A3R15		RESISTOR: MIL type RC07GF470J.	5-56
2A3R16		SAME AS 2A2R17.	5-56
2A3R17		SAME AS 2A1R34.	5-56
2A3R18		SAME AS 2A1R11.	5-56
2A3R19		SAME AS 2A1R9.	5-56
2A3R20		SAME AS 2A1R6.	5-56
2A3R21		SAME AS 2A2R4.	5-56
2A3R22		SAME AS 2A1R23.	5-56
2A3R23		SAME AS 2A2R17.	5-56
2A3R24		SAME AS 2A1R6.	5-56
2A3R25		SAME AS 2A1R6.	5-56
2A3R26		SAME AS 2A1R6.	5-56
2A3R27		SAME AS 2A1R34.	5-56
2A3R28		SAME AS 2A1R24.	5-56
2A3R29		SAME AS 2A2R71.	5-56
2A3R30		SAME AS 2A1R19.	5-56
2A3R31		SAME AS 2A1R34.	5-56
2A3R32		RESISTOR: MIL type RC07GF104J.	5-56
2A3R33		SAME AS 2A2R71.	5-56
2A3R34		SAME AS 2A2R4.	5-56
2A3R35		SAME AS 2A1R7.	5-56
2A3R36		SAME AS 2A1R3.	5-56
2A3R37		SAME AS 2A2R1.	5-56
2A3R38		SAME AS 2A1R34.	5-56
2A3R39		SAME AS 2A2R4.	5-56
2A3R40		SAME AS 2A2R1.	5-56
2A3R41		SAME AS 2A2R4.	5-56
2A3R42		SAME AS 2A2R1.	5-56
2A3R43		SAME AS 2A2R1.	5-56
2A3R44		SAME AS 2A1R34.	5-56
2A3R45		SAME AS 2A2R4.	5-56
2A3R46		SAME AS 2A1R9.	5-56
2A3R47		SAME AS 2A1R7.	5-56
2A3R48		SAME AS 2A1R7.	5-56
2A3R49		SAME AS 2A1R16.	5-56

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A3R50		SAME AS 2A1R3.	5-56
2A3R51		SAME AS 2A1R19.	5-56
2A3R52		RESISTOR: MIL type RC07GF333J.	5-56
2A3R53		SAME AS 2A1R6.	5-56
2A3R54		SAME AS 2A2R4.	5-56
2A3R55		SAME AS 2A3R15.	5-56
2A3R56		NOT USED.	
2A3R57		SAME AS 2A3R15.	5-56
2A3R58		SAME AS 2A2R4.	5-56
2A3R59		SAME AS 2A2R4.	5-56
2A3R60		SAME AS 2A1R16.	5-56
2A3R61		SAME AS 2A1R3.	5-56
2A3R62		SAME AS 2A1R9.	5-56
2A3R63		SAME AS 2A1R9.	5-56
2A3R64		SAME AS 2A2R71.	5-56
2A3R65		SAME AS 2A1R7.	5-56
2A3R66		SAME AS 2A1R7.	5-56
2A3R67		SAME AS 2A2R71.	5-56
2A3R68		SAME AS 2A1R19.	5-56
2A3R69		SAME AS 2A1R24.	5-56
2A3R70		SAME AS 2A1R19.	5-56
2A3R71		SAME AS 2A1R19.	5-56
2A3R72		SAME AS 2A1R24.	5-56
2A3R73		SAME AS 2A1R19.	5-56
2A3R74		SAME AS 2A2R1.	5-56
2A3R75		SAME AS 2A1R6.	5-56
2A3R76		SAME AS 2A1R6.	5-56
2A3R77		SAME AS 2A2R1.	5-56
2A3R78		SAME AS 2A1R24.	5-56
2A3R79		SAME AS 2A1R6.	5-56
2A3R80		SAME AS 2A1R6.	5-56
2A3R81		SAME AS 2A1R24.	5-56
2A3Z1		INTEGRATED CIRCUIT, DECADE COUNTER: 14 pins, plastic case. Supply voltage 4.75 v to 5.25 v. Case; 0.770 in. lg by 0.250 in. wd by 0.200 in. hg. 82679 P/N NW134.	5-56
2A3Z2 thru 2A3Z5 2A3Z6		SAME AS 2A3Z1. INTEGRATED CIRCUIT, MASTER-SLAVE FLIP FLOP: 14 pins plastic case. Supply voltage 4.75 v to 5.25 v. 0.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW159.	5-56 5-56
2A4		CIRCUIT CARD ASSEMBLY: 77 resistors, 48 capacitors, 6 coils, 2 transformers, 16 transistors, 11 semiconductors, plug-in item; 0.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4630.	5-58
2A4C1		CAPACITOR, FIXED, MICA: 220 uuf, $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F221G5S.	5-58
2A4C2		CAPACITOR, FIXED, MICA: 150 uuf, $\pm 1\%$ tol, 500 vdcw, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F151F5S.	5-58
2A4C3		CAPACITOR, FIXED, MICA: 22 uuf, $\pm 5\%$ tol, 500 vdcw, 0.440 in. lg by 0.437 in. wd by 0.170 in. thk. 82679 P/N CM111E220J5S.	5-58
2A4C4 thru 2A4C7 2A4C8		SAME AS 2A1C3. SAME AS 2A3C7.	5-58 5-58

TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A4C9		SAME AS 2A3C7.	5-58
2A4C10		SAME AS 2A2C1.	5-58
2A4C11		SAME AS 2A2C1.	5-58
2A4C12			
thru			
2A4C16		SAME AS 2A1C3.	5-58
2A4C17		CAPACITOR, FIXED, MICA: 120 uuf, $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg by 0.473 in. wd by 0.170 in. thk. 82679 P/N CM111F121G5S.	5-58
2A4C18		SAME AS 2A1C3.	5-58
2A4C19		CAPACITOR, FIXED, MICA: 1500 uuf, $\pm 1\%$ tol, 500 vdcw, 0.640 in. lg by 0.591 in. thk. 82679 P/N CM112F152F5S.	5-58
2A4C20		CAPACITOR, FIXED, MICA: 4700 uuf, $\pm 5\%$ tol, 300 vdcw, 0.665 in. lg by 0.625 in. wd by 0.240 in. thk. 82679 P/N CM112F472J5S.	5-58
2A4C21		SAME AS 2A1C3.	5-58
2A4C22		SAME AS 2A1C3.	5-58
2A4C23		SAME AS 2A1C3.	5-58
2A4C24		SAME AS 2A3C51.	5-58
2A4C25			
thru			
2A4C29		SAME AS 2A1C3.	5-58
2A4C30		CAPACITOR, FIXED, MICA: 100 uuf, $\pm 1\%$ tol, 100 vdcw, 0.790 in. lg by 0.570 in. wd by 0.340 in. thk. 82679 P/N CM112F102F1S.	5-58
2A4C31		SAME AS 2A3C24.	5-58
2A4C32		SAME AS 2A2C1.	5-58
2A4C33		CAPACITOR: MIL type CS13BF226K.	5-58
2A4C34		SAME AS 2A1C6.	5-58
2A4C35		CAPACITOR, FIXED, CERAMIC: 1,000 uuf, gmV, 500 vdcw, 0.310 in. dia by 0.156 in. thk, 0.250 in. lead spacing. 82679 P/N CC100-29.	5-58
2A4C36		SAME AS 2A1C6.	5-58
2A4C37		SAME AS 2A1C6.	5-58
2A4C38		SAME AS 2A1C6.	5-58
2A4C39			
thru			
2A4C44		SAME AS 2A2C1.	5-58
2A4C45		SAME AS 2A3C2.	5-58
2A4C46		SAME AS 2A2C1.	5-58
2A4C47		SAME AS 2A2C1.	5-58
2A4C48		SAME AS 2A2C1.	5-58
2A4CR1		SEMICONDUCTOR DEVICE: MIL type 1N277.	5-58
2A4CR2			
thru			
2A4CR8		SAME AS 2A1CR13.	5-58
2A4CR9		SAME AS 2A2VR1.	5-58
2A4CR10		CAPACITOR, VOLTAGE VARIABLE: 100 uuf, at 4 vdc, approx range 57-250 uuf. Typical Q at 4 vdc = 11, 15 vdcw. 0.140 in. dia by 0.300 in. lg, wire leads. Dwg CX106-15, 01281 P/N Y100.	5-58
2A4CR11		SAME AS 2A2CR19.	5-58
2A4CR12		SAME AS 2A2CR19.	5-58
2A4L1		COIL, RF, FIXED: 3300 uh, $\pm 10\%$ tol, 10 ohms max dc res. 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-332.	5-58
2A4L2		SAME AS 2A4L1.	5-58
2A4L3		COIL, RF, FIXED: 1500 uh, $\pm 10\%$ tol, 10 ohms max dc res. 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-152.	5-58
2A4L4		COIL, RF, FIXED: 2200 uh, $\pm 10\%$ tol, 10 ohms max dc res. 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-222.	5-58
2A4L5		COIL, RF, FIXED: 220 uh, $\pm 10\%$ tol, 10 ohms max dc res. 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-221.	5-58

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A4L6		COIL, RF, FIXED: 6800 uh, ±10% tol, 10 ohms max dc res. 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-682.	5-58
2A4Q1 thru 2A4Q9		SAME AS 2A1Q3.	5-58
2A4Q10		SAME AS 2A1Q4.	5-58
2A4Q11		SAME AS 2A1Q3.	5-58
2A4Q12		SAME AS 2A1Q4.	5-58
2A4Q13 thru 2A4Q16		SAME AS 2A1Q3.	5-58
2A4R1		RESISTOR: MIL type RC07GF473J.	5-58
2A4R2		SAME AS 2A2R1.	5-58
2A4R3		SAME AS 2A2R1.	5-58
2A4R4		SAME AS 2A2R17.	5-58
2A4R5		SAME AS 2A1R19.	5-58
2A4R6		SAME AS 2A2R1.	5-58
2A4R7		SAME AS 2A3R52.	5-58
2A4R8		SAME AS 2A1R24.	5-58
2A4R9		SAME AS 2A1R24.	5-58
2A4R10		SAME AS 2A1R35.	5-58
2A4R11		SAME AS 2A2R71.	5-58
2A4R12		SAME AS 2A1R6.	5-58
2A4R13		SAME AS 2A1R16.	5-58
2A4R14		SAME AS 2A1R19.	5-58
2A4R15		SAME AS 2A2R1.	5-58
2A4R16		SAME AS 2A2R1.	5-58
2A4R17		SAME AS 2A2R1.	5-58
2A4R18		SAME AS 2A2R4.	5-58
2A4R19		SAME AS 2A1R2.	5-58
2A4R20		SAME AS 2A1R2.	5-58
2A4R21		SAME AS 2A1R2.	5-58
2A4R22		SAME AS 2A1R2.	5-58
2A4R23		SAME AS 2A1R35.	5-58
2A4R24		SAME AS 2A1R35.	5-58
2A4R25		SAME AS 2A1R7.	5-58
2A4R26		SAME AS 2A2R71.	5-58
2A4R27		SAME AS 2A2R1.	5-58
2A4R28		SAME AS 2A1R24.	5-58
2A4R29		SAME AS 2A2R1.	5-58
2A4R30		SAME AS 2A1R19.	5-58
2A4R31		SAME AS 2A2R71.	5-58
2A4R32		SAME AS 2A2R71.	5-58
2A4R33		SAME AS 2A1R6.	5-58
2A4R34		SAME AS 2A1R24.	5-58
2A4R35		SAME AS 2A1R16.	5-58
2A4R36		SAME AS 2A2R71.	5-58
2A4R37		SAME AS 2A2R71.	5-58
2A4R38		SAME AS 2A1R29.	5-58
2A4R39		SAME AS 2A2R1.	5-58
2A4R40		SAME AS 2A2R1.	5-58
2A4R41		SAME AS 2A2R71.	5-58
2A4R42		SAME AS 2A1R24.	5-58
2A4R43		SAME AS 2A1R24.	5-58
2A4R44		SAME AS 2A1R19.	5-58
2A4R45		SAME AS 2A2R71.	5-58
2A4R46		SAME AS 2A1R6.	5-58
2A4R47		SAME AS 2A1R6.	5-58
2A4R48		SAME AS 2A1R2.	5-58

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A4R49		SAME AS 2A2R71.	5-58
2A4R50		SAME AS 2A1R6.	5-58
2A4R51		SAME AS 2A1R19.	5-58
2A4R52		SAME AS 2A2R20.	5-58
2A4R53		SAME AS 2A1R2.	5-58
2A4R54		SAME AS 2A1R2.	5-58
2A4R55		SAME AS 2A1R34.	5-58
2A4R56		SAME AS 2A1R34.	5-58
2A4R57		SAME AS 2A1R11.	5-58
2A4R58		SAME AS 2A2R1.	5-58
2A4R59		SAME AS 2A1R29.	5-58
2A4R60		SAME AS 2A2R71.	5-58
2A4R61		SAME AS 2A2R1.	5-58
2A4R62		SAME AS 2A2R1.	5-58
2A4R63		SAME AS 2A2R17.	5-58
2A4R64		SAME AS 2A1R7.	5-58
2A4R65		SAME AS 2A4R1.	5-58
2A4R66		SAME AS 2A2R1.	5-58
2A4R67		SAME AS 2A1R16.	5-58
2A4R68		SAME AS 2A1R9.	5-58
2A4R69		SAME AS 2A2R17.	5-58
2A4R70		SAME AS 2A1R29.	5-58
2A4R71		SAME AS 2A2R1.	5-58
2A4R72		SAME AS 2A1R7.	5-58
2A4R73		SAME AS 2A1R19.	5-58
2A4R74		SAME AS 2A1R19.	5-58
2A4R75		SAME AS 2A1R24.	5-58
2A4R76		SAME AS 2A2R17.	5-58
2A4R77		SAME AS 2A2R17.	5-58
2A4T1		TRANSFORMER, PULSE: 2,500 uh, $\pm 20\%$ tol, wire leads 0.500 in. lg by 0.350 in. wd by 0.250 in. hg. Dwg TD374-5. 90095 P/N 21PHA.	5-58
2A4T2		SAME AS 2A4T1.	5-58
2A5		CIRCUIT CARD ASSEMBLY: 99 resistors, 64 capacitors, 6 coils, 2 filters, 21 transistors, 7 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4631.	5-60
2A5C1 thru 2A5C23		SAME AS 2A1C3.	5-60
2A5C24		SAME AS 2A4C3.	5-60
2A5C25		SAME AS 2A1C3.	5-60
2A5C26		SAME AS 2A1C3.	5-60
2A5C27		SAME AS 2A1C3.	5-60
2A5C28		SAME AS 2A4C3.	5-60
2A5C29 thru 2A5C32		SAME AS 2A1C3.	5-60
2A5C33		SAME AS 2A4C3.	5-50
2A5C34 thru 2A5C38		SAME AS 2A1C3.	5-60
2A5C39		SAME AS 2A4C3.	5-60
2A5C40 thru 2A5C51		SAME AS 2A1C3.	5-60

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A5C52		SAME AS 2A3C51.	5-60
2A5C53			
thru			
2A5C59		SAME AS 2A1C3.	5-60
2A5C60		SAME AS 2A2C5.	5-60
2A5C61		CAPACITOR, FIXED: MIL type C913BF475K.	5-60
2A5C62		CAPACITOR: MIL type CS13BF107K.	5-60
2A5C63		SAME AS 2A1C3.	5-60
2A5C64		SAME AS 2A1C3.	5-60
2A5CR1		SAME AS 2A1CR13.	5-60
2A5CR2		SAME AS 2A1CR13.	5-60
2A5CR3		SAME AS 2A1CR13.	5-60
2A5CR4		SAME AS 2A4CR1.	5-60
2A5CR5		SAME AS 2A4CR1.	5-60
2A5CR6		SAME AS 2A4CR1.	5-60
2A5FL1		FILTER, BANDPASS: 2.5 kc symmetrical, 3 v rms max signal input. 2.750 in. lg by 1.875 in. wd by 0.670 in. hg. 82679 P/N FX262.	5-60
2A5FL2		FILTER, BANDPASS: 6 kc symmetrical, 3 v rms max signal input. 2.750 in. lg by 1.875 in. wd by 0.670 in. hg. 82679 P/N FX259.	5-60
2A5L1		COIL, RF, FIXED: 10,000 uh, ±10% tol, 137 ohms max dc res, 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-103.	5-60
2A5L2			
thru			
2A5L4		SAME AS 2A5L1.	5-60
2A5L5		SAME AS 2A4L5.	5-60
2A5L6		COIL, RF, FIXED: 1000 uh, ±10%, 17.5 ohms max dc res, 0.157 in. dia by 0.450 in. lg. 82679 P/N CL275-102.	5-60
2A5Q1			
thru			
2A5Q4		SAME AS 2A1Q3.	5-60
2A5Q5		TRANSISTOR: MIL type 2N2369.	5-60
2A5Q6		SAME AS 2A5Q5.	5-60
2A5Q7		TRANSISTOR: MIL type 2N4223.	5-60
2A5Q8		TRANSISTOR: MIL type 2N4221.	5-60
2A5Q9		SAME AS 2A5Q5.	5-60
2A5Q10		SAME AS 2A5Q8.	5-60
2A5Q11		SAME AS 2A5Q8.	5-60
2A5Q12		SAME AS 2A1Q3.	5-60
2A5Q13		SAME AS 2A1Q3.	5-60
2A5Q14		SAME AS 2A1Q4.	5-60
2A5Q15			
thru			
2A5Q18		SAME AS 2A1Q3.	5-60
2A5Q19		SAME AS 2A5Q5.	5-60
2A5Q20		SAME AS 2A5Q5.	5-60
2A5Q21		SAME AS 2A5Q5.	5-60
2A5R1		SAME AS 2A2R71.	5-60
2A5R2		SAME AS 2A2R71.	5-60
2A5R3		SAME AS 2A1R24.	5-60
2A5R4		RESISTOR: MIL type RN60D5110F.	5-60
2A5R5		SAME AS 2A1R29.	5-60
2A5R6		SAME AS 2A1R19.	5-60
2A5R7		SAME AS 2A2R4.	5-60
2A5R8		SAME AS 2A2R71.	5-60
2A5R9		SAME AS 2A5R4.	5-60
2A5R10		SAME AS 2A2R71.	5-60
2A5R11		SAME AS 2A1R19.	5-60

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A5R12		SAME AS 2A2R17.	5-60
2A5R13		SAME AS 2A2R1.	5-60
2A5R14		SAME AS 2A2R71.	5-60
2A5R15		SAME AS 2A2R71.	5-60
2A5R16		SAME AS 2A1R24.	5-60
2A5R17		SAME AS 2A5R4.	5-60
2A5R18		SAME AS 2A1R19.	5-60
2A5R19		SAME AS 2A1R29.	5-60
2A5R20		SAME AS 2A2R4.	5-60
2A5R21		SAME AS 2A5R4.	5-60
2A5R22		SAME AS 2A2R71.	5-60
2A5R23		SAME AS 2A3R52.	5-60
2A5R24		SAME AS 2A1R19.	5-60
2A5R25		SAME AS 2A2R17.	5-60
2A5R26		SAME AS 2A2R1.	5-60
2A5R27		SAME AS 2A1R2.	5-60
2A5R28		SAME AS 2A1R7.	5-60
2A5R29		SAME AS 2A1R19.	5-60
2A5R30		SAME AS 2A4R1.	5-60
2A5R31		SAME AS 2A3R32.	5-60
2A5R32		SAME AS 2A1R7.	5-60
2A5R33		SAME AS 2A1R7.	5-60
2A5R34		SAME AS 2A3R32.	5-60
2A5R35		SAME AS 2A1R7.	5-60
2A5R36		SAME AS 2A3R32.	5-60
2A5R37		SAME AS 2A1R19.	5-60
2A5R38		SAME AS 2A3R32.	5-60
2A5R39		SAME AS 2A2R17.	5-60
2A5R40		SAME AS 2A1R7.	5-60
2A5R41		SAME AS 2A1R19.	5-60
2A5R42		NOT USED.	
2A5R43		SAME AS 2A2R71.	5-60
2A5R44		SAME AS 2A2R71.	5-60
2A5R45		SAME AS 2A2R17.	5-60
2A5R46		SAME AS 2A1R7.	5-60
2A5R47		SAME AS 2A2R4.	5-60
2A5R48		SAME AS 2A1R24.	5-60
2A5R49		SAME AS 2A2R77.	5-60
2A5R50		SAME AS 2A1R7.	5-60
2A5R51		SAME AS 2A2R17.	5-60
2A5R52		SAME AS 2A4R1.	5-60
2A5R53		SAME AS 2A2R71.	5-60
2A5R54		SAME AS 2A2R71.	5-60
2A5R55		SAME AS 2A1R19.	5-60
2A5R56		SAME AS 2A2R17.	5-60
2A5R57		SAME AS 2A1R7.	5-60
2A5R58		RESISTOR, VARIABLE: 10 k ohms, ±30% tol, 200 vdcw, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-103.	5-60
2A5R59		SAME AS 2A3R15.	5-60
2A5R60		SAME AS 2A3R32.	5-60
2A5R61		SAME AS 2A3R32.	5-60
2A5R62		SAME AS 2A1R19.	5-60
2A5R63		SAME AS 2A2R17.	5-60
2A5R64		SAME AS 2A1R7.	5-60
2A5R65		SAME AS 2A2R71.	5-60
2A5R66		SAME AS 2A2R71.	5-60

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A5R67		SAME AS 2A1R19.	5-60
2A5R68		SAME AS 2A1R35.	5-60
2A5R69		SAME AS 2A3R15.	5-60
2A5R70		SAME AS 2A1R9.	5-60
2A5R71		SAME AS 2A2R71.	5-60
2A5R72		SAME AS 2A1R19.	5-60
2A5R73		SAME AS 2A2R71.	5-60
2A5R74		SAME AS 2A1R9.	5-60
2A5R75		SAME AS 2A2R4.	5-60
2A5R76		NOT USED.	5-60
2A5R77		SAME AS 2A1R9.	5-60
2A5R78		SAME AS 2A2R4.	5-60
2A5R79		SAME AS 2A2R71.	5-60
2A5R80		SAME AS 2A2R71.	5-60
2A5R81		SAME AS 2A1R7.	5-60
2A5R82		SAME AS 2A2R4.	5-60
2A5R83		SAME AS 2A1R6.	5-60
2A5R84		SAME AS 2A1R24.	5-60
2A5R85		SAME AS 2A2R71.	5-60
2A5R86		SAME AS 2A2R71.	5-60
2A5R87		SAME AS 2A1R19.	5-60
2A5R88		SAME AS 2A1R29.	5-60
2A5R89		SAME AS 2A1R7.	5-60
2A5R90		SAME AS 2A2R71.	5-60
2A5R91		SAME AS 2A1R7.	5-60
2A5R92		SAME AS 2A2R1.	5-60
2A5R93		RESISTOR, VARIABLE: 100 k ohms, $\pm 30\%$ tol, 200 vdcw, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-104.	5-60
2A5R94		SAME AS 2A5R98.	5-60
2A5R95		RESISTOR, VARIABLE: 500 k ohms, $\pm 30\%$ tol, 200 vdcw, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-504.	5-60
2A5R96		RESISTOR, VARIABLE: 250 k ohms, $\pm 30\%$ tol, 200 vdcw, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-254.	5-60
2A5R97		SAME AS 2A5R96.	5-60
2A5R98		SAME AS 2A5R93.	5-60
2A5R99		SAME AS 2A2R17.	5-60
2A5VR1		SAME AS 2A2VR3.	5-60
2A6		CIRCUIT CARD ASSEMBLY: 51 resistors, 34 capacitors, 5 coils, 3 transformers, 15 transistors, 6 semiconductors, plug-in item; 9.031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4632.	5-62
2A6C1		SAME AS 2A4C1.	5-62
2A6C2		SAME AS 2A5C2.	5-62
2A6C3		SAME AS 2A4C1.	5-62
2A6C4			5-62
thru			
2A6C7		SAME AS 2A1C3.	5-62
2A6C8		CAPACITOR, FIXED, MICA: 1800 uuf, $\pm 2\%$ tol, 500 vdcw, 0.640 in. lg by 0.570 in. wd by 0.198 in. thk. 82679 P/N CM112F182G5S.	5-62
2A6C9			
thru			
2A6C12		SAME AS 2A1C3.	5-62
2A6C13		CAPACITOR, FIXED, MICA: 1,000 uuf, $\pm 5\%$ tol, 100 vdcw, 0.790 in. lg by 0.570 in. wd by 0.198 in. thk. 82679 P/N CM112F102J1S.	5-62
2A6C14		CAPACITOR, FIXED, MICA: 2200 uuf, $\pm 2\%$ tol, 500 vdcw, 0.640 in. lg by 0.591 in. wd by 0.198 in. thk. 82679 P/N CM112F222F5S.	5-62

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A6C15		CAPACITOR, FIXED, MICA: 10,000 uuf, $\pm 1\%$ tol, 100 vdcw. 0.790 in. lg by 0.570 in. wd by 0.340 in. thk. 82679 P/N CM112F103F1S.	5-62
2A6C16		SAME AS 2A1C24.	5-62
2A6C17		SAME AS 2A1C3.	5-62
2A6C18		SAME AS 2A1C6.	5-62
2A6C19		SAME AS 2A1C24.	5-62
2A6C20		SAME AS 2A4C35.	5-62
2A6C21		SAME AS 2A1C24.	5-62
2A6C22		SAME AS 2A1C24.	5-62
2A6C23		SAME AS 2A2C1.	5-62
2A6C24		SAME AS 2A1C24.	5-62
2A6C25		SAME AS 2A4C35.	5-62
2A6C26		SAME AS 2A2C1.	5-62
2A6C27			
thru			
2A6C30		SAME AS 2A1C24.	5-62
2A6C31		SAME AS 2A4C35.	5-62
2A6C32		SAME AS 2A2C1.	5-62
2A6C33		SAME AS 2A2C1.	5-62
2A6C34		SAME AS 2A1C6.	5-62
2A6CR1			
thru			
2A6CR6		SAME AS 2A1CR13.	5-62
2A6L1		SAME AS 2A4L1.	5-62
2A6L2		SAME AS 2A4L1.	5-62
2A6L3		SAME AS 2A4L3.	5-62
2A6L4		SAME AS 2A4L5.	5-62
2A6L5		SAME AS 2A4L6.	5-62
2A6Q1		SAME AS 2A1Q3.	5-62
2A6Q2		SAME AS 2A1Q4.	5-62
2A6Q3		SAME AS 2A1Q4.	5-62
2A6Q4		SAME AS 2A1Q3.	5-62
2A6Q5		SAME AS 2A1Q4.	5-62
2A6Q6		SAME AS 2A1Q3.	5-62
2A6Q7		SAME AS 2A1Q4.	5-62
2A6Q8		SAME AS 2A1Q3.	5-62
2A6Q9			
thru			
2A6Q12		SAME AS 2A1Q4.	5-62
2A6Q13		SAME AS 2A1Q9.	5-62
2A6Q14		SAME AS 2A1Q3.	5-62
2A6Q15		SAME AS 2A1Q3.	5-62
2A6R1			
thru			
2A6R3		SAME AS 2A2R1.	5-62
2A6R4		SAME AS 2A2R4.	5-62
2A6R5			
thru			
2A6R8		SAME AS 2A1R2.	5-62
2A6R9		SAME AS 2A2R71.	5-62
2A6R10		SAME AS 2A2R71.	5-62
2A6R11		SAME AS 2A1R29.	5-62
2A6R12		SAME AS 2A1R6.	5-62
2A6R13		SAME AS 2A2R1.	5-62
2A6R14		SAME AS 2A2R71.	5-62
2A6R15		SAME AS 2A2R17.	5-62
2A6R16		SAME AS 2A1R19.	5-62

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A6R17		SAME AS 2A1R2.	5-62
2A6R18		SAME AS 2A2R71.	5-62
2A6R19		SAME AS 2A1R6.	5-62
2A6R20		SAME AS 2A1R2.	5-62
2A6R21		SAME AS 2A1R6.	5-62
2A6R22		SAME AS 2A1R2.	5-62
2A6R23		SAME AS 2A2R71.	5-62
2A6R24		SAME AS 2A1R6.	5-62
2A6R25		SAME AS 2A1R19.	5-62
2A6R26		SAME AS 2A2R65.	5-62
2A6R27		SAME AS 2A1R2.	5-62
2A6R28		SAME AS 2A1R34.	5-62
2A6R29		SAME AS 2A1R34.	5-62
2A6R30		SAME AS 2A1R11.	5-62
2A6R31		SAME AS 2A1R7.	5-62
2A6R32		SAME AS 2A2R71.	5-62
2A6R33		SAME AS 2A2R4.	5-62
2A6R34		SAME AS 2A2R1.	5-62
2A6R35		SAME AS 2A1R2.	5-62
2A6R36		NOT USED.	
2A6R37		SAME AS 2A4R1.	5-62
2A6R38		SAME AS 2A2R1.	5-62
2A6R39		SAME AS 2A2R71.	5-62
2A6R40		SAME AS 2A4R1.	5-62
2A6R41		NOT USED.	
2A6R42		NOT USED.	
2A6R43		SAME AS 2A2R4.	5-62
2A6R44		SAME AS 2A1R7.	5-62
2A6R45		SAME AS 2A1R19.	5-62
2A6R46		SAME AS 2A1R7.	5-62
2A6R47		SAME AS 2A1R29.	5-62
2A6R48		SAME AS 2A1R35.	5-62
2A6R49		SAME AS 2A2R71.	5-62
2A6R50		SAME AS 2A2R71.	5-62
2A6R51		SAME AS 2A1R6.	5-62
2A6R52		SAME AS 2A1R29.	5-62
2A6R53		SAME AS 2A1R29.	5-62
2A6R54		RESISTOR: MIL type RC07GF220J.	5-62
2A6T1		SAME AS 2A4T1.	5-62
2A6T2		SAME AS 2A4T1.	5-62
2A6T3		TRANSFORMER, AUDIO: Pri imp. 500 ct. ohms; sec imp. 600 ct. ohms; 175 vdcw, solder type terminals. 0.875 in. lg by 0.750 in. wd by 0.562 in. hg. 82679 P/N TF358.	5-62
2A7		CIRCUIT CARD ASSEMBLY: 84 resistors, 53 capacitors, 6 coils, 2 filters, 19 transistors, 7 semiconductors, plug-in item; 9,031 in. lg by 5.969 in. wd by 0.750 in. hg. 82679 P/N A4633.	5-64
2A7C1 thru 2A7C9		SAME AS 2A1C3.	5-64
2A7C10		NOT USED.	
2A7C11 thru 2A7C14		SAME AS 2A1C3.	5-64
2A7C15		SAME AS 2A4C3.	5-64
2A7C16		SAME AS 2A1C3.	5-64

TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A7C17		SAME AS 2A1C3.	5-64
2A7C18		SAME AS 2A1C3.	5-64
2A7C19		SAME AS 2A4C3.	5-64
2A7C20			
thru			
2A7C24		SAME AS 2A1C3.	5-64
2A7C25		SAME AS 2A4C3.	5-64
2A7C26			
thru			
2A7C29		SAME AS 2A1C3.	5-64
2A7C30		SAME AS 2A4C3.	5-64
2A7C31			
thru			
2A7C41		SAME AS 2A1C3.	5-64
2A7C42		SAME AS 2A6C8.	5-64
2A7C43			
thru			
2A7C49		SAME AS 2A1C3.	5-64
2A7C50		SAME AS 2A2C5.	5-64
2A7C51		SAME AS 2A5C61.	5-64
2A7C52		CAPACITOR: MIL type CS13BE107K.	5-64
2A7C53		SAME AS 2A1C3.	5-64
2A7C54		SAME AS 2A1C3.	5-64
2A7CR1		SAME AS 2A1CR13.	5-64
2A7CR2		SAME AS 2A1CR13.	5-64
2A7CR3		SAME AS 2A1CR13.	5-64
2A7CR4		SAME AS 2A2CR19.	5-64
2A7CR5		SAME AS 2A2CR19.	5-64
2A7CR6		SAME AS 2A2CR19.	5-64
2A7FL1		FILTER, BANDPASS: Outer, lower sideband; 243.710 kc carrier frequency, 3 v rms max. signal input. 2.750 in. lg by 1.875 in. wd by 0.670 in. hg. 82679 P/N FX264.	5-64
2A7FL2		EQUALIZER, BANDPASS: Outer, lower sideband equalizer; source and load impedance, 500 ±5% ohms. 2.750 in. lg by 1.875 in. wd by 0.670 in. hg. 82679 P/N EQ264.	5-64
2A7L1			
thru			
2A7L4		SAME AS 2A5L1.	5-64
2A7L5		SAME AS 2A4L5.	5-64
2A7L6		SAME AS 2A5L6.	5-64
2A7Q1		SAME AS 2A1Q4.	5-64
2A7Q2		SAME AS 2A1Q4.	5-64
2A7Q3		SAME AS 2A5Q5.	5-64
2A7Q4		SAME AS 2A5Q5.	5-64
2A7Q5		SAME AS 2A5Q7.	5-64
2A7Q6		SAME AS 2A5Q8.	5-64
2A7Q7		SAME AS 2A5Q5.	5-64
2A7Q8		SAME AS 2A5Q8.	5-64
2A7Q9		SAME AS 2A5Q8.	5-64
2A7Q10		SAME AS 2A1Q3.	5-64
2A7Q11		SAME AS 2A1Q3.	5-64
2A7Q12		SAME AS 2A1Q4.	5-64
2A7Q13			
thru			
2A7Q16		SAME AS 2A1Q3.	5-64
2A7Q17		SAME AS 2A5Q5.	5-64
2A7Q18		SAME AS 2A5Q5.	5-64
2A7Q19		SAME AS 2A5Q5.	5-64
2A7R1		SAME AS 2A2R71.	5-64

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A7R2		SAME AS 2A2R71.	5-64
2A7R3		SAME AS 2A5R4.	5-64
2A7R4		SAME AS 2A1R29.	5-64
2A7R5		SAME AS 2A1R9.	5-64
2A7R6		SAME AS 2A2R4.	5-64
2A7R7		SAME AS 2A5R4.	5-64
2A7R8		SAME AS 2A2R71.	5-64
2A7R9		SAME AS 2A2R71.	5-64
2A7R10		SAME AS 2A5R4.	5-64
2A7R11		SAME AS 2A1R29.	5-64
2A7R12		SAME AS 2A1R9.	5-64
2A7R13		SAME AS 2A2R4.	5-64
2A7R14		SAME AS 2A5R4.	5-64
2A7R15		SAME AS 2A1R7.	5-64
2A7R16		SAME AS 2A1R19.	5-64
2A7R17		SAME AS 2A3R32.	5-64
2A7R18		SAME AS 2A3R32.	5-64
2A7R19		SAME AS 2A1R7.	5-64
2A7R20		SAME AS 2A1R7.	5-64
2A7R21		SAME AS 2A4R1.	5-64
2A7R22		SAME AS 2A1R7.	5-64
2A7R23		SAME AS 2A1R19.	5-64
2A7R24		SAME AS 2A3R32.	5-64
2A7R25		SAME AS 2A3R32.	5-64
2A7R26		SAME AS 2A2R17.	5-64
2A7R27		SAME AS 2A1R7.	5-64
2A7R28		SAME AS 2A1R19.	5-64
2A7R29		SAME AS 2A2R71.	5-64
2A7R30		SAME AS 2A2R71.	5-64
2A7R31		NOT USED.	
2A7R32		SAME AS 2A2R17.	5-64
2A7R33		SAME AS 2A1R7.	5-64
2A7R34		SAME AS 2A1R24.	5-64
2A7R35		SAME AS 2A2R4.	5-64
2A7R36		SAME AS 2A2R77.	5-64
2A7R37		SAME AS 2A1R7.	5-64
2A7R38		SAME AS 2A4R1.	5-64
2A7R39		SAME AS 2A2R17.	5-64
2A7R40		SAME AS 2A1R19.	5-64
2A7R41		SAME AS 2A2R71.	5-64
2A7R42		SAME AS 2A2R71.	5-64
2A7R43		SAME AS 2A2R17.	5-64
2A7R44		SAME AS 2A1R7.	5-64
2A7R45		SAME AS 2A5R58.	5-64
2A7R46		SAME AS 2A3R15.	5-64
2A7R47		SAME AS 2A1R19.	5-64
2A7R48		SAME AS 2A3R32.	5-64
2A7R49		SAME AS 2A3R32.	5-64
2A7R50		SAME AS 2A2R17.	5-64
2A7R51		SAME AS 2A1R7.	5-64
2A7R52		SAME AS 2A1R19.	5-64
2A7R53		SAME AS 2A2R71.	5-64
2A7R54		SAME AS 2A2R71.	5-64
2A7R55		SAME AS 2A1R35.	5-64
2A7R56		SAME AS 2A1R9.	5-64
2A7R57		SAME AS 2A3R15.	5-64
2A7R58		SAME AS 2A1R19.	5-64
2A7R59		SAME AS 2A2R71.	5-64

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A7R60		SAME AS 2A2R71.	5-64
2A7R61		SAME AS 2A1R9.	5-64
2A7R62		SAME AS 2A2R4.	5-64
2A7R63		NOT USED.	
2A7R64		SAME AS 2A2R4.	5-64
2A7R65		SAME AS 2A1R9.	5-64
2A7R66		SAME AS 2A2R71.	5-64
2A7R67		SAME AS 2A2R71.	5-64
2A7R68		SAME AS 2A2R4.	5-64
2A7R69		SAME AS 2A1R6.	5-64
2A7R70		SAME AS 2A1R7.	5-64
2A7R71		SAME AS 2A1R24.	5-64
2A7R72		SAME AS 2A2R71.	5-64
2A7R73		SAME AS 2A2R71.	5-64
2A7R74		SAME AS 2A1R19.	5-64
2A7R75		SAME AS 2A1R29.	5-64
2A7R76		SAME AS 2A1R7.	5-64
2A7R77		SAME AS 2A1R71.	5-64
2A7R78		SAME AS 2A1R7.	5-64
2A7R79		SAME AS 2A2R1.	5-64
2A7R80		SAME AS 2A5R96.	5-64
2A7R81		SAME AS 2A5R93.	5-64
2A7R82		SAME AS 2A5R95.	5-64
2A7R83		SAME AS 2A5R96.	5-64
2A7R84		SAME AS 2A5R96.	5-64
2A7R85		SAME AS 2A5R93.	5-64
2A7R86		NOT USED.	
2A7R87		NOT USED.	
2A7R88		NOT USED.	
2A7R89		SAME AS 2A2R17.	5-64
2A7VR1		SAME AS 2A2VR3.	5-64
2A8		CIRCUIT CARD ASSEMBLY: SAME AS 2A6.	5-62
2A9		CIRCUIT CARD ASSEMBLY: Same as 2A7 except for FL1 and FL2. FILTER, BANDPASS: Inner, lower sideband; 250 kc carrier frequency, 3 v rms max signal input. 2.750 in. lg, 1.875 in. wd, 0.670 in. hg. 82679 P/N FX260.	5-64
2A9FL1			5-64
2A9FL2		EQUALIZER, BANDPASS: Inner, lower sideband equalizer; source and load impedance, 500 ±5% ohms. 2.750 in. lg, 1.875 in. wd, 0.670 in. hg. 82679 P/N EQ260.	5-64
2A10		CIRCUIT CARD ASSEMBLY: SAME AS 2A6.	5-62
2A11		CIRCUIT CARD ASSEMBLY: Same as 2A7 except for FL1 and FL2. FILTER, BANDPASS: Inner, upper sideband; 250 kc carrier frequency, 3 v rms max signal input. 2.750 in. lg, 1.875 in. wd, 0.670 in. hg. 82679 P/N FX263.	5-64
2A11FL1			5-64
2A11FL2		EQUALIZER, BANDPASS: Inner, upper sideband equalizer; source and load impedance, 500 ±5% ohms, 2.750 in. lg, 1.875 in. wd, 0.670 in. hg. 82679 P/N EQ263.	5-64

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

DEMULTIPLEXER, TD-915/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
2A12		CIRCUIT CARD ASSEMBLY: SAME AS 2A6.	5-62
2A13 2A13FL1		CIRCUIT CARD ASSEMBLY: Same as 2A7 except for FL1 and FL2. FILTER, BANDPASS: Outer, upper sideband; 256.290 kc carrier frequency, 3 v rms max signal input. 2.750 in. lg, 1.875 in. wd, 0.670 in. hg. 82679 P/N FX261.	5-64 5-64
2A13FL2		EQUALIZER, BANDPASS: Outer, upper sideband equalizer; source and load impedance, 500 ±5% ohms. 2.750 in. lg, 1.875 in. wd, 0.670 in. hg. 82679 P/N EQ261.	5-64

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3		GENERATOR, REFERENCE SIGNAL: 0-1511/URR, the TMC Model HFS-4 is a frequency synthesizer for a 2 to 32,000 mc synthesized sideband transmission.	5-66
3A1		FREQUENCY STANDARD: 1 mc; stability 1 part in 10 ⁸ per day, 5 parts 10 ⁸ per month, 10,000 ft. altitude no change in stability, warm up 60 min. for 1 part 10 ⁸ per day, hermetically sealed steel rectangular case 2.015 in. lg by 2.015 in. wd by 4.886 in. hg. 82679 P/N NF114.	5-68
3A2		CIRCUIT CARD ASSEMBLY: 27 resistors, 20 capacitors, 12 transistors, 13 semi-conductors plug in item; 10 in. lg by 4.375 in. wd by 0.750 in. hg. 82679 P/N A4687.	5-68
3A3		1 MHz DIST: 1 circuit card assembly, 2 rf shields 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5019.	5-68
3A4		1 MC SELECTOR: 1 circuit card assembly, 2 rf shields; 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5020.	5-68
3A5		100 KC SELECTOR: 1 circuit card assembly, 2 rf shields; 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5021.	5-68
3A6		MATRIX 1: 1 circuit card assembly, 2 rf shields; 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5022.	5-68
3A7		SAME AS 3A6.	5-68
3A8		MATRIX 3: 1 circuit card assembly, 2 rf shields; 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5023.	5-68
3A9		MIXER/AMPLIFIER 1: 1 circuit card assembly, 2 rf shields; 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5024.	5-68
3A10		SAME AS 3A9.	5-68
3A11		SAME AS 3A9.	5-68
3A12		MIXER/AMPLIFIER 4: 1 circuit card assembly, 2 rf shields, 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5025.	5-68
3A13		FINAL FIXER/AMPLIFIER: 1 circuit card assembly, 2 rf shields, 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5026.	5-68
3A14 thru 3A19		SWITCH, STEPPING: Manually controlled type, direct drive type, unidirectional drive, 1 section, 3 positions, 30° angle of throw, 2 poles. Non shorting contacts, bakelite insulation. 0.250 in. dia shaft 1.750 in. lg from mtg surface, 3/8-22 thd bushing mtd. 82679 P/N AX5105.	5-68
3B1		FAN, AXIAL: 115 vac, 50/60 cps, CMF-45 at 60 cps free delivery. Plastic blade, aluminum housing with black enamel finish. Housing size; 3.625 in. by 3.625 in. by 1.500 in. o/a. 82679 P/N BL131.	5-68
3DS1		LAMP, INCANDESCENT: Single contact, T-1-3/4 base, 4 vac or vdc, 0.68 amps. Dwg, BI110-10. 08806 P/N 382.	5-68
3DS2		SAME AS 3DS1.	5-68
3DS3		SAME AS 3DS1.	5-68
3F1		FUSE, CARTRIDGE TYPE: 1 amp, 125 v. 0.250 in. dia 1.250 in. lg. Dwg FU102-1. 71400 P/N MDL-1.	5-68
3F2		SAME AS 3F1.	5-68
3FL1		FILTER, RADIO INTERFERENCE: Current, lamp; voltage rating, 600 vdc, 250 vac at 60 cps. 1.000 in. dia, 2.688 in. lg. Dwg. FI105-1, 80183 P/N 1JX130.	5-68
3FL2		SAME AS 3FL1.	5-68
3J1		CONNECTOR: MIL type MS3102A14S1P.	5-67
3J2		CONNECTOR: MIL type MS3102A28-21S.	5-67
3J3			
thru 3J7		CONNECTOR: MIL type UG625B/U.	5-67
3J8		CONNECTOR: MIL type MS3102A28-21P.	5-67

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3M1		METER, SPECIAL SCALE: 50 microamp movement, 0 center. Case; molded phenolic, 1.750 in. by 1.750 in. by 1.500 in. deep. 82679 P/N MR206.	5-68
3MP1 thru 3MP6		KNOB, INSTRUMENT TYPE: Molded plastic body with brass insert, 2 setscrews and unfilled indicator depression. 0.750 in. dia, 0.438 in. hg. 82679 P/N MP123-3UB.	5-68
3P1		CONNECTOR: MIL type MS3106A14S1S.	5-68
3P2		CONNECTOR, PLUG, ELECTRICAL: 3 prong polarized with removable ground connection, 250 v. Dwg PL218, 11136 P/N UP-121-M.	5-68
3Q1 thru 3Q3		TRANSISTOR: MIL type 2N3442.	5-68
3R1		RESISTOR: MIL type RC42GF181J.	5-68
3R2		SAME AS 3R1.	5-68
3R3		SAME AS 3R1.	5-68
3S1		SWITCH: MIL type ST22N.	5-68
3S2		SWITCH: MIL type ST22K.	5-68
3T1		TRANSFORMER, POWER, STEP DOWN: Primary; 115/230 v. 50/60 cps, 1 phase; secondary; 15 v, 1.3 adc; 25 v, 1.0 adc; 35 v, 0.9 adc. 82679 P/N TF372.	5-68
3TB1		TERMINAL BOARD: Barrier type; 2 double screw terminals, 6-32 thread; phenolic body, 1.25 in. lg by 0.875 in. wd by 0.406 in. hg. 82679 P/N TM102-2.	5-68
3XA1 3XA2 thru 3XA19		NOT USED. CONNECTOR, RECEPTACLE, ELECTRICAL: 22 double sided female contacts rated at 5 amps and 1800 volts rms. Phenolic housing with floating bushing and eyelet terminals. Accepts printed circuits board thickness of 0.054 in. to 0.071 in. 82679 P/N JJ319-22-DFE.	5-68
3XDS1		LIGHT, INDICATOR: Red lens, 1.35 to 28 v, T-1-3/4 lamp base. 2 terminals, 0.437 in. dia by 1.500 in. lg. Dwg TS153-8, 72619 P/N 162-8430-1471-502.	5-68
3XDS2		SAME AS 3XDS1.	5-68
3XDS3		LIGHT, INDICATOR: Translucent white lens, 1.35 to 28 v. T-1-3/4 lamp base. 2 terminals, 0.437 in. dia by 1.500 in. lg. Dwg TS153-12, 72619 P/N 162-8430-1475-502.	5-68
3XF1		FUSEHOLDER, LAMP INDICATING: 90-250 v, 15 amps, neon lamp, clear knob; accommodates 0.250 in. dia by 1.250 in. lg fuse. Dwg FH104-3, 71400 P/N HKLX.	5-68
3XF2		SAME AS 3XF1.	5-68
3A2		CIRCUIT CARD ASSEMBLY: 27 resistors, 21 capacitors, 12 transistors, plug-in item; 10 in. lg by 4.375 in. wd by 0.750 in. hg. 82679 P/N A4687.	5-71
3A2C1		CAPACITOR, FIXED, ELECTROLYTIC: 700 uf, 75 vdcw, 0.813 in. dia, 2.250 in. lg. Dwg CE119-700-75, 80183 P/N 39D707G075HP4.	5-71
3A2C2		CAPACITOR, FIXED, ELECTROLYTIC: 200 uf, -10% +150% at 125 cps, 25°C, 15 vdcw, 0.437 in. dia, 1.625 in. lg. Dwg CE105-200-15, 14655 P/N NLW200-15.	5-71
3A2C3		CAPACITOR, FIXED, CERAMIC: 100,000 uuf, +80% -20%, 100 vdcw, 0.690 in. dia, 0.156 in. thk; 0.375 in. lead spacing, 82679 P/N CC100-28.	5-71

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A2C4		CAPACITOR, FIXED, ELECTROLYTIC: 10 uf, -10% +150% at 125 cps 25°C, 25 vdcw, 0.312 in. dia, 0.750 in. lg. Dwg CE105-10-25, 14655 P N NLW10-25.	5-71
3A2C5		SAME AS 3A2C3.	5-71
3A2C6		CAPACITOR, FIXED, SOLID ELECTROLYTIC: 47 uf ±10%, 35 vdcw; 0.341 dia. by 0.750 lg; 82679 P/N CE123-476-35S2; 80183 P N 150D476X9035S2.	5-71
3A2C7		CAPACITOR, FIXED, CERAMIC: 10,000 uuf, gm, 600 vdcw, 0.600 in. dia. 0.156 in. thk; 0.375 in. lead spacing. 82679 P/N CC100-16.	5-71
3A2C8		SAME AS 3A2C1.	5-71
3A2C9		SAME AS 3A2C2.	5-71
3A2C10		SAME AS 3A2C3.	5-71
3A2C11		SAME AS 3A2C4.	5-71
3A2C12		SAME AS 3A2C3.	5-71
3A2C13		SAME AS 3A2C6.	5-71
3A2C14		SAME AS 3A2C7.	5-71
3A2C15		CAPACITOR, FIXED, ELECTROLYTIC: 1,000 uf, 25 vdcw. 0.813 in. dia by 2.250 in. lg. Dwg CE119-1000-25, 14655 P/N 39D108G025GL4.	5-71
3A2C16		SAME AS 3A2C2.	5-71
3A2C17		SAME AS 3A2C3.	5-71
3A2C18		SAME AS 3A2C4.	5-71
3A2C19		SAME AS 3A2C3.	5-71
3A2C20		CAPACITOR: MIL type CS18BC227K.	5-71
3A2C21		SAME AS 3A2C7.	5-71
3A2CR1		RECTIFIER, SEMICONDUCTOR DEVICE: Single-phase full-wave bridge, 1.5 vdc output current, 200 vrms volts. Corrosion resistant plastic case, wire leads. 82679 P/N DD145.	5-71
3A2CR2		SAME AS 3A2CR1.	5-71
3A2CR3		RECTIFIER, SEMICONDUCTOR DEVICE: Input voltage 140 v, dc output, 124 v res load, 200 v cap. load. Corrosion resistant plastic case, wire leads, 0.900 in. lg by 0.670 in. hg x 0.260 in. wd. 82679 P N DD144-6.	5-71
3A2CR4		SEMICONDUCTOR DEVICE: MIL type 1N914.	5-71
3A2CR5		SAME AS 3A2CR4.	5-71
3A2CR6		SAME AS 3A2CR4.	5-71
3A2CR7		SAME AS 3A2CR4.	5-71
3A2Q1		TRANSISTOR: MIL type 2N4036.	5-71
3A2Q2		TRANSISTOR: MIL type 2N2631.	5-71
3A2Q3		TRANSISTOR: MIL type 2N706.	5-71
3A2Q4		TRANSISTOR: MIL type 2N1711.	5-71
3A2Q5		SAME AS 3A2Q1.	5-71
3A2Q6		SAME AS 3A2Q2.	5-71
3A2Q7		SAME AS 3A2Q3.	5-71
3A2Q8		SAME AS 3A2Q4.	5-71
3A2Q9		SAME AS 3A2Q1.	5-71
3A2Q10		SAME AS 3A2Q2.	5-71
3A2Q11		SAME AS 3A2Q3.	5-71
3A2Q12		SAME AS 3A2Q3.	5-71
3A2R1		RESISTOR: MIL type RC20GF472J.	5-71
3A2R2		RESISTOR: MIL type RC07GF331J.	5-71
3A2R3		RESISTOR: MIL type RW69G1R0J.	5-71
3A2R4		RESISTOR, VARIABLE, WIRE WOUND: 100 ohms, +30% tol, 0.250 in. dia by 0.250 in. hg. PC type mounting pins. 82679 P/N RV124-1-101.	5-71
3A2R5		RESISTOR: MIL type RC07GF152J.	5-71
3A2R6		RESISTOR: MIL type RC07GF153J.	5-71
3A2R7		RESISTOR, VARIABLE, WIRE WOUND: 5000 ohms ±30% tol, 0.250 in. dia, by 0.250 in. hg. 82679 P/N RV124-1-502.	5-71

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A2R8		RESISTOR: MIL type RC07GF682J.	5-71
3A2R9		RESISTOR: MIL type RC20GF332J.	5-71
3A2R10		RESISTOR: MIL type RC07GF221J.	5-71
3A2R11		RESISTOR: MIL type RC07GF151J.	5-71
3A2R12		RESISTOR: MIL type RW69G1R2J.	5-71
3A2R13		SAME AS 3A2R4.	5-71
3A2R14		RESISTOR: MIL type RC07GF471J.	5-71
3A2R15		RESISTOR: MIL type RC07GF332J.	5-71
3A2R16		RESISTOR, VARIABLE, WIRE WOUND: 1000 ohms, $\pm 3\%$ tol, 0.250 in. dia by 0.250 in. hg. 82679 P/N RV124-1-102.	5-71
3A2R17		SAME AS 3A2R15.	5-71
3A2R18		RESISTOR: MIL type RC07GF222J.	5-71
3A2R19		SAME AS 3A2R11.	5-71
3A2R20		SAME AS 3A2R11.	5-71
3A2R21		SAME AS 3A2R3.	5-71
3A2R22		SAME AS 3A2R4.	5-71
3A2R23		RESISTOR: MIL type RC07GF101J.	5-71
3A2R24		SAME AS 3A2R2.	5-71
3A2R25		SAME AS 3A2R4.	5-71
3A2R26		RESISTOR: MIL type RC07GF270J.	5-71
3A2R27		SAME AS 3A2R11.	5-71
3A2VR1		SEMICONDUCTOR DEVICE: MIL type 1N4370A.	5-71
3A2VR2		SEMICONDUCTOR DEVICE: MIL type 1N754A.	5-71
3A2VR3		SAME AS 3A2VR1.	5-71
3A2VR4		SAME AS 3A2VR2.	5-71
3A2VR5		SAME AS 3A2VR1.	5-71
3A2VR6		SAME AS 3A2VR1.	5-71
3A3		1 MC DIST: 1 circuit card assembly, 2 RF shields, 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5019.	5-73
3A3E1		SHIELD, CIRCUIT CARD ASSEMBLY: "L" shaped, aluminum; 9.875 in. by 4.406 in. by 0.719 in. o/a dim. 82679 P/N MS5360.	5-73
3A3E2		SHIELD, CIRCUIT CARD ASSEMBLY: "L" shaped, aluminum; 9.875 in. by 4.459 in. by 1.000 in. o/a dim. 82679 P/N MS5361.	5-73
3A3A1		CIRCUIT CARD ASSEMBLY: 109 resistors, 44 capacitors, 12 coils, 8 integrated circuits, 27 transistors, 1 semiconductor, plug-in item, p/o AX5019, 10.000 in. lg by 4.375 in. wd by 0.750 in. hg. 82679 P/N A4688.	5-73
3A3A1C1		SAME AS 3A2C7.	5-73
3A3A1C2		SAME AS 3A2C3.	5-73
3A3A1C3		SAME AS 3A2C7.	5-73
3A3A1C4		SAME AS 3A2C7.	5-73
3A3A1C5		SAME AS 3A2C7.	5-73
3A3A1C6		SAME AS 3A2C3.	5-73
3A3A1C7		SAME AS 3A2C7.	5-73
3A3A1C8		SAME AS 3A2C7.	5-73
3A3A1C9		SAME AS 3A2C3.	5-73
3A3A1C10		CAPACITOR, FIXED, MICA: 2700 uuf, $\pm 5\%$ tol, 300 vdcw, 0.640 in. lg, 0.591 in. wd, 0.198 in. thk, 82679 P/N CM112F272J3S.	5-73
3A3A1C11		CAPACITOR, FIXED, MICA: 100 uuf, $\pm 5\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111F101J5S.	5-73
3A3A1C12		SAME AS 3A2C7.	5-73
3A3A1C13		SAME AS 3A2C7.	5-73
3A3A1C14		CAPACITOR, FIXED, ELECTROLYTIC: 47 uf, 125 vdcw, 0.218 in. dia by 0.468 in. lg, two wire leads 1.500 in. lg. Dwg CE120-1, 26769 P/N RML47EF1.	5-73

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A3A1C15		SAME AS 3A2C7.	5-73
3A3A1C16		SAME AS 3A3A1C10.	5-73
3A3A1C17		SAME AS 3A3A1C11.	5-73
3A3A1C18		SAME AS 3A2C7.	5-73
3A3A1C19		CAPACITOR: MIL type CS13BE476K.	5-73
3A3A1C20		SAME AS 3A2C7.	5-73
3A3A1C21		SAME AS 3A2C3.	5-73
3A3A1C22		SAME AS 3A2C7.	5-73
3A3A1C23		SAME AS 3A2C7.	5-73
3A3A1C24		SAME AS 3A3C3.	5-73
3A3A1C25		SAME AS 3A2C3.	5-73
3A3A1C26		SAME AS 3A2C7.	5-73
3A3A1C27		SAME AS 3A2C3.	5-73
3A3A1C28		SAME AS 3A2C3.	5-73
3A3A1C29		CAPACITOR, FIXED, MICA: 3,900 uuf, $\pm 1\%$, 500 vdcw, 0.680 lg, 0.540 in. wd, 0.270 in. thk, 82679 P/N CM112F392F5S.	5-73
3A3A1C30		SAME AS 3A3A1C29.	5-73
3A3A1C31		SAME AS 3A2C3.	5-73
3A3A1C32		SAME AS 3A2C7.	5-73
3A3A1C33		NOT USED.	
3A3A1C34		SAME AS 3A2C3.	5-73
3A3A1C35		SAME AS 3A2C7.	5-73
3A3A1C36		NOT USED.	
3A3A1C37		SAME AS 3A2C3.	5-73
3A3A1C38		SAME AS 3A2C7.	5-73
3A3A1C39		NOT USED.	
3A3A1C40		SAME AS 3A2C3.	5-73
3A3A1C41		SAME AS 3A2C3.	5-73
3A3A1C42		CAPACITOR: MIL type CS13BE106K.	5-73
3A3A1C43		SAME AS 3A2C3.	5-73
3A3A1C44		SAME AS 3A2C3.	5-73
3A3A1C45		SAME AS 3A3A1C42.	5-73
3A3A1C46		SAME AS 3A2C3.	5-73
3A3A1C47		CAPACITOR: MIL type CS13BE225K.	5-73
3A3A1L1		COIL, RF, FIXED: 1000 uh, Q=65 at 0.79 mc. 0.157 in. dia, 0.395 in. lg. 82679 P/N CL433-102.	5-73
3A3A1L2		SAME AS 3A3A1L1.	5-73
3A3A1L3		SAME AS 3A3A1L1.	5-73
3A3A1L4		SAME AS 3A3A1L1.	5-73
3A3A1L5		COIL, RF, FIXED: 100 uh, Q=52 at 2.5 mc. 0.157 in. dia, 0.395 in. lg. 82679 P/N CL433-101.	5-73
3A3A1L6		COIL, RF, FIXED: 330 uh, Q=54 at 0.79 mc. 0.157 in. dia, 0.395 in. lg. 82679 P/N CL433-331.	5-73
3A3A1L7		SAME AS 3A3A1L1.	5-73
3A3A1L8		SAME AS 3A3A1L1.	5-73
3A3A1L9		SAME AS 3A3A1L1.	5-73
3A3A1L10		SAME AS 3A3A1L1.	5-73
3A3A1L11		COIL, RF, FIXED: 15 uh, Q=65 at 2.5 mc, 0.400 in. dia, 0.500 in. lg. Dwg CL430-3, 72259 P/N VIV-15.0.	5-73
3A3A1L12		NOT USED.	
3A3A1L13		SAME AS 3A3A1L5.	5-73
3A3A1Q1			
thru			
3A3A1Q7		TRANSISTOR: MIL type 2N706A.	5-73
3A3A1Q8		TRANSISTOR: MIL type 2N4352.	5-73
3A3A1Q9		SAME AS 3A3A1Q1.	5-73
3A3A1Q10		SAME AS 3A2Q4.	5-73
3A3A1Q11		SAME AS 3A3A1Q1.	5-73
3A3A1Q12		SAME AS 3A3A1Q1.	5-73

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A3A1Q13		SAME AS 3A3A1Q1.	5-73
3A3A1Q14		SAME AS 3A2Q4.	5-73
3A3A1Q15		SAME AS 3A3A1Q1.	5-73
3A3A1Q16		SAME AS 3A3A1Q1.	5-73
3A3A1Q17		SAME AS 3A2Q4.	5-73
3A3A1Q18		SAME AS 3A3A1Q1.	5-73
3A3A1Q19		SAME AS 3A3A1Q1.	5-73
3A3A1Q20		SAME AS 3A3A1Q1.	5-73
3A3A1Q21		SAME AS 3A2Q4.	5-73
3A3A1Q22		SAME AS 3A3A1Q1.	5-73
3A3A1Q23		SAME AS 3A3A1Q1.	5-73
3A3A1Q24		SAME AS 3A2Q4.	5-73
3A3A1Q25		SAME AS 3A3A1Q1.	5-73
3A3A1Q26		SAME AS 3A3A1Q1.	5-73
3A3A1Q27		TRANSISTOR: MIL type 3N128.	5-73
3A3A1R1		RESISTOR: MIL type RC07GF470J.	5-73
3A3A1R2		SAME AS 3A2R23.	5-73
3A3A1R3		RESISTOR: MIL type RC07GF103J.	5-73
3A3A1R4		RESISTOR: MIL type RC07GF472J.	5-73
3A3A1R5		SAME AS 3A2R18.	5-73
3A3A1R6		RESISTOR: MIL type RC07GF102J.	5-73
3A3A1R7		SAME AS 3A3A1R3.	5-73
3A3A1R8		SAME AS 3A2R18.	5-73
3A3A1R9		SAME AS 3A3A1R4.	5-73
3A3A1R10		SAME AS 3A3A1R6.	5-73
3A3A1R11		SAME AS 3A3A1R3.	5-73
3A3A1R12		SAME AS 3A3A1R6.	5-73
3A3A1R13		SAME AS 3A3A1R6.	5-73
3A3A1R14		SAME AS 3A2R23.	5-73
3A3A1R15		SAME AS 3A3A1R3.	5-73
3A3A1R16		SAME AS 3A3A1R4.	5-73
3A3A1R17		SAME AS 3A3A1R1.	5-73
3A3A1R18		SAME AS 3A2R18.	5-73
3A3A1R19		SAME AS 3A3A1R6.	5-73
3A3A1R20		SAME AS 3A3A1R3.	5-73
3A3A1R21		SAME AS 3A3A1R4.	5-73
3A3A1R22		SAME AS 3A2R18.	5-73
3A3A1R23		SAME AS 3A3A1R6.	5-73
3A3A1R24		SAME AS 3A3A1R3.	5-73
3A3A1R25		SAME AS 3A3A1R6.	5-73
3A3A1R26		SAME AS 3A3A1R6.	5-73
3A3A1R27		SAME AS 3A3A1R3.	5-73
3A3A1R28		SAME AS 3A3A1R3.	5-73
3A3A1R29		SAME AS 3A3A1R3.	5-73
3A3A1R30		RESISTOR, VARIABLE, WIRE WOUND: 10,000 ohms, $\pm 20\%$ tol. 0.250 in. dia by 0.250 in. hg. PC type mounting pins. 82679 P/N RV124-1-103.	5-73
3A3A1R31		SAME AS 3A3A1R4.	5-73
3A3A1R32		SAME AS 3A3A1R4.	5-73
3A3A1R33		SAME AS 3A3A1R3.	5-73
3A3A1R34		RESISTOR: MIL type RC07GF473J.	5-73
3A3A1R35		SAME AS 3A2R5.	5-73
3A3A1R36		RESISTOR: MIL type RC07GF104J.	5-73
3A3A1R37		RESISTOR, VARIABLE, WIRE WOUND: 50,000 ohms, $\pm 20\%$ tol. 0.250 in. dia by 0.250 in. hg. PC type mounting pins. 82679 P/N RV124-1-503.	5-73
3A3A1R38		SAME AS 3A3A1R3.	5-73
3A3A1R39		SAME AS 3A3A1R3.	5-73
3A3A1R40		SAME AS 3A3A1R6.	5-73

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A3A1R41		SAME AS 3A3A1R3.	5-73
3A3A1R42		RESISTOR: MIL type RC07GF105J.	5-73
3A3A1R43		SAME AS 3A3A1R42.	5-73
3A3A1R44		RESISTOR: MIL type RC07GF223J.	5-73
3A3A1R45		SAME AS 3A2R5.	5-73
3A3A1R46		SAME AS 3A3A1R34.	5-73
3A3A1R47		SAME AS 3A3A1R44.	5-73
3A3A1R48		RESISTOR, VARIABLE, WIRE WOUND: 100.000 ohms, $\pm 20\%$ tol. 0.250 in. dia by 0.250 in. hg. PC type mounting pins. 82679 P/N RV124-1-104.	5-73
3A3A1R49		RESISTOR: MIL type RC07GF333J.	5-73
3A3A1R50		SAME AS 3A3A1R4.	5-73
3A3A1R51		SAME AS 3A3A1R3.	5-73
3A3A1R52		SAME AS 3A2R5.	5-73
3A3A1R53		SAME AS 3A3A1R3.	5-73
3A3A1R54		SAME AS 3A3A1R44.	5-73
3A3A1R55		RESISTOR: MIL type RC07GF681J.	5-73
3A3A1R56		SAME AS 3A3A1R48.	5-73
3A3A1R57		SAME AS 3A3A1R36.	5-73
3A3A1R58		SAME AS 3A3A1R3.	5-73
3A3A1R59		SAME AS 3A3A1R4.	5-73
3A3A1R60		SAME AS 3A3A1R6.	5-73
3A3A1R61		SAME AS 3A2R7.	5-73
3A3A1R62		SAME AS 3A2R14.	5-73
3A3A1R63		SAME AS 3A3A1R3.	5-73
3A3A1R64		SAME AS 3A3A1R3.	5-73
3A3A1R65		SAME AS 3A3A1R3.	5-73
3A3A1R66		SAME AS 3A3A1R4.	5-73
3A3A1R67		SAME AS 3A3A1R4.	5-73
3A3A1R68		SAME AS 3A3A1R4.	5-73
3A3A1R69		SAME AS 3A3A1R4.	5-73
3A3A1R70		SAME AS 3A2R18.	5-73
3A3A1R71		SAME AS 3A3A1R3.	5-73
3A3A1R72		SAME AS 3A3A1R55.	5-73
3A3A1R73		SAME AS 3A3A1R3.	5-73
3A3A1R74		SAME AS 3A3A1R4.	5-73
3A3A1R75		SAME AS 3A3A1R6.	5-73
3A3A1R76		SAME AS 3A2R7.	5-73
3A3A1R77		SAME AS 3A2R14.	5-73
3A3A1R78		SAME AS 3A3A1R3.	5-73
3A3A1R79		SAME AS 3A3A1R3.	5-73
3A3A1R80		SAME AS 3A3A1R55.	5-73
3A3A1R81		SAME AS 3A3A1R3.	5-73
3A3A1R82		SAME AS 3A3A1R4.	5-73
3A3A1R83		SAME AS 3A3A1R4.	5-73
3A3A1R84		SAME AS 3A3A1R4.	5-73
3A3A1R85		SAME AS 3A3A1R44.	5-73
3A3A1R86		SAME AS 3A2R18.	5-73
3A3A1R87		SAME AS 3A3A1R3.	5-73
3A3A1R88		RESISTOR: MIL type RC07GF390J.	5-73
3A3A1R89		SAME AS 3A2R7.	5-73
3A3A1R90		SAME AS 3A3A1R4.	5-73
3A3A1R91		SAME AS 3A3A1R4.	5-73
3A3A1R92		SAME AS 3A3A1R55.	5-73
3A3A1R93		SAME AS 3A2R5.	5-73
3A3A1R94		SAME AS 3A2R15.	5-73
3A3A1R95		RESISTOR: MIL type RC20GF221J.	5-73
3A3A1R96		SAME AS 3A3A1R3.	5-73

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A3A1R97		SAME AS 3A3A1R3.	5-73
3A3A1R98		SAME AS 3A2R5.	5-73
3A3A1R99		SAME AS 3A3A1R3.	5-73
3A3A1R100		SAME AS 3A3A1R3.	5-73
3A3A1R101		SAME AS 3A3A1R55.	5-73
3A3A1R102		SAME AS 3A2R23.	5-73
3A3A1R103		SAME AS 3A2R23.	5-73
3A3A1R104		SAME AS 3A2R23.	5-73
3A3A1R105		SAME AS 3A3A1R4.	5-73
3A3A1R106		SAME AS 3A3A1R4.	5-73
3A3A1R107		SAME AS 3A3A1R3.	5-73
3A3A1R108		RESISTOR: MIL type RC07GF391J.	5-73
3A3A1R109		RESISTOR: MIL type RC20GF180J.	5-73
3A3A1VR1		SEMICONDUCTOR DEVICE: MIL type 1N751A.	5-73
3A3A1Z1		INTEGRATED CIRCUIT, POSITIVE NAND GATE: 14 pins, plastic case. 4.75 to 5.25 supply v. 0.770 in. lg by 0.250 in. wd by 0.220 in. hg. 82679 P/N NW176.	5-73
3A3A1Z2 thru			
3A3A1Z5		SAME AS 3A3A1Z1.	5-73
3A3A1Z6		INTEGRATED CIRCUIT, MASTER - SLAVE FLIP FLOP: 14 pins, plastic case. Supply voltage 4.75 v to 5.25 v. 0.750 in. lg by 0.187 in. wd by 0.125 in. hg. 82679 P/N NW159.	5-73
3A3A1Z7		INTEGRATED CIRCUIT, OPERATIONAL AMPLIFIER: 8 pins metal case. Supply voltage ± 18 v, 0.375 in. dia by 0.187 in. hg. 82679 P/N NW 156.	5-73
3A3A1Z8		SAME AS 3A3A1Z7.	5-73
3A4		1 MC SELECTOR: 1 circuit card assembly, 2 RF shields, 10.000 in. lg by 4.562 in. wd by 1 in. hg. 82679 P/N AX5020.	5-75
3A4E1		SAME AS 3A3E1.	5-75
3A4E2		SAME AS 3A3E2.	5-75
3A4A1		CIRCUIT CARD ASSEMBLY: 143 resistors, 124 capacitors, 28 coils, 6 integrated circuits, 12 crystals, 34 transistors, plug-in item, p/o AX5020; 10.000 in. lg by 4.375 in. wd by 0.750 in. hg, 82679 P/N A4689.	5-75
3A4A1C1		SAME AS 3A2C3.	5-75
3A4A1C2		SAME AS 3A2C3.	5-75
3A4A1C3		SAME AS 3A3C3.	5-75
3A4A1C4		SAME AS 3A2C3.	5-75
3A4A1C5		SAME AS 3A2C7.	5-75
3A4A1C6		SAME AS 3A2C7.	5-75
3A4A1C7		SAME AS 3A2C7.	5-75
3A4A1C8		SAME AS 3A2C3.	5-75
3A4A1C9		SAME AS 3A2C7.	5-75
3A4A1C10		SAME AS 3A2C3.	5-75
3A4A1C11		CAPACITOR, FIXED, MICA: 510 uuf, $\pm 2\%$, 500 vdcw, 0.490 in. lg, 0.420 in. wd, 0.250 in. thk, 82679 P/N CM111F511G5S.	5-75
3A4A1C12		CAPACITOR, FIXED, MICA: 330 uuf, $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111F331G5S.	5-75
3A4A1C13		CAPACITOR, FIXED, CERAMIC: 10,000 uuf, $\pm 20\%$, 100 vdcw, 0.344 in. dia, 0.125 in. thk, 0.250 in. lead spacing. 82679 P/N CC100-43.	5-75
3A4A1C14		SAME AS 3A4A1C13.	5-75
3A4A1C15		CAPACITOR, FIXED, MICA: 470 uuf, $\pm 2\%$, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111F471G5S.	5-75

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR. 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A4A1C16		CAPACITOR, FIXED, MICA: 820 uuf, $\pm 2\%$, 300 vdcw. 0.640 in. lg. 0.591 in. wd, 0.198 in. thk. 82679 P/N CM111F821G3S.	5-75
3A4A1C17		SAME AS 3A4A1C13.	5-75
3A4A1C18		SAME AS 3A4A1C11.	5-75
3A4A1C19		SAME AS 3A4A1C12.	5-75
3A4A1C20		SAME AS 3A4A1C13.	5-75
3A4A1C21		SAME AS 3A4A1C13.	5-75
3A4A1C22		SAME AS 3A4A1C15.	5-75
3A4A1C23		SAME AS 3A4A1C16.	5-75
3A4A1C24		SAME AS 3A4A1C13.	5-75
3A4A1C25		SAME AS 3A4A1C13.	5-75
3A4A1C26		SAME AS 3A4A1C12.	5-75
3A4A1C27		SAME AS 3A4A1C13.	5-75
3A4A1C28		SAME AS 3A4A1C13.	5-75
3A4A1C29		CAPACITOR, FIXED, MICA: 680 uuf, $\pm 2\%$, 300 vdcw. 0.640 in. lg. 0.591 in. wd, 0.198 in. thk. 82679 P/N CM111F681G3S.	5-75
3A4A1C30		SAME AS 3A4A1C12.	5-75
3A4A1C31		SAME AS 3A4A1C13.	5-75
3A4A1C32		SAME AS 3A4A1C11.	5-75
3A4A1C33		SAME AS 3A4A1C12.	5-75
3A4A1C34		SAME AS 3A4A1C13.	5-75
3A4A1C35		SAME AS 3A4A1C13.	5-75
3A4A1C36		SAME AS 3A4A1C29.	5-75
3A4A1C37		SAME AS 3A4A1C12.	5-75
3A4A1C38		SAME AS 3A4A1C13.	5-75
3A4A1C39		SAME AS 3A4A1C13.	5-75
3A4A1C40		SAME AS 3A4A1C13.	5-75
3A4A1C41		CAPACITOR, FIXED, MICA: 910 uuf, $\pm 2\%$ tol, 100 vdcw, 0.640 in. lg. 0.591 in. wd, 0.198 in. thk. 82679 P/N CM111F911G1S.	5-75
3A4A1C42		CAPACITOR, FIXED, MICA: 8200 uuf $\pm 1\%$ tol, 300 vdcw, 0.790 in. lg. 0.570 in. wd, 0.340 in. thk, 82679 P/N CM112F822F1S.	5-75
3A4A1C43		SAME AS 3A4A1C41.	5-75
3A4A1C44		SAME AS 3A4A1C13.	5-75
3A4A1C45		SAME AS 3A2C3.	5-75
3A4A1C46		SAME AS 3A4A1C13.	5-75
3A4A1C47		CAPACITOR, FIXED, CERAMIC: 1,000 uuf gmV 500 vdcw, 0.310 in. dia, 0.156 in. thk, 0.250 in. lead spacing. 82679 P/N CC100-29.	5-75
3A4A1C48		SAME AS 3A4A1C12.	5-75
3A4A1C49		SAME AS 3A4A1C13.	5-75
3A4A1C50		SAME AS 3A4A1C13.	5-75
3A4A1C51		SAME AS 3A4A1C29.	5-75
3A4A1C52		SAME AS 3A4A1C29.	5-75
3A4A1C53		SAME AS 3A4A1C13.	5-75
3A4A1C54		SAME AS 3A4A1C11.	5-75
3A4A1C55		SAME AS 3A4A1C12.	5-75
3A4A1C56		SAME AS 3A4A1C13.	5-75
3A4A1C57		SAME AS 3A4A1C13.	5-75
3A4A1C58		SAME AS 3A4A1C29.	5-75
3A4A1C59		SAME AS 3A4A1C29.	5-75
3A4A1C60		SAME AS 3A4A1C13.	5-75
3A4A1C61		SAME AS 3A4A1C13.	5-75
3A4A1C62		SAME AS 3A2C3.	5-75
3A4A1C63		SAME AS 3A4A1C12.	5-75
3A4A1C64		SAME AS 3A4A1C13.	5-75
3A4A1C65		SAME AS 3A4A1C13.	5-75
3A4A1C66		SAME AS 3A4A1C29.	5-75
3A4A1C67		SAME AS 3A4A1C12.	5-75
3A4A1C68		SAME AS 3A4A1C13.	5-75
3A4A1C69		SAME AS 3A4A1C11.	5-75

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A4A1C70		SAME AS 3A4A1C12.	5-75
3A4A1C71		SAME AS 3A4A1C13.	5-75
3A4A1C72		SAME AS 3A4A1C13.	5-75
3A4A1C73		SAME AS 3A4A1C29.	5-75
3A4A1C74		SAME AS 3A4A1C12.	5-75
3A4A1C75		SAME AS 3A4A1C13.	5-75
3A4A1C76		SAME AS 3A2C3.	5-75
3A4A1C77		SAME AS 3A4A1C13.	5-75
3A4A1C78		SAME AS 3A4A1C12.	5-75
3A4A1C79		SAME AS 3A4A1C13.	5-75
3A4A1C80		SAME AS 3A4A1C13.	5-75
3A4A1C81		SAME AS 3A4A1C16.	5-75
3A4A1C82		CAPACITOR, FIXED, MICA: 270 uuf, $\pm 5\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111F271G3S.	5-75
3A4A1C83		SAME AS 3A4A1C13.	5-75
3A4A1C84		SAME AS 3A4A1C11.	5-75
3A4A1C85		SAME AS 3A4A1C12.	5-75
3A4A1C86		SAME AS 3A4A1C13.	5-75
3A4A1C87		SAME AS 3A4A1C13.	5-75
3A4A1C88		SAME AS 3A4A1C16.	5-75
3A4A1C89		SAME AS 3A4A1C82.	5-75
3A4A1C90		SAME AS 3A4A1C13.	5-75
3A4A1C91		SAME AS 3A2C3.	5-75
3A4A1C92		SAME AS 3A4A1C13.	5-75
3A4A1C93		SAME AS 3A4A1C13.	5-75
3A4A1C94		SAME AS 3A4A1C12.	5-75
3A4A1C95		SAME AS 3A4A1C13.	5-75
3A4A1C96		SAME AS 3A4A1C13.	5-75
3A4A1C97		SAME AS 3A4A1C29.	5-75
3A4A1C98		SAME AS 3A4A1C12.	5-75
3A4A1C99		SAME AS 3A4A1C13.	5-75
3A4A1C100		SAME AS 3A4A1C11.	5-75
3A4A1C101		SAME AS 3A4A1C12.	5-75
3A4A1C102		SAME AS 3A4A1C13.	5-75
3A4A1C103		SAME AS 3A4A1C13.	5-75
3A4A1C104		SAME AS 3A4A1C29.	5-75
3A4A1C105		SAME AS 3A4A1C12.	5-75
3A4A1C106			
thru			
3A4A1C111		SAME AS 3A4A1C13.	5-75
3A4A1C112		CAPACITOR, FIXED, MICA: 22 uuf, $\pm 5\%$, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111E220J5S.	5-75
3A4A1C113		CAPACITOR, FIXED, MICA: 68 uuf, $\pm 1\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111E680F5S.	5-75
3A4A1C114		SAME AS 3A4A1C112.	5-75
3A4A1C115		SAME AS 3A4A1C13.	5-75
3A4A1C116		SAME AS 3A2C3.	5-75
3A4A1C117		SAME AS 3A2C7.	5-75
3A4A1C118		CAPACITOR, FIXED, MICA: 10 uuf, $\pm 5\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111C100J5S.	5-75
3A4A1C119		CAPACITOR, FIXED, MICA: 39 uuf, $\pm 5\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk. 82679 P/N CM111E390J5S.	5-75
3A4A1C120		SAME AS 3A4A1C118.	5-75
3A4A1C121		SAME AS 3A4A1C13.	5-75
3A4A1C122		SAME AS 3A2C3.	5-75
3A4A1C123		SAME AS 3A4A1C13.	5-75
3A4A1C124		SAME AS 3A4A1C13.	5-75
3A4A1L1		COIL, RF, FXED: 68 uf, Q=51 at 2.5 mc, 0.157 in. dia, 0.395 in. lg. 82679 P/N CL433-680.	5-57

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR. 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A4A1L2		SAME AS 3A4A1L1.	5-75
3A4A1L3		COIL, RF, FIXED: 0.68 uh, Q-100 at 25 mc, 0.400 in. dia, 0.500 in. lg. Dwg CL430-2, 72259 P/N VIV-0.68.	5-75
3A4A1L4		SAME AS 3A4A1L3.	5-75
3A4A1L5		SAME AS 3A4A1L3.	5-75
3A4A1L6		SAME AS 3A4A1L3.	5-75
3A4A1L7		NOT USED.	
3A4A1L8		SAME AS 3A4A1L1.	5-75
3A4A1L9		SAME AS 3A4A1L3.	5-75
3A4A1L10		SAME AS 3A4A1L3.	5-75
3A4A1L11		SAME AS 3A4A1L1.	5-75
3A4A1L12		SAME AS 3A4A1L1.	5-75
3A4A1L13		SAME AS 3A4A1L3.	5-75
3A4A1L14		SAME AS 3A4A1L3.	5-75
3A4A1L15		SAME AS 3A4A1L1.	5-75
3A4A1L16		COIL, RF, FIXED: 0.47 uh, 0-100 at 25 mc, 0.400 in. dia, 0.500 in. lg. Dwg CL430-1, 72259 P/N VIV-0.47.	5-75
3A4A1L17		SAME AS 3A4A1L16.	5-75
3A4A1L18		SAME AS 3A4A1L1.	5-75
3A4A1L19		SAME AS 3A4A1L16.	5-75
3A4A1L20		SAME AS 3A4A1L16.	5-75
3A4A1L21			
thru			
3A4A1L25		SAME AS 3A4A1L1.	5-75
3A4A1L26		COIL, RF, FIXED: 33 uh, Q-46 at 25 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-330.	5-75
3A4A1L27		SAME AS 3A4A1L26.	5-75
3A4A1L28		COIL, RF, FIXED: 15 uh, Q-44 at 2.5 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-150.	5-75
3A4A1L29		SAME AS 3A4A1L28.	5-75
3A4A1Q1		SAME AS 3A2Q3.	5-75
3A4A1Q2			
thru			
3A4A1Q12		TRANSISTOR: MIL type 2N918.	5-75
3A4A1Q13		SAME AS 3A2Q3.	5-75
3A4A1Q14		SAME AS 3A4A1Q2.	5-75
3A4A1Q15			
thru			
3A4A1Q20		SAME AS 3A4A1Q2.	5-75
3A4A1Q21			
thru			
3A4A1Q32		SAME AS 3A4A1Q2.	5-75
3A4A1Q33		SAME AS 3A2Q3.	5-75
3A4A1Q34		SAME AS 3A2Q3.	5-75
3A4A1R1		SAME AS 3A3A1R3.	5-75
3A4A1R2		SAME AS 3A3A1R6.	5-75
3A4A1R3		SAME AS 3A3A1R6.	5-75
3A4A1R4		SAME AS 3A2R15.	5-75
3A4A1R5		SAME AS 3A2R14.	5-75
3A4A1R6		SAME AS 3A3A1R36.	5-75
3A4A1R7		SAME AS 3A2R15.	5-75
3A4A1R8		SAME AS 3A3A1R6.	5-75
3A4A1R9		SAME AS 3A3A1R6.	5-75
3A4A1R10		SAME AS 3A3A1R6.	5-75
3A4A1R11		SAME AS 3A3A1R3.	5-75
3A4A1R12		SAME AS 3A3A1R4.	5-75
3A4A1R13		SAME AS 3A2R10.	5-75
3A4A1R14		SAME AS 3A2R10.	5-75
3A4A1R15		SAME AS 3A3A1R1.	5-75

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A4A1R16		SAME AS 3A3A1R6.	5-75
3A4A1R17		SAME AS 3A2R15.	5-75
3A4A1R18		SAME AS 3A3A1R3.	5-75
3A4A1R19		SAME AS 3A3A1R3.	5-75
3A4A1R20		SAME AS 3A3A1R4.	5-75
3A4A1R21		SAME AS 3A3A1R6.	5-75
3A4A1R22		SAME AS 3A2R14.	5-75
3A4A1R23		SAME AS 3A3A1R1.	5-75
3A4A1R24		SAME AS 3A3A1R6.	5-75
3A4A1R25		SAME AS 3A2R15.	5-75
3A4A1R26		SAME AS 3A3A1R3.	5-75
3A4A1R27		SAME AS 3A3A1R4.	5-75
3A4A1R28		SAME AS 3A3A1R4.	5-75
3A4A1R29		SAME AS 3A2R14.	5-75
3A4A1R30		SAME AS 3A2R14.	5-75
3A4A1R31		SAME AS 3A2R23.	5-75
3A4A1R32		SAME AS 3A3A1R1.	5-75
3A4A1R33		SAME AS 3A3A1R6.	5-75
3A4A1R34		SAME AS 3A3A1R3.	5-75
3A4A1R35		SAME AS 3A2R15.	5-75
3A4A1R36		SAME AS 3A3A1R3.	5-75
3A4A1R37		SAME AS 3A3A1R4.	5-75
3A4A1R38		SAME AS 3A2R14.	5-75
3A4A1R39		SAME AS 3A3A1R1.	5-75
3A4A1R40		SAME AS 3A3A1R6.	5-75
3A4A1R41		SAME AS 3A3A1R3.	5-75
3A4A1R42		SAME AS 3A2R15.	5-75
3A4A1R43		SAME AS 3A3A1R4.	5-75
3A4A1R44		SAME AS 3A3A1R4.	5-75
3A4A1R45		SAME AS 3A2R14.	5-75
3A4A1R46		SAME AS 3A2R14.	5-75
3A4A1R47		SAME AS 3A3A1R4.	5-75
3A4A1R48		SAME AS 3A2R14.	5-75
3A4A1R49		SAME AS 3A2R14.	5-75
3A4A1R50		SAME AS 3A3A1R6.	5-75
3A4A1R51		SAME AS 3A2R5.	5-75
3A4A1R52		SAME AS 3A3A1R6.	5-75
3A4A1R53		SAME AS 3A3A1R4.	5-75
3A4A1R54		SAME AS 3A3A1R4.	5-75
3A4A1R55		SAME AS 3A2R14.	5-75
3A4A1R56		SAME AS 3A3A1R1.	5-75
3A4A1R57		SAME AS 3A3A1R6.	5-75
3A4A1R58		SAME AS 3A3A1R3.	5-75
3A4A1R59		SAME AS 3A2R15.	5-75
3A4A1R60		SAME AS 3A3A1R3.	5-75
3A4A1R61		SAME AS 3A3A1R4.	5-75
3A4A1R62		SAME AS 3A3A1R6.	5-75
3A4A1R63		SAME AS 3A2R14.	5-75
3A4A1R64		SAME AS 3A3A1R1.	5-75
3A4A1R65		SAME AS 3A3A1R6.	5-75
3A4A1R66		SAME AS 3A3A1R3.	5-75
3A4A1R67		SAME AS 3A2R15.	5-75
3A4A1R68		SAME AS 3A3A1R4.	5-75
3A4A1R69		SAME AS 3A3A1R4.	5-75
3A4A1R70		SAME AS 3A2R14.	5-75
3A4A1R71		SAME AS 3A2R10.	5-75
3A4A1R72		SAME AS 3A3A1R4.	5-75
3A4A1R73		SAME AS 3A2R14.	5-75
3A4A1R74		SAME AS 3A2R14.	5-75

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A4A1R75		SAME AS 3A3A1R6.	5-75
3A4A1R76		SAME AS 3A3A1R3.	5-75
3A4A1R77		SAME AS 3A2R15.	5-75
3A4A1R78		SAME AS 3A3A1R3.	5-75
3A4A1R79		SAME AS 3A3A1R4.	5-75
3A4A1R80		SAME AS 3A3A1R6.	5-75
3A4A1R81		SAME AS 3A2R14.	5-75
3A4A1R82		SAME AS 3A3A1R1.	5-75
3A4A1R83		SAME AS 3A3A1R6.	5-75
3A4A1R84		SAME AS 3A3A1R3.	5-75
3A4A1R85		SAME AS 3A2R15.	5-75
3A4A1R86		SAME AS 3A3A1R4.	5-75
3A4A1R87		SAME AS 3A3A1R4.	5-75
3A4A1R88		SAME AS 3A2R14.	5-75
3A4A1R89		SAME AS 3A2R10.	5-75
3A4A1R90		SAME AS 3A3A1R4.	5-75
3A4A1R91		SAME AS 3A2R14.	5-75
3A4A1R92		SAME AS 3A2R14.	5-75
3A4A1R93		SAME AS 3A3A1R1.	5-75
3A4A1R94		SAME AS 3A3A1R6.	5-75
3A4A1R95		SAME AS 3A3A1R3.	5-75
3A4A1R96		SAME AS 3A2R15.	5-75
3A4A1R97		SAME AS 3A3A1R3.	5-75
3A4A1R98		SAME AS 3A3A1R4.	5-75
3A4A1R99		SAME AS 3A3A1R6.	5-75
3A4A1R100		SAME AS 3A2R14.	5-75
3A4A1R101		SAME AS 3A3A1R1.	5-75
3A4A1R102		SAME AS 3A3A1R6.	5-75
3A4A1R103		SAME AS 3A3A1R3.	5-75
3A4A1R104		SAME AS 3A2R15.	5-75
3A4A1R105		SAME AS 3A3A1R4.	5-75
3A4A1R106		SAME AS 3A3A1R4.	5-75
3A4A1R107		SAME AS 3A2R10.	5-75
3A4A1R108		SAME AS 3A2R14.	5-75
3A4A1R109		SAME AS 3A3A1R4.	5-75
3A4A1R110		SAME AS 3A2R14.	5-75
3A4A1R111		SAME AS 3A2R14.	5-75
3A4A1R112		SAME AS 3A3A1R1.	5-75
3A4A1R113		SAME AS 3A3A1R6.	5-75
3A4A1R114		SAME AS 3A3A1R3.	5-75
3A4A1R115		SAME AS 3A2R15.	5-75
3A4A1R116		SAME AS 3A3A1R3.	5-75
3A4A1R117		SAME AS 3A3A1R4.	5-75
3A4A1R118		SAME AS 3A3A1R6.	5-75
3A4A1R119		SAME AS 3A2R14.	5-75
3A4A1R120		SAME AS 3A3A1R1.	5-75
3A4A1R121		SAME AS 3A3A1R6.	5-75
3A4A1R122		SAME AS 3A3A1R3.	5-75
3A4A1R123		SAME AS 3A2R15.	5-75
3A4A1R124		SAME AS 3A3A1R4.	5-75
3A4A1R125		SAME AS 3A3A1R4.	5-75
3A4A1R126		SAME AS 3A2R14.	5-75
3A4A1R127		SAME AS 3A2R14.	5-75
3A4A1R128		SAME AS 3A2R23.	5-75
3A4A1R129		SAME AS 3A3A1R6.	5-75
3A4A1R130		SAME AS 3A2R18.	5-75
3A4A1R131		SAME AS 3A2R18.	5-75
3A4A1R132		SAME AS 3A2R14.	5-75
3A4A1R133		SAME AS 3A2R14.	5-75

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A4A1R134		SAME AS 3A2R23.	5-75
3A4A1R135		SAME AS 3A3A1R6.	5-75
3A4A1R136		SAME AS 3A2R18.	5-75
3A4A1R137		SAME AS 3A2R18.	5-75
3A4A1R138		SAME AS 3A2R14.	5-75
3A4A1R139		SAME AS 3A2R14.	5-75
3A4A1R140		SAME AS 3A2R23.	5-75
3A4A1R141		SAME AS 3A2R23.	5-75
3A4A1R142		SAME AS 3A3A1R6.	5-75
3A4A1R143		SAME AS 3A3A1R1.	5-75
3A4A1Y1		CRYSTAL UNIT, QUARTZ: 11.0 mc, 0.150 in. hg by 0.400 in. wd, 0.150 in. thk. 82679 P/N CR119-11R0.	5-75
3A4A1Y2		SAME AS 3A4A1Y1.	5-75
3A4A1Y3		CRYSTAL UNIT, QUARTZ: 14.0 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk. 82679 P/N CR119-14R0.	5-75
3A4A1Y4		SAME AS 3A4A1Y3.	5-75
3A4A1Y5		CRYSTAL UNIT, QUARTZ: 10.0 mc, 0.150 in. thk, 82679 P/N CR119-10R0.	5-75
3A5A1Y6		SAME AS 3A4A1Y5.	5-75
3A4A1Y7		CRYSTAL UNIT, QUARTZ: 12.0 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-12R0.	5-75
3A4A1Y8		SAME AS 3A4A1Y7.	5-75
3A4A1Y9		CRYSTAL UNIT, QUARTZ: 16.0 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R0.	5-75
3A4A1Y10		SAME AS 3A4A1Y9.	5-75
3A4A1Y11		CRYSTAL UNIT, QUARTZ: 17.0 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-17R0.	5-75
3A4A1Y12		SAME AS 3A4A1Y11.	5-75
3A4A1Z1		INTEGRATED CIRCUIT, LOGIC: 14 pins, plastic case; 82679 P/N NW180-3.	5-75
3A4A1Z2		INTEGRATED CIRCUIT, DECADE COUNTER: 14 pins, plastic case. Supply voltage 4.75 v to 5.25 v, 0.770 in. lg by 0.250 in. wd by 0.200 in. hg, 82679 P/N NW134.	5-75
3A4A1Z3		SAME AS 3A3A1Z1.	5-75
3A4A1Z4		SAME AS 3A3A1Z1.	5-75
3A4A1Z5		INTEGRATED CIRCUIT, J-K FLIP FLOP: 14 pins, plastic case. Supply voltage 4.75 v to 5.25 v, 0.750 in. lg by 0.188 in. wd by 0.125 in. hg, 82679 P/N NW157.	5-75
3A4A1Z6		SAME AS 3A3A1Z6.	5-75
3A5		100 KC SELECTOR: 1 circuit card assembly 2 RF shields; 10.000 in. lg by 4.562 in. wd by 1 in. hg, 82679 P/N AX5021.	5-77
3A5E1		SAME AS 3A3E1.	5-77
3A5E2		SAME AS 3A3E2.	5-77
3A5A1		CIRCUIT CARD ASSEMBLY: 167 resistors, 149 capacitors, 20 coils, 18 crystals, 1 integrated circuit, 39 transistors, 1 semiconductor, plug-in item; 10.031 in. lg by 5.969 in. wd by 1 in. hg, 82679 P/N A4669.	5-77
3A5A1C1		SAME AS 3A2C3.	5-77
3A5A1C2		SAME AS 3A2C7.	5-77
3A5A1C3		SAME AS 3A2C3.	5-77
3A5A1C4		SAME AS 3A2C7.	5-77
3A5A1C5		SAME AS 3A2C7.	5-77
3A5A1C6		SAME AS 3A2C7.	5-77
3A5A1C7		SAME AS 3A4A1C15.	5-77
3A5A1C8		SAME AS 3A2C3.	5-77
3A5A1C9		SAME AS 3A4A1C11.	5-77

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511, URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A5A1C10		SAME AS 3A4A1C12.	5-77
3A5A1C11		SAME AS 3A4A1C13.	5-77
3A5A1C12		SAME AS 3A4A1C13.	5-77
3A5A1C13		SAME AS 3A4A1C29.	5-77
3A5A1C14		SAME AS 3A4A1C12.	5-77
3A5A1C15		SAME AS 3A4A1C13.	5-77
3A5A1C16		SAME AS 3A4A1C11.	5-77
3A5A1C17		SAME AS 3A4A1C12.	5-77
3A5A1C18		SAME AS 3A4A1C13.	5-77
3A5A1C19		SAME AS 3A4A1C13.	5-77
3A5A1C20		SAME AS 3A4A1C29.	5-77
3A5A1C21		SAME AS 3A4A1C12.	5-77
3A5A1C22		SAME AS 3A4A1C13.	5-77
3A5A1C23		SAME AS 3A4A1C13.	5-77
3A5A1C24		SAME AS 3A4A1C12.	5-77
3A5A1C25		SAME AS 3A4A1C13.	5-77
3A5A1C26		SAME AS 3A4A1C13.	5-77
3A5A1C27		SAME AS 3A4A1C29.	5-77
3A5A1C28		SAME AS 3A4A1C12.	5-77
3A5A1C29		SAME AS 3A4A1C13.	5-77
3A5A1C30		SAME AS 3A4A1C11.	5-77
3A5A1C31		SAME AS 3A4A1C12.	5-77
3A5A1C32		SAME AS 3A4A1C13.	5-77
3A5A1C33		SAME AS 3A4A1C13.	5-77
3A5A1C34		SAME AS 3A4A1C29.	5-77
3A5A1C35		SAME AS 3A4A1C12.	5-77
3A5A1C36		SAME AS 3A4A1C13.	5-77
3A5A1C37		SAME AS 3A4A1C13.	5-77
3A5A1C38		SAME AS 3A4A1C12.	5-77
3A5A1C39		SAME AS 3A4A1C13.	5-77
3A5A1C40		SAME AS 3A4A1C13.	5-77
3A5A1C41		SAME AS 3A4A1C29.	5-77
3A5A1C42		SAME AS 3A4A1C12.	5-77
3A5A1C43		SAME AS 3A4A1C13.	5-77
3A5A1C44		SAME AS 3A4A1C11.	5-77
3A5A1C45		SAME AS 3A4A1C12.	5-77
3A5A1C46		SAME AS 3A4A1C13.	5-77
3A5A1C47		SAME AS 3A4A1C13.	5-77
3A5A1C48		SAME AS 3A4A1C29.	5-77
3A5A1C49		SAME AS 3A4A1C12.	5-77
3A5A1C50		SAME AS 3A4A1C13.	5-77
3A5A1C51		SAME AS 3A4A1C13.	5-77
3A5A1C52		SAME AS 3A4A1C12.	5-77
3A5A1C53		SAME AS 3A4A1C13.	5-77
3A5A1C54		SAME AS 3A4A1C13.	5-77
3A5A1C55		SAME AS 3A4A1C29.	5-77
3A5A1C56		SAME AS 3A4A1C12.	5-77
3A5A1C57		SAME AS 3A4A1C13.	5-77
3A5A1C58		SAME AS 3A4A1C11.	5-77
3A5A1C59		SAME AS 3A4A1C12.	5-77
3A5A1C60		SAME AS 3A4A1C13.	5-77
3A5A1C61		SAME AS 3A4A1C13.	5-77
3A5A1C62		SAME AS 3A4A1C29.	5-77
3A5A1C63		SAME AS 3A4A1C12.	5-77
3A5A1C64		SAME AS 3A4A1C13.	5-77
3A5A1C65		SAME AS 3A4A1C13.	5-77
3A5A1C66		SAME AS 3A4A1C12.	5-77
3A5A1C67		SAME AS 3A4A1C13.	5-77
3A5A1C68		SAME AS 3A4A1C13.	5-77

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG.	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A5A1C69		SAME AS 3A4A1C29.	5-77
3A5A1C70		SAME AS 3A4A1C12.	5-77
3A5A1C71		SAME AS 3A4A1C13.	5-77
3A5A1C72		SAME AS 3A4A1C11.	5-77
3A5A1C73		SAME AS 3A4A1C12.	5-77
3A5A1C74		SAME AS 3A4A1C13.	5-77
3A5A1C75		SAME AS 3A4A1C13.	5-77
3A5A1C76		SAME AS 3A4A1C29.	5-77
3A5A1C77		SAME AS 3A4A1C12.	5-77
3A5A1C78		SAME AS 3A4A1C13.	5-77
3A5A1C79		SAME AS 3A4A1C13.	5-77
3A5A1C80		SAME AS 3A4A1C12.	5-77
3A5A1C81		SAME AS 3A4A1C13.	5-77
3A5A1C82		SAME AS 3A4A1C13.	5-77
3A5A1C83		SAME AS 3A4A1C29.	5-77
3A5A1C84		SAME AS 3A4A1C12.	5-77
3A5A1C85		SAME AS 3A4A1C13.	5-77
3A5A1C86		SAME AS 3A4A1C11.	5-77
3A5A1C87		SAME AS 3A4A1C12.	5-77
3A5A1C88		SAME AS 3A4A1C13.	5-77
3A5A1C89		SAME AS 3A4A1C13.	5-77
3A5A1C90		SAME AS 3A4A1C29.	5-77
3A5A1C91		SAME AS 3A4A1C12.	5-77
3A5A1C92		SAME AS 3A4A1C13.	5-77
3A5A1C93		SAME AS 3A4A1C13.	5-77
3A5A1C94		SAME AS 3A4A1C12.	5-77
3A5A1C95		SAME AS 3A4A1C13.	5-77
3A5A1C96		SAME AS 3A4A1C13.	5-77
3A5A1C97		SAME AS 3A4A1C29.	5-77
3A5A1C98		SAME AS 3A4A1C12.	5-77
3A5A1C99		SAME AS 3A4A1C13.	5-77
3A5A1C100		SAME AS 3A4A1C11.	5-77
3A5A1C101		SAME AS 3A4A1C12.	5-77
3A5A1C102		SAME AS 3A4A1C13.	5-77
3A5A1C103		SAME AS 3A4A1C13.	5-77
3A5A1C104		SAME AS 3A4A1C29.	5-77
3A5A1C105		SAME AS 3A4A1C12.	5-77
3A5A1C106		SAME AS 3A4A1C13.	5-77
3A5A1C107		SAME AS 3A4A1C13.	5-77
3A5A1C108		SAME AS 3A4A1C12.	5-77
3A5A1C109		SAME AS 3A4A1C13.	5-77
3A5A1C110		SAME AS 3A4A1C13.	5-77
3A5A1C111		SAME AS 3A4A1C29.	5-77
3A5A1C112		SAME AS 3A4A1C12.	5-77
3A5A1C113		SAME AS 3A4A1C13.	5-77
3A5A1C114		SAME AS 3A4A1C11.	5-77
3A5A1C115		SAME AS 3A4A1C12.	5-77
3A5A1C116		SAME AS 3A4A1C13.	5-77
3A5A1C117		SAME AS 3A4A1C13.	5-77
3A5A1C118		SAME AS 3A4A1C29.	5-77
3A5A1C119		SAME AS 3A4A1C12.	5-77
3A5A1C120		SAME AS 3A4A1C13.	5-77
3A5A1C121		SAME AS 3A4A1C13.	5-77
3A5A1C122		SAME AS 3A4A1C12.	5-77
3A5A1C123		SAME AS 3A4A1C13.	5-77
3A5A1C124		SAME AS 3A4A1C13.	5-77
3A5A1C125		SAME AS 3A4A1C29.	5-77
3A5A1C126		SAME AS 3A4A1C12.	5-77
3A5A1C127		SAME AS 3A4A1C13.	5-77

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A5A1C128		SAME AS 3A4A1C11.	5-77
3A5A1C129		SAME AS 3A4A1C12.	5-77
3A5A1C130		SAME AS 3A4A1C13.	5-77
3A5A1C131		SAME AS 3A4A1C13.	5-77
3A5A1C132		SAME AS 3A4A1C29.	5-77
3A5A1C133		SAME AS 3A4A1C12.	5-77
3A5A1C134		SAME AS 3A4A1C13.	5-77
3A5A1C135			5-77
thru			5-77
3A5A1C145		SAME AS 3A4A1C13.	5-77
3A5A1C146		SAME AS 3A3A1C19.	5-77
3A5A1C147		SAME AS 3A3A1C42.	5-77
3A5A1C148		SAME AS 3A4A1C13.	5-77
3A5A1C149		SAME AS 3A3A1C19.	5-77
3A5A1L1		COIL, RF, FIXED: 4700 uh, Q=44 at 0.25 mc, 0.157 in. dia, 0.395 in. lg. 82679 P/N CL433-472.	5-77
3A5A1L2		SAME AS 3A4A1L26.	5-77
3A5A1L3			
thru			
3A5A1L20		SAME AS 3A4A1L16.	5-77
3A5A1Q1		SAME AS 3A2Q3.	5-77
3A5A1Q2		SAME AS 3A2Q3.	5-77
3A5A1Q3			
thru			
3A5A1Q39		SAME AS 3A4A1Q2.	5-77
3A5A1R1		SAME AS 3A3A1R3.	5-77
3A5A1R2		SAME AS 3A3A1R6.	5-77
3A5A1R3		SAME AS 3A3A1R6.	5-77
3A5A1R4		SAME AS 3A2R15.	5-77
3A5A1R5		SAME AS 3A2R10.	5-77
3A5A1R6		SAME AS 3A3A1R6.	5-77
3A5A1R7		SAME AS 3A3A1R6.	5-77
3A5A1R8		SAME AS 3A3A1R95.	5-77
3A5A1R9		SAME AS 3A2R18.	5-77
3A5A1R10		SAME AS 3A2R23.	5-77
3A5A1R11		SAME AS 3A2R8.	5-77
3A5A1R12		SAME AS 3A3A1R6.	5-77
3A5A1R13		SAME AS 3A3A1R6.	5-77
3A5A1R14		SAME AS 3A2R23.	5-77
3A5A1R15		SAME AS 3A3A1R1.	5-77
3A5A1R16		SAME AS 3A3A1R6.	5-77
3A5A1R17		SAME AS 3A3A1R3.	5-77
3A5A1R18		SAME AS 3A2R15.	5-77
3A5A1R19		SAME AS 3A3A1R3.	5-77
3A5A1R20		SAME AS 3A3A1R4.	5-77
3A5A1R21		SAME AS 3A2R14.	5-77
3A5A1R22		SAME AS 3A3A1R6.	5-77
3A5A1R23		SAME AS 3A3A1R1.	5-77
3A5A1R24		SAME AS 3A3A1R6.	5-77
3A5A1R25		SAME AS 3A3A1R3.	5-77
3A5A1R26		SAME AS 3A2R15.	5-77
3A5A1R27		SAME AS 3A3A1R4.	5-77
3A5A1R28		SAME AS 3A3A1R4.	5-77
3A5A1R29		SAME AS 3A2R14.	5-77
3A5A1R30		SAME AS 3A2R14.	5-77
3A5A1R31		SAME AS 3A3A1R1.	5-77
3A5A1R32		SAME AS 3A3A1R6.	5-77
3A5A1R33		SAME AS 3A3A1R3.	5-77
3A5A1R34		SAME AS 3A2R15.	5-77

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A5A1R35		SAME AS 3A3A1R3.	5-77
3A5A1R36		SAME AS 3A3A1R4.	5-77
3A5A1R37		SAME AS 3A3A1R6.	5-77
3A5A1R38		SAME AS 3A2R14.	5-77
3A5A1R39		SAME AS 3A3A1R1.	5-77
3A5A1R40		SAME AS 3A3A1R6.	5-77
3A5A1R41		SAME AS 3A3A1R3.	5-77
3A5A1R42		SAME AS 3A2R15.	5-77
3A5A1R43		SAME AS 3A3A1R4.	5-77
3A5A1R44		SAME AS 3A3A1R4.	5-77
3A5A1R45		SAME AS 3A2R14.	5-77
3A5A1R46		SAME AS 3A2R14.	5-77
3A5A1R47		SAME AS 3A3A1R1.	5-77
3A5A1R48		SAME AS 3A3A1R6.	5-77
3A5A1R49		SAME AS 3A3A1R3.	5-77
3A5A1R50		SAME AS 3A2R15.	5-77
3A5A1R51		SAME AS 3A3A1R3.	5-77
3A5A1R52		SAME AS 3A3A1R4.	5-77
3A5A1R53		SAME AS 3A2R14.	5-77
3A5A1R54		SAME AS 3A3A1R6.	5-77
3A5A1R55		SAME AS 3A3A1R1.	5-77
3A5A1R56		SAME AS 3A3A1R6.	5-77
3A5A1R57		SAME AS 3A3A1R3.	5-77
3A5A1R58		SAME AS 3A2R15.	5-77
3A5A1R59		SAME AS 3A3A1R4.	5-77
3A5A1R60		SAME AS 3A3A1R4.	5-77
3A5A1R61		SAME AS 3A2R14.	5-77
3A5A1R62		SAME AS 3A2R14.	5-77
3A5A1R63		SAME AS 3A3A1R1.	5-77
3A5A1R64		SAME AS 3A3A1R6.	5-77
3A5A1R65		SAME AS 3A3A1R3.	5-77
3A5A1R66		SAME AS 3A2R15.	5-77
3A5A1R67		SAME AS 3A3A1R3.	5-77
3A5A1R68		SAME AS 3A3A1R4.	5-77
3A5A1R69		SAME AS 3A3A1R6.	5-77
3A5A1R70		SAME AS 3A2R14.	5-77
3A5A1R71		SAME AS 3A3A1R1.	5-77
3A5A1R72		SAME AS 3A3A1R6.	5-77
3A5A1R73		SAME AS 3A3A1R3.	5-77
3A5A1R74		SAME AS 3A2R15.	5-77
3A5A1R75		SAME AS 3A3A1R4.	5-77
3A5A1R76		SAME AS 3A3A1R4.	5-77
3A5A1R77		SAME AS 3A2R14.	5-77
3A5A1R78		SAME AS 3A2R14.	5-77
3A5A1R79		SAME AS 3A3A1R1.	5-77
3A5A1R80		SAME AS 3A3A1R6.	5-77
3A5A1R81		SAME AS 3A3A1R3.	5-77
3A5A1R82		SAME AS 3A2R15.	5-77
3A5A1R83		SAME AS 3A3A1R3.	5-77
3A5A1R84		SAME AS 3A3A1R4.	5-77
3A5A1R85		SAME AS 3A3A1R6.	5-77
3A5A1R86		SAME AS 3A2R14.	5-77
3A5A1R87		SAME AS 3A3A1R1.	5-77
3A5A1R88		SAME AS 3A3A1R6.	5-77
3A5A1R89		SAME AS 3A3A1R3.	5-77
3A5A1R90		SAME AS 3A2R15.	5-77
3A5A1R91		SAME AS 3A3A1R4.	5-77
3A5A1R92		SAME AS 3A3A1R4.	5-77
3A5A1R93		SAME AS 3A2R14.	5-77

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A5A1R94		SAME AS 3A2R14.	5-77
3A5A1R95		SAME AS 3A3A1R1.	5-77
3A5A1R96		SAME AS 3A3A1R6.	5-77
3A5A1R97		SAME AS 3A3A1R3.	5-77
3A5A1R98		SAME AS 3A2R15.	5-77
3A5A1R99		SAME AS 3A3A1R3.	5-77
3A5A1R100		SAME AS 3A3A1R4.	5-77
3A5A1R101		SAME AS 3A2R14.	5-77
3A5A1R102		SAME AS 3A3A1R6.	5-77
3A5A1R103		SAME AS 3A3A1R1.	5-77
3A5A1R104		SAME AS 3A3A1R6.	5-77
3A5A1R105		SAME AS 3A3A1R3.	5-77
3A5A1R106		SAME AS 3A2R15.	5-77
3A5A1R107		SAME AS 3A3A1R4.	5-77
3A5A1R108		SAME AS 3A3A1R4.	5-77
3A5A1R109		SAME AS 3A2R14.	5-77
3A5A1R110		SAME AS 3A2R14.	5-77
3A5A1R111		SAME AS 3A3A1R1.	5-77
3A5A1R112		SAME AS 3A3A1R6.	5-77
3A5A1R113		SAME AS 3A3A1R3.	5-77
3A5A1R114		SAME AS 3A2R15.	5-77
3A5A1R115		SAME AS 3A3A1R3.	5-77
3A5A1R116		SAME AS 3A3A1R4.	5-77
3A5A1R117		SAME AS 3A2R14.	5-77
3A5A1R118		SAME AS 3A3A1R6.	5-77
3A5A1R119		SAME AS 3A3A1R1.	5-77
3A5A1R120		SAME AS 3A3A1R6.	5-77
3A5A1R121		SAME AS 3A3A1R3.	5-77
3A5A1R122		SAME AS 3A2R15.	5-77
3A5A1R123		SAME AS 3A3A1R4.	5-77
3A5A1R124		SAME AS 3A3A1R4.	5-77
3A5A1R125		SAME AS 3A2R14.	5-77
3A5A1R126		SAME AS 3A2R14.	5-77
3A5A1R127		SAME AS 3A3A1R1.	5-77
3A5A1R128		SAME AS 3A3A1R6.	5-77
3A5A1R129		SAME AS 3A3A1R3.	5-77
3A5A1R130		SAME AS 3A2R15.	5-77
3A5A1R131		SAME AS 3A3A1R3.	5-77
3A5A1R132		SAME AS 3A3A1R4.	5-77
3A5A1R133		SAME AS 3A2R14.	5-77
3A5A1R134		SAME AS 3A3A1R6.	5-77
3A5A1R135		SAME AS 3A3A1R1.	5-77
3A5A1R136		SAME AS 3A3A1R6.	5-77
3A5A1R137		SAME AS 3A3A1R3.	5-77
3A5A1R138		SAME AS 3A2R15.	5-77
3A5A1R139		SAME AS 3A3A1R4.	5-77
3A5A1R140		SAME AS 3A3A1R4.	5-77
3A5A1R141		SAME AS 3A2R14.	5-77
3A5A1R142		SAME AS 3A2R14.	5-77
3A5A1R143		SAME AS 3A3A1R1.	5-77
3A5A1R144		SAME AS 3A3A1R6.	5-77
3A5A1R145		SAME AS 3A3A1R3.	5-77
3A5A1R146		SAME AS 3A2R15.	5-77
3A5A1R147		SAME AS 3A3A1R3.	5-77
3A5A1R148		SAME AS 3A3A1R4.	5-77
3A5A1R149		SAME AS 3A2R14.	5-77
3A5A1R150		SAME AS 3A3A1R6.	5-77
3A5A1R151		SAME AS 3A3A1R1.	5-77
3A5A1R152		SAME AS 3A3A1R6.	5-77

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A5A1R153		SAME AS 3A3A1R3.	5-77
3A5A1R154		SAME AS 3A2R15.	5-77
3A5A1R155		SAME AS 3A3A1R4.	5-77
3A5A1R156		SAME AS 3A3A1R4.	5-77
3A5A1R157		SAME AS 3A2R14.	5-77
3A5A1R158		SAME AS 3A2R14.	5-77
3A5A1R159		SAME AS 3A2R23.	5-77
3A5A1R160			
thru			
3A5A1R167		SAME AS 3A2R23.	5-77
3A5A1VR1		SAME AS 3A3A1VR1.	5-77
3A5A1Y1		CRYSTAL UNIT, QUARTZ: 16.2 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R2.	5-77
3A5A1Y2		SAME AS 3A5A1Y1.	5-77
3A5A1Y3		CRYSTAL UNIT, QUARTZ: 16.6 mc, 0.510 in. lg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R6.	5-77
3A5A1Y4		SAME AS 3A5A1Y3.	5-77
3A5A1Y5		CRYSTAL UNIT, QUARTZ: 16.9 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R9.	5-77
3A5A1Y6		SAME AS 3A5A1Y5.	5-77
3A5A1Y7		CRYSTAL UNIT, QUARTZ: 16.4 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R4.	5-77
3A5A1Y8		SAME AS 3A5A1Y7.	5-77
3A5A1Y9		CRYSTAL UNIT, QUARTZ: 16.1 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R1.	5-77
3A5A1Y10		SAME AS 3A5A1Y9.	5-77
3A5A1Y11		CRYSTAL UNIT, QUARTZ: 16.5 mc, 0.510 in. lg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R5.	5-77
3A5A1Y12		SAME AS 3A5A1Y11.	5-77
3A5A1Y13		CRYSTAL UNIT, QUARTZ: 16.8 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R8.	5-77
3A5A1Y14		SAME AS 3A5A1Y13.	5-77
3A5A1Y15		CRYSTAL UNIT, QUARTZ: 16.3 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R3.	5-77
3A5A1Y16		SAME AS 3A5A1Y15.	5-77
3A5A1Y17		CRYSTAL UNIT, QUARTZ: 16.7 mc, 0.510 in. hg, 0.400 in. wd, 0.150 in. thk, 82679 P/N CR119-16R7.	5-77
3A5A1Y18		SAME AS 3A5A1Y17.	5-77
3A5A1Z1		SAME AS 3A4A1Z2.	5-77
3A6		MATRIX 1: 1 circuit card assembly, 2 RF shields, 10.000 in. lg by 4.562 in. wd by 1 in. hg, 82679 P/N AX5022.	5-79
3A6E1		SAME AS 3A3E1.	5-79
3A6E2		SAME AS 3A3E2.	5-79
3A6A1		CIRCUIT CARD ASSEMBLY: 104 resistors, 94 capacitors, 25 coils, 22 integrated circuits, 24 transistors, plug-in item, p/o AX5022; 10.00 in. lg by 4.375 in. wd by 0.750 in. hg, 82679 P/N A4691.	5-79
3A6A1C1		SAME AS 3A4A1C13.	5-79
3A6A1C2			
thru			
3A6A1C61		SAME AS 3A5A1C13.	5-79
3A6A1C62		SAME AS 3A4A1C119.	5-79
3A6A1C63		SAME AS 3A4A1C13.	5-79
3A6A1C64		SAME AS 3A3A1C11.	5-79
3A6A1C65		SAME AS 3A2C3.	5-79
3A6A1C66		SAME AS 3A4A1C13.	5-79
3A6A1C67		SAME AS 3A4A1C13.	5-79

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A6A1C68		SAME AS 3A4A1C13.	5-79
3A6A1C69		SAME AS 3A4A1C119.	5-79
3A6A1C70		SAME AS 3A4A1C13.	5-79
3A6A1C71		SAME AS 3A3A1C11.	5-79
3A6A1C72		SAME AS 3A2C3.	5-79
3A6A1C73		SAME AS 3A4A1C13.	5-79
3A6A1C74			
thru			
3A6A1C91		SAME AS 3A4A1C13.	5-79
3A6A1C92		SAME AS 3A2C7.	5-79
3A6A1C93		SAME AS 3A2C3.	5-79
3A6A1C94		SAME AS 3A3A1C42.	5-79
3A6A1L1		SAME AS 3A4A1L1.	5-79
3A6A1L2		COIL, RF, FIXED: 2.2 uh, Q=47 at 25 mc, 0.147 in. dia, 0.395 in. lg, 82679 P/N CL433-2R2.	5-79
3A6A1L3		SAME AS 3A4A1L1.	5-79
3A6A1L4		SAME AS 3A6A1L2.	5-79
3A6A1L5			
thru			
3A6A1L22		SAME AS 3A4A1L1.	5-79
3A6A1L23		COIL, RF, FIXED: 3.3 uh, Q=44 at 7.9 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-3R3.	5-79
3A6A1L24		COIL, RF, FIXED: 1.0 uh, Q=47 at 25 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-1R0.	5-79
3A6A1L25		SAME AS 3A6A1L24.	5-79
3A6A1Q1			
thru			
3A6A1Q24		SAME AS 3A4A1Q2.	5-79
3A6A1R1		SAME AS 3A3A1R1.	5-79
3A6A1R2		SAME AS 3A3A1R6.	5-79
3A6A1R3		SAME AS 3A2R15.	5-79
3A6A1R4		SAME AS 3A3A1R6.	5-79
3A6A1R5		SAME AS 3A2R23.	5-79
3A6A1R6		SAME AS 3A3A1R3.	5-79
3A6A1R7		SAME AS 3A3A1R6.	5-79
3A6A1R8		SAME AS 3A2R14.	5-79
3A6A1R9		SAME AS 3A3A1R1.	5-79
3A6A1R10		SAME AS 3A3A1R1.	5-79
3A6A1R11		SAME AS 3A3A1R6.	5-79
3A6A1R12		SAME AS 3A2R15.	5-79
3A6A1R13		SAME AS 3A3A1R6.	5-79
3A6A1R14		SAME AS 3A2R23.	5-79
3A6A1R15		SAME AS 3A3A1R3.	5-79
3A6A1R16		SAME AS 3A3A1R6.	5-79
3A6A1R17		SAME AS 3A2R14.	5-79
3A6A1R18		SAME AS 3A3A1R1.	5-79
3A6A1R19		SAME AS 3A3A1R1.	5-79
3A6A1R20		SAME AS 3A3A1R6.	5-79
3A6A1R21		SAME AS 3A2R15.	5-79
3A6A1R22		SAME AS 3A3A1R6.	5-79
3A6A1R23		SAME AS 3A2R23.	5-79
3A6A1R24		SAME AS 3A3A1R3.	5-79
3A6A1R25		SAME AS 3A3A1R6.	5-79
3A6A1R26		SAME AS 3A2R14.	5-79
3A6A1R27		SAME AS 3A3A1R1.	5-79
3A6A1R28		SAME AS 3A3A1R1.	5-79
3A6A1R29		SAME AS 3A3A1R6.	5-79
3A6A1R30		SAME AS 3A2R15.	5-79
3A6A1R31		SAME AS 3A3A1R6.	5-79

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A6A1R32		SAME AS 3A2R23.	5-79
3A6A1R33		SAME AS 3A3A1R3.	5-79
3A6A1R34		SAME AS 3A3A1R6.	5-79
3A6A1R35		SAME AS 3A2R14.	5-79
3A6A1R36		SAME AS 3A3A1R1.	5-79
3A6A1R37		SAME AS 3A3A1R1.	5-79
3A6A1R38		SAME AS 3A2R15.	5-79
3A6A1R39		SAME AS 3A3A1R6.	5-79
3A6A1R40		SAME AS 3A2A1R6.	5-79
3A6A1R41		SAME AS 3A2R23.	5-79
3A6A1R42		SAME AS 3A3A1R3.	5-79
3A6A1R43		SAME AS 3A3A1R6.	5-79
3A6A1R44		SAME AS 3A2R14.	5-79
3A6A1R45		SAME AS 3A3A1R1.	5-79
3A6A1R46		SAME AS 3A3A1R1.	5-79
3A6A1R47		SAME AS 3A2R15.	5-79
3A6A1R48		SAME AS 3A3A1R6.	5-79
3A6A1R49		SAME AS 3A3A1R6.	5-79
3A6A1R50		SAME AS 3A2R23.	5-79
3A6A1R51		SAME AS 3A3A1R3.	5-79
3A6A1R52		SAME AS 3A3A1R6.	5-79
3A6A1R53		SAME AS 3A2R14.	5-79
3A6A1R54		SAME AS 3A3A1R1.	5-79
3A6A1R55		SAME AS 3A3A1R1.	5-79
3A6A1R56		SAME AS 3A2R15.	5-79
3A6A1R57		SAME AS 3A3A1R6.	5-79
3A6A1R58		SAME AS 3A3A1R6.	5-79
3A6A1R59		SAME AS 3A2R23.	5-79
3A6A1R60		SAME AS 3A3A1R3.	5-79
3A6A1R61		SAME AS 3A3A1R6.	5-79
3A6A1R62		SAME AS 3A2R14.	5-79
3A6A1R63		SAME AS 3A3A1R1.	5-79
3A6A1R64		SAME AS 3A3A1R1.	5-79
3A6A1R65		SAME AS 3A2R15.	5-79
3A6A1R66		SAME AS 3A3A1R6.	5-79
3A6A1R67		SAME AS 3A3A1R6.	5-79
3A6A1R68		SAME AS 3A2R23.	5-79
3A6A1R69		SAME AS 3A3A1R3.	5-79
3A6A1R70		SAME AS 3A3A1R6.	5-79
3A6A1R71		SAME AS 3A2R14.	5-79
3A6A1R72		SAME AS 3A3A1R1.	5-79
3A6A1R73		SAME AS 3A3A1R1.	5-79
3A6A1R74		SAME AS 3A2R15.	5-79
3A6A1R75		SAME AS 3A3A1R6.	5-79
3A6A1R76		SAME AS 3A3A1R6.	5-79
3A6A1R77		SAME AS 3A2R23.	5-79
3A6A1R78		SAME AS 3A2A1R3.	5-79
3A6A1R79		SAME AS 3A3A1R6.	5-79
3A6A1R80		SAME AS 3A2R14.	5-79
3A6A1R81		SAME AS 3A3A1R1.	5-79
3A6A1R82		SAME AS 3A3A1R1.	5-79
3A6A1R83		SAME AS 3A2R15.	5-79
3A6A1R84		SAME AS 3A3A1R6.	5-79
3A6A1R85		SAME AS 3A3A1R6.	5-79
3A6A1R86		SAME AS 3A2R23.	5-79
3A6A1R87		SAME AS 3A3A1R3.	5-79
3A6A1R88		SAME AS 3A3A1R6.	5-79
3A6A1R89		SAME AS 3A2R14.	5-79
3A6A1R90		SAME AS 3A3A1R1.	5-79

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR. 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A6A1R91		SAME AS 3A3A1R6.	5-79
3A6A1R92		SAME AS 3A3A1R6.	5-79
3A6A1R93		SAME AS 3A2R6.	5-79
3A6A1R94		SAME AS 3A3R15.	5-79
3A6A1R95		SAME AS 3A2R23.	5-79
3A6A1R96		SAME AS 3A3A1R4.	5-79
3A6A1R97		SAME AS 3A3A1R4.	5-79
3A6A1R98		SAME AS 3A2R10.	5-79
3A6A1R99		SAME AS 3A2R6.	5-79
3A6A1R100		SAME AS 3A2R15.	5-79
3A6A1R101		SAME AS 3A2R23.	5-79
3A6A1R102		SAME AS 3A3A1R4.	5-79
3A6A1R103		SAME AS 3A3A1R4.	5-79
3A6A1R104		SAME AS 3A2R10.	5-79
3A6A1Z1		INTEGRATED CIRCUIT, LOGIC: 14 pins, plastic case, 82679 P/N NW180-1.	5-79
3A6A1Z2		INTEGRATED CIRCUIT, LOGIC: 14 pins, plastic case, 82679 P/N NW180-2.	5-79
3A6A1Z3		SAME AS 3A6A1Z1.	5-79
3A6A1Z4		SAME AS 3A6A1Z2.	5-79
3A6A1Z5 thru			
3A6A1Z14		SAME AS 3A3A1Z1.	5-79
3A6A1Z15		INTEGRATED CIRCUIT, QUAD 2 INPUT NAND GATE: 12 pins, plastic case. Propagation delay; 35 nsec. Power dissipation; 88 mw. 0.750 in. lg by 0.187 in. wd by 0.125 in. hg, 82679 P/N NW167.	5-79
3A6A1Z16		SAME AS 3A6A1Z15.	5-79
3A6A1Z17		SAME AS 3A6A1Z15.	5-79
3A6A1Z18 thru			
3A6A1Z20		SAME AS 3A5A1Z15.	5-79
3A6A1Z21		SAME AS 3A3A1Z1.	5-79
3A6A1Z22		SAME AS 3A3A1Z1.	5-79
3A7		SAME AS 3A6.	5-79
3A8		MATRIX 3: 1 circuit card assembly, 2 RF shields, 10.000 in. lg by 4.562 in. wd by 1 in. hg, 82679 P/N AX5023.	5-81
3A8E1		SAME AS 3A3E1.	5-81
3A8E2		SAME AS 3A3E2.	5-81
3A8A1		CIRCUIT CARD ASSEMBLY: 156 resistors, 101 capacitors, 8 coils, 13 integrated circuits, 10 crystals, 30 transistors, plug-in item; p/o AX5023; 10.000 in. lg by 4.375 in. wd by 0.750 in hg, 82679 P/N A4692.	5-81
3A8A1C1		SAME AS 3A5A1C13.	5-81
3A8A1C2		SAME AS 3A4A1C13.	5-81
3A8A1C3		SAME AS 3A4A1C12.	5-81
3A8A1C4		CAPACITOR, FIXED, MICA: 220 uuf, $\pm 5\%$, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111F221G5S.	5-81
3A8A1C5		SAME AS 3A4A1C13.	5-81
3A8A1C6 thru			
3A8A1C10		SAME AS 3A4A1C13.	5-81
3A8A1C11		SAME AS 3A4A1C12.	5-81
3A8A1C12		SAME AS 3A8A1C4.	5-81

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A8A1C13			
thru			
3A8A1C18		SAME AS 3A4A1C13.	5-81
3A8A1C19		SAME AS 3A4A1C12.	5-81
3A8A1C20		SAME AS 3A8A1C4.	5-81
3A8A1C21			
thru			
3A8A1C26		SAME AS 3A4A1C13.	5-81
3A8A1C27		SAME AS 3A4A1C12.	5-81
3A8A1C28		SAME AS 3A8A1C4.	5-81
3A8A1C29			
thru			
3A8A1C34		SAME AS 3A4A1C13.	5-81
3A8A1C35		SAME AS 3A4A1C12.	5-81
3A8A1C36		SAME AS 3A8A1C4.	5-81
3A8A1C37		SAME AS 3A4A1C13.	5-81
3A8A1C38			
thru			
3A8A1C42		SAME AS 3A4A1C13.	5-81
3A8A1C43		SAME AS 3A4A1C12.	5-81
3A8A1C44		SAME AS 3A8A1C4.	5-81
3A8A1C45		SAME AS 3A4A1C13.	5-81
3A8A1C46			
thru			
3A8A1C50		SAME AS 3A4A1C13.	5-81
3A8A1C51		SAME AS 3A4A1C12.	5-81
3A8A1C52		SAME AS 3A8A1C4.	5-81
3A8A1C53		SAME AS 3A4A1C13.	5-81
3A8A1C54			
thru			
3A8A1C58		SAME AS 3A4A1C13.	5-81
3A8A1C59		SAME AS 3A5A1C12.	5-81
3A8A1C60		SAME AS 3A8A1C4.	5-81
3A8A1C61			
thru			
3A8A1C66		SAME AS 3A4A1C13.	5-81
3A8A1C67		SAME AS 3A4A1C12.	5-81
3A8A1C68		SAME AS 3A8A1C4.	5-81
3A8A1C69			
thru			
3A8A1C74		SAME AS 3A4A1C13.	5-81
3A8A1C75		SAME AS 3A4A1C12.	5-81
3A8A1C76		SAME AS 3A8A1C4.	5-81
3A8A1C77			
thru			
3A8A1C80		SAME AS 3A4A1C13.	5-81
3A8A1C81		SAME AS 3A4A1C119.	5-81
3A8A1C82		SAME AS 3A4A1C13.	5-81
3A8A1C83		SAME AS 3A4A1C13.	5-81
3A8A1C84		SAME AS 3A2C3.	5-81
3A8A1C85		SAME AS 3A4A1C13.	5-81
3A8A1C86		SAME AS 3A3A1C11.	5-81
3A8A1C87		SAME AS 3A3A1C42.	5-81
3A8A1C88		SAME AS 3A2C3.	5-81
3A8A1C89		SAME AS 3A2C3.	5-81
3A8A1C90			
thru			
3A8A1C98		SAME AS 3A4A1C13.	5-81
3A8A1C99		SAME AS 3A3A1C42.	5-81

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR. 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A8A1C100		SAME AS 3A2C3.	5-81
3A8A1C101		SAME AS 3A2C3.	5-81
3A8A1L1		SAME AS 3A6A1L2.	5-81
3A8A1L2		SAME AS 3A4A1L1.	5-81
3A8A1L3			
thru			
3A8A1L7		SAME AS 3A4A1L1.	5-81
3A8A1L8		COIL, RF. FIXED: 10 uh, 0.157 in. dia by 0.395 in. lg, 82679 P/N CL433-100.	5-81
3A8A1Q1		SAME AS 3A4A1Q2.	5-81
3A8A1Q2			
thru			
3A8A1Q11		SAME AS 3A4A1Q2.	5-81
3A8A1Q12		NOT USED.	5-81
3A8A1Q13		SAME AS 3A4A1Q2.	5-81
3A8A1Q14			
thru			
3A8A1Q31		SAME AS 3A4A1Q2.	5-81
3A8A1R1		SAME AS 3A3A1R6.	5-81
3A8A1R2		SAME AS 3A3A1R6.	5-81
3A8A1R3		SAME AS 3A3A1R6.	5-81
3A8A1R4		SAME AS 3A3A1R1.	5-81
3A8A1R5		SAME AS 3A3A1R1.	5-81
3A8A1R6		SAME AS 3A2R2.	5-81
3A8A1R7		SAME AS 3A3A1R1.	5-81
3A8A1R8		SAME AS 3A2R14.	5-81
3A8A1R9		SAME AS 3A3A1R3.	5-81
3A8A1R10		SAME AS 3A3A1R6.	5-81
3A8A1R11		SAME AS 3A3A1R6.	5-81
3A8A1R12		SAME AS 3A2R23.	5-81
3A8A1R13		SAME AS 3A2R15.	5-81
3A8A1R14		SAME AS 3A3A1R6.	5-81
3A8A1R15		SAME AS 3A3A1R1.	5-81
3A8A1R16		SAME AS 3A3A1R6.	5-81
3A8A1R17		SAME AS 3A3A1R6.	5-81
3A8A1R18		SAME AS 3A3A1R6.	5-81
3A8A1R19		SAME AS 3A3A1R1.	5-81
3A8A1R20		SAME AS 3A3A1R1.	5-81
3A8A1R21		SAME AS 3A2R2.	5-81
3A8A1R22		SAME AS 3A3A1R1.	5-81
3A8A1R23		SAME AS 3A2R14.	5-81
3A8A1R24		SAME AS 3A3A1R3.	5-81
3A8A1R25		SAME AS 3A3A1R6.	5-81
3A8A1R26		SAME AS 3A3A1R6.	5-81
3A8A1R27		SAME AS 3A2R23.	5-81
3A8A1R28		SAME AS 3A2R15.	5-81
3A8A1R29		SAME AS 3A3A1R6.	5-81
3A8A1R30		SAME AS 3A3A1R1.	5-81
3A8A1R31		SAME AS 3A3A1R6.	5-81
3A8A1R32		SAME AS 3A3A1R6.	5-81
3A8A1R33		SAME AS 3A3A1R6.	5-81
3A8A1R34		SAME AS 3A3A1R1.	5-81
3A8A1R35		SAME AS 3A3A1R1.	5-81
3A8A1R36		SAME AS 3A2R2.	5-81
3A8A1R37		SAME AS 3A3A1R1.	5-81
3A8A1R38		SAME AS 3A2R14.	5-81
3A8A1R39		SAME AS 3A3A1R3.	5-81
3A8A1R40		SAME AS 3A3A1R6.	5-81
3A8A1R41		SAME AS 3A3A1R6.	5-81

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A8A1R42		SAME AS 3A2R23.	5-81
3A8A1R43		SAME AS 3A2R15.	5-81
3A8A1R44		SAME AS 3A3A1R6.	5-81
3A8A1R45		SAME AS 3A3A1R1.	5-81
3A8A1R46		SAME AS 3A3A1R6.	5-81
3A8A1R47		SAME AS 3A3A1R6.	5-81
3A8A1R48		SAME AS 3A3A1R6.	5-81
3A8A1R49		SAME AS 3A3A1R1.	5-81
3A8A1R50		SAME AS 3A3A1R1.	5-81
3A8A1R51		SAME AS 3A2R2.	5-81
3A8A1R52		SAME AS 3A3A1R1.	5-81
3A8A1R53		SAME AS 3A2R14.	5-81
3A8A1R54		SAME AS 3A3A1R3.	5-81
3A8A1R55		SAME AS 3A3A1R6.	5-81
3A8A1R56		SAME AS 3A3A1R6.	5-81
3A8A1R57		SAME AS 3A2R23.	5-81
3A8A1R58		SAME AS 3A2R15.	5-81
3A8A1R59		SAME AS 3A3A1R6.	5-81
3A8A1R60		SAME AS 3A3A1R1.	5-81
3A8A1R61		SAME AS 3A3A1R6.	5-81
3A8A1R62		SAME AS 3A3A1R6.	5-81
3A8A1R63		SAME AS 3A3A1R6.	5-81
3A8A1R64		SAME AS 3A3A1R1.	5-81
3A8A1R65		SAME AS 3A3A1R1.	5-81
3A8A1R66		SAME AS 3A2R2.	5-81
3A8A1R67		SAME AS 3A3A1R1.	5-81
3A8A1R68		SAME AS 3A2R14.	5-81
3A8A1R69		SAME AS 3A3A1R3.	5-81
3A8A1R70		SAME AS 3A3A1R6.	5-81
3A8A1R71		SAME AS 3A3A1R6.	5-81
3A8A1R72		SAME AS 3A2R23.	5-81
3A8A1R73		SAME AS 3A2R15.	5-81
3A8A1R74		SAME AS 3A3A1R6.	5-81
3A8A1R75		SAME AS 3A3A1R1.	5-81
3A8A1R76		SAME AS 3A3A1R6.	5-81
3A8A1R77		SAME AS 3A3A1R6.	5-81
3A8A1R78		SAME AS 3A3A1R6.	5-81
3A8A1R79		SAME AS 3A3A1R1.	5-81
3A8A1R80		SAME AS 3A3A1R1.	5-81
3A8A1R81		SAME AS 3A2R2.	5-81
3A8A1R82		SAME AS 3A3A1R1.	5-81
3A8A1R83		SAME AS 3A2R14.	5-81
3A8A1R84		SAME AS 3A3A1R3.	5-81
3A8A1R85		SAME AS 3A3A1R6.	5-81
3A8A1R86		SAME AS 3A3A1R6.	5-81
3A8A1R87		SAME AS 3A2R23.	5-81
3A8A1R88		SAME AS 3A2R15.	5-81
3A8A1R89		SAME AS 3A3A1R6.	5-81
3A8A1R90		SAME AS 3A3A1R1.	5-81
3A8A1R91		SAME AS 3A3A1R6.	5-81
3A8A1R92		SAME AS 3A3A1R6.	5-81
3A8A1R93		SAME AS 3A3A1R6.	5-81
3A8A1R94		SAME AS 3A3A1R1.	5-81
3A8A1R95		SAME AS 3A3A1R1.	5-81
3A8A1R96		SAME AS 3A2R2.	5-81
3A8A1R97		SAME AS 3A3A1R1.	5-81
3A8A1R98		SAME AS 3A2R14.	5-81
3A8A1R99		SAME AS 3A3A1R3.	5-81
3A8A1R100		SAME AS 3A3A1R6.	5-81
3A8A1R101		SAME AS 3A3A1R6.	5-81

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A8A1R102		SAME AS 3A2R23.	5-81
3A8A1R103		SAME AS 3A2R15.	5-81
3A8A1R104		SAME AS 3A3A1R6.	5-81
3A8A1R105		SAME AS 3A3A1R1.	5-81
3A8A1R106		SAME AS 3A3A1R6.	5-81
3A8A1R107		SAME AS 3A3A1R6.	5-81
3A8A1R108		SAME AS 3A3A1R6.	5-81
3A8A1R109		SAME AS 3A3A1R1.	5-81
3A8A1R110		SAME AS 3A3A1R1.	5-81
3A8A1R111		SAME AS 3A2R2.	5-81
3A8A1R112		SAME AS 3A3A1R1.	5-81
3A8A1R113		SAME AS 3A2R14.	5-81
3A8A1R114		SAME AS 3A3A1R3.	5-81
3A8A1R115		SAME AS 3A3A1R6.	5-81
3A8A1R116		SAME AS 3A3A1R6.	5-81
3A8A1R117		SAME AS 3A2R23.	5-81
3A8A1R118		SAME AS 3A2R15.	5-81
3A8A1R119		SAME AS 3A3A1R6.	5-81
3A8A1R120		SAME AS 3A3A1R1.	5-81
3A8A1R121		SAME AS 3A3A1R6.	5-81
3A8A1R122		SAME AS 3A3A1R6.	5-81
3A8A1R123		SAME AS 3A3A1R6.	5-81
3A8A1R124		SAME AS 3A3A1R1.	5-81
3A8A1R125		SAME AS 3A3A1R1.	5-81
3A8A1R126		SAME AS 3A2R2.	5-81
3A8A1R127		SAME AS 3A3A1R1.	5-81
3A8A1R128		SAME AS 3A2R14.	5-81
3A8A1R129		SAME AS 3A3A1R3.	5-81
3A8A1R130		SAME AS 3A3A1R6.	5-81
3A8A1R131		SAME AS 3A3A1R6.	5-81
3A8A1R132		SAME AS 3A2R23.	5-81
3A8A1R133		SAME AS 3A2R15.	5-81
3A8A1R134		SAME AS 3A3A1R6.	5-81
3A8A1R135		SAME AS 3A3A1R1.	5-81
3A8A1R136		SAME AS 3A3A1R6.	5-81
3A8A1R137		SAME AS 3A3A1R6.	5-81
3A8A1R138		SAME AS 3A3A1R6.	5-81
3A8A1R139		SAME AS 3A3A1R1.	5-81
3A8A1R140		SAME AS 3A3A1R1.	5-81
3A8A1R141		SAME AS 3A2R2.	5-81
3A8A1R142		SAME AS 3A3A1R1.	5-81
3A8A1R143		SAME AS 3A2R14.	5-81
3A8A1R144		SAME AS 3A3A1R14.	5-81
3A8A1R145		SAME AS 3A3A1R6.	5-81
3A8A1R146		SAME AS 3A3A1R6.	5-81
3A8A1R147		SAME AS 3A2R23.	5-81
3A8A1R148		SAME AS 3A2R15.	5-81
3A8A1R149		SAME AS 3A3A1R6.	5-81
3A8A1R150		SAME AS 3A3A1R1.	5-81
3A8A1R151		SAME AS 3A3A1R6.	5-81
3A8A1R152		SAME AS 3A2R18.	5-81
3A8A1R153		SAME AS 3A2R14.	5-81
3A8A1R154		SAME AS 3A3A1R4.	5-81
3A8A1R155		SAME AS 3A3A1R4.	5-81
3A8A1R156		SAME AS 3A2R10.	5-81
3A8A1Y1		SAME AS 3A5A1Y17.	5-81
3A8A1Y2		SAME AS 3A5A1Y13.	5-81
3A8A1Y3		SAME AS 3A5A1Y1.	5-81
3A8A1Y4		SAME AS 3A5A1Y5.	5-81

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A8A1Y5		SAME AS 3A4A1Y11.	5-81
3A8A1Y6		SAME AS 3A5A1Y3.	5-81
3A8A1Y7		SAME AS 3A5A1Y9.	5-81
3A8A1Y8		SAME AS 3A5A1Y11.	5-81
3A8A1Y9		SAME AS 3A5A1Y7.	5-81
3A8A1Y10		SAME AS 3A5A1Y15.	5-81
3A8A1Z1		SAME AS 3A3A1Z1.	5-81
3A8A1Z2			
thru			
3A8A1Z10		SAME AS 3A3A1Z1.	5-81
3A9A1Z11		SAME AS 3A6A1Z1.	5-81
3A8A1Z12		SAME AS 3A6A1Z2.	5-81
3A8A1Z13		SAME AS 3A3A1Z1.	5-81
3A9		MIXER/AMPLIFIER 1: 1 circuit card assembly, 2 RF shields; 10.000 in. lg by 4.562 in. wd by 1 in. hg, 82679 P/N AX5024.	5-83
3A9E1		SAME AS 3A3E1.	5-83
3A9E2		SAME AS 3A3E2.	5-83
3A9A1		CIRCUIT CARD ASSEMBLY: 76 resistors, 79 capacitors, 16 coils, 4 transformers, 2 integrated circuits, 20 transistors, plug-in item; p/o AX5024; 10.000 in. lg by 4.375 in. wd by 0.750 in. hg, 82679 P/N A4695.	5-83
3A9A1C1		SAME AS 3A2C3.	5-83
3A9A1C2		SAME AS 3A4A1C13.	5-83
3A9A1C3		CAPACITOR, FIXED, MICA: 4700 uuf, $\pm 5\%$ tol, 500 vdcw, 0.665 in. lg, 0.625 in. wd by 0.240 in. thk, 82679 P/N CM112F472J5S.	5-83
3A9A1C4		SAME AS 3A9A1C3.	5-83
3A9A1C5		SAME AS 3A2C3.	5-83
3A9A1C6		SAME AS 3A4A1C13.	5-83
3A9A1C7		SAME AS 3A4A1C13.	5-83
3A9A1C8		SAME AS 3A4A1C13.	5-83
3A9A1C9		SAME AS 3A4A1C47.	5-83
3A9A1C10		SAME AS 3A4A1C13.	5-83
3A9A1C11		CAPACITOR, VAR: 15-60 pf, 100 vdcw, 0.375 in. dia by 0.093 in. hg, 82679 P/N CV112-9.	5-83
3A9A1C12		CAPACITOR, FIXED, MICA: 200 uuf, $\pm 2\%$ tol, 300 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111F201G3S.	5-83
3A9A1C13		SAME AS 3A9A1C3.	5-83
3A9A1C14		SAME AS 3A9A1C12.	5-83
3A9A1C15		SAME AS 3A4A1C13.	5-83
3A9A1C16		SAME AS 3A4A1C13.	5-83
3A9A1C17		SAME AS 3A4A1C13.	5-83
3A9A1C18		SAME AS 3A8A1C4.	5-83
3A9A1C19		CAPACITOR, FIXED, MICA: 180 uuf, $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111F181G5S.	5-83
3A9A1C20		SAME AS 3A4A1C13.	5-83
3A9A1C21		SAME AS 3A4A1C13.	5-83
3A9A1C22		SAME AS 3A4A1C82.	5-83
3A9A1C23		CAPACITOR, FIXED, MICA: 10,000 pf, $\pm 1\%$ tol, 100 vdcw, 0.790 in. lg, 0.570 in. wd, 0.340 in. thk, 82679 P/N CM112F103F1S.	5-83
3A9A1C24		SAME AS 3A4A1C13.	5-83
3A9A1C25		SAME AS 3A4A1C82.	5-83
3A9A1C26		SAME AS 3A3A1C11.	5-83
3A9A1C27		SAME AS 3A4A1C13.	5-83
3A9A1C28		SAME AS 3A4A1C13.	5-83
3A9A1C29		SAME AS 3A4A1C15.	5-83
3A9A1C30		SAME AS 3A4A1C15.	5-83

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A9A1C31		SAME AS 3A4A1C13.	5-83
3A9A1C32		SAME AS 3A3A1C11.	5-83
3A9A1C33		SAME AS 3A4A1C13.	5-83
3A9A1C34		SAME AS 3A4A1C13.	5-83
3A9A1C35		SAME AS 3A4A1C13.	5-83
3A9A1C36		SAME AS 3A9A1C11.	5-83
3A9A1C37		CAPACITOR, FIXED, MICA: 160 pf $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P N CM111F161G5S.	5-83
3A9A1C38		SAME AS 3A9A1C3.	5-83
3A9A1C39		SAME AS 3A9A1C37.	5-83
3A9A1C40		SAME AS 3A4A1C13.	5-83
3A9A1C41		SAME AS 3A4A1C13.	5-83
3A9A1C42		SAME AS 3A4A1C13.	5-83
3A9A1C43		SAME AS 3A8A1C4.	5-83
3A9A1C44		SAME AS 3A9A1C19.	5-83
3A9A1C45		SAME AS 3A2C3.	5-83
3A9A1C46		SAME AS 3A4A1C13.	5-83
3A9A1C47		SAME AS 3A9A1C19.	5-83
3A9A1C48		SAME AS 3A9A1C23.	5-83
3A9A1C49		SAME AS 3A4A1C19.	5-83
3A9A1C50		SAME AS 3A4A1C13.	5-83
3A9A1C51		SAME AS 3A4A1C13.	5-83
3A9A1C52		SAME AS 3A4A1C13.	5-83
3A9A1C53		SAME AS 3A3A1C11.	5-83
3A9A1C54		SAME AS 3A4A1C13.	5-83
3A9A1C55		SAME AS 3A2C3.	5-83
3A9A1C56		SAME AS 3A4A1C41.	5-83
3A9A1C57		SAME AS 3A4A1C41.	5-83
3A9A1C58		SAME AS 3A4A1C42.	5-83
3A9A1C59		SAME AS 3A4A1C13.	5-83
3A9A1C60		SAME AS 3A2C3.	5-83
3A9A1C61		SAME AS 3A4A1C13.	5-83
3A9A1C62		SAME AS 3A4A1C47.	5-83
3A9A1C63		SAME AS 3A4A1C13.	5-83
3A9A1C64		SAME AS 3A2C3.	5-83
3A9A1C65		SAME AS 3A4A1C13.	5-83
3A9A1C66		CAPACITOR, FIXED, MICA: 47 uuf $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111E470G5S.	5-83
3A9A1C67		CAPACITOR, FIXED, MICA: 150 pf $\pm 1\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111F151F5S.	5-83
3A9A1C68		SAME AS 3A9A1C66.	5-83
3A9A1C69		SAME AS 3A4A1C13.	5-83
3A9A1C70		SAME AS 3A2C3.	5-83
3A9A1C71		SAME AS 3A4A1C13.	5-83
3A9A1C72		SAME AS 3A4A1C47.	5-83
3A9A1C73		SAME AS 3A2C3.	5-83
3A9A1C74		SAME AS 3A2C3.	5-83
3A9A1C75		SAME AS 3A2C3.	5-83
3A9A1C76		SAME AS 3A4A1C13.	5-83
3A9A1C77		SAME AS 3A4A1C13.	5-83
3A9A1C78		SAME AS 3A9A1C11.	5-83
3A9A1C79		SAME AS 3A9A1C11.	5-83
3A9A1L1		COIL, RF, FIXED: 6.80 uh, Q=80 at 7.9 mc, 0.400 in. dia, 0.500 in. lg. Dwg CL430-5, 72259 P/N VIV-6.80.	5-83
3A9A1L2		SAME AS 3A4A1L3.	5-83
3A9A1L3			
thru			
3A9A1L8		SAME AS 3A4A1L3.	5-83
3A9A1L9		SAME AS 3A4A1L28.	5-83

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A9A1L10		SAME AS 3A4A1L28.	5-83
3A9A1L11		SAME AS 3A3A1L5.	5-83
3A9A1L12		COIL, RF, FIXED: 120 uh, Q=57 at 0.79 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-121.	5-83
3A9A1L13		SAME AS 3A9A1L12.	5-83
3A9A1L14		SAME AS 3A3A1L6.	5-83
3A9A1L15		SAME AS 3A3A1L6.	5-83
3A9A1L16		SAME AS 3A3A1L5.	5-83
3A9A1Q1		SAME AS 3A4A1Q2.	5-83
3A9A1Q2		SAME AS 3A4A1Q2.	5-83
3A9A1Q3		SAME AS 3A3A1Q27.	5-83
3A9A1Q4		SAME AS 3A3A1Q27.	5-83
3A9A1Q5		SAME AS 3A4A1Q2.	5-83
3A9A1Q6			
thru			
3A9A1Q9		SAME AS 3A4A1Q2.	5-83
3A9A1Q10		SAME AS 3A3A1Q27.	5-83
3A9A1Q11		SAME AS 3A3A1Q27.	5-83
3A9A1Q12		SAME AS 3A4A1Q2.	5-83
3A9A1Q13			
thru			
3A9A1Q19		SAME AS 3A4A1Q2.	5-83
3A9A1Q20		SAME AS 3A2Q3.	5-83
3A9A1R1		RESISTOR, VARIABLE: 500 ohms, ±30% tol, 200 vdcw, 0.250 in. dia by 0.250 in. hg, 82679 P/N RV124-1-501.	5-83
3A9A1R2		SAME AS 3A3A1R6.	5-83
3A9A1R3		SAME AS 3A3A1R3.	5-83
3A9A1R4		SAME AS 3A3A1R6.	5-83
3A9A1R5		SAME AS 3A2R2.	5-83
3A9A1R6		SAME AS 3A3A1R6.	5-83
3A9A1R7		SAME AS 3A3A1R3.	5-83
3A9A1R8		SAME AS 3A3A1R4.	5-83
3A9A1R9		SAME AS 3A2R14.	5-83
3A9A1R10		SAME AS 3A3A1R3.	5-83
3A9A1R11		SAME AS 3A3A1R37.	5-83
3A9A1R12		SAME AS 3A3A1R4.	5-83
3A9A1R13		SAME AS 3A9A1R1.	5-83
3A9A1R14		SAME AS 3A3A1R6.	5-83
3A9A1R15		SAME AS 3A3A1R3.	5-83
3A9A1R16		SAME AS 3A3A1R6.	5-83
3A9A1R17		SAME AS 3A2R2.	5-83
3A9A1R18		SAME AS 3A3A1R6.	5-83
3A9A1R19		SAME AS 3A3A1R3.	5-83
3A9A1R20		SAME AS 3A3A1R4.	5-83
3A9A1R21		SAME AS 3A2R14.	5-83
3A9A1R22		SAME AS 3A3A1R6.	5-83
3A9A1R23		SAME AS 3A3A1R3.	5-83
3A9A1R24		SAME AS 3A3A1R4.	5-83
3A9A1R25		SAME AS 3A2R14.	5-83
3A9A1R26		SAME AS 3A9A1R1.	5-83
3A9A1R27		SAME AS 3A3A1R1.	5-83
3A9A1R28		SAME AS 3A2R15.	5-83
3A9A1R29		SAME AS 3A3A1R3.	5-83
3A9A1R30		SAME AS 3A3A1R6.	5-83
3A9A1R31		SAME AS 3A3A1R6.	5-83
3A9A1R32		SAME AS 3A3A1R3.	5-83
3A9A1R33		SAME AS 3A3A1R4.	5-83
3A9A1R34		SAME AS 3A2R14.	5-83
3A9A1R35		SAME AS 3A3A1R3.	5-83

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A9A1R36		SAME AS 3A3A1R4.	5-83
3A9A1R37		SAME AS 3A3A1R37.	5-83
3A9A1R38		NOT USED.	
3A9A1R39		SAME AS 3A2R15.	5-83
3A9A1R40		SAME AS 3A3A1R6.	5-83
3A9A1R41		SAME AS 3A3A1R6.	5-83
3A9A1R42		SAME AS 3A2R23.	5-83
3A9A1R43		SAME AS 3A3A1R3.	5-83
3A9A1R44		SAME AS 3A3A1R6.	5-83
3A9A1R45		SAME AS 3A3A1R6.	5-83
3A9A1R46		SAME AS 3A3A1R6.	5-83
3A9A1R47		SAME AS 3A2R16.	5-83
3A9A1R48		SAME AS 3A3A1R6.	5-83
3A9A1R49		SAME AS 3A3A1R3.	5-83
3A9A1R50		SAME AS 3A3A1R4.	5-83
3A9A1R51		SAME AS 3A2R14.	5-83
3A9A1R52		SAME AS 3A3A1R6.	5-83
3A9A1R53		SAME AS 3A3A1R3.	5-83
3A9A1R54		SAME AS 3A3A1R4.	5-83
3A9A1R55		SAME AS 3A2R14.	5-83
3A9A1R56		SAME AS 3A9A1R1.	5-83
3A9A1R57		SAME AS 3A3A1R1.	5-83
3A9A1R58		SAME AS 3A3A1R6.	5-83
3A9A1R59		SAME AS 3A3A1R3.	5-83
3A9A1R60		SAME AS 3A2R15.	5-83
3A9A1R61		SAME AS 3A3A1R6.	5-83
3A9A1R62		SAME AS 3A3A1R3.	5-83
3A9A1R63		SAME AS 3A3A1R4.	5-83
3A9A1R64		SAME AS 3A2R14.	5-83
3A9A1R65		SAME AS 3A2R15.	5-83
3A9A1R66		SAME AS 3A3A1R6.	5-83
3A9A1R67		SAME AS 3A2R23.	5-83
3A9A1R68		SAME AS 3A3A1R6.	5-83
3A9A1R69		SAME AS 3A3A1R6.	5-83
3A9A1R70		SAME AS 3A3A1R3.	5-83
3A9A1R71		SAME AS 3A2R14.	5-83
3A9A1R72		SAME AS 3A3A1R6.	5-83
3A9A1R73		SAME AS 3A2R5.	5-83
3A9A1R74		SAME AS 3A2R14.	5-83
3A9A1R75		SAME AS 3A3A1R4.	5-83
3A9A1R76		SAME AS 3A3A1R4.	5-83
3A9A1R77		SAME AS 3A2R14.	5-83
3A9A1T1		TRANSFORMER, RF, ADJUSTABLE: Q=50 at 12 mc. Metal case. 0.614 in. dia by 0.532 in. hg, 82679 P/N TT301.	5-83
3A9A1T2		SAME AS 3A9A1T1.	5-83
3A9A1T3		TRANSFORMER, PULSE: 0.5 uh, ±20% tol, wire leads, 0.650 in. lg, 0.425 in. wd, 0.350 in. hg, Dwg TF374-3; 90095 P/N 11KGB.	5-83
3A9A1T4		SAME AS 3A9A1T3.	5-83
3A9A1Z1		INTEGRATED CIRCUIT, DECADE DIVIDER: 8 pins plastic case. Digital input dc to 30 mc, analog input 5 cps to 30 mc. 0.438 in. lg by 0.187 in. wd by 0.125 in. hg, 82679 P/N NW171.	5-83
3A9A1Z2		SAME AS 3A4A1Z2.	5-83
3A10		SAME AS 3A9.	5-83
3A11		SAME AS 3A9.	5-83

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A12		MIXER/AMPLIFIER 4: 1 circuit card assembly, 2 RF shields, 10.000 in. lg by 4.562 in. wd, by 1 in. hg, 82679 P/N AX5025.	5-85
3A12E1		SAME AS 3A3E1.	5-85
3A12E2		SAME AS 3A3E2.	5-85
3A12A1		CIRCUIT CARD ASSEMBLY: 75 resistors, 81 capacitors, 16 coils, 4 transformers, 2 integrated circuits, 20 transistors, plug-in item; p/o AX5025; 10.000 in. lg by 4.375 in. wd by 0.750 in. hg, 82679 P/N A4694.	5-85
3A12A1C1		SAME AS 3A2C3.	5-85
3A12A1C2		SAME AS 3A4A1C13.	5-85
3A12A1C3		SAME AS 3A9A1C3.	5-85
3A12A1C4		SAME AS 3A9A1C3.	5-85
3A12A1C5		SAME AS 3A2C3.	5-85
3A12A1C6		SAME AS 3A4A1C13.	5-85
3A12A1C7		SAME AS 3A4A1C13.	5-85
3A12A1C8		SAME AS 3A4A1C13.	5-85
3A12A1C9		SAME AS 3A4A1C47.	5-85
3A12A1C10		SAME AS 3A4A1C13.	5-85
3A12A1C11		SAME AS 3A9A1C11.	5-85
3A12A1C12		SAME AS 3A9A1C12.	5-85
3A12A1C13		SAME AS 3A9A1C3.	5-85
3A12A1C14		SAME AS 3A9A1C12.	5-85
3A12A1C15		SAME AS 3A4A1C13.	5-85
3A12A1C16		SAME AS 3A4A1C13.	5-85
3A12A1C17		SAME AS 3A4A1C13.	5-85
3A12A1C18		SAME AS 3A8A1C4.	5-85
3A12A1C19		SAME AS 3A9A1C19.	5-85
3A12A1C20		SAME AS 3A4A1C13.	5-85
3A12A1C21		SAME AS 3A4A1C13.	5-85
3A12A1C22		SAME AS 3A4A1C82.	5-85
3A12A1C23		SAME AS 3A9A1C23.	5-85
3A12A1C24		SAME AS 3A4A1C13.	5-85
3A12A1C25		SAME AS 3A4A1C82.	5-85
3A12A1C26		SAME AS 3A3A1C11.	5-85
3A12A1C27		SAME AS 3A4A1C13.	5-85
3A12A1C28		SAME AS 3A4A1C13.	5-85
3A12A1C29		SAME AS 3A4A1C15.	5-85
3A12A1C30		SAME AS 3A4A1C15.	5-85
3A12A1C31		SAME AS 3A4A1C13.	5-85
3A12A1C32		SAME AS 3A3A1C11.	5-85
3A12A1C33		SAME AS 3A4A1C13.	5-85
3A12A1C34		SAME AS 3A4A1C13.	5-85
3A12A1C35		SAME AS 3A4A1C13.	5-85
3A12A1C36		SAME AS 3A9A1C11.	5-85
3A12A1C37		SAME AS 3A9A1C37.	5-85
3A12A1C38		SAME AS 3A9A1C3.	5-85
3A12A1C39		SAME AS 3A9A1C37.	5-85
3A12A1C40		SAME AS 3A4A1C13.	5-85
3A12A1C41		SAME AS 3A4A1C13.	5-85
3A12A1C42		SAME AS 3A4A1C13.	5-85
3A12A1C43		SAME AS 3A8A1C4.	5-85
3A12A1C44		SAME AS 3A9A1C19.	5-85
3A12A1C45		SAME AS 3A2C3.	5-85
3A12A1C46		SAME AS 3A4A1C13.	5-85
3A12A1C47		SAME AS 3A9A1C19.	5-85
3A12A1C48		SAME AS 3A9A1C23.	5-85
3A12A1C49		SAME AS 3A9A1C19.	5-85
3A12A1C50		SAME AS 3A4A1C13.	5-85
3A12A1C51		SAME AS 3A4A1C13.	5-85

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A12A1C52		SAME AS 3A4A1C13.	5-85
3A12A1C53		SAME AS 3A3A1C11.	5-85
3A12A1C54		SAME AS 3A4A1C13.	5-85
3A12A1C55		SAME AS 3A2C3.	5-85
3A12A1C56		CAPACITOR, FIXED, MICA: 91 uuf $\pm 2\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111F910G5S.	5-85
3A12A1C57		SAME AS 3A12A1C56.	5-85
3A12A1C58		CAPACITOR, FIXED, MICA: 820 pf $\pm 1\%$ tol, 300 vdcw, 0.640 in. lg, 0.591 in. wd, 0.198 in. thk, 82679 P/N CM111F821F3S.	5-85
3A12A1C59		SAME AS 3A4A1C13.	5-85
3A12A1C60		SAME AS 3A2C3.	5-85
3A12A1C61		SAME AS 3A2C7.	5-85
3A12A1C62		SAME AS 3A4A1C47.	5-85
3A12A1C63		SAME AS 3A4A1C13.	5-85
3A12A1C64		SAME AS 3A2C3.	5-85
3A12A1C65		SAME AS 3A4A1C13.	5-85
3A12A1C66		SAME AS 3A9A1C66.	5-85
3A12A1C67		SAME AS 3A9A1C67.	5-85
3A12A1C68		SAME AS 3A9A1C66.	5-85
3A12A1C69		SAME AS 3A4A1C13.	5-85
3A12A1C70		SAME AS 3A2C3.	5-85
3A12A1C71		SAME AS 3A4A1C13.	5-85
3A12A1C72		SAME AS 3A4A1C47.	5-85
3A12A1C73		SAME AS 3A2C3.	5-85
3A12A1C74		SAME AS 3A2C3.	5-85
3A12A1C75		SAME AS 3A2C3.	5-85
3A12A1C76		SAME AS 3A4A1C13.	5-85
3A12A1C77		SAME AS 3A4A1C13.	5-85
3A12A1C78		SAME AS 3A9A1C11.	5-85
3A12A1C79		SAME AS 3A9A1C11.	5-85
3A12A1C80		SAME AS 3A4A1C3.	5-85
3A12A1C81		SAME AS 3A4A1C3.	5-85
3A12A1L1		SAME AS 3A9A1L1.	5-85
3A12A1L2		SAME AS 3A4A1L3.	5-85
3A12A1L3 thru 3A12A1L8		SAME AS 3A4A1L3.	5-85
3A12A1L9		COIL, RF, FIXED: 1.5 uh, $\pm 10\%$ tol, 3.12 ohms max dc res. 0.157 in. dia by 0.450 in. lg, 82679 P/N CL275-1R5.	5-85
3A12A1L10		SAME AS 3A12A1L9.	5-85
3A12A1L11		COIL, RF, FIXED: 100 uh, $\pm 10\%$ tol, 3.12 ohms max dc res. 0.157 in. dia by 0.450 in. lg, 82679 P/N CL275-101.	5-85
3A12A1L12		COIL, RF, FIXED: 120 uh, $\pm 10\%$ tol, 3.12 ohms max dc res. 0.157 in. dia by 0.450 in. lg, 82679 P/N CL275-121.	5-85
3A12A1L13		SAME AS 3A12A1L12.	5-85
3A12A1L14		COIL, RF, FIXED: 330 uh, $\pm 10\%$ tol, 3.12 ohms max dc res. 0.157 in. dia by 0.450 in. lg, 82679 P/N CL275-331.	5-85
3A12A1L15		SAME AS 3A12A1L14.	5-85
3A12A1L16		SAME AS 3A12A1L11.	5-85
3A12A1Q1		SAME AS 3A4A1Q2.	5-85
3A12A1Q2		SAME AS 3A4A1Q2.	5-85
3A12A1Q3		SAME AS 3A3A1Q27.	5-85
3A12A1Q4		SAME AS 3A3A1Q27.	5-85
3A12A1Q5		SAME AS 3A4A1Q2.	5-85
3A12A1Q6		SAME AS 3A4A1Q2.	5-85
3A12A1Q7 thru 3A12A1Q9		SAME AS 3A4A1Q2.	5-85

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A12A1Q10		SAME AS 3A3A1Q27.	5-85
3A12A1Q11		SAME AS 3A3A1Q27.	5-85
3A12A1Q12		SAME AS 3A4A1Q2.	5-85
3A12A1Q13			
thru			
3A12A1Q19		SAME AS 3A4A1Q2.	5-85
3A12A1Q20		SAME AS 3A2Q3.	5-85
3A12A1R1		SAME AS 3A9A1R1.	5-85
3A12A1R2		SAME AS 3A3A1R6.	5-85
3A12A1R3		SAME AS 3A3A1R3.	5-85
3A12A1R4		SAME AS 3A3A1R6.	5-85
3A12A1R5		SAME AS 3A2R2.	5-85
3A12A1R6		SAME AS 3A3A1R6.	5-85
3A12A1R7		SAME AS 3A3A1R3.	5-85
3A12A1R8		SAME AS 3A3A1R4.	5-85
3A12A1R9		SAME AS 3A2R14.	5-85
3A12A1R10		SAME AS 3A3A1R3.	5-85
3A12A1R11		SAME AS 3A3A1R37.	5-85
3A12A1R12		SAME AS 3A3A1R4.	5-85
3A12A1R13		SAME AS 3A9A1R1.	5-85
3A12A1R14		SAME AS 3A3A1R6.	5-85
3A12A1R15		SAME AS 3A3A1R3.	5-85
3A12A1R16		SAME AS 3A3A1R6.	5-85
3A12A1R17		SAME AS 3A2R2.	5-85
3A12A1R18		SAME AS 3A3A1R6.	5-85
3A12A1R19		SAME AS 3A3A1R3.	5-85
3A12A1R20		SAME AS 3A3A1R4.	5-85
3A12A1R21		SAME AS 3A2R14.	5-85
3A12A1R22		SAME AS 3A3A1R6.	5-85
3A12A1R23		SAME AS 3A3A1R3.	5-85
3A12A1R24		SAME AS 3A3A1R4.	5-85
3A12A1R25		SAME AS 3A2R14.	5-85
3A12A1R26		SAME AS 3A9A1R1.	5-85
3A12A1R27		SAME AS 3A3A1R1.	5-85
3A12A1R28		SAME AS 3A2R15.	5-85
3A12A1R29		SAME AS 3A3A1R3.	5-85
3A12A1R30		SAME AS 3A3A1R6.	5-85
3A12A1R31		SAME AS 3A3A1R6.	5-85
3A12A1R32		SAME AS 3A3A1R3.	5-85
3A12A1R33		SAME AS 3A3A1R4.	5-85
3A12A1R34		SAME AS 3A2R14.	5-85
3A12A1R35		SAME AS 3A3A1R3.	5-85
3A12A1R36		SAME AS 3A3A1R4.	5-85
3A12A1R37		SAME AS 3A3A1R37.	5-85
3A12A1R38		NOT USED.	
3A12A1R39		SAME AS 3A2R15.	5-85
3A12A1R40		SAME AS 3A3A1R6.	5-85
3A12A1R41		SAME AS 3A3A1R6.	5-85
3A12A1R42		SAME AS 3A2R23.	5-85
3A12A1R43		SAME AS 3A3A1R3.	5-85
3A12A1R44		SAME AS 3A3A1R6.	5-85
3A12A1R45		SAME AS 3A3A1R6.	5-85
3A12A1R46		SAME AS 3A3A1R6.	5-85
3A12A1R47		SAME AS 3A2R16.	5-85
3A12A1R48		SAME AS 3A3A1R6.	5-85
3A12A1R49		SAME AS 3A3A1R3.	5-85
3A12A1R50		SAME AS 3A3A1R4.	5-85
3A12A1R51		SAME AS 3A2R14.	5-85
3A12A1R52		SAME AS 3A3A1R6.	5-85

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A12A1R53		SAME AS 3A3A1R3.	5-85
3A12A1R54		SAME AS 3A3A1R4.	5-85
3A12A1R55		SAME AS 3A2R14.	5-85
3A12A1R56		SAME AS 3A9A1R1.	5-85
3A12A1R57		SAME AS 3A3A1R1.	5-85
3A12A1R58		SAME AS 3A3A1R6.	5-85
3A12A1R59		SAME AS 3A3A1R3.	5-85
3A12A1R60		SAME AS 3A2R15.	5-85
3A12A1R61		SAME AS 3A3A1R6.	5-85
3A12A1R62		SAME AS 3A3A1R3.	5-85
3A12A1R63		SAME AS 3A3A1R4.	5-85
3A12A1R64		SAME AS 3A2R14.	5-85
3A12A1R65		SAME AS 3A2R15.	5-85
3A12A1R66		SAME AS 3A3A1R6.	5-85
3A12A1R67		SAME AS 3A2R23.	5-85
3A12A1R68		SAME AS 3A3A1R6.	5-85
3A12A1R69		SAME AS 3A3A1R6.	5-85
3A12A1R70		SAME AS 3A3A1R3.	5-85
3A12A1R71		SAME AS 3A2R14.	5-85
3A12A1R72		SAME AS 3A3A1R6.	5-85
3A12A1R73		SAME AS 3A2R5.	5-85
3A12A1R74		SAME AS 3A2R14.	5-85
3A12A1R75		SAME AS 3A3A1R4.	5-85
3A12A1R76		SAME AS 3A3A1R4.	5-85
3A12A1R77		SAME AS 3A2R14.	5-85
3A12A1T1		SAME AS 3A9A1T1.	5-85
3A12A1T2		SAME AS 3A9A1T1.	5-85
3A12A1T3		SAME AS 3A9A1T3.	5-85
3A12A1T4		SAME AS 3A9A1T3.	5-85
3A12A1Z1		SAME AS 3A9A1Z1.	5-85
3A12A1Z2		SAME AS 3A3A1Z1.	5-85
3A13		FINAL MIXER/AMPLIFIER: 1 circuit card assembly, 2 RF shields, 10,000 in. lg, 4.562 in. wd by 1 in. wd by 1 in. hg, 82679 P/N AX5026.	5-87
3A13E1		SAME AS 3A3E1.	5-87
3A13E2		SAME AS 3A3E2.	5-87
3A13A1		CIRCUIT CARD ASSEMBLY: 97 resistors, 98 capacitors, 20 coils, 2 transformers, 3 integrated circuits, 28 transistors, 9 semi-conductors, plug-in item, p/o AX5026; 10,000 in. lg by 4.375 in. wd by 0.750 in. hg, 82679 P/N A4695.	5-87
3A13A1C1		SAME AS 3A2C3.	5-87
3A13A1C2		SAME AS 3A2C3.	5-87
3A13A1C3		SAME AS 3A3A1C42.	5-87
3A13A1C4		SAME AS 3A2C3.	5-87
3A13A1C5		SAME AS 3A3C3.	5-87
3A13A1C6		CAPACITOR, FIXED, MICA: 22 uuf, $\pm 5\%$ tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111C220J5S.	5-87
3A13A1C7		CAPACITOR, FIXED, CERAMIC: 10,000 pf +80 -20% tol, 25 vdcw, 0.385 in. dia, 0.156 in. thk, 0.250 in. lead spacing, 82679 P/N CC100-41.	5-87
3A13A1C8		SAME AS 3A13A1C6.	5-87
3A13A1C9		SAME AS 3A2C3.	5-87
3A13A1C10		SAME AS 3A13A1C7.	5-87
3A13A1C11		SAME AS 3A4A1C13.	5-87
3A13A1C12		SAME AS 3A4A1C13.	5-87
3A13A1C13		SAME AS 3A13A1C7.	5-87

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511, URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A13A1C14		SAME AS 3A4A1C13.	5-87
3A13A1C15		CAPACITOR, VARIABLE, CERAMIC: 5.5 -18 uuf, 200 vdcw, min Q-500 at 1 mc. 0.375 in. dia, 0.300 in. hg, 82679 P/N CV112-7.	5-87
3A13A1C16		SAME AS 3A3A1C15.	5-87
3A13A1C17		SAME AS 3A4A1C113.	5-87
3A13A1C18		SAME AS 3A4A1C113.	5-87
3A13A1C19		SAME AS 3A9A1C3.	5-87
3A13A1C20		SAME AS 3A4A1C13.	5-87
3A13A1C21		SAME AS 3A4A1C13.	5-87
3A13A1C22		SAME AS 3A8A1C4.	5-87
3A13A1C23		SAME AS 3A4A1C13.	5-87
3A13A1C24		SAME AS 3A4A1C13.	5-87
3A13A1C25		SAME AS 3A9A1C19.	5-87
3A13A1C26		SAME AS 3A4A1C13.	5-87
3A13A1C27		SAME AS 3A2C3.	5-87
3A13A1C28		SAME AS 3A4A1C13.	5-87
3A13A1C29		SAME AS 3A4A1C13.	5-87
3A13A1C30		SAME AS 3A13A1C15.	5-87
3A13A1C31		SAME AS 3A13A1C15.	5-87
3A13A1C32		SAME AS 3A4A1C113.	5-87
3A13A1C33		SAME AS 3A4A1C113.	5-87
3A13A1C34		SAME AS 3A9A1C23.	5-87
3A13A1C35		SAME AS 3A4A1C13.	5-87
3A13A1C36		SAME AS 3A4A1C13.	5-87
3A13A1C37		SAME AS 3A3A1C11.	5-87
3A13A1C38		SAME AS 3A3A1C47.	5-87
3A13A1C39		SAME AS 3A4A1C13.	5-87
3A13A1C40		SAME AS 3A4A1C13.	5-87
3A13A1C41		SAME AS 3A2C3.	5-87
3A13A1C42		SAME AS 3A3A1C47.	5-87
3A13A1C43		CAPACITOR, FIXED, MICA: 15 uuf, ±5% tol, 500 vdcw, 0.440 in. lg, 0.473 in. wd, 0.170 in. thk, 82679 P/N CM111C150J5S.	5-87
3A13A1C44		SAME AS 3A13A1C43.	5-87
3A13A1C45		SAME AS 3A3A1C47.	5-87
3A13A1C46		SAME AS 3A2C3.	5-87
3A13A1C47		SAME AS 3A3A1C47.	5-87
3A13A1C48		SAME AS 3A2C3.	5-87
3A13A1C49		SAME AS 3A3A1C47.	5-87
3A13A1C50		SAME AS 3A13A1C43.	5-87
3A13A1C51		SAME AS 3A13A1C43.	5-87
3A13A1C52		SAME AS 3A3A1C42.	5-87
3A13A1C53		SAME AS 3A3A1C42.	5-87
3A13A1C54		SAME AS 3A3A1C47.	5-87
3A13A1C55		SAME AS 3A3A1C47.	5-87
3A13A1C56		SAME AS 3A2C3.	5-87
3A13A1C57		SAME AS 3A3A1C47.	5-87
3A13A1C58		SAME AS 3A3A1C42.	5-87
3A13A1C59		SAME AS 3A3A1C42.	5-87
3A13A1C60		SAME AS 3A4A1C119.	5-87
3A13A1C61		SAME AS 3A4A1C119.	5-87
3A13A1C62		SAME AS 3A3A1C47.	5-87
3A13A1C63		SAME AS 3A3A1C42.	5-87
3A13A1C64		SAME AS 3A3A1C42.	5-87
3A13A1C65		SAME AS 3A3A1C19.	5-87
3A13A1C66		SAME AS 3A3A1C19.	5-87
3A13A1C67		SAME AS 3A2C3.	5-87
3A13A1C68		SAME AS 3A3A1C47.	5-87
3A13A1C69		SAME AS 3A3A1C42.	5-87

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511 URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A13A1C70		SAME AS 3A3A1C19.	5-87
3A13A1C71		SAME AS 3A3A1C19.	5-87
3A13A1C72		SAME AS 3A2C3.	5-87
3A13A1C73		SAME AS 3A2C3.	5-87
3A13A1C74		SAME AS 3A2C3.	5-87
3A13A1C75		SAME AS 3A4A1C13.	5-87
3A13A1C76		SAME AS 3A5A1C13.	5-87
3A13A1C77		SAME AS 3A4A1C29.	5-87
3A13A1C78		SAME AS 3A4A1C12.	5-87
3A13A1C79		SAME AS 3A4A1C13.	5-87
3A13A1C80		SAME AS 3A3A1C11.	5-87
3A13A1C81		SAME AS 3A4A1C13.	5-87
3A13A1C82		CAPACITOR: MIL type CS13BF106K.	5-87
3A13A1C83		SAME AS 3A4A1C13.	5-87
3A13A1C84		SAME AS 3A4A1C13.	5-87
3A13A1C85		SAME AS 3A4A1C13.	5-87
3A13A1C86		SAME AS 3A4A1C13.	5-87
3A13A1C87		SAME AS 3A2C3.	5-87
3A13A1C88		SAME AS 3A2C3.	5-87
3A13A1C89		SAME AS 3A2C3.	5-87
3A13A1C90		SAME AS 3A2C3.	5-87
3A13A1C91		SAME AS 3A4A1C13.	5-87
3A13A1C92		SAME AS 3A4A1C13.	5-87
3A13A1C93		CAPACITOR, FIXED, MICA: 560 pf, $\pm 2\%$, 300 vdcw, 0.640 in. lg, 0.591 in. lg, 0.591 in. wd, 0.198 in. thk, 82679 P/N CM111F561G3S.	5-87
3A13A1C94		SAME AS 3A9A1C19.	5-87
3A13A1C95		SAME AS 3A4A1C13.	5-87
3A13A1C96		SAME AS 3A3A1C11.	5-87
3A13A1C97		SAME AS 3A4A1C13.	5-87
3A13A1C98		SAME AS 3A13A1C7.	5-87
3A13A1CR1		SAME AS 3A2CR4.	5-87
3A13A1CR2		SAME AS 3A2CR4.	5-87
3A13A1CR3		SAME AS 3A2CR4.	5-87
3A13A1L1		COIL, RF, FIXED: 47 uh, Q=52 at 2.5 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-470.	5-87
3A13A1L2		SAME AS 3A4A1L3.	5-87
3A13A1L3		SAME AS 3A4A1L16.	5-87
3A13A1L4		SAME AS 3A4A1L16.	5-87
3A13A1L5		SAME AS 3A4A1L16.	5-87
3A13A1L6		SAME AS 3A3A1L5.	5-87
3A13A1L7		SAME AS 3A3A1L5.	5-87
3A13A1L8		COIL, RF, FIXED: 10,000 uh, Q=39 at 0.25 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-103.	5-87
3A13A1L9		SAME AS 3A13A1L8.	5-87
3A13A1L10		SAME AS 3A13A1L1.	5-87
3A13A1L11		SAME AS 3A13A1L8.	5-87
3A13A1L12		SAME AS 3A13A1L8.	5-87
3A13A1L13		SAME AS 3A3A1L1.	5-87
3A13A1L14		SAME AS 3A13A1L8.	5-87
3A13A1L15		SAME AS 3A3A1L1.	5-87
3A13A1L16		SAME AS 3A3A1L6.	5-87
3A13A1L17		SAME AS 3A3A1L6.	5-87
3A13A1L18		SAME AS 3A3A1L6.	5-87
3A13A1L19		COIL, RF, FIXED: 0.68 uh, Q=42 at 25 mc, 0.157 in. dia, 0.395 in. lg, 82679 P/N CL433-0R68.	5-87
3A13A1L20		SAME AS 3A13A1L8.	5-87
3A13A1Q1		SAME AS 3A2Q3.	5-87
3A13A1Q2		SAME AS 3A2Q3.	5-87

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A13A1Q3		SAME AS 3A3A1Q27.	5-87
3A13A1Q4		SAME AS 3A3A1Q27.	5-87
3A13A1Q5		SAME AS 3A4A1Q2.	5-87
3A13A1Q6			
thru			
3A13A1Q9		SAME AS 3A4A1Q2.	5-87
3A13A1Q10		SAME AS 3A3A1Q27.	5-87
3A13A1Q11			
thru			
3A13A1Q15		SAME AS 3A4A1Q2.	5-87
3A13A1Q16		TRANSISTOR: MIL type 2N2219.	5-87
3A13A1Q17		SAME AS 3A4A1Q2.	5-87
3A13A1Q18		SAME AS 3A13A1Q16.	5-87
3A13A1Q19		SAME AS 3A4A1Q2.	5-87
3A13A1Q20		SAME AS 3A2Q4.	5-87
3A13A1Q21		TRANSISTOR: MIL type 2N1132.	5-87
3A13A1Q22		SAME AS 3A2Q4.	5-87
3A13A1Q23		SAME AS 3A2Q3.	5-87
3A13A1Q24		SAME AS 3A2Q3.	5-87
3A13A1Q25		SAME AS 3A2Q3.	5-87
3A13A1Q26		SAME AS 3A2Q3.	5-87
3A13A1Q27		SAME AS 3A4A1Q2.	5-87
3A13A1Q28		SAME AS 3A4A1Q2.	5-87
3A13A1R1		SAME AS 3A9A1R1.	5-87
3A13A1R2		SAME AS 3A3A1R3.	5-87
3A13A1R3		SAME AS 3A3A1R6.	5-87
3A13A1R4		SAME AS 3A3A1R6.	5-87
3A13A1R5		SAME AS 3A3A1R6.	5-87
3A13A1R6		SAME AS 3A2R2.	5-87
3A13A1R7		SAME AS 3A3A1R3.	5-87
3A13A1R8		SAME AS 3A3A1R6.	5-87
3A13A1R9		SAME AS 3A3A1R6.	5-87
3A13A1R10		SAME AS 3A2R14.	5-87
3A13A1R11		SAME AS 3A3A1R3.	5-87
3A13A1R12		SAME AS 3A3A1R37.	5-87
3A13A1R13		SAME AS 3A3A1R4.	5-87
3A13A1R14		SAME AS 3A3A1R3.	5-87
3A13A1R15		SAME AS 3A3A1R3.	5-87
3A13A1R16		SAME AS 3A3A1R3.	5-87
3A13A1R17		SAME AS 3A3A1R4.	5-87
3A13A1R18		SAME AS 3A3A1R6.	5-87
3A13A1R19		SAME AS 3A2R14.	5-87
3A13A1R20		SAME AS 3A2R4.	5-87
3A13A1R21		SAME AS 3A3A1R4.	5-87
3A13A1R22		SAME AS 3A2R23.	5-87
3A13A1R23		SAME AS 3A3A1R6.	5-87
3A13A1R24		SAME AS 3A3A1R3.	5-87
3A13A1R25		SAME AS 3A3A1R6.	5-87
3A13A1R26		SAME AS 3A2R15.	5-87
3A13A1R27		SAME AS 3A3A1R3.	5-87
3A13A1R28		SAME AS 3A3A1R3.	5-87
3A13A1R29		SAME AS 3A3A1R3.	5-87
3A13A1R30		SAME AS 3A3A1R4.	5-87
3A13A1R31		SAME AS 3A3A1R6.	5-87
3A13A1R32		SAME AS 3A2R14.	5-87
3A13A1R33		SAME AS 3A3A1R4.	5-87
3A13A1R34		SAME AS 3A2R5.	5-87
3A13A1R35		SAME AS 3A2R23.	5-87
3A13A1R36		SAME AS 3A3A1R4.	5-87

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A13A1R37		SAME AS 3A3A1R4.	5-87
3A13A1R38		SAME AS 3A3A1R3.	5-87
3A13A1R39		SAME AS 3A2R18.	5-87
3A13A1R40		SAME AS 3A3A1R4.	5-87
3A13A1R41		SAME AS 3A2R5.	5-87
3A13A1R42		SAME AS 3A2R23.	5-87
3A13A1R43		SAME AS 3A3A1R6.	5-87
3A13A1R44		SAME AS 3A3A1R3.	5-87
3A13A1R45		SAME AS 3A2R18.	5-87
3A13A1R46		SAME AS 3A3A1R6.	5-87
3A13A1R47		SAME AS 3A2R10.	5-87
3A13A1R48		SAME AS 3A3A1R3.	5-87
3A13A1R49		SAME AS 3A2R15.	5-87
3A13A1R50		SAME AS 3A3A1R6.	5-87
3A13A1R51		SAME AS 3A2R2.	5-87
3A13A1R52		SAME AS 3A2R8.	5-87
3A13A1R53		SAME AS 3A2R5.	5-87
3A13A1R54		SAME AS 3A3A1R6.	5-87
3A13A1R55		SAME AS 3A2R2.	5-87
3A13A1R56		SAME AS 3A2R8.	5-87
3A13A1R57		SAME AS 3A3A1R95.	5-87
3A13A1R58		SAME AS 3A2R6.	5-87
3A13A1R59		SAME AS 3A3A1R34.	5-87
3A13A1R60		SAME AS 3A3A1R36.	5-87
3A13A1R61		SAME AS 3A3A1R3.	5-87
3A13A1R62		SAME AS 3A2R18.	5-87
3A13A1R63		SAME AS 3A3A1R30.	5-87
3A13A1R64		SAME AS 3A2R8.	5-87
3A13A1R65		SAME AS 3A3A1R95.	5-87
3A13A1R66		SAME AS 3A9A1R1.	5-87
3A13A1R67		SAME AS 3A3A1R3.	5-87
3A13A1R68		SAME AS 3A3A1R6.	5-87
3A13A1R69		SAME AS 3A3A1R6.	5-87
3A13A1R70		SAME AS 3A2R2.	5-87
3A13A1R71		SAME AS 3A3A1R3.	5-87
3A13A1R72		SAME AS 3A3A1R4.	5-87
3A13A1R73		SAME AS 3A3A1R6.	5-87
3A13A1R74		SAME AS 3A2R14.	5-87
3A13A1R75		SAME AS 3A3A1R4.	5-87
3A13A1R76		SAME AS 3A3A1R55.	5-87
3A13A1R77		SAME AS 3A2R15.	5-87
3A13A1R78		SAME AS 3A3A1R4.	5-87
3A13A1R79		SAME AS 3A2R8.	5-87
3A13A1R80		SAME AS 3A2R7.	5-87
3A13A1R81		SAME AS 3A2R8.	5-87
3A13A1R82		SAME AS 3A3A1R44.	5-87
3A13A1R83		SAME AS 3A3A1R44.	5-87
3A13A1R84		SAME AS 3A3A1R44.	5-87
3A13A1R85		SAME AS 3A3A1R30.	5-87
3A13A1R86		SAME AS 3A2R7.	5-87
3A13A1R87		RESISTOR, VARIABLE: 25,000 ohms, ±30% tol, 0.250 in. dia by 0.250 in. hg, 82679 P/N RV124-1-253.	5-87
3A13A1R88		SAME AS 3A9A1R1.	5-87
3A13A1R89		SAME AS 3A2R6.	5-87
3A13A1R90		SAME AS 3A3A1R6.	5-87
3A13A1R91		SAME AS 3A3A1R6.	5-87
3A13A1R92		SAME AS 3A3A1R55.	5-87
3A13A1R93		SAME AS 3A2R23.	5-87
3A13A1R94		SAME AS 3A3A1R4.	5-87

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

REFERENCE SIGNAL GENERATOR, 0-1511/URR

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
3A13A1R95 3A13A1R96 3A13A1R97 3A13A1T1		SAME AS 3A3A1R4. SAME AS 3A2R14. SAME AS 3A2R14. TRANSFORMER, RF ADJUSTABLE: Q=50 at 16 mc, 0.614 in. dia by 0.532 in. hg, 82679 P/N TT302.	5-87 5-87 5-87 5-87
3A13A1T2 3A13A1VC1		SAME AS 3A9A1T3. CAPACITOR, VOLTAGE VARIABLE: 100 uuf at 4 vdc, approx range 57-260 uuf, typical Q at 4 vdc, = 11, 15 vdcw, 0.140 in. dia by 0.3000 lg by 0.300 lg, wire leads. Dwg CX106-14, 01281 P/N V100.	5-87 5-87
3A13A1VC2 thru 3A13A1VC4 3A13A1VR1 3A13A1VR2 3A13A1Z1		SAME AS 3A13A1VC1. SEMICONDUCTOR DEVICE: MIL type 1N746. SEMICONDUCTOR DEVICE: MIL type 1N959. INTEGRATED CIRCUIT: Diode matrix, 14-pin dual inline flat pack. 82679 P/N NW180-3.	5-87 5-87 5-87 5-87
3A13A1Z2 3A13A1Z3		SAME AS 3A3A1Z1. SAME AS 3A3A1Z1.	5-87 5-87

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

TMC MODEL RAK127-2A

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
4		The TMC Model RAK127-2A is a modified CY-597A/G for use with the TMC Model DDR-10K. (Receiving Set, Radio AN/URR-64(V)2.)	5-2
4B1		FAN, AXIAL: 115 vac, 50/60 cps, aluminum housing with black enamel finish, 3.625 in. sq by 1.500 in. thk, 82679 P/N BL131.	5-2
4B2		SAME AS 4B1.	5-2
4W1		WIRING HARNESS, BRANCHED: Intraconnect cable for AN/URR-64(V)2, 82679 P/N CA1450-1.	5-2
4W1J1 thru 4W1J4		NOT USED.	
4W1J5		CONNECTOR: MIL type MS3102A14S-2S.	5-2
4W1J6		CONNECTOR: MIL type MS3102A20-27S.	5-2
4W1J7		CONNECTOR: MIL type MS3102A24-28S.	5-2
4W1J8		CONNECTOR: MIL type UG-556/U.	5-2
4W1P1		CONNECTOR: MIL type UG-536/U.	5-2
4W1P2		CONNECTOR, PLUG, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.563 in. dia by 1.063 in. lg, Dwg PL144-1, 95712 P/N 30220-13.	5-2
4W1P3		SAME AS 4W1P2.	5-2
4W1P4		SAME AS 4W1P2.	5-2
4W1P5		SAME AS 4W1P2.	5-2
4W1P6		SAME AS 4W1P2.	5-2
4W1P7		SAME AS 4W1P2.	5-2
4W1P8		SAME AS 4W1P2.	5-2
4W1P9		SAME AS 4W1P2.	5-2
4W1P10		SAME AS 4W1P2.	5-2
4W1P11		SAME AS 4W1P2.	5-2
4W1P12		SAME AS 4W1P2.	5-2
4W1P13		SAME AS 4W1P2.	5-2
4W1P14		CONNECTOR, RECEPTACLE, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.687 in. dia by 1.156 in. lg, 82679 P/N JJ172.	5-2
4W1P15		SAME AS 4W1P14.	5-2
4W1P16		CONNECTOR, PLUG, ELECTRICAL: 9 contacts, 7.5 amp current rating, 0.750 in. dia by 1.250 in. lg, Dwg PL189-9P, 02660 P/N 126-220.	5-2
4W1P17		SAME AS 4W1P16.	5-2
4W1P18		SAME AS 4W1P16.	5-2
4W1P19		SAME AS 4W1P16.	5-2
4W1P20		SAME AS 4W1P16.	5-2
4W1P21		SAME AS 4W1P16.	5-2
4W1P22		SAME AS 4W1P16.	5-2
4W1P23		SAME AS 4W1P16.	5-2
4W1P24		SAME AS 4W1P16.	5-2
4W2		CABLE ASSEMBLY, POWER, ELECTRICAL: Coiled ac power cable, 12 in. lg retracted, 4 ft lg extended, MIL type connector MS3106A14S-1S at one end, TMC P/N PL218 at other end, 82679 P/N CA1068-1-12.	5-2
4W2P1		CONNECTOR: MIL type MS3106A14S-1S.	5-2
4W2P2		CONNECTOR, PLUG, ELECTRICAL: 3 prong polarized with removable ground connection, 2.000 in. lg by 1.500 in. hg by 1.000 in. thk. Dwg PL218, 11136 P/N UP-121-M.	5-2
4W3		SAME AS 4W2.	5-2
4W3P1		SAME AS 4W2P1.	5-2
4W3P2		SAME AS 4W2P2.	5-2
4W4		SAME AS 4W2.	5-2
4W4P1		SAME AS 4W2P1.	5-2
4W4P2		SAME AS 4W2P2.	5-2

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

TMC MODEL RAK127-2B

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
6		The TMC Model RAK127-2B is a modified CY-597/G for use with the TMC Model DDR-10L. (Receiving Set, Radio AN/URR-64(V)3.)	5-3
6B1		FAN, AXIAL: 115 vac, 50/60 cps, aluminum housing with black enamel finish, 3.625 in. sq by 1.500 in. thk, 82679 P/N BL131.	5-3
6B2		SAME AS 6B1.	5-3
6W1		WIRING HARNESS, BRANCHED: Intraconnect cable for AN/URR-64(V)3, 82679 P/N CA1450-1.	5-3
6W1J1 thru 6W1J4		NOT USED.	
6W1J5		CONNECTOR: MIL type MS3102A14S-2S.	5-3
6W1J6		CONNECTOR: MIL type MS3102A20-27S.	5-3
6W1J7		CONNECTOR: MIL type MS3102A24-28S.	5-3
6W1J8		CONNECTOR: MIL type UG-556/U.	5-3
6W1P1		CONNECTOR: MIL type UG-536/U.	5-3
6W1P2		CONNECTOR, PLUG, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.563 in. dia by 1.063 in. lg, Dwg PL144-1, 95712 P/N 30220-13.	5-3
6W1P3		SAME AS 6W1P2.	5-3
6W1P4		SAME AS 6W1P2.	5-3
6W1P5		SAME AS 6W1P2.	5-3
6W1P6		SAME AS 6W1P2.	5-3
6W1P7		SAME AS 6W1P2.	5-3
6W1P8		SAME AS 6W1P2.	5-3
6W1P9		SAME AS 6W1P2.	5-3
6W1P10		SAME AS 6W1P2.	5-3
6W1P11		SAME AS 6W1P2.	5-3
6W1P12		SAME AS 6W1P2.	5-3
6W1P13		SAME AS 6W1P2.	5-3
6W1P14		CONNECTOR, RECEPTACLE, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.687 in. dia by 1.156 in. lg, 82679 P/N JJ172.	5-3
6W1P15		SAME AS 6W1P14.	5-3
6W1P16		CONNECTOR, PLUG, ELECTRICAL: 9 contacts, 7.5 amp current rating, 0.750 in. dia by 1.250 in. lg, Dwg PL189-9P, 02660 P/N 126-220.	5-3
6W1P17		SAME AS 6W1P16.	5-3
6W1P18		SAME AS 6W1P16.	5-3
6W1P19		SAME AS 6W1P16.	5-3
6W1P20		SAME AS 6W1P16.	5-3
6W1P21		SAME AS 6W1P16.	5-3
6W1P22		SAME AS 6W1P16.	5-3
6W1P23		SAME AS 6W1P16.	5-3
6W1P24		SAME AS 6W1P16.	5-3
6W2		WIRING HARNESS, BRANCHED: Intraconnect cable for AN/URR-63(V)3, 82679 P/N CA1450-4.	5-3
6W2J1 thru 6W2J4		NOT USED.	
6W2J5		SAME AS 6W1J5.	5-3
6W2J6		SAME AS 6W1J6.	5-3
6W2J7		SAME AS 6W1J7.	5-3
6W2J8		SAME AS 6W1J8.	5-3
6W2P1		SAME AS 6W1P1.	5-3
6W2P2		SAME AS 6W1P2.	5-3
6W2P3		SAME AS 6W1P2.	5-3

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

TMC MODEL RAK127-2B

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
6W2P4		SAME AS 6W1P2.	5-3
6W2P5		SAME AS 6W1P2.	5-3
6W2P6		SAME AS 6W1P2.	5-3
6W2P7		SAME AS 6W1P2.	5-3
6W2P8		SAME AS 6W1P2.	5-3
6W2P9		SAME AS 6W1P2.	5-3
6W2P10		SAME AS 6W1P2.	5-3
6W2P11		SAME AS 6W1P2.	5-3
6W2P12		SAME AS 6W1P2.	5-3
6W2P13		SAME AS 6W1P2.	5-3
6W2P14		SAME AS 6W1P14.	5-3
6W2P15		SAME AS 6W1P15.	5-3
6W2P16		SAME AS 6W1P16.	5-3
6W2P17		SAME AS 6W1P16.	5-3
6W2P18		SAME AS 6W1P16.	5-3
6W2P19		SAME AS 6W1P16.	5-3
6W2P20		SAME AS 6W1P16.	5-3
6W2P21		SAME AS 6W1P16.	5-3
6W2P22		SAME AS 6W1P16.	5-3
6W2P23		SAME AS 6W1P16.	5-3
6W2P24		SAME AS 6W1P16.	5-3
6W3		CABLE ASSEMBLY, POWER, ELECTRICAL: Coiled ac power cable, 12 in. lg retracted by 4 ft lg extended. MIL type connector MS3106A14S-1S at one end, TMC P/N PL218 at other end.	5-3
6W3P1		CONNECTOR: MIL type MS3106A14S-1S.	5-3
6W3P2		CONNECTOR, PLUG, ELECTRICAL: 3 prong polarized with removable ground connection. 2.000 in. lg by 1.500 in. hg by 1.000 in. thk, Dwg PL218, 11136 P/N UP-121-M.	5-3
6W4		SAME AS 6W3.	5-3
6W4P1		SAME AS 6W3P1.	5-3
6W4P2		SAME AS 6W3P2.	5-3
6W5		SAME AS 6W3.	5-3
6W5P1		SAME AS 6W3P1.	5-3
6W5P2		SAME AS 6W3P2.	5-3
6W6		SAME AS 6W3.	5-3
6W6P1		SAME AS 6W3P1.	5-3
6W6P2		SAME AS 6W3P2.	5-3
6W7		SAME AS 6W3.	5-3
6W7P1		SAME AS 6W3P1.	5-3
6W7P2		SAME AS 6W3.	5-3

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

TMC MODEL RAK127-2C

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
7		The TMC Model RAK127-2C is a modified CY-597A/G for use with the TMC Model DDR-10M. (Receiving Set, Radio AN/URR-64(V)1.)	5-1
7B1		FAN, AXIAL: 115 vac, 50/60 cps, aluminum housing with black enamel finish, 3.625 in. sq by 1.500 in. thk, 82679 P/N BL131.	5-1
7B2		SAME AS 7B1.	5-1
7W1		WIRING HARNESS, BRANCHED: Intraconnect cable for AN/URR-64(V)1, 82679 P/N CA1450-1.	5-1
7W1J1 thru 7W1J4		NOT USED.	
7W1J5		CONNECTOR: MIL type MS3102A14S-2S.	5-1
7W1J6		CONNECTOR: MIL type MS3102A20-27S.	5-1
7W1J7		CONNECTOR: MIL type MS3102A24-28S.	5-1
7W1J8		CONNECTOR: MIL type UG-556/U.	5-1
7W1P1		CONNECTOR: MIL type UG-536/U.	5-1
7W1P2		CONNECTOR, PLUG, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.563 in. dia by 1.063 in. lg, Dwg PL144-1, 95712 P/N 30220-13.	5-1
7W1P3		SAME AS 7W1P2.	5-1
7W1P4		SAME AS 7W1P2.	5-1
7W1P5		SAME AS 7W1P2.	5-1
7W1P6		SAME AS 7W1P2.	5-1
7W1P7		SAME AS 7W1P2.	5-1
7W1P8		SAME AS 7W1P2.	5-1
7W1P9		SAME AS 7W1P2.	5-1
7W1P10		SAME AS 7W1P2.	5-1
7W1P11		SAME AS 7W1P2.	5-1
7W1P12		SAME AS 7W1P2.	5-1
7W1P13		SAME AS 7W1P2.	5-1
7W1P14		CONNECTOR, RECEPTACLE, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.687 in. dia by 1.156 in. lg, 82679 P/N JJ172.	5-1
7W1P15		SAME AS 7W1P14.	5-1
7W1P16		CONNECTOR, PLUG, ELECTRICAL: 9 contacts, 7.5 amp current rating, 0.750 in. dia by 1.250 in. lg, Dwg PL189-9P, 02660 P/N 126-220.	5-1
7W1P17		SAME AS 7W1P16.	5-1
7W1P18		SAME AS 7W1P16.	5-1
7W1P19		SAME AS 7W1P16.	5-1
7W1P20		SAME AS 7W1P16.	5-1
7W1P21		SAME AS 7W1P16.	5-1
7W1P22		SAME AS 7W1P16.	5-1
7W1P23		SAME AS 7W1P16.	5-1
7W1P24		SAME AS 7W1P16.	5-1
7W2		WIRING HARNESS, BRANCHED: Intraconnect cable for AN/URR-64(V)1, 82679 P/N CA1450-2.	5-1
7W2J1 thru 7W2J4		NOT USED.	
7W2J5		CONNECTOR: MIL type MS3102A14S-2S.	5-1
7W2J6		CONNECTOR: MIL type MS3102A20-27S.	5-1
7W2J7		CONNECTOR: MIL type MS3102A24-28S.	5-1
7W2J8		CONNECTOR: MIL type UG-556/U.	5-1
7W2P1		CONNECTOR: MIL type UG-536/U.	5-1

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TABLE 6-4. MAINTENANCE PARTS LIST (Continued)

TMC MODEL RAK127-2C

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
7W2P2		CONNECTOR, PLUG, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.563 in. dia by 1.063 in. lg, Dwg PL144-1, 95712 P/N 30220-13.	5-1
7W2P3		SAME AS 7W2P2.	5-1
7W2P4		SAME AS 7W2P2.	5-1
7W2P5		SAME AS 7W2P2.	5-1
7W2P6		SAME AS 7W2P2.	5-1
7W2P7		SAME AS 7W2P2.	5-1
7W2P8		SAME AS 7W2P2.	5-1
7W2P9		SAME AS 7W2P2.	5-1
7W2P10		SAME AS 7W2P2.	5-1
7W2P11		SAME AS 7W2P2.	5-1
7W2P12		SAME AS 7W2P2.	5-1
7W2P13		SAME AS 7W2P2.	5-1
7W2P14		CONNECTOR, RECEPTACLE, ELECTRICAL: BNC type, one contact, brass silver plated shell, 0.687 in. dia by 1.156 in. lg, 82679 P/N JJ172.	5-1
7W2P15		SAME AS 7W1P14.	5-1
7W2P16		CONNECTOR, PLUG, ELECTRICAL: 9 contacts, 7.5 amp current rating, 0.750 in. dia by 1.250 in. lg, Dwg PL189-9P, 02660 P/N 126-220.	5-1
7W2P17		SAME AS 7W2P16.	5-1
7W2P18		SAME AS 7W2P16.	5-1
7W2P19		SAME AS 7W2P16.	5-1
7W2P20		SAME AS 7W2P16.	5-1
7W2P21		SAME AS 7W2P16.	5-1
7W2P22		SAME AS 7W2P16.	5-1
7W2P23		SAME AS 7W2P16.	5-1
7W2P24		SAME AS 7W2P16.	5-1
7W3		CABLE ASSEMBLY, POWER, ELECTRICAL: Coiled ac power cable, 12 in. lg retracted, 4 ft lg extended, MIL type connector MS3106A14S-1S at one end, TMC P/N PL218 at other end, 82679 P/N CA1068-1-12.	5-1
7W3P1		CONNECTOR: MIL type MS3106A14S-1S.	5-1
7W3P2		CONNECTOR, PLUG, ELECTRICAL: 3 prong polarized with removable ground connection, 2.000 in. lg by 1.500 in. hg by 1.000 in. thk. Dwg PL218, 11136 P/N UP-121-M.	5-1
7W4		SAME AS 7W3.	5-1
7W4P1		SAME AS 7W3P1.	5-1
7W4P2		SAME AS 7W3P2.	5-1
7W5		SAME AS 7W3.	5-1
7W5P1		SAME AS 7W3P1.	5-1
7W5P2		SAME AS 7W3P2.	5-1
7W6		SAME AS 7W3.	5-1
7W6P1		SAME AS 7W3P1.	5-1
7W6P2		SAME AS 7W3P2.	5-1
7W7		SAME AS 7W3.	5-1
7W7P1		SAME AS 7W3P1.	5-1
7W7P2		SAME AS 7W3P2.	5-1
7W8		SAME AS 7W3.	5-1
7W8P1		SAME AS 7W3P1.	5-1
7W8P2		SAME AS 7W3P2.	5-1

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TABLE 6-4. LIST OF MANUFACTURERS

MFR CODE	NAME	ADDRESS
08806	General Electric Company Miniature Lamp. Dept.	Nela Park Cleveland, Ohio 44112
14655	Cornell-Dublier Electronics Div. Federal Pacific Electric Co.	50 Paris Street Newark, New Jersey 07105
71400	Bussmann Mfg. Division of McGraw & Edison Co.	2536 W. University St. St. Louis, Mo. 63017
72619	Dialight Corp.	60 Steward Avenue Brooklyn, N. Y. 11237
72983	Essex Wire Corp.	1601 Wall Street Fort Wayne, Ind. 46804
75382	Kulka Electric Corp.	520 S. Fulton Ave. Mt. Vernon, N. Y. 10550
80183	Sprague Products Co.	North Adams Massachusetts
81349	Military Specifications Promulgated By Standardization Div.	Directorate of Logistic Services DSA
82679	The Technical Materiel Corp.	700 Fenimore Road Mamaroneck, N. Y. 10543
83594	Burroughs Corp. Electronic Components Div.	P. O. Box 1226 Plainfield, N. J. 07061
91506	Augat Inc.	33 Perry Avenue Attleboro, Mass. 02703

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AN/URR-64(V)2	1-1 thru 1-5, 2-4b (1), 2-4b (2), 6-2, (1-2), (2-2), (2-5), (3-4), (4-1), (5-2), (5-89), *1-1, *1-2, *1-5, *1-6, *2-2, *2-5, *3-1 thru *3-4, *4-1, *6-1, *6-4
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