INSTRUCTION MANUAL
FOR
TYPES 701A AND 702A
RECEIVERS

COMMUNICATION ELECTRONICS, INC.
6006 EXECUTIVE BOULEVARD
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WARNING

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

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Type of Reception	AM, FM and CW
Frequency Range	235 to 1000 mc in two bands: Band A, 235-500 mc; Band B, 490-1000 mc
Dial Accuracy	±1%
Fine Tuning	Front panel control provided for vernier tuning
Input Impedance	One input for each band at 50 ohms, type N connectors
Noise Figure	Band A, 10 db, maximum; Band B, 12 db, maximum
Image Rejection	Band A, 65 db, minimum; Band B, 75 db, minimum
I.F. Rejection	Band A, 80 db, minimum; Band B, 90 db, minimum
Oscillator Radiation at Antenna Input	Band A, 8μv, maximum; Band B, 75 μv, maximum
Local Oscillator Frequencies	
First Local Oscillator	Incoming signal plus 60 mc
Second Local Oscillator	81.4 mc, crystal controlled
Intermediate Frequencies	60 mc and 21.4 mc
I.F. Bandwidths	
Type 701A Receiver	2 mc and 300 kc, operating simultaneously
Type 702A Receiver	2 mc operating continuously, and either 300 kc or 50 kc, selectable from front panel
Sensitivity	
2-mc Bandwidth	AM: 22μv, modulated 50% at 1 kc rate, produces at least 10 db (s plus n)/n ratio FM: 24μv, modulated at 1 kc rate with 750 kc deviation, produces at least 21 db (s plus n)/n ratio
300-kc Bandwidth	AM: 8μv, modulated 50% at 1 kc rate, produces at least 10 db (s plus n) /n ratio. FM: 8 μv, modulated at 1 kc rate with 100 kc deviation, produces at least 21 db (s plus n)/n ratio.
50-kc Bandwidth (Type 702A only)	AM: 3.5 μv, modulated 50% at 1 kc rate, produces at least 10 db (s plus n)/n ratio. FM: 4 μv, modulated at 1 kc rate with 15 kc deviation, produces at least 21 db (s plus n)/n ratio.
Output Stability	
2-mc Bandwidth	AM: Output varies less than 4 db for an input range of 8 μv to 1 mv FM: Output varies less than 4 db for input levels greater than 8 μv
300-kc Bandwidth	AM: Output varies less than 4 db for an input range of 4 μv to 1 mv FM: Output varies less than 2 db for input levels greater than 3 μv
50-kc Bandwidth (Type 702A only)	AM: Output varies less than 4 db for an input range of 4 μv to 1 mv FM: Output varies less than 2 db for input levels greater than 3 μv
Manual Gain Control Range	Greater than 100 db in AM/MAN and CW modes
Video Output	
2-mc Bandwidth	AM: 0.7 volt, rms, across 93 ohms. Amplifier response, less than 3 db variation from 30 cps to 2 mc. FM: 0.7 volt, rms, across 93 ohms. Amplifier response, less than 3 db variation from dc to 2 mc.
300-kc and 50-kc Bandwidths	5 volts, rms, across 10K ohms. Amplifier response, less than 3 db variation from 50 cps to 500 kc
Audio Output	100 mw into 600 ohms. Amplifier response, 100 cps to 40 kc at 3 db points.
FM Deviation Sensitivity	
2-mc Bandwidth	Less than 175-kc deviation produces 0.1 volt, rms
300-kc Bandwidth	Less than 40-kc deviation produces 5 volts, rms
Beat Frequency Oscillator	Crystal-controlled at 21.4 mc; operates with 300-kc or 50-kc bandwidths in CW mode
Signal Monitor Output	21.4 mc center frequency output signal provided for use with CEI Signal Monitors.

Table 1-1. Types 701A and 702A Receivers, Specifications (continued)

Front Panel Controls	Function: FM, AM/AGC, AM/MAN, CW: IF BANDWIDTH (Type 702A only): 300 KC, 50 KC; VIDEO GAIN: POWER: ON-OFF: AUDIO GAIN; Bandswitch; FINE TUNING; IF GAIN; COR SENSITIVITY; COR DELAY: FAST-SLOW; BFO TUNING
Meters	Tuning and Signal Strength
Carrier Operated Relay	
Sensitivity	Less than 1 μv
Range	Adjustable to operate over an input signal level range of 1 μv to greater than 500 μv
Release Time	Slow: 6 seconds, ±20%; Fast: less than 0.5 second
Output	SPDT contacts
Power Input	115/230 volts, 50-400 cps
Power Consumption	63 watts nominal
Weight	21 lbs
Size	3.5-inches high, 19-inches wide, and 15-inches deep

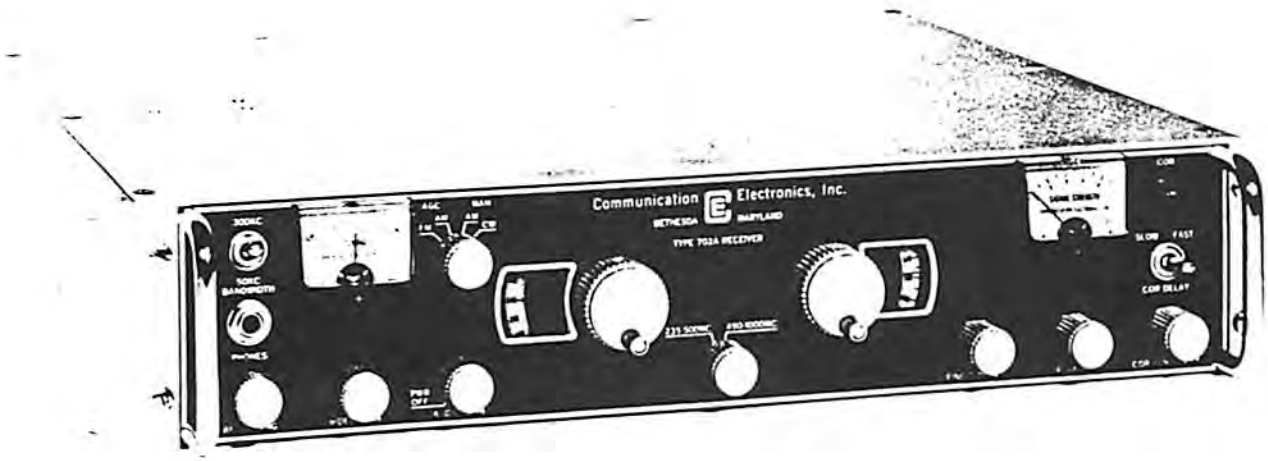


Fig. 1-1. Type 702A Receiver, Front View

Table 1-2. Type 702A Receiver, Tube and Transistor Complement

Ref. Desig.	Type	Function
	Main Chassis	
Q1	2N1544	Voltage Regulator
	235-500 mc Tuner	
A1V1	7077	RF Amplifier
A1V2	7077	RF Amplifier
A1V3	7587	Mixer
A1V4	7486	Local Oscillator
	490-1000 mc Tuner	
A2V1	7486	Local Oscillator
A2V2	6CW4	IF Amplifier
A2V3	6CW4	IF Amplifier
	60-21.4 mc Converter	
A3V1	7587	IF Amplifier
A3V2	7587	IF Amplifier
A3V3	7587	Mixer
A3V4	6CW4	Local Oscillator
	300/50 kc IF Strip	
A4Q1	2N335	Emitter Follower
A4Q2	2N335	Emitter Follower
A4Q3	2N335	DC Amplifier
A4Q4	2N1305	Regulator
A4Q5	2N706	BFO
A4V1	7587	IF Amplifier
A4V2	7587	IF Amplifier
A4V3	7587	IF Amplifier
A4V4	7587	IF Amplifier
A4V5	7587	IF Amplifier
A4V6	7587	Limiter
A4V7	7587	Limiter
	2 mc IF Strip	
A5Q1	2N1305	Regulator
A5Q2	2N335	DC Amplifier
A5Q3	2N335	Emitter Follower
A5Q4	2N697	Emitter Follower
A5Q5	2N697	Emitter Follower
A5Q6	2N335	Emitter Follower
A5Q7	2N335	Emitter Follower
A5V1	7587	IF Amplifier
A5V2	7587	IF Amplifier
A5V3	7587	IF Amplifier
A5V4	7587	Limiter
A5V5	7587	Limiter
	Video Amplifier	
A6Q1	2N335	Emitter Follower
A6Q2	2N335	Emitter Follower
A6Q3	2N335	Voltage Amplifier
A6Q4	2N335	Emitter Follower
	Audio Amplifier	
A7Q1	2N335	Voltage Amplifier
A7Q2	2N335	Driver
A7Q3	2N1700	Power Amplifier
	COR Amplifier	
A8Q1	2N335	DC Amplifier
A8Q2	2N335	DC Amplifier
A8Q3	2N697	Relay Driver
	Power Supply	
A9Q1	2N697	Voltage Regulator
A9Q2	2N1038	Voltage Regulator

SECTION I

GENERAL DESCRIPTION

1.1 GENERAL

The types 701A and 702A Receivers are designed for the reception of AM, FM, and CW signals in the UHF band. These superheterodyne receivers tune the frequency range of 235-1000 mc in two bands: 235-500 mc and 490-1000 mc. The type 702A contains three IF bandwidths: a 2-mc bandwidth which operates continuously, and either a 50 kc or a 300 kc bandwidth IF which is controlled by the front panel IF BANDWIDTH switch. The 701A contains a 2-mc IF and a 300-kc IF. The 50/300 kc IF strip in the type 702A and the 300 kc IF in the type 701A receivers contain a BFO (beat frequency oscillator) which is automatically turned on when the CW reception mode is selected. Six signal outputs are available from the receivers: audio output, COR (carrier operated relay) output, video output, FM video output, AM video output and a signal monitor output. The receivers contain signal strength and tuning meters mounted on the front panel. Pertinent specifications for the receivers are included in Table 1-1; the tube and transistor complement is presented in Table 1-2.

1.2 MECHANICAL CHARACTERISTICS

A front view of the type 702A Receiver is shown in Figure 1-1. The front panel of the type 701A Receiver contains all controls and indicators found on the front panel of the type 702A Receiver except for the IF BANDWIDTH switch. The controls and indicators located on the front panel are: BFO TUNING, VIDEO GAIN, AUDIO GAIN, (also turns power on and off), FINE TUNING, IF GAIN and COR SENSITIVITY controls; COR DELAY, function and band, and IF BANDWIDTH switches; COR lamp; PHONES jack; and TUNING and SIGNAL STRENGTH meters.

1.2.1 The rear apron of the receiver, shown in Figure 1-2, mounts the RF input jacks, J1 for the 235-500 mc input, and J2 for the 490-1000 mc input. These are both type N connectors. The SM OUTPUT J3, VIDEO OUTPUT J4, AM VIDEO OUTPUT J5, and FM VIDEO OUTPUT J6 are type BNC connectors. The rear apron also mounts the terminal strip TB1 for the COR and AUDIO outputs and the two fuseholders F1 and F2. The power cord is permanently connected through the rear apron of the unit.

1.2.2 The main chassis, front panel, and top and bottom dust covers are constructed of aluminum. The grey front panel is overlaid with a black-anodized etched plate. The main chassis contains nine subassemblies. Five of these, the low band tuner, high band tuner, 60-21.4 mc converter, 2-mc IF strip, and the 50/300-kc IF strip are all built on silver-plated, gold-flashed brass chassis. The remaining four subassemblies, the video amplifier, audio amplifier, COR amplifier, and power supply module are constructed on etched printed circuit boards. The receivers are designed for mounting in a standard 19-inch rack. Over-all dimensions are: 19-inch wide, 3.5-inches high and 15-inches deep.

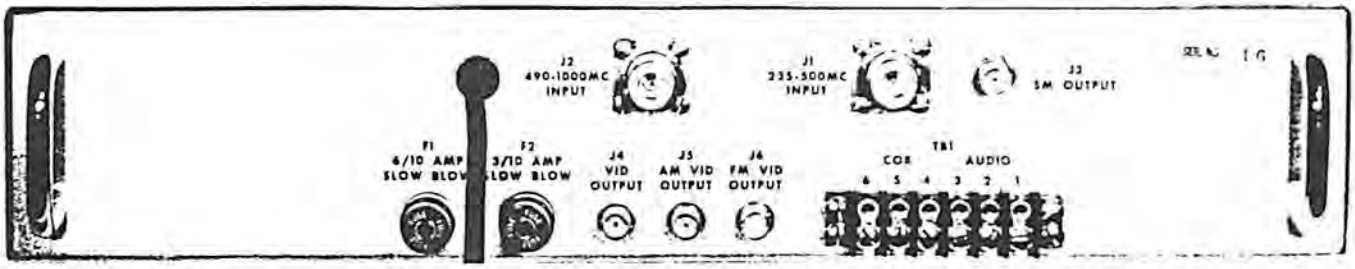


Figure 1-2
Type 702A Receiver, Rear View

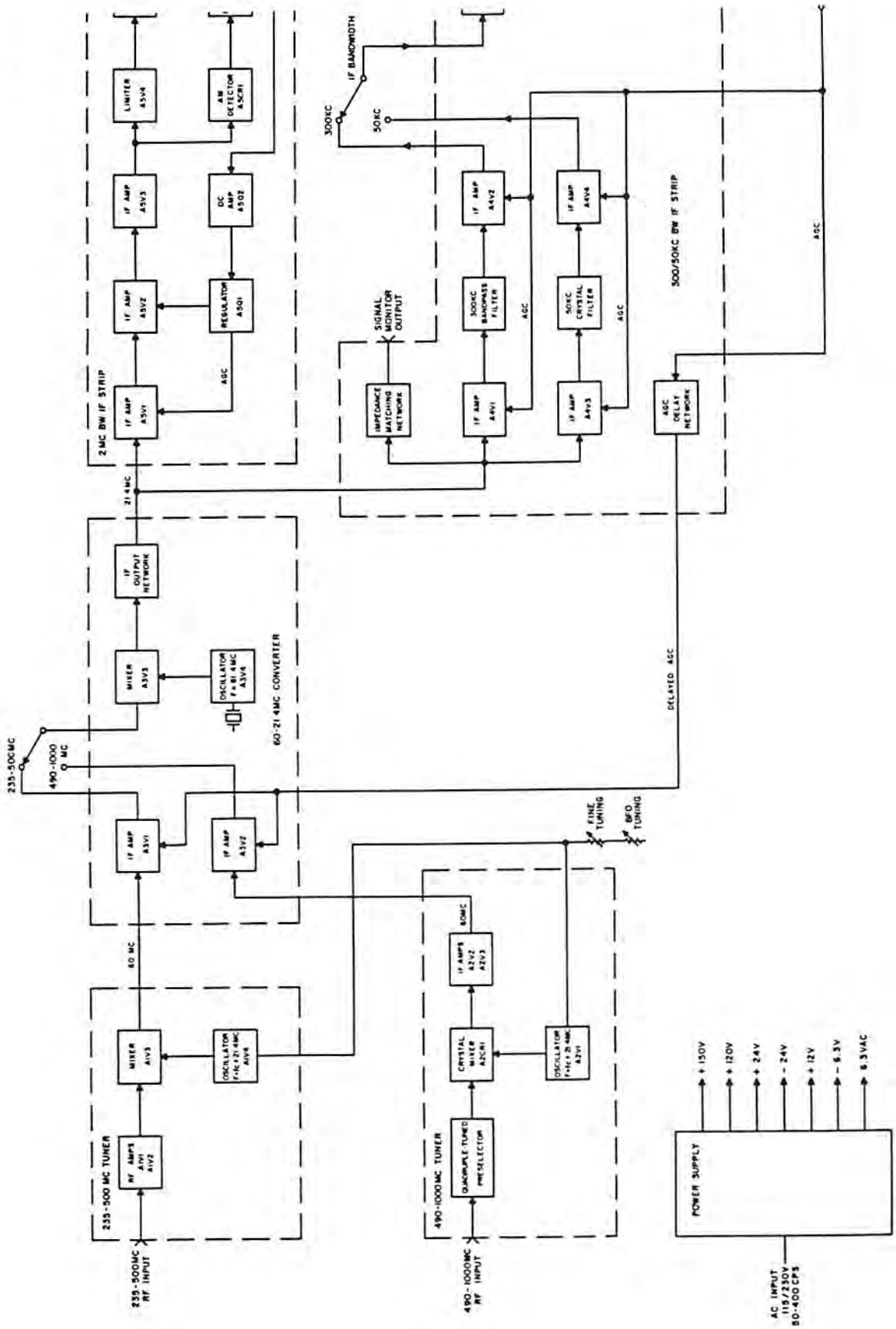
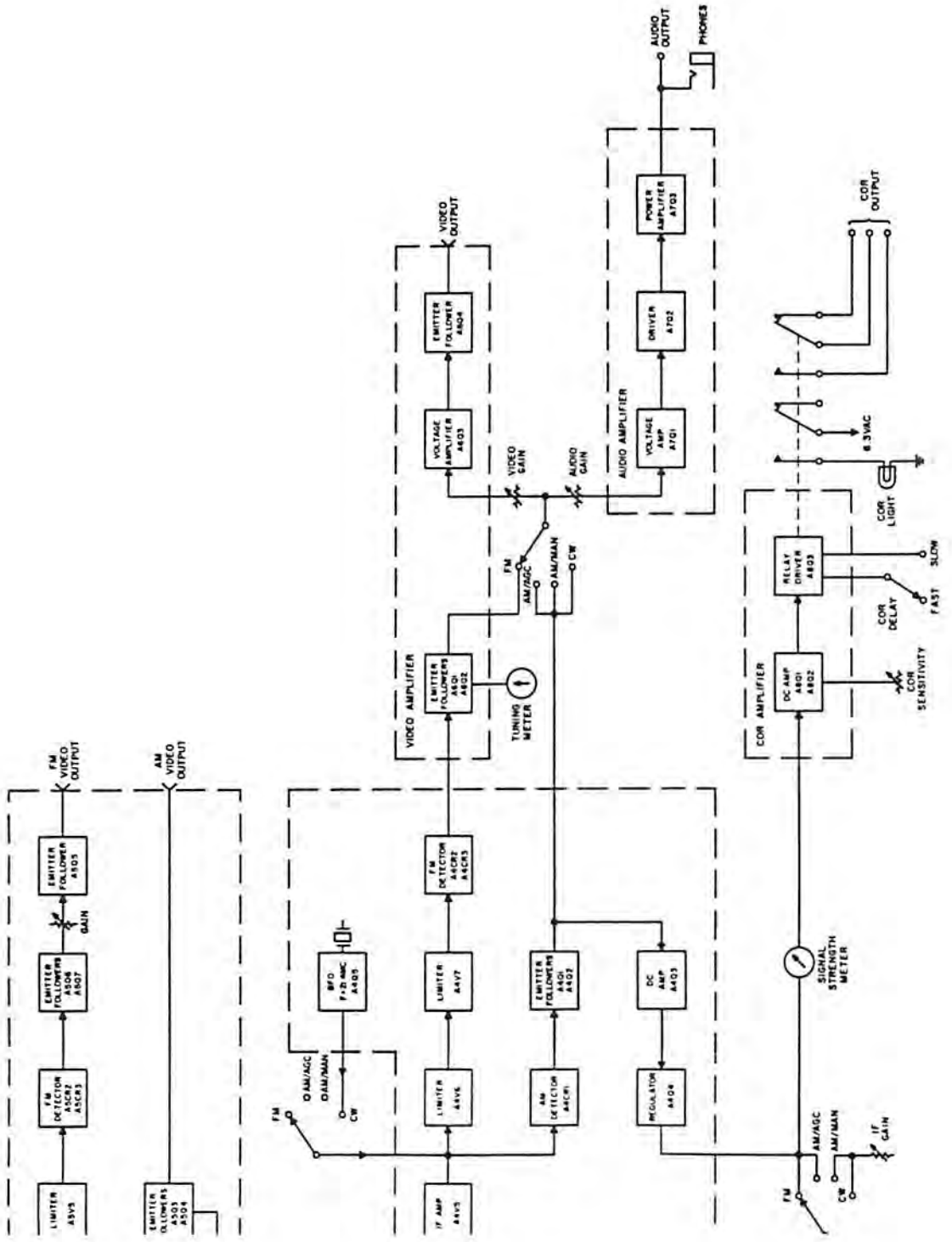


Figure 2-1. Type 702A Receiver, Functional Block Diagram



SECTION II

CIRCUIT DESCRIPTION

2.1 GENERAL

The operation of the various stages in the type 702A receiver is explained in the following paragraphs using the functional block diagram, Figure 2-1, and the schematic diagrams 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 A1C1 and A9CR11). 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 functional block diagram shown in Figure 2-1 is applicable to the type 702A Receiver. This diagram is also applicable to the type 701A Receiver except the A4V3, A4V4 IF stages and the associated 50-kc crystal filter are omitted. The IF bandwidth switch is also omitted in the type 701A Receiver.

2.2.1 An incoming RF signal to the 235-500 mc tuner is amplified in A1V1 and A1V2 before being applied to the mixer, A1V3. The local oscillator, A1V4, operates 60-mc higher in frequency than the incoming RF signal. The 60-mc difference frequency from the mixer is connected to an IF amplifier (A3V1) in the 60-21.4 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, A2CR1. The local oscillator in the high band tuner, A2V1, operates 60-mc higher than the incoming RF signal, and the oscillator output is also applied to the crystal mixer. The 60-mc difference frequency from the mixer is amplified by stages A2V2 and A2V3 and then applied to the 60-21.4 mc converter.

2.2.3 The FINE TUNING and BFO TUNING controls provide vernier tuning and also to change the pitch of the CW-audio signal when the receiver is in the CW mode of operation. These controls function by varying the frequency of the local oscillator in the tuners.

2.2.4 The converter chassis contains a separate 60-mc IF amplifier (A3V1 and A3V2) for the output signal from each tuner. These stages are switched from operating to non-operating conditions by the bandswitch. The crystal-controlled local oscillator in the converter, A3V4, operates at 81.4 mc and this frequency is applied to the mixer stage, A3V3, along with the 60-mc IF signal from the tuner in operation. The 21.4-mc IF output from the mixer is coupled to an output network and then applied simultaneously to the input of the IF strips.

2.2.5 The 2-mc bandwidth IF strip operates continuously and provides simultaneous AM and FM video outputs. Either a 50-kc bandwidth or 300-kc bandwidth IF is also available, depending on the setting of the IF BANDWIDTH switch. The output from either the AM or FM detectors in the 300/50-kc bandwidth IF strip is available at the video output jack, phones jack, and audio terminal strip, depending on the setting of the function switch.

2.2.6 The 21.4-mc IF signal from the converter is applied to IF stages A4V1 and A4V3 and, through an impedance matching network, to the signal monitor output on the rear apron. If the IF BANDWIDTH switch is in the 50 kc position, the signal path through the IF strip is through stages A4V3 and A4V4 and the 50-kc bandwidth crystal filter installed between these two stages. Similarly, in the 300 kc bandwidth, the signal path is through stages A4V1 and A4V2 and the associated bandpass filter. The output of either A4V2 or A4V4 is coupled into a common IF amplifier, A4V5, after which the signal is applied to both an AM detector and two limiter stages. The output from the AM detector is coupled through cascaded emitter followers to the function switch and to the AGC amplifier A4Q3. The output from the limiters (A4V6 and A4V7) is coupled through the FM discriminator to the cascaded emitter followers (A6Q1 and A6Q2) in the video amplifier. When the receiver is in the CW operating mode, a 21.4-mc signal from the crystal-controlled BFO (A4Q5) is injected into the AM detector to produce a CW-audio note.

2.2.7 The 2-mc bandwidth IF strip provides three stages of 21.4-mc IF amplification (A5V1 through A5V3) before coupling to the AM detector (A5CR1) and the limiters. The output of the limiters (A5V4 and A5V5) is applied to the FM discriminator which includes diodes A5CR2 and A5CR3. The FM video signal is coupled through emitter follower stages (A5Q5 through A5Q7) to a jack on the rear apron. The output from the AM detector is coupled through emitter follower stages (A5Q3 and A5Q4) to a jack on the rear apron. Simultaneously, the output from the emitter follower A5Q3 is coupled through two AGC amplifier stages (A5Q1 and A5Q2) to provide automatic gain control to the first two IF amplifiers, A5V1 and A5V2.

2.2.8 The FM output from the 30/300 kc IF strip is coupled to the cascaded emitter followers, A6Q1 and A6Q2, on the video amplifier module. If the function switch is in the FM position, the video signal from transistor A5Q2 is connected through the AUDIO GAIN control to the audio amplifier module and through the VIDEO GAIN control to the video amplifier and emitter follower, A6Q3 and A6Q4 respectively. The output from A6Q4 is applied to the VIDEO OUTPUT jack J4 on the rear panel. The output of the cascaded emitter followers, A6Q1 and A6Q2, is also used to operate the TUNING meter.

2.2.9 If the function switch is in the AM/AGC, AM/MAN, or CW position, the output of the AM detector in the 300/50 kc bandwidth IF strip is applied through the VIDEO and AUDIO GAIN controls.

2.2.10 The audio amplifier receives its input signal from the AM output of the 300/50-kc IF strip or from the cascaded emitter follower stage, A6Q1 and A6Q2, in the video amplifier module depending upon the setting of the function switch. The audio amplifier contains a voltage amplifier stage, A7Q1, a driver, A7Q2, and a power amplifier, A7Q3. 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 gain of the 2-mc bandwidth IF strip is controlled by an AGC voltage derived by circuits within this strip. The AM detector output through emitter follower stages A5Q3 and A5Q4 is applied to a dc amplifier, A5Q2. The output from A5Q2 controls the regulator stage, A5Q1, which in turn controls the gain of the first two IF stages A5V1 and A5V2.

2.2.12 Either manual or automatic gain control may be employed for stages in the receiver other than those in the 2-mc IF strip. If the function switch is in the AM/MAN or CW mode, the gain control voltage is derived from the IF GAIN control. In the FM or AM/AGC mode, the AGC voltage is derived from circuits in the 300/50-kc IF strip. This voltage, whether manual or AGC, is used to control the gain of stages A4V1 through A4V4 in the 300/50-kc IF strip and stages A3V1 and A3V2 in the 60-21.4-mc converter. The gain control voltage to the converter stages is delayed by a network located on the 300/50-kc IF chassis.

2.2.13 The AGC voltage from the 300/50-kc IF strip is derived from a dc voltage present at the AM detector output. This voltage is reflected through emitter follower stages A4Q1 and A4Q2 and applied to a dc amplifier A4Q3. The output of A4Q3 controls conduction through stage A4Q4. The output of A4Q4 is the gain control voltage for the receiver (except the 2-mc IF strip) when the function switch is in the FM or AM/AGC modes. The output of A4Q4 also supplies the current which operates the SIGNAL STRENGTH meter.

2.2.14 The signal voltage which operates the SIGNAL STRENGTH meter also provides the signal input to the COR (carrier operated relay) amplifier. The COR operating point can be adjusted over a wide range of RF signal levels by means of the COR SENSITIVITY control located in the front panel. When an incoming signal of sufficient strength activates the COR, the red lamp on the front panel is illuminated, and a circuit is closed between terminals 4 and 6 of TB1 and opened between terminals 5 and 6. In the unactuated state, terminals 5 and 6 are short-circuited and terminals 4 and 6 are open-circuited. The return of the COR function from an actuated condition to an unactuated condition can be set for a FAST (less than 0.5 second) return or a SLOW (6 second) return by the front panel COR DELAY switch.

2.2.15 The power supply is self-contained and provides all of the necessary operating voltages for the receiver. The nominal primary power input to the unit is 115/230 volts, 50-400 cps; power consumption is approximately 63 watts.

2.3 235-500 MC RF TUNER

The type 7104 tuner contains RF amplifier, mixer, and oscillator stages. A schematic diagram of the tuner is shown in Figure 6-1; reference designation prefix A1 is used.

2.3.1 RF Amplifier. - The RF amplifier consists of two type 7077 ceramic triodes, V1 and V2, both in grounded-grid configuration. The nominal input impedance at jack J1 is 50 ohms. The input circuit is designed to match 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 accomplished by inductors L3A, L3B, L3C, and L3D, and L3E, five sections of a six-section inductuner.

2.3.2 Local Oscillator. - The local oscillator, V4, is a type 7486 ceramic triode operated in a Colpitts configuration. The tank circuit is tuned by inductor L3F, a section of the inductuner. The operating frequency is maintained 60-mc above the carrier. Increased frequency stabilization is obtained by the use of a regulated -6.3 volt filament supply. The oscillator 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, R16, and the BFO TUNING potentiometer R10.

2.3.3 Mixer. - The mixer, V3, is a type 7587 Nuvistor tetrode which has 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 A3L1 in the converter. Capacitor A3C1 establishes the degree of coupling between L14 and A3L1.

2.4 490-1000 MC RF TUNER

The type 7105 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.

2.4.2 Local Oscillator. - The local oscillator, V1, is a type 7486 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 volt 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.

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

2.4.4 60-mc IF Amplifier. - To compensate for the lack of gain in the quadruple-tuned preselector, the 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 A3L2 located in the 60-21.4 mc converter. Capacitor A3C2 fixes the degree of coupling between L17 and A3L2.

2.5 60-21.4-MC CONVERTER

The type 7106 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, A3 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 the 60-mc incoming IF signal to produce a 21.4-mc second IF. The output from the plate of the mixer is taken through 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 6-10). The bandswitch, S3, is divided into five sections. S3A applies the -6.3 volt cathode-return source to the low band RF amplifiers during low band tuner operation. At the same time, S3C applies 120 volts regulated to the selected tuner, and S3B applies 150 volts to the selected tuner, switch section S3D applies 150 volts to the 60-mc IF amplifier common to the output of the tuner in operation. Switch section S3E controls the operation of the lamps mounted behind the tuning dials.

2.7 300/50 KC IF STRIP

The operation of the 300/50 kc IF strip is explained in the following paragraphs using the schematic diagram shown in Figure 6-4. Note that the reference designation prefix is A4. The operation of the 50-kc IF bandwidth is not applicable to the 701A receiver since this receiver does not contain a 50-kc IF bandwidth. For replacement purposes, the 300/50 kc bandwidth IF strip in the 702A Receiver is identified as a type 7205 while the 300-kc bandwidth IF strip in a 701A Receiver is a type 7207.

2.7.1 Input Stages. - The input through J1 is in parallel with the input to the 2 mc IF strip. The input signal is coupled to the primary of T1 with an SM OUTPUT, J2, obtained from this point across R1, R2, and R3. The output from the secondary of T1 is coupled to the input of the first 300-kc IF amplifier (V1) and the first 50-kc IF amplifier (V3). The IF strip contains two paths through which the signal may be conducted to subsequent circuits. The signal path is determined by the position of the IF BANDWIDTH switch on the front panel which connects supply voltages to the tubes in the circuit selected. The 300 KC bandpass filter is formed by the circuitry between V1 and V2. The output of V1 is double tuned to obtain a 300-kc bandpass which is then amplified by V2 and coupled to V3. The output of V2 is also double-tuned to pass the 300-kc IF signal. The remaining signal path is through V3 and V4 which contains a 50-kc crystal bandpass filter. The input and output of the bandpass filter contains tuning coils, L5 and L6 respectively, to eliminate reactances associated with the crystal filter. The amplified output from V4 is coupled through the double-tuned circuit at the output of V2 to the common IF amplifier V5. Gain control for V1 and V3 is coupled through C81 and through C84 for V2 and V4.

2.7.2 Third IF Amplifier. - The third IF amplifier, V5, is common to the output of stages V2 and V4. The output of the respective bandpass IF amplifiers is coupled to the grid of V5 through capacitor C14. The third IF amplifier contains a slight amount of degeneration which is developed across R17 to increase the stability of this circuit. The output of V5 is double tuned by L7 and L8 with coupling to the AM detector and the FM limiters provided through C34.

2.7.3 AM Detector. - Diode CR1 is the AM detector. The resistor at the output, R43, functions both as the detector load resistor and part of the base biasing network for Q1. The AM detector output is coupled through the cascaded emitter followers, Q1 and Q2, to the AM output, to the AGC amplifier circuit, Q3 and Q4, and to the SIGNAL STRENGTH meter through diodes CR7 and CR8, when using manual gain control.

2.7.4 Limiters/Discriminator. - The 21.4-mc IF signal is coupled to the grid of the first limiter, V6, through coupling capacitor C34. Both limiter stages employ type 7587 Nuvistor tetrodes, the output of which are single tuned by L9 and L10 respectively. The test point, TP1, located in the grid circuit of V7, can be used to observe the response of strip up to that point. Resistor R26 provides isolation for the signal at TP1. The output of the second limiter, V7, is coupled to the FM discriminator through capacitor C45 and the transformer action which exists between L10 and L11. The Foster-Seeley type discriminator uses capacitance center-tapping of the secondary to provide a high degree of balance unaffected by coil characteristics or tuning slug positions. Detection within the discriminator is performed by CR2 and CR3. The FM output is coupled across a series self-resonant choke L12, which attenuates any 21.4-mc IF signal in the output.

2.7.5 Beat Frequency Oscillator. - In the CW mode of operation, a 21.4-mc signal is injected into the AM detector through capacitor C63 and C34. This 21.4-mc signal heterodynes with the IF frequency to produce an audible note. The BFO circuit is placed in operation by application of plus 24 volts from switch section S4C on the main chassis through C89. The plus 24 volts places diode CR10 in the forward direction thereby coupling the dc voltage to the collector of transistor Q5. The BFO is a self-regulating Colpitts oscillator; regulation is provided by rectification of the 21.4-mc signal at the base-emitter junction of Q5. The output signal is derived from the feedback divider consisting of capacitors C54 and C56. In this mode of operation, diode CR11 is back-biased and has little effect in

the circuit; however, when the function switch is moved to any position other than for CW operation, -24 volts is applied to CR11 biasing this diode in the forward direction and back-biasing CR10. When CR11 is the forward direction, a short circuit is effectively placed across crystal Y1. If this action was not taken, crystal Y1 would be coupled to the IF strip through capacitors C54 and C63 which could cause undesirable effects in the IF response curve. Back-biasing CR10 protects transistor Q5.

2.7.6 Automatic Gain Control. - The AGC amplifier circuit consists of a dc amplifier stage, Q3, and a regulator stage, Q4. The AM detector output is coupled through the cascaded emitter followers, Q1 and Q2. The output of Q2 is coupled to the dc amplifier, to the AM output through the series self-resonant coil, L19, and to the SIGNAL STRENGTH meter when using manual gain control. Diodes CR7 and CR8 are voltage drop compensating diodes for Q1 and Q2 thereby providing better linearity for the SIGNAL STRENGTH meter. If the function switch is in the FM or AM/AGC position, resistors R45 and R46, in conjunction with capacitors C65 and C66 form a modulation filter which removes the modulation and allows subsequent circuitry to operate from the dc voltage present at the detector output. This dc voltage is proportional to the carrier level. The dc input to Q3 is amplified and applied to the base of Q4. The conduction of Q4 is controlled by Q3. As Q3 conducts heavier, its collector voltage drops thereby permitting greater conduction of Q4. The output of Q4 provides the signal voltage for the SIGNAL STRENGTH meter and the AGC output. Another modulation filter (R53, R54, C69, and C70) is connected in the collector circuit of Q4. The SIGNAL STRENGTH meter output from Q4 must first overcome the breakdown voltage of CR9. Until this occurs, the SIGNAL STRENGTH meter signal is obtained from the output of Q2, across R58.

2.8 2-MC BANDWIDTH IF STRIP

The type 7206 2-mc bandwidth IF strip consists of three 21.4-mc IF stages, two limiter stages, an AM detector, an FM demodulator, AGC amplifier circuit, and emitter follower stages for the AM and FM video outputs. This IF strip remains on at all times when power is applied to the receiver. The schematic diagram is shown in Figure 6-5; the reference designation prefix is A5.

2.8.1 21.4-mc IF Amplifiers. - The output of the 60-21.4-mc converter is coupled across the coupling transformer, T1, into the grid of V1. The three IF amplifiers (V1, V2, and V3) are designed to restrict the input signal to a 2-mc bandwidth around a center frequency of 21.4 mc. The output of each amplifier is double-tuned to provide an overcoupled response curve which is filled in by the response curve of the 60-21.4-mc converter. Neutralization is provided by a network in the screen grid circuit of each stage. Degeneration is prevented by the by-pass capacitor across each cathode biasing resistor. The gain of the first two stages is controlled by the gain control voltage from the output of Q1.

2.8.2 AM Detector. - The 21.4-mc IF signal from the plate circuit of V3 is applied to the AM detector diode CR1. The output of the AM detector is applied to the base of Q3. The output of Q3, an emitter follower, is coupled to the base of Q4, another emitter follower, through coupling capacitor C44. The AM video output is taken off the emitter of Q4 through E2 to the AM VIDEO OUTPUT jack, J5, on the rear apron.

2.8.3 Limiters/Demodulator. - The amplified 21.4-mc IF signal from V3 is coupled to the grid circuit of V4 through capacitor C22. The interstage coupling between the limiters is single tuned by L9. Test point, TP1, through isolation resistor R20 provides a point at which the response of the preceding stages can be observed on an oscilloscope. The output of the second limiter is coupled into the discriminator through C31 and the transformer action which exists across L10, L11, and L12. Capacitors C32 and C33, across L12, act as a center top which provides a high degree of balance unaffected by coil characteristics or tuning slug positions. The FM video output from the discriminator is coupled through the cascaded emitter followers Q7 and Q6 to the gain potentiometer R53. This potentiometer is a screwdriver adjustment internal to the receiver. The signal voltage tapped off R53 is reflected through the emitter follower, Q5, to the FM VIDEO OUTPUT jack J6 through feedthrough E1.

2.8.4 AGC Amplifier. - The input to the AGC amplifier, Q2, is derived from the emitter of Q3. The base circuit of Q2 contains a modulation filter, consisting of R40, R38, C39 and C40 which removes the modulation component and allows subsequent circuitry to operate from the average carrier level since the dc component at the detector output is referenced to average carrier level. The output of Q2 is direct-coupled to the input of Q1. A second modulation filter (R32, R30, C37, and C36) is included in the collector circuit of Q1. The output of Q1 is used to control the gain of IF stages V1 and V2.

2.9 VIDEO AMPLIFIER

The type 7300 video amplifier is constructed on a plug-in printed circuit board. The schematic diagram is presented in Figure 6-6; the reference designation prefix is A6.

2.9.1 The FM video signal from A4E2 is connected through module pin 10 to the base of transistor Q1. Transistors Q1 and Q2, type 2N335, are connected in a cascaded emitter follower configuration. From the emitter of Q2, the signal is applied through module pin 11 and function switch S4D to the AUDIO and VIDEO GAIN controls, R9 and R15 respectively. The TUNING meter signal is also obtained from the emitter Q2 through resistor R3 and module pin number 12.

2.9.2 The video signal from the arm of potentiometer R15 is coupled through module pin number 3, capacitor C1, and resistor R6 to the base of common emitter amplifier Q3, a type 2N335 transistor. Capacitor C2 shunts resistor R6 to provide high frequency compensation. The amplifier stage is direct-coupled to an emitter follower, Q4, which provides a low impedance output. The video signal is coupled from the emitter of Q4 by capacitor C4 and appears at the VIDEO OUTPUT jack J4 on the rear apron.

2.10 AUDIO AMPLIFIER

The type 7400 audio amplifier contains amplifier driver, and power amplifier stages. The schematic diagram is presented in Figure 6-7; the reference designation prefix is A7.

2.10.1 The audio amplifier 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, R9, is applied to this stage through module pin 3, capacitor C1, and resistor R1. The second stage (Q2) is a driver which matches the high output impedance of Q1 to the low input impedance of Q3, 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 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 collector load for Q3.

2.11 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 diagram, Figure 6-10. The gain control voltage to A3V1 and A3V2 is delayed by a network, which includes zener diode A4CR4, located on the 300/50 kc IF chassis. The gain for the first and second IF amplifiers, A5V1 and A5V2, in the 2 mc IF strip, is provided by circuitry contained within that strip.

2.11.1 CW or AM/MAN Reception. - With the function switch in the CW or the AM/MAN position, the gain of the converter and IF amplifiers in the 300/50 kc IF strip is controlled by the IF GAIN potentiometer, R12.

2.11.2 FM or AM/AGC Reception. - During reception in the FM or AM/AGC modes, the AGC amplifier internal to the 300/50 kc IF strip provides the gain control voltage supplied to the converter and the IF amplifiers in the 300/50 kc bandwidth IF strip.

2.12 CARRIER OPERATED RELAY (COR)

The COR circuitry consists of a plug-in COR amplifier and a relay mounted on the main chassis. Refer to the schematic diagrams, Figures 6-8 and 6-10. The COR amplifier is a type 7500; the reference designation prefix is A8.

2.12.1 The first two stages in the COR module, 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 stripor from the cascaded emitter followers, A4Q1 and A4Q2, depending upon the type of gain control used. The current produced by this voltage operates the SIGNAL STRENGTH meter and returns to ground through the input to the module. This current turns off Q1 and Q2 which turns on Q3 and actuates the relay.

2.12.2 The COR SENSITIVITY control, R14, sets the level of input current which flows in the absence of a carrier. Thus, adjusting R14 determines the level of negative control current (and hence the carrier level) required to turn off Q1.

2.12.3 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 position, capacitor C3 is connected between the collector of Q3 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 off Q3. 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.

2.13 POWER SUPPLY

Most of the power supply components are mounted on a type 7602 plug-in module. A schematic diagram of this module is shown in Figure 6-9. The remaining power supply components are mounted on the main chassis; the main chassis schematic diagram is shown in Figure 6-10.

2.13.1 (See Figure 6-10) The input voltage is applied to the primary of T1 through switches S1 and S2 and fuse F1 for a 115 volt source. When using a 230 volt source, switch S2 also places F2 in series with the input. The secondary contains four windings, which function as follows: the 5-6-7 winding drives a full wave rectifier which ultimately furnishes plus 120 volts regulated, plus 150 volts unregulated, and plus 56 volts regulated; the 8-9-10 winding drives two full wave rectifiers which ultimately furnish plus 24 volts regulated and minus 24 volts regulated; and the 13-14-15 winding drives two full wave rectifiers which ultimately supplies plus 12 volts unregulated and minus 6.3 volts regulated.

2.13.2 (See Figure 6-9) Rectifiers A9CR1 and A9CR2 provide full wave rectification for the plus 12 volts unregulated output, which is filtered by C3. Rectifiers A9CR3 and A9CR4 provide full wave rectification for the minus 6.3 volts regulated output. Regulation is provided by Q1, CR2, and associated components on the main chassis. Rectifiers A9CR5 and A9CR6 provide full wave rectification for the plus 120 volt output which is regulated by CR1. Rectifiers A9CR7 and A9CR8 provide full wave rectification for the regulated plus 24 volt output. Transistor Q1, diode CR12, and associated components provide regulation for this output. Rectifiers CR9 and CR10 provide full wave rectification for the minus 24 volts regulated output; regulation is provided by Q2 and CR12. The 11-12 winding of the secondary transformer provides the 6.3 volts for the various dial and indicator lights and for the operation of tube filaments.

SECTION III

INSTALLATION AND OPERATION

3.1 INSTALLATION

The types 701A and 702A Receivers are designed for installation in a standard 19-inch rack. They require 3.5-inches of vertical space and will project 14.5-inches back into the rack. Adequate ventilation should be provided for proper operation and to prevent unnecessary aging of components.

3.1.1 Power Connection. - Plug the power cord into a 115/230 volt, 50-400 cycle source. The third pin of the power cord is used for receiver ground. If a three pin receptacle is not available, use the adapter provided. Before energizing the receiver, insure that the 230/115 volt switch (S2) is in the correct position.

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, J3, using a 50-ohm coaxial cable.

3.1.4 Video Output. - The video output signal from the 300/50 kc bandwidth IF strip is available at the VIDEO OUTPUT jack, J4, on the rear apron.

3.1.5 AM and FM Video Outputs. - Connect the AM VIDEO OUTPUT J5 and the FM VIDEO OUTPUT J6 as required. These are the simultaneous outputs from the 2-mc bandwidth IF strip.

3.1.6 COR Output. - Connect the device to be COR controlled to terminals 4, 5, and 6 of terminal strip TB1 on the rear apron. With the COR unactuated, terminals 5 and 6 are short-circuited and terminals 4 and 6 are open-circuited. The reverse is true when the COR operates.

3.2 OPERATION

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

3.2.1 Tuning Controls. - Set the band switch 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 frequency 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 (used on 702A receivers only) sets the bandwidth of the IF strip at either 50 kc or 300 kc. This switch does not affect the operation of the 2-mc bandwidth IF strip.

3.2.3 Function Switch. - Set the function switch to either FM, AM/AGC, AM/MAN or CW as desired before the receiver is tuned. For FM or AM/AGC reception, the gain of the receivers is controlled by internal circuitry. For AM/MAN and CW reception, the gain of the various circuits are controlled by the IF GAIN potentiometer.

3.2.4 Video Gain Control. - Adjust the VIDEO GAIN control for the desired amplitude of the video output signal present at jack J4.

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

3.2.6 Fine Tuning Control. - Set the FINE TUNING control at mid-range when tuning with one of the main tuning controls. 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.

3.2.7 Audio Gain Control. - Adjust the AUDIO GAIN control for the desired audio level from the rear terminal strip or from the front panel PHONES jack.

3.2.8 IF Gain. - When the receiver function switch is in the CW or the AM/MAN position, the gain of the receiver must be adjusted with the IF GAIN control. Clockwise rotation of the IF GAIN control increases the gain of the receiver.

3.2.9 Phones Jack. - The PHONES jack is provided for headset monitoring. The AUDIO GAIN control varies the signal amplitude at this point.

3.2.10 COR Sensitivity Control. - The front panel COR SENSITIVITY control is used to obtain COR operation at the desired signal input level. Clockwise rotation of the control increases the sensitivity.

3.2.11 COR Delay Switch. - The COR DELAY toggle switch serves to control the length of time the COR function remains operated after the activating signal disappears. In the FAST mode, the COR function remains on for about 0.5 second; in SLOW the delay is about 6 seconds. The COR lamp, when illuminated, indicates a carrier being received.

3.2.12 Power Switch and Fuse. - The ac power switch is ganged with the AUDIO GAIN control. When this control is turned clockwise from its maximum counter-clockwise position, the ac input is applied to the receiver. The input power may be either 115 volts or 230 volts. When 115 volts is used the slide switch S2 must be in the 115 volt position. When using 320 volts, switch S2 must be placed in the 230 volt position. The fuse holder, F1, on the rear apron contains a 6/10 ampere slow-blow fuse which fuses the primary winding of the transformer for a 115 volt input. Fuse, F2 is placed in series with fuse F1 when a 230 volt input is used.

3.2.13 Tuning Meter. - The TUNING meter indicates the relative position between an incoming signal and the center of the receiver. The meter operates from the discriminator output of the 300/50 kc bandwidth IF strip.

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

SECTION IV

MAINTENANCE

4.1 GENERAL

The types 701A and 702A Receivers have been carefully designed so they 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 5-14 where the component locations are shown; to the schematic diagrams, Figures 6-1 through 6-10; 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 mechanically realign either dial, follow the steps given in paragraphs 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 counter-clockwise 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, COR amplifier, power supply, 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 6-10, 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.

4.4 TROUBLESHOOTING

Most troubles will be caused by failures of the fuse, tubes, diodes, or relays. The proper functioning of all these parts should be assured either by test or by replacement with parts known to be good before any further troubleshooting is carried out. After the above measure has been carried out, initial troubleshooting should be directed toward localizing the problem to a specific portion of the 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 necessary. Allow several minutes for warm-up before beginning the 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) Sweep Generator, Jerrold 900B with D-50 Detector

(4) Signal Generator, Hewlett-Packard 606A

(5) Sweep Generator, Telonic Model SM-2000 with Type L-4 plug-in head (10-35 mc with variable sweep rate)

(6) Signal Generator, Hewlett-Packard 608D

(7) Signal Generator, Hewlett-Packard 612A

(8) Assorted cables, connector, attenuation pads and alignment tools

(9) Step Attenuator, Jerrold AV-50

4.6 300/50 KC IF ALIGNMENT

The 300/50 kc bandwidth 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 switch to AM/MAN position; BANDWIDTH switch to 300 KC.

(2) Disconnect IF strip from RF tuners by removing P8 from A5J1.

(3) Set the oscilloscope horizontal sensitivity to 0.5 volt per centimeter.

(4) Connect VTVM to AGC line at A4C84 and adjust RF GAIN control for an indication of -1.5 volts on the VTVM.

(5) Install the L-4 plug-in head in the sweep generator.

(6) Set sweep generator sweep rate to line frequency.

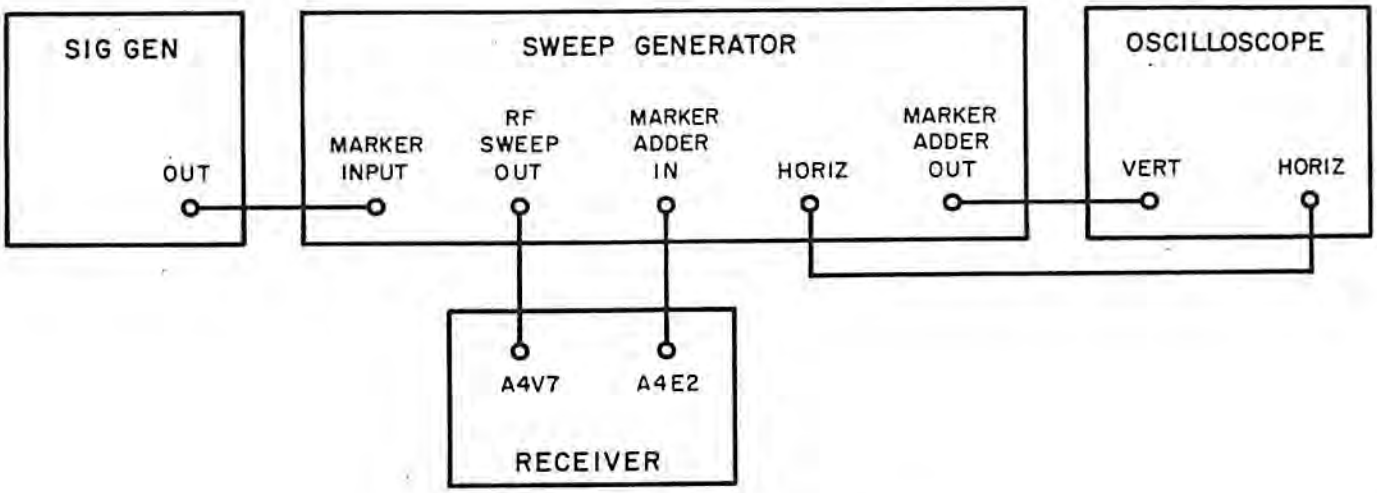


Fig. 4-1. Equipment Setup, IF Alignment

4.6.2 Discriminator Alignment.- Proceed as follows:

(1) Remove tube V6

(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 21.4-mc marker

(6) Adjust L10 for amplitude symmetry of the S-curve and L11 for zero crossing of the S-curve at 21.4 mc. If necessary, adjust the physical position of L11 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 V6

4.6.3 V6 to V7 Interstage Alignment.- Proceed as follows:

(1) Set up the equipment as shown in Figure 4-1, except the sweep output is connected to V6, pin 4 and and the marker adder input to TP1.

(2) Adjust the sweep generator until a response curve is displayed on the oscilloscope screen.

(3) Adjust L9 for a single-peak response centered at 21.4 mc.

4.6.4 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 V5, pin 4 and

the marker adder input to E1.

(2) Adjust L7 and L8 for a single-peak response centered at 21.4 mc.

(3) Move the sweep generator output to V2, pin 4.

(4) Adjust L3 and L4 for a single-peak response centered at 21.4 mc.

4.6.5 Over-all 300-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 J6 on the rear apron of the receiver and the marker adder input to E1.

(2) Adjust L1 and L2 for a single peak response centered at 21.4 mc.

(3) Replace bottom cover.

(4) Readjust L1 and L2 for a symmetrical, single-peak response centered at 21.4 mc, with a 3-db bandwidth of 300 kc. Readjust L3 and L4 if necessary. A typical response curve is shown in Figure 4-3.

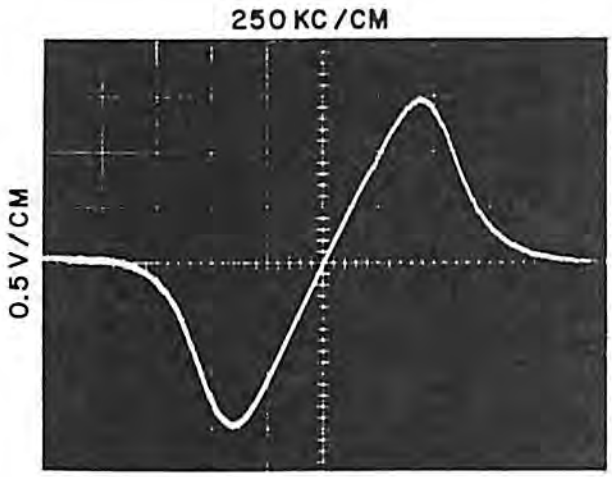


Figure 4-2
Typical Response Curve,
Discriminator Alignment (300 kc)

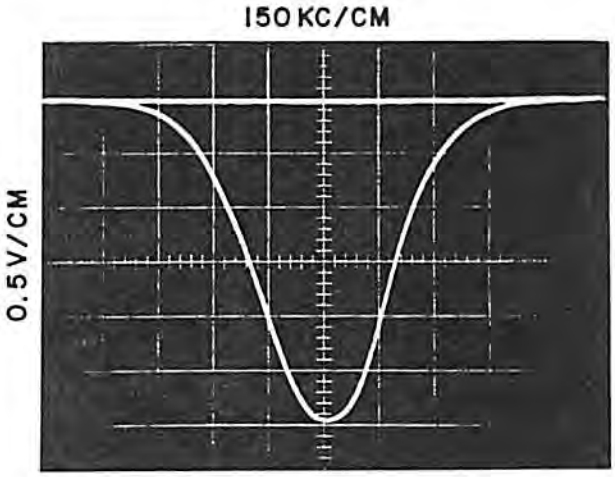


Figure 4-3
Typical Response Curve,
Over-all 300 kc Alignment

4.6.6 Over-all 50-kc Alignment (Type 702A Receiver only). - Proceed as follows:

(1) Leave the equipment setup as in paragraph 4.6.5.

(2) Set the BANDWIDTH switch to the 50 KC position.

(3) Adjust the sweep generator sweep rate to 5 cps; horizontal scope sensitivity to 0.5 volts per cm.

(4) Adjust the sweep setup until a response curve is displayed on the oscilloscope screen.

(5) Adjust L5 and L6 for a symmetrical response. A typical response curve is shown in Figure 4-4.

4.7 2-MC IF ALIGNMENT

The 2-mc bandwidth 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) Disconnect IF strip from RF tuners by removing P8 from A5J1.

(2) Set oscilloscope horizontal sensitivity to 0.5 volt per centimeter.

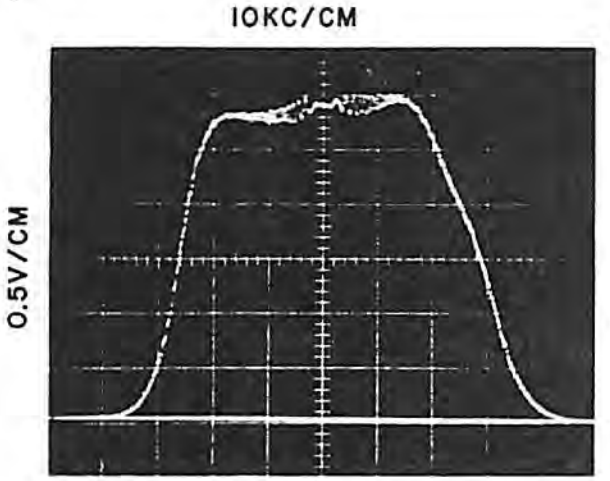


Figure 4-4
Typical Response Curve,
Over-all 50 kc Alignment

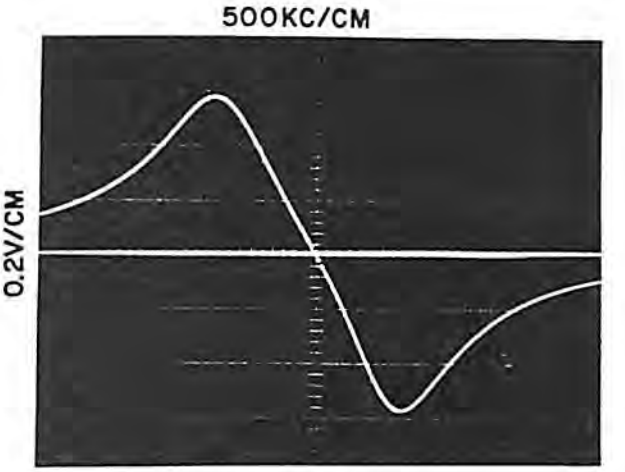


Figure 4-5
Typical Response Curve,
Discriminator Alignment (2 mc)

(3) Connect VTVM and negative voltage source to A5C53 (test bias) and adjust source for an indication of -6.0 volts on the VTVM.

(4) Install the L-4 plug-in head in the sweep generator.

(5) Set sweep generator sweep rate to line frequency.

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 A5V5 pin 4 and the marker adder input to A5E1.

(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 L10 for amplitude symmetry of the S-curve and L12 for zero crossing of the S-curve at 21.4 mc. If necessary, adjust the physical position of L11 (the coupling loop) to give the correct peak-to-peak separation of the S-curve. A typical response is shown in Figure 4-5.

(7) Replace tube V4.

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 L9 for a single peak response centered at 21.4 mc.

4.7.4 V1 to V4 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 the junction of R40, R42 and R63.

(2) Adjust L7 and L8 for overcoupled response centered at 21.4 mc (the frequency differences between the peaks and center frequency should be equal).

(3) Move the sweep generator output to V2, pin 4.

(4) Adjust L5 and L6 for an overcoupled response centered at 21.4 mc (the frequency differences between the peaks and center frequency should be equal).

4.7.5 Over-all 2-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 J6 on the rear apron of the receiver and the marker adder input to the junction of R40, R42 and R63.

(2) Adjust L1 and L2 for an overcoupled response centered at 21.4 mc (the frequency differences between the peaks and center frequency should be equal).

(3) Readjust L1 and L2 for a symmetrical, extremely overcoupled response centered at 21.4 mc.

(4) Readjust L3 and L4 if necessary. A typical response curve is shown in Figure 4-6.

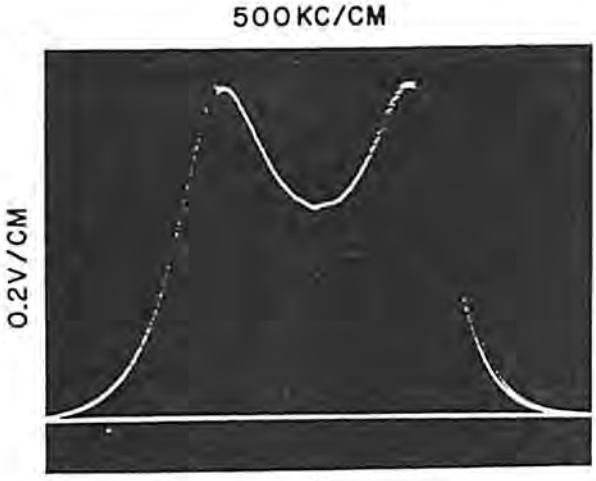


Figure 4-6
Typical Response Curve, Over-all 2 mc Alignment

4.8 60-21.4-MC CONVERTER ALIGNMENT

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

4.8.1 Initial Settings. - Make the following initial settings.

(1) Set the function switch in the AM/MAN position.

(2) Adjust the IF GAIN control fully clockwise.

(3) Set the bandswitch in the 235-500 MC position.

(4) Set the BANDWIDTH switch to the 300-KC position.

(5) Connect VTVM and a negative voltage source to A5C53 (test bias) and adjust the source for an indication of -6.0 volts on the VTVM.

(6) Disconnect P6 from A3J1 and P4 from A3J2.

4.8.2 60.0-mc Alignment. - Proceed as follows:

(1) Set up the equipment as shown in Figure 4-7.

(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, maximum amplitude, centered at 60.0 mc.

(4) Connect the sweep output to A3J2.

(5) Set the bandswitch to the 490-1000 MC position.

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

4.8.3 21.4-mc Mixer Alignment. - Proceed as follows:

(1) Set up the equipment as shown in Figure 4-7, except the sweep output is connected to A3J2, and the input to the D-50 is connected to SM OUTPUT jack J3 at the rear of the receiver (the external detector input not in use during this check).

(2) Set oscilloscope vertical sensitivity to 2 mv/cm.

(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 L6 so that the peaked response is centered at 60.0-mc. A typical response is shown in Figure 4-8. The response curve in Figure 4-9 was obtained at this time by moving the ext. det. connection to the junction of A5R40, A5R42 and A5R63.

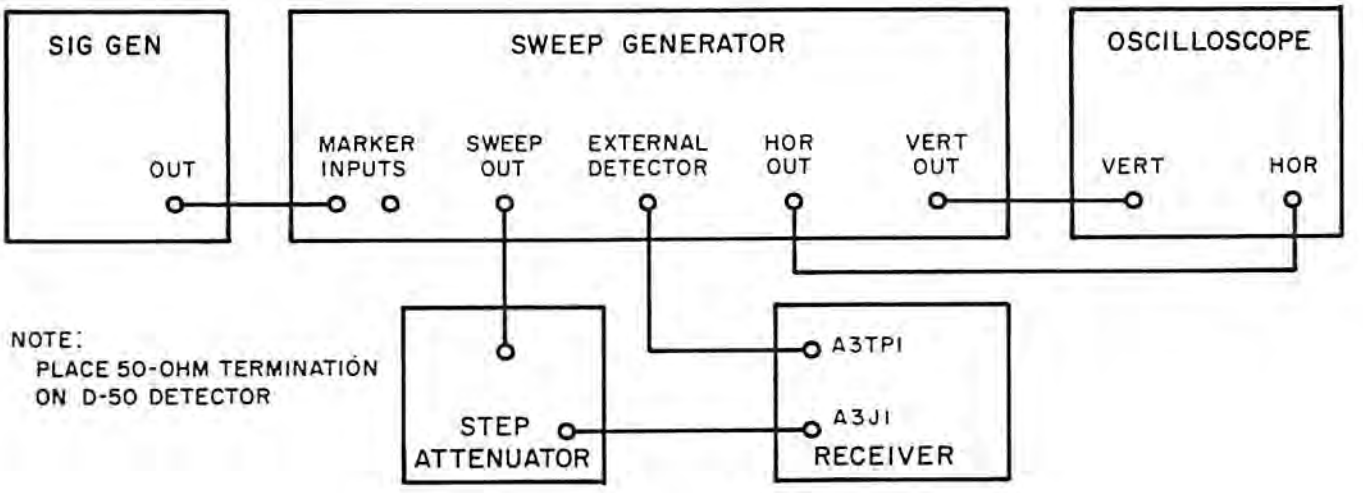


Figure 4-7. Equipment Setup, Converter Alignment

4.8.4 A1V3 to A3V1 Interstage Alignment. - Proceed as follows:

(1) At A3C7, ground the AGC line.

(2) Set the signal generator to exactly 325 mc.

(3) Connect signal generator to the 235-500 MC input jack J1 and tune the receiver to the signal generator using the tuning meter to indicate proper tuning.

(4) Set equipment shown in Figure 4-7 except the sweep output will connect to J1 on the rear apron.

(5) Set oscilloscope vertical sensitivity at 50 millivolts per cm and adjust sweep generator sweep width until a response curve is displayed on the oscilloscope.

(6) Adjust A1L14 and A3L1 for a maximum double-tuned response centered at 60 mc.

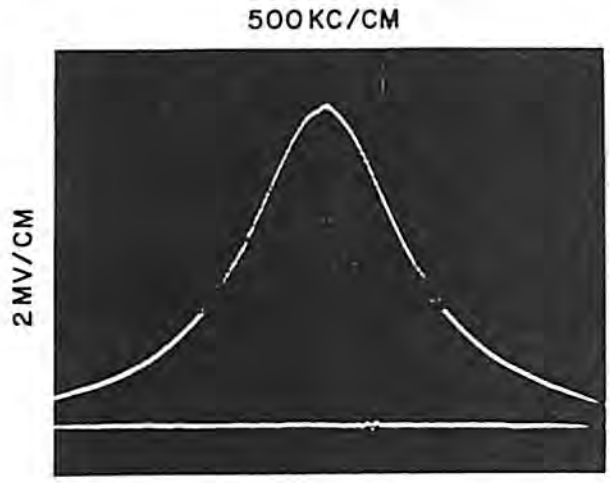


Figure 4-8
Typical Response Curve, 21.4-mc Mixer Alignment

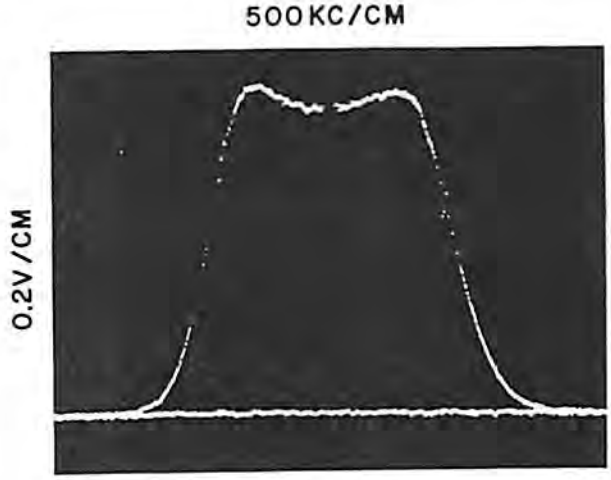


Figure 4-9
Typical Response Curve, Mixer and IF Response

4.8.5 A2V4 to A3V2 Interstage Alignment. - Proceed as follows:

(1) Ground the AGC line at A3C7.

(2) Set the signal generator to 500 mcs.

(3) Set the bandswitch to 490-1000 MC position.

(4) Connect signal generator to the 490-1000 MC input jack J2 and tune the receiver to the signal generator using the tuning meter to indicate proper tuning.

(5) Set up equipment as shown in Figure 4-7 except the sweep output will connect to J2 on the rear apron.

(6) Set the oscilloscope vertical sensitivity to 50 mv/cm and adjust the sweep generator sweep width until a response curve is displayed on the oscilloscope.

(7) Adjust A2L17 and A3L2 for maximum double-tuned response centered at 60-mc. A typical response is shown in Figure 4-10.

4.9 235-500 MC TUNER

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

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

(1) Check the mechanical alignment of the gear train and tuning dial as described in paragraph 4.2.1 prior to the electrical alignment.

(2) Connect the signal generator to the 235-500 MC input jack J1.

(3) Calibrate the signal generator to 250 mc.

(4) Set the bandswitch to 235-500 MC, BANDWIDTH switch to 300-KC, and function switch to AM/AGC.

(5) Tune the receiver to the signal generator using the tuning meter to indicate proper tuning.

(6) The receiver tuning dial should indicate 250 mc ± 1%.

(7) Repeat steps (3) through (6) for 350 mc and 450 mc.

(8) If any of the dial indications exceed the ± 1% tolerance, adjust C39. After any adjustment of C39, repeat steps (3) through (7).

4.9.2 RF Circuit Alignment. - Proceed as follows:

(1) Set the bandswitch in the 235-500 MC position.

(2) Set up equipment as shown in Figure 4-7 except that the sweep output will connect to J1 on the rear apron and the external detector input will be connected to A1TP1.

(3) Set both sweep generator and the tuner at 500 mc.

(4) Set the oscilloscope vertical sensitivity at 50 millivolts per cm and adjust the sweep width until a response curve is displayed on the oscilloscope.

(5) Adjust C6, C13, C17 and C24 for a maximum tuned response centered at 500 mc. A typical response is shown in Figure 4-11. If the alignment is being performed after the replacement of one of these four capacitors, adjust only the one that has been replaced.

(6) Adjust C1 for maximum gain at 500 mc.

(7) Inductor L14 is aligned in conjunction with the converter; see paragraph 4.8.4.

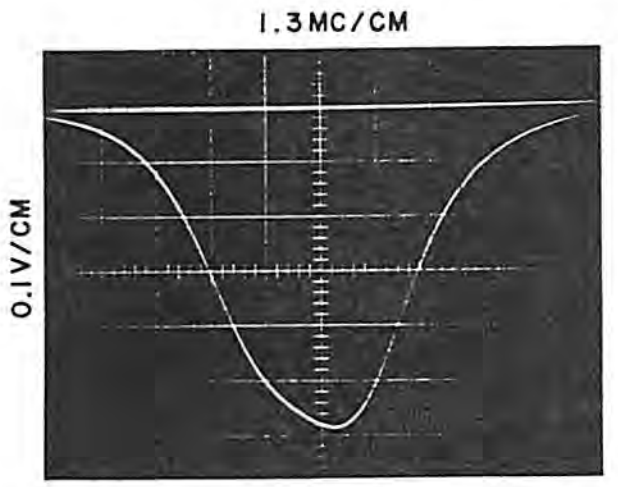


Figure 4-10
Typical Response Curve, Converter Alignment

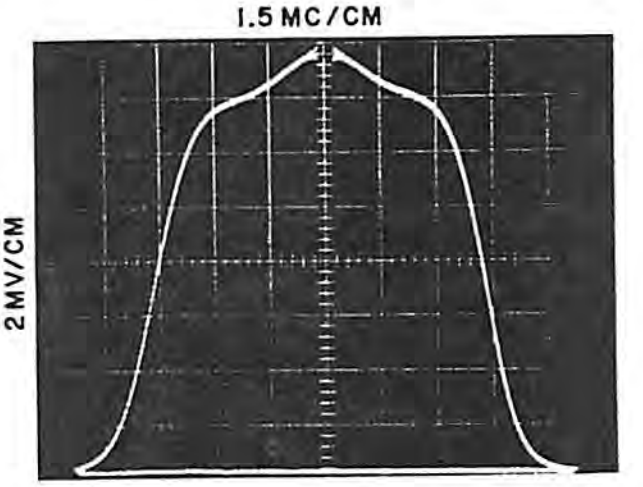


Figure 4-11
Typical Response Curve, RF Response at 500 mc

4.10 490-1000 MC TUNER

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

4.10.1 Local Oscillator Alignment. - Proceed as follows:

(1) Check the mechanical alignment of the gear train and tuning dial as described in paragraph 4.2.2 prior to electrical alignment.

(2) Connect the signal generator to the 490-1000 MC input jack J2.

(3) Calibrate the signal generator to 500 mc.

(4) Set the bandswitch to 490-1000 MC, BANDWIDTH switch to 300 KC, and function switch to AM/AGC.

(5) Tune the receiver to the signal generator frequency using the tuning meter to indicate the proper tuning.

(6) The receiver tuning dial should indicate 500 mc ± 1%.

(7) If this dial indication exceeds the tolerance, adjust C7.

(8) Repeat steps (3) through (5) for 1000 mc.

(9) If the dial reading exceeds the ± 1% tolerance, adjust C6.

4.10.2 Checking High Band Tuner Oscillator Injection Current. - To check the high band local oscillator injection current, connect a milliammeter to the mating plug provided for jack J4 and insert the plug into the jack. This places the meter in series with the crystal mixer dc ground return. The normal current reading is greater than 0.5 ma and less than 2.5 ma.

Table 4-1. Type 702A Receiver, Transistor and Tube Element Voltages

Ref. Desig.	Type	PIN NUMBER OR ELEMENT								
		2 Screen Grid	4 Control Grid (Ring)	8 Cathode (Groove)	10 Heater	12 Heater	Plate (Cap)	Emitter	Base	Collector
Q1	2N1544							-6.0	-6.2	-12.6
A1V1	7077		0	-.73			+150			
A1V2	7077		0	-.95			+150			
A1V3	7587	+13.6	-1.75	0	6.1 vac	0	+150			
A1V4	7486		-2.0*	0			+72			
A2V1	7486		-.32*	0			-.56			
A2V2	6CW4		-.34	0			-.55			
A2V3	6CW4		-.85	-.55			-1.02			
A3V1	7587	+16.5	-.16	0	6.1 vac	0	+150			
A3V2	7587	+25.0	-.40	0	6.1 vac	0	+150			
A3V3	7587	+16.0	-.5	0	6.1 vac	0	+132			
A3V4	6CW4		-3.2*	0	6.1 vac	0	+70			
A4Q1	2N335							-3.3	-2.7	+23.0
A4Q2	2N335							-1.2	-3.3	+23.0
A4Q3	2N335							-4.9	-4.3	-.12
A4Q4	2N1305							0	-.12	-.02
A4Q5	2N706							+21.7	+22.5	+22.5
A4V1	7587	+26	-4.0	+.12	6.0 vac	0	+112			
A4V2	7587	+23	-.35	+.2	6.0 vac	0	+112			
A4V3	7587	+27	-3.1	0	6.0 vac	0	+112			
A4V4	7587	+23	-.4	+.14	6.0 vac	0	+112			
A4V5	7587	+20.5	-.35	+.14	6.0 vac	0	+111			
A4V6	7587	+17.0	-2.0	+.1	6.0 vac	0	+75			
A4V7	7587	+14.0	-12.4	+.1	6.0 vac	0	+22.5			
A5Q1	2N1305							0	-.1	-.1
A5Q2	2N335							-4.8	-4.25	-.1
A5Q3	2N335							-3.7	-3.3	+14.0
A5Q4	2N697							+.4	+1.0	+11.6
A5Q5	2N697							-.06	+.52	+11.6
A5Q6	2N335							+.5	+.8	+14.0
A5Q7	2N335							+.8	+1.4	+11.6
A5V1	7587	+43.5	-4.7	+.44	6.2 vac	0	+110.			
A5V2	7587	+43.0	-.96	+.48	6.2 vac	0	+110.			
A5V3	7587	+28.5	0	+.60	6.2 vac	0	+110.			
A5V4	7587	+22.0	-1.8	0	6.2 vac	0	+107.			
A5V5	7587	+20.0	-5.0	+.14	6.2 vac	0	+21.			
A6Q1	2N335							-.43	+.06	+12.0
A6Q2	2N335							-1.06	-.43	+12.0
A6Q3	2N335							-10.5	-10.0	-1.15
A6Q4	2N335							-1.8	-1.15	+12.0
A7Q1	2N335							+.72	+1.3	+5.0
A7Q2	2N335							+6.5	+5.0	+26.5
A7Q3	2N1700							+.55	+1.0	+26.5
A8Q1	2N335							-.84	-.42	+9.0
A8Q2	2N335							-1.35	-.84	+5.6
A8Q3	2N697							0	+.7	+.15
A9Q1	2N697							+25	+24.0	+29.5
A9Q2	2N1030							-25.5	-24.0	-31.0

Table 4-1. Type 702A Receiver, Transistor and Tube Element Voltages - (Continued)

Test Conditions: All voltages are dc measured with respect to ground unless otherwise indicated. Readings taken with 115 vac, 60 cps primary power and controls as follows: function switch in FM except when measuring voltages at A4Q5 when the CW position is used; COR Delay switch at FAST position; BFO Tuning, Video Gain and Audio Gain control max CW; Line Tuning control at mid-range; IF Gain control max CW; COR Sensitivity control max CW; bandswitch at 235-500 MC position when measuring A1V1 thru A1V4 and A3V1; and at 490-1000 MC position when measuring at A2V1 thru A2V3 and A3V2; IF Bandwidth switch at 300 KC position.

Notes: * indicates 1.5 meg resistor in series with probe.

Table 4-2. Module Pin Voltages

Video Amplifier Module A6

Pin Number	1	2	3	4	5	9	10	11	12
Voltage	0	-23.5	-6.6	0	-11.0	+23	0	-1.0	0

Audio Amplifier Module A7

Pin Number	2	3	4	11	13
Voltage	0	-7.0	+23	0	0

COR Amplifier Module

Pin Number	1	2	3	4	5	11	12	13	14
Voltage	+23	+2.9	-.5	0	-23.5	0	0	13.0	0

Power Supply Module

Pin Number	8	9	10	11	12	13	14	15
Voltage	25ac	25ac	+23	-23.5	0	+165	+56	+180
Pin Number	16	17	18	19	20	21	22	
Voltage	+210	12ac	12ac	190ac	190ac	+14.5	-12.5	

Test Conditions: All voltages are dc with respect to ground unless otherwise stated. Readings taken with 115 vac, 60 cps primary power. Controls as follows: function switch in FM; COR Delay switch at FAST; BFO Tuning, Video Gain, Audio Gain, IF Gain, COR Sensitivity controls at max CW; Fine Tuning at mid-range.

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:

A1R1

Subassembly Designation — Class and No. of item

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 West Greenfield Avenue Milwaukee, Wisconsin
FXR	Amphenol-Borg Electronics 33 East Franklin Street Danbury, Connecticut
Arco	Arco Electronics, Inc. Community Drive Great Neck, New York
CTC	Cambridge Thermionic Corp. 445 Concord Avenue Cambridge, Massachusetts
Cinch	Cinch-Jones Manufacturing Co. 1026 South Homan Avenue Chicago, Illinois
CEI	Communication Electronics, Inc. 4908 Hampden Lane Bethesda 14, Maryland
CD	Continental Devices Corp. 12515 Chadion Avenue Hawthorne, California
CW	Continental Wirt Electronics, Inc. Philadelphia 44 Pennsylvania
IRC	International Resistance Co. 2801 72nd Street North St. Petersburg, Florida
Cornish	Cornish Wire 50 Church Street New York, New York
C-H	Cutler-Hammer, Inc. 321 North 12th Street Milwaukee, Wisconsin
Dale	Dale Electronics, Inc. P.O. Box 488 Columbus, Nebraska
Erie	Erie Technological Products, Inc. 644 West 12th Street Erie, Pennsylvania
Ferroxcube	Ferroxcube Corp. of America Saugerties New York
GE	General Electric Company 777 14th Street N.W. Washington, D.C.
GI	General Instrument 165 Front Street Chicopee, Massachusetts
IEI	International Electronics Industries Nashville Tennessee
Raytheon	Raytheon Co. 55 Chappel Street Newton 58, Massachusetts

Abbreviation	Name and Address
Littelfuse	Littelfuse, Inc. 1865 Miner Street Des Plaines, Illinois
McCoy	McCoy Electronics Co. Mt. Holly Spring Pennsylvania
Motorola	Motorola Semiconductor Products, Inc. 5005 East McDowell Road Phoenix, Arizona
Oak	Oak Manufacturing Co. Crystal Lake Illinois
PSI	Pacific Semiconductors, Inc. 10451 West Jefferson Boulevard Culver City, California
QC	Quality Components, Inc. St. Marys Pennsylvania
RCA	Radio Corp. of America 415 South Fifth Street Harrison, New Jersey
RMC	Radio Materials Corp. 4242 West Bryn Mawr Avenue Chicago 46, Illinois
Roanwell	Roanwell Corp. 180 Varick Street New York 14, New York
Sigma	Sigma Instruments Inc. 70 Pearl Street South Braintree, Massachusetts
Sprague	Sprague Electric Co. 91 Marshall Street North Adams, Massachusetts
Switchcraft	Switchcraft, Inc. 5555 North Elston Avenue Chicago, Illinois
Sylvania	Sylvania Electric Products, Inc. 1740 Broadway New York, New York
Taurus	Taurus Corp. 8 Coryell Street Lambertville, New Jersey
TI	Texas Instruments, Inc. 6000 Lemmon Avenue Dallas, Texas
Wilco	Wilco Corp. 546 Drover Street Indianapolis, Indiana

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 Types 701A and 702A Receivers, Main Chassis

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A1	235-500 MC RF TUNER	7104	CEI
A2	490-1000 MC RF TUNER	7105	CEI
A3	60-21.4 MC CONVERTER	7106	CEI
A4	50/300 KC IF CHASSIS (Type 702A Receiver)	7205	CEI
A4	300 KC IF CHASSIS (Type 701A Receiver)	7207	CEI
A5	2 MC IF CHASSIS	7206	CEI
A6	VIDEO AMPLIFIER	7300A	CEI
A7	AUDIO AMPLIFIER	7400B	CEI
A8	COR AMPLIFIER	7500A	CEI
A9	POWER SUPPLY	7602	CEI
C1	CAPACITOR, METAL CLAD THRU PASS, 0.01 μf, 600V	102P515	Sprague
C2	Same as C1		
C3	CAPACITOR, ELECTROLYTIC: 500 μf, 25V	43F8123BA2	GE
C4	CAPACITOR, ELECTROLYTIC: 1000 μf, 25V	43F2468BA1	GE
C5A,B	CAPACITOR, ELECTROLYTIC: DUAL, 15 μf, 350V	43F2299BB1	GE
C6	CAPACITOR, ELECTROLYTIC: 25 μf, 12V	30D256G012BB4	Sprague
CR1	DIODE, SILICON, ZENER	IN3008B	RCA
CR2	DIODE, SILICON, ZENER	IN753A	CD
DS1	LAMP 6-8V, 150 ma	47	GE
DS2	Same as DS1		
DS3	LAMP, 6V, 40ma	345	GE
F1	FUSE: 0.6 amp, Slo-Blo	313.600	Littelfuse
F2	FUSE: 0.3 amp, Slo-Blo	313.300	Littelfuse
J1	RECEPTACLE, JACK: type N, p/o W1	UG 1052/U	FXR
J2	Same as J1, p/o W2		
J3	RECEPTACLE, JACK: type BNC, p/o W7	17825	FXR
J4	Same as J3		
J5	Same as J3		
J6	Same as J3		
J7	JACK PHONE: OPEN CIRCUITED	C11	Switchcraft
K1	RELAY	22RJCC1000G-SIL	Sigma
L1	CHOKE, FILTER	1070	CEI
M1	METER: 0-50 μa, DC microammeter	1632	CEI
M2	METER: 100-0-100 μa, DC microammeter	1633	CEI
P1	RECEPTACLE, PLUS, BNC, p/o W1	UG 88/U	FXR
P2	Same as P1, p/o W2		

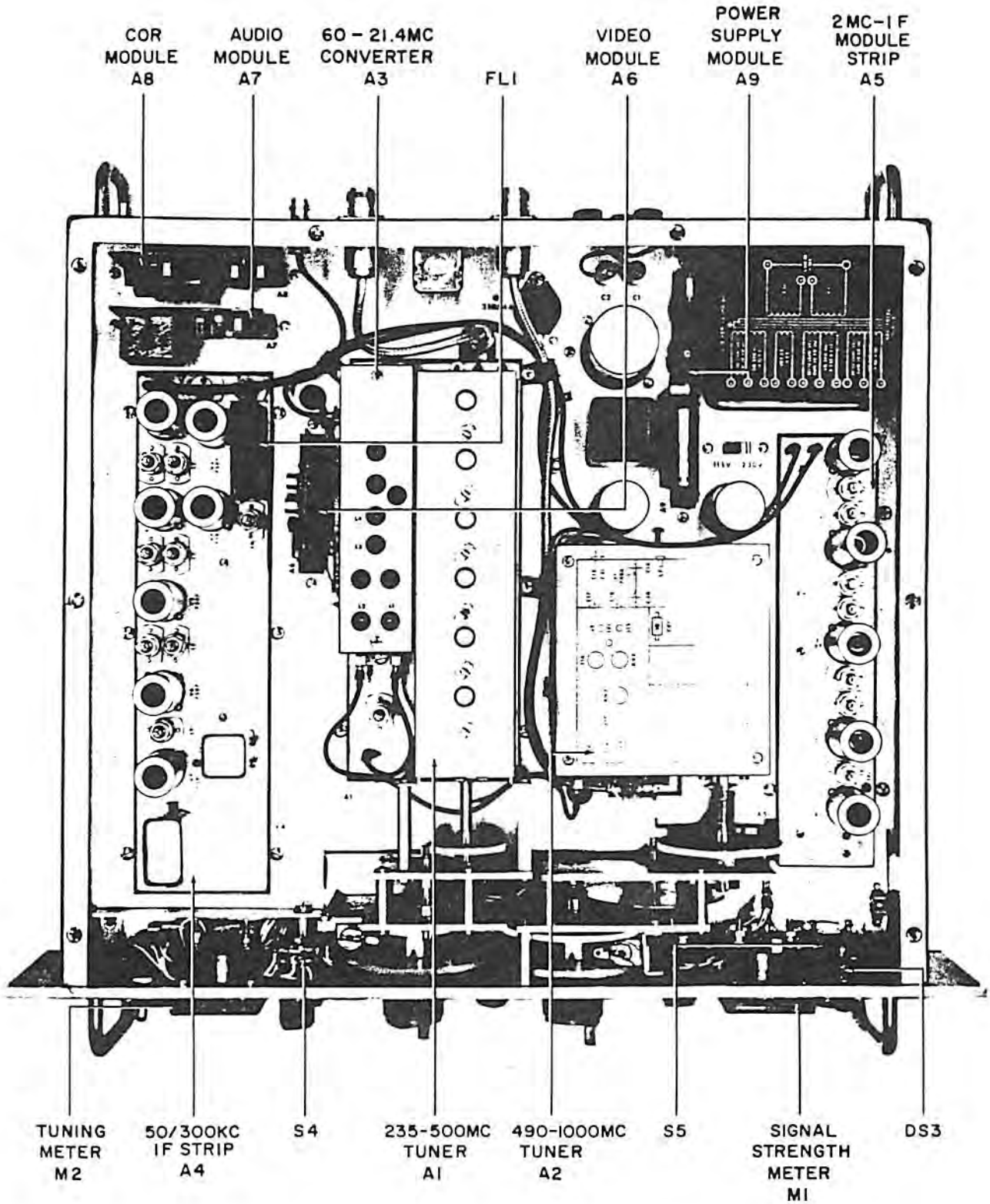


Fig. 5-1. Type 702A Receiver, Top View

Ref. Desig.	Description	Vendor Part No.	Vendor Name
P3	RECEPTACLE, PLUG, SUB MINIATURE, p/oW3	27-7	FXR
P4	Same as P3, p/oW3		
P5	RECEPTACLE, PLUG, SUB MINIATURE, p/oW4	27-26	FXR
P6	Same as P3, p/oW4		
P7	Same as P5, p/oW5		
P8	Same as P3, p/oW5		
P9	Same as P3, p/oW6		
P10	Same as P3, p/oW6		
P11	Same as P5, p/oW7		
P12	POWER CORD AND PLUG	01753-001	Cornish
Q1	TRANSISTOR	2N1544	Motorola
R1	RESISTOR, FIXED, COMPOSITION: 150 Ω, 5%, 1/4W	CB1515	AB
R2	RESISTOR, WIRE WOUND, 1K, 3%, 5W	RH-5	Dale
R3	Same as R1		
R4	NOT USED		
R5	RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/2W	EB8215	AB
R6	RESISTOR, FIXED, COMPOSITION: 51K Ω, 5%, 1/4W	CB5135	AB
R7	RESISTOR, FIXED, COMPOSITION: 180K Ω, 5%, 1/4W	CB1845	AB
R8	RESISTOR, FIXED, COMPOSITION: 1.0M Ω, 5%, 1/4W	CB1055	AB
R9	RESISTOR, VARIABLE, COMPOSITION: 100K, 10%, 2W, with switch	JS1N056P104UA	AB
R10	RESISTOR, VARIABLE, COMPOSITION: 500K, 10%, 2W	RV4NAYSD504A	AB
R11	RESISTOR, FIXED, COMPOSITION: 15K, 5%, 1/4W	CB1535	AB
R12	RESISTOR, VARIABLE, COMPOSITION: 10K, 10%, 2W	RV4NAYSD103A	AB
R13	RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W	CB3915	AB
R14	Same as R10		
R15	Same as R12		
R16	RESISTOR, VARIABLE, COMPOSITION: 100K, 10%, 2W	RV4NAYSD104A	AB
S1	SWITCH, SPST: p/o R9		
S2	SWITCH, DPDT SLIDE	G326	Continental Wirt
S3, A,B,C, D,E	SWITCH, ROTARY, NON-SHORTING: 5 pole, 2 pos.	399227A	Oak
S4, A,B,C, D	SWITCH, ROTARY, NON-SHORTING: 4 pole, 4 pos.	399225A	Oak
S5	SWITCH, TOGGLE, SPDT (used in 702A only)	8282-K14	C-H

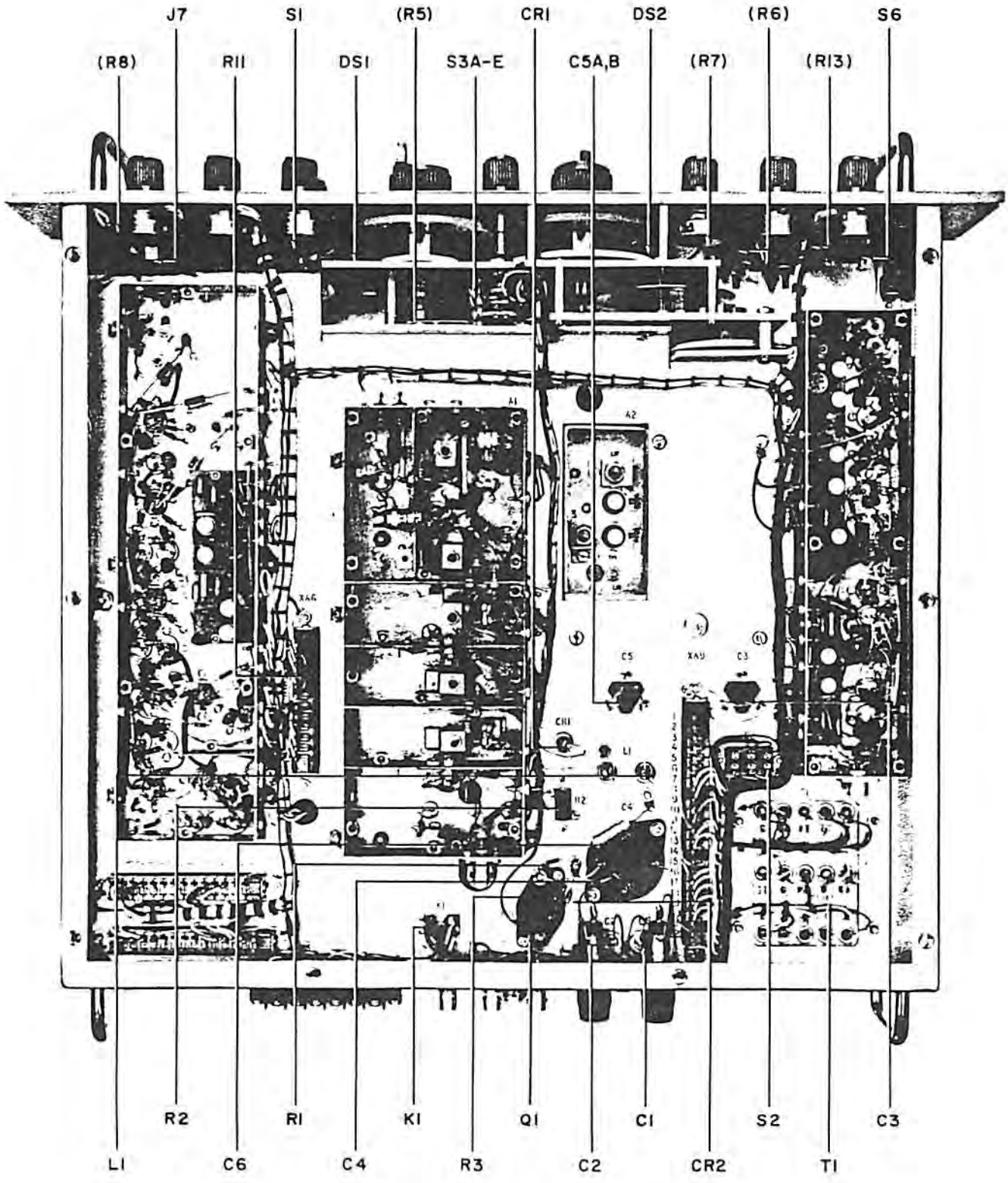


Fig. 5-2. Type 702A Receiver, Bottom View

Ref. Desig.	Description	Vendor Part No.	Vendor Name
S6	Same as S5		
T1	TRANSFORMER, POWER	1610	CEI
TB1	TERMINAL STRIP: Barrier Type	6-140-Y	Cinch
W1	CABLE AND CONNECTOR ASSEMBLY		CEI
W2	CABLE AND CONNECTOR ASSEMBLY		CEI
W3	CABLE AND CONNECTOR ASSEMBLY		CEI
W4	CABLE AND CONNECTOR ASSEMBLY		CEI
W5	CABLE AND CONNECTOR ASSEMBLY		CEI
W6	CABLE AND CONNECTOR ASSEMBLY		CEI
W7	CABLE AND CONNECTOR ASSEMBLY		CEI

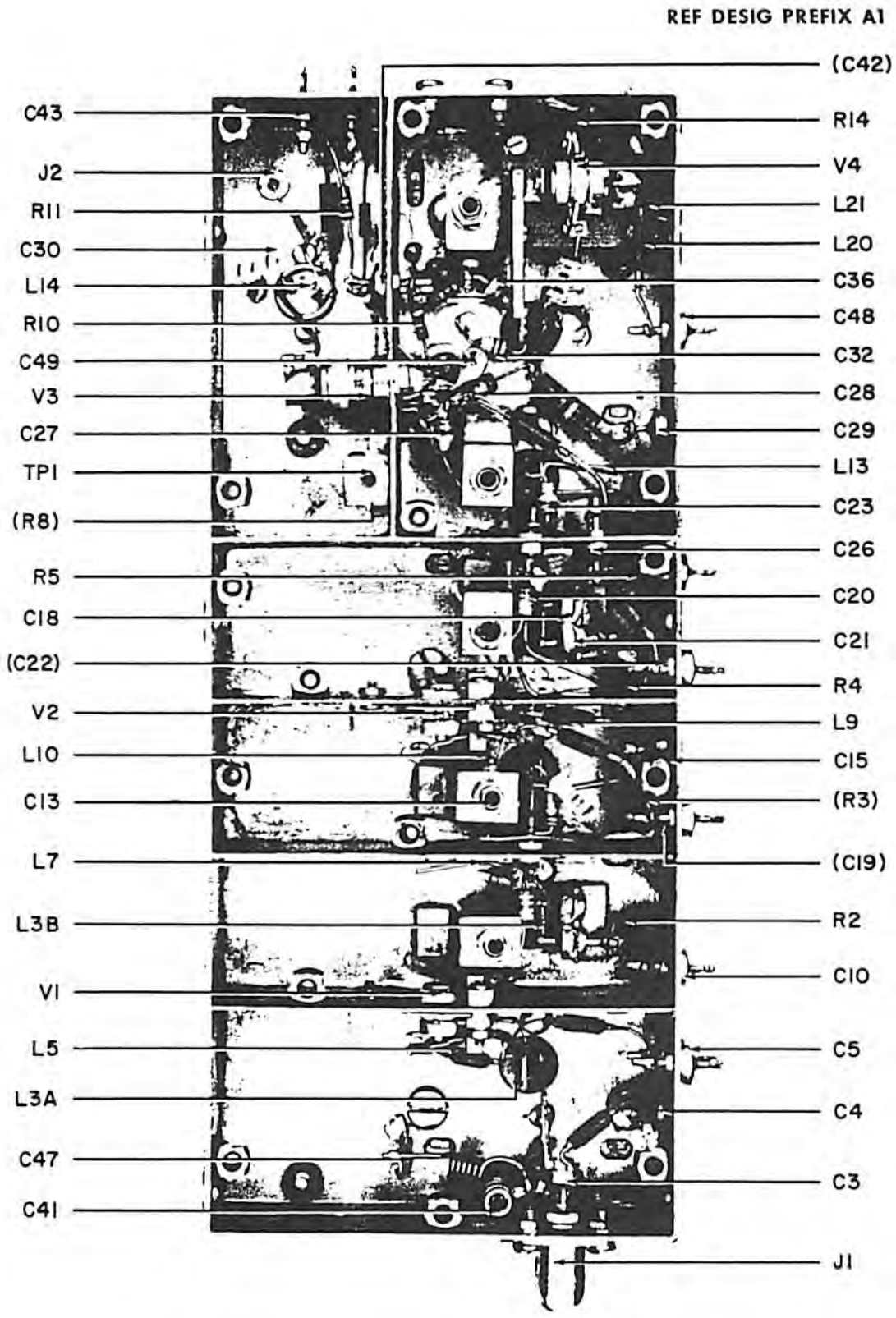


Fig. 5-3. Type 7104 235-500 mc Tuner, Component Locations

5.4.2 Type 7104 235-500 mc RF Tuner

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A1C1	CAPACITOR, VARIABLE: 0.5-4.5 pf	CST-6	CTC
A1C2	CAPACITOR, CERAMIC, TUBULAR: 2.0 pf, 10%	MC	QC
A1C3	CAPACITOR, STANDOFF: 470 pf, 500 V	SS5A-4712	AB
A1C4	Same as A1C3 (in all cases)		
A1C5	CAPACITOR, FEEDTHRU: 470 pf, 500 V	FA5C-4712	AB
A1C6	CAPACITOR, VARIABLE: 0.8-4.5 pf	MG 1305	Roanwell
A1C7	Same as A1C3		
A1C8	Same as A1C5		
A1C9	Same as A1C5		
A1C10	Same as A1C5		
A1C11	CAPACITOR, CERAMIC, TUBULAR: 0:68 pf, 10%	QC	QC
A1C12	CAPACITOR, CERAMIC, TUBULAR: 1.0 pf, 10%		
A1C13	Same as A1C6		
A1C14	CAPACITOR, CERAMIC, TUBULAR: 2.0 pf, ±0.25 pf	301-000-COKO-209C	Erie
A1C15	Same as A1C3		
A1C16	Same as A1C5		
A1C17	Same as A1C6		
A1C18	Same as A1C3		
A1C19	Same as A1C5		
A1C20	CAPACITOR, CERAMIC, TUBULAR: 0.51 pf, 10%	QC	QC
A1C21	Same as A1C5		
A1C22	Same as A1C5		
A1C23	Same as A1C12		
A1C24	Same as A1C6		
A1C25	Same as A1C5		
A1C26	Same as A1C5		
A1C27	CAPACITOR, CERAMIC, TUBULAR: 2.7 pf, ±.25 pf	301-000-C0J0-279C	Erie
A1C28	CAPACITOR, CERAMIC, TUBULAR: 1.8 pf, 10%	QC	QC
A1C29	Same as A1C3		
A1C30	CAPACITOR, CERAMIC, TUBULAR: 4.7 pf, ±0.25 pf	301-000-COHO-479C	Erie
A1C31	Same as A1C3		
A1C32	CAPACITOR, CERAMIC, TUBULAR: 0.82 pf, 10%	QC	QC
A1C33	Same as A1C5		
A1C34	CAPACITOR, CERAMIC, TUBULAR: 6.2 pf, ±0.5 pf	301-000-COHO-629D	Erie

REF DESIG PREFIX A1

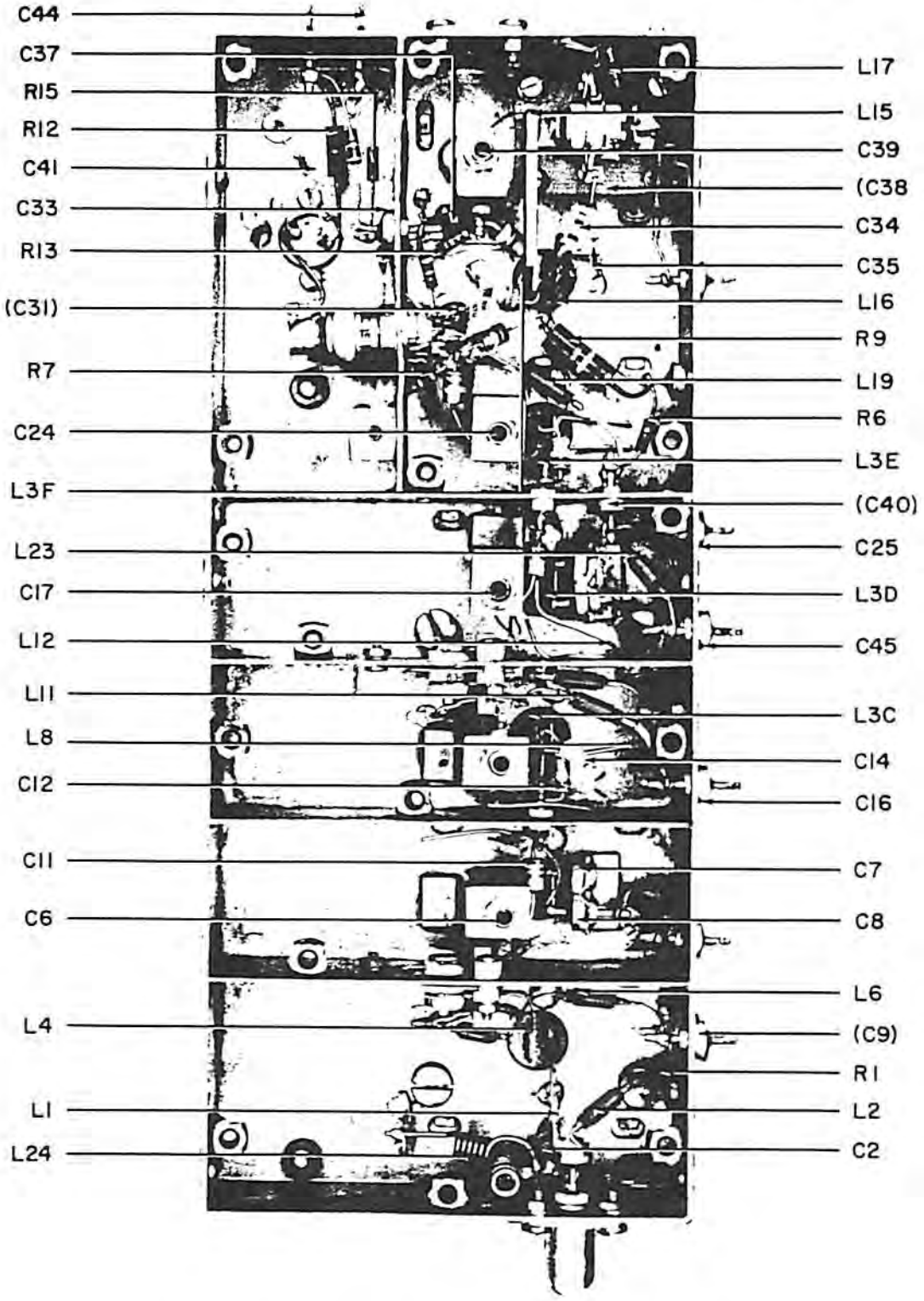


Fig. 5-4. Type 7104 235-500 mc Tuner, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A1C35	CAPACITOR, CERAMIC, TUBULAR: 6.2 pf. ±0.5 pf	301-000-U2J0 629D	Erie
A1C36	CAPACITOR, CERAMIC, TUBULAR: 0.47 pf, 10%	QC	QC
A1C37	VARICAP	PC115	PSI
A1C38	CAPACITOR, CERAMIC, TUBULAR: 1.0 pf ±0.25 pf	301-000-COKO 109C	Erie
A1C39	Same as A1C6		
A1C40	Same as A1C5		
A1C41	CAPACITOR, CERAMIC DISC: 470pf, 1000V	Type B	RMC
A1C42	Same as A1C5		
A1C43	Same as A1C5		
A1C44	Same as A1C5		
A1C45	Same as A1C5		
A1C46	NOT USED		
A1C47	Same as A1C11		
A1C48	Same as A1C5		
A1C49	Same as A1C41		
A1J1	RECEPTACLE, JACK: Type BNC	UG-535/U	FXR
A1J2	RECEPTACLE, JACK: Sub-miniature	27-9	FXR
A1L1	INDUCTOR:	1966	CEI
A1L2	INDUCTOR: RFC	1131-21	CEI
A1L3A thru F	INDUCTUNER	2208	CEI
A1L4	INDUCTOR: Tinned copper strip		
A1L5	Same as A1L2		
A1L6	Same as A1L2		
A1L7	INDUCTOR: #20 bus wire		
A1L8	INDUCTOR: #20 bus wire		
A1L9	Same as A1L2		
A1L10	Same as A1L2		
A1L11	Same as A1L2		
A1L12	INDUCTOR: #20 bus wire		
A1L13	INDUCTOR: #20 bus wire		
A1L14	INDUCTOR: Variable	1472-13	CEI
A1L15	INDUCTOR	1234	CEI
A1L16	INDUCTOR	1131-34	CEI
A1L17	Same as A1L2		
A1L18	NOT USED		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A1L19	Same as A1L2		
A1L20	Same as A1L2		
A1L21	Same as A1L2		
A1L22	NOT USED		
A1L23	Same as A1L2		
A1L24	INDUCTOR	1129-04	CEI
A1R1	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A1R2	RESISTOR, FIXED, COMPOSITION: 3K, 5%, 1/2W	EB3021	AB
A1R3	Same as A1R1		
A1R4	Same as A1R2		
A1R5	RESISTOR, FIXED, COMPOSITION: 100 Ω, 10%, 1/4W	CB1011	AB
A1R6	Same as A1R5		
A1R7	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A1R8	Same as A1R7		
A1R9	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1W	GB1035	AB
A1R10	Same as A1R7		
A1R11	Same as A1R7		
A1R12	RESISTOR, FIXED, COMPOSITION: 2.7K, 5%, 1/2W	EB2725	AB
A1R13	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A1R14	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A1R15	RESISTOR, FIXED, COMPOSITION: 1.5K, 5%, 1/4W	CB1525	AB
A1TP1	TEST POINT	TJ-6	Taurus
A1V1	TUBE, ELECTRON: Ceramic triode	7077	GE
A1V2	Same as A1V1		
A1V3	TUBE, ELECTRON: Nuvistor tetrode	7587	RCA
A1V4	TUBE, ELECTRON: Ceramic triode	7486	GE

5.4.3 Type 7105 490-1000 mc RF Tuner

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A2C1,A,B,C,D,E	CAPACITOR, TRIMMER	1271	CEI
A2C2	CAPACITOR, VARIABLE, TUNING	1261	CEI
A2C3	Same as A2C2		
A2C4	Same as A2C2		
A2C5	Same as A2C2		
A2C6	CAPACITOR, VARIABLE, TUNING	1276	CEI
A2C7	CAPACITOR, CERAMIC, TRIMMER: 0.5-3 pf	3115-001-IR	Erie
A2C8	CAPACITOR, CERAMIC, TUBULAR: 1.0 pf ± 0.25 pf	301-000-COKO-109C	Erie
A2C9	CAPACITOR, CERAMIC, TUBULAR: 1.5 pf, ±0.25 pf	301-000-COKO-159C	Erie
A2C10	CAPACITOR, CERAMIC, TUBULAR: 0.27 pf, 10%	QC	QC
A2C11	VARICAP	PC115	PSI
A2C12	CAPACITOR, FEEDTHRU: 470 pf, 500 V	FA5C-4712	AB
A2C13	CAPACITOR, STANDOFF: 137 pf, 20% 500V	32-25394-1	GI
A2C14	Same as A2C12		
A2C15	CAPACITOR, SILVER MICA, BUTTON: 15 pf, 10%	370-CB-150K	Erie
A2C16	CAPACITOR, DIPPED MICA, 56 pf, 5%	DM10-560J	Arco
A2C17	CAPACITOR, STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A2C18	CAPACITOR, CERAMIC FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A2C19	Same as A2C18		
A2C20	CAPACITOR, CERAMIC DISC: 1000 pf, 20%	Type SM	RMC
A2C21	Same as A2C20		
A2C22	Same as A2C20		
A2C23	Same as A2C20		
A2C24	Same as A2C17		
A2C25	Same as A2C18		
A2C26	CAPACITOR, CERAMIC TUBULAR: 2.2 pf, ±0.25 pf	301-000-COJO-229C	Erie
A2C27	Same as A2C20		
A2C28	Same as A2C20		
A2C29	Same as A2C18		
A2C30	Same as A2C12		
A2C31	Same as A2C12		
A2C32	Same as A2C17		
A2CR1	DIODE, SILICON, UHF: Mixer, Must be plastic case, Type C	1N82A	Raytheon

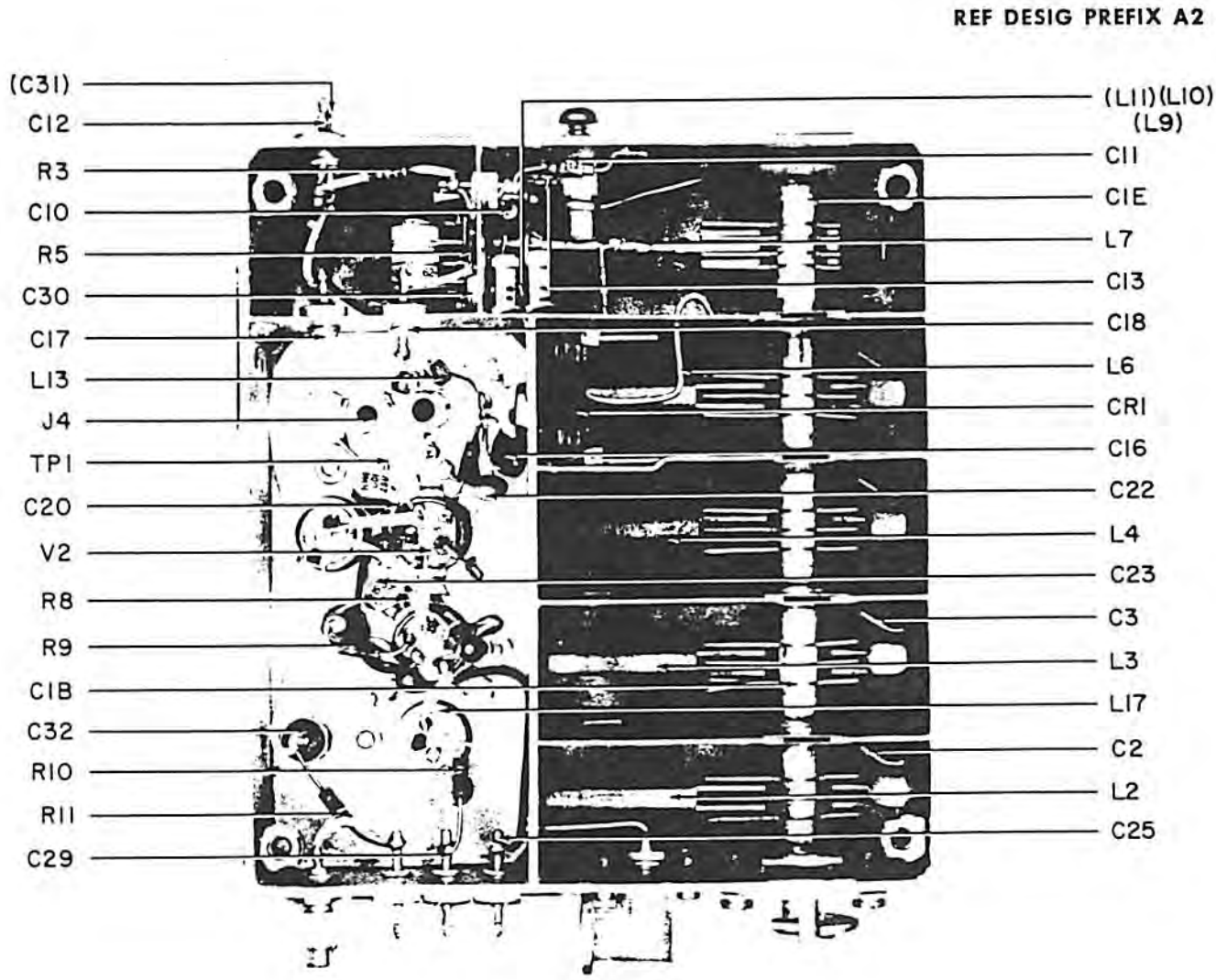


Fig. 5-5. Type 7105 490-1000 mc Tuner, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A2J1	RECEPTACLE, JACK: Type BNC	UG-535/U	FXR
A2J2	RECEPTACLE, JACK: sub miniature	27-9	FXR
A2J3	NOT USED		
A2J4	PHONE, JACK: Ultra-miniaturized, Microjax	TR-2A	Switchcraft
A2L1	INDUCTOR: Adjustable	1461	CEI
A2L2	INDUCTOR: Fixed Line	1265	CEI
A2L3	Same as A2L2		
A2L4	Same as A2L2		
A2L5	Same as A2L2		
A2L6	INDUCTOR: Fixed	1462	CEI
A2L7	INDUCTOR: Fixed Line	1301	CEI
A2L8	INDUCTOR: Fixed	1973	CEI
A2L9	INDUCTOR: RF Choke	1466-4	CEI
A2L10	INDUCTOR: RF Choke	1466-3	CEI
A2L11	Same as A2L10		
A2L12	NOT USED		
A2L13	INDUCTOR: Fixed	1466-1	CEI
A2L14	INDUCTOR: Fixed	1466-2	CEI
A2L15	INDUCTOR: Adjustable	1471-2	CEI
A2L16	INDUCTOR: Adjustable	1472-12	CEI
A2L17	INDUCTOR: Adjustable	1472-13	CEI
A2R1	NOT USED		
A2R2	RESISTOR, FIXED, COMPOSITION: 5.6K, 5%, 1/4W	CB5625	AB
A2R3	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A2R4	RESISTOR, FIXED, COMPOSITION: 100 Ω 5% 1/4W	CB1015	AB
A2R5	RESISTOR, FIXED, COMPOSITION: 1K, 5% 1/4W	CB1025	AB
A2R6	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	AB
A2R7	RESISTOR, FIXED, COMPOSITION: 68 Ω 5%, 1/4W	CB6805	AB
A2R8	Same as R6		
A2R9	RESISTOR, FIXED, COMPOSITION: 10 Ω 5%, 1/4W	CB1005	AB
A2R10	Same as R5		
A2R11	RESISTOR, FIXED, COMPOSITION: 3.9K, 5%, 1/4W	CB3925	AB
A2TP1	TEST POINT	TJ-6	Taurus
A2V1	TUBE, ELECTRON: Ceramic triode	7486	GE
A2V2	TUBE, ELECTRON: Nuvistor triode	6CW4	RCA
A2V3	Same as V2		

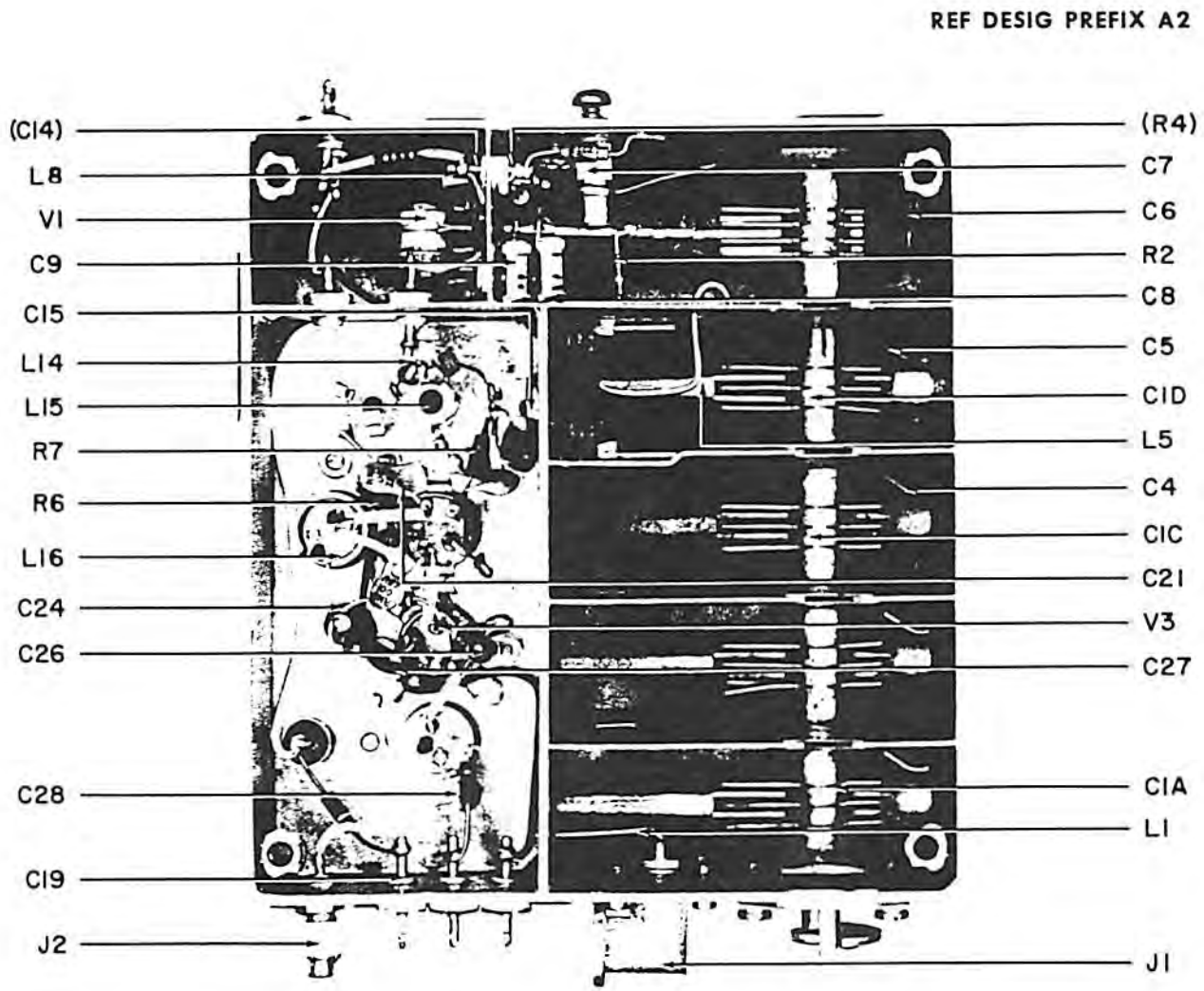


Fig. 5-6. Type 7105 490-1000 mc Tuner, Component Locations

5.4.4 Type 7106 60-21.4 mc Converter

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3C1	CAPACITOR, DIPPED MICA: 82 pf, 5%, 500V	DM10-820J	Arco
A3C2	CAPACITOR, DIPPED MICA: 62 pf, 5%, 500V	DM10-620J	Arco
A3C3	CAPACITOR, CERAMIC, TUBULAR: 2.2 pf, ± 0.25 pf	301-000-COJO-229C	Erie
A3C4	Same as A3C3		
A3C5	CAPACITOR, DIPPED MICA: 12 pf, 5%, 500V	DM10-120J	Arco
A3C6	Same as A3C5		
A3C7	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A3C8	Same as A3C7		
A3C9	CAPACITOR, CERAMIC, TUBULAR: 4.7 pf ± 0.25 pf	301-000-COHO-479C	Erie
A3C10	CAPACITOR, DISC, CERAMIC: 470 pf, 20%, 1000V	Type B	RMC
A3C11	Same as A3C7		
A3C12	CAPACITOR, DISC. CERAMIC: 1000 pf, GMV, 500V	Type SM	RMC
A3C13	CAPACITOR, CERAMIC STANDOFF: 100 pf, GMV	SS5A-102W	AB
A3C14	Same as A3C12		
A3C15	CAPACITOR, COMPOSITION, TUBULAR: 1.0 pf, 10%	MC	QC
A3C16	Same as A3C12		
A3C17	CAPACITOR, CERAMIC, TUBULAR: 1.5 pf ± 0.1 pf	301-000-COKO-159B	Erie
A3C18	Same as A3C7		
A3C19	CAPACITOR, CERAMIC, TUBULAR: 3.3 pf, ± 0.25 pf	301-000-COJO-339C	Erie
A3C20	CAPACITOR, CERAMIC, TUBULAR: 6.8 pf, ± 0.5 pf	301-000-COHO-689D	Erie
A3C21	CAPACITOR, COMPOSITION, TUBULAR: .82 pf, 10%	MC	QC
A3C22	Same as A3C12		
A3C23	Same as A3C12		
A3C24	CAPACITOR, CERAMIC, TUBULAR: 2.7 pf ± 0.25 pf	301-000-COJO-279C	Erie
A3C25	Same as A3C12		
A3C26	Same as A3C12		
A3C27	Same as A3C12		
A3C28	CAPACITOR, DIPPED MICA: 10 pf, 5%	DM10-100J	Arco
A3C29	Same as A3C12		
A3C30	CAPACITOR, DIPPED MICA: 270 pf 5%	DM10-271J	Arco
A3C31	Same as A3C7		
A3FB1	FERRITE BEAD	56-590-65/4A	Ferroxcube

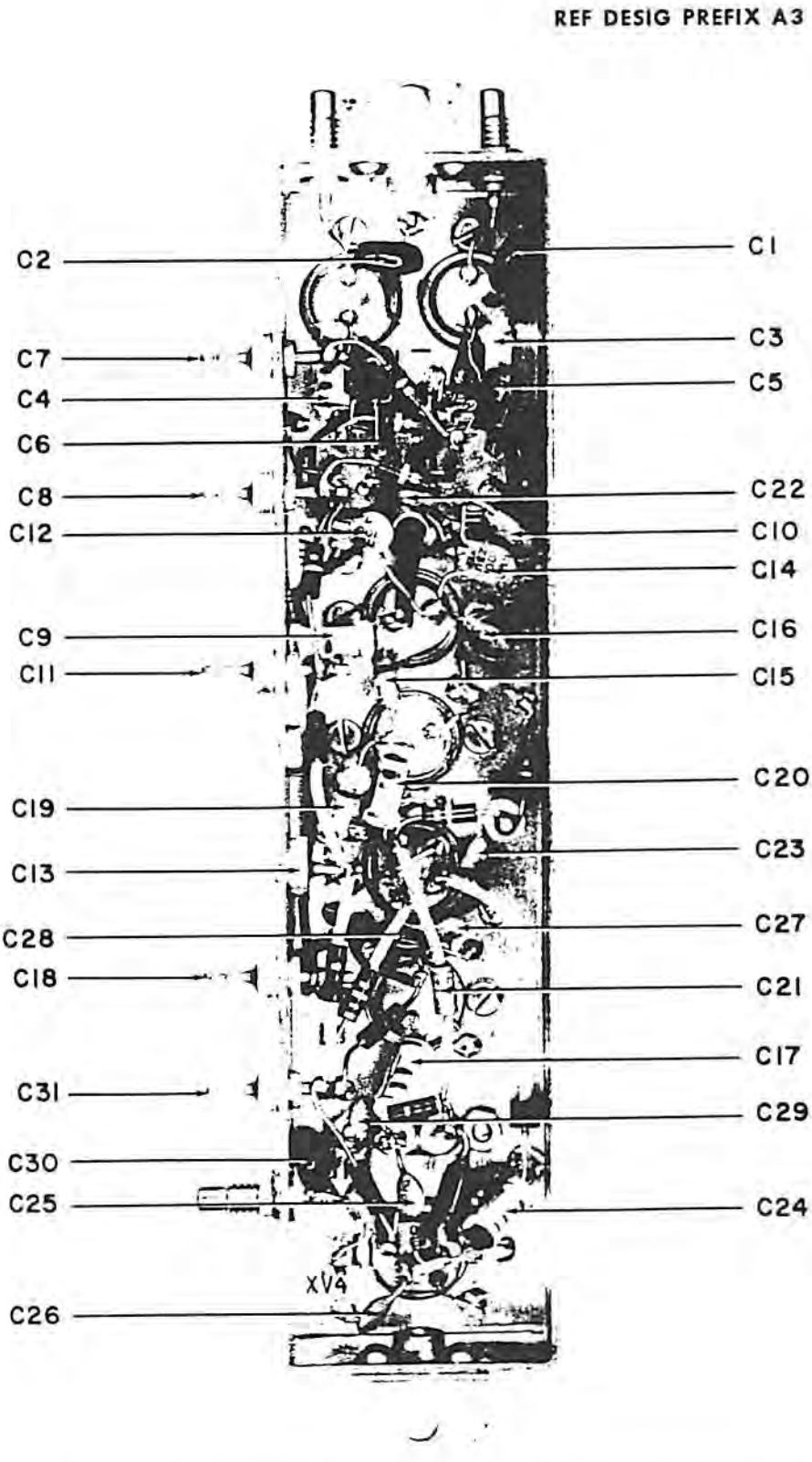


Fig. 5-7. Type 7106 60-21.4 mc Converter, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A3J1	RECEPTACLE, JACK: Sub-miniature	27-9	FXR
A3J2	Same as A3J1		
A3J3	Same as A3J1		
A3L1	COIL, VARIABLE	1472-13	CEI
A3L2	Same as A3L1		
A3L3	COIL,VARIABLE	1472-11	CEI
A3L4	COIL ,VARIABLE	1472-1	CEI
A3L5	COIL, FIXED: 0.82 μh	204-11	Wilco
A3L6	COIL, VARIABLE	1472-4	CEI
A3R1	RESISTOR, FIXED, COMPOSITION: 3.3K, 5%, 1/4W	CE3325	AB
A3R2	Same as A3R1		
A3R3	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A3R4	NOT USED		
A3R5	RESISTOR, FIXED, COMPOSITION: 68 Ω 5%, 1/4W	CB6805	AB
A3R6	Same as A3R3		
A3R7	Same as A3R5		
A3R8	RESISTOR, FIXED, COMPOSITION: 220K, 5%, 1/4W	CB2245	AB
A3R9	Same as A3R8		
A3R10	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A3R11	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A3R12	RESISTOR, FIXED, COMPOSITION: 3.0K, 5% 1/4 W	CB3025	AB
A3R13	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	CB4715	AB
A3R14	Same as A3R8		
A3R15	Same as A3R8		
A3R16	Same as A3R3		
A3R17	RESISTOR, FIXED, COMPOSITION: 330K, 5%, 1/4W	CB3345	AB
A3R18	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A3R19	RESISTOR, FIXED, COMPOSITION: 15K, 5%, 1/4W	CB1535	AB
A3TP1	TEST POINT	TJ-6	Taurus
A3V1	TUBE, ELECTRON: Nuvistor tetrode	7587	RCA
A3V2	Same as A3V1		
A3V3	Same as A3V1		
A3V4	TUBE, ELECTRON: Nuvistor triode	6CW4	RCA
A3Y1	CRYSTAL: 81.4 MC	CR82/U	McCoy

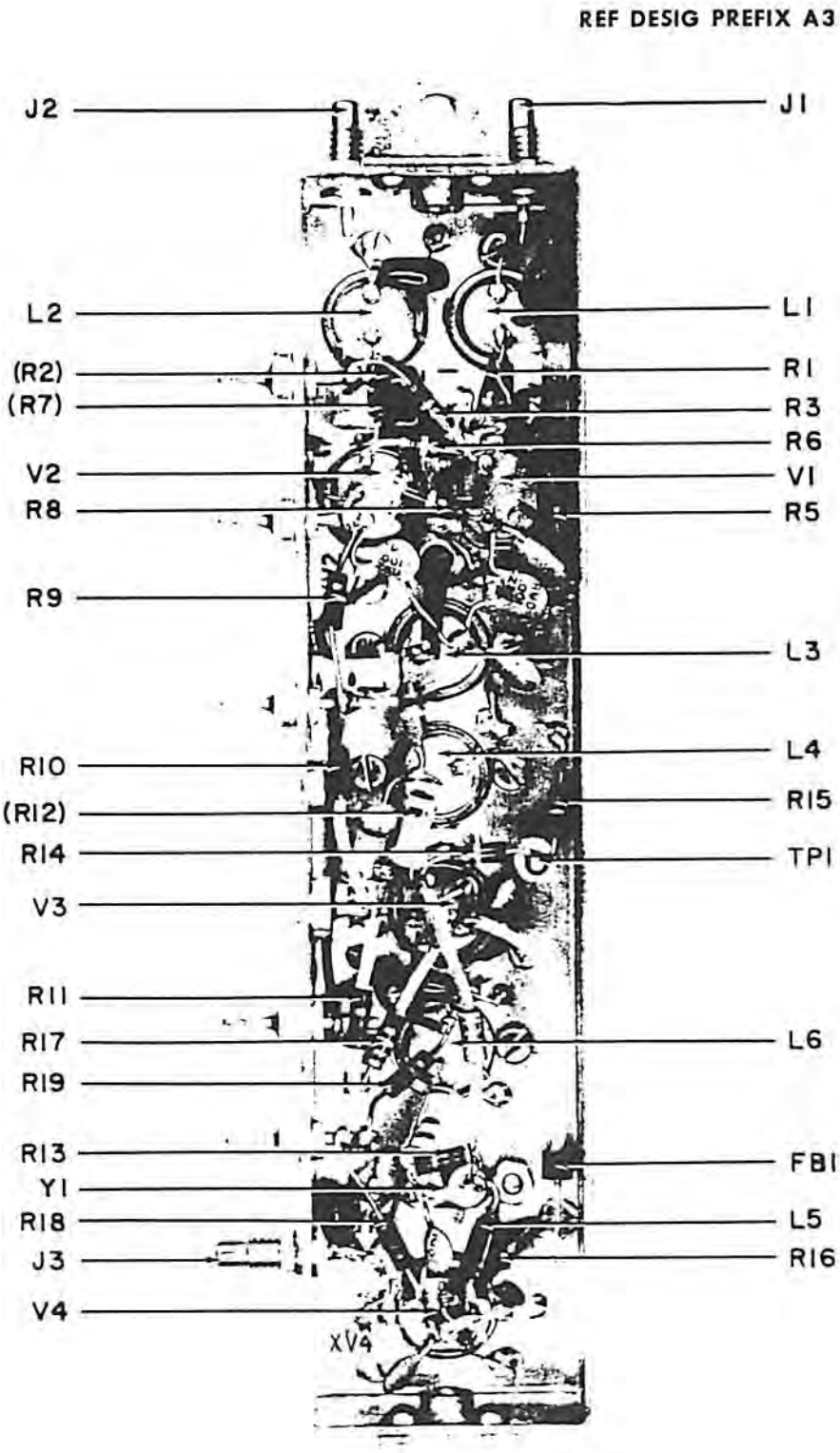


Fig. 5-8. Type 7106 60-21.4 mc Converter, Component Locations

5.4.5 Type 7205 50/300 kc Bandwidth IF Strip - Type 702A Receiver Only.

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4C1	CAPACITOR, CERAMIC DISC: 1000 pf, 20%, GMV	Type SM	RMC
A4C2	CAPACITOR, CERAMIC DISC: 470 pf, 20%	Type B	RMC
A4C3	Same as A4C1		
A4C4	CAPACITOR, CERAMIC, STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A4C5	CAPACITOR, DIPPED MICA: 15 pf, 5%	DM10-150J	Arco
A4C6	Same as A4C2		
A4C7	CAPACITOR, CERAMIC, TUBULAR: 0.36 pf, 10%	QC	QC
A4C8	CAPACITOR, DIPPED MICA: 10 pf, 5%	DM10-100J	Arco
A4C9	CAPACITOR, DIPPED MICA: 33pf, 5%	DM10-330J	Arco
A4C10	Same as A4C2		
A4C11	CAPACITOR, DIPPED MICA: 330 pf, 5%	DM10-331J	Arco
A4C12	Same as A4C2		
A4C13	Same as A4C5		
A4C14	Same as A4C7		
A4C15	Same as A4C8		
A4C16	Same as A4C2		
A4C17	Same as A4C2		
A4C18	Same as A4C1		
A4C19	CAPACITOR, DIPPED MICA: 27 pf, 5%	DM10-270J	Arco
A4C20	CAPACITOR, DIPPED MICA: 68 pf, 5%	DM10-680J	Arco
A4C21	Same as A4C19		
A4C22	Same as C20		
A4C23	Same as A4C1		
A4C24	NOT USED		
A4C25	Same as A4C2		
A4C26	Same as A4C9		
A4C27	Same as A4C2		
A4C28	Same as A4C2		
A4C29	Same as A4C2		
A4C30	Same as A4C4		
A4C31	Same as A4C5		
A4C32	CAPACITOR, CERAMIC, TUBULAR: 0.75 pf, 10%	QC	QC
A4C33	CAPACITOR, DIPPED MICA: 39 pf, 5%	DM10-390J	Arco
A4C34	Same as A4C5		
A4C35	Same as A4C1		
A4C36	Same as A4C1		

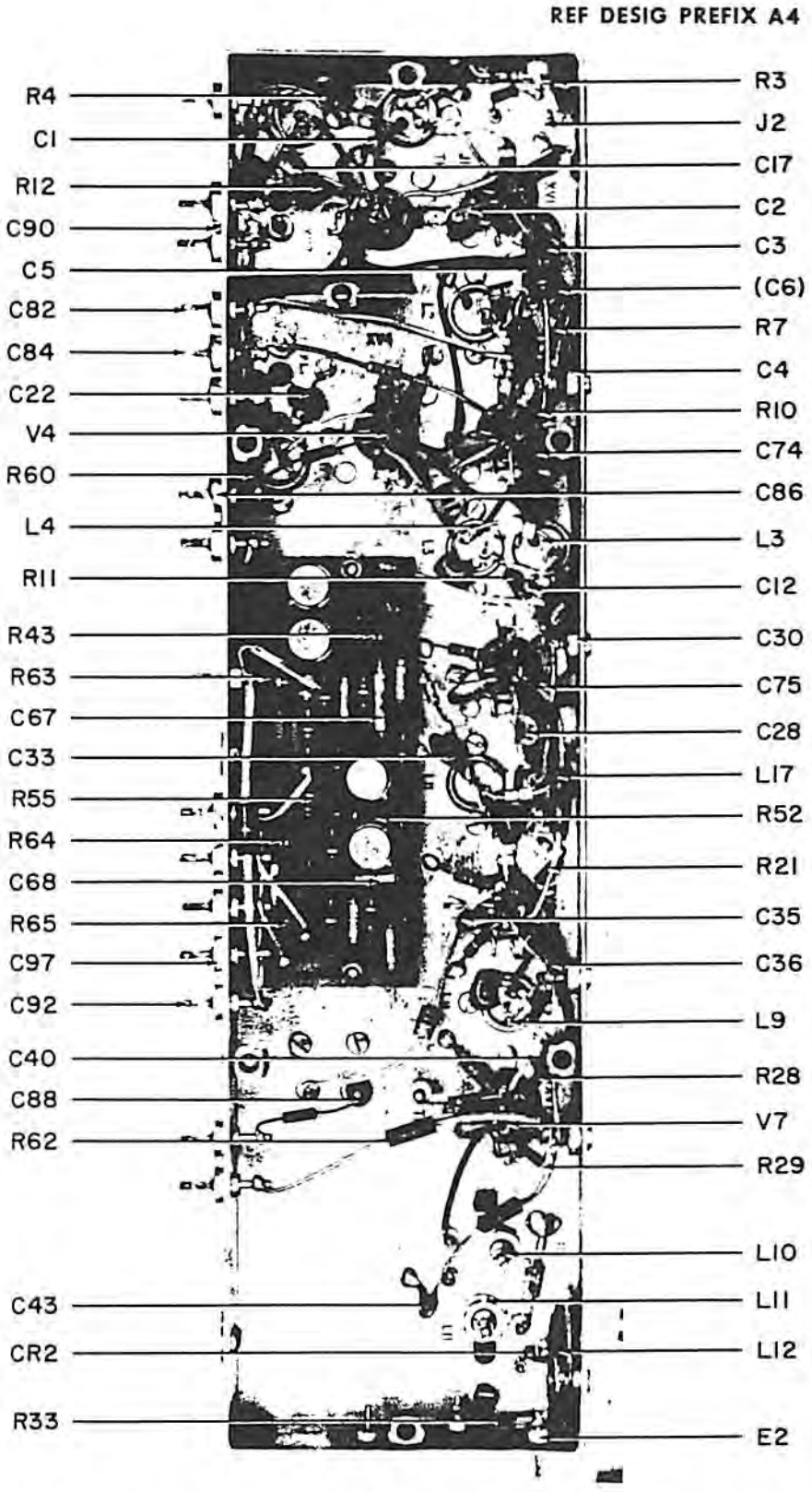


Fig. 5-9. Type 7205 300/50 kc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4C37	NOT USED		
A4C38	Same as A4C4		
A4C39	Same as A4C8		
A4C40	Same as A4C8		
A4C41	Same as A4C1		
A4C42	Same as A4C4		
A4C43	Same as A4C1		
A4C44	CAPACITOR, CERAMIC, TUBULAR: 22 pf, 10% (N150-TC)	N150A	Erie
A4C45	CAPACITOR, DIPPED MICA: 22 pf, 5%	DM10-220J	Arco
A4C46	CAPACITOR, CERAMIC, TUBULAR: 10 ± 0.5 pf (N750-TC)	301-000-U2J0-100D	Erie
A4C47	CAPACITOR, DIPPED MICA: 100 pf, 5%	DM10-101J	Arco
A4C48	Same as A4C47		
A4C49	Same as A4C9		
A4C50	NOT USED		
A4C51	NOT USED		
A4C52	NOT USED		
A4C53	NOT USED		
A4C54	CAPACITOR, DIPPED MICA: 68 pf, 5%	DM10-680J	Arco
A4C55	NOT USED		
A4C56	CAPACITOR, DIPPED MICA: 43 pf, 5%	DM10-430J	Arco
A4C57	Same as A4C1		
A4C58	NOT USED		
A4C59	NOT USED		
A4C60	NOT USED		
A4C61	NOT USED		
A4C62	NOT USED		
A4C63	CAPACITOR, CERAMIC, TUBULAR: 3.3 pf, 10%	301-000-C0J0-339C	Erie
A4C64	Same as C9		
A4C65	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.1 µf, 20%, 35V	150D104X-0035A2	Sprague
A4C66	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 µf, 20%, 35V	150D105X-0035A2	Sprague
A4C67	CAPACITOR, ELECTROLYTIC, TANTALUM: 10 µf, 20%, 20V	150D106X-0020B2	Sprague
A4C68	Same as A4C66		

REF DESIG PREFIX A4

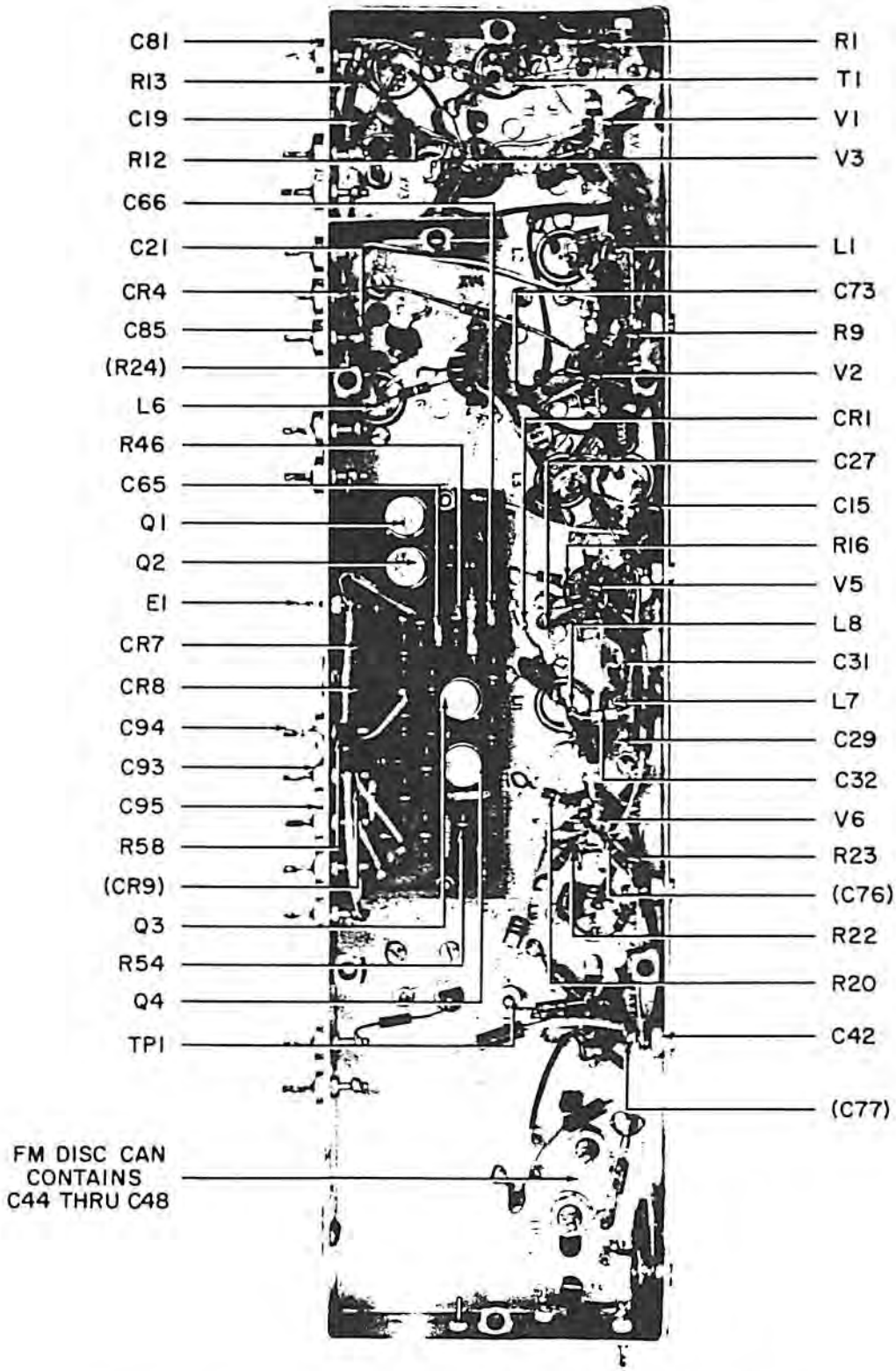


Fig. 5-10. Type 7205 300/50 kc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4C69	Same as A4C65		
A4C70	Same as A4C66		
A4C71	Same as A4C1		
A4C72	Same as A4C1		
A4C73	Same as A4C1		
A4C74	Same as A4C1		
A4C75	Same as A4C1		
A4C76	Same as A4C1		
A4C77	Same as A4C1		
A4C78	NOT USED		
A4C79	NOT USED		
A4C80	Same as A4C66		
A4C81	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A4C82	Same as A4C81		
A4C83	Same as A4C81		
A4C84	Same as A4C81		
A4C85	Same as A4C81		
A4C86	Same as A4C81		
A4C87	Same as A4C81		
A4C88	Same as A4C81		
A4C89	Same as A4C81		
A4C90	Same as A4C81		
A4C91	NOT USED		
A4C92	Same as A4C81		
A4C93	Same as A4C81		
A4C94	Same as A4C81		
A4C95	Same as A4C81		
A4C96	Same as A4C81		
A4C97	Same as A4C81		
A4CR1	DIODE	IN198A	Sylvania
A4CR2	Same as A4CR1		
A4CR3	Same as A4CR1		
A4CR4	DIODE, ZENER	IN752A	CD
A4CR5	NOT USED		
A4CR6	DIODE	IN462	CD
A4CR7	Same as A4CR6		

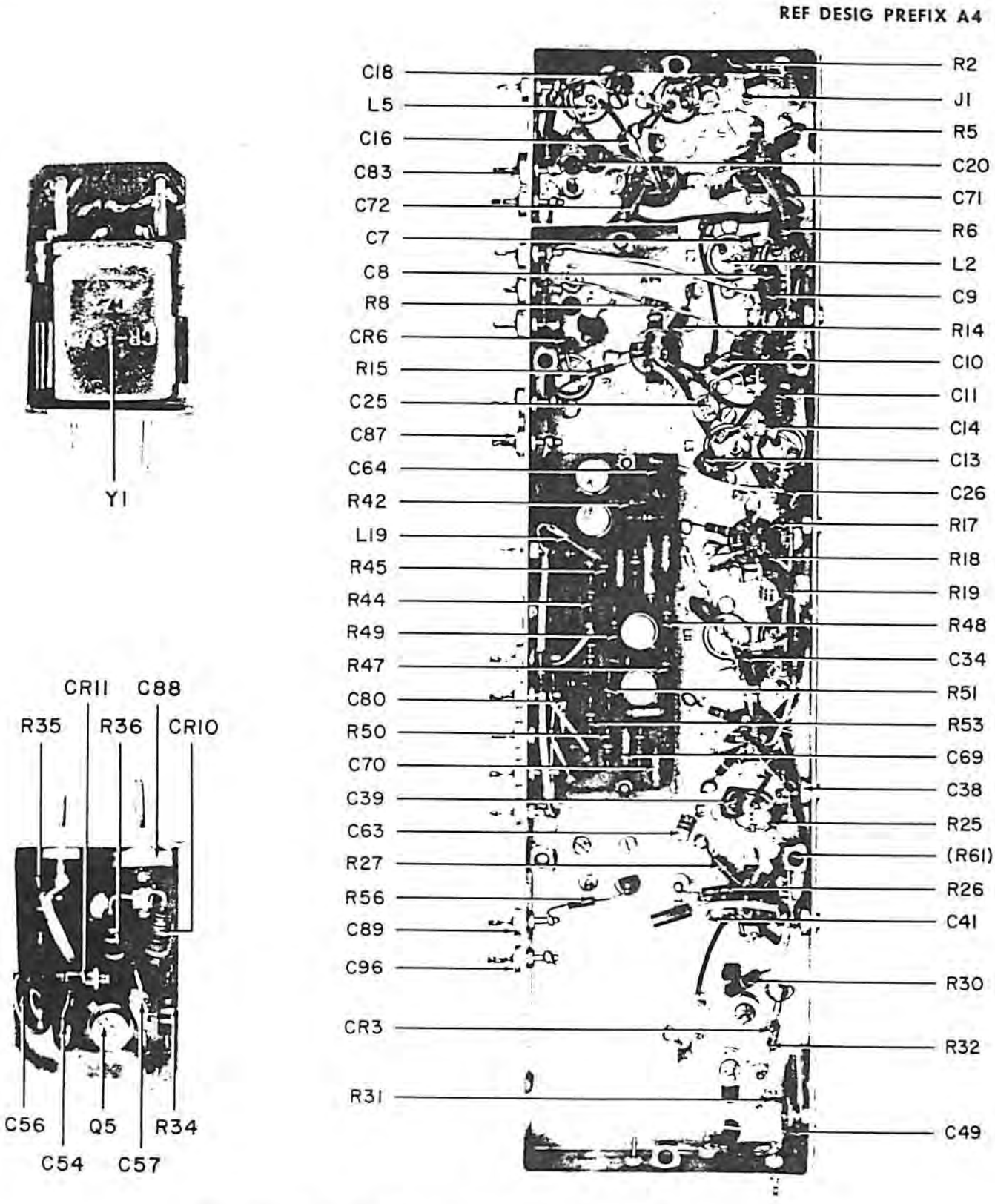


Fig. 5-11. Type 7205 300/50 kc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4CR8	Same as A4CR6		
A4CR9	DIODE, ZENER: 8.2V	1N756A	CD
A4CR10	Same as A4CR6		
A4CR11	Same as A4CR6		
A4E1	FEEDTHRU, TEFLON	SFU-16	Taurus
A4E2	Same as A4E1		
FB1	FERRITE BEAD	56-590-65/4A	Ferroxcube
FB2	Same as FB1		
FB3	Same as FB1		
FB4	Same as FB1		
FB5	Same as FB1		
FB6	Same as FB1		
A4FL1	CRYSTAL FILTER: 50-kc BW	40B2	McCoy
A4J1	RECEPTACLE, JACK: Sub-miniature	27-9	FXR
A4J2	Same as J1		
A4L1	INDUCTOR, VARIABLE	1472-3	CEI
A4L2	Same as A4L1		
A4L3	Same as A4L1		
A4L4	Same as A4L1		
A4L5	Same as A4L1		
A4L6	Same as A4L1		
A4L7	Same as A4L1		
A4L8	INDUCTOR, VARIABLE	1472-2	CEI
A4L9	Same as A4L1		
A4L10	INDUCTOR, VARIABLE	2171-12	CEI
A4L11	INDUCTOR, VARIABLE	2171-20	CEI
A4L12	INDUCTOR, FIXED	1131-17	CEI
A4L13	NOT USED		
A4L14	NOT USED		
A4L15	NOT USED		
A4L16	NOT USED		
A4L17	INDUCTOR, FIXED	1131-16	CEI
A4L18	NOT USED		
A4L19	INDUCTOR, FIXED	1131-37	CEI
A4Q1	TRANSISTOR	2N335	TI
A4Q2	Same as A4Q1		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4Q3	Same as A4Q1		
A4Q4	TRANSISTOR	2N1305	TI
A4Q5	TRANSISTOR	2N706	TI
A4R1	RESISTOR, FIXED, COMPOSITION: 24 Ω 5%, 1/4W	CB2405	AB
A4R2	RESISTOR, FIXED, COMPOSITION: 33 Ω 5%, 1/4W	CB3305	AB
A4R3	Same as A4R1		
A4R4	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A4R5	RESISTOR, FIXED, COMPOSITION: 30 Ω, 5%, 1/4W	CB3005	AB
A4R6	RESISTOR, FIXED, COMPOSITION: 110K, 5%, 1/4W	CB1145	AB
A4R7	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A4R8	Same as A4R4		
A4R9	RESISTOR, FIXED, COMPOSITION: 47 Ω 5%, 1/4W	CB4705	AB
A4R10	Same as A4R6		
A4R11	Same as A4R7		
A4R12	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A4R13	Same as A4R7		
A4R14	RESISTOR, FIXED, COMPOSITION: 27 Ω 5%, 1/4W	CB2705	AB
A4R15	Same as A4R12		
A4R16	Same as A4R4		
A4R17	Same as A4R14		
A4R18	Same as A4R12		
A4R19	Same as A4R7		
A4R20	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	AB
A4R21	Same as A4R14		
A4R22	Same as A4R12		
A4R23	Same as A4R12		
A4R24	Same as A4R4		
A4R25	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A4R26	RESISTOR, FIXED, COMPOSITION: 1 meg, 5%, 1/4W	CB1055	AB
A4R27	Same as R20		
A4R28	Same as R14		
A4R29	Same as R12		
A4R30	RESISTOR, FIXED, COMPOSITION: 56K, 5%, 1/2W	EB5635	AB
A4R31	RESISTOR, FIXED, COMPOSITION: 75K, 5%, 1/4W	CB7535	AB
A4R32	Same as R31		
A4R33	Same as R7		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4R34	RESISTOR, FIXED, COMPOSITION: 240K, 5%, 1/4W	CB2445	AB
A4R35	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A4R36	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	AB
A4R37	NOT USED		
A4R38	NOT USED		
A4R39	NOT USED		
A4R40	NOT USED		
A4R41	NOT USED		
A4R42	RESISTOR, FIXED, COMPOSITION: 7.5 M, 5%, 1/4W	CB7555	AB
A4R43	RESISTOR, FIXED, COMPOSITION: 51K, 5%, 1/4W	CB5135	AB
A4R44	Same as A4R25		
A4R45	Same as A4R12		
A4R46	RESISTOR, FIXED, COMPOSITION: 3.9K, 5%, 1/4W	CB3925	AB
A4R47	Same as A4R20		
A4R48	Same as A4R20		
A4R49	Same as A4R20		
A4R50	Same as A4R12		
A4R51	Same as A4R12		
A4R52	Same as A4R12		
A4R53	Same as A4R12		
A4R54	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	CB4715	AB
A4R55	Same as A4R36		
A4R56	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A4R57	NOT USED		
A4R58	RESISTOR, FIXED, COMPOSITION: 1 M, 5%, 1/4W	CB1055	AB
A4R59	NOT USED		
A4R60	RESISTOR, FIXED, COMPOSITION: 10 M, 5%, 1/4W	CB1065	AB
A4R61	Same as A4R7		
A4R62	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/2W	EB1025	AB
A4R63	Same as A4R12		
A4R64	RESISTOR, FIXED, COMPOSITION: 68K, 5%, 1/4W	CB6835	AB
A4R65	Same as A4R26		
A4T1	TRANSFORMER	1126-2	CEI
A4TP1	TEST POINT	TJ-6	Taurus
A4V1	TUBE, ELECTRON: Nuvistor tetrode	7587	RCA
A4V2	Same as V1		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4V3	Same as A4V1		
A4V4	Same as A4V1		
A4V5	Same as A4V1		
A4V6	Same as A4V1		
A4V7	Same as A4V1		
A4Y1	CRYSTAL: 21.4 MC (Except must be wire leads)	CR18/U	McCoy

5.4.6 Type 7207 300-kc Bandwidth IF Strip. - Type 701A Receiver Only.

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4C1	CAPACITOR, CERAMIC DISC: 1000 pf, GMV	Type SM	RMC
A4C2	CAPACITOR, CERAMIC DISC: 470 pf, 20%	Type B	RMC
A4C3	Same as A4C1		
A4C4	CAPACITOR, CERAMIC, STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A4C5	CAPACITOR, DIPPED MICA: 15 pf, 5%	DM10-150J	Arco
A4C6	Same as A4C2		
A4C7	CAPACITOR, CERAMIC, TUBULAR: 0.36 pf, 10%	QC	QC
A4C8	CAPACITOR, DIPPED MICA: 10 pf, 5%	DM10-100J	Arco
A4C9	CAPACITOR, DIPPED MICA: 33 pf, 5%	DM10-330J	Arco
A4C10	Same as A4C2		
A4C11	CAPACITOR, DIPPED MICA: 330 pf, 5%	DM15-331J	Arco
A4C12	Same as A4C2		
A4C13	Same as A4C5		
A4C14	Same as A4C7		
A4C15	Same as A4C8		
A4C16	NOT USED		
A4C17	NOT USED		
A4C18	NOT USED		
A4C19	NOT USED		
A4C20	NOT USED		
A4C21	NOT USED		
A4C22	NOT USED		
A4C23	NOT USED		
A4C24	NOT USED		
A4C25	NOT USED		
A4C26	Same as A4C9		
A4C27	Same as A4C2		
A4C28	Same as A4C2		
A4C29	Same as A4C2		
A4C30	Same as A4C4		
A4C31	Same as A4C5		
A4C32	CAPACITOR, CERAMIC, TUBULAR: 0.75 pf, 10%	QC	QC
A4C33	CAPACITOR, DIPPED MICA: 39 pf, 5%	DM10-390J	Arco
A4C34	Same as A4C5		
A4C35	Same as A4C1		

REF DESIG PREFIX A4

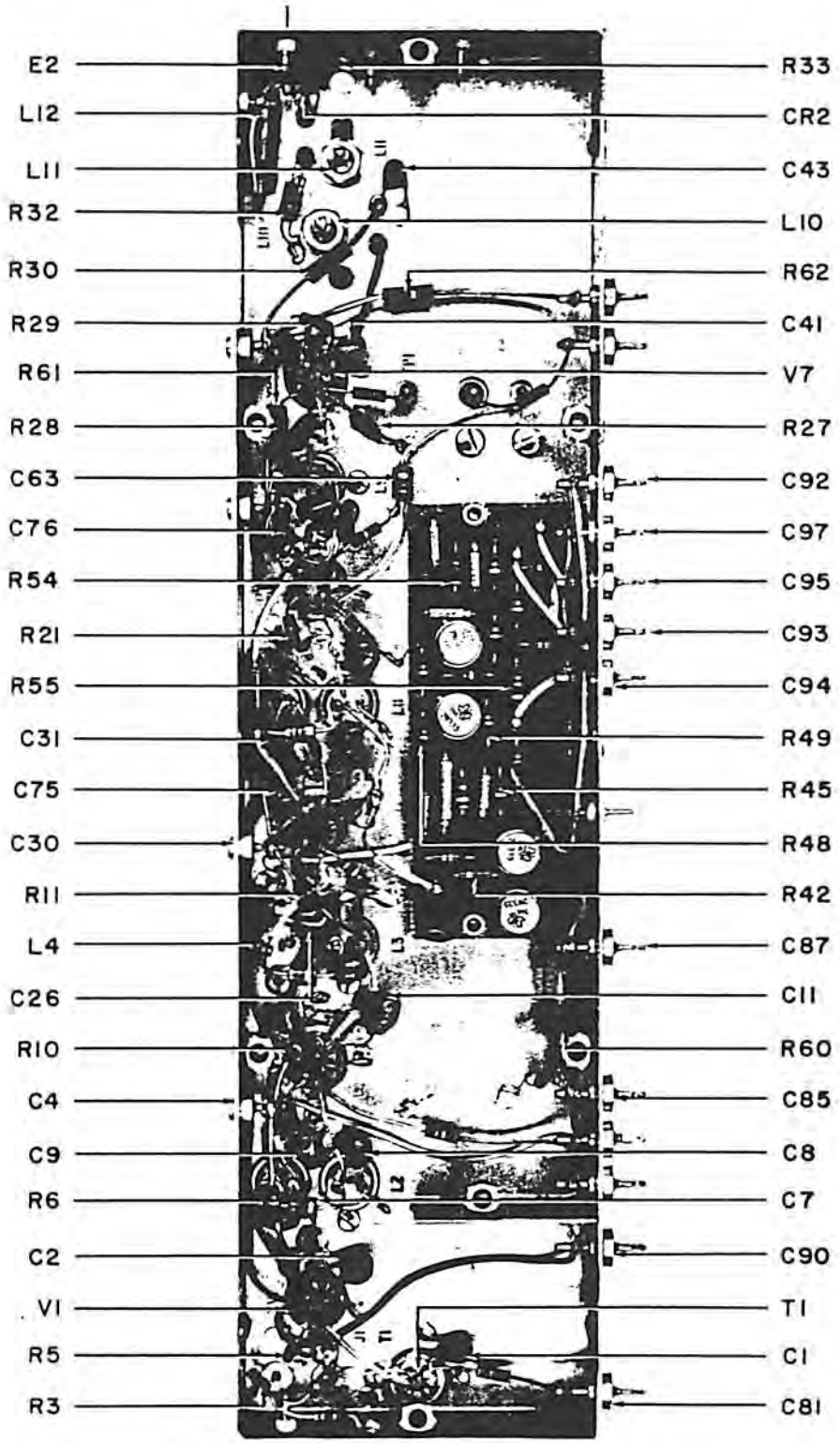


Fig. 5-12. Type 7207 300 kc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4C36	Same as A4C1		
A4C37	NOT USED		
A4C38	Same as A4C4		
A4C39	Same as A4C8		
A4C40	Same as A4C8		
A4C41	Same as A4C1		
A4C42	Same as A4C4		
A4C43	Same as A4C1		
A4C44	CAPACITOR, CERAMIC, TUBULAR: 22 pf, 5%	N150A	Erie
A4C45	CAPACITOR, DIPPED MICA: 22 pf, 5%	DM10-220J	Arco
A4C46	CAPACITOR, CERAMIC, TUBULAR: 10 ± 0.5 pf	301-000-U2J0-100D	Erie
A4C47	CAPACITOR, DIPPED MICA: 100 pf, 5%	DM10-101J	Arco
A4C48	Same as A4C47		
A4C49	Same as A4C9		
A4C50	NOT USED		
A4C51	NOT USED		
A4C52	NOT USED		
A4C53	NOT USED		
A4C54	CAPACITOR, DIPPED MICA: 68 pf, 5%	DM10-680J	Arco
A4C55	NOT USED		
A4C56	CAPACITOR, DIPPED, MICA: 43 pf, 5%	DM10-430J	Arco
A4C57	Same as A4C1		
A4C58	NOT USED		
A4C59	NOT USED		
A4C60	NOT USED		
A4C61	NOT USED		
A4C62	NOT USED		
A4C63	CAPACITOR, CERAMIC, TUBULAR: 3.3 pf, 10%	301-000-C0J0-339C	Erie
A4C64	Same as A4C9		
A4C65	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.1 µf, 20%, 35V	150D104X-0035A2	Sprague
A4C66	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 µf, 20%, 35V	150D105X-0035A2	Sprague
A4C67	CAPACITOR, ELECTROLYTIC, TANTALUM: 10 µf, 20%, 20V	150D106X-0020B2	Sprague
A4C68	Same as A4C66		

REF DESIG PREFIX A4

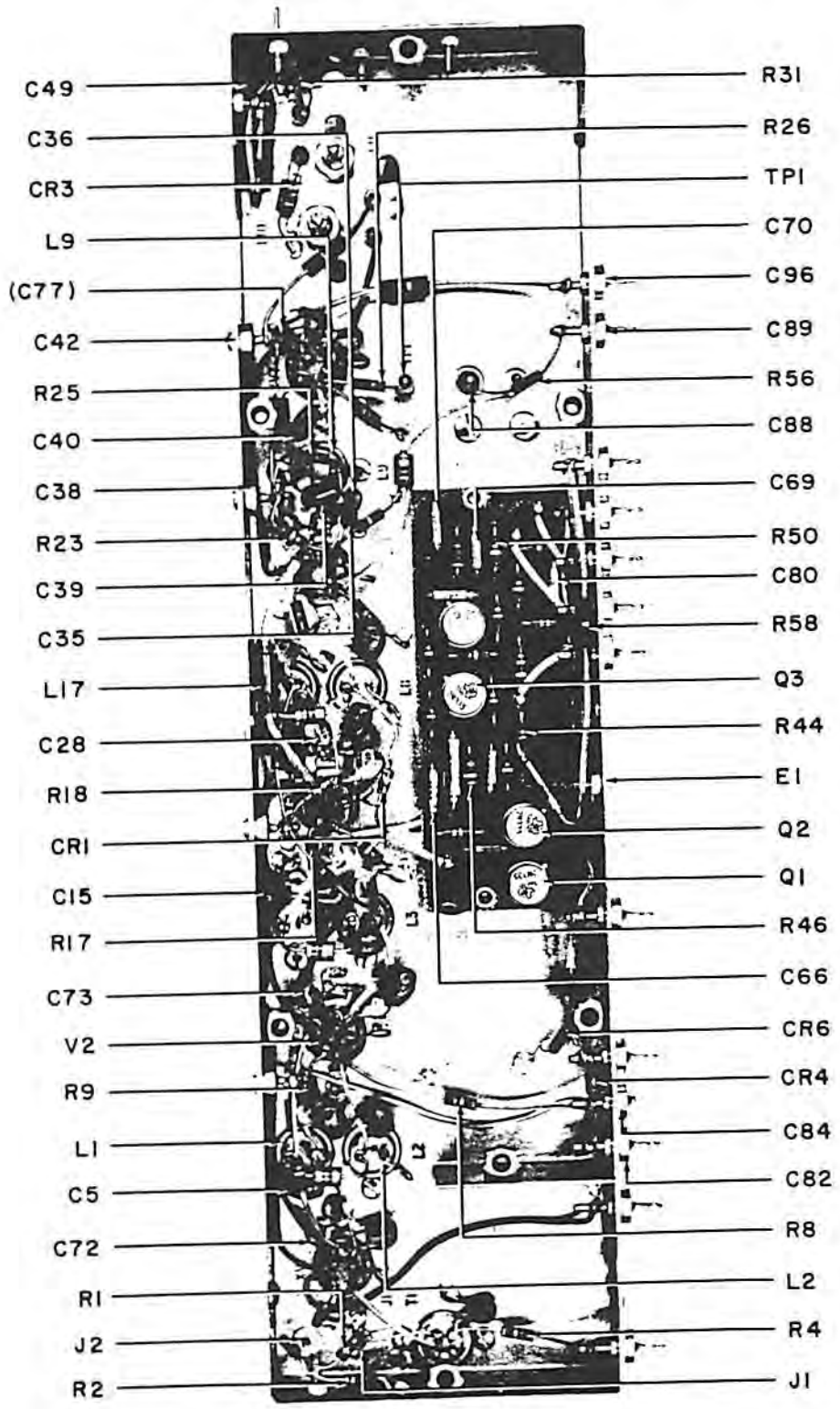


Fig. 5-13. Type 7207 300 kc IF Strip, Converter Alignment

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4C69	Same as A4C65		
A4C70	Same as A4C66		
A4C71	NOT USED		
A4C2	Same as C1		
A4C73	Same as A4C1		
A4C74	NOT USED		
A4C75	Same as A4C1		
A4C76	Same as A4C1		
A4C77	Same as A4C1		
A4C78	NOT USED		
A4C79	NOT USED		
A4C80	Same as C66		
A4C81	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A4C82	Same as A4C81		
A4C83	NOT USED		
A4C84	Same as A4C81		
A4C85	Same as A4C81		
A4C86	NOT USED		
A4C87	Same as A4C81		
A4C88	Same as A4C81		
A4C89	Same as A4C81		
A4C90	Same as A4C81		
A4C91	NOT USED		
A4C92	Same as A4C81		
A4C93	Same as A4C81		
A4C94	Same as A4C81		
A4C95	Same as A4C81		
A4C96	Same as A4C81		
A4C97	Same as A4C81		
A4CR1	DIODE	1N198	Sylvania
A4CR2	Same as A4CR1		
A4CR3	Same as A4CR1		
A4CR4	DIODE, ZENER	IN752A	CD
A4CR5	NOT USED		
A4CR6	DIODE	IN462	CD
A4CR7	Same as A4CR6		

REF DESIG PREFIX A4

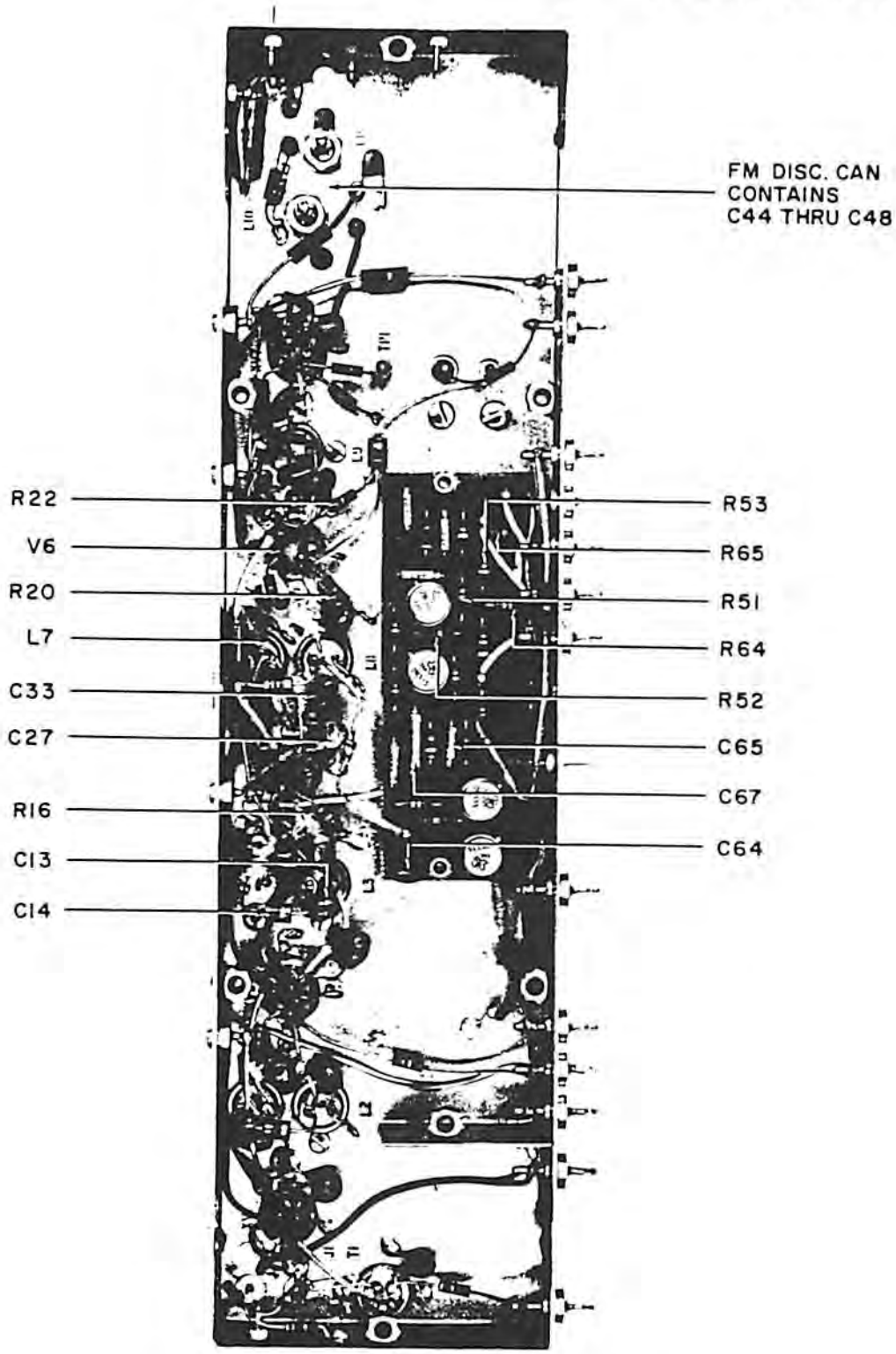


Fig. 5-14. Type 7207 300 kc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4CR8	Same as A4CR6		
A4CR9	DIODE, ZENER:	1N756A	CD
A4CR10	DIODE	1N462	CD
A4CR11	Same as A4CR10		
A4E1	FEEDTHRU, TEFLON	SFU-16	Taurus
A4E2	Same as A4E1		
A4FB1	FERRITE BEAD	56-590-65/4A	Ferroxcube
A4FB2	Same as A4FB1		
A4FB3	Same as A4FB1		
A4FB4	Same as A4FB1		
A4FB5	Same as A4FB1		
A4FB6	Same as A4FB1		
A4J1	RECEPTACLE, JACK: Sub miniature	27-9	FXR
A4J2	Same as A4J1		
A4L1	INDUCTOR, VARIABLE	1472-3	CEI
A4L2	Same as L1		
A4L3	Same as L1		
A4L4	Same as L1		
A4L5	NOT USED		
A4L6	NOT USED		
A4L7	Same as L1		
A4L8	INDUCTOR, VARIABLE	1472-2	CEI
A4L9	Same as L1		
A4L10	INDUCTOR, VARIABLE	2171-12	CEI
A4L11	INDUCTOR, VARIABLE	2171-20	CEI
A4L12	INDUCTOR, FIXED	1131-17	CEI
A4L13	NOT USED		
A4L14	NOT USED		
A4L15	NOT USED		
A4L16	NOT USED		
A4L17	INDUCTOR, FIXED	1131-16	CEI
A4L18	NOT USED		
A4L19	INDUCTOR, FIXED	1131-37	CEI
A4Q1	TRANSISTOR	2N335	TI
A4Q2	Same as Q1		
A4Q3	Same as Q1		

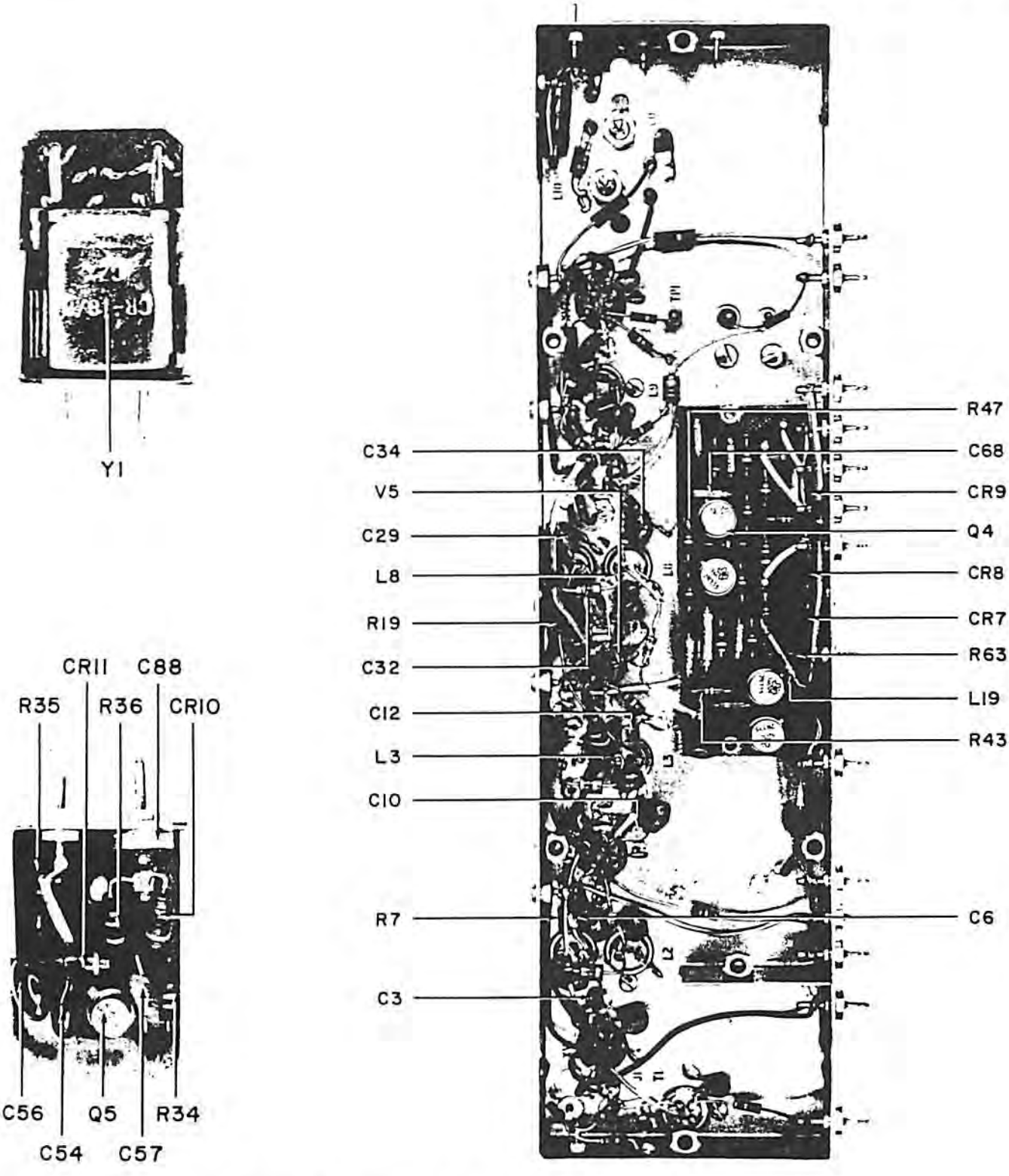


Fig. 5-15 Type 7207 300 kc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4Q4	TRANSISTOR	2N1305	TI
A4Q5	TRANSISTOR	2N706	TI
A4R1	RESISTOR, FIXED, COMPOSITION: 24Ω, 5%, 1/4W	CB2405	AB
A4R2	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	CB3305	AB
A4R3	Same as R1		
A4R4	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A4R5	RESISTOR, FIXED, COMPOSITION: 30Ω, 5%, 1/4W	CB3005	AB
A4R6	RESISTOR, FIXED, COMPOSITION: 110K, 5%, 1/4W	CB1145	AB
A4R7	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A4R8	Same as A4R4		
A4R9	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	CB4705	AB
A4R10	Same as A4R6		
A4R11	Same as A4R7		
A4R12	NOT USED		
A4R13	NOT USED		
A4R14	NOT USED		
A4R15	NOT USED		
A4R16	Same as A4R4		
A4R17	RESISTOR, FIXED, COMPOSITION: 27 Ω, 5%, 1/4W	CB2705	AB
A4R18	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A4R19	Same as A4R7		
A4R20	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	AB
A4R21	Same as A4R17		
A4R22	Same as A4R18		
A4R23	Same as A4R18		
A4R24	NOT USED		
A4R25	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A4R26	RESISTOR, FIXED, COMPOSITION: 1 M, 5%, 1/4W	CB1055	AB
A4R27	Same as R20		
A4R28	Same as R17		
A4R29	Same as R18		
A4R30	RESISTOR, FIXED, COMPOSITION: 56K, 5%, 1/2W	EB5635	AB
A4R31	RESISTOR, FIXED, COMPOSITION: 75K, 5%, 1/4W	CB7535	AB
A4R32	Same as R31		
A4R33	Same as R7		
A4R34	RESISTOR, FIXED, COMPOSITION: 240K, 5%, 1/4W	CB2445	AB

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4R35	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A4R36	RESISTOR, FIXED, COMPOSITION: 47K, 5%, 1/4W	CB4735	AB
A4R37	NOT USED		
A4R38	NOT USED		
A4R39	NOT USED		
A4R40	NOT USED		
A4R41	NOT USED		
A4R42	RESISTOR, FIXED, COMPOSITION: 7.5 M, 5%, 1/4W	CB7555	AB
A4R43	RESISTOR, FIXED, COMPOSITION: 51K, 5%, 1/4W	CB5135	AB
A4R44	Same as A4R25		
A4R45	Same as A4R18		
A4R46	RESISTOR, FIXED, COMPOSITION: 3.9K, 5%, 1/4W	CB3925	AB
A4R47	Same as A4R20		
A4R48	Same as A4R20		
A4R49	Same as A4R20		
A4R50	Same as A4R18		
A4R51	Same as A4R18		
A4R52	Same as A4R18		
A4R53	Same as A4R18		
A4R54	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	CB4715	AB
A4R55	Same as A4R36		
A4R56	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A4R57	NOT USED		
A4R58	RESISTOR, FIXED, COMPOSITION: 1 M, 5%, 1/2W	EB1055	AB
A4R59	NOT USED		
A4R60	RESISTOR, FIXED, COMPOSITION: 10 M, 5%, 1/4W	CB1065	AB
A4R61	Same as A4R7		
A4R62	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/2W	EB1025	AB
A4R63	Same as A4R18		
A4R64	RESISTOR, FIXED, COMPOSITION: 68K, 5%, 1/4W	CB6835	AB
A4R65	Same as A4R26		
A4T1	TRANSFORMER	1126-1	CEI
A4TP1	TEST POINT	TJ-6	Taurus
A4V1	TUBE, ELECTRON: Nuvistor tetrode	7587	RCA
A4V2	Same as A4V1		
A4V3	NOT USED		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A4V4	NOT USED		
A4V5	Same as A4V1		
A4V6	Same as A4V1		
A4V7	Same as A4V1		
A4Y1	CRYSTAL: 21.4 MC (Except must be wire leads)	CR18/U	McCoy

5.4.7 Type 7206 2-mc Bandwidth IF Strip

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A5C1	CAPACITOR, CERAMIC DISC: 0.5 μf, 50V	552C23A1	Sprague
A5C2	CAPACITOR, CERAMIC DISC: 0.01 μf, 200V	4835-000-Z5U0-103M	Erie
A5C3	Same as A5C1		
A5C4	Same as A5C1		
A5C5	CAPACITOR, CERAMIC DISC: 470 pf, 1000 V	Type B	RMC
A5C6	CAPACITOR, CERAMIC, TUBULAR: 1.8 pf ±0.25 pf	301-000-COKO 189C	Erie
A5C7	CAPACITOR, DIPPED MICA: 10 pf, 5%, 500V	DM10-100J	Arco
A5C8	Same as A5C2		
A5C9	Same as A5C1		
A5C10	Same as A5C1		
A5C11	CAPACITOR, CERAMIC, STANDOFF: 1000 pf, GMV	SS5A-102W	AB
A5C12	CAPACITOR, CERAMIC, TUBULAR: 1.5 pf, ±0.25 pf	301-000-COKO 159C	Erie
A5C13	Same as A5C5		
A5C14	Same as A5C7		
A5C15	Same as A5C2		
A5C16	Same as A5C1		
A5C17	Same as A5C1		
A5C18	Same as A5C5		
A5C19	Same as A5C11		
A5C20	CAPACITOR, CERAMIC, TUBULAR: 2.2 pf, ±0.25 pf	301-000-COJO 229C	Erie
A5C21	Same as A5C7		
A5C22	Same as A5C7		
A5C23	Same as A5C1		
A5C24	Same as A5C11		
A5C25	Same as A5C11		
A5C26	Same as A5C7		
A5C27	Same as A5C1		
A5C28	CAPACITOR, CERAMIC, TUBULAR: 2.7 pf ± 0.25 pf	301-000-COJO 279C	Erie
A5C29	Same as A5C1		
A5C30	Same as A5C11		
A5C31	Same as A5C28		
A5C32	CAPACITOR, DIPPED MICA: 18 pf, 5%, 500V	DM10-180J	Arco
A5C33	Same as A5C32		

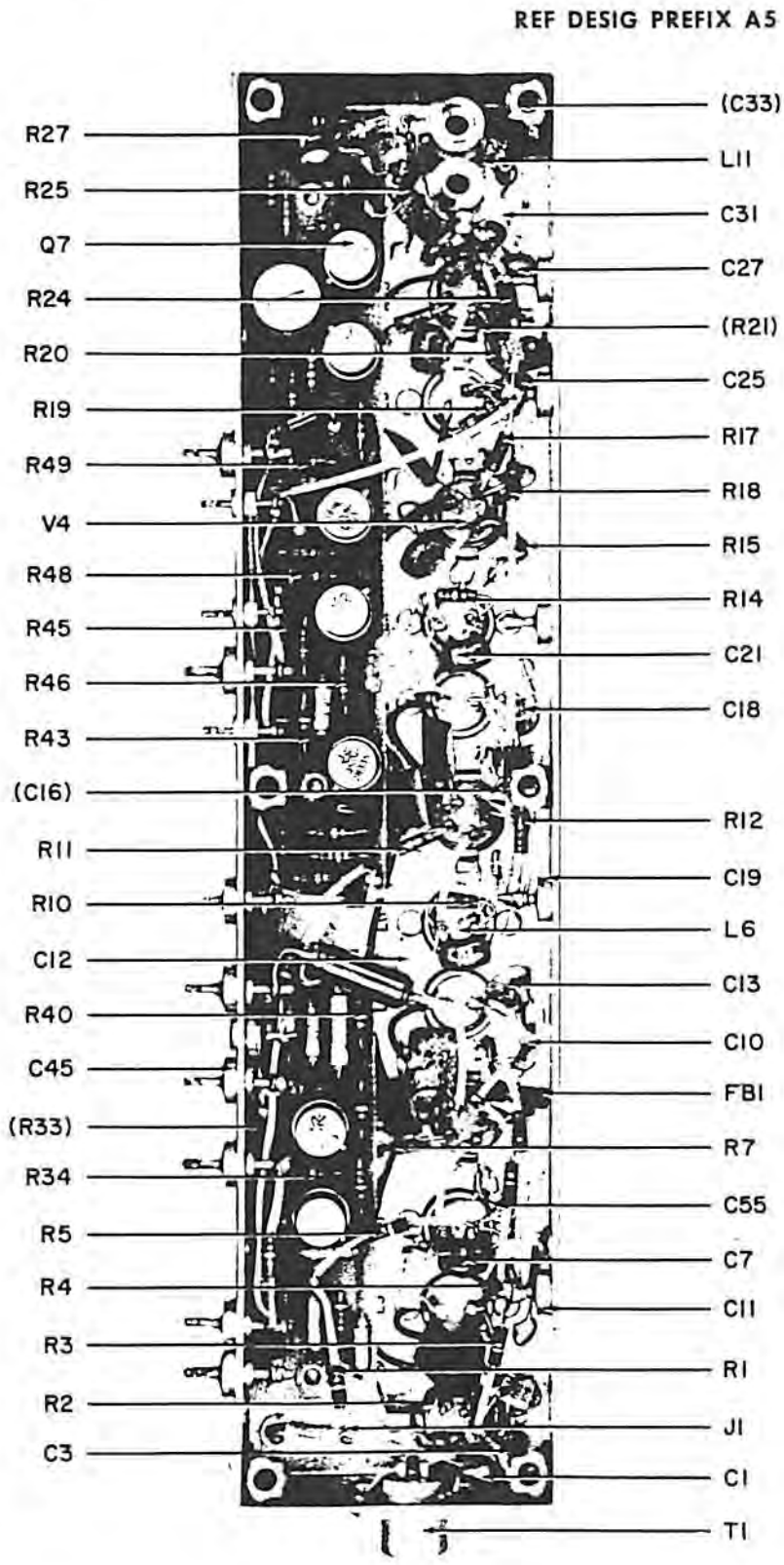


Fig. 5-16. Type 7206 2 mc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A5C34	Same as A5C1		
A5C35	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pf, GMV	FA5C-102W	AB
A5C36	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μf, 20%, 35V	150D105X-0035A2	Sprague
A5C37	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.1 μf, 20%, 35V	150D104X-0035A2	Sprague
A5C38	CAPACITOR, ELECTROLYTIC, TANTALUM: 10 μf, 20%, 20V	150D106X-0020B2	Sprague
A5C39	Same as A5C36		
A5C40	Same as A5C37		
A5C41	Same as A5C36		
A5C42	Same as A5C35		
A5C43	CAPACITOR, DIPPED MICA: 33pf, 5%, 500V	DM10-330J	Arco
A5C44	Same as A5C36		
A5C45	Same as A5C35		
A5C46	Same as A5C35		
A5C47	Same as A5C35		
A5C48	Same as A5C7		
A5C49	Same as A5C2		
A5C50	Same as A5C2		
A5C51	Same as A5C2		
A5C52	Same as A5C2		
A5C53	Same as A5C35		
A5C54	Same as A5C35		
A5C55	Same as A5C1		
A5C56	NOT USED		
A5C57	Same as A5C35		
A5C58	Same as A5C11		
A5CR1	DIODE	IN198A	Sylvania
A5CR2	Same as A5CR1		
A5CR3	Same as A5CR1		
A5CR4	DIODE, ZENER	IN759A	CD
A5E1	FEEDTHRU, TEFLON	SFU-16	Taurus
A5E2	Same as A5E1		
A5E3	Same as A5EI		

REF DESIG PREFIX A5

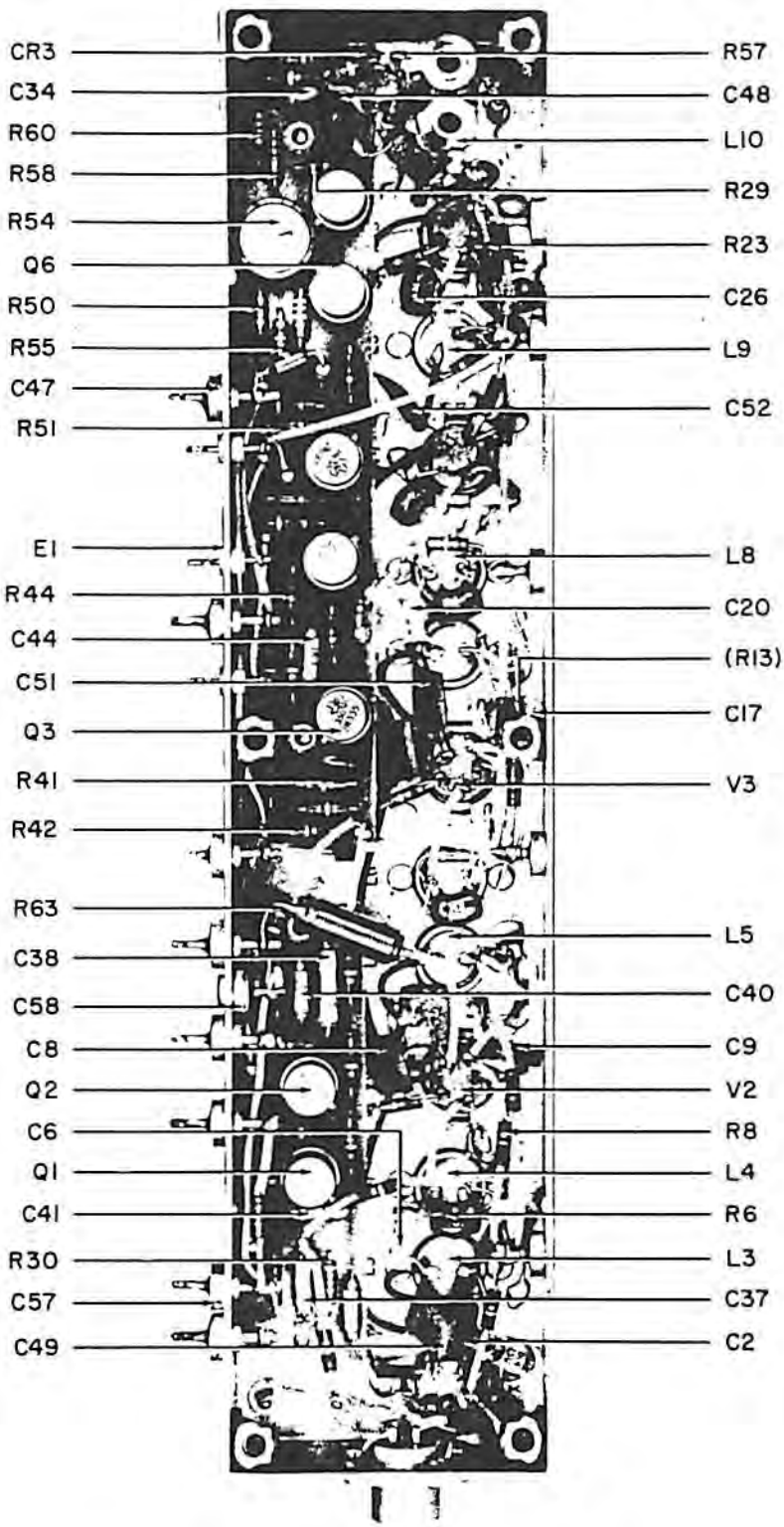


Fig. 5-17. Type 7206 2 mc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A5FB1	FERRITE BEAD	56-590-65/4A	Ferroxcube
A5FB2	Same as FB1		
A5J1	RECEPTACLE, JACK: Sub-miniature	27-9	FXR
A5J2	Same as J1		
A5L1	NOT USED		
A5L2	NOT USED		
A5L3	COIL, VARIABLE	1472-4	CEI
A5L4	COIL, VARIABLE	1472-3	CEI
A5L5	Same as A5L3		
A5L6	Same as A5L4		
A5L7	Same as A5L3		
A5L8	Same as A5L4		
A5L9	Same as A5L3		
A5L10	COIL, VARIABLE	1588	CEI
A5L11	COIL, FIXED	1974	CEI
A5L12	COIL, VARIABLE	1588-2	CEI
A5L13	COIL, FIXED	1131-5	CEI
A5L14	COIL, FIXED	1131-29	CEI
A5L15	COIL FIXED	1131-37	CEI
A5L16	Same as L15		
A5Q1	TRANSISTOR	2N1305	TI
A5Q2	TRANSISTOR	2N335	TI
A5Q3	Same as A5Q2		
A5Q4	TRANSISTOR	2N697	TI
A5Q5	Same as A5Q4		
A5Q6	Same as A5Q2		
A5Q7	Same as A5Q2		
A5R1	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A5R2	RESISTOR, FIXED, COMPOSITION: 100Ω, 5%, 1/4W	CB1015	AB
A5R3	RESISTOR, FIXED, COMPOSITION: 82K, 5%, 1/4W	CB8235	AB
A5R4	RESISTOR, FIXED, COMPOSITION: 1K, 5%, 1/4W	CB1025	AB
A5R5	Same as A5R1		
A5R6	RESISTOR, FIXED, COMPOSITION: 5.1K, 5%, 1/4W	CB5125	AB
A5R7	Same as A5R2		
A5R8	Same as A5R3		
A5R9	Same as A5R4		
A5R10	Same as A5R6		

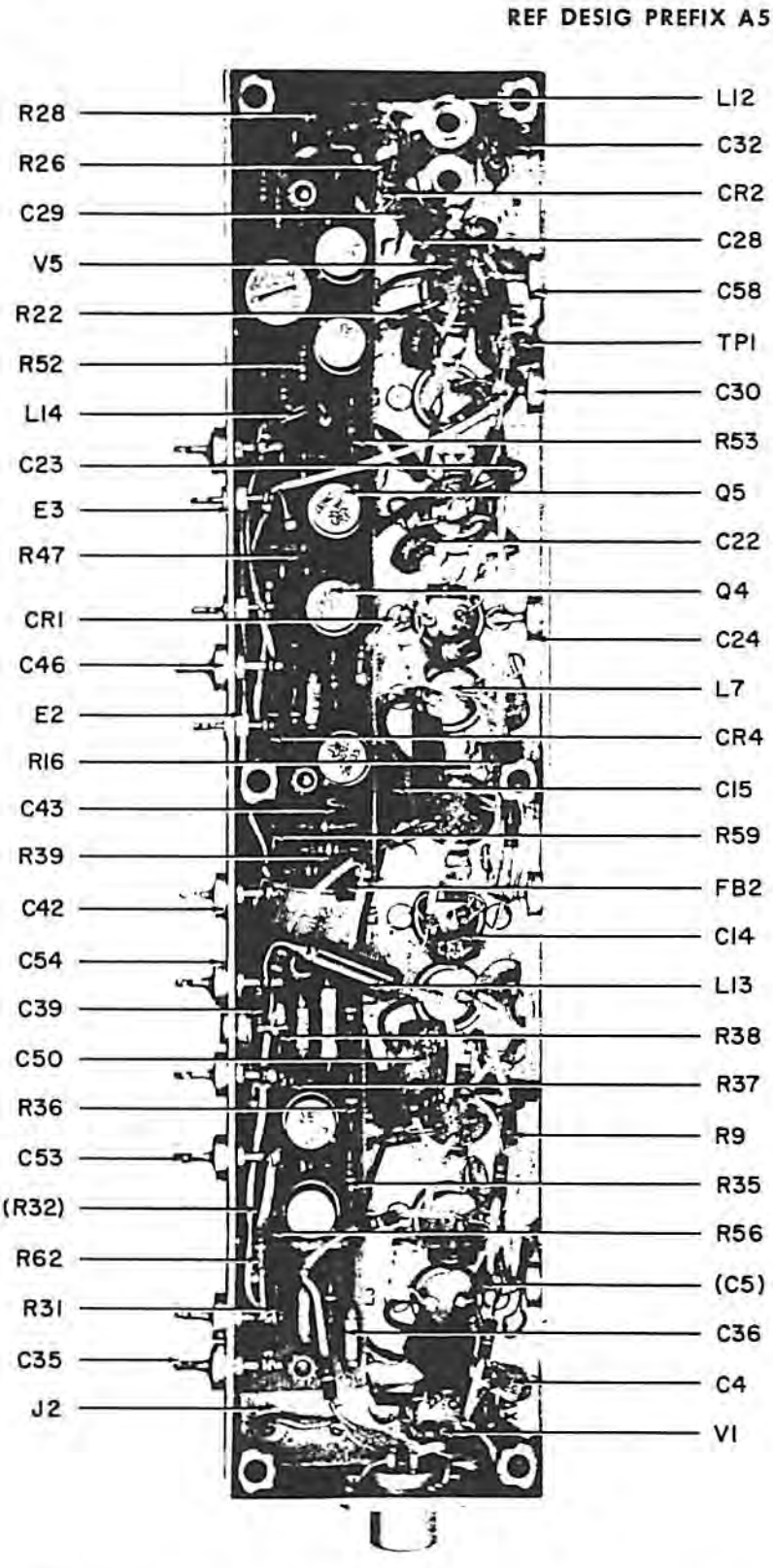


Fig. 5-18. Type 7206 2 mc IF Strip, Component Locations

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A5R11	Same as A5R2		
A5R12	RESISTOR, FIXED, COMPOSITION: 68K, 5%, 1/4W	CB6835	AB
A5R13	Same as A5R4		
A5R14	RESISTOR, FIXED, COMPOSITION: 11K, 5%, 1/4W	CB1135	AB
A5R15	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A5R16	Same as A5R4		
A5R17	Same as A5R4		
A5R18	Same as A5R4		
A5R19	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/4W	CB4725	AB
A5R20	RESISTOR, FIXED, COMPOSITION: 1 meg, 5%, 1/4W	CB1055	AB
A5R21	Same as A5R15		
A5R22	RESISTOR, FIXED, COMPOSITION: 30Ω, 5%, 1/4W	CB3005	AB
A5R23	Same as A5R4		
A5R24	Same as A5R4		
A5R25	RESISTOR, FIXED, COMPOSITION: 27K, 5%, 1/4W	CB2735	AB
A5R26	Same as A5R25		
A5R27	Same as A5R1		
A5R28	RESISTOR, FIXED, COMPOSITION: 18K, 5%, 1/4W	CB1835	AB
A5R29	RESISTOR, FIXED, COMPOSITION: 5.6 meg, 5%, 1/4	CB5655	AB
A5R30	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	CB4715	AB
A5R31	Same as A5R1		
A5R32	Same as A5R1		
A5R33	RESISTOR, FIXED, COMPOSITION: 47K, 5% 1/4W	CB4735	AB
A5R34	Same as A5R1		
A5R35	RESISTOR, FIXED, COMPOSITION: 16K, 5% 1/4W	CB1635	AB
A5R36	RESISTOR, FIXED, COMPOSITION: 22K, 5%, 1/4W	CB2235	AB
A5R37	Same as A5R36		
A5R38	RESISTOR, FIXED, COMPOSITION: 3.9K, 5%, 1/4W	CB3925	AB
A5R39	RESISTOR, FIXED, COMPOSITION: 180K, 5%, 1/4W	CB1845	AB
A5R40	Same as A5R1		
A5R41	Same as A5R15		
A5R42	Same as A5R15		
A5R43	Same as A5R15		
A5R44	RESISTOR, FIXED, COMPOSITION: 2.2K, 5%, 1/4W	CB2225	AB
A5R45	RESISTOR, FIXED, COMPOSITION: 33K, 5%, 1/4W	CB3335	AB
A5R46	Same as A5R2		

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A5R47	RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W	CB2715	AB
A5R48	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	CB4705	AB
A5R49	Same as A5R48		
A5R50	Same as A5R2		
A5R51	Same as A5R47		
A5R52	Same as A5R45		
A5R53	Same as A5R2		
A5R54	RESISTOR, VARIABLE, TRIMMER: 10K, 5%, 1W	CT100	IRC
A5R55	Same as A5R15		
A5R56	Same as A5R1		
A5R57	RESISTOR, FIXED, COMPOSITION: 8.2K, 5%, 1/4W	CB8225	AB
A5R58	Same as A5R44		
A5R59	RESISTOR, FIXED, COMPOSITION: 5.6K, 5%, 1/4W	CB5625	AB
A5R60	Same as A5R45		
A5R61	NOT USED		
A5R62	Same as A5R39		
A5R63	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A5T1	TRANSFORMER	1126-1	CEI
A5TP1	TEST POINT	TJ-6	Taurus
A5V1	TUBE, ELECTRON: Nuvistor tetrode	7587	RCA
A5V2	Same as A5V1		
A5V3	Same as A5V1		
A5V4	Same as A5V1		
A5V5	Same as A5V1		

5.4.8 Type 7300A Video Amplifier

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A6C1	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.47 µf, 10%, 35V	150D474X-9035A2	Sprague
A6C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 4.7 µf, 20%, 35V	150D475X-0035B2	Sprague
A6CR1	DIODE	1N462A	CD
A6Q1	TRANSISTOR	2N697	TI
A6Q2	Same as A6Q1		
A6Q3	TRANSISTOR	2N1131	TI
A6Q4	Same as A6Q1		
A6R1	RESISTOR, FIXED, COMPOSITION: 7.5M, 5%, 1/4W	CB7555	AB
A6R2	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A6R3	RESISTOR, FIXED, COMPOSITION: 8.2K, 5%, 1/4W	CB8225	A-B
A6R4	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A6R5	RESISTOR, FIXED, COMPOSITION: 2M, 5%, 1/4W	CB2055	AB
A6R6	RESISTOR, FIXED, COMPOSITION: 240K, 5%, 1/4W	CB2445	AB
A6R7	RESISTOR, FIXED, COMPOSITION: 15K, 5%, 1/4W	CB1535	AB
A6R8	RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/4W	CB8215	AB
A6R9	RESISTOR, FIXED, COMPOSITION: 2K, 5%, 1/4W	CB2025	AB
A6R10	RESISTOR, FIXED, COMPOSITION: 200 Ω, 5%, 1/4W	CB2015	AB
A6R11	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	CB1015	AB
A6R12	Same as A6R4		

REF DESIG PREFIX A6

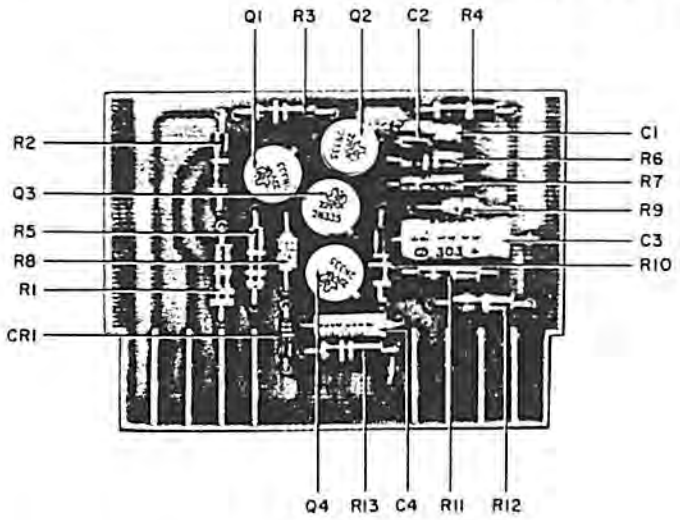


Fig. 5-19. Type 7300A Video Amplifier, Component Locations

5.4.9 Type 7400B Audio Amplifier

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A7C1	CAPACITOR, ELECTROLYTIC TANTALUM: 0.47 µf, 20%, 35V	150D474X-0035A2	Sprague
A7C2	CAPACITOR, ELECTROLYTIC TANTALUM: 10 µf, 20%, 20V	150D106X-0020B2	Sprague
A7CR1	DIODE, ZENER	IN759A	CD
A7Q1	TRANSISTOR, SILICON	2N929	TI
A7Q2	TRANSISTOR, SILICON	2N2270	RCA
A7Q3	Same as A7Q2		
A7R1	RESISTOR, FIXED, COMPOSITION: 10K, 5%, 1/4W	CB1035	AB
A7R2	RESISTOR, FIXED, CARBON FILM: 75K, 1%, 1/8W	RN60B7502F	TI
A7R3	RESISTOR, FIXED, CARBON FILM: 10K, 1%, 1/8W	RN60B1002F	TI
A7R4	RESISTOR, FIXED, CARBON FILM: 6.81K, 1%, 1/8W	RN60B6811F	TI
A7R5	RESISTOR, FIXED, CARBON FILM: 619 Ω, 1%, 1/8W	RN60B6190F	TI
A7R6	RESISTOR, FIXED, COMPOSITION: 3.9K, 5%, 1/4W	CB3925	AB
A7R7	RESISTOR, FIXED, COMPOSITION: 100K, 5%, 1/4W	CB1045	AB
A7R8	RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/4W	CB8215	AB
A7R9	RESISTOR, FIXED, COMPOSITION: 620 Ω, 5%, 1/4W	CB6215	AB
A7R10	RESISTOR, FIXED, CARBON FILM: 68.1 Ω, 1%, 1/8W	RN60B68R1F	TI
A7RA1	RADIATOR, TRANSISTOR	NF207	Wakefield
A7T1	TRANSFORMER: Audio output	1170	CEI

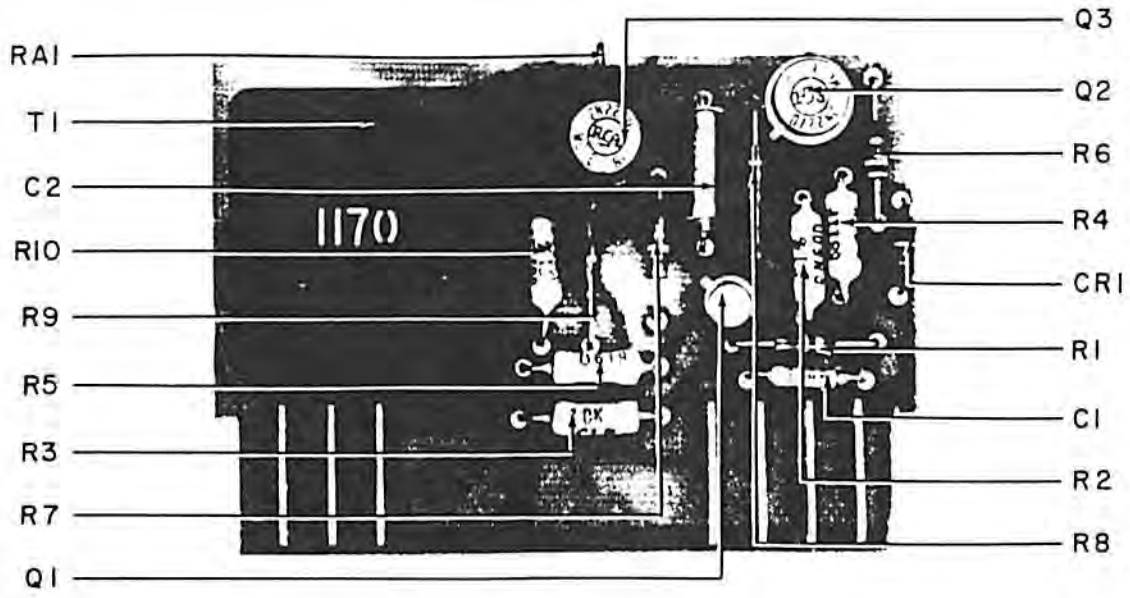


Fig. 5-20. Type 7400B Audio Amplifier, Component Locations

5.4.10 Type 7500A COR Amplifier

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A8C1	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.1 μf, 10%, 35V	150D104X-9035A2	Sprague
A8C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μf, 20%, 35V	150D105X-0035A2	Sprague
A8C3	CAPACITOR, ELECTROLYTIC: 100 μf, 50V	APD-127	IEI
A8CR1	DIODE, SILICON	IN462	CD
A8CR2	Same as A8CR1		
A8CR3	Same as A8CR1		
A8CR4	Same as A8CR1		
A8CR5	Same as A8CR1		
A8Q1	TRANSISTOR, SILICON	2N335	TI
A8Q2	Same as A8Q1		
A8Q3	TRANSISTOR, SILICON	2N697	TI
A8R1	RESISTOR, FIXED, COMPOSITION: 470K, 5%, 1/4W	CB4745	AB
A8R2	RESISTOR, FIXED, COMPOSITION: 20K, 5% 1/4W	CB2035	AB
A8R3	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/4W	CB4725	AB
A8R4	RESISTOR, FIXED, COMPOSITION: 6.2K, 5%, 1/4W	CB6225	AB
A8R5	RESISTOR, FIXED, COMPOSITION: 10K, 5% 1/4W	CB6225	AB
A8R6	RESISTOR, FIXED, COMPOSITION: 1.2K, 5%, 1/4W	CB1225	AB

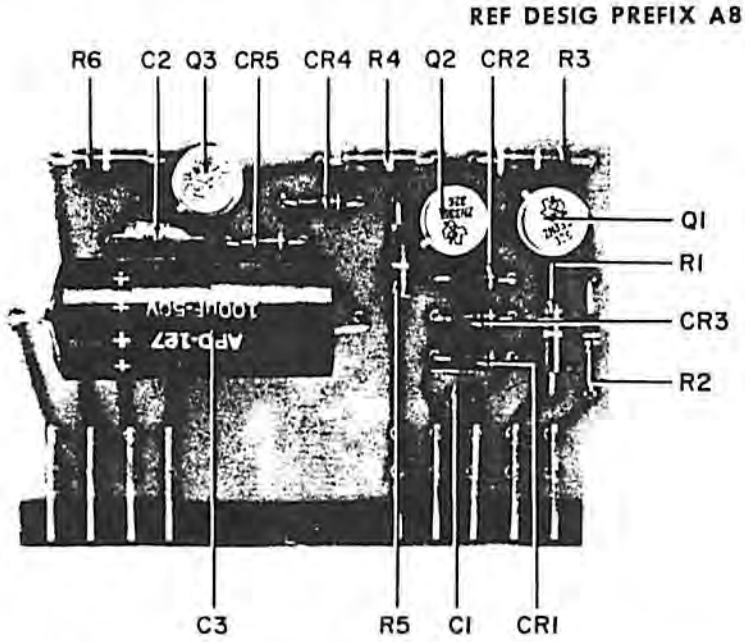


Fig. 5-21. Type 7500 COR Amplifier, Component Locations

REF DESIG PREFIX A9

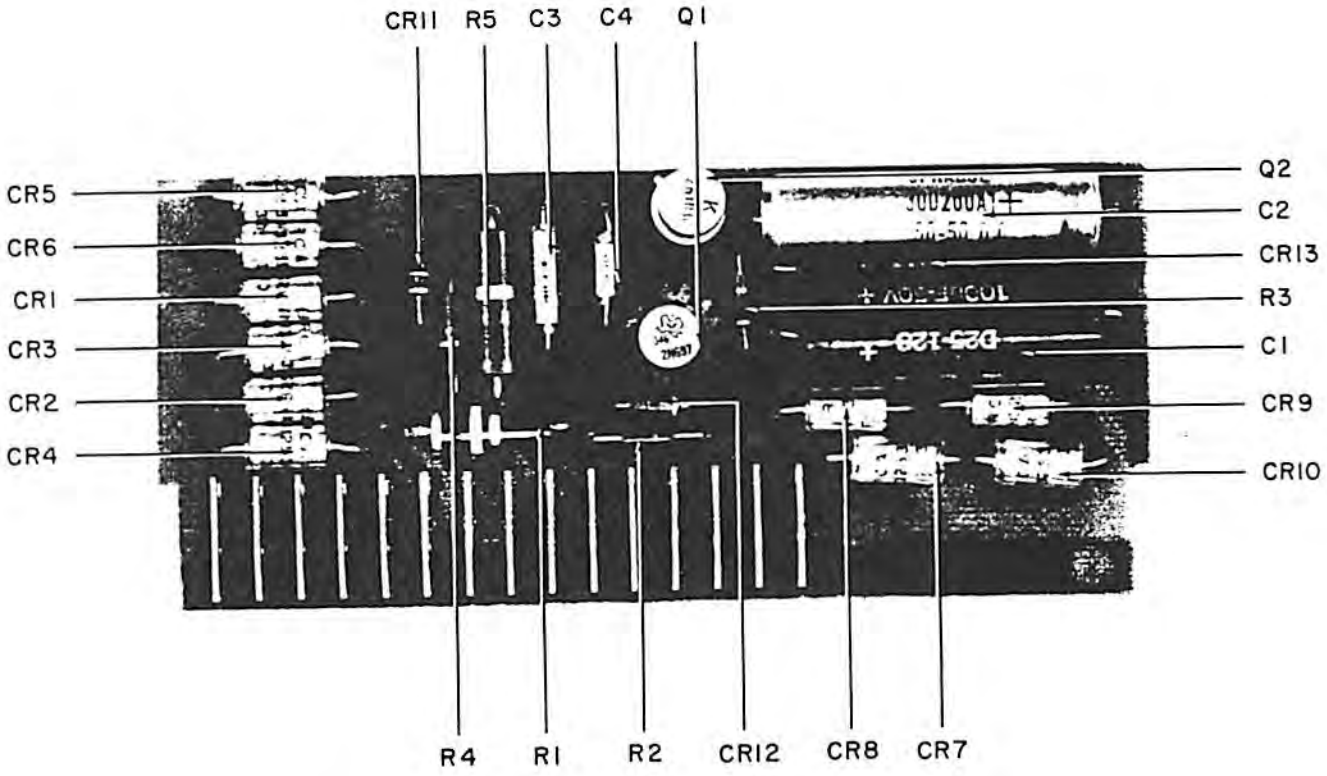


Fig. 5-22. Type 7602 Power Supply, Component Locations

5.4.11 Type 7602 Power Supply

Ref. Desig.	Description	Vendor Part No.	Vendor Name
A9C1	CAPACITOR, ELECTROLYTIC: 100 μf, 50V	APD-127	IEI
A9C2	CAPACITOR, ELECTROLYTIC: 50 μf, 50V	30D506GO-50DH4	Sprague
A9C3	CAPACITOR, ELECTROLYTIC: 4.7 μf, 20%, 35V	150D475X-0035A2	Sprague
A9C4	CAPACITOR, ELECTROLYTIC: 1.0 μf, 20%, 35V	150D105X-0035A2	Sprague
A9CR1	DIODE, SILICON, RECTIFIER	IN3253	RCA
A9CR2	Same as A9CR1		
A9CR3	Same as A9CR1		
A9CR4	Same as A9CR1		
A9CR5	DIODE, SILICON, RECTIFIER	IN3255	RCA
A9CR6	Same as A9CR5		
A9CR7	Same as A9CR1		
A9CR8	Same as A9CR1		
A9CR9	Same as A9CR1		
A9CR10	Same as A9CR1		
A9CR11	DIODE, ZENER	IN979A	CD
A9CR12	DIODE, ZENER	IN970A	CD
A9CR13	Same as A9CR12		
A9Q1	TRANSISTOR	2N2270	TI
A9Q2	TRANSISTOR	2N1038	RCA
A9R1	RESISTOR, FIXED, COMPOSITION: 100 K, 5%, 1W	GB1045	AB
A9R2	RESISTOR, FIXED, COMPOSITION: 2.2K, 5%, 1/4W	CB2225	AB
A9R3	RESISTOR, FIXED, COMPOSITION: 4.7K, 5%, 1/4W	CB4725	AB
A9R4	RESISTOR, FIXED, COMPOSITION: 75 K, 5%, 1/2W	EB7535	AB
A9R5	RESISTOR, FIXED, COMPOSITION: 1 K, 5%, 2W	HB1025	AB

SECTION VI

SCHEMATIC DIAGRAMS

REF DESIG PREFIX A1

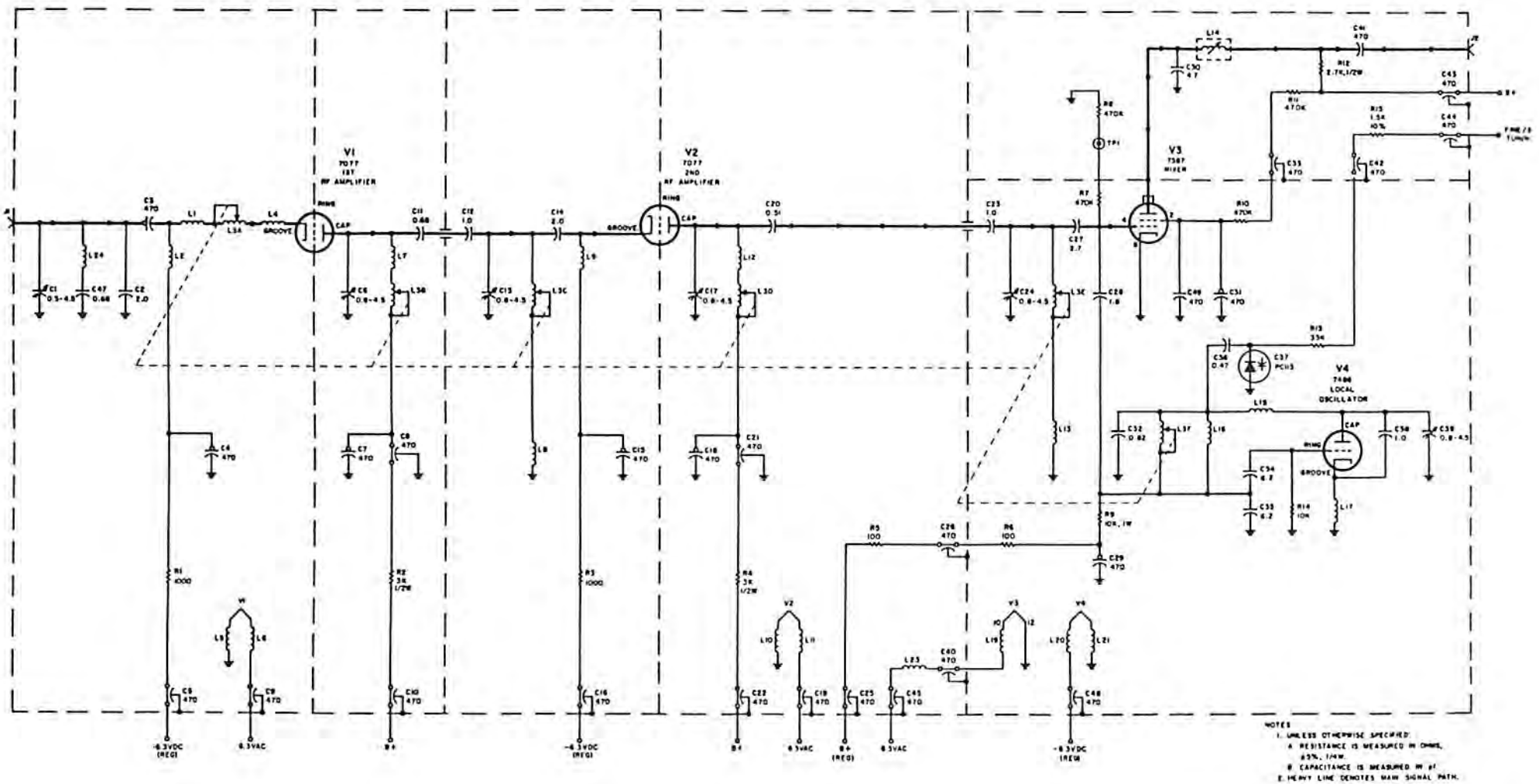
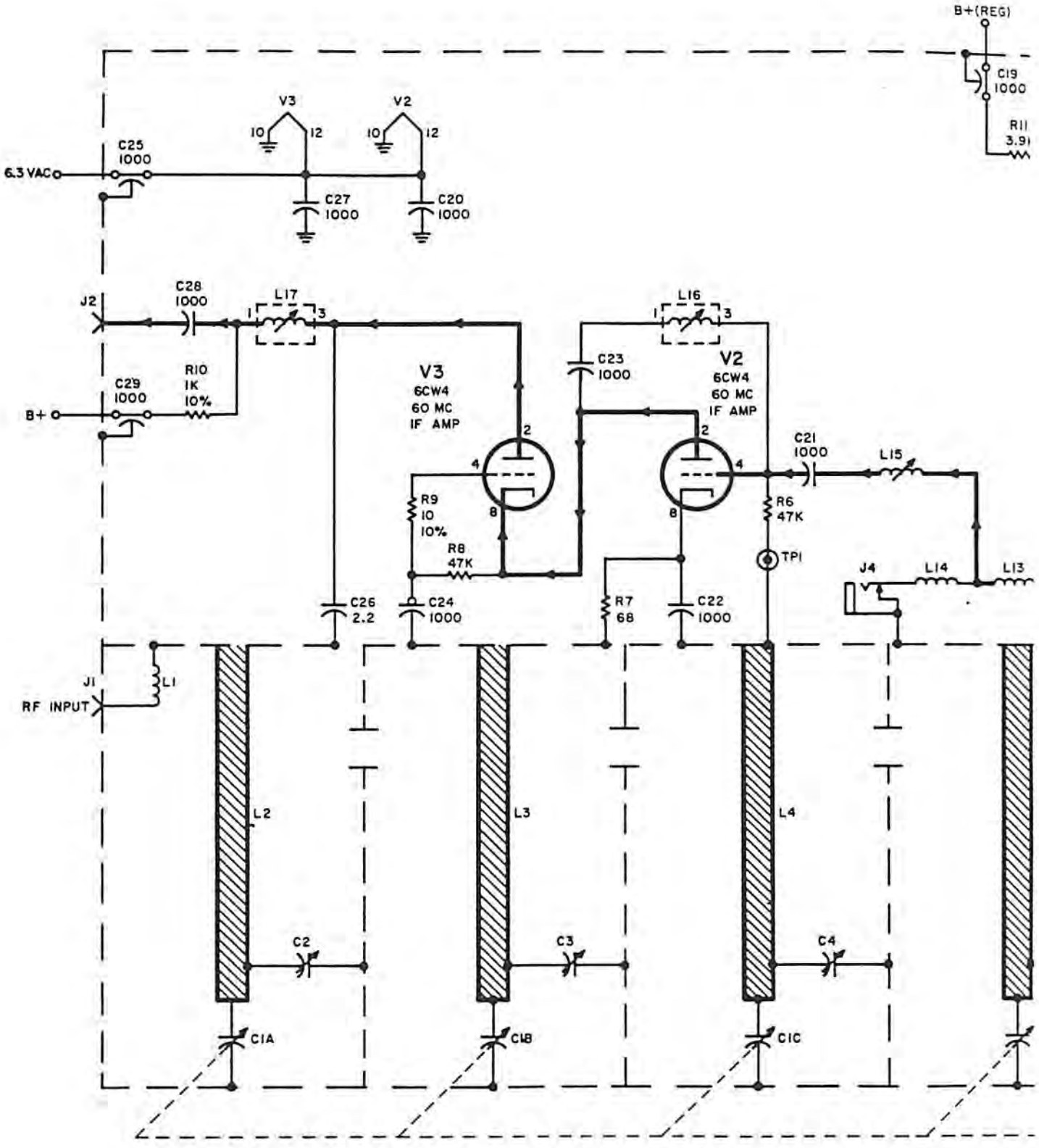


Fig. 6-1. Type 7104 235-500 mc Tuner, Schematic Diagram



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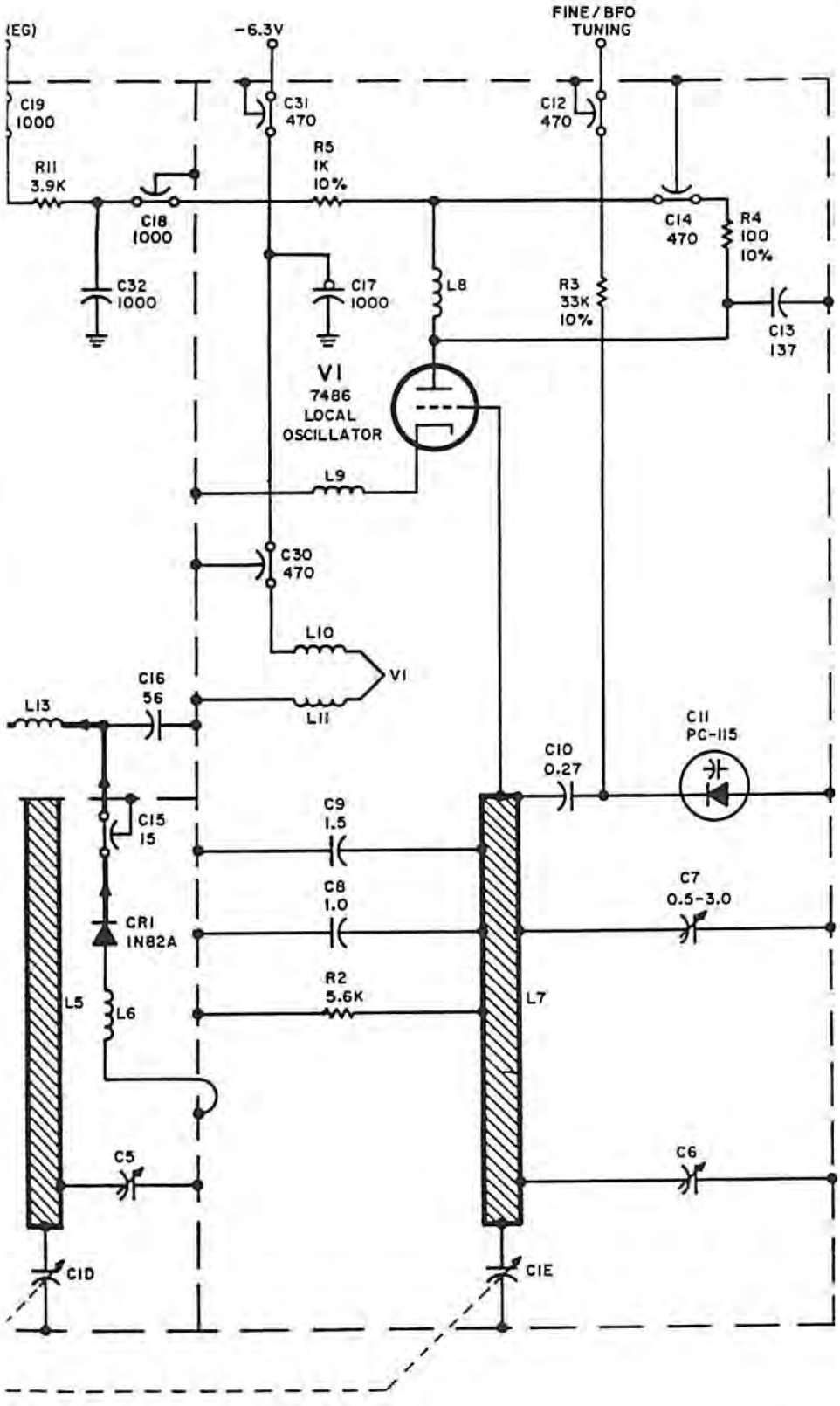
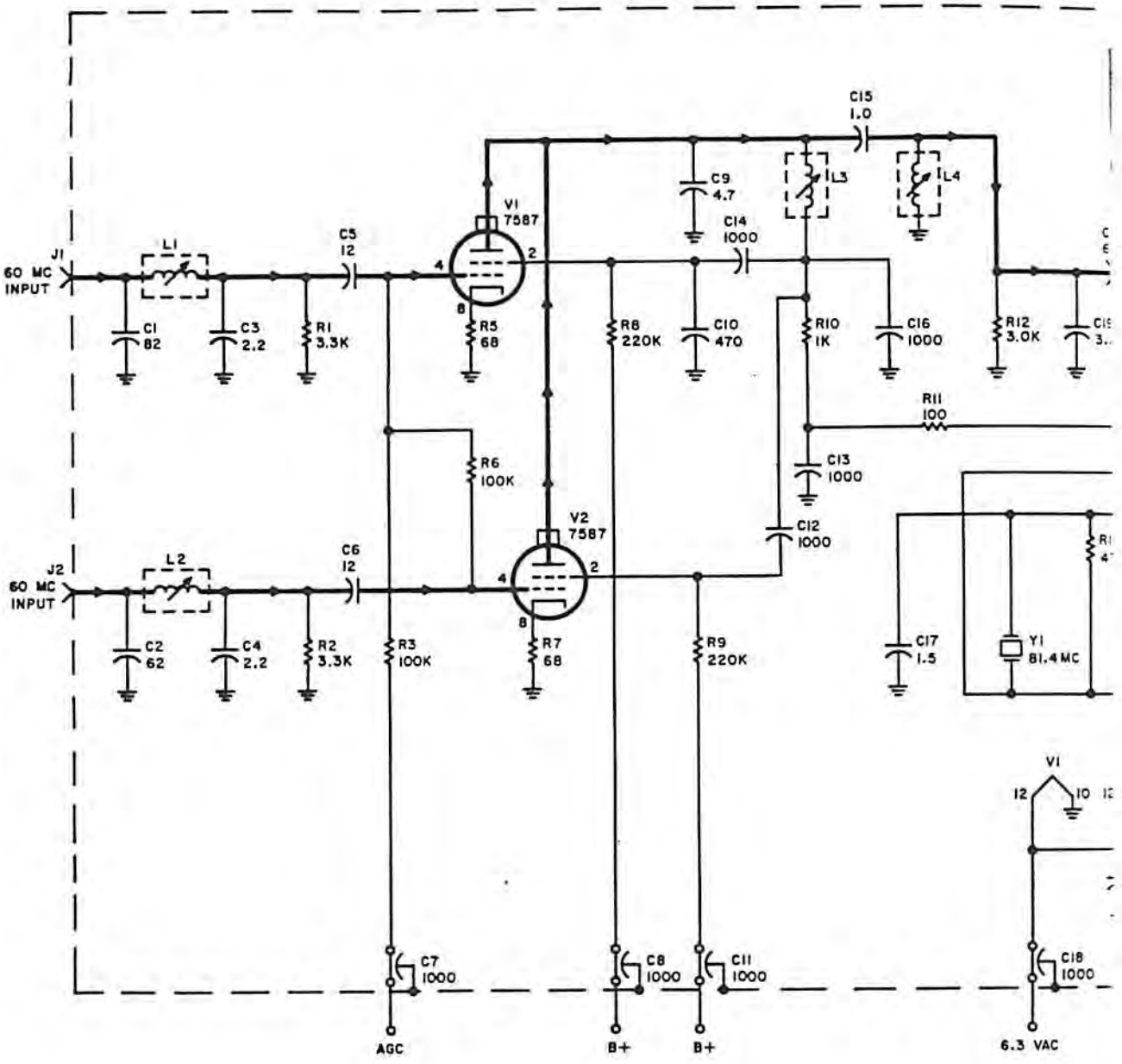


NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   B. CAPACITANCE IS MEASURED IN pf.
2. HEAVY LINE DENOTES MAIN SIGNAL PATH.

Fig. 6-2. Type 7105 490-1000 mc Tuner, Schematic Diagram



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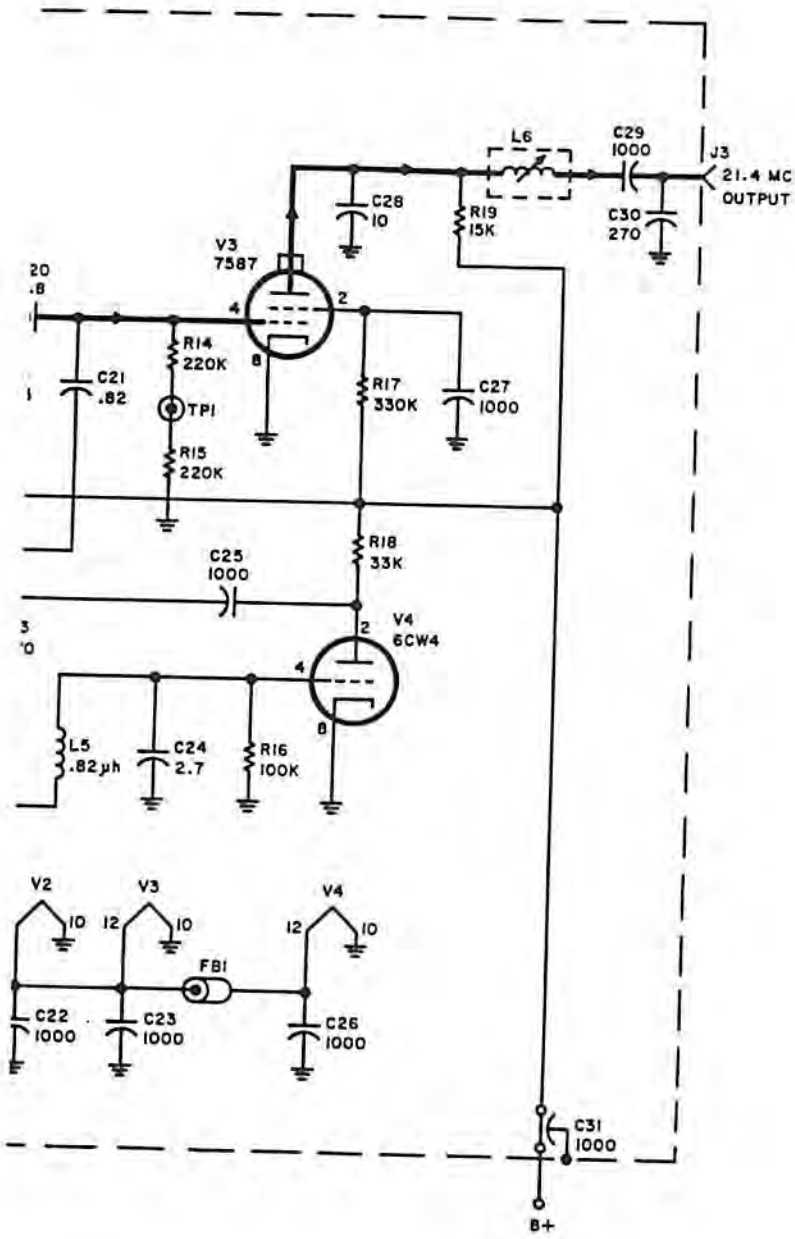
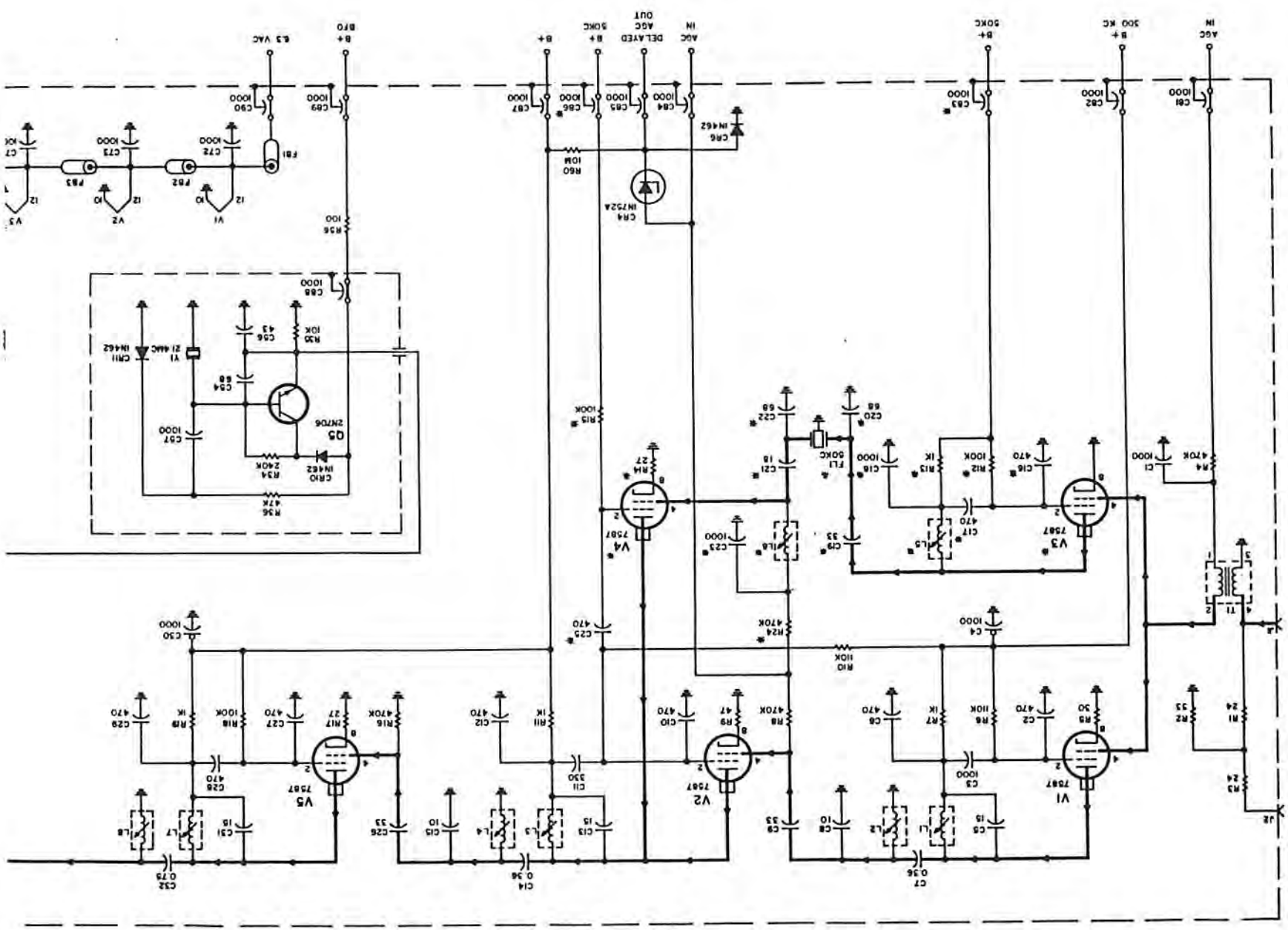


NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) ALL RESISTORS ARE IN OHM ±5%, 1/4W.
   b) ALL CAPACITORS ARE IN pf.
2. HEAVY LINE DENOTES MAIN SIGNAL PATH.

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



REF DESIG PREFIX A4

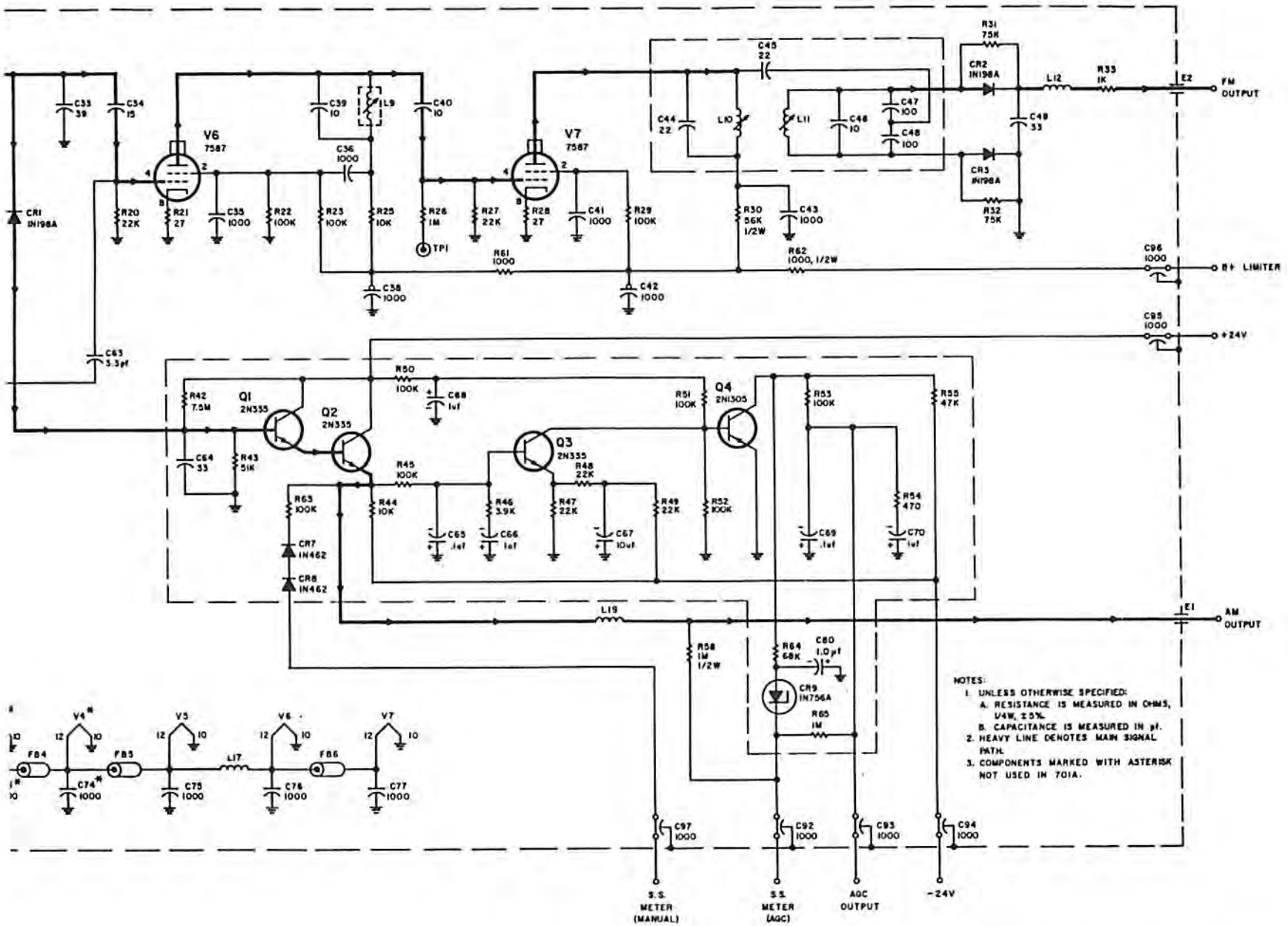
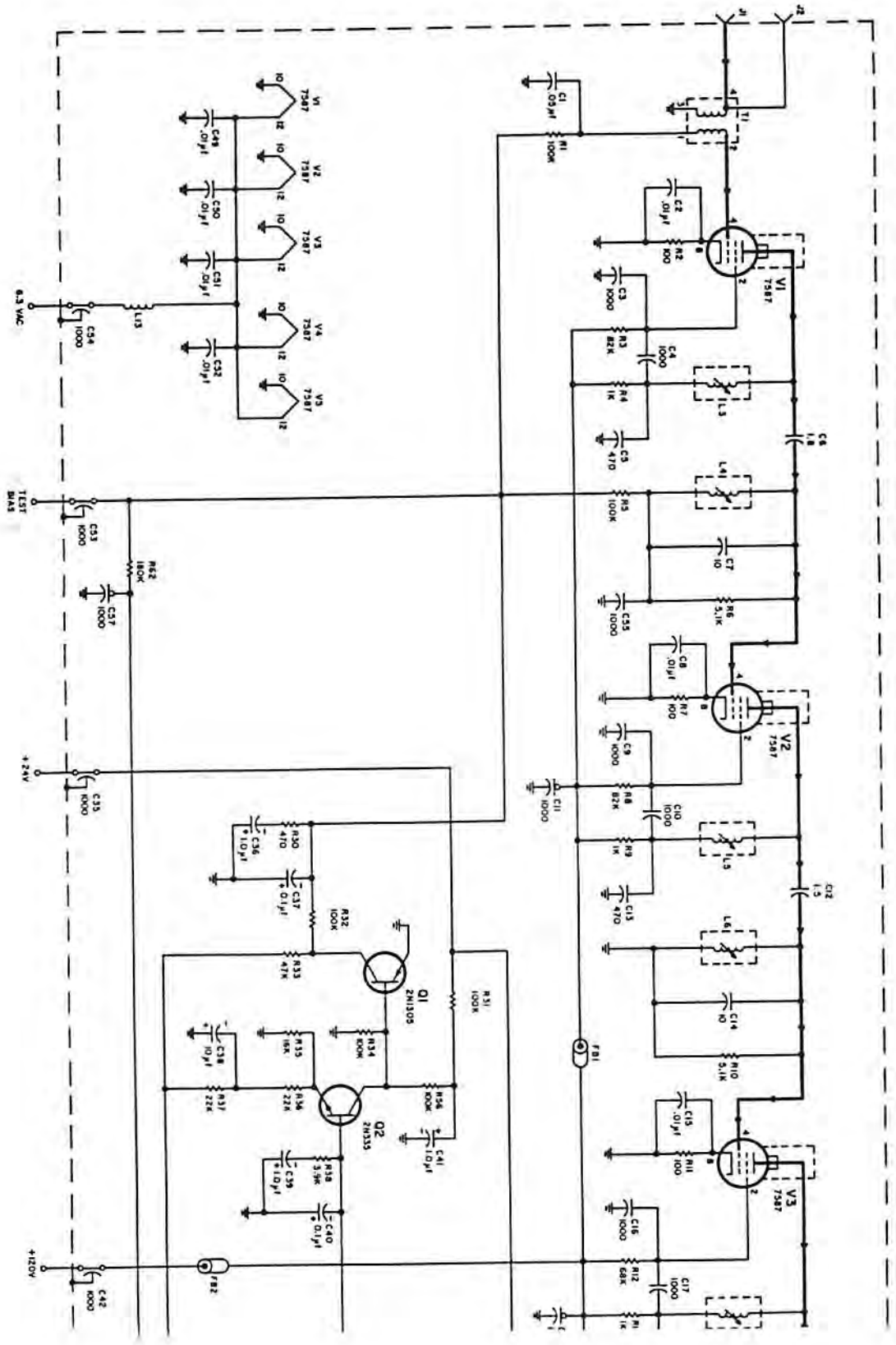


Fig. 6-4. Type 7205 300/50 kc and type 7207 300 kc IF Strips, Schematic Diagram



REF DESIG PREFIX A5

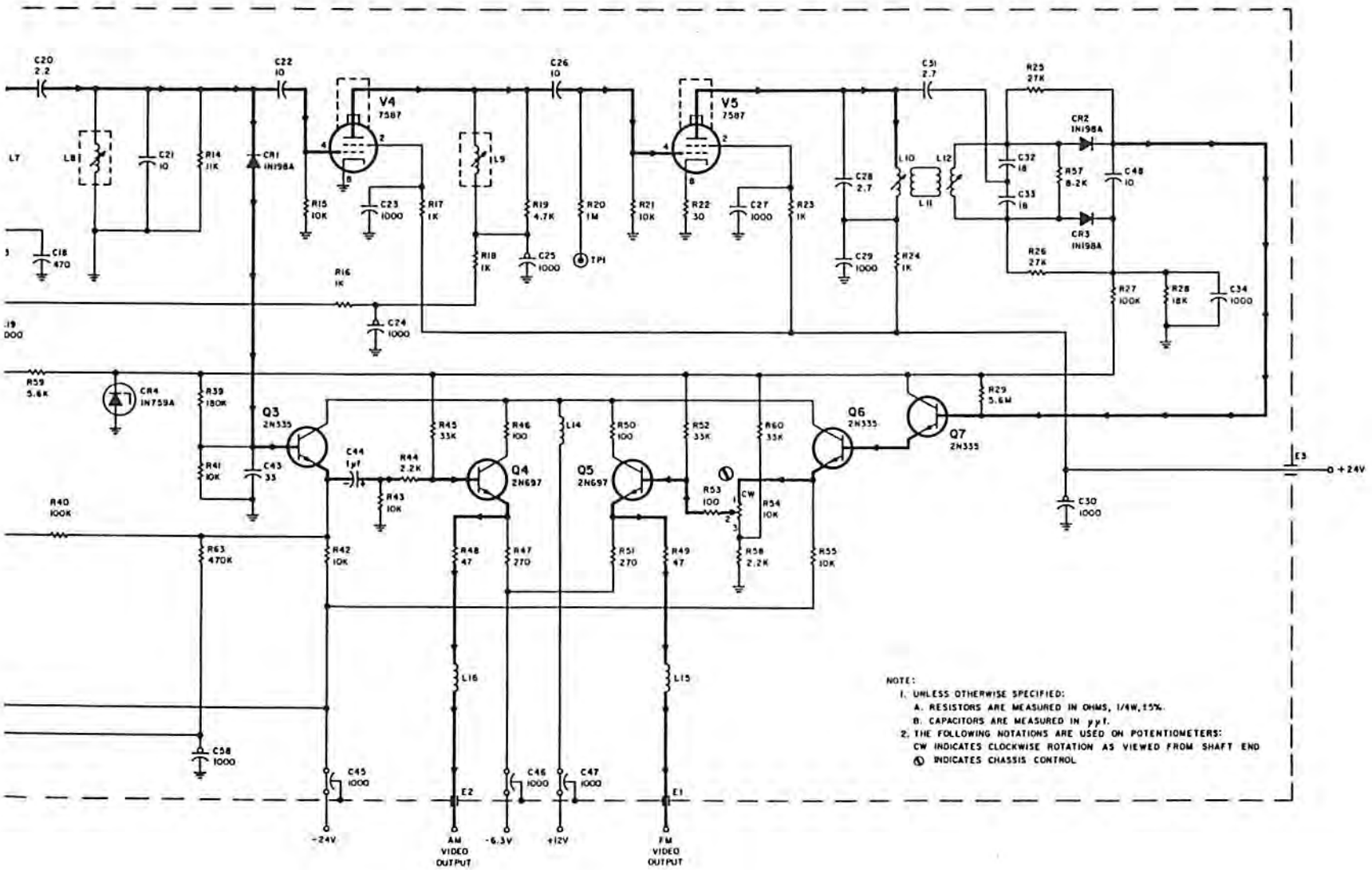
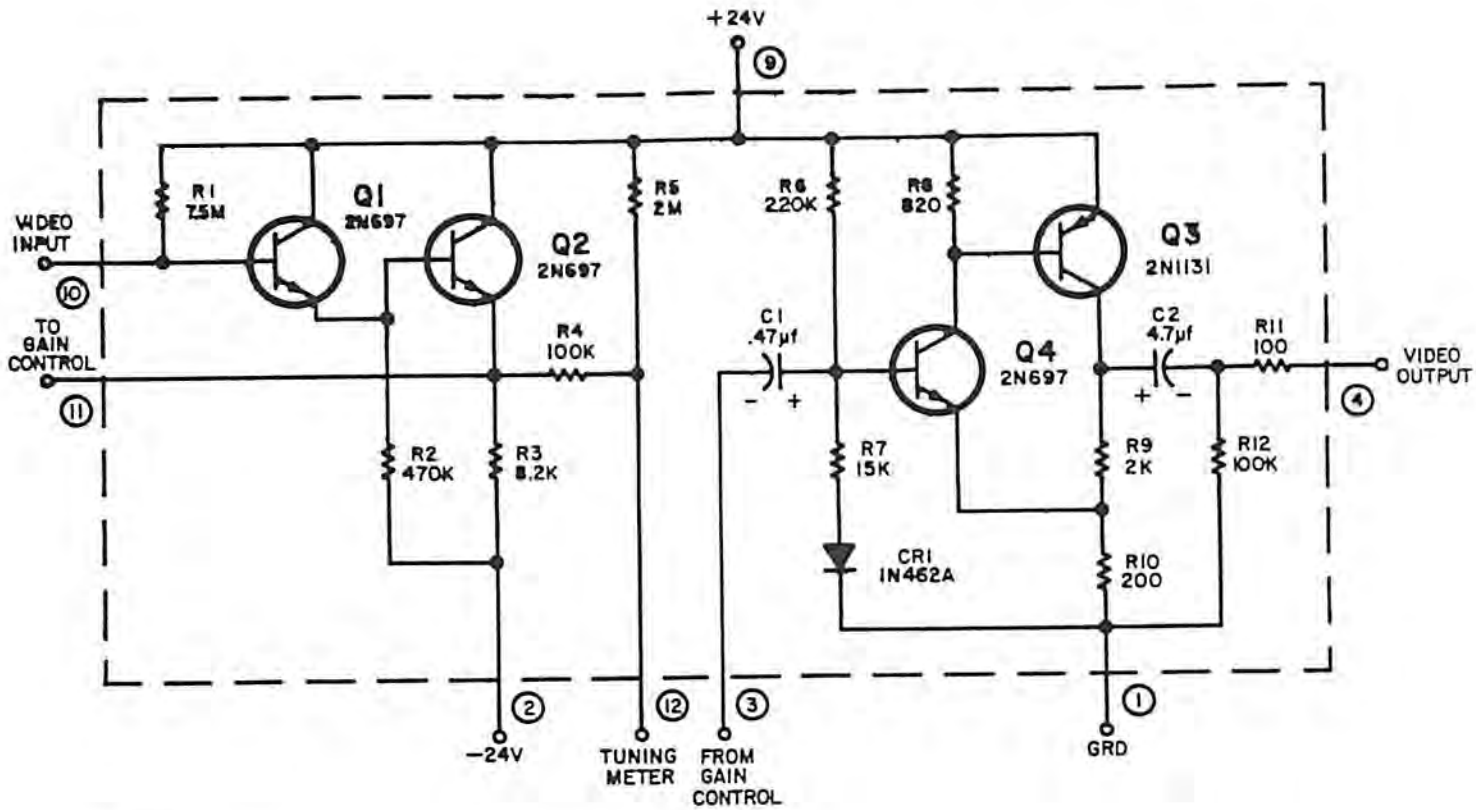


Fig. 6-5. Type 7206 2 mc IF Strip, Schematic Diagram

REF DESIG PREFIX A6



NOTES:

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

Fig. 6-6. Type 7300A Video Amplifier, Schematic Diagram

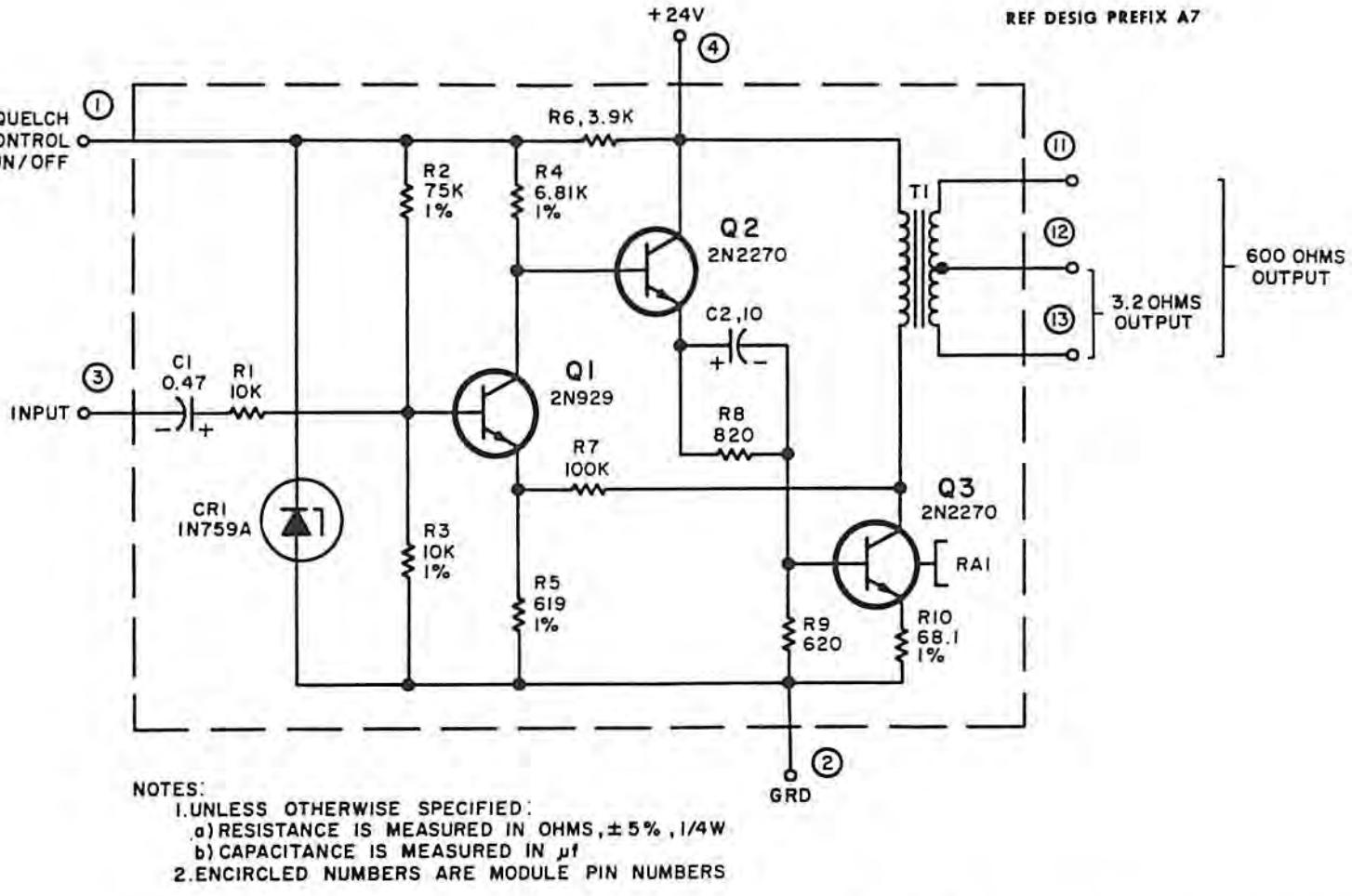
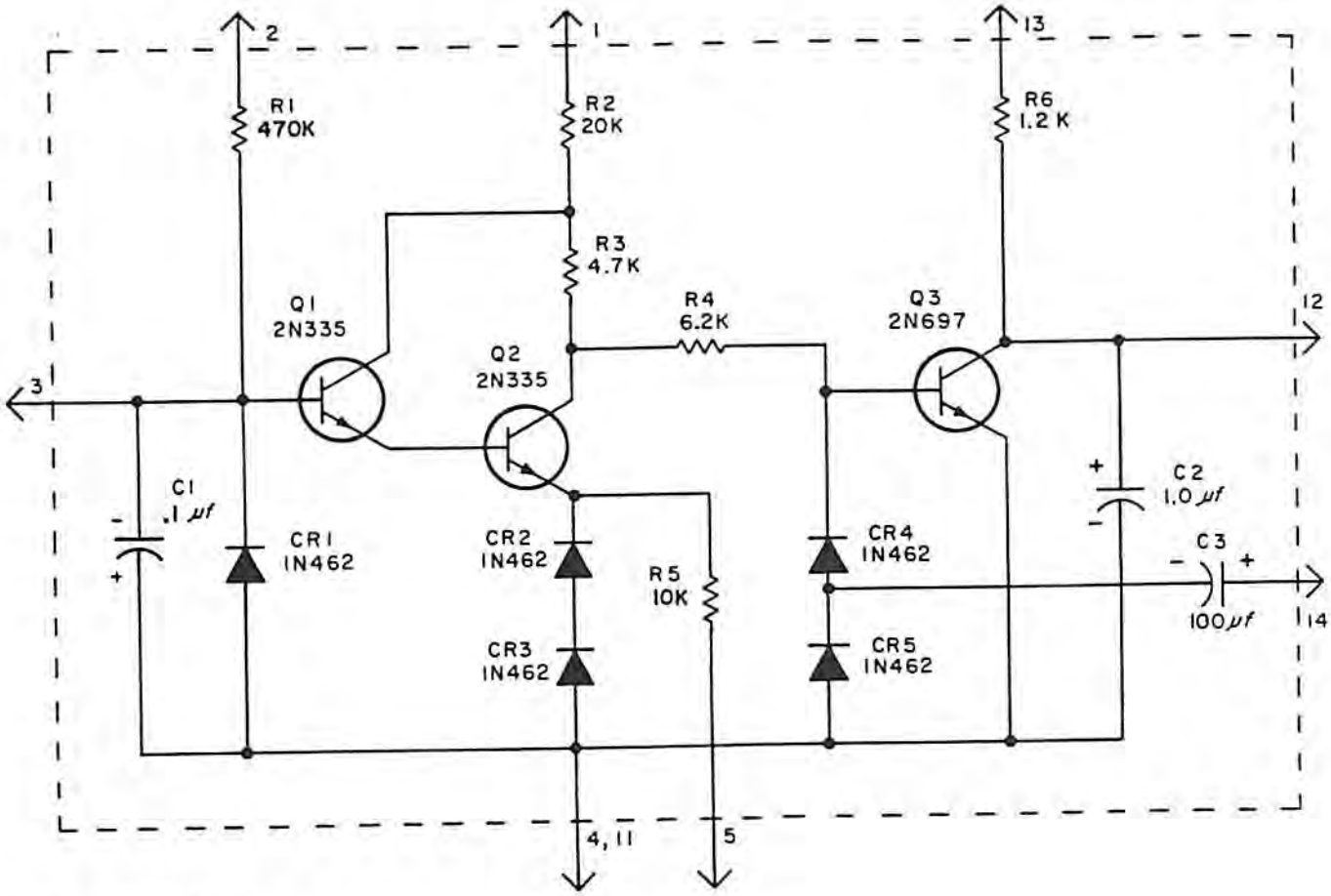


Fig. 6-7. Type 7400B Audio Amplifier, Schematic Diagram

REF DESIG PREFIX A8



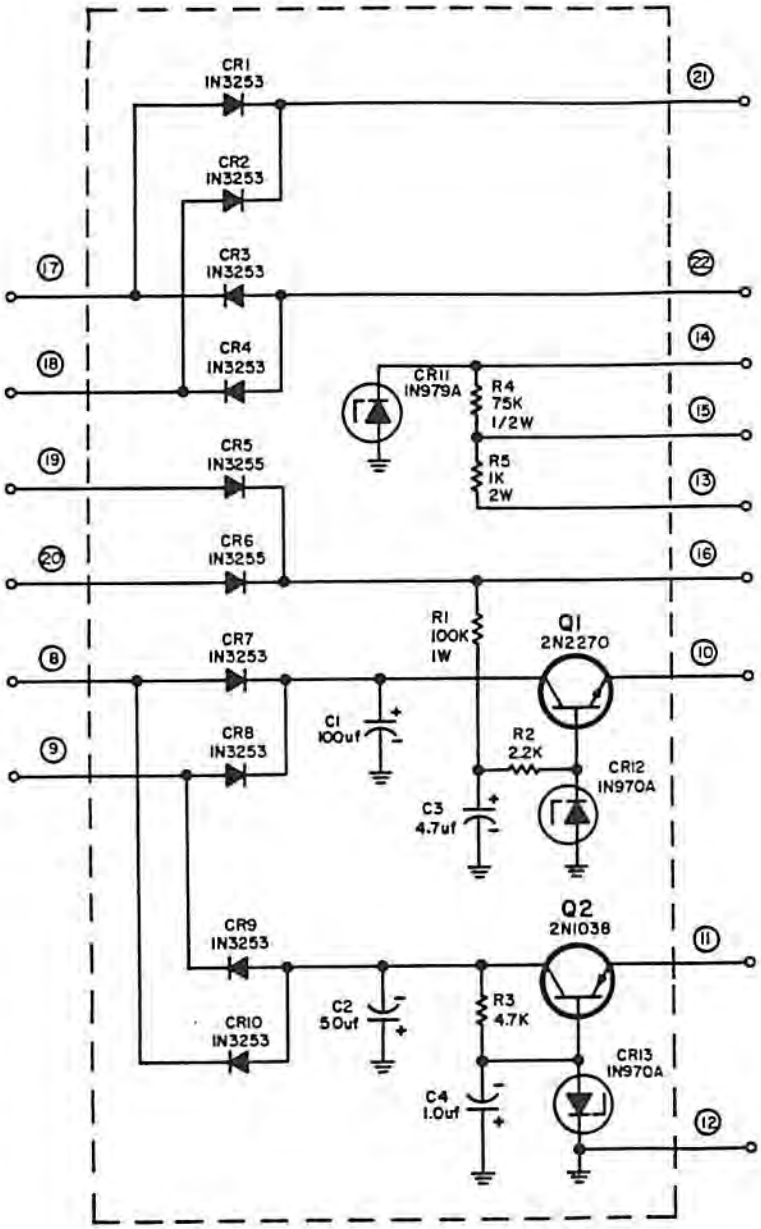
NOTES:
UNLESS OTHERWISE SPECIFIED:

1. RESISTORS ARE MEASURED IN OHMS, ±5%, 1/4 W
2. CAPACITORS ARE MEASURED IN μμf.

Fig. 6-8. Type 7500 COR Amplifier, Schematic Diagram

Figure 6-9

REF DESIG PREFIX A9



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. ALL RESISTORS ARE IN OHMS, 1/4W ±5%.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.

Fig. 6-9. Type 7602 Power Supply, Schematic Diagram

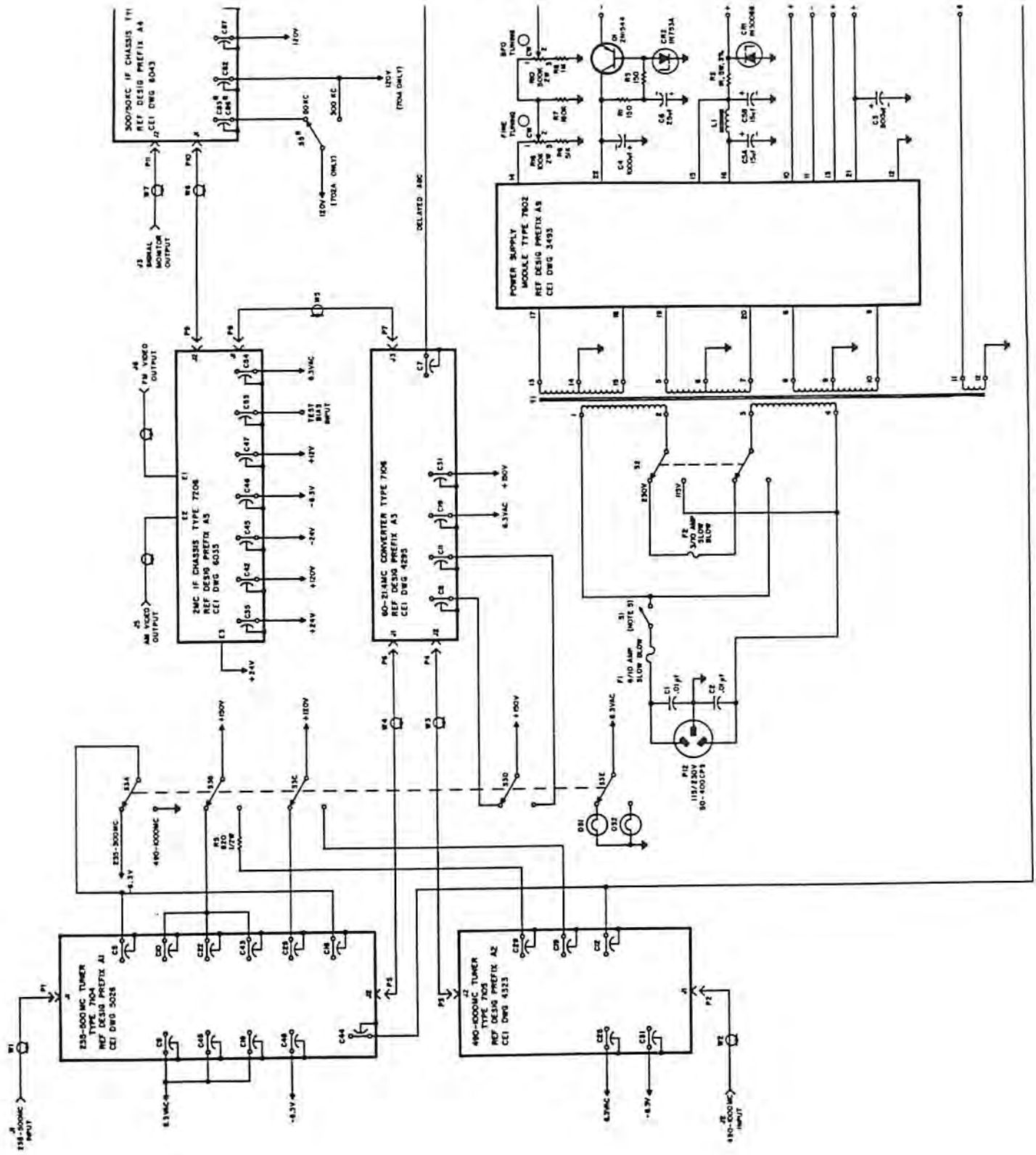


Figure 6-10

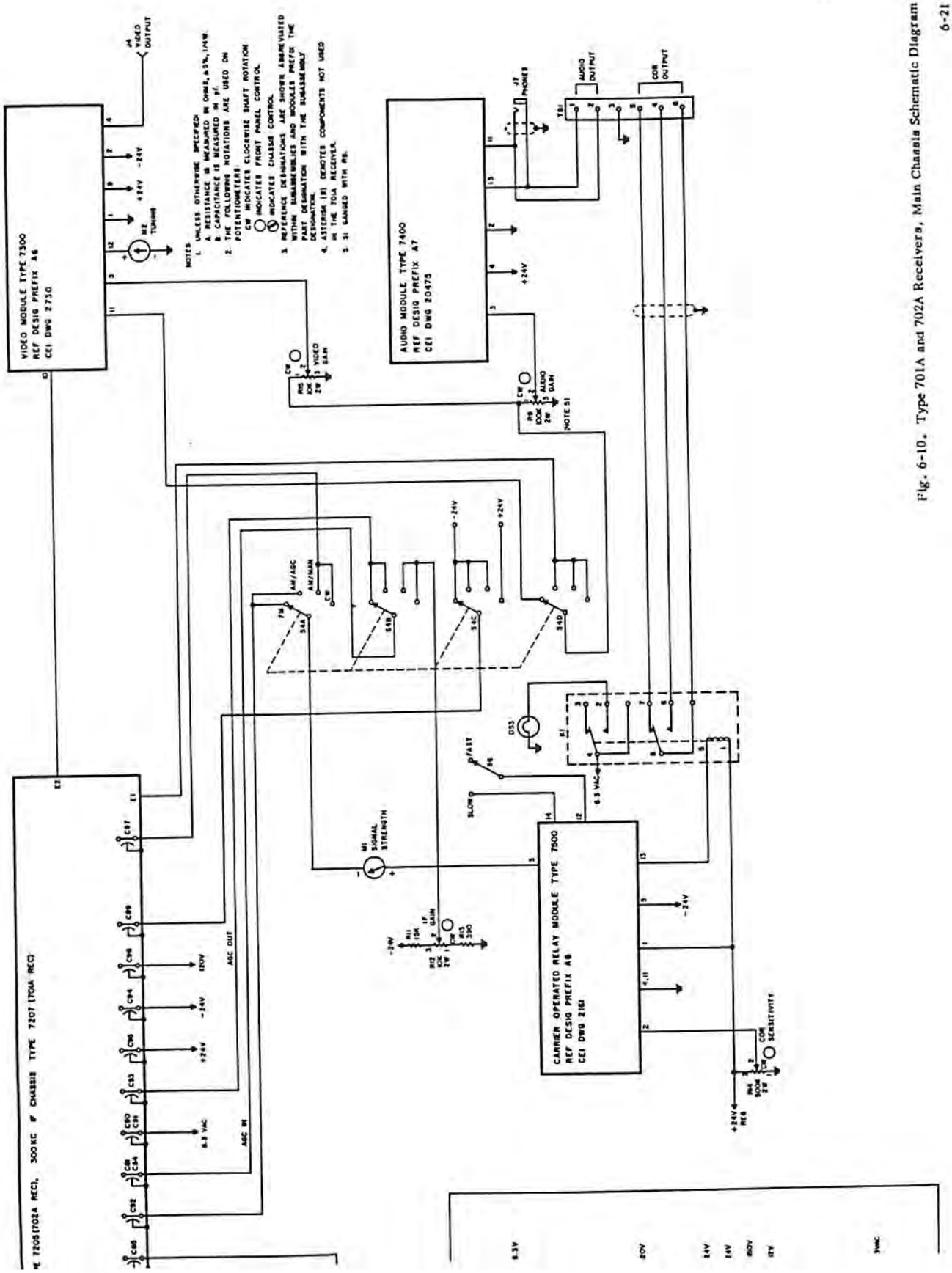


Fig. 6-10. Type 701A and 702A Receivers, Main Chassis Schematic Diagram