

## Errata

**Title & Document Type:** 5110B Synthesizer Driver Operating and Service Manual

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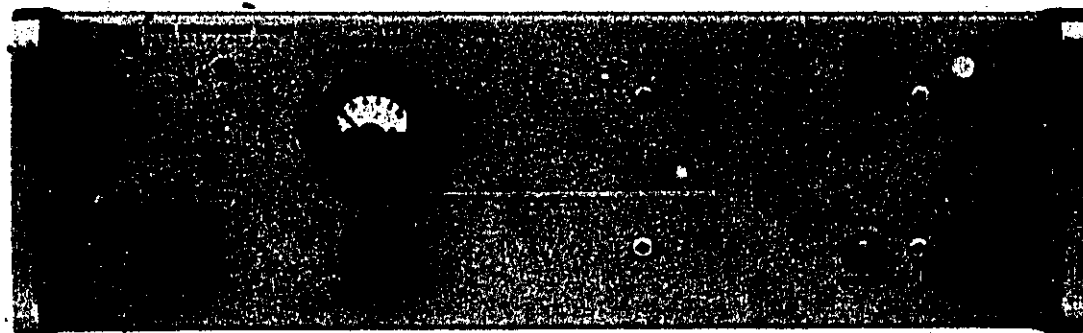
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**Agilent Technologies**

OPERATING AND SERVICE MANUAL

**SYNTHESIZER  
DRIVER  
5110B**



HEWLETT  PACKARD

## **CERTIFICATION**

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# **SYNTHESIZER DRIVER 5110B**

## **SERIALS PREFIXED: 1048A**

This manual applies directly to HP Model 5110B Synthesizer Drivers with serial number prefix 1048A. See Paragraph 1-7 for serial numbering system.

## **MANUAL CHANGES AND OPTIONS**

Options 01 through 04 (multiple outputs for driving up to four Frequency Synthesizers) are discussed in Section VII. Older 5110B instruments are also documented in Section VII.

## **MODEL 5110A**

The Model 5110A Frequency Synthesizer is similar to the Model 5110B, and this Operating and Service Manual also applies to Model 5110A instruments. Differences are explained in Section VIII at the back of this manual.

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## MANUAL CONTENT

This manual is supplied to help you make the best use of your Synthesizer Driver. The manual covers nine sections of information as follows:

Section I is an introduction to the instrument. Electrical and mechanical specifications are given, plus information on accessories and applications.

Section II covers inspection, power, mounting, packing, shipping, and connection.

Section III outlines operating procedures.

Section IV discusses technical details of circuit operation.

Section V provides performance check, troubleshooting, and adjustment procedures.

Section VII includes information on instrument options.

Section VIII is backdating information for older Model 5110A instruments.

Section IX contains circuit diagrams with component location.

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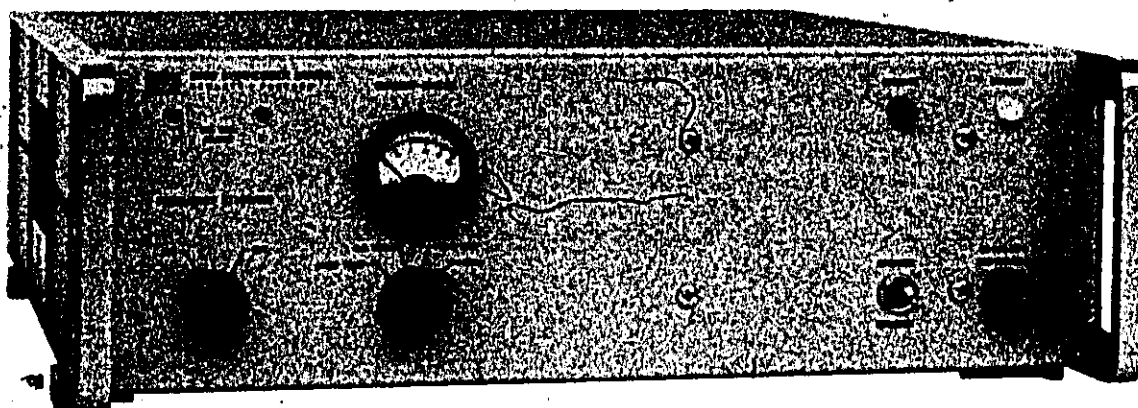
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**model 5110B**



**power cord**



**rack mounting kit**



Figure 1-1. Model 5110B and Accessories

## SECTION I GENERAL INFORMATION

### 1-1. INTRODUCTION.

#### 1-2. DESCRIPTION.

1-3. The Hewlett-Packard Model 5110B Synthesizer Driver (Figure 1-1) is part of a frequency synthesizer system consisting of the 5110B and the Hewlett-Packard Model 5105A Frequency Synthesizer.

1-4. The Synthesizer Driver provides the 22 fixed frequencies necessary to drive the 5105A. The Driver derives all these frequencies from an internal 1 Mc frequency standard which is stable to  $\pm 3$  parts in  $10^9$  per day. The filtered 1 Mc signal is fed to a comb or harmonic generator:

1-5. Immediately after the harmonic generator, the third harmonic is filtered off, amplified, and re-filtered. The remainder of the harmonic rich signal is passed through a 24 to 39 Mc bandpass filter, amplified, and then fed to active filtering, synchronously tuned transistor-tank stages which select out the 24 Mc and 30 through 39 Mc components. The filtered components lying between 30 Mc and 39 Mc are also fed to frequency dividers to provide the low frequency spectrum output of 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, and 3.9 Mc.

1-6. The 5110B thus provides the 5105A Frequency Synthesizer, by means of rear panel BNC connectors, very stable and clean signals of 20 Mc, 24 Mc, 3.0 through 3.9 Mc in 100-kc steps, and 30 through 39 Mc in 1 Mc steps.

#### 1-7. INSTRUMENT IDENTIFICATION.

1-8. Hewlett-Packard uses a two-section, eight-digit serial number to identify instruments. The serial number is located on the rear panel of the instrument. The first three digits (serial prefix) identify a series of instruments; the last five digits refer to a specific instrument in that series. Later instruments use a nine-digit serial number and the last five digits refer to a specific instrument. If the first three digits of your instrument serial number do not appear on the title page of this manual, there are differences between the manual and your instrument which are described in Section VII (Serial Prefix 976 and below) or in a change sheet included with the manual. If the change sheet is missing, the information can be supplied by your nearest Hewlett-Packard field or sales office.

#### 1-9. SPECIFICATIONS.

1-10. Table 1-3 lists the technical specifications for the Model 5110B Synthesizer Driver.

### 1-11. OPTIONS.

1-12. The  $\odot$  5110B Synthesizer Driver is capable of driving up to four  $\odot$  5105A Frequency Synthesizers. The following options are available:

Option 02: outputs for driving 2  $\odot$  5105A Synthesizers  
 Option 03: outputs for driving 3  $\odot$  5105A Synthesizers  
 Option 04: outputs for driving 4  $\odot$  5105A Synthesizers

#### Note

Outputs provided for driving more than one  $\odot$  5105A Synthesizer must be terminated in 50 ohms when not connected to a synthesizer if full specified spurious performance is required. See Table 1-2 for 50-ohm terminations and special cables available.

Table 1-1. Equipment Supplied

Equipment	Description	$\odot$ Part No.
Synthesizer Driver	See Table 1-3	Model 5110B
AC Power Cable	Three conductor, 7.5 feet long	8120-1348
Rack Mount Kit	Hardware for conversion from bench to rack model	5060-0775

Table 1-3. Equipment Available

Equipment	Description	$\odot$ Part No.
Termination	50ohm BNC termination for unused outputs (see note, Paragraph 1-12)	1250-0207
Cable	Low frequency interconnect cable $\odot$ 5110B to 5105A	05105-6054
Cable	High frequency interconnect cable $\odot$ 5110B to 5105A	05100-6213
Cable	Special interconnecting cable for connecting 5110B to 5105A; available in lengths from 5 to 50 feet in multiples of 5 feet	C05-5110B specify configuration and length
Joining Bracket Kit	Brackets for joining 5105A and 5110B when stacked	5060-0216

Table 1-3. Specifications

**5110B SYNTHESIZER DRIVER****OUTPUT FREQUENCIES:**

Provides 22 fixed frequencies for the 5105A Frequency Synthesizer; 3.0 through 3.9 Mc in 0.1 Mc steps (50 mv  $\pm$  1, -3 db) 30 through 39 Mc in 1 Mc steps, 24 Mc, and 20 Mc (100 mv  $\pm$  1.5 db), 50-ohm system.

1 Mc buffered output (1 volt  $\pm$  1.5 db into a 50-ohm resistive load) available at rear panel connector.

**INTERNAL FREQUENCY STANDARD**

**TYPE:** 1 Mc Quartz Oscillator.

**AGING RATE:** Less than  $\pm$  3 parts in  $10^9$  per 24 hours.\*

**STABILITY:**

As a function of ambient temperature:  
 $\pm 2 \times 10^{-10}$  per  $^{\circ}\text{C}$  from  $0^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ .

As a function of line voltage:  
 $\pm 5 \times 10^{-11}$  for a  $\pm 10\%$  change in line voltage (rated at 115 or 230 volts rms line voltage).

**RMS FRACTIONAL FREQUENCY DEVIATION:**

Average Time	1 Mc Output Frequency
10 millisecc	$6 \times 10^{-10}$
1 sec	$1 \times 10^{-11}$

**SIGNAL-TO-PHASE NOISE RATIO:** \*\*  $> 85$  db

**SIGNAL-TO-AM NOISE RATIO:**\*\*  $> 80$  db

**HARMONIC SIGNALS:**  $> 40$  db below the output (with proper termination)

**PHASE LOCKING CAPABILITY:**

A voltage control feature allows 5 parts in  $10^8$  frequency control for -5 to +5 volts applied externally.

**EXTERNAL FREQUENCY STANDARD****INPUT REQUIREMENTS:**

1 Mc or 5 Mc, 0.2 v rms min., 5 v max across 500 ohms. Stability and spectral purity of 5105A Synthesizer will be partially determined by the characteristics of the external standard if used. Filtering is provided for broadband noise cleanup.

**WEIGHT:**

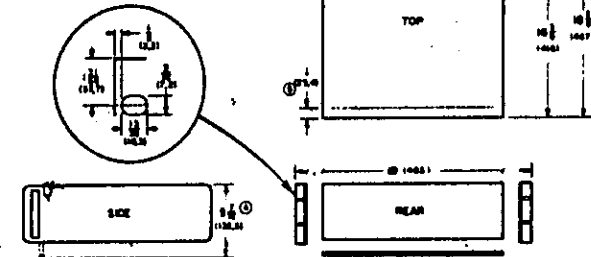
Net: 54 lbs (25 kg)  
Shipping: 60 lbs (27 kg)

\* After 72 hours of continuous operation.

\*\*In a 30 Kc band centered on the carrier, excluding a 1 cps band centered on the carrier.

**DIMENSIONS:****NOTES:**

① DIMENSIONS IN DECIMALS AND MILLIMETERS  
② SEE DRAWING FOR DIMENSIONS FROM CENTER OF FRONT PANEL TO CENTER OF REAR PANEL  
③ REAR PANEL MOUNT

**OPTIONAL FEATURES:**

The 5110B Synthesizer Driver is capable of driving up to four 5105A Frequency Synthesizers.

- Option 02: Outputs for driving two 5105A's.
- Option 03: Outputs for driving three 5105A's.
- Option 04: Outputs for driving four 5105A's.

**Note:**

1. If Option 02-04 is selected, the additional outputs must be terminated in 50 ohms when not connected to a 5105A Synthesizer if full specified spurious performance is required.

Accessory Available: 50 ohm BNC termination. Stock No. 10510A (22 required for each set of outputs not connected; e. g., max requirement would be 66 when Option 04 is selected but only one 5105A is being driven).

2. A special interconnecting cable may be required for driving additional 5105A Synthesizers. If a special length cable assembly is required, order spec C05-5110A. Specify configuration and length (max separation 50 feet). Cable is supplied in 5-foot sections only.
3. Small phase jumps (less than 1 radian) will be experienced on one 5105A output when another 5105A, connected to the same 5110B, is switched from one frequency to another.

**GENERAL**

**OPERATING TEMP RANGE:**  $0^{\circ}$  to  $55^{\circ}\text{C}$ .

**INTERFERENCE:** Complies with MIL-I-26600, Class 1 and 3, MIL-I-6181D. \*\*\*

**SUSCEPTIBILITY:** Complies with MIL-I-26600, Class 1 and 3, MIL-I-6181D.

**POWER:** 115 or 230 v  $\pm 10\%$ , 50 to 400 cycles, 35 watts.

\*\*\*Interference compliance requires that the and 5110B are connected by a low inductance path such as adjacent rack mounting.

# INSTALLATION

## SECTION II INSTALLATION

### 2-1. INITIAL INSPECTION.

2-2. **Mechanical Check.** If damage to the shipping carton is evident, ask that the carrier's agent be present when the instrument is unpacked. Inspect the instrument for mechanical damage (scratches, dents, broken knobs, etc.) Also check the cushioning material for signs of severe stress.

2-3. **Performance Check.** The electrical performance of Model 5110B should be verified as soon as possible after receipt. A performance check that is suitable for incoming inspection is given in Paragraph 5-5.

2-4. **Claim for Damage.** If Model 5110B is mechanically damaged or fails to meet specifications on receipt, notify the carrier and the nearest Hewlett-Packard field office immediately. (A list of field offices is at the back of this manual.) Retain the shipping carton and the padding material for the carrier's inspection. The field office will arrange for the repair or replacement of your instrument without waiting for the claim against the carrier to be settled.

### 2-5. STORAGE AND SHIPMENT.

2-6. **PACKAGING.** To protect valuable electronic equipment during storage or shipment always use the best packaging methods available. Your Hewlett-Packard field office can provide packing material such as that used for original factory packaging. Contract packaging companies in many cities can provide dependable custom packaging on short notice. Here are two recommended packaging methods:

a. **RUBBERIZED HAIR.** Cover painted surfaces of instrument with protective wrapping paper. Pack instrument securely in strong corrugated container (350 lb/sq in. bursting test) with 2-inch rubberized hair pads placed along all surfaces of the instrument. Insert fillers between pads and container to ensure a snug fit. Mark the box "Delicate Instrument" and seal with strong tape or metal bands.

b. **EXCELSIOR.** Cover painted surfaces of instrument with protective wrapping paper. Pack instrument in strong corrugated container (350 lb/sq in. bursting test) with a layer of excelsior about 6 inches thick packed firmly against all surfaces of the instrument. Mark the box "Delicate Instrument" and seal with strong tape or metal bands.

### 2-7. RACK INSTALLATION.

2-8. The Model 5110B is ready for bench operation as shipped from the factory. Additional parts necessary for rack mounting are packaged with the instrument. To convert for rack installation, refer to Figure 2-1 and proceed as follows:

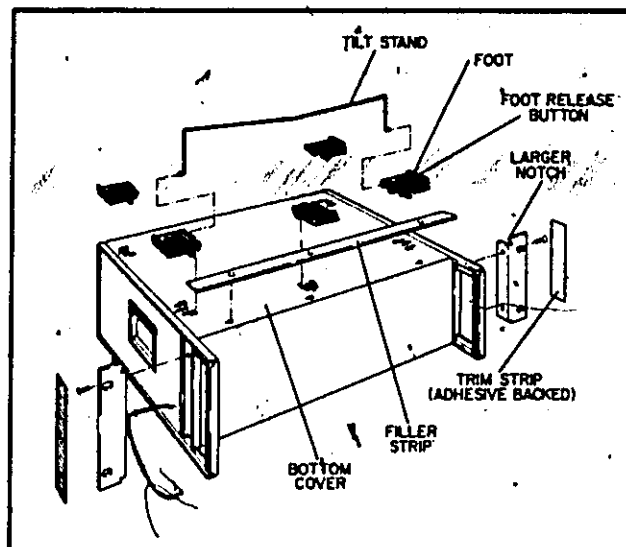


Figure 2-1. Conversion for Rack Mounting

- Remove tilt stand.
- Remove feet (press the foot-release button, slide foot toward center of instrument, and lift off).
- Remove adhesive-backed trim strips at front end of sides.
- Attach filler strip along bottom edge of front panel.
- Attach flanges to front end of sides (larger corner notch toward bottom of instrument). Instrument is now ready to mount in standard rack.

### 2-9. POWER CONNECTION.

2-10. **LINE VOLTAGE.** The Model 5110B may be operated from either 115- or 230-volt ( $\pm 10\%$ ) power lines. A slide switch on the rear panel permits quick conversion for operation from either voltage. Insert a narrow-blade screwdriver in the switch slot and slide the switch up for 115-volt operation ("115" marking exposed) or down for 230-volt operation ("230" marking exposed).

#### Note

Prior to ac power application, be sure correct fuse is installed (.5 amp 115V/.25 amp 230V).

2-11. **POWER CABLE.** The Model 5110B is equipped with a detachable 3-wire power cable. Proceed as follows for installation:

- Connect flat plug (3-socket connector) to ac line jack at rear of instrument.

b. Connect plug (2-blade with round grounding pin) to 3-wire (grounded) power outlet. Exposed portions of instrument are grounded through the round pin of the plug for safety; when only 2-blade outlet is available, use connector adapter (Ⓢ part no. 1251-0048), then connect short wire from side of adapter to ground.

#### Note

To maintain oscillator stability, crystal oven circuits are energized continuously when the Model 5110A is connected to the power line. Proper operation of the oven may be verified by use of the CIRCUIT CHECK meter. Place CIRCUIT CHECK switch in the OVEN TEMP position and note indication on the meter when the power cord is connected to the power line. The meter should pin down scale for approximately 15 to 30 minutes (ambient about 22°C), then rise to upper part of the scale. After a few minutes the needle will come down scale. It will then slowly oscillate and settle down in the green area. If the instrument has been in a much colder environment than 22°C, the needle will stay pinned down scale for a longer time. After the oven has come up to temperature, indicated by a meter reading in the green area of the CIRCUIT CHECK meter, it should stay there as long as the power is connected to the instrument. If the needle should go up scale or stay up scale after the instrument has been on for 1 hour, disconnect the power and look for a malfunction in the oven controller circuits.

### 2-12. INSTRUMENT INTERCONNECTION.

2-13. Connect the Model 5110B to the Model 5105A with cable assemblies provided as shown in Figure 2-2. Cables and connectors are marked for proper connection. Output may be taken directly from the rear panel output connectors. A joining bracket kit is available for fastening the 5110B and 5105A together. The part number is 5060-0216.

2-14. The Model 5110B can be provided with additional fixed frequency outputs which enable it to drive up to four Frequency Synthesizers. This is done by removing plug buttons and installing additional output connectors in the filter divider modules (see Figure 2-3). When extra outputs are installed, internal 49.9 ohm terminating resistors are also installed as determined by the number of outputs desired (see Section VII, Options). When any output from the filter divider or filter assemblies in the Model 5110B is not used, it must be terminated with a 50-ohm load.

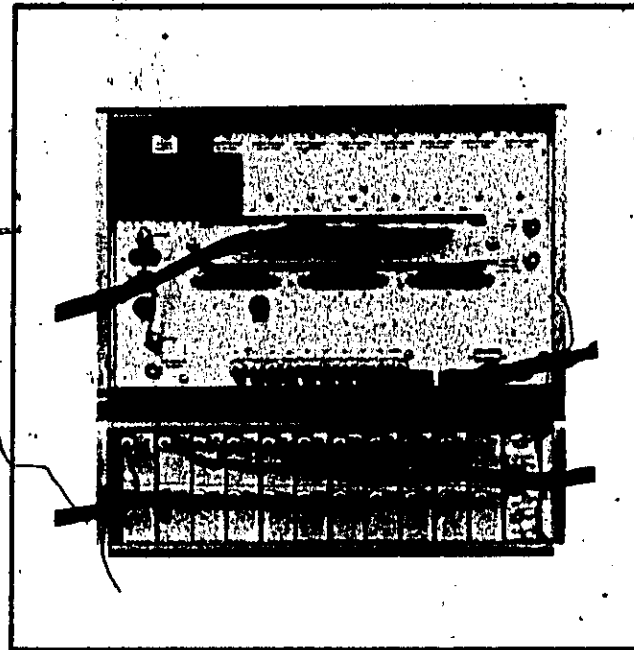


Figure 2-2. 5105A and 5110B Cable Interconnections

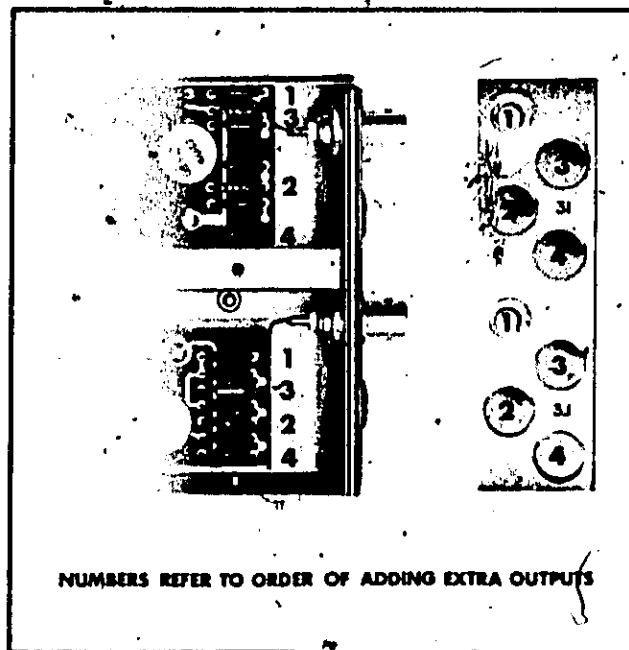


Figure 2-3. Adding Extra Outputs to the 5110B

# OPERATION

## SECTION III OPERATION

### 3-1. GENERAL.

3-2. Figures 3-1 and 3-2 indicate the location and briefly explain the function of the Model 5110B controls, indicators, and connectors. Section IV gives a more detailed circuit description of the Synthesizer Driver.

### 3-3. OPERATION.

#### 3-4. POWER.

3-5. Set the slide switch on the rear panel to the position corresponding to your ac line voltage (115 or 230 volts). Apply line voltage to the three-pin ac line input jack on rear panel using the power cord supplied with the instrument. The instrument has no power switch and voltage is applied to the crystal oven and oven control circuits any time the power cord is connected to the line. To maintain internal oscillator stability, the 5110B should be connected to the line at all times.

#### 3-6. CIRCUIT CHECK SWITCH AND METER.

3-7. The CIRCUIT CHECK switch and meter provide a convenient means of checking the operation of the Driver circuits. Set the CIRCUIT CHECK switch for each position and observe the meter indication. The meter indication for all positions of the CIRCUIT CHECK switch is factory-set to read in the green when operation is normal.

#### 3-8. FREQUENCY STANDARD.

3-9. The FREQUENCY STANDARD INT. EXT. switch gives the operator a choice of using the internal 1 Mc frequency standard which is stable to  $\pm 3$  parts in  $10^9$  per day, or an external 1 Mc or 5 Mc standard.

#### 3-10. GENERAL FREQUENCY CHECK.

3-11. The 22 fixed frequencies can be quickly checked by connecting an  $\text{C} 5245\text{L}$  Electronic Counter with an  $\text{C} 5261$  Video Amplifier plug-in to each of the labeled outputs on the rear panel of the 5110B and reading the frequency directly on the Counter.



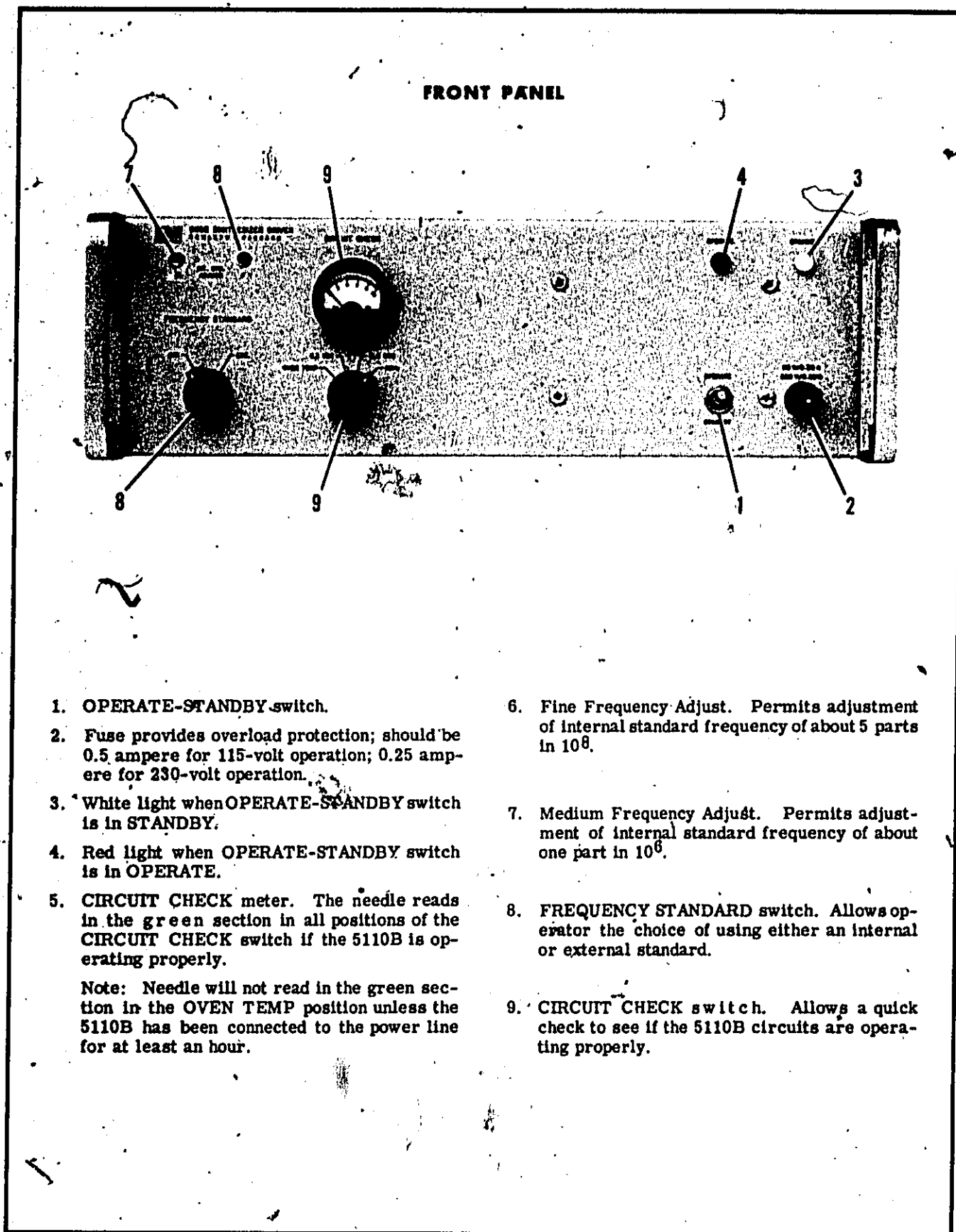
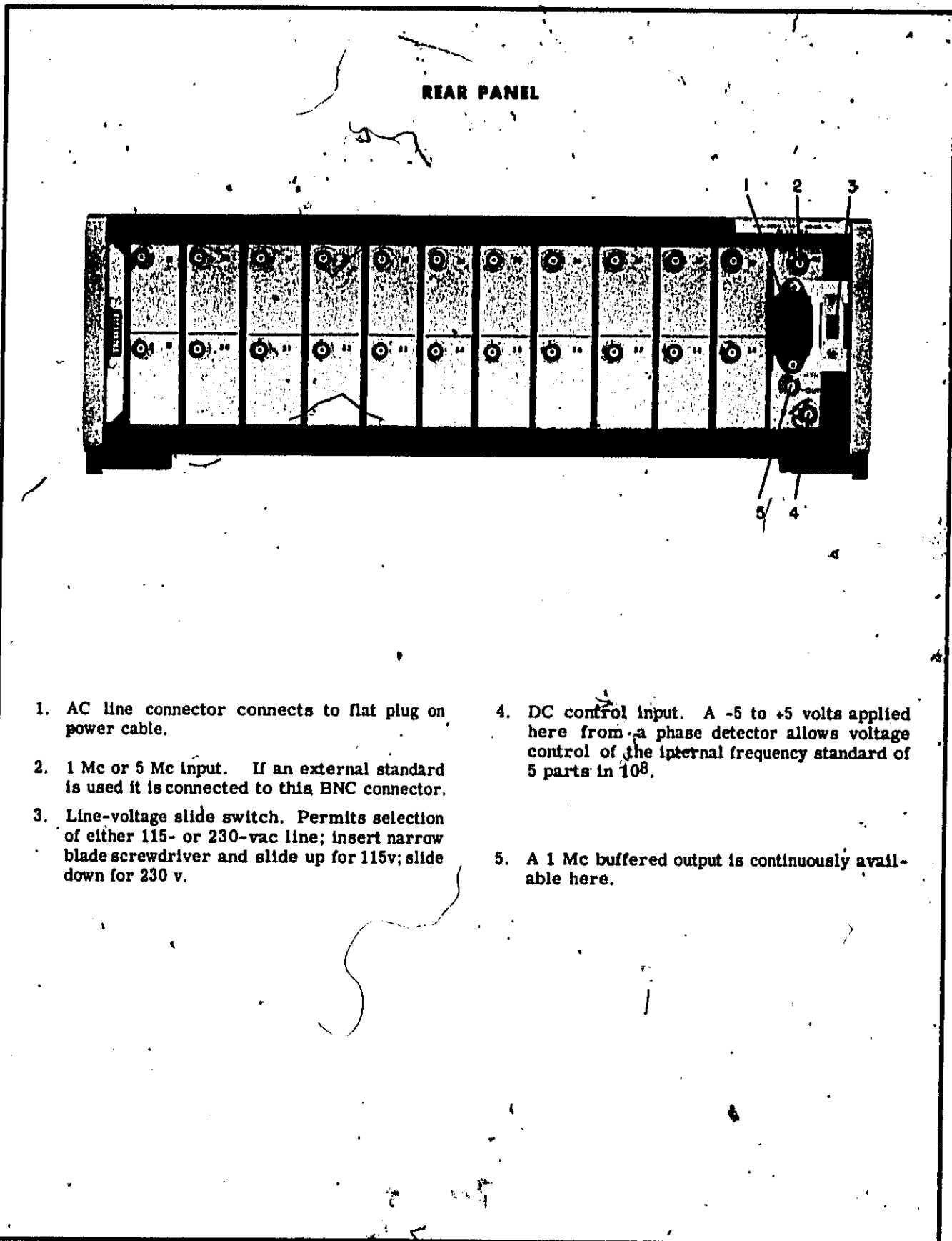


Figure 3-1. Operating Controls (Front Panel)



1. AC line connector connects to flat plug on power cable.
2. 1 Mc or 5 Mc input. If an external standard is used it is connected to this BNC connector.
3. Line-voltage slide switch. Permits selection of either 115- or 230-vac line; insert narrow blade screwdriver and slide up for 115v; slide down for 230 v.
4. DC control input. A -5 to +5 volts applied here from a phase detector allows voltage control of the internal frequency standard of 5 parts in  $10^8$ .
5. A 1 Mc buffered output is continuously available here.

Figure 3-2. Operating Controls (Rear Panel)

# THEORY

## SECTION IV

### THEORY OF OPERATION

#### 4-1. GENERAL.

4-2. The 5110B Synthesizer Driver is part of a frequency synthesizer system consisting of the 5110B and the 5105A Frequency Synthesizer. The 5110B provides the 22 fixed frequencies necessary to drive the 5105A Frequency Synthesizer. A buffered, 1 volt, 1 Mc signal is also supplied.

4-3. Following is a discussion of the theory of operation of the Synthesizer Driver. Overall operation is treated first. This is followed by a discussion of the theory of operation of each module in order of its module designation. For example, Input Amplifier/Buffer Amplifier A1 is discussed first.

4-4. A block diagram of the 5110B is shown in Figure 9-2. The synthesis process always starts with a 1-Mc signal. The operator is given the choice of using the internal 1-Mc Frequency Standard A2 which is stable to  $\pm 3$  parts in  $10^9$  per day, or an external 1-Mc or 5-Mc standard. If an external Mc standard is employed, it is accepted straight through, while a 5-Mc signal is divided to 1 Mc. A -5 to +5 volts applied at a rear panel connector allows frequency control ( $\pm 5$  parts in  $10^8$ ) of the internal crystal oscillator.

4-5. The internal Frequency Standard A2 includes a 1-Mc quartz resonator with associated circuits in a modified Pierce configuration. The crystal and a temperature sensing thermistor bridge circuit are housed in an oven having proportional temperature control.

4-6. The instrument is designed for minimum noise and to this end a crystal filter A3 is placed between the frequency standard and the Comb Generator A4 and immediately following the Selector Switch A18. This filter effectively limits the bandwidth of the standard so that any noise outside of this band is eliminated. The filtered 1-Mc signal is fed through a buffer amplifier and is made available at the rear panel. This signal may be used for synchronous operation in various tests performed on the system.

4-7. The filtered 1-Mc signal is also fed to comb generator module A4. The comb generator contains a driver amplifier, a step-recovery diode (harmonic generator), eleven filter networks, and eleven tuned amplifiers.

4-8. Immediately following the step-recovery diode, 20 Mc is filtered off, amplified, refiltered and made available at the rear panel.

4-9. The remainder of the signal is passed through a 24 to 39 Mc band-pass filter, amplified, and then fed to synchronously tuned transistor-tank stages. The stages select out the 24 Mc and 30 through 39 Mc components and feed these components to more active filtering before being made available at the rear panel.

4-10. The filtered components from 20 to 39 Mc are also fed to filter/dividers. The stored-charge divide-by-two, and regenerative-divide-by-five types provide the low frequency spectrum output of 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, and 3.9 Mc.

4-11. The 5110B thus provides the 5105A Frequency Synthesizer, by means of rear panel connectors, very stable and clean signals of 20 Mc, 24 Mc, 3.0 through 3.9 Mc in 100-kc steps, and 30 through 39 Mc in 1-Mc steps.

#### 4-12. INPUT AMPLIFIER/ BUFFER AMPLIFIER A1.

##### 4-13. INPUT AMPLIFIER A1.

4-14. The input amplifier is designed to accept signals of 1 Mc or 5 Mc. When either a 1-Mc or 5-Mc external standard is used to drive the 5110B the signal is connected to rear panel connector labeled IN. Refer to Figure 9-3 during the following discussion.

4-15. The signal sees two broad-tuned circuits; one (L1-C1) tuned to 1-Mc and the other (L2-C2) tuned to 5-Mc. CR1 and CR2 are limiters which are followed by amplifier Q1. More limiting by CR3 and CR4 follows amplifier Q1. The signal is amplified again by Q2. The signal is again amplified by Q3 if it is 1 Mc.

4-16. If the input is 5 Mc, Q3 acts as a divider. Its output circuit is tuned to 1 Mc and a portion of the signal is fed back to the emitter of Q3 to complete the loop and generally favor only a 1 Mc signal or simply to amplify every fifth pulse of a 5 Mc signal.

4-17. The signal sees more limiting in CR5 and CR6 and is amplified again by Q4 whose output is tuned to 1 Mc. A 1-Mc, 1-volt rms signal results at A1J4.

##### 4-18. BUFFER AMPLIFIER A1A2.

4-19. The buffer amplifier receives (from A3) the crystal filtered signal of either the internal frequency standard or the external standard from the input amplifier and provides a buffered 1 Mc signal at the rear panel.

#### 4-20. FREQUENCY STANDARD A2.

##### 4-21. GENERAL.

4-22. Crystal oven assembly A2A1, part of oven control assembly A2A3, and oscillator assembly A2A2 generate an extremely stable 1-Mc signal. Another part of A2A3 provides buffering and amplifies the 1-Mc from A2A2.

##### 4-23. CRYSTAL OVEN ASSEMBLY A2A1.

4-24. The crystal oven assembly is a thermally insulated chamber which contains a heating element, a

temperature sensing circuit, and a 1-Mc piezo-electric crystal.

#### 4-25. OVEN CONTROL ASSEMBLY A2A3.

4-26. The oven control assembly includes oscillator Q1 which produces a 3-kc output whose amplitude is controlled by the temperature-sensing element in the oven. The oscillator output is amplified by Q2 and detected to produce a dc level whose amplitude is inversely proportional to oven temperature. The dc level is amplified and applied to the heating element in the oven. On the Oven Control assembly there is an ambient temperature sensing circuit which monitors the oven temperature and makes the necessary circuit compensations so that the meter will read in the green region over a wide ambient temperature range as long as the crystal oven is operating properly. Also on the Oven Control assembly is a 2-stage amplifier circuit which buffers the 1-Mc signal from A2A2. Any time that the 5110B power cord is connected to the line the oscillator oven is on.

#### 4-27. OSCILLATOR ASSEMBLY A2A2.

4-28. The oscillator assembly includes the Q1 oscillator circuit which is connected to the 1-Mc crystal in A1. The 1-Mc oscillator output is amplified by Q2, Q3, and Q4. A portion of the Q4 output is detected and applied to Q1 as AGC so that power dissipation in the crystal can be held at a constant low value.

4-29. Varying the voltage at the cathode of varactor CR2 allows a frequency control of the crystal oscillator. Applying -5 to +5 volts dc at a rear panel connector allows a frequency control of  $\pm 5$  parts in  $10^8$ .

#### 4-30. CIRCUIT DETAILS.

4-31. Refer to the schematic diagram, Figure 9-4, for circuit details. The oscillator A2A3Q1 is controlled by the Wien bridge in A2A1. Positive feedback from the A2A3Q2 emitter through A2A1R1-A2A1C6 to the A2A3Q1 emitter maintains oscillation at the frequency of maximum feedback, which occurs at that frequency for which the A2A1R1-A2A1C6 phase shift equals the A2A1R2-A2A1C7 phase shift (about 3 kc). Degenerative feedback is provided from the A2A3Q2 emitter and the A2A1RT1-A2A1R3-A2A1R4 divider to the A2A3Q1 base; an increase in oven temperature lowers the resistance of RT1, thus increasing degenerative feedback to produce decreased oscillator output. This results in a lower detected dc level at the base of A2A3Q3 and hence a reduction in current through the Oven Heater A2A1HR1. The reverse process occurs for a decrease in oven temperature. The detector is a voltage doubler circuit; A2A3C4 charges fully through the negative half cycle, and then discharges through A2A3CR2 in series with the driving source during the positive half cycle. Capacitor A2A3C9 between the collector and base of A2A3Q4 dampens sudden dc voltage swings and filters any ac component from the detected signal.

4-32. The A2A2Q1 oscillator is a modified Pierce oscillator; its base is maintained at a dc level from the A2A2R7-A2A2R8 junction; AGC current is supplied to its emitter from the A2A2CR3-A2A2CR4 detector

(voltage doubler) which is referenced to the A2A2R7-A2A2R8 junction. A2A3Q3 is a driver amplifier for the tuned gain stage A2A3Q6. A2A3L2, A2A3C15, and A2A3C16 comprise a tuned pi-matching network to provide an output impedance of approximately 50-ohms.

#### 4-33. CRYSTAL FILTER A3.

4-34. It is necessary to generate a number of frequencies of high spectral purity for use by the 5105A Frequency Synthesizer. The design of the 5110B accounts for sources of noise and minimizes any unavoidable noise that is generated. One of the steps taken to achieve this end is to place a crystal filter after the switch which selects the frequency standard to be used. This filter effectively limits the bandwidth of the standard so that any noise outside of this band is eliminated.

4-35. Refer to Figure 9-3 during the following discussion. A 1 Mc signal from a 50-ohm source is presented to the input of the crystal filter. T1 transforms this impedance to the image impedance at its secondary, approximately 2000 ohms. Capacitors C1 through C4 form an impedance balancing network with C4 tuning out Y1 capacitance. L1 helps transform the output impedance to 100 ohms. Crystal filter bandwidth is about 100 cycles.

#### 4-36. COMB GENERATOR A4.

4-37. The filtered 1-Mc signal from Crystal Filter A3 is connected to A4J1. After limiting by CR2, CR3, and CR4 the signal is amplified by power amplifier Q1. A portion of the 1-Mc signal is sampled at the base of Q1 and connected to the front panel meter. L1, C3, and C5 are tuned to 1 Mc. C3 is a temperature compensating capacitor.

4-38. The 1-Mc signal at the collector of Q1 is applied to step recovery diode CR6. R6 is a bias adjust and L3 is an rf choke. R5, CR5, Q2, R7, and RT1 form a temperature control circuit which keeps the temperature around the step-recovery diode CR6 constant.

4-39. The step recovery diode is suited for high frequency generation due to its ability to maintain high reverse conduction for a period immediately following forward conduction. For every cycle of the 1-Mc signal, the ending of conduction results in the generation of a very sharp spike which is rich in 1-Mc harmonics. R8, L5, and C1 couple the 20Mc harmonic to pin 7 of A4J15. C10, E2, and E3 are used to suppress UHF harmonic signals.

4-40. L4, C10, and L6 form a high pass filter which will pass frequencies above 20 Mc.

4-41. After passing through the high pass filter the harmonic rich spikes are presented to pulse amplifier Q3 where they are amplified 20 db. CR7 serves as a reverse current limiter for Q3 and thus is a protecting device for Q3. L8 is a dc pass and also provides some tuning of the load seen by Q3. R9 reduces the "Q" of L8 and the load.

4-42. C12 and T1 form a parallel tuned circuit resonating at 39 Mc. C37 limits the reverse current through Q4. R15 and C22 are decoupling components. C27 and T12 form another parallel tuned circuit which is resonant at 39 Mc.

4-43. The rest of the circuits are similar tuned transistor stages which select the 24 Mc and 30 through 38 Mc components.

#### 4-44. FILTER/DIVIDERS A5-A14.

##### 4-45. 30-39 MC FILTERS A5A1-A14A1.

4-46. A signal of about 10 millivolts with sidebands down almost 15 db is brought to pin 3 of P1. Pin 3 is connected to the emitter of Q1, a common base amplifier whose collector circuit provides about 15 db filtering of 1 Mc sidebands. The signal on the collector of Q1 after filtering is lightly coupled to Q2 by C31. Each following stage operates similarly with some limiting in each stage. Note the thermistor in Q7 emitter circuit. This makes Q7 operate as a function of ambient temperature and controls its output level. L12 is a current source and also suppresses undesirable harmonics. It is adjusted to provide about 150 millivolts at its output. At this point the signal sees an impedance of about 18 ohms. L1 stops any undesirable signals that are on the -12.6 volt line coming in at pin 1 of P1. L1, L2, and L3 are RF chokes which decouple the -12.6 vdc line. L21, L22, and L23 serve the same purpose for the +6.3 line.

##### 4-47. 3.0-3.9 MC DIVIDERS A5A2-A14A2.

4-48. A portion of the signal is coupled through C36 and brought to the emitter of Q51 in the divider. Q51 and Q52 are amplifiers whose output circuits are tuned to the filter's (A1) frequency. CR51 selects only the negative peaks of the signal. L55 is tuned to provide the proper amount of current leak-off so that Q53 will function as a stored-charge divider. R66 and C76 form a self-biasing circuit which assures that Q53 will operate in the range of L55.

4-49. The divided signal on the collector of Q53 goes to regenerative divider Q54 where it is amplified. The output circuit of Q54 is tuned to the output frequency at J5. The fourth harmonic of the output frequency is tapped off between C58 and C59 and fed back to the

emitter of Q54 where its fourth harmonic is formed and mixed at the base. C77, CR52, CR53, and C81 form a limiting network. The signal is coupled to Q55 where it is amplified. The collector circuit of Q55 is tuned to the desired output frequency. L59 is adjusted to provide 75 millivolts at its output.

##### 4-50. 20/24 MC FILTER A15.

##### 4-51. 24 MC FILTER A15A1.

4-52. The same theory applies to A15A1 as that in Paragraph 4-44, discussing A5A1-A14A1 Filter theory.

##### 4-53. 20 MC FILTER A15A2.

4-54. A15A2 theory is generally the same as that discussed in Paragraph 4-45.

#### 4-55. POWER SUPPLY RECTIFIER A16.

4-56. A1CR1 through A1CR12 rectify the voltage on the secondary of T1. C1 and C2 filter this rectified voltage. Q1 and Q4 are series regulators with Q2 and Q3 acting as their drivers, respectively. A2Q1 and A2Q2 are current limiters which are normally biased off. They sense heavy current changes at the output and limit current through Q1 and Q4. A1C1, A1R1, and A1C2, A1R2 are filters and A1CR13, A1CR14 is a stage of preregulation. A1Q1 is an emitter follower which acts as a buffer between pre-regulation stages A1CR13, A1CR14, and A1CR15, A1CR16, A1CR17, and A1CR18. A1CR19, A1CR20, A1CR23, and A1CR24 are temperature compensating diodes. A1CR21 and A1CR22 are zeners which maintain the necessary voltages at pin 7 and pin 6 of A1.

#### 4-57. POWER SUPPLY REGULATOR A17.

4-58. Q5, A1Q1 and Q6, A1Q4 are series regulators connected in a Darlington configuration. A1Q5 and A1Q6 are differential pairs and form part of a feedback loop. The gain of the feedback amplifier is approximately 500 at low frequencies. A1Q5A, A1Q5B and A1Q6A, A1Q6B are housed in the same package to provide equal tracking over the operating temperature range. A1CR1 and A1CR2 are reference diodes on one side of the differential amplifiers. A1R8 and A1R10 are on the other side and are adjusted to give +6.3 volts and -12.6 volts at the output of A17. A1R5 and A1R6 are in the emitter circuits of Q2 and Q3 and provide the correct temperature coefficient over the operating range.

# MAINTENANCE

Table 5-1. Recommended Test Equipment

Instrument Type	Characteristics	Use	Instrument Recommended
Frequency Synthesizer	Precision signal source .01 cps to 500Mc (certified spurious down 100 db)	Performance Check	Ⓢ 5105A/5110B
High Frequency Signal Generator	100 kc to 10 Mc 606A Specifications	Circuit Adjustment Troubleshooting	Ⓢ 606A
Oscilloscope	Bandwidth to 40 Mc	Circuit Adjustment Troubleshooting	Ⓢ 175A
Electronic Counter	Measure frequency to 40 Mc ± 1 count	Performance Check	Ⓢ 5245L
Differential Voltmeter	0 to 100 vdc .01% accuracy	Circuit Adjustment Troubleshooting	Ⓢ 740 A
RF Millivoltmeter	1 mv. to 500 mv to 50 Mc 3% accuracy	Circuit Adjustment Troubleshooting	Ⓢ 411A with Ⓢ 11025A Probe
Balanced Mixer	Frequency to 1 Mc, N.F. < 7 db	Performance Check	Ⓢ 10514A
DC Null Voltmeter	Dc null detection ± 2%	Circuit Adjustment Performance Check	Ⓢ 413A
Frequency Standard	1 Mc sine wave	Performance Check	Ⓢ 105A/B
DC Voltmeter	10 megohm input Z, 1% accuracy ± 50 volts	Troubleshooting	Ⓢ 412A
Low Noise Amplifier	40 db ampl., N.F. < 6 db	Performance Check	
AC Voltmeter	1 cps to 1 Mc ± 3%	Performance Check	Ⓢ 403A with 500 μf across meter
Variable Delay Line	Delay signal over frequency range	Performance Check	
Strip Chart Recorder	0.2% accuracy, full scale	Performance Check	Moseley 680
Tuned Voltmeter	1000 cps bandwidth 13 to 130 cps	Performance Check	Ⓢ 415E
Transistor Power Supply	0 to 40 volts DC	Circuit Adjustment Troubleshooting	Ⓢ 723B
Variable AC Voltage Supply	0 to 300 VAC	Circuit Adjustment Troubleshooting	
Attenuator	0 to 110 db in 10 db steps coaxial	Circuit Adjustment Troubleshooting	Ⓢ 355D
Feed-thru Termination	50-ohm feed-thru	Circuit Adjustment Performance Check	Ⓢ 11048B
Termination	50-ohm BNC	Circuit Adjustment Performance Check	Ⓢ 1250-0207
Connector	BNC Tee (4 required)	Circuit Adjustment Performance Check	Ⓢ 1250-0072
Connector	BNC to clip leads	Circuit Adjustment Performance Check	See Figure 5-7



## SECTION V MAINTENANCE

### 5-1. INTRODUCTION.

5-2. This section provides maintenance and service information for the Model 5110B Synthesizer Driver. Included are a table of recommended test equipment, troubleshooting aids, adjustment procedures, and an in-cabinet performance check which may be used to verify proper operation of the 5110B.

### 5-3. TEST EQUIPMENT.

5-4. Recommended test equipment for performance checking and troubleshooting is listed in Table 5-1. Other test instruments may be used if their specifications equal or exceed the required characteristics. The recommended measuring systems must be composed of a number of standard and special instruments connected together. Therefore the performance of the measurement system is being checked as well as the performance of the Synthesizer Driver. The following measurement systems will require a considerable amount of effort to duplicate and also to verify that an "out of specification" reading is traceable to the instrument under test or to the test equipment.

### 5-5. IN-CABINET PERFORMANCE CHECK.

5-6. GENERAL. The In-Cabinet Performance Checks, Table 5-2, and Performance Check Test Card (to be filled out during incoming inspection) page 5-6a, verify specifications and provide a permanent record of performance of each instrument. The In-Cabinet Performance Check verifies proper operation of all circuits in Model 5110B Synthesizer Driver and may be used:

- a. As part of an incoming inspection check of instrument specifications;
- b. Periodically, for instruments used in systems where maximum reliability is of utmost importance;
- c. as part of a troubleshooting procedure to locate malfunctioning circuits, and
- d. after any repairs or adjustments, before returning instrument to regular service.

5-7. OPERATION. A check of general operation is made by noting the circuit check meter indication as the switch is rotated through its four positions. All readings should be in the green area.

### 5-8. MODULE DESIGNATIONS.

5-9. Table 5-3 gives the reference designations and names of all modules used in the Synthesizer Driver.

### 5-10. INSTRUMENT COVER REMOVAL.

5-11. For access to modules in the Synthesizer Driver remove top and bottom instrument covers.

Remove the four screws from the cover and slide cover toward the rear of the instrument.

### 5-12. TROUBLESHOOTING.

5-13. The best approach to isolating trouble in the Model 5110B is first to obtain all possible information from the controls, indicators, and connectors; then logically apply this information to locate the defective unit or module. Figures 3-1 (Front Panel Controls and Indicators), 3-2 (Rear Panel Connectors and 115-230 v control), 5-11 (Component Location) 9-2 (Overall Block Diagram) can be used to help understand operation and locate modules and parts. To further aid in analysis, each position of the CIRCUIT CHECK switch is discussed in the following paragraphs. Table 5-4 (Troubleshooting Aids) lists basic trouble indications and checks for their cause. The In-Cabinet Performance Check, Table 5-2, is a good troubleshooting aid.

### 5-14. CIRCUIT CHECK SWITCH.

5-15. OVEN TEMP POSITION. The meter signal is supplied from the Frequency Standard A2. If the meter reading is in the green section it is an indication that the oven circuits have brought the crystal up to operating temperature. The meter monitors the output of oscillator A2A3Q2. When the oven circuits have reached operating temperature this sampling gives a reading in the green section.

5-16. 6.3 VDC. The meter signal is supplied from the +6.3 volt lead on Power Supply Regulator Assembly A17. The meter reading has been normalized to read in the green section if the +6.3 volts is present.

5-17. 12.6 VDC. The meter signal is supplied from the -12.6 volt lead from Power Supply Regulator Assembly A17. The meter reading has been normalized to read in the green section if -12.6 volts is present.

5-18. 1 MHz. The meter signal is supplied from the base of A4A1Q1 in Comb Generator module A4. The meter reading has been normalized to read in the green section if 1 Mc at the proper amplitude is present.

### 5-19. ADJUSTMENTS.

#### 5-20. GENERAL.

5-21. The only periodic adjustment necessary for proper operation is the front panel INT. STD. ADJUST for standardizing the oscillator. All other internal adjustments, especially the power supply voltages, should not be adjusted until checks prove operation of the Synthesizer Driver is out of specifications. The power supply in this instrument is extremely stable for long periods of time. If the voltages are essentially correct ( $\pm 100$  mv for 6.3 volts and  $\pm 200$  mv for -12.6 volts) and regulate within  $\pm 100$  microvolts between low and high line voltage, there is no reason to make an adjustment. Do not make adjustments with a 1% voltmeter.

Table 5-2. In-Cabinet Performance Check

**1. OUTPUT FREQUENCIES:** Provides 22 fixed frequencies for the 5105A Frequency Synthesizer; 3.0 through 3.9 Mc in .1 Mc steps (50 mv +1, -3 db) 30 through 39 Mc in 1 Mc steps, 24 Mc, and 20 Mc (100 Mv  $\pm$  1.5 db), 50-ohm system.

**OUTPUT LEVELS:** Connect a 50-ohm load to each output in turn and check output levels with an  $\text{\textcircled{C}}$  411A RF Millivoltmeter

**OUTPUT FREQUENCIES:** Connect an  $\text{\textcircled{C}}$  5245L Electronic Counter to each output in turn and note that the output frequency is correct. A consistent one or two cycle variation indicates the time bases of the instruments are offset. In order to check the low level outputs (3.0 to 3.9 Mc), they must be connected to the  $\text{\textcircled{C}}$  5261A Video Amplifier plug-in of the Counter.

**SIGNAL-TO-PHASE NOISE RATIO, SIGNAL-TO-SPURIOUS RATIO ON THESE OUTPUT FREQUENCIES.**

Although they are not part of the specifications, it is advisable to measure the signal-to-phase noise ratio and the signal-to-spurious ratio to verify acceptable operation. These ratios are checked indirectly when the 5110B Synthesizer Driver is used to drive the 5105A Frequency Synthesizer and the overall signal-to-phase noise ratio and the signal-to-spurious ratio are checked; however in some cases it is desirable to verify proper operation of the 5110B directly.

Figures 5-1 and 5-2 are general block diagrams which show the setup required to make the measurements. Test equipment specifications are shown. Some of the units may not be commercially available.

**SIGNAL-TO-PHASE NOISE RATIO:**

30 to 39 Mc, 20 Mc & 24Mc: Greater than 68db (30 kc bandwidth) for 24, 30 to 32 and 34 Mc.  
Greater than 78db (30 kc bandwidth) for 33, 35 to 39 Mc. All 30 kc bandwidths exclude a 1 cps band centered on signal.

Make the measurements using setup shown in Figure 5-1 and the following general procedure:

1. Connect equipment as shown except for the phase control to the reference unit.
2. Connect the same frequency  $f_0$ , from the reference unit to the mixer as the frequency to be measured.
3. Set the calibration generator to the frequency being checked plus one hundred cycles; and to the same amplitude as the output level of the 5110B.
4. Disconnect the 5110B and connect the Calibration generator in its place.
5. Adjust voltmeter for an on-scale reading. Note the range setting and the meter reading in db. This is the reference signal level.
6. Reconnect the 5110B to the circuit. Vary the delay for minimum dc indication on the phasemeter, which indicates the desired condition of phase quadrature.
7. Connect the phase control lead to the reference unit. This insures phase lock during the measurement.
8. Adjust the AC voltmeter for an on-scale reading. Note this reading in db and add one db for correction of the average reading meter to rms. The difference in this sum and the reference reading is the signal-to-noise ratio. It is in a 0.5 cps to 15 kc bandwidth. Since a demodulated bandwidth is equal to half the RF spectrum bandwidth, the measurement is of a 30 kc bandwidth centered on the signal, excluding a one cps band centered on the signal.

**3.0 TO 3.9 MC:** Greater than 73 db (30 kc bandwidth) for 3.0 to 3.9 Mc.

The same circuit and procedure is used as for the 24 and 30 to 39 Mc frequencies except that amplifiers 1 and 2 must have 6 db more gain to compensate for the lower output levels of the 3.0 to 3.9 Mc frequencies.

Table 5-2. In-Cabinet Performance Check (cont'd)

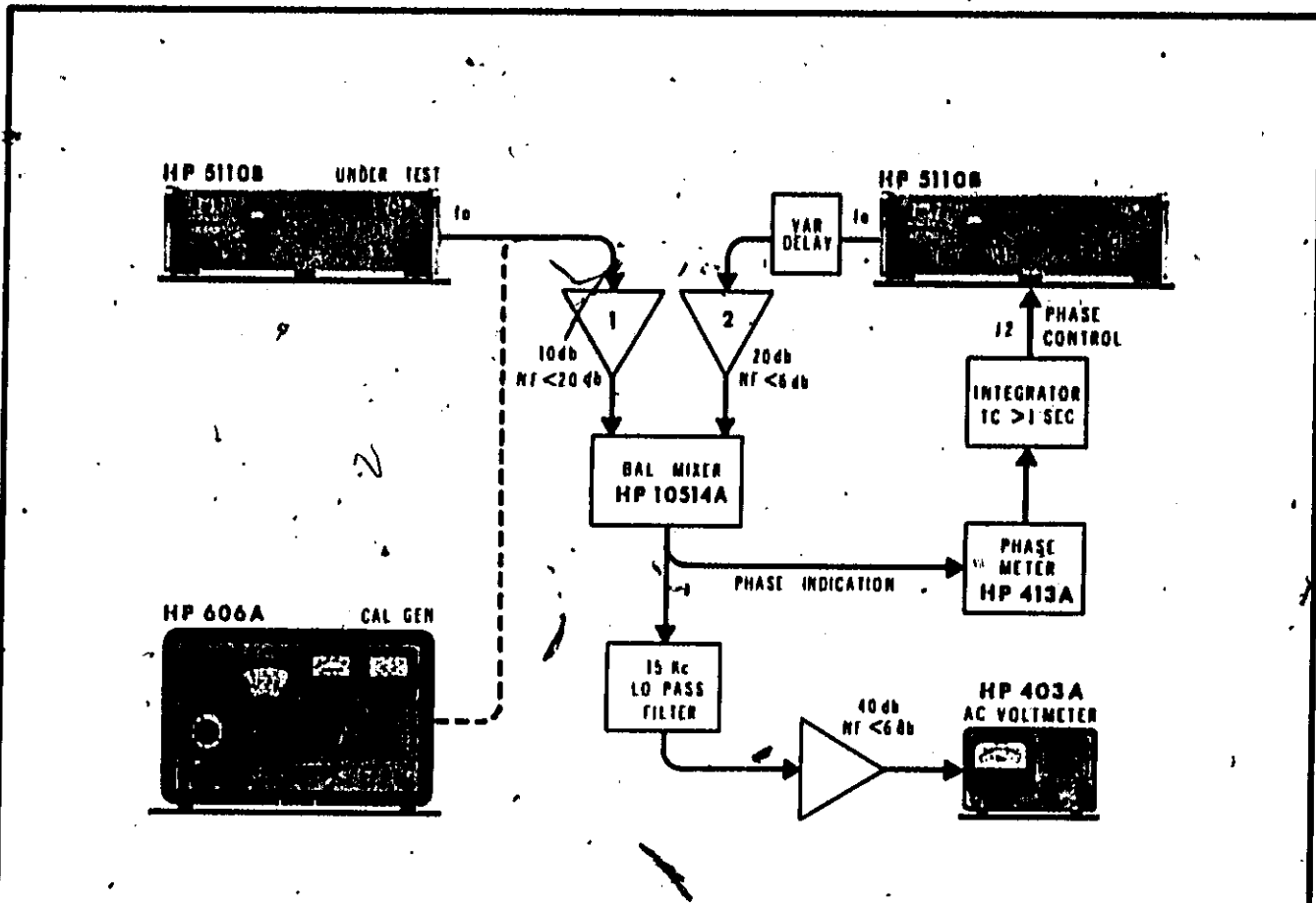


Figure 5-1. Test Setup - Signal-to-Phase Noise Measurements

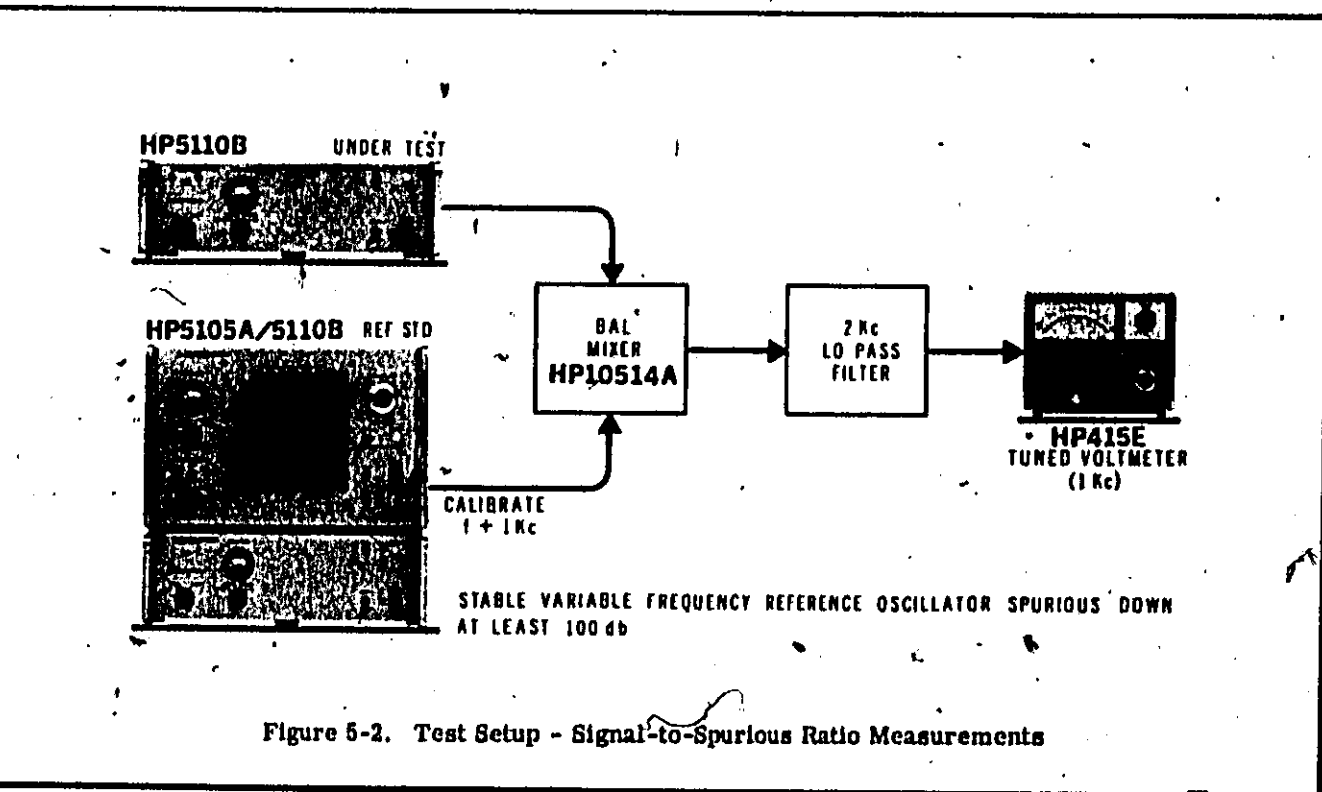


Figure 5-2. Test Setup - Signal-to-Spurious Ratio Measurements

Table 5-2. In-Cabinet Performance Check (cont'd)

**SIGNAL-TO-SPURIOUS SIGNAL RATIO:****30 TO 39 MC AND 24 MC:**

At least 105 db.

Make the measurements using setup shown in Figure 5-2 and the following procedure:

1. Connect the equipment as shown in Figure 5-2.
2. With the reference oscillator offset 1 kc from the frequency under test, adjust the tuned voltmeter for an on-scale reading. Note the meter reading and range setting in db. This is the reference reading.
3. Offset the reference oscillator  $\pm 1$  Mc plus 1 kc from the frequency under test. Adjust the voltmeter for an on-scale reading. The difference between this reading and the reference reading is the signal-to-spurious signal ratio for a spurious signal 1 Mc away from the frequency under test.

**Note**

The tuned voltmeter is calibrated for an input from a square law device (output voltage proportional to power input). The db reading must be doubled when using the voltmeter in the circuit of Figure 5-2. That is, an indication of 40 db is really 80 db in this application.

The most pronounced spurious signals are plus and minus 1 Mc from the frequency under test. If these spurious signals are down 105 db, any other spurious signals may be expected to be down 105 db.

**2. INTERNAL FREQUENCY STANDARD: Type - 1 Mc Quartz Oscillator.**

Aging Rate: less than  $\pm 3$  parts in  $10^9$  per 24 hours (after 72 hours of continuous operation).

The frequency accuracy and drift rate may be checked by comparison with the standard time broadcasts from the National Bureau of Standards' station WWVB in Fort Collins, Colorado.

After 72 hours of continuous operation, the 1 Mc output from the 5110B (marked OUT on rear panel) is connected to the 1 Mc Local Standard input of the VLF Comparator (H03-117A).

Make a phase comparison as described in the operating manual for the Comparator. The 5110B Oscillator offset will be plotted out on the self-contained strip chart recorder.

The oscillator may be set on frequency by adjustment of the M and F screwdriver Internal Standard controls on the front panel of the Synthesizer Driver. A course adjustment is available under the left front side cover of the 5110B. Removal of the cover will expose a plug button under which is the course adjustment control. If it is necessary to use it, the M and F controls should first be set to the center of their range (slots horizontal).

The drift rate is checked by noting the average offset at two different times several hours apart, determining the difference in average offset and dividing it by the time between observations. This gives the rate of change of frequency per unit time. It is then necessary to convert it to the total change for a 24-hour period to find the aging rate of the standard for a 24-hour period.

**Example:-** Reading #1 average offset is +3 parts in  $10^{10}$  about 10 AM.

Reading #2 average offset is +7 parts in  $10^{10}$  about 4 PM.

Difference in average offset is  $7-3 = 4$  parts in  $10^{10}$ .

Time between observations is 4 PM - 10 AM = 6 hours.

Average rate of change is  $\frac{4 \times 10^{10}}{6} = 6.666$  parts in  $10^{11}$  per hour.

Total change for a 24-hr period is:  $6.66$  parts in  $10^{11} \times 24 = 1.6$  parts in  $10^9$ .

Two coherent measurements of offset may be made 24 hours apart and the difference will be the aging rate directly.

Table 5-2. In-Cabinet Performance Check (cont'd)

**3. INTERNAL FREQUENCY STANDARD:**

**STABILITY:** As a function of ambient temperature:  $\pm 2 \times 10^{-10}$  per  $^{\circ}\text{C}$  from  $0^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ .  
As a function of line voltage:  $\pm 5 \times 10^{-11}$  for a  $\pm 10\%$  change in line voltage  
(rated at 115 or 230 volts rms line voltage).

Measure the stability of the internal standard using the circuit in Figure 5-3 and the following procedure:

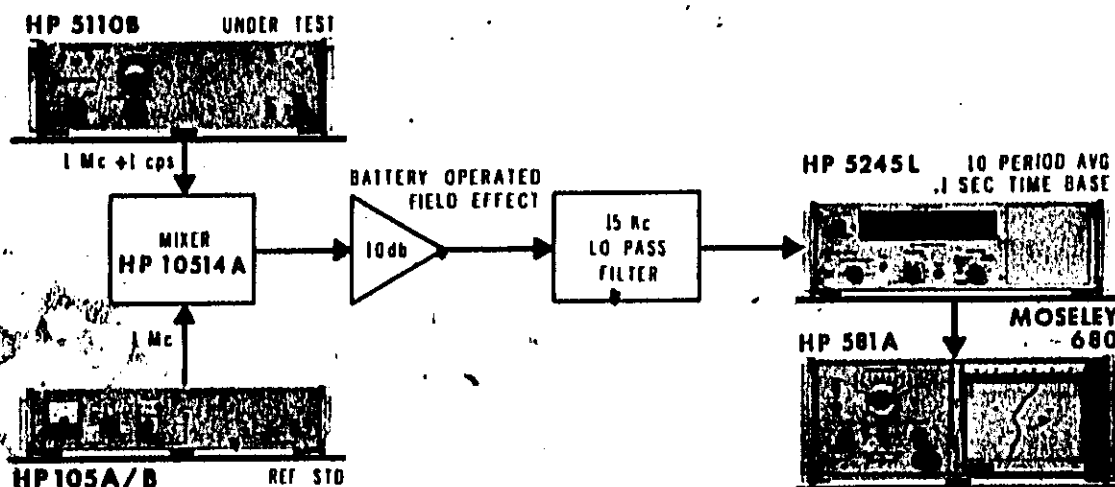


Figure 5-3. Test Setup - Stability Measurements

**TEMPERATURE:**

1. Place the 5110B in a temperature-controlled environment. The rest of the circuit should be in a constant temperature environment.
2. Set the digital to analog converter to analog columns 4, 5, and 6. This gives a full scale plot on the strip chart recorder of 10 parts in  $10^9$ .
3. Make a reference plot with unit at room temperature. Lower the temperature of the 5110B ambient to  $0^{\circ}\text{C}$  and allow 3 hours for the unit to reach thermal equilibrium. Make a plot of the output. Increase the temperature gradually to  $+55^{\circ}\text{C}$  and allow 3 hours for thermal equilibrium. Make a plot of the output. Note that the change in frequency shall not exceed  $\pm 2$  parts in  $10^{10}$  per  $^{\circ}\text{C}$  change of ambient temperature.

**LINE VOLTAGE:**

1. Connect the 5110B to a variable voltage power line source. Using the circuit of Figure 5-3 and with the column selector of the digital to analog recorder set to columns 3, 4, and 5 make a plot with the line voltage at 115v rms (full scale is 10 parts in  $10^{10}$ ). Lower the line voltage 10% to 103v rms and make a second plot. Set the line voltage to 10% above normal line (127 v rms), and make a third plot.
2. Note that the frequency change is less than  $\pm 5$  parts in  $10^{11}$  from the first reference plot.

**4. INTERNAL FREQUENCY STANDARD: SIGNAL-TO-PHASE NOISE RATIO -  $> 85$  db**

Use Figure 5-1 to check the signal-to-phase noise ratio. The same general procedure used to check the signal-to-phase noise ratio on the output frequencies may be employed.

**5. INTERNAL FREQUENCY STANDARD: HARMONIC SIGNALS -  $> 40$  db below the output with 50-ohm termination.**

Use circuit of Figure 5-2 to measure the harmonic signals. There should be a 40 db attenuation between the frequency standard and the signal input of the Mixer. A 5105A/5110B may be used as the reference standard. Use same general procedure for checking the second, third, and fourth harmonics of the 1 Mc fundamental as was used in checking signal-to-spurious ratio on the output frequencies.

Table 5-2. In-Cabinet Performance Check (cont'd)

<p><b>6. INTERNAL FREQUENCY STANDARD: PHASE LOCKING CAPABILITY</b> - A voltage control allows 5 parts in <math>10^8</math> frequency control for -5 to +5 volts applied externally (J2 on rear panel).</p> <ol style="list-style-type: none"> <li>1. Connect an <math>\phi</math> 721A Variable Power Supply to rear BNC connector J2.</li> <li>2. Use circuit of Figure 5-3 with the digital to analog column selector set to columns 5, 6, and 7 (full scale is 10 parts in <math>10^8</math>).</li> <li>3. Make a reference plot with the power supply set to 0 volts.</li> <li>4. Set the power supply voltage to -5 volts and make a second plot.</li> <li>5. Set the power supply voltage to +5 volts and make a third plot.</li> <li>6. Note that the frequency has changed at least 5 parts in <math>10^8</math> between the 2nd &amp; 3rd plots.</li> </ol>
<p><b>7. EXTERNAL FREQUENCY STANDARD: INPUT REQUIREMENTS</b> - 1 Mc or 5 Mc, 0.2 v rms minimum, 5 v maximum across 500 ohms. Stability and spectral purity of 5106A Frequency Synthesizer will be partially determined by the characteristics of the external standard if used. Filtering is provided for broadband noise cleanup.</p> <ol style="list-style-type: none"> <li>1. Apply a 1 Mc or 5 Mc signal, level 0.2v to 5v rms to rear panel BNC connector marked IN.</li> <li>2. Note a 1-Mc signal at 1 volt, <math>\pm 0.1</math> volt rms at rear panel BNC connector marked OUT.</li> </ol>

Table 5-3. Assembly or Module Identification

Ass'y No.	Function	$\phi$ Part No.
A1	Input Amplifier/Buffer Amplifier	05110-6015
A2	Frequency Standard	05110-6014
A3	Crystal Filter	05110-6081
A4	Comb Generator	05110-6102
A5	39/3.9 Mc Filter/Divider	05110-6100
A6	38/3.8 Mc Filter/Divider	05110-6099
A7	37/3.7 Mc Filter/Divider	05110-6098
A8	36/3.6 Mc Filter/Divider	05110-6097
A9	35/3.5 Mc Filter/Divider	05110-6096
A10	34/3.4 Mc Filter/Divider	05110-6095
A11	33/3.3 Mc Filter/Divider	05110-6094
A12	32/3.2 Mc Filter/Divider	05110-6093
A13	31/3.1 Mc Filter/Divider	05110-6092
A14	30/3.0 Mc Filter/Divider	05110-6091
A15	20/24 Mc Filter	05110-6101
A16	Power Supply Rectifier	05110-6027
A17	Power Supply Regulator	05110-6018
A18	Selector Switch	05110-6017

5-22. Adjustments should not be attempted until it is verified that the module in question is at fault. In the following paragraphs normal operation of each module or assembly is described first followed by adjustment procedure. The input level, frequency, power to the module, and the measuring technique should all be checked before assuming the module is in need of adjustment or repair. See Figures 5-10, 5-11 for location of modules and assemblies.

#### 5-23. INPUT AMPLIFIER A1A1.

5-24. NORMAL OPERATION. Input Amplifier output is 1 Mc at  $1 \pm 0.1$  volt rms into 50 ohms with an input of either 1 or 5 Mc, 0.2 to 5 volts rms.

5-25. 1 MC ADJUSTMENTS. Using the  $\phi$  Model 411A RF Millivoltmeter to measure input and output levels proceed as follows:

1. Set output level of  $\phi$  606A Signal Generator to 1 volt and 1 Mc (use CRYSTAL OSCILLATOR) and apply to J3. Use extender cable to get module out of unit where adjustments can be made.
2. Adjust L5 for maximum output at J4.
3. Adjust L4 for maximum output at J4.
4. Adjust R14 for 1 volt output at J4.
5. Reduce input level until output falls to about 0.5v.
6. Adjust L1 for maximum output. This adjustment will be very broad.

5-26. 5 MC ADJUSTMENTS. Using Signal Generator and  $\phi$  175A Oscilloscope, proceed as follows:

1. Use crystal calibrator to set 606A at 5 MC, then tune 606A to 4.85 MC.
2. Set input level from 606A to 0.2 volt and connect to J3.
3. Connect vertical input of Oscilloscope to J3 and horizontal input to J4.
4. Observing lissajous pattern on the Oscilloscope, adjust L4 so that the divider Q3 pulls into synchronism at 4.85 Mc when tuning towards 5 Mc from a lower frequency, and at 5.3 Mc or higher when tuning towards 5 Mc from a higher frequency.
5. It may be necessary to adjust R14 again for a 1 volt output. This should be done at 5 Mc.
6. Reduce input signal level until output falls to approximately 0.5 volt.
7. Adjust L2 for maximum output. This adjustment will be very broad.
8. Using 0.2 volt input, repeat step d.

**PERFORMANCE CHECK TEST CARD**

Description	Check		
<b>1. OUTPUT FREQUENCIES</b>	Signal-to-Phase Noise >60 db	Signal-to-Spurious >105 db	Amplitude
24 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
30 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
31 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
32 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
33 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
34 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
35 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
36 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
37 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
38 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
39 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
20 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 100 mv
3.0 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.1 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.2 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.3 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.4 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.5 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.6 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.7 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.8 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
3.9 MC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 50 mv
<b>2. INTERNAL FREQUENCY STANDARD</b> 1 MC	<input type="checkbox"/>	<input type="checkbox"/>	Parts in $10^7$ (frequency offset at beginning of test)
AGING RATE (after 72 hrs of continuous operation)	<input type="checkbox"/>	<input type="checkbox"/>	$\pm 3$ parts in $10^9$ per 24 hrs (frequency offset 24 hrs later at same temperature)
<b>3. STABILITY:</b> As a function of temperature: 0°C to +55°C	<input type="checkbox"/>	<input type="checkbox"/>	$\pm 2$ parts in $10^{10}/^\circ\text{C}$
As a function of $\pm 10\%$ line voltage change	<input type="checkbox"/>	<input type="checkbox"/>	$\pm 5$ parts in $10^{11}$
<b>4. SIGNAL-TO-PHASE NOISE RATIO</b>	<input type="checkbox"/>	<input type="checkbox"/>	85 db
<b>5. HARMONIC SIGNALS</b>	<input type="checkbox"/>	<input type="checkbox"/>	40 db below output
<b>6. PHASE LOCKING CAPABILITY</b> -5 to +5 volts applied at rear panel BNC J2	<input type="checkbox"/>	<input type="checkbox"/>	5 parts in $10^8$
<b>7. EXTERNAL FREQUENCY STANDARD</b> INPUT REQUIREMENTS: 1 Mc or 5 Mc 0.2 volts rms minimum 5 volts rms maximum across 500-ohm load	<input type="checkbox"/>	<input type="checkbox"/>	1 volt $\pm 1.5$ db into 50-ohm resistive load

Table 5-4. Troubleshooting Aids

The following is a general procedure to follow in locating a defective module. See Overall Block Diagram, Figure 9-2.		
Symptom	Procedure	Proper Indication
No output	Check to see if OPERATE light is on Rotate CIRCUIT CHECK switch thru all its positions Check to see if FREQUENCY STANDARD switch is in INT Check Crystal Filter Assembly A3 Check Frequency Standard A2	A green reading in all positions  1 Mc 1 Mc
Output OK with FREQUENCY STANDARD switch in INT but no output when switch in EXT.	Check to see if 1 or 5 Mc, at .2 to 5 volt level is connected to BNC labelled IN on rear panel. Check Input Amplifier/Buffer Amplifier A1 Check FREQUENCY STANDARD switch (Selector Switch A18)	1 Mc 1 Mc
1 Mc output OK, no other output  No 30 Mc No 31 Mc No 32 Mc No 33 Mc No 34 Mc No 35 Mc No 36 Mc No 37 Mc No 38 Mc No 39 Mc	Check Comb Generator A4  Check Filter Divider A14 Check Filter Divider A13 Check Filter Divider A12 Check Filter Divider A11 Check Filter Divider A10 Check Filter Divider A9 Check Filter Divider A8 Check Filter Divider A7 Check Filter Divider A6 Check Filter Divider A5	Check outputs from Comb Generator A4 (14 mv into 50 ohms)  Filter section outputs are 100 mv into 50 ohms
No 3.0 Mc No 3.1 Mc No 3.2 Mc No 3.3 Mc No 3.4 Mc No 3.5 Mc No 3.6 Mc No 3.7 Mc No 3.8 Mc No 3.9 Mc	Check 30 Mc from A14 Check 31 Mc from A13 Check 32 Mc from A12 Check 33 Mc from A11 Check 34 Mc from A10 Check 35 Mc from A9 Check 36 Mc from A8 Check 37 Mc from A7 Check 38 Mc from A6 Check 39 Mc from A5	If filter output is present, Divider section is at fault  Divider section outputs are 50 mv into 50 ohms
No 24 Mc	Check 24 Mc Filter A15J1  Check Comb Generator A4J15 (3)	Normal output from filter is 100 mv  Normal output from A4J15 (3) is > .12 mv into 50 ohms



Table 5-4. Troubleshooting Aids (cont'd)

Symptom	Procedure	Proper Indication
No 20 Mc	Check 20 Mc Filter A15J2  Check Comb Generator A4J15 (7)	Normal output from A15J2 (3) is 100 mV into 50 ohms.  Normal output from A4J15(7) is 3 mv
No 1 Mc, all other frequencies present	Check Input Amplifier/Buffer Amplifier A1	Normal output from Buffer Amplifier A1J6 is 1 volt
Power Supply Rectifier A18	Open S2; Short emitter to base of Q4 Short emitter to collector of A2Q1	Output should go to zero Output should go to zero

5-27. **1 MC SYNCHRONISM TEST.** Observe the Lissajous pattern on the Oscilloscope. The pattern should rotate smoothly with no abrupt jumps as the Signal Generator frequency is changed. The output should remain synchronized over frequency range from 0.9 Mc to 1.10 Mc, with an input level range of 0.2 volt to 5.0 volts.

5-28. **OUTPUT LEVEL CHECK.**

- a. Set the Signal Generator to 1 Mc using CRYSTAL CALIBRATOR.
- b. Vary input level from 0.2 volt to 5.0 volts.
- c. Monitor output level at J4 with RF Millivoltmeter; level should be between 1.0 and 1.1 volts.
- d. Set Signal Generator to 5 Mc using CRYSTAL CALIBRATOR.
- e. Vary input level to J3 from 0.2 v to 5.0 v.
- f. Output should be between 0.95 and 1.05 volts.

5-29. **BUFFER AMPLIFIER A1A2.**

5-30. **NORMAL OPERATION.** Buffer Amplifier output is 1 Mc at 1v  $\pm 1/5$  db into 50 ohms with a 1 Mc, 1.2 volt rms input.

5-31. If adjustments are necessary proceed as follows:

- a. Set Signal Generator output to 1 Mc using CRYSTAL CALIBRATOR.
- b. Set Signal Generator output level to 1.2v rms and connect to J5.
- c. Adjust L2 for maximum output at J6.
- d. Adjust R8 for 1.0 volt into 50 ohms at J6.

5-32. **FREQUENCY STANDARD A2.**

5-33. **NORMAL OPERATION.**

- a. Generates 1 Mc, 1 volt rms into 50 ohms signal.
- b. Coarse, medium and fine frequency adjustments.
- c. Oven controller circuit controls the oven temperature.
- d. Phase locking - An external  $\pm 5$  volts dc applied at J2 on rear panel will vary frequency a total of 5 parts in  $10^8$ .

5-34. **-21 VOLT ADJUST.** Connect instrument to a power source set to 115 volts (normal line) and leave it on for at least an hour. Measure the dc volts at the +10 and -16 volt terminal on the Frequency Standard module. Having verified these voltages connect the voltmeter between the +10 volt terminal and the test point on the module. The negative lead is connected to the +10 volt terminal. The voltmeter must have a floating input to avoid grounding the +10 volt line. Adjust the -21 volt control (bottom side of Frequency Standard module) so that the meter indicates -21 volts.

5-35. **OVEN CONTROLLER TEST.** Start with an instrument that has been disconnected from the power line for at least 5 minutes. Turn the Circuit Check switch to Oven Temp. Connect the power cord to the power line. Note the meter indication. When power is first applied, the meter will pin down scale. After about 15 minutes, depending on how long the oven has been off, the meter indication will go up scale to or near maximum. It will stay up scale for approximately one minute, then go down scale below the green area. It will then rise again and slowly oscillate about the green area until the oven comes to its operating temperature. At that time the needle will settle down in the green area. It should stay in the green area as long as the instrument is connected to the power line. If at any time the needle is not in the green area after warmup, oven controller circuits should be checked.

5-36. **OUTPUT LEVEL.** Connect an ac voltmeter with a 50-ohm load to J2 of the Frequency Standard module A2. J2 is located under the Crystal Filter Assembly A3. Adjust R18 Level Adjust control for an output of 1 volt rms.

5-37. **FREQUENCY SETTING.**

a. Allow oven temperature to stabilize crystal for 24 hours and instrument to warm up for at least two hours.

b. Connect a 1 Mc signal from a frequency standard to the EXT AC trigger input of an oscilloscope.

c. Connect the output of the Frequency Standard to the vertical input of the oscilloscope. The output may be obtained either directly from the Frequency Standard output connection A2J2 or from the rear connector marked OUT. (The Frequency Standard switch must be in the INT position.)

d. Set the oscilloscope sweep speed to 0.1  $\mu$  sec.

e. Center the M and F INTERNAL STANDARD ADJUST controls on the front panel. (They are centered when their slots are horizontal.)

f. Adjust the coarse frequency control (located behind the left front side panel of the unit under a plug button) until the pattern on the scope is approximately stationary. Use the M and F controls, if necessary, to make the drift of the scope pattern zero. With the external standard frequency of 1 Mc and the sweep speed of 0.1  $\mu$ sec/cm, a drift of one centimeter per second is equal to a frequency offset of one part in  $10^7$ . An average drift rate of one centimeter in 100 seconds is equal to a frequency offset of one part in  $10^9$ . (1 Mc off by 0.001 cycle per second.) A more accurate method of setting the Frequency Standard on frequency is explained under IN CABINET PERFORMANCE CHECKS, Internal Frequency Standard.

5-38. **CRYSTAL FILTER ASSEMBLY A3.**

5-39. **NORMAL OPERATION.** Tuned to 1 Mc. Lower frequency, -3 db point is between 999.935 kc and 999.965 kc. Upper frequency, -3 db point is between 1000.035 kc and 1000.065 kc.

5-40. **ADJUSTMENTS.** If adjustments are necessary proceed as follows:

a. Connect Crystal Filter output J4 (vertical BNC on top side of A3) to an AC voltmeter with a 100-ohm load resistor.

b. Using a 50-ohm coax cable connect the output of the Frequency Standard A2J2 directly to the 1 Mc input connector J1 on the Comb Generator A4. It is the BNC connector with a "T" on it located at the left end of the Comb Generator as seen from the top of the instrument. Remove the T connector and connect the jumper coax. This allows the use of the Synthesizer Driver to drive a 5105A Frequency Synthesizer which is needed to complete this adjustment.

c. Set Frequency Synthesizer to 1000.000 kc.

d. Connect this signal to the Crystal Filter input connector (90° BNC next to output BNC).

e. The AC Voltmeter should indicate the output of the Synthesizer, approximately 1.2 volts rms. Note the level in db. This is the reference reading.

f. Change the Synthesizer frequency to 1016.000 kc.

g. Output should be less than 5 mv. Adjust C4 for less than 5 mv output. C4 is on the Crystal Filter Assembly facing the top of the instrument.

h. Set the frequency to 999.945 kc.

i. Vary the Synthesizer frequency to locate the upper and lower -3 db frequencies.

j. The upper -3 db frequency should be between 1000.035 kc and 1000.065 kc; the lower between 999.935 kc and 999.965 kc.

k. Check the output at 1005.00 kc and 995.000 kc. It should be at least 30 db below the reference output.

l. This completes the adjustments and tests.

5-41. **COMB GENERATOR MODULE A4.**

5-42. **NORMAL OPERATION.** Input 1 Mc, 1 volt rms into 50 ohms (from Crystal Filter Assembly A3). Output is 24 and 30 to 39 Mc in 1 Mc steps; at least 12 mv into 50 ohms. 20Mc output is greater than 5 mv into 50 ohms. Spurious  $\pm$  1 Mc side band signals at least 13 db below output level on 24 and 30 to 39 Mc outputs. Phase Noise: 24, 30 to 32, and 34 Mc outputs at least 60 db below signal level. All in a 30 kc bandwidth centered in the signal, excluding a 1 cps band centered on the signal.

5-43. **ADJUSTMENTS AND TESTS.** Remove filter/divider assemblies to expose tuning holes of tank circuits in the comb generator. Verify proper input by putting CIRCUIT CHECK meter into 1 Mc position. The 1 Mc is sampled from the input stage of the comb generator. A reading in the green area of the meter indicates a satisfactory 1 Mc input to the comb generator circuits.

5-44. **24 AND 30 TO 39 MC OUTPUTS.** Fabricate an extension cable as shown in Figure 5-4. Verify that the output is tuned to the correct frequency with an electronic counter and a video amplifier (5245L & 5261A). Use the extension cable to make the connection between the comb generator and the video amplifier, counter combination. The output level is normally about 14 mv.

5-45. The correct frequency for each comb generator output is listed in Table 5-5.

Table 5-5. Comb Generator Frequencies

Conn. No.	Freq.	Input Trans.	Output Trans.
A5	39 Mc	T1	T12
A6	38 Mc	T2	T13
A7	37 Mc	T3	T14
A8	36 Mc	T4	T15
A9	35 Mc	T5	T16
A10	34 Mc	T6	T17
A11	33 Mc	T7	T18
A12	32 Mc	T8	T19
A13	31 Mc	T9	T20
A14	30 Mc	T10	T21
A15	29 Mc	T11	T22

a. If an output is not the proper frequency (1 Mc high or low), tune the indicated input and output transformers.

**Note**

Turn the instrument up on its front panel, and put a drop of acetone on the slug that is to be adjusted. This will loosen the dope that holds it in place. After adjustments are completed, re-dope the slugs to prevent any movement.

b. After the proper frequency output is verified, connect an RF Voltmeter (411A) to output using a 11048B 50-ohm feed-thru termination.

c. Tune the related input and output transformers for a maximum. Be careful not to tune the transformers too far. They might peak on an adjacent frequency. Output level must be at least 12 mv into 50 ohms.

d. Repeat for all frequencies of 24, and 30 to 39 Mc.

e. There is some interaction between the input transformers. Their adjustment should be repeated until they are all peaked. The output transformers need be set only once.

5-46. 20 MC OUTPUT. There is no adjustment for the 20Mc output. Its level should be at least 5 mv into 50 ohms.

5-47. POWER AMPLIFIER AND STEP RECOVERY DIODE BIAS. If any of the outputs cannot be tuned to the correct level or if some components in the power amplifier or step recovery diode circuits are changed the following adjustments should be made.

5-48. Connect an RF Voltmeter (411A) with an 11048B 50-ohm feed-thru termination to the 39 Mc connector A5 of the comb generator using the special connector shown in Figure 5-4 and a 50-ohm coax. Tune L1 for maximum output. Input Amplifier/Buffer module A1 must be removed. Be sure to keep the 1 Mc connection intact from the Crystal Filter to the Comb Generator.

5-49. The cover of the Comb Generator Module must be removed to adjust the bias of the step recovery diode. Proceed as follows:

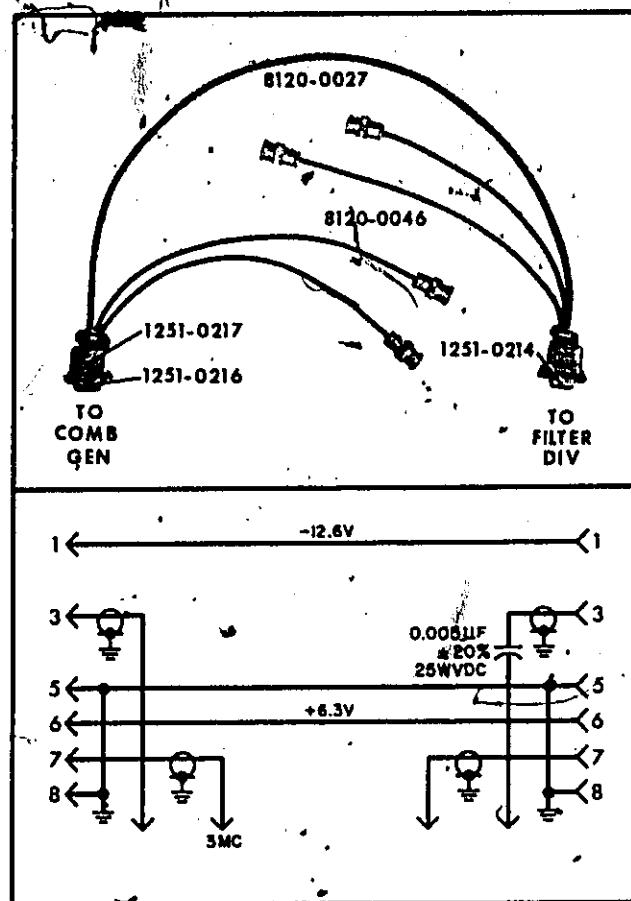


Figure 5-4. Extension Cable used to Check Comb Generator and Filter/Divider Modules

a. Remove the side covers and the 3 screws on each side of the instrument that mount the assembly.

b. Remove the screws along the top and bottom edge of the assembly.

c. Remove the cover. The bias adjust pot R6 is located in the lower left hand corner on the end that the BNC connector is on.

d. Connect the RF Voltmeter to the 39 Mc output, A5.

e. Turn R6 maximum clockwise, then counterclockwise and set on the first stable peak in the 39 Mc output.

f. Tune L1 for maximum output.

g. Replace the cover using all the screws and making sure they are all tight.

5-50. SPURIOUS SIGNALS. The circuit in Figure 5-5 may be used to measure the spurious signal levels. They should be at least 13 db below the signal level on the 24 and 30 to 39 Mc outputs.

5-51. Connect the equipment as shown in Figure 5-5. With the reference oscillator offset 1 kc from the frequency under test, adjust the tuned voltmeter for an

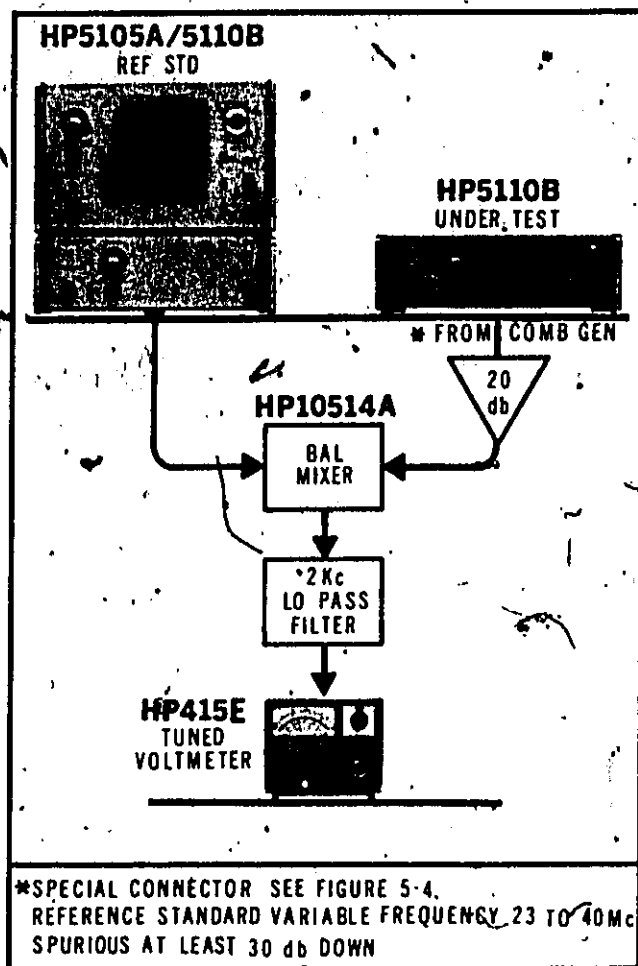


Figure 5-5. Spurious Signal Test Setup

on-scale reading. Note the meter reading and range setting in db. This is the reference reading.

5-52. Offset the reference oscillator  $\pm 1$  Mc plus 1 kc from the frequency under test. Adjust the voltmeter for an on-scale reading. The difference between this reading and the reference reading is the signal to spurious signal voltage ratio for a spurious signal 1 Mc away from the frequency under test.

#### Note

The tuned voltmeter is calibrated for an input from a square law device (output voltage proportional to power input). The db reading must be doubled when using the voltmeter in the circuit of Figure 5-7 (i. e. an indication of 40 db is really 80 db in this application).

5-53. The most pronounced spurious signals are plus and minus 1 Mc from the frequency under test. If these spurious signals are within specifications, any other spurious signals may be expected to be within specifications.

5-54. PHASE NOISE. The circuit of Figure 5-1 in the In-Cabinet Performance Checks may be used to measure the phase noise in the comb generator assembly with the following changes:

a. Amplifier #1 must have 20 db of gain and the extension cable of Figure 5-4 is used to make the connection from the Comb Generator module to the amplifier input cable.

b. The 24, 30 to 32, and 34 Mc (A15, A14 to A12 and A10) outputs typically have a signal to phase noise ratio of at least 60 db.

c. The 33, 35 to 39 Mc (A11, A9 to A5) outputs typically have a signal to phase noise ratio of at least 58 db.

#### 5-55. FILTER/DIVIDER MODULES A5-A14.

5-56. NORMAL OPERATION. With normal input from the Comb Generator A4 (100 mv, spurious down 13 db, and phase noise at least 60 db down on the 24, 30 to 32, and 34 Mc inputs; and at least 58 db down on the 33, and 35 to 39 Mc inputs) the outputs should be the input frequency and  $1/10$ th the input frequency. The output levels are typically 100 mv and 50 mv respectively into 50 ohms. The signal to  $\pm 1$  Mc spurious ratio is typically 103 db for 24, and 30 to 39 Mc outputs. The signal-to-phase noise ratio is typically greater than 68 db for 24, 30 to 32 and 34 Mc outputs; greater than 78 db for 33, and 35 to 39 Mc; and greater than 73 db for the 3.0 to 3.9 Mc outputs. All measurements made in a 30 kc bandwidth centered on the signal and excluding a 1 cps band centered on the signal.

5-57. OPERATIONAL CHECK. To quickly check to see if the Filter Divider is operating properly proceed as follows:

a. Remove the module to be checked from the 5110A and supply it with power using the fabricated cable shown in Figure 5-4.

b. Connect an  $\text{C} 411\text{A}$  to Filter output J1, using an  $\text{C} 11048\text{B}$  50-ohm feed-thru termination.

c. Connect 606A set to  $f_0$  ( $f_0$  is frequency associated with filter under test) with an output level of 100 mv, to input BNC on extension cable.

d. Tune 606A for peak at Filter output J1.

e. Connect 606A output to input of 5245L Electronic Counter and note frequency.

f. If frequency of 606A is  $f_0$  after peaking, and output level at J1 of Filter is 100 mv,  $\pm 1.5$  db, the Filter is operating properly.

g. Connect 606A to input BNC on extension cable and check Divider output J5 with 411A and 5245L. Use an  $\text{C} 11048\text{B}$  50-ohm termination.

h. If output frequency is  $1/10$ th of  $f_0$  and level is 50 mv,  $\pm 1 - 3$  db; the Divider is operating properly.

5-58. ALIGNMENT OF FILTERS. If it is necessary to align Filters, proceed as follows:

a. Remove the Filter/Divider Module from the instrument and connect it to its normal input with the extension cable diagrammed in Figure 5-4. Remove cover from Filter/Divider module.

## Note

To effectively align filters it is necessary to keep the input level at about 3 mv. For this reason, the attenuator is placed between the Comb Generator output and the input to the Filters. If the normal input from the Comb Generator is used, set the 355C Attenuator to 12 db. If the 606A is used with a 100 mv level, set the 355D Attenuator to 30 db.

b. Connect the output frequency  $f_0$  from the special cable to Variable Attenuator. The other side of the Attenuator is connected to the Filter/Divider by the special cable.

c. Connect an  $\text{C11048B}$  50-ohm feed-thru termination to Filter output J1.

d. Turn on the instruments and adjust attenuator to set output of about 20 mv. Align the Filter by starting at the output tuned circuit L11 and moving toward the input tuned circuit L5, adjusting each coil for maximum output. After adjusting each tuned circuit, adjust attenuator to keep output of Filter at about 20 mv.

## Note

The slugs in the tuning coils have all been set with a drop of dope. Rather than freeing all these slugs with a drop of acetone, it would be wise to compare the outputs of the various stages first, to see if the troublesome stage can be localized.

e. Set the attenuator to 12 db and realign the tuned circuit as before.

f. Set Attenuator to 0 db. If more than one Filter output is provided, put 50-ohm terminations ( $\text{C}$  Part No. 1250-0207) on the other outputs.

g. Adjust L12 to set output level to  $100 \text{ mv} \pm 4 \text{ mv}$ . Adjusting L12 detunes the last stage and L11 must be readjusted every time L12 is adjusted.

h. Connect a 606A set to  $f_0$  at a 100 mv level to input of 355D set to 0 db. Connect output of 355D to input of Filter.

i. Reduce the input signal by 30 db. The output should drop no more than 15 db. This indicates the proper amount of limiting is present.

5-59. ALIGNMENT OF DIVIDERS. To align Divider section of the Filter/Dividers, proceed as follows:

## Note

The output of the Filter should not be used as the input signal when aligning the Dividers.

a. Remove the cover from the Filter/Divider.

b. Connect power to it by using the extension cable (Figure 5-4) plugged into the Comb Generator connector normally occupied by the Filter/Divider.

c. Divide by 2: Connect appropriate frequency  $f_0$  ( $f_0$  is frequency of Filter associated with the Divider) at 100 mv level from a 606A Signal Generator to the input on the extension cable.

d. Connect Oscilloscope channel A probe to base of Q52 and adjust L54 for maximum.

e. Touch the probe to the can of T51 and adjust T51 for maximum signal.

f. If L55 has been replaced adjust for minimum inductance by turning the tuning slug clockwise until it bottoms. Do not use excessive force. Normally L55 should not be adjusted unless divider bandwidth (see step s below) cannot be adjusted using L57.

h. Divide by 5: Use the same connections as for the divide-by-two adjustment.

j. Check for proper operation of the divide-by-5 circuit as indicated by the waveform at the junction of R67 and L56. The proper waveform is "a" in Figure 5-6.

k. Connect the oscilloscope (175A) channel B probe to the output of the signal generator (use a BNC "T"). Set scope channel selector to A-B.

m. Remove the signal generator cable from the Filter/Divider. Put "T" on cable and terminate one side with 50 ohms and attach BNC end of Test Clip Lead Assembly to the other. The Test Clip Lead Assembly is shown in Figure 5-7.

n. Set the Signal Generator to 0.6 volts output.

p. Connect the alligator clip with the 10 pf capacitor in series to base of Q52. Connect the other alligator clip to ground.

q. An overall division ratio of 10:1 should be seen on the 175A. See Figure 5-8. Adjust L57, if necessary, to obtain this ratio.

s. Vary frequency of the 606A about  $f_0$  to check the divider bandwidth. See Figure 5-9. The band edge should always be determined by the transition point when going from unsynchronized operation to synchronized operation.

t. Adjust L57, if necessary, so that the divider bandwidth is centered about  $f_0$ . Use procedure which follows as check on bandwidth.

u. Reduce the 606A level 10 db below 0.6 volt and check divider bandwidth. Divider must stay synchronized over a frequency range of  $f_0 + \text{or} - 400 \text{ kc}$ .

v. Increase 606A level to 0.6 volt and check divider bandwidth. Divider must stay synchronized over a frequency range of  $f_0 + \text{or} - 800 \text{ kc}$ .

w. Increase the 606A level 10 db above 0.6 volt and check divider bandwidth. Divider must stay synchronized over a frequency of  $f_0 + \text{or} - 400 \text{ kc}$ .

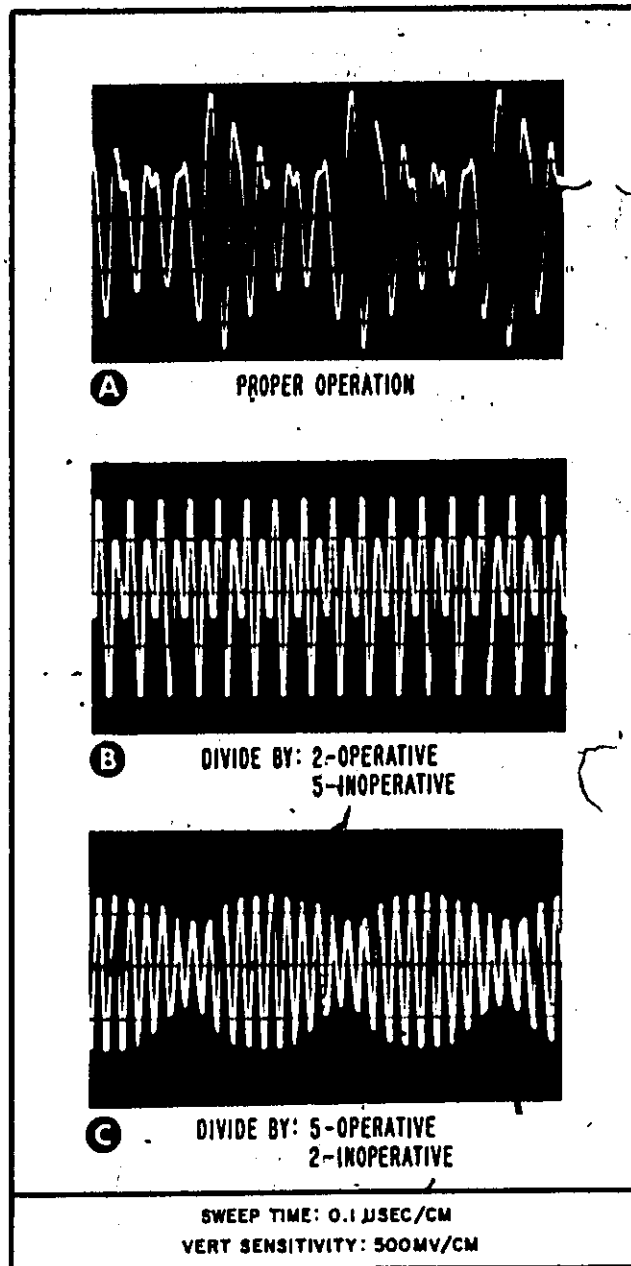


Figure 5-6. Divider Waveforms

x. Set 606A to 10 db above 0.6 volt and at  $f_0 + 400$  kc. Use 606A vernier to smoothly reduce level to 10 db below 0.6 volt level. The divider should remain synchronized over the full range of level variation.

y. Set 606A to 10 db below 0.6 volt level and at  $f_0 - 400$  kc. Use 606A vernier to smoothly increase level to 10 db above 0.6 volt. The divider should remain synchronized over the full range of level variation.

z. T51 and L57 may have to be readjusted slightly for divider to meet all test limits. Recheck all limits after making final adjustments.

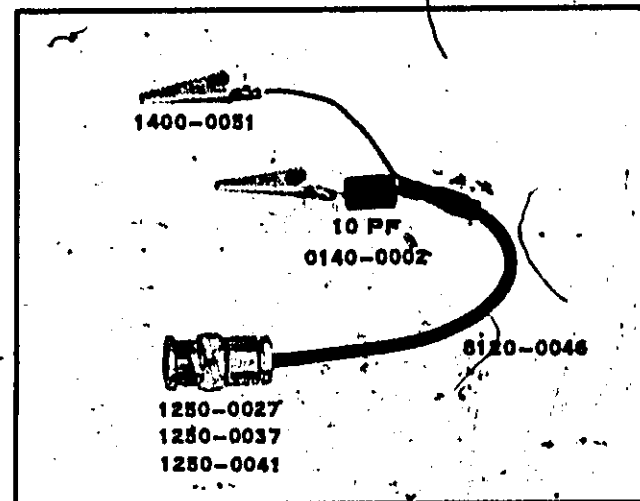


Figure 5-7. Test Clip Lead Assembly

5-60. OUTPUT LEVEL. To adjust output level proceed as follows:

a. Connect 411A to the divider output (J5). The 11048B termination should be connected to the 411A "Tee" probe.

b. If more than one divider output is provided, put 50-ohm terminations on the other outputs.

c. Adjust L59 to set output level to 50 mv  $\pm$  2 mv. Adjusting L59 detunes the last stage and L58 must be readjusted after each adjustment of L59.

d. Replace cover and recheck output level. Readjust L59 and L58 if necessary.

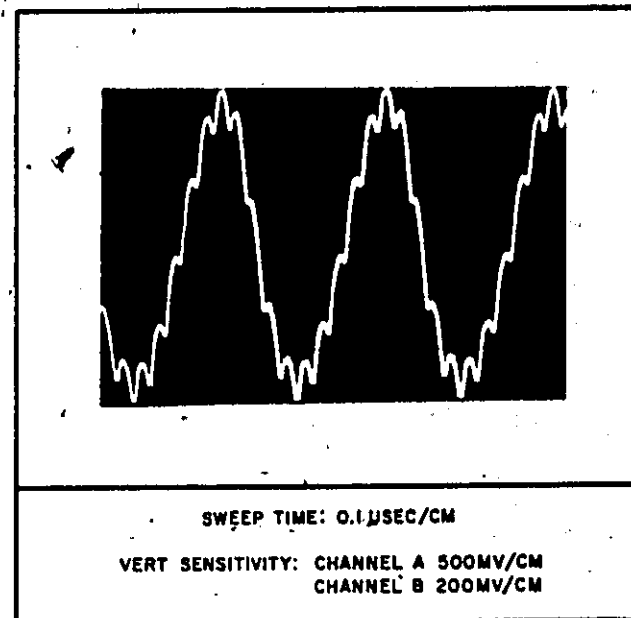


Figure 5-8. Divider Output Synchronized with Input

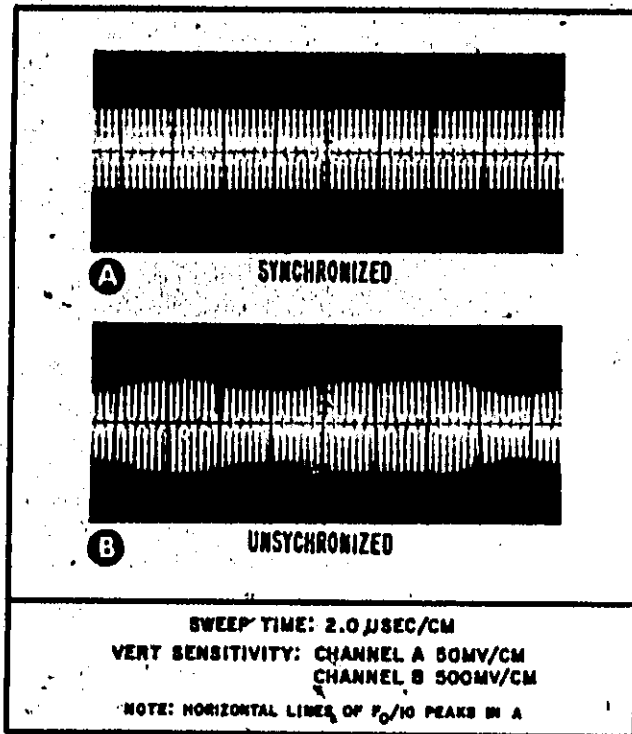


Figure 5-9. Divider Output at Edge of Band

**5-61. TESTS.**

Spurious Signals: See In-Cabinet Performance Test.  
 Phase Noise: See In-Cabinet Performance Test.

**5-63. 20/24 MC FILTER A15.****5-64. NORMAL OPERATION.**

Inputs: 24 Mc is 12 mv into 50 ohms  
 20 Mc is 5 mv into 50 ohms  
 Outputs: 24 Mc is  $100 \pm 4$  mv into 50 ohms  
 20 Mc is  $100 \pm 6$  mv into 50 ohms  
 Spurious signals 1 Mc from 24 Mc are typically 103 db below output level.

**5-65. OPERATIONAL CHECK.** The same general procedure may be used as described in Paragraph 5-57.

**5-66. 24 MC FILTER A15A1 ALIGNMENT.** If it is necessary to align this Filter remove the 3/24 Mc Filter module from the 5110A and proceed as follows:

a. Connect Filter to its normal input with the extension cable diagrammed in Figure 5-4. Remove cover from module.

b. Connect a variable attenuator in the 27 Mc signal line using BNC connectors of extension cable.

c. Connect an  $\text{Q} 11049\text{B}$  50-ohm Feed-Thru termination to Filter output J1.

d. Align the Filter (see Paragraph 5-58, d) by starting at L11 and moving forward to L5, adjusting each coil for maximum output.

e. Set the attenuator to 12 db, and again adjust the Filter starting at L11.

f. Set the Attenuator to 0 db.

g. If more than one 24 Mc output is provided, put 50-ohm terminations on the other outputs.

h. Adjust L12 to set output level to  $100 \text{ mv} \pm 4 \text{ mv}$ , Adjusting L12 detunes the last stage and L11 must be readjusted every time L12 is adjusted.

j. Connect a 606A set to 24 Mc at a 100 mv level to input of 355D set to 0 db. Connect output of 355D to input of 24 Mc Filter.

k. Reduce input signal by 30 db. The output should drop no more than 15 db. This indicates the proper amount of limiting is present. Put drop of dope on slugs to lock adjustment. Replace cover and recheck output level. Readjust L11 and L12 if necessary.

**5-67. 20 MC FILTER A15A2 ALIGNMENT.** If it is necessary to align this filter, remove the 20/24-Mc module from the 5110B and proceed as follows:

a. Remove cover of 20/24 Mc module and connect Filter to its normal input with the extension cable diagrammed in Figure 5-4.

b. Connect a variable attenuator in 20-Mc signal line using 20Mc BNC connectors of extension cable.

c. Set Attenuator 355C to 4 db.

d. Adjust L11 through L5 for maximum output.

e. Set Attenuator to 0 db.

f. If more than one 20-Mc output is provided, put 50-ohm terminations on other terminals.

g. Adjust L6 to set the output level at  $100 \text{ mv} \pm 6 \text{ mv}$ . Adjusting L12 detunes the last stage and L11 must be re-adjusted after each adjustment of L12.

h. Connect a 606A set to 20 Mc at a 100 mv level to input of 355D set to 0 db. Connect output of 355D to input of 20 Mc Filter.

i. Reduce input signal by 10 db. The output should drop no more than 5 db. This indicates the proper amount of limiting is present. Put drop of dope in slugs to lock adjustments. Replace cover and recheck output level. Readjust L11 and L12 if necessary.

**5-68. TESTS.** For spurious signals and phase noise checks, see Table 5-2.

**5-69. POWER SUPPLY RECTIFIER ASSEMBLY A16.**

**5-70. GENERAL.** Check the voltages at the output of Regulator Assembly A17 first and if they are essentially correct ( $\pm 100$  mv for +6.3 volt and  $\pm 200$  mv for -12.6 volt) and regulate within  $\pm 100$  microvolts between low and high line voltage, there is no reason to suspect trouble with the Rectifier Assembly A16.

**5-71. NORMAL OPERATION.**

- a. Line Current (normal line) approximately 0.25 amp (standby); 0.5 amp (operate).
- b. Input Voltage: Between pins 4 & 5, 21.2 v rms  
Between pins 10 & 11, 15.3 v rms  
Between pins 12 & 13, 72 v rms  
50 to 400 cps line frequency

c. Outputs: Pin 14 to ground, +13 volts dc or more

9	-15.80 to -17.60
7	+15.41 to +16.59
6	-20.28 to -21.82
3	+11.05 to +12.35
2	-18.85 or less

Voltages are measured with assembly in normal circuit connection.

- d. Ripple: less than 1.2 volt peak-to-peak.

**5-72. TESTS.**

a. Line Current: Connect the power cord to a variable ac source that has a 0-1 amp meter. Set it to normal line (115 v). Note that Synthesizer Driver draws approximately 0.25 amps in Standby. Switch to operate. Line current should be approximately 0.5 amp.

b. Input Voltage: Set line voltage to Synthesizer Driver Unit at normal line (115V) using an AC voltmeter with ungrounded leads. Measure the input ac voltages to the Rectifier Board assembly. Be careful not to short connector pins. Proper values are shown below:

A16 Rectifier	Pins 4 to 5 at least 21.2 v rms
Assembly Connector	10 to 11 at least 15.3 v rms
	12 to 13 at least 72 v rms

c. Output Voltage: Connect an accurate (.02%) DC Differential Voltmeter (740A) as indicated below to check the dc output voltages. The low side of the voltmeter is connected to pin 8. Be careful not to short any of the pins together or to ground. High lead to:

Pin No.	Voltage Range
14	at least +13
9	-15.80 to -17.60
7	+15.41 to +16.59
6	-20.28 to -21.82
3	+11.05 to +12.35
2	-18.85 or less

**5-73.** Voltages are measured with power line at normal line (115V) and normal load on Rectifier Assembly.

Check rectifier voltage by connecting hot side of voltmeter to the plus side (top end when viewed from top of instrument) of either C1 or C2 on rectifier board assembly (see Figure 5-4). Voltage is generally between +20.05 and +20.15 volts. Turn instrument off and use 15-pin Extender Board (#5000-0040) to locate rectifier board so that high side of voltmeter can be placed on the base of the transistor. Turn instrument on. Voltage is generally -31.6 to -35.4 volts.

**5-74. RIPPLE.** Connect the probes of an oscilloscope to pin 14 (+13V) of the rectifier assembly board. Ground should be connected to pin 8. The ripple typically does not exceed 1.2 volts peak-to-peak. Connect probe to pin 2 (-18V). Ripple typically does not exceed 1.2 volts peak-to-peak.

**5-75. POWER SUPPLY REGULATOR ASSEMBLY A17.**

**5-76. NORMAL OPERATION.**

- a. Input voltages: +10 volts on White-Red-Orange wire at collector of Q5  
+15.9 volts at pin 4 of A1  
-16.0 volts on White-Orange-Violet at collector of Q6

- b. Output voltages: +6.300 v,  $\pm 100$  mv on red wire  
-12.600 v,  $\pm 200$  mv on violet wire

- c. Ripple: 5 microvolts or less of 60 and 120 cps components on the +6.3 and -12.6 volt outputs.

- d. Line Regulation: Less than 100  $\mu$ v change on +6.3 or -12.6 volt outputs from low line to high line.

**5-77. POWER SUPPLY ADJUSTMENTS.** There are only two adjustments on the Power Supply and they are on Regulator Board Assembly A17A1. To make these adjustments, proceed as follows:

- a. Connect Differential Voltmeter #740A to -12.6 volt output (violet wire).

**Note**

As +6.3 v output uses -12.6 v output as reference, -12.6 v output should be adjusted first.

- b. Adjust R10 for -12.600 v,  $\pm 10$  mv.
- c. Connect 740A to +6.3 volt output (red wire).
- d. Adjust R8 for +6.300 volt,  $\pm 10$  mv.

**Note**

R8 and R10 are wirewound potentiometers and discrete voltage steps of about 10 mv will be observed. Adjust R8 and R10 to the center of one of these steps closest to the required voltage.

**5-78. LINE REGULATION TEST.**

- a. Connect Differential Voltmeter to either +6.3 v or -12.6 volt output and set "null" to most sensitive position.



b. Vary input line voltage quickly from 102 VAC to 128 VAC and observe instantaneous deflection of meter. Maximum deflection is typically less than 100 microvolts on +6.3 or -12.6.

#### 5-79. RIPPLE TEST.

a. Connect 30 db amplifier, 50 to 150 cps, noise referred to input less than 1 microvolt, to either +6.3 v or -12.6 v output. Connect output of amplifier to input of Wave Analyzer @302A.

b. Measure 60 cps and 120 cps ripple components on both +6.3 v and -12.6 v outputs. Maximum ripple is typically less than 10 microvolts rms on +6.3 v or -12.6 v.

5-80. NOISE IN 3 KC BANDWIDTH TEST. To check for noise in 3 kc bandwidth, proceed as follows:

a. Connect same amplifier used in ripple test, Paragraph 5-79 to output of either +6.3 v or -12.6 v outputs.

b. Connect output of amplifier to input of low pass filter.

c. Connect output of filter to input of 405 (put a 500  $\mu$ f capacitor across meter terminals of 405A) in 1 cps position.

d. Measure the noise voltage. It is typically less than 30 microvolts in the 3 kc bandwidth on +6.3 volt and -12.6 volt outputs.

e. Monitor the character of noise on the Oscilloscope. There should be no discrete steps of voltage discernible. Picture should show only "grass".

5-81. SHORT TERM STABILITY TEST. To check the short term stability of the power supply, proceed as follows:

a. Connect output of either +6.3 volts or -12.6 volts from Regulator A17 to input of Differential Voltmeter @740A. Connect Recorder output of 740A to input of Moseley 680 Recorder.

b. Adjust 740A to null out +6.3 v or -12.6v and set Moseley 680 on 1 v full scale and 4 inches per minute.

c. Run Moseley 680 Strip Chart Recorder for one and one-half minutes.

d. Read chart to determine peak-to-peak excursions. Maximum peak-to-peak excursion is typically less than 250 microvolts for both +6.3 v and -12.6 v.

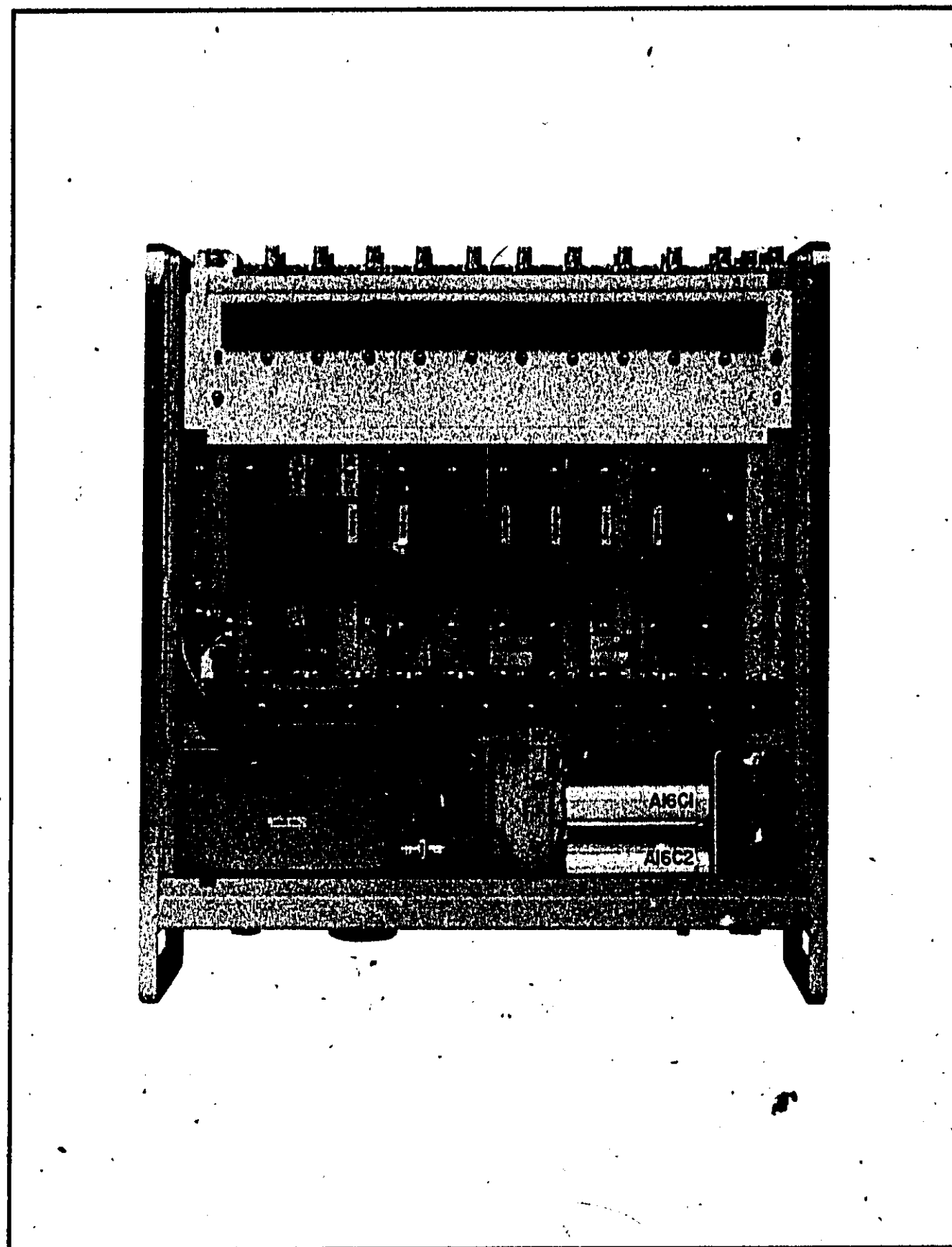


Figure 5-10. Top View of 5110B - Modules, Assemblies, Components

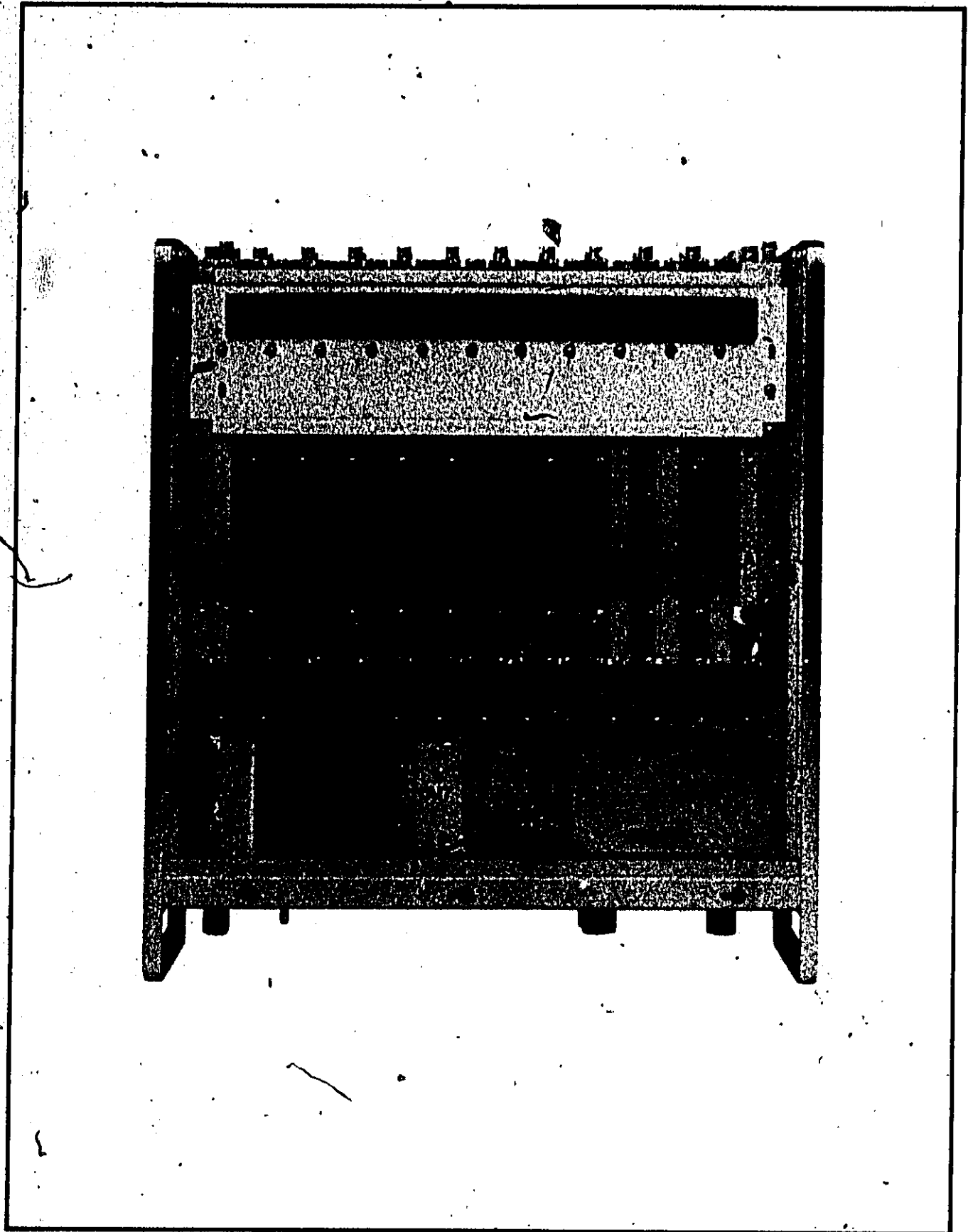


Figure 5-11. Bottom View of 5110B - Modules, Assemblies, Components

# PARTS LIST

## SECTION VI REPLACEABLE PARTS

### 6-1. INTRODUCTION.

6-2. This section contains information for ordering replacement parts. Tables 6-1 through 6-14 list parts in alpha-numerical order of their reference designators and indicate the description and stock number of each part, together with any applicable notes. Table 6-15 lists parts in alpha-numerical order of their stock number and provides the following information on each part:

- a. Description of the part (see list of abbreviations below).
- b. Typical manufacturer of the part in a five-digit code, see list of manufacturers in Table 6-16.
- c. Manufacturer's part number.
- d. Total quantity used in the instrument (TQ column).

6-3. Miscellaneous parts are listed at the end of each table.

### 6-4. ORDERING INFORMATION.

6-5. To obtain replacement parts, address order or inquiry to your local Hewlett-Packard Field Office (see lists at rear of this manual for addresses). Identify parts by their Hewlett-Packard stock numbers.

6-6. To obtain a part that is not listed, include:

- a. Instrument model number.
- b. Instrument serial number.
- c. Description of the part.
- d. Function and location of the part.

REFERENCE DESIGNATORS							
A	assembly	F	fuse	MP	mechanical part	U	integrated circuit
B	motor	FL	filter	P	plug	V	vacuum tube, neon bulb, photocell, etc
BT	battery	IC	integrated circuit	Q	transistor	VR	voltage regulator
C	capacitor	J	jack	R	resistor	W	wire
CP	coupler	K	relay	RT	thermistor	X	socket
CR	diode	L	inductor	S	switch	Y	crystal
DL	delay line	LS	loud speaker	T	transformer	Z	tuned cavity, network
DS	device signaling (lamp)	M	meter	TB	terminal board		
E	misc. electronic part	MK	microphone	TP	test point		

ABBREVIATIONS							
A	amperes	H	henries	N/O	normally open	RMO	rack mount only
AFI	automatic frequency control	HDW	hardware	NOM	nominal	RMS	root-mean square
AMPL	amplifier	HEX	hexagonal	NPO	negative positive zero (zero temperature coefficient)	RWV	reverse working voltage
BFO	beat frequency oscillator	HG	mercury			S-B	slow-blow
BE CU	beryllium copper	HR	hour(s)	NPN	negative positive negative	SCR	silicon section(s)
BH	binder head	HZ	hertz	NKR	not recommended for field replacement	SECT	semiconductor
BP	bandpass	IF	intermediate freq	NSR	not separately replaceable	SI	silicon
BRS	brass	IMPG	impregnated	OB	order by description	SIL	silver
BWO	backward wave oscillator	INCD	incandescent	OH	oval head	SL	slide
CCW	counter-clockwise	INCL	include(s)	OX	oxide	SPG	spring
CER	ceramic	INS	insulation(ed)	P	peak	SPL	spectral
CMO	cabinet mount only	INT	internal	PC	printed circuit	SST	stainless steel
COEF	coefficient	K	kilo 1000	PF	picofarads - 10 <sup>-12</sup> farads	SR	split ring
COM	common	LH	left hand	PH BRZ	phosphor bronze	STL	steel
COMP	composition	LN	linear taper	PHL	Phillips	TA	tantalum
COMPL	complete	LK WASH	lock washer	PIV	peak inverse voltage	TD	time delay
CONN	connector	LOG	logarithmic taper	PNP	positive-negative-positive	TGL	toggle
CP	cadmium plate	LPF	low pass filter	P O	part of	THD	thread
CRT	cathode-ray tube	M	milli 10 <sup>-3</sup>	POLY	polystyrene	TI	titanium
CW	clockwise	MEG	mega 10 <sup>6</sup>	PORC	porcelain	TOL	tolerance
DEPO	deposited carbon	MET FLM	metal film	POT	potentiometer	TRIM	trimmer
DR	drive	MET OX	metallic oxide	PP	peak-to-peak	TWT	traveling wave tube
ELECT	electrolytic	MFR	manufacturer	PT	point	U	micro - 10 <sup>-6</sup>
ENCAP	encapsulated	MHZ	mega hertz	PWV	peak working voltage	VAR	variable
EXT	external	MINAT	miniature	RECT	rectifier	VDCW	dc working volts
F	farads	MOM	momentary	RF	radio frequency	W	watts
FH	flat head	MOS	metal oxide substrate	RH	round head or right hand	WIV	working inverse voltage
FIL H	fillister head	MTG	mounting			WW	wirewound
FXD	fixed	MY	"mylar"			W/O	without
G	giga (10 <sup>9</sup> )	N	nano (10 <sup>-9</sup> )				
GE	germanium	N/C	normally closed				
GL	glass	NE	neon				
GRD	ground(ed)	NI PL	nickel plate				

01104-14

Table 6-1. Chassis Parts

Reference Designation	Stock No.	Description #	Note
A1	05110-6015	INPUT AMP/BUFFER AMP. ASS'Y.	
A2	05110-6014	FREQUENCY STD. ASS'Y.	
A3	05110-6081	FILTER ASSEMBLY CRYSTAL	
A4	05110-6102	COMB GENERATOR ASS'Y.	
A5	05110-6100	FILTER/DIVIDER ASSY: 39/3.9 MC	
A6	05110-6099	FILTER/DIVIDER ASSY: 38/3.8 MC	
A7	05110-6098	FILTER/DIVIDER ASSY: 37/3.7 MC	
A8	05110-6097	FILTER/DIVIDER ASSY: 36/3.6 MC	
A9	05110-6096	FILTER/DIVIDER ASSY: 35/3.5 MC	
A10	05110-6095	FILTER/DIVIDER ASSY: 34/3.4 MC	
A11	05110-6094	FILTER/DIVIDER ASSY: 33/3.3 MC	
A12	05110-6093	FILTER/DIVIDER ASSY: 32/2.2 MC	
A13	05110-6092	FILTER/DIVIDER ASSY: 31/3.1 MC	
A14	05110-6091	FILTER/DIVIDER ASSY: 30/3.0 MC	
A15	05110-6101	FILTER ASSY: 20 /24 MC	
A16	05110-6027	RECTIFIER ASSY. POWER SUPPLY	
A17	05110-6018	REGULATOR ASSY. POWER SUPPLY	
A18	05110-6017	SWITCH ASSY. SELECTOR	
DS1	1450-0094	LIGHT INDICATOR WHITE 10V 13MA	
	0510-0123	FASTENER PLSH-ON TYPE	
DS2	1450-1701	LIGHT INDICATOR GREEN 10V 13 MA	
	0510-0123	FASTENER PLSH-ON TYPE	
F1	2110-0012	FUSE CARTRIDGE 1/2AMP 250V	
FL1	9110-3112	FILTER AC LINE (INCLUDES J1) 115 VAC OR 230 VAC	
M1	1120-0152	MICROAMMETER 100 MICROAMPERES	
R1	0727-0215	RIFXD DEPC 123K OHM 1/2W 1/2W	
R2	0757-0270	RIFXD MET FLM 249K OHM 1/2W 1/2W	
S1	3101-1234	SWITCH SLICE DPDT	
S2	3101-0036	SWITCH TOGGLE DPDT 3 AMP 125V	
S3	3100-0707	SWITCH-ROT 4 POS	
W1	8120-1348	CABLE POWER 7.5FT.	
XF1	1400-0084	FUSEHOLDER EXTRACTOR POST TYPE	
		MISCELLANEOUS	
	05110-0082	BRACKET: POWER INPUT	
	05110-0001	BRACKET: FILTER	
	05110-0003	BRACKET: FREQ. STD. MTC	
	05110-6034	CABLE ASSY. POWER SUPPLY INCLUDES SWITCH S2	
	05110-6035	CABLE ASSY. AC	
	05110-6041	CABLE ASSY. (BUFFER INPUT)	
	05110-6042	CABLE ASSY. (COMB INPUT)	
	1250-0781	CONNECTOR IRF BNC T 2-FEMALE 1-MALE	
	05100-6061	COVER ASSY. BOTTOM	
	05100-6062	COVER ASSY. TOP	
	05110-0028	COVER: FRONT SIDE	

\* See list of abbreviations in introduction to this section

Table 6-1. Chassis Parts (Cont'd)

Reference Designation	Stock No.	Description #	Note
		MISCELLANEOUS (CONT'D)	
	05110-0029	COVER: REAR SIDE	
	5060-0767	FOOT ASSY-SNAP ON	
	5060-0732	FRAME:SIDE 5 1/4 IN	
	0900-0034	GASKET:SILICONE RUBBER 1-7/16ID	
	05110-0002	GUARD:AC INPUT	
	05110-2030	GUIDE:IM AND F FREQ ADJ	
	5060-0763	HANDLE ASSY-SIDE:2 REQ'D	
	5060-0775	KIT:RACK MOUNTING	
	0370-0112	KNOB	
	05110-0025	PANEL:FRONT	
	05110-0030	RETAINER: HANDLE	
	4324-0007	RUBBER STRIP:NEOPRENE 1X13X3/16 ACROSS FILTER MODULES	
	4324-0008	RUBBER STRIP:NEOPRENE 1X13X3/8	
	05110-0060	SPACER:COMB GEN MODULE	
	05110-0058	SPRING: GROUNDING:FILTER/DIVIDER	
	1490-0030	STAND:TILT	
	05110-0020	STRAP: POWER SUPPLY	
	5000-0051	TRIM STRIP:ALUM W/ADHESIVE BACK	

\* See list of abbreviations in introduction to this section

Table 6-2. A1 Input Ampl/Buffer Ampl (05110-6015)  
(prefix all parts A1)

Reference Designation	Stock No.	Description #	Note
A1	05110-6088 05110-2038	BOARD ASS'Y.-INPUT AMP. BOARD-INPUT AMP.	
A1C1	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A1C2	0140-0207	CIFXD MICA 330PF 5% 500VDCW	
A1C3	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A1C4	0160-0127	CIFXD CER 1UF 20% 25VDCW	
A1C5	0160-0161	CIFXD 0.01UF 10%	
A1C6	0160-0168	CIFXD 0.1UF 10%	
A1C7	0160-0161	CIFXD 0.01UF 10%	
A1C8	0160-0161	CIFXD 0.01UF 10%	
A1C9	0160-0161	CIFXD 0.01UF 10%	
A1C10	0150-0117	CIFXD CER 100PF 10% 500VDCW	
A1C11	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A1C12	0140-0152	CIFXD MICA 1000 PF 5% 300 VDCW	
A1C13	0140-0206	CIFXD MICA 270PF 5% 500VDCW	
A1C14	0160-0161	CIFXD 0.01UF 10%	
A1C15	0160-0168	CIFXD 0.1UF 10%	
A1C16	0140-0162	CIFXD MICA 4700 PF 10% 300 VDCW	
A1C17	0150-0117	CIFXD CER 100PF 10% 500VDCW	
A1C18	0140-0184	CIFXD MICA 8200 PF 1% 100 VDCW	
A1C19	0140-0184	CIFXD MICA 8200 PF 1% 100 VDCW	
A1C20	0160-0168	CIFXD 0.1UF 10%	
A1CR1	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR2	1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	
A1CR3	1901-0040	SEMICON DEVICE:DIODE SILICON	
A1CR4	1901-0040	SEMICON DEVICE:DIODE SILICON	
A1CR5	1901-0040	SEMICON DEVICE:DIODE SILICON	
A1CR6	1901-0040	SEMICON DEVICE:DIODE SILICON	
A1L1	05110-6073	COIL-VARIABLE 50-100UH	
A1L2	05110-6071	COIL-VARIABLE 4.5-7UH	
A1L3	9140-0137	COIL:FXD RF 100 UHY	
A1L4	05110-6073	COIL-VARIABLE 50-100UH	
A1L5	05110-6071	COIL-VARIABLE 4.5-7UH	
A1L6	9140-0129	COIL:FXD RF 220 UH	
A1Q1	1853-0009	TRANSISTOR:SILICON PNP	
A1Q2	1853-0009	TRANSISTOR:SILICON PNP	
A1Q3	1853-0009	TRANSISTOR:SILICON PNP	
A1Q4	1853-0009	TRANSISTOR:SILICON PNP	
A1R1	0758-0054	RIFXD MET FLM 330 OHM 5% 1/2W	
A1R2	0758-0012	RIFXD MET FLM 12K OHM 5% 1/2W	
A1R3	0758-0005	RIFXD MET OX 4700 OHM 5% 1/2W	
A1R4	0758-0003	RIFXD MET FLM 1000 OHM 5% 1/2W	
A1R5	0758-0008	RIFXD MET FLM 390 OHM 5% 1/2W	
A1R6	0758-0057	RIFXD MET FLM 5600 OHM 5% 1/2W	
A1R7	0758-0003	RIFXD MET FLM 1000 OHM 5% 1/2W	
A1R8	0758-0015	RIFXD MET FLM 220 OHM 5% 1/2W	
A1R9	0757-0316	R-FXD MET FLM 42.2 OHM 1% 1/8W	
A1R10	0758-0024	RIFXD MET FLM 100 OHM 5% 1/2W	

= See list of abbreviations in introduction to this section

Table 6-2. A1 Input Ampl/Buffer Ampl (05110-6015) (Cont'd)  
(prefix all parts A1)

Reference Designation	Stock No.	Description #	Note
A1R11	0758-0002	RIFXD MET FLM 560 OHM 5% 1/2W	
A1R12	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R13	0758-0010	RIFXD MET OY FLM 3300 OHM 5% 1/2W	
A1R14	2100-0277	RIVAR COMP 100 OHM 20% LIN 0.3W	
A1R15	0758-0015	RIFXD MET FLM 220 OHM 5% 1/2W	
A2	05110-6089 05110-2039	BOARD ASS'Y.-BUFFER AMP. BOARD-BUFFER AMP.	
A2C1	0160-0161	CIFXD 0.01UF 10% CIFXD 0.01UF 10%	
A2C2	0160-0161	CIFXD 0.01UF 10%	
A2C3	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C4	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C5	0160-0168	CIFXD 0.10F 10%	
A2C6	0140-0162	CIFXD MICA 4700 PF 10% 300 VDCW	
A2C7	0140-0176	CIFXD MICA 100 PF 2% 300 VDCW	
A2C8	0140-0184	CIFXD MICA 2200 PF 1% 100 VDCW	
A2C9	0140-0184	CIFXD MICA 8200 PF 1% 100 VDCW	
A2C10	0160-0168	CIFXD 0.10F 10%	
A2C11	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2L1	9140-0137	COIL:IFXD RF 100 UHY	
A2L2	05110-6071	COIL-VARIABLE	
A2L3	9140-0137	COIL:IFXD RF 100 UHY	
A2Q1	1853-0009	TRANSISTOR: SILICON PNP	
A2Q2	1853-0009	TRANSISTOR: SILICON PNP	
A2R1	0758-0029	RIFXD MET FLM 470 OHM 5% 1/2W	
A2R2	0758-0029	RIFXD MET FLM 470 OHM 5% 1/2W	
A2R3	0758-0048	RIFXD MET FLM 8200 OHM 5% 1/2W	
A2R4	0758-0005	RIFXD MET CX 4700 OHM 5% 1/2W	
A2R5	0758-0002	RIFXD MET FLM 560 OHM 5% 1/2W	
A2R6	0758-0020	RIFXD MET FLM 22K OHM 5% 1/2W	
A2R7	0758-0044	RIFXD MET FLM 2200 OHM 5% 1/2W	
A2R8	2100-0277	RIVAR COMP 100 OHM 20% LIN 0.3W	
A2R9	0758-0054	RIFXD MET FLM 330 OHM 5% 1/2W	
A2R10	0758-0003	RIFXD MET FLM 1000 OHM 5% 1/2W	
C1	0160-0345	CIFXD CER 1000PF +80% -20% 500VDCW FEEDTHRU	
J3	1250-0118	CONNECTOR: BNC	
J4	1250-0149	CONNECTOR: IRF COAXIAL BNC RT-ANGLE RECEPT	
J5	1250-0149	CONNECTOR: IRF COAXIAL BNC RT-ANGLE RECEPT	
J6	1250-0118	CONNECTOR: BNC	
MP1	05110-0017	INPUT CKT. HOUSING	
MP2	05110-0018	COVER: INPUT CKT.	
MP3	05110-0019	BRACKET: DIVIDER	
MP4	05110-0031	BRACKET: MOUNTING	
MP5	05110-0057	SHIELD: SPRING	
MP6	05110-2001	SPACER: FILTER SHIELD	
MP7	05110-2027	CAP: FRONT	
MP8	05110-2028	CAP: REAR	

\* See list of abbreviations in introduction to this section



Table 6-2. A1 Input Ampl/Buffer Ampl (05110-6015) (Cont'd)  
(prefix all parts A1)

Reference Designation	Stock No.	Description #	Note
		MISCELLANEOUS	
	0340-0038	TERMINALISTUD	
	05110-6039	CABLE ASSY: DC FREQ. CONTROL	
	0340-0039	INSULATOR:BUSHING	
	0510-0124	NUT:CAPTIVE 6-32 ST CP	
	1250-0102	CONNECTOR:RNC	

= See list of abbreviations in introduction to this section

Table 6-3. A2 Frequency Standard Module (05110-6014)  
(prefix all parts A2)

Reference Designation	Stock No.	Description #	Note
A1	05110-6043	OVEN ASSEMBLY-CRYSTAL PARTS IN THIS ASSY, N.S.R.	
A2	05110-6030 05110+2024	OSCILLATOR BOARD ASS'Y. BLANK BOARD OSCILLATOR	
A2C1	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C2	0160-0182	CIFXD MICA 47PF 5% 300VDCW	
A2C3	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C4	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C5	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C6	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C7	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C8	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C9	THRU		
A2C10		NOT ASSIGNED	
A2C11	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C12	0170-0084	CIFXD MY 0.068UF 20% 50VDCW	
A2C13	0150-0098	CIFXD CER 0.01 UF 1000 VDCW	
A2C14	0150-0098	CIFXD CER 0.01 UF 1000 VDCW	
A2C15	0150-0098	CIFXD CER 0.01 UF 1000 VDCW	
A2C16	0170-0084	CIFXD MY 0.068UF 20% 50VDCW	
A2C17	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C18	0140-0190	CIFXD MICA 39 PF 5% 300 VDCW	
A2C19	0150-0098	CIFXD CER 0.01 UF 1000 VDCW	
A2C20	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C21	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C22	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C23	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C24	0150-0098	CIFXD CER 0.01 UF 1000 VDCW	
A2CR1	1901-0025	SEMICON DEVICE:DIODE JUNCTION	
A2CR2	0122-0005	CIVAR VOLTAGE 39 PF AT -4V	
A2CR3	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR4	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2L1	05110-6072	COIL: FIXED 185UH	
A2L2	9140-0137	COIL:FIXD RF 100 UH	
A2L3	9140-0137	COIL:FIXD RF 100 UH	
A2L4	9140-0129	COIL:FIXD RF 220 UH	
A2Q1	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2Q2	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2Q3	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2Q4	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2R1	0758-0006	RIFXD MET FLM 10K OHM 5% 1/2W	
A2R2	0683-4735	RIFXD COMP 47K OHM 5% 1/4W	
A2R3	0758-0006	RIFXD MET FLM 10K OHM 5% 1/2W	
A2R4	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R5	0683-4735	RIFXD COMP 47K OHM 5% 1/4W	
A2R6	0683-2735	RIFXD COMP 27K OHM 5% 1/4W	
A2R7	0758-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R8	0758-0017	RIFXD MET FLM 1500 OHM 5% 1/2W	
A2R9	THRU		
A2R10		NOT ASSIGNED	

\* See list of abbreviations in introduction to this section

Table 8-3. A2 Frequency Standard Module (05110-8014) (Cont'd)  
(prefix all parts A2)

Reference Designation	Stock No.	Description #	Note
A2R11	0683-4715	RIFXD COMP 470 OHM 5% 1/4W	
A2R12	0683-4715	RIFXD COMP 470 OHM 5% 1/4W	
A2R13	0683-4715	RIFXD COMP 470 OHM 5% 1/4W	
A2R14	0683-4715	RIFXD COMP 470 OHM 5% 1/4W	
A2R15	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R16	0758-0045	RIFXD MET FLM 3900 OHM 5% 1/2W	
A2R17	0683-1335	RIFXD COMP 13K OHM 5% 1/4W	
A2R18	0683-4725	RIFXD COMP 4700 OHM 5% 1/4W	
A2R19	0683-2725	RIFXD COMP 2700 OHM 5% 1/4W	
A2R20	0683-2025	RIFXD COMP 2000 OHM 5% 1/4W	
A2R21	0683-1235	RIFXD COMP 12K OHM 5% 1/4W	
A2R22	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R23	THRU		
A2R24		NOT ASSIGNED	
A2R25	0683-2215	RIFXD COMP 220 OHM 5% 1/4W	
A2R26	0758-0013	RIFXD MET FLM 120 OHM 5% 1/2W	
A2R27	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R28	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R29	0683-1235	RIFXD COMP 12K OHM 5% 1/4W	
A2R30	0683-2725	RIFXD COMP 2700 OHM 5% 1/4W	
A2R31	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R32	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R33	0758-0013	RIFXD MET OX 120 OHM 5% 1/2W	
A3	05110-6031 05110-2025	OVEN CONTROL BOARD ASSY. BOARD: OVEN CONTROL BLANK	
A3C1	0160-0162	CIFXD MY 0.022UF 10%	
A3C2	0180-0100	CIFXD ELECT TA 4.7UF 10% 35VDCW	
A3C3	0180-0100	CIFXD ELECT TA 4.7UF 10% 35VDCW	
A3C4	0180-0100	CIFXD ELECT TA 4.7UF 10% 35VDCW	
A3C5	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3C6	0180-0100	CIFXD ELECT TA 4.7UF 10% 35VDCW	
A3C7	0180-0100	CIFXD ELECT TA 4.7UF 10% 35VDCW	
A3C8	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3C9	0180-0100	CIFXD ELECT TA 4.7UF 10% 35VDCW	
A3C10	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3C11	0150-0093	CIFXD CER 0.01 UF +80-20% 100VDCW	
A3C12	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3C13	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3C14	0150-0093	CIFXD CER 0.01 UF +80-20% 100VDCW	
A3C15	0160-0217	CIFXD MICA 2300 PF 1% 300VDCW	
A3C16	0140-0189	CIFXD MICA 5825 PF 2% 300VDCW	
A3C17	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3C18	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3C19	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A3CR1	I901-0025	SEMICON DEVICE:DIODE JUNCTION	
A3CR2	I901-0025	SEMICON DEVICE:DIODE JUNCTION	
A3CR3	I910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A3CR4	I910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A3CR5	I901-0025	SEMICON DEVICE:DIODE JUNCTION	
A3CR6	I901-0026	SEMICON DEVICE:DIODE SILICON 200PIV	

\* See list of abbreviations in introduction to this section

Table 6-3. A2 Frequency Standard Module (05110-8014) (Cont'd)  
(prefix all parts A2)

Reference Designation	Stock No.	Description #	Note
A3L1	9140-0137	COIL:FXD RF 1MH 5%	
A3L2	05110-6060	COIL: VARIABLE 13.5-19.0UH	
A3L3	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A3L4	9140-0129	COIL:FXD RF 220 UH	
A301	1850-0054	TRANSISTOR:GERMANIUM 2N652A PNP	
A302	1853-0001	TRANSISTOR:PNP SILICON 30V 900MW	
A303	1850-0054	TRANSISTOR:GERMANIUM 2N652A PNP	
A304	1853-0001	TRANSISTOR:PNP SILICON 30V 900MW	
A305	1853-0016	TRANSISTOR:SILICON PNP	
A306	1853-0009	TRANSISTOR:SILICON PNP 2N3250	
A3R1	0683-2205	RIFXD COMP 22 OHM 5% 1/4W	
A3R2	0683-4325	RIFXD COMP 4300 OHM 5% 1/4W	
A3R3	0683-4325	RIFXD COMP 4300 OHM 5% 1/4W	
A3R4	0683-1515	RIFXD COMP 150 OHM 5% 1/4W	
A3R5	0683-8215	RIFXD COMP 820 OHM 5% 1/4W	
A3R6	0758-0015	RIFXD MET FLM 220 OHM 5% 1/2W	
A3R7	2100-0328	RIVAR WW 500 OHM 10% LIN 1W	
A3R8	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A3R9	0727-0405	R-FXD DEPC 57.46K OHM 1/2% 1/2W	
A3R10	0727-0187	RIFXD DEPC 37.4K OHM 1% 1/2W	
A3R11	0683-2035	RIFXD COMP 20K OHM 5% 1/4W	
A3R12	0727-0221	RIFXD DEPC 200K OHM 1% 1/2W	
A3R13	2100-0094	RIVAR COMP 50K OHM 30% LIN 1/5W	
A3R14	0689-0565	RIFXD COMP 5.6 OHM 5% 1W	
A3R15	0757-0924	RIFXD MET FLM 1000 OHM 2% 1/8W	
A3R16	0757-0940	RIFXD MET FLM 4700 OHM 2% 1/8W	
A3R17	0757-0949	RIFXD MET FLM 11K OHM 2% 1/8W	
A3R18	2100-0151	RIVAR COMP 500 OHM 2% LIN 1/8W	
A3R19	0757-0917	RIFXD MET FLM 510 OHM 2% 1/8W	
A3R20	0757-0937	RIFXD MET FLM 3600 OHM 2% 1/8W	
A3R21	0757-0922	RIFXD MET FLM 820 OHM 2% 1/8W	
A3R22	0757-0936	RIFXD MET FLM 3300 OHM 2% 1/8W	
A3R23	0757-0899	RIFXD MET FLM 91 OHM 2% 1/8W	
A3R24	0757-0908	RIFXD MET FLM 220 OHM 2% 1/8W	
A3R25	0757-0924	RIFXD MET FLM 1000 OHM 2% 1/8W	
A3RT1	0839-0012	THERMISTOR: 50K OHM 10%	
C1	0121-0013	CIVAR AIR 6-100.SPF	
C2	0130-0003	CIVAR CER 1.5-7PF 500VDC	
J1	1250-0083	CONNECTOR:1BNC	
J2	1250-0083	CONNECTOR:1BNC	
MP1	05110-0014	HOUSING: FREQ. STD.	
MP2	05110-0015	COVER: FREQ. STD.	
MP3	05110-0021	BRACKET: BOTTOM	
MP4	05110-0022	BRACKET: TOP LEFT	
MP5	05110-0023	BRACKET: TOP-RIGHT	
MP6	05110-0024	BRACKET: SIDE	

# See list of abbreviations in introduction to this section

Table 6-3. A2 Frequency Standard Module (05110-6014) (Cont'd)  
(prefix all parts A2)

Reference Designation	⊗ Stock No.	Description #	Note
Q1	1850-0090 1200-0076 1200-0087 1200-0092	TRANSISTOR:GERMANIUM 2N1183B PNP INSULATOR:TRANSISTOR CLAMP:TRANSISTOR BUSHING:TRANSISTOR	
TP1	1251-0131	CONNECTOR:SOCKET FEMALE 1-PIN  MISCELLANEOUS	
	0340-0039 0510-0124	INSULATOR:BUSHING NUT:CAPTIVE 6-32 ST CP	

= See list of abbreviations in introduction to this section

Table 6-4. Crystal Filter Assembly A3 (05110-6081)(Prefix all parts in this table A3)

Reference Designation	HP Stock No.	Description
C1	0130-0001	C:VAR CER 7-45 pF 500 VDCW
C2	0150-0116	C:FXD CER 47 pF 10% 500 VDCW
C3	0160-0950	C:FXD MICA 60 pF 5%
C4	0160-0950	C:FXD MICA 60 pF 5%
C5	0130-0006	C:VAR CER 5-20 pF 500 VDCW
C6	0160-0952	C:FXD MICA 220 pF 1%
C7	0150-0117	C:FXD CER 100 pF 10% 500 VDCW
J3	1250-0149	CONNECTOR: RF COAX BNC RT-ANGLE RECEPT
J4	1250-0083	CONNECTOR: BNC
L1	9140-0238	COIL: FXD RF 82 $\mu$ H 5%
T1	05110-6082	TRANSFORMER ASSEMBLY
Y1	05110-6074 05110-0061 0340-0110	CRYSTAL ASSEMBLY HOUSING: CRYSTAL FILTER INSULATOR: STANDOFF MELAMINE 2-56 0.4 INCH

Table 6-5. A4 Comb Generator Module (05110-8102)  
(prefix all parts A4)

Reference Designation	Stock No.	Description #	Note
A1	05110-6110 05110-2021	BOARD ASSY. 1 COMB GEN. BLANK BOARDICOMB	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C2	0160-0168	CIFXD MYLAR 0.1UF 10%	
A1C3	0150-0110	CIFXD CER 470PF 5% 300VDCW	
A1C4	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A1C5	0140-0182	CIFXD MICA 5000 PF 2% 300 VDCW	
A1C6	0140-0180	CIFXD MICA 2000 PF 2% 300 VDCW	
A1C7	0160-0168	CIFXD MYLAR 0.1UF 10%	
A1C8	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A1C9	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A1C10	0140-0205	CIFXD MICA 62PF 5% 300VDCW	
A1C11	0160-0161	CIFXD MY 0.01 UF 10% 200VDCW	
A1C12	0160-0357	CIFXD CER DISK 85PF 5%	
A1C13	0160-0357	CIFXD CER DISK 85PF 5%	
A1C14	0160-0358	CIFXD CER DISK 94PF 5%	
A1C15	0160-0358	CIFXD CER DISK 94PF 5%	
A1C16	0160-0359	CIFXD CER DISK 103PF 5%	
A1C17	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A1C18	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A1C19	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A1C20	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A1C21	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A1C22	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C24	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C25	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C26	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C27	0160-0357	CIFXD CER DISK 85PF 5%	
A1C28	0160-0357	CIFXD CER DISK 85PF 5%	
A1C29	0160-0358	CIFXD CER DISK 94PF 5%	
A1C30	0160-0358	CIFXD CER DISK 94PF 5%	
A1C31	0160-0359	CIFXD CER DISK 103PF 5%	
A1C32	0150-0042	CIFXD TI 4.7 PF 5% 500 VDCW	
A1C33	0150-0042	CIFXD TI 4.7 PF 5% 500 VDCW	
A1C34	0150-0042	CIFXD TI 4.7 PF 5% 500 VDCW	
A1C35	0150-0042	CIFXD TI 4.7 PF 5% 500 VDCW	
A1C36	0150-0042	CIFXD TI 4.7 PF 5% 500 VDCW	
A1C37	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C38	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C39	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C40	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C41	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C42	0150-0047	CIFXD TI 6.8 PF 10% 500 VDCW	
A1CR1	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A1CR2	1901-0050	SEMICON DEVICE:DIODE SILICON	
A1CR3	1901-0050	SEMICON DEVICE:DIODE SILICON	
A1CR4	1901-0050	SEMICON DEVICE:DIODE SILICON	
A1CR5	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	

= See list of abbreviations in introduction to this section

Table 6-5. A4 Comb Generator Module (06110-6102) (Cont'd)  
(prefix all parts A4)

Reference Designation	Stock No.	Description #	Note
A1CR6 A1CR7	1910-0022	NOT RECOMMENDED FOR FIELD REPLACEMENT SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5MS	
A1E1 A1E2 A1E3	05110-6049 9170-0029 9170-0029	DIODE OVEN ASSY. INCLUDES CR6, R7, RT1 CORE: FERRITE BEAD CORE: FERRITE BEAD	
A1L1	05110-6048 9170-0106	COIL: VARIABLE 2.6-4.7UH CORE ADJUSTABLE TUNING POWDERED IRON	
A1L2 A1L3 A1L4	9140-0129 9140-0181 9100-1790	COIL:FXD RF 220 UH COIL:FXD RF 22UH 5% INDUCTOR:RF 0.36 UH 5%	
A1L5 A1L6 A1L7 A1L8 A1L9	9140-0111 9100-1790 9140-0179 9140-0179 9140-0129	COIL:FXD RF 3.3 UH 10% INDUCTOR:RF 0.36 UH 5% COIL-FXD R.F. 22 UH 10% 275 MA COIL-FXD R.F. 22 UH 10% 275 MA COIL:FXD RF 220 UH	
A1Q1 A1Q2 A1Q3 A1Q4 A1Q5	1853-0001 1850-0062 1850-0020 1850-0138 1850-0138	TRANSISTOR:PNP SILICON 30V 900MW TRANSISTOR:GERMANIUM ALLOY JUNCTION TRANSISTOR:GERMANIUM 2N1143 PNP TRANSISTOR:SPL2N2360 PNP GERMANIUM MADT TRANSISTOR:SPL2N2360 PNP GERMANIUM MADT	
A1Q6 A1Q7 A1Q8	1850-0138 1850-0138 1850-0138	TRANSISTOR:SPL2N2360 PNP GERMANIUM MADT TRANSISTOR:SPL2N2360 PNP GERMANIUM MADT TRANSISTOR:SPL2N2360 PNP GERMANIUM MADT	
A1R1 A1R2 A1R3 A1R4 A1R5	0757-0349 0757-0316 0757-0316 0758-0096 0758-0035	R:FXD DEPC 22.6K OHM 1% 1/8W R:FXD MET FLM 42.2 OHM 1% 1/8W R:FXD MET FLM 42.2 OHM 1% 1/8W R:FXD MET FLM 110 OHM 5% 1/2W R:FXD MET FLM 3000 OHM 5% 1/2W	
A1R6 A1R7 A1R8 A1R9 A1R10	2100-0737 0758-0029 0758-0066 0758-0009	R:VAR WW 200 OHM TYPE H CONFIGURATION NOT RECOMMENDED FOR FIELD REPLACEMENT R:FXD MET FLM 470 OHM 5% 1/2W R:FXD MET FLM 620 OHM 5% 1/2W R:FXD MET FLM 6800 OHM 5% 1/2W	
A1R11 A1R12 A1R13 A1R14 A1R15	0758-0009 0758-0009 0758-0009 0758-0009 0683-3925	R:FXD MET FLM 6800 OHM 5% 1/2W R:FXD MET FLM 6800 OHM 5% 1/2W R:FXD MET FLM 6800 OHM 5% 1/2W R:FXD MET FLM 6800 OHM 5% 1/2W R:FXD COMP 3900 OHM 5% 1/4W	
A1R16 A1R17 A1R18 A1R19	0683-3925 0683-3925 0683-3925 0683-3925	R:FXD COMP 3900 OHM 5% 1/4W R:FXD COMP 3900 OHM 5% 1/4W R:FXD COMP 3900 OHM 5% 1/4W R:FXD COMP 3900 OHM 5% 1/4W	
A1RT1		NOT RECOMMENDED FOR FIELD REPLACEMENT	
A1T1 A1T2 A1T3	05110-6044 9170-0105 05110-6044 9170-0105 05110-6044 9170-0105	TRANSFORMER: CORE:ADJUSTABLE TUNING TRANSFORMER: CORE:ADJUSTABLE TUNING TRANSFORMER: CORE:ADJUSTABLE TUNING	
	9170-0105	CORE:ADJUSTABLE TUNING	

\* See list of abbreviations in introduction to this section



Table 6-5. A4 Comb Generator Module (05110-6102) (Cont'd)  
(prefix all parts A4)

Reference Designation	Stock No.	Description #	Note
A1T4	05110-6044 9170-0105	TRANSFORMER; CORE: ADJUSTABLE TUNING	
A1T5	05110-6044 9170-0105	TRANSFORMER; CORE: ADJUSTABLE TUNING	
A1T6 THRU A1T11		NOT ASSIGNED	
A1T12	05110-6044 9170-0105	TRANSFORMER; CORE: ADJUSTABLE TUNING	
A1T13	05110-6044 9170-0105	TRANSFORMER; CORE: ADJUSTABLE TUNING	
A1T14	05110-6044	TRANSFORMER;	
A1T15	9170-0105 05110-6044	CORE: ADJUSTABLE TUNING TRANSFORMER;	
A1T16	9170-0105 05110-6044 9170-0105	CORE: ADJUSTABLE TUNING TRANSFORMER; CORE: ADJUSTABLE TUNING	
A2	05110-6025 05110-2020	BOARD ASSY.: COMB GEN. BOARD: COMB. GEN.	
A2C1	0150-0121	CIFXD CER 0.01UF 50 VDCW	
A2C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C4	0160-0359	CIFXD CER DISK 103PF 5%	
A2C5	0160-0360	CIFXD CER DISK 120PF 5%	
A2C6	0160-0360	CIFXD CER DISK 120PF 5%	
A2C7	0160-0361	CIFXD CER DISK 140PF 5% 500VDCW	
A2C8	0160-0361	CIFXD CER DISK 140PF 5% 500VDCW	
A2C9	0160-0357	CIFXD CER DISK 85PF 5%	
A2C10	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A2C11	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A2C12	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A2C13	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A2C14	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A2C15	0140-0204	CIFXD MICA 47PF 5% NPO 500VDCW	
A2C16	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C18	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C20	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C22	0160-0359	CIFXD CER DISK 103PF 5%	
A2C23	0160-0360	CIFXD CER DISK 120PF 5%	
A2C24	0160-0360	CIFXD CER DISK 120PF 5%	
A2C25	0160-0361	CIFXD CER DISK 140PF 5% 500VDCW	
A2C26	0160-0361	CIFXD CER DISK 140PF 5% 500VDCW	
A2C27	0160-0357	CIFXD CER DISK 85PF 5%	
A2C28	0150-0044	CIFXD TI 5.6 PF 5% 500 VDCW	
A2C29	0150-0044	CIFXD TI 5.6 PF 5% 500 VDCW	
A2C30	0150-0044	CIFXD TI 5.6 PF 5% 500 VDCW	
A2C31	0150-0047	CIFXD TI 6.8 PF 10% 500 VDCW	
A2C32	0150-0047	CIFXD TI 6.8 PF 10% 500 VDCW	

= See list of abbreviations in introduction to this section

Table 6-5. A4 Comb Generator Module (05110-6102) (Cont'd)  
(prefix all parts A4)

Reference Designation	Stock No.	Description #	Note
A2C33	0150-0047	CIFXD TI 6.8 PF 10% 500 VDCW	
A2C34	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2C35	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2C36	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2C37	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2C38	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2C39	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2Q1	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MAOT	
A2Q2	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MAOT	
A2Q3	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MAOT	
A2Q4	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MAOT	
A2Q5	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MAOT	
A2Q6	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MAOT	
A2R1	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R2	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R3	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R4	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R5	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R6	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R7	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R8	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R9	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R10	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R11	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R12	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2T6	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T7	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T8	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T9	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T10	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T11	05110-6064	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T12 THRU A2T16 A2T17	05110-6044	NOT ASSIGNED	
	9170-0105	TRANSFORMER: VARIABLE	
		CORE: ADJUSTABLE TUNING	
A2T18	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T19	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T20	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	

\* See list of abbreviations in Introduction to this section

Table 6-8. A4 Comb Generator Module (05110-6102) (Cont'd)  
(prefix all parts A4)

Reference Designation	Stock No.	Description #	Note
A2T21	05110-6044	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
A2T22	05110-6064	TRANSFORMER: VARIABLE	
	9170-0105	CORE: ADJUSTABLE TUNING	
C1	0160-0345	C-FXD CER 1000 PF +80-20% 500VDCW FEED-THR	
C2	0160-0345	C-FXD CER 1000 PF +80-20% 500VDCW FEED-THR	
J1	1250-0083	CONNECTOR: BNC	
J2			
J4			
J5	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J6	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J7	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J8	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J9	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J10	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J11	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J12	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J13	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J14	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
J15	1251-0214	CONNECTOR: SUBMINAT TYPE D 9-CONTACT FEMALE	
MP1	05110-0009	HOUSING: COMB GENERATOR	
MP2	05110-0008	COVER: COMB GENERATOR	
		MISCELLANEOUS	
	0340-0038	TERMINAL: 1ST UO	
	0340-0039	INSULATOR: BUSHING	
	0510-0124	NUT: CAPTIVE 6-32 1ST CP	
	0510-0208	NUT: CAPTIVE 8-32	

\* See list of abbreviations in introduction to this section

Table 8-6. A5 Filter/Divider Module (05110-6100)  
 A6 Filter/Divider Module (05110-6099)  
 (prefix all parts A5, A6)

Reference Designation	Stock No.	Description #	Note
A1	05110-6115 05110-2043	ASSYIFILTER BOARD 38 OR 39 MC(UNTUNED) BLANK BOARDIFILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C12	0160-0357	CIFXD CER DISK 85PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C14	0160-0357	CIFXD CER DISK 85PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C16	0160-0357	CIFXD CER DISK 85PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C18	0160-0357	CIFXD CER DISK 85PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C20	0160-0357	CIFXD CER DISK 85PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C22	0160-0357	CIFXD CER DISK 85PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C24	0160-0357	CIFXD CER DISK 85PF 5%	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0011	CIFXD TI 1.5PF 20% 500VDCW	
A1C32	0150-0031	CIFXD TI 2PF 5% 500VDCW	
A1C33	0150-0011	CIFXD TI 1.5PF 20% 500VDCW	
A1C34	0150-0015	CIFXD TI 2.2 PF 5% 500VDCW	
A1C35	0150-0041	CIFXD TI 2.7 PF 5% 500VDCW	
A1C36	0150-0031	CIFXD TI 2PF 5% 500VDCW	
A1C37	0150-0041	CIFXD TI 2.7PF 5% 500VDCW FACTORY SELECTED COMPITYPICAL VALUE GIVEN NOT ASSIGNED	
A1C38			
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C46	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C47	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C48	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C49	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4		NOT ASSIGNED	
A1L5	05100-6186	COIL 0.17-0.20UH	
	9170-0105	CORE ADJUSTABLE TUNING	

\* See list of abbreviations in introduction to this section

Table 6-6. A5 Filter/Divider Module (05110-6100) (Cont'd)  
 A6 Filter/Divider Module (05110-6099)  
 (prefix all parts A5, A6)

Reference Designation	Stock No.	Description #	Note
A1L6	05100-6186	COIL: 0.17-0.20UM	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L7	05100-6186	COIL: 0.17-0.20UM	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L8	05100-6186	COIL: 0.17-0.20UM	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L9	05100-6186	COIL: 0.17-0.20UM	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L10	05100-6186	COIL: 0.17-0.20UM	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L11	05100-6186	COIL: 0.17-0.20UM	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L12	05110-6047	COIL: VARIABLE 1.8-3.5UM	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UM 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UM 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UM 10% 275 MA	
A1Q1	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q2	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q3	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q4	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q5	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q6	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q7	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10		NOT ASSIGNED	
A1R11	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R12	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R13	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R14	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R15	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R16	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R17	0758-0004	RIFXD MET CX 2700 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R20		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR: 10K OHM 10% 25C	

≡ See list of abbreviations in introduction to this section

Table 6-6. A5 Filter/Divider Module (05110-6100) (Cont'd)  
 A6 Filter/Divider Module (05110-6099)  
 (prefix all parts A5, A6)

Reference Designation	Stock No.	Description #	Note
A2	05110-6059 05110-2018	BOARD ASSY:DIVIDER 3.8 OR 3.9 MC(UNTUNED) BLANK BOARD:DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2C59	0160-0182	CIFXD MICA 47PF 5% 300VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0140-0230	CIFXD MICA 420PF 1% 300VDCW	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63	THRU		
A2C70		NOT ASSIGNED	
A2C71	0160-0357	CIFXD CER DISK 85PF 5%	
A2C72	0150-0029	CIFXD T1 1FF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0140-0145	CIFXD MICA 22 PF 5% 500 VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR54	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL:FXD RF 220 UH	
A2L53	9140-0129	COIL:FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL: VARIABLE CORE:ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL: VARIABLE 3.2-5.6UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L56	9140-0077	COIL:FXD RF 2.2UH	
A2L57	05110-6023 9170-0106	COIL: VARIABLE 21-34UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6061 9170-0106	COIL: VARIABLE 3.5-6.0UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L59	05110-6024 9170-0106	COIL: VARIABLE 28-45UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60	THRU		
A2L70		NOT ASSIGNED	
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

\* See list of abbreviations in Introduction to this section

Table 6-6. A5 Filter/Divider Module (05110-6100) (Cont'd)  
 A6 Filter/Divider Module (05110-6099)  
 (Prefix all parts A5, A6)

Reference Designation	Stock No.	Description #	Note
A2L72	9140-0129	COILIFXD RF 220 UH	
A2L73	9140-0129	COILIFXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTORISPL2N2360 PNP GERMANIUM MADT	
A2Q54	1850-0091	TRANSISTORIGERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTORIGERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56 THRU			
A2R60		NOT ASSIGREC	
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0758-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER:	
J1 THRU	1250-0118	CONNECTORIBNC	
J2			
J4		NOT ASSIGREC	
J5	1250-0118	CONNECTORIBNC	
MP1	05110-0005	FILTER HOOSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET: DIVIDER	
MP4	05110-2002	CAP: FRONT	
MP5	05110-2035	CAP: REAR	
P1	1251-0216	CONNECTORIMALE 9-CONTACT TYPE D	
		MISCELLANEOUS	
	0340-0038	TERMINALISTLO	
	0340-0039	INSULATORIBUSHING	
	0510-0207	NUTICAPTIVE 4-40 3/16 SST	
	05110-2001	SPACER: FILTER	

\* See list of abbreviations in introduction to this section

Table 6-7. A7 Filter/Divider Module (05110-6098)  
 A8 Filter/Divider Module (05110-6097)  
 (prefix all parts A7, A8)

Reference Designation	Stock No.	Description #	Note
A1	05110-6114 05110-2043	ASSY:FILTER BOARD 36 OR 37 MC(UNTUNED) BLANK BOARD:FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C12	0160-0358	CIFXD CER DISK 94PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C14	0160-0358	CIFXD CER DISK 94PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C16	0160-0358	CIFXD CER DISK 94PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C18	0160-0358	CIFXD CER DISK 94PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C20	0160-0358	CIFXD CER DISK 94PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C22	0160-0358	CIFXD CER DISK 94PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C24	0160-0358	CIFXD CER DISK 94PF 5%	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0031	CIFXD TI 2FF 5% 500VDCW	
A1C32	0150-0031	CIFXD TI 2FF 5% 500VDCW	
A1C33	0150-0031	CIFXD TI 2FF 5% 500VDCW	
A1C34	0150-0015	CIFXD TI 2.2 PF 5% 500VDCW	
A1C35	0150-0041	CIFXD TI 2.7 PF 5% 500VDCW	
A1C36	0150-0031	CIFXD TI 2FF 5% 500VDCW	
A1C37	0150-0041	CIFXD TI 2.7PF 5% 500VDCW FACTORY SELECTED COMPI TYPICAL VALUE GIVEN NOT ASSIGNED	
A1C38			
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C46	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C47	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C48	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C49	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4		NOT ASSIGNED	
A1L5	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE:ADJUSTABLE TUNING	

\* See list of abbreviations in Introduction to this section



Table 6-7. A7 Filter/Divider Module (05110-6096) (Cont'd)  
 A8 Filter/Divider Module (05110-6097)  
 (prefix all parts A7, A8)

Reference Designation	Stock No.	Description #	Note
A1L6	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L7	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L8	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L9	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L10	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L11	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L12	05110-6047	COIL: VARIABLE 1.8-3.5UH	
	9170-0106	CORE: ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q2	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q3	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q4	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q5	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q6	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q7	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10		NOT ASSIGNED	
A1R11	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R12	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R13	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R14	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R15	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R16	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R17	0758-0004	RIFXD MET CX 2700 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R20		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR: 10K OHM 10% 25C	

\* See list of abbreviations in Introduction to this section

Table 6-7. A7 Filter/Divider Module (05110-6098) (Cont'd)  
 A8 Filter/Divider Module (05110-6097)  
 (prefix all parts A7, A8).

Reference Designation	Stock No.	Description #	Note
A2	05110-6058 05110-2018	BOARD ASSY:DIVIDER 3.6 OR 3.7 MC(UNTUNED) BLANK BOARD-DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0140-0190	CIFXD MICA 39 PF 5% 300 VDCW	
A2C59	0140-0191	CIFXD MICA 56 PF 5% 300 VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0140-0149	CIFXD MICA 470 PF 5% 300 VDCW	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63	THRU	NOT ASSIGNED	
A2C70		CIFXD CER DISK 94PF 5%	
A2C71	0160-0358	CIFXD T1 1PF 10% 500VDCW	
A2C72	0150-0029	CIFXD T1 1PF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0140-0145	CIFXD MICA 22 PF 5% 500 VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR54	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL:FXD RF 220 UH	
A2L53	9140-0129	COIL:FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE:ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL: VARIABLE 3.2-5.6UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L56	9140-0077	COIL:FXD RFI 2.2UH	
A2L57	05110-6024 9170-0106	COIL: VARIABLE 28-45UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6061 9170-0106	COIL: VARIABLE 3.5-6.0UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L59	05110-6024 9170-0106	COIL: VARIABLE 28-45UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60	THRU	NOT ASSIGNED	
A2L70		NOT ASSIGNED	
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

\* See list of abbreviations in introduction to this section

Table 6-7. A7 Filter/Divider Module (05110-0098) (Cont'd)  
 A8 Filter/Divider Module (05110-8097)  
 (prefix all parts A7, A8)

Reference Designation	Stock No.	Description	Note
A2L72	9140-0129	COIL:FXD RF 220 UH	
A2L73	9140-0129	COIL:FXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTOR:SP2N2360 PNP GERMANIUM MADO	
A2Q54	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56	THRU		
A2R60		NOT ASSIGNED	
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0756-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER	
J1	1250-0118	CONNECTOR:18NC	
J2	THRU		
J4		NOT ASSIGNED	
J5	1250-0118	CONNECTOR:18NC	
MP1	05110-0005	FILTER HOOSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET: DIVIDER	
MP4	05110-2002	CAPI FRONT	
MP5	05110-2035	CAPI REAR	
P1	1251-0216	CONNECTOR:MALE 9-CONTACT TYPE D	
		MISCELLANEOUS	
	0340-0038	TERMINAL:1STLD	
	0340-0039	INSULATOR:18USHING	
	0510-0207	NUT:CAPTIVE 4-40 3/16 SST	
	05110-2001	SPACER: FILTER SHIELD	

= See list of abbreviations in introduction to this section

Table 6-8. A9 Filter/Divider Module (05110-6096)  
 A10 Filter/Divider Module (05110-6095)  
 (prefix all parts A9, A10)

Reference Designation	Stock No.	Description #	Note
A1	05110-6113 05110-2043	ASSYIFILTER BOARD 34 OR 35 MC(UNTUNED) BLANK BOARDIFILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C12	0160-0359	CIFXD CER DISK 103PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C14	0160-0359	CIFXD CER DISK 103PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C16	0160-0359	CIFXD CER DISK 103PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C18	0160-0359	CIFXD CER DISK 103PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C20	0160-0359	CIFXD CER DISK 103PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C22	0160-0359	CIFXD CER DISK 103PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C24	0160-0359	CIFXD CER DISK 103PF 5%	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0015	CIFXD TI 2.2PF 10% 500VDCW	
A1C32	0150-0015	CIFXD TI 2.2PF 10% 500VDCW	
A1C33	0150-0015	CIFXD TI 2.2PF 10% 500VDCW	
A1C34	0150-0041	CIFXD TI 2.7 PF 5% 500VDCW	
A1C35	0150-0022	CIFXD TI 3.3 PF 10% 500VDCW	
A1C36	0150-0015	CIFXD TI 2.2PF 10% 500VDCW	
A1C37	0150-0022	CIFXD TI 3.3PF 10% 500VDCW FACTORY SELECTED COMPI TYPICAL VALUE GIVEN NOT ASSIGNED	
A1C38			
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C46	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C47	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C48	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C49	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4		NOT ASSIGNED	
A1L5	05100-6186	COIL VARIABLE 0.17-0.20UH	
	9170-0105	CORE ADJUSTABLE TUNING	

\* See list of abbreviations in introduction to this section

Table 6-8. A9 Filter/Divider Module (05110-6096) (Cont'd)  
 A10 Filter/Divider Module (05110-6098)  
 (prefix all parts A9, A10)

Reference Designation	Stock No.	Description #	Note
A1L6	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L7	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L8	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L9	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L10	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L11	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L12	05110-6047	COIL: VARIABLE 1.8-3.5UM	
	9170-0106	CORE: ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1P1	1251-0216	CONNECTOR: MALE 9-CONTACT TYPE U	
A1Q1	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q2	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q3	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q4	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q5	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q6	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q7	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10		NOT ASSIGNED	
A1R11	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R12	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R13	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R14	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R15	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R16	0758-0057	RIFXD MET OX 5600 OHM 5% 1/2W	
A1R17	0758-0004	RIFXD MET CX 2700 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R20		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR: 10K OHM 10% 25C	

≡ See list of abbreviations in introduction to this section

Table 6-8. A9 Filter/Divider Module (05110-6096) (Cont'd)  
 A10 Filter/Divider Module (05110-6095)  
 (prefix all parts A9, A10)

Reference Designation	Stock No.	Description #	Note
A2	05110-6057 05110-2018	BOARD ASSY. 1 DIVIDER 3.4 OR 3.5 MC(UNTUNED) BLANK BOARD DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0140-0190	CIFXD MICA 39 PF 5% 300 VDCW	
A2C59	0140-0205	CIFXD MICA 62PF 5% 300VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0160-0362	CIFXD MICA 510 PF 5%	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63	THRU		
A2C70		NOT ASSIGNED	
A2C71	0160-0359	CIFXD CER DISK 103PF 5%	
A2C72	0150-0029	CIFXD TI 1PF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0140-0145	CIFXD MICA 22 PF 5% 500 VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR54	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL-FXD RF 220 UH	
A2L53	9140-0129	COIL-FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL VARIABLE CORE ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL VARIABLE 3.2-5.6UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L56	9140-0077	COIL-FXD RF 2.2UH	
A2L57	05110-6024 9170-0106	COIL VARIABLE CORE ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6061 9170-0106	COIL VARIABLE 3.5-6.0UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L59	05110-6024 9170-0106	COIL VARIABLE CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60	THRU		
A2L70		NOT ASSIGNED	

\* See list of abbreviations in introduction to this section

Table 6-8. A9 Filter/Divider Module (05110-8096) (Cont'd)  
 A10 Filter/Divider Module (05110-8095)  
 (prefix all parts A9, A10)

Reference Designation	Stock No.	Description #	Note
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L72	9140-0129	COIL:FXD RF 220 UH	
A2L73	9140-0129	COIL:FXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTOR: SPL 2N2360 PNP GERMANIUM MADD	
A2Q54	1850-0091	TRANSISTOR: GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR: GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56 THRU			
A2R60		NOT ASSIGNED	
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0758-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER:	
J1 THRU			
J2	1250-0118	CONNECTOR: BNC	
J4		NOT ASSIGNED	
J5	1250-0118	CONNECTOR: BNC	
MP1	05110-0005	SHIELD: FILTER HOUSING	
MP2	05110-0006	SHIELD: FILTER COVER	
MP3	05110-0007	BRACKET: DIVIDER	
MP4	05110-2002	CAP: FRONT	
MP5	05110-2035	CAP: REAR	
		MISCELLANEOUS	
	0340-0038	TERMINAL: 1ST L0	
	0340-0039	INSULATOR: BUSHING	
	0510-0207	NUT: CAPTIVE 4-40 3/16 SST	
	05110-2001	SPACER: FILTER SHIELD	

# See list of abbreviations in introduction to this section

Table 6-9. A11 Filter/Divider Module (05110-6094)  
 A12 Filter/Divider Module (05110-6093)  
 (prefix all parts A11, A12)

Reference Designation	Stock No.	Description #	Note
A1	05110-6112 05110-2043	ASSY:FILTER BOARD 32 OR 33 MC(UNTUNED) BLANK BOARD:FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C12	0160-0360	CIFXD CER DISK 120PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C14	0160-0360	CIFXD CER DISK 120PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C16	0160-0360	CIFXD CER DISK 120PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C18	0160-0360	CIFXD CER DISK 120PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C20	0160-0360	CIFXD CER DISK 120PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C22	0160-0360	CIFXD CER DISK 120PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C24	0160-0360	CIFXD CER DISK 120PF 5%	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0041	CIFXD TI 2.7PF 5% 500VDCW	
A1C32	0150-0041	CIFXD TI 2.7PF 5% 500VDCW	
A1C33	0150-0041	CIFXD TI 2.7PF 5% 500VDCW	
A1C34	0150-0041	CIFXD TI 2.7PF 5% 500VDCW	
A1C35	0150-0022	CIFXD TI 3.3PF 10% 500VDCW	
A1C36	0150-0041	CIFXD TI 2.7PF 5% 500VDCW	
A1C37	0150-0034	CIFXD TI 3.9 PF 10% 500 VDCW FACTORY SELECTED COMPTYPICAL VALUE GIVEN NOT ASSIGNED	
A1C38			
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C46	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C47	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C48	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C49	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4		NOT ASSIGNED	
A1L5	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE:ADJUSTABLE TUNING	

\* See list of abbreviations in introduction to this section



Table 6-9. A11 Filter/Divider Module (05110-6094) (Cont'd)  
 A12 Filter/Divider Module (05110-6093)  
 (prefix all parts A11, A12)

Reference Designation	Stock No.	Description #	Note
A1L6	05100-6186	COIL: VARIABLE 0.17-0.20UH	
A1L7	9170-0105	CORE:ADJUSTABLE TUNING	
A1L8	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L9	05100-6186	COIL: VARIABLE 0.17-0.20UH	
A1L10	9170-0105	CORE:ADJUSTABLE TUNING	
	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L11	05100-6186	COIL: VARIABLE 0.17-0.20UH	
A1L12	9170-0105	CORE:ADJUSTABLE TUNING	
A1L13	05110-6047	COIL: VARIABLE 1.8-3.5UR	
A1L20	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q2	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q3	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q4	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q5	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q6	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q7	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9			
A1R10			
A1R11	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R12	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R13	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R14	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R15	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R16	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R17	0758-0004	RIFXD MET CX 2700 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19			
A1R20			
A1R21	0757-0291	NOT ASSIGNED	
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
		RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR: 10K OHM 10% 25C	

# See list of abbreviations in introduction to this section

Table 6-9. A11 Filter/Divider Module (05110-6094) (Cont'd)  
 A12 Filter/Divider Module (05110-6093)  
 (prefix all parts A11, A12)

Reference Designation	Stock No.	Description #	Note
A2	05110-6056 05110-2018	BOARD ASSY:DIVIDER 3.2 OR 3.3 MC(UNTUNED) BLANK BOARD:DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0140-0190	CIFXD MICA 39 PF 5% 300 VDCW	
A2C59	0140-0192	CIFXD MICA 68PF 5% 300VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0140-0178	CIFXD MICA 566 PF 2% 300 VDCW	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63	THRU		
A2C70		NOT ASSIGNED	
A2C71	0160-0360	CIFXD CER CISK 120PF 5%	
A2C72	0150-0029	CIFXD TI 1PF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0160-0178	CIFXD MICA 27PF 5% 300VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR54	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL:FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL:FXD RF 220 UH	
A2L53	9140-0129	COIL:FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL: VARIABLE 0.16-0.23UH CORE:ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL: VARIABLE 3.2-5.6UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L56	9140-0077 9170-0106	COIL:FXD RF: 2.2UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L57	05110-6063	COIL: VARIABLE 35-50UH	
A2L58	9170-0106 05110-6061	CORE ADJUSTABLE TUNING POWDERED IRON COIL: VARIABLE 3.5-6.0UH	
A2L59	9170-0106 05110-6024	CORE ADJUSTABLE TUNING POWDERED IRON COIL: VARIABLE	
A2L60	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L70	THRU	NOT ASSIGNED	

\* See list of abbreviations in introduction to this section

Table 6-9. A11 Filter/Divider Module (05110-6094) (Cont'd)  
 A12 Filter/Divider Module (05110-6093)  
 (prefix all parts A11; A12)

Reference Designation	Stock No.	Description #	Note
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10R 275 MA	
A2L72	9140-0129	COILIFXD RF 220 UH	
A2L73	9140-0129	COILIFXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTOR ISPL 2N2360 PNP GERMANIUM MADT	
A2Q54	1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5R 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5R 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5R 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5R 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5R 1/4W	
A2R56 THRU A2R60		NOT ASSIGNED	
A2R61	0683-5625	RIFXD COMP 560 OHM 5R 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5R 1/4 W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5R 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5R 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5R 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5R 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5R 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5R 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5R 1/4W	
A2R70	0758-0035	RIFXD MET FLM 3000 OHM 5R 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1R 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1R 1/8W	
A2T51	05100-6167	TRANSFORMER I	
J1 THRU J2 J4 J5	1250-0118	CONNECTOR I BNC	
		NOT ASSIGNED	
	1250-0118	CONNECTOR I BNC	
MP1	05110-0005	FILTER HOOSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET I DIVIDER	
MP4	05110-2002	CAP I FRONT	
MP5	05110-2035	CAP I REAR	
P1	1251-0216	CONNECTOR I MALE 9-CONTACT TYPE D	
		MISCELLANEOUS	
	0340-0038	TERMINAL I STD	
	0340-0039	INSULATOR I BUSHING	
	05110-2001	SPACER I FILTER SHIELD	

\* See list of abbreviations in introduction to this section

Figure 6-10. A13 Filter/Divider Module (05110-6092)  
 A14 Filter/Divider Module (05110-6091)  
 (prefix all parts A13, A14)

Reference Designation	Stock No.	Description #	Note
A1	05110-6111 05110-2043	ASSY FILTER BOARD 300R 31 MC(UNTUNED) BANK BOARD FILTER	
A1C1	0160-2045	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C12	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C14	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C16	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C18	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C20	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C22	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C24	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0022	CIFXD TI 3.3PF 10N 500VDCW	
A1C32	0150-0022	CIFXD TI 3.3PF 10N 500VDCW	
A1C33	0150-0022	CIFXD TI 3.3PF 10N 500VDCW	
A1C34	0150-0022	CIFXD TI 3.3PF 10N 500VDCW	
A1C35	0150-0034	CIFXD TI 3.9 PF 10N 500 VDCW	
A1C36	0150-0022	CIFXD TI 3.3PF 10N 500VDCW	
A1C37	0150-0042	CIFXD TI 4.7 PF 5N 500 VDCW FACTORY SELECTED COMPITYPICAL VALUE GIVEN NOT ASSIGNED	
A1C38			
A1C39	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A1C44	0160-0179	CIFXD MICA 33PF 5N 300VDCW	
A1C45	0160-0179	CIFXD MICA 33PF 5N 300VDCW	
A1C46	0160-0179	CIFXD MICA 33 PF 5N 300VDCW	
A1C47	0160-0179	CIFXD MICA 33 PF 5N 300VDCW	
A1C48	0160-0179	CIFXD MICA 33 PF 5N 300VDCW	
A1C49	0160-0179	CIFXD MICA 33 PF 5N 300VDCW	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10N 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10N 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10N 275 MA	
A1L4		NOT ASSIGNED	
A1L5	05100-6186	COIL VARIABLE 0.17-0.20UH	
	9170-0105	CORE ADJUSTABLE TUNING	

\* See list of abbreviations in introduction to this section

Table 6-10. A13 Filter/Divider Module (05110-6092) (Cont'd)  
 A14 Filter/Divider Module (05110-6091)  
 (prefix all parts A13, A14)

Reference Designation	Stock No.	Description #	Note
A1L6	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L7	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L8	05100-6186	COIL: VARIABLE 0.17-0.20UH	
A1L9	9170-0105 05100-6186	CORE: ADJUSTABLE TUNING COIL: VARIABLE 0.17-0.20UH	
A1L10	9170-0105 05100-6186	CORE: ADJUSTABLE TUNING COIL: VARIABLE 0.17-0.20UH	
A1L11	9170-0105 05100-6186	CORE: ADJUSTABLE TUNING COIL: VARIABLE 0.17-0.20UH	
A1L12	05110-6047 9170-0106	COIL: VARIABLE 1.8-3.5UH CORE: ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10R 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10R 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10R 275 MA	
A1Q1	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q2	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q3	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q4	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q5	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q6	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1Q7	1853-0036	TRANSISTOR: SILICON PNP 2N3906	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10		NOT ASSIGNED	
A1R11	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R12	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R13	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R14	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R15	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R16	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R17	0758-0004	RIFXD MET CA 2700 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R20		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1RT1	0639-0026	THERMISTOR: 10K OHM 10R 25C	

\* See list of abbreviations in introduction to this section

Figure 6-10. A13 Filter/Divider Module (05110-6002) (Cont'd)  
 A14 Filter/Divider Module (05110-6001)  
 (prefix all parts A13, A14)

Reference Designation	* Stock No.	Description #	Note
A2	05110-6055 05110-2016	BOARD ASSY:DIVIDER 3.0 OR 3.1 MC(UNTUNED) BLANK BOARD:DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0140-0190	CIFXD MICA 39 PF 5N 300 VDCW	
A2C59	0140-0215	CIFXD MICA 80PF 2N 300VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0160-0363	CIFXD MICA 620 PF 5N	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63	THRU		
A2C70		NOT ASSIGNED	
A2C71	0160-0361	CIFXD CER DISK 140PF 5N 500VDCW	
A2C72	0150-0029	CIFXD T1 1PF 10N 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A2C74	0160-0179	CIFXD MICA 33PF 5N 300VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20N 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2N 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5N 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR54	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10N 275 MA	
A2L52	9140-0129	COIL:FXD RF 220 UH	
A2L53	9140-0129	COIL:FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL: VARIABLE CORE:ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL: VARIABLE 3.2-5.6UM CORE ADJUSTABLE TUNING POWDERED IRON	
A2L56	9140-0077 9170-0106	COIL:FXD RF: 2.2UM CORE ADJUSTABLE TUNING POWDERED IRON	
A2L57	05110-6063	COIL: VARIABLE 35-50UM	
A2L58	9170-0106 05110-6061	CORE ADJUSTABLE TUNING POWDERED IRON COIL: VARIABLE 3.5-6.0UM	
A2L59	9170-0106 05110-6023 9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON COIL: VARIABLE CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60	THRU		
A2L70		NOT ASSIGNED	

\* See list of abbreviations in introduction to this section

Table 6-10. A13 Filter/Divider Module (05110-6092) (Cont'd)  
 A14 Filter/Divider Module (05110-6091)  
 (prefix all parts A13, A14)

Reference Designation	Stock No.	Description #	Note
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10B 275 MA	
A2L72	9140-0129	COILIFXD RF 220 OH	
A2L73	9140-0129	COILIFXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTOR ISPL 2N2360 PNP GERMANIUM MAOT	
A2Q54	1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP. 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56	THRU		
A2R60		NOT ASSIGNED	
A2R61	0683-3625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0758-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER:	
J1	1250-0118	CONNECTOR 1BNC	
J2	THRU		
J4		NOT ASSIGNED	
J5	1250-0118	CONNECTOR 1BNC	
MP1	05110-0005	FILTER HOOSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET: DIVIDER	
MP4	05110-2002	CAP: FRONT	
MP5	05110-2035	CAP: REAR	
P1	1251-0216	CONNECTOR MALE 9-CONTACT TYPE D	
		MISCELLANEOUS	
	0340-0038	TERMINAL 1STLD	
	0340-0039	INSULATOR 1BUSHING	
	05110-2001	SPACER: FILTER SHIELD	

\* See list of abbreviations in Introduction to this section

Table 6-11. A15 20/24 MHz-Filter Module (05110-6101)  
(prefix all parts A15)

Reference Designation	Stock No.	Description #	Note
A1	05110-6109 05110-2043	BOARD ASSY. 1 24 MC FILTER BLANK BOARD FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C12	0160-0360	CIFXD CER 120 PF 5% 500VDCW	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C14	0160-0360	CIFXD CER 120 PF 5% VDCW	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C16	0160-0360	CIFXD CER 120 PF 5% VDCW	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C18	0160-0360	CIFXD CER 120 PF 5% VDCW	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C20	0160-0360	CIFXD CER 120 PF 5% VDCW	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C22	0160-0360	CIFXD CER 120 PF 5% VDCW	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C24	0160-0360	CIFXD CER 120 PF 5% VDCW	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0022	CIFXD TI 3.3 PF 10% 500VDCW	
A1C32	0150-0022	CIFXD TI 3.3 PF 10% 500VDCW	
A1C33	0150-0041	CIFXD TI 2.7 PF 5% 500VDCW	
A1C34	0150-0041	CIFXD TI 2.7 PF 5% 500VDCW	
A1C35	0150-0041	CIFXD TI 2.7 PF 5% 500VDCW	
A1C36	0150-0041	CIFXD TI 2.7 PF 5% 500VDCW FACTORY SELECTED COMPITYPICAL VALUE GIVEN	
A1C37 THRU A1C38		NOT ASSIGNED	
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C46	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C47	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C48	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1C49	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L4		NOT ASSIGNED	
A1L5	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	

\* See list of abbreviations in introduction to this section



Table 6-11. A15 20/24 MHz Filter Module (05110-6101) (Cont'd)  
(prefix all parts A15)

Reference Designation	Stock No.	Description #	Note
A1L6	05110-6085	COIL:VARIABLE .34-.47 UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L7	05110-6085	COIL:VARIABLE .34-.47 UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L8	05110-6085	COIL:VARIABLE .34-.47 UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L9	05110-6085	COIL:VARIABLE .34-.47 UR	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L10	05110-6085	COIL:VARIABLE .34-.47 UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L11	05110-6085	COIL:VARIABLE .34-.47 UH	
	9170-0105	CORE:ADJUSTABLE TUNING	
A1L12	05110-6086	COIL:VARIABLE 3.6-5.8 UR	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A1Q2	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A1Q3	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A1Q4	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A1Q5	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A1Q6	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A1Q7	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10 A1R11		NOT ASSIGNED	
	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R12	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R13	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R14	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R15	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A1R16	0758-0057	RIFXD MET CX 5600 OHM 5% 1/2W	
A1R17	0758-0004	RIFXD MET CX 2700 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R20 A1R21 A1R22		NOT ASSIGNED	
	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR: 10K OHM 10% 25C	

\* See list of abbreviations in introduction to this section

Table 6-11. A15 20/24 MHz Filter Module (05110-6101) (Cont'd)  
(prefix all parts A15)

Reference Designation	* Stock No.	Description #	Note
A2	05110-6103 05110-2041	BOARD ASSY:20 MC FILTER BLANK BOARD:20MC FILTER	
A2C1	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C2	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C3	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C4	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C5 THRU A2C10		NOT ASSIGNED	
A2C11	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C12	0160-0359	CIFXD CER 103 PF 5% 500VDCW	
A2C13	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C14	0160-0360	CIFXD CER 120 PF 5% 500VDCW	
A2C15	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C16	0160-0360	CIFXD CER 120 PF 5% 500SD W 16P	
A2C17	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C18	0160-0360	CIFXD CER 120 PF 5% 500VDCW	
A2C19	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C20	0160-0360	CIFXD CER 120 PF 5% 500VDCW	
A2C21	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C22	0160-0360	CIFXD CER 120 PF 5% 500VDCW	
A2C23	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C24	0160-0360	CIFXD CER 120 PF 5% 500VDCW	
A2C25 THRU A2C30		NOT ASSIGNED	
A2C31	0140-0202	CIFXD MICA 15 PF 5%	
A2C32	0150-0022	CIFXD TI 3.3 PF 10% 500VDCW	
A2C33	0150-0022	CIFXD TI 3.3 PF 10% 500VDCW	
A2C34	0150-0022	CIFXD TI 3.3 PF 10% 500VDCW	
A2C35	0150-0022	CIFXD TI 3.3 PF 10% 500VDCW	
A2C36	0150-0034	CIFXD TI 3.9 PF 10% 500VDCW FACTORY SELECTED PART:TYPICAL VALUE GIVEN	
A2C37 THRU A2C38		NOT ASSIGNED	
A2C39	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C40	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C41	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C42	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C43	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C44	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A2C45	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A2C46	0160-2055	CIFXD CER 0.01 UF +80-20% 100VDCW	
A2C47	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A2C48	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A2C49	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A2C50	0160-0179	CIFXD MICA 33 PF 5% 300VDCW	
A2L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L4		NOT ASSIGNED	
A2L5	05102-6114	COIL:IVAR .40-.50 UH	
	9170-0105	CORE:ADJUSTABLE TUNING	

\* See list of abbreviations in Introduction to this section

Table 6-11. A18 20/24 MHz Filter Module (05110-6101) (Cont'd)  
(prefix all parts A18)

Reference Designation	Stock No.	Description #	Note
A2L6	05102-6114 9170-0105	COIL:IVAR .40-.50 UH CORE:ADJUSTABLE TUNING	
A2L7	05102-6114 9170-0105	COIL:IVAR .40-.50 UH CORE:ADJUSTABLE TUNING	
A2L8	05102-6114	COIL:IVAR .40-.50 UH	
A2L9	9170-0105 05102-6114	CORE:ADJUSTABLE TUNING COIL:IVAR .40-.50 UH	
A2L10	9170-0105 05102-6114 9170-0105	CORE:ADJUSTABLE TUNING COIL:IVAR .40-.50 UH CORE:ADJUSTABLE TUNING	
A2L11	05102-6114 9170-0105	COIL:IVAR .40-.50 UH CORE:ADJUSTABLE TUNING	
A2L12	05110-6086 9170-0106	COIL:IVAR 3.6-5.8 UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L13 THRU A2L20		NOT ASSIGNED	
A2L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2Q1	1853-0036	TRANSISTOR:SILICON-PNP 2N3906	
A2Q2	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A2Q3	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A2Q4	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A2Q5	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A2Q6	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A2Q7	1853-0036	TRANSISTOR:SILICON PNP 2N3906	
A2R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A2R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R9 THRU A2R10		NOT ASSIGNED	
A2R11	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R12	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R13	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R14	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R15	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R16	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A2R17	0758-0045	RIFXD MET FLM 3900 OHM 5% 1/2W	
A2R18	0758-0004	RIFXD MET CX 2700 OHM 5% 1/2W	
A2R19 THRU A2R20		NOT ASSIGNED	
A2R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
J1	1250-0118	CONNECTOR:BMG	

\* See list of abbreviations in introduction to this section

Table 6-11. A15 20/24 MHz Filter Module (05110-6101) (Cont'd)  
(prefix all parts A15)

Reference Designation	Stock No.	Description #	Note
J2 THRU J4 J5	1250-0118	NOT ASSIGNED CONNECTOR: BNC	
MP1	05110-0005	FILTER HOUSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0026	BRACKET: DIVIDER	
MP4	05110-2002	CAP: FRONT	
MP5	05110-2035	CAP: REAR	
P1	1251-0216	CONNECTOR: MALE 9-CONTACT TYPE D  MISCELLANEOUS	
	0510-0207	NUT: CAPTIVE 4-40 3/16 SST	
	05110-2001	SPACER: FILTER SHIELD	

\* See list of abbreviations in introduction to this section

Table 6-12. A16 Power Supply Rectifier Assy (05110-6027)  
(prefix all parts A16)

Reference Designation	Stock No.	Description #	Note
		Note: A16 not separately replaceable, order 05110-6116 Power Supply Assembly which includes A16, A17, T1, S2.	
A1	05110-6028 05110-2022	BOARD ASSY. RECTIFIER BLANK BOARD RECTIFIER	
A1C1 A1C2	0180-0205 0180-0205	CIFXD ALUM. 12 UF -10 +75% 150VDCW CIFXD ALUM. 12 UF -10 +75% 150VDCW	
A1CR1 A1CR2 A1CR3 A1CR4 A1CR5	1901-0049 1901-0049 1901-0049 1901-0049 1901-0026	SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON 200PIV	
A1CR6 A1CR7 A1CR8 A1CR9 A1CR10	1901-0026 1901-0026 1901-0026 1901-0049 1901-0049	SEMICON DEVICE DIODE SILICON 200PIV SEMICON DEVICE DIODE SILICON 200PIV SEMICON DEVICE DIODE SILICON 200PIV SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON	
A1CR11 A1CR12 A1CR13 A1CR14 A1CR15	1901-0049 1901-0049 1902-0060 1902-0061 1902-0058	SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON	
A1CR16 A1CR17 A1CR18 A1CR19 A1CR20	1901-0025 1902-0059 1901-0025 1901-0025 1901-0025	SEMICON DEVICE DIODE JUNCTION SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE JUNCTION SEMICON DEVICE DIODE JUNCTION SEMICON DEVICE DIODE JUNCTION	
A1CR21 A1CR22 A1CR23 A1CR24	1902-0080 1902-0079 1901-0025 1901-0025	SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE SILICON SEMICON DEVICE DIODE JUNCTION SEMICON DEVICE DIODE JUNCTION	
A1F1 A1F2	2110-0001 2110-0001	FUSE 1.0 AMP 250V FUSE 1.0 AMP 250V	
A1Q1	1850-0064	TRANSISTOR GERMANIUM 2N1183 PNP	
A1R1 A1R2 A1R3 A1R4 A1R5	0757-0290 0757-0290 0757-0289 0757-0289 0757-0290	RIFXD MET FLM 6.19K OHM 1% 1/8W RIFXD MET FLM 6.19K OHM 1% 1/8W RIFXD MET FLM 13.3K OHM 1% 1/8W RIFXD MET FLM 13.3K OHM 1% 1/8W RIFXD MET FLM 6.19K OHM 1% 1/8W	
A1R6	0757-0290	RIFXD MET FLM 6.19K OHM 1% 1/8W	
A2	05110-6013 05110-2019	BOARD ASSY. LIMITER BLANK BOARD LIMITER	
A2C1 A2C2	0170-0055 0170-0055	CIFXD MY 0.1UF 20% 200VDCW CIFXD MY 0.1UF 20% 200VDCW	
A2Q1 A2Q2	1851-0017 1850-0062	TRANSISTOR 2N1304 TRANSISTOR GERMANIUM ALLOY JUNCTION	
A2R1 A2R2 A2R3	0683-4715 0812-0017 0683-3935	RIFXD COMP 470 OHM 5% 1/4W RIFXD RW 0.25 OHM 5% 3W RIFXD COMP 39K OHM 1/4W	

= See list of abbreviations in Introduction to this section

Table 6-12. A16 Power Supply Rectifier Assy (05110-6027) (Cont'd)  
(prefix all parts A16)

Reference Designation	Stock No.	Description #	Note
A2R4	0683-3935	RIFXD COMP 39K OHM 1/4W	
A2R5	0683-4715	RIFXD COMP 470 OHM 5% 1/4W	
A2R6	0812-0017	RIFXD RW 0.25 OHM 5% 3W	
C1	0180-0128	CIFXD ELECT 3000UF -10+30% 30VDCW	
C2	0180-0204	CIFXD ALUM 2800 UF 40 VDCW +100 -10%	
E1	9170-0016	BEAD: FERRITE	
E2	9170-0016	BEAD: FERRITE	
Q1	1854-0020	TRANSISTOR: PNP SILICON	
	1200-0076	INSULATOR: TRANSISTOR	
	1200-0087	CLAMP: TRANSISTOR	
	1200-0092	BUSHING: TRANSISTOR	
Q2	1854-0003	TRANSISTOR NPN SILICON	
	1200-0080	WASHER: FLAT INSULATING ANODIZED AL 0.53100	
	1205-0025	NUT: HEAT DISSIPATOR	
	1205-0026	HEAT DISSIPATOR: BODY	
Q3	1853-0001	TRANSISTOR PNP SILICON 30V 900MW	
	1200-0080	WASHER: FLAT INSULATING ANODIZED AL 0.53100	
	1205-0025	NUT: HEAT DISSIPATOR	
	1205-0026	HEAT DISSIPATOR: BODY	
Q4	1850-0098	TRANSISTOR GERMANIUM PNP SELECTED	
	1200-0043	INSULATOR: TRANSISTOR ANODIZED ALUMINUM	
	1200-0081	BUSHING: INSULATOR NYLON	
T1	9100-0175	TRANSFORMER: POWER	
		MISCELLANEOUS	
	0380-0059	SPACER: SLEEVE BRZ CP 0.2500X0.1521DX0.25	
	0510-0207	NUT: CAPTIVE 4-40 3/16 SST	
	1251-0194	CONNECTOR: PRINTED CIRCUIT 15-CONTACT	
	1400-0010	CLIP: ELECTRICAL PH BRZ NP 13/32X3/8X1/2	
	0403-0150	SUPPORT: PLASTIC	
	05100-2046	MOUNTING: CAPACITOR	
	05110-0004	BRACKET: TRANSISTOR	
	05110-0013	BRACKET: TRANSFORMER	
	05110-6027	RECTIFIER ASSY.: POWER SUPPLY	

\* See list of abbreviations in introduction to this section

Table 6-13. A17 Power Supply Regulator Assy (05110-6018)  
(prefix all parts A17)

Reference Designation	Stock No.	Description #	Note
		Note: A16 not separately replaceable, order 05110-6116 Power Supply Assembly which includes A16, A17, T1, S2.	
A1	05102-6036 05102-7008	BOARD: ASSY. REGULATOR BLANK BOARD:REGULATOR	
A1C1 A1C2	0180-0049 0180-0049	CIFXD ELECT 20UF 50VDC# CIFXD ELECT 20UF 50VDC#	
A1CR1 A1CR2	1902-0506 1902-0506	DIODE: BREAKDOWN 4.7V DIODE: BREAKDOWN 4.7V	
A1Q1 A1Q2 A1Q3 A1Q4 A1Q5	1851-0017 1854-0003 1853-0001 1850-0062 05100-6188	TRANSISTOR: 2N1304 TRANSISTOR: IMPN SILICON TRANSISTOR: PNP SILICON 30V 900MW TRANSISTOR: GERMANIUM ALLOY JUNCTION TRANSISTOR ASSY: 6.3V	
A1Q6	05100-6187	TRANSISTOR ASSY: 12.6V	
A1R1 A1R2 A1R3 A1R4 A1R5	0757-0288 0757-0288 0758-0003 0758-0003 0757-0086	RIFXD MET FLM 9.09K OHM 1% 1/8W RIFXD MET FLM 9.09K OHM 1% 1/8W RIFXD MET FLM 1000 OHM 5% 1/2W RIFXD MET FLM 1000 OHM 5% 1/2W RIFXD MET FLM 51 OHM 2% 1/2W	
A1R6 A1R7 A1R8 A1R9 A1R10	0757-0086 0698-3122 2100-0325 0757-0287 2100-0325	RIFXD MET FLM 51 OHM 2% 1/2W RIFXD MET FLM 412 OHM 1% 1/8W RIVAR WW 100 OHM 10% LIN 1/4W RIFXD MET FLM 499 OHM 1% 1/2W RIVAR WW 100 OHM 10% LIN 1/4W	
A1R11 A1R12 A1R13 A1R14 A1R15	0698-3443 0758-0066 0758-0066 0758-0004 0758-0066	RIFXD MET FLM 287 OHM 1% 1/8W RIFXD MET FLM 620 OHM 5% 1/2W RIFXD MET FLM 620 OHM 5% 1/2W RIFXD MET FLM 2700 OHM 5% 1/2W RIFXD MET FLM 620 OHM 5% 1/2W	
A1R16 A1R17 A1R18 A1R19 A1R20 A1R21	0758-0066 0758-0004 0698-3150 0757-0317 0683-3025 0757-0401	RIFXD MET FLM 620 OHM 5% 1/2W RIFXD MET FLM 2700 OHM 5% 1/2W RIFXD MET FLM 2370 OHM 1% 1/8W RIFXD MET FLM 1.33K OHM 1% 1/8W RIFXD COMP 3000 OHM 5% 1/4W RIFXD MET FLM 100 OHM 1% 1/8W	
A2	05100-6059	CAPACITOR & COIL ASSY: INCLUDES C1 & L1 FILTER ASSEMBLY	
A3	05100-6059	CAPACITOR & COIL ASSY: INCLUDES C1 & L1 FILTER ASSEMBLY	
C3 C4	0160-0127 0160-0127	CIFXD CER 1UF 20% 25VDC# CIFXD CER 1UF 20% 25VDC#	
MP1 MP2 MP3	05110-0010 05110-0011 05110-0012	HOUSING: POWER SUPPLY BRACKET: POWER SUPPLY COVER: POWER SUPPLY	
Q5	1854-0020 1200-0076 1200-0087 1200-0092	TRANSISTOR: IMPN SILICON INSULATOR: TRANSISTOR CLAMP: TRANSISTOR BUSHING: TRANSISTOR	

\* See list of abbreviations in introduction to this section

Table 6-13. A17 Power Supply Regulator Assy (05110-6018) (Cont'd)  
(prefix all parts A17)

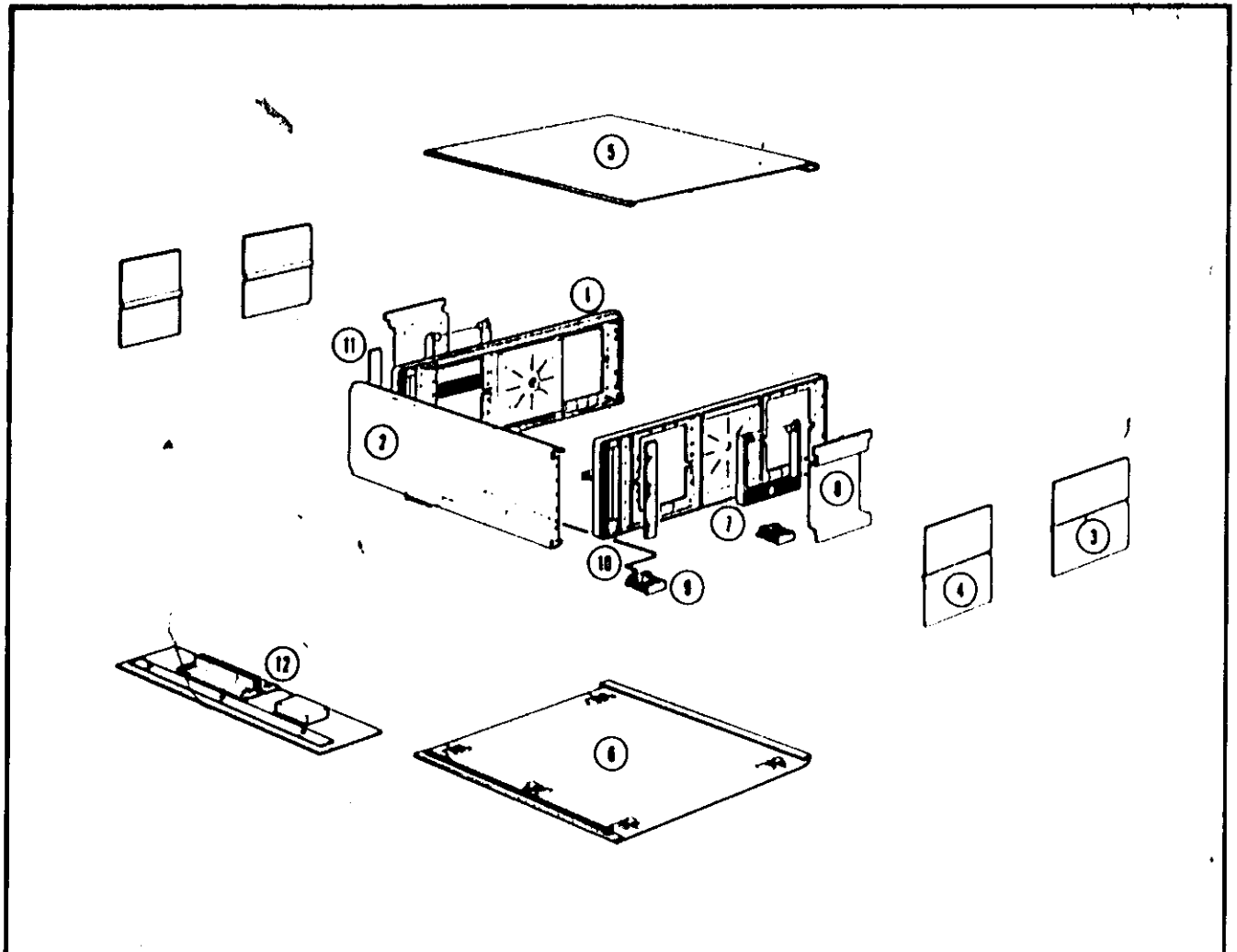
Reference Designation	Stock No.	Description #	Note
06	1850-0098 1200-0043 1200-0081	TRANSISTOR:GERMANIUM PNP SELECTED INSULATOR:TRANSISTOR ANODIZED ALUMINUM BUSHING:INSULATOR NYLON  MISCELLANEOUS	
	0360-0351 0510-0124 0510-0208 1251-0382 5040-0601	TERMINAL:ILCG 3-TERMINAL NUT:CAPTIVE 6-32 ST CP NUT:CAPTIVE 8-32 CONNECTOR:12-TERMINAL SUPPORT:PLASTIC	

Table 6-14. A18 Selector Switch Assy (05110-6017)  
(prefix all parts A18)

61	3100-0706 0340-0038 0340-0039 05110-6036 05110-6037 05110-6038	SWITCH: ROT 2POS, FREQ STD TERMINAL: STUD INSULATOR: BUSHING CABLE ASSY: EXT FREQ INPUT CABLE ASSY: OSCILLATOR CABLE ASSY: CRYSTAL	
	05110-2031 05110-0027	CAP: SELECTOR SWITCH HOUSING: SELECTOR SWITCH	

\* See list of abbreviations in introduction to this section





Item No.	Description	Stock Number
1	Frame Assembly	5060-0732
2	Front Panel	05110-0062
3	Rear Side Cover	05110-0020
4	Front Side Cover	05110-0028
5	Top Cover	05100-6062
6	Bottom Cover	05100-6061
7	Handle Assembly	5060-0763
8	Retainer Handle	05110-0030
9	Foot Assembly	5060-0767
10	Tilt Stand	1490-0030
11	Fluted Aluminum Plate	5000-0051
12	Rack Mount Adapter Kit	5060-0775

Figure 6-1. Modular Cabinet Parts

Table 6-15. Replaceable Parts

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
0121-0013	CIVAR AIR 6-100.5PF	80486	08D	1
0122-0005	CIVAR VOLTAGE 39 PF AT -4V	28480	V39	1
0130-0003	CIVAR CER 1.5-7PF 500VDCW	72982	503-000COP0-10R	1
0130-0017	CIVAR CER 8-50 PF	28480	0130-0017	1
0140-0101	CIFXD MICA 15PF 5W 500 VDCW	00853	RCM15C150J	10
0140-0149	CIFXD MICA 22 PF 5W 500 VDCW	04062	DM15C220J	6
0140-0149	CIFXD MICA 470 PF 5W 300 VDCW	04062	DM15F471J	2
0140-0152	CIFXD MICA 1000 PF 5W 300 VDCW	04062	DM16F102J	1
0140-0162	CIFXD MICA 4700 PF 10W 300 VDCW	04062	DM20F472K	2
0140-0176	CIFXD MICA 100 PF 2W 300 VDCW	04062	DM15F101B 300V	1
0140-0178	CIFXD MICA 560 PF 2W 300 VDCW	04062	DM15F561G 300V	14
0140-0180	CIFXD MICA 2000 PF 2W 300 VDCW	04062	DM19F202G (300V)	1
0140-0182	CIFXD MICA 5000 PF 2W 300 VDCW	04062	DM20F502G 300V	1
0140-0184	CIFXD MICA 8200 PF 1W 100 VDCW	04062	DM20F822F 100V	4
0140-0189	CIFXD MICA 5825 PF 2W 300VDCW	04062	DM20F5825G	1
0140-0190	CIFXD MICA 39 PF 5W 300 VDCW	04062	DM15E390J 300V	9
0140-0191	CIFXD MICA 56 PF 5W 300 VDCW	04062	DM15E560J 300V	2
0140-0192	CIFXD MICA 68PF 5W 300VDCW	04062	DM15E680J	2
0140-0202	CIFXD MICA 15 PF 5W	28480	0140-0202	1
0140-0204	CIFXD MICA 47PF 5W NPO 500VDCW	04062	DM15E470J	11
0140-0205	CIFXD MICA 62PF 5W 300VDCW	04062	DM15E620J 300V	3
0140-0206	CIFXD MICA 270PF 5W 500VDCW	04062	DM15F271J 500V	1
0140-0207	CIFXD MICA 330PF 5W 500VDCW	04062	DM15F331J 500V	1
0140-0215	CIFXD MICA 80PF 2W 300VDCW	04062	DM15E8005 300V	2
0140-0230	CIFXD MICA 420PF 1W 300VDCW	04062	DM15F4212 300V	2
0150-0011	CIFXD TI 1.5PF 20W 500VDCW	78488	TYPE GA	4
0150-0015	CIFXD TI 2.2 PF 5W 500VDCW	78488	TYPE GA	12
0150-0022	CIFXD TI 3.3 PF 10W 500VDCW	78488	GA	22
0150-0029	CIFXD TI 1PF 10W 500VDCW	78488	GA1.0PF	10
0150-0031	CIFXD TI 2PF 5W 500VDCW	78488	TYPE GA 2PF 5W	12
0150-0034	CIFXD TI 3.9 PF 10W 500 VDCW	78488	TYPE GA	5
0150-0041	CIFXD TI 2.7 PF 5W 500VDCW	78488	TYPE GA	24
0150-0042	CIFXD TI 4.7 PF 5W 500 VDCW	78488	TYPE GA	7
0150-0044	CIFXD TI 5.6 PF 5W 500 VDCW	78488	TYPE GA	3
0150-0047	CIFXD TI 6.8 PF 10W 500 VDCW	78488	TYPE GA	4
0150-0093	CIFXD CER 0.01 UF +80-20% 100VDCW	91418	TA	2
0150-0098	CIFXD CER 0.01 UF 1000 VDCW	91418	B	5
0150-0110	CIFXD CER 470PF 5W 300VDCW	71590	CB T864 471J P3K	1
0150-0117	CIFXD CER 100PF 10W 500VDCW	71590	CC20 TCN 100	2
0150-0121	CIFXD CER 0.1UF 50 VDCW	56289	5C50A	139
0160-0127	CIFXD CER 1UF 20W 25VDCW	56289	5C13	3
0160-0161	CIFXD 0.01UF 10W	28480	0160-0161	8
0160-0162	CIFXD MY 0.022UF 10W	28480	0160 0162	1
0160-0168	CIFXD 0.1UF 10W	28480	0160-0168	7
0160-0178	CIFXD MICA 27PF 5W 300VDCW	04062	DM15E270J	2
0160-0179	CIFXD MICA 33 PF 5W 300VDCW	04062	DM15E330J 300V	88
0160-0182	CIFXD MICA 47PF 5W 300VDCW	14655	DM15E470J 300V	3
0160-0217	CIFXD MICA 230C PF 1W 300VDCW	28480	0160-0217	1
0160-0338	CIFXD MICA 267 PF 1W 300VDCW	28480	0160-0338	1
0160-0345	CIFXD CER 1000PF +80%-20% 500VDCW FEEDTHRU	01121	FB2B-102E	3

\* See list of abbreviations in Introduction to this section

Table 6-15. Replaceable Parts (Cont'd)

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ
0160-0357	CIFXD CER DISK 85PF 5R	71590	TB82850JS1G	22
0160-0358	CIFXD CER DISK 94PF 5R	71590	TB82940JS1G	20
0160-0359	CIFXD CER DISK 103PF 5R	71590	DA162-069J	21
0160-0360	CIFXD CER DISK 120PF 5R	71590	DA163-022J	33
0160-0361	CIFXD CER DISK 140PF 5R 500VDCW	71590	DA-163-023J	20
0160-0362	C-FXD NICA 510 PF 5R	28480	0160-0362	2
0160-0363	CIFXD NICA 620 PF 5R	28480	0160-0363	2
0160-2055	CIFXD CER 0.01UF +80-20R 100 VDCW	91418	TA	257
0160-2595	CIFXD CER 68 PF 2R 600VDCW	71590	TCL-68	1
0176-0055	CIFXD MY 0.1UF 20R 200VDCW	56289	192P10402	2
0170-0084	CIFXD MY 0.068UF 20R 50VDCW	84411	601PE STYLE 3	2
0180-0049	CIFXD ELECT 20UF 50VDCW	56289	300198A1	2
0180-0100	CIFXD ELECT TA 4.7UF 10R 35VDCW	56289	1500475X9035B2	6
0180-0128	CIFXD ELECT 3000UF -10+30R 30VDCW	00853	505 1010 02	1
0180-0204	CIFXD ALUM 2800 UF 40 VDCW +100 -10R	05571	456430	1
0180-0205	CIFXD ALUM. 12 UF -10 +75R 150VDCW	05571	30012661500M4	2
0340-0038	TERMINAL STUD	28480	0340-0039	46
0340-0039	INSULATOR BUSHING	00866	HP-3000TD1	38
0360-0351	TERMINAL LUG 3-TERMINAL	71785	332-14-05-201	2
0370-0112	KNOB	28480	0370-0112	2
0380-0059	SPACER SLEEVE BR5 CP 0.2500X0.15210X0.25	00866	OBD#	2
0510-0123	FASTENER PUSH-ON TYPE	78553	C12008-014-4	3
0510-0124	NUTICAPTIVE 6-32 ST CP	83324	RPN 6-32 5C	51
0510-0207	NUTICAPTIVE 4-40 3/16 SST	42498	NCN-4-3-2-4	87
0510-0208	NUTICAPTIVE 8-32	13576	JIFFY CE103-82	8
0683-1025	RIFXD COMP 1000 OHM 5R 1/4W	01121	CB 1025	64
0683-1035	RIFXD COMP 10K OHM 5R 1/4W	01121	CB 1035	12
0683-1235	RIFXD COMP 12K OHM 5R 1/4W	01121	CB 1235	2
0683-1335	RIFXD COMP 13K OHM 5R 1/4W	01121	CB 1335	1
0683-1515	RIFXD COMP 150 OHM 5R 1/4W	01121	CB 1515	1
0683-1525	RIFXD COMP 150 OHM 5R 1/4W	01121	CB 1525	10
0683-1825	RIFXD COMP 1800 OHM 5R 1/4W	01121	CB 1825	36
0683-2025	RIFXD COMP 2000 OHM 5R 1/4W	01121	CB 2025	1
0683-2035	RIFXD COMP 20K OHM 5R 1/4W	01121	CB 2035	1
0683-2205	RIFXD COMP 22 OHM 5R 1/4W	01121	CB 2205	1
0683-2215	RIFXD COMP 220 OHM 5R 1/4W	01121	CB 2215	1
0683-2725	RIFXD COMP 2700 OHM 5R 1/4W	01121	CB 2725	2
0683-2735	RIFXD COMP 27K OHM 5R 1/4W	01121	CB 2735	1
0683-3025	RIFXD COMP 300C OHM 5R 1/4W	01121	CB 3025	12
0683-3915	RIFXD COMP 390 OHM 5R 1/4W	01121	CB 3915	11
0683-3925	RIFXD COMP 3900 OHM 5R 1/4W	01121	CB 3925	83
0683-3935	RIFXD COMP 39K OHM 1/4W	01121	CB 3935	2
0683-4325	RIFXD COMP 4300 OHM 5R 1/4W	01121	CB 4325	2
0683-4715	RIFXD COMP 470 OHM 5R 1/4W	01121	CB 4715	6
0683-4725	RIFXD COMP 4700 OHM 5R 1/4W	01121	CB 4725	1
0683-4735	RIFXD COMP 47K OHM 5R 1/4W	01121	CB 4735	2
0683-5605	RIFXD COMP 56 OHM 5R 1/4W	01121	CB 5605	10
0683-5625	RIFXD COMP 560 OHM 5R 1/4W	01121	CB 5625	10
0683-7515	RIFXD COMP 750 OHM 5R 1/4W	01121	CB 7515	10
0683-8215	RIFXD COMP 820 OHM 5R 1/4W	01121	CB 8215	1

\* See list of abbreviations in introduction to this section

Table 6-15. Replaceable Parts (Cont'd)

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ	RS
0699-0365	R FXD COMP 5.6 OHM 5A 1W	01171	GB 5665	1	1
0698-3172	R FXD MET FLM 412 OHM 1A 1/8W	28480	0698-3172	1	1
0698-3150	RIFXD MET FLM 2370 OHM 1A 1/8W	28480	0698-3150	1	1
0698-3443	RIFXD MET FLM 287 OHM 1A 1/8W	28480	0698-3443	1	1
0727-0187	RIFXD DEPC 37.4K OHM 1A 1/2W	19701	DC 1/2CR5	1	1
0727-0215	RIFXD DEPC 123K OHM 1/2A 1/2W	19701	DC 1/2A 15	1	1
0727-0221	RIFXD DEPC 200K OHM 1A 1/2W	28480	0727-0221	1	1
0727-0405	R FXD DEPC 57.46K OHM 1/2A 1/2W	19701	DC 1/2 AR5	1	1
0757-0086	RIFXD MET FLM 51 OHM 2A 1/2W	07115	C 20	2	1
0757-0270	RIFXD MET FLM 249K OHM 1A 1/8W	28480	0757-0270	1	1
0757-0287	RIFXD MET FLM 499 OHM 1A 1/2W	19701	MF7C-T2	1	1
0757-0288	RIFXD MET FLM 9.09K OHM 1A 1/8W	19701	MF6C-T0	2	1
0757-0289	R FXD MET FLM 13.3K OHM 1A 1/8W	28480	0757-0289	2	1
0757-0290	RIFXD MET FLM 6.19K OHM 1A 1/8W	28480	0757-0290	4	1
0757-0291	RIFXD MET FLM 24.9 OHM 1A 1/8W	28480	0757-0291	44	9
0757-0316	RIFXD MET FLM 42.2 OHM 1A 1/8W	28480	0757-0316	3	1
0757-0317	R FXD MET FLM 1.33K OHM 1A 1/8W	28480	0757-0317	1	1
0757-0349	RIFXD MET FLM 22.5K OHM 1A 1/8W	28480	0757-0349	1	1
0757-0401	R FXD MET FLM 100 OHM 1A 1/8W	28480	0757-0401	1	1
075-0899	RIFXD MET FLM 91 OHM 2A 1/8W	28480	0757-0899	1	1
0757-0908	RIFXD MET FLM 220 OHM 2A 1/8W	28480	0757-0908	1	1
0757-0917	RIFXD MET FLM 510 OHM 2A 1/8W	28480	0757-0917	1	1
0757-0922	RIFXD MET FLM 820 OHM 2A 1/8W	28480	0757-0922	1	1
0757-0924	RIFXD MET FLM 1000 OHM 2A 1/8W	28480	0757-0924	2	1
0757-0934	RIFXD MET FLM 2700 OHM 2A 1/8W	28480	0757-0934	1	1
0757-0936	RIFXD MET FLM 3300 OHM 2A 1/8W	28480	0757-0936	1	1
0757-0937	RIFXD MET FLM 3600 OHM 2A 1/8W	28480	0757-0937	1	1
0757-0940	RIFXD MET FLM 4700 OHM 2A 1/8W	28480	0757-0940	1	1
0757-0949	RIFXD MET FLM 11K OHM 2A 1/8W	28480	0757-0949	1	1
0758-0002	RIFXD MET FLM 560 OHM 5A 1/2W	07115	C 20	2	1
0758-0003	RIFXD MET FLM 1000 OHM 5A 1/2W	07115	C 20/1K-5A-1/2W	5	1
0758-0004	RIFXD MET OX 2700 OHM 5A 1/2W	28480	0758-0004	25	5
0758-0005	RIFXD MET OX 4700 OHM 5A 1/2W	28480	0758-0005	2	1
0758-0006	RIFXD MET FLM 10K OHM 5A 1/2W	07115	C 20	2	1
0758-0008	RIFXD MET FLM 390 OHM 5A 1/2W	07115	C 20	1	1
0758-0009	RIFXD MET FLM 6800 OHM 5A 1/2W	07115	C 20	18	4
0758-0010	RIFXD MET OX FLM 3300 OHM 5A 1/2W	28480	0758-0010	1	1
0758-0012	RIFXD MET FLM 12K OHM 5A 1/2W	07115	C 20	1	1
0758-0013	RIFXD MET FLM 120 OHM 5A 1/2W	07115	C 20	2	1
0758-0015	RIFXD MET FLM 220 OHM 5A 1/2W	07115	C 20	3	1
0758-0017	RIFXD MET FLM 1500 OHM 5A 1/2W	07115	C 20	1	1
0758-0020	RIFXD MET FLM 22K OHM 5A 1/2W	07115	C 20/22K-5A	1	1
0758-0024	RIFXD MET FLM 100 OHM 5A 1/2W	07115	C 20	1	1
0758-0029	RIFXD MET FLM 470 OHM 5A 1/2W	07115	C 20	3	1
0758-0035	RIFXD MET FLM 3000 OHM 5A 1/2W	07115	C 20	12	3
0758-0044	RIFXD MET FLM 2200 OHM 5A 1/2W	07115	C 20	1	1
0758-0045	RIFXD MET FLM 3900 OHM 5A 1/2W	28480	0758-0045	2	1
0758-0046	RIFXD MET FLM 6200 OHM 5A 1/2W	07115	C 20	40	8
0758-0048	RIFXD MET FLM 8200 OHM 5A 1/2W	07115	C 20	1	1
0758-0054	RIFXD MET FLM 330 OHM 5A 1/2W	07115	C 20	2	1
0758-0057	RIFXD MET FLM 5600 OHM 5A 1/2W	07115	C 20	28	6
0758-0066	RIFXD MET FLM 620 OHM 5A 1/2W	07115	C 20	5	1
0758-0096	RIFXD MET FLM 110 OHM 5A 1/2W	07115	C-20	1	1

\* See list of abbreviations in introduction to this section

Table 6-15. Replaceable Parts (Cont'd)

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ	RS
0812-0017	RIFXD W/ 0.25 OHM 5B 3B	35434	VTA 3	2	1
0839-0012	THERMISTOR 50K OHM 10B	83186	45R1	1	1
0839-0026	THERMISTOR 10K OHM 10B 25C	83136	4104	11	11
0900-0034	GASKET SILICONE RUBBER 1-7/16ID	02286	08DW	1	1
1120-0152	MICROAMMETER 100 MICROAMPERES	28480	1120-0152	1	1
1200-0043	INSULATOR TRANSISTOR ANODIZED ALUMINUM	76530	294457	2	2
1200-0076	INSULATOR TRANSISTOR	02735	DF 14A	3	3
1200-0080	WASHER FLAT INSULATING ANODIZED AL 0.53100	71785	294834	2	2
1200-0081	BUSHING INSULATOR NYLON	26365	974SPECIAL	4	4
1200-0087	CLAMP TRANSISTOR	02735	DF-13-A	3	3
1200-0092	BUSHING TRANSISTOR	02735	495334-1	6	6
1205-0025	NUT HEAT DISSIPATOR	13103	1101A-1	2	2
1205-0026	HEAT DISSIPATOR BODY	28480	1205-0026	2	2
1250-0083	CONNECTOR BNC	91737	UG-1094/U	4	1
1250-0102	CONNECTOR BNC	91737	1250-0102	1	1
1250-0118	CONNECTOR BNC	91737	8427	24	5
1250-0149	CONNECTOR IRF COAXIAL BNC RT-ANGLE RECEPT	91737	UG-1174/M	3	1
1250-0781	CONNECTOR IRF BNC T 2-FEMALE 1-MALE	95712	3424-3	1	1
1251-0131	CONNECTOR SOCKET FEMALE 1-PIN	00373	69026-1164 (RED)	1	1
1251-0194	CONNECTOR PRINTED CIRCUIT 15-CONTACT	95354	50-6155	1	1
1251-0214	CONNECTOR SUBMINAT TYPE D 9-CONTACT FEMALE	71785	DEM-9A	11	3
1251-0216	CONNECTOR MALE 9-CONTACT TYPE C	71468	DEM-9P	11	3
1251-0382	CONNECTOR 12-TERMINAL	28480	1251-0382	1	1
1400-0010	CLIP ELECTRICAL PH BRZ NP 13/32X3/8X1/2	71400	4550	4	1
1400-0084	FUSE HOLDER EXTRACTOR POST TYPE	75915	342014	1	1
1450-0701	LIGHT INDICATOR GREEN 10V 13 MA	28480	1450-0701	1	1
1450-0094	LIGHT INDICATOR WHITE 10V 13MA	28480	1450-0094	1	1
1490-0030	STAND TILT	28480	1490 0030	1	1
1850-0020	TRANSISTOR GERMANIUM 2N1143 PNP	01295	2N1143	1	1
1850-0054	TRANSISTOR GERMANIUM 2N652A PNP	04713	2N652A	2	2
1850-0062	TRANSISTOR GERMANIUM ALLOY JUNCTION	28480	1850-0062	3	3
1850-0064	TRANSISTOR GERMANIUM 2N1183 PNP	02735	2N1183	1	1
1850-0090	TRANSISTOR GERMANIUM 2N1183B PNP	86684	2N1183B	1	1
1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	87216	2N2048	24	13
1850-0098	TRANSISTOR GERMANIUM PNP SELECTED	28480	1850-0099	2	2
1850-0118	TRANSISTOR PNP GERMANIUM EIA 2N2360	82767	2N2360	20	12
1850-0138	TRANSISTOR SPL 2N2360 PNP GERMANIUM MADO	28480	1850-0138	21	13
1851-0017	TRANSISTOR 2N1304	01295	2N1304	2	2
1853-0001	TRANSISTOR PNP SILICON 30V 900MB	28480	1853 0001	5	5
1853-0009	TRANSISTOR SILICON PNP	28480	1853-0009	7	7
1853-0016	TRANSISTOR SILICON PNP	28480	1853-0016	1	1
1853-0036	TRANSISTOR SILICON PNP 2N3906	04713	2N3906	84	20
1854-0003	TRANSISTOR NPN SILICON	28480	1854-0003	4	4
1854-0020	TRANSISTOR NPN SILICON	28480	1854-0020	2	2
1901-0025	SEMICON DEVICE DIODE JUNCTION	28480	1901 0025	10	10
1901-0026	SEMICON DEVICE DIODE SILICON 200PIV	28480	1901-0026	5	5
1901-0040	SEMICON DEVICE DIODE SILICON	28480	1901-0040	34	15
1901-0049	SEMICON DEVICE DIODE SILICON	28480	1901 0049	8	8
1901-0050	SEMICON DEVICE DIODE SILICON	28480	1901 0050	3	3
1902-0058	SEMICON DEVICE DIODE SILICON	28480	1902-0059	1	1

\* See list of abbreviations in introduction to this section

Table 6-15. Replaceable Parts (Cont'd)

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ	RS
1902-0059	SEMICON DEVICE:DIODE SILICON	28480	1902-0059	1	1
1902-0060	SEMICON DEVICE:DIODE SILICON	28480	1902-0060	1	1
1902-0061	SEMICON DEVICE:DIODE SILICON	28480	1902-0061	1	1
1902-0079	SEMICON DEVICE:DIODE SILICON	28480	1902-0079	1	1
1902-0080	SEMICON DEVICE:DIODE SILICON	28480	1902-0080	1	1
1902-0506	DIODE:BREAKDOWN 4.7V	28480	1902-0506	2	2
1910-0016	SEMICON DEVICE:DIODE GERMANIUM	93332	02361	36	16
1910-0022	SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS	28480	1910-0022	3	3
2100-0094	RIVAR COMP 50K OHM 30R LIN 1/5W	28480	2100-0094	1	1
2100-0151	RIVAR COMP 500 OHM 2R LIN 1/8W	28480	2100-0151	1	1
2100-0277	RIVAR COMP 100 OHM 20R LIN 0.3W	28480	2100-0277	2	1
2100-0325	RIVAR RW 100 OHM 10R LIN 1/4W	28480	2100 0325	2	1
2100-0328	RIVAR RW 500 OHM 10R LIN 1W	28480	2100 0328	1	1
2100-0737	RIVAR RW 200 OHM TYPE H CONFIGURATION	28480	2100-0737	1	1
2110-0001	FUSE:1.0 AMP 250V	28480	2110-0001	2	20
2110-0012	FUSE:CARTRIDGE 1/2AMP 250V	75915	312500	1	10
3100-0707	SWITCH-ROT 4 POS	76854	080R	1	1
3101-1234	SWITCH:SLIDE DPDT			1	1
3101-0038	SWITCH:TOGGLE DPDT 3 AMP 125V	28480	3101-0038	1	1
4324-0007	RUBBER STRIP:NEOPRENE 1X13X3/16	02286	080R	2	
4324-0008	RUBBER STRIP:NEOPRENE 1X13X3/8	02286	080R	2	
5000-0051	TRIM STRIP:ALUM #/ADHESIVE BACK	28480	5000-0051	2	
5040-0601	SUPPORT:PLASTIC	28480	5040-0601	4	
5060-0732	FRAME:SIDE 5 1/4 IN	28480	5060-0732	2	
5060-0763	HANDLE ASSY-SIDE:2 REQ'D	28480	5060-0763	2	
5060-0767	FOOT ASSY-SNAP ON	28480	5060-0767	5	
5060-0775	KIT:RACK MOUNTING	28480	5060-0775	1	
8120-1348	CABLE POWER 7.5FT.			1	1
9100-0175	TRANSFORMER:POWER	28480	9100-0175	1	1
9100-1790	INDUCTOR:RF 0.36 UH 5R	95265	080R	2	1
9110-3112	FILTER:AC LINE (INCLUDES J1)	28480	9110-3112	1	1
9140-0077	COIL:FXD PF 1 2.2UH	28480	9140-007	10	2
9140-0111	COIL:FXD RF 3.3 UH 10R	28480	9140-0111	1	1
9140-0129	COIL:FXD PF 220 UHY	28480	9140-0129	46	10
9140-0137	COIL:FXD PF 100 UHY	28480	9140-0137	6	2
9140-0179	COIL-FXD P.F. 22 UH 10R 275 MA	99800	1537-44	96	20
9140-0181	COIL:FXD RF 22UH 5R	78526	12201M	1	1
9140-0238	COIL:FXD PF 62UH 5R	99800	1537-72	1	1
9170-0029	CORE: FERRITE BEAD	02114	56-590-654A	2	1
9170-0105	CORE:ADJUSTABLE TUNING	95566	A1-464 NO WAX	116	20
9170-0106	CORE ADJUSTABLE TUNING POWDER:EL IRON	95566	A1-288	58	12
05100-2046	MOUNTING:CAPACITOR	28480	05100-2046	1	
05100-6059	CAPACITOR & COIL ASSY:INCLUDES C1 & L1	28480	05100-6059	2	
05100-6061	COVER ASSY.:1 BOTTOM	28480	05100-6061	1	
05100-6062	COVER ASSY.:1 TOP	28480	05100-6062	1	
05100-6166	COIL: VARIABLE	28480	05100-6166	10	2
05100-6167	TRANSFORMER:1	28480	05100-6167	10	2
05100-6170	COIL: VARIABLE 3.2-5.6UH	28480	05100-6170	10	2
05100-6186	COIL: 0.17-0.20UH	28480	05100-6186	70	14
05100-6187	TRANSISTOR ASSY: 12.6V	28480	05100-6187	1	1

# See list of abbreviations in introduction to this section

Table 6-15. Replaceable Parts (Cont'd)

Stock No.	Description #	Mfr.	Mfr. Part No.	TQ	RS
05100-6188	TRANSISTOR ASSY: 6.3V	28480	05100-6188	1	1
05102-6114	COIL:VAR .40-.50 UH	28480	05102-6114	7	2
05110-0001	BRACKET: FILTER	28480	05110-0001	2	
05110-0002	GUARDIAC INPUT	28480	05110-0002	1	
05110-0003	BRACKET: FREQ. STD. MTG	28480	05110-0003	1	
05110-0004	BRACKET: TRANSISTOR	28480	05110-0004	1	
05110-0005	FILTER HOUSING	28480	05110-0005	11	
05110-0006	FILTER COVER	28480	05110-0006	11	
05110-0007	BRACKET: DIVIDER	28480	05110-0007	10	
05110-0008	COVER: COMB GENERATOR	28480	05110-0008	1	
05110-0009	HOUSING: COMB GENERATOR	28480	05110-0009	1	
05110-0010	HOUSING: POWER SUPPLY	28480	05110-0010	1	
05110-0011	BRACKET: POWER SUPPLY	28480	05110-0011	1	
05110-0012	COVER: POWER SUPPLY	28480	05110-0012	1	
05110-0013	BRACKET: TRANSFORMER	28480	05110-0013	1	
05110-0014	HOUSING: FREQ. STD.	28480	05110-0014	1	
05110-0015	COVER: FREQ. STD.	28480	05110-0015	1	
05110-0017	INPUT CKT. HOUSING	28480	05110-0017	1	
05110-0018	COVER: INPUT CKT.	28480	05110-0018	1	
05110-0019	BRACKET: DIVIDER	28480	05110-0019	1	
05110-0020	STRAP: POWER SUPPLY	28480	05110-0020	1	
05110-0021	BRACKET: BOTTOM	28480	05110-0021	2	
05110-0022	BRACKET: TOP LEFT	28480	05110-0022	1	
05110-0023	BRACKET: TOP-RIGHT	28480	05110-0023	1	
05110-0024	BRACKET: SIDE	28480	05110-0024	1	
05110-0025	PANEL:FRONT	28480	05110-0025	1	
05110-0026	BRACKET: DIVIDER	28480	05110-0026	1	
05110-0028	COVER: FRONT SIDE	28480	05110-0028	2	
05110-0029	COVER: REAR SIDE	28480	05110-0029	2	
05110-0030	RETAINER: HANDLE	28480	05110-0030	2	
05110-0031	BRACKET: MOUNTING	28480	05110-0031	1	
05110-0057	SHIELD: SPRING	28480	05110-0057	2	
05110-0058	SPRING: GROUNDING, FILTER	28480	05110-0058	5	
05110-0060	SPACER:COMB GEN MODULE	28480	05110-0060	2	
05110-2001	SPACER: FILTER SHIELD	28480	05110-2001	24	
05110-0082	BRACKET: POWER SUPPLY	28480	05110-0082	1	
05110-2002	CAP: FRONT	28480	05110-2002	11	
05110-2018	BLANK BOARD:DIVIDER	28480	05110-2018	10	
05110-2019	BLANK BOARD:LIMITER	28480	05110-2019	1	
05110-2020	BOARD: COMB. GEN.	28480	05110-2020	1	
05110-2021	BLANK BOARD:COMB	28480	05110-2021	1	
05110-2022	BLANK BOARD:RECTIFIER	28480	05110-2022	1	
05110-2024	BLANK BOARD:OSCILLATOR	28480	05110-2024	1	
05110-2025	BOARD: OVEN CONTROL BLANK	28480	05110-2025	1	
05110-2027	CAP: FRONT	28480	05110-2027	1	
05110-2028	CAP: REAR	28480	05110-2028	1	
05110-2030	GUIDE:M AND F FREQ ADJ	28480	05110-2030	2	
05110-2035	CAP: REAR	28480	05110-2035	11	
05110-2038	BOARD-INPUT AMP.	28480	05110-2038	1	
05110-2039	BOARD-BUFFER AMP.	28480	05110-2039	1	

\* See list of abbreviations in introduction to this section

Table 6-15. Replaceable Parts (Cont'd)

Block No.	Description #	Mfr.	Mfr. Part No.	TQ	RS
05110-2041	BLANK BOARD 120MC FILTER	28480	05110-2041	1	
05110-2042	BOARD 1 BLANK PC	28480	05110-2042	1	
05110-2043	BLANK BOARD 1 FILTER	28480	05110-2043	11	
05110-6011	ASSY 1 FILTER BOARD 30 & 31 MC	28480	05110-6011	2	
05110-6013	BOARD ASSY. 1 LIMITER	28480	05110-6013	1	
05110-6014	FREQUENCY STD. ASS'Y.	28480	05110-6014	1	
05110-6015	INPUT AMP/BUFFER AMP. ASS'Y.	28480	05110-6015	1	
05110-6017	SWITCH ASSY. 1 SELECTOR	28480	05110-6017	1	
05110-6018	REGULATOR ASSY. 1 POWER SUPPLY	28480	05110-6018	1	
05110-6023	COIL 1 VARIABLE 21-34UH	28480	05110-6023	4	1
05110-6024	COIL 1 VARIABLE 28-45UH	28480	05110-6024	12	3
05110-6025	BOARD ASSY. 1 COMB GEN.	28480	05110-6025	1	
05110-6027	RECTIFIER ASSY. 1 POWER SUPPLY	28480	05110-6027	2	
05110-6028	BOARD ASSY. 1 RECTIFIER	28480	05110-6028	1	
05110-6030	OSCILLATOR BOARD ASS'Y.	28480	05110-6030	1	
05110-6031	OVEN CONTROL BOARD ASSY.	28480	05110-6031	1	
05110-6034	CABLE ASSY. 1 POWER SUPPLY	28480	05110-6034	1	
05110-6035	CABLE ASSY. 1 AC	28480	05110-6035	1	
05110-6039	CABLE ASSY 1 DC FREQ. CONTROL	28480	05110-6039	1	
05110-6041	CABLE ASSY. 1 (BUFFER INPUT)	28480	05110-6041	1	
05110-6042	CABLE ASSY. 1 (COMB INPUT)	28480	05110-6042	1	
05110-6043	OVEN ASSEMBLY-CRYSTAL	28480	05110-6043	1	
05110-6044	TRANSFORMER 1	28480	05110-6044	20	4
05110-6047	COIL 1 VARIABLE 1.8-3.5UH	28480	05110-6047	10	2
05110-6048	COIL 1 VARIABLE 2.6-4.7UH	28480	05110-6048	1	1
05110-6049	DIODE OVEN ASSY. INCLUDES CR6, R7, RT1	28480	05110-6049	1	1
05110-6055	BOARD ASSY. 1 DIVIDER	28480	05110-6055	2	
05110-6056	BOARD ASSY. 1 DIVIDER	28480	05110-6056	2	
05110-6057	BOARD ASSY. 1 DIVIDER	28480	05110-6057	2	
05110-6058	BOARD ASSY. 1 DIVIDER	28480	05110-6058	2	
05110-6059	BOARD ASSY. 1 DIVIDER	28480	05110-6059	2	
05110-6060	COIL 1 VARIABLE 13.5-19.0UH	28480	05110-6060	1	1
05110-6061	COIL 1 VARIABLE 3.5-6.0UH	28480	05110-6061	10	2
05110-6063	COIL 1 VARIABLE 35-50UH	28480	05110-6063	4	1
05110-6064	TRANSFORMER 1 VARIABLE	28480	05110-6064	2	1
05110-6071	COIL-VARIABLE 4.5-7UH	28480	05110-6071	3	1
05110-6072	COIL 1 FIXED 185UH	28480	05110-6072	1	1
05110-6073	COIL-VARIABLE 50-100UH	28480	05110-6073	2	1
05110-6085	COIL 1 VARIABLE .34-.47 UH	28480	05110-6085	7	2
05110-6081	FILTER: CRYSTAL	28480	05110-6081	1	1
05110-6086	COIL 1 VARIABLE 3.6-5.8 UH	28480	05110-6086	2	1
05110-6088	BOARD ASS'Y. -INPUT AMP.	28480	05110-6088	1	
05110-6089	BOARD ASS'Y. -BUFFER AMP.	28480	05110-6089	1	
05110-6091	FILTER/DIVIDER ASS'Y 1 30/3.0 MC	28480	05110-6091	1	
05110-6092	FILTER/DIVIDER ASS'Y 1 31/3.1 MC	28480	05110-6092	1	
05110-6093	FILTER/DIVIDER ASSY 1 32/2.2 MC	28480	05110-6093	1	
05110-6094	FILTER/DIVIDER ASSY 1 33/3.3 MC	28480	05110-6094	1	
05110-6095	FILTER/DIVIDER ASSY 1 34/3.4 MC	28480	05110-6095	1	
05110-6096	FILTER/DIVIDER ASSY 1 35/3.5 MC	28480	05110-6096	1	
05110-6097	FILTER/DIVIDER ASSY 1 36/3.6 MC	28480	05110-6097	1	

\* See list of abbreviations in Introduction to this section



Table 6-15. Replaceable Parts (Cont'd)

Stock No.	Description #	Mfr.	Mfr. Part No.	T	Q	R	S
05110-6098	FILTER/DIVIDER ASSY: 37/3.7 MC	28480	05110-6098				1
05110-6099	FILTER/DIVIDER ASSY: 38/3.8 MC	28480	05110-6099				1
05110-6100	FILTER/DIVIDER ASSY: 39/3.9 MC	28480	05110-6100				1
05110-6101	FILTER ASSY: 20 #24 MC	28480	05110-6101				1
05110-6102	COMB GENERATOR ASS'Y.	28480	05110-6102				1
05110-6103	BOARD ASSY: 120 MC FILTER	28480	05110-6103				1
05110-6105	BOARD:FILTER	28480	05110-6105				1
05110-6106	ASSY:OVEN, INCL HR1, RT1, Y1	28480	05110-6106				1
05110-6108	TRANSFORMER	28480	05110-6108				1
05110-6109	BOARD ASSY: 1 24 MC FILTER	28480	05110-6109				1
05110-6110	BOARD ASSY: 1 COMB GEN.	28480	05110-6110				1
05110-6112	ASSY:FILTER BOARD 32 & 33 MC	28480	05110-6112				2
05110-6113	ASSY:FILTER BOARD 34 & 35 MC	28480	05110-6113				2
05110-6114	ASSY:FILTER BOARD 36 AND 37 MC	28480	05110-6114				2
05110-6115	ASSY:FILTER BOARD 38 AND 39 MC	28480	05110-6115				2
05102-2008	BLANK BOARD:REGULATOR	28480	05102-2008				1
05102-6036	BOARD:ASSY REGULATOR	28480	05102-6036				1

\* See list of abbreviations in introduction to this section





Table 6-16. Code List of Manufacturers (Cont'd)

Code No	Manufacturer	Address	Code No	Manufacturer	Address	Code No	Manufacturer	Address
94870	Sarkes Tarzian, Inc	Bloomington Ind	91920	Honeywell Inc Micro Switch Division	Freeport, Ill	94075	H-42 Div of Aerocon Corp	Olean N Y
94874	Bunton Molding Company	Boston, N J	91961	Nahco Bros Spring Co	Oakland, Cal	94396	Thordarson-Metomer Inc	Mt Carmel, Ill
94871	A B Boyd Co	San Francisco, Cal	92180	Tru-Connector Corp	Peabody, Mass	94394	Solar Mig Co	Los Angeles, Cal
94874	R M Bracamonte & Co	San Francisco, Cal	93367	Elget Optical Co Inc	Rutherford, N Y		Microswitch Div of Minn-Honeywell	Freeport, Ill
94860	Knitted Kords, Inc	Hampden, Conn	92607	Tensolite Insulated Wire Co, Inc	Tarrytown, N Y	94330	Carlson Screw Co	Chicago, Ill
94811	Seamless Rubber Co	Chicago, Ill	92702	IMC Magnetics Corp	Westbury, L.I., N Y	94341	Microwave Associates Inc	Burlington, Mass
94174	Fahrer Bearing Co	Los Angeles, Calif	92966	Hudson Lamp Co	Kearney, N J	94301	Karel Transformer Co	Oakland, Cal
94197	Clifton Precision Products Co, Inc	Clifton Heights, Pa	93332	Sylvania Electric Prod Inc Semiconductor Div	Woburn, Mass	94500	Krellie, Inc	Orchard Park, N Y
94579	Precision Rubber Products Corp	Dayton, Ohio	93368	Robbins & Myers Inc	Palladas Park, N J	94733	San Fernando Elec Mig Co	San Fernando, Cal
94684	Radio Corp of America Electronic Comp & Devices Division	Harrison, N J	93410	Stemco Controls Div of Essex Wire Corp	Manassas, Ohio	94881	Thomson Ind Inc	Long Island, N Y
94928	Seastrom Mig Co	Glendale, Cal	93632	Waters Mig Co	Culver City, Cal	94884	Industrial Retaining Ring Co	Irvine, N J
97034	Marco Industries	Anaheim, Cal	93929	G V Controls	Livingston, N J	97329	Automatic & Precision Mig	Englewood, N J
97216	Phileo Corporation (Lanadale Division)	Lanadale, Pa	94137	General Cable Corp	Bayonne, N J	97970	Reun Reunier Corp	Yonkers, N Y
97473	Western Fibrous Glass Products Co	San Francisco, Cal	94144	Raytheon Co Comp Div Ind Comp Operations	Quincy, Mass	97982	Lifton System Inc, Adler Westra Common Div	New Rochelle, N Y
97664	Van Waters & Rogers Inc	San Francisco, Cal	94148	Scientific Electronics Products Inc	Lowland, Colo	98141	R Tronics, Inc	Jamaica, N Y
97930	Tower Mig Corp	Providence, R I	94154	Wagner Elect Corp	Newark, N J	98159	Rubber Tech, Inc	Gardena, Cal
98140	Cutter Hammer Inc	Lincoln, Ill	94187	Curtain Wright Corp Electronics Div	East Paterson, N J	98220	Hewlett Packard Co Medical Ele Div	Pasadena, Cal
98220	Gould-National Batteries Inc	Paul, Minn	94222	South Chester Corp	Chester, Pa	98276	Micronix Inc	By Pasadena, Cal
98698	General Mills Inc	Buffalo, N Y	94330	Wire Cloth Products Inc	Belleard, Ill	98291	Sealotron Corp	Mammoth, N Y
99231	Graybar Electric Co	Oakland, Cal	94375	Automatic Metal Products Co	Brooklyn, N Y	98276	Zero Mig Co	Burbank, Cal
99479	G E Distributing Corp	Schenectady, N Y	94482	Worcester Pressed Aluminum Corp	Worcester, Mass	98410	Eic Inc	Cleveland, Ohio
99479	Security Co	Detroit, Mich	94696	Magnecraft Electric Co	Chicago, Ill	98721	General Mills Inc Electronics Div	Minneapolis, Minn
99665	United Transformer Co	Chicago, Ill	95023	George A Philbrick Researches Inc	Boston, Mass	98734	Parco Division of Hewlett Packard Co	Palo Alto, Cal
99030	United Shoe Machinery Corp	Beverly, Mass	95148	Alco Elect Mig Co	Lawrence, Mass	98821	North Hills Electronics Inc	Glen Cove, N Y
99179	U S Rubber Co Consumer Ind & Plastics Prod Div	Passaic, N J	95236	Allies Products Corp	Diana, Fla	98970	International Electronic Research Corp	Burbank, Cal
99365	Belleville Speciality Tool Mig Inc	Belleville, Ill	95238	Continental Connector Corp	Woodside, N Y	99109	Columbia Technical Corp	New York, N Y
99763	United Carr Fastener Corp	Chicago, Ill	95265	Federal Mig Co Inc	Long Island, N Y	99313	Varian Associates	Palo Alto, Cal
99970	Hearing Engineering Co	San Francisco, Cal	95275	National Coil Co	Sheridan, Wyo	99378	Atlee Corp	Winchester, Mass
91146	ITT Cannon Elect Inc	Salem Div Salem, Mass	95348	Vetramon Inc	Bridgeport, Conn	99515	Marshall Ind Capacitor Div	Monrovia, Cal
91260	Cannon Spring Mig Co	San Francisco, Cal	95354	Methods Mig Co	Rolling Meadows, Ill	99707	Control Switch Division Controls Co of America	El Segundo, Cal
91345	Miller Dial & Nameplate Co	El Monte, Cal	95366	Arnold Engineering Co	Mazungu, Ill	99800	Delevan Electronics Corp	East Aurora, N Y
91419	Radio Materials Co	Chicago, Ill	95712	Dage Electric Co Inc	Franklin, Ind	99848	Wilco Corporation	Indianapolis, Ind
91504	Augal Inc	Chillicothe, Miss	95984	Simon Mig Co	Wayne, Ill	99928	Branson Corp	Whippany, N J
91837	Dale Electronics Inc	Chillicothe, Miss	95987	Wickens Co	Chicago, Ill	99934	Hembrandt Inc	Boston, Mass
91862	Elo Corp	Whites (Grove), Pa	96067	Microwave Assoc West Inc	Shonvale, Cal	99943	Hoffman Electronics Corp Semiconductor Division	El Monte, Cal
91873	Epiphone Inc	New York, N Y				99957	Technology Instrument Corp of California	Newbury Park, Cal
91737	Gramer Mig Co Inc	Wakelield, Mass						
91827	K F Development Co	Redwood City, Cal						
91886	Malen Mig Inc	Chicago, Ill						

The following RP Vendors have no number assigned in the latest supplement to the Federal Supply Code or Manufacturers Handbook

0000F	Malco Tool and Die	Los Angeles, Calif	000 S	Hewlett Packard Co	Colorado Springs, Colo	000JQ	Contron	Oakland, Cal
0000Z	Willow Leather Products Corp	Newark, N J	000MM	Rubber Eng & Development	Hayward, Cal	000W	California Eastern Lab	Burlington, Cal
000AB	ETA	England	000NN	A "N" D Mig Co	San Jose, Cal	000Y	S K Smith Co	Los Angeles, Cal
000BH	Precision Instrument Comp Co	Van Nuys, Cal						

00015-48  
Revised May, 1970

From Handbook Supplement  
H4-1 Dated January 1970

**BACK DATING  
MANUAL  
CHANGES**

## SECTION VII MANUAL CHANGES AND OPTIONS

### 7-1. INTRODUCTION.

7-2. This section outlines the changes made to standard 5110B instruments for driving more than one HP Frequency Synthesizer. BNC connectors and output load resistors are installed in Filter Modules A5 through A15 for driving two (Option 02), three (Option 03), or four (Option 04) Frequency Synthesizers. Any unused outputs should be terminated in 50 ohms (HP 10510A 50-ohm BNC load available) to maintain specified spurious performance. Twenty two (22) loads are required for each set of outputs not used. For example, if the 5110B has Option 04 installed and only two Frequency Synthesizers are being driven, 44 outputs should be terminated. The diagrams in Figures 7-1 through 7-6 and parts lists in Tables 7-1 through 7-6 outline the changes required for Options 02 through 04.

### 7-3. MANUAL CHANGES.

7-4. CURRENT INSTRUMENTS. This manual applies directly to Model 5110B Synthesizer Drivers with serial prefix 1048A. Refer to Paragraph 1-7 for serial numbering system.

7-5. NEWER INSTRUMENTS. As changes are made in the Model 5110B, newer instruments may have serial number prefixes not listed in this manual. The manuals for these instruments will be supplied with an additional "Manual Changes" sheet containing the required information. Contact your nearest Hewlett-Packard Sales and Service Office for information if this sheet is missing.

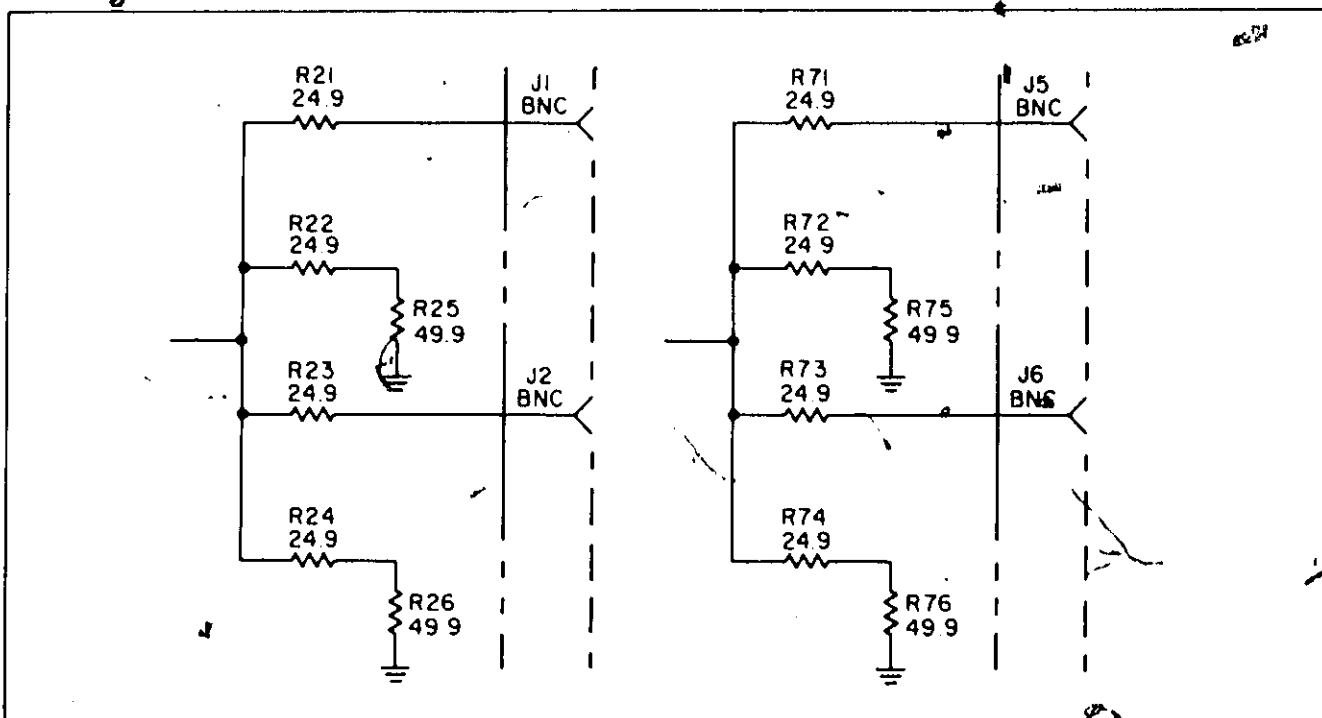


Figure 7-1. Option 02, A5-A14 Circuits

Table 7-1. A5-A14 Parts added for Option 02

A1R23	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R24	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R25	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A1R26	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A2R73	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R74	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R75	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A2R76	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
J2	1250-0118	Connector: BNC
J6	1250-0118	Connector: BNC

7-6. OLDER INSTRUMENTS. This manual with changes listed below also applies to Model 5110B Synthesizer Drivers having serial prefix numbers 976 and below.

Serial Prefix	Make Manual Changes
976	1
830	1, 2
708	1, 2, 3

#### CHANGE 1: (976)

- Page 5-6, Table 5-3:  
Change A3, Crystal Filter to 05170-6104
- Page 6-2, Table 6-1:  
Change A3 to 05110-6104.
- Page 6-11, Table 6-4:  
Replace with Table 7-7.
- Page 6-53, Table 6-15:  
Delete 05110-6081, Crystal Filter
- Page 6-54, Table 6-15:  
Add 05110-6104, Crystal Filter
- Page 9-5, Figure 9-3:  
Replace Component Locators with Figure 7-7  
Replace A3 Schematic with Figure 7-8

#### CHANGE 2: (820)

- Page 1-0, Power Cord Photo:  
Replace with Figure 7-9.
- Page 1-1, Table 1-1:  
Change AC Power Cord part number to 8120-0070
- Page 3-3/3-4, Figure 3-2:  
Replace with Figure 7-10.
- Page 6-2, Table 6-1:  
Change: DS2 to 1450-0093, Light Indicator Red  
FL1 to 9110-0086  
S1 to 3101-0033  
W1 to 8120-1348
- Delete 05110-0082, Bracket: Power Supply

#### CHANGE 2 (Cont'd):

- Page 6-50, Table 6-15:  
Change 1450-0701 to 1450-0093, Light Indicator Red
- Page 6-51, Table 6-15:  
Change 3101-1234 to 3101-0033.  
Change 8120-1340 to 8120-0070  
Change 9110-3112 to 9110-0086
- Page 6-52, Table 6-15:  
Delete 05110-0082, Bracket: Power Supply

#### CHANGE 3: (708)

- Page 6-44, Table 6-13:  
Change A1 to 05102-6030, Board Assy: Regulator.  
Delete 05110-2023
- Change A1CR1, CR2 to 1902-0506, Diode: Break-down, 4.7V.
- Change A1R11 to 0098-3443, R:Fxd Met Flm 287 ohm, 1/4, 1/8W.
- Change A1R18 to 0098-3150, R:Fxd Met Flm 2370 ohm, 1/4, 1/8W.
- Change A1R19 to 0757-0317, R:Fxd Met Flm 1330 ohm, 1/4, 1/8W.
- Add A2R21, 0757-0401, R:Fxd Met Flm, 100 ohm, 1/4, 1/8W.

Make appropriate changes to Table 6-15

Page 9-23, A17A1 Power Supply Regulator Board is changed as follows:

- A1R11 to 287 ohms
- A1R18 to 2370 ohms
- A1R19 to 1330 ohms
- A1CR1 to 4.7V
- A1CR2 to 4.7V

Add A1R21, 100 ohm between R8 and ground lead.  
Change A17A1 HP Part No. to 05102-6036

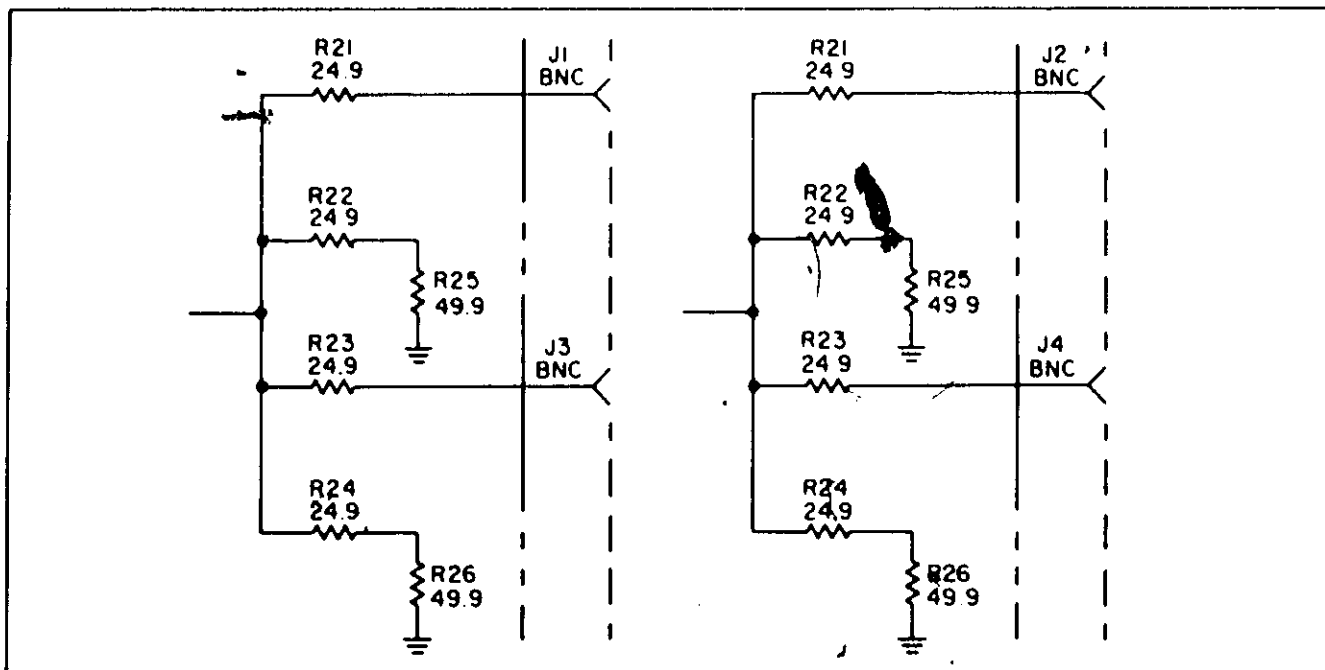


Figure 7-2. Option 02, A15 Circuits

Table 7-2. A15 Parts Added for Option 02

A1R23	0757-0201	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R24	0757-0201	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R25	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A1R26	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A2R24	0757-0201	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R24	0757-0201	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R25	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A2R26	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
J3	1250-0118	Connector: BNC
J4	1250-0118	Connector: BNC

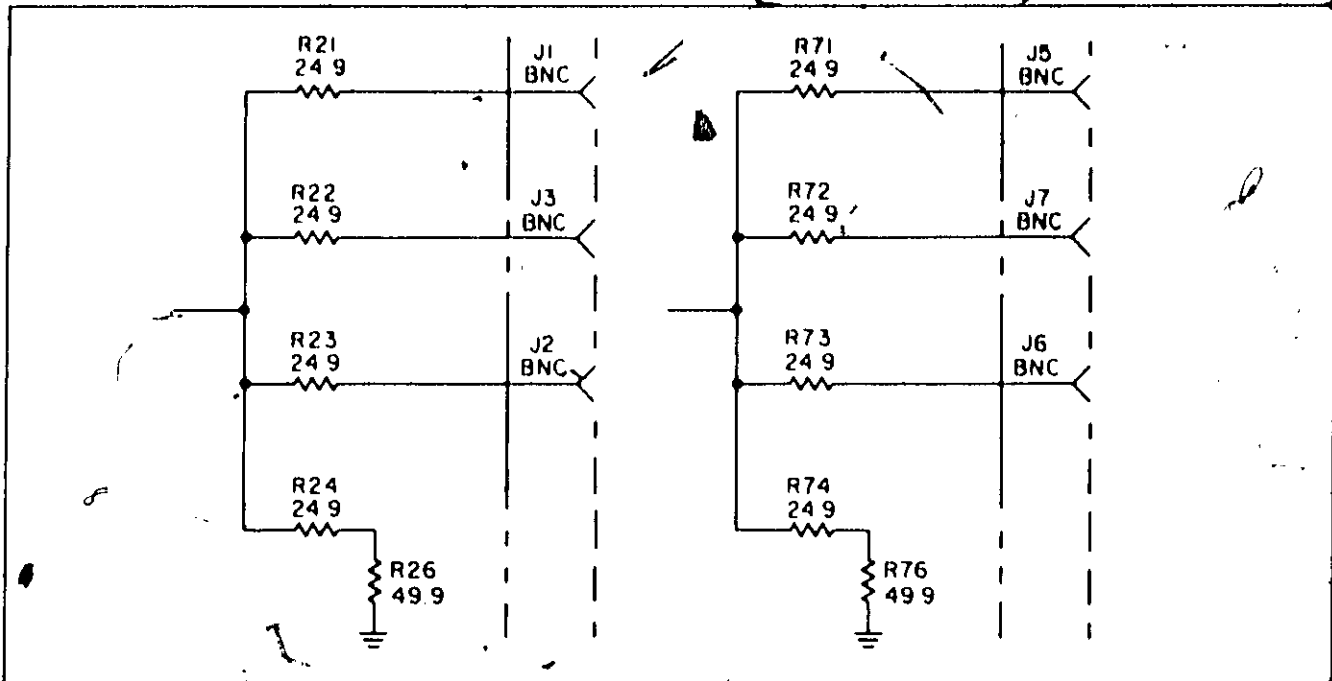


Figure 7-3. Option 03, A5-A14 Circuits

Table 7-3. A5-A14 Parts added for Option 03

A1R23	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R24	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R25	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A1R26	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A2R73	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R74	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R75	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A2R76	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
J2	1250-0118	Connector: BNC
J3	1250-0118	Connector: BNC
J6	1250-0118	Connector: BNC
J7	1250-0118	Connector: BNC



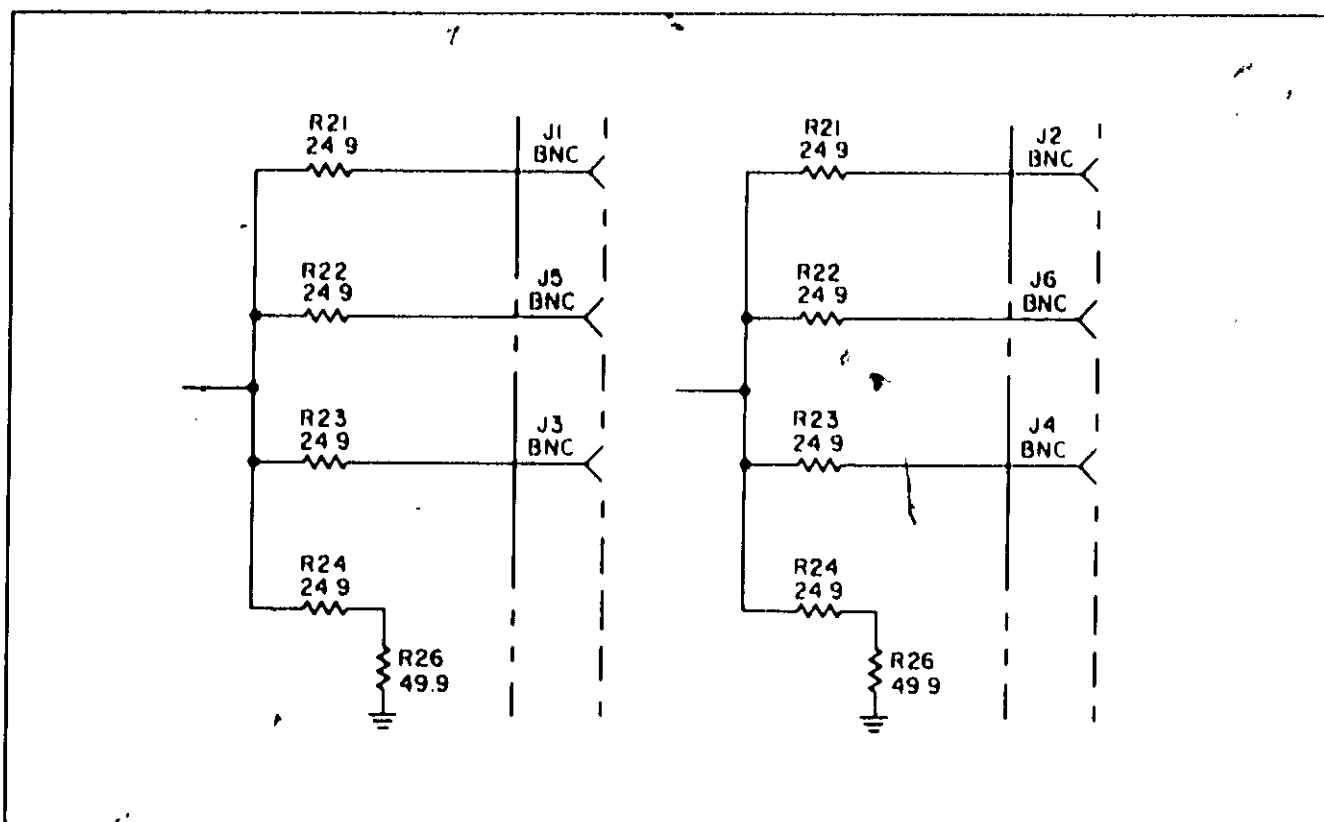


Figure 7-4. Option 03, A15 Circuits

Table 7-4. A15 Parts added for Option 03

A1R23	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R24	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R26	0757-0277	R: fxd met flm 49.9 ohm, 1%, 1/8W
A2R23	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R24	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R26	0757-0277	R: fxd met flm 24.9 ohm, 1%, 1/8W
J3	1250-0118	Connector: BNC
J4	1250-0118	Connector: BNC
J5	1250-0118	Connector: BNC
J6	1250-0118	Connector: BNC

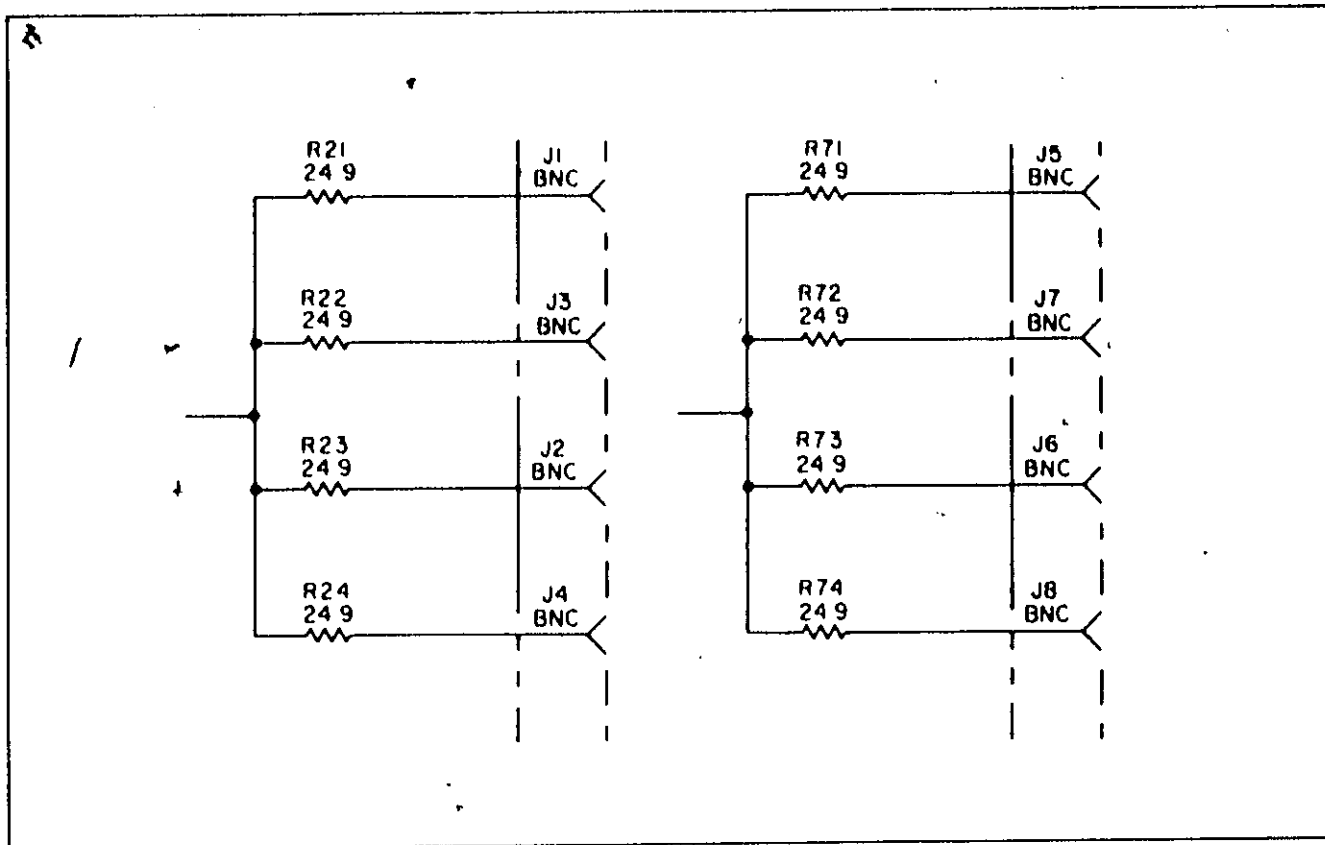


Figure 7-5. Option 04, A5-A14 Circuits

Table 7-5. A5-A14 Parts added for Option 04

A1R23	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R24	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R73	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R74	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
J2	1250-0118	Connector: BNC
J3	1250-0118	Connector: BNC
J4	1250-0118	Connector: BNC
J6	1250-0118	Connector: BNC
J7	1250-0118	Connector: BNC
J8	1250-0118	Connector: BNC

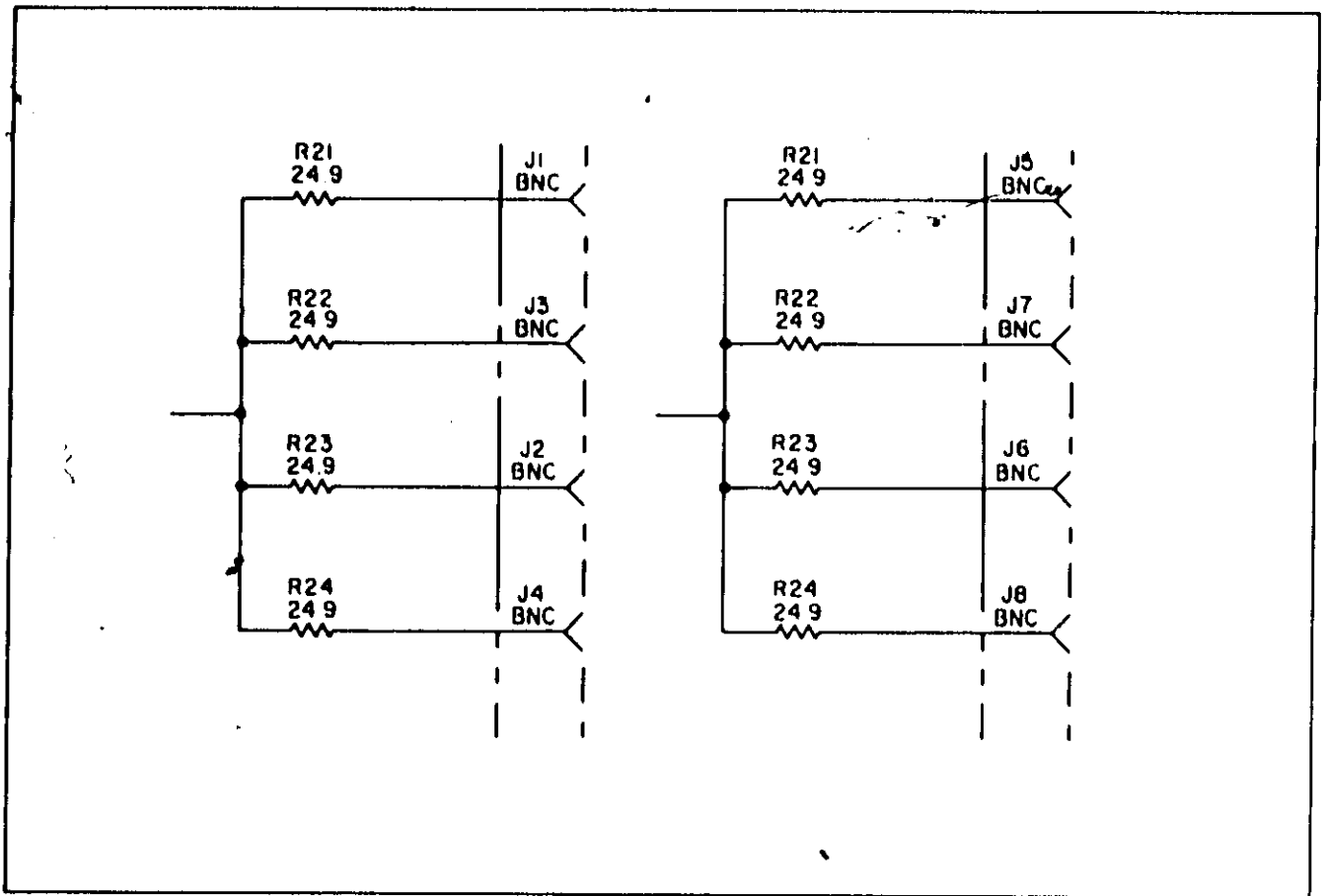


Figure 7-6. Option 04, A15 Circuits

Table 7-6. A15 Parts added for Option 04

A1R23	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A1R24	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R23	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
A2R24	0757-0291	R: fxd met flm 24.9 ohm, 1%, 1/8W
J3	1250-0118	Connector: BNC
J4	1250-0118	Connector: BNC
J5	1250-0118	Connector: BNC
J6	1250-0118	Connector: BNC
J7	1250-0118	Connector: BNC
J8	1250-0118	Connector: BNC

Table 7-7. Crystal Filter Assembly (05110-6104)  
(prefix all parts A3)

Reference Designation	* Stock No.	Description #	Note
	05110-6104	CRYSTAL FILTER ASSY	
A1	05110-6105 05110-2042 05110-6106	BOARDIFILTER BOARDIBLANK PC ASSYIOVEN-INCL HR1,RT1,Y1 NOT RECOMMENDED FOR FIELD REPLACEMENT	
A1C1	0160-0174	CIFXD MICA 33 PF 5W 300VDCW	
A1C2	0160-2599	CIFXD CER 66 PF 2W 600VDCW	
A1C3	0160-0336	CIFXD MICA 267 PF 1W 300VDCW	
A1C4	0130-0017	CIVAR CER 8-50 PF	
A1HR1		NOT RECOMMENDED FOR FIELD REPLACEMENT	
A1L1	9140-0238	COILIFXD RF 82UH 5W	
A1Q1	1854-0003	TRANSISTOR NPN SILICON	
A1Q2	1854-0003	TRANSISTOR NPN SILICON	
A1R1	0757-0934	RIFXD MET FLM 2700 OHM 2W 1/8W	
A1R2	0683-1025	RIFXD COMP 1000 OHM 5W 1/4W	
A1RT1		NOT RECOMMENDED FOR FIELD REPLACEMENT	
A1T1	05110-6108	TRANSFORMER	
A1Y1		NOT RECOMMENDED FOR FIELD REPLACEMENT	
J1	1250-0149	CONNECTORIRF COAXIAL BNC RT-ANGLE RECEPT	
J2	1250-0083	CONNECTORIBNC	

\* See list of abbreviations in introduction to this section

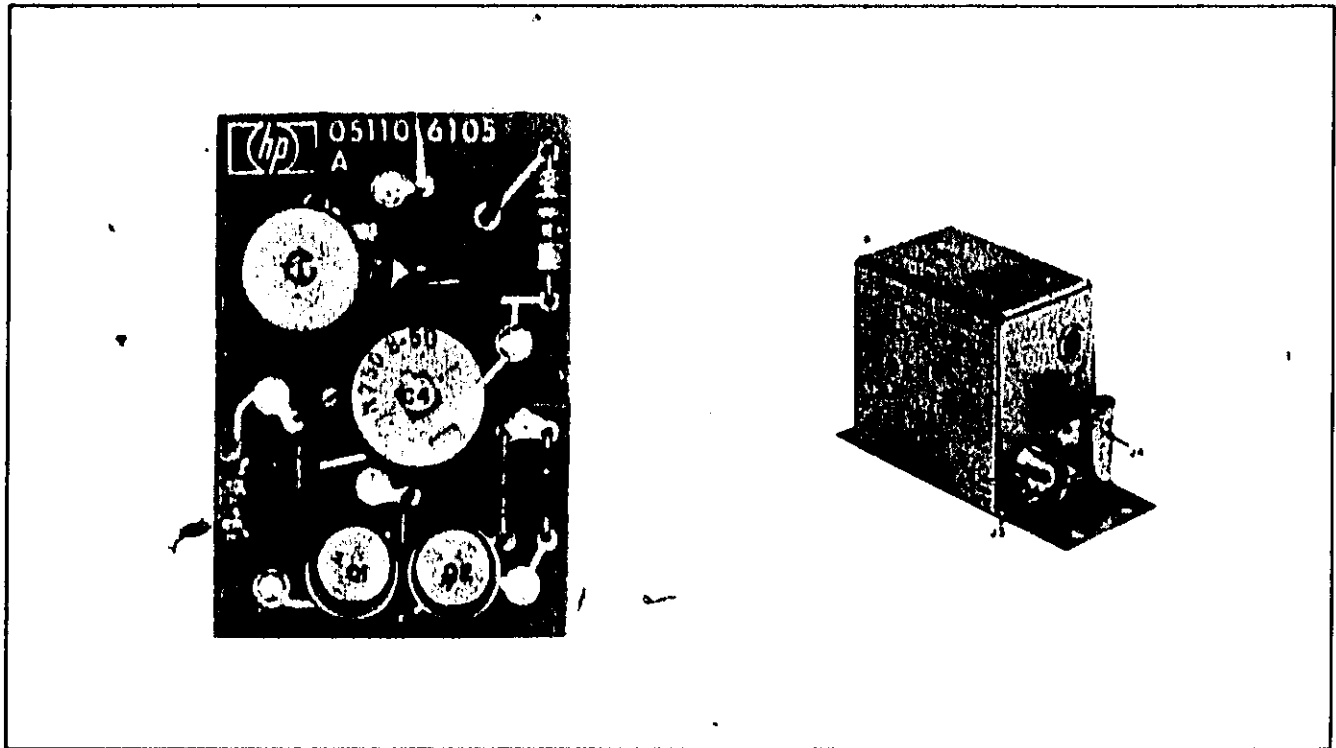


Figure 7-7. A3A1 Component Locator

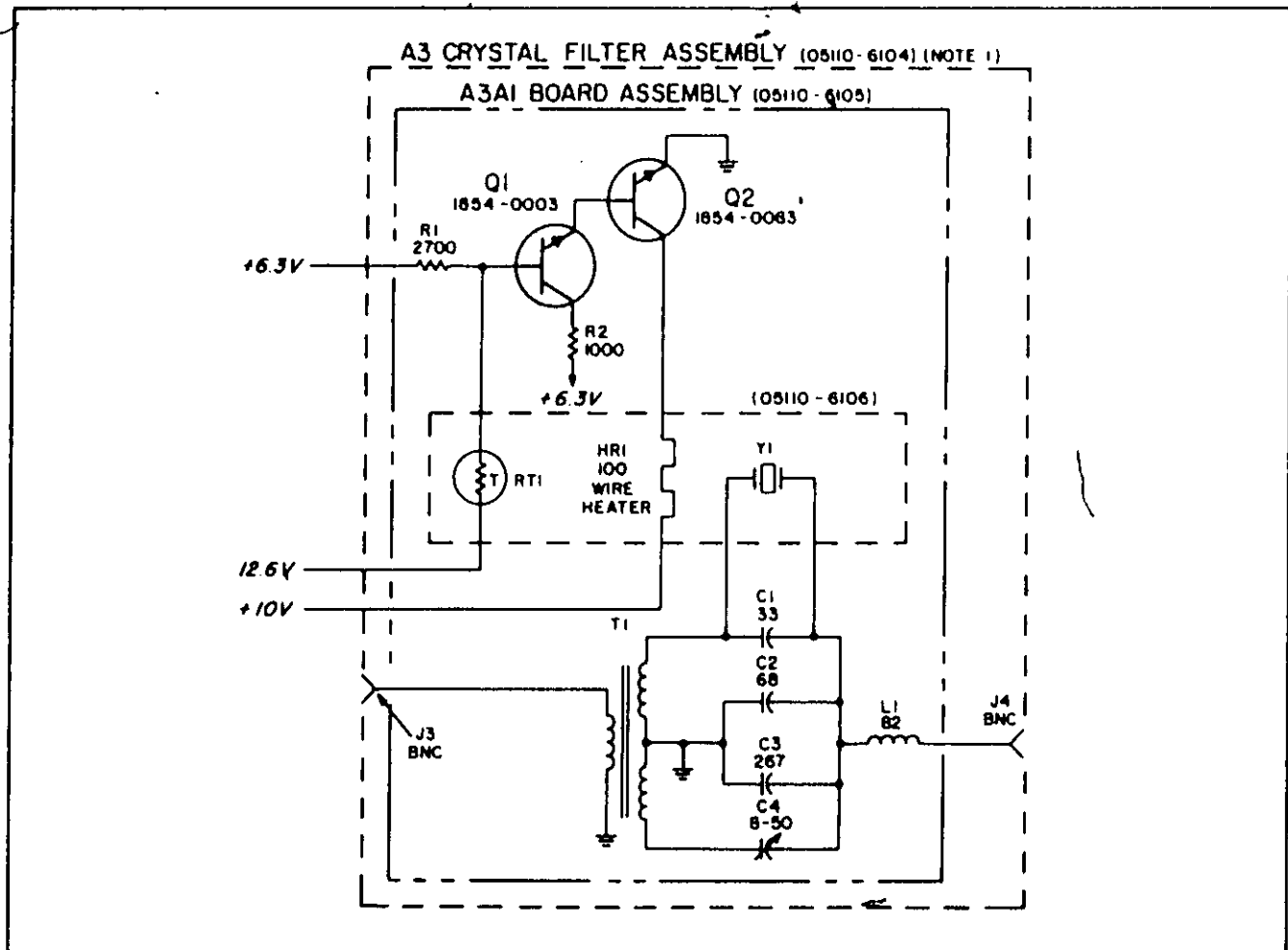


Figure 7-8. A3A1 Crystal Filter Schematic

**MANUAL  
CHANGES  
5110 A**

## SECTION VIII MANUAL CHANGES FOR 5110A

### 8-1. INTRODUCTION.

8-2. The Model 5110A is similar to the Model 5110B Synthesizer Driver. Both units supply 22 fixed output frequencies to drive HP Frequency Synthesizers, but the 5110A supplies a 3 MHz signal in place of the 20 MHz signal from the 5110B. The standard 5110A drives only the Model 5100A Frequency Synthesizer. The 5110A is the same size and has the same number of modules as the 5110B. Manual changes required to make this manual apply to 5110A instruments with serial prefix number 624- are listed below. For older 5110A instruments, see Paragraph 8-3.

1. Crystal Filter Assembly A3 (HP Part No. 05110-6081) was installed. See schematic diagram, Figure 8-1 and parts list, Table 8-1.

2. Coil A1L5 in Comb Generator Module A4 was 22 microhenries (HP Part No. 9140-0179). Comb Generator Module was HP Part No. 05110-6012.

3. Different Filter/Divider Modules A5 through A14 were installed. These modules performed the same electrical function. See schematic diagrams, Figures 8-5 through 8-10 and parts lists, Tables 8-3 through 8-8.

4. In Filter Module A15 (HP Part No. 05110-6001), 20 MHz Filter Board Assembly is replaced by 3 MHz Filter Board Assembly with HP Part No. 05110-6021. This provided the 3 MHz output at the rear panel. See schematic diagram, Figure 8-10 and parts list, Table 8-8.

### 8-3. OLDER 5110A INSTRUMENTS

8-4. With the changes listed in Table 8-8, this manual will apply to older 5110A Synthesizer Drivers with serial number prefix 552, 524, 442, 433, 427, 420, 408, 406, or 351. To use this manual with these older instruments, make changes as listed in Table 8-2 for your instrument's serial number prefix.

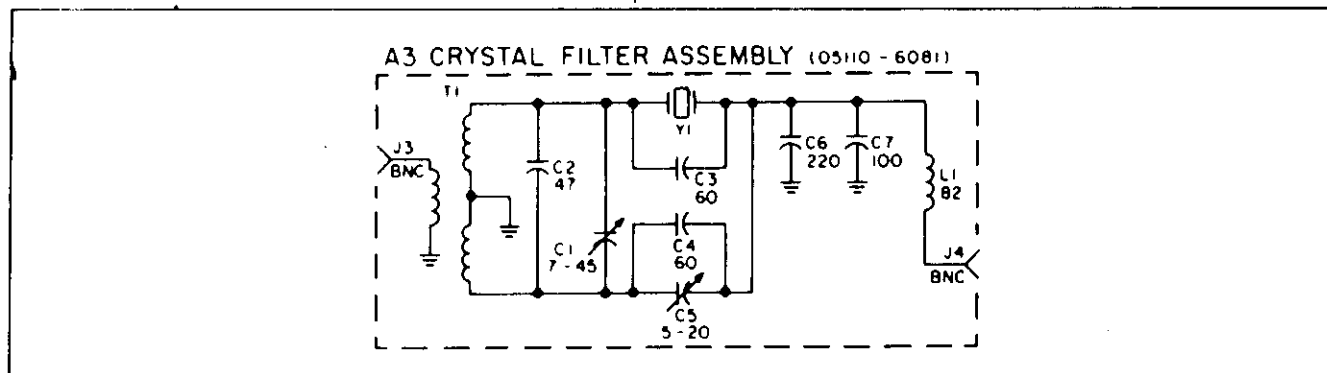


Figure 8-1. Crystal Filter A3

Table 8-1. Crystal Filter Assembly A3 (05110-6081) (Prefix all parts in this table A3)

Reference Designation	HP Stock No.	Description
C1	0130-0001	C: VAR CER 7-45 PF 500 VDCW
C2	0150-0116	C: FXD CER 47 PF 10% 500 VDCW
C3	0160-0950	C: FXD MICA 60 PF 5%
C4	0160-0950	C: FXD MICA 60 PF 5%
C5	0130-0006	C: VAR CER 5-20 PF 500 VDCW
C6	0160-0952	C: FXD MICA 220 PF 1%
C7	0150-0117	C: FXD CER 100 PF 10% 500 VDCW
J3	1250-0149	CONNECTOR: RF COAX BNC RT-ANGLE RECEPT
J4	1250-0083	CONNECTOR: BNC
L1	9140-0238	COIL: FXD RF 82 $\mu$ H 5%
T1	05110-6082	TRANSFORMER ASSEMBLY
Y1	05110-6074 05110-0061 0340-0110	CRYSTAL ASSEMBLY HOUSING: CRYSTAL FILTER INSULATOR: STANDOFF MELAMINE 2-56 0.4 INCH

Table 8-2. Manual Changes

Serial Prefix	Make Change:
552-	1
524-	1, 2
442-	1, 2, 3
433-	1 thru 4
427- and 420-	1 thru 5
408	1 thru 6
406-	1 thru 7
351-	1 thru 8

**CHANGE 1:** Fuses A16A1F1, F2 on Rectifier Board Assembly A16A1 were 0.75 ampere, (552-)

but 1.0 ampere is the preferred value.  
The trigger circuit at the oscillator output on Frequency Standard Module A2 was as shown in Figure 8-2.

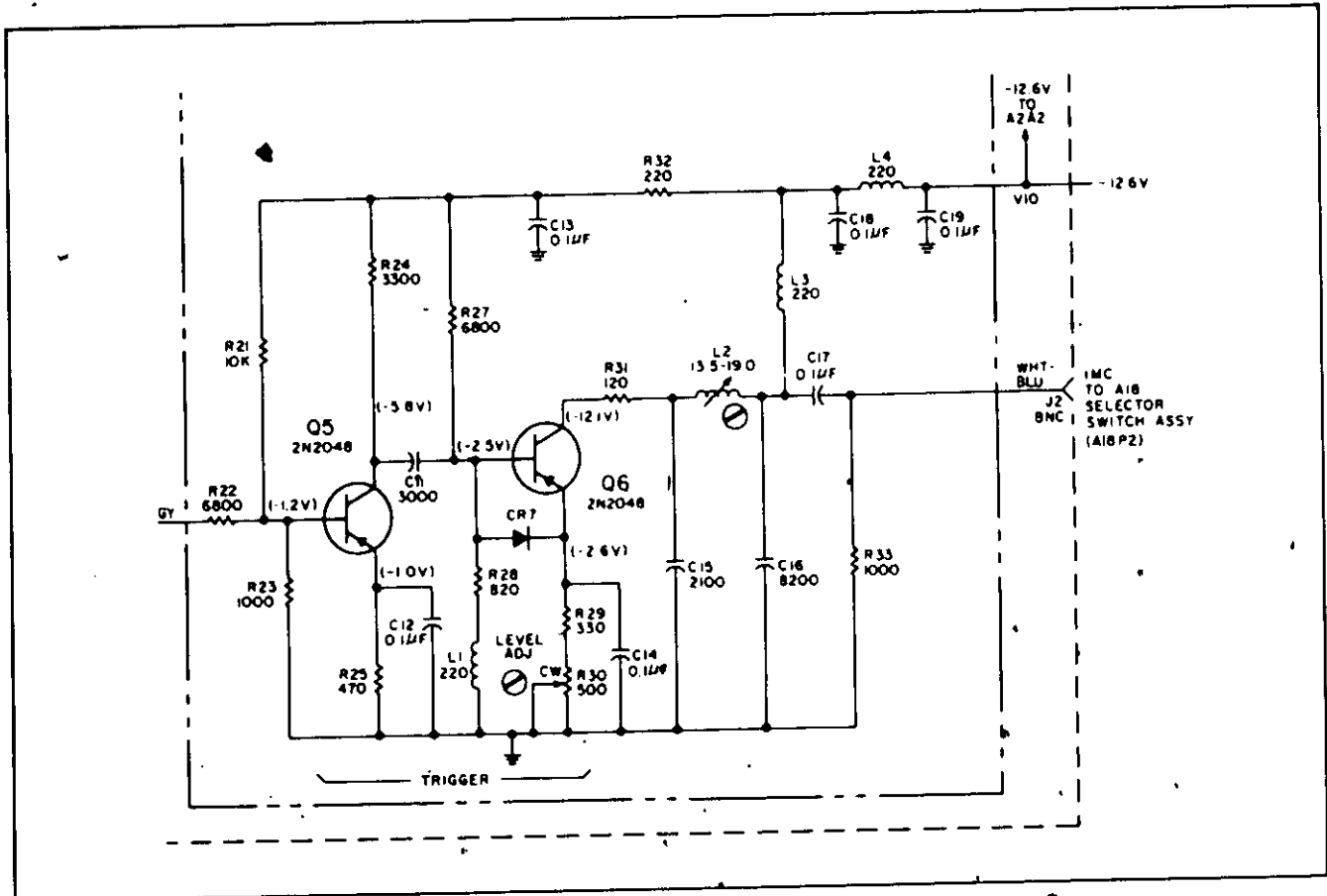


Figure 8-2. Trigger Circuit Changes

**CHANGE 2:** Filter/Divider Modules A5 through A14 and Filter Module A15 were as shown (524-) in Figures 8-3 through 8-8. Note that terminating resistors were installed at the outputs for driving more than one Synthesizer and only BNC jacks needed to be added and connected to obtain multiple output signals.

Capacitor A17C5 on Power Supply Regulator Module A17 was not in these older instruments, but should be installed for optimum operation.

Transistors A1A1Q1 through Q4 and A1A2Q1, Q2 were HP Part No. 1853-0008, but 1853-0009 is the preferred part.



- CHANGE 3:** (442-) Diodes CR54, CR55, and CR56 in Divider Boards A5A through A14A2 were not in these older instruments, but should be installed for optimum operation.
- Resistor R12 on Oven Control Board A2A3 in Frequency Standard Module A2 was 214K ohms, but 200K ohms is the preferred value.
- Resistor A1A1R9 in Input Amplifier Module A1 was 51.1 ohms, but 42.2 ohms is the preferred value.
- Transistor A2Q53 in Filter/Divider Modules A5 through A14 was HP Part No. 1850-0118 (2N2360), but 1850-0138 is the preferred part.
- CHANGE 4:** (433-) Resistors A17A1R7, R11 on Power Supply Regulator Module A17 were 499 ohms, but 412 ohms is the preferred value.
- Breakdown diodes A17A1CR1, CR2 were 6.2 vdc, but 5.5 vdc is the preferred value.
- Resistor A2A2R33 in Frequency Standard Module A2 was 68 ohms, but 120 ohms is the preferred value.
- Resistor A2A2R26 in Frequency Standard Module A2 was 13 ohms, but 120 ohms is the preferred value.
- Input Amplifier/Buffer Amplifier Module A1 was as shown in Figure 8-4.
- CHANGE 6:** (427- & 420-) In 20 MHz Filter Board A15A1 of 3/24 MHz Filter Module A15, parts were as follows: C
- C12, C14, C16, C18, C20, C22, C24 were 85 pf, but 120 pf is the preferred value.
- C31 and C32 were 2.0 pf, but 3.3 pf is the preferred value.
- C33 through C36 were 2.0 pf, but 2.7 pf is the preferred value.
- L5 through L11 were .40-.50  $\mu$ h, but .34-.47 is the preferred value.
- L12 was 1.8-3.5  $\mu$ h, but 3.6-5.8 is the preferred value.
- CHANGE 6:** (408-) On Divider Boards A13A2 and A14A2 in Filter/Divider Modules A13 and A14, parts were as follows:
- C74 was 27 pf, and C78 was 18 pf, but values shown are preferred.
- CHANGE 7:** (406-) Crystal Filter Assembly A3 was as shown in Figure 8-3.

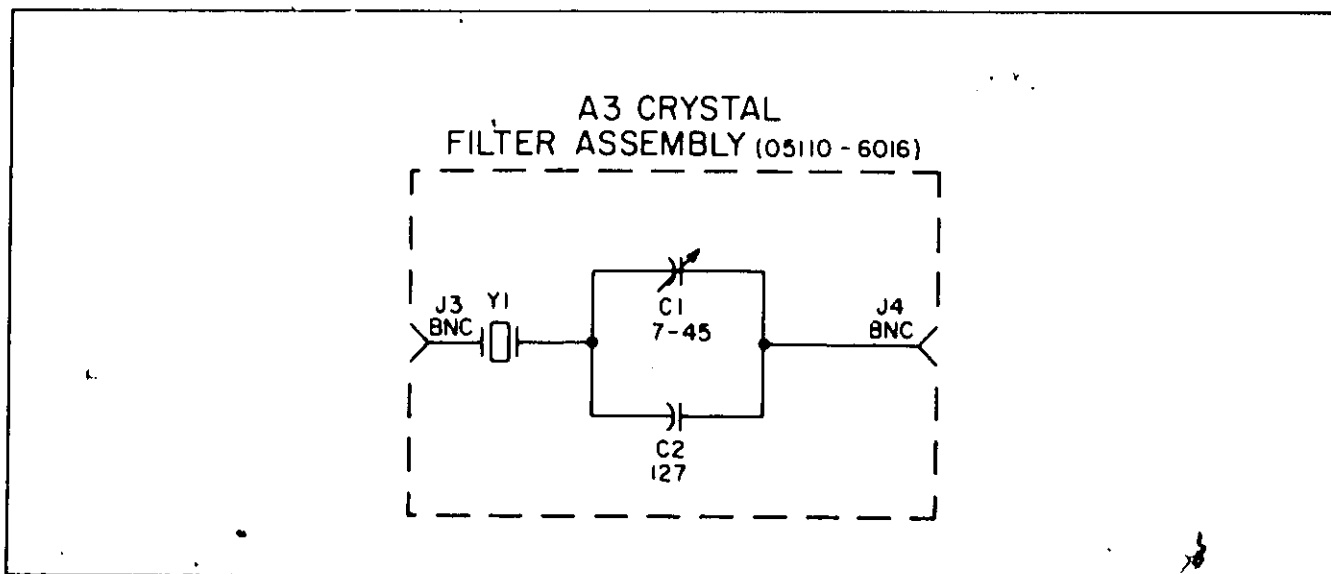


Figure 8-3. Crystal Filter A3 Changes

**CHANGE 8:** On Regulator Board Assembly A17A1 in Power Supply Regulator Module A17, CR2 was HP Part No. 1902-0033, but 1902-0081 is the preferred part.

On Comb Generator Board Assembly A4A1, parts were:

C42 was 6.8 pf (5.6 pf preferred).

C37 through C41 were not installed.

CR8 through CR12 were installed in place of C37 through C41.

On Comb Generator Board Assembly A4A2, parts were:

C31 and C32 were 5.6 pf (6.8 pf preferred).

C34 through C39 were not installed.

CR1 through CR6 were installed in place of C34 through C39.

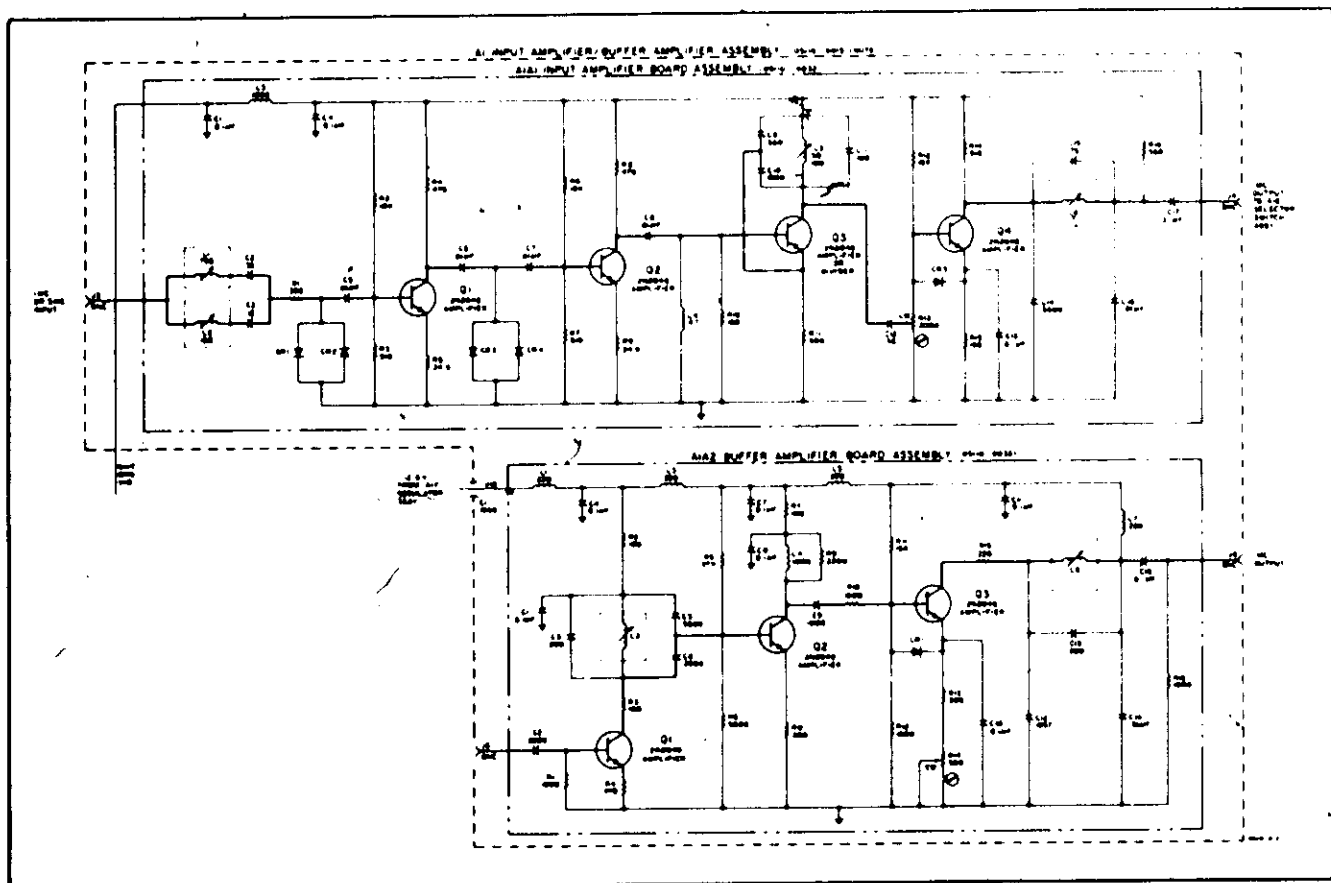


Figure 8-4. Input Amplifier A1 Changes

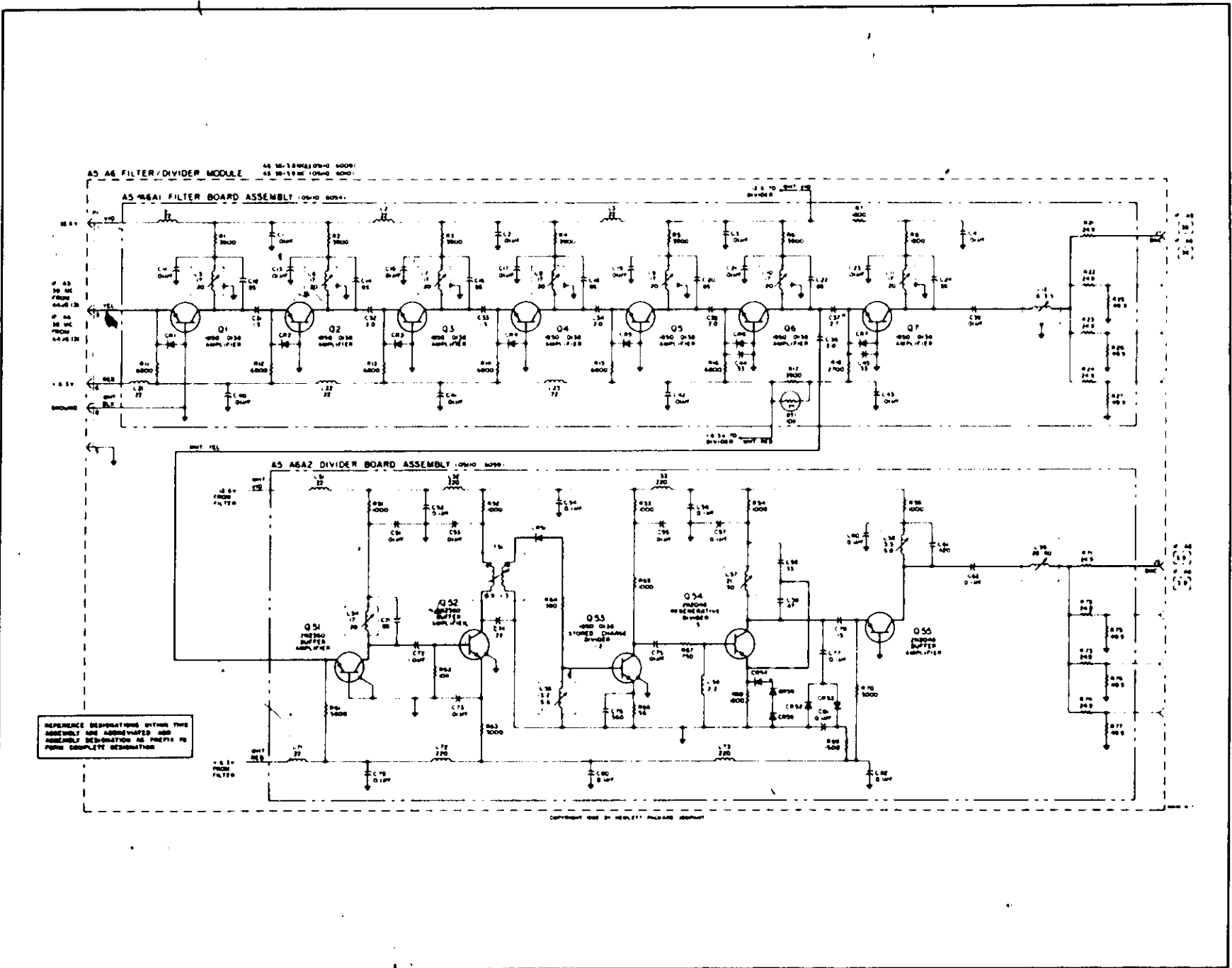


Figure 8-5. AS-A6 Filter/Dividers

Table 8-3. FILTER/DIVIDER MODULE A5 (05110-6010)  
 FILTER/DIVIDER MODULE A6 (05110-6009)  
 (Prefix all parts in this table A5 or A6)

Reference Designation	Stock No.	Description	Note
A1	05110-6054 05110-2014	BOARD ASSY. FILTER BLANK BOARD FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C12	0160-0357	CIFXD CER DISK 85PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C14	0160-0357	CIFXD CER DISK 85PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C16	0160-0357	CIFXD CER DISK 85PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C18	0160-0357	CIFXD CER DISK 85PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C20	0160-0357	CIFXD CER DISK 85PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C22	0160-0357	CIFXD CER DISK 85PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C24	0160-0357	CIFXD CER DISK 85PF 5%	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0011	CIFXD TI 1.5PF 20% 500VDCW	
A1C32	0150-0031	CIFXD TI 2PF 5% 500VDCW	
A1C33	0150-0011	CIFXD TI 1.5PF 20% 500VDCW	
A1C34	0150-0031	CIFXD TI 2PF 5% 500VDCW	
A1C35	0150-0031	CIFXD TI 2PF 5% 500VDCW	
A1C36	0150-0031	CIFXD TI 2PF 5% 500VDCW	
A1C37	0150-0041	CIFXD TI 2.7PF 5% 500VDCW FACTORY SELECTED COMP TYPICAL VALUE GIVEN	
A1C38		NOT ASSIGNED	
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A1CR1	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR2	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR3	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR4	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR5	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR6	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR7	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

Table 8-3. FILTER/DIVIDER MODULE A5 (05110-6010) cont'd  
 FILTER/DIVIDER MODULE A6 (05110-6009) cont'd  
 (Prefix all parts in this table A5 or A6)

Reference Designation	Stock No.	Description	Note
A1L4		NOT ASSIGNED	
A1L5	05100-6186 9170-0105	COIL: 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L6	05100-6186 9170-0105	COIL: 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L7	05100-6186 9170-0105	COIL: 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L8	05100-6186 9170-0105	COIL: 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L9	05100-6186	COIL: 0.17-0.20UH	
A1L10	9170-0105 05100-6186	CORE: ADJUSTABLE TUNING COIL: 0.17-0.20UH	
A1L11	9170-0105 05100-6186	CORE: ADJUSTABLE TUNING COIL: 0.17-0.20UH	
A1L12	05110-6047 9170-0106	COIL: VARIABLE 1.8-3.5UH CORE: ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q2	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q3	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q4	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q5	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q6	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q7	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10		NOT ASSIGNED	
A1R11	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R12	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R13	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R14	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R15	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R16	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R17	0758-0045	RIFXD MET FLM 3900 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R21		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	

Table 8-3. FILTER/DIVIDER MODULE A5 (05110-6010) cont'd  
 FILTER/DIVIDER MODULE A6 (05110-6009) cont'd  
 (Prefix all parts in this table A5 or A6)

Reference Designation	Stock No.	Description	Note
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R23	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R24	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R25	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R26	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R27	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R71	0839-0026	THERMISTOR: 10K OHM 10% 25C	
A2	05110-6059 05110-2018	BOARD ASSY.: DIVIDER BLANK BOARD: DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0160-0179	CIFXD MICA 33PF 5% 300VDCW	
A2C59	0160-0182	CIFXD MICA 47PF 5% 300VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0140-0230	CIFXD MICA 420PF 1% 300VDCW	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63	THRU	NOT ASSIGNED	
A2C70			
A2C71	0160-0357	CIFXD CER DISK 85PF 5%	
A2C72	0150-0029	CIFXD T1 1PF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0140-0145	CIFXD MICA 22 PF 5% 500 VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A2CR54	1901-0040	DIODE: SILICON 30 MA AT IV 30 PIV	
A2CR55	1901-0040	DIODE: SILICON 30 MA AT IV 30 PIV	
A2CR56	1901-0040	DIODE: SILICON 30 MA AT IV 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL: FXD RF 220 UH	
A2L53	9140-0129	COIL: FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL: VARIABLE CORE: ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL: VARIABLE 3.2-5.6UH CORE: ADJUSTABLE TUNING POWDERED IRON	

Table 8-3. FILTER/DIVIDER MODULE A5 (05110-6010) cont'd  
 FILTER/DIVIDER MODULE A6 (05110-6009) cont'd  
 (Prefix all parts in this table A5 or A6)

Reference Designation	Stock No.	Description	Note
A2L56	9140-0077	COIL: FXD RF 2.2UH	
A2L57	05110-6023 9170-0106	COIL: VARIABLE 21-34UH CORE: ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6061 9170-0106	COIL: VARIABLE 3.5-6.0UH CORE: ADJUSTABLE TUNING POWDERED IRON	
A2L59	05110-6024 9170-0106	COIL: VARIABLE 28-45UH CORE: ADJUSTABLE TUNING POWDERED IRON	
A2L60	THRU	NOT ASSIGNED	
A2L70			
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L72	9140-0129	COIL: FXD RF 220 UH	
A2L73	9140-0129	COIL: FXD RF 220 UH	
A2Q51	1850-0116	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTOR: SPL 2N2360 PNP GERMANIUM MDT	
A2Q54	1850-0091	TRANSISTOR: GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR: GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56	THRU	NOT ASSIGNED	
A2R60			
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0758-0035	RIFXD MET FLM 3000 OHM 5% 1/4W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R73	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R74	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R75	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R76	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R77	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER: I	
J1	THRU	CONNECTOR: BMC	
J2			
J4		NOT ASSIGNED	
J5	1250-0118	CONNECTOR: BMC	
MP1	05110-0005	FILTER HOUSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET: DIVIDER	
MP4	05110-2002	CAP: FRONT	
MP5	05110-2035	CAP: REAR	
P1	1251-0216 0340-0039 0510-0207 05110-2001 0340-0038	CONNECTOR: MALE 9-CONTACT TYPE D INSULATOR: BUSHING NUT: CAPTIVE 4-40 X 3/16 SST SPACER: FILTER TERMINAL: STUD	

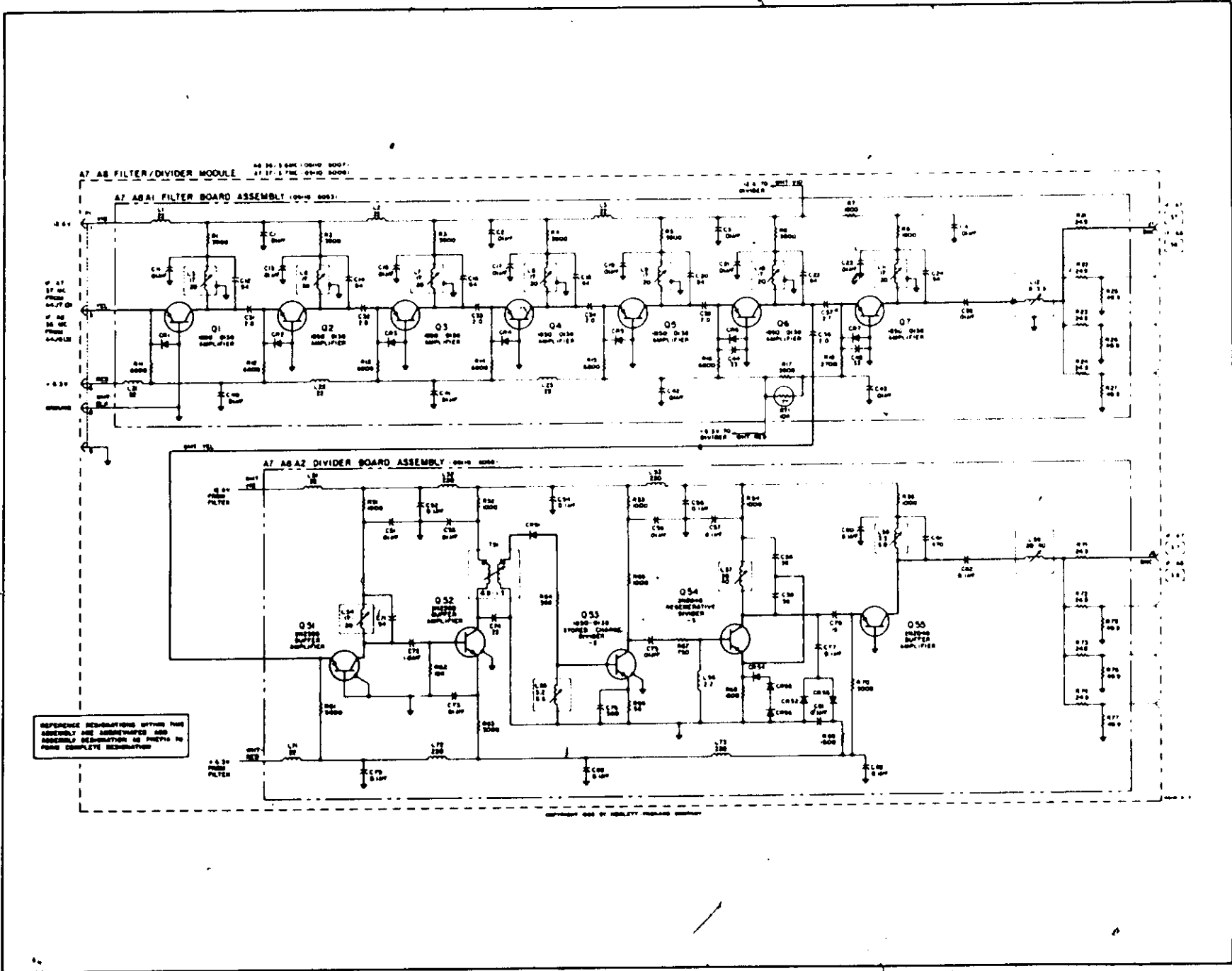


Figure 8-6. A7-A8 Filter/Dividers

Table 8-4. FILTER/DIVIDER MODULE A7 (05110-8008)  
 FILTER/DIVIDER MODULE A8 (05110-8007)  
 (Prefix all parts in this table A7 or A8)

Reference Designation	Stock No.	Description	Note
A1	05110-6053 05110-2014	BOARD ASSY. 1 FILTER BLANK BOARD FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C12	0160-0358	CIFXD CER DISK 94PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C14	0160-0358	CIFXD CER DISK 94PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C16	0160-0358	CIFXD CER DISK 94PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C18	0160-0358	CIFXD CER DISK 94PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C20	0160-0358	CIFXD CER DISK 94PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C22	0160-0358	CIFXD CER DISK 94PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C24	0160-0358	CIFXD CER DISK 94PF 5%	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0031	CIFXD TI 2PF 5% 500VDC	
A1C32	0150-0031	CIFXD TI 2PF 5% 500VDC	
A1C33	0150-0031	CIFXD TI 2PF 5% 500VDC	
A1C34	0150-0031	CIFXD TI 2PF 5% 500VDC	
A1C35	0150-0031	CIFXD TI 2PF 5% 500VDC	
A1C36	0150-0031	CIFXD TI 2PF 5% 500VDC	
A1C37	0150-0041	CIFXD TI 2.7PF 5% 500VDC FACTORY SELECTED COMPI TYPICAL VALUE GIVEN	
A1C38		NOT ASSIGNED	
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDC	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDC	
A1CR1	1910-0016	SEMICON DEVICE 1D100E GERMANIUM	
A1CR2	1910-0016	SEMICON DEVICE 1D100E GERMANIUM	
A1CR3	1910-0016	SEMICON DEVICE 1D100E GERMANIUM	
A1CR4	1910-0016	SEMICON DEVICE 1D100E GERMANIUM	
A1CR5	1910-0016	SEMICON DEVICE 1D100E GERMANIUM	
A1CR6	1910-0016	SEMICON DEVICE 1D100E GERMANIUM	
A1CR7	1910-0016	SEMICON DEVICE 1D100E GERMANIUM	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

Table 8.4. FILTER/DIVIDER MODULE A7 (05110-6008) cont'd  
 FILTER/DIVIDER MODULE A8 (05110-6007)  
 (Prefix all parts in this table A7 or A8)

Reference Designation	Stock No.	Description	Note
A1L4		NOT ASSIGNED	
A1L5	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L6	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L7	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L8	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L9	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L10	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L11	05100-6186	COIL: VARIABLE 0.17-0.20UH	
	9170-0105	CORE: ADJUSTABLE TUNING	
A1L12	05110-6047	COIL: VARIABLE 1.8-3.5UH	
	9170-0106	CORE: ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU			
A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q2	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q3	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q4	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q5	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q6	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q7	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU			
A1R10		NOT ASSIGNED	
A1R11	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R12	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R13	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R14	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R15	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R16	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R17	0758-0045	RIFXD MET FLM 3900 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU			
A1R20		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	



Table 8-4. FILTER/DIVIDER MODULE A7 (05110-6008)  
 FILTER/DIVIDER MODULE A8 (05110-6007)  
 (Prefix all parts in this table A7 or A8)

Reference Designation	Stock No.	Description	Note
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R23	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R24	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R25	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R26	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R27	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR 10K OHM 10% 25C	
A2	05110-6058 05110-2018	BOARD ASSY: DIVIDER BLANK BOARD-DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0140-0190	CIFXD MICA 39 PF 5% 300 VDCW	
A2C59	0140-0191	CIFXD MICA 56 PF 5% 300 VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0140-0149	CIFXD MICA 470 PF 5% 300 VDCW	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63	THRU	NOT ASSIGNED	
A2C70			
A2C71	0160-0358	CIFXD CER DISK 94PF 5%	
A2C72	0150-0029	CIFXD T1 1PF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0140-0145	CIFXD MICA 22 PF 5% 500 VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR54	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL:FXD RF 220 UH	
A2L53	9140-0129	COIL:FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE:ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL: VARIABLE 3.2-5.6UH CORE ADJUSTABLE TUNING POWDERED IRON	

Table 8-4. FILTER/DIVIDER MODULE A7 (05110-6008)  
 FILTER/DIVIDER MODULE A8 (05110-6009)  
 (Prefix all parts in this table A7 or A8)

Reference Designation	Stock No.	Description	Note
A2L56	9140-0077	COIL:FXD RF 2.2UH	
A2L57	05110-6024 9170-0106	COIL: VARIABLE 28-45UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6061 9170-0106	COIL: VARIABLE 3.5-6.0UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L59	05110-6024 9170-0106	COIL: VARIABLE 28-45UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60 THRU		NOT ASSIGNED	
A2L70			
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10W 275 MA	
A2L72	9140-0129	COIL:FXD RF 220 UH	
A2L73	9140-0129	COIL:FXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTORISPL2N2360 PNP GERMANIUM MDT	
A2Q54	1850-0091	TRANSISTORIGERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTORIGERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56 THRU		NOT ASSIGNED	
A2R60			
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0757-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R73	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R74	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R75	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R76	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R77	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2T81	05100-6167	TRANSFORMER:	
J1			
J2 THRU	1250-0118	CONNECTOR:18NC	
J4			
J5	1250-0118	NOT ASSIGNED CONNECTOR:18NC	
MP1	05110-0005	FILTER HOUSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET: DIVIDER	
MP4	05110-2002	CAP:FRONT	
MP5	05110-2035	CAP:REAR	
P1	1251-0216	CONNECTOR:MALE 9-CONTACT TYPE D	
	0340-0039	INSULATOR:BUSHING	
	0510-0207	NUT:CAPTIVE 4-40 X 3/16 SST	
	05110-2001	SPACER:FILTER SHIELD	
	0340-0038	TERMINAL:STUD	

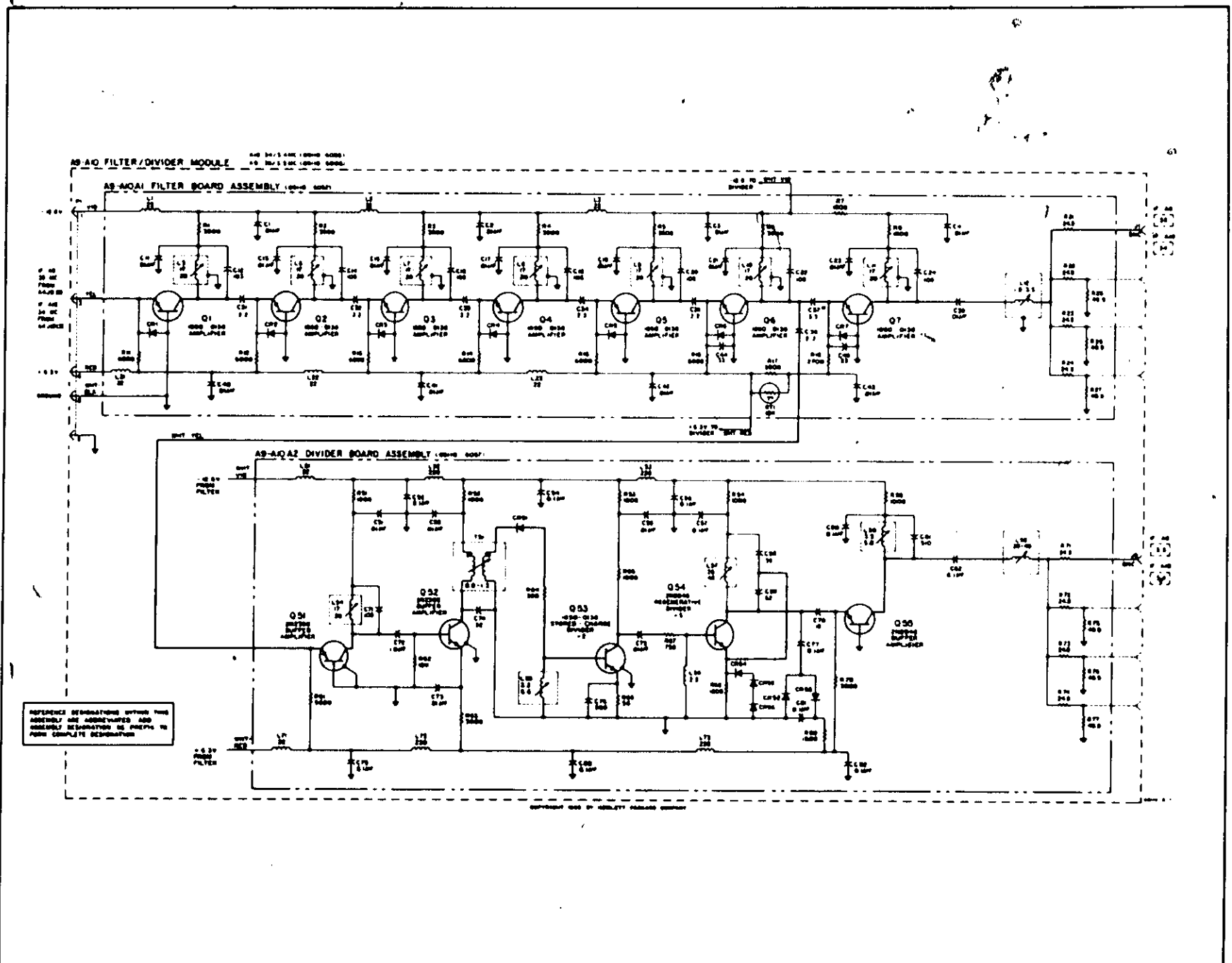


Figure 8-7. A9-A10 Filter/Dividers

Table 8-5. FILTER/DIVIDER MODULE A9 (05110-6006)  
FILTER/DIVIDER MODULE A10 (05110-6005)  
(Prefix all parts in this table A9 or A10)

Reference Designation	Stock No.	Description	Note
A1	05110-6052 05110-2014	BOARD ASSY. FILTER BLANK BOARD FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C5	THRU		
A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C12	0160-0359	CIFXD CER DISK 103PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C14	0160-0359	CIFXD CER DISK 103PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C16	0160-0359	CIFXD CER DISK 103PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C18	0160-0359	CIFXD CER DISK 103PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C20	0160-0359	CIFXD CER DISK 103PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C22	0160-0359	CIFXD CER DISK 103PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C24	0160-0359	CIFXD CER DISK 103PF 5%	
A1C25	THRU		
A1C30		NOT ASSIGNED	
A1C31	0150-0015	CIFXD TI 2.2PF 10% 500VDC	
A1C32	0150-0015	CIFXD TI 2.2PF 10% 500VDC	
A1C33	0150-0015	CIFXD TI 2.2PF 10% 500VDC	
A1C34	0150-0015	CIFXD TI 2.2PF 10% 500VDC	
A1C35	0150-0015	CIFXD TI 2.2PF 10% 500VDC	
A1C36	0150-0015	CIFXD TI 2.2PF 10% 500VDC	
A1C37	0150-0022	CIFXD TI 3.3PF 10% 500VDC FACTORY SELECTED COMPI TYPICAL VALUE GIVEN	
A1C38		NOT ASSIGNED	
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDC	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDC	
A1CR1	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR2	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR3	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR4	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR5	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR6	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR7	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

Table 8-5. FILTER/DIVIDER MODULE A9 (05110-6006) cont'd  
FILTER/DIVIDER MODULE A10 (05110-6005)  
(Prefix all parts in this table A9 or A10)

Reference Designation	Stock No.	Description	Note
A1L4		NOT ASSIGNED	
A1L5	05100-6186 9170-0105	COIL VARIABLE 0.17-0.20UH CORE ADJUSTABLE TUNING	
A1L6	05100-6186 9170-0105	COIL VARIABLE 0.17-0.20UH CORE ADJUSTABLE TUNING	
A1L7	05100-6186 9170-0105	COIL VARIABLE 0.17-0.20UH CORE ADJUSTABLE TUNING	
A1L8	05100-6186 9170-0105	COIL VARIABLE 0.17-0.20UH CORE ADJUSTABLE TUNING	
A1L9	05100-6186	COIL VARIABLE 0.17-0.20UH	
A1L10	9170-0105 05100-6186	CORE ADJUSTABLE TUNING COIL VARIABLE 0.17-0.20UH	
A1L11	9170-0105 05100-6186 9170-0105	CORE ADJUSTABLE TUNING COIL VARIABLE 0.17-0.20UH CORE ADJUSTABLE TUNING	
A1L12	05110-6047 9170-0106	COIL VARIABLE 1.8-3.5UH CORE ADJUSTABLE TUNING POWDERED IRON	
A1L13	THRU		
A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1P1	1251-0216	CONNECTOR MALE 9-CONTACT TYPE D	
A1Q1	1850-0138	TRANSISTOR SPL2N2360 PNP GERMANIUM MADT	
A1Q2	1850-0138	TRANSISTOR SPL2N2360 PNP GERMANIUM MADT	
A1Q3	1850-0138	TRANSISTOR SPL2N2360 PNP GERMANIUM MADT	
A1Q4	1850-0138	TRANSISTOR SPL2N2360 PNP GERMANIUM MADT	
A1Q5	1850-0138	TRANSISTOR SPL2N2360 PNP GERMANIUM MADT	
A1Q6	1850-0138	TRANSISTOR SPL2N2360 PNP GERMANIUM MADT	
A1Q7	1850-0138	TRANSISTOR SPL2N2360 PNP GERMANIUM MADT	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9	THRU		
A1R10		NOT ASSIGNED	
A1R11	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R12	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R13	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R14	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R15	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R16	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R17	0758-0045	RIFXD MET FLM 3900 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19	THRU		
A1R20		NOT ASSIGNED	

Table 8-5. FILTER/DIVIDER MODULE A9 (05110-8006)  
 FILTER/DIVIDER MODULE A10 (05110-8005)  
 (Prefix all parts in this table A9 or A10)

Reference Designation	Stock No.	Description	Note
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1 $\frac{1}{8}$ "	
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1 $\frac{1}{8}$ "	
A1R23	0757-0291	RIFXD MET FLM 24.9 OHM 1 $\frac{1}{8}$ "	
A1R24	0757-0291	RIFXD MET FLM 24.9 OHM 1 $\frac{1}{8}$ "	
A1R25	0757-0277	RIFXD MET FLM 49.9 OHM 1 $\frac{1}{8}$ "	
A1R26	0757-0277	RIFXD MET FLM 49.9 OHM 1 $\frac{1}{8}$ "	
A1R27	0757-0277	RIFXD MET FLM 49.9 OHM 1 $\frac{1}{8}$ "	
A1R71	0839-0026	THERMISTOR: 10K OHM 10% 25C	
A2	05110-8057 05110-2018	BOARD ASSY. 1 DIVIDER BLANK BOARD/DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0160-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0140-0190	CIFXD MICA .39 PF 5% 300 VDCW	
A2C59	0140-0205	CIFXD MICA .62PF 5% 300VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0160-0364	C-FXD MICA 510 PF 5%	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63 THRU		NOT ASSIGNED	
A2C70			
A2C71	0160-0359	CIFXD CER DISK 103PF 5%	
A2C72	0150-0029	CIFXD TI 1PF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0140-0145	CIFXD MICA 22 PF 5% 500 VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE:DIODE GERMANIUM	
A2CR54	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE:SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COILIFXD RF 220 UH	
A2L53	9140-0129	COILIFXD RF 220 UH	
A2L54	05100-6166	COIL: VARIABLE	
A2L54	9170-0105	CORE:ADJUSTABLE TUNING	
A2L55	05100-6170	COIL: VARIABLE 3.2-5.6UH	

Table 8-5. FILTER/DIVIDER MODULE A9 (05110-8006)  
 FILTER/DIVIDER MODULE A10 (05110-8005)  
 (Prefix all parts in this table A9 or A10)

Reference Designation	Stock No.	Description #	Note
A2L56	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L57	9140-0077	COILIFXD RF 2.2UH	
	05110-6024	COIL: VARIABLE	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6061	COIL: VARIABLE 3.5-6.0UH	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L59	05110-6024	COIL: VARIABLE	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60 THRU			
A2L70		NOT ASSIGNED	
A2L71	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L72	9140-0129	COILIFXD RF 220 UH	
A2L73	9140-0129	COILIFXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0136	TRANSISTOR:5PL2N2360 PNP GERMANIUM MDT	
A2Q54	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56 THRU			
A2R60		NOT ASSIGNED	
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0757-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R73	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R74	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R75	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R76	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R77	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER:	
J1		CONNECTOR:BNCL	
J2 THRU	1250-0118		
J4		NOT ASSIGNED	
J5	1250-0118	CONNECTOR:BNCL	
MP1	05110-0005	SHIELD: FILTER HOUSING	
MP2	05110-0006	SHIELD: FILTER COVER	
MP3	05110-0007	BRACKET:DIVIDER	
MP4	05110-2002	CAP:FRONT	
MP5	05110-2035	CAP:REAR	
	0346-0038	TERMINAL:STUD	
	0340-0039	INSULATOR:BUSMING	
	0510-0207	NUT:CAPTIVE 4-40 X 3/16 SST	
	05110-2001	SPACER:FILTER SHIELD	

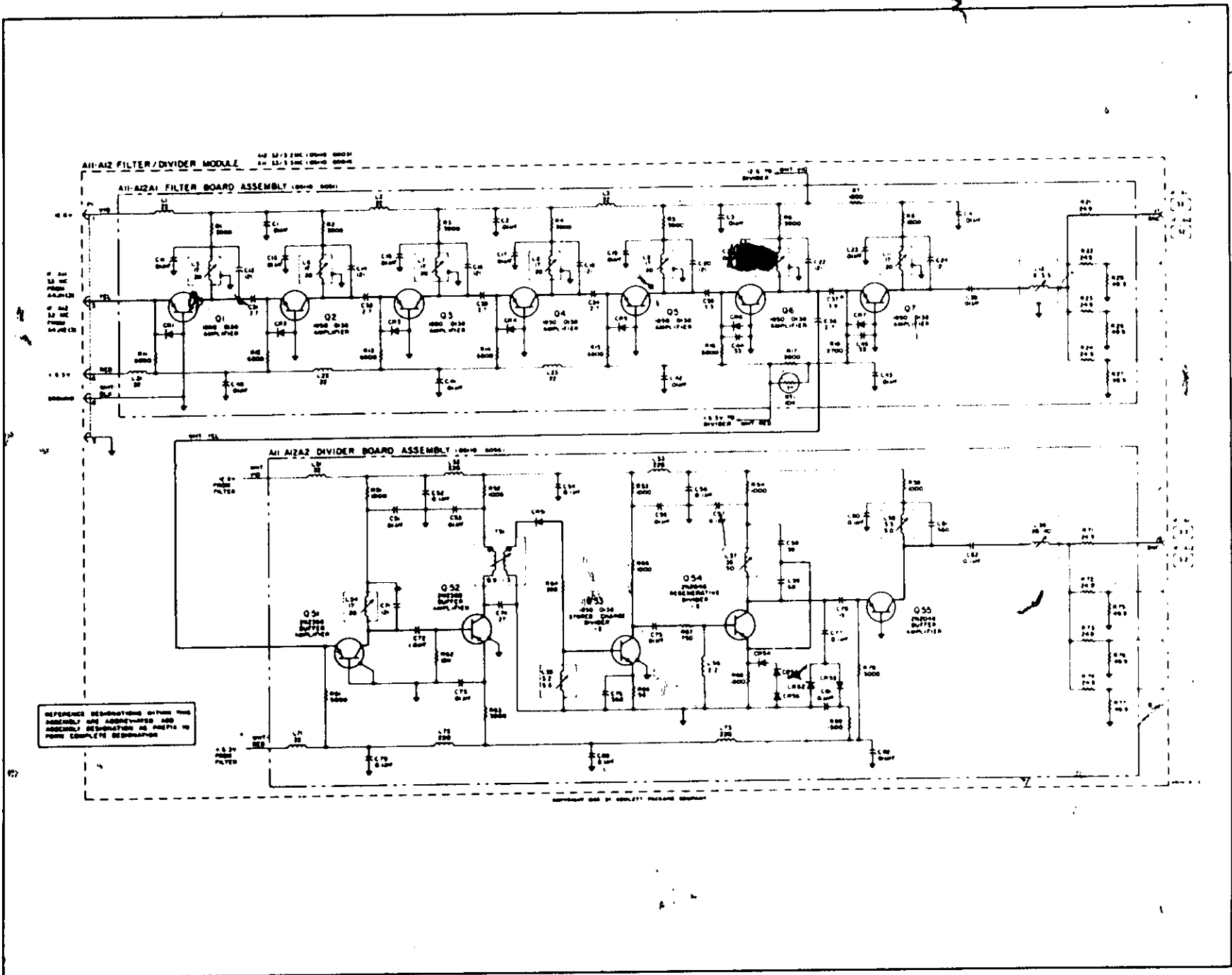


Figure 8-28. A11-A12 Filter/Dividers

Table 8-6. FILTER/DIVIDER MODULE A11 (05110-6004)  
 FILTER/DIVIDER MODULE A12 (05110-8004)  
 (Prefix all parts in this table A11 or A12)

Reference Designation	Stock No.	Description	Note
A1	05110-6051 05110-2014	BOARD ASSY. FILTER 32 & 33 MC BLANK BOARD FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C12	0160-0360	CIFXD CER DISK 120PF 5%	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C14	0160-0360	CIFXD CER DISK 120PF 5%	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C16	0160-0360	CIFXD CER DISK 120PF 5%	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C18	0160-0360	CIFXD CER DISK 120PF 5%	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C20	0160-0360	CIFXD CER DISK 120PF 5%	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C22	0160-0360	CIFXD CER DISK 120PF 5%	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C24	0160-0360	CIFXD CER DISK 120PF 5%	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0041	CIFXD TI 2.7PF 5% 500VDC	
A1C32	0150-0041	CIFXD TI 2.7PF 5% 500VDC	
A1C33	0150-0041	CIFXD TI 2.7PF 5% 500VDC	
A1C34	0150-0041	CIFXD TI 2.7PF 5% 500VDC	
A1C35	0150-0022	CIFXD TI 3.3PF 10% 500VDC	
A1C36	0150-0041	CIFXD TI 2.7PF 5% 500VDC	
A1C37	0150-0034	CIFXD TI 3.9 PF 10% 500 VDC FACTORY SELECTED COMPITYPICAL VALUE GIVEN	
A1C38		NOT ASSIGNED	
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDC	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDC	
A1CR1	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR2	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR3	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR4	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR5	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR6	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR7	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

Table 8-6. FILTER/DIVIDER MODULE A11 (05110-6004)  
 FILTER/DIVIDER MODULE A12 (05110-6004) cont'd  
 (Prefix all parts in this table A11 or A12)

Reference Designation	Stock No.	Description	Note
A1L4	05100-6186 9170-0105 05100-6186 9170-0105	NOT ASSIGNED	
A1L5		COIL: VARIABLE 0.17-0.20UH	
A1L6		CORE: ADJUSTABLE TUNING	
		COIL: VARIABLE 0.17-0.20UH	
A1L7	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH	
A1L8		CORE: ADJUSTABLE TUNING	
A1L9	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH	
		CORE: ADJUSTABLE TUNING	
A1L10	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH	
A1L11		CORE: ADJUSTABLE TUNING	
A1L12	05110-6047 9170-0106	COIL: VARIABLE 1.8-3.5UH	
A1L13 THRU		CORE: ADJUSTABLE TUNING POWDERED IRON	
A1L20	9140-0179 9140-0179 9140-0179	NOT ASSIGNED	
A1L21		COIL-FXD R.F. 22 UH 10N 275 MA	
A1L22		COIL-FXD R.F. 22 UH 10N 275 MA	
A1L23		COIL-FXD R.F. 22 UH 10N 275 MA	
A1Q1	1850-0138 1850-0138 1850-0138 1850-0138 1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q2		TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q3		TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q4		TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q5		TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q6	1850-0138 1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q7		TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1R1	0683-3925 0683-3925 0683-3925 0683-3925 0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2		RIFXD COMP 3900 OHM 5% 1/4W	
A1R3		RIFXD COMP 3900 OHM 5% 1/4W	
A1R4		RIFXD COMP 3900 OHM 5% 1/4W	
A1R5		RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925 0683-1825 0683-1825	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7		RIFXD COMP 1800 OHM 5% 1/4W	
A1R8		RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU			
A1R10	0758-0009	*NOT ASSIGNED	
A1R11		RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R12	0758-0009 0758-0009 0758-0009 0758-0009 0758-0009 0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R13		RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R14		RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R15		RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R16		RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R17		0758-0045 0758-0004	RIFXD MET FLM 3900 OHM 5% 1/2W
A1R18	RIFXD MET FLM 2700 OHM 5% 1/2W		
A1R19 THRU			
A1R20	NOT ASSIGNED		
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	



Table 8-8. FILTER/DIVIDER MODULE A11 (05110-6004) cont'd  
 FILTER/DIVIDER MODULE A12 (05110-6004)  
 (Prefix all parts in this table A11 or A12)

Reference Designation	Stock No.	Description	Note
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R23	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R24	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R25	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R26	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R27	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR 10K OHM 10% 25C	
A2	05110-6056 05110-2018	BOARD ASSY. 1 DIVIDER BLANK BOARD DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C58	0140-0190	CIFXD MICA 39 PF 5% 300 VDCW	
A2C59	0140-0192	CIFXD MICA 68PF 5% 300VDCW	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C61	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C63 THRU		NOT ASSIGNED	
A2C70			
A2C71	0160-0360	CIFXD CER DISK 120PF 5%	
A2C72	0150-0029	CIFXD TI 1PF 10% 500VDCW	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C74	0160-0178	CIFXD MICA 27PF 5% 300VDCW	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDCW	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDCW	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDCW	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDCW	
A2CR51	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR54	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL FXD RF 220 UH	
A2L53	9140-0129	COIL FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL VARIABLE 0.16-0.23UH CORE ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL VARIABLE 3.2-5.6UH CORE ADJUSTABLE TUNING POWDERED IRON	

Table 8-6. FILTER/DIVIDER MODULE A11 (05110-6004)  
 FILTER/DIVIDER MODULE A12 (05110-6004)  
 (Prefix all parts in this table A11 or A12)

Reference Designation	Stock No.	Description	Note
A2L56	9140-0077	COIL:FXD RF 2.2UH	
A2L57	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6063	COIL: VARIABLE 35-50UH	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
	05110-6061	COIL: VARIABLE 3.5-6.0UH	
A2L59	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
	05110-6024	COIL: VARIABLE	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60 THRU A2L70 A2L71	9140-0179	NOT ASSIGNED COIL:FXD R.F. 22 UH 10% 275 MA	
A2L72	9140-0129	COIL:FXD RF 220 UH	
A2L73	9140-0129	COIL:FXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM E1A 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM E1A 2N2360	
A2Q53	1850-0138	TRANSISTOR:SP12N2360 PNP GERMANIUM MDT	
A2Q54	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR:GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56 THRU A2R60		NOT ASSIGNED	
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4 W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0757-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R73	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R74	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R75	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R76	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R77	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER:	
J1 THRU J2 J4 J5	1250-0118	CONNECTOR:BNC	
		NOT ASSIGNED	
	1250-0118	CONNECTOR:BNC	
MP1	05110-0005	FILTER HOUSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET:DIVIDER	
MP4	05110-2002	CAP:FRONT	
MP5	05110-2035	CAP:REAR	
P1	1251-0216	CONNECTOR:MALE 9-CONTACT TYPE D	
	0340-0039	INSULATOR:BUSHING	
	05110-2001	SPACER:FILTER SHIELD	
	0340-0038	TERMINAL:STUD	

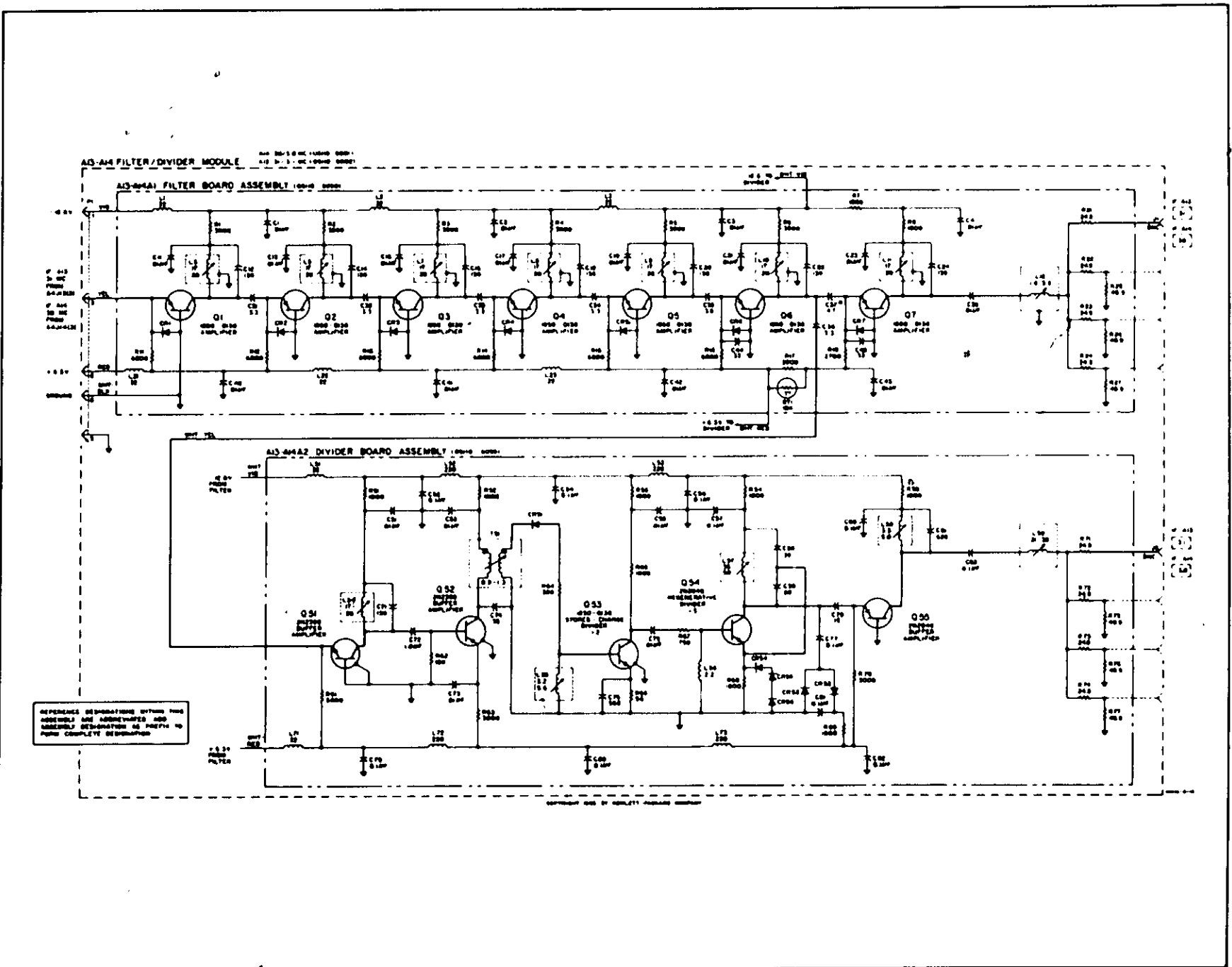


Figure 8-9. A13-A14 Filter/Dividers

Table 8-7. FILTER/DIVIDER MODULE A13 (05110-6002)  
 FILTER/DIVIDER MODULE A14 (05110-6001)  
 (Prefix all parts in this table A13 or A14)

Reference Designation	Stock No.	Description	Note
A1	05110-6050 05110-2014	BOARD ASSY. I FILTER BLANK BOARD I FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C12	0160-0361	CIFXD CER DISK 140PF 5% 500VDC#	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C14	0160-0361	CIFXD CER DISK 140PF 5% 500VDC#	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C16	0160-0361	CIFXD CER DISK 140PF 5% 500VDC#	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C18	0160-0361	CIFXD CER DISK 140PF 5% 500VDC#	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C20	0160-0361	CIFXD CER DISK 140PF 5% 500VDC#	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C22	0160-0361	CIFXD CER DISK 140PF 5% 500VDC#	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C24	0160-0361	CIFXD CER DISK 140PF 5% 500VDC#	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0022	CIFXD TI 3.3PF 10% 500VDC#	
A1C32	0150-0022	CIFXD TI 3.3PF 10% 500VDC#	
A1C33	0150-0022	CIFXD TI 3.3PF 10% 500VDC#	
A1C34	0150-0022	CIFXD TI 3.3PF 10% 500VDC#	
A1C35	0150-0034	CIFXD TI 3.9 PF 10% 500 VDC#	
A1C36	0150-0022	CIFXD TI 3.3PF 10% 500VDC#	
A1C37	0150-0042	CIFXD TI 4.7 PF 5% 500 VDC# FACTORY SELECTED COMPITYPICAL VALUE GIVEN	
A1C38		NOT ASSIGNED	
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDC#	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDC#	
A1CR1	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR2	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR3	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR4	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR5	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR6	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1CR7	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A1L1	9140-0179	COIL-FXD H.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

Table 8-7. FILTER/DIVIDER MODULE A13 (05110-6002)  
 FILTER/DIVIDER MODULE A14 (05110-6001)  
 (Prefix all parts in this table A13 or A14)

Reference Designation	Stock No.	Description	Note
A1L4		NOT ASSIGNED	
A1L5	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L6	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L7	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L8	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L9	05100-6186  9170-0105	COIL: VARIABLE 0.17-0.20UH  CORE: ADJUSTABLE TUNING	
A1L10	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L11	05100-6186 9170-0105	COIL: VARIABLE 0.17-0.20UH CORE: ADJUSTABLE TUNING	
A1L12	05110-6047 9170-0106	COIL: VARIABLE 1.8-3.5UH CORE: ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q2	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q3	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q4	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q5	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q6	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1Q7	1850-0138	TRANSISTOR: SPL2N2360 PNP GERMANIUM MDT	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10		NOT ASSIGNED	
A1R11	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R12	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R13	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R14	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R15	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R16	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R17	0758-0045	RIFXD MET FLM 3900 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R20		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	

Table 8-7. FILTER/DIVIDER MODULE A13 (05110-6002)  
 FILTER/DIVIDER MODULE A14 (05110-6001) cont'd  
 (Prefix all parts in this table A13 or A14)

Reference Designation	Stock No.	Description	Note
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R23	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R24	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R25	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R26	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R27	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R71	0839-0026	THERMISTOR 10K OHM 10% 25C	
A2	05110-6055 05110-2018	BOARD ASSY. 1 DIVIDER BLANK BOARD DIVIDER	
A2C51	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC*	
A2C52	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C53	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC*	
A2C54	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C55	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC*	
A2C56	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C57	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C58	0140-0190	CIFXD MICA 39 PF 5% 300 VDC*	
A2C59	0140-0215	CIFXD MICA 80PF 2% 300VDC*	
A2C60	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C61	0160-0363	CIFXD MICA 620 PF 5%	
A2C62	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C63	THRU		
A2C70		NOT ASSIGNEL	
A2C71	0160-0361	CIFXD CER DISK 140PF 5% 500VDC*	
A2C72	0150-0029	CIFXD TI 1PF 10% 500VDC*	
A2C73	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC*	
A2C74	0160-0179	CIFXD MICA 33PF 5% 300VDC*	
A2C75	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC*	
A2C76	0140-0178	CIFXD MICA 560 PF 2% 300 VDC*	
A2C77	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C78	0140-0101	CIFXD MICA 15PF 5% 500 VDC*	
A2C79	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C80	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C81	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2C82	0150-0121	CIFXD CER 0.1UF 50 VDC*	
A2CR51	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR52	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR53	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR54	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2CR55	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2CR56	1901-0040	DIODE SILICON 30 MA AT 1V 30 PIV	
A2L51	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A2L52	9140-0129	COIL FXD RF 220 UH	
A2L53	9140-0129	COIL FXD RF 220 UH	
A2L54	05100-6166 9170-0105	COIL VARIABLE CORE ADJUSTABLE TUNING	
A2L55	05100-6170 9170-0106	COIL VARIABLE 3.2-5.6UH CORE ADJUSTABLE TUNING POWDERED IRON	

Table 8-7. FILTER/DIVIDER MODULE A13 (05110-6002) cont'd  
 FILTER/DIVIDER MODULE A14 (05110-6001)  
 (Prefix all parts in this table A13 or A14)

Reference Designation	Stock No.	Description	Note
A2L56	9140-0077	COIL:FXD RF: 2.2UH	
A2L57	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L58	05110-6063	COIL: VARIABLE 35-50UH	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
	05110-6061	COIL: VARIABLE 3.5-6.0UH	
A2L59	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
	05110-6023	COIL: VARIABLE	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A2L60 THRU A2L70 A2L71		NOT ASSIGNED	
	9140-0179	COIL-FXD R.F. 22 UH 10R 275 MA	
A2L72	9140-0129	COIL:FXD RF 220 UH	
A2L73	9140-0129	COIL:FXD RF 220 UH	
A2Q51	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q52	1850-0118	TRANSISTOR-PNP GERMANIUM EIA 2N2360	
A2Q53	1850-0138	TRANSISTOR: SPL 2N2360 PNP GERMANIUM MADO	
A2Q54	1850-0091	TRANSISTOR: GERMANIUM 2N2048 PNP	
A2Q55	1850-0091	TRANSISTOR: GERMANIUM 2N2048 PNP	
A2R51	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R52	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R53	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R54	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R55	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R56 THRU A2R60		NOT ASSIGNED	
A2R61	0683-5625	RIFXD COMP 560 OHM 5% 1/4W	
A2R62	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R63	0683-3025	RIFXD COMP 3000 OHM 5% 1/4W	
A2R64	0683-3915	RIFXD COMP 390 OHM 5% 1/4W	
A2R65	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R66	0683-5605	RIFXD COMP 56 OHM 5% 1/4W	
A2R67	0683-7515	RIFXD COMP 750 OHM 5% 1/4W	
A2R68	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A2R69	0683-1525	RIFXD COMP 150 OHM 5% 1/4W	
A2R70	0758-0035	RIFXD MET FLM 3000 OHM 5% 1/4W	
A2R71	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R72	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R73	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R74	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R75	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R76	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2R77	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A2T51	05100-6167	TRANSFORMER:	
J1 THRU J2 J4 J5	1250-0116	CONNECTOR: BMC	
		NOT ASSIGNED	
	1250-0118	CONNECTOR: BMC	
MP1	05110-0005	FILTER HOUSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0007	BRACKET: DIVIDER	
MP4	05110-2002	CAP: FRONT	
MP5	05110-2035	CAP: REAR	
P1	1251-0216	CONNECTOR: MALE 9-CONTACT TYPE D	
	0340-0039	INSULATOR: BUSHING	
	0340-0038	TERMINAL: STUD	
	05110-2001	SPACER: FILTER SHIELD	

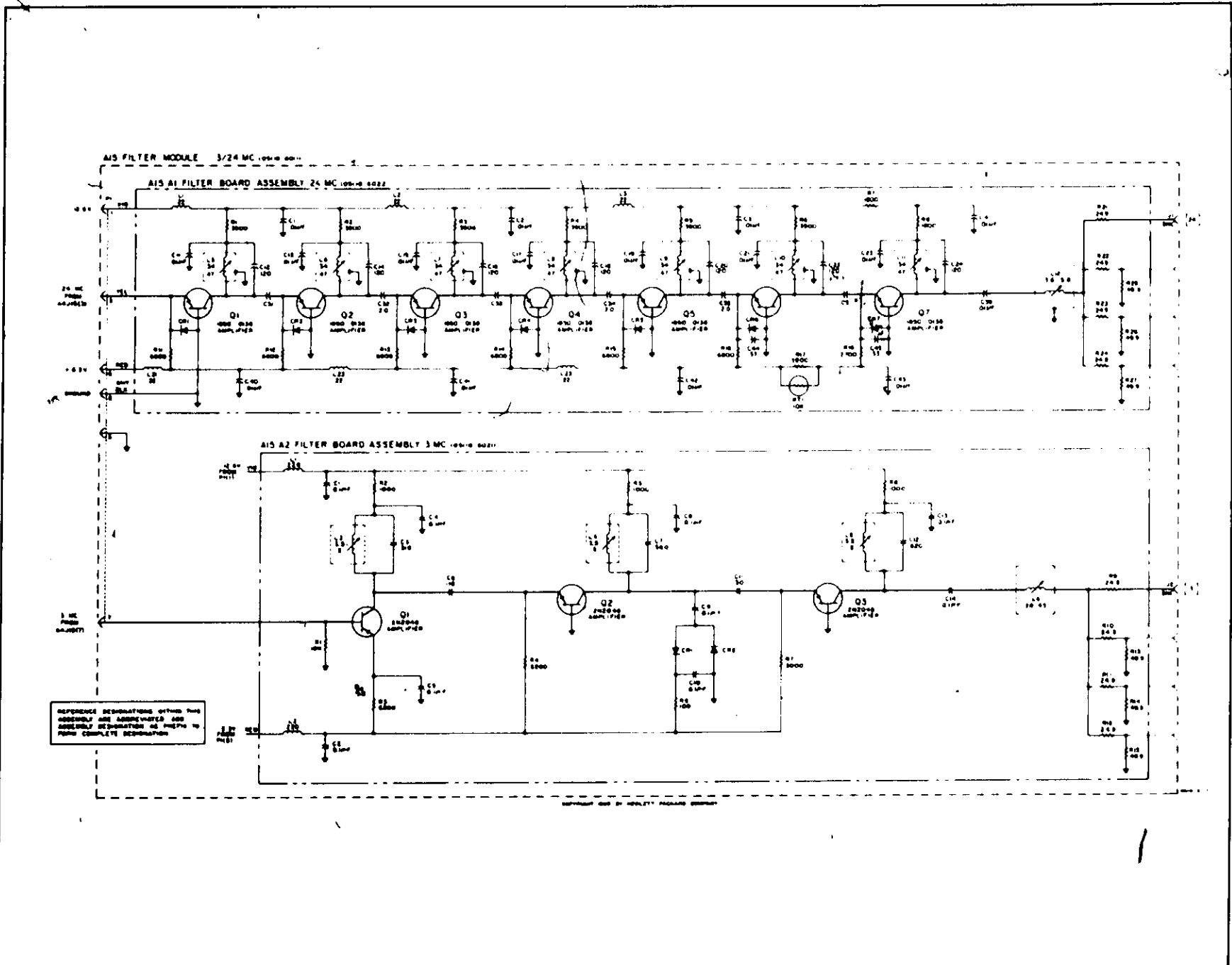


Figure 8-10. AIS 3/24 Mc Filter



Table 8-8. 3/24 MC FILTER MODULE A15 (05110-6011)  
(Prefix all parts in this table A15)

Reference Designation	Stock No.	Description	Note
A1	05110-6022 05110-2014	BOARD ASSY.: 24 MC FILTER BLANK BOARD: FILTER	
A1C1	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C2	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C3	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C4	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C5 THRU A1C10		NOT ASSIGNED	
A1C11	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C12	0160-0360	CIFXD CER 120 PF 5% 500VDC#	
A1C13	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C14	0160-0360	CIFXD CER 120 PF 5% VDC#	
A1C15	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C16	0160-0360	CIFXD CER 120 PF 5% VDC#	
A1C17	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C18	0160-0360	CIFXD CER 120 PF 5% VDC#	
A1C19	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C20	0160-0360	CIFXD CER 120 PF 5% VDC#	
A1C21	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C22	0160-0360	CIFXD CER 120 PF 5% VDC#	
A1C23	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C24	0160-0360	CIFXD CER 120 PF 5% VDC#	
A1C25 THRU A1C30		NOT ASSIGNED	
A1C31	0150-0022	CIFXD TI 3.3 PF 10% 500VDC#	
A1C32	0150-0022	CIFXD TI 3.3 PF 10% 500VDC#	
A1C33	0150-0041	CIFXD TI 2.7 PF 5% 500VDC#	
A1C34	0150-0041	CIFXD TI 2.7 PF 5% 500VDC#	
A1C35	0150-0041	CIFXD TI 2.7 PF 5% 500VDC#	
A1C36	0150-0041	CIFXD TI 2.7 PF 5% 500VDC# FACTORY SELECTED COMPITYPICAL VALUE GIVEN	
A1C37 THRU A1C38		NOT ASSIGNED	
A1C39	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C40	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C41	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C42	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C43	0160-2055	CIFXD CER 0.01UF +80-20% 100 VDC#	
A1C44	0160-0179	CIFXD MICA 33PF 5% 300VDC#	
A1C45	0160-0179	CIFXD MICA 33PF 5% 300VDC#	
A1CR1	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A1CR2	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A1CR3	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A1CR4	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A1CR5	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A1CR6	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A1CR7	1910-0016	SEMICON DEVICE: DIODE GERMANIUM	
A1L1	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L2	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L3	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	

Table 8-8. 3/24 MC FILTER MODULE A15 (05110-6011)  
(Prefix all parts in this table A15)

Reference Designation	Stock No.	Description	Note
A1L4		NOT ASSIGNED	
A1L5	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	
A1L6	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	
A1L7	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	
A1L8	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	
A1L9	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	
A1L10	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	
A1L11	05110-6085	COIL VARIABLE .34-.47 UH	
	9170-0105	CORE ADJUSTABLE TUNING	
A1L12	05110-6086	COIL VARIABLE 3.6-5.8 UH	
	9170-0106	CORE ADJUSTABLE TUNING POWDERED IRON	
A1L13 THRU A1L20		NOT ASSIGNED	
A1L21	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L22	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1L23	9140-0179	COIL-FXD R.F. 22 UH 10% 275 MA	
A1Q1	1850-0138	TRANSISTOR 1SPL2N2360 PNP GERMANIUM MDT	
A1Q2	1850-0138	TRANSISTOR 1SPL2N2360 PNP GERMANIUM MDT	
A1Q3	1850-0138	TRANSISTOR 1SPL2N2360 PNP GERMANIUM MDT	
A1Q4	1850-0138	TRANSISTOR 1SPL2N2360 PNP GERMANIUM MDT	
A1Q5	1850-0138	TRANSISTOR 1SPL2N2360 PNP GERMANIUM MDT	
A1Q6	1850-0138	TRANSISTOR 1SPL2N2360 PNP GERMANIUM MDT	
A1Q7	1850-0138	TRANSISTOR 1SPL2N2360 PNP GERMANIUM MDT	
A1R1	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R2	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R3	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R4	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R5	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R6	0683-3925	RIFXD COMP 3900 OHM 5% 1/4W	
A1R7	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R8	0683-1825	RIFXD COMP 1800 OHM 5% 1/4W	
A1R9 THRU A1R10		NOT ASSIGNED	
A1R11	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R12	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R13	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R14	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R15	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R16	0758-0009	RIFXD MET FLM 6800 OHM 5% 1/2W	
A1R17	0758-0045	RIFXD MET FLM 3900 OHM 5% 1/2W	
A1R18	0758-0004	RIFXD MET FLM 2700 OHM 5% 1/2W	
A1R19 THRU A1R20		NOT ASSIGNED	
A1R21	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	

Table 8-8. 3/24 MC FILTER MODULE A15 (05110-6011)  
(Prefix all parts in this table A15)

Reference Designation	Stock No.	Description	Note
A1R22	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R23	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R24	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A1R25	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R26	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1R27	0757-0277	RIFXD MET FLM 49.9 OHM 1% 1/8W	
A1RT1	0839-0026	THERMISTOR 10K OHM 10% 25C	
A2	05110-6021 05110-2016	BOARD ASSY. 3 MC FILTER BLANK BOARD 3 MC FILTER	
A2C1	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C2	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C3	0160-0362	CIFXD MICA 510PF 5%	
A2C4	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C5	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C6	0140-0194	CIFXD MICA 110 PF 5% 300 VDC	
A2C7	0140-0178	CIFXD MICA 560 PF 2% 300 VDC	
A2C8	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C9	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C10	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C11	0140-0203	CIFXD MICA 30PF 5% 500VDC	
A2C12	0160-0363	CIFXD MICA 620PF 5%	
A2C13	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2C14	0150-0121	CIFXD CER 0.1UF 50 VDC	
A2CR1	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2CR2	1910-0016	SEMICON DEVICE DIODE GERMANIUM	
A2L1	9140-0129	COIL IFXD RF 220 UH	
A2L2	9140-0129	COIL IFXD RF 220 UH	
A2L3	05110-6061	COIL VARIABLE 3.5-6.0UH	
A2L4	9170-0106 05110-6061	CORE ADJUSTABLE TUNING POWDERED IRON COIL VARIABLE 3.5-6.0UH	
A2L5	9170-0106 05110-6061	CORE ADJUSTABLE TUNING POWDERED IRON COIL VARIABLE 3.5-6.0UH	
A2L6	05110-6024 9170-0106	COIL VARIABLE 28-45UH CORE ADJUSTABLE TUNING POWDERED IRON	
A2Q1	1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	
A2Q2	1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	
A2Q3	1850-0091	TRANSISTOR GERMANIUM 2N2048 PNP	
A2R1	0683-1035	RIFXD COMP 10K OHM 5% 1/4W	
A2R2	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R3	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A2R4	0758-0046	RIFXD MET FLM 6200 OHM 5% 1/2W	
A2R5	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R6	0683-1015	RIFXD COMP 100 OHM 5% 1/4W	
A2R7	0758-0035	RIFXD MET FLM 3000 OHM 5% 1/2W	
A2R8	0683-1025	RIFXD COMP 1000 OHM 5% 1/4W	
A2R9	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	
A2R10	0757-0291	RIFXD MET FLM 24.9 OHM 1% 1/8W	

Table 8-8. 3/24 MC FILTER MODULE A15 (05110-6011) cont'd  
(Prefix all parts in this table A15)

Reference Designation	Stock No.	Description	Note
A2R11	0757-0291	RIFXJ MET FLM 24.9 OHM 1/8 1/8W	
A2R12	0757-0291	RIFXD MET FLM 24.9 OHM 1/8 1/8W	
A2R13	0757-0277	RIFXD MET FLM 49.9 OHM 1/8 1/8W	
A2R14	0757-0277	RIFXD MET FLM 49.9 OHM 1/8 1/8W	
A2R15	0757-0277	RIFXD MET FLM 49.9 OHM 1/8 1/8W	
J1	1250-0118	CONNECTOR: BNC	
J2	1250-0118	CONNECTOR: BNC	
MP1	05110-0005	FILTER HOUSING	
MP2	05110-0006	FILTER COVER	
MP3	05110-0026	BRACKET: DIVIDER	
MP4	05110-2002	CAP: FRONT	
MP5	05110-2035	CAP: REAR	
P1	1251-0216	CONNECTOR: MALE 9-CONTACT TYPE U	
	05110-6011	FILTER ASSY: 3/24 MC	
	0510-0207	NUT: CAPTIVE 4-40 3/16 5ST	
	05110-2001	SPACER: FILTER SHIELD	

# **SCHEMATIC DIAGRAMS**

## SECTION IX CIRCUIT DIAGRAMS

### 9-1. INTRODUCTION.

9-2. This section includes the following:

- a. Schematic Diagram Notes, Figure 9-1.
- b. Block Diagram, Figure 9-2.
- c. Schematic diagrams and component location illustrations in order of their designation (A1 through A17, Figures 9-3 through 9-12).

9-3. The block diagram or any schematic diagram can be unfolded and used with any other part of this manual.

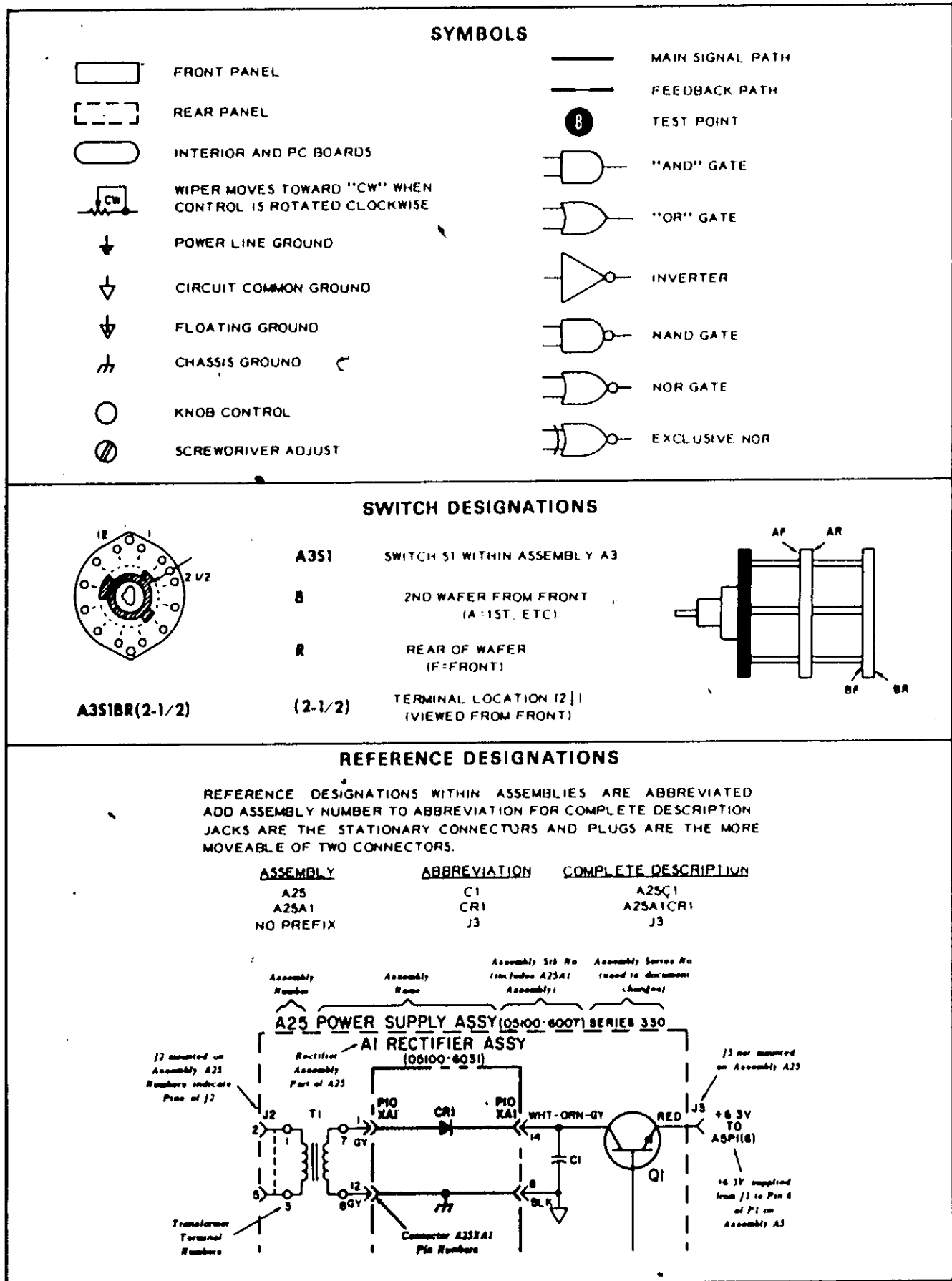


Figure 9-1. Schematic Diagram Notes

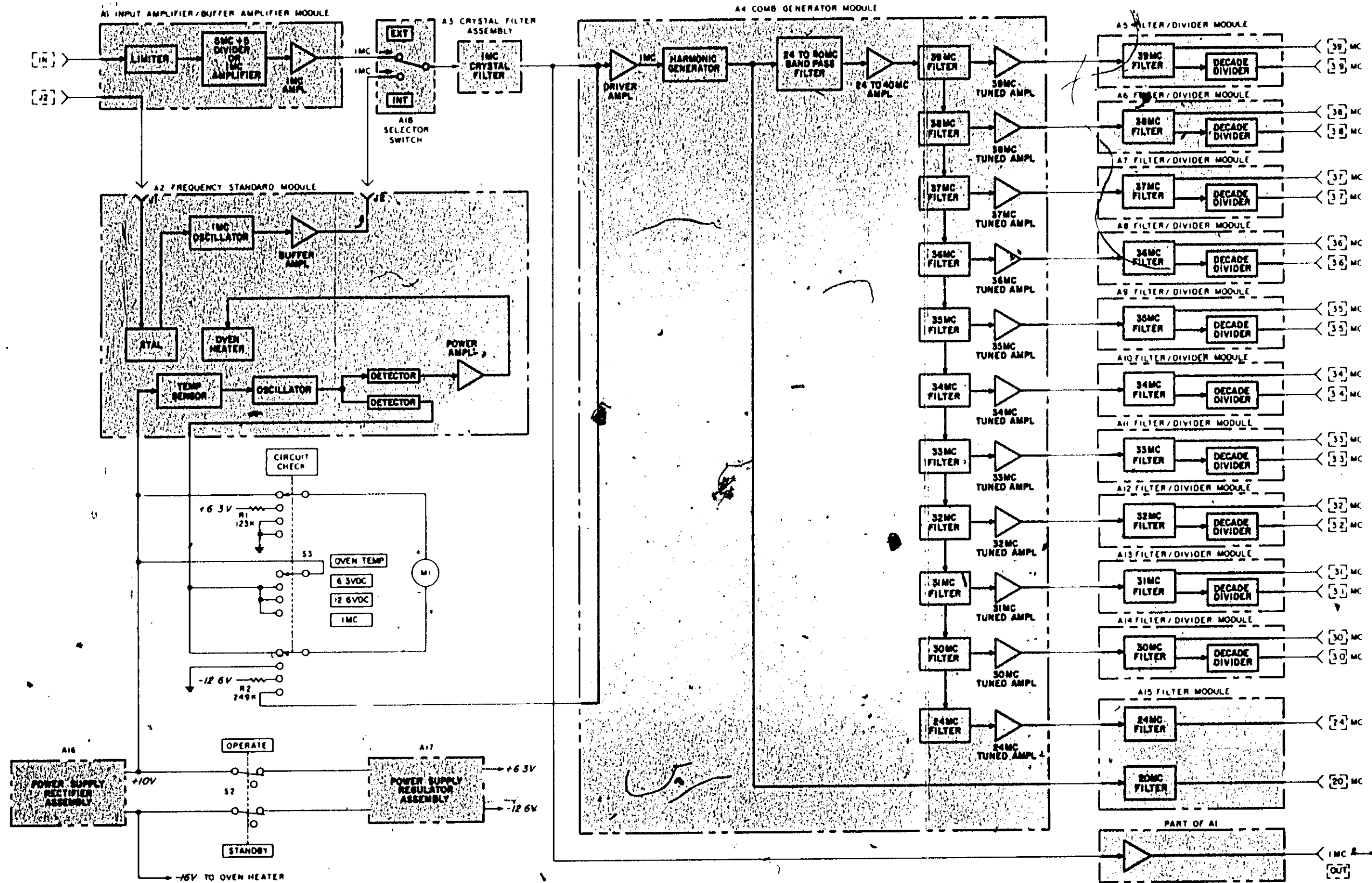
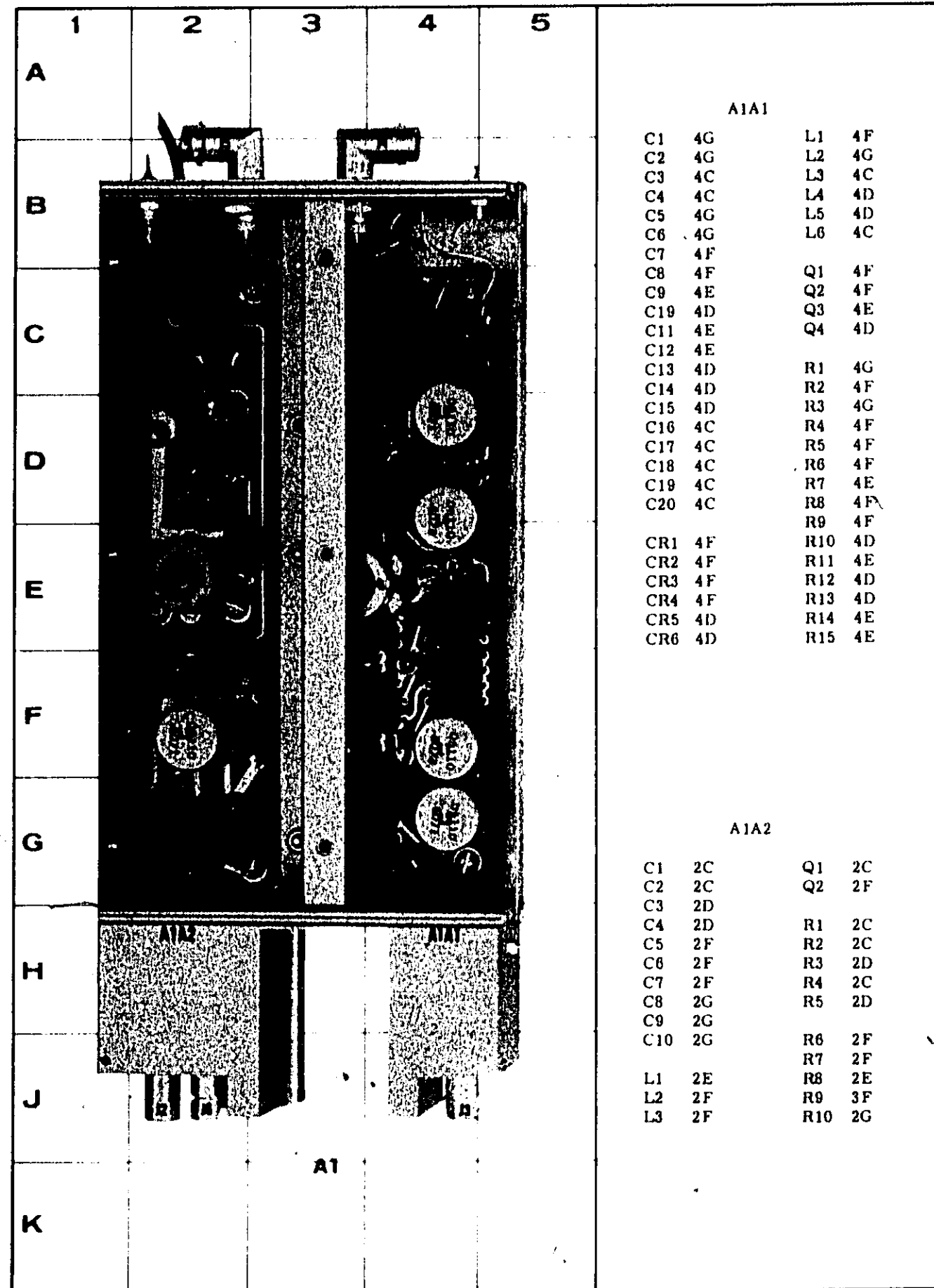


Figure 9-2. Overall Block Diagram



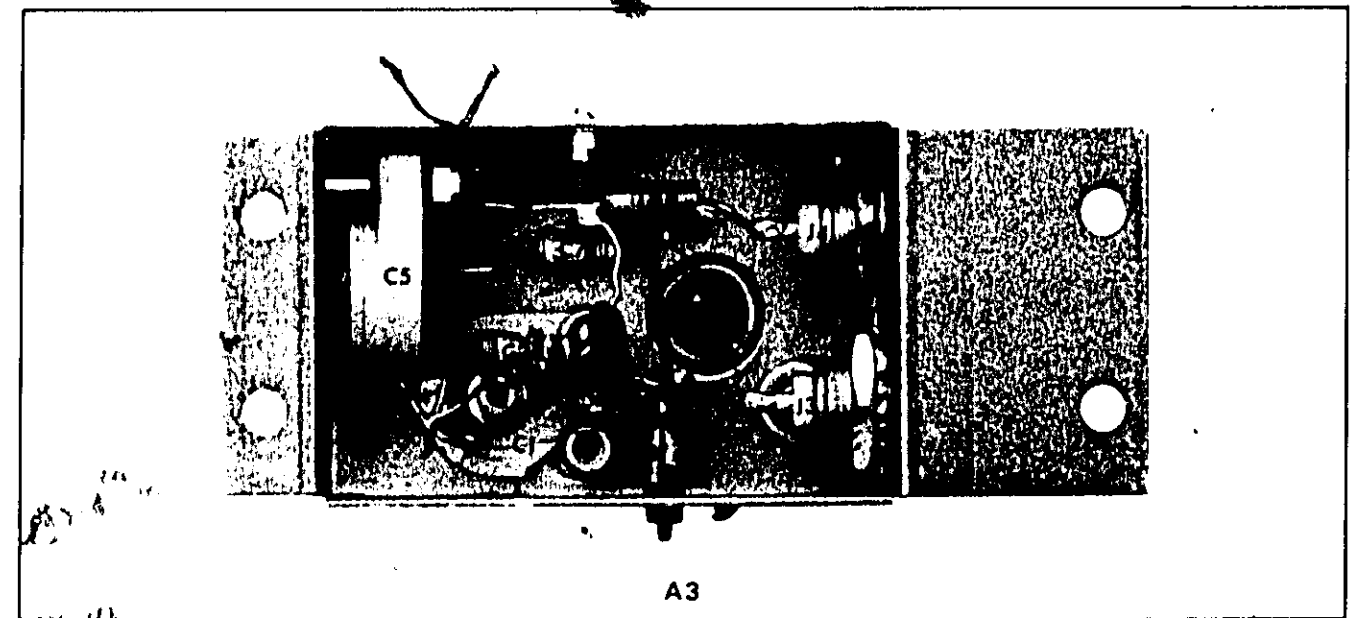


A1A1

C1	4G	L1	4F
C2	4G	L2	4G
C3	4C	L3	4C
C4	4C	L4	4D
C5	4G	L5	4D
C6	4G	L6	4C
C7	4F		
C8	4F	Q1	4F
C9	4E	Q2	4F
C10	4D	Q3	4E
C11	4E	Q4	4D
C12	4E		
C13	4D	R1	4G
C14	4D	R2	4F
C15	4D	R3	4G
C16	4C	R4	4F
C17	4C	R5	4F
C18	4C	R6	4F
C19	4C	R7	4E
C20	4C	R8	4F
		R9	4F
CR1	4F	R10	4D
CR2	4F	R11	4E
CR3	4F	R12	4D
CR4	4F	R13	4D
CR5	4D	R14	4E
CR6	4D	R15	4E

A1A2

C1	2C	Q1	2C
C2	2C	Q2	2F
C3	2D		
C4	2D	R1	2C
C5	2F	R2	2C
C6	2F	R3	2D
C7	2F	R4	2C
C8	2G	R5	2D
C9	2G		
C10	2G	R6	2F
		R7	2F
L1	2E	R8	2E
L2	2F	R9	3F
L3	2F	R10	2G



A3

NOTES

REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD ASSEMBLY DESIGNATION AS PREFIX TO FORM COMPLETE DESIGNATION.

2 UNLESS OTHERWISE INDICATED RESISTANCE IN OHMS, CAPACITANCE IN PICOFARADS, INDUCTANCE IN MICROHENRIES

REFERENCE DESIGNATIONS

NO PREFIX	A1	A1A1	A1A2	A3	A1B
	C1	C1-20	C1-11	C1-7	
	J2-6	CR1-6		J3-4	
	P1	L1-6	L1-3	L1	P2-4
		Q1-4	Q1,2		S1
		R1-15	R1-10	T1	
				Y1	

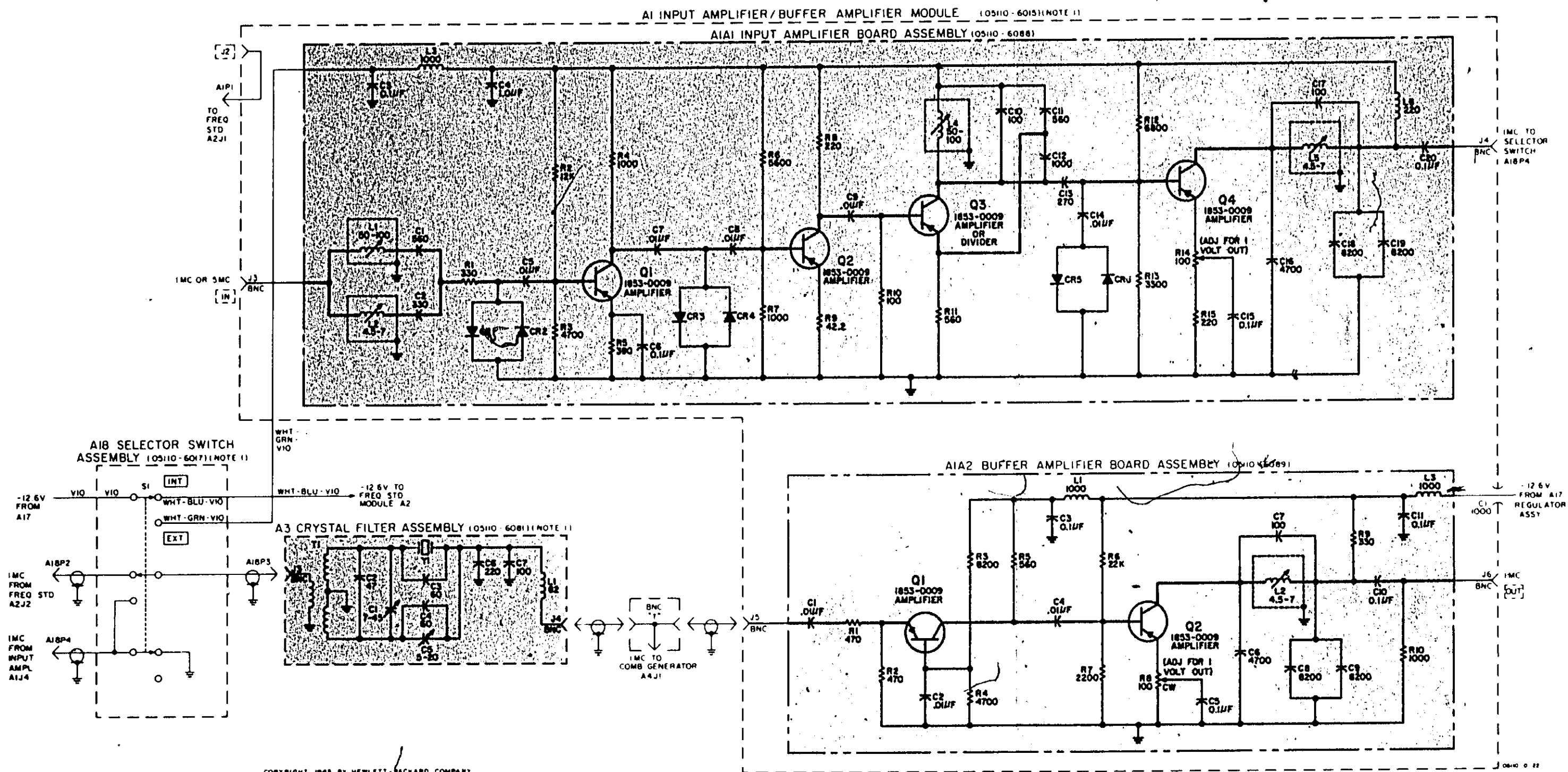
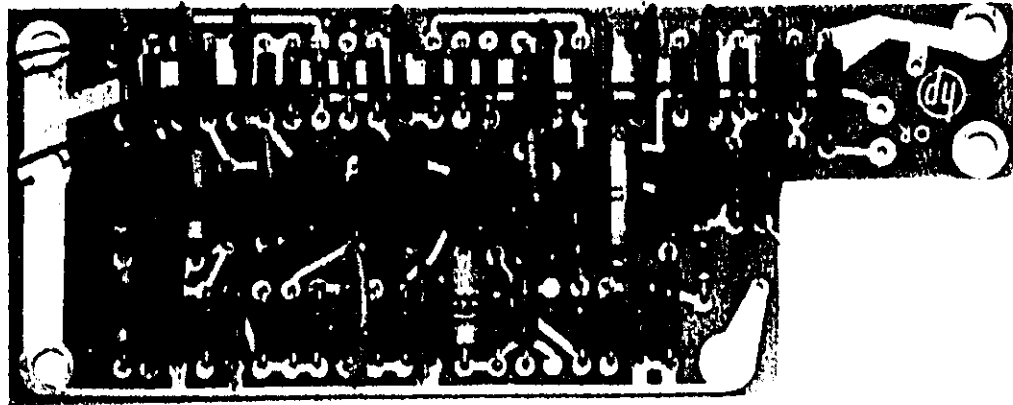
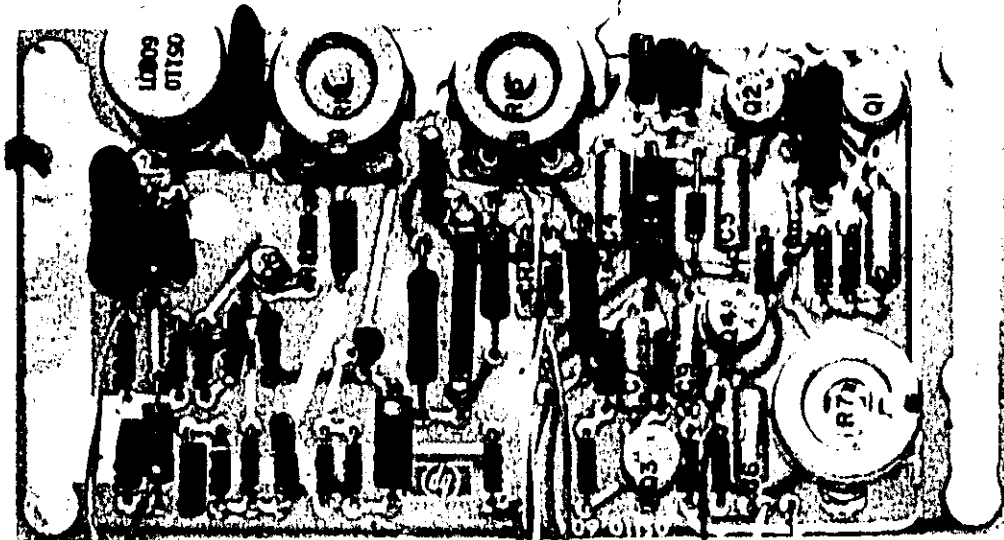


Figure 9-3. A1 Input Amplifier/Buffer Amplifier  
A3 Crystal Filter  
A18 Selector Switch

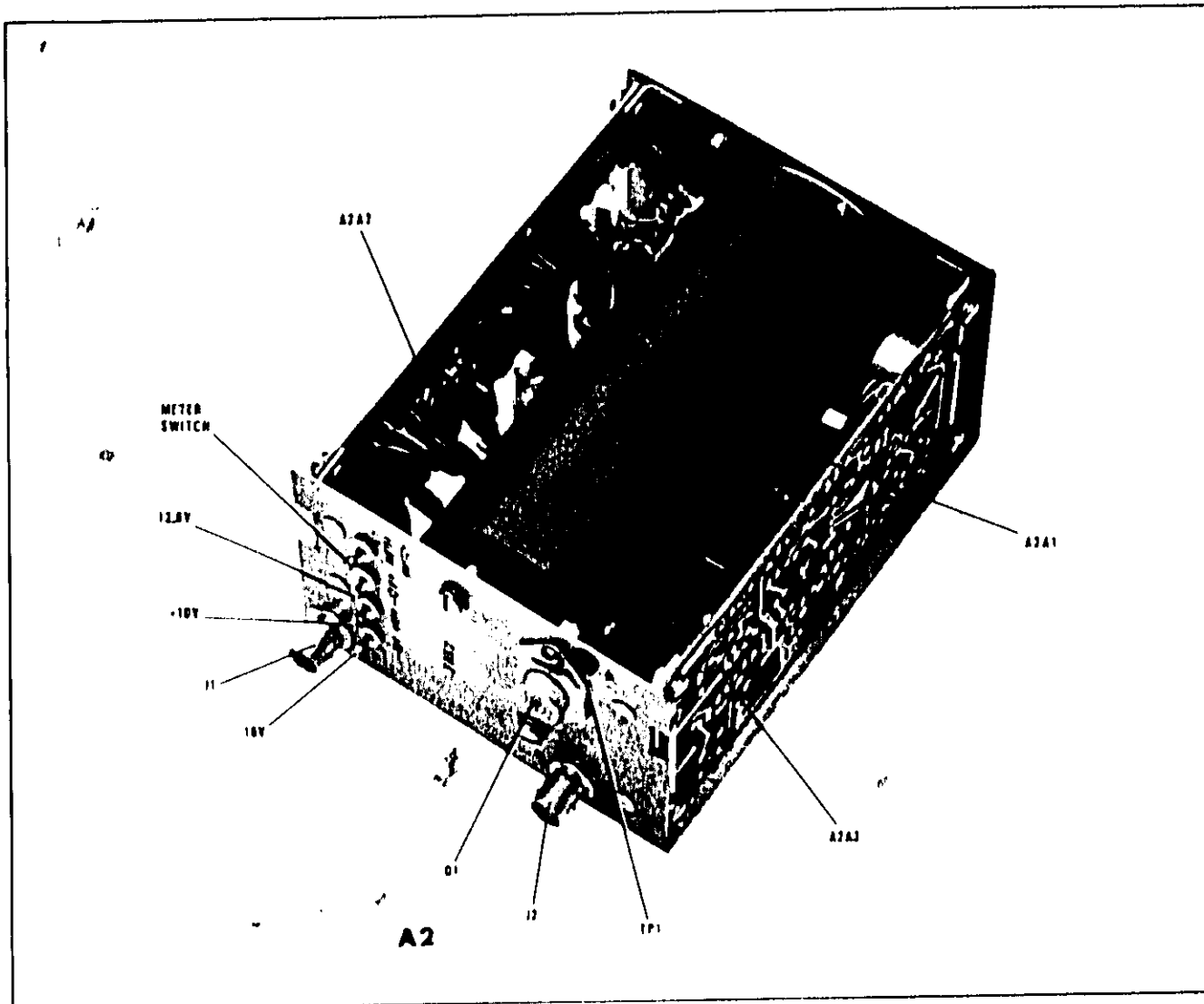


A2A2



A2A3

Model 6110B



REFERENCE DESIGNATIONS

A2	A2A1	A2A2	A2A3
C1 2	C1 7	C1 8 C1 24 CR1 4	C1 19 CR1 6
J1 2	NR1	L1 4 Q1 4 R1 6	L1 4 Q1 6 R1 25
Q1	R1 4	C1 22 25 33	R1 1
TP1	RT1 Y1		

OMC 6 54

NOTES

- 1 UNLESS OTHERWISE INDICATED  
RESISTANCE IN OHMS,  
CAPACITANCE IN PICOFARADS  
INDUCTANCE IN MICRORHENRIES
- 2 ASTERISK (\*) INDICATES SELECTED  
COMPONENT AVERAGE VALUES  
SHOWN

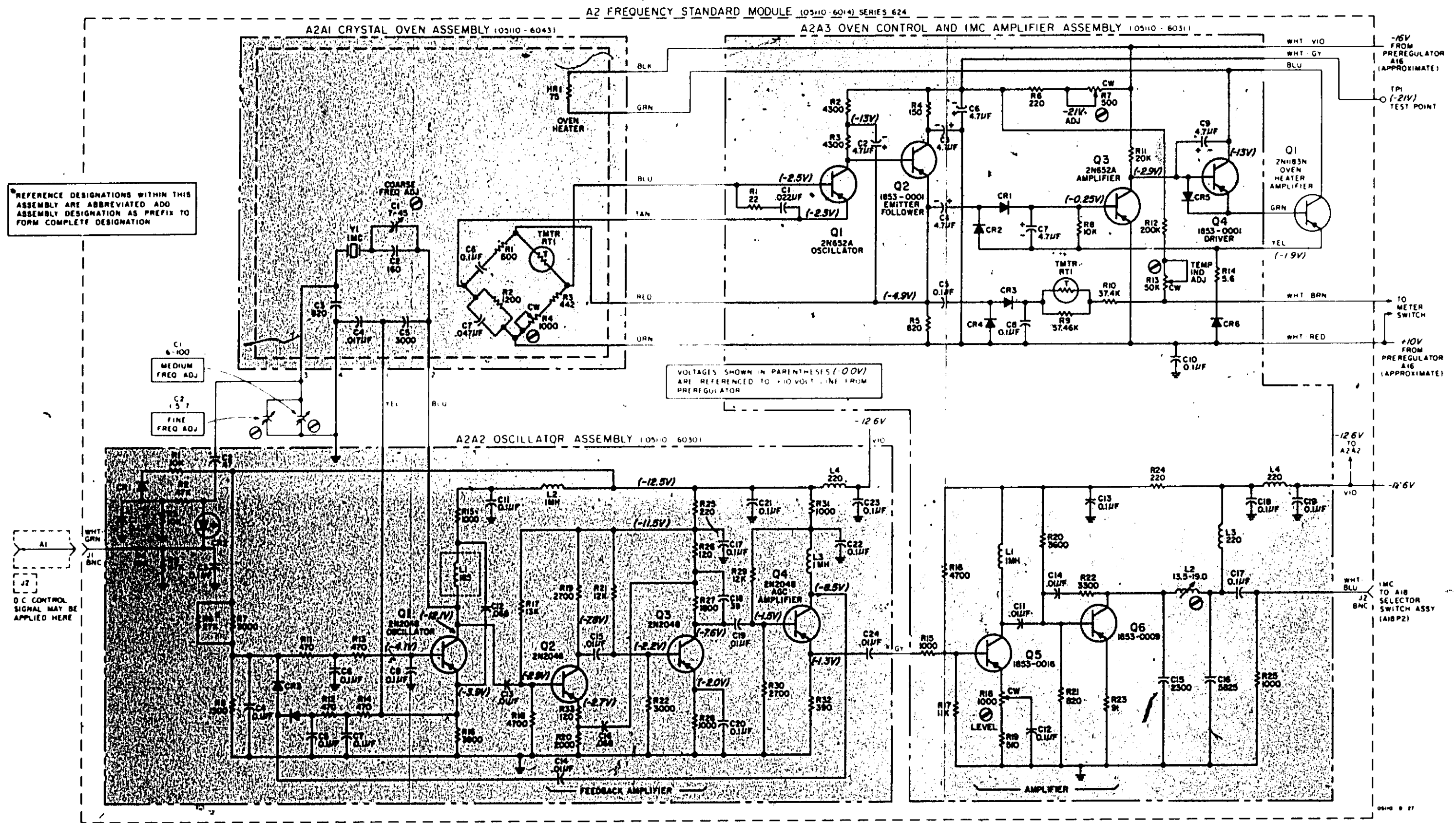
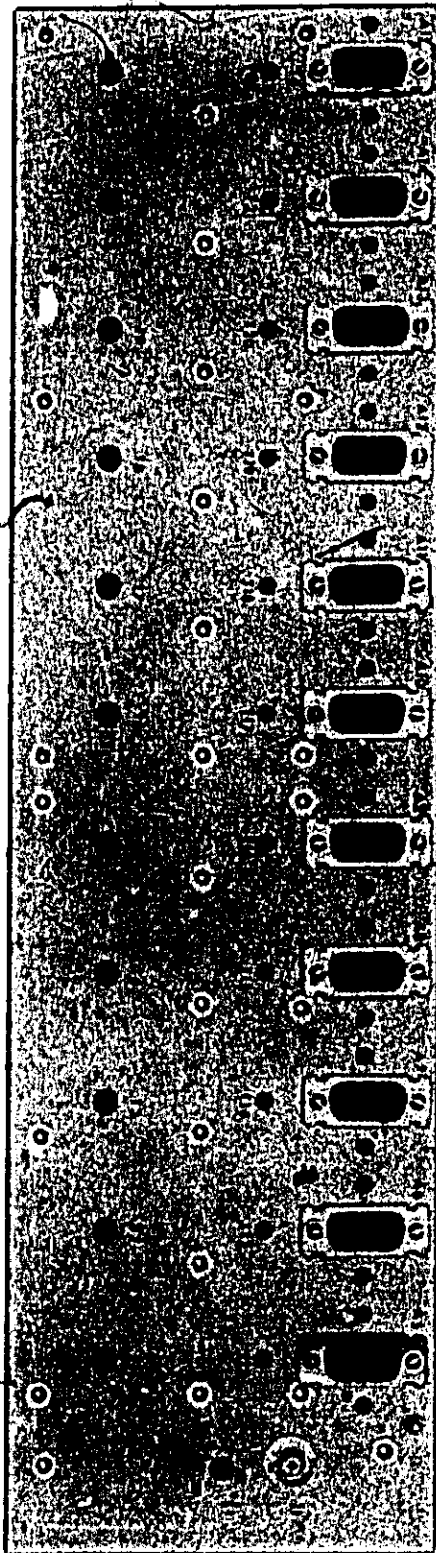


Figure 9-4. A2 Frequency Standard



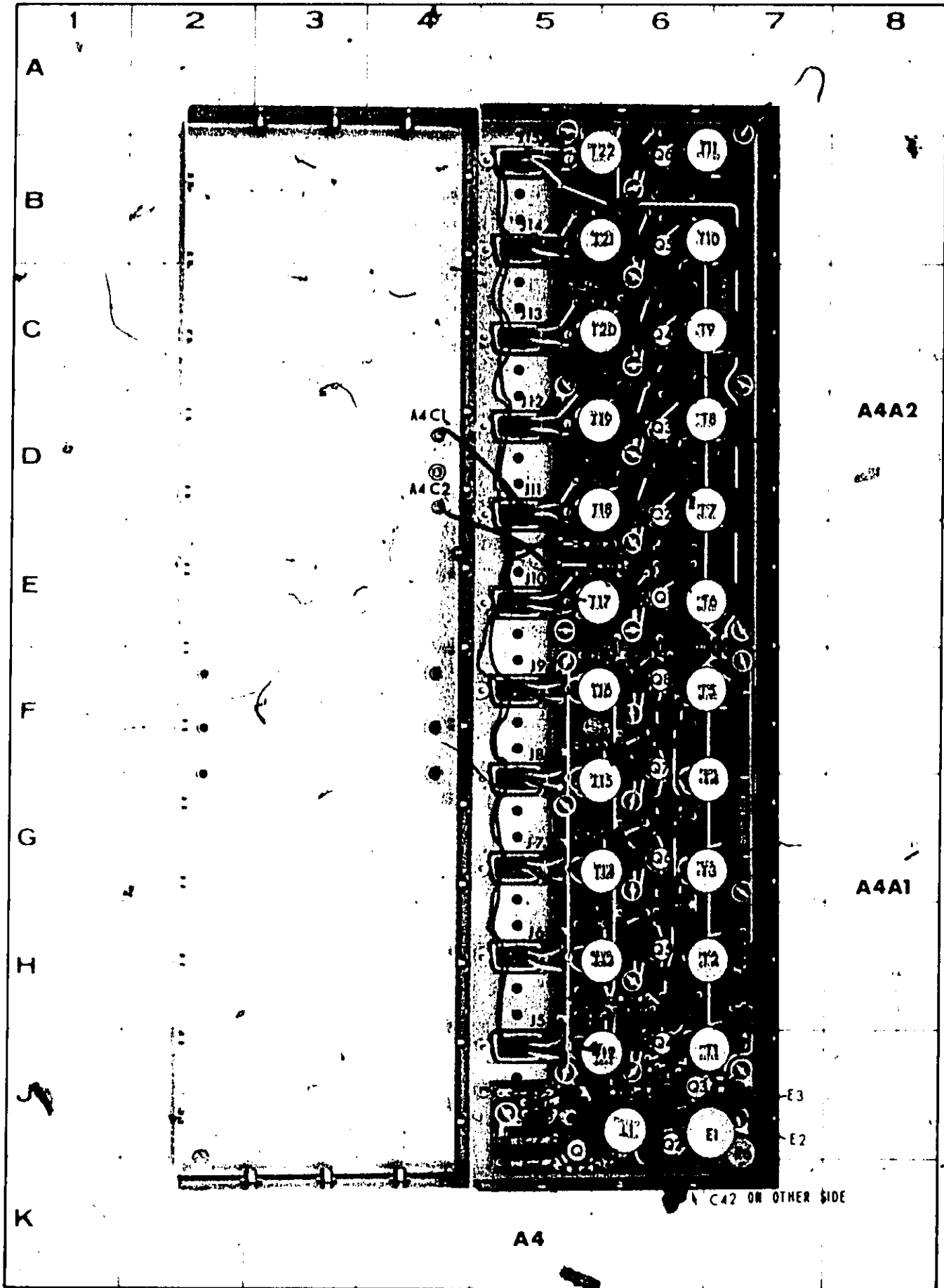
A4

A4A1

C1	5J	C36	5F	R1	5J
C2	5J	C37	6H	R2	5K
C3	5J	C38	6H	R3	6J
C4	5J	C39	6G	R4	6K
C5	6J	C40	6F	R5	6J
C6	6K	C41	6F		
C7	5J			R6	7J
C8	5H	CR1	5J	R7	7J
C9	6J	CR2	5J	R8	7H
C10	7J	CR3	5J	R9	7J
C11	6J	CR4	5J	R10	7H
C12	7J	CR5	6J		
C13	7H	CR6	7J	R11	6H
C14	7G	CR7	7J	R12	6H
C15	7G			R13	6G
C16	7F	E1	7J	R14	6F
C17	6H			R15	5H
C18	6H	L1	6J	R16	6H
C19	6G	L2	6J	R17	6G
C20	6G	L3	6J	R18	6F
C21	6F	L4	7H	R19	6F
C22	6J	L5	7H		
C23	6H	L6	7J	RT1	7J
C24	6G	L7	7H		
C25	6F	L8	6J	T1	7J
C26	6F	L9	7H	T2	7H
C27	6J			T3	7G
C28	6H	Q1	5J	T4	7G
C29	6G	Q2	6J	T5	7F
C30	6F	Q3	6J		
C31	6F	Q4	6J	T12	6J
C32	5H	Q5	6H	T13	6H
C33	5H	Q6	6G	T14	6G
C34	5G	Q7	6G	T15	6G
C35	5F	Q8	6F	T16	6G

A4A2

C1	6B	C26	6B	R1	6E
C2	5E	C27	6B	R2	6E
C3	6E	C28	5E	R3	6D
C4	7E	C29	5D	R4	6C
C5	7D	C30	5C	R5	6C
C6	7D	C31	5C	R6	6B
C7	7C	C32	5B	R7	6E
C8	7B	C33	5B	R8	6D
C9	7B	C34	6E	R9	6C
C10	6E	C35	6D	R10	6C
C11	6E			R11	6B
C12	6D	C36	6C	R12	6B
C13	6C	C37	6C		
C14	6C	C38	6B	T6	7E
C15	6B	C39	6B	T7	7D
C16	6E			T8	7D
C17	6D	L1	6E	T9	7C
C18	6D	L2	6E	T10	7B
C19	6C			T11	7B
C20	6B	Q1	6E	T17	6E
C21	6B	Q2	6D	T18	6D
C22	6E	Q3	6D	T19	6D
C23	6D	Q4	6C	T20	6C
C24	6D	Q5	6B	T21	6B
C25	6C	Q6	6B	T22	6B



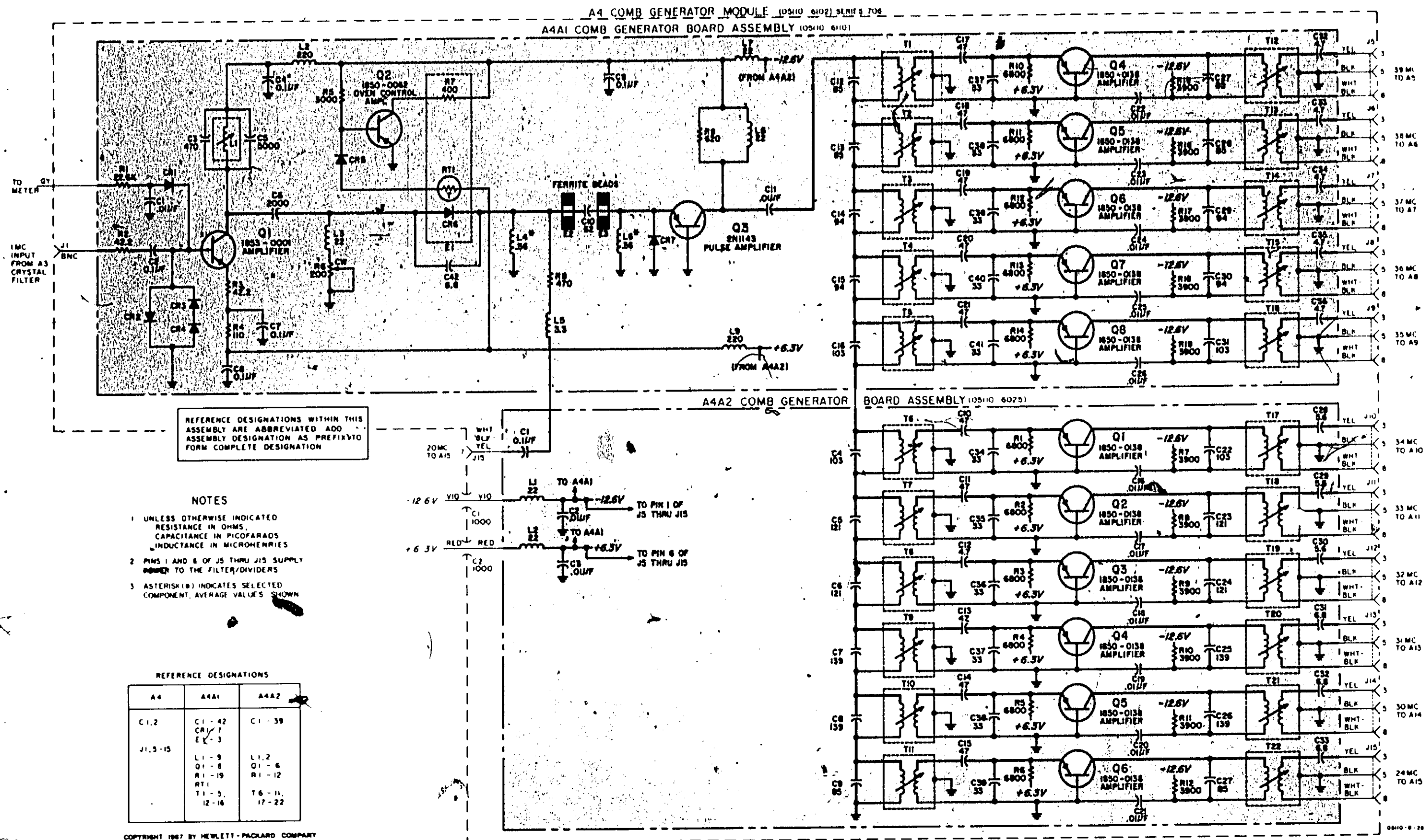
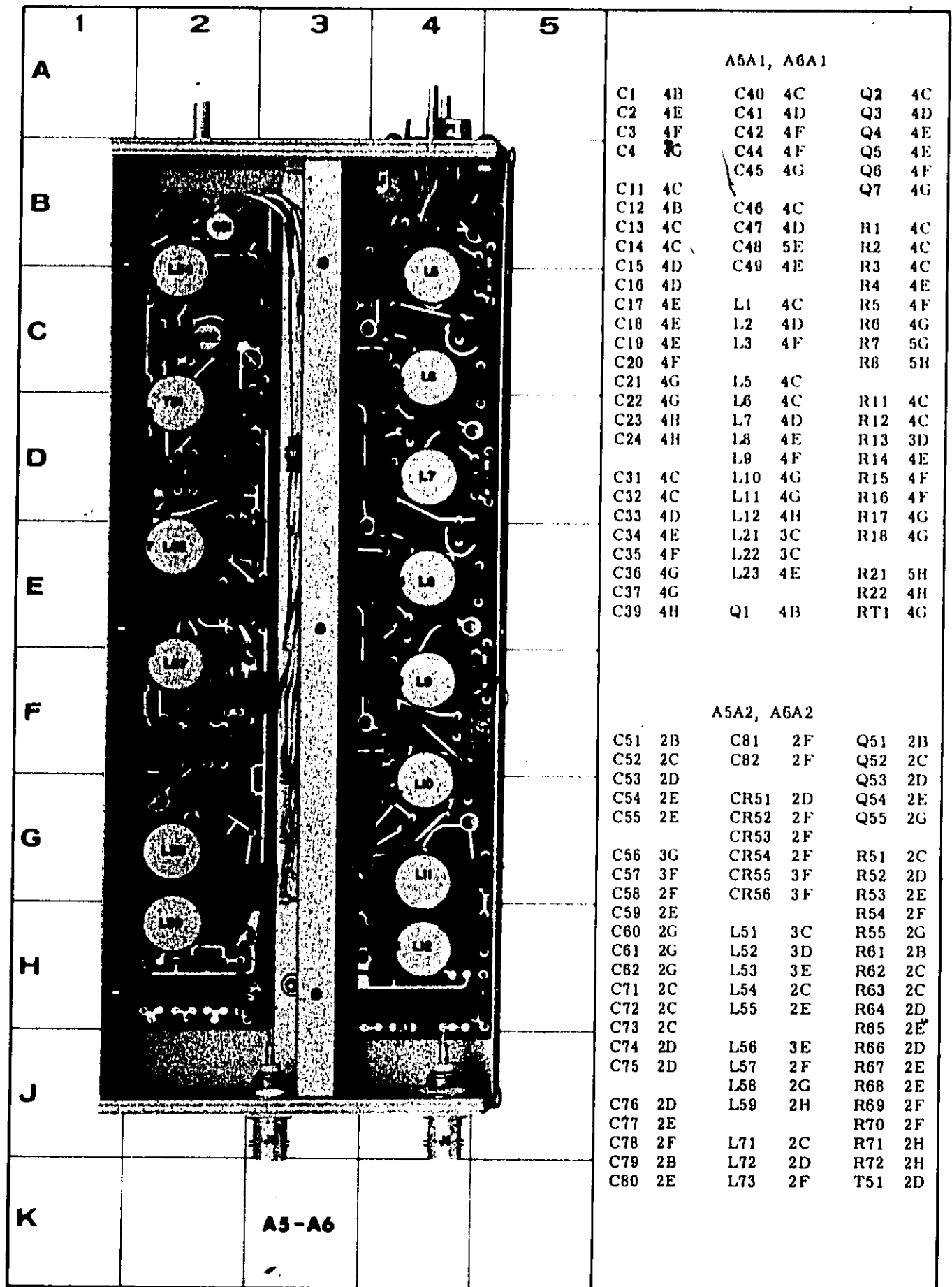


Figure 9-5. A4 Comb Generator





NOTES

- 1 UNLESS OTHERWISE INDICATED  
RESISTANCE IN OHMS  
CAPACITANCE IN PICOFARADS  
INDUCTANCE IN MICROHENRIES
- 2 ASTERISK (\*) INDICATES SELECTED  
COMPONENT AVERAGE VALUES  
SHOWN

REFERENCE DESIGNATIONS

A5	A6	A5	A6A1	A5	A6A2
		C1	4	C51	62
		C2	24	C71	82
		C3	37		
		C9	49	CR51	56
Q1	*	C1	3, 5, 12	C51	59
		C2	23	C71	73
R1		Q1	7	Q51	55
		R1	8	R51	55
		R2	18	R61	72
		R3	21, 22		
		RT1		T51	

05-10 0 28

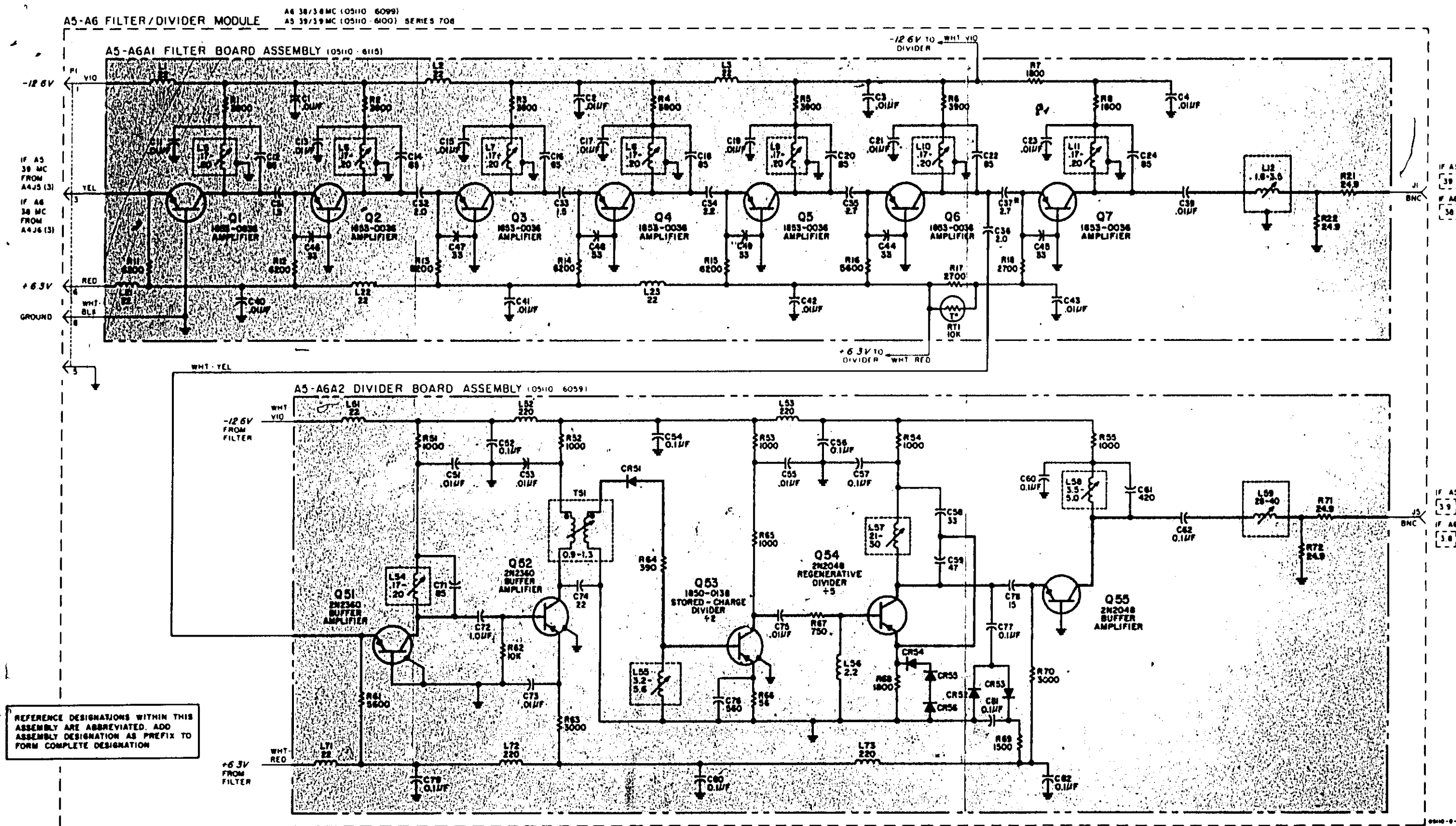


Figure 9-6. A5-A6 Filter/Divider

	1	2	3	4	5						
A						A7A1, A8A1					
						C1	4B	C40	4C	Q2	4C
						C2	4E	C41	4D	Q3	4D
						C3	4F	C42	4F	Q4	4E
B						C4	4G	C44	4F	Q5	4E
								C45	4G	Q6	4F
						C11	4C				
						C12	4B	C46	4C		
C						C13	4C	C47	4D	R1	4C
						C14	4C	C48	5E	R2	4C
						C15	4D	C49	4E	R3	4C
						C16	4D			R4	4E
D						C17	4E	L1	4C	R5	4F
						C18	4E	L2	4D	R6	4G
						C19	4E	L3	4F	R7	5G
						C20	4F			R8	5H
E						C21	4G	L5	4C		
						C22	4G	L6	4C	R11	4C
						C23	4H	L7	4D	R12	4C
						C24	4H	L8	4E	R13	3D
F								L9	4F	R14	4E
						C31	4C	L10	4G	R15	4F
						C32	4C	L11	4G	R16	4F
						C33	4D	L12	4H	R17	4G
G						C34	4E	L21	3C	R18	4G
						C35	4F	L22	3C	R21	5H
						C36	4G	L23	4E	R22	4H
						C37	4G				
H						C39	4H	Q1	4B	RT1	4G
I											
J											
K			A7-A8			A7A2, A8A2					
						C51	2B	C81	2F	Q51	2B
						C52	2C	C82	2F	Q52	2C
						C53	2D			Q53	2D
					C54	2E	CR51	2D	Q54	2E	
					C55	2E	CR52	2F	Q55	2G	
							CR53	2F			
					C56	3G	CR54	2F	R51	2C	
					C57	3F	CR55	3F	R52	2D	
					C58	2F	CR56	3F	R53	2E	
					C59	2E			R54	2F	
					C60	2G	L51	3C	R55	2G	
					C61	2G	L52	3D	R61	2B	
					C62	2G	L53	3E	R62	2C	
					C71	2C	L54	2C	R63	2C	
					C72	2C	L55	2E	R64	2D	
					C73	2C			R65	2E	
					C74	2D	L56	3E	R66	2D	
					C75	2D	L57	2F	R67	2E	
							L58	2G	R68	2E	
							L59	2H	R69	2F	
									R70	2F	
						C78	2F	L71	2C	R71	2H
						C79	2B	L72	2D	R72	2H
						C80	2E	L73	2F	T51	2D

NOTES

- 1 UNLESS OTHERWISE INDICATED  
RESISTANCE IN OHMS  
CAPACITANCE IN PICOFARADS  
INDUCTANCE IN MICROMHRIES
- 2 ASTERISK (\*) INDICATES SELECTED  
COMPONENT AVERAGE VALUES  
SHOWN

REFERENCE DESIGNATIONS

A7 AB	A7 ABA1	A7 ABA2
	C1 - 4, 11 - 24 31 - 37, 39 - 49	C51 - 62, 71 - 82  CR51 - 56
J1,5	L1 - 3, 5 - 12, 21 - 23	L51 - 59, 71 - 73
P1	Q1 - 7 R1 - 8, 11 - 16 21, 22 RT1	Q51 - 55 R51 - 55, 61 - 72  T51

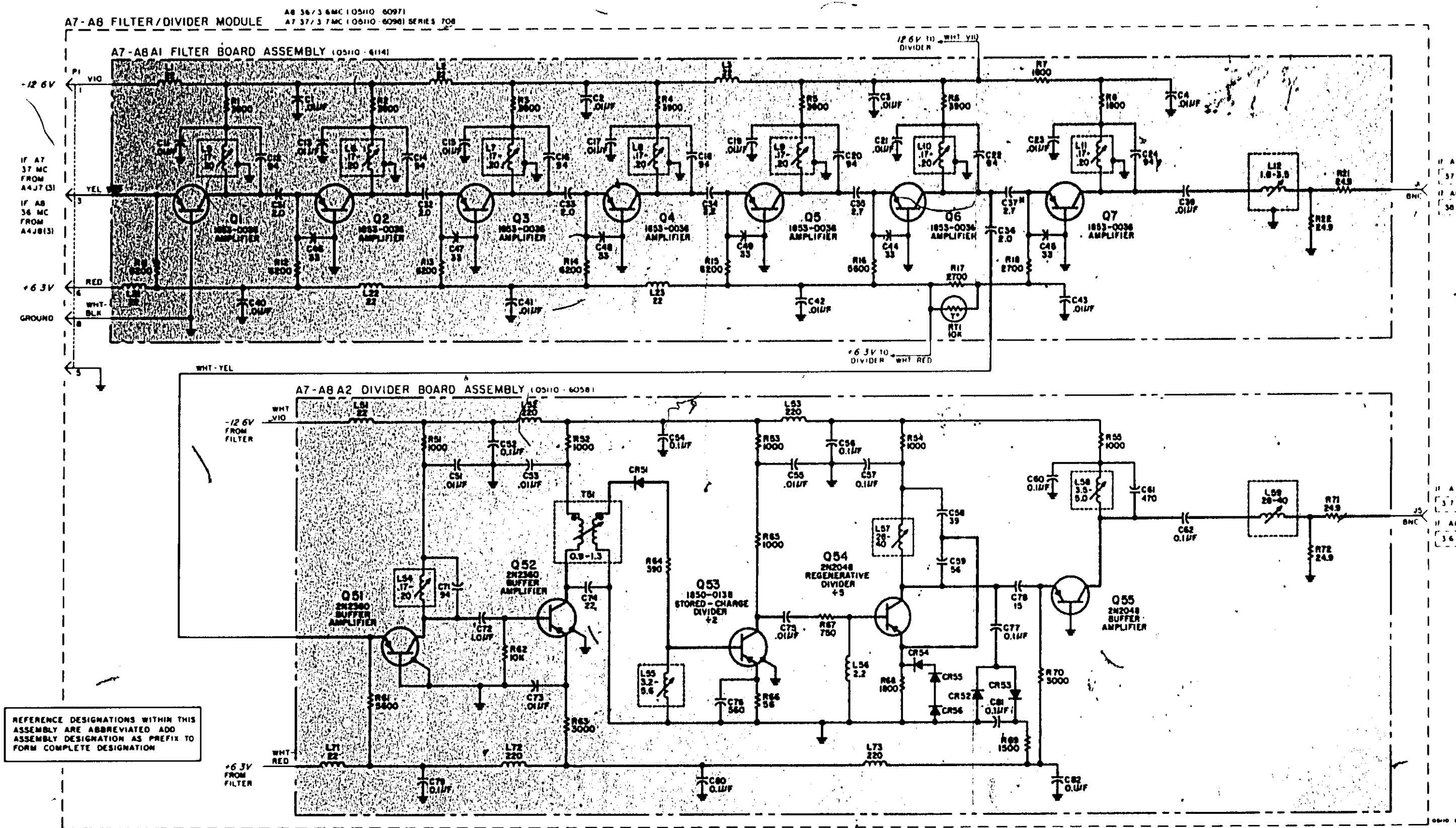
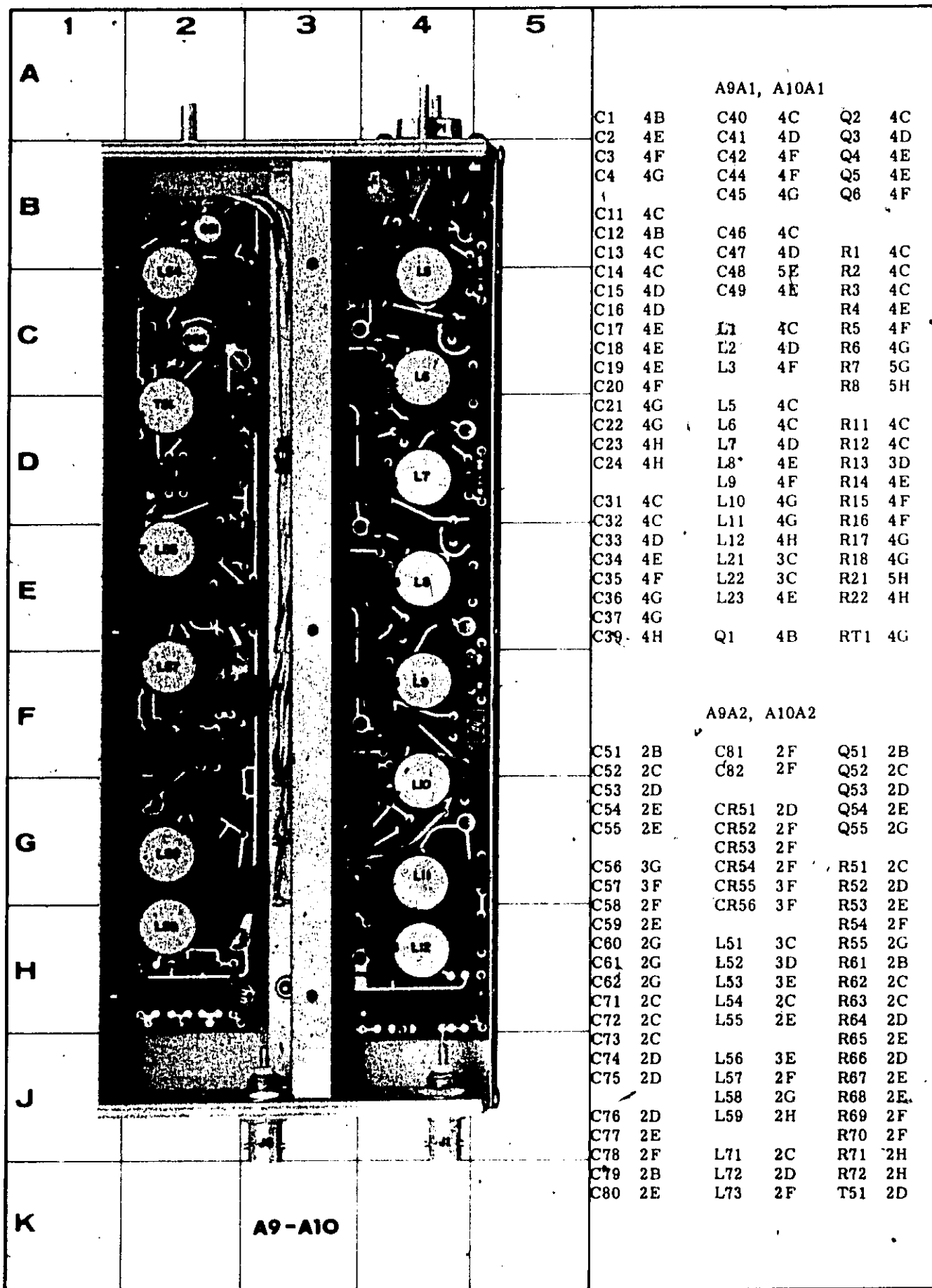


Figure 9-7. A7-A8 Filter/Divider



A9-A10

NOTES

- 1 UNLESS OTHERWISE INDICATED  
RESISTANCE IN OHMS  
CAPACITANCE IN PICOFARADS  
INDUCTANCE IN MICROHENRIES
- 2 ASTERISK (\*) INDICATES SELECTED  
COMPONENT. AVERAGE VALUES  
SHOWN

REFERENCE DESIGNATIONS

A9 A10	A9 A10A1	A9 A10A2
	C1-4 11-24 31-35 59-69	C51-62 76-82  CR51-56
21,5	L1-3, 5-12, 21-23	LS1-59, 71-73
P1	Q1-7 R1-8 11-18, 21,22 RT1	QS1-55 RS1-55, 61-72  TS1



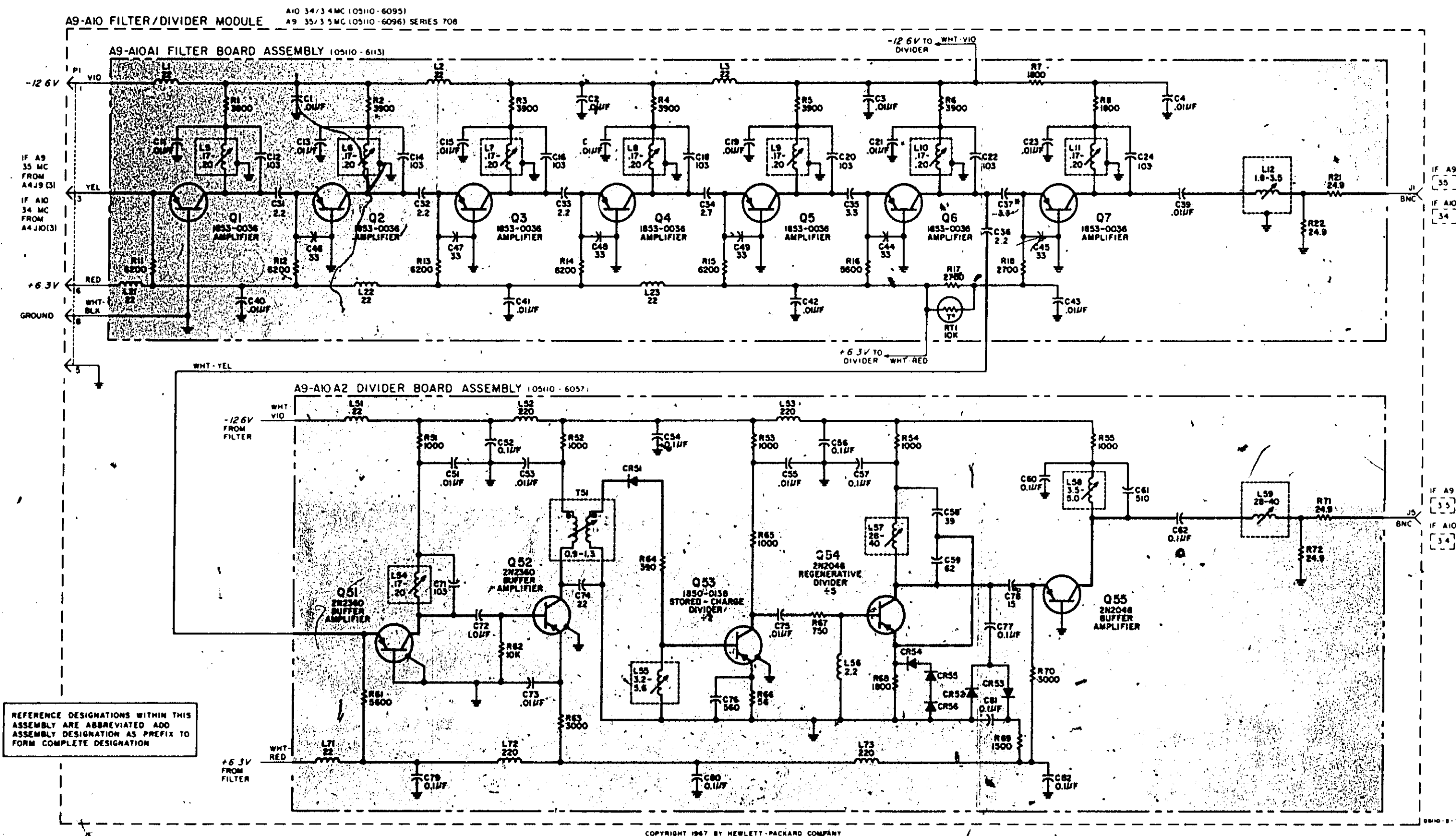


Figure 9-8. 3.5 and 3.4 Mc Filter/Dividers A9, A10  
9-15

	1	2	3	4	5						
A							A11A1, A12A1				
						C1	4B	C40	4C	Q2	4C
						C2	4E	C41	4D	Q3	4D
						C3	4F	C42	4F	Q5	4E
								C45	4G	Q6	4F
B						C11	4C	C46	4C		
						C12	4B	C47	4D	R1	4C
						C13	4C	C48	5E	R2	4C
						C14	4C	C49	4E	R3	4C
						C15	4D			R4	4E
						C16	4D			R5	4F
						C17	4E	L1	4C	R6	4G
						C18	4E	L2	4D	R7	5G
						C19	4E	L3	4F	R8	5H
						C20	4F				
						C21	4G	L5	4C		
						C22	4G	L6	4C	R11	4C
						C23	4H	L7	4D	R12	4C
						C24	4H	L8	4E	R13	3D
								L9	4F	R14	4E
								L10	4G	R15	4F
						C31	4C	L11	4G	R16	4F
						C32	4C	L12	4H	R17	4G
						C33	4D	L21	3C	R18	4G
						C34	4E	L22	3C	R21	5H
						C35	4F	L23	4E	R22	4H
						C36	4G				
						C37	4G				
						C39	4H	Q1	4B	RT1	4G
								A11A2, A12A2			
						C51	2B	C81	2F	Q51	2B
						C52	2C	C82	2F	Q52	2C
						C53	2D			Q53	2D
						C54	2E	CR51	2D	Q54	2E
						C55	2E	CR52	2F	Q55	2G
								CR53	2F		
						C56	3G	CR54	2F	R51	2C
						C57	3F	CR55	3F	R52	2D
						C58	2F	CR56	3F	R53	2E
						C59	2E			R54	2F
						C60	2G	L51	3C	R55	2G
						C61	2G	L52	3D	R61	2B
						C62	2G	L53	3E	R62	2C
						C71	2C	L54	2C	R63	2C
						C72	2C	L55	2E	R64	2D
						C73	2C			R65	2E
						C74	2D	L56	3E	R66	2D
						C75	2D	L57	2F	R67	2E
								L58	2G	R68	2E
								L59	2H	R69	2F
						C76	2D			R70	2F
						C77	2E			R71	2H
						C78	2F	L71	2C	R72	2H
						C79	2B	L72	2D		
						C80	2E	L73	2F	T51	2D
K			A11-A12								

NOTES

- 1 UNLESS OTHERWISE INDICATED  
RESISTANCE IN OHMS,  
CAPACITANCE IN PICOFARADS  
INDUCTANCE IN MICROHENRIES
- 2 ASTERISK (\*) INDICATES SELECTED  
COMPONENT AVERAGE VALUES  
SHOWN

REFERENCE DESIGNATIONS

A1- A12	A4- A12A1	A11- A12A2
	C1- 4, 11- 24, 31- 37, 39- 48	C51- 62 71- 82  CR51- 56
J1- 5	L1- 3, 5- 12, 21- 23	L51- 59, 71- 73
P1	Q1- 7 R1- 8, 11- 18, 21, 22 RT1	Q51- 55 R51- 55, 61- 72  T51

05110 0 55

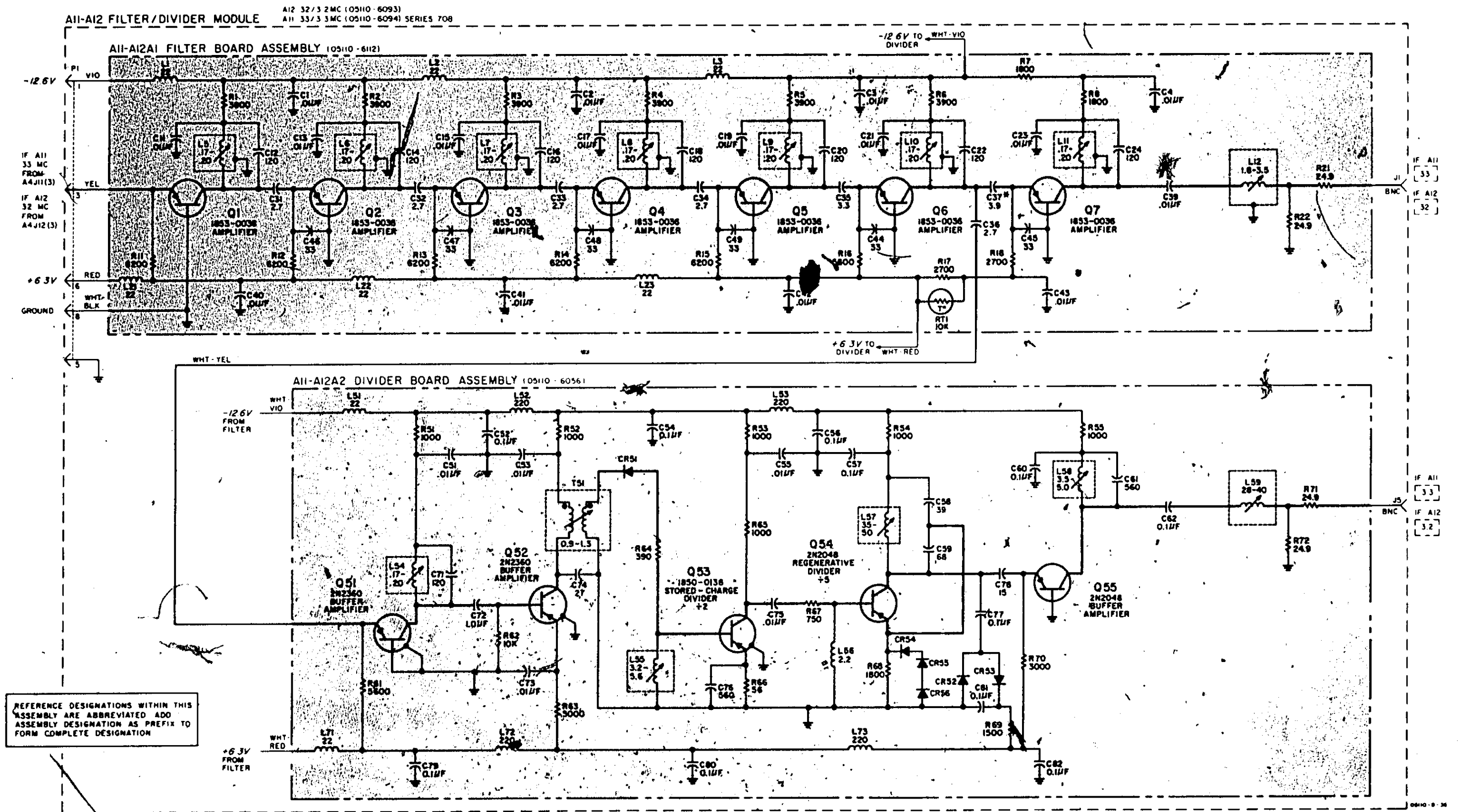
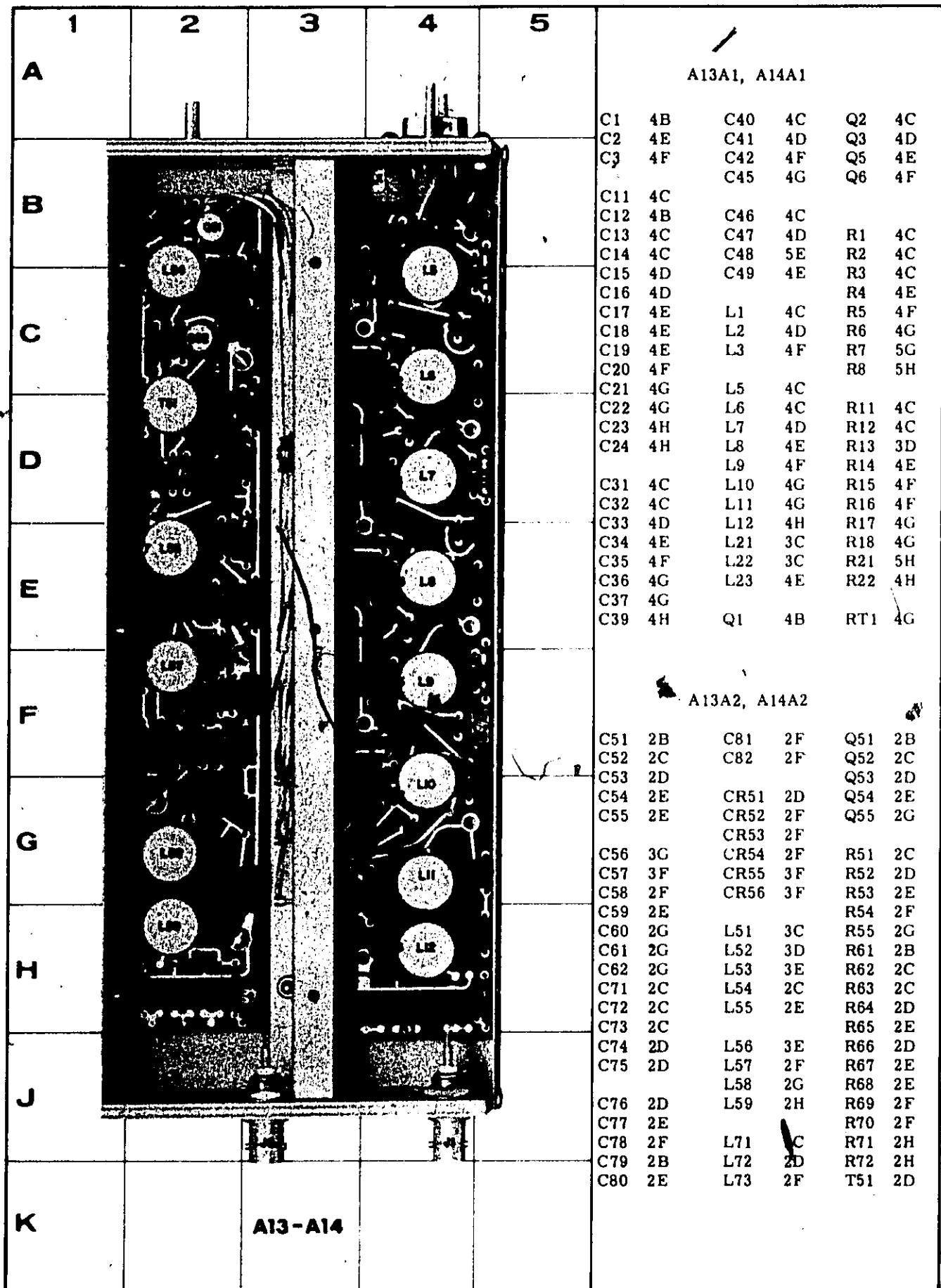


Figure 9-9. 3.3 and 3.2 Mc Filter/Dividers A11, A12  
9-17



NOTES

1. UNLESS OTHERWISE INDICATED  
RESISTANCE IN OHMS,  
CAPACITANCE IN PICOFARADS  
INDUCTANCE IN MICROHENRIES
2. ASTERISK (\*) INDICATES SELECTED  
COMPONENT AVERAGE VALUES  
SHOWN

REFERENCE DESIGNATIONS

A 3 A4	A15 A14A1	A15 A14A2
	4	C5: 62
	24	7: 82
	3: 37	
	19: 49	CR5: 56
21: 5	1: 3	C51: 59
	5: 12	71: 73
	2: 23	
P	J1: 7	Q51: 55
	R1: 8	R51: 55
	11: 18	6: 72
	2: 22	
	RT1	T51

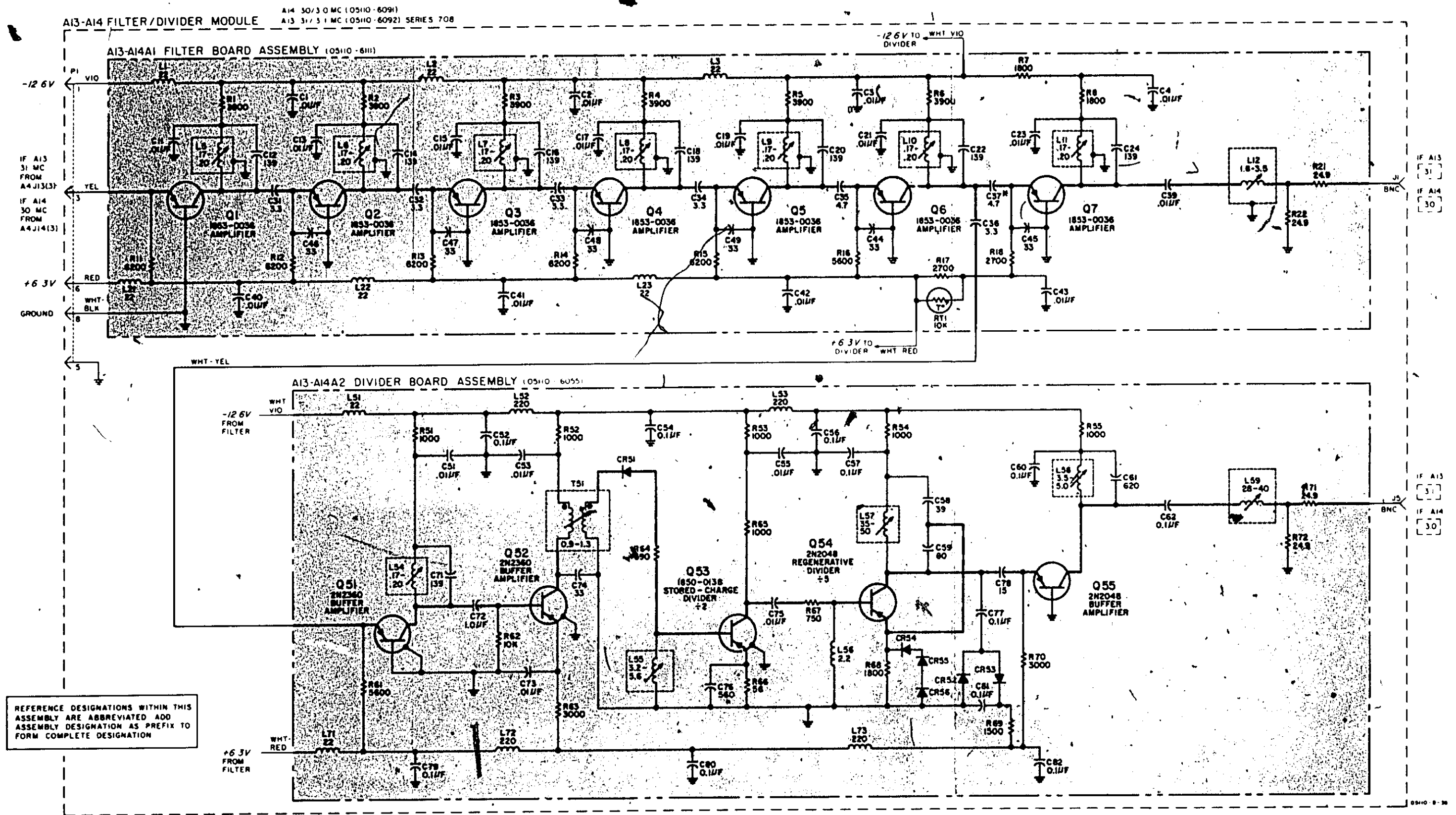


Figure 9-10. 3.1 and 3.0 Mc Filter/Dividers A13-A14

**SCHEMATIC**

**DIAGRAMS**

**CON'T**





NOTES

- 1 UNLESS OTHERWISE INDICATED  
RESISTANCE IN OHMS  
CAPACITANCE IN PICOFARADS  
INDUCTANCE IN MICROHENRIES
- 2 ASTERISK (\*) INDICATES SELECTED  
COMPONENT. AVERAGE VALUES  
SHOWN

REFERENCE DESIGNATIONS

A13-A14	A15 A14A1	A15 A14A2
	C1-4 6-24 51-37 39-49	C51-62 71-82  CR51-56
J1,5	L1-3 5-12 21-23	L51-59 71-73
P1	Q1-7 R1-8 11-18 21,22 RT1	Q51-55 R51-55 61-72  TS1

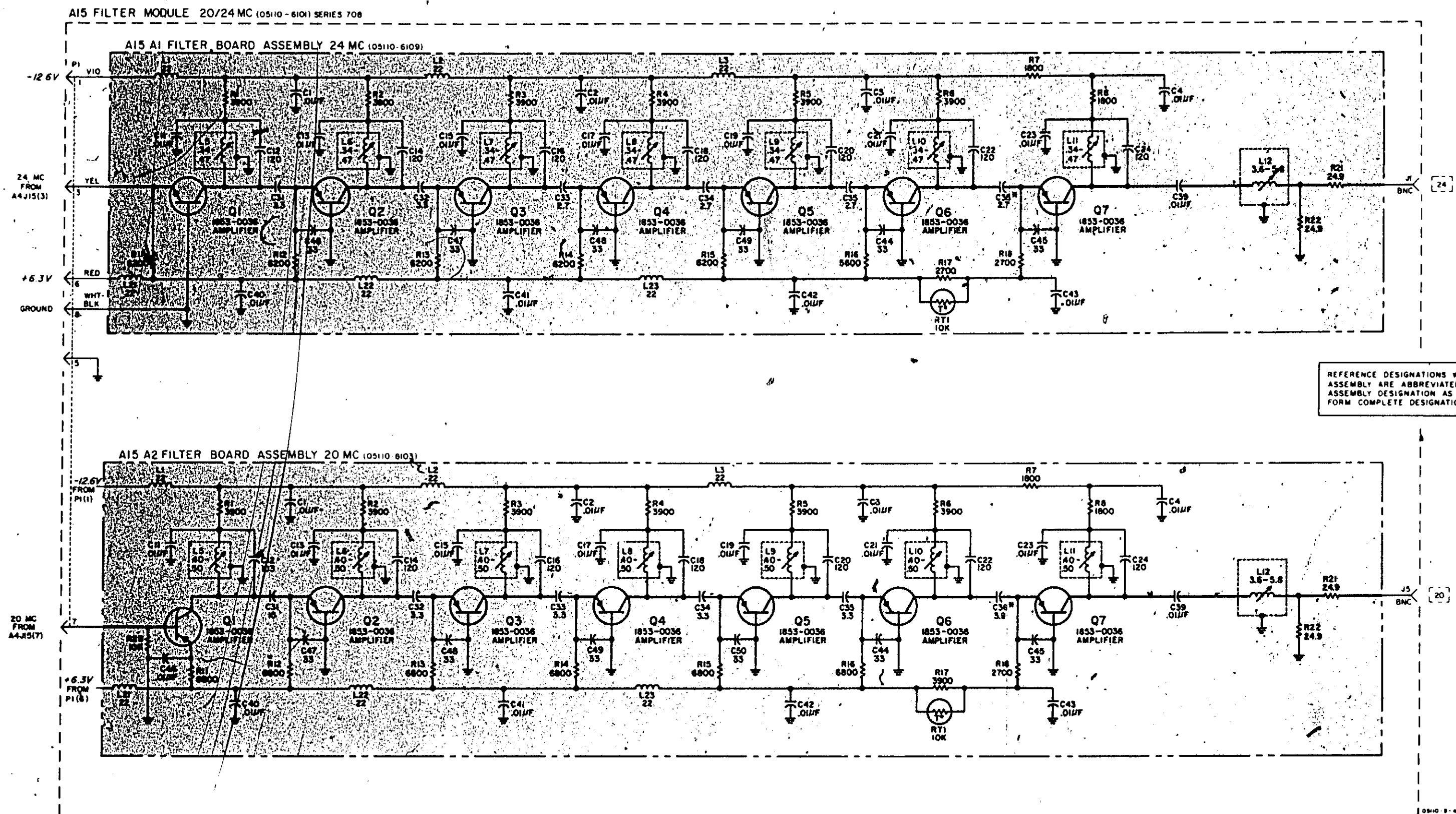
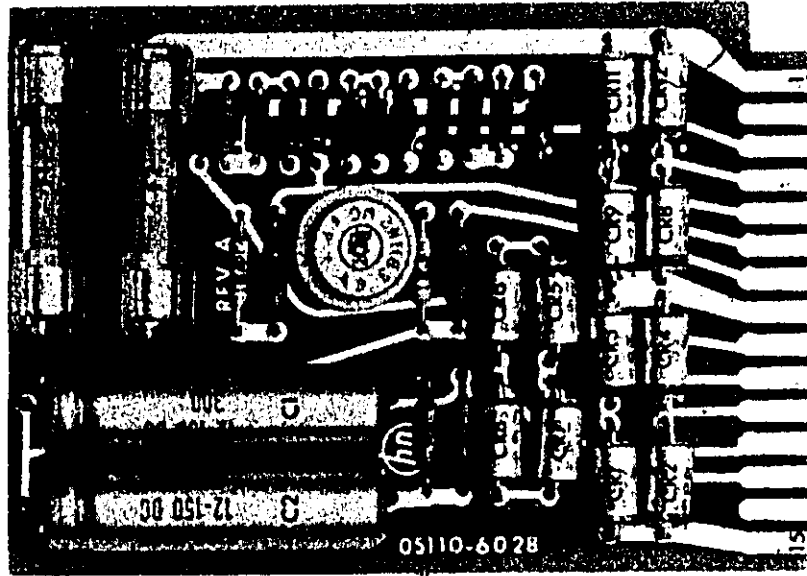
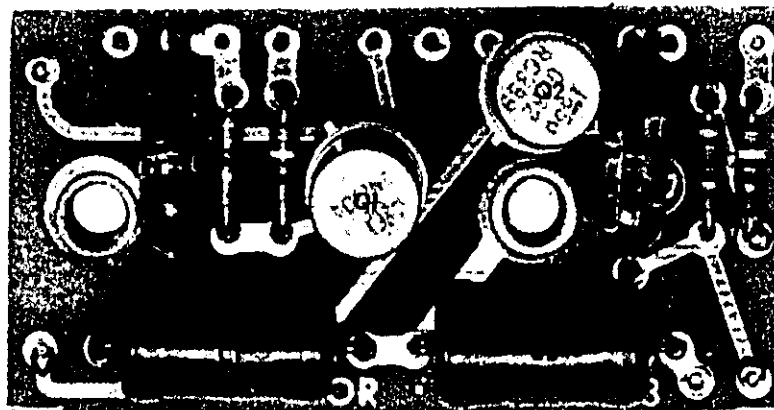


Figure 9-11. A15 20/24 MHz Filter

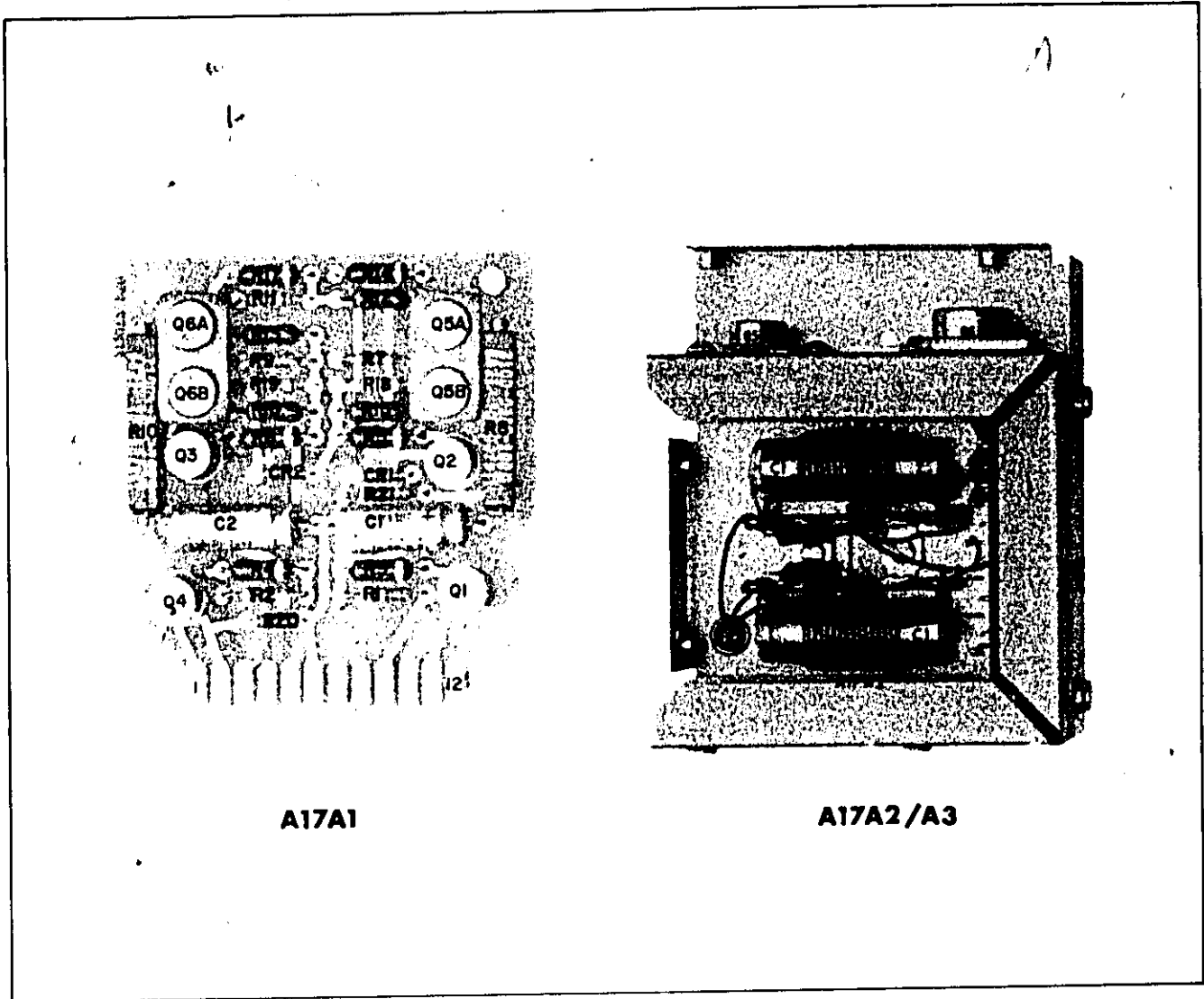
1



A16A1



A16A2



A17A1

A17A2/A3

NOTES

- 1 UNLESS OTHERWISE INDICATED
- RESISTANCE IN OHMS
- CAPACITANCE IN PICOFARADS

REFERENCE DESIGNATIONS

NO PREFIX	A16	A16A1	A16A2	A17	A17A1	A17A2	A17A3
DS1,2	C1,2	C1,2 CR1-24	C1,2	C3,4	C1,2 CR1,2	C1	C1
F1	E1,2	F1,2					
J1	Q1,4 R1	Q1 R1-6	Q1,2 R1-6	Q5,6	Q1-6 R1-21	L1	L1
S1,2	T1						
W1							

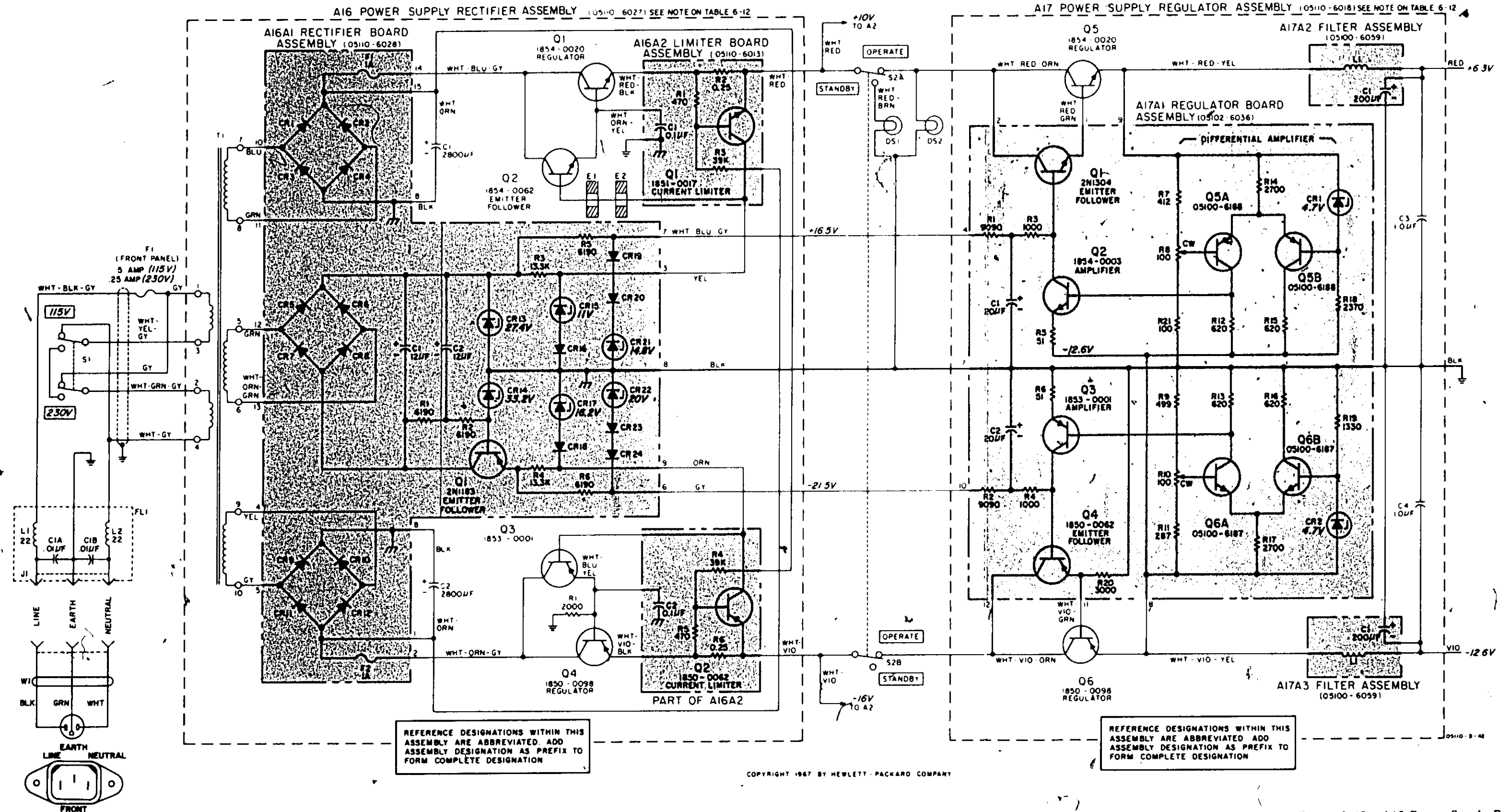


Figure 9-12. A16 Power Supply Rectifier  
A17 Power Supply Regulator

# MANUAL CHANGES

# HEWLETT PACKARD MANUAL CHANGES

MANUAL DESCRIPTION	
INSTRUMENT: 6110B Synthesizer Driver	
SERIAL PREFIX: 1048A	
DATE PRINTED: DEC 1970	
HP PART NO: 05110-9032	

**CHANGE DATE:** January 31, 1974

(This change supersedes all earlier dated changes)

- Make all changes listed as ERRATA.
- Check the following table for your instrument's serial prefix or serial number and make listed change(s) to manual.

IF YOUR INSTRUMENT HAS SERIAL PREFIX OR SERIAL NUMBER	MAKE THE FOLLOWING CHANGES TO YOUR MANUAL	IF YOUR INSTRUMENT HAS SERIAL PREFIX OR SERIAL NUMBER	MAKE THE FOLLOWING CHANGES TO YOUR MANUAL
1124A	1		
1212A	1,2		
1228A	1,2,3		

► **NEW OR REVISED ITEM**

**ERRATA**

Page 1-1, Table 1-1:

Change 8120-1348 to 8120-1378.

Change 5060-0775 to 5060-8740.

Page 3-2, Figure 3-1:

Change call-outs 8 and 9 (at top) to 6 and 5 respectively.

Change 1st word item 4 from "Red" to "Green".

Page 5-2, Table 5-2, SIGNAL-TO-PHASE NOISE RATIO:

Change first line from "68 dB" to "65 dB"

Change second line from "78 dB" to "65 dB".

Change step 8. from "78 dB" to "65 dB".

Page 6-2, Table 6-1:

Change DS2 to 1450-0701.

Change FL1 to 9100-3112.

Add F1 2110-0201 FUSE 1/4 AMP 250 V.

Change W1 from 8120-1248 to 8120-1378.

► Change F1 from 2110-0012 to 2110-0202; add "Slo-Blow" to description.

Page 6-4, Table 6-2:

Change A1C3 to 0160-3060.

Page 6-5, Table 6-2:

Change A1C3,4 to 0160-3060.

Page 6-7, Table 6-3:

Change A1C1, 3-8, 11, 17, 20-23 to 0160-3060.

Page 6-8, Table 6-3:

Change A3CR6 from 1901-0026 to 1901-0028 400 PIV.

Change A1C5, 8, 10, 12, 13, 17-19 to 0160-3060.



ERRATA (Cont'd)

Page 6-9, Table 6-3:

Change A2A3R8 from 0683-1035 to 0683-5625 5600 OHM;  
add to description "FACTORY SELECT COMPONENT."

Page 6-12, Table 6-5:

Change A1C4, 8, 9 to 0160-3060 25V.  
Change A1C37-41 to 0160-2150.

Page 6-14, Table 6-5:

Change A2C1 to 0160-3060.  
Change A2C34-39 to 0160-2150.

Page 6-17, Table 6-6:

Change A1C44-49 to 0160-2150.

Page 6-19, Table 6-6:

Change A2C58 to 0160-2150.  
Change A2C52, 54, 56, 57, 60, 62, 77, 79-82 to 0160-3060 25V.

Page 6-21, Table 6-7:

Change A1C44-49 to 0160-2150.

Page 6-23, Table 6-7:

Change A2C52, 54, 56, 57, 60, 62, 77, 79-82 to 0160-3060 25V.

Page 6-25, Table 6-8:

Change A1C44-49 to 0160-2150.

Page 6-27, Table 6-8:

Change A2C52, 54, 56, 57, 60, 62, 77, 79-82 to 0160-3060 25V.

Page 6-29, Table 6-8:

Change A1C44-49 to 0160-2150.

Page 6-31, Table 6-9:

Change A2C52, 54, 56, 57, 60, 62, 77, 79-82 to 0160-3060 25V.

Page 6-33, Table 6-10:

Change A1C44-49 to 0160-2150.

Page 6-35, Table 6-10:

Change A2C74 to 0160-2150.  
A2C52, 54, 56, 57, 60, 62, 77, 79-82 to 0160-3060 25V.

Page 6-37, Table 6-11:

Change A1C46 to 0160-2150.  
Change A1C35, 38 to 0150-0011 1.5 PF.  
A1C44, 45, 47-49 to 0140-0194 110 PF.  
Change A15A1C35, 38 from 0150-0011 to 0150-0041 2.7 PF (original value)  
Change A15A1R16 from 0758-0057 to 0758-0047 7500 OHM.

Page 6-39, Table 6-11:

Change A2C44, 45, 47-50 to 0160-2150.

ERRATA (Cont'd)

▶Page 6-42, Table 6-12:  
Change A16A1CR1-12 to 1901-0028 400 PIV.

▶Page 6-45, Table 6-13:  
Change 5040-0601 to 0403-0150.

Page 6-51, Table 6-15:  
Change 9110-3112 to 9100-3112 in HP Stock No. and Mfr. Part No. columns.  
▶Change 5040-0601 to 0403-0150.

Page 7-2, Paragraph 7-6, Serial Prefix/Manual Changes table:  
Change Serial Prefix 830 to "820".

Page 7-8, Figure 7-7, Right-hand photo:  
Change J3 to J4.  
Change J4 to J3.

Page 9-6, A2A2 Component Locator (Photo):  
Replace with Figure (A2A2).



Page 9-7, Figure 9-4, A2A2 schematic:  
Add reference designator (CR4) to diode connected between CR3 anode and junction of R12 and C5.

Page 9-7, Figure 9-4, A2A3 schematic:  
Change A2A3R8 to 5600 OHM; add asterisk (\*) to reference designator.

Page 9-21, Figure 9-11, A15A1 schematic:  
Change A15A1C35, 36 to 2.7 PF (original value).  
Change A15A1R16 to 7500 OHM.

Change C35, 36 to 1.5 PF.  
C44, 45, 47-49 to 110 PF.

Page 9-23, A7A1 COMPONENT LOCATOR (Photo):  
Change pin # 1 to 12; # 12 to 1.

**CHANGE 1  
(1124A)**

**NOTE**

This change provides for the new standard and optional instrument colors. Option A85, designates use of light gray panel with olive gray cabinet. Option X95 designates use of light gray panel and blue textured cabinet. Standard colors are mint gray panel and olive gray cabinet.

Page 6-46, Figure 6-1:  
Replace table of Modular Cabinet Parts with Table 1.

Item No.	Description	HP Part No.		
		Standard	Option A85	Option X95
1	Frame Assembly	5060-0732	5060-0732	5060-0732
2	Front Panel	05110-0090	05110-0062	05110-0062
3	Rear Side Cover	05110-0086	05110-0088	05110-0029
4	Front Side Cover	05110-0084	05110-0084	05110-0028
5	Top Cover	05100-6222	05100-6222	05100-6062
6	Bottom Cover	05100-6220	05100-6220	05100-6061
7	Handle Assembly	5060-0222	5060-0222	5060-0222
8	Retainer Handle	05110-0088	05110-0088	05110-0030
9	Foot Assembly	5060-0767	5060-0767	5060-0767
10	Tilt Stand	1490-0030	1490-0030	1490-0030
11	Fluted Aluminum Plate	5000-0051	5000-0051	5000-0051
12	Rack Mount Adapter Kit	5060-8740	5060-0775	5060-0775

**CHANGE 2  
(1212A)**

Page 6-42, Table 6-12:  
Change A18A1Q1 to 1853-0012 2N2904A

**CHANGE 3  
(1228A)**

Page 6-10, Table 6-3:  
Change A2Q1 from 1850-0090 to 1853-0052

Page 6-10, Table 6-3:  
Change 1200-0076 to 0340-0162 and Delete 1200-0087

Page 9-7, Figure 9-4:  
Change A2Q1 from 2N1183N to 2N3740

# SERVICE NOTES

## S E R V I C E   N O T E

SUPERSEDES

## Installation of Option 02 thru 04 in HP Model 5110A &amp; 5110B Frequency Synthesizer

When modifying the HP Model 5110A or 5110B Synthesizer Driver from Option 01 to Option 02, 03, or 04, new end plates may be required for assemblies A5 thru A15. Before attempting this modification check the end plates of these modules, at the rear of the instrument, to be sure there are enough holes to accomodate the additil output connector.

If new end plates are required for the modification they may be ordered from your nearest HP Sales and Service Office. The HP part numbers are given in Table 1.

The new end plates are provided with connector holes for Option 04. When installing Option 02 or 03 not all of the holes will be needed. The unused holes should be plugged using 3/8 inch plug buttons, HP part number 6960-0045.

Table 1. Module End Plate Stock Numbers for Options 02 thru 04

ASSEMBLY	END PLATE PART NO. FOR 02-04
A5	05110-2012
A6	05110-2011
A7	05110-2010
A8	05110-2009
A9	05110-2008
A10	05110-2007
A11	05110-2006
A12	05110-2005
A13	05110-2004
A14	05110-2033
A15	05110-2013

Instructions for installing this modification are given in Section VII of the Model 5110B Operating & Service Manual. Instruments shipped from the factory with Option 02 or 03 do not require new end plates.

Customer Service • 333 Logue Avenue, Mountain View, California 94040 Tel (415) 966-9200

Europe 54 Route Des Acacias, Geneva, Switzerland, Cable "HEWPACKSA" Tel (022) 42 81 50

CL/sg/wn

HEWLETT  PACKARD

April 15, 1966

hp Model 5110A Synthesizer Driver  
Serials Prefixed 552 and below

## Fuse Replacement

When a change is made of either F1 or F2 on A16Q1 Rectifier Board Assembly (05110-6028) it is recommended that these fuses be replaced with 1 ampere fast blow fuses. hp Part No. 2110-0001.

The 1 ampere fuses will provide adequate protection at the lower temperatures and will eliminate occasional fuse failure at high ambient temperatures.

The present markings on the printer circuit board should be corrected to reflect the new value. †

Before replacing the fuse take a pair of longnose pliers and squeeze the fuse clip terminals together to provide a snug fit when fuse is snapped in.