

UNCLASSIFIED

TECHNICAL MANUAL
FOR
TYPE RS-111-1B-7
PANORAMIC DATA
RECEIVING SET

NOTE: The RS-111-1B-7 Receiving System is the commercial version of the AN/URR-52A. This instruction manual for the AN/URR-52A is entirely applicable to the RS-111-1B-7.

URR 52

WATKINS-JOHNSON COMPANY
CEI DIVISION
6006 EXECUTIVE BOULEVARD
ROCKVILLE, MARYLAND 20852

AIR FORCE, 16, APR., 1973-250-REPRINT

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ADDENDA FOR AN/URR-52A

The following changes are required in this manual:

Page	Ref. Symbol	Change	Applies To
5-39	A1C3	was Roanwell MG 11016, now JFD Inc. VC26G	Parts List Only
5-52	A2C1	was 301C0H569D (± 0.5 pF), now 301C0H569C (± 0.25 pF)	Parts List Only
5-52	A2C3	was CC20CK1R5C, now Erie 301-000C0K0109C	Parts List Only
5-54	A2C23	was NP0A, now Erie 301-000C0J0279C	Parts List Only
5-57	A2L1	was 2027, now 2027-3	Parts List Only
5-59	A2R5	was RC07GF622J (1/4W), now RC42GF622J (2W)	Parts List Only
5-59	A2R6	was RC07GF470J (47 ohms), now RC07GF100J (10 ohms)	Parts List Only
5-63	A3C6	was Roanwell MG1305, now JFD Inc. VC21GY	Parts List Only
5-65	A3C33	was same as A3C9, should read same as A3C5	Parts List Only
5-66	A3C38	was CC20CK010C, now Erie 301-000C0K0109C	Parts List Only
5-76, 6-9	A4C33	Add Quality Components QC(.27pF, K) (Nominal value). Show C33 across CR1.	Parts List and Figure 6-4
5-79	A4R7	was RC07GF683J (68K), now RC07GF680J (68 ohms)	Parts List Only
5-87, 6-13	A5A1R20	was RC07GF684J (680K), now RC07GF274J (270K)	Parts List and Figure 6-6
5-89	A5A2C2	was MC3.4PFP0RM10PCT (3.4 pF), now MC4.3PFP0RM10PCT (4.3 pF)	Parts List Only
5-93, 6-15	A5CR1	was 1N198, now 1N1449	Parts List and Figure 6-7
5-93, 6-15	A5CR2	was 1N198, now 1N1449	Parts List and Figure 6-7
5-94	A5A2R3	was RC07GF473J (47K), now RC07GF562J (5.6K)	Parts List Only
5-95	A5A2R21	was RC32GF103J (1W), now RC07GF103J (1/4W)	Parts List Only
5-95	A5A2R22	was RC32GF103J (1W), now RC07GF103J (1/4W)	Parts List Only
5-95	A5A2R23	was RC32GF103J (1W), now RC07GF103J (1/4W)	Parts List Only
5-98	A5W1	was 2126-127, now CEI 30020-428	Parts List Only
5-98	A5W2	was 2126-127, now CEI 30020-429	Parts List Only
5-101	A5A3T1	was 10272, now CEI 10998	Parts List Only
5-102	A5P1	was Winchester MRE7-2P-G7, now Phelps Dodge 1026/174	Parts List Only
5-102	A5P2	was Amphenol 27-26, now Phelps Dodge 1026/174	Parts List Only

Page	Ref. Symbol	Change	Applies To
5-102	A5P3	was Amphenol 27-26, now Phelps Dodge 1026/174	Parts List Only
5-102	A5P4	was Amphenol 27-26, now Phelps Dodge 1026/174	Parts List Only
5-102	A5P5	was Amphenol 27-26, now Winchester MRE7-2P-G7	Parts List Only
5-104, 6-19	A6C3	was CC20CK010C (1.0 pF), now Erie 301-000C0j0229C (2.2 pF)	Parts List and Figure 6-9
5-107, 6-19	A6R1	was RC07GF272J (2.7K), now RC07GF332J (3.3K)	Parts List and Figure 6-9
5-107, 6-19	A6R2	was RC07GF272J (2.7K), now RC07GF332J (3.3K)	Parts List and Figure 6-9
5-107, 6-19	A6R12	was RC07GF272J (2.7K), now RC07GF302J (3K)	Parts List and Figure 6-9
5-108	A6R16	was RC07GF680J (68 ohms, now RC07GF104J (100K)	Parts List Only
5-112	A7A1L2	was 1131-37, now 1131-40	Parts List Only
5-116, 6-21	A7A2R7	was RC07GF103J (10K), now RC07GF123J (12K)	Parts List and Figure 6-10
5-116, 6-21	A7A2R8	was RC07GF222J (2.2K), now RC07GF471J (470 ohms)	Parts List and Figure 6-10
5-118	A7C21	was Allen-Bradley SS5A102W, now Electro Motive DM10-470J	Parts List Only
5-119	A7C26	was Radio Materials Co. SMC0JGMV, now Allen-Bradley SS5A102W	Parts List Only
5-121, 6-21		Add A7L10, CEI 1131-37 (See addenda Figure A-1)	Parts List and Figure 6-10
5-121		Delete A7Q4	
5-122, 6-21		Add A7R21, RC07GF471J (See addenda Figure A-2)	Parts List and Figure 6-10
5-125	A8A1C12	Should read same as A5A1C2	Parts List Only
5-125	A8A1C13	Should read same as A5A1C2	Parts List Only
5-125	A8A1CR1	Should read same as A5A2CR1	Parts List Only
5-125	A8A1L2	was 1131-37, now 1131-40	Parts List Only
5-129	A8A2Y1	was Piezo CR18U21.4MC, now CEI 91803-1	Parts List Only
5-131	A8C26	Should read same as A1C38	Parts List Only
5-132	A8C38	was QC1PFP0RM10PCT, now QC0.82PFP0RM10PCT	Parts List Only
5-135	A8CR3	was 1N462A, now 1N198A	Parts List Only
5-135	A8FL1	was McCoy 40B4, now Piezo 4065527	Parts List Only
5-136	A8FL2	was McCoy 40B1, now Piezo 4065526	Parts List Only
5-142, 6-23		Add A8R69, RC07GF471J (See addenda Figure A-3)	Parts List and Figure 6-11

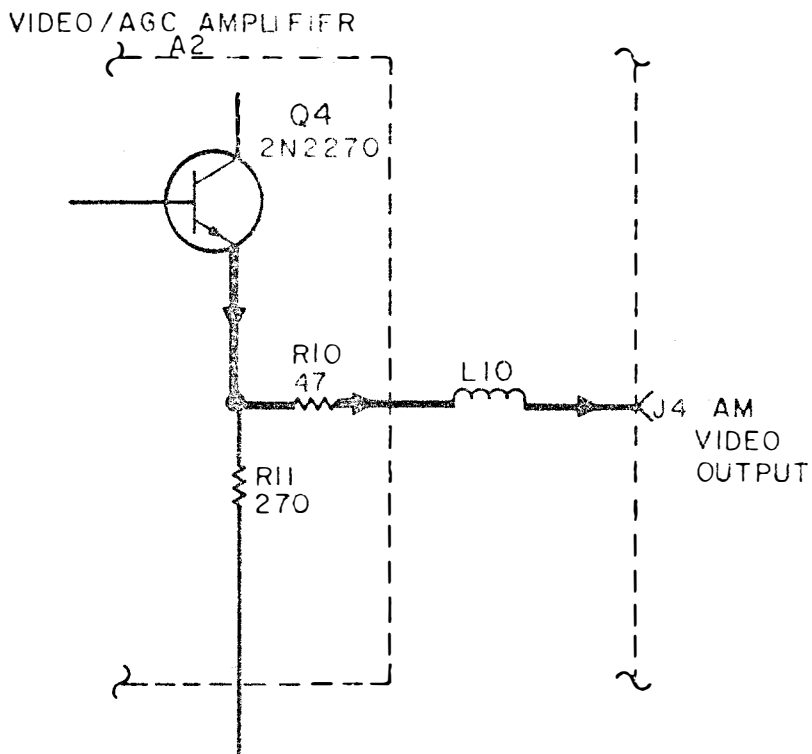


FIGURE A-1

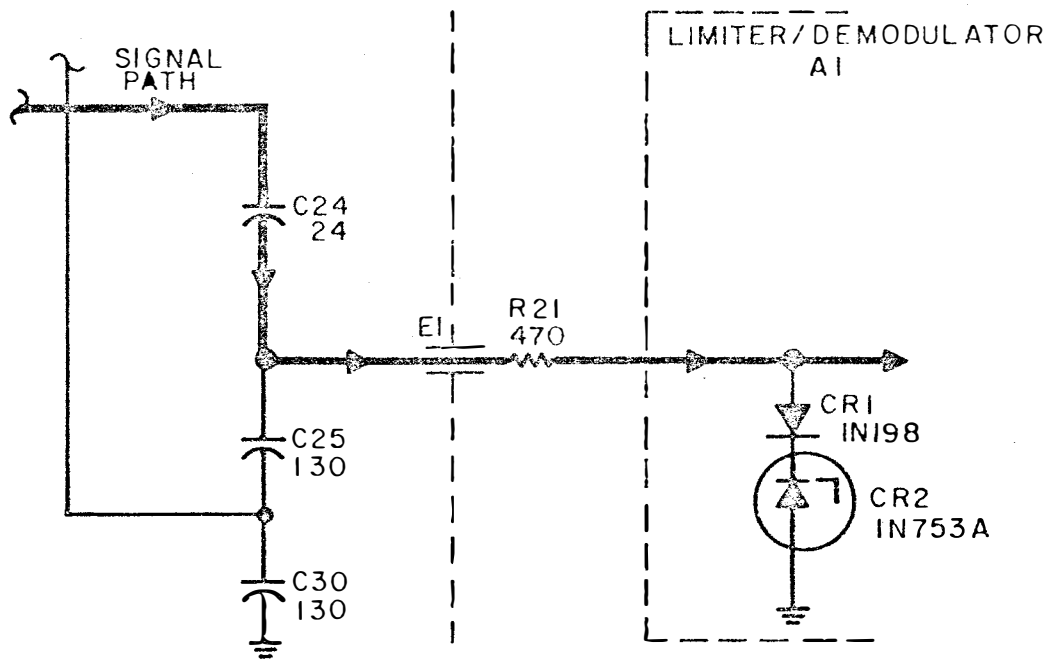


FIGURE A-2

Page	Ref. Symbol	Change	Applies To
5-147, 6-27	A10R4	was RN60D6811J, now RC07GF622J	Parts List and Figure 6-13
5-153, 6-31	A12Q1	was 2N3053, now 2N2270	Parts List and Figure 6-15
5-153, 6-31	A12Q3	was 2N3053, now 2N2270	Parts List and Figure 6-15
5-153, 6-31	A12Q4	was 2N3053, now 2N2270	Parts List and Figure 6-15
5-153, 6-31	A12Q5	was 2N3053, now 2N2270	Parts List and Figure 6-15
5-154	A12R12	was RC32GF633J (63K), now RC32GF363J (36K)	Parts List Only
5-154	A12RA3	was Wakefield NF207, now Birtcher 3AL635-2R	Parts List Only
5-157	A15R3	was IRC CT150-104K, now Beckman 62PR500K	Parts List Only
5-157, 6-35	A15R4	was RC07GF204J (200K), now RC07GF104J (100K)	Parts List and Figure 6-17
5-162	J10	was JJ-034, now Switchcraft L11	Parts List Only
5-173	W14	was 30020-127, now 30020-427	Parts List Only

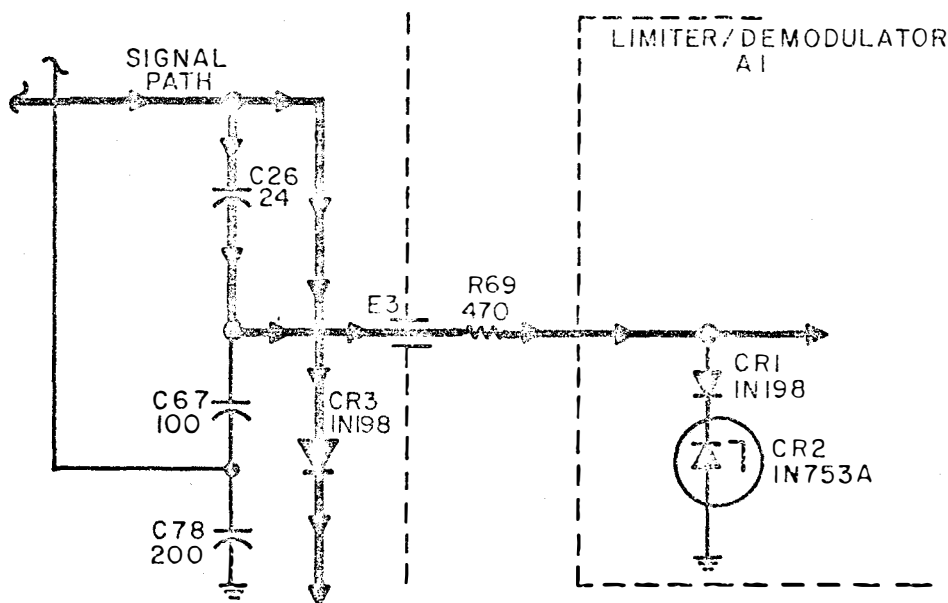


FIGURE A-3

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**TECHNICAL MANUAL
FOR
TYPE AN/URR-52A
PANORAMIC DATA
RECEIVING SET**

Communication Electronics, Inc.
6006 Executive Boulevard
Washington Science Center
Rockville, Maryland 20852

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WARNING

This equipment employs voltages which are dangerous and may be fatal if contacted. Extreme caution should be exercised in working with the equipment with any of the protective covers removed.

TABLE OF CONTENTS

Paragraph		Page
SECTION I GENERAL DESCRIPTION		
1.1	Electrical Description	1-1
1.2	Mechanical Description	1-1
SECTION II CIRCUIT DESCRIPTION		
2.1	General	2-1
2.2	Functional Analysis	2-1
2.3	30-60 mc RF Tuner	2-3
2.4	60-300 mc RF Tuner	2-3
2.5	235-500 mc RF Tuner	2-4
2.6	490-1000 mc RF Tuner	2-5
2.7	60-21.4 mc Converter	2-5
2.8	Bandswitching	2-6
2.9	20/75/300-kc Bandwidth IF Strip	2-6
2.10	AGC Monitor Amplifier	2-8
2.11	2-mc Bandwidth IF Strip	2-8
2.12	Video Amplifier	2-9
2.13	Audio Amplifier	2-9
2.14	Gain Control System	2-9
2.15	Signal Monitor	2-9
2.16	Power Supply	2-11
SECTION III INSTALLATION AND OPERATION		
3.1	Installation	3-1
3.2	Operation	3-1
SECTION IV MAINTENANCE		
4.1	General	4-1
4.2	Maintenance of Gear Trains and Tuning Dials	4-1
4.3	Plug-In Modules	4-2
4.4	Troubleshooting	4-2
4.5	Alignment Instructions	4-2
4.6	20/75/300-kc IF Alignment	4-4
4.7	2-mc IF Alignment	4-6
4.8	60-21.4-mc Converter Alignment	4-7
4.9	235-500-mc RF Tuner Alignment	4-9
4.10	490-1000-mc RF Tuner Alignment	4-10
4.11	60-300-mc RF Tuner Alignment	4-10
4.12	30-60-mc RF Tuner Alignment	4-12
4.13	Signal Monitor Alignment	4-13
SECTION V IDENTIFICATION TABLE OF PARTS		
5.1	Unit Numbering Method	5-1
5.2	Reference Designation Prefix	5-1
5.3	Identification Table of Parts	5-1

LIST OF ILLUSTRATIONS

Illustration		Page
Table 1-1	Type AN/URR -52A Panoramic Data Receiving Set, Specifications	vi
Table 1-2	Type AN/URR -52A Panoramic Data Receiving Set, Tube and Transistor Complement . .	1-2
Table 4-1	Type AN/URR -52A Panoramic Data Receiving Set, Tube and Transistor Element Voltages	4-15
Figure 1-1	Type AN/URR -52A Panoramic Data Receiving Set, Front View	1-0
Figure 1-2	Type AN/URR -52A Panoramic Data Receiving Set, Rear View	1-2
Figure 2-1	Type AN/URR -52A Panoramic Data Receiving Set, Functional Block Diagram	2-0
Figure 4-1	Equipment Setup, 20-kc/75-kc/300-kc IF Alignment	4-3
Figure 4-2	Typical Response Curve, 300-kc Discriminator Alignment	4-5
Figure 4-3	Typical Response Curve, 300-kc Bandwidth IF Alignment	4-5
Figure 4-4	Typical Response Curve, 20-kc Bandwidth IF Alignment	4-5
Figure 4-5	Typical Response Curve, 75-kc Bandwidth IF Alignment	4-5
Figure 4-6	Equipment Setup, 2-mc IF Alignment	4-6
Figure 4-7	Typical Response Curve, 2-mc Discriminator Alignment	4-7
Figure 4-8	Typical Response Curve, 2-mc Bandwidth IF Alignment	4-7
Figure 4-9	Equipment Setup, Converter Alignment	4-8
Figure 4-10	Equipment Setup, Converter and Tuner Alignment	4-9
Figure 4-11	Typical Response Curve, A4V3 to A6V2 Interstage Alignment	4-10
Figure 4-12	Typical Response Curve, 235-500 mc Tuner Alignment	4-10
Figure 4-13	Typical Response Curve, 60-300 mc Tuner Alignment	4-12
Figure 4-14	Typical Response Curve, 30-60 mc Tuner Alignment	4-12
Figure 4-15	VHF Gear Train Assembly, Exploded View	4-17
Figure 4-16	UHF Gear Train Assembly, Exploded View	4-19
Figure 5-1	Type AN/URR -52A Panoramic Data Receiving Set, Top View	5-2
Figure 5-2	Type AN/URR -52A Panoramic Data Receiving Set, Top View	5-3
Figure 5-3	Type AN/URR -52A Panoramic Data Receiving Set, Bottom View	5-4
Figure 5-4	Type 7165 30-60-mc Tuner, Component Locations	5-5
Figure 5-5	Type 7165 30-60-mc Tuner, Component Locations	5-6
Figure 5-6	Type 7165 30-60-mc Tuner, Component Locations	5-7
Figure 5-7	Type 7164 60-300-mc Tuner, Component Locations	5-8
Figure 5-8	Type 7164 60-300-mc Tuner, Component Locations	5-9
Figure 5-9	Type 7162 235-500-mc Tuner, Component Locations	5-10
Figure 5-10	Type 7162 235-500-mc Tuner, Component Locations	5-11
Figure 5-11	Type 7163 490-1000-mc Tuner, Component Locations	5-12
Figure 5-12	Type 7163 490-1000-mc Tuner, Component Locations	5-13
Figure 5-13	Type 7930 Signal Monitor, Component Locations	5-14
Figure 5-14	Type 8003 Shaping Amplifier/Sweep Oscillator, Component Locations	5-15
Figure 5-15	Type 8003 Shaping Amplifier/Sweep Oscillator, Component Locations	5-16
Figure 5-16	Type 8101 IF Output Amplifier, Component Locations	5-17
Figure 5-17	Type 8101 IF Output Amplifier, Component Locations	5-18
Figure 5-18	Type 8202 Horizontal Sweep Oscillator, Component Locations	5-19
Figure 5-19	Type 7120 60-21.4-mc Converter, Component Locations	5-20
Figure 5-20	Type 7120 60-21.4-mc Converter, Component Locations	5-21
Figure 5-21	Type 72121 2-mc Bandwidth IF Strip, Component Locations	5-22
Figure 5-22	Type 72121 2-mc Bandwidth IF Strip, Component Locations	5-23
Figure 5-23	Part 10523 Limiter/Demodulator, Component Locations	5-24
Figure 5-24	Part 10527 Video/AGC Amplifier, Component Locations	5-25
Figure 5-25	Type 72120 20/75/300-kc Bandwidth IF Strip, Component Locations	5-26
Figure 5-26	Type 72120 20/75/300-kc Bandwidth IF Strip, Component Locations	5-27
Figure 5-27	Type 72120 20/75/300-kc Bandwidth IF Strip, Component Locations	5-28
Figure 5-28	Type 72120 20/75/300-kc Bandwidth IF Strip, Component Locations	5-29

Illustration		Page
Figure 5-29	Part 10710 Limiter/Demodulator, Component Locations	5-30
Figure 5-30	Part 1769-3 Beat Frequency Oscillator, Component Locations	5-31
Figure 5-31	Type 7312 Video Amplifier, Component Locations	5-32
Figure 5-32	Type 7400A Audio Amplifier, Component Locations	5-33
Figure 5-33	Type 7633 Power Supply Regulator (CRT), Component Locations.	5-34
Figure 5-34	Type 7631 Power Supply Regulator (Gen.), Component Locations	5-35
Figure 5-35	Type 79125 Coupling Network, Component Locations	5-36
Figure 5-36	Type 7836 AGC Monitor Amplifier, Component Locations	5-37
Figure 6-1	Type 7165 30-60-mc Tuner, Schematic Diagram	6-3
Figure 6-2	Type 7164 60-300-mc Tuner, Schematic Diagram	6-5
Figure 6-3	Type 7162 235-500-mc Tuner, Schematic Diagram	6-7
Figure 6-4	Type 7163 490-1000-mc Tuner, Schematic Diagram	6-9
Figure 6-5	Type 7930 Signal Monitor, Schematic Diagram	6-11
Figure 6-6	Type 8003 Shaping Amplifier/Sweep Oscillator, Schematic Diagram	6-13
Figure 6-7	Type 8101 IF Output Amplifier, Schematic Diagram	6-15
Figure 6-8	Type 8202 Horizontal Sweep Oscillator, Schematic Diagram	6-17
Figure 6-9	Type 7120 60-21.4-mc Converter, Schematic Diagram	6-19
Figure 6-10	Type 72121 2-mc Bandwidth IF Strip, Schematic Diagram	6-21
Figure 6-11	Type 72120 20/75/300-kc Bandwidth IF Strip, Schematic Diagram	6-23
Figure 6-12	Type 7312 Video Amplifier, Schematic Diagram	6-25
Figure 6-13	Type 7400A Audio Amplifier, Schematic Diagram	6-27
Figure 6-14	Type 7633 Power Supply Regulator (CRT), Schematic Diagram	6-29
Figure 6-15	Type 7631 Power Supply Regulator (Gen.), Schematic Diagram	6-31
Figure 6-16	Type 79125 Coupling Network, Schematic Diagram	6-33
Figure 6-17	Type 7683 AGC Monitor Amplifier, Schematic Diagram	6-35
Figure 6-18	Type AN/URR-52A Panoramic Data Receiving Set, Main Chassis Schematic Diagram	6-37

Table 1-1. AN/URR-52A Panoramic Data Receiving Set, Specifications

Type of Reception	AM, FM, CW
Frequency Range	30-1000 mc in four bands: Band A, 30-60 mc; Band B, 60-300 mc; Band C, 235-500 mc; Band D, 490-1000 mc
Input Impedance	50-ohm, nominal
Noise Figure	Band A, 4 db max; Band B, 6.5 db max; Band C, 10 db max; Band D, 12 db max
Image Rejection	Band A, 60 db min; Band B, 50 db min; Band C, 65 db min; Band D, 75 db min
IF Rejection	Band A, 54 db min; Band B, 80 db min; Band C, 80 db min; Band D, 90 db min
Oscillator to Antenna Conduction	Band A, 15 μ v max; Band B, 15 μ v max from 60-260 mc and 25 μ v max from 260-300 mc; Band C, 8 μ v max; Band D, 75 μ v max
IF Bandwidths	Four total, 2 mc, 20 kc, 75 kc, or 300 kc, selectable from front panel
IF Frequency	21.4 mc
Band A and Band B Sensitivity	
20-kc Bandwidth	AM: 1 μ v input, modulated 50%, produces 10 db (s plus n)/n min FM: 2 μ v input, modulated at 1 kc with 7-kc deviation, produces 21 db (s plus n)/n min
75-kc Bandwidth	AM: 2 μ v input, modulated 50%, produces 10 db (s plus n)/n min FM: 3 μ v input, modulated at 1 kc with 25-kc deviation, produces 21 db (s plus n)/n min
300-kc Bandwidth	AM: 4 μ v input, modulated 50%, produces 11 db (s plus n)/n min FM: 4 μ v input, modulated at 1 kc with 100-kc deviation, produces 21 db (s plus n)/n min
2-mc Bandwidth	AM: 11 μ v input, modulated 50%, produces 10 db (s plus n)/n min FM: 12 μ v input, modulated at 1 kc with 750-kc deviation, produces 21 db (s plus n)/n min
Band C and Band D Sensitivity	
20-kc Bandwidth	AM: 2 μ v input, modulated 50%, produces 10 db (s plus n)/n min FM: 4 μ v input, modulated 1 kc with 7-kc deviation, produces 21 db (s plus n)/n min
75-kc Bandwidth	AM: 8 μ v input, modulated 50%, produces 17 db (s plus n)/n min FM: 6 μ v input, modulated at 1 kc with 25-kc deviation, produces 21 db (s plus n)/n min
300-kc Bandwidth	AM: 8 μ v input, modulated 50%, produces 10 db (s plus n)/n min FM: 8 μ v input, modulated at 1 kc with 100-kc deviation, produces 21 db (s plus n)/n min
2-mc Bandwidth	AM: 22 μ v input, modulated 50%, produces 10 db (s plus n)/n min FM: 24 μ v input, modulated at 1 kc with 750-kc deviation, produces 21 db (s plus n)/n min
Band A and Band B Output Stability	
20-kc/75-kc/300-kc Bandwidths	AM: Output varies less than 3 db for input range of 2 to 10,000 μ v FM: Output varies less than 2 db for input range of 1.5 to 10,000 μ v
2-mc Bandwidth	AM: Output varies less than 4 db for input range of 4 to 10,000 μ v FM: Output varies less than 4 db for input range of 4 to 10,000 μ v
Band C and Band D Output Stability	
20-kc/75-kc/300-kc Bandwidths	AM: Output varies less than 4 db for input range of 4 to 10,000 μ v FM: Output varies less than 2 db for input range of 3 to 10,000 μ v
2-mc Bandwidth	AM: Output varies less than 4 db for input range of 8 to 10,000 μ v FM: Output varies less than 4 db for input range of 8 to 10,000 μ v
Outputs from 20-kc/75-kc/300-kc Bandwidth	

Table 1-1. AN/URR -52A Panoramic Data Receiving Set, Specifications (Cont'd)

Audio Amplifier Response	Within 3 db from 100 cps to 40 kc
Audio Output Power	0.1 watt, min, into 600-ohm load, balanced or unbalanced
Video Amplifier Response	Within 3 db from 50 cps to 150 kc
Video Output Level	5 volts rms across a 10K unbalanced load
IF Output	21.4 mc predetection output
Outputs from 2-mc Bandwidth	
FM Video Amplifier Response . . .	Within 3 db from dc to 1 mc
AM Video Amplifier Response . . .	Within 3 db from 30 cps to 1 mc
FM Video Output Level	0.7 volt rms across a 93-ohm load
AM Video Output Level	0.7 volt rms across a 93-ohm load
IF Output	21.4 mc predetection output
Fine Tuning	Operates on all bands
Beat Frequency Oscillator	Operates in CW mode on either 20-kc, 75-kc, or 300-kc IF bandwidths
AGC Monitor Amplifier Output	15 volts max, across 10K ohm load
Meter	Tuning
L.O. Output	50 mv across 50 ohm load
Frequency Display Section	
Sweep Linearity	Within 5% of sweep width
Sweep Width	Continuously adjustable from 0 to 3 mc
Sensitivity for Full Deflection . . .	2.5 μ v input to receiver
Resolution	Using approximately 100-kc sweep width, two signals 20-kc apart will be displayed with at least a 6-db valley between the peaks
Power Input	115/230 volts, 50-400 cps
Power Consumption	45 watts, approximately
Weight	35 lbs., approximately
Size	5.25-inches high x 19-inches wide x 15.5-inches deep

Figure 1-1

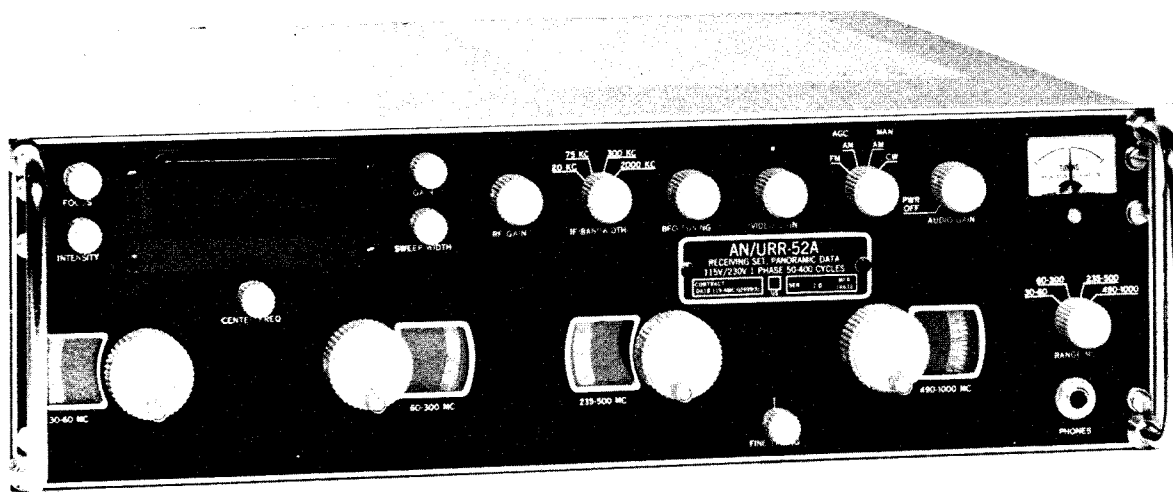


Figure 1-1. Type AN/URR-52A Panoramic Data Receiving Set, Front View

SECTION I

GENERAL DESCRIPTION

1.1 ELECTRICAL DESCRIPTION

The AN/URR-52A Panoramic Data Receiving Set provides a visual display and AM, FM, and CW reception of RF signals in the 30 to 1000-mc frequency range in four bands: 30-60 mc, 60-300 mc, 235-500 mc, and 490-1000 mc. The unit provides four IF bandwidths: 20 kc, 75 kc, 300 kc, and 2 mc. The bandwidth in operation is determined by the setting of the front-panel IF BANDWIDTH switch. A single AM video or FM video output from the IF strip in operation is available depending on the setting of the front-panel function switch. The 20/75/300-kc bandwidth IF strip contains a beat frequency oscillator (BFO) which operates in the CW position of the function switch when one of these three bandwidths is selected. A single FINE TUNING control provides vernier tuning of the tuner in operation; the switching of the four tuners is controlled by the RANGE switch on the front panel. The visual display of the signals is provided by a signal monitor which is an integral part of the unit. Pertinent specifications for the AN/URR-52A are included in Table 1-1; the tube and transistor complement is presented in Table 1-2.

1.2 MECHANICAL DESCRIPTION

The entire AN/URR-52A Panoramic Data Receiving Set is packaged in a cabinet which is 5.25-inches high, 19-inches wide, and 15.5-inches deep. The unit weighs approximately 35 pounds and operates from a 115/230 volt, 50-400 cps source; power consumption is approximately 50 watts.

1.2.1 As shown in Figure 1-1, the front panel of the AN/URR-52A contains: four tuning dials and knobs; FINE TUNING, AUDIO GAIN, VIDEO GAIN, BFO TUNING, and RF GAIN controls; function, RANGE, and IF BANDWIDTH switches; PHONES jack; and a tuning meter. These controls, switches and indicators are primarily associated with the receiver functions of the unit. The front panel additionally contains GAIN, SWEEP WIDTH, CENTER FREQ, INTENSITY, and FOCUS controls which are associated with the signal monitor section of the AN/URR-52A; the rectangular CRT screen is also installed in the front panel.

1.2.2 The input and output connections are made on the rear apron (see Figure 1-2). Terminal board TB1 provides AUDIO and AGC outputs and a voltage output corresponding to the band selected. The 30-1000 MC INPUT jack, J1, is an N-type connector. A three-pin Deutsch, quick-disconnect type of jack is used as the 115/230 V AC INPUT connector, J4. The remaining connectors are all BNC-type which are marked as follows: VIDEO OUTPUT J3, NB IF OUTPUT J17, WB IF OUTPUT J18, 30-60 MC LO OUTPUT A13J3, 60-300 MC LO OUTPUT A13J4, 500-1000 MC LO OUTPUT A14J3, and 235-500 MC LO OUTPUT A14J4. The rear apron also mounts the two ac line fuses, F1 and F2, power switch S4, and the permanently connected power cord.

1.2.3 The AN/URR-52A contains 15 subassemblies. Nine of these (the 30-60 mc tuner, 60-300 mc tuner, 235-500 mc tuner, 490-1000 mc tuner, 60-21.4 mc converter, local oscillator coupling networks, 2-mc IF strip, and 20/75/300 kc IF strip) are constructed on silver-plated brass chassis which have been gold-flashed to prevent tarnishing. Five of the assemblies are constructed on etched circuit boards: the video amplifier, audio amplifier, and low voltage power supply etched board assemblies mount plug-in fashion on top of the chassis while the high voltage power supply etched board is mounted on the inside of the side panel. The AGC monitor amplifier board mounts on the bottom of the main chassis. The fifteenth assembly contains the signal monitor circuitry and is constructed on a brass deck which is mounted above the main chassis. The signal monitor assembly includes the cathode ray tube and three etched circuit board subassemblies: the shaping amplifier and sweep oscillator, the IF output amplifier, and the horizontal sweep oscillator.

Figure 1-2

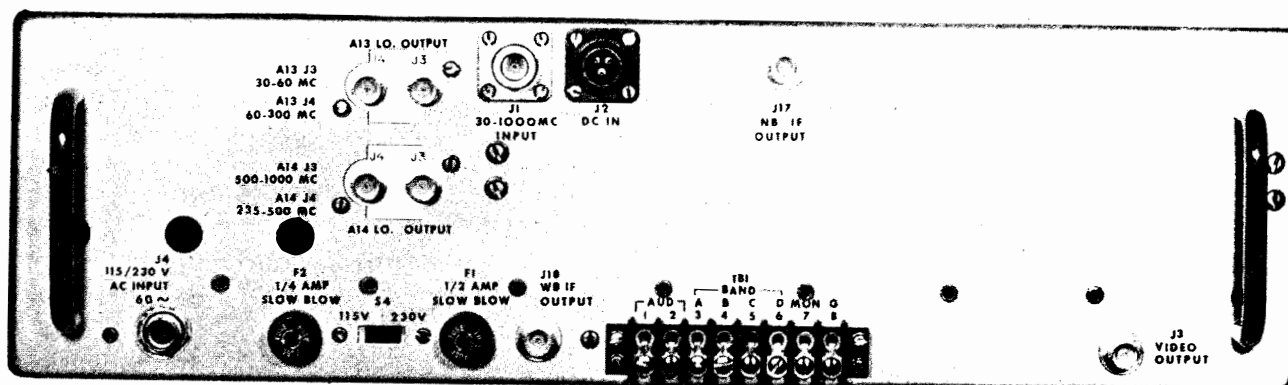


Figure 1-2. Type AN/URR-52A Panoramic Data Receiving Set, Rear View

Table 1-2. Type AN/URR-52A Panoramic Data Receiving Set, Tube and Transistor Complement

Ref. Desig.	Type	Function	Ref. Desig.	Type	Function
<u>Main Chassis</u>			<u>2-mc Bandwidth IF Amplifier (cont.)</u>		
Q1	2N1544	Voltage Regulator	A7Q3	2N2708	IF Amplifier
<u>30-60 mc Tuner</u>			A7A1Q1	2N706	1st Limiter
A1V1	6CW4	RF Amplifier	A7A1Q2	2N706	1st Limiter
A1V2	6CW4	RF Amplifier	A7A1Q3	2N706	2nd Limiter
A1V3	7587	Mixer	A7A1Q4	2N706	2nd Limiter
A1V4	6CW4	Local Oscillator	A7A1Q5	2N2270	DC Amplifier
<u>60-300 mc Tuner</u>			A7A1Q6	2N2270	DC Amplifier
A2V1	8058	RF Amplifier	A7A1Q7	2N2270	Emitter Follower
A2V2	8058	RF Amplifier	A7A2Q1	2N2270	AGC Amplifier
A2V3	7587	Mixer	A7A2Q2	2N2270	AGC Amplifier
A2V4	6CW4	Local Oscillator	A7A2Q3	2N2270	Emitter Follower
<u>235-500 mc Tuner</u>			A7A2Q4	2N2270	Emitter Follower
A3V1	7077	RF Amplifier	A7A2Q5	2N2270	Emitter Follower
A3V2	7077	RF Amplifier	<u>20/75/300-kc Bandwidth IF Amplifier</u>		
A3V3	7587	Mixer	A8Q1	2N2708	300-kc BW IF Amp
A3V4	7486	Local Oscillator	A8Q2	2N2708	75-kc BW IF Amp
<u>490-1000 mc Tuner</u>			A8Q3	2N2708	20-kc BW IF Amp
A4V1	7486	Local Oscillator	A8Q4	2N2708	300-kc BW IF Amp
A4V2	6CW4	IF Amplifier	A8Q5	2N2708	75-kc BW IF Amp
A4V3	6CW4	IF Amplifier	A8Q6	2N2708	20-kc BW IF Amp
<u>Signal Monitor Chassis</u>			A8Q7	2N2708	IF Amplifier
A5V1	3XP1	CRT	A8Q8	2N2708	IF Amplifier
A5A1Q1	2N706	Shaping Amplifier	A8Q9	2N697	Emitter Follower
A5A1Q2	2N706	Shaping Amplifier	A8Q10	2N697	Emitter Follower
A5A1Q3	2N706	Shaping Amplifier	A8Q11	2N697	AGC Amplifier
A5A1Q4	2N706	Shaping Amplifier	A8Q12	2N697	DC Amplifier
A5A1Q5	2N706	Mixer	A8Q13	2N1131	AGC Regulator
A5A1Q6	2N706	Sweep Oscillator	A8A1Q1	2N706	1st Limiter
A5A2Q1	2N706	IF Amplifier	A8A1Q2	2N706	1st Limiter
A5A2Q2	2N706	Mixer	A8A1Q3	2N706	2nd Limiter
A5A2Q3	2N706	IF Amplifier	A8A1Q4	2N706	2nd Limiter
A5A2Q4	2N706	IF Amplifier	A8A1Q5	2N697	Emitter Follower
A5A2Q5	2N706	Local Oscillator	A8A1Q6	2N697	Emitter Follower
A5A3Q1	2N489	Sawtooth Generator	A8A2Q1	2N706	BFO
A5A3Q2	2N2270	Sawtooth Generator	<u>Video Amplifier</u>		
A5A3Q3	2N697	Horizontal Amplifier	A9Q1	2N697	Video Amplifier
A5A3Q4	2N1925	Horizontal Amplifier	A9Q2	2N526	Video Amplifier
A5A3Q5	2N2270	Voltage Regulator	<u>Audio Amplifier</u>		
<u>60-21.4-mc Converter</u>			A10Q1	2N335	Audio Amplifier
A6V1	7587	IF Amplifier	A10Q2	2N335	Driver
A6V2	7587	IF Amplifier	A10Q3	2N2270	Power Amplifier
A6V3	7587	Mixer	<u>CRT Power Supply Regulator</u>		
A6V4	6CW4	Local Oscillator	A11V1	GV3A-1200	Voltage Regulator
<u>2-mc Bandwidth IF Amplifier</u>			<u>General Power Supply Regulator</u>		
A7Q1	2N2708	IF Amplifier	A12Q1	2N2270	Voltage Regulator
A7Q2	2N2708	IF Amplifier	A12Q2	2N1038	Voltage Regulator
			A12Q3	2N2270	Voltage Regulator
			A12Q4	2N2270	Voltage Regulator
			A12Q5	2N2270	Voltage Regulator
			<u>AGC Monitor Amplifier</u>		
			A15Q1	2N929	DC Amplifier
			A15Q2	2N3251	DC Amplifier

Figure 2-1

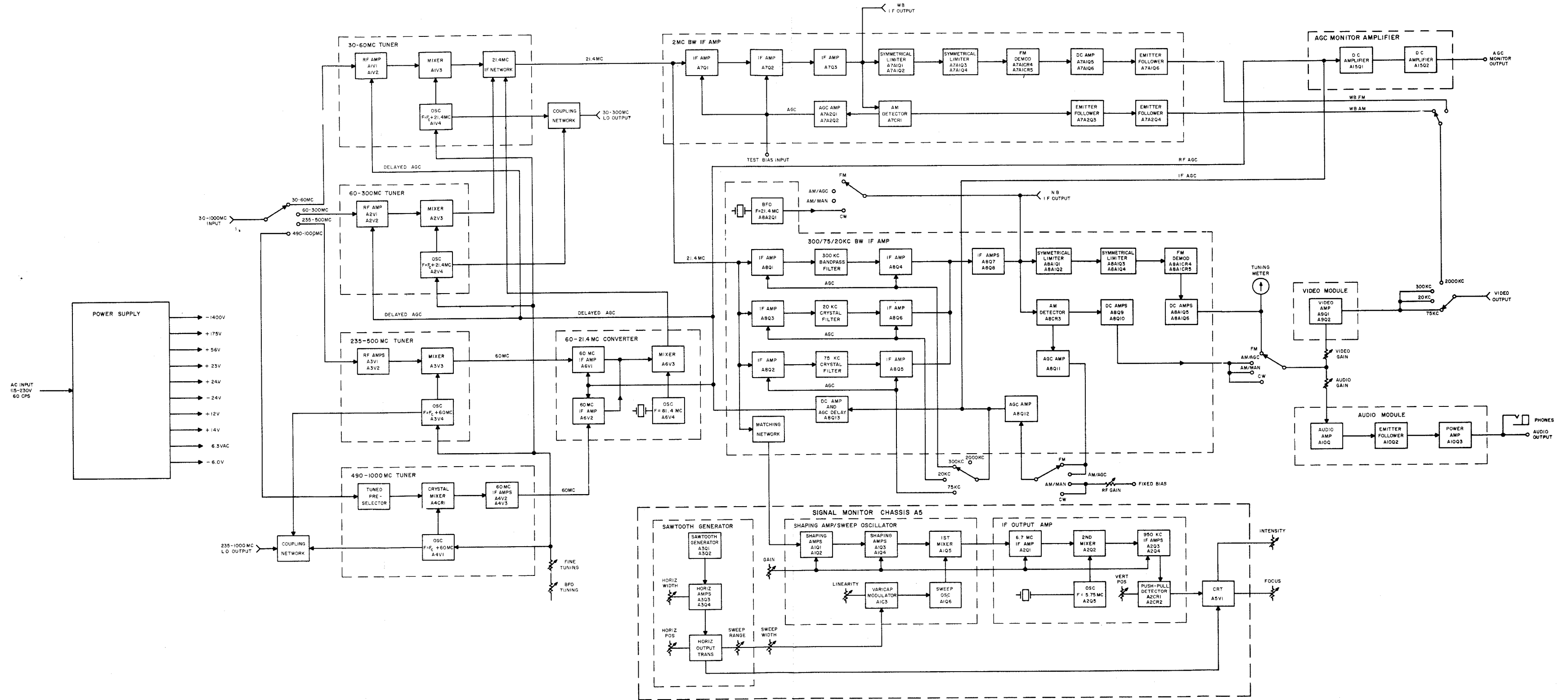


Figure 2-1. Type AN/URR-52A Panoramic Data Receiving Set, Functional Block Diagram

SECTION II

CIRCUIT DESCRIPTION

2.1 GENERAL

An over-all description of the AN/URR-52A Panoramic Data Receiving Set is presented in the following paragraphs using the functional block diagram Figure 2-1, and the schematic diagrams included at the back of this manual. Note that the unit numbering method is used for the electrical components, which means that parts on assemblies and subassemblies of the unit carry a prefix before the usual class letter and number of the item (such as A1R1 and A3C5). These prefixes are omitted on illustrations and in the text except in those cases where confusion might result from their omission.

2.2 FUNCTIONAL ANALYSIS

The AN/URR-52A contains a single antenna input for the entire 30 to 1000 mc frequency range. The input to the tuner in operation is connected to the antenna input by means of three coaxial relays under the control of the front panel RANGE switch. This same switch also removes source voltages to the three tuners which are not in operation. In addition the switch applies the voltage used by the coaxial relays to the rear apron terminal board TB1.

2.2.1 The incoming RF signal to the 490-1000-mc tuner is applied to a tuned preselector. The local oscillator in this tuner operates at a frequency 60-mc higher than the incoming carrier. The oscillator signal is injected into the tuned preselector where a crystal mixer heterodynes it with the incoming signal. The 60-mc difference frequency from the crystal mixer is amplified and then connected to the converter.

2.2.2 When the 235-500-mc tuner is in operation, the RF signal is amplified by stages A3V1 and A3V2 and then coupled to the mixer stage, A3V3. The local oscillator, A3V4, operates at a frequency 60-mc higher than the incoming carrier; the output signal from the oscillator is also applied to the mixer. The 60-mc IF from the mixer is coupled to the converter.

2.2.3 The converter contains two 60-mc IF amplifier stages, A6V1 and A6V2; stage A6V1 is associated with the 60-mc output from the 235-500-mc tuner and A6V2 with the 60-mc output from the 490-1000-mc tuner. The RANGE switch disables one stage or the other (or the entire converter) depending on the tuner selected. The output of A6V1 (or A6V2 if the 490-1000-mc tuner is in operation) is coupled to the mixer stage, A6V3. The local oscillator in the converter is crystal controlled at 81.4 mc. The mixer combines the incoming signal and the oscillator signal to produce a second IF at 21.4 mc which is connected to a common 21.4-mc IF output network on the 30-60 mc tuner.

2.2.4 The 60-300-mc tuner contains a cascode RF amplifier, a mixer stage, and a local oscillator stage which operates at a frequency 21.4-mc higher than the incoming carrier. The output from this tuner is a 21.4-mc IF which is connected to the common 21.4-mc IF output network located in the 30-60-mc tuner.

2.2.5 When the 30-60-mc tuner is selected for operation, the incoming signal from the antenna is applied to a cascode RF amplifier formed by stages A1V1 and A1V2. The output of the RF amplifier is coupled to a mixer stage, A1V3. The local oscillator stage, A1V4, operates 21.4-mc higher than the carrier frequency; the output from the oscillator is applied to the mixer stage. The 21.4-mc IF from the mixer is coupled to the IF output network.

2.2.6 The IF output network, located in the 30-60-mc tuner, receives the output from the mixer stages in the 30-60-mc tuner, 60-300-mc tuner and 60-21.4-mc converter, depending on the setting of the RANGE switch. This network provides impedance transformation to match the output of the tuners to the input of the IF amplifiers.

2.2.7 The 21.4-mc IF from the low band tuner output network is simultaneously applied to the input of the 2-mc bandwidth IF amplifier, the input of the 20/75/300-kc bandwidth IF amplifier, and, through a resistive pad, to the input of the signal monitor assembly.

2.2.8 The 2-mc bandwidth IF strip contains three stages of amplification, A7Q1 through A7Q3. The signal at the

CIRCUIT DESCRIPTION

output of the third IF amplifier is coupled to an AM detector, to symmetrical limiter stages and to the rear apron WB IF OUTPUT jack. The output of the AM detector, through emitter followers, is connected through two coaxial relays to the rear apron VIDEO OUTPUT jack. The output from the symmetrical limiter stages is applied to an FM discriminator. A dc amplifier receives the video output from the discriminator. The output signal from the dc amplifier is applied through an emitter follower and two SPDT relays to the rear apron VIDEO OUTPUT jack. The first coaxial relay to receive the AM or FM video signals from the 2-mc IF strip is controlled by the front panel function switch. Placing the switch in the FM position energizes the relay. The signal is then connected to a second relay which is controlled by the IF BANDWIDTH switch. A two stage AGC amplifier within the strip provides a gain control voltage which is applied to the first and second IF amplifier stages.

2.2.9 The 20/75/300-kc bandwidth IF strip contains three paths through which the signal can be conducted to subsequent stages in the unit. All three paths are similar, each containing two IF amplifiers separated by bandpass filters. The circuits in two paths are disabled by the IF BANDWIDTH switch while the circuits in the third path are activated, depending on whether this switch is placed in the 20 KC, 75 KC or 300 KC position. The bandpass filter in the 300-kc bandwidth path is conventional LC circuit while crystal filters are used in the 20 kc and 75 kc paths. The signal out of the path in operation receives additional amplification in stages A8Q7 and A8Q8 before application to the limiters, AM detector and NB IF OUTPUT jack. From the detector, the AM video signal is connected through two emitter followers to an AGC amplifier (A8Q11, A8Q12 and A8Q13). The video signal from the emitter followers is applied through the function switch to the video amplifier module. The voltage at the output of the AGC amplifier is used to control the gain of several stages in the receiver when the function switch is in the FM or AM/AGC positions. The AGC signal is also applied to the input of the AGC monitor amplifier, A15. This subassembly contains two dc amplifier stages (A15Q1, A15Q2) which amplify the AGC voltage and apply it to terminal seven of TBI.

2.2.10 The output of the symmetrical limiter stages in the 20/75/300-kc bandwidth IF strip is applied to an FM discriminator circuit which includes A8A1CR4 and A8A1CR5. The output of the discriminator is amplified and applied to an emitter follower. The FM video signal from the emitter follower is used to drive the TUNING meter and is also connected to the FM position on the function switch. The AM video signal from this IF strip is connected to the AM/AGC, AM/MAN, and CW positions of the function switch. Thus, the signal at the arm of the function switch is either the FM video output or the AM video output as determined by the switch setting.

2.2.11 The video signal from the arm of the function switch is applied through the VIDEO and AUDIO gain controls to the video and audio amplifiers, respectively. The output from the video amplifiers (A9Q1 and A9Q2) is connected to an SPDT relay which applies it to the rear apron VIDEO OUTPUT jack, J3.

2.2.12 The audio amplifier receives its input through the AUDIO GAIN control. The module contains an amplifier (A10Q1), emitter follower (A10Q2) and a power amplifier (A10Q3). The audio output from the module is available at the PHONES jack on the front panel and at the terminal strip on the rear apron.

2.2.13 The output of the local oscillator in the four tuners is connected to one of two coupling networks. One network couples the outputs of the 30-60-mc tuner local oscillator and the 60-300-mc tuner local oscillator to rear-apron jacks marked 30-60 MC LO OUTPUT and 60-300 MC LO OUTPUT. The outputs of the oscillators in the remaining two tuners are similarly coupled through a second coupling network to the 235-500 MC LO OUTPUT and 500-1000 MC LO OUTPUT jacks.

2.2.14 The front-panel FINE TUNING and BFO TUNING controls are used to vary the frequency of the local oscillator in operation. The BFO stage (A3A2Q1) is crystal controlled at 21.4 mc. The BFO is activated when the function switch is placed in the CW position; the 21.4-mc output of the BFO is injected into the AM detector in the multiple-bandwidth IF strip. Since the BFO is crystal controlled, it is necessary to vary the frequency of the local oscillator in the tuner in operation in order to vary the pitch of the CW-audio signal.

2.2.15 The signal monitor assembly contains the cathode ray tube (CRT), and the sweep generator, IF output amplifier, and shaping amplifier/sweep oscillator subassemblies. The sawtooth generator section provides the waveform which is used to control both the horizontal deflection on the CRT and the frequency excursions of the sweep oscillator. The fact that this single waveform controls the action in both of these circuits explains how synchronization is obtained between the various signals in the incoming RF spectrum and their position on the CRT trace.

2.2.16 The sawtooth waveform originates in A3Q1 and A3Q2 and associated circuitry. The sawtooth wave is ampli-

fied by stages A3Q3 and A3Q4 and then connected to the horizontal output transformer. Control of the CRT trace width is provided by a width potentiometer which operates in conjunction with the horizontal amplifiers. A horizontal position control, connected in the horizontal transformer circuit, provides a means of centering the trace on the CRT screen. The sawtooth waveform is connected from the horizontal transformer to the deflection plates in the CRT, and through the sweep range and sweep width controls to the sweep oscillator.

2.2.17 The input to the signal monitor is the 21.4-mc IF output from the tuner in operation. This signal is applied to the shaping amplifiers, A1Q1 through A1Q4. These shaping amplifiers provide a response curve which adds to the tuner response curve and provides an essentially flat 3-mc bandwidth. The signal from the shaping amplifiers is coupled to the mixer stage, A1Q5; this stage also receives the output of the sweep oscillator. The sweep oscillator, A1Q6, has a normal resting frequency of 28.1 mc, which is 6.7-mc higher than the incoming signal. However, using maximum sweep width, an incoming signal at 19.9 mc and an oscillator frequency of 26.6 mc combine in the mixer to produce 6.7 mc (the first IF), or an incoming 22.9 mc and an oscillator frequency of 29.6 mc also combine with 6.7 mc as a resultant. These two conditions are noted in order to explain the relationship between the signal monitor IF, the sweep oscillator frequency, and the position of a signal in the incoming spectrum.

2.2.18 The sawtooth waveform produced in the sawtooth generator section is applied to a varicap modulator (A1C3) in the shaping amplifier/sweep oscillator section. The varicap modulator reacts to the impressed sawtooth wave and causes the sweep oscillator to move up and down in frequency in conformance with the sawtooth waveform. Therefore, a 6.7-mc output is produced from the mixer as the sweep oscillator changes in frequency and differs from a signal in the input spectrum by exactly 6.7 mc. Since the horizontal movement of the trace on the CRT is controlled by this same sawtooth wave, the signals out of the first mixer ultimately appear as vertical pips across the face of the tube in a manner which corresponds to their original position in the input spectrum.

2.2.19 The IF output amplifier section of the signal monitor chassis contains a 6.7 mc IF amplifier (A2Q1) followed by a second mixer stage (A2Q2). A crystal-controlled oscillator in this section, A2Q5, produces a 5.75-mc output which is also applied to the second mixer. The 950-kc second IF from the mixer is amplified in A2Q3 and A2Q4 and then applied to a push-pull detector. The output from this detector consists of two equal signals of opposite polarity which are applied to the vertical deflection plates of the CRT.

2.2.20 The front-panel GAIN control, associated with the signal monitor, controls the gain of the shaping amplifiers and all IF amplifiers. Controlling the gain of these stages sets the amplitude of the pips on the screen, assuming a constant input signal level. The linearity control adjusts circuit parameters in the varicap modulator in order to provide a linear sweep on the CRT. The vertical position of the trace on the CRT screen is adjusted by the vertical position control, which functions in conjunction with the push-pull detector circuitry.

2.2.21 The power supply for the receiving system is self-contained and is designed to operate from a primary power source of 115/230 volts, 50-400 cps. All voltages required by the unit are developed in the power supply.

2.3 30-60 MC RF TUNER

The type 7165 tuner covers the 30 to 60 mc range. The tuner schematic is shown in Figure 6-1; the reference designation prefix is A1.

2.3.1 RF Amplifier. - The RF amplifier consists of two type 6CW4 Nuvistor triodes, V1 and V2, in a cascode amplifier configuration. Input tuning is accomplished by inductor L2A, one section of a four-section inductuner, in the grid circuit of V1. Output tuning is accomplished by inductor L2B, another inductuner section in the plate circuit of V2. Neutralization is achieved by feeding a small out-of-phase signal from the plate to the grid of V1 through broadband transformer T1. To extend the dynamic range of the receiver, the RF amplifier signal handling capability is improved by applying a delayed gain control voltage derived in the multiple-bandwidth IF strip and fed to the grid of V1 through resistors R2 and R3.

2.3.2 Local Oscillator. - The local oscillator is a type 6CW4 Nuvistor triode, V4, operated in a Colpitts configuration with the plate at RF ground. The tank circuit is tuned by inductor L2D, a section of the inductuner. The frequency of operation is maintained 21.4-mc above the carrier. The output of the oscillator is coupled to the grid of the mixer through capacitor C18 and to the LO output jack through capacitor C44.

CIRCUIT DESCRIPTION

2.3.3 Mixer. - The mixer, V3, is a type 7587 Nuvistor tetrode with its input circuit tuned by inductuner section L2C. Both the signal from the RF amplifier and the output of the local oscillator are applied to its grid, and the two signals are mixed to produce a 21.4-mc IF. The point TP1, decoupled from the grid, can be used to check oscillator injection and also to check RF alignment by means of an oscilloscope. The mixer output is a plate circuit pi-network formed by capacitor C22 as one leg, the variable inductor L5, and the mixer plate capacitances plus cable capacitance as the other leg. This network also serves as the mixer output network for the 60-21.4 mc converter mixer and the 60-300 mc tuner mixer. The common output to the IF strip is taken through blocking capacitor C24 and jack J3.

2.4 60-300 MC RF TUNER

The type 7164 tuner covers the frequency range of 60 to 300 mc. It contains an RF amplifier, mixer, and local oscillator stages. A schematic diagram of the tuner is included as Figure 6-2; prefix the parts in this assembly with A2.

2.4.1 RF Amplifier. - The tuner employs type 8058 Nuvistor triodes, V1 and V2, in a cascode configuration as the RF amplifier. The input to the tuner is applied through jack J1. The input is tuned by inductor L1A, one section of a four-section inductuner. The amplifier is neutralized by the use of a bridge arrangement which balances the plate-to-grid capacitance of V1. The arms of the bridge are: capacitor C3, the combination of capacitors C4 and C5, the input capacitance of V1, and the plate-to-grid capacitance V1. The gain of the RF amplifier is varied by a delayed gain control voltage which is derived in the multiple-bandwidth IF strip and applied to the stage through resistor R3.

2.4.2 Local Oscillator. - The local oscillator stage, V4, employs a type 6CW4 Nuvistor triode in a Colpitts configuration. It is tuned by L1D, a section of the inductuner, and maintained at a frequency 21.4-mc higher than the incoming RF carrier. Tank circuit capacitors C25 and C26 have a negative temperature coefficient to compensate for frequency drift due to ambient temperature change. The output from the oscillator is coupled through capacitor C20 to the mixer control grid circuit, and from the divider formed by capacitors C22 and C42 to the LO output.

2.4.3 Mixer. - The mixer stage, V3, utilizes a type 7587 Nuvistor tetrode. The interstage coupling network between the RF amplifier second stage and the mixer input is tuned by inductors L1B and L1C, two sections of the inductuner. The mixer stage heterodynes the incoming RF signal and the local oscillator signal to produce a 21.4-mc IF signal in the plate circuit. The 21.4-mc signal in the plate circuit is coupled through blocking capacitor C39 and jack J2 to the common IF output network located in the 30-60 mc tuner.

2.5 235-500 MC RF TUNER

The operation of the type 7162 tuner is explained in the following paragraphs. Refer to the schematic diagram, Figure 6-3 and note that the reference designation prefix for this subassembly is A3.

2.5.1 RF Amplifier. - The RF amplifier consists of two type 7077 ceramic triodes, V1 and V2, both in grounded-grid configuration. The nominal input impedance at jack J1 is 50 ohms. The input circuit is a pi-network matching the antenna to the input of the first stage, V1. Interstage coupling and coupling from the second stage to the mixer is by means of double-tuned circuits. Tuning within the RF amplifier is by inductors L3A, L3B, L3C, L3D, and L3E, five sections of a six-section inductuner. An improvement in stability is obtained by returning the cathode of V1 and V2 to a -6.3 volt regulated source through resistors R1 and R3.

2.5.2 Local Oscillator. - The local oscillator, V4, is a type 7486 ceramic triode operated in a Colpitts configuration. The tank circuit is tuned by inductor L3F, a section of the inductuner. The operating frequency is maintained 60 mc above the carrier. Increased frequency stabilization is obtained by the use of a regulated -6.3 volt filament supply. The oscillator's signal is coupled to the low band tuner mixer through capacitor C28. Fine tuning and BFO pitch control are accomplished by a voltage-variable capacitor, CR1, which varies the capacitance of the tank circuit. A voltage-variable capacitor is a semi-conductor device whose effective capacitance varies with the voltage across it. The capacitance of CR1 is controlled by a dc voltage applied through resistors R13 and R15. The level of this voltage is controlled by the FINE TUNING potentiometer and the BFO TUNING potentiometer.

2.5.3 Mixer. - The mixer, V3, is a type 7587 Nuvistor tetrode with its input circuit tuned by inductuner section L3E. Both the signal from the RF amplifier and the output of the local oscillator are applied to its grid and the two signals are mixed to produce a 60-mc IF. An oscilloscope can be connected at test point TP1 in the mixer grid circuit to check oscillator injection and also to check the RF response. The mixer output is taken from the tuner

and applied to the converter through a double-tuned coupling whose primary is inductor L14 and whose secondary is inductor A6L1 in the converter. Capacitor A6C1 establishes the degree of coupling between L14 and A6L1.

2.6 490-1000 MC RF TUNER

The type 7163 tuner consists of a preselector, local oscillator, mixer, and two IF amplifiers. The reference designation prefix is A4; a schematic diagram of the tuner is presented in Figure 6-4.

2.6.1 Quadruple-Tuned Preselector. - The RF input circuit in the 490-1000 mc tuner presents an impedance designed for a 50-ohm antenna. The signal is coupled from the input to the quadruple-tuned preselector. Tuning is accomplished by four tuned cavities. The signal passes from cavity to cavity through coupling irises. The cavities are resonated to the carrier frequency by changing the capacitance between the inner conductor and ground. This action effectively produces quarter-wave tuning and is analagous to coaxial-line cavity tuning in which the resonant frequency is determined by the position of the plunger. From the fourth cavity, inductor L6 couples the signal to the crystal mixer.

2.6.2 Local Oscillator. - The local oscillator, V1, is a type 7586 ceramic triode operated as a modified Colpitts oscillator. The tank circuit is a length of transmission line. Capacitor C1E, ganged with the high band tuning control, loads the transmission line so as to make its effective length one-half wavelength at the desired frequency. The oscillator is operated at a frequency 60 mc above the carrier. Increased frequency stabilization is obtained by the use of a regulated -6.3 vdc filament supply. Fine tuning and BFO pitch control are accomplished by the use of a voltage-variable capacitor, CR2, in the same manner used for fine tuning of the other three tuners (see paragraph 2.5.2). The oscillator signal to the crystal mixer is picked up by the inductor L6 whose lower end reaches through a shield into the chamber where the oscillator stage is mounted.

2.6.3 Crystal Mixer. - The mixer, CR1, is a type 1N82A crystal diode. It receives both the incoming carrier and the oscillator injection signal through inductor L6. Jack J4 is present to facilitate checking the oscillator injection level. The mixer output, a 60-mc IF signal, is applied to the 60-mc IF low-noise amplifier within the tuner.

2.6.4 60-mc IF Amplifier. - To compensate for the lack of gain in the quadruple-tuned preselector, the high band tuner has a 60-mc IF amplifier consisting of two type 6CW4 triodes, V2 and V3, in cascode configuration. Coupling from the mixer is through inductors L13, L15, and capacitor C21. The first stage is neutralized by inductor L16. The output from the amplifier is through a double-tuned circuit, the primary of which is inductor L17 and the secondary of which is inductor A6L2 located in the 60-21.4 mc converter. Capacitor A6C2 fixes the degree of coupling between L17 and A6L2.

2.7 60 TO 21.4-MC CONVERTER

The type 7120 converter contains 60-mc IF buffer amplifiers, a mixer, and an 81.4-mc crystal-controlled oscillator. As shown on the schematic diagram (Figure 6-9) of the converter, A6 is used as the reference designation prefix.

2.7.1 60-mc IF Amplifiers. - The converter uses type 7587 Nuvistor tetrodes (V1 and V2) to amplify the incoming 60-mc signal from the 235-500 mc tuner or the 490-1000 mc tuner. V1 operates in conjunction with the 235-500 mc tuner and V2 with the 490-1000 mc tuner. As the RANGE control switches the source voltages to the tuners, it also switches B-plus to these two stages in the converter. Plate voltage for V3 and V4 is supplied through CR1 or CR2, one of which is forward biased by the voltage applied to C8 or C11. The output from the stage in operation is applied through a double-tuned coupling (L3 and L4) to the grid circuit of the mixer stage.

2.7.2 81.4-mc Oscillator. - The oscillator, V4, utilizes a type 6CW4 Nuvistor triode. It is crystal controlled and operates at a frequency of 81.4 mc. Feedback to sustain oscillation is from grid to plate through capacitor C25. The output signal is coupled through capacitor C21 to the mixer.

2.7.3 Mixer and IF Output Network. - The mixer stage employs a type 7587 Nuvistor tetrode. The 81.4 mc output from the oscillator is coupled to the control grid. The mixer heterodynes this signal with the 60-mc incoming IF signal to produce a 21.4 mc second IF. The output from the plate of the mixer is taken through capacitor C29 to the common IF output network located in the 30-60 mc tuner.

2.8 BANDSWITCHING

Bandswitching is accomplished by switching the dc voltage sources to the tuners and the converter (see Figure 6-18). The RANGE switch, S1, is divided into four sections. These four sections control the lamps behind the tuning dials, the coaxial relays which switch the tuner inputs, and the regulated and unregulated power supply voltages to the tuners and converter. Three coaxial relays are incorporated in order that a single antenna input may be used to supply all four RF tuners. Switch section S1AW applies +23 volts to relays K1, K2, or K3 depending on the switch setting. As shown on the main chassis schematic diagram (Figure 6-18) relay K1 is energized when the RANGE switch is placed in the 30-60 MC position. The RF input to tuner A1 is through relay K2 (J14 to J16), and relay K1 (J11 to J12). Selection of the 60-300 MC range de-energizes K1 and the signal path is through relay K2 (J14 to J16) and K1 (J11 to J13) to the 60-300 mc RF tuner. Switching to the 235-500 MC position energizes relays K2 and K3 feeding the input signal through relay K2 (J14 to J15) and relay K3 (J20 to J19). Diode CR2 is forward biased providing a dc path to K2. Selection of the 490-1000 MC range de-energizes relay K2, energizes relay K3 and reverse biases diode CR2. The signal path is through relay K2 (J14 to J15) and relay K3 (J20 to J21) to the high band tuner. RANGE switch, S1, also applies the relay voltage to corresponding pins on terminal board TBI.

2.9 20/75/300-KC BANDWIDTH IF STRIP

The circuits in the 20/75/300-kc bandwidth IF strip are explained in the following paragraphs using the schematic diagram, Figure 6-11. Parts in this IF strip carry the reference designation prefix A8. The 21.4-mc input is connected to the IF strip through input jack J1. An impedance matching network consisting of resistors R1, R2, and R3 feeds the input signal to the SM OUTPUT jack J2. The IF BANDWIDTH switch determines if the signal is passed through the 20 kc, 75 kc, or 300 kc bandpass amplifiers by supplying base bias from the AGC amplifier to the IF amplifiers for the selected bandwidth.

2.9.1 300-kc Bandwidth IF Amplifiers. - Transistors Q1 and Q4 are the first and second IF amplifiers for the 300-kc bandwidth. The bandwidth is determined by the interstage coupling between Q1 and Q4, a double-tuned, over-coupled network. The tuned circuit in the collector of Q1 consisting of C22, C23, and L4 has the junction of C22 and C23 grounded to provide a signal voltage at the junction of C23 and L4 which is out of phase with the input signal. This voltage is coupled back to the base of Q1 through C14 to neutralize the stage. This same method of neutralization is used by the second IF amplifier, Q4. The gain of both stages is controlled by the AGC amplifier when the function switch is in the FM or AM/AGC positions, and by the RF GAIN control when the function switch is in AM/MAN or CW positions. Placing the IF BANDWIDTH switch in the 75 KC position or the 20 KC position removes base bias from both Q1 and Q4, disabling these stages.

2.9.2 75-kc and 20-kc Bandwidth IF Amplifiers. - Transistors Q3 and Q6 are the first and second IF amplifiers for the 20-kc bandwidth. The 20-kc bandpass is determined by crystal filter FL2 in the coupling network between Q3 and Q6. The tuned collector load of Q6 is shared with Q5 and Q4. Neutralization of Q6 is accomplished by feeding back an out-of-phase signal from the junction of C43 and L9 through C44 to the transistor's base. Neutralization of Q3 is not necessary as the heavy loading of the crystal filter in the collector circuit insures that oscillation will not occur. Operation of the 75-kc bandwidth path is identical to the operation of the 20-kc path. The 75-kc path includes stages Q2 and Q5 and filter FL1.

2.9.3 Third and Fourth IF Amplifiers. - The third and fourth IF amplifiers, Q7 and Q8, are common to all three IF bandwidths. Double-tuned, over-coupled networks are used to connect the stages and as the output circuit of Q8. Both transistors are neutralized using the same method described for the 300-kc IF amplifiers. The output of Q8 is fed to the AM detector, CR3, and through a capacitive voltage divider to the FM demodulator and the narrow band (NB) IF output jack, J17, on the rear apron.

2.9.4 AM Detector and Output. - The 21.4 mc signal from the fourth IF amplifier is applied to the AM detector, CR3. Capacitors C65 and C68, and resistor R55 form a filter to eliminate the RF signal components from the output of the detector. The audio-video output from the detector is fed through cascaded emitter followers Q9 and Q10 to the AGC amplifier and to section S2A of the function switch. Series-connected silicon diodes CR1 and CR2 are used to compensate for the voltage drop across the base-emitter junction of silicon transistors Q9 and Q10. This refinement is included so that the AM video output will be zero volts with no signal input. Resistor R54 connects CR1 and CR2 to the plus 12-volt supply. Thus the junction of R54 and CR1 is clamped at 1.2 volt (0.6 volt drop across each diode). The base of Q9 is clamped at 1.2 volt through resistor R55 which compensates for the 0.6 volt drop across the base-emitter junction of each transistor. Note that the clamp voltage appears at both ends of the AM

detector, CR3, so that its operation is not affected.

2.9.5 FM Limiters. - The 21.4-mc signal from the IF amplifiers is fed to a symmetrical limiter stage formed by A1Q1 and A1Q2 from a capacitive voltage divider. The incoming signal swings about a dc level of approximately plus 3 volts established by base-bias resistors A1R1 and A1R2. Similar networks are in the base circuits of A1Q2, A1Q3, and A1Q4. Transistors A1Q1 and A1Q2 share a common emitter resistor, A1R3. Under no-signal conditions the combined emitter currents of the two transistors develops a voltage across A1R3 which approaches plus 3 volts. When a signal is applied to the base of A1Q1, the positive-going half cycle causes increased conduction through A1Q1 which increases the voltage drop across A1R3. This action causes the collector of A1Q2 to move rapidly toward the source voltage level. The negative-going half cycle of the incoming signal reverses the process, reducing the conduction through A1Q1, and increasing the conduction through A1Q2. The base of A1Q2 is held at RF ground potential by capacitor A1C2. Diodes A1CR1, A1CR2 and A1CR3 in the base circuit of A1Q1 prevent large positive-going signals from overloading the limiter, and large negative-going signals from back biasing the base-emitter junction of A1Q1. If the input signal exceeds approximately 7 volts peak-to-peak, Zener diode A1CR2 breaks down and clips positive-going excursions in excess of approximately 4 volts. Negative-going excursions in excess of approximately 4 volts forward bias A1CR3, shorting signal voltage greater than the clipping level to ground. Diode A1CR1 in series with A1CR2 blocks the Zener on negative excursions, preventing it from acting as an ordinary diode. The first limiter output is coupled to the second limiter through capacitor A1C3. Operation of the second limiter is identical to that of the first.

2.9.6 FM Discriminator and Output. - The FM discriminator is a modified Foster-Seeley circuit. Capacitor A1C5 couples the 21.4-mc signal from the second limiter to a resonant circuit consisting of capacitor A1C7, variable inductor A1L3, and the primary of the discriminator transformer, A1T1, which is tuned to the same frequency. An inductive voltage divider is formed by A1L3 and the primary of A1T1, with only a very small percentage of the limiter output appearing across the transformer primary. Capacitor A1C8 couples the reference voltage to the secondary of A1T1. Capacitive center-tapping of the secondary through A1C9 and A1C10 makes it possible to obtain a high degree of discriminator balance unaffected by coil characteristics or the position of the tuning slug. The FM video output from the discriminator is direct coupled to cascaded emitter followers A1Q5 and A1Q6. The output from A1Q6 is coupled to the tuning meter and, through section S2A of the function switch, to the AUDIO GAIN and VIDEO GAIN controls.

2.9.7 Beat Frequency Oscillator. - The BFO is a subassembly on the IF strip; its complete reference designation is A8A2. In the CW mode of operation a 21.4 mc signal from the BFO is injected into the AM detector through capacitor C64. This signal beats with the IF frequency to produce an audible note. The BFO is placed in operation by the application of plus 24 volts through switch section S2C on the main chassis. The plus 24 volts biases diode CR2 in the forward direction, which applies the dc voltage to the collector of transistor Q1. The BFO is a self-regulating Colpitts oscillator. The output signal is derived from the feedback divider circuit consisting of capacitors C1 and C3. With the BFO on, diode CR1 is back biased and has little effect upon the circuit. When switch S2C is moved to any position other than the CW position, minus 24 volts is applied to CR1 and CR2. Diode CR1 is now forward biased and CR2 is back biased. When CR1 is conducting, a short circuit is effectively placed across crystal Y1. If this action were not taken, the crystal would be coupled to the IF strip through capacitors C3 and C64. This could cause undesirable effects in the IF response curve. Back biasing CR2 protects transistor Q1 from having the negative voltage applied to its collector.

2.9.8 AGC Amplifier. - The AGC amplifier controls the gain of two of the RF tuners, the converter and the 20/75/300-kc IF strip when the function switch is in the FM or AM/AGC position.

2.9.8.1 Input to the AGC amplifier is the AM video output from the emitter of Q10. Resistor R58 and capacitor C69 form a modulation filter to remove audio variations from the dc component present at the AM detector output and at the emitter of Q10. A second modulation filter consists of resistor R62 and capacitor C70 in the collector circuit of Q11. Transistor Q11 is cut-off under no-signal conditions. As the output from the AM detector increases in the positive direction, Q11 begins to conduct. The negative-going voltage on the collector is fed to transistor Q12 through section S2A of the function switch. AGC voltage for the IF strip is obtained at the emitter of Q12. With no signal input this point is approximately plus 10 volts. As the base of Q12 goes less positive, as a result of the collector voltage of Q11 decreasing, the emitter also becomes less positive, thus decreasing the gain of the IF strip. The IF AGC voltage is also coupled to the base of A15Q1 in the AGC monitor amplifier.

CIRCUIT DESCRIPTION

2.9.8.2 AGC voltage for the two tuners and the converter is obtained from the collector of Q13, a PNP transistor. This transistor is biased to saturation until the tuner signal-to-noise ratio reaches approximately 30 db, thus providing a delayed AGC voltage for the tuner. Until this signal level is reached, the tuner AGC output at the junction of resistors R66 and R67 is approximately zero and the tuner in use operates at maximum gain. This point is clamped by diode CR4 to prevent it from ever going more positive than 0.5 volt. When the signal-to-noise ratio reaches the proper level, the positive-going collector voltage of Q12 takes control of Q13, biasing it out of saturation. As the input signal strength increases, the collector of Q12 goes more positive, further decreasing the conduction through Q13. This results in the tuner AGC voltage increasing in the negative direction from zero volts towards the minus 24-volt supply. Once the tuner AGC voltage is obtained, the IF AGC voltage remains fairly constant so that the receiver gain is now controlled by the tuner AGC for stronger signals. The delayed AGC voltage for the tuners is also coupled to the input of the AGC monitor amplifier, A15.

2.10 AGC MONITOR AMPLIFIER

Figure 6-17 is the schematic diagram for the AGC monitor amplifier; its reference designation prefix is A15. Incoming RF and IF AGC voltages are applied to the amplifier through resistors R1 and R2 respectively. Zener diodes CR1 and CR2 are forward biased from the -24 volt supply through resistors R3 and R4. These series connected diodes provide the necessary voltage drop to establish the proper bias level at the base of dc amplifier Q1. Under no signal conditions the base of Q1 is held at approximately -8.0 volts. Potentiometer R3 is adjusted so that the output of the amplifier is zero volts with no signal input. The collector of Q1 is dc coupled to the base of Q2, a PNP transistor. When AGC is being applied, the base of Q1 goes more positive causing the stage to conduct harder. The increased voltage drop across R5 causes Q2 to conduct less. As a result, the voltage at the collector and at the output of the amplifier increases in the negative direction toward the -24-volt supply. The amplifier is designed so that a change of approximately 5.0 volts at the input will cause a change of approximately 15 volts at the output. This output signal voltage is connected to terminal seven of TBL.

2.11 2-MC BANDWIDTH IF STRIP

Figure 6-10 is the schematic diagram for the 2-mc IF strip. Components in the strip carry the reference designation prefix A7. This IF strip contains its own AGC circuit, limiter stages, FM discriminator, and AM and FM output stages.

2.11.1 IF Amplifiers. - There are three stages of IF amplification: transistors Q1, Q2, and Q3. The 2-mc IF bandwidth is determined by interstage coupling. Each stage is overcoupled to produce a dip in the over-all IF response curve. This is to compensate for the peaked output from the tuners so that the over-all response will be essentially flat over the 2-mc bandwidth. The C4, C5, L2 tuned circuit in the collector of Q1 has the junction of C4 and C5 grounded to provide a signal voltage at the junction of C5 and L2 which is out of phase with that at the input. This voltage is coupled back to the base through capacitor C2 to neutralize the stage. Both the second and third IF amplifiers use this same method of neutralization. The gain of Q1 and Q2 is controlled by A2Q2, the AGC regulator transistor. Output from the third IF amplifier, Q3, is fed to the AM detector and, through a capacitive voltage divider, to the limiter stages, and wide band (WB) IF output jack, J18, on the rear apron.

2.11.2 AM Detector and Output. - Diode CR1 detects the AM signal and feeds it to emitter follower stage, A2Q3. The output of A2Q3 is ac coupled through capacitor A2C2 to a second emitter follower, A2Q4. Transistor A2Q4 provides a low-impedance output to the AM VIDEO output jack, J5, on the rear apron of the receiver.

2.11.3 FM Limiters and Discriminator. - The FM limiter and discriminator circuits are nearly identical to those in the 20/75/300-kc IF strip except for component values. For a discussion of the operation of these circuits refer to paragraphs 2.9.5 and 2.9.6. The video output from the Foster-Seeley discriminator is direct coupled to cascaded emitter followers A1Q5, A1Q6, and A1Q7 which provide high current amplification to drive a low-impedance load.

2.11.4 AGC Amplifier. - The AGC amplifier consists of a dc amplifier, A2Q1, and a series regulator, A2Q2. Input voltage to A2Q1 is obtained from the emitter of A2Q3. Resistor A2R1 and capacitor A2C1 form a filter which removes the modulation from the signal so that A2Q1 is supplied with a dc voltage which varies in proportion to the average level of the input carrier signal. This voltage is amplified by A2Q1 which, in turn, controls the current flow through A2Q2. The series regulator is connected between the plus 12-volt supply and the base-bias circuits of the first and second IF amplifier stages. If, for example, the detector output is increasing in the positive direction, the control voltage on the base of A2Q2 goes more negative, reducing the positive base bias on the first and second

IF stages. This, in turn, decreases the gain of the IF strip. When the average detector output is increasing in the negative direction, the control voltage on the base of A2Q2 goes more positive, resulting in increased IF gain.

2.12 VIDEO AMPLIFIER

The type 7312 video module amplifies either the AM or the FM output of the multiple-bandwidth IF strip as determined by the setting of the function switch. The reference designation prefix for this assembly is A9; a schematic diagram of the amplifier is shown in Figure 6-12. If the function switch is in the FM position, the FM video signal is applied to the VIDEO GAIN and AUDIO GAIN controls. In any of the other three function switch positions, the AM video signal from the multiple-bandwidth IF strip is applied through switch section S2B to the gain controls. The AM or FM video signal from the arm of potentiometer R9 enters the video amplifier on pin 1 and is applied to the base of Q1 through capacitor C1. The video signal is amplified by Q1 and Q2 and coupled to the output through capacitor C2. This signal is coupled to relay K6 which applies it to the rear apron VIDEO OUTPUT jack, J3. The relay is energized when the function switch is placed in the 2000 KC position.

2.13 AUDIO AMPLIFIER

The type 7400A audio amplifier (see Figure 6-13) is contained on a separate module and uses three-dc coupled transistors, Q1, Q2, and Q3. The first stage is a conventional voltage amplifier in a common emitter configuration. The input signal from the AUDIO GAIN potentiometer, R10, is applied to this stage through capacitor C1 and resistor R1. The second stage is an emitter follower used to match the high output impedance of the first stage to the low input impedance of the third stage, the power amplifier. An improvement in stability is obtained by a coupling network between the second and third stages. This coupling is made up of capacitor C2 and resistor R8 in parallel. Resistor R7 provides direct signal feedback from the third to the first stage. Resistor R10, in the emitter circuit of the output stage, provides additional stability. The output is through transformer T1 which forms the third stage collector load.

2.14 GAIN CONTROL SYSTEM

The over-all system of gain control used within the receiver sections of the receiving system can be understood using the block diagram, Figure 2-1, or the main chassis schematic diagram, Figure 6-18.

2.14.1 Both delayed and undelayed gain control voltages are used in the receiver section of the unit. A delay network in the 20/75/300-kc bandwidth IF strip provides a delayed gain control voltage which is applied to the 30-60 mc tuner, the 60-300 mc tuner, and the converter (see paragraph 2.9.8). The undelayed gain control voltage present at the arm of function switch section S2B is used to control the gain of certain stages in the multiple bandwidth IF strip. The 2-mc bandwidth IF strip uses an AGC voltage derived in that strip to control the gain of its own first and second IF amplifiers.

2.14.2 In the FM or AM/AGC positions of the function switch, an AGC voltage derived in the multiple-bandwidth IF strip is used for gain control in all receiver sections except the 2-mc bandwidth IF strip. In the CW or AM/MAN settings of the function switch, this AGC voltage is replaced by a voltage from the arm of the RF GAIN potentiometer R7.

2.15 SIGNAL MONITOR

The type 7930 signal monitor section of the AN/URR-52A Panoramic Data Receiving Set provides a visual display of the received signal. The input to the signal monitor is the 21.4-mc IF from the tuner in operation. This signal is connected through a resistive pad in the multiple-bandwidth IF strip to jack A5J1 on the signal monitor chassis. Refer to the main chassis schematic diagram, Figure 6-18, and the signal monitor chassis schematic diagram, Figure 6-5, in conjunction with the individual subassembly schematics as necessary during the following paragraphs.

2.15.1 Shaping Amplifier/Sweep Oscillator. - The shaping amplifier/sweep oscillator (see the schematic diagram, Figure 6-6) contains four shaping amplifier stages (Q1 through Q4), a sweep oscillator (Q6), and a mixer stage (Q5). The 21.4-mc input is connected through jack J1 to the primary of transformer T1. The signal at the secondary of T1 is applied to the base of Q1, the first shaping amplifier. The method of coupling used between the shaping amplifiers and between the shaping amplifier and the mixer consists of stagger-tuned transformers T2 through T5. Each transformer has its primary connected in the collector circuit of the preceding stage and one of the two secondary windings connected in the base circuit of the succeeding stage. The third winding is connected as a tuned circuit.

CIRCUIT DESCRIPTION

In the first two transformers (T2 and T3) a resistance is added across the tank to lower the Q of the circuit. The gain of all four shaping amplifier stages is controlled by a voltage derived at the arm of the GAIN potentiometer (A5R1) and fed to the base circuits of these stages through the secondary windings of the transformers involved.

2.15.1.1 The mixer stage, Q5, receives the 21.4-mc center-frequency signal from the secondary of transformer T5. The output of the sweep oscillator is coupled through capacitor C27 and also appears on the base of Q5. The mixer collector circuit is connected through jack J2 to the input of the IF output amplifier, where the primary of the input transformer on this subassembly acts as the collector load for the mixer.

2.15.1.2 The sweep oscillator is a Colpitts type with the output taken from the feedback divider. The frequency of the sweep oscillator at any particular instant of time is under the control of a sawtooth waveform which is applied to the junction of diodes CR4 and CR5. This waveform originates in the horizontal sweep oscillator section of the signal monitor chassis. This general waveform is ultimately impressed across voltage-variable capacitor C32, which is in parallel with the oscillator tank circuit. The voltage-variable capacitor is a semiconductor device whose effective capacitance varies with the amplitude of the voltage impressed across it. The sawtooth wave varies the capacitance of C32 which, in turn, varies the frequency of the sweep oscillator. Since the voltage-vs-capacitance curve of C32 is not linear, the waveform of the incoming sawtooth must be re-formed to provide a linear sweep. This reshaping is accomplished at higher amplitude levels of the sawtooth wave by Zener diodes CR4 and CR5 and associated series resistors, R23 and R24. These Zeners break-down at specific amplitude levels and tend to round-off the top of the wave. The lower portion of the wave is adjusted by the action of diode CR1 in series with the linearity control, R18. A fixed bias is applied to this network through resistor R19. The center frequency of the sweep oscillator is set by a dc voltage applied from the arm of the CENTER FREQ control, A5R3.

2.15.2 IF Output Amplifier. - The input to the IF output amplifier (see Figure 6-7) is a 6.7-mc signal from the first mixer. A double-tuned coupling is provided between the input and the base of the 6.7-mc IF amplifier stage, Q1. This double-tuned circuit is formed by the secondary of T1, capacitors C1, C2, and C3, and the primary of T2. Transformer action of T2 places the signal in the base circuit of Q1. The coupling between the IF amplifier and the second mixer is similar to the one previously described. An additional winding on T3 is used to provide a neutralizing voltage which is coupled by capacitor C37 to the base of Q1. The second stage in the IF output amplifier is the mixer Q2, which combines the 6.7-mc incoming signal with the 5.75-mc output of the oscillator (Q5) to produce a 950-kc second IF. The frequency of the oscillator is stabilized at 5.75-mc by crystal Y1. The output of the oscillator is coupled into the mixer base by C14. Stages Q3 and Q4 provide amplification at 950-kc and increased selectivity. The output of stage Q4 is applied to the detector (CR1 and CR2) circuits which provide equal but opposite outputs to the vertical deflection plates of the CRT. The gain of the 6.7-mc IF amplifier and the first 950-kc IF amplifier is controlled by the setting of the GAIN potentiometer which varies the base bias on these stages.

2.15.3 Horizontal Sweep Oscillator. - The horizontal sweep oscillator subassembly (see Figure 6-8) generates the waveform used to control the excursions of the first local oscillator (A5A1Q6) and the horizontal deflection of the trace on the CRT.

2.15.3.1 Capacitor C1 charges from the plus 24-volt source through resistor R1. When the voltage on C1 reaches a certain level, the unijunction transistor Q1 is fired. The firing of Q1 allows C1 to discharge through resistor R13 and the transistor. This action develops a pulse across R1 which is reflected through diode CR1 and turns stage Q2 on. Capacitor C2 has charged while Q2 was off through diode CR2, resistors R3 and R5, and potentiometer R4 to the plus 24-volt line. When Q2 goes on, capacitor C2 discharges quickly through this transistor. Since C2 is connected from the base of Q4 to ground, conduction through Q4 follows the charge and discharge of C2. Transistors Q3 and Q4 are arranged as complementary emitter followers with bootstrapping action provided by connecting the output back to the base of Q3 through capacitor C7. Diode CR2 is used to offset the base-bias on Q3.

2.15.3.2 The output waveform at the emitters of Q3 and Q4 is coupled by capacitor C3 to the horizontal output transformer T1. One output at the secondary of T1 is applied through the sweep range control (R11) to the sweep oscillator. Two other outputs, of equal but opposite polarity, are taken at each end of the secondary and coupled through capacitors C4 and C5 to the horizontal deflection plates in the CRT. The horizontal position control (R9) is used to center the trace horizontally on the CRT. This potentiometer allows the dc voltage applied to one of the horizontal plates to be varied from zero to plus 24 volts. The fixed voltage on the other plate is held at plus 12 volts by the voltage divider action of resistors R7 and R8.

2.16 POWER SUPPLY

The AN/URR-52A Panoramic Data Receiving Set includes the ac input circuits (shown in Figure 6-18), the general power supply regulator (see Figure 6-15), and a regulator for the CRT voltages (see Figure 6-14).

2.16.1 Input Circuit. - The ac input to the unit is connected through the power plug P42 which is a Deustch quick-disconnect type of jack. The power is then fed through jack J4, line fuse F1 and the on-off switch, S5, which is ganged with the AUDIO GAIN control. The arrangement of the two primary windings on the power transformer is controlled by the 115/230V switch, S4. In the 115V setting of S4, the windings are in parallel; in the 230V setting the windings are in series and the 1/4 ampere fuse, F2, is included in the circuit. Three of the six secondary windings on the power transformer operate in conjunction with regulator A12, and a fourth operates in conjunction with regulator A11. The functions of these windings will be explained in subsequent paragraphs. The remaining two windings provide 6.3 vac to filaments and dial lamps, and the filament voltage to the CRT respectively.

2.16.2 General Regulator. - The schematic diagram for the type 7631 Power supply regulator is shown in Figure 6-15; its reference designation prefix is A12. The ac voltage at the 5-6 winding of T1 enters the regulator on pins 9 and 10 and is applied to a full-wave rectifier formed by CR5 and CR6. The output of the rectifier is connected through pin 14 to a capacitance-input filter formed by C3A, R13, and C3B. The output of the filter is the plus 175 volt supply. The 175 volt source is connected back to the regulator through pin 12 where Zener diode CR20 and resistor R12 provide a regulated 56 volt source. The 13-14 winding on T1 is connected to full-wave rectifiers formed by CR1, CR2 and CR3, CR4. The output of one of these rectifiers is filtered by capacitor C1 on the main chassis and is used as the plus 14 volt source. The output of the other rectifier (through pin 15) operates into a series regulator circuit which includes transistor Q1. The voltage at the emitter of Q1 is minus 6 volts regulated. The 9-10 secondary winding on transformer T1 operates into three full-wave rectifiers located on the general power supply regulator module. One of these rectifiers consists of CR7 and CR8; the output of this rectifier is filtered by C1 and is the 23 volt supply used for relay operation. The output of the second rectifier (CR9, CR10) is connected to a regulator which includes stages Q1, Q3 and Q4. Zener diode CR16 sets the base bias on Q1 which, in turn, sets the base bias on Q3 and Q4. Resistors R7 and R8, in conjunction with diodes CR14, CR15 and CR17 provide short-circuit protection for the transistors. The output of this regulator is plus 24 volts. The regulator formed by Q5 and CR19 operates from the 24-volt source to provide a plus 12-volt supply. A similar regulator (Q2, CR13, and CR21) operates from the CR11 - CR12 rectifier to supply minus 24 volts.

2.16.3 CRT Regulator. - Figure 6-14 is the schematic diagram for the type 7633 power supply regulator; its reference designation prefix is A11. The output of the 11-12 secondary winding of T1 is connected to the CRT regulator assembly where a full-wave rectifier formed by diodes CR1 and CR2 provide a negative high-voltage source. Tube V1, in series with resistor R1, provides a minus 1200 volt supply at the output of the rectifier. A voltage divider consisting of resistors R2, R4, R6 and R7, and potentiometers R3 and R5 is connected between the minus 1200 volt source and ground. The potential at the arm of R3 is connected to the cathode of the CRT; potentiometer R3 functions as the INTENSITY control. Potentiometer R5 is the FOCUS control and the arm of this control is connected to the CRT first anode. The minus 1200 volt potential is connected to the CRT control grid.

SECTION III

INSTALLATION AND OPERATION

3.1 INSTALLATION

The AN/URR-52A is designed for installation in a standard 19-inch rack. The unit requires 5.25 inches of vertical space and will project 15.5-inches back into the rack. Adequate ventilation should be provided.

CAUTION

Before placing the unit in a rack, first install one pair of shelf angles (Bud type SA-1350 or equivalent, or other hardware which will support the bottom of the chassis. Do not attempt to make an installation using the mounting holes in the front panel as the only means of support.

3.1.1 Power Connection. - Place the rear-apron slide switch, S4, in either 115V or 230V depending on the power source to be used. Connect the power cord to the ac outlet; the third pin of the plug grounds the unit. If a three pin receptacle is not available, use the three-to-two pin adapter provided.

3.1.2 Antenna Connections. - Connect the 30-1000 mc antenna to the 30-1000 MC INPUT jack J1 using an N-type connector and 50-ohm coaxial cable.

3.1.3 Audio Output Connection. - The 600-ohm audio output is available at terminals 1 and 2 of the terminal strip marked TB1 AUDIO on the rear apron, and at the PHONES jack on the front panel.

3.1.4 AGC Output Connection. - The AGC output is available at terminal 7 of TB1.

3.1.5 Video Output. - The AM or FM video signal from the 2-mc IF strip is available at the VIDEO OUTPUT jack, J3, when the BANDWIDTH switch is in the 2000 KC position. The AM or FM output from the multiple bandwidth IF strip is coupled to the VIDEO OUTPUT jack when the BANDWIDTH switch is placed in the 20 KC, 75 KC, or 300 KC positions.

3.1.6 Local Oscillator Outputs. - The output of the local oscillator in operation is available at one of the four BNC-type connectors on the rear apron. The output of the oscillator in the 30-60-mc tuner is present at jack A13J3. The output of the oscillator in the 60-300-mc tuner is present at jack A13J4. The output of the oscillator in the 235-500-mc tuner is present at jack A14J4. The output of the oscillator in the 490-1000-mc tuner is present at jack A14J3 (500-1000 MC LO OUTPUT).

3.1.7 Bandswitching Voltage Outputs. - Voltage outputs corresponding to the band selected are present at terminals 3, 4, 5, and 6 of TB1. These terminals are marked BAND A, B, C, and D respectively.

3.2 OPERATION

The front panel operating controls on the AN/URR-52A are explained in the following paragraphs.

3.2.1 Range Switch. - The RANGE switch selects the proper tuner for use as determined by the frequency of the incoming signal. A lamp will light behind the tuning dial of the tuner selected.

3.2.2 Audio Gain Control and Power Switch. - The combination AUDIO GAIN control and ac power switch turns on the receiving system when rotated clockwise from the PWR OFF position. Once the unit is operating, this control sets the audio level at the PHONES jack and at the rear apron audio terminal strip.

3.2.3 Function Switch. - Set the function switch in one of the four positions before the receiver is tuned. When

INSTALLATION AND OPERATION

this switch is in the AM/MAN or CW positions, the gain of the receiver must be manually controlled using the RF GAIN potentiometer. The BFO is automatically activated when the switch is placed in the CW mode.

3.2.4 BFO Tuning Control. - The BFO TUNING control allows the operator to change the pitch of the CW audio signal from the 20/75/300-kc bandwidth strip when the function switch is placed in the CW position. Place the BFO TUNING control at mid-position when tuning; the audio pitch can then be increased or decreased as desired.

3.2.5 IF Bandwidth Switch. - The IF BANDWIDTH switch controls both IF strips. Set this switch as desired depending on the characteristics of the signal to be received. This switch applies the video signal from either the 2-mc IF or multiple-bandwidth IF strip to the VIDEO OUTPUT jack, J3.

3.2.6 RF Gain Control. - The RF GAIN control is used to manually control the gain of the receiver sections (except the 2-mc bandwidth IF strip) when the function switch is in the AM/MAN or the CW position. In the other two function switch positions, the RF GAIN control is inoperative.

3.2.7 Tuning Meter. - The tuning meter indicates the relative position between the incoming signal and the center of the IF bandpass.

3.2.8 Cathode Ray Tube. - The CRT displays the signals present at the output of the tuner in operation.

3.2.9 Gain Control. - Use the GAIN control to adjust the amplitude of the display on the CRT. Adjustment of this control does not affect the receiver sections of the unit.

3.2.10 Sweep Width Control. - The SWEEP WIDTH control varies the display bandwidth on the CRT. Clockwise rotation of the control increases the bandwidth. When searching for a signal, place the control at the maximum clockwise position and then reduce the bandwidth as desired by counterclockwise rotation of the control after the signal has been located.

3.2.11 Center Frequency Control. - Use the CENTER FREQ control to move the displayed pips on the CRT either right or left as desired or to place a particular pip on the center marker before reducing the displayed bandwidth.

3.2.12 Focus and Intensity Controls. - Adjust the FOCUS and INTENSITY controls for maximum sharpness and the desired brightness of the CRT trace.

SECTION IV

MAINTENANCE

4.1 GENERAL

The AN/URR-52A Panoramic Data Receiving Set has been carefully designed to operate for long periods of time with little more than routine maintenance. Should trouble occur, it is important that maintenance personnel be familiar with Section II, in which the circuits are described. In addition, they should refer to Figures 5-1 through 5-36 where the component locations are shown; to the schematic diagrams, Figure 6-1 through 6-18; and to Table 4-1, the tube and transistor element voltages.

CAUTION

The physical placement and lead length of components in the four tuners are extremely critical. When replacing any component in the tuners, the new part must duplicate the location and lead length of the original part. In addition, certain components are sufficiently critical to preclude their replacement at any maintenance level. These components are suitably indicated on the illustrations, schematic diagrams and in the parts lists.

4.2 MAINTENANCE OF GEAR TRAINS AND TUNING DIALS

If it should be necessary to align the RF tuners in the AN/URR-52A, the gear trains and tuning dials must first be checked for mechanical alignment. The gear train mechanisms use friction drive and rely on the stops of the inductuner to halt the turning in the case of the 30-60 mc, 60-300 mc, 235-500 mc RF tuners, and on stops mounted on the gear train to halt the turning in the case of the 490-1000 mc tuner. Exploded views of the gear train assemblies are presented in Figures 4-15 and 4-16. These illustrations are included as an aid in disassembly in the event the gear trains are to be repaired in the field. It is recommended that disassembly be performed only by trained and experienced maintenance personnel.

4.2.1 30-60 mc RF Tuner. - Proceed as follows:

- (1) Release the Allen head set screws on each side of the coupling between the gear train shaft and the inductuner shaft.
- (2) Rotate the inductuner shaft to maximum clockwise position.
- (3) Turn the dial until the hairline is at the second mark above 62.
- (4) Tighten the coupling between the gear train and the inductuner shaft.
- (5) Check the operation by turning the tuning crank counterclockwise until the inductuner no longer turns. The dial should read at the mark just beyond 30.

4.2.2 60-300 mc RF Tuner. - Proceed as follows:

- (1) Release the Allen head set screws on each side of the coupling between the gear train and the inductuner shaft.
- (2) Rotate the inductuner shaft to maximum clockwise position.
- (3) Turn the dial until the hairline is at the first mark above 300.
- (4) Tighten the coupling between the gear train and the inductuner shaft.
- (5) Check the operation by turning the tuning crank counterclockwise until the inductuner no longer turns. The dial should read at the mark just beyond 60.

MAINTENANCE

4.2.3 235-500 mc RF Tuner. - Proceed as follows:

- (1) Release the Allen head set screws on each side of the coupling between the gear train shaft and the inductuner shaft.
- (2) Rotate the inductuner shaft to maximum clockwise position.
- (3) Turn the dial until the hairline is at the mark above 500.
- (4) Tighten the coupling between the gear train and the inductuner shaft.
- (5) Check the operation by turning the tuning crank counterclockwise until the inductuner no longer turns. The dial should read at the fifth mark beyond 235 mc.

4.2.4 490-1000 mc RF Tuner. - Proceed as follows:

- (1) Release the Allen head set screws on each side of the coupling between the gear train shaft and the RF tuner shaft.
- (2) Rotate the RF tuner shaft to maximum counterclockwise position.
- (3) Turn the dial until the hairline is at the mark below 490. The gear train should be at the low end stop.
- (4) Tighten the coupling between the gear train and the RF tuner shaft.
- (5) Check the operation by turning the tuning crank clockwise until the RF tuner shaft no longer turns. The dial should read between 1000 and the mark beyond 1000.

4.3 PLUG-IN MODULES

The plug-in modules can be easily removed by pulling them out of the receptacles into which they are fitted. The numbers on the pins coming out of the modules correspond to the numbers indicated on the main chassis schematic diagram, Figure 6-18, at the points where the connecting leads pass through the line outlining each module on the schematic. For example, the output from the audio amplifier to the PHONES jack is through pins 11 and 13 of the receptacle into which the audio amplifier module is plugged.

4.4 TROUBLESHOOTING

Most troubles will be caused by failures of the fuse, tubes, diodes, or relays. The proper functioning of all these parts should be assured either by test or by replacement with parts known to be good before any further troubleshooting is carried out. After the above measure has been carried out, initial troubleshooting should be directed toward localizing the problem to a specific portion of the receiving system. In the case of the plug-in modules, a quick check can be made by simply plugging in a new module known to be good. Another procedure which should be considered for localizing troubles is to feed in a signal at the antenna jack and then check the signals present at each test point. To this end, it is desirable that all maintenance personnel familiarize themselves with the alignment procedures, even if an alignment is not required, because those procedures include methods of checking performance which may help in analyzing the cause of the trouble. In addition, be certain that the power supply is functioning normally before any other circuit is suspected.

4.5 ALIGNMENT INSTRUCTIONS

The alignment procedures in this book are suitable for performance in the field when making periodic performance checks, or when making adjustments after replacing tubes or components. Only those controls specifically referred to within a series of steps given for aligning a particular circuit affect the work in that circuit. Those controls not mentioned in any one series of steps may be left in any position. The alignment of this receiving system should be performed only with suitable equipments by technicians thoroughly familiar with the receiver. If the limits and tolerances specified in the following steps cannot be obtained during a field alignment, a factory alignment is necessary.

4.5.1 Use of Marker During Alignment. - A post-detection type of marker adder is recommended, and the alignment procedures in this book assume that one is to be used. However, if such a marker adder is not

available, the marker generator output should be loosely coupled to the sweep generator output. This can be done by connecting the marker signal source to a turn or two of insulated wire wrapped around the sweep generator lead near the point of connection to the circuit under test, or by coupling to the sweep generator lead through a small capacitor. To insure that the addition of the marker is not affecting the response curve, disconnect the marker generator and observe that no change in the curve's shape or symmetry occurs.

4.5.2 Use of Oscilloscope During Alignment. - The vertical and horizontal amplifier inputs on the oscilloscope should be set in the dc coupled mode. The dc component of the signal on the vertical input should be cancelled out by applying an equal voltage to the unused vertical differential scope input, since the dc component sometimes makes it impossible to center the signal vertically. Otherwise it will sometimes be necessary to use the ac coupled mode. A low-capacity shielded cable should be used to connect to the oscilloscope, and the shield should be grounded as closely as possible to the point to which the center conductor is connected.

4.5.3 Equipments Required. - The following equipments, or their equivalents, are required to perform the complete receiving system alignment.

- (1) Signal Generator, Newlett-Packard 612A
- (2) Signal Generator, Hewlett-Packard 608D
- (3) Signal Generator, Hewlett-Packard 606A
- (4) Sweep Generator, Telonic, Model SM-2000 with Types LH-2 and SH-1 Plug-In heads
- (5) Sweep Generator, Jerrold 900A
- (6) VTVM, RCA Type WV-98B
- (7) Power Supply, Eico 1020
- (8) Oscilloscope, Tektronix 503
- (9) Marker, 21.4 mc, Type C, for Telonic SM-2000

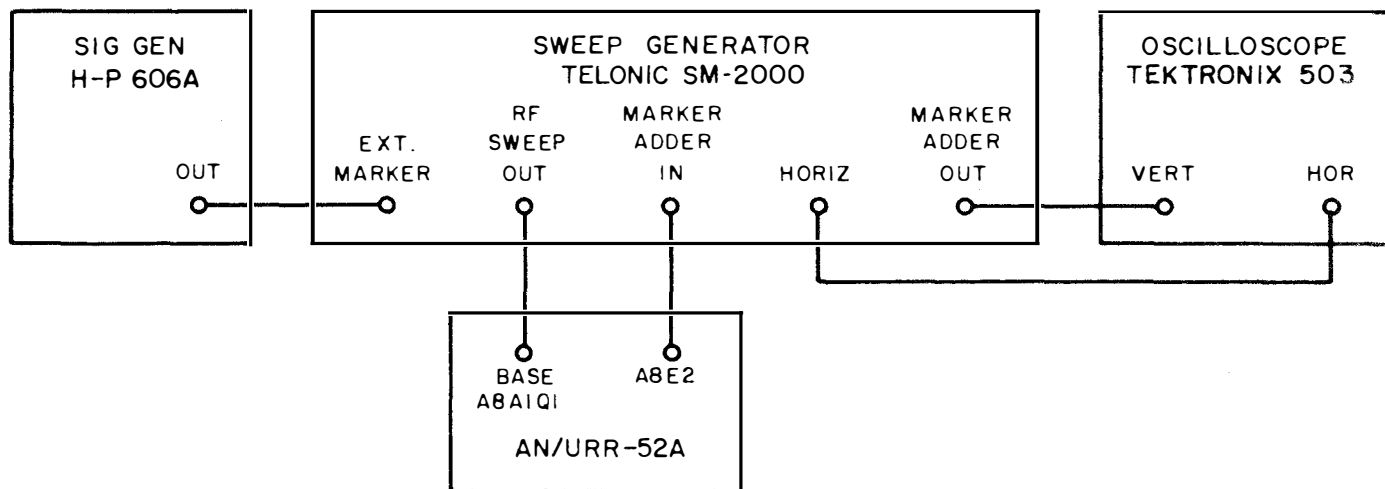


Figure 4-1. Equipment Setup, 20-kc/75-kc/300-kc IF Alignment

MAINTENANCE

4.6 20/75/300 KC IF ALIGNMENT

The alignment procedure for the multiple bandwidth IF strip is presented in the following paragraphs. It will be necessary to remove the IF chassis to perform the alignment.

4.6.1 Initial Settings. - The following steps should be performed before beginning alignment:

- (1) Set the receiver function switch to FM position; bandwidth switch to 300 kc.
- (2) Disconnect IF strip from RF tuners by removing P21 from A8J1.
- (3) Set oscilloscope horizontal sensitivity to obtain a 10 cm wide sweep, and the vertical sensitivity to 0.2 volt per cm.
- (4) Install the LH-2 plug-in head in the sweep generator.
- (5) Set the sweep generator output frequency to 21.4 mc; set sweep rate to line frequency.
- (6) Calibrate signal generator for a 21.4-mc output.

4.6.2 Discriminator Alignment. - Proceed as follows:

- (1) Remove Q8.
- (2) Remove bottom cover from the IF strip.
- (3) Set up equipment as shown in Figure 4-1.
- (4) Adjust sweep generator output to display an S-curve response on the oscilloscope.
- (5) Adjust A1L3 for amplitude symmetry and A1T1 for zero crossing of the S-curve about the 21.4-mc marker. A typical response is shown in Figure 4-2.
- (6) Replace Q8.

4.6.3 300-kc IF Alignment. - Proceed as follows:

- (1) Set up the equipment as shown in Figure 4-1, except that the sweep output is connect to the junction of L13 and C55.
- (2) Adjust L16 and L15 for a maximum amplitude response centered on the 21.4-mc marker.
- (3) Change the sweep generator output to A8J1.
- (4) Adjust L13, L12, L10, L9, L5, and L4 (in that order), for a maximum amplitude response.
- (5) Replace bottom cover.
- (6) Readjust L5 and L4 for a symmetrical, single-peak response, centered at 21.4 mc, with a 3-db bandwidth of 300 kc. Readjust L10 and L9 if necessary. A typical response is shown in Figure 4-3.

4.6.4 20-kc IF Alignment - Proceed as follows:

- (1) Leave equipment set up as in paragraph 4.6.3, step (3).
- (2) Set the bandwidth switch to the 20 KC position.
- (3) Set oscilloscope horizontal sensitivity to obtain a 10 cm wide sweep, and the vertical sensitivity to 0.2 volt per cm.
- (4) Set the sweep generator sweep rate to 5 cps; adjust frequency and output level until a response curve is displayed on the oscilloscope.
- (5) Adjust L7 and L3 for a symmetrical response similar to the response shown in Figure 4-4.

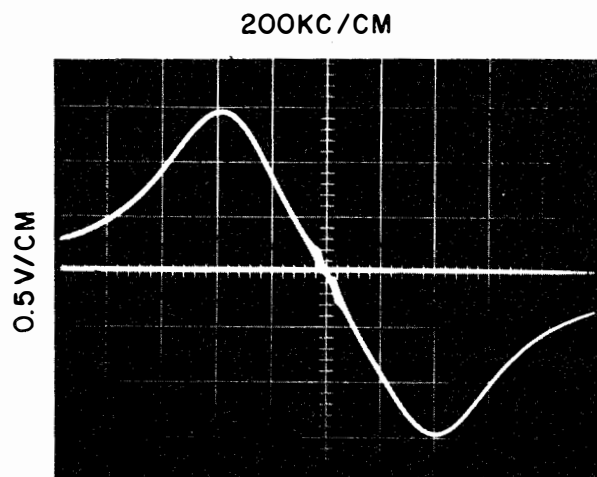


Figure 4-2. Typical Response Curve,
300-kc Discriminator Alignment

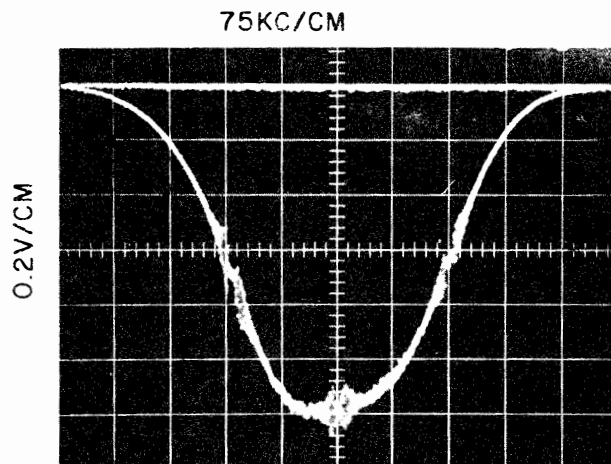


Figure 4-3. Typical Response Curve,
300-kc Bandwidth IF Alignment

4.6.5 75-kc IF Alignment. - Proceed as follows:

- (1) Leave the equipment set up as in paragraph 4.6.3, step (3).
- (2) Set the bandwidth switch to the 75 KC position.
- (3) Set oscilloscope horizontal sensitivity to obtain a 10 cm wide sweep, and the vertical sensitivity to 0.2 volt per cm.

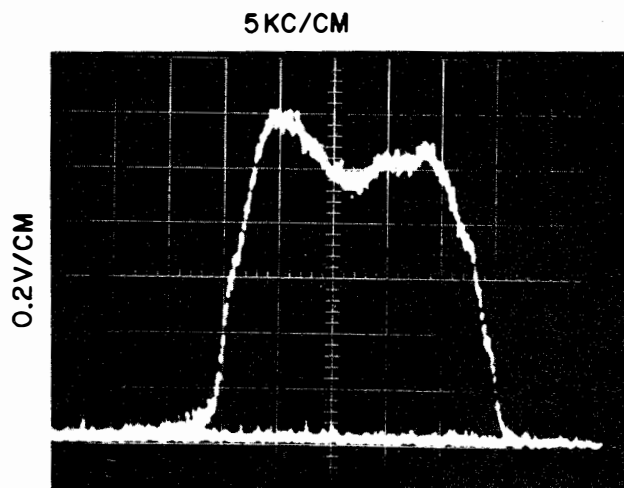


Figure 4-4. Typical Response Curve,
20-kc Bandwidth IF Alignment

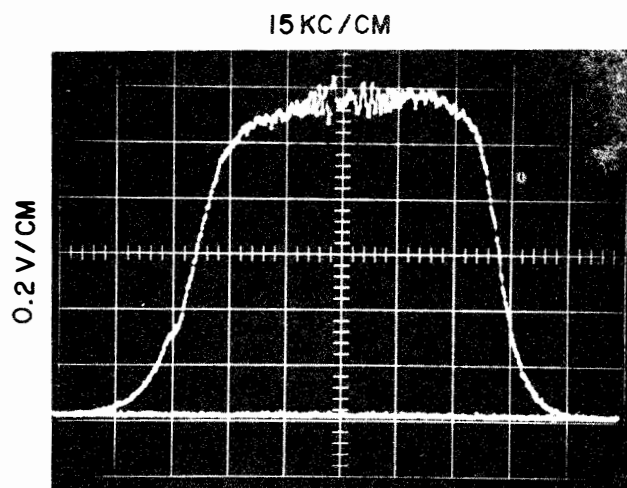


Figure 4-5. Typical Response Curve,
75-kc Bandwidth IF Alignment

- (4) Set the sweep generator sweep rate to 5 cps; adjust frequency and output level until a response curve is displayed on the oscilloscope.
- (5) Adjust L6 and L2 for a symmetrical response similar to the response shown in Figure 4-5.

MAINTENANCE

4.7 2-MC IF ALIGNMENT

The alignment of the 2-mc bandwidth IF strip is explained in the following paragraphs.

4.7.1 Preliminary Steps. - Perform the following steps prior to the alignment:

- (1) Remove the 20/75/300-kc IF strip from the receiver.
- (2) Disconnect plug P20 from A7J2.
- (3) Remove the bottom cover from the 2-mc IF strip.
- (4) Set IF BANDWIDTH switch to 2 MC; place function switch in FM position.

4.7.2 Discriminator Alignment. - Proceed as follows:

- (1) Connect equipment as shown in Figure 4-6.
- (2) Adjust power supply for a +4 volt output.
- (3) Set output frequency of sweep generator to 21.4 mc. Turn internal 21.4-mc marker on.
- (4) Calibrate 606A signal generator for a 19.9 mc output; calibrate the 608D signal generator for a 22.9 mc output.
- (5) Adjust sweep generator and oscilloscope controls to display an "S" response curve.
- (6) Adjust A7A1L3 for amplitude symmetry and A7A1T1 for zero crossing of the "S" curve. The 3-mc markers should appear at the peaks of the response. A typical response is shown in Figure 4-7.

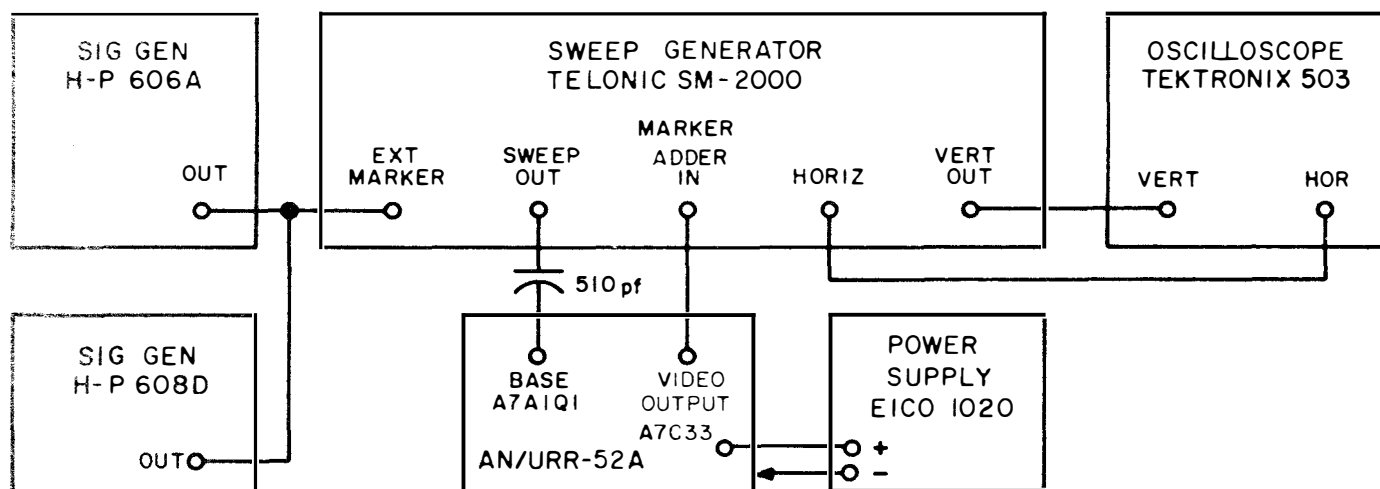


Figure 4-6. Equipment Setup, 2-mc IF Alignment

4.7.3 IF Alignment. - Proceed as follows:

- (1) Set output frequency of 606A signal generator to 19.4 mc and output frequency of 608D signal generator to 22.4 mc.
- (2) Adjust power supply for +6.5 volt output.

- (3) Connect equipment as shown in Figure 4-6 except that the sweep generator output is connected to A7J1 and the marker adder input is connected to the emitter of A7Q3.
- (4) Set output frequency of sweep generator to 21.4 mc; turn internal 21.4-mc marker on.
- (5) Adjust sweep generator and oscilloscope controls to display a response curve.
- (6) Adjust A7L9, A7L8, A7L6, A7L5, A7L3, and A7L2, in the order given, for a maximum amplitude, symmetrical response centered about the 21.4-mc marker. The 2-mc markers should appear at the 3-db points on the response curve. A typical response is shown in Figure 4-8.

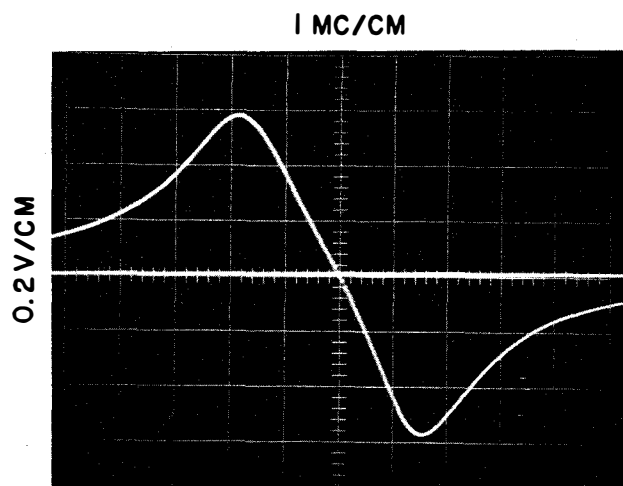


Figure 4-7. Typical Response Curve,
2-mc Discriminator Alignment

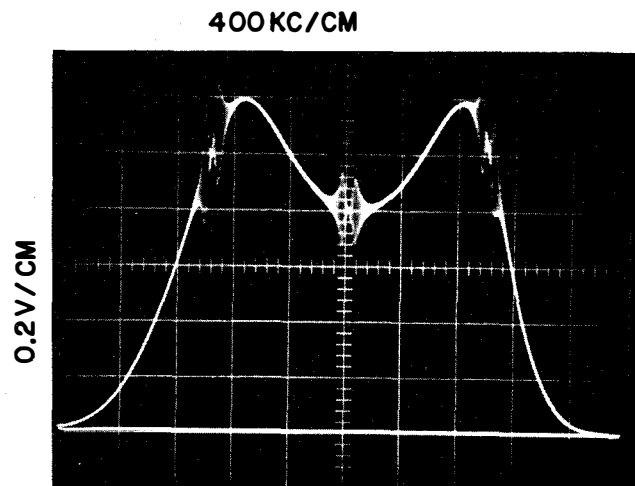


Figure 4-8. Typical Response Curve,
2-mc Bandwidth IF Alignment

4.8 CONVERTER ALIGNMENT

The alignment of the 60-21.4 mc converter is described in the following paragraphs.

4.8.1 Initial Settings. - Make the following initial settings:

- (1) Set the function switch to the AM/AGC position.
- (2) Set the RANGE switch to the 235-500 MC position.
- (3) Set the IF BANDWIDTH switch to the 300 KC position.
- (4) Set sweep generator and signal generator to 60 mc.

4.8.2 V1 to V3 Interstage Alignment. - Proceed as follows:

- (1) At A6C7, ground the AGC line.
- (2) Connect equipment as shown in Figure 4-9.
- (3) Set sweep generator and signal generator to 60 mc.
- (4) Adjust oscilloscope until a response curve is displayed.
- (5) Adjust A6L1 for a peak response.
- (6) Adjust A6L3 and A6L4 for a maximum double-tuned response centered at 60 mc.

MAINTENANCE

4.8.3 A3V3 to A6V1 Interstage Alignment. - Proceed as follows:

- (1) At A6C7, ground the AGC line.
- (2) Set the signal generator to exactly 325 mc.
- (3) Connect signal generator to rear panel jack, J1, and tune the AN/URR-52A to the signal generator using the tuning meter to indicate proper tuning.
- (4) Set equipment as shown in Figure 4-10.
- (5) Set the sweep generator to 325 mc.
- (6) Calibrate the signal generator to produce a 60-mc marker.
- (7) Set oscilloscope vertical sensitivity at 50 millivolts per cm and adjust sweep generator sweep width until a response curve is displayed on the oscilloscope.

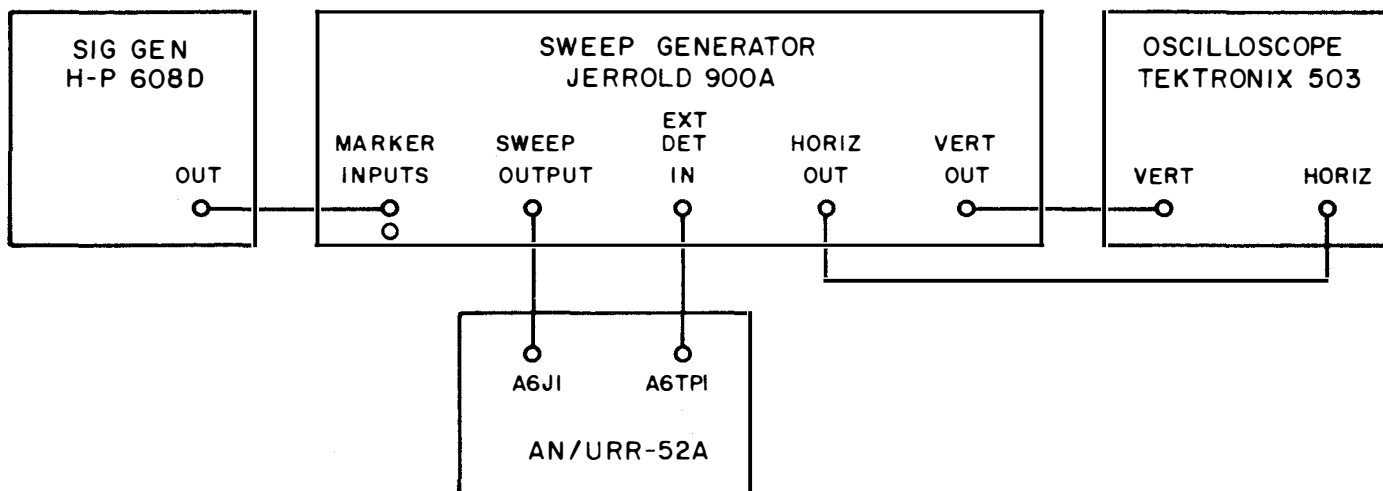


Figure 4-9. Equipment Setup, Converter Alignment

- (8) Adjust A3L14 and A6L1 for a maximum tuned response centered at 60 mc.

4.8.4 A4V3 to A6V2 Interstage Alignment. - Proceed as follows:

- (1) Ground the AGC line at A6C7.
- (2) Set the signal generator to exactly 500 mc.
- (3) Set the receiver RANGE switch to 490-1000 MC position.
- (4) Connect signal generator to J1 on the rear apron and tune the receiver to the signal generator using the tuning meter to indicate proper tuning.
- (5) Set up equipment as shown in Figure 4-10, except the sweep output will connect to J1 on the rear apron.
- (6) Set sweep generator to 500 mc.
- (7) Calibrate signal generator to produce a 60-mc marker.
- (8) Set the oscilloscope vertical sensitivity to 50 millivolts per cm and adjust sweep generator sweep width until a response curve is displayed on the oscilloscope.

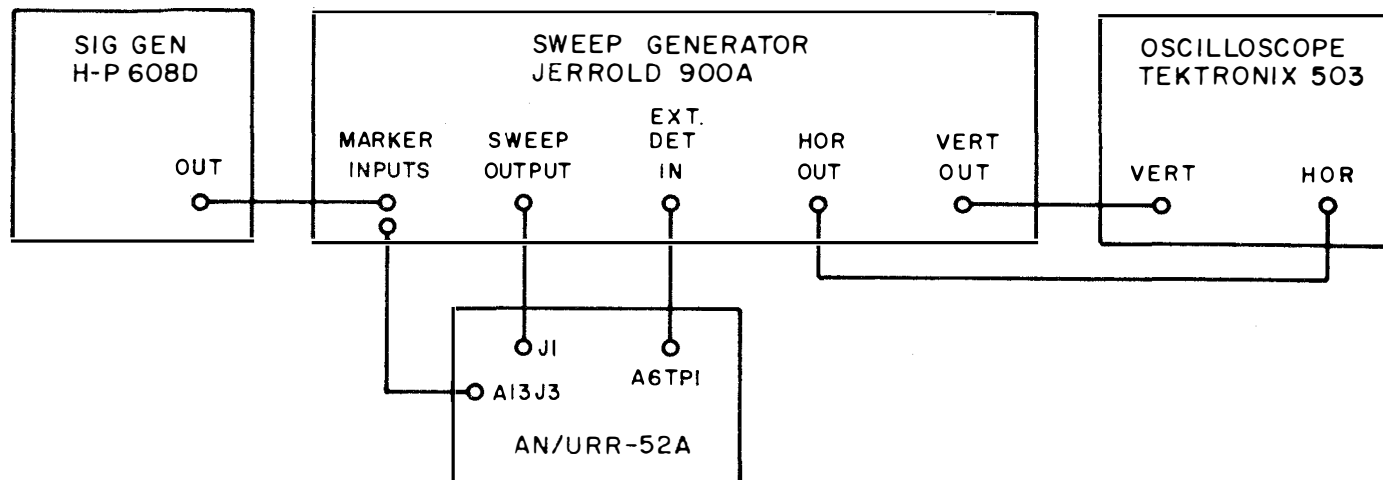


Figure 4-10. Equipment Setup, Converter and Tuner Alignment

- (9) Adjust A4L17 and A6L2 for a maximum tuned response centered at 60 mc. A typical response is shown in Figure 4-11.

4.9 235-500 MC TUNER

The alignment of the RF circuits is highly critical and should not be attempted in the field unless considered absolutely necessary, such as after replacement of a variable capacitor in the interstage between V1, V2 and V3. The replacement of an RF amplifier tube, 7077, or the mixer tube, 7587, in most cases will restore the original performance of the tuner without any alignment.

4.9.1 Local Oscillator Alignment. - The local oscillator is aligned as follows:

- (1) Check the mechanical alignment of the gear train and tuning dial as described in paragraph 4.2.3 prior to electrical alignment.
- (2) Connect the signal generator to jack J1 on the rear apron.
- (3) Calibrate the signal generator to 250 mc.
- (4) Set the receiver RANGE switch to 235-500 MC, IF BANDWIDTH switch to 300 KC, and function switch to AM/AGC.
- (5) Tune the receiver to the signal generator using the tuning meter to indicate proper tuning.
- (6) The receiver tuning dial should indicate 250 mc $\pm 1\%$.
- (7) Repeat steps (3) through (6) for 350 mc and 450 mc.
- (8) If any of the dial indications exceed the $\pm 1\%$ tolerance, adjust C39. After any adjustment of C39, repeat steps (3) through (7).

4.9.2 RF Circuit Alignment. - Proceed as follows:

- (1) Set the RANGE switch in the 235-500 MC position.
- (2) Set up equipment as shown in Figure 4-9 except that the sweep output will connect to J1 on the rear apron and the external detector input will be connected to A3TPI.
- (3) Set both sweep generator and the tuner at 500 mc.

MAINTENANCE

- (4) Set the oscilloscope horizontal sensitivity to obtain a 10 cm wide sweep, and the vertical sensitivity to 50 millivolts per cm.
- (5) Adjust the sweep generator sweep width and frequency until a response curve is displayed on the oscilloscope.
- (6) Adjust A3C6, A3C13, A3C17 and A3C24 for a maximum tuned response centered at 500 mc. A typical response is shown in Figure 4-12. If the alignment is being performed after the replacement of one of these four capacitors, adjust only the one that has been replaced.
- (7) Adjust A3C1 for maximum gain at 500 mc.
- (8) Inductor A3L14 is aligned in conjunction with the converter; see paragraph 4.8.3.

4.10 490-1000 MC TUNER

Under no circumstances should adjustment be made in the high band RF tuner section. The tuned circuits are factory aligned, and will need no further adjustment. If the receiver is unusually noisy, check all cable connections. The most likely cause of trouble in the RF section will be a damaged crystal mixer, and its replacement will usually restore the original performance. The local oscillator adjustments are made using an accurately aligned IF strip. Before alignment of the tuner is attempted, check the 300 kc IF alignment as described in paragraph 4.6. Inductor L17 is aligned in conjunction with the converter as described in paragraph 4.8.4.

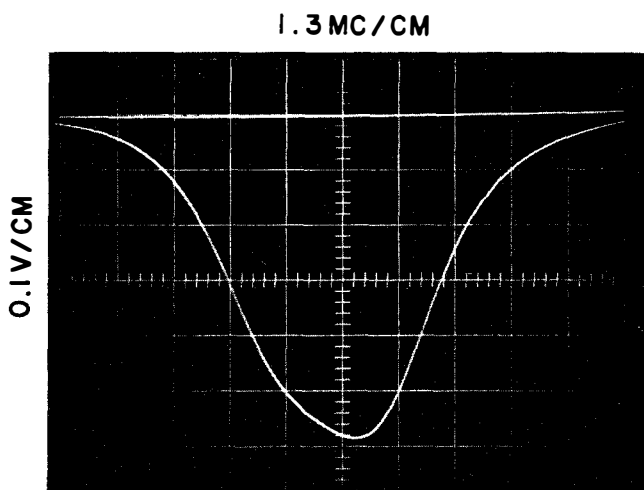


Figure 4-11. Typical Response Curve,
A4V3 to A6V2 Interstage Alignment

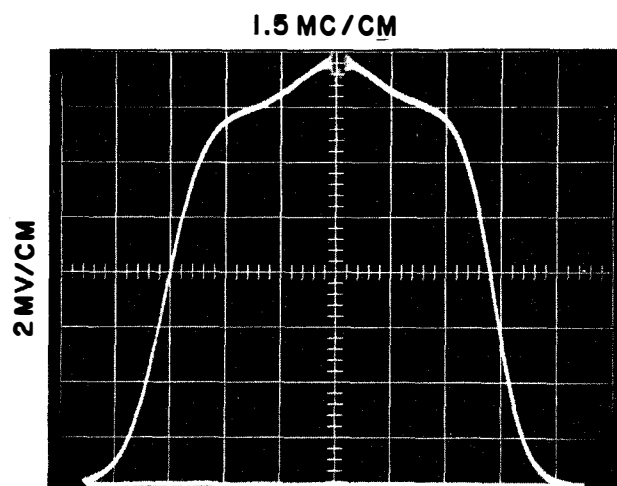


Figure 4-12. Typical Response Curve,
235-500 mc Tuner Alignment

4.10.1 Local Oscillator Alignment. - Proceed as follows:

- (1) Check the mechanical alignment of the gear train and tuning dial as described in paragraph 4.2.4 prior to electrical alignment.
- (2) Connect the signal generator to jack J1 on the rear apron.
- (3) Calibrate the signal generator to 500 mc.
- (4) Set the receiver RANGE switch to 490-1000 MC, IF BANDWIDTH switch to 300 KC, and function switch to AM/AGC.
- (5) Tune the receiver to the signal generator frequency using the tuning meter to indicate the proper tuning.
- (6) The receiver tuning dial should indicate 500 mc $\pm 1\%$.

- (7) If this dial indication exceeds the tolerance, adjust C7.
- (8) Repeat steps (3) through (5) for 1000 mc.
- (9) If the dial reading exceeds the $\pm 1\%$ tolerance, adjust C6.

4.10.2 Checking High Band Tuner Oscillator Injection Current. - To check the high band local oscillator injection current, connect a milliammeter to the mating plug provided for jack A4J4 and insert the plug into the jack. This places the meter in series with the crystal mixer dc ground return. The normal current reading is greater than 0.5 ma and less than 2.5 ma.

4.11 60-300 MC TUNER

The tuner is aligned in part using an accurately aligned IF strip. Before an alignment of the tuner is attempted, check the 300 kc IF alignment as described in paragraph 4.6. Check the mechanical alignment of the gear train and tuning dial as described in paragraph 4.2.2 prior to electrical alignment.

4.11.1 Initial Settings. - Make the following initial settings:

- (1) Set the function switch in the AM/MAN position.
- (2) Adjust the RF GAIN control fully clockwise.
- (3) Set the RANGE switch in the 60-300 MC position.
- (4) Set the IF BANDWIDTH switch to the 300 KC position.

4.11.2 Local Oscillator Alignment. - Proceed as follows:

- (1) Connect the output of the signal generator to jack J1 on the rear apron.
- (2) Calibrate the signal generator to produce a 100 mc signal.
- (3) Tune the receiver to the signal generator frequency using the tuning meter to indicate proper tuning.
- (4) The tuning dial should indicate 100.0 mc $\pm 1\%$.
- (5) Repeat steps (2) through (3) for 60 mc.
- (6) Repeat steps (2) through (3) for 290 mc.
- (7) If any of the tuning dial indications exceed the $\pm 1\%$ tolerance, adjust C29. If C29 is adjusted, repeat steps (2) through (3).

4.11.3 RF Circuit Alignment. - Proceed as follows:

- (1) Set up equipment as shown in Figure 4-9 except the sweep output will connect to J1, and the external detector will be connected to A2TP1.
- (2) Set the receiver tuning dial to 100 mc and the sweep generator to 100 mc.
- (3) Calibrate the signal generator to produce a 100-mc marker.
- (4) Remove the local oscillator tube V4.
- (5) Set the oscilloscope horizontal sensitivity to obtain a 10 cm wide sweep, and the vertical sensitivity to 50 millivolts per cm.
- (6) Adjust sweep generator sweep width and frequency until a response curve is displayed on the oscilloscope screen.
- (7) Adjust C11 and C18 for a symmetrical, double-tuned response, with the 100 mc marker appearing between the center of the response and the low frequency peak. Adjust C15 for a peak-to-peak bandwidth of 3.5 mc. A typical response is shown in Figure 4-13.
- (8) Adjust C5 for a maximum amplitude of the response at 100 mc.

MAINTENANCE

- (9) Check the response at 60 mc and 300 mc. The response shape will vary but the marker should still be on or between the peaks of the response curve.
- (10) Re-install the local oscillator tube V4.

4.12 30-60 MC TUNER

The tuner is aligned in part using an accurately aligned IF strip. Before an alignment of the tuner is attempted, check the 300 KC IF alignment as described in paragraph 4.6. Check the mechanical alignment of the gear train and tuning dial as described in paragraph 4.2.1 prior to electrical alignment.

4.12.1 Initial Settings. - Make the following initial settings:

- (1) Set the IF BANDWIDTH switch to 300 KC.
- (2) Set the RANGE switch to the 30-60 MC position.
- (3) Set the function switch to the AM/MAN position.

4.12.2 Local Oscillator Alignment. - Proceed as follows:

- (1) Connect the output of the signal generator to the input jack J1 on the rear apron.
- (2) Calibrate the signal generator to produce a 30 mc signal.
- (3) Tune the receiver to the signal generator frequency using the tuning meter to indicate proper tuning.

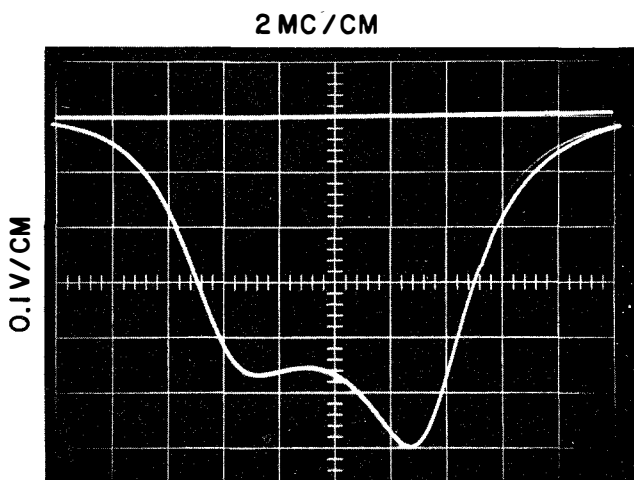


Figure 4-13. Typical Response Curve, 60-300 mc Tuner Alignment

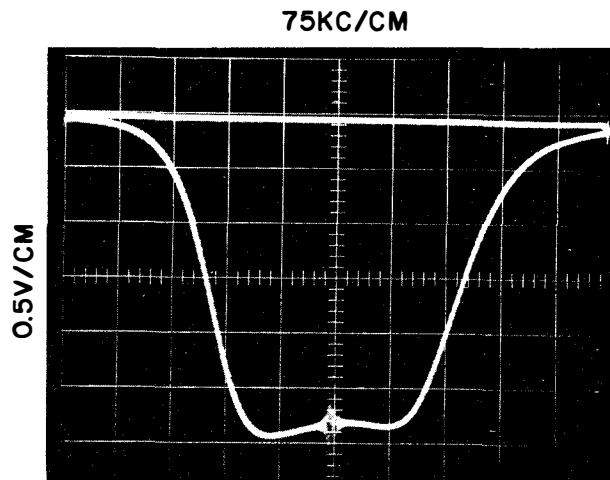


Figure 4-14. Typical Response Curve, 30-60 mc Tuner Alignment

- (4) The receiver tuning dial should indicate 30.0 mc $\pm 1\%$.
- (5) Repeat steps (2) through (5) for 40 mc, 50 mc and 60 mc.
- (6) If any of the tuning dial indications exceed the $\pm 1\%$ tolerance, adjust C27. After any adjustment of C27, repeat steps (2) through (6).

4.12.3 RF Circuit Alignment. - Proceed as follows:

- (1) Set up the equipment as shown in Figure 4-9, except the sweep output is connected to J1 on the rear apron and the external detector is connected to A1TP1.
- (2) Adjust RF GAIN for a -1.5 volt reading at A1C38.

- (3) Set the receiver tuning dial to 30 mc and the sweep generator to 30 mc.
- (4) Remove the local oscillator tube, V4.
- (5) Set the oscilloscope horizontal sensitivity to obtain a 10 cm wide sweep, and the vertical sensitivity to 50 millivolts per cm.
- (6) Adjust sweep generator sweep width and frequency until a response curve is displayed on the oscilloscope.
- (7) Using a calibrated 30-mc marker from the signal generator, adjust C3 for maximum amplitude of the response at 30 mc.
- (8) Adjust C13 and C15 for a symmetrical response centered at 30 mc. A typical response is shown in Figure 4-14.
- (9) Check the response at 40 mc, 50 mc and 60 mc. The response shape will vary but the markers should still be on or between the peaks of the response curve.
- (10) Re-install the local oscillator tube, V4.

4.12.4 Mixer Plate Coil Alignment. - Proceed as follows:

- (1) Set IF BANDWIDTH switch to the 20 KC position.
- (2) Set function switch to AM/MAN position.
- (3) Set RF GAIN fully cw.
- (4) Set receiver tuning dial to 30.0 mc.
- (5) From the signal generator, feed a calibrated 30.0-mc signal to the input jack J1.
- (6) Connect the VTVM to A8E2 and adjust signal generator output level until a -3.5 volt indication is obtained.
- (7) Adjust L5 for a maximum indication on the VTVM.

4.13 SIGNAL MONITOR

The alignment procedure for the signal monitor section of the receiving system is presented in the following paragraphs. Throughout the alignment, adjust the gain, focus, and intensity controls as necessary.

4.13.1 IF Output Amplifier Alignment. - Proceed as follows:

- (1) Set the center frequency control to mid-range.
- (2) Connect the output of the signal generator through a 1000 pf capacitor to A5A1TP1.
- (3) Calibrate the signal generator to 6.7 mc.
- (4) Adjust A5A2T1 through A5A2T9 for a maximum deflection on the CRT, decreasing the signal generator output level as needed to keep the base line on the CRT.

4.13.2 Shaping Amplifier Alignment. - Proceed as follows:

- (1) Set the center frequency control to mid-range.
- (2) Set sweep width control to maximum cw position.
- (3) Connect the output of the signal generator calibrated to 21.4 mc through a 1000 pf capacitor to A5A1TP1.
- (4) Adjust A5A1T6 until the pip is centered horizontally.
- (5) Decrease sweep width, and note whether or not the pip has moved from its position while moving the sweep width.

MAINTENANCE

- (6) If the pip has moved appreciably, adjust A5A1T6 for best centering consistent with minimum pip movement with changes in sweep width.
- (7) The response should now be in the center of the signal monitor screen with the center frequency adjust set at mid-range. If this is not the case, A5A3R9 (Horizontal Position adjust) may be adjusted to center the response.
- (8) It may be necessary to repeat steps (2) through (5) until no adjustment of A5A1T6 or A5A3R9 is necessary.
- (9) Set the signal generator to 22.9 mc.
- (10) Set the sweep width control to maximum cw position.
- (11) Adjust A5A3R11 to center this signal on the far left reticule mark; adjust A5A1T5 for peak signal amplitude.
- (12) Change the signal generator to 19.9 mc; adjust A5A1T4 for a peak signal indication.
- (13) Adjust A5A1R18 until this signal is centered on the far right side reticule mark. A5A3R11 may interact with A5A1R18, so it will be necessary to recheck these adjustments.
- (14) Move the signal generator to A5A1J1.
- (15) Calibrate the signal generator to 20.4 mc.
- (16) Adjust A5A1T2 for a peak indication on the signal monitor.
- (17) Calibrate the signal generator to 22.4 mc.
- (18) Adjust A5A1T3 for a peak indication on the signal monitor.

4.13.3 Horizontal Width Adjustment. - The horizontal width control, A5A3R4, should be set so that the horizontal sweep just starts to wrap around the edges of the tube.

4.13.4 Vertical Position Adjustment. - The vertical position control, A5A3R6, should be set so that the horizontal sweep is vertically positioned on the horizontal reticule, with no signal input and the gain control set maximum ccw.

Table 4-1. AN/URR-52A Panoramic Data Receiving Set, Tube and Transistor Element Voltages

Ref. Desig.	Type	2	4	8	10	12	Plate	Emitter	Base	Collector
			Grid	Cathode	Heater	Heater				
A1V1	6CW4	82.0	0.14	0.72	6.3ac	0				
A1V2	6CW4	144.0	76.0	82.0	6.3ac	0				
A1V3	7587	66.0		0	0	6.3ac	110			
A1V4	6CW4	92.0	46.0*#	46.0*#	6.3ac	0				
A2V1	8058	0	0	0	0	6.3ac	102			
A2V2	8058	0.5	0.5	0.5	0	6.3ac	108			
A2V3	7587	20.0	-0.9	0	0	6.3ac	110			
A2V4	6CW4	73.0	10.9*#	11.8*#	0	6.3ac				
A3V1	7077		0	0	0	6.3ac	118.0			
A3V2	7077		0	0.6	0	6.3ac	118.0			
A3V3	7587	14.0	-0.96	0	6.3ac	0	180.0			
A3V4	7486		-1.6*#	0	0	6.3ac	86.0			
A4V1	7486		-0.5*#	0	0	6.3ac	100.0			
A4V2	6CW4	92.0	0	0.5	0	6.3ac				
A4V3	6CW4	170	83.0	92.0	0	6.3ac				
A5A1Q1	2N706							2.3	3.0	11.0
A5A1Q2	2N706							2.3	2.9	11.6
A5A1Q3	2N706							2.3	2.9	11.6
A5A1Q4	2N706							2.3	2.9	11.6
A5A1Q5	2N706							1.0	1.5	0.35
A5A1Q6	2N706							5.0	5.3	14.7
A5A2Q1	2N706							2.3	3	12.4
A5A2Q2	2N706							0.95	1.6	14.2
A5A2Q3	2N706							2.3	1.1	13.4
A5A2Q4	2N706							13.8	5.0	12.2
A5A2Q5	2N706							5.2	2.2	14.7
A5A3Q1	2N489							8.2	21.5 ⁽¹⁾	0.28 ⁽²⁾
A5A3Q2	2N2270							0	0	10.6
A5A3Q3	2N697							10.6	11.2	24
A5A3Q4	2N1925							10.6	10.6	0
A5A3Q5	2N2270							14.6	15.0	24.0
A6V1	7587	1.38	0.9	0	0	6.3ac	180			
A6V2	7587	36	-0.94	0.24	0	6.3ac	180			
A6V3	7587	21.0	-0.7	0	0	6.3ac	130			
A6V4	6CW4	84.0	-4.4	0	0	6.3ac				
A7Q1	2N2708							2.5	3.1	12.0
A7Q2	2N2708							2.3	3.0	11.2
A7Q3	2N2708							2.0	2.8	10.4
A7A1Q1	2N706							2.7	3.3	11.2
A7A1Q2	2N706							2.7	3.4	11.4
A7A1Q3	2N706							2.7	10.2	11.6
A7A1Q4	2N706							2.7	3.2	11.6
A7A1Q5	2N2270							1.6	2.1	12.0
A7A1Q6	2N2270							1.4	1.6	12.0
A7A1Q7	2N2270							0.1	0.5	9.7
A7A2Q1	2N2270							11.0	11.7	12.0
A7A2Q2	2N2270							0	-0.44	11.7
A7A2Q3	2N2270							-0.46	0.14	13.8
A7A2Q4	2N2270							0.48	1.1	11.4
A7A2Q5	2N2270							0.11	0.94	11.3
A8Q1	2N2708							2.0	2.8	11.9

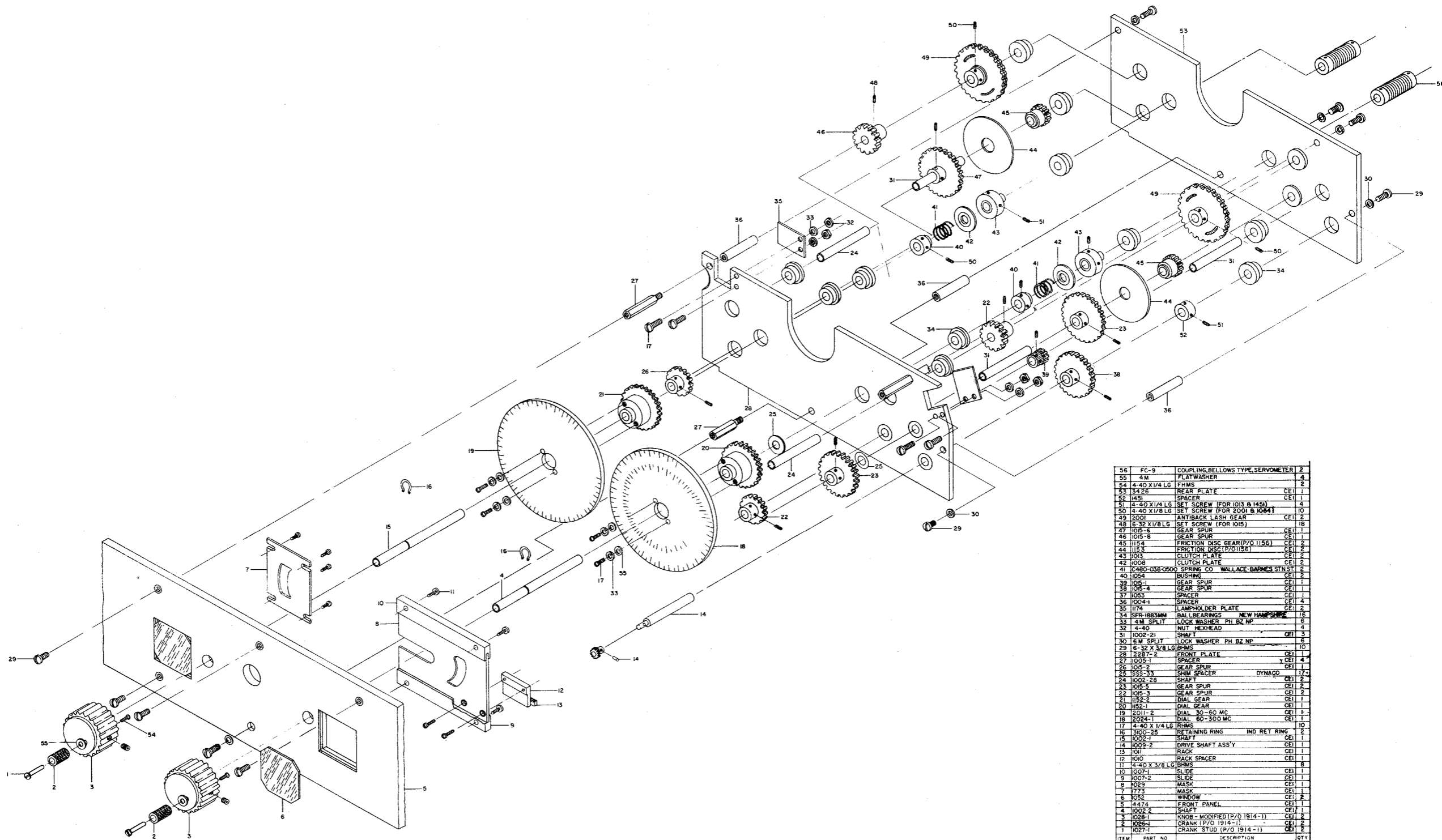
Table 4-1

Table 4-1. AN/URR-52A Panoramic Data Receiving Set, Tube and Transistor Element Voltages (Cont.)

Ref. Desig.	Type	2	4	8	10	12	Plate	Emiiter	Base	Collector
			Grid	Cathode	Heater	Heater				
A8Q2	2N2708							1.9	2.7	11.8
A8Q3	2N2708							2.0	2.8	11.7
A8Q4	2N2708							2.0	2.8	11.9
A8Q5	2N2708							1.8	2.6	11.8
A8Q6	2N2708							1.9	2.7	11.8
A8Q7	2N2708							2.1	2.8	10.9
A8Q8	2N2708							2.6	3.4	11.6
A8Q9	2N697							0.7	1.2	12.2
A8Q10	2N697							0	0.6	12.2
A8Q11	2N697							1.44	-.04	12.2
A8Q12	2N697							10.8	11.4	11.0
A8Q13	2N1131							11.7	11.0	11.6
A8A1Q1	2N706							2.7	3.2	11.4
A8A1Q2	2N706							2.7	3.3	11.3
A8A1Q3	2N706							3.0	3.1	11.5
A8A1Q4	2N706							3.0	3.1	11.5
A8A1Q5	2N697							0.68	1.2	12
A8A1Q6	2N697							-24	0.68	12
A8A2Q1	2N706							17.0	16.0	23.0
A9Q1	2N697							1.37	2.0	25.0
A9Q2	2N526							25.0	25.0	16.0
A10Q1	2N335							0.6	1.25	6.0
A10Q2	2N335							4.7	5.4	24.0
A10Q3	2N2270							1.2	1.5	22.5
A11V1	GV3A1200						1100			
A12Q1	2N2270							24.5	25.0	31.0
A12Q2	2N2270							24.5	25.0	31.0
A12Q3	2N1038							-25.0	-24.5	-33.0
A15Q1	2N929							-16.1	-15.5	8.0
A15Q2	2N3251							8.6	8.0	0

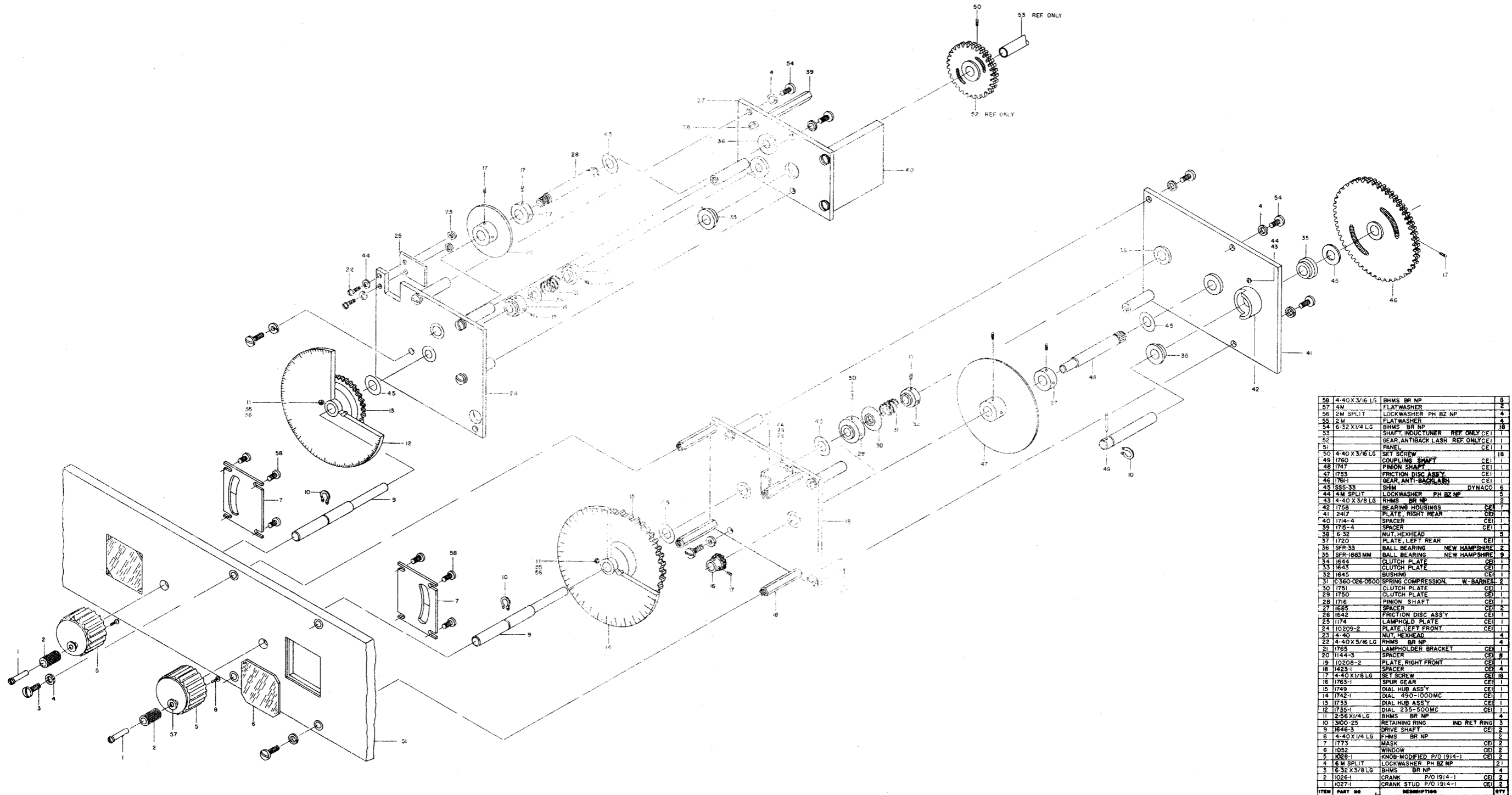
Test Conditions: All voltages are positive dc with respect to chassis unless otherwise indicated. Readings taken with RCA WV-98B VTVM with 115 vac applied to the receiving system. Control settings as follows: FOCUS, INTENSITY, and CENTER FREQ for normal operation; GAIN, SWEEP WIDTH, RF GAIN, BFO TUNING, VIDEO GAIN, AUDIO GAIN, and FINE TUNING at max cw; RANGE switch set to tuner being measured; IF BANDWIDTH to IF strip being measured; function switch in CW.

- NOTES:
- * - indicates 1 meg resistor used in series with probe.
 - # - indicates reading which may vary with tuning.
 - (1) - Base one.
 - (2) - Base two.



ITEM	PART NO	DESCRIPTION	QTY
56	FC-9	COUPLING, BELLOWS TYPE, SERVOMETER	2
55	4M	PLAT WASHER	4
54	4-40 X 1/4 LG	FHMS	2
53	3426	REAR PLATE	CEI 1
52	1451	SPACER	CEI 1
51	4-40 X 1/4 LG	SET SCREW (FOR 1013 & 1430)	4
50	4-40 X 1/8 LG	SET SCREW (FOR 2001 & 1064)	10
49	2001	ANTIBACK LASH GEAR	CEI 2
48	6-32 X 1/8 LG	SET SCREW (FOR 1015)	16
47	1015-6	GEAR SPUR	CEI 1
46	1015-8	GEAR SPUR	CEI 1
45	115-4	FRICION DISC GEAR (P/O 1156)	CEI 2
44	115-3	FRICION DISC (P/O 1155)	CEI 2
43	1013	CLUTCH PLATE	CEI 2
42	1008	CLUTCH PLATE	CEI 2
41	C480-058-0500	SPRING CO. WALLACE-BARNES STN ST	2
40	1054	BUSHING	CEI 2
39	105-1	GEAR SPUR	CEI 1
38	105-4	GEAR SPUR	CEI 1
37	1053	SPACER	CEI 1
36	1004-1	SPACER	CEI 4
35	1174	LAMPHOLDER PLATE	CEI 2
34	SFR-183MM	BAL BEARINGS NEW HAMPSPRNG	16
33	4M	SPLIT LOCK WASHER PH BZ NP	6
32	4-40	NUT HEXHEAD	4
31	1002-21	SHAFT	CEI 3
30	6M	SPLIT LOCK WASHER PH BZ NP	10
29	16-32 X 3/8 LG	BHMS	10
28	2287-2	FRONT PLATE	CEI 4
27	1005-1	SPACER	CEI 4
26	1005-2	GEAR SPUR	CEI 1
25	SS5-33	SHM SPACER	DYNAGO 17
24	1002-28	SHAFT	CEI 2
23	1015-5	GEAR SPUR	CEI 2
22	1015-3	GEAR SPUR	CEI 2
21	1152-2	DIAL GEAR	CEI 1
20	1152-1	DIAL GEAR	CEI 1
19	2011-2	DIAL 30-60 MC	CEI 1
18	2024-1	DIAL 60-300 MC	CEI 1
17	4-40 X 1/4 LG	RHMS	10
16	300-25	RETAINING RING	IND RET RING 2
15	1002-1	SHAFT	CEI 2
14	1003-2	DRIVE SHAFT ASSY	CEI 1
13	1011	RACK	CEI 1
12	1010	RACK SPACER	CEI 1
11	4-40 X 3/8 LG	BHMS	8
10	1007-1	SLIDE	CEI 1
9	1007-2	SLIDE	CEI 1
8	1029	MASK	CEI 1
7	1773	MASK	CEI 1
6	1052	WINDOW	CEI 2
5	4474	FRONT PANEL	CEI 2
4	1002-2	SHAFT	CEI 1
3	1028-1	KNOB - MODIFIED (P/O 1914-1)	CEI 2
2	1028-1	CRANK (P/O 1914-1)	CEI 2
1	1027-1	CRANK STUD (P/O 1914-1)	CEI 2

Figure 4-15. VHF Gear Train Assembly, Exploded View



58	4-40 X 3/16 LG	BHMS BR NP	8	
57	4M	FLATWASHER	2	
56	2M SPLIT	LOCKWASHER PH BZ NP	4	
55	2M	FLATWASHER	4	
54	6-32 X 1/4 LG	BHMS BR NP	18	
53		SHAFT INDUCTOR REF ONLY CEI	1	
52		GEAR ANTI-BACK LASH REF ONLY CEI	1	
51		PANEL	CEI	1
50	4-40 X 3/16 LG	SET SCREW	18	
49	1760	COUPLING SHAFT	CEI	1
48	1747	PINION SHAFT	CEI	1
47	1753	FRICION DISC ASSY	CEI	1
46	1761-1	GEAR ANTI-BACK LASH	CEI	1
45	SS5-33	SHIM	DYNACO	6
44	4M SPLIT	LOCKWASHER PH BZ NP	2	
43	4-40 X 3/8 LG	BHMS BR NP	2	
42	1758	BEARING HOUSINGS	CEI	1
41	2417	PLATE RIGHT REAR	CEI	1
40	1714-4	SPACER	CEI	1
39	1715-4	SPACER	CEI	1
38	6-32	NUT, HEXHEAD	8	
37	1720	PLATE, LEFT REAR	CEI	1
36	SFR-33	BALL BEARING	NEW HAMPSHIRE	2
35	SFR-1833MM	BALL BEARING	NEW HAMPSHIRE	9
34	1644	CLUTCH PLATE	CEI	1
33	1643	CLUTCH PLATE	CEI	1
32	1645	BUSHING	CEI	1
31	0360-026-0500	SPRING COMPRESSION	W-BARNES	2
30	1751	CLUTCH PLATE	CEI	1
29	1750	CLUTCH PLATE	CEI	1
28	1716	PINION SHAFT	CEI	1
27	1685	SPACER	CEI	2
26	1642	FRICION DISC ASSY	CEI	1
25	1174	LAMPHOLD PLATE	CEI	1
24	10209-2	PLATE, LEFT FRONT	CEI	1
23	4-40	NUT, HEXHEAD	4	
22	4-40 X 5/16 LG	BHMS BR NP	4	
21	1765	LAMPHOLDER BRACKET	CEI	1
20	1144-3	SPACER	CEI	8
19	10208-2	PLATE, RIGHT FRONT	CEI	1
18	1423-1	SPACER	CEI	4
17	4-40 X 1/8 LG	SET SCREW	CEI	18
16	1763-1	SPUR GEAR	CEI	1
15	1749	DIAL HUB ASSY	CEI	1
14	1742-1	DIAL 490-1000MC	CEI	1
13	1733	DIAL HUB ASSY	CEI	1
12	1735-1	DIAL 235-500MC	CEI	1
11	2-56 X 1/4 LG	BHMS BR NP	4	
10	3000-25	RETAINING RING	IND RET RING	3
9	1846-3	DRIVE SHAFT	CEI	2
8	4-40 X 1/4 LG	BHMS BR NP	CEI	2
7	1773	MASK	CEI	2
6	1052	WINDOW	CEI	2
5	1028-1	KNOB MODIFIED P/O 1914-1	CEI	2
4	6 M SPLIT	LOCKWASHER PH BZ NP	CEI	2
3	6-32 X 3/8 LG	BHMS BR NP	CEI	4
2	1026-1	CRANK P/O 1914-1	CEI	2
1	1027-1	CRANK STUD P/O 1914-1	CEI	2
ITEM	PART NO	DESCRIPTION	QTY	

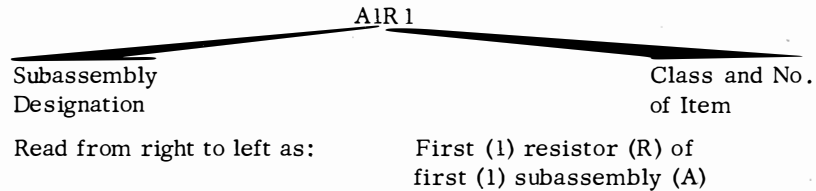
Figure 4-16. UHF Gear Train Assembly, Exploded View

SECTION V

IDENTIFICATION TABLE OF PARTS

5.1 UNIT NUMBERING METHOD

The unit numbering method of assigning reference designations (electrical symbol numbers) has been used to identify assemblies, subassemblies (and modules), and parts. An example of the unit method follows:



As shown on the main chassis schematic, components which are an integral part of the main chassis have no sub-assembly designation.

5.2 REFERENCE DESIGNATION PREFIX

Partial reference designations have been used on the equipment and on the illustrations in this manual. The partial reference designations consist of the class letter(s) and identifying item number. The complete reference designations may be obtained by placing the proper prefix before the partial reference designations. Prefixes are provided on drawings and illustrations following the notation "REF DESIG PREFIX".

5.3 IDENTIFICATION TABLE OF PARTS

The Identification Table OF Parts presented on the following pages lists the repair parts for the AN/URR -52A Panoramic Data Receiving Set.

Figure 5-2

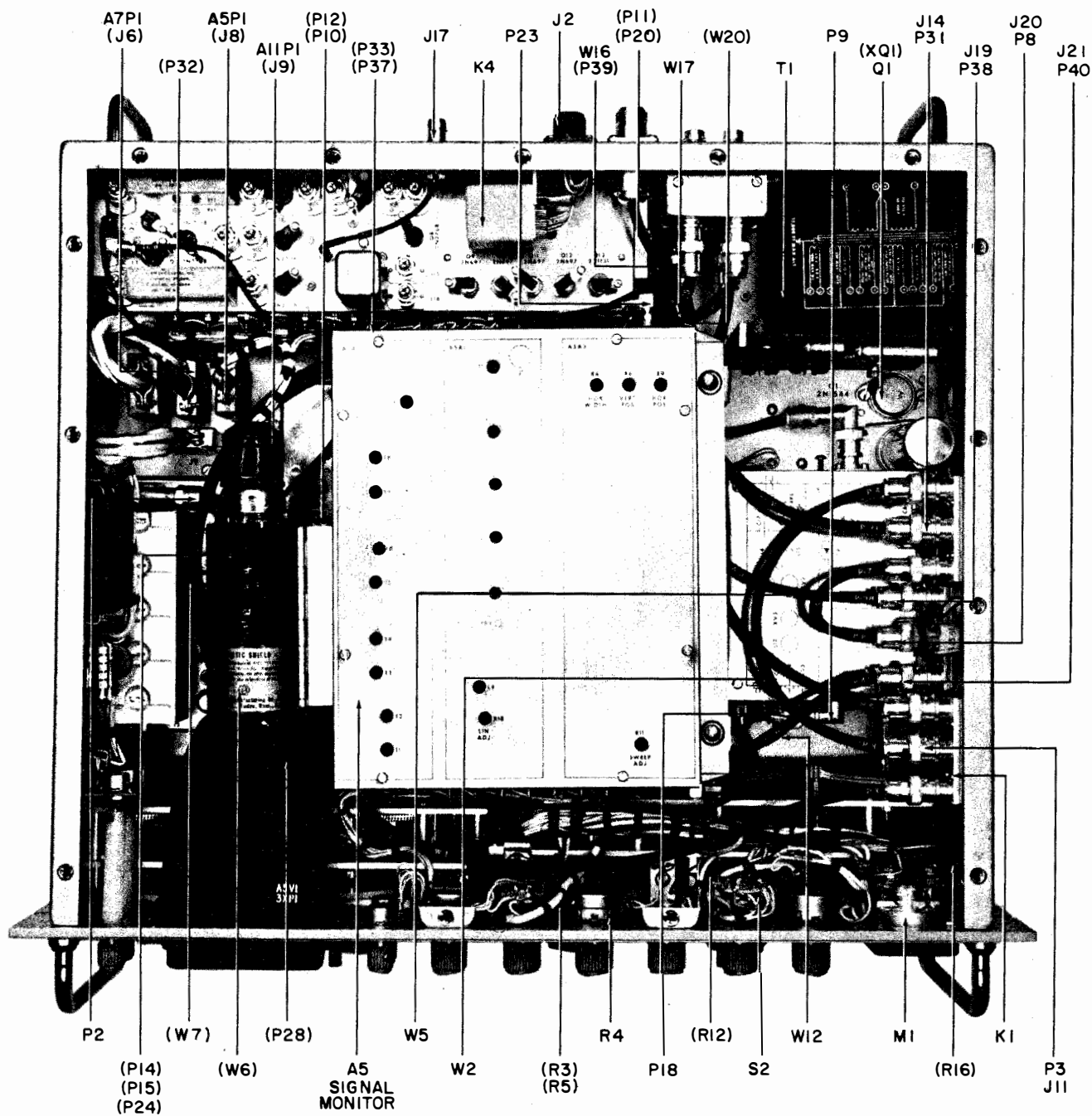


Figure 5-2. Type AN/URR-52A Panoramic Data Receiving Set, Top View

Figure 5-3

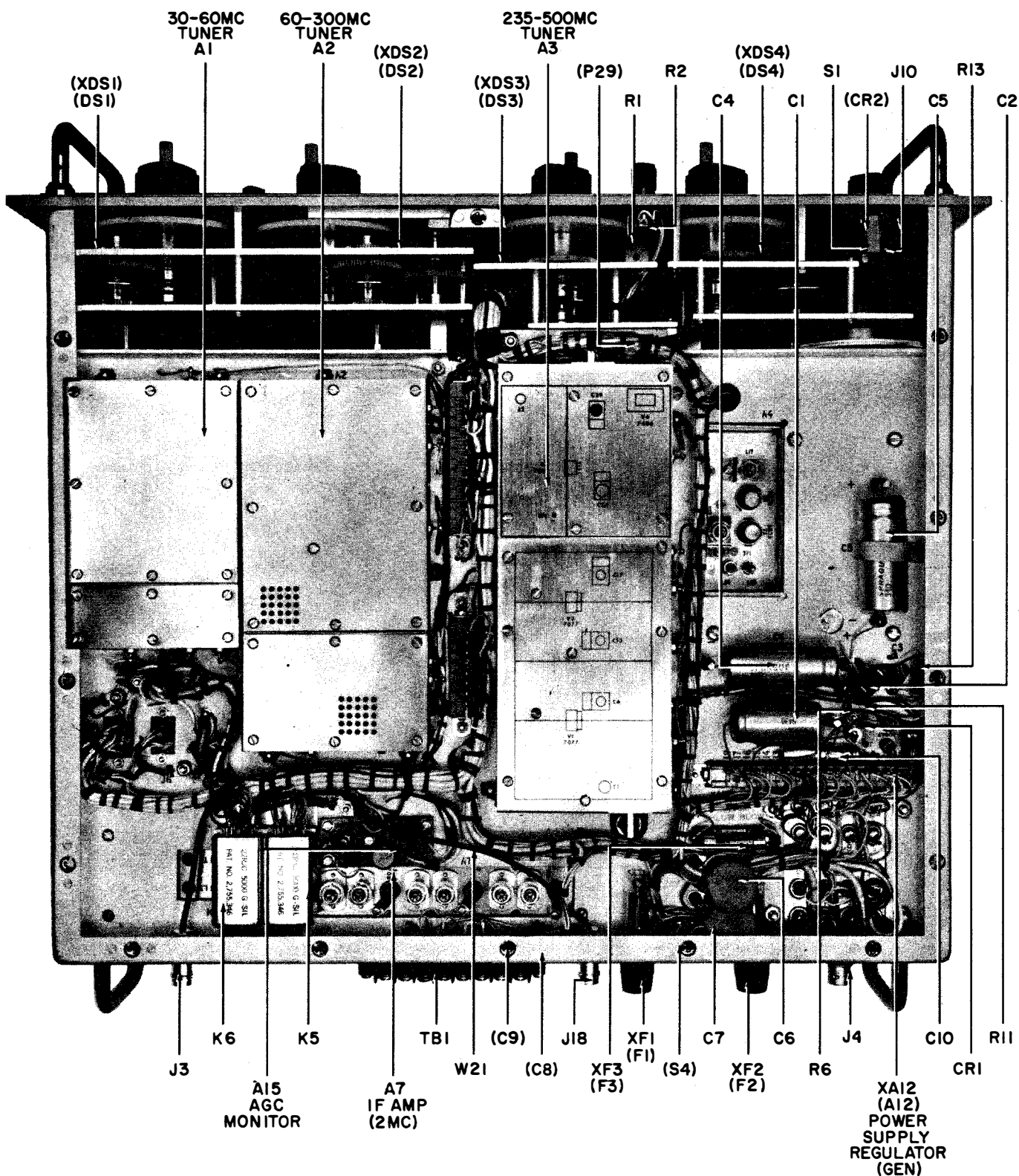
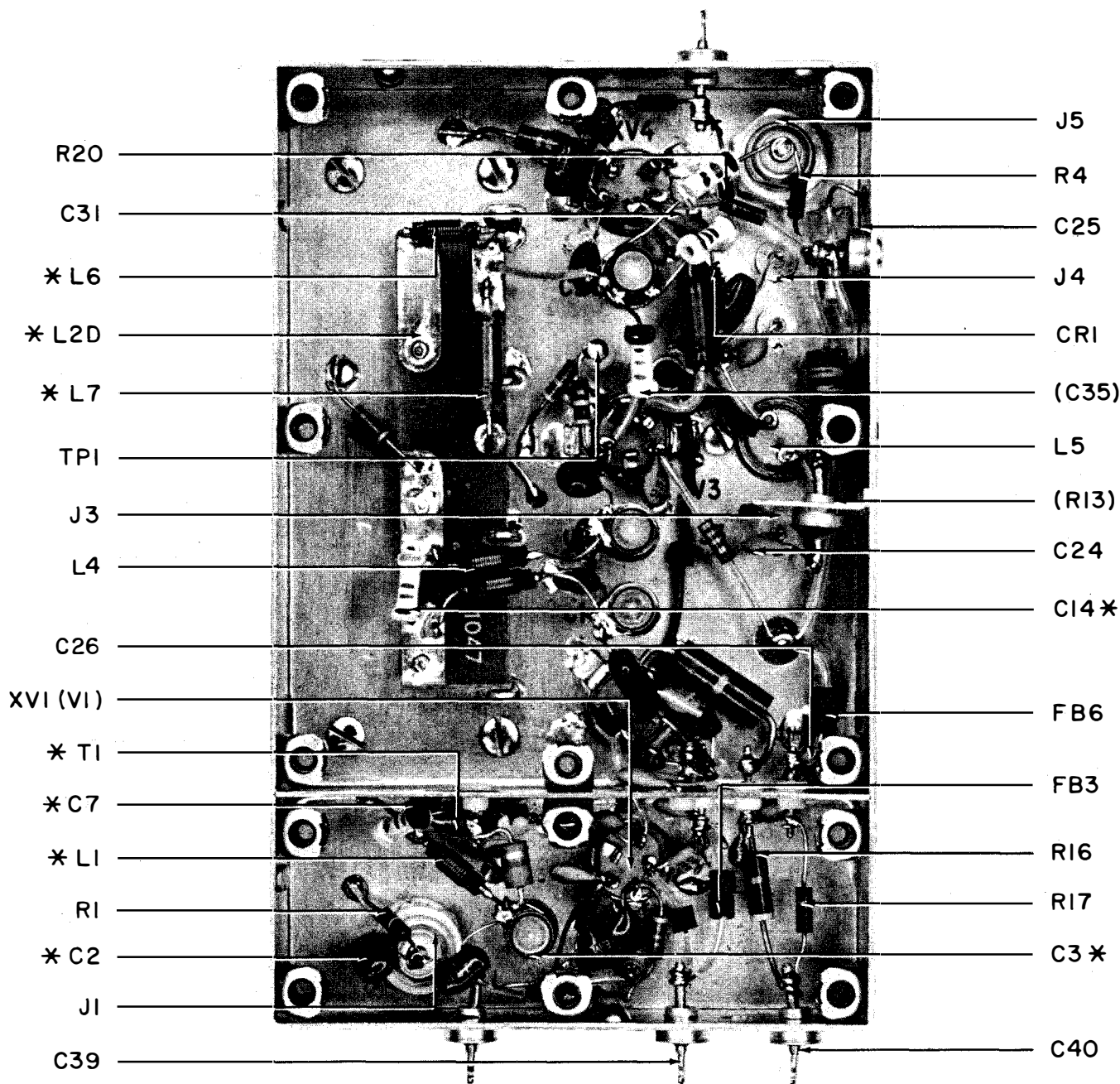


Figure 5-3. Type AN/URR-52A Panoramic Data Receiving Set, Bottom View

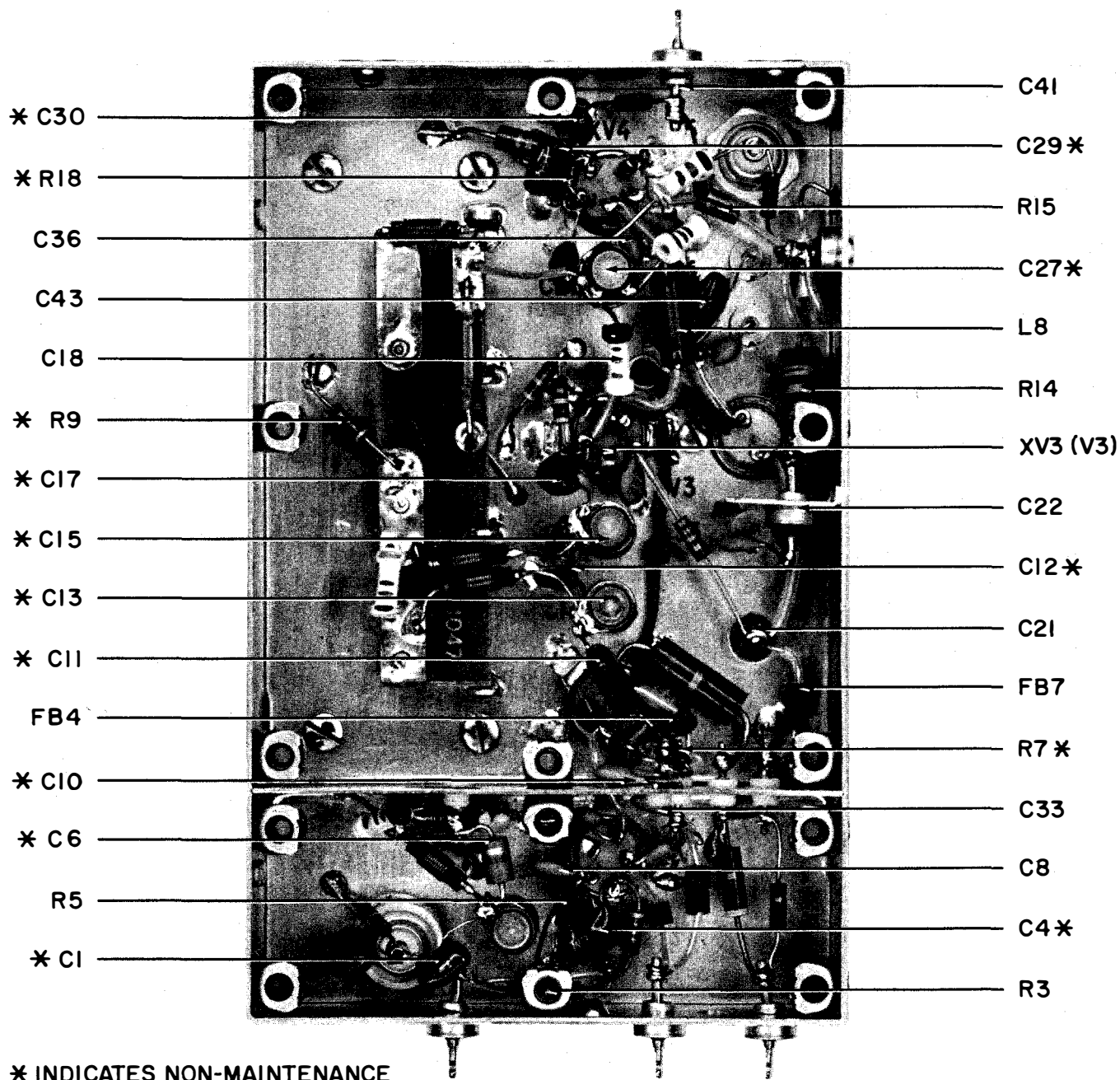
REF DESIG PREFIX A1



* INDICATES NON-MAINTENANCE ITEM

Figure 5-4. Type 7165 30-60 mc Tuner, Component Locations

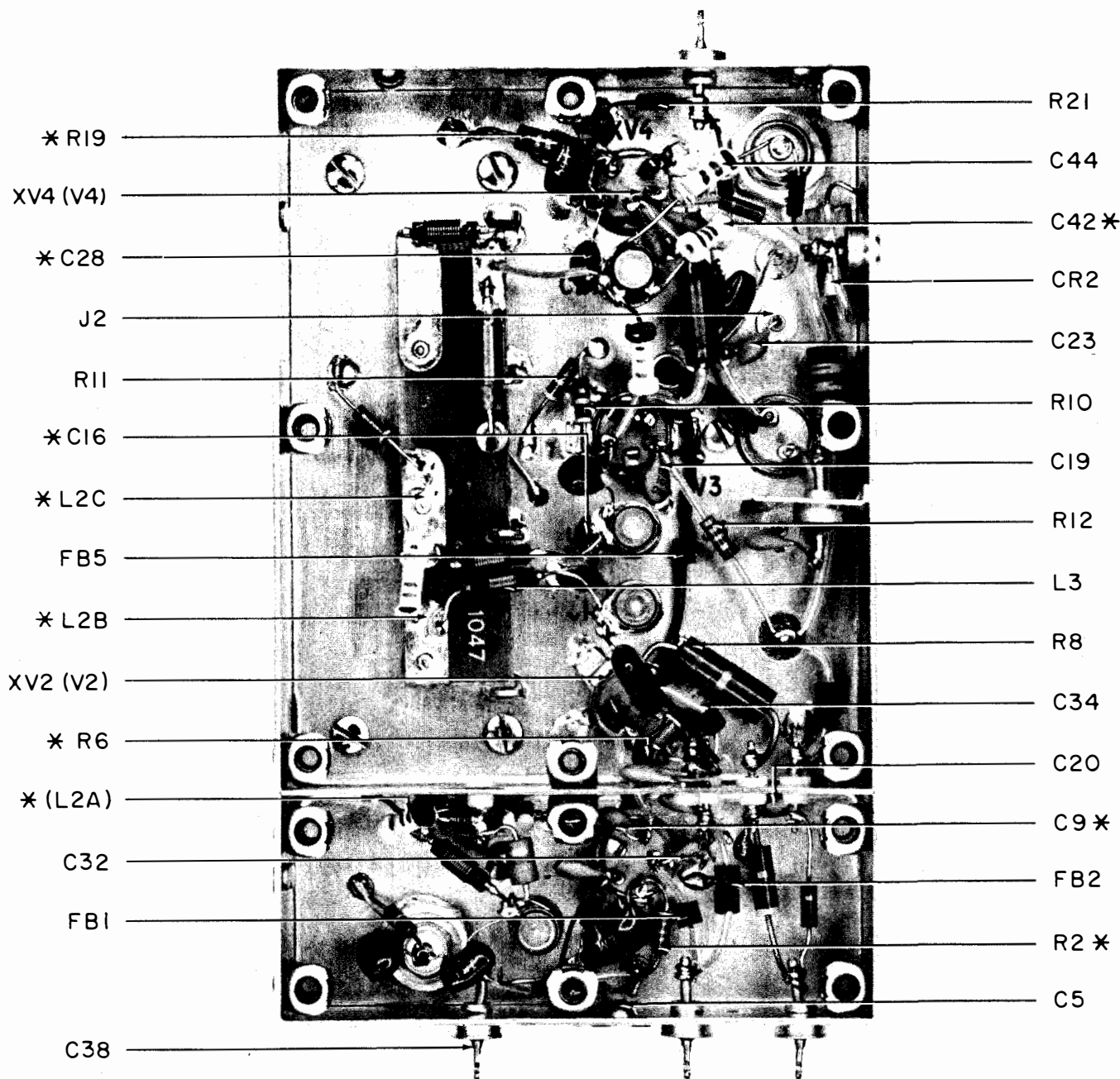
REF DESIG PREFIX A1



* INDICATES NON-MAINTENANCE ITEM

Figure 5-5. Type 7165 30-60 mc Tuner, Component Locations

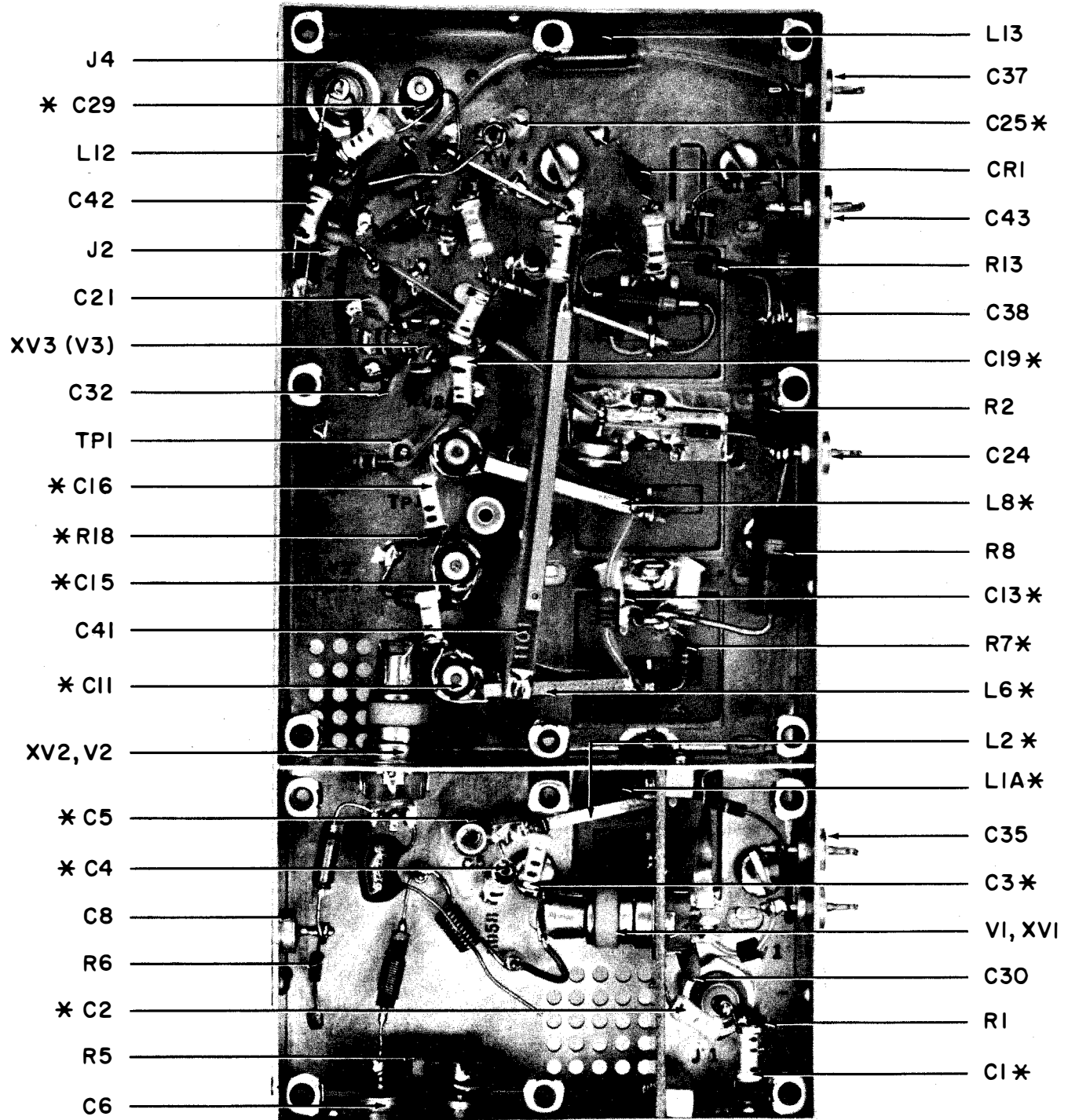
REF DESIG PREFIX A1



* INDICATES NON-MAINTENANCE
ITEM

Figure 5-6. Type 7165 30-60 mc Tuner, Component Locations

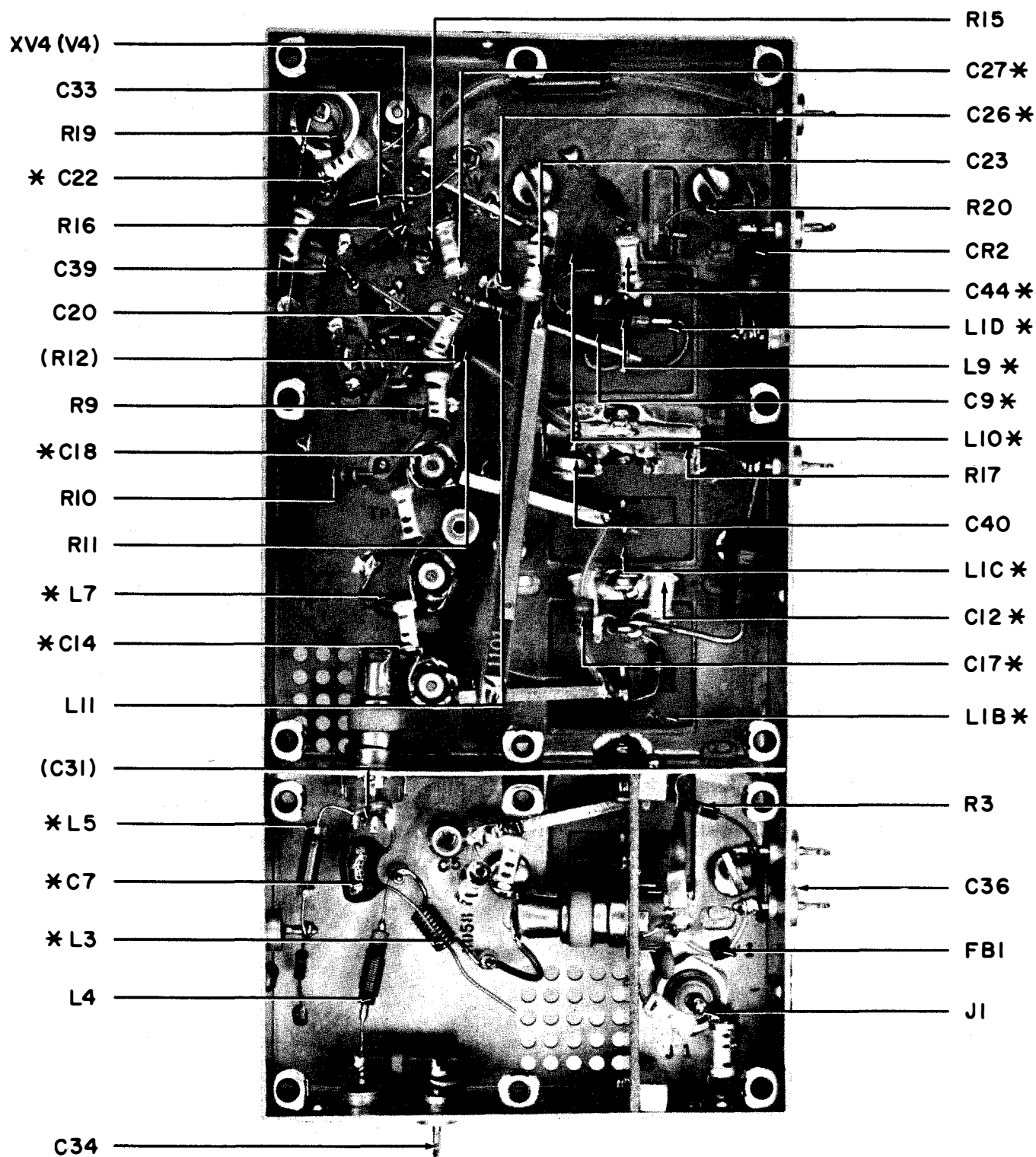
REF DESIG PREFIX A2



* INDICATES NON-MAINTENANCE ITEM

Figure 5-7. Type 7164 60-300 mc Tuner, Component Locations

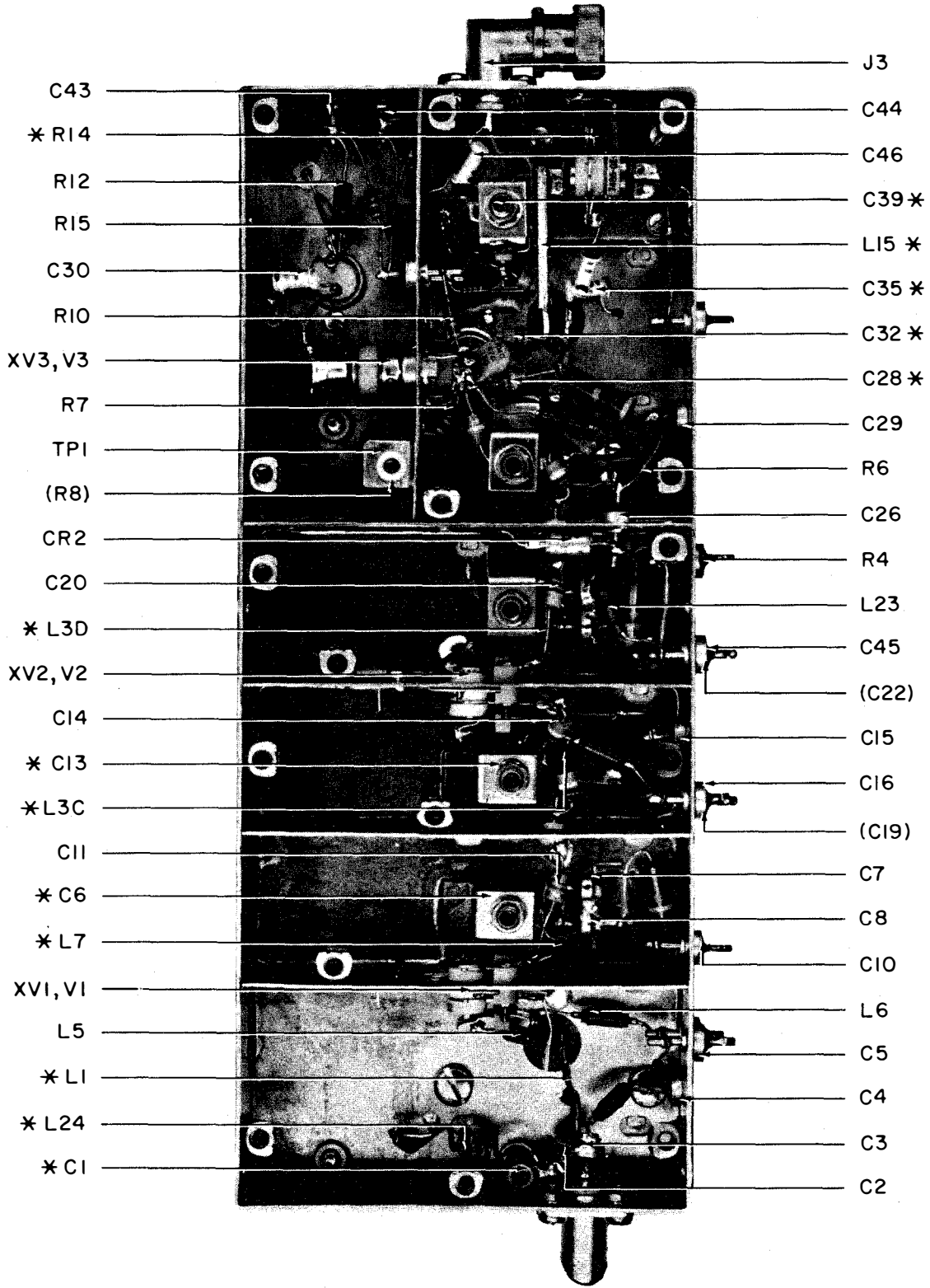
REF DESIG PREFIX A2



* INDICATES NON-MAINTENANCE ITEM

Figure 5-8. Type 7164 60-300 mc Tuner, Component Locations

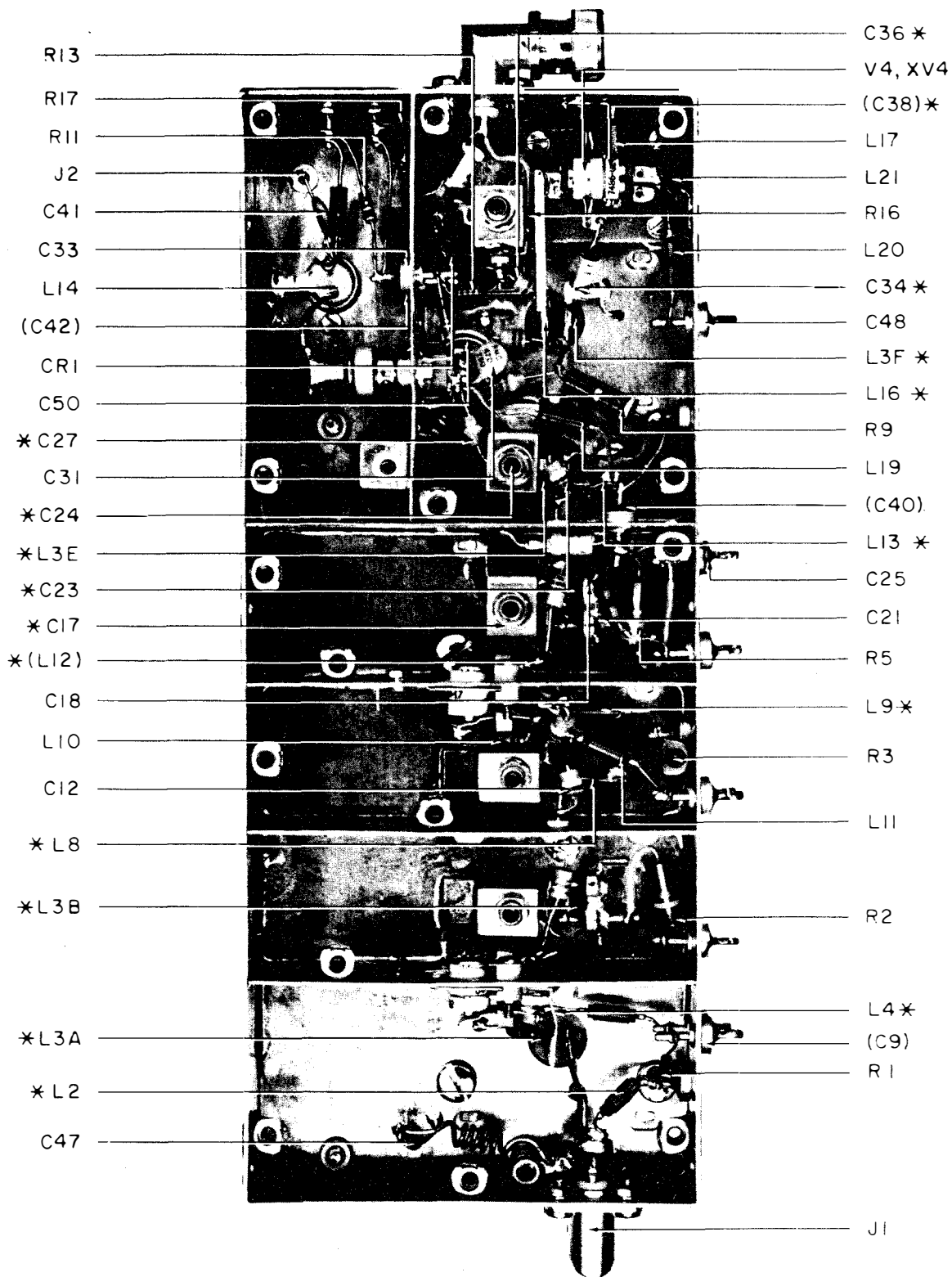
REF DESIG PREFIX A3



* INDICATES NON-MAINTENANCE ITEM

Figure 5-9. Type 7162 235-500 mc Tuner, Component Locations

REF DESIG PREFIX A3



* INDICATES NON-MAINTENANCE ITEM

Figure 5-10. Type 7162 235-500 mc Tuner, Component Locations

REF DESIG PREFIX A4

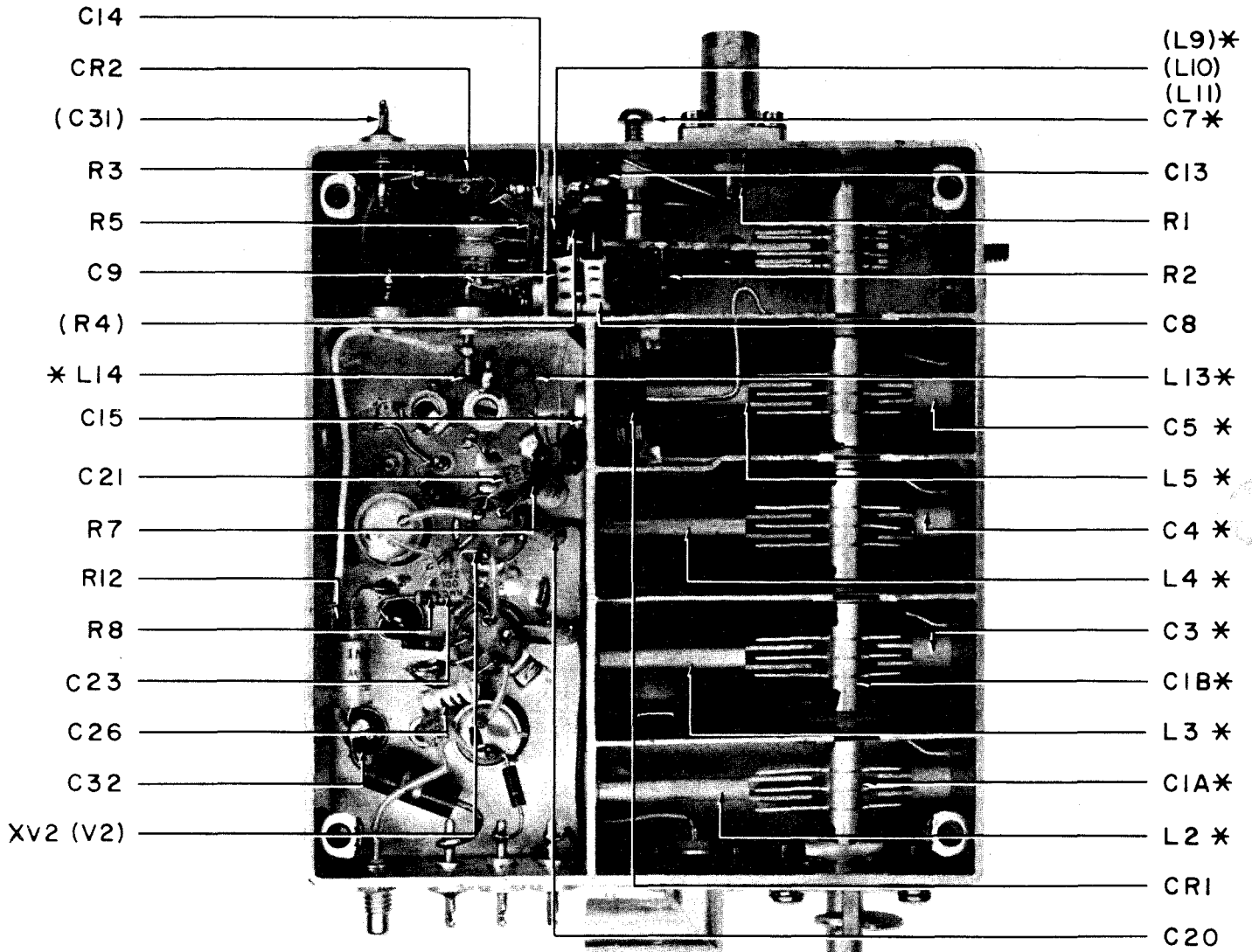


Figure 5-11. Type 7163 490-1000 mc Tuner, Component Locations

REF DESIG PREFIX A4

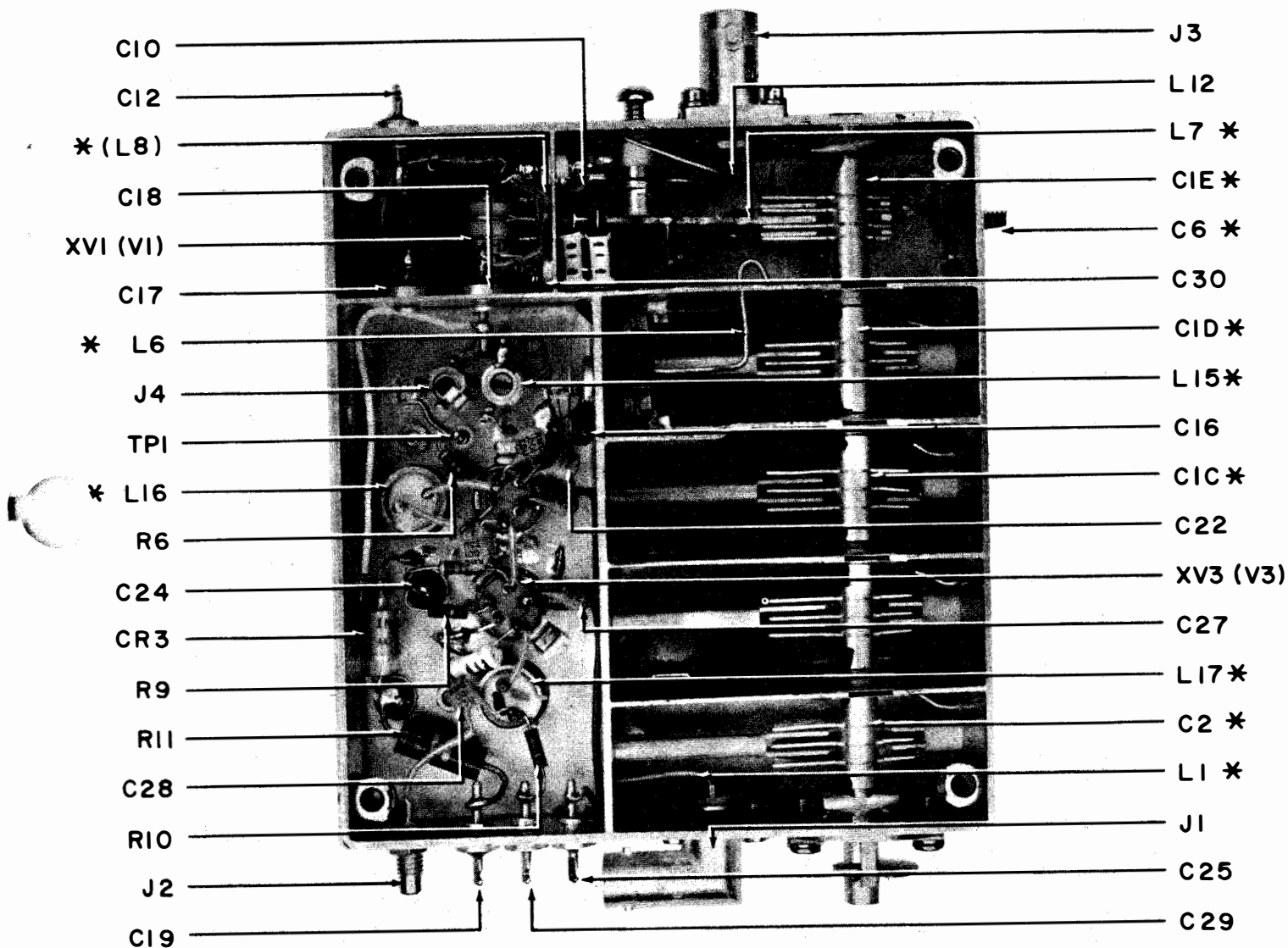


Figure 5-12. Type 7163 490-1000 mc Tuner, Component Locations

Figure 5-13

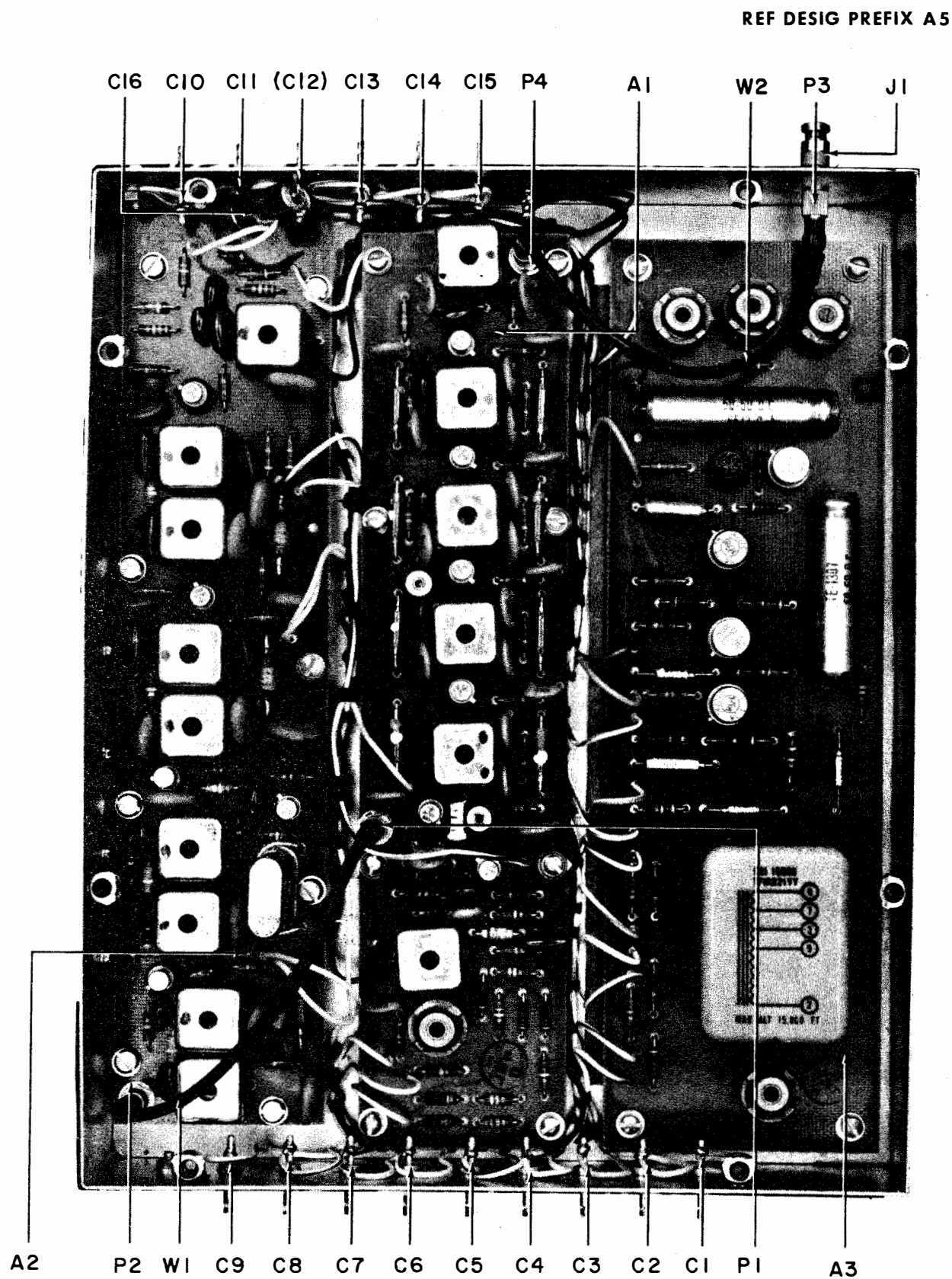


Figure 5-13. Type 7930 Signal Monitor, Component Locations

REF DESIG PREFIX A5A1

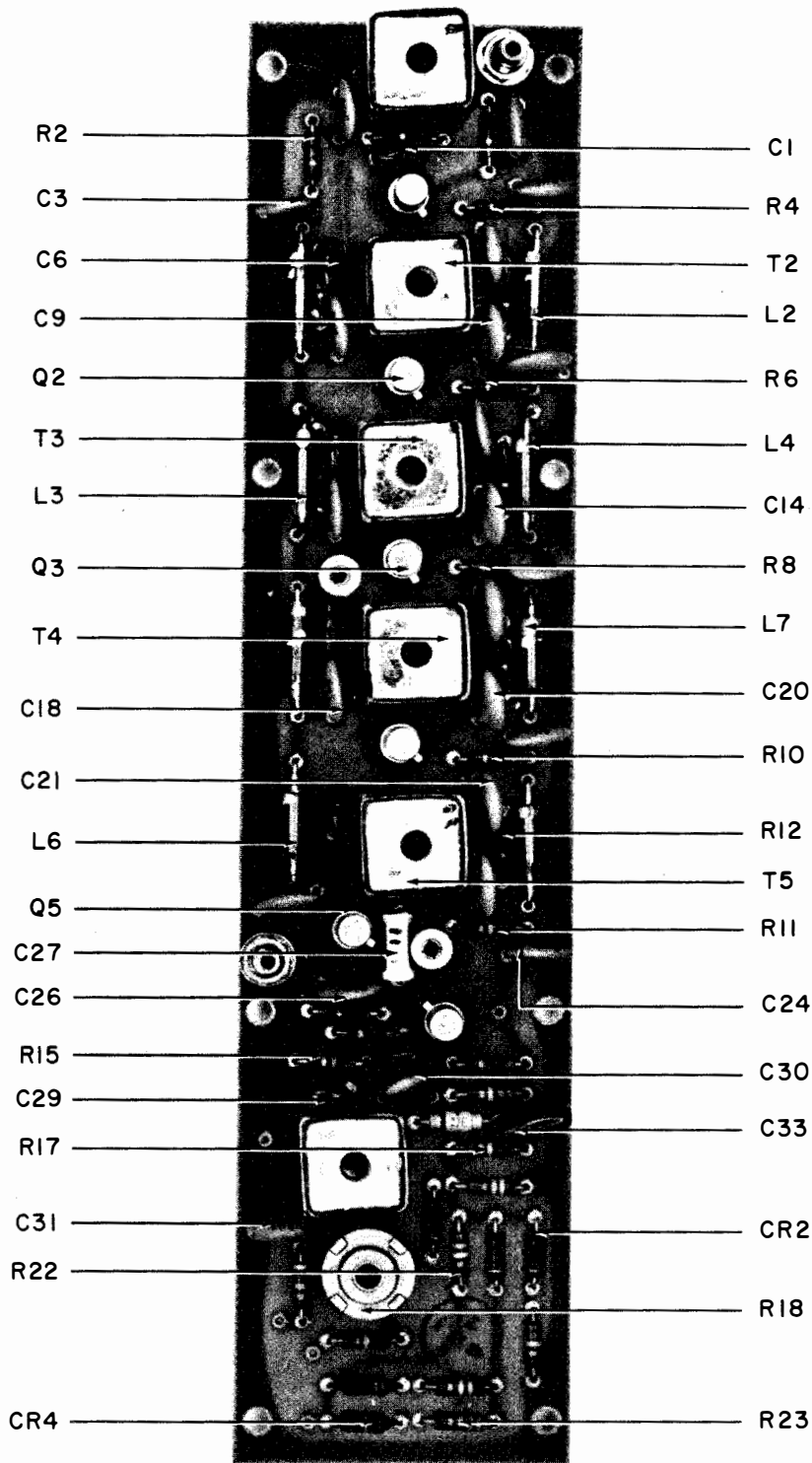


Figure 5-14. Type 8003 Shaping Amplifier/Sweep Oscillator, Component Locations

Figure 5-15

REF DESIG PREFIX A5A1

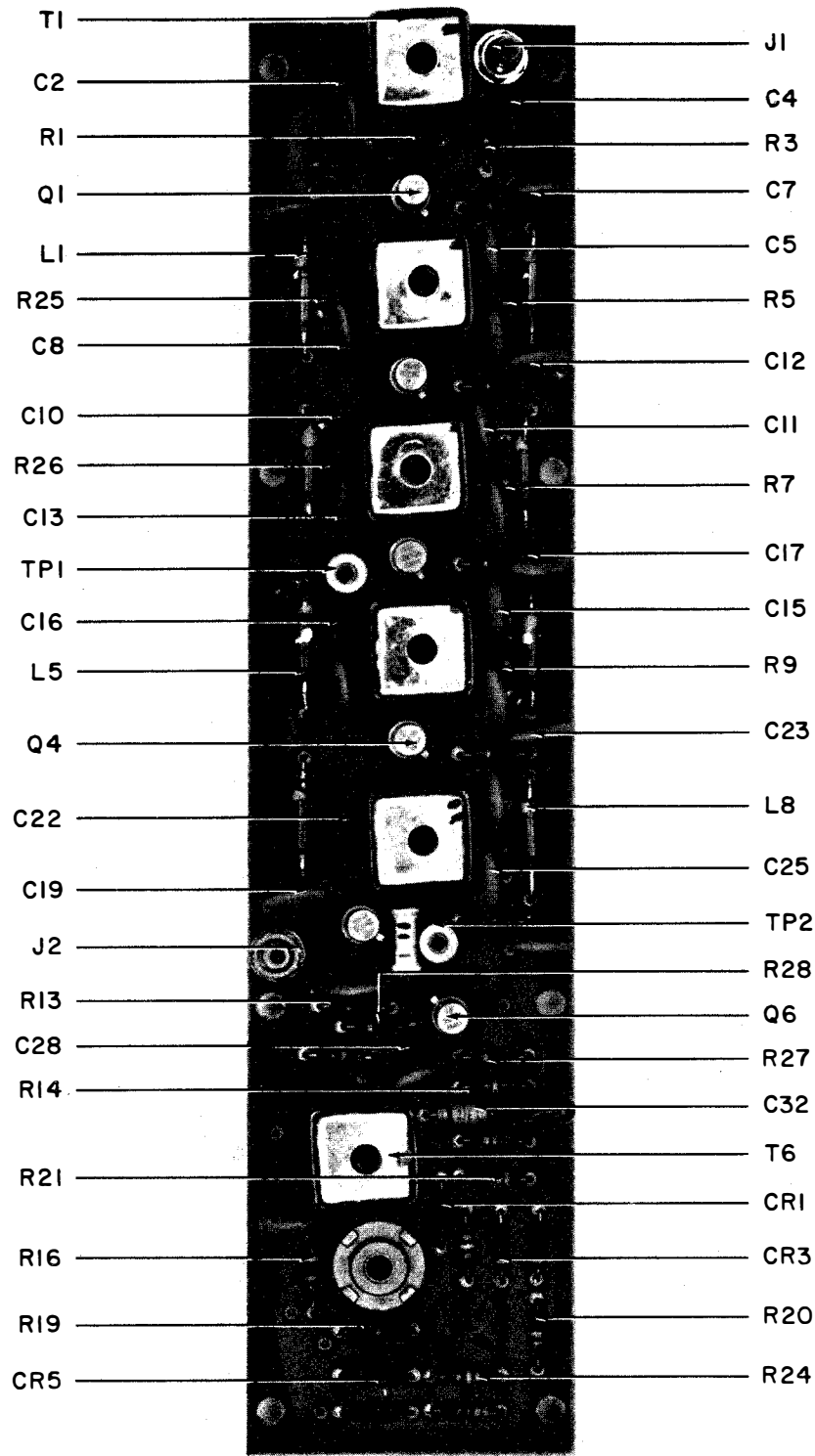


Figure 5-15. Type 8003 Shaping Amplifier/Sweep Oscillator, Component Locations

REF DESIG PREFIX A5A2

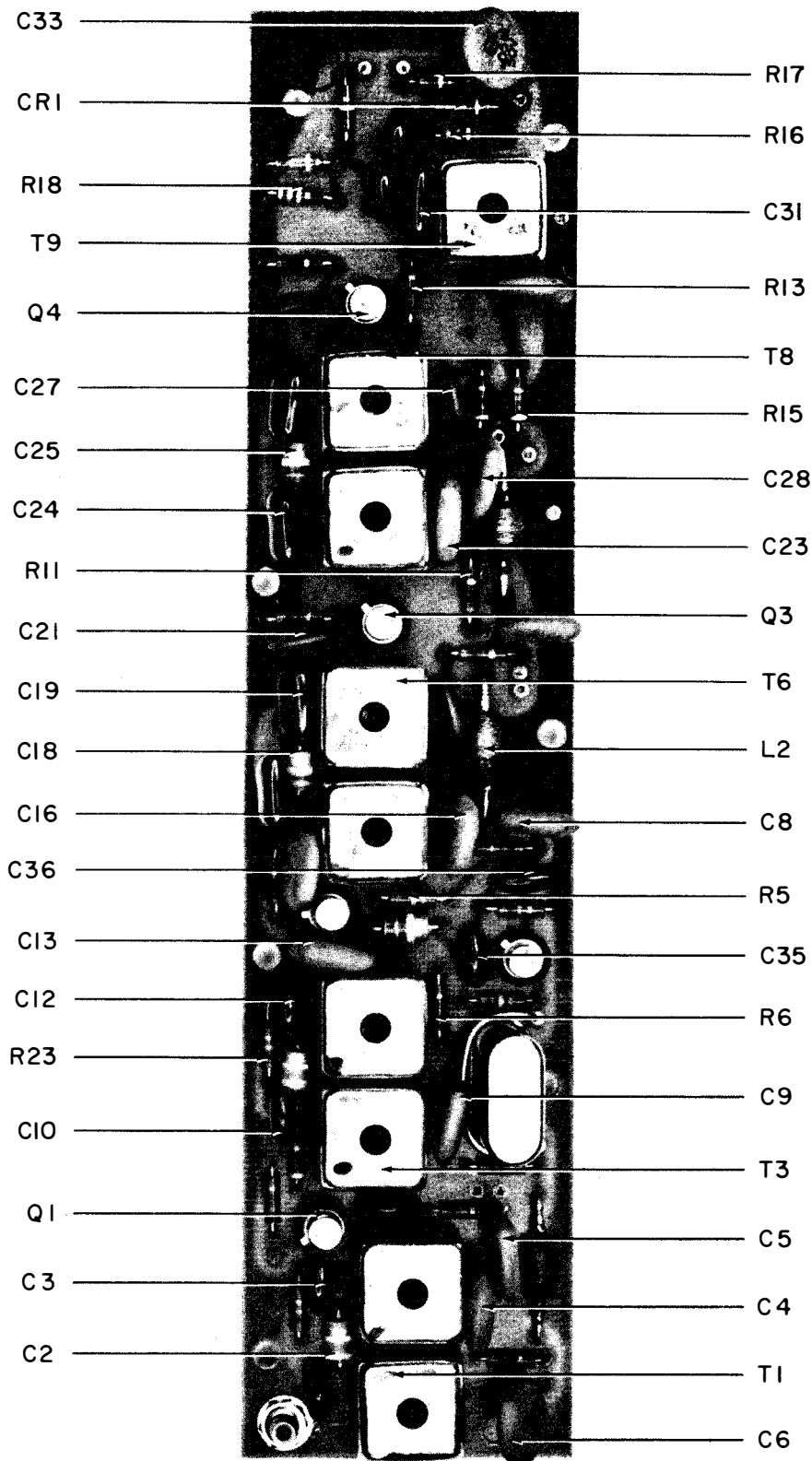


Figure 5-16. Type 8101 IF Output Amplifier, Component Locations

Figure 5-17

REF DESIG PREFIX A5A2

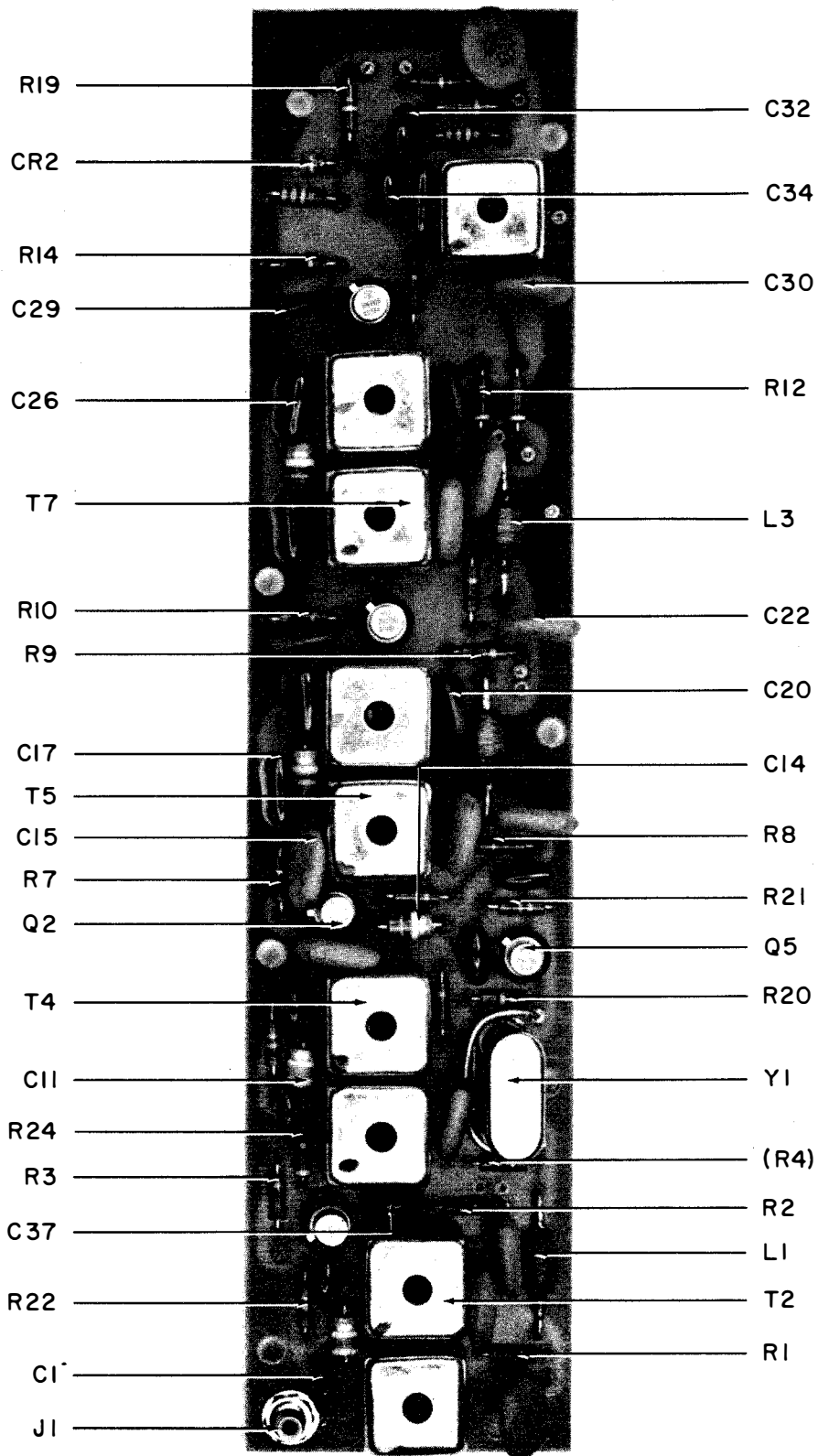


Figure 5-17. Type 8101 IF Output Amplifier, Component Locations

REF DESIG PREFIX A5A3

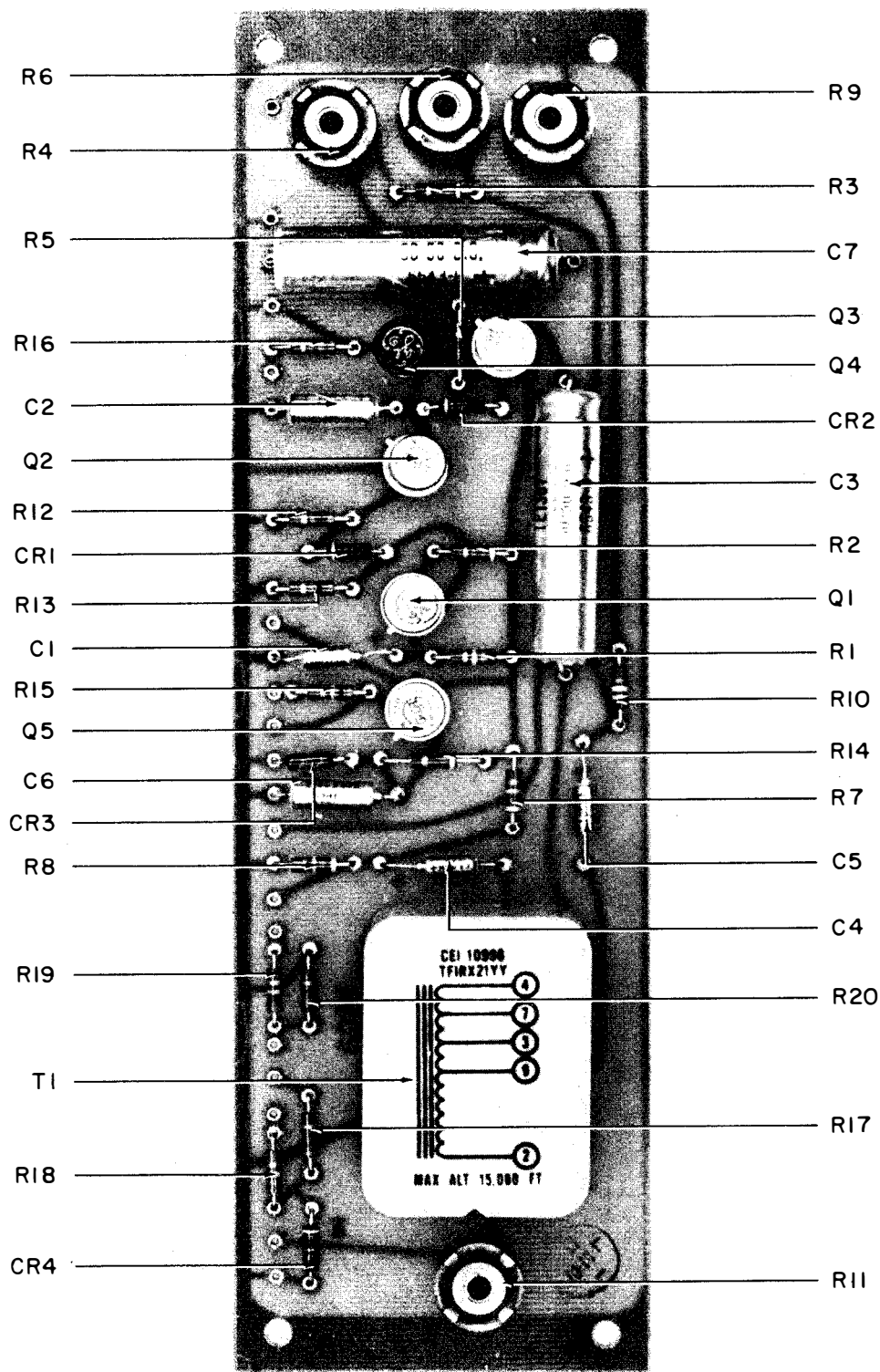


Figure 5-18. Type 8202 Horizontal Sweep Oscillator, Component Locations

Figure 5-19

REF DESIG PREFIX A6

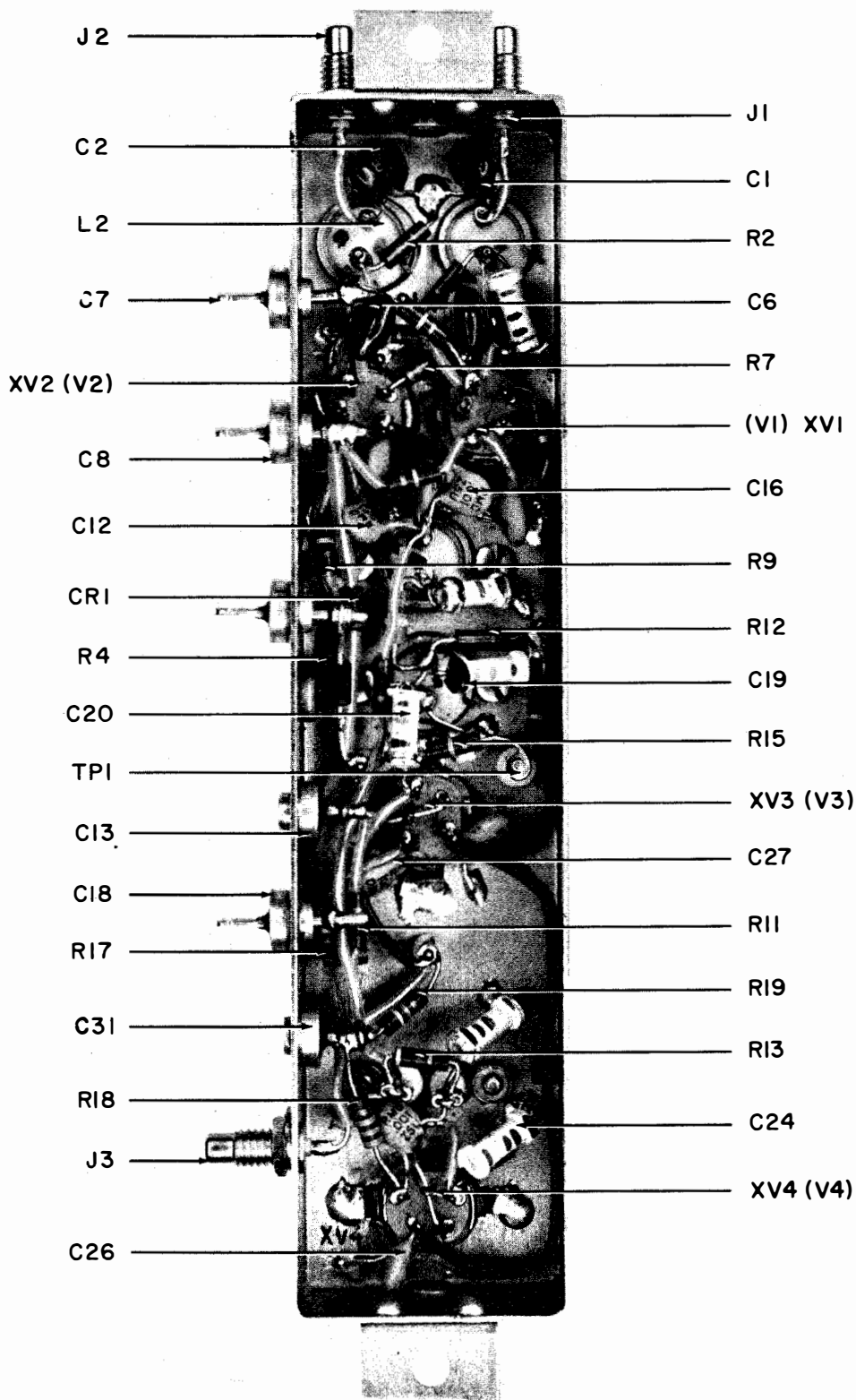


Figure 5-19. Type 7120 60-21.4 mc Converter, Component Locations

REF DESIG PREFIX A6

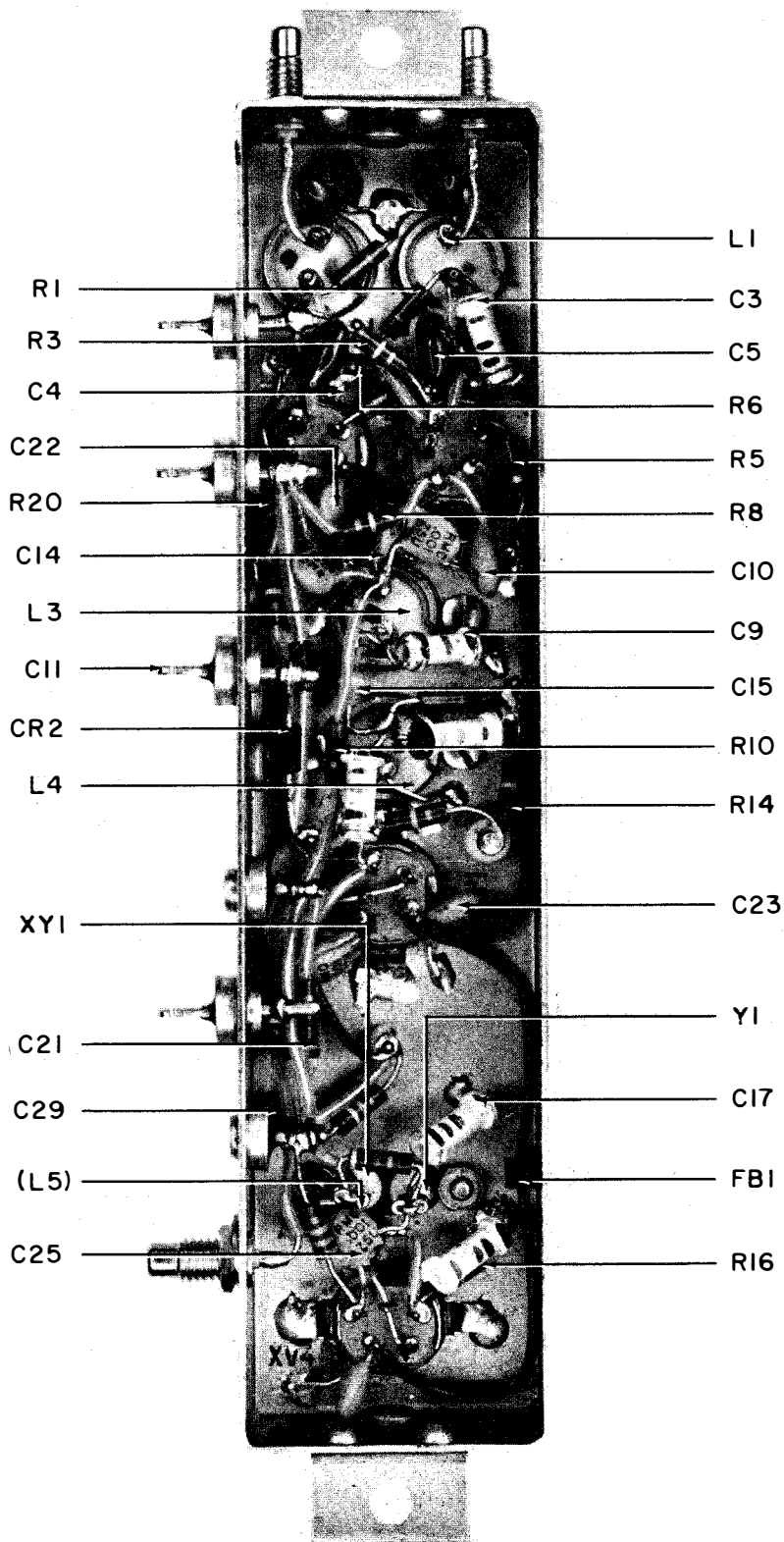


Figure 5-20. Type 7120 60-21.4 mc Converter, Component Locations

REF DESIG PREFIX A7

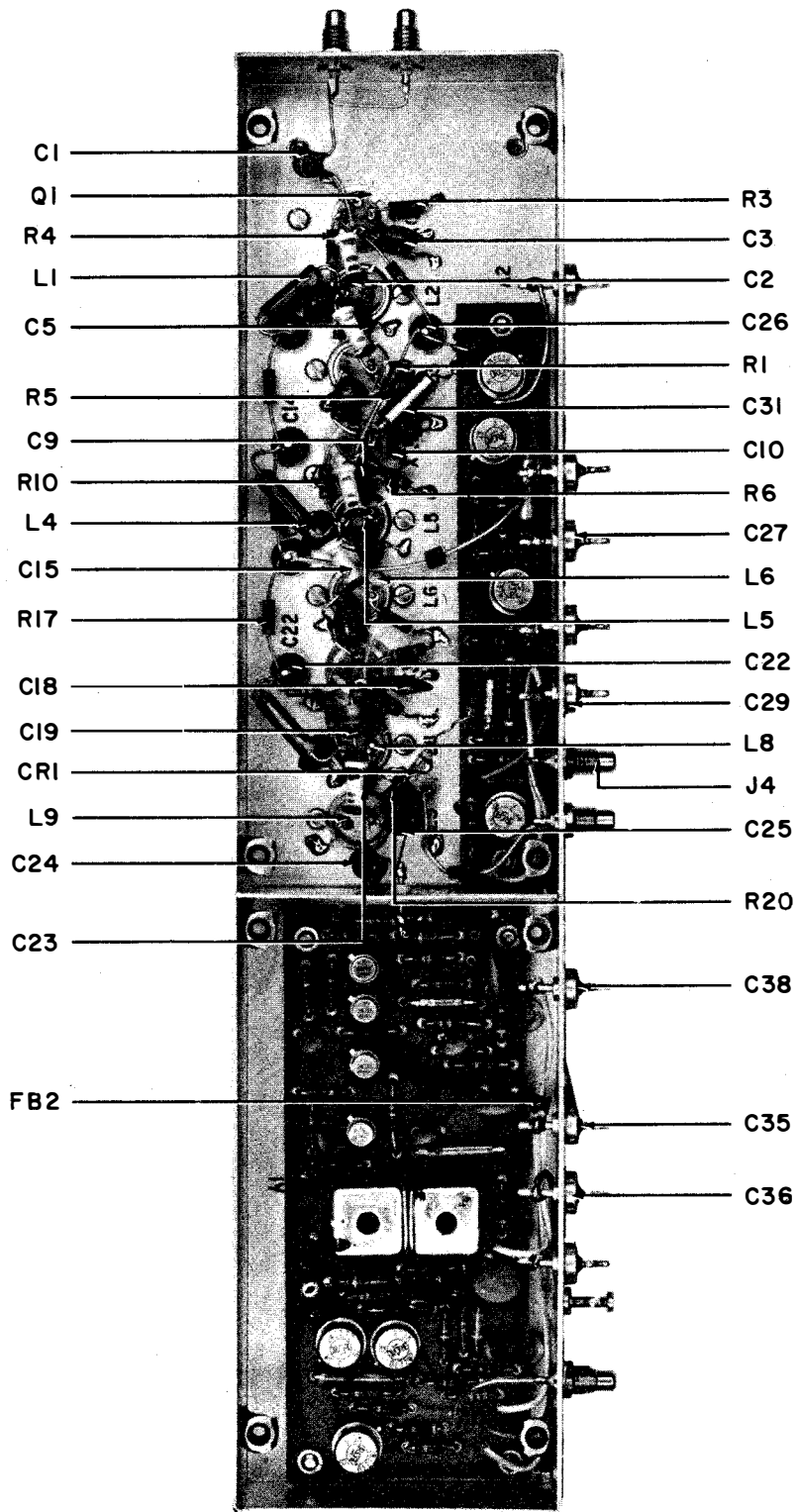


Figure 5-21. Type 72121 2-mc Bandwidth IF Strip, Component Locations

REF DESIG PREFIX A7

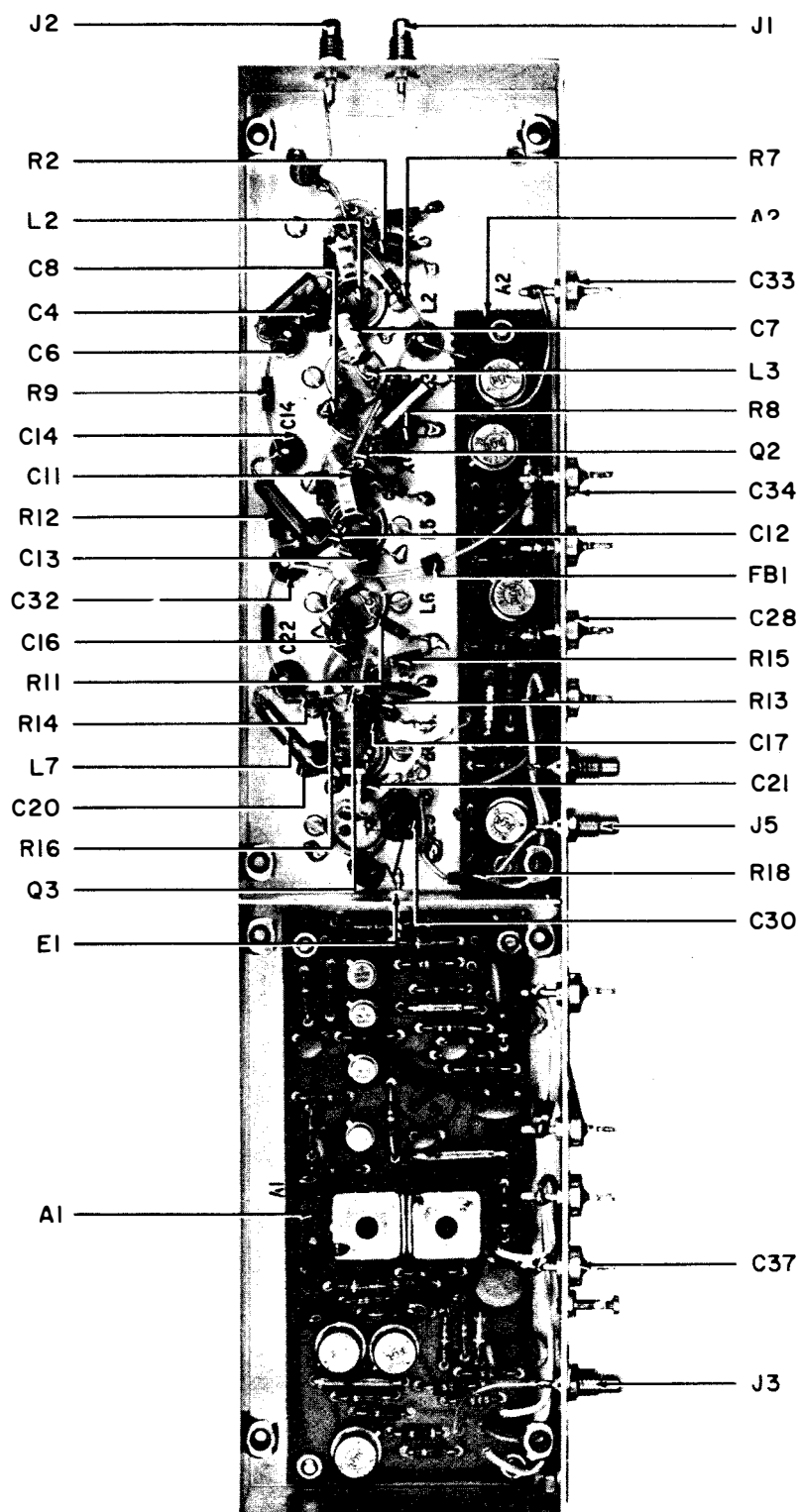


Figure 5-22. Type 72121 2-mc Bandwidth IF Strip, Component Locations

REF DESIG PREFIX A7A1

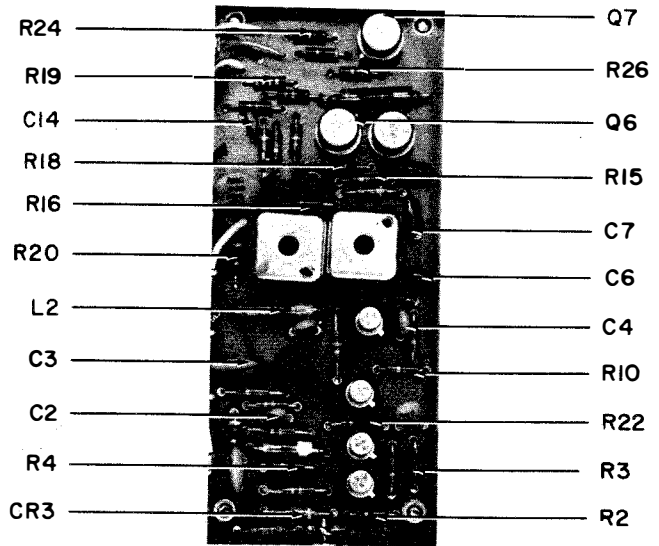
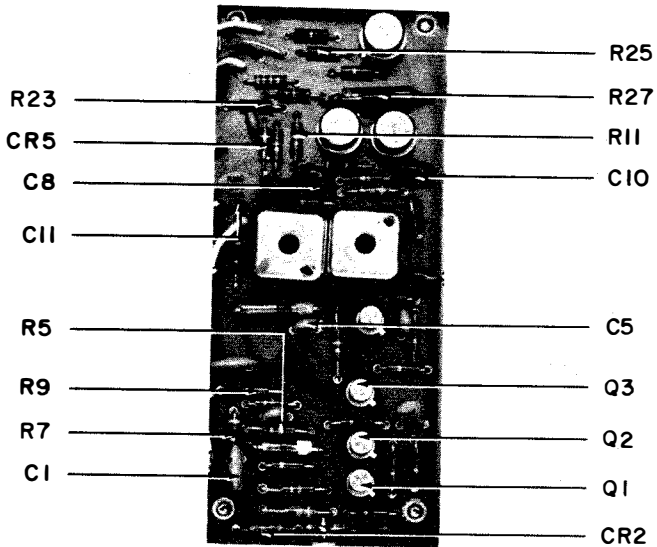
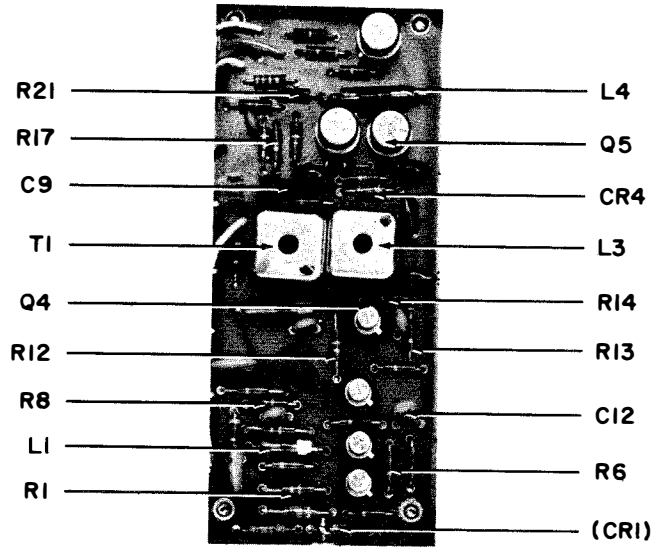


Figure 5-23. Part 10523 Limiter/Demodulator, Component Locations

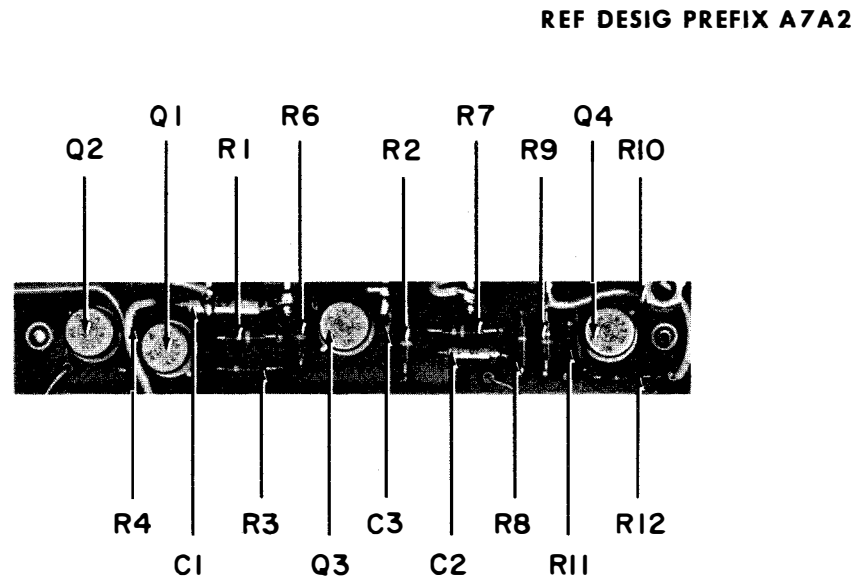


Figure 5-24. Part 10527 Video/AGC Amplifier, Component Locations

REF DESIG PREFIX A8

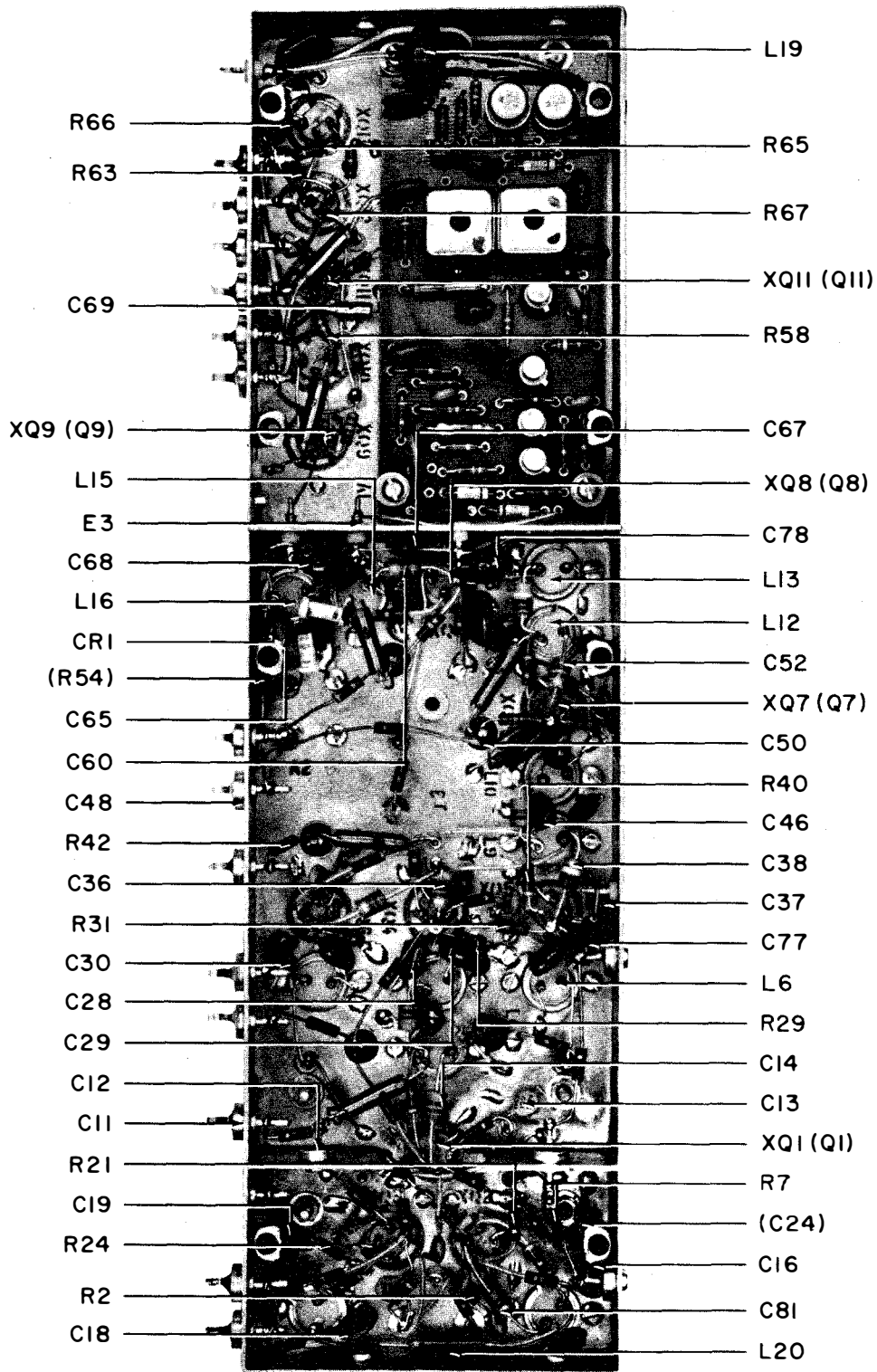


Figure 5-25. Type 72120 20/75/300 kc Bandwidth IF Strip, Component Locations

REF DESIG PREFIX A8

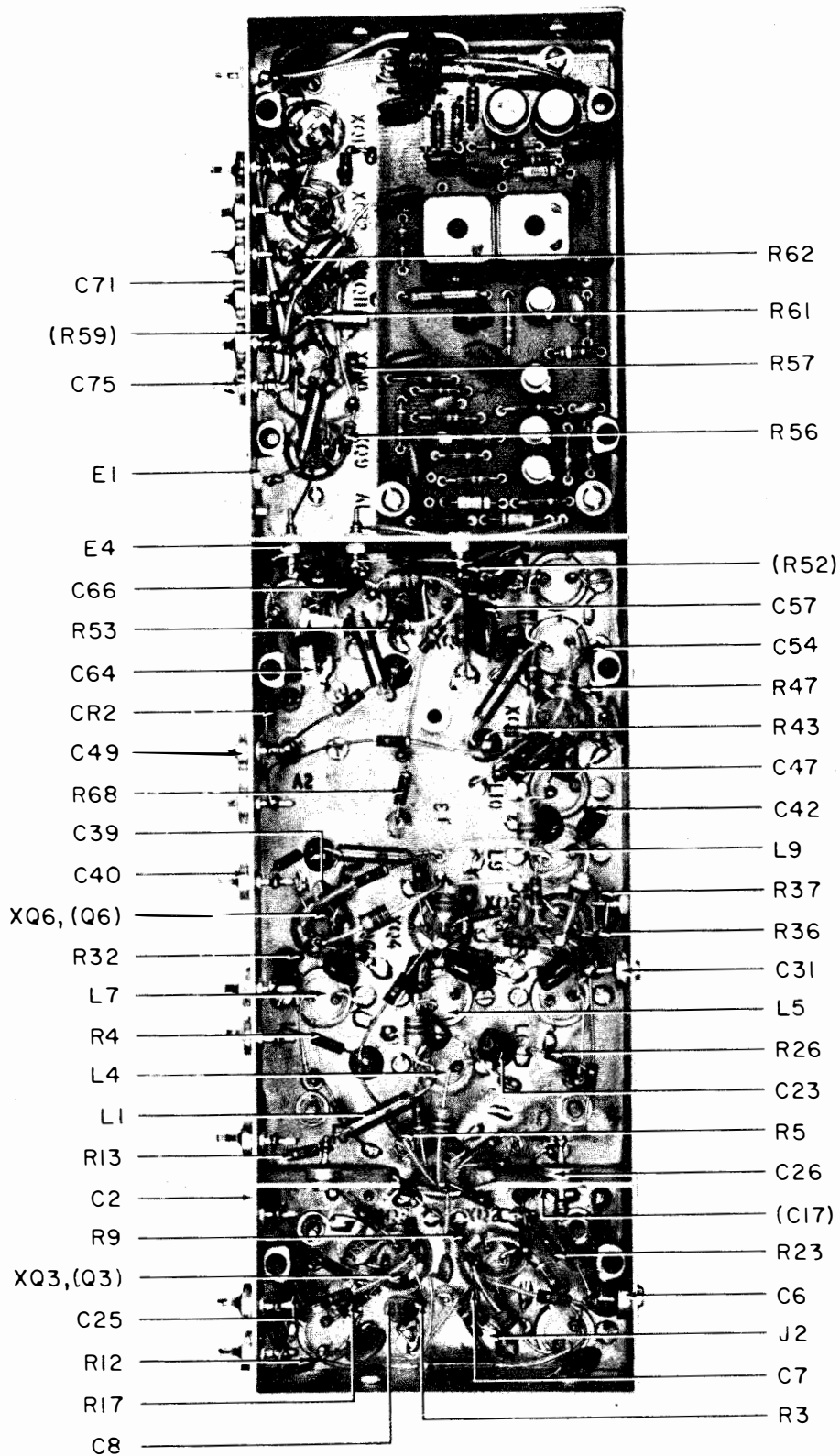


Figure 5-26. Type 72120 20/75/300 kc Bandwidth IF Strip, Component Locations

REF DESIG PREFIX A8

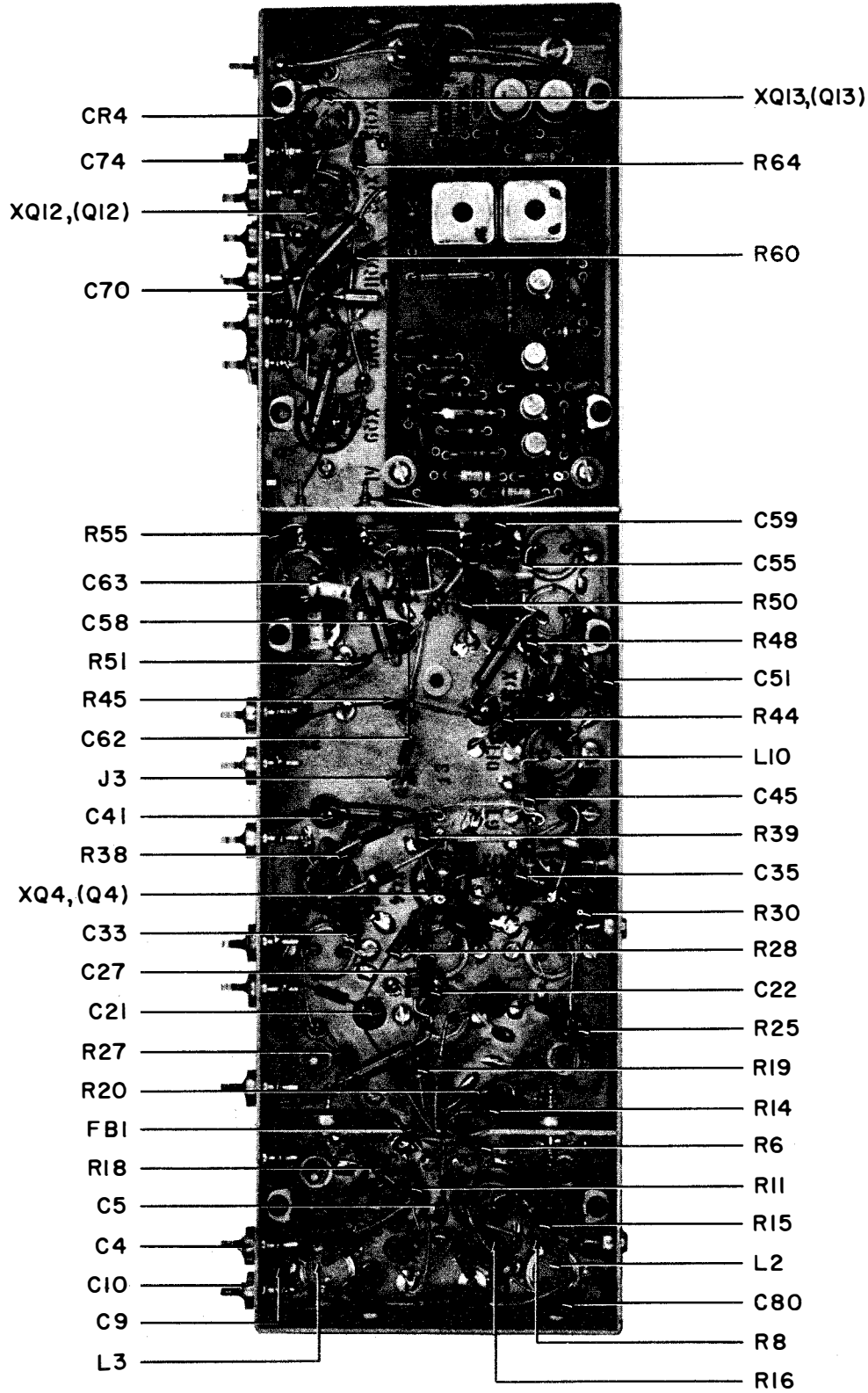


Figure 5-27. Type 72120 20/75/300 kc Bandwidth IF Strip, Component Locations

REF DESIG PREFIX A8

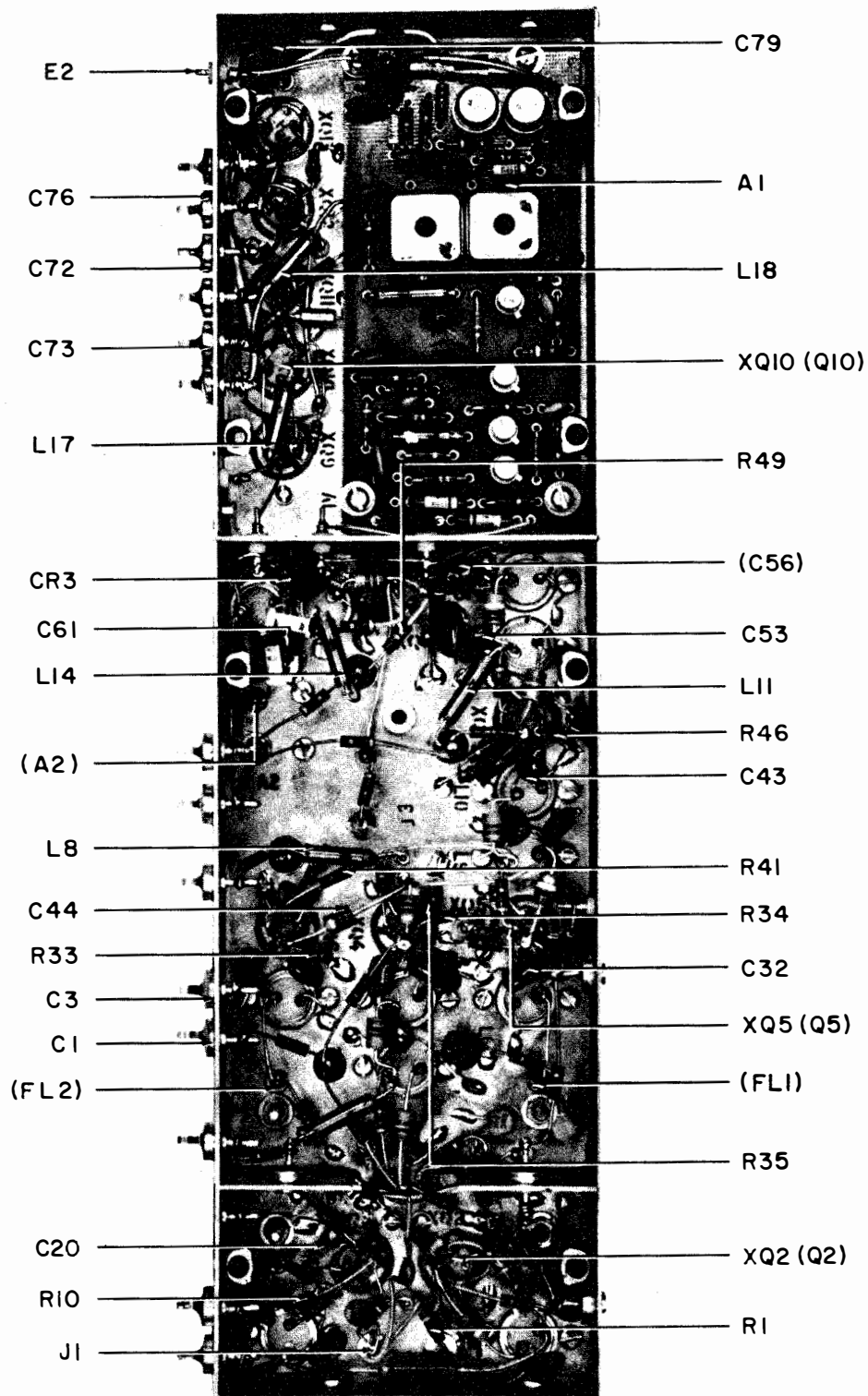


Figure 5-28. Type 72120 20/75/300 kc Bandwidth IF Strip, Component Locations

Figure 5-29

REF DESIG PREFIX A8A1

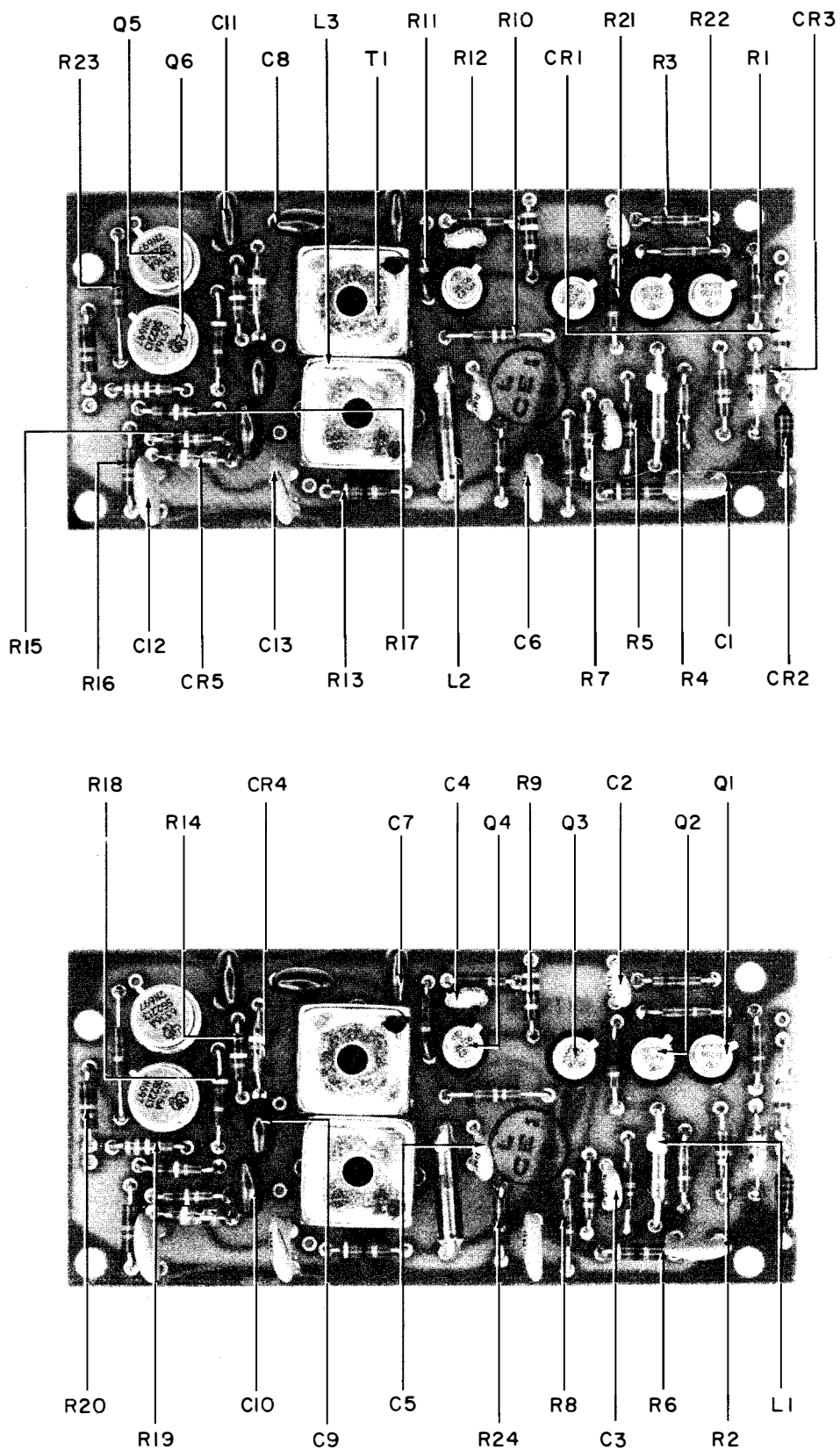


Figure 5-29. Part 10710 Limiter/Demodulator, Component Locations

REF DESIG PREFIX A8A2

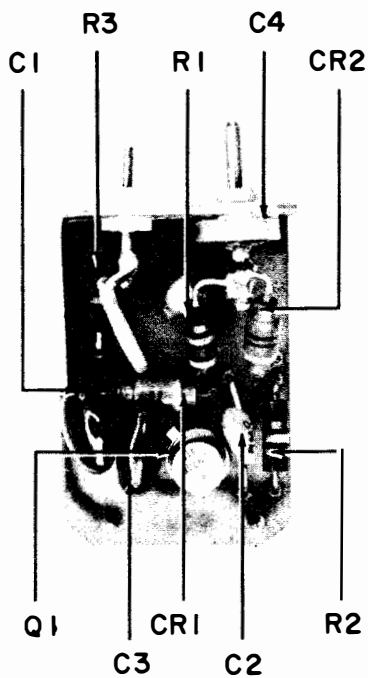


Figure 5-30. Part 1769-3 Beat Frequency Oscillator, Component Locations

Figure 5-31

REF DESIG PREFIX A9

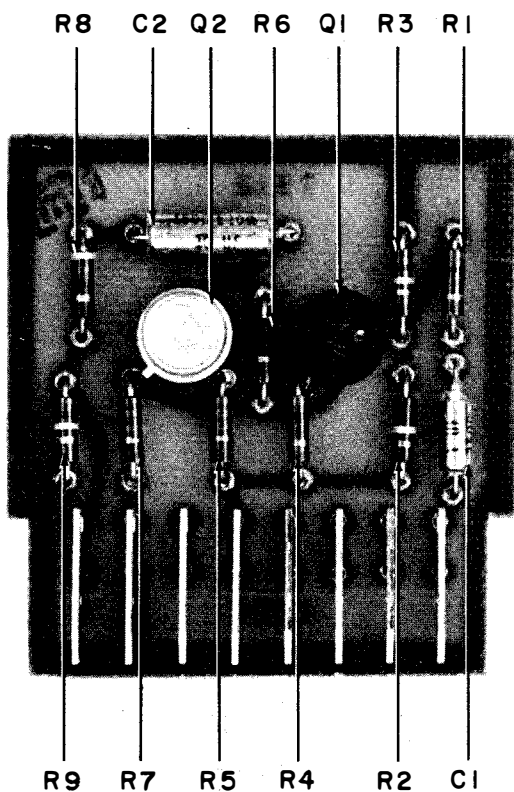


Figure 5-31. Type 7312 Video Amplifier, Component Locations

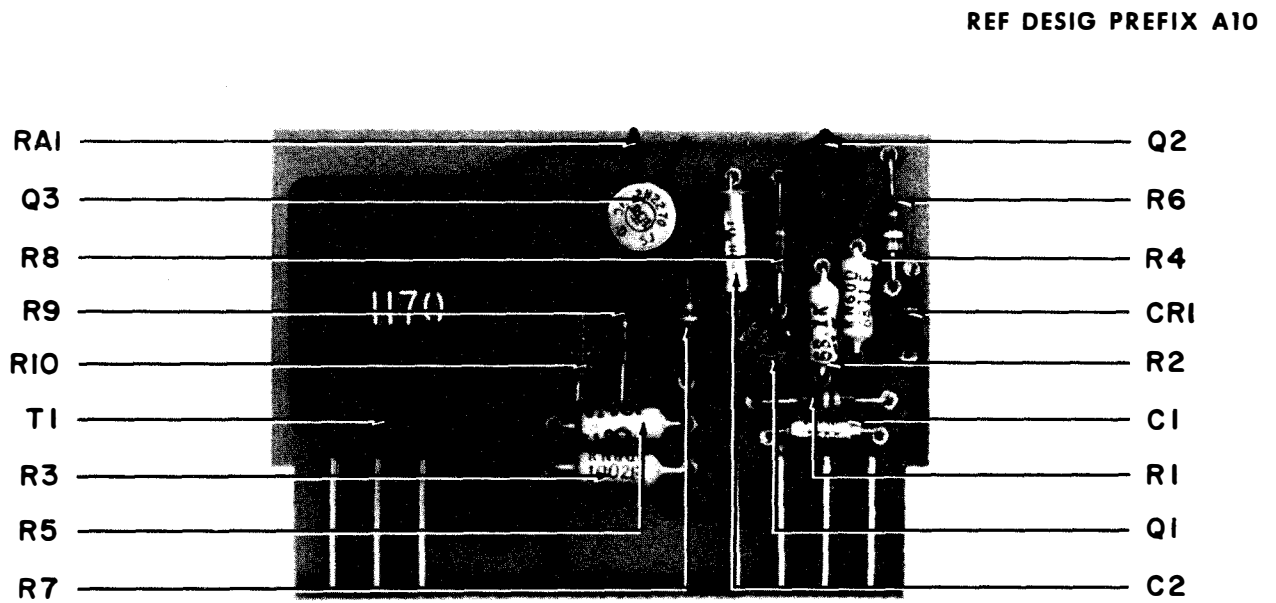


Figure 5-32. Type 7400A Audio Amplifier, Component Locations

Figure 5-33

REF DESIG PREFIX A11

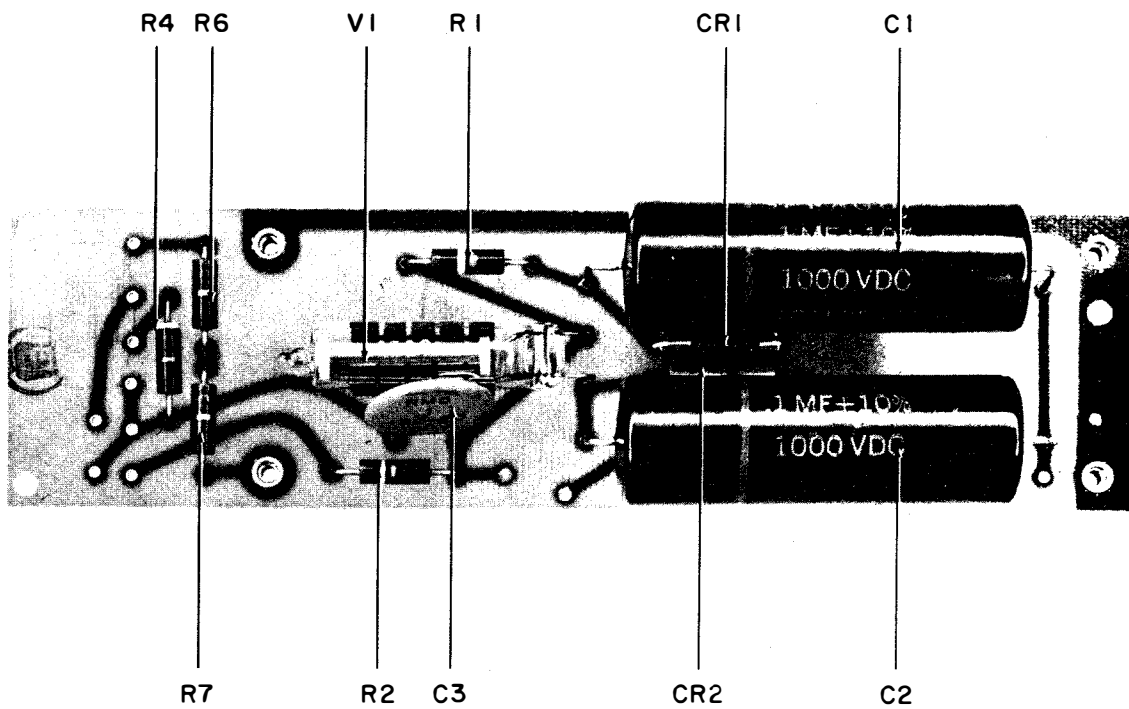


Figure 5-33. Type 7633 Power Supply Regulator (CRT), Component Locations

REF DESIG PREFIX A12

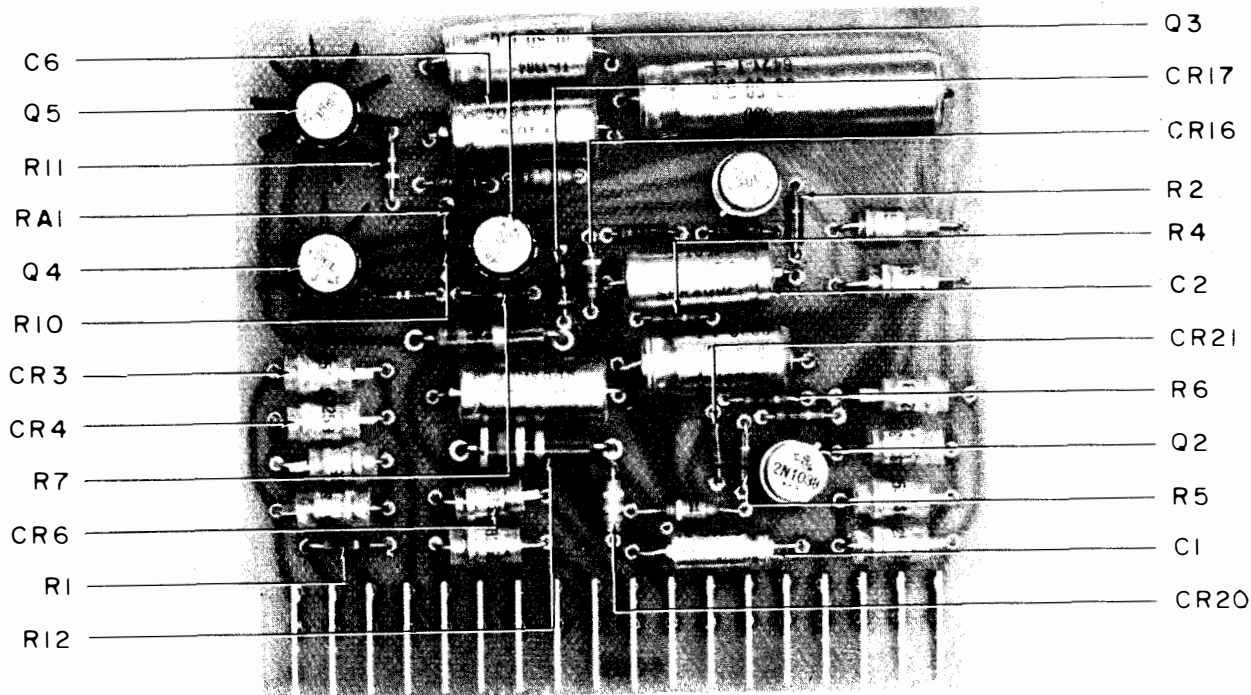
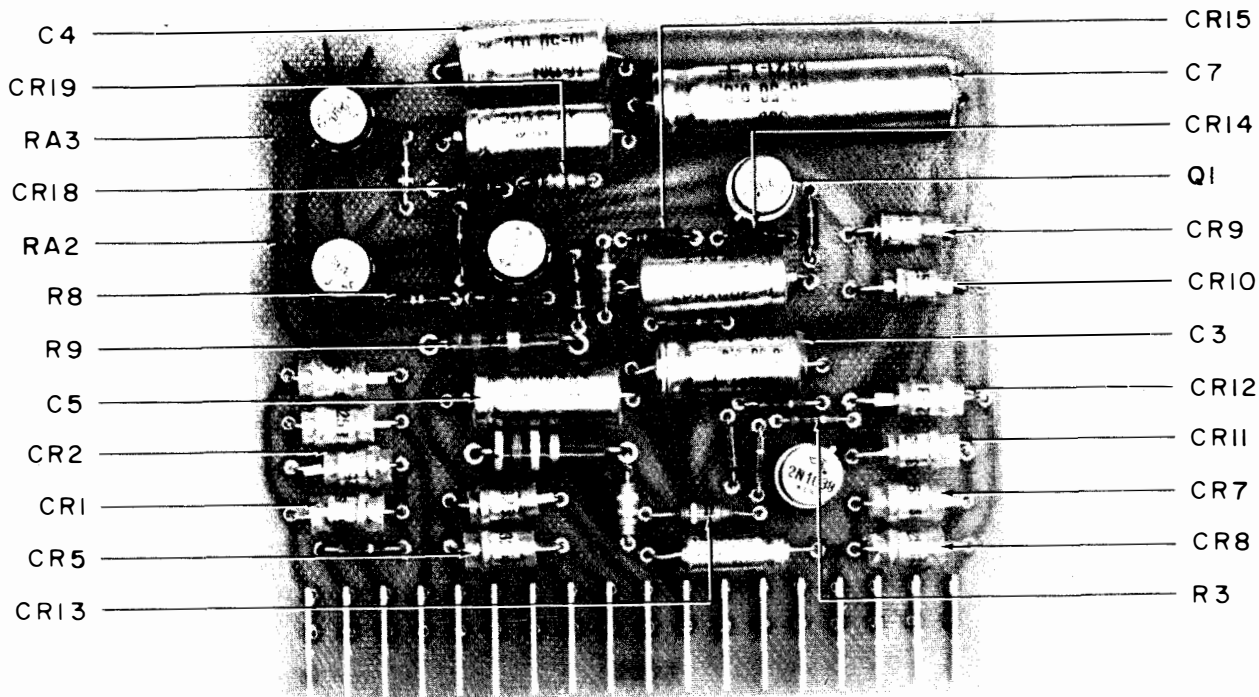


Figure 5-34. Type 7631 Power Supply Regulator (Gen.), Component Locations

Figure 5-35

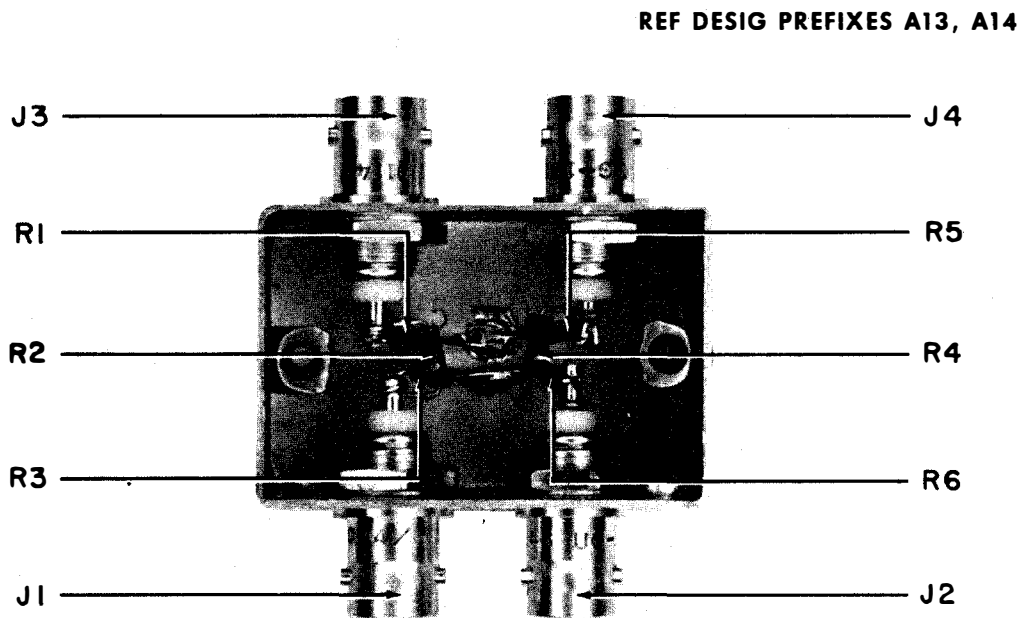


Figure 5-35. Type 79125 Coupling Network, Component Locations

REF DESIG PREFIX A15

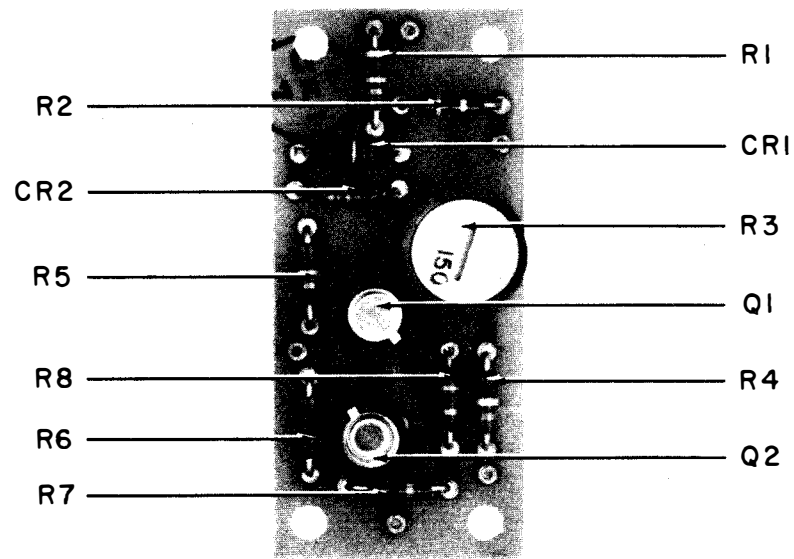


Figure 5-36. Type 7836 AGC Monitor Amplifier, Component Locations

7165		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC -02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-1, Fig. 5-2, Fig. 5-3	RECEIVING SET, RADIO-INDICATOR, PANORAMIC, AN/URR -52A: Aluminum chassis and front panel, grey enamel finished front panel with black photo etched overlay, 5.20 in. h, 19.0 in. w, 17.7 in. d o/a dim., 21.4-mc receiver and signal monitor IF frequency, 20/75/300 kc, 2-mc receiver IF bandwidths, requires 115 or 230 vac, 60 cps power source; Communication Electronics, Inc.	Intercept AM, FM and CW signals propagated by a transmitter with effective tuning range of 30-1000 mc in four bands; Band A, 30-60 mc; Band B, 60-300 mc; Band C, 235-500 mc; Band D, 490-1000mc.					1	
Fig. 5-4, Fig. 5-5, Fig. 5-6 A1	AMPLIFIER, radio frequency: Brass chassis, silver plate, gold flashed, 2.190 in. h, 4.940 in. w, 5.880 in. lg o/a dim., 30-90 mc input frequency range, 21.4-mc output frequency, 50-ohm input impedance; Communication Electronics, Inc. Type 7165.	Tunes 30-60 mc frequency range and converts received signals to 21.4-mc output.	A1				1	5-3
A1C1 *	CAPACITOR, fixed, mica dielectric: 1 section, 500 wvdc, 15 pf $\pm 5\%$, -55 deg C to 150 deg C operating temp range, plastic case 0.190 in. thk by 0.330 in. w by 0.360 in. lg o/a dim., 2 radial wire lead terminals; Electro Motive DM10C150J.	Part of a voltage divider.	A1C1, A5A1C1, A7A1C6, A8A1C7			5910-960-7288	4	5-5
A1C2 *	CAPACITOR, fixed, mica dielectric: 1 section 500 wvdc, 15 pf $\pm 5\%$, -55 deg C to 150 deg C operating temp range, plastic case 0.190 in. thk by 0.330 in. w by 0.360 in. lg o/a dim., 2 radial wire lead terminals; Electro Motive DM10-220J.	Part of a voltage divider.	A1C2, A1C29			5910-956-8397	2	5-4

* Indicates Non-Maintenance Item

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED	CONTRACT NO. DA18-119-AMC-02499(X)
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REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1C3*	CAPACITOR, variable, glass dielectric: 1 section, 1250 wvdc, 0.6 pf to 9.0 pf screw driver type, 0.312 in. dia by 1.156 in. lg o/a dim.; Roanwell MG11016.	Padder	A1C3, A1C13, A1C15, A1C27, A2C11, A2C15 A2C18, A2C29			5910-916-0798	8	5-4
A1C4*	CAPACITOR, fixed, mica dielectric: 270 pf $\pm 5\%$, 500 wvdc; per MIL-C-5.	Coupling	A1C4, A1C11	CM05F271J03		5910-649-2915	2	5-5
A1C5	CAPACITOR, fixed, ceramic dielectric: 1 section, 1000 pf, GMV, 500 wvdc, insulated body, 0.156 in. thk by 0.235 in. dia o/a dim., 2 radial wire lead terminals; Radio Materials Co. SM001GMV.	Filtering	A1C5, A1C8, A1C9, A1C10, A1C19, A1C20, A1C23, A1C24, A1C26, A1C31, A1C32, A1C33, A1C34, A1C35, A1C36, A2C21, A2C30, A2C31, A2C32, A2C33, A2C39, A4C20, A4C21, A4C22, A4C23, A4C27, A4C28, A6C12, A6C14, A6C16, A6C22, A6C23, A6C25, A6C26, A6C27, A6C29, A7A1C2, A7A1C4, A7A1C5, A7A1C12, A7A1C14, A7C1, A7C10, A8A1C2, A8A1C3, A8A1C4, A8A1C5,			5910-899-7745	57	5-6

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		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1C6 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.33 pf ±10%, 500 wvdc, 0.125 in. dia by 0.250 in. lg o/a dim., 2 axial wire lead terminals; Quality Components QC-33PFPORM10PCT.	Neutralization	A8A2C2, A8C5, A8C7, A8C8, A8C13, A8C17, A8C20, A8C35, A8C37, A8C39 A1C6			5910-855-5056	1	5-5
A1C7	CAPACITOR, fixed, ceramic dielectric: 1.5 pf ±0.25 pf, 500 wvdc; per MIL-C-20.	Neutralization	A1C7, A2C3, A4C9, A5A1C27	CC20CK1R5C		5910-725-1709	4	5-4
A1C8	CAPACITOR, Same as A1C5.	Bypass						5-5
A1C9 *	CAPACITOR, Same as A1C5.	Neutralization						5-6
A1C10 *	CAPACITOR, Same as A1C5.	Filtering						5-5
A1C11 *	CAPACITOR, Same as A1C4.	Coupling						5-5
A1C12 *	CAPACITOR, fixed, mica dielectric: 1 section, 18 pf ±5%, 500 wvdc, -55 deg C to 150 deg C operating temp range, plastic case 0.220 in. thk, by 0.420 in. h by 0.490 in. lg o/a dim., 2 radial wire lead terminals; Electro Motive DM10C180J.	Part of a voltage divider.	A1C12, A5A2C37			5910-728-2790	2	5-5
A1C13 *	CAPACITOR, Same as A1C3.	Part of a tuned circuit.						5-5

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		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1C14*	CAPACITOR, fixed, ceramic dielectric: 1 section, 2.2 pf ±0.25 pf, 500 wvdc, uninsulated case 0.200 in. dia by 0.400 in. lg o/a dim., 2 axial wire lead terminals; Erie 301-000COJ0229C.	Coupling	A1C14, A4C26, A6C4			5910-957-5121	3	5-4
A1C15*	CAPACITOR, Same as A1C3.	Part of a tuned circuit.						5-5
A1C16*	CAPACITOR, fixed, mica dielectric: 1 section 12 pf ±5%, 500 wvdc, -55 deg C to 150 deg C operating temp range, plastic case 0.220 in. thk by 0.420 in. h by 0.490 in. lg o/a dim., 2 radial wire lead terminals; Electro Motive DM10C120J.	Part of a voltage divider.	A1C16, A1C43, A6C5, A6C6			5910-771-6072	4	5-6
A1C17*	CAPACITOR, fixed, mica dielectric: 1 section 47 pf ±5%, 500 wvdc, -55 deg C to 150 deg C operating temp range, plastic case 0.220 in. thk by 0.420 in. h by 0.490 in. lg o/a dim., 2 radial wire lead terminals; Electro Motive DM10-470J.	Coupling	A1C17, A5A2C32, A5A2C34, A7A1C8, A7A1C9, A7C20, A7C21, A8C22, A8C23, A8C42, A8C43, A8C53, A8C54, A8C61, A8C62, A8C80			5910-956-8400	16	5-5
A1C18	CAPACITOR, fixed, ceramic dielectric: 1 section, 1.2 pf, ±0.25 pf, 500 wvdc, uninsulated case 0.200 in. dia by 0.400 in. lg o/a dim., 2 radial wire lead terminals; Erie 301COK129C.	Coupling	A1C18, A2C22, A2C25			5910-993-1821	3	5-5
A1C19	CAPACITOR, Same as A1C5.	Filtering						5-6

* Indicates Non-Maintenance Item

S-42

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1C20	CAPACITOR, Same as A1C5.	Filtering						5-6
A1C21	CAPACITOR, fixed, ceramic dielectric: 1 section, 1000 pf, GMV, 500 wvdc, metal case 0.281 in. dia by 0.437 in. lg o/a dim., standoff type 1 solder lug terminal; Allen-Bradley SS5A102W.	Bypass	A1C21, A1C25, A2C6, A2C8, A2C38, A2C40, A4C17, A4C24, A4C32, A6C13, A6C31, A7C6, A7C14, A7C22, A7C26, A7C32, A8C6, A8C12, A8C21, A8C31, A8C41, A8C50, A8C58			5910-898-0216	23	5-5
A1C22	CAPACITOR, fixed, ceramic dielectric: 1 section, 330 pf $\pm 10\%$, 500 wvdc, 0.281 in. dia by 0.687 in. lg o/a dim., 2 solder lug terminals; Allen-Bradley FA5C3311.	Filtering	A1C22				1	5-5
A1C23	CAPACITOR, Same as A1C5.	Coupling						5-6
A1C24	CAPACITOR, Same as A1C5.	Coupling						5-4
A1C25	CAPACITOR, Same as A1C21.	Filtering						5-4
A1C26	CAPACITOR, Same as A1C5.	Filtering						5-4
A1C27*	CAPACITOR, Same as A1C3.	Part of a tuned circuit.						5-5
A1C28*	CAPACITOR, fixed, mica dielectric: 1 section, 10 pf $\pm 5\%$, 500wvdc, -55 deg C to 150 deg C operating temp range, plastic case 0.190 in. thk by 0.330 in. w by 0.360 in. lg o/a dim., 2 radial wire lead terminals; Electro Motive DM10F100J.	Blocking	A1C28, A1C30, A5A1C28, A5A1C29, A7A1C7			5910-760-6877	5	5-6

* Indicates Non-Maintenance Item

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN- AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1C29*	CAPACITOR, Same as A1C2.	Part of a voltage divider.						5-5
A1C30*	CAPACITOR, Same as A1C28.	Part of a voltage divider.						5-5
A1C31	CAPACITOR, Same as A1C5.	Filtering						5-4
A1C32	CAPACITOR, Same as A1C5.	Filtering						5-6
A1C33	CAPACITOR, Same as A1C5.	Filtering						5-5
A1C34	CAPACITOR, Same as A1C5.	Filtering						5-6
A1C35	CAPACITOR, Same as A1C5.	Filtering						5-4
A1C36	CAPACITOR, Same as A1C5.	Filtering						5-5
A1C37	NOT USED	-----						
A1C38	CAPACITOR, fixed, ceramic dielectric: 1 section, 1000 pf, GMV, 500 wvdc, metal case 0.281 in. dia by 0.687 in. lg o/a dim., feedthru type, 2 solder lug terminals; Allen-Bradley FA5C102W.	Filtering	A1C38, A1C39, A1C40, A1C41, A2C24, A2C34, A2C35, A2C36, A2C37, A2C43, A4C25, A4C29, A5C1, A5C2, A5C3, A5C4, A5C5, A5C6, A5C7, A5C8, A5C9, A5C10, A5C11, A6C7, A6C8, A6C11, A6C18, A7C27, A7C28, A7C29, A7C33, A7C34, A7C35, A7C36, A7C37, A7C38,			5910-802-7432	53	5-6

* Indicates Non-Maintenance Item

5-44

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1C39	CAPACITOR, Same as A1C38.	Filtering	A8A2C4, A8C1, A8C2, A8C3, A8C4, A8C10, A8C11, A8C26, A8C40, A8C49, A8C50, A8C71, A8C72, A8C73, A8C74, A8C75, A8C76					5-4
A1C40	CAPACITOR, Same as A1C38.	Filtering						5-4
A1C41	CAPACITOR, Same as A1C38.	Filtering						5-5
A1C42*	CAPACITOR, fixed, ceramic, dielectric: 2 pf ±0.25 pf, 500 wvdc; per MIL-C-20.	Blocking	A1C42, A1C44	CC20CK020C		5910-842-2292	2	5-6
A1C43	CAPACITOR, Same as A1C16.	Coupling						5-5
A1C44	CAPACITOR, Same as A1C42.	Coupling						5-6
A1CR1	SEMICONDUCTOR DEVICE, diode: Silicon hermetically sealed 0.125 in. dia by 0.300 in. lg o/a dim., 2 axial wire lead terminals; Thompson Ramo Woolridge V27E.	Varies oscillator tank circuit frequency	A1CR1, A2CR1, A5A1C32			5910-902-8035	3	5-4
A1CR2	SEMICONDUCTOR DEVICE, diode: EIA designation 1N3044B; per MIL-S-19500.	Voltage regulator.	A1CR2, A2CR2, A3CR2, A4CR3	JAN 1N3044B		5960-893-6766	4	5-6
A1FB1	FERRITE BEAD: Parasitic suppressor, ferrite, 0.047 in. id by 0.138 in. od by 0.118 in. lg o/a dim.; Ferroxcube 56-590-65-4A.	Filtering	A1FB1, A1FB2, A1FB3, A1FB4, A1FB5, A1FB6, A1FB7, A2FB1,			5844-980-1271	12	5-6

* Indicates Non-Maintenance Item

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1FB2	FERRITE BEAD, Same as A1FB1.	Filtering	A6FB1, A7FB1, A7FB2, A8FB1					5-6
A1FB3	FERRITE BEAD, Same as A1FB1.	Filtering						5-4
A1FB4	FERRITE BEAD, Same as A1FB1.	Filtering						5-5
A1FB5	FERRITE BEAD, Same as A1FB1.	Filtering						5-6
A1FB6	FERRITE BEAD, Same as A1FB1.	Filtering						5-4
A1FB7	FERRITE BEAD, Same as A1FB1.	Filtering						5-5
A1J1	CONNECTOR, receptacle, electrical: series BNC; per MIL-C-3608.	RF input connector.	A1J1, A1J5, A2J1, A2J4, A13J1, A13J2, A13J3, A13J4, A14J1, A14J2, A14J3, A14J4	UG1094AU		5935-665-5718	12	5-4
A1J2	CONNECTOR, receptacle, electrical: 1 male contact, 1 connector mating end, low-loss plastic dielectric insulation, 50 ohms impedance, straight, 0.234 in. dia by 0.594 in. lg o/a dim., mtd w/10-32 hex nut; Amphenol 27-9.	Mixer input jack.	A1J2, A1J3, A1J4, A2J2, A3J2, A4J2, A5A1J1, A5A1J2, A5A2J1, A6J1, A6J2, A6J3, A7J1, A7J2, A7J3, A7J4, A7J5, A8J1, A8J2, A8J3			5935-518-9551	20	5-6
A1J3	CONNECTOR, Same as A1J2.	Mixer output jack.						5-4
A1J4	CONNECTOR, Same as A1J2.	Mixer input jack.						5-4
A1J5	CONNECTOR, Same as A1J1	LO output jack.						5-4

IDENTIFICATION TABLE OF PARTS

5-46

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1L1*	COIL, radio frequency: 12 turns closewound no. 28 sns wire, 0.130 in. dia by 0.500 in. lg o/a dim., plastic coil form, uninsulated, 2 axial wire lead terminals; Communication Electronics, Inc. 1131-6.	Trimmer coil for L2A.	A1L1, A1L3, A1L4				3	5-4
A1L2A,B, C, D*	TUNER, radio frequency: variable inductor, 4 sections 30-60 mc frequency range, 4 solder lug terminals, 1.500 in. by 1.500 in. by 3.250 in. o/a dim; Communication Electronics, Inc. 2026.	Four-section induc-tuner used to tune frequency range of 30-60mc.	A1L2A,B,C,D				1	5-4, 5-6
A1L3*	COIL, Same as A1L1.	Trimmer coil for L2B.						5-6
A1L4*	COIL, Same as A1L1.	Trimmer coil for L2C.						5-4
A1L5	COIL, radio frequency: 18 turns closewound no. 34 sf wire. 0.438 in. dia by 1.497 in. lg o/a dim., shielded 2 solder lug terminals, mounted w/1/4-28 hex nut; Communication Electronics, Inc. 1472-3.	Part of a tuned circuit.	A1L5, A7L2, A7L3, A7L5, A7L6, A7L8, A7L9, A8L2, A8L3, A8L4, A8L5, A8L6, A8L7, A8L9, A8L10, A8L12, A8L13, A8L15, A8L16				19	5-4
A1L6*	COIL, radio frequency: 14 turns closewound no. 20 sns wire, 0.130 in. dia by 0.500 in. lg o/a dim., plastic coil form, uninsulated, 2 axial wire lead terminals; Communication Electronics, Inc. 1131-7.	Trimmer coil for L2D.	A1L6				1	5-4

* Indicates Non-Maintenance Item

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A1L7*	COIL, radio frequency: 31 turns closewound no. 31 sns wire. 0.187 in. dia by 0.625 in. lg o/a dim., plastic coil form insulated, 2 axial wire lead terminals; Communication Electronics, Inc. 1131-8.	Padder inductor for L2D.	A1L7				1	5-4
A1L8	COIL, radio frequency: 3.3 μ h, 0.35ohms resistance, 127 mc nominal resonance frequency, 50 minimum Q, 0.212 in. dia by 0.625 in. lg o/a dim., plastic coil form, baked varnish insulation. 2 axial wire lead terminals; Wilco Corp. 211-11.	Filtering	A1L8			5950-681-9446	1	5-5
A1R1	RESISTOR, fixed, composition: 100K \pm 5%, 1/4W; per MIL-R-11.	Input load resistor.	A1R1, A1R20, A2R1, A2R20, A6R3, A6R6, A7A1R11, A7A2R1, A8A1R14, A8A1R15, A8A1R17, A8R64, A9R9, A10R6	RC07GF104J		5905-686-3129	14	5-4
A1R2 *	RESISTOR, fixed, composition: 47K \pm 5%, 1/4W; per MIL-R-11.	Dropping	A1R2, A1R6, A1R18, A2R15, A4R6, A4R8, A5A1R16, A8A2R1, A8R55	RC07GF473J		5905-683-2246	9	5-6
A1R3	RESISTOR, fixed, composition: 270K \pm 5%, 1/4W; per MIL-R-11.	Part of a filter.	A1R3	RC07GF274J		5905-681-8822	1	5-5

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A1R4	RESISTOR, fixed, composition: 51 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a filter.	A1R4, A2R19, A3R16, A4R1	RC07GF510J		5905-683-7720	4	5-4
A1R5	RESISTOR, fixed, composition: 150 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Cathode resistor for A1V1.	A1R5, R6	RC07GF151J		5905-683-2243	2	5-5
A1R6*	RESISTOR, Same as A1R2.	Part of a voltage divider.						5-6
A1R7*	RESISTOR, fixed, composition: 10 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A1R7 A4R9, A5A1R27, A5A1R28, A8R46, A12R1, A12R6,	RC07GF100J		5905-817-7971	7	5-5
A1R8	RESISTOR, fixed, composition: 6.8K $\pm 5\%$, 1W; per MIL-R-11.	Dropping	A1R8	RC32GF682J		5905-299-2036	1	5-6
A1R9*	RESISTOR, fixed, composition: 4.7K $\pm 5\%$, 1/4W; per MIL-R-11.	Swamping	A1R9, A2R16, A2R17, A5A2R12, A5A3R3, A5A3R14	RC07GF472J		5905-686-9998	6	5-5
A1R10	RESISTOR, fixed, composition: 470K $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A1R10, A1R11, A2R9, A2R10, A3R7, A3R8, A3R10, A3R11, A5A3R7, A5A3R8, A15R1	RC07GF474J		5905-681-8957	11	5-6
A1R11	RESISTOR, Same as A1R10.	Part of a voltage divider.						5-6
A1R12	RESISTOR, fixed, composition: 330K $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a filter.	A1R12, A2R11, A5A2R16, A5A2R18, A6R17, A7A1R19,	RC07GF334J		5905-686-3131	8	5-6

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		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A1R13	RESISTOR, fixed, composition: 33K ±5%, 1/4W; per MIL-R-11.	Dropping	A8A1R19, A8R56 A1R13, A2R12, A3R13, A4R3, A5A1R23, A6R18, A7A1R4, A8R58, A8R59	RC07GF333J		5905-686-3903	9	5-4
A1R14	RESISTOR, fixed, composition: 13K ±5%, 1/4W; per MIL-R-11.	Part of a filter.	A1R14, A2R2, A3R5	RC32GF133J		5905-279-2549	3	5-5
A1R15	RESISTOR, fixed, composition: 1K ±5%, 1/4W; per MIL-R-11.	Dropping	A1R15, A3R1, A3R3, A4R5, A4R12, A5A1R3, A5A1R4, A5A1R5, A5A1R6, A5A1R7, A5A1R8, A5A1R9, A5A1R10, A5A1R13, A5A2R1, A5A2R4, A5A2R7, A5A2R8, A5A2R10, A5A2R11, A5A2R14, A6R10, A7A1R3, A7A2R3, A7R3, A7R8, A8A1R3, A8R14, A8R16, A8R18, A8R35, A8R37, A8R38, A8R47, A9R1,	RC07GF102J		5905-681-6462	41	5-5

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A1R16	RESISTOR, fixed, composition: 4.7K ±5%, 1/2W; per MIL-R-11.	Part of a filter; dropping.	A9R4, A12R2, A12R3, A12R4, A12R5, A15R6 A1R16	RC20GF472J		5905-279-3504	1	5-4
A1R17	RESISTOR, fixed, composition: 2.2K ±5%, 1/4W; per MIL-R-11.	Part of a filter	A1R17, A7A2R8	RC07GF222J		5905-723-5251	2	5-4
A1R18*	RESISTOR, Same as A1R2.	Part of a voltage divider.						5-5
A1R19*	RESISTOR, fixed, composition: 22K ±5%, 1/2W; per MIL-R-11.	Part of a voltage divider.	A1R19	RC20GF223J		5905-687-0002	1	5-6
A1R20	RESISTOR, Same as A1R1.	Dropping						5-4
A1R21	RESISTOR, fixed, composition: 1.5 meg ±5%, 1/4W; per MIL-R-11.	Part of a voltage divider.	A1R21, A3R17	RC07GF155J		5905-800-3481	2	5-6
A1T1*	TRANSFORMER, radio frequency: CEI 1131-09 coil with 13 turns no. 27 wire ccw around plastic sleeving 3 wire terminals, 0.250 in. dia, by 0.750 in. lg; Communication Electronics, Inc. 1134.	Neutralization	A1T1				1	5-4
A1TP1	JACK, tip: Insulated, low-loss plastic, white, 3500 vac nominal rating, single thru hole mtg, 0.218 in. dia by 0.438 in. lg o/a dim., 1 solder lug terminal; Taurus TJ-6.	Test point	A1TP1, A2TP1, A3TP1, A4TP1, A5A1TP1, A5A1TP2, A6TP1			5935-226-0489	7	5-4
A1V1	ELECTRON TUBE: EIA designation 6CW4, metal case, high- μ , triode; RCA 6CW4.	RF Amplifier	A1V1, A1V2, A1V4, A2V4, A4V2, A4V3, A6V4			5960-956-8414	7	5-4

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A1V2	ELECTRON TUBE: Same as A1V1.	RF amplifier						5-6
A1V3	ELECTRON TUBE: EIA designation 7587; per MIL-E-1.	Mixer	A1V3, A2V3, A3V3, A6V1, A6V2, A6V3	7587		5960-852-5545	6	5-5
A1V4	ELECTRON TUBE, Same as A1V1.	Oscillator						5-6
A1XV1	SOCKET, electron tube: 5 pin Nuvistor contact configuration, cadmium plated brass contacts, molded, low-loss composition body 0.469 in. h by 0.562 in. dia o/a dim., 5 solder tap terminals, clinch type mtg; Cinch 133-65-10-001.	Mounts A1V1.	A1XV1, A1XV2, A1XV3, A1XV4, A2XV1, A2XV2, A2XV3, A2XV4, A3XV3, A4XV2, A4XV3, A6XV1, A6XV2, A6XV3, A6XV4			5935-885-1010	15	5-4
A1XV2	SOCKET, Same as A1XV1.	Mounts A1V2						5-6
A1XV3	SOCKET, Same as A1XV1.	Mounts A1V3						5-5
A1XV4	SOCKET, Same as A1XV1.	Mounts A1V4						5-6

5-52

7164		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-7 Fig. 5-8 A2	AMPLIFIER, radio frequency: Brass chassis, silver plate, gold-flashed, 2.950 in. h, 4.190 in. w, 7.880 in. lg, o/a dim., 60-300 mc input frequency range, 21.4-mc output frequency, 50-ohm input impedance; Communication Electronics, Inc. type 7164.	Tunes 60-300 mc frequency range and converts received frequencies to 21.4-mc output.	A2				1	5-3
A2C1 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 5.6 pf \pm 0.5 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Erie 301COH569D.	Part of a voltage divider.	A2C1			5910-828-5842	1	5-7
A2C2 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 8.0 pf \pm 0.5 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Erie 301COH829D.	Part of a voltage divider.	A2C2			5910-823-1818	1	5-7
A2C3 *	CAPACITOR, Same as A1C7.	Neutralization						5-7
A2C4 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 6.2 pf \pm 0.5 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Erie 301COH629D.	Padder for A2C5.	A2C4, A3C34, A7C23				3	5-7
A2C5 *	CAPACITOR, variable, ceramic dielectric: 1 section, 500 wvdc, 0.5 to 4.5 pf, 0.250 in. dia by 1.297 in. lg, o/a dim., 1 solder tab terminal; Cambion CST6.	Neutralization	A2C5, A3C1			5910-648-7991	2	5-7
A2C6	CAPACITOR, Same as A1C21.	Filtering						5-7

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IDENTIFICATION TABLE OF PARTS

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
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A2C7 *	CAPACITOR, fixed, mica dielectric: 1 section, 500 wvdc, 510 pf ±5%, -55 deg C to 150 deg C operating temp range, plastic case, 0.240 in. thk by 0.420 in. h by 0.490 in. lg, o/a dim., 2 radial wire lead terminals; Electro Motive DM15-511J.	Coupling	A2C7			5910-649-2917	1	5-8
A2C8	CAPACITOR, Same as A1C21.	Filtering						5-7
A2C9 *	CAPACITOR, fixed, composition dielectric: 1 section, 0.47 pf ±10%, 500 wvdc, uninsulated case, 0.150 in. dia by 0.235 in. lg, o/a dim., 2 axial wire lead terminals; Quality Components QC0.47PF PORM10PCT.	Part of a tuned circuit.	A2C9			5910-899-5818	1	5-8
A2C10 *	NOT USED							
A2C11 *	CAPACITOR, Same as A1C3.	Part of a tuned circuit.						5-7
A2C12 *	CAPACITOR, fixed, ceramic dielectric: 47 pf ±5%, 500 wvdc; per MIL-C-20.	Filtering	A2C12, A2C13	CC30CH470J		5910-577-7921	2	5-8
A2C13 *	CAPACITOR, Same as A2C12.	Filtering						5-7
A2C14 *	CAPACITOR, fixed, ceramic dielectric: 1.0 pf ±0.25 pf, 500 wvdc; per MIL-C-20.	Coupling	A2C14, A2C16, A2C20, A3C38, A6C3	CC20CK010C		5910-583-1590	5	5-8
A2C15 *	CAPACITOR, Same as A1C3	Part of a tuned circuit.						5-7
A2C16 *	CAPACITOR, Same as A2C14.	Coupling						5-7

* Indicates Non-Maintenance Item

IDENTIFICATION TABLE OF PARTS

5-54

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A2C17 *	CAPACITOR, fixed, composition dielectric: 1 section, 0.22 pf ±10%, 500 wvdc, uninsulated case, 0.160 in. dia by 0.240 in. lg, o/a dim., 2 axial wire lead terminals; Quality Components QC0.22PRFORM10PCT.	Feedback	A2C17			5910-890-8973	1	5-8
A2C18 *	CAPACITOR, Same as A1C3	Part of a tuned circuit.						5-8
A2C19 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 5.1 pf ±0.5 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Eire 301COH519D.	Coupling	A2C19			5910-833-0688	1	5-7
A2C20	CAPACITOR, Same as A2C14.	Coupling						5-8
A2C21	CAPACITOR, Same as A1C5.	Filtering						5-7
A2C22 *	CAPACITOR, Same as A1C18.	Coupling						5-8
A2C23	CAPACITOR, fixed, ceramic dielectric: 1 section, 2.7 pf nominal value, NPOA; Erie 301.	Coupling	A2C23				1	5-8
A2C24	CAPACITOR, Same as A1C38.	Filtering						5-7
A2C25 *	CAPACITOR, Same as A1C18.	Part of a voltage divider.						5-7
A2C26 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 2.7 pf ±0.25 pf, 500 wvdc, -470 deg C temp coefficient, tol J, uninsulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Erie 301T2J279C.	Part of a voltage divider.	A2C26				1	5-8

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IDENTIFICATION TABLE OF PARTS

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED CONTRACT NO. DA18-119-AMC-02499(X)

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A2C27 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 3.3 pf ±0.25 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Eire 301COJ339C.	Blocking	A2C27, A3C46, A6C19, A8C64			5910-950-9073	4	5-8
A2C28	NOT USED	-----						
A2C29 *	CAPACITOR, Same as A1C3.	Part of a tuned circuit.						5-7
A2C30	CAPACITOR, Same as A1C5.	Filtering						5-7
A2C31	CAPACITOR, Same as A1C5.	Filtering						5-8
A2C32	CAPACITOR, Same as A1C5.	Filtering						5-7
A2C33	CAPACITOR, Same as A1C5.	Filtering						5-8
A2C34	CAPACITOR, Same as A1C38.	Filtering						5-8
A2C35	CAPACITOR, Same as A1C38.	Filtering						5-7
A2C36	CAPACITOR, Same as A1C38.	Filtering						5-8
A2C37	CAPACITOR, Same as A1C38.	Filtering						5-7
A2C38	CAPACITOR, Same as A1C21.	Filtering						5-7
A2C39	CAPACITOR, Same as A1C5.	Coupling						5-8
A2C40	CAPACITOR, Same as A1C21.	Filtering						5-8

* Indicates Non-Maintenance Item

5-56

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A2C41	CAPACITOR, fixed, air dielectric: 1 section, undetermined value, un-insulated, 0.650 in. thk by 0.190 in. h by 3.380 in. lg, o/a dim., no terminals, contains facilities for mounting 1 or 2 capacitors; Commu-nication Electronics, Inc. 1101.	Coupling	A2C41				1	5-7
A2C42	CAPACITOR, fixed, ceramic dielectric: 1 section, 4.7 pf ±0.25 pf, 500 wvdc, un-insulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Erie 301COH479C.	Filtering	A2C42, A3C30 A6C9			5910-842-0885	3	5-7
A2C43	CAPACITOR, Same as A1C38.							5-7
A2C44 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 2.4 pf ±0.25 pf, 500 wvdc, un-insulated case, 0.200 in. dia by 0.400 in. lg, o/a dim., 2 radial wire lead terminals; Erie 301COJ249C.	Coupling	A2C44, A8C63				2	5-8
A2CR1	DIODE, Same as A1CR1.	Varies oscillator tank circuit freq- uency.						5-7
A2CR2	DIODE, Same as A1CR2.	Voltage regulator.						5-8
A2FB1	FERRITE BEAD, Same as A1FB1.	Filtering						5-8
A2J1	CONNECTOR, Same as A1J1.	RF input jack.						5-8
A2J2	CONNECTOR, Same as A1J2.	IF output jack.						5-7
A2J3	NOT USED	-----						

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A2J4	CONNECTOR, Same as A1J1.	LO output jack.						5-7
A2L1A, B, C, D *	TUNER, radio frequency: 4 sections, variable inductor tuning, 2.125 in. w by 2.328 in. h by 7.685 in. lg, o/a dim.; Communication Electronics, Inc. 2027.	Tunes frequency range of 60 to 300 mc	A2L1A, B, C, D				1	5-7, 5-8
A2L2 *	COIL, radio frequency: 1 section, undetermined inductance, copper strip, 0.093 in. w by 0.190 in. h by 1.060 in. lg, o/a dim.; Communication Electronics, Inc. 10167.	Filtering	A2L2				1	5-7
A2L3 *	COIL, radio frequency: 1 section, undetermined inductance, 9 turns, closewound no. 20 sns wire, no coil form, 0.187 in. dia by 1.000 in. lg, o/a dim., 2 axial terminals, uninsulated; Communication Electronics, Inc. 1129-01.	Filtering	A2L3				1	5-8
A2L4	COIL, radio frequency: 1 section, 16 turns, closewound no. 28 sn wire, iron core form, 0.150 in. dia by 0.500 in. lg, o/a dim., 2 axial wire lead terminals, uninsulated; Communication Electronics, Inc. 1131-36.	Filtering	A2L4				1	5-8
A2L5 *	COIL, radio frequency: 1 section, 20 turns, closewound no. 28 sns wire, plastic coil form, 0.130 in. dia by 0.500 in. lg, o/a dim., 2 axial wire lead terminals, insulated; Communication Electronics, Inc. 1131-1.	Filtering	A2L5				1	5-8

* Indicates Non-Maintenance Item

CONTRACTOR COMMUNICATION ELECTRON CS INCORPORATED						CONTRACT NO. DA 18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A2L6 *	COIL, radio frequency: 1 section, undetermined inductance, copper strip, 0.093 in. w by 0.190 in. h by 1.310 in. lg, o/a dim., Communication Electronics, Inc. 10166.	Trimmer coil for L1B.	A2L6				1	5-7
A2L7 *	COIL, radio frequency: 1 section, 17 turns, closewound no. 28 sns wire, iron coil form, 0.150 in. dia by 0.500 in. lg, o/a dim., 2 axial wire lead terminals, insulated; Communication Electronics, Inc. 1131-2.	Padder coil for L1B.	A2L7				1	5-8
A2L8 *	COIL, radio frequency: 1 section, undetermined inductance, brass strip, 0.090 in. thk by 0.190 in. w by 1.380 in. lg, o/a dim., un-insulated; Communication Electronics Inc. 1200-02.	Trimmer coil for L1C.	A2L8				1	5-7
A2L9 *	COIL, radio frequency: 1 section, 16 turns, closewound no. 26 sn wire, un-insulated, iron coil form, 0.150 in. dia by 0.500 in. lg, o/a dim.; Communication Electronics, Inc. 1131-27.	Part of a tuned circuit.	A2L9				1	5-8
A2L10 *	COIL, radio frequency: 1 section, undetermined inductance, copper strip, 0.032 in. thk by 0.370 in. h by 1.690 in. lg, o/a dim., un-insulated; Communication Electronics Inc. 1107-2.	Part of a tuned circuit.	A2L10				1	5-8

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		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A2L11	COIL, radio frequency: 1 section, undetermined inductance, copper strip, 0.032 in. thk by 0.120 in. h by 1.380 in. lg, o/a dim., unin-sulated; Communication Electronics Inc. 10169.	Part of a tuned circuit.	A2L11				1	5-8
A2L12	COIL, radio frequency: 1 section, 27 μ h, Q80 min., 33.2 mc nominal, self-resonant frequency, iron core form, 0.156 in. dia by 0.500 in. lg, o/a dim., 2 axial wire lead terminals; Wilco W270.	Filtering	A2L12			5950-902-3655	1	5-7
A2L13	COIL, radio frequency: 1 section, 28 turns, closewound no. 26 sns wire, insulated, iron core form, 0.250 in. dia by 0.687 in. lg, o/a dim., 2 axial wire lead terminals; Communication Electronics, Inc. 1131-5.	Filtering	A2L13				1	5-7
A2R1	RESISTOR, Same as A1R1.	Input load resistor.						5-7
A2R2	RESISTOR, Same as A1R14.	Part of a filter.						5-7
A2R3	RESISTOR, fixed, composition: 680K \pm 5%, 1/4W; per MIL-R-11.	Dropping	A2R3, A5A1R14, A5A1R20, A5A2R20	RC07GF684J		5905-681-8823	4	5-8
A2R4	NOT USED	-----						
A2R5	RESISTOR, fixed, composition: 6.2K \pm 5%, 1/4W; per MIL-R-11.	Part of a filter.	A2R5	RC07GF622J		5905-190-8868	1	5-7
A2R6	RESISTOR, fixed, composition: 47 ohms \pm 5%, 1/4W; per MIL-R-11.	Part of a filter.	A2R6, A5A2R24, A7A1R7,	RC07GF470J		5905-802-6730	24	5-7

5-59

IDENTIFICATION TABLE OF PARTS

5-60

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECT ONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A2R7 *	RESISTOR, fixed, composition: 15K ±5%, 1/4W; per MIL-R-11.	Swamping	A7A1R20, A7A1R25, A7A2R10, A7R4, A7R10, A7R16, A7R17, A7R18, A8A1R6, A8A1R13, A8R15, A8R17, A8R19, A8R39, A8R40, A8R41, A8R48, A8R51, A8R53, A8R68, A9R8 A2R7, A5A1R15, A5A3R19, A8R5, A8R8, A8R10, A8R28, A8R30, A8R32, A8R43	RC07GF153J		5905-681-8818	10	5-7
A2R8	RESISTOR, fixed, composition: 6.8K ±5%, 2W; per MIL-R-11.	Dropping	A2R8	RC42GF682J		5905-279-2528	1	5-7
A2R9	RESISTOR, Same as A1R10.	Part of a voltage divider.						5-8
A2R10	RESISTOR, Same as A1R10.	Part of a voltage divider.						5-8
A2R11	RESISTOR, Same as A1R12.	Dropping						5-8
A2R12	RESISTOR, Same as A1R13.	Dropping						5-8
A2R13	RESISTOR, fixed, composition: 10K ±5%, 1/2W; per MIL-R-11.	Dropping	A2R13	RC20GF103J		5905-185-8510	1	5-7

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		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A2R14	NOT USED	-----						
A2R15	RESISTOR, Same as A1R2.	Grid biasing.						5-8
A2R16	RESISTOR, Same as A1R9.	Cathode biasing.						5-8
A2R17	RESISTOR, Same as A1R9.	Dropping						5-8
A2R18*	RESISTOR, fixed, composition: 22K ±5%, 1/4W; per MIL-R-11.	Part of a filter.	A2R18, A5A1R11, A5A2R5, A7A2R2, A8R54, R14	RC07GF223J		5905-687-0002	6	5-7
A2R19	RESISTOR, Same as A1R4.	Part of a filter.						5-8
A2R20	RESISTOR, Same as A1R1.	Dropping						5-8
A2TP1	JACK, TIP, Same as A1TP1.	Test point.						5-7
A2V1	ELECTRON TUBE: EIA designation 8058; per MIL-E-1.	RF amplifier	A2V1, A2V2	8058		5960-710-2769	2	5-7
A2V2	ELECTRON TUBE, Same as A2V1.	RF amplifier						5-7
A2V3	ELECTRON TUBE, Same as A1V3.	Mixer						5-7
A2V4	ELECTRON TUBE, Same as A1V1.	Oscillator						5-8
A2XV1	SOCKET, Same as A1XV1.	Mounts A2V1.						5-7
A2XV2	SOCKET, Same as A1XV1.	Mounts A2V2.						5-7
A2XV3	SOCKET, Same as A1XV1.	Mounts A2V3.						5-7
A2XV4	SOCKET, Same as A1XV1.	Mounts A2V4.						5-8

* Indicates Non-Maintenance Item

5-62

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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Fig. 5-9 Fig. 5-10 A3	AMPLIFIER, radio frequency: Brass chassis, silver-plated, gold-flashed, 2.960 in. h, 4.120 in. w, 9.310 in. lg, o/a dim., 235-500 mc input frequency range, 60-mc output frequency, 50-ohm input impedance; Communication Electronics, Inc. type 7162.	Tunes 235 to 500 mc frequency range and converts received signals to 60-mc output.	A3				1	5-3
A3C1*	CAPACITOR, Same as A2C5.	Padder for C2.						5-9
A3C2	CAPACITOR, fixed, ceramic dielectric: 1 section, 2 pf $\pm 10\%$, 500 wvdc, uninsulated case, 0.156 in. dia by 0.225 in. lg, o/a dim., 2 axial wire lead terminals; Quality Components QC2PFPORM10PCT.	Tuned to input signal.	A3C2, A3C14			5910-836-6736	2	5-9
A3C3	CAPACITOR, fixed, ceramic dielectric: 1 section, 470 pf $\pm 20\%$, 500 wvdc, metal case, 0.281 in. dia by 0.437 in. lg, o/a dim., standoff type, 1 solder lug terminal; Allen-Bradley SS5A4712.	Coupling	A3C3, A3C4, A3C7, A3C15, A3C18, A3C29, A3C50			5910-956-8406	7	5-9
A3C4	CAPACITOR, Same as A3C3.	Filtering						5-9
A3C5	CAPACITOR, fixed, ceramic dielectric: 1 section, 470 pf $\pm 20\%$, 500 wvdc, metal case, 0.281 in. dia by 0.687 in. lg, o/a dim., feedthru type, 2 solder lug terminals; Allen-Bradley FA5C4712.	Filtering	A3C5, A3C8, A3C9, A3C10, A3C16, A3C19, A3C21, A3C22, A3C25, A3C26, A3C33, A3C40, A3C42, A3C43, A3C44, A3C45, A3C48, A4C12, A4C14, A4C18, A4C19, A4C30, A4C31				23	5-9

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		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3C6 *	CAPACITOR, variable, glass dielectric: 1 section, 0.5 pf min to 4.5 pf max, 1000 wvdc, screw driver type, 0.312 in. dia by 0.562 in. lg o/a dim.; Roanwell MG1305.	Part of a tuned circuit.	A3C6, A3C13, A3C17, A3C24, A3C39			5910-226-0486	5	5-9
A3C7	CAPACITOR, Same as A3C3.	Filtering						5-9
A3C8	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C9	CAPACITOR, Same as A3C5.	Filtering						5-10
A3C10	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C11	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.68 pf $\pm 10\%$, 500 wvdc, uninsulated case, 0.156 in. dia by 0.225 in. lg o/a dim., 2 axial wire lead terminals; Quality Components QC0.68PFFORM10PCT.	Coupling	A3C11, A3C47, A7C19, A8C14, A8C52, A8C60			5910-078-9508	6	5-9
A3C12	CAPACITOR, fixed, ceramic dielectric: 1 section, 1 pf $\pm 10\%$, 500 wvdc, uninsulated case, 0.125 in. dia by 0.250 in. lg o/a dim., 2 axial wire lead terminals; Quality Components MC1PFFORM10PCT.	Coupling	A3C12, A3C23, A6C15			5910-226-0474	3	5-10
A3C13 *	CAPACITOR, Same as A3C6.	Part of a tuned circuit.						5-9
A3C14	CAPACITOR, Same as A3C2.	Coupling						5-9
A3C15	CAPACITOR, Same as A3C3.	Filtering						5-9
A3C16	CAPACITOR, Same as A3C5.	Filtering						5-9

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IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A3C17*	CAPACITOR, Same as A3C6.	Part of a tuned circuit.						5-10
A3C18	CAPACITOR, Same as A3C3.	Filtering						5-10
A3C19	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C20	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.51 pf $\pm 10\%$, 500 wvdc, un-insulated case, 0.156 in. dia by 0.225 in. lg o/a dim., 2 axial wire lead terminals; Quality Components QC0.51PPORM10PCT.	Coupling	A3C20			5910-668-4293	1	5-9
A3C21	CAPACITOR, Same as A3C5.	Filtering						5-10
A3C22	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C23*	CAPACITOR, Same as A3C12.	Coupling						5-10
A3C24*	CAPACITOR, Same as A3C6.	Part of a tuned circuit.						5-10
A3C25	CAPACITOR, Same as A3C5.	Filtering						5-10
A3C26	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C27*	CAPACITOR, fixed, ceramic dielectric: 1 section, 2.7 pf ± 0.25 pf, 500 wvdc, un-insulated case, 0.200 in. dia by 0.400 in. lg o/a dim., 2 radial wire lead terminals; Erie 301COJ279C.	Coupling	A3C27, A6C24			5910-226-0475	2	5-10

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CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18 -119-AMC -02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3C28*	CAPACITOR, fixed, ceramic dielectric: 1 section, 1.8 pf ±10%, 500 wvdc, uninsulated case, 0.157 in. dia by 0.225 in. lg o/a dim., 2 axial wire lead terminals; Quality Components QC1.8PFPORM10PCT.	Coupling	A3C28			5960-617-9354	1	5-9
A3C29	CAPACITOR, Same as A1C3.	Filtering						5-9
A3C30	CAPACITOR, Same as A2C42.	Filtering						5-9
A3C31	CAPACITOR, fixed, ceramic dielectric: 470 pf ±20%, 1000 wvdc; per MIL-C -11015.	Filtering	A3C31, A3C41, A5A1C30, A6C10	CK60AW471M		5910-781-3802	4	5-10
A3C32*	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.82 pf ±10%, 500 wvdc, uninsulated case, 0.156 in. dia by 0.225 in. lg o/a dim., 2 axial wire lead terminals; QUALITY COMPONENTS MC0.82PFPORM10PCT.	Part of a tuned circuit.	A3C32, A6C21			5910-889-2392	2	5-9
A3C33	CAPACITOR, Same as A3C9.	Filtering						5-10
A3C34*	CAPACITOR, Same as A2C4.	Part of a voltage divider.						5-10
A3C35*	CAPACITOR, fixed, ceramic dielectric: 1 section, 6.2 pf ±0.5 pf, 500 wvdc, temperature coefficient -750, uninsulated 0.200 in. dia by 0.400 in. lg o/a dim., 2 radial wire lead terminals; Erie 301-000U2JO629D.	Part of a voltage divider.	A3C35			5910-226-0478	1	5-9

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REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MANAGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3C36 *	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.47 pf ±10%, 500 wvdc, uninsulated, 0.125 in. dia by 0.250 in. lg o/a dim., 2 axial wire lead terminals; Quality Components MC0.47PFORM10PCT.	Blocking	A3C36			5910-688-6886	1	5-10
A3C37	NOT USED	-----						
A3C38 *	CAPACITOR, Same as A2C14.	Feedback						5-10
A3C39 *	CAPACITOR, Same as A3C6.	Part of a tuned circuit.						5-9
A3C40	CAPACITOR, Same as A3C5.	Filtering						5-10
A3C41	CAPACITOR, Same as A3C31.	Coupling						5-10
A3C42	CAPACITOR, Same as A3C5.	Filtering						5-10
A3C43	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C44	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C45	CAPACITOR, Same as A3C5.	Filtering						5-9
A3C46	CAPACITOR, Same as A2C27.	Filtering						5-9
A3C47	CAPACITOR, Same as A3C11.	Filtering						5-10
A3C48	CAPACITOR, Same as A3C5.	Filtering						5-10
A3C49	NOT USED	-----						
A3C50	CAPACITOR, Same as A3C3.	Filtering						5-10

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REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3CR1	SEMICONDUCTOR DEVICE, diode: Silicon, varicap, 0.125 in. dia by 0.281 in. lg o/a dim., hermetically sealed, 2 axial wire lead terminals; Thompson, Ramo, Woolridge PC115	Varies oscillator tank circuit frequency.	A3CR1, A4CR2			5960-226-0404	2	5-10
A3CR2	SEMICONDUCTOR, Same as A1CR2	Voltage regulator						5-9
A3J1	CONNECTOR, receptacle, electrical: 1 male contact, 1 connector mating end low-loss plastic dielectric insulating material, 50-ohms impedance, right angle, 0.750 in. by 0.937 in. by 1.093 in. o/a dim., 4 holes 0.140 in. dia in flange for mounting; JETDS UG535/U.	RF input jack.	A3J1, A3J3, A4J1			5935-259-0817	3	5-10
A3J2	CONNECTOR, Same as A1J2.	IF output jack.						5-10
A3J3	CONNECTOR, Same as A3J1.	LO output jack.						5-9
A3L1 *	COIL, radio frequency: fixed inductor, brass, 0.091 in. thk by 0.190 in. w by 1.000 in. lg, inductance undetermined; Communication Electronics, Inc. 1966.	Series trimmer for A3L3A.	A3L1				1	5-9
A3L2 *	COIL, radio frequency: 17 turns closewound, no. 27 sn wire 0.150 in. dia by 0.500 in. lg, iron core form, 2 axial wire terminals; Communication Electronics, Inc. 1131-21.	RF choke	A3L2, A3L5, A3L6, A3L9, A3L10, A3L11, A3L17, A3L19, A3L20, A3L21, A3L23			5950-956-8408	11	5-10

* Indicates Non-Maintenance Item

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3L3A, B, C, D, E, F *	COIL, radio frequency: variable inductor, 0.680 μ h per 6 turns of the tuning shaft, 2.500 in. h by 2.750 in. w by 9.500 in. lg; Communication Electronics, Inc. 2403.	Tunes frequency range of 235-500 mc.	A3L3A, B, C, D, E, F				1	5-9, 5-10
A3L4*	COIL, radio frequency: fixed inductor, 0.012 in. thk by 0.120 in. w, copper bent 90 deg, 1 leg 0.180 in. lg, other leg 0.620 in. lg; Communication Electronics, Inc. 1967.	Series trimmer for A3L3A.	A3L4				1	5-10
A3L5	COIL, Same as A3L2.	RF choke						5-9
A3L6	COIL, Same as A3L2.	RF choke						5-9
A3L7 *	COIL, radio frequency: no. 20 awg wire, bent to form 90 deg angle, both legs 0.500 in. lg; Communication Electronics, Inc. 1968.	Series trimmer for A3L3B.	A3L7				1	5-9
A3L8*	COIL, radio frequency: no.20 awg wire, bent 90 deg with legs 0.440 in. and 0.250 in. lg; Communication Electronics, Inc. 1969.	Series trimmer for A3L3C.	A3L8				1	5-10
A3L9*	COIL, Same as A3L2.	RF choke						5-10
A3L10	COIL, Same as A3L2.	RF choke						5-10
A3L11	COIL, Same as A3L2.	RF choke						5-10

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		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3L12*	COIL, radio frequency: no. 20 awg wire, bent 90 deg with legs 0.500 in. and 0.620 in. lg; Communication Electronics, Inc. 1970.	Series trimmer for A3L3D.	A3L12				1	5-10
A3L13*	COIL, radio frequency: no. 20 awg wire, bent in shape of a "U", 0.300 in. between points, 0.380 in lg; Communication Electronics, Inc. 1971.	Series trimmer for A3L3E.	A3L13				1	5-10
A3L14	COIL, radio frequency: adjustable, 13 turns, closewound, no. 30 sf wire, 0.438 in. dia by 1.497 in. lg, 2 solder lug terminals, shielded, mounted with 1/4-28 hex nut; Communication Electronics, Inc. 1472-13.	Part of a tuned circuit.	A3L14, A4L17, A6L1, A6L2				4	5-10
A3L15*	COIL, radio frequency: fixed inductor, 0.091 in. thk by 0.310 in. wide by 1.310 in. lg; Communication Electronics, Inc. 1097.	Part of a tuned circuit.	A3L15				1	5-9
A3L16*	COIL, radio frequency: 11 turns, closewound, no. 27 sn wire, plastic core, 0.150 in. dia by 0.440 in. lg, uninsulated; Communication Electronics, Inc. 1131-34.	Part of a tuned circuit.	A3L16.				1	5-10
A3L17	COIL, Same as A3L2.	RF choke						5-10
A3L18	NOT USED	-----						
A3L19	COIL, Same as A3L2.	RF choke						5-10
A3L20	COIL, Same as A3L2.	RF choke						5-10

* Indicates Non-Maintenance Item

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3L21	COIL, Same as A3L2.	RF choke						5-10
A3L22	NOT USED	-----						
A3L23	COIL, Same as A3L2.	RF choke						5-9
A3L24*	COIL, radio frequency: 6 turns closewound, no. 18 sns wire, 0.125 in. id; Communication Electronics, Inc. 1129-04.	Part of a filter.	A3L24				1	5-9
A3R1	RESISTOR, Same as A1R15.	Part of a filter.						5-10
A3R2	RESISTOR, fixed, composition: 10K ±5%, 1W; per MIL-R-11.	Part of a filter.	A3R2, A3R4	RC32GF103J		5905-279-1719	2	5-10
A3R3	RESISTOR, Same as A1R15.	Part of a filter.						5-10
A3R4	RESISTOR, Same as A3R2.	Part of a filter.						5-9
A3R5	RESISTOR, Same as A1R14.	Dropping						5-10
A3R6	RESISTOR, fixed, composition: 100 ohms ±5%, 1/4W; per MIL-R-11.	Part of a filter.	A3R6, A4R4, A5A1R2, A5A2R2, A5A2R9, A5A3R13, A6R11, A7A1R24, A7A2R12, A7R9, A7R12, A8R4, A8R7, A8R12, A8R13, A8R25, A8R42, A13R2, A13R4, A14R2, A14R4	RC07GF101J		5905-683-7721	21	5-9

* Indicates Non-Maintenance Item

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3R7	RESISTOR, Same as A1R10.	Part of a voltage divider.						5-9
A3R8	RESISTOR, Same as A1R10.	Part of a voltage divider.						5-9
A3R9	RESISTOR, fixed, composition: 4.7K ±5%, 1W; per MIL-R-11.	Part of a filter.	A3R9	RC32GF472J		5905-299-2040	1	5-10
A3R10	RESISTOR, Same as A1R10.	Part of a filter .						5-9
A3R11	RESISTOR, Same as A1R10	Part of a filter.						5-10
A3R12	RESISTOR, fixed, composition: 2.7K ±5%, 1/2W; per MIL-R-11.	Plate load	A3R12	RC20GF272J		5905-279-1880	1	5-9
A3R13	RESISTOR, Same as A1R13.	Part of a filter						5-10
A3R14*	RESISTOR, fixed, composition: 10K ±5%, 1/4W; per MIL-R-11.	Grid bias	A3R14, A5A1R25, A5A1R26, A5A2R21, A5A2R22, A5A2R23, A5A3R15, A7A1R21, A7A2R6, A7A2R7, A8A1R20, A8A2R3, A8R57, A10R1	RC07GF103J		5905-683-2238	14	5-9
A3R15	RESISTOR, fixed, composition: 1.5K ±5%, 1/4W; per MIL-R-11.	Part of a filter.	A3R15, A5A3R17, A8R60	RC07GF152J		5905-683-7723	3	5-9
A3R16	RESISTOR, Same as A1R4.	Impedance matching						5-10

5-71

* Indicates Non-Maintenance Item

IDENTIFICATION TABLE OF PARTS

5-72

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A3R17	RESISTOR, Same as A1R21.	Part of a voltage divider.						5-10
A3TP1	JACK, TIP, Same as A1TP1.	Test point						5-9
A3V1	ELECTRON TUBE: EIA designation 7077; per MIL-E-1.	RF amplifier	A3V1, A3V2	JAN7077		5960-688-6706	2	5-9
A3V2	ELECTRON TUBE, Same as A3V1.	RF amplifier						5-9
A3V3	ELECTRON TUBE, Same as A1V3.	Mixer						5-9
A3V4	ELECTRON TUBE: EIA designation 7486; per MIL-E-1.	Oscillator	A3V4, A4V1	JAN7486		5960-845-9953	2	5-10
A3XV1	SOCKET, electron tube: Silver plated, beryllium copper contacts, 3 solder lug terminals, chassis barrier mounted with 2 no. 2-56 screws 0.625 in. by 0.860 in. by 1.281 in. assembled; Jettron 86-040.	Mounts A3V1.	A3XV1, A3XV2			5935-785-8823	2	5-9
A3XV2	SOCKET, Same as A3XV1.	Mounts A3V2.						5-9
A3XV3	SOCKET, Same as A1XV1.	Mounts A3V3.						5-9
A3XV4	SOCKET, electron tube: Silver plated beryllium copper contacts, riveted to epoxy glass laminate, 0.531 in. h by 0.900 in. w by 1.190 in. lg; Communication Electronics, Inc. 10898.	Mounts A3V4.	A3XV4				1	5-10

IDENTIFICATION TABLE OF PARTS

7163		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-11, Fig. 5-12 A4	AMPLIFIER, RADIO FREQUENCY: Brass chassis, silver plated, gold-flashed, 1.75 in. h, 4.0 in. w, 5.5 in. d o/a dim., 490-1000-mc input frequency range, 60-mc input frequency, 50-ohm input impedance; Communication Electronics, Inc. Type 7163.	Tunes 490 to 1000 mc frequency range and converts received signals to 60-mc output.	A4				1	5-1
A4C1A, B, C, D, E *	CAPACITOR, variable, air dielectric: 5 sections, installed into and a part of the amplifier chassis; Communication Electronics, Inc. 1271.	Preselector variable tuning element.	A4C1A, B, C, D, E				1	5-11, 5-12
A4C2 *	CAPACITOR, variable, air dielectric: (part of the chassis); Communication Electronics, Inc. 1261.	Trimmer for A4C1A.	A4C2, A4C3, A4C4, A4C5				4	5-12
A4C3 *	CAPACITOR, Same as A4C2.	Trimmer for A4C1B.						5-11
A4C4 *	CAPACITOR, Same as A4C2.	Trimmer for A4C1C.						5-11
A4C5 *	CAPACITOR, Same as A4C2.	Trimmer for A4C1D.						5-11
A4C6 *	CAPACITOR, variable, air dielectric: Screw adjusted plate mounted in/and a part of amplifier chassis; Communication Electronics, Inc. 1276.	Trimmer for A4C1E.	A4C6				1	5-12
A4C7 *	CAPACITOR, variable, ceramic dielectric: 1 section, 0.5-3.0 pf, 0.750 in. o/a lg single wire lead terminal; Erie 3115-001-1R.	Trimmer for A4C9.	A4C7				1	5-11

* Indicates Non-Maintenance Item

S-74

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED CONTRACT NO. DA18-119-AMC-02499(X)

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A4C8	CAPACITOR, fixed, ceramic dielectric: 1 section, 1.0 pf \pm 0.1 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, 2 radial wire lead terminals; Erie 301-000COKO109B.	With A4C9 corrects oscillator tracking.	A4C7				1	5-11
A4C9	CAPACITOR, Same as A1C7.	With A4C7, corrects oscillator tracking.						5-11
A4C10	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.27 pf \pm 10%, 500 wvdc, 0.10 in. dia by 0.250 in. lg, 2 axial wire lead terminals; Quality Components MC0-27PFPORM10PCT.	Coupling	A4C10			5910-226-0479	1	5-12
A4C11	NOT USED	-----						
A4C12	CAPACITOR, Same as A3C5.	Filtering						5-12
A4C13	CAPACITOR, fixed, ceramic dielectric: 1 section, 137 pf \pm 20%, 500 wvdc, 0.125 in. w by 0.500 in. h. by 0.500 in. lg, standoff type, 1 solder lug terminal; Sickles 32-25394-1.	Filtering	A4C13			5910-776-6849	1	5-11
A4C14	CAPACITOR, Same as A3C5.	Filtering						5-11
A4C15	CAPACITOR, fixed, mica dielectric 15 pf \pm 10%, 500 wvdc; per MIL -C-10950.	Filtering	A4C15	CB11RD150K			1	5-11

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A4C16	CAPACITOR, fixed, mica dielectric: 1 section, 56 pf ±5%, 500 wvdc, -55 deg C to +150 deg C operating temp range, plastic case, 0.190 in. thk by 0.330 in. w by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10-560J.	Filtering	A4C16, A5A1C6 A5A1C11, A5A1C16, A5A1C23, A5A2C1, A5A2C12			5910-226-0471	7	5-12
A4C17	CAPACITOR, Same as A1C21.	Filtering						5-12
A4C18	CAPACITOR, Same as A3C5.	Filtering						5-12
A4C19	CAPACITOR, Same as A3C5.	Filtering						5-12
A4C20	CAPACITOR, Same as A1C5.	Filtering						5-11
A4C21	CAPACITOR, Same as A1C5.	Coupling						5-11
A4C22	CAPACITOR, Same as A1C5.	Filtering						5-12
A4C23	CAPACITOR, Same as A1C5.	Coupling						5-11
A4C24	CAPACITOR, Same as A1C21.	Filtering						5-12
A4C25	CAPACITOR, Same as A1C38.	Filtering						5-12
A4C26	CAPACITOR, Same as A1C14.	Part of a filter .						5-11
A4C27	CAPACITOR, Same as A1C5.	Filtering						5-12
A4C28	CAPACITOR, Same as A1C5.	Coupling						5-12
A4C29	CAPACITOR, Same as A1C38.	Filtering						5-12
A4C30	CAPACITOR, Same as A3C5.	Filtering						5-12
A4C31	CAPACITOR, Same as A3C5.	Filtering						5-11

5-76

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A4C32	CAPACITOR, Same as A1C21.	Filtering						5-11
A4CR1	SEMICONDUCTOR DEVICE, diode: EIA designation 1N82A; per MIL-S-19500.	Crystal detector	A4CR1	JAN 1N82A		5960-669-6876	1	5-11
A4CR2	DIODE, Same as A3CR1.	Varies oscillator tank circuit frequency.						5-11
A4CR3	DIODE, Same as A1CR2.	Voltage regulator						5-12
A4J1	CONNECTOR, Same as A3J1.	RF input jack.						5-12
A4J2	CONNECTOR, Same as A1J2.	IF output jack.						5-12
A4J3	CONNECTOR, receptacle, electrical: Type BNC; per Communication Electronics Nomenclature Subpanel UG290A/U.	LO output jack	A4J3			5935-201-3511	1	5-12
A4J4	JACK, telephone: 2 conductor miniature jack, single hole, mounted with no. 10-48 hex nut, 0.500 in. dia by 0.531 in. lg; Switchcraft TR-2A.	Test jack	A4J4			5935-045-9075	1	5-12
A4L1*	COIL, radio frequency: No. 16 wire bent 90 deg, having 1 leg 0.060 in. lg and 1 leg 0.880 in. lg; Communication Electronics, Inc. 1461.	Input coupling coil	A4L1				1	5-12
A4L2*	COIL, radio frequency: Shaped brass soldered into and becoming a part of the tuner chassis; Communication Electronics, Inc. 1265.	Part of RF tuning circuit.	A4L2, A4L3, A4L4, A4L5				4	5-11

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REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A4L3 *	COIL, Same as A4L2.	Part of RF tuning circuit.						5-11
A4L4 *	COIL, Same as A4L2.	Part of RF tuning circuit.						5-11
A4L5 *	COIL, Same as A4L2.	Part of RF tuning circuit.						5-11
A4L6 *	COIL, radio frequency: No. 20 wire shaped, 0.500 in. by 0.900 in. o/a dim.; Communication Electronics, Inc. 1462.	Detector input coupling coil.	A4L6				1	5-12
A4L7 *	COIL, radio frequency: Shaped brass soldered into and becoming a part of the tuner chassis; Communication Electronics, Inc. 1301.	Part of oscillator tank circuit.	A4L7				1	5-12
A4L8 *	COIL, radio frequency: 0.012 in. thk copper strip, 0.140 in. wide "J" shaped, bend with short leg 0.090 in. lg and long lg 0.620 in.; Communication Electronics, Inc. 1973.	Tunes plate circuit of A1V1.	A4L8				1	5-12
A4L9 *	COIL, radio frequency: 10 turns no. 26 wire, closewound, 0.107 in. i.d., no core, radial leads; Communication Electronics, Inc. 1466-4.	RF choke	A4L9				1	5-11
A4L10	COIL, radio frequency: 14 turns no. 26 wire, closewound, 0.107 in. i.d., no core, radial leads; Communication Electronics, Inc. 1466-3	RF choke	A4L10, A4L11				2	5-11

* Indicates Non-Maintenance Item

5-78

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A4L11	COIL, Same as A4L10.	RF choke						5-11
A4L12	COIL, radio frequency: bent no.24 AWG wire; Communication Electronics, Inc. 1975.	RF choke	A4L12				1	5-12
A4L13*	COIL, radio frequency: 4 turns no. 26 wire, closewound, 0.107 in. i.d., no core, radial leads; Communication Electronics, Inc. 1466-1.	Part of interstage coupling network.	A4L13				1	5-11
A4L14*	COIL, radio frequency: 5 turns, no. 26 wire, closewound, 0.107 in. i.d., no core, radial leads; Communication Electronics, Inc. 1466-2.	RF choke	A4L14				1	5-11
A4L15*	COIL, radio frequency: adjustable coil, 14-1/2 turns, no. 26 sns wire, powdered ironcore, 0.326in. dia by 1.255 in. lg, 2 solder lug terminals mtd with no. 8-32 hex nut; Communi-cation Electronics, Inc. 1471-2.	Tunes input to A4V2.	A4L15				1	5-12
A4L16*	COIL, radio frequency: 33 turns, closewound, no. 40 sf wire, 0.438 in. dia by 1.497 in. lg, shielded, 2 solder lug terminals, mounted with no. 1/4-28 hex nut; Communication Electronics, Inc. 1472-12.	Neutralization	A4L16				1	5-12
A4L17*	COIL, Same as A3L14.	Tunes output of A4V3.						5-12
A4R1	RESISTOR, Same as A1R4.	LO input termination.						5-11
A4R2	RESISTOR, fixed, composition: 5.6K ±5%, 1/4W; per MIL-R-11.	Load for tracking capacitors.	A4R2, A7R5,	RC07GF562J		5905-691-0195	5	5-11

* Indicates Non-Maintenance Item

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A4R3	RESISTOR, Same as A1R13.	Part of a filter.						5-11
A4R4	RESISTOR, Same as A3R6.	Part of a filter.						5-11
A4R5	RESISTOR, Same as A1R15.	Dropping						5-11
A4R6	RESISTOR, Same as A1R2.	Dropping						5-12
A4R7	RESISTOR, fixed, composition: 68K ±5%, 1/4W; per MIL-R-11	Cathode resistor	A4R7	RC07GF683J		5905-681-8853	1	5-11
A4R8	RESISTOR, Same as A1R2.	Part of a voltage divider.						5-11
A4R9	RESISTOR, Same as A1R7.	Part of a voltage divider.						5-12
A4R10	RESISTOR, fixed, composition: 2.7K ±5%, 1/4W; per MIL-R-11.	Part of a filter.	A4R10, A5A1R12, A5A2R6, A5A2R13, A5A3R5, A6R1, A6R2, A6R12, A7A1R16, A7A1R27, A8R63	RC07GF272J		5905-686-3798	11	5-12
A4R11	RESISTOR, fixed, composition: 11K ±5%, 1W; per MIL-R-11.	Dropping	A4R11	RC32GF113J		5905-665-6047	1	5-12
A4R12	RESISTOR, Same as A1R15.	Dropping						5-11
A4TP1	JACK, tip, Same as A1TP1.	Test point						5-12
A4V1	ELECTRON TUBE, Same as A3V4.	Oscillator						5-12
A4V2	ELECTRON TUBE, Same as A1V1.	60-mc Amplifier						5-11

5-79

IDENTIFICATION TABLE OF PARTS

5-80

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A4V3	ELECTRON TUBE, Same as A1V1.	60-mc Amplifier						5-12
A4XV1	SOCKET, electron tube: for JAN7077 electron tube, 0.468 in. w by 0.812 in. h by 0.875 in. lg, mounted with 2 no. 2-56 screws, contacts beryllium copper, insulation-low-loss material; Jettron 86-000.	Mounts A4V1.	A4XV1			5960-084-8518	1	5-12
A4XV2	SOCKET, Same as A1XV1.	Mounts A4V2.						5-11
A4XV3	SOCKET, Same as A1XV1.	Mounts A4V3.						5-12

7930		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-13 A5	INDICATOR, PANORAMIC: Brass chassis, silver plated, gold-flashed, 9.6 in. lg, 8.2 in. w, 1.5 in. d o/a dim., contains three etched circuit boards, 21.4-mc IF input frequency, horizontal and vertical deflection output voltages, drives cathode ray tube, 50-ohm input impedance, 21.4-mc 1st IF frequency, 6.7-mc 2nd IF frequency, 950-kc 3rd IF frequency, Communication Electronics, Inc. type 7930.	Provides visual display of signals within 3.0 mc around frequency to which receiver is tuned.	A5				1	5-2
Fig. 5-14 Fig. 5-15 A5A1	AMPLIFIER-OSCILLATOR: Etched circuit board, epoxy resin glass base laminate, 1-oz copper (1-side) 8.0 in. lg, 1.8 in. w, 0.6 in. d o/a dim., 21.4-mc input frequency, 6.7-mc output frequency, non-linear sawtooth input voltage; Communication Electronics, Inc. type 8003.	Shapes incoming IF signal and sawtooth voltage, synchronizes incoming signal with horizontal CRT sweep, drives IF output amplifier A5A2.	A5A1				1	5-13
A5A1C1	CAPACITOR, Same as A1C1.	Part of a tuned circuit.						5-15
A5A1C2	CAPACITOR, fixed, ceramic dielectric: 0.005 μ f \pm 20%, 500 wvdc, insulated case, 0.156 in. thk by 0.390 in. dia, disk style, 2 radial wire lead terminals; Radio Materials Corp. SM-005UFPORM20PCT	Filtering	A5A1C2, A5A1C3, A5A1C4, A5A1C5, A5A1C7, A5A1C8, A5A1C9, A5A1C10, A5A1C12, A5A1C13, A5A1C14, A5A1C15, A5A1C17,				33	5-14

IDENTIFICATION TABLE OF PARTS

5-82

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
			A5A1C18, A5A1C19, A5A1C20, A5A1C21, A5A1C22, A5A1C24, A5A1C25, A5A1C26, A5A1C31, A7A1C1, A7A1C3, A7A1C11, A8A1C1, A8A1C6, A8A1C12, A8A1C13, A8C9, A8C18, A8C59, A8C65					
A5A1C3	CAPACITOR, Same as A5A1C2.	Filtering						5-15
A5A1C4	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C5	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C6	CAPACITOR, Same as A4C16.	Part of a tuned circuit.						5-15
A5A1C7	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C8	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C9	CAPACITOR, Same as A5A1C2.	Degeneration						5-15
A5A1C10	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C11	CAPACITOR, Same as A4C16.	Part of a tuned circuit.						5-14
A5A1C12	CAPACITOR, Same as A5A1C2.	Filtering						5-14

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A1C13	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C14	CAPACITOR, Same as A5A1C2.	Degeneration						5-15
A5A1C15	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C16	CAPACITOR, Same as A4C16.	Part of a tuned circuit.						5-14
A5A1C17	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C18	CAPACITOR, Same as A5A1C2.	Filtering						5-15
A5A1C19	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C20	CAPACITOR, Same as A5A1C2.	Filtering						5-15
A5A1C21	CAPACITOR, Same as A5A1C2.	Degeneration						5-15
A5A1C22	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C23	CAPACITOR, Same as A4C16.	Part of a tuned circuit.						5-14
A5A1C24	CAPACITOR, Same as A5A1C2.	Filtering						5-15
A5A1C25	CAPACITOR, Same as A5A1C2.	Filtering						5-14
A5A1C26	CAPACITOR, Same as A5A1C2.	Degeneration						5-15
A5A1C27	CAPACITOR, Same as A1C7.	Coupling						5-15
A5A1C28	CAPACITOR, Same as A1C28.	Part of a voltage divider.						5-14
A5A1C29	CAPACITOR, Same as A1C28.	Part of a voltage divider.						5-15
A5A1C30	CAPACITOR, Same as A3C31.	Coupling						5-15

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A1C31	CAPACITOR, Same as A5A1C2.	Filtering						5-15
A5A1C32	CAPACITOR, Same as A1CR1.	Variable coupling capacitor.						5-14
A5A1C33	CAPACITOR, fixed, mica dielectric: 1 section, 360 pf $\pm 5\%$, 500 wvdc, insulated case, 0.190 in. thk by 0.330 in. h by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10F361J.	Filtering	A5A1C33, A5A2C17, A5A2C19, A5A2C24, A5A2C26, A5A2C31			5910-954-7817	6	5-15
A5A1CR1	SEMICONDUCTOR DEVICE, diode: EIA designation 1N462.	Part of a wave shaping network.	A5A1CR1, A5A1CR2, A5A1CR3, A5A3CR1, A5A3CR2			5960-543-0432	5	5-14
A5A1CR2	DIODE, Same as A5A1CR1.	Clamping						5-15
A5A1CR3	DIODE, Same as A5A1CR1.	Part of a wave shaping network.						5-14
A5A1CR4	SEMICONDUCTOR DEVICE, diode: EIA designation 1N749.	Part of a wave shaping network.	A5A1CR4			5960-877-8285	1	5-15
A5A1CR5	SEMICONDUCTOR DEVICE, diode: EIA designation 1N746.	Part of a wave shaping network.	A5A1CR5			5960-984-3570	1	5-14
A5A1J1	CONNECTOR, Same as A1J2.	IF input jack.						5-14
A5A1J2	CONNECTOR, Same as A1J2.	IF output jack.						5-14
A5A1L1	COIL, radio frequency: 35 turns, closewound, no. 34 sn wire, iron core, insulated case, 0.150 in. dia by 0.400 in. lg, 2 axial wire lead terminals; Communication Electronics, Inc. 1131-39.	RF choke.	A5A1L1, A5A1L2, A5A1L3, A5A1L4, A5A1L5, A5A1L6,				8	5-14

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A5A1L2	COIL, Same as A5A1L1.	RF choke.	A5A1L7, A5A1L8					5-15
A5A1L3	COIL, Same as A5A1L1.	RF choke.						5-15
A5A1L4	COIL, Same as A5A1L1.	RF choke.						5-15
A5A1L5	COIL, Same as A5A1L1.	RF choke.						5-14
A5A1L6	COIL, Same as A5A1L1.	RF choke.						5-15
A5A1L7	COIL, Same as A5A1L1.	RF choke.						5-15
A5A1L8	COIL, Same as A5A1L1.	RF choke.						5-14
A5A1Q1	TRANSISTOR: EIA designation 2N706; per MIL-S-19500.	Wave shaping.	A5A1Q1, A5A1Q2, A5A1Q3, A5A1Q4, A5A1Q5, A5A1Q6, A5A2Q1, A5A2Q2, A5A2Q3, A5A2Q4, A5A2Q5, A7A1Q1, A7A1Q2, A7A1Q3, A7A1Q4, A8A1Q1, A8A1Q2, A8A1Q3, A8A1Q4, A8A2Q1	JAN2N706		5960-824-8448	20	5-14

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A1Q2	TRANSISTOR, Same as A5A1Q1.	Shaping amplifier.						5-15
A5A1Q3	TRANSISTOR, Same as A5A1Q1.	Shaping amplifier.						5-15
A5A1Q4	TRANSISTOR, Same as A5A1Q1.	Shaping amplifier.						5-14
A5A1Q5	TRANSISTOR, Same as A5A1Q1.	Shaping amplifier.						5-15
A5A1Q6	TRANSISTOR, Same as A5A1Q1.	Shaping amplifier.						5-14
A5A1R1	RESISTOR, fixed, composition: 1.1K ±5%, 1/4W; per MIL-R-11	Biasing	A5A1R1	RC07GF112J		5905-800-8063	1	5-14
A5A1R2	RESISTOR, Same as A3R6.	Dropping						5-15
A5A1R3	RESISTOR, Same as A1R15.	Biasing						5-14
A5A1R4	RESISTOR, Same as A1R15.	Part of a filter.						5-15
A5A1R5	RESISTOR, Same as A1R15.	DC return.						5-14
A5A1R6	RESISTOR, Same as A1R15.	Part of a filter.						5-15
A5A1R7	RESISTOR, Same as A1R15.	DC return.						5-14
A5A1R8	RESISTOR, Same as A1R15.	Part of a filter.						5-15
A5A1R9	RESISTOR, Same as A1R15.	DC return.						5-14
A5A1R10	RESISTOR, Same as A1R15.	Part of a filter.						5-15
A5A1R11	RESISTOR, Same as A2R18.	Part of a filter.						5-15
A5A1R12	RESISTOR, Same as A4R10.	Part of a voltage divider.						5-15
A5A1R13	RESISTOR, Same as A1R15.	DC return.						5-14
A5A1R14	RESISTOR, Same as A2R3.	Dropping						5-14

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A5A1R15	RESISTOR, Same as A2R7.	Part of a voltage divider.						5-15
A5A1R16	RESISTOR, Same as A1R2.	Part of a filter.						5-14
A5A1R17	RESISTOR, fixed, composition: 27K ±5%, 1/4W; per MIL-R-11.	Part of a filter.	A5A1R17	RC07GF273J		5905-686-3838	1	5-15
A5A1R18	RESISTOR, variable: 500K, linear, ±20%, 0.500 in. dia by 1.093 in. lg, 3 solder pin terminals; Allen-Bradley FR504M.	Linearity adjust.	A5A1R18				1	5-15
A5A1R19	RESISTOR, fixed, composition: 51K ±5%, 1/4W; per MIL-R-11.	Dropping	A5A1R19, A7A2R9, R1, R15	RC07GF513J		5905-682-4103	4	5-14
A5A1R20	RESISTOR, Same as A2R3.	Part of a wave shaping network.						5-14
A5A1R21	RESISTOR, fixed, composition: 240K ±5%, 1/4W; per MIL-R-11.	Part of a wave shaping network.	A5A1R21, A5A1R24, A5A3R10, A8A2R2	RC07GF244J		5905-681-8820	4	5-14
A5A1R22	RESISTOR, fixed, composition: 130K ±5%, 1/4W; per MIL-R-11.	Part of a wave shaping network.	A5A1R22	RC07GF134J		5905-686-3130	1	5-15
A5A1R23	RESISTOR, Same as A1R13.	Part of a wave shaping network.						5-15
A5A1R24	RESISTOR, Same as A5A1R21.	Part of a wave shaping network.						5-14
A5A1R25	RESISTOR, Same as A3R14.	Swamping.						5-14
A5A1R26	RESISTOR, Same as A3R14.	Swamping.						5-14
A5A1R27	RESISTOR, Same as A1R7.	Collector load.						5-15

5-88

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A5A1R28	RESISTOR, Same as A1R7.	Part of a voltage divider.						5-15
A5A1T1	TRANSFORMER, radio frequency: 2 windings, 18 turns, no 32 wire and 4 turns no. 34 wire, untapped, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 4 solder pin terminals; Communication Electronics, Inc. 3476-1.	Input transformer.	A5A1T1				1	5-14
A5A1T2	TRANSFORMER, radio frequency: 3 windings, 10 1/2 turns no. 29 wire, 3 turns no. 32 wire, and 2 turns no. 34 wire, untapped, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 6 solder pin terminals; Communication Electronics, Inc. 3476-2	Part of a tuned circuit.	A5A1T2, A5A1T3, A5A1T4,				3	5-15
A5A1T3	TRANSFORMER, Same as A5A1T2.	Part of a tuned circuit.						5-15
A5A1T4	TRANSFORMER, Same as A5A1T2.	Part of a tuned circuit.						5-15
A5A1T5	TRANSFORMER, radio frequency: 3 windings, 10 1/2 turns no. 29 wire, 3 turns no. 32 wire, and 2 turns no. 34 wire, untapped, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 6 solder pin terminals; Communication Electronics, Inc. 3476-11	Part of a tuned circuit.	A5A1T5				1	5-15

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A5A1T6	COIL, radio frequency: 12 1/2 turns no. 32 wire, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 2 solder pin terminals; Communication Electronics, Inc. 3476-3.	Part of a tuned circuit.	A5A1T6.				1	5-14
A5A1TP1	JACK, Same as A1TP1.	Test point.						5-14
A5A1TP2	JACK, Same as A1TP1.	Test point.						5-14
Fig. 5-16 Fig. 5-17 A5A2	AMPLIFIER, intermediate frequency: Etched circuit board, 8.0 in. lg, 1.8 in. w, 0.95 in. d, o/a dim., epoxy resin glass base laminate, 1-oz. copper (1-side), 6.7-mc input frequency, 950-kc resultant frequency, crystal controlled oscillator; Communication Electronics, Inc., type 8101.	Provides second conversion for desired resolution and synchronization of incoming RF signals to receiver section drives vertical deflection plates of CRT.	A5A2				1	5-13
A5A2C1	CAPACITOR, Same as A4C16.	Part of a tuned circuit.						5-17
A5A2C2	CAPACITOR, fixed, ceramic dielectric: 1 section, 3.4 pf ±10%, 500 wvdc, 0.100 in. dia by 0.250 in. lg, 2 axial wire lead terminals; Quality Components MC3.4PF PORM10PCT.	Coupling	A5A2C2, A5A2C11				2	5-16
A5A2C3	CAPACITOR, fixed, mica dielectric: 1 section. 82 pf ±5%, 500 wvdc, -55°C to 150°C operating temp range, insulated plastic case, 0.190 in. thk by 0.330 in. w by 0.360 in. lg, o/a dim., 2 radial wire lead terminals; Electro Motive DM10-820J.	Part of a tuned circuit.	A5A2C3, A5A2C10, A6C1, A6C2			5910-226-0470	4	5-16

5-90

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)			
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A5A2C4	CAPACITOR, fixed, ceramic dielectric: 1 section. 0.05 μ f \pm 20%, 50 wvdc, disk type, ceramic case, 0.156 in. thk by 0.475 in. dia, 2 radial wire lead terminals; Sprague 55C23.	Filtering	A5A2C4, A5A2C5, A5A2C6, A5A2C8, A5A2C9, A5A2C13, A5A2C15, A5A2C16, A5A2C22, A5A2C23, A5A2C28, A5A2C30, A5A2C33			5910-061-7356	13	5-16	
A5A2C5	CAPACITOR, Same as A5A2C4.	Filtering						5-16	
A5A2C6	CAPACITOR, Same as A5A2C4.	Filtering						5-16	
A5A2C7	NOT USED	-----							
A5A2C8	CAPACITOR, Same as A5A2C4.	Filtering						5-16	
A5A2C9	CAPACITOR, Same as A5A2C4.	Filtering						5-16	
A5A2C10	CAPACITOR, Same as A5A2C3.	Part of a tuned circuit.						5-16	
A5A2C11	CAPACITOR, Same as A5A2C2.	Coupling.						5-17	
A5A2C12	CAPACITOR, Same as A4C16.	Part of a tuned circuit.						5-16	
A5A2C13	CAPACITOR, Same as A5A2C4.	Filtering						5-16	

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A5A2C14	CAPACITOR, fixed, ceramic dielectric: 1 section, 2.2 pf ±10%, 500 wvdc, 0.125 in. dia by 0.250 in. lg, 2 axial wire lead terminals; Quality Components MC2-2PFORM10PCT.	Coupling	A5A2C14, A5A2C18, A5A2C25			5910-844-7873	3	5-17
A5A2C15	CAPACITOR, Same as A5A2C4.	Degeneration						5-17
A5A2C16	CAPACITOR, Same as A5A2C4.	Filtering						5-16
A5A2C17	CAPACITOR, Same as A5A1C33.	Part of a tuned circuit.						5-17
A5A2C18	CAPACITOR, Same as A5A2C14.	Coupling						5-16
A5A2C19	CAPACITOR, Same as A5A1C33.	Part of a tuned circuit.						5-16
A5A2C20	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.1 µf +80%-20%, 10 wvdc, disk type, 0.408 in. dia, 2 radial wire lead terminals; Centralab UK10-104.	Filtering	A5A2C20, A5A2C21, A5A2C27, A5A2C29			5910-995-2851	4	5-17
A5A2C21	CAPACITOR, Same as A5A2C20.	Degeneration						5-16
A5A2C22	CAPACITOR, Same as A5A2C4.	Filtering						5-17
A5A2C23	CAPACITOR, Same as A5A2C4.	Filtering						5-16
A5A2C24	CAPACITOR, Same as A5A1C33.	Part of a tuned circuit.						5-16
A5A2C25	CAPACITOR, Same as A5A2C14.	Coupling						5-16
A5A2C26	CAPACITOR, Same as A5A1C33	Part of a tuned circuit.						5-17

IDENTIFICATION TABLE OF PARTS

5-92

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A5A2C27	CAPACITOR, Same as A5A2C20.	Filtering						5-16
A5A3C28	CAPACITOR, Same as A5A2C4.	Filtering						5-16
A5A2C29	CAPACITOR, Same as A5A2C20.	Degeneration						5-17
A5A2C30	CAPACITOR, Same as A5A2C4.	Filtering						5-17
A5A2C31	CAPACITOR, Same as A5A1C33.	Part of a tuned circuit.						5-16
A5A2C32	CAPACITOR, Same as A1C17.	Coupling						5-17
A5A2C33	CAPACITOR, Same as A5A2C4.	Filtering						5-16
A5A2C34	CAPACITOR, Same as A1C17.	Coupling						5-17
A5A2C35	CAPACITOR, fixed, mica dielectric: 1 section, 68 pf $\pm 2\%$, 500 wvdc, -55°C to $+150^{\circ}\text{C}$ operating temperature range, plastic insulated case, 0.190 in. thk by 0.330 in. w by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10E680G.	Part of a voltage divider.	A5A2C35, A8A2C3			5910-904-9836	2	5-16
A5A2C36	CAPACITOR, fixed, mica dielectric: 1 section, 33 pf $\pm 2\%$, 500 wvdc, -55°C to $+150^{\circ}\text{C}$ operating temperature range, plastic insulated case, 0.190 in. thk by 0.330 in. w by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10E330G.	Part of a voltage divider.	A5A2C36, A7A2C3, A7C4, A7C12, A8A1C11, A8C68			5910-080-0292	6	5-16
A5A2C37	CAPACITOR, Same as A1C12.	Neutralization						5-17

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A5A2CR1	SEMICONDUCTOR DEVICE, diode: EIA designation 1N198.	Clamping	A5A2CR1, A5A2CR2, A7A1CR1, A7A1CR3, A7A1CR4, A7A1CR5, A7CR1, A8A1CR1, A8A1CR3, A8A1CR4, A8A1CR5, A8CR3, A8CR4				13	5-16
A5A2CR2	DIODE, Same as A5A2CR1.	Clamping						5-17
A5A2J1	CONNECTOR, Same as A1J2.	IF input jack.						5-17
A5A2L1	COIL, radio frequency: fixed, 15 μ h \pm 10% inductance, 18.7 mc nominal resonant frequency, minimum Q-15, varnish coated, 0.219 in. dia by 0.187 in. lg; Wilco 1015-15.	RF choke.	A5A2L1, A5A2L2, A5A2L3				3	5-17
A5A2L2	COIL, Same as A5A2L1.	RF choke.						5-16
A5A2L3	COIL, Same as A5A2L1.	RF choke.						5-17
A5A2Q1	TRANSISTOR, Same as A5A1Q1.	IF amplifier						5-16
A5A2Q2	TRANSISTOR, Same as A5A1Q1.	Mixer						5-17
A5A2Q3	TRANSISTOR, Same as A5A1Q1.	IF amplifier						5-16
A5A2Q4	TRANSISTOR, Same as A5A1Q1.	IF amplifier						5-16
A5A2Q5	TRANSISTOR, Same as A5A1Q1.	Oscillator						5-17
A5A2R1	RESISTOR, Same as A1R15.	Part of a filter.						5-17

5-94

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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A5A2R2	RESISTOR, Same as A3R6.	Part of a filter.						5-17
A5A2R3	RESISTOR, Same as A1R2.	Biasing						5-17
A5A2R4	RESISTOR, Same as A1R15.	Part of a filter.						5-17
A5A2R5	RESISTOR, Same as A2R18.	Dropping						5-16
A5A2R6	RESISTOR, Same as A4R10.	Part of a voltage divider.						5-16
A5A2R7	RESISTOR, Same as A1R15.	Biasing						5-17
A5A2R8	RESISTOR, Same as A1R15.	Part of a filter.						5-17
A5A2R9	RESISTOR, Same as A3R6.	Part of a filter.						5-17
A5A2R10	RESISTOR, Same as A1R15.	Biasing						5-17
A5A2R11	RESISTOR, Same as A1R15.	Part of a filter.						5-16
A5A2R12	RESISTOR, Same as A1R9.	Part of a filter.						5-17
A5A2R13	RESISTOR, Same as A4R10.	Part of a filter.						5-16
A5A2R14	RESISTOR, Same as A1R15.	Biasing						5-17
A5A2R15	RESISTOR, fixed, composition: 470 ohms $\pm 5\%$, 1/4W; per MIL-R-11	Part of a filter.	A5A2R15, A5A3R2, A6R13, A7R15, A8R45, A8R52	RC07GF471J		5905-683-2242	6	5-16
A5A2R16	RESISTOR, Same as A1R12.	Biasing						5-16
A5A2R17	RESISTOR, fixed, composition: 150K $\pm 5\%$, 1/4W; per MIL-R-11.	Dropping	A5A2R17, A5A2R19	RC07GF154J		5905-686-9995	2	5-16
A5A2R18	RESISTOR, Same as A1R12.	Biasing						5-16

IDENTIFICATION TABLE OF PARTS

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED CONTRACT NO. DA18-119-AMC-02499(X)

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A2R19	RESISTOR, Same as A5A2R17.	Dropping						5-17
A5A2R20	RESISTOR, Same as A2R3.	Biasing						5-17
A5A2R21	RESISTOR, Same as A3R2.	Biasing						5-17
A5A2R22	RESISTOR, Same as A3R2.	Swamping						5-17
A5A2R23	RESISTOR, Same as A3R2.	Swamping						5-16
A5A2R24	RESISTOR, Same as A2R6.	Parasitic suppressor						5-17
A5A2T1	TRANSFORMER, radio frequency: 2 windings, 30 1/2 turns no. 36 wire and 12 1/2 turns no. 34 wire, untapped, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 4 solder pin terminals; Communication Electronics, Inc. 3476-4	Part of a tuned circuit.	A5A2T1				1	5-16
A5A2T2	TRANSFORMER, radio frequency: 2 windings, 30 turns no. 36 wire and 10 turns no. 34 wire, untapped, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 4 solder pin terminals; Communication Electronics, Inc. 3476-5	Part of a tuned circuit.	A5A2T2, A5A2T4				2	5-17
A5A2T3	TRANSFORMER, radio frequency: 3 windings, 30 turns no. 36 wire, 12 turns no. 34 wire, and 2 1/2 turns no. 36 wire, untapped, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 4 solder pin terminals; Communication Electronics, Inc. 3476-6	Part of a tuned circuit.	A5A2T3				1	5-16
A5A2T4	TRANSFORMER, Same as A5A2T2.	Part of a tuned circuit.						5-17

IDENTIFICATION TABLE OF PARTS

96-5

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A2T5	TRANSFORMER, radio frequency: 1 winding, 90 1/2 turns no. 36 wire tapped at 60 1/2 turns, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 3 solder pin terminals; Communication Electronics, Inc. 3476-7.	Part of a tuned circuit.	A5A2T5, A5A2T7, A5A2T9				3	5-17
A5A2T6	TRANSFORMER, radio frequency: 1 winding, 90 1/2 turns no. 36 wire tapped at 80 1/2 turns, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 3 solder lug terminals; Communication Electronics, Inc. 3476-8.	Part of a tuned circuit.	A5A2T6, A5A2T8				2	5-16
A5A2T7	TRANSFORMER, Same as A5A2T5.	Part of a tuned circuit.						5-17
A5A2T8	TRANSFORMER, Same as A5A2T6.	Part of a tuned circuit.						5-16
A5A2T9	TRANSFORMER, Same as A5A2T5.	Part of a tuned circuit.						5-16
A5A2Y1	CRYSTAL UNIT, quartz: 5.750 mc; per MIL-C-3098.	Determines oscillator center frequency.	A5A2Y1	CR18/U			1	5-17
Fig. 5-18 A5A3	GENERATOR, sweep: Etched circuit board, epoxy resin glass base laminate with 1-oz copper (1-side), 8.0 in. lg, 2.35 in. w, 1.2 in. d, o/a dim., dc input, sawtooth voltage output; Communication Electronics, Inc. type 8202.	Generates sawtooth sweep voltage for use by CRT and sweep oscillator in A5A1.	A5A3				1	5-13

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A3C1	CAPACITOR, fixed, electrolytic: 1 section, 1.0 μf $\pm 20\%$, 35 wvdc, insulated case, 0.135 in. dia by 0.322 in. lg, 2 axial wire lead terminals; Sprague 150D105X0035A2.	Part of sawtooth generator circuit.	A5A3C1, A5A3C4, A5A3C5, A7A2C2, A9C1			5910-755-9291	5	5-18
A5A3C2	CAPACITOR, fixed, electrolytic: 1 section, 2.2 μf $\pm 20\%$, 35 wvdc, insulated case, 0.185 in. dia by 0.510 in. lg, 2 axial wire lead terminals; Sprague 150D225X0035B2.	Filtering	A5A3C2			5910-685-9700	1	5-18
A5A3C3	CAPACITOR, fixed, electrolytic: 1 section, 50 μf -10% +75%, 50 wvdc, insulated case, 0.438 in. dia by 1.312 in. lg, 2 axial wire lead terminals; Sprague 30D506G050DH4.	Coupling	A5A3C3, A5A3C7, A12C7, C10			5910-786-2208	4	5-18
A5A3C4	CAPACITOR, Same as A5A3C1.	Coupling						5-18
A5A3C5	CAPACITOR, Same as A5A3C1.	Coupling						5-18
A5A3C6	CAPACITOR, fixed, electrolytic: 1 section, 22 μf $\pm 20\%$, 15 wvdc, insulated case, 0.185 in. dia by 0.512 in. lg, 2 axial wire lead terminals; Sprague 150D226X0015B2.	Filtering	A5A3C6				1	5-18
A5A3C7	CAPACITOR, Same as A5A3C3.	Feedback						5-18
A5A3CR1	DIODE, Same as A5A1CR1.	Clamping						5-18
A5A3CR2	DIODE, Same as A5A1CR1.	Temperature compensation.						5-18

IDENTIFICATION TABLE OF PARTS

5-98

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5R1	RESISTOR, variable: 1 section, 2.5K ±10%, 1/4W, linear taper, 0.500 in. dia by 0.312 in. lg, with 0.875 in. shaft and 0.375 in. bushing, 3 solder lug terminals; Mallory 70-08462.	Gain control.	A5R1, A5R3				2	5-2
A5R2	RESISTOR, variable: 1 section, 100K ±10%, 1/4W, linear taper, 0.500 in. dia by 0.312 in. lg, with 0.875 in. shaft and 0.375 in. bushing, 3 solder lug terminals; Mallory 70-08460.	Sweep width control.	A5R2, R2				2	5-2
A5R3	RESISTOR, Same as A5R1.	Center frequency control.						5-2
A5V1	ELECTRON TUBE: EIA designation 3XP1; per MIL-E-1.	Cathode ray tube.	A5V1	JAN3XP1		5960-636-1526	1	5-1
A5W1	CABLE, assembly, radio frequency: 2 connector plugs, Amphenol no. 27-9, and RG174/Ucable with a total length of 5.000 in; Communication Electronics, Inc. 2126-127.	Connects A5A1 to A5A2.	A5W1, A5W2				2	5-13
A5W2	CABLE, Same as A5W1.	Connects IF input signal to A5A1.						5-13
A5XV1	SOCKET, electron tube: 8 phosphor bronze contacts, 3 amp current rating, 1250 volts, 0.875 in. thk by 1.156 in. w by 1.625 in. lg, o/a dim., 8 solder lug terminals, mica filled phenolic dielectric material; Amphenol 78S8L.	Mounts A5V1.	A5XV1			5935-222-9967	1	5-1

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A3CR3	SEMICONDUCTOR DEVICE, diode: EIA designation 1N965B; per MIL-S-19500.	Voltage regulation.	A5A3CR3	JAN1N965B		5960-752-6163	1	5-18
A5A3CR4	SEMICONDUCTOR DEVICE, diode: EIA designation 1N970B; per MIL-S-19500.	Voltage regulation.	A5A3CR4, A12CR13, A12CR16	JAN1N970B		5960-878-4287	3	5-18
A5A3Q1	TRANSISTOR: EIA designation 2N489; per MIL-S-19500.	Sawtooth generator.	A5A3Q1	JAN2N489		5960-838-1142	1	5-18
A5A3Q2	TRANSISTOR: EIA designation 2N2270; per MIL-S-19500.	Driver	A5A3Q2, A5A3Q5, A7A1Q5, A7A1Q6, A7A1Q7, A7A2Q1, A7A2Q2, A7A2Q3, A7A2Q4, A10Q2, A10Q3	JAN2N2270		5960-066-4454	11	5-18
A5A3Q3	TRANSISTOR: EIA designation 2N697; per MIL-S-19500.	Emitter follower.	A5A3Q3, A8A1Q5, A8A1Q6, A8Q9, A8Q10, A8Q11, A8Q12, A9Q1	JAN2N697		5960-837-7262	8	5-18
A5A3Q4	TRANSISTOR: EIA designation 2N1925	Emitter follower.	A5A3Q4				1	5-18
A5A3Q5	TRANSISTOR, Same as A5A3Q2.	Emitter follower.						5-18
A5A3R1	RESISTOR, fixed, composition: 56K ±5%, 1/4W; per MIL-R-11.	Part of sawtooth generator network.	A5A3R1	RC07GF563J		5905-800-0179	1	5-18
A5A3R2	RESISTOR, Same as A5A2R15.	Biasing						5-18

5-90

IDENTIFICATION TABLE OF PARTS

5-100

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A3R3	RESISTOR, Same as A1R9.	Extends range of A5A3R4.						5-18
A5A3R4	RESISTOR, variable: 10K, linear, $\pm 20\%$, 0.500 in. dia by 1.093 in. lg, 3 solder pin terminals; Allen-Bradley FR103M.	Horizontal width control.	A5A3R4				1	5-18
A5A3R5	RESISTOR. Same as A4R10.	Biasing						5-18
A5A3R6	RESISTOR, variable: 20K, linear, $\pm 20\%$, 0.500 in. dia by 1.093 in. lg, 3 solder pin terminals; Allen-Bradley FR203M	Vertical positioning control.	A5A3R6, A5A3R9				2	5-18
A5A3R7	RESISTOR, Same as A1R10.	Biasing						5-18
A5A3R8	RESISTOR, Same as A1R10.	Biasing						5-18
A5A3R9	RESISTOR, Same as A5A3R6.	Horizontal positioning control.						5-18
A5A3R10	RESISTOR, Same as A5A1R21.	Dropping						5-18
A5A3R11	RESISTOR, variable: 100K, linear, $\pm 20\%$, 0.500 in. dia by 1.093 in. lg, 3 solder pin terminals; Allen-Bradley FR104M	Sweep range adjust control.	A5A3R11				1	5-18
A5A3R12	RESISTOR, fixed, composition: 820 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Biasing	A5A3R12, A10R7	RC07GF821J		5905-686-9996	2	5-18
A5A3R13	RESISTOR, Same as A3R6.	Biasing						5-18
A5A3R14	RESISTOR, Same as A1R9.	Dropping						5-18
A5A3R15	RESISTOR, Same as A3R14.	Dropping						5-18

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5A3R16	RESISTOR, fixed, composition: 680 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Extends range of gain control.	A5A3R16	RC07GF681J		5905-727-8001	1	5-18
A5A3R17	RESISTOR, Same as A3R15.	Part of a voltage divider.						5-18
A5A3R18	RESISTOR, fixed, composition: 18K $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A5A3R18, A7A1R23	RC07GF183J		5905-687-0000	2	5-18
A5A3R19	RESISTOR, Same as A2R7.	Part of a voltage divider.						5-18
A5A3R20	RESISTOR, fixed, composition: 5.1K $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A5A3R20, A7A1R2, A7A1R4, A7A1R6, A7A1R9, A7A1R13, A7R2, A7R6, A7R13, A8A1R1, A8A1R4, A8A1R8, A8A1R12, A8A1R22, A8R6, A8R9, A8R11, A8R26, A8R29, A8R31, A8R33, A8R44, A8R50, A15R7	RC07GF512J		5905-683-2241	24	5-18
A5A3T1	TRANSFORMER, power, fixed, autotransformer: 13,800 turns no. 42 hn wire with taps at 2587 turns, 5607 turns and 6900 turns, aluminum case, 1.656 in. by 1.656 in. by 1.312 in. o/a dim., 5 solder pin terminals; Communication Electronics, Inc. 10272	Horizontal output transformer.	A5A3T1				1	5-18

5-102

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5C1	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C2	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C3	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C4	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C5	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C6	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C7	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C8	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C9	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C10	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C11	CAPACITOR, Same as A1C38.	Filtering						5-13
A5C12	CAPACITOR, fixed, ceramic dielectric: 1 section, 33 pf $\pm 10\%$, 500 wvdc, feedthru type, metal case, 0.281 in. dia by 0.687 in. lg, o/a dim., 2 solder lug terminals; Allen-Bradley FA5C-3301.	Filtering	A5C12, A5C13, A5C14, A5C15				4	5-13
A5C13	CAPACITOR, Same as A5C12.	Filtering						5-13
A5C14	CAPACITOR, Same as A5C12.	Filtering						5-13
A5C15	CAPACITOR, Same as A5C12.	Filtering						5-13

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A5C16	CAPACITOR, fixed, electrolytic: 1 section, 22 μ f \pm 10%, 35 wvdc, insulated case, 0.289 in. dia by 0.722 in. lg, 2 axial wire lead terminals; Sprague 150D226X9035R2.	Filtering	A5C16			5910-851-2095	1	5-13
A5J1	ADAPTER, connector: single contact, 2 connector mating ends, low loss plastic dielectric material, straight bulkhead type, 0.234 in. dia by 0.656 in. lg, o/a dim., gold plated brass shell; Amphenol 27-11.	Signal input jack.	A5J1				1	5-13
A5P1	CONNECTOR, plug, electrical: 9 pin, rectangular connector, 7 pins rated 7.5 amps, 2 pins rated 10 amps, self-aligning, polarized, arc resistant plastic dielectric material, 0.375 in. w by 0.781 in. h by 1.312 in. lg, o/a dim.; Winchester MRE7-2P-G7.	High and low voltage input connector.	A5P1			5935-259-6792	1	5-2
A5P2	CONNECTOR, plug, electrical: 1 female contact, 1 connector mating end, low-loss plastic dielectric material, 50 ohms impedance, right angle, 0.234 in. by 0.469 in. by 0.547 in, screw-on type; Amphenol 27-26	Connects A5W1 to A5A2J1.	A5P2, A5P3, A5P4, A5P5, P10, P11, P12, P16, P20, P21, P23, P32, P33				13	5-13
A5P3	CONNECTOR, Same as A5P2.	Connects A5W2 to A5J1.						5-13
A5P4	CONNECTOR, Same as A5P2.	Connects A5W2 to A5A1J1.						5-13
A5P5	CONNECTOR, Same as A5P2.	Connects A5W1 to A5A1J2.						5-13

5-104

7120		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-19, Fig. 5-20 A6	CONVERTER, FREQUENCY, ELECTRIC: Brass chassis, silver-plated, gold-flashed, 5.500 in. lg, 0.750 in. w, 1.250 in. d o/a dim., 60-mc incoming frequency, 21.4-mc output frequency, 50-ohm input and output impedance; Communication Electronics, Inc. 7120.	Converts incoming 60-mc signal to 21.4-mc output.	A6				1	5-1
A6C1	CAPACITOR, Same as A5A2C3.	Part of a filter.						5-19
A6C2	CAPACITOR, Same as A5A2C3.	Part of a filter.						5-19
A6C3	CAPACITOR, Same as A2C14.	Part of a filter.						5-20
A6C4	CAPACITOR, Same as A1C14.	Part of a filter.						5-20
A6C5	CAPACITOR, Same as A1C16.	Coupling						5-20
A6C6	CAPACITOR Same as A1C16.	Coupling						5-19
A6C7	CAPACITOR, Same as A1C38.	Filtering						5-19
A6C8	CAPACITOR, Same as A1C38.	Filtering						5-19
A6C9	CAPACITOR, Same as A2C42.	Filtering						5-20
A6C10	CAPACITOR, Same as A3C31.	Part of a voltage divider.						5-20
A6C11	CAPACITOR, Same as A1C38.	Filtering						5-20
A6C12	CAPACITOR, Same as A1C5.	Blocking						5-19
A6C13	CAPACITOR, Same as A1C21.	Filtering						5-19
A6C14	CAPACITOR, Same as A1C5.	Part of a voltage divider.						5-20

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A6C15	CAPACITOR, Same as A3C12.	Coupling						5-20
A6C16	CAPACITOR, Same as A1C5.	Filtering						5-19
A6C17	CAPACITOR, fixed, ceramic dielectric: 1 section, 1.5 pf ±0.1 pf, 500 wvdc, un-insulated case, 0.200 in. dia by 0.400 in. lg o/a dim., 2 axial wire lead terminals; Erie 301-000COKO159B.	Part of crystal tank circuit.	A6C17			5910-865-7008	1	5-20
A6C18	CAPACITOR, Same as A1C38.	Filtering						5-19
A6C19	CAPACITOR, Same as A2C27.	Filtering						5-19
A6C20	CAPACITOR, fixed, ceramic dielectric: 1 section, 6.8 pf ±0.5 pf, 500 wvdc, un-insulated case, 0.200 in. dia by 0.400 in. lg o/a dim., 2 axial wire lead terminals; Erie 301-000COHO689D.	Coupling	A6C20			5910-754-9391	1	5-19
A6C21	CAPACITOR, Same as A3C32.	Coupling						5-20
A6C22	CAPACITOR, Same as A1C5.	Filtering						5-20
A6C23	CAPACITOR, Same as A1C5.	Filtering						5-20
A6C24	CAPACITOR, Same as A3C27.	Filtering						5-19
A6C25	CAPACITOR, Same as A1C5.	Feedback						5-20
A6C26	CAPACITOR, Same as A1C5.	Filtering						5-19
A6C27	CAPACITOR, Same as A1C5.	Filtering						5-19
A6C28	NOT USED	-----						

5-106

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A6C29	CAPACITOR, Same as A1C5.	Filtering						5-20
A6C30	NOT USED	-----						
A6C31	CAPACITOR, Same as A1C21.	Filtering						5-19
A6CR1	SEMICONDUCTOR DEVICE, diode: EIA designation 1N4003.	Rectifier	A6CR1, A6CR2				2	5-19
A6CR2	SEMICONDUCTOR, Same as A6CR1	Rectifier						5-20
A6FB1	FERRITE BEAD, Same as A1FB1.	RF choke						5-20
A6J1	CONNECTOR, Same as A1J2.	60-mc input jack.						5-19
A6J2	CONNECTOR, Same as A1J2.	60-mc input jack.						5-19
A6J3	CONNECTOR, Same as A1J2.	21.4-mc output jack.						5-19
A6L1	COIL, Same as A3L14.	Part of a filter.						5-20
A6L2	COIL, Same as A3L14.	Part of a filter.						5-19
A6L3	COIL, radio frequency: Adjustable, 7 turns closewound, no. 27 sf wire, 0.438 in. dia by 1.497 in. lg, 2 solder lug terminals, shielded, mounted with 1/4-28 hex nut; Communication Electronics, Inc. 1472-11.	Part of a filter.	A6L3			5950-906-7806	1	5-20
A6L4	COIL, radio frequency: Adjustable, 10 turns closewound no.27 sf wire, 0.438 in. dia by 1.497 in. lg, 2 solder lug terminals, shielded, mounted with 1/4-28 hex nut; Communication Electronics, Inc. 1472-1.	Part of a filter.	A6L4			5950-906-7805	1	5-20

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED CONTRACT NO. DA18-119-AMC-02499(X)

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A6L5	COIL, radio frequency: 0.82 μ h, 40 minimum Q, 258 mc nominal resonant frequency, plastic coil form, 0.125 in. dia by 0.250 in. lg, 2 axial wire lead terminals; Wilco 204-11.	Part of oscillator tank circuit.	A6L5				1	5-20
A6R1	RESISTOR, Same as A4R10.	Impedance matching						5-20
A6R2	RESISTOR, Same as A4R10.	Impedance matching						5-19
A6R3	RESISTOR, Same as A1R1.	Part of a filter.						5-20
A6R4	RESISTOR, fixed, composition: 220K \pm 5%, 1/4W; per MIL-R-11.	Part of a voltage divider.	A6R4, A6R8, A6R9, A6R14, A6R15, A6R20, A9R2, A15R2	RC07GF224J		5905-682-4105	8	5-19
A6R5	RESISTOR, fixed, composition: 68 ohms \pm 5%, 1/4W; per MIL-R-11.	Part of a voltage divider.	A6R5, A6R7, A6R16	RC07GF680J		5905-683-2235	3	5-20
A6R6	RESISTOR, Same as A1R1.	Dropping						5-20
A6R7	RESISTOR, Same as A6R5.	Biasing						5-19
A6R8	RESISTOR, Same as A6R4.	Dropping						5-20
A6R9	RESISTOR, Same as A6R4.	Dropping						5-19
A6R10	RESISTOR, Same as A1R15.	Dropping						5-20
A6R11	RESISTOR, Same as A3R6.	Part of a filter.						5-19
A6R12	RESISTOR, Same as A4R10.	Swamping						5-19
A6R13	RESISTOR, Same as A5A2R15.	Crystal load						5-19
A6R14	RESISTOR, Same as A6R4.	Part of a voltage divider.						5-20

5-107

IDENTIFICATION TABLE OF PARTS

5-108

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A6R15	RESISTOR, Same as A6R4.	Part of a voltage divider.						5-19
A6R16	RESISTOR, Same as A6R5.	Grid leak resistor.						5-20
A6R17	RESISTOR, Same as A1R12.	Dropping						5-19
A6R18	RESISTOR, Same as A1R13.	Dropping						5-19
A6R19	RESISTOR, fixed, composition: 24K ±5%, 1/4W; per MIL-R-11.	Plate load	A6R19, A8R67	RC07GF243J		5905-721-0579	2	5-19
A6R20	RESISTOR, Same as A6R4.	Part of a voltage divider.						5-20
A6 TP1	JACK, TIP, Same as A1TP1.	Test point						5-19
A6V1	ELECTRON TUBE, Same as A1V3.	Amplifier						5-19
A6V2	ELECTRON TUBE, Same as A1V3.	Amplifier						5-19
A6V3	ELECTRON TUBE, Same as A1V3.	Mixer						5-19
A6V4	ELECTRON TUBE, Same as A1V1.	Oscillator						5-19
A6XV1	SOCKET, Same as A1XV1.	Mount A6V1						5-19
A6XV2	SOCKET, Same as A1XV1.	Mount A6V2						5-19
A6XV3	SOCKET, Same as A1XV1.	Mount A6V3						5-19
A6XV4	SOCKET, Same as A1XV1.	Mount A6V4						5-19

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED CONTRACT NO. DA18-119-AMC-02499(X)

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A6XY1	SOCKET, crystal: 2 phosphor bronze contacts, gold over silver plated, low-loss plastic dielectric material, spring clip mounting ears 0.328 in. by 0.812 in. by 1.031 in. o/a dim., 2 solder lug terminals; Augat 8004-1G13.	Mounts A6Y1	A6XY1			5935-864-5470	1	5-20
A6Y1	CRYSTAL UNIT, quartz: 81.400 mc per MIL-C-3098.	Determines oscillator frequency.	A6Y1	CR82/U			1	5-20

5-110

IDENTIFICATION TABLE OF PARTS

7233		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-21 Fig. 5-22 A7	AMPLIFIER, intermediate frequency: Brass chassis, silver plated gold-flashed, 10.580 in. lg, 2.390 in. w, 1.800 in. d, o/a dim., 2 mc bandwidth, 21.4-mc center frequency, 50-ohm input and output impedance, AM, FM video output, IF output, signal monitor output; Communication Electronics, Inc. type 72121.	Detects and amplifies RF signals within 2-mc bandwidth, provides audio and video output signals.	A7				1	5-3
Fig. 5-23 A7A1	LIMITER, electrical: etched circuit board, epoxy resin glass base laminate, 1-oz copper (1-side), 4.300 in. lg, 1.800 in. w, 0.625 in. d, o/a dim., FM input signals, video output signals; Communication Electronics, Inc. type 10523.	Removes large positive and negative spikes from RF signals and couples to FM discriminator.	A7A1				1	5-22
A7A1C1	CAPACITOR, Same as A5A1C2.	Filtering						5-23
A7A1C2	CAPACITOR, Same as A1C5.	Coupling						5-23
A7A1C3	CAPACITOR, Same as A5A1C2.	Filtering						5-23
A7A1C4	CAPACITOR, Same as A1C5.	Filtering						5-23
A7A1C5	CAPACITOR, Same as A1C5.	Part of a voltage divider.						5-23
A7A1C6	CAPACITOR, Same as A1C1.	Part of a voltage divider.						5-23
A7A1C7	CAPACITOR, Same as A1C28.	Feedback						5-23
A7A1C8	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-23

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7A1C9	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-23
A7A1C10	CAPACITOR, fixed, mica dielectric: 1 section, 20 pf $\pm 5\%$, 500 wvdc, -55 deg C to 150 deg C, operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10-200J.	Diode load.	A7A1C10, A8A1C8			5910-842-3525	2	5-23
A7A1C11	CAPACITOR, Same as A5A1C2.	Filtering						5-23
A7A1C12	CAPACITOR, Same as A1C5.	Filtering						5-23
A7A1C13	NOT USED	-----						
A7A1C14	CAPACITOR, Same as A1C5.	Diode load.						5-23
A7A1CR1	SEMICONDUCTOR, Same as A5A2CR1.	Clipping						5-23
A7A1CR2	SEMICONDUCTOR DEVICE, diode: EIA designation 1N753A; per MIL-S-19500.	Regulator	A7A1CR2, A8A1CR2, A15CR2, CR1	JAN1N753A		5960-752-6121	4	5-23
A7A1CR3	SEMICONDUCTOR, Same as A5A2CR1.	Clipping						5-23
A7A1CR4	SEMICONDUCTOR, Same as A5A2CR1.	FM detector.						5-23
A7A1CR5	SEMICONDUCTOR, Same as A5A2CR1.	FM detector.						5-23

5-112

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7A1L1	COIL, radio frequency: 23 turns, closewound, no. 34 sn wire, iron core, insulated, 0.150 in. dia by 0.375 in. lg, 2 axial wire lead terminals; Communication Electronics, Inc. 1131-41.	RF choke.	A7A1L1, A8A1L1			5950-919-3226	2	5-23
A7A1L2	COIL, radio frequency: 120 turns, closewound, no. 40 sn wire, iron core, insulated, 0.150 in. dia by 0.375 in. lg, 2 axial wire lead terminals; Communication Electronics, Inc. 1131-37.	RF choke.	A7A1L2, A7A1L4, A7L1, A7L4, A7L7, A8A1L2, A8L1, A8L8, A8L11, A8L14, A8L17, A8L18, A8L20			5950-918-7594	13	5-23
A7A1L3	COIL, radio frequency: 15 turns, no. 33 wire, aluminum case, 0.562 in. by 0.562 in. by 0.600 in., o/a dim., 2 solder pin terminals; Communication Electronics, Inc. 3476-19.	Part of a tuned circuit.	A7A1L3				1	5-23
A7A1L4	COIL, Same as A7A1L2.	Part of a filter.						5-23
A7A1Q1	TRANSISTOR, Same as A5A1Q1.	Limiter						5-23
A7A1Q2	TRANSISTOR, Same as A5A1Q1.	Limiter						5-23
A7A1Q3	TRANSISTOR, Same as A5A1Q1.	Limiter						5-23
A7A1Q4	TRANSISTOR, Same as A5A1Q1.	Limiter						5-23
A7A1Q5	TRANSISTOR, Same as A5A3Q2.	Emitter follower.						5-23
A7A1Q6	TRANSISTOR, Same as A5A3Q2.	Emitter follower.						5-23
A7A1Q7	TRANSISTOR, Same as A5A3Q2.	Emitter follower.						5-23

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7A1R1	RESISTOR, fixed, composition: 12K $\pm 5\%$, 1/4W; per MIL-R-11.	Biasing	A7A1R1, A7A1R5, A7A1R8, A7A1R12, A7R1, A7R7, A7R14, A8A1R2, A8A1R5, A8A1R7, A8A1R10, A8A1R16, A8R49, A15R5	RC07GF 123J		5905-726-4413	14	5-23
A7A1R2	RESISTOR, Same as A5A3R20.	Biasing						5-23
A7A1R3	RESISTOR, Same as A1R15.	Biasing						5-23
A7A1R4	RESISTOR, Same as A5A3R20.	Biasing						5-23
A7A1R5	RESISTOR, Same as A7A1R1.	Biasing						5-23
A7A1R6	RESISTOR, Same as A5A3R20.	Part of a voltage divider.						5-23
A7A1R7	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-23
A7A1R8	RESISTOR, Same as A7A1R1.	Biasing						5-23
A7A1R9	RESISTOR, Same as A5A3R20.	Biasing						5-23
A7A1R10	RESISTOR, fixed, composition: 620 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Biasing	A7A1R10, A10R8	RC07GF 621J		5905-801-6998	2	5-23
A7A1R11	RESISTOR, Same as A1R1.	Part of a voltage divider.						5-23
A7A1R12	RESISTOR, Same as A7A1R1.	Biasing						5-23

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7A1R13	RESISTOR, Same as A5 A3R20.	Part of a voltage divider.						5-23
A7A1R14	RESISTOR, fixed, composition: 22 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A7A1R14, A7A1R22, A8A1R11, A8A1R21, A8R20, A8R34, A8R36	RC07GF220J		5905-755-8389	7	5-23
A7A1R15	RESISTOR, fixed, composition: 75K $\pm 5\%$, 1/4W; per MIL-R-11.	Diode shunt.	A7A1R15, A7A1R17				2	5-23
A7A1R16	RESISTOR, Same as A4R10.	Swamping						5-23
A7A1R17	RESISTOR, Same as A7A1R15.	Diode shunt.						5-23
A7A1R18	RESISTOR, fixed, composition: 4.7 meg $\pm 5\%$, 1/4W; per MIL-R-11.	Biasing	A7A1R18, A8A1R18	RC07GF475J		5905-800-0181	2	5-23
A7A1R19	RESISTOR, Same as A1R12.	Biasing						5-23
A7A1R20	RESISTOR, Same as A2R6.	Part of a filter.						5-23
A7A1R21	RESISTOR, Same as A3R14.	Part of a voltage divider.						5-23
A7A1R22	RESISTOR, Same as A7A1R14.	Part of a voltage divider.						5-23
A7A1R23	RESISTOR, Same as A5A3R18.	Part of a voltage divider.						5-23
A7A1R24	RESISTOR, Same as A3R6.	Biasing						5-23
A7A1R25	RESISTOR, Same as A2R6.	Part of a voltage divider.						5-23

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-2499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7A1R26	RESISTOR, fixed, composition: 270 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A7A1R26, A7A2R11	RC07GF271J		5905-725-6995	2	5-23
A7A1R27	RESISTOR, Same as A4R10.	Part of a filter.						5-23
A7A1T1	TRANSFORMER, radio frequency: 2 windings, 14 1/2 turns no. 33 wire and 2 1/2 turns no. 31 wire, untapped, aluminum case, 0.562 in. by 0.562 in. by 0.600 in., o/a dim., 4 solder pin terminals; Communication Electronics, Inc. 3476-18.	Discriminator transformer.	A7A1T1				1	5-23
Fig. 5-24 A7A2	AMPLIFIER, video-direct current: Etched circuit component board, 4.300 in. lg, 0.720 in. w, 0.48 in. d, o/a dim., AM video input signal, amplified video output signal; Communication Electronics, Inc. 10527.	Amplifies AM video signal from AM detector, and applies it to video output jack.					1	5-22
A7A2C1	CAPACITOR, fixed, electrolytic: 1 section, 4.7 μf $\pm 20\%$, 35 wvdc, insulated case, 0.185 in. dia by 0.510 in. lg, 2 axial wire lead terminals; Sprague 150D475X0035B2.	Filtering	A7A2C1, A8C70			5910-542-7387	2	5-24
A7A2C2	CAPACITOR, Same as A5A3C1.	Coupling						5-24
A7A2C3	CAPACITOR, Same as A5A2C36.	Diode load.						5-24
A7A2Q1	TRANSISTOR, Same as A5A3Q2.	AGC amplifier.						5-24
A7A2Q2	TRANSISTOR, Same as A5A3Q2.	AGC regulator.						5-24
A7A2Q3	TRANSISTOR, Same as A5A3Q2.	Emitter follower.						5-24
A7A2Q4	TRANSISTOR, Same as A5A3Q2.	Emitter follower.						5-24

IDENTIFICATION TABLE OF PARTS

5-116

IDENTIFICATION TABLE OF PARTS

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7A2R1	RESISTOR, Same as A1R1.	Part of a filter.						5-24
A7A2R2	RESISTOR, Same as A2R18.	Part of a filter.						5-24
A7A2R3	RESISTOR, Same as A1R15.	Biasing						5-24
A7A2R4	RESISTOR, Same as A1R13.	Biasing						5-24
A7A2R5	NOT USED	-----						
A7A2R6	RESISTOR, Same as A3R14.	Biasing						5-24
A7A2R7	RESISTOR, Same as A3R14.	Part of a voltage divider.						5-24
A7A2R8	RESISTOR, Same as A1R17.	Part of a voltage divider.						5-24
A7A2R9	RESISTOR, Same as A5A1R19.	Biasing						5-24
A7A2R10	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-24
A7A2R11	RESISTOR, Same as A7A1R26.	Biasing						5-24
A7A2R12	RESISTOR, Same as A3R6.	Biasing						5-24
A7C1	CAPACITOR, Same as A1C5.	Coupling						5-21
A7C2	CAPACITOR, fixed, ceramic dielectric: 1 section, 1.8 pf \pm 0.25 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, 2 radial wire lead terminals; Erie 301-000COKO189C.	Neutralization	A7C2, A7C11			5910-226-0476	2	5-21

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7C3	CAPACITOR, fixed, ceramic dielectric: 1 section, 1500 pf $\pm 10\%$, 1000 wvdc, insulated disk type, 0.156 in. thk by 0.385 in. dia, 2 radial wire lead terminals; Centralab DD-152.	Emitter bypass.	A7C3, A7C18, A8C51			5910-913-5598	3	5-21
A7C4	CAPACITOR, Same as A5A2C36.	Part of a voltage divider.						5-22
A7C5	CAPACITOR, fixed, mica dielectric: 1 section, 100 pf $\pm 5\%$, 500 wvdc, -55°C to 150°C operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10F101J.	Part of a voltage divider.	A7C5, A7C9, A7C13, A7C17, A7C25, A8C67			5910-959-8347	6	5-21
A7C6	CAPACITOR, Same as A1C21.	Filtering						5-22
A7C7	CAPACITOR, fixed, ceramic dielectric: 1 section, 3.9 pf ± 0.25 pf, 500 wvdc, uninsulated case, 0.200 in. dia by 0.400 in. lg, 2 radial wire lead terminals; Erie 301COH399C.	Coupling	A7C7, A7C15			5910-987-1610	2	5-22
A7C8	CAPACITOR, fixed, mica dielectric: 1 section, 24 pf $\pm 5\%$, 500 wvdc, -55°C to 150°C operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10-240J.	Part of a voltage divider.	A7C8, A7C16, A7C24, A8C28, A8C46, A8C56, A8C66				7	5-22
A7C9	CAPACITOR, Same as A7C5.	Part of a voltage divider.						5-21

5-117

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN- AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7C10	CAPACITOR, Same as A1C5.	Emitter degeneration.						5-21
A7C11	CAPACITOR, Same as A7C2.	Neutralization						5-22
A7C12	CAPACITOR, Same as A5A2C36.	Part of a voltage divider.						5-22
A7C13	CAPACITOR, Same as A7C5.	Part of a voltage divider.						5-22
A7C14	CAPACITOR, Same as A1C21.	Filtering						5-22
A7C15	CAPACITOR, Same as A7C7.	Coupling						5-21
A7C16	CAPACITOR, Same as A7C8.	Part of a voltage divider.						5-22
A7C17	CAPACITOR, Same as A7C5.	Part of a voltage divider.						5-22
A7C18	CAPACITOR, Same as A7C3.	Emitter ac degeneration.						5-21
A7C19	CAPACITOR, Same as A3C11.	Neutralization						5-21
A7C20	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-22
A7C21	CAPACITOR, Same as A1C21.	Part of a voltage divider.						5-22
A7C22	CAPACITOR, Same as A1C21.	Filtering						5-21
A7C23	CAPACITOR, Same as A2C4.	Coupling						5-21
A7C24	CAPACITOR, Same as A7C8.	Part of a voltage divider.						5-21

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MANAGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7C25	CAPACITOR, fixed, mica dielectric: 1 section, 130 pf $\pm 5\%$, 500 wvdc, -55°C to 150°C operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10-131J.	Part of a voltage divider.	A7C25, A7C30				2	5-21
A7C26	CAPACITOR, Same as A1C5.	Filtering						5-21
A7C27	CAPACITOR, Same as A1C38.	Filtering						5-21
A7C28	CAPACITOR, Same as A1C38.	Filtering						5-22
A7C29	CAPACITOR, Same as A1C38.	Filtering						5-21
A7C30	CAPACITOR, Same as A7C25.	Part of a voltage divider.						5-22
A7C31	CAPACITOR, fixed, electrolytic: 1 section, 47 μf $\pm 20\%$, 6 wvdc, insulated case, 0.185 in. dia by 0.510 in. lg, 2 axial wire lead terminals; Sprague 150D476X9006B2.	Emitter ac degeneration.	A7C31				1	5-21
A7C32	CAPACITOR, Same as A1C21.	Filtering						5-22
A7C33	CAPACITOR, Same as A1C38.	Filtering						5-22
A7C34	CAPACITOR, Same as A1C38.	Filtering						5-22
A7C35	CAPACITOR, Same as A1C38.	Filtering						5-21
A7C36	CAPACITOR, Same as A1C38.	Filtering						5-21
A7C37	CAPACITOR, Same as A1C38.	Filtering						5-22
A7C38	CAPACITOR, Same as A1C38.	Filtering						5-21

5-120

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
		FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7CR1	SEMICONDUCTOR, Same as A7A1CR1	AM detector.						5-21
A7E1	TERMINAL, feedthru, insulated: Pin type conductor accommodation, low-loss plastic insulation, white, 0.172 in. dia by 0.515 in. lg, press fit mounting; Taurus SFU16.	Couples FM signal through brass partition to limiter board.	A7E1, A8A2E1, A8E1, A8E2, A8E3, A8E4				6	5-22
A7FB1	FERRITE BEAD, Same as A1FB1.	RF choke.						5-22
A7FB2	FERRITE BEAD, Same as A1FB1.	RF choke.						5-21
A7J1	CONNECTOR, Same as A1J2.	IF input jack.						5-22
A7J2	CONNECTOR, Same as A1J2.	IF output jack.						5-22
A7J3	CONNECTOR, Same as A1J2.	FM video output jack.						5-22
A7J4	CONNECTOR, Same as A1J2.	AM video output jack.						5-21
A7J5	CONNECTOR, Same as A1J2.	IF output jack.						5-22
A7L1	COIL, Same as A7A1L2.	RF choke.						5-21
A7L2	COIL, Same as A1L5.	Part of a tuned circuit.						5-22
A7L3	COIL, Same as A1L5.	Part of a tuned circuit.						5-22
A7L4	COIL, Same as A7A1L2.	RF choke.						5-21
A7L5	COIL, Same as A1L5.	Part of a tuned circuit.						5-21
A7L6	COIL, Same as A1L5.	Part of a tuned circuit.						5-21
A7L7	COIL, Same as A7A1L2.	RF choke.						5-22

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7L8	COIL, Same as A1L5.	Part of a tuned circuit.						5-21
A7L9	COIL, Same as A1L5.	Part of a tuned circuit.						5-21
A7P1	CONNECTOR, plug, electrical: 14 pin rectangular connector. 7.5 amp, self-aligning, polarized, arc resistant plastic dielectric material, 0.437 in. by 0.781 in. by 1.250 in., o/a dim.; Winchester MRE14P-G7.	Connects various voltages to strip.	A7P1			5935-257-8730	1	5-1
A7Q1	TRANSISTOR: EIA designation 2N2708, NPN, silicon; per MIL-S-19500.	IF amplifier.	A7Q1, A7Q2, A7Q3, A8Q1, A8Q2, A8Q3, A8Q4, A8Q5, A8Q6, A8Q7, A8Q8	JAN2N2708			11	5-21
A7Q2	TRANSISTOR, Same as A7Q1.	IF amplifier.						5-22
A7Q3	TRANSISTOR, Same as A7Q1.	IF amplifier.						5-22
A7Q4	TRANSISTOR, Same as A7Q1.	IF amplifier.						5-22
A7R1	RESISTOR, Same as A7A1R1.	Biasing						5-21
A7R2	RESISTOR, Same as A5A3R20.	Biasing						5-22
A7R3	RESISTOR, Same as A1R15.	Biasing						5-21
A7R4	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-21
A7R5	RESISTOR, Same as A4R2.	Swamping						5-21
A7R6	RESISTOR, Same as A5A3R20.	Biasing						5-21

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7R7	RESISTOR, Same as A7A1R1.	Biasing						5-22
A7R8	RESISTOR, Same as A1R15.	Biasing						5-22
A7R9	RESISTOR, Same as A3R6.	Part of a filter.						5-22
A7R10	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-21
A7R11	RESISTOR, Same as A4R2.	Swamping						5-22
A7R12	RESISTOR, Same as A3R6.	Part of a filter.						5-22
A7R13	RESISTOR, Same as A5A3R20.	Biasing.						5-22
A7R14	RESISTOR, Same as A7A1R1.	Biasing						5-22
A7R15	RESISTOR, Same as A5A2R15.	Biasing						5-22
A7R16	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-22
A7R17	RESISTOR, Same as A2R6.	Part of a voltage divider.						5-21
A7R18	RESISTOR, Same as A2R6.	Impedance matching.						5-22
A7R19	NOT USED	-----						
A7R20	RESISTOR, fixed, composition: 6.8K ±5%, 1/4W; per MIL-R-11.	Swamping	A7R20	RC07GF682J		5905-258-1197	1	5-21
A7XQ1	SOCKET, semiconductor device: 4 silver plated gold flashed beryllium copper contacts, mica filled phenolic dielectric material, retaining ring mounted, ring not included, 0.400 in. dia by 0.440 in. lg, o/a dim.; Grayhill 22-16-4.	Mounts A7Q1.	A7XQ1, A7XQ2, A7XQ3, A8XQ1, A8XQ2, A8XQ3, A8XQ4, A8XQ5, A8XQ6, A8XQ7, A8XQ8				11	5-21

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A7XQ2	SOCKET, Same as A7XQ1.	Mounts A7Q2.						5-22
A7XQ3	SOCKET, Same as A7XQ1.	Mounts A7Q3.						5-22

5-124

IDENTIFICATION TABLE OF PARTS

72120		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-25, Fig. 5-26, Fig. 5-27, Fig. 5-28 A8	AMPLIFIER, intermediate frequency: Brass chassis, silver-plated, gold-flashed, 10.500 in. lg, 2.880 in. w, 2.200 in. d, o/a dim., 21.4-mc center frequency, 20, 75, or 300 kc bandwidth, selectable, 50 ohm input and output impedance; Communication Electronics, Inc. type 72120	Amplify and detect RF signals within selected bandwidth and provide audio and video output signals.	A8				1	5-1
Fig. 5-29 A8A1	LIMITER, electrical: Etched circuit component board, 3.800 in. lg, 1.000 in. w, 0.700 in. d, o/a dim., FM input signal, rectified dc output to video jack; Communication Electronics, Inc. 10710.	Removes large positive and negative spikes from input signal, demodulates input signal.	A8A1				1	5-28
A8A1C1	CAPACITOR, Same as A5A1C2.	Filtering						5-29
A8A1C2	CAPACITOR, Same as A1C5.	AC degeneration.						5-29
A7A1C3	CAPACITOR, Same as A1C5.	Coupling						5-29
A8A1C4	CAPACITOR, Same as A1C5.	AC degeneration.						5-29
A8A1C5	CAPACITOR, Same as A1C5.	Coupling						5-29
A8A1C6	CAPACITOR, Same as A5A1C2.	Filtering						5-29
A8A1C7	CAPACITOR, Same as A1C1.	Part of a voltage divider.						5-29
A8A1C8	CAPACITOR, Same as A7A1C10.	Part of a voltage divider.						5-29

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED	CONTRACT NO. DA18-119-AMC-02499(X)
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REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8A1C9	CAPACITOR, fixed, mica dielectric: 1 section, 75 pf $\pm 5\%$, 500 wvdc, -55°C to 150°C operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. w, 2 radial wire lead terminals; Electro Motive DM10F750J.	Part of a voltage divider.	A8A1C9, A8A1C10			5910-768-4005	2	5-29
A8A1C10	CAPACITOR, Same as A8A1C9.	Part of a voltage divider.						5-29
A8A1C11	CAPACITOR, Same as A5A2C36.	Diode load.						5-29
A8A1C12	CAPACITOR, Same as A5A1C1.	Diode load.						5-29
A8A1C13	CAPACITOR, Same as A5A1C1.	Filtering						5-29
A8A1CR1	SEMICONDUCTOR, Same as A3A2CR1.	Clipping						5-29
A8A1CR2	SEMICONDUCTOR, Same as A7A1CR2.	Regulator						5-29
A8A1CR3	SEMICONDUCTOR, Same as A5A2CR1.	Clipping						5-29
A8A1CR4	SEMICONDUCTOR, Same as A5A2CR1.	FM detector.						5-29
A8A1CR5	SEMICONDUCTOR, Same as A5A2CR1.	FM detector.						5-29
A8A1L1	COIL, Same as A7A1L1.	RF choke.						5-29
A8A1L2	COIL, Same as A7A1L2.	RF choke.						5-29

5-126

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8A1L3	COIL, radio frequency: 18 turns, no. 30 wire, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 2 solder pin terminals; Communication Electronics, Inc. 3476-20.	Part of a tuned circuit.	A8A1L3			5950-913-9004	1	5-29
A8A1Q1	TRANSISTOR, Same as A5A1Q1.	Limiter						5-29
A8A1Q2	TRANSISTOR, Same as A5A1Q1.	Limiter						5-29
A8A1Q3	TRANSISTOR, Same as A5A1Q1.	Limiter						5-29
A8A1Q4	TRANSISTOR, Same as A5A1Q1.	Limiter						5-29
A8A1Q5	TRANSISTOR, Same as A5A3Q3.	Emitter follower.						5-29
A8A1Q6	TRANSISTOR, Same as A5A3Q3.	Emitter follower.						5-29
A8A1R1	RESISTOR, Same as A5A3R20.	Biasing						5-29
A8A1R2	RESISTOR, Same as A7A1R1.	Biasing						5-29
A8A1R3	RESISTOR, Same as A1R15.	Biasing						5-29
A8A1R4	RESISTOR, Same as A5A3R20.	Collector load.						5-29
A8A1R5	RESISTOR, Same as A7A1R1.	Biasing						5-29
A8A1R6	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-29
A8A1R7	RESISTOR, Same as A7A1R1.	Biasing						5-29
A8A1R8	RESISTOR, Same as A5A3R20.	Biasing						5-29
A8A1R9	RESISTOR, fixed, composition: 390 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Biasing	A8A1R9	RC07GF391J		5905-683-2236	1	5-29

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8A1R10	RESISTOR, Same as A7A1R1.	Biasing						5-29
A8A1R11	RESISTOR, Same as A7A1R14.	Biasing						5-29
A8A1R12	RESISTOR, Same as A5A3R20.	Biasing						5-29
A8A1R13	RESISTOR, Same as A2R6.	Part of a filter.						5-29
A8A1R14	RESISTOR, Same as A1R1.	Diode shunt.						5-29
A8A1R15	RESISTOR, Same as A1R1.	Diode shunt.						5-29
A8A1R16	RESISTOR, Same as A7A1R1.	Part of a voltage divider.						5-29
A8A1R17	RESISTOR, Same as A1R1.	Part of a voltage divider.						5-29
A8A1R18	RESISTOR, Same as A7A1R18.	Biasing						5-29
A8A1R19	RESISTOR, Same as A1R12.	Biasing						5-29
A8A1R20	RESISTOR, Same as A3R14.	Biasing						5-29
A8A1R21	RESISTOR, Same as A7A1R14.	Part of a voltage divider.						5-29
A8A1R22	RESISTOR, Same as A5A3R20.	Part of a voltage divider.						5-29
A8A1R23	RESISTOR, fixed, composition: 560 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Impedance matching.	A8A1R23	RC07GF561J		5905-682-4109	1	5-29
A8A1R24	RESISTOR, Same as A4R2.	DC return for A8A1L3.						5-29

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8A1T1	TRANSFORMER, radio frequency: 2 windings, 14 1/2 turns no. 30 wire and 1 1/2 turns no. 27 wire, no taps, aluminum case, 0.562 in. by 0.562 in. by 0.600 in. o/a dim., 4 solder pin terminals; Communication Electronics, Inc. 3476-21.	Discriminator transformer.	A8A1T1			5950-913-9007	1	5-29
Fig. 5-30 A8A2	OSCILLATOR, radio frequency: Etched circuit component board, epoxy resin glass base laminate, 1-oz copper (1-side), 1.500 in. lg, 1.700 in. w, 1.700 in. d, o/a dim., 21.4-mc output frequency, crystal controlled; Communication Electronics, Inc. type 1769-3.	Beat frequency oscillator.	A8A2				1	5-28
A8A2C1	CAPACITOR, fixed, mica dielectric: 1 section, 43 pf ±5%, 500 wvdc, -55°C to 150°C operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10-430J.	Part of a voltage divider.	A8A2C1, A8C24				2	5-30
A8A2C2	CAPACITOR, Same as A1C5.	Blocking						5-30
A8A2C3	CAPACITOR, Same as A5A2C35.	Part of a voltage divider.						5-30
A8A2C4	CAPACITOR, Same as A1C38.	Filtering						5-30
A8A2CR1	SEMICONDUCTOR DEVICE, diode: Silicon type; EIA designation 1N462A.	Crystal shunt.	A8A2CR1, A8A2CR2, A12CR14, A12CR15, A12CR17, A12CR18,			5960-822-9588	9	5-30

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8A2CR2	SEMICONDUCTOR, Same as A8A2CR1.	Biasing	A12CR21					5-30
A8A2E1	TERMINAL, Same as A7E1.	Feedthru						5-30
A8A2Q1	TRANSISTOR, Same as A5A1Q1.	Oscillator						5-30
A8A2R1	RESISTOR, Same as A1R2.	Biasing						5-30
A8A2R2	RESISTOR, Same as A5A1R21.	Biasing						5-30
A8A2R3	RESISTOR, Same as A3R14.	Biasing						5-30
A8A2Y1	CRYSTAL UNIT, quartz: Style same as CR18-U except that the 21.400 mc frequency is outside the range of the MIL type crystal; Piezo CR18U21.4MC.	Determines oscillator frequency.	A8A2Y1				1	5-30
A8C1	CAPACITOR, Same as A1C38.	Filtering						5-28
A8C2	CAPACITOR, Same as A1C38.	Filtering						5-26
A8C3	CAPACITOR, Same as A1C38.	Filtering						5-28
A8C4	CAPACITOR, Same as A1C38.	Filtering						5-27
A8C5	CAPACITOR, Same as A1C5.	Coupling						5-27
A8C6	CAPACITOR, Same as A1C21.	Filtering						5-26
A8C7	CAPACITOR, Same as A1C5.	Coupling						5-26
A8C8	CAPACITOR, Same as A1C5.	Coupling						5-26
A8C9	CAPACITOR, Same as A5A1C2.	Filtering						5-27

S-129

IDENTIFICATION TABLE OF PARTS

5-130

IDENTIFICATION TABLE OF PARTS

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
		FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8C10	CAPACITOR, Same as A1C38.	Filtering						5-27
A8C11	CAPACITOR, Same as A1C38.	Filtering						5-25
A8C12	CAPACITOR, Same as A1C21.	Filtering						5-25
A8C13	CAPACITOR, Same as A1C5.	Part of a shelf network.						5-25
A8C14	CAPACITOR, Same as A3C11.	Neutralization						5-25
A8C15	NOT USED	-----						
A8C16	CAPACITOR, fixed, mica dielectric: 1 section, 200 pf ±5%, 500 wvdc, -55°C to 150°C operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. w, 2 radial wire lead terminals; Electro Motive DM10-201J.	Coupling	A8C16, A8C78			5910-995-2873	2	5-25
A8C17	CAPACITOR, Same as A1C5.	Part of a shelf network.						5-26
A8C18	CAPACITOR, Same as A5A1C2.	Filtering						5-25
A8C19	CAPACITOR, fixed, mica dielectric: 1 section, 39 pf ±5%, 500 wvdc, -55°C to 150°C operating temperature range, plastic case, 0.190 in. thk by 0.330 in. h by 0.360 in. lg, 2 radial wire lead terminals; Electro Motive DM10-390J.	Coupling	A8C19, A8C25, A8C30, A8C32, A8C33, A8C77			5910-954-0146	6	5-25
A8C20	CAPACITOR, Same as A1C5.	Filtering						5-28

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8C21	CAPACITOR, Same as A1C21.	Filtering						5-27
A8C22	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-27
A8C23	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-26
A8C24	CAPACITOR, Same as A8A2C21.	Part of a voltage divider.						5-25
A8C25	CAPACITOR, Same as A8A2C1.	Part of a voltage divider.						5-26
A8C26	CAPACITOR, Same as A8C38.	Filtering						5-26
A8C27	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.75 pf $\pm 10\%$, 500 wvdc, 0.125 in. dia by 0.250 in. lg, 2 axial wire lead terminals; Quality Components QC-75PFFORM10PCT.	Coupling	A8C27, A8C45, A8C81				3	5-27
A8C28	CAPACITOR, Same as A7C8.	Part of a voltage divider.						5-25
A8C29	CAPACITOR, fixed, mica dielectric: 360 pf $\pm 5\%$, 500 wvdc; per MIL-C-5.	Part of a voltage divider.	A8C29, A8C47, A8C57	CM05F361J03		5910-964-7276	3	5-25
A8C30	CAPACITOR, Same as A8C19.	Part of a voltage divider.						5-25
A8C31	CAPACITOR, Same as A1C21.	Filtering						5-26
A8C32	CAPACITOR, Same as A8C19.	Part of a voltage divider.						5-28

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8C33	CAPACITOR, Same as A8C19.	Part of a voltage divider.						5-27
A8C34	NOT USED	-----						
A8C35	CAPACITOR, Same as A1C5.	Part of a shelf network.						5-27
A8C36	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.82 pf ±10%, 500 wvdc, 0.125 in. dia by 0.250 in. lg, o/a dim., 2 axial wire lead terminals; Quality Components QC0.82PFPORM10PCT.	Neutralization	A8C36, A8C44				2	5-25
A8C37	CAPACITOR, Same as A1C5.	Part of a shelf network.						5-25
A8C38	CAPACITOR, fixed, ceramic dielectric: 1 section, 1 pf ±10%, 500 wvdc, 0.125 in. dia by 0.250 in. lg, o/a dim., 2 axial wire lead terminals; Quality Components QC1PFPORM10PCT.	Neutralization	A8C38, A8C55			5910-722-2471	2	5-25
A8C39	CAPACITOR, Same as A1C5.	AC degeneration.						5-26
A8C40	CAPACITOR, Same as A1C38.	Filtering						5-26
A8C41	CAPACITOR, Same as A1C21.	Filtering						5-27
A8C42	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-26
A8C43	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-28
A8C44	CAPACITOR, Same as A8C36.	Neutralization						5-28

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8C45	CAPACITOR, Same as A8C27.	Coupling						5-27
A8C46	CAPACITOR, Same as A7C8.	Part of a voltage divider.						5-25
A8C47	CAPACITOR, Same as A8C29.	Part of a voltage divider.						5-28
A8C48	CAPACITOR, Same as A1C38.	Filtering						5-25
A8C49	CAPACITOR, Same as A1C38.	Filtering						5-26
A8C50	CAPACITOR, Same as A1C21.	Filtering						5-25
A8C51	CAPACITOR, Same as A7C3.	AC degeneration.						5-27
A8C52	CAPACITOR, Same as A3C11.	Neutralization						5-25
A8C53	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-28
A8C54	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-26
A8C55	CAPACITOR, Same as A8C38.	Coupling						5-27
A8C56	CAPACITOR, Same as A7C8.	Part of a voltage divider.						5-28
A8C57	CAPACITOR, Same as A8C29.	Part of a voltage divider.						5-26
A8C58	CAPACITOR, Same as A1C21.	Filtering						5-27
A8C59	CAPACITOR, Same as A5A1C2.	AC degeneration.						5-27
A8C60	CAPACITOR, Same as A3C11.	Neutralization						5-25

5-134

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8C61	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-28
A8C62	CAPACITOR, Same as A1C17.	Part of a voltage divider.						5-27
A8C63	CAPACITOR, Same as A2C44.	Coupling						5-27
A8C64	CAPACITOR, Same as A2C27.	Coupling						5-26
A8C65	CAPACITOR, Same as A5A1C2.	Part of a filter.						5-25
A8C66	CAPACITOR, Same as A7C8.	Part of a voltage divider.						5-26
A8C67	CAPACITOR, Same as A7C5.	Part of a voltage divider.						5-25
A8C68	CAPACITOR, Same as A5A2C36.	Part of a filter.						5-25
A8C69	CAPACITOR, fixed, electrolytic: 1 section, 2.2 μ f \pm 10%, 20 wvdc, insulated case, 0.141 in. dia by 0.312 in. lg, 2 axial wire lead terminals; Sprague 150D225X9020A2.	Filtering	A8C69			5910-850-5355	1	5-25
A8C70	CAPACITOR, Same as A7A2C1.	Part of a filter.						5-27
A8C71	CAPACITOR, Same as A1C38.	Filtering						5-26
A8C72	CAPACITOR, Same as A1C38.	Filtering						5-28
A8C73	CAPACITOR, Same as A1C38.	Filtering						5-28
A8C74	CAPACITOR, Same as A1C38.	Filtering						5-27
A8C75	CAPACITOR, Same as A1C38.	Filtering						5-26
A8C76	CAPACITOR, Same as A1C38.	Filtering						5-28

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8C77	CAPACITOR, Same as A8C19.	Coupling						5-25
A8C78	CAPACITOR, Same as A8C16.	Part of a voltage divider.						5-25
A8C79	CAPACITOR, fixed, mica dielectric: 2000 pf ±5%, 500 wvdc; per MIL-C-5.	Filtering	A8C79	CM06F202J03			1	5-28
A8C80	CAPACITOR, Same as A1C17.	Filtering						5-27
A8C81	CAPACITOR, Same as A8C27.	Neutralization						5-25
A8CR1	SEMICONDUCTOR, Same as A8A2CR1.	Clamping						5-25
A8CR2	SEMICONDUCTOR, Same as A8A2CR1.	Clamping						5-26
A8CR3	SEMICONDUCTOR, Same as A8A2CR1.	AM detector.						5-28
A8CR4	SEMICONDUCTOR, Same as A8A2CR1.	Clamping						5-27
A8E1	TERMINAL, Same as A7E1.	Feedthru						5-26
A8E2	TERMINAL, Same as A7E1.	Feedthru						5-28
A8E3	TERMINAL, Same as A7E1.	Feedthru						5-25
A8E4	TERMINAL, Same as A7E1.	Feedthru						5-26
A8FB1	FERRITE BEAD, Same as A1FB1.	RF choke.						5-27
A8FL1	FILTER, bandpass: 21.4-mc center frequency, 75 kc bandwidth not tapped, aluminum case, 0.625 in. by 1.000 in. by 2.000 in., 2 solder lug terminals; McCoy 40B4.	Sets bandwidth of one section of amplifier at 75 kc.	A8FL1				1	5-28

		CONTRACTOR COMMUNICATION ELECT ONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8FL2	FILTER, bandpass: 21.4-mc center frequency, 20 kc bandwidth, not tapped, aluminum case, 0.625 in. by 1.000 in. by 2.000 in., 2 solder lug terminals; McCoy 40B1.	Sets bandwidth of one section of amplifier at 20 kc.	A8FL2				1	5-28
A8J1	CONNECTOR, Same as A1J2.	IF input jack.						5-28
A8J2	CONNECTOR, Same as A1J2.	IF output jack.						5-26
A8J3	CONNECTOR, Same as A1J2.	IF output jack.						5-27
A8L1	COIL, Same as A7A1L2.	RF choke.						5-26
A8L2	COIL, Same as A1L5.	Part of a tuned circuit.						5-27
A8L3	COIL, Same as A1L5.	Part of a tuned circuit.						5-27
A8L4	COIL, Same as A1L5.	Part of a tuned circuit.						5-26
A8L5	COIL, Same as A1L5.	Part of a tuned circuit.						5-26
A8L6	COIL, Same as A1L5.	Part of a tuned circuit.						5-25
A8L7	COIL, Same as A1L5.	Part of a tuned circuit.						5-26
A8L8	COIL, Same as A7A1L2.	RF choke.						5-28
A8L9	COIL, Same as A1L5.	Part of a tuned circuit.						5-26
A8L10	COIL, Same as A1L5.	Part of a tuned circuit.						5-27

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED	CONTRACT NO. DA18-119-AMC-02499(X)
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REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8L11	COIL, Same as A7A1L2.	RF choke.						5-28
A8L12	COIL, Same as A1L5.	Part of a tuned circuit.						5-25
A8L13	COIL, Same as A1L5.	Part of a tuned circuit.						5-25
A8L14	COIL, Same as A7A1L2.	RF choke.						5-28
A8L15	COIL, Same as A1L5.	Part of a tuned circuit.						5-25
A8L16	COIL, Same as A1L5.	Part of a tuned circuit.						5-25
A9L17	COIL, Same as A7A1L2.	Part of a filter.						5-28
A8L18	COIL, Same as A7A1L2.	RF choke.						5-28
A8L19	COIL, radio frequency: 500 μ h \pm 10%, 3.80-mc nominal resonant frequency, 15 minimum Q, varnish insulated, 0.500 in. dia by 0.312 in. lg, 2 axial wire lead terminals; Wilco 1500-15.	RF choke.	A8L19			5950-552-0776	1	5-25
A8L20	COIL, Same as A7A1L2.	RF choke.						5-25
A8P1	CONNECTOR, plug, electrical: 18 pin, rectangular, 7.5 amp, self-aligning, polarized, arc resistant dielectric material, 0.562 in. by 0.781 in. by 1.312 in., o/a dim.; Winchester MRE18P-G7.	Connects various voltages to amplifier.	A8P1				1	5-1
A8Q1	TRANSISTOR, Same as A7Q1.	300-kc IF amplifier.						5-25

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8Q2	TRANSISTOR, Same as A7Q1.	75-kc IF amplifier.						5-28
A8Q3	TRANSISTOR, Same as A7Q1.	20-kc IF amplifier.						5-26
A8Q4	TRANSISTOR, Same as A7Q1.	300-kc IF amplifier.						5-28
A8Q5	TRANSISTOR, Same as A7Q1.	75-kc IF amplifier.						5-28
A8Q6	TRANSISTOR, Same as A7Q1.	20-kc IF amplifier.						5-26
A8Q7	TRANSISTOR, Same as A7Q1.	Common IF amplifier.						5-25
A8Q8	TRANSISTOR, Same as A7Q1.	Common IF amplifier.						5-25
A8Q9	TRANSISTOR, Same as A5A3Q3.	Emitter follower.						5-25
A8Q10	TRANSISTOR, Same as A5A3Q3.	Emitter follower.						5-28
A8Q11	TRANSISTOR, Same as A5A3Q3.	AGC amplifier.						5-25
A8Q12	TRANSISTOR, Same as A5A3Q3.	AGC amplifier.						5-27
A8Q13	TRANSISTOR: NPN, silicon, EIA designation, 2N1131; per MIL-S-19500.	AGC regulator.	A8Q13	JAN2N1131		5960-081-8365	1	5-27
A8R1	RESISTOR, fixed, composition: 24 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A8R1, A8R3, A8R21	RC07GF240J		5905-835-1632	3	5-28
A8R2	RESISTOR, fixed, composition: 33 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A8R2	RC07GF330J		5905-806-0636	1	5-25
A8R3	RESISTOR, Same as A8R1.	Part of a voltage divider.						5-26

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8R4	RESISTOR, Same as A3R6.	Part of a filter.						5-26
A8R5	RESISTOR, Same as A2R7.	Biasing						5-26
A8R6	RESISTOR, Same as A5A3R20.	Biasing						5-27
A8R7	RESISTOR, Same as A3R6.	Biasing						5-25
A8R8	RESISTOR, Same as A2R7.	Biasing						5-27
A8R9	RESISTOR, Same as A5A3R20.	Biasing						5-26
A8R10	RESISTOR, Same as A2R7.	Biasing						5-28
A8R11	RESISTOR, Same as A5A3R20.	Biasing						5-27
A8R12	RESISTOR, Same as A3R6.	Part of a filter.						5-26
A8R13	RESISTOR, Same as A3R6.	Part of a filter.						5-26
A8R14	RESISTOR, Same as A1R15.	Biasing						5-27
A8R15	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-27
A8R16	RESISTOR, Same as A1R15.	Biasing						5-27
A8R17	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-26
A8R18	RESISTOR, Same as A1R15.	Biasing						5-27
A8R19	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-27
A8R20	RESISTOR, Same as A7A1R14.	Part of a shelf network.						5-27
A8R21	RESISTOR, Same as A8R1.	Part of a shelf network.						5-25
A8R22	NOT USED	-----						

5-140

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8R23	RESISTOR, fixed, composition: 8.2K ±5%, 1/4W; per MIL-R-11.	Filter load.	A8R23	RC07GF822J		5905-681-9970	1	5-26
A8R24	RESISTOR, fixed, composition: 750 ohms ±5%, 1/4W; per MIL-R-11.	Filter load.	A8R24, A8R27	RC07GF751J			2	5-25
A8R25	RESISTOR, Same as A3R6.	Part of a filter.						5-27
A8R26	RESISTOR, Same as A5A3R20.	Filter load.						5-26
A8R27	RESISTOR, Same as A8R24.	Filter load.						5-27
A8R28	RESISTOR, Same as A2R7.	Biasing						5-27
A8R29	RESISTOR, Same as A5A3R20.	Biasing						5-25
A8R30	RESISTOR, Same as A2R7.	Biasing						5-27
A8R31	RESISTOR, Same as A5A3R20.	Biasing						5-25
A8R32	RESISTOR, Same as A2R7.	Biasing						5-26
A8R33	RESISTOR, Same as A5A3R20.	Biasing						5-28
A8R34	RESISTOR, Same as A7A1R14.	Part of a shelf network.						5-28
A8R35	RESISTOR, Same as A1R15.	Biasing						5-28
A8R36	RESISTOR, Same as A7A1R14.	Part of a shelf network.						5-26
A8R37	RESISTOR, Same as A1R15.	Biasing						5-26
A8R38	RESISTOR, Same as A1R15.	Biasing						5-27
A8R39	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-27
A8R40	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-25

IDENTIFICATION TABLE OF PARTS

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8R41	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-28
A8R42	RESISTOR, Same as A3R6.	Part of a filter.						5-25
A8R43	RESISTOR, Same as A2R5.	Biasing						5-26
A8R44	RESISTOR, Same as A5A3R20.	Biasing						5-27
A8R45	RESISTOR, Same as A5A2R15.	Dropping						5-27
A8R46	RESISTOR, Same as A1R7.	Biasing						5-28
A8R47	RESISTOR, Same as A1R15.	Biasing						5-26
A8R48	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-27
A8R49	RESISTOR, Same as A7A1R1.	Biasing						5-28
A8R50	RESISTOR, Same as A5A3R20.	Biasing						5-27
A8R51	RESISTOR, Same as A2R6.	Part of a filter.						5-27
A8R52	RESISTOR, Same as A5A2R15.	Biasing						5-26
A8R53	RESISTOR, Same as A2R6.	Parasitic suppressor.						5-26
A8R54	RESISTOR, Same as A2R18.	DC return.						5-25
A8R55	RESISTOR, Same as A1R2.	Part of a filter.						5-27
A8R56	RESISTOR, Same as A1R12.	Biasing						5-26
A8R57	RESISTOR, Same as A3R14.	Biasing						5-26
A8R58	RESISTOR, Same as A1R13.	Part of a filter.						5-25
A8R59	RESISTOR, Same as A1R13.	Biasing						5-26
A8R60	RESISTOR, Same as A3R15.	Biasing						5-27

S-141

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8R61	RESISTOR, fixed, composition: 11K ±5%, 1/4W; per MIL-R-11.	Biasing	A8R61, A8R66	RC07GF113J		5905-686-3128	2	5-26
A8R62	RESISTOR, fixed, composition: 910 ohms ±5%, 1/4W; per MIL-R-11.	Part of a filter .	A8R62	RC07GF911J		5905-801-6444	1	5-26
A8R63	RESISTOR, Same as A4R10.	Biasing						5-25
A8R64	RESISTOR, Same as A1R1.	Biasing						5-27
A8R65	RESISTOR, fixed, composition: 220 ohms ±5%, 1/4W; per MIL-R-11.	Biasing	A8R65	RC07GF221J		5905-892-6941	1	5-25
A8R66	RESISTOR, Same as A8R61.	Biasing						5-25
A8R67	RESISTOR, Same as A6R19.	Biasing						5-25
A8R68	RESISTOR, Same as A2R6.	Impedance matching.						5-26
A8XQ1	SOCKET, Same as A7XQ1.	Mounts A8Q1.						5-25
A8XQ2	SOCKET, Same as A7XQ1.	Mounts A8Q2.						5-28
A8XQ3	SOCKET, Same as A7XQ1.	Mounts A8Q3.						5-26
A8XQ4	SOCKET, Same as A7XQ1.	Mounts A8Q4.						5-27
A8XQ5	SOCKET, Same as A7XQ1.	Mounts A8Q5.						5-28
A8XQ6	SOCKET, Same as A7XQ1.	Mounts A8Q6.						5-26
A8XQ7	SOCKET, Same as A7XQ1.	Mounts A8Q7.						5-25
A8XQ8	SOCKET, Same as A7XQ1.	Mounts A8Q8.						5-25

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A8XQ9	SOCKET, semiconductor device: 3 silver plated, gold flashed beryllium copper contacts, mica filled phenolic dielectric material, retaining ring mounted, ring not included, 0.400 in. dia by 0.440 in. lg, o/a dim.; Grayhill 22-16-3.	Mounts A8Q9.	A8XQ9, A8XQ10, A8XQ11, A8XQ12, A8XQ13				5	5-25
A8XQ10	SOCKET, Same as A8XQ9.	Mounts A8Q10.						5-28
A8XQ11	SOCKET, Same as A8XQ9.	Mounts A8Q11.						5-25
A8XQ12	SOCKET, Same as A8XQ9.	Mounts A8Q12.						5-27
A8XQ13	SOCKET, Same as A8XQ9.	Mounts A8Q13.						5-27

7312		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-31 A9	AMPLIFIER, video: Etched circuit, plug-in card, epoxy resin glass base laminate, with 1-oz copper (1-side), 2.050 in. h, 2.000 in. w, 0.3000 in. d o/a dim., low level video input signal, amplified video output signal; Communication Electronics, Inc. type 7312.	Amplifies video output from IF strip A8, applies signal to video output jack.					1	5-31
A9C1	CAPACITOR, Same as A5A3C1.							5-31
A9C2	CAPACITOR, fixed, electrolytic: 1 section, 10.0 μ f \pm 20%, 20 wvdc, insulated case, 0.185 in. dia by 0.512 in. lg, 2 axial wire lead terminals; Sprague 150D106X0020B2.	Coupling and filtering.	A9C2			5910-542-7372	1	5-31
A9Q1	TRANSISTOR, Same as A5A3Q3.	Amplifier						5-31
A9Q2	TRANSISTOR: PNP, germanium, EIA designation 2N526; per MIL-S-19500.	Amplifier	A9Q2	JAN2N526		5960-892-3473	1	5-31
A9R1	RESISTOR, Same as A1R15.	Part of a filter.						5-31
A9R2	RESISTOR, Same as A6R4.	Biasing						5-31
A9R3	RESISTOR, fixed, composition: 20K \pm 5%, 1/4W; per MIL-R-11.	Biasing	A9R3	RC07GF203J		5905-686-3368	1	5-31
A9R4	RESISTOR, Same as A1R15.	Biasing						5-31
A9R5	RESISTOR, fixed, composition: 160 ohms \pm 5%, 1/4W; per MIL-R-11.	Biasing	A9R5, A9R7	RC07GF161J		5905-825-5592	2	5-31
A9R6	RESISTOR, fixed, composition: 2K \pm 5%, 1/4W; per MIL-R-11.	Biasing	A9R6	RC07GF202J		5905-686-3370	1	5-31

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED CONTRACT NO. DA18-119-AMC-02499(X)

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A9R7	RESISTOR, Same as A9R5.	Biasing						5-31
A9R8	RESISTOR, Same as A2R6.	Part of a voltage divider.						5-31
A9R9	RESISTOR, Same as A1R1.	Part of a voltage divider.						5-31

S-146

IDENTIFICATION TABLE OF PARTS

7400A		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-32 A10	AMPLIFIER, audio: Etched circuit, plug-in card, epoxy resin glass base laminate, grade G10 with 1-oz copper (1-side), 3.000 in. lg, 2.120 in. h, 1.200 in. d o/a dim., 13 contacts; Communication Electronics, Inc. type 7400A.	Amplifies audio frequencies from output of IF strip A8.					1	5-1
A10C1	CAPACITOR, fixed, electrolytic: 1 section, 0.47 μ f \pm 20%, 35 wvdc, insulated case, 0.135 in. dia by 0.322 in. lg, 2 axial wire lead terminals; Sprague 150D474X0035A2.	Part of a filter.	A10C1			5910-683-7276	1	5-32
A10C2	CAPACITOR, fixed, electrolytic: 1 section, 10 μ f \pm 10%, 20 wvdc, insulated case, 0.185 in. dia by 0.510 in. lg, 2 axial wire lead terminals; Sprague 150D106X9020B2.	Part of a filter.	A10C2			5910-812-2752	1	5-32
A10CR1	SEMICONDUCTOR DEVICE, diode: Zener type, EIA designation 1N759A; per MIL-S-19500.	Voltage regulation.	A10CR1, A12CR19, A15CR1	JAN1N759A		5960-846-9157	3	5-32
A10Q1	TRANSISTOR: NPN, silicon type, EIA designation 2N929; per MIL-S-19500.	Audio amplifier.	A10Q1, A15Q1	JAN2N929		5960-081-3783	2	5-32
A10Q2	TRANSISTOR, Same as A5A3Q2.	Emitter follower.						5-32
A10Q3	TRANSISTOR, Same as A5A3Q2.	Power amplifier.						5-32
A10R1	RESISTOR, Same as A3R14.	Part of a filter.						5-32
A10R2	RESISTOR, fixed, film: 75K \pm 1%, 1/4W; per MIL-R-10509.	Biasing	A10R2	RN60D7502F			1	5-32

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A10R3	RESISTOR, fixed, film: 10K ±1%, 1/4W; per MIL-R-10509.	Biasing	A10R3	RN60D1002F		5905-983-6914	1	5-32
A10R4	RESISTOR, fixed, film: 6.81K ±1%, 1/4W; per MIL-R-10509.	Biasing	A10R4	RN60D6811J		5905-681-8754	1	5-32
A10R5	RESISTOR, fixed, film: 619 ohms ±1%, 1/4W; per MIL-R-10509.	DC return.	A10R5	RN60D6190F		5905-702-1148	1	5-32
A10R6	RESISTOR, fixed, composition: 3.9K ±5%, 1/4W; per MIL-R-11.	Dropping	A10R6	RC07GF392J		5905-682-4098	1	5-32
A10R7	RESISTOR, Same as A1R1.	Feedback						5-32
A10R8	RESISTOR, Same as A5A3R12.	Part of a filter.						5-32
A10R9	RESISTOR, Same as A7A1R10.	Biasing						5-32
A10R10	RESISTOR, fixed, film: 68.1 ohms ±1%, 1/4W; per MIL-R-10509.	DC return.	A10R10	RN60D68R1F		5905-685-9824	1	5-32
A10RA1	HEAT SINK, electrical-electronic component: Copper, snap-on type, 0.255 in. id by 0.375 in. h by 0.720 in. od; Wakefield NF207.	Heat radiator.	A10RA1, A12RA1, A12RA2, A12RA3			5895-758-1799	4	5-32
A10T1	TRANSFORMER, audio frequency: 10V, 100 cps to 40 kc, single phase, plastic case, fully enclosed, hermetically sealed, printed circuit mounted, 5 wire terminals; Communication Electronics, Inc. 1170.	Audio output transformer.	A10T1			5950-913-4388	1	5-32

5-147

IDENTIFICATION TABLE OF PARTS

7633		CONTRACTOR COMMUNICATION ELECTRON CS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-33 A11	POWER SUPPLY: Etched circuit component board, epoxy resin glass base laminate, grade G10, with 1-oz copper (1-side), 7.180 in. lg, 1.875 in. w, 1.5 in. d o/a dim, 600 vac input, high voltage dc output, regulated; Communication Electronics, Inc. type 7633.	Supplies high voltage for cathode ray tube.	A11				1	5-1
A11C1	CAPACITOR, fixed, paper dielectric: 1 section, mylar-paper type, 0.1 μ f \pm 10%, 1000 wvdc, plastic case, 0.750 in. dia by 2.250 in. lg, 2 axial wire lead terminals; Sprague 10TMP10.	Part of a voltage divider.	A11C1, A11C2			5910-985-5159	2	5-33
A11C2	CAPACITOR, Same as A11C1.	Part of a voltage divider.						5-33
A11C3	CAPACITOR, fixed, ceramic dielectric: 1 section, 0.1 μ f +80%-20%, 100 wvdc, insulated case, 0.125 in. thk by 0.625 in. dia disc type, 2 radial wire lead terminals; RMC TA.1UF P80PCTM20PCT.	Filtering	A11C3				1	5-33
A11CR1	SEMICONDUCTOR DEVICE, diode: Silicon rectifier, 2000 peak inverse volts, 1400 vrms, 2000 continuous reverse dc volts, 50 kcps maximum operating frequency, -65°C to 175°C operating temp range, hermetically sealed, 0.140 in. dia by 0.310 in. lg, 2 axial solid silver wire lead terminals; Semtech SC20.	Rectifier	A11CR1, A11CR2				2	5-33
A11CR2	SEMICONDUCTOR, Same as A11CR1.	Rectifier						5-33

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A11P1	CONNECTOR, plug, electrical: 9 pin rectangular connector, 7.5 amp self-aligning, polarized, arc resistant dielectric material, 0.375 in. by 0.781 in. by 1.312 in. o/a dim.; Winchester MRE9P-G7.	Connects voltages to CRT assembly.	A11P1			5935-295-4340	1	5-1
A11R1	RESISTOR, fixed, composition: 750K ±5%, 1/2W; per MIL-R-11.	Dropping	A11R1	RC20GF754J		5905-279-1759	1	5-33
A11R2	RESISTOR, fixed, composition: 100K ±5%, 1/2W; per MIL-R-11.	Part of a voltage divider.	A11R2	RC20GF104J		5905-195-6761	1	5-33
A11R3	RESISTOR, variable: 500K ±10%, 1/4W, linear taper, 0.500 in. dia by 0.312 in. lg, with 0.875 in. shaft and 0.375 in. bushing, 3 solder lug terminals; Mallory 70-08459.	Part of a voltage divider.	A11R3				1	
A11R4	RESISTOR, fixed, composition: 4.7 meg ±5%, 1/2W; per MIL-R-11.	Part of a voltage divider.	A11R4	RC20GF475J		5905-185-8490	1	5-33
A11R5	RESISTOR, variable: 2.5 meg ±20%, 1/4W, linear taper, 0.500 in. dia by 0.312 in. lg, with 0.875 in. shaft and 0.375 in. bushing, 3 solder lug terminals; Mallory 70-08458.	Part of a voltage divider.	A11R5				1	
A11R6	RESISTOR, fixed, composition: 6.8 meg ±5%, 1/2W; per MIL-R-11.	Part of a voltage divider.	A11R6, A11R7	RC20GF685J		5905-279-1892	2	5-33
A11R7	RESISTOR, Same as A11R6.	Part of a voltage divider.						5-33
A11V1	ELECTRON TUBE: Glass, coronatron; Victoreen GV3A-1200.	Regulator	A11V1				1	5-33

7631		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MANAGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-34 A12	POWER SUPPLY: Etched circuit, plug-in card, epoxy resin glass base laminate, grade G10, with 1-oz copper (1-side), 4.000 in. w, 3.68 in. h, 0.500 in. thk o/a dim., 12 vac, 157 vac, 26 vac, input voltages, 14 vdc, 175 vdc, 23 vdc, 24 vdc, 12 vdc, -24 vdc, and 56 vdc output voltages, 18 contacts; Communication Electronics, Inc. type 7631	Rectifies and regulates ac outputs from power transformer, supplies dc voltages for entire unit.	A12				1	5-3
A12C1	CAPACITOR, fixed, electrolytic: 1 section, 1.0 μ f -10% +75%, 50 wvdc, metal case, hermetically sealed, 0.187 in. dia by 0.500 in. lg, 2 axial wire lead terminals; Sprague 30D105G050AA4.	Filtering	A12C1				1	5-34
A12C2	CAPACITOR, fixed, electrolytic: 1 section, 47 μ f \pm 20%, 35 wvdc, insulated case, 0.344 in. dia by 0.859 in. lg, 2 axial wire lead terminals; Sprague 150D476X0035S2.	Filtering	A12C2, A12C5, A12C6			5910-801-9721	3	5-34
A12C3	CAPACITOR, fixed, electrolytic: 1 section, 10 μ f -10% +75%, 50 wvdc, metal case, hermetically sealed, 0.312 in. dia by 0.688 in. lg, 2 axial wire lead terminals; Sprague 30D106G050CB4.	Filtering	A12C3, A12C4				2	5-34
A12C4	CAPACITOR, Same as A12C3.	Filtering						5-34
A12C5	CAPACITOR, Same as A12C2.	Filtering						5-34
A12C6	CAPACITOR, Same as A12C2.	Filtering						5-34

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A12C7	CAPACITOR, Same as A5A3C3.	Filtering						5-34
A12CR1	SEMICONDUCTOR DEVICE, diode: Silicon, diffused-junction rectifier; EIA designation 1N3253.	Rectifier	A12CR1, A12CR2, A12CR3, A12CR4, A12CR7, A12CR8, A12CR9, A12CR10, A12CR11, A12CR12			5960-964-5478	10	5-34
A12CR2	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR3	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR4	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR5	SEMICONDUCTOR DEVICE, diode: Silicon, diffused-junction rectifier; EIA designation 1N3255.	Rectifier	A12CR5, A12CR6			5960-964-5242	2	5-34
A12CR6	SEMICONDUCTOR, Same as A12CR5.	Rectifier						5-34
A12CR7	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR8	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR9	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34

5-152

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A12CR10	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR11	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR12	SEMICONDUCTOR, Same as A12CR1.	Rectifier						5-34
A12CR13	SEMICONDUCTOR, Same as A5A3CR4.	Regulator						5-34
A12CR14	SEMICONDUCTOR, Same as A8A2CR1.	Compensation						5-34
A12CR15	SEMICONDUCTOR, Same as A8A2CR1.	Compensation						5-34
A12CR16	SEMICONDUCTOR, Same as A5A3CR4.	Regulator						5-34
A12R17	SEMICONDUCTOR, Same as A8A2CR1.	Compensation						5-34
A12CR18	SEMICONDUCTOR, Same as A8A2CR1.	Clamping						5-34
A12CR19	SEMICONDUCTOR, Same as A10CR1.	Regulator						5-34
A12CR20	SEMICONDUCTOR DEVICE, diode: Silicon, diffused zener, EIA designation 1N979B; per MIL-S-19500.	Regulator	A12CR20	JAN1N979B		5960-740-3042	1	5-34
A12CR21	SEMICONDUCTOR, Same as A8A2CR1.	Compensation						5-34

REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
		FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A12Q1	TRANSISTOR: Silicon, NPN; EIA designation 2N3053.	Regulator control.	A12Q1, A12Q3, A12Q4, A12Q5				4	5-34
A12Q2	TRANSISTOR: Germanium, PNP; EIA designation 2N1038.	Series regulator.	A12Q2			5960-808-7498	1	5-34
A12Q3	TRANSISTOR, Same as A12Q1.	Series regulator.						5-34
A12Q4	TRANSISTOR, Same as A12Q1.	Series regulator.						5-34
A12Q5	TRANSISTOR, Same as A12Q1.	Series regulator.						5-34
A12R1	RESISTOR, Same as A1R7.	Dropping						5-34
A12R2	RESISTOR, Same as A1R15.	Biasing						5-34
A12R3	RESISTOR, Same as A1R15.	Biasing						5-34
A12R4	RESISTOR, Same as A1R15.	Biasing						5-34
A12R5	RESISTOR, Same as A1R15.	Biasing						5-34
A12R6	RESISTOR, Same as A1R7.	Biasing						5-34
A12R7	RESISTOR, fixed, composition: 5.1 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Dropping	A12R7, A12R8	RC07GF5R1J		5905-730-0331	2	5-34
A12R8	RESISTOR, Same as A12R7.	Dropping						5-34
A12R9	RESISTOR, fixed, composition: 62 ohms $\pm 5\%$, 1W; per MIL-R-11.	Biasing	A12R9	RC32GF620J		5905-279-1687	1	5-34
A12R10	RESISTOR, fixed, composition: 2.4K $\pm 5\%$, 1/4W; per MIL-R-11.	Biasing	A12R10, A12R11, A15R8	RC07GF242J		5905-683-7724	3	5-34
A12R11	RESISTOR, Same as A12R10.	Biasing						5-34

IDENTIFICATION TABLE OF PARTS

5-154

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A12R12	RESISTOR, fixed, composition: 63K ±5%, 1W; per MIL-R-11.	Dropping	A12R12	RC32GF633J			1	5-34
A12RA1	HEAT SINK, Same as A10RA1.	Heat radiator.						5-34
A12RA2	HEAT SINK, Same as A10RA1.	Heat radiator.						5-34
A12RA3	HEAT SINK, Same as A10RA1.	Heat radiator.						5-34

IDENTIFICATION TABLE OF PARTS

79125		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-35 A13	NETWORK, SUMMATION: Brass chassis, silver plated, gold flashed, 1.100 in. h, 1.960 in. lg, 2.469 in. w, o/a dim., two inputs, one output, 50 ohm input and output impedance; Communication Electronics, Inc. type 79125.	Impedance matching, voltage divider.	A13				2	5-1
A13J1	CONNECTOR, Same as A1J1.	A1 tuner input jack.						5-35
A13J2	CONNECTOR, Same as A1J1.	A2 tuner input jack.						5-35
A13J3	CONNECTOR, Same as A1J1.	30-60 mc LO output jack.						5-35
A13J4	CONNECTOR, Same as A1J1.	60-300 mc LO output jack.						5-35
A13R1	RESISTOR, fixed, composition: 130 ohms $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	A13R1, A13R3, A13R5, A13R6, A14R1, A14R3, A14R5, A14R6	RC07GF 131J		5905-807-6269	8	5-35
A13R2	RESISTOR, Same as A3R6.	Part of a voltage divider.						5-35
A13R3	RESISTOR, Same as A13R1.	Part of a voltage divider.						5-35
A13R4	RESISTOR, Same as A3R6.	Part of a voltage divider.						5-35
A13R5	RESISTOR, Same as A13R1.	Part of a voltage divider.						5-35
A13R6	RESISTOR, Same as A13R1.	Part of a voltage divider.						5-35

5-156

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MANAGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-35 A14	NETWORK, SUMMATION, Same as A13.	Impedance matching, voltage divider.	A14					5-1
A14J1	CONNECTOR, Same as A1J1.	A4 tuner input jack.						5-35
A14J2	CONNECTOR, Same as A1J1.	A3 tuner input jack.						5-35
A14J3	CONNECTOR, Same as A1J1.	500-1000 mc LO output jack.						5-35
A14J4	CONNECTOR, Same as A1J1.	235-500 mc LO output jack.						5-35
A14R1	RESISTOR, Same as A13R1.	Part of a voltage divider.						5-35
A14R2	RESISTOR, Same as A3R6.	Part of a voltage divider.						5-35
A14R3	RESISTOR, Same as A13R1.	Part of a voltage divider.						5-35
A14R4	RESISTOR, Same as A3R6.	Part of a voltage divider.						5-35
A14R5	RESISTOR, Same as A13R1.	Part of a voltage divider.						5-35
A14R6	RESISTOR, Same as A13R1.	Part of a voltage divider.						5-35

7836		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
Fig. 5-36 A15	AMPLIFIER, direct current: Etched circuit component board, epoxy resin glass base laminate, grade G10, with 1-oz copper (1-side), 2.250 in. lg, 1.000 in. w, 0.480 in. thk o/a dim., dc input, dc output; Communication Electronics, Inc. type 7836.	Amplifies AGC volt-ages.	A15				1	5-3
A15CR1	SEMICONDUCTOR, Same as A10CR1.	Reference element.						5-36
A15CR2	SEMICONDUCTOR, Same as A7A1CR2.	Reference element.						5-36
A15Q1	TRANSISTOR, Same as A10Q1.	DC amplifier.						5-36
A15Q2	TRANSISTOR: Silicon, PNP, EIA designation 2N3251; per MIL-S-19500.	DC amplifier.	A15Q2	JAN2N3251		5960-765-6071	1	5-36
A15R1	RESISTOR, Same as A1R10.	Biasing						5-36
A15R2	RESISTOR, Same as A6R4.	Biasing						5-36
A15R3	RESISTOR, variable: 100K \pm 10%, 3/4W, screw driver adjust, film element, 0.500 in. dia by 0.225 in. lg, 3 pin terminals; IRC CT150-104K.	Variable biasing control.	A15R3				1	5-36
A15R4	RESISTOR, fixed, composition: 200K \pm 5%, 1/4W; per MIL-R-11.	Dropping	A15R4	RC07GF204J		5905-681-8821	1	5-36
A15R5	RESISTOR, Same as A7A1R1.	Biasing						5-36
A15R6	RESISTOR, Same as A1R15.	Biasing						5-36

5-158

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
A15R7	RESISTOR, Same as A5A3R20.	Part of a voltage divider.						5-36
A15R8	RESISTOR, Same as A12R10.	Part of a voltage divider.						5-36

Main Chassis		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
C1	CAPACITOR, fixed, electrolytic: 1 section 500 μ f -10 +100%, 15 vdc, insulated metal case, 0.812 in. dia by 1.750 in. lg, 2 axial wire lead terminals; Sprague 34D507H015GJ4.	Filtering	C1				1	5-3
C2	CAPACITOR, fixed, electrolytic: 1 section, 50 μ f -10 +75%, 12 vdc, insulated metal case, 0.437 in. dia by 0.749 in. lg, 2 axial wire lead terminals; Sprague 30D506G012DB4.	Filtering	C2			5910-827-1216	1	5-3
C3	CAPACITOR, fixed, electrolytic: 2 sections (both-identical), 40 μ f -10 +50%, 250 vdc, metal case, 1.000 in. dia by 2.000 in. lg, mounting is with 3 twist lock tabs, 3 solder lug terminals; Sprague TVL2520.	Filtering	C3				1	5-1
C4	CAPACITOR, fixed, electrolytic: 1 section, 250 μ f -10 +100%, 40 vdc, insulated metal case, 0.812 in. dia by 2.250 in. lg, 2 axial wire lead terminals; Sprague 34D257H040GL4.	Filtering	C4				1	5-3
C5	CAPACITOR, fixed, electrolytic: 1 section, 1000 μ f -10 +100%, 15 vdc, insulated metal case, 0.937 in. dia by 2.250 in. lg, 2 axial wire lead terminals; Sprague 34D108H015HL4.	Filtering	C5				1	5-3

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECT ONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
C6	CAPACITOR, fixed, ceramic, dielectric: 1 section, 0.01 μ f, GMV, 1400 wvdc, insulated body, 0.225 in. thk by 1.025 in. dia, disc type, 2 radial wire lead terminals; Radio Material Corp. U-01UFGMV.	Ac line filter.	C6, C7			5910-899-8093	2	5-3
C7	CAPACITOR, Same as C6.	Ac line filter.						5-3
C8	CAPACITOR, fixed, ceramic, dielectric: 1 section, 0.01 μ f \pm 20% 500 wvdc, insulated body, 0.156 in. thk by 0.510 in. dia, disc type, 2 radial wire lead terminals; Radio Material Corp SM-01UFPORM20PCT.	Filtering	C8, C9			5910-828-5705	2	5-3
C9	CAPACITOR, Same as C8.	Filtering						5-3
C10	CAPACITOR, Same as A5A3C7.	Filtering						5-3
CR1	SEMICONDUCTOR, Same as A7A1CR2.	Voltage regulator.						5-3
CR2	SEMICONDUCTOR DEVICE, diode: Silicon (diffused-junction) rectifier; EIA designation 1N3253.	Blocking	CR2				1	5-3
DS1	LAMP, incandescent: 6-8 v, 150 ma.	Dial lamp	DS1, DS2, DS3, DS4	MS15571-2		6240-155-8706	4	5-3
DS2	LAMP, Same as DS1.	Dial lamp						5-3
DS3	LAMP, Same as DS1.	Dial lamp						5-3
DS4	LAMP, Same as DS1.	Dial lamp						5-3

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F1	FUSE, cartridge: 0.5 amp, 250 v; per MIL-F-15160.	Overload protection	F1, F3	F02B250V1-2A		5920-199-9498	2	5-3
F2	FUSE, cartridge: 0.25 amp, 250 v, per MIL-F-15160.	Overload protection	F2	F02B250V1-4A		5920-504-6834	1	5-3
F3	FUSE, Same as F1.	Overload protection						5-3
J1	CONNECTOR, receptacle, electrical: series N; per MIL-C-71	RF input connector.	J1	UG1052/U		5935-201-8443	1	5-1
J2	CONNECTOR, receptacle, electrical: multipin; per MIL-C-5015.	DC Input connector.	J2	MS3102A-10SL-3P			1	5-2
J3	CONNECTOR, receptacle, electrical: 1 female contact, 1 mating end, 50 ohms impedance, low-loss plastic dielectric, straight brass shell, silver plated bayonet-lock coupling, 0.090 in. dia cable accommodated, bulkhead type, front mounted, 0.625 in. dia by 1.078 in. lg o/a dim; Amphenol 17825.	Video output jack.	J3, J17, J18			5935-841-7109	3	5-3
J4	CONNECTOR, receptacle, electrical: 3 pins, 1 mating end, straight aluminum shell, single hole bulkhead mounting, synthetic rubber dielectric, 0.750 in. dia by 1.125 in. lg o/a dim; Deutsch DM9601-3P.	AC input jack.	J4				1	5-3
J5	NOT USED							

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICA ION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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J6	CONNECTOR, receptacle, electrical: 14 contacts, 7.5 amp, rectangular, self aligning, polarized, arc resistant plastic dielectric material, 0.437 in. by 0.859 in. by 1.250 in. o/a dim; Winchester MRE 14S-G7.	Voltage input connector to subassembly A7.	J6			5935-198-9608	1	5-2
J7	CONNECTOR, receptacle, electrical: 18 contacts, 7.5 amps, rectangular, self aligning polarized arc resistant plastic dielectric material, 0.562 in. by 0.859 in. by 1.312 in. o/a dim; Winchester MRE 18S-G7.	Voltage input and signal output connector.	J7			5935-227-8997	1	5-1
J8	CONNECTOR, receptacle, electrical: 9 contacts, rectangular, 7 contacts rated 7.5 amps, 2 contacts rated 10 amps, self aligning, polarized, arc resistant plastic dielectric material, 0.375 in. by 0.859 in. by 1.312 in. o/a dim; Winchester MRE 7-2S-G7.	Voltage input connector for subassembly A8.	J8			5935-257-9260	1	5-2
J9	CONNECTOR, receptacle, electrical: 9 contacts, 7.5 amps, rectangular, self aligning polarized arc resistant plastic dielectric material, 0.375 in. by 0.859 in. by 1.312 in. o/a dim; Winchester MRE 9S-G7.	Voltage input and output connector for subassembly A11.	J9			5935-201-4389	1	5-2
J10	JACK, telephone: per MIL-J-641.	Headphone jack.	J10	JJ-034		5935-683-2746	1	5-3
J11	CONNECTOR, receptacle electrical: BNC receptacle, part of K1.	Relay input connector.						5-2

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED	CONTRACT NO. DA18-119-AMC-02499(X)
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J12	CONNECTOR, Same as J11.	Relay output connector						5-1
J13	CONNECTOR, Same as J11.	Relay output connector						5-1
J14	CONNECTOR, receptacle, electrical: BNC receptacle, part of K2.	Relay input connector						5-2
J15	CONNECTOR, Same as J14.	Relay output connector						5-1
J16	CONNECTOR, Same as J14.	Relay output connector						5-1
J17	CONNECTOR, Same as J3.	NB IF output connector						5-2
J18	CONNECTOR, Same as J3.	WB IF output connector.						5-3
J19	CONNECTOR, receptacle, electrical: BNC receptacle, part of K3.	Relay output connector.						5-2
J20	CONNECTOR, Same as J19.	Relay input connector						5-2
J21	CONNECTOR, Same as J19.	Relay output connector						5-2
K1	SWITCH, radio frequency transmission line: 3 coupling positions, electrically operated, 280 ohms impedance, 26 vdc, 1.562 in. w by 2.000 in. lg, 4 no. 4-40 tap mounting holes; Amphenol 318-010382-3.	Signal switching relay	K1, K2, K3			5985-957-0253	3	5-2
K2	SWITCH, Same as K1.	Signal switching relay						5-1
K3	SWITCH, Same as K1.	Signal switching relay						5-1

IDENTIFICATION TABLE OF PARTS

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
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K4	RELAY-SWITCH: 4 poles, double throw, 115v, 11,000 ohms, 900 mv nominal power, 3 amp, nylon dust cover, one no. 3-48 thd stud mounting, 0.875 in. by 1.437 in. by 1.500 in. o/a dim; Potter-Brumfield KHP17A11-115V.	DC signal switching relay.	K4					5-2
K5	RELAY-SWITCH: SPDT, 2.0 ma, 8,000 ohms, 2 amp contact load, 8 "J" hook solder terminals, two no 4-40 thd stud mounted, hermetically sealed metal case, 1.000 in. by 1.000 in. by 2.000 in. o/a dim; Sigma 22RJC-5000-G/SIL.	IF signal output switching relay for subassembly A7.	K5, K6				2	5-3
K6	RELAY-SWITCH, Same as K5.	Video signal switching relay.						5-3
M1	AMMETER: Panel type, 100-0-100 μ adc range of inscription, linear graduation, plastic case, 1.344 in. w by 1.594 in. sq, 2 screw stud terminals, accuracy $\pm 2\%$, black scale markings on white background; Communication Electronics, Inc. 1633.	Tuning meter	M1				1	5-2
P1	CONNECTOR, plug, electrical: Type BNC; per MIL-C-3608.	Connects W1 to J12	P1, P3, P4, P5, P7, P8, P9, P24, P25, P27, P28, P29, P30, P31, P35, P38, P39, P40	UG88E/U		5935-149-4066	18	5-1
P2	CONNECTOR, plug, electrical: Type BNC; per MIL-C-3608.	Connects W1 to A1J1.	P2, P6, P34	UG913A/U			3	5-2

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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P3	CONNECTOR, Same as P1.	Connects W2 to J11.						5-2
P4	CONNECTOR, Same as P1.	Connects W2 to J16.						5-1
P5	CONNECTOR, Same as P1.	Connects W3 to J13.						5-1
P6	CONNECTOR, Same as P2.	Connects W3 to A2J1.						5-1
P7	CONNECTOR, Same as P1.	Connects W4 to J15.						5-1
P8	CONNECTOR, Same as P1.	Connects W4 to J20.						5-2
P9	CONNECTOR, Same as P1.	Connects W12 to A4J1.						5-2
P10	CONNECTOR, Same as A5P2.	Connects W7 to A1J3.						5-2
P11	CONNECTOR, Same as A5P2.	Connects W7 to A7J1.						5-2
P12	CONNECTOR, Same as A5P2.	Connects W10 to A1J4.						5-2
P13	CONNECTOR, plug, electrical: 1 female contact, 1 connector mating end, low-loss plastic dielectric material, 50 ohms impedance, straight 0.234 in. dia by 0.593 in. lg, screw-on type; Amphenol 27-7.	Connects W10 to A6J3.	P13, P14, P15, P17, P18, P19, P22, P36, P37				9	5-1
P14	CONNECTOR, Same as P13.	Connects W6 to A1J2.						5-2
P15	CONNECTOR, Same as P13.	Connects W6 to A2J2.						5-2
P16	CONNECTOR, Same as A5P2.	Connects W8 to A3J2.						5-1
P17	CONNECTOR, Same as P13.	Connects W8 to A6J1.						5-1
P18	CONNECTOR, Same as P13.	Connects W9 to A4J2.						5-2

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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P19	CONNECTOR, Same as P13.	Connects W9 to A6J2.						5-1
P20	CONNECTOR, Same as A5P2.	Connects W11 to A7J2.						5-2
P21	CONNECTOR, Same as A5P2.	Connects W11 to A8J1.						5-1
P22	CONNECTOR, Same as P13.	Connects W14 to A8J2.						5-1
P23	CONNECTOR, Same as A5P2.	Connects W14 to A5J1.						5-2
P24	CONNECTOR, Same as P1.	Connects W17 to A1J5.						5-2
P25	CONNECTOR, Same as P1.	Connects W7 to A13J1.						5-2
P26	NOT USED	-----						
P27	CONNECTOR, Same as P1.	Connects W18 to A13J2						5-1
P28	CONNECTOR, Same as P1.	Connects W18 to A2J4.						5-2
P29	CONNECTOR, Same as P1.	Connects W19 to A3J3.						5-3
P30	CONNECTOR, Same as P1.	Connects W19 to A14J2						5-1
P31	CONNECTOR, Same as P1.	Connects W16 to J14.						5-2
P32	CONNECTOR, Same as A5P2.	Connects cable from A7J3 to relay K5.						5-2
P33	CONNECTOR, Same as A5P2.	Connects cable from A7J4 to relay K5.						5-2
P34	CONNECTOR, Same as P2.	Connects W20 to A4J3.						5-1
P35	CONNECTOR, Same as P1.	Connects W20 to A14J1						5-1
P36	CONNECTOR, Same as P13.	Connects W22 to A8J3.						5-1

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED CONTRACT NO. DA18-119-AMC-02499(X)

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P37	CONNECTOR, Same as P13.	Connects W21 to A7J5.						5-2
P38	CONNECTOR, Same as P1.	Connects W5 to J19.						5-2
P39	CONNECTOR, Same as P1.	Connects W5 to A3J1.						5-2
P40	CONNECTOR, Same as P1.	Connects W12 to J21.						5-2
P41	CONNECTOR, plug, electrical: 1 mating end, straight aluminum shell, 3 contact positions, synthetic rubber dielectric, quick-disconnect push-pull type with cable clamp, 2.093 in. by 0.812 in. by 0.719 in. o/a dim; Deutsch DM9702-3S.	AC quick-disconnect plug.	P41				1	---
P42	CORD ASSEMBLY, electrical: 3 no. 18 awg wire size conductors, separately insulated, rubber jacketed, 7 amp, 125 v rating, one end terminated with connector plug Cornish no. 72, other end unprocessed, 6 ft length; Cornish 01753-001.	AC input plug.	P42			5995-226-0491	1	---
Q1	TRANSISTOR: Germanium, power type; EIA designation 2N1544.	Series regulator	Q1			5960-833-6322	1	5-2
R1	RESISTOR, Same as A5A1R19.	Extends range of R2.						5-3
R2	RESISTOR, Same as A5R2.	Fine tuning control.						5-3
R3	RESISTOR, fixed, composition: 1 meg $\pm 5\%$, 1/4W; per MIL-R-11.	Extends range of R4.	R3	RC07GF105J		5905-681-8817	1	5-2
R4	RESISTOR, variable: 500K, $\pm 10\%$, 2W; per MIL-R-94.	BFO tuning control.	R4	RV4NAYS-504A		5905-553-2023	1	5-2

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R5	RESISTOR, fixed, composition: 180K, $\pm 5\%$, 1/4W; per MIL-R-11.	Part of a voltage divider.	R5, R11	RC07GF184J		5905-681-8819	2	5-2
R6	RESISTOR, Same as A1R5.	Part of a voltage divider.						5-3
R7	RESISTOR, variable: 10K, $\pm 10\%$ 2W; per MIL-R-94.	RF gain control.	R7	RV4NAYS-103C		5905-552-3480	1	5-1
R8	NOT USED	-----						
R9	RESISTOR, variable: 1 section, 10K, $\pm 10\%$, 1/4W, linear taper, 0.500 in. dia by 0.375 in. lg with 0.875 in. shaft and 0.375 in. bushing, 3 solder lug terminals; Mallory 70-08461.	Video gain control.	R9				1	5-1
R10	RESISTOR, variable: 1 section, w/spst switch (S5), 100K $\pm 10\%$, 2W, linear taper, 1.156 in. dia by 0.812 in. lg body with 3/8-32 thd bushing 0.375 in. lg and 0.562 in. lg shaft, 3 solder lug terminals; Allen-Bradley JS1N056P104UA.	Audio gain control.	R10				1	5-1
R11	RESISTOR, Same as R5.	Part of a voltage divider.						5-3
R12	RESISTOR, fixed, composition: 62K $\pm 5\%$, 1/4W; per MIL-R-11.	Dropping	R12	RC07GF623J		5905-682-4104	1	5-2
R13	RESISTOR, fixed, composition: 470 ohms $\pm 5\%$, 2W; per MIL-R-11.	Part of a filter.	R13	RC42GF471J		5905-683-2242	1	5-3
R14	RESISTOR, Same as A2R18.	Part of a voltage divider.						5-1

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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R15	RESISTOR, Same as A5A1R19.	Part of a voltage divider.						5-1
R16	RESISTOR, fixed, wirewound: 250 ohms $\pm 2\%$, 5W, -55 to +275°C operating temp range, 0.320 in. by 0.647 in. by 0.600 in. o/a dim., 2 axial solder lug terminals; Dale RH5-251G.	Impedance matching.	R16				1	5-2
S1	SWITCH, rotary: 4 poles, 2-6 positions, 2 sections, 2 poles per section, 1 amp at 28 vdc, 0.5 amp at 115 vac, 1.187 in. dia by 0.800 in. lg body with 0.810 in. lg shaft; Communication Electronics, Inc. 1128-20.	Range switch.	S1, S2				2	5-3
S2	SWITCH, Same as S1.	Function switch.						5-2
S3	SWITCH, rotary: 6 poles, 2-6 positions, 1 section, 2 poles, 1 amp at 28 vdc, 0.5 amp at 115 vac, 1.187 in. dia by 0.500 in. lg body with 0.810 in. lg shaft; Communication Electronics, Inc. 1128-43.	Bandwidth	S3				1	5-1
S4	SWITCH, slide: 115/230 vac, 0.531 in. by 0.593 in. by 1.375 in. slide button type actuating mechanism, 6 solder lug terminals flange mounted; Muter 4633.	Power switch.	S4			5930-977-1760	1	5-3
S5	Part of R10.	Power ON/OFF switch						5-1

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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T1	TR NSFORMER, power, step-down and step-up: fully enclosed metal case, hermetically sealed, 115/230V, 50-400 cps single phase primary input, 3.000 in. by 3.500 in. by 3.250 in. body, 4 no. 8-32 mounting studs, 16 solder lug terminals; Communication Electronics, Inc. 10775.	rovides high and low voltages for input to rectifiers.	T1				1	5-2
TB1	TERMINAL BOARD: plastic, 8 terminals, screw type, barrier type, 0.406 in. by 0.875 in. by 3.750 in. o/a dim., 4 mounting holes; Cinch 8-140Y.	Provides access to band in use voltage and AGC.	TB1				1	5-3
W1	CABLE ASSEMBLY, radio frequency: single conductor, coaxial type RG55/U cable, UG88E/U and UG913/U connectors, 20.500 in. lg o/a dim; Communication Electronics, Inc. 30020-408.	Connects J12 to A1J1	W1				1	5-1
W2	CABLE ASSEMBLY, radio frequency: single conductor, coaxial type RG55/U cable, UG88E/U connector on each end, 9.500 in. lg o/a dim; Communication Electronics, Inc. 30020-409.	Connects J16 to J11.	W2				1	5-2
W3	CABLE ASSEMBLY, radio frequency: single conductor, coaxial type RG55/U cable, UG88E/U and UG913/U connectors, 17.500 in. lg o/a dim; Communication Electronics, Inc. 30020-410.	Connects J13 to A2J1	W3				1	5-1

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
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W4	CABLE ASSEMBLY, radio frequency single conductor, coaxial type RG55/U cable, UG88E/U connector on each end, 5.500 in. lg o/a dim; Communication Electronics, Inc. 30020-411.	Connects J15 to J20.	W4				1	5-1
W5	CABLE ASSEMBLY, radio frequency single conductor, coaxial type RG55/U cable, UG88E/U connector on each end, 11.500 in. lg o/a dim; Communication Electronics, Inc. 30020-412.	Connects J19 to A3J1.	W5				1	5-2
W6	CABLE ASSEMBLY, radio frequency single conductor, coaxial type RG174/U cable, Amphenol 27-7 connector on each end, 3.125 in. lg o/a dim; Communication Electronics, Inc. 30020-413.	Connects A1J2 to A2J2.	W6				1	5-2
W7	CABLE ASSEMBLY, radio frequency single conductor, coaxial type RG174/U cable, Amphenol 27-26 connector on each end, 14.00 in. lg o/a dim; Communication Electronics, Inc. 30020-414.	Connects A1J3 to A7J1.	W7				1	5-2
W8	CABLE ASSEMBLY, radio frequency single conductor, coaxial type RG174/U cable, Amphenol 27-7 and 27-26 connectors, 2.750 in. lg o/a dim; Communication Electronics, Inc. 30020-415.	Connects A3J2 to A6J1.	W8				1	5-1

IDENTIFICATION TABLE OF PARTS

		CONTRACTOR COMMUNICATION ELECT ONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
W9	CABLE ASSEMBLY, radio frequency: single conductor, coaxial type RG174/U cable, Amphenol 27-7 connector on each end, 9.250 in. lg o/a dim; Communication Electronics, Inc. 30020-416.	Connects A4J2 to A6J2.	W9				1	5-1
W10	CABLE ASSEMBLY, radio frequency: single conductor, coaxial type RG174/U cable, Amphenol 27-7 and 27-26 connectors, 10.000 in. lg. o/a dim; Communication Electronics, Inc. 30020-417.	Connects A1J4 to A6J3.	W10				1	5-1
W11	CABLE ASSEMBLY, radio frequency: single conductor, coaxial type RG174/U cable, Amphenol 27-26 connector on each end, 14.250 in. lg o/a dim; Communication Electronics, Inc. 30020-418.	Connects A7J2 to A8J1.	W11				1	5-1
W12	CABLE ASSEMBLY, radio frequency: single conductor, coaxial type RG55/U cable, UG88E/U connector on each end, 7.250 in. lg o/a dim; Communication Electronics, Inc. 30020-419.	Connects J21 to A4J1.	W12				1	5-2
W13	CABLE ASSEMBLY, power, electrical: cord assembly, electrical, P42 with connector plug, electrical P41 attaching to one end; Communication Electronics, Inc. 12840.	AC input cable.	W13				1	---

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
W14	CABLE ASSEMBLY, radio frequency; single conductor coaxial type RG174/U cable, Amphenol 27-7 and 27-26 connectors, 14.000 in. lg o/a dim; Communication Electronics, Inc. 30020-127.	Connects A8J2 to A5J1.	W14				1	5-1
W15	NOT USED	-----						
W16	CABLE ASSEMBLY, radio frequency; single conductor, coaxial type RG55/U cable, UG1052/U and UG88E/U connectors, 12.375 in. lg o/a dim; Communication Electronics, Inc. 30020-420.	Connects J1 to J14.	W16				1	5-2
W17	CABLE ASSEMBLY, radio frequency; single conductor, coaxial type RG55/U cable, UG88E/U connector on each end, 19.500 in. lg o/a dim; Communication Electronics, Inc. 30020-421.	Connects A1J5 to A13J1.	W17				1	5-2
W18	CABLE ASSEMBLY, radio frequency; single conductor, coaxial type RG55/U cable, UG88E/U connector on each end, 20.000 in. lg o/a dim; Communication Electronics, Inc. 30020-422.	Connects A2J4 to A13J2.	W18				1	5-1
W19	CABLE ASSEMBLY, radio frequency; single conductor, coaxial type RG55/U cable, UG88E/U connector on each end, 14.500 in. lg o/a dim; Communication Electronics, Inc. 30020-423.	Connects A3J3 to A14J2.	W19				1	5-1

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
W20	CABLE ASSEMBLY, radio frequency; single conductor, coaxial type RG55/U cable, UG913/U and UG88E/U connectors, 7.000 in. lg o/a dim; Communication Electronics, Inc. 30020-424.	Connects A4J3 to A14J1.	W20				1	502
W21	CABLE ASSEMBLY, radio frequency; single conductor, coaxial type RG174/U cable, Amphenol 17825 and 27-7 connectors, 11.500 in. lg o/a dim; Communication Electronics, Inc. 30020-425.	Connects A7J5 to J18.	W21				1	5-3
W22	CABLE ASSEMBLY, radio frequency; single conductor, coaxial type RG174/U cable, Amphenol 17825 and 27-7 connectors, 4.500 in. lg o/a dim; Communication Electronics, Inc. 30020-426.	Connects A8J3 to J17.	W22				1	5-1
XA9	CONNECTOR, receptacle, electrical: printed wiring board type, 8 contacts, 1 connector mating end, arc resistant plastic dielectric, 0.453 in. by 1.000 in. by 2.875 in. o/a dim; flange mounted, 8 solder lug terminals; Elco 00-5002-008-103-002.	Mounts A9.	XA9				1	5-1
XA10	CONNECTOR, receptacle, electrical; printed wiring board type, 13 contacts, 1 connector mating end, arc resistant plastic dielectric, 0.453 in. by 1.000 in. by 3.875 in. o/a dim, flange mounted, 13 solder lug terminals; Elco 00-5002-013-103-002.	Mounts A10.	XA10				1	5-1

CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED						CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
XA12	CONNECTOR, receptacle, electrical: printed wiring board type, 18 contacts, 1 connector mating end, arc resistant plastic dielectric, 0.453 in. by 1.000 in. by 4.875 in. o/a dim., flange mounted, 18 solder lug terminals; Elco 00-5002-018-103-002.	Mounts A12.	XA12					1 5-3
XDS1	LAMPHOLDER: accommodates 1 miniature bayonet base lamp, 125V, cad plated steel shell, 2 solder lug terminals clip mounted; Dialight 7-02.	Mounts DS1.	XDS1, XDS2, XDS3, XDS4			6250-299-7170	4	5-3
XDS2	LAMPHOLDER, Same as XDS1.	Mounts DS2.						5-3
XDS3	LAMPHOLDER, Same as XDS1.	Mounts DS3.						5-3
XDS4	LAMPHOLDER, Same as XDS1.	Mounts DS4.						5-3
XF1	FUSEHOLDER: per MIL-F-19207.	Mounts F1.	XF1, XF2	FHN26G		5920-892-9311	2	5-3
XF2	FUSEHOLDER, Same as XF1.	Mounts F2.						5-3
XF3	FUSEHOLDER: block type, accommodates one type F02 fuse, phosphor bronze clip type contacts, plastic base, 2 solder lug terminals 0.500 in. by 0.656 in. by 1.562 in. o/a dim; Littelfuse 357001.	Mounts F3.	XF3				1	5-3

		CONTRACTOR COMMUNICATION ELECTRONICS INCORPORATED				CONTRACT NO. DA18-119-AMC-02499(X)		
REF. SYM. OR PART NUMBER (1)	NAME OF PARTS OR DESCRIPTION (2)	FUNCTION (3)	ALL SYMBOLS AND PART NUMBERS INVOLVED (4)	JAN OR MIL TYPE NUMBER (5)	MAN-AGER (6)	FEDERAL STOCK NUMBER (7)	TOTAL NUMBER PARTS PER END ITEM (8)	REF FIGURE (9)
XQ1	SOCKET, semiconductor device: 2 contacts, low-loss composition molded body 0.672 in. by 1.000 in. by 1.578 in. o/a dim., 3 solder lug terminals, mica chassis insulator included, mounted with two no. 2 screws with nuts and washers, Augat 8038-1G1.	Mounts Q1.					1	5-2

SECTION VI

SCHEMATIC DIAGRAMS

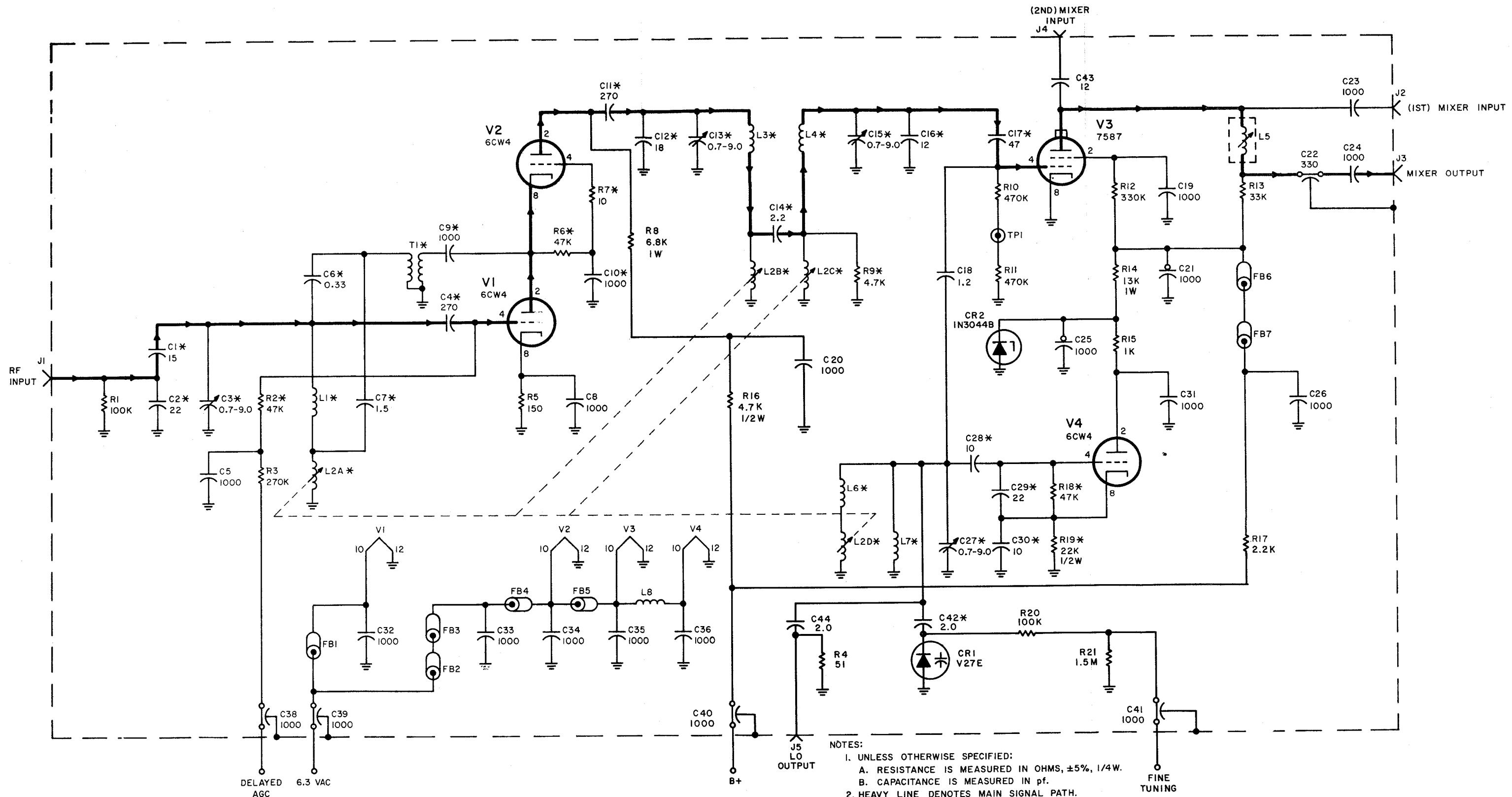
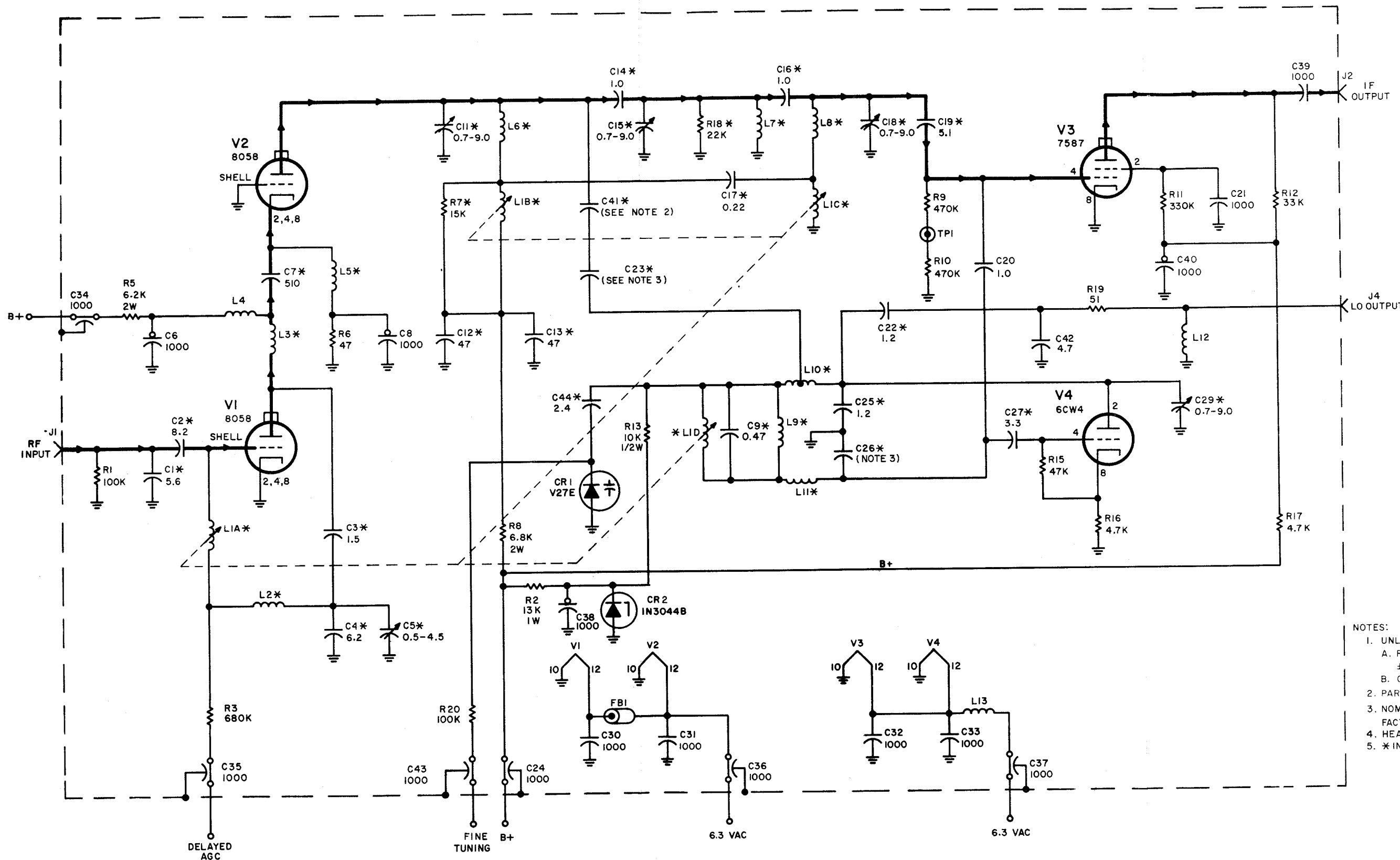


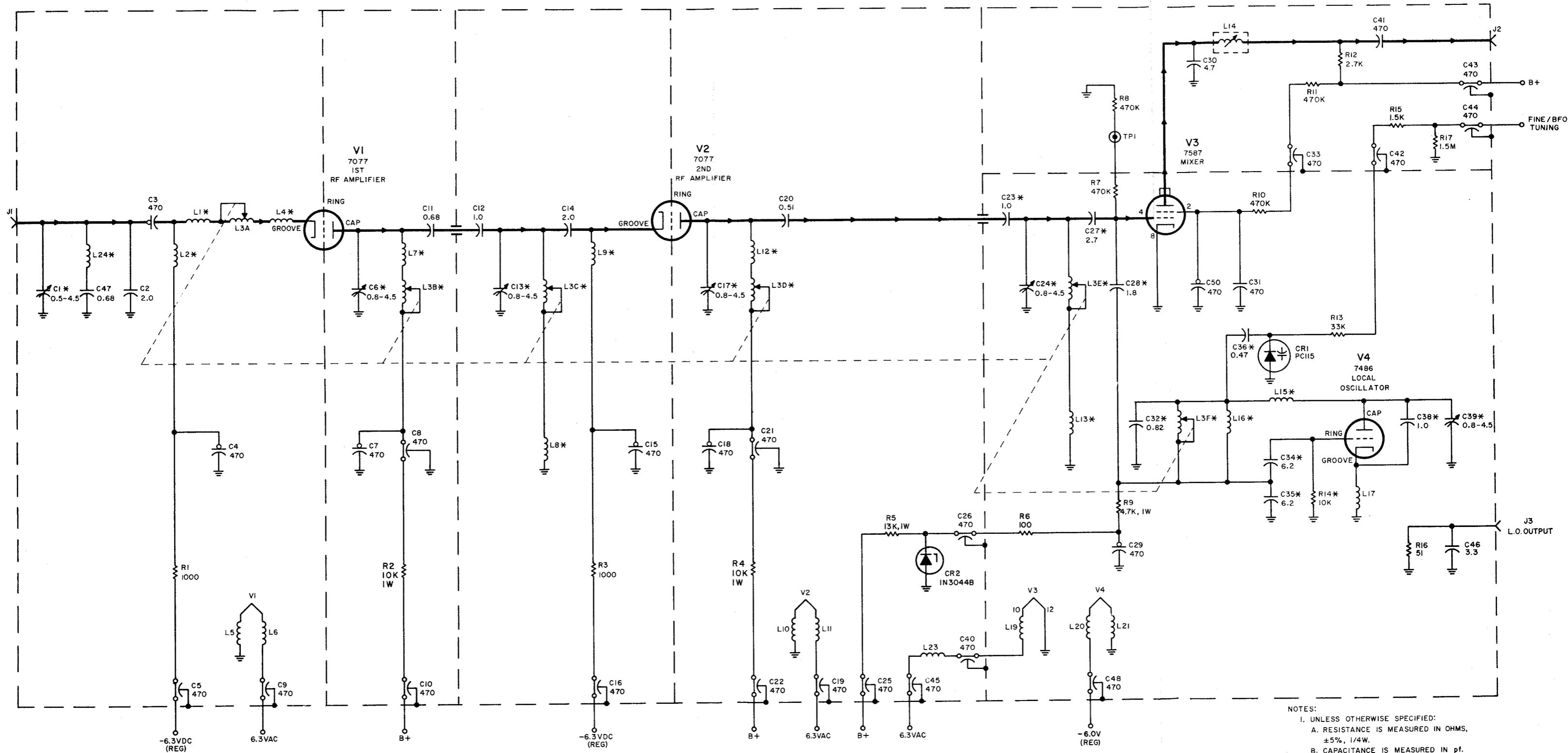
Figure 6-1. Type 7165 30-60 mc Tuner, Schematic Diagram



- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
 - A. RESISTANCE IS MEASURED IN OHMS, $\pm 5\%$, 1/4W.
 - B. CAPACITANCE IS MEASURED IN pf.
 2. PART OF CIRCUIT BOARD, CEI #1101.
 3. NOMINAL VALUE 2.7 pf; FINAL VALUE FACTORY SELECTED.
 4. HEAVY LINE DENOTES MAIN SIGNAL PATH.
 5. * INDICATES NON-MAINTENANCE ITEM.

Figure 6-2. Type 7164 60-300 mc Tuner, Schematic Diagram

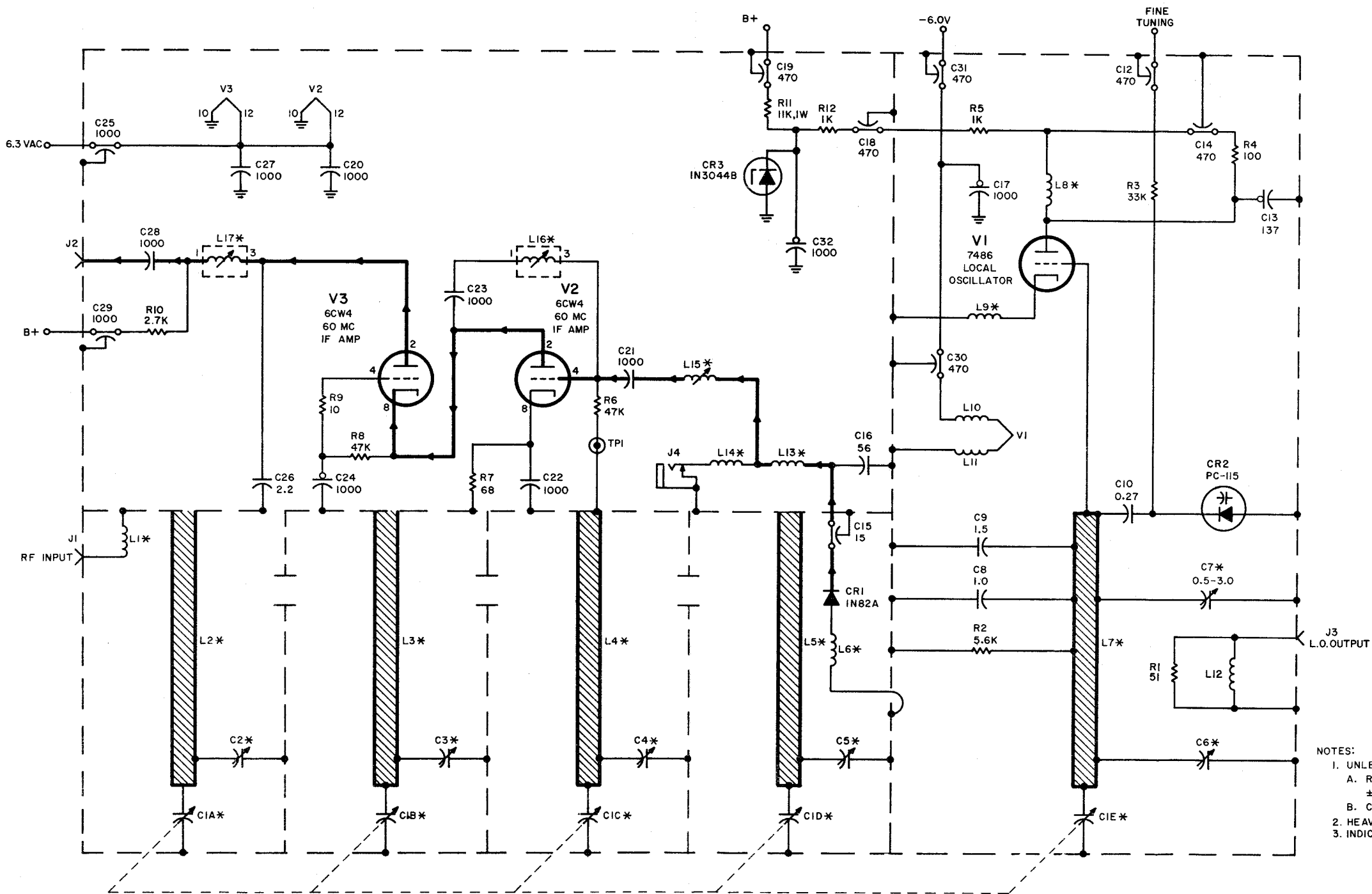
REF DESIG PREFIX A3



NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
 B. CAPACITANCE IS MEASURED IN pf.
 2. HEAVY LINE DENOTES MAIN SIGNAL PATH.
 3. INDICATES NON-MAINTENANCE ITEM.

Figure 6-3. Type 7162 235-500 mc Tuner, Schematic Diagram

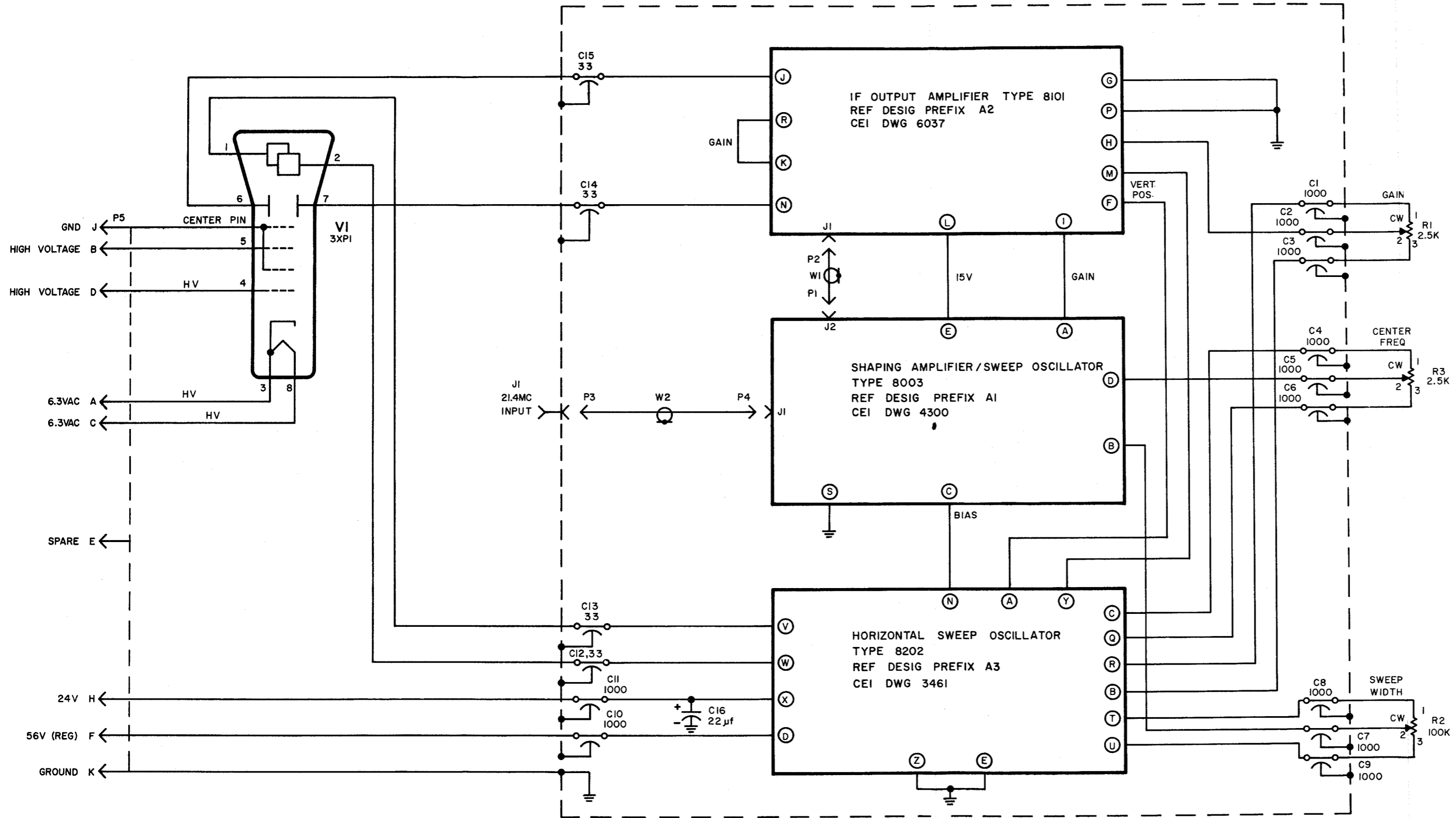
REF DESIG PREFIX A4



NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
 B. CAPACITANCE IS MEASURED IN pf.
 2. HEAVY LINE DENOTES MAIN SIGNAL PATH.
 3. INDICATES NON-MAINTENANCE ITEM.

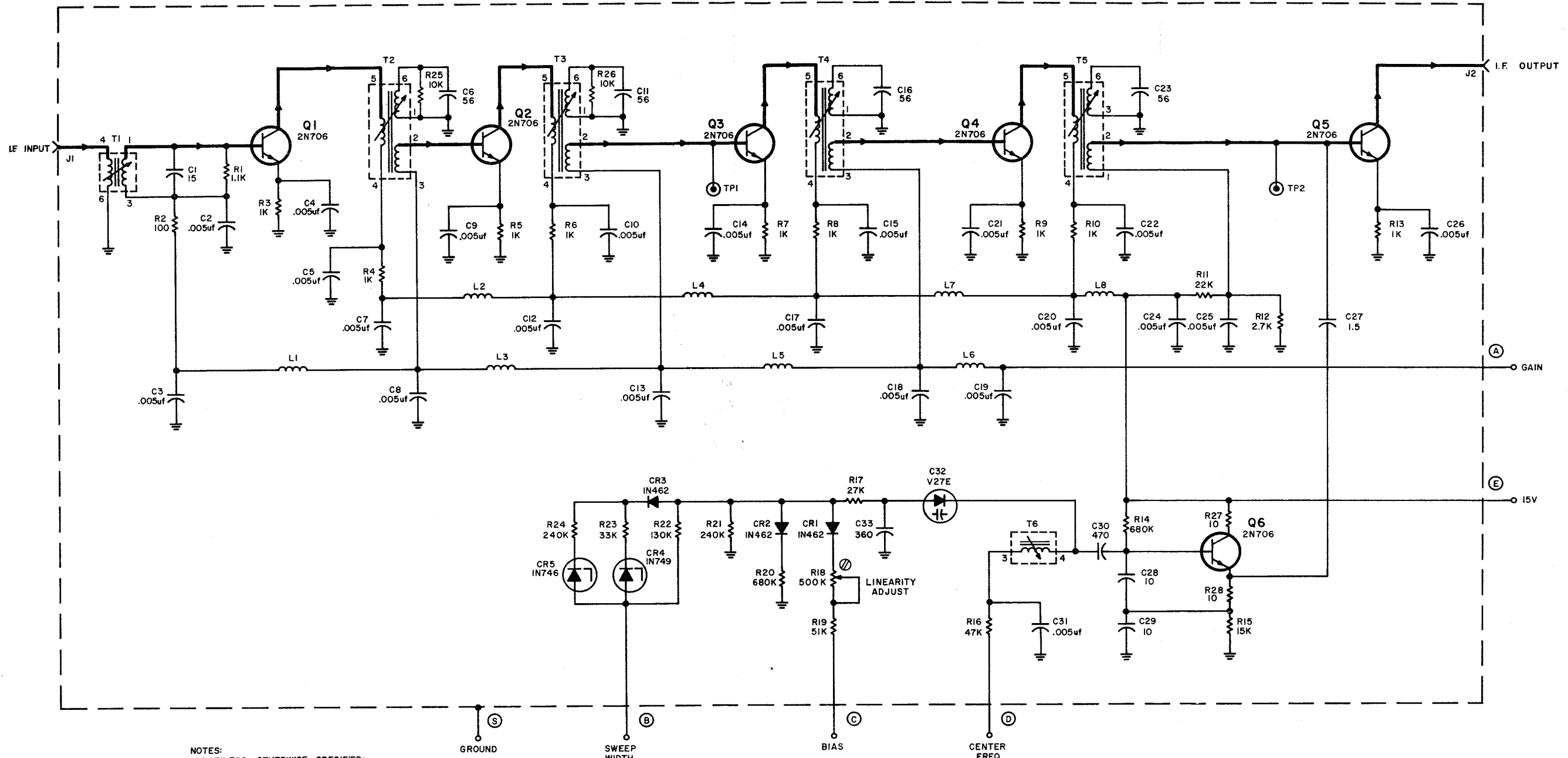
Figure 6-4. Type 7163 490-1000 mc Tuner, Schematic Diagram

REF DESIG PREFIX A5



NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 A) RESISTORS ARE IN OHMS $\pm 5\%$, 1/4W.
 B) CAPACITORS ARE IN pf.
 2. ENCIRCLED LETTERS ARE FOR REFERENCE ONLY.

Figure 6-5. Type 7930 Signal Monitor, Schematic Diagram



- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
 - a) ALL RESISTORS ARE IN OHMS $\pm 5\%$, 1/4W.
 - b) ALL CAPACITORS ARE IN pf.
 2. ENCIRCLED LETTERS ARE FOR REFERENCE ONLY.
 3. PRINTED CKT. ASSEMBLY REF. 10184.

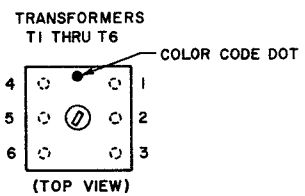
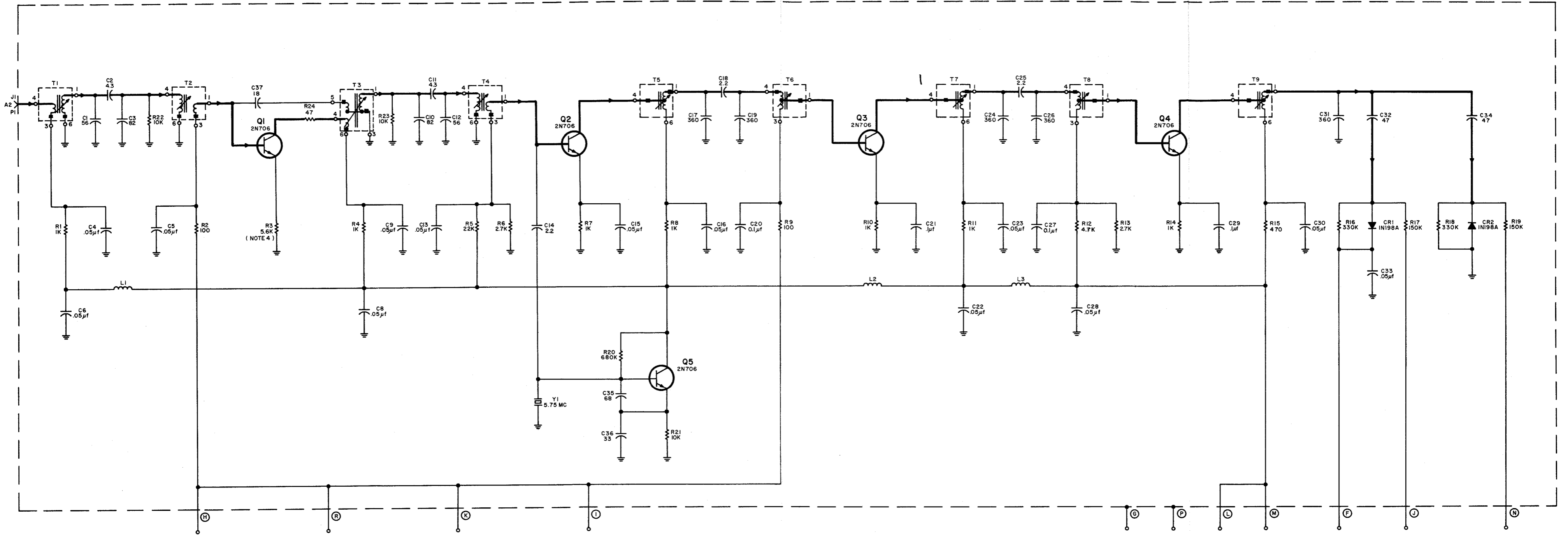


Figure 6-6. Type 8003 Shaping Amplifier/Sweep Oscillator, Schematic Diagram

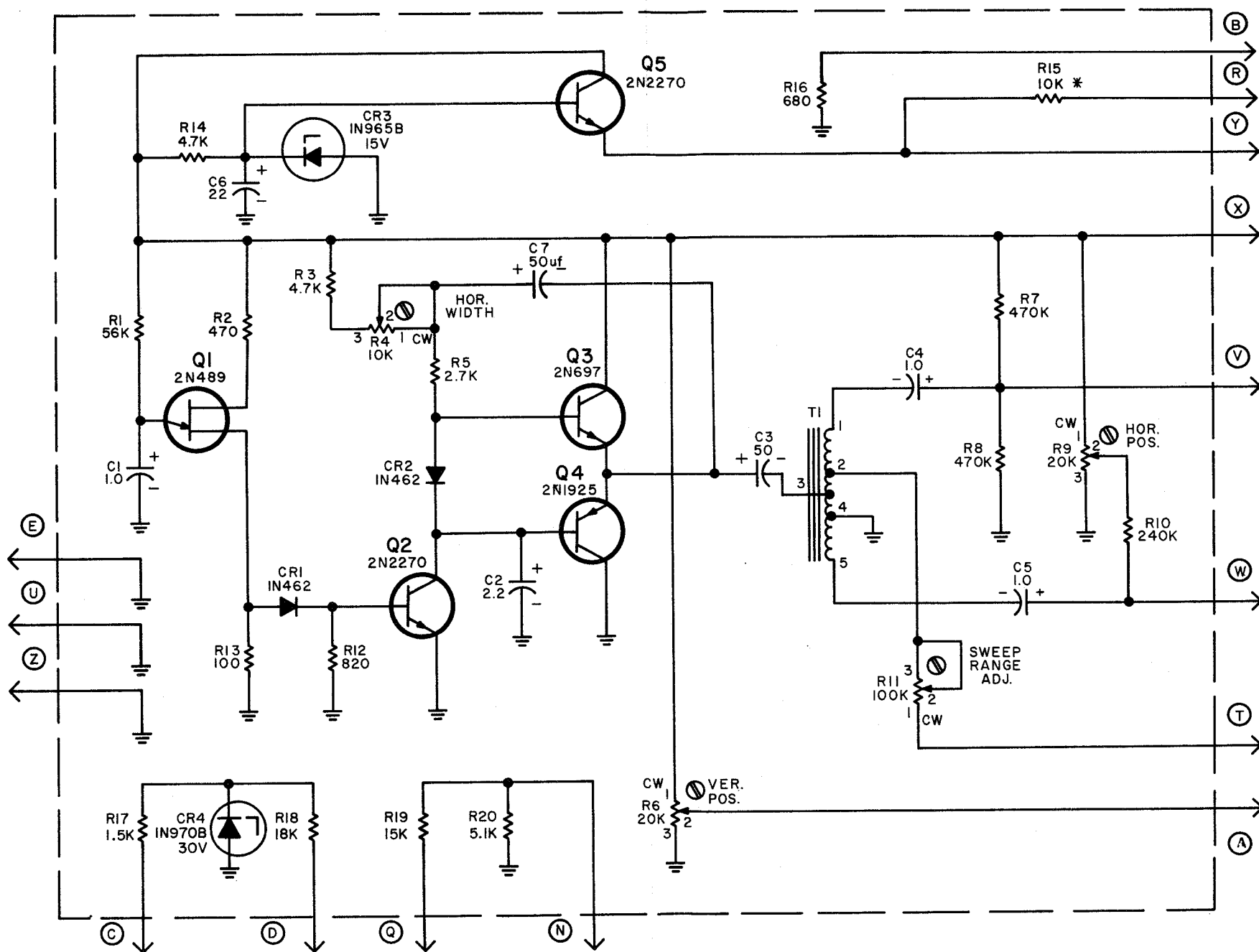
REF DESIG PREFIX A5A2



- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
A. RESISTORS ARE MEASURED IN OHMS,
±5%, 1/4W.
B. CAPACITORS ARE MEASURED IN μF.
 2. ENCIRCLED LETTERS ARE FOR REFERENCE ONLY.
 3. PRINTED CKT. ASSEMBLY REF 10250.
 4. NOMINAL VALUE. FINAL VALUE FACTORY SELECTED.

Figure 6-7. Type 8101 IF Output Amplifier. Schematic Diagram

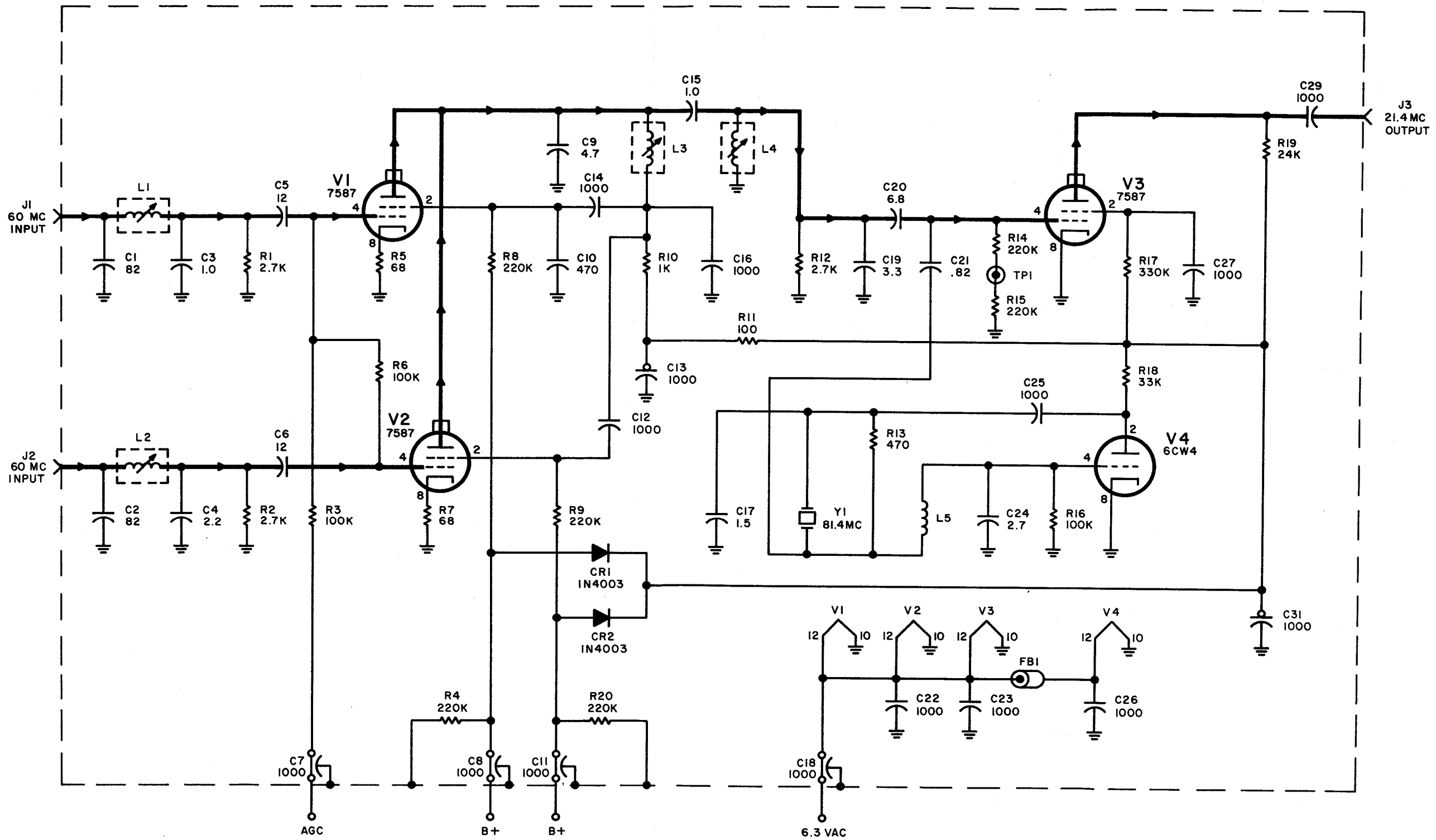
REF DESIG PREFIX A5A3



- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
A. RESISTORS ARE MEASURED IN OHMS,
5%, 1/4W.
B. CAPACITORS ARE MEASURED IN μ f.
 2. * INDICATES NOMINAL VALUE; ACTUAL VALUE
DETERMINED BY FACTORY.

Figure 6-8. Type 8202 Horizontal Sweep Oscillator, Schematic Diagram

REF DESIG PREFIX A6

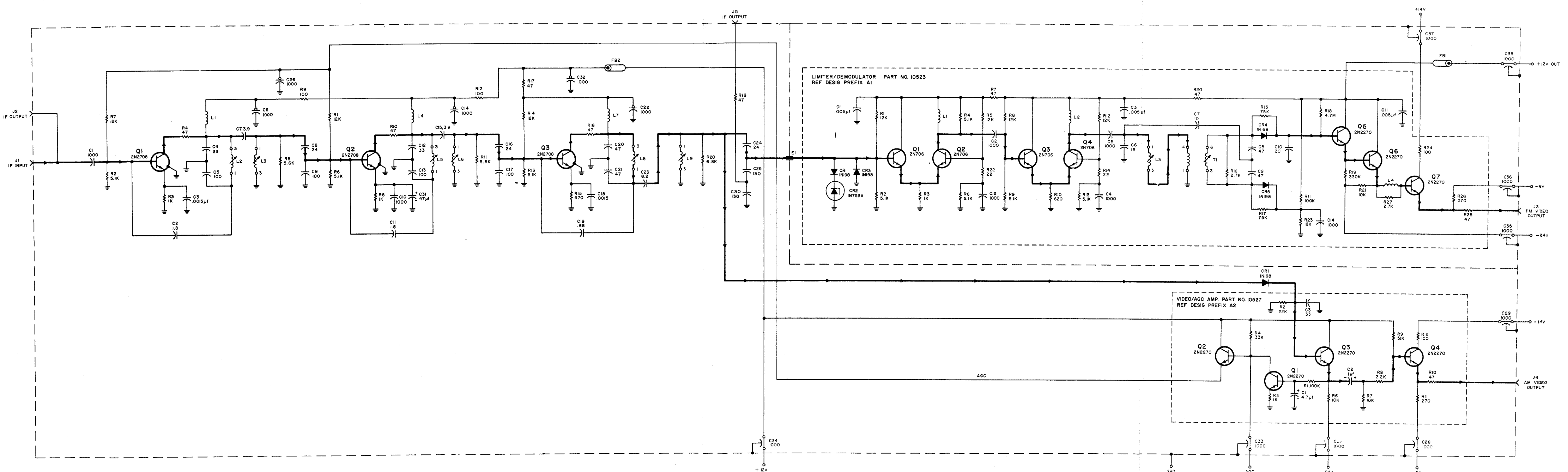


NOTES:

1. UNLESS OTHERWISE SPECIFIED:
 - a) RESISTANCE IS MEASURED IN OHMS, $\pm 5\%$, 1/4W.
 - b) CAPACITANCE IS MEASURED IN pf.
2. HEAVY LINE DENOTES MAIN SIGNAL PATH.

Figure 6-9. Type 7120 60-21.4 mc Converter, Schematic Diagram

REF DESIG PREFIX A7



NOTES
 1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS MEASURED IN OHMS ± 5%, 1/4W.
 b) CAPACITANCE IS MEASURED IN pF.
 2. HEAVY LINE DENOTES MAIN SIGNAL PATH

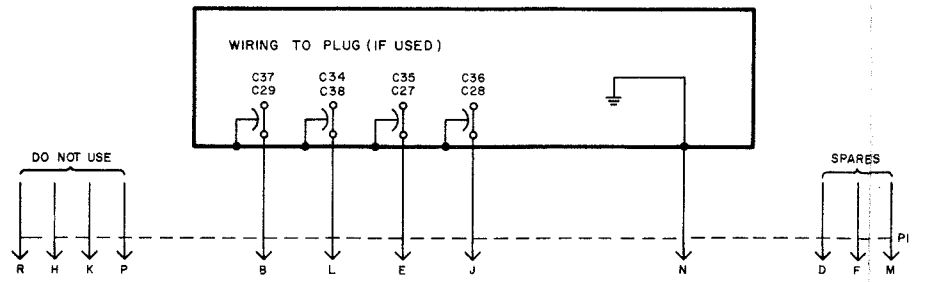


Figure 6-10. Type 72121 2-mc Bandwidth IF Strip, Schematic Diagram

REF DESIG PREFIX A8

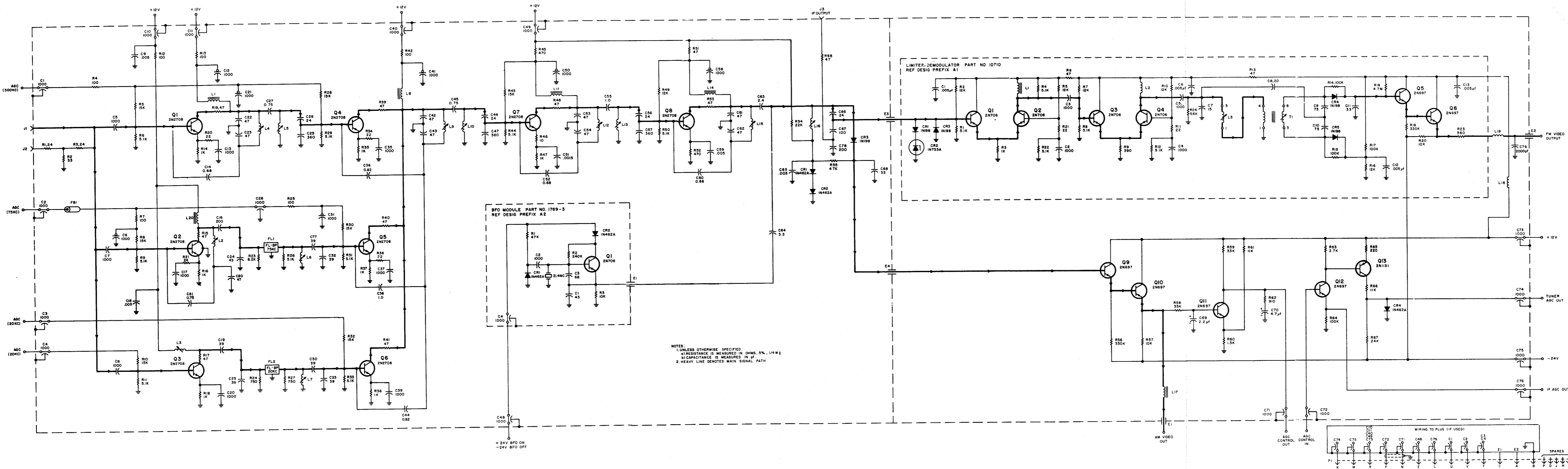
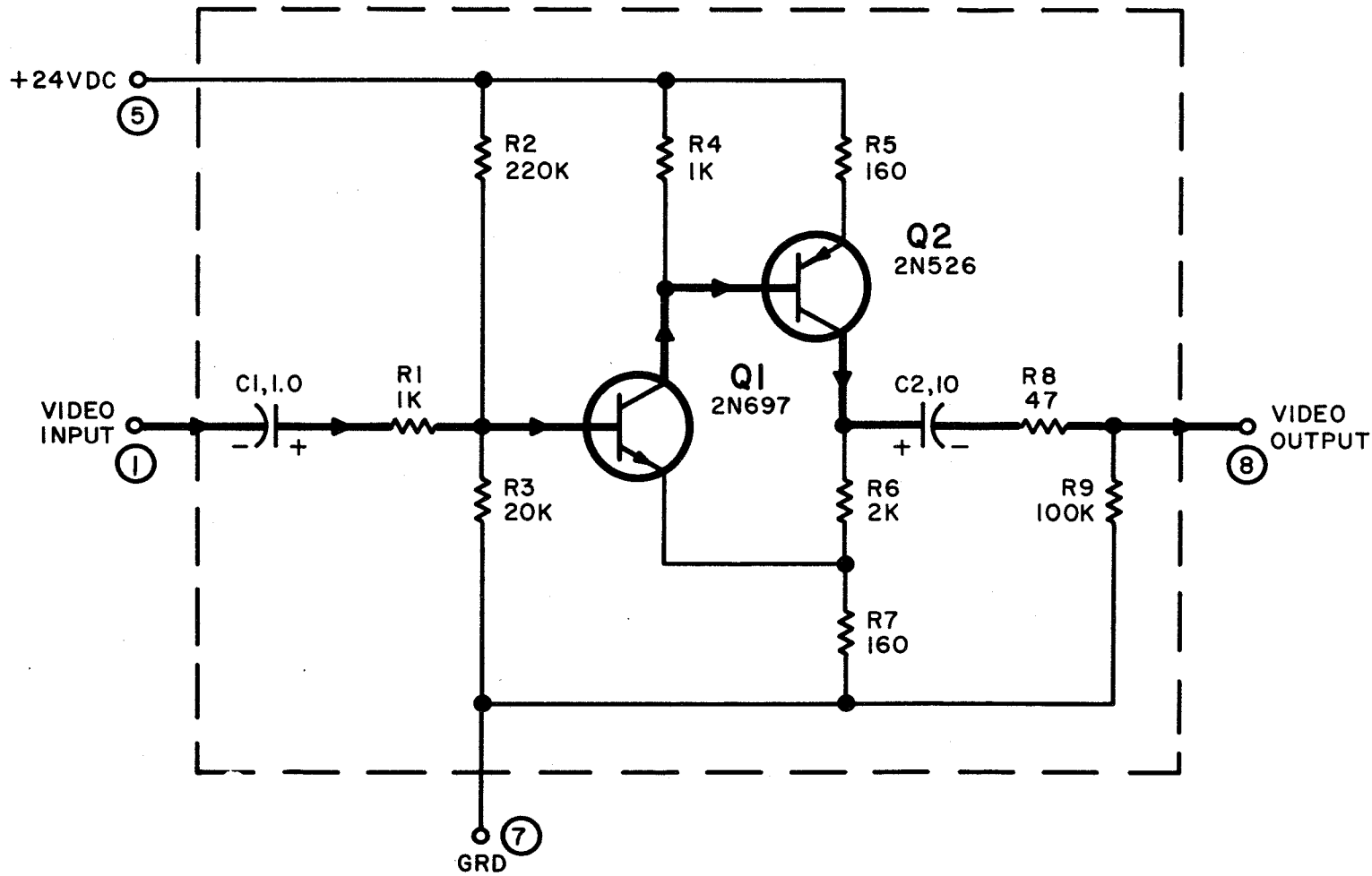


Figure 6-11. Type 72120 20/75/300-kc Bandwidth IF Strip, Schematic Diagram

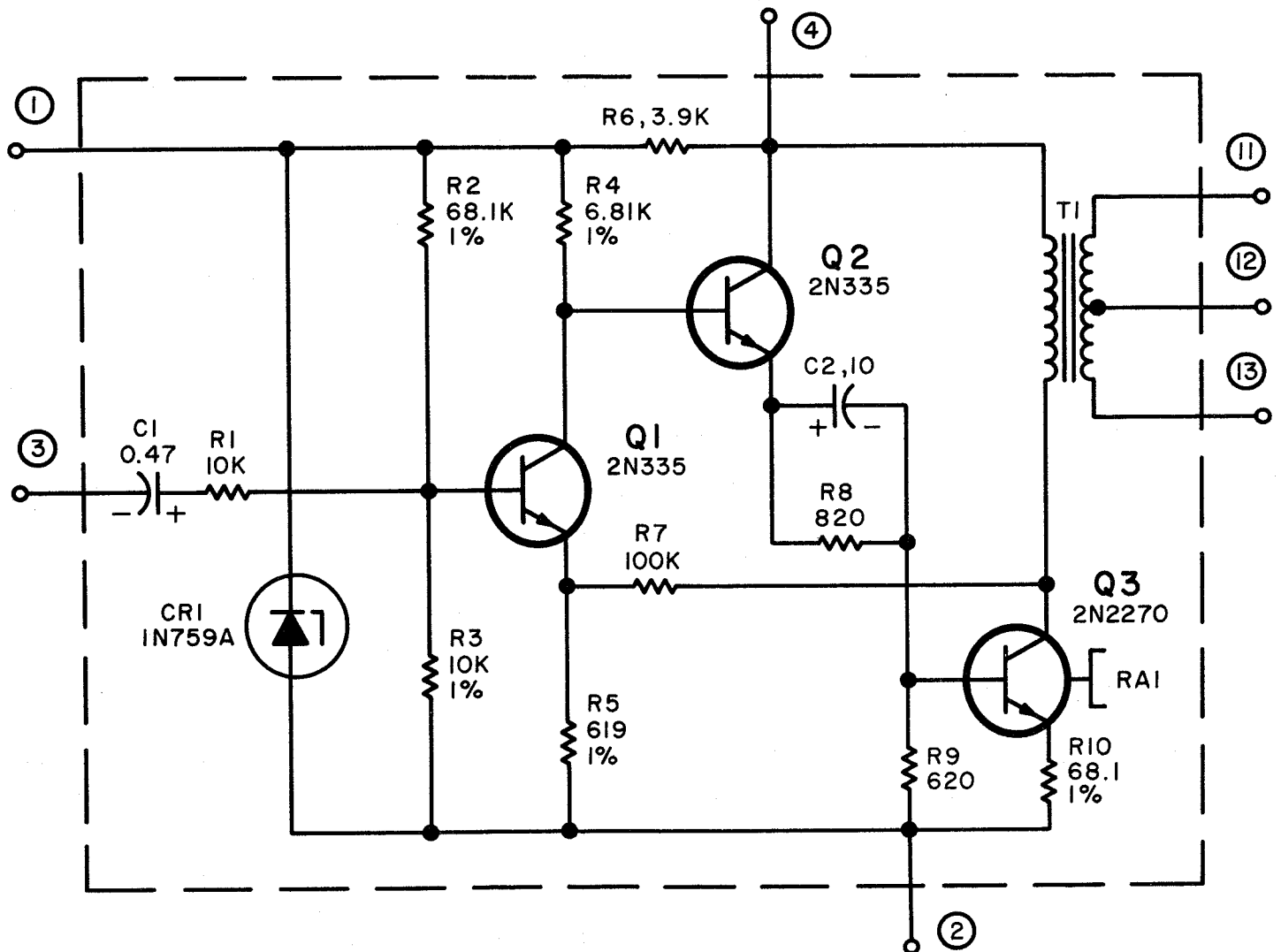
REF DESIG PREFIX A9



- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
 - a) RESISTANCE IS MEASURED IN OHMS, $\pm 5\%$, 1/4W.
 - b) CAPACITANCE IS MEASURED IN μf .
 2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
 3. HEAVY LINE DENOTES MAIN SIGNAL PATH.

Figure 6-12. Type 7312 Video Amplifier, Schematic Diagram

REF DESIG PREFIX A10



NOTES:

1. UNLESS OTHERWISE SPECIFIED:

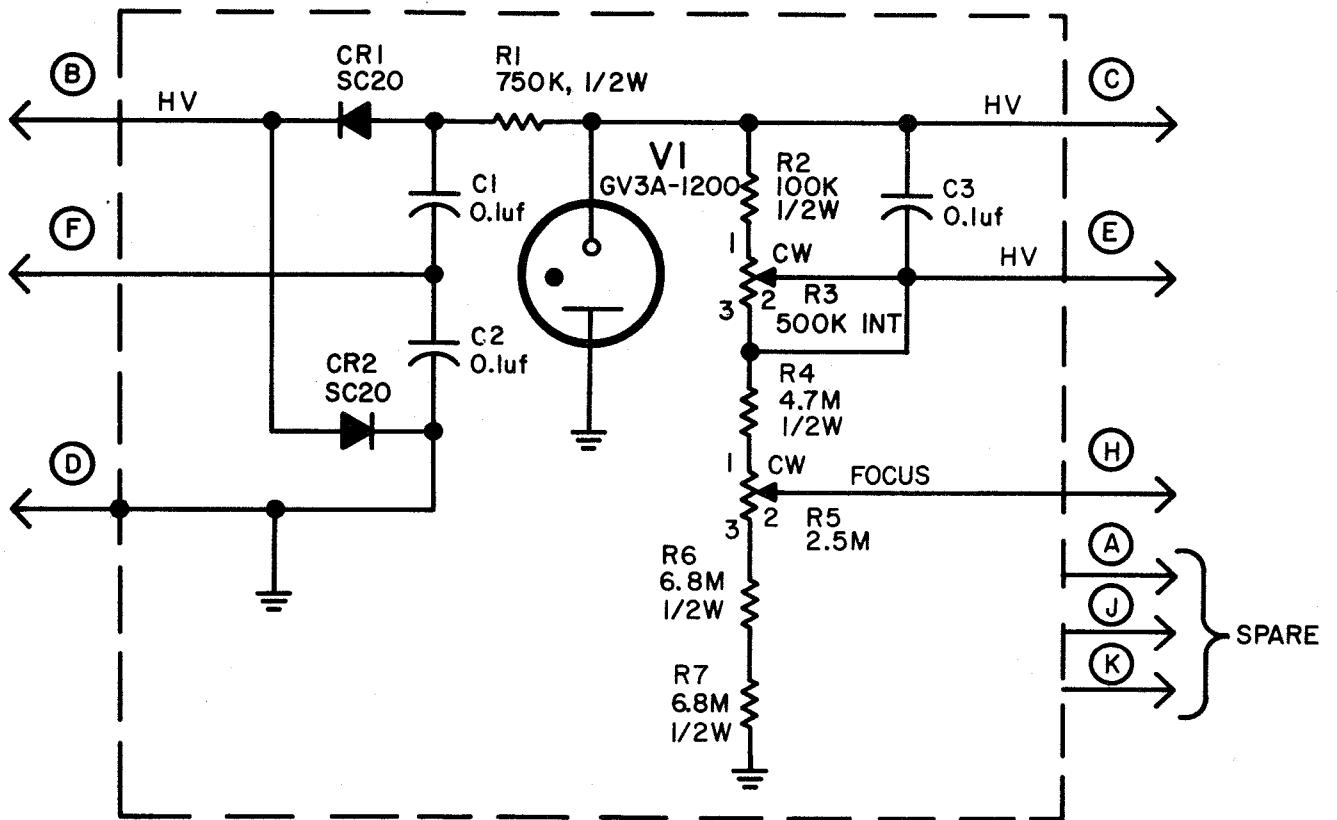
a) RESISTANCE IS MEASURED IN OHMS, $\pm 5\%$, 1/4W

b) CAPACITANCE IS MEASURED IN μf

2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS

Figure 6-13. Type 7400A Audio Amplifier, Schematic Diagram

REF DESIG PREFIX A11

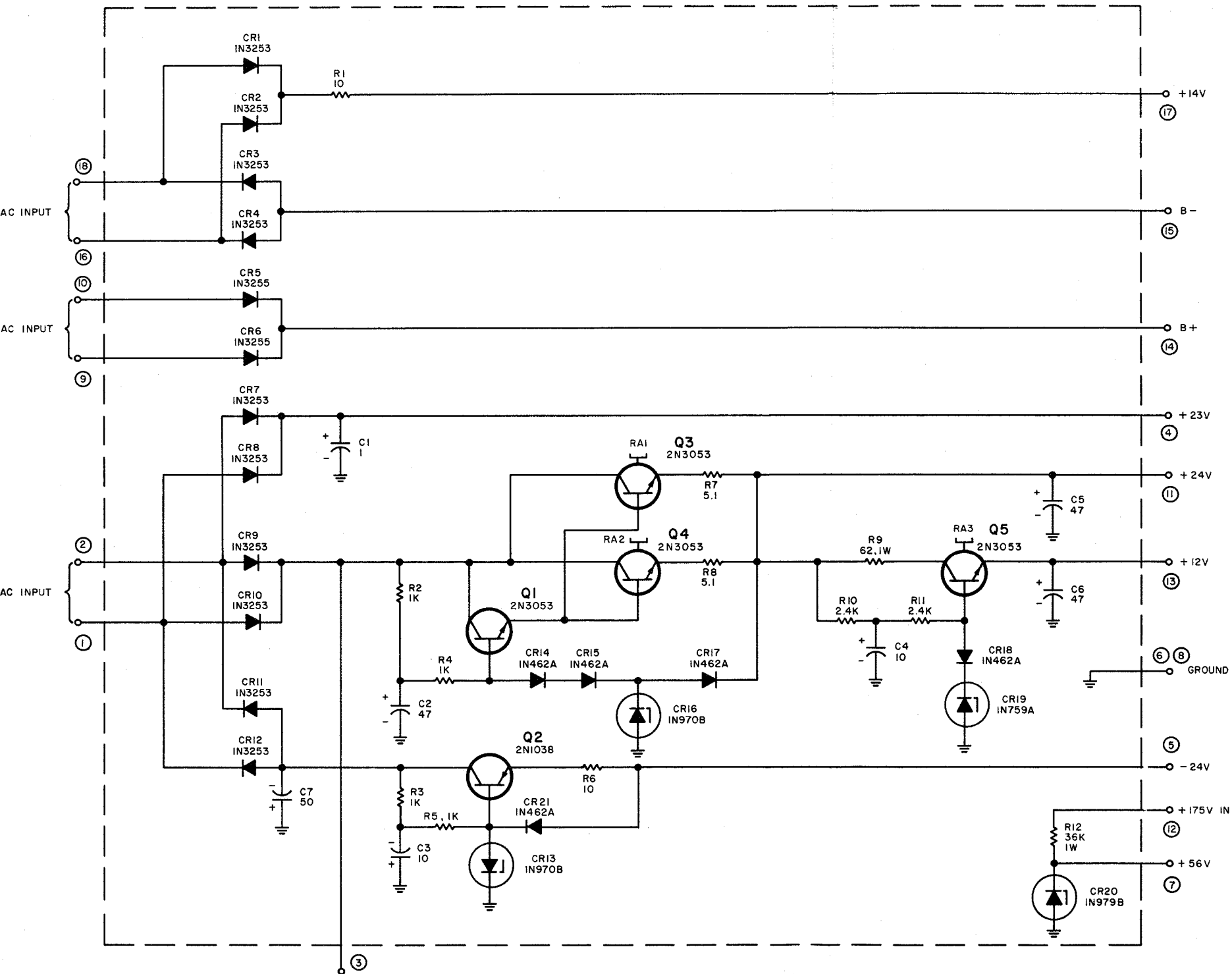


NOTES:

1. RESISTORS ARE MEASURED IN OHMS $\pm 5\%$, 1/4W.
2. ENCIRCLED NUMBERS ARE PIN NUMBERS IN PLUG PI.

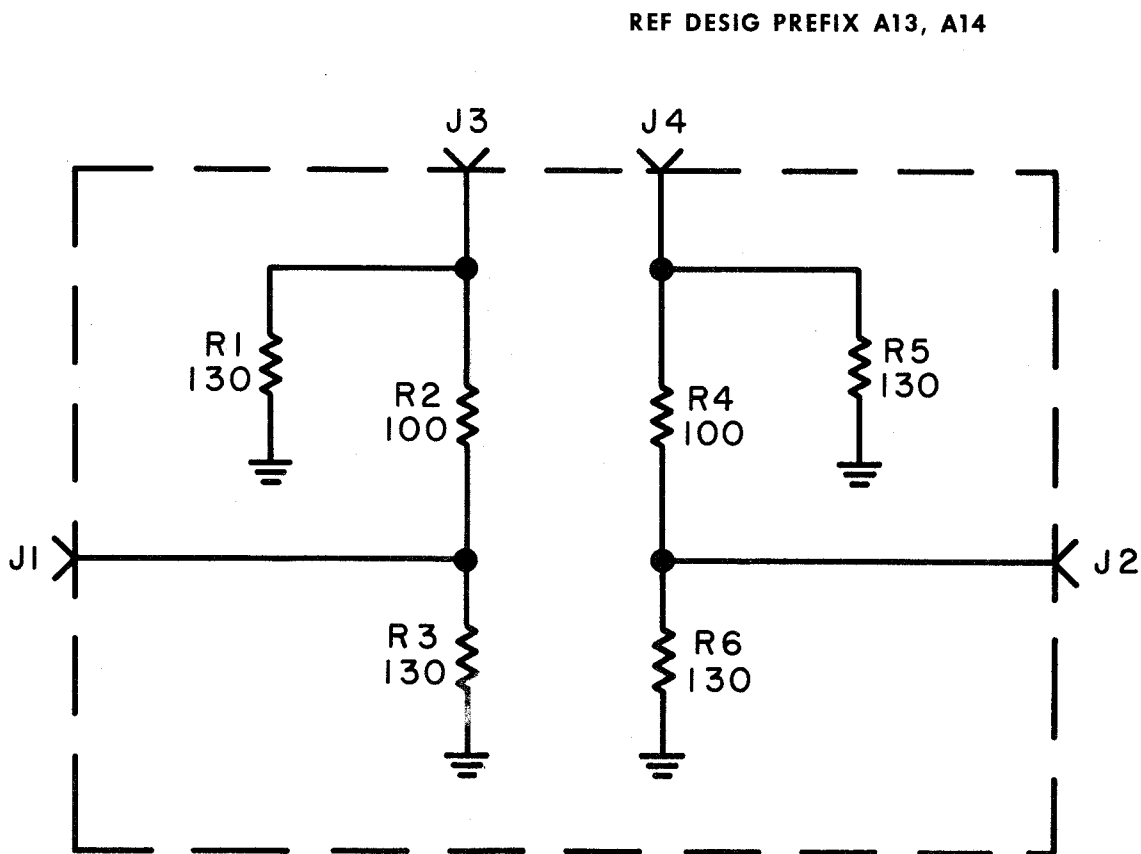
Figure 6-14. Type 7633 Power Supply Regulator (CRT), Schematic Diagram

REF DESIG PREFIX A12



NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS MEASURED IN OHMS $\pm 5\%$, 1/4W
 b) CAPACITANCE IS MEASURED IN μf .
 2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.

Figure 6-15. Type 7631 Power Supply Regulator (Gen.), Schematic Diagram

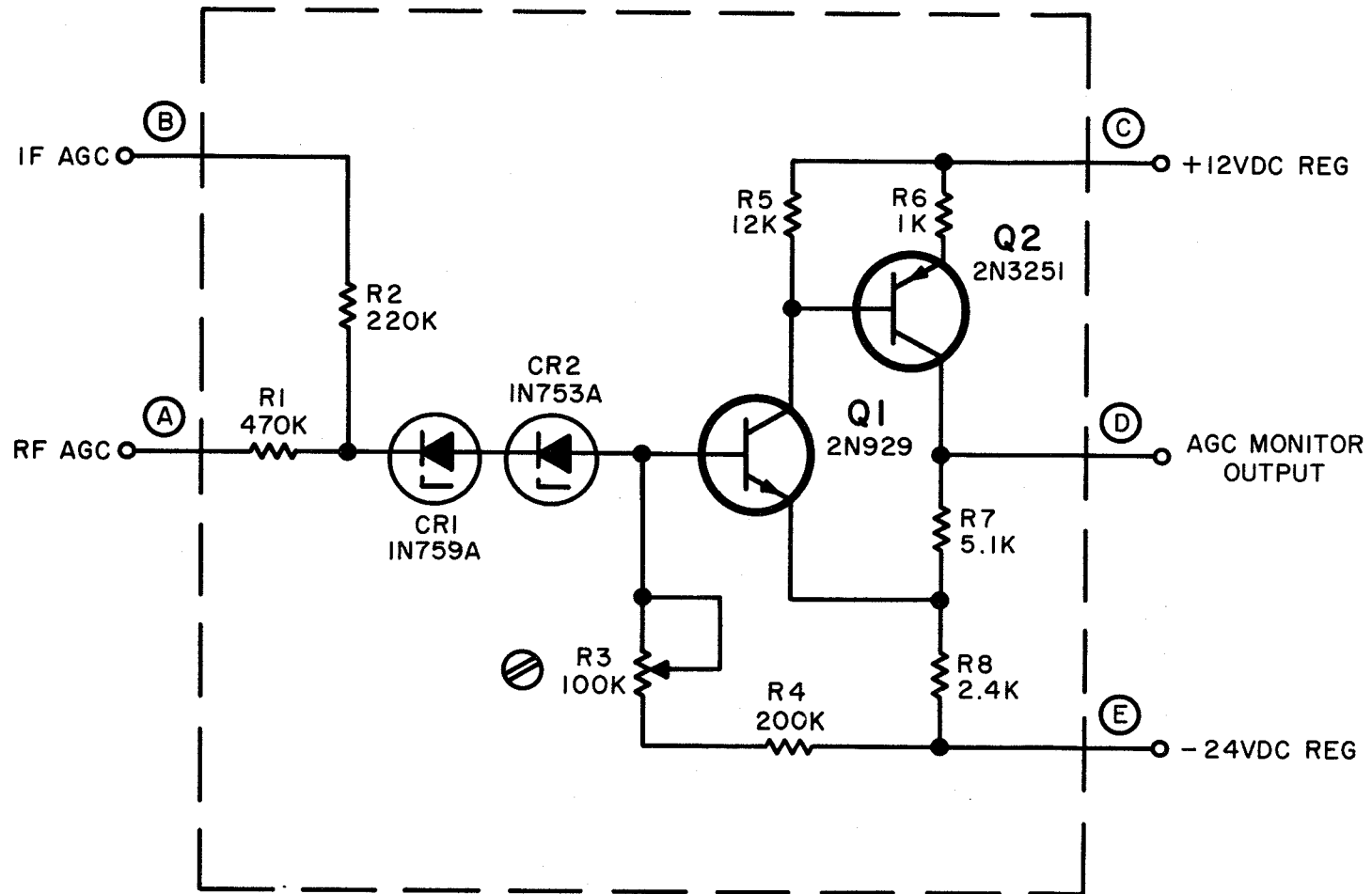


NOTE :

RESISTANCE IS MEASURED IN OHMS ,
±5% ,1/4W UNLESS OTHERWISE
SPECIFIED

Figure 6-16. Type 79125 Coupling Network, Schematic Diagram

REF DESIG PREFIX A15




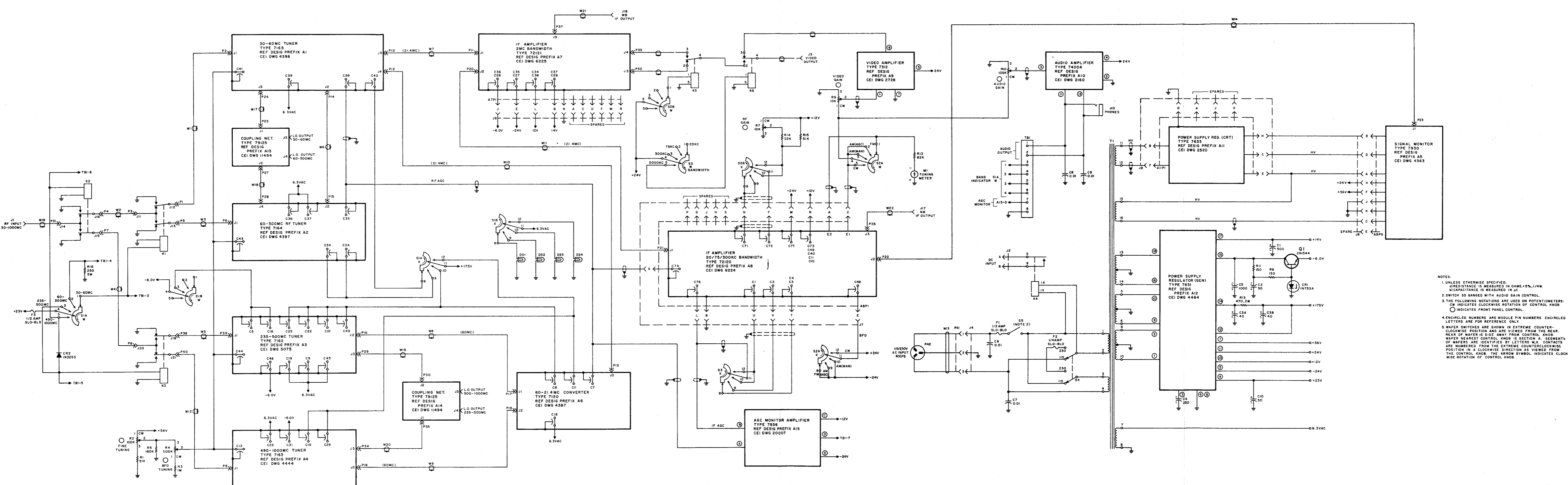
- NOTES:
1. RESISTANCE IS MEASURED IN OHMS, $\pm 5\%$, 1/4W UNLESS OTHERWISE SPECIFIED
 2. ENCIRCLED LETTERS ARE FOR REFERENCE ONLY
 3.  INDICATES SCREWDRIVER ADJUSTMENT

Figure 6-17. Type 7836 AGC Monitor Amplifier, Schematic Diagram



- NOTES:
- UNLESS OTHERWISE SPECIFIED, RESISTANCE IS MEASURED IN OHMS, 15% 1/4W.
 - CAPACITANCE IS MEASURED IN μ F.
 - SWITCH S5 GANGED WITH AUDIO GAIN CONTROL.
 - THE FOLLOWING NOTATIONS ARE USED ON POTENTIOMETERS:
 CW INDICATES CLOCKWISE ROTATION OF CONTROL KNOB
 CCW INDICATES COUNTERCLOCKWISE ROTATION OF CONTROL KNOB
 INDICATES FRONT PANEL CONTROL.
 - ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS. ENCIRCLED LETTERS ARE FOR REFERENCE ONLY.
 - WAFER SWITCHES ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION AND ARE VIEWED FROM THE REAR. REAR OF WAFER IS SIDE AWAY FROM CONTROL KNOB. WAFER NEAREST CONTROL KNOB IS SECTION A. SEGMENTS OF WAFERS ARE IDENTIFIED BY LETTERS W-X. CONTACTS ARE NUMBERED FROM THE EXTREME COUNTERCLOCKWISE POSITION IN A CLOCKWISE DIRECTION AS VIEWED FROM THE CONTROL KNOB. THE ARROW SYMBOL INDICATES CLOCKWISE ROTATION OF CONTROL KNOB.

Figure 6-18. Type AN/URR-52A Panoramic Data Receiving Set, Main Chassis Schematic Diagram