INSTRUCTION MANUAL
FOR
TYPE 775-3 RECEIVER

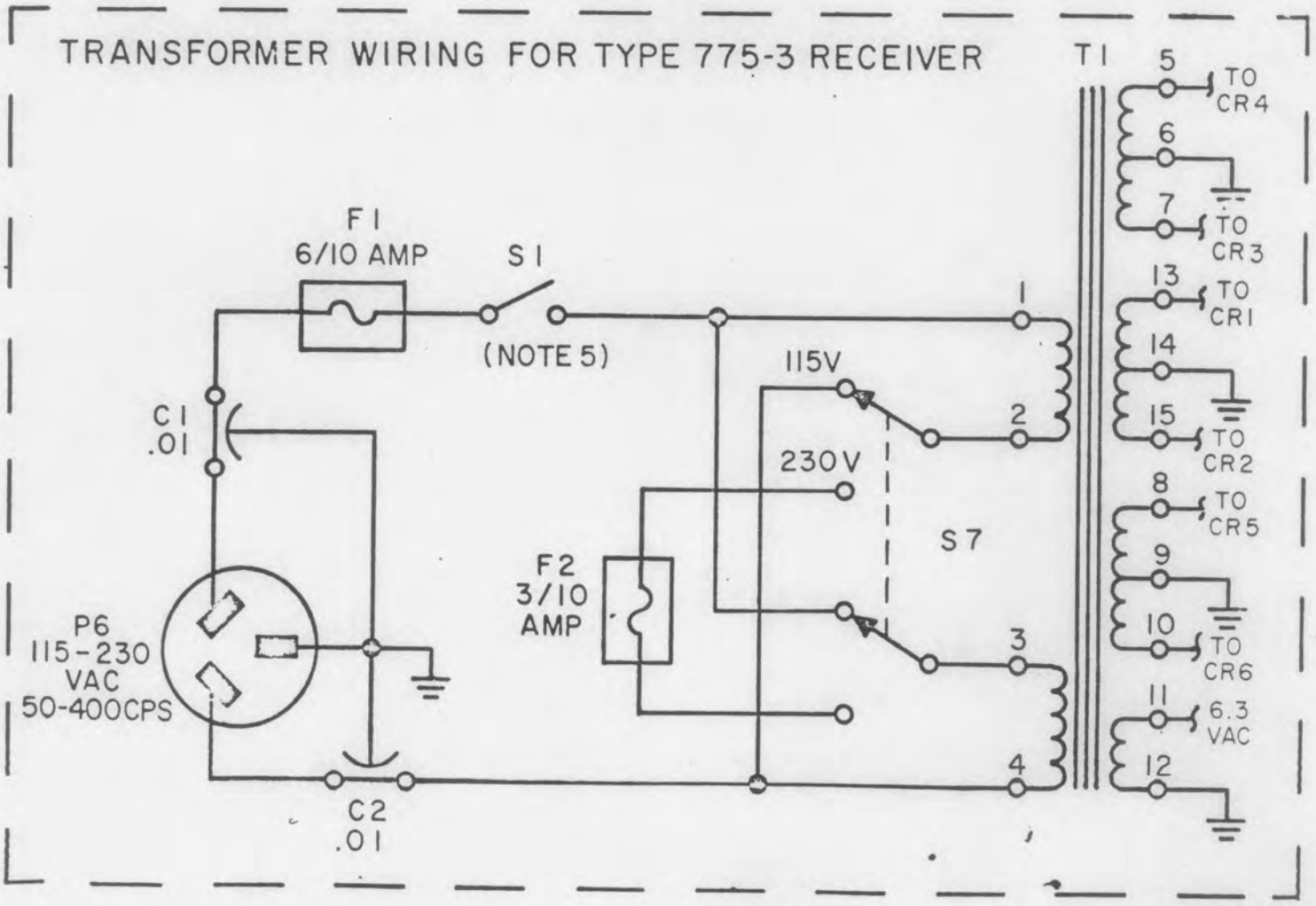
COMMUNICATION ELECTRONICS, INC.
6006 EXECUTIVE BOULEVARD
ROCKVILLE, MARYLAND, 20852

INTRODUCTION

The 775-3 Receiver is a 775 Receiver modified for operation from both 115 Vac and 230 Vac power sources. The modification consists of adding a rear apron mounted slide switch, S7, that enables the operator to select the appropriate transformer terminals and fuse for the desired power source. A schematic diagram showing the transformer wiring for the 775-3 is shown below. In addition, make the following changes on the main chassis parts list:

(1) Change T1 to P/N 1610, 14632
(2) Add F2, 3/10A, Slow-Blow, 3AG, MDL-3/10, 71400
(3) Add S7, Slide, DP-DT, 11A-1009, 82389

In all other respects the units are identical.



NOTE: Late versions of the 775 series receivers use a Type 71221 490-1000 MHz RF Tuner. In the Type 7111, J3 is UG-290A/U connector. In the 71221, J3 is a UG-535/U connector. Otherwise the two tuners are identical. There is no change in the 770A Receiver.

INSTRUCTION MANUAL
FOR
TYPES 770A and 775
RECEIVERS

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Change 1
200/10/1/64

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.

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Table 1-1. Type 770A Receiver, Specifications

Type of Reception	AM, FM, CW, and Pulse; CW available on 100-kc bandwidth only
Frequency Range	235-1000 mc in two bands; Band A: 235-500 mc Band B: 490-1000 mc
Signal Inputs	Antenna input for Band A Antenna input for Band B Reference input for marker injection
Signal Outputs	Video output, audio output, signal monitor output, 21.4-mc IF output, local oscillator output
Noise Figure	Band A: 10 db maximum, Band : 12 db maximum
Image Rejection	Band A: 65 db minimum, Band B: 75 db minimum
IF Rejection	Band A: 80 db minimum, Band B: 90 db minimum
Oscillator Radiation at Input of Receiver	Band A: 8 μv maximum, Band B: 75 μv maximum
Antenna Input Impedance	Band A: 50 Ω, nominal, Band B: 50 Ω, nominal
IF Bandwidth	100 kc, 500 kc, and 4 mc switchable from front panel
IF Frequencies	60 mc; 21.4 mc; 2.5 mc, 100-kc bandwidth only
Gain Control Characteristics	
Pulse AGC, 4-mc Bandwidth	Charge time is sufficiently short to permit pulse widths as narrow as 1 microsecond and as wide as a square wave. Discharge time is sufficiently long to operate with pulse reception rates as low as 50 pps.
Normal AGC	Charge time: 0.3 sec, Discharge time: 0.3 sec
Manual Control	All IF's
Over-all Pulse Response for 4-mc Bandwidth	Rise time or decay time no greater than 0.35 μsec. Pulse sag no greater than 10% for an 800 μsec pulse width.
Sensitivity	
100-kc Bandwidth	AM: 5 μv input, modulated 50% at 1-kc rate, produces 10 db (s plus n)/n min. FM: 5 μv input, modulated at 1-kc rate with 30-kc deviation produces 21 db (s plus n)/n min. FM Sensitivity: 0.1V per kc deviation, min. Pulse: -100 dbm tangential sensitivity, min.
500-kc Bandwidth	AM: 11 μv input, modulated 50% at 1-kc rate, produces 10 db (s plus n)/n min. FM: 11 μv input, modulated at 1-kc rate with 150-kc deviation produces 21 db (s plus n)/n min. FM Sensitivity: 0.02V per kc deviation, min. Pulse: -93 dbm tangential sensitivity, min.
4-mc Bandwidth	AM: 30 μv input, modulated 50% at 1-kc rate, produces 10 db (s plus n)/n min. FM: 30 μv input, modulated at 1-kc rate with 1-mc deviation produces 21 db (s plus n)/n min. FM Sensitivity: 0.004V per kc deviation, min. Pulse: -88 dbm tangential sensitivity, min.
Audio Output	0.1 watt across 600 Ω, balanced or unbalanced
Video Output	2V peak-to-peak across 100-ohm load
Video Amplifier Response	Within 3 db from 20 cps to 2 mc
FM Output Stability	Less than 2-db variation for inputs above 10 μv
AM Output Stability	Less than 10-db variation for 70-db input change above 10 μv
Signal Monitor Output Frequency	21.4 mc
Signal Monitor Output Level	4 μv at antenna produces 50 μv at output
Signal Monitor Ouput Bandwidth	Compatible with CEI signal monitors to produce 3-mc display

21.4-mc IF Output	100 mv minimum into 50-ohm load available during 4-mc operation only
Local Oscillator Output	75 mv ± 25 mv across 50 Ω
Beat Frequency Oscillator	Tunable over ±10 kc on 100-kc CW operation only
Front Panel Switches	Power ON-OFF, RF tuning band; IF bandwidth selector; Function, AM, FM, CW, Pulse; Gain Control, AGC-Manual
Front Panel Controls	BFO Pitch, RF Gain, Video Gain, Audio Gain, Fine Tuning, and Tuning
Front Panel Meters	Signal Strength, for AM, FM, and Pulse only; Tuning for AM and FM only
Dial Accuracy	Band A: 0.5%; Band B: 1.0%
Dial Resetability	0.25% (Fine tuning provided)
Power	115 vac, 50-400 cps, 60 watts (approximately)
Size	19 inches x 3.5 inches x 16 inches, rack-mounted

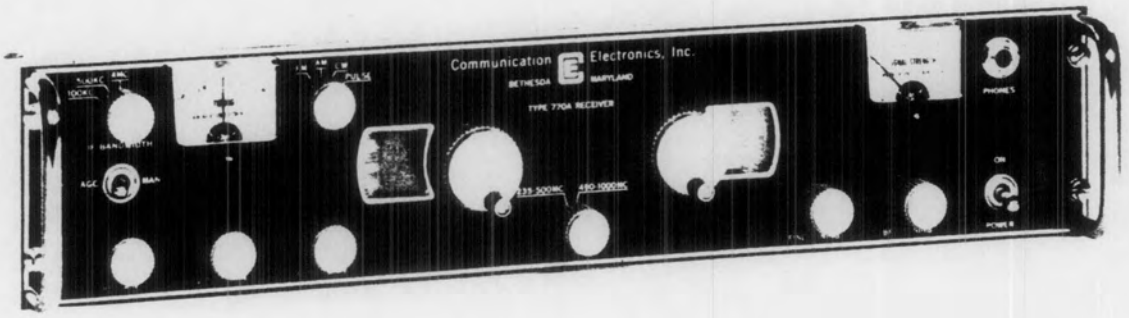

Figure 1-1. Type 770A Receiver, Front View

SECTION I
GENERAL DESCRIPTION

1.1 ELECTRICAL CHARACTERISTICS

The CEI Type 770A Receiver is designed for AM, FM, CW, and Pulse reception in the UHF band. This superheterodyne receiver tunes the range of 235 to 1000 mc in two bands; 235 to 500 mc and 490 to 1000 mc. Three IF bandwidths are available: 100-kc, 500-kc, and 4-mc. The 100-kc IF includes a beat-frequency oscillator (BFO), and this strip must be selected when CW reception is desired. Five signal outputs are available from the receiver: an audio output, a video output, signal monitor output, local oscillator output, and an IF output. The receiver has signal strength and tuning meters, and a reference input for marker injection. Pertinent specifications for the unit are included in Table 1-1; the semiconductor and tube complement is presented in Table 1-2.

1.2 MECHANICAL CHARACTERISTICS

A front view of the Type 770A Receiver is shown in Figure 1-1. The IF BANDWIDTH switch, function switch, bandswitch, AGC-MAN switch, BFO TUNING control, FINE TUNING control, VIDEO GAIN control, RF GAIN control, AUDIO GAIN control, PHONES jack, POWER switch, SIGNAL STRENGTH meter, and TUNING meter are located on the front panel.

1.2.1 The rear apron of the receiver is shown in Figure 1-2. The antenna input jacks located on the rear apron (one for each band) are type N connectors. The remaining rear apron jacks are type BNC connectors. The audio output is available at the terminal strip, TB1. The rear apron additionally contains the 6/10 AMP line fuse F1.

1.2.2 The main chassis and front panel are constructed of aluminum as are the top and bottom dust covers. The front panel is grey with an overlaid black-anodized etched plate. The main chassis contains ten subassemblies. Six of these, the high band tuner, low band tuner, 60-21.4 mc converter, 500-kc/4-mc IF strip, 100-kc strip and local oscillator coupling network are all built on silver-plated, gold-flashed brass chassis. The video amplifier, audio amplifier, AGC amplifier, low band tuner AGC amplifier and power supply components are built on etched circuit boards. The receiver is designed for mounting in a standard 19-inch rack. Over-all dimensions are: 19-inches wide, 3.5-inches high, and 16-inches deep.

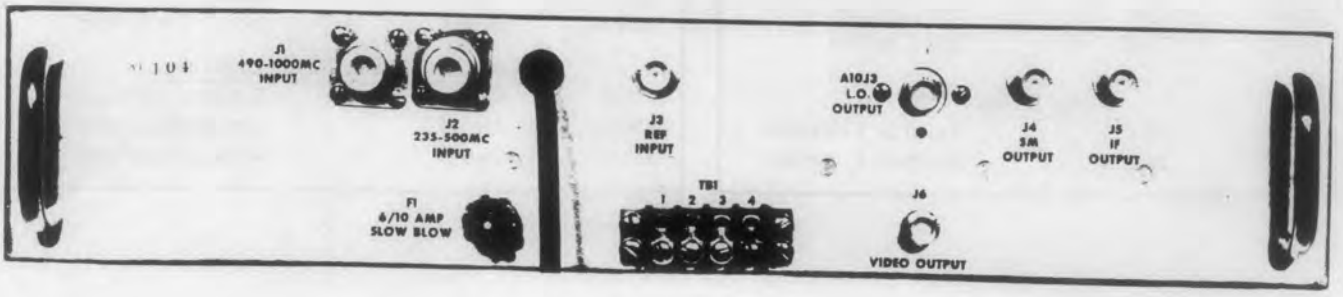

Figure 1-2. Type 770A Receiver, Rear View

Table 1-2. Type 770A Receiver, Tube and Transistor Complement

Ref. Desig.	Type	Function
	Main Chassis	
Q1	2N1544	Voltage Regulator
Q2	2N1700	Voltage Regulator
Q3	2N1038	Voltage Regulator
	490-1000 mc Tuner	
A1V1	7486	Local Oscillator
A1V2	6CW4	60-mc IF Amplifier
A1V3	6CW4	60-mc IF Amplifier
	230-500 mc Tuner	
A2V1	7077	RF Amplifier
A2V2	7077	RF Amplifier
A2V3	7587	Mixer
A2V4	7486	Local Oscillator
	4-mc/500-kc IF Strip	
A3Q1	2N335	Emitter Follower
A3Q2	2N335	Emitter Follower
A3Q3	2N335	Emitter Follower
A3Q4	2N335	Emitter Follower
A3V1	7587	1st IF Amplifier
A3V2	7587	2nd IF Amplifier
A3V3	7587	3rd IF Amplifier
A3V4	7587	1st Limiter
A3V5	7587	2nd Limiter
A3V6	7587	1st IF Amplifier
A3V7	7587	2nd IF Amplifier
A3V8	7587	3rd IF Amplifier
A3V9	7587	1st Limiter
A3V10	7587	2nd Limiter
	100-kc IF Strip	
A4Q1	2N335	Emitter Follower
A4Q2	2N335	Emitter Follower

Ref. Desig.	Type	Function
	100-kc IF Strip (cont.)	
A4Q3	2N706	BFO
A4V1	7587	IF Amplifier
A4V2	7587	Mixer
A4V3	6CW4	Local Oscillator
A4V4	7587	IF Amplifier
A4V5	7587	1st Limiter
A4V6	7587	2nd Limiter
	Video Amplifier	
A5Q1	2N335	Emitter Follower
A5Q2	2N697	Voltage Amplifier
A5Q3	2N1131	Output Amplifier
	Audio Amplifier	
A6Q1	2N335	Voltage Amplifier
A6Q2	2N335	Driver
A6Q3	2N1700	Power Amplifier
	AGC Amplifier	
A7Q1	2N697	Emitter Follower
A7Q2	2N697	Emitter Follower
A7Q3	2N697	Emitter Follower
A7Q4	2N697	DC Amplifier
A7Q5	2N1305	Regulator
	60-21.4-mc Converter	
A8V1	7587	60-mc IF Amplifier
A8V2	7587	60-mc IF Amplifier
A8V3	7587	Mixer
A8V4	6CW4	Local Oscillator
	Low Band Tuner AGC Amplifier	
A9Q1	2N1305	Emitter Follower
A9Q2	2N697	Series Regulator
A9Q3	2N697	Series Regulator

SECTION II

CIRCUIT DESCRIPTION

2.1 GENERAL

The operation of the various stages in the type 770A Receiver is explained using the functional block diagram, Figure 2-1, and the schematic diagrams included at the back of this manual. Note that the unit numbering system is used for the electrical components which means that parts on subassemblies and modules carry a prefix before the usual class letter and number of the item (such as A1R1 and A3C81). These subassembly 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 Type 770A Receiver is a superheterodyne type covering the frequency range of 235 to 1000 mc in two bands and providing reception for AM, FM, CW, and Pulse signals. IF bandwidths of 100 kc, 500 kc, and 4 mc are available. The receiver employs double conversion when the 500-kc or 4-mc bandwidths are in use; first to 60 mc and then to 21.4 mc.. Triple conversion is used when the 100-kc bandwidth IF strip is in operation; first to 60 mc, then to 21.4 mc, and then to 2.5 mc.

2.2.1 An incoming RF signal to the low-band tuner is amplified in A2V1 and A2V2 and applied to the mixer stage, A2V3. The local oscillator in the tuner, A2V4, operates 60-mc higher than the incoming RF signal. The 60-mc difference frequency from the mixer is connected to an IF amplifier in the 60 to 21.4 mc converter.

2.2.2 A signal in the 490-1000 mc range, which is received by the high-band tuner, passes through a quadruple-tuned preselector to a crystal mixer. The oscillator in the high-band tuner, A1V1, operates 60-mc higher than the incoming signal, and the output from the oscillator is also applied to the crystal mixer. The 60-mc difference frequency from the mixer is amplified by stages A1V2 and A1V3 and passes to the converter.

2.2.3 The LO OUTPUT (local oscillator output) is derived from a coupling network which is connected to the oscillators in both tuners. The FINE TUNING and BFO controls operate in conjunction to provide vernier tuning and also to change the pitch of the CW-audio signal when in the CW mode of operation. These controls function by varying the frequency of the local oscillator in the tuners. The REF INPUT (reference input) is loosely coupled to the RF sections in both tuners and is used to inject an external marker.

2.2.4 The converter chassis contains a separate 60-mc IF amplifier (A8V1 and A8V2) for the output signal from each tuner. These stages are switched from operating to non-operating conditions by the bandswitch which also switches supply voltages to the tuners. The crystal-controlled local oscillator in the converter, A8V4, operates at 81.4 mc and this frequency is applied to the mixer stage, A8V3, along with the 60-mc IF from the tuner in operation. The 21.4-mc second IF output from the mixer is coupled to an output network and then applied simultaneously to the input of all three IF strips.

2.2.5 The IF strip in operation is selected by the IF BANDWIDTH switch on the front panel. All three IF strips, when in operation, provide simultaneous AM and FM outputs to subsequent circuitry in the receiver. In addition, when the 4-mc strip is in operation, an IF OUTPUT at 21.4 mc is provided from the third IF amplifier, A3V8. The 100-kc strip must be selected for CW reception since this is the only strip with a BFO. The SM OUTPUT (signal monitor output) is derived from the input signal to the IF strips through an impedance matching network located on the 500-kc/4-mc bandwidth subassembly.

2.2.6 The 500-kc IF strip and the 4-mc IF strips are functionally analogous. Each strip provides three stages of 21.4-mc amplification, after which the signal is applied both to an AM detector and to two limiter stages. The output from the AM detector is applied to an emitter follower; the output from the limiters is coupled to an FM demodulator and then to an emitter follower.

2.2.7 The 100-kc IF strip contains a single 21.4-mc IF amplifier, A4V1. The signal from A4V1 is heterodyned in a mixer, A4V2, with an 18.9-mc signal from a crystal-controlled oscillator, A4V3. The output from the mixer is amplified by A4V4, a 2.5-mc IF amplifier. The output of A4V4 is applied both to an AM detector and to limiter stages as in the 500-kc and 4-mc IF strips. When the receiver is in the CW operating mode, 100-kc bandwidth, the 2.5-mc output from the BFO stage, A4Q3, is injected into the AM detector and beats with the 2.5-mc IF signal.

2.2.8 The FM outputs from the emitter followers in the three IF strips are connected through an IF BANDWIDTH switch section to an emitter follower, A5Q1, on the video module. If the function switch is in the FM position, the video signal from transistor Q1 is connected through the AUDIO GAIN control to the audio module and through

the VIDEO GAIN control to a two stage video amplifier consisting of transistors A5Q2 and A5Q3. The output from A5Q3 is applied to the VIDEO OUTPUT jack. The emitter follower stage, A5Q1, is also used to operate the TUNING meter.

2.2.9 The AM-class signals (AM, CW, and Pulse) from the emitter followers in the respective IF strips are applied through one of the IF BANDWIDTH switch sections to the AGC amplifier and also to the VIDEO GAIN and AUDIO GAIN controls through one of the function switch sections.

2.2.10 The audio amplifier receives its input signal from the AM output of the IF strip in operation or from the emitter follower stage (A5Q1) in the video module depending on the setting of the function switch. The audio amplifier contains a voltage amplifier stage A6Q1, a driver stage, A6Q2, and a power amplifier stage, A6Q3. The audio output from the module is available at the PHONES jack on the front panel and at the rear apron terminal strip.

2.2.11 The AGC amplifier module contains an emitter follower, A7Q1, which is followed by a combination modulation filter and pulse rectifier. A cascaded emitter follower, A7Q2 and A7Q3, follows this combination network. The remaining stages, A7Q4 and A7Q5, are a voltage sensing stage and regulator respectively. The network following the input emitter follower acts as a modulation filter during AM and FM reception and the output of the AGC amplifier is a voltage which is based on the average RF carrier level. During pulse reception, the arrangement of the network is changed so that the voltage at the output of the amplifier is referenced to the amplitude of the pulses being received. The function switch disables the AGC amplifier when placed in the CW operating mode. The SIGNAL STRENGTH meter operates from the output of the final stage in the module.

2.2.12 Either manual gain control or automatic gain control may be employed in the receiver, depending on the mode of operation. During FM reception, only AGC is available. In the AM and pulse modes, either AGC or manual gain control may be selected. In the CW mode, only manual gain control is available. Regardless of the operating mode, two of the gain control voltages used in the receiver are delayed before application. The gain control voltage applied to the 60-mc amplifier in the high band tuner is delayed by a network in the wideband IF strip, and to the first RF amplifier in the low band tuner by a delay network located in the low band tuner AGC amplifier.

2.2.13 The self-contained power supply provides all of the necessary operating voltages for the receiver. The nominal primary power input to the unit is 115 volts, 50-400 cps; power consumption is approximately 60 watts.

2.3 LOW BAND TUNER, 235-500 MC

The operation of the low band tuner is explained in the following paragraphs. Refer to the schematic diagram, Figure 6-1 and note that the reference designation prefix for this subassembly is A1.

2.3.1 RF Amplifier.- The low band tuner 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. The gain of the tuner is controlled by returning the cathodes of V1 and V2 through circuits in the low band tuner AGC amplifier. The gain control voltage applied to V1 is delayed to increase the dynamic range of the receiver. The reference input is loosely coupled into the RF amplifier through inductor L18, and then connected to the high band tuner through jack J5.

2.3.2 Local Oscillator.- The low band tuner 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-vdc 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, C37, which varies the capacitance of the tank circuit. A voltage-variable capacitor is a semiconductor device whose effective capacitance varies with the voltage across it. The capacitance of C37 is controlled by a dc voltage applied through resistors R13 and R15. The level of this voltage is controlled by the FINE TUNING potentiometer, R11, and the BFO TUNING potentiometer R12. The local oscillator signal is induced across resistor R16 and passed through jack J3 to a common coupling network on the main chassis.

2.3.3 Mixer.- The low band tuner 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 A8L1 in the converter. Capacitor A8C1 establishes the degree of coupling between L14 and A8L1.

2.4 HIGH BAND TUNER

The high band tuner consists of a preselector, local oscillator, mixer, and two IF amplifiers. The reference designation prefix is A2; a schematic diagram of the tuner is presented in Figure 6-2.

2.4.1 Quadruple-Tuned Preselector.- The RF input circuit in the high band tuner presents an impedance designed for a 50-ohm antenna. From the input the signal is coupled 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. The 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. The reference input is coupled in through resistor R12.

2.4.2 Local Oscillator.- The high band tuner 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, C11, in the same manner used for fine tuning of the low band tuner (see paragraph 2.3.2). The oscillator signal to the crystal mixer is picked up by inductor L6 whose lower end reaches through a shield into the chamber where the oscillator stage is mounted. The local oscillator output signal is coupled out by inductor L12 to the common coupling network on the main chassis.

2.4.3 Crystal Mixer.- The high band tuner 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.

2.4.4 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 section 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 A8L2 located in the 60-21.4-mc converter. Capacitor A8C2 fixes the degree of coupling between L17 and A8L2.

2.5 60- TO 21.4-MC CONVERTER

The converter contains 60-mc IF buffer amplifiers, a mixer, and an 81.4-mc crystal-controlled oscillator. As shown on the schematic diagram (Figure 6-3) of the converter, A8 is used as the reference designation prefix.

2.5.1 60-mc IF Amplifiers.- The converter uses type 7587 Nuvistor tetrodes (V1 and V2) to amplify the incoming 60-mc signal from the tuner in operation; V1 operates in conjunction with the low band tuner and V2 with the high band tuner. As the bandswitch (S3) switches the source voltages to the tuners, it also switches B-plus to these two stages in the converter. 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.

2.5.2 81.4-mc Oscillator.- The oscillator in the converter V4, is a type 6CW4 Nuvistor triode. It is crystal controlled and operates at 81.4 mc.

2.5.3 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 of the mixer through capacitor C21. The mixer heterodynes this signal with 60-mc incoming IF signal to produce a 21.4 mc second IF. The output from the plate of the mixer is taken through a 21.4-mc output network, which includes inductor L6, and simultaneously applied to the input of all three IF strips.

2.6 BANDSWITCHING

Bandswitching is accomplished by switching the dc voltage sources to the tuners and the converter (see Figure 6-11). The bandswitch, S3, is divided into four sections. S3A applies the -6.3 vdc cathode-return source to the low band RF amplifiers during low band tuner operation through the low band AGC amplifier. At the same time,

S3C applies 120 vdc regulated, to the low band tuner and S3B applies 150 vdc to both the low band tuner and stage V1 in the converter. During high band tuner opration S3C applies the regulated 120 vdc to the high band tuner, and S3B applies the 150-vdc source to both the high band tuner and stage V2 in the converter. S3D turns on the dial light of the selected band.

2.7 100-KC BANDWIDTH IF STRIP

The operation of the 100-kc bandwidth IF strip (assembly A4) is explained using the schematic diagram, Figure 6-5.

2.7.1 21.4-mc IF Amplifier.- The input to the strip is through jack J1 which is in parallel with the input to the 500-kc/4-mc IF strip. From jack J1 the signal is applied to the grid of the IF amplifier through broadband transformer T1. The 21.4-mc IF amplifier, V1, is a type 7587 Nuvistor tetrode connected with a double-tuned plate circuit which has a bandwidth of approximately 300 kc. The gain of the stage is varied by a gain control voltage applied through capacitor C41, resistor R1, and the secondary of transformer T1 to the control grid of the tube. The output is coupled by capacitor C7 to the grid circuit of the mixer.

2.7.2 18.9-mc Oscillator.- The 18.9-mc oscillator, V3, uses a type 6CW4 Nuvistor triode in a crystal-controlled Colpitts configuration. The output is applied to the mixer through capacitor C6.

2.7.3 Mixer.- The mixer stage, V2, heterodynes the incoming 21.4-mc IF and the 18.9-mc oscillator signal to produce a 2.5-mc second IF. A type 7587 Nuvistor tetrode is employed in the circuit. The double-tuned mixer plate circuit establishes the bandwidth of the IF strip at 100 kc.

2.7.4 2.5-mc IF Amplifier.- The output from the mixer at 2.5 mc is amplified in V4, a type 7587 Nuvistor tetrode. The input signal is coupled through capacitor C41, resistor R34, and variable inductor L3.

2.7.5 Limiter Stages.- The 2.5-mc IF output from V4 is applied to V5, a type 7587 Nuvistor tetrode operating as the first limiter. A single-tuned plate circuit is used to develop the output signal which is coupled through capacitor C25 to the second limiter V6. Test point TP1, through isolation resistor R21, can be used to observe the response of the strip to that point.

2.7.6 FM Demodulator.- Demodulation of an FM carrier occurs in a Foster-Seeley type discriminator which operates from the second limiter output. Capacitance center tapping of the discriminator secondary is used to obtain a high degree of balance unaffected by coil characteristics or tuning slug positions. The FM video output is applied to transistor Q2, which operates as an emitter follower, and then through feedthru E2 to the function switch on the main chassis.

2.7.7 AM Detector.- Diodes CR1 and CR6 are arranged as an AM detector and voltage doubler. The 2.5-mc IF signal is coupled from the plate of V4 through capacitor C52 to the diodes. The AM video output is applied to emitter follower, Q1, and then through feedthru E1 to the function switch on the main chassis.

2.7.8 Beat Frequency Oscillator.- In the CW mode of operation a 2.5-mc signal is injected into the AM detector through capacitor C34. This 2.5-mc signal beats with the IF frequency to produce an audible note. The pitch of the audio signal is varied by rotation of the BFO control which shifts the frequency of the local oscillator in the tuner. The BFO is placed in operation by application of +24 volts from switch section S4D in the main chassis. The +24 volts places diode CR5 in the forward direction which, in turn, applies the dc voltage to the collector of transistor Q3. The BFO is a self-regulating Colpitts oscillator; regulation is provided by connecting the collector of Q3 to the base through resistor R31. The output signal is derived from the feedback divider consisting of capacitors C36 and C37. In this mode of operation, diode CR4 is back-biased and has little effect in the circuit; but when the function switch is moved to any position other than the CW position, -24 volts is applied and CR4 is in the forward direction and CR5 is back-biased. When CR4 is in the forward direction, a short circuit is effectively placed across crystal Y2. If this action were not taken, crystal Y2 would be coupled to the IF strip through capacitors C36 and C34 and could cause undesirable effects in the IF response curve. Back-biasing CR5 protects transistor Q3.

2.8 500-KC BANDWIDTH IF STRIP

The 500-kc bandwidth IF strip contains three 21.4-mc IF amplifiers, two FM limiter stages, an AM detector, an FM demodulator, and emitter followers for the AM and FM video outputs. A schematic diagram of this IF strip is shown in Figure 6-4; the reference designation prefix is A3.

2.8.1 21.4-mc IF Amplifiers.- The input signal to the IF strip is connected to jack J1. A connection at this point through jack J2 paralles the input to the 100-kc IF strip. The SM OUTPUT is taken off at this point through a T-pad

at jack J4. Transformer T1 provides impedance transformation between the input and the grid circuits of V1 and V6. The first and second IF amplifiers, V1 and V2, employ type 7587 Nuvistor tetrodes. These stages are neutralized and are the bandwidth determining elements in the IF strip. The gain of both stages is controlled by a gain control voltage fed through capacitor C43. The third 21.4-mc IF amplifier, V3, uses a type 7587 Nuvistor tetrode in a conventional voltage amplifier configuration with a double-tuned plate circuit.

2.8.2 Limiter Stages.- The amplified 21.4-mc IF signal from V3 is coupled to the grid circuit of V4 through capacitor C24. The first limiter, V4, has a single-tuned plate circuit formed by inductor L7 and capacitor C26; the output from the first limiter is applied to the control grid of the second limiter through capacitor C30. Test point TP1, through isolation resistor R19, provides a point at which the response of the preceding stages can be observed on an oscilloscope.

2.8.3 FM Demodulator.- Diodes CR2 and CR3 are used for phase detection within the Foster-Seeley type discriminator which is driven from the plate circuit of V5. Transistor Q4, arranged in an emitter follower circuit, provides a high impedance load to the discriminator and a low impedance output through feedthru E2 to the main chassis components.

2.8.4 AM Detector.- The output of the third IF amplifier is applied to both the first limiter and the AM detector diode CR1. The output of the detector is a positive-going voltage which is impressed on emitter follower Q3. The AM video output is also the source of AGC voltage in the FM, PULSE/AGC and AM/AGC modes of operation.

2.9 4-MC BANDWIDTH IF STRIP

The 4-mc bandwidth IF strip consists of three 21.4-mc IF stages, two limiter stages, an AM detector, an FM demodulator, and emitter follower stages for the AM and FM video outputs. All of the tubes in the strip are type 7587 Nuvistor tetrodes; the transistors are both type 2N335. The 500-kc IF strip and the 4-mc IF strip are both constructed on the same subchassis, and the schematic diagram, Figure 6-4, includes the circuitry of both strips.

2.9.1 21.4-mc IF Amplifiers.- Stages V6, V7, and V8 are the 21.4-mc IF amplifiers and the components in these stages determine the over-all bandwidth of the IF strip. The input to the first stage is in parallel with the input to the 500-kc strip from the secondary of transformer T1. The three amplifiers are all neutralized and over-coupled. The over-coupling causes a dip in the response which is filled in by a peak in the response of the 60- to 21.4-mc converter. The gain of the first two stages is controlled by gain control voltages. The 21.4-mc IF output (J3) is derived from a capacitive divider, capacitors C71 and C72, in the plate circuit of V8.

2.9.2 Demodulator Circuits.- An AM detector, diode CR5, and two limiter stages, V9 and V10, follow the three IF amplifiers. The output of the limiters drives a Foster-Seeley type discriminator formed by diodes CR6 and CR7 and associated components. Emitter follower Q2 provides impedance transformation between the output of the discriminator and the FM video output. The output of the AM detector diode is a positive-going AM video signal which is also used as the AGC source. The AM video signal is taken from the emitter of Q1 through feedthru E3 to the main chassis.

2.10 VIDEO AMPLIFIER

The FM video output from the IF strip in operation is applied through IF BANDWIDTH switch section S2A to pin 1 of the video amplifier (see Figure 6-6). The video signal at pin 1 is applied to the base of transistor Q1, an emitter follower. The signal from the emitter of Q1 (in the FM mode) is developed across VIDEO GAIN potentiometer R10 through switch section S4B. From the arm of the control, the signal is coupled through capacitor C1 to the base of transistor Q2. In the AM, CW, or PULSE modes, the AM video signal from the IF strip in operation is applied through IF BANDWIDTH switch section S2B and function switch section S4B to the VIDEO GAIN control R10. The AM video signal is coupled from the arm of potentiometer R10 to the base of Q2 in the same manner as the FM video signal. Transistor Q2 is a common emitter amplifier; the output signal from Q2 is coupled to a second video amplifier stage, Q3. The signal is coupled from the collector of Q3 through resistor R9, capacitor C2, through module pin 9 to the VIDEO OUTPUTjack J6 on the rear apron of the receiver. The dc voltage at the emitter of Q1 is also used to operate the TUNING meter.

2.11 AUDIO AMPLIFIER

The type 7400 audio amplifier (see Figure 6-7) 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, R7, 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 lead of the output stage provides additional dc stability. The output is through transformer T1 which forms the third stage collector load.

2.12 AGC AMPLIFIER (TYPE 7800)

The AGC amplifier is designed to provide a voltage during AM and FM reception which is referenced to the average carrier level. During pulse reception, the AGC amplifier references both the amplitude of the pulses and the average carrier level. The amplifier is not used during CW reception. The reference designation prefix is A7; the schematic diagram is shown in Figure 6-8.

2.12.1 The AGC amplifier module consists of an emitter follower (Q1), followed by a combination modulation filter and pulse rectifier, a cascaded emitter follower (Q2 and Q3), a voltage sensing stage (Q4), and a regulator (Q5).

2.12.2 The input signal to the AGC amplifier is obtained from the AM output of the IF strip in operation through IF BANDWIDTH switch section S2B. As shown on the schematic diagrams of the IF strips, this signal from the AM detector in operation is positive-going and direct-coupled through an emitter follower stage. This direct coupling is preserved in the AGC amplifier. The input signal enters the module on pin 1 and is applied to the base of transistor Q1, which is used as an emitter follower. If the function switch is in the AM or FM position, resistors R4 and R5, in conjunction with capacitors C1 and C2 form a modulation filter which removes the modulation and allows subsequent circuitry to operate from the average carrier level. In the pulse mode, function switch section S4A connects diode CR1 across resistor R4. Under these conditions, CR1 rectifies the incoming pulses and capacitors C1 and C2 become the rectifier load. In the CW position, the function switch connects the output of Q1 to ground through resistor R9 located on the main chassis.

2.12.3 The modulation filter is followed by a cascaded emitter follower, Q2 and Q3, which provides a very high impedance load for the filter. The emitter of Q3 is dc coupled to the base of the succeeding stage through resistor R8. Under conditions of no signal input to the receiver, the voltage input to the AGC amplifier is near zero and transistor Q4 is biased to cutoff by a voltage divider network in the emitter circuit. The stage will not begin to conduct until the incoming RF signal causes a positive-going voltage at the AM detector output which is sufficiently large to overcome the bias on Q4. When Q4 is turned off, the collector voltage approaches the source voltage.

2.12.4 Current flows at all times through zener diodes CR2 and CR3 through one of two paths. When Q4 is turned off, the flow is between the plus 24 volt and minus 24 volt sources. When Q4 is conducting, the flow is through Q4. As a result of the voltage developed across the zener diodes, stage Q5 is biased off when stage Q4 is off and is turned on when the collector voltage of Q4 falls as the stage goes into conduction.

2.12.5 When stage Q5 is biased off, as is the case when no signal is applied to the receiver, the AGC voltage output at pin 17 of the module is almost zero. When a very strong signal is applied to the receiver, stage Q5 will conduct and the voltage developed across emitter resistor R19 (and applied to pin 17) exceeds the voltage that would be required to cutoff gain-controlled stages in the tuners and IF strips. Resistors R22, R23, R24, and R25 in conjunction with capacitors C8 and C9 form a second modulation filter in the output of Q5. During pulse operation, switch S4C grounds pin 16 which removes resistor R25 from the filter and increases the filtering on pulse signals. The signal strength meter operates from the output of Q5 through resistor R21 and module pin 18.

2.13 LOW BAND TUNER AGC AMPLIFIER

The low band tuner AGC amplifier (see the schematic diagram, Figure 6-9) is constructed on an etched circuit board mounted on the underside of the main chassis. The amplifier is designed to provide gain control voltages to the RF stages in the 235-500 mc tuner from the gain control voltage developed in other sections of the receiver. The input stage in the module, Q1, is an emitter follower which receives the gain control voltage on its base. This gain control voltage is obtained from the output of the AGC amplifier if the receiver is in the AGC mode (see paragraph 2.12) or from the RF GAIN potentiometer if the receiver is in the MAN mode. The voltage at the emitter of Q1 is applied to the base circuits of stages Q2 and Q3. These two stages are in series with the cathodes of the RF amplifiers in the 235-500 mc tuner and vary the gain of the tuner by varying the cathode bias. The circuitry associated with stage Q2 applies delayed gain control voltage to A2V1 because the voltage at the emitter of Q1 must exceed the zener voltage of CR1 before stage Q2 begins to vary the cathode voltage on A2V1. Stage Q3 functions in a similar manner with stage A2V2 except a voltage delay is not included.

2.14 OVER-ALL GAIN CONTROL SYSTEM

The over-all system of gain control for the receiver is shown in the functional block diagram, Figure 2-1, and can also be determined from the main chassis schematic diagram, Figure 6-11. The gain control voltage to the first 60-mc IF amplifier A1V2 in the high band tuner is delayed by a network, which includes zener diode A3CR4, located on the 500-kc/4-mc IF chassis. The first and second RF amplifiers in the low band tuner A2V1 and A2V2 are gain controlled by transistors A8Q2 and A8Q3, located on the low band tuner AGC amplifier module. The IF amplifiers in the converter (A8V1 and A8V2) and in the IF strips (A3V1, A3V2, A3V6, A3V7, A4V1 and A4V7) all receive a gain control voltage which is not delayed.

2.14.1 CW, PULSE/MAN or AM/MAN Reception. - With the function switch in the CW mode, or the AM or PULSE modes with the AGC switch in the MAN position, the gain control voltage used in the receiver is derived from the arm of RF GAIN potentiometer R8.

2.14.2 Pulse Reception with AGC. - During pulse reception with AGC, the AGC amplifier provides a gain control voltage through pin 17 of the module which is referenced to the amplitude of the received pulses.

2.14.3 FM or AM/AGC Reception. - During reception in the FM or AM/AGC modes, the AGC amplifier provides average-type AGC from pin 17 of the module.

2.15 LOCAL OSCILLATOR COUPLING NETWORK

A common local oscillator output from the tuner is provided on the rear apron of the receiver (LO OUTPUT, A10J3). This output jack is connected through a resistive network to the local oscillator output signal from each tuner (see the schematic diagrams, Figures 6-10 and 6-11). The local oscillator output from the 235-500 mc tuner is connected from A2J3 to A10J2; the 490-1000 mc tuner oscillator output is connected from A1J3 to A10J1. The mixing pad is formed by resistors R1 through R5 in the coupling network.

2.16 POWER SUPPLY

The power supply schematic diagram is shown in Figure 6-11. All of the necessary voltage sources to operate the receiver are furnished by the power supply. Switch S1 applies input power to the primary winding of transformer T1 through fuse F1. There are four secondary windings on T1 which function as follows: the 9-10 winding operates the filaments and is the source for the dial lights; the 6-7-8 winding drives two full-wave rectifiers which ultimately furnish +24 volts regulated and -24 volts regulated; the 3-4-5 secondary operates into a full-wave rectifier from which the 205 volt, 150 volt and 120 volt regulated supplies are derived; and the 11-12-13 winding powers a full-wave rectifier from which the -6.3 volt regulated source is derived. Rectifiers CR5 and CR6 provide full-wave rectification of the ac voltage present at the 6-7-8 secondary winding. The output of this rectifier is filtered and then regulated at +24 volts by the combined action of transistor Q3 and zener diode CR13. A second rectifier operating from this winding provides a -24 volt regulated source in conjunction with transistor Q2 and zener CR11 in a similar fashion. The output of the full-wave rectifier (CR3 and CR4) operating from the 3-4-5 winding is applied to a capacitance input filter; the output of the filter is 205 volts. Zener diode CR10 in series with resistor R4, provides a regulated 120-volt source from the 205 volt supply. The -6.3 volt source is regulated by transistor Q1 and zener CR9, which are connected at the output of the full-wave rectifier formed by CR1 and CR2.

2.17 AGC AMPLIFIER (TYPE 7811)

The type 7811 AGC amplifier module is used in type 770A receivers with serial numbers above 110 and in all type 775 receivers. The AGC amplifier is designed to provide a voltage during AM and FM reception which is referenced to the average carrier level. During pulse reception, the AGC amplifier references both the amplitude of the pulses and the average carrier level. The amplifier is not used during CW reception. The reference designation prefix is A7; the schematic diagram is shown in Figure 6-14.

2.12.1 The AGC amplifier module consists of an emitter follower (Q1), followed by a combination modulation filter and pulse rectifier, a cascaded emitter follower (Q2 and Q3), a voltage sensing stage (Q4), a regulator (Q5), and a driver-amplifier (Q6).

2.12.2 The input signal to the AGC amplifier is obtained from the AM output of the IF strip in operation through IF BANDWIDTH switch section S2B. As shown on the schematic diagrams of the IF strips, this signal from the AM detector in operation is positive-going and direct-coupled through an emitter follower stage. This direct coupling is preserved in the AGC amplifier. The input signal enters the module on pin 1 and is applied to the base of transistor Q1, which is used as an emitter follower. If the function switch is in the AM or FM position, resistors R4 and R5,

in conjunction with capacitors C1 and C2 form a modulation filter which removes the modulation and allows subsequent circuitry to operate from the average carrier level. In the PULSE mode, function switch section S4A connects diode CR1 across resistor R4. Under these conditions, CR1 rectifies the incoming pulses and capacitors C1 and C2 become the rectifier load. In the CW position, the function switch connects the output of Q1 to ground through pin 3 and resistor R9 located on the main chassis.

2.12.3 The modulation filter is followed by a cascaded emitter follower, Q2 and Q3, which provides a very high-impedance load for the filter. The emitter Q3 is dc coupled to the base of the succeeding stage through resistor R8. Under conditions of no signal input to the receiver, the voltage input to the AGC amplifier is near zero and, due to the direct coupling through stages Q1-Q3, transistor Q4 is biased to cutoff by a voltage divider network in the emitter circuit. The stage will not begin to conduct until the incoming RF signal causes a positive-going voltage at the AM detector output (reflected through the direct-coupled emitter follower) which is sufficiently large to overcome the bias on Q4. When Q4 is turned off, the collector voltage approaches the source voltage.

2.12.4 Current flows at all times through zener diodes CR2 and CR3 through one of two paths. When Q4 is turned off, the flow is between the plus 24 and minus 24 volt sources. When Q4 is conducting, flow is through Q4. As a result of the voltage developed across the zener diodes, stage Q5 is biased off when Q4 is off and is turned on when the collector voltage of Q4 falls as the stage goes into conduction.

2.12.5 Stage Q5 is biased off by Q4 when no signal appears at the input of the receiver or when the input is too small to produce a voltage that will overcome the bias developed across the emitter resistors of Q4. When Q5 is turned off due to a small signal input, the input of the SIGNAL STRENGTH meter is obtained from the output of Q6 across resistor R28. The input to the COR (type 775 Receiver) is likewise obtained from the output of Q6 through resistor R29, for small signal inputs. When a stronger signal is applied to the receiver, stage Q5 will conduct and the voltage developed across emitter resistor R19 (and applied to pin 17) exceeds the voltage that would be required to cutoff gain controlled stages in the tuners and IF strips. Resistors R22, R23, R24, and R25 in conjunction with capacitors C8 and C9 form a second modulation filter in the output of Q5. During pulse operation, switch S4C grounds pin 16 which removes resistor R25 from the filter and increases the filtering on pulse signals. For signal inputs above the AGC threshold, the SIGNAL STRENGTH meter receives its input from Q5 through resistor R21. The COR (type 775 Receiver) receives its input from Q5 through resistor R30 and module pin 6.

SECTION III

INSTALLATION AND OPERATION

3.1 INSTALLATION

The receiver is designed for installation in a standard 19-inch rack. It requires 3-1/2 inches of vertical space and will project 15-1/2 inches back into the rack. Adequate ventilation should be provided.

3.1.1 Power Connections.- Plug the power cord into a 115 volt, 50-400 cycle source. The third pin of the power cord grounds the receiver. If a three pin receptacle is not available, use the adapter provided.

3.1.2 Antenna Connections.- Connect the low band antenna (235-500 mc) to the 235-500 MC INPUT jack, J2. Connect the high band antenna (490-1000 mc) to the 490-1000 MC INPUT jack, J1.

3.1.3 Signal Monitor Connection.- Connect the signal monitor input if one is used, to the SM OUTPUT jack, J4, using a 50-ohm coaxial cable.

3.1.4 Video Output.- The video output signal is available at the VIDEO OUTPUT jack, J6 on the rear apron.

3.1.5 Local Oscillator Output.- The local oscillator signal from the tuner in operation appears at the LO OUTPUT jack A10J3 at a level of approximately 75 mv.

3.1.6 Reference Signal Input.- A reference signal can be injected into the RF amplifier in operation through the REF INPUT jack, J3.

3.1.7 IF Output Signal.- A 21.4-mc IF output signal is available at the IF OUTPUT jack, J5, when the receiver is operating with the 4-mc bandwidth IF strip.

3.2 OPERATION

The operating controls on the front panel of the receiver are described in the following paragraphs. These controls are shown in Figure 1-1.

3.2.1 Tuning Controls.- Set the bandswitch to the 235-500 MC or the 490-1000 MC position depending on the frequency to be received. A lamp will light behind the tuning dial corresponding to the band selected. The tuning dials may each be preset, allowing rapid switching between two RF carriers in different bands.

3.2.2 IF Bandwidth Selector.- The IF BANDWIDTH switch removes B-plus voltages from the IF strips not in use and applies B-plus sources to strip which has been selected. Set this switch to select the desired IF bandwidth. When searching for a signal it is advisable to use the 4-mc bandwidth until the signal is located. Also, since only the 100-kc contains a BFO, this strip must be used for CW reception.

3.2.3 Gain Control Mode Switch.- The MAN/AGC toggle switch is used to select the system of gain control when the receiver function switch is in the AM or PULSE positions. Under these conditions, if the toggle switch is moved to MAN, the gain of various stages in the receiver is under control of the RF GAIN potentiometer. When in the AGC position, the gain of these stages is automatically controlled by circuits within the receiver. The switch may be in either position when the function switch is in the FM or CW positions since internal circuitry provides that automatic gain control functions during FM reception and manual gain control is always in use during CW reception.

3.2.4 Function Switch.- Set the function switch to either FM, AM, CW, or PULSE as desired before the receiver is tuned. If the CW position is selected, the 100-kc bandwidth IF strip must also be selected and the gain must be manually controlled by the RF GAIN control. If the AM or PULSE positions are selected, and the MAN/AGC switch is in the MAN position, the gain of the receiver must be manually controlled with the RF GAIN control.

3.2.5 RF Gain Control.- When the receiver is adjusted for the reception of CW signals, or AM or pulse signals with manual gain control, the gain of the receiver must be adjusted with the RF GAIN control. Clockwise rotation of the control will increase the gain of the receiver.

3.2.6 Video Gain Control.- Adjust the VIDEO GAIN control for the desired amplitude of the video output signal present at jack J6.

3.2.7 BFO Tuning Control.- The BFO TUNING control varies the frequency of the local oscillators in the tuners to change the pitch of the CW-audio signal when in the CW mode of operation. The control should be normally set

at mid-range and then adjusted during reception to increase or decrease the pitch of the received signal as desired.

3.2.8 Fine Tuning Control.- Set the FINE TUNING control at mid-range when tuning with one of the main tuning knobs. Small corrections in receiver tuning can then be effected by rotating the FINE TUNING control in either a clockwise or counter-clockwise direction as necessary.

3.2.9 Power Switch and Fuse.- The toggle switch marked ON/POWER controls the ac input to the receiver. The fuse holder on the rear apron contains a 6/10 ampere slow-blow fuse which fuses the primary winding of the power transformer.

3.2.10 Tuning Meter.- The TUNING meter indicates the relative position between an incoming signal and the center of the receiver in the AM and FM modes. Normally, the energy contained in the pulses will not be sufficient to cause a tuning meter deflection when the receiver is in the PULSE mode. If a deflection is observed, however, the meter will accurately indicate the average frequency of the pulse-modulated carrier. The meter operates from the discriminator output of the IF strip in operation.

3.2.11 Signal Strength Meter.- The SIGNAL STRENGTH meter indicates the relative magnitude of the carrier received in AM, FM and Pulse operations. The meter is not calibrated in any specific units.

SECTION IV
MAINTENANCE

4.1 GENERAL

Type 770A Receiver has been carefully designed so that it will 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 5-22 where the component locations are shown; to the schematic diagrams, Figures 6-1 through 6-11; and to Tables 4-1 and 4-2, the tube, transistor, and module pin socket voltages.

CAUTION

All maintenance work within this receiver should be kept to a minimum and performed only by trained and experienced personnel. The placement of components and the dress of leads in the equipment (especially within the RF tuners) have been carefully engineered to give optimum performance. In replacing any components, great care should be exercised to duplicate the exact physical layout of the original assembly.

4.2 MAINTENANCE OF GEAR TRAINS AND TUNING DIALS

The gear train mechanisms use friction drive and rely on the stops of the inductuner to halt the turning in the case of the 235-500 mc RF tuner and on stops mounted on the gear train to halt the turning in the case of the 490-1000 mc RF tuner. The tuning dials are rigidly attached to their shafts and are geared to the tuners in a manner such as to make it quite unlikely they will ever get out of position. However, if it becomes necessary to mechnically realign either dial, follow the steps given in 4.2.1 and 4.2.2.

4.2.1 235-500 mc RF Tuner.- Proceed as follows:

(1) Release the Allen head setscrews 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.

4.2.2 490-1000 mc RF Tuner.- Proceed as follows:

(1) Release the Allen head setscrews 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 stopped at the low end gear train stop at this point.
(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 modules used for the video amplifier, AGC amplifier, and the audio amplifier 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 6-11 at the points where the connecting leads pass through the lines 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.

Table 4-1. Type 770A Receiver, Tube and Transistor Pin Voltages

Ref. Desig.	Type	Pin Number or Element								
		2	4 Grid	8 Cathode	10 Heater	12 Heater	Plate	Emitter	Base	Collector
A1V1 (1)	7486		-2*	0	-6.1	0	95			
A1V2 (1)	6CW4	80	-0.4*	0	0	6.3 vac				
A1V3 (1)	6CW4	150	73	80	0	6.3 vac				
A2V1 (2)	7077		0	0.3	6.3 vac	0	88			
A2V2 (2)	7077		0	0.4	6.3 vac	0	88			
A2V3 (2)	7587	10	-1.1	0	6.3 vac	0	130			
A2V4 (2)	7486		-1.5	0	-6.1	0	75			
A3V1 (3)	7587	25	-0.7*	.08	0	6.3 vac	118			
A3V2 (3)	7587	20	-0.7*	.04	0	6.3 vac	118			
A3V3 (3)	7587	16	0	.3	0	6.3 vac	118			
A3V4 (3)	7587	20	-0.6*		0	6.3 vac	113			
A3V5 (3)	7587	18	-4.0*	.09	0	6.3 vac	20			
A3Q3 (3)	2N335							-.55	0	22
A3Q4 (3)	2N335							-0.6 (6)	0 (6)	22 (6)
A3V6 (4)	7587	40	-0.5*	0.4	0	6.3 vac	116			
A3V7 (4)	7587	40	-0.5*	0.6	0	6.3 vac	116			
A3V8 (4)	7587	37	0	0.6	0	6.3 vac	116			
A3V9 (4)	7587	15	-0.4*	0	0	6.3 vac	111			
A3V10 (4)	7587	15	-6.0*	0.15	0	6.3 vac	50			
A3Q1 (4)	2N335							0.3	0.9	22
A3Q2 (4)	2N335							-0.7 (6)	0 (6)	22 (6)
A4V1 (5)	7587	26	-0.5		0	6.3 vac	107			
A4V2 (5)	7587	8	-0.5		0	6.3 vac	110			
A4V3 (5)	6CW4	85	21*	26*	0	6.3 vac				
A4V4 (5)	7587	30	-0.5		0	6.3 vac	117			
A4V5 (5)	7587		-0.2		0	6.3 vac	75			
A4V6 (5)	7587	4	-2		0	6.3 vac	15			
A4Q1 (5)	2N335							-0.5	.05	22
A4Q2 (5)	2N335							-0.6 (6)	0 (6)	22 (6)
A4Q3 (5)	2N706							**	**	**
A8V1 (2)	7587	18	-0.4	0.2	0	6.3 vac	130			
A8V2 (1)	7587	18	-0.4	0 2	0	6.3 vac	130			
A8V3	7587	15	-0.6	0	0	6.3 vac	110			
A8V4	6CW4	60	-3*	0	0	6.3 vac				

Table 4-1. Type 770A Receiver, Tube and Transistor Pin Voltages (continued)

Test Conditions: All voltages are positive dc with respect to ground unless otherwise indicated. Readings taken with RCA WV-98B VTVM with 115 vac applied. Control settings as follows unless otherwise indicated: RF GAIN, VIDEO GAIN, AUDIO GAIN, FINE TUNING, and BFO TUNING controls at mid-range; AGC/MAN switch in AGC; band-switch in 235-500 mc; IF BANDWIDTH in 4 MC; function switch in AM.

NOTES:
(1) Bandswitch in 490-1000 MC position.
(2) Bandswitch in 235-500 MC position.
(3) 500 KC IF Bandwidth Position
(4) 4 MC IF Bandwidth Position
(5) 100 KC IF Bandwidth Position
(6) FM IF BANDWIDTH Position.
* Measured with 1 megohm series resistor
** Element not accessible

Table 4-2. Type 770A Receiver, Module Pin Voltages

Video Amplifier Module

Pin Number	1	2	3	4	5	7	8	9
Voltages	0	-1.5	0	-24	22	-.25	0	0

Audio Amplifier Module

Pin Number	2	3	4	11	12	13
Voltages	0	-0.2	22	0	0	0

AGC Amplifier Module

Pin Number	1	2	3	5	11	16	17	18	19
Voltages	-0.5	0	-0.8	0	-24	0	-0.5	0	22

Test Conditions: All voltages are positive dc with respect to ground unless otherwise indicated. Readings taken with RCA WV-98B VTVM with 115 vac applied. Control settings as follows unless otherwise indicated: RF GAIN, VIDEO GAIN, AUDIO GAIN, FINE TUNING, and BFO TUNING controls at mid-range; AGC/MAN switch in AGC; band-switch in 235-500 mc; IF BANDWIDTH in 4 MC; function switch in AM.

4.4 TROUBLESHOOTING

Most troubles will be caused by failures of the fuse, tubes, or diodes. The proper functioning of all these parts should be assured by either test or by replacement with parts known to be good before any further trouble-shooting 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 receiver. 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 receiver should be performed only with suitable equipments by technicians thoroughly familiar with their use. If the limits and tolerances specified in the following steps cannot be obtained during a field alignment, a factory alignment is necessay. Allow several minutes for warm-up before beginning to work.

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 receiver alignment.

(1) Oscilloscope, Tektronix Type 503
(2) VTVM, RCA Type WV-98B
(3) Signal Generator, Hewlett-Packard 606A
(4) Sweep Generator, Telonic Model HD-1A
(5) Signal Generator, Hewlett-Packard 608D
(6) Signal Generator, Hewlett-Packard 612A
(7) Assorted cables, connectors, attenuation pads and alignment tools

4.6 100 KC IF ALIGNMENT

The 100 kc IF strip alignment is given in the following paragraphs.

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

(1) Set the receiver function switches to AM/MAN mode; IF BANDWIDTH switch to 100 KC.
(2) Disconnect IF strip from the 60-21.4 mc converter by removing P14 from A3J1.
(3) Set oscilloscope horizontal sensitivity to 0.5 volt per centimeter.
(4) Connect VTVM to AGC line at A4C41 and adjust RF GAIN control for an indication of -1.5 volts on the VTVM.

4.6.2 Discriminator Alignment.- Proceed as follows:

(1) Remove tube V5.

(2) Remove bottom cover from the IF strip.
(3) Set up the equipment as shown in Figure 4-1.
(4) Adjust sweep generator output to display an S-curve response on the scope.
(5) Set signal generator to give an accurate 2.5 mc marker.
(6) Adjust L6 for amplitude symmetry of the S-curve and L7 for zero crossing of the S-curve at 2.5 mc. If necessary, adjust the physical position of L7 in the mounting slot to give the correct peak-to-peak separation of the S-curve. A typical response is shown in Figure 4-2.
(7) Replace tube V5.

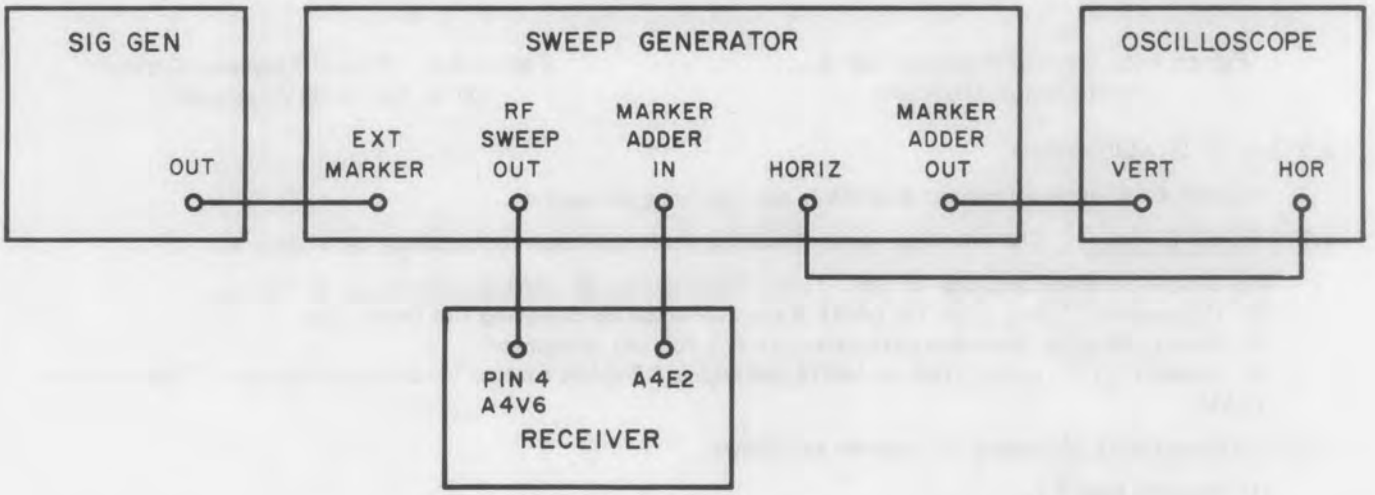

Figure 4-1. Equipment Setup, IF Alignment

4.6.3 V5 to V6 Interstage Alignment.- Proceed as follows:

(1) Remove tube V3.
(2) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V5 pin 4 and the marker adder input to TP1.
(3) Adjust the sweep generator until a response curve is displayed on the oscilloscope screen.
(4) Adjust L5 for a single-peak response centered at 2.5 mc.

4.6.4 V2 to V5 Interstage Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V4, pin 4 and the marker adder input to E1.
(2) Adjust L4 for a single peak response centered at 2.5 mc.
(3) Move the sweep generator output to V2, pin 4.
(4) Adjust L2 and L3 for a single peak response centered at 2.5 mc.

4.6.5 Over-all 100-kc Alignment.- Proceed as follows:

(1) Replace tube V3.
(2) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to the SM OUTPUT jack J4 on the rear apron of the receiver, and the marker adder input to E1.
(3) Adjust L1 and L9 for a single-peak response centered at 21.4 mc.
(4) Replace bottom cover.
(5) Readjust L1 and L9 for a symmetrical, single peak response centered at 21.4 mc, with a 3-db bandwidth of 100 kc. Readjust L2, L3 and L4 if necessary. A typical response curve is shown in Figure 4-3.

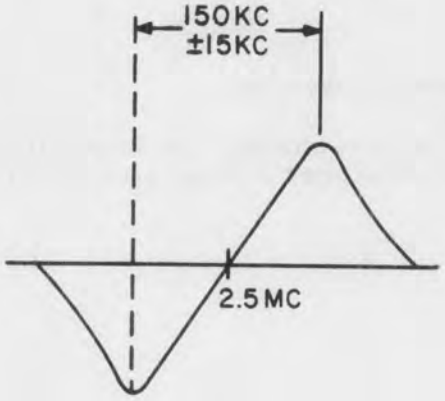

Figure 4-2. Typical Response Curve, Discriminator Alignment

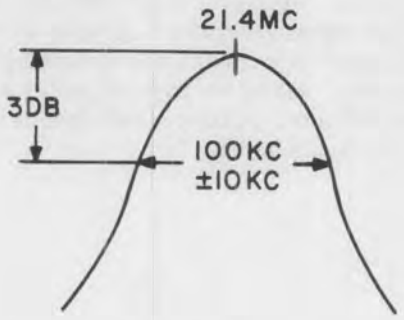

Figure 4-3. Typical Response Curve, 100-kc Bandwidth Alignment

4.7 500 KC IF ALIGNMENT

The 500 kc IF strip alignment is given in the following paragraphs.

4.7.1 Initial Settings.- The following steps should be performed before beginning the alignment.

(1) Set the receiver function switch to AM/MAN mode; IF BANDWIDTH switch to 500 kc.
(2) Disconnect IF strip from the 60-21.4 mc converter by removing P14 from A3J1.
(3) Set oscilloscope horizontal sensitivity to 0.5 volt per centimeter.
(4) Connect VTVM to AGC line at A3C43 and adjust RF GAIN control for an indication of -1.5 volts on the VTVM.

4.7.2 Discriminator Alignment.- Proceed as follows:

(1) Remove tube V4.
(2) Remove bottom cover from the IF strip.
(3) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V5 pin 4 and the marker adder input to E2.
(4) Adjust sweep generator output to display an S-curve response on the scope.
(5) Set signal generator to give an accurate 21.4 mc marker.
(6) Adjust L8 for amplitude symmetry of the S-curve and L9 for zero crossing of the S-curve at 21.4 mc. If necessary, adjust the physical position of L9 in the mounting slot to give the correct peak-to-peak separation of the S-curve. A typical response is shown in Figure 4-4.
(7) Replace tube V4.

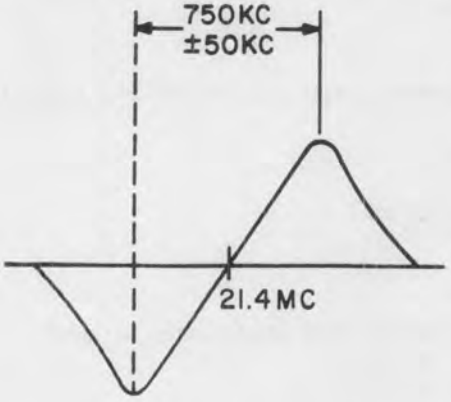

Figure 4-4. Typical Response Curve, Discriminator Alignment

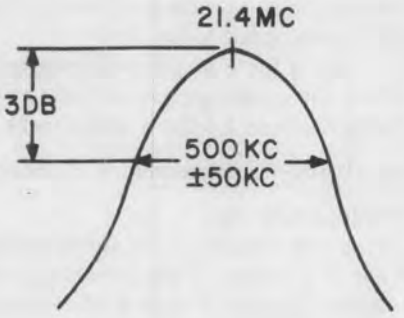

Figure 4-5. Typical Response Curve, 500-kc Bandwidth Alignment

4.7.3 V4 to V5 Interstage Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V4, pin 4 and the marker adder input to TP1.
(2) Adjust the sweep generator until a response curve is displayed on the oscilloscope screen.
(3) Adjust L7 for a single-peak response centered at 21.4 mc.

4.7.4 V2 to V6 Interstage Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V3, pin 4 and the marker adder input to E1.
(2) Adjust L5 and L6 for a response centered at 21.4 mc.
(3) Move the sweep generator output to V2, pin 4.
(4) Adjust L3 and L4 for a response centered at 21.4 mc.

4.7.5 Over-all 500 kc Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to the SM OUTPUT jack J4 on the rear apron of the receiver and the marker adder input to E1.
(2) Adjust L1 and L2 for a response centered at 21.4 mc.
(3) Replace bottom cover.
(4) Readjust L1 and L2 for a symmetrical response centered at 21.4 mc, with a 3-db bandwidth of 500-kc. Readjust L3 and L4 if necessary. A typical response curve is shown in Figure 4-5.

4.8 4 MC IF ALIGNMENT

The 4 mc IF strip alignment is given in the following paragraphs.

4.8.1 Initial Settings.- The following steps should be performed before beginning the alignment.

(1) Set the receiver function switches to AM/MAN mode; IF BANDWIDTH switch to 4 MC.
(2) Disconnect IF strip from the 60-21.4 mc converter by removing P14 from A3J1.
(3) Set oscilloscope horizontal sensitivity to 0.5 volt per centimeter.
(4) Connect VTVM to AGC line at A3C43 and adjust RF GAIN control for an indication of -6.0 volts on the VTVM.

4.8.2 Discriminator Alignment.- Proceed as follows:

(1) Remove tube V9.
(2) Remove bottom cover from the IF strip.
(3) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V10, pin 4 and the marker adder input to E4.
(4) Adjust sweep generator output to display an S-curve response on the scope.
(5) Set signal generator to give an accurate 21.4-mc marker.
(6) Adjust L19 for amplitude symmetry of the S-curve and L20 for zero crossing of the S-curve at 21.4 mc. If necessary, adjust the coupling loop, L21, to give the correct peak-to-peak separation of the S-curve. A typical response is shown in Figure 4-6.
(7) Replace tube V9.

4.8.3 V9 to V10 Interstage Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V9, pin 4 and the marker adder input to TP2.
(2) Adjust the sweep generator until a response curve is displayed on the oscilloscope screen.
(3) Adjust L18 for a single-peak response centered at 21.4 mc.

4.8.4 V7 to V9 Interstage Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V8, pin 4 and the marker adder input to E3.
(2) Adjust L16 and L17 for an over-coupled response centered at 21.4 mc. The frequency difference between the peaks and center frequency should be equal.
(3) Move the sweep generator output to V7, pin 4.
(4) Adjust L14 and L15 for an over-coupled response centered at 21.4 mc.
The frequency difference between the peaks and center frequency should be equal.

4.8.5 Over-all 4 mc Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to the SM OUTPUT jack J4, on the rear apron of the receiver, and the marker adder input to E3.
(2) Adjust L12 and L13 for an extremely over-coupled response centered at 21.4 mc. A typical response is shown in Figure 4-7.
(3) Replace bottom cover.

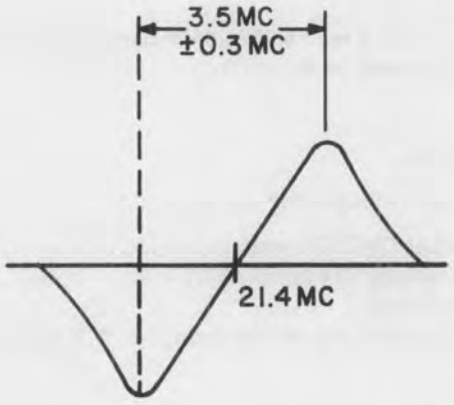

Figure 4-6. Typical Response Curve, Discriminator Alignment

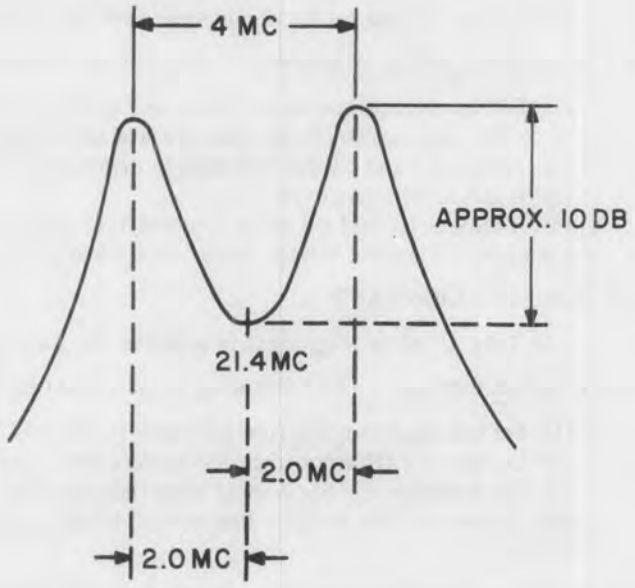

Figure 4-7. Typical Response Curve, 3-mc Bandwidth Alignment

4.9 21.4 MC CONVERTER ALIGNMENT

The 60 to 21.4-mc converter is aligned in part using accurately aligned IF strips. Before an alignment of the converter is attempted, check the IF alignment as described in paragraphs 4.6, 4.7 and 4.8.

4.9.1 Initial Settings.- Make the following initial settings.

(1) Set the receiver function switches to the AM/MAN mode and the IF BANDWIDTH switch to 4 MC.
(2) Set the bandswitch in the 235-500 MC position.
(3) Adjust the RF GAIN control fully clockwise.
(4) Disconnect P11 from A8J2 and P12 from A8J1.

4.9.2 60.0-mc Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to A8J1 and the marker adder input to A8TP1.
(2) Adjust the sweep generator so that a response curve is displayed on the oscilloscope screen.
(3) Adjust L1, L3 and L4 for a symmetrical response of maximum amplitude centered at 60.0 mc.
(4) Connect the sweep output to A8J2.
(5) Set the bandswitch to the 490-1000 MC position.

(6) Adjust L2 for symmetrical response of maximum amplitude centered at 60.0 mc.

4.9.3 21.4-mc Mixer Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to A8J2 and the marker adder input to A3E3.
(2) Connect the VTVM to the AGC line at A3C43 and adjust the RF GAIN control for an indication of -6.0 volts on the VTVM.
(3) Set the bandswitch in the 490-1000 MC position.
(4) Adjust the sweep generator until a response curve is displayed on the oscilloscope screen.
(5) Adjust A3L6 so that the middle peak of a three peaked response is centered at 60.0 mc. A typical response is shown in Figure 4-8.

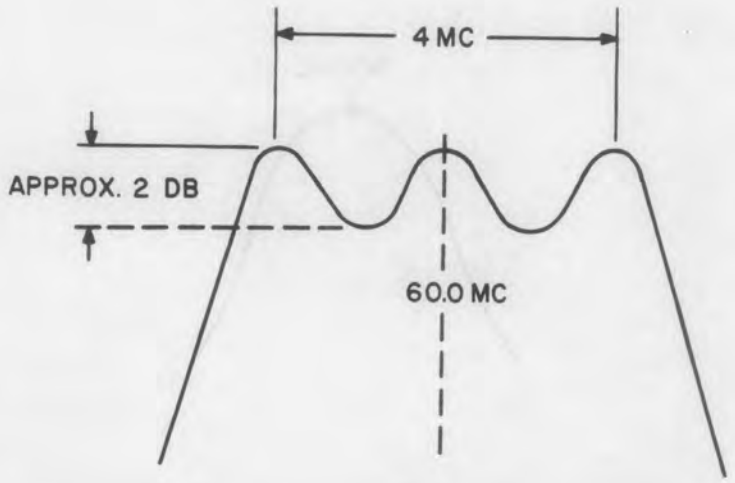

Figure 4-8. Typical Response Curve, 3-mc Bandwidth Alignment

4.10 235-500 MC TUNER ALIGNMENT

The 235-500 mc tuner is aligned in part using an accurately aligned 60-21.4 mc converter and accurately aligned IF strips. Before an alignment of the tuner is attempted, check the converter and IF alignment as described in paragraphs 4.6, 4.7, 4.8 and 4.9. Alignment of the RF tuner should be necessary only after replacement of a tube or component. A factory alignment is necessary if satisfactory responses cannot be obtained in the field using only those adjustments directly associated with the replaced tube or component.

4.10.1 Initial Settings.- Make the following initial settings.

(1) Set the function switches in the AM/MAN mode.
(2) Adjust the RF GAIN fully clockwise.
(3) Set the bandswitch to the 235-500 MC position.
(4) Set the FINE TUNING control to mid-range.
(5) Set the IF BANDWIDTH switch to the 500 KC position.

4.10.2 RF Circuit Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1 except the sweep output is connected to J2, 235-500 MC IN-

PUT and the marker adder input to A2TP1.
(2) Set the receiver tuning dial to 500 MC and the sweep generator to 500 mc.
(3) Set the oscilloscope vertical sensitivity to 50 millivolts per centimeter.
(4) Adjust the sweep generator sweep width and oscilloscope horizontal sensitivity until a response curve is displayed on the oscilloscope screen.
(5) Remove the larger of the two bottom covers from the 235-500 mc tuner.
(6) If V1 or any associated components are replaced, adjust C6 for maximum amplitude of a single-peak response. The response should be centered at exactly 500 mc. Typical response is shown in Figure 4-9.
(7) If V2 or any associated components are replaced, adjust C13 and C17 for maximum amplitude of a single-peak response. The response should be centered at exactly 500 mc.
(8) If V3 or any associated components are replaced, adjust C24 for a single-peak response. The response should be centered at exactly 500 mc.
(9) Check the response at 250 mc and 350 mc. The response shape will vary slightly. The markers should be near the peak of the response curve.
(10) Replace the bottom cover.

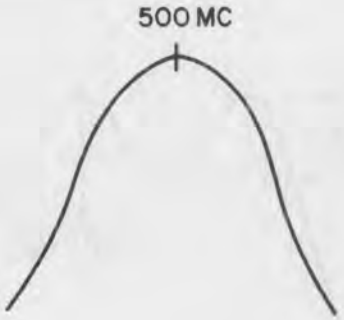

Figure 4-9. Typical Response Curve, Tuner Alignment

4.10.3 Local Oscillator Alignment.- Proceed as follows:

(1) Set the function switch to the FM mode.
(2) Connect the output of the Hewlett-Packard 612A signal generator to J2, 235-500 MC RF INPUT.
(3) Adjust the signal generator to 500 mc.
(4) Adjust the signal generator output to 100 μv.
(5) Tune the receiver to the signal generator frequency using the tuning meter to indicate proper tuning.
(6) The receiver tuning dial should indicate 500 mc ±0.5%.
(7) Repeat steps (2) through (5) for 350 mc. (Use a Hewlett-Packard 608 signal generator).
(8) Repeat steps (2) through (5) for 250 mc. (Use a Hewlett-Packard 608 signal generator).
(9) If any of the tuning dial indications exceed the ±0.5% tolerance, adjust C39. After any adjustment of C39, repeat steps (2) through (7).

4.10.4 60-mc Mixer Adjustment

(1) Set the function switches to the AM/MAN mode.
(2) Repeat 4.10.2 steps (1) through (4) except the marker adder input is connected to A8TP1.
(3) Adjust A2L14 and A8L1 for a slightly over-coupled symmetrical response.

4.11 490-1000 MC RF TUNER ALIGNMENT

The 490-1000 mc RF tuner is aligned in part using an accurately aligned 60-21.4 mc converter and accurately aligned IF strips. Before an alignment of the tuner is attempted, check the converter and IF alignment as described in paragraphs 4.6, 4.7, 4.8 and 4.9. Alignment of the tuner should be necessary only after the replacement of a

tube or component. A factory alignment is necessary if satisfactory responses cannot be obtained in the field using only those adjustments directly associated with the replaced tube or component.

4.11.1 Initial Settings.- Make the following initial settings.

(1) Set the function switch in the FM mode.
(2) Adjust the RF GAIN fully clockwise.
(3) Set the bandswitch to the 490-1000 MC position.
(4) Set the FINE TUNING control to mid-range.
(5) Set the IF BANDWIDTH switch to the 500 KC position.

4.11.2 RF Circuit Alignment.- The tunable RF filter is factory aligned and in no case should a field alignment be attempted.

4.11.3 Local Oscillator Alignment.- Proceed as follows:

(1) Connect the output of the Hewlett-Packard 612A signal generator to J1, 490-1000 MC RF INPUT.
(2) Adjust the signal generator to 1000 mc.
(3) Adjust the signal generator output to 100 μv.
(4) Tune the receiver to the signal generator frequency, using the tuning meter to indicate proper tuning.
(5) The receiver tuning dial should indicate 1000 mc ±1%.
(6) If the tuning dial indication exceeds the ±1% tolerance, adjust C6 so that the indication is within tolerance.
(7) Repeat steps (2) through (5) for 500 mc.
(8) If the tuning dial indication exceeds the ±1% tolerance, adjust C7 so that the indication is within tolerance.
(9) Repeat steps (2) through (5) for 750 mc.
(10) Repeat steps (2) through (5) for 1000 mc.
(11) Repeat step (6) if necessary.

4.11.4 60-mc Mixer Alignment.- The tuning inductors L15 and L16 in the 60-mc cascode amplifier are factory aligned and should not be adjusted in the field.

(1) Set the function switches to the AM/MAN mode.
(2) Set up the equipment as shown in Figure 4-1 except the sweep output is connected to J1, 490-1000 MC RF INPUT and the marker adder input to A8TP1.
(3) Set the receiver tuning dial to 500 mc and the sweep generator to 500 mc.
(4) Set the oscilloscope vertical sensitivity to 50 millivolts per centimeter.
(5) Adjust the sweep generator sweep width and oscilloscope horizontal sensitivity so that a response curve is displayed on the oscilloscope screen.
(6) Adjust A1L17 and A8L2 for a slightly over-coupled symmetrical response.

SECTION V

REPLACEMENT PARTS LIST

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:

Read from right to left as: First (1) resistor (R) of first (1) subassembly (A)

As shown on the main chassis schematic, components which are an integral part of the main chassis have no subassembly 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 LIST OF MANUFACTURERS

Abbreviation	Name and Address
AB	Allen-Bradley Co. 136 W. Greenfield Avenue Milwaukee, Wisconsin
FXR	Amphenol-Borg Electronics 33 E. Franklin Street Danbury, Connecticut
Arco	Arco Electronics, Inc. Community Drive Great Neck, New York
Bussman	Bussman Manufacturing Co. University at Jefferson Street St. Louis, Missouri
CEI	Communication Electronics, Inc. 4908 Hampden Lane Bethesda 14, Maryland
CD	Continental Devices Corp. 12515 Chadion Avenue Hawthorne, California
C-H	Cutler-Hammer, Inc. 321 N. 12th Street Milwaukee, Wisconsin
C-J	Cinch-Jones Manufacturing Co. 1026 S. Homan Avenue Chicago, Illinois
Cornish	Cornish Wire Co. 50 Church Street New York, New York
CTC	Cambridge Thermionic Corp. 445 Concord Avenue Cambridge, Massachusetts
Dale	Dale Electronics, Inc. P.O. Box 488 Columbus, Nebraska
Erie	Erie Resistor Corp. 644 W. 12th Street Erie, Pennsylvania
Ferroxcube	Ferroxcube Corp. of America Saugerties, New York
GE	General Electric Co. 777 14th Street, N.W. Washington, D.C.
GI	General Instrument Corp. 165 Front Street Chicopee, Massachusetts
Glenco	Glenco Corp. 212 Durham Avenue Metuchen, New Jersey

Abbreviation	Name and Address	Abbreviation	Name and Address
JFD	J.F.D. Electronics Corp. 6101 16th Avenue Brooklyn, New York	RMC	Radio Materials Corp. 4242 W. Bryn Mawr Avenue Chicago 46, Illinois
Motorola	Motorola Semiconductor Products, Inc. 5005 E. McDowell Road Phoenix, Arizona	Sprague	Sprague Electric Co. 91 Marshall Street N. Adams, Massachusetts
Oak	Oak Manufacturing Co. Crystal Lake, Illinois	Switchcraft	Switchcraft, Inc. 5555 N. Elston Avenue Chicago, Illinois
Piezo	Piezo Crystal Co. 265 E/ Pomfret Street Carlisle, Pennsylvania	Taurus	Taurus Corp. 8 Coryell Street Lambertville, New Jersey
PSI	Pacific Semiconductors, Inc. 10451 W. Jefferson Boulevard Culver City, California	TI	Texas Instrument, Inc. 6000 Lemmon Avenue Dallas, Texas
QC	Quality Components, Inc. St. Marys, Pennsylvania	Wilco	Wilco Corp. 546 Drover Street Indianapolis, Indiana
RCA	Radio Corp. of America 415 S. Fifth Street Harrison, New Jersey		

5.4 PARTS LIST

When ordering replacement parts from CEI, specify the type and serial number of the equipment, and the reference designations and description of each part ordered. The Vendors and Vendor Part Numbers listed are included as a guide to the user of the equipment in the field and do not necessarily agree with the parts installed in the equipment. Except in those cases specifically noted, the replacement part may be obtained from any vendor as long as the physical and electrical parameters of the part selected agree with the original part.

5.4.1 Main Chassis

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A1	ASSEMBLY, 490-1000 MC RF TUNER	7111	CEI
A2	ASSEMBLY, 235-500 MC RF TUNER	7109	CEI
A3	ASSEMBLY, 500 KC/4 MC IF STRIP	7214	CEI
A4	ASSEMBLY, 100 KC IF STRIP	7213	CEI
A5	ASSEMBLY, VIDEO AMPLIFIER MODULE	7301	CEI
A6	ASSEMBLY, AUDIO AMPLIFIER MODULE	7400	CEI
A7	ASSEMBLY, PULSE AGC AMPLIFIER MODULE	7800	CEI
A8	ASSEMBLY, 60 to 21.4 MC CONVERTER	7106	CEI
A9	ASSEMBLY, LOW BAND TUNER AGC AMPLIFIER	7801	CEI
A10	ASSEMBLY, COUPLING NETWORK	7912	CEI
C1	CAPACITOR, METAL CLAD, THRUPASS: 0.01 μf, 600V	102P515	Sprague
C2	Same as C1		
C3	CAPACITOR, ELECTROLYTIC: 1000 μf, 25V	43F2468BA1	GE
C4	CAPACITOR, ELECTROLYTIC: 25 μf, 12V	30D256G012BB4	Sprague
C5A,B	CAPACITOR, ELECTROLYTIC: 15-15 μf, 350-350V	43F2299BB1	GE
C6A,B	CAPACITOR, ELECTROLYTIC: 100-100 μf, 50-50V	43F2300BB1	GE
C7	CAPACITOR, ELECTROLYTIC: 50 μf, 50V	30D506G050DH4	Sprague
C8	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μf, 20%, 35V	150D105X-0035A2	Sprague
C9	NOT USED		
C10	CAPACITOR, ELECTROLYTIC: 4.7 μf, 20%, 35V	150D475X-0035B2	Sprague
CR1	DIODE, SILICON, RECTIFIER	1N3253	RCA only
CR2	Same as CR1		
CR3	DIODE, SILICON, RECTIFIER	1N3255	RCA only
CR4	Same as CR3		
CR5	Same as CR1		
CR6	Same as CR1		
CR7	Same as CR1		
CR8	Same as CR1		
CR9	DIODE, SILICON, ZENER	1N753A	CD
CR10	DIODE, SILICON, ZENER	1N3008B	Motorola
CR11	DIODE, SILICON, ZENER	1N970A	CD
CR12	DIODE, SILICON, ZENER	1N979A	CD
CR13	Same as CR11		
DS1	LAMP: 6-8V, 150 ma	#47	GE

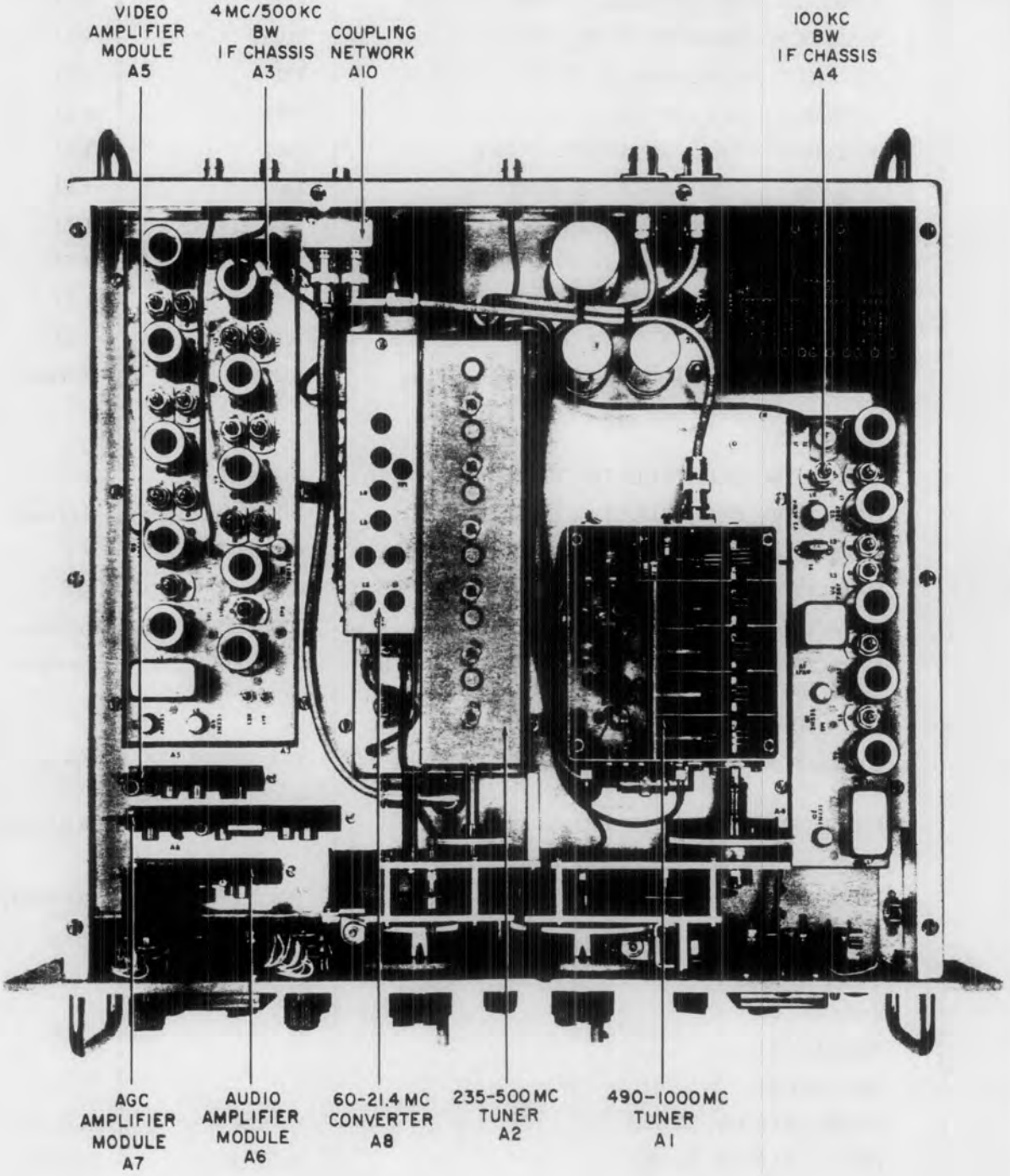

Figure 5-1. Type 770A Receiver, Top View

Ref. Desig.	Description	Vendor Part No.	Vendor Name
DS2	Same as DS1		
F1	FUSE: 3AG, Slow-Blow, 6/10 amp	MDL-6/10	Bussman
J1	CONNECTOR, N: p/o W8	UG-1052/U	FXR
J2	Same as J1		
J3	CONNECTOR, BNC: p/o W9	17825	FXR
J4	CONNECTOR, BNC: p/o W11	UG-1094/U	FXR
J5	Same as J3, p/o W12		
J6	Same as J4,		
J7	JACK, PHONE	C11	Switchcraft
L1	FILTER, CHOKE	1070	CEI
M1	METER, MICROAMMETER DC: 0-50 μa	1632	CEI
M2	METER, MICROAMMETER DC: 100-0-100 μa	1633	CEI
P1	CONNECTOR, BNC: p/o W8	UG-88/U	FXR
P2	Same as P1		
P3	CONNECTOR, SUB-MINIATURE: p/o W9	27-7	FXR
P4	Same as P3, p/o W11		
P5	Same as P3, p/o W12		
P6	POWER CORD	01753-001	Cornish
P7	Same as P1, p/o W1		
P8	CONNECTOR, SUB-MINIATURE: p/o W3	27-26	FXR
P9	Same as P1, p/o W1		
P10	Same as P1, p/o W2		
P11	Same as P3, p/o W3		
P12	Same as P8, p/o W7		
P13	Same as P8, p/o W5		
P14	Same as P3, p/o W5		
P15	Same as P8, p/o W6		
P16	Same as P8, p/o W6		
P17	Same as P3, p/o W4		
P18	Same as P1, p/o W2		
P19	Same as P3, p/o W7		
P20	Same as P3, p/o W4		
Q1	TRANSISTOR	2N1544	Motorola
Q2	TRANSISTOR	2N1038	TI
Q3	TRANSISTOR	2N1700	RCA
R1	RESISTOR, FIXED, COMPOSITION: 150 Ω, 5%, 1/4W	CB1515	AB
R2	Same as R1		

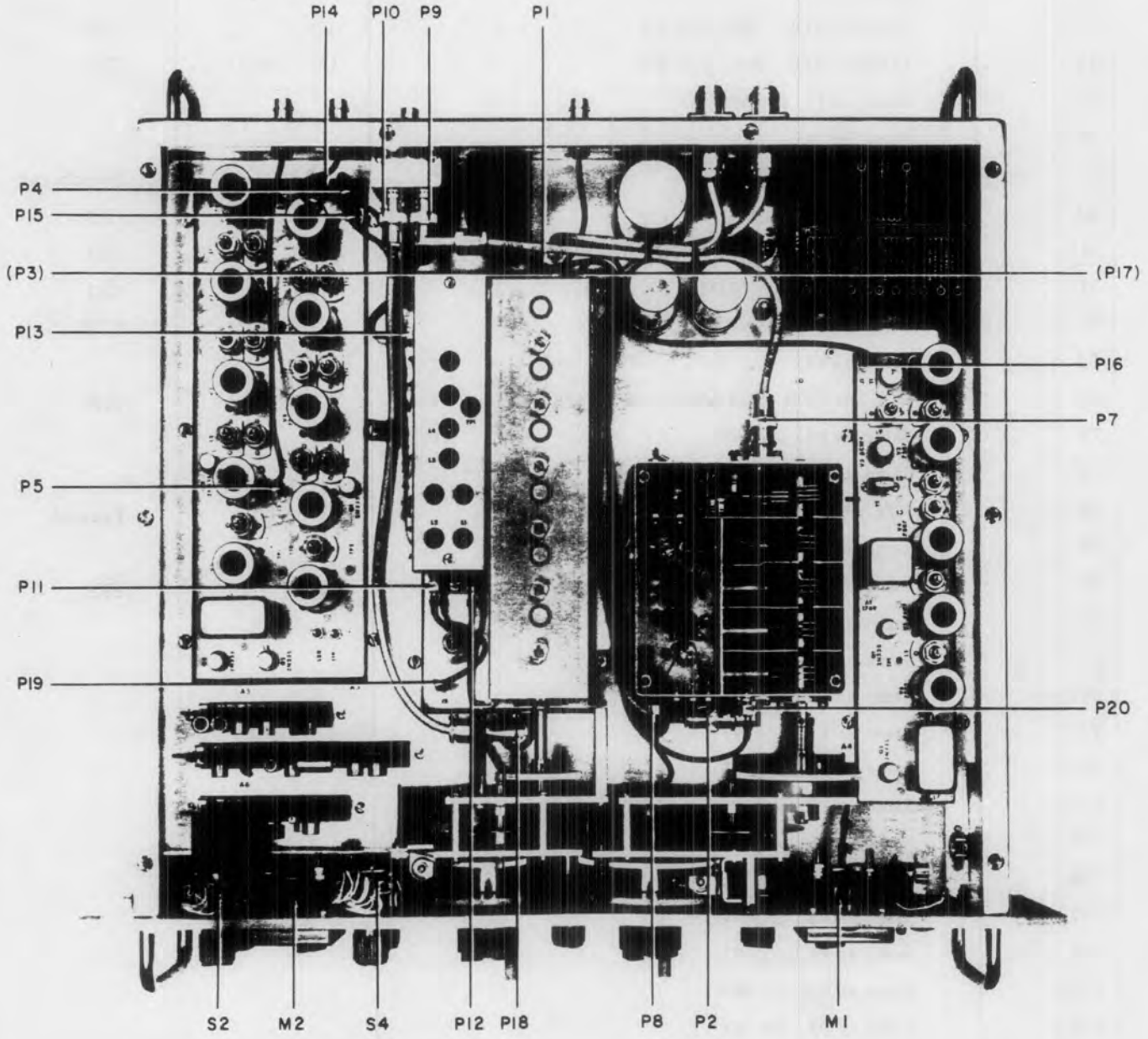

Figure 5-2. Type 770A Receiver, Top View

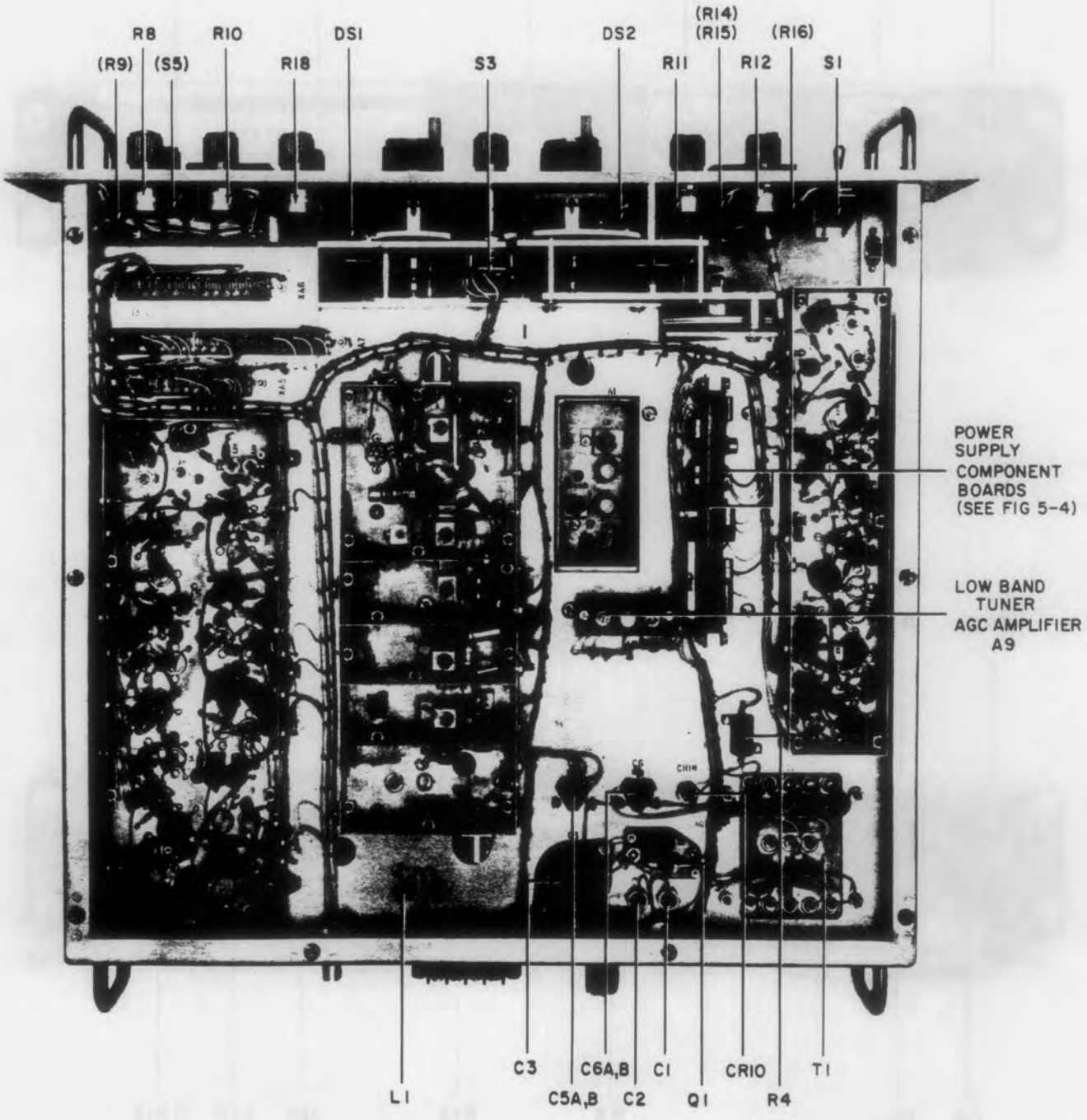

Figure 5-3. Type 770A Receiver, Bottom View

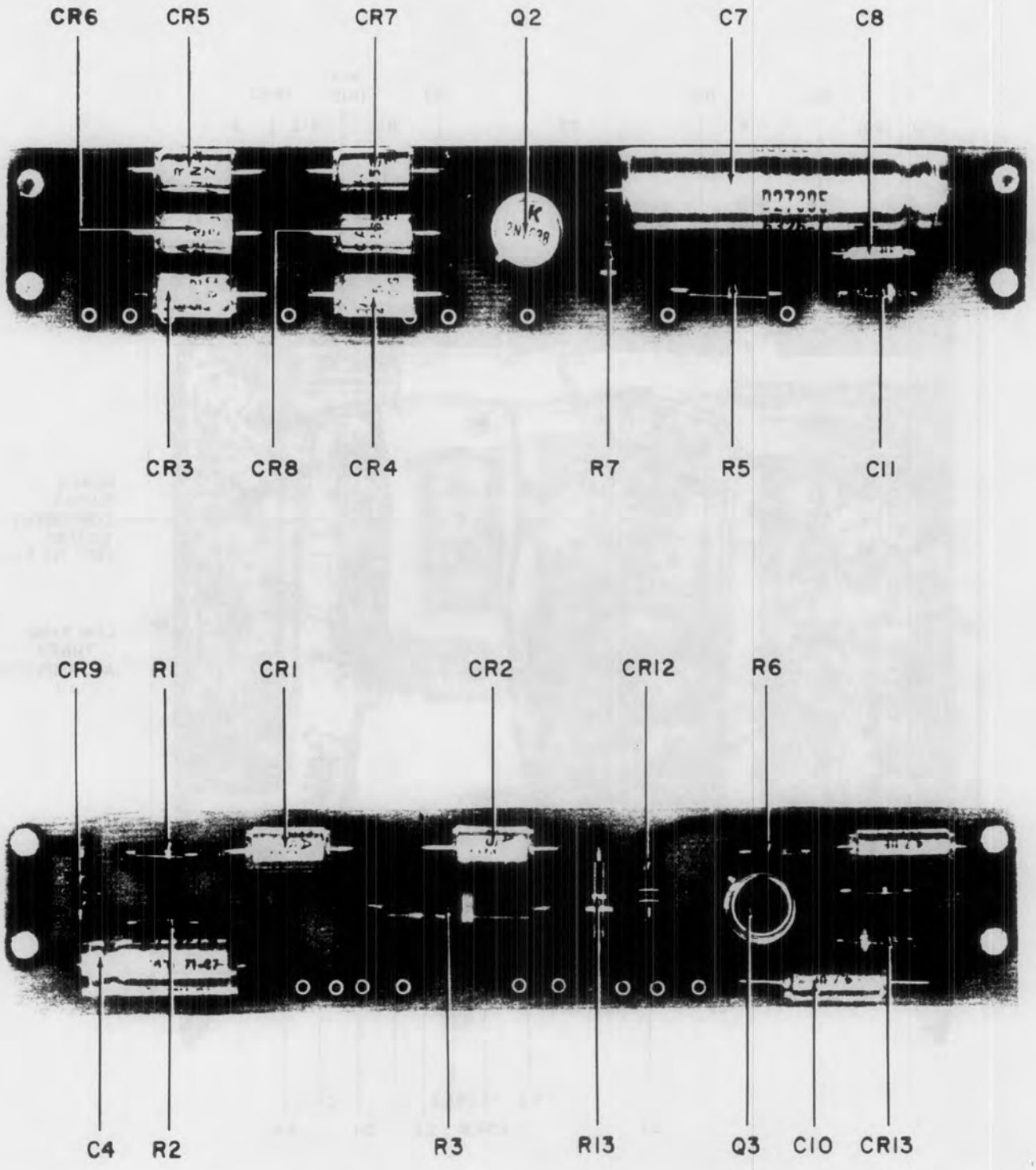

Figure 5-4. Power Supply Component Boards

Ref. Desig.	Description	Vendor Part No.	Vendor Name
R3	RESISTOR, FIXED, COMPOSITION: 2.7K, 5%, 2W	HB2725	AB
R4	RESISTOR, FIXED, WIREWOUND: 2.5K, 10%, 10W	RH10	Dale
R5	RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/2W	EB8215	AB
R6	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1W	GB4735	AB
R7	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/4W	CB4725	AB
R8	RESISTOR, VARIABLE, COMPOSITION: 10K, 10%, 2W	RV4NAYSD-103A	AB
R9	RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W	CB3915	AB
R10	RESISTOR, VARIABLE, COMPOSITION: 5K, 10%, 2W	RV4NAYSD-502A	AB
R11	RESISTOR, VARIABLE, COMPOSITION: 100K, 10%, 2W	RV4NAYSD-104A	AB
R12	RESISTOR, VARIABLE, COMPOSITION: 500K, 10%, 2W	RV4NAYSD-504A	AB
R13	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/2W	EB1045	AB
R14	RESISTOR, FIXED, COMPOSITION: 51K, 5%, 1/4W	CB5135	AB
R15	RESISTOR, FIXED, COMPOSITION: 180K, 5%, 1/4W	CB1845	AB
R16	RESISTOR, FIXED, COMPOSITION: 1 meg, 5%, 1/4W	CB1055	AB
R17	NOT USED		
R18	Same as R11		
S1	SWITCH, TOGGLE: SPST	8280-K16	C-H
S2	SWITCH, ROTARY	399225A	Oak
S3	SWITCH, ROTARY	399235A	Oak
S4	SWITCH, ROTARY	399227A	Oak
S5	SWITCH, TOGGLE: SPDT	8816-K5	C-H
T1	TRANSFORMER	1870	CEI
TB1	TERMINAL BOARD	4-140-Y	Cinch
W1	CABLE AND CONNECTOR ASSEMBLY	2126-66	CEI
W2	CABLE AND CONNECTOR ASSEMBLY	2126-67	CEI
W3	CABLE AND CONNECTOR ASSEMBLY	2126-68	CEI
W4	CABLE AND CONNECTOR ASSEMBLY	2126-69	CEI
W5	CABLE AND CONNECTOR ASSEMBLY	2126-37	CEI
W6	CABLE AND CONNECTOR ASSEMBLY	2126-69	CEI
W7	CABLE AND CONNECTOR ASSEMBLY	2126-70	CEI
W8	CABLE AND CONNECTOR ASSEMBLY	2126-71	CEI
W9	CABLE AND CONNECTOR ASSEMBLY	2126-72	CEI
W10	CABLE AND CONNECTOR ASSEMBLY	2126-42	CEI
W11	CABLE AND CONNECTOR ASSEMBLY	2126-72	CEI

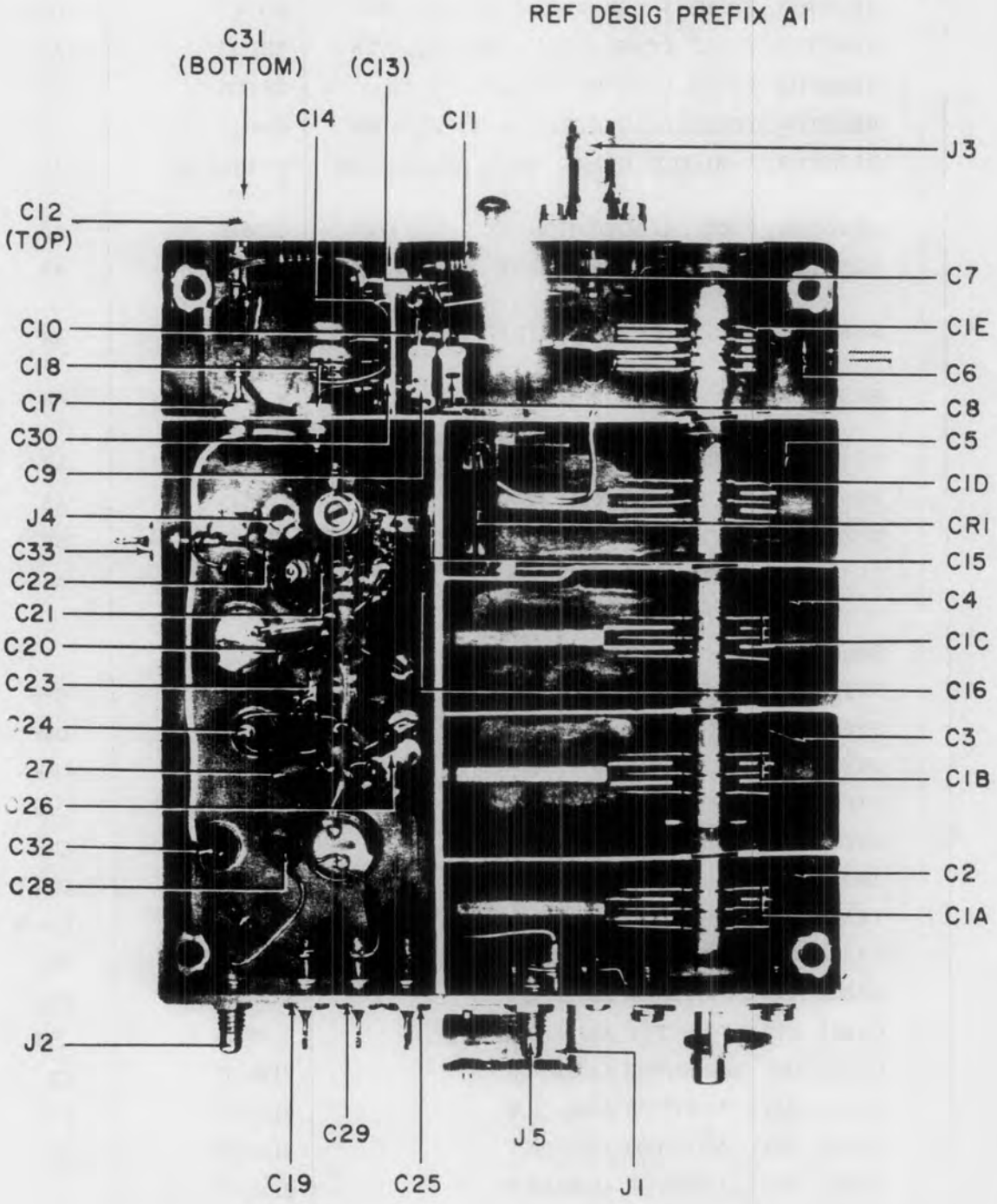

Figure 5-5. 490-1000 mc RF Tuner Type 7111, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
W12	CABLE AND CONNECTOR ASSEMBLY	2126-74	CEI
5.4.2 490-1000 mc Tuner, Type 7111			
A1C1A,B C,D,E	CAPACITOR, VARIABLE TUNING:	1271	CEI
A1C2	CAPACITOR, TRIMMER	1261	CEI
A1C3	Same as A1C2		
A1C4	Same as A1C2		
A1C5	Same as A1C2		
A1C6	CAPACITOR, VARIABLE TUNING	1276	CEI
A1C7	CAPACITOR, CERAMIC, TRIMMER: 0.5-3 pf	3115-001-1R	Erie
A1C8	CAPACITOR, CERAMIC, TUBULAR: 1.0 ±0.1 pf	301-000-COKO-109B	Erie
A1C9	CAPACITOR, CERAMIC, TUBULAR: 1.5 ±0.25 pf	301-000-COKO-159C	Erie
A1C10	CAPACITOR, FIXED: 0.27 pf, 10%	Type MC	QC
A1C11	VARICAP	PC115	PSI
A1C12	CAPACITOR, FEEDTHRU: 470 pf, 20%, 500V	FA5C-4712	AB
A1C13	CAPACITOR, STANDOFF: 137 pf, 20%, 500V	32-25394-1	GI
A1C14	Same as A1C12		
A1C15	CAPACITOR, SILVER MICA BUTTON: 15 pf, 10%	370-CB-150K	Erie
A1C16	CAPACITOR, DIPPED MICA: 56 pf, 5%	DM10-560J	Arco
A1C17	CAPACITOR, STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A1C18	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A1C19	Same as A1C18		
A1C20	CAPACITOR, CERAMIC DISC: 1000 pf, 20%	Type SM	RMC
A1C21	Same as A1C20		
A1C22	Same as A1C20		
A1C23	Same as A1C20		
A1C24	Same as A1C17		
A1C25	Same as A1C18		
A1C26	CAPACITOR, CERAMIC, TUBULAR: 2.2 ±0.25 pf	301-000-COJO-229C	Erie
A1C27	Same as A1C20		
A1C28	Same as A1C20		
A1C29	Same as A1C18		
A1C30	Same as A1C12		
A1C31	Same as A1C12		
A1C32	Same as A1C17		
A1C33	Same as A1C18		

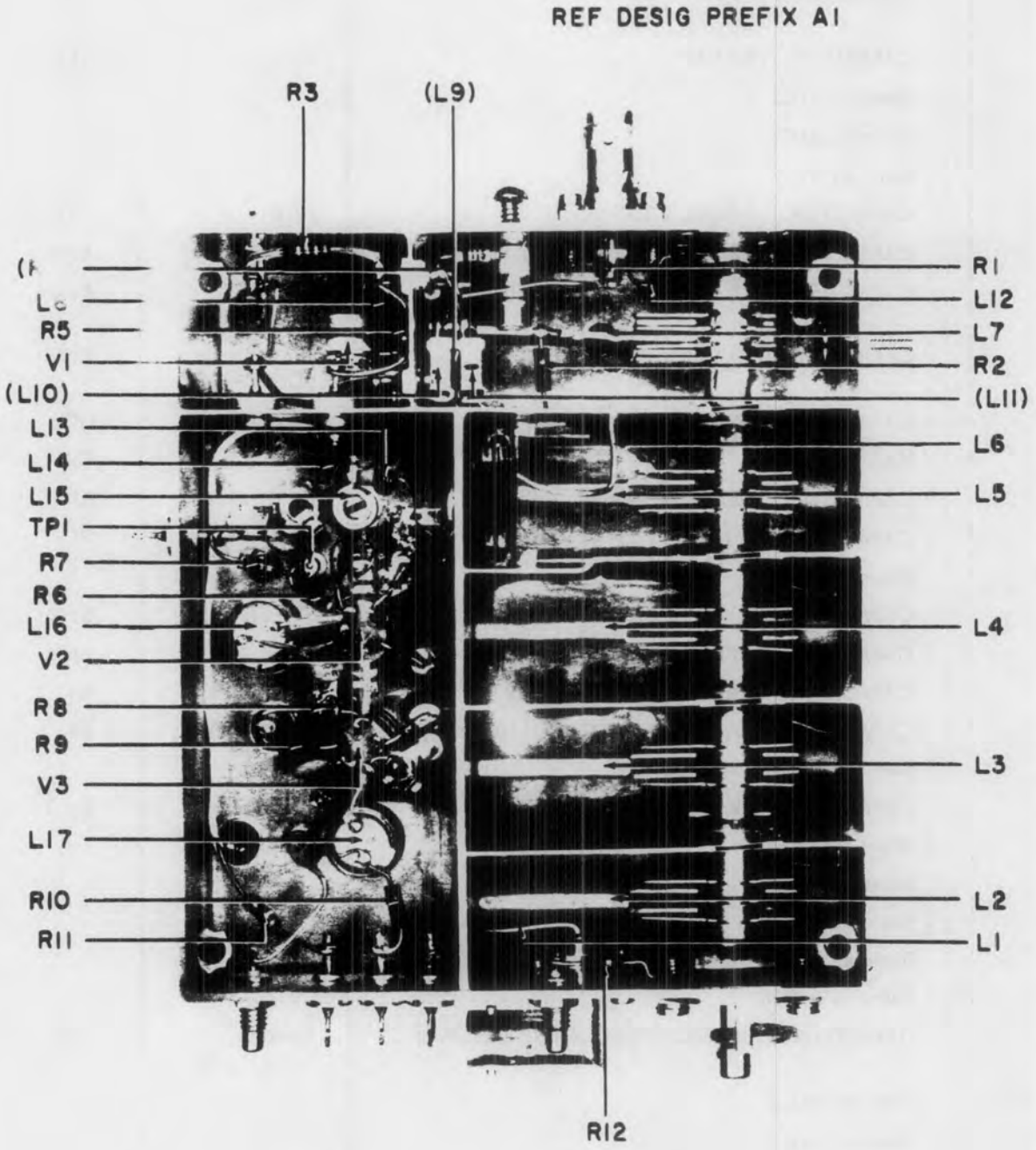

Figure 5-6. 490-1000 mc RF Tuner Type 7111, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A1CR1	DIODE, SILICON: UHF Mixer, plastic case, Type C	1N82A	GE
A1J1	RECEPTACLE, JACK: Type BNC	UG-535/U	FXR
A1J2	RECEPTACLE, JACK	27-9	FXR
A1J3	Same as A1J1		
A1J4	PHONE, JACK: Ultra-miniaturized, Microjax	TR-2A	Switchcraft
A1J5	Same as A1J2		
A1L1	INDUCTOR	1461	CEI
A1L2	INDUCTOR: Fixed line	1265	CEI
A1L3	Same as A1L2		
A1L4	Same as A1L2		
A1L5	Same as A1L2		
A1L6	INDUCTOR	1462	CEI
A1L7	INDUCTOR: Fixed line	1301	CEI
A1L8	INDUCTOR: Fixed	1973	CEI
A1L9	INDUCTOR: RF Choke	1466-4	CEI
A1L10	INDUCTOR: RF Choke	1466-3	CEI
A1L11	Same as A1L10		
A1L12	INDUCTOR: Fixed	1975	CEI
A1L13	INDUCTOR: Fixed	1466-1	CEI
A1L14	INDUCTOR: Fixed	1466-2	CEI
A1L15	INDUCTOR: Adjustable	1471-2	CEI
A1L16	INDUCTOR: Adjustable	1472-12	CEI
A1L17	INDUCTOR: Adjustable	1472-13	CEI
A1R1	RESISTOR, FIXED, COMPOSITION: 51 Ω, 5%, 1/4W	CB5105	AB
A1R2	RESISTOR, FIXED, COMPOSITION: 5.6K, 5%, 1/4W	CB5625	AB
A1R3	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A1R4	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A1R5	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A1R6	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	AB
A1R7	Same as A1R6		
A1R8	Same as A1R6		
A1R9	RESISTOR, FIXED, COMPOSITION: 10 Ω, 10%, 1/4W	CB1001	AB
A1R10	Same as A1R5		
A1R11	RESISTOR, FIXED, COMPOSITION: 3.9K, 5%, 1/4W	CB3925	AB
A1R12	Same as A1R1		
A1TP1	TEST POINT	TJ-6	Taurus
A1V1	TUBE, ELECTRON: Ceramic planar triode	7486	GE

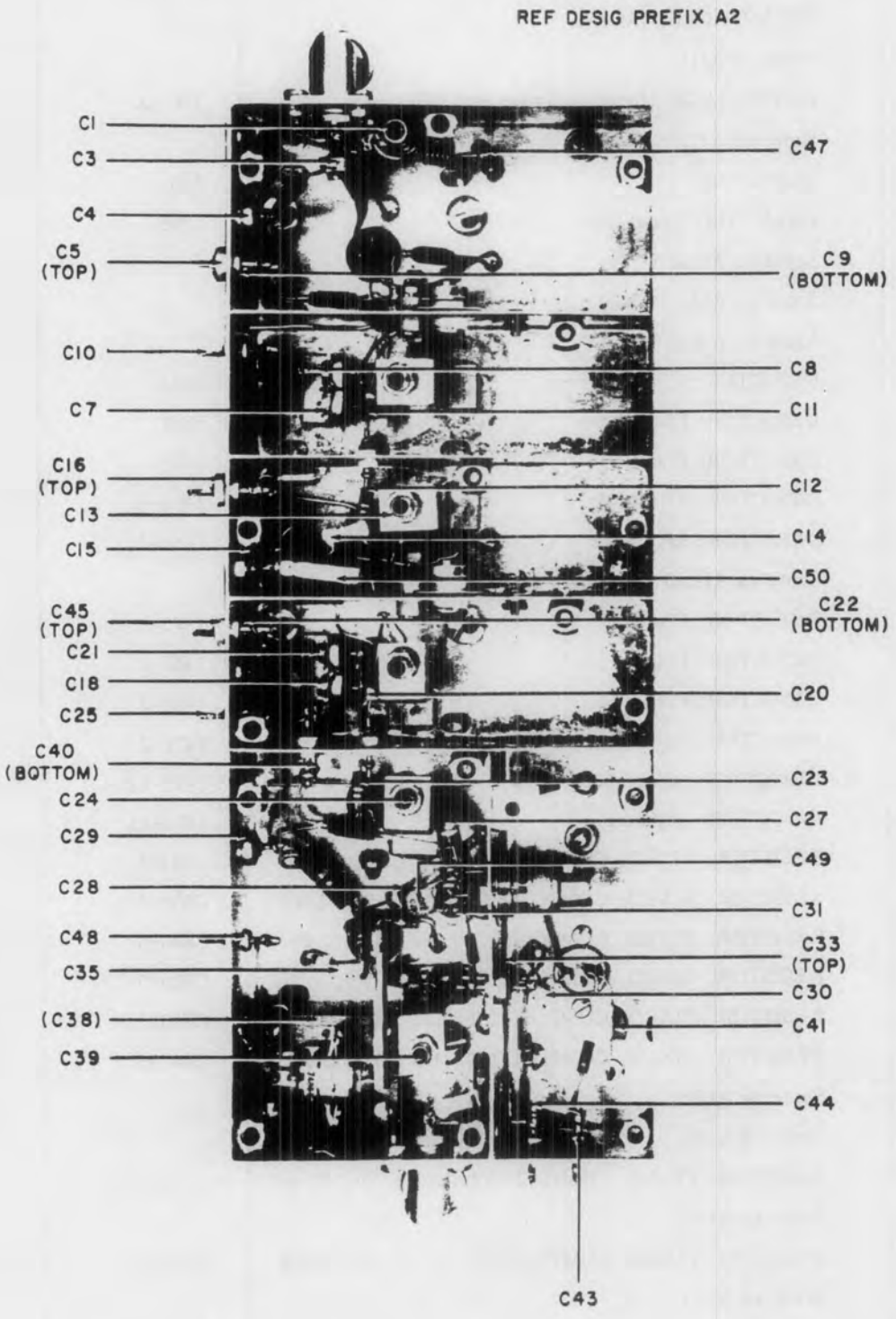

Figure 5-7. 235-500 mc RF Tuner Type 7109, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A1V2	TUBE, ELECTRON: Nuvistor triode	6CW4	RCA
A1V3	Same as A1V2		
5.4.3	235-500 mc Tuner, Type 7109		
A2C1	CAPACITOR, VARIABLE: 0.5-4.5 pf	CST-6	CTC
A2C2	CAPACITOR, TUBULAR COMPOSITION: 3.9 pf, 10%	Type QC	QC
A2C3	CAPACITOR, STANDOFF: 470 pf, 20%, 500 wvdc	SS5A-4712	AB
A2C4	Same as A2C3		
A2C5	CAPACITOR, FEEDTHRU: 470 pf, 20%, 500 wvdc	FA5C-4712	AB
A2C6	CAPACITOR, VARIABLE: 0.8-4.5 pf	VC21-G	JFD
A2C7	Same as A2C3		
A2C8	Same as A2C5		
A2C9	Same as A2C5		
A2C10	Same as A2C5		
A2C11	CAPACITOR, TUBULAR COMPOSITION: 0.68 pf, 10%	Type QC	QC
A2C12	CAPACITOR, TUBULAR COMPOSITION: 1.0 pf, 10%	Type MC	QC
A2C13	Same as A2C6		
A2C14	CAPACITOR, CERAMIC TUBULAR: 2.0 pf, ±0.25 pf	301-000-COKO-209C	Erie
A2C15	Same as A2C3		
A2C16	Same as A2C5		
A2C17	Same as A2C6		
A2C18	Same as A2C3		
A2C19	Same as A2C5		
A2C20	CAPACITOR, TUBULAR COMPOSITION: 0.51 pf, 10%	Type QC	QC
A2C21	Same as A2C5		
A2C22	Same as A2C5		
A2C23	Same as A2C12		
A2C24	Same as A2C6		
A2C25	Same as A2C5		
A2C26	Same as A2C5		
A2C27	CAPACITOR, TUBULAR COMPOSITION: 2.7 pf, ±.25 pf	301-000-COJO-279C	Erie
A2C28	CAPACITOR, TUBULAR COMPOSITION: 1.8 pf, 10%	Type QC	QC
A2C29	Same as A2C3		
A2C30	CAPACITOR, FIXED, CERAMIC: 4.7 pf, ±.25 pf	301-000-COHO-479C	Erie
A2C31	Same as A2C3		
A2C32	CAPACITOR, TUBULAR COMPOSITION: 0.82 pf, 10%	Type MC	QC
A2C33	Same as A2C5		

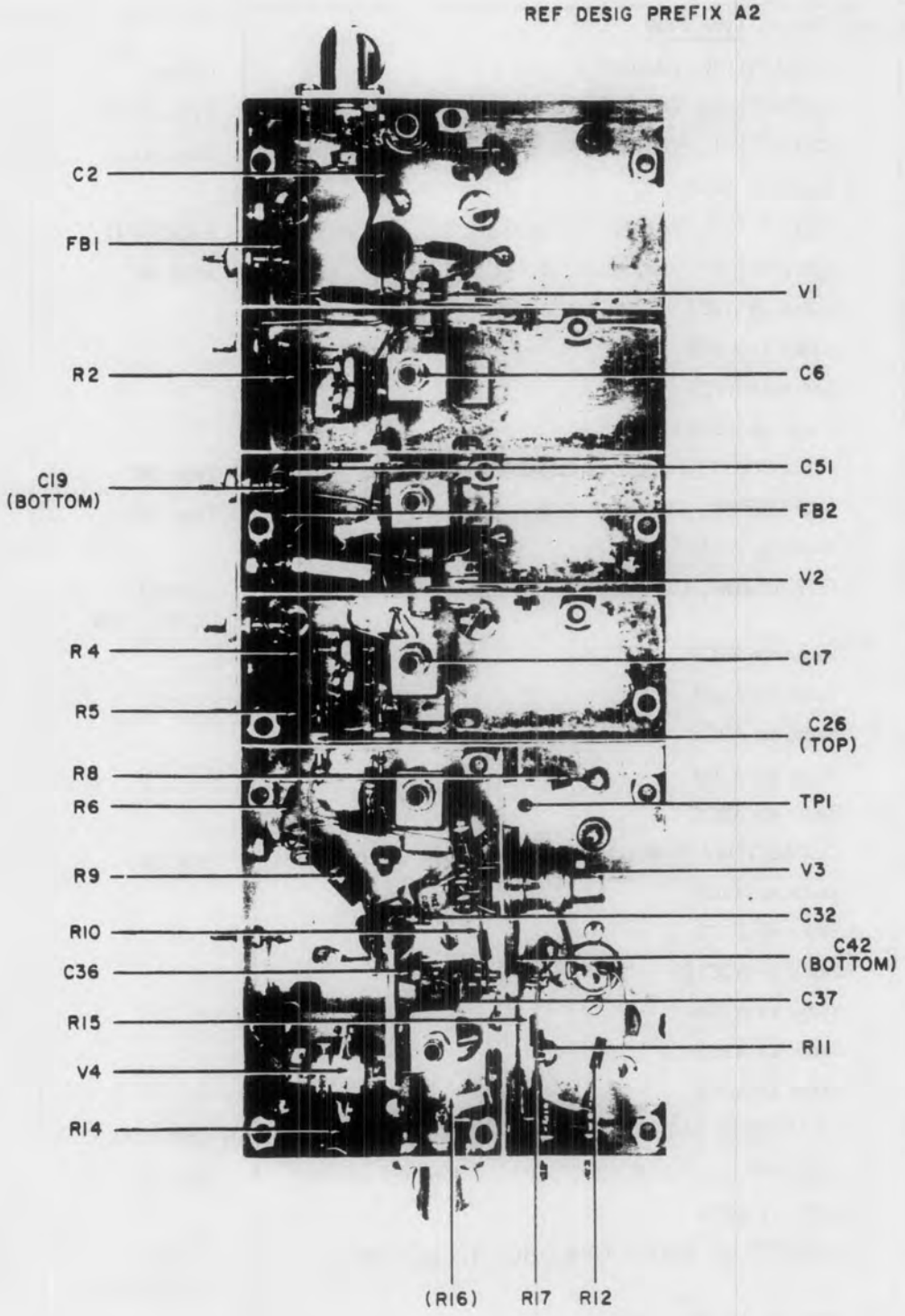

Figure 5-8. 235-500 mc RF Tuner Type 7109, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A2C34	CAPACITOR, CERAMIC, TUBULAR: 6.0 pf, ±0.25 pf	NPOA	Erie
A2C35	CAPACITOR, CERAMIC, TUBULAR: 6.2 pf, ±0.25 pf, temperature compensated	N750A	Erie
A2C36	CAPACITOR, TUBULAR COMPOSITION: 0.47 pf, 10%	Type MC	QC
A2C37	VARICAP	PC 115	PSI
A2C38	CAPACITOR, CERAMIC, TUBULAR: 1.0 pf, ±0.1 pf	301-000-COKO-109B	Erie
A2C39	Same as A2C6		
A2C40	Same as A2C5		
A2C41	CAPACITOR, CERAMIC DISC: 470 pf, 1000 vdc	Type B	RMC
A2C42	Same as A2C5		
A2C43	Same as A2C5		
A2C44	Same as A2C5		
A2C45	Same as A2C5		
A2C46	CAPACITOR, CERAMIC, TUBULAR: 3.3 pf, ±0.25 pf	301-000-COJO-339C	Erie
A2C47	Same as A2C11		
A2C48	Same as A2C5		
A2C49	Same as A2C41		
A2C50	CAPACITOR, ELECTROLYTIC, TANTALUM: 10 µf, 20%, 35 wvdc	150D106X-0035A2	Sprague
A2C51	CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2 µf, 20%, 35V	150D225X-0035B2	Sprague
A2FB1	FERRITE BEAD	56-590-65/4A	Ferroxcube
A2FB2	Same as A2FB1		
A2J1	RECEPTACLE, JACK: Type BNC	UG-535/U	FXR
A2J2	RECEPTACLE, JACK	27-9	FXR
A2J3	Same as A2J1		
A2J4	Same as A2J2		
A2J5	Same as A2J2		
A2L1	INDUCTOR	1966	CEI
A2L2	INDUCTOR, RFC	1131-21	CEI
A2L3A thru F	INDUCTUNER	2208	CEI
A2L4	INDUCTOR	1967	CEI
A2L5	Same as A2L2		
A2L6	Same as A2L2		
A2L7	INDUCTOR	1968	CEI
A2L8	INDUCTOR	1969	CEI

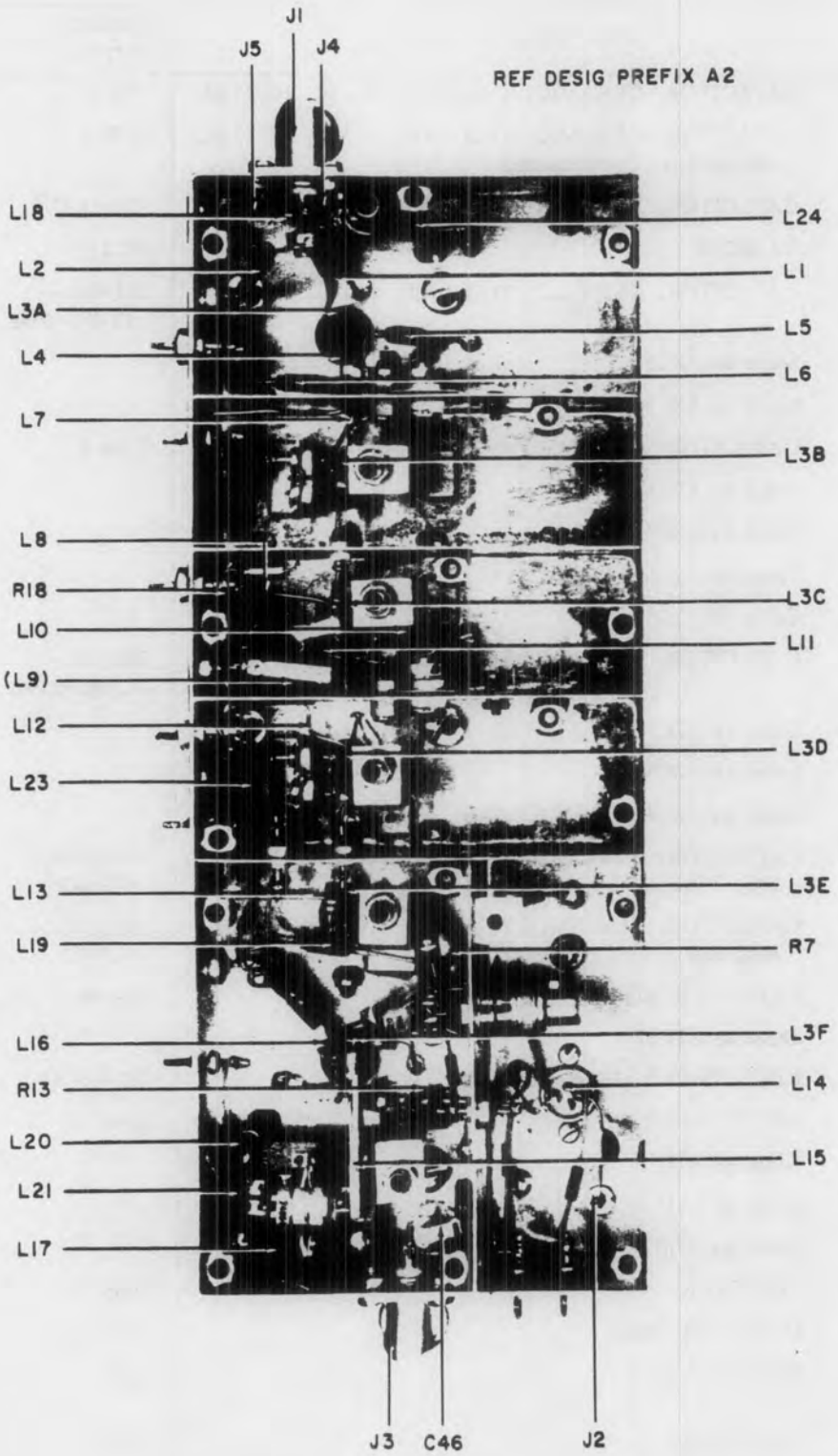

Figure 5-9. 235-500 mc RF Tuner Type 7109, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A2L9	Same as A2L2		
A2L10	Same as A2L2		
A2L11	Same as A2L2		
A2L12	INDUCTOR	1970	CEI
A2L13	INDUCTOR	1971	CEI
A2L14	INDUCTOR, VARIABLE	1472-13	CEI
A2L15	INDUCTOR	1234	CEI
A2L16	INDUCTOR	1131-34	CEI
A2L17	Same as A2L2		
A2L18	INDUCTOR	1972	CEI
A2L19	Same as A2L2		
A2L20	Same as A2L2		
A2L21	Same as A2L2		
A2L22	NOT USED		
A2L23	Same as A2L2		
A2L24	INDUCTOR	1129-04	CEI
A2R1	NOT USED		
A2R2	RESISTOR, FIXED, COMPOSITION: 7.5K, 5%, 1/2W	EB7525	AB
A2R3	NOT USED		
A2R4	Same as A2R2		
A2R5	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A2R6	Same as A2R5		
A2R7	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A2R8	Same as A2R7		
A2R9	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1W	GB1035	AB
A2R10	Same as A2R7		
A2R11	Same as A2R7		
A2R12	RESISTOR, FIXED, COMPOSITION: 2.7K, 5%, 1/4W	CB2725	AB
A2R13	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A2R14	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A2R15	RESISTOR, FIXED, COMPOSITION: 1.5K, 5%, 1/4W	CB1525	AB
A2R16	RESISTOR, FIXED, COMPOSITION: 51 Ω, 5%, 1/4W	CB5105	AB
A2R17	RESISTOR, FIXED, COMPOSITION: 1.5 meg, 5%, 1/4W	CB1555	AB
A2R18	RESISTOR, FIXED, COMPOSITION: 2.2K, 5%, 1/4W	CB2225	AB
A2TP1	TEST POINT	TJ-6	Taurus
A2V1	ELECTRON TUBE: Ceramic triode	7077	GE
A2V2	Same as A2V1		

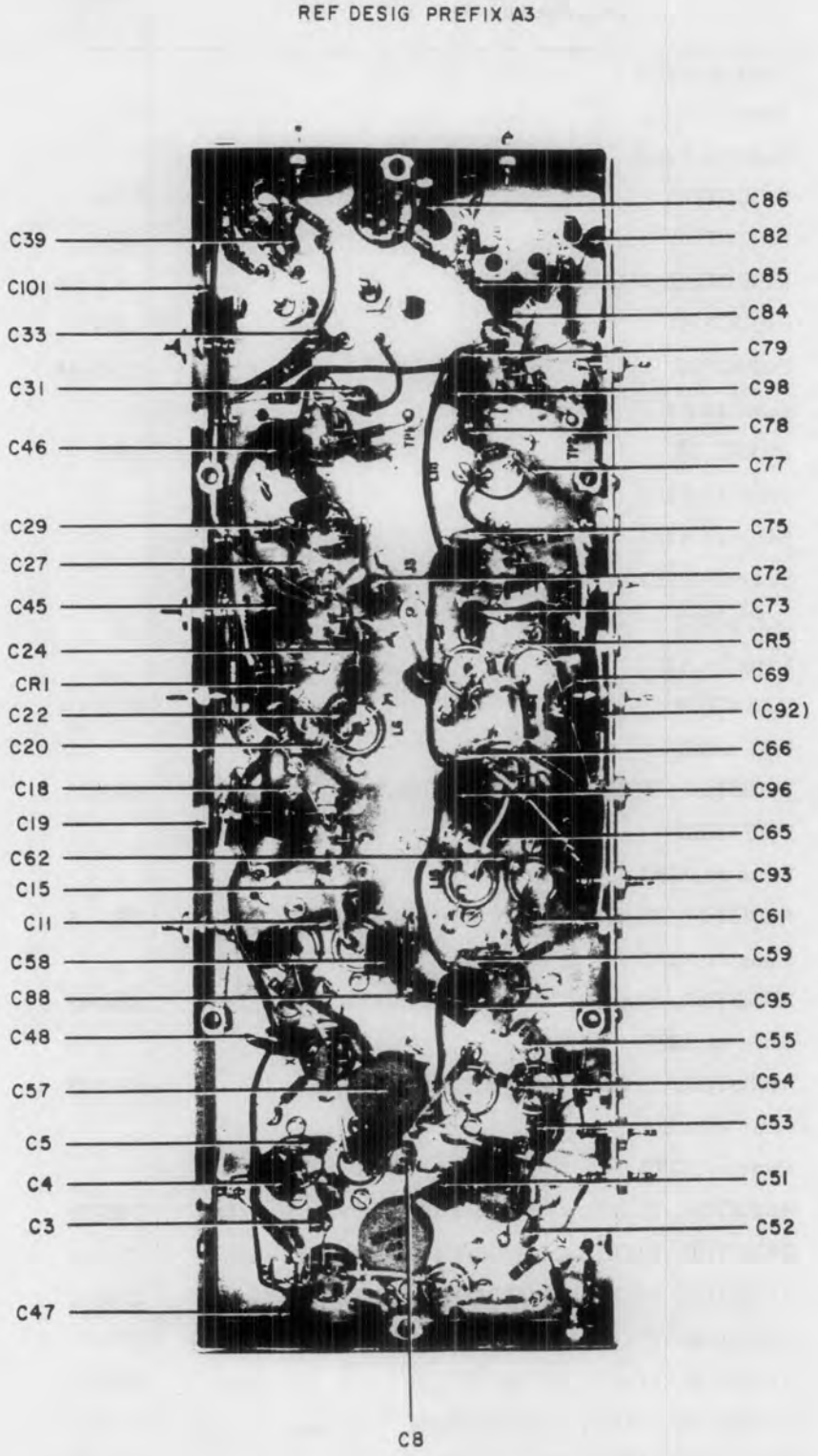

Figure 5-10. 4-mc/500-kc Bandwidth IF Strip Type 7214, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A2V3	ELECTRON TUBE: Nuvistor Tetrode	7587	RCA
A2V4	ELECTRON TUBE: Ceramic Triode	7486	GE
5.4.4	500-kc/4-mc Bandwidth IF Strip, Type 7214		
A3C1	CAPACITOR, CERAMIC DISC: .05 μf, 20%, 500V	33C17A	Sprague
A3C2	CAPACITOR, CERAMIC DISC: 1000 pf, 20%, 500VDC	Type SM	RMC
A3C3	Same as A3C2		
A3C4	CAPACITOR, DIPPED MICA: 18 pf, 5%, 500VDC	DM10-180J	Arco
A3C5	CAPACITOR: 0.62 pf, 10%	Type MC	QC
A3C6	CAPACITOR, CERAMIC DISC: 470 pf, 1000VDC	Type B	RMC
A3C7	CAPACITOR, DIPPED MICA: 15 pf, 500VDC	DM10-150J	Arco
A3C8	Same as A3C6		
A3C9	Same as A3C2		
A3C10	Same as A3C4		
A3C11	Same as A3C5		
A3C12	Same as A3C2		
A3C13	CAPACITOR, CERAMIC STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A3C14	Same as A3C6		
A3C15	Same as A3C7		
A3C16	Same as A3C2		
A3C17	Same as A3C4		
A3C18	Same as A3C2		
A3C19	Same as A3C13		
A3C20	CAPACITOR, TUBULAR COMPOSITION: .82 pf, 10%	Type MC	QC
A3C21	Same as A3C6		
A3C22	Same as A3C4		
A3C23	Same as A3C7		
A3C24	Same as A3C7		
A3C25	Same as A3C2		
A3C26	Same as A3C7		
A3C27	Same as A3C2		
A3C28	Same as A3C13		
A3C29	Same as A3C2		
A3C30	CAPACITOR, DIPPED MICA: 75 pf, 5%, 500VDC	DM10-750J	Arco
A3C31	Same as A3C2		
A3C32	CAPACITOR, DIPPED MICA: 22 pf, 5%, 500VDC	DM10-220J	Arco
A3C33	Same as A3C2		
A3C34	Same as A3C13		

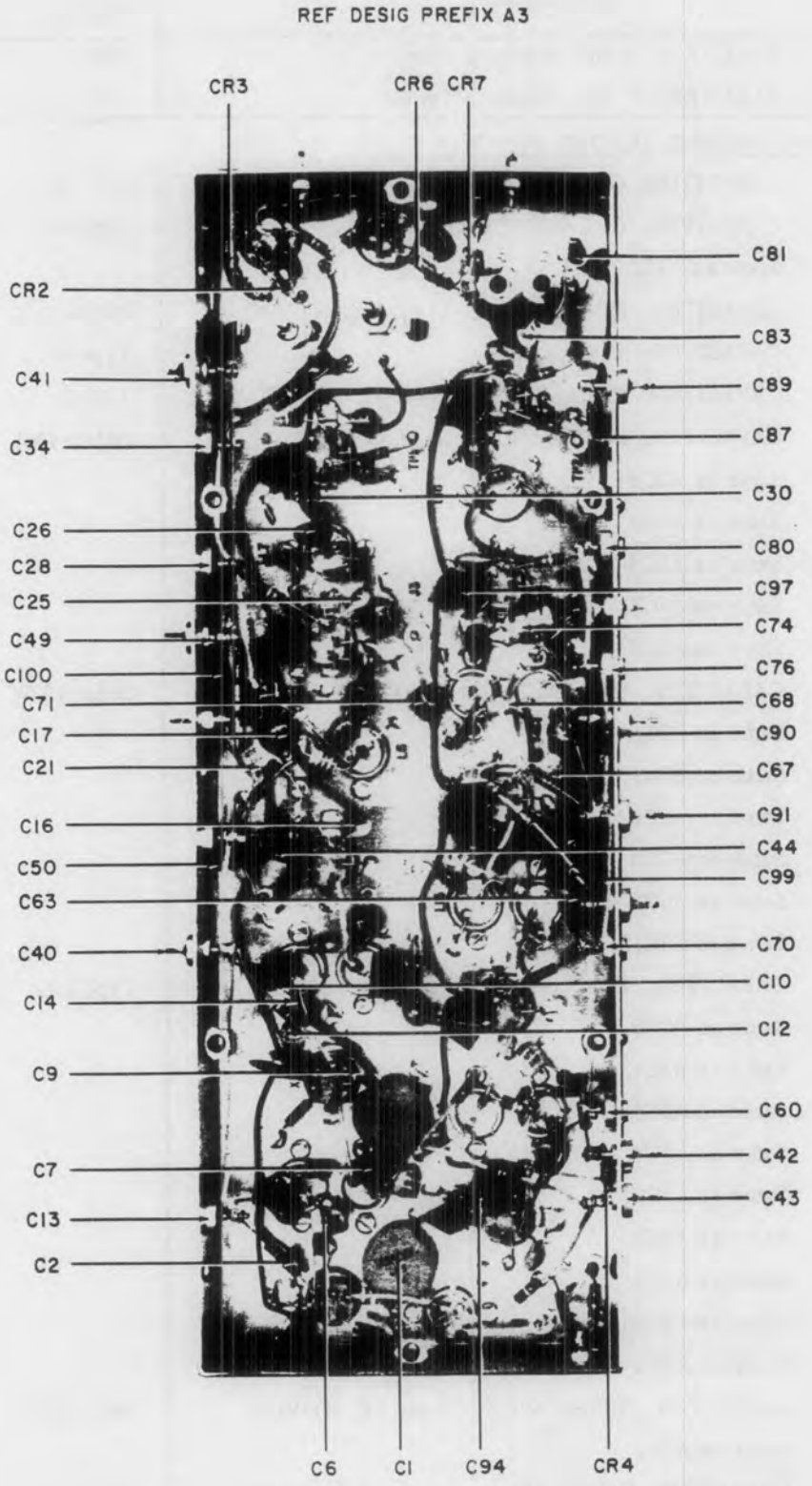

Figure 5-11. 4-mc/500-kc Bandwidth IF Strip Type 7214, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3C35	Same as A3C32		
A3C36	CAPACITOR, DIPPED MICA: 10 pf, 5%, 500VDC	DM10-100J	Arco
A3C37	CAPACITOR, DIPPED MICA: 100 pf, 5%, 500VDC	DM10-101J	Arco
A3C38	Same as A3C37		
A3C39	CAPACITOR, DIPPED MICA: 33 pf, 5%, 500VDC	DM10-330J	Arco
A3C40	CAPACITOR, CERAMIC FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A3C41	Same as A3C40		
A3C42	Same as A3C40		
A3C43	Same as A3C40		
A3C44	CAPACITOR, CERAMIC: 0.01 μf, 200VDC	4835-00Z5U0-103M	Erie
A3C45	Same as A3C44		
A3C46	Same as A3C44		
A3C47	Same as A3C44		
A3C48	Same as A3C44		
A3C49	Same as A3C40		
A3C50	Same as A3C44		
A3C51	Same as A3C44		
A3C52	Same as A3C2		
A3C53	Same as A3C2		
A3C54	CAPACITOR, TUBULAR COMPOSITION: 2.0 pf, 10%	Type MC	QC
A3C55	Same as A3C6		
A3C56	NOT USED		
A3C57	Same as A3C1		
A3C58	Same as A3C44		
A3C59	Same as A3C2		
A3C60	Same as A3C13		
A3C61	Same as A3C2		
A3C62	Same as A3C54		
A3C63	Same as A3C6		
A3C64	NOT USED		
A3C65	Same as A3C44		
A3C66	Same as A3C2		
A3C67	Same as A3C2		
A3C68	CAPACITOR, TUBULAR COMPOSITION: 2.7 pf, 10%	Type MC	QC
A3C69	Same as A3C6		
A3C70	Same as A3C13		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3C71	Same as A3C36		
A3C72	CAPACITOR, DIPPED MICA: 120 pf, 500VDC	DM10-121J	Arco
A3C73	Same as A3C36		
A3C74	CAPACITOR, CERAMIC TUBULAR: 8.2 pf, ±0.5 pf	301-000-COHO-829D	Erie
A3C75	Same as A3C2		
A3C76	Same as A3C13		
A3C77	Same as A3C2		
A3C78	Same as A3C36		
A3C79	Same as A3C2		
A3C80	Same as A3C13		
A3C81	CAPACITOR, CERAMIC TUBULAR: 2.7 pf, ±.25 pf	301-000-COJO-279C	Erie
A3C82	Same as A3C2		
A3C83	Same as A3C81		
A3C84	Same as A3C4		
A3C85	Same as A3C4		
A3C86	Same as A3C36		
A3C87	Same as A3C44		
A3C88	Same as A3C13		
A3C89	Same as A3C40		
A3C90	Same as A3C40		
A3C91	Same as A3C40		
A3C92	Same as A3C44		
A3C93	Same as A3C40		
A3C94	Same as A3C44		
A3C95	Same as A3C44		
A3C96	Same as A3C44		
A3C97	Same as A3C44		
A3C98	Same as A3C44		
A3C99	Same as A3C44		
A3C100	Same as A3C44		
A3C101	Same as A3C44		
A3CR1	DIODE	1N198A	Sylvania
A3CR2	Same as A3CR1		
A3CR3	Same as A3CR1		
A3CR4	DIODE	1N753A	CD
A3CR5	Same as A3CR1		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3CR6	Same as A3CR1		
A3CR7	Same as A3CR1		
A3E1	FEEDTHRU	SFU-16	Taurus
A3E2	Same as A3E1		
A3E3	Same as A3E1		
A3E4	Same as A3E1		
A3J1	CONNECTOR, JACK	27-9	FXR
A3J2	Same as A3J1		
A3J3	Same as A3J1		
A3J4	Same as A3J1		
A3L1	COIL, VARIABLE	1472-3	CEI
A3L2	Same as A3L1		
A3L3	Same as A3L1		
A3L4	Same as A3L1		
A3L5	Same as A3L1		
A3L6	Same as A3L1		
A3L7	Same as A3L1		
A3L8	COIL, VARIABLE	2171-12	CEI
A3L9	COIL, VARIABLE	2171-20	CEI
A3L10	COIL, FIXED: 63 μh	1131-37	CEI
A3L11	Same as A3L10		
A3L12	COIL, VARIABLE	1472-4	CEI
A3L13	Same as A3L12		
A3L14	Same as A3L12		
A3L15	Same as A3L12		
A3L16	Same as A3L12		
A3L17	Same as A3L1		
A3L18	Same as A3L12		
A3L19	COIL, VARIABLE	1588-1	CEI
A3L20	COIL, VARIABLE	1588-2	CEI
A3L21	COIL, FIXED	1974	CEI
A3L22	CHOKE: Radio Frequency, 10 μh	1131-40	CEI
A3L23	Same as A3L22		
A3L24	COIL, FIXED	1131-5	CEI
A3Q1	TRANSISTOR	2N335	TI
A3Q2	Same as A3Q1		
A3Q3	Same as A3Q1		

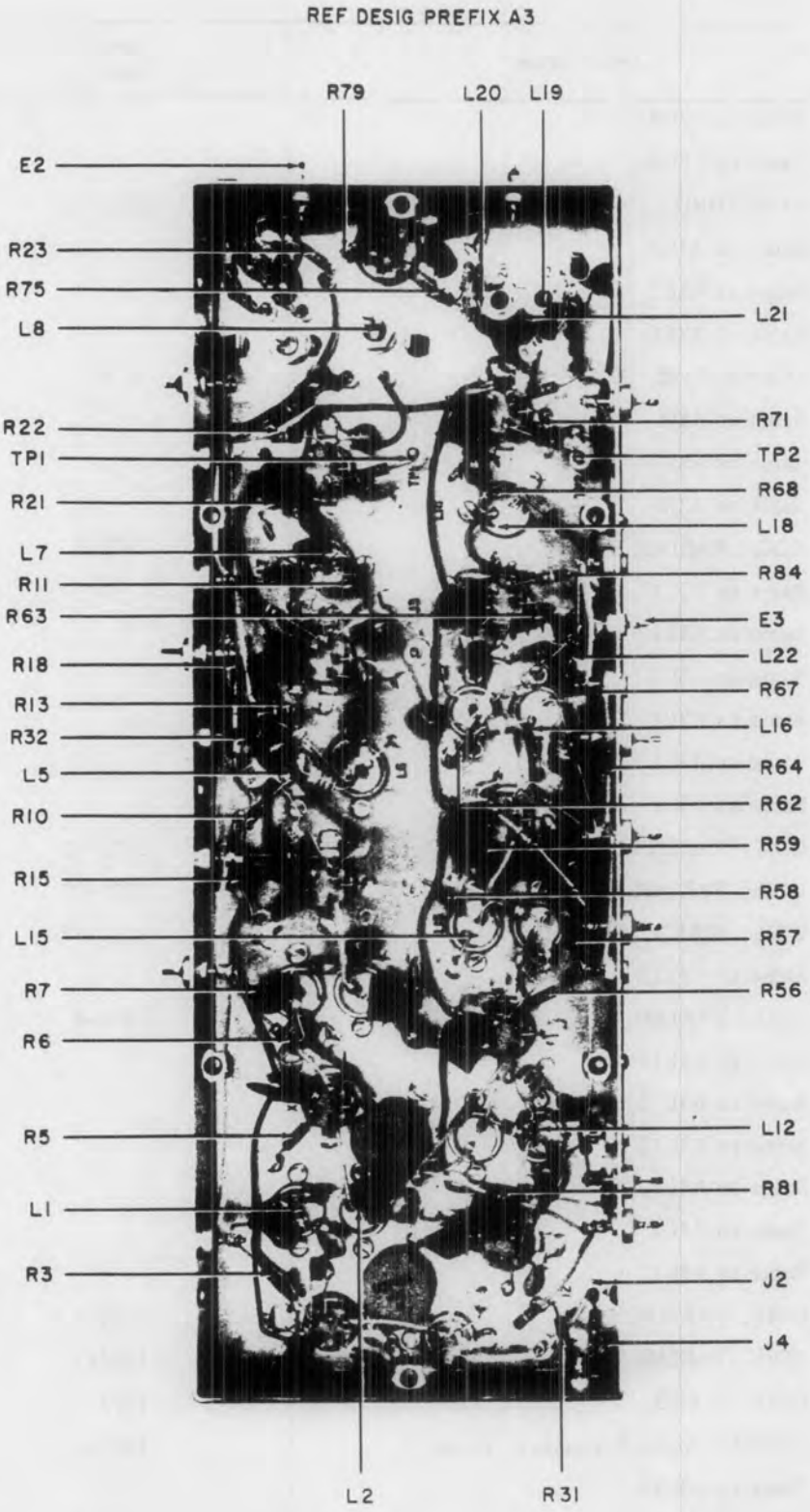

Figure 5-12. 4-mc/500-kc Bandwidth IF Strip Type 7214, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3Q4	Same as A3Q1		
A3R1	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A3R2	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	CB3305	AB
A3R3	RESISTOR, FIXED, COMPOSITION: 220K, 5%, 1/4W	CB2245	AB
A3R4	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A3R5	Same as A3R2		
A3R6	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A3R7	Same as A3R4		
A3R8	Same as A3R2		
A3R9	Same as A3R3		
A3R10	Same as A3R4		
A3R11	RESISTOR, FIXED, COMPOSITION: 8.2K, 5%, 1/4W	CB8225	AB
A3R12	Same as A3R3		
A3R13	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	AB
A3R14	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	AB
A3R15	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A3R16	RESISTOR, FIXED, COMPOSITION: 150K, 5%, 1/4W	CB1545	AB
A3R17	Same as A3R4		
A3R18	Same as A3R14		
A3R19	RESISTOR, FIXED, COMPOSITION: 1 meg, 5%, 1/4W	CB1055	AB
A3R20	Same as A3R14		
A3R21	Same as A3R2		
A3R22	Same as A3R1		
A3R23	Same as A3R1		
A3R24	RESISTOR, FIXED, COMPOSITION: 3.3 meg, 5%, 1/4W	CB3355	AB
A3R25	RESISTOR, FIXED, COMPOSITION: 68K, 5%, 1/2W	EB6835	AB
A3R26	RESISTOR, FIXED, COMPOSITION: 75K, 5%, 1/4W	CB7535	AB
A3R27	Same as A3R26		
A3R28	Same as A3R4		
A3R29	RESISTOR, FIXED, COMPOSITION: 24 Ω, 5%, 1/4W	CB2405	AB
A3R30	Same as A3R29		
A3R31	Same as A3R2		
A3R32	RESISTOR, FIXED, COMPOSITION: 1.2 meg, 5%, 1/4W	CB1255	AB
A3R33	Same as A3R14		
A3R34 thru A3R50	NOT USED		
A3R51	Same as A3R15		

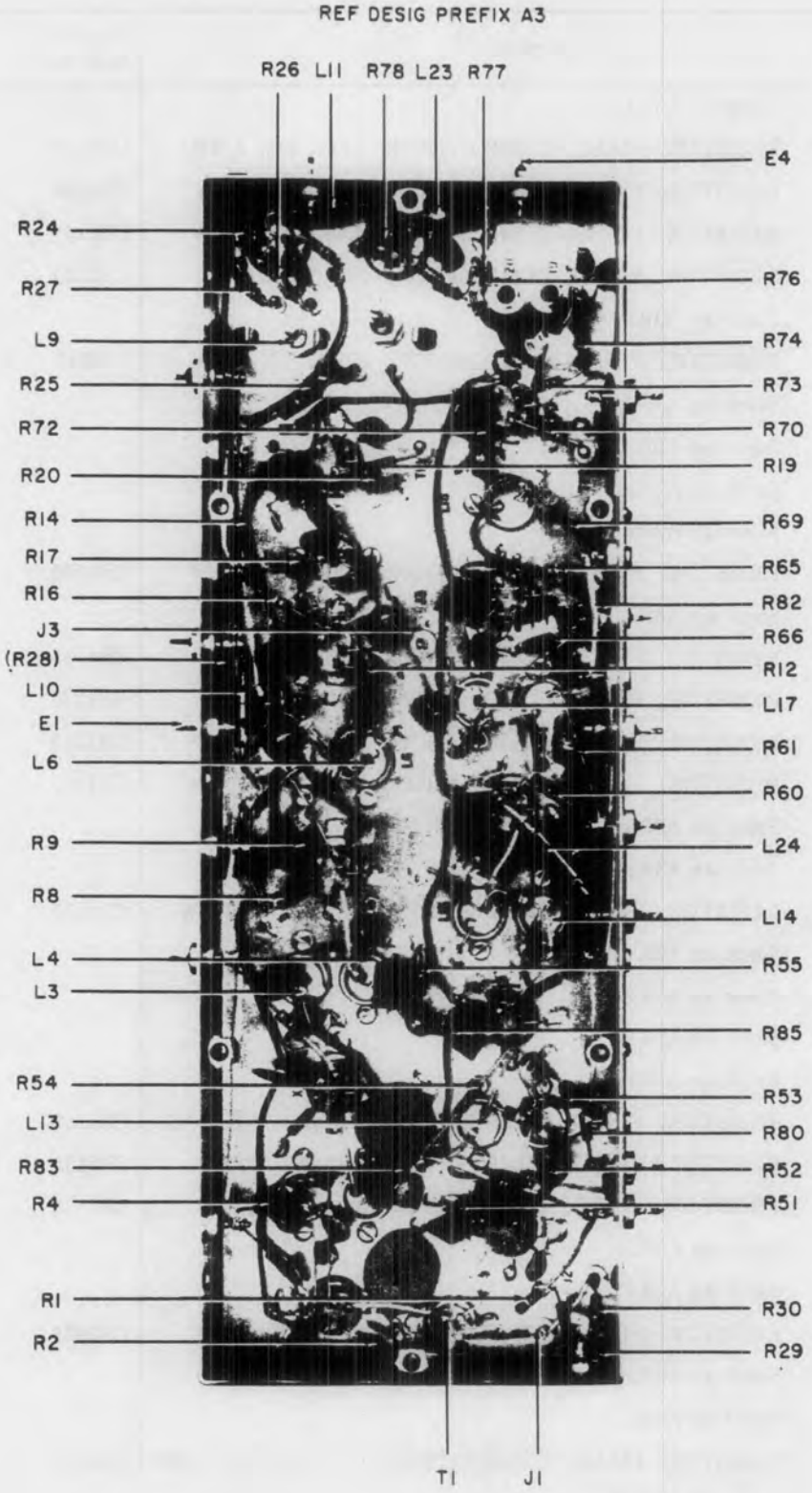

Figure 5-13. 4-mc/500-kc Bandwidth IF Strip Type 7214, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3R52	RESISTOR, FIXED, COMPOSITION: 82K, 5%, 1/4W	CB8235	AB
A3R53	Same as A3R4		
A3R54	RESISTOR, FIXED, COMPOSITION: 5.1K, 5%, 1/4W	CB5125	AB
A3R55	Same as A3R15		
A3R56	Same as A3R52		
A3R57	Same as A3R4		
A3R58	RESISTOR, FIXED, COMPOSITION: 5.6K, 5%, 1/4W	CB5625	AB
A3R59	Same as A3R15		
A3R60	RESISTOR, FIXED, COMPOSITION: 68K, 5%, 1/4W	CB6835	AB
A3R61	Same as A3R4		
A3R62	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A3R63	Same as A3R62		
A3R64	Same as A3R4		
A3R65	Same as A3R16		
A3R66	Same as A3R62		
A3R67	Same as A3R14		
A3R68	Same as A3R13		
A3R69	Same as A3R4		
A3R70	Same as A3R19		
A3R71	Same as A3R62		
A3R72	Same as A3R2		
A3R73	Same as A3R1		
A3R74	Same as A3R14		
A3R75	RESISTOR, FIXED, COMPOSITION: 27K, 5%, 1/4W	CB2735	AB
A3R76	Same as A3R11		
A3R77	Same as A3R75		
A3R78	RESISTOR, FIXED, COMPOSITION: 2.2 meg, 5%, 1/4W	CB2255	AB
A3R79	Same as A3R14		
A3R80	Same as A3R19		
A3R81	Same as A3R1		
A3R82	Same as A3R14		
A3R83	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	CB4715	AB
A3R84	Same as A3R78		
A3R85	Same as A3R2		
A3T1	TRANSFORMER	1126	CEI
A3TP1	TEST POINT	TJ-6	Taurus
A3TP2	Same as A3TP1		

REF DESIG PREFIX A4

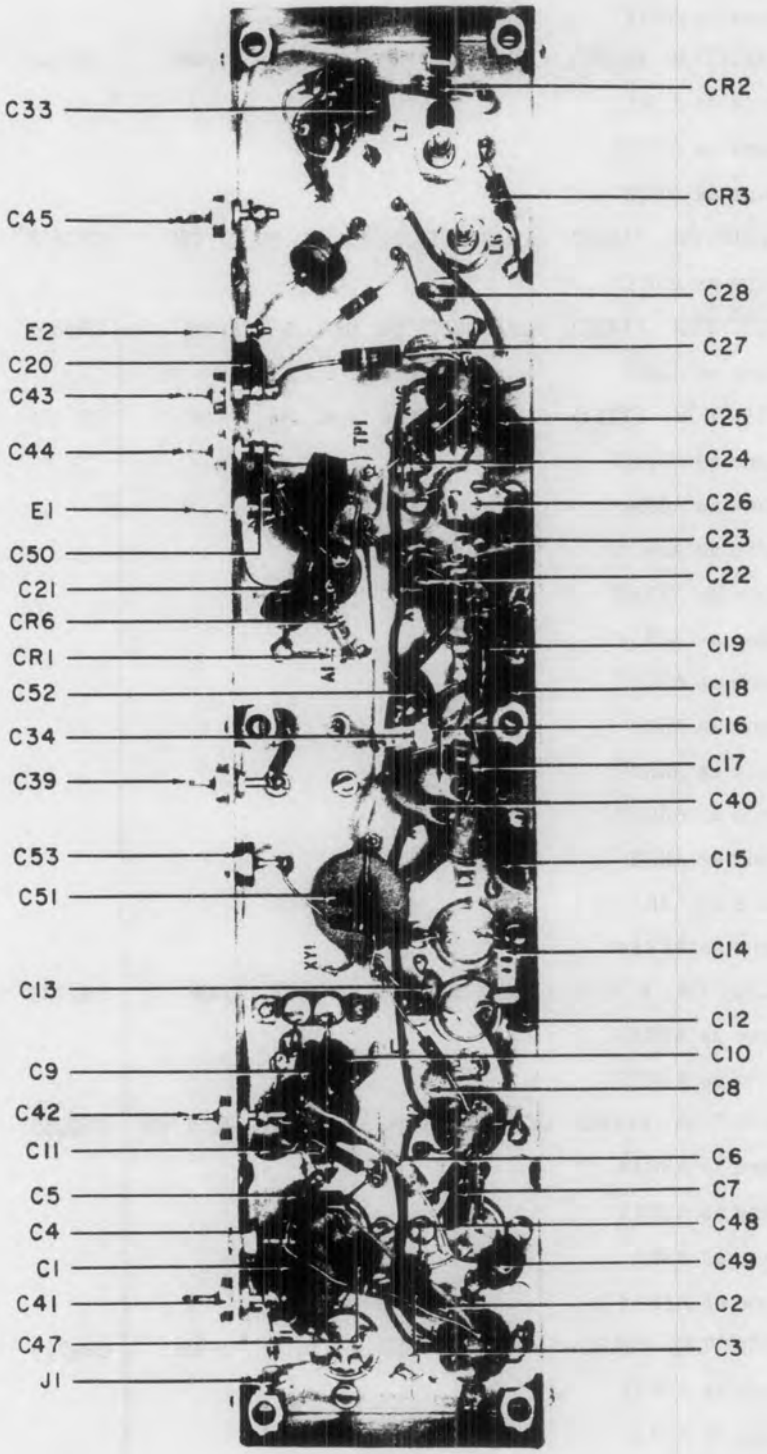

Figure 5-14. 100-kc Bandwidth IF Strip Type 7213, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3V1	ELECTRON TUBE: Nuvistor Tetrode	7587	RCA
A3V2	Same as A3V1		
A3V3	Same as A3V1		
A3V4	Same as A3V1		
A3V5	Same as A3V1		
A3V6	Same as A3V1		
A3V7	Same as A3V1		
A3V8	Same as A3V1		
A3V9	Same as A3V1		
A3V10	Same as A3V1		
5.4.5 100-kc Bandwidth IF Strip, Type 7213			
A4C1	CAPACITOR, CERAMIC DISC: .05 μf, 20%, 500V	33C17A	Sprague
A4C2	CAPACITOR, CERAMIC DISC: 1000 pf, 20%, 500VDC	Type SM	RMC
A4C3	CAPACITOR, DIPPED MICA: 270 pf, 5%	DM10-271J	Arco
A4C4	CAPACITOR, CERAMIC STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A4C5	Same as A4C2		
A4C6	CAPACITOR, TUBULAR, COMPOSITION: 0.5 pf, 10%	Type QC	QC
A4C7	CAPACITOR, DIPPED MICA: 47 pf, 5%	DM10-470J	Arco
A4C8	Same as A4C2		
A4C9	CAPACITOR, DIPPED MICA: 22 pf, 5%	DM10-220J	Arco
A4C10	Same as A4C9		
A4C11	Same as A4C2		
A4C12	Same as A4C7		
A4C13	Same as A4C2		
A4C14	CAPACITOR, CERAMIC TUBULAR: 2.2 pf, ±.25 pf	301-000-COJO-229C	Erie
A4C15	CAPACITOR, DIPPED MICA: 43 pf, 5%	DM10-430J	Arco
A4C16	Same as A4C2		
A4C17	Same as A4C2		
A4C18	Same as A4C2		
A4C19	CAPACITOR, DIPPED MICA: 10 pf, 5%	DM10-100J	Arco
A4C20	CAPACITOR, DIPPED MICA: 100 pf, 5%	DM10-101J	Arco
A4C21	CAPACITOR, DIPPED MICA: 33 pf, 5%	DM10-330J	Arco
A4C22	Same as A4C2		
A4C23	Same as A4C2		
A4C24	Same as A4C2		
A4C25	Same as A4C19		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4C26	CAPACITOR, CERAMIC TUBULAR: 4.7 pf, ±.5 pf	301-000-COHO-479D	Erie
A4C27	Same as A4C2		
A4C28	Same as A4C2		
A4C29	CAPACITOR, DIPPED MICA: 82 pf, 5%	DM10-820J	Arco
A4C30	Same as A4C21		
A4C31	Same as A4C20		
A4C32	Same as A4C20		
A4C33	Same as A4C20		
A4C34	Same as A4C14		
A4C35	CAPACITOR, CERAMIC DISC: .005 μf, 20%, 500V	Type SM	RMC
A4C36	CAPACITOR, DIPPED MICA: 68 pf, 5%	DM10-680J	Arco
A4C37	Same as A4C15		
A4C38	CAPACITOR, FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A4C39	Same as A4C38		
A4C40	Same as A4C35		
A4C41	Same as A4C38		
A4C42	Same as A4C38		
A4C43	Same as A4C38		
A4C44	Same as A4C38		
A4C45	Same as A4C38		
A4C46	NOT USED		
A4C47	CAPACITOR, DIPPED MICA: 30 pf, 5%	DM10-300J	Arco
A4C48	CAPACITOR, TUBULAR, COMPOSITION: 0.82 pf, 10%	Type QC	QC
A4C49	Same as A4C47		
A4C50	CAPACITOR, DIPPED MICA: 470 pf, 5%	DM10-471J	Arco
A4C51	Same as A4C1		
A4C52	Same as A4C19		
A4C53	Same as A4C4		
A4CR1	DIODE	1N198A	Sylvania
A4CR2	Same as A4CR1		
A4CR3	Same as A4CR1		
A4CR4	DIODE	1N462	CD
A4CR5	Same as A4CR4		
A4CR6	Same as A4CR1		
A4E1	FEEDTHRU INSULATED	SFU-16	Taurus
A4E2	Same as A4E1		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4J1	CONNECTOR, JACK	27-9	FXR
A4L1	COIL, VARIABLE	1472-2	CEI
A4L2	COIL, VARIABLE	1472-8	CEI
A4L3	Same as A4L2		
A4L4	COIL, VARIABLE	1472-9	CEI
A4L5	Same as A4L4		
A4L6	COIL, VARIABLE	2060-6	CTC
A4L7	COIL, VARIABLE	1041-1	CEI
A4L8	COIL, FIXED: 1000 μh	11000-15	Wilco
A4L9	Same as A4L1		
A4L10	COIL, FIXED: 430 μh	3430-15	Wilco
A4Q1	TRANSISTOR	2N335	TI
A4Q2	Same as A4Q1		
A4Q3	TRANSISTOR	2N706	TI
A4R1	RESISTOR, FIXED, COMPOSITION: 220K, 5%, 1/4W	CB2245	AB
A4R2	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A4R3	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A4R4	Same as A4R2		
A4R5	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A4R6	Same as A4R3		
A4R7	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	AB
A4R8	Same as A4R7		
A4R9	Same as A4R5		
A4R10	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A4R11	Same as A4R3		
A4R12	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	AB
A4R13	RESISTOR, FIXED, COMPOSITION: 56 Ω, 5%, 1/4W	CB5605	AB
A4R14	Same as A4R2		
A4R15	Same as A4R3		
A4R16	Same as A4R12		
A4R17	Same as A4R13		
A4R18	Same as A4R1		
A4R19	Same as A4R7		
A4R20	Same as A4R7		
A4R21	RESISTOR, FIXED, COMPOSITION: 1 meg, 5%, 1/4W	CB1055	AB
A4R22	Same as A4R10		
A4R23	Same as A4R13		

REF DESIG PREFIX A4

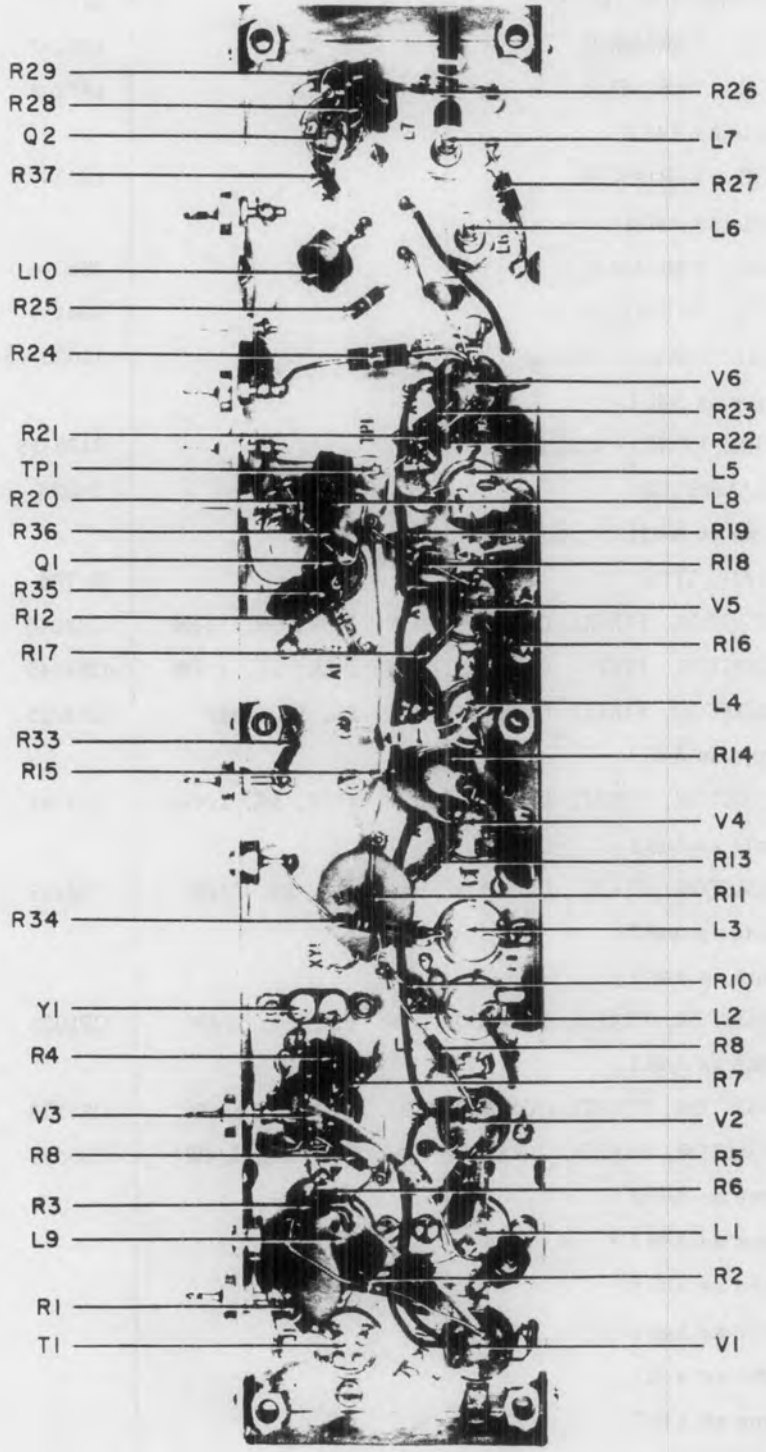

Figure 5-15. 100-kc Bandwidth IF Strip Type 7213, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4R24	RESISTOR, FIXED, COMPOSITION: 220K, 5%, 1/2W	EB2245	AB
A4R25	RESISTOR, FIXED, COMPOSITION: 150K, 5%, 1/4W	CB1545	AB
A4R26	Same as A4R2		
A4R27	Same as A4R2		
A4R28	RESISTOR, FIXED, COMPOSITION: 3.3 meg, 5%, 1/4W	CB3355	AB
A4R29	Same as A4R2		
A4R30	Same as A4R12		
A4R31	RESISTOR, FIXED, COMPOSITION: 240K, 5%, 1/4W	CB2445	AB
A4R32	Same as A4R10		
A4R33	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A4R34	Same as A4R1		
A4R35	RESISTOR, FIXED, COMPOSITION: 1.2 meg, 5%, 1/4W	CB1255	AB
A4R36	Same as A4R7		
A4R37	Same as A4R3		
A4T1	TRANSFORMER	1126	CEI
A4TP1	TEST POINT	TJ-6	Taurus
A4V1	ELECTRON TUBE: Nuvistor Tetrode	7587	RCA
A4V2	Same as A4V1		
A4V3	ELECTRON TUBE: Nuvistor triode	6CW4	RCA
A4V4	Same as A4V1		
A4V5	Same as A4V1		
A4V6	Same as A4V1		
A4Y1	CRYSTAL: 18.9 mc	1402	Piezo
A4Y2	CRYSTAL: 2.5 mc	CR-18/U	Piezo
5.4.6 Video Amplifier, Type 7301			
A5C1	CAPACITOR, ELECTROLYTIC: 2.2 µf, ±20%, 20V	150D225X-0020A2	Sprague
A5C2	CAPACITOR, ELECTROLYTIC: 47 µf, ±20%, 35V	150D476X-0035S2	Sprague
A5C3	Same as A5C2		
A5C4	CAPACITOR, FIXED, CERAMIC: .01 µf, 20%, 200V	Type SM	RMC
A5Q1	TRANSISTOR	2N335	TI
A5Q2	TRANSISTOR	2N697	TI
A5Q3	TRANSISTOR	2N1131	TI
A5R1	RESISTOR, FIXED, COMPOSITION: 2 meg, 5%, 1/4W	CB2055	AB
A5R2	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A5R3	RESISTOR, FIXED, COMPOSITION: 8.2K, 5%, 1/4W	CB8225	AB
A5R4	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	AB

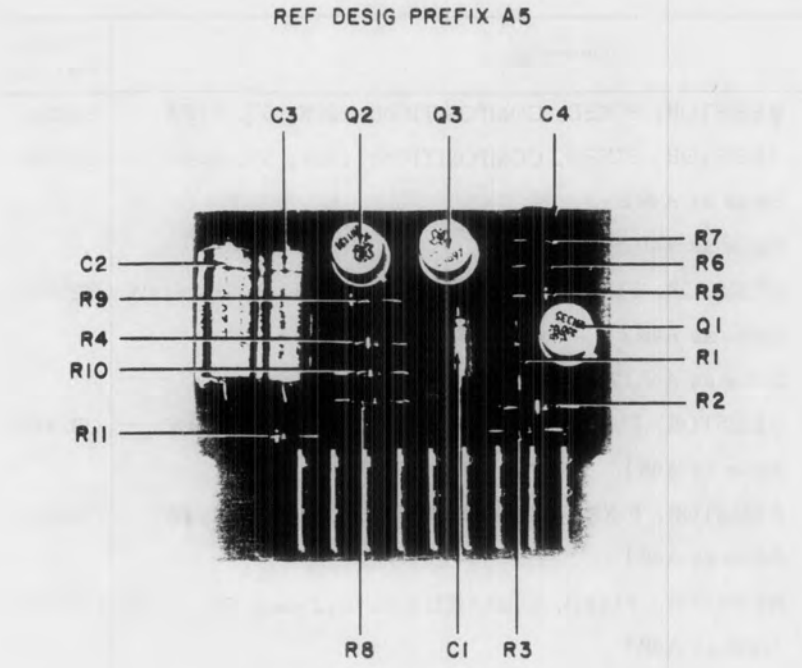

Figure 5-16. Video Amplifier Type 7301, Component Locations

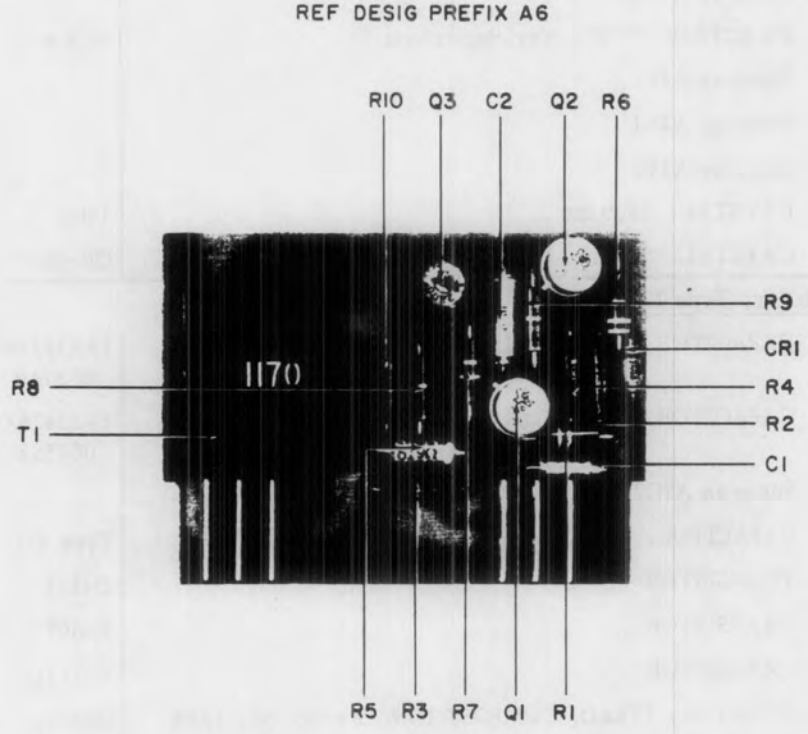

Figure 5-17. Audio Amplifier Type 7400, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A5R5	RESISTOR, FIXED, COMPOSITION: 110K, 5%, 1/4W	CB1145	AB
A5R6	RESISTOR, FIXED, COMPOSITION: 2.2K, 5%, 1/4W	CB2225	AB
A5R7	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A5R8	RESISTOR, FIXED, COMPOSITION: 620 Ω, 5%, 1/4W	CB6215	AB
A5R9	RESISTOR, FIXED, COMPOSITION: 24 Ω, 5%, 1/4W	CB2405	AB
A5R10	RESISTOR, FIXED, COMPOSITION: 160 Ω, 5%, 1/4W	CB1615	AB
A5R11	Same as A5R2		
5.4.7 Audio Amplifier, Type 7400			
A6C1	CAPACITOR, ELECTROLYTIC TANTALUM: 0.47 μf	150D474X-0035A2	Sprague
A6C2	CAPACITOR, ELECTROLYTIC TANTALUM: 10 μf, 20% 20V	150D106X-0020B2	Sprague
A6CR1	DIODE, ZENER	1N759A	CD
A6Q1	TRANSISTOR, SILICON	2N335	TI
A6Q2	Same as A6Q1		
A6Q3	TRANSISTOR, SILICON	2N1700	RCA
A6R1	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/2W	EB1035	AB
A6R2	RESISTOR, FIXED, CARBON FILM: 68.1K, 1%, 1/8W	RN60B6812F	TI
A6R3	RESISTOR, FIXED, CARBON FILM: 10K, 1%, 1/8W	RN60B1002F	TI
A6R4	RESISTOR, FIXED, CARBON FILM: 6.81K, 1%, 1/8W	RN60B6811F	TI
A6R5	RESISTOR, FIXED, CARBON FILM: 619 Ω, 1%, 1/8W	RN60B6190F	TI
A6R6	RESISTOR, FIXED, COMPOSITION: 3.9K, 5%, 1/2W	EB3925	AB
A6R7	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/2W	EB1045	AB
A6R8	RESISTOR, FIXED, COMPOSITION: 620 Ω, 5%, 1/2W	EB6215	AB
A6R9	Same as A6R8		
A6R10	RESISTOR, FIXED, CARBON FILM: 68.1 Ω, 1%, 1/8W	RN60B68R1F	
A6T1	TRANSFORMER: Audio Output	1170	CEI
5.4.8 Pulse AGC Amplifier, Type 7800. Used on 770A Receivers, serials 101 through 110. (see par. 5.4.13)			
A7C1	CAPACITOR, TANTALUM: .047 μf ±20%, 35V	150D473X-0035A2	Sprague
A7C2	CAPACITOR, TANTALUM: .47 μf ±20%, 35V	150D474X-0035A2	Sprague
A7C3	CAPACITOR, TANTALUM: 10 μf ±20%, 35V	150D106X-0035R2	Sprague
A7C4	Same as A7C3		
A7C5	CAPACITOR, DIPPED MICA: 470 pf ±5%	DM10-471J	Arco
A7C6	Same as A7C3		
A7C7	CAPACITOR, TANTALUM: 1 μf ±20%, 35V	150D105X-0035A2	Sprague

REF DESIG PREFIX A7

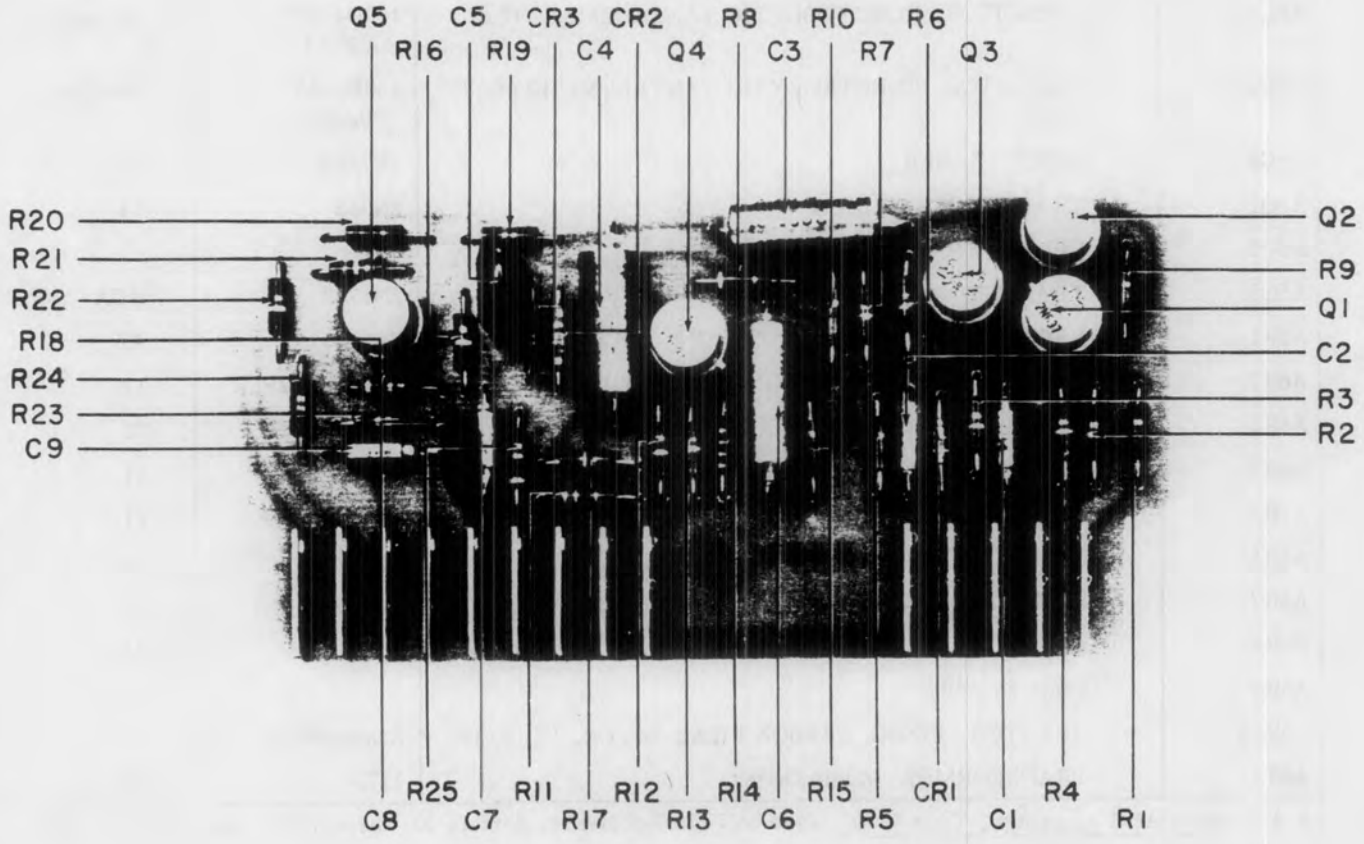

Figure 5-18. AGC Amplifier Type 7800, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A7C8	CAPACITOR, CERAMIC DISC: .01 μf, 200V	SMCB-01-97	Glenco
A7C9	Same as A7C7		
A7CR1	DIODE, SWITCHING	1N914	CD
A7CR2	DIODE, ZENER: 6.2V	1N753A	CD
A7CR3	DIODE, ZENER: 8.2V	1N756A	CD
A7Q1	TRANSISTOR	2N697	TI
A7Q2	Same as A7Q1		
A7Q3	Same as A7Q1		
A7Q4	Same as A7Q1		
A7Q5	TRANSISTOR	2N1305	TI
A7R1	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	CB2215	AB
A7R2	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	AB
A7R3	Same as A7R2		
A7R4	RESISTOR, FIXED, COMPOSITION: 680K, 5%, 1/4W	CB6845	AB
A7R5	RESISTOR, FIXED, COMPOSITION: 620 Ω, 5%, 1/4W	CB6215	AB
A7R6	Same as A7R2		
A7R7	Same as A7R2		
A7R8	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/4W	CB4725	AB
A7R9	RESISTOR, FIXED, COMPOSITION: 22 meg, 5%, 1/4W	CB2265	AB
A7R10	RESISTOR, FIXED, COMPOSITION: 2.7K, 5%, 1/4W	CB2725	AB
A7R11	RESISTOR, FIXED, COMPOSITION: 3.3K, 5%, 1/4W	CB3325	AB
A7R12	Same as A7R2		
A7R13	Same as A7R2		
A7R14	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A7R15	Same as A7R10		
A7R16	RESISTOR, FIXED, COMPOSITION: 150K, 5%, 1/4W	CB1545	AB
A7R17	Same as A7R2		
A7R18	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A7R19	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A7R20	RESISTOR, FIXED, COMPOSITION: 10.0 meg, 5%, 1/4W	CB1065	AB
A7R21	RESISTOR, FIXED, COMPOSITION: 200K, 5%, 1/4W	CB2045	AB
A7R22	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A7R23	Same as A7R19		
A7R24	Same as A7R19		
A7R25	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	AB

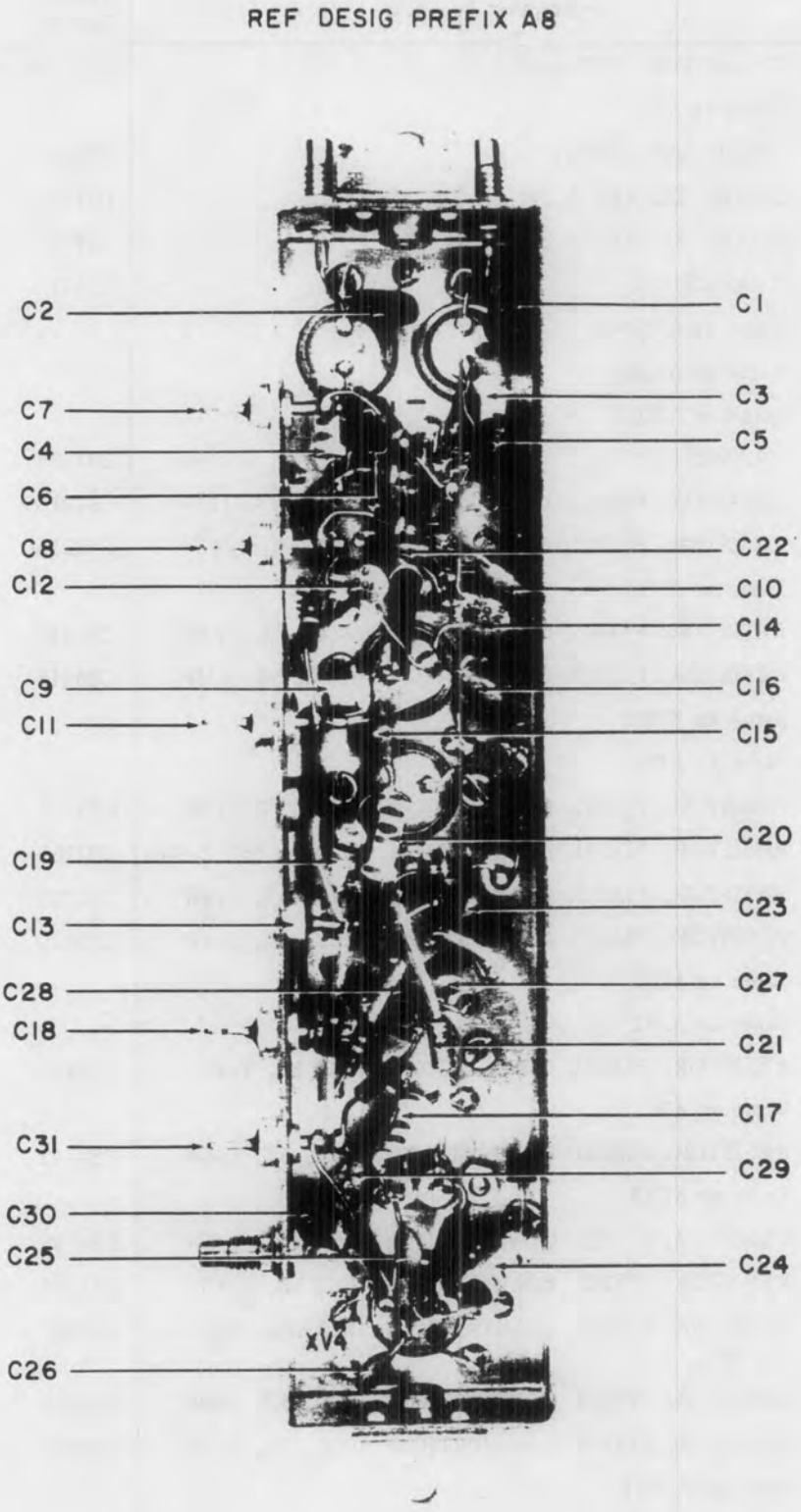

Figure 5-19. 60-21.4 mc Converter Type 7106, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
5.4.9 60-21.4-mc Converter, Type 7106			
A8C1	CAPACITOR, DIPPED MICA: 82 pf, 5%, 500V	DM10-820J	Arco
A8C2	CAPACITOR, DIPPED MICA: 62 pf, 5%, 500V	DM10-620J	Arco
A8C3	CAPACITOR, CERAMIC, TUBULAR: 2.2 pf, ±.25 pf	301-000-COJO-229C	Erie
A8C4	Same as A8C3		
A8C5	CAPACITOR, DIPPED MICA: 12 pf, 5%, 500V	DM10-120J	Arco
A8C6	Same as A8C5		
A8C7	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A8C8	Same as A8C7		
A8C9	CAPACITOR, CERAMIC, TUBULAR: 4.7 pf, ±.25 pf	301-000-COHO-479C	Erie
A8C10	CAPACITOR, CERAMIC DISC: 470 pf, 20%, 1000V	Type B	RMC
A8C11	Same as A8C7		
A8C12	CAPACITOR, CERAMIC DISC: 1000 pf, 500V, GMV	Type SM	RMC
A8C13	CAPACITOR, CERAMIC, STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A8C14	Same as A8C12		
A8C15	CAPACITOR, TUBULAR COMPOSITION: 1.0 pf, 10%	Type MC	QC
A8C16	Same as A8C12		
A8C17	CAPACITOR, CERAMIC TUBULAR: 1.5 pf, ±.1 pf	301-000-COKO-159B	Erie
A8C18	Same as A8C7		
A8C19	CAPACITOR, CERAMIC TUBULAR: 3.3 pf, ±.25 pf	301-000-COJO-339C	Erie
A8C20	CAPACITOR, CERAMIC TUBULAR: 6.8 pf, ±.5 pf	301-000-COHO-689D	Erie
A8C21	CAPACITOR, TUBULAR COMPOSITION: .82 pf, 10%	Type MC	QC
A8C22	Same as A8C12		
A8C23	Same as A8C12		
A8C24	CAPACITOR, CERAMIC TUBULAR: 2.7 pf, ±.25 pf	301-000-COJO-279C	Erie
A8C25	Same as A8C12		
A8C26	Same as A8C12		
A8C27	Same as A8C12		
A8C28	CAPACITOR, DIPPED MICA: 10 pf, 5%	DM10-100J	Arco
A8C29	Same as A8C12		
A8C30	CAPACITOR, DIPPED MICA: 270 pf, 5%	DM10-271J	Arco
A8C31	Same as A8C7		
A8FB1	FERRITE BEAD	56-590-65/4A	Ferroxcube

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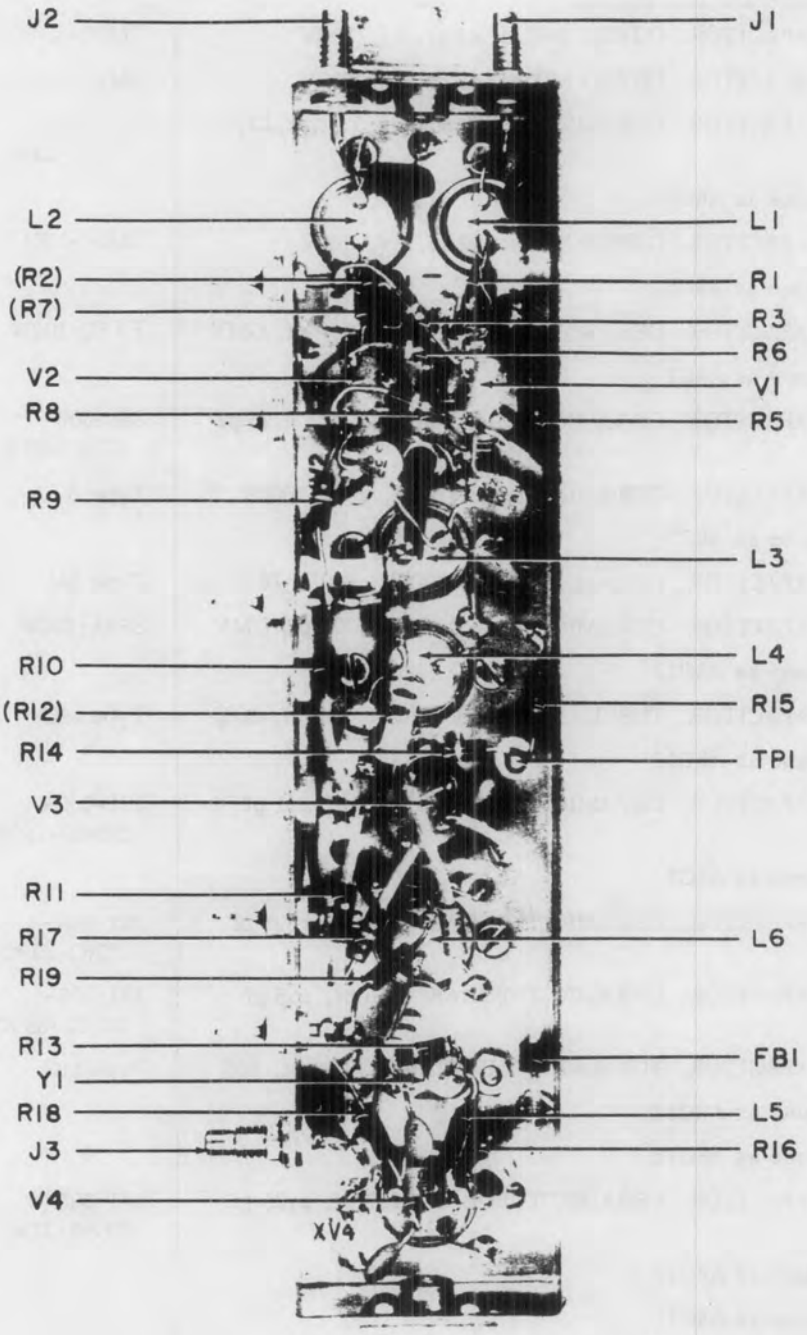

Figure 5-20. 60-21.4 mc Converter Type 7106, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A8J1	JACK	27-9	FXR
A8J2	Same as A8J1		
A8J3	Same as A8J1		
A8L1	COIL, VARIABLE	1472-13	CEI
A8L2	Same as A8L1		
A8L3	COIL, VARIABLE	1472-11	CEI
A8L4	COIL, VARIABLE	1472-1	CEI
A8L5	COIL, FIXED: .82 μh	204-11	Wilco
A8L6	COIL, VARIABLE	1472-4	CEI
A8R1	RESISTOR, FIXED, COMPOSITION: 2.7K, 5%, 1/4W	CB2725	AB
A8R2	Same as A8R1		
A8R3	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A8R4	NOT USED		
A8R5	RESISTOR, FIXED, COMPOSITION: 68 Ω, 5%, 1/4W	CB6805	AB
A8R6	Same as A8R3		
A8R7	Same as A8R5		
A8R8	RESISTOR, FIXED, COMPOSITION: 220K, 5%, 1/4W	CB2245	AB
A8R9	Same as A8R8		
A8R10	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4 W	CB1025	AB
A8R11	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A8R12	Same as A8R1		
A8R13	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	CB4715	AB
A8R14	Same as A8R8		
A8R15	Same as A8R8		
A8R16	Same as A8R3		
A8R17	RESISTOR, FIXED, COMPOSITION: 330K, 5%, 1/4W	CB3345	AB
A8R18	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A8R19	RESISTOR, FIXED, COMPOSITION: 15K, 5%, 1/4W	CB1535	AB
A8TP1	TEST POINT	TJ-6	Taurus
A8V1	TUBE, ELECTRON: Nuvistor tetrode	7587	RCA
A8V2	Same as A8V1		
A8V3	Same as A8V1		
A8V4	TUBE, ELECTRON: Nuvistor triode	6CW4	RCA
A8Y1	CRYSTAL: 81.4 MC	CR-82/U	FXR
5.4.10	Low Band Tuner AGC Amplifier, Type 7801		
A9Q1	TRANSISTOR	2N1305	TI
A9Q2	TRANSISTOR	2N697	TI

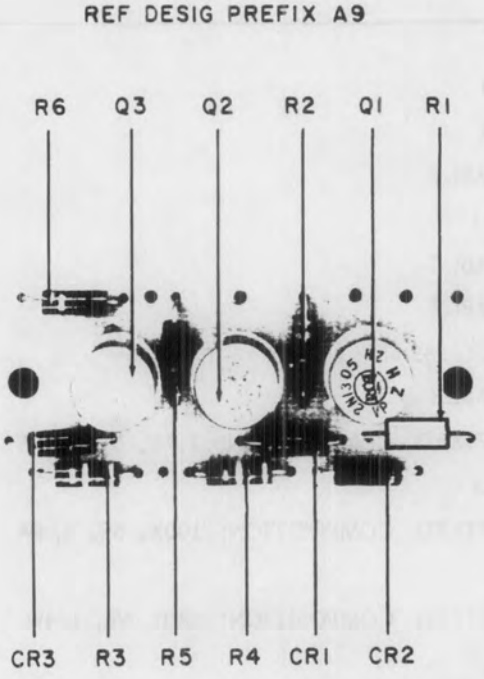

Figure 5-21. Low Band Tuner AGC Amplifier Type 7801, Component Locations

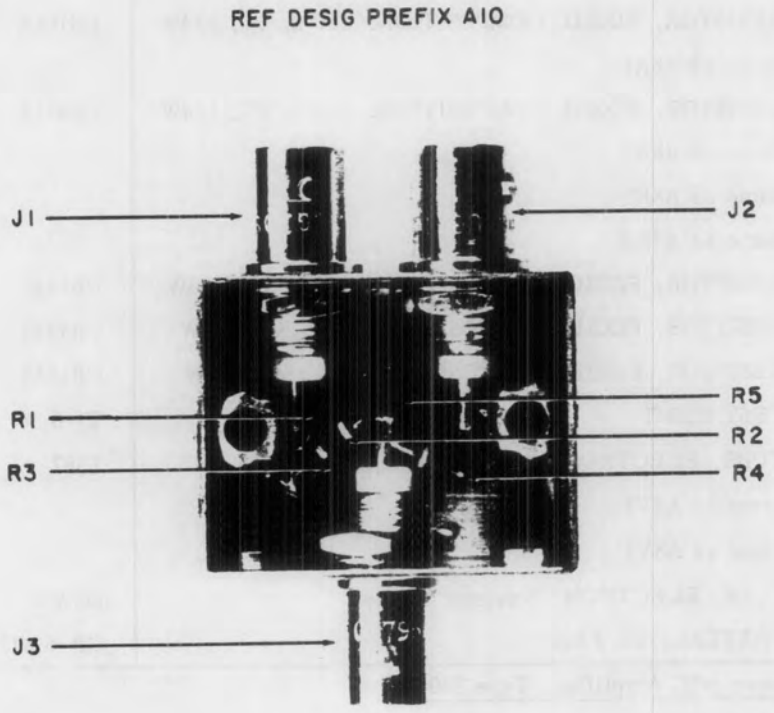

Figure 5-22. Local Oscillator Coupling Network Type 7912, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A9Q3	Same as A9Q2		
A9R1	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/4W	CB4725	AB
A9R2	RESISTOR, FIXED, COMPOSITION: 3.3K, 5%, 1/4W	CB3325	AB
A9R3	RESISTOR, FIXED, COMPOSITION: 68K, 5%, 1/4W	CB6835	AB
A9R4	Same as A9R3		
A9R5	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A9R6	Same as A9R5		
A9CR1	DIODE, ZENER	1N751A	CD
A9CR2	DIODE	1N462	CD
A9CR3	Same as A9CR2		
5.4.11 Coupling Network, Type 7912			
A10J1	JACK, BNC	UG-1094/U	FXR
A10J2	Same as A10J1		
A10J3	Same as A10J1		
A10R1	RESISTOR, FIXED, COMPOSITION: 82 Ω, 5%, 1/4W	CB8205	AB
A10R2	RESISTOR, FIXED, COMPOSITION: 91 Ω, 5%, 1/4W	CB9105	AB
A10R3	RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W	CB2715	AB
A10R4	Same as A10R2		
A10R5	Same as A10R1		
5.4.12 COR Amplifier, Type 7500.- Not used in type 770A Receiver.			
A11C1	CAPACITOR, CERAMIC DISC: 0.01 μf, 20%, 200V	SMCB0197	Glenco
A11C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μf, 20%, 35V	150D105X-0035A2	Sprague
A11C3	CAPACITOR, ELECTROLYTIC: 100 μf, 50V	APD-127	IEI
A11CR1	DIODE, SILICON	1N462	CD
A11CR2	Same as A11CR1		
A11CR3	Same as A11CR1		
A11CR4	Same as A11CR1		
A11CR5	Same as A11CR1		
A11Q1	TRANSISTOR, SILICON	2N335	TI
A11Q2	Same as A11Q1		
A11Q3	TRANSISTOR, SILICON	2N697	TI
A11R1	RESISTOR, FIXED, COMPOSITION: 560K, 5%, 1/2W	EB5645	AB
A11R2	RESISTOR, FIXED, COMPOSITION: 20K, 5%, 1/4W	CB2035	AB
A11R3	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/2W	EB4725	AB
A11R4	RESISTOR, FIXED, COMPOSITION: 6.8K, 5%, 1/2W	EB6825	AB
A11R5	RESISTOR, FIXED, COMPOSITION: 6.2K, 5%, 1/2W	EB6225	AB

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A11R6	RESISTOR, FIXED, COMPOSITION: 1.2K, 5%, 1/2W	EB1225	AB

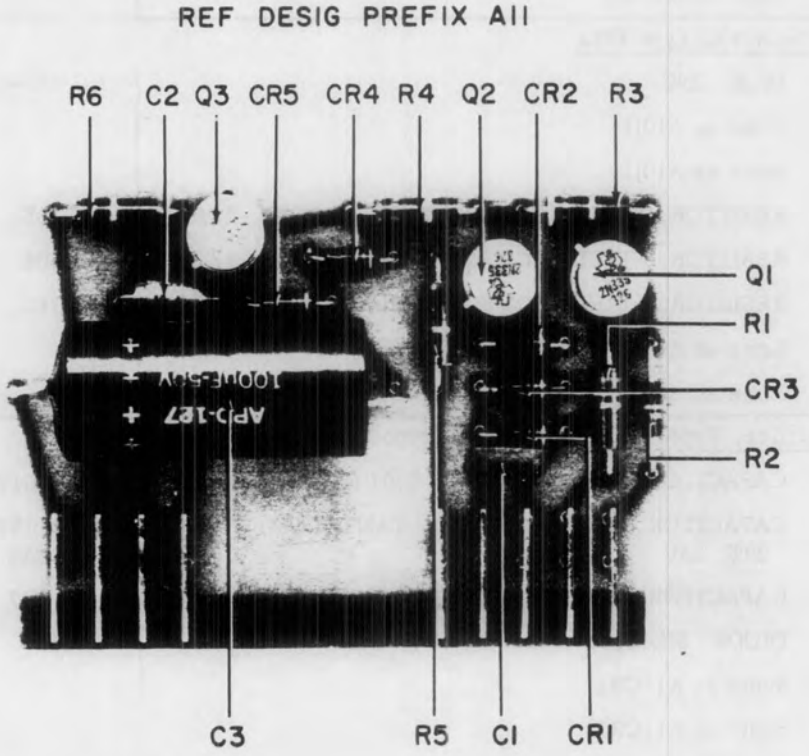

Figure 5-23. COR Amplifier Type 7500, Component Locations

5.4.13 AGC Amplifier, Type 7811. The 7811 AGC Amplifier is used on all 775 Receivers and 770A Receivers serial number 111 and higher.

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A7C1	CAPACITOR, ELECTROLYTIC: .047 μf, 20%, 35V	150D473X0035A2	Sprague
A7C2	CAPACITOR, ELECTROLYTIC: .47 μf, 20%, 35V	150D474X0035A2	Sprague
A7C3	CAPACITOR, ELECTROLYTIC: 10 μf, 20%, 35V	150D106X0035R2	Sprague
A7C4	Same as A7C3		
A7C5	CAPACITOR, DIPPED MICA: 470 pf, 5%, 500V	DM15-471J	Arco
A7C6	Same as A7C3		
A7C7	CAPACITOR, ELECTROLYTIC: 1 μf, 20%, 35V	150D105X0035A2	Sprague
A7C8	CAPACITOR, CERAMIC DISC: .01 μf, 20%, 200V	4835-000-Z5U0-103M	Erie
A7C9	Same as A7C7		
A7C10	CAPACITOR, ELECTROLYTIC: 4.7 μf, 20%, 35V	150D475X0035B2	Sprague
A7CR1	DIODE	1N914	TI
A7CR2	DIODE, ZENER	1N753A	Motorola
A7CR3	DIODE, ZENER	1N756A	CD
A7Q1	TRANSISTOR	2N697	TI
A7Q2	Same as A7Q1		
A7Q3	Same as A7Q1		
A7Q4	Same as A7Q1		
A7Q5	TRANSISTOR	2N1305	GE
A7Q6	Same as A7Q5		
A7R1	RESISTOR, FIXED, COMPOSITION: 220Ω, 5%, 1/4W	CB2215	A-B
A7R2	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	A-B
A7R3	Same as A7R2		
A7R4	RESISTOR, FIXED, COMPOSITION: 680K, 5%, 1/4W	CB6845	A-B
A7R5	RESISTOR, FIXED, COMPOSITION: 620Ω, 5%, 1/4W	CB6215	A-B
A7R6	Same as A7R2		
A7R7	Same as A7R2		
A7R8	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/4W	CB4725	A-B
A7R9	RESISTOR, FIXED, COMPOSITION: 22M, 5%, 1/4W	CB2265	A-B
A7R10	RESISTOR, FIXED, COMPOSITION: 2.7K, 5%, 1/4W	CB2725	A-B
A7R11	RESISTOR, FIXED, COMPOSITION: 3.3K, 5%, 1/4W	CB3325	A-B
A7R12	Same as A7R2		
A7R13	Same as A7R2		
A7R14	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	A-B
A7R15	Same as A7R10		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A7R16	RESISTOR, FIXED, COMPOSITION: 150K, 5%, 1/4W	CB1545	A-B
A7R17	Same as A7R2		
A7R18	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	A-B
A7R19	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	A-B
A7R20	RESISTOR, FIXED, COMPOSITION: 10M, 5%, 1/4W	CB1065	A-B
A7R21	RESISTOR, FIXED, COMPOSITION: 200K, 5%, 1/4W	CB2045	A-B
A7R22	RESISTOR, FIXED, COMPOSITION: 100K, ±5%, 1/4W	CB1045	A-B
A7R23	Same as A7R19		
A7R24	Same as A7R19		
A7R25	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	A-B
A7R26	RESISTOR, FIXED, COMPOSITION:1K, 5%, 1/4W	CB1025	A-B
A7R27	Same as A7R19		
A7R28	RESISTOR, FIXED, COMPOSITION: 2.2M, 5%, 1/4W	CB2255	A-B
A7R29	Same as A7R28		
A7R30	EESISTOR, FIXED, COMPOSITION: 270K, ±5%, 1/4W	CB2745	A-B

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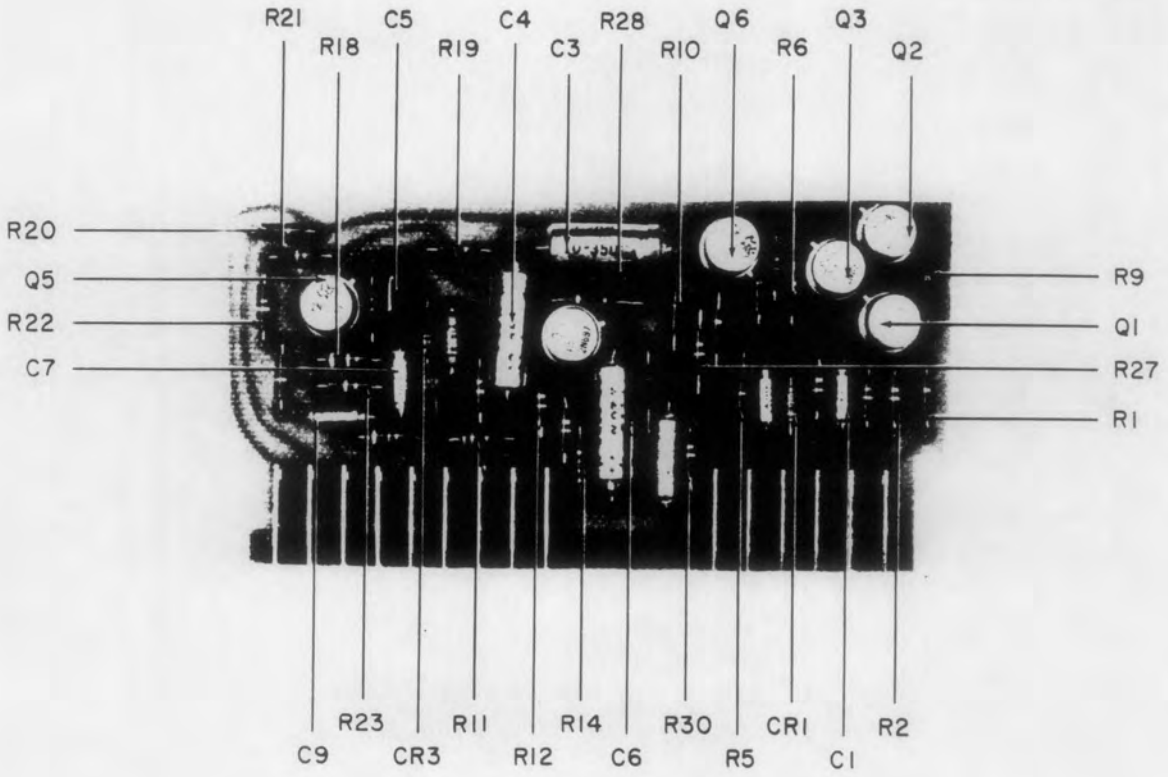


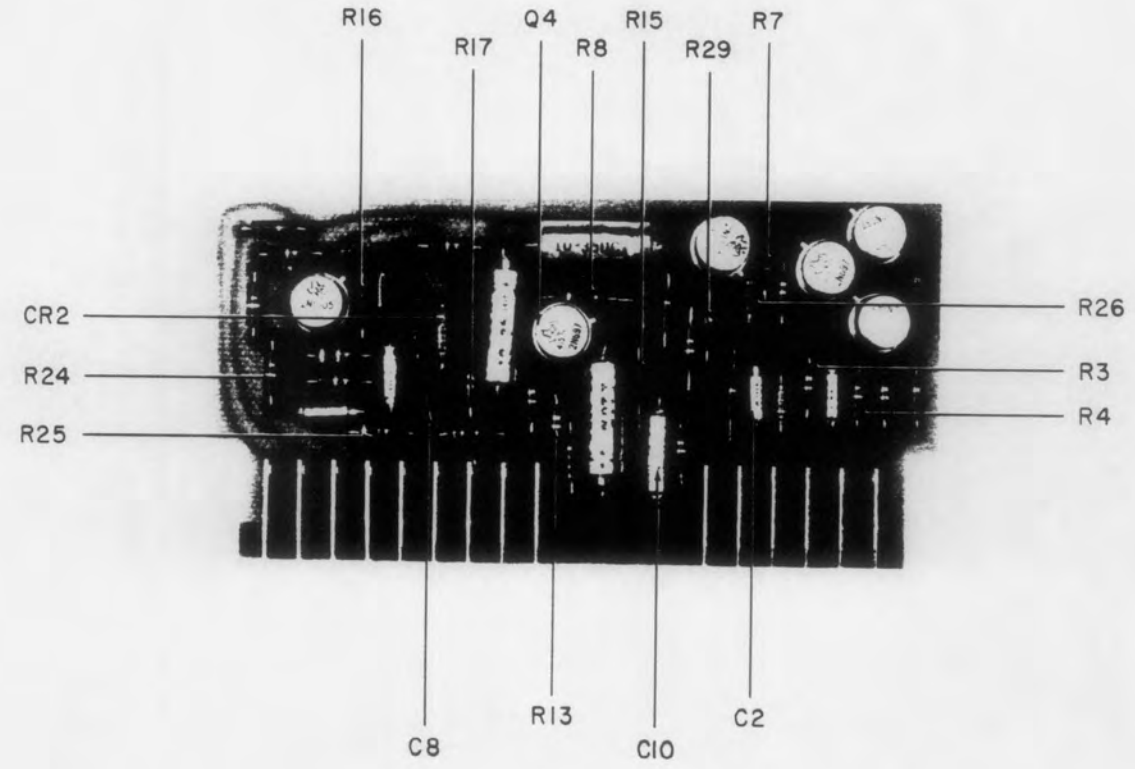


Figure 5-24. AGC Amplifier Type 7811, Component Locations

SECTION VI

TYPE 775 RECEIVER SUPPLEMENT

AND

SCHEMATIC DIAGRAMS

6.1 GENERAL

The types 770A and 775 Receivers are identical except that the type 775 Receiver contains a COR (carrier operated relay) which is not included in the type 770A Receiver. This section of the manual contains that information which pertains to the type 775 Receiver which has not been covered in other sections.

6.2 ELECTRICAL AND MECHANICAL DESCRIPTION

The COR provides for the control of external devices as a function of the received signal level. The SPDT contacts of the relay are connected to terminal strip TB1 on the rear apron of the receiver. The COR function is adjustable to operate over an input signal level range of at least 1 μv to 500 μv. Two COR release times are provided: SLOW (6 seconds) and FAST (less than 0.5 seconds). This means that the relay remains operated after the carrier disappears for either 6 seconds or 0.5 seconds, depending on the setting of the COR DELAY switch. The front-panel differences between the types 770A and 775 Receivers are:

(1) The power toggle switch has been removed and the COR SENSITIVITY control added in its place.
(2) The power on/off switch has been added to the AUDIO GAIN control.
(3) The combination COR indicator and COR DELAY switch has been added to the right side of the front panel.

6.3 COR CIRCUIT DESCRIPTION

The COR circuitry consists of a plug-in COR amplifier and a relay mounted on the main deck. Refer to the schematic diagrams, Figures 6-12 and 6-13. The COR amplifier is a CEI type 7500; the reference designation prefix is A11.

6.3.1 The first two stages in the amplifier, Q1 and Q2, form a dc amplifier. The third stage, Q3, is a combination switch, relay driver, and time delay network. In the absence of a carrier, Q1 and Q2 conduct to saturation and hold Q3 biased to non-conduction. In the presence of a carrier, a negative-going voltage is developed at the output of the AGC amplifier in the IF strip. The current produced by this voltage operates the SIGNAL STRENGTH meter and returns to ground through the input of the module. This current turns off Q1 and Q2 which turns on Q3 and actuates the relay.

6.3.2 The COR SENSITIVITY control, R19, sets the level of input current which flows in the absence of a carrier. Thus, adjusting R19 fixes the level of negative control current (and hence the carrier level) required to turn off Q1.

6.3.3 It is possible to delay the return of the relay to the unactuated state following the disappearance of a carrier. When the COR DELAY switch, S6, is in the SLOW mode, capacitor C3 is connected between the Q3 collector and the junction of the diodes CR4 and CR5. When Q3 conducts, C3 is discharged through CR5. When the carrier disappears, Q1 and Q2 conduct and the voltage at the collector of Q2 falls rapidly which would tend to simultaneously turn Q3 off. But capacitor C3 is now connected through diode CR4 between the collector and the base of Q3 forming a capacitance multiplier circuit. The return of Q3 to the non-conducting state is therefore delayed about six seconds in accordance with the time constant formed by resistor R6 in series with relay K1 winding and the capacitance of C3 multiplied by the Beta of Q3. In the FAST mode, C3 is removed from the circuit by switch S6.

6.4 COR INSTALLATION AND OPERATION

Connect the device to be COR controlled to terminals 5, 6, and 7 of terminal strip TB1 on the rear apron. With the COR unactuated, terminals 5 and 7 are short-circuited and terminals 6 and 7 are open-circuited. The reverse is true when the COR operates.

6.4.1 COR Sensitivity Control.- The front-panel COR SENSITIVITY control (R19) is used to obtain COR operation at the desired signal input level. One of the two indicators built into the COR DELAY push button will be illuminated when the COR is activated. Clockwise rotation of the control increases the sensitivity.

6.4.2 COR Delay Switch.- The COR DELAY push button switch serves to control the length of time the COR function remains operated after the activating signal disappears and also to indicate when the COR is operated. The switch is a locking type which reverses modes each time it is depressed, alternately changing from FAST release to SLOW

release. When the COR activates, one of the two lamp in the push button switch will light. This action tells the operator that the COR is activated and also which release time is in effect.

6.5 ADDITIONAL REPLACEMENT PARTS

The replacement parts for the types 770A and 775 Receivers are identical unless specifically noted below.

6.5.1 Main Chassis.- In Section V, make the following changes and additions to the main chassis components:

(1) Add A11, ASSEMBLY, COR MODULE, 7500, CEI.
(2) Add DS3 and DS4, LAMP: p/o S6
(3) Add K1, RELAY, miniature, hermetically sealed, DPDT, 22RJCC1000G/SIL, Sigma.
(4) Change R18, RESISTOR, VARIABLE, COMPOSITION: 100K, 10%, 2W, with switch JS1N056P104UA, AB.
(5) Add R19, RESISTOR, VARIABLE, COMPOSITION: 500K, 10%, 2W, RV4NAYSD504A, AB.
(6) Change S1, Part of R18.
(7) Add S6, SWITCH, INDICATOR, 302-PB6-T-GR, Microswitch.
(8) Add C11, CAPACITOR, ELECTROLYTIC, TANTALUM: 10 μf, 20%, 35V, 150D106X0035R2, Sprague.

6.5.2 COR Replacement Parts List.- The COR module is shown in Figure 5-23. The replacement parts are listed in paragraph 5.4.12.

6.6 SCHEMATIC DIAGRAMS

Complete schematic diagrams for the types 770A and 775 Receivers are presented on the following pages.

Figure 2-1

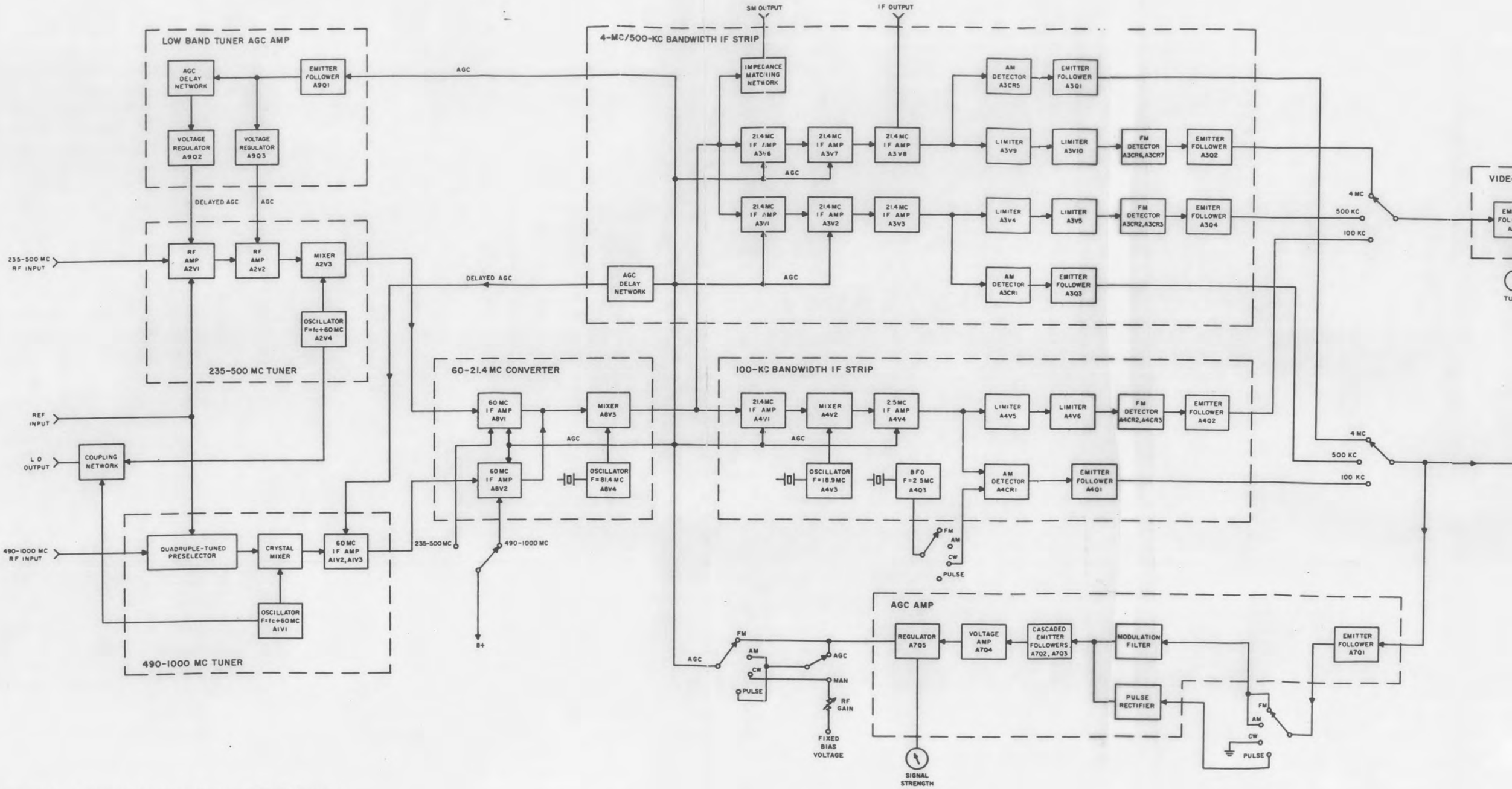
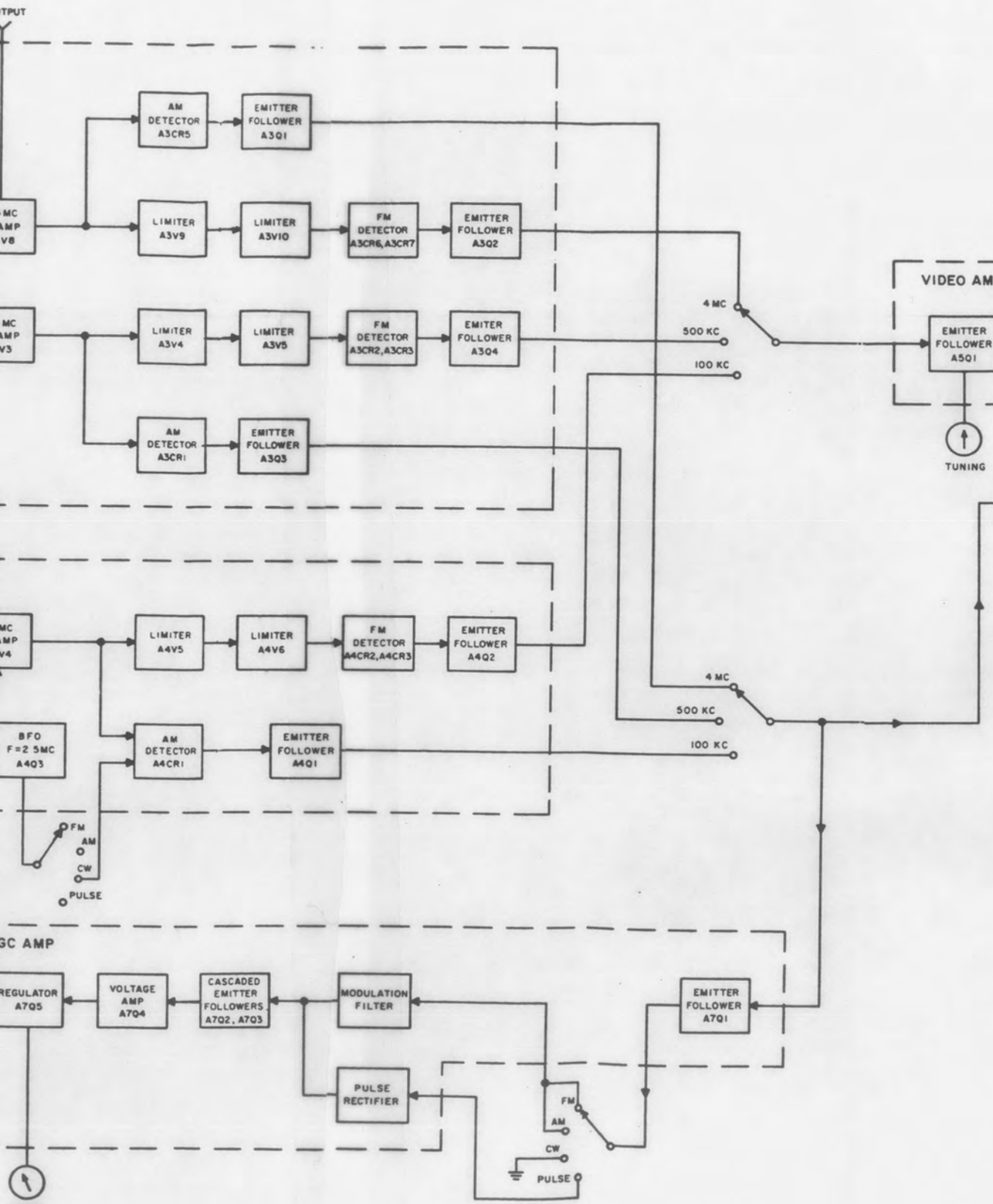
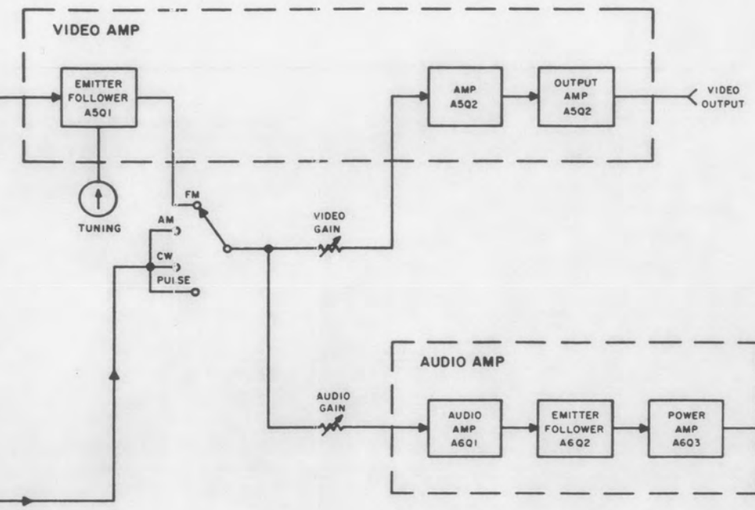
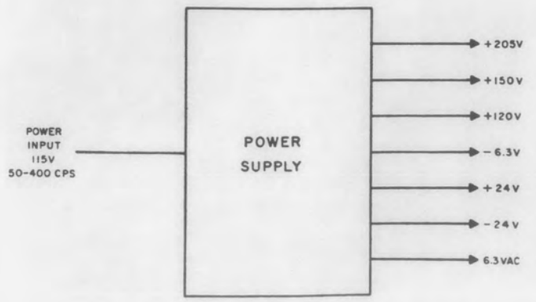
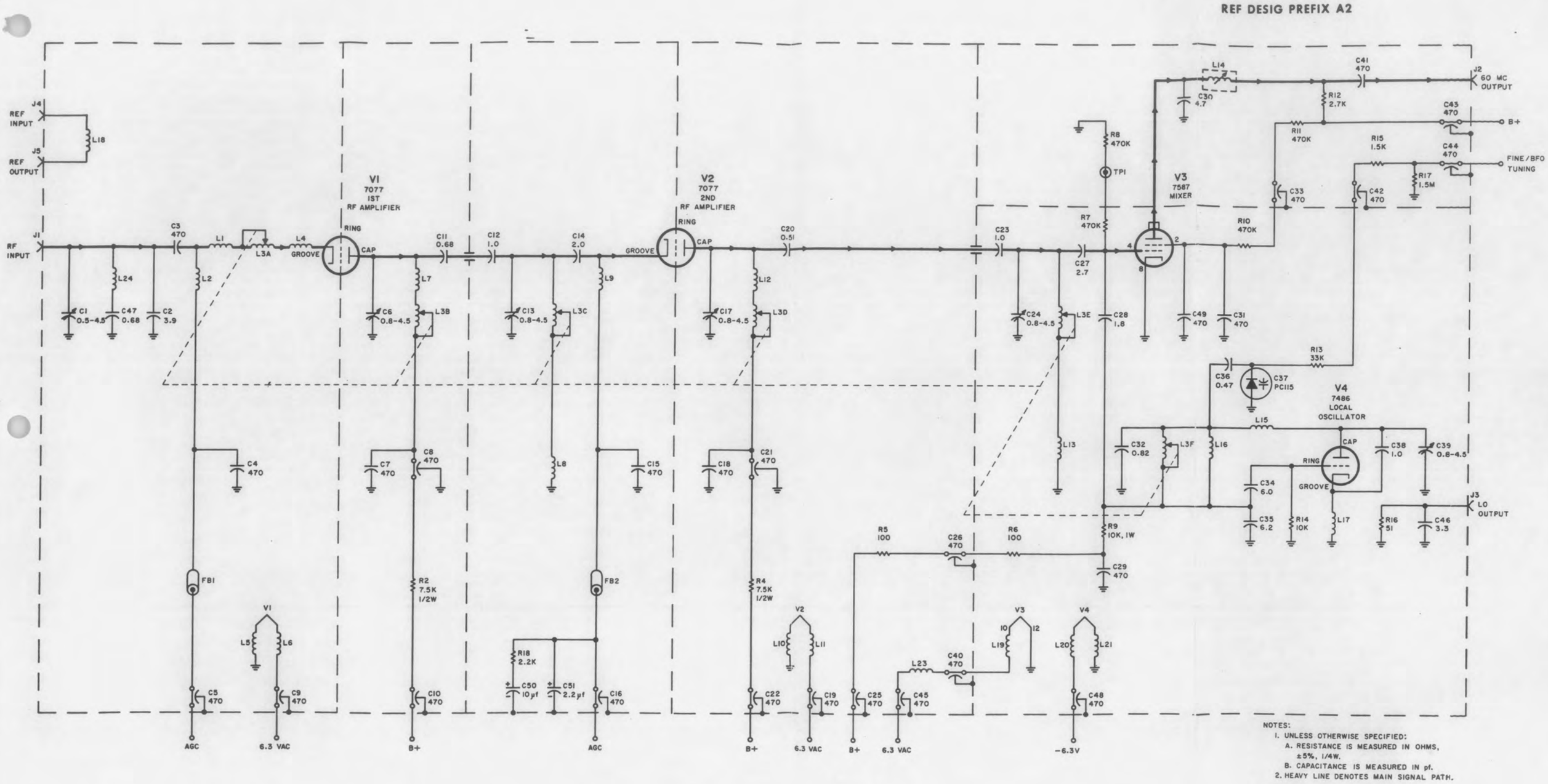


Figure 2-1. Type 770A Receiver, Functional Block Diagram





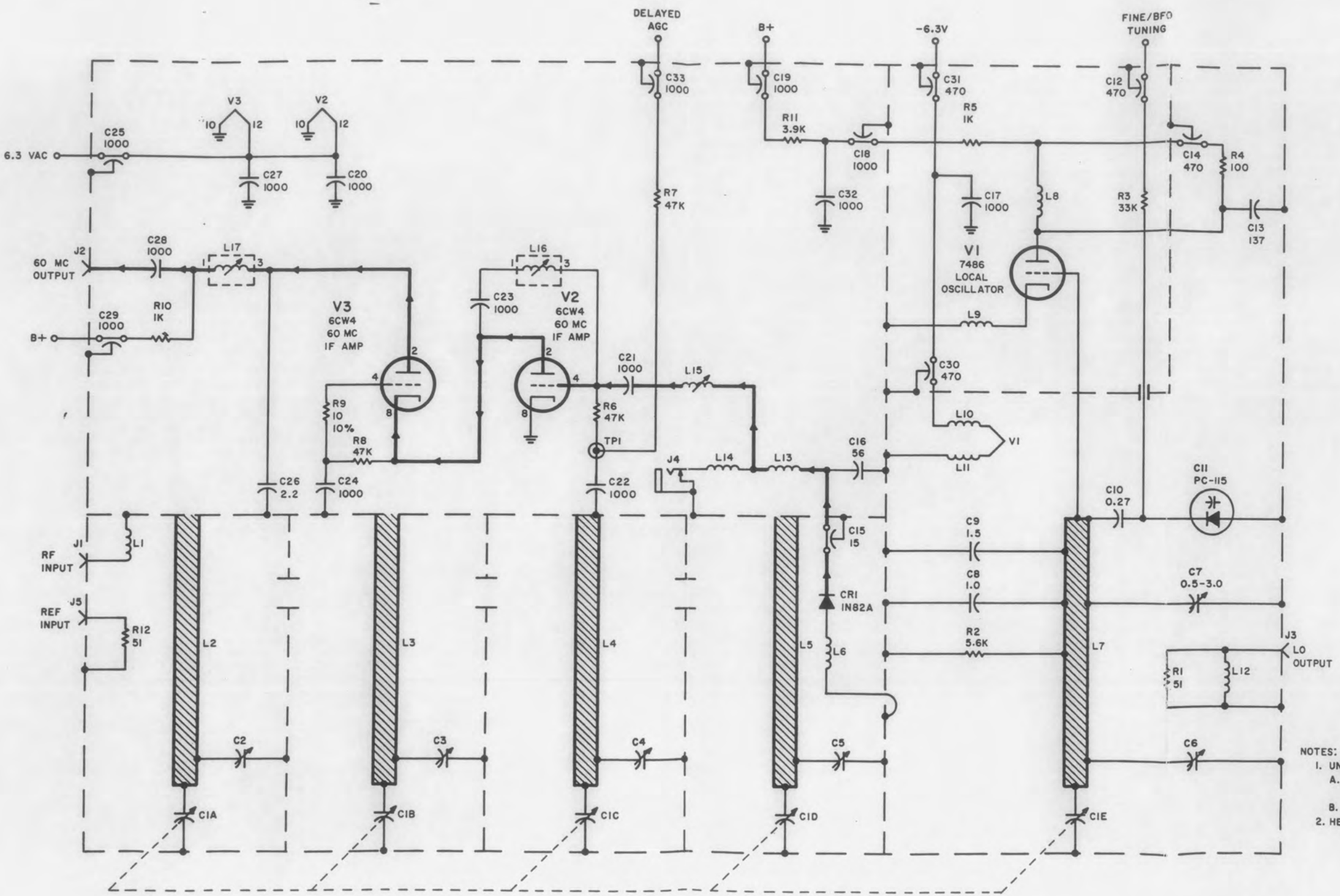




NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   B. CAPACITANCE IS MEASURED IN pf.
2. HEAVY LINE DENOTES MAIN SIGNAL PATH.

Figure 6-1. 235-500 mc RF Tuner Type 7109 Schematic Diagram

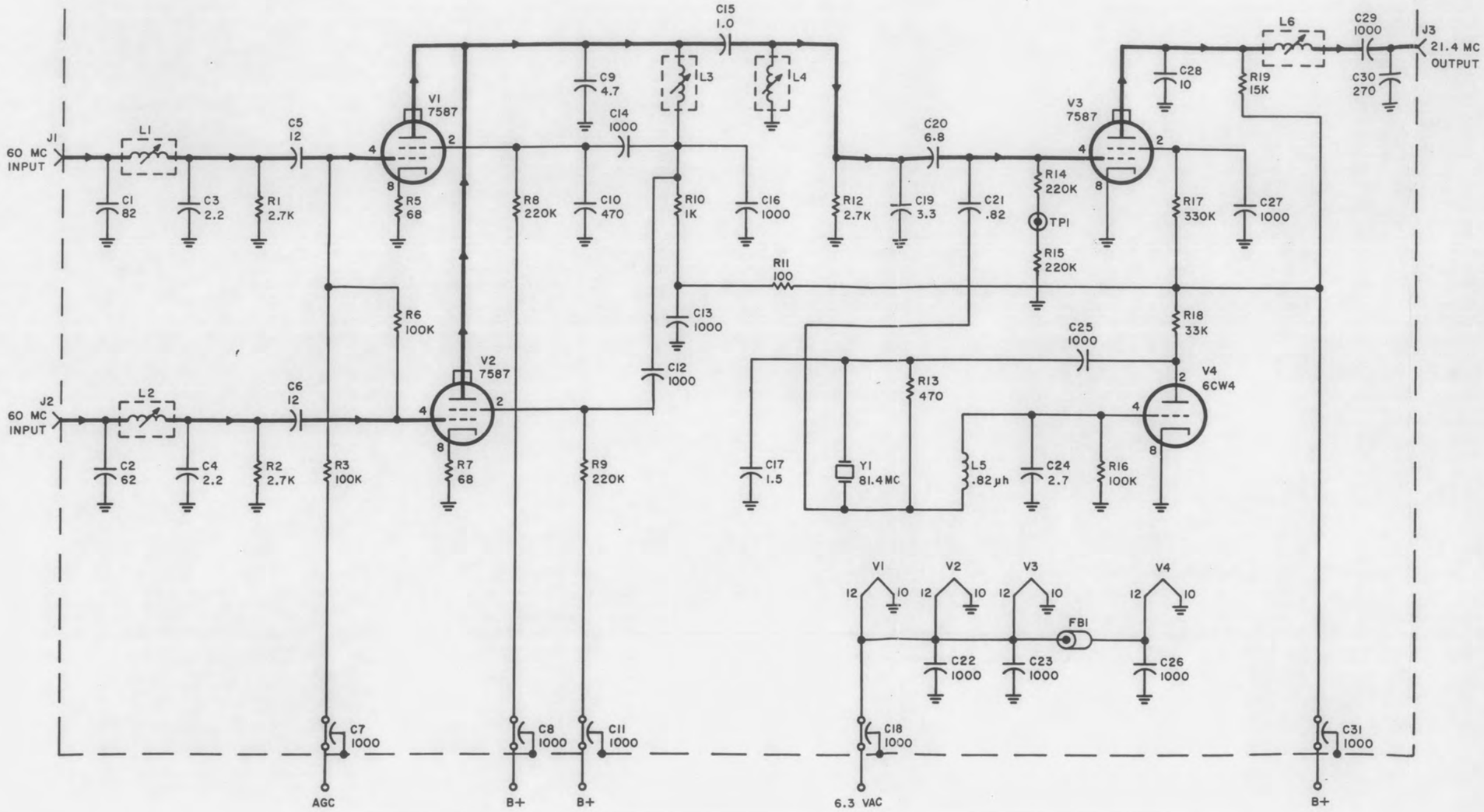
REF DESIG PREFIX A1



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.

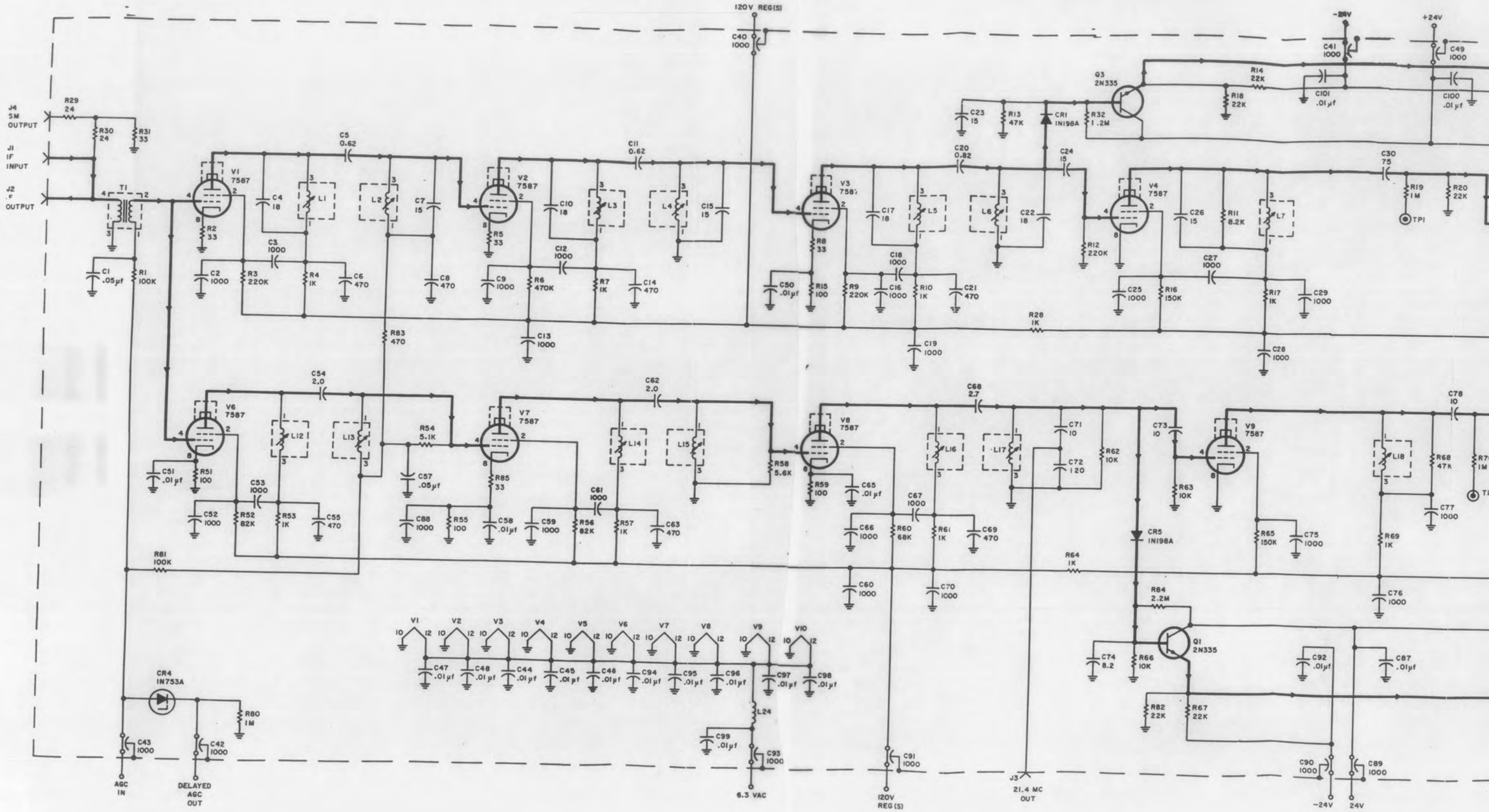
Figure 6-2. 490-1000 mc RF Tuner Type 7111, Schematic Diagram

REF DESIG PREFIX A8



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) ALL RESISTORS ARE IN OHM ±5%, 1/4W.
   b) ALL CAPACITORS ARE IN pf.
2. HEAVY LINE DENOTES MAIN SIGNAL PATH.

Figure 6-3. 60-21.4 mc Converter Type 7106, Schematic Diagram



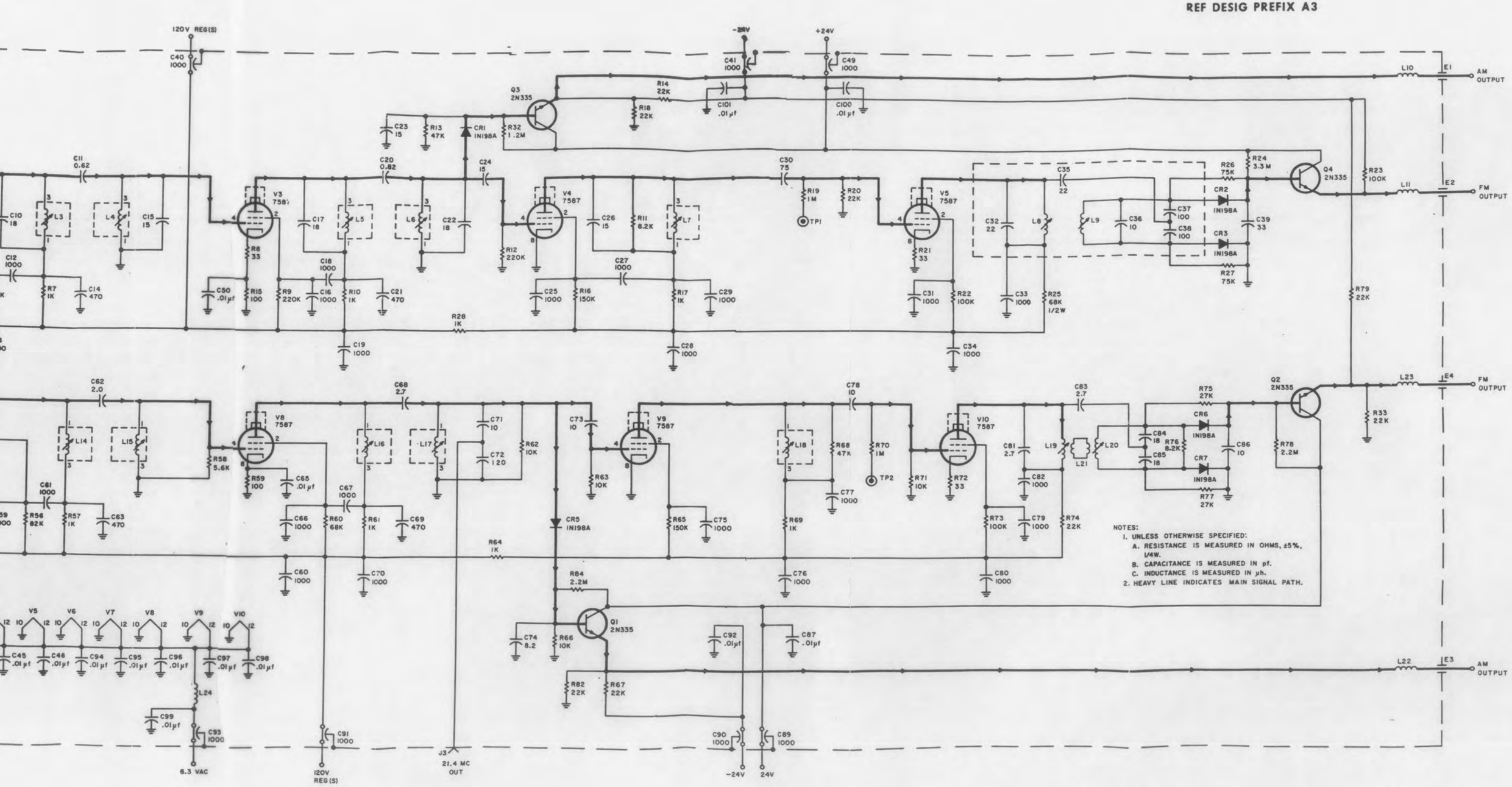
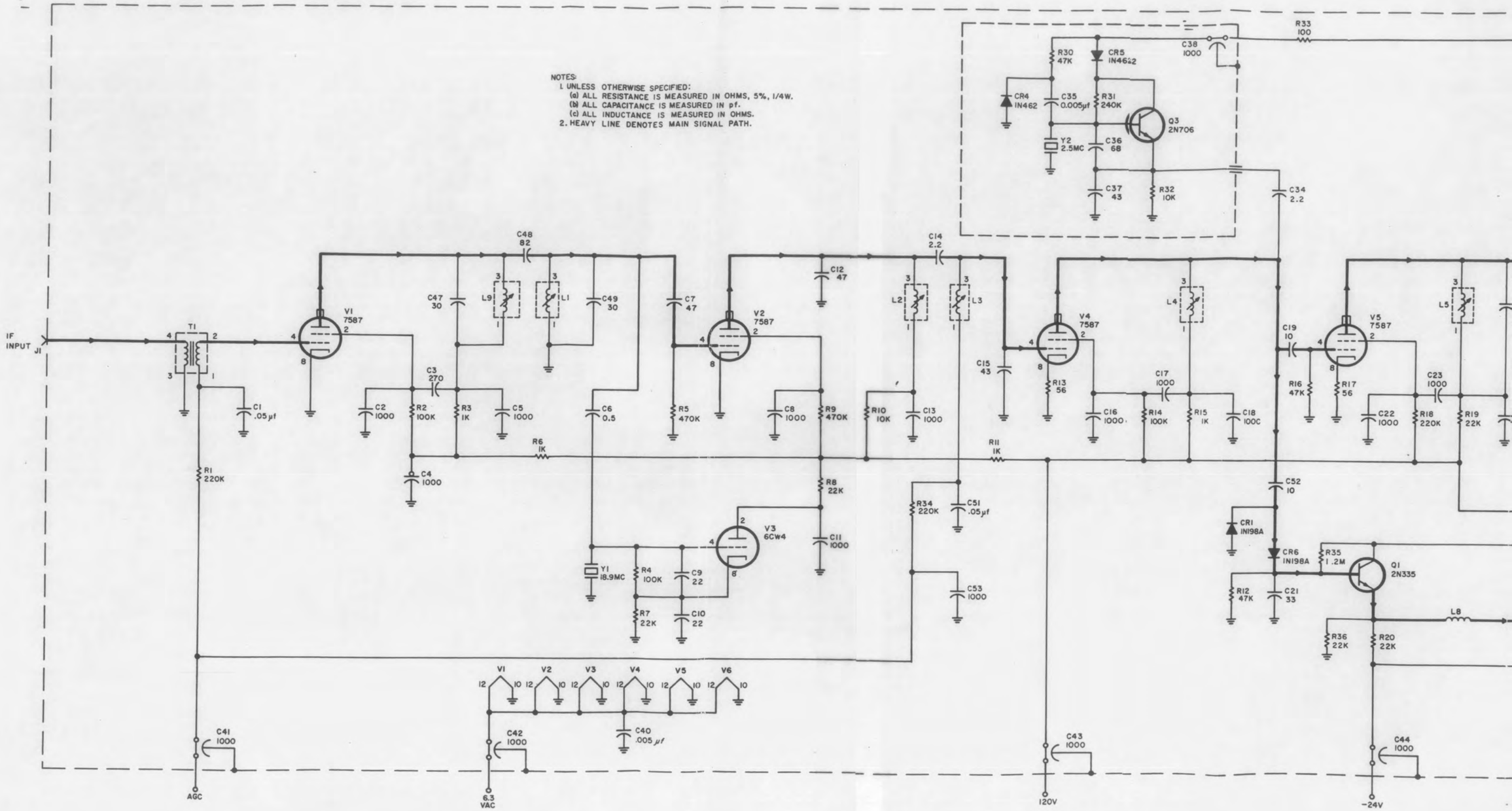


Figure 6-4. 4-mc/500-kc Bandwidth IF Strip Type 7214, Schematic Diagram

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



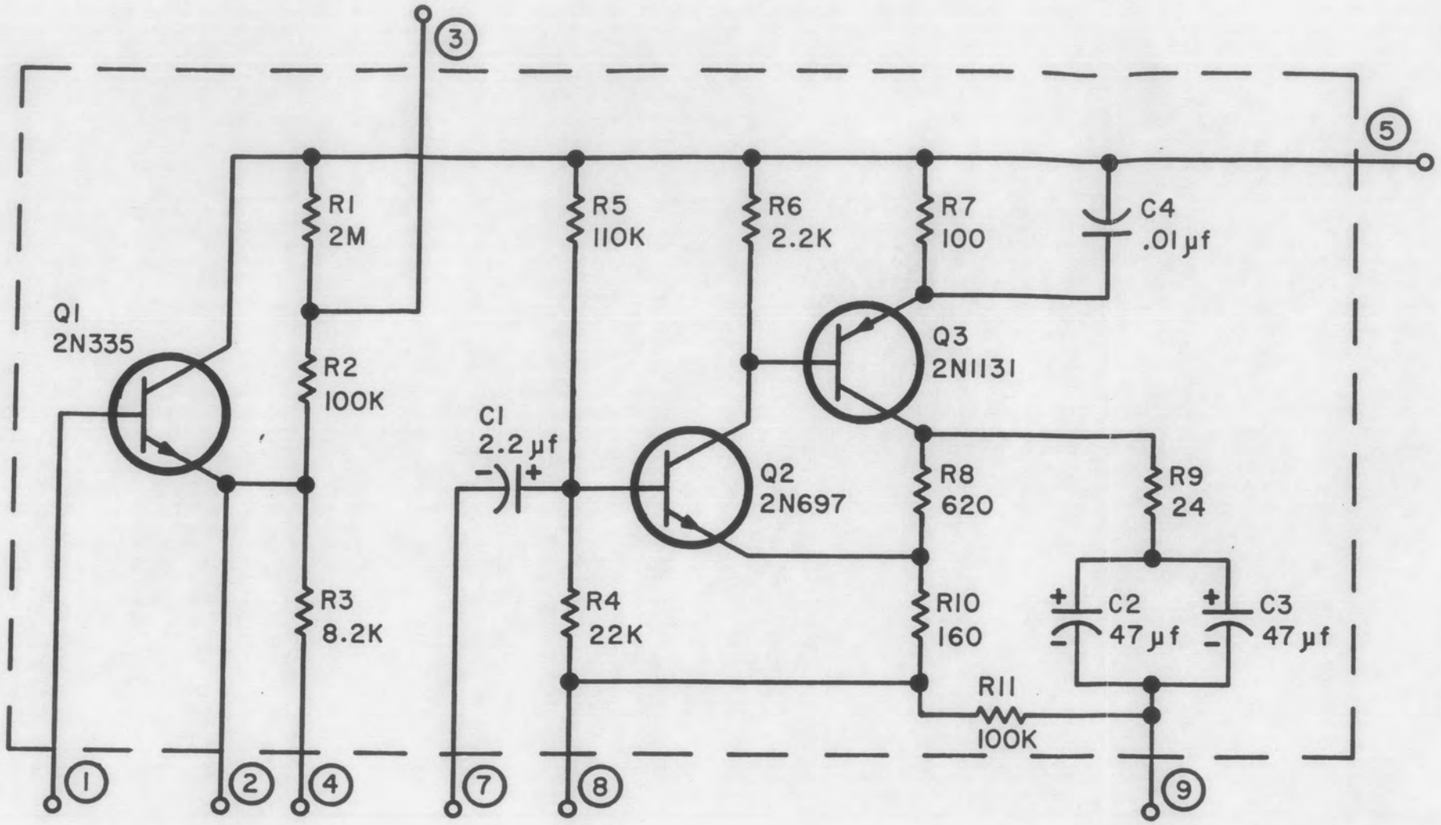
REF DESIG PREFIX A4

WISE SPECIFIED:
ANCE IS MEASURED IN OHMS, 5%, 1/4W.
TANCE IS MEASURED IN pf.
TANCE IS MEASURED IN OHMS.
DENOTES MAIN SIGNAL PATH.

R33 100
C38 1000
C39 1000
24/-24V
R30 47K
CR5 IN4642
CR4 IN462
C35 0.005μf
R31 240K
Q3 2N706
Y2 2.5MC
C36 68
C37 43
R32 10K
C34 2.2
L10
E2
FM OUTPUT
R37 1K
C20 100
C14 2.2
C12 47
C7 47
V2 7587
L2
L3
V4 7587
L4
C19 10
V5 7587
L5
C26 4.7
C25 10
V6 7587
L6
L7
C29 82
C30 33
C31 100
C32 100
CR2 IN198A
CR3 IN198A
R26 100K
Q2 2N335
C33 100
R28 3.3M
R27 100K
R29 100K
C15 43
R13 56
C17 1000
C16 1000
R14 100K
R15 1K
C18 100C
R16 47K
R17 56
C23 1000
C22 1000
R18 220K
R19 22K
C24 1000
TP1
R21 1M
R22 10K
R23 56
C28 1000
C27 1000
R24 220K 1/2W
R25 150K
R5 470K
C8 1000
R9 470K
R10 10K
C13 1000
R11 1K
R8 22K
R34 220K
C51 .05μf
V3 6CW4
C11 1000
R4 100K
C9 22
C10 22
R7 22K
C53 1000
C52 10
CR1 IN198A
CR6 IN198A
R35 1.2M
Q1 2N335
R12 47K
C21 33
L8
R36 22K
R20 22K
E1
AM OUTPUT
C50 470
V5
V6
10 12 10 12 10
40
005 μf
C43 1000
120V
C44 1000
-24V
C45 1000
+24V

Figure 6-5. 100-kc Bandwidth IF Strip Type 7213, Schematic Diagram

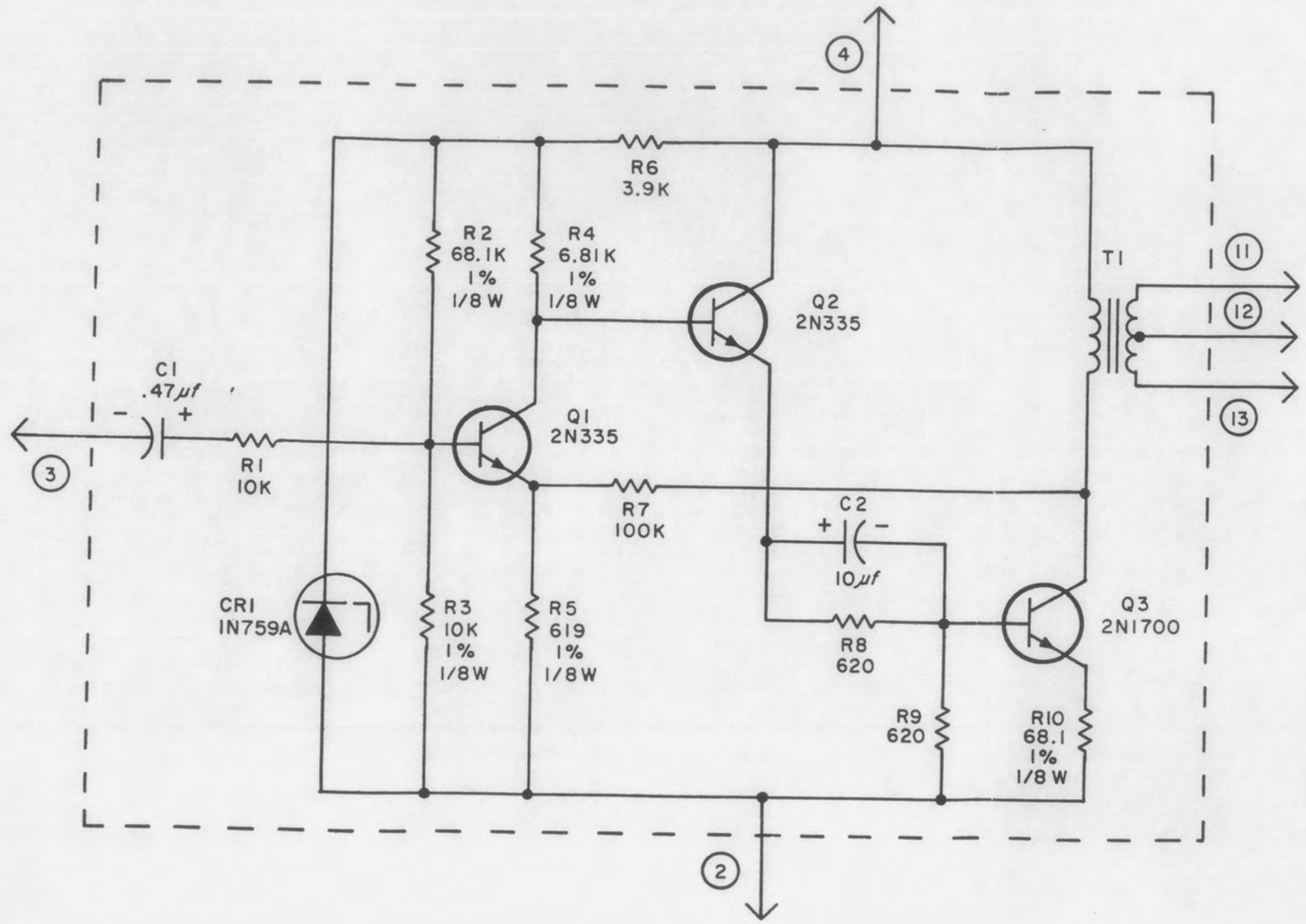
REF DESIG PREFIX A5



1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, 1/4W, 5%.
2. PIN NUMBERS ARE ENCIRCLED.

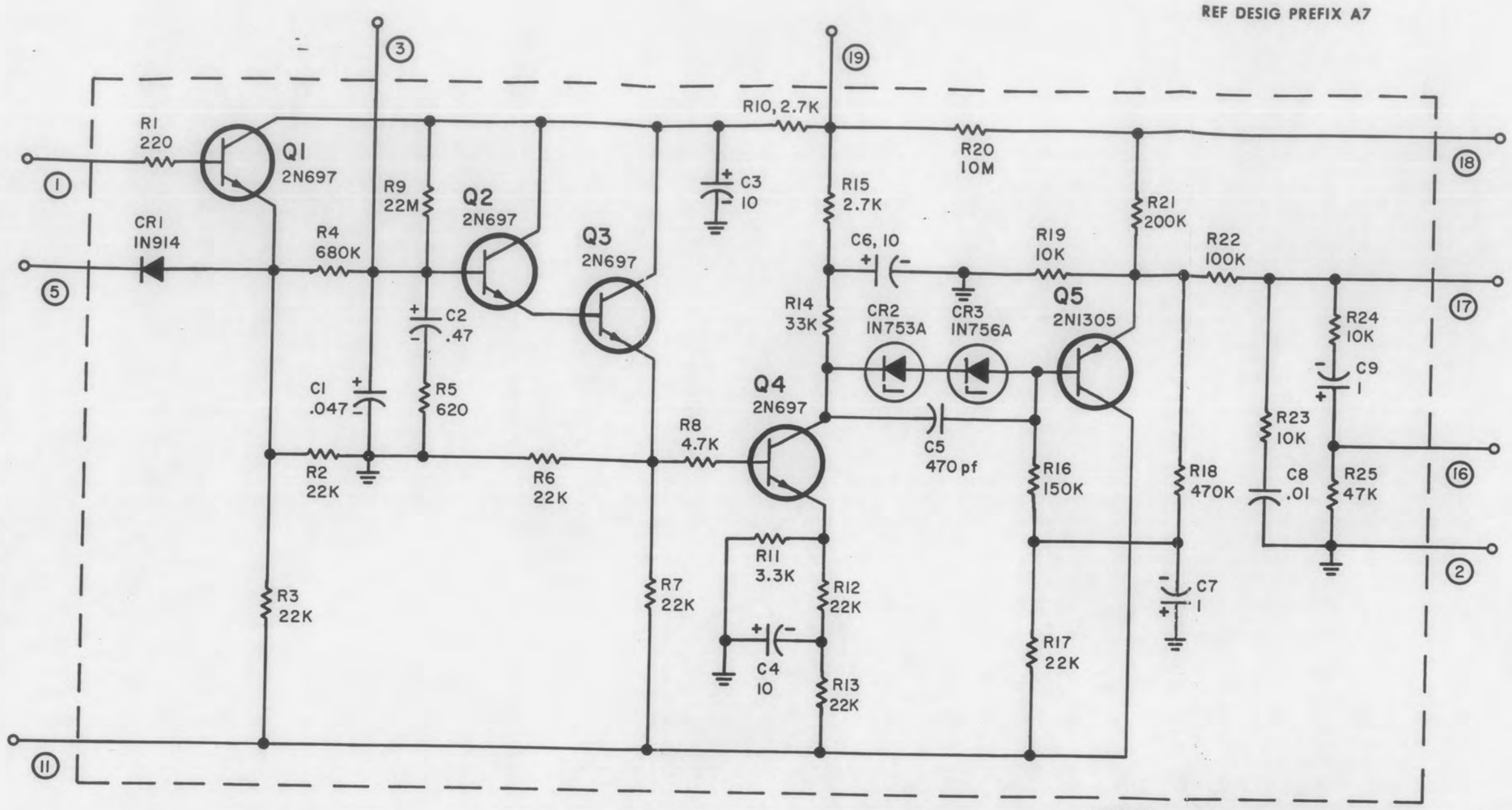
Figure 6-6. Video Amplifier Type 7301, Schematic Diagram

REF DESIG PREFIX A6



1. ENCIRCLED NUMBERS ARE PIN NUMBERS ON PLUG P1.
2. UNLESS OTHERWISE SPECIFIED:
   a. RESISTORS ARE MEASURED IN OHMS, 1/2W, ±5%.
   b. CAPACITORS ARE MEASURED IN pf.
3. Q3 UTILIZES A HEAT RADIATOR.

Figure 6-7. Audio Amplifier Type 7400, Schematic Diagram

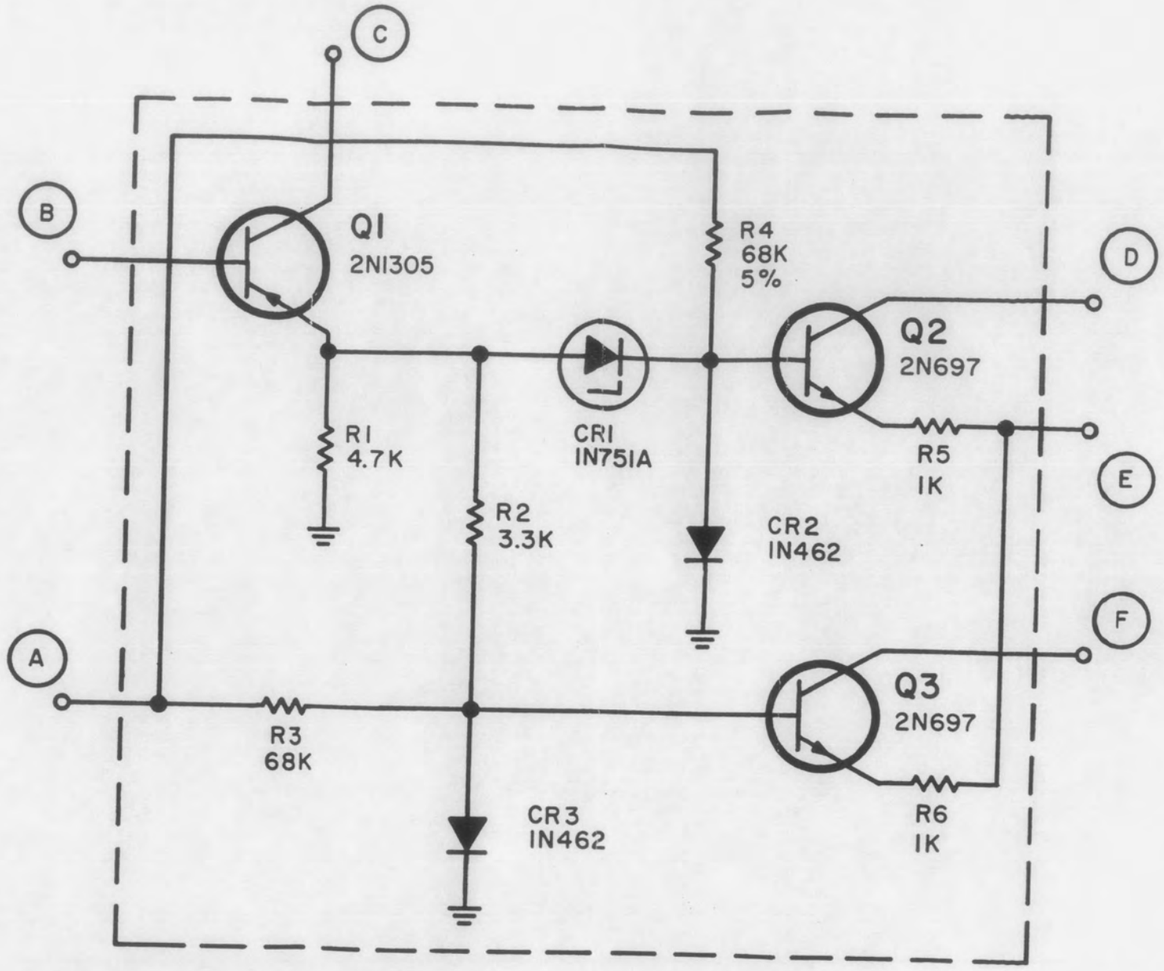


NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   B. CAPACITANCE IS MEASURED IN μf.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. SUPERSEDED BY AGC AMP TYPE 7811, SCHEMATIC 4415
   TYPE 7800 WAS USED ON:
   770A : S/N 101-110
   975 : S/N 101-103
   970A : S/N 101-110

Figure 6-8. AGC Amplifier Type 7800, Schematic Diagram

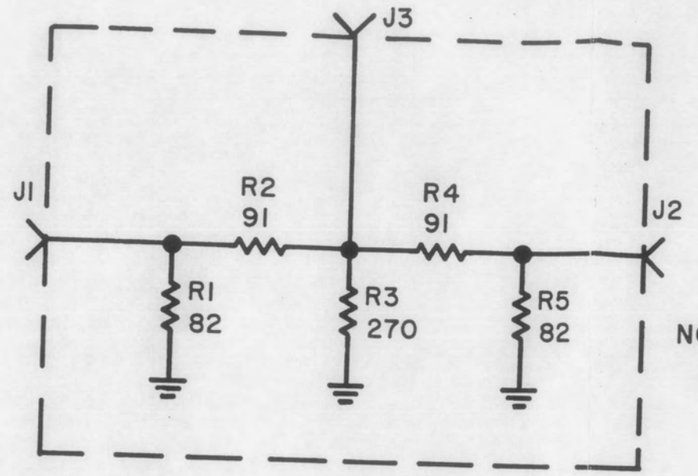
REF DESIG PREFIX A9



NOTES:
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE IS MEASURED IN OHMS, 5%, 1/4W.
2. ENCIRCLED LETTERS ARE FOR REFERENCE ONLY.

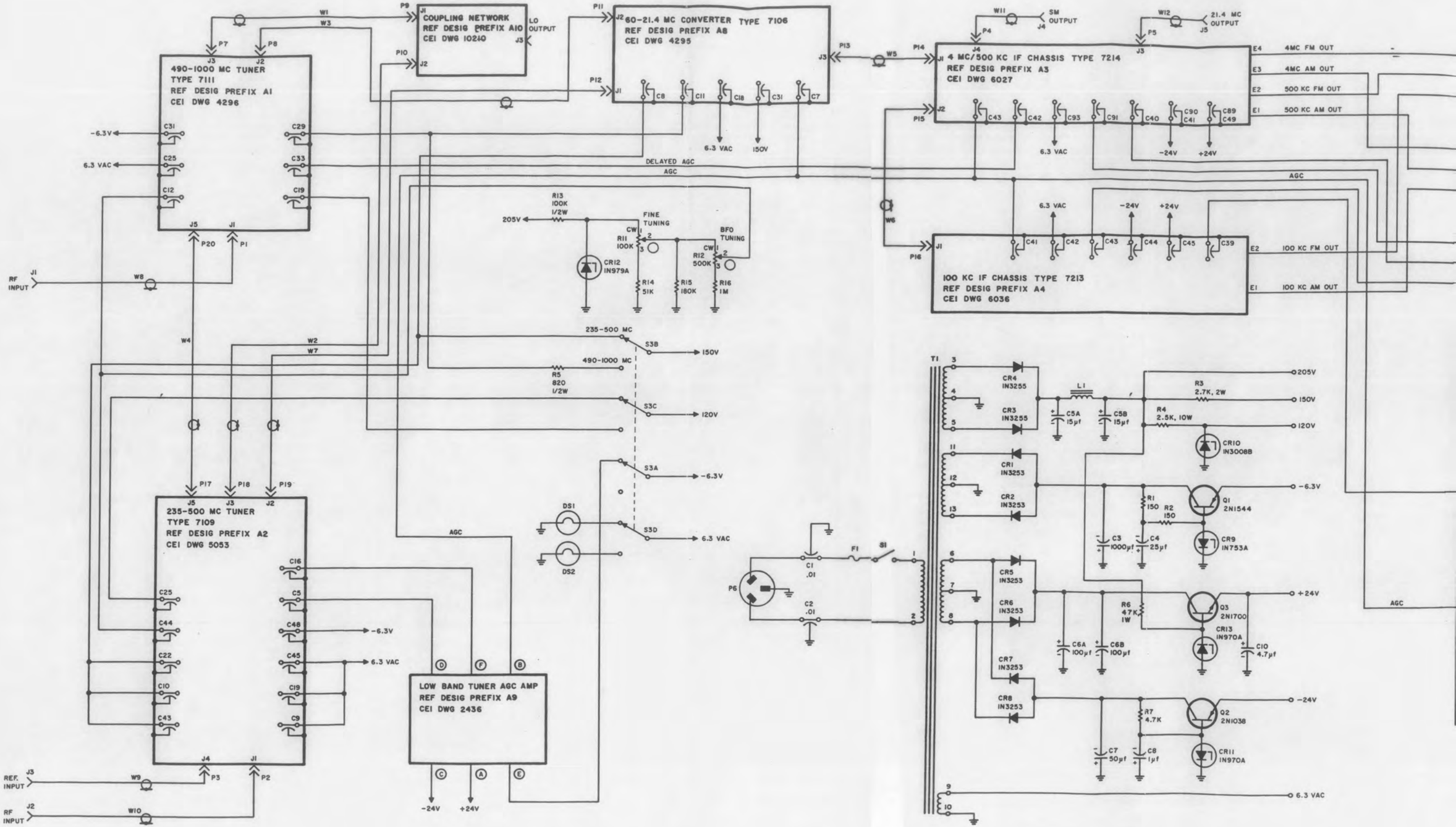
Figure 6-9. Low Band Tuner AGC Amplifier Type 7801, Schematic Diagram

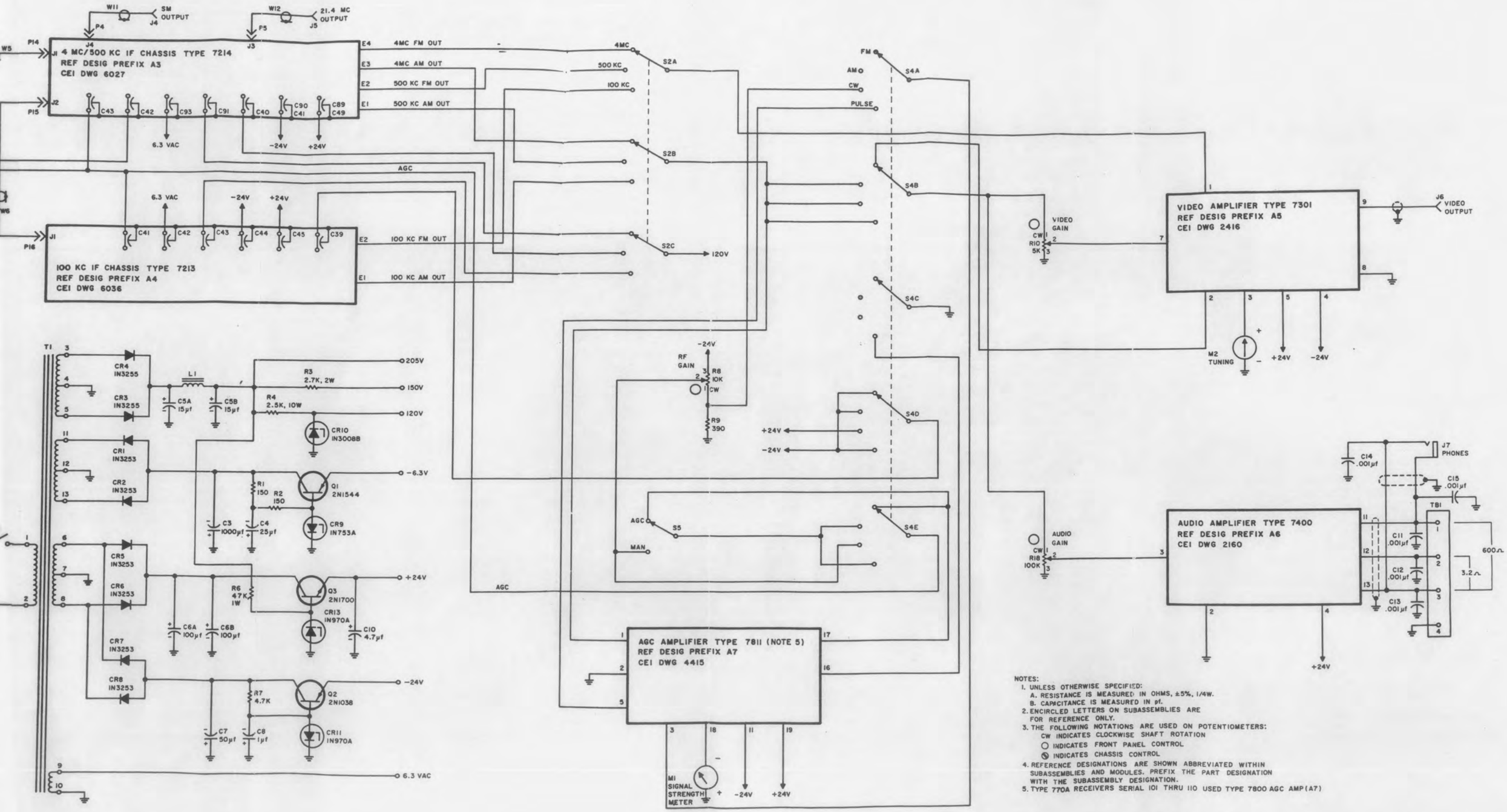
REF DESIG PREFIX A10



NOTE:
1. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.

Figure 6-10. Local Oscillator Coupling Network Type 7912, Schematic Diagram

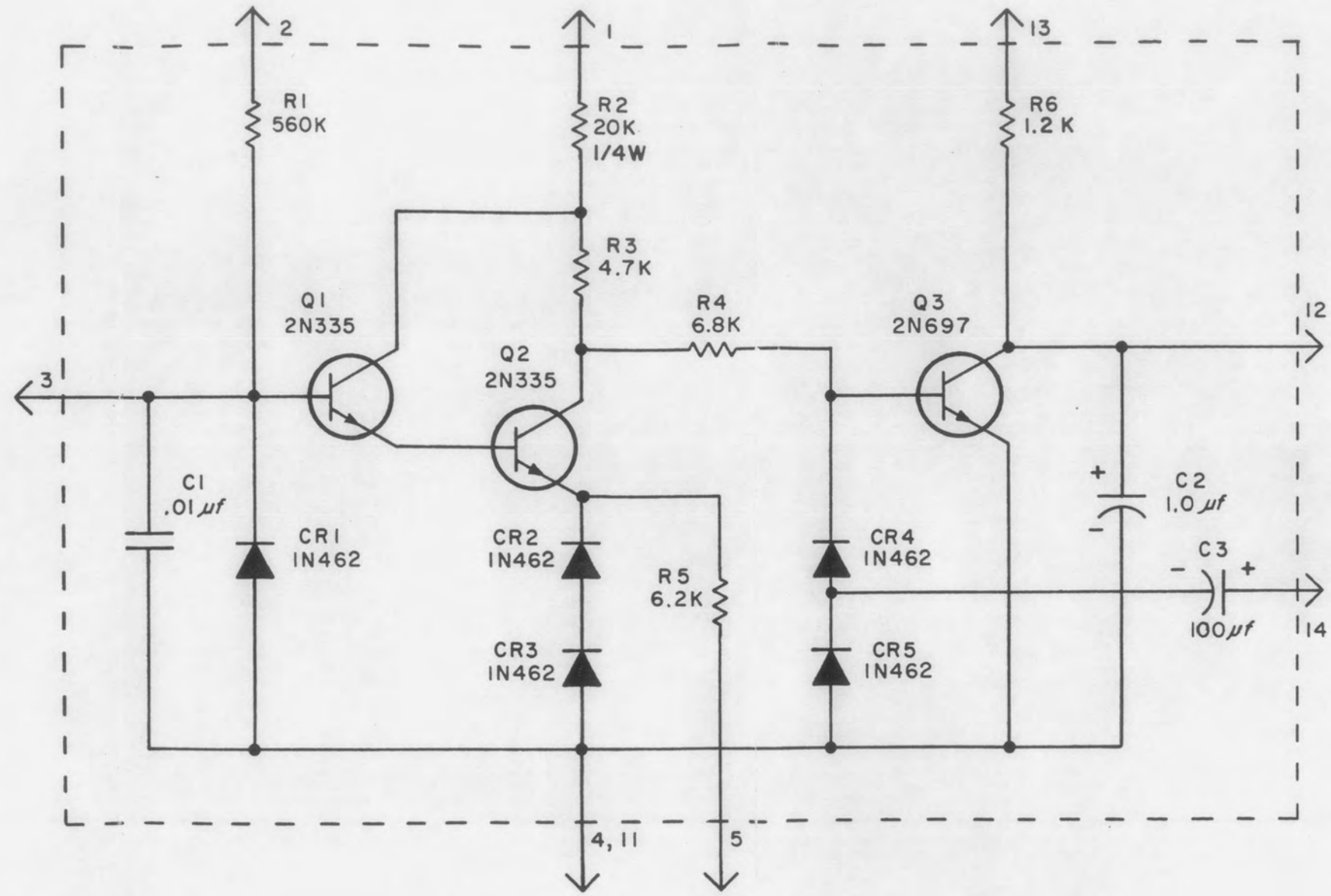




NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   B. CAPACITANCE IS MEASURED IN pf.
2. ENCIRCLED LETTERS ON SUBASSEMBLIES ARE FOR REFERENCE ONLY.
3. THE FOLLOWING NOTATIONS ARE USED ON POTENTIOMETERS:
   CW INDICATES CLOCKWISE SHAFT ROTATION
   ○ INDICATES FRONT PANEL CONTROL
   Ⓢ INDICATES CHASSIS CONTROL
4. REFERENCE DESIGNATIONS ARE SHOWN ABBREVIATED WITHIN SUBASSEMBLIES AND MODULES. PREFIX THE PART DESIGNATION WITH THE SUBASSEMBLY DESIGNATION.
5. TYPE 770A RECEIVERS SERIAL 101 THRU 110 USED TYPE 7800 AGC AMP(A7)

Figure 6-11. Type 770A Receiver, Main Chassis Schematic Diagram

REF DESIG PREFIX A11

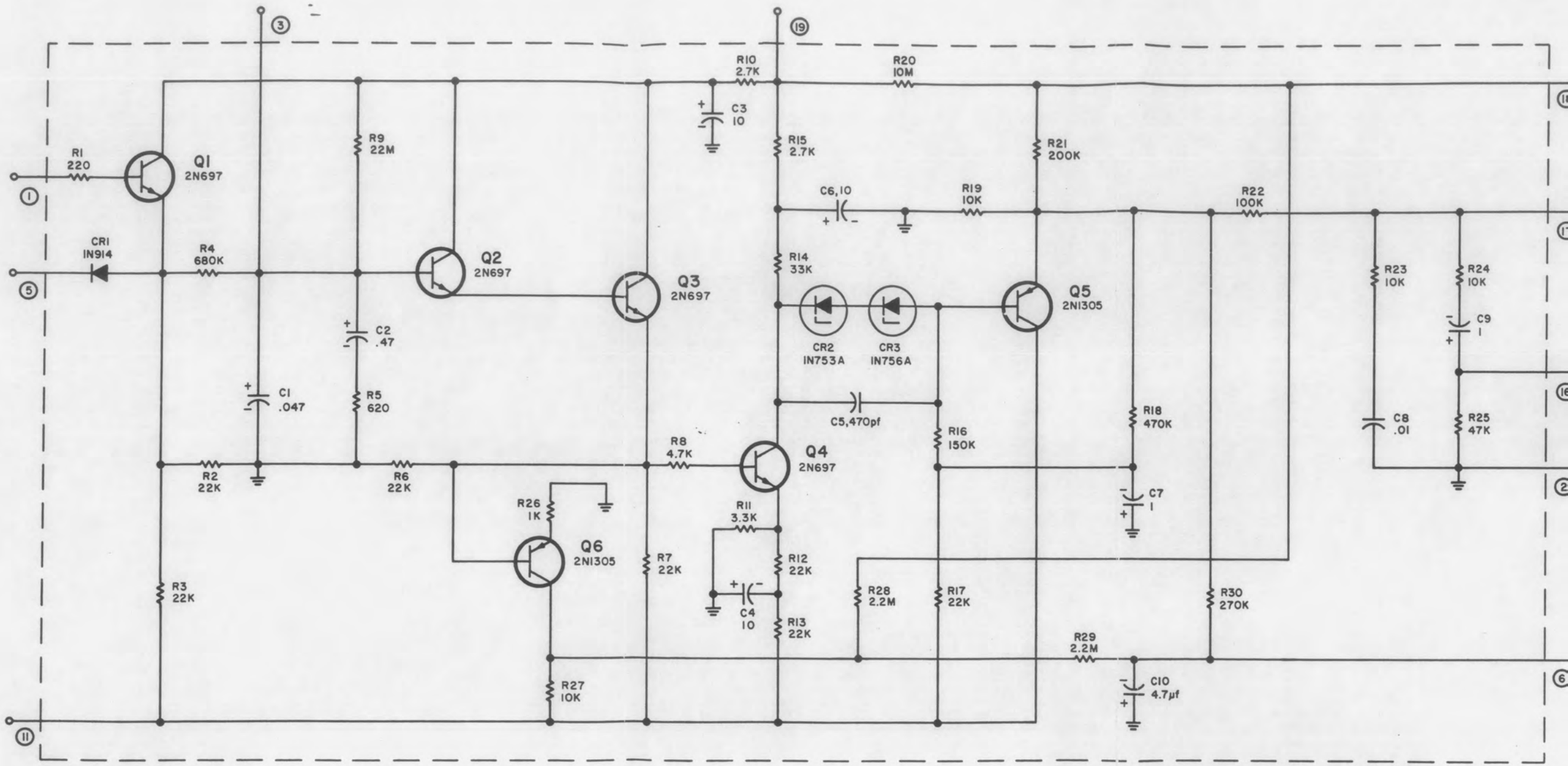


NOTES:

UNLESS OTHERWISE SPECIFIED:

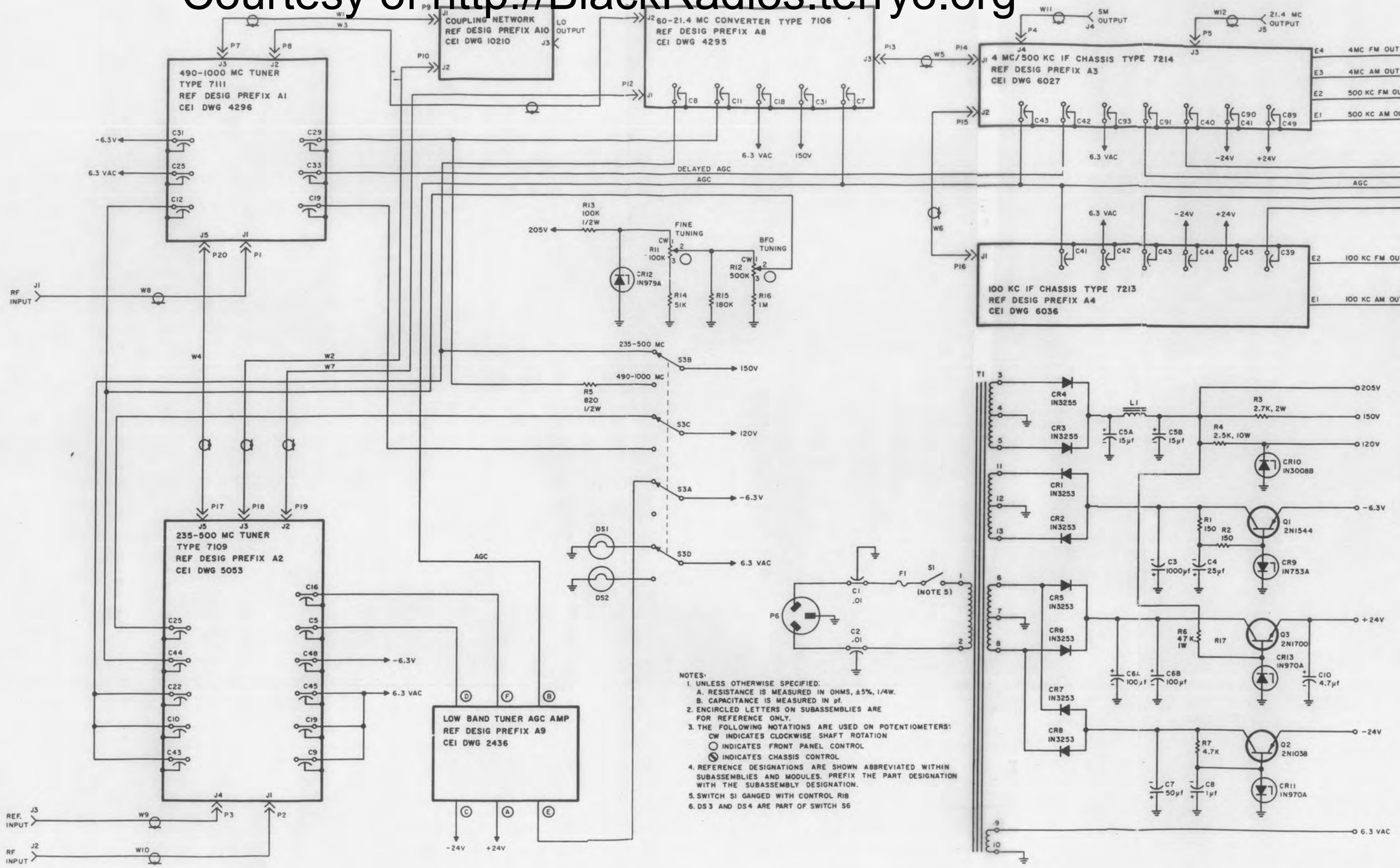
1. RESISTORS ARE MEASURED IN OHMS, ±5%, 1/2W
2. CAPACITORS ARE MEASURED IN μμf.

Figure 6-12. COR Amplifier Type 7500, Schematic Diagra



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, 1 5%, 1/4 W.
   B. CAPACITANCE IS MEASURED IN µf.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. SUPERSEDES TYPE 7800 (SEE SCHEMATIC 3466)

Figure 6-14. AGC Amplifier Type 7811, Schematic Diagra



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   B. CAPACITANCE IS MEASURED IN pf.
2. ENCIRCLED LETTERS ON SUBASSEMBLIES ARE FOR REFERENCE ONLY.
3. THE FOLLOWING NOTATIONS ARE USED ON POTENTIOMETERS:
   CW INDICATES CLOCKWISE SHAFT ROTATION
   ○ INDICATES FRONT PANEL CONTROL
   ⊘ INDICATES CHASSIS CONTROL
4. REFERENCE DESIGNATIONS ARE SHOWN ABBREVIATED WITHIN SUBASSEMBLIES AND MODULES. PREFIX THE PART DESIGNATION WITH THE SUBASSEMBLY DESIGNATION.
5. SWITCH S1 GANGED WITH CONTROL R18
6. DS3 AND DS4 ARE PART OF SWITCH S6

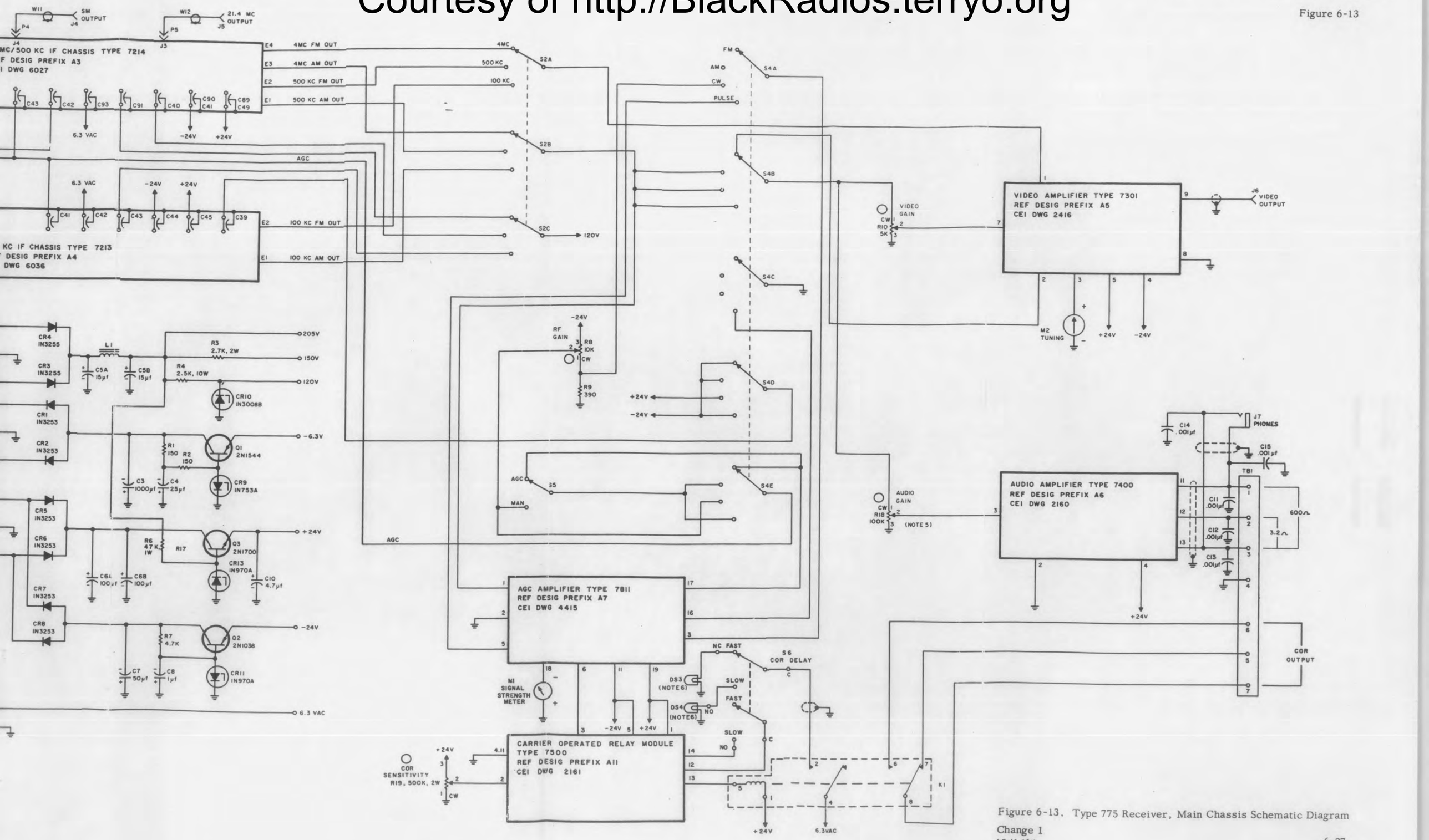


Figure 6-13. Type 775 Receiver, Main Chassis Schematic Diagram