FOR RL 6304

OPERATION AND SERVICE MANUAL

FREQUENCY DIFFERENCE METER

MODEL 527A

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INTRODUCTION

This manual contains the information necessary to operate and maintain the Frequency Difference Meter Model 527A, assembly number 6064, manufactured by TRACOR, Inc. This information includes physical description, installation and preliminary adjustment procedures, operating procedures, theory of operation, procedures for calibration and alignment, a parts list, and applicable drawings and diagrams required to provide adequate manual support.

This manual is to be used by all personnel operating or servicing the Frequency Difference Meter.

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SECTION I

GENERAL DESCRIPTION

1-1. SCOPE OF SECTION.

1-2. This section describes the purpose and physical characteristics of the TRACOR, Inc., all-silicon solid state Model 527A Frequency Difference Meter (FDM) and provides a brief description of the operating controls and connectors.

1-3. PURPOSE OF EQUIPMENT.

1-4. The Model 527A FDM is used to determine the fractional frequency difference between two stable oscillators, to adjust two oscillators to the same frequency, to offset one oscillator from another by a specified frequency, and to analyze short and long term frequency stability at nominal frequencies of 100 kHz, 1 mHz, 2.5 mHz, and 5 mHz.

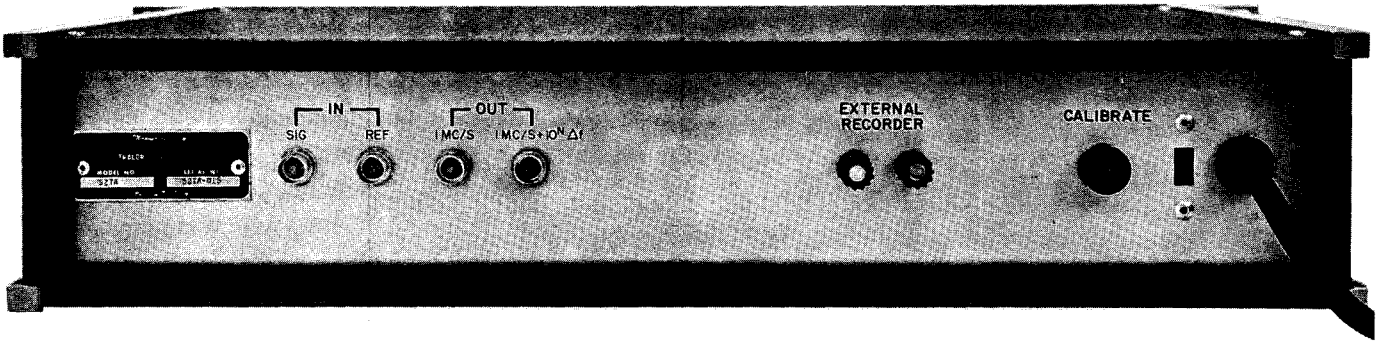
1-5. DESCRIPTION OF EQUIPMENT.

1-6. The FDM (figure 1-1) is 3.5 inches high, 12.75 inches deep, 16.875 inches wide, and weighs approximately 15 pounds. The rack mounted model is 19 inches wide. It contains 14 printed circuit plug-in boards: a power transistor board, a flip-flop board, 4 error multiplier boards, a reference input/9 mHz amplifier board, a 5 mHz/1 mHz divider board, a buffer amplifier board, a power supply board, a differentiator/integrator board, a single shot/phase comparator board, a crystal filter board and a scope driver board. A PCB extender board is provided to faciliate trouble shooting and maintenance. Refer to table 1-I for a functional description of the FDM controls, connectors, and indicators.

1-7. ELECTRICAL SPECIFICATIONS.

1-8. The electrical specifications of the Model 527A FDM are as listed in the following paragraphs.

Front View



Rear View

Figure 1-1. Frequency Difference Meter Model 527A.

TABLE 1-I. Frequency Difference Meter Controls, Indicators, and Connectors (Sheet 1 of 2).

Name	Reference Designation	Function
POWER switch and lamp	S5/DS1	Applies 115 volt ac power to FDM circuitry. Lamp lights when POWER switch is in ON position and unit is connected to facility power.
ZERO ADJ potentiometer	R2	Adjusts electrical zero of meter when reference signal is applied and TEST/OPERATE switch is set to TEST.
Scope	V1	Indicates phase relationship between two nominal frequencies for conversion to fractional frequency difference.
Meter	M1	Indicates fractional difference between two nominal frequencies in parts in 10^N.
OVERRANGE lamp	DS2	Indicates when fractional frequency difference exceeds meter range or when excessively noisy input signal is applied.
METER RANGE/ DIFF MULT selector	S3	Selects fractional frequency difference range for meter in parts in 10^7, 10^8, 10^9, 10^{10}, or 10^{11}. Also indicates amount of multiplication of fractional frequency difference.
SIG INPUT connectors	J5/J6	Provides connection of unknown frequency signal on either front or back panel.

TABLE 1-I. Frequency Difference Meter Controls, Indicators, and Connectors (Sheet 2 of 2).

Name	Reference Designation	Function
REF INPUT connectors	J4/J7	Provides connection of known frequency reference on either front or back panel.
TEST/OPERATE switch	S2	In TEST position, reference input is applied to error multiplier circuits, instead of unknown signal, to allow meter to be electrically zeroed.
FILTER switch	S4	Switches crystal filter into signal circuit in 10^{10} and 10^{11} meter ranges. Is used when signal input is excessively noisy.
Fuse	F1	Protects FDM circuitry from excessive current overloads.
EXTERNAL RECORDER connectors	J1/J9	Provides connection of dc output voltage, proportional to fractional frequency difference indicated on meter, to external chart recorder.
FOCUS potentiometer	R4	Adjusts cathode ray beam to provide clear scope image.
BRT potentiometer	R3	Adjusts brightness of scope image.
115/230 switch	S1	Switches internal transformer windings from parallel to series to allow operation from 115 or 230 volts ac.
CALIBRATE potentiometer	R1	Adjusts output voltage available at EXTERNAL RECORDER connectors to scale of chart recorder being used.

1-9.	INPUT REQUIREMENTS.	
1-10.	Frequencies	100 kHz (±0.25%); 1 mHz (±0.50%); 2.5 mHz (±0.50%); 5 mHz (±0.50%).
1-11.	Voltage	0.5 to 10.0 volts rms.
1-12.	Impedance	1000 ohms nominal.
1-13.	Connectors	BNC, both front and back panels.
1-14.	OUTPUT REQUIREMENTS.	
1-15.	Frequencies	1 mHz derived from reference input; 1 mHz + 10^N ΔF derived from signal input.
1-16.	Voltage	2 volts peak-to-peak
1-17.	Impedance	2000 ohms nominal.
1-18.	Connectors	BNC, back panel.
1-19.	Record output	DC voltage proportional to front panel meter reading. Back panel binding posts on 0.75 inch centers. Will drive 0.5 milliampere recorder with input impedance less than or equal to 2000 ohms.
1-20.	FREQUENCY DIFFERENCE INDICATORS.	
1-21.	Meter	Front panel; zero center, scale from -10 to +10 parts in 10^7, 10^8, 10^9, 10^{10} or 10^{11}. (±5% of full scale reading on all ranges.)
1-22.	Scope	Signal phase, with multiplied differential error, is shown by dot moving in circular pattern.
1-23.	POWER REQUIREMENTS.	115 volts (±15%)or 230 volts (±15%), 48-420 Hz; approximately 20 watts.

SECTION II
INSTALLATION AND ADJUSTMENTS

2-1. SCOPE OF SECTION .

2-2. This section will provide instructions for installation and initial adjustment of Model 527A FDM.

2-3. INSTALLATION.

2-4. Carefully unpack and examine the FDM for possible damage during shipment. Special attention should be given to areas where the outside shipping package was damaged.

NOTE

The Model 527A FDM is, by necessity, an extremely sensitive instrument and is conservatively designed for minimum susceptability to excessive vibration and large alternating magnetic fields. However, operation in such environments should be avoided. Problems that can arise by operating in such environments are covered in paragraph 3-9.

2-5. The FDM can be mounted in a standard 19 inch rack or located on a bench. For bench operation, rubber feet provided in the accessary parts set (6355-0002) should be used. Refer to figure 2-1 for proper installation of rubber feet.

2-6. PRELIMINARY ADJUSTMENTS.

2-7. The operator should become familiar with the controls and connectors and then perform the following preliminary adjustment procedure:

a. Check that 115/230 switch on back panel is in correct position for power source to be used.
b. Connect FDM to 115 or 230 volt, 48 to 420 Hz, single phase power source.

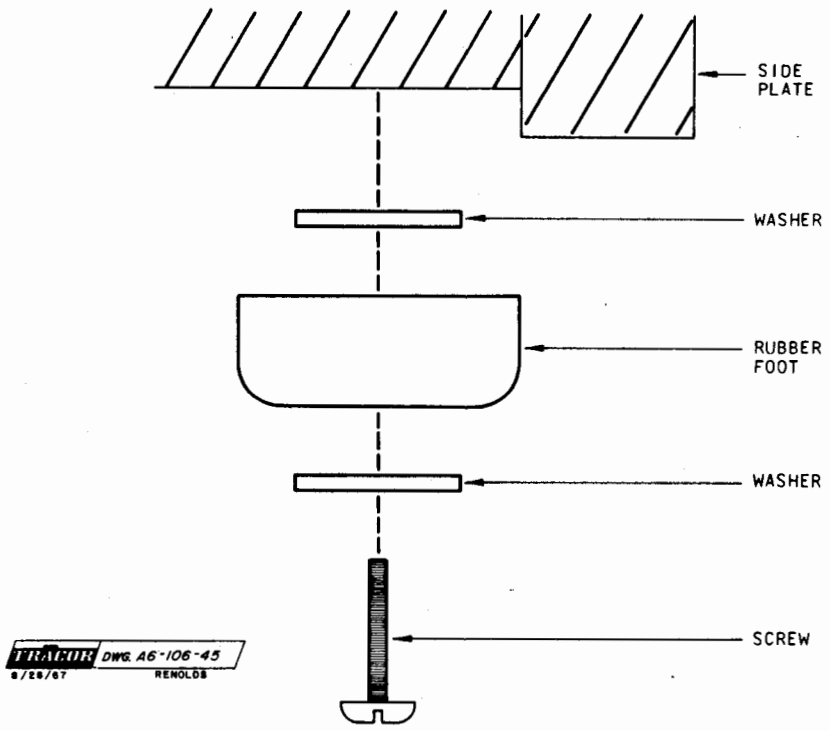


Figure 2-1. Installation of Rubber Feet.

c. Check that front panel meter indicates zero when POWER switch is OFF. Use recessed mechanical zero adjustment just below meter, if meter does not indicate zero. Do not use ZERO ADJ potentiometer.

d. Connect reference frequency standard to REF INPUT connector on either front or back panel.

e. Set TEST/OPERATE switch to TEST.

f. Set POWER switch to ON. POWER lamp should light.

CAUTION

To prevent burning scope face, avoid excessive brightness.

g. Adjust FOCUS and BRT potentiometers as required to obtain clear spot on scope.

h. Front panel meter should indicate zero; if it does not, adjust ZERO ADJ potentiometer to obtain zero indication. METER RANGE selector or FILTER switch position will not affect meter zero.

SECTION III
OPERATION

3-1. SCOPE OF SECTION.

3-2. This section provides detailed procedures for operation of the Model 527A FDM to measure frequency difference, perform oscillator adjustments, offset one oscillator frequency from another, and to analyze and measure short and long term oscillator stability.

3-3. EQUIPMENT TURN ON.

3-4. The Model 527A FDM requires no special turn on procedures beyond setting the 115/230 switch to the correct position; connecting the power cord to a 115 or 230 volt, 48-420 Hz power source; and setting the POWER switch to ON. It does not require any warmup period.

3-5. OPERATION.

3-6. Prior to using the FDM, the meter should be zeroed in accordance with paragraph 2-6.

3-7. Care should be taken to avoid external ground loops and excessive cable lengths. All cabling should be properly shielded. This will minimize cross coupling between the signal and reference inputs or between the 1 mHz + 10^N ΔF output and either the reference or signal input. Cross coupling between signal and reference inputs is indicated by low frequency cycling on the front panel meter; cross coupling between the 1 mHz + $10^N\Delta$F output and either the signal or reference input is indicated by higher frequency cycling on the front panel meter. An oscilloscope synchronized with the reference input and connected to view the signal input can introduce sufficient cross coupling to cause the front panel meter to cycle. Phase shifts between the signal source and the FDM can also affect meter readings.

3-8. FREQUENCY DIFFERENCE MEASUREMENT. To determine the fractional frequency difference between two stable oscillators, any one of the following methods may be used:

a. Meter readout.
b. Internal oscilloscope.
c. External chart recorder.
d. External oscilloscope.
e. External electronic counter with counter time base.
f. External electronic counter with external time base.

3-9. Meter Readout. The fractional frequency difference between a signal and reference input can be read directly from the meter. Determine the fractional frequency difference as follows:

a. Set METER RANGE selector to 10^7.
b. Connect reference frequency standard to REF INPUT connector.
c. Connect signal frequency to SIG INPUT connector.
d. Set TEST/OPERATE switch to OPERATE.
e. Set METER RANGE selector to position giving largest on-scale reading without causing OVERRANGE lamp to light.

NOTE

If OVERRANGE lamp remains lighted in all METER RANGE selector positions, either fractional frequency difference is beyond meter range or excessive noise is present. Presence of phase noise indicates that either reference or signal inputs are noisy, or the instrument is being subjected to vibration or alternating magnetic fields. In 10^{10} and 10^{11} position noise can be reduced somewhat by setting FILTER switch to IN. Filter is limited to input frequencies within 5 parts in 10^7 of the standard frequencies due to filter bandwidth limitation.

f. Read fractional frequency difference directly from meter. For example, if meter reading is 6.5 and METER RANGE selector is set to 10^9 position, fractional frequency difference between signal and reference frequencies is 6.5 parts in 10^9.

3-10. Internal Oscilloscope. The spot rotation rate on the front panel scope is proportional to the fractional frequency difference between a signal and reference input. Accuracy of this method is limited only by accuracy with which rotation rate, or its reciprocal, is determined. Determine the fractional frequency difference as follows:

a. Set DIFF MULT selector to 10.
b. Connect reference frequency standard to REF INPUT connector.
c. Connect signal frequency to SIG INPUT connector.
d. Set TEST/OPERATE switch to OPERATE.
e. Set DIFF MULT selector to position giving greatest, readable rotation rate without causing OVERRANGE lamp to light.

NOTE

If scope spot "smears" into an arc and the arc length is greater than 360 degress, excessive phase noise is present. Presence of phase noise indicates that either reference or signal inputs are noisy, or the instrument is being subjected to vibration or alternating magnetic fields. In 10^{10} and 10^{11} position noise can be reduced somewhat by setting FILTER switch to IN. Filter is limited to input frequencies within 5 parts in 10^7 of the standard frequencies due to filter bandwidth limitation.

f. Rotation rate is related to the fractional frequency difference and the difference multiplier as follows: rotations/sec = (DIFF MULT position) ($\Delta F/F$) (10^6). After rotation rate is determined, $\Delta F/F$ can be easily determined. For example, if the rotation rate is 0.43 rotations/second clockwise and the DIFF MULT selector is in the 10^3 position, the fractional frequency difference is plus 4.3 parts in 10^{10}. A stopwatch should be used to time the rotation rate or its reciprocal. Figures 2-1 and 2-2 can be used to help determine $\Delta F/F$ when either rotation rate or its reciprocal is known.

3-11. External Chart Recorder. A $\pm$0.5 miliampere recorder with input impedance less than or equal to 2000 ohms can be used for recording fractional frequency differences. The EXTERNAL RECORDER output on back panel is proportional to front panel meter reading. Determine fractional frequency difference as follows:

a. Set up meter indication in accordance with paragraph 3-9.
b. Set TEST/OPERATE switch to TEST.
c. Adjust recorder for zero indication at center of chart.
d. Set TEST/OPERATE switch to OPERATE.
e. Adjust CALIBRATE potentiometer on rear panel until recorder reading corresponds to meter reading.

3-12. External Oscilloscope. An oscilloscope can be used to measure the fractional frequency difference by displaying the signal output on the oscilloscope when it is synchronized to the reference output. Accuracy of this method is limited only by accuracy with which display movement rate, or its reciprocal, is determined. Determine fractional frequency difference as follows:

a. Connect 1 MC/S OUT signal to oscilloscope as signal to be displayed.

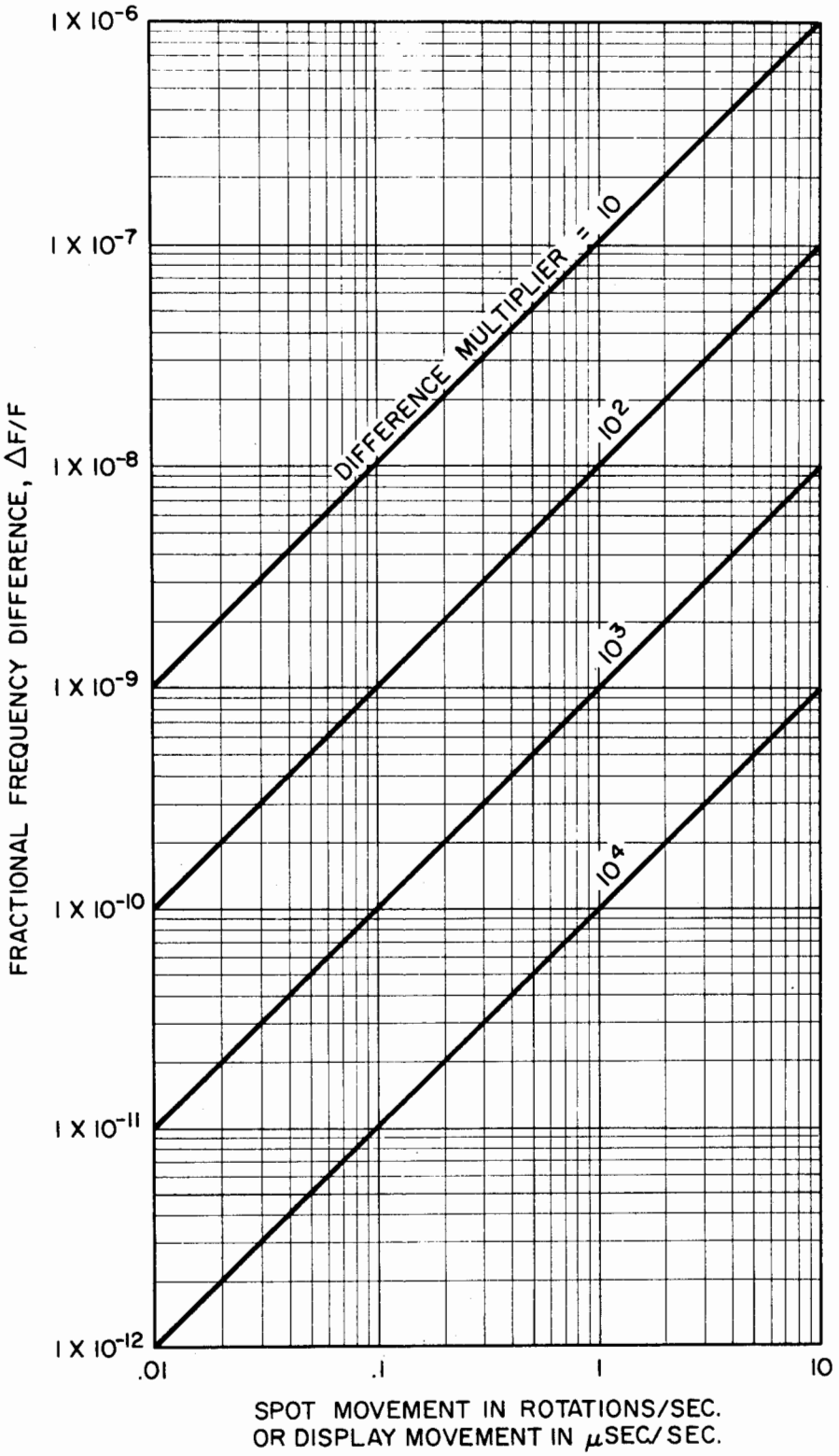


Figure 3-1. Fractional Frequency Difference vs Display Movement in μsec/sec or Spot Rotation in rotations/sec.

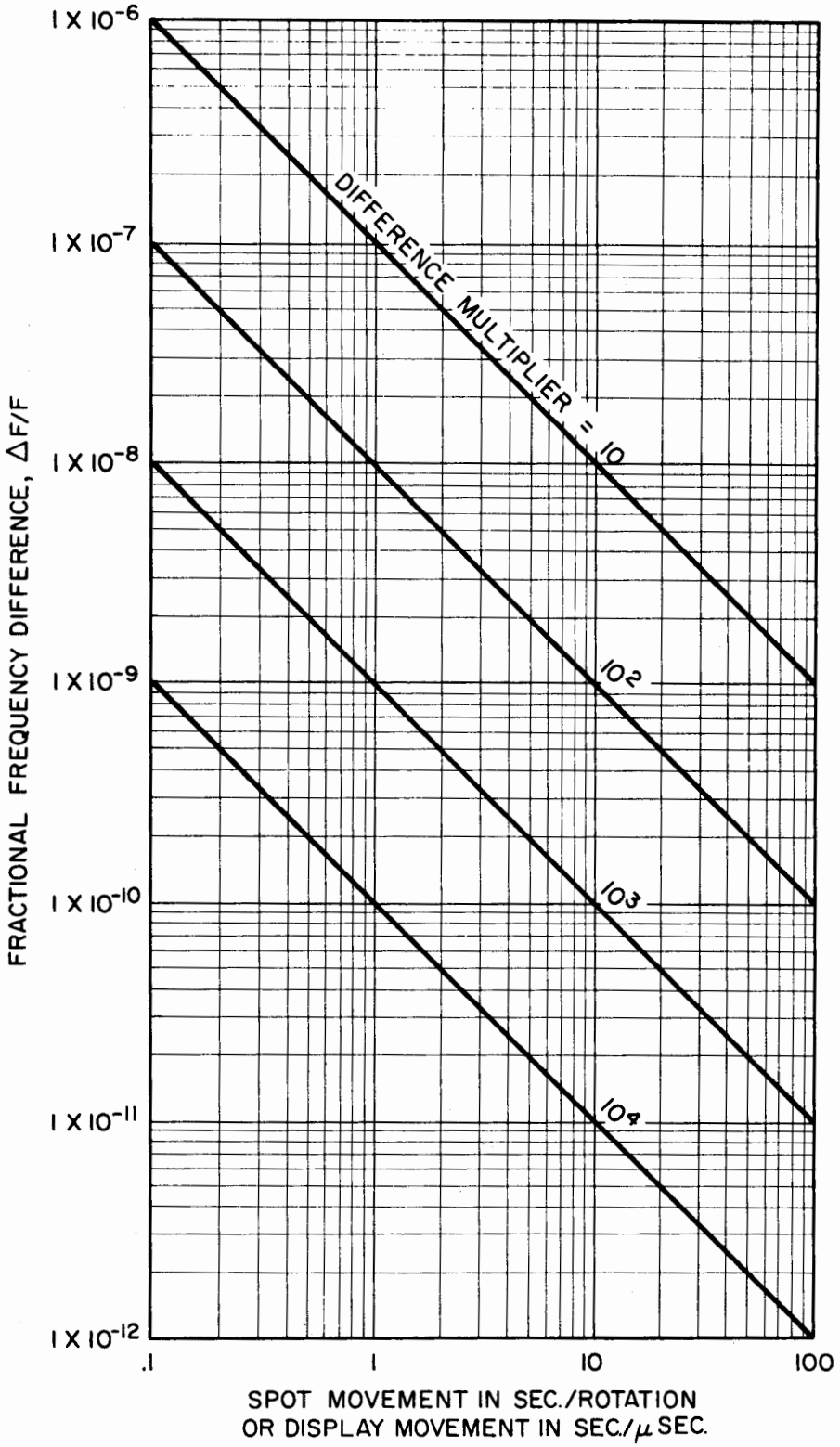


Figure 3-2. Fractional Frequency Difference vs Display Movement in sec/μsec or Spot Rotation in sec/rotation

b. Connect 1 MC/S + 10^N Δf OUT reference to oscilloscope as synchronizing signal.

c. Use most sensitive usable scale for DIFF MULT selector.

d. Rate in microseconds per second at which oscilloscope display moves is related to fractional frequency difference between signal and reference as follows: μsec/sec = (DIFF MULT position) (Δ F/F) (10^6).

After the rate at which display moves is determined, ΔF/F can be easily determined. For example, if display moves right at 1.8 μsec/sec and DIFF MULT selector is set to 10^3, ΔF/F equals minus 1.8 parts in 10^9. Figures 2-1 and 2-2 can be used to help determine ΔF/F when either display movement rate or its reciprocal is known.

3-13. External Electronic Counter With Counter Time Base. This method is useful when the fractional frequency difference exceeds the meter readout limit of 10 parts in 10^7. This method is limited only by the FDM 10 kHz bandwidth at 1 mHz + 10^N ΔF. With the DIFF MULT selector set to 10, as large as one part in 10^3 can be measured.

3-14. The only requirements for the counter are that its frequency range include 1 mHz and that it have sufficient input sensitivity to operate from the FDM outputs. Always account for the counter's ±1 count ambiguity by using the longest available gate time and the most sensitive, usable DIFF MULT selector position. Determine the fractional frequency difference as follows:

a. Connect 1 MC/S + 10^N Δf OUT signal to counter input.

b. Set TEST/OPERATE switch to OPERATE. Note counter readout.

c. Set TEST/OPERATE switch to TEST. Note counter readout.

d. Calculate the fractional frequency difference using the following equation: ΔF/F =

$$\frac{\text{(TEST position readout) - (OPERATE position readout)}}{(10^6)\quad\text{(DIFF MULT selector position)}}$$

As an example, assume the counter time base is 1 mHz, its gate time is set to 10 seconds, and it has a 6 digit readout. Starting with the DIFF MULT selector set to 10, the counter readout is 1000.0776 kHz with the TEST/OPERATE switch in the OPERATE position. This readout represents the signal input frequency. The underlined digits are all that will be visible on the counter readout. This gives a frequency offset of 77 Hz (neglecting the time base offset and the ±1 count ambiguity). Since the FDM bandwidth limit is 10,000 Hz, the DIFF MULT selector can be set to 10^3. Assume the counter readout in this position is 1007.7616 kHz. This gives a frequency offset of 7,761 Hz, within the bandwidth limit. Set the TEST/OPERATE switch to TEST to measure the reference input frequency. Assume the counter readout is 1000.0003 kHz; this gives a frequency offset of 0.3 Hz (neglecting the ±1 count ambiguity). The equation given in paragraph 3-14 d., gives the following results:

$$\Delta F/F = \frac{1{,}007{,}761.6\text{ Hz} - 1{,}000{,}000.3\text{ Hz}}{(10^6)\quad(10^3)} = \frac{7{,}761.3}{(10^9)}$$

or 7.7613 parts in 10^6. Using the method, the time base offset is cancelled out in the subtraction. The only remaining error is the ±1 count ambiguity, which is eliminated by dropping the last digit in the answer. The correct fractional frequency difference is then 7.761 parts in 10^6.

3-15. If the signal and reference input frequency errors in paragraph 3-14 had the same absolute values, but were low instead of high, the counter readouts would have been 992.2384 kHz and 999.9997 kHz for the signal and reference outputs respectively. In this case, the fractional frequency difference would have been -7.761 parts in 10^6.

3-16. It was assumed in paragraph 3-14 that the signal and reference inputs were extremely stable and that the readouts

remained constant for any number of 10 second gate intervals. Actually, phase noise will probably cause one or more readout digits to change from one gate interval to the next. These digits should be considered unreliable and should not be used when calculating the fractional frequency difference.

3-17 External Electronic Counter With External Time Base. This method is basically the same as the method described in paragraph 3-13, except that no reading is taken with the TEST/OPERATE switch in the TEST position. The 1 MC/S OUT signal is used as the time base. Use the following equation to determine the fractional frequency difference:

$$\Delta F/F = \frac{\text{(OPERATE position readout)} - 1{,}000{,}000.0 \text{ Hz}}{(10^6) \quad \text{(DIFF MULT position)}}$$

The results will be the same as in paragraph 3-13. The ± 1 count ambiguity and any phase noise must also be accounted for in the results.

3-18 OSCILLATOR ADJUSTMENT. The basic procedures for oscillator adjustment are the same as specified in paragraphs 3-8 or 3-9 for frequency difference measurement. After the meter reading or oscilloscope spot is set up, increase or decrease the oscillator frequency until the desired meter reading or spot rotation is obtained. Always start with the METER RANGE/DIFF MULT selector in the least sensitive position, advancing it to more sensitive positions as the frequency difference is decreased.

NOTE

The two input frequencies do not have to be at the same nominal frequency. For example, the reference input frequency can be at a nominal 1 mHz and the frequency to be adjusted at a nominal 2.5 mHz.

3-19. ANALYZING OSCILLATOR SHORT TERM STABILITY. The basic procedures for analyzing oscillator short term stability are the same as specified in paragraphs 3-8 or 3-9 for frequency difference measurement. This can be done by observing the front panel meter or oscilloscope, analyzing an external recorder output, or by observing the change in a counter readout. The 1 MC/S + 10^N Δf OUT signal can also be analyzed with a spectrum analyzer or checked against the 1 MC/S OUT signal by external phase comparison using any desired time constant. Since both oscillators can contribute to instability, the measured stability is relative between the two oscillators.

3-20. OSCILLATOR LONG TERM STABILITY MEASUREMENT. The basic procedures for analyzing oscillator long term stability are the same as specified in paragraphs 3-8 or 3-9 for frequency difference measurement. The rate of frequency change with respect to time can be determined by recording the frequency difference on an external chart recorder. This is also useful for studying oscillator ageing behavior or studying oscillator behavior under various service conditions such as temperature changes.

SECTION IV
THEORY OF OPERATION

4-1. SCOPE OF SECTION.

4-2. This section provides a general description of the overall operation of the Model 527A FDM and detailed analysis of its individual circuits and modules. This analysis is supported by block diagrams and references to schematic diagrams as required.

4-3. FUNCTIONAL ANALYSIS.

4-4. The FDM can be divided into two main operational sections; the error multiplier section and the difference detector section. Refer to figure 4-1 for a functional block diagram of the FDM.

4-5. ERROR MULTIPLIER SECTION. The error multiplier section consists of a synthesizer, four error multipliers, and a crystal filter. The synthesizer converts the reference input signal to a 9 mHz reference signal for the error multipliers, and to a 1 mHz reference signal for the display circuits and 1 MC/S OUT reference signal. The first error multiplier converts the input signal to a 1 mHz signal with 10 time the fractional frequency offset of the input signal. The second, third, and fourth error multipliers have 1 mHz outputs with 100, 1,000, and 10,000 times the fractional frequency offset of the input signal, respectively. A crystal filter can be switched into the circuit between the second and third error multipliers to allow for better difference multiplication of noisy input signals. Table 4-I gives the relationships between the signal inputs and the error multiplier outputs.

Table 4-I. Signal Input and Error Multiplier Output Relationships.

Input Signal	DIFF MULT Selector Setting			
	10	10^2	10^3	10^4
100 kHz + ΔF_1	1 mHz + 100ΔF_1	1 mHz + 1,000ΔF_1	1 mHz + 10,000ΔF_1	1 mHz + 100,000ΔF_1
1 mHz + ΔF_2	1 mHz + 10ΔF_2	1 mHz + 100ΔF_2	1 mHz + 1,000ΔF_2	1 mHz + 10,000ΔF_2
2.5 mHz + ΔF_3	1 mHz + 4ΔF_3	1 mHz + 40ΔF_3	1 mHz + 400ΔF_3	1 mHz + 4,000ΔF_3
5 mHz + ΔF_4	1 mHz + 2ΔF_4	1 mHz + 20ΔF_4	1 mHz + 200ΔF_4	1 mHz + 2,000ΔF_4

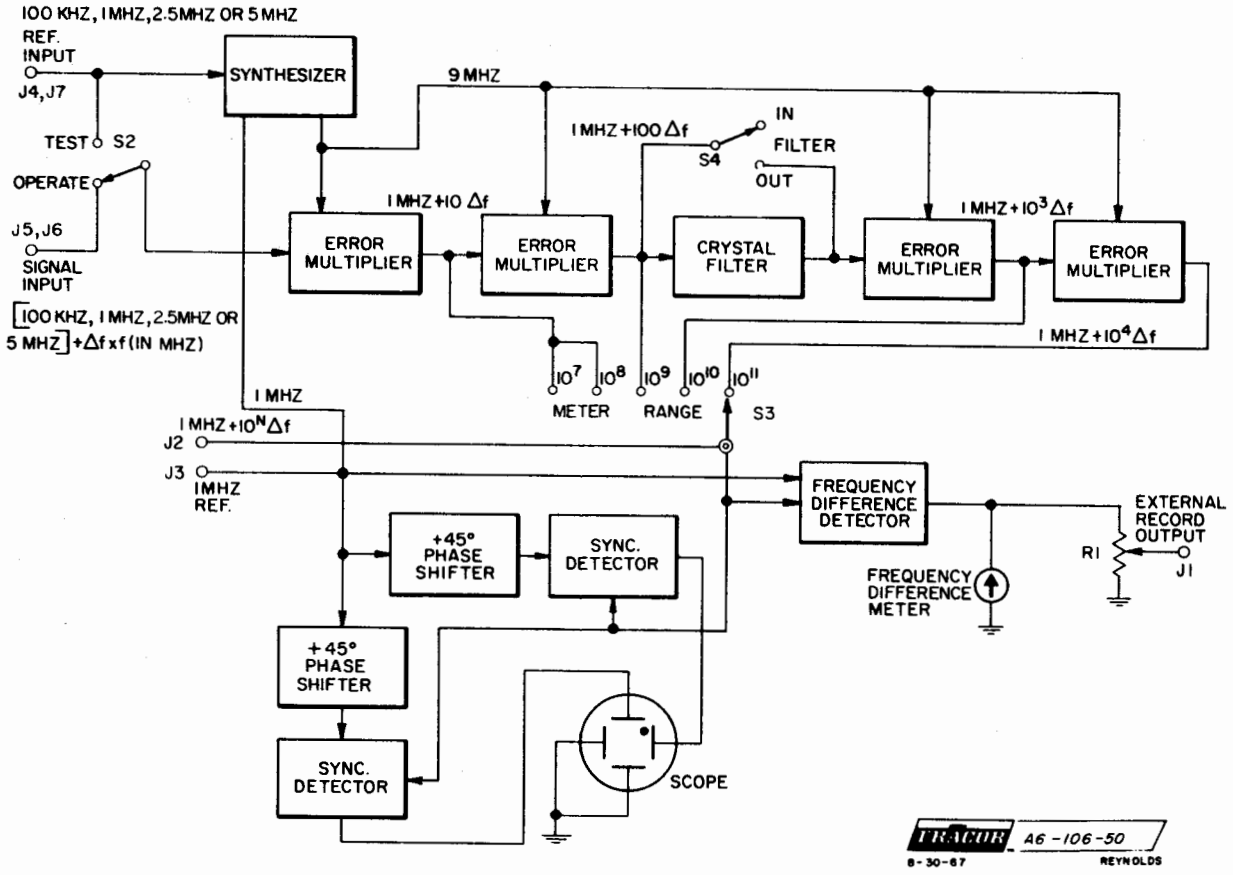


Figure 4-1. Model 527A Functional Block Diagram.

4-6. DIFFERENCE DETECTOR SECTION. The difference detector section consists of a frequency difference detector, frequency difference meter, and oscilloscope. The frequency difference detector converts the fractional frequency difference between the synthesizer and error multiplier outputs, as selected by the METER RANGE selector, to a dc voltage for use by the front panel meter. The frequency difference detector is calibrated such that when (DIFF MULT) ($\Delta F/F$) (10^6) equals 1 Hz, the front panel meter deflects full scale.

4-7. The 1 mHz reference signal from the synthesizer is phase shifted by plus and minus 45 degrees and applied to two synchronus detectors. The reference signal for the synchronus detectors is

the 1 mHz + 10^N ΔF signal from the error multipliers. The outputs of the synchronus detectors are proportion to the sine and cosine of the phase angle between the 1 mHz and 1 mHz + 10^N ΔF signals. Oscilloscope spot rotation rate is proportional to $10^N\Delta F$. The spot rotates clockwise when the signal frequency is greater than the reference frequency and counterclockwise when the signal frequency is less than the reference frequency.

4-8. DETAILED THEORY OF OPERATION

4-9. The FDM contains 14 plug-in printed circuit boards, or modules, which are as follows; power transistor board, flip-flop, 4 error multipliers, reference input/9 mHz amplifier, 5 mHz/1 mHz divider, buffer amplifier, power supply, differentiator/integrator, single shot/phase comparator, crystal filter, and scope driver.

4-10. POWER SUPPLY. The power supply consists of power transistor printed circuit board assembly 6153 and power supply printed circuit board assembly 6160 (see schematic 6201). The power supply has three dc outputs; + 15, -15, and +9 volts; and operates from 115 volts ac coupled through FDM transformer T1. The +9 volt dc power supply consists of transistors Q1, Q2, and Q6. Its output is regulated by voltage regulator VR1 with capacitor C4 across the output to reduce ripple. The +15 volt dc power supply consists of transistors Q3, Q4, and Q5. It uses the -15 volt dc power supply as a reference for voltage regulation. Capacitor C2 across its output reduces ripple. The -15 volt dc power is derived directly from the diode bridge and input filter. The output is regulated by voltage regulator VR 2 with capacitor C5 across its output to reduce ripple.

4-11. SYNTHESIZER. The synthesizer consists of reference input/9 mHz amplifier printed circuit board assembly 6157 (see schematic 6207) and 5 mHz/1 mHz divider printed circuit board assembly 6158 (see schematic 6206). Refer to figure 4-2 for a functional block diagram of the synthesizer.

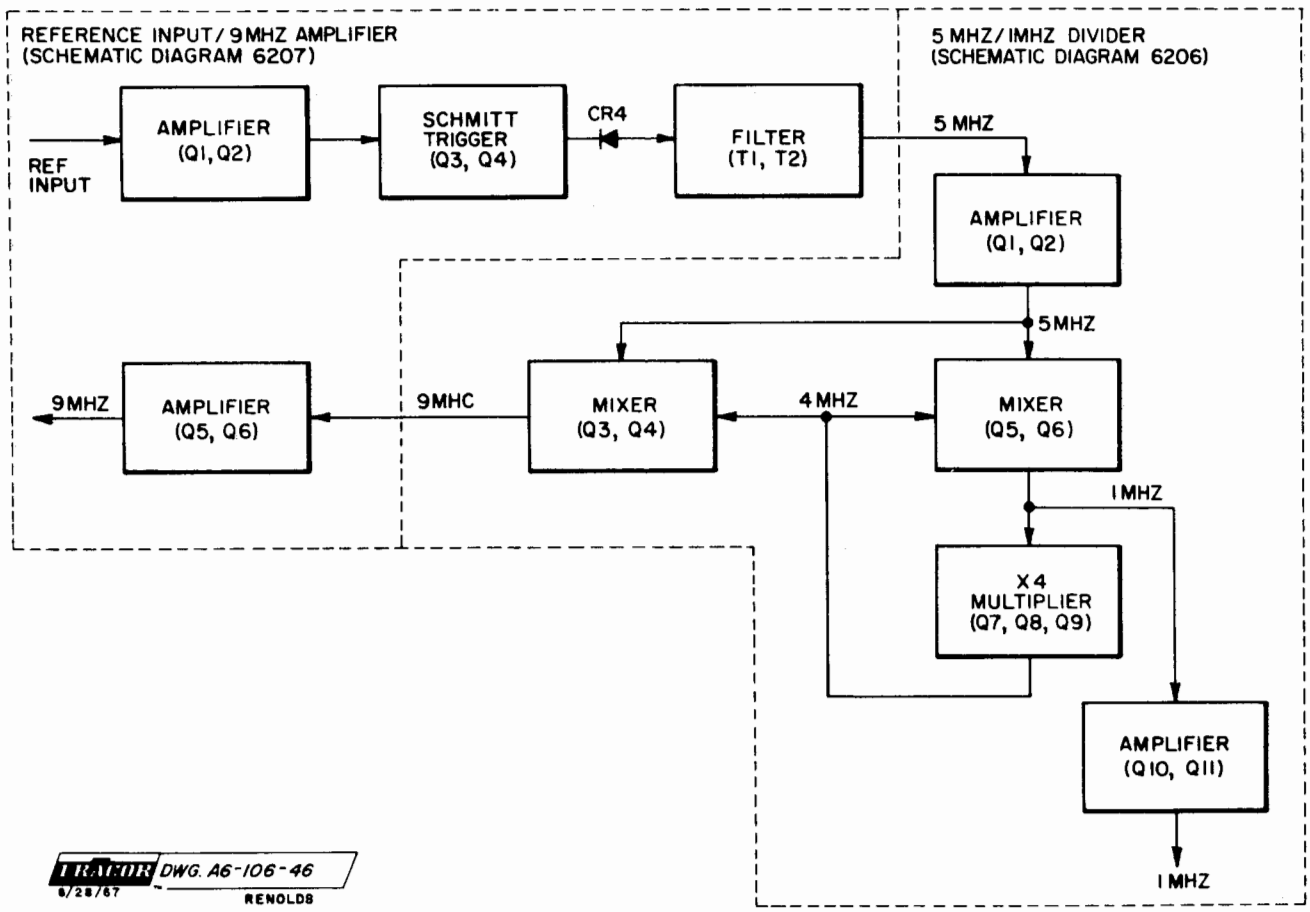


Figure 4-2. Synthesizer Functional Block Diagram.

4-12. The FDM reference input, which can be any submultible of 5 mHz, is amplified and limited by the amplifier consisting of transistors Q1 and Q2. This signal is applied to the Schmitt trigger, consisting of transistors Q3 and Q4, where it is converted to a square wave. The negative going portion of the square wave is coupled through diode CR4, which blocks the positive going portion of the square wave, to the 5 mHz filter consisting of variable transformers T1 and T2. This output goes to the 5 mHz/ 1 mHz divider board where it is amplified by the amplifier consisting of transistors Q1 and Q2. The amplifier output is coupled to the two mixers, or dividers, through the 5 mHz filter, variable transformer T1. The output of the mixer, consisting of transistors

Q5 and Q6, is filtered at 1 mHz by variable transformer T2. This 1 mHz signal is quadrupled in frequency by the multiplier consisting of transistors Q7, Q8, and Q9. Transistor Q9 oscillates at approximately 4 mHz, when no input signal is present, to provide a starting signal for the two mixers. Once the mixer output signal is present, transistor Q9 is forced to oscillate at exactly 4 mHz. The 1 mHz output of the mixer, consisting of transistors Q5 and Q6, is amplified by transistors Q10 and Q11 to provide the 1 mHz reference signal for the FDM. The output signal of the 9 mHz mixer, consisting of transistors Q3 and Q4, is sent back to the reference input/9 mHz amplifier board, where it is filtered by variable transformers T3 and T4 at 9 mHz. This signal is amplified by transistors Q5 and Q6 to provide the 9 mHz reference signal for the error multipliers.

4-13. ERROR MULTIPLIER. The FDM has four error multiplier boards; three error multiplier printed circuit board assemblies 6155 and one error multiplier printed circuit board assembly 6156 (see schematic diagram 6208). The only difference between the 6155 and 6156 assemblies is that the 6156 has two additional diodes, one additional resistor, and one additional capacitor in the signal input circuit. Refer to figure 4-3 for a functional block diagram of the error multiplier.

4-14. The error multiplier converts the FDM signal input, which must be a multiple of 10 mHz, to a 1 mHz signal with ten times the fractional frequency error of the signal input. The input signal, $F + \Delta F$ (nominal frequency plus some unknown error), is amplified by transistors Q1 and Q2.

NOTE

$\Delta F/F$ is the fractional frequency difference between the input reference and the signal input.

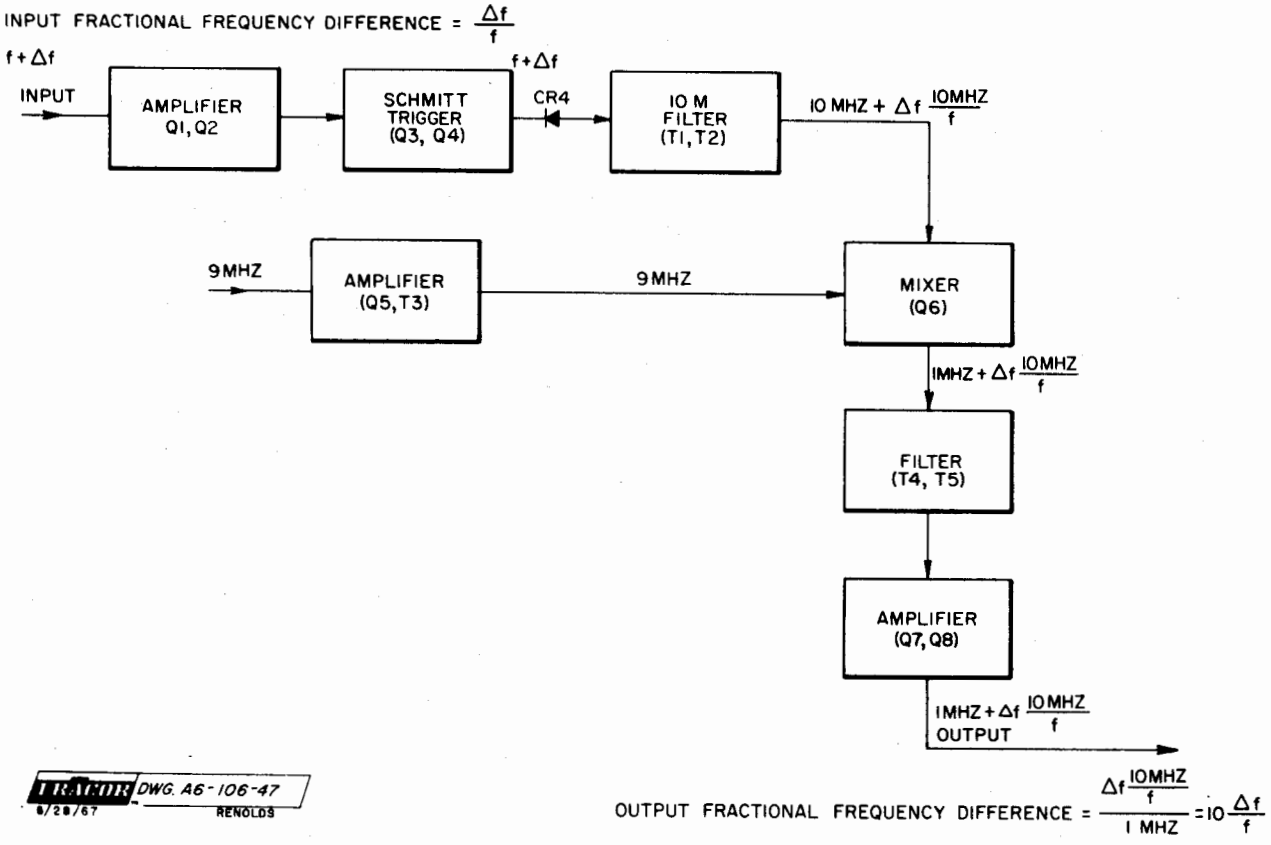


Figure 4-3. Error Multiplier Functional Block Diagram.

This signal is applied to the Schmitt trigger, consisting of transistors Q3 and Q4, where it is converted to a square wave. The negative going portion of the square wave is coupled through diode CR4, which blocks the positive going portion of the square wave, to the 10 mHz filter, consisting of variable transformers T1 and T2. The filter output is 10 mHz + ΔF (10 mHz/F). The amount of frequency multiplication from the error multiplier input to the 10 mHz filter is 10 mHz/F. The 9 mHz reference input, from the reference input/9 mHz amplifier, is amplified and filtered, at 9 mHz, by transistor Q5 and variable transformer T3. The 10 mHz + ΔF (10 mHz/F) signal is mixed with this 9 mHz reference signal by transistor Q6. The output of transistor Q6, 1 mHz + ΔF (10 mHz/F), is filtered at 1 mHz by variable trans-

formers T4 and T5. This signal is amplified by transistors Q7 and Q8 and filtered at 1 mHz by variable transformer T6 to provide the 1 mHz + ΔF (10 mHz/F) output signal. Thus, the fractional frequency error of the output signal is $\frac{\Delta F(10\ mHz/F)}{1\ mHz}$ or 10 ΔF/F, which is ten times the input error.

4-15. CRYSTAL FILTER. The crystal filter printed circuit board assembly 6164 (see schematic 6198) is electrically located between the second (10^2) and third (10^3) error multipliers. Under normal operating conditions, the crystal filter is shorted out by FILTER switch S4. When the filter must be used, S4 is set to OUT, forcing the signal throught the crystal filter. The crystal, Y1, is tuned to exactly 1 mHz by variable capacitor C2.

4-16. BUFFER AMPLIFIER. The buffer amplifier printed circuit board assembly 6159 (see schematic diagram 6205) is used to buffer the 1 mHz and 1 mHz + 10^N ΔF signals and to switch on the OVERRANGE lamp using solid state switching.

4-17. The 1 mHz reference signal from the 5 mHz/1 mHz divider, in the synthesizer, is amplified by the transistor pair (emitter follower coupled to common base) consisting of transistors Q7 and Q8. This output is buffered by emitter follower transistor Q9. The 1 mHz + 10^N ΔF signal from the error multiplier, selected by the METER RANGE selector S4, is amplified and buffered by an identical circuit consisting of transistors Q6, Q5, and Q4 respectively.

4-18. The blanking pulses, from the single shot/phase comparator (see paragraph 4-25), are filtered by the active low pass filter, consisting of transistor Q3 and associated circuitry. When this filtered signal becomes negative (an indication of excessive noise or an overrange signal) transistors Q1 and Q2 are turned on, applying approximately -15 volts dc to the OVERRANGE lamp DS2. Since the OVERRANGE lamp has +15 volts dc applied to it at all times, the negative voltage increases, the potential

across the lamp to approximately 28 volts dc, causing the lamp to light.

4-19. SCOPE DRIVER. The scope driver printed circuit board assembly 6163 (see schematic diagram 6200) converts the frequency difference between the 1 mHz reference and the 1 mHz + 10^N ΔF signal from the buffer amplifier, to dc voltages for use by the scope. Refer to figure 4-4 for a functional block diagram of the scope driver.

4-20. The buffered 1 mHz + 10^N ΔF signal is converted to a square wave by limiter amplifier Q7. This square wave turns the two phase detectors on and off.

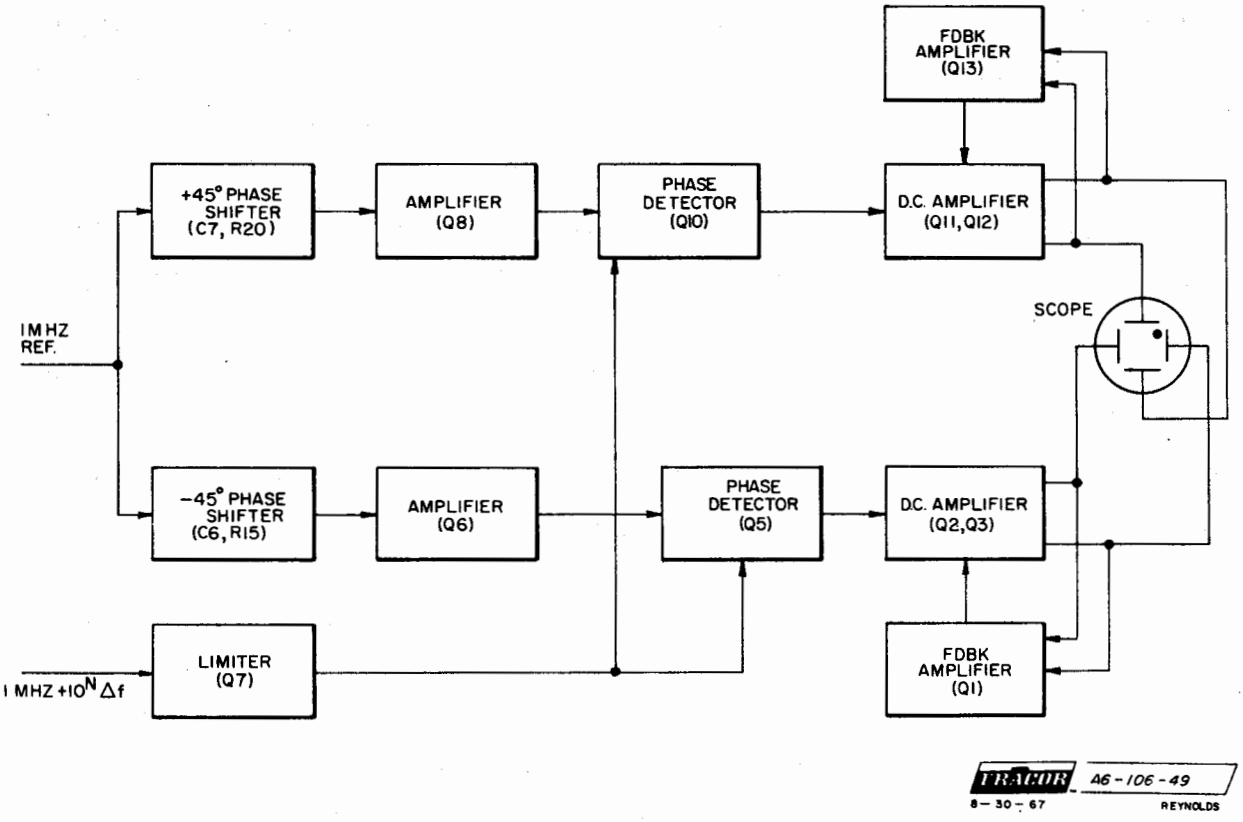


Figure 4-4. Scope Driver Functional Block Diagram

4-21. The buffered 1 mHz reference is phase shifted plus 45 degrees by the RC network consisting of capacitor C7 and potentiometer R20, which is used to make phase adjustments. This reference is also phase shifted minus 45 degrees by the RC network consisting of resistor R15 and capacitor C6. These two phase shifted references are amplified by transistors Q8 and Q6, respectively.

4-22. The plus phase shifted reference is used as the input for phase detector transistor Q9. When the square wave turns on Q9, part of the sine wave reference is cut off from the dc amplifier, consisting of transistors Q11 and Q12, causing the dc amplifier to see, at that particular instant, either a positive or negative voltage. This voltage cycles between positive and negative at a rate dependent on the difference in frequency between the signal, square wave, and reference, sine wave, inputs. The dc amplifier output is used to drive the vertical deflection plates of the scope. Amplifier Q13 provides feedback for the dc amplifier to keep its output balanced with respect to ground.

4-23. An identical circuit, consisting of phase detector transistor Q5, dc amplifier transistor Q2 and Q3, and feedback amplifier transistor Q1, is used to convert the minus 45 degree phase shifted reference to a cycling dc voltage to drive the horizontal deflection plates of the scope.

4-24. FREQUENCY DIFFERENCE DETECTOR. The frequency difference detector consists of flip-flop printed circuit board assembly 6154 (see schematic diagram 6204), single shot/phase comparator printed circuit board assembly 6162 (see schematic diagram 6202), and differentiator/integrator printed circuit board assembly 6161 (see schematic diagram 6203). Refer to figure 4-5 for a functional block diagram of the frequency difference detector and to figure 4-6 for the frequency difference detector pulses.

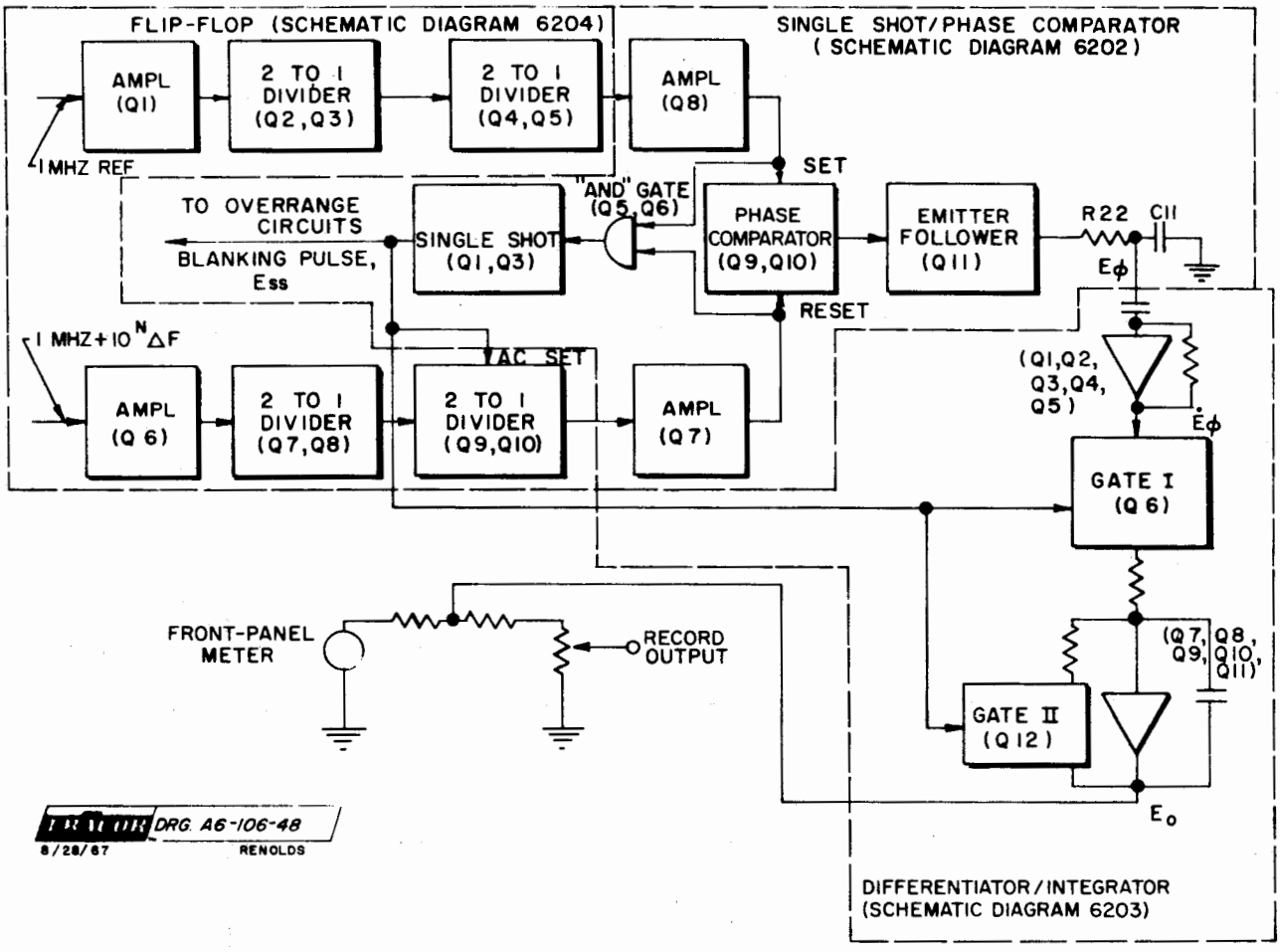


Figure 4-5. Frequency Difference Detector Functional Block Diagram.

4-25. The buffered 1 mHz and 1 mHz + 10^N ΔF signals from the buffer amplifier are divided down from 1 mHz to 250 kHz by the flip-flop. These signals are phase compared by setting and resetting a phase comparator (flip-flop) circuit in the single shot/phase comparator. The signals applied to the phase comparator are also applied to an AND gate, which triggers a single shot circuit when the two input signals are coincident (within 0.5 microseconds of each other). The single shot circuit output sets one of the signal input flip-flop dividers, adding one count to that divider. This change in count causes the signals to the phase comparator to become 180 degrees out of phase, returning the phase comparator to center of its range.

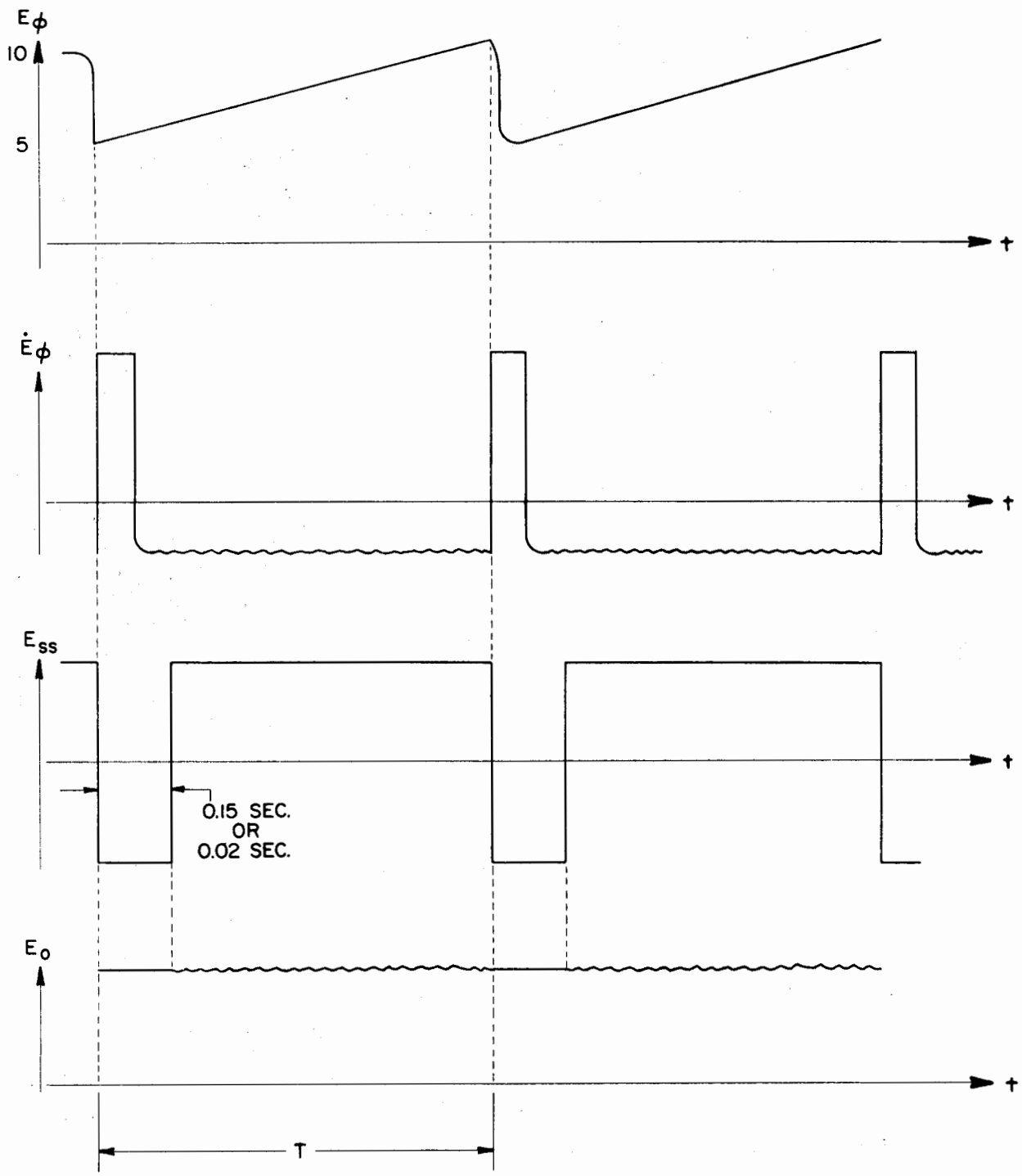


Figure 4-6. Frequency Difference Detector Pulses.

4-26. The phase comparator measures the phase difference between the 1 mHz and 1 mHz + 10^N ΔF signals on a linear scale. Its output also steps back to center range when it reaches zero or full scale (the two input signals are coincident). The phase comparator output is differentiated to produce signal $\dot{E}_{\phi}$. The transient produced when the phase comparator steps back to center range is blanked out by GATE I, which is driven by single shot pulse E_{SS}. The differentiator output, after blanking, is filtered by an active low pass filter. During the time the single shot pulse is present, a dc feedback path is opened by GATE II to hold the output voltage at a stable level. This output voltage, E_0, is proportional to the phase rate, or frequency difference, between the 1 mHz and 1 mHz + 10^N ΔF signals.

4-27. Flip-Flop. The flip-flop is used as a square wave converter and a 1 mHz to 250 kHz divider for the 1 mHz and 1 mHz + 10^N ΔF signals received from the buffer amplifier.

4-28. The 1 mHz and 1 mHz + 10^N ΔF signals are converted to square wave signals by amplifiers Q1 and Q6 respectively. These amplifiers have sufficient gain to saturate the amplifier output. This causes the output to take the form of a square wave. The 1 mHz square wave is divided by two casaded binary dividers, consisting of transistors Q2 and Q3 and transistors Q4 and Q5. The output of the second divider is a 250 kHz square wave. An identical circuit is used for the 1 mHz + 10^N ΔF signal, consisting of transistors Q7 and Q8 and transistors Q9 and Q10. The second divider of each circuit receives its reset pulse from the single shot/phase comparator. The two flip-flop outputs are then sent to the single shot/phase comparator.

4-29. Single Shot/Phase Comparator. The single shot/phase comparator compares the phase of the two signals from the flip-flop and has a ramp voltage output proportional to the difference in phase between the two signals.

4-30. The 250 kHz and 250 kHz + 10^N $\Delta F/4$ square wave signals from the flop-flop are amplified by transistors Q8 and Q7 respectively. These square waves are used to set and reset the phase comparator consisting of transistors Q9 and Q10. The phase comparator output is buffered by emitter follower transistor Q11 and filtered by the RC network consisting of resistor R22 and capacitor C11. The filter output, E_ϕ, is a ramp voltage proportional to the phase difference between the 1 mHz and 1 mHz + 10^N ΔF signals.

4-31. The negative going portion of the square wave outputs from transistors Q7 and Q8 are also compared by the AND gate consisting of transistors Q5 and Q6. When the two signals are within approximately 0.5 microseconds of each other, the AND gate triggers the single shot circuit, producing a blanking pulse. The width of the single shot output pulse, E_{SS}, is determined by the setting of the METER RANGE selector. In the 10^8, 10^9, 10^{10}, and 10^{11} positions the pulse width is approximately 150 milliseconds. In the 10^7 position, resistor R3 is switched into the circuit parallel to resistor R2, reducing the pulse width to about 20 milliseconds. The pulse period, T, is determined by the phase change rate.

4-32. Differentiator/Integrator. The differentiator/integrator converts the phase comparator output ramp voltage to a stable dc voltage for use by the frequency difference meter.

4-33. The ramp voltage from the phase comparator is differentiated by an active differentiator consisting of a high gain amplifier (transistors Q1 through Q5), feedback resistor R3, and capacitors C1 and C2. Capacitor C1 is switched into the circuit only when the METER RANGE selector S4 is in the 10^7 position. The blanking switch (GATE I), transistor Q6, disconnects the differentiator output, $\dot{E}_\phi$, from the active low pass filter during the time the flip-flop divider is being reset. The active low pass filter, whose time constant is approximately

1 second, consists of transistors Q7 through Q11; capacitor C6; and resistors R11, R12, R13, and R18.

4-34. The blanking pulse also turns off transistor Q12. This holds the output voltage stable during the flip-flop reset time. The filter output, E_0, is proportional to the frequency difference between the 1 mHz and 1 mHz + 10^N ΔF signals. Potentiometer R12 calibrates the front panel meter for the 10^8, 10^9, 10^{10}, and 10^{11}, ranges and potentiometer R13 calibrates the meter for the 10^7 range.

SECTION V

MAINTENANCE

5-1. SCOPE OF SECTION.

5-2. This section provides a list of all special test equipment required, a table of common malfunctions and probable causes, and calibration procedures for aligning the tuned amplifiers in the FDM.

5-3. TEST EQUIPMENT REQUIRED.

5-4. All special test equipment required to analyze malfunctions and perform required calibrations is as follows:

a. Frequency standard with known offset in parts in 10^7.
b. Frequency standard with known offset in parts in 10^8, 10^9, 10^{10}, or 10^{11}.
c. Stable 1 mHz reference.
d. Insulated alignment tool.
e. Oscilloscope
f. High impedance, low capacitance probe.

5-5. TROUBLE ANALYSIS.

5-6. The operator should become familiar with the operating instructions in section III and the theory of operation in section IV before performing a trouble analysis on the FDM. Table 5-1 lists the most common troubles and associated probable malfunctioning components. Table 5-II is a cross reference list between module assembly stock numbers and the associated printed circuit board assembly stock number. This table is useful when locating boards in the FDM.

5-7. CALIBRATION.

5-8. This paragraph provides procedures for calibration of the front panel meter, adjustment of the oscilloscope display, and alignment of the tuned amplifiers in the FDM.

Table 5-I. Common Troubles and Probable Malfunctioning Components. (Sheet 1 of 2)

Trouble	Probable Malfunctioning Component
POWER lamp off	Indicator lamp DS1 Fuse F1 115/230 switch S1 Power switch S5 Power Transistor board, 6153 (J18) Power Supply board, 6160 (J17)
1 MC/S OUT signal not present	Buffer Amplifier board, 6159 (23) Reference Input/9 mHz Amplifier board, 6157 (J11) 5 mHz/1 mHz Divider board, 6158 (J10)
1 MC/S + 10^N Δf OUT signal not present regardless of METER RANGE selector position	Buffer Amplifier board, 6159 (J23) First Error Multiplier board, 6156 (J12) METER RANGE selector S4
1 MC/S + 10^N Δf OUT signal present only in METER RANGE selector 10^7 and 10^8 positions	Second Error Multiplier board, 6155 (J13)
1 MC/S + 10^N Δf OUT signal present only in METER RANGE selector 10^7, 10^8, and 10^9 positions	Third Error Multiplier board, 6155 (J15)
1 MC/S + 10^N Δf OUT signal present only in METER RANGE selector 10^7, 10^8, 10^9, and 10^{10} positions	Fourth Error Multiplier board, 6155 (J16)

Table 5-I. Common Troubles and Probable Malfunctioning Components. (Sheet 2 of 2)

Trouble	Probable Malfunctioning Component
1 MC/S + 10^N Δf OUT signal disappears in METER RANGE selector 10^{10} or 10^{11} positions with Filter switch set to IN	Crystal Filter board, 6164 (J14)
Abnormal meter indication	Flip-Flop board, 6154 (J22) Single Shot/Phase Comparator board, 6162 (J21) Differentiator/Integrator board, 6161 (J20) Meter M1
Abnormal slope indication	Scope Driver board, 6163 (J24) Scope Power Supply board, 6166 Cathode ray tube V1
OVERRANGE lamp behaves abnormally	OVERRANGE lamp DS2 Buffer Amplifier board, 6159 (J23)

5-9. METER CALIBRATION. Any method, exclusive of meter and external chart recorder readout methods, specified in section III can be used to set in a desired fractional frequency difference to calibrate the meter. Meter calibration accuracy depends only on accuracy with which desired frequency difference can be set in.

5-10. Meter Calibration for 10^8, 10^9, 10^{10}, and 10^{11} Ranges. Calibrate the meter for the 10^8, 10^9, 10^{10}, and 10^{11} ranges, as follows:

a. Adjust frequency difference to 10 or less parts in 10^N, where N equals 8, 9, 10, or 11 depending on meter range to be used for calibration.

Table 5-II. Module Assembly to Printed Circuit Board Assembly Cross Reference.

Module Assembly	PC Board Assembly	Name
-	6153	Power Transistor
6168	6154	Flip-Flop
6169	6155	Error Multiplier
6170	6156	Error Multiplier
6171	6157	Reference Input/9 mHz Amplifier
6172	6158	5 mHz/1 mHz Divider
6173	6159	Buffer Amplifier
6174	6160	Power Supply
6175	6161	Differentiator/Integrator
6193	6162	Single Shot/Phase Comparator
6194	6163	Scope Driver
6195	6164	Crystal Filter

b. Set METER RANGE selector to corresponding meter range position (10^9 position if meter will be calibrated for 10 or less parts in 10^9).

c. Adjust potentiometer R12 on Differentiator/Integrator board 6161 until meter indication equals frequency difference set in. For example, if frequency difference set in equals 9.6 parts in 10^9, potentiometer R12 is adjusted until meter indicates 9.6 parts in 10^N with the METER RANGE selector in the 10^9 position.

5-11. Meter Calibration for 10^7 Range. Calibrate the meter for the 10^7 range, as follows:

NOTE

Adjustment of potentiometer R 12 will affect the calibration of the meter in the 10^7 range. Therefore, meter must

be properly calibrated for 10^8, 10^9, 10^{10}, or 10^{11} range. Adjustment of R13 will not affect calibration of meter for 10^8, 10^9, 10^{10}, or 10^{11} range.

a. Adjust frequency difference to 10 or less parts in 10^7.

b. Set METER RANGE selector to 10^7.

c. Adjust potentiometer R13 on Differentiator/Integrator board 6161 until meter indication equals frequency difference set in. Do not, under any circumstances, adjust potentiometer R12.

5-12. SCOPE DISPLAY ADJUSTMENT. Adjust the scope spot rotation to describe a circle as follows:

a. Adjust frequency difference and FDM operating controls for spot rotation rate sufficient to retain one complete rotation on scope face at all times.

b. Adjust potentiometers R20 (phase), R22 (vertical deflection), and R7 (horizontal deflection) on Scope Driver board 6163 to obtain circular spot rotation on scope.

c. Adjust potentiometers R8 (horizontal centering) and R30 (vertical centering) on Scope Driver board 6163 to center display on scope face.

5-13. AMPLIFIER ALIGNMENT. The FDM will normally operate within specified limits after a defective component has been replaced, without amplifier alignment. Do not attempt to realign the amplifiers unless it is absolutely certain the FDM is not operating within specified limits.

5-14. Realign the tuned amplifier as follows:

CAUTION

Do not remove or replace any printed circuit board with power applied to the FDM. This could cause arcing which can damage the circuits.

NOTE

The printed circuit board assembly shields must be in place when any adjustment is being made.

a. Connect stable 1 mHz source to REF INPUT connector. Do not connect anything to SIG INPUT connector.
b. Set TEST/OPERATE switch to TEST.
c. Set FILTER switch to IN.
d. Remove all boards from FDM except Power Transistor board 6153 (J18), Power Supply board 6160 (J17), and Reference Input/9 mHz Amplifier board 6157 (J11).
e. Place PCB extender (located in connector J19) in connector J10 and connect 5 mHz/1 mHz Divider board 6158 to PDB extender.
f. Adjust transformers T1 and T2 on Reference Input/9 mHz Amplifier board and transformer T1 on 5 mHz/1 mHz Divider board for minimum dc voltage at TP1 on 5 mHz/1 mHz Divider board (see schematic diagram 6206).

NOTE

Unless otherwise specified, test points referenced are on same board as transformer being adjusted.

g. Adjust transformer T2 on 5 mHz/1 mHz Divider board for minimum dc voltage at TP2 (see schematic diagram 6206).

h. Adjust transformer T3 on 5 mHz/1 mHz Divider board for minimum dc voltage at TP3 (see schematic diagram 6206).
i. Adjust transformer T4 on 5 mHz/1 mHz Divider board for minimum dc voltage at TP4 (see schematic diagram 6206).
j. Readjust transformers T1, T2, and T3 on 5 mHz/1 mHz Divider board for minimum dc voltage at TP1, TP2, and TP3 respectively (see schematic diagram 6206).
k. Set POWER switch to OFF.
l. Remove 5 mHz/1 mHz Divider board and PCB extender and insert 5 mHz/1 mHz Divider board in connector J10.
m. Set POWER switch to OFF.
n. Adjust transformer T3, T4, and T5 on Reference Input/9 mHz Amplifier board for minimum dc voltage at TP1 (see schematic diagram 6207).
o. Set POWER switch to OFF.
p. Insert PCB extender in connector J12 and connect Error Multiplier board 6156 to PCB extender.
q. Set POWER switch to ON.
r. Set TEST/OPERATE switch to OPERATE.
s. Adjust transformer T3 on Error Multiplier board for maximum 9 mHz sine wave amplitude at TP1 (see schematic diagram 6208).
t. Set TEST/OPERATE switch to TEST.
u. Adjust transformers T1 and T2 on Error Multiplier board for maximum 1 mHz envelope amplitude at TP1 (see Schematic diagram 6208).
v. Adjust transformers T6, T1, T2, T4, and T5 on Error Multiplier board for minimum dc voltage at TP2 (see schematic diagram 6208).

w. Set POWER switch to OFF.
x. Remove Error Multiplier board and PCB extender.
y. Repeat steps p. through x. for three Error Multiplier boards, 6155, using connector J12.
z. Insert Error Multiplier board 6156 in connector J12.
aa. Insert an Error Multiplier board 6155 in connector J13.
ab. Insert Crystal Filter board 6164 in connector J14.
ac. Insert PCB extender in connector J15 and connect another Error Multiplier board 6155 to PCB extender.
ad. Set POWER switch to ON.
ae. Adjust capacitor C2 on Crystal Filter board for maximum 1 mHz sine wave amplitude at pin 4 of Error Multiplier board on PCB extender (see schematic diagram 6208).
af. Set POWER switch to OFF.
ag. Remove Error Multiplier board and PCB extender.
ah. Install Error Multiplier boards 6155 in connectors J15 and J16.
ai. Install PCB extender in connector J19.
aj. Install Differentiator/Integrator board 6161 in connector J20.
ak. Install Single Shot/Phase Comparator board 6162 in connector J21.
al. Install Flip-Flop board 6154 in connector J22.
am. Install Buffer Amplifier board 6159 in connector J23.
an. Install Scope Driver board 6163 in connector J24.

FDM is now ready for operation.

SECTION VI

REPLACEABLE PARTS

6-1. SCOPE OF SECTION.

6-2. This section provides all necessary information for quick identification of replaceable parts for the FDM. The section consists of an item reference designation list, a list of replaceable parts, a numeric list of manufacturer codes, and ordering information.

6-3. ITEM REFERENCE DESIGNATION.

6-4. An Index of item reference designations for the FDM is presented in Table 6-I. Information in the table includes item number, reference designation, TRACOR stock number, description, and assembly stock number, presented in that order.

6-5. ITEM NUMBER. An item number is assigned to identify each part in a particular assembly from other parts within that same assembly. Identical parts within an assembly have the same Item Number.

6-6. REFERENCE DESIGNATION. The Reference Designation is an alpha-numeric identification assigned to each assembly and to electrical components within an assembly. Reference Designations are obtained by referring to the schematic diagrams or printed circuit board illustrations in Section VII or by markings on the assembly.

6-7. TRACOR STOCK NUMBER. A TRACOR Stock Number is assigned to every replaceable part in the FDM. Identical parts have identical stock numbers.

6-8. PART DESCRIPTION. All parts are described using the noun-modifier method. For example, a 2500 ohm variable resistor is described as: RES VAR 2X5 K.

6-9. ASSEMBLY STOCK NUMBER. The Assembly Stock Number is the number assigned to a particular assembly to identify it from other assemblies within the FDM. Assembly Stock Numbers are identical to assembly drawing numbers.

6-10. USE OF ITEM REFERENCE DESIGNATION INDEX.

6-11. The Item Reference Designation Index is divided into subsections which correspond to each assembly in the FDM. The subsections are listed in numeric order by Assembly Stock Number. Parts are listed in each subsection as follows:

a. Parts having no Reference Designation assigned are listed first, in numeric order, by Item Number.
b. Parts having Reference Designations assigned are listed last, in alpha-numeric order, by Reference Designation.

6-12. To locate a specific part within the Item Reference Designation Index (Table 6-I), proceed as follows:

a. Obtain the number and/or name of the assembly that contains the part. (Refer to the printed circuit board illustration in Section VII.)
b. Obtain the Reference Designation or theItem Number for the part. (Refer to the schematic diagram or printed circuit board illustration in Section VII.)
c. Locate the subsection which corresponds to the assembly in the Item Reference Designation Index.
d. Locate the part within the subsection by Item Number or Reference Designation.

NOTE

Using an opaque straight edge, ruler, or sheet or paper under the row being examined will reduce reading errors in multicolumn indexes.

6-13. REPLACEABLE PARTS.

6-14. A list of replaceable parts for the FDM is presented in Table 6-II. Information in the table includes the TRACOR Stock Number, part description, manufacturer code, manufacturer part number, and the total quantity and unit of measure for a given part in the complete instrument, presented in that order. The parts are listed in numerical order by TRACOR Stock Number.

6-15. To locate a part in the List of Replaceable Parts (Table 6-II), proceed as follows:

a. Obtain the TRACOR Stock Number by referring to the Item Reference Designation Index (Table 6-I). See paragraph 6-12.

6-16. NUMERIC LIST OF MANUFACTURER CODES.

6-17. A list of manufacturers supplying parts for the FDM is provided in Table 6-III. Information in the table includes the manufacturer code number, manufacturer's name, and manufacturer's address, presented in that order. The manufacturers are listed in numerical order by code number.

6-18. To locate the manufacturer of a part, proceed as follows:

a. Obtain the manufacturer code number of referring to the List of Replaceable Parts (Table 6-II).

b. Locate the code number in the appropriate column of the Numeric List of Manufacturer Codes (Table 6-III).

6-19. ORDERING INFORMATION.

6-20. Address orders or inquiries to either an authorized TRACOR, Inc. Sales Representative or to:

Customer Service
TRACOR, Inc.
6500 Tracor Lane
Austin, Texas 78721

6-21. To insure prompt service, orders must include the following information:

a. Name, model, and serial number of the instrument.
b. Assembly or sub-assembly name and/or number.
c. Reference Designation. If no reference designation is listed, include the Item Number.
d. TRACOR Stock Number.
e. Full description of the part.

6-22. Item a. is located on the instrument; item b. can be found on either the assembly itself or in the pertinent section of the Reference Designation Index; and items c., d., and e. are found in the Reference Designation Index (Table 6-I).

6-23. The part numbers shown will change occasionally as manufacturers' items are reevaluated or as improved components become available. The component shipped will be the component used in production at the time the order is received, and will be equivalent to the component it replaces in both dimensions and performance.

6-24. The minimum billing on any order is $15.00, with a standard delivery of 30 days. All prices are FOB Austin, Texas, and are subject to change without notice.

Table 6-I. Item Reference Designation Index (Sheet 1 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
			ASSY FREQ DIFF METER	6064
2		142-0020	SCR FLAT HD 2-56X5/16	6064
3		147-0024	SCR FLAT HD 8-32X3/8	6064
6		175-0016	SCR BIND HD 4-40X1/4	6064
7		175-0020	SCR BIND HD 4-40X5/16	6064
8		175-0028	SCR BIND HD 4-40X7/16	6064
9		177-0016	SCR BIND HD 6-32X1/4	6064
10		177-0032	SCR BIND HD 6-32X1/2	6064
11		178-0024	SCR BIND HD 8-32X3/8	6064
12		444-0016	SCR FLAT HD 6-32X1/4	6064
13		617-0273	WASHER FLAT NO 8	6064
14		620-0123	WASHER LOCK INT NO 4	6064
15		620-0125	WASHER LOCK INT NO 6	6064
16		620-0126	WASHER LOCK INT NO 8	6064
17		649-0074	NUT HEX 4-40	6064
18		649-0114	NUT HEX 6-32	6064
19		649-0134	NUT HEX 8-32	6064
20		658-0012	SCR FLAT 4-40X3/16	6064
21		658-0016	SCR FLAT HD 4-40X1/4	6064
23		3326-0032	RIVET POP	6064
24		3326-0041	RIVET POP	6064
25		3332-0053	NUT CLINCH 4-40	6064
26		3332-0078	NUT CLINCH 6-32	6064
31		3472-0001	SHAFT LOCK BLACK	6064
32		3486-0027	LUG SOLDER 3/8 ID	6064
32		3486-0027	LUG SOLDER 3/8 I D	6064
34		3495-0037	GROMMET RUBBER	6064
36		3624-0002	LUG SOLDER NO 4	6064
37		3625-2002	NUT CLINCH 4-40	6064
39		3627-0001	BRACKET CAP VERT MTG	6064
43		3783-0214	BRACKET ANGLE	6064
44		3814-0026	GASKET O RING	6064
45		3814-0216	GASKET O RING	6064
46		5002	PLATE	6064
47		5024	BEZEL SCOPE	6064
48		6032	PLATE	6064
50		6043	PANEL	6064
52		6053	PLATE	6064
53		6054	PANEL	6064
54		6055	TRAY COMPONENT	6064
56		6059	COVER	6064
57		6060	COVER	6064
66		6100	SHIELD	6064
69		6111	SHIELD	6064
70		6113	SHIELD	6064
73		6152	PLATE IDENTIFICATION	6064
108		6300	PLATE WARNING	6064
109		6316	ASSY WIRING HARNESS	6064
110		6355-0001	ACCESSORY PARTS SET	6064
114		25449	SHIELD TUBE	6064
115		32115-0062	CLAMP CABLE	6064
87	A 1	6166	ASSY PCB SCOPE PWR	6064
86	A 2	6165	ASSY PCB INTERCONN	6064
92	A 3	6172	ASSY MODULE 5 MC/1 MC	6064
91	A 4	6171	ASSY MODULE REF INPUT	6064
90	A 5	6170	ASSY MODULE ERR MULT	6064
89	A 6	6169	ASSY MODULE ERR MULT	6064
105	A 7	6195	ASSY MODULE XTAL FILT	6064
89	A 8	6169	ASSY MODULE ERR MULT	6064
89	A 9	6169	ASSY MODULE ERR MULT	6064
94	A 10	6174	ASSY MODULE POWER SUP	6064
74	A 11	6153	ASSY PCB POWER TSTR	6064
72	A 12	6151	ASSY PCB EXTENDER	6064
95	A 13	6175	ASSY MODULE DIFF/INT	6064
103	A 14	6193	ASSY MODULE SS/PH COM	6064
88	A 15	6168	ASSY MODULE FLIP FLOP	6064
93	A 16	6173	ASSY MODULE BUFF AMPL	6064
104	A 17	6194	ASSY MODULE SCOPE DRV	6064
38	C 1	3626-0703	CAP ELECT 1500 MFD	6064
28	E 1	3458-0024	KNOB	6064
28	E 2	3458-0024	KNOB	6064
29	E 3	3458-0188	KNOB	6064
27	F 1	3348-9502	FUSE FAST .5 AMP	6064
40	J 1	3629-0102	POST BINDING RED	6064
118	J 2	33747	CONNECTOR BNC	6064
118	J 3	33747	CONNECTOR BNC	6064
118	J 4	33747	CONNECTOR BNC	6064
118	J 5	33747	CONNECTOR BNC	6064
118	J 6	33747	CONNECTOR BNC	6064
118	J 7	33747	CONNECTOR BNC	6064
41	J 9	3629-0103	POST BINDING BLACK	6064
58	M 1	6062	METER 0 CTR W/BEZEL	6064

Table 6-I. Item Reference Designation Index. (Sheet 2 of 13)

ITEM NUMBER	REFERENCE DESIGNATION		T R A C O R STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
35	R	2	3578-0103	RES VAR 10K	6064
42	S	1	3633-0001	SWITCH SLIDE	6064
65	T	1	6090	XFMR POWER	6064
22	V	1	700-0220	TUBE ELECTRONIC	6064
30	W	1	3467-0028	CABLE POWER, VINYL	6064
1	DS	1	87-0342	LAMP MINAT 28 V	6064
1	DS	2	87-0342	LAMP MINAT 28 V	6064
49	MP	1	6034	HANDLE	6064
49	MP	2	6034	HANDLE	6064
51	MP	3	6051	BRACKET RACK MTG	6064
51	MP	4	6051	BRACKET RACK MTG	6064
33	XF	1	3488-0001	FUSEHOLDER	6064
117	XDS	1	33687-1500	LAMPHOLDER GRN LENS	6064
116	XDS	2	33687-1200	LAMPHOLDER RED LENS	6064
				ASSY TRANSFORMER	6084
1			3501-0032	WIRE AWG 32	6084
2			3569	GLUE	6084
3			3668-0001	BOBBIN	6084
4			3669-0003	CORE PAIR	6084
5			3670-0001	ADJUSTMENT ASSY	6084
6			3671	PLATE	6084
7			3674	CLAMP	6084
8			3675-0004	PAINT YELLOW	6084
9			3675-0006	PAINT BLUE	6084
10			3675-0008	PAINT GREY	6084
11			3675-0010	PAINT BLACK	6084
12			3677-0008	TAPE 1/8 WIDE	6084
				ASSY TRANSFORMER	6086
1			3501-0032	WIRE AWG 32	6086
2			3501-0036	WIRE AWG 36	6086
3			3569	GLUE	6086
4			3668-0001	BOBBIN	6086
5			3669-0003	CORE PAIR	6086
6			3670-0001	ADJUSTMENT ASSY	6086
7			3671	PLATE	6086
8			3674	CLAMP	6086
9			3675-0006	PAINT BLUE	6086
10			3675-0008	PAINT GREY	6086
11			3675-0010	PAINT BLACK	6086
12			3677-0008	TAPE 1/8 WIDE	6086
				ASSY TRANSFORMER	6087
1			3501-0032	WIRE AWG 32	6087
2			3501-0036	WIRE AWG 36	6087
3			3569	GLUE	6087
4			3668-0001	BOBBIN	6087
5			3669-0003	CORE PAIR	6087
6			3670-0001	ADJUSTMENT ASSY	6087
7			3671	PLATE	6087
8			3672	TERMINAL	6087
9			3673	WASHER	6087
10			3674	CLAMP	6087
11			3675-0006	PAINT BLUE	6087
12			3675-0007	PAINT VIOLET	6087
13			3675-0008	PAINT GREY	6087
14			3675-0010	PAINT BLACK	6087
15			3677-0008	TAPE 1/8 WIDE	6087
				ASSY TRANSFORMER	6088
1			3501-0032	WIRE AWG 32	6088
2			3501-0040	WIRE AWG 40	6088
3			3569	GLUE	6088
4			3668-0001	BOBBIN	6088
5			3669-0003	CORE PAIR	6088
6			3670-0001	ADJUSTMENT ASSY	6088
7			3671	PLATE	6088
8			3674	CLAMP	6088
9			3675-0006	PAINT BLUE	6088
10			3675-0008	PAINT GREY	6088
11			3675-0010	PAINT BLACK	6088
12			3677-0008	TAPE 1/8 WIDE	6088

Table 6-I. Item Reference Designation Index (Sheet 3 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
			ASSY TRANSFORMER	6089
1		3501-0032	WIRE AWG 32	6089
2		3501-0040	WIRE AWG 40	6089
3		3569	GLUE	6089
4		3668-0001	BOBBIN	6089
5		3669-0003	CORE PAIR	6089
6		3670-0001	ADJUSTMENT ASSY	6089
7		3671	PLATE	6089
8		3672	TERMINAL	6089
9		3673	WASHER	6089
10		3674	CLAMP	6089
11		3675-0006	PAINT BLUE	6089
12		3675-0008	PAINT GREY	6089
13		3675-0009	PAINT WHITE	6089
14		3675-0010	PAINT BLACK	6089
15		3677-0008	TAPE 1/8 WIDE	6089
			ASSY PCB EXTENDER	6151
2		620-0123	WASHER LOCK INT NO 4	6151
4		649-0074	NUT HEX 4 40	6151
5		3326-0042	RIVET POP	6151
6		3628-0215	CONNECTOR PCB	6151
7		3805-0031	SPADE BOLT	6151
8		5009	BOARD PRINTED CIRCUIT	6151
			ASSY PCB POWER TSTR	6153
1		177-0032	SCR BND HD 6 32X1/2	6153
2		705-0610	IN WIRE 22AWG BLU	6153
5		3326-0042	RIVET POP	6153
6		3794-0002	MOUNTING KIT TSTR	6153
7		6068	BOARD PRINTED CIRCUIT	6153
8		6081	HEAT SINK	6153
4	Q 5	900-3055	TSTR NPN 2N3055	6153
4	Q 6	900-3055	TSTR NPN 2N3055	6153
3	VR 2	801-1606	DIODE 1N1606A	6153
			ASSY PCB FLIP FLOP	6154
1		175-0008	SCR BIND HD 4 40X1/8	6154
12		3657-0001	INSULATOR TRANSISTOR	6154
13		5046-0012	STANDOFF HEX 4 40	6154
14		6077	BOARD PRINTED CIRCUIT	6154
20	C 1	27513-0150	CAP FXD MICA 15 PFD	6154
20	C 2	27513-0150	CAP FXD MICA 15 PFD	6154
17	C 3	27512-0100	CAP FXD MICA 10 PFD	6154
17	C 4	27512-0100	CAP FXD MICA 10 PFD	6154
18	C 5	27512-0220	CAP FXD MICA 22 PFD	6154
18	C 6	27512-0220	CAP FXD MICA 22 PFD	6154
17	C 7	27512-0100	CAP FXD MICA 10 PFD	6154
17	C 8	27512-0100	CAP FXD MICA 10 PFD	6154
20	C 9	27513-0150	CAP FXD MICA 15 PFD	6154
20	C 10	27513-0150	CAP FXD MICA 15 PFD	6154
17	C 11	27512-0100	CAP FXD MICA 10 PFD	6154
17	C 12	27512-0100	CAP FXD MICA 10 PFD	6154
18	C 13	27512-0220	CAP FXD MICA 22 PFD	6154
18	C 14	27512-0220	CAP FXD MICA 22 PFD	6154
17	C 15	27512-0100	CAP FXD MICA 10 PFD	6154
17	C 16	27512-0100	CAP FXD MICA 10 PFD	6154
16	C 17	8916-9331	CAP SOLID TA 3X3 MFD	6154
19	C 18	27512-0470	CAP FXD MICA 47 PFD	6154
11	Q 1	900-3646	TSTR NPN 2N3646	6154
11	Q 2	900-3646	TSTR NPN 2N3646	6154
11	Q 3	900-3646	TSTR NPN 2N3646	6154
11	Q 4	900-3646	TSTR NPN 2N3646	6154
11	Q 5	900-3646	TSTR NPN 2N3646	6154
11	Q 6	900-3646	TSTR NPN 2N3646	6154
11	Q 7	900-3646	TSTR NPN 2N3646	6154
11	Q 8	900-3646	TSTR NPN 2N3646	6154
11	Q 9	900-3646	TSTR NPN 2N3646	6154
11	Q 10	900-3646	TSTR NPN 2N3646	6154
2	R 1	200-0101	RES FXD COMP 100 OHM	6154
6	R 2	200-0272	RES FXD COMP 2X7 K	6154
8	R 3	200-0473	RES FXD COMP 47 K	6154
4	R 4	200-0222	RES FXD COMP 2X2 K	6154
4	R 5	200-0222	RES FXD COMP 2X2 K	6154
4	R 6	200-0222	RES FXD COMP 2X2 K	6154
5	R 7	200-0223	RES FXD COMP 22 K	6154
5	R 8	200-0223	RES FXD COMP 22 K	6154
5	R 9	200-0223	RES FXD COMP 22 K	6154

Table 6-I. Item Reference Designation Index. (Sheet 4 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
5	R 10	200-0223	RES FXD COMP 22 K	6154
5	R 11	200-0223	RES FXD COMP 22 K	6154
5	R 12	200-0223	RES FXD COMP 22 K	6154
7	R 13	200-0334	RES FXD COMP 330 K	6154
4	R 14	200-0222	RES FXD COMP 2X2 K	6154
4	R 15	200-0222	RES FXD COMP 2X2 K	6154
6	R 16	200-0272	RES FXD COMP 2X7 K	6154
5	R 17	200-0223	RES FXD COMP 22 K	6154
5	R 18	200-0223	RES FXD COMP 22 K	6154
5	R 19	200-0223	RES FXD COMP 22 K	6154
5	R 20	200-0223	RES FXD COMP 22 K	6154
5	R 21	200-0223	RES FXD COMP 22 K	6154
5	R 22	200-0223	RES FXD COMP 22 K	6154
6	R 23	200-0272	RES FXD COMP 2X7 K	6154
8	R 24	200-0473	RES FXD COMP 47 K	6154
4	R 25	200-0222	RES FXD COMP 2X2 K	6154
5	R 26	200-0223	RES FXD COMP 22 K	6154
5	R 27	200-0223	RES FXD COMP 22 K	6154
5	R 28	200-0223	RES FXD COMP 22 K	6154
5	R 29	200-0223	RES FXD COMP 22 K	6154
5	R 30	200-0223	RES FXD COMP 22 K	6154
5	R 31	200-0223	RES FXD COMP 22 K	6154
4	R 32	200-0222	RES FXD COMP 2X2 K	6154
4	R 33	200-0222	RES FXD COMP 2X2 K	6154
4	R 34	200-0222	RES FXD COMP 2X2 K	6154
4	R 35	200-0222	RES FXD COMP 2X2 K	6154
5	R 36	200-0223	RES FXD COMP 22 K	6154
5	R 37	200-0223	RES FXD COMP 22 K	6154
5	R 38	200-0223	RES FXD COMP 22 K	6154
5	R 39	200-0223	RES FXD COMP 22 K	6154
5	R 40	200-0223	RES FXD COMP 22 K	6154
5	R 41	200-0223	RES FXD COMP 22 K	6154
6	R 42	200-0272	RES FXD COMP 2X7 K	6154
3	R 43	200-0103	RES FXD COMP 10 K	6154
10	CR 1	800-0914	DIODE 1N914	6154
10	CR 2	800-0914	DIODE 1N914	6154
10	CR 3	800-0914	DIODE 1N914	6154
10	CR 4	800-0914	DIODE 1N914	6154
10	CR 5	800-0914	DIODE 1N914	6154
10	CR 6	800-0914	DIODE 1N914	6154
10	CR 7	800-0914	DIODE 1N914	6154
10	CR 8	800-0914	DIODE 1N914	6154
10	CR 9	800-0914	DIODE 1N914	6154
10	CR 10	800-0914	DIODE 1N914	6154
10	CR 11	800-0914	DIODE 1N914	6154
10	CR 12	800-0914	DIODE 1N914	6154
10	CR 13	800-0914	DIODE 1N914	6154
10	CR 14	800-0914	DIODE 1N914	6154
10	CR 15	800-0914	DIODE 1N914	6154
10	CR 16	800-0914	DIODE 1N914	6154
10	CR 17	800-0914	DIODE 1N914	6154
10	CR 18	800-0914	DIODE 1N914	6154
			ASSY PCB ERROR MULT	6155
1		175-0008	SCR BIND HD 4 40X1/8	6155
23		3657-0001	INSULATOR TRANSISTOR	6155
24		5046-0012	STANDOFF HEX 4 40	6155
25		6073	BOARD PRINTED CIRCUIT	6155
29		8819-0024	WIRE BUS BAR AWG 24	6155
21	C 1	3319-0222	CAP FXD CER X0022 MFD	6155
31	C 2	8917-0390	CAP SOLID TA 39 MFD	6155
0	C 3		NOT USED	6155
22	C 4	3403-9103	CAP FXD CER X01 MFD	6155
30	C 5	8916-9331	CAP SOLID TA 3X3 MFD	6155
22	C 6	3403-9103	CAP FXD CER X01 MFD	6155
34	C 7	27512-0221	CAP FXD MICA 220 PFD	6155
22	C 8	3403-9103	CAP FXD CER X01 MFD	6155
38	C 9	27512-0910	CAP FXD MICA 91 PFD	6155
32	C 10	27512-0100	CAP FXD MICA 10 PFD	6155
37	C 11	27512-0820	CAP FXD MICA 82 PFD	6155
34	C 12	27512-0221	CAP FXD MICA 220 PFD	6155
31	C 13	8917-0390	CAP SOLID TA 39 MFD	6155
33	C 14	27512-0111	CAP FXD MICA 110 PFD	6155
43	C 15	27513-0681	CAP FXD MICA 680 PFD	6155
34	C 16	27512-0221	CAP FXD MICA 220 PFD	6155
31	C 17	8917-0390	CAP SOLID TA 39 MFD	6155
42	C 18	27513-0561	CAP FXD MICA 560	6155
22	C 19	3403-9103	CAP FXD CER X01 MFD	6155
36	C 20	27512-0750	CAP FXD MICA 75 PFD	6155
41	C 21	27513-0511	CAP FXD MICA 510 PFD	6155
22	C 22	3403-9103	CAP FXD CER X01 MFD	6155
22	C 23	3403-9103	CAP FXD CER X01 MFD	6155
0	C 24		NOT USED	6155

Table 6-I. Item Reference Designation Index. (Sheet 5 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
39	C 25	27512-9501	CAP FXD MICA 5 PFD	6155
0	C 26		NOT USED	6155
35	C 27	27512-0390	CAP FXD MICA 39 PFD	6155
40	C 28	27513-0150	CAP FXD MICA 15 PFD	6155
35	C 29	27512-0390	CAP FXD MICA 39 PFD	6155
42	C 30	27513-0561	CAP FXD MICA 560 PFD	6155
20	Q 1	900-3646	TSTR NPN 2N3646	6155
20	Q 2	900-3646	TSTR NPN 2N3646	6155
20	Q 3	900-3646	TSTR NPN 2N3646	6155
20	Q 4	900-3646	TSTR NPN 2N3646	6155
20	Q 5	900-3646	TSTR NPN 2N3646	6155
20	Q 6	900-3646	TSTR NPN 2N3646	6155
44	Q 7	900-3705	TSTR NPN 2N3705	6155
44	Q 8	900-3705	TSTR NPN 2N3705	6155
3	R 1	200-0101	RES FXD COMP 100 OHM	6155
3	R 2	200-0101	RES FXD COMP 100 OHM	6155
0	R 3		NOT USED	6155
6	R 4	200-0122	RES FXD COMP 1X2 K	6155
17	R 5	200-0681	RES FXD COMP 680 PHM	6155
15	R 6	200-0472	RES FXD COMP 4X7 K	6155
15	R 7	200-0472	RES FXD COMP 4X7 K	6155
11	R 8	200-0332	RES FXD COMP 3X3 K	6155
11	R 9	200-0332	RES FXD COMP 3X3 K	6155
10	R 10	200-0222	RES FXD COMP 2X2 K	6155
4	R 11	200-0102	RES FXD COMP 1X0 K	6155
2	R 12	200-0100	RES FXD COMP 10 OHM	6155
16	R 13	200-0561	RES FXD COMP 560 OHM	6155
8	R 14	200-0183	RES FXD COMP 18 K	6155
4	R 15	200-0102	RES FXD COMP 1X0 K	6155
3	R 16	200-0101	RES FXD COMP 100 OHM	6155
9	R 17	200-0221	RES FXD COMP 220 OHM	6155
18	R 18	200-0682	RES FXD COMP 6X8 K	6155
11	R 19	200-0332	RES FXD COMP 3X3 K	6155
12	R 20	200-0391	RES FXD COMP 390 OHM	6155
13	R 21	200-0392	RES FXD COMP 3X9 K	6155
18	R 22	200-0682	RES FXD COMP 6X8 K	6155
11	R 23	200-0332	RES FXD COMP 3X3 K	6155
8	R 24	200-0183	RES FXD COMP 18 K	6155
10	R 25	200-0222	RES FXD COMP 2X2 K	6155
9	R 26	200-0221	RES FXD COMP 220 OHM	6155
5	R 27	200-0121	RES FXD COMP 120 OHM	6155
14	R 28	200-0394	RES FXD COMP 390 K	6155
7	R 29	200-0151	RES FXD COMP 150 OHM	6155
7	R 30	200-0151	RES FXD COMP 150 OHM	6155
10	R 31	200-0222	RES FXD COMP 2X2 K	6155
13	R 32	200-0392	RES FXD COMP 3X9 K	6155
26	T 1	6084	XFMR	6155
26	T 2	6084	XFMR	6155
26	T 3	6084	XFMR	6155
27	T 4	6088	XFMR	6155
27	T 5	6088	XFMR	6155
27	T 6	6088	XFMR	6155
0	CR 1		NOT USED	6155
0	CR 2		NOT USED	6155
19	CR 3	800-0914	DIODE 1N914	6155
19	CR 4	800-0914	DIODE 1N914	6155
19	CR 5	800-0914	DIODE 1N914	6155
			ASSY PCB ERROR MULT	6156
1		175-0008	SCR BIND HD 4 40X1/8	6156
23		3657-0001	INSULATOR TRANSISTOR	6156
24		5046-0012	STANDOFF HEX 4 40	6156
25		6073	BOARD PRINTED CIRCUIT	6156
29		8919-0024	WIRE BUS BAR AWG 24	6156
21	C 1	3319-0222	CAP FXD CER X0022 MFD	6156
31	C 2	8917-0390	CAP SOLID TA 39 MFD	6156
22	C 3	3403-9103	CAP FXD CER X01 MFD	6156
22	C 4	3403-9103	CAP FXD CER X01 MFD	6156
30	C 5	8916-9331	CAP SOLID TA 3X3 MFD	6156
22	C 6	3403-9103	CAP FXD CER X01 MFD	6156
34	C 7	27512-0221	CAP FXD MICA 220 PFD	6156
22	C 8	3403-9103	CAP FXD CER X01 MFD	6156
38	C 9	27512-0910	CAP FXD MICA 91 PFD	6156
32	C 10	27512-0100	CAP FXD MICA 10 PFD	6156
37	C 11	27512-0820	CAP FXD MICA 82 PFD	6156
34	C 12	27512-0221	CAP FXD MICA 220 PFD	6156
31	C 13	8917-0390	CAP SOLID TA 39 MFD	6156
33	C 14	27512-0111	CAP FXD MICA 110 PFD	6156
43	C 15	27513-0681	CAP FXD MICA 680 PFD	6156
34	C 16	27512-0221	CAP FXD MICA 220 PFD	6156
31	C 17	8917-0390	CAP SOLID TA 39 MFD	6156
42	C 18	27513-0561	CAP FXD MICA 560 PFD	6156
22	C 19	3403-9103	CAP FXD CER X01 MFD	6156

Table 6-I. Item Reference Designation Index. (Sheet 6 of 13).

ITEM NUMBER	REFERENCE DESIGNATION	T R A C O R STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
36	C 20	27512-0750	CAP FXD MICA 75 PFD	6156
41	C 21	27513-0511	CAP FXD MICA 510 PFD	6156
22	C 22	3403-9103	CAP FXD CER X01 MFD	6156
22	C 23	3403-9103	CAP FXD CER X01 MFD	6156
0	C 24		NOT USED	6156
39	C 25	27512-9501	CAP FXD MICA 5 PFD	6156
0	C 26		NOT USED	6156
35	C 27	27512-0390	CAP FXD MICA 39 PFD	6156
40	C 28	27513-0150	CAP FXD MICA 15 PFD	6156
35	C 29	27512-0390	CAP FXD MICA 39 PFD	6156
42	C 30	27513-0561	CAP FXD MICA 560 PFD	6156
20	Q 1	900-3646	TSTR 2N3646	6156
20	Q 2	900-3646	TSTR 2N3646	6156
20	Q 3	900-3646	TSTR 2N3646	6156
20	Q 4	900-3646	TSTR 2N3646	6156
20	Q 5	900-3646	TSTR 2N3646	6156
20	Q 6	900-3646	TSTR 2N3646	6156
44	Q 7	900-3705	TSTR 2N3705	6156
44	Q 8	900-3705	TSTR 2N3705	6156
3	R 1	200-0101	RES FXD COMP 100 OHM	6156
3	R 2	200-0101	RES FXD COMP 100 OHM	6156
4	R 3	200-0102	RES FXD COMP 1X0 K	6156
6	R 4	200-0122	RES FXD COMP 1X2 K	6156
17	R 5	200-0681	RES FXD COMP 680 OHM	6156
15	R 6	200-0472	RES FXD COMP 4X7 K	6156
15	R 7	200-0472	RES FXD COMP 4X7 K	6156
11	R 8	200-0332	RES FXD COMP 3X3 K	6156
11	R 9	200-0332	RES FXD COMP 3X3 K	6156
10	R 10	200-0222	RES FXD COMP 2X2 K	6156
4	R 11	200-0102	RES FXD COMP 1X0 K	6156
2	R 12	200-0100	RES FXD COMP 10 OHM	6156
16	R 13	200-0561	RES FXD COMP 560 OHM	6156
8	R 14	200-0183	RES FXD COMP 18 K	6156
4	R 15	200-0102	RES FXD COMP 1X0 K	6156
3	R 16	200-0101	RES FXD COMP 100 OHM	6156
9	R 17	200-0221	RES FXD COMP 220 OHM	6156
18	R 18	200-0682	RES FXD COMP 6X8 K	6156
11	R 19	200-0332	RES FXD COMP 3X3 K	6156
12	R 20	200-0391	RES FXD COMP 390 OHM	6156
13	R 21	200-0392	RES FXD COMP 3X9 K	6156
18	R 22	200-0682	RES FXD COMP 6X8 K	6156
11	R 23	200-0332	RES FXD COMP 3X3 K	6156
8	R 24	200-0183	RES FXD COMP 18 K	6156
10	R 25	200-0222	RES FXD COMP 2X2 K	6156
9	R 26	200-0221	RES FXD COMP 220 OHM	6156
5	R 27	200-0121	RES FXD COMP 120 OHM	6156
14	R 28	200-0394	RES FXD COMP 390 K	6156
7	R 29	200-0151	RES FXD COMP 150 OHM	6156
7	R 30	200-0151	RES FXD COMP 150 OHM	6156
10	R 31	200-0222	RES FXD COMP 2X2 K	6156
13	R 32	200-0392	RES FXD COMP 3X9 K	6156
26	T 1	6084	XFMR	6156
26	T 2	6084	XFMR	6156
26	T 3	6084	XFMR	6156
27	T 4	6088	XFMR	6156
27	T 5	6088	XFMR	6156
27	T 6	6088	XFMR	6156
19	CR 1	800-0914	DIODE 1N914	6156
19	CR 2	800-0914	DIODE 1N914	6156
19	CR 3	800-0914	DIODE 1N914	6156
19	CR 4	800-0914	DIODE 1N914	6156
19	CR 5	800-0914	DIODE 1N914	6156
			ASSY PCB REF INPUT	6157
1		175-0008	SCR BIND HD 4 40X1/8	6157
20		3657-0001	INSULATOR TRANSISTOR	6157
21		5046-0012	STANDOFF HEX 4 40	6157
24		6093	BOARD PRINTED CIRCUIT	6157
27	C 1	8917-0390	CAP SOLID TA 39 MFD	6157
18	C 2	3319-0222	CAP FXD CER X0022 MFD	6157
19	C 3	3403-9103	CAP FXD CER X01 MFD	6157
19	C 4	3403-9103	CAP FXD CER X01 MFD	6157
26	C 5	8916-9331	CAP SOLID TA 3X3 MFD	6157
19	C 6	3403-9103	CAP FXD CER X01 MFD	6157
31	C 7	27512-0161	CAP FXD MICA 160 PFD	6157
19	C 8	3403-9103	CAP FXD CER X01 MFD	6157
33	C 9	27512-0910	CAP FXD MICA 91 PFD	6157
28	C 10	27512-0100	CAP FXD MICA 10 PFD	6157
32	C 11	27512-0820	CAP FXD MICA 82 PFD	6157
27	C 12	8917-0390	CAP SOLID TA 39 MFD	6157
29	C 13	27512-0101	CAP FXD MICA 100 PFD	6157
28	C 14	27512-0100	CAP FXD MICA 10 PFD	6157
29	C 15	27512-0101	CAP FXD MICA 100 PFD	6157

Table 6-I. Item Reference Designation Index. (Sheet 7 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
19	C 16	3403-9103	CAP FXD CER X01 MFD	6157
19	C 17	3403-9103	CAP FXD CER X01 MFD	6157
34	C 18	27513-9301	CAP FXD MICA 3 PFD	6157
0	C 19		NOT USED	6157
0	C 20		NOT USED	6157
30	C 21	27512-0111	CAP FXD MICA 110 PFD	6157
34	C 22	27513-9301	CAP FXD MICA 3 PFD	6157
0	C 23		NOT USED	6157
17	Q 1	900-3646	TSTR 2N3646	6157
17	Q 2	900-3646	TSTR 2N3646	6157
17	Q 3	900-3646	TSTR 2N3646	6157
17	Q 4	900-3646	TSTR 2N3646	6157
35	Q 5	900-3705	TSTR 2N3705	6157
17	Q 6	900-3646	TSTR 2N3646	6157
3	R 1	200-0101	RES FXD COMP 100 OHM	6157
4	R 2	200-0102	RES FXD COMP 1X0 K	6157
12	R 3	200-0472	RES FXD COMP 4X7 K	6157
12	R 4	200-0472	RES FXD COMP 4X7 K	6157
5	R 5	200-0122	RES FXD COMP 1X2 K	6157
14	R 6	200-0681	RES FXD COMP 680 OHM	6157
15	R 7	200-0682	RES FXD COMP 6X8 K	6157
15	R 8	200-0682	RES FXD COMP 6X8 K	6157
9	R 9	200-0222	RES FXD COMP 2X2 K	6157
4	R 10	200-0102	RES FXD COMP 1X0 K	6157
2	R 11	200-0100	RES FXD COMP 10 OHM	6157
13	R 12	200-0561	RES FXD COMP 560 OHM	6157
10	R 13	200-0333	RES FXD COMP 33 K	6157
3	R 14	200-0101	RES FXD COMP 100 OHM	6157
11	R 15	200-0392	RES FXD COMP 3X9 K	6157
9	R 16	200-0222	RES FXD COMP 2X2 K	6157
8	R 17	200-0221	RES FXD COMP 220 OHM	6157
3	R 18	200-0101	RES FXD COMP 100 OHM	6157
7	R 19	200-0154	RES FXD COMP 150 K	6157
6	R 20	200-0151	RES FXD COMP 150 OHM	6157
6	R 21	200-0151	RES FXD COMP 150 OHM	6157
23	T 1	6086	XFMR	6157
23	T 2	6086	XFMR	6157
22	T 3	6084	XFMR	6157
22	T 4	6084	XFMR	6157
22	T 5	6084	XFMR	6157
16	CR 1	800-0914	DIODE 1N914	6157
16	CR 2	800-0914	DIODE 1N914	6157
16	CR 3	800-0914	DIODE 1N914	6157
16	CR 4	800-0914	DIODE 1N914	6157
16	CR 5	800-0914	DIODE 1N914	6157
			ASSY PCB 5 MC/1 MC DI	6158
1		175-0008	SCR BIND HD 4 40X1/8	6158
16		3657-0001	INSULATOR TRANSISTOR	6158
17		5046-0012	STANDOFF HEX 4 40	6158
18		6067	BOARD PRINTED CIRCUIT	6158
23		8819-0024	WIRE BUS BAR AWG 24	6158
25	C 1	8917-0390	CAP SOLID TA 39 MFD	6158
27	C 2	27512-0221	CAP FXD MICA 220 PFD	6158
15	C 3	3403-9103	CAP FXD CER X01 MFD	6158
30	C 4	27512-9501	CAP FXD MICA 5 PFD	6158
27	C 5	27512-0221	CAP FXD MICA 220 PFD	6158
27	C 6	27512-0221	CAP FXD MICA 220 PFD	6158
27	C 7	27512-0221	CAP FXD MICA 220 PFD	6158
27	C 8	27512-0221	CAP FXD MICA 220 PFD	6158
15	C 9	3403-9103	CAP FXD CER X01 MFD	6158
28	C 10	27512-0390	CAP FXD MICA 39 PFD	6158
27	C 11	27512-0221	CAP FXD MICA 220 PFD	6158
27	C 12	27512-0221	CAP FXD MICA 220 PFD	6158
15	C 13	3403-9103	CAP FXD CER X01 MFD	6158
31	C 14	27513-0150	CAP FXD MICA 15 PFD	6158
27	C 15	27512-0221	CAP FXD MICA 220 PFD	6158
27	C 16	27512-0221	CAP FXD MICA 220 PFD	6158
15	C 17	3403-9103	CAP FXD CER X01 MFD	6158
15	C 18	3403-9103	CAP FXD CER X01 MFD	6158
32	C 19	27513-0561	CAP FXD MICA 560 PFD	6158
24	C 20	8916-9331	CAP SOLID TA 3X3 MFD	6158
29	C 21	27512-0820	CAP FXD MICA 82 PFD	6158
32	C 22	27513-0561	CAP FXD MICA 560 PFD	6158
26	C 23	27512-0131	CAP FXD MICA 130 PFD	6158
28	C 24	27512-0390	CAP FXD MICA 39 PFD	6158
14	Q 1	900-3646	TSTR NPN 2N3646	6158
14	Q 2	900-3646	TSTR NPN 2N3646	6158
14	Q 3	900-3646	TSTR NPN 2N3646	6158
14	Q 4	900-3646	TSTR NPN 2N3646	6158
14	Q 5	900-3646	TSTR NPN 2N3646	6158
14	Q 6	900-3646	TSTR NPN 2N3646	6158
14	Q 7	900-3646	TSTR NPN 2N3646	6158

Table 6-I. Item Reference Designation Index. (Sheet 8 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
14	Q 8	900-3646	TSTR NPN 2N3646	6158
14	Q 9	900-3646	TSTR NPN 2N3646	6158
33	Q 10	900-3705	TSTR NPN 2N3705	6158
33	Q 11	900-3705	TSTR NPN 2N3705	6158
2	R 1	200-0101	RES FXD COMP 100 OHM	6158
11	R 2	200-0473	RES FXD COMP 47 K	6158
5	R 3	200-0153	RES FXD COMP 15 K	6158
8	R 4	200-0272	RES FXD COMP 2X7 K	6158
2	R 5	200-0101	RES FXD COMP 100 OHM	6158
7	R 6	200-0224	RES FXD COMP 220 K	6158
6	R 7	200-0221	RES FXD COMP 220 OHM	6158
7	R 8	200-0224	RES FXD COMP 220 K	6158
2	R 9	200-0101	RES FXD COMP 100 OHM	6158
2	R 10	200-0101	RES FXD COMP 100 OHM	6158
11	R 11	200-0473	RES FXD COMP 47 K	6158
11	R 12	200-0473	RES FXD COMP 47 K	6158
11	R 13	200-0473	RES FXD COMP 47 K	6158
2	R 14	200-0101	RES FXD COMP 100 OHM	6158
2	R 15	200-0101	RES FXD COMP 100 OHM	6158
11	R 16	200-0473	RES FXD COMP 47 K	6158
11	R 17	200-0473	RES FXD COMP 47 K	6158
11	R 18	200-0473	RES FXD COMP 47 K	6158
6	R 19	200-0221	RES FXD COMP 220 OHM	6158
6	R 20	200-0221	RES FXD COMP 220 OHM	6158
12	R 21	200-0683	RES FXD COMP 68 K	6158
6	R 22	200-0221	RES FXD COMP 220 OHM	6158
4	R 23	200-0103	RES FXD COMP 10 K	6158
8	R 24	200-0272	RES FXD COMP 2X7 K	6158
11	R 25	200-0473	RES FXD COMP 47 K	6158
9	R 26	200-0273	RES FXD COMP 27 K	6158
3	R 27	200-0102	RES FXD COMP 1X0 K	6158
10	R 28	200-04 1	RES FXD COMP 470 OHM	6158
19	T 1	6087	XFMR	6158
21	T 2	6089	XFMR	6158
19	T 3	6087	XFMR	6158
20	T 4	6088	XFMR	6158
13	CR 1	800-0914	DIODE 1N914	6158
13	CR 2	800-0914	DIODE 1N914	6158
13	CR 3	800-0914	DIODE 1N914	6158
13	CR 4	800-0914	DIODE 1N914	6158
			ASSY PCB BUFFER AMPL	6159
1		82	INSULATOR TRANSISTOR	6159
2		175-0008	SCR BIND HD 4 40X1/8	6159
17		3657-0001	INSULATOR TRANSISTOR	6159
18		5046-0012	STANDOFF HEX 4 40	6159
19		6049	BOARD PRINTED CIRCUIT	6159
22	C 1	8917-0390	CAP SOLID TA 39 MFD	6159
16	C 2	3403-9103	CAP FXD CER X01 MFD	6159
16	C 3	3403-9103	CAP FXD CER X01 MFD	6159
21	C 4	8914-0100	CAP SOLID TA 10 MFD	6159
21	C 5	8914-0100	CAP SOLID TA 10 MFD	6159
16	C 6	3403-9103	CAP FXD CER X01 MFD	6159
16	C 7	3403-9103	CAP FXD CER X01 MFD	6159
16	C 8	3403-9103	CAP FXD CER X01 MFD	6159
13	Q 1	900-3705	TSTR NPN 2N3705	6159
15	Q 2	900-3702	TSTR PNP 2N3702	6159
14	Q 3	900-3705	TSTR NPN 2N3705	6159
13	Q 4	900-3705	TSTR NPN 2N3705	6159
13	Q 5	900-3705	TSTR NPN 2N3705	6159
13	Q 6	900-3705	TSTR NPN 2N3705	6159
13	Q 7	900-3705	TSTR NPN 2N3705	6159
13	Q 8	900-3705	TSTR NPN 2N3705	6159
13	Q 9	900-3705	TSTR NPN 2N3705	6159
7	R 1	200-0392	RES FXD COMP 3X9 K	6159
10	R 2	200-0473	RES FXD COMP 47 K	6159
8	R 3	200-0471	RES FXD COMP 470	6159
4	R 4	200-0122	RES FXD COMP 1X2 K	6159
3	R 5	200-0103	RES FXD COMP 10 K	6159
6	R 6	200-0272	RES FXD COMP 2X7 K	6159
9	R 7	200-0472	RES FXD COMP 4X7 K	6159
9	R 8	200-0472	RES FXD COMP 4X7 K	6159
4	R 9	200-0122	RES FXD COMP 1X2 K	6159
5	R 10	200-0223	RES FXD COMP 22 K	6159
5	R 11	200-0223	RES FXD COMP 22 K	6159
10	R 12	200-0473	RES FXD COMP 47 K	6159
11	R 13	200-0681	RES FXD COMP 680 OHM	6159
11	R 14	200-0681	RES FXD COMP 680 OHM	6159
10	R 15	200-0473	RES FXD COMP 47 K	6159
4	R 16	200-0122	RES FXD COMP 1X2 K	6159
5	R 17	200-0223	RES FXD COMP 22 K	6159
5	R 18	200-0223	RES FXD COMP 22 K	6159
9	R 19	200-0472	RES FXD COMP 4X7 K	6159

Table 6-I. Item Reference Designation Index. (Sheet 9 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
3	R 20	200-0103	RES FXD COMP 10 K	6159
6	R 21	200-0272	RES FXD COMP 2X7 K	6159
9	R 22	200-0472	RES FXD COMP 4X7 K	6159
12	CR 1	800-0914	DIODE 1N914	6159
			ASSY PCB POWER SUPPLY	6160
1		82	INSULATOR TRANSISTOR	6160
2		175-0008	SCR BIND HD 4 40X1/8	6160
16		5007	BOARD PRINTED CIRCUIT	6160
17		5046-0012	STANDOFF HEX 4 40	6160
19	C 1	8914-0100	CAP SOLID TA 10 MFD	6160
19	C 2	8914-0100	CAP SOLID TA 10 MFD	6160
20	C 3	8917-0390	CAP SOLID TA 39 MFD	6160
20	C 4	8917-0390	CAP SOLID TA 39 MFD	6160
19	C 5	8914-0100	CAP SOLID TA 10 MFD	6160
14	Q 1	900-2102	TSTR NPN 2N2102	6160
21	Q 2	900-3705	TSTR NPN 2N3705	6160
15	Q 3	900-3702	TSTR 2N3702	6160
14	Q 4	900-2102	TSTR 2N2102	6160
11	R 1	211-3481	RES FXD FILM 3X48 K	6160
10	R 2	211-3161	RES FXD FILM 3X16 K	6160
8	R 3	200-0562	RES FXD COMP 5X6 K	6160
3	R 4	200-0102	RES FXD COMP 1X0 K	6160
6	R 5	200-0182	RES FXD COMP 1X8 K	6160
4	R 6	200-0152	RES FXD COMP 1X5 K	6160
7	R 7	200-0331	RES FXD COMP 330 OHM	6160
5	R 8	200-0153	RES FXD COMP 15 K	6160
3	R 9	200-0102	RES FXD COMP 1X0 K	6160
9	R 10	208-0681	RES FXD COMP 680 OHM	6160
9	R 11	208-0681	RES FXD COMP 680 OHM	6160
12	CR 1	800-3193	DIODE 1N3193	6160
12	CR 2	800-3193	DIODE 1N3193	6160
12	CR 3	800-3193	DIODE 1N3193	6160
12	CR 4	800-3193	DIODE 1N3193	6160
13	VR 1	801-0756	DIODE 1N756A	6160
			ASSY PCB DIFF/INT	6161
1		82	INSULATOR TRANSISTOR	6161
2		175-0008	SCR BIND HD 4 40X1/8	6161
23		5046-0012	STANDOFF HEX 4 40	6161
24		6070	BOARD PRINTED CIRCUIT	6161
20	C 1	3324-9222	CAP FXD MYLAR X22 MFD	6161
22	C 2	3611-9201	CAP FXD MYLAR 2X0 MFD	6161
28	C 3	27512-0470	CAP FXD MICA 47 PFD	6161
19	C 4	3324-9102	CAP FXD MYLAR X10 MFD	6161
28	C 5	27512-0470	CAP FXD MICA 47 PFD	6161
22	C 6	3611-9201	CAP FXD MYLAR 2X0 MFD	6161
30	Q 1	9237	TSTR MTCHD PAIR	6161
30	Q 2	9237	TSTR MTCHD PAIR	6161
29	Q 3	9236	TSTR MTCHD PAIR	6161
29	Q 4	9236	TSTR MTCHD PAIR	6161
26	Q 5	900-3707	TSTR NPN 2N3707	6161
18	Q 6	900-2102	TSTR NPN 2N2102	6161
30	Q 7	9237	TSTR MTCHD PAIR	6161
30	Q 8	9237	TSTR MTCHD PAIR	6161
29	Q 9	9236	TSTR MTCHD PAIR	6161
29	Q 10	9236	TSTR MTCHD PAIR	6161
26	Q 11	900-3707	TSTR NPN 2N3707	6161
18	Q 12	900-2102	TSTR NPN 2N2102	6161
4	R 1	200-0474	RES FXD COMP 470 K	6161
4	R 2	200-0474	RES FXD COMP 470 K	6161
10	R 3	211-2372	RES FXD FILM 23X7 K	6161
10	R 4	211-2372	RES FXD FILM 23X7 K	6161
9	R 5	211-2153	RES FXD FILM 215 K	6161
9	R 6	211-2153	RES FXD FILM 215 K	6161
0	R 7		NOT USED	6161
10	R 8	211-2372	RES FXD FILM 23X7 K	6161
5	R 9	200-0683	RES FXD COMP 68 K	6161
3	R 10	200-0104	RES FXD COMP 100 K	6161
11	R 11	211-2872	RES FXD FILM 28X7 K	6161
21	R 12	3598-0104	RES VAR 100K	6161
21	R 13	3598-0104	RES VAR 100K	6161
4	R 14	200-0474	RES FXD COMP 470 K	6161
4	R 15	200-0474	RES FXD COMP 470 K	6161
11	R 16	211-2872	RES FXD FILM 28X7 K	6161
6	R 17	211-1000	RES FXD FILM 100 OHM	6161
15	R 18	212-4223	RES FXD FILM 422 K	6161
7	R 19	211-1103	RES FXD FILM 110 K	6161
7	R 20	211-1103	RES FXD FILM 110 K	6161
12	R 21	211-4641	RES FXD FILM 4X64 K	6161
14	R 22	211-5622	RES FXD FILM 56X2 K	6161

Table 6-I. Item Reference Designation Index. (Sheet 10 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
8	R 23	211-2151	RES FXD FILM 2X15 K	6161
13	R 24	211-5231	RES FXD FILM 5X23 K	6161
16	CR 1	800-0914	DIODE 1N914	6161
16	CR 2	800-0914	DIODE 1N914	6161
16	CR 3	800-0914	DIODE 1N914	6161
16	CR 4	800-0914	DIODE 1N914	6161
16	CR 5	800-0914	DIODE 1N914	6161
16	CR 6	800-0914	DIODE 1N914	6161
17	VR 1	801-0751	DIODE 1N751A	6161
			ASSY PCB S SHOT/PH CO	6162
1		82	INSULATOR TRANSISTOR	6162
2		175-0008	SCR BIND HD 4 40X1/8	6162
20		3657-0001	INSULATOR TRANSISTOR	6162
21		5046-0012	STANDOFF HEX 4 40	6162
22		6072	BOARD PRINTED CIRCUIT	6162
19	C 1	3611-9201	CAP FXD MYLAR 2X0 MFD	6162
28	C 2	27512-0470	CAP FXD MICA 47 PFD	6162
27	C 3	27512-0220	CAP FXD MICA 22 PFD	6162
18	C 4	3403-9103	CAP FXD CER X01 MFD	6162
18	C 5	3403-9103	CAP FXD CER X01 MFD	6162
27	C 6	27512-0220	CAP FXD MICA 22 PFD	6162
27	C 7	27512-0220	CAP FXD MICA 22 PFD	6162
26	C 8	27512-0100	CAP FXD MICA 10 PFD	6162
26	C 9	27512-0100	CAP FXD MICA 10 PFD	6162
27	C 10	27512-0220	CAP FXD MICA 22 PFD	6162
25	C 11	21485-9101	CAP SOLID TA 1X0 MFD	6162
24	C 12	8916-9331	CAP SOLID TA 3X3 MFD	6162
24	C 13	8916-9331	CAP SOLID TA 3X3 MFD	6162
16	Q 1	900-3646	TSTR NPN 2N3646	6162
16	Q 2	900-3646	TSTR NPN 2N3646	6162
17	Q 3	900-3702	TSTR PNP 2N3702	6162
16	Q 4	900-3646	TSTR NPN 2N3646	6162
16	Q 5	900-3646	TSTR NPN 2N3646	6162
16	Q 6	900-3646	TSTR NPN 2N3646	6162
16	Q 7	900-3646	TSTR NPN 2N3646	6162
16	Q 8	900-3646	TSTR NPN 2N3646	6162
16	Q 9	900-3646	TSTR NPN 2N3646	6162
16	Q 10	900-3646	TSTR NPN 2N3646	6162
16	Q 11	900-3646	TSTR NPN 2N3646	6162
9	R 1	200-0272	RES FXD COMP 2X7 K	6162
12	R 2	200-0563	RES FXD COMP 56 K	6162
6	R 3	200-0123	RES FXD COMP 12 K	6162
6	R 4	200-0123	RES FXD COMP 12 K	6162
12	R 5	200-0563	RES FXD COMP 56 K	6162
8	R 6	200-0222	RES FXD COMP 2X2 K	6162
11	R 7	200-0474	RES FXD COMP 470 K	6162
3	R 8	200-0100	RES FXD COMP 10 OHM	6162
12	R 9	200-0563	RES FXD COMP 56 K	6162
10	R 10	200-0473	RES FXD COMP 47 K	6162
8	R 11	200-0222	RES FXD COMP 2X2 K	6162
10	R 12	200-0473	RES FXD COMP 47 K	6162
9	R 13	200-0272	RES FXD COMP 2X7 K	6162
9	R 14	200-0272	RES FXD COMP 2X7 K	6162
13	R 15	211-2151	RES FXD FILM 2X15 K	6162
13	R 16	211-2151	RES FXD FILM 2X15 K	6162
14	R 17	211-3482	RES FXD FILM 34X8 K	6162
14	R 18	211-3482	RES FXD FILM 34X8 K	6162
5	R 19	200-0103	RES FXD COMP 10 K	6162
5	R 20	200-0103	RES FXD COMP 10 K	6162
4	R 21	200-0101	RES FXD COMP 100 OHM	6162
8	R 22	200-0222	RES FXD COMP 2X2 K	6162
7	R 23	200-0182	RES FXD COMP 1X8 K	6162
11	R 24	200-0474	RES FXD COMP 470 K	6162
11	R 25	200-0474	RES FXD COMP 470 K	6162
15	CR 1	800-0914	DIODE 1N914	6162
15	CR 2	800-0914	DIODE 1N914	6162
15	CR 3	800-0914	DIODE 1N914	6162
15	CR 4	800-0914	DIODE 1N914	6162
15	CR 5	800-0914	DIODE 1N914	6162
15	CR 6	800-0914	DIODE 1N914	6162
15	CR 7	800-0914	DIODE 1N914	6162
15	CR 8	800-0914	DIODE 1N914	6162
15	CR 9	800-0914	DIODE 1N914	6162
15	CR 10	800-0914	DIODE 1N914	6162
15	CR 11	800-0914	DIODE 1N914	6162
			ASSY PCB SCOPE DRIVER	6163
1		82	INSULATOR TRANSISTOR	6163
2		175-0008	SCR BIND HD 4 40X1/8	6163
29		3657-0001	INSULATOR TRANSISTOR	6163

Table 6-I. Item Reference Designation Index. (Sheet 11 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
32		5046-0012	STANDOFF HEX 4 40	6163
33		6079	BOARD PRINTED CIRCUIT	6163
25	C 1	3324-9224	CAP FXD MYL X0022 MFD	6163
35	C 2	8914-0100	CAP SOLID TA 10 MFD	6163
26	C 3	3403-9103	CAP FXD CER X01 MFD	6163
35	C 4	8914-0100	CAP SOLID TA 10 MFD	6163
26	C 5	3403-9103	CAP FXD CER X01 MFD	6163
36	C 6	27512-0201	CAP FXD MICA 200 PFD	6163
36	C 7	27512-0201	CAP FXD MICA 200 PFD	6163
26	C 8	3403-9103	CAP FXD CER X01 MFD	6163
25	C 9	3324-9224	CAP FXD MYL X0022 MFD	6163
24	Q 1	900-3702	TSTR PNP 2N3702	6163
22	Q 2	900-3705	TSTR NPN 2N3705	6163
22	Q 3	900-3705	TSTR NPN 2N3705	6163
23	Q 5	900-3646	TSTR NPN 2N3646	6163
22	Q 6	900-3705	TSTR NPN 2N3705	6163
21	Q 7	900-0708	TSTR NPN 2N708	6163
22	Q 8	900-3705	TSTR NPN 2N3705	6163
23	Q 9	900-3646	TSTR NPN 2N3646	6163
22	Q 11	900-3705	TSTR NPN 2N3705	6163
22	Q 12	900-3705	TSTR NPN 2N3705	6163
24	Q 13	900-3702	TSTR PNP 2N3702	6163
11	R 1	211-1003	RES FXD FILM 100 K	6163
11	R 2	211-1003	RES FXD FILM 100 K	6163
4	R 3	200-0105	RES FXD COMP 1X0 M	6163
4	R 4	200-0105	RES FXD COMP 1X0 M	6163
14	R 5	211-2152	RES FXD FILM 21X5 K	6163
12	R 6	211-1102	RES FXD FILM 11X0 K	6163
31	R 7	3838-0502	RES VAR 5 K	6163
30	R 8	3838-0103	RES VAR 10 K	6163
9	R 9	200-0473	RES FXD COMP 47 K	6163
8	R 11	200-0182	RES FXD COMP 1.8 K	6163
15	R 12	211-5111	RES FXD FILM 5X11 K	6163
18	R 13	211-7501	RES FXD FILM 7X50 K	6163
13	R 14	211-1212	RES FXD FILM 12X1 K	6163
17	R 15	211-7500	RES FXD FILM 750 OHM	6163
6	R 16	200-0222	RES FXD COMP 2X2 K	6163
7	R 17	200-0272	RES FXD COMP 2X7 K	6163
9	R 18	200-0473	RES FXD COMP 47 K	6163
6	R 19	200-0222	RES FXD COMP 2X2 K	6163
27	R 20	3596-0102	RES VAR 1 K	6163
15	R 21	211-5111	RES FXD FILM 5X11K	6163
28	R 22	3596-0502	RES VAR 5 K	6163
16	R 23	211-5231	RES FXD FILM 5X23 K	6163
19	R 24	211-9091	RES FXD FILM 9X09 K	6163
10	R 25	200-0681	RES FXD COMP 680 OHM	6163
8	R 26	200-0182	RES FXD COMP 1.8 K	6163
12	R 28	211-1102	RES FXD FILM 11X0 K	6163
14	R 29	211-2152	RES FXD FILM 21X5 K	6163
30	R 30	3838-0103	RES VAR 10 K	6163
0	R 31		NOT USED	6163
4	R 32	200-0105	RES FXD COMP 1X0 M	6163
4	R 33	200-0105	RES FXD COMP 1X0 M	6163
11	R 34	211-1003	RES FXD FILM 100 K	6163
11	R 35	211-1003	RES FXD FILM 100 K	6163
3	R 36	200-0101	RES FXD COMP 100 OHM	6163
3	R 37	200-0101	RES FXD COMP 100 OHM	6163
9	R 38	200-0473	RES FXD COMP 47 K	6163
5	R 39	200-0106	RES FXD COMP 10 M	6163
5	R 40	200-0106	RES FXD COMP 10 M	6163
20	CR 1	800-0914	DIODE 1N914	6163
20	CR 2	800-0914	DIODE 1N914	6163
			ASSY PCB XTAL FILTER	6164
1		175-0008	SCR BIND HD 4 40X1/8	6164
5		5046-0012	STANDOFF HEX 4 40	6164
6		6094	BOARD PRINTED CIRCUIT	6164
8	C 1	27512-0180	CAP FXD MICA 18 PFD	6164
4	C 2	3632-0011	CAP VAR X8 30 PFD	6164
9	C 3	27512-0201	CAP FXD MICA 200 PFD	6164
2	Y 1	3630-0001	XTAL 1000 KC	6164
3	XY 1	3631-0001	HOLDER CRYSTAL	6164
			ASSY PCB INTERCONN	6165
3		610-0141	TERMINAL SOLDER	6165
4		3326-0046	RIVET POP	6165
5		3486-0001	LUG SOLDER NO 4	6165
7		6057	BOARD PRINTED CIRCUIT	6165
9		8819-0020	WIRE BUS BAR AWG 20	6165
12		617-0256	WASHER, FLAT NO 4	6165
11	C 2	8917-0390	CAP SOLID TA 39 MFD	6165

Table 6-I. Item Reference Designation Index. (Sheet 12 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
10	C 3	8914-0101	CAP SOLID TA 100 MFD	6165
10	C 4	8914-0101	CAP SOLID TA 100 MFD	6165
6	J 10	3628-0215	CONNECTOR PCB	6165
6	J 11	3628-0215	CONNECTOR PCB	6165
6	J 12	3628-0215	CONNECTOR PCB	6165
6	J 13	3628-0215	CONNECTOR PCB	6165
6	J 14	3628-0215	CONNECTOR PCB	6165
6	J 15	3628-0215	CONNECTOR PCB	6165
6	J 16	3628-0215	CONNECTOR PCB	6165
6	J 17	3628-0215	CONNECTOR PCB	6165
6	J 18	3628-0215	CONNECTOR PCB	6165
6	J 19	3628-0215	CONNECTOR PCB	6165
6	J 20	3628-0215	CONNECTOR PCB	6165
6	J 21	3628-0215	CONNECTOR PCB	6165
6	J 22	3628-0215	CONNECTOR PCB	6165
6	J 23	3628-0215	CONNECTOR PCB	6165
6	J 24	3628-0215	CONNECTOR PCB	6165
2	R 5	200-0152	RES FXD COMP 1X5 K	6165
2	R 6	200-0152	RES FXD COMP 1X5 K	6165
2	R 7	200-0152	RES FXD COMP 1X5 K	6165
2	R 8	200-0152	RES FXD COMP 1X5 K	6165
1	R 9	200-0102	RES FXD COMP 1X0 K	6165
2	R 10	200-0152	RES FXD COMP 1X5 K	6165
			ASSY PCB SCOPE PWR SU	6166
1		184-0016	SCR PAN HD 4 40X1/4	6166
4		520-0123	WASHER LOCK NO 4	6166
5		649-0074	NUT HEX 4 40	6166
8		3783-0213	BRACKET ANGLE	6166
9		6082	BOARD PRINTED CIRCUIT	6166
7	C 1	3610-0066	CAP FXD ELECT 4 MFD	6166
3	R 1	208-0105	RES FXD COMP 1X0 M	6166
2	R 2	208-0104	RES FXD COMP 100 K	6166
6	CR 1	800-3255	DIODE 1N3255	6166
			ASSY MODULE FLIP FLOP	6168
1		175-0008	SCR BIND HD 4 40X1/8	6168
2		6101	SHIELD	6168
4	A 1	6154	ASSY PCB FLIP FLOP	6168
			ASSY MODULE ERR MULT	6169
1		144-0012	SCR FLAT HD 4 40X3/16	6169
2		175-0008	SCR BIND HD 4 40X1/8	6169
3		175-0012	SCR BIND HD 4 40X3/16	6169
4		3332-0053	NUT CLINCH 4 40	6169
5		6075	SHIELD	6169
6		6101	SHIELD	6169
8	A 1	6155	ASSY PCB ERROR MULT	6169
			ASSY MODULE ERR MULT	6170
1		144-0012	SCR FLAT HD 4 40X3/16	6170
2		175-0008	SCR BIND HD 4 40X1/8	6170
3		175-0012	SCR BIND HD 4 40X3/16	6170
4		3332-0053	NUT CLINCH 4 40	6170
5		6075	SHIELD	6170
6		6101	SHIELD	6170
8	A 1	6156	ASSY PCB ERROR MULT	6170
			ASSY MODULE REF INPUT	6171
1		144-0012	SCR FLAT HD 4 40X3/16	6171
2		175-0008	SCR BIND HD 4 40X1/8	6171
3		175-0012	SCR BIND HD 4 40X3/16	6171
4		3332-0053	NUT CLINCH 4 40	6171
5		6076	SHIELD	6171
6		6101	SHIELD	6171
8	A 1	6157	ASSY PCB REF INPUT	6171
			ASSY MODULE 5MC/1MC	6172
1		144-0012	SCR FLAT HD 4 40X3/16	6172
2		175-0008	SCR BIND HD 4 40X1/8	6172
3		175-0012	SCR BIND HD 4 40X3/16	6172
4		3332-0053	NUT CLINCH 4 40	6172
5		6078	SHIELD	6172

Table 6-I. Item Reference Designation Index (Sheet 13 of 13)

ITEM NUMBER	REFERENCE DESIGNATION	TRACOR STOCK NUMBER	DESCRIPTION	STOCK NUMBER USED ON
6		6101	SHIELD	6172
8	A 1	6158	ASSY PCB 5MC/1MC	6172
			ASSY MODULE BUFF AMPL	6173
1		175-0008	SCR BIND HD 4 40X1/8	6173
2		6101	SHIELD	6173
4	A 1	6159	ASSY PCB BUFF AMPL	6173
			ASSY MODULE POWER SUP	6174
1		175-0008	SCR BIND HD 4 40X1/8	6174
2		6101	SHIELD	6174
4	A 1	6160	ASSY PCB POWER SUP	6174
			ASSY MODULE DIFF/INT	6175
1		175-0008	SCR BIND HD 4 40X1/8	6175
3		6183	SHIELD	6175
4	A 1	6161	ASSY PCB DIFF/INT	6175
			ASSY MODULE SS/PH COM	6193
1		175-0008	SCR BIND HD 4 40X1/8	6193
2		6101	SHIELD	6193
4	A 1	6162	ASSY PCB SS/PH COM	6193
			ASSY MODULE SCOPE DRV	6194
1		175-0008	SCR BIND HD 4 40X1/8	6194
4		6185	SHIELD	6194
3	A 1	6163	ASSY PCB SCOPE DRV	6194
			ASSY MODULE XTAL FILT	6195
1		144-0012	SCR FLAT HD 4 40X3/16	6195
2		175-0008	SCR BIND HD 4 40X1/8	6195
3		175-0012	SCR BIND HD 4 40X3/16	6195
4		3332-0053	NUT CLINCH 4 40	6195
5		6074	SHIELD	6195
8		6181	SHIELD	6195
7	A 1	6164	ASSY PCB XTAL FILTER	6195
			ASSY WIRING HARNESS	6316
7		6032	PLATE	6316
3	R 1	3522-0502	RES VAR 5 K	6316
5	R 3	3507-0253	RES VAR 25 K	6316
4	R 4	3507-0104	RES VAR 100 K	6316
1	S 2	3490-0002	SWITCH TOGGLE DPST	6316
6	S 3	3799-0003	SWITCH ROTAY	6316
1	S 4	3490-0002	SWITCH TOGGLE DPST	6316
2	S 5	3490-0003	SWITCH TOGGLE DPDT	6316
10	XV 1	25306	SOCKET 11 PIN	6316
			ACCESSORY PARTS SET	6355-0001
1		87-0342	LAMP MINAT 28 V	6355-0001
2		175-0028	SCR 4 40X 7/16	6355-0001
3		187-0024	SCR PAN HD 8 32X3/8	6355-0001
4		617-0267	WASHER FLAT NO 6	6355-0001
5		3348-9502	FUSE FAST X5 AMP	6355-0001
6		3666-0003	RUBBER BUMPER FEET	6355-0001
7		3676-0002	TUNING TOOL ADJUST	6355-0001
8		6370	MANUAL OPS/SER 527A	6355-0001

Table 6-II. List of Replaceable Parts. (Sheet 1 of 4)

TRACOR STOCK NUMBER	DESCRIPTION	MFGR CODE	MANUFACTURER PART NUMBER	TOTAL QUANTITY	U/M
82	INSULATOR TSTR PAD	17069	88000	25.	EA
87-0342	LAMP BULB INCD 1.12W	08806	327	4.	EA
142-0020	SCR FLT HD 2-56X5/16	73734	3122	4.	EA
144-0012	SCR FLAT HD 4-40X3/16	73734	3130	14.	EA
147-0024	SCR FLAT HD 8-32X3/8	73734	3163	4.	EA
175-0008	SCR BND HD 4-40X1/8	73734	4020	104.	EA
175-0012	SCR BND HD 4-40X3/16	73734	4021	14.	EA
175-0016	SCR BND HD 4-40X1/4	73734	4022	14.	EA
175-0020	SCR BND HD 4-40X5/16	73734	4023	12.	EA
175-0028	SCR BND HD 4-40X7/16	73734	4025	11.	EA
177-0016	SCR BND HD 6-32X1/4	73734	4032	4.	EA
177-0032	SCR BND HD 6-32X1/2	73734	4036	10.	EA
178-0024	SCR BND HD 8-32X3/8	73734	4054	4.	EA
184-0016	SCR PAN HD 4-40X1/4	73734	12022	2.	EA
187-0024	SCR PAN HD 8-32X3/8	73734	12064	4.	EA
200-0100	RES FXD COMP 10 OHM	01121	RC07GF100K (MIL-R-11/8)	6.	EA
200-0101	RES FXD COMP 100 OHM	01121	RC07GF101K (MIL-R-11/8)	25.	EA
200-0102	RES FXD COMP 1 K	01121	RC07GF102K (MIL-R-11/8)	15.	EA
200-0103	RES FXD COMP 10 K	01121	RC07GF103K (MIL-R-11/8)	6.	EA
200-0104	RES FXD COMP 100 K	01121	RC07GF104K (MIL-R-11/8)	1.	EA
200-0105	RES FXD COMP 1 M	01121	RC07GF105K (MIL-R-11/8)	4.	EA
200-0106	RES FXD COMP 10 M	01121	RC07GF106K (MIL-R-11/8)	2.	EA
200-0121	RES FXD COMP 120 OHM	01121	RC07GF121K (MIL-R-11/8)	4.	EA
200-0122	RES FXD COMP 1.2 K	01121	RC07GF122K (MIL-R-11/8)	8.	EA
200-0123	RES FXD COMP 12 K	01121	RC07GF123K (MIL-R-11/8)	2.	EA
200-0151	RES FXD COMP 150 OHM	01121	RC07GF151K (MIL-R-11/8)	10.	EA
200-0152	RES FXD COMP 1.5 K	01121	RC07GF152K (MIL-R-11/8)	6.	EA
200-0153	RES FXD COMP 15 K	01121	RC07GF153K (MIL-R-11/8)	2.	EA
200-0154	RES FXD COMP 150 K	01121	RC07GF154K (MIL-R-11/8)	1.	EA
200-0182	RES FXD COMP 1.8 K	01121	RC07GF182K (MIL-R-11/8)	4.	EA
200-0183	RES FXD COMP 18 K	01121	RC07GF183K (MIL-R-11/8)	8.	EA
200-0221	RES FXD COMP 220 OHM	01121	RC07GF221K (MIL-R-11/8)	13.	EA
200-0222	RES FXD COMP 2.2 K	01121	RC07GF222K (MIL-R-11/8)	29.	EA
200-0223	RES FXD COMP 22 K	01121	RC07GF223K (MIL-R-11/8)	28.	EA
200-0224	RES FXD COMP 220 K	01121	RC07GF224K (MIL-R-11/8)	2.	EA
200-0272	RES FXD COMP 2.7 K	01121	RC07GF272K (MIL-R-11/8)	12.	EA
200-0273	RES FXD COMP 27 K	01121	RC07GF273K (MIL-R-11/8)	1.	EA
200-0331	RES FXD COMP 330 OHM	01121	RC07GF331K (MIL-R-11/8)	1.	EA
200-0332	RES FXD COMP 3.3 K	01121	RC07GF332K (MIL-R-11/8)	16.	EA
200-0333	RES FXD COMP 33 K	01121	RC07GF333K (MIL-R-11/8)	1.	EA
200-0334	RES FXD COMP 330 K	01121	RC07GF334K (MIL-R-11/8)	1.	EA
200-0391	RES FXD COMP 390 OHM	01121	RC07GF391K (MIL-R-11/8)	4.	EA
200-0392	RES FXD COMP 3.9 K	01121	RC07GF392K (MIL-R-11/8)	10.	EA
200-0394	RES FXD COMP 390 K	01121	RC07GF394K (MIL-R-11/8)	4.	EA
200-0471	RES FXD COMP 470 OHM	01121	RC07GF471K (MIL-R-11/8)	2.	EA
200-0472	RES FXD COMP 4.7 K	01121	RC07GF472K (MIL-R-11/8)	14.	EA
200-0473	RES FXD COMP 47 K	01121	RC07GF473K (MIL-R-11/8)	18.	EA
200-0474	RES FXD COMP 470 K	01121	RC07GF474K (MIL-R-11/8)	7.	EA
200-0561	RES FXD COMP 560 OHM	01121	RC07GF561K (MIL-R-11/8)	5.	EA
200-0562	RES FXD COMP 5.6 K	01121	RC07GF562K (MIL-R-11/8)	1.	EA
200-0563	RES FXD COMP 56 K	01121	RC07GF563K (MIL-R-11/8)	3.	EA
200-0681	RES FXD COMP 680 OHM	01121	RC07GF681K (MIL-R-11/8)	8.	EA
200-0682	RES FXD COMP 6.8 K	01121	RC07GF682K (MIL-R-11/8)	10.	EA
200-0683	RES FXD COMP 68 K	01121	RC07GF683K (MIL-R-11/8)	2.	EA
208-0104	RES FXD COMP 100 K	01121	RC20GF104K (MIL-R-11/3)	1.	EA
208-0105	RES FXD COMP 1 M	01121	RC20GF105K (MIL-R-11/3)	1.	EA
208-0681	RES FXD COMP 680 OHM	01121	RC20GF681K (MIL-R-11/3)	2.	EA
211-1000	RES FXD FILM 100 OHM	07115	RN55D1000F (MIL-R-10509/7)	1.	EA
211-1003	RES FXD FILM 100 K	07115	RN55D1003F (MIL-R-10509/7)	4.	EA
211-1102	RES FXD FILM 11 K	07115	RN55D1102F (MIL-R-10509/7)	2.	EA
211-1103	RES FXD FILM 110 K	07115	RN55D1103F (MIL-R-10509/7)	2.	EA
211-1212	RES FXD FILM 12.1 K	07115	RN55D1212F (MIL-R-10509/7)	1.	EA
211-2151	RES FXD FILM 2.15 K	07115	RN55D2151F (MIL-R-10509/7)	3.	EA
211-2152	RES FXD FILM 21.5 K	07115	RN55D2152F (MIL-R-10509/7)	2.	EA
211-2153	RES FXD FILM 215 K	07115	RN55D2153F (MIL-R-10509/7)	2.	EA
211-2372	RES FXD FILM 23.7 K	07115	RN55D2372F (MIL-R-10509/7)	3.	EA
211-2872	RES FXD FILM 28.7 K	07115	RN55D2872F (MIL-R-10509/7)	2.	EA
211-3161	RES FXD FILM 3.16 K	07115	RN55D3161F (MIL-R-10509/7)	1.	EA
211-3481	RES FXD FILM 3.48 K	07115	RN55D3481F (MIL-R-10509/7)	1.	EA
211-3482	RES FXD FILM 34.8 K	07115	RN55D3482F (MIL-R-10509/7)	2.	EA
211-4641	RES FXD FILM 4.64 K	07115	RN55D4641F (MIL-R-10509/7)	1.	EA
211-5111	RES FXD FILM 5.11 K	07115	RN55D5111F (MIL-R-10509/7)	2.	EA
211-5231	RES FXD FILM 5.23 K	07115	RN55D5231F (MIL-R-10509/7)	2.	EA
211-5622	RES FXD FILM 56.2 K	07115	RN55D5622F (MIL-R-10509/7)	1.	EA
211-7500	RES FXD FILM 750 OHM	07115	RN55D7500F (MIL-R-10509/7)	1.	EA
211-7501	RES FXD FILM 7.50 K	07115	RN55D7501F (MIL-R-10509/7)	1.	EA
211-9091	RES FXD FILM 9.09	17864	RN55D9091F (MIL-R-10509/7)	1.	EA
212-4223	RES FXD FILM 422 K	07115	RN60D4223F (MIL-R-10509/1)	1.	EA
444-0016	SCR FLT HD 6-32X1/4	73734	6-32X1/4 BRASS UND	2.	EA
610-0141	TERMINAL	71279	1558-3	46.	EA
617-0256	WASHER FLAT NO 4	73734	1402 STL CAD PL	30.	EA
617-0267	WASHER FLAT NO 6	73734	1404 STL CAD PL	8.	EA
617-0273	WASHER FLAT NO 8	73734	1408 STL CAD PL	4.	EA
620-0123	WASHER LOCK INT NO 4	73734	1302	33.	EA
620-0125	WASHER LOCK INT NO 6	73734	1304	12.	EA

Table 6-II. List of Replaceable Parts. (Sheet 2 of 4)

TRACOR STOCK NUMBER	DESCRIPTION	MFGR CODE	MANUFACTURER PART NUMBER	TOTAL QUANTITY	U/M
620-0126	WASHER LOCK INT NO 8	73734	1305	4.	EA
649-0074	NUT HEX 4-40X1/4 AF	73734	8003 STL CAD PL	13.	EA
649-0114	NUT HEX 6-32X1/4 AF	73734	8005 STL CAD PL	8.	EA
649-0134	NUT HEX 8-32X5/16 AF	73734	8008 STL CAD PL	4.	EA
658-0012	SCR FLT HD 4-40X3/16	73734	4-40X3/16 UND STL CAD PL	14.	EA
658-0016	SCR FLT HD 4-40X1/4	73734	4-40X1/4 UND STL CAD PL	8.	EA
700-0220	TUBE JAN-1EP1	85599	JAN-1EP1 (MIL-E-1/13[illegible])	1.	EA
705-0610	WIRE 22AWG BLU STRD	70903	8503 BLU (MIL-W-16878)	1.	IN
800-0914	DIODE 1N914	01295	1N914	61.	EA
800-3193	DIODE 1N3193	02735	1N3193	4.	EA
800-3255	DIODE 1N3255	02735	1N3255	1.	EA
801-0751	DIODE 1N751A	01281	1N751A	1.	EA
801-0756	DIODE 1N756A	01281	1N756A	1.	EA
801-1606	DIODE 1N1606A	95640	1N1606A	1.	EA
900-0708	TSTR 2N708		2N708	1.	EA
900-2102	TSTR 2N2102	01295	2N2102	4.	EA
900-3055	TSTR 2N3055	01295	2N3055	2.	EA
900-3646	TSTR 2N3646	13715	2N3646	60.	EA
900-3702	TSTR 2N3702	01295	2N3702	5.	EA
900-3705	TSTR 2N3705	01295	2N3705	26.	EA
900-3707	TSTR 2N3707	01295	2N3707	2.	EA
3319-0222	CAP FXD CER 2200 PFD	71590	DD 222	5.	EA
3324-9102	CAP FXD MYL .10 MFD	56289	192P10492	1.	EA
3324-9222	CAP FXD MYL .22 MFD	56289	192P22492	1.	EA
3324-9224	CAP FXD MYL .0022 MFD	56289	192P22292	2.	EA
3326-0032	RIVET POP 3/32X212	07707	AD32BS	2.	EA
3326-0041	RIVET POP 1/8X170	07707	AD41BS	2.	EA
3326-0042	RIVET POP 1/8X232	07707	AD42BS	6.	EA
3326-0046	RIVET POP 1/8X481	07707	AD46BS	30.	EA
3332-0053	NUT CLINCH 4-40	46384	S-440-2-C	44.	EA
3332-0078	NUT CLINCH 6-32	46384	S-632-3-C	6.	EA
3348-9502	FUSE .5 A 250 VOLT	71400	AGC 1/2	3.	EA
3403-9103	CAP FXD CER .01 MFD	80183	TG-S10	46.	EA
3458-0024	KNOB	94144	70-2-2G OR (MS91528-1D2B)	2.	EA
3458-0188	KNOB	94144	70-3-2G OR (MS91528-1F2B)	1.	EA
3467-0028	CABLE POWER	70903	17239	1.	EA
3472-0001	SHAFT LOCK BLACK	94144	SL-100B	1.	EA
3486-0001	LUG TERMINAL NO 4	73734	118020	2.	EA
3486-0027	LUG TERMINAL 3/8	73734	118100	6.	EA
3488-0001	HOLDER FUSE	71400	HKP	1.	EA
3490-0002	SWITCH TOGGLE DPST	72653	34-182	2.	EA
3490-0003	SWITCH TOGGLE DPDT	72653	34-192	1.	EA
3495-0037	GROMMET 1/4 ID	72653	1042	15.	EA
3501-0032	WIRE MAGNET 32 AWG	09040	SOLDEREZE SIZE 32	REF	IN
3501-0036	WIRE MAGNET 36 AWG	09040	SOLDEREZE SIZE 36	REF	IN
3501-0040	WIRE MAGNET 40 AWG	09040	SOLDEREZE SIZE 40	REF	IN
3507-0104	RES VAR 100 K	01121	RV4NAYSD104A (MIL-R-94/5)	1.	EA
3507-0253	RES VAR 25 K	01121	RV4NAYSD253A (MIL-R-94/5)	1.	EA
3522-0502	RES VAR COMP 5 K	01121	RV4LAYSA502A (MIL-R-94/5)	1.	EA
3569	ADHESIVE	74364	910	REF	GM
3578-0103	RES VAR WW 10 K	80294	273-1-103M	REF	EA
3596-0102	RES VAR WW 1 K	80294	3067P-1-102	1.	EA
3596-0502	RES VAR WW 5 K	80294	3067P-1-502	1.	EA
3598-0104	RES VAR WW 100 K	80294	3068P-1-104	2.	EA
3610-0066	CAP FXD ELEC 4 MFD	80183	TVA-1702	1.	EA
3611-9201	CAP FXD MYLR 2 MFD	09134	31-205C	3.	EA
3624-0002	LUG SOLDER NO 4	83330	1411-4	2.	EA
3625-2002	NUT CLINCH 4-40	46384	F-440-2	8.	EA
3626-0703	CAP FXD ELECT 1500MFD	37942	CG152U75C1	1.	EA
3627-0001	CLAMP CAP VERT MTG	37942	VR 3	1.	EA
3628-0215	CONNECTOR PCB 15 PIN	71785	50-30B-10	16.	EA
3629-0102	POST BINDING RED	74970	111-102	1.	EA
3629-0103	POST BINDING BLK	74970	111-103	1.	EA
3630-0001	CRYSTAL 1000 KC	00815	NE 6A 1000 KC	1.	EA
3631-0001	HOLDER CRYSTAL	91506	8000-DG1	1.	EA
3632-0011	CAP VAR .8-30 PFD	73899	VC43GWY	1.	EA
3633-0001	SWITCH SLIDE	82389	46256LF	1.	EA
3657-0001	PAD MTG TSTR	07047	10171-N	83.	EA
3666-0003	BUMPER RUBBER	83330	2194	4.	EA
3668-0001	BOBBIN	T0007	B65522-A0000-P001	33.	EA
3669-0003	CORE POT	T0007	B65521-00040-0001	33.	EA
3670-0001	TRIMMER CORE ASSY	T0007	B65529-K1A	33.	EA
3671	PLATE BASE	T0007	C60358-B3052-C106	66.	EA
3672	TERMINAL	T0007	C60358-B3052-C103	3.	EA
3673	WASHER	T0007	C60358-B3052-C105	3.	EA
3674	CLAMP	T0007	C60358-B3052-C102	132.	EA
3675-0004	PAINT YELLOW	T0010	ENAMEL-YELLOW	REF	GM
3675-0006	PAINT BLUE	T0010	ENAMEL-BLUE	REF	GM
3675-0007	PAINT VIOLET	T0010	ENAMEL-VIOLET	REF	GM
3675-0008	PAINT GRAY	T0010	ENAMEL-GRAY	REF	GM
3675-0009	PAINT WHITE	T0010	ENAMEL-WHITE	REF	GM
3675-0010	PAINT BLACK	T0010	ENAMEL-BLACK	REF	GM
3676-0002	TOOL TUNING ADJ	T0007	B63399-A2	2.	EA
3677-0008	TAPE MYLAR 1/8 WIDE	88301	7300-02-05 1/8 WIDE	REF	IN
3783-0213	BRACKET ANGLE	72653	6261	2.	EA
3783-0214	BRACKET ANGLE	71218	A8631	2.	EA

Table 6-II. List of Replaceable Parts. (Sheet 3 of 4)

TRACOR STOCK NUMBER	DESCRIPTION	MFGR CODE	MANUFACTURER PART NUMBER	TOTAL QUANTITY	U/M
3794-0002	MOUNTING KIT TSTR	08289	DM-101	2.	EA
3799-0003	SWITCH ROTARY	19397	3799-0003	1.	EA
3805-0031	BOLT SPADE 4-40	73734	52130	2.	EA
3814-0026	GASKET O-RING RUBBER	77308	PRP-568-026 RUBBER	1.	EA
3814-0216	GASKET O-RING RUBBER	77308	PRP-568-216 RUBBER	1.	EA
3838-0103	RES VAR 10 K	73138	62P R10K	2.	EA
3838-0502	RES VAR 5 K	73138	62P R5K	1.	EA
5002	PLATE	19397	5002	2.	EA
5007	BOARD PRINTED CIRCUIT	19397	5007	1.	EA
5009	BOARD PRINTED CIRCUIT	19397	5009	1.	EA
5024	SCOPE BEZEL	19397	5024	1.	EA
5046-0012	STANDOFF H 4-40X3/16	06540	8101-A-0440-1B	52.	EA
6032	PLATE	19397	6032	2.	EA
6034	HANDLE	19397	6034	2.	EA
6043	PANEL	19397	6043	1.	EA
6049	BOARD PRINTED CKT	19397	6049	1.	EA
6051	BRACKET RACK MTG	19397	6051	2.	EA
6053	PLATE	19397	6053	1.	EA
6054	PANEL	19397	6054	1.	EA
6055	TRAY COMPONENT	19397	6055	1.	EA
6057	BOARD PRINTED CKT	19397	6057	1.	EA
6059	COVER	19397	6059	2.	EA
6060	COVER	19397	6060	2.	EA
6062	METER 0 CTR W/BEZEL	19397	6062	1.	EA
6067	BOARD PRINTED CKT	19397	6067	1.	EA
6068	BOARD PRINTED CKT	19397	6068	1.	EA
6070	BOARD PRINTED CKT	19397	6070	1.	EA
6072	BOARD PRINTED CKT	19397	6072	1.	EA
6073	BOARD PRINTED CKT	19397	6073	4.	EA
6074	SHIELD	19397	6074	1.	EA
6075	SHIELD	19397	6075	4.	EA
6076	SHIELD	19397	6076	1.	EA
6077	BOARD PRINTED CKT	19397	6077	1.	EA
6078	SHIELD	19397	6078	1.	EA
6079	BOARD PRINTED CKT	19397	6079	1.	EA
6081	HEAT SINK	19397	6081	1.	EA
6082	BOARD PRINTED CKT	19397	6082	1.	EA
6084	XFMR ASSEMBLY(8:1)	19397	6084	15.	EA
6086	XFMR ASSEMBLY(16:2)	19397	6086	2.	EA
6087	XFMR ASSEMBLY(16:4CT)	19397	6087	2.	EA
6088	XFMR ASSEMBLY(32:4)	19397	6088	13.	EA
6089	XFMR ASSEMBLY(32:8CT)	19397	6089	1.	EA
6090	XFMR POWER	19397	6090	1.	EA
6093	BOARD PRINTED CKT	19397	6093	1.	EA
6094	BOARD PRINTED CKT	19397	6094	1.	EA
6100	SHIELD	19397	6100	1.	EA
6101	SHIELD	19397	6101	10.	EA
6111	SHIELD	19397	6111	1.	EA
6113	SHIELD	19397	6113	1.	EA
6151	ASSY PCB EXTENDER	19397	6151	1.	EA
6152	PLATE IDENT	19397	6152	1.	EA
6153	ASSY PCB POWER TSTR	19397	6153	1.	EA
6154	PCB FLIP FLOP ASSY	19397	6154	1.	EA
6155	PCB ERROR MULT ASSY	19397	6155	3.	EA
6156	PCB ERROR MULT ASSY	19397	6156	1.	EA
6157	PCB REF INPUT ASSY	19397	6157	1.	EA
6158	PCB 5 MC/1 MC ASSY	19397	6158	1.	EA
6159	PCB BUFFER AMPL ASSY	19397	6159	1.	EA
6160	PCB POWER SUP ASSY	19397	6160	1.	EA
6161	PCB DIFF/INT ASSY	19397	6161	1.	EA
6162	PCB S S/PH COMP ASSY	19397	6162	1.	EA
6163	PCB SCOPE DRIV ASSY	19397	6163	1.	EA
6164	PCB XTAL FILTER ASSY	19397	6164	1.	EA
6165	ASSY PCB INTERCONN	19397	6165	1.	EA
6166	ASSY PCB SCOPE PWR	19397	6166	1.	EA
6168	ASSY MODULE FLIP FLOP	19397	6168	1.	EA
6169	ASSY MODULE ERR MULT	19397	6169	3.	EA
6170	ASSY MODULE ERR MULT	19397	6170	1.	EA
6171	ASSY MODULE REF INPUT	19397	6171	1.	EA
6172	ASSY MODULE 5 MC/1 MC	19397	6172	1.	EA
6173	ASSY MODULE BUFF AMPL	19397	6173	1.	EA
6174	ASSY MODULE POWER SUP	19397	6174	1.	EA
6175	ASSY MODULE DIFF/INT	19397	6175	1.	EA
6181	SHIELD	19397	6181	1.	EA
6183	SHIELD	19397	6183	1.	EA
6185	SHIELD	19397	6185	1.	EA
6193	ASSY MODULE SS/PH COM	19397	6193	1.	EA
6194	ASSY MODULE SCOPE DRV	19397	6194	1.	EA
6195	ASSY MODULE XTAL FILT	19397	6195	1.	EA
6300	PLATE WARNING	19397	6300	1.	EA
6316	WIRING HARNESS ASSY	19397	6316	1.	EA
6355-0001	ACCESSORY PARTS SET	19397	6355-0001	1.	EA
6370	MANUAL OP/SER 527A	19397	6370	2.	EA
8819-0020	WIRE BUS BAR 20 AWG	70903	8020	REF	IN
8819-0024	WIRE BUS BAR 24 AWG	70903	8022	REF	IN

Table 6-II. List of Replaceable Parts. (Sheet 4 of 4)

TRACOR STOCK NUMBER	DESCRIPTION	MFGR CODE	MANUFACTURER PART NUMBER	TOTAL QUANTITY	U/M
8914-0100	CAP FXD ELEC 10 MFD	01295	CS13BE106K (MIL-C-26655/2)	7.	EA
8914-0101	CAP FXD ELEC 100 MFD	01295	CS13BE107K (MIL-C-26655/2)	2.	EA
8916-9331	CAP FXD TA 3.3 MFD	05397	CS13BD335K (MIL-C-26655/2)	9.	EA
8917-0390	CAP FXD TA 39 MFD	05397	CS13BC396K (MIL-C-26655/2)	19.	EA
9236	TSTR MTCHD PAIR	19397	9236	2.	EA
9237	TSTR MTCHD PAIR	19397	9237	2.	EA
21485-9101	CAP FXD TA 1 MFD	05397	CS13BF105K (MIL-C-26655/2)	1.	EA
25306	SOCKET 11 PIN	01009	411 SBU	1.	EA
25449	SHIELD TUBE	76487	K-80801-C	1.	EA
27512-0100	CAP FXD MICA 10 PFD	00853	CM05C100K03 (MIL-C-5/18)	16.	EA
27512-0101	CAP FXD MICA 100 PFD	00853	CM05F101G03 (MIL-C-5/18)	2.	EA
27512-0111	CAP FXD MICA 110 PFD	00853	CM05F111G03 (MIL-C-5/18)	5.	EA
27512-0131	CAP FXD MICA 130 PFD	00853	CM05F131G03 (MIL-C-5/18)	1.	EA
27512-0161	CAP FXD MICA 160 PFD	00853	CM05F161G03 (MIL-C-5/18)	1.	EA
27512-0180	CAP FXD MICA 18 PFD	00853	CM05C180K03 (MIL-C-5/18)	1.	EA
27512-0201	CAP FXD MICA 200 PFD	00853	CM05F201G03 (MIL-C-5/18)	3.	EA
27512-0220	CAP FXD MICA 22 PFD	00853	CM05E220J03 (MIL-C-5/18)	8.	EA
27512-0221	CAP FXD MICA 220 PFD	00853	CM05F221G03 (MIL-C-5/18)	21.	EA
27512-0390	CAP FXD MICA 39 PFD	00853	CM05E390G03 (MIL-C-5/18)	10.	EA
27512-0470	CAP FXD MICA 47 PFD	00853	CM05E470G03 (MIL-C-5/18)	4.	EA
27512-0750	CAP FXD MICA 75 PFD	00853	CM05E750G03 (MIL-C-5/18)	4.	EA
27512-0820	CAP FXD MICA 80 PFD	00853	CM05E820G03 (MIL-C-5/18)	6.	EA
27512-0910	CAP FXD MICA 91 PFD	00853	CM05F910G03 (MIL-C-5/18)	5.	EA
27512-9501	CAP FXD MICA 5 PFD	00853	CM05C050K03 (MIL-C-5/18)	5.	EA
27513-0150	CAP FXD MICA 15 PFD	00853	DM-15-150G	9.	EA
27513-0511	CAP FXD MICA 510 PFD	84171	DM-15-511G	4.	EA
27513-0561	CAP FXD MICA 560 PFD	84171	DM-15-561G	10.	EA
27513-0681	CAP FXD MICA 680 PFD	84171	DM-15-681G	4.	EA
27513-9301	CAP FXD MICA 3 PFD	84171	DM-15-030	2.	EA
32115-0062	CLAMP CABLE	28520	SR-6P-1	1.	EA
33687-1200	HOLDER LAMP RED LENS	72765	5131-038-103 RED	1.	EA
33687-1500	HOLDER LAMP GRN LENS	72765	5131-038-103 GREEN	1.	EA
33747	CONNECTOR BNC	02660	5575	6.	EA

Table 6-III. Numeric List of Manufacturer Codes. (Sheet 1 of 7)

CODE NO.	MANUFACTURER	ADDRESS
T0002	LANSDALE TRANSISTOR CORP	LANSDALE PA
T0003	PAMOTOR INC	SAN FRANCISCO CALIF
T0004	PATEK PHILIPPE	GENEVA, SWITZERLAND
T0005	RUSSELL INDUSTRIES INC	LYNBROOK, L. I., N. Y.
T0006	TRINITY CAPACITOR CO	TRINITY, TEXAS
T0007	SIEMENS AMERICA INC	WHITE PLAINS, N. Y.
T0008	SOUTHWEST ELECTRONICS INC	HOUSTON TEX
T0009	MOLECU-WIRE CORP.	SCOBEYVILLE, ILL
T0010	PACTRA CHEMICAL CO INC	LOS ANGELES CALIFORNIA
T0011	EPCO	FLINT, MICH
T0012	DABURN ELECTRONICS AND CABLE CORPORATION	NEW YORK N Y
T0013	GRAYSON-STADLER	WEST CONCORD MASS
T0014	PEERLESS IMPERIAL CO	NEWARK N J
T0015	GENERAL PACKAGING CORP	DALLAS TEX
T0017	I SQUARE R ELEMENT CO	TONAWANDA N Y
T0020	VICTOR WIRE AND CABLE CO	LOS ANGELES CALIF
T0021	UNIFORM TUBES INC	COLLEGEVILLE P A
T0022	LONE STAR PAPER CO	AUSTIN TEX
T0023	NATIONWIDE PAPERS	AUSTIN, TEX
T0024	RADIOEAR CORP.	CANONSBURG PENN
T0025	RING CHEMICAL CO	HOUSTON TEXAS
T0026	TACONIC PLASTICS	PETERSBURG N Y
T0027	ORGANIC PRODUCTS CO	IRVING TEX
T0028	AVCO CORP	WILMINGTON MASS
T0030	SENNHEISER ELECTRONIC CORP	NEW YORK N Y
T0031	PRECISION SAMPLING CORP	BATON ROUGE LA
T0032	KURTZ INC	HOUSTON TEX
T0034	HOUSTON OMNIGRAPHIC CORP	HOUSTON TEX
00141	PIC DESIGN CORP	EAST ROCKAWAY N Y
00276	CONSOLIDATED AVIONICS DIV.OF CONDEC CORP.	WESTBURY N Y
00328	STERLING INST DIV OF DESIGNATRONICS INC	MINEOLA LONG ISLAND N Y
00348	MICROTRAN CO INC	VALLEY STREAM N Y
00544	METAL CAL A DIVISION OF AVERY ADHESIVE PRODUCTS INC	INGLEWOOD CALIF
00656	AEROVOX CORP	NEW BEDFORD MASS
00779	AMP INC	HARRISBURG PA
00781	AIRCRAFT RADIO CORP	BOONTON N J
00815	NORTHERN ENGINEERING LABORATORIES INC	BURLINGTON WIS
00853	SANGAMO ELECTRIC CO PICKENS DIVISION	PICKENS S C
01009	ALDEN PRODUCTS CO	BROCKTON MASS
01121	ALLEN-BRADLEY CO	MILWAUKEE WIS
01139	GENERAL ELECTRIC SILICONE PRODUCTS DEPT	WATERFORD, NEW YORK
01170	BELLOFRAM CORP	BURLINGTON MASS
01281	TRW SEMICONDUCTORS INC	LAWNDALE CALIF
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR-COMPONENTS DIVISION	DALLAS TEX
01351	DYNAMIC GEAR CO INC	AMITYVILLE N Y
01364	ALLIED RADIO CORP	CHICAGO ILL
01490	REZOLIN INC	SANTA MONICA CALIF
01561	CHASSIS-TRAK CORP	INDIANAPOLIS IND
01766	INTERNATIONAL CRYSTAL	OKLAHOMA CITY OKLA
01807	PETERSEN RADIO CO INC	COUNCIL BLUFFS IOWA
02111	SPECTROL ELECTRONICS CORP	SAN GABRIEL CALIF 91778
02114	FERROXCUBE CORP OF AMERICA	SAUGERTIES N Y
02376	CONSOLIDATED AVIONICS CORP	WESTBURY N Y
02570	CRAWFORD FITTING CO(SWAGELOK)	SOLON OHIO
02640	TORWICO ELECTRONICS INC	LAKEWOOD N J
02660	AMPHENOL-BORG ELECTRONICS CORP	BROADVIEW CHICAGO ILL
02733	PENN AIRCRAFT PRODUCTS INC	DAYTON, OHIO
02735	RADIO CORP OF AMERICA COMML REC TUBE AND SEMICONDUCTOR DIV	SOMERVILLE N J
02768	FASTEX DIV OF ILLINOIS TOOL WORKS	DES PLAINES ILL
02770	BRISTOL MOTORS DIV OF VOCALINE CO OF AMERICA	OLD SAYBROOK, CONN
02777	HOPKINS ENGINEERING CO	SAN FERNANDO CALIF
02811	METALPHOTO CORP	CLEVELAND OHIO
02833	ANTENNA SPECIALISTS CO	CLEVELAND OHIO
02863	EMCOR DIV OF INGERSOLL PRODUCTS DIV OF BORG-WARNER CORP	ELGIN ILL
02875	HUDSON TOOL AND DIE CO INC	NEWARK N J
02918	MARKITE CORP	NEW YORK N Y
03038	LONG-LOK CORP	LOS ANGELES CAL
03171	ELECTRONIC PRODUCTION AND DEVELOPMENT INC	HAWTHORNE CALIF
03296	NYLON MOLDING CORP	SPRINGFIELD N J
03481	GOODRICH B F CO AEROSPACE AND DEFENSE PRODUCTS DIVISION	AKRON OHIO
03508	GECO-SEMICONDUCTOR PRODUCTS	SYRACUSE, N Y
03550	VANGUARD ELECTRONICS CO	INGLEWOOD CALIF
03743	APPELTON ELECTRIC	CHICAGO ILL
03756	APPLIED RESEARCH LABORATORIES	GLENDALE CALIF
03765	AUTOMATIC COIL CO	MINEOLA N Y
03797	ELDEMA CORP	COMPTON, CALIF
03877	TRANSITRON ELECTRONIC CORP	WAKEFIELD MASS
03878	SIGNAL MFGR COMPANY	LYNN MASS
03911	CLAIREX CORP	NEW YORK N Y
03945	WHITE INSTRUMENT LABORATORIES	AUSTIN TEX
03954	DIEHL MFG CO A SUBSIDIARY OF SINGER MFG CO	SOMERVILLE N J
03984	GENERAL ELECTRIC CO,SEMI-CONDUCTOR PROD DEPT	CLYDE N Y
04009	ARROW-HART AND HEGEMAN ELECTRIC CO	HARTFORD CONN
04099	CAPCO CAPACITORS	IRVING TEX
04264	CIRCON COMPONENT CORP	GOLETA CALIF 93017

Table 6-III. Numeric List of Manufacturer Codes. (Sheet 2 of 7)

CODE NO.	MANUFACTURER	ADDRESS
04347	HYSOL CORP	OLEAN N Y
04426	LICON SWITCH & CONTROL	ELYRIA, OHIO
04552	EMERSON AND CUMING INC	CANTON MASS
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS DIVISION	PHOENIX ARIZONA
04773	AUTOMATIC ELECTRIC CO	NORTHLAKE ILL
04814	CHATHAM CONTROLS CORP	CHATHAM N J
05010	THERMISTOR DIVISION OF GULTON INDUSTRIES INC	METUCHEN N J
05236	JONATHAN MFG CO	FULLERTON CALIF
05245	COMPONENTS CORP	CHICAGO ILL
05276	POMONA ELECTRONICS CO INC	POMONA CALIF
05277	WESTINGHOUSE ELECTRIC CORP SEMI-CONDUCTOR DEPARTMENT	YOUNGWOOD PA
05301	ENGELHARD INDUSTRIES	NEWARK N J
05397	UNION CARBIDE CORP LINDE DIVISION KEMET DEPT	CLEVELAND OHIO
05464	INDUSTRIAL ELECTRONIC ENGINEERS INC	VAN NUYS CALIF
05574	VIKING INDUSTRIES INC	CHATSWORTH CALIF
05820	WAKEFIELD ENGINEERING INC	WAKEFIELD MASS
05972	LOCKTITE (AMERICAN SEALANTS CO.)	HARTFORD CONN
05972	AMERICAN SEALANTS CO (LOCKTITE)	HARTFORD,CONN
06004	BASSICK CO THE	BRIDGEPORT CONN
06008	NEW DEPARTURE DIVISION OF GENERAL MOTORS CORP	MERIDEN CONN
06229	ELECTROVERT INC	MOUNT VERNON N Y
06317	BERMITE POWDER CO	SAUGUS CALIF
06383	PANDUIT CORP.	TINLEY PARK ILL
06531	BECTON DICKINSON & CO	RUTHERFORD N J
06540	AMATOM ELECTRONIC HARDWARE CO INC	NEW ROCHELLE N Y
06555	BEEDE ELECTRICAL INSTRUMENT CO	PENACOOK NH 03303
06668	TEXAS INSTRUMENTS INC APPARATUS DIV	HOUSTON TEX
06682	MAGNETIC SHIELD DIVISION OF PERFECTION MICA CO	CHICAGO ILL
06751	SEMCOR DIVISION COMPONENTS INC	PHOENIX ARIZ
06915	RICHCO PLASTIC CO	CHICAGO ILL
07047	ROSS MILTON CO	HATBORO PA
07065	LINE ELECTRIC CO	ORANGE N J
07088	KELVIN ELECTRIC CO	VAN NUYS CAL
07115	CORNING GLASS WORKS ELECTRONIC COMPONENTS DEPARTMENT	RALEIGH N C
07126	DIGITRAN CO	PASADENA CALIF
07183	DECCO INC	DALLAS TEX
07263	FAIRCHILD CAMERA AND INST CORP SEMICONDUCTOR DIV	MOUNTAIN VIEW CALIF
07633	EPOXY PRODUCTS INC	IRVINGTON N J
07707	UNITED SHOE MACHINERY CORP FASTENER DIVISION	SHELTON CONN
07776	MCDANEL REFRACTORY PROCELAIN CO	BEAVER FALLS PA
07812	NOPCO CHEMICAL CO	NORTH ARLINGTON N J
07829	BODINE ELECTRIC CO	CHICAGO ILL
07843	LEAR SIEGLER INC BOGEN COMMUNICATION DIV	PARAMUS N J
07886	NATIONAL RADIO CO INC	MELROSE MASS
07910	CONTINENTAL DEVICE CORP	HAWTHORNE CAL
07933	RAYTHEON MFG CO SEMICONDUCTOR DIVISION	MOUNTAIN VIEW CALIF
08018	BORG-WARNER CORP.	CHICAGO, ILL.
08242	THETA INSTRUMENT CORP	SADDLE BROOK N J
08257	NUCLEONICS PRODUCTS CO INC	LOS ANGELES CALIF
08261	SPECTRA-STRIP WIRE AND CABLE CORP	GARDEN GROVE CALIF
08289	BLINN DELBERT CO	POMONA CALIF
08726	UNIVERSAL TRANSFORMER CO INC	WYLIE TEX
08779	SIGNAL TRANSFORMER CO	BROOKLYN NY
08795	RAYCLAD TUBES INC	REDWOOD CITY CALIF
08800	GENERAL ELECTRIC CO INSULATING MATERIALS DEPT	SCHENECTADY N Y
08806	MINIATURE LAMP DEPARTMENT GECO	CLEVELAND OHIO
08987	HONEYWELL INC INDUSTRIAL PRODUCTS DIV	FORT WASHINGTON PA
08987	HONEYWELL INC PHILADELPHIA DIVISION	PHILADELPHIA PA
08987	BROWN INSTRUMENTS DIV OF HONEYWELL INC	MINNEAPOLIS MINN
09040	PHELPS DODGE COPPER PRODUCTS CORP	FORT WAYNE IND
09134	TEXAS CAPACITOR CO	HOUSTON TEX
09145	ATOHM ELECTRONICS	SUN VALLEY CALIF
09214	GENERAL ELECTRIC CO SEMICONDUCTOR PRODUCTS DEPT	AUBURN N Y
09709	BULLDOG ELECTRIC PRODUCTS INC	DETROIT MICH
09808	STOCKER HINGE MFG CO	BROOKFIELD, ILL 60513
09823	BURGESS BATTERY CO DIV SERVEL INC	FREEPORT ILL
09922	BURNDY CORP	NORWALK CONN
10108	HURST MFG CORP	PRINCETON,IND
10110	SCIENTIFIC-ATLANTA INC	ATLANTA GA
11139	DEUTSCH CO ELECTRONIC COMPONENTS DIVISION	BANNING CALIF
11147	EPOXYLITE CORP	SOUTH EL MONTE, CALIF
11352	TRANSFORMER ELECTRONICS CO	BOULDER COLO
11649	CAJON CO	CHICAGO ILL
11700	J B ELECTRONICS	CHICAGO ILL
11884	GENERAL MILLS,INC CHEMICAL DIV	KANKAKEE ILL
11907	CALFAX INC	REDONDO BEACH CALIF
12060	DIODES INC	CANOGA PARK CALIF
12136	PHILADELPHIA HANDLE CO.	CAMDEN, N. J.
12360	ALBANY PRODUCTS CO INC	SOUTH NORWALK CONN
12405	HYSOL CORP	EL MONTE CALIF
12515	THERMATICS INC	ELM CITY N C
12599	FLUOROCARBON CO	ANAHEIM CALIF
12623	WHITEY RESEARCH TOOL CO.	EMERYVILLE CALIF
12697	CLAROSTAT MFG CO INC	DOVER N H
12744	INDEPENDENT INK CO	GARDENA CALIF

Table 6-III. Numeric List of Manufacturer Codes. (Sheet 3 of 7)

CODE NO.	MANUFACTURER	ADDRESS
12760	OWEN-CORNING FIBERGLAS CORP	SANTA CLARA CALIF
12954	DICKSON ELECTRONICS CORP	SCOTTSDALE ARIZ
12969	UNITRODE CORP	WATERTOWN MASS
13103	THERMALLOY CO	DALLAS TEX
13113	SHEPHERD CASTERS INC	BENTON HARBOR MICH
13148	VOGUE INSTRUMENT CORP	COLLEGE POINT N Y
13209	BENDIX CORP THE SEMICONDUCTOR DIVISION	HOLMDEL N J
13327	SOLITRON DEVICES INC	NORWOOD N J
13440	AMERICAN PACKING AND GASKET CO	HOUSTON TEX
13550	ATLAS CONNECTORS CO	EL MONTE CALIF
13715	FAIRCHILD CAMERA & INSTRUMENT CORP	SAN RAFAEL CALIF
13812	DIALCO ELECTRIC CORP	BROOKLYN NY
13850	TECHNIPOWER INC	SOUTH NORWALK, CONN.
13934	MIDWEC CORP	OSHKOSH NEBR
14099	SEMTECH CORP	NEWBURY PARK CALIF
14193	CALIFORNIA RESISTOR CORP	SANTA MONICA, CALIF
14195	ELECTRONIC CONTROLS INC	WILTON CONN
14433	ITT SEMICONDUCTORS	WEST PALM BEACH FLA
14655	CORNELL-DUBILIER ELECTRIC CORP	NEWARK N J
14735	FERROTRAN ELECTRONICS CO INC	NEW YORK N Y
14841	WARD LEONARD ELECTRIC CO	HAGERSTOWN MD
14869	RUSTRAK INSTRUMENT CO	MANCHESTER N H
14907	CRAMER DIV OF GIANNINI CONTROLS	OLD SAYBROOK, CONN.
14959	CRANE CO	CHICAGO ILL
15235	CROUSE-HINDS CO	SYRACUSE N Y
15481	CURTIN W H AND CO	HOUSTON, TEX
15584	RIEDON DIV OF ON-MARK ENGR CO	NORTH HOLLYWOOD CALIF
15605	CUTLER-HAMMER INC	MILWAUKEE WIS
15653	KAYLOCK DIVISION, KAYNAR MFG. CO.	FULLERTON, CALIF.
15801	FENWAL ELECTRONICS INC	FRAMINGHAM MASS
15849	USECO INC	MT VERNON N Y
15909	DAVEN DIVISION THOMAS A EDISON INDUSTRIES MCGRAW EDISON CO	LIVINGSTON N J
16059	DEVCON CORP	DANVERS MASS
16089	MICRO-TEK	BATON ROUGE 70806
16129	CAPACITOR MOUNTING CLIP CORP	DALLAS TEX
16231	PARKER INSTRUMENT CORP	STAMFORD CONN
16245	CONAP INC	ALLEGANY N Y
16332	MILWAUKEE RELAYS INC	CEDARBURG WIS
16339	PHOTO CHEMICAL PRODUCTS	SANTA MONICA CALIF
16352	COMPUTER DIODE CORP	LODI N J
16959	DENNISON MANUFACTURING COMPANY	FARMINGHAM,MASS
17069	CIRCUIT STRUCTURES LAB	SANTA ANA CALIF
17276	NEXUS RESEARCH LABORATORY INC	CANTON MASS
17397	BURGESS BATTERY CO	NEW YORK N Y
17414	ROWAN CONTROLLER CO	RED BANK N J
17856	SILICONIX INC	SUNNYVALE CAL
18034	NUCLEAR PRODUCTS CO	CLEVELAND OHIO
18154	FLO-LOK INC	HOUSTON TEX
18324	SIGNETICS CORP	SUNNYVALE CALIF
18626	DRIVER HARRIS CO	HARRISON N J
18643	ETHYLENE CORP	MURRAY HILL N J
18677	SCANBE MFG CORP	MONTEREY PARK CALIF
18873	DU PONT E I DE NEMOURS AND CO INC	WILMINGTON DEL
18911	DURANT MFG CO	MILWAUKEE WIS
18915	BIRTCHER CORP THE INDUSTRIAL DIVISION	MONTEREY PARK CALIF
19141	CAL-VAL R AND D CORP ISOMODE DIVISION	BURBANK, CALIF
19291	ECLIPSE FUEL ENGR CO	ROCKFORD ILL
19397	TRACOR INC (ROBT L STONE DIV)	AUSTIN TEX
19397	TRACOR INC	AUSTIN TEX
19701	ELECTRA MFG CO	INDEPENDENCE KANS
20093	ELECTRICAL INDUSTRIES DIV OF PHILIPS ELECTRONICS	MURRAY HILL N J
20512	SARGENT E H CO	SPRINGFIELD N J
21520	FANSTEEL METALLURGICAL CORP	NORTH CHICAGO ILL
21649	OTTO CONTROLS	MORTON GROVE ILL 60053
21926	GENERAL TECHNOLOGY CORP.	TORRANCE, CALIF
22582	HAMILTON CO	WHITTIER CAL
22835	TRA-CON INC	MEDFORD MASS
22893	SHELL CHEMICAL CO	PITTSBURG, CALIF
23050	PRODUCT COMPONENTS CORPORATION	HASTINGS-ON-HUDSON N Y
23347	ROTO ACTUATOR CORP	ST CLAIR SHORES MICH
23732	TRACOR INC (SULZER DIV.)	ROCKVILLE,MD
24655	GENERAL RADIO CO	WEST CONCORD MASS
25709	GOW MACK INSTRUMENT CO	MADISON N J
25795	GRAINGER W W INC	CHICAGO ILL
26844	INJECTION MOLDERS SUPPLY CO INC	CLEVELAND OHIO
28520	HEYMAN MFG CO	KENILWORTH N J
29424	HOSKINS MFG CO	DETROIT MICH
30119	IDEAL INDUSTRIES INC	SYCAMORE ILL
30327	IMPERIAL EASTMAN CORP	CHICAGO ILL
31356	J B T INSTRUMENTS INC	NEW HAVEN CONN
35529	LEEDS AND NORTHRUP	PHILADELPHIA PA
37942	MALLORY P R AND CO INC	INDIANAPOLIS IND
38056	MANNING MAXWELL AND MOORE DIV OF DRESSER IND INC	STRATFORD CONN
38443	MARLIN-ROCKWELL CORP	JAMESTOWN N Y
39861	METAL GOODS CORP	ST LOUIS MO

Table 6-III. Numeric List of Manufacturer Codes. (Sheet 4 of 7)

CODE NO.	MANUFACTURER	ADDRESS
40920	MINIATURE PRECISION BEARINGS INC	KEENE N H
41387	MOORE PRODUCTS CO	SPRINGE HOUSE PA
42190	MUTER CO	CHICAGO ILL
42498	NATIONAL CO INC	MALDEN MASS
42679	NATIONAL LEAD COMPANY	NEW YORK NY
44038	NORTH ELECTRIC CO	GALION OHIO
44197	NORTON CO	WORCESTER MASS
44655	OHMITE MFG CO	SKOKIE ILL
46384	PENN ENGINEERING AND MFG CORP	DOYLESTOWN PA
52660	RYERSON JOSEPH T AND SON INC	CHICAGO ILL
53629	SCIENTIFIC GLASS APPARATUS CO	BLOOMFIELD N J
54294	SHALLCROSS MFG CO	SELMA N C
54636	SHERWIN-WILLIAMS	CLEVELAND OHIO
54715	SHURE BROS INC	EVANSTON ILL
55026	SIMPSON ELECTRIC CO	CHICAGO ILL
55130	SKINNER PRECISION INDUSTRIES INC	NEW BRITAIN CONN
55814	SOLA ELECTRIC CO	ELK GROVE ILL
56289	SPRAGUE ELECTRIC CO	NORTH ADAMS MASS
56631	STANDARD ELECTRIC TIME CO	SPRINGFIELD MASS
56878	STANDARD PRESSED STEEL CO PRECISION FASTNERS	JENKINTOWN PA
57771	STIMPSON EDWIN B CO	BROOKLYN N Y
58553	SUPERIOR VALVE AND FITTINGS CO	PITTSBURGH PA
59446	TELEX INC	ST PAUL MINN
59730	THOMAS AND BETTS CO	ELIZABETH N J
60741	TRIPLETT ELECTRICAL INSTRUMENT CO	BLUFFTON OHIO
61349	UNITED STATES GAUGE DIV OF AMETEK	SELLERSVILLE PA
63060	VICTOREEN INSTRUMENT CO	CLEVELAND OHIO
64484	WELCH SCIENTIFIC CO	CHICAGO ILLINOIS 60610
65092	WESTON INSTR. INC.	NEWARK N J
65586	WIEGAND EDWIN L CO	PITTSBURGH PA
70119	ADVANCE ELECTRIC AND RELAY CO	BURBANK CALIF
70269	ALLEGHENY LUDLUM STEEL CORP	PITTSBURGH, PA
70276	ALLEN MFG CO	HARTFORD CONN
70318	ALLMETAL SCREW PRODUCTS COMPANY INC	GARDEN CITY N Y
70331	ALPHA WIRE CORP	NEW YORK N Y
70472	ASSOCIATED SPRING CORP	BRISTOL CONN
70528	ATLAS TACK CORP	FAINHAVEN MASS
70563	AMPERITE CO	UNION CITY N J
70661	ATLAS SOUND DIV OF AMERICAN TRADING AND PRODUCTION CORP	BROOKLYN N Y
70777	AUTOMATIC LOCKING DEVICES INC	BRIDGEPORT CONN
70884	BAYSTATE STAMPING CO	WORCESTER MASS
70892	BEAD CHAIN MFG CO	BRIDGEPORT CONN
70903	BELDEN MFG CO	CHICAGO ILL
71002	BIRNBACH RADIO CO INC	NEW YORK N Y
71034	BLILEY ELECTRIC CO INC	ERIE PA
71087	BOOTS AIRCRAFT NUT DIV TOWNSEND CO	NORWALK CONN
71098	BRISTOL CO READ INDUSTRIAL INSTRUMENT DIV	WATERBURY CONN
71218	BUD RADIO INC	WILLOUGHBY OHIO
71279	CAMBRIDGE THERMIONIC CORP	CAMBRIDGE MASS
71286	CAMLOC FASTNER CORP	PARAMUS N J 07652
71400	BUSSMAN MFG DIVISION OF MCGRAW-EDISON CO	ST LOUIS MO
71450	CTS CORP	ELKHART IND
71468	ITT CANNON ELECTRIC CO	LOS ANGELES CALIF
71482	CLARE C P AND CO	CHICAGO ILL
71590	CENTRALAB DIVISION OF GLOBE-UNION INC	MILWAUKEE WIS
71744	CHICAGO MINIATURE LAMP WORKS	CHICAGO ILL
71785	CINCH MFG CO AND HOWARD B JONES DIV	CHICAGO ILL
71913	DE-STA-CO CORP	DETROIT MICH
71984	DOW CORNING CORP	MIDLAND MICH
72136	ELECTRO MOTIVE MFG CO	WILLIMANTIC CONN
72259	NYTRONICS INC	BERKELEY HEIGHTS N J
72271	EUTECTIC WELDING ALLOYS CORP	FLUSHING N Y
72307	FAHNESTOCK ELECTRIC CO	LONG ISLAND CITY NY
72354	FAST JOHN E CO DIVISION OF VICTOREEN INSTRUMENT CO	CHICAGO ILL
72512	DAVIES, HARRY MOLDING CO	CHICAGO ILL
72619	DIALIGHT CORP	BROOKLYN NY
72653	G C ELECTRONICS MFG CO	ROCKFORD ILL
72656	INDIANA GENERAL CORP ELECTRONICS DIVISION	KEASBY N J
72688	DOLPH JOHN C CO	MONMOUNTH JUNCTION N J
72699	GENERAL INSTRUMENT CORP	NEWARK N J
72765	DRAKE MFG CO	CHICAGO ILL
72794	DZUS FASTENER CO INC	WEST ISLIP N Y
72825	EBY HUGH H INC	PHILADELPHIA PA
72962	ELASTIC STOP NUT CORP OF AMERICA	UNION N J
72982	ERIE TECHNOLOGICAL PRODUCTS INC	ERIE PA
73138	HELIPOT DIVISION OF BECKMAN INSTRUMENTS INC	FULLERTON CALIF
73293	HUGHES PRODUCTS DIV OF HUGHES AIRCRAFT CO	NEWPORT BEACH CALIF
73445	AMPEREX ELECTRONIC CO DIV OF NORTH AMERICAN PHILIPS CO INC	HICKSVILLE N Y
73506	BRADLEY SEMICONDUCTOR CORP	HAMDEN CONN
73559	CARLING ELECTRIC INC	HARTFORD CONN
73734	FEDERAL SCREW PRODUCTS CORP	CHICAGO ILL
73793	GENERAL INDUSTRIES CO.	DANVERS, MASS
73803	METALS AND CONTROLS INC. DIV OF TI	ATTLEBORO, MASS
73899	J F D ELECTRONICS CORP	BROOKLYN N Y
73949	GUARDIAN ELECTRIC MFG CO	CHICAGO ILL

Table 6-III. Numeric List of Manufacturer Codes. (Sheet 5 of 7)

CODE NO.	MANUFACTURER	ADDRESS
73977	HANDY AND HARMON	NEW YORK N Y
74042	MERIT COIL AND TRANSFORMER CORP	HOLLYWOOD FLORIDA
74199	GUAM NICHOLS CO	CHICAGO ILL
74438	HOLLINGSHEAD R M CORP	CAMDEN N J
74440	HOBBS JOHN W CORP	SPRINGFIELD ILL
74545	HUBBELL HARVEY INC	BRIDGEPORT CONN
74840	ILLINOIS CONDENSER CO	CHICAGO ILL
74900	INTERNATIONAL NICKEL CO INC	NEW YORK N Y
74970	JOHNSON E F CO	WASECA MINN
75042	INTERNATIONAL RESISTANCE CO	PHILADELPHIA PA
75263	KEYSTONE CARBON CO INC	ST MARYS PA
75285	KENNEDY CAR LINER AND BAG CO INC	SHELBYVILLE IND
75297	KESTER SOLDER COMPANY	CHICAGO ILL
75376	KURZ-KASCH INC	DAYTON OHIO
75378	KNIGHTS JAMES CO THE	SANDWICH ILL
75382	KULKA ELECTRIC MFG CO	MOUNT VERNON N Y
75582	LEVITON MFG CO	BROOKLYN N Y
75915	LITTELFUSE INC	DES PLAINES ILL
76101	MAICO ELECTRONICS	MINNEAPOLIS MINN
76323	M AND T CHEMICALS	CARTERET N J
76381	MINNESOTA MINING AND MFG CO	ST PAUL, MINN
76487	MILLEN JAMES MFG CO INC	MALDEN MASS
76493	MILLER J W CO	LOS ANGELES CALIF
76545	MUELLER ELECTRIC CO	CLEVELAND OHIO
76854	OAK MFG CO	CRYSTAL LAKE ILL
77247	PERMATEX CO INC	HUNTINGTON STATION N Y
77342	POTTER BRUMFIELD DIV OF AMF	PRINCETON IND
77342	AMERICAN MACHINE AND FOUNDRY CO POTTER AND BRUMFIELD DIV	PRINCETON IND
77820	BENDIX CORP. SCINTILLA DIV.	SIDNEY N Y
77969	RUBBERCRAFT CORP	TORRANCE CALIF
78189	SHAKEPROOF DIVISION OF ILLINOIS TOOL WORKS	ELGIN ILL
78277	SIGMA INSTRUMENTS INC	SO BRAINTREE MASS
78290	STRUTHERS-DUNN INC	PITMAN N J
78488	STACKPOLE CARBON CO	ST MARYS PA
78553	TINNERMAN PRODUCTS INC	CLEVELAND OHIO
78580	STERLING VARNISH CO.	SWICKLEY PENN
78711	TELEPHONICS CORP	HUNTINGTON NY 11743
78947	UCINITE CO THE	NEWTONVILLE MASS
79061	VACO PRODUCTS INC	CHICAGO ILL
79136	WALDES KOHINOOR INC	LONG ISLAND CITY N Y
79142	VEEDER ROOT INC	HARTFORD CONN
79221	WATLOW ELECTRIC MFG CO	ST LOUIS MO
79405	WOOD ELECTRIC CORP.	ST. LYNN MASS
79687	WILLSON PRODUCTS INC	READING PA
79725	THE WIREMOLD CO	HARTFORD CONN
79727	CONTINENTAL-WIRT ELECTRONICS CORP	PHILADELPHIA PA
79963	ZIERICH MFGR CORP	NEW ROCHELLE, N. Y.
80103	LAMBDA ELECTRONICS CORP	HUNTINGTON N Y
80145	ASSEMBLY PRODUCTS INC	CHESTERLAND OHIO
80183	SPRAGUE PRODUCTS CO	NORTH ADAMS MASS
80223	UNITED TRANSFORMER CO	NEW YORK N Y
80294	BOURNS LABORATORIES INC	RIVERSIDE CALIF
80308	SOUTHERN SCREW CO	STATESVILLE N C
80411	ACRO DIV OF ROBERTSHAW CONTROLS	COLUMBUS OHIO
80583	HAMMARLUND CO INC	NEW YORK N Y
80640	STEVENS ARNOLD CO INC	BOSTON MASS
80740	BECKMAN INSTRUMENTS INC	FULLERTON CALIF
80813	DIMCO GRAY CO	DAYTON OHIO
80868	PHOTOCON RESEARCH PRODUCTS CO	PASADENA CALIF
81030	INTERNATIONAL INSTRUMENTS INC	ORANGE CONN
81073	GRAYHILL INC	LA GRANGE ILL
81095	TRIAD TRANSFORMER CORP	VENICE CALIF
81134	ELECTRO-VOICE INC	BUCHANAN MICH
81312	WINCHESTER ELECTRONICS CO INC	NORWALK CONN
81483	INTERNATIONAL RECTIFIER CORP	EL SEGUNDO CALIF
81640	CONTROLS COMPANY OF AMERICA	SELMA,NC
81812	TRIMM INC	LIBERTYVILLE ILL
81840	LEDEX INC	DAYTON OHIO
81904	CLOVER INDUSTRIES INC	TONAWANDA N Y
82107	AMERLINE CORP	CHICAGO ILL
82227	HAYDON A W CO	WATERBURY CONN
82389	SWITCHCRAFT INC	CHICAGO ILL
82768	PHILLIPS-ADVANCE CONTROL CO DIV OF PHILLIPS-ECKARDT ELECT CORP	JOLIET ILL
82877	ROTRON MFG CO INC	WOODSTOCK N Y
82879	ROYAL ELECTIC CORP	PAWTUCKET,RHODE ISLAND
82893	VECTOR ELECTRONIC CO	GLENDALE CALIF
83008	STACO INC	DAYTON OHIO
83014	HARTWELL CORP	LOS ANGELES CALIF
83125	GENERAL INSTRUMENT CORP CAPACITOR DIVISION	DARLINGTON S C
83186	VICTORY ENGINEERING CO	SPRINGFIELD N J
83241	FUSITE CORP	CINCINATI OHIO
83330	SMITH HERMAN H INC	BROOKLYN N Y
83332	TECH LABORATORIES INC	PALISADES PARK N J
83594	BURROUGHS CORP ELECTRONIC TUBE DIVISION	PLAINFIELD N J
83740	UNION CARBIDE CORP CONSUMER PRODUCTS DIV	NEW YORK N Y

Table 6-III. Numeric List of Manufacturer Codes. (Sheet 6 of 7)

CODE NO.	MANUFACTURER	ADDRESS
83833	THOMAS AND SKINNER INC	INDIANAPOLIS IND
84171	ARCO ELECTRONICS INC	GREAT NECK N Y
84411	GOOD-ALL ELECTRIC MFG CO	OGALLALLA NEBR
84830	LEE SPRING CO., INC.	BROOKLYN, NEW YORK
84970	SARKES TARZIAN INC	BLOOMINGTON IND
84971	TA MFG CORP	LOS ANGELES CALIF 90039
85599	GENERAL ELECTRIC CO TUBE DEPT	SCHENECTADY N Y
86104	CELLUPLASTIC CORP	NEWARK N J
86335	GLENCO CORP	METUCHEN N J
86415	PAWTUCKET SCREW COMPANY	PAWTUCKET R I
86577	PRECISION METAL PRODUCTS CO	STONEHAM MASS
86603	PROTECTION PRODUCTS MFG CO [WELDWOOD CEMENT]	KALAMAZOO, MICH
86797	ROGAN BROS	SKOKIE ILL
86928	SEASTROM MFG CO INC	GLENDALE CALIF 91201
87034	MARCO-OAK INDUSTRIES A DIV OF ELECTRO/NETICS CORP	ANAHEIM CALIF
87187	KRYLON INC	NORRISTOWN PENN
87216	PHILCO CORP LANSDALE DIVISION	LANSDALE PA
87569	STEMCO CORP	CLEVELAND, OHIO
88145	IDEAL CORP	BROOKLYN N Y
88220	GOULD-NATIONAL BATTERIES INC	ST PAUL MINN
88245	U S ENGINEERING CO	VAN NUYS CALIF
88301	MYSTIK TYPE INC	NORTHFIELD, ILL
88499	STAYTITE PRODUCTS CO	CLEVELAND, OHIO
88920	GRAPHIC CONTROLS CORP DETROIT DIV	LATHRUP VILLAGE MICH
89038	HOYT ELECTRICAL INSTRUMENT WORKS	PENACOOK N H
89307	SPRAGUE ENGINEERING DIVISION OF TELEDYNE INC	GARDENA CALIF
89469	BUCKEYE MOLDING CO	MIAMISBURG OHIO
89482	HOLTZER CABOT CORP	BOSTON MASS
89698	REES MACKWORTH G INC	DETROIT MICH
89904	WESTINGHOUSE ELECTRIC CORP LAMP DIVISION	TRENTON N J
90052	BOSTON GEAR WORKS DIV OF MURRAY CO OF TEXAS	PHILADELPHIA PA
90095	TECHNITROL ENGINEERING CO	PHILADELPHIA PA
90179	U.S. RUBBER CO. MECH. GOODS DIV.	PASSAIC NEW JERSEY
90411	BRISCOE MFG CO	COLUMBUS OHIO
90634	GULTON INDUSTRIES INC	METUCHEN N J
90797	MAGNETICS INC	BUTLER PA
91407	SUPERIOR ELECTRIC CO THE	BRISTOL CONN
91506	AUGAT INC	ATTLEBORO MASS
91556	BROOKS INSTRUMENT DIV EMERSON ELECTRIC	HATFIELD PA
91637	DALE ELECTRONICS INC	COLUMBUS NEBR
91662	ELCO CORP	WILLOW GROVE PA
91767	HELI-COIL CORP	DANBURY CONN
91886	MALCO MFG CO	CHICAGO ILL
91927	MICRO METAL PRODUCTS INC	LOS ANGELES CALIF
91929	MINNEAPOLIS HONEYWELL MICROSWITCH DIV	FREEPORT ILL
92215	VOI-SHAN MFG CO	CULVER CITY CALIF
92264	ENGINEERED PRODUCTS CO	FLINT MICHIGAN 48501
92607	TENSOLITE INSULATED WIRE CO INC	TARRYTOWN N Y
92966	HUDSON LAMP COMPANY	KEARNY N J
93308	CLARK ELECTRONICS LABORATORIES	PALM SPRINGS CALIF
93332	SYLVANIA ELECTRONICS DIV	WOBURN MASS 01801
93460	WHITE SS DENTAL MFG CO	PRINCE BAY STATEN ISLAND NY 10309
93768	CLAUD S. GORDON CO.	RICHMOND ILL
93908	CARLON PRODUCTS CORP	AURORA OHIO
93990	CLIMAX METAL PRODUCTS	CLEVELAND, OHIO
93994	CHART PAK INC	LEEDS MASS
94139	KEYSTONE ELECTRONICS CO	NEWARK N J
94144	RAYTHEON CO INDUSTRIAL COMPONENTS	QUINCY MASS
94222	SOUTH CHESTER CORP	CHESTER, PA
94310	TRU-OHM PRODUCTS MEMCOR COMPONENTS DIVISION	HUNTINGTON IND
94499	ALPHA MOLYKOTE CORP	STANFORD CONN
94696	MAGNECRAFT ELECTRIC CO	CHICAGO ILL
95023	PHILBRICK GEORGE A RESEACHES INC	BOSTON MASS
95146	ALCO ELECTRONICS MFG CO	LAWRENCE, MASS
95263	LEECRAFT MFG CO, INC.	LONG ISLAND CITY NEW YORK
95265	NATIONAL COIL CO	SHERIDAN WYO
95275	VITRAMON INC	BRIDGEPORT CONN
95348	GORDOS CORP	BLOOMFIELD N J
95354	METHODE MANUFACTURING CO	CHICAGO ILL
95640	WESTRONICS	FORTWORTH TEX
95696	CADILLAC PLASTIC AND CHEMICAL CO	DETROIT MICH
96182	MASTER SPECIALTIES CO.	COSTA MESA CALIF
96256	THORDARSON-MEISSNER INC	MT CARMEL ILL
96336	ENSIGN-BICKFORD PRODUCTS	SIMSBURY CONN
96341	MICROWAVE ASSOCIATES INC	BURLINGTON MASS
96467	SUPERIOR MFG AND INSTRUMENT CORP	LONG ISLAND CITY N Y
96613	ALPHA METALS INC.	JERSEY CITY N J
97393	SHUR-LOK CORP	SANTA ANA CALIF
97464	INDUSTRIAL RETAINING RING CO	IRVINGTON N J
97539	A P M CORP	ENGLEWOOD N J
97814	SEALTRON CO	CINCINNATI OHIO
97852	STAR STAINLESS SCREW CO	PATTERSON N J
97954	U S COMPONENTS INC	NEW YORK N Y
97965	STANCOR ELECTRONICS INC	CHICAGO ILL
98159	RUBBER TECK INC	GARDENA CALIF

Table 6-III. Numeric List of Manufacturer Codes. (Sheet 7 of 7)

CODE NO.	MANUFACTURER	ADDRESS
98278	MICRODOT INC	SOUTH PASADENA CALIF
98291	SEALECTRO CORP	MAMARONECK N Y
98376	ZERO MFG CO	BURBANK CALIF
98410	ETC INC	CLEVELAND OHIO
98911	ARMSTRONG PRODUCTS COMPANY	WARSAW INDIANA 56580
98978	INTERNATIONAL ELECTRONIC RESEARCH CORP	BURBANK CALIF
98991	WORCESTER VALVE CO INC	WORCESTER MASS
98996	OLYMPIC SCREW AND RIVET CO	DOWNEY CAL
98997	SIGHTMASTER CORP	PROVIDENCE,RHODE ISLAND
99114	HITEMP WIRES INC	WESTBURY N Y
99127	BALCO RESEARCH LABORATORIES	NEWARK N J
99378	ATLEE CORP	WINCHESTER MASS
99515	ELECTRON PRODUCTS (DIV OF MARSHALL INDUSTRIES)	SAN MARINO CALIF
99800	DELEVAN ELECTRONICS CORP	EAST AURORA N Y
99934	RENBRANDT INC	BOSTON MASS
99942	HOFFMAN ELECTRONICS CORP SEMICONDUCTOR DIVISION	EL MONTE CALIF

SECTION VII

DRAWING AND DIAGRAMS

7-1. SCOPE OF SECTION.

7-2. This section contains all schematic diagrams and printed circuit board illustrations referenced in sections IV (theory of operation) and V (maintenance). These diagrams and drawings are arranged in the order in which they are referenced in section IV, with the printed circuit board illustration before the schematic diagram.

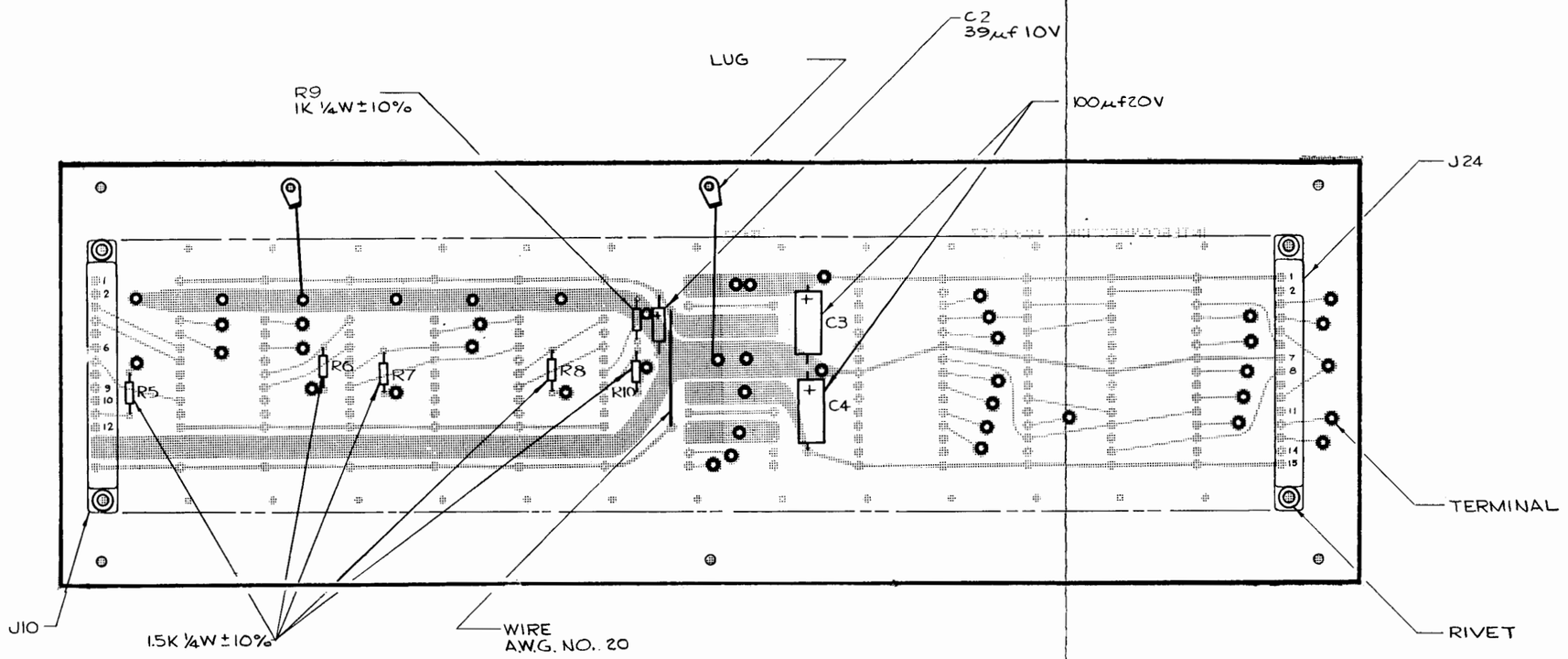


Figure 7-1. Interconnecting PC Board Assembly 6165 Rev E

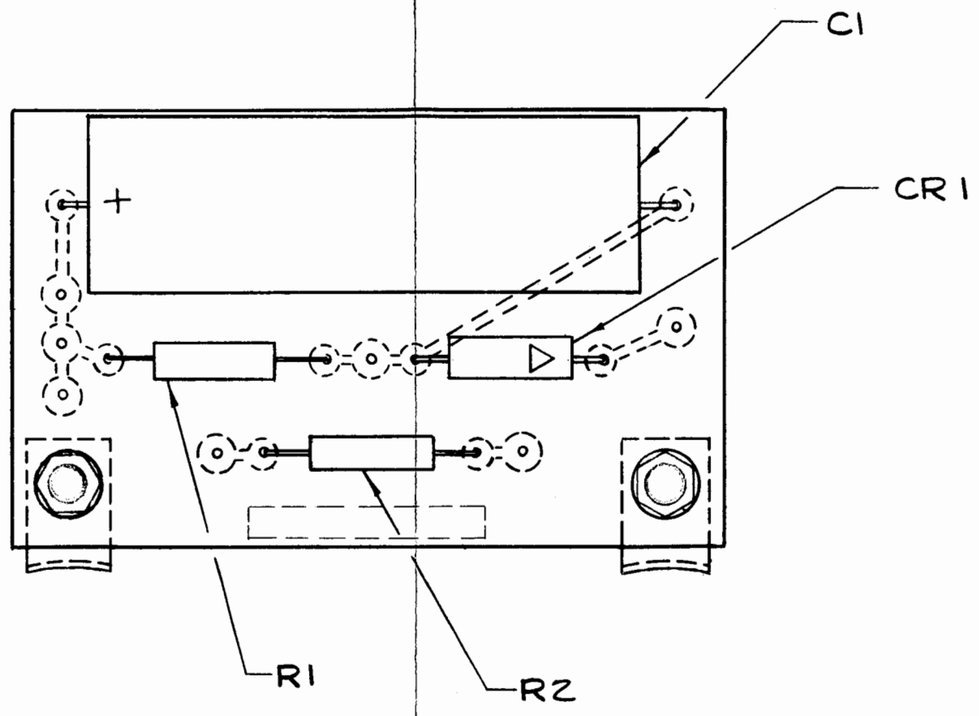
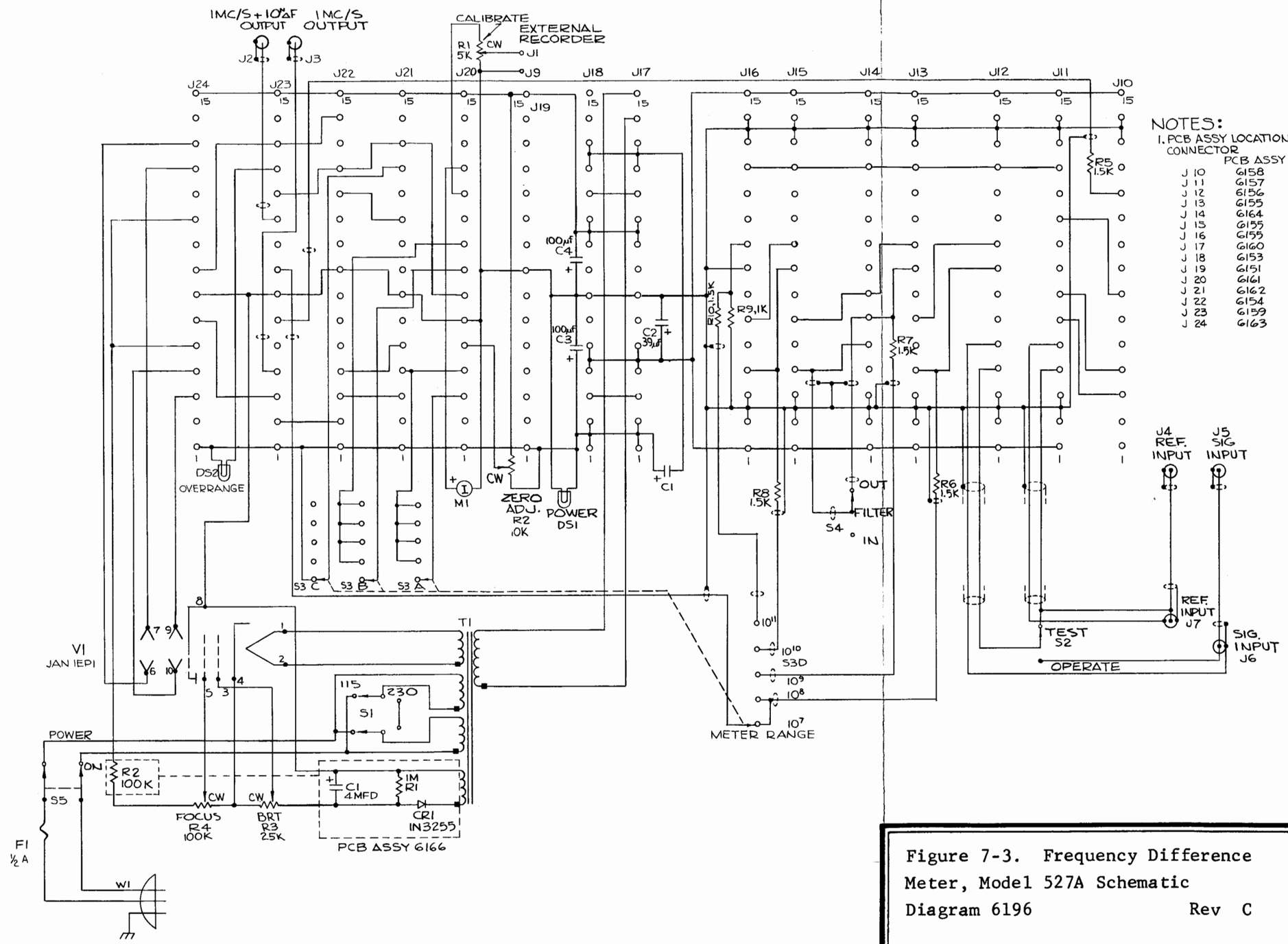


Figure 7-2. Scope Power PC
Board Assembly 6166 Rev B



NOTES:

1. PCB ASSY LOCATIONS

CONNECTOR	PCB ASSY
J 10	6158
J 11	6157
J 12	6156
J 13	6155
J 14	6164
J 15	6155
J 16	6155
J 17	6160
J 18	6153
J 19	6151
J 20	6161
J 21	6162
J 22	6154
J 23	6159
J 24	6163

Figure 7-3. Frequency Difference Meter, Model 527A Schematic Diagram 6196 Rev C

6370 Rev E 7-7/7-8

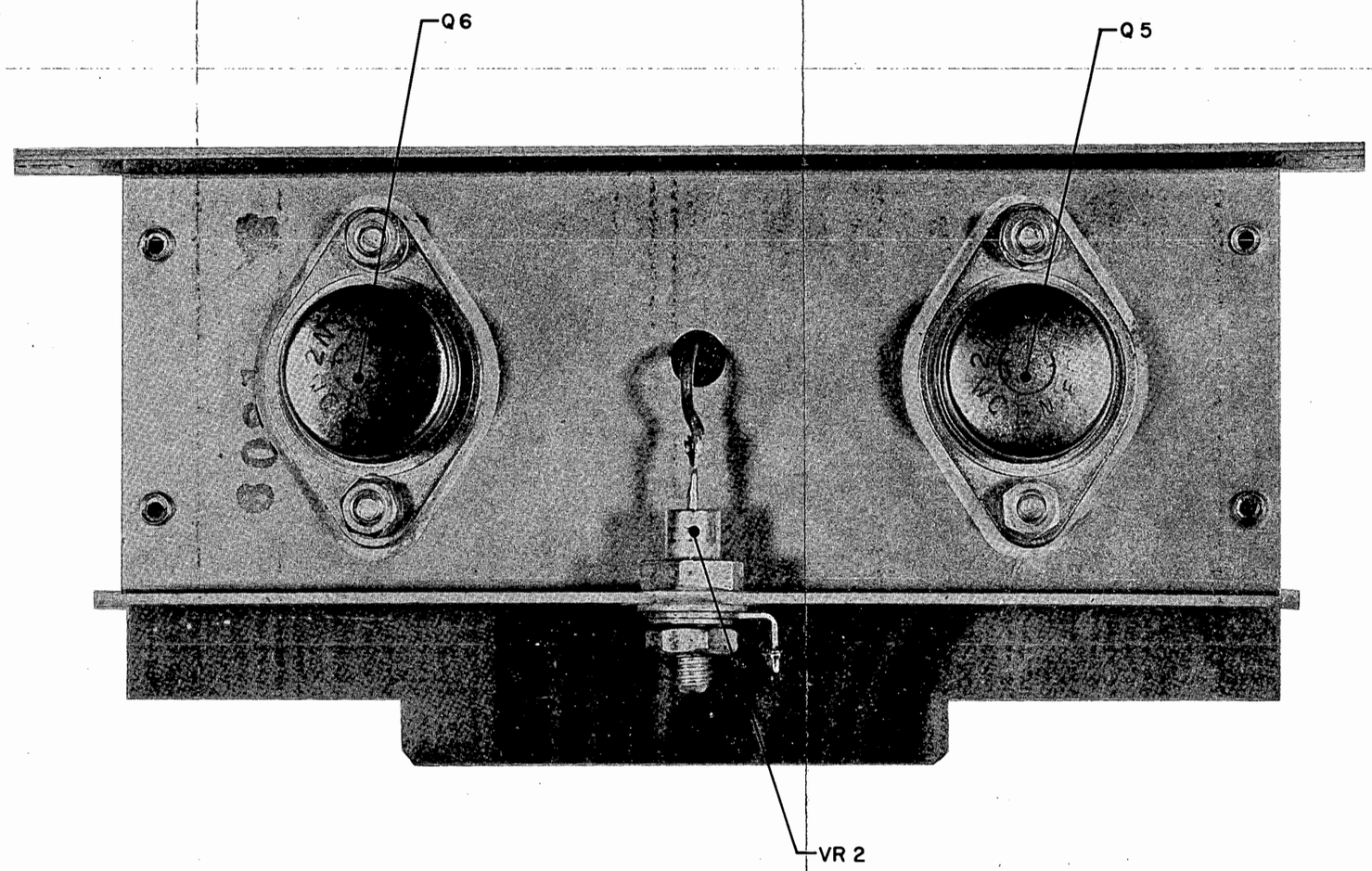


Figure 7-4. Power Transistor
PC Board Assembly 6153

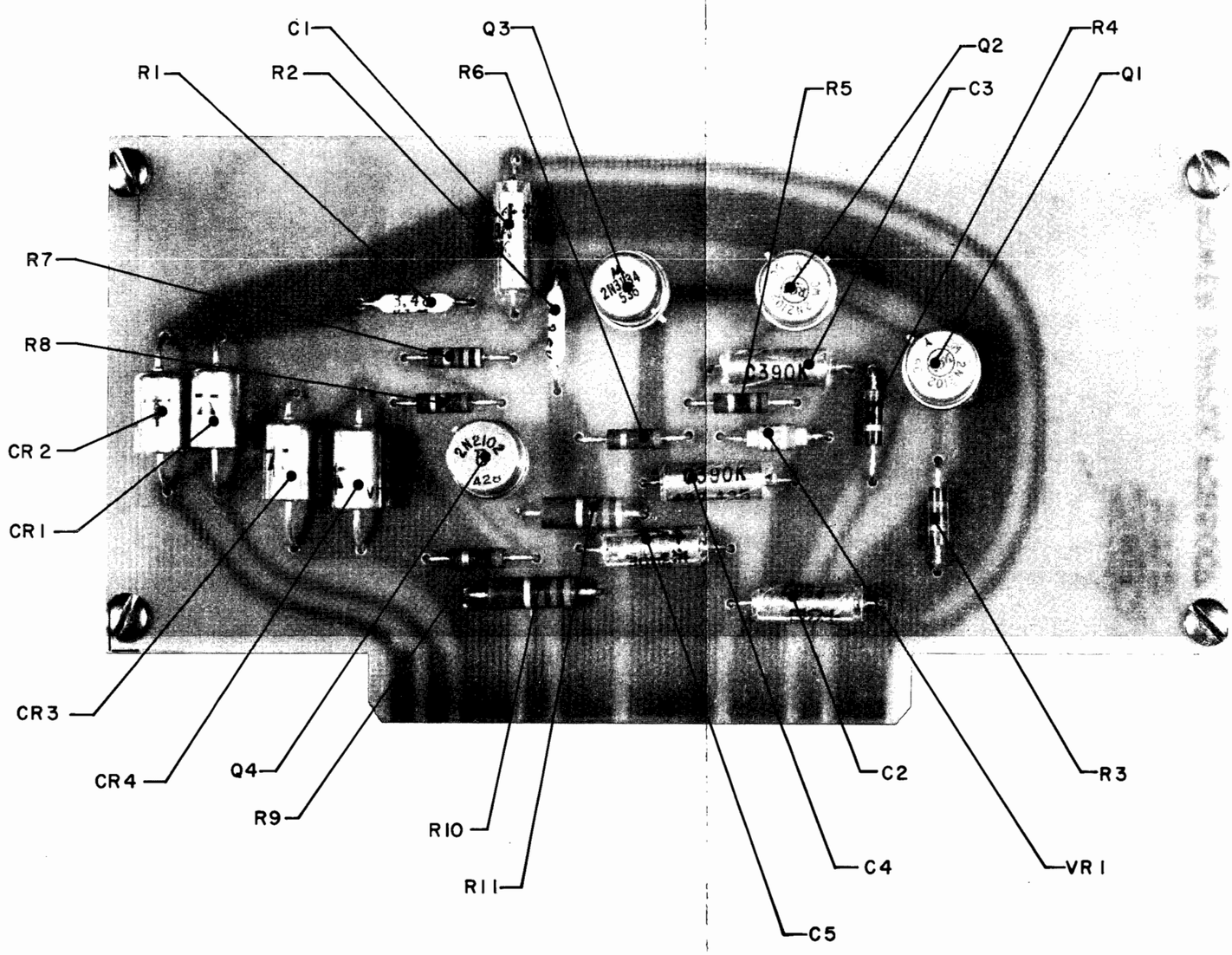
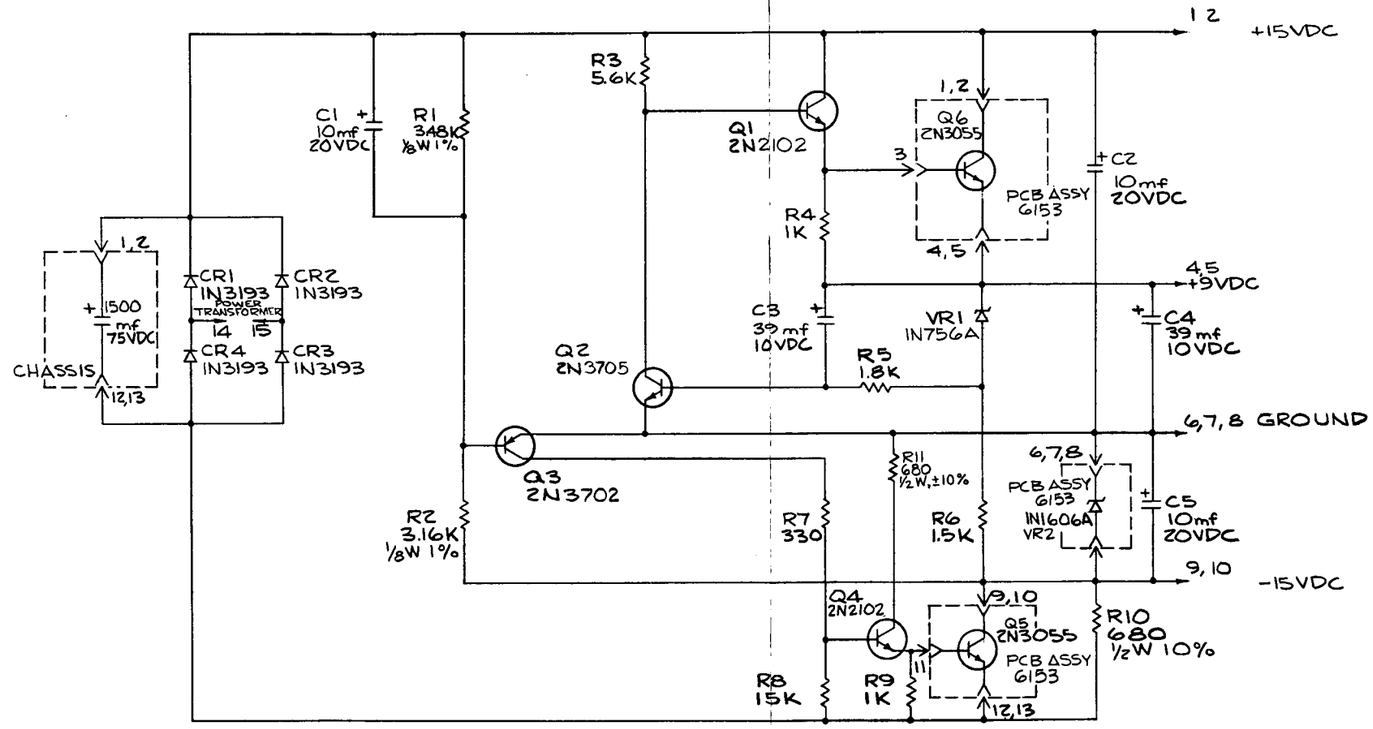


Figure 7-5. Power Supply
PC Board Assembly 6160



NOTES:
1. UNLESS SPECIFIED
   A. RESISTORS ARE ¼W, ±10%
   B. CAPACITANCE IS IN MICROFARADS

Figure 7-6. Power Supply
Schematic Diagram 6201 Rev B

6370 Rev E 7-13/7-14

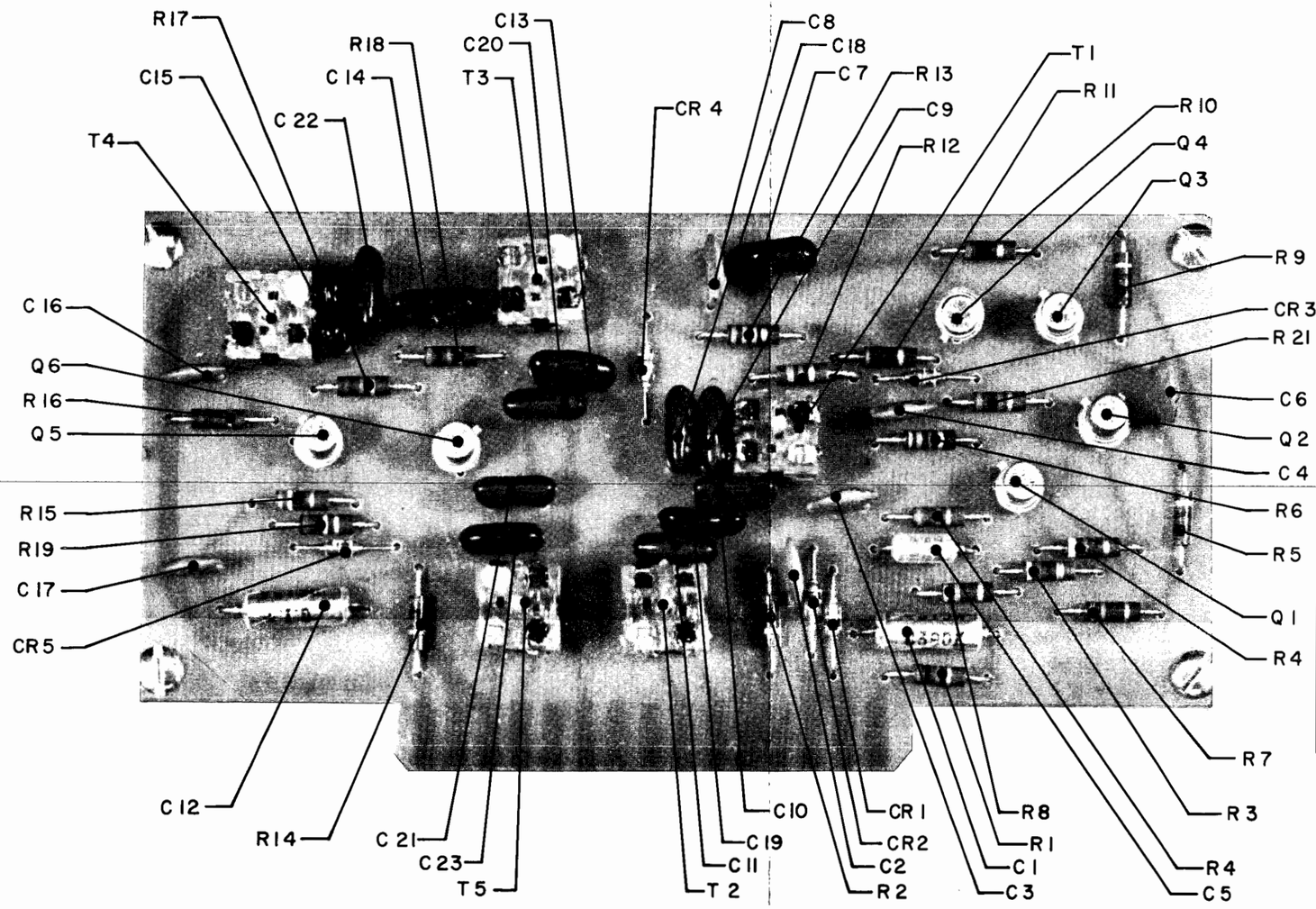
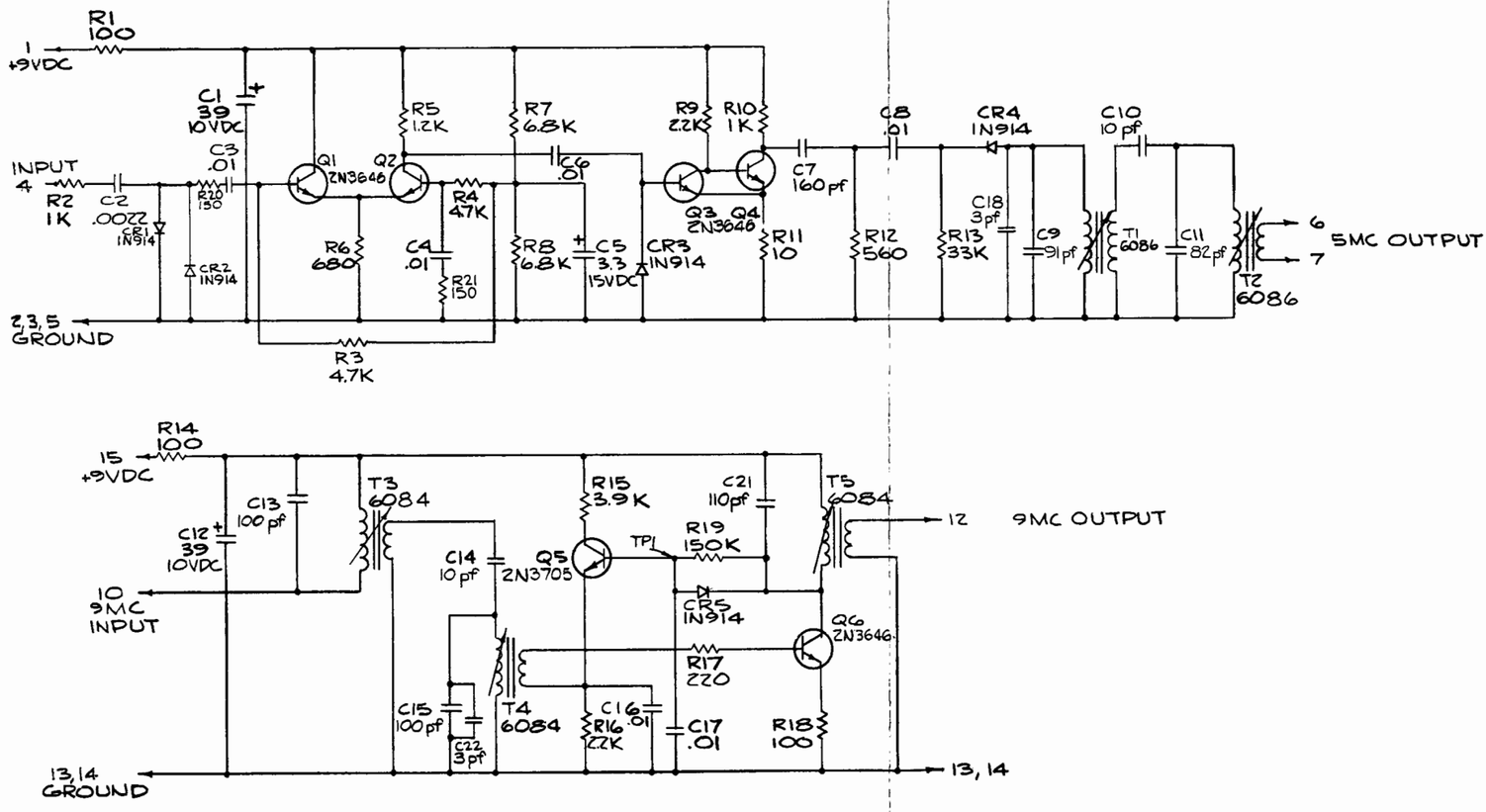


Figure 7-7. Reference Input/9 mHz Amplifier PC Board Assembly 6157



NOTES
1. UNLESS OTHERWISE INDICATED
   A. RESISTORS ARE 1/4 W ±10%
   B. CAPACITANCE IS IN MICROFARADS

Figure 7-8. Reference Input/9 mHz Amplifier Schematic
Diagram 6207 Rev A

6370 Rev E 7-17/7-18

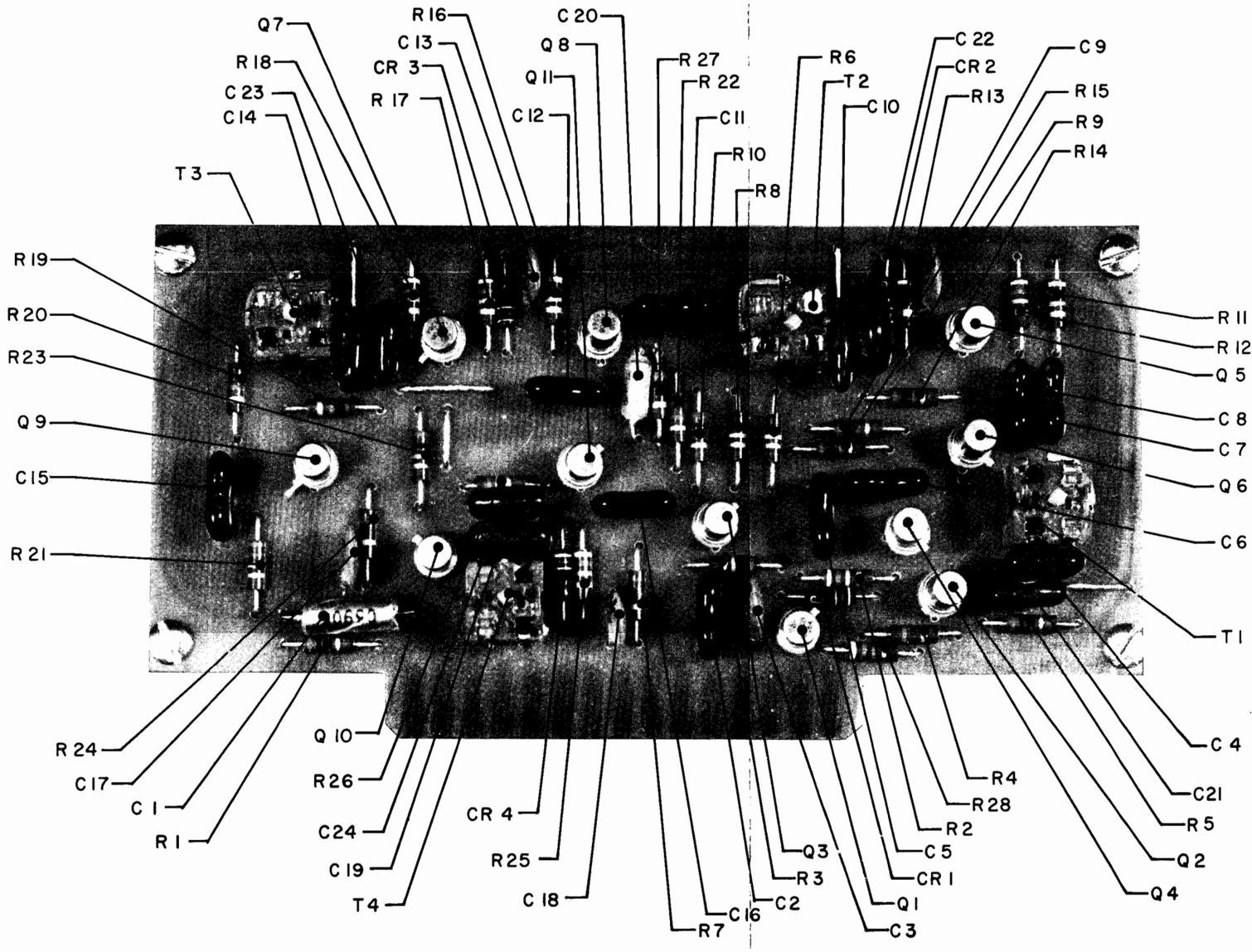
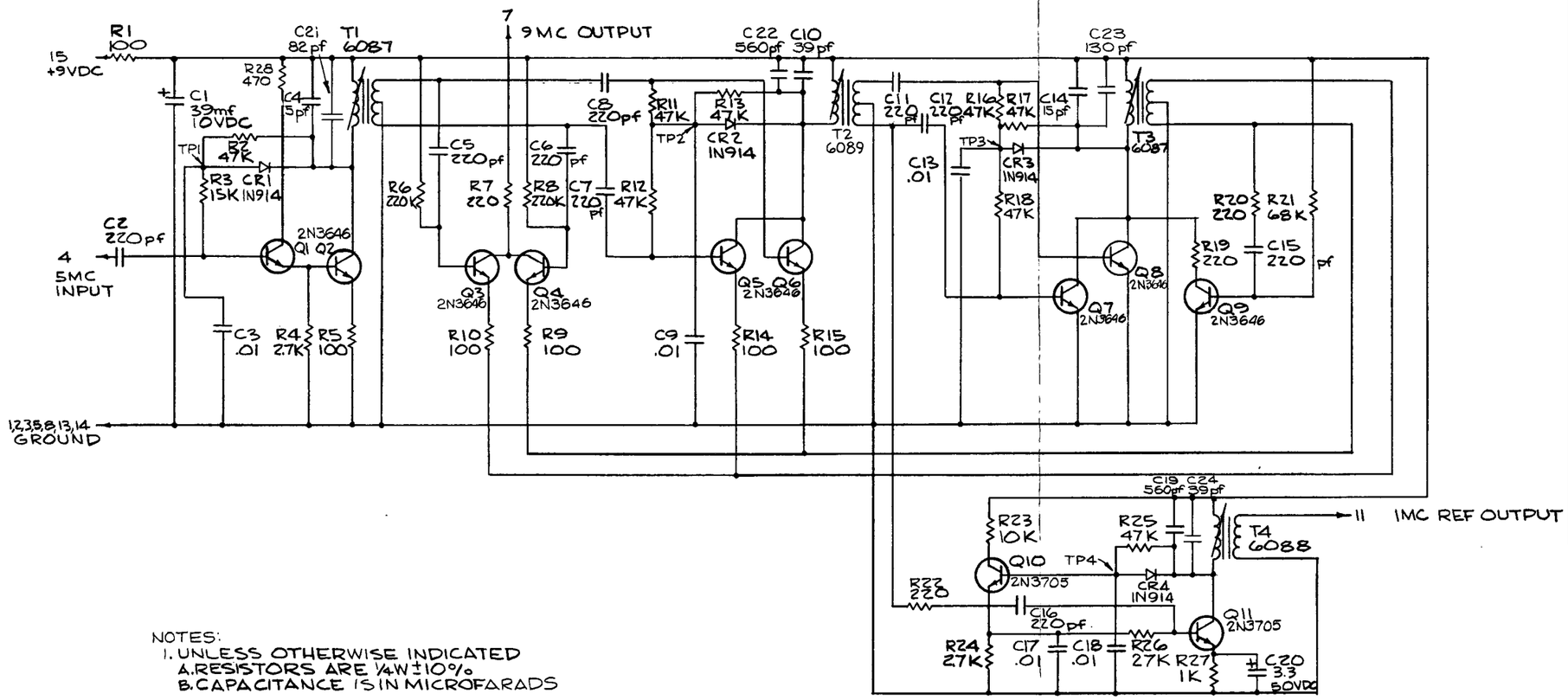


Figure 7-9. 5 mHz/ 1 mHz
Divider PC Board Assembly
6158



NOTES:
1. UNLESS OTHERWISE INDICATED
   A. RESISTORS ARE 1/4W ±10%
   B. CAPACITANCE IS IN MICROFARADS

Figure 7-10. 5 mHz/ 1 mHz Divider Schematic Diagram

6206 Rev B

6370 Rev E 7-21/7-22

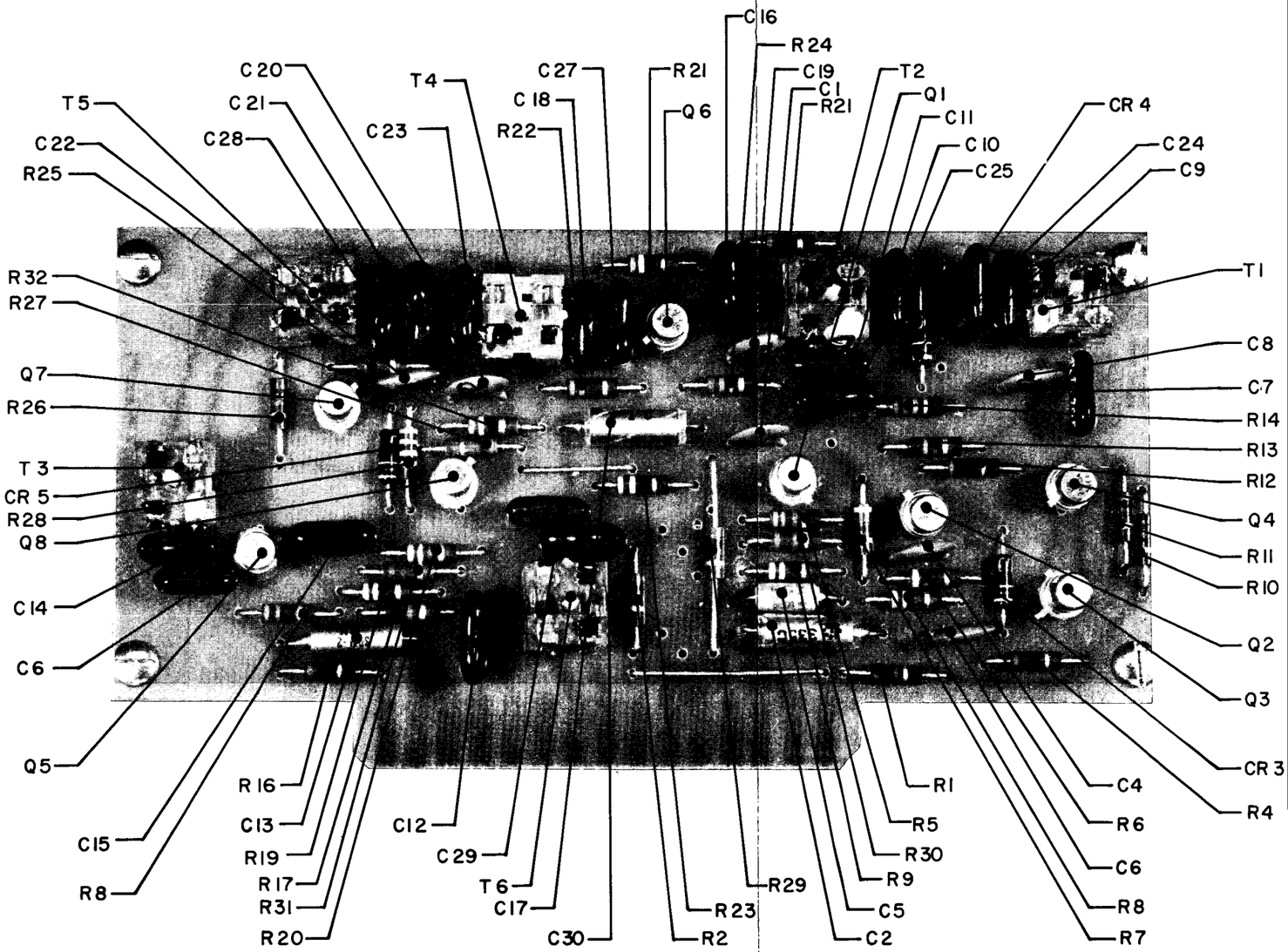


Figure 7-11. Error Multiplier
PC Board Assembly 6155

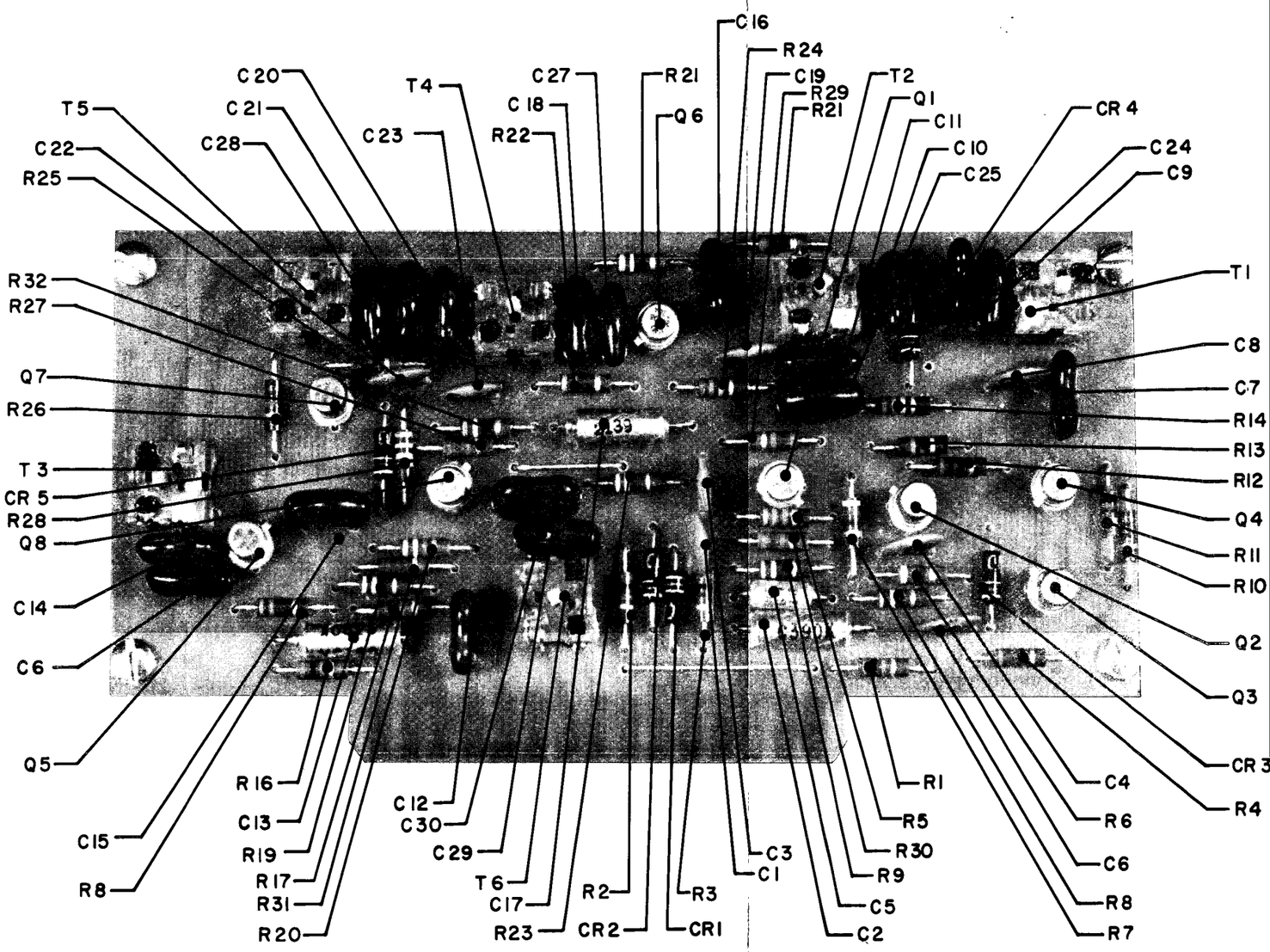
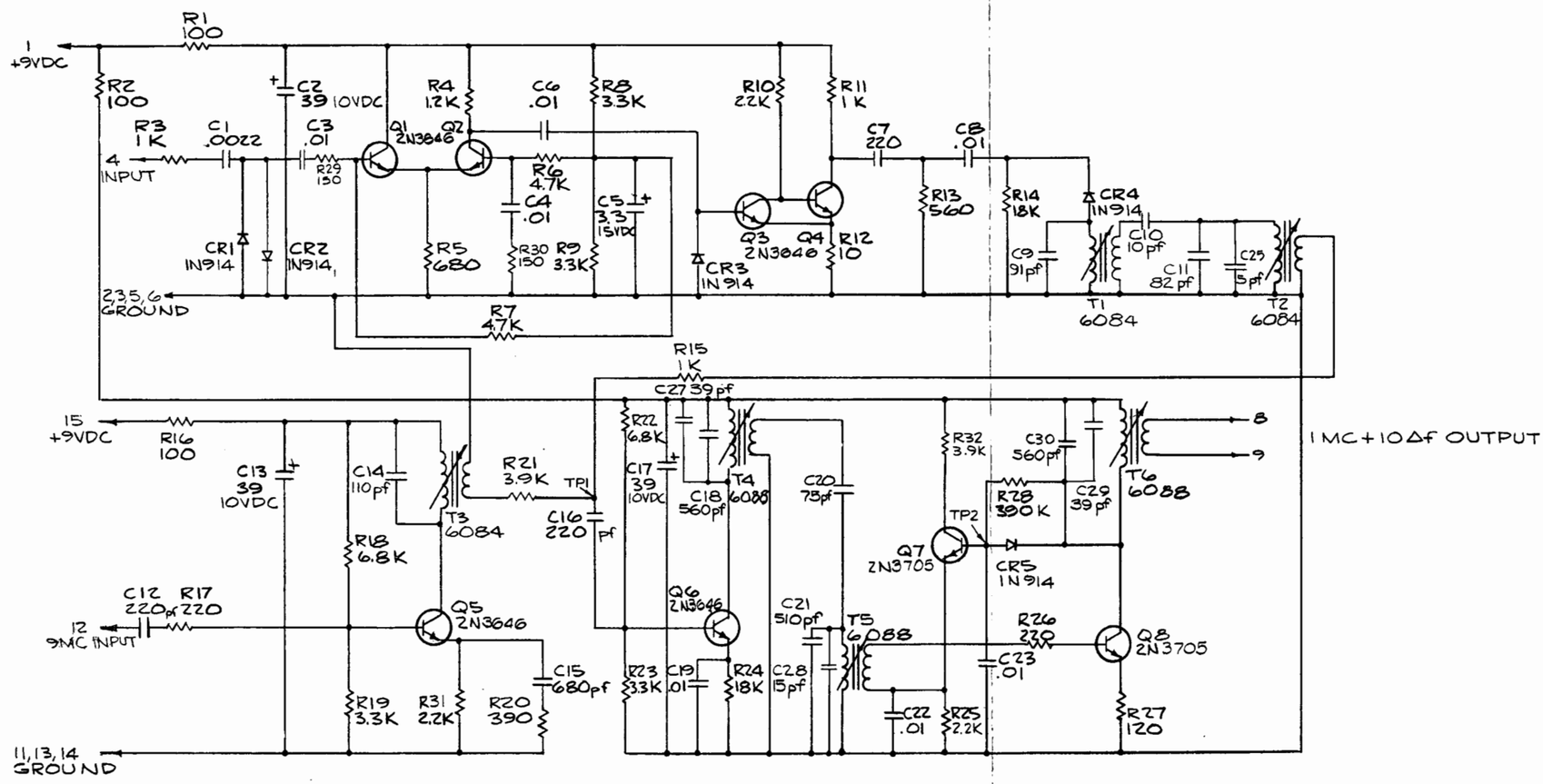


Figure 7-12. Error Multiplier
PC Board Assembly 6156



NOTES
1. UNLESS OTHERWISE INDICATED
   A. RESISTORS ARE ¼ W ± 10%
   B. CAPACITANCE IS IN MICROFARADS
2. PCB ASSY NO. 6155 DOES NOT HAVE CR1, CR2, R3 OR C3.

Figure 7-13. Error Multiplier
Schematic Diagram 6208 Rev A

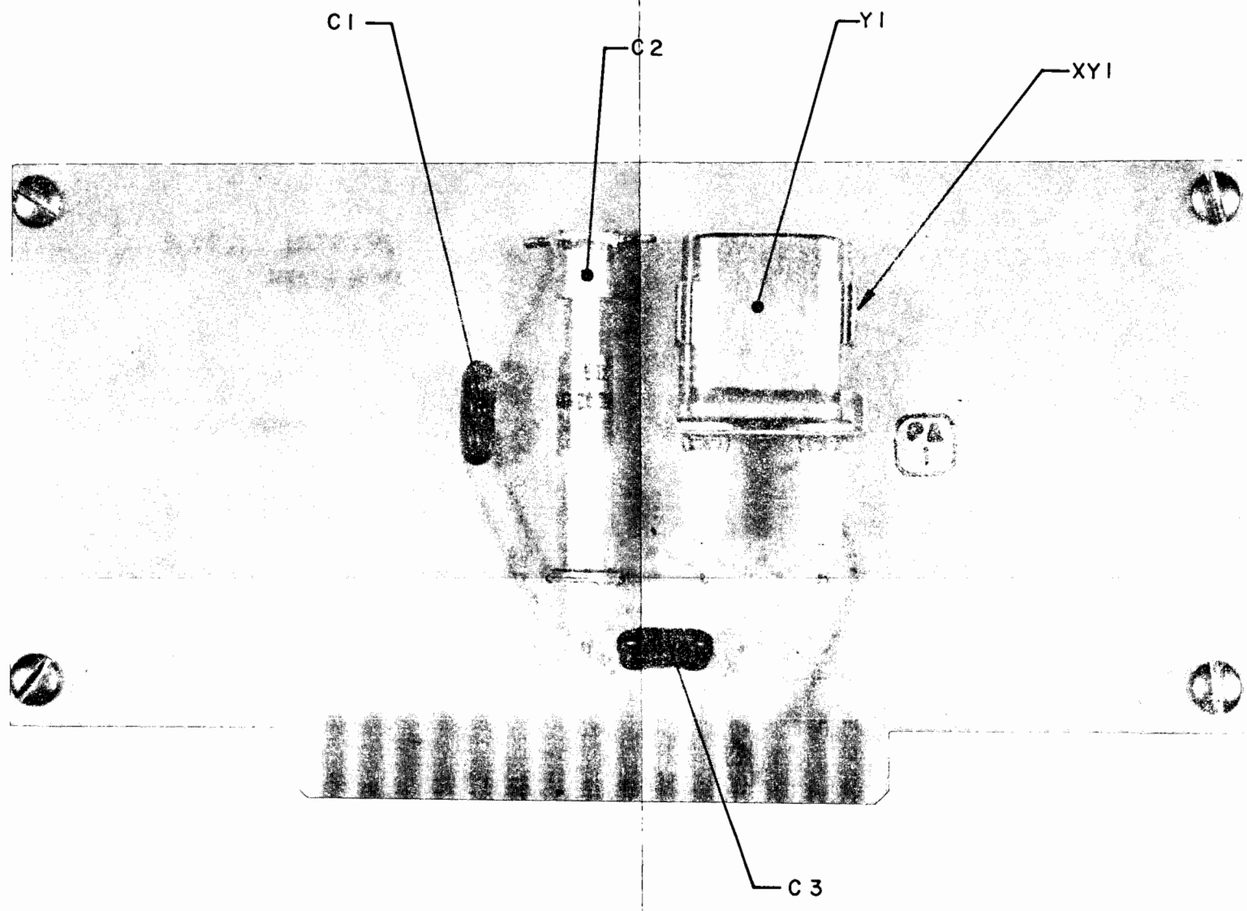


Figure 7-14. Crystal Filter PC Board Assembly 6164

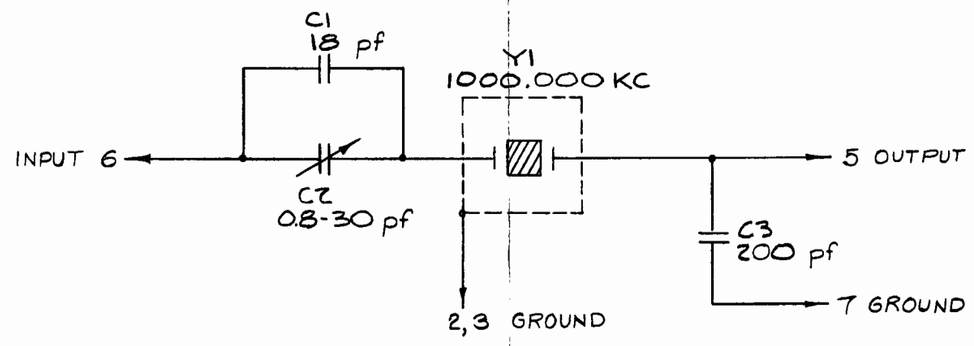


Figure 7-15. Crystal Filter
Schematic Diagram 6198 Rev -

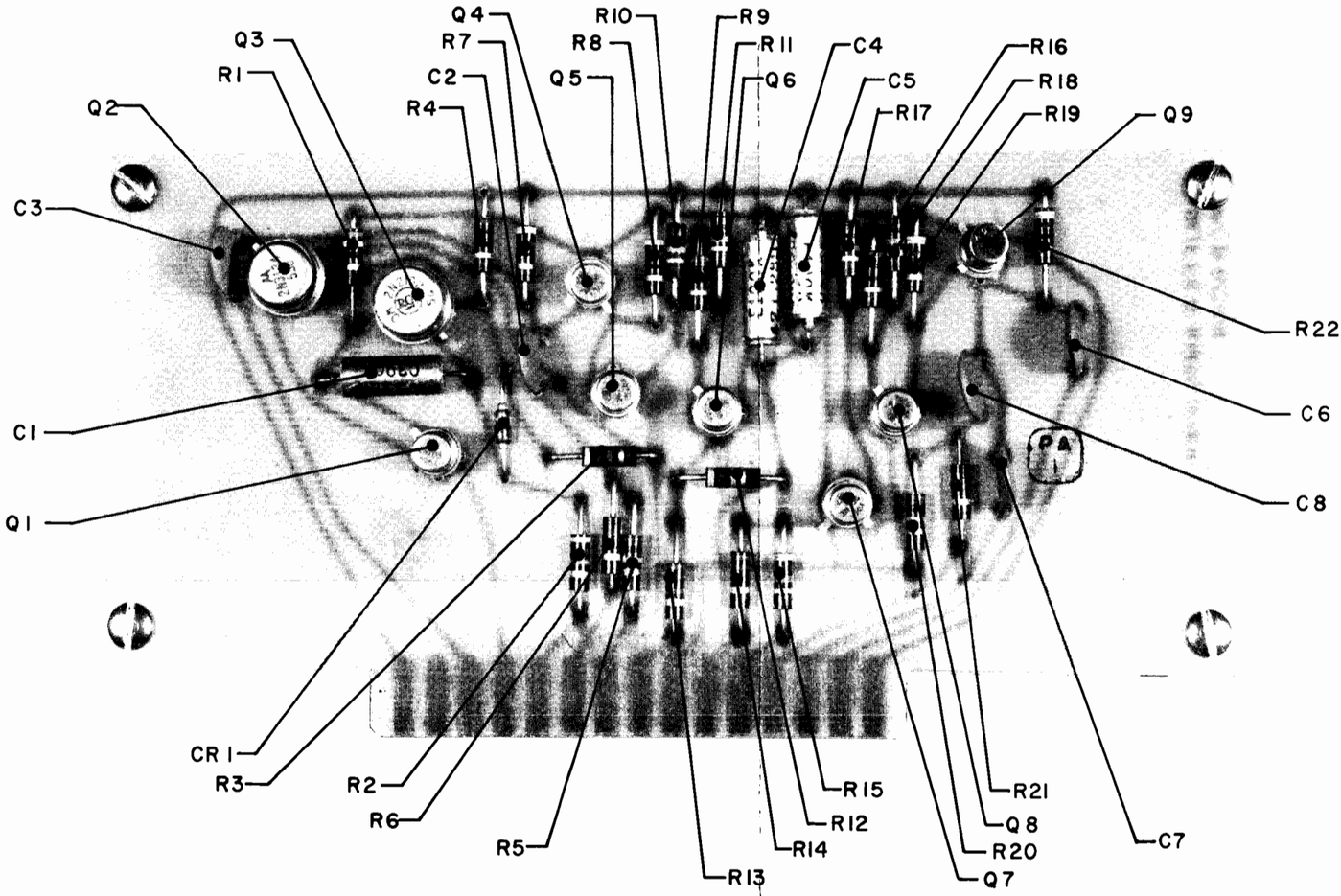


Figure 7-16. Buffer Amplifier
PC Board Assembly 6159

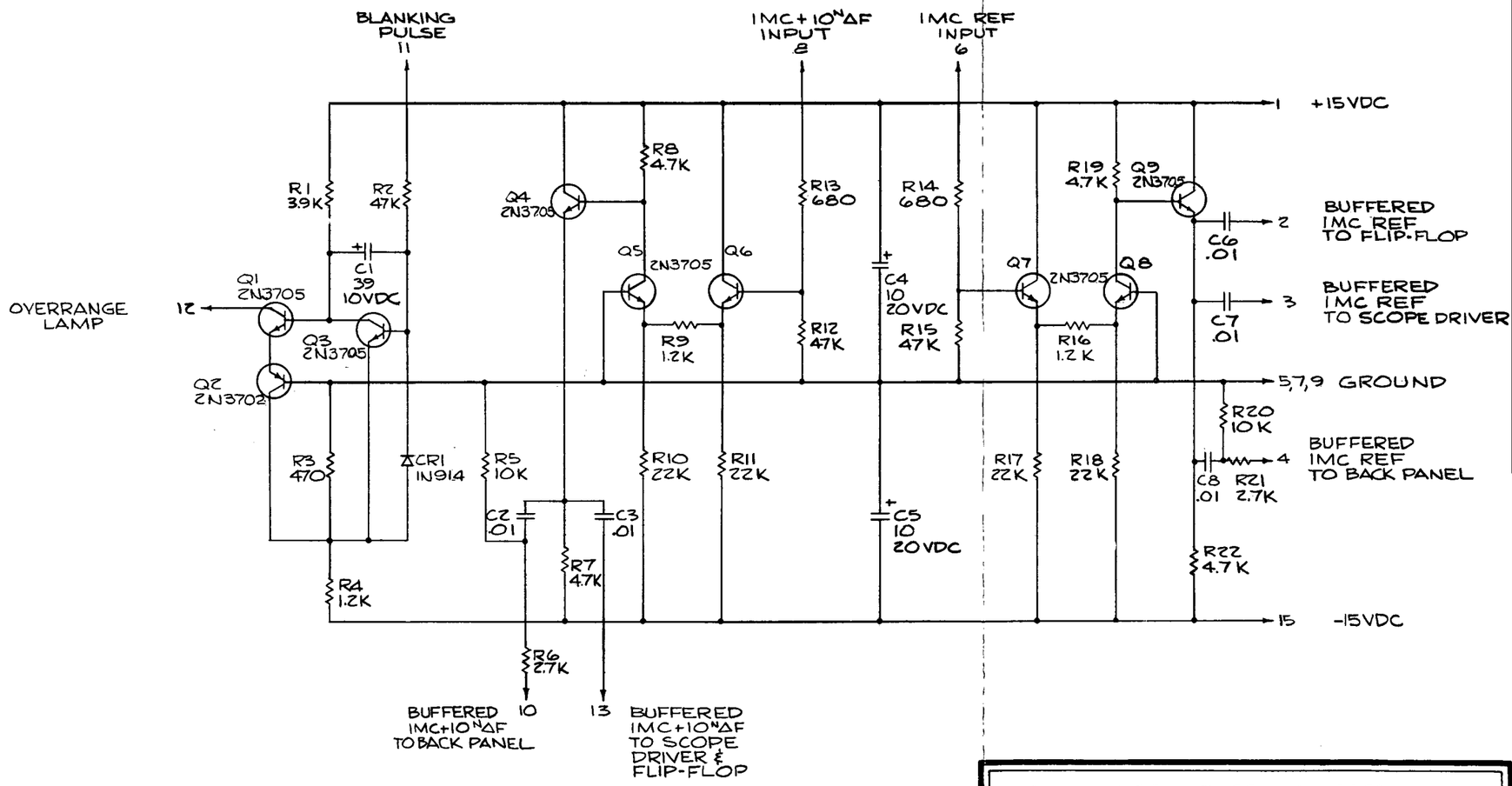


Figure 7-17. Buffer Amplifier
Schematic Diagram 6205 Rev A

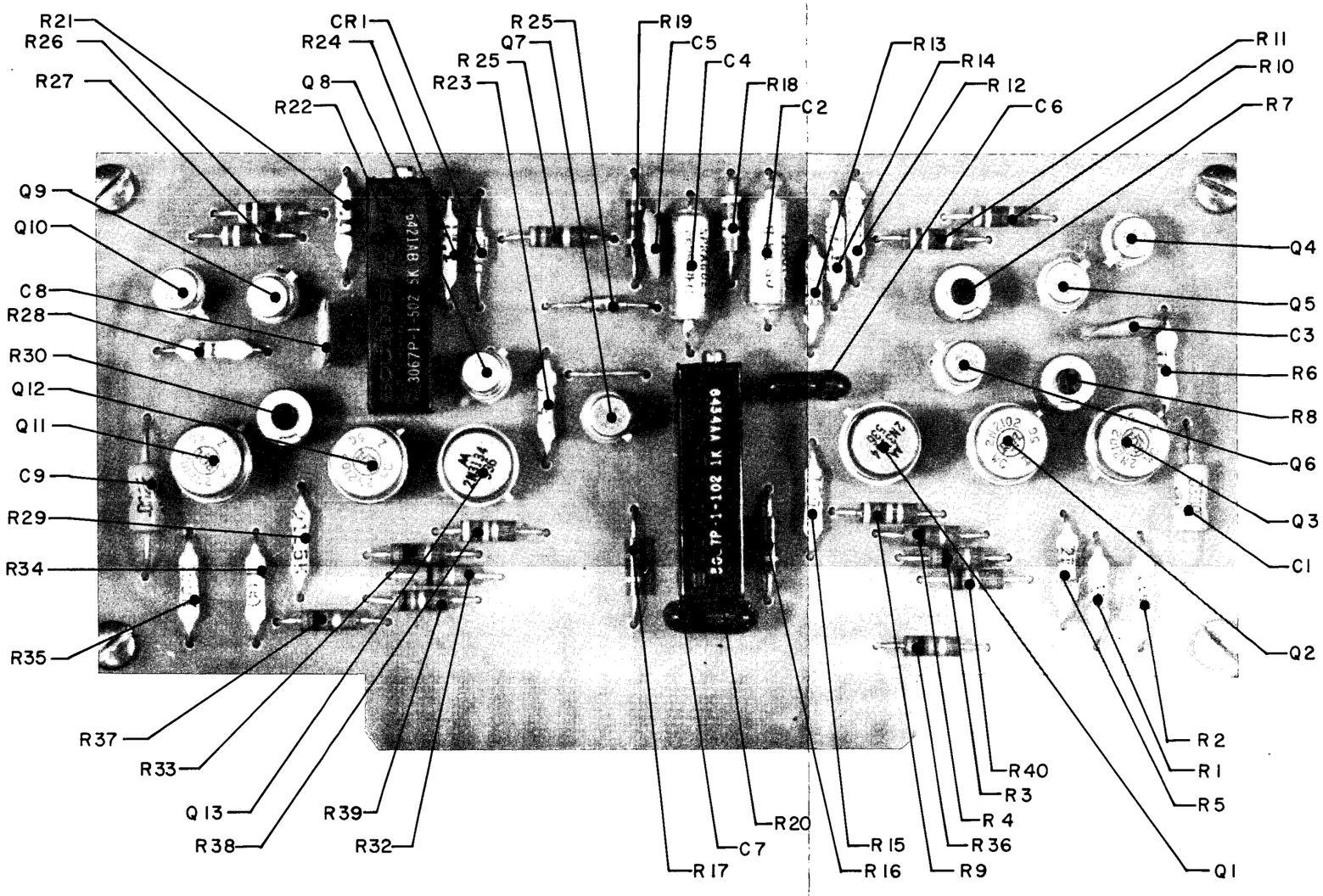


Figure 7-18. Scope Driver PC Board Assembly 6163

NOTES
1. UNLESS OTHERWISE INDICATED
   A. RESISTORS ARE 1/4W 10%
   B. CAPACITANCE IS IN MICROFARADS

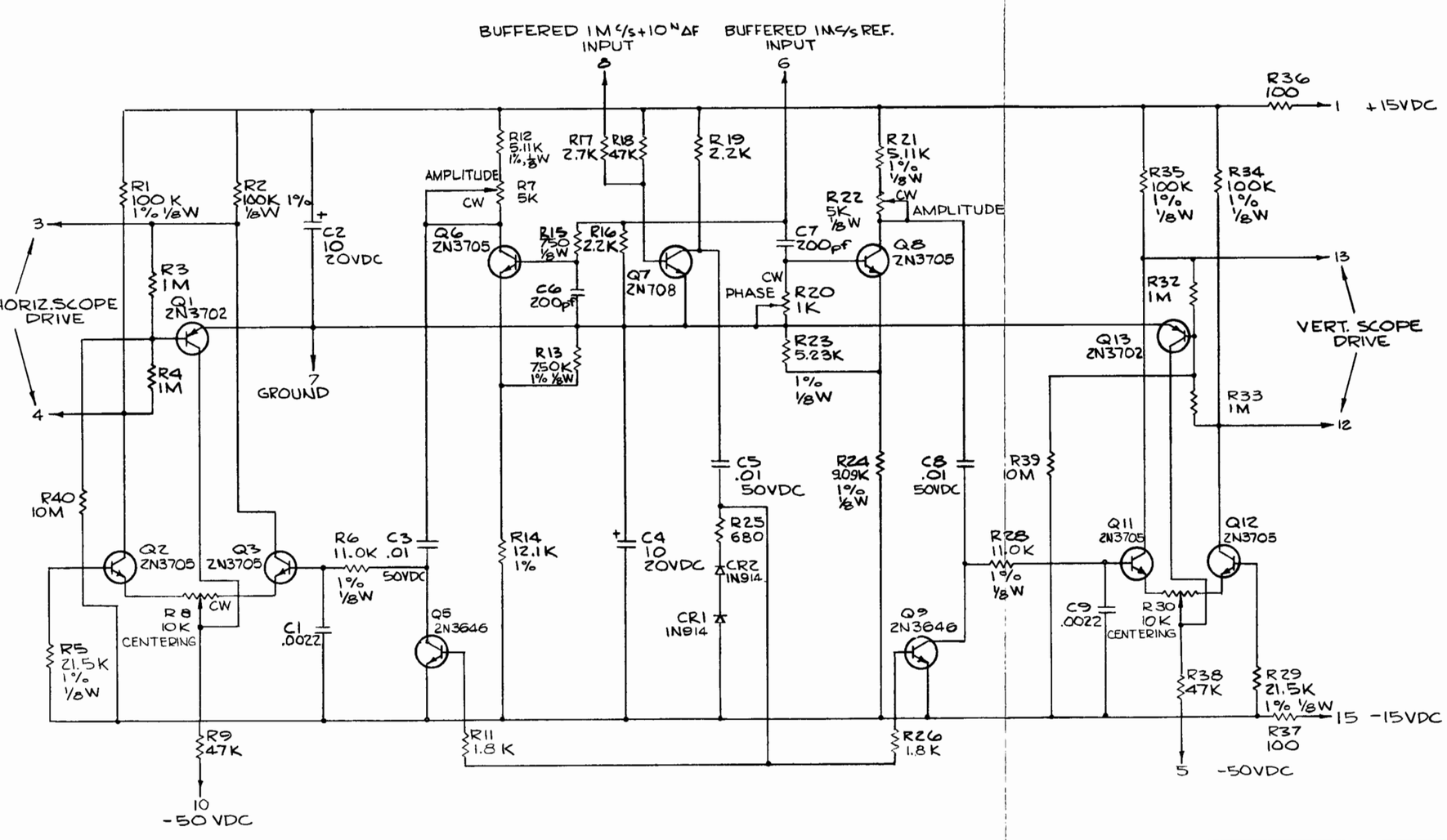


Figure 7-19. Scope Driver Schematic Diagram 6200 Rev C

6370 Rev E 7-39/7-40

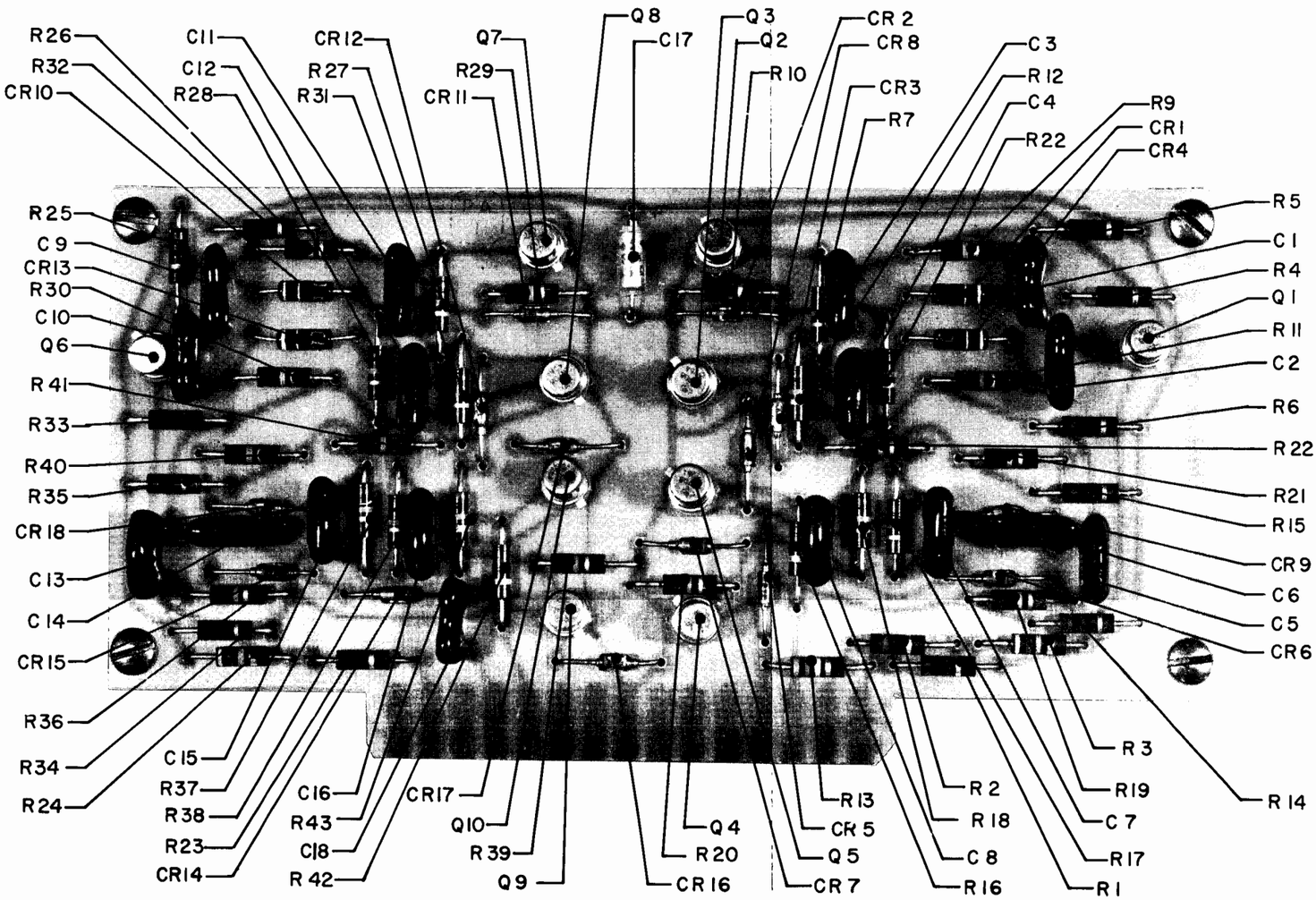
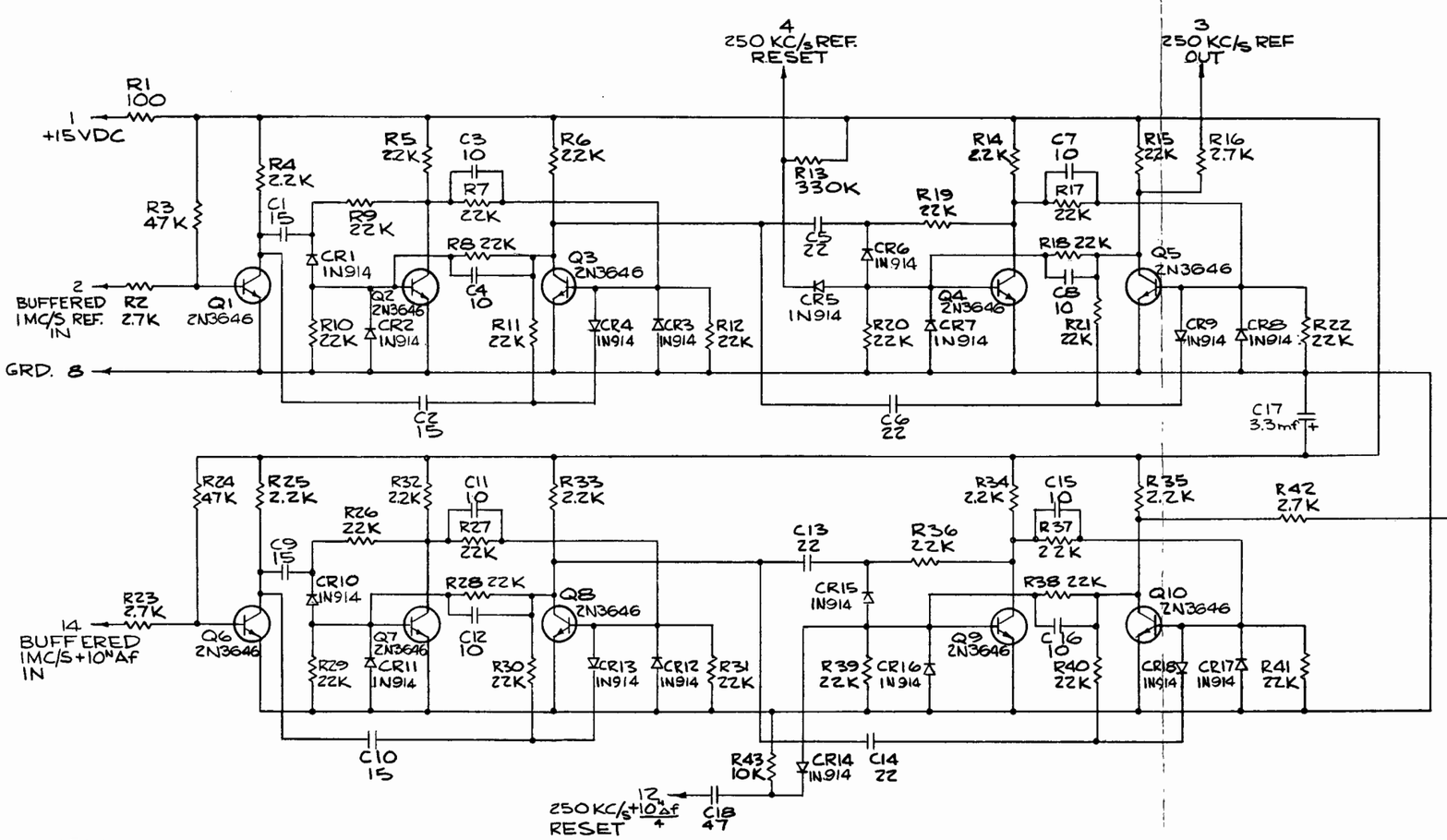


Figure 7-20. Flip-Flop PC Board Assembly 6154



NOTES:
1. UNLESS OTHERWISE INDICATED
   A. RESISTORS ARE ¼ WATT ±10%
   B. CAPACITANCE IN PICOFARADS

Figure 7-21. Flip-Flop Schematic
Diagram 6204 Rev A

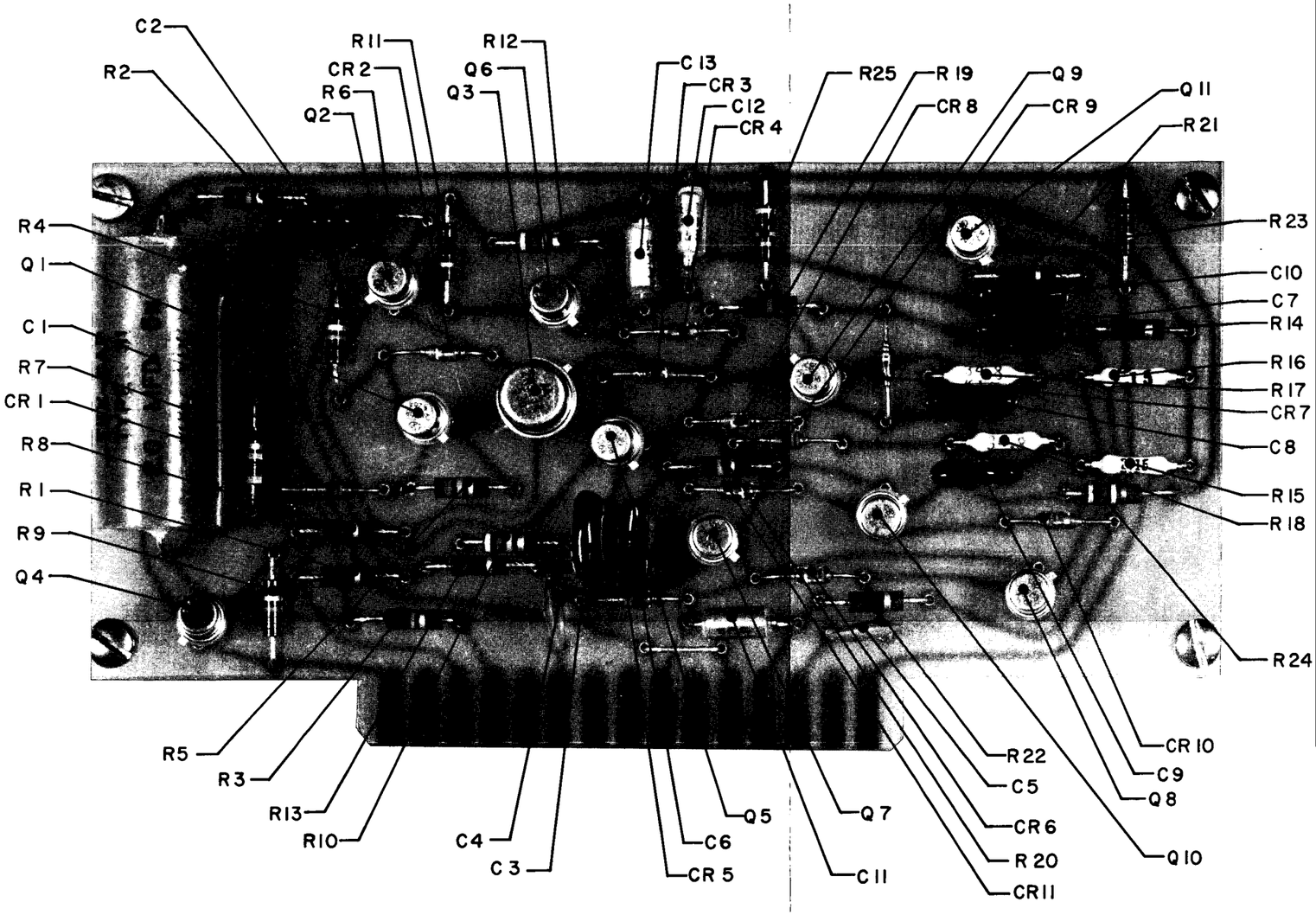
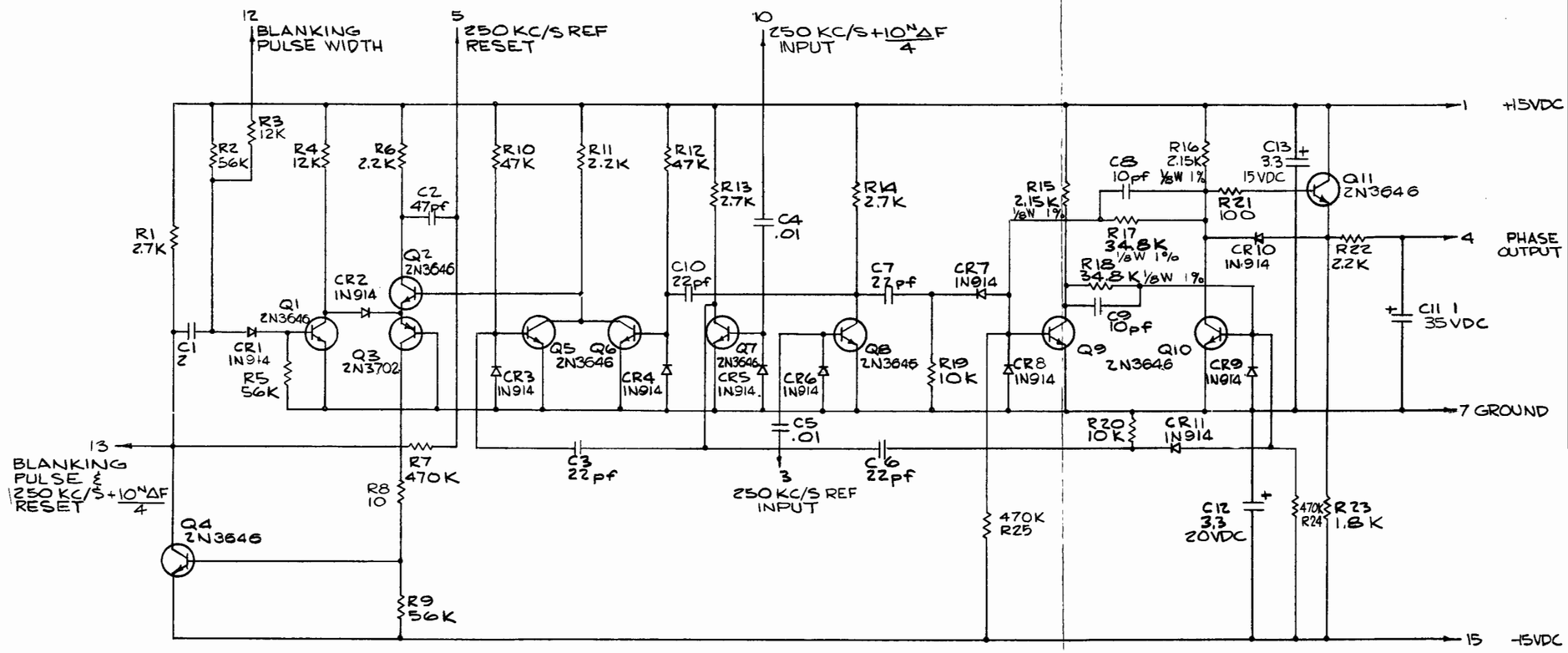


Figure 7-22. Single Shot/Phase Comparator PC Board Assembly 6162



NOTES:
1. UNLESS SPECIFIED
   A. RESISTORS ARE 1/4 W 10%
   B. CAPACITANCE IS IN MICROFARADS

Figure 7-23. Single Shot/Phase Comparator Schematic
Diagram 6202 Rev A

6370 Rev E 7-47/7-48

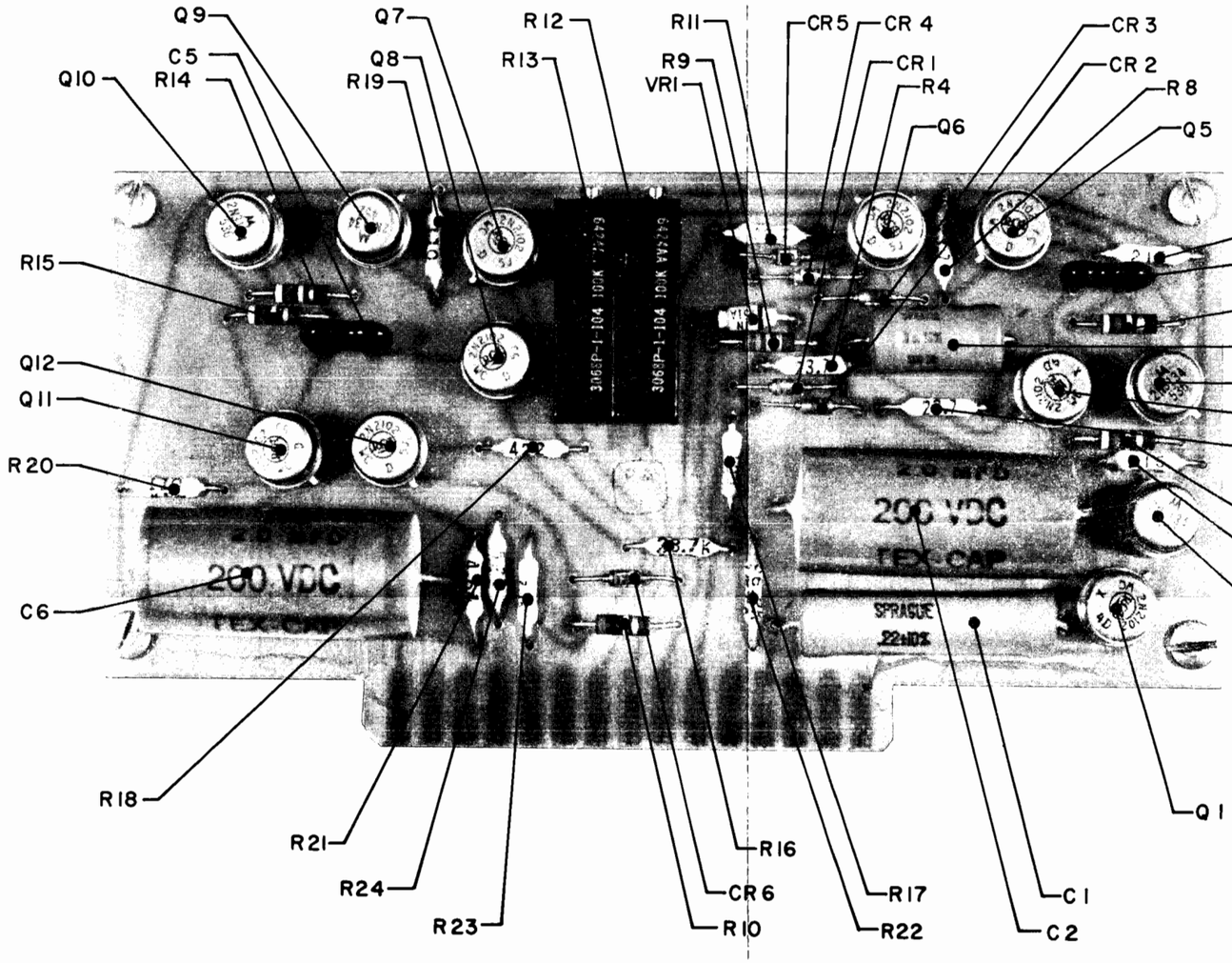
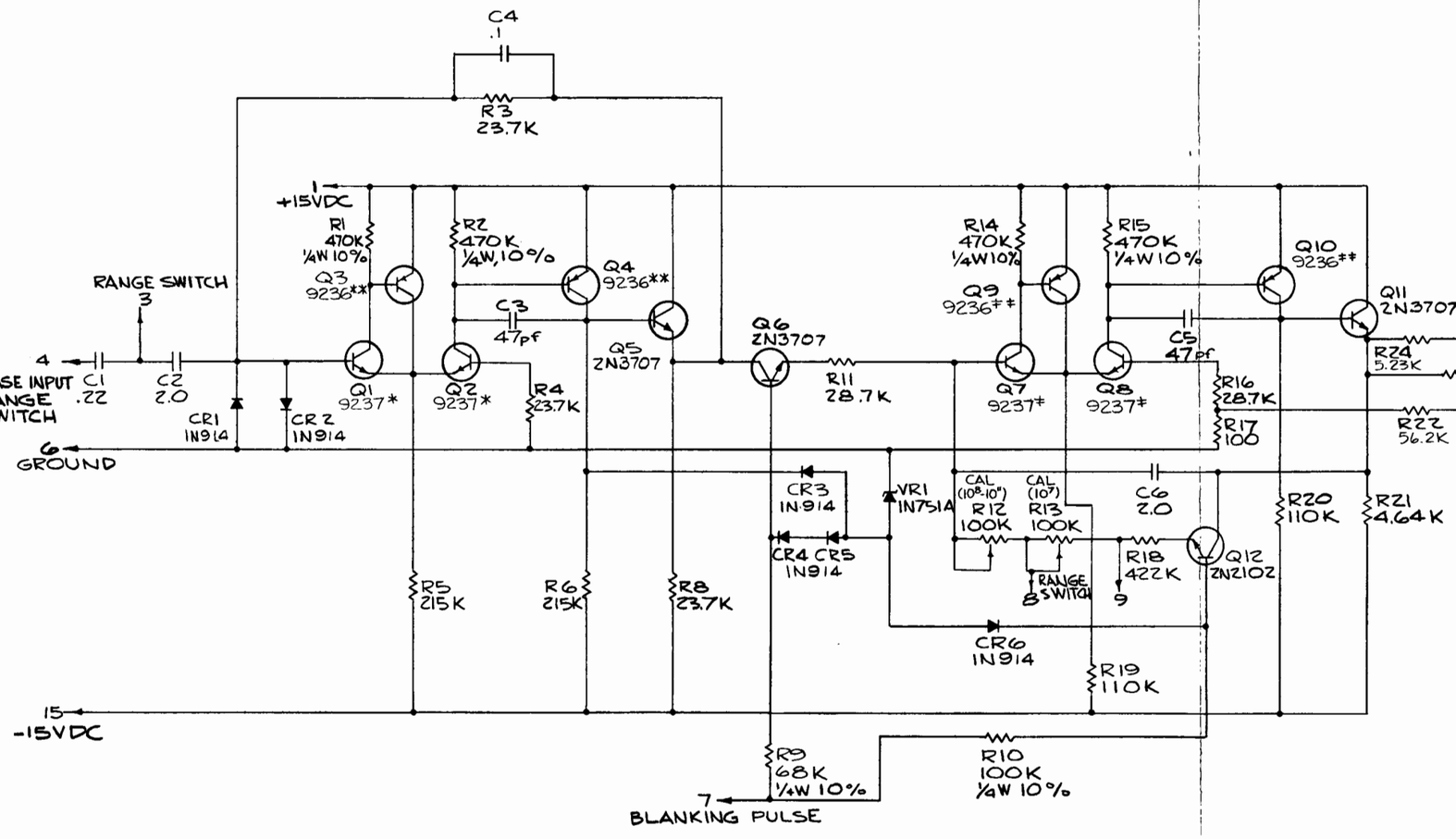


Figure 7-24. Differentiator/ Integrator PC Board Assembly 6161



NOTES:
1. UNLESS SPECIFIED
   A. RESISTORS ARE ⅛ W 1%
   B. CAPACITANCE IS IN MICROFARADS
(B) 2. * INDICATES MATCHED PAIR
   ** INDICATES MATCHED PAIR
   # INDICATES MATCHED PAIR
   ## INDICATES MATCHED PAIR

Figure 7-25. Differentiator/ Integrator Schematic
Diagram 6203 Rev B