# INSTRUCTION MANUAL

# FOR

# TYPES 371A AND 373A RECEIVERS

WATKINS-JOHNSON

# INSTRUCTION MANUAL

# FOR

# TYPES 371A AND 373A RECEIVERS

WATKINS—JOHNSON COMPANY
700 Quince Orchard Road
Gaithersburg, Maryland 20878

2nd Printing
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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.

# ADDENDA

The following changes are required in the parts lists and schematic diagrams for the 371A and 373A Receiver:

Part 14212 IF and SM Driver Board, Ref Desig Prefix A3A2

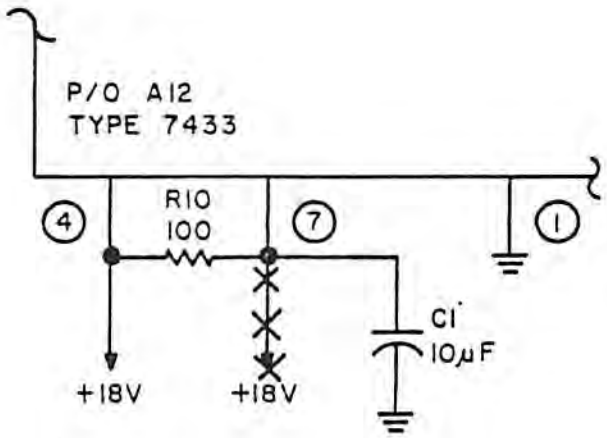
Change R6 to 22 Ω, 5%, 1/4W (CB2205, 01121).

Part 14227 Converter, Ref Desig Prefix A9A1

Change R8 to 470 kΩ, 5%, 1/4W (CB4745, 01121).

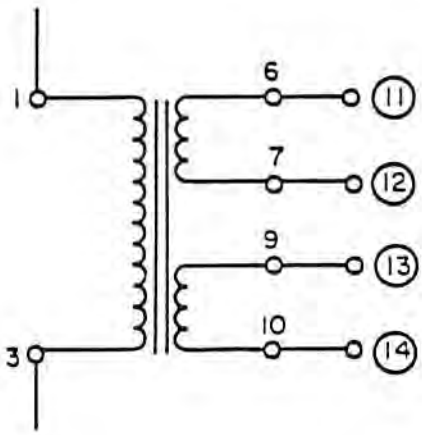
Main Chassis

Add R10, 100 Ω, 5%, 1/4W (CB1015, 01121) and C1, 10 μF, -10+80%, 25V (30D106G025BB2, 56289) as shown in the sketch below:



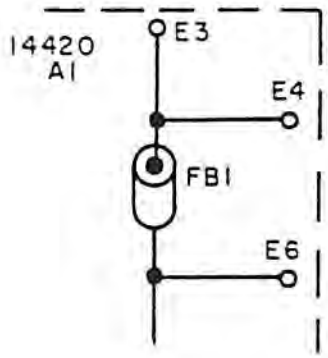

Type 7433 Audio Amplifier, Ref Desig Prefix A12

Change pin numbers on transformer T1 to appear as shown below:



Part 14420 RF Amplifier, Ref Desig Prefix A16A1A1

Change Vendor Part No. for C4 to: 538-011-94D. Add FB1 (P/N 56-590-65/4A, Mfr. 02114) as shown below:




List of Manufacturers

Add:

. 02114 Ferroxcube Corporation of America
Mt. Marion Road
Saugerties, New York 12477

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# LIST OF ILLUSTRATIONS

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Table 1-1. Types 371A and 373A Receivers, Specifications

| | |
|---|---|
| Tuning Range: | |
| 371A | 500 kHz to 10 MHz in one band |
| 373A | 500 kHz to 30 MHz in two bands: 500 kHz to 10 MHz and 10 MHz to 30 MHz |
| Types of Reception | AM, FM, and CW |
| Noise Figure | 7 dB, maximum |
| Sensitivity: | |
| 6-kHz Bandwidth | AM: 0.5-μV input, modulated 50% at 1-kHz rate, produces 10 dB (s plus n)/n, minimum<br>FM: 0.8-μV input, modulated at 400-Hz rate with 2-kHz deviation, produces 20 dB (s plus n)/n, minimum |
| 20-kHz Bandwidth | AM: 0.8-μV input, modulated 50% at 1-kHz rate, produces 10 dB (s plus n)/n, minimum<br>FM: 1.5-μV input, modulated at 1-kHz rate with 7-kHz deviation, produces 20 dB (s plus n)/n, minimum |
| 100-kHz Bandwidth | AM: 2.5-μV input, modulated 50% at 1-kHz rate, produces 10 dB (s plus n)/n, minimum<br>FM: 1.7-μV input, modulated at 1-kHz rate with 35-kHz deviation produces 20 dB (s plus n)/n, minimum |
| 400-kHz Bandwidth | AM: 7.0-μV input, modulated 50% at 1-kHz rate, produces 10 dB (s plus n)/n, minimum<br>FM: 2.0-μV input, modulated at 1-kHz rate with 150-kHz deviation, produces 20 dB (s plus n)/n, minimum |
| Input Impedance | 50 ohms, nominal |
| Input Attenuator | 0 dB, 10 dB, 20 dB, 30 dB, and 40 dB |
| IF Bandwidths | 6 kHz, 20 kHz, 100 kHz, or 400 kHz, selectable by front-panel switch. 100-kHz IF bandwidth usable over tuning range of 550 kHz to 10 MHz. 400-kHz IF bandwidth usable over tuning range of 700 kHz to 10 MHz. |
| Image Rejection | 80 dB, minimum |
| IF Rejection | 65 dB, minimum |
| IF Frequencies | 21.4 MHz and 455 kHz |
| Local Oscillator Output | 50 mV, minimum, into 50-ohm load |
| Audio Outputs | Two: front-panel phone jack (2000 ohms, nominal) and rear-apron audio, 100 milliwatts (600 ohms, balanced or unbalanced) |
| Predetection Outputs | 21.4 MHz and 455 kHz |
| Predetection Output Level | 25 mV, minimum, into 50-ohm load for input signals above AGC threshold |
| Signal Monitor Output Frequency | 21.4 MHz |
| Video Output Level | 5 volts peak-to-peak into 91-ohm load |
| Video Amplifier Response | Within 3 dB from 20 Hz to 400 kHz |
| Input Power | 115/230 Vac, 50-400 Hz |
| Power Consumption | 12 watts |
| Dimensions | 19 inches wide, 3.5 inches high, and 18 inches deep |
| Weight | 25 lbs., approximately |

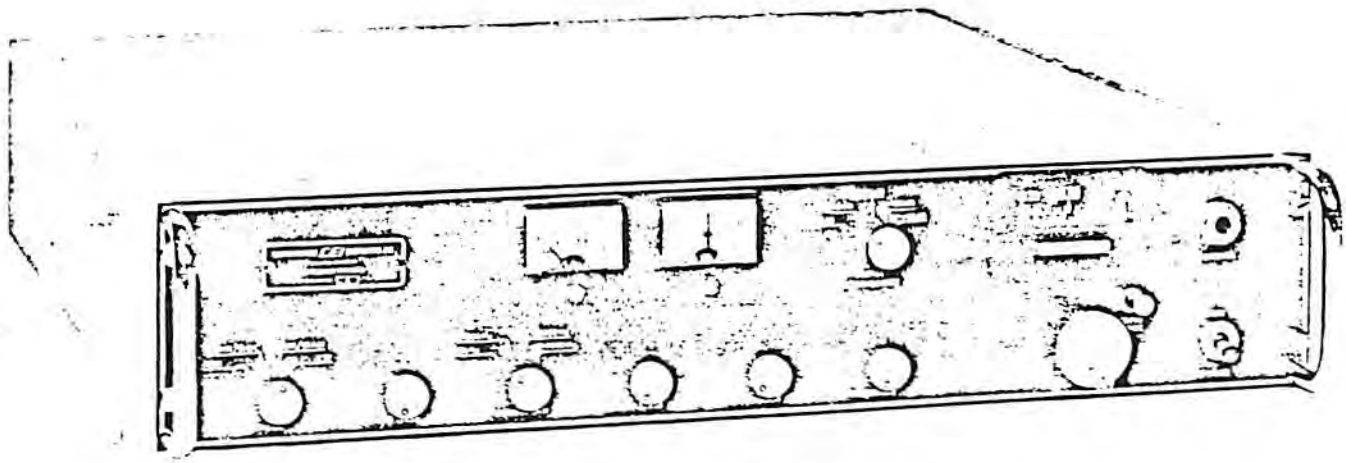


Figure 1-1. Type 371A Receiver, Front View

# SECTION I

# GENERAL DESCRIPTION

## 1.1 ELECTRICAL CHARACTERISTICS

1.1.1 The CEI Types 371A and 373A Receivers are solid-state, wideband HF units designed for the reception of AM, FM, and CW signals. The type 371A covers the 500-kHz to 10-MHz frequency range in a single band. The type 373A tunes from 500 kHz to 30 MHz in two bands: 500 kHz to 10 MHz and 10 MHz to 30 MHz. These receivers are particularly suitable for RFI detection and predetection recording. A bandwidth of 2 MHz is maintained through the RF tuners and is available for viewing at rear-apron signal monitor output jacks. Dual gate MOS field-effect transistors are utilized in all critical stages in the RF tuner and IF amplifiers for maximum sensitivity and dynamic range. Further expansion of the dynamic range is by means of a front-panel controlled, five-position input attenuator providing a maximum of 40-dB signal attenuation.

1.1.2 The 371A and 373A receivers provide IF bandwidths of 6, 20, 100, and 400 kHz. The desired bandwidth may be selected by a front-panel switch. The 100-kHz bandwidth is usable above 550 kHz and the 400-kHz bandwidth is usable above 700 kHz. A 455-kHz IF center frequency is used when the 6-kHz or 20-kHz bandwidth is selected. A 21.4-MHz center frequency is used when the 100-kHz or 400-kHz bandwidth is selected. Predetection IF output signals are provided for both center frequencies. Additional outputs from the receivers include 3.2- and 600-ohm audio outputs, a video output, an IF AGC output, an LO output, and a detector level output. Pertinent specifications for the receivers are listed in Table 1-1.

1.1.3 Sections II through VI of this manual, as well as the remainder of this section, are written in terms of the 371A receiver. Supplemental Section VII deals with the 373A receiver and contains complete information on those subassemblies not covered in the first six section.

## 1.2 MECHANICAL CHARACTERISTICS

1.2.1 The front panel of the 371A receiver, shown in Figure 1-1, mounts the following controls and indicators: RF/IF GAIN, VIDEO GAIN, AUDIO GAIN, and FINE TUNING controls; MODE, IF BANDWIDTH, INPUT ATTENUATOR, and POWER switches, main tuning knob and tape dial, TUNING and SIGNAL STRENGTH meters, and a PHONES jack.

1.2.2 The rear apron of the 371A, shown in Figure 5-2, mounts the following BNC-type connectors: RF INPUT J1, LO OUTPUT J2, SM OUTPUT J3, 21.4-MHz IF OUTPUT J4, 455-kHz IF OUTPUT J5, DET LEVEL OUTPUT J6, and VIDEO OUTPUT J7. The rear apron also mounts terminal board TB1, line fuses F1 and F2, power selector switch S1, and the permanently connected power cord.

1.2.3 The front panel, main chassis and top and bottom dust covers are constructed of aluminum. The front panel is finished with gray enamel and is overlaid with a black-anodized etched bezel. The 371A contains 15 subassemblies. Nine of these, the input attenuator, input filter, RF assembly, LO amplifier, tuning assembly, 21.4-MHz IF amplifier, 21.4-MHz limiter/discriminator, 455-kHz IF amplifier, and 455-kHz limiter/discriminator are constructed on silver-plated brass chassis which have been gold-flashed to prevent tarnishing. Five of the remaining six subassemblies, the audio, video, and AGC amplifiers, and the +18V and -12V power supply regulators are constructed on etched circuit cards that plug into receptacles on the main chassis. The fine tuning regulator component board is attached to the main chassis by means of conventional hardware. The 371A receiver is designed for mounting in a standard 19-inch rack. Overall dimensions are: 19 inches wide, 3.5 inches high, and 18 inches deep. The unit weighs approximately 25 pounds.

Figure 2-1



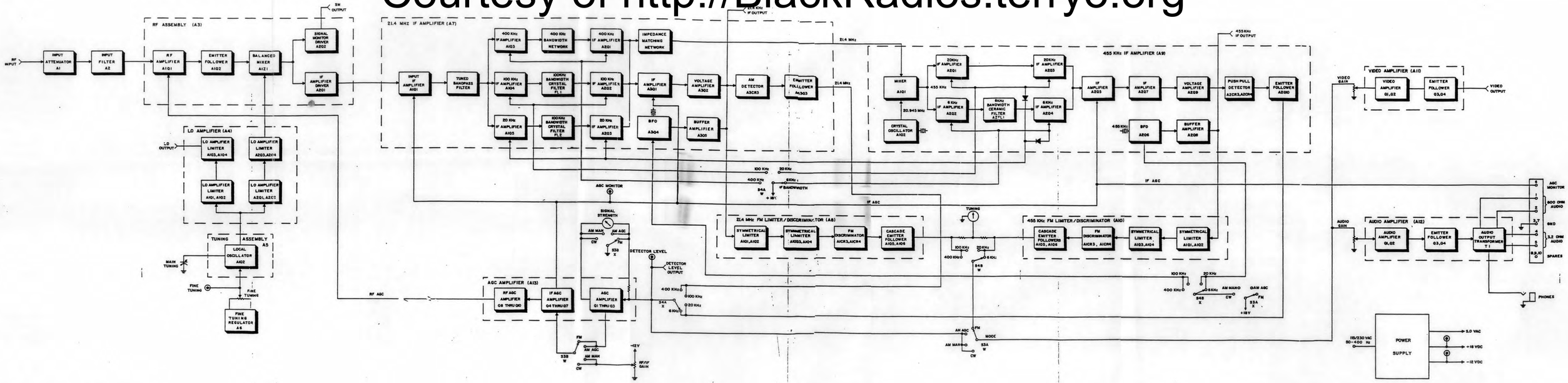



Figure 2-1. Type 371A Receiver, Functional Block Diagram

# SECTION II
# CIRCUIT DESCRIPTION

## 2.1 GENERAL

Operation of the various circuits in the 371A Receiver is described in the following paragraphs using the functional block diagram, Figure 2-1, and the schematic diagrams Figures 6-1 through 6-19 at the rear of this manual. Note that the unit numbering method is used for electrical components. This means that parts on subassemblies and modules carry a prefix before the usual class letter and number of the item (such as A1R1 and A2C2). These prefixes are omitted from some callouts on the illustrations and from some references to components in the text except in those cases where confusion might result from their omission. Subassembly reference designation prefixes are shown at the upper right of each illustration and schematic diagram.

## 2.2 FUNCTIONAL DESCRIPTION

2.2.1 The Type 371A Receiver is a solid-state, superheterodyne unit designed to tune the 500-kHz to 10-MHz frequency range in a single band. Selectable IF bandwidths of 6, 20, 100, and 400 kHz are available. Double conversion of incoming signals occurs when the 6- or 20-kHz bandwidth is selected. The first conversion is from the RF frequency down to 21.4 MHz, and the second is from 21.4 MHz down to 455 kHz. Amplification of IF signals occurs at the 21.4-MHz center frequency when the 100- or 400-kHz bandwidth is employed.

2.2.2 Incoming RF signals are applied to an input attenuator which is used to prevent strong signals from overloading the receiver. The input signal may be attenuated by a factor of 0, -20, -30, or -40 dB.

2.2.3 From the attenuator the signal is fed to a low-pass input filter which will pass only those frequencies below 10 MHz. The filter prevents undesirable signals from reaching the RF amplifier circuits.

2.2.4 The incoming signal is next fed to a single-stage, untuned, wideband amplifier utilizing a dual gate MOS field-effect transistor. This stage, A3A1Q1, is gain controlled by the application of AGC voltage to pin no. 2. After amplification, the signal is passed through emitter follower A3A1Q2 to a balanced mixer where it is heterodyned with the local oscillator signal. The 21.4-MHz difference frequency which results from the mixing action is then fed through IF amplifier driver stage, A3A2Q1, to the input of the 21.4-MHz IF amplifier, and through signal monitor driver stage, A3A2Q2, to the rear-apron SM OUTPUT jack, J3.

2.2.5 The local oscillator, A5A1A1Q2, operates 21.4 MHz above the frequency of the incoming signal. The local oscillator is tuned from 21.9 to 31.4 MHz by means of the main tuning control which is mechanically ganged to A5A1C1. The output signal from the oscillator is fed through LO amplifier assembly A4 before being applied to the balanced mixer. This subassembly contains two paths through which the oscillator signal is passed. Each path contains two symmetrical limiter stages which square the sinusoidal oscillator signal. The output from one path is used to drive the balanced mixer in the RF assembly, and the output from the other path is fed to LO OUTPUT jack, J2, on the rear apron.

2.2.6 A second dual gate MOS field-effect transistor, A7A1Q1, is used as the input stage in the 21.4-MHz IF amplifier. It is also gain controlled by the application of AGC voltage to pin no. 2. The amplified output from this stage is passed through a double-tuned bandpass filter and applied in parallel to transistors A7A1Q3, A7A1Q4, and A7A1Q5 which function as the first IF amplifiers for the 400-, 100-, and 20-kHz bandwidths respectively. Depending on the position of the IF BANDWIDTH switch, one of the transistors will be energized so that the signal passes through it and into the associated bandwidth filter. (The path containing A7A1Q5 is activated when either the 6-kHz or 20-kHz position is selected.) A single-tuned network sets the bandwidth of the 400-kHz path; crystal filters are used to set the 100- and 20-kHz bandwidths. Output signals from the 400- and 100-kHz bandwidth filters receive additional amplification from A7A2Q1 and A7A2Q2 respectively. These two stages then feed the IF signal to A7A3Q1, another dual gate MOS FET. Signals from the 20-kHz filter are amplified by A7A2Q3 and fed through an impedance-matching network to the input of the 455-kHz IF amplifier, A9.

2.2.7 Transistor A7A3Q1 is also gain controlled by the application of AGC voltage to pin no. 2. Driver stage A7A3Q2 amplifies the output from the FET, and applies it to AM detector, A7A3CR3. A portion of the input to the

detector is also fed through an impedance-matching capacitive voltage divider to the rear-apron predetection 21.4-MHz IF OUTPUT jack, J4, and to the input of FM limiter/discriminator, A8. Transistor A7A3Q4 is the beat frequency oscillator for this IF amplifier. It is crystal controlled at 21.4 MHz and is activated, during the CW mode of operation, when the 100- or 400-kHz bandwidths are selected. The BFO signal is fed through buffer amplifier A7A3Q5 to the AM detector circuit.

2.2.8 Diode A7A3CR3 demodulates the IF signal and applies it to emitter follower A7A3Q3. This stage feeds the video signal through a section of the IF BANDWIDTH switch, S4, to the input of the AGC module, and through a section of the MODE switch, S3, to the audio and video gain controls.

2.2.9 The 21.4-MHz limiter/discriminator (A8) contains two symmetrical limiter stages, A8A1Q1-A8A1Q2 and A8A1Q3-A8A1Q4, which remove amplitude variations from the video input so that the output varies only in frequency. Diodes A8A1CR3 and A8A1CR4 are part of a Foster-Seely discriminator which demodulates the limited signal and applies it to cascade emitter followers A8A1Q5 and A8A1Q6. From these stages the FM video signal is fed through sections of the IF BANDWIDTH and MODE switches to the audio and video gain controls.

2.2.10 The input stage of the 455-kHz IF amplifier, A9A1Q1, is a single-gate, MOS field-effect transistor functioning as a mixer. It heterodynes the 21.4-MHz IF signal from subassembly A7 with the output of crystal oscillator A9A1Q2, which is operating at 20.945 MHz. The 455-kHz difference frequency produced by the mixing action is fed in parallel to A9A2Q1 and A9A2Q2 from a double-tuned circuit. The IF BANDWIDTH switch determines which stage will be energized by supplying bias voltage to the base divider networks. Placing S4 in the 20-kHz position activates A9A2Q1 and A9A2Q3, the sixth and seventh IF amplifiers for this bandwidth. Transistor A9A2Q2 is energized when the 6-kHz bandwidth is selected, and the signal is then passed through ceramic filter A9A2FL1 to A9A2Q4.

2.2.11 Additional amplification of the output from A9A2Q3 or A9A2Q4 is provided by A9A2Q5, a dual, insulated-gate FET. This stage is gain controlled by the application of AGC voltage to pin no. 2. Transistors A9A2Q7 and A9A2Q9 amplify the output from A9A2Q5 and simultaneously apply it to the predetection 455-kHz IF OUTPUT jack, J5, to the AM detector circuit, and to the input of FM limiter/discriminator, A10.

2.2.12 Push-pull AM detector diodes A9A2CR3 and A9A2CR4 demodulate the IF signal and apply it to emitter follower A9A2Q10. This stage provides isolation and impedance matching between the AM detector and the output stages of the receiver. From A9A2Q10, the AM video signal is fed to the AGC module and through sections of the MODE and IF BANDWIDTH switches to the audio and video gain controls.

2.2.13 The BFO circuit contained in this IF amplifier consists of oscillator transistor A9A2Q6 and buffer amplifier A9A2Q8. The crystal-controlled BFO operates at a frequency of 455 kHz and is activated, during the CW mode of operation, when the IF BANDWIDTH switch is placed in the 6- or 20-kHz positions.

2.2.14 The FM limiter/discriminator associated with the 455-kHz IF amplifier is functionally identical to the unit described in paragraph 2.2.9. It differs electrically in that circuit component values and arrangements are changed slightly to accomodate the 455-kHc center frequency.

2.2.15 The video module receives its input from the VIDEO GAIN control, R7. This input signal is amplified by A11Q1 and A11Q2 and fed through emitter followers A11Q3 and A11Q4 to the VIDEO OUTPUT jack, J7, on the rear apron.

2.2.16 Transistors A12Q1 and A12Q2 amplify the audio input signal from the AUDIO GAIN control, R8. The amplified signal is then fed through emitter followers A12Q3 and A12Q4 to the audio output transformer. This component provides the proper impedance match between the output stages and the load. The audio signal appears at rear-apron terminal board TB1 and at the PHONES jack on the front panel.

2.2.17 Voltage amplifier stages on the AGC module supply outputs that are used to control the gain of the RF and IF stages in the receiver. Transistors A13Q1 through A13Q3 form an AGC preamplifier circuit that provides the necessary gain to drive IF AGC amplifiers A13Q4 through A13Q7. The preamplifier network also drives the RF AGC stages, A13Q8 through A13Q10. The front-panel RF/IF GAIN potentiometer supplies the input signal for the IF and RF gain control voltage amplifiers when the AM MAN or CW modes are selected.

2.2.18 All active circuits in the receiver operate from internal -12 Vdc and +18 Vdc regulated power supplies. The receiver will operate from either 115 or 230 Vac, 50-400 Hz. Power consumption is approximately 12 watts.

## 2.3 TYPE 79260 INPUT ATTENUATOR

The input attenuator is used to prevent overloading of the receiver during the reception of strong signals. It is connected in series between the antenna input jack and the input filter. Figure 6-1 is the schematic diagram for the attenuator; its reference designation prefix is A1. The front-panel INPUT ATTENUATOR switch, A1S1, selects various combinations of resistors to provide attenuations of -10, -20, -30, and -40 dB. When the 0 dB position is selected, the signal is routed through the attenuator without encountering any resistors.

## 2.4 TYPE 79339 INPUT FILTER

Figure 6-2 is the schematic diagram for the filter; its reference designation prefix is A2. Resistor R1 terminates the input in a high impedance. This circuit is essentially a low-pass type having a 10-MHz cut-off frequency. A parallel-tuned trap in the output section provides a "notch" in the filter response to ensure maximum attenuation at 21.4 MHz, which is the first IF center frequency. The function of the filter is to prevent interference from signals above the tuning range of the receiver particularly the 21.4-MHz IF or harmonics of this frequency.

## 2.5 TYPE 71218 RF ASSEMBLY

The schematic diagram for the RF assembly is Figure 6-3; its reference designation prefix is A3.

2.5.1 RF Amplifier. - The RF amplifier, A1Q1, employs a dual-gate MOS field-effect transistor. It operates in a wideband, untuned circuit. A FET is used because of its excellent signal handling and AGC characteristics, in addition to its large dynamic range and low noise figure. The input to gate no. 1 (pin 3) is from step-up transformer A1T1 which is used to match the 50-ohm antenna to the input impedance of the amplifier. Stabilization of current flow through the transistor is achieved by the application of a positive bias to gate no. 1 from voltage divider A1R7-A1R9. Capacitor A1C3 holds gate no. 2 (pin 2) at RF ground potential. A gain-control voltage is applied to this gate from the AGC amplifier when the signal-to-noise ratio at the receiver's output reaches a predetermined level. Diode A1CR1 clamps gate no. 2 of A1Q1 to set the proper bias level in the event a dc ground is absent in the AGC line (RF amplifier operating with AGC module removed). This prevents damage to the transistor. The amplified RF signal is taken at the drain connection and coupled through dc-blocking capacitor A1C6 to the base of emitter follower A1Q2. Inductor A1L1, an RF choke, functions as the drain load for A1Q1 and maintains a relatively constant impedance throughout the entire 10.5-MHz frequency range. Resistor A1R16 prevents the inductor from peaking at its self-resonant frequency in the band. Emitter follower A1Q2 isolates the RF amplifier from the balanced mixer and feeds the signal to step-down transformer A1T2. The transformer matches the output impedance of A1Q2 to the input of A1Z1. Coupling from the transformer to the mixer is by means of A1C9.

2.5.2 Balanced Mixer. - A balanced mixer is used rather than a conventional mixer to prevent the local oscillator signal from entering the IF amplifier when the receiver is tuned near the low-frequency end of its range. At this point the LO frequency is only 500 kHz higher than the first IF frequency. The balanced mixer, A1Z1, a completely self-contained, sealed module, suppresses the input signal to the receiver and the local oscillator signal, passing only the sum and difference of the two. Since the following IF stage is tuned to the difference frequency (21.4 MHz) only this frequency is passed. This IF signal is simultaneously fed to the IF and signal monitor driver stages.

2.5.3 IF and SM Drivers. - The 21.4-MHz output from the balanced mixer is fed through A2C1 to the base of IF amplifier stage A2Q1, and through A2C11 to the base of A2Q2. The collector circuit of A2Q1 is tuned to the IF frequency by A2L2 and A2L3 which are connected in a conventional over-coupled network. This circuit sets the bandwidth of the IF signal at approximately 500 kHz. Neutralization of A2Q1 is by means of out-of-phase signals that are taken at the junction of A2L2 and A2C4 and fed through A2C3 to the transistor's base. The IF output signal is fed through jack J3 to the input of the 21.4-MHz IF amplifier, A7. Transistor A2Q2, an emitter follower, supplies an output signal through A2T1, that may be viewed on a signal monitor. Capacitor A2C13 couples the signal from A2T1 to J4. The bandwidth of the signal present at J4 is approximately 2 MHz.

## 2.6 TYPE 71217 TUNING ASSEMBLY

The tuning assembly consists of a type 7730 local oscillator, and a type 8552 gear train and tape dial. Figure 6-4 is the schematic diagram for the entire assembly; its reference designation prefix is A5. All signal and voltage connections are made through plug A5P1.

2.6.1 Local Oscillator. - The schematic diagram for the local oscillator is Figure 6-5; its reference designation prefix is A5A1. The output frequency of the local oscillator, A1Q2, is maintained 21.4-MHz above the frequency of the incoming signal. The oscillator operates in a modified Clapp configuration. Regenerative emitter-to-base feedback to sustain oscillation is taken at the junction of A1C6 and A1C7. Variable capacitor C1 is the main tuning control, with C2 functioning as its trimmer. Variable inductor L1 is the trimmer for tank circuit inductor A1L1. Compensation for frequency drift due to ambient temperature change is provided by capacitors A1C3 and A1C4. Vernier tuning of the receiver is accomplished by the front-panel FINE TUNING control in conjunction with voltage variable capacitors A1CR1 and A1CR2 which are connected in parallel with the oscillator tank circuit. The capacitance of the semiconductors is inversely proportional to the reverse voltage applied across them. This bias voltage is supplied by the fine tuning regulator subassembly and fed to the diodes through the FINE TUNING potentiometer, R1. Rotation of this control in the clockwise direction increases the reverse bias on the diodes decreasing their capacitance and increasing the oscillator output frequency. The output is tapped down through a capacitive voltage divider consisting of A1C7 and A1C8 to minimize loading of the oscillator. The signal is then fed through jack J1 to the LO amplifier.

## 2.7 TYPE 79340 LOCAL OSCILLATOR AMPLIFIER

2.7.1 The reference designation prefix for the local oscillator amplifier is A4; its schematic diagram is Figure 6-6. This assembly employs two identical etched circuit boards, each containing limiter circuits which convert the sinusoidal oscillator output to a square wave for more efficient operation of the balanced mixer, and attenuation of intermodulation products inherent in the mixing process. The schematic diagram for the two boards is Figure 6-7; the boards carry reference designation prefixes A1 and A2. The input to the amplifier assembly is terminated by resistor R1. Incoming LO signals are fed through dc-blocking capacitor C3 to board A1 and through C4 to board A2.

2.7.2 The local oscillator amplifier circuit consists of two symmetrical limiter stages, Q1-Q2, and Q3-Q4 which square the sinusoidal oscillator input signal. The limiters utilize ac coupling between transistors to permit independent dc operation. Positive half-cycles of the input to Q1 develop a positive emitter signal which is coupled through C2 to Q2. This positive signal cuts Q2 off by reverse biasing the base-emitter junction. Negative half-cycles of the input signal bias Q2 into saturation. Thus, the transistor operates between cut-off and saturated conditions so that the signal is limited on both the positive and negative excursions. Capacitor C4 holds the base of Q2 at RF ground potential. The output of the first limiter is coupled to the second through C3. Operation of the second limiter (Q3-Q4) is identical to that of the first. Capacitor C6 couples these two transistors. The limited output from the collector of Q4 is fed through impedance-matching transformer T1 and capacitor C7 to the rear-apron LO OUTPUT jack J2. Transformer T1 on board A2 matches the output impedance of the limiter to the input impedance of the balanced mixer in the RF assembly. Resistor R21 and capacitor C8 form a frequency compensation network which eliminates a tendency of the gain slope of the limiter to increase at the high-frequency end of the local oscillator's tuning range.

## 2.8 TYPE 79338 FINE TUNING REGULATOR

Figure 6-8 is the schematic diagram for the fine tuning regulator; its reference designation prefix is A6. This assembly provides a regulated output of +12 Vdc which is applied through the front-panel FINE TUNING control, R1, to voltage variable capacitor A5A1A1CR1 in the tuning assembly. Zener diode CR1 provides regulation of the +18-Vdc input. Silicon diode CR2 compensates for the positive temperature coefficient of the voltage variable capacitor. The capacity of A5A1A1CR1 rises with increases in temperature, and since silicon diodes have a negative temperature coefficient, the voltage drop across them decreases with rising temperature. Thus, as the capacity of A5A1A1CR1 tends to increase at higher temperatures, more voltage is applied to it due to the decreased drop across CR2, maintaining the capacity nearly constant.

## 2.9 TYPE 72201 21.4-MHz IF AMPLIFIER

The schematic diagram for this IF amplifier is Figure 6-9; its reference designation prefix is A7. The input signal to this IF strip is the 21.4-MHz output from RF assembly A3.

2.9.1 Input IF Amplifier. - Transistor A1Q1 is the input IF amplifier stage. It is a gain controlled, dual gate MOS field-effect transistor. The input signal from jack J1 is fed through dc-blocking capacitor A1C1 to gate no. 1 (pin 3). Resistor R1 terminates the amplifier input. A resistive voltage divider, consisting of A1R3 and A1R4, applies a positive bias to gate no. 1 to stabilize the current through the stage. Gain control of the transistor is by

the same method described for the RF amplifier FET (see paragraph 2.5.1). Bias voltage on gate no. 2 is supplied through resistor A1R16. The drain load for A1Q1 consisting of a double-tuned network utilizing variable capacitors A1C7 and A1C10, provides a nominal bandwidth of 400 kHz. The response of this network is combined with the response developed in the RF assembly output network to provide increased selectivity for the 400-kHz path. A portion of the signal voltage at this point is fed through diode A1CR2 to feedthrough capacitor C5 to provide a means of monitoring the response with a wideband oscilloscope for troubleshooting and alignment. Capacitors A1C11 and A1C12 form a capacitive impedance-matching network that supplies the output from the tuned circuit.

2.9.3 400-kHz Bandwidth IF Amplifiers. - The 21.4-MHz IF signal is fed in parallel to three signal paths Each path contains two IF amplifiers separated by bandpass filters. The path through which the signal is passed is determined by section S4A-W of the front-panel IF BANDWIDTH switch. This switch section applies bias voltage to the base divider networks of the transistors in the selected bandwidth path. Placing S4 in the 400-kHz position energizes transistors A1Q3 and A2Q1. The network in the collector circuit of A1Q3, consisting of variable capacitor A1C24 and torroid transformer A1T1, produces a response which is combined with the response curves produced by the preceeding circuits to improve the over-all 400-kHz bandwidth selectivity. Neutralization of A1Q3 is by means of an out-of-phase signal voltage which is taken at the junction of A1C20 and pin 4 of A1T1 and fed through A1C16 to the transistor's base. A reverse bias is applied to the emitter of A1Q3 through A1R33 and A1R40 to ensure that the transistor is cut off when one of the other bandwidth paths is selected. This prevents feedthrough in the unused path which would cause undesirable effects in the response curve. The input stages for the other two paths are similarly reverse biased when they are not used. Resistor A1R29 in series with capacitor A1C17 supplies ac degeneration to reduce the stage gain. Capacitor A1C25 couples the signal from the collector of A1Q3 to a T-trap located in the base circuit of A2Q1. This trap is tuned to 22 MHz and produces a notch at the high end of the 400-kHz bandwidth response to eliminate the local oscillator signal that may be present when the receiver is tuned to the low-frequency end of its range. A double-tuned network, containing torroid transformer A2T1 and variable capacitors A2C13 and A2C16, forms a common collector load for the output stages of all three bandwidth paths. Winding 3-4 of A2T1 supplies an out-of-phase signal voltage that is fed back to the base of A2Q1 through A2C7 to neutralize the stage. A2C6 and A2C8 function as the neutralization capacitors for A2Q2 and A2Q3 respectively.

2.9.4 20-kHz and 100-kHz Bandwidth IF Amplifiers. - Transistors A1Q4 and A2Q2 are the second and third IF amplifiers for the 100-kHz path. Crystal filter FL1, located between the two stages sets the 100-kHz bandwidth. The second and third IF amplifiers for the 20-kHz path are A1Q5 and A2Q3 respectively. The bandwidth of this path is determined by crystal filter FL2. In addition to their primary function as 20-kHz bandwidth amplifiers, the latter two stages provide a path through the 21.4-MHz IF strip when the 6-kHz position is selected by the IF BANDWIDTH switch. Bias voltage in this case is fed from a connection on the 455-kHz IF strip to the base networks of A1Q5 and A2Q3 through C10 and C20 respectively. Voltage to operate the 21.4-MHz FM limiter/discriminator subassembly (A8) is supplied through diodes CR1 and CR2 which act as switches. Selection of the 100-kHz bandwidth applies +18 volts to CR1 causing it to conduct. Diode CR2 is then reverse biased preventing the voltage from reaching the base networks of the 400-kHz amplifiers. Operating voltage is then fed through CR1 and C17 to module A8. The opposite occurs when the 400-kHz bandwidth is selected. Diode CR2 is forward biased and CR1 is cut off.

2.9.5 IF Output and Voltage Amplifiers. - The IF output transistor A3Q1 is a dual-gate, MOS FET. This stage is gain controlled by the application of AGC voltage to gate no. 2 (pin 2). The 21.4-MHz signal from the double-tuned network on board A2 is fed to gate no. 1 (pin 3). Inductor A3L1 and variable capacitor A1C5 tune the drain of A3Q1 to the IF frequency. A capacitive impedance-matching network (A3C4, A3C8) is used to feed the signal to the base of voltage amplifier A3Q2. This stage compensates for the losses sustained in A3Q1 when high-level input signals are present. When this condition exists, the gain of A3Q1 is greatly reduced by the action of the applied AGC voltage.

2.9.6 AM Detector and Output. - The collector signal of A3Q2 is fed through parasitic suppressor A3R15 to the primary of transformer A3T1. It is a torroid type having a one-to-one turns ratio. Connected across the transformer secondary, which is tuned to the IF frequency by A3C19, is a capacitive voltage divider (A3C15, A3C16, A3C17) providing two output signals. One is fed through jack J4 to the input of the 21.4-MHz FM limiter/discriminator, A8, and the other is fed through J5 to the rear-apron 21.4-MHz IF OUTPUT connector, J4. AM detector diode A3CR3 demodulates the 21.4-MHz signal and feeds it to emitter follower A3Q3. Silicon diode A3CR2 compensates for the base-emitter voltage drop of the emitter follower so that the AM output will be zero volts with no signal input. A3CR2 is connected to the +18-volt supply by A3R23 and A3R24. The clamp voltage appears on both sides of A3CR3 so that its operation is not affected. Capacitor A3C20 functions as the detector filter. The AM video

signal from emitter follower A3Q3 is fed through jack J6 to the 100-kHz and 400-kHz positions on switch section S4A-X. The filtering action of inductor A3L2 and capacitor A3C21 eliminates any remaining 21.4-MHz component from the video output.

2.9.7 Beat Frequency Oscillator. - Transistor A3Q4 operates as the BFO in a crystal-controlled Clapp configuration. In the CW mode of operation a 21.4-MHz signal is injected into the IF circuit. This signal beats with the IF signal to produce an audible note. Regenerative feedback through A3R10 and A3C6 sustains oscillation. The BFO output is taken from this feedback circuit and coupled through A3C10 to buffer stage A3Q5. This transistor isolates the BFO from load changes that might affect the operating frequency. The BFO and buffer stages are energized by the application of +18 volts from switch sections S4B-X and S3A-X on the main chassis when the CW mode and 100-kHz or 400-kHz bandwidths are selected.

## 2.10 TYPE 79335 21.4-MHz LIMITER/DISCRIMINATOR

The schematic diagram for this subassembly is Figure 6-10; its reference designation prefix is A8.

2.10.1 Limiters. - A pair of symmetrical limiter stages, A1Q1-A1Q2 and A1Q3-A1Q4, remove amplitude variations from the incoming signal so that the input to the discriminator varies only in frequency. The input to A1Q1 swings about a positive dc level of approximately 3 volts which is established by base bias resistors A1R1 and A1R2. Similar bias networks are in the base circuits of the other three transistors. Capacitors A1C3 and A1C7 provide ac coupling between the two stages of each limiter. This permits independent dc operation as well as the use of different transistor types. Under no-signal conditions the emitter currents of A1Q1 and A1Q2 develop a nominal voltage across their respective emitter resistors. The positive-going half cycle of a signal that is applied to A1Q1 will cause increased conduction through the stage, which increases the voltage drop across A1R3. This changing emitter signal is coupled to A1Q2 through A1C3. Since the positive-going signal is being applied to the emitter of A1Q2, it is driven toward cut-off. If the input signal has sufficient amplitude, the base-emitter junction will be completely reverse biased. The negative-going half-cycle of the input signal decreases the drop across A1R3 and causes A1Q2 to conduct to saturation. Thus the transistor operates between cut off and saturated conditions, limiting both the positive and negative half cycles of the input signal. Silicon diode A1CR1 and resistor A1R4 provide additional limiting of high-level input signals, thereby extending the capability of the limiters to function over a greater range of signal amplitudes. Capacitor A1C5 holds the base of A1Q2 at RF ground potential. The signal from the collector of A1Q2 is coupled to the second limiter by A1C4. The operation of the second limiter is identical to that of the first except that A1Q4 is prevented from entering saturation by the action of current limiting diode A1CR2. It prevents the collector voltage of A1Q4 from decreasing below the base potential (approximately +5 volts) which could cause undesirable effects in the discriminator response.

2.10.2 FM Discriminator. - The FM discriminator is a modified Foster-Seeley circuit. The 21.4-MHz signal from the collector of A1Q4 is fed through inductor A1L2 to the primary of discriminator transformer A1T1. The primary and secondary of A1T1 are tuned to the IF frequency by A1C9 and A1C14 respectively. Only a small percentage of the limiter output appears across the primary of A1T1 due to the dividing action of A1L2 and the primary winding. The RF reference voltage is coupled from the input to the transformer secondary by A1C12. Silicon diodes A1CR3 and A1CR4 demodulate the FM signal and apply it to cascaded emitter followers A1Q5 and A1Q6. The video output from the emitter followers is fed through jack J2 to section S4B-W of the IF BANDWIDTH switch and to the front-panel TUNING meter, M2.

## 2.11 TYPE 72197 455-kHz IF AMPLIFIER

The 455-kHz IF strip contains amplifier stages for the 6-kHz and 20-kHz bandwidths as well as a BFO that operates at this IF frequency. Figure 6-11 is the schematic diagram for this IF amplifier; its reference designation prefix is A9.

2.11.1 Input Converter and Oscillator. - The input stage of the 455-kHz IF strip, A1Q1, is a single-gate, MOS field-effect transistor. It functions as a mixer and heterodynes the incoming 21.4-MHz IF signal with the 20.945-MHz oscillator signal from A1Q2. The 455-kHz difference frequency produced by this mixing action is taken from the drain connection. Transistor A1Q2 operates in a self-regulating, crystal-controlled, Clapp configuration. The output signal is taken from the feedback circuit and fed to the gate of A1Q1 by capacitor A1C3. An additional eyelet, E4, has been included in the source circuit of A1Q1 to provide a means of monitoring the oscillator injection level with a wideband oscilloscope.

2.11.2 6-kHz and 20-kHz IF Amplifiers. - A double-tuned network containing variable inductors A2L1 and A2L3 forms the drain load for A1Q1. It is tuned to the 455-kHz difference frequency and produces a response having a 20-kHz bandwidth. From this network the signal is fed in parallel to two separate paths. The one through which the signal is passed is determined by the position of IF BANDWIDTH switch S4. Placing this switch in the 20-kHz position applies +18 volts through feedthrough capacitor C4 to the base networks of A2Q1 and A2Q3 which are the fourth and fifth IF amplifiers for this bandwidth. In addition, diode CR5 becomes forward biased and results in the application of collector voltage through C6 and C2 to A2Q1 and the double-tuned circuit. This same dc path (CR5-C6) supplies operating voltage for the 20-kHz bandwidth amplifiers in the 21.4-MHz IF strip, and the 20.945-MHz crystal oscillator in that amplifier. Transistors A2Q2 and A2Q4 are the fourth and fifth amplifiers for the 6-kHz bandwidth. Ceramic filter A2FL1 sets the bandwidth of this path. Base bias voltage for A2Q2 and A2Q4 is supplied from the IF BANDWIDTH switch when the 6-kHz position is selected. Collector voltage for A2Q2 is obtained from the same source as that for A2Q1 except that diode A2CR6 is utilized in this case. The signal from the path in operation is fed through dc-blocking capacitor A2C16 to the output amplifier stages.

2.11.3 IF Output and Voltage Amplifiers. - IF amplifier A2Q5, a dual gate, MOS field-effect transistor, is common to both IF bandwidths. Incoming signals are fed to gate no. 1 (pin 3). AGC voltage is applied to gate no. 2 (pin 2) when the AM AGC or FM modes are selected. Output signals are taken from the drain connection and coupled to voltage amplifier A2Q7 by A2C25. This stage provides the necessary drive for IF amplifier A2Q9 when high-level input signals are present. When this condition exists the gain of A2Q5 is reduced by the action of the applied AGC voltage. This loss of signal voltage is compensated for by A2Q7. The amplified output from A2Q9 is simultaneously fed to the primary of detector transformer A2T1, through A2C31 and a resistive voltage divider (A2R51, A2R53) to the FM limiters, and through a capacitive voltage divider (A2C32-A2C33) and jack J3 to the rear-apron 455-kHz IF OUTPUT connector, J5.

2.11.4 AM Detector and Output. - Silicon diodes A2CR3 and A2CR4 are connected as a push-pull AM detector. The secondary of transformer A2T1 is center tapped to supply the proper output signals. A full-wave configuration is employed to minimize output ripple that is inherent in conventional AM detectors. Diode A2CR2 compensates for the base-emitter voltage drop of output emitter follower A2Q10. This is done so that the AM video output will be zero volts with no signal input. Note that the clamp voltage appears on both sides of the detector diodes so that their operation is not affected. The AM video output from emitter follower A2Q10 is fed through jack J2 to the 6-kHz and 20-kHz positions on switch section S4A-X. Inductor A2L5 and capacitor A2C38 eliminate any remaining 455-kHz IF component from the video output.

2.11.5 Beat Frequency Oscillator. - The 455-kHz BFO, A2Q6, operates in a self-regulating, crystal-controlled Clapp circuit. Regenerative feedback through A2R34 and A2C20 sustains oscillation. The BFO output signal is obtained from the emitter of A2Q6 and fed to the base of buffer transistor A2Q8. This stage isolates the BFO from load changes that might affect the operating frequency. The 455-kHz signal is injected into the IF path at the junction of A2R48 and A2C31. This BFO is activated when the CW mode and the 6- or 20-kHz bandwidths are selected.

## 2.12 TYPE 79337 455-kHz LIMITER/DISCRIMINATOR

The schematic diagram for the 455-kHz FM limiter/discriminator is Figure 6-12; its reference designation prefix is A10. The operation of this limiter is similar to that of the 21.4-MHz limiter, A8, described in paragraph 2.10. Silicon diodes A1CR1 and A1CR2, in this circuit, limit input signals in excess of 0.6 volts. These diodes prevent signals from over-driving Q3. The discriminator input circuit is tuned by variable inductor A1L1 and discriminator transformer A1T1 in lieu of variable capacitors. The demodulated FM signal is fed through jack J2 to the TUNING meter and to the 6-kHz and 20-kHz positions of switch section S4B-W.

## 2.13 TYPE 7352 VIDEO AMPLIFIER

The schematic diagram for this plug-in module is Figure 6-3; its reference designation prefix is A11. The module consists of an NPN transistor, Q1, dc-coupled to Q2, a PNP transistor. These two stages provide the necessary voltage gain to drive complementary symmetry emitter followers Q3 and Q4. The latter two transistors are biased to operate Class B. Negative dc feedback to set the over-all gain of the amplifier is taken at the junction of emitter resistors R11 and R12 and fed to the emitter of Q1 through R6. Silicon diodes CR1 and CR2 determine the idling currents of Q3 and Q4, and eliminate crossover distortion while preventing thermal runaway. Since the transistors and diodes are made of the same material they exhibit the same temperature coefficient of voltage characteristics. A rise in temperature lowers the base-emitter voltage drop of the transistors tending to make them conduct harder. However, the diode voltage drop decreases by the same amount so that the voltage applied to the

bases also decreases, holding the collector current nearly constant. Resistors R11 and R12 are included in the emitter circuits of Q3 and Q4 to provide additional feedback with low-input signal levels. These resistors eliminate distortion introduced by the difference between the voltage drops of CR1 and CR2 and the base-emitter junctions of Q3 and Q4. With little or no input signal the drop across the resistors is a few tenths of a volt. Large input signals would cause the drop to become excessive except that CR3 and CR4 become forward biased and limit the drop to approximately 0.6 volt. The low-impedance output of the complementary symmetry emitter followers is matched to the higher impedance output terminals by means of R13. This resistor has the additional effect of preventing amplifier damage if the output terminal is accidentally shorted to ground. Resistor R14 provides a discharge path to ground for C6 if the amplifier is operated without a dc load. Capacitor C3 provides additional drive for Q4 through R9 during the negative-going portion of the input signal. The base of Q3 and Q4 are coupled through capacitor C4 to equalize the input signal level to the two stages. The output signal from the module is fed to the rear-apron VIDEO OUTPUT jack, J7.

## 2.14. TYPE 7433 AUDIO AMPLIFIER

Figure 6-14 is the schematic diagram for the audio amplifier; A12 is its reference designation prefix. The operation of this module is similar to the video module discussed in paragraph 2.13. Notable differences exist in that a transformer is used to supply 3.2- and 600-ohm audio outputs as well as some negative feedback which is produced by current flow through the primary and resistor R6. The two low-impedance outputs are fed to rear-apron terminal board TB1. The high impedance output is fed to the PHONES jack on the front panel.

## 2.15 TYPE 79354 AGC AMPLIFIER

Figure 6-15 is the schematic diagram for the AGC amplifier; its reference designation prefix is A13.

2.15.1 IF AGC. - The input signal to the module is the positive-going output from the AM detector in the selected IF amplifier. It is fed to the base of IF AGC preamplifier Q1 through resistor R2. Filtering of the input signal to remove modulation is provided by C1. Reverse biasing of the base-emitter junction of Q1 from the +18V supply through R4 provides the desired delay prior to AGC action. The point at which the transistor becomes forward biased is when the signal-to-noise ratio at the receiver's output reaches approximately 30 dB. Until this time Q2 is conducting heavily with emitter current flowing through CR1, CR2, and R7. When Q1 conducts, the collector signal reduces the conduction through Q2. The emitter voltage of Q2 then drops to approximately +13 volts. The AGC preamplifier voltage is taken from the emitter of Q3, which is at zero volts due to the compensation provided by CR3 and CR4. As the incoming signal amplitude continues to increase, the voltage at the emitter of Q2 continues to decrease causing an approximately equal emitter voltage decrease on Q3. This emitter signal is then fed through pin 11 of the module to the AM AGC and FM positions on function switch section S3B-W. An additional modulation filter, consisting of C2 and R33, is connected at the junction of CR1 and CR3. Current to operate the SIGNAL STRENGTH meter when the AGC circuit is operating is also derived from Q3. This current is fed through diode CR5, and resistor R10, to meter M1. The diode prevents movement of the meter needle until the voltage output exceeds -0.6 volts. An AGC monitor is also provided from this output through resistor R9. It is fed to pin no. 6 of rear-apron terminal board TB1 and to test point TP4 on the main chassis. Placing switch S3 in the AM AGC or FM positions results in the preamplifier output at pin 11 being fed to pin 8. From this point the signal passes through resistor R12 to cascaded emitter followers Q4 and Q6. The resultant output from the emitter of Q6 (module pin 9) is a signal that increases, in the negative direction, an equal amount for a given input voltage change on the base of Q4. Thus, a one-volt change on pin 11 results in a one-volt change at the IF AGC output. The IF AGC voltage is fed directly to the gain controlled stages in both IF amplifiers. A change in the slope of the IF AGC characteristic curve occurs as the voltage amplitude at the emitter of Q6 exceeds approximately 3.6 volts. This slope change is a result of the action of transistor Q5, whose function resembles that of a Zener diode. Under no signal conditions, the reverse bias voltage on the base, determined by resistors R16, R17, R18, and R20, is approximately -3.0 volts and the stage is cut off. As the negative-going signal on the emitter exceeds the reverse bias voltage, the stage conducts and resistor R14 is added to the circuit. The result is an IF AGC output that continues to increase with an increasing input signal, but at a reduced rate of change.

2.15.2 RF AGC. - Transistor Q7 performs essentially the same function as Q5. The reverse bias on the base of this stage is approximately -2.5 volts. As the incoming signal at pin 11 approaches approximately -3.1 volts, Q7 conducts, causing current flow through the stage and resistors R22, R23, and R24. The voltage at the base of Q8 rises rapidly to -0.6 volts, at which time CR6 is forward biased, shunting resistor R24. These three resistors and the diode form a voltage shaping network for the RF AGC. The gain of the receiver is primarily controlled by the RF AGC voltage once these circuits begin to function. Transistors Q8 and Q9 are connected in a differential

feedback amplifier configuration. The input signal on the base of Q8, and the feedback signal on the base of Q9 are summed in the common emitter circuit to produce a signal on the collector of Q8 that is the difference between the two inputs. This signal is fed directly to the base of voltage amplifier Q10. Two outputs are provided by this stage. One is the feedback signal developed at the junction of resistors R28 and R29. This signal sets the voltage gain of the over-all amplifier at a factor of three. The second output is the RF AGC signal which is taken at the junction of R28 and R30, and fed through R31 to the gain-controlled stage in the RF assembly.

2.15.3 Manual Gain Control. - When switch S3 is placed in the AM MAN or CW positions the gain of the receiver is controlled by the front-panel RF/IF GAIN potentiometer, R3. Bias voltage from this control is fed to the AGC module through pin 8. Rotating R3 in the counterclockwise direction increases the reverse bias applied to emitter follower Q4 and has the same effect as the negative going input that is supplied from pin 11 during AGC operation, namely decreasing the forward bias on the gain-controlled IF and RF stages, and lowering the gain of the receiver. Transistors Q5 through Q10 function as they do when the AGC circuits are operating.

2.15.4 Signal Strength Meter. - The polarity of SIGNAL STRENGTH meter M1 is reversed by section S3B-X of the function switch, depending on the operating mode selected. The current path through the meter when the AM AGC or FM modes are selected is through transistor Q3, diode CR5, resistor R10, and meter M1 to ground. Selection of the AM MAN or CW modes results in the terminal of M1 that is connected to S3B-X pin 10 becoming positive with respect to ground. Current flow is then from the AM detector, through resistor R1 on the module, and the meter and function switch to ground.

## 2.16 POWER SUPPLY

The power supply for the 371A receiver consists of various main chassis components (see Figure 6-18) and plug-in modules A14 and A15. The ac input power from plug P26 is fed through line filter FL1, line fuse F1, and POWER switch S2, to the two primary windings of power transformer T1. Input power selector switch S1, located on the rear apron, is used to connect the two primary windings in parallel for 115-volt operation or in series for 230-volt operation. Fuse F2 provides additional overload protection when the latter input power is used. The power transformer has two secondary windings. One of these, 8-9, supplies 5.0 Vac to operate the dial lamps in the tuning assembly. Winding 5-6-7 supplies the ac input power to the +18-volt and -12-volt regulated power supply boards.

2.16.1 Type 76123 +18V Regulated Power Supply. - The schematic diagram for this module is Figure 6-16; its reference designation prefix is A14. Transistor Q1 functions as a series regulator whose conduction is controlled by Q2, an emitter follower. Transistors Q3 and Q4 are connected in a differential amplifier configuration. The base of Q3 is connected to the regulated output through a sampling network consisting of fixed resistors R6 and R8, and potentiometer R7. The signals at the bases of the two stages are summed in the common emitter circuit to produce a signal at the collector of Q3 that is the difference between the two inputs. Thus, any fluctuation in the output voltage is sensed by Q3, amplified and inverted and fed to the base of Q2. For example, if the output voltage rises (becomes more positive) Q3 will conduct harder, causing an increased voltage drop across R2 and R3. This lowers the forward bias voltage and the current flow through Q2. As a result, the current flow through Q1 is reduced, returning the output voltage to its nominal value. Resistor R4 connects the base of Q3 to the input side of the regulator so that voltage fluctuations at this point can be sensed and compensated for by Q1. A differential amplifier is used in the comparison circuit as variations in base-emitter voltage due to temperature changes in one transistor will tend to cancel similar changes in the other. This configuration also permits the reference diode, CR2, to be placed in the base circuit rather than the emitter, as is the case with a one-stage error amplifier. Less current flows through the diode, resulting in a more stable reference voltage.

2.16.2 Type 76113 -12V Regulated Power Supply. - Figure 6-17 is the schematic diagram for this module; its reference designation prefix is A15. The operation of this module is identical to power supply board A14. The polarity of the capacitors, transistors, and diodes has been reversed to supply the negative output voltage.

# SECTION III

# INSTALLATION AND OPERATION

## 3.1 INSTALLATION

The 371A Receiver is designed for mounting in a standard 19-inch rack. The unit will occupy 3.5 inches of vertical space and extend 18 inches back into the rack. The receiver weighs approximately 25 pounds. If a mobile installation is anticipated, some means should be devised to support the sides and/or rear of the equipment. A brace extending along the sides from the front panel to the rear apron is preferred. Do not rely solely on the front panel mounting hardware to support the receiver.

3.1.1 Power Connection. - Place the POWER toggle switch in the off position. Plug the power cord into a 115 or 230 volt, 50-400 Hz source. The third pin of the power cord grounds the unit. If a three-pin receptacle is not available, use the adapter provided. Before energizing the receiver, ensure that the rear-apron input power selector switch, S1, is in the position for the line voltage being used.

3.1.2 Antenna Connection. - Connect the 500-kHz to 10-MHz antenna to RF INPUT jack J1 on the rear apron. This is a BNC-type connector.

3.1.3 LO Output. - The local oscillator signal is available at rear-apron LO OUTPUT connector J2. This jack is a BNC-type receptacle.

3.1.4 Signal Monitor Output. - A 21.4-MHz output for use with a signal monitor is available at the SM OUTPUT jack, J3. This jack is a BNC-type connector.

3.1.5 IF Outputs. - A predetection IF output signal is available from both IF amplifiers. The output from the 21.4-MHz IF strip is available at jack J4. The 455-kHz IF output is available at jack J5. Both are BNC-type connectors.

3.1.6 Detector Level Output. - AM detector output signals from the selected IF strip are available at rear-apron BNC-type jack J6, DET LEVEL OUTPUT.

3.1.7 Video Output. - The video amplifier output signal is available at VIDEO OUTPUT jack, J7. This BNC-type jack supplies a 5-volt peak-to-peak signal, minimum, into a 91-ohm load.

3.1.8 Audio Output. - Both 3.2-ohm and 600-ohm audio output signals are available at rear-apron terminal board TB1. A high-impedance audio signal is supplied to the PHONES jack on the front panel.

3.1.9 AGC Monitor Output. - The IF AGC signal voltage may be monitored at pin 6 of terminal board TB1.

## 3.2 OPERATION

The function of the front-panel controls and indicators is described in the following paragraphs. These controls and indicators are shown in Figure 5-1, a front view of the 371A receiver.

3.2.1 Power Toggle Switch. - The receiver is energized when the POWER switch is placed in the ON position. The tape dial and frequency sign will be illuminated indicating power is being applied.

3.2.2 Input Attenuator Switch. - The input attenuator permits the receiver to accept input signals of up to 1-volt rms without overloading.

3.2.3 Mode Switch. - The MODE switch selects the operating condition of the receiver. Placing this switch in the AM AGC or FM positions results in the receiver gain being controlled by internal circuitry. Selection of the AM MAN or CW modes allows the operator to control the gain by means of the RF/IF GAIN potentiometer. Operation in the CW mode also activates a beat frequency oscillator located in the selected IF amplifier.

3.2.4 RF/IF Gain Control. - The gain of the receiver is controlled by the RF/IF GAIN potentiometer when the AM MAN or CW modes are selected.

3.2.5 IF Bandwidth Switch. - Bandwidths of 6 kHz, 20 kHz, 100 kHz, or 400 kHz may be selected by the IF BANDWIDTH switch. The 100-kHz bandwidth is usable above 550 kHz, and the 400-kHz bandwidth is usable above 700 kHz. A 21.4-MHz center frequency is used when the 100- or 400-kHz bandwidths are selected, whereas a 455-kHz IF is used when the 6- or 20-kHz bandwidths are selected.

3.2.6 Video Gain Control. - The amplitude of the video signal present at jack J7 may be varied by means of the VIDEO GAIN potentiometer.

3.2.7 Audio Gain Control. - The AUDIO GAIN control is used to vary the amplitude of the audio signal present at rear-apron terminal board TB1 and at the PHONES jack on the front panel.

3.2.8 Fine Tuning Control. - Small changes in the frequency to which the receiver is tuned may be made with the FINE TUNING control.

3.2.9 Main Tuning Control and Lock. - The main tuning control is used to select the desired frequency between 500 kHz and 10 MHz. The tuning dial may be locked in position by depressing the plunger. (The low band tuner in the 373A is also equipped with a dial lock.)

3.2.10 Signal Strength Meter. - The SIGNAL STRENGTH meter indicates the relative amplitude of incoming signals. The meter is not calibrated in any specific units.

3.2.11 Tuning Meter. - The TUNING meter indicates the position of an incoming signal with respect to the center of the IF bandpass. When the meter reads "0" the signal is tuned in properly.

# SECTION IV
# MAINTENANCE

## 4.1 GENERAL

The Type 371A Receiver has been carefully designed to operate for long periods of time with little more than routine preventive maintenance. The receiver requires no special maintenance procedures and normally needs only to be cleaned at periodic intervals. Down time will be minimized, should trouble occur, if the maintenance technician is familiar with Section II of this manual in which the circuits are described. Reference should also be made to the block diagram, Figure 2-1, and to the schematic diagrams, Figures 6-1 through 6-18. Field maintenance should be confined to cleaning and the replacement of fuses and plug-in modules. All other maintenance should be carried out in a well equipped shop and performed by experienced personnel who are familiar with the receiver.

## 4.2 PLUG-IN MODULES

The plug-in modules can be easily removed by simply pulling them upward from the receptacles into which they are fitted. The numbers on the main chassis adjacent to the receptacle pins correspond to the numbers indicated on the schematic diagrams at the points where the connecting leads pass through the lines outlining each module. Modules having different functions are keyed to prevent them from being damaged as a result of being placed in the wrong receptacle. All plug-in modules have their type numbers etched on the back of the cards. By referring to the schematic diagrams their reference designation prefixes can be found, and thus their proper location in the unit.

## 4.3 TROUBLESHOOTING

Initial investigation should be directed toward localizing the trouble to a specific section of the receiver. In the case of the plug-in modules, a quick check can be made by plugging in a spare known to be good. If these substitutions do not cure the trouble, then the video, audio, and AGC amplifiers, and the +18V and -12V power supplies may be eliminated from consideration. This leaves the two IF amplifiers and their associated FM discriminators, and the local oscillator/tuning assembly. To check these subassemblies feed in a signal within the receiver's tuning range, tune the receiver to the frequency and use a wideband oscilloscope to check for an output at each subassembly. Be sure to select the FM operating mode in order to activate the limiter/discriminator subassemblies. A complete loss of output signals in all modes indicates a possible faulty local oscillator. Once the defective subassembly is located, additional signal tracing will usually find the inoperative stage. Voltage and resistance measurements should then be used to pinpoint the malfunctioning component. Typical transistor and module pin voltages are given in Table 4-1.

## 4.4 MAINTENANCE OF GEAR TRAIN ASSEMBLY

Figure 5-15 is an exploded view of the gear train assembly. It relies on built-in stops to halt rotation at the high- and low-frequency ends of the dial. The gear train requires very little maintenance. The occasional application of a few drops of light oil to the shaft bearings and removal of any accumulated dust or dirt is all that is necessary to assure proper operation.

4.4.1 Dial Lamp Replacement. - To replace a burned out dial lamp proceed as follows:

(1) Remove plug A5P1 from jack J11.

(2) If necessary, loosen the cable clamp on the side of the tuning assembly and remove any lacing cord that is used to secure the dial lamp wires to the gear train spacer.

(3) Remove the two black screws that secure the dial escutcheon. Remove the escutcheon (see Figure 5-15).

(4) Remove the two screws that hold the light bar to the gear train.

(5) Gently pull the light bar and printed circuit light board away from the gear train.

(6) Tilt the light board up and remove the two screws that secure the board to the bar. Remove the light bar.

(7) Unsolder the burned out dial lamp and replace with a new unit.

(8) Replace the light board and light bar by reversing steps (3) through (7).

(9) Re-tighten the cable clamp and insert plug A5P1 into jack J11.

4.4.2 Alignment of Dial Tape. - A calibrated steel tape is used as the tuning dial. It is geared to the assembly in such a manner that it is unlikely it will ever get out of position. However, to check the alignment or to mechanically realign the tape, follow the steps given below:

(1) Turn the tuning knob counterclockwise until rotation stops.

(2) The mark to the left of the arrow should line up with the dial pointer. If it does not, proceed with the next step.

(3) Loosen the set screw on gear no. 15 (Figure 5-15).

(4) Remove the dial escutcheon as described in paragraph 4.4.1, step (3).

(5) By hand, move the dial tape, independent of the gear train, to align reference mark with pointer.

(6) Tighten the set screw on gear no. 15 and replace the dial escutcheon.

(7) Tune from one end of the dial to the other to determine if binding occurs in the gear train. If some binding is present, loosen the set screws on gear no. 30 and slightly readjust its position.

4.4.3 Removal and Disassembly of Gear Train and Tape Dial. - The gear train and tape dial assembly may be removed from the receiver by performing the following steps. Once removed from the receiver, the gear train may be disassembled using Figure 5-15 as a guide. It is recommended however, that the gear train, tape dial, and tuning assembly (A5) be replaced as a unit.

(1) Remove the dial escutcheon and main tuning knob.

(2) Remove plug A5P1 from jack J11, and plug P12 from jack A1J1.

(3) From the bottom of the receiver, remove the four machine screws that secure the tuning assembly to the main chassis.

(4) Insure that the dial lock plunger is pulled out. The entire assembly may now be removed by lifting it out from the top of the receiver.

## 4.5 ALIGNMENT PROCEDURES

4.5.1 General. - The alignment procedures given below are suitable when making periodic performance checks, or when making adjustments after replacing transistors or components. Only those controls specifically referred to within a series of steps given for aligning a particular circuit, effect the alignment of 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 executed in a well-equipped shop and performed only by trained and experienced personnel who are thoroughly familiar with the receiver. If the limits and tolerances specified in the following procedures cannot be obtained then a factory alignment is necessary.

4.5.2 Test Equipment Required. - The following equipments or their equivalents are required to perform the complete receiver alignment.

(1) Sweep Generator, Telonic SM-2000 with internal 21.4-MHz marker.

(2) Sweep Generator Plug-In Heads, Types LH-2 and VR-2M

(3) Electronic Frequency Counter, Hewlett Packard Type 5245L

(4) Signal Generator, Hewlett Packard Type 606A

(5) VTVM, RCA WV-98B

(6) Oscilloscope, Tektronix Type 503

(7) Detector, 50-ohm, Telonic Type XD-3A

(8) Assorted Cables, connectors, and alignment tools

## 4.6 21.4-MHz IF AMPLIFIER ALIGNMENT

4.6.1 Input Network Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1.

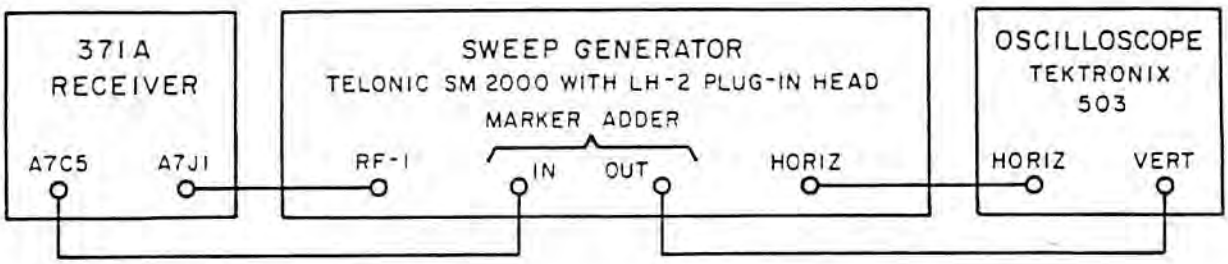



Figure 4-1. Equipment Setup, 21.4-MHz IF Amplifier, Input Network Alignment

(2) Set 371A receiver MODE switch to AM MAN, IF BANDWIDTH switch to 400 kHz and rotate RF/IF GAIN control fully clockwise.

(3) Set output frequency of sweep generator to 21.4 MHz; turn internal 21.4-MHz marker on.

(4) Adjust sweep generator and oscilloscope controls to display a response curve.

(5) Adjust capacitors A7A1C10 and A7A1C7 for a maximum amplitude, over-coupled response centered about the 21.4-MHz marker. A typical response is shown in Figure 4-2.

4.6.2 400-kHz Bandwidth IF Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-4.

(2) Set output frequency of sweep generator to 21.4 MHz; internal marker off.

(3) Adjust sweep generator and oscilloscope controls to display a response curve.

(4) Adjust capacitors A7A1C24, A7A2C13, and A7A2C16 for a maximum amplitude, double-tuned response.

NOTE

Detune capacitor A7A2C2 to prevent it from affecting the main response.

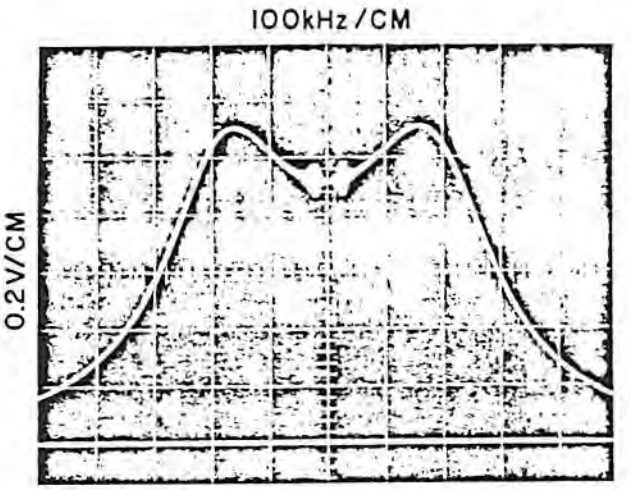



Figure 4-2. Typical Response, 21.4-MHz IF Input Network

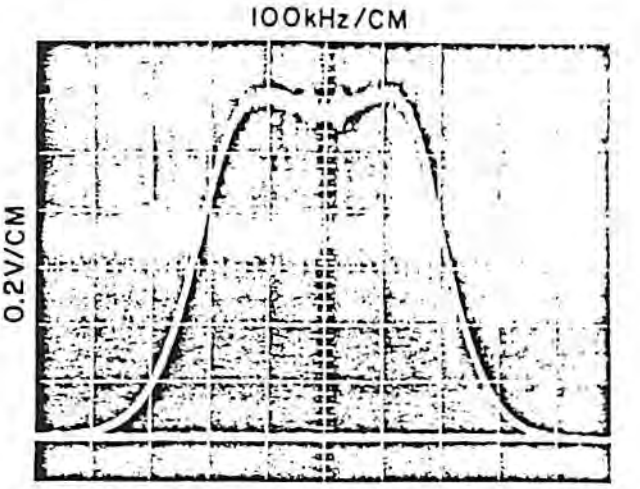



Figure 4-3. Typical Response, 400-kHz Bandwidth IF Amplifier

(5) Remove the XD-3A detector from the test setup and reconnect the sweep generator MARKER ADDER INPUT to jack A7J6.

(6) Adjust capacitors A7A3C5 and A7A3C19 for a maximum response at 21.4 MHz.

(7) Adjust capacitor A7A2C2 for maximum rejection of the response at at 22.0 MHz.

(8) Reconnect equipment as shown in Figure 4-4.

(9) Turn sweep generator internal 21.4-MHz marker on.

(10) Readjust capacitors A7A1C24, A7A2C13, and A7A2C16, for a maximum amplitude, symmetrical response centered about the IF marker.

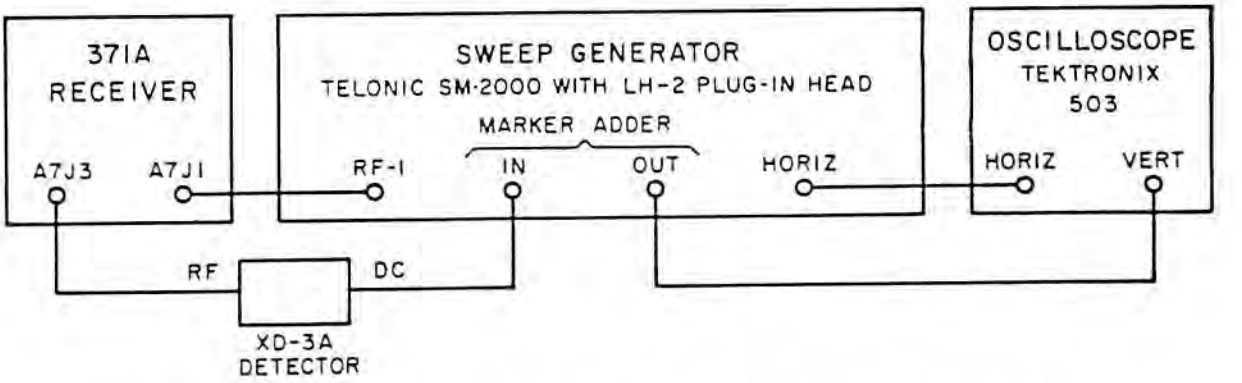



Figure 4-4. Equipment Setup, 400-kHz Bandwidth IF Amplifier Alignment

(11) Reconnect equipment as described in step (5).

(12) Readjust capacitors A7A3C5 and A7A3C19 for a maximum amplitude, symmetrical response centered about the 21.4-MHz marker. A typical over-all response is shown in Figure 4-3.

(13) Place IF BANDWIDTH switch in 100 kHz position and note that response bandwidth changes. A typical 100-kHz bandwidth response is shown in Figure 4-5.

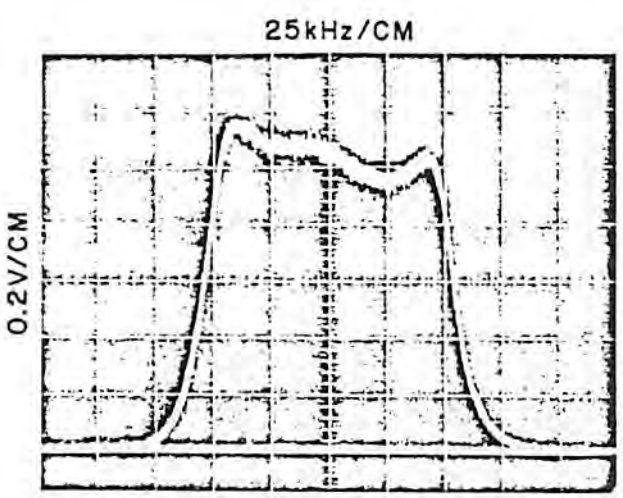



Figure 4-5. Typical Response, 100-kHz Bandwidth IF Amplifier

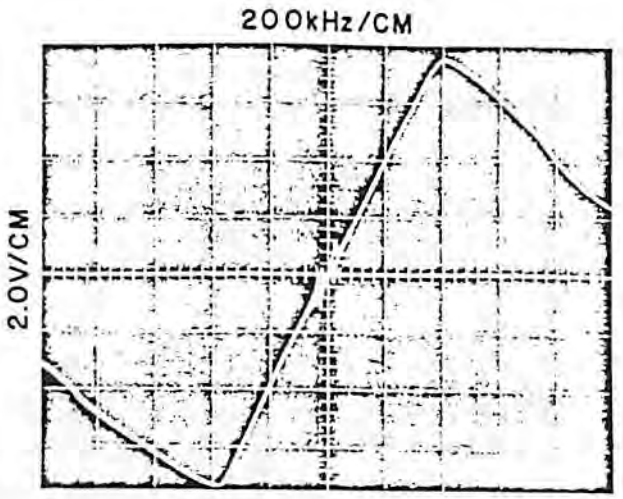



Figure 4-6. Typical Response, 21.4-MHz FM Discriminator

4.6.3 21.4-MHz Limiter/Discriminator Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1 except that sweep generator RF output is connected to jack A8J1 and MARKER ADDER INPUT is connected to A8J2.

(2) Place 371A receiver IF BANDWIDTH switch in 400 kHz position and MODE switch in FM.

(3) Set output frequency of sweep generator to 21.4 MHz; turn internal 21.4-MHz marker on.

(4) Adjust sweep generator and oscilloscope controls to display an "S" response curve.

(5) Adjust A8A1C9 for amplitude symmetry and A8A1C14 for zero crossing of the "S" curve. Use the signal generator to check for maximum linearity between 21.2 MHz and 21.6 MHz. A typical response is shown in Figure 4-6.

4.7 455-kHz IF AMPLIFIER ALIGNMENT

4.7.1 20-kHz Bandwidth IF Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-7.

(2) Place 371A receiver IF BANDWIDTH switch in 20-kHz position.

(3) Set output frequency of sweep generator to 21.4 MHz; turn internal 21.4-MHz marker on.

(4) Adjust sweep generator and oscilloscope controls to display a response curve.

(5) Adjust inductors A9A2L1, A9A2L3, and A9A2T1, for a maximum amplitude, symmetrical response centered about the center frequency marker. A typical 20-kHz bandwidth response is shown in Figure 4-8.

(6) Place IF BANDWIDTH switch in 6-kHz position, and note that bandwidth response changes. A typical 6-kHz bandwidth response is shown in Figure 4-9.

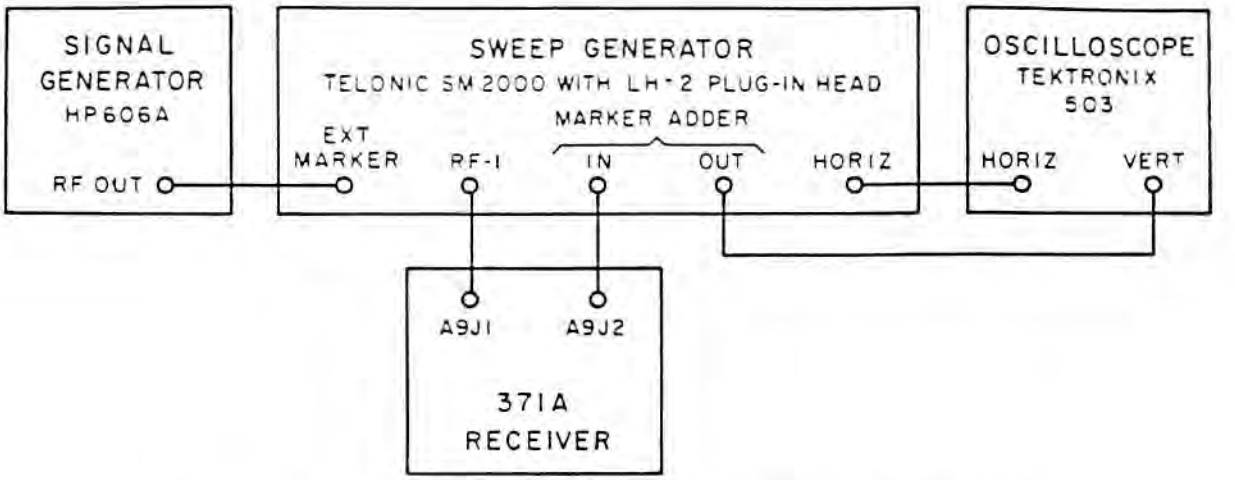



Figure 4-7. Equipment Setup, 20-kHz Bandwidth IF Amplifier Alignment

4.7.2 455-kHz Limiter/Discriminator Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-7 except that sweep generator RF output is connected to A10J1 and MARKER ADDER INPUT is connected to A10J2; install VR-2M plug-in head in sweep generator.

(2) Place 371A receiver MODE switch in FM and IF BANDWIDTH switch in 20-kHz position.

(3) Set output frequency of sweep generator to 455 kHz.

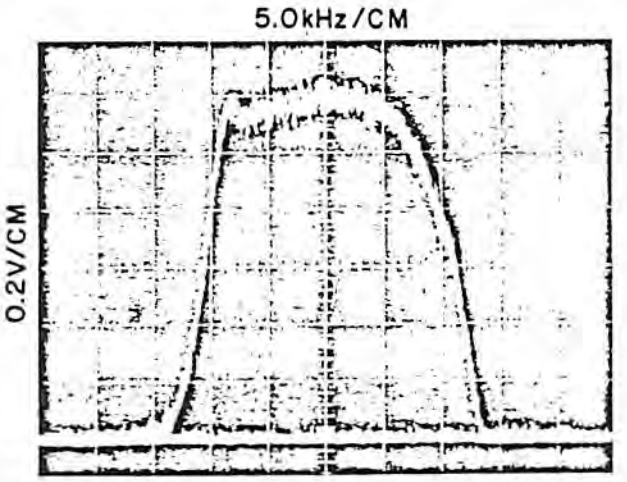



Figure 4-8. Typical Response, 20-kHz Bandwidth IF Amplifier

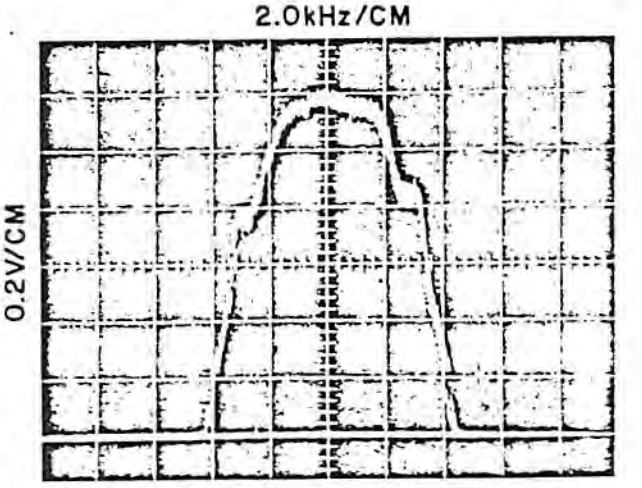



Figure 4-9. Typical Response, 6-kHz Bandwidth IF Amplifier

(4) Adjust sweep generator and oscilloscope controls to display an "S" response curve.

(5) Adjust A10A1L1 for amplitude symmetry and A10A1T1 for zero crossing of the "S" curve. A typical response is shown in Figure 4-10.

4.8 LOCAL OSCILLATOR ALIGNMENT AND DIAL CALIBRATION

Figure 4-10
Figure 4-11
Figure 4-12

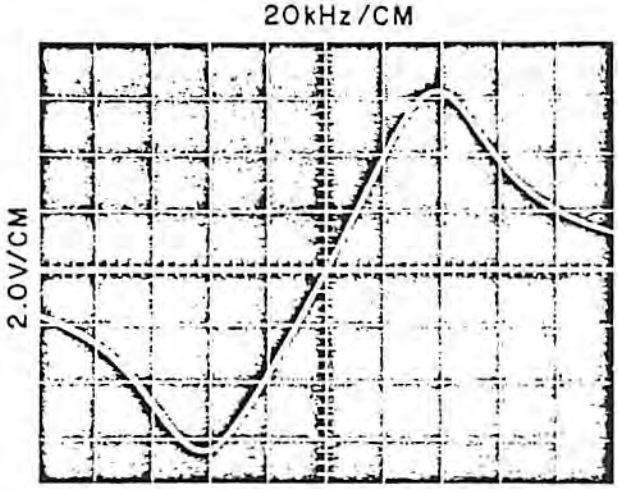



Figure 4-10. Typical Response, 455-kHz FM Discriminator

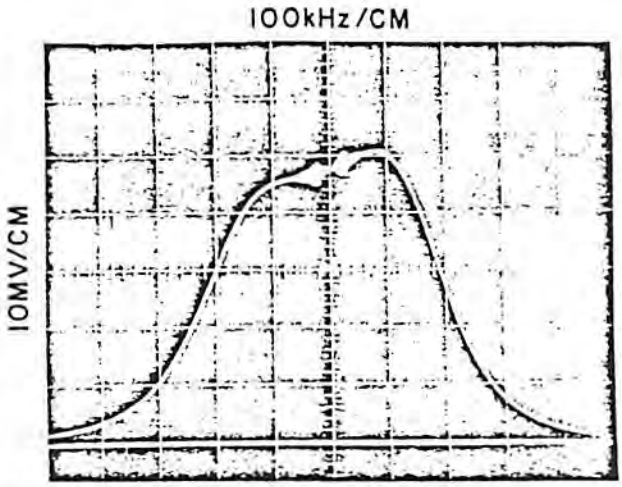



Figure 4-11. Typical Response, RF Assembly Output Network

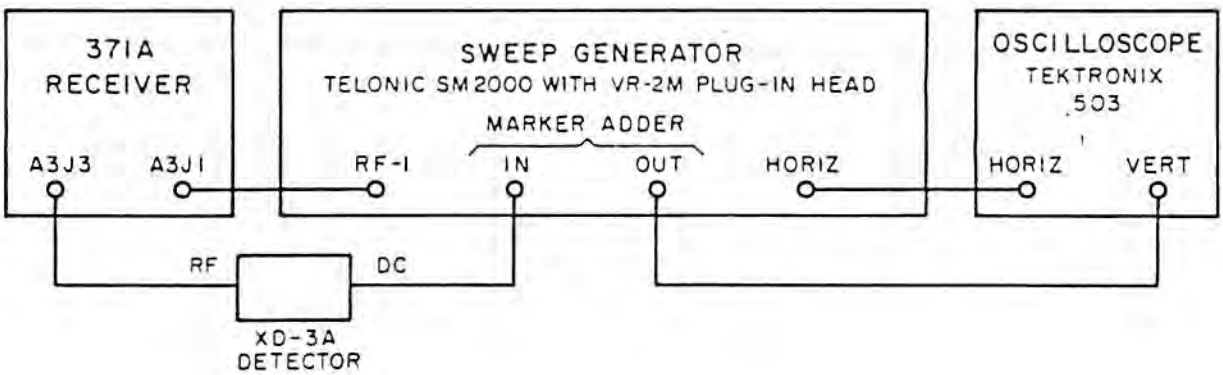



Figure 4-12. Equipment Setup, RF Assembly Alignment

NOTE

Alignment of the local oscillator should not be attempted unless considered absolutely necessary, such as after the replacement of a frequency determining component in the network. The LO normally does not require re-alignment after the replacement of oscillator transistor A5A1A1Q2.

4.8.1 Fine Tuning Voltage Adjustment. - The fine tuning voltage must be set prior to alignment of the local oscillator. Proceed as follows:

(1) Connect VTVM to test point TP3 (F.T.) on receiver main chassis.

(2) Set VTVM to read positive dc volts.

(3) Adjust FINE TUNING control for a +7 Vdc reading on VTVM.

4.8.2 LO Alignment. - Proceed as follows:

(1) Connect HP5245L counter to LO OUTPUT jack J2 on the rear apron of the receiver.

(2) Place receiver MODE switch in AM MAN and rotate RF/IF GAIN control fully clockwise.

(3) Tune receiver to 0.5 MHz. The counter should read 21.9 MHz, ±0.04 MHz. If not, adjust capacitor A5A1C2 until it does.

(4) Tune receiver to 10.0 MHz. The counter should read 31.4 MHz, ±0.10 MHz. If not, obtain the difference between the actual counter reading and 31.4 MHz. Divide this difference by 2 and adjust inductor A5A1L1 so that the counter reading moves away from 31.4 MHz by that amount.

(5) Tune the receiver to 0.50 MHz. Adjust A5A1C2 for a counter reading of 21.9 MHz ±0.04 MHz.

(6) Repeat steps (4) and (5) until the low and high-end readings are within the tolerances given.

(7) Check the dial readings at 1-MHz intervals from 0.50 MHz to 10.0 MHz. The dial readings should be within ±1% from 1 MHz to 9 MHz. If not, repeat the entire calibration procedure.

4.9 RF ASSEMBLY ALIGNMENT

The output network in RF assembly A3 is aligned by performing the following steps.

(1) Connect equipment as shown in Figure 4-12.

(2) Set output frequency of sweep generator to 7.0 MHz.

(3) Tune 371A receiver to 7.0 MHz.

(4) Adjust sweep generator and oscilloscope controls to display a response curve.

(5) Adjust inductors A3A2L2 and A3A2L3 for a maximum amplitude, symmetrical response. A typical response is shown in Figure 4-11.

Table 4-1. Type 371A Receiver Typical Transistor Element and Module Pin Voltages

| Ref. Desig. | Type | Pin Number | | | | Element | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | Emitter | Base | Collector |
| A3A1Q1 | TA2644 | 11.60 | 3.41 | 1.09 | 1.28 | | | |
| A3A1Q2 | 2N3478 | | | | | 7.90 | 8.60 | 15.00 |
| A3A2Q1 | 2N3478 | | | | | 2.70 | 3.48 | 15.50 |
| A3A2Q2 | 2N3478 | | | | | 7.40 | 8.10 | 15.19 |
| A4A1Q1, A4A2Q1 | 2N3478 | | | | | 4.40 | 5.00 | 17.80 |
| A4A1Q2, A4A2Q2 | 2N3478 | | | | | 4.40 | 5.20 | 15.90 |
| A4A1Q3, A4A2Q3 | 2N3478 | | | | | 5.00 | 5.60 | 18.00 |
| A4A1Q4, A4A2Q4 | 2N3478 | | | | | 5.00 | 5.60 | 18.00 |
| A5A1A1Q2 | 2N3478 | | | | | -13.42 | -1.17 | 18.00 |
| A7A1Q1 | TA2644 | 15.7 | 1.1 | 3.6 | 1.5 | | | |
| A7A1Q3(1) | 2N3478 | | | | | 6.0 | 6.7 | 16.4 |
| A7A1Q4(2) | 2N3478 | | | | | 6.2 | 7.0 | 16.2 |
| A7A1Q5(3) | 2N3478 | | | | | 9.0 | 9.8 | 15.5 |
| A7A2Q1(1) | 2N3478 | | | | | 2.6 | 3.3 | 17.1 |
| A7A2Q2(2) | 2N3478 | | | | | 2.8 | 3.5 | 17.0 |
| A7A2Q3(3) | 2N3478 | | | | | 2.6 | 3.3 | 17.2 |
| A7A3Q1 | TA2644 | 15.1 | 1.1 | 3.5 | 1.3 | | | |
| A7A3Q2 | 2N3478 | | | | | 2.0 | 2.8 | 14.9 |
| A7A3Q3 | 2N4074 | | | | | 2.4 | 3.0 | 17.2 |
| A7A3Q4 | 2N3478 | | | | | 8.6 | 9.1 | 17.1 |
| A7A3Q5 | 2N3478 | | | | | 6.1 | 4.9 | 14.2 |
| A8A1A1(4) | 2N706 | | | | | 2.4 | 3.1 | 15.9 |
| A8A1Q2(4) | 2N706 | | | | | 2.3 | 2.9 | 15.9 |
| A8A1Q3(4) | 2N706 | | | | | 2.2 | 2.9 | 16.3 |
| A8A1Q4(4) | 2N3478 | | | | | 2.1 | 2.9 | 16.0 |
| A8A1Q5(4) | 2N3251 | | | | | 0.6 | 0.1 | -12.0 |
| A8A1Q6(4) | 2N4074 | | | | | 0.1 | 0.6 | 18.0 |
| A9A1Q1 | 3N128 | 17.0 | 1.6 | 0 | | | | |
| A9A1Q2 | 2N3478 | | | | | 1.6 | 2.2 | 15.4 |
| A9A2Q1(3) | 2N3478 | | | | | 2.1 | 2.9 | 15.2 |
| A9A2Q2 | 2N3478 | | | | | 1.9 | 2.7 | 11.5 |
| A9A2Q3 | 2N3933 | | | | | 0.7 | 1.5 | 13.2 |
| A9A2Q4 | 2N3933 | | | | | 0.6 | 1.4 | 13.5 |
| A9A2Q5 | TA2644 | 11.0 | 1.0 | 3.7 | 1.4 | | | |
| A9A2Q6(5) | 2N3478 | | | | | 3.7 | 4.2 | 7.7 |
| A9A2Q7 | 2N3251 | | | | | 16.0 | 15.3 | 2.3 |
| A9A2Q8(5) | 2N3478 | | | | | 1.9 | 2.6 | 14.8 |
| A9A2Q9 | 2N3478 | | | | | 1.5 | 2.3 | 14.7 |
| A9A2Q10 | 2N4074 | | | | | 2.5 | 3.2 | 18.0 |
| A10A1Q1(6) | 2N4074 | | | | | 2.2 | 2.8 | 15.2 |
| A10A1Q2(6) | 2N4074 | | | | | 2.1 | 2.7 | 11.4 |
| A10A1Q3(6) | 2N4074 | | | | | 2.1 | 2.7 | 16.2 |
| A10A1Q4(6) | 2N3478 | | | | | 2.0 | 2.6 | 14.1 |
| A10A1Q5(6) | 2N3251 | | | | | 0.5 | 0 | -12.0 |
| A10A1Q6(6) | 2N4074 | | | | | 0 | 0.5 | 18.0 |

Table 4-1. Type 371A Receiver Typical Transistor Element and Module Pin Voltages (Continued)

Type 7352 Video Amplifier (A11)

| Pin Number | 1 | 3 | 5 | 14 |
|---|---|---|---|---|
| Voltage | 0 | 0.0 | 18.0 | 2.4 |

Type 7433 Audio Amplifier (A12)

| Pin Number | 3 | 7 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|
| Voltage | 2.4 | 18.0 | 0 | 0 | 0 | 0 | 0 |

Type 79354 AGC Amplifier (A13)

| Pin Number | 1 | 5 | 6 | 15 |
|---|---|---|---|---|
| Voltage | 0.0 | -12.0 | 18.0 | 2.3 |

Type 76123 +18V Regulated Power Supply (A14)

| Pin Number | 5 | 6 | 12 | 15 |
|---|---|---|---|---|
| Voltage | 23.0 Vac | 23.0 Vac | 18.0 | 0.0 |

Type 76118 -12V Power Supply (A15)

| Pin Number | 1 | 2 | 14 | 15 |
|---|---|---|---|---|
| Voltage | 23.0 Vac | 23.0 Vac | -12.0 | 0.0 |

TEST CONDITIONS:

All readings are positive dc with respect to chassis unless otherwise noted; readings taken with RCA-WV98C VTVM; 115 Vac applied to receiver; no signal input; all gain controls maximum CW position; FINE TUNING at mid-range.

NOTES:

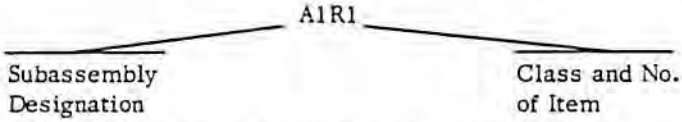
(1) IF BW switch in 400 kHz position
(2) IF BW switch in 100 kHz position
(3) IF BW switch in 6 or 20 kHz position
(4) IF BW switch in 400 or 100 kHz position and MODE switch in FM
(5) MODE switch in CW position, IF BW switch in 100 or 400 kHz position
(6) IF BW switch in 6 or 20 kHz position and MODE switch in FM

# SECTION V

# REPLACEMENT PARTS LIST

## 5.1 UNIT NUMBERING METHOD

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




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

As shown on the main chassis schematic components which are an integral part of the main chassis have no subassembly designation.

## 5.2 REFERENCE DESIGNATION PREFIX

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

## 5.3 LIST OF MANUFACTURERS

| Vendor Code | Name and Address |
|---|---|
| 01121 | Allen-Bradley Company<br>1201 South 2nd Street<br>Milwaukee, Wisconsin 53204 |
| 01281 | TRW Semiconductors, Inc.<br>14520 Aviation Boulevard<br>Lawndale, California 90260 |
| 01351 | Dynamic Gear Company, Inc.<br>173-177 Dixon Avenue<br>Amityville, New York 11701 |
| 04013 | Taurus Corporation<br>1 Academy Hill<br>Lambertiville, New Jersey 08530 |
| 04713 | Motorola Semiconductor Products Inc.<br>5005 East McDowell Road<br>Phoenix, Arizona 85008 |
| 04941 | Walsco Electronics Corporation<br>4 South Wyman<br>Rockford, Illinois 61101 |
| 06961 | Piezoelectric Division of<br>Cleveite Corporation<br>232 Forbes Road<br>Bedford, Ohio 44014 |
| 14632 | Watkins-Johnson Company<br>700 Quince Orchard Road<br>Gaithersburg, Maryland 20760 |
| 15605 | Cutler-Hammer, Inc.<br>315 North 12th Street<br>Milwaukee, Wisconsin 53233 |
| 21604 | Buckeye Stamping Company<br>555 Marion Road<br>Columbus, Ohio 43207 |
| 23783 | British Radio Electronics, Ltd.<br>1742 Wisconsin Avenue, N. W.<br>Washington, D. C. 20007 |
| 27956 | Relcom<br>2164 East Middlefield Road<br>Mountain View, California 94040 |

| Vendor Code | Name and Address |
|---|---|
| 56289 | Sprague Electric Company<br>North Adams,<br>Massachusetts 01247 |
| 70417 | Chrysler Corporation<br>Amplex Division<br>6501 Harper Avenue<br>Detroit, Michigan 48211 |
| 71279 | Cambridge Thermionic Corporation<br>445 Concord Avenue<br>Cambridge, Massachusetts 02138 |
| 71400 | Bussman Manufacturing<br>Division of McGraw-Edison Co.<br>2538 W. University Street<br>St. Louis, Missouri 63107 |
| 71590 | Centralab, Division of<br>Globe-Union, Inc.<br>932 E. Keefe Avenue<br>Milwaukee, Wisconsin 53212 |
| 71744 | Chicago Miniature Lamp Works<br>4433 Ravenswood Avenue<br>Chicago, Illinois 60640 |
| 71785 | Cinch Manufacturing Company<br>Howard B. Jones Division<br>1026 South Homan Avenue<br>Chicago, Illinois 60624 |
| 72136 | Electro Motive Manufacturing Co., Inc.<br>South Park & John Streets<br>Willimantic, Connecticut 06226 |
| 72982 | Erie Technological Products, Inc.<br>644 West 12th Street<br>Erie, Pennsylvania 16512 |
| 73138 | Beckman Instruments, Inc.<br>Helipot Division<br>2500 Harbor Boulevard<br>Fullerton, California 92634 |
| 73899 | JFD Electronics Company<br>Division of Stratford Retreat House<br>15th at 62nd Street<br>Brooklyn, New York 11219 |
| 74306 | Piezo Crystal Company<br>265 East Pomfret Street<br>Carlisle, Pennsylvania 17013 |
| 74868 | Amphenol Corporation<br>Amphenol RF Division<br>33 East Franklin Street<br>Danbury, Connecticut 06810 |
| 75915 | Littelfuse, Incorporated<br>800 E. Northwest Highway<br>Des Plaines, Illinois 60016 |
| 76854 | Oak Manufacturing Company<br>S. Main Street<br>Crystal Lake, Illinois 60014 |
| 79136 | Waldes Kohinoor Inc.<br>47-16 Austel Place<br>Long Island City, New York 11101 |
| 80131 | Electronic Industries Association<br>2001 Eye Street, N. W.<br>Washington, D. C. 20006 |
| 81073 | Grayhill Incorporated<br>561 Hillgrove Avenue<br>LaGrange, Illinois 60525 |
| 81312 | Litton Industries Inc.<br>Winchester Electronics Division<br>Main Street & Hillside Avenue<br>Oakville, Connecticut 06779 |
| 81349 | Military Specifications |
| 82389 | Switchcraft, Incorporated<br>5527 North Elston Avenue<br>Chicago, Illinois 60630 |
| 83086 | New Hampshire Ball Bearings, Inc.<br>Peterborough,<br>New Hampshire 03458 |
| 88044 | Aeronautical Standards Group<br>Department of Navy and Air Force |
| 91418 | Radio Materials Company<br>4242 West Bryn Mawr Avenue<br>Chicago, Illinois 60646 |

| Vendor Code | Name and Address |
|---|---|
| 91662 | Elco Corporation<br>Maryland Rd. & Computer Avenue<br>Willow Grove, Pennsylvania 19090 |
| 95121 | Quality Components, Inc.<br>P. O. Box 113<br>St. Mary's, Pennsylvania 15857 |
| 96906 | Military Standards<br>Promulgated by Standardization Div.<br>Directorate of Logistic Services DSA |

5.4 PARTS LIST

When ordering replacement parts from CEI, specify the type and serial number of the equipment, and the reference designation 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.

NOTE

As improved semiconductors become available it is the policy of CEI to incorporate them in proprietary products. For this reason some transistors and diodes installed in an equipment may not agree with those specified in the parts lists and schematic diagrams of this manual. However, the semiconductors designated in the manual may be substituted in every case with satisfactory results.

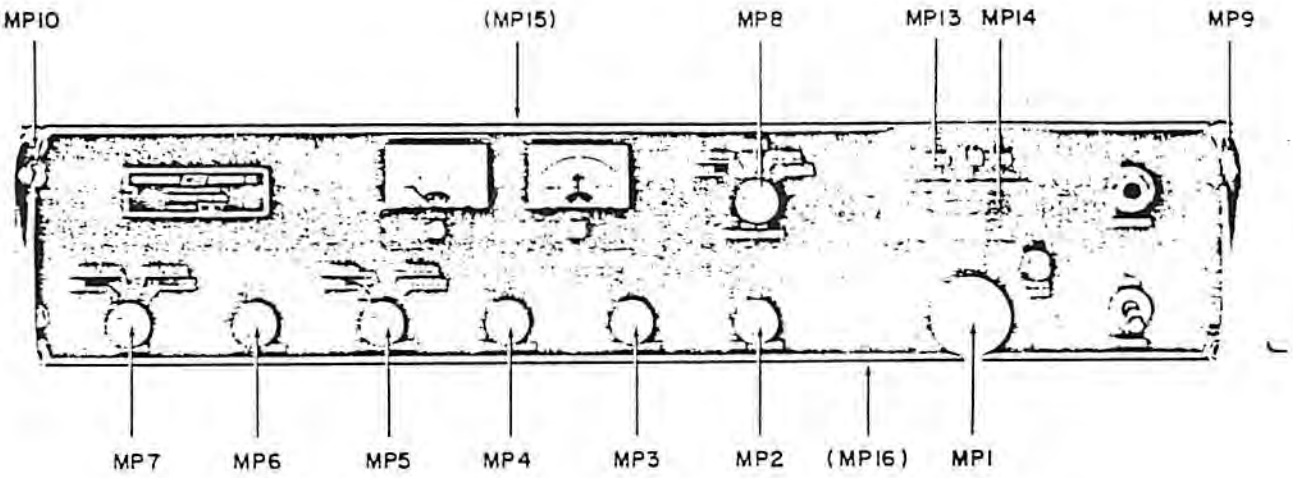



Figure 5-1. Location of Mechanical Parts, Type 371A Receiver, Front Panel

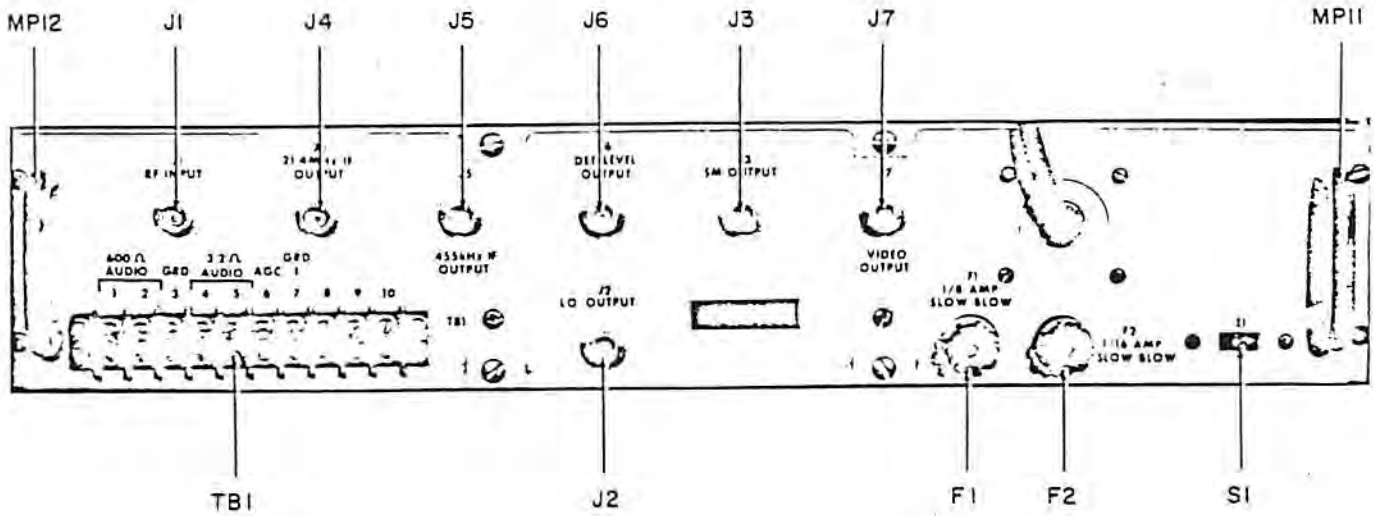



Figure 5-2. Location of Mechanical Parts, Type 371A Receiver, Rear Apror.

5.4.1 Type 371A HF Receiver, Main Chassis

| Ref Desig | Description | | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|---|
| A1 | INPUT ATTENUATOR | | 1 | 79260 | 14632 |
| A2 | INPUT FILTER | | 1 | 79339 | 14632 |
| A3 | RF ASSEMBLY | | 1 | 71218 | 14632 |
| A4 | LO AMPLIFIER | | 1 | 79340 | 14632 |
| A5 | TUNING ASSEMBLY | | 1 | 71217 | 14632 |
| A6 | FINE TUNING REGULATOR | | 1 | 79338 | 14632 |
| A7 | 21.4 MHz IF AMPLIFIER | | 1 | 72201 | 14632 |
| A8 | 21.4 MHz LIMITER/DISCRIMINATOR | | 1 | 79335 | 14632 |
| A9 | 455 kHz IF AMPLIFIER | | 1 | 72197 | 14632 |
| A10 | 455 kHz LIMITER/DISCRIMINATOR | | 1 | 79337 | 14632 |
| A11 | VIDEO AMPLIFIER | | 1 | 7352 | 14632 |
| A12 | AUDIO AMPLIFIER | | 1 | 7433 | 14632 |
| A13 | AGC AMPLIFIER | | 1 | 79354 | 14632 |
| A14 | +18V REGULATED POWER SUPPLY BOARD | | 1 | 76123 | 14632 |
| A15 | -12V REGULATED POWER SUPPLY BOARD | | 1 | 76118 | 14632 |
| F1 | FUSE 3AG, SLOW-BLOW: 1/8A | | 1 | MDL-1/8 | 71400 |
| F2 | FUSE 3AG, SLOW-BLOW: 1/16A | | 1 | MDL-1/16 | 71400 |
| FL1 | FILTER, POWER INPUT | | 1 | JN33-694A | 56289 |
| J1 | CONNECTOR, JACK, BNC SERIES | Part of W1 | 7 | 17825 | 74868 |
| J2 | Same as J1 | Part of W7 | | | |
| J3 | Same as J1 | Part of W4 | | | |
| J4 | Same as J1 | Part of W9 | | | |
| J5 | Same as J1 | Part of W12 | | | |
| J6 | Same as J1 | | | | |
| J7 | Same as J1 | | | | |
| J8 | CONNECTOR, PHONE JACK | | 1 | L-11 | 82389 |
| J9 | CONNECTOR, RECEPTACLE, MULTIPIN | | 4 | M7S-LRN | 81312 |
| J10 | Same as J9 | | | | |
| J11 | CONNECTOR, RECEPTACLE, MULTIPIN | | 3 | M10S-LRN | 81312 |
| J12 | Same as J11 | | | | |
| J13 | Same as J9 | | | | |
| J14 | Same as J11 | | | | |
| J15 | Same as J9 | | | | |
| MP1 | CRANK ASSEMBLY | | 1 | 11755-2 | 14632 |

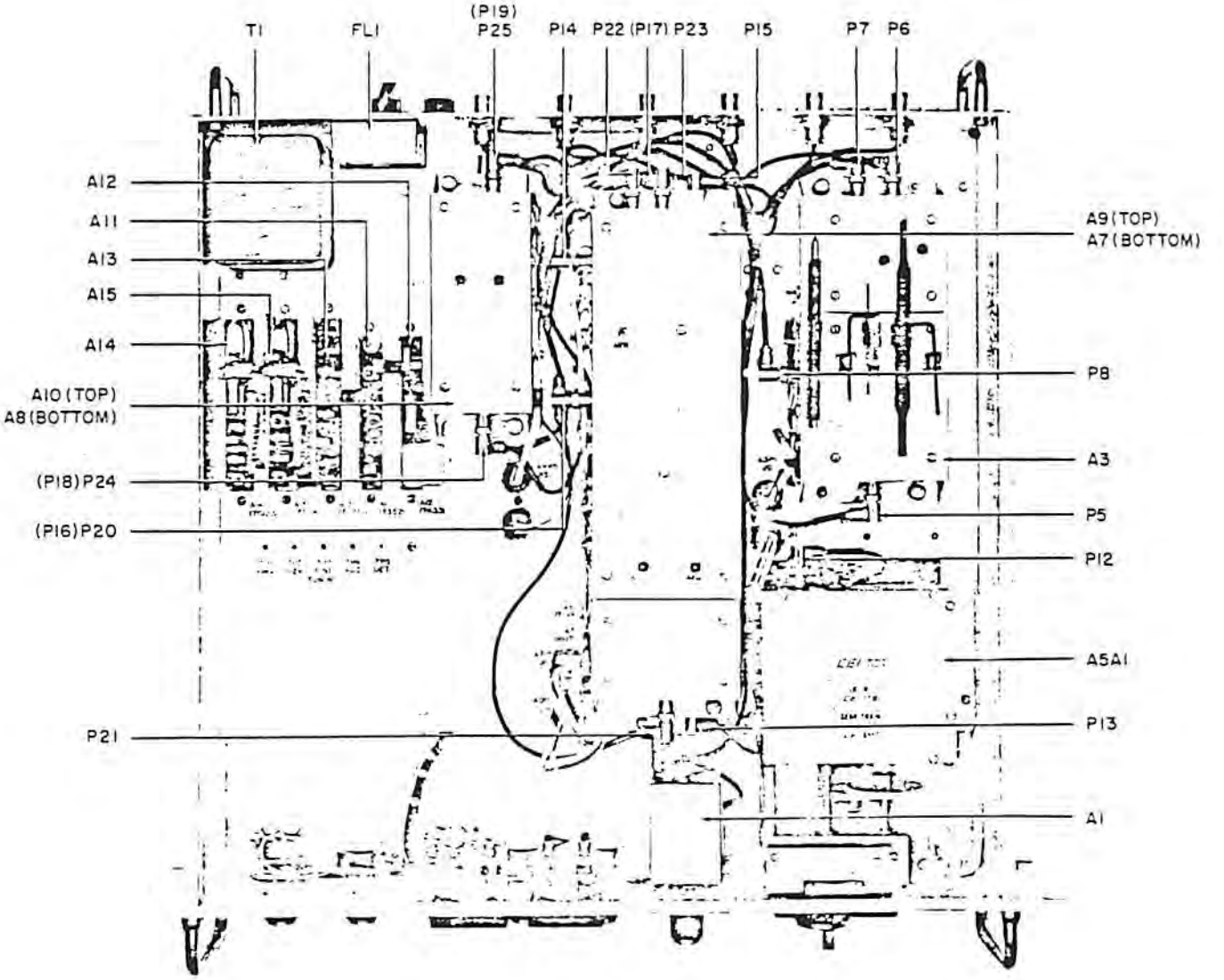



Figure 5-3. Type 371A Receiver, Top View

| Ref Desig | Description | | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|---|
| MP2 | KNOB | | 7 | PS-70D-2 | 21604 |
| MP3 | Same as MP2 | | | | |
| MP4 | Same as MP2 | | | | |
| MP5 | Same as MP2 | | | | |
| MP6 | Same as MP2 | | | | |
| MP7 | Same as MP2 | | | | |
| MP8 | Same as MP2 | | | | |
| MP9 | HANDLE | | 2 | 1250-1 | 71279 |
| MP10 | Same as MP9 | | | | |
| MP11 | HANDLE | | 2 | 1252-1 | 71279 |
| MP12 | Same as MP11 | | | | |
| MP13 | WINDOW | | 1 | 11448-1 | 14632 |
| MP14 | WINDOW | | 1 | 11449-1 | 14632 |
| MP15 | COVER, TOP | | 1 | 30625-6 | 14632 |
| MP16 | COVER, BOTTOM | | 1 | 12479-14 | 14632 |
| M1 | METER, SIGNAL STRENGTH | | 1 | 1632 | 14632 |
| M2 | METER, TUNING | | 1 | 1633 | 14632 |
| P1 | CONNECTOR, PLUG, MB SERIES | Part of W1 | 25 | 45775 | 74868 |
| P2 | Same as P1 | Part of W2 | | | |
| P3 | Same as P1 | Part of W2 | | | |
| P4 | Same as P1 | Part of W3 | | | |
| P5 | Same as P1 | Part of W3 | | | |
| P6 | Same as P1 | Part of W5 | | | |
| P7 | Same as P1 | Part of W4 | | | |
| P8 | Same as P1 | Part of W6 | | | |
| P9 | Same as P1 | Part of W6 | | | |
| P10 | Same as P1 | Part of W7 | | | |
| P11 | Same as P1 | Part of W8 | | | |
| P12 | Same as P1 | Part of W8 | | | |
| P13 | Same as P1 | Part of W5 | | | |
| P14 | Same as P1 | | | | |
| P15 | Same as P1 | Part of W9 | | | |
| P16 | Same as P1 | Part of W11 | | | |

| Ref Desig | Description | | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|---|
| P17 | Same as P1 | Part of W10 | | | |
| P18 | Same as P1 | Part of W10 | | | |
| P19 | Same as P1 | | | | |
| P20 | Same as P1 | Part of W12 | | | |
| P21 | Same as P1 | Part of W11 | | | |
| P22 | Same as P1 | | | | |
| P23 | Same as P1 | Part of W13 | | | |
| P24 | Same as P1 | Part of W13 | | | |
| P25 | Same as P1 | | | | |
| P26 | CONNECTOR, PLUG AND POWER CORD | Part of FL1 | -- | | |
| R1 | RESISTOR, VARIABLE, COMPOSITION: 50 kΩ, 10%, 2W | | 2 | RV4NAYSD503A | 81349 |
| R2 | RESISTOR, FIXED, COMPOSITION: 2.2kΩ, 5%, 1/4W | | 1 | CB2225 | 01121 |
| R3 | RESISTOR, VARIABLE, COMPOSITION: 10 kΩ, 10%, 2W | | 2 | RV4NAYSD103A | 81349 |
| R4 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | | 1 | CB4735 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 43 kΩ, 5%, 1/4W | | 1 | CB4335 | 01121 |
| R6 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | | 1 | CB2235 | 01121 |
| R7 | Same as R3 | | | | |
| R8 | Same as R1 | | | | |
| S1 | SWITCH, SLIDE, DPDT | | 1 | 11A-1009 | 82389 |
| S2 | SWITCH, TOGGLE, SPST | | 1 | 8280-K16 | 15605 |
| S3 | SWITCH, ROTARY: 2 SECTION, 4 POLES, 4 POSITION | | 2 | 265757-A2 | 76854 |
| S4 | Same as S3 | | | | |
| T1 | TRANSFORMER | | 1 | 14238 | 14632 |
| TB1 | TERMINAL BOARD | | 1 | 353-18-10-001 | 71785 |
| TP1 | TERMINAL, FEEDTHRU | | 5 | TJ-6 | 04013 |
| TP2 | Same as TP1 | | | | |
| TP3 | Same as TP1 | | | | |
| TP4 | Same as TP1 | | | | |
| TP5 | Same as TP1 | | | | |
| W1 | CABLE AND CONNECTOR ASSEMBLY | | 1 | 30020-825 | 14632 |
| W2 | CABLE AND CONNECTOR ASSEMBLY | | 1 | 30020-826 | 14632 |
| W3 | CABLE AND CONNECTOR ASSEMBLY | | 1 | 30020-827 | 14632 |
| W4 | CABLE AND CONNECTOR ASSEMBLY | | 1 | 30020-828 | 14632 |
| W5 | CABLE AND CONNECTOR ASSEMBLY | | 1 | 30020-829 | 14632 |

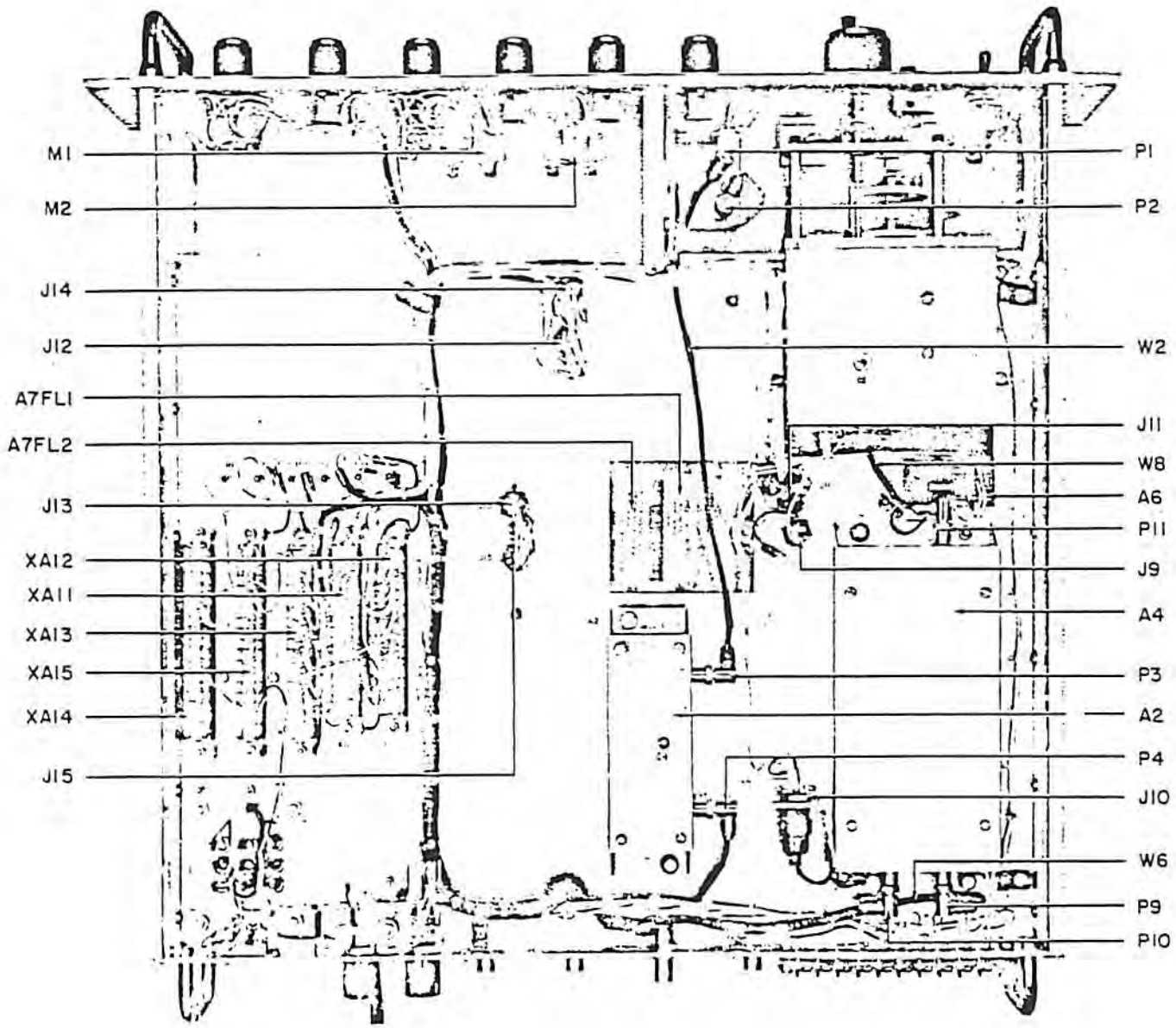



Figure 5-4. Type 371A Receiver, Bottom View

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| W6 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-830 | 14632 |
| W7 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-831 | 14632 |
| W8 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-832 | 14632 |
| W9 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-833 | 14632 |
| W10 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-834 | 14632 |
| W11 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-835 | 14632 |
| W12 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-836 | 14632 |
| W13 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-837 | 14632 |
| XA11 | CONNECTOR, PRINTED CIRCUIT CARD | 2 | 00-5002-014-103-002 | 91662 |
| XA12 | Same as XA11 | | | |
| XA13 | CONNECTOR, PRINTED CIRCUIT CARD | 3 | 00-5002-016-103-002 | 91662 |
| XA14 | Same as XA13 | | | |
| XA15 | Same as XA13 | | | |
| XF1 | FUSEHOLDER | 2 | 342004 | 75915 |
| XF2 | Same as XF1 | | | |

5.4.2 Type 79260 Input Attenuator REF DESIG PREFIX A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| E1 | TERMINAL, FEEDTHRU | 5 | SFU-16 | 04013 |
| E2 | Same as E1 | | | |
| E3 | Same as E1 | | | |
| E4 | Same as E1 | | | |
| E5 | Same as E1 | | | |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 2 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| MP1 | COVER | 1 | 21421-1 | 14632 |
| R1 | RESISTOR, FIXED, COMPOSITION: 62 Ω, 5%, 1/4W | 4 | CB6205 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 240 Ω, 5%, 1/4W | 1 | CB2415 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 30 Ω, 5%, 1/4W | 1 | CB3005 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W | 2 | CB2715 | 01121 |
| R5 | Same as R1 | | | |
| R6 | RESISTOR, FIXED, COMPOSITION: 51 Ω, 5%, 1/4W | 1 | CB5105 | 01121 |
| R7 | RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/4W | 1 | CB8215 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 56 Ω, 5%, 1/4W | 1 | CB5605 | 01121 |
| R9 | Same as R1 | | | |
| R10 | Same as R4 | | | |
| R11 | Same as R1 | | | |
| R12 | RESISTOR, FIXED, COMPOSITION: 27 Ω, 5%, 1/4W | 2 | CB2705 | 01121 |
| R13 | RESISTOR, FIXED, COMPOSITION: 36 Ω, 5%, 1/4W | 1 | CB3605 | 01121 |
| R14 | Same as R12 | | | |
| S1 | SWITCH, ROTARY | 1 | 21424-1 | 14632 |

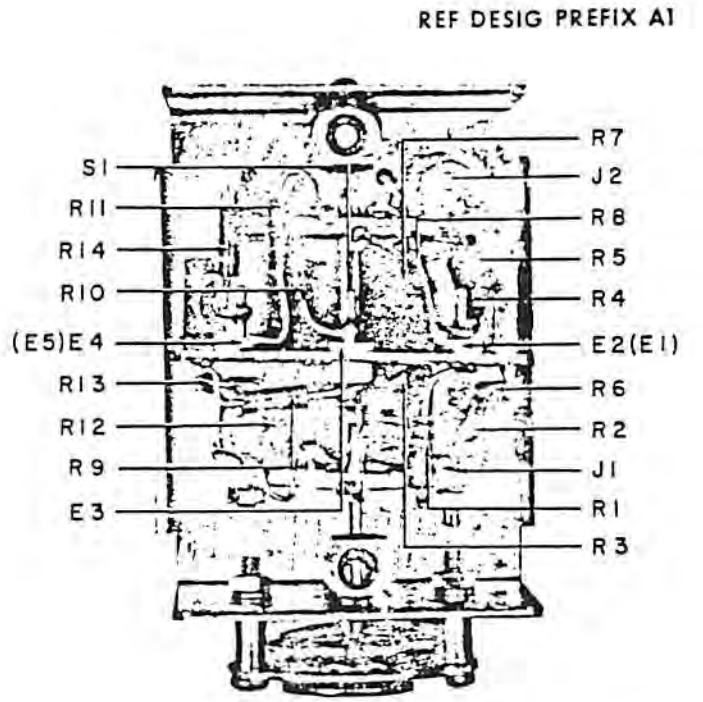



Figure 5-5. Type 79260 Attenuator, Component Locations

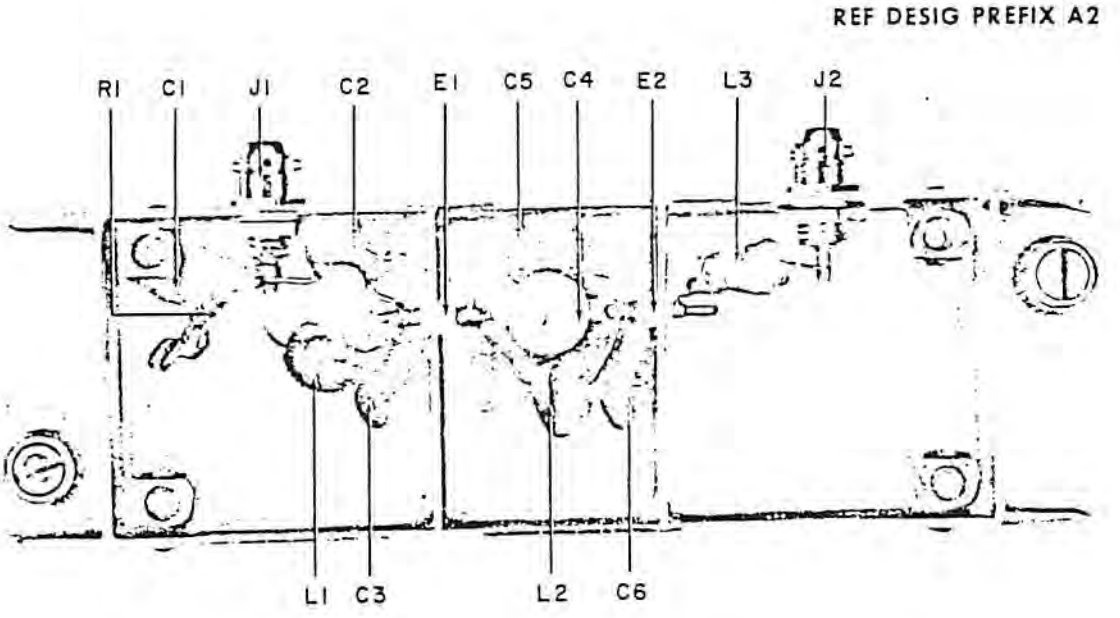



Figure 5-6. Type 79339 Input Filter, Component Locations

5.4.3 Type 79339 Input Filter

REF DESIG PREFIX A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, DIPPED MICA: 220 pF, 5%, 500V | 1 | CM05F221J03 | 81349 |
| C2 | CAPACITOR, DIPPED MICA: 22 pF, 5%, 500V | 1 | CM05E220J03 | 81349 |
| C3 | CAPACITOR, DIPPED MICA: 470 pF, 5%, 500V | 1 | DM15-471J | 72136 |
| C4 | CAPACITOR, VARIABLE, CERAMIC: 5.5-18 pF | 1 | 538-002-C0P0-92R | 72982 |
| C5 | CAPACITOR, DIPPED MICA: 43 pF, 5%, 500V | 1 | CM05E430J03 | 81349 |
| C6 | CAPACITOR, DIPPED MICA: 390 pF, 5%, 500V | 1 | CM05F391J03 | 81349 |
| E1 | TERMINAL, FEEDTHRU | 2 | SFU-16 | 04013 |
| E2 | Same as E1 | | | |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 2 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| L1 | COIL, FIXED | 1 | 20681-7 | 14632 |
| L2 | COIL, FIXED | 1 | 20681-8 | 14632 |
| L3 | COIL, FIXED | 1 | 20681-6 | 14632 |
| MP1 | COVER | 1 | 14175-1 | 14632 |
| R1 | RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W | 1 | CB1045 | 01121 |

5.4.4 Type 71218 RF Assembly REF DESIG PREFIX A3

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | RF AMPLIFIER AND BALANCED MIXER | 1 | 14210 | 14632 |
| A2 | IF AND SM DRIVER BOARD | 1 | 14212 | 14632 |
| C1 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 3 | FA5C-102W | 01121 |
| C2 | Same as C1 | | | |
| C3 | Same as C1 | | | |
| C4 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 4.7 μF, 10%, 35V | 1 | CS13BF475K | 81349 |
| C5 | CAPACITOR, CERAMIC, DISK: 0.1 μF, 20%, 50V | 1 | 33C41B6 | 56289 |
| E1 | TERMINAL, FEEDTHRU | 1 | SFU-16 | 04013 |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 4 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| J3 | Same as J1 | | | |
| J4 | Same as J1 | | | |
| L1 | COIL, RADIO FREQUENCY: 10 μH | 2 | 3635-49 | 71279 |
| L2 | Same as L1 | | | |
| MP1 | COVER | 1 | 21484-1 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M7P-LSH9 | 81312 |
| R1 | RESISTOR, FIXED, COMPOSITION: 56Ω, 5%, 1/4W | 1 | CB5605 | 01121 |

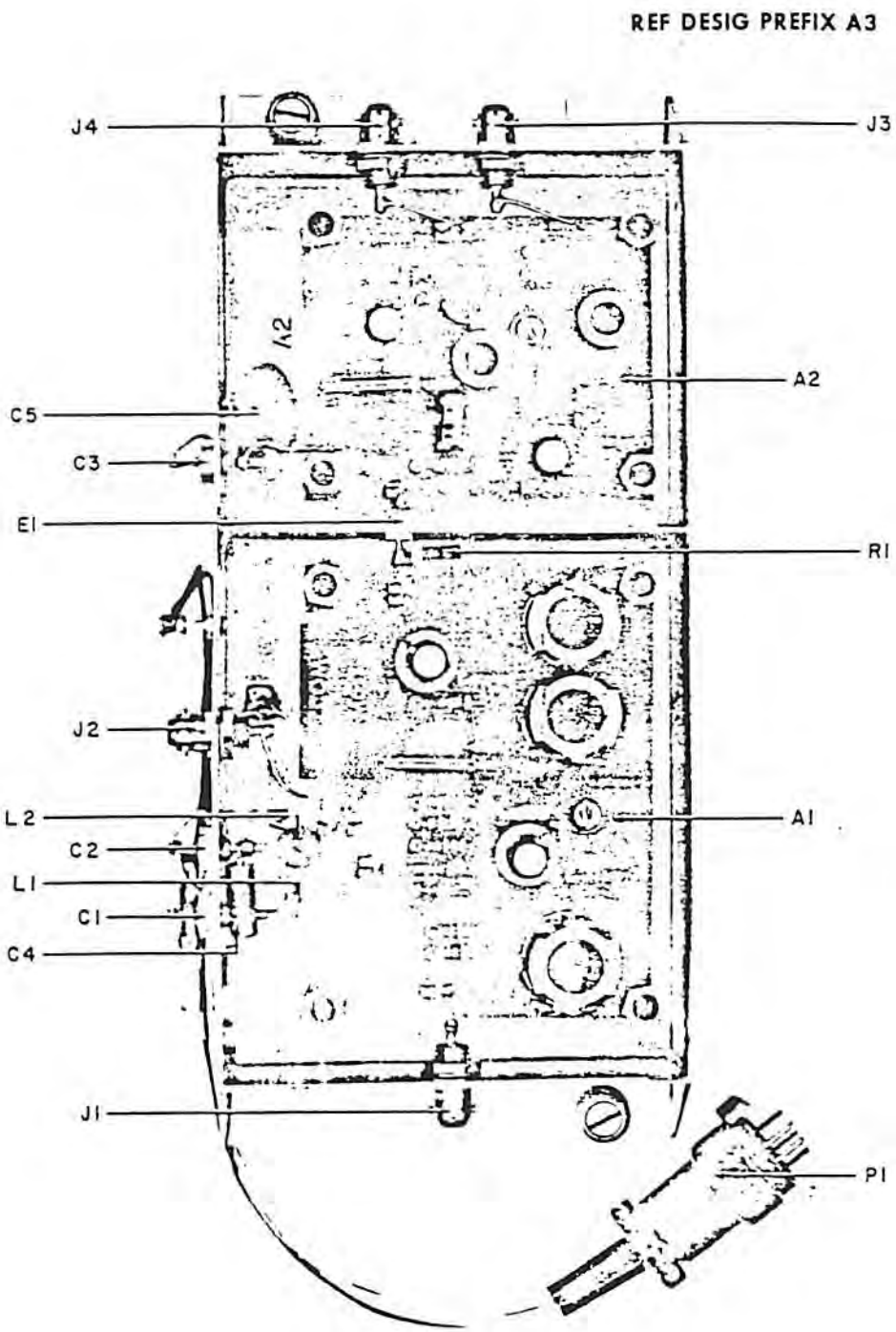



Figure 5-7. Type 71218 RF Assembly, Component Locations

5.4.4.1 Part 14210 RF Amplifier and Balanced Mixer REF DESIG PREFIX A3A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, DISC: 0.1 μF, +80-20%, 10V | 6 | UK10-104 | 71590 |
| C2 | Same as C1 | | | |
| C3 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 2 | C023B101F103M | 56289 |
| C4 | Same as C1 | | | |
| C5 | Same as C3 | | | |
| C6 | Same as C1 | | | |
| C7 | CAPACITOR, CERAMIC, DISC: 0.1 μF, +80-20%, 25V | 1 | DFJ-3 | 73899 |
| C8 | Same as C1 | | | |
| C9 | Same as C1 | | | |
| CR1 | DIODE | 1 | 1N462A | 80131 |
| L1 | COIL, FIXED | 1 | 30312-54 | 14632 |
| L2 | COIL, FIXED | 1 | 1131-37 | 14632 |
| Q1 | TRANSISTOR | 1 | 3N140 | 80131 |
| Q2 | TRANSISTOR | 1 | 2N3478 | 80131 |
| R1 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 1 | CB4725 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W | 1 | CB3335 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 1 | CB1545 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 680 Ω, 5%, 1/4W | 1 | CB6815 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 2 | CB1035 | 01121 |
| R6 | RESISTOR, FIXED, COMPOSITION: 150Ω, 5%, 1/4W | 1 | CB1515 | 01121 |
| R7 | Same as R5 | | | |
| R8 | RESISTOR, FIXED, COMPOSITION: 51 kΩ, 5%, 1/4W | 1 | CB5135 | 01121 |
| R9 | RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W | 1 | CB1045 | 01121 |
| R10 | RESISTOR, FIXED, COMPOSITION: 7.5 kΩ, 5%, 1/4W | 1 | CB7525 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 8.2 kΩ, 5%, 1/4W | 1 | CB8225 | 01121 |
| R12 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 1 | CB4715 | 01121 |
| R13 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 1 | CB4705 | 01121 |
| R14 | RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W | 1 | CB1525 | 01121 |
| R15 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 1 | CB1005 | 01121 |
| R16 | RESISTOR, FIXED, COMPOSITION: 1.8 kΩ, 5%, 1/4W | 1 | CB1825 | 01121 |
| T1 | TRANSFORMER | 2 | 30312-53 | 14632 |
| T2 | Same as T1 | | | |
| XQ1 | SOCKET, TRANSISTOR | 1 | 22-16-4 | 81073 |
| Z1 | BALANCED MIXER | 1 | M-6 | 27956 |

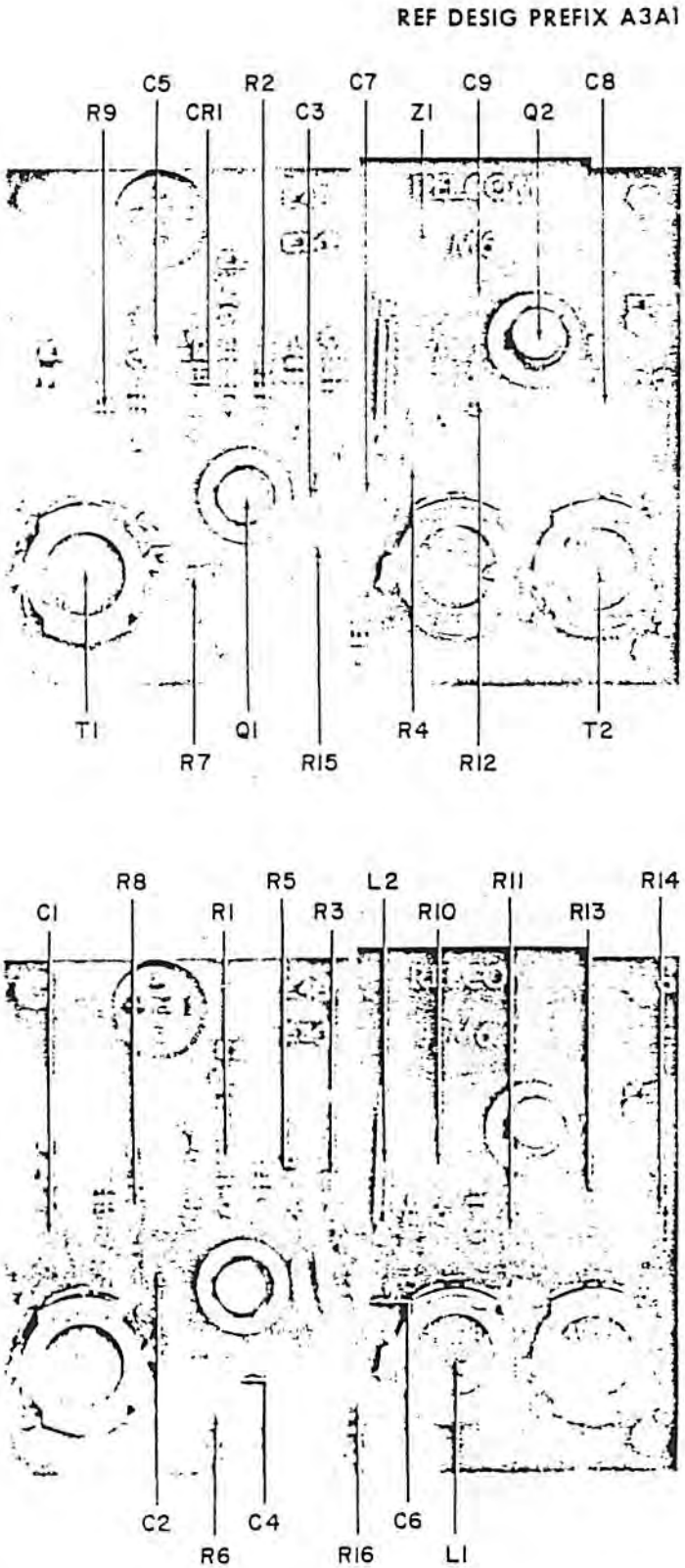



Figure 5-8. Part 11210 RF Amplifier and Balanced Mixer, Component Locations

5.4.4.2 Part 14212 IF and SM Driver Board REF DESIG PREFIX A3A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC DISC: 0.001 μF, GMV, 500V | 4 | SM(.001 μF, GMV) | 91418 |
| C2 | CAPACITOR, CERAMIC DISC: 0.005 μF, 20%, 50V | 2 | C023B101E502M | 56289 |
| C3 | CAPACITOR, CERAMIC TUBULAR: 5.6 pF, ±.5 pF, 500V | 1 | 301-000-COHO-569D | 72982 |
| C4 | CAPACITOR, DIPPED MICA: 330 pF, 5%, 500V | 1 | CM05F331J03 | 81349 |
| C5 | CAPACITOR, DIPPED MICA: 33 pF, 5%, 500V | 1 | CM05E330J03 | 81349 |
| C6 | Same as C2 | | | |
| C7 | CAPACITOR, COMPOSITION, TUBULAR: .68 pF, 10%, 500V | 1 | QC(.68pF, 10%) | 95121 |
| C8 | CAPACITOR, DIPPED MICA: 39 pF, 5%, 500V | 1 | CM05E390J03 | 81349 |
| C9 | CAPACITOR, DIPPED MICA: 510 pF, 5%, 300V | 2 | DM15-511J | 72136 |
| C10 | Same as C9 | | | |
| C11 | Same as C1 | | | |
| C12 | Same as C1 | | | |
| C13 | Same as C1 | | | |
| L1 | COIL, FIXED | 1 | 1131-37 | 14632 |
| L2 | COIL, VARIABLE | 2 | 3387-01 | 71279 |
| L3 | Same as L2 | | | |
| Q1 | TRANSISTOR | 2 | 2N3478 | 80131 |
| Q2 | Same as Q1 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W | 1 | CB2715 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 15 kΩ, 5%, 1/4W | 1 | CB1535 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 1 | CB4725 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 2 | CB4705 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 1 | CB1025 | 01121 |
| R6 | RESISTOR, FIXED, COMPOSITION: 39 Ω, 5%, 1/4W | 1 | CB3905 | 01121 |
| R7 | RESISTOR, FIXED, COMPOSITION: 7.5 kΩ, 5%, 1/4W | 1 | CB7525 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 8.2 kΩ, 5%, 1/4W | 1 | CB8225 | 01121 |
| R9 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 1 | CB4715 | 01121 |
| R10 | Same as R4 | | | |
| R11 | RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W | 1 | CB1525 | 01121 |
| T1 | TRANSFORMER | 1 | 21428-1 | 14632 |

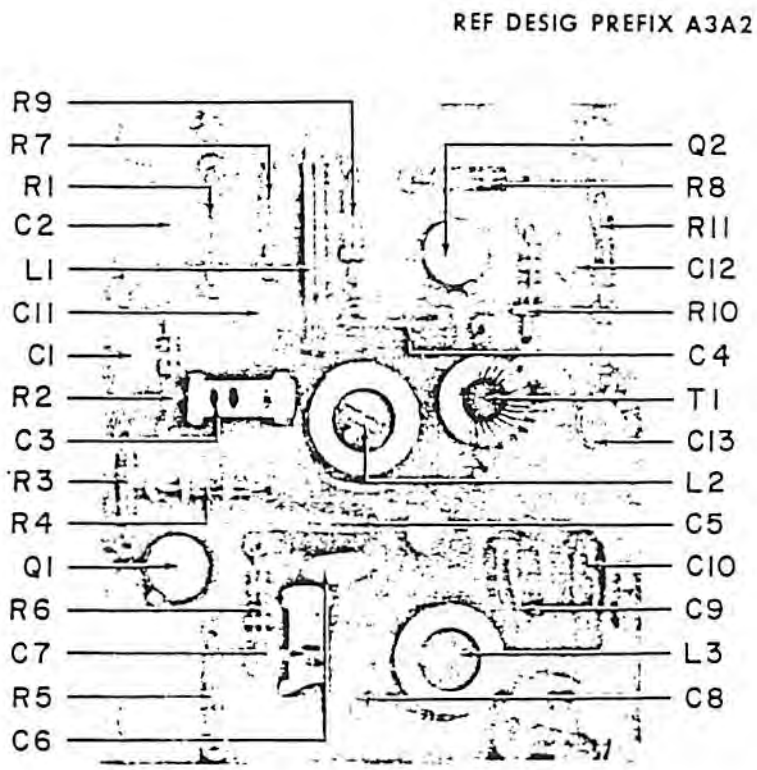



Figure 5-9. Part 14212 IF and SM Driver Board, Component Locations

5.4.5 Type 79340 Local Oscillator Amplifier REF DESIG PREFIX A4

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | LOCAL OSCILLATOR AMPLIFIER BOARD | 2 | 14007 | 14632 |
| A2 | Same as A1 | | | |
| C1 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 2 | FA5C-102W | 01121 |
| C2 | Same as C1 | | | |
| C3 | CAPACITOR, CERAMIC, DISC: 0.005 μF, 20%, 50V | 2 | C023B101E502M | 56289 |
| C4 | Same as C3 | | | |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 3 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| J3 | Same as J1 | | | |
| MP1 | COVER | 1 | 21394-1 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M7P-LSH9 | 81312 |
| R1 | RESISTOR, FIXED, COMPOSITION: 51 Ω, 5%, 1/4W | 1 | CB5105 | 01121 |

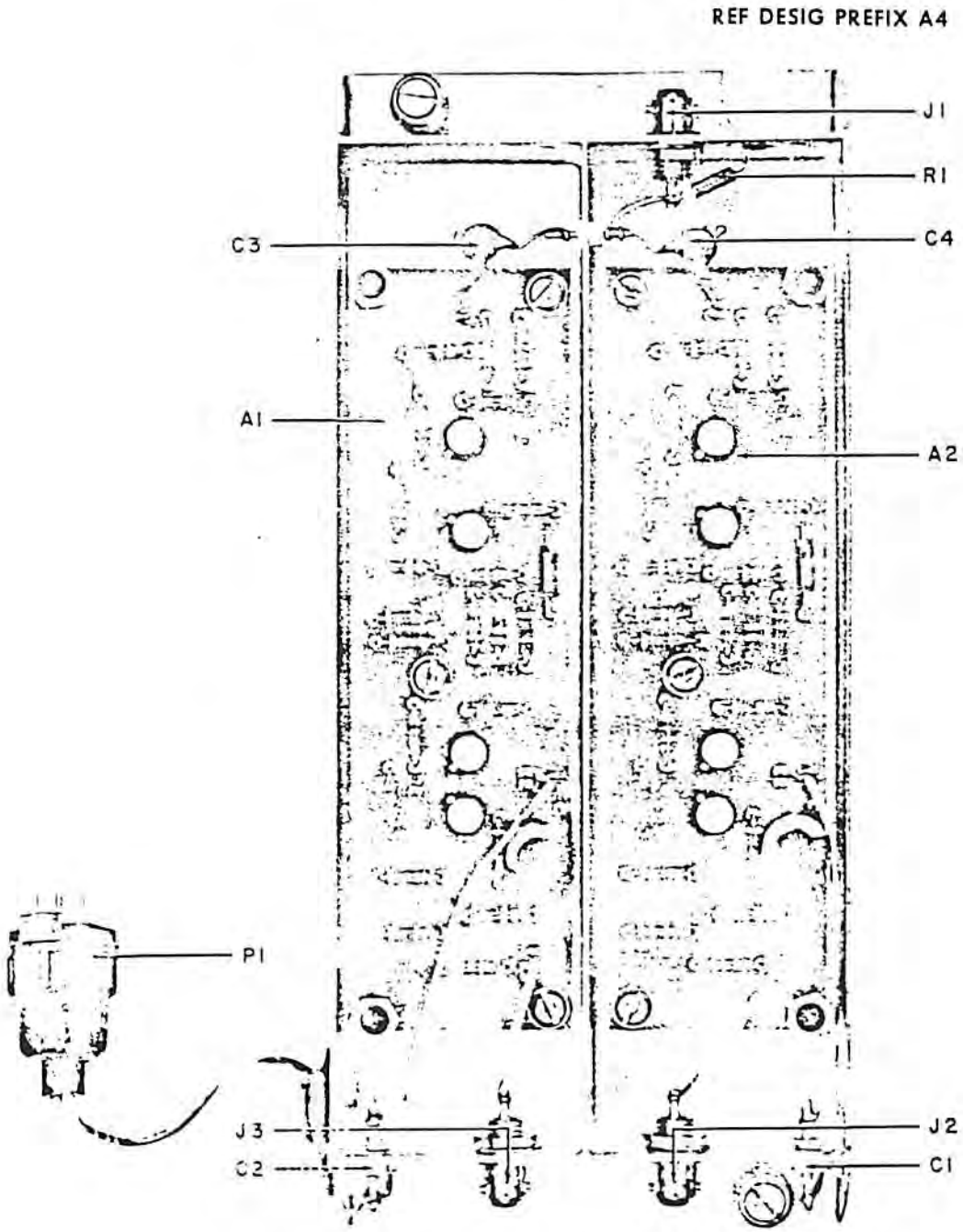



Figure 5-10. Type 79340 Local Oscillator Amplifier, Component Locations

5.4.5.1 Part 14007 Local Oscillator Amplifier Board REF DESIG PREFIX A4A1 & A4A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 2 | C023B101F103M | 56289 |
| C2 | CAPACITOR, CERAMIC, DISC: 0.005 μF, 20%, 50V | 3 | C023B101E502M | 56289 |
| C3 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 3 | SM(.001μF, GMV) | 91418 |
| C4 | Same as C3 | | | |
| C5 | Same as C1 | | | |
| C6 | Same as C2 | | | |
| C7 | Same as C2 | | | |
| C8 | CAPACITOR, DIPPED MICA: 22 pF, 5%, 500V | 1 | CM05E220J03 | 81349 |
| C9 | Same as C3 | | | |
| L1 | COIL, FIXED | 1 | 21210-20 | 14632 |
| Q1 | TRANSISTOR | 4 | 2N3478 | 80131 |
| Q2 | Same as Q1 | | | |
| Q3 | Same as Q1 | | | |
| Q4 | Same as Q1 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | 2 | CB2235 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 2 | CB1015 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 4 | CB1035 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 6 | CB4705 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 3 | CB2225 | 01121 |
| R6 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 3 | CB1025 | 01121 |
| R7 | Same as R5 | | | |
| R8 | Same as R1 | | | |
| R9 | Same as R3 | | | |
| R10 | Same as R4 | | | |
| R11 | Same as R4 | | | |
| R12 | Same as R3 | | | |
| R13 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 2 | CB4725 | 01121 |
| R14 | Same as R2 | | | |
| R15 | Same as R4 | | | |
| R16 | Same as R6 | | | |
| R17 | Same as R4 | | | |
| R18 | Same as R6 | | | |
| R19 | Same as R3 | | | |
| R20 | Same as R13 | | | |

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R21 | RESISTOR, FIXED, COMPOSITION: 200 Ω, 5%, 1/4W | 1 | CB2015 | 01121 |
| R22 | Same as R4 | | | |
| T1 | TRANSFORMER | 1 | 21428-2 | 14632 |

REF DESIG PREFIX A4A1 AND A4A2

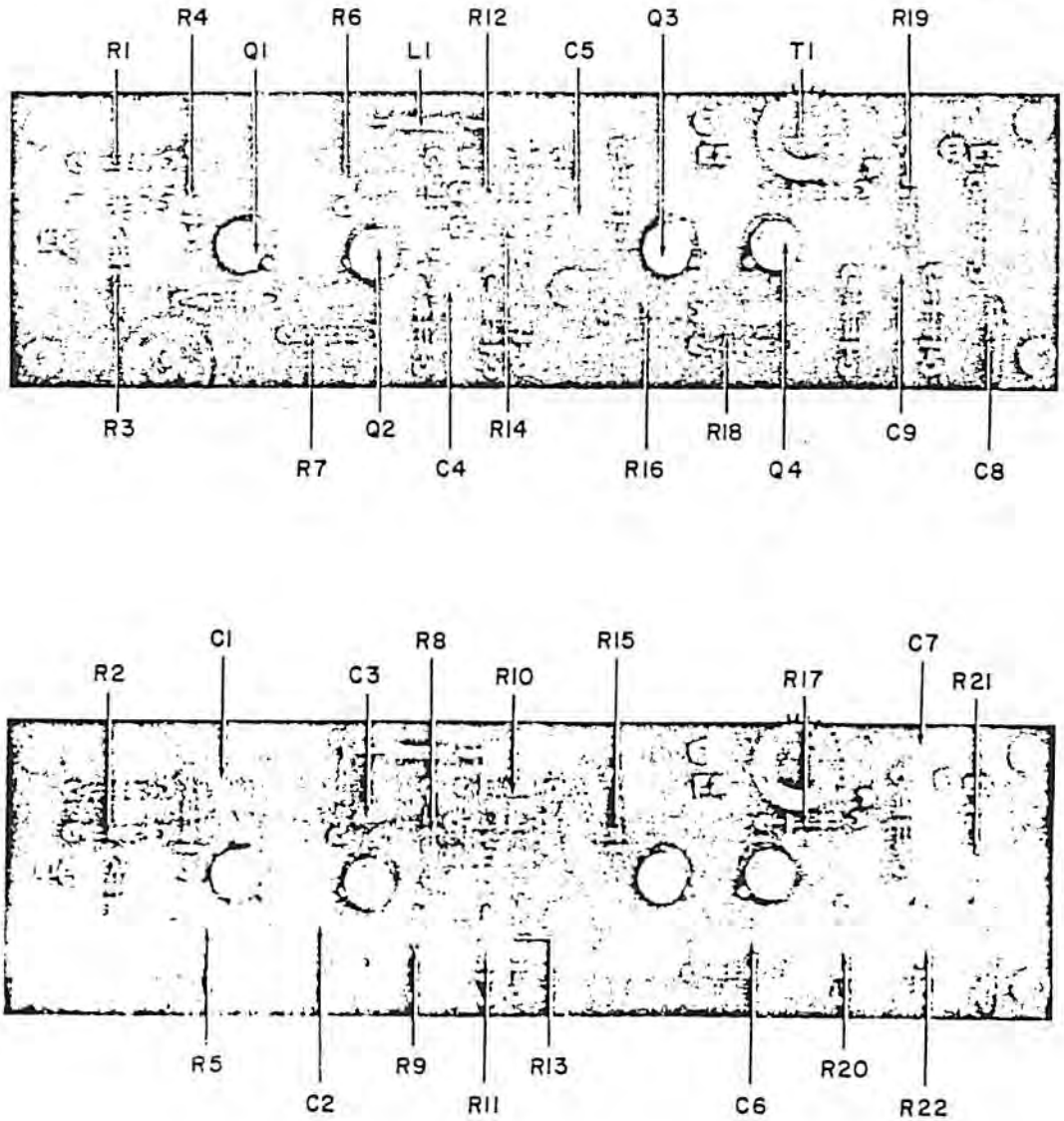



Figure 5-11. Part 14007 Local Oscillator Amplifier Board, Component Locations

5.4.6 Type 71217 Tuning Assembly REF DESIG PREFIX A5

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | LOCAL OSCILLATOR | 1 | 7730 | 14632 |
| A2 | TUNING DRIVE | 1 | 8552 | 14632 |
| MP1 | COVER | 1 | 12180-2 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M10P-LSH19C | 81312 |
| W1 | CABLE AND CONNECTOR ASSEMBLY | 1 | 31541-2 | 14632 |

REF DESIG PREFIX A5

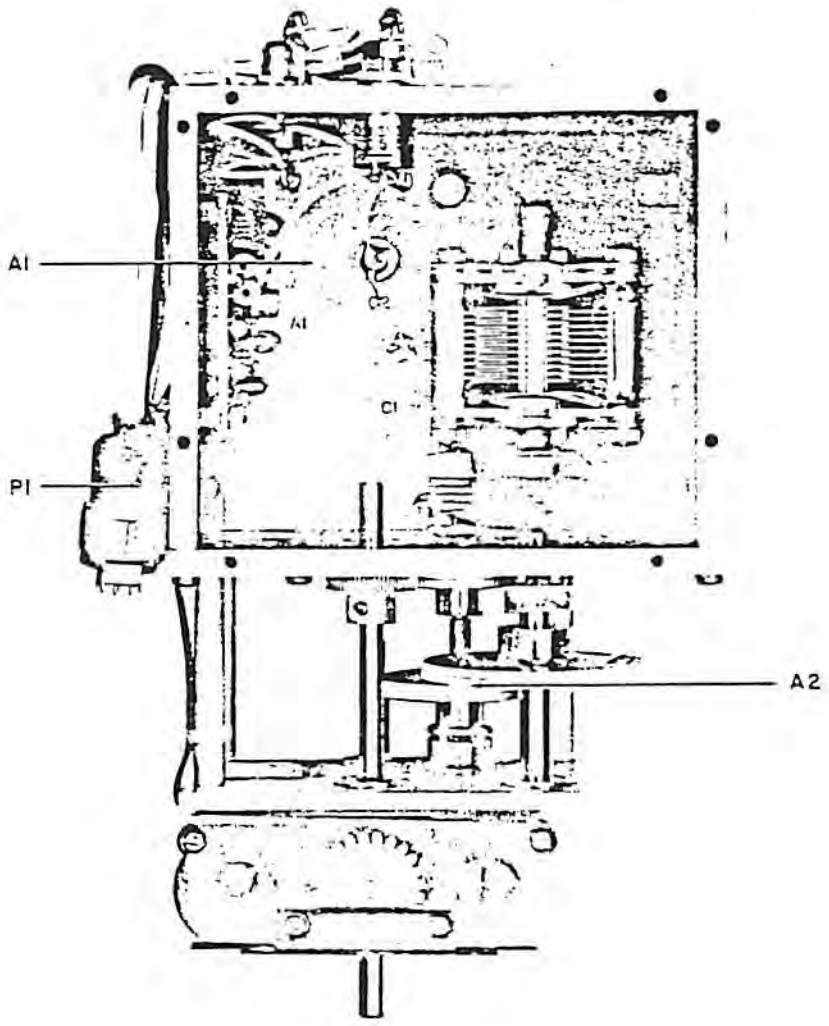



Figure 5-12. Type 71217 Tuning Assembly, Component Locations

5.4.6.1 Type 7730 Local Oscillator REF DESIG PREFIX A5A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | LOCAL OSCILLATOR BOARD | 1 | 14230 | 14632 |
| C1 | CAPACITOR, VARIABLE, AIR: 6.5-62 pF | 1 | C28-341(20/.012") | 23783 |
| C2 | CAPACITOR, VARIABLE, GLASS: 1-28 pF, 1000V | 1 | MC-603 | 73899 |
| C3 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, 20%, 500V | 4 | CK70AW102M | 81349 |
| C4 | Same as C3 | | | |
| C5 | Same as C3 | | | |
| C6 | Same as C3 | | | |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 1 | 46025 | 74868 |
| L1 | COIL, VARIABLE: 7.8-16 μH | 1 | 1505-5 | 71279 |

REF DESIG PREFIX A5A1

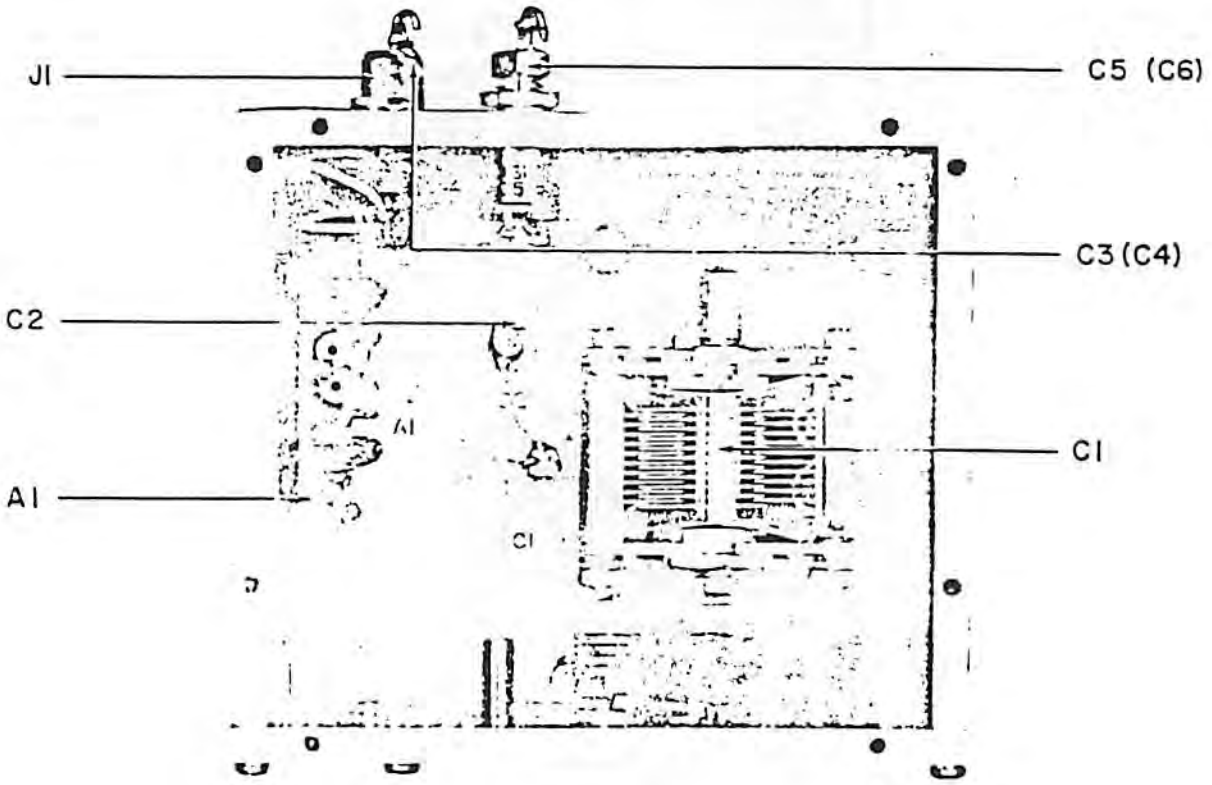



Figure 5-13. Type 7730 Local Oscillator, Component Locations

5.4.6.1.1 Part 14230 Local Oscillator REF DESIG PREFIX A5A1A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, DIPPED MICA: 30 pF, 5%, 500V | 2 | DM15-300J | 72136 |
| C2 | Same as C1 | | | |
| C3 | CAPACITOR, CERAMIC, TUBULAR: 10 pF, ±.5 pF, 500V(TC-N750) | 2 | 301-000-U2J0-100D | 72982 |
| C4 | Same as C3 | | | |
| C5 | CAPACITOR, DIPPED MICA: 12 pF, 5%, 500V | 1 | CM05C120J03 | 81349 |
| C6 | CAPACITOR, DIPPED MICA: 680 pF, 5%, 300V | 1 | DM15-681J | 72136 |
| C7 | CAPACITOR, DIPPED MICA: 180 pF, 5%, 500V | 1 | CM05F181J03 | 81349 |
| C8 | CAPACITOR, DIPPED MICA: 1000 pF, 5%, 100V | 1 | DM15-102J | 72136 |
| CR1 | DIODE, ZENER | 2 | V27E | 01281 |
| CR2 | Same as CR1 | | | |
| L1 | COIL, FIXED | 1 | 20681-9 | 14632 |
| Q1 | NOT USED | | | |
| Q2 | TRANSISTOR | 1 | 2N3478 | 80131 |
| R1 | RESISTOR, FIXED, COMPOSITION: 470 kΩ, 5%, 1/4W | 2 | CB4745 | 01121 |
| R2 | Same as R1 | | | |
| R3 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 2 | CB4705 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 1 | CB4735 | 01121 |
| R5 | Same as R3 | | | |
| R6 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 1 | CB4725 | 01121 |

REF DESIG PREFIX A5A1A1

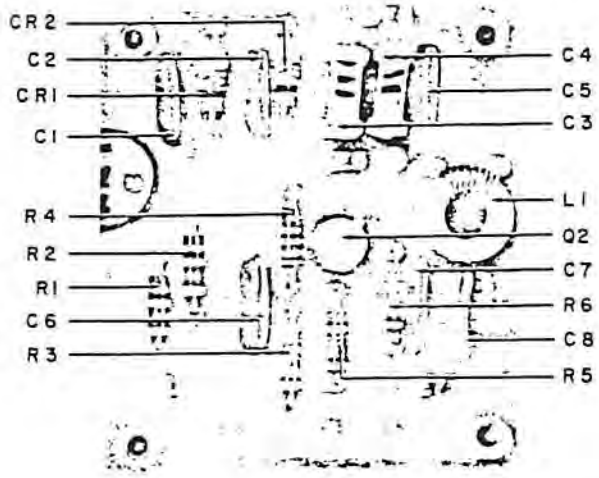



Figure 5-14. Part 14230 Local Oscillator Board, Component Locations

5.4.6.2 Type 8552 Tuning Drive REF DESIG PREFIX A5A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| DS1 | LAMP, INCANDESCENT: 5V, .06A | 3 | CM8-683 | 71744 |
| DS2 | Same as DS1 | | | |
| DS3 | Same as DS1 | | | |
| -- | For Mechanical Parts See Exploded View | | | |

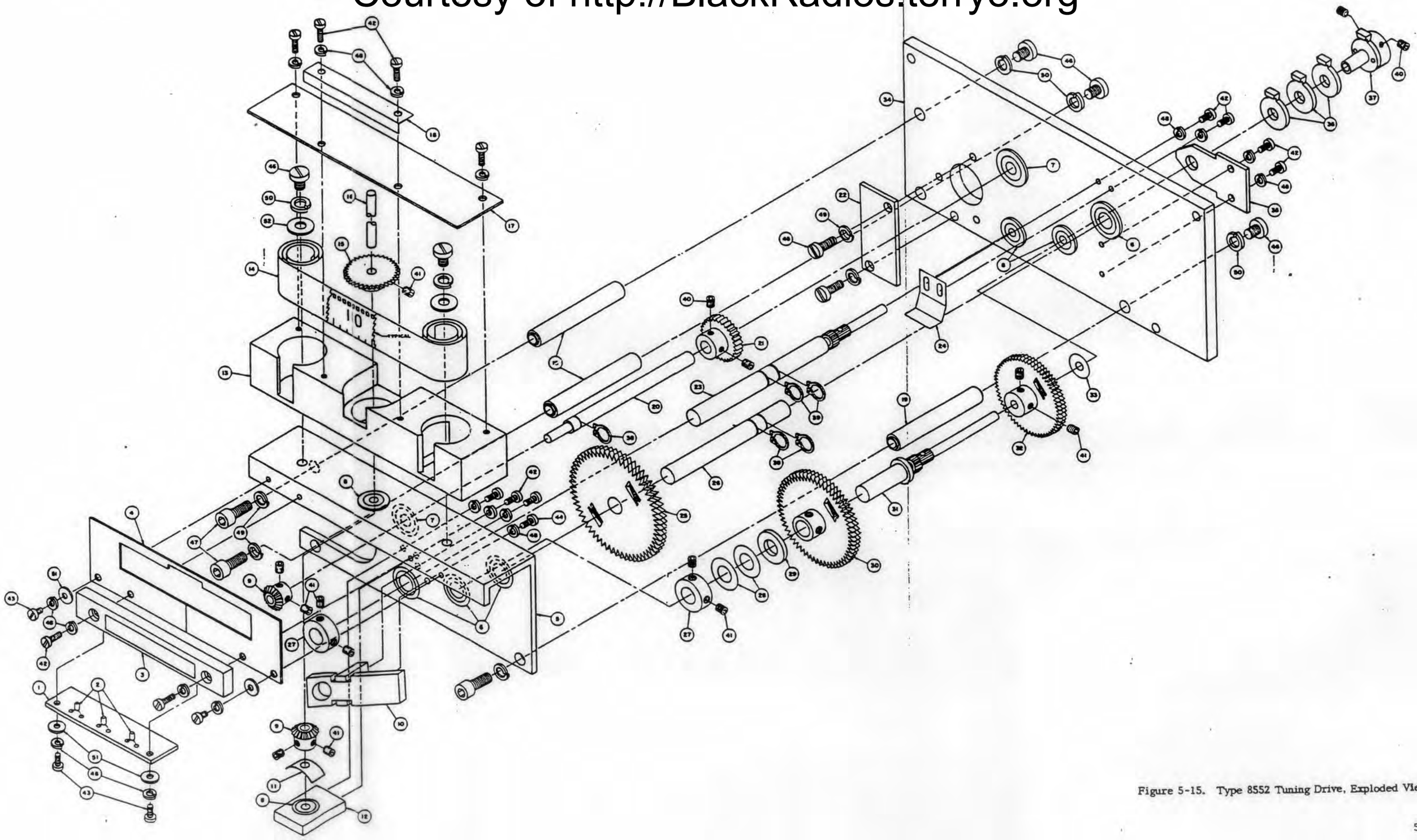


Figure 5-15. Type 8552 Tuning Drive, Exploded View

5.4.7 Type 79338 Fine Tuning Regulator REF DESIG PREFIX A6

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, ELECTROLYTIC, TANTALUM: 4.7 μF, 10%, 35 V | 1 | 150D475X9035B2 | 56289 |
| CR1 | DIODE | 1 | 1N759A | 80131 |
| CR2 | DIODE | 1 | 1N462A | 80131 |
| R1 | RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/4W | 1 | CB8215 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 20 kΩ, 5%, 1/4W | 1 | CB2035 | 01121 |

REF DESIG PREFIX A6

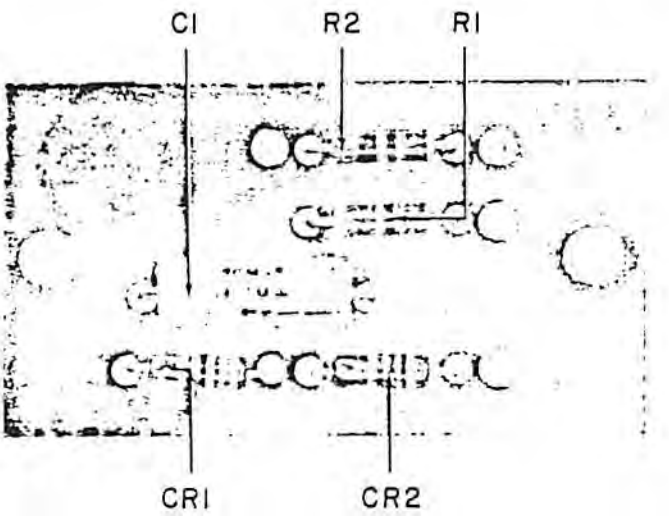



Figure 5-1b. Type 79338 Fine Tuning Regulator, Component Locations

5.4.8 Type 72201 IF Amplifier (21.4 MHz CF) REF DESIG PREFIX A7

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | INPUT IF AMPLIFIER | 1 | 14259 | 14632 |
| A2 | MIDSECTION IF AMPLIFIER | 1 | 14342 | 14632 |
| A3 | OUTPUT AMPLIFIER | 1 | 14345 | 14632 |
| C1 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 15 | FA5C-102W | 01121 |
| C2 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 14 | C023B101E103M | 56289 |
| C3 | Same as C1 | | | |
| C4 | NOT USED | | | |
| C5 | CAPACITOR, CERAMIC, FEEDTHRU: 330 pF, 10%, 500V | 1 | FA5C3311 | 01121 |
| C6 | Same as C2 | | | |
| C7 | Same as C1 | | | |
| C8 | Same as C1 | | | |
| C9 | Same as C2 | | | |
| C10 | Same as C1 | | | |
| C11 | Same as C2 | | | |
| C12 | Same as C2 | | | |
| C13 | Same as C1 | | | |
| C14 | NOT USED | | | |
| C15 | Same as C2 | | | |
| C16 | Same as C1 | | | |
| C17 | Same as C1 | | | |
| C18 | Same as C2 | | | |
| C19 | Same as C1 | | | |
| C20 | Same as C1 | | | |
| C21 | Same as C2 | | | |
| C22 | Same as C1 | | | |
| C23 | Same as C2 | | | |
| C24 | Same as C1 | | | |
| C25 | Same as C2 | | | |
| C26 | Same as C1 | | | |
| C27 | Same as C2 | | | |
| C28 | Same as C1 | | | |
| C29 | Same as C2 | | | |
| C30 | Same as C2 | | | |
| C31 | Same as C1 | | | |

REF DESIG PREFIX A7

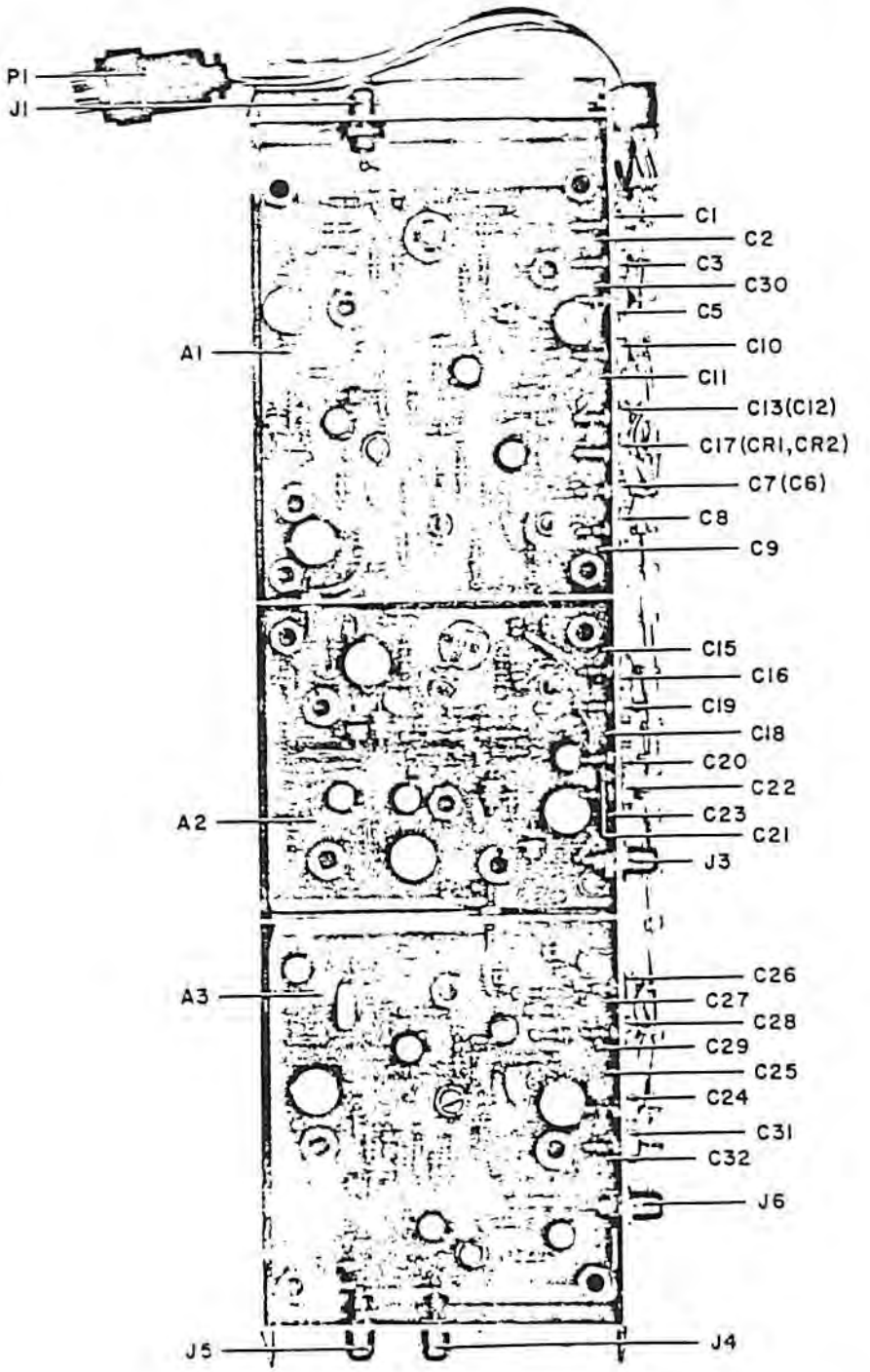



Figure 5-17. Type 72201 21.4-MHz IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C32 | Same as C2 | | | |
| E1 | TERMINAL, FEEDTHRU | 2 | SFU-16 | 04013 |
| E2 | Same as E1 | | | |
| FL1 | FILTER, CRYSTAL: 21.4 CF, 100 KHz BW | 1 | 6063674 | 74306 |
| FL2 | FILTER, CRYSTAL: 21.4 CF, 20 KHz BW | 1 | 6053653 | 74306 |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 5 | 46025 | 74868 |
| J2 | NOT USED | | | |
| J3 | Same as J1 | | | |
| J4 | Same as J1 | | | |
| J5 | Same as J1 | | | |
| J6 | Same as J1 | | | |
| MP1 | COVER | 1 | 21391-1 | 14632 |
| MP2 | COVER | 1 | 21466-1 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M10P-LSH19C | 81312 |
| R1 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 1 | CB4705 | 01121 |

REF DESIG PREFIX A7A1

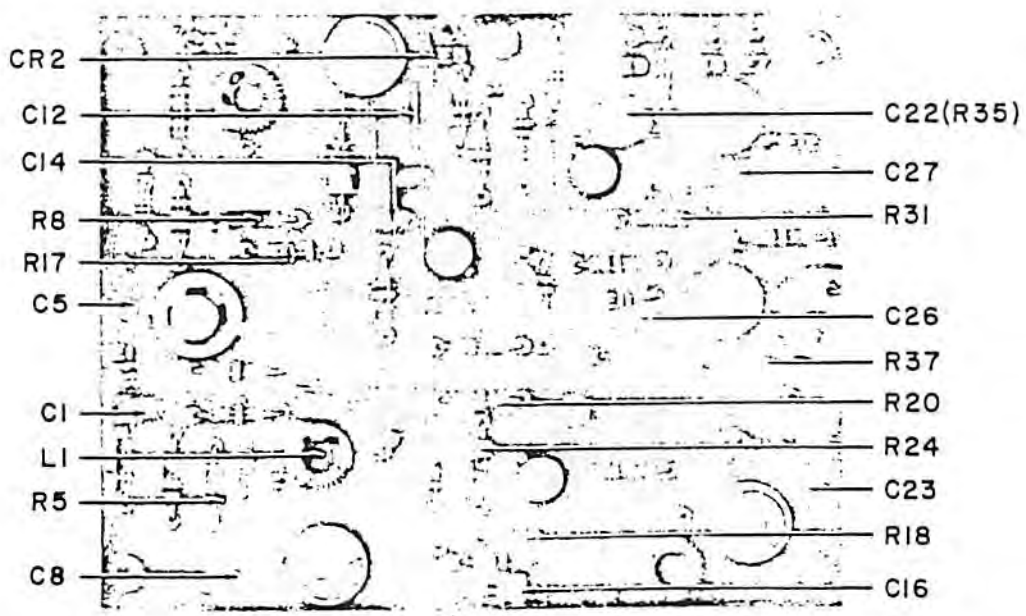
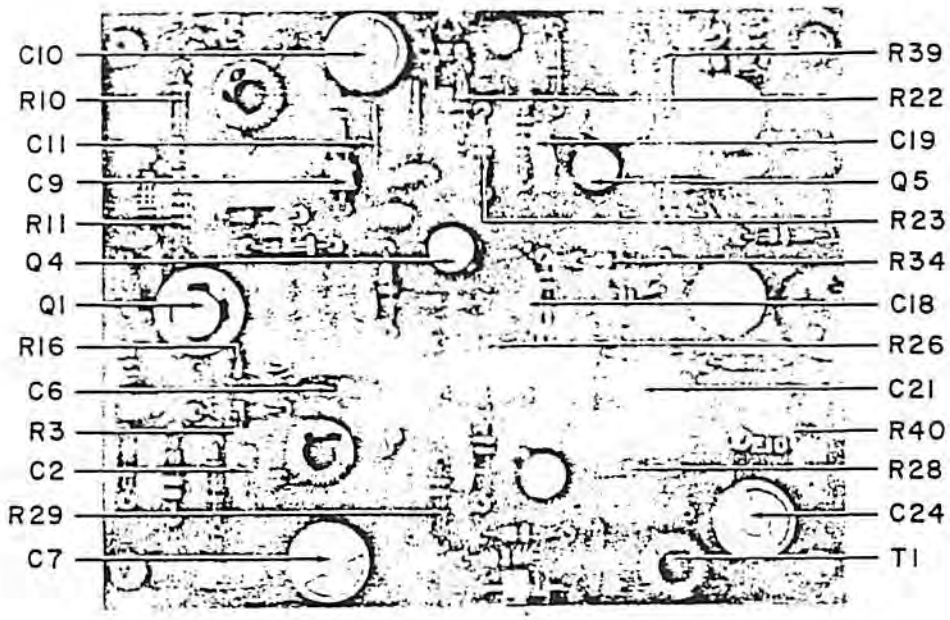



Figure 5-18. Part 14259 Input IF Amplifier, Component Locations

5.4.8.1 Part 14259 Input IF Amplifier REF DESIG PREFIX A7A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 4 | SM(.001μF, GMV) | 91418 |
| C2 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 12 | C023B101F103M | 56289 |
| C3 | NOT USED | | | |
| C4 | NOT USED | | | |
| C5 | Same as C2 | | | |
| C6 | CAPACITOR, DIPPED MICA: 56 pF, 5%, 500V | 1 | CM05E560J03 | 81349 |
| C7 | CAPACITOR, VARIABLE, CERAMIC: 7-25 pF, 350V (TC-N300) | 3 | 538-011-B2P0-93R | 72982 |
| C8 | Same as C2 | | | |
| C9 | CAPACITOR, COMPOSITION, TUBULAR: 1.2 pF, 10%, 500V | 1 | QC(1.2pF, 10%) | 95121 |
| C10 | Same as C7 | | | |
| C11 | CAPACITOR, DIPPED MICA: 62 pF, 5%, 500V | 1 | CM05E620J03 | 81349 |
| C12 | CAPACITOR, DIPPED MICA: 330 pF, 5%, 500V | 1 | CM05F331J03 | 81349 |
| C13 | Same as C1 | | | |
| C14 | Same as C1 | | | |
| C15 | Same as C1 | | | |
| C16 | CAPACITOR, COMPOSITION, TUBULAR: 2.2 pF, 10%, 500V | 1 | QC(2.2pF, 10%) | 95121 |
| C17 | Same as C2 | | | |
| C18 | Same as C2 | | | |
| C19 | Same as C2 | | | |
| C20 | CAPACITOR, DIPPED MICA: 36 pF, 5%, 500V | 1 | CM05E360J03 | 81349 |
| C21 | Same as C2 | | | |
| C22 | Same as C2 | | | |
| C23 | Same as C2 | | | |
| C24 | Same as C7 | | | |
| C25 | Same as C2 | | | |
| C26 | Same as C2 | | | |
| C27 | Same as C2 | | | |
| CR1 | DIODE | 1 | 1N462A | 80131 |
| CR2 | DIODE | 1 | 1N198 | 80131 |
| L1 | COIL, FIXED | 2 | 20681-10 | 14612 |
| L2 | Same as L1 | | | |
| Q1 | TRANSISTOR | 1 | 3N140 | 80131 |
| Q2 | NOT USED | | | |

REF DESIG PREFIX A7A1



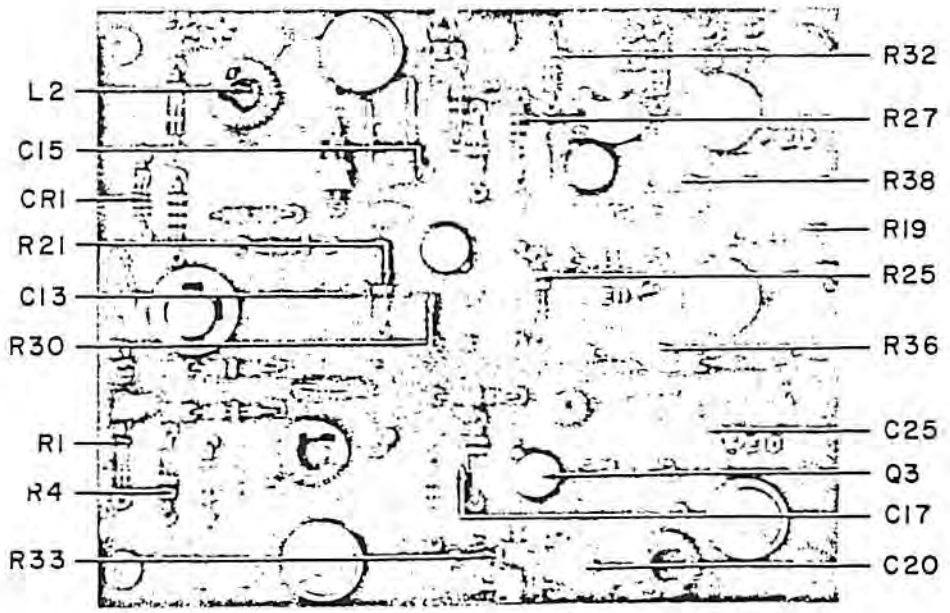




Figure 5-19. Part 14259 Input IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| Q3 | TRANSISTOR | 3 | 2N3478 | 80131 |
| Q4 | Same as Q3 | | | |
| Q5 | Same as Q3 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 51 Ω, 5%, 1/4W | 1 | CB5105 | 01121 |
| R2 | NOT USED | | | |
| R3 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 2 | CB1545 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 1 | CB1035 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 300 Ω, 5%, 1/4W | 1 | CB3015 | 01121 |
| R6 | NOT USED | | | |
| R7 | NOT USED | | | |
| R8 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 3 | CB1005 | 01121 |
| R9 | NOT USED | | | |
| R10 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 1 | CB4725 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W | 1 | CB3335 | 01121 |
| R12 | NOT USED | | | |
| R13 | NOT USED | | | |
| R14 | NOT USED | | | |
| R15 | NOT USED | | | |
| R16 | Same as R3 | | | |
| R17 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 1 | CB4715 | 01121 |
| R18 | RESISTOR, FIXED, COMPOSITION: 27 kΩ, 5%, 1/4W | 6 | CB2735 | 01121 |
| R19 | Same as R18 | | | |
| R20 | RESISTOR, FIXED, COMPOSITION: 18 kΩ, 5%, 1/4W | 3 | CB1835 | 01121 |
| R21 | Same as R20 | | | |
| R22 | Same as R18 | | | |
| R23 | Same as R20 | | | |
| R24 | RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W | 3 | CB3925 | 01121 |
| R25 | Same as R24 | | | |
| R26 | RESISTOR, FIXED, COMPOSITION: 56 Ω, 5%, 1/4W | 1 | CB5605 | 01121 |
| R27 | Same as R24 | | | |
| R28 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 1 | CB1015 | 01121 |
| R29 | RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W | 1 | CB3315 | 01121 |
| R30 | Same as R3 | | | |
| R31 | Same as R8 | | | |

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R32 | RESISTOR, FIXED, COMPOSITION: 150 Ω, 5%, 1/4W | 1 | CB1515 | 01121 |
| R33 | Same as R18 | | | |
| R34 | Same as R18 | | | |
| R35 | Same as R18 | | | |
| R36 | RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W | 2 | CB2215 | 01121 |
| R37 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 3 | CB1025 | 01121 |
| R38 | Same as R36 | | | |
| R39 | Same as R37 | | | |
| R40 | Same as R37 | | | |
| T1 | TRANSFORMER | 1 | 20937-6 | 14632 |

5.4.8.2 Part 14342 Mid-Section IF Amplifier REF DESIG PREFIX A7A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, DIPPED MICA: 200 pF, 5%, 500V | 2 | CM05F201J03 | 81349 |
| C2 | CAPACITOR, VARIABLE, CERAMIC: 7-25 pF, 350V (TC-N300) | 3 | 538-011-93B | 72982 |
| C3 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 2 | SM(.001μF, GMV) | 91418 |
| C4 | Same as C3 | | | |
| C5 | Same as C1 | | | |
| C6 | CAPACITOR, COMPOSITION, TUBULAR: 3.3 pF, 10%, 500V | 1 | QC(3.3pF, 10%) | 95121 |
| C7 | CAPACITOR, COMPOSITION, TUBULAR: 2.7 pF, 10%, 500V | 1 | QC(2.7pF, 10%) | 95121 |
| C8 | CAPACITOR, COMPOSITION, TUBULAR: 4.3 pF, 10%, 500V | 1 | QC(4.3pF, 10%) | 95121 |
| C9 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 100V | 3 | C023B101F103M | 56289 |
| C10 | CAPACITOR, DIPPED MICA: 30 pF, 5%, 500V | 1 | CM05E300J03 | 81349 |
| C11 | Same as C9 | | | |
| C12 | Same as C9 | | | |
| C13 | Same as C2 | | | |
| C14 | CAPACITOR, CERAMIC, DISC: 0.005 μF, 20%, 100V | 1 | C023B101E502M | 56289 |
| C15 | CAPACITOR, COMPOSITION, TUBULAR: 1.2 pF, 10%, 500V | 1 | QC(1.2pF, 10%) | 95121 |
| C16 | Same as C2 | | | |
| C17 | CAPACITOR, DIPPED MICA: 47 pF, 5%, 500V | 1 | CM05E470J03 | 81349 |
| C18 | CAPACITOR, DIPPED MICA: 470 pF, 5%, 500V | 1 | DM15-471J | 72136 |
| C19 | CAPACITOR, DIPPED MICA: 160 pF, 5%, 500V | 1 | CM05F161J03 | 81349 |
| L1 | COIL, FIXED | 1 | 20681-11 | 14632 |
| L2 | COIL, FIXED | 1 | 20681-14 | 14632 |
| Q1 | TRANSISTOR | 3 | 2N3478 | 80131 |
| Q2 | Same as Q1 | | | |
| Q3 | Same as Q1 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 3 | CB4735 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 12 kΩ, 5%, 1/4W | 3 | CB1235 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 240 Ω, 5%, 1/4W | 2 | CB2415 | 01121 |
| R4 | Same as R3 | | | |
| R5 | RESISTOR, FIXED, COMPOSITION: 1.8 kΩ, 5%, 1/4W | 1 | CB1825 | 01121 |
| R6 | Same as R1 | | | |
| R7 | Same as R1 | | | |
| R8 | Same as R2 | | | |
| R9 | Same as R2 | | | |

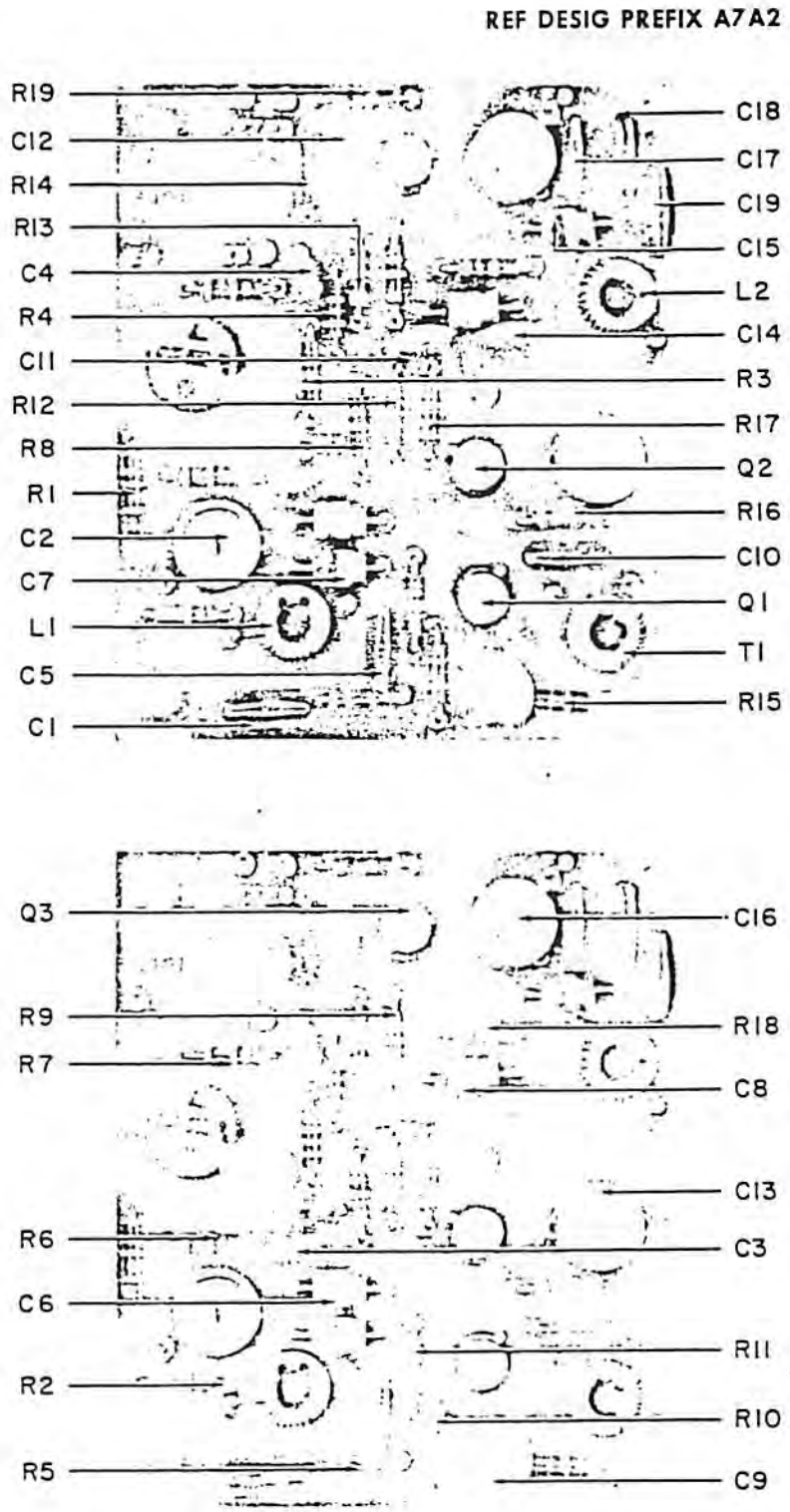



Figure 5-20. Part 14342 Mid-Section IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R10 | RESISTOR, FIXED, COMPOSITION: 2.7 kΩ, 5%, 1/4W | 3 | CB2725 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W | 1 | CB2715 | 01121 |
| R12 | Same as R10 | | | |
| R13 | RESISTOR, FIXED, COMPOSITION: 100Ω, 5%, 1/4W | 1 | CB1015 | 01121 |
| R14 | Same as R10 | | | |
| R15 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 4 | CB1005 | 01121 |
| R16 | Same as R15 | | | |
| R17 | Same as R15 | | | |
| R18 | Same as R15 | | | |
| R19 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 1 | CB1025 | 01121 |
| T1 | TRANSFORMER | 1 | 20937-6 | 14632 |

5.4.8.3 Part 14345 Output IF Amplifier REF DESIG PREFIX A7A3

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC DISC: 0.01 μF, 20%, 100V | 9 | C023B101F103M | 56289 |
| C2 | Same as C1 | | | |
| C3 | Same as C1 | | | |
| C4 | CAPACITOR, DIPPED MICA: 36 pF, 5%, 500V | 1 | CM05E360J03 | 81349 |
| C5 | CAPACITOR, VARIABLE, CERAMIC: 7-25 pF, 350V (TC-N300) | 1 | 538-011-93B | 72982 |
| C6 | CAPACITOR, DIPPED MICA: 51 pF, 5%, 500V | 2 | CM05E510J03 | 81349 |
| C7 | Same as C6 | | | |
| C8 | CAPACITOR, DIPPED MICA: 180 pF, 5%, 500V | 1 | CM05F181J03 | 81349 |
| C9 | Same as C1 | | | |
| C10 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 1 | SM(.001μF, GMV) | 91418 |
| C11 | Same as C1 | | | |
| C12 | CAPACITOR, COMPOSITION, TUBULAR: 0.30 pF, 10%, 500V | 1 | QC(.3pF, 10%) | 95121 |
| C13 | Same as C1 | | | |
| C14 | Same as C1 | | | |
| C15 | CAPACITOR, DIPPED MICA: 39 pF, 5%, 500V | 1 | CM05E390J03 | 81349 |
| C16 | CAPACITOR, DIPPED MICA: 360 pF, 5%, 500V | 2 | CM05F361J03 | 81349 |
| C17 | Same as C16 | | | |
| C18 | Same as C1 | | | |
| C19 | CAPACITOR, VARIABLE, CERAMIC: 2-8 pF, 350V | 1 | 538-011-89A | 72982 |
| C20 | CAPACITOR, DIPPED MICA: 24 pF, 5%, 500V | 1 | CM05E240J03 | 81349 |
| C21 | CAPACITOR, DIPPED MICA: 100 pF, 5%, 500V | 1 | CM05F101J03 | 81349 |
| C22 | NOT USED | | | |
| C23 | NOT USED | | | |
| C24 | NOT USED | | | |
| C25 | NOT USED | | | |
| C26 | NOT USED | | | |
| C27 | NOT USED | | | |
| C28 | NOT USED | | | |
| C29 | NOT USED | | | |
| C30 | NOT USED | | | |
| C31 | NOT USED | | | |
| C32 | NOT USED | | | |
| C33 | Same as C1 | | | |

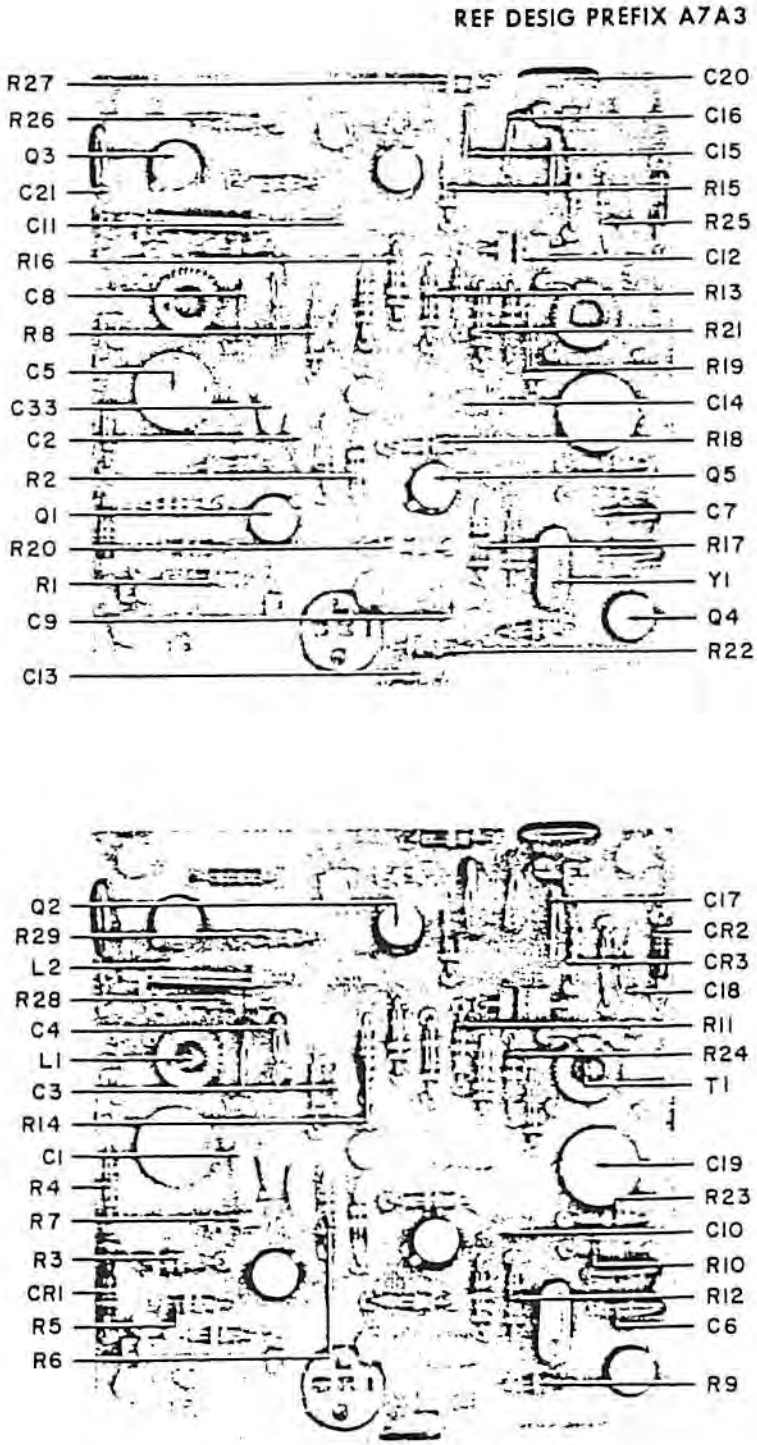



Figure 5-21. Part 14345 Output IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| CR1 | DIODE | 2 | 1N462A | 80131 |
| CR2 | Same as CR1 | | | |
| CR3 | DIODE | 1 | 1N198 | 80131 |
| L1 | COIL, FIXED | 1 | 20681-14 | 14632 |
| L2 | COIL, FIXED | 1 | 1131-37 | 14632 |
| Q1 | TRANSISTOR | 1 | 3N140 | 80131 |
| Q2 | TRANSISTOR | 3 | 2N3478 | 80131 |
| Q3 | TRANSISTOR | 1 | 2N4074 | 80131 |
| Q4 | Same as Q2 | | | |
| Q5 | Same as Q2 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 2 | CB1545 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 3 | CB1035 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W | 1 | CB3335 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 3 | CB4725 | 01121 |
| R5 | Same as R1 | | | |
| R6 | RESISTOR, FIXED, COMPOSITION: 300 Ω, 5%, 1/4W | 1 | CB3015 | 01121 |
| R7 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 3 | CB4705 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 1 | CB4715 | 01121 |
| R9 | RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W | 1 | CB2245 | 01121 |
| R10 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 2 | CB1015 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 18 kΩ, 5%, 1/4W | 1 | CB1835 | 01121 |
| R12 | Same as R4 | | | |
| R13 | Same as R4 | | | |
| R14 | RESISTOR, FIXED, COMPOSITION: 6.8 Ω, 5%, 1/4W | 1 | CB68G5 | 01121 |
| R15 | Same as R7 | | | |
| R16 | RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W | 2 | CB3915 | 01121 |
| R17 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 1 | CB4735 | 01121 |
| R18 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | 4 | CB2235 | 01121 |
| R19 | Same as R7 | | | |
| R20 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 1 | CB2225 | 01121 |
| R21 | Same as R16 | | | |
| R22 | RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W | 1 | CB3315 | 01121 |
| R23 | Same as R18 | | | |
| R24 | Same as R18 | | | |

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R25 | Same as R18 | | | |
| R26 | RESISTOR, FIXED, COMPOSITION: 2.7 MΩ, 5%, 1/4W | 1 | CB2755 | 01121 |
| R27 | Same as R2 | | | |
| R28 | Same as R2 | | | |
| R29 | Same as R10 | | | |
| T1 | TRANSFORMER | 1 | 20937-9 | 14632 |
| Y1 | CRYSTAL, QUARTZ: 21.4 MHz | 1 | 96402-01 | 14632 |

5.4.9 Type 79335 Limiter/Discriminator (21.4 MHz) REF DESIG PREFIX A8

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | LIMITER/DISCRIMINATOR | 1 | 14208 | 14632 |
| C1 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 3 | C023B101F103M | 56289 |
| C2 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 3 | FA5C-102W | 01121 |
| C3 | Same as C1 | | | |
| C4 | Same as C1 | | | |
| C5 | Same as C2 | | | |
| C6 | Same as C2 | | | |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 2 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| MP1 | COVER | 1 | 21390-1 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M7P-1SH9 | 81312 |

REF DESIG PREFIX A8

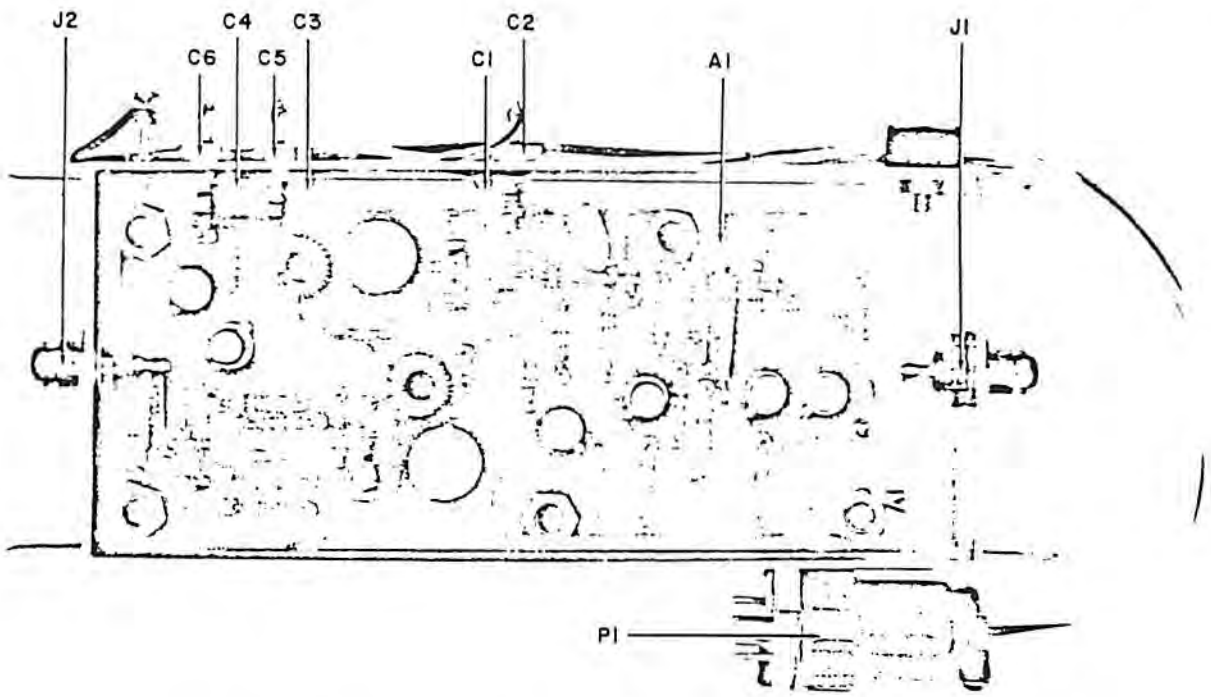



Figure 5-22. Type 79335 21.4-MHz Limiter/Discriminator, Component Locations

5.4.9.1 Part 14208 Limiter/Discriminator REF DESIG PREFIX A8A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, DISC: 0.005 μF, 20%, 500V | 4 | SM(.005 μF, 20%) | 91418 |
| C2 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 6 | SM(.001 μF, GMV) | 91418 |
| C3 | Same as C2 | | | |
| C4 | Same as C2 | | | |
| C5 | Same as C2 | | | |
| C6 | Same as C1 | | | |
| C7 | Same as C2 | | | |
| C8 | Same as C1 | | | |
| C9 | CAPACITOR, VARIABLE, CERAMIC: 2-8 pF, 350 V | 2 | 538-011-COPO-89R | 72982 |
| C10 | Same as C2 | | | |
| C11 | CAPACITOR, CERAMIC, TUBULAR: 15 pF, 5%, 500V (TC-N750) | 1 | CC20UJ150J | 81349 |
| C12 | CAPACITOR, DIPPED MICA: 12 pF, 5%, 500V | 2 | CM05C120J03 | 81349 |
| C13 | Same as C1 | | | |
| C14 | Same as C9 | | | |
| C15 | Same as C12 | | | |
| C16 | CAPACITOR, CERAMIC, TUBULAR: 33pF, 2%, 500V (TC-N330) | 1 | CC20SH330G | 81349 |
| C17 | CAPACITOR, DIPPED MICA: 33 pF, 5%, 500V | 1 | CM05E330J03 | 81349 |
| CR1 | DIODE | 4 | 1N914A | 80131 |
| CR2 | Same as CR1 | | | |
| CR3 | Same as CR1 | | | |
| CR4 | Same as CR1 | | | |
| L1 | COIL, FIXED | 1 | 1131-41 | 14632 |
| L2 | COIL, FIXED | 1 | 20681-17 | 14632 |
| L3 | COIL, FIXED | 1 | 1131-37 | 14632 |
| Q1 | TRANSISTOR | 3 | 2N706 | 80131 |
| Q2 | Same as Q1 | | | |
| Q3 | Same as Q1 | | | |
| Q4 | TRANSISTOR | 1 | 2N3478 | 80131 |
| Q5 | TRANSISTOR | 1 | 2N3251 | 80131 |
| Q6 | TRANSISTOR | 1 | 2N4074 | 80131 |
| R1 | RESISTOR, FIXED, COMPCSITION: 22 kΩ, 5%, 1/4W | 2 | CB2235 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 6 | CB4725 | 01121 |
| R3 | RESISTOR, FIXED COMPOSITION: 2.2 kΩ, 5%, 1/4W | 2 | CB2225 | 01121 |

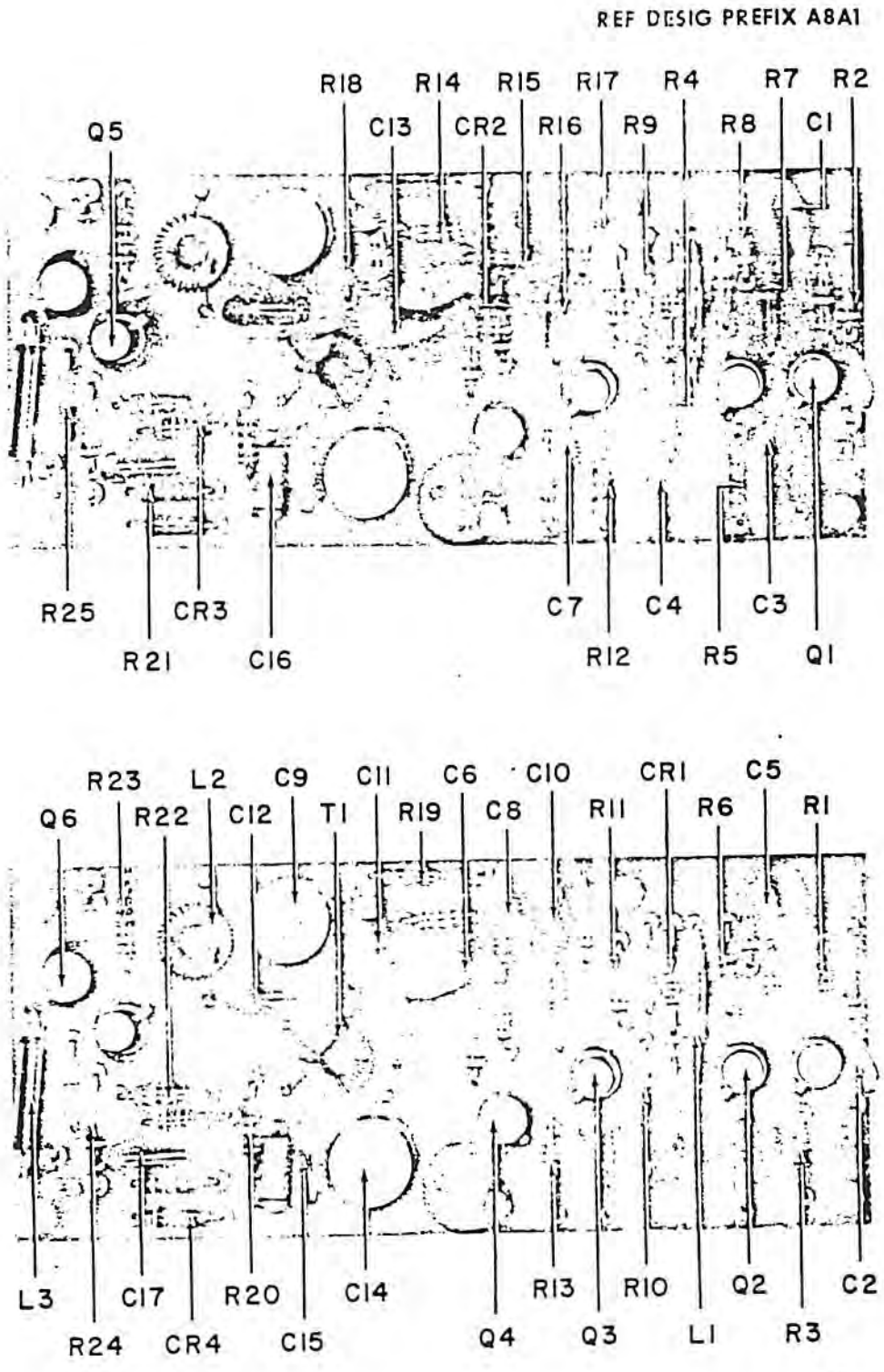



Figure 5-23. Part 14208 Limiter/Discriminator, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R4 | RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W | 1 | CB2215 | 01121 |
| R5 | Same as R3 | | | |
| R6 | Same as R1 | | | |
| R7 | RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W | 2 | CB2205 | 01121 |
| R8 | Same as R2 | | | |
| R9 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 3 | CB1015 | 01121 |
| R10 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | 1 | CB2235 | 01121 |
| R11 | Same as R2 | | | |
| R12 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 3 | CB1025 | 01121 |
| R13 | Same as R12 | | | |
| R14 | RESISTOR, FIXED, COMPOSITION: 16 kΩ, 5%, 1/4W | 1 | CB1635 | 01121 |
| R15 | Same as R2 | | | |
| R16 | Same as R7 | | | |
| R17 | Same as R2 | | | |
| R18 | Same as R9 | | | |
| R19 | Same as R9 | | | |
| R20 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 3 | CB4735 | 01121 |
| R21 | Same as R20 | | | |
| R22 | RESISTOR, FIXED, COMPOSITION: 3.3 MΩ, 5%, 1/4W | 1 | CB3355 | 01121 |
| R23 | Same as R20 | | | |
| R24 | Same as R2 | | | |
| R25 | Same as R12 | | | |
| R26 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 1 | CB4705 | 01121 |
| T1 | TRANSFORMER | 1 | 21427-1 | 14632 |

5.4.10 Type 72197 IF Amplifier (455 KHz) REF DESIG PREFIX A9

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | CONVERTER | 1 | 14227 | 14632 |
| A2 | IF AMPLIFIER | 1 | 21418 | 14632 |
| C1 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 9 | FA5C-102W | 01121 |
| C2 | Same as C1 | | | |
| C3 | Same as C1 | | | |
| C4 | Same as C1 | | | |
| C5 | Same as C1 | | | |
| C6 | Same as C1 | | | |
| C7 | Same as C1 | | | |
| C8 | Same as C1 | | | |
| C9 | Same as C1 | | | |
| E1 | TERMINAL, FEEDTHRU | 1 | SFU-16 | 04013 |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 4 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| J3 | Same as J1 | | | |
| J4 | Same as J1 | | | |
| MP1 | COVER | 1 | 21469-1 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M10P-LSH19C | 81312 |

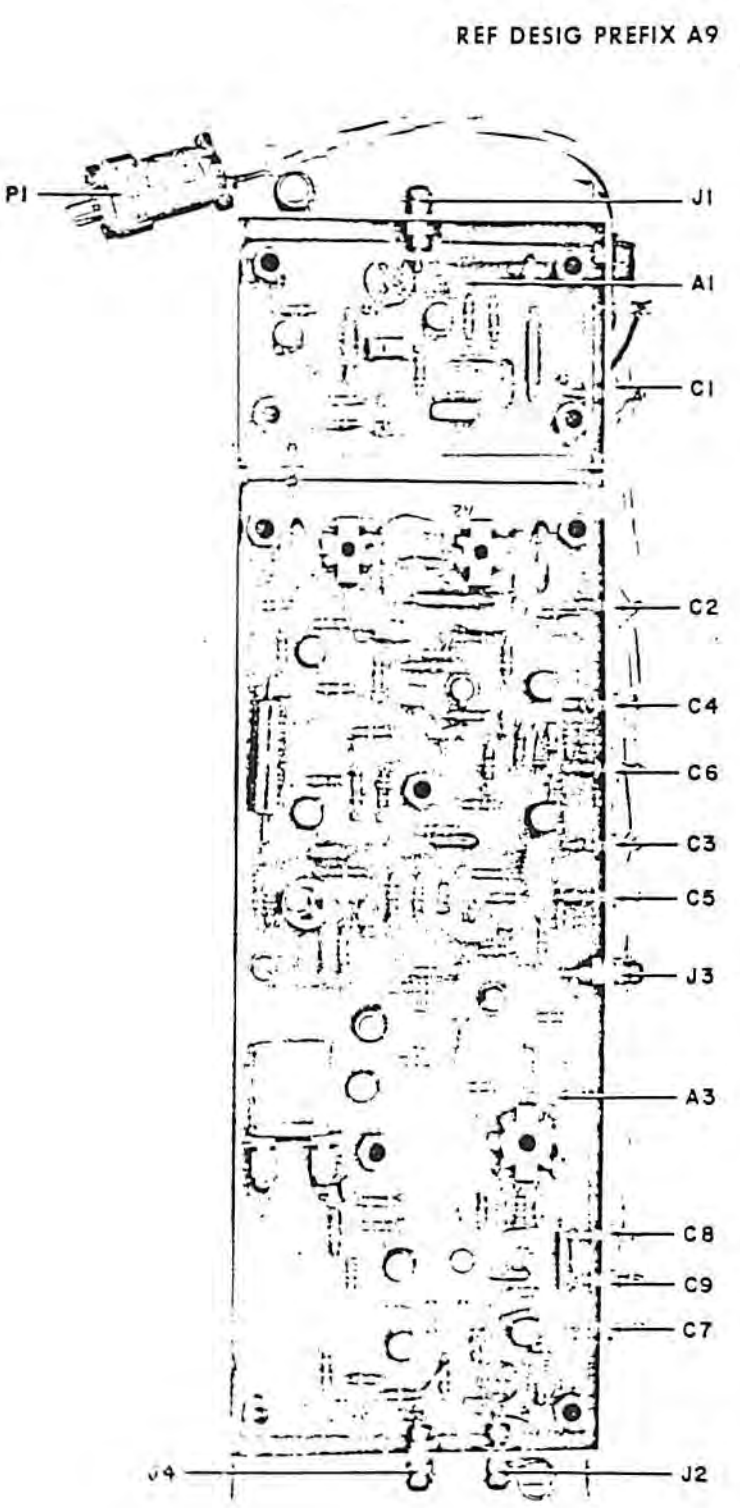
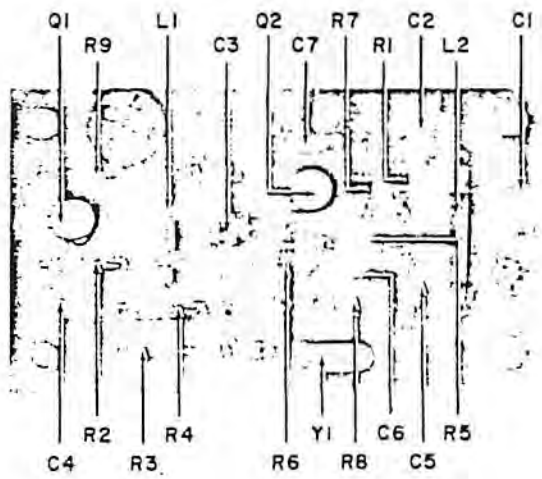



Figure 5-24. Type 72197 455-kHz IF Amplifier, Component Locations

5.4.10.1 Part 14227 Converter REF DESIG PREFIX A9A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, DISC: 0.05 μF, 20%, 100V | 3 | 55C23A7 | 56289 |
| C2 | Same as C1 | | | |
| C3 | CAPACITOR, CERAMIC, TUBULAR: 2.2 pF, ±.25 pF, 500V | 1 | 301-000-COJO-229C | 95121 |
| C4 | Same as C1 | | | |
| C5 | CAPACITOR, DIPPED MICA: 51 pF, 5%, 500V | 2 | CM05E510J03 | 81349 |
| C6 | Same as C5 | | | |
| C7 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 1 | SM(.001μF, GMV) | 91418 |
| L1 | COIL, FIXED | 1 | 21210-17 | 14632 |
| L2 | COIL, FIXED | 1 | 1131-37 | 14632 |
| Q1 | TRANSISTOR | 1 | 3N128 | 80131 |
| Q2 | TRANSISTOR | 1 | 2N3478 | 80131 |
| R1 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 2 | CB4725 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 3 | CB2225 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 1 | CB1005 | 01121 |
| R4 | Same as R2 | | | |
| R5 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 1 | CB1015 | 01121 |
| R6 | Same as R1 | | | |
| R7 | RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W | 1 | CB2245 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 1 | CB4735 | 01121 |
| R9 | Same as R2 | | | |
| Y1 | CRYSTAL, QUARTZ: 20.945 MHz | 1 | 96402-2 | 14632 |




REF DESIG PREFIX A9A1

Figure 5-25. Part 14227 Converter, Component Locations

5.4.10.2 Part 21418 IF Amplifier REF DESIG PREFIX A9A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, DIPPED MICA: 910 pF, 5%, 500V | 2 | CM06F911J03 | 81349 |
| C2 | CAPACITOR, CERAMIC, DISC: 0.05 μF, 20%, 100V | 14 | 55C23A7 | 56289 |
| C3 | CAPACITOR, DIPPED MICA: 180 pF, 5%, 500V | 1 | CM05F181J03 | 81349 |
| C4 | Same as C2 | | | |
| C5 | Same as C2 | | | |
| C6 | Same as C1 | | | |
| C7 | Same as C2 | | | |
| C8 | CAPACITOR, CERAMIC, DISC: 0.005 μF, 20%, 50V | 5 | C023B101E502M | 56289 |
| C9 | Same as C8 | | | |
| C10 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 6 | C023B101F103M | 56289 |
| C11 | Same as C10 | | | |
| C12 | Same as C8 | | | |
| C13 | Same as C2 | | | |
| C14 | Same as C2 | | | |
| C15 | CAPACITOR, DIPPED MICA: 91 pF, 5%, 500V | 1 | CM05F910J03 | 81349 |
| C16 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 3 | SM(.001 μF, GMV) | 91418 |
| C17 | Same as C16 | | | |
| C18 | CAPACITOR, DIPPED MICA: 100 pF, 5%, 500V | 3 | CM05F101J03 | 81349 |
| C19 | Same as C10 | | | |
| C20 | Same as C18 | | | |
| C21 | Same as C18 | | | |
| C22 | Same as C10 | | | |
| C23 | Same as C2 | | | |
| C24 | Same as C2 | | | |
| C25 | Same as C8 | | | |
| C26 | Same as C2 | | | |
| C27 | Same as C2 | | | |
| C28 | Same as C8 | | | |
| C29 | Same as C2 | | | |
| C30 | Same as C2 | | | |
| C31 | Same as C15 | | | |
| C32 | CAPACITOR, DIPPED MICA: 360 pF, 5%, 500V | 1 | CM05F361J03 | 81349 |
| C33 | Same as C10 | | | |
| C34 | Same as C10 | | | |

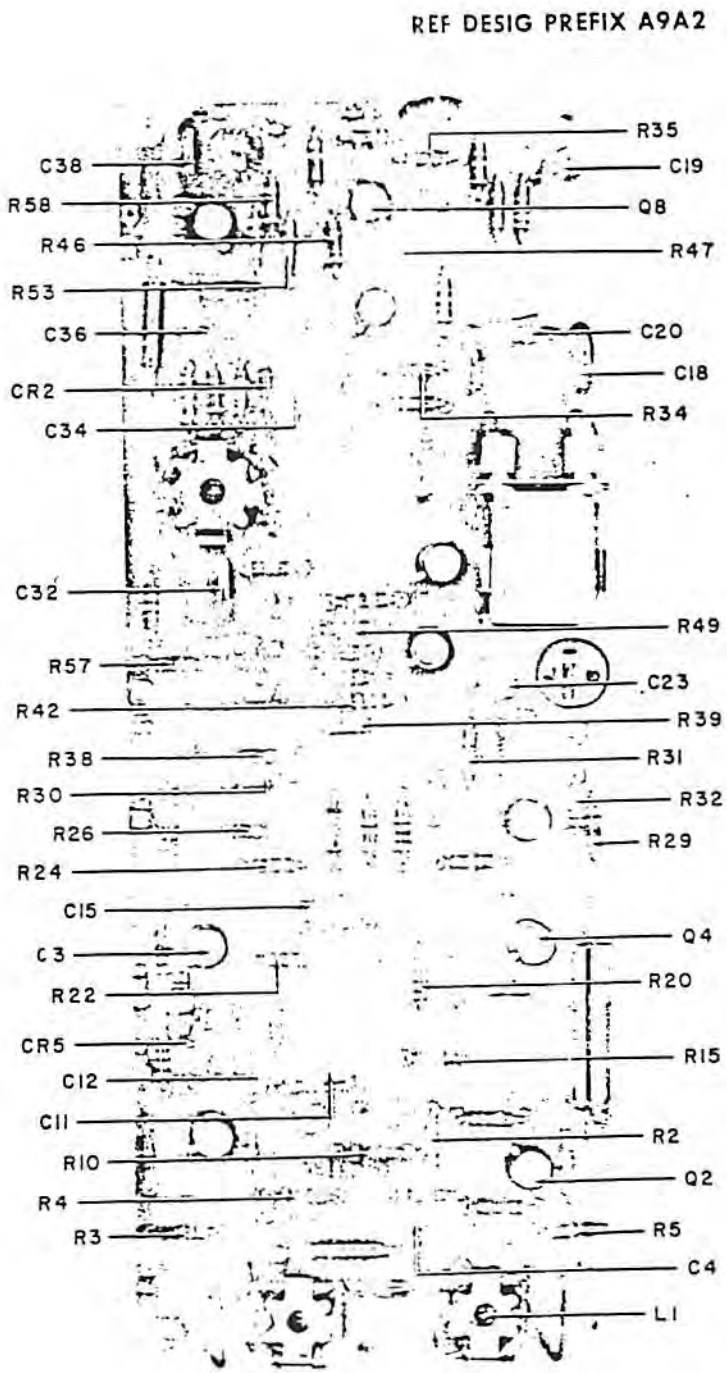



Figure 5-26. Part 21418 IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C35 | CAPACITOR, DIPPED MICA: 47 pF, 5%, 500V | 1 | CM05E470J03 | 81349 |
| C36 | Same as C2 | | | |
| C37 | Same as C2 | | | |
| C38 | CAPACITOR, DIPPED MICA: 220 pF, 5%, 500V | 1 | CM05F221J03 | 81349 |
| CR1 | DIODE | 4 | 1N462A | 80131 |
| CR2 | Same as CR1 | | | |
| CR3 | DIODE | 2 | 1N198 | 80131 |
| CR4 | Same as CR3 | | | |
| CR5 | Same as CR1 | | | |
| CR6 | Same as CR1 | | | |
| FL1 | FILTER, CERAMIC, LADDER: 6 KHz, BW | 1 | TL-6D9-12A-1 | 06961 |
| L1 | COIL, VARIABLE | 2 | 30705-15 | 14632 |
| L2 | COIL, FIXED | 2 | 1131-37 | 14632 |
| L3 | Same as L1 | | | |
| L4 | Same as L2 | | | |
| L5 | COIL, FIXED: 22 mH | 1 | 3635-53 | 71279 |
| Q1 | TRANSISTOR | 5 | 2N3478 | 80131 |
| Q2 | Same as Q1 | | | |
| Q3 | TRANSISTOR | 2 | 2N3933 | 80131 |
| Q4 | Same as Q3 | | | |
| Q5 | TRANSISTOR | 1 | 3N140 | 80131 |
| Q6 | Same as Q1 | | | |
| Q7 | TRANSISTOR | 1 | 2N3251 | 80131 |
| Q8 | Same as Q1 | | | |
| Q9 | Same as Q1 | | | |
| Q10 | TRANSISTOR | 1 | 2N4074 | 80131 |
| R1 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 6 | CB1025 | 01121 |
| R2 | Same as R1 | | | |
| R3 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | 2 | CB2235 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 4 | CB4725 | 01121 |
| R5 | Same as R3 | | | |
| R6 | Same as R4 | | | |
| R7 | RESISTOR, FIXED, COMPOSITION: 100Ω, 5%, 1/4W | 7 | CB1015 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 620 Ω, 5%, 1/4W | 1 | CB6215 | 01121 |

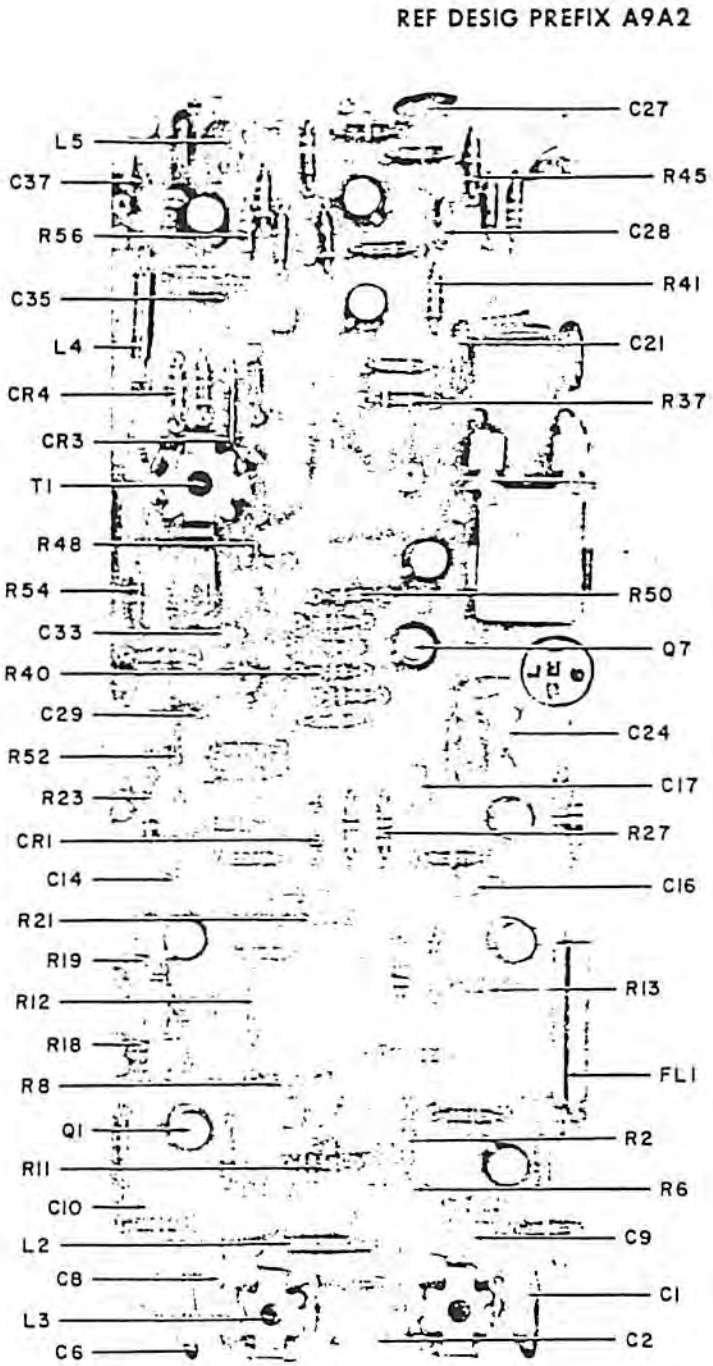



Figure 5-27. Part 21418 IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R9 | RESISTOR, FIXED, COMPOSITION: 1.8 kΩ, 5%, 1/4W | 3 | CB1825 | 01121 |
| R10 | RESISTOR, FIXED, COMPOSITION: 910 Ω, 5%, 1/4W | 1 | CB9115 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 430 Ω, 5%, 1/4W | 2 | CB4315 | 01121 |
| R12 | Same as R7 | | | |
| R13 | Same as R7 | | | |
| R14 | Same as R1 | | | |
| R15 | RESISTOR, FIXED, COMPOSITION: 18 kΩ, 5%, 1/4W | 2 | CB1835 | 01121 |
| R16 | Same as R9 | | | |
| R17 | Same as R1 | | | |
| R18 | RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W | 2 | CB3335 | 01121 |
| R19 | RESISTOR, FIXED, COMPOSITION: 3.3 kΩ, 5%, 1/4W | 1 | CB3325 | 01121 |
| R20 | RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W | 1 | CB3915 | 01121 |
| R21 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 3 | CB1005 | 01121 |
| R22 | Same as R21 | | | |
| R23 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 2 | CB4715 | 01121 |
| R24 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 4 | CB2225 | 01121 |
| R25 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 2 | CB1545 | 01121 |
| R26 | Same as R4 | | | |
| R27 | Same as R18 | | | |
| R28 | Same as R25 | | | |
| R29 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 3 | CB1035 | 01121 |
| R30 | Same as R7 | | | |
| R31 | RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W | 1 | CB1525 | 01121 |
| R32 | RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W | 1 | CB3315 | 01121 |
| R33 | RESISTOR, FIXED, COMPOSITION: 330 kΩ, 5%, 1/4W | 1 | CB3345 | 01121 |
| R34 | Same as R24 | | | |
| R35 | RESISTOR, FIXED, COMPOSITION: 15 kΩ, 5%, 1/4W | 1 | CB1535 | 01121 |
| R36 | Same as R7 | | | |
| R37 | Same as R4 | | | |
| R38 | Same as R1 | | | |
| R39 | Same as R24 | | | |
| R40 | RESISTOR, FIXED, COMPOSITION: 27 kΩ, 5%, 1/4W | 1 | CB2735 | 01121 |
| R41 | RESISTOR, FIXED, COMPOSITION: 68 kΩ, 5%, 1/4W | 1 | CB6835 | 01121 |
| R42 | Same as R11 | | | |

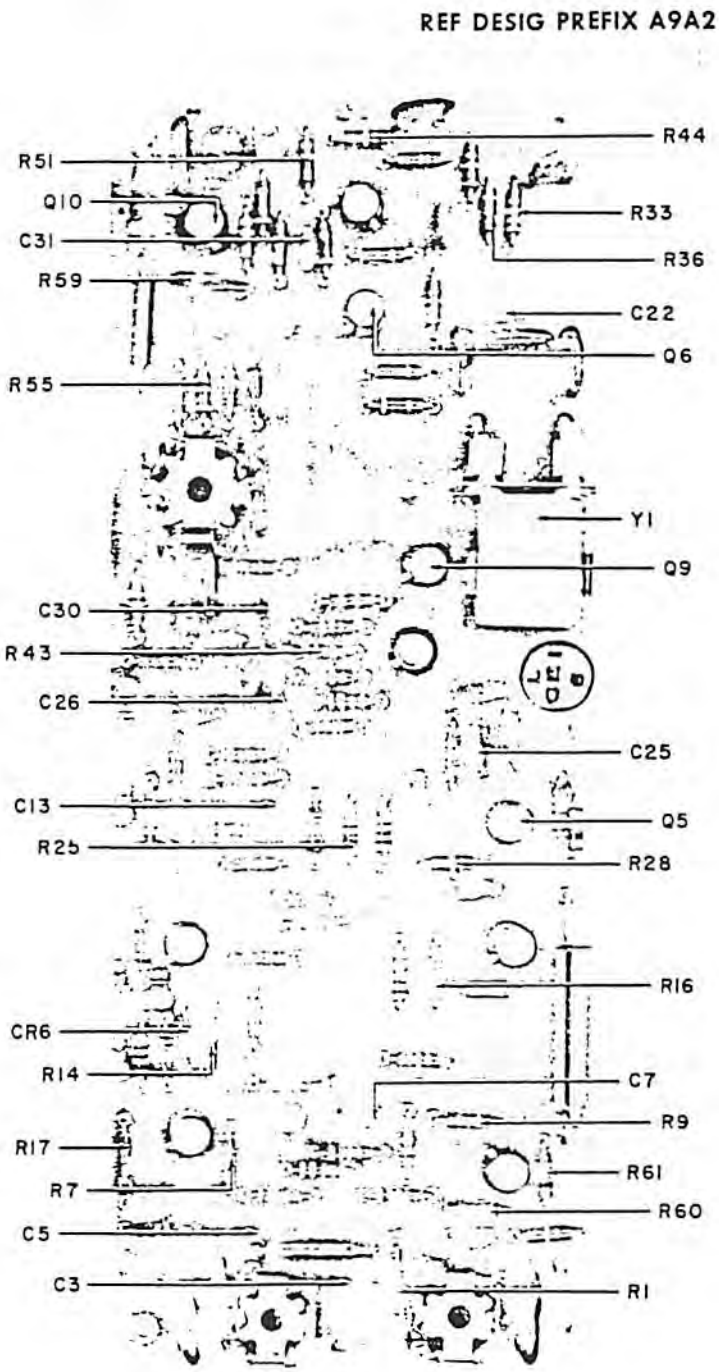



Figure 5-28. Part 21418 IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R43 | Same as R9 | | | |
| R44 | RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W | 1 | CB2245 | 01121 |
| R45 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 2 | CB4735 | 01121 |
| R46 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 2 | CB4705 | 01121 |
| R47 | Same as R24 | | | |
| R48 | Same as R46 | | | |
| R49 | RESISTOR, FIXED, COMPOSITION: 560 Ω, 5%, 1/4W | 1 | CB5615 | 01121 |
| R50 | RESISTOR, FIXED, COMPOSITION: 56 Ω, 5%, 1/4W | 1 | CB5605 | 01121 |
| R51 | Same as R29 | | | |
| R52 | Same as R1 | | | |
| R53 | RESISTOR, FIXED, COMPOSITION: 150 Ω, 5%, 1/4W | 1 | CB1515 | 01121 |
| R54 | Same as R15 | | | |
| R55 | Same as R45 | | | |
| R56 | Same as R29 | | | |
| R57 | Same as R21 | | | |
| R58 | Same as R23 | | | |
| R59 | RESISTOR, FIXED, COMPOSITION: 2.7 MΩ, 5%, 1/4W | 1 | CB2755 | 01121 |
| R60 | Same as R7 | | | |
| R61 | Same as R7 | | | |
| T1 | TRANSFORMER | 1 | 30312-57 | 14632 |
| XQ5 | SOCKET, TRANSISTOR | 1 | 22-16-4 | 81073 |
| Y1 | CRYSTAL, QUARTZ: 455 KHz | 1 | CR-46/U | 81349 |

5.4.11 Type 79337 Limiter/Discriminator (455 kHz) REF DESIG PREFIX A10

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | P. C. BOARD | 1 | 14206 | 14632 |
| C1 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 1 | C023B101F103M | 56289 |
| C2 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 3 | FA5C-102W | 01121 |
| C3 | Same as C2 | | | |
| C4 | NOT USED | | | |
| C5 | Same as C2 | | | |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 2 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| L1 | COIL, FIXED: 22 mH | 1 | 3635-53 | 71279 |
| MP1 | COVER | 1 | 21385-1 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M7P-LSH9 | 81312 |

REF DESIG PREFIX A10

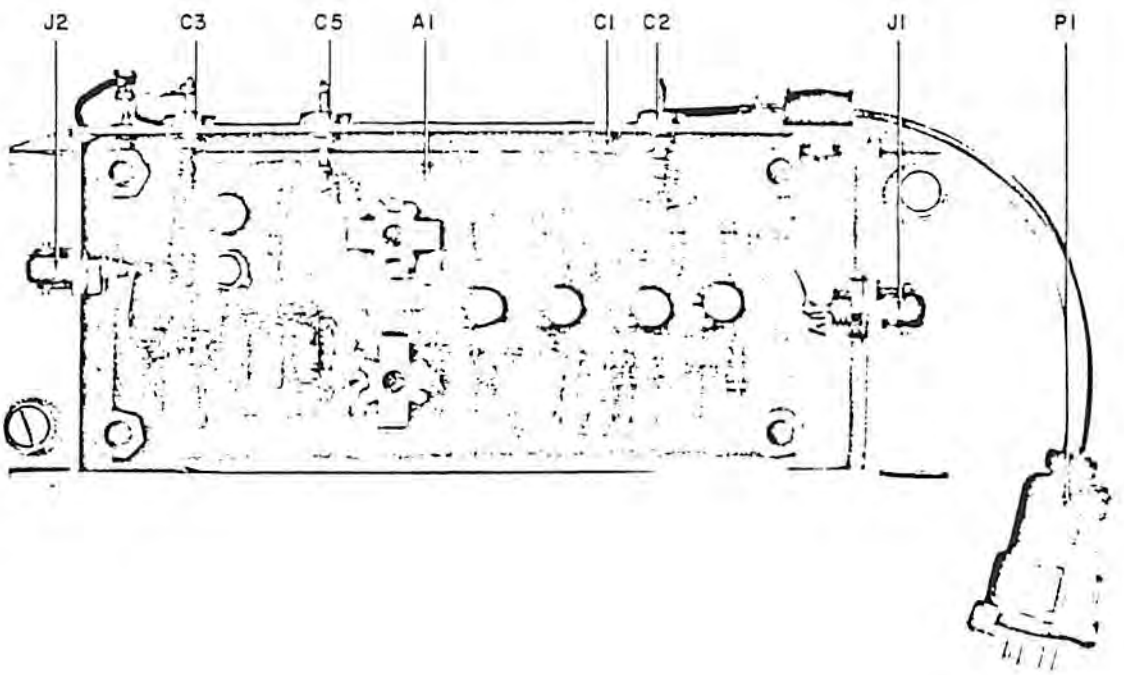



Figure 5-29. Type 79337 455-kHz Limiter/Discriminator, Component Locations

5.4.11.1 Part 14206 P. C. Board REF DESIG PREFIX A10A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 2 | SM(.001 μF, GMV) | 91418 |
| C2 | CAPACITOR, CERAMIC, DISC: 0.05 μF, 20%, 100V | 7 | 55C23A7 | 56289 |
| C3 | NOT USED | | | |
| C4 | Same as C1 | | | |
| C5 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 2 | C023B101F103M | 56289 |
| C6 | NOT USED | | | |
| C7 | Same as C2 | | | |
| C8 | Same as C5 | | | |
| C9 | Same as C2 | | | |
| C10 | Same as C2 | | | |
| C11 | Same as C2 | | | |
| C12 | Same as C2 | | | |
| C13 | CAPACITOR, DIPPED MICA: 510 pF, 5%, 500V | 1 | DM15-511J | 72136 |
| C14 | CAPACITOR, DIPPED MICA: 220 pF, 5%, 500V | 2 | CM05F221J03 | 81349 |
| C15 | CAPACITOR, DIPPED MICA: 430 pF, 5%, 300V | 2 | DM15-431J | 72136 |
| C16 | CAPACITOR, DIPPED MICA: 22 pF, 5%, 500V | 1 | CM05E220J03 | 81349 |
| C17 | CAPACITOR, CERAMIC, DISC: 82 pF, 5%, 75V | 1 | TCN-82 | 71590 |
| C18 | Same as C14 | | | |
| C19 | Same as C15 | | | |
| C20 | Same as C2 | | | |
| CR1 | DIODE | 4 | 1N914A | 80131 |
| CR2 | Same as CR1 | | | |
| CR3 | Same as CR1 | | | |
| CR4 | Same as CR1 | | | |
| L1 | COIL, VARIABLE | 1 | 30705-12 | 14632 |
| L2 | COIL, FIXED: 22 mH | 1 | 3635-53 | 71279 |
| Q1 | TRANSISTOR | 4 | 2N4074 | 80131 |
| Q2 | Same as Q1 | | | |
| Q3 | Same as Q1 | | | |
| Q4 | TRANSISTOR | 1 | 2N3478 | 80131 |
| Q5 | TRANSISTOR | 1 | 2N3251 | 80131 |
| Q6 | Same as Q1 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | 4 | CB2235 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 4.7 k, 5%, 1/4W | 6 | CB4725 | 01121 |

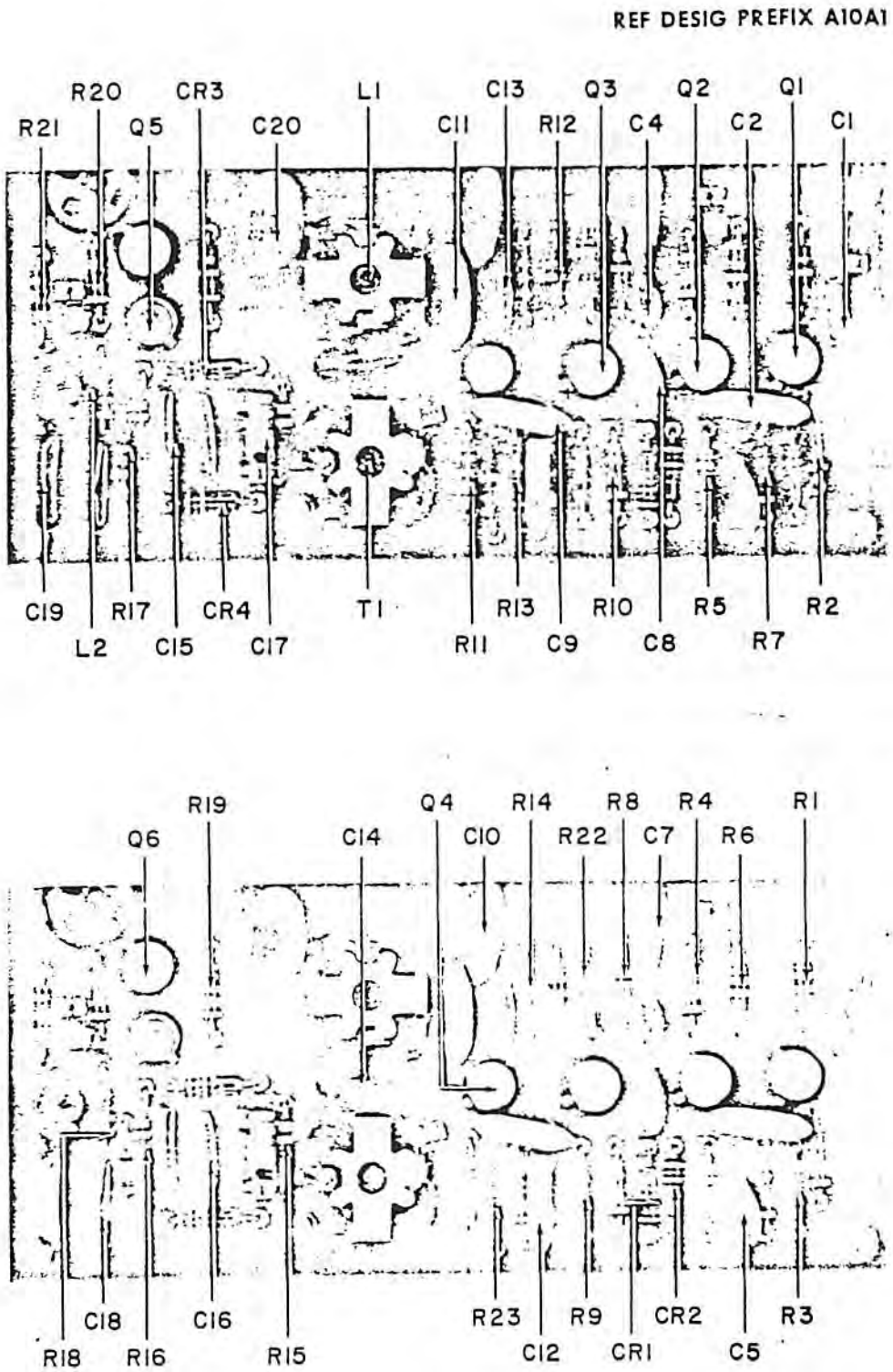



Figure 5-30. Part 14206 Printed Circuit Board, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R3 | RESISTOR, FIXED, COMPOSITION: 2.2 k, 5%, 1/4W | 2 | CB2225 | 01121 |
| R4 | Same as R2 | | | |
| R5 | Same as R3 | | | |
| R6 | Same as R1 | | | |
| R7 | Same as R2 | | | |
| R8 | Same as R1 | | | |
| R9 | Same as R2 | | | |
| R10 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 3 | CB1025 | 01121 |
| R11 | Same as R10 | | | |
| R12 | Same as R1 | | | |
| R13 | Same as R2 | | | |
| R14 | Same as R10 | | | |
| R15 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 1 | CB1035 | 01121 |
| R16 | RESISTOR, FIXED, COMPOSITION: 27 kΩ, 5%, 1/4W | 1 | CB2735 | 01121 |
| R17 | RESISTOR, FIXED, COMPOSITION: 43 kΩ, 5%, 1/4W | 1 | CB4335 | 01121 |
| R18 | RESISTOR, FIXED, COMPOSITION: 3.3 MΩ, 5%, 1/4W | 1 | CB3355 | 01121 |
| R19 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 1 | CB4735 | 01121 |
| R20 | Same as R2 | | | |
| R21 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 2 | CB1015 | 01121 |
| R22 | Same as R21 | | | |
| R23 | RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W | 1 | CB2205 | 01121 |
| T1 | TRANSFORMER | 1 | 30705-14 | 14632 |

5.4.12 Type 7352 Video Amplifier REF DESIG PREFIX A11

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2μF, 10%, 35V | 1 | 150D225X9035B2 | 56289 |
| C2 | CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0μF, 10% 35V | 4 | 150D105X9035A2 | 56289 |
| C3 | CAPACITOR, ELECTROLYTIC, TANTALUM: 22μF, 10%, 35V | 1 | 150D226X9035R2 | 56289 |
| C4 | Same as C2 | | | |
| C5 | Same as C2 | | | |
| C6 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 100μF, 10%, 30V | 1 | 109D107X9030T2 | 56289 |
| C7 | Same as C2 | | | |
| CR1 | DIODE | 2 | 1N462A | 80131 |
| CR2 | Same as CR1 | | | |
| CR3 | DIODE | 2 | 1N914 | 80131 |
| CR4 | Same as CR3 | | | |
| Q1 | TRANSISTOR | 2 | 2N3904 | 80131 |
| Q2 | TRANSISTOR | 2 | 2N3906 | 80131 |
| Q3 | Same as Q1 | | | |
| Q4 | Same as Q2 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 1 | CB4715 | 01121 |
| R2 | RESISTOR, FIXED, FILM: 150 kΩ, 1%, 1/4W | 1 | RN60D1503F | 81349 |
| R3 | RESISTOR, FIXED, FILM: 24.3 kΩ, 1%, 1/4W | 1 | RN60D2432F | 81349 |
| R4 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 3 | CB1025 | 01121 |
| R5 | RESISTOR, FIXED, FILM: 681 Ω, 1%, 1/4W | 1 | RN60D6810F | 81349 |
| R6 | RESISTOR, FIXED, FILM: 4.75 kΩ, 1%, 1/4W | 1 | RN60D4751F | 81349 |
| R7 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 3 | CB4705 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 1 | CB1015 | 01121 |
| R9 | Same as R4 | | | |
| R10 | Same as R4 | | | |
| R11 | Same as R7 | | | |
| R12 | Same as R7 | | | |
| R13 | RESISTOR, FIXED, COMPOSITION: 75 Ω, 5%, 1/4W | 1 | CB7505 | 01121 |
| R14 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 1 | CB1035 | 01121 |
| R15 | RESISTOR, FIXED, COMPOSITION: 20 kΩ, 5%, 1/4W | 1 | CB2035 | 01121 |

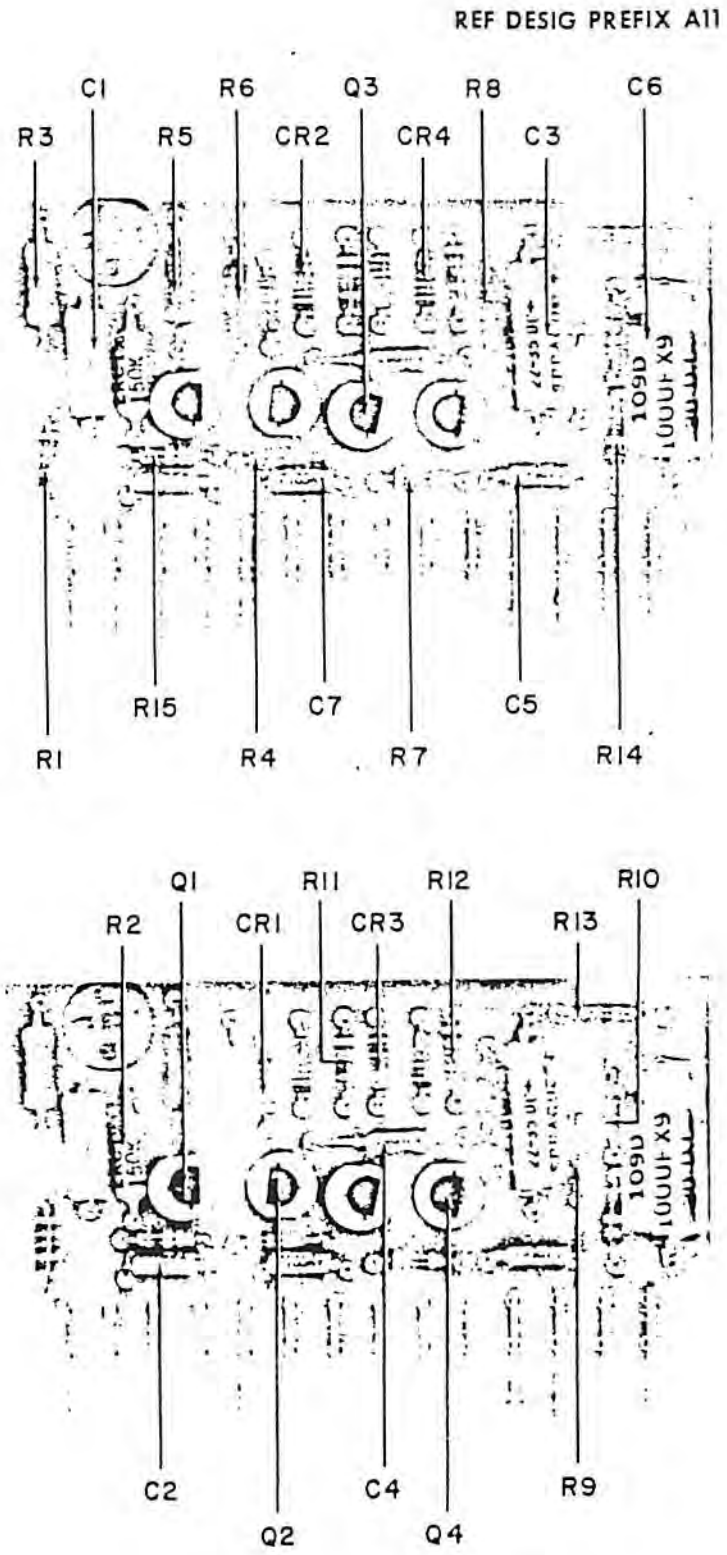



Figure 5-31. Type 7352 Amplifier, Component Locations

5.4.13 Type 7433 Audio Amplifier REF DESIG PREFIX A12

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, ELECTROLYTIC, TANTALUM: 0.1μF, 10%, 35V | 1 | 150D104X9035A2 | 56289 |
| C2 | CAPACITOR, ELECTROLYTIC, TANTALUM: 22μF, 10%, 15V | 1 | 150D226X9015B2 | 56289 |
| C3 | CAPACITOR, ELECTROLYTIC, TANTALUM: 100μF, 10%, 20V | 1 | 150D107X9020S2 | 56289 |
| C4 | CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0μF, 10%, 35V | 1 | 150D105X9035A2 | 56289 |
| CR1 | DIODE | 4 | 1N462A | 80131 |
| CR2 | Same as CR1 | | | |
| CR3 | Same as CR1 | | | |
| CR4 | Same as CR1 | | | |
| Q1 | TRANSISTOR | 1 | 2N4074 | 80131 |
| Q2 | TRANSISTOR | 1 | 2N3251 | 80131 |
| Q3 | TRANSISTOR | 1 | 2N2270 | 80131 |
| Q4 | TRANSISTOR | 1 | 2N4037 | 80131 |
| R1 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 2 | CB4715 | 01121 |
| R2 | RESISTOR, FIXED, FILM: 274 kΩ, 1%, 1/4W | 1 | RN60D2743F | 81349 |
| R3 | RESISTOR, FIXED, FILM: 24.3 kΩ, 1%, 1/4W | 1 | RN60D2432F | 81349 |
| R4 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 1 | CB2225 | 01121 |
| R5 | RESISTOR, FIXED, FILM: 681 Ω, 1%, 1/4W | 1 | RN60D6810F | 81349 |
| R6 | RESISTOR, FIXED, COMPOSITION: 2.7 Ω, 5%, 1/4W | 1 | CB27G5 | 01121 |
| R7 | RESISTOR, FIXED, FILM: 10 kΩ, 1%, 1/4W | 1 | RN60D1002F | 81349 |
| R8 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 1 | CB1015 | 01121 |
| R9 | RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W | 2 | CB1025 | 01121 |
| R10 | Same as R9 | | | |
| R11 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 2 | CB4705 | 01121 |
| R12 | Same as R11 | | | |
| R13 | Same as R1 | | | |
| T1 | TRANSFORMER | 1 | 13116 | 14632 |

Figure 5-32

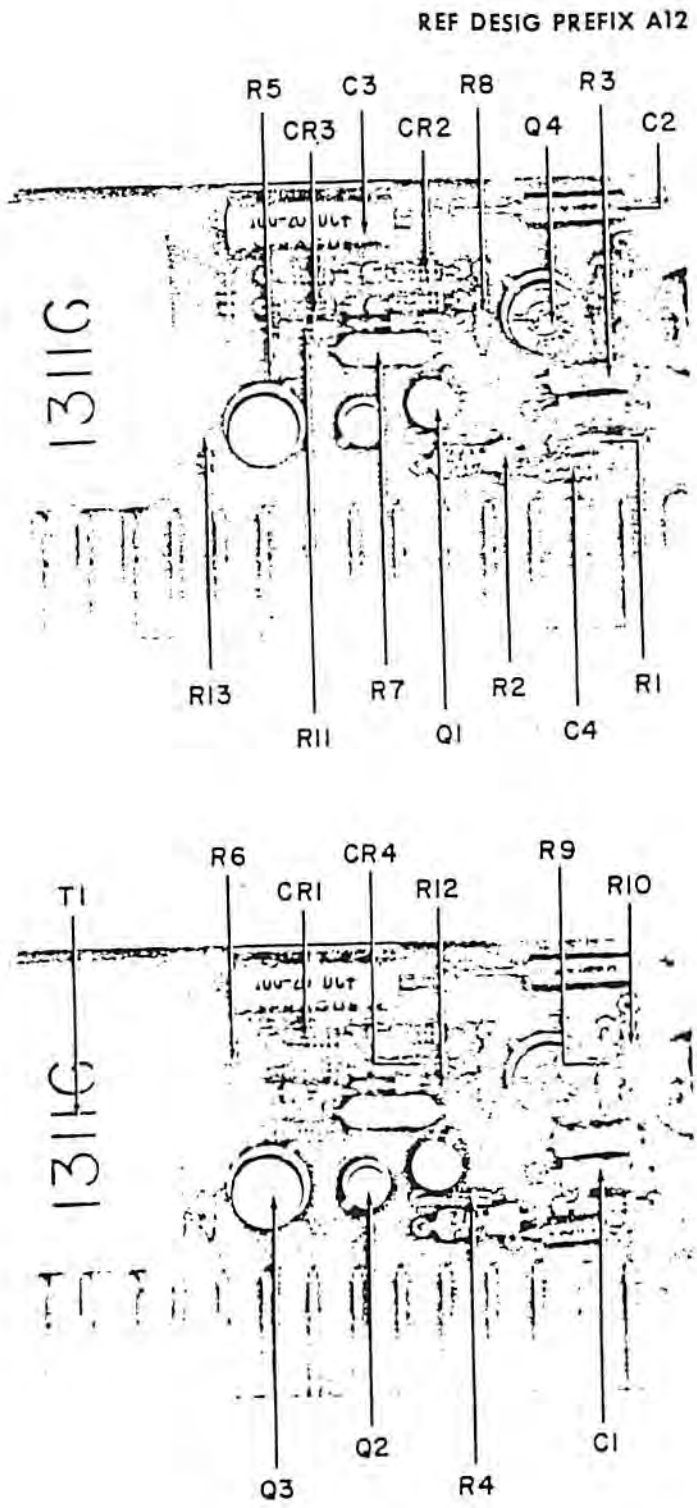



Figure 5-32. Type 7433 Audio Amplifier, Component Locations

5.4.14 Type 79354 AGC Amplifier REF DESIG PREFIX A13

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, ELECTROLYTIC, TANTALUM: 15μF, 10% 20V | 1 | 150D156X9020B2 | 56289 |
| C2 | CAPACITOR, ELECTROLYTIC, TANTALUM: 3.3μF, 10% 35V | 1 | 150D335X9035B2 | 56289 |
| CR1 | DIODE | 5 | 1N462A | 80131 |
| CR2 | DIODE | 1 | 1N759A | 80131 |
| CR3 | Same as CR1 | | | |
| CR4 | Same as CR1 | | | |
| CR5 | Same as CR1 | | | |
| CR6 | Same as CR1 | | | |
| Q1 | TRANSISTOR | 6 | 2N4074 | 80131 |
| Q2 | Same as Q1 | | | |
| Q3 | TRANSISTOR | 4 | 2N3251 | 80131 |
| Q4 | Same as Q1 | | | |
| Q5 | Same as Q1 | | | |
| Q6 | Same as Q3 | | | |
| Q7 | Same as Q1 | | | |
| Q8 | Same as Q3 | | | |
| Q9 | Same as Q3 | | | |
| Q10 | Same as Q1 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 43 kΩ, 5%, 1/4W | 1 | CB4335 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 62 kΩ, 5%, 1/4W | 1 | CB6235 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W | 3 | CB1045 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 470 kΩ, 5%, 1/4W | 1 | CB4745 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | 2 | CB4735 | 01121 |
| R6 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 2 | CB2225 | 01121 |
| R7 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 1 | CB4725 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 39 kΩ, 5%, 1/4W | 1 | CB3935 | 01121 |
| R9 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 3 | CB1035 | 01121 |
| R10 | RESISTOR, FIXED, COMPOSITION: 110 kΩ, 5%, 1/4W | 1 | CB1145 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | 5 | CB2235 | 01121 |
| R12 | Same as R11 | | | |
| R13 | Same as R3 | | | |
| R14 | RESISTOR, FIXED, COMPOSITION: 5.1 kΩ, 5%, 1/4W | 1 | CB5125 | 01121 |
| R15 | Same as R11 | | | |

REF DESIG PREFIX A13

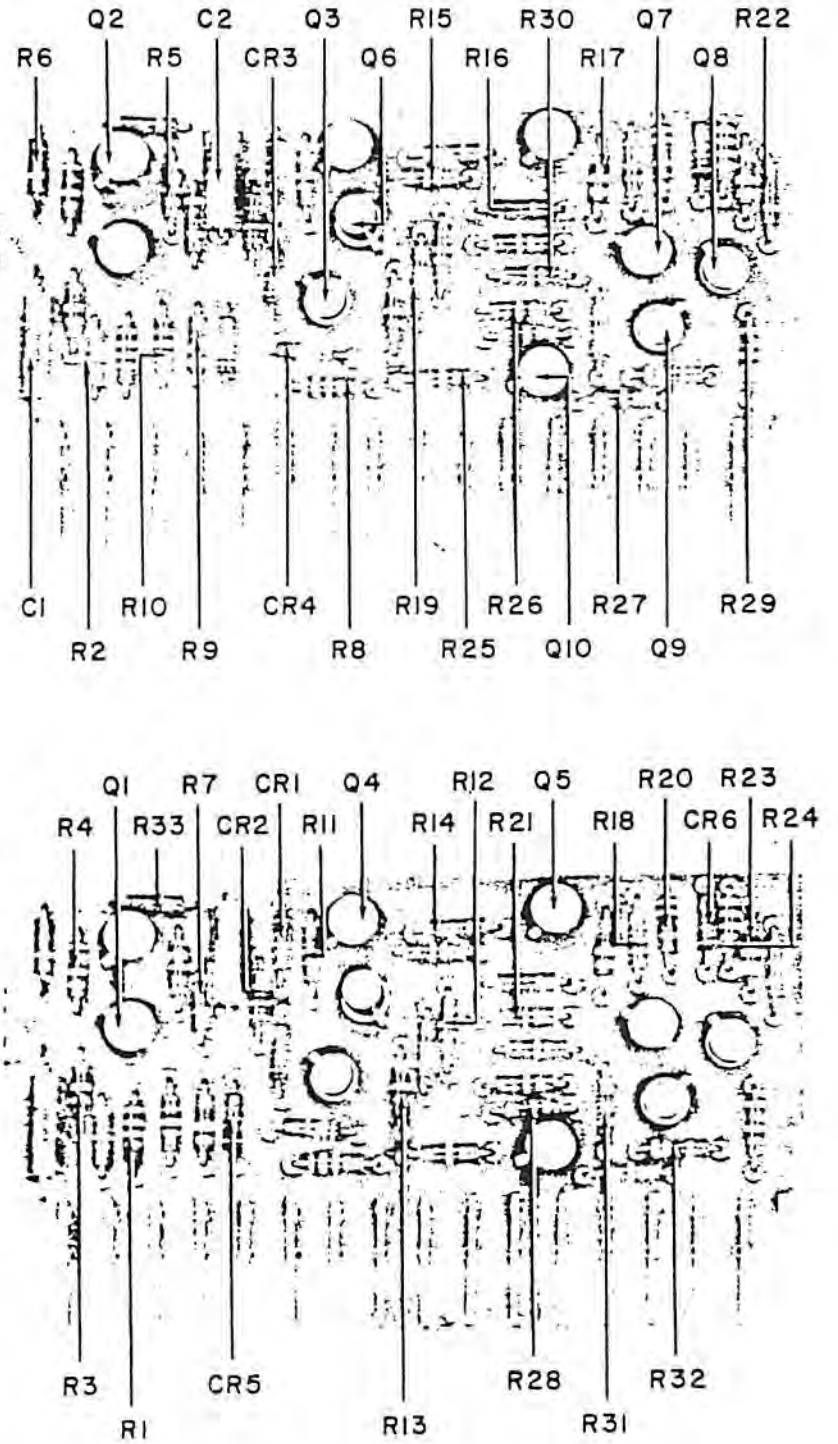



Figure 5-33. Type 79354 AGC Amplifier, Component Locations

REPLACEMENT PARTS LIST

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R16 | RESISTOR, FIXED, COMPOSITION: 2.7 kΩ, 5%, 1/4W | 1 | CB2725 | 01121 |
| R17 | Same as R9 | | | |
| R18 | RESISTOR, FIXED, COMPOSITION: 750 Ω, 5%, 1/4W | 1 | CB7515 | 01121 |
| R19 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 2 | CB1015 | 01121 |
| R20 | RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W | 1 | CB3925 | 01121 |
| R21 | Same as R11 | | | |
| R22 | RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W | 1 | CB1525 | 01121 |
| R23 | Same as R9 | | | |
| R24 | RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W | 1 | CB3335 | 01121 |
| R25 | RESISTOR, FIXED, COMPOSITION: 12 kΩ, 5%, 1/4W | 2 | CB1235 | 01121 |
| R26 | RESISTOR, FIXED, COMPOSITION: 180 kΩ, 5%, 1/4W | 1 | CB1845 | 01121 |
| R27 | Same as R25 | | | |
| R28 | Same as R3 | | | |
| R29 | Same as R5 | | | |
| R30 | Same as R11 | | | |
| R31 | Same as R19 | | | |
| R32 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 1 | CB4705 | 01121 |
| R33 | Same as R6 | | | |

5.4.15 Type 76123 +18V Regulated Power Supply (0-250MA) REF DESIG PREFIX A14

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 200μF, -10, +75%, 50V | 1 | 39D207G050FJ4 | 56289 |
| C2 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 10μF, -10, +75%, 50V | 1 | 30D106G050CB2 | 56289 |
| C3 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 10μF, -10, +75%, 25V | 1 | 30D106G025BB2 | 56289 |
| C4 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 15 μF, 10%, 20V | 1 | CS13BE150K | 81349 |
| CR1 | DIODE | 1 | MDA940A-3 | 04713 |
| CR2 | DIODE | 1 | 1N754A | 80131 |
| CR3 | DIODE | 1 | 1N462A | 80131 |
| Q1 | TRANSISTOR | 1 | 2N3055 | 80131 |
| Q2 | TRANSISTOR | 3 | 2N4074 | 80131 |
| Q3 | Same as Q2 | | | |
| Q4 | Same as Q2 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 47Ω, 5%, 1/4W | 1 | CB4705 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 6.8 kΩ, 5%, 1/4W | 2 | CB6825 | 01121 |
| R3 | Same as R2 | | | |
| R4 | RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W | 1 | CB2245 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 1kΩ, 5%, 1/4W | 1 | CB1025 | 01121 |
| R6 | RESISTOR, FIXED, COMPOSITION: 5.6 kΩ, 5%, 1/4W | 1 | CB5625 | 01121 |
| R7 | RESISTOR, VARIABLE, FILM: 1 kΩ, 30%, 1/2W | 1 | 62PAR1K | 73138 |
| R8 | RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W | 1 | CB3925 | 01121 |
| R9 | RESISTOR, FIXED, COMPOSITION: 1.8 kΩ, 5%, 1/4W | 1 | CB1825 | 01121 |
| R10 | RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W | 1 | CB2215 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 1 | CB4725 | 01121 |

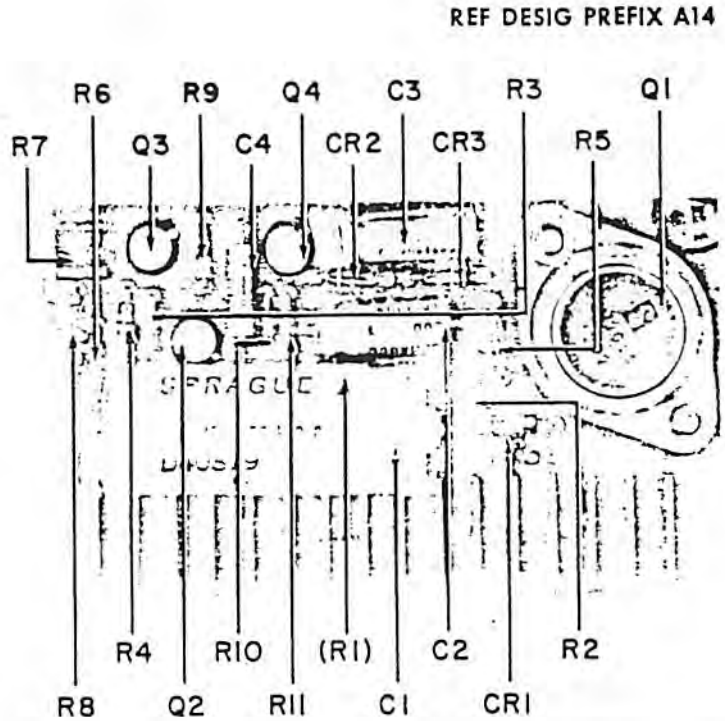



Figure 5-34. Type 76123 +18V Regulated Power Supply, Component Locations

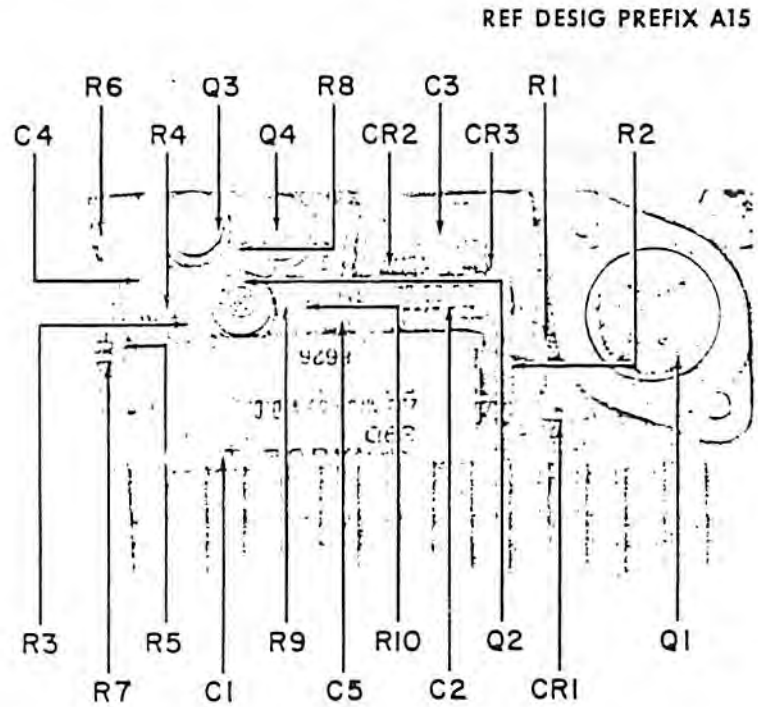



Figure 5-35. Type 76118 +12V Regulated Power Supply, Component Locations

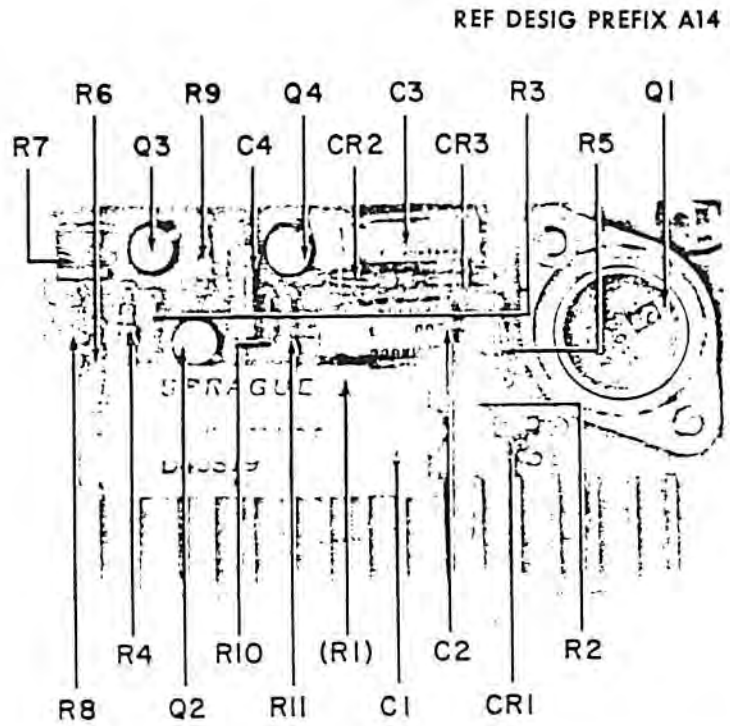



Figure 5-34. Type 76123 +15V Regulated Power Supply, Component Locations

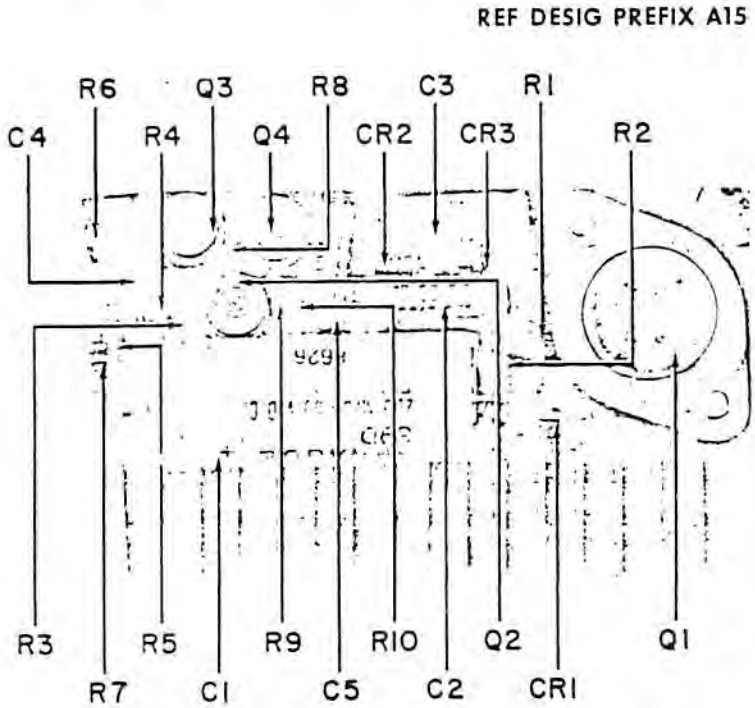



Figure 5-35. Type 76118 -12V Regulated Power Supply, Component Locations

5.4.16 Type 76118 -12V Regulated Power Supply REF DESIG PREFIX A15

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 200 μF, -10, +75%, 50V | 1 | 39D207G050FJ4 | 56289 |
| C2 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 10 μF, -10, +75%, 50V | 1 | 30D106G050CB2 | 56289 |
| C3 | CAPACITOR, ELECTROLYTIC, ALUMINUM: 10 μF, -10, +75%, 25V | 1 | 30D106G025BB2 | 56289 |
| C4 | CAPACITOR, DIPPED MICA: 200 pF, 5%, 500V | 1 | CM05F201J03 | 81349 |
| C5 | CAPACITOR, ELECTROLYTIC, TANTALUM: 47 μF, 10%, 20V | 1 | 150D476X9020R2 | 56289 |
| CR1 | DIODE | 1 | MDA950A-3 | 04713 |
| CR2 | DIODE | 1 | 1N754A | 80131 |
| CR3 | DIODE | 1 | 1N462A | 80131 |
| Q1 | TRANSISTOR | 1 | 2N3055 | 80131 |
| Q2 | TRANSISTOR | 3 | 2N4037 | 80131 |
| Q3 | Same as Q2 | | | |
| Q4 | Same as Q2 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 1 | CB4715 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 6.8 kΩ, 5%, 1/4W | 2 | CB6825 | 01121 |
| R3 | Same as R2 | | | |
| R4 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 1 | CB1545 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 2 | CB2225 | 01121 |
| R6 | RESISTOR, VARIABLE, FILM: 1 kΩ, 30%, 1/2W | 1 | 62PAR1K | 73138 |
| R7 | RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W | 1 | CB3925 | 01121 |
| R8 | Same as R5 | | | |
| R9 | RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W | 1 | CB2215 | 01121 |
| R10 | Same as R5 | | | |

# SECTION VI

# SCHEMATIC DIAGRAMS

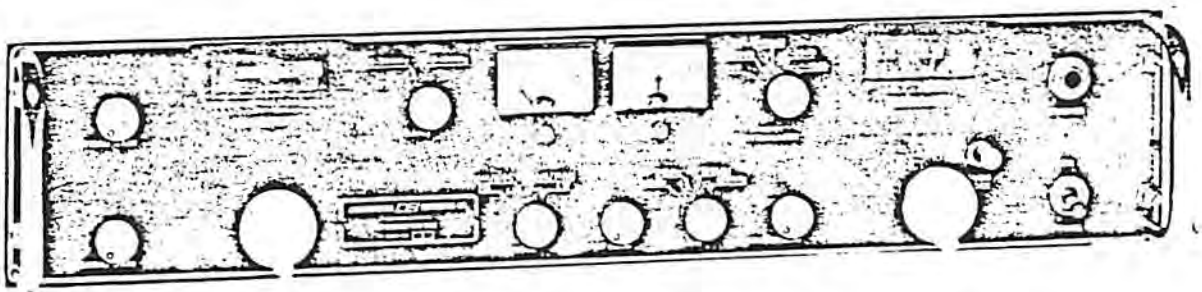
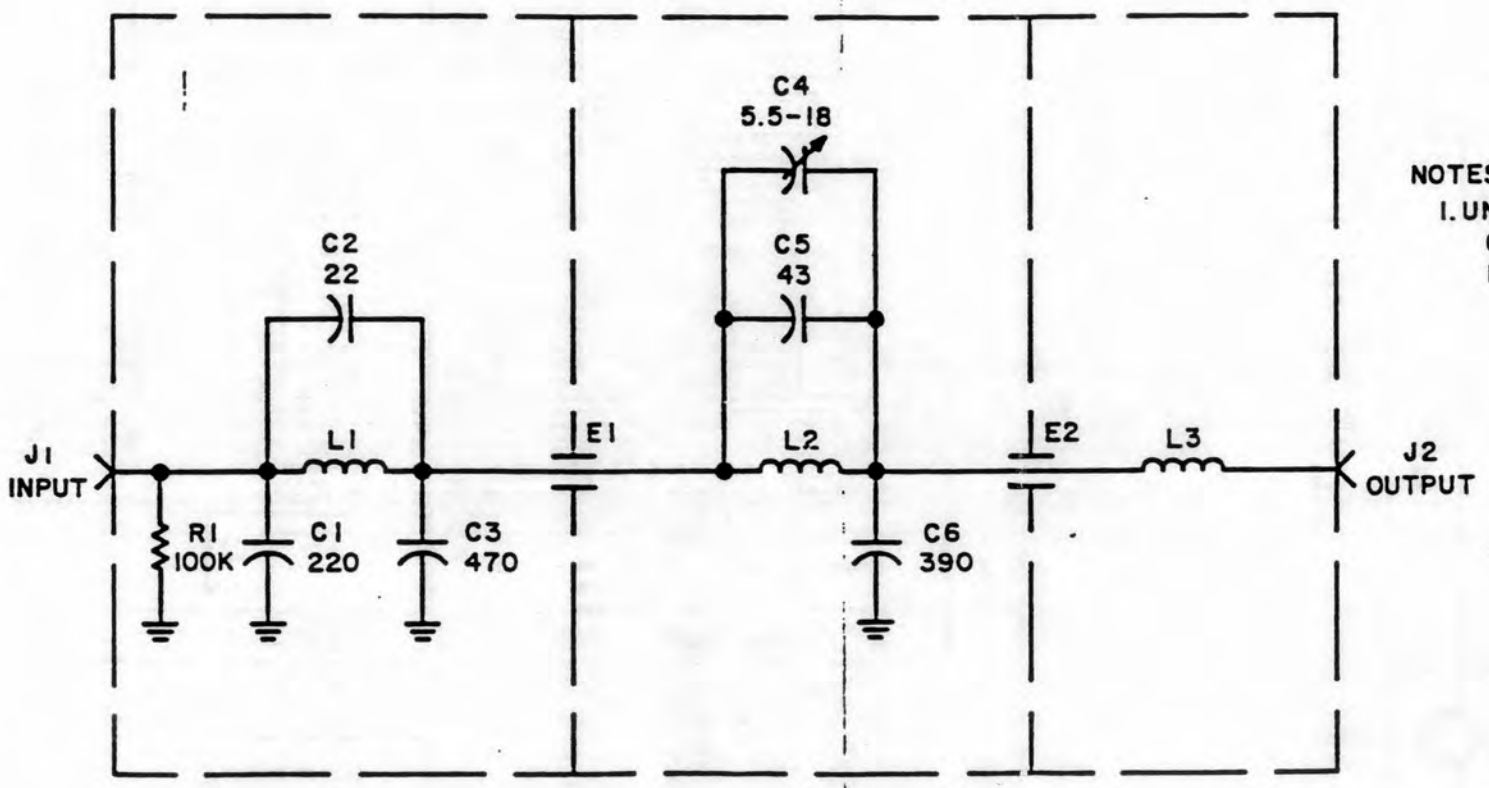


Figure 7-1. Type 373A Receiver, Front View

REF DESIG PREFIX A2




NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   CAPACITANCE IS MEASURED IN pF.
   RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4 W.

Figure 6-2. Type 79339 Input Filter, Schematic Diagram

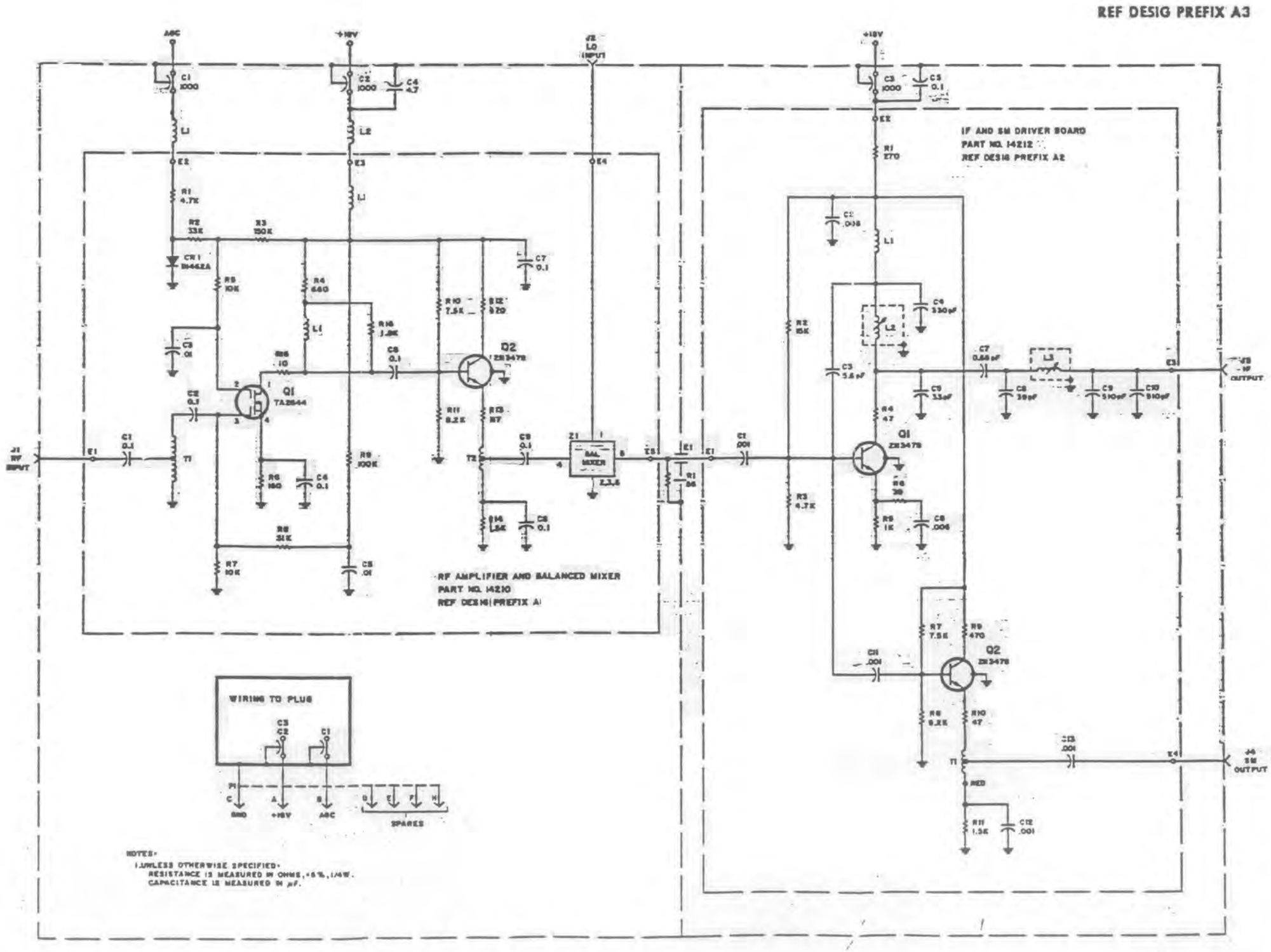



Figure 6-3. Type 71218 RF Assembly, Schematic Diagram

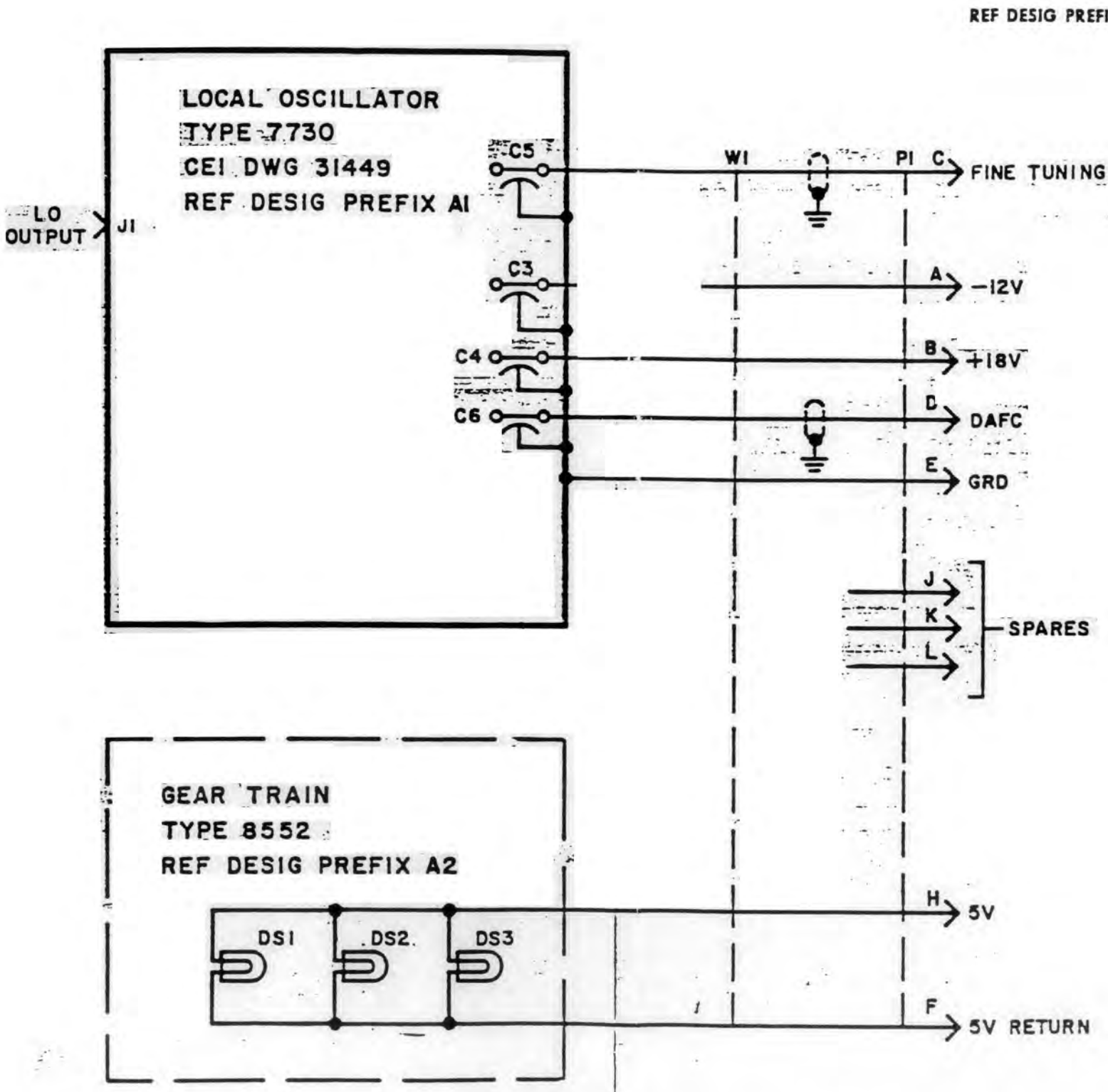
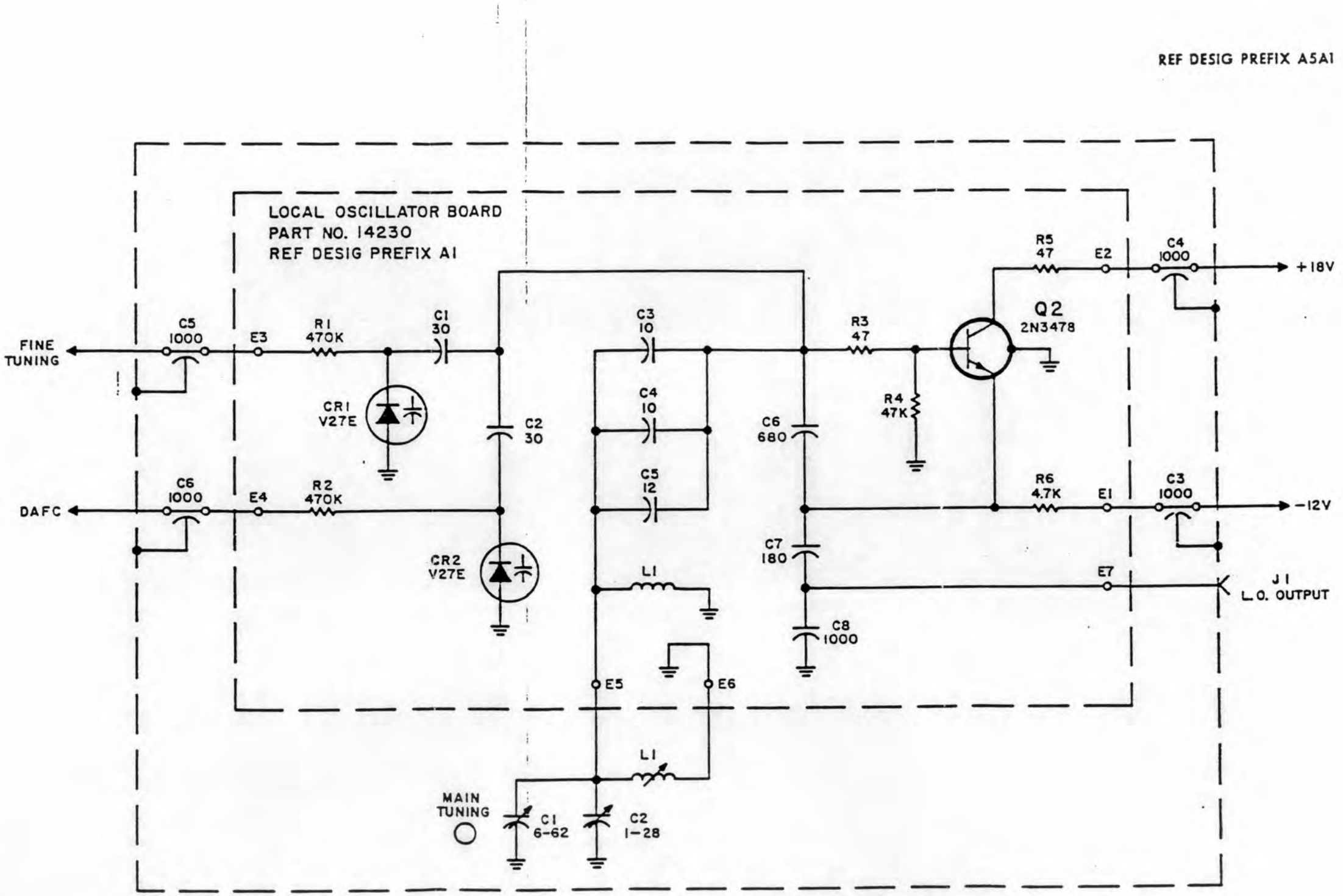



Figure 6-4. Type 71217 Tuning Assembly, Schematic Diagram

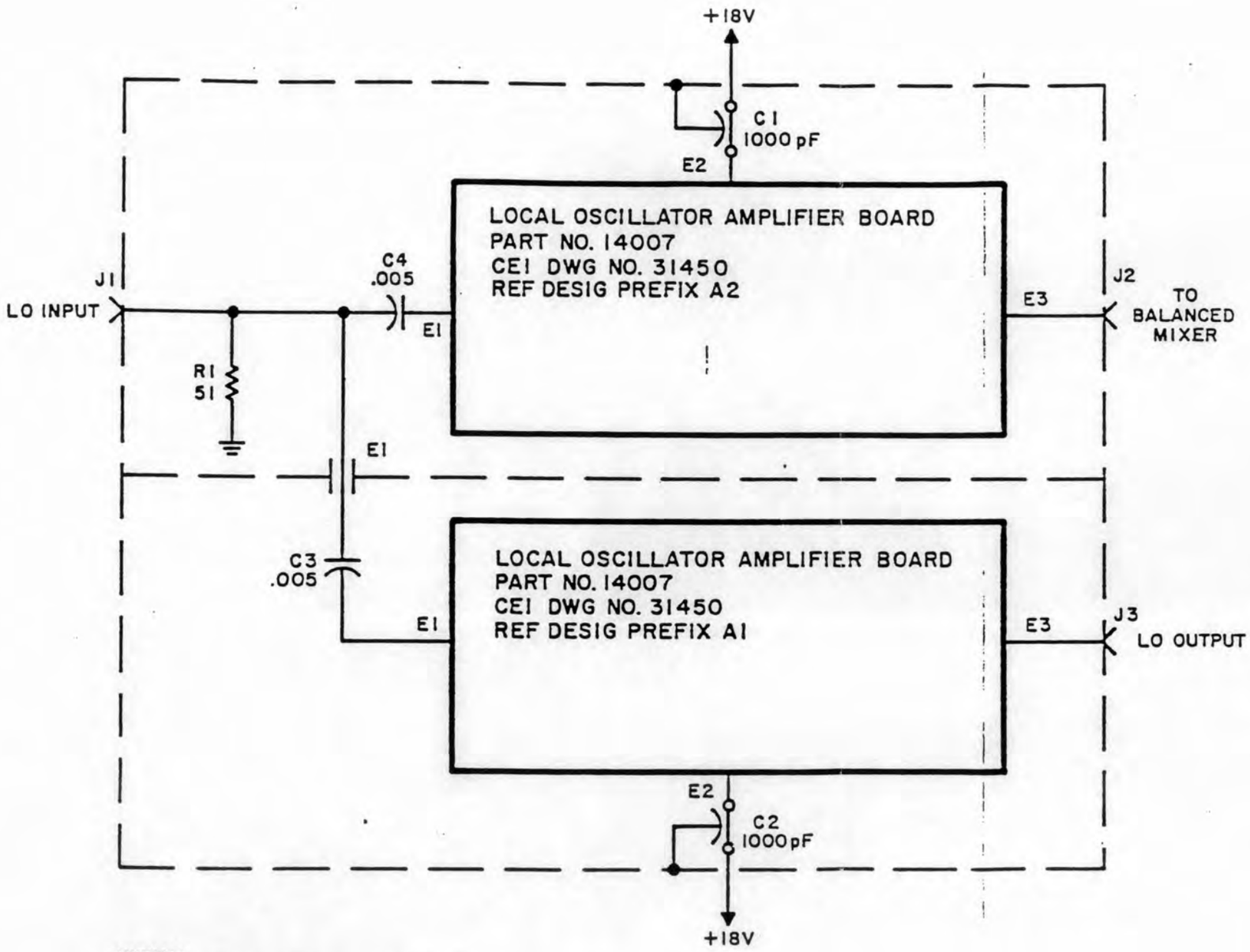


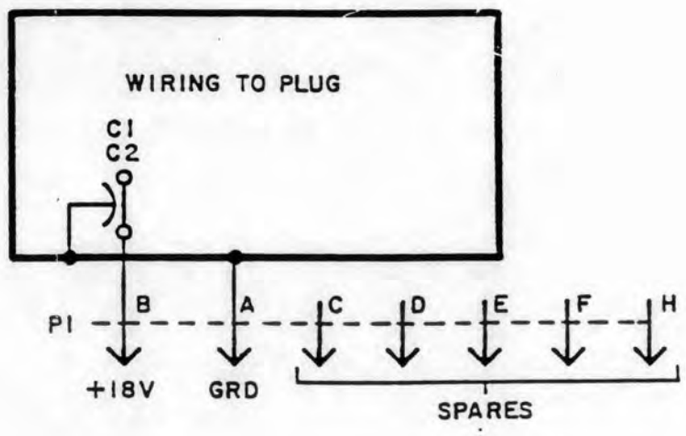

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a.) RESISTANCE IS MEASURED IN OHMS, 5%, 1/4W.
   b.) CAPACITANCE IS MEASURED pF.
2. DIFFERENCE BETWEEN TYPES IS MECHANICAL ONLY
3. ◯ INDICATES FRONT PANEL CONTROL.

Figure 6-5. Type 7730 Local Oscillator, Schematic Diagram

REF DESIG PREFIX A4



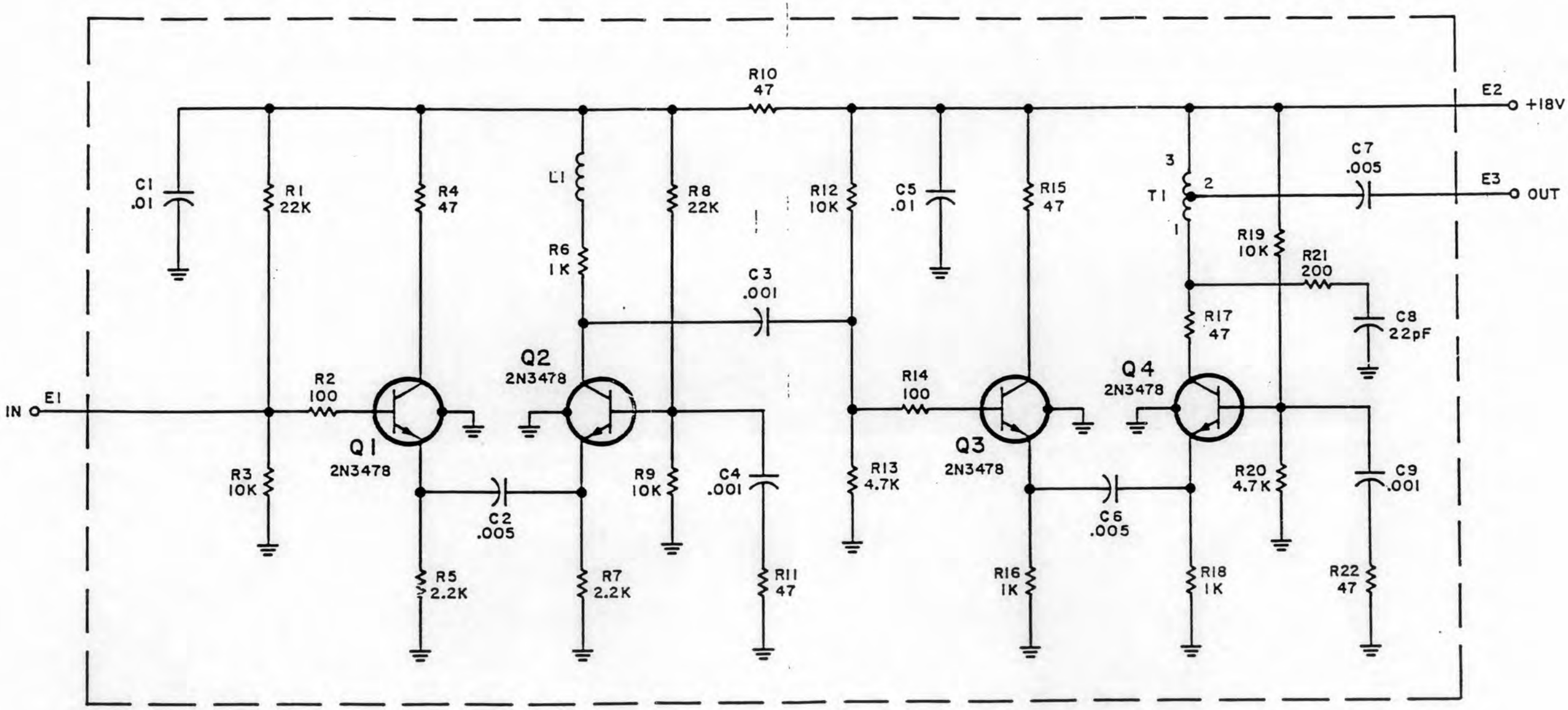




NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a. RESISTANCE IS MEASURED IN OHMS, 1/4W, ± 5%.
   b. CAPACITANCE IS MEASURED IN μF.

Figure 6-6. Type 79340 Local Oscillator Amplifier, Schematic Diagram

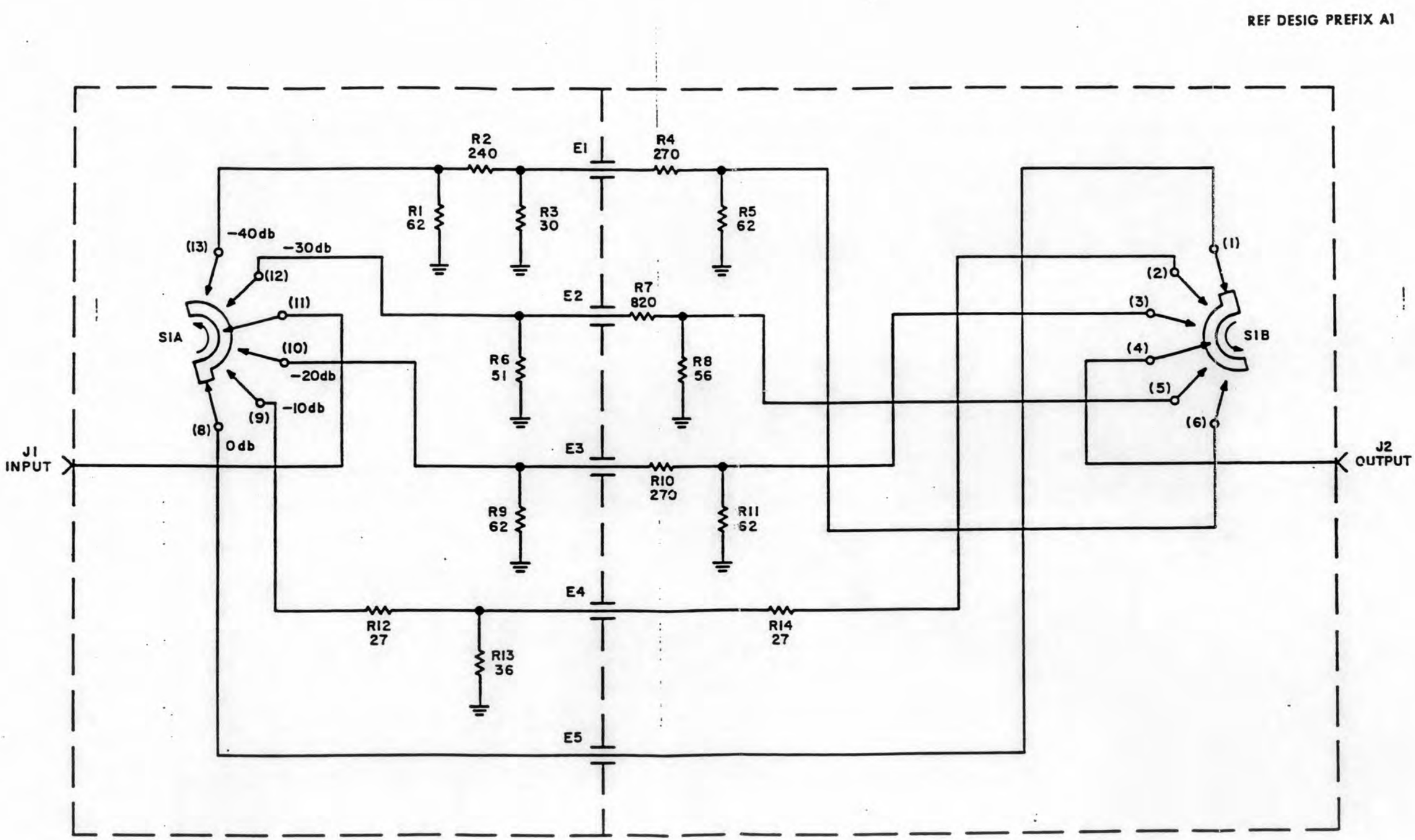
REF DESIG PREFIXES A4A1 AND A4A2




NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a.) RESISTANCE IS MEASURED IN OHMS, 1/4W, ±5%,
   b.) CAPACITANCE IS MEASURED IN µF.

Figure 6-7. Part 14007 Local Oscillator Amplifier Board, Schematic Diagram




NOTES:

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

Figure 6-1. Type 79260 Input Attenuator, Schematic Diagram

REF DESIG PREFIX A6

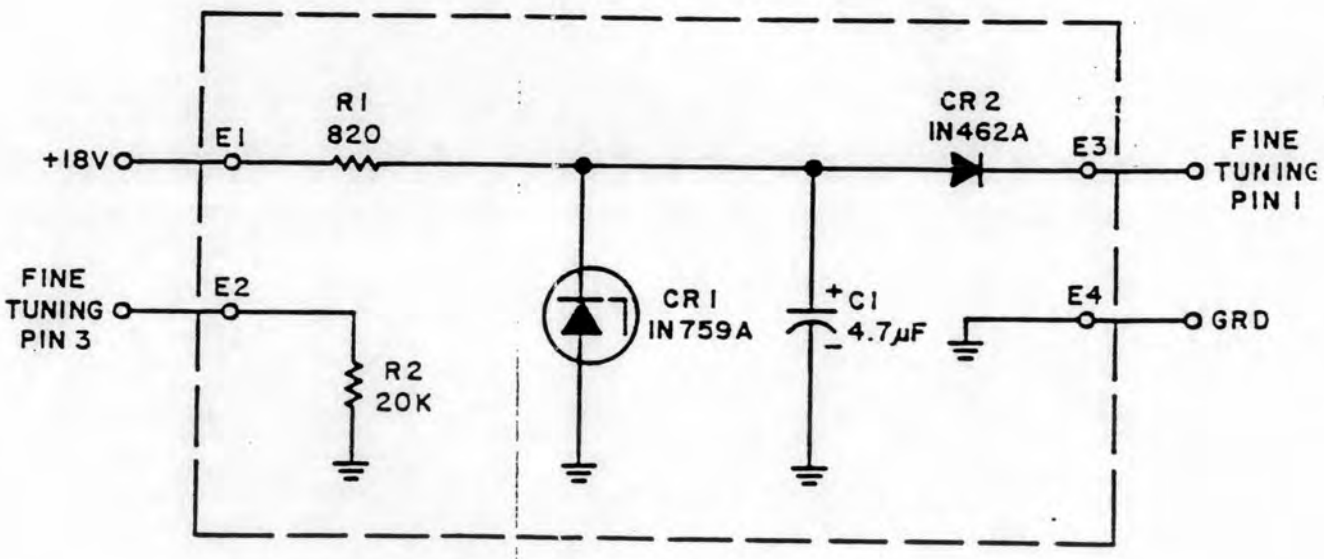



Figure 6-8. Type 79338 Fine Tuning Regulator, Schematic Diagram

REF DESIG PREFIX A7

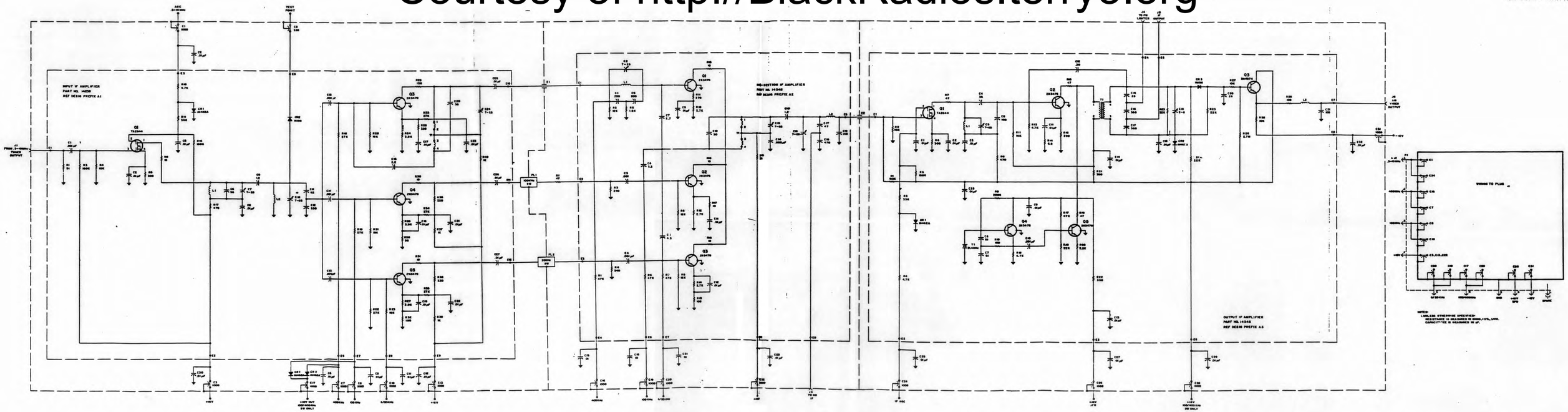
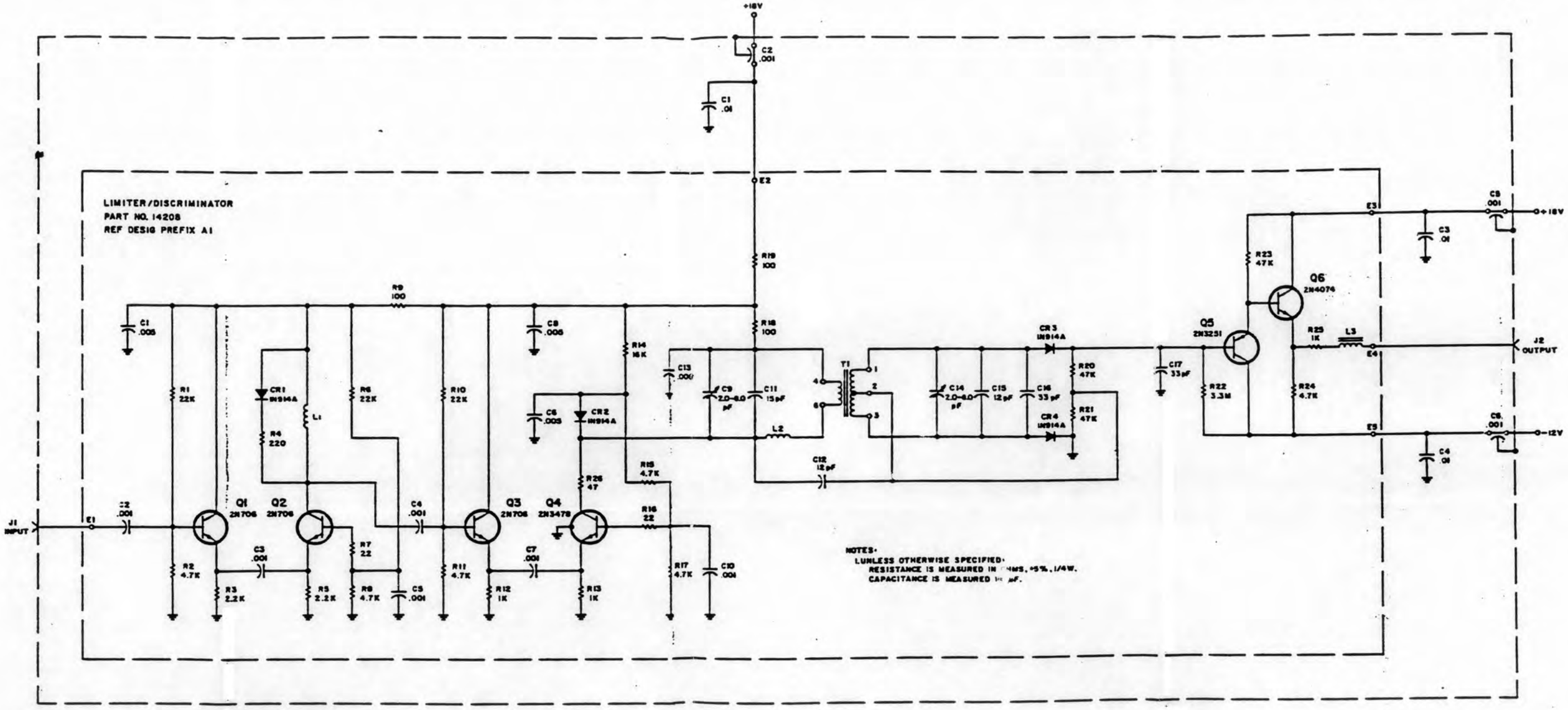



Figure 6-9. Type 72201 21.4-MHz IF Amplifier Schematic Diagram

REF DESIG PREFIX A8

LIMITER/DISCRIMINATOR
PART NO. 14208
REF DESIG PREFIX A1




NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   CAPACITANCE IS MEASURED IN µF.

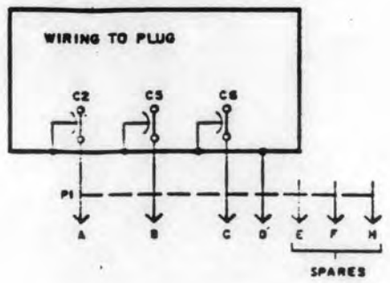



Figure 6-10. Type 79335 21.4-MHz Limiter/Discriminator, Schematic Diagram

REF DESIG PREFIX A9

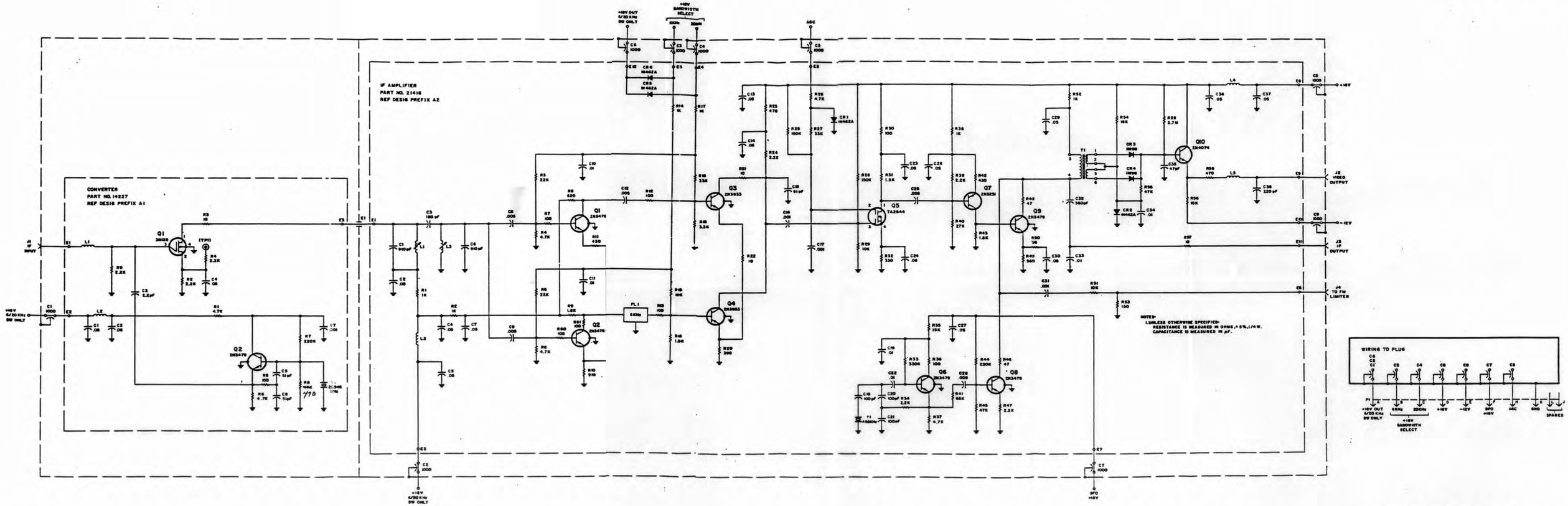
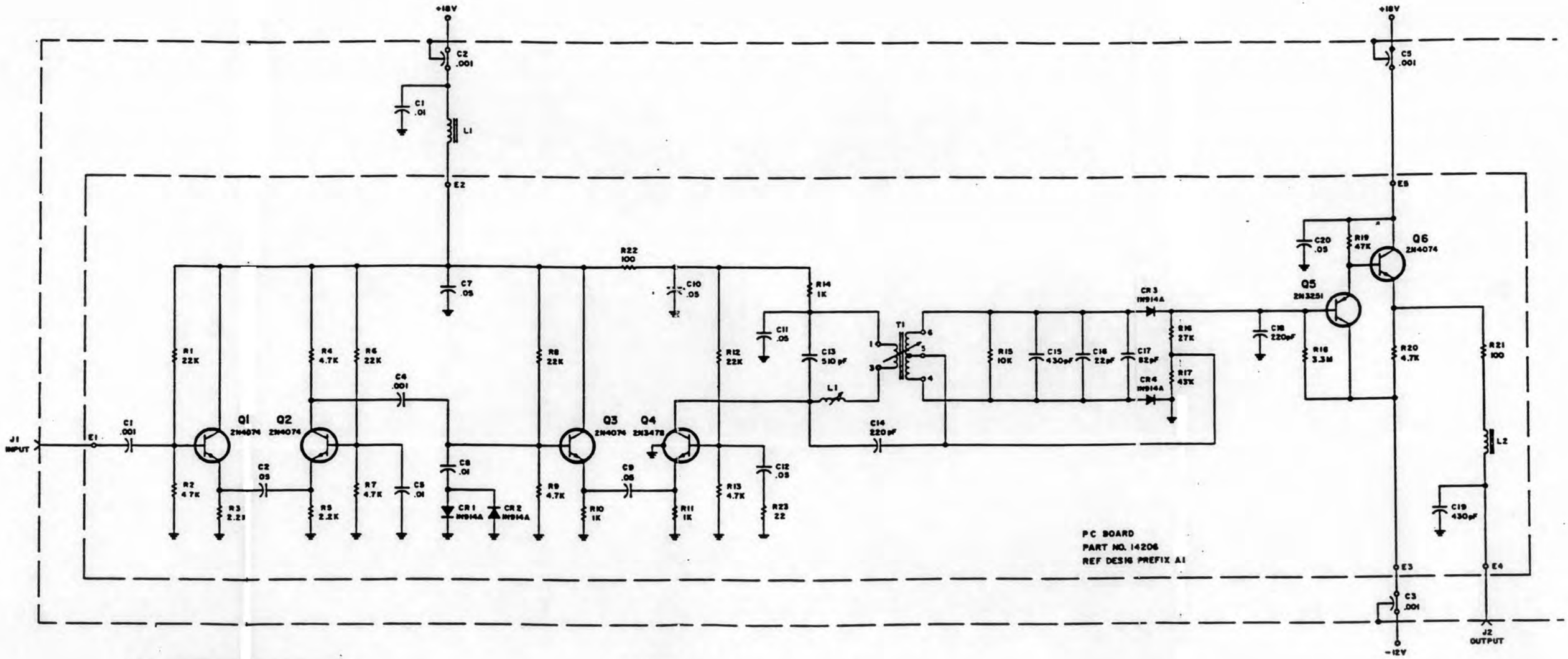
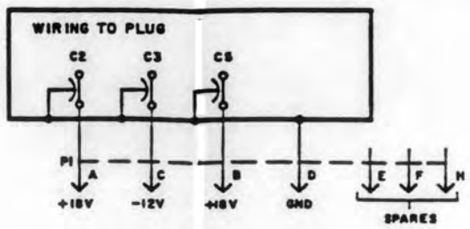



Figure 6-11. Type 72197 455-kHz IF Amplifier, Schematic Diagram

REF DESIG PREFIX A10

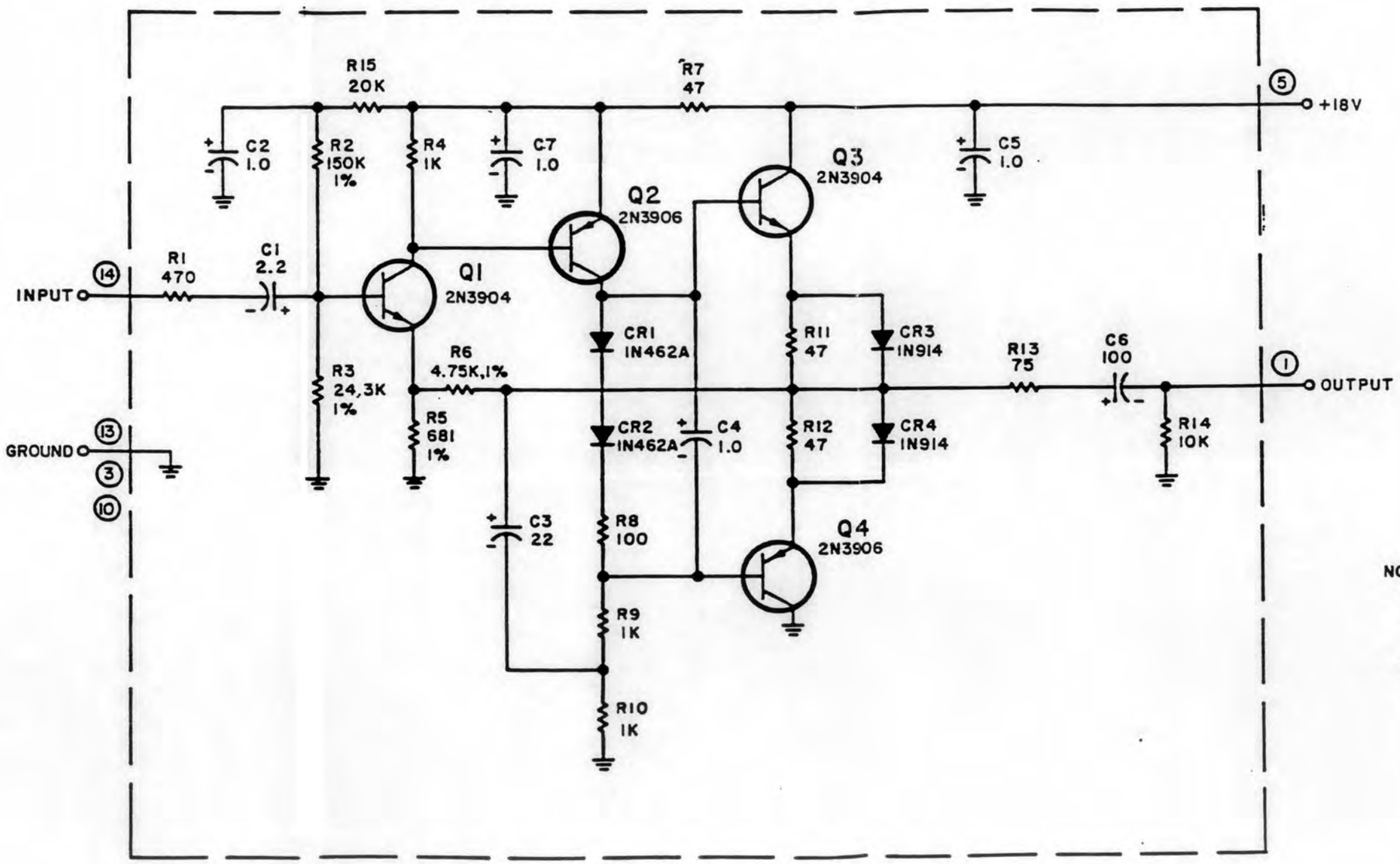



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   CAPACITANCE IS MEASURED IN μF.

Figure 6-12. Type 79337 455-kHz Limiter/Discriminator, Schematic Diagram

REF DESIG PREFIX A11

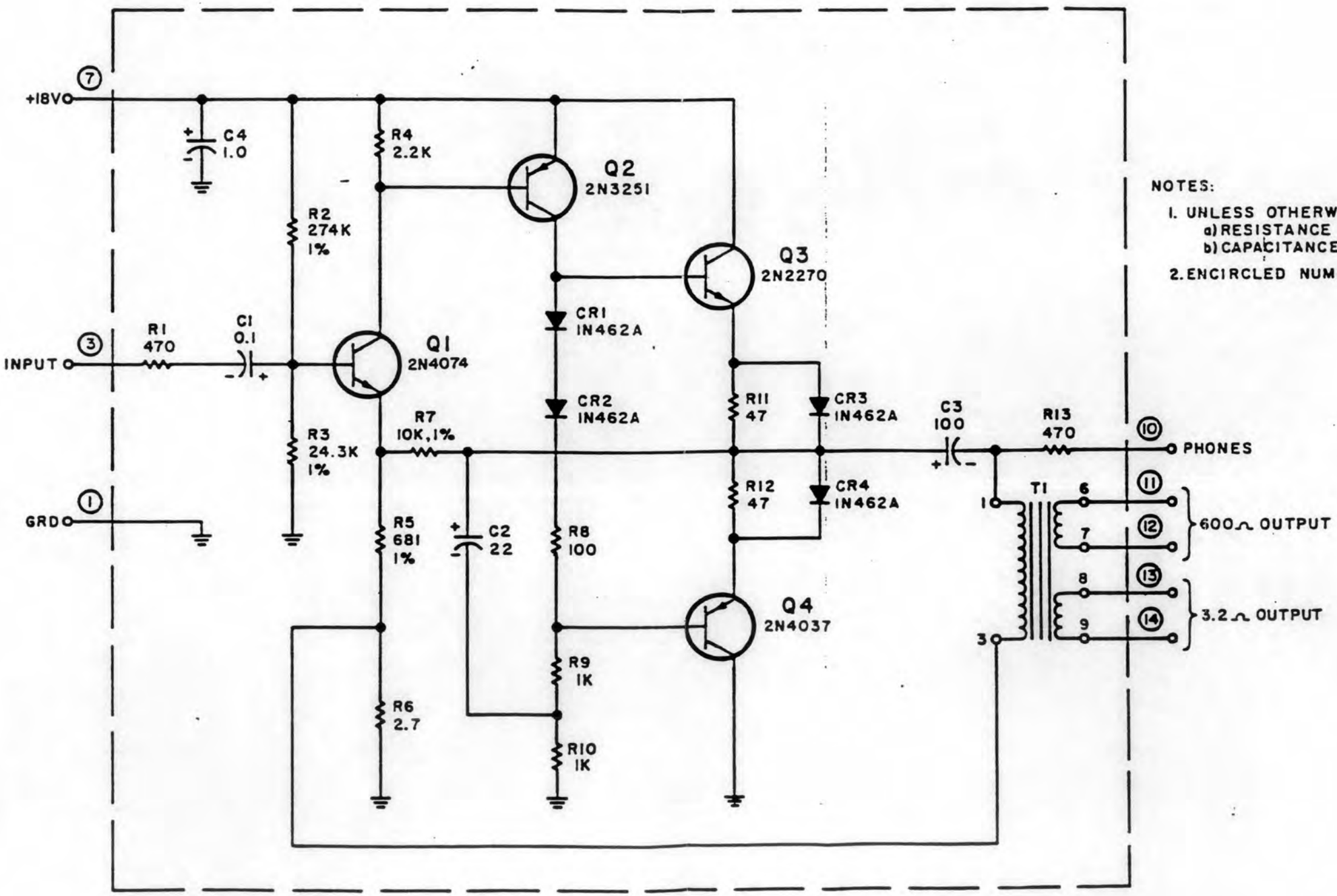



NOTES:

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

Figure 6-13. Type 7352 Video Amplifier, Schematic Diagram

REF DESIG PREFIX A12




NOTES:

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

Figure 6-14. Type 7433 Audio Amplifier, Schematic Diagram

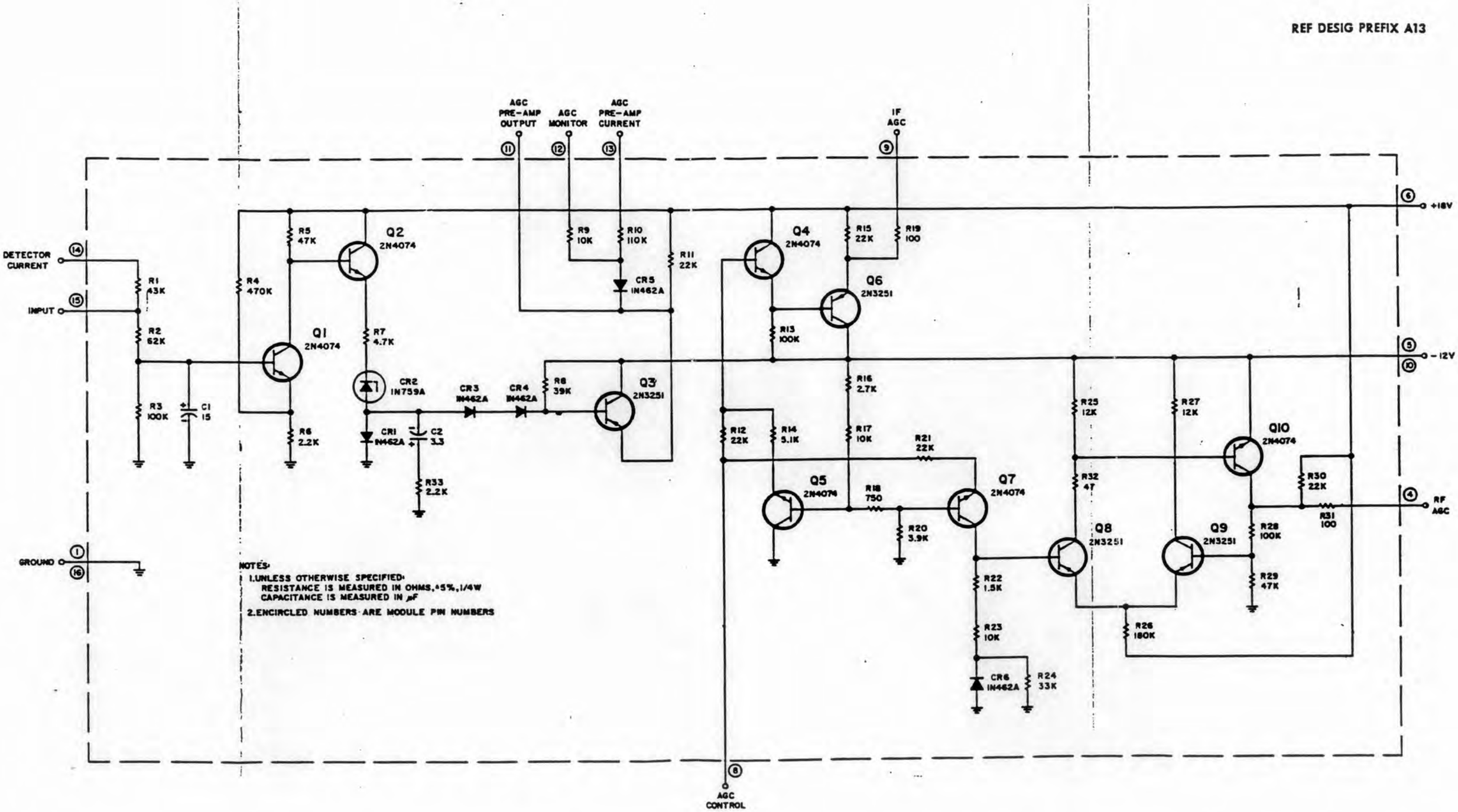
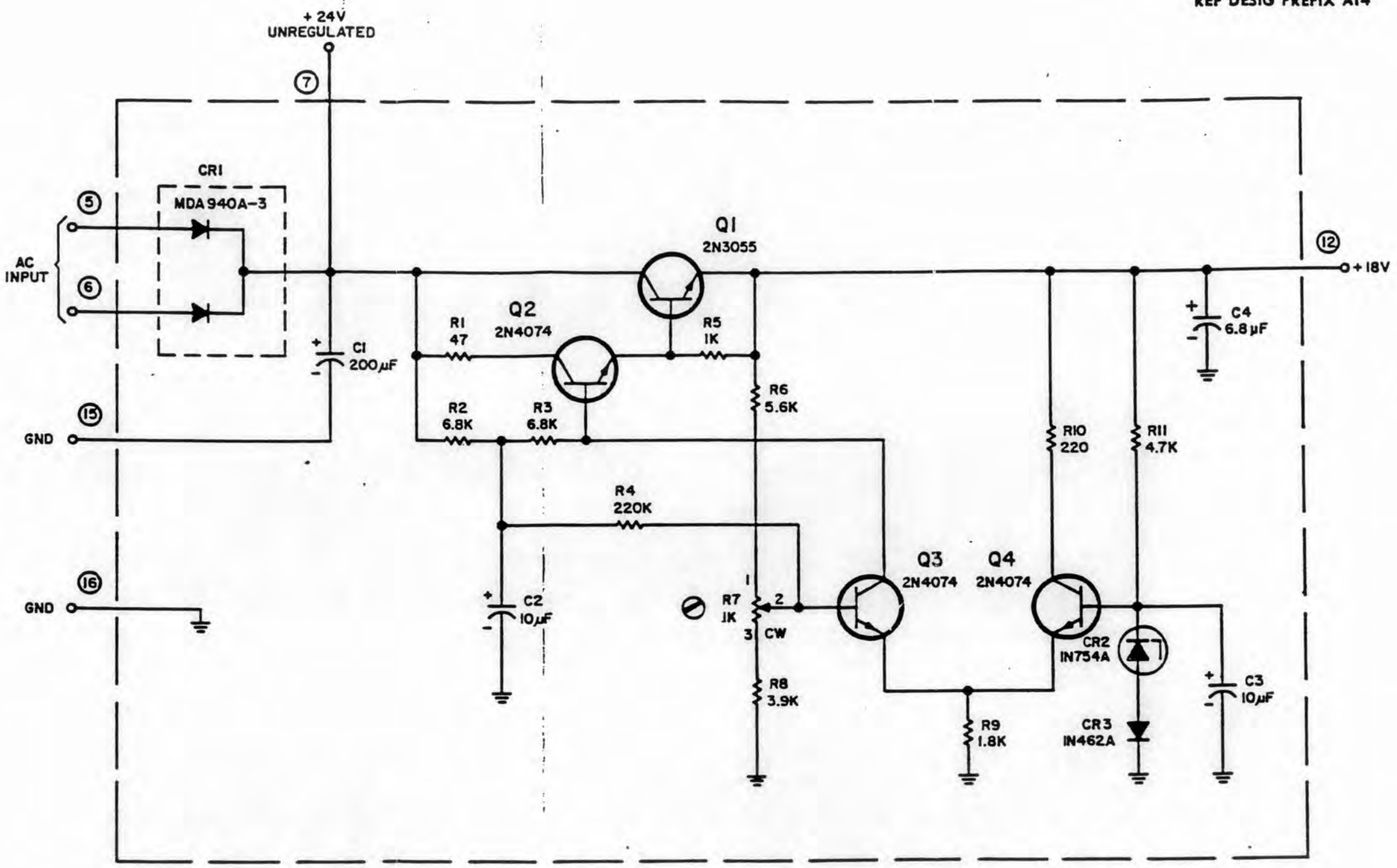



Figure 6-15. Type 79354 AGC Amplifier, Schematic Diagram

Figure 6-16

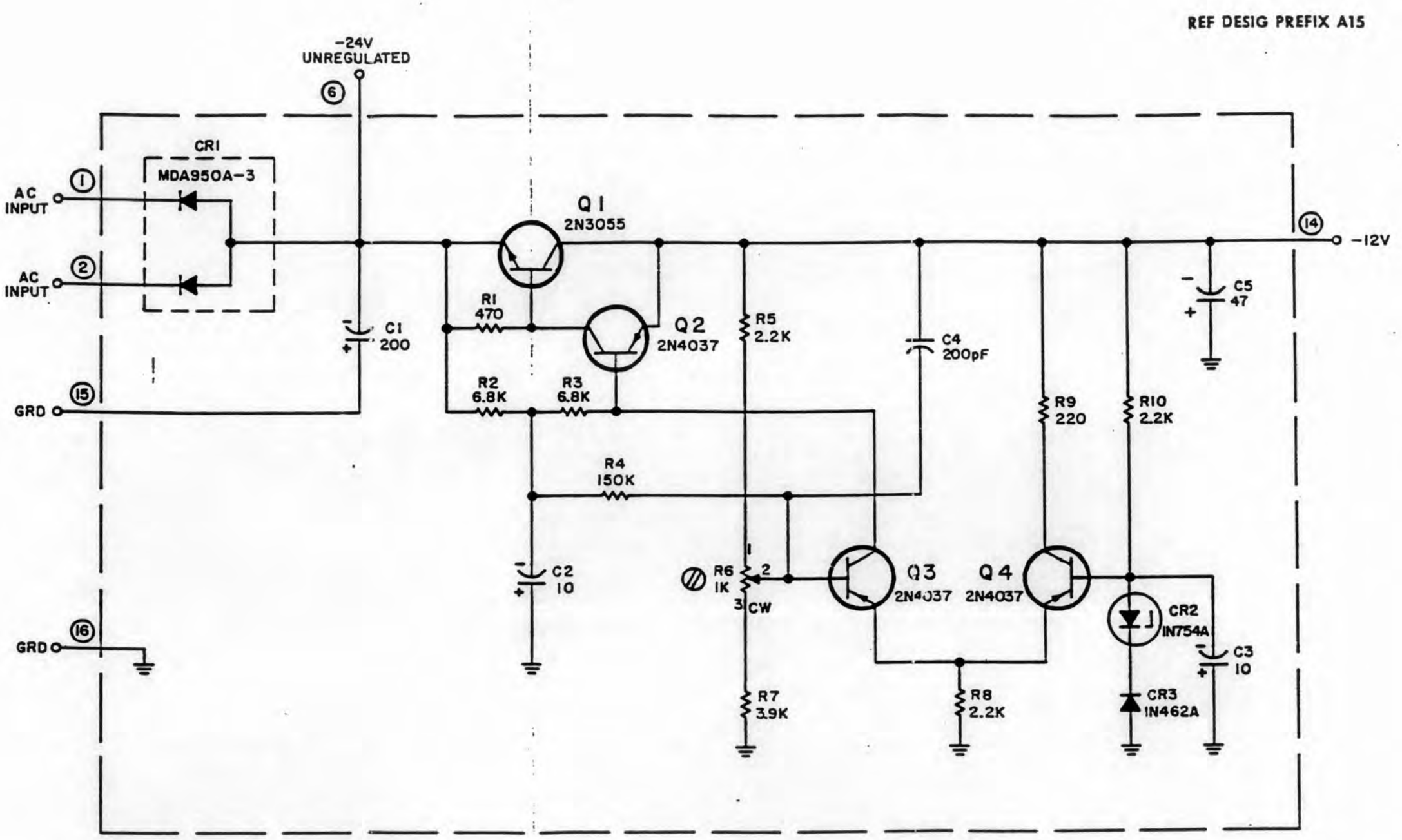
REF DESIG PREFIX A14




NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE IS MEASURED OHMS, ±5%, 1/4 W
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS
3. THE FOLLOWING NOTATIONS ARE USED ON POTENTIOMETERS:
   CW INDICATES CLOCKWISE ROTATION
   ⊘ INDICATES SCREWDRIVER ADJUSTMENT

Figure 6-16. Type 76123 +18V Regulated Power Supply, Schematic Diagram




NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   B. CAPACITANCE IS MEASURED IN μF.
2. THE FOLLOWING NOTATIONS ARE USED ON POTENTIOMETERS:
   CW INDICATES CLOCKWISE ROTATION
   ⊘ INDICATES SCREWDRIVER ADJUSTMENT.
3. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.

Figure 6-17. Type 76118 -12V Regulated Power Supply, Schematic Diagram

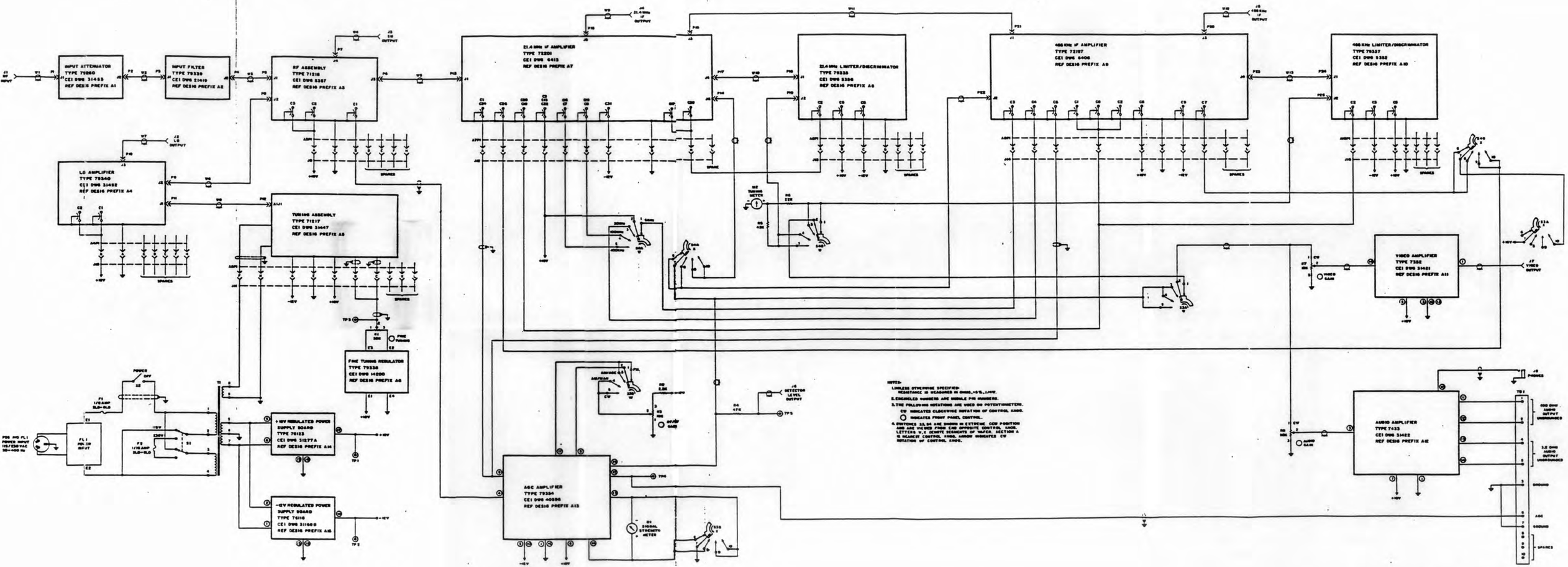



Figure 6-18. Type 371A Receiver, Main Chassis Schematic Diagram

# SECTION VII

# SUPPLEMENT FOR TYPE 373A RECEIVER

## 7.1 ELECTRICAL CHARACTERISTICS

The CEI Type 373A Receiver is quite similar to the type 371A receiver described in the preceeding six sections of this manual. Differences between the two units include an additional RF tuner in the 373A which extends its tuning range from 10 MHz to 30 MHz. In addition, a 60 to 21.4-MHz converter is included to translate the output of the high-band tuner down to the first IF frequency. A type 72198 21.4-MHz IF amplifier is employed in the 373A in lieu of the type 72201 IF strip used in the 371A. Typical transistor pin voltages for the subassemblies described in this section are given in Table 7-1. The local oscillator outputs from the 373A RF tuners are fed to an LO coupling assembly before they are applied to the rear-apron output connector. Pertinent specifications for the 373A have been included in Table 1-1 in the front of this manual.

## 7.2 MECHANICAL CHARACTERISTICS

7.2.1 A front view of the 373A is shown in Figure 7-1. The front panel of the 373A contains all the controls and indicators found on the 371A front panel, with the addition of the 10-30-MHz tape dial and tuning knob and the BAND switch. The input attenuator, A1, has been modified to accept two separate inputs and supply two separate outputs, one to each RF tuning assembly.

7.2.2 The rear apron of the 373A is shown in Figure 7-9. Mounted on the rear apron, in addition to the connectors listed in paragraph 1.2, is the 10-30-MHz RF INPUT jack, J2. The LO OUTPUT jack for the 373A is labeled A18J2. Top and bottom views of the 373A are shown in Figures 7-10 and 7-11 respectively. Overall dimensions of the 373A receiver are: 3.5 inches high, 19 inches wide, and 18 inches deep. The unit weighs approximately 25 pounds.

## 7.3 TYPE 79366 INPUT ATTENUATOR

Figure 7-27 is the schematic diagram for the input attenuator; its reference designation prefix is A1. This attenuator is functionally and electrically identical to the unit used in the 371A receiver, except that it contains two separate paths, one for each band. The attenuator switch in this case is a two-wafer, four-section type. The input for the 500-kHz to 10-MHz band is fed to jack J1 and the output is taken at jack J2. Jacks J3 and J4 are the input and output receptacles for the 10-MHz to 30-MHz band.

## 7.4 TYPE 72198 21.4-MHz IF AMPLIFIER

The schematic diagram for this amplifier is Figure 7-28; its reference designation prefix is A7.

7.4.1 This IF amplifier is quite similar to the type 72201 IF strip described in paragraph 2.9. The type 72198 employs an additional IGFET (A1Q2) in the input network. It is connected in parallel with A7A1Q1 and supplies additional gain for the 21.4-MHz IF output from the 60/21.4-MHz converter, A17. This transistor is gain controlled by the application of AGC voltage to pin no. 2. Silicon diode A1CR2 performs the same function for A1Q2 as that described for A1CR1 and A1Q1, namely to protect the transistor in the event a dc return is absent in the AGC line or the IF amplifier is operated out of the receiver. The 21.4-MHz IF input signal from jack J2 is coupled to A1Q2 by dc-blocking capacitor A1C2. Resistor A1R2 terminates the high-band IF input.

7.4.2 The remaining information contained in paragraph 2.9 is entirely applicable to the type 72198 IF strip. The alignment procedure given in paragraph 4.6 is also applicable to this IF amplifier. Photographs of the input amplifier board (14264) are shown in Figures 7-14 and 7-15.

## 7.5 TYPE 71227 10-30-MHz TUNING ASSEMBLY

The high-band tuner assembly consits of a type 71223 10-30-MHz RF tuner and a type 8500A grear train. Figure 7-29 is the schematic diagram for the entire assembly; its reference designation prefix is A16.

7.5.1 Type 71223 10-30-MHz RF Tuner. - The schmatic diagram for the RF tuner is Figure 7-30; its reference designation prefix is A16A1. Incoming RF signals are fed through jack J1 to a capacitive impedance-matching net-

work (A1C1-A1C2) which matches the 50-ohm antenna to the tuned input network. Capacitor C4 and L2 form a low-pass filter to improve the 60-MHz IF rejection. Resistor R1 shunts to ground any static charge that may build up on the antenna. From the input network, which is tuned by L1A, one section of a four-section inductuner, the signals are coupled through dc-blocking capacitor A1C5 to the signal gates of the RF amplifier stages.

7.5.2 RF Amplifiers. - Two parallel-connected, dual insulated-gate field-effect transistors (Q1, Q2) are used as the RF amplifiers. Incoming signals are simultaneously fed to gate no. 1 of each stage (pin no. 3). These transistors are essentially two single-gate stages connected in cascode. The parallel configuration is used to obtain the desired noise figure with low distortion. Both transistors are gain controlled by the application of a negative-going voltage to gate no. 2 (pin no. 2). This voltage is delayed, when the receiver is operated in the AM AGC or FM modes, until the signal-to-noise ratio at the output reaches approximately 30 dB. Until this time the tuner operates at maximum gain. Silicon diode A1CR1 is included to insure that the FET's are properly biased if the tuner is operated without a dc return through the AGC line. (AGC amplifier removed or tuner operated out of receiver.) Gate no. 1 of each stage is biased to its most efficient operating point by the dividing action of resistors R15 and A1R2. Output signals from the drain connections are fed in parallel through 2.7-ohm parasitic suppressors to the interstage network.

7.5.3 Interstage Network. - The interstage network is essentially a double-tuned bandpass filter. It utilizes split-C tuning to maintain the desired bandwidth and gain throughout the 30-MHz tuning range. One-half of the filter capacitance (A2C1 plus A2C2 and A2C10 plus A2C11) is connected across the entire inductance while the other half (A2C4, A2C9) appears only across the inductuner sections. The RF amplifier output network is tuned by section L1B and the mixer input circuit is tuned by section L1C. Inductors A2L1 and A2L3 supply some additional inductance at the high end of the band since the inductuner is reaching its high-end limit. Increased coupling through the network at the low-frequency end of the band is provided by capacitors A2C6 and A2C8. These two components are connected in parallel with A2C5 by the action of a parallel circuit consisting of A2L2 and A2C7. This network is resonant just below the low-frequency end and therefore presents a high impedance at the junction of A2C6 and A2C8 when the tuner approaches 10 MHz. These two capacitors have little effect on the network at the high-frequency end due to the high impedance of end-inductors A2L1 and A2L3. At this point signal coupling is made primarily through A2C5. Resistors A2R4 and A2R6 provide additional loading of the network at the low-frequency end to maintain the desired bandwidth at this point.

7.5.4 Local Oscillator Buffer. - The local oscillator in the tuner, A3Q1, is operated in a Colpitts configuration. The oscillator tank circuit is tuned by section L1D of the inductuner. Capacitor A3C7 couples the oscillator signal, which is maintained 60-MHz above the incoming carrier, to the base of buffer amplifier A3Q2. This stage is an emitter follower. Changes in tuning are accomplished through the use of voltage-variable capacitor A3CR1. The capacitance of this semiconductor is varied by a reverse voltage which is supplied by the front-panel FINE TUNING control. As this control is rotated, a varying voltage is applied to A3CR1, changeing its capacitance. Consequently, the frequency of the oscillator is changed and with it the beat-note of the CW-audio signal. Regenerative emitter-to-base feedback to sustain oscillation is taken from the junction of A3C1 and A3C2. Resistor A3R2 improves the linearity of the sine-wave output from the oscillator. Variable capacitor A3C5 is the tank circuit trimmer. Emitter follower A3Q2 supplies two output signals. One is fed through capacitor C9 to the mixer, and the second is taken from transformer A3T1 and fed to output jack J3. The transformer provides the proper impedance match between A3Q2 and the local oscillator output connector.

7.5.5 Mixer. - The mixer, A2Q1, is a type 3N128 MOS FET. The signal from the interstage network is fed to the gate and the local oscillator signal is coupled to the source. The two inputs are heterodyned to produce a 60-MHz difference frequency which is taken at the drain. Local oscillator radiation is reduced by the action of a neutralization network composed of the inter-element capacitance of A2Q1, capacitor A2C13 and transformer A2T1. The transformer is center-tapped resulting in a 1:1 turns ratio. Capacitor A2C12 places the center tap at ac ground potential, as well as bypasses source resistor A2R8. The neutralization components are connected to form a balanced bridge network. Any local oscillator signal conducted through the inter-element capacitance of A2Q1 is cancelled by a signal of equal amplitude, but of opposite polarity, that is fed through the other leg of the bridge. Test point J4 (TP1) is included in the source circuit of A2Q1 to permit measurement of the oscillator injection level and monitoring of the interstage response by means of a wideband oscilloscope. A double-tuned network containing inductors L4 and L5 tunes the mixer output to 60 MHz.

7.6 TYPE 71228 60-21.4-MHz CONVERTER

The schematic diagram for the converter is Figure 7-31; its reference designation prefix is A17.

7.6.1 60-MHz Amplifier. - The output signal from the mixer in the 10-30-MHz RF tuner is fed through input jack J1 and dc-blocking capacitor A1C1 to the signal gate of 60-MHz amplifier A1Q1. Resistor A1R1 terminates the converter input. Transistor A1Q1, a dual, insulated-gate FET is gain controlled by the same method used for the RF amplifiers. Biasing of gate no. 1 (pin 3) in this case is by the dividing action of resistors A1R2 and A1R5. The amplified 60-MHz signal is taken from the drain and fed through parasitic suppressor A1R7 to an interstage bandpass network. A double-tuned, over-coupled response is developed by this circuit, which contains variable capacitors A1C4 and A1C8. A capacitive impedance matching network, (A1C9, A1C10) feeds the 60-MHz signal to the mixer stage.

7.6.2 Local Oscillator and Buffer. - The local oscillator in the converter, A2Q1, operates in a crystal-controlled Colpitts configuration at a frequency of 81.4 MHz. A fifth overtone crystal is used. The base of the oscillator is held at RF ground potential by A2C2. Inductor A2L2 resonates with the stray crystal capacitance and the crystal holder capacitance to prevent parasitic oscillations. Variable capacitor A2C3 peaks the collector circuit of A1Q1 to the proper crystal overtone. Regenerative feedback through A2C4 and A2Y1 sustains oscillation. The oscillator output, which is taken from the feedback divider, is coupled through dc-blocking capacitor A2C6 to the base of buffer amplifier A2Q2. This stage, an emitter follower, isolates the oscillator from changing load conditions that might affect the fundamental frequency. The 81.4-MHz output is fed to the mixer through capacitor C3.

7.6.3 Mixer. - The mixer stage, A1Q2, is a single gate, MOS field-effect transistor. The 60-MHz IF signal is fed to the gate and LO signal is fed to the source. Heterodyning of these two inputs in A1Q2 produces a difference frequency of 21.4 MHz which is taken at the drain connection. This IF signal is fed through a single-tuned circuit, containing variable capacitor A1C12, to the output stage. This circuit tunes the drain of A1Q2 to 21.4 MHz and produces a single-peaked response at the converter output which is approximately 2 MHz wide at the 3-dB points.

7.6.4 Mixer Matching Amplifier. - The tuner output stage, A3Q1, is an emitter follower that matches the high-impedance output of the mixer to the low-impedance input of the 21.4-MHz IF amplifier. It also isolates the mixer output network in this tuner from the output network in the low-band tuner to prevent inter-action that might affect the response of the latter unit. This transistor is switched on and off by the front-panel BAND switch. Resistors A3R1 and A3R6 eliminate any tendency of the emitter follower to oscillate. The 21.4-MHz IF signal is fed through dc-blocking capacitor C9 to the IF output jack, J2, and through resistor R4 to the signal monitor connector J3.

## 7.7 TYPE 79357 COUPLING ASSEMBLY

Figure 7-32 is the schematic diagram for the LO coupler; its reference designation prefix is A18. Resistors R1 through R4 form an impedance-matching network that is used to couple the local oscillator signal from the tuner in operation to the rear-apron LO OUTPUT jack, A18J2.

## 7.8 ALIGNMENT PROCEDURES

The following paragraphs contain alignment procedures for the 10-30-MHz RF tuner and the 60-21.4-MHz converter. Alignment procedures for the low-band tuning assembly and the IF amplifiers is given in Section IV of this manual.

7.8.1 Equipment Required. - The following equipments or their equivalents are required to align the high-band RF tuner and 60-21.4-MHz IF converter.

(1) Sweep Generator, Telonic SM-2000 with internal 1-MHz, 10-MHz, and 21.4-MHz markers.

(2) Sweep Generator Plug-In Head, Telonic LH-2

(3) Signal Generator Hewlett Packard 606A

(4) Oscilloscope, Tektronix 503

(5) Detector, 50-ohm, Telonic XD-3A

(6) Frequency Counter, Hewlett Packard 5245L

(7) Frequency Converter, Hewlett Packard 5253B

(8) Resistor, Fixed, Composition, 100 ohms 1/4W, 5%, CB1015

7.8.2 10-30-MHz RF Tuner Alignment. - The alignment procedures for the high-band tuner are given in the following paragraphs. These procedures should be performed in a well-equipped shop by trained and experienced personnel, and only after the replacement of a frequency determining component in the RF interstage, local oscillator, or output networks. The construction of this tuner is such that a defective transistor may be replaced without distrubing the critical circuits. The tuner does not require re-alignment after the replacement of a transistor. No repair work should be undertaken within the tuner unless considered absolutely necessary.

CAUTION

If a component is replaced in any of the circuits mentioned above, extreme care should be exercised to duplicate the exact physical placement of the original part.

7.8.2.1 RF Interstage Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1 except that the sweep generator MARKER ADDER INPUT is connected to jack J4 (TP1) and the RF output is connected to J1 on the rear apron.

(2) Remove the bottom covers from the tuner.

(3) Temporarily solder the 100-ohm resistor across capacitor A1C3.

(4) Place MODE switch in AM MAN, BAND switch in 10-30-MHz position and rotate RF/IF GAIN control fully clockwise.

(5) Set output frequency of sweep generator to 10 MHz and turn internal 10-MHz marker on.

(6) Tune 373A receiver to 10 MHz.

(7) Adjust sweep generator and oscilloscope controls to display a response curve.

(8) Adjust capacitors A2C1 and A2C11 for a maximum amplitude, highly overcoupled, symmetrical response centered about the 10-MHz marker.

(9) Tune sweep generator and receiver to 30 MHz.

(10) Adjust inductors A2L1 and A2L3, by spreading or compressing the turns, for a response similar to that obtained in step (8).

(11) Turn on sweep generator internal 1-MHz marker and readjust A2L1 and A2L3 (if necessary) for a symmetrical response having a 3-dB bandwidth of 1.8 MHz, minimum. A typical response at 30 MHz is shown in Figure 7-2.

(12) Tune sweep generator and receiver to 10 MHz.

(13) Readjust capacitors A2C1 and A2C11 (if necessary) for a highly-overcoupled, symmetrical response centered about the 10-MHz marker. Check for 3-dB bandwidth of 1.8 MHz minimum. A typical response at 10 MHz is shown in Figure 7-3.

(14) Unsolder the 100-ohm resistor installed in step (3).

(15) Turn sweep generator internal 1-MHz marker off.

(16) Adjust capacitor A1C4 for a maximum amplitude, symmetrical response centered about the 10-MHz marker.

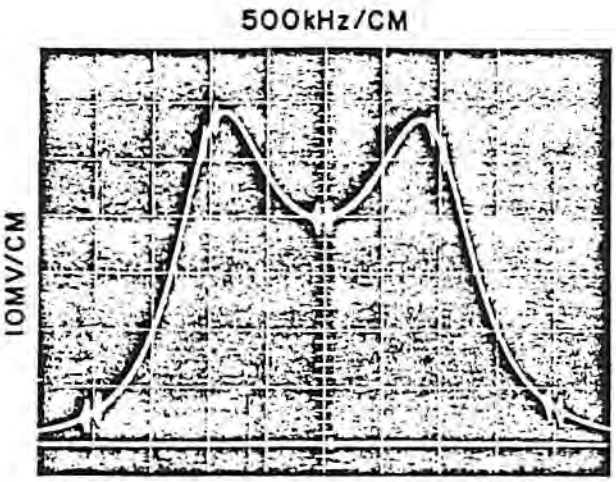



Figure 7-2. Typical RF Response at 30 MHz

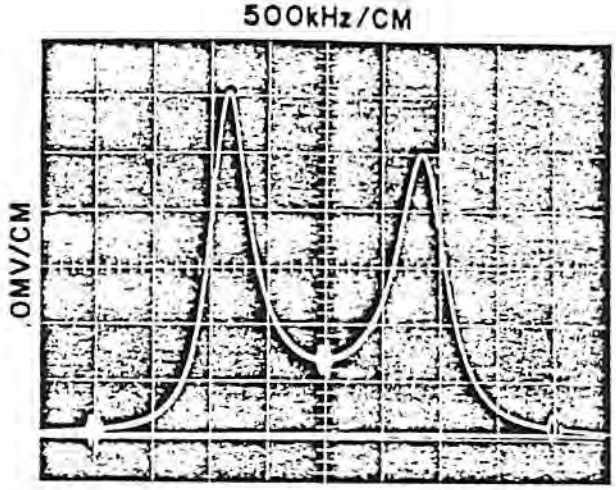



Figure 7-3. Typical RF Response at 10 MHz

(17) Tune receiver and sweep generator to 30 MHz.

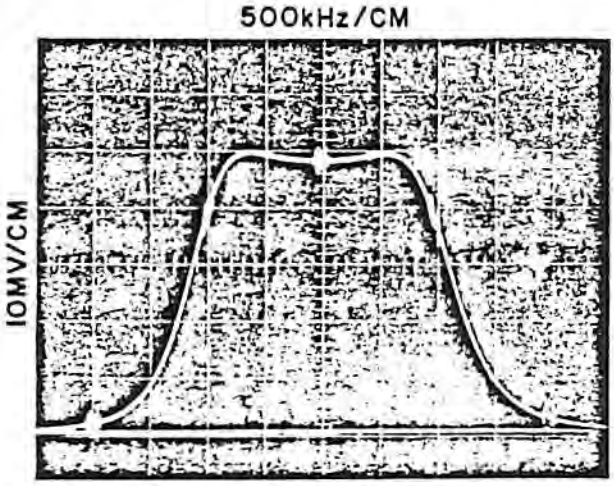



Figure 7-4. Typical Overall RF Response at 30 MHz

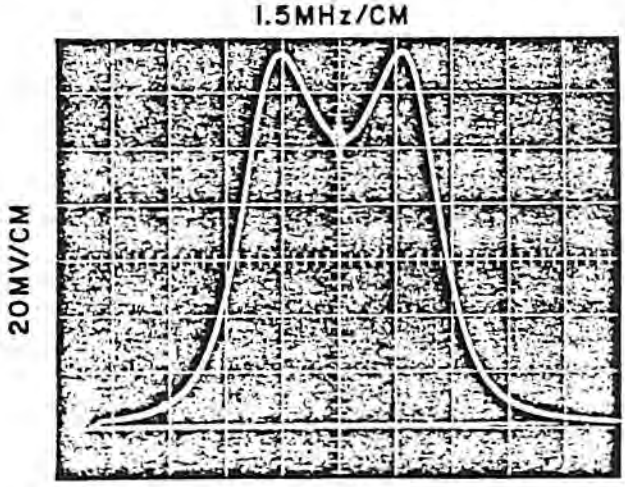



Figure 7-5. Typical Mixer Response

(18) Adjust inductor A1L2, by spreading or compressing the turns, for a symmetrical response centered about the 30-MHz marker. A typical overall response at 30 MHz is shown in Figure 7-4.

7.8.2.2 Mixer Output Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 7-6.

(2) Set output frequency of sweep generator to 60 MHz; turn internal markers off.

(3) Set output frequency of signal generator to 60 MHz, CW mode. Increase output level to obtain suitable marker on oscilliscope screen.

(4) Adjust sweep generator and oscilloscope controls to display a response curve.

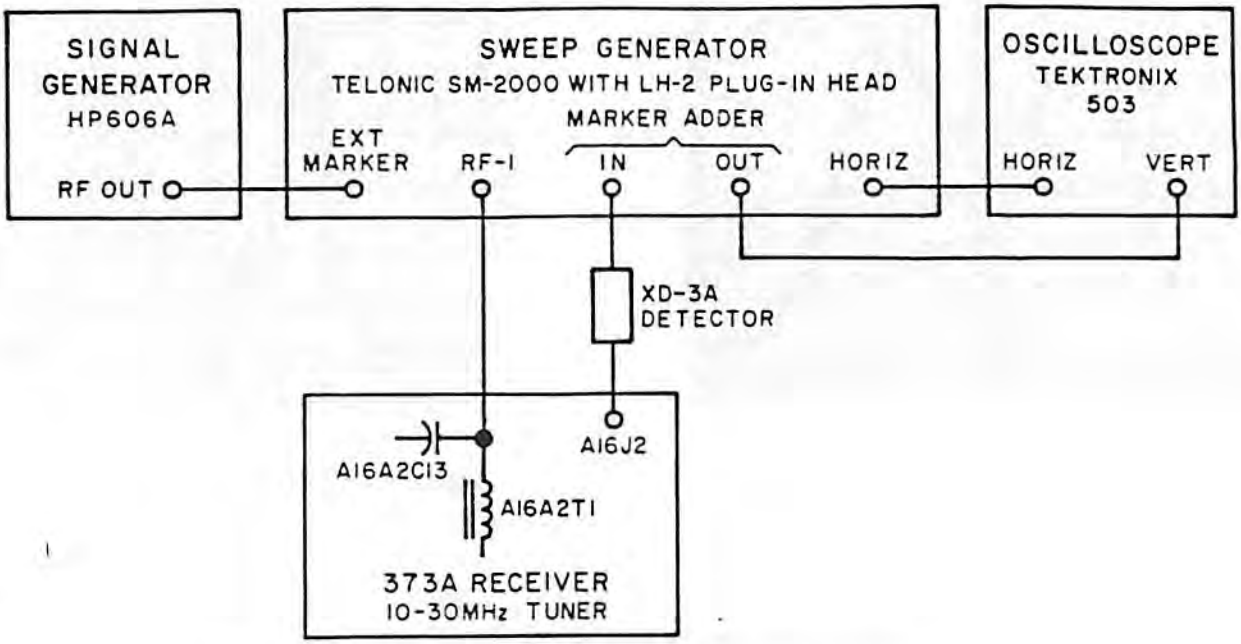



Figure 7-6. Equipment Setup, Mixer Output Alignment

(5) Adjust inductors A16L4 and A16L5 for a maximum amplitude, over-coupled response centered about the 60-MHz marker. A typical response is shown in Figure 7-5.

7.8.3 60-21.4 MHz Converter Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 7-6 except that sweep generator RF output is connected to A17J1 and the MARKER ADDER INPUT is connected through the XD-3A detector to A17J2.

(2) Calibrate output frequency of sweep generator to 60 MHz; turn on 10-MHz internal marker.

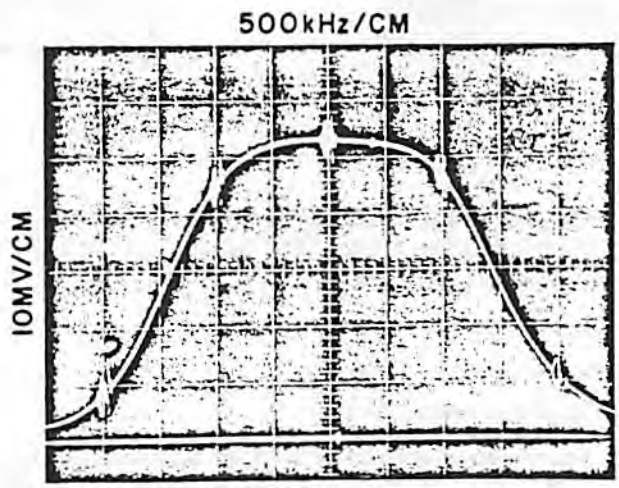



Figure 7-7. Typical 60-21.4-MHz Converter Response

(3) Adjust sweep generator and oscilloscope controls to display a response curve.

(4) Adjust capacitors A17A1C4, A17A1C8, and A17A1C12 for maximum amplitude, symmetrical response centered about the center-frequency marker. A typical response is shown in Figure 7-7.

Table 7-1. Type 373A Receiver Typical Transistor Element Voltages

| Ref. Desig. | Type | Pin Number | | | | Element | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | Emitter | Base | Collector |
| A7A1Q1(1) | TA2644 | 15.6 | 1.1 | 3.6 | 1.6 | | | |
| A7A1Q2(2) | TA2644 | 15.6 | 1.1 | 3.6 | 1.6 | | | |
| A7A1Q3(3) | 2N3478 | | | | | 6.2 | 6.9 | 16.3 |
| A7A1Q4(4) | 2N3478 | | | | | 6.2 | 6.9 | 16.3 |
| A7A1Q5(5) | 2N3478 | | | | | 9.0 | 9.7 | 15.4 |
| A16Q1 | TA2644 | 14.7 | 1.1 | 3.6 | 1.8 | | | |
| A16Q2 | TA2644 | 14.7 | 1.1 | 3.6 | 1.5 | | | |
| A16A2Q1 | 3N128 | 18.0 | 0.8 | 0.0 | | | | |
| A16A3Q1 | 2N3478 | | | | | 7.8 | 8.0 | 14.0 |
| A16A3Q2 | 2N3478 | | | | | 9.4 | 10.2 | 16.2 |
| A17A1Q1 | TA2644 | 16.3 | 0.9 | 3.7 | 1.3 | | | |
| A17A1Q2 | 3N128 | 16.0 | 1.7 | 0 | | | | |
| A17A2Q1 | 2N3478 | | | | | 0.7 | 1.4 | 16.5 |
| A17A2Q2 | 2N3478 | | | | | 9.2 | 10.0 | 17.1 |
| A17A3Q1 | 2N3478 | | | | | 5.2 | 5.9 | 17.8 |

TEST CONDITIONS:

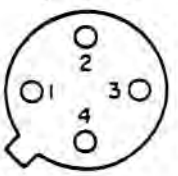
All readings are dc with respect to chassis unless otherwise noted; readings taken with RCA-WV98C VTVM; no signal input; 115 Vac applied to receiver; all gain controls maximum CW; FINE TUNING to mid-range.

NOTES:

(1) BAND switch in 0.5-10-MHz position
(2) BAND switch in 10-30-MHz position
(3) IF BW switch in 400-kHz position
(4) IF BW switch in 100-kHz position
(5) IF BW switch in 6 or 20-kHz position

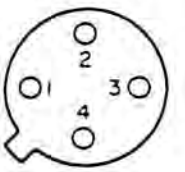
Bottom view diagrams for the 3N128 and TA2644 (3N140) transistors are shown below.

3N140




1 Drain
2 Gate No. 2
3 Gate No. 1
4 Source

3N128




1 Drain
2 Source
3 Gate
4 Bulk and Case

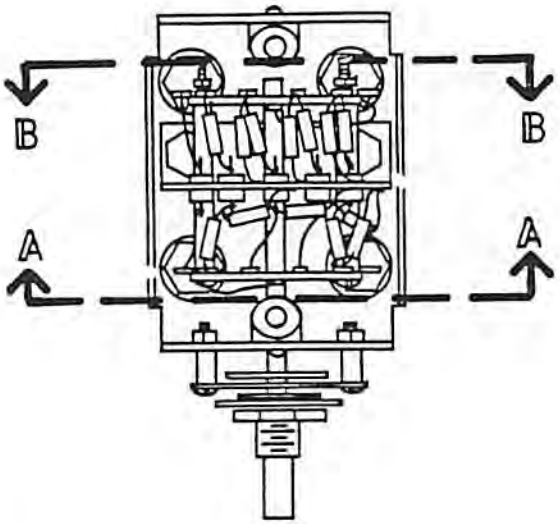
| Ref Desig | Description | | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|---|
| P11 | Same as P6 | Part of W7 | | | |
| P12 | Same as P4 | Part of W7 | | | |
| P13 | Same as P4 | Part of W8 | | | |
| P14 | Same as P4 | Part of W8 | | | |
| P15 | Same as P4 | Part of W9 | | | |
| P16 | Same as P1 | Part of W10 | | | |
| P17 | Same as P4 | Part of W10 | | | |
| P18 | Same as P1 | Part of W11 | | | |
| P19 | Same as P1 | Part of W11 | | | |
| P20 | Same as P1 | Part of W12 | | | |
| P21 | Same as P4 | Part of W12 | | | |
| P22 | Same as P4 | Part of W13 | | | |
| P23 | Same as P4 | Part of W13 | | | |
| P24 | Same as P4 | Part of W15 | | | |
| P25 | Same as P1 | Part of W16 | | | |
| P26 | Same as P1 | Part of W16 | | | |
| P27 | Same as P1 | | | | |
| P28 | CONNECTOR, PLUG AND POWER CORD | Part of FL1 | --- | | |
| P29 | Same as P4 | Part of W17 | | | |
| P30 | Same as P1 | Part of W17 | | | |
| P31 | Same as P4 | | | | |
| P32 | Same as P4 | | | | |
| P33 | Same as P1 | Part of W18 | | | |
| P34 | Same as P4 | Part of W19 | | | |
| P35 | Same as P1 | Part of W19 | | | |
| P36 | Same as P4 | | | | |
| P37 | Same as P4 | Part of W14 | | | |
| P38 | Same as P4 | Part of W14 | | | |
| R1 | RESISTOR, VARIABLE, COMPOSITION: 50 kΩ, 10%, 2W | | 2 | RV4NAYSD503A | 81349 |
| R2 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | | 1 | CB2225 | 01121 |
| R3 | RESISTOR, VARIABLE, COMPOSITION: 10 kΩ, 10%, 2W | | 2 | RV4NAYSD103A | 81349 |
| R4 | RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W | | 1 | CB4735 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 43 kΩ, 5%, 1/4W | | 1 | CB4335 | 01121 |

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R6 | RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W | 1 | CB2235 | 01121 |
| R7 | Same as R3 | | | |
| R8 | Same as R1 | | | |
| R9 | RESISTOR, FIXED, COMPOSITION: 5.1 kΩ, 5%, 1/4W | 1 | CB5125 | 01121 |
| S1 | SWITCH, SLIDE, DP-DT | 1 | 11A-1009 | 82389 |
| S2 | SWITCH, TOGGLE SP-ST | 1 | 8280-K16 | 15605 |
| S3 | SWITCH, ROTARY: 2 Section, 6 Poles, 4 Position | 2 | 265757-A2 | 76854 |
| S4 | Same as S3 | | | |
| S5 | SWITCH, ROTARY: 2 Section, 8 Poles, 2 Position | 1 | 1128-45 | 14632 |
| T1 | TRANSFORMER | 1 | 14238 | 14632 |
| TB1 | TERMINAL BOARD | 1 | 353-18-10-001 | 71785 |
| TP1 | TEST POINT | 5 | TJ-6 | 04013 |
| TP2 | Same as TP1 | | | |
| TP3 | Same as TP1 | | | |
| TP4 | Same as TP1 | | | |
| TP5 | Same as TP1 | | | |
| W1 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-932 | 14632 |
| W2 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-933 | 14632 |
| W3 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-934 | 14632 |
| W4 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-935 | 14632 |
| W5 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-936 | 14632 |
| W6 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-937 | 14632 |
| W7 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-938 | 14632 |
| W8 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-939 | 14632 |
| W9 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-940 | 14632 |
| W10 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-941 | 14632 |
| W11 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-942 | 14632 |
| W12 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-943 | 14632 |
| W13 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-944 | 14632 |
| W14 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-945 | 14632 |
| W15 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-946 | 14632 |
| W16 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-947 | 14632 |
| W17 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-948 | 14632 |
| W18 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-949 | 14632 |
| W19 | CABLE AND CONNECTOR ASSEMBLY | 1 | 30020-950 | 14632 |

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| XA11 | CONNECTOR, PRINTED CIRCUIT CARD | 2 | 00-5002-014-103-002 | 91662 |
| XA12 | Same as XA11 | | | |
| XA13 | CONNECTOR, PRINTED CIRCUIT CARD | 3 | 00-5002-016-103-002 | 91662 |
| XA14 | Same as XA13 | | | |
| XA15 | Same as XA13 | | | |
| XF1 | FUSEHOLDER | 2 | 342004 | 75915 |
| XF2 | Same as XF1 | | | |

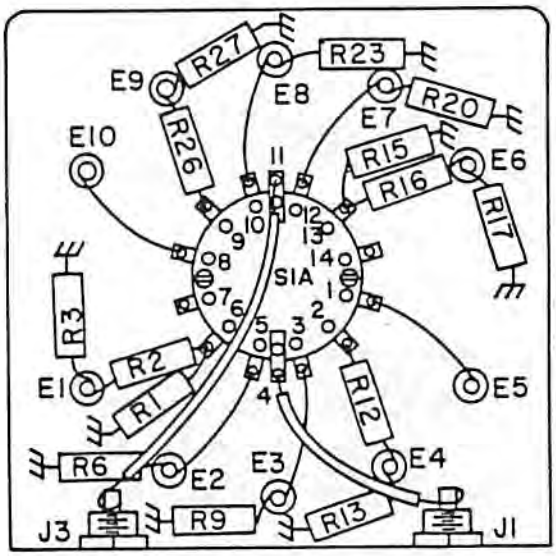
7.12.2 Type 79366 Input Attenuator REF DESIG PREFIX A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| E1 | TERMINAL, FEEDTHRU | 10 | SFU-16 | 04013 |
| E2 | Same as E1 | | | |
| E3 | Same as E1 | | | |
| E4 | Same as E1 | | | |
| E5 | Same as E1 | | | |
| E6 | Same as E1 | | | |
| E7 | Same as E1 | | | |
| E8 | Same as E1 | | | |
| E9 | Same as E1 | | | |
| E10 | Same as E1 | | | |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 4 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| J3 | Same as J1 | | | |
| J4 | Same as J1 | | | |
| MP1 | COVER | 1 | 21421-1 | 14632 |
| R1 | RESISTOR, FIXED, COMPOSITION: 62 Ω, 5%, 1/4W | 8 | CB6205 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 240 Ω, 5%, 1/4W | 2 | CB2415 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 30 Ω, 5%, 1/4W | 2 | CB3005 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W | 4 | CB2715 | 01121 |
| R5 | Same as R1 | | | |
| R6 | RESISTOR, FIXED, COMPOSITION: 51 Ω, 5%, 1/4W | 2 | CB5105 | 01121 |
| R7 | RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/4W | 2 | CB8215 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 56 Ω, 5%, 1/4W | 2 | CB5605 | 01121 |
| R9 | Same as R1 | | | |
| R10 | Same as R4 | | | |
| R11 | Same as R1 | | | |
| R12 | RESISTOR, FIXED, COMPOSITION: 27 Ω, 5%, 1/4W | 4 | CB2705 | 01121 |
| R13 | RESISTOR, FIXED, COMPOSITION: 36 Ω, 5%, 1/4W | 2 | CB3605 | 01121 |
| R14 | Same as R12 | | | |
| R15 | Same as R1 | | | |
| R16 | Same as R2 | | | |
| R17 | Same as R3 | | | |
| R18 | Same as R4 | | | |
| R19 | Same as R1 | | | |




REF DESIG PREFIX A1

SECTION A-A




SECTION B-B

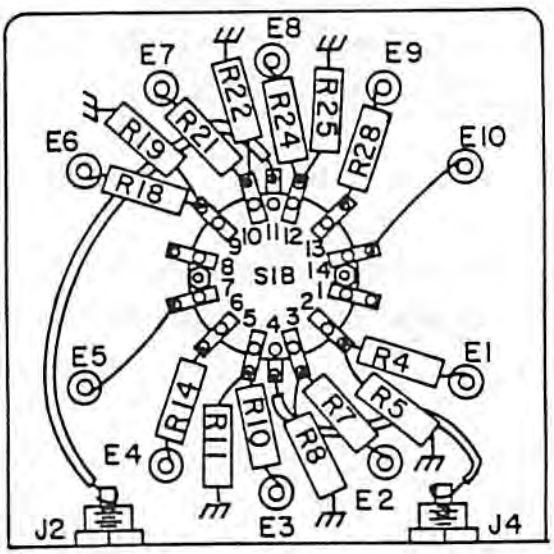



Figure 7-12. Type 79366 Input Attenuator, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R20 | Same as R6 | | | |
| R21 | Same as R7 | | | |
| R22 | Same as R8 | | | |
| R23 | Same as R1 | | | |
| R24 | Same as R4 | | | |
| R25 | Same as R1 | | | |
| R26 | Same as R12 | | | |
| R27 | Same as R13 | | | |
| R28 | Same as R12 | | | |
| S1 | SWITCH, ROTARY: 2 Section, 4 Poles, 2-6 Position | 1 | 21424-2 | 14632 |

7.12.3 Type 72198 21.4 MHz IF Amplifier REF DESIG PREFIX A7

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | INPUT IF AMPLIFIER | 1 | 14264 | 14632 |
| A2 | MIDSECTION IF AMPLIFIER | 1 | 14342 | 14632 |
| A3 | OUTPUT IF AMPLIFIER | 1 | 14345 | 14632 |
| C1 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 16 | FA5C-102W | 01121 |
| C2 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 15 | C023B101F103M | 56289 |
| C3 | Same as C1 | | | |
| C4 | Same as C2 | | | |
| C5 | CAPACITOR, CERAMIC, FEEDTHRU: 330 pF, 10%, 500V | 1 | FA5C-3311 | 01121 |
| C6 | Same as C2 | | | |
| C7 | Same as C1 | | | |
| C8 | Same as C1 | | | |
| C9 | Same as C2 | | | |
| C10 | Same as C1 | | | |
| C11 | Same as C1 | | | |
| C12 | Same as C2 | | | |
| C13 | Same as C1 | | | |
| C14 | Same as C2 | | | |
| C15 | Same as C2 | | | |
| C16 | Same as C1 | | | |
| C17 | Same as C2 | | | |
| C18 | Same as C1 | | | |
| C19 | Same as C2 | | | |
| C20 | Same as C1 | | | |
| C21 | Same as C2 | | | |
| C22 | Same as C1 | | | |
| C23 | Same as C2 | | | |
| C24 | Same as C1 | | | |
| C25 | Same as C2 | | | |
| C26 | Same as C1 | | | |
| C27 | Same as C2 | | | |
| C28 | Same as C1 | | | |
| C29 | Same as C2 | | | |
| C30 | Same as C1 | | | |
| C31 | Same as C2 | | | |
| C32 | Same as C1 | | | |

# REPLACEMENT PARTS LIST

## 7.9 UNIT NUMBERING METHOD

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


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

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

## 7.10 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."

## 7.11 LIST OF MANUFACTURERS

| Vendor Code | Name and Address | Vendor Code | Name and Address |
|---|---|---|---|
| 00779 | AMP, Incorporated<br>P. O. Box 3608<br>Harrisburg, Pennsylvania 17105 | 15605 | Cutler-Hammer, Inc.<br>315 North 12th Street<br>Milwaukee, Wisconsin 53233 |
| 01121 | Allen-Bradley Company<br>1201 South 2nd Street<br>Milwaukee, Wisconsin 53204 | 21604 | Buckeye Stamping Company<br>555 Marion Road<br>Columbus, Ohio 43207 |
| 01281 | TRW Semiconductors, Inc.<br>14520 Aviation Blvd.<br>Lawndale, California 90260 | 56289 | Sprague Electric Company<br>North Adams,<br>Massachusetts 01247 |
| 02114 | Ferroxcube Corp. of America<br>Mt. Marion Road<br>Saugerties, New York 12477 | 71279 | Cambridge Thermionic Corporation<br>445 Concord Avenue<br>Cambridge, Massachusetts 02138 |
| 04013 | Taurus Corporation<br>1 Academy Hill<br>Lambertville, New Jersey 08530 | 71400 | Bussman Manufacturing<br>Division of McGraw-Edison Co.<br>2538 W. University Street<br>St. Louis Missouri 63107 |
| 14632 | Communication Electronics, Inc.<br>6006 Executive Boulevard<br>Rockville, Maryland 20852 | 71744 | Chicago Miniature Lamp Works<br>4433 Ravenswood Avenue<br>Chicago, Illinois 60640 |

| Vendor Code | Name and Address |
|---|---|
| 71785 | Cinch Manufacturing Company<br>Howard B. Jones Division<br>1026 South Homan Avenue<br>Chicago, Illinois 60624 |
| 72136 | Electro Motive Manufacturing Co., Inc.<br>South Park & John Streets<br>Willimantic, Connecticut 06226 |
| 72982 | Erie Technological Products, Inc.<br>644 West 12th Street<br>Erie, Pennsylvania 16512 |
| 74306 | Piezo Crystal Company<br>265 East Pomfret Street<br>Carlisle, Pennsylvania 17013 |
| 74868 | Amphenol Corporation<br>Amphenol RF Division<br>33 East Franklin Street<br>Danbury, Connecticut 06810 |
| 75915 | Littelfuse, Incorporated<br>800 E. Northwest Highway<br>Des Plaines, Illinois 60016 |
| 76854 | Oak Manufacturing Company<br>S. Main Street<br>Crystal Lake, Illinois 60014 |
| 80131 | Electronic Industries Association<br>2001 Eye Street, N. W.<br>Washington, D. C. 20006 |
| 81073 | Grayhill Incorporated<br>561 Hillgrove Avenue<br>LaGrange, Illinois 60525 |
| 81312 | Litton Industries Inc.<br>Winchester Electronics Division<br>Main Street & Hillside Avenue<br>Oakville, Connecticut 06779 |
| 81349 | Military Specifications |
| 82389 | Switchcraft, Incorporated<br>5527 North Elston Avenue<br>Chicago, Illinois 60630 |
| 91418 | Radio Materials Company<br>4242 West Bryn Mawr Avenue<br>Chicago, Illinois 60646 |
| 91662 | Elco Corporation<br>Maryland Rd. & Computer Ave.<br>Willow Grove, Pennsylvania 19090 |
| 95121 | Quality Components, Inc.<br>P. O. Box 113<br>St. Mary's Pennsylvania 15857 |
| 99848 | Wilco Corporation<br>P. O. Box 22248<br>Indianapolis, Indiana 46222 |

## 7.12 PARTS LIST

When ordering replacement parts from CEI, specify the type and serial number of the equipment, and the reference designation 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.

NOTE

As improved semiconductors become available it is the policy of CEI to incorporate them in proprietary products. For this reason some transistors and diodes installed in an equipment may not agree with those specified in the parts lists and schematic diagrams of this manual. However, the semiconductors designated in the manual may be substituted in every case with satisfactory results.

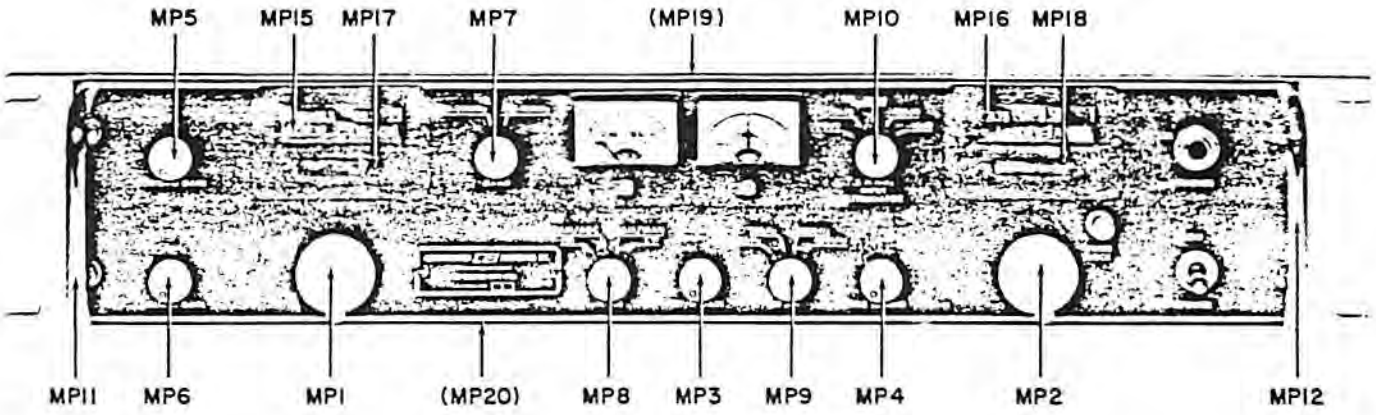



Figure 7-8. Location of Mechanical Parts, Type 373A Receiver, Front Panel

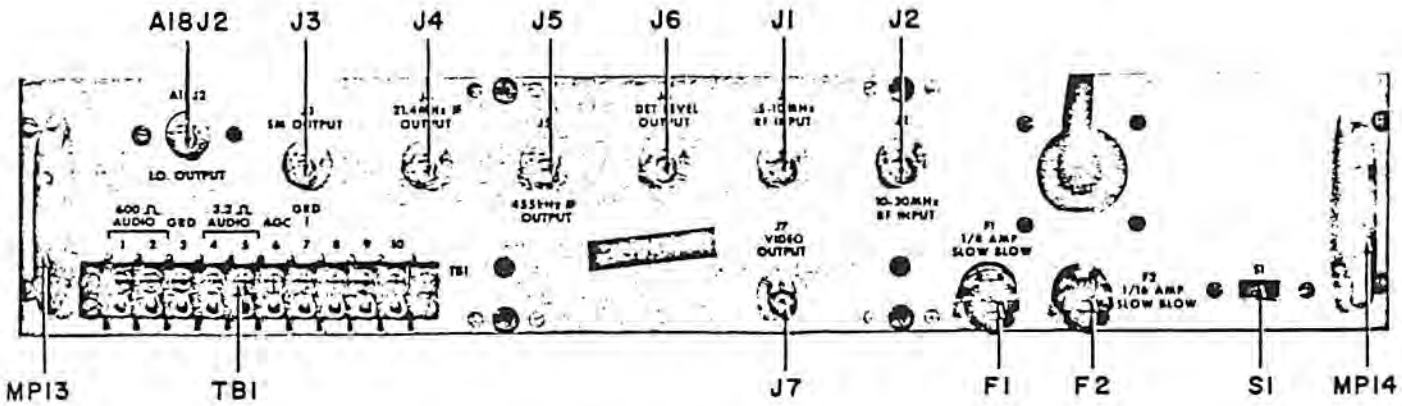



Figure 7-9. Location of Mechanical Parts, Type 373A Receiver, Rear Apron

7.12.1 Type 373A HF Receiver, Main Chassis

| Ref Desig | Description | | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|---|
| A1 | INPUT ATTENUATOR | | 1 | 79366 | 14632 |
| A2 | INPUT FILTER | | 1 | 79339 | 14632 |
| A3 | RF ASSEMBLY | | 1 | 71218 | 14632 |
| A4 | LO AMPLIFIER | | 1 | 79340 | 14632 |
| A5 | .5-10 MHz TUNING ASSEMBLY | | 1 | 71217 | 14632 |
| A6 | FINE TUNING REGULATOR | | 1 | 79338 | 14632 |
| A7 | 21.4 MHz IF AMPLIFIER | | 1 | 72198 | 14632 |
| A8 | 21.4 MHz LIMITER/DISCRIMINATOR | | 1 | 79335 | 14632 |
| A9 | 455 kHz IF AMPLIFIER | | 1 | 72197 | 14632 |
| A10 | 455 kHz LIMITER/DISCRIMINATOR | | 1 | 79337 | 14632 |
| A11 | VIDEO AMPLIFIER | | 1 | 7352 | 14632 |
| A12 | AUDIO AMPLIFIER | | 1 | 7433 | 14632 |
| A13 | AGC AMPLIFIER | | 1 | 79354 | 14632 |
| A14 | +18V REGULATED POWER SUPPLY BOARD | | 1 | 76123 | 14632 |
| A15 | -12V REGULATED POWER SUPPLY BOARD | | 1 | 76118 | 14632 |
| A16 | 10-30 MHz TUNER ASSEMBLY | | 1 | 71227 | 14632 |
| A17 | 60-21.4 MHz CONVERTER | | 1 | 71228 | 14632 |
| A18 | COUPLING ASSEMBLY | | 1 | 79357 | 14632 |
| F1 | FUSE, 3AG, SLOW-BLOW: 1/8A | | 1 | MDL-1/8 | 71400 |
| F2 | FUSE, 3AG, SLOW-BLOW: 1/16A | | 1 | MDL-1/16 | 71400 |
| FL1 | FILTER, POWER INPUT | | 1 | JN33-694A | 56289 |
| J1 | CONNECTOR, JACK BNC SERIES | Part of W1 | / | 17825 | 74868 |
| J2 | Same as J1 | Part of W2 | | | |
| J3 | Same as J1 | Part of W9 | | | |
| J4 | Same as J1 | Part of W15 | | | |
| J5 | Same as J1 | Part of W18 | | | |
| J6 | Same as J1 | | | | |
| J7 | Same as J1 | | | | |
| J8 | CONNECTOR, PHONE JACK | | 1 | L11 | 82389 |
| J9 | CONNECTOR, RECEPTACLE, MULTIPIN | | 5 | M7S-LRN | 81312 |
| J10 | Same as J9 | | | | |
| J11 | CONNECTOR, RECEPTACLE, MULTIPIN | | 4 | M10S-LRN | 81312 |
| J12 | Same as J11 | | | | |
| J13 | Same as J9 | | | | |
| J14 | Same as J11 | | | | |

| Ref Desig | Description | | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|---|
| J15 | Same as J9 | | | | |
| J16 | Same as J11 | | | | |
| J17 | Same as J9 | | | | |
| MP1 | CRANK ASSEMBLY | | 2 | 11755-2 | 14632 |
| MP2 | Same as MP1 | | | | |
| MP3 | KNOB | | 4 | PS-70D-2 | 21604 |
| MP4 | Same as MP3 | | | | |
| MP5 | Same as MP3 | | | | |
| MP6 | Same as MP3 | | | | |
| MP7 | KNOB | | 4 | PS-70PL-2W | 21604 |
| MP8 | Same as MP7 | | | | |
| MP9 | Same as MP7 | | | | |
| MP10 | Same as MP7 | | | | |
| MP11 | HANDLE | | 2 | 1250-1 | 71279 |
| MP12 | Same as MP11 | | | | |
| MP13 | HANDLE | | 2 | 1252-1 | 71279 |
| MP14 | Same as MP13 | | | | |
| MP15 | WINDOW | | 2 | 11448-1 | 14632 |
| MP16 | Same as MP15 | | | | |
| MP17 | WINDOW | | 2 | 11449-1 | 14632 |
| MP18 | Same as MP17 | | | | |
| MP19 | COVER | | 2 | 30625-6 | 14632 |
| MP20 | Same as MP19 | | | | |
| M1 | METER, SIGNAL STRENGTH | | 1 | 1632 | 14632 |
| M2 | METER, TUNING | | 1 | 1633 | 14632 |
| P1 | CONNECTOR, PLUG, MB SERIES | Part of W1 | 15 | 45775 | 74868 |
| P2 | Same as P1 | Part of W2 | | | |
| P3 | Same as P1 | Part of W3 | | | |
| P4 | CONNECTOR, PLUG, MB SERIES | Part of W3 | 17 | 44950 | 74868 |
| P5 | Same as P1 | Part of W4 | | | |
| P6 | CONNECTOR, PLUG, BNC SERIES | Part of W4 | 5 | 2-330058-1 | 00779 |
| P7 | Same as P6 | Part of W5 | | | |
| P8 | Same as P6 | Part of W5 | | | |
| P9 | Same as P6 | Part of W6 | | | |
| P10 | Same as P1 | Part of W6 | | | |

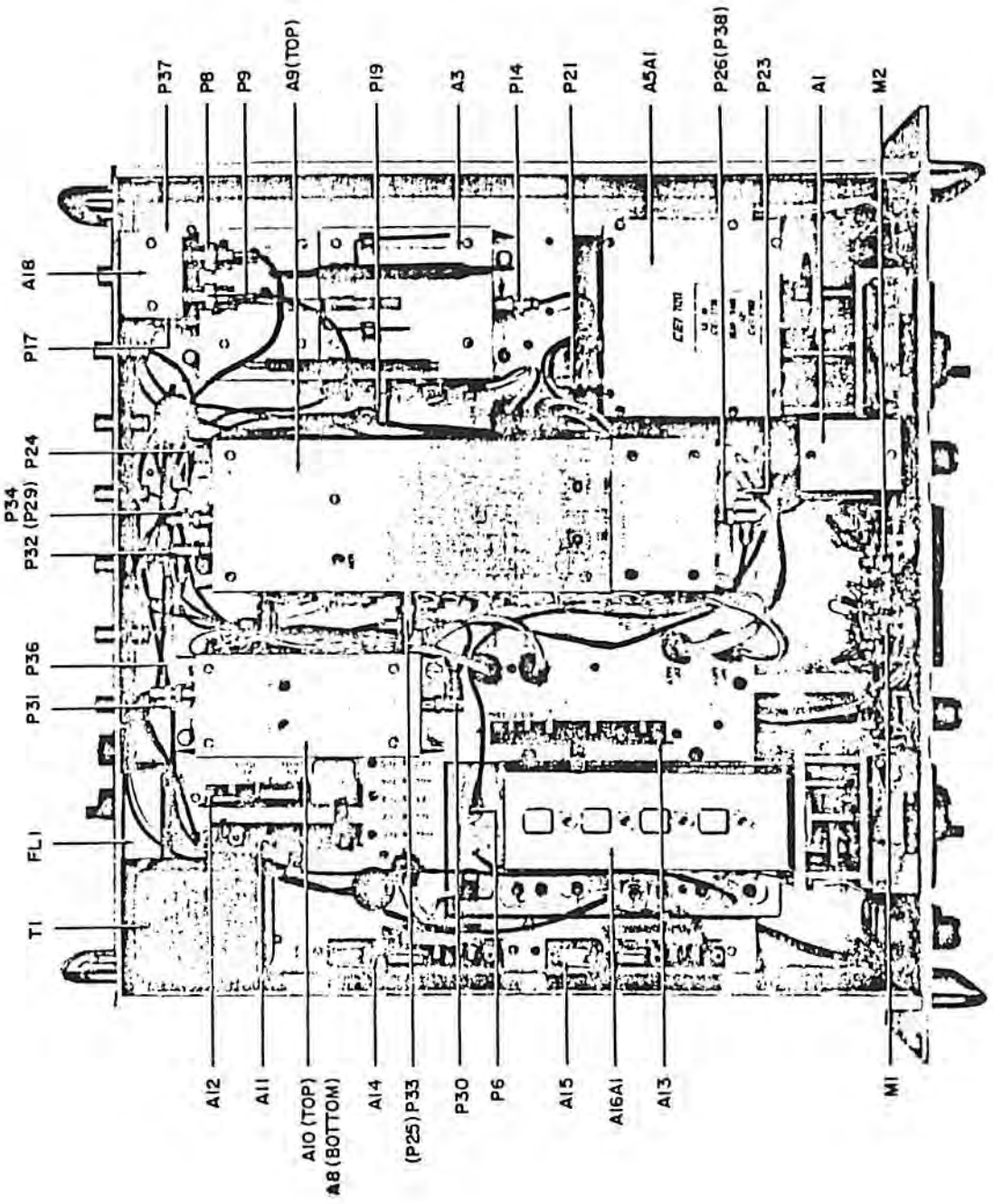



Figure 7-10. Type 373A Receiver, Top View

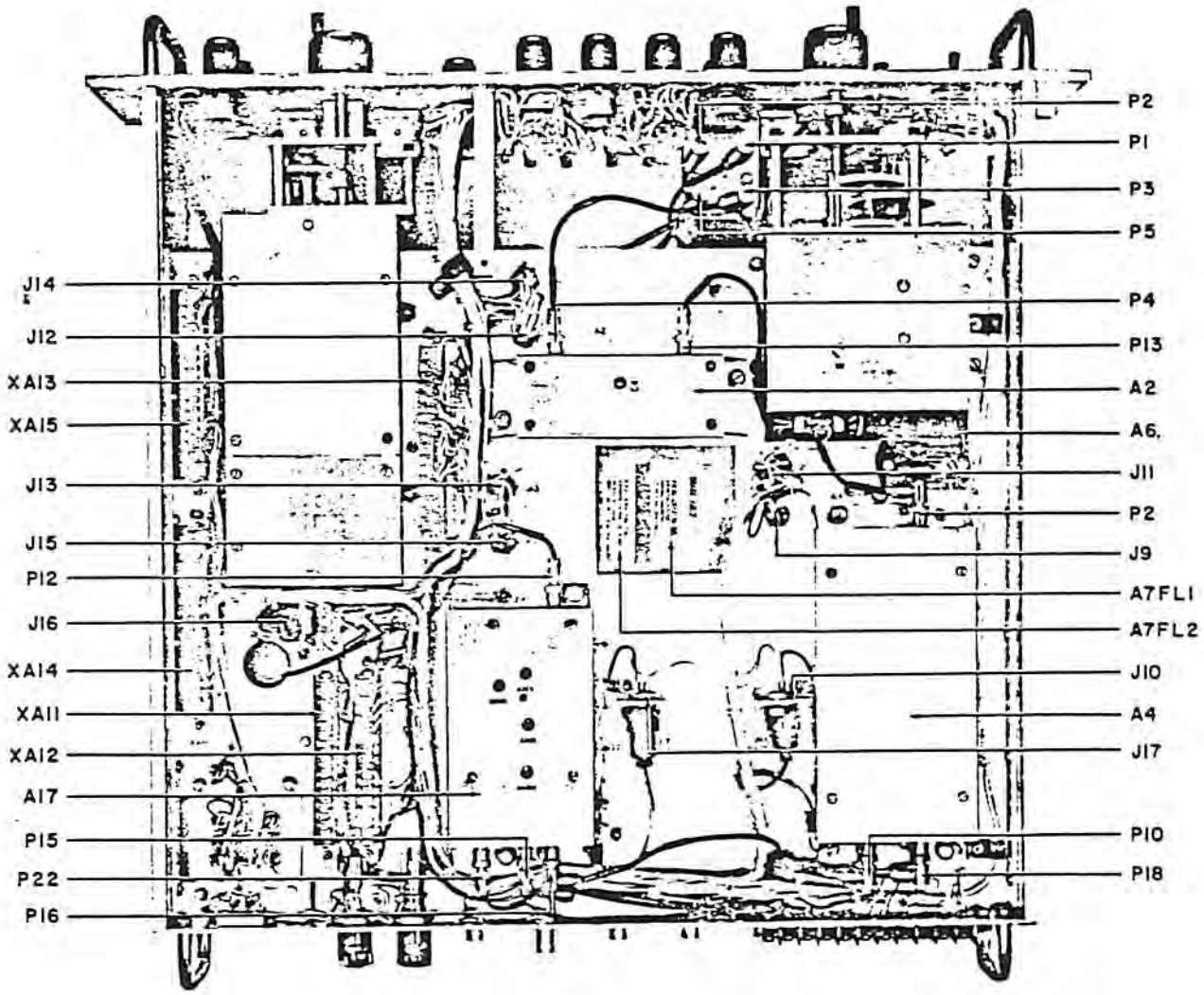



Figure 7-11. Type 373A Receiver, Bottom View

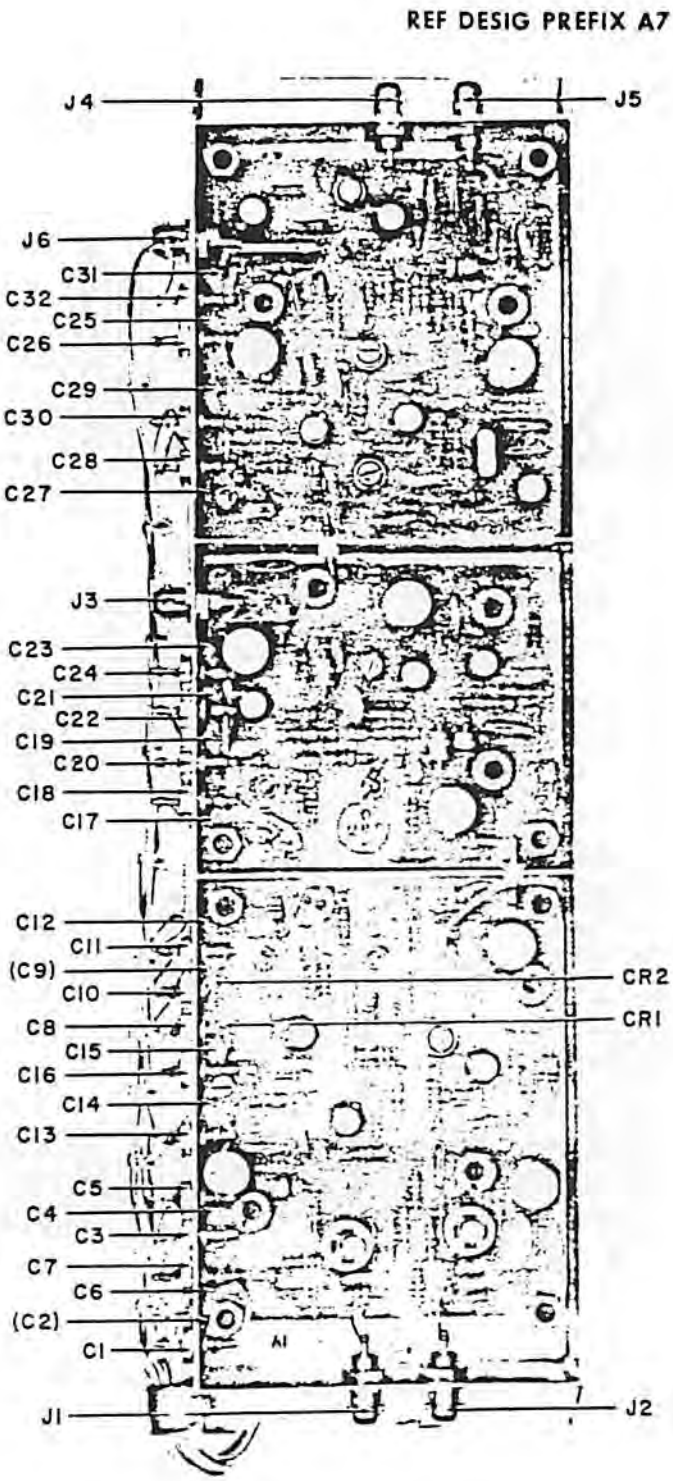


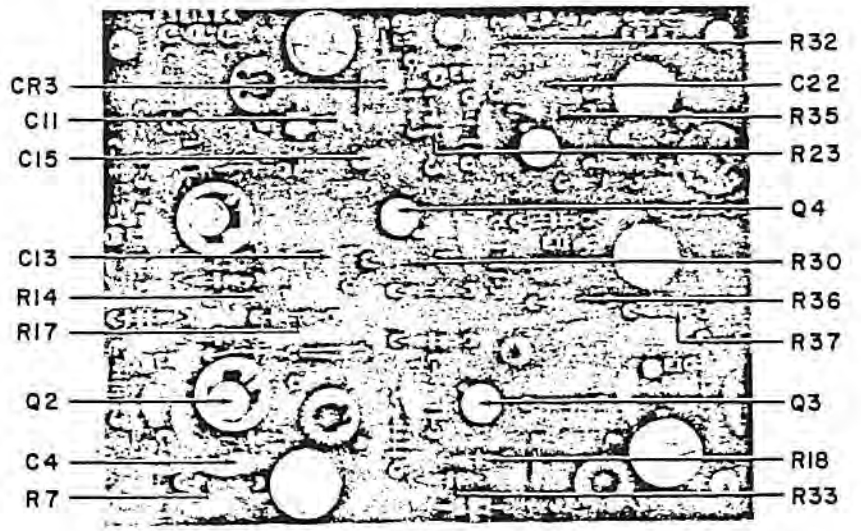

Figure 7-13. Type 72198 IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| CR1 | DIODE | 2 | 1N462A | 80131 |
| CR2 | Same as CR1 | | | |
| E1 | TERMINAL, FEEDTHRU | 1 | SFU-16 | 04013 |
| FL1 | FILTER, BAND-PASS: 21.4 CF, 100 kHz, BW | 1 | 6063674 | 74306 |
| FL2 | FILTER, BAND-PASS: 21.4 CF, 20 kHz, BW | 1 | 6053653 | 74306 |
| J1 | CONNECTOR, RECEPTACLE, MB SERIES | 6 | 46025 | 74868 |
| J2 | Same as J1 | | | |
| J3 | Same as J1 | | | |
| J4 | Same as J1 | | | |
| J5 | Same as J1 | | | |
| J6 | Same as J1 | | | |
| MP1 | COVER | 1 | 21391-1 | 14632 |
| MP2 | COVER | 1 | 21466-1 | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M10P-LSH19C | 81312 |
| R1 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 1 | CB4705 | 01121 |

7.12.3.1 Part 14264 Input IF Amplifier REF DESIG PREFIX A7A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 5 | SM(.001 μF, GMV) | 91418 |
| C2 | Same as C1 | | | |
| C3 | CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 50V | 13 | C023B101F103M | 56289 |
| C4 | Same as C3 | | | |
| C5 | Same as C3 | | | |
| C6 | CAPACITOR, DIPPED MICA: 56 pF, 5%, 500V | 1 | CM05E560J03 | 81349 |
| C7 | CAPACITOR, VARIABLE, CERAMIC: 7-25 pF, 350V (TC-N300) | 3 | 538-011-93B | 72982 |
| C8 | Same as C3 | | | |
| C9 | CAPACITOR, COMPOSITION, TUBULAR: 1.2 pF, 10%, 500V | 1 | QC(1.2 pF, 10%) | 95121 |
| C10 | Same as C7 | | | |
| C11 | CAPACITOR, DIPPED MICA: 62 pF, 5%, 500V | 1 | CM05E620J03 | 81349 |
| C12 | CAPACITOR, DIPPED MICA: 330 pF, 5%, 500V | 1 | CM05F331J03 | 81349 |
| C13 | Same as C1 | | | |
| C14 | Same as C1 | | | |
| C15 | Same as C1 | | | |
| C16 | CAPACITOR, COMPOSITION, TUBULAR: 2.2 pF, 10%, 500V | 1 | QC(2.2 pF, 10%) | 95121 |
| C17 | Same as C3 | | | |
| C18 | Same as C3 | | | |
| C19 | Same as C3 | | | |
| C20 | CAPACITOR, DIPPED MICA: 36 pF, 5%, 500V | 1 | CM05E360J03 | 81349 |
| C21 | Same as C3 | | | |
| C22 | Same as C3 | | | |
| C23 | Same as C3 | | | |
| C24 | Same as C7 | | | |
| C25 | Same as C3 | | | |
| C26 | Same as C3 | | | |
| C27 | Same as C3 | | | |
| CR1 | DIODE | 2 | 1N462A | 80131 |
| CR2 | Same as CR1 | | | |
| CR3 | DIODE | 1 | 1N198 | 80131 |
| L1 | COIL, FIXED | 2 | 20681-10 | 14632 |
| L2 | Same as L1 | | | |
| Q1 | TRANSISTOR | 2 | 3N140 | 80131 |
| Q2 | Same as Q1 | | | |

REF DESIG PREFIX A7A1



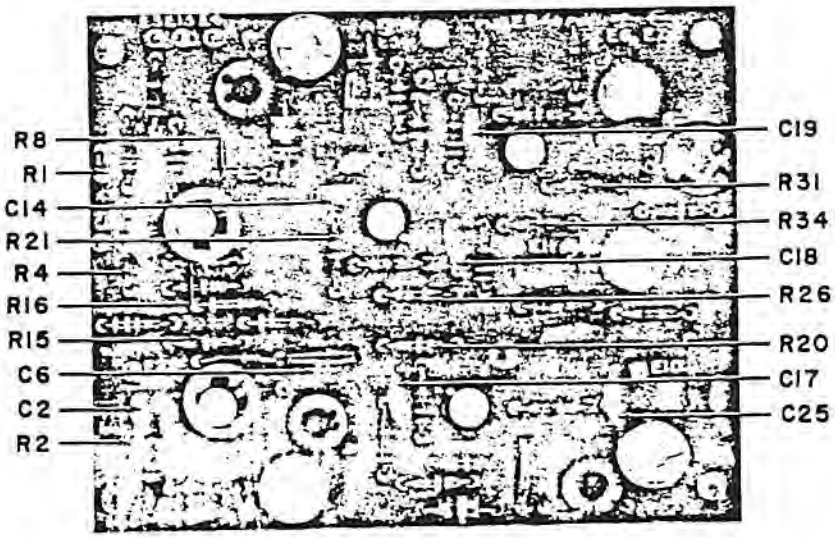




Figure 7-14. Part 14264 Input IF Amplifier, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| Q3 | TRANSISTOR | 3 | 2N3478 | 80131 |
| Q4 | Same as Q3 | | | |
| Q5 | Same as Q3 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 51 Ω, 5%, 1/4W | 2 | CB5105 | 01121 |
| R2 | Same as R1 | | | |
| R3 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 4 | CB1545 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 2 | CB1035 | 01121 |
| R5 | Same as R3 | | | |
| R6 | Same as R4 | | | |
| R7 | RESISTOR, FIXED, COMPOSITION: 300 Ω, 5%, 1/4W | 1 | CB3015 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 4 | CB1005 | 01121 |
| R9 | Same as R8 | | | |
| R10 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 2 | CB4725 | 01121 |
| R11 | RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W | 2 | CB3335 | 01121 |
| R12 | NOT USED | | | |
| R13 | Same as R11 | | | |
| R14 | Same as R10 | | | |
| R15 | Same as R3 | | | |
| R16 | Same as R3 | | | |
| R17 | RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W | 1 | CB4715 | 01121 |
| R18 | RESISTOR, FIXED, COMPOSITION: 27 kΩ, 5%, 1/4W | 6 | CB2735 | 01121 |
| R19 | Same as R18 | | | |
| R20 | RESISTOR, FIXED, COMPOSITION: 18 kΩ, 5%, 1/4W | 3 | CB1835 | 01121 |
| R21 | Same as R20 | | | |
| R22 | Same as R18 | | | |
| R23 | Same as R20 | | | |
| R24 | RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W | 3 | CB3925 | 01121 |
| R25 | Same as R24 | | | |
| R26 | RESISTOR, FIXED, COMPOSITION: 56 Ω, 5%, 1/4W | 1 | CB5605 | 01121 |
| R27 | Same as R24 | | | |
| R28 | Same as R8 | | | |
| R29 | RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W | 1 | CB3315 | 01121 |
| R30 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 1 | CB1015 | 01121 |
| R31 | Same as R8 | | | |
| R32 | RESISTOR, FIXED, COMPOSITION: 150 Ω, 5%, 1/4W | 1 | CB1515 | 01121 |

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| R33 | Same as R18 | | | |
| R34 | Same as R18 | | | |
| R35 | Same as R18 | | | |
| R36 | RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W | 2 | CB2215 | 01121 |
| R37 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 3 | CB1025 | 01121 |
| R38 | Same as R36 | | | |
| R39 | Same as R37 | | | |
| R40 | Same as R37 | | | |
| T1 | TRANSFORMER | 1 | 20937-6 | 14632 |
| XQ1 | SOCKET, TRANSISTOR | 2 | 22-16-4 | 81073 |
| XQ2 | Same as XQ1 | | | |

REF DESIG PREFIX A7A1

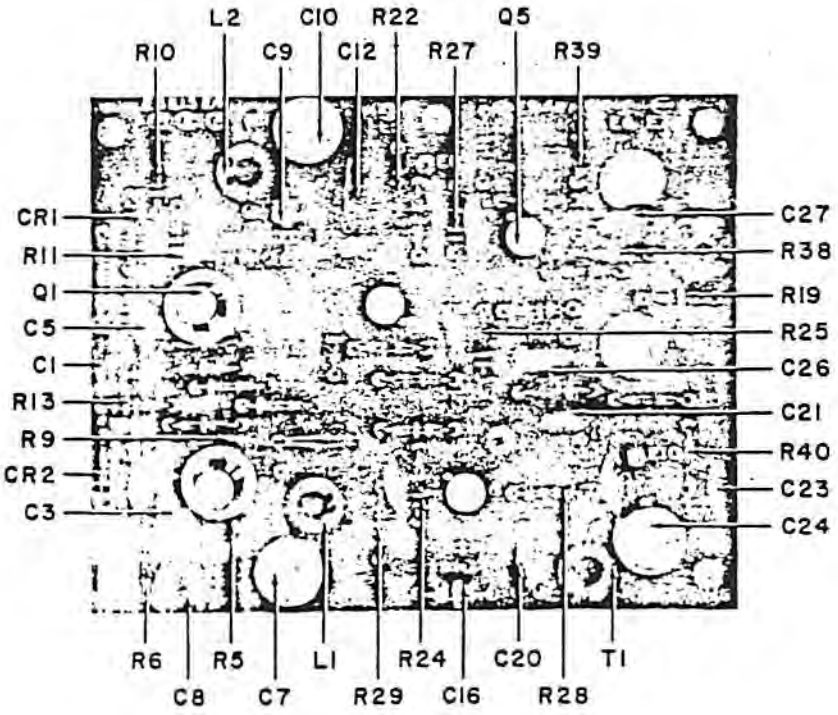



Figure 7-15. Part 14264 Input IF Amplifier, Component Locations

7.12.4 Type 71227 10-30 MHz Tuning Assembly REF DESIG PREFIX A16

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | RF CHASSIS, 10-30 MHz | 1 | 71223 | 14632 |
| A2 | GEAR TRAIN | 1 | 8500A | 14632 |
| P1 | CONNECTOR, PLUG, MULTIPIN | 1 | M10P-LSH19C | 14632 |
| W1 | CABLE AND CONNECTOR ASSEMBLY | 1 | | 14632 |

REF DESIG PREFIX A16

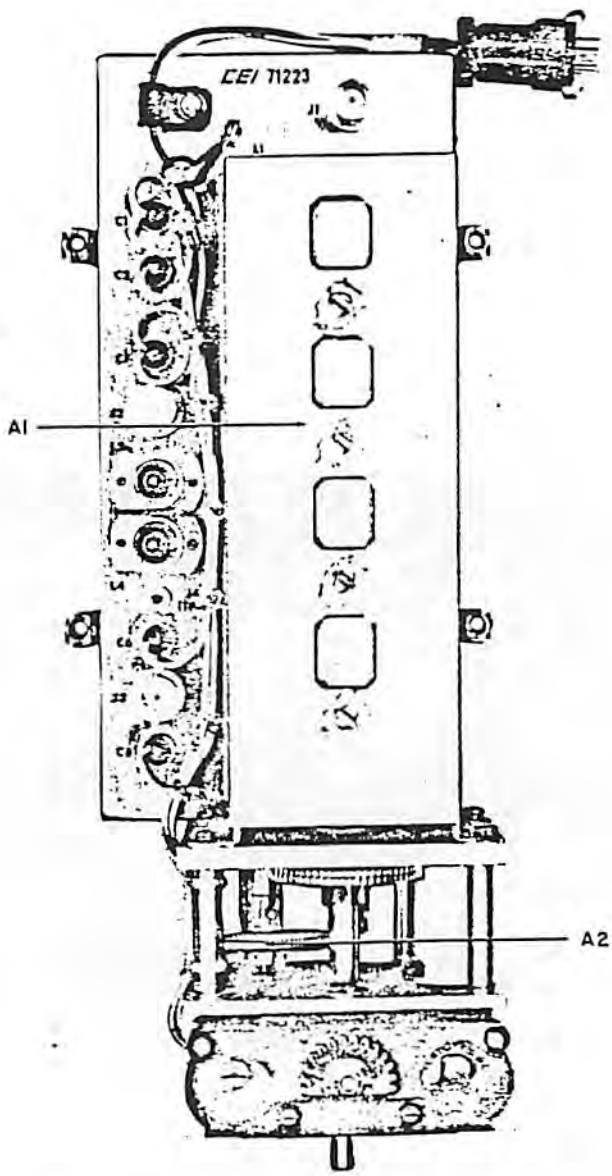



Figure 7-16. Type 71227 10-30-MHz Tuning Assembly, Component Locations

7.12.4.1 Type 71223 10-30 MHz Tuner

REF DESIG PREFIX A16A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| A1 | RF AMPLIFIER | 1 | 14420 | 14632 |
| A2 | INTERSTAGE MIXER | 1 | 14422 | 14632 |
| A3 | OSCILLATOR/BUFFER | 1 | 14424 | 14632 |
| C1 | CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V | 6 | FA5C-102W | 01121 |
| C2 | Same as C1 | | | |
| C3 | Same as C1 | | | |
| C4 | CAPACITOR, DIPPED MICA: 36 pF, 5%, 500V | 1 | CM05E360J03 | 81349 |
| C5 | CAPACITOR, CERAMIC, STANDOFF: 1000 pF, 5%, 500V | 1 | SS5A-102W | 01121 |
| C6 | Same as C1 | | | |
| C7 | Same as C1 | | | |
| C8 | Same as C1 | | | |
| C9 | CAPACITOR, CERAMIC, DISC: 0.005 μF, 20%, 100V | 1 | C023B101E502M | 56289 |
| C10 | CAPACITOR, CERAMIC, TUBULAR: 3.9 pF, ± .25 pF, 500V | 1 | 301-000-COJO-399C | 72982 |
| C11 | CAPACITOR, DIPPED MICA: 33 pF, 5%, 500V | 1 | CM05E330J03 | 81349 |
| C12 | CAPACITOR, CERAMIC, FEEDTHRU: 33 pF, 10%, 500V | 2 | FA5C-3301 | 01121 |
| C13 | CAPACITOR, DIPPED MICA: 100 pF, 5%, 500V | 1 | CM05F101J03 | 81349 |
| C14 | CAPACITOR, CERAMIC, DISC: 470 pF, 20%, 1000V | 2 | B(.00047μF, 20%) | 91418 |
| C15 | Same as C14 | | | |
| C16 | Same as C12 | | | |
| FB1 | FERRITE BEAD | 4 | 56-590-65/4A | 02114 |
| FB2 | Same as FB1 | | | |
| FB3 | Same as FB1 | | | |
| FB4 | Same as FB1 | | | |
| J1 | CONNECTOR, JACK, BNC SERIES | 3 | UG-1094/U | 81349 |
| J2 | Same as J1 | | | |
| J3 | Same as J1 | | | |
| J4 | CONNECTOR, TEST JACK | 1 | TJ-6 | 04013 |
| L1 | INDUCTUNER | 1 | 2027-2 | 14632 |
| L2 | COIL, FIXED | 1 | 1131-31 | 14632 |
| L3 | COIL, FIXED | 1 | 1131-41 | 14632 |
| L4 | COIL, VARIABLE | 2 | 1472-15 | 14632 |
| L5 | Same as L4 | | | |
| MP1 | COVER | 1 | 21511-1 | 14632 |
| MP2 | COVER | 1 | 21512-1 | 14632 |
| Q1 | TRANSISTOR | 2 | 3N140 | 80131 |

REF DESIG PREFIX A16A1

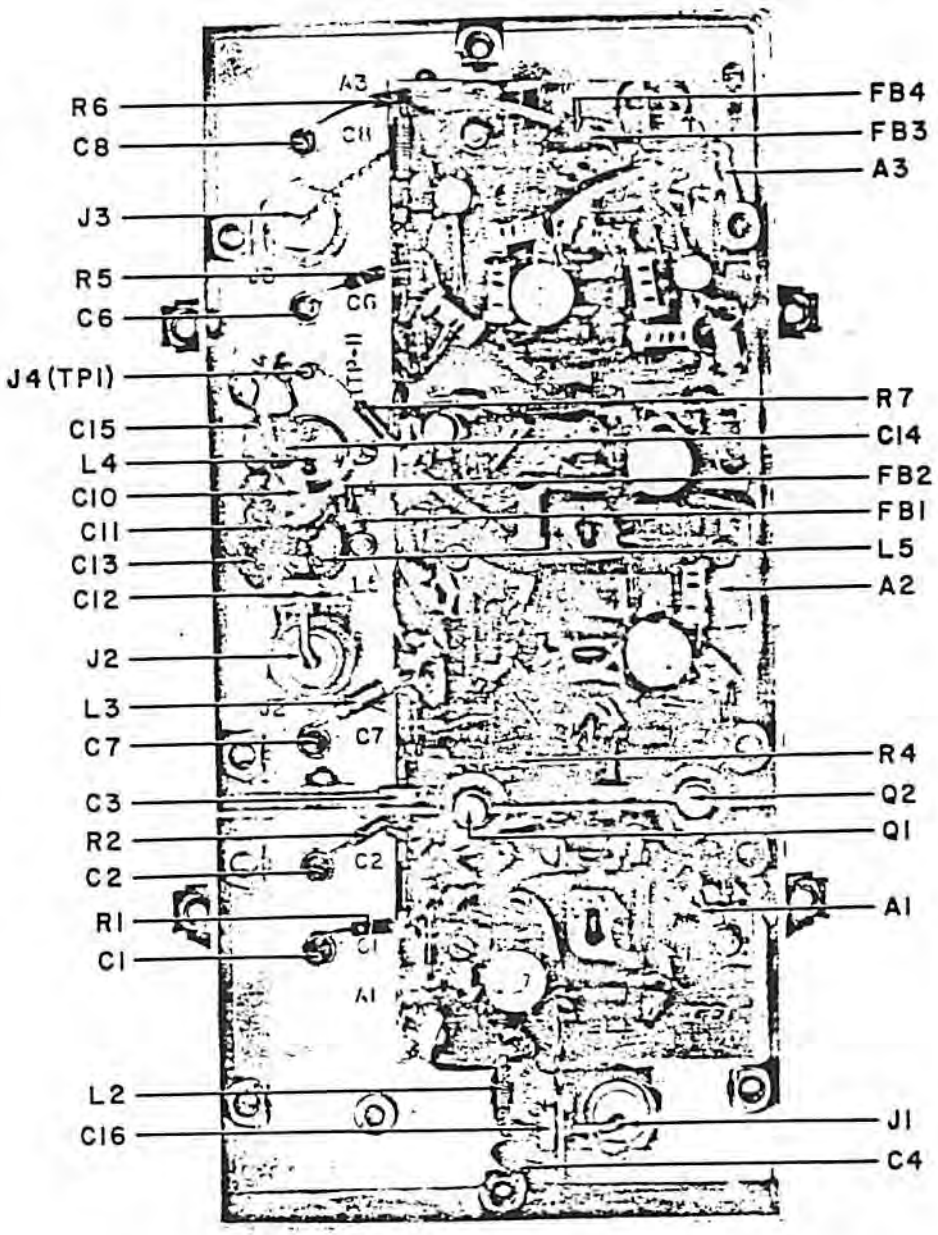



Figure 7-17. Type 71223 10-30-MHz RF Tuner, Component Locations

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| Q2 | Same as Q1 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 1 | CB1545 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W | 1 | CB4725 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W | 1 | CB3335 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 1 | CB1005 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W | 1 | CB1045 | 01121 |
| R6 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 1 | CB4705 | 01121 |
| R7 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 1 | CB2225 | 01121 |

7.12.4.1.1 Part 14420 RF Amplifier

REF DESIG PREFIX A16A1A1

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, DIPPED MICA: 180 pF, 5%, 500V | 1 | CM05F181J03 | 81349 |
| C2 | CAPACITOR, DIPPED MICA: 360 pF, 5%, 500V | 1 | CM05F361J03 | 81349 |
| C3 | CAPACITOR, DIPPED MICA: 250 pF, 5%, 500V | 1 | CM05F251J03 | 81349 |
| C4 | CAPACITOR, VARIABLE, CERAMIC: 9-35 pF (TC-N650) | 1 | 538-011-110D | 72982 |
| C5 | CAPACITOR, DIPPED MICA: 1000 pF, 5%, 100V | 1 | DM15-102J | 72136 |
| C6 | CAPACITOR, CERAMIC DISC: 0.005 μF, 20%, 100V | 2 | C023B101E502M | 56289 |
| C7 | Same as C6 | | | |
| CR1 | DIODE | 1 | 1N462A | 80131 |
| L1 | COIL, FIXED | 1 | 21210-6 | 14632 |
| L2 | COIL, FIXED | 1 | 21210-7 | 14632 |
| R1 | RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W | 1 | CB1045 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 1 | CB1035 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 300 Ω, 5%, 1/4W | 2 | CB3015 | 01121 |
| R4 | Same as R3 | | | |
| R5 | RESISTOR, FIXED, COMPOSITION: 2.4 kΩ, 5%, 1/4W | 1 | CB2425 | 01121 |

REF DESIG PREFIX A16A1A1

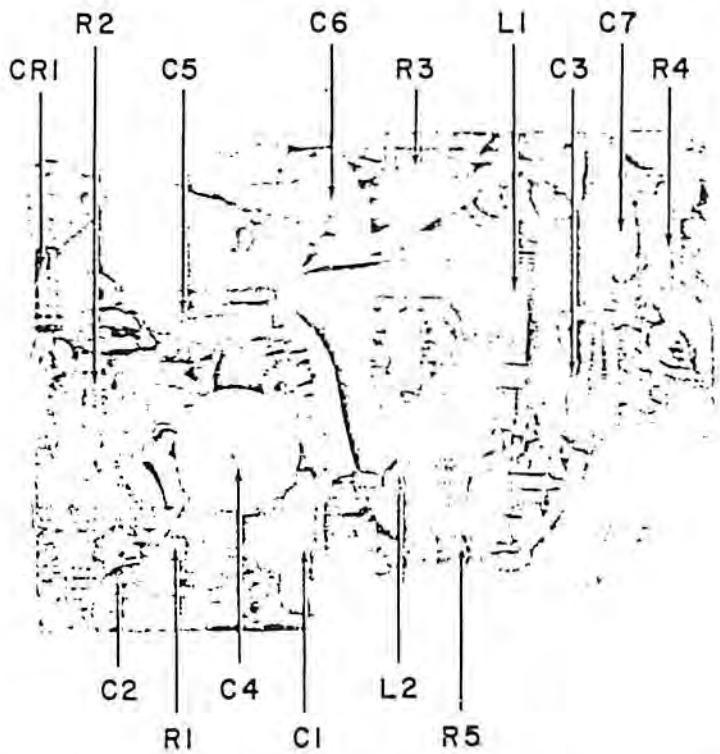



Figure 7-18. Part 14420 RF Amplifier, Component Locations

7.12.4.1.2 Part 14422 Interstage/Mixer REF DESIG PREFIX A16A1A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, VARIABLE, CERAMIC: 9-35 pF (TC-N650) | 2 | 538-011-110D | 72982 |
| C2 | CAPACITOR, DIPPED MICA: 130 pF, 5%, 500V | 1 | CM05F131J03 | 81349 |
| C3 | CAPACITOR, CERAMIC, DISC: 0.005 μF, 20%, 100V | 2 | C023B101E502M | 56289 |
| C4 | CAPACITOR, DIPPED MICA: 160 pF, 5%, 500V | 2 | CM05F161J03 | 81349 |
| C5 | CAPACITOR, CERAMIC, TUBULAR: 10 pF, ± .5 pF, 500V | 1 | 301-000-COHO-100D | 72982 |
| C6 | CAPACITOR, DIPPED MICA: 120 pF, 5%, 500V | 3 | CM05F121J03 | 81349 |
| C7 | CAPACITOR, DIPPED MICA: 100 pF, 5%, 500V | 1 | CM05F101J03 | 81349 |
| C8 | Same as C6 | | | |
| C9 | Same as C4 | | | |
| C10 | Same as C6 | | | |
| C11 | Same as C1 | | | |
| C12 | Same as C3 | | | |
| C13 | CAPACITOR, CERAMIC, TUBULAR: 3.6 pF, ± .25 pF, 500V | 1 | 301-000-COJO-369C | 72982 |
| C14 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 1 | SM(.001μF, GMV) | 91418 |
| C15 | CAPACITOR, DIPPED MICA: 24 pF, 5%, 500V | 1 | CM05E240J03 | 81349 |
| L1 | COIL, FIXED | 2 | 21210-8 | 14632 |
| L2 | COIL, FIXED | 1 | 21210-11 | 14632 |
| L3 | Same as L1 | | | |
| Q1 | TRANSISTOR | 1 | 3N128 | 80131 |
| R1 | RESISTOR, FIXED, COMPOSITION: 2.7 Ω, 5%, 1/4W | 2 | CB27G5 | 01121 |
| R2 | Same as R1 | | | |
| R3 | RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W | 1 | CB1545 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 3.0 Ω, 5%, 1/4W | 2 | CB30G5 | 01121 |
| R5 | RESISTOR, FIXED, COMPOSITION: 300 Ω, 5%, 1/4W | 1 | CB3015 | 01121 |
| R6 | Same as R4 | | | |
| R7 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 1 | CB1025 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 1 | CB2225 | 01121 |
| R9 | NOT USED | | | |
| R10 | RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W | 1 | CB1005 | 01121 |
| T1 | TRANSFORMER | 1 | 11464-16 | 14632 |

REF DESIG PREFIX A16A1A2

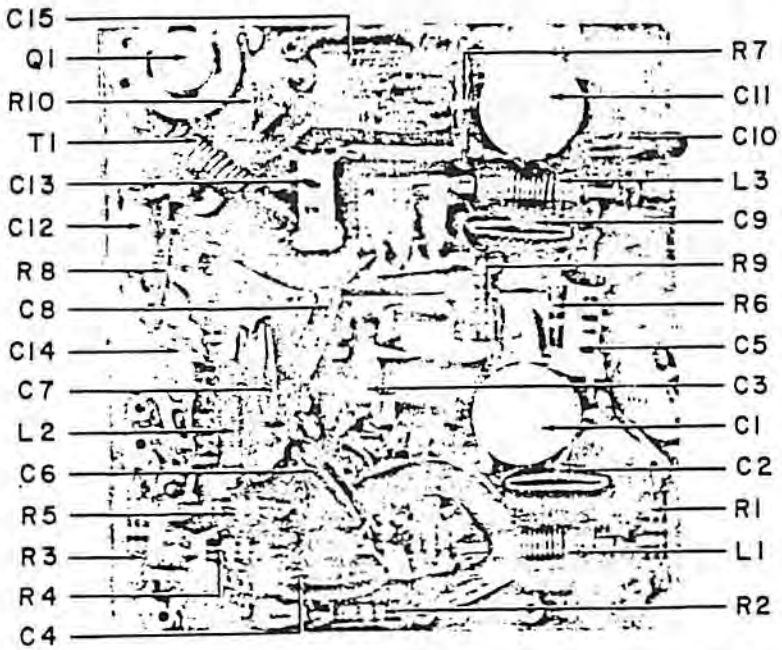



Figure 7-19. Part 14422 Interstage/Mixer, Component Locations

REF DESIG PREFIX A16A1A3

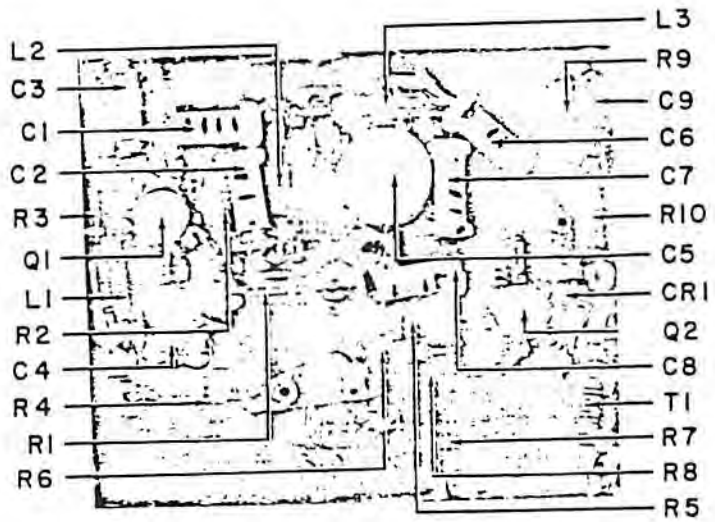



Figure 7-20. Part 14424 Oscillator/Buffer, Component Locations

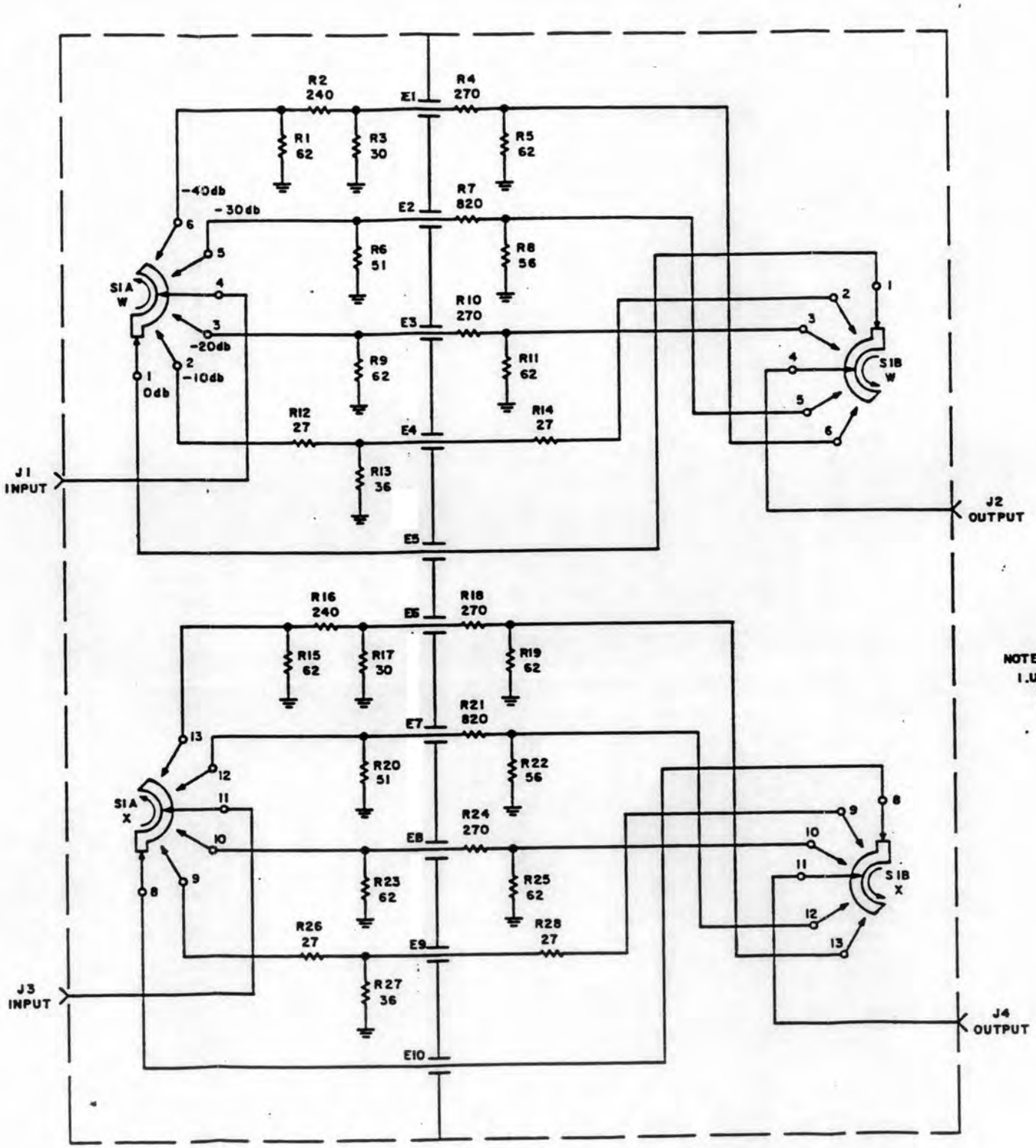
7.12.4.1.3 Part 14424 Oscillator/Buffer REF DESIG PREFIX A16A1A3

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| C1 | CAPACITOR, CERAMIC, TUBULAR: 10 pF, ±.5 pF, 500V | 1 | 301-000-COHO-100D | 72982 |
| C2 | CAPACITOR, CERAMIC, TUBULAR: 5 pF, ±.5 pF, 500V (TC-N150) | 1 | 301-000-P2HO-509D | 72982 |
| C3 | CAPACITOR, CERAMIC, TUBULAR: 3.9 pF, ±.25 pF, 500V | 1 | 301-000-COJO-399C | 72982 |
| C4 | CAPACITOR, CERAMIC, DISC: 0.001 μF, GMV, 500V | 2 | SM(.001μF, GMV) | 91418 |
| C5 | CAPACITOR, VARIABLE, CERAMIC: 2-8 pF, 350V | 1 | 538-011-89A | 72982 |
| C6 | CAPACITOR, CERAMIC, TUBULAR: 1 pF, ±.1 pF, 500V (TC-N1500) | 1 | 301-000-P3KO-109B | 72982 |
| C7 | CAPACITOR, CERAMIC, TUBULAR: 2.2 pF, ±.25 pF, 500V | 1 | 301-000-COJO-229C | 72982 |
| C8 | CAPACITOR, CERAMIC, TUBULAR: 18 pF, 5%, 500V | 1 | 301-000-COGO-180J | 72982 |
| C9 | Same as C4 | | | |
| CR1 | DIODE, CAPACITOR | 1 | V27E | 01281 |
| L1 | COIL, FIXED | 1 | 21209-1 | 14632 |
| L2 | COIL, FIXED | 1 | 21210-28 | 14632 |
| L3 | COIL, FIXED | 1 | 21210-10 | 14632 |
| Q1 | TRANSISTOR | 2 | 2N3478 | 80131 |
| Q2 | Same as Q1 | | | |
| R1 | RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W | 1 | CB2225 | 01121 |
| R2 | RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W | 2 | CB4705 | 01121 |
| R3 | RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W | 1 | CB1045 | 01121 |
| R4 | RESISTOR, FIXED, COMPOSITION: 1 kΩ, 5%, 1/4W | 1 | CB1025 | 01121 |
| R5 | Same as R2 | | | |
| R6 | RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W | 1 | CB1035 | 01121 |
| R7 | RESISTOR, FIXED, COMPOSITION: 18 kΩ, 5%, 1/4W | 1 | CB1835 | 01121 |
| R8 | RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W | 1 | CB1015 | 01121 |
| R9 | RESISTOR, FIXED, COMPOSITION: 820 Ω, 5%, 1/4W | 1 | CB8215 | 01121 |
| R10 | RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W | 1 | CB2215 | 01121 |
| T1 | TRANSFORMER | 1 | 11464-16 | 14632 |

7.12.4.2 Type 8500A Gear Train REF DESIG PREFIX A16A2

| Ref Desig | Description | Qty Per Assy | Vendor Part No. | Vendor Code |
|---|---|---|---|---|
| DS1 | LAMP, INCANDESCENT: 5V, 0.06A | 3 | CM8-683 | 71744 |
| DS2 | Same as DS1 | | | |
| DS3 | Same as DS1 | | | |
| --- | For Mechanical Parts See Exploded View | | | |

REF DESIG PREFIX A1




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

Figure 7-27. Type 79366 Input Attenuator, Schematic Diagram

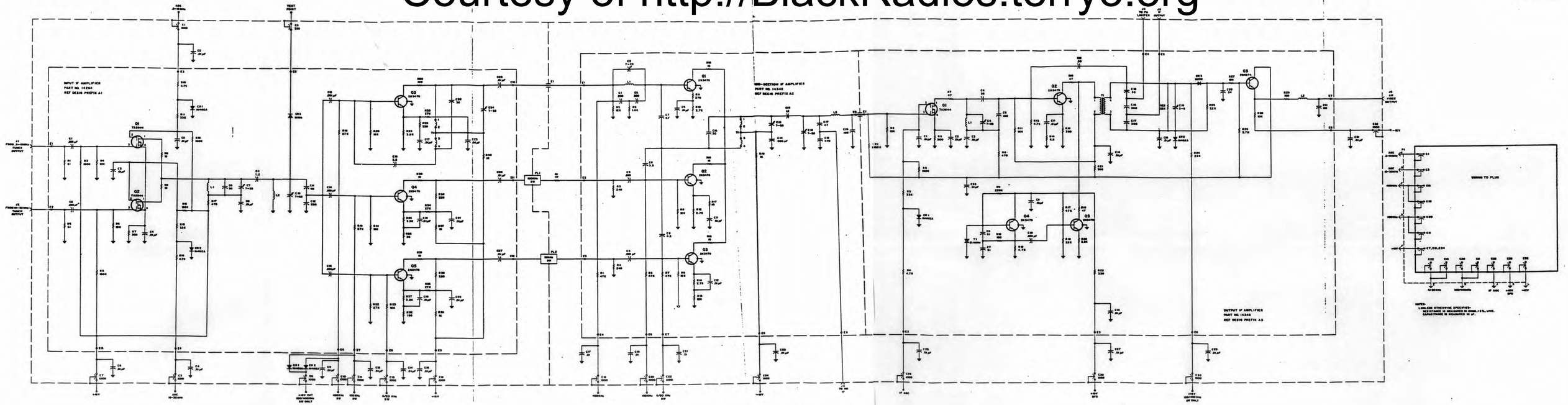



Figure 7-28. Type 72198 21.4-MHz IF Amplifier, Schematic Diagram

REF DESIG PREFIX A16

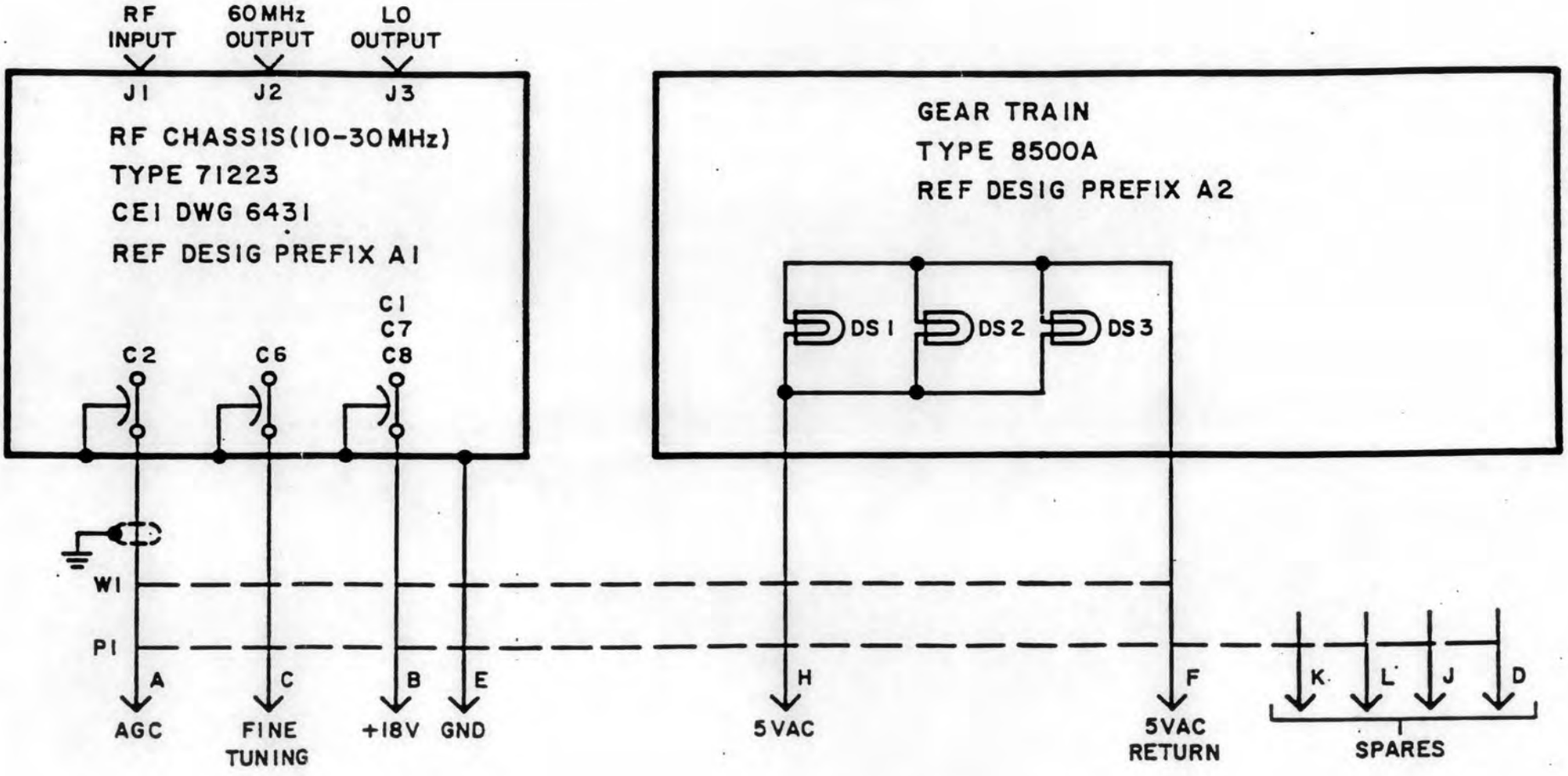
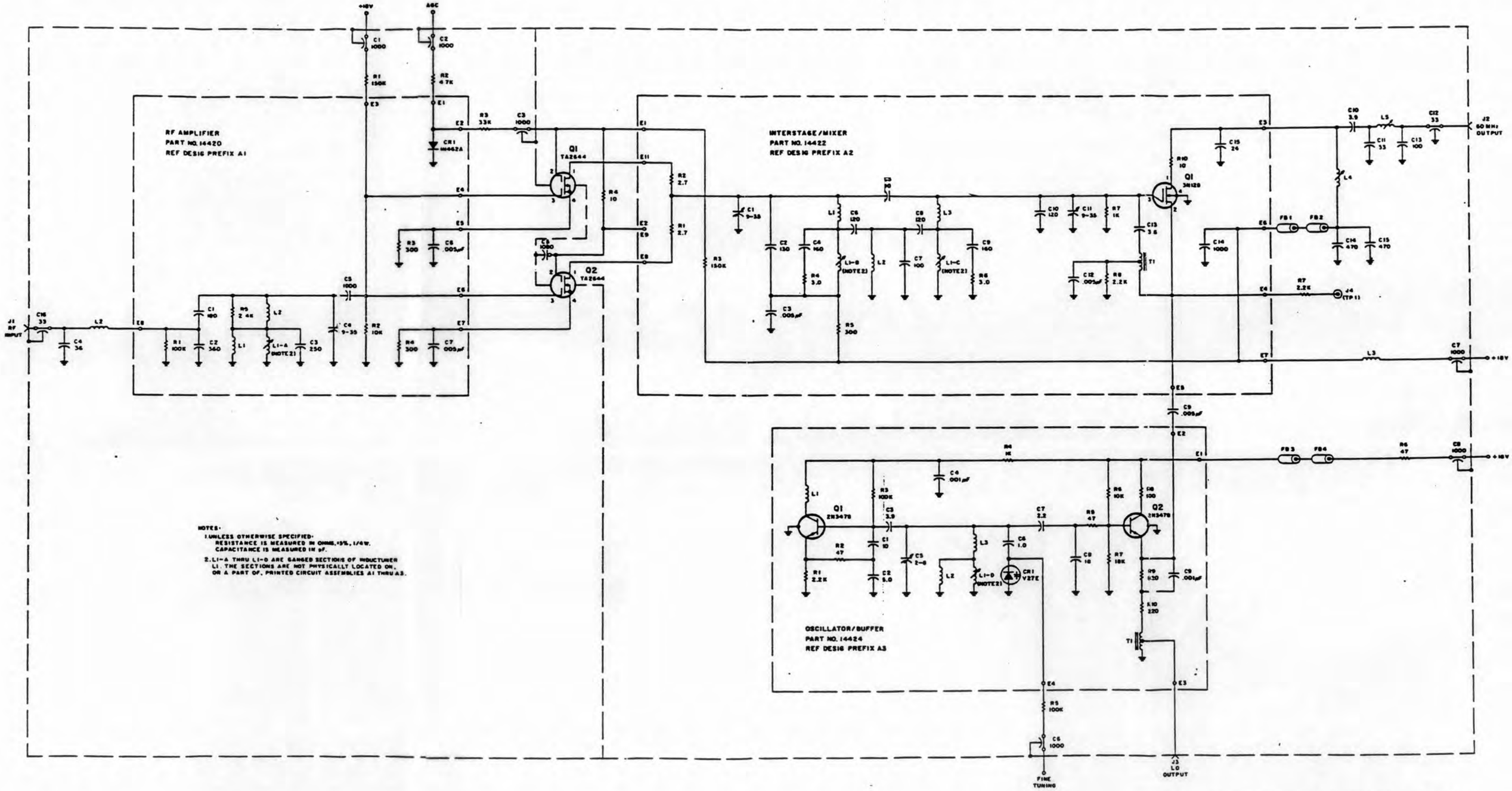



Figure 7-29. Type 71227 10-30-MHz Tuning Assembly, Schematic Diagram

REF DESIG PREFIX A16A1




NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   CAPACITANCE IS MEASURED IN pF.
2. L1-A THRU L1-D ARE GANGED SECTIONS OF INDUCTUNER L1. THE SECTIONS ARE NOT PHYSICALLY LOCATED ON, OR A PART OF, PRINTED CIRCUIT ASSEMBLIES A1 THRU A3.

Figure 7-30. Type 71223 10-30-MHz RF Tuner, Schematic Diagram

REF DESIG PREFIX A17

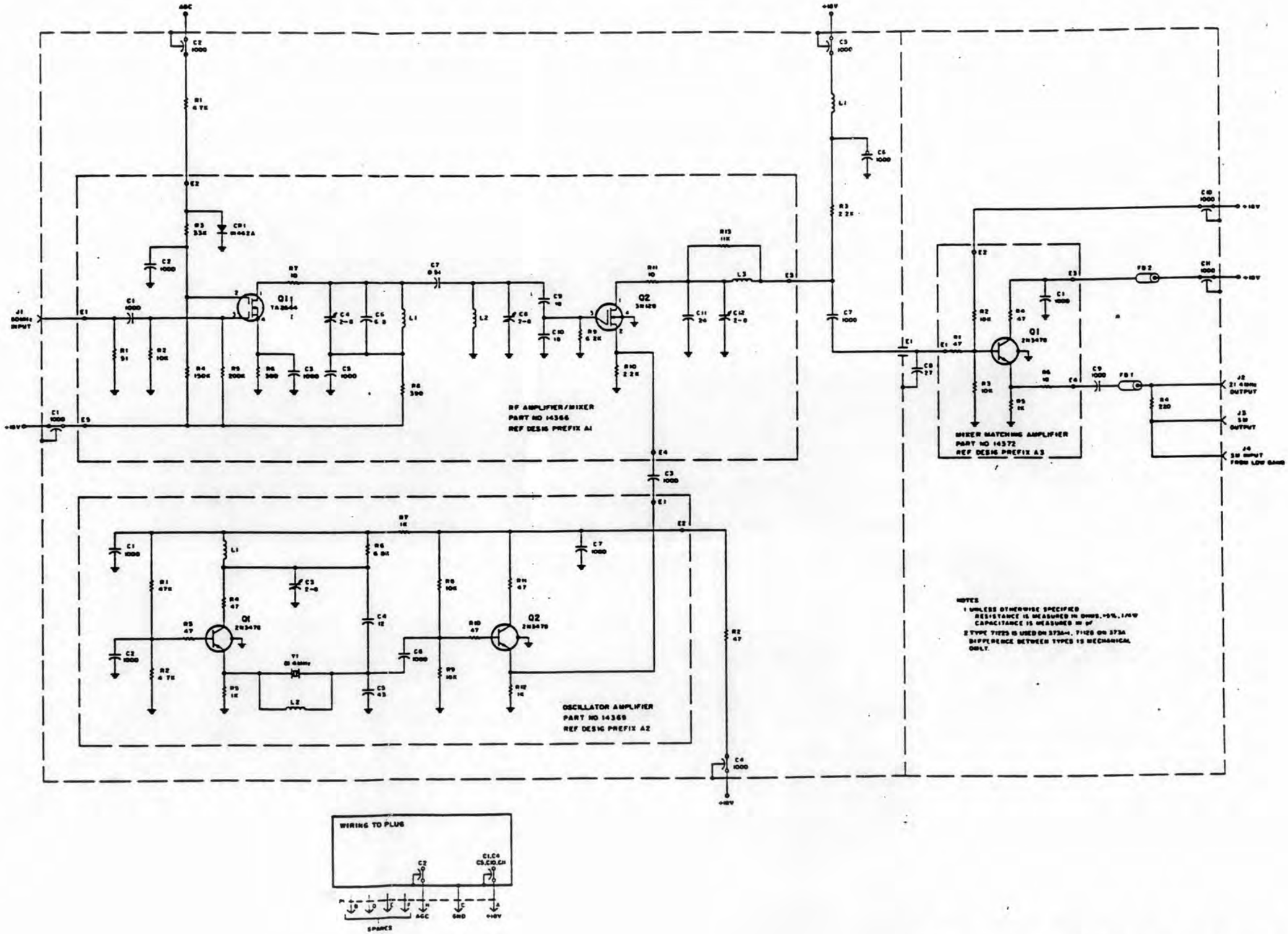
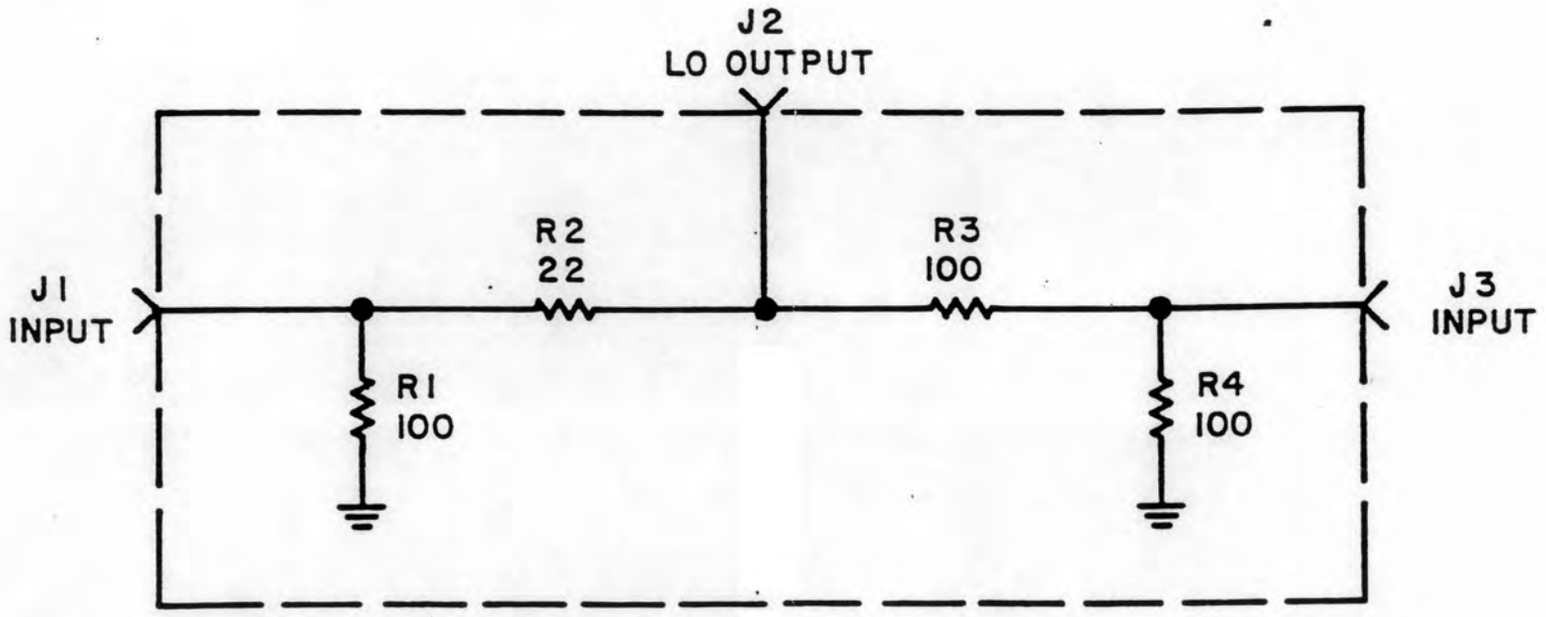



Figure 7-31. Type 71228 60-21.4-MHz Converter, Schematic Diagram

REF DESIG PREFIX A18




NOTES:

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

Figure 7-32. Type 79357 Coupling Assembly, Schematic Diagram

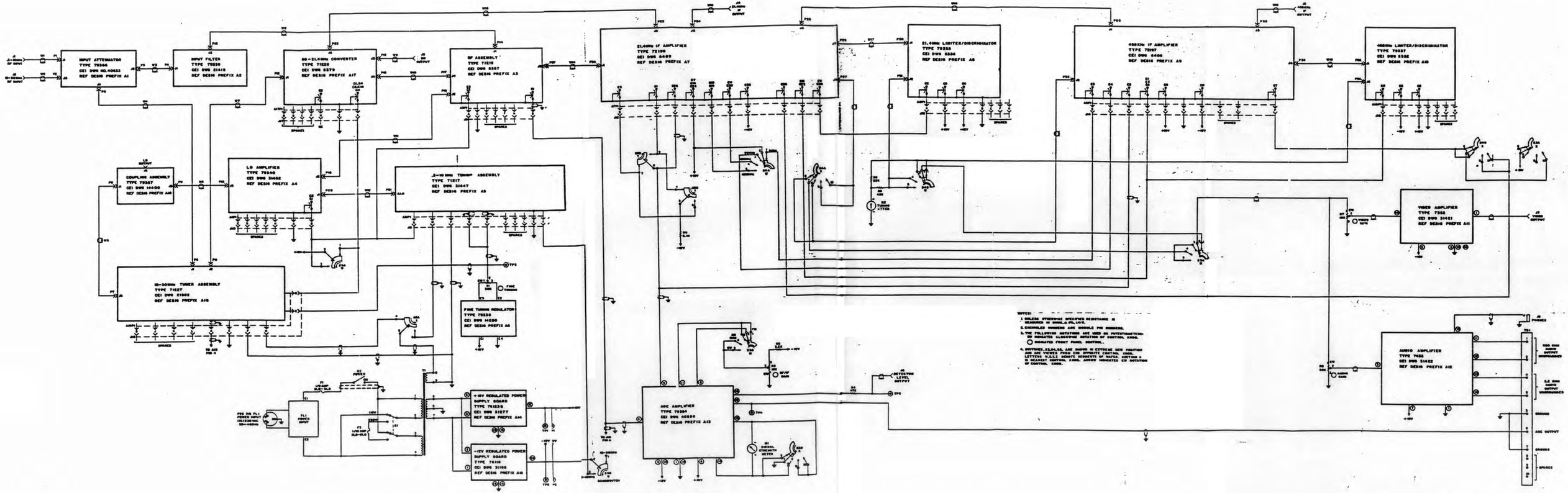



Figure 7-33. Type 373A Receiver, Main Chassis Schematic Diagram