## Errata

**Title & Document Type:** **5253B Frequency Converter Operating and Service Manual**

**Manual Part Number:** **05253-9017**

**Revision Date:** **August 1974**

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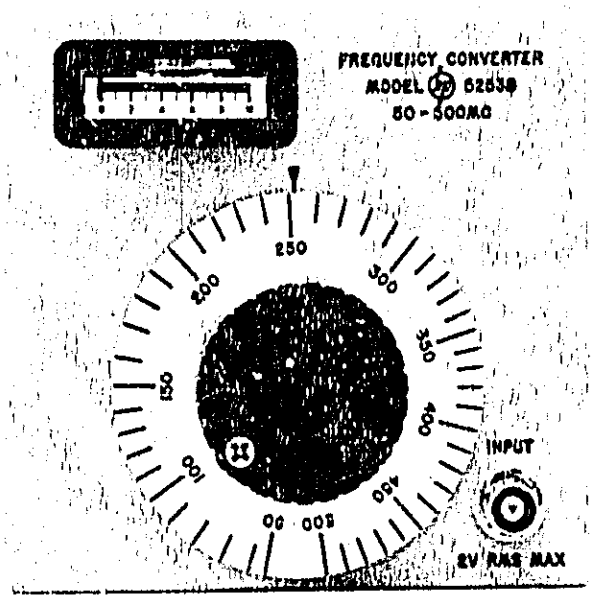
Agilent Technologies

OPERATING AND SERVICE MANUAL

# FREQUENCY CONVERTER
## 5253B

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## CERTIFICATION

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# FREQUENCY CONVERTER

# 5253B

## SERIAL PREFIX: 1124A

This manual applies directly to HP Model 5253B Frequency Converts having serial number prefix 1124A.

## OLDER INSTRUMENT

This manual with changes provided in Appendix I also applies to models having serial prefix numbers 828, 716, 513, 450, 321, and 311.

## MODEL 5253A

This manual with information provided in Appendix II also applies to Model 5253A Frequency Converters having serial prefix numbers 238 and 226.



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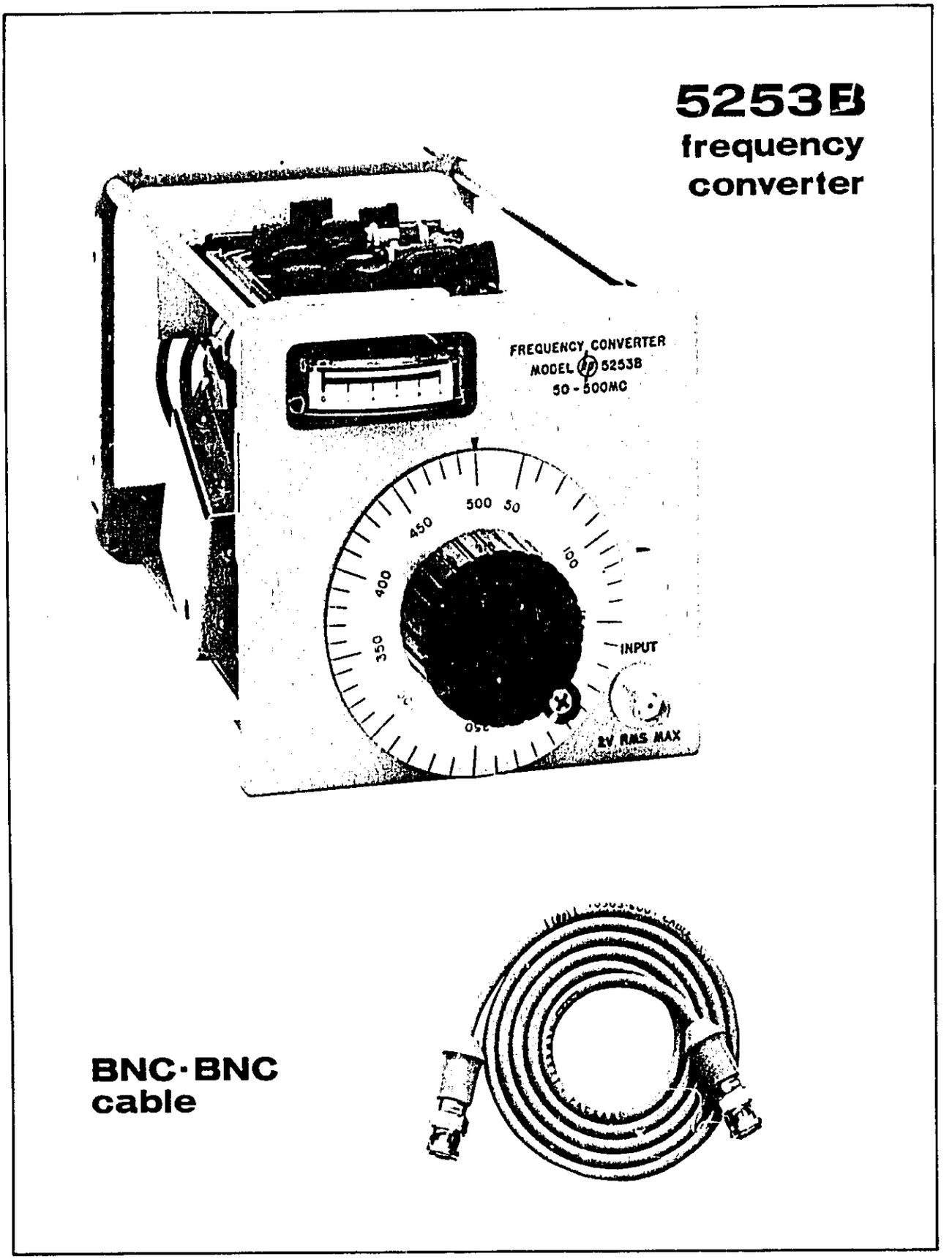



Figure 1-1. Model 5253B and Accessory

# SECTION I
# GENERAL

## 1-1. DESCRIPTION.

1-2. The Hewlett-Packard Model 5253B Frequency Converter is a plug-in unit which converts a Hewlett-Packard Model 5245L, 5245M, 5246L, 5248L/M, 5345A, and 5360A into a direct reading counter from 50 to 512 Mc.

1-3. The stability and accuracy of the basic counter are retained by multiplying a 10-Mc signal, derived from the 1-Mc internal time base of the counter, to a selectable harmonic frequency between 50 and 500 Mc. This known harmonic of 10 Mc is then heterodyned with the INPUT signal. If the resulting difference frequency is between 100 kc and 12 Mc (bandwidth of amplifier in plug-in), it is counted and displayed by the counter. The frequency of the INPUT signal is then indicated by the combination of the MIXING FREQUENCY control (in megacyles; front panel of plug-in) and the digital display of the counter (in megacycles).

1-4. A front panel meter, by monitoring the difference-frequency output of the plug-in to the counter, aids in selecting the desired MIXING FREQUENCY and also in determining if INPUT signal amplitude is adequate for accurate frequency measurement.

## 1-5. SPECIFICATIONS.

1-6. Table 1-1 contains all technical specifications for the Model 5253B when operated in the Model 5245L or Model 5246L Electronic Counter. Test specifications given in the Maintenance Section (Section V) of this manual, for the purposes of troubleshooting and adjustment, do not represent the technical specifications of the instrument.

## 1-7. ACCESSORY.

1-8. A 50-ohm coaxial cable, 48 inches long, male BNC to male BNC, is furnished with the Model 5253B.

## 1-9. IDENTIFICATION.

1-10. Hewlett-Packard uses a two-section serial number mounted on the rear panel. Earlier instruments use an 8-digit serial number (000-00000). The first three digits are a serial prefix number; the last five digits refer to the specific instrument. Later instruments use a 9-digit serial number (0000A00000). The first four digits are the serial prefix and the last five digits refer to the specific instrument. If the serial prefix of your instrument differs from that listed on the title page of this manual, there are differences between this manual and your instrument. Lower serial prefixes are documented in Appendixes I and II and higher serial prefixes are covered with manual change sheets included with the manual. If the change sheet is missing, contact the nearest Hewlett-Packard Sales and Service Office listed on the inside rear cover of this manual.

## 1-11. COOLING.

1-12. The Model 5253B is cooled by the ventilation system of the counter in which it is installed. See operating and service manual of counter for cooling system maintenance instructions.

Table 1-1. Specifications*

RANGE: As converter for 5245L or 5246L counter, 50 Mc to 512 Mc, using mixing frequencies of 50 Mc to 500 Mc in 10 Mc steps.

ACCURACY: Retains accuracy of 5245L or 5246L counter.

INPUT VOLTAGE RANGE: 50 mV to 1 V rms (-13 dBm to +13 dBm).

MAXIMUM INPUT: 2 V rms or 100 Vdc will not damage the instrument.

INPUT IMPEDANCE: Approximately 50 ohms.

LEVEL INDICATOR: Meter aids frequency selection; indicates output voltage level to counter.

REGISTRATION: Counter display in MHz is added to the converter dial reading.

COMPATIBLE HP COUNTERS: 5243L, 5245L**/M, 5246L, 5247M, 5248L/M, M54 versions, 5360A (with 10536A adapter). 5345A (with 10590A adapter).

WEIGHT: Net 5 lb. (2, 3 kg), Shipping 7 lb. (3, 2 kg).

ACCESSORY FURNISHED: HP Ω0503A (AC-16K) Cable, 4-feet long, male BNC connectors.

*When installed in Hewlett-Packard Model 5245L or Model 5246L Electronic Counter.

**5245L serial number must be prefixed 402 or higher, or counter modification is required.

# SECTION II
# PREPARATION FOR USE

## 2-1. UNPACKING AND INSPECTION.

2-2. If the shipping carton is damaged, ask that the carrier's agent be present when the instrument is unpacked. Inspect the instrument for damage (scratches, dents, broken knobs, etc). If the instrument is damaged or fails to meet specifications, notify the carrier and the nearest Hewlett-Packard field office immediately (field offices are listed at the back of this manual). Retain the shipping carton and the padding material for the carrier's inspection. The field office will arrange for the repair or replacement of your instrument without waiting for the claim against the carrier to be settled.

## 2-3. ELECTRICAL INSPECTION.

2-4. The performance check procedure (Paragraph 5-31) may be used to verify proper electrical operation as part of an incoming quality control inspection.

## 2-5. STORAGE AND RESHIPMENT.

2-6. PACKAGING. To protect valuable electronic equipment during storage or reshipment, always use the best packaging methods available. Your Hewlett-Packard field engineer can provide packing materials similar to those used for original factory packaging. Here are two recommended packing methods:

a. Original. Place instrument in original container. Replace each packing pad and filler in the exact position that it originally occupied.

b. Alternate. Cover panel with soft wrapping paper. Wrap corrugated cardboard completely around instrument and place in strong corrugated cardboard container (350 lb/sq in. bursting test). Insert filler material between wrapped instrument and container to obtain a snug fit on all surfaces. Filler should be rubberized hair (2 in. thick), excelsior (6 in. thick), or equivalent.

2-7. ENVIRONMENT. Conditions during storage and shipment should normally be limited as follows:

a. Maximum altitude 20, 000 feet (6, 096 meters).

b. Minimum temperature -40°F (-40°C).

c. Maximum temperature 167°F (75°C).

> CAUTION
>
> TURN COUNTER POWER OFF BEFORE INSTALLING OR REMOVING FREQUENCY CONVERTER.

## 2-8. INSTALLATION.

2-9. The Model 5253B plugs into the rectangular compartment at the right-hand side of the front panel of the Model 5243L or 5245L Electronic Counter. To install unit in counter, first check that retaining screw (see Figure 3-1) is turned fully counterclockwise, then push unit firmly into compartment until front panel of plug-in is flush with front panel of counter. Then turn retaining screw clockwise until it is tight. With the 10536A Adapter the Model 5253B plugs into the Model 5360A Counter and with the 10590A Adapter the Model 5253B plugs into the Model 5345A Counter.

2-10. To remove unit from counter, turn retaining screw counterclockwise to its stop. Then grasp mixing frequency selector (see Figure 3-1) and firmly pull unit from counter. If any difficulty is encountered with installation or removal, check that retaining screw is fully counterclockwise.

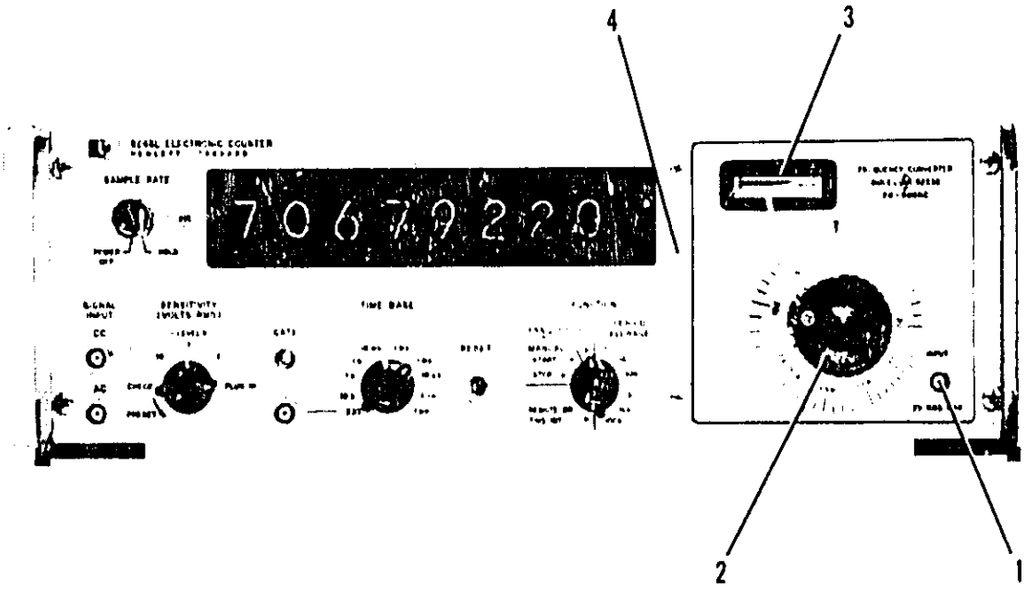
## 2-11. POWER REQUIREMENTS.

2-12. All electrical power required to operate the Model 5253B is supplied by the counter in which the unit is installed.

## 2-13. ELECTRICAL CONNECTIONS.

2-14. INPUT connector on front panel of plug-in (see Figure 3-1) is the only external electrical connection to the unit. All other connections are made through the 50-pin connector at the rear of plug-in when installed in counter.

# OPERATION




1. INPUT signal connector.

2. MIXING FREQUENCY SELECTOR. Calibrated in mc, this control tunes the internal cavity to select a harmonic of 10 mc to be heterodyned with the INPUT signal.

3. LEVEL INDICATOR METER. The meter circuit continuously monitors the level of the difference-frequency output of converter to counter. When meter reads in the green portion of its scale, INPUT signal amplitude is adequate for accurate frequency measurement.

4. RETAINING SCREW. The screw which holds the converter in place is located on the front panel of the counter. To tighten, turn fully clockwise. To loosen, turn fully counterclockwise.

Figure 3-1. Front Panel

# SECTION III
# OPERATION

## 3-1. FRONT PANEL.

3-2. The functions of the front panel control, meter, connector, and retaining screws are given in Figure 3-1.

## 3-3. MAXIMUM INPUT VOLTAGES.

3-4. Damage to the converter may result if an AC signal greater than 2 v RMS or a DC voltage greater than 100 v is applied to converter INPUT connector.

## 3-5. OPERATING PROCEDURES.

### 3-6. NORMAL RANGE MEASUREMENTS.

3-7. Figure 3-2 is the procedure to be used for measurement of frequencies from 50.1 to 512 Mc with INPUT signal amplitudes from 50 mv to 1 v RMS.

### 3-8. EXTENDED RANGE MEASUREMENTS.

3-9. The frequency of signals not within the normal range of 50.1 to 512 Mc, 50 mv to 1 v RMS, may be measured using the following procedures:

3-10. 50 TO 50.1 MC, 50 MV TO 1 V RMS. Perform steps 1 through 5 of Figure 3-2. Then:

a. Set mixing frequency control to slightly more than 60 Mc.

b. Turn mixing frequency control slowly clockwise until level indicator meter first reaches a maximum reading in the green portion of its scale.

c. Subtract counter display (in Mc) from reading of mixing frequency control (in Mc) for frequency of INPUT signal.

3-11. 50 TO 512 MC, AMPLITUDE LESS THAN 50 MV RMS. The front panel level indicator meter indicates in the green portion of its scale only when converter is properly tuned and amplitude of INPUT signal is adequate for accurate frequency measurement. However, because of conservative specifications of both the converter and counter, frequencies may often be accurately measured when meter reads in the red portion of its scale. To make these extended range measurements:

a. Follow normal procedure (Figure 3-2 or Paragraph 3-10, depending upon frequency range) except that mixing frequency control should be tuned for first maximum reading on the level indicator meter, regardless of the color of region maximum.

b. Check frequency measurement result as described in Paragraph 3-12, or

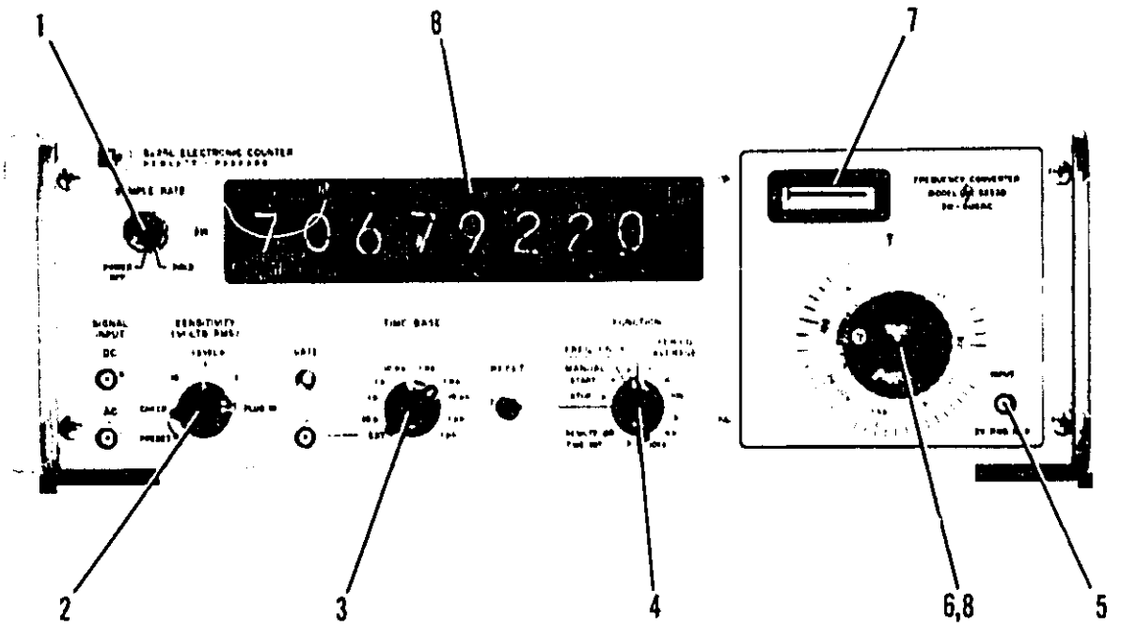
c. Insert an external variable attenuator (such as Hewlett-Packard Model 355A or 355C) in the transmission line between the converter and the source of INPUT signal. Vary attenuation from 0 to 1 db during final step of frequency measurement procedure. If counter display does not change more than momentarily (during switching of attenuator), INPUT signal is above noise threshold and frequency measurement result is valid.

## 3-12. DOUBLE-CHECKING FREQUENCY MEASUREMENT RESULT.

3-13. Because of the heterodyne action of the converter, frequency measurement results obtained at any one setting of the mixing frequency control may be checked at other settings. See Figure 3-3 for examples.

Table 3-1. Frequency Resolution

| INPUT SIGNAL FREQUENCY = 151.1223344 Mc<br>MIXING FREQUENCY CONTROL set to 140 Mc | | |
|---|---|---|
| Time Base Setting | Counter Display | Measurement Resolution |
| .1 μs | * (no display) | |
| 1 μs | 1 1. Mc | 1 5 1. Mc |
| 10 μs | 1 1.1 Mc | 1 5 1.1 Mc |
| .1 ms | 1 1.1 2 Mc | 1 5 1.1 2 Mc |
| 1 ms | 1 1 1 2 2. kc | 1 5 1.1 2 2 Mc |
| 10 ms | 1 1 1 2 2.3 kc | 1 5 1.1 2 2 3 Mc |
| .1 s | 1 1 1 2 2.3 3 kc | 1 5 1.1 2 2 3 3 Mc |
| 1 s | 1 1 1 2 2.3 3 4 kc | 1 5 1.1 2 2 3 3 4 Mc |
| 10 s | 1 1 2 2.3 3 4 4 kc | 1 5 1.1 2 2 3 3 4 4 Mc |




1. Turn SAMPLE RATE control slightly out of POWER OFF position.
2. Set SENSITIVITY to PLUG IN.
3. Set TIME BASE to .1 ms.*
4. Set FUNCTION to FREQUENCY.
5. Connect signal whose frequency is to be measured to INPUT of converter.
6. Set mixing frequency control to read slightly less than 50 Mc.
7. Slowly turn mixing frequency control counterclockwise until level indicator meter first reaches a maximum reading in the green portion of its scale.
8. Add counter display (in Mc) to mixing frequency control reading (in Mc) for frequency of INPUT signal.

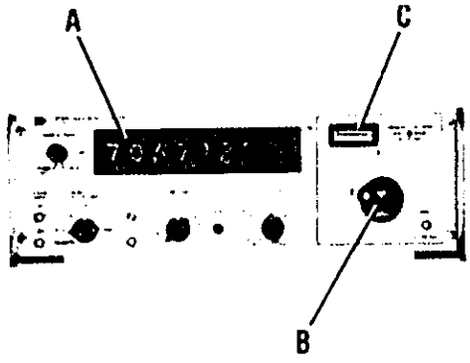
---

*TIME BASE setting may vary, depending on desired resolution of INPUT signal frequency. See Table 3-1.

Figure 3-2. Frequency Measurement Procedure

## 3-14. AID TO RAPID TUNING

3-15. To easily obtain an indication of the proper MIXING FREQUENCY when rapidly tuning the Model 5253B through its frequency range in search of an unknown INPUT frequency, set counter FUNCTION control to MANUAL START. This allows the counter to totalize each cycle of any difference frequency produced during rapid tuning. When counter display changes, indicating that the MIXING FREQUENCY is heterodyning with the INPUT frequency and producing a difference frequency within the frequency range of the basic counter, set counter FUNCTION control to FREQUENCY and proceed with measurement.




| INPUT FREQ. | A | B | C | |
|---|---|---|---|---|
| 155.000 MC | 00000000 | 140 | | DIFFERENCE FREQUENCY OF 15 MC IS ABOVE PASS BAND OF VIDEO AMPLIFIER ASSEMBLY. |
| | 00005000 | 150 | | 150.000 MC<br>+ 5.000 MC<br>155.000 MC |
| | 00005000 | 160 | | 160.000 MC<br>− 5.000 MC<br>155.000 MC |
| 150.030 MC | 00010030 | 140 | | 140.000 MC<br>+ 10.030 MC<br>150.030 MC |
| | 00000000 | 150 | | DIFFERENCE FREQUENCY OF 30 KC IS BELOW PASS BAND OF VIDEO AMPLIFIER ASSEMBLY |
| | 00009970 | 160 | | 160.000 MC<br>− 9.970 MC<br>150.030 MC |
| 512.000 MC | 00000000 | 480 | | DIFFERENCE FREQUENCY OF 32 MC IS ABOVE PASS BAND OF VIDEO AMPLIFIER ASSEMBLY. |
| | 00000000 | 490 | | DIFFERENCE FREQUENCY OF 22 MC IS ABOVE PASS BAND OF VIDEO AMPLIFIER ASSEMBLY |
| | 00012000 | 500 | | 500.000 MC<br>+ 12.000 MC<br>512.000 MC |

Figure 3-3. Typical Frequency Measurements

# THEORY

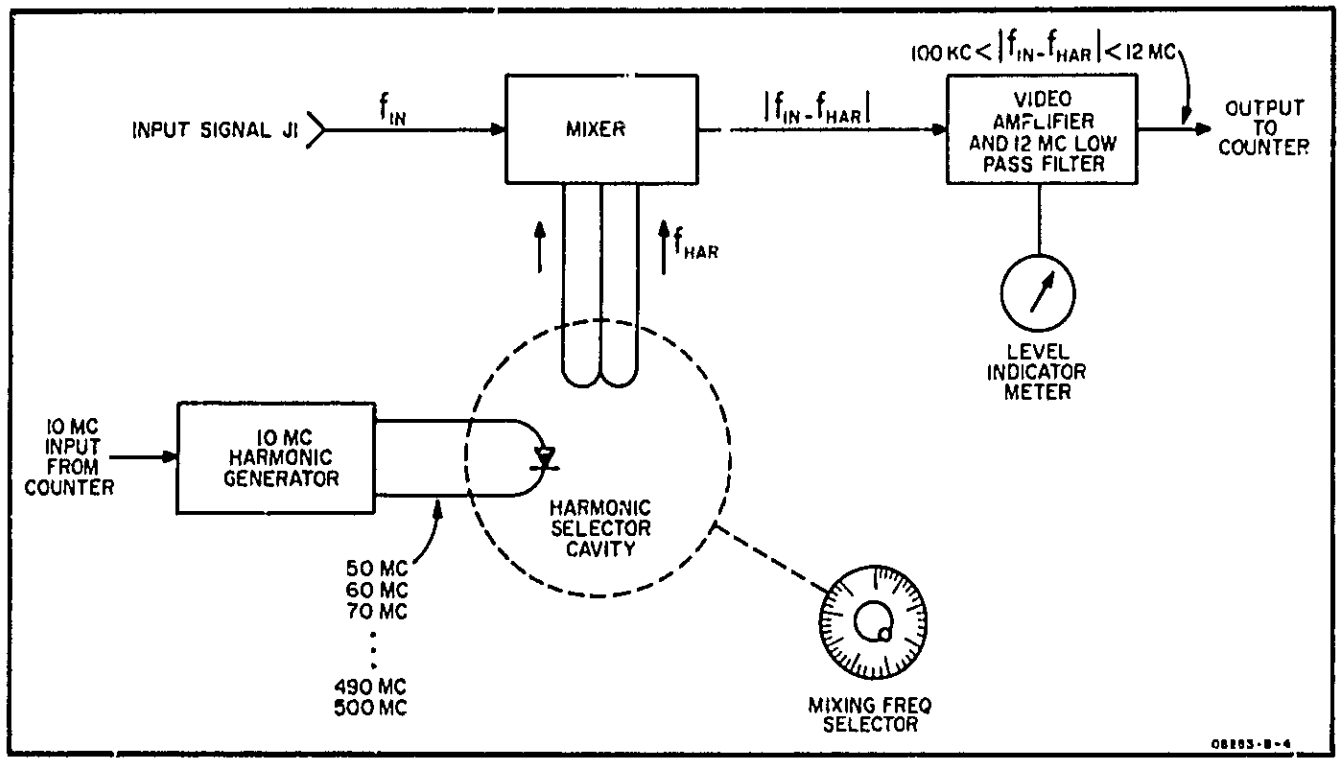



Figure 4-1. Block Diagram

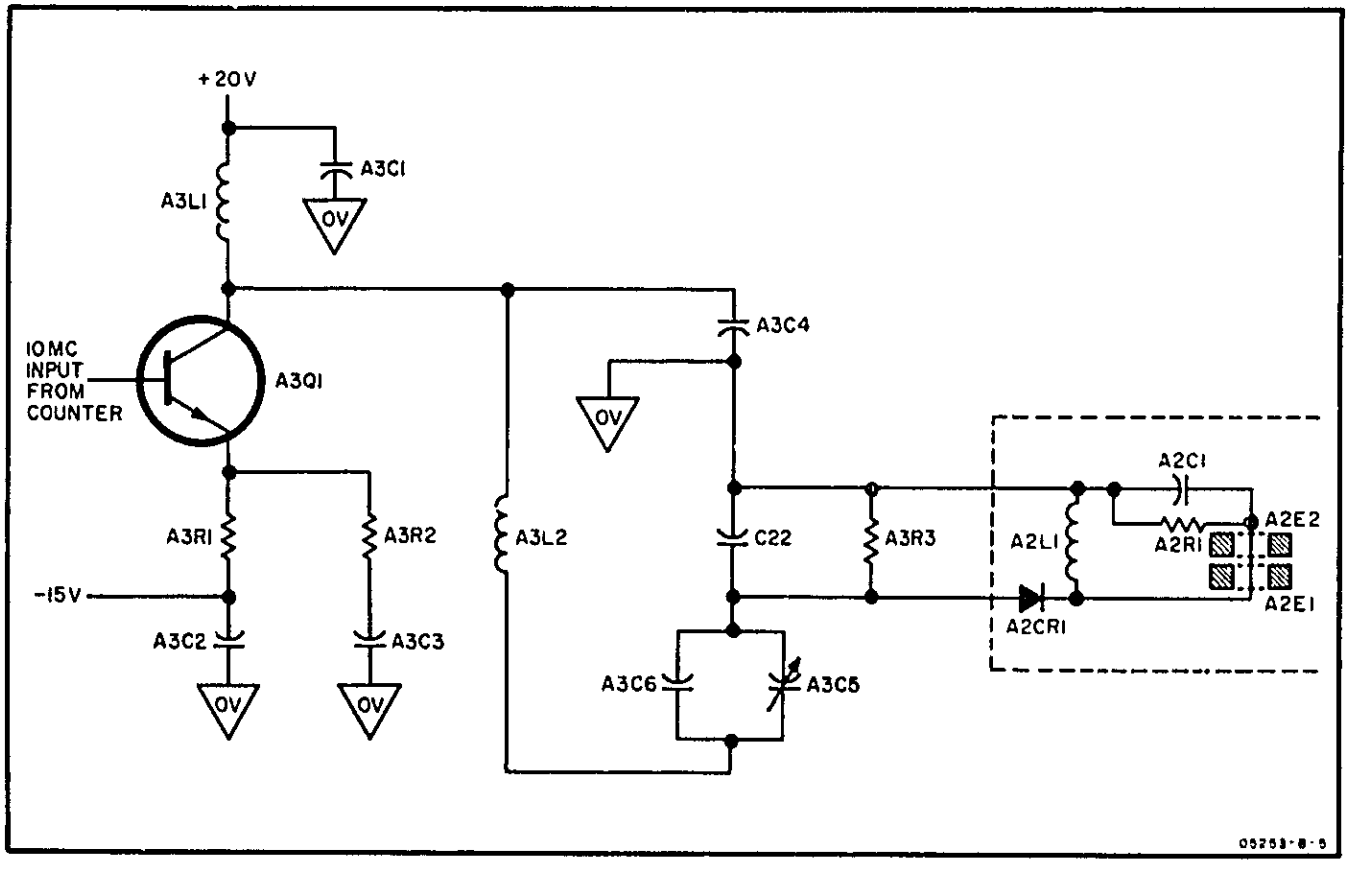



Figure 4-2. Harmonic Generator (A2, A3)

# SECTION IV
# PRINCIPLES OF OPERATION

## 4-1. GENERAL

4-2. The Model 5253B is a heterodyne frequency converter designed to extend the range of frequency measurements of the Model 5243L, 5245L, 5245M, 5248L/M, 5345A, and 5360A Electronic Counters to 512 Mc.

4-3. The converter contains four basic functional sections: harmonic generator, harmonic selector cavity, mixer, and video amplifier (see Figure 4-1).

4-4. In normal operation, the harmonic generator produces all of the harmonics of 10 Mc between 50 and 500 Mc. The harmonic selector cavity is tuned to select one of these harmonics to be supplied to the mixer. The mixer output is the difference frequency produced by the mixing of the INPUT frequency and the frequency supplied by the harmonic selector cavity. This difference frequency is amplified by the video amplifier and supplied to the counter input circuit. A low-pass filter within the video amplifier prevents all difference frequency signals above approximately 12 Mc from reaching the counter input circuit. The output of the video amplifier is monitored by a meter circuit which indicates when difference frequency output amplitude is greater than minimum signal required by counter input circuit.

## 4-5. HARMONIC GENERATOR (A2,A3), AND HARMONIC SELECTOR CAVITY

4-6. A 10-Mc signal, supplied by the Counter, is amplified by A3Q1 to cause a tuned circuit, composed of A3L2, A3C4, A3C5, A3C6, and C22, to oscillate at 10-Mc (Fig. 4-2). Step-recovery diode*, A2CR1, takes energy from this tuned circuit during a portion of each cycle of the 10-Mc oscillation and produces a sharp step in the current following in the input loop of the harmonic selector cavity. This current step makes available, inside the cavity, all harmonics of 10 Mc from 10 Mc (fundamental) to over 500 Mc (fiftieth harmonic). The remaining components of the step-recovery diode network (Assembly A2) are used to maintain the sensitivity of the counter across its frequency range. The harmonic selector cavity is tuned to resonate at a particular harmonic of 10 Mc between 50 and 500 Mc so that energy at that frequency is coupled from the input loop to the output loops providing one of the two inputs to the mixer circuit (Fig. 4-4).

*-hpa- Application Note #1 (The Step Recovery Diode; Circuit Design and Performance), -hpa- Application Note #2 (Harmonic Generation, Rectification, and Lifetime Evaluation with the Step Recovery Diode; reprinted from the PROCEEDINGS OF THE IRE, VOL. 50, NO. 7, JULY 1962); available from -hp associates-, 620 Page Mill Road, , Palo Alto, California.

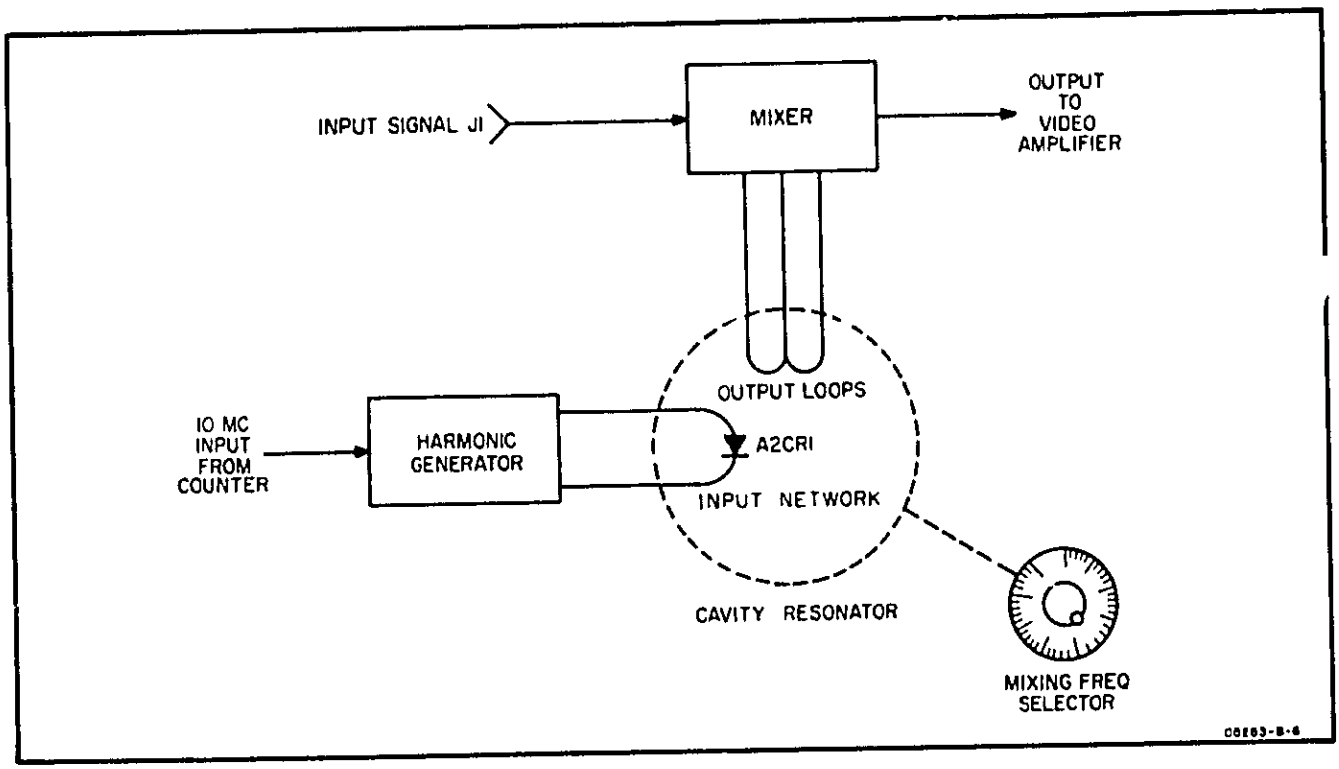



Figure 4-3. Harmonic Selector Cavity

## 4-7. MIXER (A4)

4-8. Two diodes are used in a balanced mixer circuit in order to minimize the generation of even-order harmonics of both the INPUT signal and the selected mixing frequency. The balanced input signal required by the circuit is accomplished by grounding the junction of the two resistors of equal value, A4R1 and A4R2, and installing ferrite rings (E1, E2, and E3) around the input coaxial cable (see Figure 4-4). Both sides of resistor A4R1 are returned to common for DC currents. However, for AC currents in the frequency range of 50 to 512 Mc, the impedance of the input signal path is large, due to the inductance provided by the ferrite rings E1, E2, and E3, causing a balanced AC signal condition at the mixer diodes. Limiting diode A4CR3 prevents INPUT signals of high amplitude from overloading the mixer circuit. The output of the mixer diodes, during normal operation when the converter is properly tuned, is a complex signal containing the INPUT signal frequency, the frequency of the harmonic of 10 Mc to which the harmonic selector cavity is tuned, the frequency that is the sum of these two frequencies, and the frequency that is the difference between these two frequencies. Inductor A4L1 reduces the amplitude of any signal with a frequency above approximately 15 Mc before the signal reaches the input to the video amplifier. The output of the mixer circuit is then essentially composed of the difference frequency signal.

## 4-9. VIDEO AMPLIFIER ASSEMBLY (A1)

4-10. The output of the mixer circuit is amplified by transistors A1Q1 and A1Q2 and is fed to the 12-Mc low-pass filter network (see Figure 4-5). This filter passes any signal frequency below approximately 12 Mc and attenuates all higher frequency signals. The lowpass filter output is amplified by A1Q3 and A1Q4 and fed to the last transistor amplifier, A1Q5, which provides both the output to the counter and the drive for the level indicator meter. The limiter diode, A1CR1, prevents the amplitude of the video amplifier output signal from exceeding approximately 300 mv RMS so that counter input circuits will not be overloaded. The low frequency limit of the video amplifier, determined by the bypass and interstage coupling networks, is approximately 100 kc. The converter output signal to the counter, when converter is properly tuned, will be between approximately 100 kc and 12 Mc and will have an amplitude that is less than approximately 300 mv RMS.

## 4-11. LEVEL INDICATOR METER

4-12. The DC current supply for the meter is produced by metering detector A1CR3 and smoothed by capacitor A1C16 (see Figure 4-6). The value of shunt resistor A1R20 is selected to make level indicator meter M1 read at red-green border when amplitude of converter output to counter is in excess of the 100-mv RMS minimum signal amplitude normally required by the counter for accurate frequency measurement.

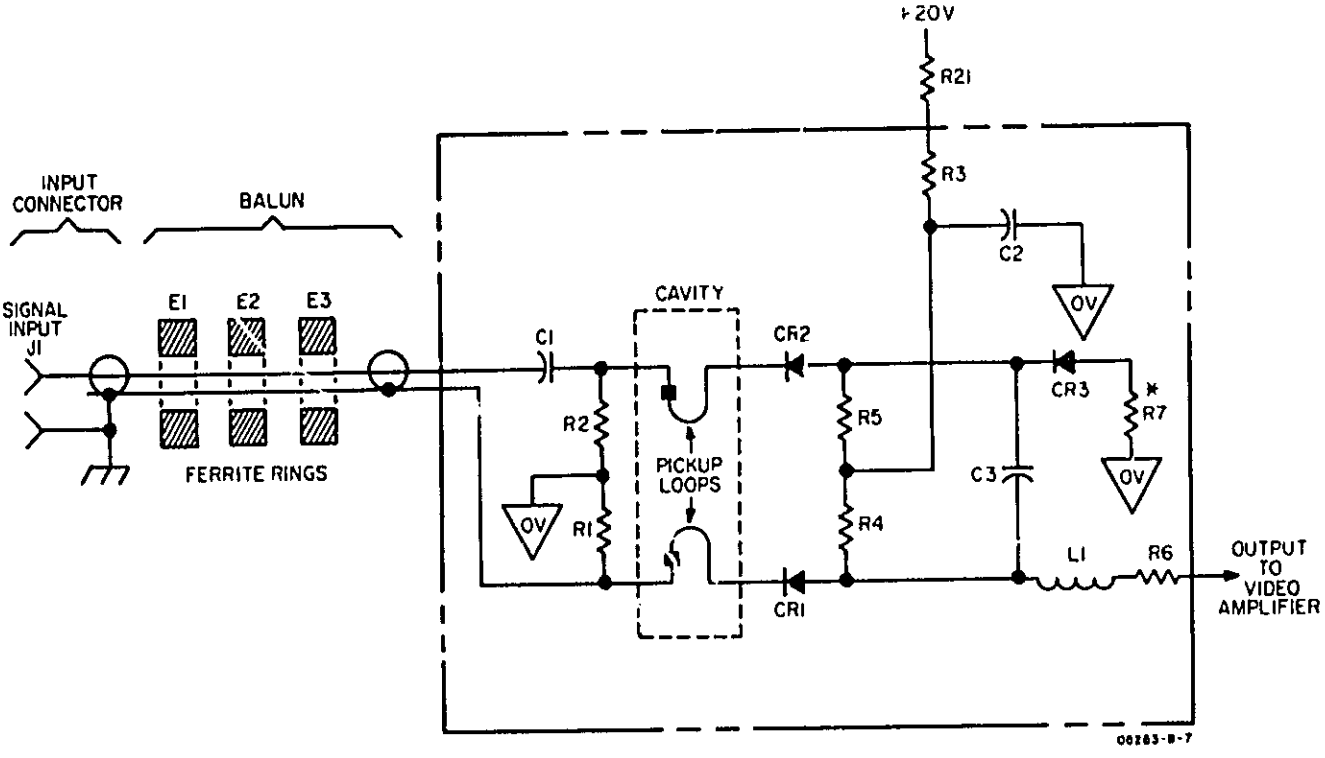



Figure 4-4. Balanced Mixer (A4)

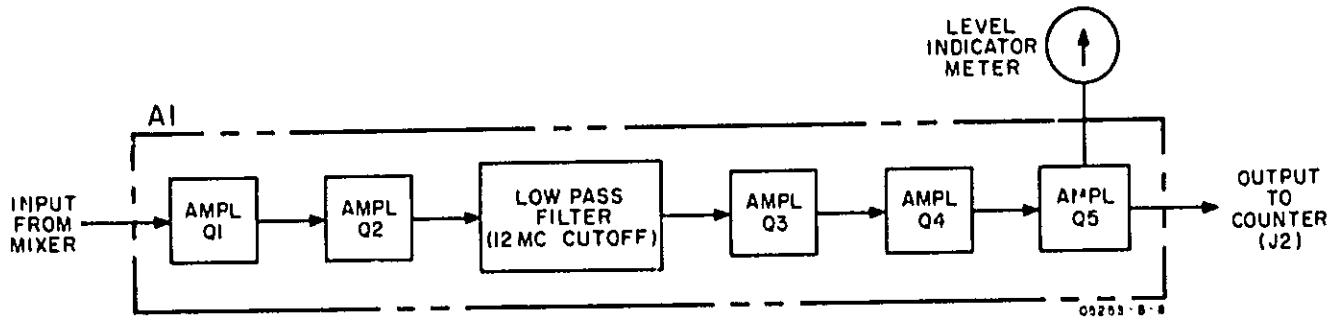



Figure 4-5. Video Amplifier (A1)

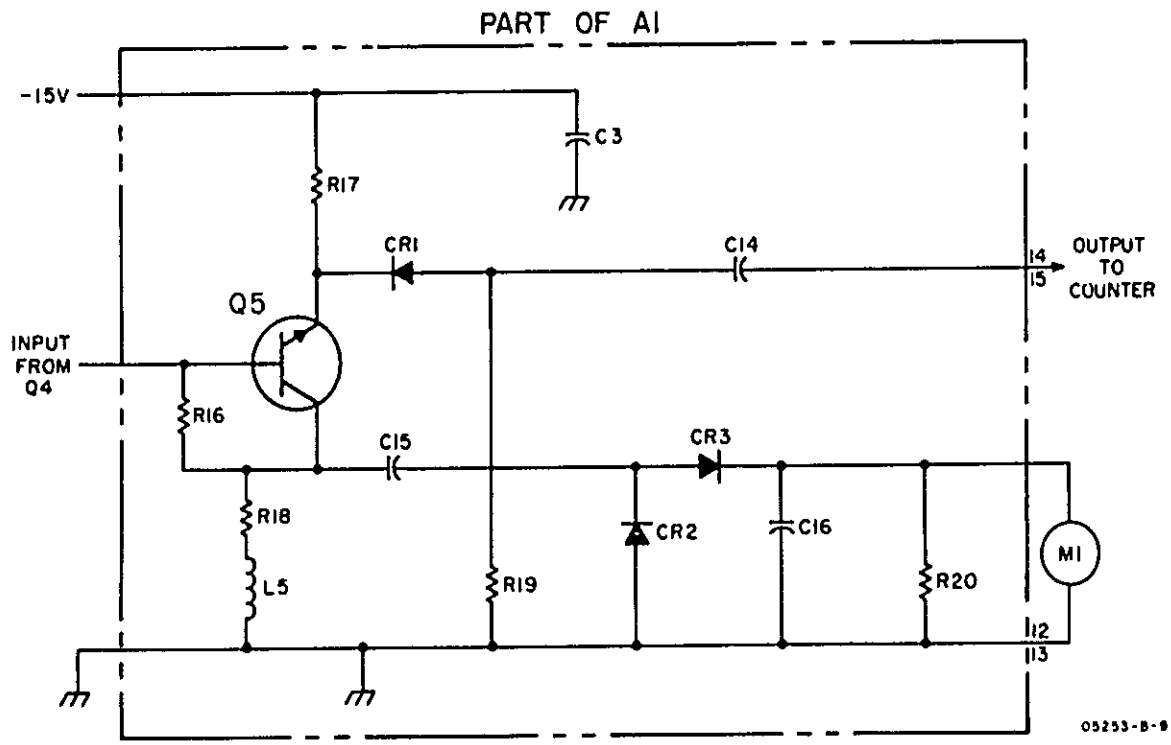



Figure 4-6. Level Indicator Meter Circuit

# MAINTENANCE

# SECTION V
# MAINTENANCE

## 5-1. GENERAL.

### 5-2. INTRODUCTION.

5-3. This section contains information concerning periodic maintenance, troubleshooting and recommended test equipment, repair, circuit adjustments, and performance testing. A complete schematic diagram of the converter is at the rear of this section (Figure 5-5).

### 5-4. PERIODIC MAINTENANCE.

5-5. No special maintenance procedures are required when the converter is operated in normal environments. However, if unit is subjected to operation in extremely dusty environments, periodically clean all gears with a lint-free cloth and apply a coating of light, petroleum base, open-gear grease to all gear teeth.

### 5-6. TEST EQUIPMENT.

5-7. All test instruments required for performance testing, troubleshooting, and circuit adjustment after repair are listed in Table 5-1. Instruments having equivalent specifications may be substituted for the specific instruments recommended.

## 5-8. TROUBLESHOOTING.

5-9. Table 5-2 lists resistances from connecting pins on connector J1 to chassis (when unit is not connected to counter) to aid in troubleshooting. Table 5-3 is a suggested troubleshooting procedure which lists circuit conditions at Test Points throughout the converter. These Test Points are keyed to the component location drawings, Figures 5-1, 5-2, 5-3 and 5-4, and also to the schematic diagram, Figure 5-5. Voltages listed in Table 5-3 are approximate and may vary widely between instruments, due to variations in component values. Table 5-4 lists recommended adjustments to be made after repair of any section of the converter.

Table 5-2. Resistance Troubleshooting Aid

| Location | Resistance (to Chassis)* |
|---|---|
| J2 - Pin 1 | > 100 megohms |
| J2 - Pin 15 | 1 K ohms ±20% |
| J2 - Pin 20 | 140 K ohms ±20% |
| J2 - Pin 25 | 125 K ohms ±20% |

*Unit not connected to counter.

## 5-10. REPAIR AND REPLACEMENT.

5-11. Paragraphs 5-12 through 5-19 are replacement procedures to aid in repair of the converter. Detailed procedures for replacement of all the individual components of the unit are beyond the scope of this manual. In-field repair is, for the most part, simple and straightforward. However, do not attempt adjustment of the gearing arrangement, the harmonic selector cavity or the step-recovery diode. Should gear, cavity, or step recovery diode problems arise, please contact your Hewlett-Packard field office to arrange for repair.

Table 5-1. Recommended Test Equipment

| Instrument | Required Characteristics | Use | Instrument Recommended |
|---|---|---|---|
| Electronic Counter | | Supply Power, Visual Operational Indicator | ℔ Model 5243L or ℔ Model 5245L |
| RF Millivoltmeter | 1 Mc to 20 Mc<br>10 mv to 10 vdc<br>10 mv resolution | Circuit Adjustment, Troubleshooting | ℔ Model 411A with Pen Type Probe Tip, ℔ 11022A (formerly ℔ 411A-21B) |
| DC VTVM and Ohmmeter | 0 to +25 vdc<br>0.1 v resolution<br>0 to 100 M ohms | Circuit Adjustment, Troubleshooting | ℔ Model 412A |
| VHF Signal Generator | 50 Mc to 480 Mc<br>10 mv to 1 v | Circuit Adjustment, Trouble shooting | ℔ Model 608C |
| Oscilloscope | 15 Mc bandwidth | Circuit Adjustment, Troubleshooting | ℔ Model 175A with ℔ Model 1752A High Gain Amplifier and ℔ Model 1780A Aux Unit |
| Extension Cable | 50 pin straight-thru connections | Circuit Adjustment, Troubleshooting | ℔ 10506A (formerly ℔ AC-16Y) |

Table 5-3. Troubleshooting Procedure

All voltages given are approximate and may vary from instrument to instrument because of variations in component characteristics.

TEST EQUIPMENT: ℔ Model 411A RF Millivoltmeter with ℔ 11022A (formerly 411A-21B) Pen Type Probe Tip, ℔ Model 412A DC VTVM

| | |
|---|---|
| REMOVE ℔ 5253B FROM COUNTER; SELF-CHECK COUNTER | See counter manual for self-check procedure. |
| CONNECT ℔ 5253B TO COUNTER WITH EXTENSION CABLE, ℔ 10506A (formerly AC-16Y) | Extension cable available from ℔; see parts list. |
| 1 +20 VDC<br>2 -15 VDC | Checks power supplied to plug-in from counter; see counter manual for power supply adjustment procedure. |
| 3 + 6 VDC<br>2 VAC | Checks 10-Mc drive of harmonic generator. |
| 4 ± 2 VDC<br>2 VAC | Checks generator diode drive. Voltages vary widely because of both the detuning effect of voltmeter probe and the variable value of A3R3. DC voltage may be either + or -, depending upon factory determined generator diode orientation. |
| 5 +100 MV DC<br>6 +100 MV DC | Voltages vary widely because of diode characteristics. Voltages are 0 VDC when diode shorted, and +20 VDC when diode open. Voltages should be approximately equal because of matched characteristics. |

CONNECT SIGNAL GENERATOR TO ℔ 5253B.
SET GENERATOR TO 52 MC, CW, 100 MV.
SET COUNTER CONTROLS AND 5253B TO MEASURE FREQUENCY OF INPUT SIGNAL.

| | |
|---|---|
| 7 5 MV RMS | This voltage is total harmonic energy output of mixer and varies widely. |
| 8 -11.2 VDC<br>30 MV RMS | Checks bias and amplification of A1Q2 and A1Q1. |
| 9 -12.3 VDC<br>17 MV RMS | General check of low pass filter section |
| 10 -9.3 VDC<br>360 MV RMS | Checks bias and amplification of A1Q3 and A1Q4 |
| 11 -7.1 VDC<br>300 MV RMS | Checks operation of A1Q5 |
| 12 0 VDC<br>190 MV RMS | Checks operation of limiter, A1CR1 |
| 13 0 MV DC WHEN METER READS AT LEFT END OF SCALE;<br>50 MV DC WHEN METER READS FULL SCALE;<br>15 MV DC WHEN TEST POINT #12 IS 100 MV RMS, AND METER READS AT RED-GREEN BORDER. | Checks accuracy of meter circuit in relation to output to counter |

## 5-12. PRINTED CIRCUIT COMPONENT REPLACEMENT.

5-13. Component lead-holes in the Model 5253B circuit boards have plated walls to insure good electrical contact between conductors on the opposite sides of the board. To prevent damage to this plating and also to the replacement component, apply heat sparingly and work carefully. The following replacement procedure is recommended:

a. Remove defective component.

b. Melt solder in component lead-holes. Use clean, "dry" soldering iron to remove excess solder. Clean holes with toothpick or wooden splinter. Do not use metal tool for cleaning as this may damage the through-hole plating.

c. Bend leads of replacement component to the correct shape and insert component leads in component lead-holes. Using heat and solder sparingly, solder leads in place. Heat may be applied to either side of board as is convenient. A heat sink (long-nose pliers, commercial heat-sink tweezers, etc.) should be used when replacing transistors and diodes in order to prevent excessive heat from being conducted by the leads from the soldering iron to the component.

d. Through-hole plating breaks are indicated by the separation from the board of the round conductor-pad on either side of the board. To repair breaks, press conductor-pads against board and solder replacement component lead to conductor-pad on both sides of the board.

## 5-14. VIDEO AMPLIFIER ASSEMBLY REPLACEMENT.

5-15. If video amplifier printed circuit board requires replacement, follow this procedure:

a. Remove the converter from counter.

b. Unscrew and remove small screw (MP1; see Figure 5-4) which holds video amplifier A1 in place. Remove screws which secure supporting bracket to front panel. Remove supporting bracket.

c. Firmly grasp assembly at component-free end and pull out of socket using a slight back-and-forth sideways movement.

d. Check that the connecting terminals of replacement assembly are clean. Push replacement assembly firmly into socket and check for proper seating. Replace supporting bracket and all screws.

e. All replacement video amplifier assemblies are adjusted and inspected at the factory for optimum performance. However, if a general operational check is desired, perform the in-cabinet performance check given in Paragraph 5-31.

## 5-16. MIXER DIODE REPLACEMENT.

5-17. If either of the mixer diodes (A4CR1 or A4CR2) is found to be defective, both diodes should be replaced. The recommended replacement procedure is as follows:

a. Remove mixer-assembly shield cover (see Figure 5-3).

b. Remove diodes, noting orientation.

c. Install replacement diodes with same orientation.

d. Replace mixer-assembly shield cover.

e. Perform the sensitivity check (Paragraph 5-28) to insure that converter operation is within specifications.

## 5-18. METER REPLACEMENT PROCEDURE.

5-19. If the level indicator meter requires replacement, follow this procedure:

a. Remove converter from counter.

b. Unscrew and remove small retaining screw (MP1; see Figure 5-4) which holds video amplifier board A1 in place. Remove screws which secure supporting bracket to front panel. Remove supporting bracket.

c. Firmly grasp video amplifier board at the component-free end and pull board out of socket using a slight back-and-forth sideways movement.

d. Place converter on bench with bottom plate resting on bench surface and with the front panel facing to the rear of the bench.

e. Remove screw (MP2) which holds aluminum spacer-rod (MP3) to plastic rear-support (MP4; see Figure 5-2). Grasp spacer-rod and turn counterclockwise to remove rod from front support.

f. Cut connecting wires at meter terminals.

g. Remove screws (MP5, 6; see Figure 5-4) from meter bezel at sides of meter. Push bezel forward as far as possible.

h. Remove screws (MP7, 8) on top of meter bracket.

i. Grasp meter and gently pull meter (and bracket) backwards out of front panel hole, at the same time twisting rear of meter slightly sideways to the right and pulling up.

j. Remove bracket and hardware from meter and install in identical manner on replacement meter. Hardware which may come from the manufacturer with the replacement meter may be discarded.

k. Place meter (with bracket) in unit by reversing removal procedure.

m. Replace screws on top of meter bracket.

n. Replace meter bezel at sides of meter.

p. Check that meter terminals are not close to front bearing-block. Bend terminals away from block if necessary.

q. Strip 1/4-inch insulation from ends of each connecting wire and solder to meter terminals. Black wire goes to inside terminal and white wire goes to outside terminal.

r. Replace aluminum spacer-rod. Tighten only "finger-tight" as excessive torque may break end of rod.

s. Replace screw which holds spacer-rod to rear-support.

t. Replace video amplifier assembly, supporting bracket, and all screws.

## 5-20. HARMONIC GENERATOR ADJUSTMENT.

5-21. To adjust the harmonic generator assembly, proceed as follows:

a. Remove converter from counter and reconnect to counter with Extension Cable, hp 10506A.

b. Connect VHF Signal Generator to converter INPUT and set to 472 Mc, CW, at 100 mv.

c. Connect RF Millivoltmeter to Test Point #12 (see Figure 5-4).

d. Set converter mixing frequency control to 470 Mc, and tune for maximum reading on RF Millivoltmeter.

e. Vary output of VHF Signal Generator to make converter level indicator meter read at red-green border.

f. Using plastic tuning tool, tune A3C5 (see Figure 5-2) for maximum reading on RF Millivoltmeter. Tune A3C5 through hole in harmonic generator assembly shield cover.

## 5-22. LOW PASS FILTER ADJUSTMENT.

5-23. To adjust the low pass filter in the video amplifier assembly, proceed as follows:

a. Remove converter from counter and reconnect to counter with Extension Cable, hp 10506A.

b. Connect VHF Signal Generator to converter INPUT and set to 110 Mc, CW, at 50 mv.

c. Connect RF Millivoltmeter to Test Point #12 (see Figures 5-4 and 5-5).

d. Set converter mixing frequency control to 100 Mc and tune for maximum reading on RF Millivoltmeter.

e. Set Signal Generator to 116.2 Mc, CW, at 1 v.

f. Using plastic tool, adjust variable inductor A1L4 (see Figures 5-1 and 5-5) for minimum reading of RF Millivoltmeter.

g. Set Signal Generator to 120.2 Mc, CW, at 1 v.

h. Using plastic tool, adjust variable inductor A1L3 (see Figures 5-1 and 5-5) for minimum reading of RF Millivoltmeter.

i. Set Signal Generator to 115 Mc, CW, at 1 v.

j. Reading of RF Millivoltmeter should be less than 100 mv. If reading is above 100 mv, troubleshoot video amplifier assembly.

Table 5-4. Adjustments after Repair

| AFTER REPLACING COMPONENT IN THIS SECTION: | PERFORM: |
|---|---|
| Harmonic generator (A3) | Harmonic generator adjustment (Paragraph 5-20) |
| Mixer (A4) | Sensitivity check (Paragraph 5-28) |
| A1Q1 | Sensitivity check (Paragraph 5-28) |
| A1Q2 | Sensitivity check (Paragraph 5-28), and Low pass filter adjustment (Paragraph 5-22) |
| Low Pass Filter | Sensitivity check (Paragraph 5-28), and Low pass filter adjustment (Paragraph 5-22) |
| A1Q3 | Sensitivity check (Paragraph 5-28), and Low pass filter adjustment (Paragraph 5-22) |
| A1Q4 | Sensitivity check (Paragraph 5-28), and Low pass filter adjustment (Paragraph 5-22) |
| Meter circuit | Meter accuracy check (Paragraph 5-29) |

5-24. METER CALIBRATION ADJUSTMENT. (pri.)

a. Turn counter power off, remove converter from counter, and reconnect to counter with Extension Cable, ℔10506A.

b. Set VHF Signal Generator to 102 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set counter controls as shown in Figure 3-2. Counter should display approximately 2 Mc.

d. Vary VHF Generator output to make level indicator meter read at red-green border.

e. Using RF Millivoltmeter, measure voltage at Test Point #12. Voltage should be between 100 mv and 130 mv. If not, change value of resistor A1R20 to change voltage to between 100 mv and 130 mv. If voltage is too high, increase value of A1R20. If voltage is too low, decrease value of A1R20. Repeat steps d and e after changing value of A1R20.

## 5-25. MECHANICAL ADJUSTMENT OF METER ZERO.

5-26. TRUE SIGNAL LEVEL INDICATION. Level indicator meter is adjusted at the factory for proper mechanical zero. However, normal aging of meter components may change indicated zero level. To insure accuracy of input signal level indication, periodic adjustment of meter zero may be necessary.

5-27. ZERO-SET. When meter is properly zero-set, pointer rests over the zero calibration mark at the left-hand end of meter scale when converter is (1) at normal operating temperature, (2) in normal operating position, and (3) without power. Proceed as follows:

a. Allow counter and converter to operate for one hour to permit meter movement to reach normal operating temperature.

b. Turn counter off and allow one minute for all capacitors to discharge.

c. Remove converter from counter to enable access to rear of meter.

d. Remove adhesive-backed-paper cover from meter zero-adjustment access hole on top-rear of meter.

e. Carefully insert small tool in access hole and engage adjustment fork.

f. Vary setting of adjustment fork until meter reads zero.

g. Remove tool and replace adhesive-backed-paper cover on access hole. This completes meter zero adjustment procedure.

## 5-28. SENSITIVITY CHECK.

a. Turn counter power off, remove converter from counter, and reconnect to counter with Extension Cable, ℔10506A.

b. Set VHF Signal Generator to 52 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Adjust controls as shown in Figure 3-2.

d. Set converter mixing frequency control to 50 Mc. Counter should display approximately 2 Mc.

e. Using RF Millivoltmeter, measure output of converter at Test Point #12 (see Figures 5-4 and 5-5). Voltage should be at least 100 mv.

f. Repeat above steps c, d, and e with VHF Generator frequency of 472 Mc and converter mixing frequency control set to 470 Mc. Converter output to counter, as measured by RF Millivoltmeter, should be at least 100 mv.

g. A similar check may be made at any frequency within the range of the Model 5253B. Converter output to counter should be at least 100 mv when difference frequency is between 100 kc and 12 Mc and converter is properly tuned.

## 5-29. METER ACCURACY CHECK.

a. Turn counter power off, remove converter from counter, and reconnect to counter with Extension Cable, ℔10506A.

b. Set VHF Signal Generator to 102 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set controls as shown in Figure 3-2. Set converter mixing frequency control to 100 Mc. Counter should display approximately 2 Mc.

d. Vary output of VHF Signal Generator for converter level indicator to make meter read at red-green border.

e. Using RF Millivoltmeter, measure converter output to counter at Test Point #12. Voltage should be between 100 mv and 130 mv. If not, see Paragraph 5-24 for meter calibration adjustment procedure.

## 5-30. LOW PASS FILTER CHECK.

a. Turn counter power off, remove converter from counter and reconnect to counter with Extension Cable, ℔10506A.

b. Set VHF Signal Generator to 110 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set controls as shown in Figure 3-2. Set converter mixing frequency control to 100 Mc. Counter should display approximately 10 Mc.

d. Connect RF Millivoltmeter to Test Point #12. Vary output of VHF Signal Generator for RF Millivoltmeter reading of 100 mv. Note output level of VHF Signal Generator.

e. Set VHF Signal Generator to 115 Mc at same output level as noted in step d above. Converter output to counter, as shown on RF Millivoltmeter, should not exceed 50 mv. If converter output to counter is greater than 50 mv, see Paragraph 5-23 for low pass filter adjustment procedure.

## 5-31. IN-CABINET PERFORMANCE CHECK.

a. Turn counter power off and install converter.

b. Set VHF Signal Generator to 52 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set controls as shown in Figure 3-2. Counter should display approximately 2 Mc.

d. Set VHF Signal Generator to any frequency between 50 Mc and 512 Mc with output of 50 mv. Counter should display correct frequency at any frequency within this range.

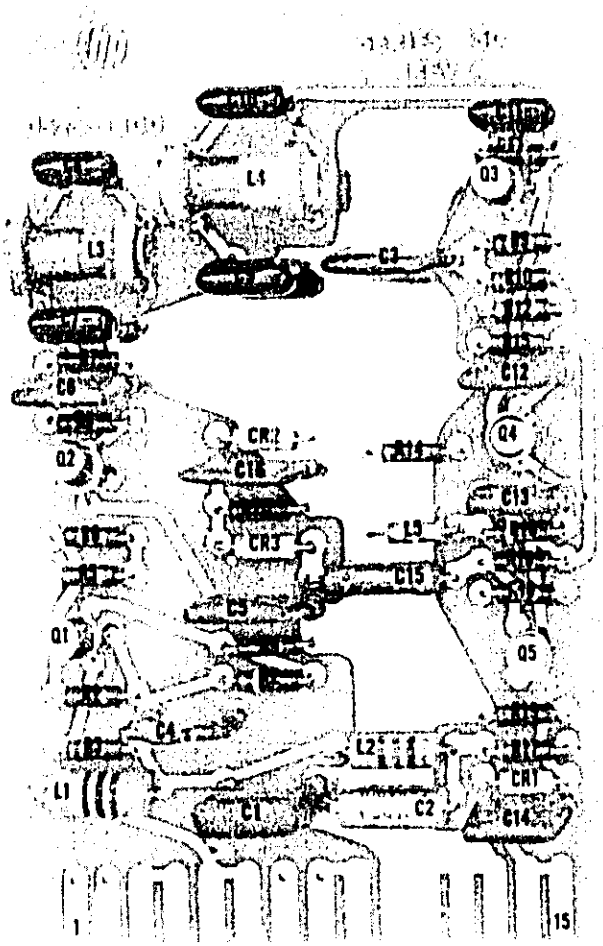



Figure 5-1. Video Amplifier Assembly A1 Component Location

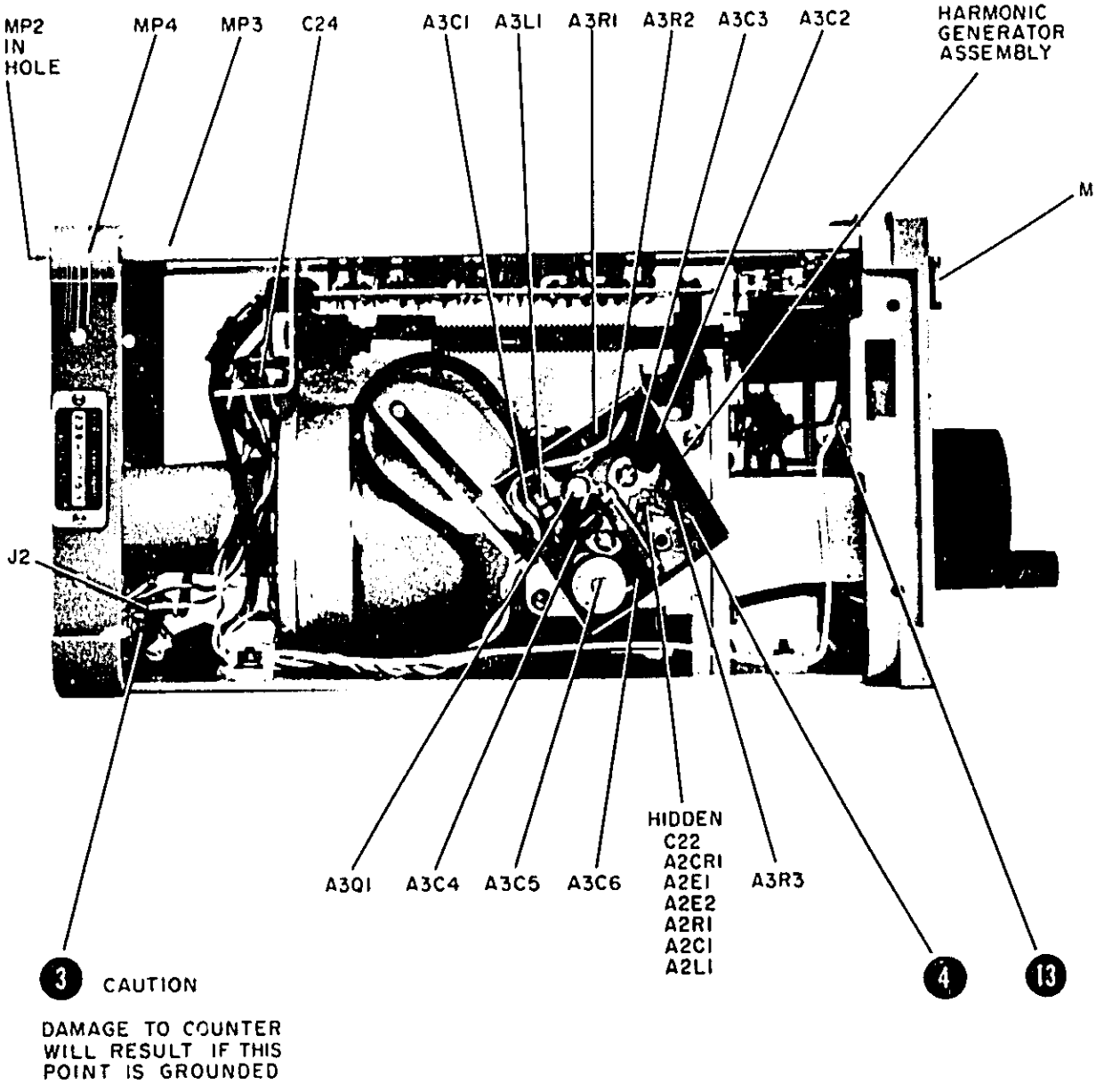



Figure 5-2. Left Side View

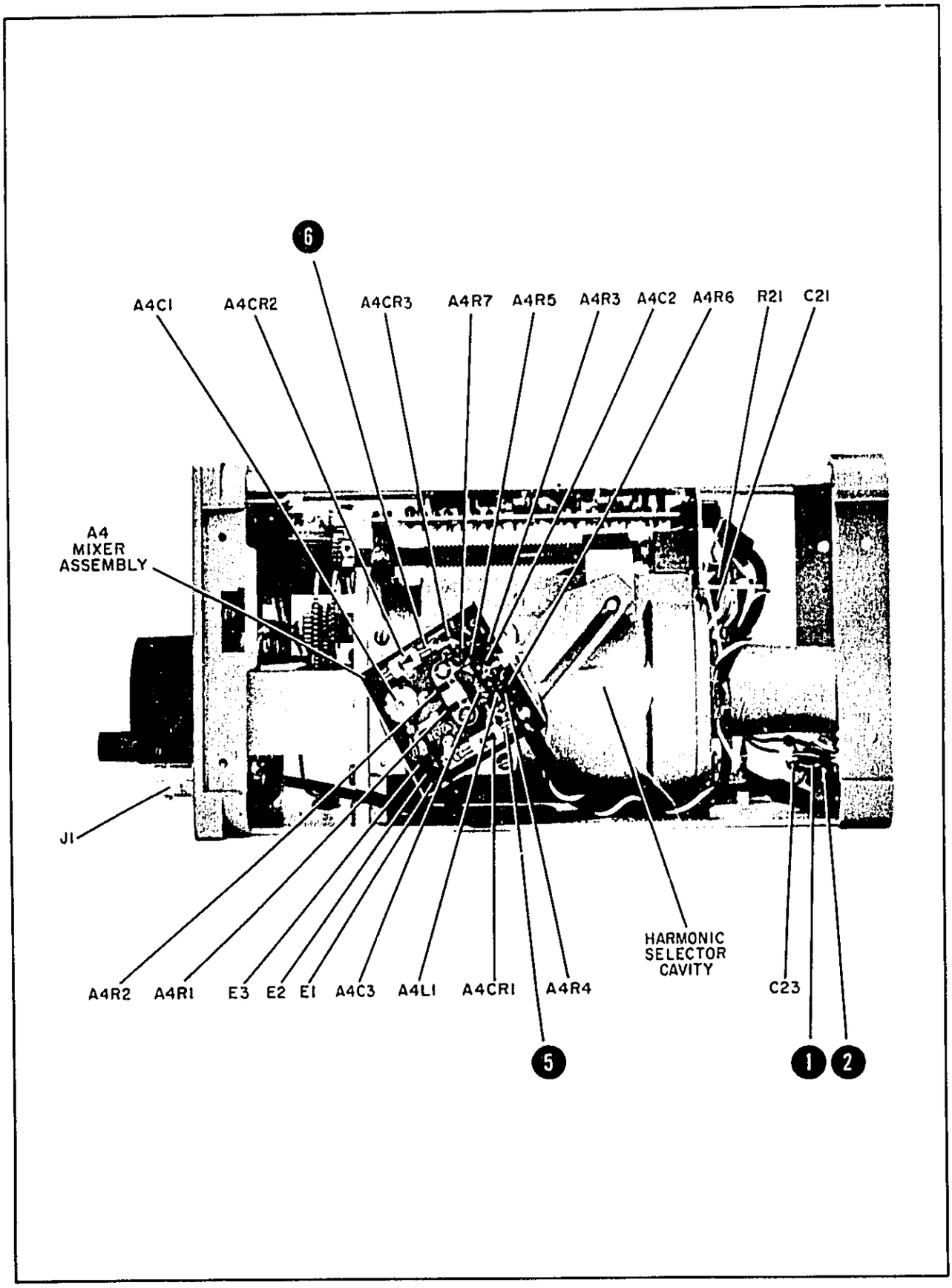



Figure 5-3. Right Side View

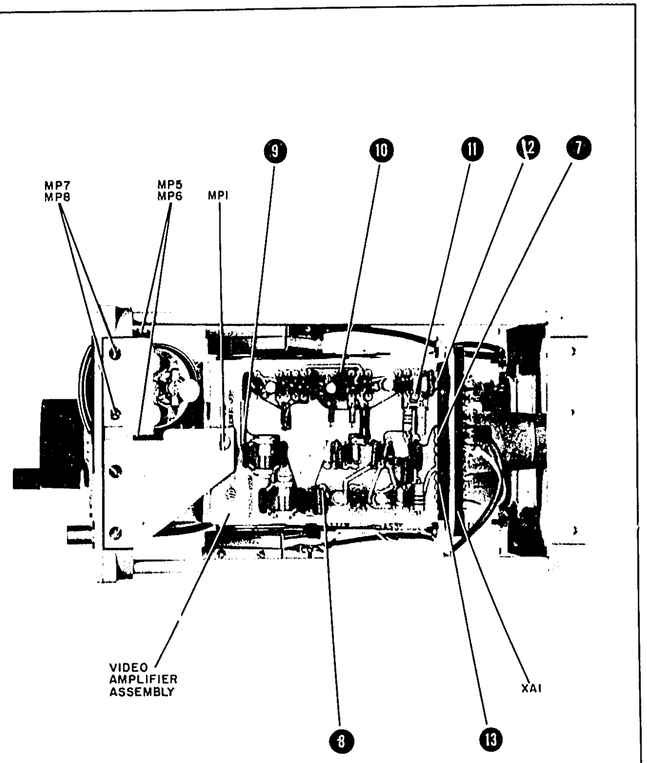
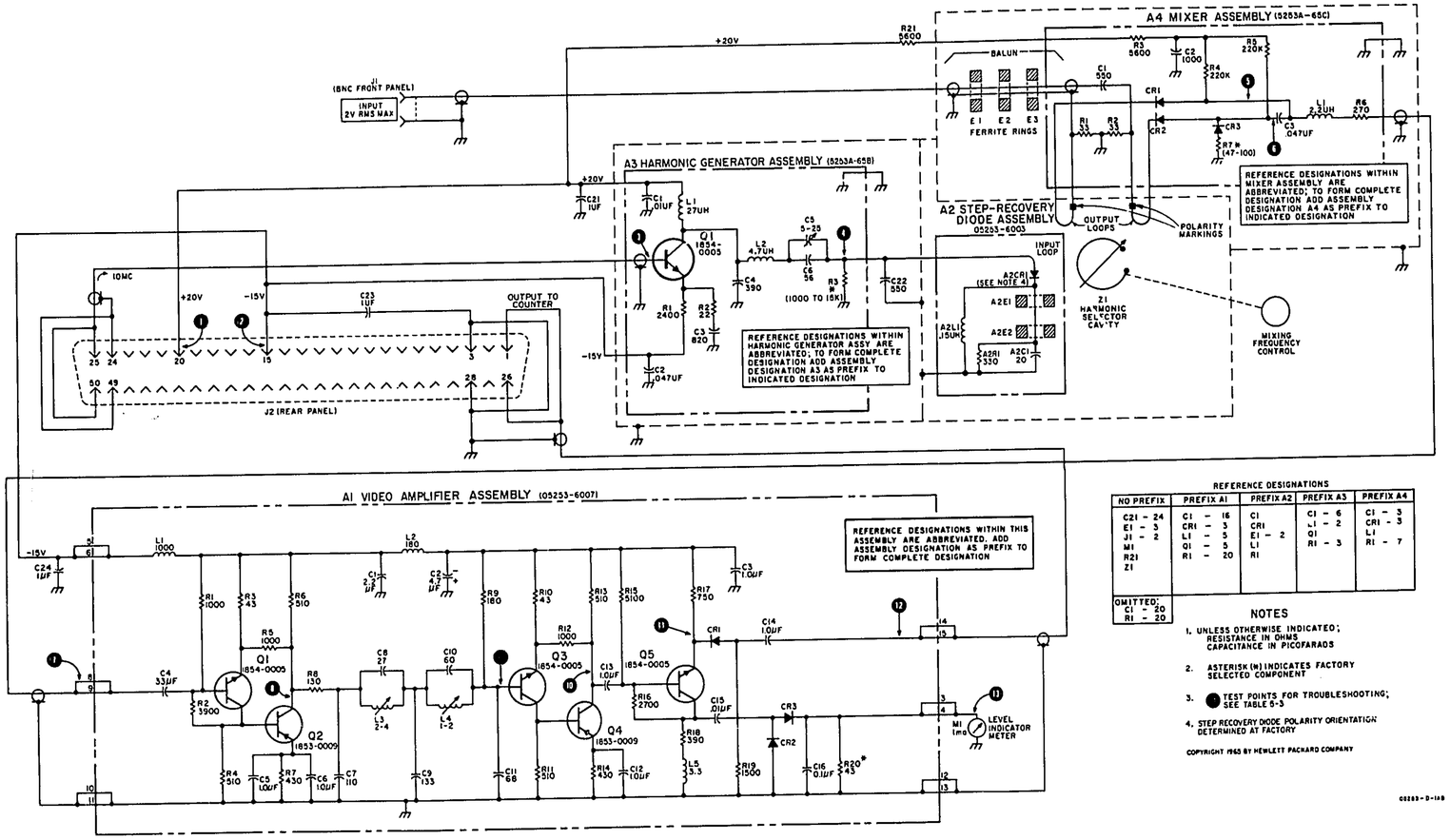



Figure 5-4. Top View - Test Points








REFERENCE DESIGNATIONS

| NO PREFIX | PREFIX A1 | PREFIX A2 | PREFIX A3 | PREFIX A4 |
|---|---|---|---|---|
| C21 - 24<br>E1 - 5<br>J1 - 2<br>M1<br>R21<br>Z1 | C1 - 16<br>CR1 - 3<br>L1 - 5<br>Q1 - 5<br>R1 - 20 | C1<br>CR1<br>E1 - 2<br>L1<br>R1 | C1 - 6<br>L1 - 2<br>Q1<br>R1 - 3 | C1 - 3<br>CR1 - 3<br>L1<br>R1 - 7 |
| OMITTED:<br>C1 - 20<br>R1 - 20 | | | | |

NOTES

1. UNLESS OTHERWISE INDICATED; RESISTANCE IN OHMS CAPACITANCE IN PICOFARADS
2. ASTERISK (*) INDICATES FACTORY SELECTED COMPONENT
3. ● TEST POINTS FOR TROUBLESHOOTING; SEE TABLE 5-3
4. STEP RECOVERY DIODE POLARITY ORIENTATION DETERMINED AT FACTORY



05253-D-1AB

Figure 5-5. Schematic Diagram

# PARTS LIST

# SECTION VI
# REPLACEABLE PARTS

## 6-1. INTRODUCTION.

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

a. Description of the part (see list of abbreviations below).

b. Typical manufacturer of the part in a five-digit code; see list of manufacturers in Table 6-3.

c. Manufacturer's part number.

d. Total quantity used in the instrument (TQ column).

6-3. Miscellaneous parts are listed at the end of Table 6-1.

## 6-4. ORDERING INFORMATION.

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

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

a. Instrument model number.

b. Instrument serial number.

c. Description of the part.

d. Function and location of the part.

### REFERENCE DESIGNATORS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | assembly | E | misc electronic part | MP | mechanical part | TB | terminal board |
| B | motor | F | fuse | P | plug | TP | test point |
| C | capacitor | FL | filter | Q | transistor | V | vacuum tube, neon bulb, photocell, etc. |
| CP | coupling | J | jack | R | resistor | | |
| CR | diode | K | relay | RT | thermistor | W | cable |
| DL | delay line | L | inductor | S | switch | X | socket |
| DS | device signaling (lamp) | M | meter | T | transformer | Y | crystal |

### ABBREVIATIONS

| | | | | | |
|---|---|---|---|---|---|
| A | amperes | GE | germanium | N C | normally closed |
| A.F.C | automatic frequency control | GL | glass | NE | neon |
| AMPL | amplifier | GRD | grounded | NI PL | nickel plate |
| | | | | N O | normally open |
| B.F.O. | beat frequency oscillator | H | henries | NPO | negative-positive zero (zero temperature coefficient) |
| BE CU | beryllium copper | HEX | hexagonal | | |
| BH | binder head | HG | mercury | NRFR | not recommended for field replacement |
| BP | bandpass | HR | hour(s) | | |
| BRS | brass | | | NSR | not separately replaceable |
| BWO | backward wave oscillator | IF | intermediate freq | | |
| | | IMPG | impregnated | | |
| CCW | counter-clockwise | INCD | incandescent | | |
| CER | ceramic | INCL | include(s) | OBD | order by description |
| CMO | cabinet mount only | INS | insulation(ed) | OH | oval head |
| COEF | coefficient | INT | internal | OX | oxide |
| COM | common | | | | |
| COMP | composition | K | kilo = 1000 | P | peak |
| CONN | connector | | | PC | printed circuit |
| CP | cadmium plate | LIN | linear taper | PF | picofarads = $10^{-12}$ farads |
| CRT | cathode-ray tube | LK WASH | lock washer | PH BRZ | phosphor bronze |
| CW | clockwise | LOG | logarithmic taper | PHL | Phillips |
| | | LPF | low pass filter | PIV | peak inverse voltage |
| DEPC | deposited carbon | | | P O | part of |
| DR | drive | M | milli = $10^{-3}$ | POLY | polystyrene |
| | | MEG | meg = $10^{6}$ | PORC | porcelain |
| ELECT | electrolytic | METFLM | metal film | POS | position(s) |
| ENCAP | encapsulated | MFR | manufacturer | POT | potentiometer |
| EXT | external | MINAT | miniature | PP | peak-to-peak |
| | | MOM | momentary | PT | point |
| F | farads | MTG | mounting | RECT | rectifier |
| FH | flat head | MY | "mylar" | RF | radio frequency |
| FIL H | fillister head | | | RH | round head |
| FXD | fixed | N | nano ($10^{-9}$) | | |

| | | | |
|---|---|---|---|
| RMO | rack mount only | TA | tantalum |
| RMS | root-mean-square | TD | time delay |
| | | TGL | toggle |
| S-B | slow-blow | TI | titanium |
| SCR | screw | TOL | tolerance |
| SE | selenium | TRIM | trimmer |
| SECT | section(s) | TWT | traveling wave tube |
| SEMICON | semiconductor | | |
| SI | silicon | U | micro = $10^{-6}$ |
| SIL | silver | | |
| SL | slide | VAR | variable |
| SPL | special | VDCW | dc working volts |
| SST | stainless steel | | |
| SR | split ring | W/ | with |
| STL | steel | W | watts |
| | | WW | wirewound |
| | | W/O | without |

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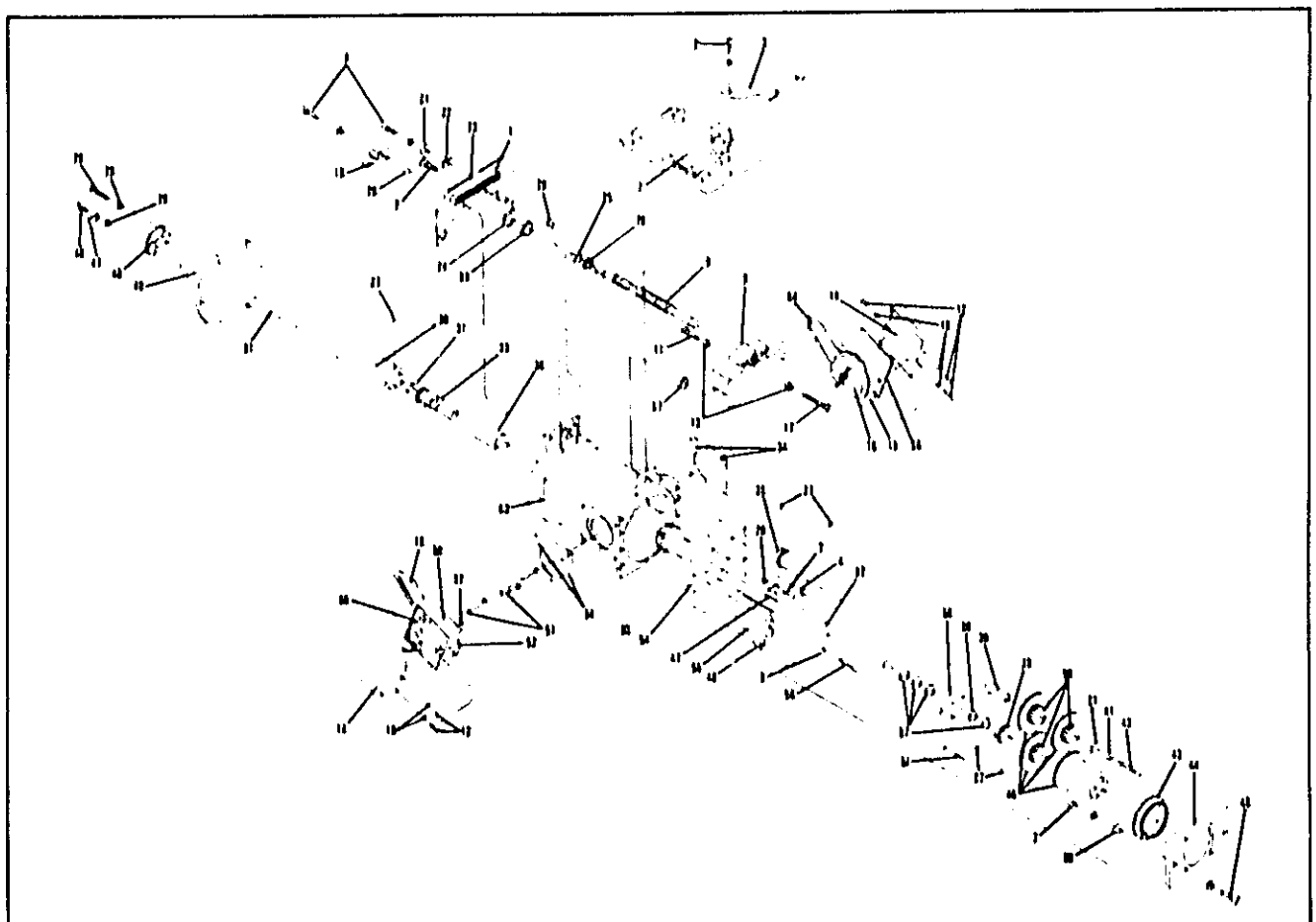
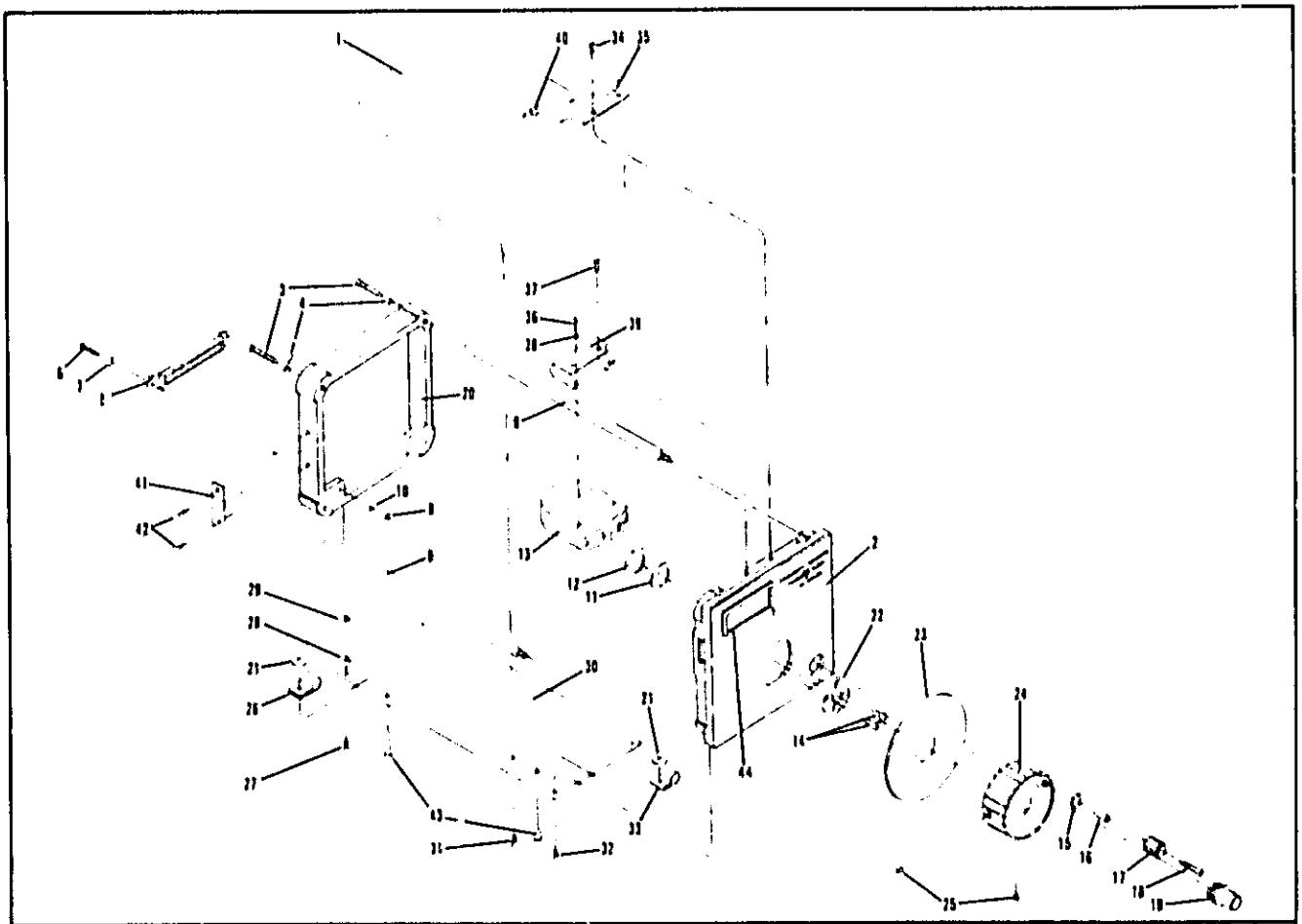


| REF. | STOCK NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 1251-0135 | Connector, Printed Crt, 15 | 1 |
| 2 | 2390-0007 | Screw BH SS 6-32 x .312 with Lock | 7 |
| 3 | 05253-0006 | Bracket, Panel | 1 |
| 4 | 2390-0009 | Screw BH SS 6-32 x .375 with Lock | 4 |
| 5 | 2360-0003 | Not Assigned | |
| 6 | 2190-0046 | Washer Lock Split No. 6, 141 ID | 4 |
| 7 | 05253-6007 | Ass'y, Vidio Amplifier | 1 |
| 8 | 525C-37A | Shaft, Loop Drive | 1 |
| 9 | 5253A-12A | Yoke, Loop Drive | 1 |
| 10 | 2190-0014 | Washer Lock Internal No. 2 | 6 |
| 11 | 3030-0003 | Screw Cap 6-32 x .375 | 2 |
| 12 | 0620-0025 | Screw Mach RH 2-56 .125 LG | 6 |
| 13 | 2500-0001 | Nuts - Hex BRS 6-32 x 1/4 x 3/32 In. | 4 |
| 14 | 5253A-41B | Cover | 2 |
| 15 | 5253A-65A | Shield | 1 |
| 16 | 5253A-17C | Bushing | 1 |
| 17 | 3030-0078 | Screw Cap Hex Dr 6-32 x 1.125 | 2 |
| 18 | 525C-108-AL | Left Cam | 1 |
| 19 | 0360-0016 | Board-Terminal 4 Ins. 1 GRD Term A1A1GA1A1 | 1 |
| 20 | 2190-0008 | Washer Lock External No. 6 | 3 |
| 21 | 3050-0066 | Washer Brass .375 OD .147 ID | 2 |
| 22 | 1400-0053 | Clamp Cable for .188 Dia. Cable | 1 |
| 23 | 5253A-12D | Bracket, Connector | 1 |
| 24 | 0510-0083 | Ring Retain Ext .025 Thk | 1 |
| 25 | 1410-0724 | Bushing .252 ID | 1 |
| 26 | 0510-0001 | Fastener Steel .281 Dia. .063 Thk | 1 |
| 27 | 3030-0022 | Screw-Set SH 6-32 x 1/8 HD LSS Hex Drive | 8 |
| 28 | 2200-0009 | Screw Mach RH SS 4-40 .6 | 4 |
| 29 | 2190-0004 | Washer Lock Internal No. 4 | 4 |
| 30 | 05253-2004 | Probe | 1 |
| 31 | | Collar, Spring P/O MP68 | |
| 32 | 05253-6003 | Assy: Step Rec Dio | |
| 33 | | Spring Comp 1.5 LG .484 OD P/O MP68 | |
| 34 | 5253A-12B | Retainer | 4 |
| 35 | 525C-24B | Gear, Drive | 2 |
| 36 | | P/O MP68 | |
| 37 | 5253A-37A | Shaft | 1 |
| 38 | 3050-0017 | Washer Phos Br .375 OD .26 ID | 1 |
| 39 | 5253A-37B | Shaft | 1 |
| 40 | 05253-6001 | Gear Assy, w/hub | 4 |
| 41 | 2190-0006 | Washer Lock Split Ring No. 6 | 1 |
| 42 | 2360-0013 | Screw RH SS 6-32 x 1 | 1 |
| 43 | 1410-0021 | Bearing Ball 1.5 OD 1.063 Bore | 1 |
| 44 | 5253A-17D | Holder | 1 |
| 45 | 2550-0009 | Screw Mach BH SS 6-32 x .5 with Lock | 2 |
| 46 | 2390-0001 | Screw BH SS 6-32 x .5 | 12 |
| 47 | 0360-0042 | Solder Lug - Brs .144 Mtg Hole 90 Deg Bend | 2 |
| 48 | 05253-2002 | Collar, Rear | 1 |
| 49 | 05253-2011 | Flange, Cavity | 1 |
| 50 | 5253A-65B | Shield | 1 |
| 51 | 2200-0004 | Screw Mach BH SS 4-40 with Lock .250 LG | 8 |
| 52 | 05253-6004 | Generator Bushing Ass'y | 1 |
| 53 | 05253-2015 | Cavity | 1 |
| 54 | 05253-6001 | Ass'y, Probe Positioning | 1 |
| 55 | 5253A-47B | Support | 2 |
| 56 | 2340-0004 | Screw FH H SS 6-32 x .750 | 4 |
| 57 | 3050-0028 | Washer Brass .4375 OD .25 ID | 4 |
| 58 | 05253-2009 | Bushing, Probe Support | 1 |
| 59 | 525C-24C | Gear, Idler | 3 |
| 60 | 565A-17A | Retainer, Bearing | 4 |
| 61 | 05253-60101 | Support Cap P/O MP68 | |
| 62 | | Not Assigned | |
| 63 | 1460-0061 | Pin Cross .06 ID .312 LG | 4 |
| 64 | 525C-108-AR | Right Cam | 1 |
| 65 | 5253A-65B | Board Ass'y, Circuit | 1 |
| 66 | 5253A-65C | Board Ass'y, Circuit | 1 |
| 67 | 1410-0088 | Bushing .252 ID | 1 |
| 68 | 05253-6005 | Probe Assy | 1 |
| 69 | 2190-0390 | Washer Nylon .26 ID .562 OD | 1 |
| 70 | 3050-0180 | Washer .27 ID .375 OD | 1 |

Figure 6-1. Mechanical Parts Location - 5253B



| REF. | STOCK NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | | See Figure No. 6-1 | |
| 2 | 05253-2014 | Panel, Front | 1 |
| 3 | 2360-0004 | Screw FH H SS 6-32 x .750 | 2 |
| 4 | 2190-0046 | Washer Lock Split No. 6 .141 ID | 2 |
| 5 | 1251-0099 | Connector Male 50 Pin | 1 |
| 6 | 0525-0003 | Screw - Mach BD H 3-56 .50 LG | 2 |
| 7 | 2190-0031 | Washer Lock Internal No. 3 | 2 |
| 8 | 0615-0001 | Nut-Hex SS 3-56 Thrd .1875 WD | 2 |
| 9 | 5262A-47A | Rod, 7-3/4 16 In. Long | 2 |
| 10 | 2190-0019 | No. 4 Split Lock | 2 |
| 11 | 2190-0068 | Washer - Lock Int .630 OD .512 ID | 1 |
| 12 | 2950-0054 | BNC Hex Nut Brs | 1 |
| 13 | 1120-0140 | Meter 0-1 Ma Edge View Per. Spec. | 1 |
| 14 | 2370-0012 | Screw - Mach FH SS 6-32 x 1-4 | 2 |
| 15 | 3050-0017 | Washer Phos Br .375 OD .26 ID | 1 |
| 16 | 1410-0033 | Bushing Knob .219 OD .140 ID | 1 |
| 17 | 0370-0050 | Knob - Round 3/8 OD .221 ID .525 LG BLK | 1 |
| 18 | 2410-0001 | Screw OH SS 6-32 x .625 | 1 |
| 19 | 1250-0102 | Cable Jack-Blk HD Mtg. Series BNC | 1 |
| 20 | 5262A-83A | Guide, Plastic 4-3/16 In. x 4-3/8 In. | 1 |
| 21 | 3050-0066 | Washer Brass .375 OD .147 ID | 2 |
| 22 | 05253-2012 | Plate, Frequency Dial | 1 |
| 23 | 5000-0062 | Dial Blank - Alum 1.75 ID 2.875 OD | 1 |
| 24 | 0370-0126 | Knob - Crank 1-5/8 D 1/4 Shaft Blk | 1 |
| 25 | 3030-0001 | Screw Set SH Hex Dr 8/32 x .1875 LG | 2 |
| 26 | 1400-0024 | Clamp Cable for .25 Dia Cable | 1 |
| 27 | 2210-0003 | Screw - Mach FH SS 4-40 .375 LG | 2 |
| 28 | 2190-0019 | Washer Lock Split Ring No. 4 | 2 |
| 29 | 2340-0001 | Nut Hex BNP 4-40 .188 WD | 2 |
| 30 | 05253-0005 | Plate, Bottom | 1 |
| 31 | 2210-0002 | Screw - Mach FH SS 4-40 .250 LG | 3 |
| 32 | 2210-0018 | Screw - Mach SS 4-40 x 3/16 100 Deg FH SD | 2 |
| 33 | 1400-0082 | Clamp Cable .375 WD .125 ID | 1 |
| 34 | 2210-0018 | Screw - Mach SS 4-40 x 3 16 100 Deg FH SD | 2 |
| 35 | 05253-0006 | Bracket, Panel | 1 |
| 36 | 0520-0022 | Screw - Mach RH 2-56 .50 LG | 2 |
| 37 | 2210-0018 | Screw - Mach SS 4-40 x 3/16 100 Deg FH SD | 2 |
| 38 | 2190-0014 | Washer Lock Internal No. 2 | 2 |
| 39 | 05251-0002 | Bracket, Meter | 1 |
| 40 | 2390-0007 | Screw BH SS 6-32 x .312 | 1 |
| 41 | 7122-0097 | Plate Name Serial Dwg 50 MM 1874 | 1 |
| 42 | 3040-0006 | Screw Drive BH SS 0 x .1875 | 2 |
| 43 | 0361-0011 | Rivet - Semi Tub, Alum OH 1/8 Dia 1.4 LG | 2 |
| 44 | 5040-0185 | Bezel | 1 |

Figure 6-2. Mechanical Parts Location - 5253B

Table 6-1. Reference Designation Index

| Reference Designation | Stock No. | Description # | Note |
|---|---|---|---|
| A1 | 05253-6007 | ASSY:AMPLIFIER | |
| | 05253-2007 | BOARD:BLANK P.C. | |
| A1C1 | 0160-0128 | C:FXD CER 2.2UF 20% 25VDCW | |
| A1C2 | 0180-0100 | C:FXD ELECT TA 4.7UF 10% 35VDCW | |
| A1C3 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| A1C4 | 0160-0137 | C:FXD CER 0.33UF 20% 25VDCW | |
| A1C5 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| A1C6 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| A1C7 | 0140-0194 | C:FXD MICA 110 PF 5% 300 VDCW | |
| A1C8 | 0160-0178 | C:FXD MICA 27PF 5% 300VDCW | |
| A1C9 | 0160-0332 | C:FXD MICA 133PF 1% | |
| A1C10 | 0140-0214 | C:FXD MICA 60PF 5% 300VDCW | |
| A1C11 | 0140-0192 | C:FXD MICA 68PF 5% 300VDCW | |
| A1C12 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| A1C13 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| A1C14 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| A1C15 | 0160-0161 | C:FXD MY 0.01 UF 10% 200VDCW | |
| A1C16 | 0150-0121 | C:FXD CER 0.1UF +80%-20% 50VDCW | |
| A1CR1 | 1910-0022 | SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS | |
| A1CR2 | 1910-0022 | SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS | |
| A1CR3 | 1910-0022 | SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS | |
| A1L1 | 9140-0137 | COIL:FXD RF 1000UH | |
| A1L2 | 9140-0138 | COIL:FXD RF 180UH 5% | |
| A1L3 | 9140-0126 | COIL:VAR 1.76-4.02 | |
| A1L4 | 9140-0125 | COIL:VAR 0.9-1.9 UH | |
| A1L5 | 9140-0143 | COIL:FXD RF 3.3 UH | |
| A1Q1 | 1854-0005 | TRANSISTOR:2N708 NPN SILICON | |
| A1Q2 | 1853-0009 | TRANSISTOR:SILICON PNP | |
| A1Q3 | 1854-0005 | TRANSISTOR:2N708 NPN SILICON | |
| A1Q4 | 1853-0009 | TRANSISTOR:SILICON PNP | |
| A1Q5 | 1854-0005 | TRANSISTOR:2N708. NPN SILICON | |
| A1R1 | 0683-1025 | R:FXD COMP 1000 OHM 5% 1/4W | |
| A1R2 | 0683-3925 | R:FXD COMP 3900 OHM 5% 1/4W | |
| A1R3 | 0683-4305 | R:FXD COMP 43 OHM 5% .25W | |
| A1R4 | 0683-5115 | R:FXD COMP 510 OHM 5% 1/4W | |
| A1R5 | 0683-1025 | R:FXD COMP 1000 OHM 5% 1/4W | |
| A1R6 | 0683-5115 | R:FXD COMP 510 OHM 5% 1/4W | |
| A1R7 | 0683-4315 | R:FXD COMP 430 OHM 5% 1/4W | |
| A1R8 | 0683-1315 | R:FXD COMP 130 OHM 5% 1/4W | |
| A1R9 | 0683-1815 | R:FXD COMP 180 OHM 5% 1/4W | |
| A1R10 | 0683-4305 | R:FXD COMP 43 OHM 5% .25W | |
| A1R11 | 0683-5115 | R:FXD COMP 510 OHM 5% 1/4W | |
| A1R12 | 0683-1025 | R:FXD COMP 1000 OHM 5% 1/4W | |
| A1R13 | 0683-5115 | R:FXD COMP 510 OHM 5% 1/4W | |
| A1R14 | 0683-4315 | R:FXD COMP 430 OHM 5% 1/4W | |
| A1R15 | 0683-5125 | R:FXD COMP 5100 OHM 5% 1/4W | |
| A1R16 | 0683-2725 | R:FXD COMP 2700 OHM 5% 1/4W | |
| A1R17 | 0683-7515 | R:FXD COMP 750 OHM 5% 1/4W | |

= See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | ℔ Stock No. | Description # | Note |
|---|---|---|---|
| A1R18 | 0683-3915 | R:FXD COMP 390 OHM 5% 1/4W | |
| A1R19 | 0683-1525 | R:FXD COMP 1500 OHM 5% 1/4W | |
| A1R20 | 0683-4305 | R:FXD COMP 43 OHM 5% .25W<br>FACTORY SELECTED COMP:TYPICAL VALUE GIVEN | |
| A2 | 05253-6003 | ASSY:STEP RECOVERY DIODE | |
| A2C1 | 0150-0061 | C:FXD CER 20 PF 100 VDCW | |
| A2CR1 | | SPECIALLY SELECTED PART<br>NOT RECOMMENDED FOR FIELD REPLACEMENT | |
| A2E1 | 9170-0029 | CORE: FERRITE BEAD | |
| A2E2 | 9170-0029 | CORE: FERRITE BEAD | |
| A2L1 | 9140-0170 | COIL-FXD .15 UH 20% 350 MA | |
| A2R1 | 0683-3315 | R:FXD COMP 330 OHM 5% 1/4W<br>FACTORY SELECTED PART:TYPICAL VALUE GIVEN | |
| A3 | 5253A-65B | ASSY:HARMONIC GENERATOR | |
| A3C1 | 0150-0093 | C:FXD CER 0.01UF +80-20% 100VDCW | |
| A3C2 | 0170-0094 | C:FXD MY 0.047UF 20% 50VDCW | |
| A3C3 | 0140-0151 | C:FXD MICA 620PF 2% 300VDCW | |
| A3C4 | 0140-0200 | C:FXD MICA 390PF 5% 300VDCW | |
| A3C5 | 0130-0016 | C:VAR CER 5-25 PF NPO | |
| A3C6 | 0140-0191 | C:FXD MICA 56 PF 5% 300 VDCW | |
| A3L1 | 9140-0107 | COIL:FXD RF 27 UH | |
| A3L2 | 9140-0025 | COIL:FXD RF 4.7 UH | |
| A3Q1 | 1854-0005 | TRANSISTOR:SILICON NPN 2N708 | |
| A3R1 | 0686-2425 | R:FXD COMP 2400 OHM 5% 1/2W | |
| A3R2 | 0683-2205 | R:FXD COMP 22 OHM 5% 1/4W | |
| A3R3 | 0683-5625 | R:FXD COMP 5600 OHM 5% 1/4W<br>FACTORY SELECTED PART:TYPICAL VALUE GIVEN | |
| A4 | 5253A-65C | ASSY:MIXER | |
| A4C1 | 0140-0069 | C:FXD MICA 550 PF 10% 500 VDCW | |
| A4C2 | 0150-0050 | C:FXD CER 1000PF 600 VDCW | |
| A4C3 | 0170-0040 | C:FXD MY .047 UF 10% 200VDCW | |
| A4CR1 | 1901-0347 | SEMICON DEVICE: DIODE | |
| A4CR2 | 1901-0347 | SEMICON DEVICE: DIODE | |
| A4CR3 | 1910-0016 | DIODE, GERMANIUM:100MA AT 0.85 V 60PIV | |
| A4L1 | 9140-0142 | COIL:FXD RF 2.2 UH | |
| A4R1 | 0683-3305 | R:FXD COMP 33 OHM 5% 1/4W | |
| A4R2 | 0683-3305 | R:FXD COMP 33 OHM 5% 1/4W | |
| A4R3 | 0684-5621 | R:FXD COMP 5.6K OHM 10% 1/4W | |
| A4R4 | 0683-2245 | R:FXD COMP 220K OHM 5% 1/4W | |
| A4R5 | 0683-2245 | R:FXD COMP 220K OHM 5% 1/4W | |
| A4R6 | 0683-2715 | R:FXD COMP 270 OHM 5% 1/4W | |
| A4R7 | 0683-6205 | R:FXD COMP 62 OHM 5% 1/4W<br>FACTORY SELECTED PART:TYPICAL VALUE GIVEN | |
| C21 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| C22 | 0140-0069 | C:FXD MICA 550 PF 10% 500 VDCW<br>NOT RECOMMENDED FOR FIELD REPLACEMENT | |

℔ = See list of abbreviations in introduction to this section

Table 6-1. Reference Designation Index (Cont'd)

| Reference Designation | ℔ Stock No. | Description # | Note |
|---|---|---|---|
| C23 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| C24 | 0160-0127 | C:FXD CER 1UF 20% 25VDCW | |
| E1 | 9170-0059 | MAGNETIC CORE:TOROID FERRITE | |
| E2 | 9170-0059 | MAGNETIC CORE:TOROID FERRITE | |
| E3 | 9170-0059 | MAGNETIC CORE:TOROID FERRITE | |
| J1 | 1250-0102 | CONNECTOR:BNC | |
| J2 | 1251-0099 | CONNECTOR:50 PIN MINAT | |
| M1 | 1120-0140 | METER:0-1 MILLIAMPERE EDGE-VIEW | |
| R21 | 0684-5621 | R:FXD COMP 5.6K OHM 10% 1/4W | |
| XA1 | 1251-0135 | CONNECTOR:PRINTED CIRCUIT 15 CONTACTS | |
| | | MISCELLANEOUS | |
| | 05251-0002 | BRACKET:METER | |
| | 05253-0006 | BRACKET:PANEL | |
| | 05253-0005 | PLATE:BOTTOM | |
| | 5040-0185 | BEZEL:METER | |
| | 05253-20223 | PANEL:FRONT (MINT GRAY) | |

℔ = See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ | |
|---|---|---|---|---|---|
| 0130-0016 | C:VAR CER 5-25 PF NPO | 28480 | 0130-0016 | 1 | |
| 0140-0069 | C:FXD MICA 550 PF 10% 500 VDCW | 00853 | TYPE M 100 E10 | 2 | |
| 0140-0151 | C:FXD MICA 920PF 2% 300VDCW | 04062 | RDM15F821G3S | 1 | |
| 0140-0191 | C:FXD MICA 56 PF 5% 300 VDCW | 04062 | RDM15E560J3C | 1 | |
| 0140-0192 | C:FXD MICA 68PF 5% 300VDCW | 04062 | RDM15E680J3C | 1 | |
| 0140-0[illegible] | C:FXD MICA 110 PF 5% 300 VDCW | 04062 | RDM15F111J3C | 1 | |
| 0140-02[illegible]0 | C:FXD MICA 390PF 5% 300VDCW | 04062 | RDM15F391J3C | 1 | |
| 0140-0214 | C:FXD MICA 60PF 5% 300VDCW | 04062 | RDM15E600J3C | 1 | |
| 0150-0[illegible] | C:FXD CER 1000PF 600 VDCW | 84411 | TYPE E | 1 | |
| 0150-0061 | C:FXD CER 20 PF 100 VDCW | 56289 | 53C47 | 1 | |
| 0150-0093 | C:FXD CER 0.01UF +80-20% 100VDCW | 91418 | TA | 1 | |
| 0150-0121 | C:FXD CER 0.1UF +80%-20% 50VDCW | 56289 | 5C50A | 1 | |
| 0160-0127 | C:FXD CER 1UF 20% 25VDCW | 56289 | 5C13 | 6 | |
| 0160-0128 | C:FXD CER 2.2UF 20% 25VDCW | 56289 | 5C15 | 1 | |
| 0160-0137 | C:FXD CER 0.33UF 20% 25VDCW | 56289 | 5C10 | 1 | |
| 0160-0161 | C:FXD MY 0.01 UF 10% 200VDCW | 28480 | 0160-0161 | 1 | |
| 0160-0178 | C:FXD MICA 27PF 5% 300VDCW | 04062 | RDM15E270J3S | 1 | |
| 0160-0332 | C:FXD MICA 133PF 1% | 28480 | 0160-0332 | 1 | |
| 0170-0040 | C:FXD MY .047 UF 10% 200VDCW | 28480 | 0170-0040 | 1 | |
| 0170-0094 | C:FXD MY 0.047UF 20% 50VDCW | 84411 | TYPE 602 | 1 | |
| 0180-0100 | C:FXD ELECT TA 4.7UF 10% 35VDCW | 56289 | 150D475X9035B2 | 1 | |
| 0683-1025 | R:FXD COMP 1000 OHM 5% 1/4W | 01121 | CB 1025 | 3 | |
| 0683-1315 | R:FXD COMP 130 OHM 5% 1/4W | 01121 | CB 1315 | 1 | |
| 0683-1525 | R:FXD COMP 1500 OHM 5% 1/4W | 01121 | CB 1525 | 1 | |
| 0683-1815 | R:FXD COMP 180 OHM 5% 1/4W | 01121 | CB 1815 | 1 | |
| 0683-2205 | R:FXD COMP 22 OHM 5% 1/4W | 01121 | CB 2205 | 1 | |
| 0683-2245 | R:FXD COMP 220K OHM 5% 1/4W | 01121 | CB 2245 | 2 | |
| 0683-2715 | R:FXD COMP 270 OHM 5% 1/4W | 01121 | CB 2715 | 1 | |
| 0683-2725 | R:FXD COMP 2700 OHM 5% 1/4W | 01121 | CB-2725 | 1 | |
| 0683-3305 | R:FXD COMP 33 OHM 5% 1/4W | 01121 | CB 3305 | 2 | |
| 0683-3315 | R:FXD COMP 330 OHM 5% 1/4W | 01121 | CB 3315 | 1 | |
| 0683-3915 | R:FXD COMP 390 OHM 5% 1/4W | 01121 | CB 3915 | 2 | |
| 0683-3925 | R:FXD COMP 3900 OHM 5% 1/4W | 01121 | CB 3925 | 1 | |
| 0683-4305 | R:FXD COMP 43 OHM 5% .25W | 01121 | CB 4305 | 3 | |
| 0683-4315 | R:FXD COMP 430 OHM 5% 1/4W | 01121 | CB [illegible] | 2 | |
| 0683-5115 | R:FXD COMP 510 OHM 5% 1/4W | 01121 | CB 5115 | 4 | |
| 0683-5125 | R:FXD COMP 5100 OHM 5% 1/4W | 0112 | CB 5125 | 1 | |
| 0683-5625 | R:FXD COMP 5600 OHM 5% 1/4W | 0112. | CB 5625 | 1 | |
| 0683-6205 | R:FXD COMP 62 OHM 5% 1/4W | 0112[illegible] | CB 6205 | 1 | |
| 0683-7515 | R:FXD COMP 750 OHM 5% 1/4W | 01121 | CB 7515 | 1 | |

# See list of abbreviations in introduction to this section

Table 6-2. Replaceable Parts (Cont'd)

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ | |
|---|---|---|---|---|---|
| 0684-5621 | R:FXD COMP 5.6K OHM 10% 1/4W | 01121 | CB 5621 | 2 | |
| 0686-2425 | R:FXD COMP 2400 OHM 5% 1/2W | 01121 | EB 2425 | 1 | |
| 1120-0140 | METER:0-1 MILLIAMPERE EDGE-VIEW | 28480 | 1120-0140 | 1 | |
| 1250-0102 | CONNECTOR:BNC | 91737 | 7011 | 1 | |
| 1251-0099 | CONNECTOR:50 PIN MINAT | 28480 | 1251-0099 | 1 | |
| 1251-0135 | CONNECTOR:PRINTED CIRCUIT 15 CONTACTS | 95354 | SD-615UR | 1 | |
| 1853-0009 | TRANSISTOR:SILICON PNP | 28480 | 1853-0009 | 2 | |
| 1854-0005 | TRANSISTOR:2N708 NPN SILICON | 07263 | 2N708 | 4 | |
| 1901-0347 | SEMICON DEVICE:DIODE | 28480 | 1901-0347 | 2 | |
| | | 28480 | 1901-0040 | | |
| 1910-0016 | DIODE:GERMANIUM:100MA AT0.85V 60PIV | 28480 | 1910-0016 | 1 | |
| 1910-0022 | SEMICON DEVICE:DIODE GE 100MA 6PIV 3.5NS | 28480 | 1910-0022 | 3 | |
| 9140-0025 | COIL:FXD RF 4.7 UH | 28480 | 9140-0025 | 1 | |
| 9140-0107 | COIL:FXD RF 27 U.. | 99800 | 1840-38 | 1 | |
| | | 28480 | 9140 0111 | | |
| | | 99800 | 2500-14 | | |
| 9140-0125 | COIL:VAR 0.9-1.9 UH | 28480 | 9140-0125 | 1 | |
| 9140-0126 | COIL:VAR 1.76-4.02 | 28480 | 9140-0126 | 1 | |
| 9140-0137 | COIL:FXD RF 1000UH | 28480 | 9140-0137 | 1 | |
| 9140-0138 | COIL:FXD RF 180UH 5% | 99800 | 9140-0138 | 1 | |
| 9140-0142 | COIL:FXD RF 2.2 UH | 28480 | 9140-0142 | 1 | |
| 9140-0143 | COIL:FXD RF 3.3 UH | 28480 | 9140-0143 | 1 | |
| 9140-0170 | COIL-FXD .15 UH 20% 350 MA | 36196 | 1A1503M | 1 | |
| 9170-0029 | CORE: FERRITE BEAD | 02114 | 56-590-65/4A | 2 | |
| 9170-0059 | MAGNETIC CORE:TOROID FERRITE | 02114 | 396T125-303 | 3 | |
| 05253-2007 | BOARD:BLANK P.C. AMPLIFIER | 28480 | 05253-2007 | 1 | |
| 05253-6003 | ASSY:STEP RECOVERY DIODE | 28480 | 05253-6003 | 1 | |
| 05253-6007 | ASSY:AMPLIFIER | 28480 | 05253-6007 | 1 | |
| 5253A-65B | ASSY:HARMONIC GENERATOR | 28480 | 5253A-65B | 1 | |
| 5253A-65C | ASSY:MIXER | 28480 | 5253A-65C | 1 | |
| 05251-0002 | BRACKET:METER | 28480 | 05251-0002 | 1 | |
| 05253-0005 | PLATE:BOTTOM | 28480 | 05253-0005 | 1 | |
| 05253-0006 | BRACKET:PANEL | 28480 | 05253-0006 | 1 | |
| 05253-20223 | PANEL:FRONT (MINT GRAY) | 28480 | 05253-20223 | 1 | |

# See list of abbreviations in introduction to this section

## Table 6-3. Manufacturer's Code

The following code numbers are from the Federal Supply Code for Manufacturers Cataloging Handbooks H4-1 (Name to Code) and H4-2 (Code to Name) and their latest supplements. The date of revision and the date of the supplements used appear at the bottom of each page. Alphabetical codes have been arbitrarily assigned to suppliers not appearing in the H4 Handbooks.

| Code No. | Manufacturer | Address |
|---|---|---|
| 00000 | U S A Common | Any supplier of U S. |
| 00136 | McCoy Electronics | Mount Holly Springs, Pa |
| 00213 | Sage Electronics Corp | Rochester, N Y |
| 00247 | Cemco Inc | Danielson, Conn |
| 00334 | Humidial | Colton, Calif |
| 00348 | Micrichem Co , Inc. | Valley Stream N Y. |
| 00373 | Gertech Inc | Cherry Hill N J |
| 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 Div | Pickens, S C |
| 00866 | Gen Engineering Lo | City of Industry, Cal |
| 00891 | Carl E Holmes Corp | Los Angeles, Calif |
| 00929 | Microlab Inc. | Livingston, N J |
| 01002 | General Electric Co , Capacitor Dept | Hudson Falls, N Y |
| 01009 | Aiden Products Co | Brockton, Mass |
| 01121 | Allen Bradley Co | Milwaukee Wis |
| 01255 | Litton Industries, Inc | Beverly Hills, Calif |
| 01281 | TRW Semiconductors, Inc | Lawndale, Calif |
| 01295 | Texas Instruments, Inc Transistor Products Div | Dallas, Texas |
| 01349 | The Alliance Mfg Co | Alliance Ohio |
| 01569 | Pacific Relays, Inc | Van Nuys Calif |
| 01670 | Guardian Elect Mfg Co. | New York N Y |
| 01930 | Amperex Corp | Hackford, Ill |
| 01961 | Pulse Engineering Co | Santa Clara Calif |
| 02114 | Ferroxcube Corp of America | Saugerties, N Y, |
| 02116 | Wheelock Signals, Inc | Long Branch, N. J. |
| 02286 | Cole Rubber and Plastics Inc | Sunnyvale Calif |
| 02660 | Amphenol Borg Electronics Corp | Broadview, Ill |
| 02735 | Radio Corp of America Semiconductor and Materials Div | Somerville, N J |
| 02771 | Vocaline Co of America, Inc | Old Saybrook, Conn |
| 02777 | Hopkins Engineering Co | San Fernando, Calif |
| 02815 | Hudson Tool & Die Co | Newark N J |
| 02866 | G E Semiconductor Prod Dept | Syracuse, N Y |
| 03705 | Apex Machine & Tool Co | Dayton, Ohio |
| 03797 | Eldema Corp | Compton, Calif |
| 03816 | Parker Seal Co | Los Angeles, Calif |
| 03877 | Transition Electric Corp | Bakefield, Mass |
| 03888 | Pyrofilm Resistor Co Inc | Cedar Knolls, N J |
| 03954 | Singer Co Diehl Div Finishing Plant | Somerville, N J |
| 04009 | Arrow, Hart and Hegeman Elect Co | Hartford, Conn |
| 04013 | Taurus Corp | Lambertville, N.J. |
| 04062 | Arco Electronics Inc | Great Neck, N Y |
| 04227 | Hi Q Division of Aerovox | Myrtle Beach, S C |
| 04354 | Precision Paper Tube Co | Wheeling, Ill |
| 04404 | Dymec Division of Hewlett Packard Co | Palo Alto, Calif |
| 04651 | Sylvania Electric Products Microwave Device Div | Mountain View, Calif |
| 04673 | Dakota Engr Inc. | Culver City, Calif |
| 04713 | Motorola, Inc , Semiconductor Prod Div | Phoenix, Arizona |
| 04732 | Filtron Co , Inc Western Div | Culver City Calif |
| 04773 | Automatic Electric Co | Northlake, Ill |
| 04796 | Sequoia Wire Co | Redwood City, Calif |
| 04811 | Precision Coil Spring Co | El Monte, Calif |
| 04870 | P M Motor Company | Westchester, Ill |
| 04919 | Components Mfg Service Co. | W Bridgewater, Mass |
| 05006 | Twentieth Century Plastics, Inc | Los Angeles, Calif |
| 05245 | Components Corp | Chicago Ill |
| 05277 | Westinghouse Electric Corp Semi Conductor Dept | Youngwood Pa |
| 05347 | Ultronix Inc | San Mateo Calif |
| 05397 | Union Carbide Corp Elect Div | New York, N Y |
| 05524 | Viking Inc Inc | Canoga Park, Calif |
| 05593 | Icore Electric Plastics Inc | Sunnyvale, Calif |
| 05616 | Cosmic Plastic Cosmic Electrical Spec Co ) | Cleveland, Ohio |
| 05624 | Ember Corman Co | Rockford, Ill |
| 05728 | Tiffen Optical Co | Roslyn Heights, Long Island N Y |
| 05729 | Metro Tel Corp | Westbury, N Y |
| 05783 | Stewart Engineering Co | Santa Cruz Calif |
| 05820 | Bakefield Engineering Inc | Wakefield, Mass |
| 05828 | Bassick Co , Div of Stewart Bamon Corp | Bridgeport, Conn |
| 06090 | Raychem Corp | Redwood City, Calif. |
| 06325 | Bausch and Lomb Optical Co | Rochester, N Y |
| 06402 | E T A Products Co of America | Chicago, Ill |
| 06540 | Amelcon Electronic Hardware Co Inc | New Rochelle, N Y |
| 06555 | Beede Electrical Instrument Co Inc | Penacook N H |
| 06666 | General Devices Co Inc | Indianapolis, Ind |
| 06751 | Components Inc , Ariz Div | Phoenix, Ariz. |
| 06812 | Torrington Mfg Co , West Div | Van Nuys, Calif |
| 06980 | Varian Assoc Exmac Div | San Carlos Calif |
| 07088 | Nelson Electric Co | Van Nuys, Calif |
| 07126 | Digitran Co | Pasadena, Calif |
| 07137 | Transistor Electronics Corp | Minneapolis, Minn |
| 07138 | Westinghouse Electric Corp Electronic Tube Div | Elmira N Y |
| 07149 | Filmohm Corp | New York N Y |
| 07233 | Cinch Graphik Co | City of Industry, Calif |
| 07256 | Silicon Transistor Corp | Carle Place N Y |
| 07261 | Avnet Corp | Culver City Calif |
| 07263 | Fairchild Camera & Inst Corp Semiconductor Div | Mountain View Calif |
| 07322 | Minnesota Rubber Co | Minneapolis Minn |
| 07367 | Bircher Corp The | Monterey Park, Calif |
| 07397 | Sylvania Elect Prod Inc , Mt View Operations | Mountain View Calif |
| 07700 | Technical Wire Products Inc | Cranford, N J |
| 07819 | Bodine Elect Co | Chicago Ill |
| 07910 | Continental Device Corp | Hawthorne, Calif |
| 07933 | Raytheon Mfg Co Semiconductor Div | Mountain View Calif |
| 07980 | Hewlett Packard Co , Boonton Radio Div | Rockaway, N J |
| 08145 | U S Engineering Co | Los Angeles, Calif |
| 08269 | Blinn, Delbert Co | Pomona Calif |
| 08358 | Burgess Battery Co | Niagara Falls, Ontario, Canada |
| 08574 | Deutsch Fastener Corp | Los Angeles, Calif |
| 08668 | Bristol Co The | Waterbury, Conn |
| 08717 | Sloan Company | Sun Valley, Calif |
| 08718 | ITT Cannon Electric Inc , Phoenix Div | Phoenix, Arizona |
| 08727 | National Radio Lab Inc | Paramus, N. J. |
| 08792 | CBS Electronics Semiconductor Operations Div of C B S Inc | Lowell, Mass |
| 08806 | General Electric Co Miniat Lamp Dept | Cleveland, Ohio |
| 08984 | Wet Rare | Indianapolis, Ind |
| 09074 | Babcock Relays Div | Costa Mesa, Calif |
| 09134 | Texas Capacitor Co | Houston, Texas |
| 09145 | Tech Ind Inc Atche Elect | Burbank Calif |
| 09250 | Electro Assemblies Inc | Chicago Ill |
| 09353 | C & K Components Inc | Newton Mass |
| 09569 | Mallory Battery Co of Canada Ltd | Toronto Ontario Canada |
| 09922 | Burndy Corp | Norwalk Conn |
| 10214 | General Transistor Western Corp | Los Angeles Calif |
| 10411 | Te Tai Inc | Berkeley, Calif |
| 10646 | Carborundum Co | Niagara Falls N Y |
| 11236 | CTS of Berne, Inc | Berne, Ind |
| 11237 | Chicago Telephone of California Inc | So Pasadena Calif |
| 11242 | Bay State Electronics Corp | Waltham, Mass |
| 11312 | Teledyne Inc Microwave Div | Palo Alto Calif |
| 11314 | National Seal | Downey Calif |
| 11451 | Precision Connector Corp | Jamaica N Y |
| 11534 | Duncan Electronics Inc | Costa Mesa Calif |
| 11711 | General Instrument Corp , Semiconductor Div , Products Group | Newark, N J |
| 11717 | Integrated Electronic, Inc | Buena Park Calif |
| 11870 | Metals, Inc | Palo Alto Calif |
| 12040 | National Semiconductor | Danbury Conn |
| 12136 | Philadelphia Handle Co | Camden, N J |
| 12181 | Grove Mfg Co Inc | Shady Grove Pa |
| 12574 | Gulton Ind Inc Data System Div | Albuquerque N M |
| 12697 | Clarostat Mfg Co | Dover N H |
| 12728 | Elmar Fuller Corp | N Haven, Conn |
| 12859 | Nippon Electric Co , Ltd | Tokyo Japan |
| 12881 | Metex Electronics Corp | Clark N J |
| 12930 | Delta Semiconductor Inc | Newport Beach Calif |
| 12954 | Dickson Electronics Corp | Scottsdale Arizona |
| 13103 | Thermotics | Dallas Texas |
| 13356 | Telefunken GmbH | Hanover, Germany |
| 13835 | Midland-Wright Div of Pacific Industries Inc | Kansas City Kansas |
| 14099 | Sem Tech | Newbury Park Calif |
| 14193 | Calif Resistor Corp | Santa Monica Calif |
| 14298 | American Components, Inc | Conshohocken Pa |
| 14433 | ITT Semiconductor, A Div of Int Telephone & Telegraph Corp | West Palm Beach Fla |
| 14493 | Hewlett Packard Company | Loveland, Colo |
| 14655 | Cornell Dubilier Electric Corp | Newark N J |
| 14674 | Corning Glass Works | Corning N Y |
| 14757 | Electric Cube Inc | San Gabriel Calif |
| 14960 | Watkins Mfg Co | San Jose, Calif |
| 15203 | Webster Electronics Co | New York, N Y |
| 15287 | Sprague Corp | Northridge Calif. |
| 15291 | Adjustable Bushing Co | N Hollywood, Calif |
| 15558 | Micro-Electronics Garden City, Long Island N Y | |
| 15566 | Amperite Inst Corp | Lyndhurst N Y |
| 15631 | Cabletronics | Costa Mesa, Calif |
| 15772 | Twentieth Century Coil Spring Co | Santa Clara, Calif |
| 15801 | Fenwal Elect Inc | Framingham Mass |
| 15818 | Ameico Inc | Mt View, Calif |
| 16037 | Spruce Pine Mica Co | Spruce Pine, N C |
| 16179 | Omni-Spectra Inc | Farmington Mich |
| 16352 | Computer Diode Corp | Lodi, N J |
| 16585 | Booth Aircraft Nut Corp | Pasadena, Calif |
| 16888 | Ideal Proc Meter Co , Inc De Jur Meter Div | Brooklyn, N Y |
| 16758 | Delco Radio Div of G M Corp | Kokomo, Ind. |
| 17109 | Thermometrics Inc | Canoga Park, Calif |
| 17478 | Trompeo Company | Mountain View, Calif |
| 17550 | Components Inc | Biddeford, Me |
| 17675 | Hamlin Metal Products Corp | Akron Ohio |
| 17745 | Angstrohm Prec Inc | No Hollywood, Calif |

## Table 6-3. Manufacturer's Code (Continued)

| Code No. | Manufacturer | Address |
|---|---|---|
| 17870 | McGraw Edison Co | Manchester, N H |
| 18042 | Power Design Pacific Inc | Palo Alto, Calif |
| 18083 | Clevite Corp , Semiconductor Div | Palo Alto, Calif |
| 18324 | Signetics C ,, | S vale, Calif |
| 18476 | Sy-Cor Mfg C Inc | sfield, Mass |
| 18486 | TRW Electr Comp Div | Des Plaines, Ill |
| 18583 | Curtis Instrument, Inc | Mt Kisco, N Y |
| 18612 | Vishay Instruments Inc | Malvern Pa |
| 18873 | E.I. DuPont and Co , Inc | Wilmington, Del |
| 18911 | Durant Mfg. Co. | Milwaukee, Wis |
| 19315 | The Bendix Corp , Navigation & Control Div | Teterboro, N J |
| 19500 | Thomas A. Edison Industries, Div of McGraw Edison Co | West Orange, N J |
| 19589 | Centon | Baldwin Park, Calif |
| 19644 | LRC Electronics | Horseheads, N Y |
| 19701 | Electro Mfg Co | Independence, Kansas |
| 20183 | General Atronics Corp | Philadelphia, Pa |
| 21226 | Executone, Inc | Long Island City, N Y |
| 21335 | Fafnir Bearing Co , The | New Britain, Conn |
| 21520 | Frantzel Metallurgical Corp | N Chicago, Ill |
| 21947 | Textron Corp. | Indianapolis, Ind |
| 23783 | British Radio Electronics Ltd | Washington, D.C |
| 24455 | G E Lamp Division | Nela Park, Cleveland, Ohio |
| 24655 | General Radio Co | West Concord Mass |
| 24681 | Memcor Inc , Comp. Div. | Huntington, Ind |
| 24756 | Paralco Inc | San Juan Capistrano, Calif |
| 26365 | Gries Reproducer Corp | New Rochelle, N Y |
| 26462 | Grobet File Co of America, Inc | Carlstadt, N J |
| 26851 | Compac Hollister Co | Hollister, Calif |
| 26992 | Hamilton Watch Co | Lancaster, Pa |
| 27251 | Specialities Mfg Co , Inc | Shelfield, Conn |
| 28480 | Hewlett Packard Co | Palo Alto, Calif |
| 28520 | Heyman Mfg. Co. | Kenilworth, N J |
| 28817 | Instrument Specialties Co Inc | Little Falls, N J. |
| 33173 | G E Receiving Tube Dept | Owensboro, Ky |
| 35434 | Lectrohm Inc | Chicago, Ill |
| 36196 | Stackpole Coil Products Ltd | Hawkesbury, Ontario, Canada |
| 36787 | Cunningham, W.H. & Hill, Ltd | Toronto Ontario, Canada |
| 37942 | P R Mallory & Co Inc | Indianapolis, Ind |
| 39543 | Mechanical Industries Prod Co. | Akron, Ohio |
| 41820 | Miniature Precision Bearings, Inc | Keene, N.H |
| 42190 | Muter Co | Chicago, Ill |
| 43990 | C A Neergea Co | Englewood, Colo |
| 44655 | Ohmite Mfg Co | Skokie, Ill |
| 46384 | Penn Eng & Mfg Corp. | Doylestown, Pa. |
| 47904 | Polaroid Corp | Cambridge, Mass |
| 48620 | Precision Thermometer & Inst Co | Southampton, Pa |
| 49956 | Microwave & Power Tube Div | Waltham, Mass |
| 52050 | Rheem Controller Co | Westminster, Md |
| 52983 | Sanborn Company | Waltham, Mass |
| 54294 | Shallcross Mfg Co | Selma, N C |
| 55026 | Simpson Electric Co | Chicago, Ill |
| 55933 | Sonotone Corp | Elmsford N Y. |
| 55938 | Raytheon Co Commercial Apparatus & Systems Div | So Norwalk, Conn |
| 56137 | Spaulding Fibre Co , Inc | Tonawanda, N Y |
| 56289 | Sprague Electric Co | North Adams, Mass |
| 59446 | Telex Corp | Tulsa, Okla |
| 59730 | Thomas S Wells Co | Elizabeth, N J |
| 60741 | Triplett Electrical Inst Co | Bluffton Ohio |
| 61775 | Unison Switch and Signal Div of Westinghouse Air Brake Co | Pittsburgh, Pa |
| 62119 | Universal Electric Co | Owosso Mich |
| 63743 | Ward Leonard Electric Co | Mt Vernon N Y |
| 64959 | Western Electric Co , Inc | New York N Y |
| 65092 | Weston Inst Inc Weston Newark | Newark N J |
| 66295 | Bitten Mfg Co | Chicago, Ill |
| 66346 | Minnesota Mining & Mfg Co Revere Mineral Div | St Paul Minn |
| 70276 | Allen Mfg Co | Hartford Conn |
| 70309 | Allied Control | New York N Y |
| 70318 | Almetal Screw Product Co , Inc | Garden City N Y |
| 70417 | Amplex, Div of Chrysler Corp | Detroit Mich |
| 70485 | Atlantic India Rubber Works Inc | Chicago Ill |
| 70563 | Augenite Co Inc | Union City, N J |
| 70674 | ADC Products Inc | Minneapolis, Minn |
| 70903 | Belden Mfg Co | Chicago Ill |
| 70998 | Bird Electronic Corp | Cleveland, Ohio |
| 71002 | Burnbach Radio Co | New York N Y |
| 71030 | Bliley Electric Co , Inc | Erie, Pa |
| 71041 | Boston Gear Works Div of Murray Co of Texas | Quincy, Mass |
| 71218 | Bud Radio, Inc | Willoughby Ohio |
| 71279 | Cambridge Thermionics Corp | Cambridge Mass |
| 71281 | Camloc Fastener Corp | Paramus N J |
| 71313 | Caldwell Condenser Corp | Lindenhurst L I N Y |
| 71400 | Bussmann Mfg Div of McGraw Edison Co | St Louis, Mo |
| 71436 | Chicago Condenser Corp | Chicago, Ill |
| 71468 | Calif Spring Co Inc | Palo Alto, Calif |
| 71450 | CTS Corp | Elkhart, Ind |
| 71468 | ITT Cannon Electric Inc | Los Angeles Calif |
| 71471 | Cinema, Div Aerovox Corp | Burbank Calif |
| 71482 | C P Clare & Co | Chicago Ill |
| 71590 | Centralab Div of Globe Union Inc | Milwaukee, Wis |
| 71611 | Commercial Plastics Co | Chicago Ill |
| 71700 | Cornish Wire Co , The | New York N Y |
| 71707 | Cole Coil Co Inc | Providence R I |
| 71744 | Chicago Miniature Lamp Works | Chicago Ill |
| 71785 | Cinch Mfg. Co., Howard B Jones Div | Chicago, Ill |
| 71984 | Dow Corning Corp | Midland Mich |
| 72136 | Electro Motive Mfg Co , Inc | Willimantic, Conn |
| 72619 | Dialight Corp | Brooklyn, N Y |
| 72656 | Indiana General Corp Electronics Div | Keasby N J |
| 72699 | General Instrument Corp , Cap. Div Newark, N.J. | |
| 72765 | Drake Mfg Co | Harwood Heights, Ill |
| 72825 | Hugh H Eby Inc | Philadelphia Pa |
| 72928 | Gudeman Co | Chicago, Ill |
| 72962 | Elastic Stop Nut Corp | Union, N J |
| 72964 | Robert M Hadley Co | Los Angeles Calif |
| 72982 | Erie Technological Products Inc | Erie Pa |
| 73061 | Hansen Mfg Co , Inc | Princeton Ind |
| 73076 | H M Harper Co | Chicago Ill |
| 73138 | Helipot Div of Beckman Inst , Inc | Fullerton Calif |
| 73293 | Hughes Products Division of Hughes Aircraft Co | Newport Beach Calif |
| 73485 | Amperex Elect Co | Hicksville L I N Y |
| 73506 | Bradley Semiconductor Corp | New Haven Conn |
| 73559 | Carling Electric Inc | Hartford Conn |
| 73586 | Circle F Mfg Co | Trenton, N J |
| 73637 | George K Garrett Co Div MSL Industries Inc | Philadelphia Pa |
| 73738 | Federal Screw Products Inc | Chicago Ill |
| 73743 | Fischer Special Mfg Co | Cincinnati Ohio |
| 73793 | General Industries Co The | Elyria Ohio |
| 73846 | Gotham Stamping & Tool Co | Goshen, Ind |
| 73859 | J F D Electronics Corp | Brooklyn N Y |
| 73905 | Jennings Radio Mfg Corp | San Jose Calif |
| 73957 | Green Fin Corp | Ridgefield N J |
| 74276 | Signalite Inc | Neptune N J |
| 74455 | J H Rhoads and Sons | Manchester Mass |
| 74861 | Industrial Condenser Corp | Chicago, Ill |
| 74868 | R F Products Division of Amphenol Borg Electronics Corp | Danbury Conn |
| 74970 | E F Johnson Co | Waseca Minn |
| 75042 | International Resistance Co | Philadelphia Pa |
| 75183 | Keystone Carbon Co , ter | St Marys, Pa |
| 75378 | CTS Knights Inc | Sandwich, Ill |
| 75382 | Kulka Electric Corporation | Mt Vernon N Y |
| 75818 | Lenz Electric Mfg Co | Chicago, Ill |
| 75915 | Littelfuse Inc | Des Plaines, Ill |
| 76005 | Lord Mfg Co | Erie Pa |
| 76210 | C W Marwedel | San Francisco Calif |
| 76433 | General Instrument Corp , Micamold Division | Newark, N J |
| 76487 | James Millen Mfg Co Inc | Malden Mass |
| 76493 | J W Miller Co | Los Angeles Calif |
| 76530 | Cinch Monadnock, Div of United Carr Fastener Corp | San Leandro, Calif |
| 76545 | Mueller Electric Co | Cleveland, Ohio |
| 76703 | National Union | Newark N J |
| 76854 | Oak Manufacturing Co | Crystal Lake Ill |
| 77068 | The Bendix Corp Electrodynamics Div | N Hollywood Calif |
| 77075 | Pacific Metals Co | San Francisco Calif |
| 77221 | Phaostron Instrument and Electronic Co | South Pasadena Calif |
| 77252 | Philadelphia Steel and Wire Corp | Philadelphia, Pa |
| 77342 | American Machine & Foundry Co Potter & Brumfield Div | Princeton, Ind |
| 77630 | ERA Electronic Components Div | Camden N J |
| 77638 | General Instrument Corp Rectifier Div | Brooklyn N Y |
| 77764 | Resistance Products Co | Harrisburg, Pa |
| 77969 | Rubbercraft Corp of Calif | Torrance, Calif |
| 78189 | Shakeproof Division of Illinois Tool Works | Elgin, Ill |
| 78277 | Sigma | So Braintree, Mass |
| 78283 | Signal Indicator Corp | New York, N Y |
| 78450 | Struthers-Dunn Inc | Pitman, N J |
| 78474 | Specialty Leather Prod Co | Newark N J |
| 78492 | Thompson Bremer & Co | Chicago, Ill |
| 78671 | Tinnerman Products Inc | San Francisco, Calif |
| 78688 | Stackpole Carbon Co | St Marys, Pa |
| 78693 | Standard Thomson Corp | Waltham, Mass |
| 78953 | Timeraan Products Inc | Cleveland, Ohio |
| 78990 | Transformer Engineers | San Gabriel, Calif |
| 79067 | Ultimate Co | Newtonville Mass |
| 79136 | Waldes Kohinoor Inc | Long Island City, N Y |
| 79142 | Vreden Rect, Inc | Hartford Conn |
| 79251 | Bronc Mfg Co | Chicago Ill |
| 79727 | Continental Wirt Electronics Corp | Philadelphia Pa |
| 79963 | Zierick Mfg Corp | New Rochelle N Y |
| 80031 | Mepco Division of Sessions Clock Co | Morristown N J |
| 80120 | Schnitzer Alloy Products Co | Elizabeth, N J |
| 80131 | Electronic Industries Association Any brand Tube meeting EIA Standards Washington, DC | |
| 80207 | Unimax Switch Div Maxon Electronics Corp | Ballingford, Conn |
| 80223 | United Transformer Corp | New York, N Y |
| 80348 | Oxford Electric Corp | Chicago, Ill |
| 80798 | Bourns Inc | Riverside, Calif |
| 80883 | Acro Div of Robertshaw Controls Co | Columbus Ohio |

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## Table 6-3. Manufacturer's Code (Continued)

| Code No. | Manufacturer | Address |
|---|---|---|
| 80486 | All Star Products Inc | Defiance Ohio |
| 80509 | Avery Label Co | Monrovia Calif |
| 80583 | Hammarlund Co Inc | Mars Hill, N. C |
| 80640 | Stevens Arnold Co Inc | Boston Mass |
| 80811 | Diamond Gray Co | Dayton Ohio |
| 81030 | International Instruments Inc | Orange, Conn |
| 81073 | Grayhill Co | LaGrange Ill |
| 81095 | Triad Transformer Corp | Venice, Calif |
| 81312 | Winchester Elec Div Litton Ind Inc | Gabbville Conn |
| 81349 | Military Specifications | |
| 81483 | International Rectifier Corp | El Segundo, Calif |
| 81541 | Airpax Electronics, Inc | Cambridge Maryland |
| 81860 | Barry Controls Div Barry Wright Corp | Watertown Mass |
| 82042 | Carter Precision Electric Co | Skokie, Ill |
| 82047 | Speed Faraday Inc . Copper Hewitt Electric Div | Hoboken, N J |
| 82116 | Electric Regulator Corp | Norwalk, Conn. |
| 82142 | Jeffers Electronics Division of Speer Carbon Co | Du Bois Pa |
| 82170 | Fairchild Camera & Inst Corp Space & Defense System Div | Palmyra, N J |
| 82209 | Magnetic Industries, Inc | Greenwich, Conn |
| 82219 | Sylvania Electric Prod Inc Electronic Tube Division | Emporium Pa |
| 82376 | Astron Corp | East Newark, Harrison, N. J. |
| 82389 | Switchcraft Inc | Chicago Ill |
| 82647 | Metals & Controls Inc Spencer Products | Attleboro Mass |
| 82866 | Research Products Corp | Madison, Wis |
| 82877 | Rotron Mfg Co Inc | Woodstock, N Y |
| 82893 | Vector Electronic Co | Glendale, Calif |
| 83014 | Halldorth Corp | Los Angeles, Calif |
| 83058 | Carr Fastener Co | Cambridge, Mass |
| 83086 | New Hampshire Ball Bearing Inc | Peterborough, N H |
| 83125 | General Instrument Corp Capacitor Div | Darlington, S C |
| 83148 | ITT Wire and Cable Div | Los Angeles, Calif |
| 83186 | Victory Eng Corp | Springfield, N J |
| 83298 | Bendix Corp Red Bank Div | Red Bank, N J |
| 83315 | Hubbell Corp | Muscatine Ill |
| 83324 | Rosan Inc | Newport Beach, Calif |
| 83330 | Smith, Herman H , Inc | Brooklyn, N Y |
| 83337 | Tech Labs | Palisade's Park, N J |
| 83385 | Central Screw Co | Chicago Ill |
| 83501 | Gavitt Wire and Cable Co Div of Amerace Corp | Brookfield, Mass |
| 83594 | Burroughs Corp Electronic Tube Div | Plainfield, N J |
| 83740 | Union Carbide Corp Consumer Prod Div | New York, N Y |
| 83777 | Model Eng and Mfg , Inc | Huntingtn Ind |
| 83821 | Lead Seuggs Co | Fostub Mo |
| 83942 | Aeronautical Inst & Radio Co | Lodi, N J |
| 84171 | Arco Electronics Inc | Great Neck, N Y |
| 84396 | A J Glassmeyer Co Inc | San Francesco, Calif |
| 84411 | TRW Capacitor Div | Ogallala Neb |
| 84970 | Sarkes Tarzian, Inc | Bloomington, Ind |
| 85454 | Bennies Molding Company | Bogalusa, N J |
| 85471 | A B Boyd Co | San Francisco, Calif |
| 85478 | R M Bracamonte & Co | San Francisco, Calif |
| 85660 | Rexolite Assoc, Inc | Hawden, Conn |
| 85911 | Seamless Rubber Co | Chicago, Ill |
| 86174 | Fafnir Bearing Co | Los Angeles, Calif. |
| 86197 | Clifton Precision Products Co , Inc | Clifton Heights, Pa |
| 86579 | Precision Rubber Products Corp | Dayton, Ohio |
| 86684 | Radio Corp of America, Electronic Comp & Devices Div | Harrison, N J |
| 86928 | Seastrom Mfg Co | Glendale, Calif. |
| 87034 | Marco Industries | Anaheim, Calif |
| 87225 | Philco Corporation (Lansdale Division) | Lansdale Pa |
| 87473 | Western Fibrous Glass Products Co | San Francisco, Calif |
| 87664 | Van Waters & Rogers Inc | San Francisco, Calif. |
| 87931 | Tower Mfg Corp | Providence, R I |
| 88140 | Cutler Hammer, Inc | Lincoln, Ill |
| 88320 | Gould National Batteries, Inc | St Paul, Minn |
| 88658 | General Mills, Inc | Buffalo, N. Y |
| 89231 | Graybar Electric Co | Oakland, Calif |
| 89473 | G E Distributing Corp | Schenectady, N. Y |
| 89765 | United Transformer Co | Chicago, Ill |
| 90420 | United Spce Machinery Corp | Beverly, Mass |
| 90739 | US Rubber Co . Consumer Ind & Plastics Prod Div | Passaic, N J |
| 90970 | Bearing Engineering Co | San Francisco, Calif |
| 91346 | ITT Cannon Elect, Inc., Salem Div Salem, Mass | |
| 91640 | Conner Spring Mfg Co | San Francisco Calif |
| 91745 | Millers Oval & Nameplate Co | El Monte Calif |
| 91928 | Radio Materials Co | Chicago Ill |
| 91958 | Augat Inc | Attleboro Mass |
| 91959 | Dale Electronics, Inc | Columbus, Nebr |
| 91962 | Elco Corp | Willow Grove, Pa |
| 91969 | Gremar Mfg Co Inc | Wakefield, Mass |
| 91977 | K F Development Co | Redwood City, Calif |
| 91986 | Waldes Mfg Co , Inc | Chicago, Ill |
| 91995 | Honeywell Inc Micro Switch Div | Freeport Ill |
| 91961 | Hahn-Black Spring Co | Oakland, Calif |
| 92160 | Tru Connector Corp | Peabody, Mass |
| 92167 | Elgeet Optical Co Inc | Rochester, N Y |
| 92607 | Penscote Insulated Wire Co , Inc | Tarrytown, N Y |
| 92702 | IMC Magnetics Corp | Westbury Long Island, N Y |
| 92966 | Hudson Lamp Co | Kearney, N J |
| 93332 | Sylvania Electric Prod Inc Semiconductor Div | Woburn Mass |
| 93419 | Rollins & Myers Inc | Palisades Park, N J |
| 93810 | Stamco Controls, Div of Essex Wire Corp | Mansfield, Ohio |
| 93832 | Waters Mfg Co | Culver City, Calif |
| 93929 | G V Controls | Livingston, N J |
| 94137 | General Cable Corp | Bayonne, N J |
| 94142 | Phelps Dodge | Yonkers, N Y |
| 94144 | Raytheon Co , Comp Ops , Ind Comp Operations | Quincy, Mass |
| 94148 | Scientific Electronics Products Inc | Loveland, Colo |
| 94154 | Wagner Elect Corp Tung-Sol Div | Newark, N J |
| 94197 | Curtiss Wright Corp, Electronics Div | East Paterson, N J |
| 94222 | South Chester Corp | Chester Pa |
| 94310 | Dixie Cloth Products, Inc | Bellwood, Ill |
| 94375 | Automatic Metal Products Co | Brooklyn, N Y |
| 94667 | Worcester Pressed Aluminum Corp | Worcester Mass |
| 94696 | Magnecraft Electric Co | Chicago, Ill |
| 95023 | George A Philbrick Researchers Inc | Boston, Mass |
| 95236 | Aimes Products Corp , | Ocala Fla |
| 95238 | Continental Connector Corp | Woodside, N Y |
| 95263 | Lovecraft Mfg Co , Inc | Long Island, N Y |
| 95265 | National Coil Co | Sheridan, Wyo |
| 95275 | Vitramon, Inc | Bridgeport, Conn |
| 95348 | Gordos Corp | Bloomfield, N J. |
| 95354 | Methode Mfg Co | Rolling Meadows, Ill. |
| 95566 | Arnold Engineering Co | Marengo, Ill. |
| 95712 | Dage Electric Co , Inc | Franklin, Ind |
| 95984 | Siemon Mfg Co | Wayne, Ill |
| 95987 | Winchester Co | Chicago, Ill. |
| 96467 | Microwave Assoc , West Inc | Sunnyvale, Calif. |
| 96595 | Hi Q Div of Aerovox Corp | Olean, N Y. |
| 96256 | Thordarson Meissner Inc | Mt Carmel, Ill |
| 96296 | Solar Manufacturing Co | Los Angeles, Calif |
| 96356 | Microswitch, Div of Minn.-Honeywell | Freeport, Ill. |
| 96330 | Carlton Screw Co | Chicago, Ill |
| 96341 | Microwave Associates, Inc | Burlington, Mass |
| 96501 | Excel Transformer Co | Oakland, Calif |
| 96733 | San Fernando Elect Mfg Co | San Fernando, Calif. |
| 96881 | Thomson Ind. Inc | Long Is , N Y. |
| 97464 | Industrial Retaining Ring Co | Irvington, N J |
| 97539 | Automatic & Precision Mfg | Englewood, N J. |
| 97979 | Reon Resistor Corp | Yonkers, N Y |
| 97983 | Litton System Inc , Adler Westrex Commun Div | New Rochelle, N Y |
| 98141 | R Tronics, Inc | Jamaica, N Y |
| 98159 | Rubber Tech, Inc | Gardena, Calif |
| 98220 | Hewlett-Packard Co , Mosley Div | Pasadena, Calif |
| 98278 | Microdot, Inc | So Pasadena, Calif |
| 98291 | Spectrol Corp | Mamaroneck, N Y |
| 98376 | Zeus Mfg Co | Burbank, Calif |
| 98410 | Etc Inc | Cleveland, Ohio |
| 98731 | General Mills Inc , Electronics Div | Minneapolis, Minn |
| 98738 | Parco Div of Hewlett Packard Co | Palo Alto, Calif |
| 98821 | North Hills Electronics, Inc | Glen Cove, N Y |
| 98978 | International Electronic Research Corp | Burbank, Calif |
| 99109 | Columbia Technical Corp | New York, N Y |
| 99313 | Varian Associates | Palo Alto, Calif. |
| 99378 | Atlee Corp | Winchester, Mass. |
| 99515 | Marshall Ind , Capacitor Div | Monrovia, Calif |
| 99707 | Control Switch Division, Controls Co of America | El Segundo, Calif |
| 99800 | Delevan Electronics Corp | East Aurora, N Y |
| 99848 | Delco Corporation | Indianapolis, Ind |
| 99920 | Bramco Corp | Whippany, N. J. |
| 99934 | Rembrandt, Inc | Boston, Mass |
| 99942 | Hoffman Electronics Corp Semiconductor Div | El Monte, Calif |
| 99957 | Technotcgy Instrument Corp of Calif | Newbury Park, Calif |

THE FOLLOWING HP VENDORS HAVE NO NUMBER ASSIGNED IN THE LATEST SUPPLEMENT TO THE FEDERAL SUPPLY CODE FOR MANUFACTURERS HANDBOOK

| | | |
|---|---|---|
| CCCOF | Matic Tool and Die | Los Angeles, Calif |
| CCOOZ | Dillow Leather Products Corp | Newark, N J |
| OCEAB | EFA | England |
| OCCBB | Precision Instrument Components Co | Van Nuys, Calif |
| COOCS | Hewlett-Packard Co., Colorado Springs | Colorado Springs, Colorado |
| OCCMW | Rubber Eng & Development | Hayward, Calif |
| CCCNN | A M C O Mfg Co | San Jose, Calif. |
| CCCQQ | Coolitron | Oakland, Calif |
| OCCWW | California Eastern Lab | Burlington, Calif |
| CCOYY | S R Smith Co | Los Angeles, Calif. |

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# BACK DATING MANUAL CHANGES

# APPENDIX I - MANUAL CHANGES

This manual applies directly to the 5253B Frequency Converter having serial prefix 1124A. This manual with the following changes also applies to the 5253B Frequency Converters having serial prefix numbers 828, 716, 513, 450, 321, and 311.

| Instrument Serial Prefix No. | Change No. |
|---|---|
| 311, 321 | 1, 2, 3, 4, 5 |
| 450 | 2, 3, 4, 5 |
| 513 | 3, 4, 5 |
| 716 | 4, 5 |
| 828 | 5 |

CHANGE 1: Figure 5-5, Table 6-1:
Change: A1 from 05253-6007 to 5253A-65A

Replace schematic with Figure IA-1.

Replace A1 portion of parts list with Table IA-1

CHANGE 2: Tables 6-1, Misc., Table 6-2:
Change: Plate: Bottom from 05253-0005 to HP Part No. 5253A-12E.

Bracket: Meter from 05251-0002 to HP Part No. 5253A-12F.

Bracket: Panel from 05253-0006 to HP Part No. 05253-0002.

Panel: Front from 05253-2014 to HP Part No. 05253-2003.

CHANGE 3: Figure 6-1, Page 6-2:
Change MP5 to HP Part No. 2380-0003, Qty. 4.

Change MP25 to HP Part No. 1410-0047, Qty. 2.

Change MP53 to HP Part No. 5253A-20A.

Delete MP67.

CHANGE 4: Table 6-1, Page 6-5 and Table 6-2, Page 6-8 Parts List:
HP Part No. for matched diode pair A4CR1 was 1900-0011. New HP Part No. 1901-0347 is the preferred replacement.

CHANGE 5: Table 6-1, Page 6-6 and Table 6-2, Page 6-8:
Change 05253-20223 to 05253-2014.

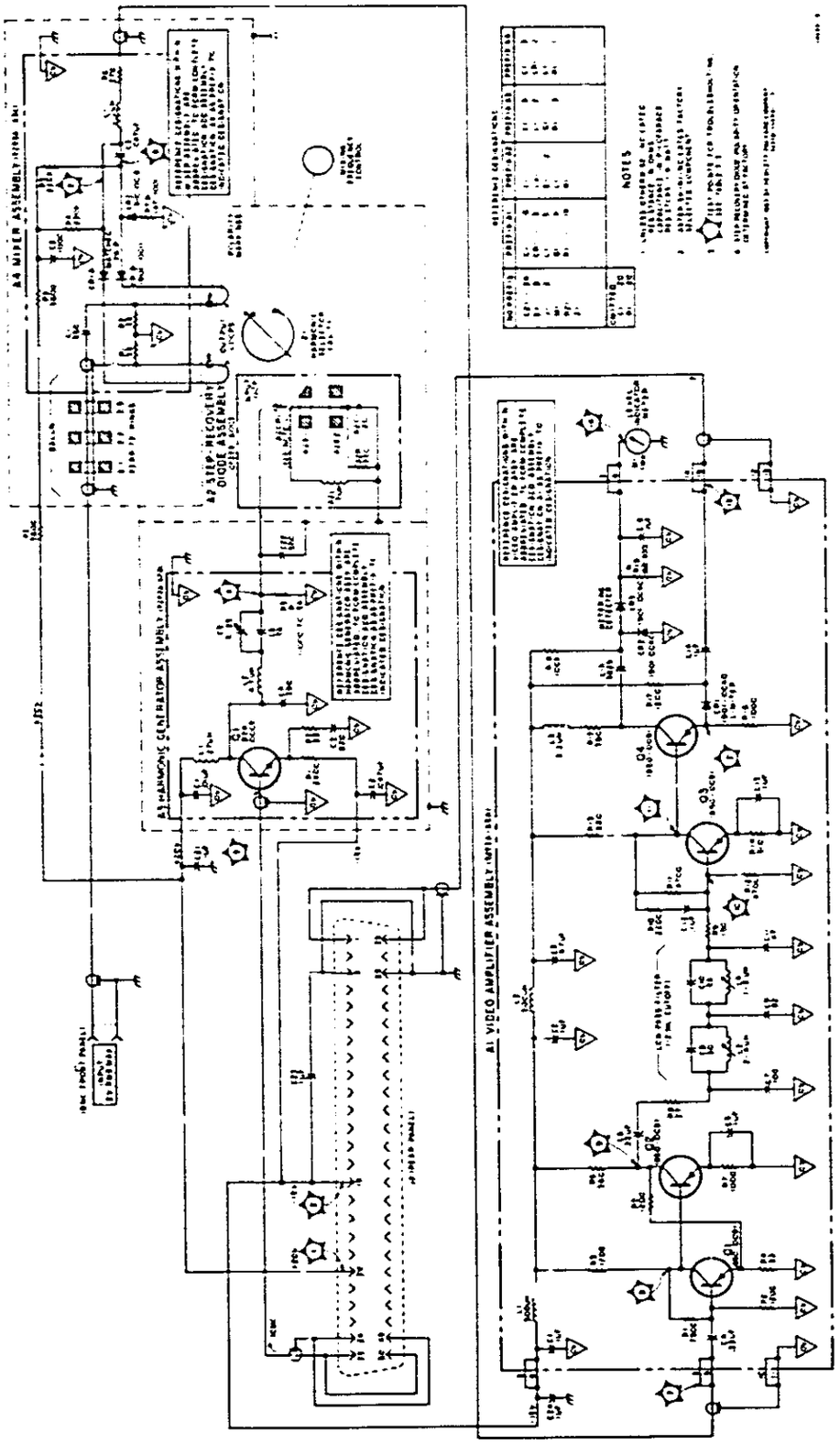


Figure 1A-1

Table IA-1. Reference Designation Index

| Reference Designation | Stock No. | Description # | Note |
|---|---|---|---|
| A1 | *253A-65A | ASSY:VIDEO AMPLIFIER | |
| A1C1 | 0160-0127 | C:FXD 1UF 0HM 20% 25VDCW | |
| A1C2 | 0160-0127 | C:FXD 1UF 0HM 20% 25VDCW | |
| A1C3 | 0180-0100 | C:FXD ELECT TA 4.7UF 10% 35VDCW | |
| A1C4 | 0160-0137 | C:FXD CER 0.33UF 20% 25VDCW | |
| A1C5 | 0160-0127 | C:FXD 1UF 0HM 20% 25VDCW | |
| A1C6 | 0160-0137 | C:FXD CER 0.33UF 20% 25VDCW | |
| A1C7 | 0140-0176 | C:FXD MICA 100 PF 2% 300 VDCW | |
| A1C8 | 0140-0203 | C:FXD MICA 30PF 5% 500VDCW | |
| A1C9 | 0140-0193 | C:FXD MICA 62 PF 5% 300 VDCW | |
| A1C10 | 0140-0191 | C:FXD MICA 56 PF 5% 300 VDCW | |
| A1C11 | 0140-0204 | C:FXD 47PF 5% NPO 500 VDCW | |
| A1C12 | 0150-0121 | C:FXD .1MF 50VDCW | |
| A1C13 | 0160-0127 | C:FXD 1UF 0HM 20% 25VDCW | |
| A1C14 | 0160-0127 | C:FXD 1UF 0HM 20% 25VDCW | |
| A1C15 | 0140-0189 | C:FXD MICA 5825 PF 2% 300 VDCW | |
| A1C16 | 0150-0121 | C:FXD .1MF 50VDCW | |
| A1CR1 | 1901-0040 | DIODE:SILICON | |
| A1CR2 | 1901-0040 | DIODE:SILICON | |
| A1CR3 | 1901-0040 | DIODE:SILICON | |
| L1 | 9140-0118 | COIL:FXD 500 UH 5% | |
| L2 | 9140-0118 | COIL:FXD 500 UH 5% | |
| A1L3 | 9140-0126 | COIL:VAR 1.76-4.02 | |
| A1L4 | 9140-0125 | COIL:VAR 0.9-1.9 UH | |
| A1L5 | 9140-0111 | COIL:FXD RF 3.3UH | |
| A1Q1 | 1850-0091 | TRANSISTOR:GERMANIUM 2N2048 PNP | |
| A1Q2 | 1850-0091 | TRANSISTOR:GERMANIUM 2N2048 PNP | |
| A1Q3 | 1850-0091 | TRANSISTOR:GERMANIUM 2N2048 PNP | |
| A1Q4 | 1850-0091 | TRANSISTOR:GERMANIUM 2N2048 PNP | |
| A1R1 | 0683-7525 | R:FXD COMP 7500 OHMS 5% 1/4W | |
| A1R2 | 0683-1225 | R:FXD 1200 OHM 5% 1/4W | |
| A1R3 | 0683-1225 | R:FXD 1200 OHM 5% 1/4W | |
| A1R4 | 0683-3305 | R:FXD COMP 33 OHMS 5% 1/4W | |
| A1R5 | 0683-1225 | R:FXD COMP 1200 OHMS 5% 1/4W | |
| A1R6 | 0683-3615 | R:FXD COMP 360 OHMS 5% 1/4W | |
| A1R7 | 0683-1025 | R:FXD COMP 1000 OHMS 5% 1/4W | |
| A1R8 | 0684-2701 | R:FXD 27 OHM 10% 1/4 W | |
| A1R9 | 0684-1511 | R:FXD COMP 15K OHMS 10% 1/4W | |
| A1R10 | 0683-2225 | R:FXD 2.2K OHM 5% 1/4W | |
| A1R11 | 0683-4725 | R:FXD COMP 4700 OHMS 5% 1/4W | |
| A1R12 | 0683-4725 | R:FXD COMP 4700 OHMS 5% 1/4W | |
| A1R13 | 0683-6815 | R:FXD COMP 680 OHMS 5% 1/4W | |
| A1R14 | 0683-5115 | R:FXD COMP 510 OHMS 5% 1/4W | |
| A1R15 | 0683-3915 | R:FXD COMP 390 OHMS 5% 1/4W | |
| A1R16 | 0683-1025 | R:FXD COMP 1000 OHMS 5% 1/4W | |
| A1R17 | 0683-1225 | R:FXD 1200 OHM 5% 1/4W | |
| A1R18 | 0684-1041 | R:FXD 100 K OHM 10% 1/4 W | |
| A1R19 | 0683-8205 | R:FXD COMP 82 OHMS 5% 1/4W | |

# See list of abbreviations in introduction to this section

# APPENDIX

# 5253A

# APPENDIX II - 5253A

## IIA-1. INTRODUCTION.

IIA-2. The 5253A is basically the same as the 5253B except for frequency range. The 5252A measures from 100 to 500 Mc. The 5253B measures from 50 to 500 Mc. The frequency range of the 5253B was extended by changing the pick-up loop in the cavity. The 5353B manual will apply for most applications. Appendix II covers the differences between the two models and contains the necessary information for the operation and maintenance of the 5253A.

## IIA-3. DESCRIPTION.

IIA-4. The Hewlett-Packard Model 5253A Frequency Converter is a plug-in unit which converts a Hewlett-Packard Model 5243L or 5245L Electronic Counter into a direct reading counter from 88 to 512 Mc.

IIA-5. The stability and accuracy of the basic counter are retained by multiplying a 10-Mc signal, derived from the 1-Mc internal time base of the counter, to a selectable harmonic frequency between 100 and 500 Mc. This known harmonic of 10 Mc is then heterodyned with the INPUT signal. If the resulting difference frequency is between 100 kc and 12 Mc (bandwidth of amplifier in plug-in), it is counted and displayed by the counter. The frequency of the INPUT signal is then indicated by the combination of the MIXING FREQUENCY control (in megacycles; front panel of plug-in) and the digital display of the counter (in megacycles.

IIA-6. A front panel meter, by monitoring the difference-frequency output of the plug-in to the counter, aids in selecting the desired MIXING FREQUENCY and also in determining if INPUT signal amplitude is adequate for accurate frequency measurement.

## IIA-7. OPERATING PROCEDURE.

IIA-8. NORMAL RANGE MEASUREMENTS.

IIA-9. Figure IIA-1 is the procedure to be used for measurement of frequencies from 100.1 to 512 Mc with INPUT signal amplitudes from 50 mv to 1 v RMS.

IIA-10. EXTENDED RANGE MEASUREMENTS.

IIA-11. The frequency of signals not within the normal range of 100.1 to 512 Mc, 50 mv to 1 v RMS, may be measured using the following procedures:

IIA-12. 88 TO 100.1 MC, 50 MV TO 1 V RMS. Perform steps 1 through 5 of Figure IIA-1. Then:

a. Set mixing frequency control to slightly more than 110 Mc.

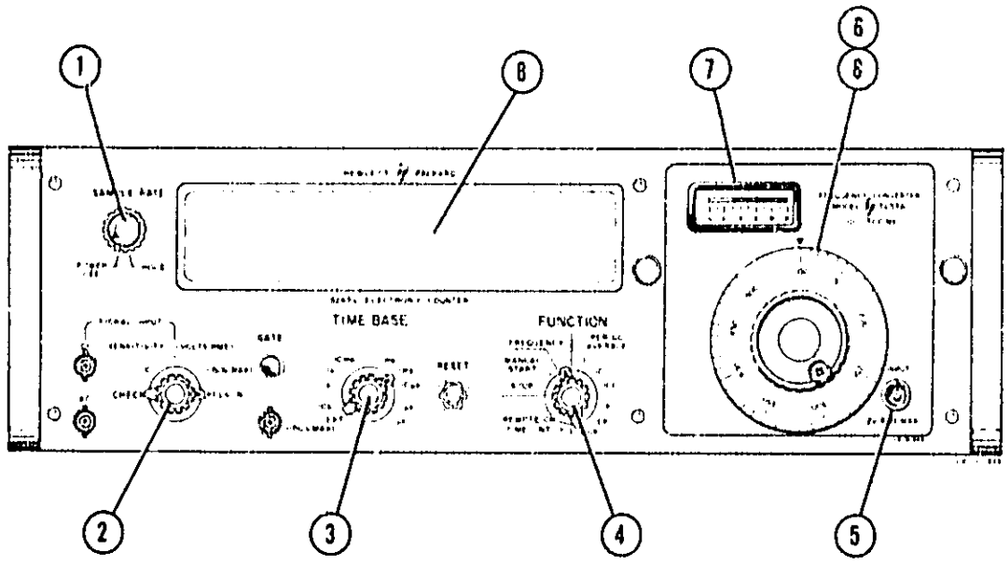
b. Turn mixing frequency control slowly clockwise until level indicator meter first reaches a maximum reading in the green portion of the scale.

c. Subtract counter display (in Mc) from reading of mixing frequency control (in Mc) for frequency of INPUT signal.

Table IIA-1. Specifications*

| | |
|---|---|
| RANGE: | As converter for 5243L or 5245L counter, 88 Mc to 512 Mc, using mixing frequencies of 100 Mc to 500 Mc in 10 Mc steps |
| ACCURACY: | Retains accuracy of 5243L or 5245L counter |
| INPUT VOLTAGE RANGE: | 50 mv to 1 v RMS |
| MAXIMUM INPUT: | 2 v RMS or 100 vdc will not damage the instrument |
| INPUT IMPEDANCE: | Approximately 50 ohms |
| LEVEL INDICATOR: | Meter aids frequency selection; indicates output voltage level to counter |
| REGISTRATION: | Counter display is added to the converter dial reading |
| WEIGHT: | Net 5-1/2 lbs, shipping 9 lbs |
| ACCESSORY FURNISHED: | 1 10503A (AC-16K) Cable, 4 ft long, male BNC connectors |

*When installed in Hewlett-Packard Model 5243L or Model 5245L Electronic Counter.




1. Turn SAMPLE RATE control slightly out of POWER OFF position.
2. Set SENSITIVITY to PLUG IN.
3. Set TIME BASE to .1 ms.*
4. Set FUNCTION to FREQUENCY.
5. Connect signal whose frequency is to be measured to INPUT of converter.
6. Set mixing frequency control to read slightly less than 100 mc.
7. Slowly turn mixing frequency control counterclockwise until level indicator meter first reaches a maximum reading in the green portion of its scale.
8. Add counter display (in mc) to mixing frequency control reading (in mc) for frequency of INPUT signal.

---

* TIME BASE setting may vary, depending on desired resolution of INPUT signal frequency. See table 3-1.

Figure IIA-1. Frequency Measurement Procedure

IIA-13. 88 TO 512 MC, AMPLITUDE LESS THAN 50 MV RMS. The front panel level indicator meter indicates in the green portion of its scale only when converter is properly tuned and amplitude of INPUT signal is adequate for accurate frequency measurement. However, because of conservative specifications of both the converter and counter, frequencies may often be accurately measured when meter reads in the red portion of its scale. To make these extended range measurements:

a. Follow normal procedure (Figure IIA-1 or Paragraph IIA-12, depending upon frequency range) except that mixing frequency control should be tuned for first maximum reading on the level indicator meter, regardless of the color of region maximum.

b. Insert an external variable attenuator (such as Hewlett-Packard Model 355A or 355C) in the transmission line between the converter and the source of INPUT signal. Vary attenuation from 0 to 1db during final step of frequency measurement procedure. If counter display does not change more than momentarily (during switching of attenuator), INPUT signal is above noise threshold and frequency measurement result is valid.

## IIA-14. VIDEO AMPLIFIER ASSEMBLY (A1).

IIA-15. The output of the mixer circuit is amplified by transistors A1Q1 and A1Q2 and is fed to the 12-Mc low-pass filter network (see Figure IIA-2). This filter passes any signal frequency below approximately 12 Mc and attenuates all higher frequency signals. The low-pass filter output is amplified by A1Q3 and fed to the last transistor amplifier, A1Q4, which provides both the output to the counter and the drive for the level indicator meter. The limiter diode, A1CR1, prevents the amplitude of the video amplifier output signal from exceeding approximately 300 mv RMS so that counter input circuits will not be overloaded. The low frequency limit of the video amplifier, determined by the bypass and interstage coupling networks, is approximately 100 kc. The converter output signal to the counter, when converter is properly tuned, will be between approximately 100 kc and 12 Mc and will have an amplitude that is less than approximately 300 mv RMS.

## IIA-16. LEVEL INDICATOR METER.

IIA-17. The dc current supply for the meter is produced by metering detector A1CR3 and smoothed by capacitor A1C16 (see Figure IIA-3). The value of shunt resistor A1R19 is selected to make level indicator meter M1 read at red-green border when amplitude of converter output to counter is in excess of the 100-mv RMS minimum signal amplitude normally required by the counter for accurate frequency measurement.

## IIA-18. HARMONIC GENERATOR ADJUSTMENT.

IIA-19. To adjust the harmonic generator assembly, proceed as follows:

a. Remove converter from counter and reconnect to counter with Extension Cable, hp 10506A.

b. Connect VHF Signal Generator to converter INPUT and set to 472 Mc, CW, at 100 mv.

c. Connect RF Millivoltmeter to Test Point #13 (see Figure IIA-5).

d. Set converter mixing frequency control to 470 Mc, and tune for maximum reading on RF Millivoltmeter.

e. Vary output of VHF Signal Generator to make converter level indicator meter read at red-green border.

f. Using plastic tuning tool, tune A3C5 (see Figure IIA-5) for maximum reading on RF Millivoltmeter. Tune A3C5 through hole in harmonic generator assembly shield cover.

## IIA-20. LOW PASS FILTER ADJUSTMENT.

IIA-21. To adjust the low pass filter in the video amplifier assembly, proceed as follows:

a. Remove converter from counter and reconnect to counter with Extension Cable, hp 10506A.

b. Connect VHF Signal Generator to converter INPUT and set to 110 Mc, CW, at 50 mv.

c. Connect RF Millivoltmeter to Test Point #13 (see Figure IIA-7).

d. Set converter mixing frequency control to 100 Mc and tune for maximum reading on RF Millivoltmeter.

e. Set Signal Generator to 118 Mc, CW, at 1 v.

f. Using plastic tool, adjust variable inductor A1L4 (see Figure IIA-4) for minimum reading of RF Millivoltmeter.

g. Set Signal Generator to 117 Mc, CW, at 1 v.

h. Using plastic tool, adjust variable inductor A1L3 (see Figure IIA-4) for minimum reading of RF Millivoltmeter.

i. Set Signal Generator to 115 Mc, CW, at 1 v.

j. Reading of RF Millivoltmeter should be less than 100 mv. If reading is above 100 mv, troubleshoot video amplifier assembly.

## IIA-22. METER ADJUSTMENT.

a. Turn counter power off, remove converter from counter, and reconnect to counter with Extension Cable, hp 10506A.

b. Set VHF Signal Generator to 102 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set counter controls as shown in Figure IIA-1. Counter should display approximately 2 Mc.

d. Vary VHF Generator output to make level indicator meter read at red-green border.

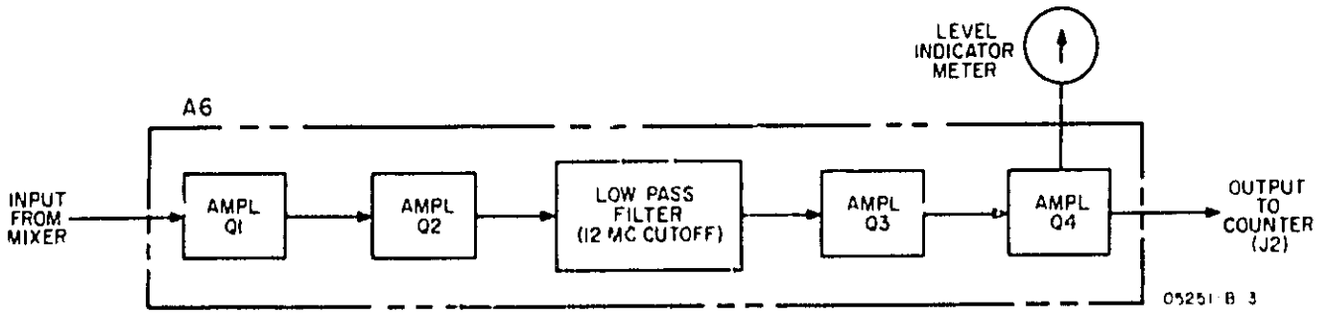



Figure IIA-2. Video Amplifier (A6)

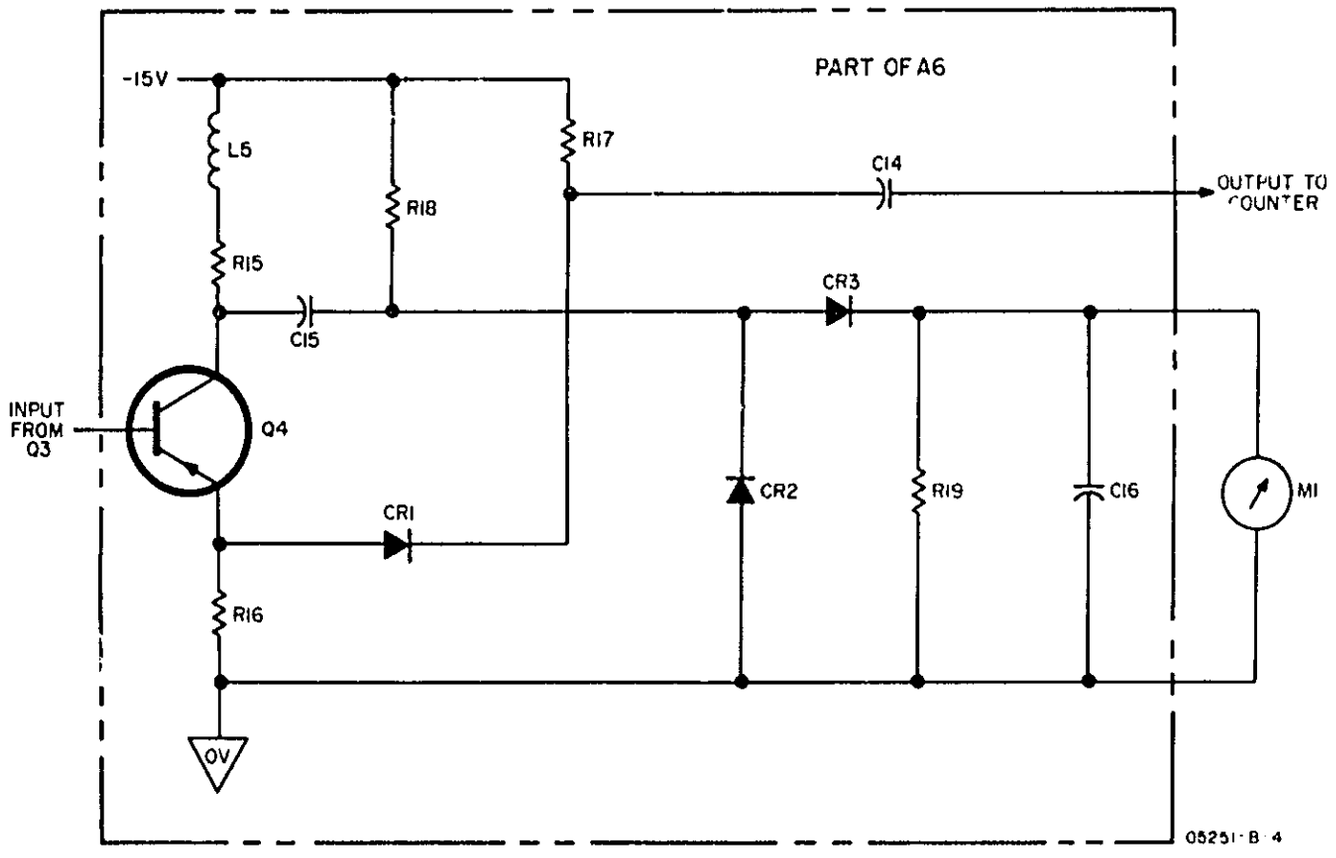



Figure IIA-3. Level Indicator Meter Circuit

e. Using RF Millivoltmeter, measure voltage at Test Point #13. Voltage should be between 100 mv and 130 mv. If not, change value of resistor A1R19 to change voltage to between 100 mv and 130 mv. If voltage is too high, increase value of A1R19. If voltage is too low, decrease value of A1R19. Repeat steps d and e after changing value of A1R19.

## IIA-23. MECHANICAL ADJUSTMENT OF METER ZERO .

IIA-24. TRUE SIGNAL LEVEL INDICATION. Level indicator meter is adjusted at the factory for proper mechanical zero. However, normal aging of meter components may change indicated zero level. To insure accuracy of input signal level indication, periodic adjustment of meter zero may be necessary.

IIA-25. ZERO-SET. When meter is properly zero-set, pointer rests over the zero calibration mark at the left-hand end of meter scale when converter is (1) at normal operating temperature, (2) in normal operating position, and (3) without power. Proceed as follows:

a. Allow counter and converter to operate for one hour to permit meter movement to reach normal operating temperature.

b. Turn counter off and allow one minute for all capacitors to discharge

c. Remove converter from counter to enable access to rear of meter.

d. Remove adhesive-backed-paper cover from meter zero-adjustment access hole on top-rear of meter.

e. Carefully insert small tool in access hole and engage adjustment fork.

f. Vary setting of adjustment fork until meter reads zero.

g. Remove tool and replace adhesive-backed paper cover on access hole. This completes meter zero adjustment procedure.

## IIA-26. SENSITIVITY CHECK.

a. Turn counter power off, remove converter from counter, and reconnect to counter with Extension Cable, hp 10506A.

b. Set VHF Signal Generator to 102 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Adjust controls as shown in Figure IIA-2.

d. Set converter mixing frequency control to 100 Mc. Counter should display approximately 2 Mc.

e. Using RF Millivoltmeter, measure output of converter at Test Point #13 (see Figure IIA-7). Voltage should be at least 100 mv.

f. Repeat above steps c, d, and e with VHF Generator frequency of 472 Mc and converter mixing frequency control set to 470 Mc. Converter output to counter, as measured by RF Millivoltmeter, should be at least 100 mv.

g. A similar check may be made at any frequency within the range of the Model 5253A. Converter output to counter should be at least 100 mv when difference frequency is between 100 kc and 12 Mc and converter is properly tuned.

## IIA-27. METER ACCURACY CHECK.

a. Turn counter power off, remove converter from counter, and reconnect to counter with Extension Cable, hp 10506A.

b. Set VHF Signal Generator to 102 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set controls as shown in Figure IIA-1. Set converter mixing frequency control to 100 Mc. Counter should display approximately 2 Mc.

d. Vary output of VHF Signal Generator for converter level indicator to make meter read at red-green border.

e. Using RF Millivoltmeter, measure converter output to counter at Test Point #13. Voltage should be between 100 mv and 130 mv. If not, see Paragraph IIA-22 for meter calibration adjustment procedure.

## IIA-28. LOW PASS FILTER CHECK.

a. Turn counter power off, remove converter from counter and reconnect to counter with Extension Cable, hp 10506A.

b. Set VHF Signal Generator to 110 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set controls as shown in Figure IIA-1. Set converter mixing frequency control to 100 Mc. Counter should display approximately 10 Mc.

d. Connect RF Millivoltmeter to Test Point #13. Vary output of VHF Signal Generator for RF Millivoltmeter reading of 100 mv. Note output level of VHF Signal Generator.

e. Set VHF Signal Generator to 115 Mc at same output level as noted in step d above. Converter output to counter, as shown on RF Millivoltmeter, should not exceed 50 mv. If converter output to counter is greater than 50 mv, see Paragraph IIA-20 for low pass filter adjustment procedure.

## IIA-29. IN-CABINET PERFORMANCE CHECK.

a. Turn counter power off and install converter.

b. Set VHF Signal Generator to 102 Mc, CW, at 50 mv and connect to INPUT of converter.

c. Set controls as shown in Figure IIA-1. Counter should display approximately 2 Mc.

d. Set VHF Signal Generator to any frequency between 88 Mc and 512 Mc with output of 50 mv. Counter should display correct frequency at any frequency within this range

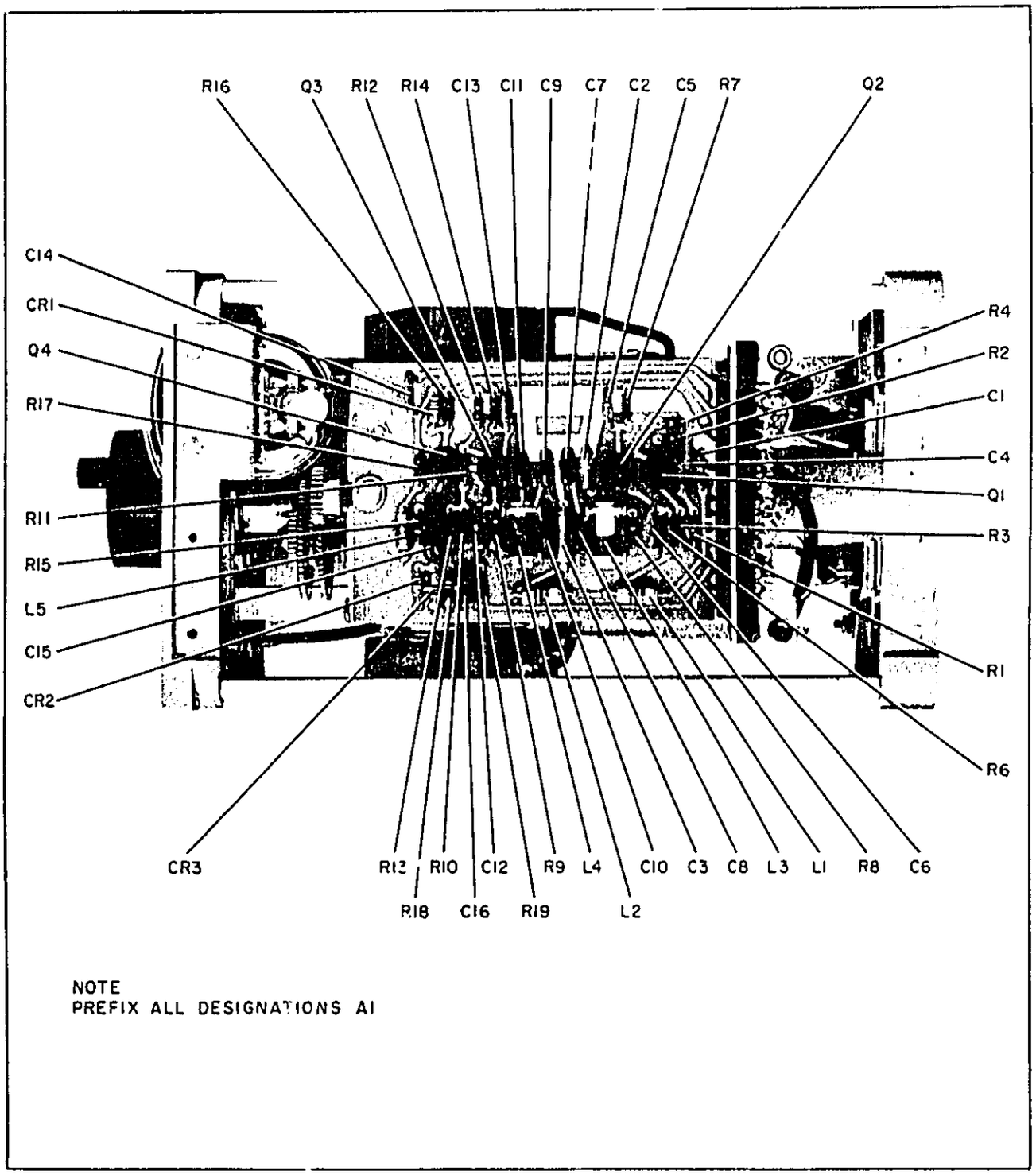



Figure IIA-4. Model 5253A, Top View

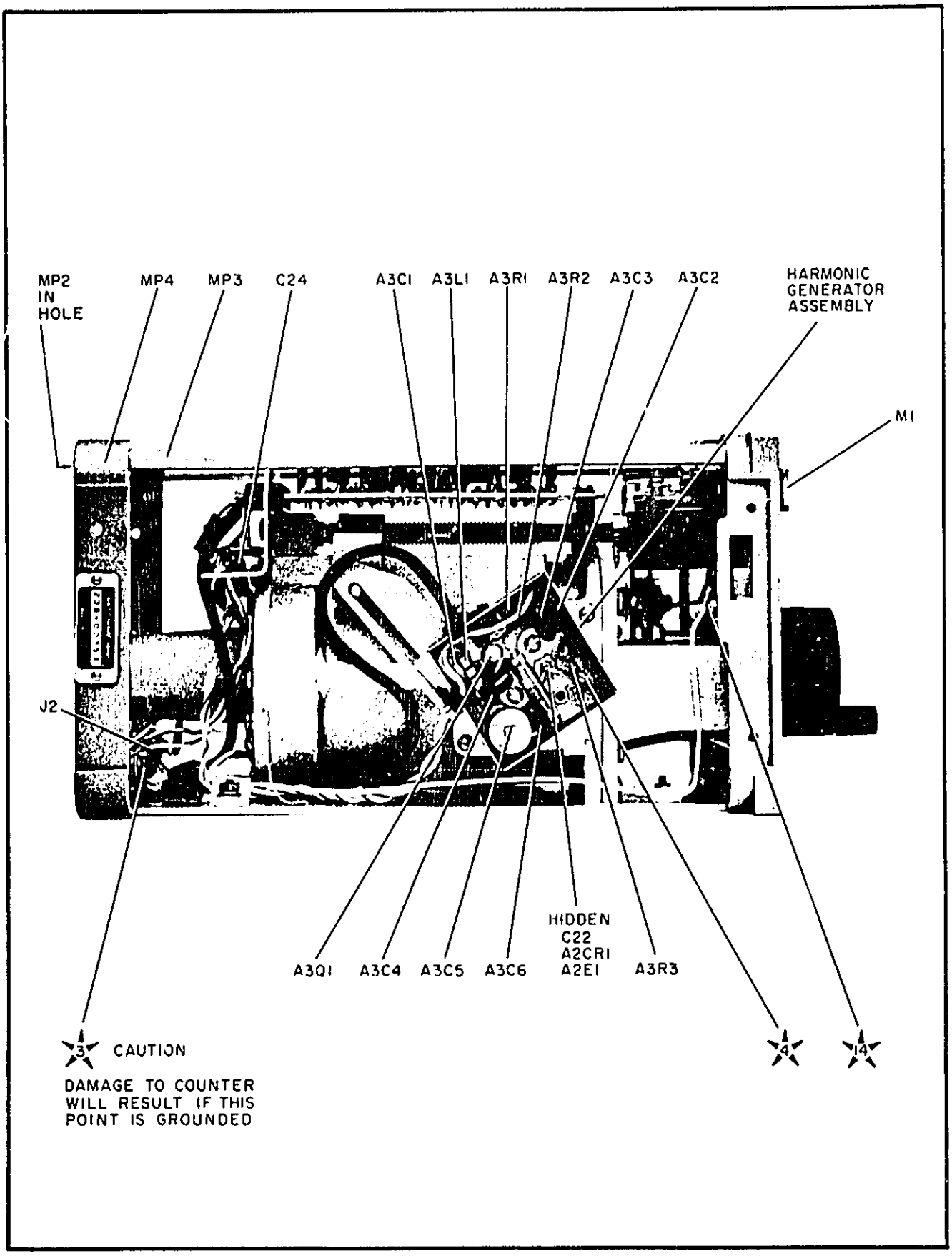



Figure IIA-5. Left Side View

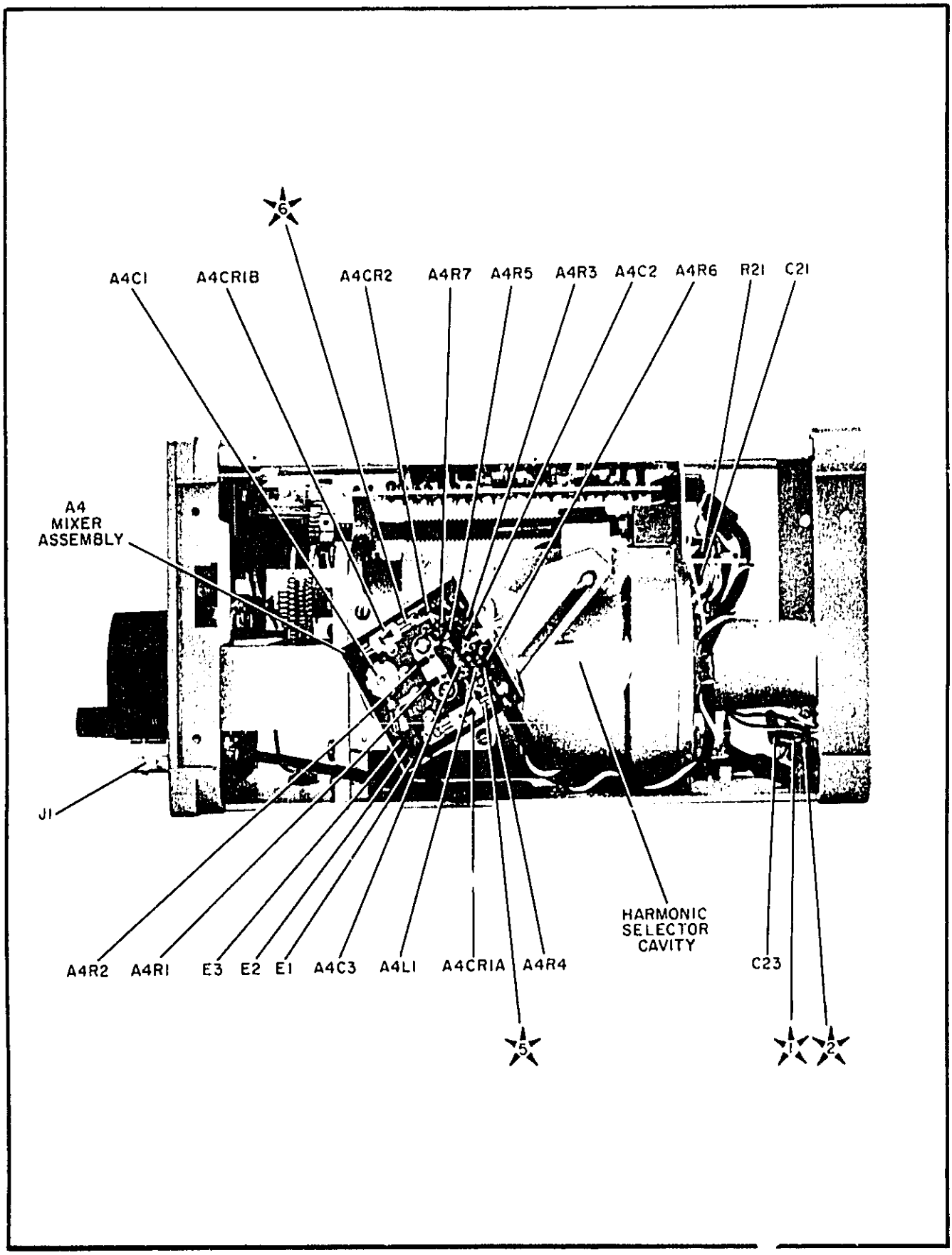



Figure IIA-6. Right Side View

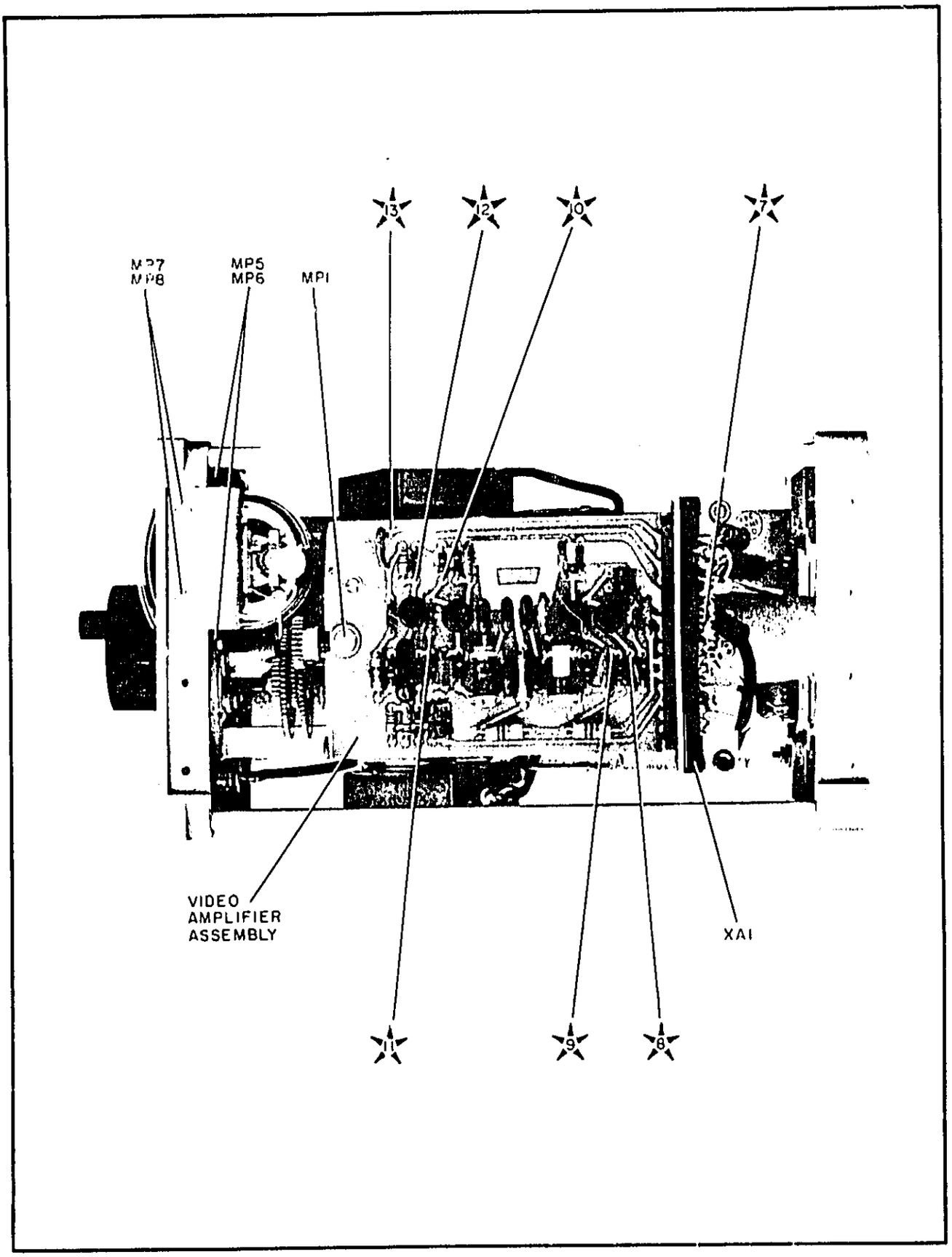



Figure IIA-7. Top View - Test Points

Table IIA-2. Troubleshooting Procedure

All voltages given are approximate and may vary from instrument to instrument because of variations in component characteristics.

TEST EQUIPMENT: ℔ Model 411A RF Millivoltmeter with ℔ 11022A (formerly 411A-21B) Pen Type Probe Tip, ℔ Model 412A DC VTVM

| | |
|---|---|
| REMOVE ℔ 5253A FROM COUNTER; SELF-CHECK COUNTER | See counter manual for self-check procedure. |
| CONNECT ℔ 5253A TO COUNTER WITH EXTENSION CABLE, ℔ 10506A (formerly AC-16Y) | Extension cable available from ℔; see parts list. |
| ① +20 VDC<br>② -15 VDC | Checks power supplied to plug-in from counter; see counter manual for power supply adjustment procedure. |
| ③ + 6 VDC<br>2 VAC | Checks 10-Mc drive of harmonic generator. |
| ④ ± 2 VDC<br>2 VAC | Checks generator diode drive. Voltages vary widely because of both the detuning effect of voltmeter probe and the variable value of A3R3. DC voltage may be either + or -, depending upon factory determined generator diode orientation. |
| ⑤ +100 MV DC<br>⑥ +100 MV DC | Voltages vary widely because of diode characteristics. Voltages are 0 VDC when diode shorted, and +20 VDC when diode open. Voltages should be approximately equal because of matched characteristics. |

CONNECT SIGNAL GENERATOR TO ℔ 5253A.
SET GENERATOR TO 102 MC, CW, 100 MV.
SET COUNTER CONTROLS AND 5253A TO MEASURE FREQUENCY OF INPUT SIGNAL.

| | |
|---|---|
| ⑦ 5 MV RMS | This voltage is total harmonic energy output of mixer and varies widely. |
| ⑧ -6 VDC<br>15 MV RMS | Checks bias and amplification of A1Q1 |
| ⑨ -10 VDC<br>200 MV RMS | Checks bias and amplification of A1Q2 |
| ⑩ -4 VDC<br>15 MV RMS | General check of low pass filter section |
| ⑪ -9 VDC<br>500 MV RMS | Checks bias and amplification of A1Q3 |
| ⑫ -8.5 VDC<br>300 MV RMS | Checks operation of A1Q4 |
| ⑬ 0 VDC<br>200 MV RMS | Checks operation of limiter, A1CR1 |
| ⑭ 0 MV DC WHEN METER READS AT LEFT END OF SCALE;<br>50 MV DC WHEN METER READS FULL SCALE;<br>15 MV DC WHEN TEST POINT #13 IS 100 MV RMS, AND METER READS AT RED-GREEN BORDER. | Checks accuracy of meter circuit in relation to output to counter |

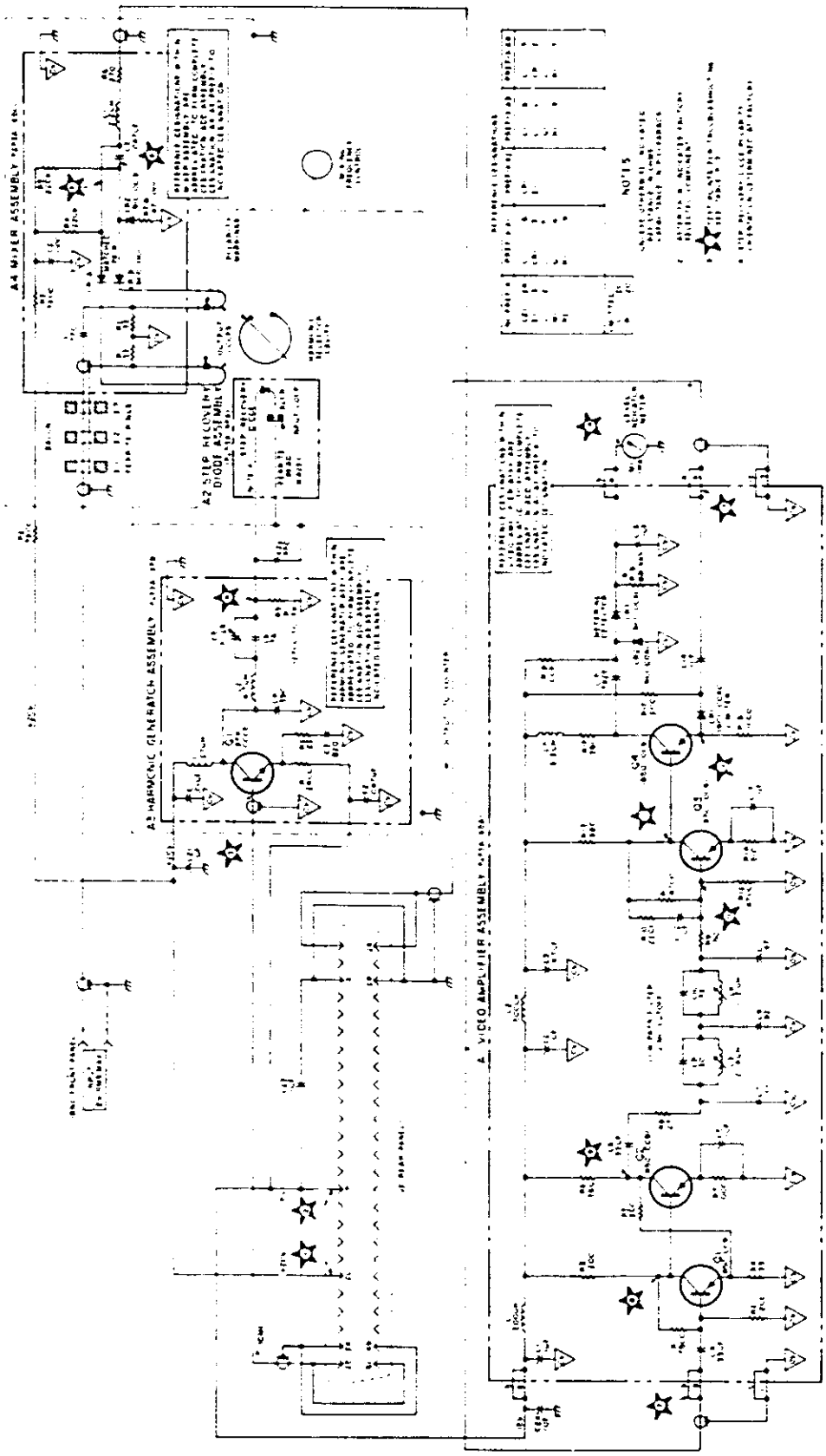


Figure IIA-8. Schematic Diagram

Table IIA-3. Reference Designation Index

| Reference Designation | Stock No. | Description # | Note |
|---|---|---|---|
| A1 | 5253A-65A | ASSY:VIDEO AMPLIFIER | |
| A1C1 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| A1C2 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| A1C3 | 0180-0100 | C:FXD ELECT TA 4.7 UF 10% 35VDCW | |
| A1C4 | 0160-0137 | C:FXD CER 0.33 UF 20% 25VDCW | |
| A1C5 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| A1C6 | 0160-0137 | C:FXD CER 0.33 UF 20% 25VDCW | |
| A1C7 | 0140-0176 | C:FXD MICA 100 PF 2% 300VDCW | |
| A1C8 | 0140-0203 | C:FXD MICA 30 PF 5% 500VDCW | |
| A1C9 | 0140-0193 | C:FXD MICA 82 PF 5% 300VDCW | |
| A1C10 | 0140-0191 | C:FXD MICA 56 PF 5% 300VDCW | |
| A1C11 | 0140-0204 | C:FXD MICA 47 PF 5% NPO 500VDCW | |
| A1C12 | 0150-0121 | C:FXD CER 0.1 UF +80-20% 50VDCW | |
| A1C13 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| A1C14 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| A1C15 | 0140-0189 | C:FXD MICA 5825 PF 2% 300VDCW | |
| A1C16 | 0150-0121 | C:FXD CER 0.1 UF +80-20% 50VDCW | |
| A1CR1 | 1901-0040 | DIODE:SILICON | |
| A1CR2 | 1901-0040 | DIODE:SILICON | |
| A1CR3 | 1901-0040 | DIODE:SILICON | |
| A1L1 | 9140-0118 | COIL:500MH 5% | |
| A1L2 | 9140-0118 | COIL:500 MH 5% | |
| A1L3 | 9140-0126 | COIL:VAR 1.76-4.02 UH | |
| A1L4 | 9140-0125 | COIL:VAR 0.9-1.9 UH | |
| A1L5 | 9140-0111 | COIL:FXD RF 3.3 UH | |
| A1Q1 | 1850-0091 | TRANSISTOR:GERMANIUM PNP 2N2048 | |
| A1Q2 | 1850-0091 | TRANSISTOR:GERMANIUM PNP 2N2048 | |
| A1Q3 | 1850-0091 | TRANSISTOR:GERMANIUM PNP 2N2048 | |
| A1Q4 | 1850-0091 | TRANSISTOR:GERMANIUM PNP 2N2048 | |
| A1R1 | 0683-7525 | R:FXD COMP 7500 OHM 5% 1/4W | |
| A1R2 | 0683-1225 | R:FXD COMP 1200 OHM 5% 1/4W | |
| A1R3 | 0683-1225 | R:FXD COMP 1200 OHM 5% 1/4W | |
| A1R4 | 0683-3305 | R:FXD COMP 33 OHM 5% 1/4W | |
| A1R5 | 0683-1225 | R:FXD COMP 1200 OHM 5% 1/4W | |
| A1R6 | 0683-3615 | R:FXD COMP 360 OHM 5% 1/4W | |
| A1R7 | 0683-1025 | R:FXD COMP 1000 OHM 5% 1/4W | |
| A1R8 | 0684-2701 | R:FXD COMP 27 OHM 10% 1/4W | |
| A1R9 | 0684-1511 | R:FXD COMP 150 OHM 10% 1/4W | |
| A1R10 | 0683-2225 | R:FXD COMP 2.2K OHM 5% 1/4W | |
| A1R11 | 0683-4725 | R:FXD COMP 4700 OHM 5% 1/4W | |
| A1R12 | 0683-4725 | R:FXD COMP 4700 OHM 5% 1/4W | |
| A1R13 | 0683-6815 | R:FXD COMP 680 OHM 5% 1/4W | |
| A1R14 | 0683-5115 | R:FXD COMP 510 OHM 5% 1/4W | |
| A1R15 | 0683-3915 | R:FXD COMP 390 OHM 5% 1/4W | |
| A1R16 | 0683-1025 | R:FXD COMP 1000 OHM 5% 1/4W | |
| A1R17 | 0683-1225 | R:FXD COMP 1200 OHM 5% 1/4W | |
| A1R18 | 0684-1041 | R:FXD COMP 100K OHM 10% 1/4W | |
| A1R19 | 0683-8205 | R:FXD COMP 82 OHM 5% 1/4W<br>FACTORY SELECTED PART;TYPICAL VALUE GIVEN | |

= See list of abbreviations in introduction to this section

Table IIA-3. Reference Designation Index (Cont'd)

| Reference Designation | # Stock No. | Description # | Note |
|---|---|---|---|
| A2 | 5253A-95A | ASSY:STEP RECOVERY DIODE<br>NOT RECOMMENDED FOR FIELD REPLACEMENT | |
| A2CR1 | 1901-0120 | DIODE:STEP RECOVERY,SPECIALLY SELECTED PART. | |
| A2E1 | | CORE:TOROID,SPECIALLY SELECTED PART. | |
| A3 | 5253A-65B | ASSY:HARMONIC GENERATOR | |
| A3C1 | 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | |
| A3C2 | 0170-0094 | C:FXD MY 0.047 UF 20% 50VDCW | |
| A3C3 | 0140-0151 | C:FXD MICA 3[illegible] PF 2% 300VDCW | |
| A3C4 | 0140-0200 | C:FXD MICA 3[illegible] PF 5% 300VDCW | |
| A3C5 | 0130-0016 | C:VAR CER 5-25 PF NPO | |
| A3C6 | 0140-0191 | C:FXD MICA 56 PF 5% 300VDCW | |
| A3L1 | 9140-0107 | COIL:FXD RF 27 UH | |
| A3L2 | 9140-0025 | COIL:FXD RF 4.7 UH | |
| A3R1 | 0686-2425 | R:FXD COMP 2400 OHM 5% 1/2W | |
| A3R2 | 0683-2205 | R:FXD COMP 22 OHM 5% 1/4W | |
| A3R3 | 0683-5625 | R:FXD COMP 5600 OHM 5% 1/4W<br>FACTORY SELECTED PART;TYPICAL VALUE GIVEN | |
| A4 | 5253A-65C | ASSY:MIXER<br>DOES NOT CONTAIN A4CR1, ORDER SEPARATELY | |
| A4C1 | 0140-0069 | C:FXD MICA 550 PF 10% 500VDCW | |
| A4C2 | 0150-0050 | C:FXD CER 1000 PF 600VDCW | |
| A4C3 | 0170-0040 | C:FXD MY 0.047 UF 10% 200VDC | |
| A4CR1,2 | 1901-0347 | DIODE:SILICON | |
| A4CR3 | 1910-0016 | DIODE:GERMANIUM 1 MICROSEC 60 WIV | |
| A4L1 | 9140-0142 | COIL:FXD RF 2.2 UH | |
| A4R1 | 0683-3305 | R:FXD COMP 33 OHM 5% 1/4W | |
| A4R2 | 0683-3305 | R:FXD COMP 33 OHM 5% 1/4W | |
| A4R3 | 0684-5621 | R:FXD COMP 5.6K OHM 10% 1/4W | |
| A4R4 | 0683-2245 | R:FXD COMP 220K OHM 5% 1/4W | |
| A4R5 | 0683-2245 | R:FXD COMP 220K OHM 5% 1/4W | |
| A4R6 | 0683-2715 | R:FXD COMP 270 OHM 5% 1/4W | |
| A4R7 | 0683-6205 | R:FXD COMP 62 OHM 5% 1/4W<br>FACTORY SELECTED APRT;TYPICAL VALUE GIVEN | |
| C21 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| C22 | 0140-0069 | C:FXD MICA 550 PF 10% 500VDCW | |
| C23 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| C24 | 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | |
| E1 | 9170-0059 | CORE:TOROID | |
| E2 | 9170-0059 | CORE:TOROID | |
| E3 | 9170-0059 | CORE:TOROID | |
| J1 | 1250-0102 | CONNECTOR:BNC | |
| J2 | 1251-0099 | CONNECTOR:50-PIN MINIATURE | |
| R21 | 0684-5621 | R:FXD COMP 5600 OHM 10% 1/4W | |
| XA1 | 1251-0135 | CONNECTOR:15 CONTACTS | |

= See list of abbreviations in introduction to this section

Table IIA-4. Replaceable Parts

| Stock No. | Description # | Mfr. | Mfr. Part No. | TQ |
|---|---|---|---|---|
| 5253A-65A | ASSY:VIDEO AMPLIFIER | 28480 | 5253A-65A | 1 |
| 5253A-65B | ASSY:HARMONIC GENERATOR | 28480 | 5253A-65B | 1 |
| 5253A-65C | ASSY:MIXER | 28480 | 5253A-65C | 1 |
| 5253A-95A | ASSY:STEP RECOVERY DIODE | 28480 | 5253A-95A | 1 |
| 0130-0016 | C:VAR CER 5-25 PF NPO | 28480 | 0130-0016 | 1 |
| 0140-0069 | C:FXD MICA 550 PF 10% 500VDCW | 00853 | TYPE M100 E10 | 2 |
| 0140-0151 | C:FXD MICA 820 PF 2% 300VDCW | 04062 | DM15F 821G | 1 |
| 0140-0176 | C:FXD MICA 100 PF 2% 300VDCW | 04062 | DM15F 101G 300V | 1 |
| 0140-0189 | C:FXD MICA 5825 PF 2% 300VDCW | 04062 | DM20F 5825G | 1 |
| 0140-0191 | C:FXD MICA 56 PF 5% 300VDCW | 04062 | DM15E 560J 300V | 2 |
| 0140-0193 | C:FXD MICA 82 PF 5% 300VDCW | 04062 | DM15E 820J 300V | 1 |
| 0140-0200 | C:FXD MICA 390 PF 5% 300VDCW | 04062 | DM15F 391J 300V | 1 |
| 0140-0203 | C:FXD MICA 30 PF 5% 300VDCW | 04062 | DM15F 300J 500V | 1 |
| 0140-0204 | C:FXD MICA 47 PF 5% NPO 500VDCW | 04062 | DM15E 470J | 1 |
| 0150-0050 | C:FXD CER 1000 PF 500VDCW | 18486 | TYPE E | 1 |
| 0150-0093 | C:FXD CER 0.01 UF +80-20% 100VDCW | 91413 | TA | 1 |
| 0150-0121 | C:FXD CER 0.1 UF +80-20% 50VDCW | 56289 | 5C50A | 2 |
| 0160-0127 | C:FXD CER 1.0 UF 20% 25VDCW | 56289 | 5C13 | 8 |
| 0160-0137 | C:FXD CER 0.33 UF 20% 25VDCW | 56289 | 5C10 | 2 |
| 0170-0040 | C:FXD MY 0.047 UF 10% 200VDCW | 56289 | 192P47392 | 1 |
| 0170-0094 | C:FXD MY 0.047 UF 20% 50VDCW | 84411 | TYPE 602 | 1 |
| 0180-0100 | C:FXD ELECT TA 4.7 UF 10% 35VDCW | 56289 | 1500475X9035B2 | 1 |
| 0683-1025 | R:FXD COMP 1000 OHM 5% 1/4W | 01121 | CB 1025 | 2 |
| 0683-1225 | R:FXD COMP 1200 OHM 5% 1/4W | 01121 | CB 1225 | 4 |
| 0683-2205 | R:FXD COMP 22 OHM 5% 1/4W | 01121 | CB 2205 | 1 |
| 0683-2225 | R:FXD COMP 2.2K OHM 5% 1/4W | 01121 | CB 2225 | 1 |
| 0683-2245 | R:FXD COMP 220K OHM 5% 1/4W | 01121 | CB 2245 | 2 |
| 0683-2715 | R:FXD COMP 270 OHM 5% 1/4W | 01121 | CB 2715 | 1 |
| 0683-3305 | R:FXD COMP 33 OHM 5% 1/4W | 01121 | CB 3305 | 3 |
| 0683-3615 | R:FXD COMP 360 OHM 5% 1/4W | 01121 | CB 3615 | 1 |
| 0683-3915 | R:FXD COMP 390 OHM 5% 1/4W | 01121 | CB 3915 | 1 |
| 0683-4725 | R:FXD COMP 4700 OHM 5% 1/4W | 01121 | CB 4725 | 2 |
| 0683-5115 | R:FXD COMP 510 OHM 5% 1/4W | 01121 | CB 5115 | 1 |
| 0683-5625 | R:FXD COMP 5600 OHM 5% 1/4W | 01121 | CB 5625 | 1 |
| 0683-6205 | R:FXD COMP 62 OHM 5% 1/4W | 01121 | CB 6205 | 1 |
| 0683-6815 | R:FXD COMP 680 OHM 5% 1/4W | 01121 | CB 6815 | 1 |
| 0683-7525 | R:FXD COMP 7500 OHM 5% 1/4W | 01121 | CB 7525 | 1 |
| 0683-8205 | R:FXD COMP 82 OHM 5% 1/4W | 01121 | CB 8205 | 1 |
| 0684-1041 | R:FXD COMP 100K OHM 10% 1/4W | 01121 | CB 1041 | 1 |
| 0684-1511 | R:FXD COMP 150 OHM 10% 1/4W | 01121 | CB 1511 | 1 |
| 0684-2701 | R:FXD COMP 27 OHM 10% 1/4W | 01121 | CB 2701 | 1 |
| 0684-5621 | R:FXD COMP 5600 OHM 10% 1/4W | 01121 | CB 5621 | 2 |
| 0686-2425 | R:FXD COMP 2400 OHM 5% 1/2W | 01121 | EB 2425 | 1 |
| 1250-0102 | CONNECTOR:BNC | 91737 | 1250-0102 | 1 |
| 1251-0099 | CONNECTOR:50-PIN MINIATURE | 02660 | 57-10500 | 1 |
| 1251-0135 | CONNECTOR:15-CONTACTS | 95354 | SD 615UR | 1 |
| 1850-0091 | TRANSISTOR:GERMANIUM PNP 2N2048 | 87216 | 2N2048 | 4 |
| 1901-0040 | DIODE:SILICON | 28480 | 1901-0040 | 3 |
| 1901-0347 | DIODE:SILICON | 28480 | 1901-0347 | 2 |
| 1910-0016 | DIODE:GERMANIUM 1 MICROSEC 60 WIV | 28480 | 1910-0016 | 1 |
| 9140-0025 | COIL:FXD RF 4.7 UH | 28480 | 9140-0025 | 1 |
| 9140-0107 | COIL:FXD RF 27 UH | 28480 | 9140-0107 | 1 |
| 9140-0111 | COIL:FXD RF 3.3 UH | 28480 | 9140-0111 | 1 |
| 9140-0118 | COIL:500 MH 5% | 99800 | 2500-14 | 2 |
| 9140-0125 | COIL:VAR 0.9-1.9 UH | 28480 | 9140-0125 | 1 |
| 9140-0126 | COIL:VAR 1.76-4.02 UH | 28480 | 9140-0126 | 1 |
| 9140-0142 | COIL:FXD RF 2.2 UH | 28480 | 9140-0142 | 1 |
| 9170-0059 | CORE:TOROID | 02114 | 396T125-102 | 3 |

= See list of abbreviations in introduction to this section

# MANUAL CHANGES

HEWLETT PACKARD

# MANUAL CHANGES

**MANUAL DESCRIPTION**

INSTRUMENT: 5253B Frequency Converter
Operating & Service Manual
SERIAL PREFIX: 1124A

DATE PRINTED: AUGUST 1974
HP PART NO: 05253-9017
MICROFICHE NO: 05253-9018

**CHANGE DATE** November 21, 1977

(This change supersedes all earlier dated changes)

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

| IF YOUR INSTRUMENT HAS SERIAL PREFIX OR SERIAL NUMBER | MAKE THE FOLLOWING CHANGES TO YOUR MANUAL | IF YOUR INSTRUMENT HAS SERIAL PREFIX OR SERIAL NUMBER | MAKE THE FOLLOWING CHANGES TO YOUR MANUAL |
|---|---|---|---|
| | | | |
| | | | |

► NEW OR REVISED ITEM

ERRATA

Page 1-0, Figure 1-1, Model 5253B and Accessory:
The 5253B Frequency Converter is supplied less the Model 10503A BNC-BNC coaxial cable shown in Figure 1-1. The cable assembly is available as an additional cost accessory.

Page 1-1/1-2, Paragraph 1-7 Accessory:
Change Paragraph 1-8 to the following:

1-8. A Model 10503A 50-ohm coaxial cable, 122 cm (48 in) long, male BNC to male BNC, is available as an accessory at an additional cost.

Page 1-1/1-2, Table 1-1 Specifications:
Change ACCESSORY FURNISHED to ACCESSORY AVAILABLE:
HP 10503A (AC-16K) Cable 122 cm (4-feet) long, male BNC connectors.

►Page 6-5, Table 6-1, Reference Designation Index:
Change A3C2 part number from 0170-0094 or 0160-0575 to 0160-4256; C: FXD CER 0.047 UF 20% 200VDCW.

Page 6-7, Table 6-2, Replaceable Parts:
Change 0170-0094 to 0160-0575; Mfr to 28480; Mfr Part No. to 0160-0575.

# HP MANUAL CHANGES

MAKE ALL CORRECTIONS IN YOUR MANUAL ACCORDING TO ERRATA.

Check the following table for your instrument serial prefix and make any indicated changes to the manual:

MANUAL TITLE: 5253B
MANUAL PRINTED: August 74
MANUAL PART NO: 05253-9017
CHANGE DATE: 26th November, 74

| SERIAL PREFIX | MAKE CHANGE | SERIAL PREFIX | MAKE CHANGE | SERIAL PREFIX | MAKE CHANGE |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

ERRATA All 10% carbon composition resistors are replaced with 5%.
Number sequence is changed:-

0684-xxx1 to 0683-xxx5
0687-xxx1 to 0696-xxx5