#### **Errata**

Title & Document Type: 8552A Spectrum Analyzer IF Section Operating and

**Service Manual** 

Manual Part Number: 08552-90023

**Revision Date: May 1970** 

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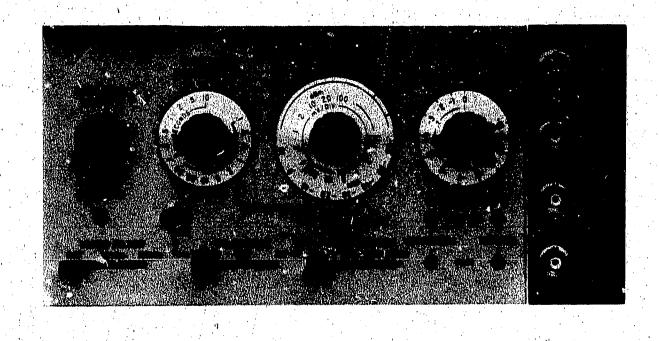
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## SPECTRUM ANALYZER IF SECTION 8552A





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# 8552A SPECTRUM ANALYZER IF SECTION

#### SERIAL PREFIXES

This manual applies directly to HP Model 8552A IF Section having Serial Prefix numbers listed below:

#### Serial Prefixes:

809-, 821 , 825-, 837-, 841-, 844-851-, 852-, 903-, 905-, 943-, 945-, 952-.

#### **OTHER PREFIXES**

For Serial Prefixes not listed, a "Manual Changes" sheet is included with this manual.

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#### **FOREWORD**

A complete set of manuals for a spectrum analyzer consists of the IF Section manual(s), the RF Section manual(s), and the Display Section Manual(s). The various manuals for the analyzer are listed and described below:

- 1. 8552A Spectrum Analyzer IF Section Operating and Service Manual. (08552-90023)

  Includes operating and service information for the 8552A Spectrum Analyzer IF Section.
- 2. 8553B Spectrum Analyzer RF Section Operating and Service Manual. (08553-90013)
  Includes operating and service information for the 8553B Spectrum Analyzer RF Section.
- 3. 8554L/8552A Spectrum Analyzer Operating Manual. (08554-90016)
  Shows how to operate the instrument and provides some application information.
- 4. 8554L/8552A Spectrum Analyzer Calibration and Adjustment Manual. (08554-90009) Contains performance tests, calibration procedures and adjustment instructions.
- 5. 8554L/8552A Spectrum Analyzer Service Manual. (08554-90010)

  Contains schematics, theory, troubleshooting information and other data required to service and maintain the instrument.
- 6. DISPLAY SECTION OPERATING AND SERVICE MANUALS:
  - a. 140A Oscilloscope Operating and Service Manual.

    Includes operating and service information for the 140A Oscilloscope Mainframe.
  - b. 140S Display Section Operating and Service Manual.

    Includes operating and service information for the 140S Display Section.
  - c. 140T Display Section Operating and Service Manual.
    Includes operating and service information for the 140T Display Section.
  - d. 141A Oscilloscope Operating and Service Manual.

    Includes operating and service information for the 141A Oscilloscope Mainframe.
  - e. 141S Display Section Operating and Service Manual.
    Includes operating and service information for the 141S Display Section.
  - f. 141T Display Section Operating and Service Manual.

    Includes operating and service information for the 140T Display Section.
  - g. 143A Oscilloscope Operating and Service Manual.
    Includes operating and service information for the 143A Oscilloscope Mainframe.

NOTE: Spectrum Analyzer Application Notes are available upon request.

General Information Model 8552A

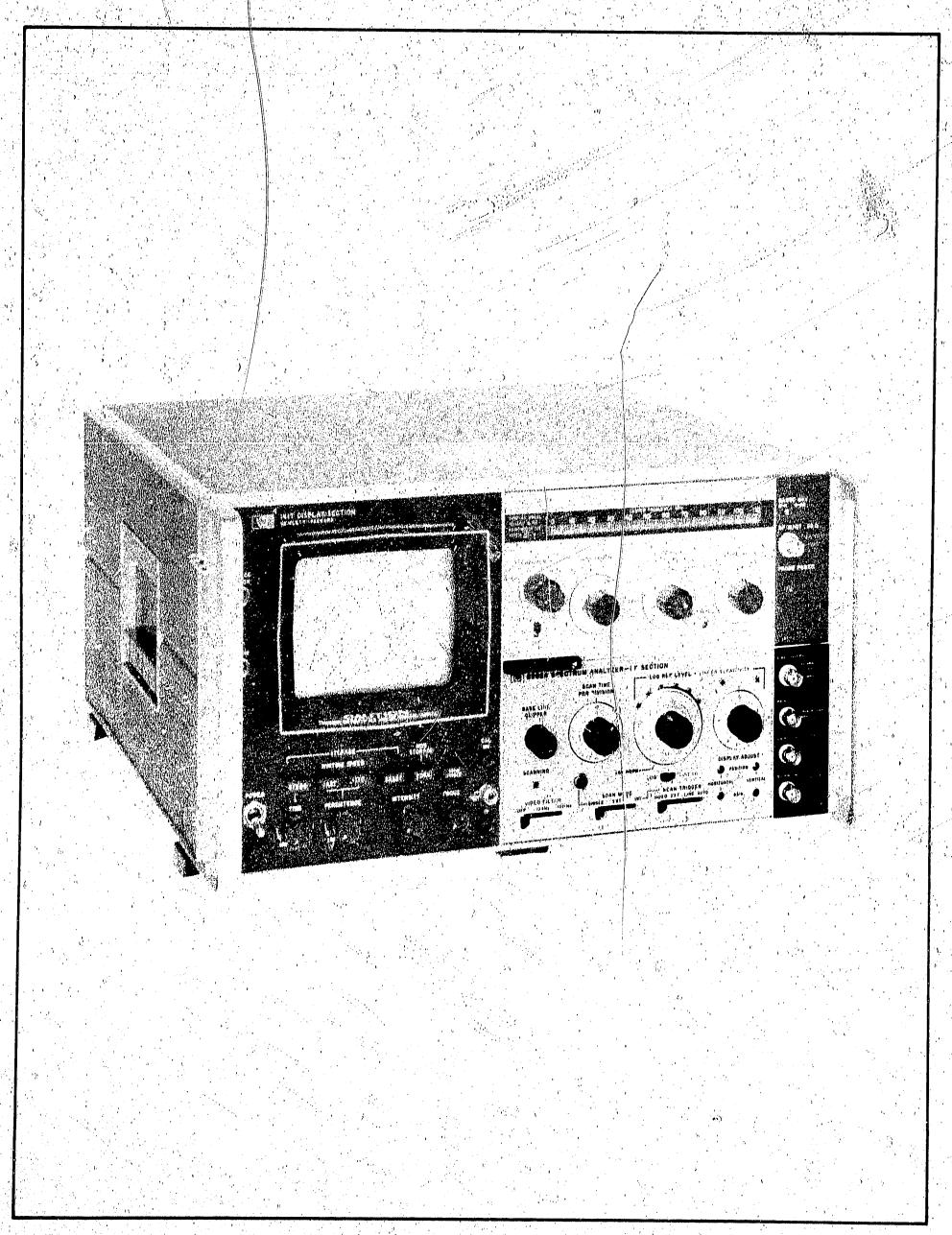


Figure 1-1. Model 8552A Spectrum Analyzer IF Section with Model 8553B Spectrum Analyzer RF Section and 141T Display Section.

#### SECTION I/ GENERAL INFORMATION

#### 1-1. INTRODUCTION.

- 1-2. This manual contains pertinent information required to install, operate, test, adjust and service the Hewlett-Packard Model 8552A Spectrum Analyzer IF Section. This section covers instrument identification, description, options, accessories, specifications and other basic information.
- 1-3. Figure 1-1 shows the Hewlett-Packard Model 8552A Spectrum Analyzer IF Section with the Model 8553B Spectrum Analyzer RF Section and the Model 141T Display Section.
- 1-4. The various sections in this manual provide information as follows:

SECTION II, INSTALLATION, provides information relative to inspection, power requirements, mounting, packing and shipping, etc.

SECTION III, OPERATION, provides information relative to operating the equipment.

SECTION IV, PERFORMANCE TESTS, provides information required to ascertain that the instrument is performing in accordance with published specifications.

SECTION V, ADJUSTMENTS, provides information required to properly adjust and align the instrument.

SECTION VI, PARTS LIST, provides ordering information for all replaceable parts and assemblies.

SECTION VII, MANUAL CHANGES, normally will contain no relevant information in the original issue of a manual. This section is reserved to provide back-dated and up-dated information in manual revisions or reprints.

SECTION VIII, SERVICE, includes information for servicing the instrument.

#### 1-5. INSTRUMENTS COVERED BY MANUAL.

1-6. Hewlett-Packard instruments carry an eight digit serial number (see Figure 1-2) on the back panel. When the serial number prefix on the instrument serial number plate of your instrument is the same as one of the prefix numbers on the inside

title page of this manual, the manual applies directly to the instrument. When the instrument serial number prefix is not listed on the inside title page of initial issue, manual change sheets and manual up-dating information is provided. Later editions or revisions to the manual will contain the required change information in Section VII.

#### 1-7. DESCRIPTION.

- 1-8. The HP Model 8552A Spectrum Analyzer IF Section is shown in Figure 1-1 with the Model 8553B Spectrum Analyzer RF Section and the Model 141T Display Section. The 8552A Specifications are contained in Table 1-1.
- 1-9. Each analyzer is a highly sensitive superheterodyne receiver with spectrum scanning capabilities determined by the RF Section. Output video from the receiver circuits is applied to the CRT in the display section; thus, a signal or group of signals can be analyzed in the frequency domain. Input signals are plotted on the CRT as a function of amplitude versus frequency. The amplitude (y-axis) of the CRT is calibrated in absolute units of power (dBm) or voltage ( $\mu V/mV$ ); accordingly, absolute and relative measurements of both amplitude and frequency can be made.
- 1-10. The controls of each instrument are arranged for easy operation. For wide spectrum analysis the operator can use a wide preset scan; the width depends on the RF Section used. For a more detailed study, the spectrum width can be progressively narrowed, again depending on the RF Section. The scanning capabilities of each IF Section and RF Section combination can be eliminated altogether to use the instrument as a fixed frequency receiver. The RF Section's widest bandwidth is automatically selected for preset scan operation; for variable scan and fixed frequency operation, narrower bandwidths can be selected by the operator.

#### 1-11. OPTIONAL EQUIPMENT.

1-12. The IF/RF Section combinations can be used with any 140 series oscilloscope. The 140 Display Sections are equipped with a fixed-presistence non-storage CRT whereas the 141 Display Sections are equipped with a variable-presistence storage CRT. Overlays are available for the standard 140A and 141A Display Section to provide LOG and LINEAR graticule scales.

General Information Model 8552

1-13. IF Section's bearing serial numbers 945-01889 and below must be modified to provide interface compatibility with the HP Model 8443A Tracking Generator/Counter. The required modification kit part number is HP 08552-6060. After modification, the unit is designated as 8552A-TG-1.

1-14. IF Section's bearing serial numbers above 945-01889 require no modification to be compatible with the 8443A Tracking Generator/Counter.

#### 1-15. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

1-16. The 8552A Spectrum Analyzer IF Section must be mated with an RF Section such as the 8553B or 8554L and one of the 140 series oscilloscopes before the units can perform their functions as analyzers.

#### 1-17. EQUIPMENT AVAILABLE.

1-18. Table 1-2 lists the test equipment and test equipment accessories required to check, adjust and repair the 8552A Spectrum Analyzer IF Section.

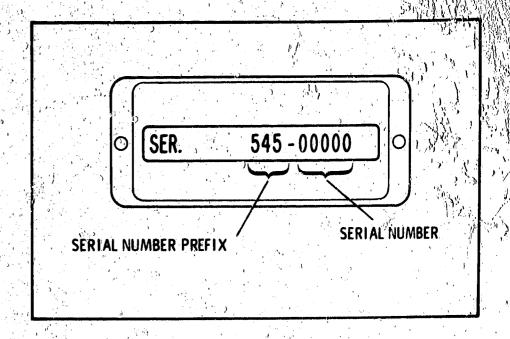


Figure 1-2. Instrument Identification

#### 1-19. WARRANTY.

1-20. The 8552A Spectrum Analyzer IF Section is warranted and certified as indicated on the inner front cover. For further information, contact the nearest Hewlett-Packard Sales and Service Office; addresses are provided at the back of this manual.

Table 1-1. 8552A Specifications

#### GENERAL SPECIFICATIONS

Scan Time: 16 internal scan rates from 0.1 ms/div to 10 sec/div in a 1,2,5 sequence.

Scan Time Accuracy:

0.1 ms/div to 20 ms/div: ±10% 50 ms/div to 10 sec/div: ±20%

Scan Characteristics

Scan Mode:

Int: Analyzer repetitively scanned by internally generated ramp; synchronization selected by Scan Trigger.

Single: Single scan actuated by front panel pushbutton.

Ext: Scan determined by 0 to +8 volt external signal; scan input impedance >10 k $\Omega$ . Blanking: +1.5V external blanking signal required.

Scan Trigger: For Int scan mode, select between:

Auto: Scan free runs.

Line: Scan synchronized with power line frequency.

Ext: Scan synchronized with >2 volt (20 volt max.) trigger signal polarity selected by internally located switch in Model 8552A IF Section.

Video: Scan internally synchronized to envelope of RF input signal (signal amplitude of 1.5 major divisions peak-topeak required on display section CRT).

#### Penlift Characteristics:

Penlift oùtput 0-14 volts (0

Output available in Int and Single Scan modes and Auto, Line, and Video scan trigger.

Power Requirements: 115 or 230 volts ±10%, 50 to 60 Hz, normally less than 225 watts (varies with plug-in units used).

#### Weight:

Model 8552A IF Section: Net 9 lb (4,1 kg). Shipping, 14 lb (6,4 kg).

#### Table 1-1, 8552A Specifications (cont'd)

#### AMPLITUDE SPECIFICATIONS

Absolute Amplitude Calibration Range:

Log: From 130 to +10 dBm, 10 dB/div

on a 70 dB display.

Linear from 0.1 aV/div to 100 mV div/ii/.

2 1,2 sequence on an 8-division display.

Calibrator Chatgut:

Amplitude: -30 dBm, ±0.3 dB Frequency: 80 MHz, ±0.3 MHz Amplitude Accuracy:

Log : Linear

Switching between

bandwidths:  $(20^{\circ}C)$   $\pm 0.5$  dB  $\pm 5.8\%$ Amplitude Display:  $\pm 0.25$  dB/dB  $\pm 2.8\%$ 

> but not more of full 8 than ±1.5 dB division over full 70 dB deflection

display range.

FREQUENCY SPECIFICATIONS

Resolution

Bandwidth: IF bandwidths of 50 Hz and 0.1 to 300 kHz provided in a 1,3

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Bandwidth Accuracy: Individual IF bandwidths: 3 dB points calibrated to ±20% (10 kHz bandwidth ±5%).

Bandwidth Selectivity: 60 dB/3 dB IF bandwidth ratio <20:1 for IF bandwidths from 1 kHz to 300 kHz. 60 dB/3 dB bandwidth ratio <25:1 for 50, 100 and 300 Hz IF bandwidths.

Table 1-2. Test Equipment and Test Accessories

Item	Minimum Specifications or Required Features	Suggested Model	(Note 1)
Frequency Comb Generator	Frequency markers spaced 1, 10, 100 MHz apart; usable to 120 MHz Frequency Accuracy: ±0.01% Output Amplitude: >-40 dBm	HP 8406A Generator	P
HF Signal Generator	Frequency Range: 1-50 MHz Output Amplitude: -20 dBm Output Amplitude Accuracy: ± 1% Frequency Accuracy: ±1% Output Impedance: 50 ohms	HP 606B HF Signal Generator	A
VHF Signal Generator	Frequency Range: 40—310 MHz Frequency Accuracy: ±1% Output Amplitude: >—20 dBm Output Impedance: 50 ohms	HP 608E/F VHF Signal Generator	P,A,T
Sweep Oscillator	Frequency Range: 1-110 MHz Output Flatness: ±0.25 dB over full band Output Impedance: 50 ohms External VTO: must be capable for use as a tracking oscillator; +3 dBm, 201-310 MHz input from VTO to obtain 1-110 MHz output. Output Amplitude: at least 0 dBm	HP 8601A Gener- ator/Sweeper	A

NOTE 1, USE: Performance = P, Adjustment = A, Troubleshooting = T

Table 1-2. Test Equipment and Test Accessories (cont'd)

Item	Minimum Specifications or Required Features	Suggested Model	(Note 1)
Oscillator Synchronizer	Frequency Range: 50 kHz-310 MHz Input Signal Level: 50 kHz-20 MHz; 0.1-2V rms into 50 ohms, 10-310 MHz 180-400 mV rms into 50 ohms Frequency Reference Stability: short term, 5 x 10-8/ minute Frequency Control Output: frequency control voltage directly compatible with HP 606B and HP 608F signal generators; output voltage range, -2 to -32 Vdc (maximum)	HP 8708A Synchronizer	A
Crystal Detector	Frequency Range: 1-50 MHz Sensitivity: >0.04 mV/µW Frequency Response: ±0.2 dB Polarity: Negative	HP 423A Crystal Detector	A
Audio Oscillator	Frequency Range: 10 kHz Output Amplitude: 2 Vrms Frequency Accuracy: ±2% Output Impedance: 600 ohms	HP 200 C D Audio Oscillator	Р, А
Power Supply	Output Voltage: Variable, 0—30 Vdc Output Current: 0—400 mA Meter Resolution: <5 mV	HP 6217A Power Supply	A
Amplifier	Frequency Range: 40—60 MHz Amplifier Gain: 20 and 40 dB Input and Output Impedance: 50 ohms	HP 8447A Dual Amplifier	A
Frequency Counter	Frequency Range: 100 kHz—310 MHz Accuracy: ±0.001% Sensitivity: 100 mV rms Readout Digits: 7 digits	HP 5245L Frequency Counter with HP 5252A Plug-in	P, A, T
Tunable RF Voltmeter	Bandwidth: 1 kHz Frequency Range: 1—310 MHz Sensitivity: 10 mV−1 Vrms Input Impedance: ≥0.1 megohms	HP 8405A Vector Voltmeter	P, A, T
Digital Voltmeter	Voltage Accuracy: ±0.2% Range Selection: Manual or Automatic Voltage Range: 1—1000 Vdc full scale Input Impedance: 10 megohms Polarity: Automatic indication	HP 3440 A Digital Voltmeter with HP 3443 A Plug-in	<b>A, T</b>
Oscilloscope	Frequency Range: dc to 50 MHz Time Base: 1 µs/div to 10 ms/div Time Base Accuracy: ±3% Dual Channel, Alternate Operation Ac or Dc Coupling External Sweep Mode Voltage Accuracy: ±3% Sensitivity: 0.005 V/div	HP 180A with HP 1801A Vertical Amplifier and HP 1821A Hori- Contal Amplifier HP 10004A 10:1 Divider Probes (2)	<b>A, T</b>

Table 1-2. Test Equipment and Test Accessories (cont'd)

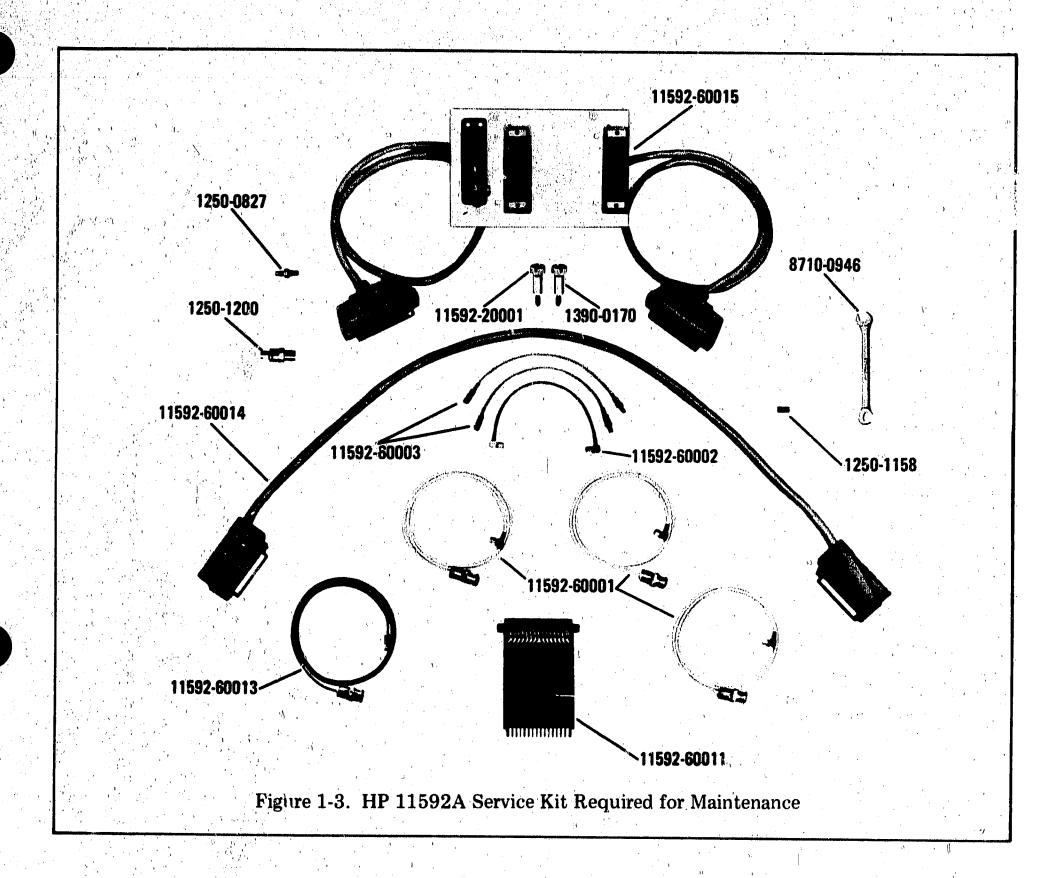
Item	Minimum Specifications or Required Features	Suggested Model	(Note 1
Ohmmeter	Resistance Range: 1 ohm—100 megohm Accuracy: ±10% of Reading	41/44)	T
50-ohm Tee	Type N female connectors on two ports, with the third port able to accept HP 8405A probe tips.	HP 11536A 50-Ohm Tee	<b>P, A</b>
12 dB Variable Attenuator	Frequency Range: DC-10 MHz Flatness: ±0.3 dB	HP 355C	A
Variable Attenuator	0—60 dB in 10 dB steps	HP 355D	A
50-Ohm Termination	Frequency Range: DC—310 MHz VSWR: 1.1 Power Rating: 0.5 Watts Connector: Type N Male	HP 908A Coaxial Termination	P, A
Variable Voltage Transformer	Range: 102—127 Vac Voltmeter Range: 103—127 Vac ±1 volt	General Radio W5MT3A or Superior Electric UC1M	A
BNC Tee	Two BNC Female Connectors; one Male BNC Connector	UG-274B/U HP 1250-0781	Р, А, Т
Adapter	BNC Male to Type N Female	UG-349A/U HP 1250-0077	<i>о</i> <b>А</b>
Adapter	BNC Male to Binding Post	HP 10110A	A
Adapter (two)	BNC Female to Type N Male	UG-201A/U HP 1250-0780	Р, А
Voltage Probe	Dual Banana Plug-to-Probe Tip and Clip (Ground) Lead	HP 10025A Straight-Thru Voltage Probe	P, A, T
Cable Assy (3)	Male BNC Connectors, 48 inches long	HP 10503A	P, A, T
Cable Assy	BNC Male to Dual Banana Plug, 45 inches long	HP 11001A	P, A, T
Cable Assy 18	Dual Banana Plug to Clip Leads, 45 inches long	HP 11002A	P, A, T
Cable Assy	Dual Banana Plug to Dual Banana Plug, 44 inches long	HP 11000A	P, A, T
Cable Assy	BNC Male to one end only; 44 "long. (Attach Test Clips to Shield and Center Conductor.)	HP 10501A	Р, А, Т
Tuning Tool, Slot	Nonmetallic, 6-inch shaft	Gowanda PC9668	A, T

Table 1-2. Test Equipment and Test Accessories (cont'd)

Item	Minimum Specifications or Required Features	Suggested Model	(Note 1
Screwdrivers	Pozidriv #1 (small) Stanley #5531	HP 8710-0899	А, Т
Tuning tool, Slot	Nonmetallic, 2.5-inch shaft	HP 8710-0095	A, T
Capacitor	8200 pF (approx.), see Paragraph 5-38	HP 0140-0184	A, T
Adapter	Type N Female Connector to Type N Female Connector	UG-29B/U HP 1250-0777	P, A, T
Adapter	Type N Female to BNC Female Adapter	FXR 21850	P, A, T
Adapter	Type BNC Plug-to-Plug Adapter	UG-491B/U HP 1250-0216	P, A, T
Service Kit	Contents: 140/141 Display Section to Spectrum Analyzer Plug-in Extender Assembly (HP 11592-60015)	HP 11592A Service Kit	Α, Τ
	IF to RF Unit Interconnection Extender Cable Assembly (HP 11592-60014) Selectro Female to BNC Male Test Cable,		
	Three each, 36" long (HP 11592-60001) Selectro Male to Selectro Female Test Cable, Two each, 8" long (HP 11592-60003)		
	Selectro Female to Selectro Female Cable, Two each, 8" long (HP 11592-60002)		
	Extender Board Assembly, 15 pins, 30 conductors, for Plug-in Circuit Boards (HP 11592-60011)		
	Fastener Assembly, 8553 Circuit Board Extender, Two each (HP 11592-20001 and HP 1390-0170)		\(\frac{1}{2}\)
	Selector Jack-to-Jack Adapter (HP 1250-0827)		
	Wrench, open-end, 15/64" (HP 8710-0946)		
	BNC Jack-to-OSM Plug Adapter (HP 1250-1200)		•
	OSM Plug-to-Plug Adapter (HP 1250-1158)		.' , , , , , ,
	Cable Assembly, R and P Connector (HP 11592-60013)		

NOTE 1, USE: Performance = P, Adjustment = A, Troubleshooting = T.

Model 8552A General Information



### SECTION II INSTALLATION

#### 2-1. SHIPPING INFORMATION.

2-2. Because of individual customer requirements, shipping configurations are flexible. Initial inspection is based on the premise that the RF and IF sections are installed in the display section; thus, the instrument is physically and functionally complete for test. Since the RF and IF sections are usually received separately the plug-ins must be mechanically fitted together, electrically connected, and inserted in an oscilloscope mainframe of the 140-series.

#### 2-3. INITIAL INSPECTION.

#### 2-4. Mechanical Check.

2-5. If shipping carton is damaged, ask that agent of carrier be present when instrument is unpacked. Inspect instrument for mechanical damage such as scratches, dents, broken knobs, or other defects. Also, check cushioning material for signs of severe stress.

#### 2-6. Performance Checkout.

2-7. As soon as possible after receipt, the instrument should be performance-tested in accordance with the Performance Test, Section IV.

#### 2-8. CLAIMS FOR DAMAGE.

2-9. If the Spectrum Analyzer IF Section is mechanically damaged or fails to meet the specified performance tests, immediately notify the carrier and the nearest Hewlett-Packard Sales and Service Office. (A current list of sales and service offices appears at the back of this manual.) Retain shipping carton and padding material for inspection by the carrier. Any Hewlett-Packard Sales and Service Office will arrange for instrument repair or replacement without waiting for a claim settlement with the carrier.

#### 2-10. POWER REQUIREMENTS.

#### 2-11. Source Power.

2-12. The Spectrum Analyzer can be operated from a 50- to 60-hertz input line that supplies

either 115-volt or 230-volt (±10% in each case) power. Consumed power varies with the plug-ins used but is normally less than 225 watts. Line power enters the display section mainframe and is distributed to the RF and IF sections via internal connectors.

#### 2-13. Preliminary Power Settings.

2-14. The 115/230 power selector switch at rear of display section must be set to agree with the available line voltage — that is, if the line voltage is 115 volts, the slide switch must be positioned so that 115 is clearly visible. (The instrument is internally fused for 115-volt operation; if 230-volt power is used, refer to fuse replacement procedures in the display section manual.

#### 2-15. Power Cable.

2-16. To protect operating personnel, the National Electrical Manufacturers' Association (NEMA) recommends that instrument panel and cabinet be grounded. The analyzer is equipped with a three-conductor power cable; the third conductor is the ground conductor and, when the cable is plugged into an appropriate receptacle, the instrument is grounded. To preserve the protection feature when operating the instrument from a two-contact outlet, use a three-prong to two-prong adapter and connect the green lead on the adapter to ground.

#### 2-17. CONNECTIONS.

2-18. Since the RF and IF Sections are usually shipped separately, the plug-ins must be mechanically fitted together, electrically connected, and then inserted into the display section mainframe. To make these connections refer to the RF Section Manual.

#### 2-19. INSTALLATION CHECKOUT.

2-20. After installing the IF/RF Sections in the Display Section, the installation procedures given in Section II of the RF Section manual should be performed.

# 

# PEREDRIANCE OF CHECK

## SECTION III OPERATION

#### 3-1. INTRODUCTION.

3-2. This section provides operating instructions for the HP 8552A Spectrum Analyzer IF Section. Front and rear panel controls and connectors are described in Figure 3-1. Operation adjustments for the IF Section are given in the appropriate RF Section Manuals.

3-3. The IF Section processes the 50 MHz signal from the RF Section for display on the CRT. Control functions on the IF Section include scan time, scan mode, scan trigger, video filter, horizontal and vertical gain adjustments, and the log reference level-linear sensitivity control. The bandwidth control on the RF Section controls the bandwidth of the IF Section.

#### 3-4. CONTROLS AND CONNECTORS.

3-5. The front and rear panel controls and connectors are identified in Figure 3-1. Identification is keyed to corresponding numbers indicated in the figure.

#### 3-6. OPERATIONAL ADJUSTMENTS.

3-7. During checkout at the factory, the IF Section is adjusted for proper operation. Upon receipt of the instrument the operator should perform the front panel adjustments given in the RF Section manual to ensure that the RF and IF Sections are calibrated properly.

#### 3-8. GENERAL OPERATING INSTRUCTIONS.

3-9. Refer to the RF Section manuals for specific operating instructions.

Operation

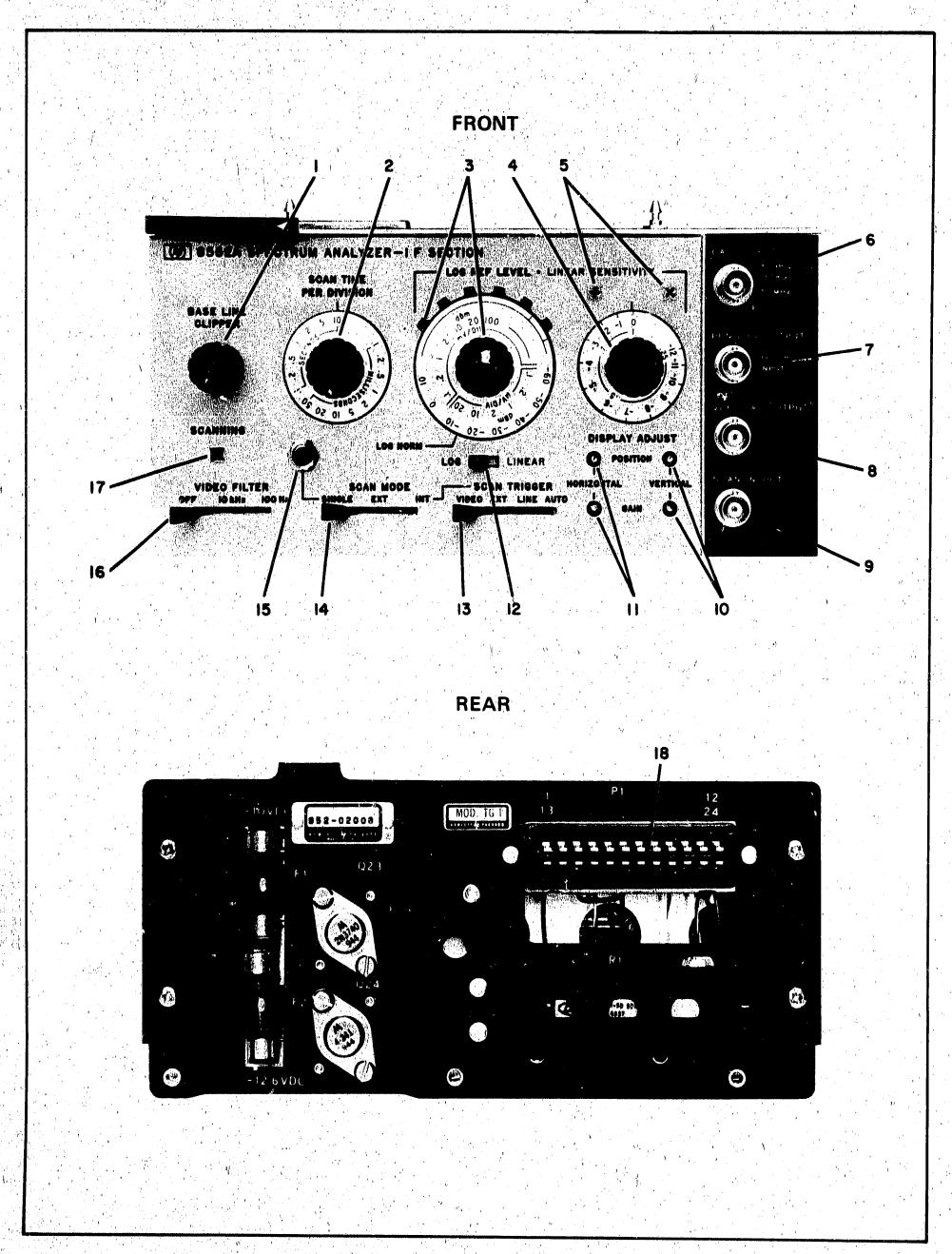


Figure 3-1. 8552A Spectrum Analyzer IF Section Controls and Connectors

#### FRONT AND REAR PANEL CONTROLS AND CONNECTORS

- 1. Blanks lower part of trace to prevent overexposure of photographs. Blanking function also prevents blooming with a variable-persistence storage display section.
- 2. Controls scan time.
- 3. Assuming that dB graduation (black numerals) matches position of lighted index lamp, LOG REF graticule line indicates power level when LOG/LINEAR (12) is set to LOG. With LOG/LINEAR set to LINEAR, indicates per division multiplier for calibrated voltage amplitude for whatever voltage graduation (blue numerals) matches position of lighted index lamp.
- 4. Indicates 1-dB increments for logarithmic amplification; indicates multiplication factors up to unity for linear amplification.
- 5. Plus "+" lights when logarithmic amplification (12) is selected; times "x" lights when linear amplification (12) is selected. With "+" lighted, LOG REF line is sum (black numerals) of LOG REF LEVEL controls. With "x" lighted, per division absolute voltage amplitude is product (blue numerals) of LINEAR SENSITIVITY controls.
- 6. Provides a 30-MHz signal at -30 dBm for amplitude calibration of spectrum analyzer.

- 7. Provides penlift operation to HP 7005, 7035, 7004, 7034 and all new TTL compatible HP recorders. Provides a blanking input for external scan mode operation. Provides an input for external trigger operation.
- 8. Detected video output proportional to vertical deflection on CRT.
- 9. For receiving an external scan ramp or output coupling for the internally-generated scan ramp. Input or output function determined by INT/EXT positions of SCAN MODE switch.
- 10. Adjusts vertical position and gain of trace.
- 11. Adjusts horizontal position and gain of trace.
- 12. Selects logarithmic or linear display mode.
- 13. Selects scan trigger mode.
- 14. Selects scan ramp mode. Ramp is internally generated for SINGLE/INT positions but it must be externally supplied for EXT position (refer to Item 9).
- 15. Press to initiate or stop scan with SCAN MODE switch set to SINGLE.
- 16. May select 100 Hz, 10 kHz or OFF position of low-pass filter for detected video.
- 17. Lights for duration of each scan.
- 18. Connects to display section.

# SECTION IV PERFORMANCE TESTS

#### 4-1. INTRODUCTION.

- 4-2. Perform tests in procedural order and with the test equipment called for, or with its equivalent. Specifications of test equipment and accessories required to performance-test the analyzer are given in Table 1-5.
- 4-3. Front panel checks for routine inspection are given in Table 4-1. Procedures for verifying that the instrument meets specifications are given in Paragraphs 4-23 through 4-28, and a test card in Table 4-5 contains data spaces for recording test results.
- 4-4. During any performance test, all shields and attaching hardware must be in place and the RF and IF Section plug-ins must be installed in the display section.

#### 4-5. FRONT PANEL CHECKS.

4-6. Before proceeding to the front panel checks, the instrument must be adjusted and all the controls set as specified in the preset adjustment instructions in Paragraph 4-12. After the instrument is set up, proceed with the checks. The instrument should perform as called out in the procedure before going on to the specification tests (Paragraphs 4-12 through 4-21).

#### 4-7 PERFORMANCE TESTS.

4-8. The performance tests given in this manual are suitable for incoming inspection, troubleshooting or preventive maintenance. The tests are designed to verify published instrument specifications. Perform the tests in the order given, and record data on the test card (Table 4-5) at the end of this section. These tests assume the use of an 8553B RF Section

4-9. The tests are arranged in the following order:

Para.	
	escription
4-23	Calibrator Output
4-24	Bandwidth Accuracy
4-25	Bandwidth Selectivity
4-26 Switching between	en Bandwidths Accuracy
4-27 Amp	litude Display Accuracy
4-28	Scan Time Accuracy

- 4-10. Each test is arranged so that the specification is written out as it appears in the Table of Specifications. Next, a description of the test and any special instructions or problem areas is included. Each test that requires test equipment has a test setup drawing and a list of required equipment. Each procedure gives control settings required for that particular test. Data spaces are included in each test procedure, and the spaces are repeated in the Performance Test Card at the end of this section.
- 4-11. Required specifications for test equipment are detailed in Table 1-2. in Section I. If substitute test equipment is to be used, it must meet the specifications listed in order to performance-test the analyzer.

#### 4-12. FRONT PANEL CHECK PROCEDURE.

#### 4-13. Preset Adjustments.

4-14. Turn analyzer ON and preset the INTEN-SITY & FOCUS to approximately 1 o'clock. While the analyzer is warming up make the following control settings:

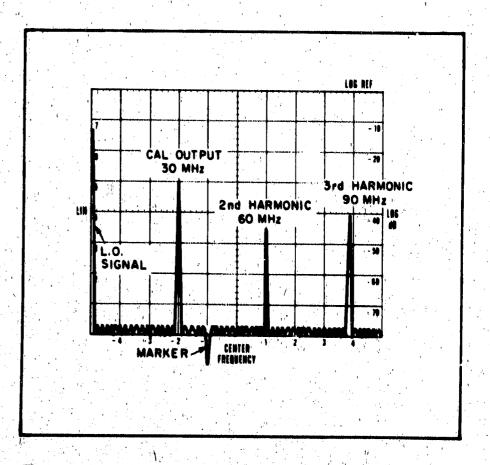


Figure 4-1. 30 MHz Calibrator Signal & Harmonics

المناط الوقع الأفا وروزوق ووالدرو ومانيا والانار أراوك وطلالا الأوفية والإرواء والورو والمركار فالإراوا	The control of the co
RANGE MHz	0-110
FREQUENCY	40 MHz
FINE TUNE	Centered
BANDWIDTH	300 kHz
SCAN WIDTH	0-100 MHz
SCAN WIDTH PER DIVISION	
INPUT ATTENUATION	10 dB
TUNING STABILIZER	ON
SCAN TIME PER DIVISION	
LOG REF LEVEL	10 dBm
LOG REF LEVEL Vernier	
	LOG
VIDEO FILTER	
SCAN MODE	
SCAN TRIGGER	

4-15. Connect CAL OUTPUT to RF INPUT using a BNC-to-BNC cable. The display on your analyzer should be similar to Figure 4-1.

#### 4-16. Display Section Adjustments.

#### a. Set LOG REF LEVEL max ccw.

- b. Set SCAN TIME PER DIVISION to 10 SECONDS and adjust FOCUS and ASTIGMATISM for the smallest round spot possible.
- c. Reset SCAN TIME PER DIVISION to 1 MILLISECOND. Adjust TRACE ALIGN so that horizontal base line of the CRT trace is exactly parallel to the horizontal graticule lines.

#### 4-17. IF Section Display Adjustments.

- a. Adjust VERTICAL POSITION so that the horizontal base line of the CRT trace is exactly on the bottom horizontal graticule line of the CRT. Set LOG REF LEVEL to 0 dBm.
- b. Adjust HORIZONTAL POSITION so display is centered on CRT. Then adjust HORIZONTAL GAIN until the displayed scan width is exactly 10 divisions. Some interaction between HORIZONTAL POSITION and GAIN may occur, requiring slight readjustment of the controls.

The display on your CRT should now match Figure 4-1 almost exactly. (The amplitudes of the individual signals may be slightly different.)

c. Note the inverted marker below the bottom graticule line. This marker indicates the disolay center frequency of the ZERO and SCAN WIDTH PER DIVISION tuning modes. Adjust the FREQUENCY control to place this marker exactly under the signal three divisions from the left.

This signal is the 30 MHz calibrator signal. Tune the marker carefully to null the signal.

#### NOTE

The other signals on the display are the "zero frequency" First LO feedthrough and the 60 MHz and 90 MHz harmonics of the calibrator signal. These harmonics have a relatively high level because the calibrator used is a multivibrator.

- d. Set the SCAN WIDTH PER DIVISION control to 0.05 MHz and the BANDWIDTH to 10 kHz.
- e. Switch the red SCAN WIDTH control to the PER DIVISION position. The BANDWIDTH, SCAN WIDTH PER DIVISION, and Center Frequency are now those selected in steps c and d. (The marker makes it easy to select any signal in 0-100 MHz scan and expand the display about that signal.)
- f. Adjust FREQUENCY tuning to center 30 MHz calibrator signal, if necessary. Then reduce SCAN WIDTH PER DIVISION to 10 kHz. Use FINE TUNE to center the signal on the display. (The analyzer's First LO is automatically phase-locked to a crystal oscillator reference for the blue color-coded SCAN WIDTH positions since the TUNING STABILIZER was set to ON. Therefore, the FREQUENCY control which tunes the First LO should not be used to tune the analyzer; frequency would tune in 100 kHz steps.)
- g. Adjust the LOG REF LEVEL controls so the maximum signal amplitude is exactly on -70 dB graticule line. Rotate LOG REF LEVEL control seven steps in the clockwise direction. The amplitude of the signal should increase in increments of one division per 10-dB step. See Figure 4-2.
- h. Adjust VERTICAL GAIN to place maximum signal amplitude exactly on LOG REF (top) graticule line, Figure 4-2. Repeat Steps g and h to obtain optimum adjustment of VERTICAL GAIN (increments as close to one division per 10 dB step as possible).

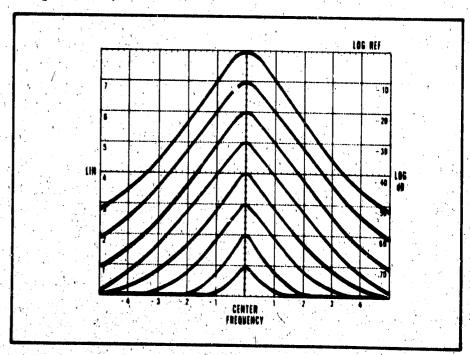


Figure 4-2. Vertical Gain Adjustment

#### 4-18. Ampl. Cal Adjustment RF Section

- a. Set the LOG REF LEVEL controls to -30 dBm (-30 +0).
- b. Adjust AMPL CAL so that the signal amplitude (-30 dBm) is exactly on the LOG REF (top) graticule line of the CRT.

The analyzer is now calibrated in the LOG display mode.

#### 4-19. Ampl Cal Check for Linear Sensitivity Accuracy.

4-20. In the LINEAR display mode the vertical display is calibrated in absolute voltage. For LINEAR measurements the LIN scale factors on the left side of the CRT and the blue color-coded scales of the LINEAR SENSITIVITY controls are used. The signal voltage is the product (note lighted "x" lamp) of the CRT deflection and LINEAR SENSITIVITY control settings. It is usually most convenient to normalize the LINEAR SENSITIVITY vernier by setting it to "1" (blue scale).

- a. Set the LOG/LINEAR switch to LINEAR. Set LINEAR SENSITIVITY to 1 mV/div (1 mV x 1). Since the -30 dBm calibrator output is  $\cong 7.1$  mV (across 50 ohms), the CRT deflection should be  $\cong 7.1$  divisions.
- b. Adjust AMPL CAL on RF Section for a ≈7.1 div CRT deflection, if necessary. (LINEAR display is more expanded than the compressed LOG display, so adjustment of the AMPL CAL control can be made with more resolution in LINEAR without noticeable effect on the LOG calibration.)

The analyzer is now calibrated for both the LOG and LIN display modes.

4-21. Set controls as	s follows:	en e
SCAN WIDTH		 0-100 MHz
SCAN WIDTH PER		. 10 MHz
BANDWIDTH		. 10 kHz
T 0 00 1 TO TO 1 TO 1		
LOG REF LEVEL	• • •	-10 dBm

Perform tests in Table 4-1, Front Panel Checks.

Table 4-1. Front Panel Checks

Function	Procedure	Result
Base Line Clipper	<ol> <li>Turn BASE LINE CLIPPER cw.</li> <li>Return clipper to ccw.</li> </ol>	1) At least the bottom 2 divisions should be blank.
Scan	3) Tune SCAN TIME across its range. 4) Return to 2 ms/div.	3) Scan should occur in all positions.
Scan Width	<ul> <li>5) Turn SCAN WIDTH to PER DIVISION.</li> <li>6) Center CAL OUTPUT signal on display.</li> <li>7) Reduce SCAN WIDTH PER DIVISION to 20 kHz; use FINE TUNE to center display.</li> </ul>	<ul> <li>5) 30 MHz signal and harmonics visible. DISPLAY UNCAL light comes on.</li> <li>7) Signal remains on-screen, centered.</li> </ul>
Phase Lock	9) Turn TUNING STABILIZER to OFF; use FREQUENCY to center display. 10) Turn TUNING STABILIZER on, use FINE TUNE to center display.	<ul> <li>8) Signal jumps to left or right hand edges of CRT (±100 kHz). This corresponds to the 100 kHz reference oscillator in the automatic phase control circuit.</li> <li>9) Signal should not jump ±100 kHz when TUNING STABILIZER is turned off.</li> <li>10) Signal should not jump 100 kHz.</li> </ul>

Table 4-1. Front Panel Checks (cont'd)

Function	Procedure	Result
Bandwidth, and Display Uncal Light	<ul> <li>11) Reduce BANDWIDTH and SCAN TIME PER DIVISION using FINE TUNE to center display.</li> <li>12) Return BANDWIDTH to 10 kHz and SCAN WIDTH PER DIVISION to 20 kHz.</li> </ul>	11) Display should be stable, and viewable as long as DISPLAY UNCAL is unlit.
Calibration	13) Lit index light on LOG REF LEVEL LINEAR SENSITIVITY corresponds to top line of graticule; with input attenuation at 20 dB and LOG REF LEVEL at -10 dBm, signal level is -30 dBm.	13) Calibrator signal is at -30 dBm level (2 divisions down from top of graticule).
Gain Vernier	14) Turn LOG REF LEVEL · LINEAR SENSITIVITY vernier cw.	14) Signal level increases by amount marked on vernier dial.
Attenuators	15) Turn INPUT ATTENUATION and LOG REF LEVEL LINEAR SENSITIVITY in 10 dB steps.	15) Signal increases or decreases one vertical division per 10 dB step.

#### 4-22. PERFORMANCE TESTS.

#### 4-23. Calibrator Output.

#### SPECIFICATION:

Amplitude: -30 dBm ±0.3 dB Frequency: 30 MHz ±0.3 MHz

DESCRIPTION: Calibrator amplitude accuracy is checked by measuring the 30 MHz fundamental voltage terminated in a known load. The frequency accuracy is checked by comparing the calibrator's 30 MHz fundamental frequency with an accurate 30 MHz source.

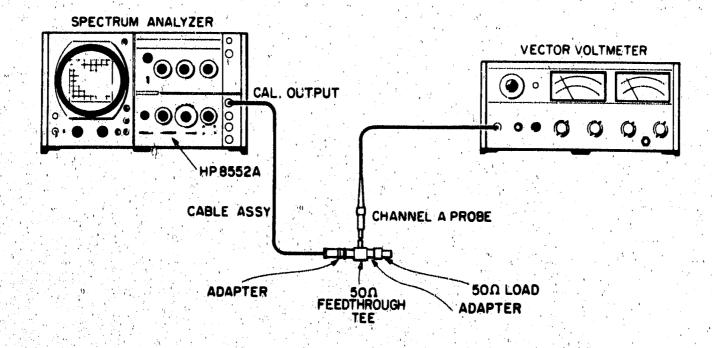


Figure 4-3. Calibrator Amplitude Test

EQ	UIPMENT:       Yector Voltmeter       HP 8408         Comb Generator       HP 8408         Cable Assembly       HP 10503         Adapter       UG-29B         50-Ohm Tee       HP 11536         Adapter       UG-201A         50-Ohm Termination       HP 908	6A 6A /U 6A /U
1. 840	Connect the equipment shown in Figure 4-3 and make the following settings:  5A FREQUENCY RANGE — MHz CHANNEL AMPLITUDE RANGE — dB	40 A
2.	Read amplitude directly on the 8405A Vector Voltmeter. It should be between -29.7 dBm and -30 dBm. (6.83 mV to 7.32 mV).  -29.7 dBm30.3 dB	.3

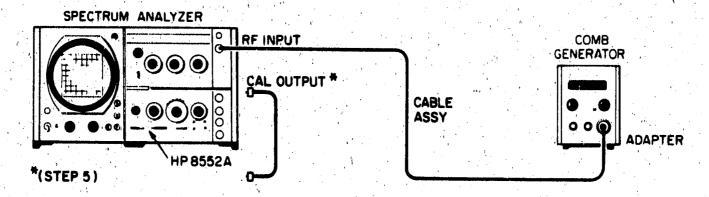


Figure 4-4. Calibrator Frequency Test

Connect the equipment shown in Figure 4-4 and make the following settings:

and +3 graticule lines on the display).

AN	ALYZER:		Ž.																		
	FREQUENCY	•	· ·	•			•	• .					•	•							30 MH:
	DANDWIDIT	• ` •	•	• :	• •	•	•	•	• .				•		•	•					3 kHz
	DUILLY WIDIII							4 -	1		_						1)	- 4	7H: K	1111	ARIAN
	SCAN MIDIULER DIVISION .					_														Λ	1 MU
	intol Alignostion	• . •	•									_		_						•	ማስ ላፔ
	DOMN TIME FER DIVISION .							1.2									าก	· M		iqt/	ツハバから
	LOG REF LEVEL	•	•	• .			• ,	• .	•	•	•		•	• '	•	٠	• • •	•.	•		30 dBm
	LOG/LINEAR VIDEO FILTER SCAN MODE	•	•	•	• , • • · · · · · · · · · · · · · · · ·	•	* * *	•	•	• •	•	. •	•	• ,	• .	•	• •	• ;	•	•	LOG
**																					
, j	SCAN TRIGGER		•		•			•	•		•	•	• •	•	•	• ,	•	· •	•	•	
840	<b>)6A:</b>							7			•	•		•	• ,	•	•	•	•	<b>D</b>	AUIU
	COMB FREQUENCY — MC				,		1					1.									10
	TIVE DESCRIPTION AND DESCRIPTIONS			_																	
	OUTPUT AMPLITUDE	• (•	•	•	,	• ;	•								• Year • •	CW	, (3	o'	cloc	k no	osition)
4.	Adjust FREQUENCY to center corgraticule line.	nb g	ene	erat	or :	30	Mŀ	Iz (	on	ıb :	sign	al	on	th	e (	EN	() ITI	ER	FR	EQU	ENCY
5.	Disconnect the comb generator and calibrator signal. The calibrator signal and +3 graticule lines on the display	nal s	nne sho	ct ( uld	CAI be	L O	U'I twe	PU en	T 1	to .7	RF MH	IN z	IPU and	JT 1 30	and ).3	d o M	bse Hz	rve (be	the	e dis een	played the -3

\_30.3 MHz

#### 4-24. Bandwidth Accuracy.

#### SPECIFICATION:

Individual IF bandwidth 3 dB points calibrated to  $\pm 20\%$  (10 kHz bandwidth  $\pm 5\%$ ).

DESCRIPTION: While observing a signal on the CRT display, the 100 kHz, 30 kHz, 3 kHz and 1 kHz bandwidths are verified by measuring the half-power points of the signal. The 10 kHz bandwidth is measured by using a frequency counter to monitor the input signal generator frequency as it is tuned between the IF filter half-power points.

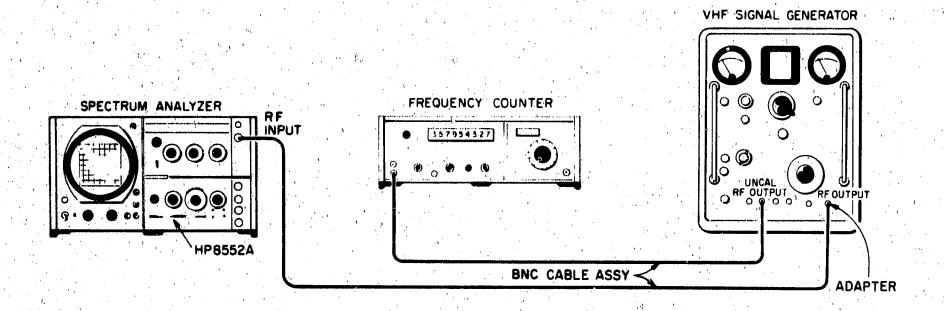


Figure 4-5. 10 kHz Bandwidth Accuracy Test Setup

EQUIPMENT:								. :	· ·		,							
Signal Generator Frequency Counter	•	•		• ;	•	•	•	•	•	· •		· •	. •	•	•	•	•	HP 6081
Cable Assembly (2)		•		•	•		•	•	•	"	A.A.		•	•	• ;	• •	•	. HP 5245
Adapter						• •			•				•	•		• •	•	. UG-201A/
. Make the following	analyze	r con	trol :	setti	ings:							77' 						
		100	•	. '					18		\$25.57" Visit	,	,			,	<b>.</b>	
FREQUENCY .	• • •	• •		•	•		• ;	•	() () • () ()	i i ki		•		•	•		•	30 MH
BANDWIDTH .	• • •	• **	•	i i	•	•	• *	• .		47.96	$oldsymbol{eta}$ .	•	•	•.	•	•, •	•	100 kF
SCAN WIDTH DED	DIVIC	ON	• 11•	•	•	• •	•	• 11•	an Å	الأراب و	•	•	. <b>•</b> 1.3	<b>▶</b> ( }	•	• •	PE	R DIVISIO
SCAN WIDTH PER INPUT ATTENUAT	ION IOI (191	ION	•	•	•	• •	•	•	16,16		• •	; • '	•	• .	• •	•	• ,	U.U5 MF
SCAN TIME PER D		N	•	•	•	•	•		7			•	•	•	•	2	MII	10 d
TUNING STABILIZ	ER	• •			•				V 3			•		•	•			OF
BASE LINE CLIPPE	R.	•		•	•	• •	•	• ;•	13.4%			, •	•	, • ,			• * •	Max cc
LOG/LINEAR		•		ı.	•		•.	• 1	1 . 5 1 E	•								LINEA
LINEAR SENSITIV	ITY	•	•	j• •	•	• •	· 'II	•, •/	( • p.)	egy •		•	•	•	• (	•	•	. 10 mV/Di
VIDEO FILTER SCAN MODE	•	•	. • •	•	• •		•	• • • • • • • • • • • • • • • • • • • •	•	•	. • . •	•	•	• '	•	•	•	. 10 kH
SCAN MODE			• 11.	•		•	• /	•	. •	• • •	•	•	ı •	•	•	17.	•	IN

- 2. Tune FREQUENCY controls to 0 MHz to center the LO Feedthrough signal; switch TUNING STABILIZER on.
- 3. Use LINEAR SENSITIVITY Vernier control to adjust for 5.7 divisions signal amplitude.
- 4. Measure the bandwidth at the half-power points at the 4.0 division line. Bandwidth should be 100 ±20 kHz (1.6 to 2.4 divisions).
- 5. Repeat steps 3 and 4 to measure the bandwidths listed in Table 4-2, and set the controls as indicated in the table.
- 6. To check the 10 kHz bandwidth, connnect the test setup shown in Figure 4-5 and make the following control settings.

# control settings. ANALYZER: BANDWIDTH 10 kHz SCAN WIDTH PER DIVISION 0.2 MHz SCAN TIME PER DIVISION 2 MILLISECONDS TUNING STABILIZER OFF 608F: 30 MEGACYCLES 30 ATTENUATION -30 dBm MODULATION CW FREQUENCY RANGE B RF OUTPUT +7 (on meter) 5245L: SENSITIVITY (VOLTS RMS) 0.1 FUNCTION FREQUENCY

#### Table 4-2. Bandwidth Checks

BANDWIDTH	SCAN WIDTH PER DIVISION	SCAN TIME PER DIVISION	3 dB Bandwidth
30 kHz	20 kHz	2 MILLISECONDS 2 MILLISECONDS 5 MILLISECONDS 10 MILLISECONDS	1.21.8 div
3 kHz	2 kHz		1.21.8 div
1 kHz	0.5 kHz		1.62.4 div
0.3 kHz	0.2 kHz		1.21.8 div
0.1 kHz	0.05 kHz	20 MILLISECONDS	1.6 2.4 div
0.05 kHz	0.02 kHz	50 MILLISECONDS	2.0 3.0 div

- 7. Fine adjust the signal generator frequency to center the 30 MHz signal on the CRT display; switch TUNING STABILIZER on (up).
- 8. Using FINE TUNE to keep the display centered, reduce SCAN WIDTH PER DIVISION to 20 kHz. Set SCAN WIDTH to ZERO scan.
- 9. Maximize signal response using FINE TUNE and adjust LINEAR SENSITIVITY Vernier control for a 7.1 division display.
- 10. Decrease HP 608F frequency until the base line drops to the 5.0 division line. Record the signal generator frequency as read from the HP 5245L Frequency Counter.
- 11. Increase HP 608F frequency until the base line peaks and then drops to the 5.0 division line. Record the signal generator frequency.
- 12. The difference in the readings of steps 10 and 11 equals the half-power bandwidth. The bandwidth should be 10 ±0.5 kHz.

  9.5 \_\_\_\_\_10.5 kHz

#### 4-25. Bandwidth Selectivity.

#### SPECIFICATION:

60 dB/3 dB IF bandwidth ratio < 20:1 for IF bandwidths from 1 kHz to 300 kHz.

60 dB/3 dB IF bandwidth ratio <25:1 for 50, 100 and 300 Hz IF bandwidth.

DESCRIPTION: Bandwidth selectivity is verified by observing the LO feedthru signal in the LOG mode on the CRT and measuring the bandwidth at the -60 dB points using the analyzer's calibrated scan widths. The ratio of this bandwidth to the 3 dB bandwidths defines the analyzer selectivity.

1. Make the following control settings:

#### ANALYZER:

·	
FREQUENCY	0 MHz
BANDWIDTH	300 kHz
INPUT ATTENUATION	0 dB
SCAN WIDTH	PER DIVISION
SCAN WIDTH PER DIVISION .	1 MHz
SCAN TIME PER DIVISION .	50 MILLISECONDS
LOG/LINEAR	LOG
LOG REF LEVEL	20 dBm
BASE LINE CLIPPER	 Max ccw
TUNING STABILIZER	On
VIDEO FILTER	100 Hz
SCAN MODE	INT
	•

- 2. Tune FREQUENCY to center the LO feedthru signal on the CRT display; adjust LOG REF LEVEL Vernier to peak the signal on the top graticule line.
- 3. Observe the bandwidth at the -60 dB graticule line; bandwidth should be less than six divisions (6 MHz).

4. To check the remaining BANDWIDTH settings refer to Table 4-3 below for control settings and test limits.

Table 4-3. Bandwidth Selectivity Checks

BANDWIDTH	SCAN WIDTH	SCAN TIME	60 dB Bandwidth
	PER DIVISION	PER DIVISION	(—60 dB graticule line)
100 kHz 30 kHz 10 kHz 3 kHz 1 kHz 0.3 kHz 0.1 kHz	0.5 MHz 0.1 MHz 0.05 MHz 10 kHz 5 kHz 2 kHz 0.5 kHz	50 MILLISECONDS 50 MILLISECONDS 50 MILLISECONDS 50 MILLISECONDS .1 SECOND 0.2 SECOND 0.2 SECOND 0.5 SECOND	4 div6 div4 div6 div4 div3.75 div5 div5 div.

#### 4-26. Switching Between Bandwidths Accuracy.

#### SPECIFICATION:

At 20 degrees C,  $\pm 0.5$  dB (LOG);  $\pm 5.8\%$  (LINEAR).

DESCRIPTION: Relative bandwidth amplitude accuracy is verified by observing the amplitude of the LO feedthru while switching IF bandwidths. The display is observed in the LINEAR mode for best amplitude resolution.

_	en <u>e</u> en					
1.	Set the analyzer controls as follows:	•	e e	1 · · · · · · · · · · · · · · · · · · ·	The state of the s	
77	EDEOLIERIOS	•	•			
· 1.	FREQUENCY					0.3477
	FINE TUNE		•		• • • • • • •	· · · · · · 0 MHz
201		• •	• • • •			Centered
	BANDWIDTH		g			· · · · · · · · Contelled
1						2/1/1 1-11-
						DID DILLOS
4.	SCAN WIDTH PER DIVISION					· · · I DIC DIVIDION
	SCAN WIDTH PER DIVISION INPUT ATTENUATION		•	•		0.2 MHz
	SCAN TIME PER DIVISION					10 ub
	BASE LINE CLIPPER LOG/LINEAR	•				· · · · · Max ccw
	LOG/LINEAR				)	· · · · · Max ccw
	LOG/LINEAR LINEAR SENSITIVITY	• • • •	• • •			· · · LINEAR
	MARAU SENSITIVITA	•				10 17/10117
	LINEAR SENSITIVITY TUNING STABILIZER					$\cdot$ · · · · · · · · · · · · · · · · · · ·
						OFF
	SCAN MODE					· · · · OFF
1,		• • •	• •	• • • •		INT
,	SCAN TRIGGER					ATIMO
						· · · · · AUTO

- 2. Adjust FREQUENCY to center LO feedthru signal on the CRT display. Switch TUNING STABILIZER on (up) and adjust FINE TUNE to center signal on CRT display.
- 3. Set LINEAR SENSITIVITY controls to approximately 7.1 division. Set SCAN WIDTH PER DIVISION to 0.5 kHz; SCAN TIME PER DIVISION to 0.5 SECOND.
- 4. Progressively switch BANDWIDTH from 300 kHz through .05 kHz. Note the signal amplitude at each BANDWIDTH. Maximum deviation between any two bandwidths should be <0.8 division.

0.8 Div.

#### 4-27. Amplitude Display Accuracy.

#### SPECIFICATION:

±0.25 dB/dB but not more than ±1.5 dB over the full 70 dB display range.

DESCRIPTION: A full eight division signal is displayed on the CRT in the LOG mode. The LOG REF LEVEL is then changed 70 dB in 10 dB steps. The error of the CRT display is measured at each step. It is assumed that the IF Section Display Adjustments in Paragraph 4-17 have been performed.

1. Connect CAL OUTPUT to RF INPUT.

)	Set Analyzer controls as follows:															
	FREQUENCY						: • , •	•								. 30 MHz
	FINE TUNE															. Centered
. :	BANDWIDTH	• .		•	•	•		• •	• •	•			•		•	. 100 kHz
	SCAN WIDTH	•• .	•	•		•• 1			•		•			• ,	. PER	DIVISION
	SCAN WIDTH PER DIVISION	•	•	•	• 1	•	•	•		• •	•	• . •	•			. 0.5 MHz
	INPUT ATTENUATION	• ,	•	•	,"•	• • •	•	•	•	• , •	•	• •	•	•	- 2417 7 7	. 20 dB
	SCAN TIME PER DIVISION	•	•	•	•	•	• •		•		•	•	•	•	9 MILLLI	SECONDS
	BASE LINE CLIPPER	•	•	•	. •	• •	• • •	•	•	•	•	•	•	• • •	• • •	
*.	LOG/LINEAR	•	• •		• ,	•	•	•	• •	•	•	•	•	• •	• • •	LOG 20 dRm
	VIDEO FILTER	•	•	•	•	•	• • •	•			•	•	·}-	• •		OFF
	SCAN MODE															INT
	SCAN TRIGGER															
				1											100	

- 3. Adjust FREQUENCY to center the 30 MHz CAL signal on the CRT display and adjust LOG REF LEVEL Vernier for a full eight division vertical display.
- 4. Change the LOG REF LEVEL to reduce the displayed signal amplitude 10 dB. Signal amplitude should be seven divisions ±0.15 division.

6.85\_\_\_\_\_7.15 div

5. Change the LOG REF LEVEL to reduce the signal amplitude in 10 dB steps to verify the entire 70 dB display range.

a20 dB	5.85	. 6.15 div	d50 dB 2.85	3.15 div
b30 dB	4.85	. 5.15 div	e60 dB 1.85	2.15 div
c40 dB	3.85	4.15 div	f70 dB 0.85	1.15 div

#### 4-28. Scan Time Accuracy.

#### SPECIFICATION:

0.1 ms/div up to 20 ms/div  $\pm 10\%$ .

50 ms/div to 10s/div ±20%.

DESCRIPTION: A sine wave modulated RF signal is connected to the RF INPUT. The demodulated signal is displayed on the analyzer CRT and its peaks aligned with the CRT graticule by adjusting the modulation frequency. Scan time is verified by measuring the period average of the modulation signal using a frequency counter.

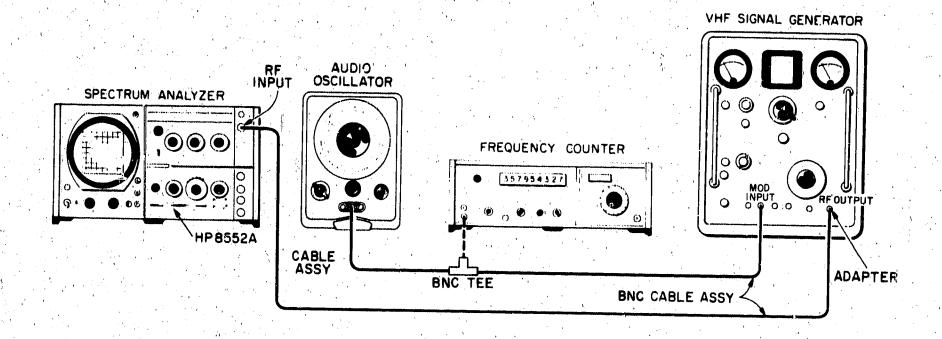


Figure 4-6. Scan Time Accuracy Test Setup.

EQUIPMENT:		• ,						•								ı	. ,	
Dan ann ann an				,				. •	,									
A 1: • • • • • • • • • • • • • • • • • •	• •	• •	• •	*	• •	• •	•	•	•	•		• •	•	•	•	· '•.	•	HP 5245
<b>~</b> :	•	•	• '•		•	• •	•	•	• , .	• •	• .	•	•	•	•	•	•	
	•	•	•	•	• .	• •	•	• *	•	• , •	•	. •	•	•	•	•		. HP 608
	• * •	`• •		•	•		• . e .	• •	•			. •	٠	• .		•	•,	HP 10503
10	• •	• •	je ● tj.•	•	• 0		• 4		_								•	HP 11001
	• ,	•	• •	•	•	•	•	• •	. •	•	, • '	•	• .	٠, ٠	٠.	•	•	UG-274B/
	• •	• •	• •	•	• •	•	•	• • •	. •	•	•	• '	٠.,	•, •		•	. !	UG-274B/ UG-201A/
. Connect the test setup in FANALYZER:	,				· ·	*				٠	*						, r:	
			. ·								*				•			
FREQUENCY		•		•	•	• . •			, ,									100 MI
FINE TUNE	•,	• •		•			_											7 h
	•			• , .	•					•	•	•	• .	•	•		•	. Centere . 300 kF
	•			•							•	•	•	• ' '	•	•	•	. 300 Kr
															• .			
SCAN TIME PER DIVISION BASE LINE CLIPPER	)N	•		. * <del>U</del>	• •		•		_		•	_ 1	•	•	9	MI	T T	ISECOND
						, e					•		•	•		1411	ىلىد.	Max cc
LOG/LINEAR		gr ng .	• . •						7			•	•	•	•	•	•	. LINEA
LINEAR SENSITIVITY	• •	•							_									1 \$7 /TO T
TANDO LIMITUIL	•	. •		• • •						•	•	•	•	• • •		•	. •	1 M V / D I
				1.					•	•	•	•	•	• . •	•	7 5, ● 5 6	•	10 kH
SCAN TRIGGER		•					•			•		•	•	• ,. •		•	•	IN'
		A 75 1	, ,		-		• •	•	•		•		•					. VIDE

meter.

#### PERFORMANCE TESTS (cont'd)

608	MEGACYCLES ATTENUATION MODULATION FREQUENCY R			•	• •		1		•	• • •		• • • • · · · · · · · · · · · · · · · ·		$-40~\mathrm{dBm}$ . EXT AM
<b>52</b> 4	I5L: SENSITIVITY ('FUNCTION . TIME BASE .	• • •	• • •	•			• • • •	• •	•		PE	KIUD	AVERA	0.1 AGE - (10) 10 μs
200	CD:		• •				•					• •		. X100
2.	Adjust the HP 2 modulation as inc	 800CD A	MPLI	<b>TUDE</b>	for 90	)%	• •		•	•, •	•	•		• • •

3. Fine tune the HP 608F Signal Generator for maximum signal indication of the analyzer CRT. Adjust LINEAR SENSITIVATY Vernier

control for a convenient display height.

- 4. Position the first modulation peak directly on the -5 graticule line by adjusting the HORIZONTAL POSITION control.
- 5. Adjust the audio oscillator modulation frequency to align the tenth modulation peak with the +4 graticule line (see Figure 4-7). Total scan time is read on the HP 5245L and should be 2.0 ±0.2 ms.
  - 1.8\_\_\_\_\_ 2.2 ms
- 6. Repeat steps 4 and 5 to verify the SCAN TIME PER DIVISION positions as listed in Table 2-5. The approximate HP 200CD frequency settings and HP 5245L PERIOD AVERAGE tolerances are also contained in Table 4-1.

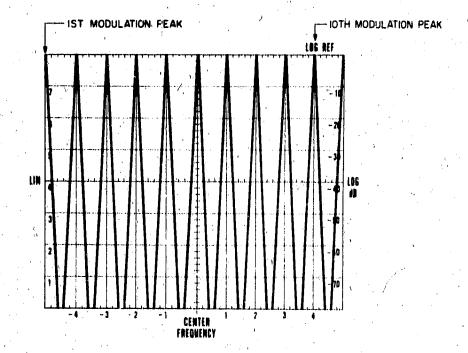


Figure 4-7. Scan Time Modulation Peaks

Table 4-4. Modulation Frequencies for Checking Scan Time

SCAN TIME PER DIVISION	HP 200CD Frequency	Scan Time
0.1 MILLISECOND	10 kHz	90110 μs
0.2 MILLISECOND	5 kHz	$\frac{180}{220} \frac{\mu s}{\mu s}$
0.5 MILLISECOND	2 kHz	450 550 μs
1 MILLISECOND	1 kHz	0.9 1.1 ms
2 MILLISECONDS	500 Hz	1.8 2.2 ms
5 MILLISECONDS	200 Hz	4.5 5.5 ms
10 MILLISECONDS	100 Hz	9.0 11.0 ms
20 MILLISECONDS	50 Hz	18.0 22.0 ms
50 MILLISECONDS	20 Hz	40.0 60.0 ms
0.1 SECOND	10 Hz	80.0 120 ms
0.2 SECOND	5 Hz	160 240 ms
		2 TO IIIS

Model 8552A

#### Table 4-5. PERFORMANCE CHECK TEST RECORD

	No. Test Description  4-23 Calibrator Output Amplitude: -30 dBm ±0.3 dBm Frequency: 30 MHz, ±0.3 MHz  4-24 Bandwidth Accuracy	Test Performed by: Date:						
Serial	No							
Para. No.	Test Description	Measurement Unit	Min	Actual Max				
4-23	Amplitude: -30 dBm ±0.3 dBm	dBm MHz	-29.7 29.7	30.3 30.3				
4-24	Bandwidths: ±20% 10 kHz Bandwidths: ±5% 100 kHz Bandwidth 30 kHz Bandwidth 3 kHz Bandwidth	divisions divisions divisions divisions kHz	1.6 1.2 1.2 0.4 9.5					
4-25	Bandwidth Selectivity  Bandwidths: -60 dB Bandwidth  300 kHz 6 MHz  100 kHz 2 MHz  30 kHz < 600 kHz  10 kHz < 200 kHz  3 kHz < 60 kHz  1 kHz < 20 kHz  0.3 kHz < 7.5 kHz	divisions divisions divisions divisions divisions divisions divisions		6 4 6 4 6 4 3.75				
4-26	Switching Between Bandwidths Accuracy: ±5% (LINEAR)	divisions		0.8				
4-27	Amplitude Display Accuracy at -10 dB: ±.15 dB -20 dB: ±.15 dB -30 dB: ±.15 dB -40 dB: ±.15 dB -50 dB: ±.15 dB -60 dB: ±.15 dB -70 dB: ±.15 dB	divisions divisions divisions divisions divisions divisions	6.85 5.85 4.85 3.85 2.85 1.85 0.85	7.15 6.15 5.15 4.15 3.15 2.15 1.15				

Table 4-5. Performance Test I 'cord (cont'd)

Para. No.	Tes	t Description	Mei irement Unit	Min Actual	Max
4-28	Scan Time				
	Accuracy at	0.1 millisecond	μs	90	110
		0.2 millisecond	$\mu$ s	180	220
		0.5 millisecond	μs	450	550
		1 millisecond	ms	0.9	1.1
		2 millisecond	ms	1.8	2.2
		5 milliseconds	ms	4.5	5.5
		10 milliseconds	ms	9.0	11.0
D. D. D. C.		20 milliseconds	ms	18.0	22.0
	v Lagranda	50 milliseconds	ms	40.0	60.0
		0.1 seconds	ms	80	120
		0.2 second	ms	160	240

# ADJUSTNENTS

# SECTION V ADJUSTMENTS

#### 5-1. INTRODUCTION.

5-2. This section describes adjustments and checks required to return the analyzer IF section to peak operating condition when repairs are required. Included in this section are test setups, procedures, and tips about tools and test equipment. Adjustment location photographs are located on fold-outs at the back of the manual. A test record for recording data taken during adjustment procedures is included at the end of this section.

#### 5-3. EQUIPMENT REQUIRED.

5-4. A complete list of test equipment and a list of accessories are contained in Table 1-2. In addition, each test procedure contains a list of test equipment and identifies all test equipment and accessories by call-outs. Any equipment substituted for the instruments or accessories listed must meet the minimum specifications in order to calibrate the analyzer.

#### 5-5. Posidriv Screwdriv

5-6. Many screws in the instrument appear to be Phillips, but are not. The table of accessories gives the name and number of the Pozidriv screwdrivers designed to fit these screws. To avoid damage to the screw slots, the Posidriv screwdrivers should be used.

### 5 7. Slug Tuning Tools.

5-8. The Gowanda Model PC9668 (HP 8710-1010) tuning tool is for tuning the slugs in the ferrite inductors used in the analyzer plug-ins. No other tool should be used for this purpose.

#### 5-9. Blade Tuning Tools.

5-10. For adjustments requiring a nonmetallic metal-blade tuning tool, use the General Cement Model No. 5003 (HP 8730-0013). It may be necessary to cut away part of the plastic on the tuning blade end to use the tool on all the adjustments. In situations not requiring nonmetallic tuning tools, an ordinary small screwdriver or other suitable tool is sufficient. No matter what tool is used, never try to force any adjustment control in the analyzer. This is especially critical when tuning variable slugtuned inductors and variable capacitors.

#### 5-11. HP 11592A Service Kit.

5-12. The HP 11592A Service Kit is an accessory item available from Hewlett-Packard for use in maintaining the spectrum analyzer. No attempt to adjust the analyzer should be made unless the user has the service kit. The kit can be obtained by contacting your nearest Hewlett-Packard Sales and Service office. A list of HP field offices is included at the back of this manual.

5-13. Table 1-2 contains a detailed description of the contents of the service kit. Any item in the kit may be ordered separately if desired. The wiring in the 11592-60015 Extended Assembly is especially critical and fabrication should not be attempted in the field. Other items in the kit may be built in the field if desired.

#### 5-14. Extender Cable Installation.

5-15. Plug-in Removal. Push the front panel latch in the direction indicated by the arrow until the latch disengages and pops out from the panel. Pull the plug-ins out of the instrument. Locate the black press-to-release button on the left side of the RF section. Press the button and firmly pull the two sections apart.

5-16. When the two sections separate at the front panel, raise the upper section until it is above the lower section by two or three inches at the front panel. Disengage the metal tab-slot connection at the rear of the plug-ins and separate the two sections.

#### 5-17. Plug-In Cover Removal.

5-18. Remove the bottom cover from the IF section. Do not remove the shield covers from the A1 and A8 assemblies in the IF section until those assemblies are to be adjusted.

### 5-19. Extender Connections.

5-20. Place the plate end of the HP 11592-60015 Extender Assembly in the display section and press firmly into place so that both plugs make contact. The plate and plugs cannot be installed upside down as the plate has two holes corresponding to two guide rods in the mainframe.

5-21. Connect the upper cable plug to the RF Section and the lower cable plug to the IF Section. The plugs are keyed so that they will go on correctly and will not make contact upside down. Connect the HP 11592-60014 Interconnection Cable Assembly between the RF and IF sections. The connectors are keyed by the shape of the plug and the arrangement of the pins. Press the connectors firmly together and extend the instrument sections as far apart as the cables will allow without putting stress on the connectors.

### 5-22. FACTORY SELECTED COMPONENTS.

5-23. Table 5-4 contains a list of factory selected components by reference designation, basis of selection, and schematic diagram location on which the component is illustrated. Factory selected components are designated by an asterisk (\*) on the schematic diagrams in Section VIII of this manual.

#### 5-24. RELATED ADJUSTMENTS.

5-25. The adjustment procedures are arranged in numerical order. Many adjustments are directly related to preceding or following ones. The following sets of adjustments are related, and if one adjustment in the set is made, the other procedures in that set should be checked or adjusted.

### Power Supply Checks and Adjustments (Para. 5-27).

#### Scan Circuits.

- 1. Horizontal Scan Checks and Adjustments (Para. 5-28).
- 2. Final Scan Checks (Para. 5-29).

### Log/Linear Amplifier Circuits.

- 1. Vertical Deflection Amplifier Checks (Para. 5-30).
- 2. Log/Linear Amplifier Checks and Adjustments (Para. 5-31).

#### 3 MHz IF Circuits.

- 1. 3 MHz IF Bandwidth Checks (Para. 5-32).
- 2. LC Filter Adjustment (Para. 5-33).
- 3. Crystal Filter Adjustment (Para. 5-34).
- 4. 300 kHz Bandpass Filter Adjustment (Para. 5-35).
- 5. 3 MHz IF Gain Adjustments (para. 5-36).

#### **Converter Circuits.**

- 1. 47 MHz Local Oscillator Check and Adjustment (Para. 5-37).
- 2. 50 MHz IF Bandpass Check and Adjustment (Para. 5-38).
- 3. 44 MHz Rejection Adjustment (Para. 5-39).

# 30 MHz Calibration Oscillator Check and Adjustment (Para. 5-40).

Analogic Check and Adjustment (Para. 5-41).

#### 5-26. CHECKS AND ADJUSTMENTS.

#### 5-27. Power Supply Check and Adjustment.

#### REFERENCE:

Schematic 17

DESCRIPTION: The spectrum analyzer If Section regulates power fed from the display section. These checks verify and validate the display section power supply voltages and the regulated voltages in the spectrum analyzer plug-ins.

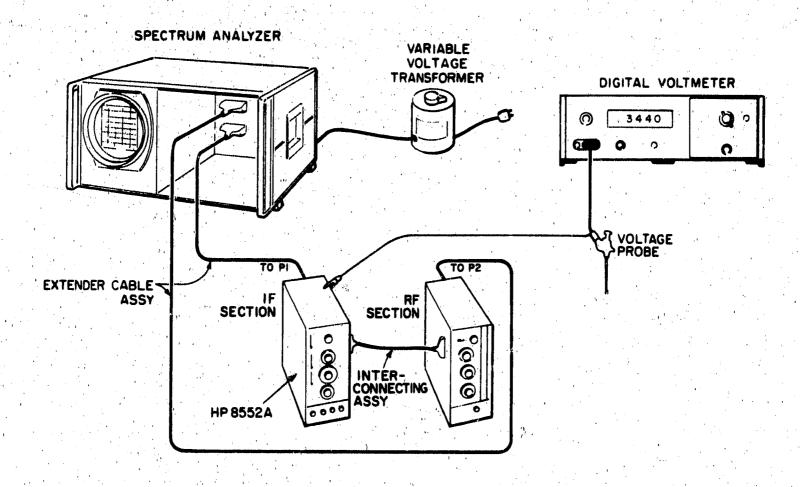


Figure 5-1. Power Supply Check and Adjustment Test Setup

EQUIPMENT:				$\mathcal{P}^{\mathcal{P}}$
Interconnection Assembly	9	•		 HP 11592-60015
Digital Voltmeter		• • • • •		HP 3440A/3443A
interconnection Assembly				. HP 11592-60014
Straight-Through Voltage Probe				HP 10025 A
Variable Voltage Transformer	• •	• • • •	• • • •	W5MT3A

1. Connect the test setup shown in Figure 5-1. Measure the DC display voltages with the HP 3440A/3443A Digital Voltmeter while the analyzer plug-ins are installed on extender cables.

Test Point (to Chassis)	Wire Color	Voltage
P1-9	red	+250 ±3 Vdc
P1-4, P2-2	whi,'red	+100 ±1 Vdc
P1-6, P2-6	vio	-100 ±1 Vdc
F1, F2	wht/vio	-12.6 ±1 Vdc

2. If the display section supplies need adjustment, refer to the manual provided with the display section for instructions.

# 5-27. Power Supply Check and Adjustment (cont'd)

3. Connect the digital voltmeter to the IF Section XA5-11 (wht/blk/red) and measure +20 ±0.10 Vdc. Ripple should be <0.5 mVrms. These tolerances should be maintained as the line voltage is varied between 103.5 Vac and 126.5 Vac using the variable voltage transformer.

+19.90 \_\_\_\_+20.10 Vdc

- 4. If the +20 Vdc supply is out of tolerance, adjust A5R16 +20V ADJ on the power supply assembly.
- 5. Connect the digital voltmeter to the IF Section XA5-8 (wht/blk/vio) and measure  $-10 \pm 0.01$  Vdc. Ripple should be <0.5 mVrms. These tolerances should be maintained as the line voltage is varied between 103.5 Vac and 126.5 Vac using the variable voltage transformer.

-9.99\_\_\_\_-10.01 Vdc

6. If the -10 Vdc supply is out of tolerance, adjust A5R32 -10V ADJ on the power supply assembly.

### 5-28. Horizontal Scan Check and Adjustment.

#### REFERENCE:

Schematic 14.

DESCRIPTION: The SCAN OUT voltage is measured and pre-set in this procedure. The Final Scan Checks (Paragraph 5-29) are then performed. The SCAN OUT voltage waveform is observed and adjustments made, if necessary, to obtain the proper waveform.

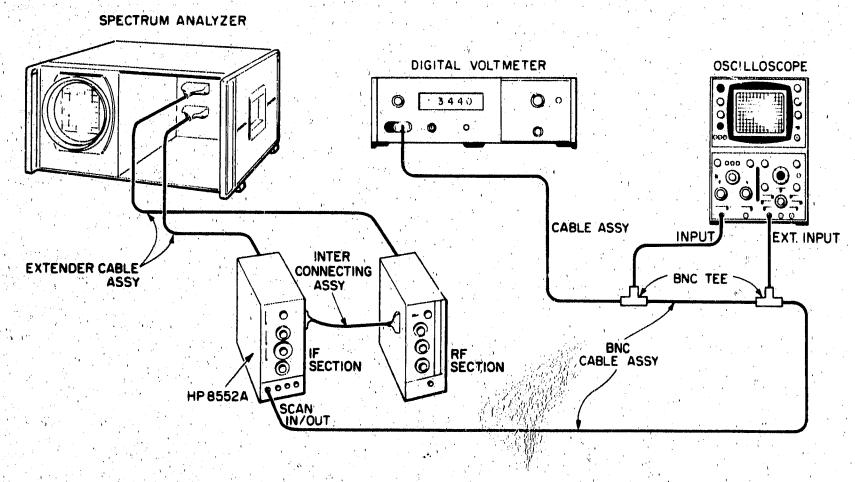


Figure 5-2. Scan Generator Check and Adjustment Test Setup.

# 5-28. Horizontal Scan Check and Adjustment (cont'd)

### **EQUIPMENT:**

	Oscilloscope				. Projekty de l Santa and an anti-	,		. НР	180A/1801A/1821A
	Digital Voltmeter								HP 3440A/3443A
: -	Extender Assembly .		•		14.1				. HP 11592-60015
	Interconnection Assemb	• • •	•		• • •	• • •	•		. HP 11592-60014
	BNC Tee (2)								
	Cable Assembly (2)	• • • •	•	•	• • •	• • • •	•		and the second s
	Cable Assembly	•	• (* • • • • • • • • • • • • • • • • • •	• • •		• •	• • •	•	HP 11001A

1. Connect the test setup shown in Figure 5-2 and make the following control settings:

#### ANALYZER:

COANTINE CLIPPER	•	•	•	•	•	•	•	•	•	•		•	• ,	• 8 •		•	•	•		Max ccw	
SCAN TIME PER DIVISION	•	•	•	•	• •	•	•	•	•	· .	•	•	• ,	• •	٠,		5	MIL	LIS	<b>ECONDS</b>	
SCAN MODE		•	•		•							_		_		 				INT	٠
SCAN TRIGGER		•	•	, •	• • •	•	•	•	. 1.		•	•	, • .						•	AUTO	

#### 180A/1801A/1821A:

HORIZONTAL SCALE										_				•	*	10 milliseconds/division
VERTICAL SENSITIVITY	٠.			٠.	-		•	•	•	•,	• :	•	•	•	•	
	`*	•	• •	•	•,	• .	•	. •	•	•	•	•	•	•	•	2 volts/division
EXTERNAL TRIGGER .	•	•		•	•	٠	•	•		•	. •	• '	•	•	• .	trigger on external dc signal

#### 3440A/3443A:

SAMPLE RATE
RANGE
RANGE
AUTO

- 2. Synchronize the oscilloscope horizontal scan with the signal from the analyzer SCAN IN/OUT jack.
- 3. Observe and measure the SCAN IN/OUT waveform and compare it against the waveform shown in Figure 5-3. Rise time should be 54 ±4 milliseconds.

50\_\_\_\_58 ms

- 4. If rise time of the scan voltage is out of tolerance, adjust A6R15 SCAN TIME control. Then proceed with the remainder of the scan generator adjustments given below.
- 5. Set the analyzer SCAN TRIGGER to EXT. Use the digital voltmeter to measure the dc voltage level at the SCAN IN/OUT jack. Voltage should be -5.0 ±0.02 Vdc.

-4.98\_\_\_\_-5.02 Vdc

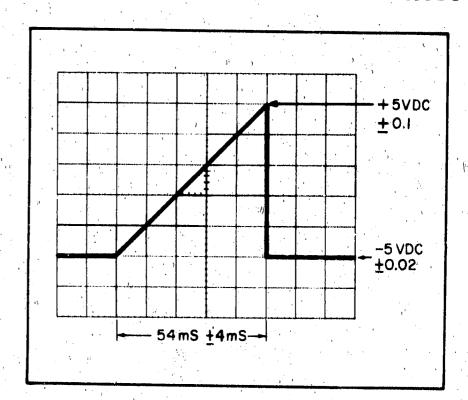


Figure 5-3. Scan Voltage Waveform Measurement

- 6. If the voltage is out of tolerance, adjust A6R49 -5V ADJ control on the scan generator assembly.
- 7. Turn the SCAN TIME PER DIVISION control to 10 SECONDS, SCAN MODE to SINGLE; push the SINGLE button.
- 8. Observe the SCAN IN/OUT voltage as the scan reaches the right-hand edge of the graticule. The highest reading should be  $\pm 5.0 \pm 0.1$  Vdc. Repeat this operation several times to make sure the voltage reading is correct.

9. If the voltage is out of tolerance, adjust A6R39 SCAN AMPL control on the scan generator assembly.

#### 5-29. Final Scan Check.

#### REFERENCE:

Schematic 14.

DESCRIPTION: A modulated RF signal is connected to the RF INPUT. The demodulated signal on the analyzer display is used to fine-adjust scan time circuits. Then, the operation of remaining scan circuits is checked.

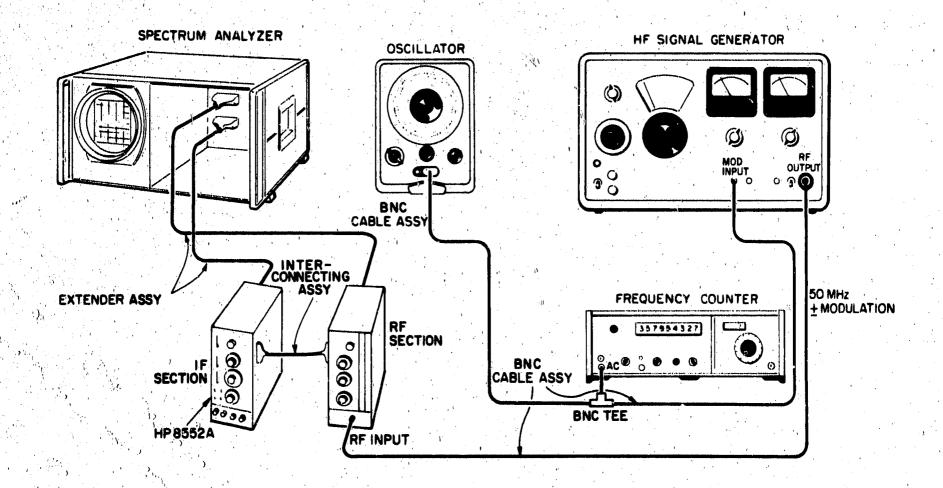


Figure 5-4. Final Scan Time Adjustment Test Setup

CII MILIN I .	· :			4,10																			7.3			
Frequency Counter	2 1 4	• , •			•		•		• '	•	• "	•	•	•	•		•	p	•	•	٠.	. •	•	•	•	. HP 524
Oscillator		• . •		•	•			. n •			•		• •	•	•	•	•				•	• ,	•	•	•	. HP 200
Signal Generator	• >•	. A	•	•	٠.	•	•	•	•	• (		•	•				•	. •			•				•	HP 60
Cable Assembly (2)	•			e de la compa			• 1		•	•					• `	•	•			•	•	• :		· · • •	•	. HP 1050
Cable Assembly .	•		•		. •	٠.	13 P		•			•		٠	•			•	· G	· 1.	•			ς •	•	. HP 1100
Interconnecting Ass																										
<b>Extender Assembly</b>	ing a special contract of the	, ) <u>.</u>	• •	h . •	, .	•	·. •	•			•.	• ,		•		•	•		•		•	٠.		. ]	HP	11592-60
BNC Tee			, j. (		•			• • .				, '• ·		•			• .	•		•	•	. •f≀i		•	•	· UG-2741

#### 1. Connect the test setup shown in Figure 5-4 and make the following control settings:

AN	AL	YZ	ER	ان د
----	----	----	----	------

**EQUIPMENT** 

	FREQUENCY	. 50 MHz
 	FINE TUNE	. Centered
٠.	BANDWIDTH	. 300 kHz
. : <b>:</b>	SCAN WIDTH	ZERO
	INPUT ATTENUATION	
در: دو:	BASE LINE CLIPPER	Max ccw
	SCAN TIME PER DIVISION	LISECOND
. ' '	LINDAR SENSELVILL STATE OF SERVICE STATES OF SER	1 mV/DIV

5-29. Final Scan Ch	eck (con	t'd)									. 7			13, 4 (4) 14 <b>(</b> 2) 13 (13)	1					
ANALYZER control	settings	(cont'c	<b>l</b> )							****			4							
LOG/LINEAR VIDEO FILTER SCAN MODE SCAN TRIGGE			•	•		•	•	•	•	•	• 3	• •	•	•	•	•		•	•	10 kF . IN
606B:						<b>.</b>				,		2 - 1 A			• .				erior Son	
FREQUENCY ATTENUATOR	(dBm)		•			•.			• •		•	•		ar Ç• · · •		•	•	•	•	50 MH
MODULATION RANGE	SELECT	ror .		•	•	. •	•		• 1, 1	•	•	•	•, *,	•	•,	•		•	• .	EXT A
<b>5245L</b> :				1							•	•								ż
SENSITIVITY FUNCTION .	• .• .•		• • •	•	•	•		•		`,•	•		•	<b>P</b>	ERI	OD	A	<b>VER</b>	LAC	iE (10
TIME BASE .	•	•		η. •·	•	•	•	•		•	•		•	• , •	•	•		•	•	. 10 µ

- 3. Fine tune the signal generator for maximum signal indication on the analyzer. Adjust LINEAR SENSITIVITY controls for a convenient display height.
- 4. Adjust the audio oscillator modulation frequency to give a 1.0 ms HP 5245L Period Average reading.

SCAN TIME PER DIVISION **HP 200CD Frequency** HP 5245L Period Average 1 MILLISECOND 1 kHz  $1.0 \pm 1 \text{ ms}$ 5 MILLISECONDS 200 Hz  $5.0 \pm 0.5 \text{ ms}$ 10 MILLISECONDS 100 Hz  $10.0 \pm 1$ **50** MILLISECONDS 20 Hz 50.0 ±10 ms 0.1 SECOND 10 Hz 100.0 ±20

Table 5-1. Modulation Frequencies for Checking Scan Time

- 5. Position the first modulation peak directly on the -5 graticule line by adjusting the HORIZONTAL POSITION control.
- 6. If the tenth modulation peak does not align with the +4 graticule line, adjust the SCAN TIME control A6R15 on the Scan Generator Assembly. (See Figure 4-7).
- 7. Check the scan time limits of the SCAN TIME PER DIVISION positions as listed in Table 5-1 by setting the first modulation peak in alignment with the -5 graticule line. Then align the tenth modulation peak with the +4 graticule line by slightly changing, if necessary, the modulation frequency from the audio oscillator (one peak per division). The HP 5245L Period Average readings should be within the tolerances as listed in Table 5-1.

#### 5-29. Final Scan Check (cont'd)

8. To check scan time linearity, set the controls as follows:

SCAN TIME PER DIVISION	•			•	2 MILLISECONDS
Modulation Frequency (HP 200 CD)	• • •	• • •	•		500 Hz

9. Use the HORIZONTAL POSITION control to set the first modulation peak on the -5 graticule line. Adjust, if necessary, the audio oscillator modulation frequency to position the tenth modulation peak on the +4 graticule line. The peaks should align with each graticule line  $\pm 0.1$  division.

Graticule	Min Actual	Max.	Graticule	Min	Actual	Max.
-5	-0.1	+0.1	CENTER FREQUENCY	-0.1		+0.1
-4	-0.1	+0.1	+1	-0.1		+0.1
-3	-0.1	+0.1	+2	-0.1		+0.1
2	-0.1	+0.1	+3	-0.1		+0.1
-1	-0.1	+0.1	+4	-0.1	·	+0.1

10. Switch to each position of the SCAN TRIGGER switch and make sure that the scan triggers. To verify the EXT position, place an ac signal (5 Hz to 50 kHz) at the TRIGGER/BLANK INPUT.

EXT Trigger: 2 \_\_\_\_\_20 V p-p

11. To check VIDEO trigger operation, reduce the signal input slowly to 1.5 divisions of vertical deflection. The scan should continue to trigger down to this level.

VIDEO TRIGGER: 1.5 divisions

12. To check the EXT position of the SCAN MODE switch, connect an 8 volt peak-to-peak, 1 kHz sine-wave signal from the HP 200CD Oscillator to the SCAN IN/OUT jack. A horizontal trace should appear on the CRT display.

EXT SCAN MODE: 8 V p-p

#### 5-30. Vertical Deflection Amplifier Check.

#### REFERENCE:

Schematics 10, 11, 12, 13.

DESCRIPTION: The A4 Crystal Filter Assembly is removed from the IF Section. A 3 MHz signal of known amplitude is applied at the input (XA4-14) of the LOG REF LEVEL LINEAR SENSITIVITY attenuator. The VERTICAL POSITION and VERTICAL GAIN controls are then checked. A time domain waveform is then placed on the analyzer by an AM modulated 3 MHz signal at XA4-14. Operation of the BASE LINE CLIPPER is checked visually on the display.

# 5-30. Vertical Deflection Amplifier Check (cont'd)

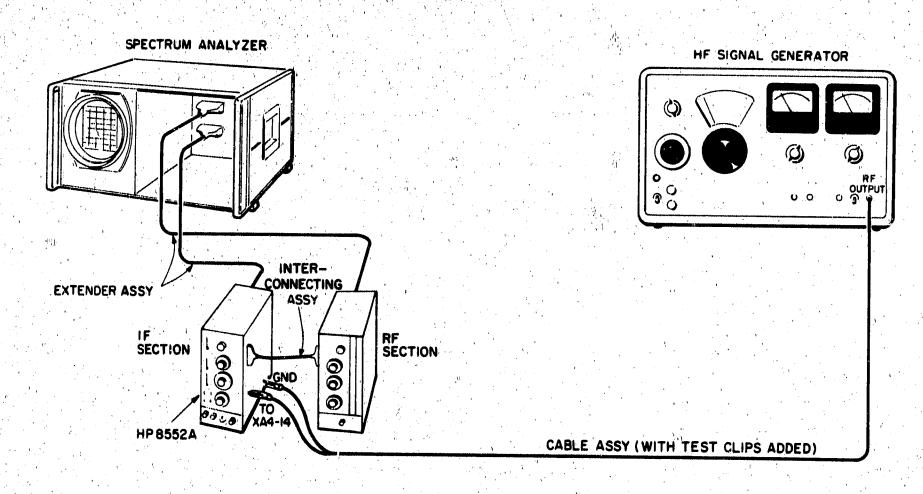


Figure 5-5. Vertical Deflection Amplifier Test Setup

EQ	UIPMENT: Signal Generator Cable Assembly (with test clips installed) Interconnection Assembly Extender Assembly HP 11592-6001
1.	With the analyzer power off, remove the A4 Crystal Filter board from the 8552A.
2.	Connect the test setup shown in Figure 5-5, turn Analyzer power ON, and set controls as follows:
AN	ALYZER: INPUT ATTENUATION SCAN TIME PER DIVISION LOG REF LEVEL LOG/LINEAR BASE LINE CLIPPER VIDEO FILTER SCAN MODE SCAN TRIGGER O  O  O  MILLISECONDS  C  Max cev  Max cev  OFI  SCAN TRIGGER
606	B: FREQUENCY ATTENUATOR (dBm) MODULATION SELECTOR RANGE

į	<b>5-30.</b>	Vertica	<b>l Def</b>	lection	<b>Amplifier</b>	Check	(cont'd	)
١,		11.		6.7				٠.

- 3. Connect a 3 MHz CW signal from the 606B to pin XA4-14.
- 4. With an input signal at -100 dBm, adjust the front-panel VERTICAL POSITION control. The baseline should move ±2 vertical divisions as the control is moved through its range.

-2 \_\_\_\_+2 div

- 5. Re-set the base line to the bottom vertical graticule line. Then increase the signal level to -50 dBm at XA4-14.
- 6. Switch LOG/LINEAR to LINEAR. Observe the display as the VERTICAL GAIN control is turned through its full range. The trace should move at least two vertical divisions.

2 div \_\_\_\_\_

- 7. Switch LOG/LINEAR to LOG. Increase the signal level to 0 dBm and adjust VERTICAL GAIN for an eight division trace deflection.
- 8. Make the following control settings on the 606B:

606B:

			•	•	The state of the s
RANGE					
FREQUENCY	•	• • • •	• • • •		$3 \text{ MHz} (\pm 1 \text{ kHz})$
MODULATION SELECTOR .					INT 1000 Hz
ATTENUATION (dBm)	•		• • • •		110
VERNIER	•			• • • • •	Set for 0 on dB scale
MODULATION AMPLITUDE	•	• • • •			90%

- 9. Turn the BASE LINE CLIPPER until the signal is blanked. The control arrow should indicate between 8 and 12 o'clock.
- 10. Increase the signal generator level to -50 dBm. Set the SCAN TRIGGER to VIDEO.
- 11. The scan should trigger on the video signal. Turn the BASE LINE CLIPPER fully clockwise and check signal clipping.
- 12. The clipping circuit should function so that two to eight divisions of signal above the base line are blanked when the BASE LINE CLIPPER is fully clockwise.

2\_\_\_\_\_ 8 div

13. Regardless of BASE LINE CLIPPER position, the scan should trigger on the video signal.

#### 5-31. Log/Linear Amplifier Check and Adjustment.

#### REFERENCE:

Schematics 10, 11, 12.

DESCRIPTION: A 3 MHz signal is applied at the input to the LOG REF LEVEL — LINEAR SENSITIVITY attenuator (XA4-14). The log and linear amplifier circuits are calibrated by varying the signal amplitude by known increments.

BASE LINE CLIPPER

VIDEO FILTER SCAN MODE

SCAN TRIGGER

### CHECKS AND ADJUSTMENTS (cont'd)

# 5-31. Log/Linear Amplifier Check and Adjustment (cont'd)

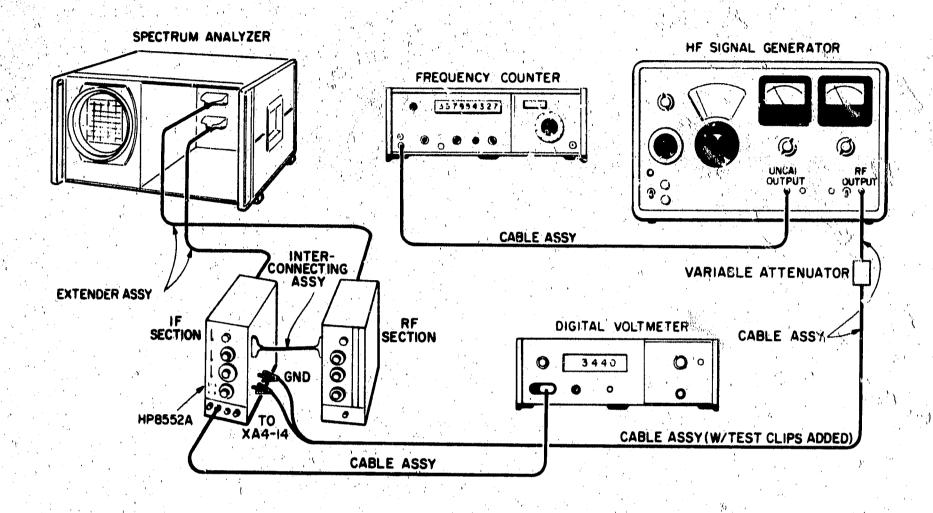


Figure 5-6. Log/Linear Amplifier Check and Adjustment Test Setup

E	UIPMENT:
	Signal Generator  Frequency Counter
;	$HP \mathfrak{D} M M M M M M M M$
•	Cable Assembly (install test clips on unterminated end)
	Tuning Tool, Slot
١.	Straight-through Voltage Probe
a 12	Digital Voltmeter
	Digital Voltmeter
	Interconnecting Assembly
	Extender Assembly
	Cable Assembly
	Attenuator
	Cable Assembly (3)
1.	With the analyzer power off, remove A4 Crystal Filter board from the IF Section.
2.	Connect the test setup shown in Figure 5-6 and make the following control settings:
	and the tollowing control settings:
AN	ALYZER:
	LOG/LINEAR LOG PER LEVEL
- 6	LOG REF LEVEL  -20 dBm
	MPOT ATTENUATION
y 1, 4, 4	SCAN TIME PER DIVISION

INT

**AUTO** 

5-31. Log/Linear Amplifier Check and Adjustment (cont'd)	
	'clock AUTO
606B:	
RANGE FREQUENCY MODULATION SELECTOR ATTENUATOR - dBm VERNIER	4
MODULATION SELECTOR	. CW
ATTENUATOR'- dBm	—110 3 scale
5 <b>245L</b> :	
SAMPLE RATE	'clock
TIME BASE	1 s
FUNCTION	ENCY.
355C:	
ATTENUATION	0 dB
3. Turn the analyzer power on and connect a 3 MHz ±1 kHz CW signal from the 606B to pin XA With an input signal of -110 dBm adjust the VERTICAL POSITION control to set the base line obottom graticule line.	14-14. on the
4. Increase the signal generator level to -40 dBm and adjust A8L12 for maximum vertical deflection the trace. Repeat -110 dBm adjustment if necessary.	on/on
5. Increase the signal level to +10 dBm. Adjust the VERTICAL GAIN control for eight division vertical deflection.	ons of
6. Decrease the signal generator level to -60 dBm and set ATTEN VERNIER for 1.0 division deflered of the vertical display. Retain this ATTEN VERNIER setting through step 14.	ection
7. Increase the signal level 20 dB (do not move ATTEN VERNIER) and set LOG/LINEAR to LIN	EAR.
3. Adjust A8R52, LINEAR GAIN, for 7.07 divisions of vertical deflection. Measure the dc voltage p at the VERTICAL OUTPUT jack with a digital voltmeter. Record the voltage.  VERTICAL OUTPUT Voltage:	resent
9. Set the HP 355C attenuation to 4 dB and turn LINEAR SENSITIVITY to 20 $\mu$ V/DIV. Adjust ADJ A8R63 to the reference voltage in step 8, ±6 mVdc. Repeat step 8 if necessary.	4 dB
10. With the analyzer power off, re-install the A4 Crystal Filter board, also remove the A7 Defle Amplifier Assembly.	ection
11. Set the HF 355C to 0 dB; set the HP 606B Signal Generator 3 MHz level to -110 dBm, as LOG/LINEAR to LOG (LOG REF LEVEL at -20 dBm).	nd set
12. Turn the analyzer on and measure the dc voltage with the HP 3440A/3443A Digital Voltmeto straight-through voltage probe (HP 10025A) connected to XA8-14. The dc level should measure negative than —6 mVdc.	er and more
	mVdc
and the provided and the contract of the contr	

# 5-31. Log/Linear Amplifier Check and Adjustment (cont'd)

- 14. Decrease the signal generator level in 10 dB steps (to -60 dBm). For each 10 dB reduction, the dc level at XA8-14 should increase by 100 ±40 mVdc.

Signal Generator Level at XA4-14	DC Level at XA8-14	Signal Generator Level at XA4-14	DC Level at XA8-14
0 dBm	-740 mVdc -660	-40 dBm	-340 mVdc −260
−10 dBm	-640 mVdc -560	-50 dBm	-240 mVdc -160
-20 dBm	-540 mVdc -460	-60 dBm	-140 mVdc - 60
-30 dBm	-440 mVdc -360	,	A Section of the sect

- 15. Turn the analyzer power off and re-install the A7 Deflection Amplifier assembly.
- 16. Turn the analyzer power on. Check vertical position Step 3. Set the LOG/LINEAR switch to LINEAR. Set the signal generator output to -30 dBm.
- 17. Adjust the generator output level vernier for a full eight division display on the analyzer.
- 18. Carefully reduce the signal input to the analyzer at XA4-14 by the amounts shown in the table below using the HP 355C and HP 606B output attenuators. Deflection should be ±0.2 division for the levels indicated.

Input at XA4-14	CRT Display: Deflection in Divisions
Reference — 30 dBm (approx.)	Reference to 8.0
Add 6 dB attenuation	$4.0 \pm 0.2$
Add 12 dB attenuation	$2.0 \pm 0.2$
Add 20 dB attenuation	$0.8  \pm 0.2$
Add 30 dB attenuation	$0.25 \pm 0.2$
Add 70 dB attenuation	$0 \qquad \pm 0.2$

19. Reinstall the A4 Assembly.

#### 5-32. 3 MHz IF Bandwidth Checks.

REFERENCE: Schematics 5, 6, 7, 8, 9, 10, 11, 12.

DESCRIPTION: Signals are applied to the analyzer and the display is used in LINEAR to measure the bandwidths accurately. A full scale reference is set in ZERO scan and tuned on either side of the center frequency down to the half power points and the bandwidth is then measured using a frequency counter.

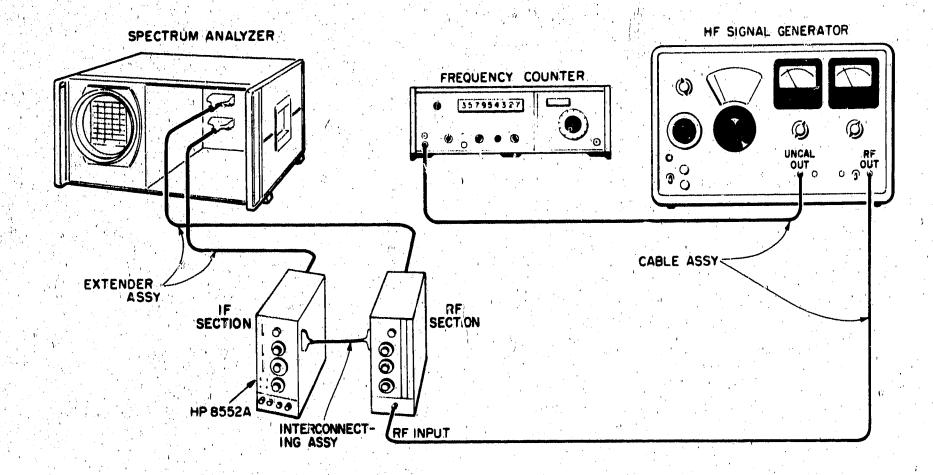


Figure 5-7. 3 MHz IF Bandwidth Checks: 100, 30, 10 kHz Test Setup

EQ	UIPMENT:								, · .,				: :				1	٠.			, 1 .				
	Signal Generator		•	$\{f_i\}_{\bullet}$	•	•	•			•	•	•	) • ,•	. •		•	• :	•.	•	•		• .		. HP 60	06B
	Oscillator Synchronizer	•		•		•				•				•	•	•	•					•		HP 870	08A
	the same of the sa	•												,									, ,		
																								HP 1050	03A
	Interconnecting Assemb																							the second secon	
																								592A-60	
1.	Connect the test setup in	a Fi	gure	e <b>5</b> -	7 a	ınd	ma	ke	the	fol	lov	win	g co	onti	ol	set	tin	gs:				,		, .	
							:	,			*							_	•		٠				
	ALYZER:						1									1.5			* '					· .	
	FREQUENCY	•	•	•	•		•	• •	•		• •	•	• 1	. •	•	• .	•	•	• .	•	•	. •	•	. 11 N	MHz
	TUNING STABILIZER	•	•	•	, <b>•</b>	• ,	•		•	•	•	•	• •	<u>.</u>	•	•		•		•	•	•	•	• • • •	ON
	BANDWIDTH	•	•	• .	•	•	•			•	• •	•			•	•	•,	•	•	• ,	• .	•	•	100	kHz
	SCAN WIDTH		• •	. • ,	•		•			• ,	•	•	• .	٠.	•	•		•	• .	•	•		PE	R DIVIS	JON.
	SCAN WIDTH PER DIV	ISIC	ON		•	• ,		• •		•	٠.	• ;		•	•	•	•		•	•		•		20	kHz
	INPUT ATTENUATION	ſ	•	¥!	•		•			•	• 1	•	•	•			•		•	•	•	•		20	dB
	BASE LINE CLIPPER																							Max	
	SCAN TIME PER DIVIS		N	•	. '		•		•	•	÷					•			•	•	•	2 N	MIL	LISECO	NDS
	LINEAR SENSITIVITY	34 FA (										•		;										1  mV/	TIV

5-3	32. 3 MHz IF Bandwidth Checks (cont'd)
AN	VALYZER control settings (cont'd)
	VIDEO FILTER LOG/LINEAR SCAN MODE SCAN TRIGGER AUTO
60	
	RANGE FREQUENCY MODULATION SELECTOR ATTENUATOR - dBm VERNIER  5  CW
87	08A: (3 to .05 kHz 'Γest Setup)
	FREQUENCY RANGE  RF INPUT  MODULATION  FREQUENCY TUNING  AC-DC  Cunder lit lamp  Centered  AC-DC
<b>52</b> ·	<b>45L:</b> Year of the control of the co
	SAMPLE RATE       9 o'clock         TIME BASE       1 s         FUNCTION       FREQUENCY         SENSITIVITY       0.1 (volts rms)
2.	Set the signal generator frequency precisely to 11 MHz, as monitored on the frequency counter.
3.	Center the display using the FINE TUNE control. Set SCAN WIDTH PER DIVISION to 20 kHz; switch to ZERO scan.
4.	Turn FINE TUNE to peak the display. Adjust LINEAR SENSITIVITY controls for a 7.1 division display.
5.	Note the exact reading on the frequency counter. Turn the signal generator frequency control above 11 MHz until the display drops to the half-power point at 5.0 divisions. Measure the frequency:  MHz
6.	Turn the signal generator frequency control below 11 MHz until the display again drops to the half-power point at 5.0 divisions. Measure the frequency:
<b>7</b> .	The bandwidth should be 100 kHz ±20 kHz.
	80120 kHz
8.	Measure 30 kHz and 10 kHz bandwidths using the same procedure used in the 100 kHz test. Test limits:
	30 kHz Bandwidth: 2337 kHz 10 kHz Bandwidth: 9.410.6 kHz
	这是我们,一个就是我们的,我就就是我们的,我们就是我们的,我们就是我们的,我们的,我们就不是我们的,我们的人,我们就是一个人,我们就是一个人,我们就是一个人,

#### 5-32. 3 MHz IF Bandwidth Checks (cont'd)

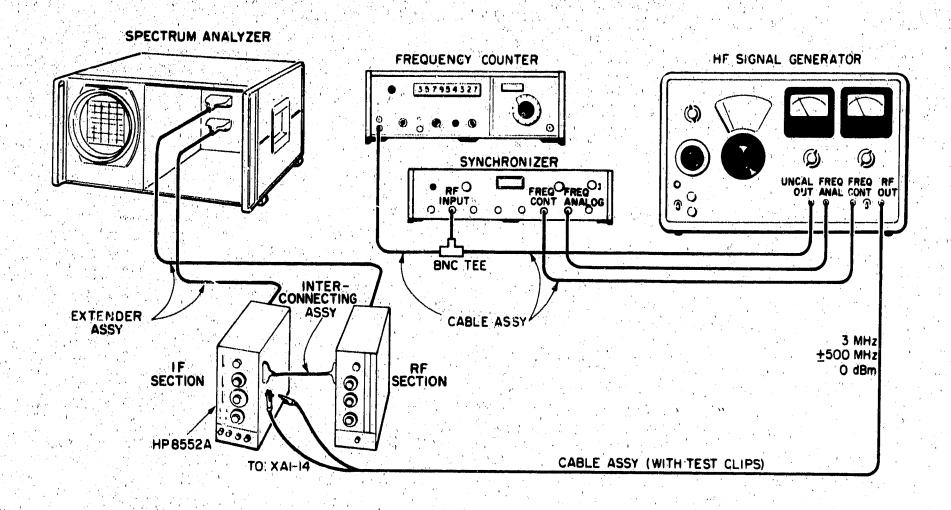


Figure 5-8. 3 MHz IF Bandwidth Checks: 3 to .05 kHz Test Setup

- 9. Remove 3 MHz Amplifier Assembly A2 and connect test setup as shown in Figure 5-8. Set signal generator frequency to 3 MHz (±500 Hz) at -40 dBm; set LINEAR SENSITIVITY control of spectrum analyzer fully ccw (see step 1, HP 8708A Test Setup).
- 10. Connect generator output to XA1-14.
- 11. Set BANDWIDTH control of spectrum analyzer to .05 kHz and set FREQUENCY TUNING control of 8708A to -.05%. Adjust frequency VERNIER of 8708A to peak display.

#### NOTE

For any bandwidth in this procedure, the VERNIER attenuator of 606B may require slight adjustment to peak the display at 7.1 divisions.

12. Turn frequency VERNIER of 8708A clockwise until display trace drops to 5.0 division line; read and record the HP 5245L frequency. Turn VERNIER counterclockwise until display peaks and then drops to 5.0 division line; read and record this frequency.

.05 kHz Bandwidth: 36\_\_\_\_\_64 Hz

13. Set BANDWIDTH control of spectrum analyzer to 0.1 kHz and repeat step 12.

0.1 kHz Bandwidth: 70\_\_\_\_130 Hz

14. Set BANDWIDTH control of spectrum analyzer to 0.3 kHz and repeat step 12.

0.3 kHz Bandwidth: 210\_\_\_\_390 Hz

15. Set BANDWIDTH control of spectrum analyzer to 1 kHz and repeat step 12. (If trace fails to reach 5.0 division line, set FREQUENCY TUNING of 8708A to -.10% and turn frequency VERNIER clockwise until the 5.0 division is reached.)

1 kHz Bandwidth: 700\_\_\_\_1300 Hz

### 5-32. 3 MHz IF Bandwidth Checks (cont'd)

16. Set BANDWIDTH control of spectrum analyzer to 3 kHz and repeat step 12. (FREQUENCY TUNING and frequency VERNIER controls may require different settings to drop the signal to the 5.0 division line on each side of the peak.)

3 kHz Bandwidth: 2100\_\_\_\_3900 Hz

#### 5-33. LC Filter Adjustment.

#### REFERENCE:

Schematic 7

DESCRIPTION: The LC Filter circuits are first tuned. Then the gain of the 10 kHz bandwidth is measured. The 10 kHz gain control is set on A1 so that the 300 kHz bandwidth has the same gain as the 10 kHz bandwidth.

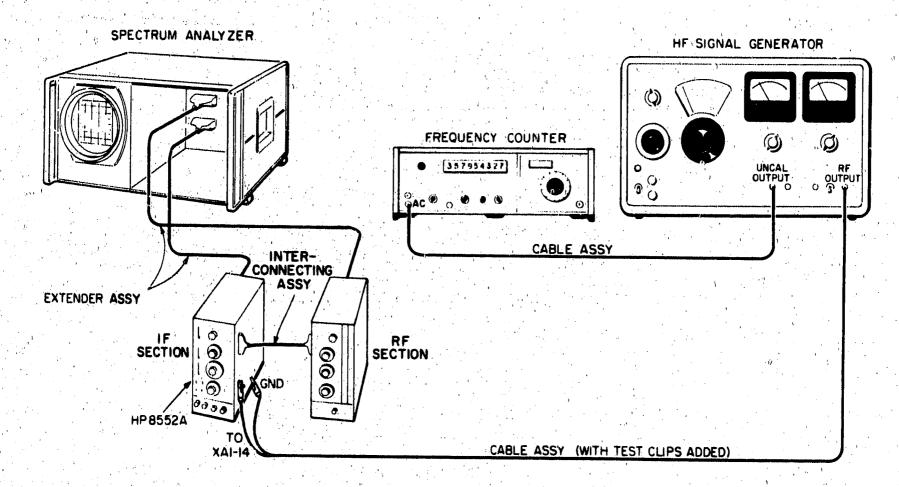


Figure 5-9. LC Filter Adjustment Test Setup.

EQ	U	IP	M	El	VT	•
	_				, .	

Signal Generator		· · · · · HP 606B
Frequency Counter		HP 5245L
Cable Assembly (1)		IID 10500 A
Interconnecting Assembly		TTD 11500 0001 4
Extender Assembly		
Cable Assembly (with test clips	installed)	HP 10501A

#### 5-33. LC Filter Adjustment (cont'd)

1. Connect the test setup in Figure 5-9 and make the following control settings:

NALYZER: INPUT ATTENUATIO	N.				14 15 15 1 14 1								0.01						:			. '			10
INPUT ATTENUATION BANDWIDTH							•					•		Ç.			•	•				. •.			10 l
SCAN WIDTH	•		•			•	•		17			•	. •			•		,, •	•	•	. ·′.	·	PER	DIV	ISI
LOG REF LEVEL		•	•		•	• .	•	. • •		•	• •		٠, .		₫.	• "	•	•	•	•				3	u a
	• •																								
SCAN TRIGGER VIDEO FILTER																									AU O
	•	•	•	•		•	•	•		•		•	•	•	•	•	•		1.	•	•	•	• • •		
06B:				•		٠.	٠.								٠.							'.			
FREQUENCY ATTENUATION — di		•	•	•			•	•	•	•	•		•	•	•	•					• • >	3	MH	z ±5	00
ATTENUATION — di	3m .		•	• .	•	•	٠,	•	•	•		•	•	• •	•	•	• •	•	•			•	•	•	•
RANGE	• •	. • <b>•</b> `	1.	•	•		•	ı • '	•	•		•	•	5 • T	•	•	•	•	• 10 (	• •	•	• '	• '	•	•
MODULATION SELECTION VERNIER	IOU	•	' n	• .	•	•	•	•	• ,	• (	•. •	· •	•	٠	•		•	•	•	• , •	• •	•,	•	• •	. •
	• •	•	•	•	. *	• • • i,	•	• .,	•,	• '	•	•	•	•	•	•	•	•	•	. 5	eu	lor	U QI	on c	me
245 <b>L</b> :						· · · · ·		<i>.</i>										*		e-					
SAMPLE RATE	• •	٠.	0	• ,	•	•	•	•	•	• 1 4		•	•	•	•	• ,	•.;	•	• :		•	' <b>•</b> '	•	9 o	'clc
TIME BASE	•	•	••′	•	.•	•		•	•	<b>.</b>		•	•	•	• •	• .	• .	• .	•	• •	•	•	י . ממנו		0.
FUNCTION																									
SENSITIVITY (volts rm	15) .	, '• '	• .	•	•	•.	•	• .	•	• •	•	è	• ,•	•	•	•	•	•	•	• (1)	•		• •	• •	٠. (

- 3. Connect the 3 MHz ±500 Hz signal from the signal generator to pin XA1-14. Set the generator level for 0 dBm.
- 4. Observe the display and adjust the PEAK tuning capacitors A1C4, 10, 16, and 22. Tune the capacitors for maximum trace deflection on the display.
- 5. Turn the BANDWIDTH control to 300 kHz. Note the signal level; then switch back to 10 kHz BANDWIDTH and adjust A1R35, 10 kHz ADJ, for the same level; ±0.1 division.

-0.1\_\_\_\_\_+0.1 div

- 6. If any of the PEAK capacitors are at the end of their range remove the circuit board from the analyzer and install it on the extender.
- 7. Center the capacitor and tune its corresponding inductor for maximum deflection on the display.

Peak Capacitor		Inductor
A1C4		A1L3
A1C10		A1L4
A1C16		A1L5
A1C22	A	A1L6

- 8. Re-install the circuit board without the extender and fine tune the PEAK capacitors.
- 9. Check the change in signal amplitude on the display as the BANDWIDTH switch is moved to 300 kHz, 100 kHz, 30 kHz and 10 kHz. Deflection in these pandwidths should all be within ±0.4 division of each other.

300 kHz: Reference 100 kHz: -0.4 \_\_\_\_\_+0.4 div 30 kHz: -0.4 \_\_\_\_\_+0.4 div 10 kHz: -0.4 \_\_\_\_\_+0.4 div

10. Reinstall A2 3 MHz Amplifier assembly.

**EQUIPMENT:** 

# CHECKS AND ADJUSTMENTS (cont'd)

# 5-34. Crystal Filter Adjustment.

REFERENCE: Schematics 8, 9, 10.

DESCRIPTION: The crystal filter circuits are adjusted by shorting the signal path and bypassing two circuits while adjusting the tuning capacitors for the third. The displayed waveform is adjusted for symmetry and null.

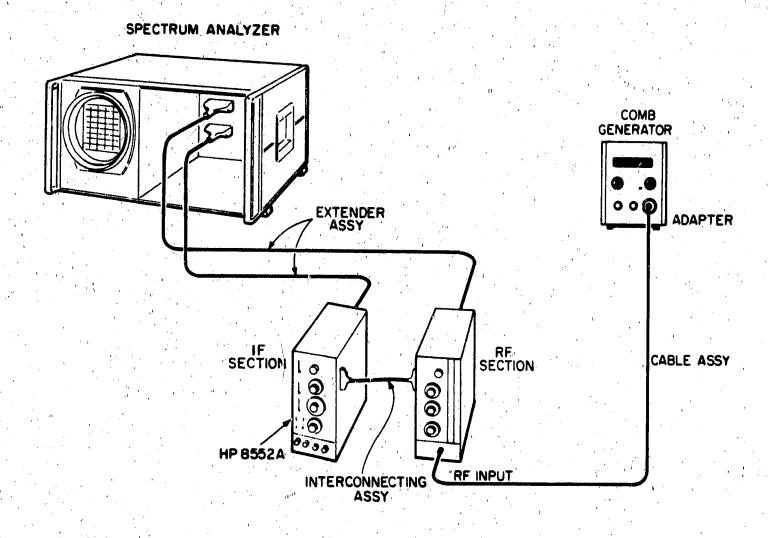


Figure 5-10. Crystal Filter Adjustment Test Setup.

Comb Generator Cable Assembly Interconnecting Assembly Extender Assembly Clip Lead 6 inches or longer (2)	• •	• •	• •	• •	• • •	• •	•	•	• •	HP 10503A . HP 11592-60014
1. Connect the test setup in Figure	5-10	and	make	the f	ollowii	ng cont	rol sett	ings:		
ANALYZER:							•			
FREQUENCY	, .	•		• •	•	• •	• •	•	•	11 MHz Center display
INPUT ATTENUATION		•								10 dB
TUNING STABILIZER BANDWIDTH						•				3  kHz
SCAN WIDTH SCAN WIDTH PER DIVISION		• •					• · · · · •			. PER DIVISION
SCAN TIME PER DIVISION	• •	<i>v</i>	•	• •	• • •		• • •	•	• •	5 MILLISECONDS
LOG/LINEAR		• •								—30 dBm LOG
VIDEO FILTER		•	• • •	• •		•	•	•	•	· · · · OFF

	4. Crystal Filter Adjustmo	ent (cont'd)			
AN	ALYZER control settings	(cont'd)			
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SCAN MODE				INT
84	06A: COMB FREQUENCY OUTPUT AMPLITUDE				and the second s
2.	Place the A4 Crystal Filt	er Assembly on	an extender board and	install it in the IF Sect	ion.
3.	Short the relay contacts	Short	ing clip leads and adjust Adjust for Symmetrical Skirts 30 dB Down	as indicated: Adjust for Null	
	A4I	K1, A4K2 K1, A4K3 K2, A4K3	A4C38 A4C23 A4C9	A4C45 A4C30 A4C15	
4.	Install the A4 assembly w	vithout an exte	ender.		
5.	Fine tune A4C15, A4C30	), and A4C45 f	or display null.		`
<b>3.</b>	Set Controls as follows: SCAN WIDTH PER DIVI			The second secon	
7.	Turn BANDWIDTH from average peak value.	n 3 to 1, to 0.	3 kHz. Peak amplitude	should change less tha	n ±0.4 div. Note
<b>3.</b>	Set Controls as follows: SCAN WIDTH PER DIVI BANDWIDTH SCAN TIME PER DIVIS	•		• • • • • • • • • • • •	0.1 kHz
€.	Adjust A4R85, 0.1 kHz,	for average valu	ue obtained above.		
l <b>0</b> .	Set Controls as follows: BANDWIDTH	 ION		• • • • • • • • •	05 kHz 0.5 SECONDS

# 5-35. 300 kHz Band ass Filter Adjustment.

REFERENCE: Schematic 5.

DESCRIPTION: The 300 kHz bandpass filter is adjusted at the input to the A1 LC Filter assembly for symmetry and center frequency. Then the 300 kHz bandwidth is checked to see that it has the same gain as the 10 kHz bandwidth.

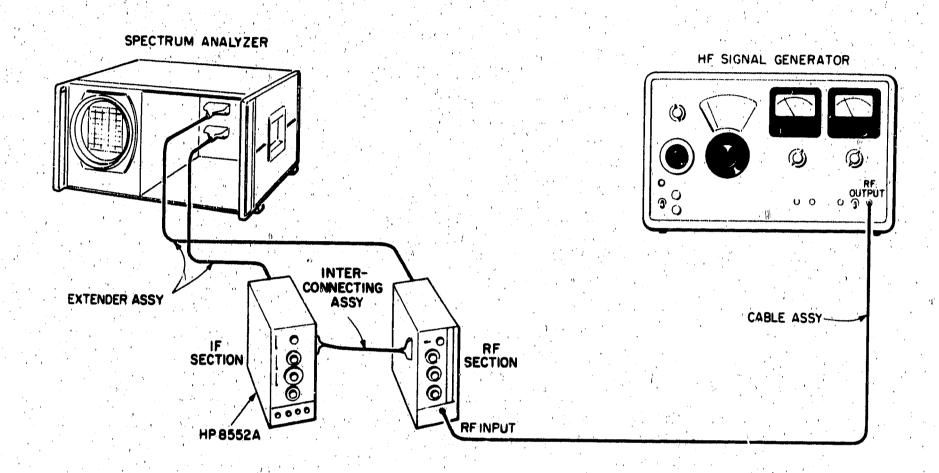


Figure 5-11. 300 kHz Bandpass Adjustment Test Setup

EQUIPMENT:			
Interconnecting Assembly Extender Assembly			HP 10503A . HP 11592-60014 HP 11592-60015
		nd make the following control settings	
ANALYZER:	A control of the cont		
			300 1-11-
 SCAN WIDTH PER DIVISIO	<b>N</b>		PER DIVISION 50 kHz
FINE TUNE			11 MHz
 COUNTRING LEW DIAIDION			5 MILLICECONIDG

### 5-35. 300 kHz Bandpass Filter Adjustment (cont'd)

ANALYZER control settings (cont'd)

SCAN MODE		• •	•		INT
SCAN TRIGGER			• • • • •		LINE
LOG/LINEAR	• • • •	•	• • • • •		LINEAR
LINEAR SENSIT			•	 	1  mV/DIV
BASE LINE CLIP	PER		• • • • • •		Max ccw

#### 606B:

5B:		
FREQUENCY		
RANGE		5
MODULATION SELECTOR .	i ja jakora kan kaj arta kan ali arta kan arta ka	CW
VERNIER		Set for 0 dB on meter

- 2. Connect the signal generator output to the RF INPUT. Place the A2 3 MHz Amplifier assembly on an extender and install it in the analyzer. Center the display with the FREQUENCY control.
- 3. Adjust A2L7, A2L9 and A2R1 IMP for a smooth, symmetrical waveshape centered on the analyzer display.
- 4. Set SCAN TIME PER DIVISION to 20 MILLISECONDS and BANDWIDTH to 3 kHz. The display should remain centered. Return these controls to 5 MILLISECONDS and 300 kHz, respectively.
- 5. Install the circuit board without the extender. Readjust A2R1 IMP if necessary.
- 6. Adjust LINEAR SENSITIVITY for 7.1 divisions of display.
- 7. With a full 7.1 division display, observe the bandpass skirts at 5.0 divisions (half-power points). The bandwidth should be 300 kHz, +50, -70 kHz.

230 \_\_\_\_350 kHz

- 8. If necessary, repeat adjustment procedure.
- 9. Switch BANDWIDTH to 10 kHz. The peak amplitude should remain the same ±0.4 division. If not, perform the LC Filter Adjustment, Paragraph 5-33.

#### 5-36. 3 MHz IF Gain Adjustment.

**REFERENCE:** Schematics 5, 6, 7, 8, 9, 10.

DESCRIPTION: The amplifier gain controls are adjusted for various positions of the LOG REF LEVEL attenuator and then the remaining positions of the LINEAR SENSITIVITY dial are checked. The VERTICAL OUTPUT circuit adjustment is set for output voltage with full-scale display deflection.

SCAN MODE SCAN TRIGGER

VIDEO FILTER

# CHECKS AND ADJUSTMENTS (cont'd)

# 5-36. 3 MHz IF Gain Adjustment (cont'd)

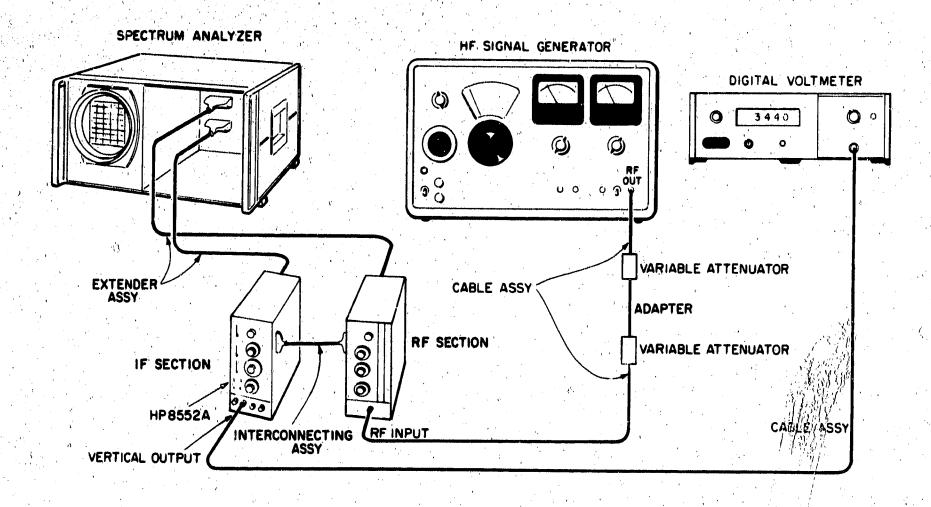


Figure 5-12. 3 MHz IF Gain Adjustments Test Setup

EQ	UIPMENT:		٠,										٠'.					•	•									٠,		
	Signal Generator	•			•	•		•				•	•					• .								_	٠,		H	P 606B
.'	Digital Voltmeter					•'																							3440A/	
	Attenuator	•	•	٠.			•	٠.			•	٠.			•	•		•	•		•	•	٠. •	·			•		H	P 355C
General Control	Adapter	. • 1	•.	•		•	•		•		•					•	•	•	. •	•		•			•	•		. ]	HP 125	8-0216
• •	Interconnecting As	sem	ıbl	У	•	•	•	. •	•	• .	•.		•	0		÷			•	,		•	•	•	•		. I	HP	11592	-60014
	Extender Assembly	<b>7</b> .				•	•	•	•	. •	•		•	•	•	•	•				•	×. •		•.	•		. I	HP	11592	-60015
	Attenuator	•	•	•	•			•				•	•	. • .			•		•	•	•	• .	,•	•	٠,	• '	•	• '		355D
	Cable Assembly (3)	)																											. HP 1	

# 1. Connect the test setup shown in Figure 5-12 and make the following control settings:

NALYZER:				,									٠. ٠							<i></i>						
FREQUENCY	•	•	•	•		•		. ,	•			•		9			•		•		دور	•	•			11 MH
TUNING STABILIZER	• • • • • • •	•	•	•	•	•	•	•	•	•	•	• '`									à.			•		0
BANDWIDTH (	•		•		•	•	•	•	•		•	• .	•			•			·							100 kH
SCAN WIDTH				•	•	. · •	•	•	•		•	•	•		•					•	• ,	•		•	•	. ZER
INPUT ATTENUATIO	N										_ 1	_			_	_							1.			0.4
SCAN TIME PER DIVI	SIOI	1							•								_		_			2	MI	T.T	.IS	ECOND
LINEAR SENSITIVITY	(	• •	•	•	•	* •	. •	•	•	•	•	•			•	•	٠.		. •		•	• .			1	mV/DI
LOG/LINEAR (	• 5			•	•	•	•			•	•	•				•	•	•	. •	•	•		 5•	٠.	٠. •	LINEA
BASE LINE CLIPPER		• •	•	•	•	•	•	oz 🏄	•	•	•		.:.			) (,	•			•	ě					Max cc

5-23

**AUTO** 

**OFF** 

# 5-36. 3 MHz IF Gain Adjustment (cont'd)

	<b>J</b> •2	o. Swinz ir Gain Adjustment (cont'd)
	600	6B: FREQUENCY ATTENUATOR (dBm) RANGE MODULATION SELECTOR VERNIER  Set for 0 dB on meter
1	344	40A/3443A:  SAMPLE RATE
	358	5C and 355D: ATTENUATION
	2.	Adjust FREQUENCY control for maximum trace deflection.
	3.	Adjust signal generator output so that VERTICAL OUTPUT voltage is -1.000 ±0.005 Vdc.
	4.	Increase test attenuators by 12 dB.
	<b>5.</b>	Turn LOG REF LEVEL vernier to -12 dB.
	6.	Adjust A2R44 for -1.000 ±0.005 Vdc.
	7.	Decrease test attenuators by 12 dB.
,	8.	Turn LOG REF LEVEL vernier to 0 dB.
	9.	Adjust A2R51 for -1.000 ±0.005 Vdc.
:	10.	Repeat adjustments in steps 4 through 9 to minimize interaction between controls.
	11.	Set test attenuator to 6 dB.
	12.	Turn LOG REF LEVEL vernier to -6. Note error from 1.000 Vdc and adjust HP 606B output for -1.000 Vdc minus error.
٠.	13.	Set test attenuator to 12 dB and repeat steps 5 through 10.
		Measure the LOG REF LEVEL vernier accuracy at each dB mark by the substitution method employed in steps 4 through 9. The VERTICAL OUTPUT voltage at each step should be -1.000 ±0.04 Vdc.

# 5-36. 3 MHz IF Gain Adjustment (cont'd)

-1 aB -0.96	1.04 Vdc	<b>−7 dB</b>	-0.96 _	 . —1.04 Vdc
—2 dB —0.96	1.04 Vdc	-8 dB	-0.96 _	1.04 Vdc
−3 dB −0.96	1.04 Vdc	−9 dB	-0.96 _	-1,04 Vdc
−4 dB −0.96		-10 dB	-0.96 _	-1.04 Vdc
−5 dB −0.96	1.04 Vdc	—11 dB	-0.96 _	-1.04 Vdc
-6 dB −0.96	1.04 Vdc	—12 dB	-0.96 _	-1.04 Vdc

# 15. Change the control settings as follows:

# ANALYZER:

	INPUT ATTENUATION	•						N					10 AR
	LOG REF LEVEL CONTROLS	•	`.	 . ' .					٠,				MBM
. 1	LOG/LINEAR		•				67.		• '		•	•	LOG
2				1.	1	. ,		*, ,=	•.	• •	•.	*. •	DOG

#### 606B:

ATTENUATOR (dBm)	and the second of the second	* •			and the second s
111 1DACATOR (GDIII)	• • •	•, •, •			Λ.
		* · · ·	,		

### 355D and 355C:

' ATTENUATION	•	1	1.		•	,							•	1							7.			
ATTEMORITOR	•	• •	• •	• .	•	•	•	•	• . •	• •	•	• , •	٠	• ,	•	• '	• , • •	•	•	٠	•		•	0 dB

- 16. Tune FREQUENCY control for maximum trace deflection.
- 17. Note reference voltage at VERTICAL OUTPUT.

Reference Voltage: \_\_\_\_

# 18. Adjust 3 MHz IF Gain positions as follows:

Test Attenuator	LOG REF LEVEL	Adjust	Error Limit: ±2 mVdc (from Reference Voltage)
10 dB	10 dBm	A4R55	-2+2
20 dB	-20 dBm	A4R30	-2+2
30 dB	-30 dBm	A2R21	-2+2
40 dB	-40 dBm	A2R24	-2 <u>+2</u>
50 dB	-50 dBm	A2R27	-2+2

# 19. Check the remaining attenuator steps as follows:

- a. Connect a shorting strap between the green and blue wires on the LOG REF LEVEL switch A10S1-2R.
- b. Set LOG/LINEAR control to LINEAR and test attenuators to 43 dB.
- c. Set LINEAR SENSITIVITY to 0.1 mV/DIV with INPUT ATTENUATION at 10 dB.
- d. Measure the voltage at the VERTICAL OUTPUT jack.

			•
Dafavar	T7-	TA Library	
Referen	ce. vo	HTAGO.	
		rombe.	

#### 5-36. 3 MHz IF Gain Adjustment (cont'd)

- e. Check the remaining LINEAR SENSITIVITY positions according to the table below.
- f. Remove the shorting strap installed in step a above.

Test Attenuator	LINEAR SENSITIVITY	Error Limit: ±15 mVdc
43 dB	0.1 mV/DIV	<b>—15</b> +15
33 dB	0.2 mV/DIV	<b>—15</b> +15
23 dB	1.0 mV/DIV	<b>—15</b> +15
13 dB	2.0 mV/DIV	<b>—15</b> +15
3 dB	10.0 mV/DIV	<b>—15</b> +15

#### 5-37. 47 MHz Local Oscillator Check and Adjustment.

REFERENCE: Schematics 3, 4.

DESCRIPTION: The 47 MHz local oscillator tuning voltages are removed by disconnecting the extender cable between the two analyzer sections. The low-end limit of the oscillator is adjusted. Then, dc voltage is applied to the tuning circuits and the upper-end limit adjusted. Points between the upper and lower limits are checked to verify frequency linearity with linear tuning voltage applied.

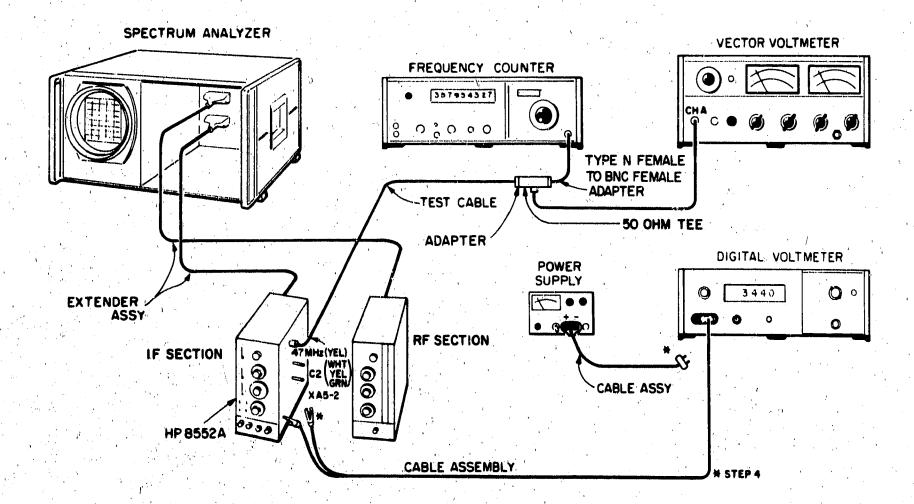


Figure 5-13. 47 MHz Local Oscillator Check and Adjustment Test Setup

5-3	37. 47 MHz Local Oscilla	ator Check and	l Adjustment	(cont'd)		<b>,</b>	
EG	UIPMENT:						
	Vector Voltmeter .	• • • • •	• • • •	• • • •	• • • •	• . • . • . •	HP 8405A
	Power Supply Digital Voltmeter	• • • •		• • • •		• • • • •	HP 6217A
1	Digital Voltmeter . Frequency Counter		• • • •	• • • •		H	P 3440A/3443A
	Frequency Counter Extender Assembly	• • • • •	• • • •	• • • •		ı	HP 5245L
	Test Cable						IP 11592-60015
,	Extender Assembly Test Cable Cable Assembly						HP 11002A
	Capie Assembly			1		4.4	LID 11000 A
	50-Ohm Tee Adapter (2)	• • • • •		• • • •	• • • •		HP 11536A
	Type N Female to BNC	C Female Adap	ter				UG-201A/U FXR 21850
1.	Make the following cor						
34	40A/3443A:						W. Carlotte
01	RANGE						100V
	SAMPLE RATE .				1.0		9 o'clock
	INPUT			• • • •	• • •	Remo	ove ground strap
84	05A:						
	FREQUENCY RANGE	E-MHz		• • • •		• . • • • • • • • • • • • • • • • • • •	40–60
	PROBE	• • • • •	• • •			• • •	CH A
	RANGE	• • • • •	•		• • • •	• • •	300 mV
<b>52</b> ⁄	45L/5252A:						
	SENSITIVITY (volts rr TIME BASE	ms)		• • • •		• • • • •	0.1
	FUNCTION		• • • • •	• • • •	• • • •		0.1 s
: ì,	SAMPLE RATE	• • • • • •		• • • •		*****	FREQUENCY 9 o'clock
						•	. 90 Clock
<b>62</b> :	17A:	.3					
	VOLTAGE		•		• • • • •	• • • • • •	0 Vdc
	METER SELECTION			• • •	• • • • •		VOLTS
2.	Refer to Figure 5-13 a eliminates inputs to the and chassis ground. ComVdc.	e 47 MHz loca	d oscillator t	uning ampli	fier. Connec	t a clip lead	between XA5-5
						<b>-200</b>	+200 mVdc
3.	Connect the counter as frequency and amplit	ude. If necess	sary, adjust	47 MHz (ye A3A2C4 fo	ellow) jack, or a LO free	7. Measure puency of 4	the 47 MHz LO 6,700 ±5 kHz.
	Amplitude should be 14	45 mVrms ±45	mV.				
i. Ny i	gn.					46,695 100	46,705 kHz 190 mV rms
4.	Turn analyzer off. Con	nect power sup	ply in parall	el with the D	VM to XA5-	2.	
5,	Turn the analyzer on, voltage with the digital	and adjust the	e power sup	ply voltage	for -30 ±0	2 Vdc. Mon	itor the supply

# 5-37. 47 MHz Local Oscillator Check and Adjustment (cont'd)

6. Check the 47 MHz LO frequency. With -30 Vdc applied to XA5-2, oscillator frequency should be 47,300 ±5 kHz. If necessary, adjust TUNING RANGE control A5R42.

47,295 \_\_\_\_ 47,305 kHz

Amplitude of the LO output at J7 (yellow) should be 145 mVrms ±45 mV.

100 \_\_\_\_\_190 mVrms

#### **NOTE**

The 47 MHz local oscillator adjustments interact. Repeat A3A2C4 and A5R42 adjustments until both frequency limits are within ±5 kHz.

7. Reduce the power supply voltage to 0 Vdc. Using the table below, increase the voltage in -5 volt increments and check the 47 MHz local oscillator frequencies:

Adjustment	Voltage at XA5-2	47 MHz LO Frequency
A3A2C4 47 MHz ADJ	0 ±0.2 Vdc - 5 ±0.2 Vdc -10 ±0.2 Vdc -15 ±0.2 Vdc	46,700 ± 5 kHz
A5R42 TUNING RANGE	-20 ±0.2 Vdc -25 ±0.2 Vdc -30 ±0.2 Vdc	47,100 ±10 kHz 47,200 ±10 kHz 47,300 ± 5 kHz

8. Turn the analyzer off, remove ground lead from XA5-5 and remove test equipment connections from the analyzer.

5-38. 50 MHz IF Bandpass Check and Adjustment.

REFERENCE: Schematic 3.

DESCRIPTION: The 50 MHz IF bandpass is checked by manually sweeping the 47 MHz Local Oscillator over a 200 kHz range and viewing the analyzer display for flatness. For adjustment, the 50 MHz IF is swept using a flat external source. The output is detected, filtered and displayed on an oscilloscope. The bandpass filter is adjusted for frequency, amplitude, width and flatness.

# 5-38. 50 MHz IF Bandpass Check and Adjustment (cont'd)

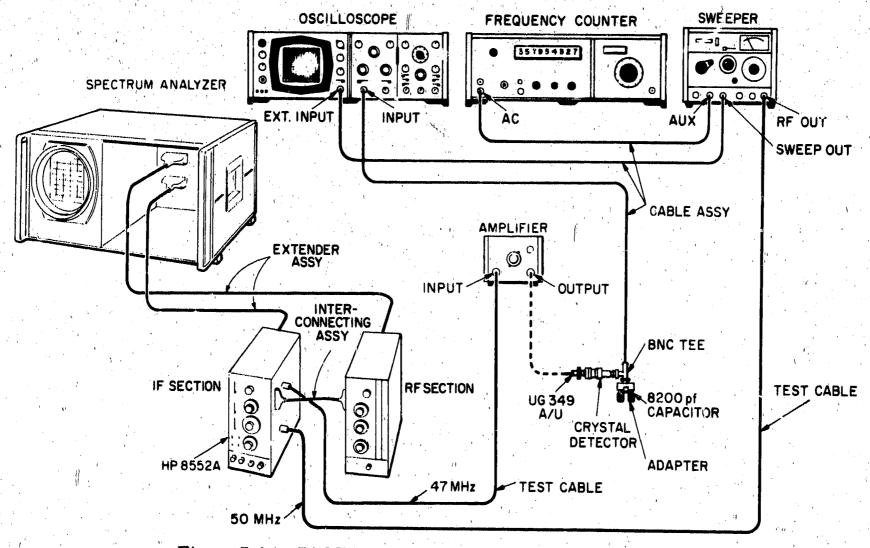


Figure 5-14. 50 MHz IF Bandpsss Adjustment Test Setup

EQ	UIPMENT:				· · · · · · · · · · · · · · · · · · ·			
11.	Generator/Sweeper Oscilloscope with 1801 Frequency Counter	•	• • •	•			$\epsilon$	HP 8601 A
	Oscilloscope with 1801	1A/1821A	Plug-ins			<i>,</i>		UD 180 A
	riequency counter						1 ×	HP 59/51
* 6	trinbillier							ΗΡ 461 Δ
	Crystal Detector ,							HP 4934
	Cable Assembly (2)	,					τ	JD 10501 A
	Cable Assembly (3)					• • • • • • • • • • •		IL TOOUTA
	Test Cable		•	•	• • • •			1P 10003A
	Test Cable	• • •	• •	• • • • • • • • • • • • • • • • • • • •	• • • •		HP II	592-60001
	Davelluel Assembly						HP 11.	592-60015
	merconnecund wasein	ibiy					HP 11!	592-60014
* · · · · · · · · · · · · · · · · · · ·	Adapter						H	IP 10110A
"	Adapter			• • • • • • • • •			U	G-201 A /II
1	BNC Tee				, , , , , , , , , , , , , , , , , , ,			IC 97/P/II
	Adapter		• • • •		• • • • • • •	• • • • • • • · · · · · · · · · · · · ·		G-214D/U
. 1	Adapter		• • •	• • • • • •	• • • • • •	• • • • • • • • • •	· · · · · U	G-349A/U
	Capacitor	• • • •		• • • • •	• • • • • •	• • • • • • • • •	8200 PF	(approx.)
			1 2 14				W * .	

# Connect the test setup as shown in Figure 5-14. Make the following control settings:

ANALYZER:
3 MHz Amplifier Assembly A2 removed.

# 8601A:

FREQUENCY		n			1	_												٠,.	٠,		10	٠		•			,		50		J
RANGE				•		•	Ŋ.	•	•	•	•	•	•	•	•	•	•	•	•	•	•			*. •	٠		•	•,	90	MI	1Z
SWEEP			δ'n.				Ī		, • . •			•	•		_	. •	•	, ju	•	•	•	•	•	. •	•	•		•	•	SY	M
OUTPUT LEVEL	•				•					100		1								-		•		•	•	•	•	•	- <u>1</u> 0		
SWEEP MODE	•		•			•		•		•	•	•			•										' -	•	•		NE-I		
1 kHz MODE	•		•.		• 15	• ,			•	•		, •	•	<u>;</u> (	•	•			٠.,					_	•	•			. <b>V 24</b> 3-1	OF	_

61A: GAIN (d)	3)				•		•	•		. •,,	1 ·	•	•	•	•			•	•	•		•	• *	•	•		•	•			•		
80A/1801A						•		. '																					,	). 	. "		
MAGNIF		•	•	•	. : .		•	•		•.		•	•				•	1 · ·	•	•								Ð •			•		2
POSITIO	N	• •	•	•	•	•	•	•	ė.		• ,		٠,		•	•	•	•	•		•	5 × 🍦	, i	. •	•		• .		(S	ee l	l'igu	re	3-1
VOLTS/I	DIV (C	han	ne	$(\mathbf{A})$	),	• .	•	•		•	•	•	•	•		•	•	•	•	•	Sec.	•	•	•		•	•			٠	•	• , •	).
POLARI	ľY.	• •	•	•	• 1	•	•	•	•	•	1.	. •	•	•	•	•	•			•	•	•			•.		• .	•	. •				Į
INPUT	, , ,	•	• .	•	•	•• '	•	•	•	٠	•	•	. • ,		·, •	.•	•	•	•	•	•	•.	7.	•	•	•	•	•	•	• • .	• •	•	L
DISPLAY		•	•	•	•	•	•	•	•	. <b>*</b> ,	•	•	•	•	•	•		•	•,	• •	•	•.	•	•	•	• ,	•	٠	•	•	•		
245L:							1							ι				•					.;		**	e e				4		•	
SAMPLE	RATE	}								\									•							_					9	o'o	clo
SENSITI	VITY (	volt	ts r	ms	)			•									•							•									• 1
TIME BA																																	
FUNCTION		•																															
. Adjust Go	enerato			. 1		٠ ٠,						٠٠.				. ,\					,			٠.			,				, , *		

- maximum amplitude and flatness.
- Select 3 MHz sweep width on the HP 8601A and observe oscilloscope display for a bandpass as shown in Figure 5-15B. Repeat Step 3 as required to obtain desired bandpass.
- Remove power from display section and install 3 MHz Amplifier Assembly A2.
- Remove cable assembly from Generator/Sweeper.
- 7. Perform 44 MHz Rejection Check, Paragraph 5-39. If capacitors A3C11, 14 or 19 are adjusted, repeat steps 1 through 4 above.

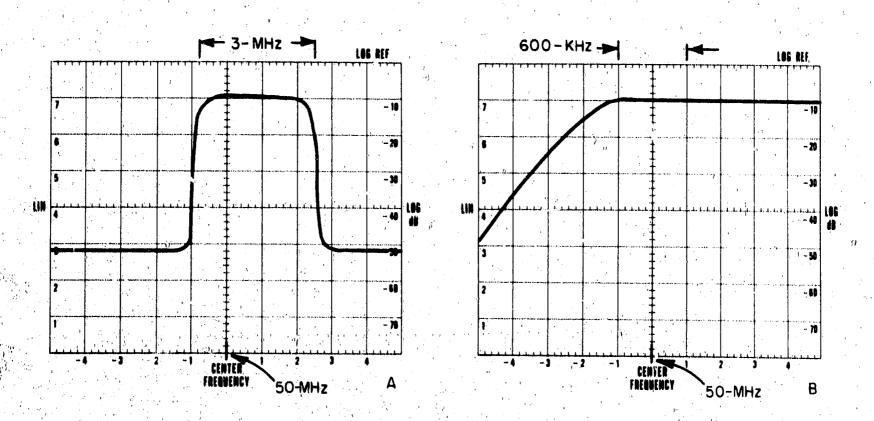


Figure 5-15. 50 MHz Bandpass Display for 10 MHz and 3 MHz Sweeps

# 5-38. 50 MHz IF Bandpass Check and Adjustment (cont'd)

8. Connect a test cable from CAL OUTPUT to RF INPUT and make the following control settings:

AN	VALYZER:	
	FREQUENCY	30 MHz
	FINE TUNE	Full cw
	INPUT ATTENUATION	0 dB
	TUNING STABILIZER	OFF
	BANDWIDTH	10 kHz
	SCAN WIDTH	PER DIVISION
	SCAN WIDTH PER DIVISION	100 kHz
	BASE LINE CLIPPER	May cow
	SCAN TIME PER DIVISION . 2 M	III I ISECONDS
	LINEAR SENSITIVITY Set for i	full scale display
	VIDEO FILTER	un scale display
	SCAN MODE	INTO
	SCAN TRIGGER	T INI
,	SCAN TRIGGER LOG/LINEAR	· · · · · LINE
	DOG/ DITTERIU	LINEAR

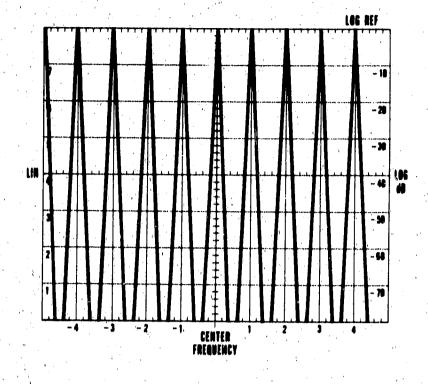


Figure 5-16. 50 MHz Bandpass Flatness Display

- 9. Tune FREQUENCY for display indicated in Figure 5-16 when FINE TUNE is rotated in 100 kHz steps.
- 10. Reduce LINEAR SENSIT. VITY Vernier to a seven division vertical deflection. Rotate FINE TUNE through its range while observing display for flatness. Display should be flat ±0.2 division across the 1.0 MHz FINE TUNE range.

-0.2 \_\_\_\_+0.2 div

# 5-39. 44 MHz Rejection Adjustment.

REFERENCE: Schematic 3.

DESCRIPTION: A 50 MHz reference is established, then 44 MHz is fed into the 47 MHz converter and nulled 70 dB below the reference level. The 50 MHz IF Bandpass Check and Adjustment must be repeated after the 44 MHz rejection controls are adjusted.

# 5-39. 44 MHz Rejection Adjustment (cont'd)

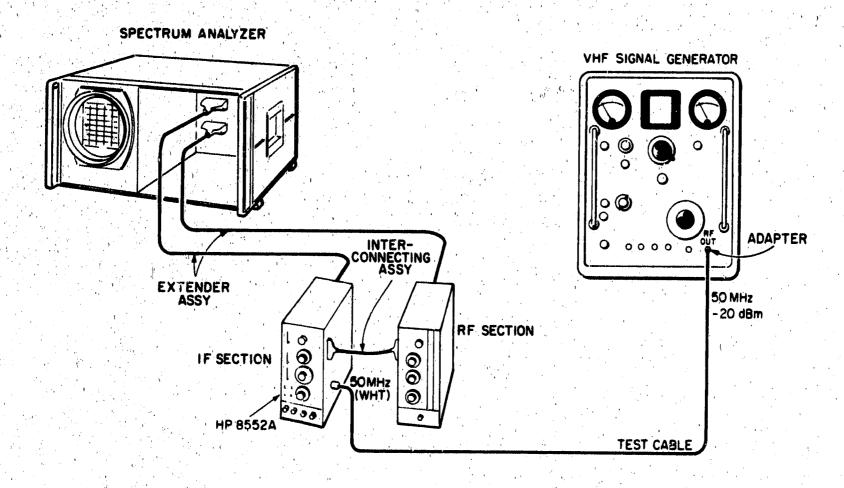


Figure 5-17. 44 MHz Rejection Adjustment Test Setup

EQ	UIPMENT: Signal Generator Test Cable Interconnecting Assembly Extender Assembly Adapter		•	•	•	•		*	• •	•		• •	. H . H	P 11592-60014 P 11592-60015
1.	Connect the test setup show					*			•	4		1 41		
AN	ALYZER:	•										7	. /	
	INPUT ATTENUATION FINE TUNE TUNING STABILIZER BANDWIDTH SCAN WIDTH PER DIVISION BASE LINE CLIPPER SCAN TIME PER DIVISION LOG REF LEVEL controls VIDEO FILTER SCAN MODE SCAN TRIGGER	ON											2 M	Centered OFF 10 kHz PER DIVISION 20 kHz Max ccw ILLISECONDS See text OFF INT
608	BF: MODULATION ATTENUATION		•				•	• •			•		•	

5-3	39. 44 MHz Rejection Adjustment (cont'd)
60	8F: (cont'd) AMPL TRIMMER
2.	Adjust LOG REF LEVEL controls for a full-scale signal display. Use the signal generator frequency control to center the display.
3.	Establish a reference by observing the position of the LOG REF LEVEL control with reference to the lit indicator light.
4.	Tune the signal generator to 44 MHz and peak the AMPL TRIMMER. Use the LOG REF LEVEI control to once more get an on-screen display, but without disturbing the vernier. If necessary, use the signal generator frequency control to center the display.
5.	Increase the signal level on the display while keeping track of the number of LOG REF LEVEL 10-dE steps. Use LOG REF LEVEL vernier for the final small adjustment.
6.	Add up total attenuation. The level of the 44 MHz signal in step 5 should be at least 70 dB below the level in step 2.
•	44 MHz Rejection: 70 dB
7.	If the rejection is not at least 70 dB, adjust the 44 MHz capacitors A3C11, 14, and 19 on the A3 50 MHz Converter assembly for minimum 44 MHz signal indication on the analyzer display.
8.	When the 44 MHz rejection adjustment is completed, repeat the check and adjustment procedure in the 50 MHz IF Bandpass Check and Adjustment, Paragraph 5-38.

# 5-40. 30 MHz Calibration Oscillator Check and Adjustment.

REFERENCE: Schematic 15.

DESCRIPTION: The CAL OUTPUT at the front panel is measured and adjusted for 30 MHz at -30 dBm. The amplitude is measured with a HP 8405A Vector Voltmeter, while the frequency is compared against a comb generator with highly accurate output frequency signals.

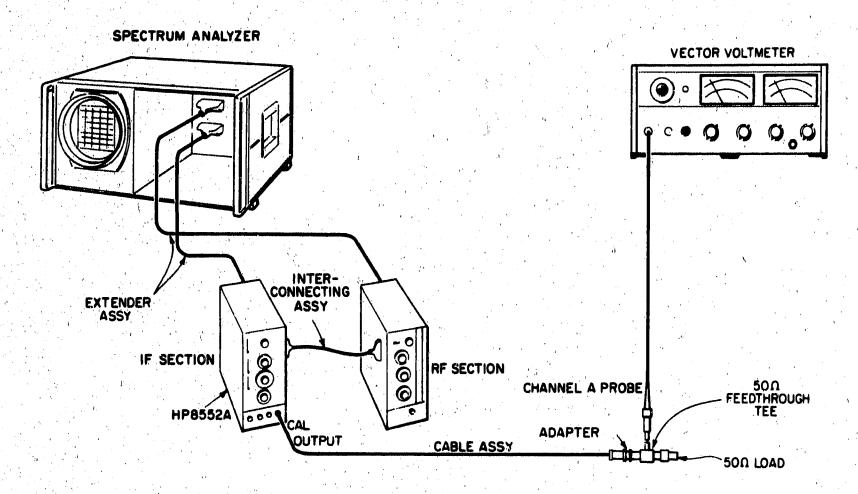


Figure 5-18. 30 MHz Calibration Amplitude Adjustment Setup

EQ	UIPMENT:
	Vector Voltmeter
	Comb Generator
	Comb Generator
	Extender Assembly
•	Interconnecting Assembly
	50-Ohm Load
	50-Ohm Tee
	Adapter
,	BNC Tee
1.	Connect the equipment shown in Figure 5-18 and make the following control settings: 8405A:
	FREQUENCY RANGE - MHz
	CHANNEL AMPLITUDE RANGE - dB -30
2.	Read amplitude directly on the HP 8405A Vector Voltmeter. It should be between -29.7 dBm and -30.3 dBm (6.83 mV to 7.32 mV).
	-29.730.3 dBm
3.	If amplitude is out of tolerance, adjust A6R54 CAL LEVEL.

# 5-40. 30 MHz Calibration Oscillator Check and Adjustment (cont'd)

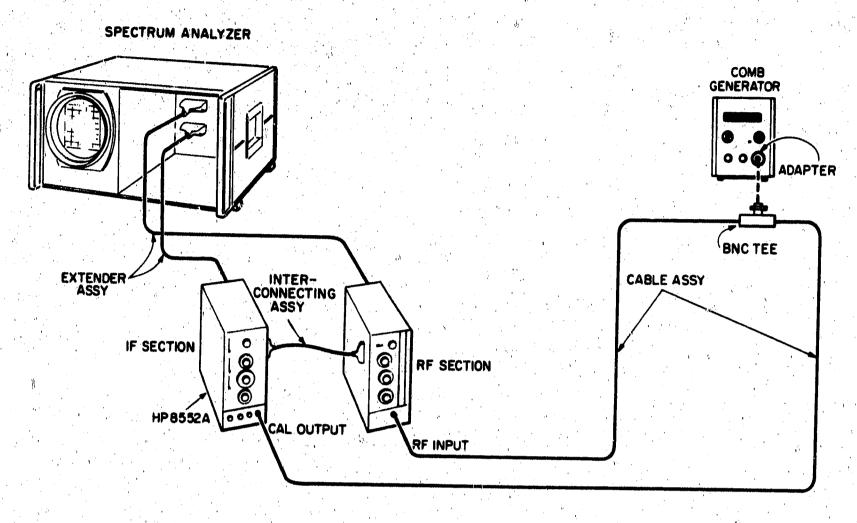


Figure 5-19. 30 MHz Calibration Frequency Adjustment Test Setup

Connect the equipment shown in Figure 5-19 and make the following control settings: ANALYZER: **FREQUENCY** BANDWIDTH **SCAN WIDTH** SCAN WIDTH PER DIVISION INPUT ATTENUATION SCAN TIME PER DIVISION LOG REF LEVEL LOG/LINEAR VIDEO FILTER SCAN MODE . . SCAN TRIGGER 8406A: COMB FREQUENCY - MC INTERPOLATION AMPLITUDE - 1 Mc OFF OUTPUT AMPLITUDE - cw

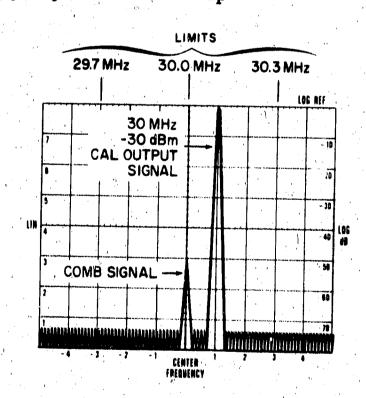


Figure 5-20. Calibrator Frequency Measurement

- 5. Adjust FREQUENCY to center comb generator 30 MHz comb signal on the display.
- 6. Connect CAL OUTPUT to BNC Tee and display calibrator signal simultaneously with comb signal. The calibrator signal should be between 29.7 MHz and 30.3 MHz (between -3 and +3 on display). See Figure 5-20.

  29.7\_\_\_\_\_\_\_ 30.3 MHz
- 7. If frequency is out of tolerance, adjust A6C15, CAL FREQ.

# 5-41. Analogic Test and Adjustment.

REFERENCE: Schematic 15.

DESCRIPTION: The A5R75 THRESH control is adjusted so that under the conditions specified in this test, the DISPLAY UNCAL light comes on. Check the remaining positions of the switches in the table to verify operation of the DISPLAY UNCAL switch matrix.

1. Install the analyzer plug-ins on the two extender cable assemblies, and make the following control settings:

ANALYZER:

VIDEO FILTER		,	 	OFF
SCAN TIME PER DIVISION			<i>r</i> • •	1 MILLISECOND
SCAN WIDTH		 		 PER DIVISION
SUAN WIDTH PER DIVISION				1 MHz
BANDWIDTH	•		•	30 kHz

- 2. With the controls set as in step 1 above, the DISPLAY UNCAL light should be on. If not, adjust A5R75 THRESH control until the light just comes on.
- 3. Use Table 5-2 below to complete adjusting the THRESH control:

Table 5 2. Analogic Threshold Adjustment

SCAN TIME PER DIVISION	BANDWIDTH	SCAN WIDTH PER DIVISION	DISPLAY UNCAL Light
1 ms	30 kHz	1 MHz	On
2 ms	30 kHz	1 MHz	Off
10 s	1 kHz	10 MHz	On
10 s	1 kHz	5 MHz	Off

4. Check operation of DISPLAY UNCAL light using Table 5-3. When the table indicates the DISPLAY UNCAL light to be "off", it is acceptable for light to be "on" if the light subsequently goes "off" when either the SCAN TIME PER DIVISION or the SCAN WIDTH PER DIVISION control is switched one position counterclockwise.

# CHECKS AND ADJUSTMENTS (cont'd)

# 5-41. Analogic Test and Adjustment (cont'd)

Table 5-3. Display Calibration Conditions

			4
SCAN TIME PER DIVISION	BANDWIDTH	SCAN WIDTH PER DIVISION	DISPLAY UNCAL Light
1 ms	300 kHz	10 MHz	Off
1 ms	100 kHz	10 MHz	On
1 ms	100 kHz	5 MHz	Off
1 ms	30 kHz	5 MHz	On On
5 ms	30 kHz	2 MHz	Off
5 ms	10 kHz	2 MHz	On
20 ms	10 kHz	1 MHz	Off
20 ms	3 kHz	1 MHz	On
0.1 s	3 kHz	0.5 MHz	Off
0.1 s	1 kHz	0.5 MHz	On
0.5 s	1 kHz	0.2 MHz	Off
0.5  s	0.3 kHz	0.2 MHz	On
2 s 2 s	0.3 kHz	0.1 MHz	Off
l – – – – – – – – – – – – – – – – – – –	0.1 kHz	0.1 MHz	On
10 s 10 s	0.1 kHz	.05 MHz	Off
	.05 kHz	.05 MHz	On
5 s 2 s	0.1 kHz	20 kHz	Off
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0.1 kHz	20 kHz	On
1 2	0.1 kHz	10 kHz	Off
1	0.1 kHz 0.1 kHz	10 kHz	On
0.5 s	0.1 kHz	5 kHz	Off
0.5 s	0.1 kHz	5 kHz	On
0.2 s	0.1 kHz	2 kHz	Off
0.2 s	0.1 kHz	2 kHz	On
0.1 s	0.1 kHz	1 kHz	Off
0.1 s	0.1 kHz	1 kHz	On
50 ms	0.1 kHz	0.5 kHz 0.5 kHz	Off
50 ms	0.1 kHz		On Off
20 ms	0.1 kHz	0.2 kHz 0.2 kHz	Off
	V.1 KIIZ	U.Z KIIZ	On

## Table 5-4. CHECK AND ADJUSTMENT TEST RECORD

	ett-Packard Model 8552 rum Analyzer IF Section		Performed by	
Sorial	No	$\frac{\partial}{\partial x} \frac{\partial}{\partial x} = \frac{\partial}{\partial x} $		
Para. No.	Test Description	Measurement Unit	Min Actual	Max
5-27	Power Supply Checks and Adjustments			
	103.5 —126.5 Line Voltage: +20 Vdc supply	Vdc	+19.90	+20.10
			10.00	
	Ripple	mV rms Vdc	<b>— 9.99</b>	0.5 10.01
	-10 Vdc supply Ripple	mV p-k	ซ.ฮ	0.02
		m v p-k		V.U4
5-28				
(V) 100	SCAN IN/OUT voltage: Rise Time	ms	50	58
	SCAN TRIGGER EXT	Vdc		<b>-5.02</b>
W.	Scan Amplitude	Vdc	+4.9	+5.1
<b>5 20</b>				
5-29.	Final Scan Checks Scan Linearity Graticule:			*
	-5	divisions	<b>—0.1</b>	+0.1
	-4	divisions	<b>-0.1</b>	+0.1
	<b>-3</b>	divisions	<b>-0.1</b>	+0.1
	<b>-2</b>	divisions	<del>-0.1</del>	+0.1
		divisions	<b>-0.1</b>	+0.1
	0	divisions	-0.1	+0.1
	<b>+1</b>	divisions	<b>-0.1</b>	+0.1
	<b>+2</b>	divisions	<del>-0</del> .1	+0.1
	<b>+3</b>	divisions	<b>-0.1</b>	+0.1
		divisions	<b>-0.1</b>	+0.1
	SCAN TRIGGER EXT	V p-p	2	20
	EXT SCAN MODE: voltage required			
	for trace	V p-p	8	
5-30.	Vertical Deflection Amplifier Checks			
	VERTICAL position check	divisions		+2
	VERTICAL GAIN control check:		•	
	Full CW to Full CCW  Base Line Clipper Check: full CW	divisions	2	
	Dase Line Cupper Check. Idii Cw	divisions	<u> </u>	8

Table 5-4. Check and Adjustment Test Record (cont'd)

No.	Test Description	Measurement Unit	Min Act	tual Max
5-31	Log-Linear Amplifier Checks & Adjustments			
	VERTICAL OUTPUT voltage: 7.07 div			
	deflection	Vdc	<del></del>	
	Input Level Output at			
***	at XA4-14 XA8-14			1.0
	-100 dBm <6 mVdc	<b>mVd</b> e		
	+ 10 dBm 800 ±40	mVdc	<del>-840</del>	<del>-760</del>
	$0 \text{ dBm} \qquad 700 \pm 40$	mVdc	<b>—740 ——</b>	
	$- 10  \mathrm{dBm} \qquad 600  \pm 40$	mVdc	<del>-6</del> 40	560
	-20  dBm 500 ±40	mVdc	<b>-540</b>	460
	-30  dBm 400 ±40	mVdc	<b>-440</b>	360
	-40  dBm 300 ±40	mVdc	<b>-340</b>	<u> </u>
	-50  dBm 200 ±40	mVdc	<b>-240</b>	160
	-60  dBm 100 ±40	mVdc	<b>-140</b>	<u> </u>
5-32	3 MHz IF Bandwidth Checks			
	100 kHz Bandwidth	kHz	80	120
e de la companya de l	30 kHz Bandwidth	kHz	23	37
,	10 kHz Bandwidth	kHz	9.4	10.6
	3 kHz Bandwidth	Hz	2100	3900
	1 kHz Bandwidth	Hz	700	1300
	0.3 kHz Bandwidth	Hz	210	390
	0.1 kHz Bandwidth	Hz	70	130
	.05 kHz Bandwidth	Hz	36	64
5-33	LC Filter Adjustment			
	300 kHz Bandwidth Reference;			
	10 kHz Bandwidth Gain: ±0.1 div	divisions	-0.1	+0.1
	Gain Check: 300 kHz Reference			
	100 kHz ±0.4 div	divisions	-0.4	+0.4
	30 kHz ±0.4 div	divisions	<b>-0.4</b>	+0.4
	10 kHz ±0.4 div	divisions	-0.4	+0.4
5-34	Crystal Filter Adjustment			
	Average gain value	divisions		
5-35	300-kHz Bandpass Filter Adjustment			
	Bandwidth at 5.0 divisions	" kHz	230	350

Table 5-4. Check and Adjustment Test Record (cont'd)

Para. No.	Test Description	Measurement Unit	Min	Actual Max
5-36	3 MHz If Gain Log Adjustments			
	LOG REF LEVEL vernier: - 1	Vdc	-0.96	+1.04
	<b>- 2</b>	Vdc	-0:96	+1.04
	<b>– 4</b>	Vdc	-0.96	+1.04
	<b>– 5</b>	Vdc	-0.96	+1.04
	<b>– 6</b>	Vdc	-0.96	+1.04
	<b>-7</b>	Vdc	-0.96	+1.04
	<b>− 8</b>	Vdc	-0.96	+1.04
	- <b>7</b>	Vdc	-0.96	+1.04
	<b>– 8</b>	Vdc	-0.96	+1.04
, "	<b>− 9</b>	Vdc	-0.96	+1.04
	<b>-10</b>	Vdc	-0.96	+1.04
	<b>–11</b>	Vdc	-0.96	+1.04
		Vdc	-0.96	+1.04
	VERTICAL OUTPUT voltage: 7.07 div deflection	$\mathbf{Vd} oldsymbol{c}$		
	Test Atten. LOG REF Error LimitLEVEL	V 40		
	10 dB —10 dBm ±2 mVdc	mVdc	<b>-2</b>	<b>4.0</b>
	20 dB —20 aBm ±2 mVdc	mVdc	<b>-2</b>	+2
	30 dB -30 dBm ±2 mVdc	mVdc		+2
	40 dB —40 dBm ±2 mVdc	mVdc	$egin{array}{cccc} -2 \ -2 \end{array}$	+2
	50 dB -50 dBm ±2 mVdc	mVdc	<b>-2</b>	+2
` <u>.</u>	VERTICAL OUTPUT reference voltage:			
	Test Atten. SENSITIVITY Limit	mVdc		
	43 dB 0.1 mV/DIV ±15 mVdc	mVdc	-15	41E
	33 dB 0.2 mV/DIV ±15 mVdc	mVdc	—15	+15
	23 dB 1 mV/DIV ±15 mVdc	mVdc	-15 -15	+15
	13 dB 2 mV/DIV ±15 mVdc	mVdc		+15
	3 dB 10 mV/DIV ±15 mVdc	mVdc mVdc	—15 —15	+15
				+15
-37	47 MHz Local Oscillator Check & Adjustment No Input:			
•	Input level at C2: 0 ±200 mVdc	mVdc	-200	+200
	Third LO frequency: 46,700 ±5 kHz	kHz	46,695	46,705
	Third LO amplitude: 145 ±45 mVrms	mVrms	100	46,705 190
	-30 Vdc Input:		— <del>, , , , , , , , , , , , , , , , , , ,</del>	130
	Third LO frequency: 47,300 ±5 kHz	kHz	47,295	AG TOE
	Third LO amplitude: 145 ±45 mVrms	mVrms	100	46,705
				130

Table 5-4. Check and Adjustment Test Record (cont'd)

Para. No.	Test Description	Measurement Unit	Min Actual	Max
5-37	47 MHz Local Oscillator Check & Adjustment Oscillator Frequency Checks: Voltage at XA5-2 Third LO	n		
	$0 \pm 0.2 \text{ Vdc} \qquad 46,7000 \pm 5 \text{ kHz}$	1-TT.	40.005	
	$-5 \pm 0.2 \text{ Vdc}$ 46,800 $\pm 10 \text{ kHz}$	kHz kH2	46,695	46,705
	$-10 \pm 0.2 \text{ Vdc} \qquad 46,900 \qquad \pm 10 \text{ kHz}$	kHz	46,790	46,810
	$-15 \pm 0.2 \text{ Vdc}$ $47,000 \pm 10 \text{ kHz}$	kHz	46,890	46,910
	$-20 \pm 0.2 \text{ Vdc} \qquad 47,100 \qquad \pm 10 \text{ kHz}$ $-20 \pm 0.2 \text{ Vdc} \qquad 47,100 \qquad \pm 10 \text{ kHz}$	kHz	46,990	47,010
	$-25 \pm 0.2 \text{ Vdc} \qquad 47,100 \pm 10 \text{ kHz}$ $-25 \pm 0.2 \text{ Vdc} \qquad 47,200 \pm 10 \text{ kHz}$	kHz	47,090	47,110
f <sub>e</sub>	$-30 \pm 0.2 \text{ Vdc}$ 47,300 $\pm 5 \text{ kHz}$	kHz	47,190	47,210
	00 10.2 vac 47,000 10 kHz	KIIZ	47,295	47,305
5-38	50 MHz IF Bandpass Check & Adjustment			
1.	Flatness: ±0.2 vertical divisions over 2 horizontal divisions	divisions	-0.2	_ +0.2
<b>5-39</b>	44 MHz Rejection Adjustment			
	44 MHz Rejection >70 dB	dB	70	_
5-40	20 MH- Calibration Oction Of			
J-40	30 MHz Calibration Oscillator Check and Adjustment			
	30MHz amplitude: -30 ±0.3 dBm			
	Adjust A6R54	dBm	<b>-29.7</b>	30.3
	30 MHz frequency: 30 ±0.2 MHz Adjust A6C15	MHz	29.7	_ 30.2
5-41	Analogic Check and Adjustment	,		
	SCAN SCAN BAND- DISPLAY TIME WIDTH WIDTH UNCAL			, in the second
	1 ms 1 MHz 30 kHz ON	<b>(√)</b>		
	2 ms 1 MHz 30 kHz OFF	( <b>√</b> )	<del>,                                    </del>	•
	10 s 10 MHz 1 kHz ON	$(\checkmark)$		
	10 s 5 MHz 1 kHz OFF	( <del>V</del> )		
				,
				· 1
			$\mathcal{L}$	

# 

# SECTION VI REPLACEABLE PARTS

## 6-1. INTRODUCTION.

6-2. This section contains information relative to ordering replacement parts and assemblies. Table 6-1 lists correct stock numbers for use when ordering printed circuit board assemblies on an exchange basis. Table 6-2 lists reference designations and abbreviations used in the preparation of manuals by Hewlett-Packard. Tables 6-3 and 6-4 list component descriptions, part numbers and other required ordering information. Table 6-5 lists code number identification of manufacturers.

### 6-3. ORDERING INFORMATION

6-4. To obtain replacement parts, address order or inquiry to your local Hewlett-Packard sales and service office (see list at rear of this manual). Identify parts by HP Part Number.

6-5. To obtain a part not listed, include instrument model number, serial number, description of part and function and location of part.

Table 6-1. Part Numbers for Assy Exchange Orders

Assembly 8552A:	Stock No.	Exch. Board Stock No.
A1 LC Filter	08552- 6005	08552-6054
A2 3 MHz Amplifier	6046	6053
A3 50 MHz Converter	6003	6052
A4 Crystal Filter	6045	6055
A5 Power Supply	6002	6051
A6 Scan Generator	6047	6050
A7 Deflection Amplifier	6008	6057
A8 Log Amplifier	6007	6056

Table 6-2. Reference Designations and Abbreviations

			* ***		REFERENCE D	<b>ESIGNA</b>	ro	RS		
	. '	, and the second second		ä						A second second
A ·	=	assembly	F	=	fuse	<b>P</b> 3	=	plug	V	= vacuum tube.
В	#		FL	=	Filter	Q	===	transistor		neon bulb,
BT	12	battery	j ~	, ,,,,,	jack	Ř	==	resistor		photocell, etc.
Č C	<b>=</b>	capacitor	ĸ	=		ŘТ	==	thermistor	VR	= voltage
ČP '	-	coupler	Ĺ	===	inductor	S	=	switch	V	regulator
CR		diode	Ĺs		loud speaker	Ť	=	transformer	w	= cable
DL .		delay line		_	meter	тв	_	terminal board	x	= socket
			M				_	test point		
DS ·		device signaling (lamp)	MK	=	The same but a same	TP			Y	= crystal
E	-	misc electronic part	MP	. ==	mechanical part	U	=	integrated circuit	Z	= tuned cavity,
		The second of the second			ABBREVI	ATIONS	٠.		. 1	network
			1 V		Appitha	AIIONS				
A	===	amperes	H	==	henries	N/O	=	normally open	RMO	= rack mount onl
AFC	122		HDW	=	hardware	NOM		nominal	RMS	= root-mean squa
		control	HEX	=	hexagonal	NPO		negative positive	RWV	= reverse working
AMPL	<b>330</b> .	amplifier	HG	=	mercury			zero (zero tem-		voltage
LEVALT TO	•	ampanter	HR		hour(s)		•	perature coef-	S-B	= slow-blow
BFO		hant fraguement agaille			Hertz			ficient)	SCR	= screw
DF U		beat frequency oscilla-	Hz	1300	HOTEZ.	NPN		negative-positive-	SE	
BE CU	_	tor			1 - A	141.14	***			GO TO NEED WALK
	===	beryllium copper	IF		intermediate freq	NIT TO TO		negative	SECT	= section(s)
BH	1837.	binder head	IMPG		impregnated	NRFR	==	not recommended	SEMICON	= semiconductor
BP	. ==	Company Company	INCD	10	TARGET AND COUNTY			for field re-	SI ,	= silicon
BRS	=	brass	INCL	=	include(s)			placement	SIL	= silver
<b>EWO</b>		backward wave oscilla-	INS		insulation(ed)	NSR	=	not separately	SL	= slide
		tor	INT	鰈	internal			replaceable	SPG	= spring
**						-			SPL	= special
CCW -		counterclockwise	•••		1.000	OBD	122	order by	SST	= Stainless steel
CER	20.2	ceramic	K	1	kilo = 1000			description	SR	= split ring
CMO		cabinet mount only				OH ·		oval head	STL	= steel
COEF		coefficient	LH	192	left hand	ox	=	oxide		
COM		common	LIN		linear taper	_			v.*	1. 1. 1.
COMP	,	composition	LK WASH	===		P		peak	TA	= tantalum
COMPL		complete		. *	lock washer	PC	=	printed circuit	TD	= time delay
CONN	•		LOG	#	logarithmic taper	PF		picofarads = $10^{-12}$	TGL	= toggle
CP		connector	LPF	*	low pass filter	1.5		farads	THD	= thread
		cadmium plate			the state of the s	PH BRZ	=	phosphor bronze	TI	= titanium
CRT		cathode-ray tube	M	192	milli = 10-3	PHL	=	Phillips	TOL	= tolerance
CW	:22	clockwise	MEG		meg = 106	PIV	<b>***</b>	peak inverse	TRIM	= trimmer
·							•	voltage	TWT	= traveling wave
DEPC		deposited carbon	MET FLM	<b>182</b>	metal film	PNP	=	positive-negative-	1 44 1	
DR	, 1922	drive	MET OX		metallic oxide	• • • •		positive		tube
9			MFR		manufacturer	P/O	-	part of		
ELECT	200	electrolytic	MHz		mega Hertz	POLY			$\sim \mu$	$= micro = 10^{-6}$
ENCAP		encapsulated	MINAT	12	miniature			polystrene	-	micro - 10
EXT		external	MOM	産	momentary	PORC		porcelain		$\mathcal{L}_{\mathcal{L}} = \mathcal{L}_{\mathcal{L}} + \mathcal{L}_{\mathcal{L}}$
	1	THE PERSON NAMED IN	MOS	(36	metalized	POS		position(s)	VAR	- variable
F	·	farads	-17 - 4 - 17		substrate	POT		potentiometer	VDCW	= dc working volt
FH		flat head	MTG	122	mounting	PP		peak-to-peak		TO TO SERVICE TO THE
			MY		"mylar"	PT		point		· · · · · · · · · · · · · · · · · · ·
FIL H		Fillister head	, <b>777. T</b>			PWV	#	peak working volt-	. W/	= with
FXD	==	fixed	.•,					age	W	= watts
	, ,	0.	N	12	nano (10 <sup>-9</sup> )				WIV	= working inverse
<u>G</u>		giga (10 <sup>9</sup> )	N/C		normally closed	RECT		rectifier		voltage
GE		germanium	NE		neon	RF	=	radio frequency	ww	= wirewound
GL ·	<b>#</b>	glass	NI PL		nickel plate	RH		round head or	w/o	= without
GRD		ground(ed)	MILM'		MICHAI PIECE			right hand	W/O	- MINIORE

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	🏵 Part No.	Description #	Note
41	08552-6005	BUARD ASSY: LC FILTER	
AICI	J160-2930	C:FXI) CER 0.01 UF +80-20% 100VDCW	
	214 0-2020	C:FXD CER 0.01 UF +80-20% 100VDCW	·
AIG2 AIG3	0160-2930	C:FXD MICA 1700 PF 18 100VDCW	<u> </u>
AIC4	0121-0105	C: VAR CER 9-35 PF NPO	
		1ST FILTER PEAK	
AIC5	0160-3132	C:FXD CER 200 PF 104 500 VDCW	
A1C6	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
AIG7	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A1C8	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
A1C9	0160-3024	C:FXD MICA 1700 PF 1% 100VDCW C:VAR CER 9-35 PF NPO	
A1C 10	0121-0105	2ND FILTER PEAK	,
AICII	0160-3132	C:FXD CER 200 PF 10% 500VDCW C:FXD CER 0.01 UF +8G-20% 100VDCW	
A1C12 A1C13	0160-2930 0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A1C14	0160-2930	C:FXD CER'0.01 UF +80-20% 100VDCW	
ALC15	0160-3024	C:FXD MICA 1700 PF 1% 100VDCW	
A1C16	0121-0105	CIVAR CER 9-35 PF NPO	
# 44, 46, 16, 16, 16, 16, 16, 16, 16, 16, 16, 1	012.1-0103	3RD FILTER PEAK	
AlL17	0160-3132	C:FXU CER 200 PF 10% 500 VDCW	
A1C18	0160-2930	C: FXU CER C.01 UF +80-20% 100VDCW	
AIL19	0160-2930	C:FXD CER 4.01 UF +80-23% 100VDCW	
A1C20	0160-2930	C:FX0 CER 0.01 UF +80-25% 100VDCW	
A1 C21	0160-3024	C:FXD MICA 1700 PF 1% 100VDCW	
A1C22	0121-0105	C:VAR CER 9-35 PF NPO 4th filter peak	
A1C.23	0160-3132	C:FXD CER 200 PF 10% 500 VDCW	
	02.0000	0.540	
A1C24 A1C25	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD ELECT 6.8 UF 10% 35VDCW	
A1026	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	1 5
A1C27	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A1C28	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A1C29	U160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A1C30	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
AIC31	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	1
A1C32	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD CER 0.01 UF +80-20% 100VDCW	'
A1C33	0160-2930	C.FXD CER USOI OF YOU ZOW ICOVDCW	
A1L34	0160-2930	C:FXD CER 0.01 UF +80-20% 1COVDCW	
A1035	0160-2201	C:FXD MICA 51 PF 54	
A1C36	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW C:FXD MICA 100PF 5%	
A1037 A1038	0160-2204	C:FXD CER 0.01 UF +80-20% 1COVDCW	
A1C39	J150-0121	C:FXD CER 0.1 UF +80-20% 50VDCW	
AICRI	1901-00-0	DIUDE: SILICON 30MA 30WV	
MILINE			
	7 (A)		
			1

<sup>#</sup> See introduction to this section for ordering information

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
			,
A1CR2	1901-0040	DIODE: SILICON 30MA 3 CHV	
AICR3	1901-0040	DIODE: SILICON BOMA BOWY	
AICR4	1901-0040	DIODE: SILICUN 30MA 3 CHV	
AICRO	1901-0040	DIODE: SILICUN 30MA 30HV DIODE: SILICUN 30MA 30HV	
A 10,00	1 301 - 0040	DIODE-SILICOR SUMA SUMA	
Alur7	1901-0040	DIODE: SILICON BOMA BONV	
AICHB	1901-0040	DIUDE: SILICUN 30MA 30MV	
AICR9	1901-0040	DIODE: SILICON 30MA 30MV	
AICRIO	1901-0040	DIUDE: SILICUN BOMA BONV	1
ATURLE	1901-0040	DIDDE: SILICON 30MA 30MV	
And the second of the second o			
AICR12	1901-0040	DIUDE: SILICON BOMA BONY	;
A1CR13	1901-0040	DIODE: SILICUN BOMA BONV	
Alcki4	1901-0040	DIODE: SILICUN BOMA BONV	
AICRI5	1901-0040	DIODE: SILICON BOMA BONV	
A ICR16	1901-0040	DIUDE: SILICON BOMA BONV	
	11/21/2024		
ALCRIV	1901-0040	DEODE: STEECUN BOMA BOWY	
AILI	9140-0237	CDIL:FXD 200 UH 5%	
	7240-0257	CHILLIPALI 200 UN 36	
AIL?	9140-0237	CUIL: FXD 200 UH 5%	**
AIL3	08552-6025	INDUCTUR: LC FILTER	
		1 TUNE	
ALL4	08552-6025	INDUCTOR: LC FILTER	
		2 TUNE	
A1L5	06552-6025	INDUCTOR:LC FILTER	
		3 TUNE	*
All.6	08552-6025	INDUCTOR: LC FILTER	
		4 TUNE	
A1L7	9140-0137	COIL:FXD RF 1000 UH 5%	
AIL8	9100-1630	COIL/CHOKE 51.0 UH 5%	
AIL9	9100-1613	COIL:FXD 0.47 UH 20%	
Allio	9140-0237	CUIL:FXD 200 UH 5%	
	7240 0231	GOIL 11 ND 200 011 34	
A101	1854-0071	U:SI NPN(SELECTED FROM 2N3704)	
A102	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	
A103	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	
A104	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	
A105	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	
A106	1853-0020	O: SI PNP(SELECTED FROM 2N37G2)	
,,,,	1 The		
AIRI	0757-0438	R:FXD MET FLM 5.11K 14 1/8W	
Alk2	0757-0428	D.EVID MET ELM 1 ADV 10 1700	
AIR3	0757-0428	R:FXD MET FLM 1.62K 1% 1/8W R:FXD MET FLM 1.62K 1% 1/8W	
AlR4	0757-0434	R:FXD MET FLM 3.65K CHM 1% 1/8W	•
AIRS	0698-3445	R:FXD MET FLM 348 DHM 12 1/8W	
Alko	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	
, and the second of the second			
AIR7	0757-0422	R:FXD MET FLM 909 UHM 1% 1/8N	
AIR8	0698-0084	R:FXD MET FLM 2.15K 1# 1/8W	
AlR9	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W	•
AIRIO	0757-0438	R:FXD MET FLM 5.11K 1% 1/8W	, , ,
1	r.		
			.5

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #		Note
And the second s				
				`, 
	A 70 / 70 / 70 /	DATE MET TIME & 42M BOLL & 40M		
AIRII	0757-0428	R:FXD MET FLM 1.62K 1% 1/8W R:FXD MET FLM 3.65K CHM 1% 1/8W		, ,
AIR12	0757-0434	R:FXD MET FLM 1.62K 1% 1/8W		
AIRIS	0757-0428	R:FXD MET FLM 348 OHM 1% 1/8W		
AIR14	0698-3445	R:FXD MET FLM 100 DHM 1% 1/8W		;
AIR15	0757-0401	REPAUREI PLR 100 ORR 14 1708		1 1 14
AIR16	0757-0280	R:FXU MET FLM 1K OHM 1% 1/8W FACTORY SELECTED PART		
AIR17	1698-0084	R:FXD MET FLM 2.15K 1% 1/8W		
A1818	6648-0084	R: FXD MET FLM 2.15% 18 1/8W		
ALRIS	0757-0438	R:FXD MET FLM 5.11K 18 1/8W		1
ALRZO	0757-0428	R:FXD MET FLM 1.62% 1% 1/8W		
AIR21	0757-0434	R:FXD MET FLM 3.65K CHR 12 1/8W		
AIR22	1757-0428	REFXD MET FLM 1.62K 18 1/8W		
ALR23	0698-3445	R:FXD MET FLM 348 OHM 1% 1/8H	$\mathcal{J}_{i}$	,
A1R24	U757-0401	R:FXD MET FLM 100 UHM 1% 1/AW		/
			$\mathcal{T}_{-\mathcal{T}_{i}}$	
A1R25	0757-0422	R:FXD MET FLM 909 DHM 1% 1/8W		
A 1K26	0698-0084	R:FXD MET FLM 2.15K 1% 1/dW	· ' ' ' '	
A1K27	U 69 8-0084	R:FXD MET FLM 2.15K 1% 1/8F		, the second
AlR28	u757-0438	R:FXD HET FLM 5.11K 1% 1/8W	*	
A1R29	0757-0428	R:FXD MET FLM 1.62K 1% 1/8W		,
		and the second of the second of the second		
AIR30	0757-0434	R:FXD MET FLM 3.65K OHM 1% 1/8W		
AIR31	0757-0428	R: FXD MET FLM 1.62K 1% 1/8W		,
A1R32	0757-0420	R:FXD MET FLM 750 DHM 1% 1/8W		,
AIR33	0648-3445	R:FXD, MET FLM 340 UHM 1% 1/8W		
A1K34	6757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	,	
A1R35	2100-1757	REVAR WW 500 UHM 5% TYPE V 1H		
		10 KHZ ADJ		
A1R36	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W		, 1,
A1H37	0698-0084	R: FXD MET FLM 2.15K 1% 1/8W		
A 1K38	L 757-0394	R:FXD MET FLM 51.1 OHM 1% 1/8W		
		FACTURY SELECTED PART		2
AIR39	0757-0438	R:FXD MET FLM 5.11K 1% 1/8W		
A 1R40	J757-0438	R:FXU MET FLM 5.11K 1% 1/8W		
A1K41	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W		
A1R42	0757-0440	R: FXD MET FLM 7.50K 1% 1/8W	• •	3
ALK43	6757-0401	R:FXD MET FLM 100 DHM 14 1/89		•
A1H44	u757-0401	R:FXD MET FLM 100 OHM 14 1/8H	,	2.4
AlK45	0757-0401	R:FXD MET FLM 100 0HM 1% 1/8W	Y .	
A1846	0757-0438	R: FXD MET FLM 5.11K 1% 1/8H		
A1K47	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W		
A1K48	0757-0280	R: FXD MET FLM 1K QHM 18 1/8H		,
				'
A1R49	0757-0289	R:FXD MET FLM 13.3K OHM 1% 1/8W		
A1K50	0698-3160	R:FXD MET FLM 31.6K 1% 1/8W		F.
Alkol	6698-3445	R: FXD MET FLM 348 UHM 18 1/8W		
AIRSA	u757-u316	R:FX0 MET FLM 42.2 OHM 18 1/8W		
A1R53	0757-0440	R:FXD MET FLM 7.50K 1% 1/8W		
A1K54	0757-0276	R:FXD MET FLM 61.9 OHM 1% 1/8W		• '
A1K55	0757-0422	R:FXD MET FLM 909 OHM 1% 1/8W		
AITHI	08552-2005	BUARD: BLANK PC		
				*
				1 1
				<u>                                     </u>
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	with the second second			

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
6)			N.
	1		1
			100
<b>A</b> 2	08552-6045	BOARD ASSY: 3 MHZ AMPLIFIER	·
A 24 1	3180-0336	COEVO ELECT A A ME LOW ASMOCH	
AZCI	0190-0110	C. PAD ELECT 040 OF 104 3340CM	
AZCZ	0180-0115	C:FXD ELECT 6.8 UF 10% 35VDCW	
AZC3	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A21.4	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
h ·			1.
AZCB	0160-3046	C: FXD MICA 250 PF 1% 100VDCW	
A 2C 7	M160-3047	CAFAD MICA 3280 PE 18 100VOCH	
1			
A2C9	0100-3048	C: FXU MICA 8000 PF 18 10GVDCH	
A2C 10 \	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A2C11: \	0180-0291	C:FXD ELECT 1.0 U. 10% 35VDCW	
A 20/2 8 20	0140-2020		1. 17
1			
٠.			
A 4	0122-0211		
A2016	0122-0221	C=VOLTAGE VAR 100 PF 10% 30VDCW	İ
· 1			
,		•	
	•		
A2C22	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
· · · · · · · · · · · · · · · · · · ·	u u		
1 11			
HECEO.	0100-2231	COPAD CER 10 PF 34 SOUVDCH	
A2C27	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A2C28	0160-2930	C:FX: CER 0.01 UF +80-20% 100VDCW	٠.
			· '
WEGSI	0122-0045	C. VOLIAGE VAR 37-17.93PF 28 4-23VUCR	
A2C32	0122-0044	C: VOLTAGE VAR 100-45.9PF 28 4-25VDCW	ł
A2C33	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A2C34	0160-2930	C:FXD CER 0.01 UF +80-202 100VDCW	
25.0			•
· · · · · · · · · · · · · · · · · · ·	0100-5430		
		NOT ASSIGNED	
A2C3B	0160-2930	C2FAD CER 0.01 UF +8C-20% 100VDCW	
A2C39	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
and the second s			
AZUTZ	0100-2930	CSPAD CER USUI UP VOU-ZUS IUUVDUR	
A2C43	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
AZCKI	1901-0040	DIODE: 21FICON 30MA 30MA	
(a) (b) (b)	<b> </b>		
er e			
			1.
	A2C1 A2C2 A2C3 A2C4 A2C5 A2C6 A2C7 A2C8 A2C9 A2C10 A2C11 A2C12 A2C13 A2C14 A2C15 A2C16 A2C17 A2C18 A2C16 A2C27 A2C28 A2C20 A2C21 A2C22 A2C23 A2C24 A2C25 A2C25 A2C26 A2C27 A2C28 A2C26 A2C27 A2C28	A2	A22

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
y			1
			1
A2CR2	1901-0040	DIODE: SILICON BOMA BONV	10
A2CR3	1901-0040	DIDDE: SILICON 30MA 30MV	
A2CR4	1901-0040	DIODE: SILICUN 30MA 30HV	
A2CR5	1901-0040	DIODE: SILICON 30MA 30HV	, <i>i</i>
A2CH6	1901-0040	DIODE:SILICUN 30MA 30HV	
AZLRŽ	1901-0040	DIODE: SILICON 30MA 30MV	
A2CHB	1901-0040	DIODE: SILICUN 30MA 30MV	
A2CR9	1901-0040	DIDDE: SILICUN BOMA BONV	•
AZCRIO	1901-0040	DIODE: SILICON 30MA 30HV	
A2CH11	1901-0040	DIODE: SILICON BOMA BOWY	
AZCR12	1901-0040	DIODE: SILICON 30MA 3CHV	
A2L1	9140-0237	COIL:FXD 200 UH 54	
	7140 0251		,
A2L2	9140-0237	COIL:FXD 200 UH 5%	<b>.</b>
A2L3	9140-0237	COIL:FXD 200 UH 5%	i i
A 2L 4	9140-0237	CUIL:FXD 200 UH 54	
A2L5	9140-0237	COIL FXD 200 UH 5%	,
A2L6	9100-2744	CUTL/CHUKE 7.8 UH 2%	
AZLO	3100-2144	CDIE/CHORE VOO ON EA	
A2L7	08552-6011	INDUCTOR: 300 KHZ FILTER #1	
		ADJ 2	
A21,8	9100-2476	CUIL/CHOKE 52.3 UH 1%	
A21.9	08552-6012	INDUCTUR: 300 KHZ FILTER #2	
i i		ADJ 1	ĺ
A2L10	9100-1611	CDIL:FXD 0.22 UH 20%	:
A2L11	9100-1636	COIL/CHOKE 110 UH 5%	
A2L12	9140-0137	COIL:FXD RF 1000'UH 5%	· ·
A2L13	9100-1611	CUIL:FXD 0.22 UH 20%	
A201	1854-0092	U:SI NPN	
, V505	1853-0010	U:SI PNP(SELECTED FROM 2N3251)	l
A203	1853-0010	0:SI PNP(SELECTED FROM 2N3251)	
A204	1854-0092	U: SI NPN	
A205	1853-0010	O:SI PNP(SELECTED FROM 2N3251)	
A206	1853-0010	/ SI PNP(SELECTED FROM 2N3251)	
			,
A2U7	1854-0071	0:SI NPN(SELECTED FROM 2N3704)	·
A208	1853-0010	Q:SI PNP(SELECTED FROM 2N3251)	
A209	1853-0010	Q:S1 PNP(SELECTED FROM 2N3251)	
A2010	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	
A2K1	2100-1755	R:VAR WM 100 OHM 5% TYPE V 1W	
		IMP AUJ	
A2H2	0698-3151	RIFXD MET FLM 2.87K OHM 1% 1/8W	
4,2R3	0757-0199	R:FXD MET FLM 21.5K CHM 1% 1/8W	, `
AZR4	0757-0447	R:FXD MET FLM 16.2K OHM 1% 1/8W	
A2R5	0757-0442	R:FXD MET FLM 10.0K 1% 1/8W	
A2H6	0757-0442	R:FXD MET FLM 10.0K 1% 1/8W	}
A2R7	0698-3162	R:FXD MET FLM 46.4K CHM 1% 1/8W	1
A2R8	0757-1094	R:FXD MET FLM 1.47K CHM 1% 1/8W	
A2R9	0757-0401	RIFXU MET FLM 100 UHM 1% 1/8W	1
A2R10	0757-0279	K:FXD MET FLM 3.16K OHM 1% 1/8W	
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Table G-3. Parts List Indexed by Reference Designator

Reference Designation	@ Part No.	Description #		Note
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	$\phi'$			***
A2R11 A2R12	0757-0346	R:FXD MET FLM 10 DHM 13 1/8H	, (6	
A2K13	0698-3446 0757-0442	REFXD MET FLM 383 UHM 1% 1/8W REFXD MET FLM 10.0K 1% 1/8W	(1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
AZR14	698-3428	R: FXD MET FLM 14.7 OHM 18 1/8W		
A2K15	1.757-0346	REFXD MET FLM 10 OHM 18 1/8W	• •	
				l .,
A2R16	0757-0280	R:FXO MET FLM 1K OHM 1% 1/8H		* . I
A2R17 A2R18	0757-0199	R:FXD MET FLM 21.5K OHM 1% 1/8W	4 - 4	
A2R19	0757-0460 0757-1094	R:FXD/MET FLM 61.9K OHM 1% 1/8W R:FXD MET FLM 1.47K OHM 1% 1/8W		
A2k20	0757-0418	R: FXD MET FLM 619 OHM 1% 1/8W		
HENZO	\	ROUAL HER FEW 019 ONH 14 1708		i i i i i i i i i i i i i i i i i i i
A2R21	2100-1757	R: VAR WW 500 UHM 54 TYPE V 1W		· V
		30 DB ADJ		
A2R22	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8W		$\mathcal{H}_{\mathcal{A}} = \{ x_{1}, \dots, x_{n} \}$
A2R23	0698-3441	R:FXD MET FLM 215 UHM 13 1/88		
A2H24	2100-1755	R: VAR WW 100 OHM 54 TYPE V 1W		•
	e e e e e e e e e e e e e e e e e e e	40 DB AUJ	,	
A2R25	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8W		
A2R26	0757-0276	R:FXD MET FLM 61.9 UHM 1% 1/8W		
A2R27	2100-1754	REVAR NH 50 OHM 5% TYPE V'IN		
		50 DB ADJ		
#2R28	0757-0280	REFXD MET FLM 1K OHM 1% 1/8h		
A2R29	0698-0084	R:FXD MET FLM 2.15K 14 1/8W		1 · · · · ·
A2R30	(698-3441	R: FXU MET FLM 2.15K 1% 1/8W		
A2R31	0757-0346	REFXD MET FLM 10 UHM 1% 1/8W		
A2R32	698-3446	R:FXD MET FLM 383 OHM 1% 1/8W		• 2
A2R 43	U757-0340	REFAD MET FLM 10 OHM 1% 1/8W		
			·	
A 2 K 34	1757-0420	R:FXU MET FLM 750 OHM 12 1/6W		•
A2R.35	0757-0199	R:FXD MET FLM 21.5K CHM 12 1/8H		
A2R 36	1.757-0460	REFXD MET FLM 61.9K CHM 1% 1/8W		•
A2K37 AZR38	0757-1094 0757-0346	R:FXD MET FLM 1.47K OHM 1% 1/8W R:FXD MET FLM 10 OHM 1% 1/8W		
A/. N.30	0151-0546	N-FAD HET FEM IO OHN 14 1/0W	,	
A2R39	0698-3446	R:FXD MET FLM 383 OHN 1% 1/8m		•
A2R40	0757-0346	R:FXD MET FLM 10 OHM 18 1/8W		# 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
A2R41	0698-3428	R: FXD MET FLM 14.7 OHM 1% 1/8W		
A2K42	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W		
A2R43	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W		
A2R44	2100-1760	RIVAR NW 5K OHM 5% TYPE V 1W		
	2.100-1100	12 DB ADJ	1	
A2R45	0757-0199	R:FXD MET FLM 21.5K CHM 1% 1/8W	v - 1	
A2K46	0757-0442	R:FXD MET FLM 10.0K 1% 1/8W		
A2R47	0757-0442	R:FXD MET FLM 10.0K 1% 1/8W		
	0777 0000			•
A2R48	0757-0288	R:FXD MET FLM 9.09K OHM 1% 1/8W	9	
A2R49 A2R50	0757-0280 0757-0442	R:FXD MET FLM 1K OHM 1% 1/8W		, i
A2R51	2100-1758	R: VAR WW 1K OHM 5% TYPE V 1W		
		O DB ADJ		
A2R52	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8W		•
A2R53	0757-0401	R:FXD MET FLM 100 OHM 18 1/8H		
A2R54	0757-0199	R:FXD MET FLM 21.5K CHM 1% 1/8W		
A2R55	0698-3162	R:FXD MET FLM 46.4K OHM 1% 1/8W		4
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description # Note
#		
A2R56	0698-3162	R:FXD MOT FLM 46.4K OHM 1% 1/8M
A2R57	0757-0401	R:FXD MET FLM 100 OHM 18 1/8W R:FXD MET FLM 1K OHM 18 1/8W
A2R58 A2R59	0757-0280	NUT ASSIGNED
A2R60	0757-0401	RIFXD MET FLM 100 OHM 1% 1/8W
en e		
A2R6I	0757-0401	R:FXD MET FLM 100 DHM 1% 1/8W
A2TB1	08552-2004	BOARD: BLANK PC
A3	08552-6003	BUARD ASSY:50 MHZ CUNVERTER
A 3C 1	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW
	A PEN ANEN	CAEVA CED DIEC 1000 DE 100-209 1000VDCH
A3C2	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW C:FXD CER DISC 1000 PF +80-20% 1000VDCW
A3C3	0150-0050	
A3C4	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCH
A3C5	0160-2930	C: FXD CER 0.01 UF +80-20% 100VDCW
A3C6'	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW
A 3C 7	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW
A3C8	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW
A36.9	0160-2142	C: FXD CER 1500 PF +100-0% 500VDCW
A3C10	0160-2307	C:FXD NICA 47 PF 5%
A3C 11	0121-0059	C: VAR CER 2-8 PF 300VDCH
ASCII	0121-0059	44 MHZ ADJ
		THE AUS
A3C12	0100-2254	C:FXD CER 7.5-0.25 PF 500VDCW
A3C13	U16U-2254	C:FXD CER 7.5-0.25 PF 500VDCW
A3C14	0121-0059	C: VAR CER 2-8 PF 300 VDCW
pa, page a rej	0121 0000	44 MHZ ADJ W
A3C 15'	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW
A3613	0170-0070	
A3C16	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW
A3C17	0160-2201	C:FXU MICA 51 PF 5%
A3C18	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCH
A3C 19	0121-0059	C:VAR CER 2-8 PF 300VDCW
		44 MHZ ADJ
: ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '		
A3C20.	0160-2254	C:FXD CER 7.5-0.25 PF 500VDCW
ABCRI	1901-0050	DIODE: SILICON 75V
A 200 14/1	1004-0050	DIODE: SILICON 75V
A3CK2	1901-0050 \$901-0050	DIODE: SILICON 75V
A3CR3	1901-0050	DIODE: SILICON 75V
A3CR4	146.1-0020	DIODE: 21F1COM 124
ABLI	9140-0114	COIL:FXD RF 10 UH
A3L2	9140-0129	COIL:FXD RF 220 UH
A3L3	9140-0129	COIL:FXD RF 220 UH
A3L4	» 9100-0346	COIL:FXD 0.05 UH 204
A31.5	9140-0056	COIL:FXD RF 1 UH
A3L6	9140-0096	COIL:FXD RF 1 UH
A 23 A 29.	9140-0114	COIL:FXD RF 10 UH
A3L7 A3L8	9140-0096	CUIL:FXD RF 1 UH
A3L9	9140-0096	COIL:FXD RF 1 UH
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ASMPL	08552-0028	PLATE: CUNVERTER
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	⊕ Part No.	Description #	Note
	ing the second of the second		
A301	1854-0247	Q: SI NPN	
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A302	1853-0089	Q:SI PNP	i ·
A3K1	0757-0438	R:FXD MET FLM 5.11K 18 1/8W	
A 3K 2	0698-3155	R: FXD MET FLM 4.64K 1% 1/8W	
A3R3	0757-0420	R: FXD MET FLM 750 OHM 12 1/8W	
A3R4	0757-0159,	R:FXD MET FLM 1000 OHM 1% 1/2W R:FXD MET FLM 19.6 OHM 1% 1/8W	100
A3R5 A3R6	6698-3429 6698-3441	R:FXD MET FLM 215 OHM 1% 1/8W	
A 3K D	0070-3441	REFAU HET FEM 215 UNM 14, 170W	
A3K7	0757-1092	R:FXD MET FLM 287 OHM 14 1/2W	·
Adr 8	U6 18-3438	R:FXD MET FLM 147 OHM 1% 1/8W	· ·
H IN O	2070 2430	FACTORY SELECTED PART	
A3R9	0698-3431	R:FXD MET FLM 23.7 UHM 1% 1/8W	
		FACTURY SELECTED PART	
			. ,
A3R10	0757-0180	R:FXD MET FLM 31.6 DHM 1% 1/8W	
A3R11	0757-0394	R:FXD MET FLM 51.1 UHM 1% 1/8W	1
A3R12	u757-0394	R:FXD MET FLM 51.1 OHM 18 1/8W	
A3R13	0757-0394	R:FXD MET FLM 51.1 UHM 1% 1/8W	
A3R14	0757-0394	R:FXD MET FLM 51.1 DHM 1% 1/8W	
A3K15	0757-0398	R:FXD MET FLM 75 OHM 1% 1/8W	
A3K16	U698-0082	R:FXD MET FLM 464 OHM 1% 1/8W	
1			
A3T1	08552-6018	TRANSFORMER:RF(CODE=RED)	
	and a series of a series at	TO ANGE AN MEGADE AS DIAN	,
A3T2	08552-6044	TRANSFURMER:RF (5 PIN) TRANSFORMER:RF(CODE=RED)	, ,
A313 A314	08552-6018 08552-6044	TRANSFORMER:RF (5 PIN)	
A 317	00772-0044	INANSPURNER OF TO PIN	
A3TB1	08552-2003	BOARD: BLANK PC	, .
13,01	00256 2005		ļ
A3A1	08552-6009	FILTER ASSY:50 MHZ	
		A3A1 IS A SEALED UNIT.	
		NOT RECOMMENUED FOR FIELD REPLACEMENT	
	to engage		
A3A1C1	0160-0778	C:FXD CER 56 PF 10% 500VDCH	
N .			
A3A1C2	0160-2236	C:FXD CER 1.0-0.25 PF 50GVDCW	
A 3A I C3	0 160~0145	C:FXD MICA 82PF 2% 100VDCW	
A3A1C4	0160-2258	Cafad CER 11 PF 54 5GOVDCW	
A3A1C5	0121-0036	C: VAR CER 5.5-18 PF	·
A JAIG6	0121-0036	GEVAR CER 5.5-18 PF	
424167	01.0 00.0	CARVID CED 11 DE EM EDOUDEN	
A3A1C7	0160-2258	C:FXD CER 11 PF 5% 500VDCW C:FXD CER 11 PF 5% 5COVDCW	
A3A1C8	0160-2258	C:VAR CER 5.5-18 PF	
A3A1C9 A3A1C10	0121-0036 0121-0036	C: VAR CER 5.5-18 PF	ł
A3A1C11	0160-2258	C:FXD CER 11 PF 5% 500VDCW	
- A SALCAI	0100-5470	COUNT OF THE PARTY	
A3A1C12	0160-0145	C:FXD MICA 82PF 28 100VDCW	
A3A1C13	0160-0778	C:FXD CER 56 PF 10% 500VDCW	
A3A1J1	1250-0829	CONNEC TOR : RF	
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Not
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		THOUGHTON ACCMAATO CODE	
A3A1L1	08552-6023	INDUCTOR ASSY:AIR CORE	
42434.2	0.05.5201.7	INDUCTOR ASSY:50 MHZ	
A3A1L2 A3A1L3	08552-6017 08552-6023	INDUCTOR ASSY:AIR CORE	
A JA IL J	00552-0025	INDUCTOR ASSISTER CORE	
A3A1MP1	08552-0021	SHIELD CAN: 50 MHZ FILTER	
	003,52,002		
A JA IMP2	08552-0022	SHIELD COVER:47 MHZ GSC	
A3A1MP3	08552+0023	INSULATOR: 47 MHZ OSC	
A3A1TB1	08552-6042	BUARD ASSY:50 MHZ FILTER	
	08552-2047	BOARD: BLANK PC	1
ABALZI	0590-0060	NUT: HEX 12-32 UNEF-28	
91		processors and the second of t	,
A3A1Z2	2190-0057	WASHER: LOCK FOR #12 HDW	7. 4
A3A1Z3	0380-0810	STANDOFF:0.437" LG	
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	OCCEAN ATOM ACCUALT MAT	
A3A2	08552-6010	OSCILLATOR ASSY:47 MHZ	' '
		SEALED UNIT: NOT RECOMMENDED FOR FIELD REPLACEMENT	
A2A2C3	0180-0197	C:FXD ELECT 2.2 UF 10% 20VDCW	'
A3A2C1	0100-0141	COPAU ELECT 202 UP 144 207DCR	
A3A2C2	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A3A2C2 A3A2C3	0160-3020	C:FXD CER 3.9+/-0.1 PF 500VDCW	
A3A2C4	0121-0457	C:VAR GL 0.8-8.5 PF 750VDCW	
M JM C UT	U & & U 7 J /	47 MHZ TUNE	. *
A3A2C5	0160-3022	C:FXD CER 16 PF 1% 500VDCW	
A3A2C6	0160-3090	C:FXD CER 22 PF 1% 500VDCW	•
A3A2C7	0160-3090	C:FXD CER 22 PF 1% 500VDCW	
A3A2CH	0160-2206	C:FXD MICA 160 PF 5%	
A3A2C9	0160-0939	C: FXU MICA 430 PF 5% 300 VDCW	
A3A2C10	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A3A2C11	0150-0050	C:FXD CER DISC 1000 PF +80-2C% 1000VDCW	
A3A2C12	3150-3050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A3A2C13	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A3A2C14	<b>0 150-0050</b>	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A3A2615	0122-0042	C:VULTAGE VAR 15.9 PF +/-2% AT 6V	:
		OVOCA CINICAN SOCIAL SOCIAL	
ABAZCRI .	1901-0033	DIODE: SILICON 10CMA 180HV	
4.0.0		VALDUM TOD A EVE A TO THE EN	
A 3 A 2 I. 1	9100-2465	INDUCTOR: FXD 0.70 UH 5%	
A 2 A 24 2	0100-1421	COIL/CHOKE 18 UH 104	,
A3A2L2	9100-1621	CULL/CHURE 10 UN 104	
A 2 A 2 M D 1	08552-0020	SHIELD CAN:47 MHZ OSC	
ABA 2MP1	U0224-UUZU	SHIELD CANOTI MAZ USC	
SAMSAEA	08552-0029	SHIELD: CUVER 47 MHZ CSC.	
ABAZMPZ ABAZMPB	08552-0023	INSULATOR: 47 MHZ OSC	
H DM ENT 3			ļ
A3A201	1854-0238	Q:SI NPN	·
			. ` `
A3A2U2	1853-0034	O:SI PNP(SELECTED FROM 2N3251)	
A3A203	1854-0019	U:SI NPN(SELECTED FROM 2N2369)	
A3A2R1	0757-0465	R:FXD MET FLM 100K 12 178W	
$(x_{k+1}, y_k) \in \mathbb{R}^{n \times n}$	·	province the Market Community of the Com	
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	No
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A302K2	0757-0465	R: FXD MET FLM 100K 18 1/8W	i i
A 3A2K3	0757-0346	R:FXD MET FLM 10 OHM 1% 1/8W	
A 3A 2K4	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8W	
ABA2K5	0757-0394	R:FXD MET FLM 51.1 UHM 12 1/8W	
A3A2R6	6698-3150	R: FXD MET FLM 2.37K OHM 1% 1/8W	
ABAZR7	0757-0401	R:FXD MET FLM 100 OHM 14 1/8W	
ABAZRB	0757-0399	R: FXD MET FLM 82.5 OHM 18 1/8W	
A34289	0757-0821	R:FXD MET FLM 1.21K OHM 1% 1/2W	
A 3A 2R 10	0757-0382	R: FXD MET FLM 16.2 UHM 1% 1/8W	
A3A2R11	0757-0400	R: FXD MET FLM 90.9 UHM 18 1/8W	A
MOMENTE	31.31-0400	Relad Rel (en 300) onn 14 1/00	100
A3A2H12	0698-3441	R:FXD MET FLM 215 OHM 1% 1/8W	
A3A2k13	0757-0398	R:FXD MET FLM 75 CHM 1% 1/8W	
		R:FXD MET FLM 90.9 DHM 1% 1/8W	
A3A2R14	0757-0400		
A3A2K15	u757-0294	R:FXD MET FLM 17.8 OHM 18 1/8W	
A3A2R16	0757-0403	R:FXD MET FLM 121 OHM 1% 1/8W	
<u> </u>			
A3A2TB1	08552-6043	BUARD ASSY: 47 MHZ USCILLATOR	
	77.		İ
	08552-2043	BOARD: BLANK PC	
<b>Y</b>	1		
A3A2	0340-0039	INSULATOR: BUSHING	
10	•		
A3A2	0340-0038	FEEDTHRU:TERMINAL	
A3A2	0380-0810	STANUDFF:0.437" LG	·
			,
Δ4	08552-6045	CRYSTAL FILTER ASSY	
·			1
A4C1	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
,			
A4C2	× 0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	
A4C3	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4C4	0180-0291	C:FXD ELECT 1.0 UF 10% 35VDCW	1
A405	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4L6	0160-2930	C:FXD LER 0.01 UF +80-20% 100VDCW	
A4C7	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4C8	0160-2930	C:FXD CER 0.01 UF +80-20# 100VDCW	
A4C9	0121-0059	C: VAR CER 2-8 PF 300 VUCH	- 11 L
A4C10	U160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4L11	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	1
AACII	0180-2930	C. FAD CER U.UI OF YOU-204 IUUVDCW	
	034.0-2022	C.EVID CER O OI HE 400-200 100VOCH	ľ
A4C12	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4C13	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH	
A4C14	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCW	
A4C 15	0121-0105	C:VAR CER 9-35 PF NPO	, I
A4C16	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
.\			
A4C17	0160-2930	C:FAD CER 0.01 UF +80-20% 100VDCW	
A4C18	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4C19	0160-2930	C:FXD CER 0-01 UF +80-20% 100VDCW	
A4C20	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C21	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCW	
A4C22	0160-2930	C:FXD CER 0.01 UF +80-201 100VDCW	
A4C 23	0121-0059	C:VAR CER 2-8 PF 300VDCH	
A4C24	0160-2917	C:FXD CER 0.05 UF +80-203 100VDCW	, l
A4C25	0160-2930	C:FXD CER/0.01 UF +80-20% 100VDCW	
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
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		and the second of the Age that the second of the	
A4C26	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	7.
A4C27	0160-2930	CafxD CER 0.01 UF +80-20% 100VDCN	, <u> </u>
A4C 28	0160-2930	C:FXD CER 0.01 UF +80-20% 1COVDCH C:FXD CER 0.01 UF +80-20% 100VDCH	
A4C29 A4C30	0160-2930 0121-0105	C: VAR CER' 9-35 PF NPO	
A4C 3U	0121-0103	COURT OLD 3 33 FT IN C	
A4C31	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCW	
A4632	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCH	
A4C33	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
A4C34	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCH	
A4C37	0160-2199	C:FXD MICA 30 PF 5%	
		C:FXD MICA 30 PF 5%	·
A4C36	0160-2199	C:FXD CER 10 PF 5% 500VDCW	
A4C37 A4C38	0121-0059	C:VAR CER 2-8 PF 300VDCH	
A4C39	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCH	1 5
A4C4U	0160-2930	C:FXU CER 0.01 UF +80-20% 100VDCH	Acceptance
A4C41	0160-2917	C:FXD CER 0.05 UF +80-30% 100VDCW	
A4C.42	U160-2930	L: FXD CER 0.01 UF +80-20% 100VDCW	
A4C43	0160-2930	C:FXD CER 0.01 UF +60-20% 100VDCH	. İ
A41.44	0160-2930	C:FXD CER U.C1 UF +80-20% 100VDCH C:VAR CER 9-35 PF NPO	
A4C45	0121-0105	LIVAK CER 9-33 PF NPU	
A4C46	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
A4C47	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
A4C48	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
A4C49	0160-2101	C:FXD MICA 27PF 24 300VDCH	
A4C50	0160-2930	C:FXU CER 0.01 UF +80-20% 100VDCH	
		CARNO CEO O OL ME AGO-200 BOOMOCH	
A4C51	0160-2930 0160-2930	C:FXD GER 0.01 UF +80-20% 100VDCH C:FXD GER 0.01 UF +80-20% 100VDCH	
A4C52	0160-2730	C.FAD CER 0.01 OF 100 204 200100	
A4CR1	1901-0040	DIODE: SILICON JOMA JOWY	
A4CR2	1901-0040	DIODE: SILICUN BOMA BOWY	
A4LR3	190 170040	DIODE: SILICON BOMA BOWY	, 1
A4CR4	1901-0640	DIODE: SILICON 30MA 30MV	).
A4CR5	1901-0040	DIODE: SILICON 30MA 30WV	· .
A4CR6	1901-0040	DIODE-21FICOM 20MM 20MA	
A4CR7	1901-0040	DIODE: SILICON 30MA 30WV	
A4CR8	1901-0040	DIODE: SILICUN 30MA 3CWV	
A4CR9	1901-0540	DAODE: SILICON BOMA' BOWY	
A4CH10	1901-0040	DIODE: SILICON 30MA 3CWV	
A4CK11	1901-0040	DIODE: SILICON 30MA 30WV	
440040	1001 0040	DIUDE: SILICUN 30MA 3CHV	The Maria
A4CR12 A4CR13	1901-0040	DIODE: SILICON BOMA BOWY	
A4CRIA	1910-0016	Didde: Germanium 100ma/0.85V 60PIV	
A4CR15	1901-0040	DIODE: SILICON BOMA BONV	
A4CRIO		NUT ASSIGNED	
· ·			;
A4CR17	1901-0040	DIDDE:SILICON 30MA 30HV	
A4CR18	1901-0040	DIODE: SILICON 30MA 30MV	
A4CR19	1901-0040	DIUDE:SILICUN 30MA 30HV DIUDE:SILICUN 30MA 30HV	· . • •
A4CR20	1701-0040	AIGNE-SIFICOU JOHN JOHN	
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Table 6-3. Parts List Indexed by Reference Designator

Designation		Description # Note
A44 923		
AAC 9.21		
A 4 ( D 2 )		
A4CR21	1901-0040	DIODE: SILICON 30MA 30MV
A4CR22	1901-0040	DIUDE: SILICUN 30MA 30MY
A4CR23	1901-0040	DIODE: SILICUN 30MA 3CMV
A4CR24	1901-0040	DIODE: SILICON 30MA 30HV
* * * * * * * * * * * * * * * * * * * *		
A4K1	0440-0743	RELAY: REED
A4K?	0490-0743	RELAY: REED
A4K3	0440-0743	RELAY: REED
•		
A4L1	9140-0237	COIL:FXU 3200 UH 5%
¥		
A41.2	9140-0237	COIL:FXD 200 UH 5%
A4L3	9140-0237	COIL:FXD 200 UH 5%
A4L4	9140-0237	CUIL:FXD 200 UH 5#
A415	9100-1622	COILYCHOKE 24.0 UH 58
A4L6	9100-1622	COIL/CHOKE 24.0 UH 5%
		in the same of the same of the same of the same of the same of the same of the same of the same of the same of
A4L7	9100-1622	COIL/CHOKE 24.0 UH 58
A4L8	9100-1622	CDIL/CHOKE 24.0 UH 5%
A4L9	9140-0237	COIL:FXD 200 UH 5%
A4L10	9100-1622	COIL/CHOKE 24.0 UH 5%
A4L11	9100-1622	CUIL/CHUKE 24.0 UH 5%
A4L12	9100-2475	COIL/CHOKE 11.3 UH 18
A401	1854-0071	U:SI NPN(SELECTED FROM 2N3704)
		200
A402	1854-0071	O:SI MPN(SELECTED FRCA 2N3704)
A403	1853-0020	U:SI PNP(SELECTED FROM 2N3702)
A404	1853-0020	Q: SI PAP(SELECTED FROM 2N3702)
A405	1853-0020	O:SI PNP(SELECTED FROM 2N3702)
A406	1854-0071	O:SI NPN(SELECTED FROM 2N3704)
		OPER HONE CARETEIN CHOM AND TOUR
A407	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)
A408	1853-0020	Q:SI PNP(SELECTED FROM 2N37G2)
A409	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)
A4010	1853-0001	O:SI PNP(SELECTED FROM 2N1132) U:SI NPN(SELECTED FROM 2N3704)
A4011	1854-0071	4:27 MANT SEFECTED LYON SUSTANI
	1054 0071	Q:SI NPN1SELECTED FROM 2N3704)
A4012	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)
A4013	1854-0071	A:21 WAMI 2EFECTED LYCH SUSTONS
A41) \$	0.75.7-0403	R:FXD MET FLM 121 OHM 1% 1/8W
A4R1	0757-0403	KAPAD HET FEH 121 UNH 14 17 GW
AAD	0.75.704.03	R:FXD MET FLM 121 OHM 1% 1/8H
A4R2	0757-0403	R:FXD MET FLM 51.1K CHM 1% 1/8W
.A4R3	0757-0458 0698-3156	R:FXD MET FLM 14.7K OHM 18 1/8h
A4R4 A4R5	0757-0394	R:FXD MET FLM 51.1 OHM 18 1/8H
A4R6	0757-0416	R:FXD MET FLM 511 UHM 1% 1/8W
ATKO	0/5/-0418	RAIND HET TEN SEE ON IN IN IVON
A4R7	U757-0403	R:FXD MET FLM 121 OHM 1% 1/8W
A4R8	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W
A4R9	0757-0346	R:FXD MET FLM 10 OHM 14 1/8H
A4R10	0757~0403	R:FXD MET FLM 121 UHM 1% 1/8W
	0757-0403	R:FXD MET FLM 121 OHM 1% 1/8W
The second of th	1,137,0403	
A4R11		
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
		DATE OF A DESCRIPTION O	
A4R12	(1648-3454 (1683-0275	R:FXD MET FLM 215K DHM 14 1/8W R:FXD COMP 2.7 UHM 58 1/4W	
A4R13 A4R14	0757-0403	R:FXD MET FLM 121 DHM 13 1/8W	
A4R15	0757-0274	R:FXD MET FLM 1.21K OHM 1% 1/8W	100
A4R16	0698-3132	R:FXU FLM 261,0HM 1% 1/8W	4
A 412 9 79	0767-0274	R:FXD MET FLM 1.21K OHM 1% 1/8W	1
A4R17 A4R18	0757-0274 0757-0447	R:FXD MET FLM 16.2K OHM 1% 1/8W	
A4R19	G757-0403	R:FXD MET FLM 121 UHM 1% 1/8W	
A4R20	0757-0459	R:FXD MET FLM 56.2K OHM 1% 1/8W	,
A4R21	0757-0422	REFXD MET FLM 909 OHM 1% 1/8W	İ.
A4H22	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W	
A4R23	0757-0439	REFAU MET FLM 6.81K CHM 1% 1/8W	
A4R24	0698-3558	REFXD MET FLM 4.02K CHM 18 1/8H	, ,
A4R25	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W	
A4R26	0757-0419	R:FXD MET FLM 681 OHM 1% 1/8W	
A4R27	∪757 <b>-</b> 0346	R:FXD MET FLM 10 DHM 1% 1/8W	
A4R28	0757-0416	R:FXD MET FLM 511 DHM 1% 1/8W	
A4K29	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W	
A4R30	2100-1754	R:VAR WW 50 OHM 5% TYPE V 1W 20 DB ADJ	
		20 00 400	
A4R31	0698-3454	R:FXD MET FLM 215K UHM 1% 1/8W	
A4R32	0757-0403	R:FXD MET FLM 121 OHM 1% 1/8W	
A4R33	0757-0274	R:FXD MET FLM 1.21K OHM 1% 1/8W R:FXD FLM 261 OHM 1% 1/8W	٠.
A4R34 A4R35	0698-3132 0757-0274	R:FXD FEH 201 CHM 14 1/00 R:FXD MET FLM 1.21K CHM 1% 1/80	
A4N33			
A4R36	6757-0422	R: FXD MET FLM 909 OHM 1% 1/8W	
A4R37	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W	
A4R38 A4R39	0698-3558 6698-0084	R:FXU MET FLM 4.02K UHM 1% 1/8W R:FXD MET FLM 2.15K 1% 1/8W	
A4R40	0683-0275	R: FXD COMP 2.7 OHM 5% 1/4W	
A4R41	0698-3157	R:FXD MET FLM 19.6K 1% 1/8W R:FXD MET FLM 38.3K 1% 1/8W	
A4R42 A4R43	0698-3161	R:FXD MET FLM 2.15K 1% 1/8W	1
A4R44	0757-0394	R: FXU MET FLM 51.1 UHM 18 1/8W	
A4R45	0698-3156	R:FXD MET FLM 14.7K CHM 18 1/8H	
			.,
A4R46	0698-0084 0757-0274	R:FXD MET FLM 2.15K 1% 1/8W R:FXD MET FLM 1.21K DHM 1% 1/8W	
A4K47 A4K48	U698-3439	R:FXD MET FLM 178 UHM 1% 1/8W	
A4K49	J757-0416	R:FXD MET FLM 511 UHM 1% 1/8W	
A4R50	( 698-0084	R: FXD MET FLM 2.15K 1% 1/8W	
		the control of the co	l
A 4K 51	0757-0403 0757-0403	R:FXD MET FLM 121 OHM 1% 1/8W R:FXD MET FLM 121 OHM 1% 1/8W	,
A4R52 A4R53	0757-0422	R:FXD MET FLM 909 OHM 1% 1/8W	
A4R54	U757-0346	R:FXD MET FLM 10 DHM 12 1/8W	ĺ
A4R55	2100-1755	REVAR WH 100 DHM 5% TYPE V 1W	ĺ
	The second of the second	10 De ADJ	
A4R56	0757-0419	R:FXD MET FLM 681 DHM 1% 1/8W	
A4K57	0757-0403	R:FXD MET FLM 121 OHM 1% 1/8W	
A4R58	0757-0274	R:FXD MET FLM 1.21K OHM 18 1/8W	
A4K59	0698-3132	R:FXU FLM 261 DHM 1% 1/86	) .
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<sup>#</sup> See introduction to this section for ordering information

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #		Note
			· / / · · · · · · · · · · · · · · · · ·	, ,
A4K60	0757-0274	N: FXD MET FLM 1.21K CHM 1% 1/8W		<b>†</b> '
A4R61	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W		
A4R62	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W		!
A4863	0698-3156	REFXE MET FLM 14.7K OHM 1% 1/8W		
A4K04	u757-0422	REFXD MET FLM 909 OHM 1# 1/8W		
A4R65	1698-0084	KIFXD MET FLM 2.15K 1% 1/8W		. '
A4K6b	9698-3494	K:FXD MET FLM 215K 0HM 1% 1/8W		, ,
A41.67	(678-3558	RIFAD MET FLM 4.02K CHM 1% 1/8W		٠.
A41668	1678-0084	R:FAD MET FLM, 2.15K 18 1/8W		
A4K69	0083-0275	R: FXU CUMP 2.7 UHM 5% 1/4W		
ATROS	0003-0213	NOTAL COMP 211 ONA JR 1748		
A4R 70	0698-3445	R: FXD MET FLM 348 OHM 1% 1/8W		. 1
A4K71	0698-3161	R:FXD MET FLM 38.3K 14 1/8W		, '
A4K72	U698-3157	R: FXD MET FLM 19.6K 14 1/8W		
A4R73	u757-0274	R: FXD MET FLM 1.21K OHM 18 1/8W		,
A4K74	0757-0403	R:FXD MET FLM 121 OHM 14 1/8W		İ.
	0131 0403	ROTAD HET TEN 121 OHN 14 17 ON		
A4x 75	(, 698-0084	R:FXD MET FLM 2.15K 18 1/8W		
A4K76	0/57-0274	R:FXD MET FLM 1.21K CHM 1% 1/8W		
A4R77	0698-0082	R:FXD MET FLM 464 UHM 14 1/8W		į v
A4K78	0030-0002	NUT ASSIGNED		' ·
A4K79	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W		, ,
				,
A4K 8()	U75 7-0439	R:FXD MET FLM 6.81K OHM 14 1/8W		'
A4KH1	0757-0416	R:FXD MET FLM 511 OHM 14 1/8W		
A4Kb2	U757-0441	R: FAU MET FLM 8.25K 14 1/8W		İ
A4KH3	L698-0084	R:FXU MET FLM 2.15K 1% 1/8W		
A 4R 84	J757-J274	R:FAU MET FEM 1.21K OHM 1% 1/8W		* * ·
A4n85	2100-1761	KIVAR WW TOK DHM 5% TYPE V TW		,
,		100 HZ ADJ		
A4K 86	. 0757-0274	R:FXD MET FLM 1.21K OHM 1% 1/8h	g .	
A41.67	0757-0274	K: FXD MET HLM 1.21K CHM 1% 1/8W		
AHKBB	2100-1760	REVAR WW 5K OHM 5% TYPE V 1W		
		50 HZ ADJ		'>
,	,			
44TH1	08552-2045	BUARD: BLANK PC		
A4Y1	0410-0139	CRYSTAL: QUARTZ (MATCHED SET OF ,3)		,
A4Y2	·	PART UF YI		
A4Y3		PART OF YI		
A5	08552-6002	BUARD ASSY: POWER SUPPLY	•	
	i			
. A5C1	0160-0163	C:FXD MY 0.033 UF 10% 200VDCW		
ASC2	0180-0116	C:FXD ELECT 6.8 UF 10# 35VDCW		
A5C3.	0160-2208	C:FXD MICA 330 PF 54 300VDCW		
A5C4	0180-1747	C:FXD ELECT 150 UF 20% 15VDCH	(A)	
A5C5	0160-0162	C:FXD MY 0.022 UF 104 200VDCH		
A5C6	0180-0116	C:FXD ELECT 6.8 UP 10% 35VDCH		
		المنافع المناف		
A5C7	0180-1747	C:FXD ELECT 150 UF 20% 15VDCW		r -
A5C8'	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW		<i></i>
A5C9	0160-0153	C:FXD MY 0.001 UF 10% 200VDCH		
A5C 10	0180-0197	C:FXD ELECT 2.2 UF 10% 20VDCW		,
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	part No.	Description #	Note
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		a many and a second second second	
A5C11	0160-2930	C:FXD CER U.01 UF +80-20% 100VDCW	
A5C12	0160-2145	C:FXD CER 5000 PF +80-20% 100VDCW C:FXD CER 0.01 UF +80-20% 100VDCW	•
A5C 13	0160-2930 0160-2143	C:FXD CER 2000 PF +80-20% 1000VDCW	
A5C14 \\ A5C15	0160-2143	C: FXD MICA 68 PF 5%	
# 3G 1 3	0140-0175		
A5C16	0180-0098	C:FXD ELECT 100 UF 20% 20VDCW	
A5C 17	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A5C18	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A5CR1	1901-0416	DIODE: SILICON 200PIV 3A	
		STORE DEFAULUITAE 2 ON 5 9	1
A5CK2	1902-3104	DIODE BREAKDUWN:5.62V 5% DIODE:SILICON 200PIV 3A	
ASCR3	1901-0416 1884-0012	RECTIFIER: SILICON CUNTRULLED 2N3528	
A5CR4 A5CR5	1902-3268	DIODE BREAKDOWN:26.1V 5%	
A5CR6	1902-0033	DIODE: BREAKDUWN 6.2V	
, , , , , , , , , , , , , , , , , , ,			
A5CR7	1901-0416	DIODE: SILICON 200PIV 3A	
A5CR8	1901-0416	DIODE: SILICON 200PIV 3A	
ASCR4	1901-0416	DIODE: SILICON 200PIV 3A	
ASCRIO	1884-0012	RECTIFIER: SILICUN' CONTROLLED' 2N3528	:
A5C H11	1902-3256	DIODE: BREAKDOWN SILICON 23.7V 5%	•
		TONE METAND MINERA ON EN	
A5CR12	1902-0040	DIODE BREAKDOWN:14.0V 5* DIODE:SILICON 200PIV 3A	
A5C R1 3	1901-0416	DIUDE: BREAKDOWN 6.2V	•
A5CR15	1901-0416	DIQUE:SILICON 200PIV 3A	
A5CH16	1901-0040	DIODE: SILICON 30MA 30MV	
7,501.20			
ASCR17	1901-0040	DIODE: SILICON 30MA 30WV	
ASCR18	1901-0039	DIUDE: SILICON 200MA 50WV	· .
A5CR19	1901-0040	DIODE: SILICUN BOMA BOWY	•
5CR20	1901-0040	DIODE: SILICON JOMA JOHV	
A5CR21	1901-0040	DIUDE:SILICON 30MA 30MV	
	1001 1040	DIODE: SILICON 30MA 30WV	
A5CR22 A5CR23	1901-0040	DIODE: SILICON BOMA BOWV	
ASCR24	1901-0040	DIODE: SILICON JOMA JOHV	
ASCR25	1901-0040	DIODE: SILICUN 30MA 30HV	
ASCR26	1901-0040	DIDDE: SILICON BOMA BONV	
	t		
45CR27	1901-0040	DIODE: SILICON 30MA 30WV	· · · · · · · · · · · · · · · · · · ·
ASCR28	1901-0040	DIUDE: SILICON BOMA BONV	
A5CR29	1902-3070	DIODE: BREAKDOWN 4.22V 5#	
A5CR30	1902-3570	DIODE: BREAKDOWN 4.22V 5%	
	145 2 00 20	Q:SI PNP(SELECTED FRUM 2N3702)	٠. ,
A5U1	185 3-0020	GIST PAPEZELECTED FROM ENSIGE	
A502	1853-0320	G:SI PNP(SELECTED FROM 2N3702)	•
A5J3	1854-0221	O:SI NPN (REPLACEABLE BY 2N4044)	
A504	1853-0020	G:SI PNP(SELECTED FROM 2N37U2)	
A505	1853-0020	USI PHP(SELECTED FROM 2N37CZ)	
A506	1854-0221	O:SI NPN(REPLACEABLE BY 2N4044)	:
	0		
A507	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	
A508	1854-0022	Q: SI NPN	
A509	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	
A5010	1853-0006	Q:SI PNP 2N3134	4
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
			. *
A5011	1853-0020	U:SI PNP(SELECTED FROM 2N3702)	
A5012	1853-0020	O:SI RNP(SELECTED FROM 2N3702)	
A5013	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	-1
A5014	1854-0071	U:SI NPN(SELECTED FROM 2N3704)	
A5015	1854-0071	U:SI NPN(SELECTED FROM 2N3704)	
A5010	1853-0020	U:SI PNP(SELECTED FROM 2N3702)	
A5017	1854-0071	U:SI NPN(SELECTED FROM 2N3704)	ι <sup>1</sup>
A5018	1853-0020	O:SI PNP(SELECTED FROM 2N3702)	
A5019	1854-0071	O:SI NPN(SELECTED FROM 2N37C4)	<u> </u>
A5020	1853-0020	G: SI PNP (SELECTED FROM 2N3702)	i .
A5021	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	• .
A5022	1854-0003	0:SI NPN(SELECTED FROM 2N1711)	
A5023		GHASSIS MUUNTED SERIES REGULATORS (SEE Q23)	,
A5024		CHASSIS MOUNTED SERIES REGULATORS (SEE Q24)	
A5025	1853-0020	O:SI PNP(SELECTED FROM 2N3702)	
A5R1		NUT ASSIGNED	
A5R2	0698-3420	R:FXD MET FLM 34.8K OHM 1% 1/2W	
A5R3	0764-0018	R: FXD MET FLM 4700 DHM 58 2W	
A5R4	0757-0276	R: FXO MET FLM 61.9 OHM 1% 1/8H	
A5R5	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W	
A5R6	0757-0405	R:FXD NET FLM 162 OHM 1% 1/8N	
A5K7	0698-3408	R:FXO MET FLM 2.15 1% 1/2W	
A5R8	0699-0001	R: FXD COMP 2.7 UHM 10% 1/2W	•
A5K9	0757-0278	R:FXD MET FLM 1.78K CHM 1% 1/8W	
A5R10	0757-0280	R: FXD MET FLM 1K OHM 1% 1/8W	
A5R11	0757-0460	R:FXD MET FLM 61.9K CHM 1% 1/8W	
A5R12	0698-3150	R:FXD MET FLM 2.37K OHM 1% 1/8W	
A5R13	0698-3136	R: FXD MET FLM 17.8K OHM 18 1/8W	
A5R14	0757-0460	R: FXD MET FLM 61.9K OHM 1% 1/8W	
A5R15	0698-6089	R: FXD MET FLM 1780 OHM 1% 1/2W	
A5R16	2100-1756	R: VAR WW 200 OHM 5% TYPE V 1W	*
		+20V ADJ	
A5K17	0757-0420	REFAU MET FLM 750 OHM 14 1/8W	
ASRIB	0757-0416	R: FXD MET FLM 511 OHM 14 1/8N	
A5R19	0757-0276	R:FXD MET FLM 61.9 CHM 1% 1/8W	
A5R20	U698-3419	R:FXD MET FLM 31.6K OHM 1% 1/2W	
A5R21	0698-0084	R: FXD MET FLM 2.15K 1% 1/8W	
A5R22	0757-0405	R:FXU MET FLM 162 OHM 1# 1/8W	
A5R23	0757-0416	R:FXD MET FLM 511 UHM 1% 1/8W	
A5H24	0757-0280	R: FXD MET FLM 1K OHM 18 1/8W	
A5R25	0757-0317	REFXU MET FLM 1.33K OHM 1% 1/8W	1 1
A5R26	0699-0001	R:FXD COMP 2.7 UHM 10% 1/2W	
A5R27	0757-0199	R:FXD MET FLM 21.5K OHM 1% 1/8W	
A5R28	0757-0441	R: FXD MET FLM 8.25K 1% 1/8W	
A5R29	0757-0418	R:FXD MET FLM 619 UHM 1% 1/8W	•
A5R30	0757-0199	R:FXD MET FLM 21.5K OHM 1% 1/8W	
A5R31	0698-3446	R:FXD MET FLM 383 UHM 1% 1/8W	, ,
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
		DAME OF THE STATE WILL	
A5R32	2100-1756	R:VAR WW 200 DHM 5% TYPE V 1W -10V ADJ	
A 5R 33	0757-0420	R:FXU MET FLM 750 UHM 1% 1/8W	· ·
A 5K 34	0683-9145	R:FXD COMP 910K OHM 5% 1/4W	. T
A5R35	0757-0200	R:FXD MET FLM 5.62K OHM 1% 1/8W	4
A5R36	0683-5145	R:FXD COMP 510K OHM 5% 1/4W	
A5K37	0757-0465	R:FXD MET FLM 100K 13 1/8W	
A5R38	0757-0465	REFXD MET FIN 100K 13 1/8W	
A5K40	0757-0458 0698-3158	R:FXD MET FLM 51.1K OHM 1% 1/8W R:FXD MET FLM 23.7K OHM 1% 1/8W	
A DK 4U	0070-3130	R.PAD HET FEH 2301K WIH 18 170W	
A5R41	0757-0274	R:FXD MET FLM 1.21K OHM 1% 1/8W	
A5R42	2100-1760	R: VAR WW 5K UHM 5% TYPE V IW	.
A # 1	0.00 3150	TUNING RANGE ADJ R:FXD MET FLM 23.7K OHM 1% 1/8W	
A5R43 A5R44	0698-3158 0698-3260	R:FXD MET FLM 464K OHM 1% 1/8W	
ADRAT	0070-3200		
A5R45	0757-0200	R:FXD MET FLM 5.62K OHM 1% 1/8W	
A 5R 46	0683-9145	R:FXD COMP 910K OHM 5% 1/4M	
A5R47.	0757-0447	R:FXD MET FLM 16.2K CHM 1% 1/8W R:FXD MET FLM 1.21K CHM 1% 1/8W	ŀ
A5K48 A5K49	0757-0274 0764-0006	RIFXD MET UX 18K OHM 5% 2W	
#.JN-7.3	0.04 0000		
A5R50	U757-0442	R:FXD MET FLM 10.0K 1% 1/8W	
A5R51	0757-0424	R:FXD MET FLM 1.10K OHM 13 1/8W	10 P
45R52	0698-3150	R:FXD MET FLM 2.37K CHM 1% 1/8W R:FXD MET FLM 1.62K 1% 1/8W	
A5R53 A5R54	0757-0428 0757-0464	R:FXD MET FLM 90.9K CHM 1% 1/8W	
A 7K 74	0757 0404	FACTURY SELECTED PART	
A 5 R 5 5	J 75 7-0464	R:FXD MET FLM 90.9K OHM 1% 1/8W FACTURY SELECTED PART	
A5R56	0757-0463	R:FXD, MET FLM 82.5K 1% 1/8W	
		FACTORY SELECTED PART	
A5R57	0757-0461	R:FXD MET FLM 68.1K OHM 1% 1/8W	
		FACTURY SELECTED PART	
A5R58	0757-0460	R:FXD MET FLM 61.9K OHM 1% 1/8W	
		FACTURY SELECTED PART	
A5859	0757-0459	R: FXD MET FLM 56.2K CHM 1% 1/8k	
	0.76.70 04.60	FACTURY SELECTED PART R:FXD MET FLM 51.1K CHM 1% 1/8m	
A5R60	0757-0458	FACTORY SELECTED PART	
A5K61	0698-3450	H:FXD MET FLM 42.2K OHM 18 1/8H	
1		FACTURY SELECTED PART	
A5K62	0698-3161	R:FXD NET FLM 38.3K 1% 1/8W	
A 5K 63	L648-3161	FACTORY SELECTED PART R:FXD MET FLM 38.3K 1% 1/8W	
A DROD	0070-3101	FACTORY SELECTED PART	
•			
ASR64	0757-0816	R:FXD HET FLM 681 UHM 1% 1/2H	
A5K65	698-3439	R:FXD MET FLM 178 DHM 14 1/8W	
A5K66 A5K67	0757-0405 0757-0405	R:FXD MET FLM 162 OHM 1% 1/8W R:FXD MET FLM 162 OHM 1% 1/8W	
AoRed	0757-0405	R:FXD MET FLM 162 OHM 1% 1/8W	<b>,</b>
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
A. A. A. A. A. A. A. A. A. A. A. A. A. A			
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ASK69	0757-0405	H:FXD MET FLM 162 UHM 1% 1/8W	
A5R70	0757-0405	R:FXD MET FLM 162 OHM 1% 1/8W	· ·
A5K71	075.7-0405	R: FXD MET FLM 162 UHM 1% 1/8W	
A5R72	0757-0405	R:FXD MET FLM 162 UHM 1% 1/8W	
	1		
A5K73	(757-0405	REFXU MET FLM Lo2 UHM 18 1/8W	
A 5 13 7 4	0757-0453	R:FXD MET FLM 30.1K DHM 1% 1/8W	
A5H74	0757-0453		
A5K75	2100-2489	R: VAR FLM 5K OHM 10% LIN 1/2W	1.14
		THRESHOLD ADJ	"
A5K76	0757-0122	R:FXD MET FLM 27.1K OHM 1% 1/8W	
A5R77	0757-0442	R:FXD MET FLM 10.0K 18 1/8W	
	27. 2. 2.2.2	(1 - F M P) AB C P (F) AB D	ļ. ' '
A5K78	0757-0279	R: FXD MET FLM 3.16K OHM 18 1/8H	
A5K79	0757-0795	R:FXD MET FLM 75 OHM 18 1/2W	٠.
A5K80	0757-0276	R:FXU MET FLM 61.9 DHM 1% 1/8W	a -
and the second second	·		
ASTOI	08552-2002	BUARD: BLANK PC	
ASTBL	000 02 - 2 UU2	DUMNU DEMIN TO	٠.
A6	08552-6047	SCAN GENERATOR ASSY	
<b>_</b>			ļ ·
A6C1	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCH	
			,
1	3190-0114	CIEVA LIECT & O HE 100 REVOCA	[ ·
A6C2	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	
A6C3	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	l
A6C4	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	Ī
l l		FACTORY SELECTED PART	
AoC 5	U180-2268	C:FXD ELECT 140 UF 10%	
		CITAL EMPOI TAG OF TAG	· ·
A + C +	11140-0000	C: FXD MICA 430 PF 5% 300 VDCW	
A6G6	0160-0939		
Anc 7	0160-2930	C:FXD CER 0:01 UF +80-20% 100VDCW	
Anu8	J 160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	1
A609	0180-1743	C:FXD ELECT O.1 UF 10% 35VDCW	l
A6010	0160-2218	C:FXD MICA 1000 PF 5%	
FT TF TF # 76"			a control of a
	NA 12 - 12 2 4 2	C.EVO MY A A22 HE 1AW 2AAUAAL	
A6C11	0160-0163	C:FXD MY 0.033 UF 10% 200VDCH	l
A6012	0140-0198	C:FXD MICA 200 PF 5%	l
A6C13	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	1
A6C14	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	
A6C15	0121-0036	C: VAR CER 5.5-18 PF	
A6C16	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
· •		C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A6C17	0150-0050		ļ
A6C18	0160-2263	C:FXD CER 18 PF 5% 500VDCW	ļ
A6C 19	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A6C20	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	1
A6C21	0160-0153	C:FXD NY 0.001 UF 108 200VDCH	Į
MUVEI	0100-0133	STIND IT STAR OF SAS PARAMETER	İ
44000	A Charles B. Albania de Par	DIODE - CILICON LOOMA / IV	· ·
A6CR1	1901-0025	DIODE: SILICON 100MA/IV	I
			ļ ·
A6CR2	1901-0025	DIODE:SILICON 100MA/1V	I
A6CR3	1901-0025	DIODE: SILICON 100MA/1V	1
A6CR4	1901-0025	DIODE:SILICON 100MA/IV	l
A6CR5	1901-0025	DIODE: SILICON 100MA/1V	ł
			1
AGCRA	1901-0025	DIUDE:SILICON 100MA/1V	l
			l
A6CR7	1901-0025	DIODE: SILICON 100MA/1V	
AGCRB	1902-0202	DIODE BREAKDOWN: 15.0V 5% 1W	i
	1902-0556	DIODE: BREAKDOWN 15.0V 5% 1W	Į.
A6CK9			•
AGCRIO	1902-3171	DIUDE BREAKDOWN:11.0V 5%	<b>j</b> ,
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Table 6-3. Parts List Indexed by Reference Designator

Reference	@ Part No.	Description #	Note
Designation			
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		DECOGO CELECON LOOMA ILM	
A6CR11	1901-0025	DIODE: SILICON 100MA/1V	
A6CR12	1901-0025	DIODE: SILICON 100MA/1V	· ·
A6CR13	1901-0025	DIODE: SILICON 100MA/1V	
A6CR14	1902-0785	DIODE BREAKDOWN: 9.09V 5%	
A6CR15	1901-0025	DIODE:SILICON 100MA/1V	
	1001 0015	DIUDE: SILICON 100MA/IV	' .
A6CR16	1901-0025	DIDDE BREAKDOWN:6.81V	
A6CR17	1902-0052	DIONE PREWNOMM:0.01A	•
	0.40 0.110	COTI - C. YO. DE 100 DH 59	
A6L1	9140-0210	CUIL:FXU RF 100 UH 5%	4.5
	0140 0210	CUIL:FXD RF 100 UH 5%	, ,
A6L2	9140-0210	COIL:FXD RF 100 UH 5%	
A6L3	9140-0210		
A6L4	9100-2267	COIL/CHOKE 18 UH	
A6L5	9160-2267	COIL/CHOKE 18 UH	
A6L6	9100-2267	COIL/CHOKE 18 UH	
/ I		TO IMPANAL OF NA COMADO	
AGMPL	0360-1514	TERMINAL PIN: SQUARE	
1	A 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2	CALEER DACAN COAN CENE DATED	
A6MP2	08552-0024	SHIELD:CAN.SCAN GENERATOR	
	and the second s	OACT NOMECCECTOD EDOM ONOTOAN	
A601	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	
		OF DE HOMECE FORCE COOK ON TOOK	,
A602	1854-0071	0:SI NPN(SELECTED FROM 2N3704)	· ·
A6Q3	1853-0020	O: SI PNP(SELECTED FROM) 2N3702)	
A604	1854-0071	UIST NPN(SELECTED FROM 2N3704)	
A005	1854-0039	U: SI NPN	
A606	1853-0020	0:SI PNP(SELECTED FROM 2N3702)	
	C		•
A607	1854-0071	OSSI NPN(SELECTED FROM 2N3704)	
A608	1853-0020	O:SI PNP(SELECTED FROM 2N3702)	
A609	1854-0071	0:SI NPN(SELECTED FROM 2N3704)	,
A6010	1853-0020	O'SI PHP(SELECTED FROM 2N3702)	
A6011	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	
		NAME OF ALBERT OF A PROPERTY OF A PAINT A PAIN	
A6012	1854-0232	O:SI NPN(SELECTED FROM 2N3440)	
A6013	1853-0020	O: SI PNP(SELECTED FROM 2N3702)	
A6014	1853-0020	U:SI PNP(SELECTED FROM 2N3702)	
A6015	1854-0071	O:SI NPNISELECTED FROM 2N3704)	
A6016	1854-0071	0:SI NPN(SELECTED FRCM 2N3704)	
A6017	/ 1854-0019	O:SI NPN(SELECTED FROM 2N2369)	
A6018	1854-0019	D:SI NPN(SELECTED FROM 2N2369)	
A6R1	0698-3136	REFXD MET FLM 17.8K OHM 1% 1/8W	
A6R2	0757-0441	R: FXD MET FLM 8.25K 14 1/8W	
AGRE	0048-3455	R:FXD MET FLM 261K UHM 12 1/8W	
A6K4	u757-0290	R: FXU MET FLM 6.19K CHM 1% 1/8W	•
A6R5	1757-0416	REFXU MET FLM 511 UHM 18 1/8W	
AORO	u757-0438	R:FXD MET FLM 5.11K 1% 1/8W	
			in the contract of the contrac
AGR 7	0757-0465	R:FXD MET FLM 100K 14 1/8W	
A6R8	0098-3454	R:FXD MET FLM 215K OHM 1% 1/8W	: '
A6R9	0698-3136	R:FXD MET FLM 17.8K CHM 1% 1/8W	
A6R 10	0698-3158	RIFKU MET FLM 23.7K OHM 1% 1/8W	
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
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A6R11	0698-3162	R:FXD MET FLM 46.4K OHM 1% 1/8W	
A6R12	0757-0418	R:FXD MET FLM 619 UHM 1% 1/8H	
A6R13	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8H	
A6R14	0757-0442	R:FXD MET FLM 10.0K 1% 1/8W	
A6R15	2100-1759	REVAR WW 2K OHM 5% TYPE V 1W	14.
A6K16	0698-3154	R:FXD MET FLM 4.22K OHM 14 1/8W	
A6R17	ű698-3451	R:FXD MET FLM 133K OHM 1% 1/8W	'
A6R18	0757-0123	R:FXD MET FLM 34.8K OHM 1% 1/8W	
A6R 19	1698-3136	K:FXD MET FLM 17.8K CHM 1% 1/8W	
A6R2U	0698-3451	REFXD MET FLM 133K UHM 1% 1/8W	
A6K21	0757-0290	R:FXD MET FLM 6.19K OHM 1% 1/8W	
A6R22 A6R23	0757-0123 0757-0280	R:FXD MET FLM 34.8K CHM 1% 1/8W R:FXD MET FLM 1K CHM 1% 1/8W	,
46K24	0698-3156	REFAU MET FLM 14.7K UHM 14 1/8W	
AGR 25	6698-3454	REFXD MET FLM 215K OHM 1% 1/8W	
A6R26	0757-0290	R:FXD MET FLM 6.19K CHM 1% 1/8W	
A6K27	0757-0123	R:FXD MET FLM 34.8K CHM 1% 1/8W	'
A6R28	0698-3154	R:FXD MET FLM 4.22K OHM 18 1/8W	
A6R29	0757-0438	R:FXD MET FLM 5.11K 1% 1/8W	
A6R30	0757-0465	R:FXD MET FLM 100K 18 1/8W	
	07E7 0000	DAEND MET EAM IN DUM IN 140H	
A6R31 A6R32	0757-0280 0698-3154	R:FXD MET FLM 1K OHM 1% 1/8W R:FXD MET FLM 4.22K OHM 1% 1/8W	
A6K33	0698-3451	R:FXD MET FLM 133K OHM 1% 1/8W	· ·
A6R34	0698-0083	R:FXD MET FLM 1.96K OHM 1% 1/8W	ľ
A6R 35	0698-3136	REFXD MET FLM 17.8K OHM 1% 1/8W	, .
			,
A6R36	0757-0461	R:FXD MET FLM 68.1K OHM 1% 1/8W	
A6R37	0757-0418	R:FXD MET FLM 619 UHM 1% 1/8W R:FXD MET FLM 82.5K 14 1/8W	
A6R38 A6R39	0757-0463 2100-1758	RIPAD HET PEH 02.5K 14 170W RIVAR HW 1K OHM 5% TYPE V 1W	
A6840	0757-0418	R:FXD MET FLM 619 OHM 1% 1/8W	
2010			
A6R41	0757-0346	R:FXD MET FLM 10 OHM 1% 1/8W	1
A6K42	6757-0442	R:FXD MET FLM 10.0K 14 1/8H	İ
A6R43	0757-0410	R:FXD MET FLM 511 OHM 1% 1/8W	· I
A6R44	0698-3152	R:FXD MET FLM 3.48K 1% 1/8W	1
A6R45	0757-0438	R:FXD HET FLM 5.11K 1% 1/8W	1
A6R46	0757-0418	R:FXD MET FLM 619 OHM 14 1/8W	İ
A6R47	0757-0418	R:FXD MET FLM 5.11K 1% 1/8W	
A6R48	0757-0289	R:FXD MET FLM 13.3K CHM 1% 1/8W	1
A6R49	2100-1757	REVAR WH 500 OHM 5% TYPE V 1W	İ
A6R50	0698-3160	R:FXD MET FLM 31.6K 1% 1/8W	
A6R51	0698-0085	RIFXD MET FLM 2.61K OHM 18 1/8W	<b>1</b>
A6R52	0698-0085	REFXD MET FLM 2.61K CHM 1% 1/8W	1
A6R53	0698-0083	R:FXD MET FLM 1.96K CHM 1% 1/8W R:VAR WW 200 CHM 5% TYPE V 1W	
A6R54 A6R55	2100-1756 0757-0438	R:FXD MET FLM 5.11K 1% 1/8W	
ACK 33	0/5/-0436	ROPAD HEI TEN SOLAR, 10 170W	
A6R56	0698-7215	R:FXD FLM 133 OHM 2% 1/8W	
A6R 57	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W	,
A6R58	0757-0279	R:FXD MET FLM 3.16K CHM 1% 1/8W	
A6R59	6698-7216	R:FXD MET FLM 147 OHM 2% 1/8W	
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Table 6-3. Parts List Indexed by Reference Designator

ADMOD  AD	Reference Designation	Part No.	Description #	Note
### AbM62   0757-0394   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM64   DESCO-0216   INTEGRATED CIRCUIT: OPERATIONAL AMPL.   ### Abm64   Abm64   Abm64   Abm64   Abm64   ### Abm64   Abm64   Abm64   Abm64   Abm64   ###	,			
### AbM62   0757-0394   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM64   DESCO-0216   INTEGRATED CIRCUIT: OPERATIONAL AMPL.   ### Abm64   Abm64   Abm64   Abm64   Abm64   ### Abm64   Abm64   Abm64   Abm64   Abm64   ###				٠.
### AbM62   0757-0394   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM63   0757-0338   REFAU MET FLM 51.1 OHM 1% 1/8%   ### AbM64   DESCO-0216   INTEGRATED CIRCUIT: OPERATIONAL AMPL.   ### Abm64   Abm64   Abm64   Abm64   Abm64   ### Abm64   Abm64   Abm64   Abm64   Abm64   ###				
AGRES 0757-0416 REFAU MET FLM 511 DHM 1% 1/8M AGRES 0757-0438 REFAU MET FLM 5.11K 1% 1/8M  AGRES 0757-0438 REFAU MET FLM 5.11K 1% 1/8M  AGRES 0757-0438 REFAU MET FLM 5.11K 1% 1/8M  AGRES 0757-0438 REFAU MET FLM 5.11K 1% 1/8M  AGRES 0757-0438 REFAU MET FLM 5.11K 1% 1/8M  AGRES 0757-0416 INTEGRATED CIRCUIT:UPERATIONAL AMPL.  AGU2 1820-0216 INTEGRATED CIRCUIT:UPERATIONAL AMPL.  ATC1 0180-0116 C:FAU ELECT 6.8 UF 10% 35VDCW  ATC2 0180-0116 C:FAU ELECT 6.8 UF 10% 35VDCW  ATC3 0160-0226 C:FAU GER 22 PF 5% 500VDCW  ATC4 0160-0380 C:FAU MY 0.22 UF 10% 200VDCW  ATC5 0150-0050 C:FAU MY 0.22 UF 10% 200VDCW  ATC6 0180-1746 C:FAU MICA 110 PF 5% ATC8 0180-1746 C:FAU MICA 110 PF 5% ATC8 0180-1746 C:FAU ELECT 15 UF 10% 200VDCW  ATC10 0160-2144 C:FAU ELECT 15 UF 10% 200VDCW  ATC11 0160-2246 C:FAU CER 3360 PF +80-20% 1kV  C:FAU CER 3360 PF +80-20% 1kV  C:FAU CER 3360 PF +80-20% 1kV  ATC13 0160-2246 C:FAU CER 3360 PF +80-20% 1kV  ATC15 0160-2246 C:FAU CER 3360 PF +80-20% 1kV  ATC16 0160-2246 C:FAU CER 3360 PF +80-20% 1kV  ATC17 0160-0153 C:FAU MY 0.001 UF 10% 200VDCW  ATCR1 1901-0090 DIUDE:SILICUN 120V  ATCR2 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR3 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR6 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR7 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR7 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR7 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50 VULTS WORKING  ATCR8 1901-0081 DIUDE:SILICUN 50	AbR60	6 <b>757-027</b> 8		
### A6TR1   08552-2047   BOARD:BLANK PC   #### A6U1   1820-0216   INTEGRATED CIRCUIT:OPERATIONAL AMPL.   #### A6U2   1820-0216   INTEGRATED CIRCUIT:OPERATIONAL AMPL.   #### A7C1   08552-6008   BOARD ASSY:DEFLECTION AMPLIFIER   #### A7C1   0180-0116   C:FXD ELECT 6.8 UF 10X 35VDCW   ### A7C2   0180-0116   C:FXD ELECT 6.8 UF 10X 35VDCW   ### A7C3   0160-0246   C:FXD GER 22 PF 5% 500VDCW   ### A7C4   0160-0380   C:FXD GER 22 PF 5% 500VDCW   ### A7C4   0140-0390   C:FXD GER 21 PF 5% 500VDCW   ### A7C5   0190-0050   C:FXD GER 21 PF 5% 500VDCW   ### A7C6   0140-0194   C:FXD MICA 110 PF 5%   ### A7C6   0140-0194   C:FXD MICA 110 PF 5%   ### A7C10   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C11   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C12   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C13   0160-244   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C14   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C15   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C16   0160-0153   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C17   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C18   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C18   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C18   0160-2246   C:FXD CER 3:60+7-0-25 PF 500VDCW   ### A7C18   0160-0153   C:FXD MY O-001 UF 1018 ZEDOVDCW   ### A7C18   0160-0153   C:FXD MY O-001 UF 1018 ZEDOVDCW   ### A7C18   0160-0163   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-0081   D:GDE:SILICON 50 VOLTS MORKING   ### A7C18   0160-				
### A6FB1	· ·	li i		
### A6U1   1820-0216   INTEGRATED CIRCUIT: OPERATIONAL AMPL.  ### A7C1   0180-0116   CIFKO ELECTION AMPLIFIER  ### A7C1   0180-0116   CIFKO ELECTION AMPLIFIER  ### A7C2   0180-0116   CIFKO ELECTION AMPLIFIER  ### A7C3   0180-0216   CIFKO ELECTION AMPLIFIER  ### A7C3   0180-0216   CIFKO ELECTION AMPLIFIER  ### A7C4   0180-0380   CIFKO ELECTION SAVOCM    ### A7C5   0190-0030   CIFKO ER 22 PF 5% 500VOCM    ### A7C6   0140-0194   CIFKO ER DISCLIDOU PF +80-20% 1000VDCM    ### A7C7   0140-0194   CIFKO ER DISCLIDOU PF +80-20% 1000VDCM    ### A7C6   0140-0194   CIFKO ER DISCLIDOU PF +80-20% 1000VDCM    ### A7C6   0140-0194   CIFKO ER 3300 PF +80-20% 1KV    ### A7C11   0160-2246   CIFKO ER 3300 PF +80-20% 1KV    ### A7C12   0160-2246   CIFKO ER 3300 PF +80-20% 1KV    ### A7C14   0160-2246   CIFKO ER 3300 PF +80-20% 1KV    ### A7C15   0160-2246   CIFKO ER 3300 PF +80-20% 1KV    ### A7C16   0160-0153   CIFKO ER 3-6+7-0.25 PF 500VDCM    ### A7C16   0160-0153   CIFKO ER 3-6+7-0.25 PF 500VDCM    ### A7C17   1901-0090   DIUDE: SILICON 120V    ### A7CR4   1901-0090   DIUDE: SILICON 120V    ### A7CR4   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR6   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR7   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR7   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR7   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8   1901-0091   DIUDE: SILICON 50 VOLTS MORKING    ### A7CR8	A6R63	0757-0438	R:FXD MET FLM 5.11K 1% 1/8W	
### APOLIZED   INTEGRATED CIRCUIT: UPERATIONAL AMPL.  ### APOLIZED   APOLIZED   ASSY: UPERIECTION AMPLIFIER  ### APOLIZED   AMPLIFIER    ### APOLIZED   APOLIZED   ASSY: UPERIECTION AMPLIFIER    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED   APOLIZED    ### APOLIZED   APOLIZED   APOLIZED	A6TB1	08552-2047	BOARD: BLANK PC	· 
A7C1 08552-6008 BOARD ASSY:DEFLECTION AMPLIFIER  A7C1 0180-0116 C:FXD ELECT 6.8 UF 10% 35VDCM  A7C2 0160-0285 C:FXD CER 22 PF 5% 500VDCM  A7C4 0160-0280 C:FXD WY 0.22 UF 10% 200VDCM  A7C5 0150-0050 C:FXD WY 0.22 UF 10% 200VDCM  A7C6 0140-0194 C:FXD MICA 110 PF 5%  A7C7 0140-0194 C:FXD MICA 110 PF 5%  A7C8 0140-0194 C:FXD MICA 110 PF 5%  A7C9 0140-0194 C:FXD MICA 110 PF 5%  A7C10 0160-2144 C:FXD CER 3.64/-0.25 PF 500VDCM  A7C11 0160-2246 C:FXD CER 3.64/-0.25 PF 500VDCM  A7C12 0160-2246 C:FXD CER 3.64/-0.25 PF 500VDCM  A7C13 0160-2246 C:FXD CER 3.04/-0.25 PF 500VDCM  A7C15 0160-2246 C:FXD CER 3.04/-0.25 PF 500VDCM  A7C16 0160-0153 C:FXD WY 0.001 UF 10% 200VDCM  A7CR1 1901-0090 DIUDE:SILICON 120V  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  BY 101-0081 DIODE:	A6U1	1820-0216	INTEGRATED CIRCUIT: OPERATIONAL AMPL.	,
A7C1 0180-0116 C:FXD ELECT 6-8 UF 10% 35VDCM  A7L2 0180-0116 C:FXD ELECT 6-8 UF 10% 35VDCM  A7L3 0160-2265 C:FXD CER 22 PF 5% 500VDCM  A7L4 0160-0380 C:FXD CER 10% 1000 PF +80-20% 1000VDCM  A7L5 0150-0050 C:FXD CER 10% 1000 PF +80-20% 1000VDCM  A7C6 0140-0194 C:FXD MICA 110 PF 5%  A7C8 0180-1746 C:FXD MICA 110 PF 5%  A7C9 0140-0194 C:FXD MICA 110 PF 5%  A7C11 0160-2246 C:FXD CER 3.64/-0.25 PF 500VDCM  A7C11 0160-2246 C:FXD CER 3.64/-0.25 PF 500VDCM  A7C13 0160-2144 C:FXD CER 3.300 PF +80-20% INV  A7C14 0160-2246 C:FXD CER 3.300 PF +80-20% INV  A7C15 0160-0153 C:FXD CER 3.300 PF 500VDCM  A7C16 0160-0153 C:FXD CER 3.54/-0.25 PF 500VDCM  A7C17 0160-0160 C:FXD CER 3.64/-0.25 PF 500VDCM  A7CR1 1901-0090 DIUDE:SILICON 10 VOLTS MORKING  DIUDE:SILICON 10 VOLTS MORKING  A7CR7 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR7 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR8 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR7 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR7 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR7 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR7 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR7 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR8 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILICON 50 VOLTS MORKING  A7CR1 1901-0081 DIODE:SILI	A6U2	1820-0216	INTEGRATED CIRCUIT: UPERATIONAL AMPL.	
### ### ### ### ### ### ### ### ### ##	A7	08552-6008	BOARD ASSY: DEFLECTION AMPLIFIER	· .
### ### ### ### ### ### ### ### ### ##		0180-0116	C:FXD FLECT 6.8 UF 10% 35VDCW	
A7C3		0100 0110		
A7C4	A7C2	0180-0116		, · · /
A7C5 A7C6 O140-0194 C:FXD MICA 110 PF 5% A7C8 A7C8 O140-0194 C:FXD MICA 110 PF 5% A7C9 O140-0194 C:FXD MICA 110 PF 5% A7C10 O160-2144 C:FXD MICA 110 PF 5% A7C11 O160-2246 C:FXD MICA 110 PF 5% A7C11 O160-2246 C:FXD MICA 110 PF 5% A7C11 O160-2246 C:FXD MICA 110 PF 5% A7C11 O160-2246 C:FXD GER 3300 PF 48C-20% 1KV C:FXD GER 3300 PF 48C-20	A7C3	n 0160-2265		ı
A7C6  A7C7  A7C8  A7C8  A7C8  A180-1746  A7C9  A7C10  A160-0194  A7C10  A7C10  A7C11  A7C11  A7C11  A7C11  A7C11  A7C11  A7C12  A7C12  A7C12  A7C12  A7C13  A7C14  A7C14  A7C14  A7C15  A7C15  A7C15  A7C15  A7C15  A7C16  A7C17  A7C17  A7C18  A7C18  A7C18  A7C11  D160-2246  C:FXD CER 33-6+/-0.25 PF 500VDCW  C:FXD CER 33-00 PF +80-203 IKV  C:FXD CER 33-6+/-0.25 PF 500VDCW  A7C14  A7C15  A7C15  A7C15  A7C16  A7C16  A7C17  A7C17  A7C18  A7C18  A7C18  A7C19  A7C19  A7C19  A7C10  A7C10  A7C10  A7C11  A	· · · · · · · · · · · · · · · · · · ·			
A7C7 A7C8 A7C9 A7C9 A7C9 A7C9 A7C9 A7C10 A7C10 A7C10 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C11 A7C12 A7C12 A7C13 A7C13 A7C13 A7C13 A7C14 A7C14 A7C14 A7C14 A7C14 A7C15 A7C15 A7C15 A7C15 A7C16 A7C16 A7C16 A7C17 A7C17 A7C18 A7C18 A7C18 A7C19 A7C19 A7C111 A7C11	the state of the s		<del>-</del> <del>-</del>	
A7C8	A7C6	0140-0194	C:FXD MICA 110 PF 5%	
A7C8	A7C7	0140-0194	C:FXD MICA 110 PF 5%	•
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### ### ##############################				, T
A7C11 0160-2246 C:FXD CER 3.6+/-0.25 PF 500VDCW  A7C12 0160-2246 C:FXD CER 3.6+/-0.25 PF 500VDCW  A7C13 0160-2144 C:FXD CER 3.6+/-0.25 PF 500VDCW  A7C14 0160-2246 C:FXD CER 3.6+/-0.25 PF 500VDCW  A7C15 0160-2246 C:FXD CER 3.6+/-0.25 PF 500VDCW  A7C15 0160-0246 C:FXD CER 3.6+/-0.25 PF 500VDCW  A7C15 0160-0246 C:FXD CER 3.6+/-0.25 PF 500VDCW  A7C16 0160-0153 C:FXD MY 0.001 UF 10% 200VDCW  A7CR1 1901-0096 DIUDE:SILICON 120V  A7CR2 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR3 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR6 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR7 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR7 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR8 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR0 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR10 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR11 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR13 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR14 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR15 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR16 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  A7CR17 1902-0683 DIUDE:SILICON 50 VOLTS WORKING  A7CR17 1902-0683 DIUDE:SILICON 50 VOLTS WORKING  A7CR19 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  DIUDE:SILICON 50 VOLTS WORKING  A7CR17 1902-0683 DIUDE:SILICON 50 VOLTS WORKING  A7CR17 1902-0683 DIUDE:SILICON 50 VOLTS WORKING  A7CR19 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  DIUDE:SILICON 50 VOLTS WORKING  A7CR19 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  DIUDE:SILICON 50 VOLTS WORKING  A7CR19 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  DIUDE:SILICON 50 VOLTS WORKING  A7CR19 1901-0081 DIUDE:SILICON 50 VOLTS WORKING  DIUDE:SILICON 50 VOLTS WORKING  A7CR19 1901-0081 DIUDE:SILICON 50 VOLTS WORKING				
A7C13				•
A7C13	A7030	(014.0 - 004.4	C.EVI CED A LAZA-O DE ECONDON	
A7C124 A7C15 A7C16 D160-2246 C:FXD CER 3.6+/-0.25 PF 500VDCW A7C15 D160-0153 C:FXD MY 0.001 UF 102 200VDCW  A7CR1 D100-0096 D100E:SILICUN 120V  A7CR2 A7CR3 A7CR4 1901-0096 D100E:SILICUN 50 VULTS WORKING				
A7C15 A7C16 O160-0153 C:FXD MY 0.001 UF 10% 200VDCW  A7CR1 1901-0090 DIUDE:SILICON 120V  A7CR2 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR3 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR6 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR6 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR7 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR8 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR8 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR8 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR10 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR11 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR12 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR13 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR14 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR15 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR16 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR16 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR16 1901-0081 DIUDE:SILICON 50 VULTS WORKING A7CR17 1902-0683 DIUDE:SILICON 50 VULTS WORKING A7CR17 1902-0683 DIUDE:SILICON 50 VULTS WORKING A7CR17 1902-0683 DIUDE:SILICON 50 VULTS WORKING A7CR17 1902-0683 DIUDE:SILICON 50 VULTS WORKING A7CR19 1901-0081 DIUDE:SILICON 50 VULTS WORKING				
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A7CR19 A7CR10 A7CR11 A7CR11 A7CR11 A7CR12 A7CR12 A7CR13 A7CR13 A7CR14 A7CR14 A7CR15 A7CR15 A7CR16 A7CR16 A7CR16 A7CR17 A7CR17 A7CR18 A7CR17 A7CR18 A7CR18 A7CR19 A7CR19 DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING DIODE: SILICON 50 VOLTS WORKING A7CR17 A7CR18 A7CR18 A9O1-OO81 DIODE: SILICON 50 VOLTS WORKING A7CR19				·
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	♠ Part No.	Description #	Note
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A7L1	9140-0129	COIL:FXD RF 220 UH	
A7L2	9140-0129	CUIL:FXD RF 220 UH	
A701	1854-0232	U:SI NPN(SELECTED FROM 2N3440)	
	1		
A702	1853-0050	U:SI PNP	
A703	1854-0232	Q:SI NPN(SELECTED FROM 2N3440)	
A704	1853-0020	Q:SI PNP(SELECTED FROM 2N3702)	
A705	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	
A706	1853-0020	U:SI PNP(SELECTED FROM 2N3702)	
A707	1853-0020	O:SI PNP(SELECTED FROM 2N3702)	1
A738	1854-0234	Q:SI NPN	
	1205-0011	HEAT DISSIPATOR: FOR TO-5 AND TO-9 CASES	
A709	1853-0050	C:SI PNP	
A7510	1854-0232	O:SI NPN(SELECTED FROM 2N3440)	•
	(		
A7011	1854-0232	Q:SI NPN(SELECTED FROM 2N3440)	
A7012	1854-0232	0:SI NPN(SELECTED FROM 2N3440)	
A7013	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	
A7014	1854-0232	"Q:SI NPN(SELECTED FROM 2N3440)	
A7015	1853-0020	U:SI PNP(SELECTED FROM 2N3702)	
	,033 0020	USI FAFTSEELCTED TROM ENSIVE	
A7016	1853-0020	O:SI PNPISELECTED FROM 2N3702)	
A7017	1854-0071	U:SI NPN(SELECTED FROM 2N3704)	100
A7018	1854-0234	O:SI NPN	
WINIO	1205-0011	HEAT DISSIPATUR: FOR TO-5 AND TO-9 CASES	
A7019	1854-0232	U:SI NPN(SELECTED FROM 2N3440)	,
A/519	1854-02.52	4:21 MANIZETECIEN LKOW SW3440)	•
A7000	105 4 00 71	OACE NONECCECTOS POCH ONSTOLA	
A7020	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	
A7021 A7022	1854-0071	O:SI NPN(SELECTED FROM 2N3704)	
	1854-0232	Q:SI NPN(SELECTED FROM 2N3440)	
A7023	1853-0620	U:SI PNP(SELECTED FROM 2N3702)	
A.731. 1	. 7. 7. 0 7	0.540 457 51 4 34 544 54 34 544	
ATRI	6757-0447	R:FXD MET FLM 16.2K OHM 1% 1/8W	,
A 7215 75	0757 0442	DATUS MET FIN 13 AV COM 18 1400	•
A7R2	0757-0443	R:FXD MET FLM 11.0K OHM 12 1/8H	
A7R3	0698-3152	R:FXD MET FLM 3.48K 18 1/8H	
A7R4	0698-0082	REFXD MET FLM 464 UHM 1% 1/8W	
A7R5	0757-0464	R:FXD MET FLM 90.9K OHM 12 1/8W	
A7R6	0698-3152	R:FXD MET FLM 3.48K 1% 1/8W	
A ****		Charles AMP TO PLAN TO BE A POLICE OF THE PARTY OF THE PA	
A7R7	0698-3444	REFXD MET FLM 316 OHM 1% 1/8W	
A7R8	0698-3418	R:FXD HET FLM 26.1K CHM 1% 1/2W	
A7R9	0757-0443	R:FXD MET FLM 11.0K CHM 1% 1/8W	ŧ
A7R10	0698-3418	R:FXU MET FLM 26.1K CHM 1% 1/2W	
A7R11	0757-0835	R:FXD MET FLM 6.81K CHM 1% 1/2W	
	0757-0280	R:FXD MET FLM 1K OHM 18 1/8W	
A7R12	0400-3444	R:FXD MET FLM 316 OHM 1% 1/8W	
A7R13	0698-3444	DAEVI MET ELM I DAV FAM 10 1/04	
A7R13 A7R14	£800-8960	R:FXD MET FLM 1.96K CHM 12 1/8H	
A7R13 A7R14 A7R15	0698-0083 0698-3154	R:FXD MET FLM 4.22K CHM 13 1/8W	
A7R13 A7R14	£800-8960		
A7R13 A7R14 A7R15 A7R16	0698-0083 0698-3154 0757-0400	R:FXD MET FLM 4.22K CHM 13 1/8W R:FXD MET FLM 90.9 CHM 13 1/8W	
A7R13 A7R14 A7R15 A7R16	0698-0083 0698-3154 0757-0400 0757-0279	R:FXD MET FLM 4.22K OHM 1% 1/8W R:FXD MET FLM 90.9 OHM 1% 1/8W R:FXD MET FLM 3.16K OHM 1% 1/8W	
A7R13 A7R14 A7R15 A7R16 A7R17 A7R18	0698-0083 0698-3154 0757-0400	R:FXD MET FLM 4.22K CHM 13 1/8W R:FXD MET FLM 90.9 CHM 13 1/8W	
A7R13 A7R14 A7R15 A7R16	0698-0083 0698-3154 0757-0400 0757-0279	R:FXD MET FLM 4.22K OHM 1% 1/8W R:FXD MET FLM 90.9 OHM 1% 1/8W R:FXD MET FLM 3.16K OHM 1% 1/8W	
A7R13 A7R14 A7R15 A7R16 A7R17 A7R18	0698-0083 0698-3154 0757-0400 0757-0279 0698-3444	R:FXD MET FLM 4.22K CHM 1% 1/8W R:FXD MET FLM 90.9 CHM 1% 1/8W R:FXD MET FLM 3.16K CHM 1% 1/8W R:FXD MET FLM 316 CHM 1% 1/8W	
A7R13 A7R14 A7R15 A7R16 A7R17 A7R18 A7R18	0698-0083 0698-3154 0757-0400 0757-0279 0698-3444 0698-3444	R:FXD MET FLM 4.22K CHM 1% 1/8W R:FXD MET FLM 90.9 CHM 1% 1/8W R:FXD MET FLM 3.16K CHM 1% 1/8W R:FXD MET FLM 316 CHM 1% 1/8W R:FXD MET FLM 316 CHM 1% 1/8W	
A7R13 A7R14 A7R15 A7R16 A7R17 A7R18 A7R19 A7R20	0698-0083 0698-3154 0757-0400 0757-0279 0698-3444 0698-3444	R:FXD MET FLM 4.22K GHM 1% 1/8W R:FXD MET FLM 90.9 OHM 1% 1/8W R:FXD MET FLM 3.16K OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 19.6K 1% 1/8W	
A7R13 A7R14 A7R15 A7R16 A7R17 A7R18 A7R19 A7R20	0698-0083 0698-3154 0757-0400 0757-0279 0698-3444 0698-3444	R:FXD MET FLM 4.22K GHM 1% 1/8W R:FXD MET FLM 90.9 OHM 1% 1/8W R:FXD MET FLM 3.16K OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 19.6K 1% 1/8W	
A7R13 A7R14 A7R15 A7R16 A7R17 A7R18 A7R19 A7R20	0698-0083 0698-3154 0757-0400 0757-0279 0698-3444 0698-3444	R:FXD MET FLM 4.22K GHM 1% 1/8W R:FXD MET FLM 90.9 OHM 1% 1/8W R:FXD MET FLM 3.16K OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 19.6K 1% 1/8W	
A7R13 A7R14 A7R15 A7R16 A7R17 A7R18 A7R19 A7R20	0698-0083 0698-3154 0757-0400 0757-0279 0698-3444 0698-3444	R:FXD MET FLM 4.22K GHM 1% 1/8W R:FXD MET FLM 90.9 OHM 1% 1/8W R:FXD MET FLM 3.16K OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 316 OHM 1% 1/8W R:FXD MET FLM 19.6K 1% 1/8W	

Table 6-3. Parts List Indexed by Reference Designator

### ATR22	1		Not
A7822	, ,		
A7872			
### A7424	,	·	
### A7824 C698-3157 R:FXD MET FLM 19-6K 11 1/8M ### A7826 0757-0420 R:FXD MET FLM 19-6K 11 1/8M ### A7827 0698-3157 R:FXD MET FLM 17-5D CHM 12 1/8M ### A7828 0757-0420 R:FXD MET FLM 19-6K 12 1/8M ### A7829 0757-0420 R:FXD MET FLM 19-6K 12 1/8M ### A7829 0757-0420 R:FXD MET FLM 19-6K 12 1/8M ### A7830 0757-0420 R:FXD MET FLM 19-6K 12 1/8M ### A7831 0698-3412 R:FXD MET FLM 30-9K CHM 12 1/2M ### A7831 0698-3412 R:FXD MET FLM 30-9K CHM 12 1/2M ### A7833 0757-0458 R:FXD MET FLM 30-9K CHM 12 1/2M ### A7834 0757-0458 R:FXD MET FLM 30-9K CHM 12 1/2M ### A7835 0698-3455 R:FXD COMP 1.5 MEGONM 53 1/4M ### A7836 0698-3450 R:FXD MET FLM 30-9K CHM 12 1/2M ### A7837 0698-3464 R:FXD MET FLM 316 CHM 12 1/8M ### A7839 0764-0020 R:FXD MET FLM 316 CHM 12 1/2M ### A7840 0696-3153 R:FXD MET FLM 316 CHM 12 1/2M ### A7841 0764-0020 R:FXD MET FLM 316 CHM 12 1/2M ### A7842 0698-3464 R:FXD MET FLM 316 CHM 12 1/2M ### A7843 0658-3466 R:FXD MET FLM 316 CHM 12 1/2M ### A7843 0658-3466 R:FXD MET FLM 316 CHM 12 1/2M ### A7844 0658-3466 R:FXD MET FLM 316 CHM 12 1/2M ### A7845 0683-1555 R:FXD MET FLM 316 CHM 12 1/2M ### A7846 0683-1555 R:FXD MET FLM 316 CHM 12 1/2M ### A7846 0683-3456 R:FXD MET FLM 316 CHM 12 1/2M ### A7846 0683-3466 R:FXD MET FLM 316 CHM 12 1/2M ### A7847 0757-0158 R:FXD MET FLM 316 CHM 12 1/2M ### A7848 0683-3456 R:FXD MET FLM 316 CHM 12 1/2M ### A7849 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7840 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7845 0683-1555 R:FXD MET FLM 316 CHM 12 1/2M ### A7846 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7847 0757-0158 R:FXD MET FLM 316 CHM 12 1/2M ### A7848 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7849 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7840 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7845 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7846 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7847 0757-0158 R:FXD MET FLM 316 CHM 12 1/2M ### A7848 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7849 0698-3444 R:FXD MET FLM 316 CHM 12 1/2M ### A7849 0698-3444 R:FXD MET FLM 316 CHM 12 1		Į.	•
A7R25 O757-0443 A7R26 O757-0420 RIFKD MET FLM 750 DHM 1% 1/8W A7R28 C757-0420 A7R28 C757-0420 A7R28 C757-0394 AFKD MET FLM 11.0K DHM 1% 1/8W A7R30 O757-0394 AFKD MET FLM 15.0 DHM 1% 1/8W A7R30 O757-0420 A1FKD MET FLM 750 DHM 1% 1/8W A7R31 D098-3412 A7R32 O757-0420 A1FKD MET FLM 90.9K DHM 1% 1/8W A7R33 O757-0458 ARIFKD MET FLM 90.9K DHM 1% 1/2W A7R34 O757-0458 ARIFKD MET FLM 90.9K DHM 1% 1/2W A7R35 O757-0458 ARIFKD MET FLM 90.9K DHM 1% 1/2W A7R36 O757-0458 RIFKD MET FLM 90.9K DHM 1% 1/2W A7R37 O688-3657 RIFKD MET FLM 90.9K DHM 1% 1/2W A7R36 O698-3444 RIFKD MET FLM 316 DHM 1% 1/2W A7R39 O764-0020 RIFKD MET FLM 3600 DHM 5% 2W A7R39 O764-0020 RIFKD MET FLM 5000 DHM 5% 2W A7R39 O764-0020 RIFKD MET FLM 5000 DHM 5% 2W A7R39 O764-0020 RIFKD MET FLM 316 DHM 1% 1/2W A7R39 O764-0020 RIFKD MET FLM 316 DHM 1% 1/2W A7R39 O764-0020 RIFKD MET FLM 316 DHM 1% 1/2W A7R39 O764-0020 RIFKD MET FLM 316 UHM 1% 1/2W A7R39 O764-0030 RIFKD MET FLM 316 UHM 1% 1/2W A7R39 O7698-3444 RIFKD MET FLM 316 UHM 1% 1/2W A7R36 O698-3446 RIFKD MET FLM 61.9K DHM 1% 1/2W A7R37 O7698-3444 RIFKD MET FLM 61.9K DHM 1% 1/2W A7R36 O698-3446 RIFKD MET FLM 61.9K DHM 1% 1/2W A7R36 O698-3458 RIFKD MET FLM 61.9K DHM 1% 1/2W A7R36 O698-3459 RIFKD MET FLM 61.9K DHM 1% 1/2W A7R36 O698-3451 RIFKD MET FLM 316 UHM 1% 1/2W A7R36 O698-3451 RIFKD MET FLM 61.9K DHM 1% 1/2W RIFKD MET FLM 316 UHM 1% 1/2W A7R36 O757-0039 RIFKD MET FLM 61.9K DHM 1% 1/2W RIFKD MET FLM 316 UHM 1% 1/2W RIFKD			
A7826 0757-0420 R:FXD MET FLM 750 DHM 1% 1/8W A7828 0757-0443 R:FXD MET FLM 19.6K 1% 1/8W A7829 0757-0349 R:FXD MET FLM 11.0K CHM 1% 1/8W A7830 0757-0420 R:FXD MET FLM 11.0K CHM 1% 1/8W A7830 0757-0420 R:FXD MET FLM 31.1 DHM 1% 1/8W A7831 0698-3412 R:FXD MET FLM 33.8K CHM 1% 1/2W A7832 0757-0458 R:FXD MET FLM 30.9K CHM 1% 1/2W A7833 0757-0458 R:FXD MET FLM 90.9K CHM 1% 1/8W A7835 0698-3457 R:FXD MET FLM 31.6 CHM 1% 1/8W A7836 0698-3457 R:FXD MET FLM 31.6 CHM 1% 1/8W A7837 C698-3444 R:FXD MET FLM 31.6 CHM 1% 1/8W A7838 C698-3444 R:FXD MET FLM 31.5K CHM 1% 1/2W A7839 C698-3454 R:FXD MET FLM 30.0 CHM 1% 1/8W A7839 C698-3454 R:FXD MET FLM 31.5K CHM 1% 1/2W A7840 0698-3153 R:FXD MET FLM 30.8% LM 1% 1/8W A7844 0757-0858 R:FXD MET FLM 31.6 CHM 1% 1/2W A7845 C683-1555 R:FXD MET FLM 31.6 CHM 1% 1/2W A7846 0757-0858 R:FXD MET FLM 31.5K CHM 1% 1/2W A7846 0757-0858 R:FXD MET FLM 31.6 CHM 1% 1/2W A7846 0757-0309 R:FXD MET FLM 31.6 CHM 1% 1/2W A7846 0757-0309 R:FXD MET FLM 31.6 CHM 1% 1/2W A7847 0757-0309 R:FXD MET FLM 31.6 CHM 1% 1/2W A7848 C698-3454 R:FXD MET FLM 31.6 CHM 1% 1/2W A7846 0757-0309 R:FXD MET FLM 31.6 CHM 1% 1/2W A7847 0757-0309 R:FXD MET FLM 31.6 CHM 1% 1/2W A7848 C698-3455 R:FXD MET FLM 31.6 CHM 1% 1/2W A7849 0698-3455 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 0698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7845 0698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7846 0757-0309 R:FXD MET FLM 31.6 CHM 1% 1/2W A7847 0757-0309 R:FXD MET FLM 31.6 CHM 1% 1/2W A7848 0698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7849 0698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 C698-3450 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 R:FXD MET FLM 31.6 CHM 1% 1/2W A7840 R:FXD MET FLM 31.6 CHM 1%		. ) [	
A7R28 A7R29 O757-0304 A7R30 O757-0340 A7R31 O698-3412 A7R31 O698-3412 A7R32 A7R32 O757-0464 A7R33 O757-0464 A7R33 O757-0464 A7R33 O757-0464 A7R34 A7R34 O757-0464 A7R35 A7R35 O698-3412 A7R36 A7R37 A7R37 A7R37 A7R38 A7R36 A7R37 A7R37 A7R37 A7R37 A7R37 A7R38 A7R37 A7R38 A7R39 A7R39 A7R39 A7R39 A7R39 A7R39 A7R40 A7R41 A7R41 A7R41 A7R41 A7R43 A7R44 A7R44 A7R44 A7R45 A7R45 A7R46 A7R47 A7R47 A7R47 A7R47 A7R48 A7R48 A7R48 A7R48 A7R48 A7R48 A7R49 A7R49 A7R49 A7R49 A7R49 A7R40 A7R40 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R42 A7R44 A7R44 A7R44 A7R44 A7R44 A7R45 A7R46 A7R47 A7R47 A7R47 A7R47 A7R48 A7R48 A7R48 A7R49 A7R40 A7R49 A7R40 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R42 A7R42 A7R44 A7R44 A7R44 A7R44 A7R44 A7R44 A7R47 A7R46 A7R47 A7R46 A7R47 A7R47 A7R47 A7R47 A7R48 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R40 A7R49 A7R40 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R42 A7R42 A7R43 A7R44 A7R44 A7R44 A7R44 A7R44 A7R44 A7R47 A7R46 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R40 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R42 A7R43 A7R44 A7R47 A7R44 A7R44 A7R44 A7R44 A7R44 A7R44 A7R44 A7R44 A7R44 A7R44 A7R46 A7R47 A7R46 A7			
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A7R29  0757-0304  A7R31  0757-0420  A1FR0 MET FLM 750 OMM 1% 1/8m  A7R32  0757-0458  A1FR0 MET FLM 3.83K OMM 1% 1/2m  A7R33  0757-0464  A1FR0 MET FLM 90.9K OMM 1% 1/8m  A7R33  0757-0468  A1FR0 MET FLM 90.9K OMM 1% 1/8m  A7R35  0683-1555  R:FXD MET FLM 5.11k 1% 1/8m  A7R36  0698-3444  A1FR0 MET FLM 5.11k 1% 1/8m  A7R37  0698-3444  A1FR0 MET FLM 5.11k 1% 1/8m  A7R38  0698-3444  A1FR0 MET FLM 5.11k 1% 1/8m  A7R39  0764-0020  A1FR0 MET FLM 5.11k 1% 1/8m  A1R40  0698-341b  A1FR0 MET FLM 3.83K 1% 1/8m  A1R41  0764-0020  A1FR0 MET FLM 3.83K 1% 1/8m  A1R44  0764-0020  A1FR0 MET FLM 3.83K 1% 1/8m  A1R44  0764-0020  A1FR0 MET FLM 3.83K 1% 1/8m  A1R44  0764-0020  A1FR0 MET FLM 3.83K 1% 1/8m  A1R44  0764-0020  A1FR0 MET FLM 3.83K 1% 1/8m  A1R44  0757-0858  A1FR0 MET FLM 3.83K 1% 1/8m  A1R44  0757-0858  A1FR0 MET FLM 3.60M 1% 1/2m  A1R46  0698-3444  A1FR0 MET FLM 90.9K CMM 1% 1/2m  A1R47  0757-0309  A1FR0 MET FLM 90.9K CMM 1% 1/2m  A1R48  0698-3446  A1FR0 MET FLM 3.83K 1% 1/8m  A1R49  0698-3455  A1FR0 MET FLM 3.83K 1% 1/8m  A1R40  0757-0309  A1FR0 MET FLM 3.80K MM 1% 1/2m  A1R45  0757-0309  A1FR0 MET FLM 3.80K MM 1% 1/2m  A1R46  0698-3451  A1R47  0757-0309  A1FR0 MET FLM 3.80K MM 1% 1/8m  A1R49  A1R49  0698-3456  A1R40		•	
A7R31 0698-3412 R:FXD MET FLM 750 OMM 12 1/2M A7R32 0757-0858 R:FXD MET FLM 90.9K CMM 12 1/2M A7R33 0757-0464 R:FXD MET FLM 90.9K CMM 12 1/2M A7R34 0757-0458 R:FXD MET FLM 90.9K CMM 12 1/2M A7R35 0698-3457 R:FXD COMP 1.5 NECOMM 52 1/4M A7R36 0698-3464 R:FXD MET FLM 316 OMM 52 1/4M A7R37 C698-3416 R:FXD MET FLM 316 OMM 52 2M A7R38 C698-3416 R:FXD MET FLM 360 OMM 52 2M A7R39 C698-3415 R:FXD MET FLM 360 OMM 52 2M A7R30 C698-3415 R:FXD MET FLM 360 OMM 52 2M A7R30 C698-3415 R:FXD MET FLM 316 OMM 52 2M A7R30 C698-3416 R:FXD MET FLM 360 OMM 52 2M A7R40 C698-3444 R:FXD MET FLM 360 OMM 52 2M A7R42 C698-3446 R:FXD MET FLM 360 OMM 52 2M A7R44 O757-0858 R:FXD MET FLM 90.9K CMM 12 1/2M A7R45 C683-1555 R:FXD MET FLM 90.9K CMM 12 1/2M A7R46 C757-0309 R:FXD MET FLM 90.9K CMM 12 1/2M A7R47 O757-0130 R:FXD MET FLM 916 OMM 12 1/2M A7R48 C698-3444 R:FXD MET FLM 916 OMM 12 1/2M A7R49 C698-3458 R:FXD MET FLM 916 OMM 12 1/2M A7R49 C698-3458 R:FXD MET FLM 916 OMM 12 1/2M A7R49 C698-3458 R:FXD MET FLM 916 OMM 12 1/2M A7R49 C698-3451 R:FXD MET FLM 916 OMM 12 1/2M A7R50 C698-3451 R:FXD MET FLM 316 OMM 12 1/2M A7R51 C698-3452 R:FXD MET FLM 316 OMM 12 1/2M A7R52 C757-0309 R:FXD MET FLM 316 OMM 12 1/2M A7R53 C757-0469 R:FXD MET FLM 31.0K CMM 12 1/2M A7R50 C698-3444 R:FXD MET FLM 31.0K CMM 12 1/2M A7R51 C698-3451 R:FXD MET FLM 31.0K CMM 12 1/2M A7R52 C757-0469 R:FXD MET FLM 31.0K CMM 12 1/2M A7R55 C698-3444 R:FXD MET FLM 31.0K CMM 12 1/2M A7R56 C698-3459 R:FXD MET FLM 31.0K CMM 12 1/2M A7R57 C698-3459 R:FXD MET FLM 31.0K CMM 12 1/2M A7R59 C698-3459 R:FXD MET FLM 31.0K CMM 12 1/2M A7R50 C698-3459 R:FXD MET FLM 31.0K CMM 12 1/2M A7R51 C698-3459 R:FXD MET FLM 31.0K CMM 12 1/2M A7R52 C757-0469 R:FXD MET FLM 31.0K CMM 12 1/2M A7R55 C698-3459 R:FXD MET FLM 31.0K CMM 12 1/2M A7R56 C698-3459 R:FXD MET FLM 31.0K CMM 12 1/2M A7R56 C698-3459 R:FXD MET FLM 20.0K CMM 12 1/2M A7R50 C698-3459 R:FXD MET FLM 20.0K CMM 12 1/2M A7R60 C698-3459 R:FXD MET FLM 20.0K CMM 12 1/2M A7R60 C698-3459 R:FXD MET FLM 20.0K CMM 12 1/2M A7R60 C698-3459 R:FXD MET FLM 20.0K CM		1	
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A7R37  A7R37  A7R37  A7R38  G698-3444  A7R38  G698-3416  A7R40  A7R40  A7R40  A7R40  A7R40  A7R40  A7R41  A7R41  A7R41  A7R41  A7R42  A7R42  A7R42  A7R44  A7R43  A7R44  A7R45  A7R44  A7R45  A7R46  A7R46  A7R47  A7R47  A7R47  A7R47  A7R47  A7R47  A7R47  A7R48  A7R49  A7R40  A7R47  A7R47  A7R47  A7R47  A7R47  A7R48  A7R49  A	ì	,	
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A7R38		· 1	
A7R38			
A7R49 A7R40 A7R40 A7R40 A7R40 A7R40 A7R40 A7R40 A7R40 A7R41 A7R42 A7R42 A7R42 A7R42 A7R43 A7R43 A7R44 A7R43 A7R44 A7R43 A7R44 A7R44 A7R44 A7R44 A7R44 A7R45 A7R46 A7R46 A7R46 A7R46 A7R47 A7R48 A7R47 A7R48 A7R48 A7R49			
A7R40 A7R41 D764-0006 A7R42 A7R42 A7R43 D098-3444 A7R43 A7R44 A7R43 A7R44 A7R44 A7R43 A7R46 A7R46 A7R46 A7R46 A7R47 A7R47 A7R47 A7R47 A7R47 A7R47 A7R47 A7R48 A7R48 A7R48 A7R48 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R49 A7R40 A7R40 A7R40 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R41 A7R42 A7R43 A7R43 A7R43 A7R44 BEBABABABABABABABABABABABABABABABABABAB			
A7R41  A7R42  A7R43  A7R43  A7R44  A7R44  A7R44  A7R45  A7R44  A7R45  A7R45  A7R45  A7R46  A7R46  A7R46  A7R46  A7R47  A7R47  A7R47  A7R47  A7R48  A7R48  A7R48  A7R49  A7R49  A7R49  A7R49  A7R40  A7R41  A7R41  A7R41  A7R41  A7R49  A7R49  A7R41  A7R41  A7R49  A7R41  A7R41  A7R41  A7R41  A7R42  A7R42  A7R43  A7R44  A7R44  A7R44  A7R44  A7R49  A7R49  A7R49  A7R49  A7R49  A7R49  A7R41  A7R49  A7R49  A7R41  A7R49  A7R41  A7R41  A7R41  A7R41  A7R42  A7R43  A7R43  A7R44  A7R44  A7R44  A7R49  A7R49  A7R49  A7R49  A7R40  A7R41  A7R41  A7R41  A7R41  A7R41  A7R44  A7R44  A7R44  A7R44  A7R44  A7R44  A7R44  A7R44  A7R45  A7R45  A7R45  A7R45  A7R46  A7R47  A7R47  A7R47  A7R48  A7R49  A7R49  A7R49  A7R49  A7R49  A7R40  A7R41  A7R41  A7R41  A7R44  A7R44  A7R44  A7R44  A7R44  A7R45  A7R45  A7R46  A7R46  A7R47  A7R47  A7R48  A7R48  A7R49  A7R49  A7R49  A7R49  A7R49  A7R49  A7R49  A7R49  A7R49  A7R40  A7R40  A7R41  A7R40  A7R41  A7R40  A7R41  A7R40  A7R41  A7R40  A7R40  A7R41  A7R40  A7R40  A7R41  A7R40  A7	*1	,	
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A7R43 A7R44 A7R45 O069-3416 A7R46 O757-0858 A7R46 A7R46 C0557-0309 A7R47 A7R47 A7R47 A7R48 A7R48 A7R49 A7R49 A7R49 A7R50 A7R51 A7R51 A7R51 A7R52 A7R52 A7R50 A7R50 A7R50 A7R51 A7R51 A7R52 A7R52 A7R52 A7R52 A7R52 A7R52 A7R53 A7R53 A7R54 A7R56 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R51 A7R51 A7R51 A7R52 A7R52 A7R52 A7R52 A7R53 A7R53 A7R54 A7R54 A7R55 A7R56 A7R56 A7R57 A7R57 A7R57 A7R58 A7R58 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R51 A7R51 A7R51 A7R51 A7R52 A7R52 A7R52 A7R53 A7R54 A7R56 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R51	•		
A7R43 A7R44 A7R45 O069-3416 A7R46 O757-0858 A7R46 A7R46 C0557-0309 A7R47 A7R47 A7R47 A7R48 A7R48 A7R49 A7R49 A7R49 A7R50 A7R51 A7R51 A7R51 A7R52 A7R52 A7R50 A7R50 A7R50 A7R51 A7R51 A7R52 A7R52 A7R52 A7R52 A7R52 A7R52 A7R53 A7R53 A7R54 A7R56 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R51 A7R51 A7R51 A7R52 A7R52 A7R52 A7R52 A7R53 A7R53 A7R54 A7R54 A7R55 A7R56 A7R56 A7R57 A7R57 A7R57 A7R58 A7R58 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R51 A7R51 A7R51 A7R51 A7R52 A7R52 A7R52 A7R53 A7R54 A7R56 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R51			
A7R44 A7R45 O683-1555 R:FXD MET FLM 90.9K CHM 1% 1/2W A7R46 O757-0309 R:FXD MET FLM 61.9K OHM 1% 1/2W A7R47 O757-0130 R:FXD MET FLM 61.9K OHM 1% 1/2W A7R48 A7R49 O698-3444 R:FXD MET FLM 316 OHM 1% 1/8W A7R49 A7R49 O698-3455 R:FXD MET FLM 261K UHM 1% 1/8W A7R50 O698-3158 R:FXD MET FLM 261K UHM 1% 1/8W A7R51 O698-3421 R:FXD MET FLM 38.3K OHM 1% 1/8W A7R52 O757-0309 R:FXD MET FLM 38.3K OHM 1% 1/2W A7R53 O757-0309 R:FXD MET FLM 61.9K OHM 1% 1/2W A7R54 O757-0279 R:FXD MET FLM 316 CHM 1% 1/8W A7R55 O698-3455 R:FXD MET FLM 316 CHM 1% 1/8W A7R56 G698-3455 R:FXD MET FLM 316 CHM 1% 1/8W A7R56 G698-3455 R:FXD MET FLM 316 CHM 1% 1/8W A7R76 A7YR1 U8552-2008 BOARD:BLANK PC  A7VR1 1940-0021 TUBE:ELECTRON 103V REF TYPE  A8C1 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C3 O160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C3 O160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C3 O160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C4 O160-0162 C:FXD CER 0.025 UF +80-20% 100VDCW A8C4 O160-0162 C:FXD CER 0.025 UF +80-20% 100VDCW	.,		
A7R45 A7R46 A7R46 A7R47 A7R47 A7R48 A7R48 A7R49 A7R49 A7R49 A7R49 A7R50 A7R51 A7R51 A7R52 A7R53 A7R54 A7R54 A7R55 A7R55 A7R55 A7R56 A7R56 A7R56 A7R57 A7R78 A7R78 A7R78 A7R78 A7R78 A7R78 A7R78 A7R78 A7R78 A7R78 A7R51 A7R51 A7R52 A7R53 A7R53 A7R53 A7R54 A7R54 A7R55 A7R54 A7R55 B757 A7R55 A7R56 B757 A7R56 B757 A7R56 B757 A7R57 B757 A7R57 A7R57 A7R57 A7R58 A7R58 A7R58 A7R59 A7R59 A7R59 A7R59 A7R59 A7R50 A7R50 A7R51 A7R51 A7R51 A7R51 A7R51 A7R51 A7R51 A7R51 A7R51 A7R51 A7R51 A7R52 A7R53 A7R53 A7R53 A7R54 A7R54 A7R55 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R58 A7R58 A7R58 A7R58 A7R58 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R50	•		
A7R46  A7R47  A7R47  A7R48  A7R48  A7R49  A7R49  A7R49  A7R50  A7R51  A7R51  A7R52  A7R53  A7R53  A7R54  A7R55  A7R55  A7R55  A7R55  A7R56  A7R56  A7R57  A7R57  A7R57  A7R58  A7R58  A7R58  A7R58  A7R59  A7R59  A7R59  A7R59  A7R51  A7R51  A7R51  A7R51  A7R52  A7853  A7854  A7855  A7856  A7856  A7856  A7857  A7858  A7857  A7858  A7858  A7859  A7859  A7859  A7859  A7859  A7859  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7851  A7850  A7851  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7850  A7860  A7			
A7R47	,	, ` <b>}</b> `	
A7R48 A7R49 A7R49 A7R49 A7R50 A7R50 A7R51 A7R51 A7R51 A7R52 A7R53 A7R53 A7R54 A7R54 A7R55 A7R55 A7R55 A7R55 A7R55 A7R56 A7R57 A7R56 A7R57 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R59 A7R50 A7R50 B0ARD:BLANK PC A7VR1 A7VR2 A7V			
A7R48 A7R49 A7R49 A7R49 A7R50 A7R50 A7R51 A7R51 A7R51 A7R52 A7R53 A7R53 A7R54 A7R55 A7R55 A7R55 A7R55 A7R55 A7R55 A7R56 A7R51 A7R51 A7R51 A7R51 A7R51 A7R52 A7R53 A7R53 A7R54 A7R55 A7R55 A7R55 A7R55 A7R55 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R58 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R51			
A7R49 A7R50 A7R50 A7R50 A7R51 O698-3158 R:FXD MET FLM 261K UHM 1% 1/8W A7R51 A7R52 A7R53 A7R53 A7R54 A7R54 A7R55 A7R55 A7R55 A7R55 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R58 A7R59 A7R59 A7R59 A7R59 A7R59 A7R59 A7R50 A7R50 A7R50 A7R50 A7R50 A7R51  A7R50 A7R50 A7R51  A7R50		Į.	
A7R50 A7R51 O698-3421 R:FXD MET FLM 23.7K CHM 1% 1/8W R:FXD MET FLM 38.3K CHM 1% 1/2W A7R52 O757-0309 A7R53 O757-0309 A7R54 O757-0309 A7R55 O698-3444 A7R55 O698-3444 A7R56 G698-3455 R:FXD MET FLM 196K CHM 1% 1/2W R:FXD MET FLM 3.16K CHM 1% 1/8W A7R56 A7R57 A7R50 A7R51 A7R51  C8552-2008 BDARD:BLANK PC A7VR1 A7VR2 A7VR2 A8C1 C160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C3 O160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C4 O160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C4 C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD CER 0.025 UF +80-20% 100VDCW C:FXD MY 0.022 UF 10% 200VDCW			
A7R51 0698-3421 R:FXD MET FLM 38.3K GHM 18 1/2W  A7R52 0757-0309 R:FXD MET FLM 61.9K CHM 18 1/2W  A7R53 0757-0263 R:FXD MET FLM 196K UHM 18 1/2W  A7R54 0.757-0279 R:FXD MET FLM 3.16K CHM 18 1/8W  A7R55 0698-3444 R:FXD MET FLM 316 CHM 18 1/8W  A7R56 G698-3455 R:FXD MET FLM 261K DHM 18 1/8W  A7R51 08552-2008 BDARD:BLANK PC  A7VR1 1940-0021 TUBE:ELECTRON 103V REF TYPE  A7VR2 1940-0021 TUBE:ELECTRON 103V REF TYPE  ABC1 0160-3208 C:FXD CER 0.025 UF +80-208 100VDCW  A8C2 0160-3208 C:FXD CER 0.025 UF +80-208 100VDCW  A8C3 0160-3208 C:FXD CER 0.025 UF +80-208 100VDCW  A8C4 0160-0162 C:FXD CER 0.025 UF +80-208 100VDCW	``		
A7R53 A7R54 A7R55 A7R56 A7R55 A7R56 A7R56 A7R56 A7R56 A7R56 A7R57 A7R57 A7R57 A7R57 A7R57 A7R57 A7R57 A7R58 A7R58 A7R58 A7R58 A7R59 A7R50			
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A7R55 A7R56	,		
A7R56 G698-3455 R:FXD MET FLM 261K DHM 1% 1/8W  A7TB1 G8552-2008 BDARD: BLANK PC  A7VR1 1940-0021 TUBE:ELECTRON 103V REF TYPE  A7VR2 1940-0021 TUBE:ELECTRON 103V REF TYPE  AB U8552-6007 BDARD ASSY:LUG AMPLIFIER  A8C1 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW  A8C2 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW  A8C3 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW  C:FXD CER 0.025 UF +80-20% 100VDCW		l	, 1
A7R56		<b>I</b>	
A7VR1 1940-0021 TUBE:ELECTRON 103V REF TYPE  A7VR2 1940-0021 TUBE:ELECTRON 103V REF TYPE  ABC 1 0160-3208 C:FXD CER 0.025 UF +80-20% 100VDCH  A8C2 0160-3208 C:FXD CER 0.025 UF +80-20% 100VDCH  A8C3 0160-3208 C:FXD CER 0.025 UF +80-20% 100VDCH  A8C4 0160-0162 C:FXD MY 0.022 UF 10% 200VDCH	•		
A7VR2 1940-0021 TUBE:ELECTRUN 103V REF TYPE  AH U8552-6007 BDARD ASSY:LUG AMPLIFIER  A8C1 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW  A8C2 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW  A8C3 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW  A8C4 U160-0162 C:FXD MY 0.022 UF 10% 200VDCW			
AH U8552-6007 BDARD ASSY:LUG AMPLIFIER  ABC1 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCH  ABC2 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCH  ABC3 U160-3208 C:FXD CER 0.025 UF +80-20% 100VDCH  ABC4 U160-0162 C:FXD MY 0.022 UF 10% 200VDCH			
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ABC2	,		
A8C3 0160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C4 0160-0162 C:FXD MY 0.022 UF 10% 200VDCW			,
A8C3 0160-3208 C:FXD CER 0.025 UF +80-20% 100VDCW A8C4 0160-0162 C:FXD MY 0.022 UF 10% 200VDCW			
ARC4 0160-0162 C:FXD MY 0.022 UF 10% 200VDCH			
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Table 6-3. Parts List Indexed by Reference Designator

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ARC 7 ARC 8 0160-3208 ARC 9 0160-3208 ARC 9 0160-3208 ARC 9 0160-3208 ARC 10 0160-3208 ARC 11 0160-3208 ARC 12 0160-3208 ARC 12 0160-3208 ARC 13 0160-3208 ARC 13 0160-3208 ARC 13 ARC 13 0160-3208 ARC 14 ARC 15 ARC 15 ARC 16 ARC 16 ARC 17 ARC 17 ARC 17 ARC 17 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 18 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 19 ARC 20 ARC 19 ARC 20 AR	<b>*</b> **	].
ARC7		
ARCR		1
ABC8		• .
### ABC10    ABC10		1
A8C10  A8C11  A8C11  A8C12  A8C13  A8C13  A8C13  A8C14  A8C14  A8C14  A8C15  A8C15  A8C15  A8C16  A8C16  A8C16  A8C16  A8C16  A8C16  A8C17  A8C17  A8C17  A8C17  A8C17  A8C19  A8C19  A8C19  A8C20  A8		
ABC12		
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A8C30  A8C31  A8C32  A8C33  A8C33  A8C33  A8C34  A8C35  A8C35  A8C36  A8C36  A8C37  A8C37  A8C38  A8C44  A8C38  A8C44  A8C45  A8C45  A8C46  A8C46  A8C47  A8C47  A8C48  A8	7	
ABC31 ABC32 ABC33 ABC33 ABC34 ABC34 ABC35 ABC36 ABC36 ABC37 ABC37 ABC37 ABC38 ABC38 ABC38 ABC37 ABC38 ABC37 ABC38 ABC38 ABC37 ABC38 ABC38 ABC39		
A8C32 A8C33 A8C34 A8C34 A8C35 C150-0121 C:FXU MICA 300 PF 5% C:FXU CER 0.1 UF +80-20% 100VDCW C:FXU ELECT 2.2 UF 10% 20VDCW C:FXU CER 0.1 UF +80-20% 50VDCW  A8C36 A8C36 A8C37 C150-0121 C:FXU MICA 30 PF 5% C:FXU MICA 30 PF 5% C:FXU MICA 110 PF 5% C:FXU MICA 82 PF 5% A8C38 A8C41 A8C38 A8C42 A8C42 A8C43 A8C44 A90-0050 D100E:SILICON 75V D100E:SILICON 15WV D100E:SILICON 15WV D100E:SILICON 0.75A 400PIV  A8C45 A8C46 A8C47 A8C47 A8C47 A8C48 A8C48 A8C48 A8C48 A8C48 A8C49 A8C49 C01L/CHOKE 5.6 UH 1% A8C49 A8C59 A8C59 A8C6		
A8C33 A8C36 A8C30 A8C30 A8C30 A8C37 A8C37 A8C38 A8C31 A9C1-0050 DIODE: SILICON 75V DIODE: SILICON 15MV DIODE: SILICON 15MV DIODE: SILICON 15MV DIODE: SILICON 0.75A 400PIV A8C31 A8C31 A8C4 A9C1-0028 DIODE: SILICON 0.75A 400PIV A8C31 A8C4 A8C4 A9C1-0028 DIODE: SILICON 0.75A 400PIV A8C4 A8C5 A8C61 A8C6		
A8C36 A8C36 A8C36 A8C36 A8C37 A8C38 A8C38 A8C38 A8C38 A8C41 A8C38 A8C42 A8C43 A8C44 A8C43 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C44 A8C45 A8C444 A8C44		i .
A8C36 A8C36 A8C36 A8C37 A8C37 A8C38 A8C81 A8C82 A8C82 A8C83 A8C84 A8C84 A8C84 A8C84 A8C84 A8C84 A8C84 A8C85 A8C85 A8C85 A8C85 A8C85 A8C86 A8C87		}
A8C36 A8C36 A8C37 O140-0194 C:FXD MICA 30 PF 5% C:FXD MICA 110 PF 5% C:FXD MICA 210 PF 5% C:FXD MICA 210 PF 5% C:FXD MICA 210 PF 5% C:FXD MICA 30 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% C:FXD MICA 10 PF 5% CITATION OF TAXABLE 10 PF 5% CITATION		
A8U37 A8U38  0140-0193  C:FXD MICA 110 PF 5% C:FXD MICA 82 PF 5%  A8UR1  1901-0050  DIODE: SILICON 75V  DIODE: SILICON 75V  DIODE: SILICON 15MV DIODE: SILICON 15MV DIODE: SILICON 15MV DIODE: SILICON 0.75A 400PIV  A8UR  A8UR  A8UR  P100-2474  COIL/CHOKE 5.6 UH 1%  A8UR  A8UR  A8UR  P100-1641  COIL:MOLDED CHOKE 240.0 UH		
A8U37 A8U38  A8U81  1901-0050  DIODE: SILICON 75V  A8C82  1901-0050  DIODE: SILICON 75V  DIODE: SILICON 75V  DIODE: SILICON 15MV  DIODE: SILICON 15MV  DIODE: SILICON 15MV  DIODE: SILICON 0.75A 400PIV  A8C83  1901-0179 DIODE: SILICON 0.75A 400PIV  A8L1  A8L2  9100-1641  A8L3  9100-1641  A8L4  9100-1641  COIL: MOLDED CHOKE 240.0 UH  A8L5  9100-1641  COIL: MOLDED CHOKE 240.0 UH  COIL: MOLDED CHOKE 240.0 UH  COIL: MOLDED CHOKE 240.0 UH  A8L5  9100-1641  COIL: MOLDED CHOKE 240.0 UH		
ASCR2  ASCR2  1901-0050  DIODE: SILICON 75V  DIODE: SILICON 75V  DIODE: SILICON 75V  DIODE: SILICON 15WV  DIODE: SILICON 15WV  DIODE: SILICON 15WV  DIODE: SILICON 0.75A 400PIV  ASCR5  1901-0028  DIODE: SILICON 0.75A 400PIV  COIL/CHOKE 5.6 UH 1%  COIL: MOLDED CHOKE 240.0 UH		
ARCR2  ABCR3  ABCR4  ABCR5  AB	,	
ARCR2  ABCR3  ABCR4  ABCR5  AB		
1901-0179		1
1901-0179		
A8CR 1901-0179 DIUDE: SILICON 15WV DIODE: SILICON 0.75A 400PIV  A8L1 9100-2474 COIL/CHOKE 5.6 UH 1%  A8L2 9100-1641 COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH A8L8 9100-1641 COIL: MOLDED CHOKE 240.0 UH A8L8 9100-1641 COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH COIL: MOLDED CHOKE 240.0 UH		
A8CR 1901-0028 DIODE:SILICON 0.75A 400PIV  A8L1 9100-2474 COIL/CHOKE 5.6 UH 1%  A8L2 9100-1641 COIL:MOLDED CHOKE 240.0 UH  A8L3 9100-1641 COIL:MOLDED CHOKE 240.0 UH  A8L4 9100-1641 COIL:MOLDED CHOKE 240.0 UH  A8L5 9100-1641 COIL:MOLDED CHOKE 240.0 UH  A8L6 9100-1641 COIL:MOLDED CHOKE 240.0 UH  A8L7 9100-1641 COIL:MOLDED CHOKE 240.0 UH  A8L8 9100-1641 COIL:MOLDED CHOKE 240.0 UH  A8L9 9100-1641 COIL:MOLDED CHOKE 240.0 UH		
A8L2 A8L3 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L4 A8L5 A8L5 A8L6 9100-1641 COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH A8L8 9100-1641 COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH		1
A8L2 A8L3 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L4 A8L5 A8L5 9100-1641 COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH A8L8 9100-1641 COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH		l
A8L3 A8L4 A8L4 A8L5 A8L6 A8L6 A8L7 A8L8 A8L9 A8L9 A8L9 A8L9 A8L9 A8L9 A8L7 A8L8 A8L9 A8L9 A8L8 A8L9 A8L8 A8L9 A8L8 A8L9 A8L8 A8L8	,	Ī
A8L3 A8L4 A8L4 A8L5 A8L6 A8L6 A8L7 A8L8 A8L8 A8L9 A8L9  9100-1641 COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH COIL:MOLDED CHOKE 240.0 UH		<b>1</b> .
A8L4 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L5 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L6 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L7 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L8 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L9 9100-1641 CUIL:MOLDED CHOKE 240.0 UH		]
A8L5 A8L6 9100-1641 COIL:MOLDED CHDKE 240.0 UH COIL:MOLDED CHDKE 240.0 UH COIL:MOLDED CHDKE 240.0 UH A8L8 A8L9 9100-1641 COIL:MOLDED CHDKE 240.0 UH COIL:MOLDED CHDKE 240.0 UH COIL:MOLDED CHDKE 240.0 UH		, '
A8L7 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L8 9100-1641 COIL:MOLDED CHOKE 240.0 UH A8L9 9100-1641 CUIL:MOLDED CHOKE 240.0 UH		1
ABL8 9100-1641 COIL:MOLDED CHOKE 240.0 UH ABL9 9100-1641 CUIL:MOLDED CHOKE 240.0 UH		
ABL8 9100-1641 COIL:MOLDED CHOKE 240.0 UH ABL9 9100-1641 CUIL:MOLDED CHOKE 240.0 UH		
A8L9 9100-1641 CUIL:MOLDED CHUKE 240.0 UH		1
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
1 .′	$f_{i}$		ĺ
	$\mathbf{r}_{i}$ , $\mathbf{r}_{i}$ , $\mathbf{r}_{i}$ , $\mathbf{r}_{i}$ , $\mathbf{r}_{i}$ , $\mathbf{r}_{i}$		
			, .
Adlil	9100-1641	CUIL:MULDED CHUKE 240.0 UH	l
AHL12	08552-6013	INDUCTOR ASSY: VAR 10 T	l
		FREQUENCY ADJ	l
A81.13	9100-1636	CUIL/CHOKE 110 UH 5%	i
A8L14	9,100-1644	CUIL/CHOKE 330 UH 5%	l
			l
ABUL	# 1854-0351	O:SI MPN	
			,
A802	1854-0351	J:SI NPN	
A803	1854-0351	U:SI NPN	į
A804	1854-0351	U: SI NPN	
A805	1854-0351	U:SI NPN	
A806	1854-0351	U:SI NPN	i.
MOND	1654-0351	4-31 NPN	
A 13 45 - 1		ALCO AIDS	l
AHU7	1854-0351	U:SI NPN	
808A	1854-0351	O:SI NPN	[
A809	1854-0351	O:SI MPN	
ABUIO	1854-0351	O:SI MPN	
ABUII	1854-0351	U:SI NPN	
A8012	1854-0351	U:SI NPN	
A8U13	1854-0351	U:SI NPN	
AHU14	1454-0351	C: SI NPN	
AHOIS	1854-0351	U:SI NPN	
Ad016	1654-0351	G: SI INPIN	
AOUID	1034-3331	9-31 WPW	
A8017	1854-0351	U:SI NPN	
A8018	1854-0351	U: SI NPN	. :
A8019	1854-0351	U:SI NPN	•
A8020	1854-0351	U: SI MPM	
A8021	1854-0351	U:SI NPN	
A8022	1854-0351	U:SI NPN	
A8023	1854-0351	U:SI NPN	2
A8024	1854-0351	U: SI NPN	
A8025	1853-0010	U:SI PNP(SELECTED FROM 2N3251)	
A8026	1854-0039	U:SI NPN	
A8027	1854-0351	U:SI NPN	
A8028	1853-0010	U:SI PNP(SELECTED FROM 2N3251)	
A8029	1853-0010	U:SI PNP(SELECTED FROM 2N3251)	,
Aak l	U757-0280	R:FXD MET FLM 1K UHM 1% 1/8W	
			,
ARR 2	0757-0280	R:FXD MET FLM IK UHM 18 1/8W	
AbR3	0698-0083	R:FXD MET FLM 1.96K OHM 1% 1/8W	
	The same of the sa	FACTORY SELECTED PART	
ASK4	0698-3440	R:FXD MET FLM 196 UHM 1% 1/8W	
ARKS	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	
AUKO	1127-0401	NAFAU MET FEM TON OUR TO 1/08	
A 4 - 1%	An ann an an an an an an an an an an an a	the control of the co	
ABRO	6698-3419	R: FXU MET FLM 31.6K OHM 1% 1/2h	
AHR7	1648-6694	A:FXU MET FLM 178 UHM 0.25% 1/8W	
AGRH	U698-3419	HEFAD MET FLM 31.6K CHM 12 1/2h	
ABR9	6698-6696	R:FXD MET FLM 619 UHM 0.25% 1/8H	
A8R 10	0757-0279	R:FXD MET FLM 3.16K CHM 1% 1/8H	
			1
A8R11	0757-0279	R:FXD MET FLM 3.16K OHM 1% 1/8W	
ABR 12	0757-0401	R:FXD MET FLM 100 UHM 1X 1/8H	
ABR13	0757-0280	N:FXD MET FLM 1K OHM 7 , 8W	٠, ٠
4	U698-3419	R:FXD MET FLM 31.6K CHM 1% 1/2N	
A8A14	V070-3717	NOTAU DEL JED JEOUN WIN ES E/EN	
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	γ' <b>t</b>	in the control of the control of the control of the control of the control of the control of the control of the	

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.		Description #		Note
					,
ASR15	6698-6694		MET FLM 178 OHM 0.25% 1/8%		
ABRI6	6698-3419	1.	MET FLM 31.6K CHM 18 1/2H		ver en en
A8K17 A8K18	0698-6696 0757-0280		MET FLM 619 OHM 0.25% 1/8W		
ABR 19	0757-0440		MET FLM 7.50K 1% 1/8W	. * - * :	
MOK 17	07,77 0770		HET FEH /+30K 18 1/0W		
A8K20	0757-0279	REFXD	MET FLM 3.16K OHM 18 1/8H		
ABA 21	0757-0401		MET FLM 100 OHM 14 1/8W		
A8R22	0757-0280	3	MET FEM IK OHM 12 1/8H		,
A6R23	L698-3419	H:FXU	MET FLM 31.6K OHM 18 1/2H		
AGR24	(1648-6644	R:FXD	MET FEM 178 OHM 0.25% 1/8H		11 2
				· .	
AbR25	0698-3419		MET FLM 31.6K OHM 12 1/2h	. ,	
A8H26	0698-6696		MET FLM 619 OHM 0.25% 1/8W		
A8R27 A8R28	0757-0280 0757-0440		MET FLM 1K OHM 1% 1/8W MET FLM 7.50K 1% 1/8W		
ABR 29	0757-0440		MET FLM 3.16K CHM 1% 1/8W	· ·	
A00.27	0131-0219	N. FAD	MET FER 3.10K UNN 18 170W		
A8R30	0757-0401	HEFEND	MET FLM 100 OHM 1% 1/8W		
A8R31	0757-0280		MET FLM IK OHM 12 1/8H		
A8K32	0698-3419	1	MET FLM 31.6K CHM 18 1/2H		
A8R33	0698-6694	R:FXD	MET FLM 178 OHM 0.25% 1/8W		1
A8K34	0698-3419	R:FXD	MET FLM 31.6K OHM 18 1/2W		
A8K35	0698-6696		MET FLM 619 UHM 0.25% 1/8W		
A8k36	0757-0280		MET FLM 1K OHM 1% 1/8H		
A8A37	0757-0440	H · ·	MET FLM 7.50K 14 1/8H		
A8438	6757-0279 6757-0401		MET FLM 3.16K CHM 12 1/8H		
A 8R 39	0157-0401	K.FAD	MET FLM 100 UHM 18 1/8W		
A8R40	0757-0280	N=EXIX	MET FLM 1K OHM 12 1/8W		
A6H41	6698-3419		MET FLM 31.6K CHM 1% 1/2h		
AHK42	1.698-6094		MET FLM 178 UHM 0.25% 1/88		,
AHR43	(1698-3419	R:FXD	MET FLM 31.6K CHM 1% 1/2W		
A8R44	0698-6696	R:FXD	MET FLM 619 OHM 0.25% 1/8W		
	H <sub>k</sub> 1				
ABK4	u757-0280		MET FLM 1K OHM 18 1/8W		*
A8R46 A8R47	0757 <del>-</del> 0440 0698-3446		MET FLM 7.50K 1% 1/8W MET FLM 383 DHM 1% 1/8W		
A8R48	0757-0279		MET FLM 303 UNN 14 1/8W		
A8R49	0757-0219		MET FLM 1K OHM 1% 1/8W		
		1			
A8R50	0698-3446	R:FXD	MET FLM 383 OHN 1% 1/8W		
A8K51	0698-3440		MET FLM 196 OHM 1% 1/8m		
A8K52	2100-2413	R: VAR	FLM 200 OHM 103 LIN 1/2H	1	
	e e e e e e e e e e e e e e e e e e e		R GAIN		
A8R53	0698-3417	R: FXD	MET FLM 23.7K CHM 1% 1/2h		
100			MATERIAL AND AND A SECOND		· · · · · · · · · · · · · · · · · · ·
A8R54	0698-6696		MET FLM 619 OHM 0.25% 1/8W		•
A8R55 A8R56	0698-6694 0698-3419		MET FLM 178 OHM 0.25% 1/8H MET FLM 31.6K OHM 1% 1/2H		
ABR 57	0698-3419		MET FLM 31.6K CHM 1% 1/2h		,
A8K58	0698-3417	a contract of the contract of	MET FLM 23.7K CHM 1% 1/2W	i i	
		1	The second secon		•
A8R59	0757-0280		MET FLM IK UHM 13 1/8H		
ABR60	0757-0440		MET FLM 7.50K 18 1/8W		
A8K61	0698-3446		MET FLM 383 UHM 18 1/8N		
ABR62	0698-3440	R=FXD	MET FLM 196 OHM 1% 1/8W		
	$\mathbf{v} = \{\mathbf{v} \in \mathcal{V} \mid \mathbf{v} \in \mathcal{V} \mid \mathbf{v} \in \mathcal{V} \}$	us e			
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Table 6-3. Parts List Indexed by Reference Designator

### ARRAGE   0757-0401   #:FXD MET FLN 100 OHN 1% 1/8M   ### ARRAGE   0757-0280   #:FXD MET FLN 18 OHN 0.25% 1/8M   ### ARRAT   0698-6694   #:FXD MET FLN 18 OHN 0.25% 1/8M   ### ARRAT   0698-3419   #:FXD MET FLN 31.6K OHN 1% 1/2M   ### ARRAT   0757-0280   #:FXD MET FLN 31.6K OHN 1% 1/2M   ### ARRAT   0757-0280   #:FXD MET FLN 18.0K OHN 1% 1/8M   ### ARRAT   0757-0400   #:FXD MET FLN 18.0K OHN 1% 1/8M   ### ARRAT   0757-0401   #:FXD MET FLN 16.0K OHN 1% 1/8M   ### ARRAT   0757-0401   #:FXD MET FLN 16.0K OHN 1% 1/8M   ### ARRAT   0757-0401   #:FXD MET FLN 18.0K OHN 1% 1/8M   ### ARRAT   0757-0401   #:FXD MET FLN 100 OHN 1% 1/8M   ### ARRAT   0757-0401   #:FXD MET FLN 18.0K OHN 1% 1/8M   ### ARRAT   0757-0401   #:FXD MET FLN 180 OHN 1% 1/8M   ### ARRAT   0757-0401   #:FXD MET FLN 180 OHN 1% 1/8M   ### ARRA   0.098-3419   #:FXD MET FLN 180 OHN 1% 1/8M   ### ARRA   0.098-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 31.0K OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FLN 10.0 OHN 1% 1/8M   ### ARRA   0.058-3419   #:FXD MET FL	Reference Designation	Part No.	Description #	Note
### ### ### ### ### ### ### ### ### ##				
### ### ### ### ### ### ### ### ### ##				
ABR65	AUKOB	2100-1755		
ABRAGO 0757-0401 RIFAU MET FLM 100 CHM 1% 1/8W  ABRAGO 0757-0401 RIFAU MET FLM 3.48K 1% 1/8W  ABRAGO 0757-0280 RIFAU MET FLM 100 CHM 1% 1/8W  ABRAGO 0757-0280 RIFAU MET FLM 100 CHM 1% 1/8W  ABR71 0698-8696 RIFAU MET FLM 110 CHM 0.25% 1/8W  ABR72 0698-3419 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR73 0757-0400 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR74 0757-0400 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR75 0757-0400 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR77 0757-0401 RIFAU MET FLM 31.6K CHM 1% 1/8W  ABR77 0757-0401 RIFAU MET FLM 1100 CHM 1% 1/8W  ABR79 0757-0401 RIFAU MET FLM 1100 CHM 1% 1/8W  ABR79 0757-0402 RIFAU MET FLM 11/8W  ABR80 0698-3419 RIFAU MET FLM 31.6K CHM 1% 1/8W  ABR80 0698-3419 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0279 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0279 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0279 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0279 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0279 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0280 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0290 RIFAU MET FLM 31.6K CHM 1% 1/2W  ABR80 0757-0416 RIFAU MET FLM 31.6K CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 11 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0417 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0418 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0418 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RIFAU MET FLM 10 CHM 1% 1/8W  ABR80 0757-0416 RI		U698-0084	R:FXD MET FLM 2.15K 1% 1/8W	
ABM67			, and the state of	
ARRES 0757-0401 RIFKD MET FLM 100 GMM 1% 1/8M ARRYO 0098-6694 RIFKD MET FLM 16 GMM 10.25% 1/8M ARRYO 0098-6694 RIFKD MET FLM 178 GMM 0.25% 1/8M ARRYO 0098-6694 RIFKD MET FLM 178 GMM 0.25% 1/8M ARRYO 0098-3419 RIFKD MET FLM 13.6K GMM 1% 1/2M ARRYO 0757-0280 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRYO 0757-0280 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRYO 0757-0280 RIFKD MET FLM 10.0 GMM 1% 1/8M ARRYO 0757-0280 RIFKD MET FLM 10.0 GMM 1% 1/8M ARRYO 0757-0280 RIFKD MET FLM 18.0 GMM 1% 1/8M ARRYO 0757-0280 RIFKD MET FLM 18.0 GMM 1% 1/8M ARRYO 0757-0280 RIFKD MET FLM 18.0 GMM 1% 1/8M ARRO 0698-3419 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0698-3419 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0280 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0280 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0280 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 31.6K GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 10 GMM 1% 1/2M ARRO 0757-0240 RIFKD MET FLM 1	ABR66	0757-0401	R:FXD MET FLM 100 UHM 1% 1/8W	
ABRRO 0757-0260 R:FXD MET FLM 1X CHM 1X 1/2M R:FXD MET FLM 19 OHM 0.25% 1/8M R:FXD MET FLM 178 OHM 0.25% 1/8M R:FXD MET FLM 178 OHM 0.25% 1/8M R:FXD MET FLM 178 OHM 0.25% 1/8M R:FXD MET FLM 131.6K OHM 1X 1/2M R:FXD MET FLM 18 OHM 1X 1/2M R:FXD MET FLM 31.6K OHM 1X 1/2M R:FXD MET FLM 31.6K OHM 1X 1/2M R:FXD MET FLM 7.50K IX 1/8M R:FXD MET FLM 7.50K IX 1/8M R:FXD MET FLM 7.50K IX 1/8M R:FXD MET FLM 7.50K IX 1/8M R:FXD MET FLM 18.6K OHM 1X 1/2M R:FXD MET FLM 18.6K OHM 1X 1/2M R:FXD MET FLM 18.0H R 1 1/8M R:FXD MET FLM 18.0H R 1 1/8M R:FXD MET FLM 18.0H R 1 1/8M R:FXD MET FLM 18.0H R 1 1/8M R:FXD MET FLM 18.6K OHM 1X 1/2M R:FXD MET FLM 31.6K OHM 1X 1/2M R:FXD MET FLM 10 OHM 1X 1/2M R:FXD MET FLM 50 OHM 1X 1/2M R:FXD MET FLM 50 OHM 1X 1/2M R:FXD MET FLM 50	A8R67	0698-3152	R:FXD NET FLM 3.48K 1% 1/8W	,
ABR70 0698-6696 R:FXD MET FLM 178 OHM 0.25% 1/8W ABR71 0698-6694 R:FXD MET FLM 178 OHM 0.25% 1/8W ABR72 0698-3419 R:FXD MET FLM 31.6K OHM 1% 1/2W ABR74 0757-0240 R:FXD MET FLM 31.6K OHM 1% 1/8W ABR76 0757-0240 R:FXD MET FLM 31.6K OHM 1% 1/8W ABR77 0757-0401 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR78 0757-0240 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR79 0757-0240 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR79 0757-0240 R:FXD MET FLM 18.0 OHM 1% 1/8W ABR80 0698-3419 R:FXD MET FLM 18.0 OHM 1% 1/2W ABR81 0698-3419 R:FXD MET FLM 31.6K OHM 1% 1/2W ABR82 0698-3419 R:FXD MET FLM 18.0 OHM 1% 1/2W ABR83 0757-0279 R:FXD MET FLM 18.0 OHM 1% 1/2W ABR80 0757-0280 R:FXD MET FLM 18.0 OHM 1% 1/8W ABR80 0757-0346 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR80 0757-0346 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR80 0757-0410 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR80 0757-0410 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR80 0757-0410 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR80 0757-0410 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR80 0757-0410 R:FXD MET FLM 18.1 (AM 1% 1/8W ABR80 0757-0410 R	A8R68	The state of the s	R:FXD MET FLM 100 OHM 1% 1/8W	
ABR71 0698-6694 R:FKD MET FLM 178 OHM 0.25% 1/8W  ABR72 0698-3419 R:FKD MET FLM 31.6K OHM 1% 1/2W  ABR73 0698-3419 R:FKD MET FLM 31.6K OHM 1% 1/2W  ABR74 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR75 0757-0280 R:FKD MET FLM 7.50K 1% 1/8W  ABR77 0757-0401 R:FKD MET FLM 7.50K OHM 1% 1/8W  ABR77 0757-0201 R:FKD MET FLM 100 OHM 1% 1/8W  ABR77 0757-0401 R:FKD MET FLM 1 100 OHM 1% 1/8W  ABR78 0757-0400 R:FKD MET FLM 1 1 1/8W  ABR80 0698-3419 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0698-3419 R:FKD MET FLM 31.6K OHM 1% 1/2W  ABR80 0757-0279 R:FKD MET FLM 31.6K OHM 1% 1/2W  ABR80 0757-0279 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 31.6K OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0280 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0416 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0416 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0416 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0416 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0401 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0401 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0401 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400 R:FKD MET FLM 10 OHM 1% 1/8W  ABR80 0757-0400		100		
ASR 72		land the second of the second		
ABR73 0698-3419 R:FRU MET FLM 31.6K CHM 1% 1/2W ABR74 0757-0280 R:FRU MET FLM 1K CHM 1% 1/8W R:FRU MET FLM 7.50K 1% 1/8W R:FRU MET FLM 7.50K 1% 1/8W R:FRU MET FLM 3.16K CHM 1% 1/8W R:FRU MET FLM 3.16K CHM 1% 1/8W R:FRU MET FLM 16. OCHM 1% 1/8W R:FRU MET FLM 18. OCHM 1% 1/8W R:FRU MET FLM 1750 CHM 1% 1/8W R:FRU MET FLM 1750 CHM 1% 1/8W R:FRU MET FLM 1750 CHM 1% 1/8W R:FRU MET FLM 1750 CHM 1% 1/8W R:FRU MET FLM 1750 CHM 1% 1/8W R:FRU MET FLM 1750 CHM 1% 1/2W R:FRU MET FLM 1750 CHM 1% 1/2W R:FRU MET FLM 31.6K CHM 1% 1/2W R:FRU MET FLM 31.6K CHM 1% 1/2W R:FRU MET FLM 31.6K CHM 1% 1/2W R:FRU MET FLM 31.6K CHM 1% 1/8W R:FRU MET FLM 31.6K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 38.16K CHM 1% 1/8W R:FRU MET FLM 511 CHM 1% 1/8W R:FRU MET FLM 511 CHM 1% 1/8W R:FRU MET FLM 00 CHM 1% 1/8W R:FRU MET FLM 00 CHM 1% 1/8W R:FRU MET FLM 00 CHM 1% 1/8W R:FRU MET FLM 00 CHM 1% 1/8W R:FRU MET FLM 00 CHM 1% 1/8W R:FRU MET FLM 1.2K CHM 1% 1/8W R:FRU MET FLM 1 1/8W	AOK / L	0648-0644	K:FXU MEI FLM 178 UHM 0.25% 178W	4
ABR74 0757-0240 RIFXD MET FLM IX OMM IX 1/8M ABR75 0757-0440 RIFXD MET FLM 7.50K IX 1/8M ABR76 0757-0279 RIFXD MET FLM 3.16K CMM IX 1/8M ABR77 0757-0420 RIFXD MET FLM 100 OMM IX 1/8M ABR78 0757-0420 RIFXD MET FLM 175 OMM IX 1/8M ABR80 0698-6694 RIFXD MET FLM 175 OMM IX 1/8M ABR80 0698-3419 RIFXD MET FLM 31.6K CMM IX 1/8M ABR83 0757-0279 RIFXD MET FLM 31.6K CMM IX 1/8M ABR883 0757-0280 RIFXD MET FLM 31.6K CMM IX 1/8M ABR88 0757-0280 RIFXD MET FLM 31.6K CMM IX 1/8M ABR88 0757-0240 RIFXD MET FLM 31.6K CMM IX 1/8M ABR88 0757-0416 RIFXD MET FLM 31.0M IX 1/8M ABR88 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 110 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 1511 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR89 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR99 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR99 0757-0416 RIFXD MET FLM 100 CMM IX 1/8M ABR99 0757-0440 RIFXD MET FLM 100 CMM IX 1/8M ABR99 0757-0440 RIFXD MET FLM 110K CMM IX 1/8M ABR99 0757-0440 RIFXD MET FLM 110K CMM IX 1/8M ABR99 0757-0440 RIFXD MET FLM 1.10K CMM IX 1/8M ABR99 0757-0440 RIFXD MET FLM 1.10K CMM IX 1/8M ABR99 0757-0440 RIFXD MET FLM 1.10K CMM IX 1/8M ABR99 0757-0440 RIFXD MET FLM 7.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5.50K IX 1/8M ABR99 0757-0440 RIFXD MET FLM 5	ASR 72	0698-3419		
ABR75- 0757-0440 R:FXD MET FLM 7.50K 1% 1/8M ABR76 0757-0279 R:FXD MET FLM 3.16K CHM 1% 1/8M ABR77 0757-0401 R:FXD MET FLM 100 OHM 1% 1/8M ABR79 0757-0220 R:FXD MET FLM 1% OHM 1% 1/8M ABR80 0698-6694 R:FXD MET FLM 178 OHM 0.25% 1/8M ABR81 0698-3419 R:FXD MET FLM 31.6K OHM 1% 1/2M ABR82 0698-3419 R:FXD MET FLM 31.6K OHM 1% 1/2M ABR83 0757-0279 R:FXD MET FLM 3.16K CHM 1% 1/8M ABR84 0757-0279 R:FXD MET FLM 33.16K CHM 1% 1/8M ABR85 0698-3446 R:FXD MET FLM 33.16K CHM 1% 1/8M ABR86 0757-0240 R:FXD MET FLM 303 OHM 1% 1/8M ABR87 0757-0346 R:FXD MET FLM 100 OHM 1% 1/8M ABR88 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR89 0757-0416 R:FXD MET FLM 511 OHM 1% 1/8M ABR99 0698-3450 R:FXD MET FLM 642-2K CHM 1% 1/8M ABR99 0757-0401 R:FXD MET FLM 642-2K CHM 1% 1/8M ABR99 0757-0404 R:FXD MET FLM 6800 OHM 5% 2M ABR99 0757-0444 R:FXD MET FLM 6800 OHM 5% 2M ABR99 0757-0444 R:FXD MET FLM 6800 OHM 5% 2M ABR99 0757-0440 R:FXD MET FLM 511 OHM 1% 1/8M ABR99 0757-0440 R:FXD MET FLM 512 OHM 1% 1/8M ABR99 0757-0440 R:FXD MET FLM 7.50K 1% 1/8M ABR99 0757-0440 R:FXD MET FLM 7.50K 1% 1/8M ABR99 0757-0440 R:FXD MET FLM 7.50K 1% 1/8M ABR99 0757-0440 R:FXD MET FLM 7.50K 1% 1/8M ABR99 0757-0440 R:FXD MET FLM 7.50K 1% 1/8M ABR90 0757-0440 R:FXD MET FLM 7.50K 1% 1/8M ABR91 08552-2007 BIJAHK PC  08552-0015 DIAL-KNOB ASSY:SCAN TIME  08552-0015 OJAH-KNOB ASSY:SCAN TIME ABR91 0180-2125 C:FXD ELECT 15 UF 5% 35VDCM ASC2 0180-2126 C:FXD ELECT 15 UF 5% 35VDCM C:FXD ELECT 0.15 UF 5% 35VDCM C:FXD ELECT 0.15 UF 5% 35VDCM	A8R73			
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ABRYB 0757-0240	A8R77	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	
ABR80 0698-3619 R:FXD MET FLM 178 DHM 0.25% 1/8W ABR81 0698-3619 R:FXD MET FLM 31.6K CHM 1% 1/2W ABR82 0698-3419 R:FXD MET FLM 31.6K CHM 1% 1/8W ABR83 0757-0280 R:FXD MET FLM 18 OHM 1% 1/8W ABR85 0698-3466 R:FXD MET FLM 383 DHM 1% 1/8W ABR86 0757-0346 R:FXD MET FLM 383 DHM 1% 1/8W ABR88 0757-0346 R:FXD MET FLM 511 DHM 1% 1/8W ABR88 0757-0416 R:FXD MET FLM 511 DHM 1% 1/8W ABR88 0757-0401 R:FXD MET FLM 510 DHM 1% 1/8W ABR89 0757-0401 R:FXD MET FLM 100 DHM 1% 1/8W ABR91 0698-3154 R:FXD MET FLM 4.22K CHM 1% 1/8W ABR92 0698-3156 R:FXD MET FLM 4.22K CHM 1% 1/8W ABR93 0764-0012 R:FXD MET FLM 14.7K CHM 1% 1/8W ABR94 0757-0344 R:FXD MET FLM 51.0HM 1% 1/8W ABR95 0757-0344 R:FXD MET FLM 51.0HM 1% 1/8W ABR96 0757-0444 R:FXD MET FLM 51.1 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 4.22K CHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 1.2K CHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR97 C698-3154 R:FXD MET FLM 51.2 DHM 1% 1/8W ABR99 O8552-0015 DIAL-KNOB ASSY:SCAN TIME  O8552-0015 DIAL-KNOB ASSY:SCAN TIME  O8952-0015 C:FXD ELECT 15 UF 5% 35VDCW A9C2 D180-2125 C:FXD ELECT 1.5 UF 5% 35VDCW C:FXD ELECT 0.15 UF 5% 35VDCW C:FXD HM 0.015 UF 5% 35VDCW C:FXD HM 0.015 UF 5% 200VDCW	A8R78			.,
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ASTRI C8552-2007 BUARD: BLANK PC  AS 08552-6021 SHITCH ASSY: SCAN TIME  08552-0015 DIAL-KNUB ASSY: SCAN TIME  0370-0432 KNUB: BLACK LEVER  ASC1 0180-2125 C:FXD ELECT 15 UF 5% 20VDCW  ASC2 0180-2126 C:FXD ELECT 1.5 UF 5% 35VDCW  ASC3 0180-2127 C:FXD ELECT 0.15 UF 5% 35VDCW  ASC4 0160-3017 C:FXD MY 0.015 UF 5% 200VDCW	4 OK 70	0131-0440	N-FAU MEI FLM 1.3UK 18 1/0W	
08552-0015 08552-0015 0370-0432  0180-2125  0180-2126 0180-2127 0180-2127 0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017  0180-3017	A RK 97	0698-3154	R:FXD MET FLM 4.22K OHM 1% 1/8W	
08552-6021 SWITCH ASSY:SCAN TIME  08552-0015 DIAL-KNUB ASSY:SCAN TIME 0370-0432 KNUB:BLACK LEVER  0180-2125 C:FXD ELECT 15 UF 5% 20VDCW  0180-2126 C:FXD ELECT 1.5 UF 5% 35VDCW 0180-2127 C:FXD ELECT 0.15 UF 5% 35VDCW 0180-2127 C:FXD MY 0.015 UF 5% 200VDCW	AHTAI	08552-2007	BUARD: BLANK PC	
08552-0015 0370-0432  A9C1  0180-2125  C:FXD ELECT 15 UF 5% 20VDCW  C:FXD ELECT 1.5 UF 5% 35VDCW  C:FXD ELECT 0.15 UF 5% 35VDCW  C:FXD ELECT 0.15 UF 5% 35VDCW  C:FXD ELECT 0.15 UF 5% 35VDCW  C:FXD MY 0.015 UF 5% 200VDCW				
0370-0432 KNOB:BLACK LEVER  0180-2125 C:FXD ELECT 15 UF 5% 20VDCH  0180-2126 C:FXD ELECT 1.5 UF 5% 35VDCH  0180-2127 C:FXD ELECT 0.15 UF 5% 35VDCH  0160-3017 C:FXD MY 0.015 UF 5% 200VDCH		08: 57-6021	SWITCH ASSYISCAN TIME	
A9C2 0180-2126 C:FXD ELECT 1.5 UF 5% 35VDCW A9C3 0180-2127 C:FXD ELECT 0.15 UF 5% 35VDCW A9C4 0160-3017 C:FXD MY 0.015 UF 5% 200VDCW				•
A9C3 A9C4 0160-3017 C:FXD MY 0.015 UF 5% 35VDCW	4961	0180-2125	C:FXD ELECT 15 UF 5% 20VDCW	• • • • • • • • • • • • • • • • • • •
A9C3 A9C4 0160-3017 C:FXD MY 0.015 UF 5% 35VDCW	49C2	0180-2126	C:FXD ELECT 1.5 UF 5% 35VDCM	ı
	A9C3	0180-2127	C:FXD ELECT 0.15 UF 5% 35VDCW	
N9R1 0757-0459 R:FXD MET FLM 56.2K OHM 1% 1/8W	A9C4	0160-3017	C:FXD MY 0.015 UF 5% 200VDCW	,
	49R1	0757-0459	R:FXD MET FLM 56.2K DHM 1% 1/8W	. · · · · ·
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	$N_{ij} \left( A_i \right) P^{ij} \left( A_i \right)$			V.

Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.		Description #	•		Note
				•		`
A9K2	0698-3449		FLM 28.7K CHM 1% 1/8W	en en en en en en en en en en en en en e		
A9R3	0757-0443		FLM 11.0K CHM 12 1/8W			'
A9R4 A9R5	0757-0443 0757-0467		FLM 11.0K CHM 1% 1/8W FLM 121K CHM 1% 1/8W			
A9R6	0686-2055		2 MEGOHM 5% 1/2W			
9	0698-3271	D.EVI MET	FLM 115K OHM 1% 1/8W			
A9R7 A9R8	0698-3271	R:FXD MET	FLM 115K DHM 1% 178W			
AGRY	0698-3157		FLM 19.6K 1% 1/8W FLM 19.6K 1% 1/8W	•	•	
A9R10 A9R11	0698-3157 0698-3271		FLM 115K OHM 13 1/8W	, <b>t</b> (	•	V
					4.1	
A9R12 A9R13	6698-3271 0698-3271		FLM 115K OHM 1% 1/8W FLM 115K OHM 1% 1/8W			
A9R14	0698-3271	R: FXD MET	FLM 115K OHM 1% 1/8W		• • • • • • • • • • • • • • • • • • •	
A9R15	0698-3260		FLM 464K OHM 1% 1/8W FLM 464K OHM 1% 1/8W		1. 1.	
A9R 16	0698-3260	KEFAU HET	FLM 404K UNH 14 170H			
A9R17	0698-3260		FLM 464K OHM 18 1/8H	0	•	
A9R18 A9R19	0698-3260 0698-3260		FLM 464K UHM 1% 1/8W FLM 464K UHM 1% 1/8W		V	
A9R20	0698-3260		FLM 464K OHM 13 1/8W			
4061	3100-2093	SWITCH: RO	FADV		•	
A9S1	3100-2043	SWITCH- NO				
				•		
				•		
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Table 6-3. Parts List Indexed by Reference Designator

Reference Designation	Part No.	Description #	Note
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A10	08552-6020	SWITCH ASSY: REFERENCE LEVEL	
ALU			
	08552-0016 0370-0432 08552-4006	DIAL-KNOB ASSY:LOG REF. FINE KNOB:BLACK LEVER INDICATOR UNIT:IF GAIN	
Aloli	9100-1630	CUIL/CHOKE 51.0 UH 5%	
AlGR1	0698-6310	R:FXD MET FLM 78.41 OHM 0.25% 1/8W	
A10R2	0698-5401	R:FXD MET FLM 247.50 OHM 0.25% 1/8W	
A10R3	C698-6311	R:FXD MET FLM 139.8 OHM 0.25% 1/8W	
Alor4	0698-0082	R:FXD MET FLM 464 OHM 1% 1/8W	
Alors	0757-1094	R:FXD MET FLM 1.47K OHM 1% 1/8W	
Alor6	0698-6941	R: FXD MET FLM 114.6 OHM 0.25% 1/8W	
A1DR7	0757-0440	R:FXD MET FLM 7.50K 1% 1/8W R:FXD MET FLM 10.0K 1% 1/8W (FACTORY SELECTED PART)	
A10R8 A10R9	0757-0442 0698-3160	RIFAD MET FLM 31.6K 1% 1/8W (FACTORY SELECTED PART)	, .
Alosi	3100-2092	SWITCH: ROTARY	
		LOG REF LEVEL	
All	08552-6022	SHITCH ASSY: VIDEO FILTER	
Alici	0180-0291	C:FXD ELECT 1.0 UF 10% 35VDCW	
Alicz	0160-0161	C:FXD MY 0.01 UF 10% 200VDCW	
Allal	u 698-4207	REFXU MET FLM 44.2K OHM 1% 1/8W	i
AllR2	0698-4507	R:FXD MET FLM 76.8K OHM 1% 1/8W	
AllSl	3100-2096	SWITCH: LEVER	/
C1	0160-2049	C:FXD CER 5000 PF 80/20%	
C2	0160-2049	C:FXD CER 5000 PF 80/208	
C3 %	u160-2049	C: FXD CER 5000 PF 80/20#	
C4	0150-0093	C:FXD CER 0.G1 UF +80-20% 100VDCW	. 11
<b>C5</b>	,0160-3219	C:FXD FEED-THRU 100 PF	i
CR1	1901-0416	DIBDE: SILICUN 200PIV 3A	
DS1	2140-0058	LAMP: INCANDESCENT 10 V	
052	2140-0058	LAMP: INCANDESCENT LOV	
083	2140-0058	LAMP: INCANDESCENT 10 V	,
DS4	2140-0058	LAMP: INCANDESCENT 10V	
DS5	2140-0058	L'AMP: INCANDESCENT' LOV	
DS6	2140-0058	LAMP: INCANDESCENT 10 V	
DS7	2140-0258	LAMP: INCANDESCENT 10V	}
	5040-0235 085 <b>52-8001</b>	BASE: LAMPHOLDER LAMPHOLDER: PLUS	
DSB	2140-0258 5040-0235	LAMP: INCANDESCENT 10V BASE: LAMPHOLDER	
	085 52~8002	LAMPHULDER: TIMES	
059	2140-0022	LAMP:GLOW NEON NE-2E 90V	
059	5040-0234 5040-0235	BASE: LAMPHOLDER	1
059	フリナリーリとコフ	WAJI, • LAMFINGLUEN	
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Table 6-3. Parts List Indexed by Reference Designation

Reference Designation	⊕ Part No.	Description #	Note
			1
+1	2110-0601	FUSE:CARTRIDGE 1A 250V FAST-BLUM	. '
	7.170 0001	FOSC-CARTRIDGE IN 2500 FAST-DEUR	
F1	2110-0281	FUSEHULDER: DUAL, CLIP	
, p	2110-3001	FUSE:CARTRIDGE 1A 250V FAST-BLOW	
F2	2110-0281	FUSEHULDER: DUAL, CLIP	
	1.36/1/1.1.1	CUNNECTOR: BNC	
71	1250-0118	CUMMECIUX: DNC	
<b>31</b>	1250-0102	CUNNECTUR: BNC	
12	1250-0118	CONNECTOR: BNC	}
J3	1251-2080	CUNNECTUR: 41 FEMALE CONTACT	
J4	1250-0830	CUNNECTURERE	,
<b>J4</b>		PART UF WO CABLE ASSY	
Jo	1250-0830	CONNECTUR: RF	
	1230-0030	COMPLETONONI	
Til.	9140-0142	CUIL:FXD RF 2.2 UH	
L2	9140-0142	CUIL:FXD RF 2.2 UH	
1.3	9140-0142	COIL:FXD RF 2.2 UH	
L4	9100-1615	CUIL/CHUKE FXD 1.20 UH 10%	
MPI	08552-0001	PANEL: FRONT	,
	00032. 0001		1 .
MP2	08552-0002	PANEL: SUB	
MP3	08552-0003	PANEL: REAR	
MP4	08552-3008	CUVER: BUTTOM	!
MP5	08552-0009	COVER: SHIELD	
Mrb	08552-0009	COVER:SHIELD	,
MP7	08552-00104	PLATE: CONNECTUR	
MP8	08552-0013	BRACKET: POT	'
MP9	08552-2044	BAR LATCH	
Pl	1251-0055	CUNNECTUR: MALE 24 CUNTACTS	
623	1 853-0052	U:SI PNP	
U/3	1493-0092	WASI FINE	
U23	0340-0162	INSULATUR: TRANSISTUR	* .
023	1200-0168	SOCKET:TRANSISTOR	
U24	1854-0237	U: SI NPN	
024	0340-0162	INSULATUR:TRANSISTOR	
024	1200-0168	SOCKET: TRANSISTOR	•
RI	0811-2501	R:FXD WW 180 UHM 3% 50W	
R2	0683-3315	R: FXD COMP 330 UHM 5% 1/4W	
K3	0683-3315	R: FXD COMP 330 OHM 58 1/4W	
R4	2100-2492	R:VAR COMP 5K OHM 20% LIN 1/2W	
R4 R5	2100-2488	HURIZUNAL PUSITION R:VAR COMP 10k OHM 20% LIN 1/2W	
R5	2100-2400	HORIZUNAL GAIN	
R6	0757-0441	R:FXD MET FLM 8.25K 1% 1/8W	
R7	0767-0010	R:FXD MET FLM 15K UHM 5% 3W	
- RA - R9	0767-0010 0757-0461	R:FXD MET FLM 15K OHM 5% 3W R:FXD MET FLM 68.1K OHM 1% 1/8W	
K10	2100-2564	R: VAR CUMP 2.5K OHM 20% LIN 2.25W	P. Committee
RIO	E. 2017 E. JUT	BASE LINE CLIPPER	
RIO	08552-0014	DIAL-KNUB ASSY: IF LEVEL	
R10	0370-0103	KNOB:BLK W/ARROW 5/8" OD 1/4" SHAFT	* 1
RII	2100-2661	R:VAR CUMP 1K OHM 20% LIN 1/2H VERTICAL GAIN	
P.14		TERIAL BRING	
Fr. S.	the state of the s		<u> </u>

Table 6-3. Parts List Indexed by Reference Designation

Reference Designation	Part No.	Description #	Note
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			'
R12	2100-2501	R: VAR WW 2K UHM 20% LIN 1.5W	
R12		LOG REF LEVEL VERNIER	
R12	0370-0432	KNOB: BLACK LEVER	1
R13	0698-3400	R:FXD MET FLM 147 OHM 1% 1/2H	
R14	0698-3400	R:FXD MET FLM 147 CHM 1% 1/2W	1
	1100 1600	REVAR COMP TOK OHM 20% LIN 1/2W	İ
R15	2100-2488	VERTICAL POSITION	ĺ
R15	0687-2731	R:FXD COMP 27K OHM 10% 1/2W	
R16 R17	0812-0100	R:FXD WW 2K UHM 5% 5W	
	0811-1666	R:FXD WW 1.0 UHM 5% 2W	
R18	0911-1000		
R19	0683-1045	R:FXD COMP 100K OHMS 5% 1/4W	ĺ
SI	3101-1338	SWITCH: SLIDE DPDT 0.5A 125V AC/DC	
	· .	LUG LINEAR	
<b>S2</b>	3101-0052	SWITCH: PUSHBUTTON SPST	<u> </u>
		SINGLE SCAN	
\$3	08552-6062	SWITCH ASSY: SCAN MUDE	
\$4	08552-6061	SWITCH ASSY:SCAN TRIGGER	
	. '		
W1	8120-1110	CABLE: RF (GREEN)	` '
		The second of th	
w2	8120-1111	CABLE: RF (BLUE)	
W3	08552-6015	CABLE ASSY: GRAY	l
W4	08552-6027	CABLE ASSY:CAL. GUTPUT	1.
<b>W4</b>	1250-0050	NUT:CLAMP PIN:CONNECTUR	
W4	1250-0051	PIN: COMMECTOR	
	1250-0252	BUDY:RF CONNECTOR BULKHEAD RECEPTACLE	İ
<b>W4</b>	08552-6028	CABLE ASSY:RED	1
W5	08552-6037	CABLE ASSY: VERT. DUTPUT	1 :
W6	1250-0118	CUNNECTOR: BNC	
w7	08552-6038	CABLE ASSY:50 MHZ	İ
•			1
w7	1250-0824	CONNECTOR:RF FOR RG-1880 CABLE	
W7	1251-0180	INSERT:R & P CONNECTOR	,
w8	08552-6039	CABLE ASSY:47 MHZ(YELLOW STRIPE)	
w8	1250-0824	CUNNECTOR: RF FOR RG-188U CABLE	, .
h8	1251-0180	INSERT: K & P CONNECTOR	
1		MISCELLANEOUS	
$x \in \mathcal{H}$	A1		],
	0403-0026	GLIDE: NYLON	
	0510-0048	FASTENER:6-32 THREADED HULE NUT:HEX FUR U160-3219 CAPACITUR	1
	0590-0159	CLAMP: CABLE	
	1400-0093	CLAMP: CABLE SPRING: EXTENSION	
	1460-0931	JENTIANS TVI TIANTAIA	
	1490-0838	STUD:LATCHING #8-32 THREAD	
	1600-0110	STAMPING: METAL	1
. 4	2190-0057	WASHER: LUCK FOR #12 HOW	
	3050-0381	WASHER: THRUST(DELRIN)	1
	03950-4001	EXTRACTOR: TOOL	
			1
	08552-0018	BRACKET: SHIELD	
	08552-0025	INSULATUR: VERTICAL	
	08552-0026	BRACE	
	08552-2016	RETAINER: BULB	
	08552-4001	HANDLE:LATCH	
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Table 6-4. Parts Indexed by HP Part Number

Part No.	Description #	Mfr.	Mfr. Part No.	TQ
121-0036	C:VAR CER 5.5-18 PF	28480	0121-0036	
121-0059	C:VAR CER 2-8 PF 300VDCW	28480	0121-0059	
121-0105	C:VAR CER 9-35 PF NPO	28480	0121-0105	
		28480	0121-0457	
121-0457	C:VAR GL 0.8-8.5 PF 750VDCW C:VULTAGE VAR 15.9 PF +/-2% AT 6V	28480	0121-045/	!
122-0042	C:VULIAGE VAR 15.9 PF +7-28 AT 6V	20400	0122-0042	
122-0043	C:VULTAGE VAR 39-17-95PF 28 4-25VDCW	28480	0122-0043	
122-0044	C:VOLTAGE VAR 100-45.9PF 2% 4-25VDCW	28480	0122-0044	
122-0211	C:VULTAGE VAR 39 PF 1N4810A	28480	0122-0211	
122-0221	C:VULTAGE VAR 100 PF 10% 30VDCH	28480	0122-0221	
140-0192	C:FXD MICA 68 PF 54	28480	0140-0192	
140-0193	C:FXD MICA 82 PF 5%	28480	V140-0193	
140-0194	C:FXD MICA 110 PF 54	72136	RDM15F111J3C	
- '		72136	KDM15F201J3C	
140-0198	C:FXD MICA 200 PF 5%		1	7
140-0205	C:FXD MICA 62 PF 5%	28480	•	
150-0050	C:FXD CER DISC 1000 PF +80-20% 1000 VDCW	56289	C067B102E102ZE19-CDH	1
150-0093	C:FXD CER 0.01 UF +80-20% 100VDCW	91418	TA	
150-0121	C:FXD CER 0.1 UF +80-20# 50VDCW	56289	1	
- :		04062	9	
160-0145	C:FXD MICA 82PF 2# 100VDCW			
160-0153	C:FXD MY 0.001 UF 10% 200VDCW	56289		
160-0161	C:FXD MY U.O1 UF 10% 200VDCW	56289	192P10392-PTS	,
60-0162	C:FXD MY 0.022 UF 10% 200VDCW	56289	192P22392-PTS	
60-0163	C:FXD MY 0.033 UF 10% 200VDCW	56289	192P33392-PTS	
60-0339	C:FXD MICA 534 PF 1%	28480	0160-0339	
	C:FXD MY 0.22 UF 10# 200VDCW	28480	0160-0380	
160-0380		01121	0,00-0300   F828	
160-0778	C:FXD CER 56 PF 10% 500VDCW	01121	1020	
160-0939	C: FXD MICA 430 PF 54 300 VDCH	28480	0160-0939	
160-2049	C:FXD CER 5000 PF 80/20%	28480	0160-2049	
160-2101	C:FXD MICA 27PF 2% 300VUCH	72136	RDM15E270G3C	
160-2142	C:FXD CER 1500 PF +100-0% 500VDCH		TYPE SM	
160-2143	C:FXD CER 2000 PF +80-20% 1000VDCW	91418	TYPE 8	
			THE S	
160-2144	C:FXD CER 3300 PF +80-20% 1KV	91418		ţ
160-2145	C:FXD CER 5000 PF +80-20% 100VDCW	91418	TA	
160-2199	C:FXD MICA 30 PF 5%	28480	•	
160-2201	C:FXD MICA 51 PF 5%	72136	RDM15E510J1C	
160-2204	C:FXD MICA 100PF 5%	72136	RDM15F101J3C	
140 2204	C:FXD MICA 160 PF 5%	28480	0160~2206	
160-2206		28480		
160-2207	C:FXD MICA 300 PF 5%		•	
160-2208	CEFXD MICA 330 PF 5% 300VDCH	28480		
160-2218	C:FXD MICA 1000 PF 5%	28480		
160-2236	C:FXD CER 1.0-0.25 PF 500VDCW	72982	301-000-C0K0-109C	
160-2246	C:FXD CER 3.6+/-0.25 PF 500VDCW	72982	301-000-0010-3690	
160-2254	C:FXU CER 7.5-0.25 PF 500VDCW	72982		
160-2257	C:FXD CER 10 PF 5% 500VDCH	72982		
		72982		
160-2258 160-2263	C:FXD CER 11 PF 5% 500VDCW	72982		
. VV - E EU J	DOLLAR TO PE SA SOUTHOR			
160-2265	C:FXD CER 22 PF 5# 500VDCW	72982		
160-2307	C:FXD MICA 47 PF 58	28480		
160-2917	C:FXD CER 0.05 UF +80-20% 100VDCW	84411	TYPE TA	
160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	91418	TA	8
160-3017	C:FXD MY 0.015 UF 5% 200VDCH	28480		٠
146-2626	CASMO CED 2 AAAAA 1 BE SAAMAY M	72002	201-000-000-2000	
160-3020	G:FXD CER 3.9+/-0.1 PF 500VDCH	1	301-000-C0J0-399B	
160-3022	C:FXD CER 16 PF 18 500VDCW	72982		
160-3024	C:FXD MICA 1700 PF 12 100VDCH	28480		
160-3045	C:FXD MICA 53.8 PF 1% 100VDCW	28480	0160-3045	•
			1	
2				

Table 6-4. Parts Indexed by HP Part Number

	Description #	Mfr.	Mfr. Part No.	TQ
				,
0160-3046	C:FXU NICA 250 PF 14 100VDCH	28480	0160-3046	
0160-3047	C:FXD MICA 3280 PF 1% 100VDCW	28480	0160-3047	1
0160-3048	C:FXD MICA 8000 PF 1% 100VDCH	28480	0160-3048	2
0160-3690	C:FXD CER 22 PF 18 500VDCH	72982	301-000-S2HU-220F	2
0160-3132	C:FXD CER 200 PF 10% 500VDCW	71590	CC32-TCN 200	4
0160-3208	C:FXD CER 0.025 UF +80-20% 100VDCW	84411	TA	19
0160-3219	C:FXD FEED-THRU 100 PF	28480	0160-3219	1
0180-0098	C:FXD ELECT 100 UF 20% 2UVDCW	56289	150D107X0020S2-DYS	1
0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	28480	0180-0116	17
0180-0197	C:FXU ELECT 2.2 UF 10% 20VDCW	56289	150D225X9020A2-DYS	3
<i>6</i> 7	GOVERN EFFOR FOR STATE OF THE S			<u>.</u>
0180-0291	C:FXD ELECT 1.0 UF 10% 35VDCH	56289	150D105X9035A2-DYS	4
0180-1743	C:FXD ELECT O.1 UF 10% 35VDCW	56289	150D104X9035A2-DYS	1
0180-1746	C:FXD ELECT 15 UF 10% 20VDCH	28480	0180-1746	ı
0180-1747	C:FXD ELECT 150 UF 20% 15VDCW	28480	0180-1747	. 2
0180-2125	C:FXD ELECT 15 UF 5% 20VDCW	2848C	0180-2125	1
11100-5152	C.PAD ELECT 15 OF 34 ZOVDCW	23700		
0180-2126	C:FXD ELECT 1.5 UF 5% 35VDCH	28480	0180-2126	1
0180-2127	C:FXD ELECT 0.15 UF 5% 35VDCW	28480	0180-2127	1
0180-2268	C: FXD ELECT 140 UF 10%	28480	0180-2268	1
0340-0038	FREDTHRU: TERMINAL	28480	0340-0038	ĩ
	INSULATOR: BUSHING	28480	0340-0039	5
0340-0039	I NOOF WINK BOO LING	20700	0340 0037	
0340-0162	INSULATOR: TRANSISTOR	28480	0340-0162	2
0360-1514	TERMINAL PIN: SQUARE	28480		1
	KNOB: BLK W/ARKUW 5/8" OD 1/4" SHAFT	28480	0370-0103	ī
0370-0103		28480	0370-0432	3
0370-0432	KNUB:BLACK LEVER STANDOFF:0.437" LG	08145	153087/16-11	2
0380-0810	21MMDDL:0.431. FR	100145	123000710 11	
0403-0026	GLIDE: NYLON	28480	0403-0026	1
0410-0139	CRYSTAL: QUARTZ(MATCHED SET OF 3)	28480	0410-0139	. 1
0490-0743	RELAY: NEED	28480	0490-0743	3
0510-0048	FASTENER:6-32 THREADED HOLE	16585		1
0590-0060	NUT: HEX 12-32 UNEF-2B	01121		ì
0590-0159	NUT:HEX FOR 0160-3219 CAPACITOR	72982	2499-202	1
0683-0275	R:FXD COMP 2.7 OHM 5% 1/4W	01121	CB 2765	3
0683-1045	R:FXD CUMP 100K CHMS 5% 1/4W	01121	CB 1045	1
0683-1555	"8:FXD COMP 1.5 MEGUHM 5% 1/4W	01121	·-	2
0683-3315	R:FXD COMP 330 OHM 5% 1/4W	01121		2
06 63-5145	REFXD CUMP 510K OHM 5% 1/4W	01121	4	l i
0683-9145	K:FXD CUMP 910K DHM 5% 1/4W	01121	·	2
0686-2055	R:FXD COMP 2 MEGUHM 5% 1/2W	01121	· ·	1
0687-2731	R:FXD COMP 27K OHM 10% 1/2M	01121		1.
0658-0082	REFXU MET FLM 464 UHM 1% 1/8W	14674	C4	4
ALCO_AAA 2	RIFXD MET FLM 1.96K DHM 1% 1/8W	14674	C4	4
0658-0083	RIPXD MET FLM 2.15K 14 1/8W	14674	I -	25
0698-0684		14674		
0658-0085	R:FXD MET FLM 2.61K UHM 1% 1/8W			2
0698-0089	R:FXD MET FLM 1780 UHM 18 1/2W	28480		
0698-3132	R:FXD FLM 261 OHM 1% 1/8W	28480	0698-3132	3
0698-3136	R:FXD MET FLM 17.8K UHM 1% 1/8W	14674	C4	5
0658-3150	R:FXD MET FLM 2.37K OHM 1% 1/8W	28480	,	3
0698-3151	R:FXD MET FLM 2.87K UHM 1% 1/8W	2848C		<u> </u>
0698-3152	R:FXD MET FLM 3.48K 14 1/8W	14674		4
0698-3153	R:FXD MET FLM 3.83K 1% 1/8W	91637	MFF-1/10-32	ì
- ਪਾਦ ਦਾ ਦਾ <b>ਅਤੇ ਦਾ</b> ਮਾਲੀ				_
0658-3154	R:FXD MET FLM 4.22K OHM 14 1/8W	2848C		6
No98-3155	R:FXD MET FLM 4.64K 14 1/8W	91637		1
0658-3156	R:FXD MET FLM 14.7K UHM 12 1/8W	14674	C4	5
6694-3157	R:FXD MET FLM 19.6K 14 1/8W	14674	C4	7
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Table 6-4. Parts Indexed by HP Part Number

@ Part No.	Description #	Mfr.	Mfr. Part No.	TQ
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8698-3158	R:FXD MET FLM 23.7K DHM 1% 1/8W	2848C	0698-3158	4
(658-3159	R:FXD MET FLM 26.1K UHM 1% 1/8W	75042	CEA	1
0698-3160	R:FXD MET FLM 31.6K 1% 1/8W	14674	C4	3
0698-3161	R:FXD MET FLM 38.3K 1% 1/8W	14674	C4	4
0698-3162	K:FXD MET FLM 46.4K UHM 18 1/8H	28480	1	4
0698-3260	R:FXD MET FLM 464K OHM 1% 1/8W	91637	CMF-1/10-32	7
0698+3271	R:FXD MET FLM 115K UHN 1% 1/8W	28480	0698-3271	6
3698-3400	R:FXD MET FLM 147 UHM 1% 1/2W	28480	0698-3400	2
0698-3408	R:FXD MET FLM 2.15 1% 1/2W	91637	MFF-1/2-10	1
698-3412	REFXD MET FLM 3.83K DHM 1% 1/2W	91637	MFF-1/2-10	1
1698-3416	R:FXD MET FLM 21.5K UHM 18 1/2H	28480	0698-3416	2
1694-3417	R:FXD MET FLM 23.7K UHM 1% 1/2W	28480	0698-3417	2
0698-3418	R:FXD MET FLM 26.1K DHM 1% 1/2W	2848C	0698-3418	2
698-3419	R:FXD MET FLM 31.6K UHM 1% 1/2W	28480	0698-3419	17
1698-3420	R:FXD MET FLM 34.8K UHM 12 1/2W	28480	0698-3420	1
1658-3421	R:FXD MET FLM 38.3K DHM 1% 1/2W	28480	0698-3421	1
698-3428	K:FXD MET FLM 14.7 OHM 14 1/88	28480	0698-3428	2
1690-3429	K:FXD MET FLM 19.6 UHA 1% 1/8W	28480	0698-3429	1
0698-3431	R:FXD MET FLM 23.7 UHM 18 1/8W	28480	0698-3431	1
698-3438	K:FXD MET FLM 147 OHM 1% 1/8W	28480	0698-3438	1
1698-3439	R:FXD MET FLM 178 UHM 1% 1/8W	14674	C4	2
698-3440	R:FXD MET FLM 196 UHM 1% 1/8W	91637	MF-1/10-32	. 3
698-3441	R:FXD MET FLM 215 OHM 12 1/8W	91637	MF-1/10-32	4
698-3444	R:FXD MET FLM 316 OHM 1% 1/8W	28480	0698-3444	9
098-3445	R:FXD MET FLM 348 UHM 18 1/8W	14674	C4	6
698-3446	R:FXD MET FLM 383 OHM 1% 1/8W	14674	C4	8
698-3449	R:FXD MET FLM 28.7K UHM 1% 1/8W	14674	C4	. 1
0698-3450	K:FXD MET FLM 42.2K UHM 1% 1/8H	28480	0698-3450	2
0698-3451	R:FXD MET FLM 133K OHM 1% 1/8W	28480	0698-3451	3
0698-3454	R:FXD MET FLM 215K OHM 1% 1/8W	28480	0698-3454	- 5
0698-3455	R:FXD MET FLM 261K OHM 1% 1/8W	28480	0698-3455	3
0698-3558	R:FXD MET FLM 4.02K OHM 12 1/8W	28480	0698-3558	. 3
1698-3647	R:FXD MET OX 15K OHM 5% 2W	28480	0698-3647	1
648-4207	K:FXD MET FLM 44.2K DHM 18 1/8H	28480	0698-4207	1
098-4507	REFERD MET FLM 76.8K DHM 1% 1/8W	28480	U698-4507	1
3698≒5401	R:FXD MET FLM 247.50 OHM 0.25% 1/8W	28480	0698-5401	1
0698-6310	R:FXD NET FLM 78.41 DHM 0.25% 1/8W	28480	0698-6310	1
698-6311	R:FXD MET FLM 139.8 OHM 0.25% 1/8W	28480	0698-6311	1
698-6694	R:FXD MET FLM 178 UHM 0.25% 1/8W	28480	0698-6694	8
698-6696	R:FXD MET FLM 619 UHM 0.25% 1/8W	28480	0698-6696	7
058-6941	R:FXU MET FLM 114.6 DHM 0.25% 1/8W	28480	0698-6941	1
698-7215	R:FXD FLM 133 OHM 2% 1/8W	28480	0698-7215	ĺ
698-7216	R:FXD MET FLM 147 OHM 2% 1/8W	28480	0698-7216	ī
699-0001	R:FXD COMP 2.7 OHM 10% 1/2W	01121	EB 27G1	. 2
757-0063	R:FXD MET FLM 196K OHM 1% 1/2W	28480	0757-0063	ī
757-0122	R:FXD MET FLM 27.1K DHM 1% 1/8H	28480	0757-0122	1
757-0123	R:FXD MET FLM 34.8K OHM 1% 1/8H	91637	MF-1/10-32	i. 3
757-0130	R:FXD MET FLM 162K OHM 18 1/2W	28480	0757-0130	1
757-0159	R:FXD HET FLM 1000 OHM 18 1/2W	28480	0757-0159	ī
757-0180	R:FXD MET FLM 31.6 UHM 18 1/8W	28480	0757-0180	ī
757-0199	R:FXD MET FLM 21.5K OHM 1% 1/8W	14674	C4	7
757-0200	R:FXD MET FLM 5.62K DHM 18 1/8H	14674	C4	2
757-0274	R:FXD MET FLM 1.21K OHM 1% 1/8H	28480	0757-0274	14
757-0276	R:FXD MET FLM 61.9 OHM 18 1/8W	28480	0757-0276	5
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# See introduction to this section for ordering information

Table 6-4. Parts Indexed by HP Part Number

Part No.	Description #	Mfr.	Mfr. Part No.	TC
757-0278	K:FXD MET FLM 1.78K OHM 1% 1/8W	28480	0757-0278	, ,
757-0279	R:FXD MET FLM 3.16K OHM 1% 1/8W	14674	C4	1
757-0280	REFXD MET FLM 1K OHM 1% 1/8W	14674	1 C 4	3
757-0288	R:FXD MET FLM 9.09K OHM 12 1/8W	14674	C4	
757-0289"	R:FXD MET FLM 13.3K OHM 1% 1/8W	28480	0757-0289	
757-0290	R:FXD MET FLM 6.19K DHM 1% 1/8W	28480	0757-0290	
		28480	0757-0294	d
757-0294	REFXD MET FLM 17.8 UHM 1% 1/8W			
757-0309	R:FXD MET FLM 61.9K OHM 1% 1/2W	28480	0757-0309	. ' .
757-0316	R:FXD MET FLM 42.2 UHM 14 1/8W	28480	0757-0316	l .
757-0317	R:FXD MET FLM 1.33K OHM 1% 1/8W	28480	0757-0317	
757-0346	K:FXD MET FLM 10 OHM 1% 1/8W	28480	0757-0346	1
757-0382	R:FXD MET FLM 16.2 OHM 18 1/88	28480	0757-0382	1,
757-0394	R:FXD MET FLM 51.1 UHM 18 1/8W	14674	C4	,1
757-0398	R:FXD MET FLM 75 OHM 1% 1/8W	28480	0757-0398	,-
757-0399	R:FXD MET FLM 82.5 OHM 1% 1/8W	28480	0757-0399	
757-0400	R:FXD MET FLM 90.9 UHM 1% 1/8W	01295	MC550	
757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	146.74	C4	. 2
757-0403	R:FXD MET FLM 121 UHM 1% 1/8W	14674	C4	1
757-0405	R:FXD MET FLM 162 UHM 13 1/8W	2848C	0757-0405	l, i
757-0416	R:FXU MET FLM 511 JHM 1% 1/8W	14674	64	i
757-0418	R:FXD MET FLM 619 UHM 1% 1/8W	14674	C4	ļ
757-0419		14674	64	·
	REFXD MET FLM 681 UHM 1% 1/8W		I .	Ì
757-0420	REFXD MET FLM 750 OHM 14 1/8W	14674	C4	
757-0422	R:FXD MET FLM 909 OHM 1% 1/8W	28480	0757-0422	,
757-0424	R:FXD MET FLM 1.10K OHM 14/1/8W	28480	0757-0424	
757-0428	R:FXD MET FLM 1.62K 1% 1/8W	14674	C4	
757-0434	R:FXD MET FLM 3.65K OHM 12 1/8W	28480	0757-0434	
757-0438	R:FXD MET FLM 5.11K 1% 1/8W	14674	C4	1
757-0439	R:FXD MET FLM 6.81K UHM 1% 1/8W	28480	0757-0439	1 -
757-0440	R:FXD MET FLM 7.50K 1% 1/8W	14674		1
7-7	WATER MET THE O' OFF THE TANK	1 24 74		
757-0441	R = FXD MET FLM 8.25K 1% 1/8W	14674	[ C4	
757-0442	R:FXD MET FLM 10.0K 1% 1/8H	14674		1
757-0443	R:FXD HET FLM 11.0K OHM 1% 1/8W	91637	MF-1/10-32	
757-0447	R:FXD MET FLM 16.2K UHM 1% 1/8W	28480	0757-0447	
757-0453	REFAD MET FLM 30.1K DHM 1% 1/8W	284.80	0757-0453	
157-0458	R:FXD MET FLM 51.1K UHM 1% 1/8W	91637	MF-1/10-32	
757-0459	R:FXD MET FLM 56.2K DHM 12 1/8W	91637		
1		/		
757-0460	R:FXD MET FLM 61.9K DHM 1% 1/8W	28480	0757-0460	
757-0461	R:FXD MET FLM 68.1K UHM 12 1/8W	91637	MF-1/10-32	
757-0463	R:FXD MET FLM 82.5K 14 1/8W	14674	C4	
757-0464	R:FXD MET FLM 90.9K DHM 12 1/8W	28480	0757-0464	
757-0465	R:FXD MET FLM 100K 1% 1/8W	14674		
757-0467	R:FXD MET FLM 121K UHM 1% 1/8W	28480		
757-0795	R:FXD MET FLM 75 OHM 1% 1/2N	28480	0757-0767	
757-0816	R:FXD MET FLM 681 UHM 1% 1/2W	28480	0757-0816	
		00155		
757-0821	R:FXD MET FLM 1.21K OHM 1% 1/2W	28480	0757-C821	
757-0833	R:FXD MET FLM 5.11K UHM 14 1/2H	91637	MF-1/10-32	· .
757-0835	R:FXD MET FLM 6.81K UHM 1% 1/2W	28480	0757-0835	
757-0858	R:FXD MET FLM 90.9K DHM 1% 1/2W	28480	0757-0858	
757-1092	R:FXD MET FLM 287 OHM 1% 1/2W	28480	0757-1092	'
757-1094	R:FXD HET FLM 1.47K OHN 18 1/8W	28480	0757-1094	
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764-0006	RIFXD MET OX 18K OHM 5% 2W	28480	0764-0006	
764-0012	R:FXD MET FLM 6800 OHM 5% 2W	28480	0764-0012	
764-0018	KIFXD MET FLM 4700 OHM 5% 2W	28480	0764-0018	
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Table 6-4. Parts Indexed by HP Part Number

Part No.	Description #	Mfr.	Mfr. Part No.	TQ
764-0020	K:FXL MET FLM 5600 OHM 5% 2W	2848C	0764-0020	1 .
767-0010	K:FXD MET FLM 15K OHM 5% 3N	28480	0767-0010	
811-1606	K:FXD WW 1.0. OHM 5% 2W	28480	0811-1666	
811-2501	R:FXD WN 180 OHM 3% 50W	28480		i,
812-0100	R:FXD WW 2K UHM 5% 5W	28480	0812-0100	1
012-0100	NOTAD WW ZN ONN 34 3W	120430		
260-0168	SOCKET: TRANSISTOR	28480	1200-0168	
205-0011	HEAT DISSIPATOR: FOR TO-5 AND TU-9 CASES	98978	TXBF-032-025B	
<b>25</b> 0-0050	NUT: CLAMP	28480	1250-0050	
250-0051	PIN:CUNNECTUR	28480	1250-0051	
250-0102	CONNECTOR: BNC	28480	1250-0102	, ,
		,		
250-0118	CONNECTOR: BNC	24931	28JR 128-1	
<b>250-</b> 0252	BODY: RF CONNECTOR BULKHEAD RECEPTACLE	2848C	1250-0252	' !
250-0824	CUNNECTUR:RF FOR RG-1880 CABLE	98291	50-024-0000	1 7
250-0829	CONNECTOR: RF	58291	50-045-0000	<b>i</b> 1
250-0830	CONNECTOR:RF	98291	50-047-0000	
			·	
251-0055	CONNECTOR: MALE 24 CONTACTS	28480	1251-0055	1
251-0180	INSERT:R & P CONNECTOR	08718	DM-53742-5001	
251-2080	CONNECTOR:41 FEMALE CONTACT	83148	DDMF-43W2S	
400-0093	CLAMP: CABLE	COOAH	4-7-1	1
460-0931	SPRING: EXTENSIUN	00000	່ນອນ	<b>.</b> .
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¥90-0838	STUD:LATCHING #8-32 THREAD	2848C	1490-C838	
5000110	STAMPING: METAL	2848C	1600-0110	
820-0216	INTEGRATED CIRCUIT: UPERATIONAL AMPL.	07263	SL8941	
853-0001	U:SI PNP(SELECTED FRUM 2N1132)	28480	1853-0001	ľ
85.3-0.006	Q:SI PNP 2N3134	02735	2N3134	
		ĺ	•	
353-6010	0:SI PAPISELECTED FRUM 2N3251)	28480	1853-0010	ľ
853-0020	U:SI PNP(SELECTED FROM 2N3702)	2848C	1853-0020	. 2
853-0034	U:SI PNP(SELECTED FRUM 2N3251)	28480	1853-0034	)
853-0050	O:SI PNP	28480	,	
853-0052	Q:SI PNP	04713	2N3740	
		A		
853-0089	U:SI PNP	07263	2N4917	<b>'</b> -1
854-0003	U:SI NPN(SELECTED FRUM 2N1711)	28480	1854-0003	j
854-0019	O:SI NPN(SELECTED FROM 2N2369)	28480	1854-0019	
B54-0022	O:SI NPN	07253		
854-0039	U:SI NPN	04713	2N3053	:
				′
854-0071	U:SI NPN(SELECTED FROM 2N3704)	28480	1854-0071	36
854-0092	U:SI NPN' CONTRACTOR OF THE STATE OF THE STA	07263	2N3563	
854-0221	Q:SI NPN(REPLACEABLE BA 2N4044)	2848C		
854-0232	U:SI NPN(SELECTED FRUM 2N3440)		1854-0232	
854-0234	O:SI NPN	02735	2N3440	
·				
354-0237	O:SI NPN	04713		,
854-0238	OSSI NPN	02735	2N3933	1.
354-0247	O:SI NPN	28480	1854-0247	
354-0351	O:SI NPN	04713		2
84-0012	RECTIFIER:SILICON CONTROLLED 2N3528	02735		-
01-0025	DIODE:SILICON 100MA/1V	I .	FD 2387	1.
901-0028	DIUDE:SILICON 0.75% 400PIV	04713	SR1358-9	
901-0033	DIODE:SILICON 100MA 180HV	07263	FD3369	
901-0039	DIODE: SILICON 200MA 50MV	28480	1901-0039	
001-0040	DIODE: SILICON 30MA 30MV	07263	FDG1088	6.
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901-0050	DIODE:SILICON 75V	14433	S270	
901-0081	DIODE:SILICON 50 VOLTS WORKING	07263	FD1415	14
901-0096	DIODE: SILICON 120V	28480	1901-0096	
901-0179	DIODE:SILICON 15WV	28480	1901-0179	
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Table 6-4. Parts Indexed by HP Part Number

Part No.	Description #	Mfr.	Mfr. Part No.	TQ
1901-0416	DIODE:SILICON 200PIV 3A	28480	1901-0416	8
1902-0033	DIODE:BREAKDOWN 6.2V	04713	1N823	2
902-0040	DIODE BREAKDOWN: 14.0V 58	28480	1902-0040	1
1962-0052	DIODE BREAKDOWN:6.81V	28480	1902-0052	1
902-0202	DIODE BREAKDOWN: 15.0V 5% 1W	28480	1902-0202	1
1902-0556	DIUDE: BREAKDOWN 20.0V 5% 19	2848C	1902-0556	1
1902-0683	DIODE BREAKDUMN: 100V 28	2848C	1902-0683	2
902-0785	DIODE BREAKDOWN: 9.09V 5%	04713	1N936	1
1902-3070	DIUDE: BREAKDUNN 4.22V 5%	04713	SZ10939-74	2
1902-3104	DIODE BREAKDOWN:5.62V 58	28480	1902-3104	1
1902-3171	DIUDE BREAKDOWN:11.0V 5%	28480	1902-3171	1
1902-3256	DIUDE:BREAKDUMN SILICUN 23.7V 5%	28480	1902-3256	1 1
	DIODE BREAKDOWN:26.1V 58	28480	1	1
1902-3268		93332	D2361	l i
1910-0016	DIODE:GERMANIUM 100MA/0.85V 60PIV	74276	2103R2	
1940-0021	TUNE: ELECTRON 103V REF TYPE	17216	ZIOJRZ	1
2100-1754	R:VAR WW 50 OHM 5% TYPE V 1W	28480	2100-1754	2
2100-1755	REVAR HH 100 UHM 5% TYPE V 1H	28480	2100~1755	4
2100-1756	R:VAR WW 200 DHM 5% TYPE V 1W	28480	2100-1756	3
100-1757	RIVAR WW 500 OHM 5% TYPE V 1W	28480	2100-1757	3
160-1758	REVAR WW IK OHM 5% TYPE V 1W	28480	2100-1758	2
2100-1759	RIVAR WW 2K OHM 5% TYPE V 1W	28480	2100-1759	1
160-1760	RIVAR WW 5K UHM 54 TYPE V IW	28480	2100-1760	3
100-1761	K: VAR NW TOK OHM 5% TYPE V TH	28480	2100-1761	1. 1
100-2413	R:VAR FLM 200 DHM 104 LIN 1/2W	28480	2100-2413	1 1
2100-2488	REVAR COMP TOK UHM 20% LIN 1/2W	28480	2100-2488	2
3.00 2400	R:VAR FLM 5K OHM 10% LIN 1/2N	2848C	2100-2489	1
2100-2489	RIVAR COMP 5K OHM 20% LIN 1/2W	28480	•	1 . 1
2100-2492		28480		·   i
2100-2501	R:VAR WW 2K OHM 20% LIN 1.5H	28480		;
2100-2564 2100-2661	R:VAR COMP 2.5K OHM 20% LIN 2.25W R:VAR COMP 1K OHM 20% LIN 1/2W	28480	2100-2661	i
1		71400	ACC 1	
2110-0001	FUSE:CARTRIDGE TA 250V FAST-BLOW	71400	•	
2110-0281	FUSEHULDER: DUAL .CLIP	1		4
2140-0022	LAMP:GLOW NEUN NE-2E 90V	24455	NE-2E	1 :
2140-0058	LAMP: INCANDESCENT 10V	24455	367	- 6
2140-0258	LAMP:INCANDESCENT 10V	71744	CM-2107	2
21 90-605 7	WASHER:LOCK FOR #12 HOW	00000	UBD	
3050-0381	WASHER: THRUST (DELRIN)	28480	3050-0381	4
3100-2092	SWITCH: RUTARY	2848C	3100-2092	] ]
3100-2093	SWITCH: RUTARY	28480	3100-2093	1 1
3100-2096	SWITCH: LEVER	2848C	3100-2096	1
3101-0052	SWITCH:PUSHBUTTON SPST	82389	961 LESS HWD	
3101-1338	SWITCH: SLIDE DPDT 0.5A 125V AC/DC	79727	G126-0017	i
5040 <b>-</b> 0234	LAMPHOLDER	2848C	5040-0234	
	BASE:LAMPHULDER	2848C	5040-0235	
5040-0235	DASE-EARPROLUER			
	CAMERONEICHECAL	28480	8120-1110	
8120-1110	CABLE: KF (GREEN)	28480	•	
81/20-1111	CABLE: RF (BLUE)			
9100-0346	CUIL:FXD 0.05 UH 20%	36196	•	
9100-1611	COIL:FXD 0.22 UH 204	28480	9100-1611	
9100-1613	COIL:FXD 0.47 UH 20%	28480	9100-1613	
9100-1615	COIL/CHOKE FXD 1.20 UH 104	28480		
9100-1621	COIL/CHOKE 18 UH 10%	28480		
9100-1622	CUIL/CHOKE 24.0 UH 54	28480	9100-1622	1 (
9100-1630	COIL/CHOKE 51.0 UH 5%	28480	9100-1630	
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Table 6-4. Parts Indexed by HP Part Number

Part No.	Description #	Mfr.	Mfr. Part No.	TQ
3100-1636	COIL/CHOKE 110 UH 5%	28480	9100-1636	
100-1641	COIL: MOLDED CHOKE 240.0 UH	26480	9100-1641	10
	I the control of the	28480	9100-1644	•
100-1644	CUIL/CHOKE 330 UH 5%		· ·	
100-2267	COIL/CHOKE 18 UH	28480 73899	9100-2267 LF%W070	
100-2465	INDUCTUREFXD G.70 UH 5%	13899	LF9NO/U	
100-2474	CUIL/CHOKE 5.6 UH 18	82142 82142	10133-4 10132-15	
100-2475	COAL/CHOKE 11.3 UH 1%			
110-2476	COIL/CHOKE 52.3 UH 1%	82142	10176-40	
100-2744	CUIL/CHOKE 7.8 UH 2%	82142	10132-17	
140-4096	CUIL:FXD RF 1 UH	28480	9140-0096	
140-0114	CUIL:FXD RF 10 UH	28480	9140-0114	
140-0129	COIL:FXD RF 220 UH	28480	9140-0129	
140-0137	COIL:FXD RF 1000 UH 5%	76493	9220-28	
40-0142	COIL:FXD RF 2.2 UH	26480	9140-0142	
140-0142	COIL:FXD RF 100 UH 5%	71895	1537-76	''
		20100	0140 0007	
140-0237	COIL:FXD 200 UH 5%	28480 28480	9140-0237 03950-4001	1
1950-4001	EXTRACTOR: TOUL			
9552-0001	PANEL: FRUNT	28480	08552-0001	
3552-0002	PANEL: SUB	28480	08552-0002	
1552-0003	PANEL:REAK	2848C	08552-0003	
1552-0008	COVER: BOTTOM	28480	08552-0008	
3552-0009	COVER: SHIELD	28480	08552-0009	
3552-00104	PLATE: CONNECTOR	28480	08552-00104	
1552-0013	BRACKET:PUT	2848G	08552-0013	
3552-0014	DIAL-KNOB ASSY: IF LEVEL	2848C	08552-0014	ı.
	STAL MODES AFEMARS AN TIME	28480	J8552-0015	
3552-0015	DIAL-KNUB ASSY: SCAN TIME			
3552-6016	DIAL-KNUB ASSY: LUG REF. FINE	2848C	08552-0016	
8552-0018	BHACKET: SHIELD	28480	08552-0018	
8552-0020	SHIELD CAN: 47 MHZ USC	28480	08552-0020	
8552-6021	SHIELD CAN:50 MHZ FILTER	28480	08552-0021	
8552-0022	SHIELD COVER: 47 MHZ OSC	2848C	08552-0022	
8552-0023	INSULATOR: 47 MHZ OSC	28480	08552-0023	
8552-0024	SHIELD:CAN-SCAN GENERATOR	28480	08552-0024	
8552-0025	INSULATOR: VERTICAL	28480	08552-0025	
8552-0026	BRACE	28480	08552-0026	
8552-0028	PLATE CONVERTER	28480	08552-0028	
8552-0029	SHIELD:COVER 47 MHZ USC.	28480	08552-0029	• '.
8552-2002	BUARD: BLANK PC	28480	08552-2002	
8552-2003	BUARD: BLANK PC	28480	08552-2003	,
8552-2004	BUAND: BLANK PC	28480	08552-2004	
8552-2005	BUARD:BLANK PC	28480	08552-2005	
8552-2007	BUARD: BLANK PC	28480	08552-2007	
		28480	08552-2008	
8552-2008	BUARD: BLANK PC		the state of the s	
8552-2016	RETAINER: BULB	2848C	08552-2016	
8552-2042	BUARD: BLANK PC	28480	08552-2042	
8552-2043	BOARD: BLANK PC	28480	08552-2043	
8552-2044	BAR LATCH	28480	08552-2044	
8552-2045	BUARD:BLANK PC	28480	08552-2045	
3552-2047	BUARD: BLANK PC	2848,0	U8552-2047	
8552-4001	HANDLE :LATCH	28480	08552-4001	
8552-4006	INDICATUR UNIT: IF GAIN	28480	08552-4006	
855 <b>2</b> -8002	BOARD ASSY:POWER SUPPLY	28480	08552-6002	
8552-6003	HOARD ASSY:50 MHZ CONVERTER	28480	08552-6003	
8 55 2-60 05	BUARD ASSY: LC FILTER	28480	08552-6005	:
8552-6007	BUARD ASSY:LUG AMPLIFIER	28480	08552-6007	
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Table 6-4. Parts Indexed by HP Part Number

Part No.	Description #	Mfr.	Mfr. Part No.	TQ
08552-6008 08552-6009 08552-6010 08552-6011	BOARD ASSY: DEFLECTION AMPLIFIER FILTER ASSY: 50 MHZ OSCILLATOR ASSY: 47 MHZ INDUCTOR: 300 KHZ FILTER #1 INDUCTOR: 300 KHZ FILTER #2	28480 28480 28480 28480 28480	08552-6008 08552-6009 08552-6010 08552-6011 08552-6012	
18552-6013 18552-6015 18552-6017 18552-6018 18552-6020	INDUCTOR ASSY: VAR 10T CABLE ASSY: GRAY INDUCTOR ASSY: 50 MHZ TRANSFURMER: RF(CODE=RED) SWITCH ASSY: REFERENCE LEVEL	26460 28480 28480 28480 28480	08552-6013 08552-6015 08552-6017 08552-6018 08552-6020	10
8552-6021 8552-6022 8552-6023 8552-6025 8552-6027	SWITCH ASSY:SCAN TIME SWITCH ASSY:VIDEO FILTER INDUCTOR ASSY:AIR CURE INDUCTOR:LC FILTER CABLE ASSY:CAL. OUTPUT	28480 28480 28480 28480 28480	08552-6021 08552-6022 08552-6023 08552-6025 08552-6027	
18552-6028 18552-6037 18552-6038 18552-6039	CABLE ASSY:RED CABLE ASSY:VERT. OUTPUT CABLE ASSY:50 MHZ CABLE ASSY:47 MHZ(YELLUM STRIPE) BOARD ASSY:50 MHZ FILTER	28480 28480 28480 28480 28480	08552-6028 08552-6037 08552-6038 08552-6039 08552-6042	
18552-6043 18552-6044 18552-6045 18552-6046	BOARD ASSY: 47 MHZ USCILLATOR TRANSFURMER: RF (5 PIN) CRYSTAL FILTER ASSY BOARD ASSY: 3 MHZ AMPLIFIER SCAN GENERATUR ASSY	28480 28480 28480 28480 28480	08552-6043 08552-6044 08552-6045 08552-6046 08552-6047	
18552-6062 18552-6062 18552-8001 18552-8002	SHITCH ASSY:SCAN TRIGGER SHITCH ASSY:SCAN MODE LAMPHOLDER:PLUS LAMPHOLDER:TIMES	28480 28480 26480 28480	08552-6061 08552-6062 08552-8001 08552-8002	
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## Table 6-5. Manufacturer's Code List

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			Code		The state of the s
No.	Manufacturer	Address	No.	Manufacturer	Address
00000	U.S.A Common Any	supplier of U.S.	05347	Ultronix, Inc	San Mateo, Cal.
00136	McCoy Electronics Mount Ho		05397	Union Carbine Corp., Elect. Div	
00213	Sage Electronics Corp	lochester, N.Y.	05574	Viking Ind. Inc	
00287	Cemco, Inc	anielson, Conn	05593	Icore Electro-Plastics Inc.	Sunnyvale, Cal.
00334	Humidial	Colton, Calif.	05616	• • • • • • • • • • • • • • • • • • • •	
00348	Mictron, Co., Inc Valle	y Stream, N.Y.			
00373	Garlock Inc	herry Hill, N.J.	05624	Barber Colman Co	
00656	Aerovox Corp New	Bedford, Mass.	05728	Tiffen Optical Co Roslyn Heigh	
00779	Amp. Inc	Boomton N. I.	05729 05783	Metro-Tel Corp.	
00781 00809	Croven,Ltd Whitby, C		05820	Stewart Engineering Co	
00815	Northern Engineering Laboratories, Inc. 1		06004	Bassick Co., Div. of Stewart Warner C	
00853	Sangamo Electric Co., Pickens Div		00001	· · · · · · · · · · · · · · · · · · ·	<b>▼</b>
00866	Goe Engineering Co City o		06090	Raychem Corp.	
00891	Carl E. Holmes Corp Lo		06175	Bausch and Lomb Optical Co	
00929	Microlab Inc		06402	E.T.A. Products Co. of America	Chicago, Ill.
01002	General Electric Co., Capacitor Dept. Hud		06540	Amatom Electronic Hardware Co., Inc	
01009	Alden Products Co	• • • • • • • • • • • • • • • • • • • •			
01121	Allen Bradley Co	•	06555	Beede Electrical Instrument Co., Inc.	
01255	Litton Industries, Inc Be	verly Hills, Cal.	06666	General Devices Co., Inc.	
01281 01295	TRW Semiconductors, Inc.  Texas Instruments, Inc., Transistor Product		06751 06812	Components Inc., Ariz. Div Torrington Mfg. Co., West Div	
U1 230	1exas instruments, inc., 11amsistor Froduct		06980	Varian Assoc. Etmac Div	
01349	The Alliance Mfg. Co		07088	Kelvin Electric Co.	
01538	Small Parts Inc Lo		07126	Digitran Co	
01589	Pacific Relays, Inc		07137	Transistor Electronics Corp	
01670	Gudebrod Bros. Lilk Co	lew York, N.Y.	07138	Westinghouse Electric Corp., Electron	
01930	Amerock Corp	Rockford, Ill			Elmira, N.Y.
01960	Pulse Engineering Co		07149	Filmohm Corp	
02114	Ferroxcube Corp. of America		07233	Cinch-Graphik Co	
02116	Wheelock Signals, Inc Lo		07256	Silicon Transistor Corp	
02286	Cole Rubber and Plastics Inc.		07261 07263	Avnet Corp.	. Culver City, Cal.
02660 02735	Amphenol-Borg Electronics Corp Radio Corp. of America, Semiconductor ar		01203	Fairchild Camera & Inst. Corp., Semic	
U2 / 35	Division		07322	Minnesota Rubber Co.	
02771	Vocaline Co. of America, Inc Old So	vbrook. Conn.	07387	Birtcher Corp. The	
02777	Hopkins Engineering Co San		07397	Sylvania Elect. Prod. Inc., Mt. View O	
02875	Hudson Tool & Die				
03508	G.E. Semiconductor Prod. Dept		07700	Technical Wire Products Inc.	Cranford, N.J.
03705	Apex Machine & Tool Co		07829	Bodine Elect. Co	Chicago, Ill.
03797	Eldema Corp		07910	Continental Device Corp	Hawthorne, Cal.
03818	Parker Seal Co Lo		07933	Raytheon Mtg. Co., Semiconductor Di	
03877	Transitron Electric Corp		07980	Howlatt Books of Co. Books B. H.	
03888	Pyrofilm Resistor Co., Inc Ce. Singer Co., Diehl Div., Finderne Plant	Sumerville, N.J.	01960	Hewlett-Packard Co., Boonton Radio I	
03954 04009		fartford, Conn.	08145	U.S. Engineering Co.	Log Appelog Col
04013		mbertville, N.J.	08289	Blinn, Delbert Co.	Pomona Cal
04062		eat Neck, N.Y.	08358	Burgess Battery Co Niagara Fa	lls. Ontario. Canada
04217	Essex Wire L	, , , , , , , , , , , , , , , , , , ,	08524	Deutsch Fastener Corp.	Los Angeles, Cal
04222	Hi-Q Division of Aerovox My		08664	Bristol Co., The	Waterbury, Conn.
04354	Precision Paper Tube Co		08717	Sloan Company	Sun Valley, Cal.
04404	Dymec Division of Hewlett-Packard Co.	Palo Alto, Cal.		ITT Cannon Electric Inc., Phoenix Div	
04651	Sylvania Electric Products, Microwave Devi		08727	National Radio Lab. Inc.	Paramus, N.J.
. /				CBS Electronics Semiconductor Oper	
04673	Dakota Engr. Inc.	4.4	09906	Inc.	Lowell, Mass.
04713	Motorola Inc, Semiconductor Prod. Div.	oeniy Arizana	08806	General Electric Co., Miniature Lamp	
04732	Filtron Co., Inc. Western Div		08984	Mel-Rain	Indiananalia 1-2
04773	Automatic Electric Co.		09026	Babcock Relays Div.	
04796	Sequoia Wire Co	wood City, Cal.		Texas Capacitor Co.	Houston Tavae
04811	Precision Coil Spring Co.		09145	Tech. Ind. Inc. Atohm Elect.	Burbank Cal
04870	P. M. Motor Company			Electro Assemblies, Inc.	Chicago III
04919	Component Mfg. Service Co W. Brid	igewater, Mass.	09353	C & K Components Inc.	. Newton, Mass.
05006	Twentieth Century Plastics, Inc L		09569	Mallory Battery Co. of Canada, Ltd.	
05277				_ · · · · · · · · · · · Toron	
	ti i de la composició esta esta esta esta esta en el persona el persona el persona el persona el persona el p	oungwood, Pa.	09922	Burndy Corp.	. Norwalk, Conn.
00015			10214	General Transistor Western Corp.	Los Angeles, Cal.
00015-4 Revised	16 : October 1969			From: Hand H4-1 Da	dbook Supplements

Table 6-5. Manufacturer's Code List

No.  Manufactoria  10411 TirTal. Inc.  N. Betkiety, Cal.  10546 Garbanudam Co.  Niagar Fale, N.Y.  11327 Chr. 125 of Berst. Inc.  10412 Carly State Electronia: Corp.  N. Walliam, No.  11328 Chr. 125 of Berst. Inc.  11329 Chr. 125 of Berst. Inc.  11320 Carly State Electronia: Corp.  N. Walliam, No.  11321 Carly State Electronia: Corp.  11324 Carly State Electronia: Corp.  11324 Carly State Electronia: Corp.  11324 Carly State Electronia: Corp.  11324 Carly State Electronia: Corp.  11324 Carly State Electronia: Corp.  11324 Dancan Reference: Corp.  11324 Dancan Reference: Corp.  11324 Dancan Reference: Corp.  11324 Dancan Reference: Corp.  11324 Dancan Reference: Corp.  11325 Carl Carl Carl Carl Carl Carl Carl Carl	1041 1064 1123 1123	l Ti-Tal, Inc 6 Carborundum		Berkeley, Cal. Niagara Falls, N.Y.			
19645 Carbornatium Co.   Niagans Fally, N.Y.   19644   LiC Electronist   Horosthetas, 1968   11237   Chiesao Pisephono California, Inc.   Service   1967	1064 1123 1123	6 Carborundum	Co	Niagara Falls, N.Y.			
1939 CTS of Berrie, Inc. 1939 CTS of Berrie, Inc. 1940 CTS of Berrie, Inc. 1940 CTS of Berrie, Inc. 1959 Chickes Delephone of California, Inc. 2018 Gereal Antonias Corp. 2018 Sir Spirit Exectorate Corp. 2018 Control Precision Connector Corp. 2018 Autional Stal 2018 Control Precision Connector Corp. 2018 Control Precision Connector Corp. 2018 Control Precision Connector Corp. 2018 Control Precision Connector Corp. 2018 Control Precision Connector Corp. 2018 Control Precision Connector Corp. 2018 Control Precision Connector Corp. 2018 Control Precision Connector Corp. 2018 Control Inc. 2018 Control In	1123 1123		Co	. Ningara Pally, N. I.			
20183 General Astronics Corp. Philadely City. 1 1242 Spy State Electronics Corp. Walkhom, Sol. 1 1243 Spy State Electronics Corp. Walkhom, Sol. 1 1244 Spy State Electronics Corp. Walkhom, Sol. 1 1245 Precision Connector Corp. Januaries, N.Y. 1 1245 Precision Connector Corp. Januaries, N.Y. 1 1245 Precision Connector Corp. Januaries, N.Y. 1 1246 Precision Connector Corp. Januaries, N.Y. 1 1247 Menter Connector Corp. Januaries, N.Y. 1 1247 Menter Connector Corp. Januaries, N.Y. 1 1247 Menter Connector Corp. Januaries, N.Y. 1 1247 Menter Connector Corp. Januaries, N.Y. 1 1247 Menter Connector Corp. Januaries, N.Y. 1 1248 Menter Electronics Inc. Buera Parl, O. 1 1248 Menter Menter Corp. Space Corp. 1 1257 Guiton Ind. Inc. Data System Dis. Albuquerque, N.M. 2 1258 Menter Electronics Corp. Catal, N. Dover, N.J. 2 1259 Guiton Ind. Inc. Data System Dis. Albuquerque, N.M. 2 1250 Menter Electronics Corp. Catal, N. Dover, N.J. 2 1250 Menter Electronics Corp. Catal, N. J. 3 1250 Delta Semiconductor Inc. Newborn Branch, C.J. 1 1250 Delta Semiconductor Inc. Newborn Branch, C.J. 1 1250 Menter Electronics Corp. Catal, N.J. 3 1251 Menter Electronics Corp. Catal, N.J. 3 1252 Delta Semiconductor Inc. Newborn Branch, C.J. 1 1253 Delta Semiconductor Inc. Newborn Branch, C.J. 1 1254 Menter Electronics Corp. Catal, N.J. 3 1255 Menter Electronics Corp. Catal, N.J. 3 1256 Menter Electronics Corp. Mark Monitor, C.J. 1 1257 Guiton Berchit Corp. Lond. Toloyo, Japan 1 1258 Menter Electronics Corp. Santa Monitor, C.J. 1 1259 Menter Electronic Corp. Santa Monitor, C.J. 1 1250 Menter Delta Corp. Santa Monitor, C.J. 1 1250 Menter Delta Corp. Santa Monitor, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1 1250 Menter Delta Corp. Northridge, C.J. 1	1123				* .		
19237 Chicago, Polephone of California, Inc. 1924 Sandy Visite Electronic Corp. Wilthum, Man. 21328 1935 Teledryte Inc., Microwave Dw. Palo Alio, Cal. 1935 Teledryte Inc., Microwave Dw. Palo Alio, Cal. 1936 Precision Connector Corp. Journal, Cal. 1936 Precision Connector Corp. Journal, Cal. 1936 Precision Connector Corp. Journal, Cal. 1937 Teledryte Inc., Microwave Dw. Palo Alio, Cal. 1938 Connect Instrument Corp., Semicolutor Division, Frod. 24650 Grant Lamp Division. Nels Park, Cleveland, Cal. 1937 Growell Instrument Corp., Semicolutor Division, Frod. 24651 Grant Lamp Division. Nels Park, Cleveland, Cal. 1938 Convending Corp. Nelson Man. 24661 1938 Connect Instrument Corp. 1939 Philadelphia Hendle Co. Canaden, N.J. 1939 Colow Mig. Co., Inc. Shady Grows, Pr. 1939 Colow Mig. Co., Inc. Shady Grows, Pr. 1939 Delta Semicolomic Corp. William Mark Electronics Corp. New Haven, Conn. 1930 Delta Semicolomicia Corp. Scott Galla, Articon. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Cal. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Cal. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Cal. 1939 Corp. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. New Holland, Co. 1930 Delta Semicolomicia Corp. Ne	1123	6 CTS of Berne	, Inc	Berne, Ind.			
11242 Bay State Electronies Corp. 11242 Bay State Electronies Corp. 11243 National Scal 11243 National Scal 11244 Dones Right State Corp. 11244 Dones Right State Corp. 11245 Bay State Disconsister Corp. 11245 Bay State Disconsister Corp. 11246 Dones Right State Corp. 11246 Bay State Disconsister Corp. 11246 Bay State Disconsister Corp. 11246 Bay State Disconsister Corp. 11247 Bay State Disconsister Corp. 11247 Bay State Disconsister Corp. 11247 Bay State Disconsister Corp. 11248 Bay State Disconsister Corp. 11249 Philosophia Handie Co. 12240 Bay State Disconsister Corp.		7 Chicago Teler	hone of California, In	c.		General Atronics Corp	Philadelphia,
1312		, Cilicado reiol		So. Pusadena, Cal.	21226	Executone, Inc.	. Long Island City, N
1912 Triedwin Inc. Microwave Dp. Pado Allo, Cal. 1906 Transien Mealinergial Corp. N. Chinege Mealinergial Corp. Inc. Downer, Cal. 20062 Texasan Corp. Inc. Commisco, N. C. 1906 Treation Connector Corp. James Co. C. 2006 Treation Connector Corp. Newsark, N. J. 1917 Imperial Electronic, Inc. Susan Park, Col. 26851 Granul Instrument Corp. Semicolator Division, Prod. 26655 Granul Instrument Corp. Semicolator Division, Prod. 26655 Granul Instrument Corp. Semicolator Division, Prod. 26655 Granul Instrument Corp. Semicolator Division, Prod. 26655 Granul Instrument Special Corp. M. Human Corp. 1918 Granul Instrument Corp. Semicolator Corp. Corp. Division Corp. 26851 Granul Microwave Corp. 26851 Granul Microwave Corp. 26851 Granul Microwave Corp. 26851 Granul Microwave Corp. 26852 Granul Microwave			As a set of the set of	Waltham Mass		Fafnir Bearing Co., The	New Britian, Co
1933 National Seal . Downer, Cal. 1934 Dinnean Biostronics Inc Jananica, N.Y. 1935 San State National Deletronics Ind Washington, I. 1936 Dinnean Biostronics Inc Semineantury on March 1935 San State National Corp. Semineantury on March 1935 San State National Corp. Semineantury on March 1935 San State National Corp. Semineantury on March 1935 San State National Corp Semineantury on March 1935 San State National Corp Semineantury on March 1935 San State National Corp Semineantury on March 1935 San State National Corp Semineantury on March 1935 San State National Corp Semineantury on March 1935 San State National Corp Clark, M. J. 1936 Dickson Biochem State Corp Semineantury on March 1935 San State	1124	2 Bay State Ele	ctronics Corp.	, , . Wattiaili, mass.		Fonctool Matallusgical Corn	N Chicago
11314 National Stal 11363 Precision Commenter Curp. 11713 General Instruments Corp. 11713 General Instruments Corp. 11714 Organization of the Comment Corp. 11717 Imperial Electronic. Inc. 11717 Imperial Electronic. Inc. 11717 Imperial Electronic. Inc. 11717 Manual Electronic.	1131	<ol> <li>Teledyne Inc.</li> </ol>	, Microwave Div	, Palo Alto, Cal.			
1463 Precision Connector Corp.  1371 Junean Electronics Inc.  1372 Junean Electronics Inc.  1373 Junean Electronics Inc.  1374 Junean Electronics Inc.  1375 Junean Electronics Inc.  1376 Melaba Inc.  1376 Melaba Inc.  1376 Melaba Inc.  1376 Melaba Inc.  1377 Julea Electronics Inc.  1377 Julea Electronics Inc.  1377 Julea Electronics Inc.  1377 Julea Electronics Inc.  1377 Julea Electronics Inc.  1377 Julea Electronics Inc.  1377 Melaba Inc.  1378 Melaba Inc.  1378 Melaba Inc.  1378 Julea Electronics Inc.  1378 Melaba Inc.  1379 Melaba Inc.  1379 Melaba Inc.  1370 Julea Electronics Inc.  13	1131	4 National Seal		Downey, Cal.			
11514 Duncan Electronics Inc.  1260 General Instrument Corp., Semiconductor Divition, Inc.  1271 Lect Of Electronics, Inc.  1272 Lect Of Electronics, Inc.  1273 Melaba, Inc.  1274 Melaba, Inc.  1275 Melaba, Inc.  1276 Philadophia Handle Co.  1276 Chronett Mig. Con.  1276 Chronett Mig. Con.  1276 Chronett Mig. Con.  1277 Melaba, Inc.  1278 Elemar Filter Corp.  1278 Melance Mig. Con.  1278 Milghord Mig. Con.  1278 Milghord M	A Company of the Comp	2 Presiden Con	nector Com	Jamaica, N.Y.	23783	British Radio Electronics Ltd	Washington, Γ
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Table 6-5. Manufacturer's Code List

Code		Code		
No.	Manufacturer Address	No.	Manufacturer	Address
83501	Gavitt Wire and Cable Co., Div. of Amerace Corp.	94144	Raytheon Co., Comp. Div., Ind. Com	p. Operations
00002	Brookfield, Mass.			Quincy, Mass.
83594	Burroughs Corp Electronic Tube Div Plainfield, N.J.	94148	Scientific Electronics Products, Inc.	•
83740	Union Carbide Corp. Consumer Prod. Div.	94154 94197	Wagner Elect. Corp., Tung-Sol Div. Curtiss-Wright Corp. Electronics Div.	Newark, N.J.
00777	Model Eng. and Mfg., Inc	34131	Curtiss-wright Corp. Electionics Div.	East Patterson, N.J.
83777 83821	Loyd Scruggs Co Festus, Mo.	94222	South Chester Corp	Chester, Pa.
83942	Aeronautical Inst. & Radio Co Lodi, N.J.	94330	Wire Cloth Products, Inc	Bellwood, Ill.
84171	Arco Electronics Inc Great Neck, N.Y.	94375	Automatic Metal Products Co	
84396	A.J. Glesener Co., Inc San Francisco, Cal.	94682	Worcester Pressed Aluminum Corp.	
84411	TRW Capacitor Div	94696 95023	Magnecraft Electric Co	
84970 85454	Boonton Molding Company Boonton, N.J.	95236	Allies Products Corp	
85471	A.B. Boyd Co San Francisco, Cal.	95238	Continental Connector Corp	Woodside, N.Y.
85474	R.M. Bracamonte & Co San Francisco, Cal.	95263	Leecraft Mfg. Co., Inc	
85660	Koiled Kords, Inc	95265	National Coil Co	
85911	Seamless Rubb. Co	95275	Vitramon, Inc.	
86174	Fafnir Bearing ( Los Angeles, Calif. Clifton Precision Products Co., Inc. Clifton Heights, Pa.	95348 95354	Gordos Corp	
86197 86579	Precision Rubber Products Corp Dayton, Ohio	95566	Arnold Engineering Co	
86684	Radio Corp. of America, Electronic Comp. & Devices Div.	95712	Dage Electric Co., Inc.	
, ,	Harrison, N.J.	95984	Siemon Mfg. Co	Wayne, Ill.
86928	Seastrom Mfg. Co Glendale, Cal.	95987	Weckesser Co	Chicago, Ill.
87034	Marco Industries Anaheim, Cal.	96067	Microwave Assoc., West Inc	
87216	Philco Corporation (Lansdale Division) Lansdale, Pa.	96095	Hi-Q Div. of Aerovox Corp	
87473	Western Fibrous Glass Products Co. San Francisco, Cal.	96256 96296	Thordarson-Meissner Inc Solar Manufacturing Co	
87664	Van Waters & Rogers Inc San Francisco, Cal. Tower Mfg. Corp Providence, R.I.	96396	Microswitch, Div. of MinnHoneywell	
87930 88140	Cutler-Hammer, Inc Lincoln, Ill.	96330	Carlton Screw Co	
88220	Gould-National Batteries, Inc St. Paul, Minn.	96341	Microwave Associates, Inc	
88698	General Mills, Inc Buffalo, N.Y.	96501	Excel Transformer Co	<del>-</del> . •
89231	Graybar Electric Co Oakland, Cal.	96508	Xcelite Inc	
89473	G.E. Distributing Corp Schenectady, N.Y.	96733	San Fernando Elect. Mfg. Co	
89665	United Transformer Co Chicago, Ill.	96881	Thomson Ind. Inc.	
90030	United Shoe Machinery Corp Beverly, Mass.	97464 97539	Industrial Retaining Ring Co Automatic & Precision Mfg	
90179	US Rubber Co., Consumer Ind. & Plastics Prod. Div.	97979	Reon Resistor Corp.	
90763	United Carr Fastener Corp	97983	Litton System Inc., Adler-Westrex Co	
90970	Bearing Engineering Co San Francisco, Cal.			New Rochelle, N.Y.
91146	ITT Cannon Elect. Inc., Salem Div Salem, Mass.	98141	R-Tronics, Inc	
91260	Connor Spring Mfg. Co San Francisco, Cal.	98159	Rubber Teck, Inc.	
91345	Miller Dial & Nameplate Co El Monte, Cal.	98220	Hewlett-Packard Co., Moseley Div	
91418	Radio Materials Co	98278 98291	Microdot, Inc	Mamaronech N V
91506 91637	Augat Inc Attleboro, Mass. Dale Electronics, Inc Columbus, Nebr.	98376	Zero Mfg. Co.	
91662	Elco Corp Willow Grove, Pa.	98410	Etc Inc.,	. Cleveland, Ohio
91737	Gremar Mfg. Co., Inc Wakefield, Mass.	98731	General Mills Inc., Electronics Div	Minneapolis, Minn.
91827	K F Development Co Redwood City, Cal.	98734	Paeco Div. of Hewlett-Packard Co	
91886	Malco Mfg. Co., Inc Chicago, Ill.	98821	North Hills Electronics, Inc.	
91929	Honeywell Inc., Micro Switch Div Freeport, Ill.	98978 99109	International Electronic Research Cor Columbia Technical Corp	
91961	Nahm-Bros, Spring Co Oakland, Cal. Tru-Connector Corp Peabody, Mass.	99109	Varian Associates	
92180 92367	Elgeet Optical Co., Inc Rochester, N.Y.	99378	Atlee Corp	
92607	Tensolite Insulated Wire Co., Inc Tarrytown, N.Y.	99515	Marshall Ind., Capacitor Div	
92702	IMC Magnetics Corp Westbury, Long Island, N.Y.	99707	Control Switch Division, Controls Co.	of America
92966	Hudson Lamp Co Kearney, N.J.			
93332	Slyvania Electric Prod. Inc., Semiconductor Div.	99800	Delevan Electronics Corp	
0000	Woburn, Mass.	99848 99928	Wilco Corporation	
93369	Robbins & Myers Inc Pallisades Park, N.J.	99926	Rembrandt, Inc	
93410	Stemco Controls, Div. of Essex Wire Corp.  Mansfield, Ohio	99942	Hoffman Electronics Corp., Semicond	
93632	Waters Mfg. Co Culver City, Cal.			
93929	G.V. Controls Livingston, N.J.	99957	Technology Instrument Corp. of Calif	
94137	General Cable Corp Bayonne, N.J.			Newbury Park, Cal.
The foll	lowing HP Vendors have no number assigned in the latest supple	ment to the	Federal Supply Code for Manufacture	rs Handbook.
0000F	Malco Tool and Die Los Angeles, Calif.	OOOMM	Rubber Eng. & Development	Hayward Cal
0000Z	Willow Leather Products Corp Newark, N.J.	000NN	A "N" D Mfg. Co.	
000AB	ETA England	000QQ	Cooltron	Oakland, Cal.
000BB	Precision Instrument Components Co. Van Nuys, Cal.	000WW		
	Hewlett-Packard Co., Colorado Springs	000YY	S.K. Smith Co	Los Angeles, Cal.
000CS	Colorado Springs, Colorado			

00015-45 Revised: October 1969

From: Handbook Supplements H4-1 Dated AUGUST 1966

# BACK DATING MANUAL OHANGES

Model 8552A Manual Changes

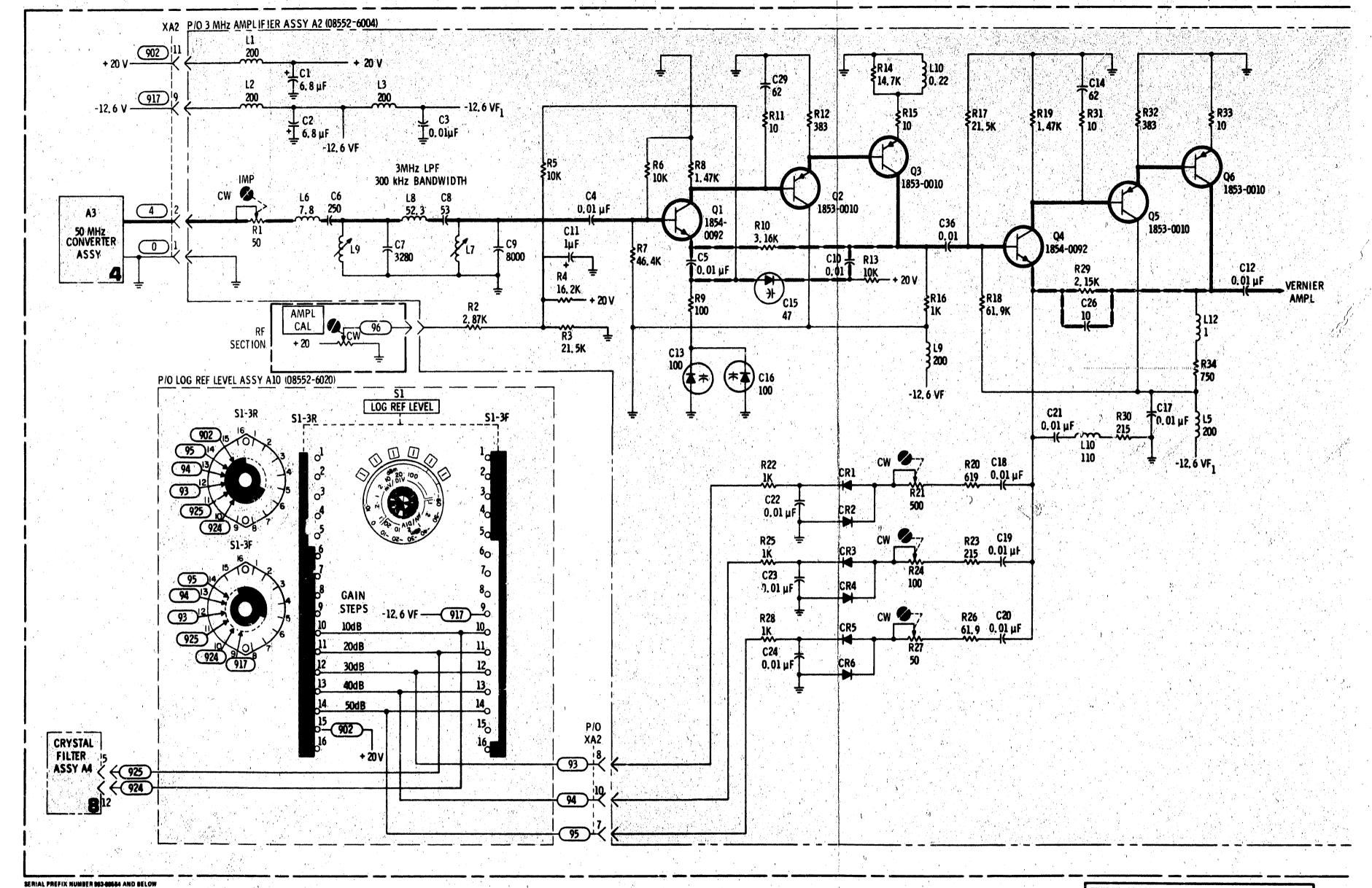
# SECTION VII MANUAL CHANGES

## 7-1. CURRENT INSTRUMENTS.

- 7-2. This manual applies directly to standard Model 8552A Spectrum Analyzer IF Sections having a serial prefix of 952.
- 7-3. This manual also covers instruments with a serial prefix below 952. Changes made to the 8552A prior to serial prefix 952 are covered in this section. Each change that was made is covered by a schematic and a parts list. Changes are identified by the serial prefix numbers on the schematics.

## 7-4. NEWER INSTRUMENTS.

7-5. As changes are made to the Model 8552A, newer instruments may have serial prefix numbers not listed in this manual. The manuals for these instruments will be supplied with an additional "Manual Changes" sheet containing the required information; contact your nearest Hewlett-Packard Sales and Service Office for information if this sheet is missing.



REFERENCE DESIGNATIONS WITHIN OUTLINED (----)
ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER; e.g., R1 OF ASSEMBLY A1
IS AIR1. DESIGNATIONS OF OTHER COMPONENTS ARE
COMPLETE AS SHOWN.

3

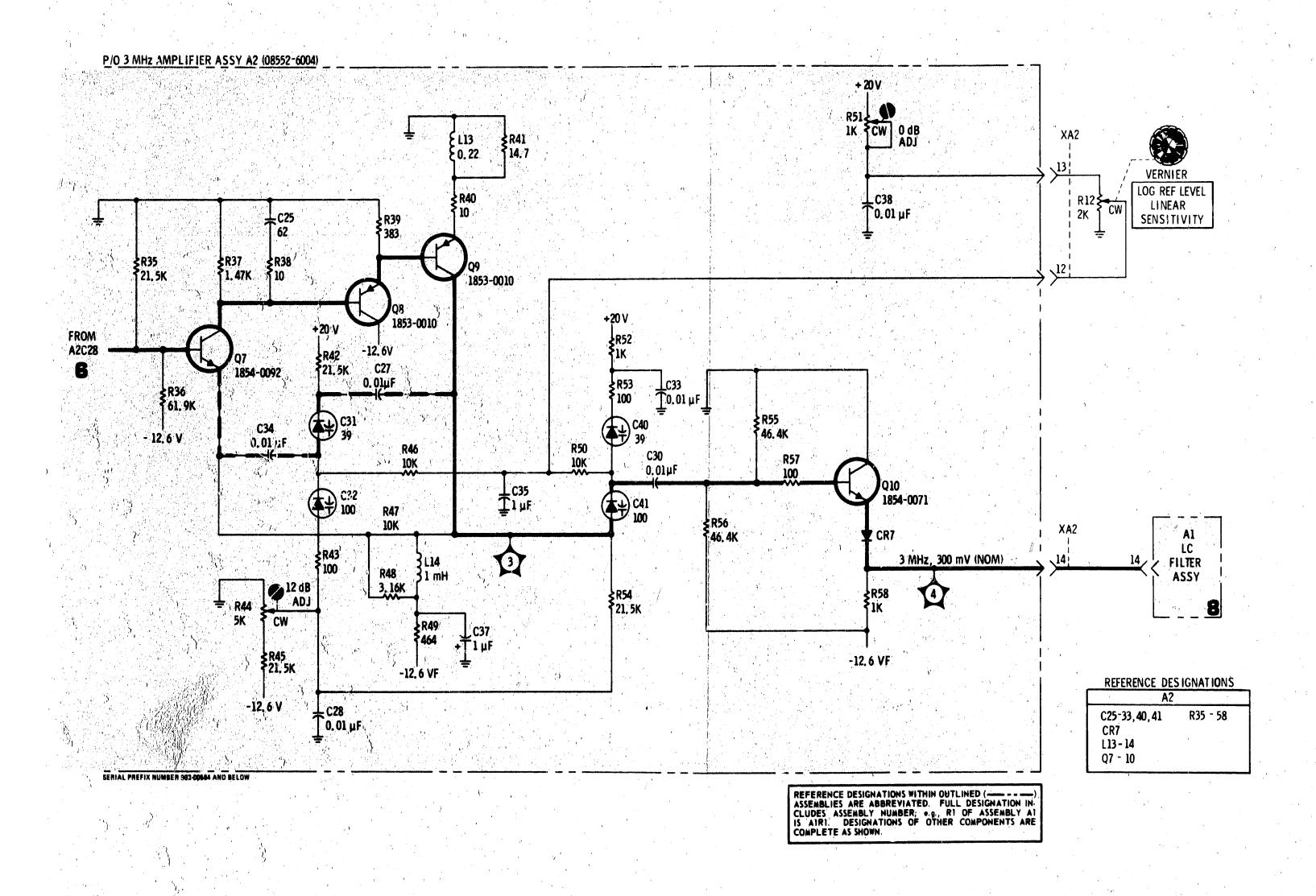


Figure 7-2. Serial Prefix 903-00564 and Below, 3 MHz Amplifier (Sheet 2 of 2)

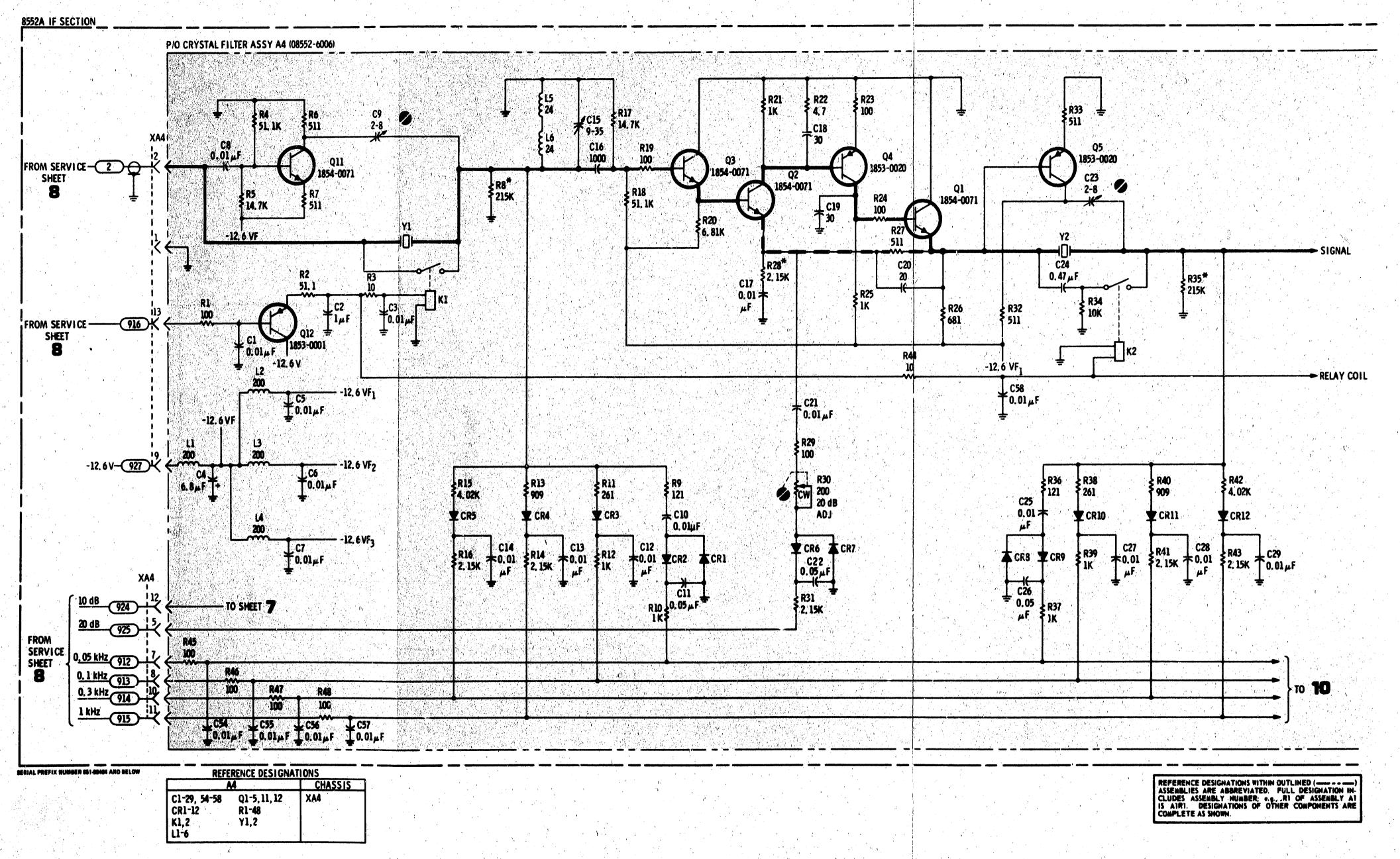


Figure 7-3. Serial Prefix 851-00464 and Below, 3 MHz Crystal Filter (Sheet 1 of 2)

## Manual Changes

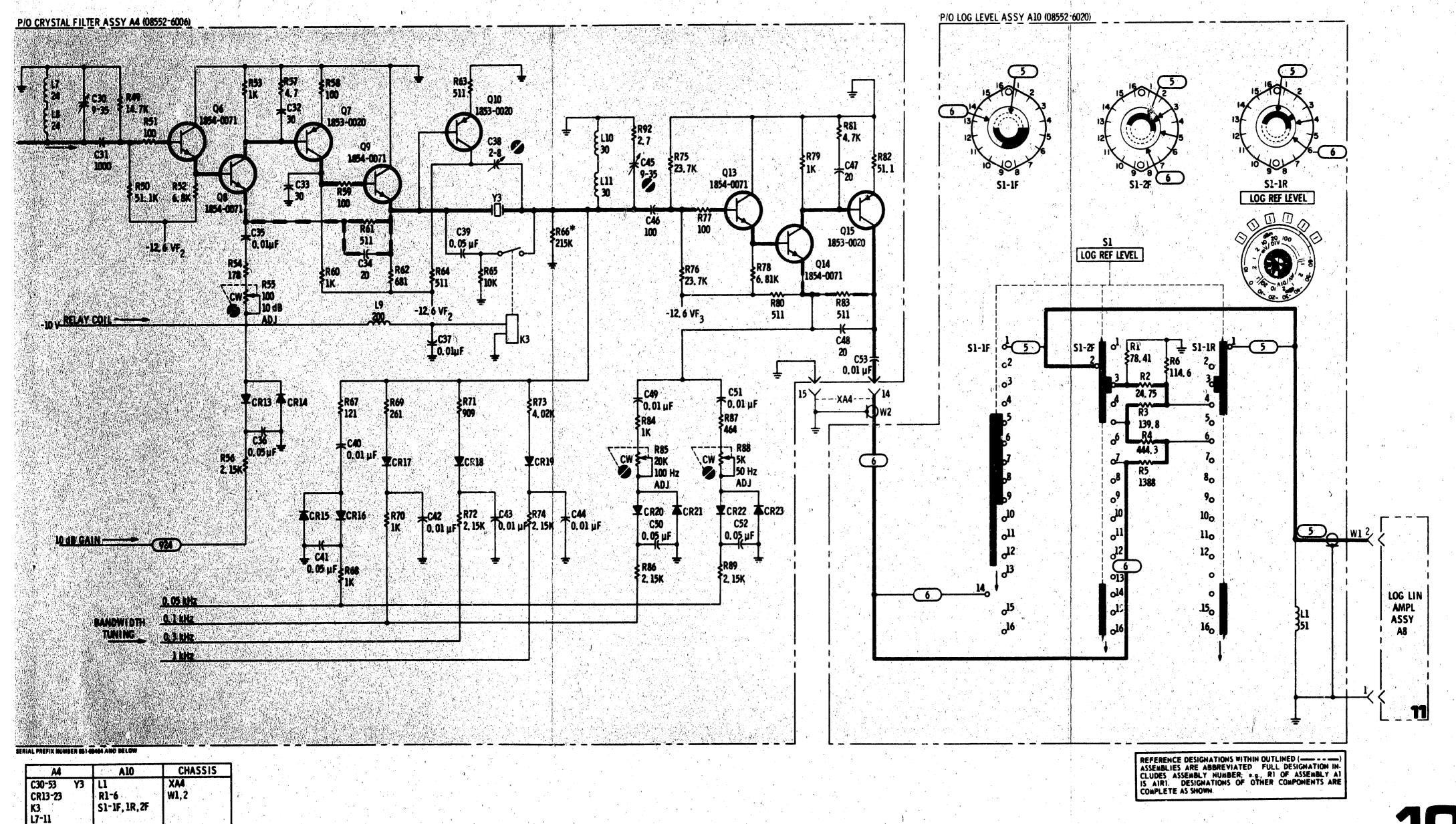
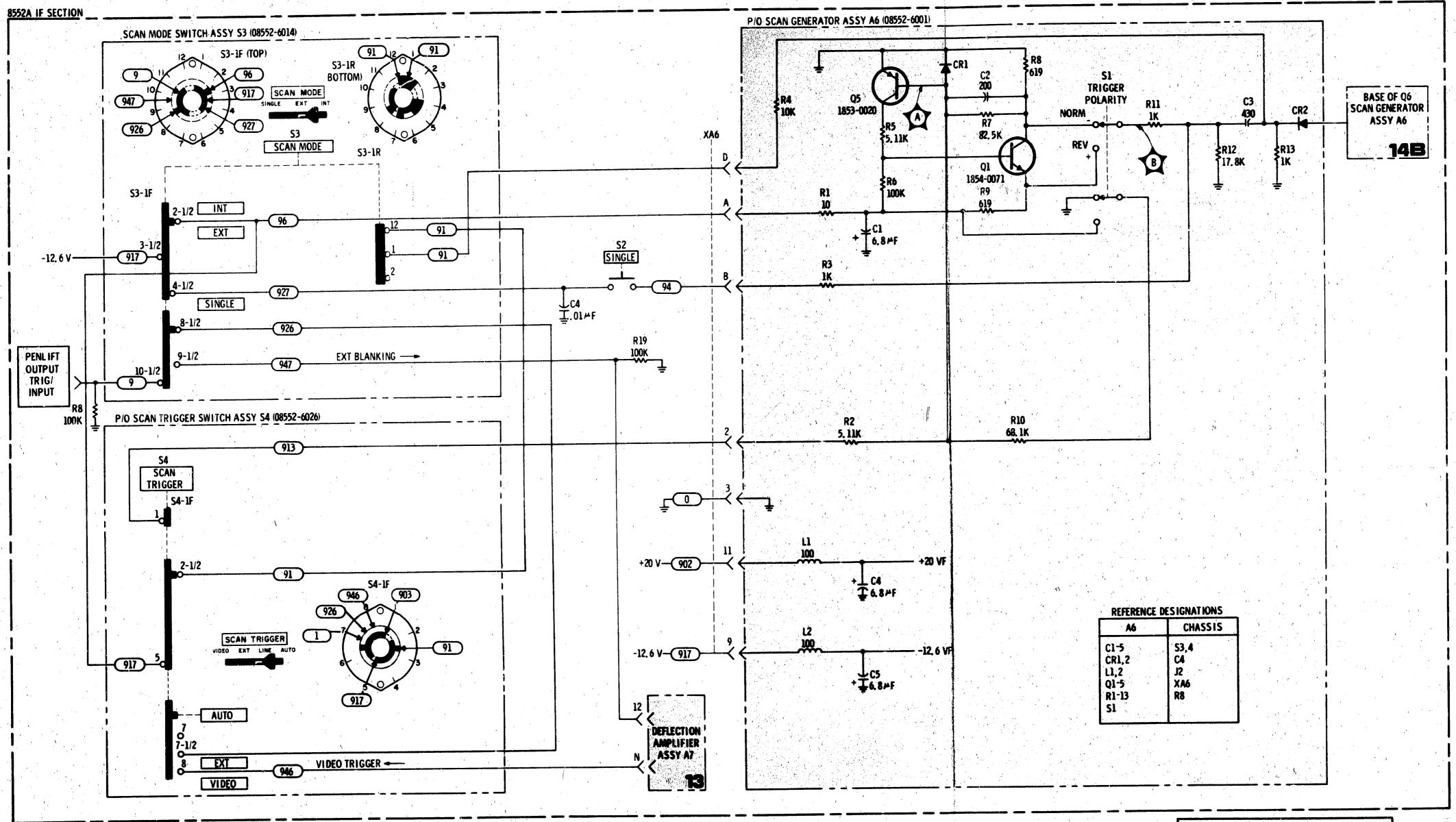


Figure 7-4. Serial Prefix 851-00464 and Below, 3 MHz Crystal Filte (Sheet 2 of 2)

Q6-10, 13-15 R49-89



SERIAL PREFIX NUMBER 943-01000 AND BELOW

14

Figure 7-5. Serial Prefix 943-01889 and Below, Scan Control and Trigger Circuits

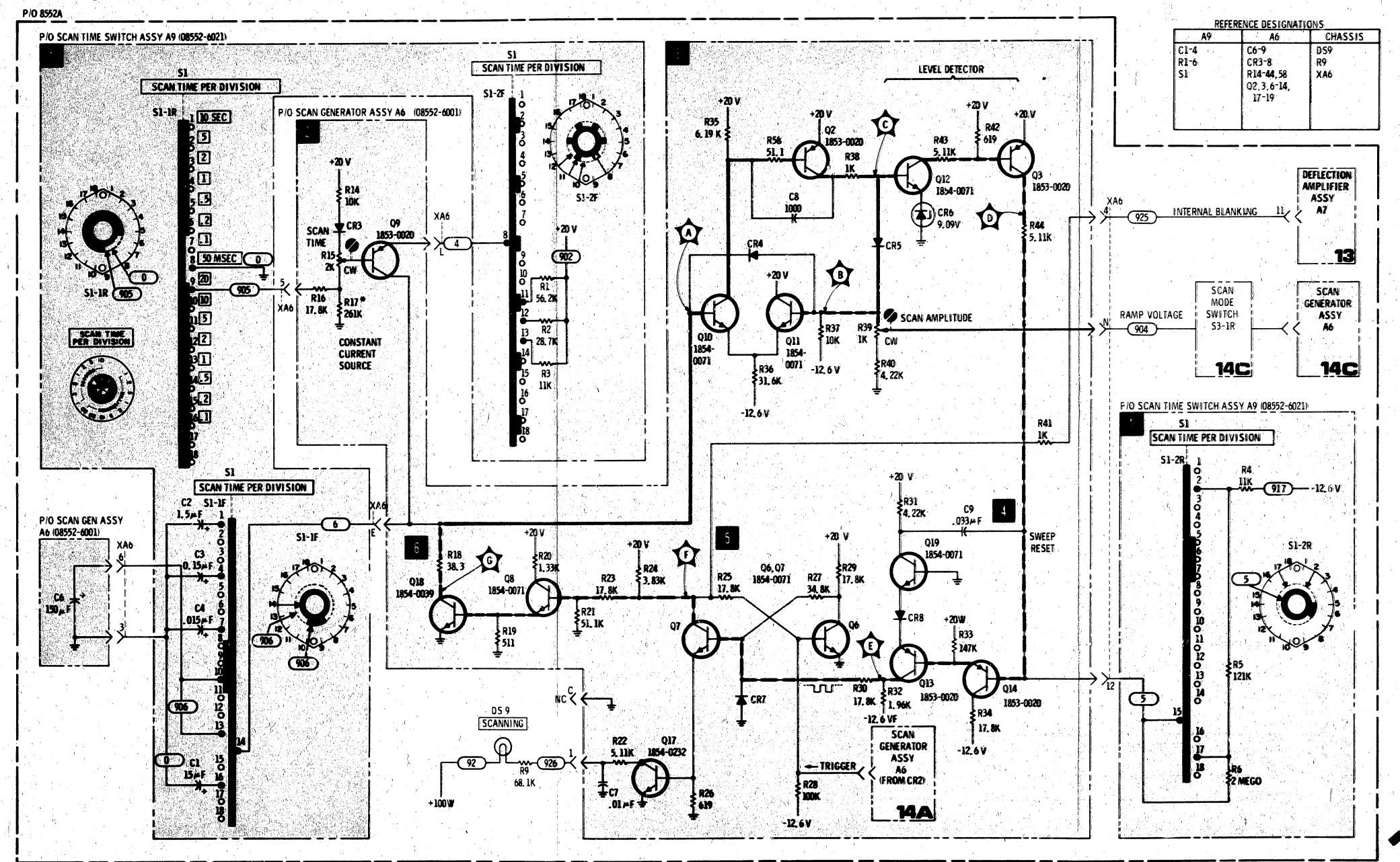


Figure 7-6. Serial Prefix 943-01889 and Below Scan Generator and Control Circuits

REFERENCE DESIGNATIONS WITHIN OUTLINED (----)
ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY. NUMBER: e.g., RT OF ASSEMBLY AT
IS ATRI. DESIGNATIONS OF OTHER COMPONENTS ARE
COMPLETE AS SHOWN.

SERIAL PREFIX 943-01889 AND BELCHES
SCAN CONTROL AND TRIGGER CIRCUITS

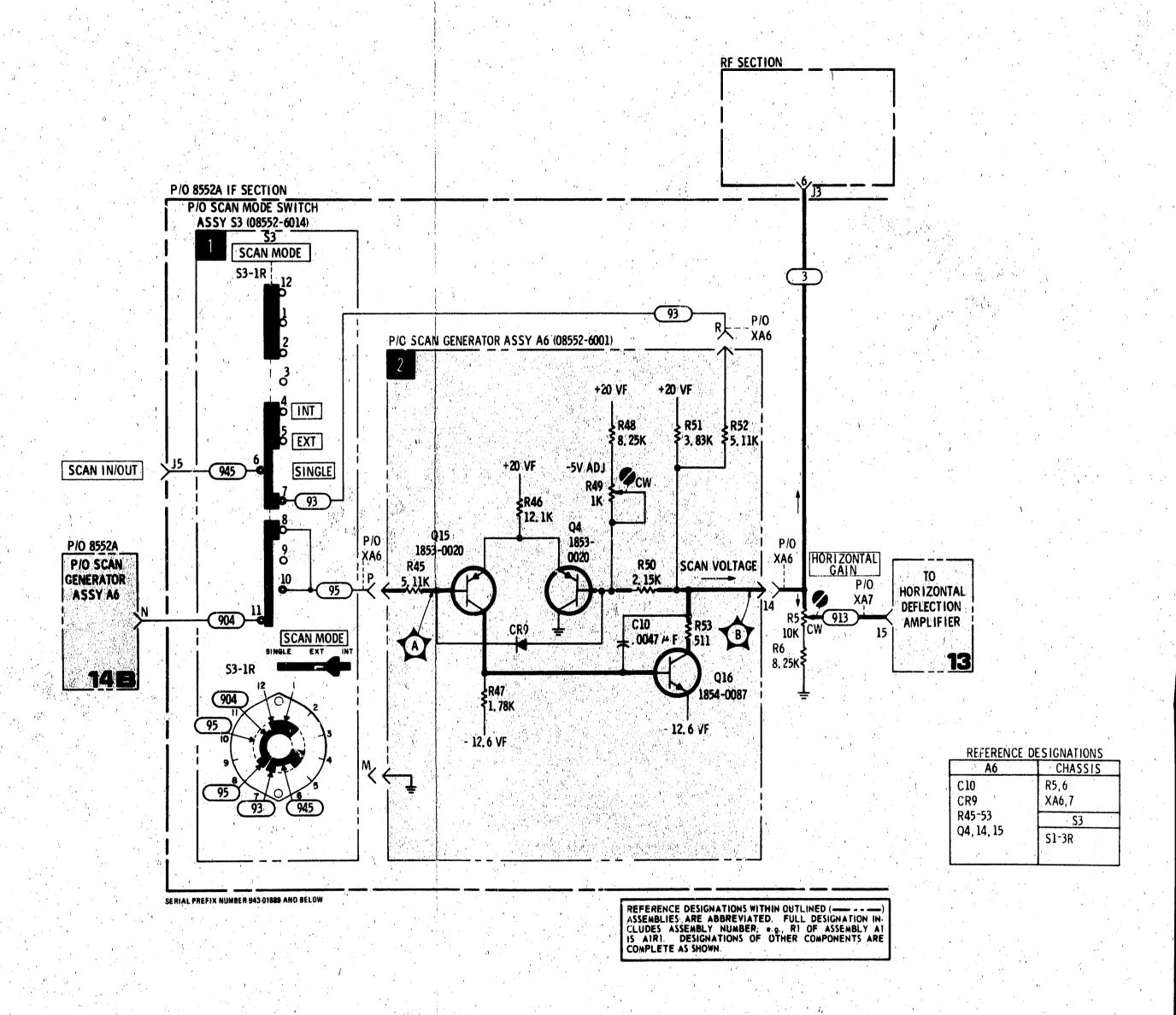


Figure 7-7. Serial Prefix 943-01889 and Below, Scan Generator Circuits

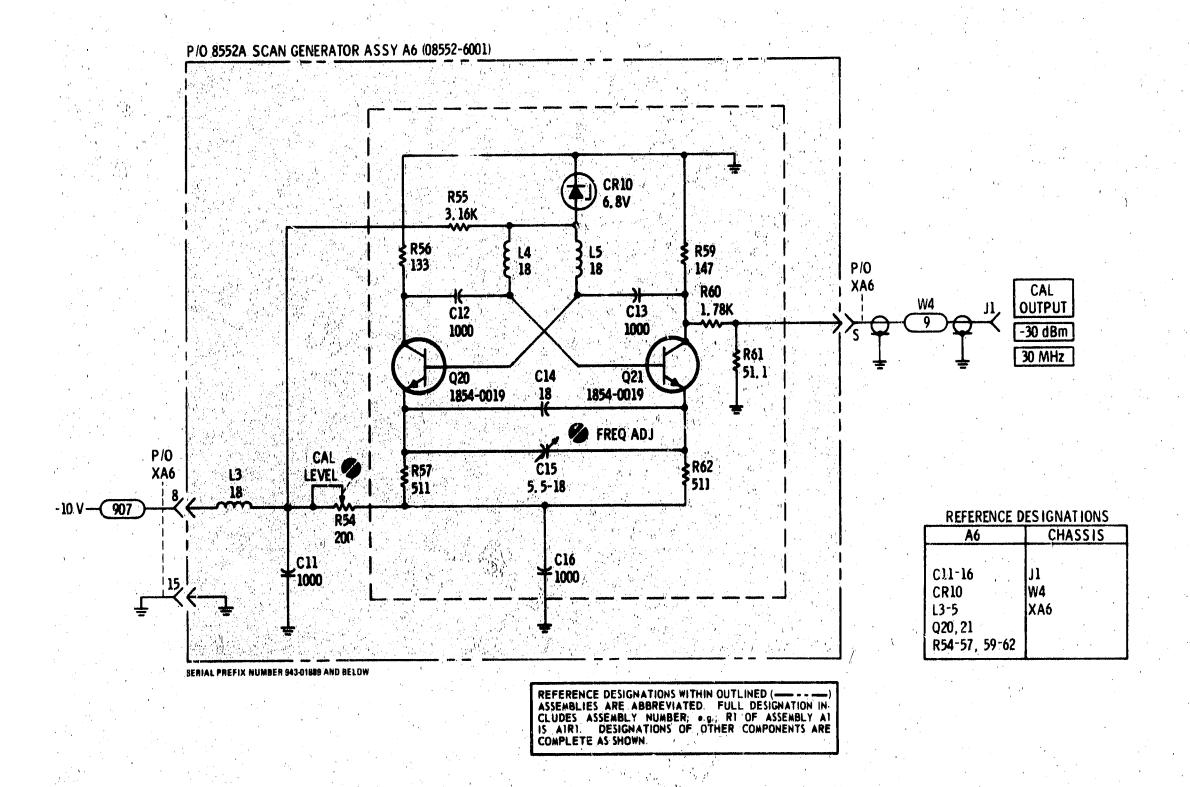


Figure 7-8. 30 MHz Calibration Oscillator

Table 7-1. 3 MHz Amplifier A2 Reference Designation Index

Reference Designation	Part No.	Description #		Note
2001811011				
				<u> </u>
			, , ,	
12	08552-6004	BOARD ASSY:3 MHZ AMPLIFIER	2 h	100
				1
A2C1	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCH		İ
A2C2	0180-0116	C:FXD ELECT 6.8 UF 108 35VDCW		
12C3	0160-2930	C:FXD CER 0.01 UF +80-20\$ 100VDCW		1
A2C4	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW		
N2C5	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW		
A2C6	0160-3046	C:FXD MICA 250 PF 18 100VDCH		
	0160-3047	C: FXD MICA 3280 PF 18 100VDCH		٠.
A2C7 A2C8	0160-3045	C:FXD NICA 53.8 PF 18 100VDCH	· .	1
1209	0160-3048	C:FXD HICA 8000 PF 18 100VDCH	,	
A2C10	0160-2930	C:FXD CER 0.01 UF +80-208 100VDGW	, · ·	1 .
A2C11	0180-0291	C: FXD ELECT 1.0 UF 108 35VDCH	<b>N</b>	1.
				l
A2C12	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW		1
A2C13	0122-0221	C: VOLTAGE VAR 100 PF 108 30VOCH		1
A2C14	0140-0205	C:FXD MICA 62 PF 58	a to the second	. *
A2C15	0122-0213	C: VOLTAGE VAR 47 PF 10% 30VDCH		
A2C16	0122-0221	C: VOLTAGE VAR 100 PF 108 30VDCW		1
A2C 17	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH		1
A2C18	0160-2930	C:FXD CER 0.01 UF +80-20\$ 100VDCW		1
A2C19	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH		1
A2C20	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW		1
A2C21	0160-2930	C: FXD CER 0.01 UF +80-208 100VDCW		1
	0140 0070	C:FXD CER 0.01 UF +80-208 100VDCH		1
A2C22 A2C23	0160-2930 0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW		
A2C24	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW		1
A2C25	0140-0205	C: FXD MICA 62 PF 58		4
A2C26	0160-2257	C:FXD CER 10 PF 58 500VDCH		<b>.</b>
	0340 0000	P. EVD CED A A3 HE 400-300 100HE		
A2C27 A2C28	0160-2930 0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH C:FXD CEP 0.01 UF +80-20% 100VDCH		
n2C28 A2C29	0140-0205	C: FXD NICA 62 PF 5%		
A2C30	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH		
A2C31	0122-0043	C: VOLTAGE VAR 39-17.95PF 28 4-25VDCH	e es	,
	0.00			ľ
A2C32 A2C33	0122-0044 0160-2930	C: VOLTAGE VAR 100-45.9PF 28 4-25VDCH C: FXD CER 0.01 UF +80-208 100VDCH		
A2C34	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH		٠,
A2C35	0180-0291	C:FXD ELECT 1.0 UF 108 35VDCW		1
A2C36	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH	; · · · · · · · · · · · · · · · · · · ·	
		المستحد شموا شريع والعمر بشريع والمتاب		
A2C37	0180-0291	C:FXD ELECT 1.0 UF 108 35VDCW C:FXD CER 0.01 UF +80-208 100VDCW		1
A2C38 A2C39	0160-2930	NOT ASSIGNED		
M2C40	0122-0043	C: VOLTAGE VAR 39-17.95PF 28 4-25VDCH		100
A2C41	0122-0044	CIVOLTAGE VAR 100-45.9PF 28 4-25VDCH		5.74
				1
A2CR1	1901-0040	DIODE:SILICON 30MA 30MV		
A2CR2	1901-0040	DIODE:SILICON 30MA 30MV		
A2CR3	1901-0040	DIODE:SILICON 30MA 30MV		
AZCR4	1901-0040	DIODE:SILICON 30MA 30MV DIODE:SILICON 30MA 30MV		
A2CR5	1901-0040	NIONE STRICKL SAW SAWA		
and the second s				Park San San
	lg Kreji i katalon (1. km² km² km²).			

Table 7-1. 3 MHz Amplifier A2 Reference Designation Index

Designation  A2CR6 A2CR7  A2L1  A2L2 A2L3 A2L4 A2L5 A2L6  A2L7 A2L8 A2L9 A2L10	1901-0040 1901-0040 9140-0237 9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	DIODE:SILICON 30MA 30MV DIODE:SILICON 30MA 30MV  COIL:FXD 200 UH 5% CO	
A2CR7 A2L1 A2L2 A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L9	1901-0040 9140-0237 9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	DIODE:SILICON 30MA 30MV  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL/CHOKE 7.8 UH 2%	
A2CR7 A2L1 A2L2 A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	1901-0040 9140-0237 9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	DIODE:SILICON 30MA 30MV  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL/CHOKE 7.8 UH 2%	
A2CR7 A2L1 A2L2 A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	1901-0040 9140-0237 9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	DIODE:SILICON 30MA 30MV  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL/CHOKE 7.8 UH 2%	
A2CR7 A2L1 A2L2 A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	1901-0040 9140-0237 9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	DIODE:SILICON 30MA 30MV  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL/CHOKE 7.8 UH 2%	
A2CR7 A2L1 A2L2 A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	1901-0040 9140-0237 9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	DIODE:SILICON 30MA 30MV  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL/CHOKE 7.8 UH 2%	
A2L1 A2L2 A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	9140-0237 9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL:FXD 200 UH 5%  COIL/CHOKE 7.8 UH 2%	
A2L2 A2L3 A2L4 A2L5 A2L6 A2L6 A2L7 A2L8 A2L8	9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL/CHOKE 7.8 UH 2%	
A2L2 A2L3 A2L4 A2L5 A2L6 A2L6 A2L7 A2L8 A2L8	9140-0237 9140-0237 9140-0237 9140-0237 9100-2744	COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL/CHOKE 7.8 UH 2%	
A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	9140-0237 9140-0237 9140-0237 9100-2744	COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL/CHOKE 7.8 UH 28	
A2L3 A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	9140-0237 9140-0237 9140-0237 9100-2744	COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL/CHOKE 7.8 UH 28	
A2L4 A2L5 A2L6 A2L7 A2L8 A2L8	9140-0237 9140-0237 9100-2744 08552-6011	COIL:FXD 200 UH 5% COIL:FXD 200 UH 5% COIL/CHOKE 7.8 UH 28	
A2L5 A2L6 A2L7 A2L8 A2L9	9140-0237 9100-2744 08552-6011	COIL:FXD 200 UH 5% COIL/CHOKE 7.8 UH 2%	
A2L6 A2L7 A2L8 A2L9	9100-2744 08552-6011	COIL/CHOKE 7.8 UH 28	•
A2L7 A2L8 A2L9	08552-6011		C - 1
A2L8 A2L9	The second secon	INDICTOR - 200 KM7 ETITER #1	
A2L8 A2L9	The second secon	ANDUCTUR - JUU NAL FALTER #1	
		COIL/CHOKE 52.3 UH 18	•
A21 10	08552-6012	INDUCTOR:300 KHZ FILTER #2	
Merso 1	9100-1611	COIL:FXD 0.22 UH 20%	
A2L11	9100-1636	COIL/CHOKE 110 UH 58	
	r i i i i i i i i i i i i i i i i i i i		
A2L12	9140-0137	CDIL: FXD RF 1000 UH 58	
A2L13	9100-1611	COIL: FXD 0.22 UH 20%	
A2L14	9140-0137	CDIL: FXD RF 1000 UH 58	
A201	1854-0092	Q:SI NPN	
		0. 41 BAD ( 64 66 66 66 66 66 66 66 66 66 66 66 66	
A202	1853-0010	Q:SI PNP(SELECTED FROM 2N3251)	
1203	1853-0010	Q:SI PNP(SELECTED FROM 2N3251)	· ·
1204	1854-0092	Q:SI NPN Q:SI PNP(SELECTED FROM 2N3251)	
A2Q5	1853-0010 1853-0010	Q:SI PNP(SELECTED FROM 2N3251)	
A206	1022-0010	TISE FIRESELLED TOWN ENGESAF	
A207	1854-0092	Q:SI NPN	
A208	1853-0010	0:SI PNP(SELECTED FROM 2N3251)	<i>j'</i> · · · ·
A209	1853-0010	Q:SI PNP(SELECTED FROM 2N3251)	
A2010	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	
A2R1	2100-1754	R:VAR WW 50 OHM 5% TYPE V 1W	
A2R2	0698-3151	R:FXD MET FLM 2.87K OHM 18 1/8W	
A2R3	0757-0199	R:FXD MET FLM 21.5K CHM 1% 1/8W	.1
A2R4	0757-0447	R:FXD MET FLM 16.2K OHM 14 1/8W	
A2R5	2757-0442	R:FXD MET FLM 10.0K 18 1/8W	•
A2R6	0757-0442	R:FXD MET FLM 10.0K 1% 1/8W	
A2R7	0698-3162	R: FXD MET FLM 46.4K OHM 13 1/8W	
A2R8	0757-1094	RIFXD MET FLM 1.47K OHM 1% 1/8W	
A2R9	0757-0401	R:FXD MET FLM 100 OHM 18 1/8W R:FXD MET FLM 3.16K OHM 18 1/8W	
A2R10	0757-0279	RIFXD MET FLM 3.16K CHM 14 1/6W	
A2R11	0757-0346	MOTAL REI FER AV UND A4 A/ON	()
42012	0609-2444	R:FXD MET FLM 383 OHM 18 1/8W	
A2R12	0698-3446 0757-0442	R:FXD MET FLM 383 UNM 12 1/8W	.*
A2R13 A2R14	0698-3428	R: FXD MET FLM 14.7 OHM 13 1/8W	
A2R15	0757-0346	R: FXD MET FLM 10 OHM 18 1/8W	i
A2R16	0757-0280	R:FXD MET FLM 1K OHM 18 1/8H	
			, v st
A2R17	0757-0199	R:FXD MET FLM 21.5K OHM 18 1/8W	· .
A2R18	0757-0460	R:FXD MET FLM 61.9K OHM 18 1/8H	
A2R19	0757-1094	R: FXD MET FLM 1.47K CHM 18 1/8W	
A2R20	0757-0418	R:FXD MET FLM 619 OHM 18 1/8W	I
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<sup>#</sup> See introduction to this section for ordering information

Table 7-1. 3 MHz Amplifier A2 Reference Designation Index

Reference Designation	⊕ Part No.	Description #	Not
A2R21	2100-1757	R: VAR WW 500 OHM 5% TYPE V 1W	
A2R22	0757-0280	R:FXD MET FLM 1K CHM 18 1/8H	
A2R23 A2R24	0698-3441 2100-1755	R:FXD MET FLM 215 OHM 1% 1/8W R:VAR WW 100 OHM 5% TYPE V 1W	
AZRZS	0757-0280	R:FXD MET FLM 1K OHM 18 1/8W	
- Che	013. 02.00	NOTICE VEH 2N COM 20 27 CM	
A2R26	0757-0276	R: FXD MET FLM 61.9 UHM 18 1/8H	
A2R27	2100-1754	R: VAR WW 50 OHM 5% TYPE V 1W	
A2R28	0757-0280	R:FXD MET FLM 1K OHM 18 1/8W	
A2R29 A2R30	0698-0084 0698-3441	R:FXD MET FLM 2.15K 1% 1/8W R:FXD MET FLM 215 OHM 1% 1/8W	
AERSU	0070-3442	ROPAD HET FER 213 OHR 14 1/OH	
A2R31	0757-0346	R:FXD MET FLM 10 OHM 18 1/8H	
A2R32	C698-3446	R:FXD MET FLM 383 OHM 1% 1/8W	
A2R33	0757-0346	R:FXD MET FLM 10 OHM 18 1/8W	
A2R34	0757-0420	RIFXD MET FLM 750 OHM 18 1/8W	
A2R35	0757-0199	R:FXD MET FLM 21.5K OHM 18 1/8W	
A 2R 36	0757-0460	R:FXD MET FLM 61.9K OHM 12 1/8W	
A2R37	0757-1094	R:FXD MET FLM 1.47K CHM 18 1/8W	
A2R38	0757-0346	R:FXD MET FLM 10 OHM 18 1/8H	
A2R39	0698-3446	R:FXD MET FLM 383 OHM 18 1/8H	
A2R40	0757-0346	R:FXD MET FLM 10 OHM 1% 1/8W	
A2R41	0698-3428	R:FXD MET FLM 14.7 OHM 13 1/8W	
2R42	0698-0084	R:FXD HET FLM 2.15K 18 1/8W	
A2R43	0757-0401	R:FXD MET FLM 100 DHM 18 1/8H	
A2R44	2100-1760	R: VAR WW 5K OHM 5% TYPE V 1W	
A2R45	0757-0199	R:FXD MET FLM 21.5K OHM 18 1/8H	
	0767 0440	D-FWD MET FIM 10 OK 10 140H	
A2R46 A2R47	0757-0442 0757-0442	R:FXD MET FLM 10.0K 1% 1/8W R:FXD MET FLM 10.0K 1% 1/8W	
A2R48	0757-0279	R:FXD MET FLM 3.16K CHM 18 1/8H	
A2R49	0698-0082	RIFXD MET FLM 464 OHM 14 1/8H	
A2R50	0757-0442	R:FXD MET FLM 10.0K 18 1/8W	
A2R51 A2R52	2100-1758 0757-0280	R:VAR WW 1K OHM 5% TYPE V 1W R:FXD MET FLM 1K OHM 1% 1/8W	
A2R53	0757-0401	R:FXD MET FLM 100 UHM 1% 1/8W	
AZR54	0757-0199	R: FXD MET FLM 21.5K OHM 18 1/8H	
N2R55	0698-3162	R:FXD MET FLM 46.4K OHM 18 1/8W	
A2R 56 A2R 57	0698-3162 0757-0401	R:FXD MET FLM 46.4K QHM 1% 1/8W R:FXD MET FLM 100 QHM 1% 1/8W	
12R58	0757-0280	R:FXD HET FLM 1K OHM 1% 1/8W	
		The second secon	
12781	08552-2004	BOARD: BLANK PC	
		TRANSMAN ARM BEE AND	
	0360-0124	TERMINAL:SOLDER LUG	
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No.		and the first of the first of the first of the	
<b>.</b>			
			ta ding to be a significant of
		The state of the s	

Table 7-2. Crystal Filter A4 Reference Designation Index

Reference Designation	Part No.	Description #	Note
<b>A4</b>	08552-6006	BOARD ASSY:CRYSTAL FILTER	
A4C1	0140-2930	C:FXD CER 0.01 UF >80-202 100VDCH	
A4C2	0140-0291	C:FXD ELECT 1.0 UF 10% 35VDCH	
A4C3	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCH	
A4C4	0180-0116	CIFND ELECT 6.8 UF 10% 35VDCH	
A4C5	0160-2930	C:FXD CER 0.01 UF +80-203 100VDCH	
A4C6	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH	
A4C7	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4C8	0160-2930	C: FXD CER 0.01 UF +80-208 100VDCW	
A4C9	0121-0059	CIVAR CER 2-8 PF 300 VOCH	
A4C10	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	
A4C11	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCH	
A4C12	0160-2930	C:FXD CER 0-01 UF +80-20% 100VDCH	,
A4C13	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH	1
A4C14	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH	
A4C15	0121-0105	C:VAR CER 9-35 PF NPO	
A4C16	0150-0050	C:FXD CER DISC 1000 PF +80-208 1000VDCH	
A4C17	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C18	0160-2199	C:FXD MICA 30 PF 58	
A4C19	0160-2199	C:FXD MICA 30 PF 58	*
A4C20	0160-2198	C:FXD MICA 20 PF 58	
A4C21	0160-2930	C:FXD CER 0-01 UF +80-208 100VDCH	
A4C22	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCH	
A4C23	0121-0059	C:VAR CER 2-8 PF 300VDCH	,
A4C24	0160-0174	C:FXD CER 0.47 UF +80-208 25VDCH C:FXD CER 0.01 UF +80-208 100VDCH	
A4C25	0160-2930	CIPAD CER OUT OF VBO-204 TOURDEN	
A4C26	0160-2917	C:FXD CER 0.05 UF +80-208 100VDCW C:FXD CER 0.01 UF /+80-208 100VDCW	
A4C27	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C28	0160-2930 0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C29 A4C30	0121-0105	CIVAR CER 9-35 PF NPO	
	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A4C31 A4C32	0150-0050 0160-2199	C:FXD MICA 30 PF 5%	
A4C33	0160-2199	C:FXD MICA 30 PF 5%	
A4C34	0160-2198	C:FXD MICA 20 PF 58	
A4C35	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C36	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCW	
A4C37	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C38	0121-0059	CIVAR CER 2-8 PF 300VDCH	
A4C39	0160-2917	C:FXD CER 0.05 UF +80-208 100VDCW	1
A4C40	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C41	0160-2917	C:FXD CER 0.05 UF +80-208 100VDCW	
A4C42	0160-2910	C: FXD CER 0.01 UF +80-208 100VDCW	/h
A4C43	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH	
A4C44	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	1 . '
A4C45	0121-0105	C:VAR CER 9-35 PF NPO	
A4C46	0150-0050	C:FXD CER DISC 1000 PF +80-208 1000VDCW	
A4C47	0160-2198	C:FXD MICA 20 PF 58	
A4C48	0160-2198	C:FXD MICA 20 PF 5%	
A4C49	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCW	
A4C50	0160-2917	C:FXD CER 0.05 UF +80-20% 100VDCW	
	0160-2930	C:FXD CER 0.01 UF +80-208 100VDCH	
A4C51	· · · · · · · · · · · · · · · · · · ·		. 1
A4C51 A4C52	0160-2917	C:FXD CER 0.05 UF +80-208 100VDCW	1 4
	· · · · · · · · · · · · · · · · · · ·	C:FXD CER 0.05 UF +80-208 100VDCH C:FXD CER 0.01 UF +80-208 100VDCH C:FXD CER 0.01 UF +80-208 100VDCH	

<sup>#</sup> See introduction to this section for ordering information

Table 7-2. Crystal Filter A4 Reference Designation Index

Reference Designation	Part No.	(	Description #		Note
		1			
41					, ·
A4C55	0160-2930	C:FXD CER 0.01 UF	+80-20% 100VDCH		
A4C56	0160-2930	C:FXD CER 0.01 UF	+80-204 100VDCW		
A4C57	0160-2930	C:FXD CER 0.01 UF	+80-20% 100VDCW		
A4C58	0160-2930	C:FXD CER 0.01 UF	+80-504 IOOADC#		
	1001 0040	DIODE:SILICON 30M	1 30HV		
A4CR1	1901-0040	DIODE: 21F1COM 2012			
A4CR2	1901-0040	DIODE:SILICON 30MA	1 30HV		
A4CR3	1901-0040	DIODE:SILICON 30MA			
A4CR4	1901-0040	DIODE:SILICON 30M		·	
A4CR5	1901-0040	DIODE:SILICON 30M/ DIODE:SILICON 30M/			
A4CR6	1901-0040	DIMPS:21F1COM 30W	I JUNY		
A4607	1901-0040	DIODE:SILICON 30M	A 30MV		
A4CR7 A4CR8	1901-0040	DIODE:SILICON 30M			
A4CR9	1903-0040	DIODE:SILICON 30M	A 3 CHV		
A4CR10	1901-0040	DIODE:SILICON 30M			
A4CR11	1901-0040	DIODE:SILICON 30N/	A 30WV		
		DIODE:SILICON 30M	4 20HV		
A4CR12	1901-0040	DIODE:SILICON 30M			1
A4CR13	1901-0040	DIODE:SILICON 30M		V	
A4CR15	1901-0040	DIODE:SILICON 30M		•	
A4CR16	1901-0040	DIODE: SILICON 30M	A 30WV		, I.,
		$\mu$			
A4CR17	1901-0040	DIODE:SILICON 30M			
A4CR18	1901-0040	DIODE:SILICON 30M	A 30WV		
A4CR19	1901-0040 1901-0040	DIODE:SILICON 30M			
A4CR2O A4CR21	1901-0040	DIODE:SILICON 30M			
ATCREA	2,02,0010				
A4CR22	1901-0040	DIODE: SILICON 30M			•
A4CR23	1901-0040	DIODE: SILICON 30M	A 30HV		
	0400 0743	RELAY:REED			
A4K1	0490-0743	RELAT . REED			. ]
A4K2	0490-0743	RELAY:REED			
A4K3	0490-0743	RELAY : REED			
, <b>\</b>			_	•	
A4L1	9140-0237	COIL:FXD 200 UH 5	<b>*</b>		
	0140-0227	COIL:FXD 200 UH 5	. (1) 1 <b>2</b>		
A4L2 A4L3	9140-0237 9140-0237	COIL:FXD 200 UH 5			·.
A4L4	9140-0237	COIL:FXD 200 UH >5			
A4L5	9100-1622	COIL/CHOKE 24-0 U			
A4L6	9100-1622	COIL/CHOKE 24.0 U	H 58		1
		COTI ICHOVE 24 O I	ш «Ф		
A4L7	9100-1622 9100-1622	COIL/CHOKE 24.0 U			
A4LB A4L9	9140-0237	COIL: FXD 200 UH			
A4L10	9100-1622	COIL/CHOKE 24.0 L			
A4L11	9100-1622	COIL/CHOKE 24-0 L	JH 58		
					,
A401	1854-0071	Q:SI NPN(SELECTED	) FROM 2837091		1 .
4 A A A A A A A A A A A A A A A A A A A	1054-0071	OSSI NPN(SELECTED	FROM 2N3704)		.   ' .
A402 A403	1854-0071 1854-0071	QISI NPNISELECTED	) FROM 2N3704)	1	
A404	1853-0020	QISI PHP (SELECTED	) FROM 2N3702)		
A405	1853-0020	QUSI PHP (SELECTED	FROM 2N3702)	<b>\</b>	,
				$A = \{a_1, \dots, a_{n-1}, \dots, a_{$	,
		Market Company of the Company	· · · · · · · · · · · · · · · · · · ·		
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Table 7-2. Crystal Filter A4 Reference Designation Index

Designation	Part No.	Description #		Note
A406	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	e de la companya de la companya de la companya de la companya de la companya de la companya de la companya de	
A407	1853-0020	Q:SI PNP(SELECTED FROM 2N3702)	<i>i</i>	
A408	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)		
1409	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)		
A4010	1853-0020	Q:SI PNP(SELECTED FROM 2N3702)		
A4011	1854-0671	O:SI NPNISELECTED FROM 2N3704)		
44012	1853-0001	Q:SI PNP(SELECTED FROM 2N1132)		
44013	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)		1
14014	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)		
14015	1853-0020	Q:SI PNP(SELECTED FROM 2N3702)		
14R1	0757-0401	R:FXD MET FLM 100 0HM 14 1/8H	77	
1701	0151-0401	KIPAD HEI FEH 100 OHA 14 1/08	ή·	
14R2	0757-0394	R: FXD MET FLM 51-1 OHM 18 1/00		
14R3	0757-0346	R:FXD MET FLM 10 OHM 18 1/84		
14R4	0757-0458	R: FXD MET FLM 51.1K CHM 18 1/8W		•
14R5	0698-3156	R:FXD MET FLM 14.7K OHM 14 1786		
14R6	0757-0416	R: FXD MET FLM 511 OHM 14 1/01		
14R7	0757-0416	R:FXD MET FLM 511 OHM 14 1/8#		
14R8	0698-3454	R:FXD MET FLM 215K OHM 1% 1/8W	l	
4R9	0757-0403	R:FXD MET FLM 121 OHM 14 1/8W		
4R10	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8W	· · · · ·	
4R11 /	0698-3132	R:FXD FLM 261 OHM 14 1/8W		
#				
4R12 4R13	0757-0280 0757-0422	R:FXD MET FLM 1K OHM 1% 1/8W R:FXD MET FLM 909 OHM 1% 1/8W		
4R14	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W		1 1
4R15	0698-3558	R:FXD MET FLM 4.02K OHM 1% 1/8W	· · · · · · · · · · · · ·	
4R16	0698-0084	R:FXD HET FLM 2.15K 18 1/8W		•••
				•
14R17	0698-3156	R:FXD MET FLM 14.7K OHM 1% 1/8W	t '	
14R18 14R19	0757-0458 0757-0401	R:FXD MET FLM 51.1K CHM 1% 1/8W R:FXD MET FLM 100 OHM 1% 1/8W		
14R20	0757-0439	R:FXD MET FLM 6.81K CHM 1% 1/8W		
4R21	0757-0280	R:FXD MET FLM 1K OHM 18 1/8W		
14R22	0698-0001	R: FXD COMP 4.7 UHM 5% 1/2W	. ,	
4R23	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8H		
4R24	0757-0401	R:FXD MET FLM 100 OHM 1# 1/8W	<b>i</b>	
4R25	0757-0280	R:FXD MET FLM 1K OHM 18 1/8W		
4R 26	0757-0419	R:FXD MET FLM 681 OHM 1% 1/8H		
4R27	0757-0416	R:FXD MET FLM 511 OHM 18 1/8H		
4R28	0698-0084	R:FXD MET FLM 2.15K 18 1/8W		
4R29	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8H		
4R30	2100-1756	R: VAR HH 200 OHM 5% TYPE V 1H		
4R31	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W		
4R32	0757-0416	R:FXD MET FLM 511 OHM 18 1/8W		
4R 33	0757-0416	R:FXD MET FLM 511 OHM 18 1/8H		
4R34	0757-0442	R: FXD MET FLM 10.0K 18 1/8W	ſ	
4R35	0698-3454	R:FXD MET FLM 215K OHM 18 1/8W		
4R 36	0757-0403	R:FXD MET FLM 121 OHM 1% 1/8W		
1 4	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8W		
40278	0698-3132	R:FXD FLM 261 OHM 1% 1/8W		· · ·
14R37		R:FXD MET FLM 1K OHM 18 1/8W		1
4R38	0757-0280	NOTAU NEI FEN IN UNN 14 1/00	I	
14R37 14R38 14R39 14R40	0757-0280 0757-0422	R:FXD MET FLM 909 OHM 12 1/8H		•
4R38 4R39				
4R38 4R39				

Table 7-2. Crystal Filter A4 Reference Designation Index

Reference Designation	Part No.	Description #	Note
	P		
A 4 D 4 1	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W	
A4R41 A4R42	0698-3558	R:FXD MET FLM 4.02K CHM 1% 1/8W	
A4R43	0698-0084	R: FXD MET FLM 2.15K 1% 1/8W	
A4R44	0757-0346	R:FXD MET FLM 10 OHM 18 1/8W	
A4R45	0757-0401	R: FXD MET FLM 100 OHM 1% 1/8W	
N-TN-TJ	0.31-0401	NOVAD NET TEN 100 ONLY 14 1/00	
A4R46	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	,
A4R47	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8H	
A4R48	0757-0401	R:FXD MET FLM 100 UHM 1% 1/8W	5.1
A4R49	0698-3156	R:FXD MET FLM 14.7K OHM 1% 1/8W	
A4R50	0757-0458	R:FXD MET FLM 51-1K OHM 18 1/8W	•
44R51	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	
A4R52	0757-0439	R:FXD MET FLM 6.81K OHM 1% 1/8W	
A4R53	0757-0280	R:FXD MET FLM 1K OHM 18 1/8H	
A4R54	0698-3439	R: FXD MET FLM 178 OHM 1% 1/8W	•
A4R55	2100-1755	R: VAR WH 100 OHM 5% TYPE V 1W	
A4R56	0698-0084	R:FXD MET FLM 2.15K 1% 1/8W	•
A4R57	0698-0001	R: FXD COMP 4.7 OHM 5% 1/2W	
A4R58	0757-0401	R:FXD MET FLM 100 OHM 1% 1/8W	
14R59	0757-0401	R:FXD MET FLM 100 UHM 1% 1/8W	
A4R60	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8H	
¥ 3			
44861	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W	*
A4R62	0757-0419	R:FXD MET FLM 681 OHM 18 1/8W	
A4R63	0757-0416	R:FXD MET FLM 511 OHM 1% 1/8W	
44R64	0757-0416	RIFXD HET FLM 511 OHM 1% 1/8W	
44R65	0757-0442	R: FXD MET FLM 10.0K 18 1/8W	1.0
A4R66	0698-3454	R:FXD MET FLM 215K OHM 18 1/8W	
A4R67	0757-0403	R:FXD MET FLM 121 UHM 1% 1/8W	
A4R68	0757-0280	R:FXD MET FLM 1K OHM 12 1/8H	
A4R69	0698-3132	R: FXD FLM 261 OHM 18 1/8H	
A4R 70	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8H	
A4R71	0757-0422	R: FXD MET FLM 909 OHM 12 1/8W	*,
A4R72	0698-0084	R:FXD MET FLM 2.15K 18 1/8N	
A4R73	0698-3558	R:FXD HET FLM 4.02K CHM 12 1/8W	
A4R74	0698-0084	R:FXD MET FLM 2.15K 18 1/8H	
A4R75	0698-3158	REFXD MET FLM 23.7K OHM 18 1/8H	
·			
A4R 76	0698-3158	R:FXD MET FLM 23.7K OHM 18 1/8W	
A4R77	0757-0401	R:FXD MET FLM 100 OHM 18 1/8W	,
A4R78	0757-0439	R:FXD MET FLM 6.81K OHM 13 1/8W	·,
A4R79	0757-0280	R:FXD MET FLM 1K OHM 18 1/8H	
A4R80	0757-0416	R:FXD MET FLM 511 OHM 14 1/8h	
A4061	04.00-0001	POSTA COMO 4 7 DUM ET 3/24	* 1
A4R81	0698-0001 0757-0394	R:FXD COMP 4.7 OHM 5% 1/2W R:FXD MET FLM 51.1 OHM 1% 1/8W	1000
A4R82 A4R83	0757-0416	R:FXD MET FLM 511 OHM 14 1/8W	
M9K85	0757-0280	RIFAD HET FLM 1K OHM 18 1/8W	* 3
,	2100-1762	R: VAR WW 20K 58 1W	*
	2 200-110g		4
A4R 85		R:FXD MET FLM 2.15K 18 1/8W	
	UTGE-UUGT .	R:FXD HET FLM 464 OHM 18 1/8H	
A4R86	0698-0084	RIPAU REL PLM 707 UNR 18 1/02	
A4R86 A4R87	0698-0082		
A4R86 A4R87 A4R88	0698-0082 2100-1760	R: VAR NN 5K OHM 5% TYPE V 1N	
A4R86 A4R87	0698-0082		
A4R86 A4R87 A4R88	0698-0082 2100-1760	R: VAR NN 5K OHM 5% TYPE V 1N	
A4R86 A4R87 A4R88	0698-0082 2100-1760	R: VAR NN 5K OHM 5% TYPE V 1N	
A4R86 A4R87 A4R88	0698-0082 2100-1760	R: VAR NN 5K OHM 5% TYPE V 1N	
14R86 14R87 14R88	0698-0082 2100-1760	R: VAR NN 5K OHM 5% TYPE V 1N	

Table 7-2. Crystal Filter A4 Reference Designation Index

	Reference Designation	Part No.	Description #	Note
	AATDA	08552-2004	BOARD: BLANK PC	
	A4TB1	08552-2006	TERMINAL:SOLDER LUG	•
	A4Y1	0360-0124	CRYSTAL:QUARTZ(MATCHED SET OF 3)	
	A4Y2	0410-0139 0410-0139		
İ	A473	0410-0139	CRYSTAL:QUARTZ(MATCHED SET OF 3) CRYSTAL:QUARTZ(MATCHED SET OF 3)	
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Table 7-3. Scan Generator A6 Reference Designation Index

Reference Designation	Part No.	Description #	Note
			•
A6	08552-6001	BOARD ASSY:SCAN GENERATOR	
AGCI	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	
A6C2	0140-0198	C:FXD MICA 200 PF 5% C: FXD MICA 430 PF 5% 300 VDCW	
A6C3	0160-0939	C:FXD FLECT 6.8 UF 10% 35VDCW	
A6C4 A6C5	0180-0116	C:FXD ELECT 6.8 UF 10% 35VDCW	
A6C6	U180-2136	C:FXD ELECT 150 UF 10% 3 GVDCH	
, , , , , , , , , , , , , , , , , , ,	02110 2.2.50		
A6C7	0160-2930	C:FXD CER 0.01 UF +80-20% 100VDCW	•
A6C8	0160-0153	C:FXD MY 0.001 UF 10% 200VDCW	
AGCS	0160-0163	C:FXD MY G.033 UF 10% 200VDCW	
A6C 10	0160-0157	C:FXD MY 0.0047 UF 10% 200VDCH	1
AbCll	0150 <b>-</b> 0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
	Y		,
A6C 12	0150-0050	C:FXD CER DISC 1000 PF +80-20% 1000VDCW	
A6C13	0150-0050	C:FAD CER DISC 1000 PF +80-20% 1000VDCW	
A6C14	0160-2263	C:FAD CER 18 PF 5% 5GOVDCH	,
A6C15	0121-0036	C:VAR CER 5.5-18 PF CAL FREQUENCY	
, ,		CAL FREQUENCY	
AoC 16 on	0150-0050	C:FXD CER DISC 1000 PF +80-2CE 100CVDCW	
#0C10	0130 0030		,
A6CR1	1901-0025	DIUDE: SILICON 100MA/1V	•
AGURZ	1901-0025	DIODE: SILICON 100MA/1V	
A6CR3	1901-0025	DIUDE: SILICON 100MA/IV	
A6CH4	1901-0040	DIDDE: SILICON 30MA 30MV	
A6CR5	1901-0025	DIODE: SILICON 100MA/1V	'
AACRA	1902-0785	DIODE: BREAKDOHN 9.09V 5%	
	7	LIQUE: \$1LICUN 100MA/1V	
A6CR7	1901-0025	DIODE: SILICUN 100MA/1V	
A6CRB A6CR9	1901-0029	DIQUE: SILICUN 30MA 30WV	
AGCRIU	1902-0052	DIODE BREAKDUMN:6.81V	
F00110	1,02 0032		,
A6L1	9140-0210	COIL:FXD RF 100 UH 5%	
		1011 -EVA DE 100 III ES	
A6L2	9140-0210	COIL:FXD RF 100 UH 5% COIL/CHOKE 18 UH	
A6L3	9100-2267	COIL/CHOKE 18 UH	
A6L4 A6L5	9100-2267	COIL/CHOKE 18 UH	,
ACLS	7100-2201	CORE, CHORE TO OH	
A6MP1	08552-0024	SHIELD:CAN, SCAN GENERATOR	•
A601	1854-0071	Q:SI NPN(SELECTED FROM 2N3704)	Ì
			,
A602	1853-0020	Q:SI PNP(SELECTED FROM 2N3702)	. ,
A603	1853-0020	Q:SI PMP(SELECTED FRUM 2N3702)	
A604	1853-0020	O:SI PNP(SELECTED FROM 2N3702)	,
A605	1853-0020	U:SI PNP(SELECTED FROM 2N3702) O:SI NPN(SELECTED FROM 2N3704)	
`Δ606	1854-0071	WOL WINDELECTED FROM ENGINEE	
A607	1854-0071	U:SI NPNISELECTED FROM 2N3704)	
AOUB	1854-0071	U:SI NPN(SELECTED FROM 2N3704)	
A6U9	1853-0020	O:SI PNP(SELECTED FROM 2N3702)	
A6010	1854-0071	USSI NPNISELECTED FROM 2N37041	
	4		
i.			
			1
			6

Table 7-3. Scan Generator A6 Reference Designation Index

Reference Designation	Part No.	Description #	Note
A6011	1854-6071	u:SI NPN(SELECTED FROM 2N3704) u:SI NPN(SELECTED FROM 2N3704)	
A6012	1854-0071 1853-0020	0:SI PNP(SELECTED FROM 2N37U2)	
A6013 A6014	1853-0620	OSI PHPISELECTED FRUM 2N3702)	
A6015	1853-0020	USI PHP (SELECTED FRCM 2N3702)	
AGUIO	1854-0087	Q:SI NPN(SIMILAR TO 2N3417)	
A6017	1854-0232	Q:SI NPN(SELECTED FROM 2N3440)	
A6018	1854-0039	Q:SI NPN Q:SI NPN(SELECTED FROM 2N3704)	ļ
A6019 A6020	1854-0071 1854-0019	Q:SI NPN(SELECTED FROM 2N2369)	
MODEU	1654-0017	dig with a property of the second sec	
A6021	1854-0019	O:SI NPNISELECTED FROM 2N2369)	
;			
AGRI	0757-0346	R:FXD MET FLM 10 OHM 1% 1/8W	
		responses and the management of the state of	
A6R2	0757-0438	R:FXD MET FLM 5.11K 12 1/8W R:FXD MET FLM 1K OHN 12 1/8W	
A6R4	0757-0280 0757-0442	R:FXD MET FLM 10.0K 12 1/8W	
A6R5	U757-0438	RIFXD MET FLM 5.11K 18 1/8W	
A6R6	0757-0465	R:FXD MET FLM 100K 12 1/8W	
A6K7	0757-0463	R:FXD MET FLM 82.5K 18 1/8W	
AGRE	0757-0418	RIFXD MET FEM 619 UHP 1% 1/8W	
A6R9	0757-0418	H: FXD MET FLM 619 UHM 12 1/8W R: FXD MET FLM 68.1K OHM 12 1/8W	
A6R10 A6R11	0757-0461	RIFXD MET FLM IK UHM 18 1/8W	
MONIT	0/5/-0200	MILIO HELL TEN IN COM. AL ANOM	
A6R12	(698-3136	R:FXD MET FLM 17.8K OHM 1% 1/8W	
A6R13	0757-0280	R:FXD MET FLM 1K OHM 1% 1/8W	
AGR 14	0757-0442	HIFXU MET FLM 10.0K 12 1/8W	
A6R15	2100-1759	R: VAR WW 2K OHM 5% TYPE V IW SCAN TIME ADJ	
	1	SCAR TIME ADS	
A6K16	0698-3136	R:FXD MET FLM 17.8K CHM 1% 1/86	
A6R17	0698-3455	R:FXD MET FLM 261K DHM 14 1/8W	
		FACTURY SELECTED PART	
AGHIB	0698-3396	RIFAU MET FLM 38.3 OHM 1% 1/2W	
A6R 19	0757-0416	RIFXD MET FLM 511 OHM 1% 1/8W	
A 4 17 (DA)	AND THE THE AND THE THE	R:FXD MET FLM 1.33K DHM 1% 1/8W	
A6R 20 A6R 21	0757-0317 0757-0458	R:FXD MET FLM 51.1K CHM 18 1/8W	
AGR 22	0757-0438	RIFXD MET FLM 5.11K 18 1/8W	
A6R23	0698-3136	RIFXD MET FLM 17.8K CHM 1% 1/8W	
A6R 24	1698-3153	RIFXO MET FLM 3.83K 1% 1/8W	
A6R25	0698-3136	RIFXD MET FEM 17.8K OHM 14 1/8W	
A6R26	U757-0418	R:FXD MET FLM 519 OHM 1% 1/8W R:FXD MET FLM 34.8K CHM 1% 1/8W	
46R27 46R28	6757-0123	RIFAU MET FEM 100K 1% 1/8W	
Ank29	3698-3136	RIFXD MET FUM 17.8K OHM 1% 1/8W	
A6R 30	1648-3136	WITH HEM ET SK ONM IN 1/8W	
A6R31	3698-3154	REFAU MET FEM 4-22K OHM 18 1/8W	,
A6R 37	0698-0083	RIFXD MET FEM 1.96K CHM 1% 1/8W	
A6R33	0698-3452	RIFXU MET FEM 147K UHM 13 178W	
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Table 7-3. Scan Generator A6 Reference Designation Index

AGN34 AGN35 OT57-0290 RIFRO MET FLM 0.19K CHM 18 1/8W AGN37 OT57-0290 RIFRO MET FLM 0.19K CHM 18 1/8W AGN37 AGN37 AGN39 Z100-1758 Z100-1758 AGN39 Z100-1758 AGN39 Z100-1758 AGN39 Z100-1758 AGN39 Z100-1758 AGN39 Z100-1758 AGN39 AGN39 Z100-1758 AGN39 Z100-1758 AGN39 AGN39 Z100-1758 AGN39 AGN39 Z100-1758 AGN39 AGN39 Z100-1758 AGN39 AGN39 Z100-1758 AGN39 AGN39 Z100-1758 AGN39 AGN39 Z100-1758 AGN39	Reference Designation	Part No.	Description #	Note
ARR35 ARR36 ARR36 ARR36 ARR36 ARR37 ARR36 ARR37 ARR37 ARR37 ARR37 ARR38 ARR37 ARR38 ARR38 ARR38 ARR38 ARR39				
ARR35 ARR36 ARR36 ARR36 ARR36 ARR37 ARR36 ARR37 ARR37 ARR37 ARR37 ARR38 ARR37 ARR38 ARR38 ARR38 ARR38 ARR39	A 4 0 2 A	0609-2126	D. SYD MET SIM 17 AK CHM TY 1/AM	
AGR36 AGR37 AGR37 AGR37 AGR37 AGR37 AGR37 AGR37 AGR37 AGR37 AGR38  2100-1758  AGR39  2100-1758  AGR39  2100-1758  AGR39  AGR40  C698-3154 AGR41 AGR41 AGR41 AGR41 AGR42 AGR42 AGR42 AGR43 AGR44 AGR44 AGR44 AGR44 AGR44 AGR44 AGR44 AGR44 AGR44 AGR44 AGR44 AGR45 AGR44	A. 1			
AGR37 AGR38  0757-0240  AGR38  0757-0280  AGR39  2100-1758  R:VAR NW IK DJM 5% TYPE V IW SLAN AMPLITUDE AGR41  0757-0240  AGR41  0757-0240  AGR41  0757-0240  AGR42  0757-02436  AGR44  0757-0436  AGR44  0757-0438  AGR44  0757-0438  AGR44  0757-0438  AGR44  0757-02438  AGR45  0757-02438  AGR46  0757-02438  AGR47  0757-0444  AGR49  0757-0244  AGR49  0757-0244  AGR49  AGR49  2100-1758  AGR49  AGR49  2100-1758  AGR49  AGR49  AGR49  AGR49  AGR49  2100-1758  AGR50  AGR51  AGR51  AGR51  AGR52  0757-0438  AGR53  0757-0416  AGR53  AGR53  O757-0416  AGR53  AGR54  AGR55  AGR55  AGR55  AGR55  AGR56  AGR57  AGR57  AGR57  AGR57  AGR58  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR59  AGR50  AGR61  AGR61  AGR61  AGR61  AGR62  AGR50  AGR61  AGR62  AGR50  AGR61  AGR62  AGR60  AGR61  AGR60  AGR				
A6838  A6839  2100-1758  REVAR WE IK DIM 5% TYPE V IM SCAN AMPLITUDE REVAR MET FLM 1K DIM 1% 1/8W A6840  A6847  A757-0280  REFAD MET FLM 1K DIM 1% 1/8W A6843  A757-0438  REFAD MET FLM 16 DIM 1% 1/8W A6844  A757-0438  REFAD MET FLM 5-11K 1% 1/8W A6845  A757-0438  REFAD MET FLM 5-11K 1% 1/8W A6846  A757-0438  REFAD MET FLM 5-11K 1% 1/8W A6847  A757-0444  REFAD MET FLM 5-11K 1% 1/8W REFAD MET FLM 5-11K 1% 1/8W A6847  A6849  2100-1758  A6850  A6851  A6853  A6853  A6853  A6853  A6854  A6855  A6855  A6855  A6855  A6855  A6856  A6856  A6856  A6857  A6857  A6856  A6856  A6856  A6857  A6857  A6857  A6858  A757-0416  REFAD MET FLM 13-14K 11 1/8W REFAD MET FLM 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1% 1/8W REFAD MET FLM 18-11K 1 1/8W REFAD MET FLM 18-11K	The second secon			
A6N49 A6N40 A6N40 A6N41 O757-0280 A6N42 A6N43 A6N44 A6N47 A6N46 A6N46 A6N46 A6N47 A6N46 A6N46 A6N46 A6N46 A6N46 A6N46 A6N46 A6N47 A6N47 A6N47 A6N47 A6N47 A6N48 A6N49 A6		• • • • • • • • • • • • • • • • • • •		
AGN40 AGN41 AGN41 AGN42 AGN42 AGN42 AGN43 AGN43 AGN44 AGN47 AGN46 AGN47 AGN46 AGN47 AGN46 AGN47 AGN46 AGN47	AOKOO	0757-0280	NAPAD HET FER IN UNH 14 1708	
AGN40 AGR41 AGR42 AGR42 AGR42 AGR42 AGR43 AGR44 AGR43 AGR44 AGR46 AGR46 AGR46 AGR46 AGR46 AGR47 AGR46 AGR47 AGR46 AGR47 AGR47 AGR46 AGR47	A6H39	2100-1758		
AGR41 AGR42 D757-0418 R:FXD MET FLM 619 UHM 1% 1/8W AGR44 D757-0438 R:FXD MET FLM 5.11K 1% 1/8W AGR44 D757-0438 R:FXD MET FLM 5.11K 1% 1/8W AGR45 D757-0438 R:FXD MET FLM 5.11K 1% 1/8W AGR46 D757-0438 R:FXD MET FLM 5.11K 1% 1/8W AGR47 D757-0438 R:FXD MET FLM 5.11K 1% 1/8W AGR47 D757-0444 R:FXD MET FLM 12.1K CHM 1% 1/8W AGR47 AGR49 AGR49 AGR49 AGR50 AGR50 AGR50 AGR50 AGR50 AGR51 AGR52 D757-0438 R:FXD MET FLM 3.15K 1% 1/8W R:FXD MET FLM 3.83K 1% 1/8W AGR51 AGR52 D757-0438 R:FXD MET FLM 3.83K 1% 1/8W AGR53 AGR53 AGR54 AGR55 AGR56 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR57 AGR59 AGR57 AGR59 AGR57 AGR59 AGR59 AGR59 AGR50 AGR57 AGR59 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR57 AGR50 AGR50 AGR57 AGR50 AG	AGUAN	1 4698-3156		
A6R47  A6R43  A6R44  A757-0438  R:FXD MET FLM 5:11K 1x 1/8M  A6R45  A757-0438  R:FXD MET FLM 5:11K 1x 1/8M  A6R45  A6R46  A757-0438  R:FXD MET FLM 5:11K 1x 1/8M  A6R46  A757-0438  R:FXD MET FLM 5:11K 1x 1/8M  A6R46  A757-0444  R:FXD MET FLM 12:1K CMM 1x 1/8M  A6R47  A757-0444  A:FXD MET FLM 12:1K CMM 1x 1/8M  A6R49  A757-0441  R:FXD MET FLM 8:25K 1x 1/8M  A6R50  A6R50  A6R51  A6R52  A6R53  A6R54  A6R52  A6R55  C757-0438  A:FXD MET FLM 5:11K 1x 1/8M  AFFXD MET FLM 5:11K 1x 1/8	The state of the s	I		
ADR43 ADR44 ADR44 ADR44 ADR44 ADR44 ADR44 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR46 ADR47 ADR46	** **			
A6R44 A6R45 A6R46 A6R47 A6R46 A6R47 A6R47 A6R47 A6R47 A6R47 A6R48 A6R47 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R50 A6R50 A6R50 A6R51 A6R51 A6R52 A6R52 A6R52 A6R53 A6R53 A6R53 A6R54 A6R54 A6R55 A6R55 A6R55 A6R56 A6R56 A6R56 A6R56 A6R56 A6R56 A6R56 A6R57 A6R56 A6R57 A6R56 A6R57 A6R57 A6R57 A6R58 A6R57 A6R58 A6R58 A6R58 A6R58 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R50 A6R50 A6R50 A6R50 A6R50 A6R51 A6R51 A6R51 A6R51 A6R51 A6R52 A6R52 A6R53 A6R51 A6R53 A6R51 A6R53 A6R51 A6R54 A6R56 A6R56 A6R56 A6R57 A6R57 A6R57 A6R58 A6R57 A6R58 A6R57 A6R58 A6R58 A6R58 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R50 A6R59 A6R50 A6R50 A6R50 A6R50 A6R50 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R52 A6R52 A6R53 A6R51 A6R53 A6R51 A6R54 A6R55 A6R55 A6R55 A6R56 A6R56 A6R57 A6R57 A6R58 A6R57 A6R58 A6R57 A6R58 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R50 A6R59 A6R50 A6R50 A6R50 A6R50 A6R50 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R52 A6R52 A6R52 A6R54 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R62 A6R62 A6R62 A6R63 A6R61 A6R62 A6R64 A6R62 A6R64 A6R62 A6R64 A6R662 A6R64 A6R662 A6R664 A6R	HUNTE			
A6R44 A6R45 A6R46 A6R47 A6R46 A6R47 A6R47 A6R47 A6R47 A6R47 A6R48 A6R47 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R49 A6R50 A6R50 A6R50 A6R51 A6R51 A6R52 A6R52 A6R52 A6R53 A6R53 A6R53 A6R54 A6R54 A6R55 A6R55 A6R55 A6R56 A6R56 A6R56 A6R56 A6R56 A6R56 A6R56 A6R57 A6R56 A6R57 A6R56 A6R57 A6R57 A6R57 A6R58 A6R57 A6R58 A6R58 A6R58 A6R58 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R50 A6R50 A6R50 A6R50 A6R50 A6R51 A6R51 A6R51 A6R51 A6R51 A6R52 A6R52 A6R53 A6R51 A6R53 A6R51 A6R53 A6R51 A6R54 A6R56 A6R56 A6R56 A6R57 A6R57 A6R57 A6R58 A6R57 A6R58 A6R57 A6R58 A6R58 A6R58 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R50 A6R59 A6R50 A6R50 A6R50 A6R50 A6R50 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R52 A6R52 A6R53 A6R51 A6R53 A6R51 A6R54 A6R55 A6R55 A6R55 A6R56 A6R56 A6R57 A6R57 A6R58 A6R57 A6R58 A6R57 A6R58 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R59 A6R50 A6R59 A6R50 A6R50 A6R50 A6R50 A6R50 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R51 A6R52 A6R52 A6R52 A6R54 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R61 A6R62 A6R62 A6R62 A6R62 A6R62 A6R63 A6R61 A6R62 A6R64 A6R62 A6R64 A6R62 A6R64 A6R662 A6R64 A6R662 A6R664 A6R	4444	0757-0434	R:FXD MET FIM 5.11K 1X 1/8M	
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A6R47 0757-0278 R:FXD MET FLM 1.78K CMM 1x 1/8W  A6R49 2100=1758 R:FXD MET FLM 8.25k 1x 1/8W  A6R50 0698-0084 R:FXD MET FLM 2.15k 1x 1/8W  A6R51 0698-3153 R:FXD MET FLM 3.83K 1x 1/8W  A6R52 0757-0438 R:FXD MET FLM 3.83K 1x 1/8W  A6R53 0757-0416 R:FXD MET FLM 5.11k 1x 1/8W  A6R54 2100-1756 R:FXD MET FLM 511 0HM 1x 1/8W  A6R55 U757-0279 R:FXD MET FLM 3.16k CHM 1x 1/8W  A6R56 0698-7073 R:FXD MET FLM 133 UHH 1x 1/8W  A6R57 0757-0416 R:FXD MET FLM 511 0HM 1x 1/8W  A6R59 0698-7074 R:FXD MET FLM 51.1 0HM 1x 1/8W  A6R59 U698-7074 R:FXD MET FLM 51.1 0HM 1x 1/8W  A6R60 U757-0278 R:FXD MET FLM 178K 0HM 1x 1/8W  A6R61 0757-0394 R:FXD MET FLM 178K 0HM 1x 1/8W  A6R62 U757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6R61 0757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6R61 U757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6R61 U757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6R61 U757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6R61 U757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6R61 U757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6R61 U757-0416 R:FXD MET FLM 51.1 UHM 1x 1/8W  A6S1 3101-0973 SWITCH:SLIDE UPDT 0.5A 125V AC/DC  NDRM/REV POLARITY  A6T81 U8552-2001 BUARD:BLANK PC				
A6R48				
A6R49  A6R50  A6R51  A6R51  A6R52  A6R52  A6R53  A6R53  A6R54  A6R54  A6R54  A6R55  A6R55  A6R55  A6R56  A6R57  A6R56  A6R57  A6R57  A6R57  A6R58  A6R57  A6R58  A6R58  A6R59  A6R60  A6R61  A757-0278  A6R60  A6R61  A757-0394  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R62  A6R61  A6R64  A6R662  A6R65  A6R65  A6R65  A6R664  A6R665  A6R665  A6R6665  A6R6666666  A6R6666666666	<b></b>			
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				Section 19 Section 19

# SERVICE INFORMATION

## SECTION VIII SERVICE

## 8-1. INTRODUCTION.

8-2. This section provides instructions for trouble-shooting and repair of the HP 8552A Spectrum Analyzer IF Section.

## 8-3. LINE VOLTAGE REQUIREMENTS.

8-4. During adjustment and testing, the Spectrum Analyzer must be installed with an RF Section into a 140 Series Display Section which is connected to a source of power which is 50 to 60 Hz and 115 or 230 Vac ±10%. If adjustment of the dc voltage regulators is necessary, the Spectrum Analyzer should be connected to the ac power source through a variable auto transformer and then be adjusted to check regulator action when the line voltage varies as much as 10%.

### 8-5. MAINTENANCE AIDS.

8-6. Servicing Aids on Printed Circuit Boards. Servicing aids provided on circuit boards include

holes to fit the board removal tool, numbered test points (on some boards), transistor designators, adjustment callouts, and assembly stock numbers.

## 8-7. TEST EQUIPMENT AND ACCESSORIES REQUIRED.

8-8. Test equipment and accessory requirements are listed in the System Test and Troubleshooting Procedure, the individual Service Sheets, and in the Test Equipments and Accessories list, Table 1-5. Test instruments other than those listed may be used if their performance equals or exceeds that of the equipment listed.

8-9. Circuit Board Extender. A circuit board extender is supplied with the HP 11592A Service Kit. The extender board may be used to extend the assemblies in the 8552A IF Section, clear of the housing (see Figure 8-1) to provide easy access to test points and components.

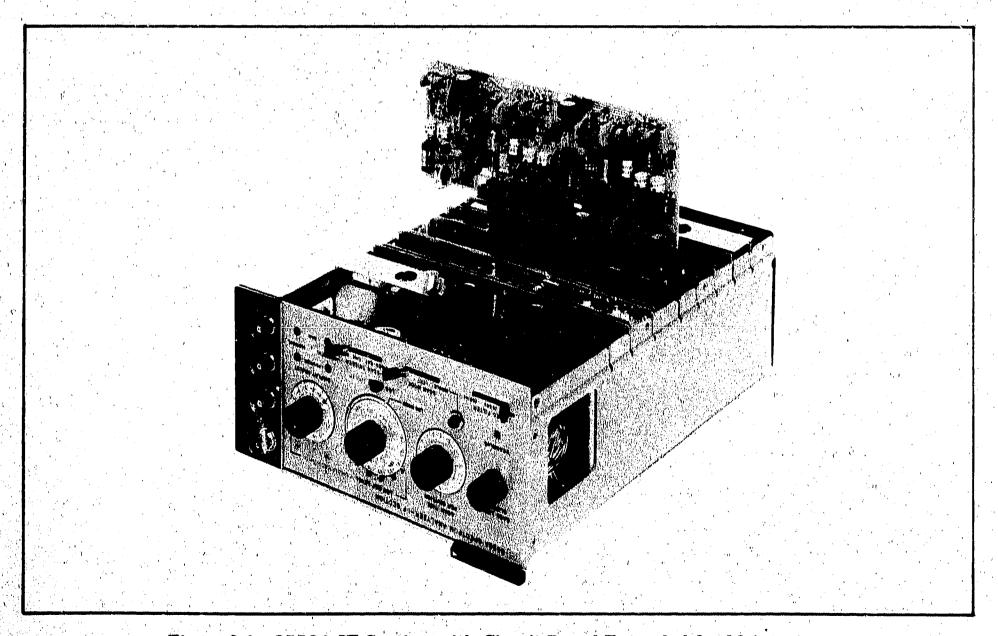


Figure 8-1. 8552A IF Section with Circuit Board Extended for Maintenance

### 8-10. ADJUSTMENTS.

8-11. The procedures contained in these sections do not include calibration or adjustment. Service Sheets which contain adjustable components refer to procedures in the Performance and Adjustment Sections which should be performed after repairs are accomplished.

### 8-12. GENERAL PROCEDURES.

- 8-13. The troubleshooting procedure is divided into two maintenance levels. The first, System Test and Troubleshooting Procedure, is designed to quickly isolate the cause of a malfunction to a circuit or assembly. The second provides circuit analysis and test procedures to aid in isolating faults to a defective component. Circuit descriptions and test procedures for the second maintenance level are located on the page facing the schematic diagram of the circuit to be repaired.
- 8-14. After the cause of a malfunction has been located and remedied in any circuit containing adjustable components, the applicable procedure specified in the Performance and Adjustment Section should be performed.

### 8-15. GENERAL SERVICE INFORMATION.

- 8-16. Part Location Aids. The locations of chassis-mounted parts and major assemblies are shown in Figure 8-7. The locations of individual components mounted on printed circuit boards or other assemblies are shown on the appropriate schematic diagram page or on the page opposite it. The part reference designator is the assembly designator plus the part designator. (Example: A10R9 is R9 on the Log Reference Assembly A10). For specific component description and ordering information refer to the parts list in Section VI.
- 8-17. Factory Selected Components. Some component values are selected at the time of final checkout at the factory (see Table 5-4). Usually these values are not extremely critical; they are selected to provide optimum compatibility with associated components. These components are 'tified on individual schematics by an asterisk. The recommended procedure for replacing a factories of the selected part is as follows:
- ... Try the original value, then perform the calibration test specified for the circuit in the performance and adjustment sections of this manual.
- b. If calibration cannot be accomplished, try the typical value shown in the parts list and repeat the test.
- c. If calibration still cannot be accomplished, perform the calibration test using various values until calibration is accomplished.

- 8-18. Wiring Diagram. Due to the complexity of the system it is not practical to provide an overall schematic diagram. However, Figure 8-12 provides overall wiring information (except for dc voltages) for all switches and assemblies.
- 8-19. Printed Circuit Board Exchange. Circuit boards for the 8552A Spectrum Analyzer IF Section are available on an exchange basis at a considerable savings in cost. Simply contact the Hewlett-Packard office nearest you and make your requirements known. The local Hewlett-Packard office will arrange for immediate airmail shipment to minimize equipment downtime. At least 90% of the orders for replacement parts received by an HP Field Sales Office will be shipped the same day—either from the sales office itself or from service center. These factory-repaired exchange circuit boards should be ordered by the special part numbers appearing in Table 6-1 of this manual.
- 8-20. System Test and Troubleshcoting Procedure. Table 8-2 provides information that will, in most cases, isolate the causes of a malfunction to a circuit or assembly, RF Section, or Display Section.
- 8-21. No attempt is made in this procedure to isolate causes of trouble to the component level. Reference is made to the specific Service Sheet which describes the circuits and test procedures for the portion of the analyzer to which the malfunction has been isolated. Where RF or Display Section maintenace is indicated, refer to the RF or Display Section Operating and Service Manual.
- 8-22. Diagram Notes. Figure 8-6, Schematic Diagram Notes, provides information relative to symbols and measurement units shown in schematic diagrams.

#### 8-23. ETCHED CIRCUITS.

- 8-24. The etched circuit boards in the 8552A are of the plated-through type consisting of metallic conductors bonded to both sides of insulating material. The metallic conductors are extended through the component mounting holes by a plating process. Soldering can be done from either side of the board with equally good results. Table 8-1 lists recommended tools and materials. Following are recommendations and precautions pertinent to etched circuit repair work.
- a. Avoid unnecessary component substitution; it can result in damage to the circuit board and/or adjacent components.
- b. Do not use a high-power soldering iron on etched circuit boards. Excessive heat may lift a conductor or damage the board.
- c. Use a suction device (Table 8-1) or wooden toothpick to remove solder from com-

ponent mounting holes. DO NOT USE A SHARP METAL OBJECT SUCH AS AN AWL OR TWIST DRILL FOR THIS PURPOSE. SHARP OBJECTS MAY DAMAGE THE PLATED-THROUGH CONDUCTOR.

- d. After soldering, remove excess flux from the soldered areas and apply a protective coating to prevent contamination and corrosion. See Table 8-1 for recommendations.
- 8-25. Etched Conductor Repair. A broken or burned section of conductor can be repaired by bridging the damaged section with a length of tinned copper wire. Allow adequate overlap and remove any varnish from etched conductor before soldering wire into place.

#### 8-26. COMPONENT REPLACEMENT.

a. Remove defective component from board.

#### NOTE

Axial lead components, such as resistors and tubular capacitors, can be replaced without unsoldering. Clip leads near body of defective component, remove component and straighten leads left in board. Wrap leads of replacement component one turn around original leads. Solder wrapped connection, and clip off excess lead.

b. If component was unsoldered, remove solder from mounting holes, and position component as original was positioned. DO NOT FORCE LEADS INTO MOUNTING HOLES; sharp lead ends may damage plated-through conductor.

### 8-27. Transistor Replacement.

8-28. Solid state transistors are in many physical forms. This sometimes results in confusion as to which lead is the collector, which is the emitter,

Table 8-1. Etched Circuit Soldering Equipment

Item	Use	Specification	Item Recommended
Soldering tool	Soldering Unsoldering	Wattage rating: $47\frac{1}{2}$ - $56\frac{1}{2}$ Tip Temp: $850$ - $900$ degrees	Ungar #776 Handle with *Ungar #4037 Heating Unit
Soldering *Tip	Soldering Unsoldering	*Shape: pointed	*Ungar #PL111
De-soldering aid	To remove molten solder from connection	Suction device	Soldapullt by Edsyn Co., Arleta, California
Resin (flux) solvent	Remove excess flux from soldered area before application of protective coating	Must not dissolve etched circuit base board material or conductor bonding agent	Freon Acetone Lacquer Thinner Isopropyl Alcohol (100% dry)
Solder	Component replace- ment Circuit board repair Wiring	Resin (flux) core, high tin content (60/40 tin/lead), 18 gauge (SWG) preferred	
Protective	Contamination, corrosion protection	Good electrical insulation, corrosion-prevention properties	Silicone Resin such as GE DRI-FILM **88

<sup>\*</sup>For working on 8552A Boards: for general purpose work, use Ungar No. 1237 Heating Unit (37, 5W, tip temp of 750-800 degrees) and Ungar No. PL113 1/8" chisel tip.

<sup>\*\*</sup>General Electric Co., Silicone Products Dept., Waterford, New York, U.S.A.

and which is the base. Figure 8-2 shows epoxy and metal case transistors and the means of identifying the leads.

- 8-29. To replace the transistor proceed as follows:
- a. Do not apply excessive heat; see Table 8-1 for recommended soldering tools.
- b. Use long-nose pliers between transistor and hot soldering iron as a heat sink. The instant solder is melted, use pliers to pull lead free of board.
- c. When installing replacement transistor, ensure sufficient lead length to dissipate soldering heat by using about the same length of exposed lead as used for original transistor.

8-30. Some transistors are mounted for good heat dissipation. This requires good thermal contact with mounting surfaces. To assure good thermal contact for a replacement transistor, coat both sides of the black insulator with Dow Corning #5 silicone compound or equivalent before fastening the transistor to the chassis. Dow Corning #5 compound is available in 8-oz tubes from Hewlett-Packard; order HP Stock No. 8500-0059.

#### 8-31. Diode Replacement.

8-32. Solid state diodes are in many physical forms. This sometimes results in confusion as to which lead or connection is for the cathode (negative) or anode (positive), since not all diodes are marked with the standard symbols. Figure 8-2 shows examples of some diode marking methods.

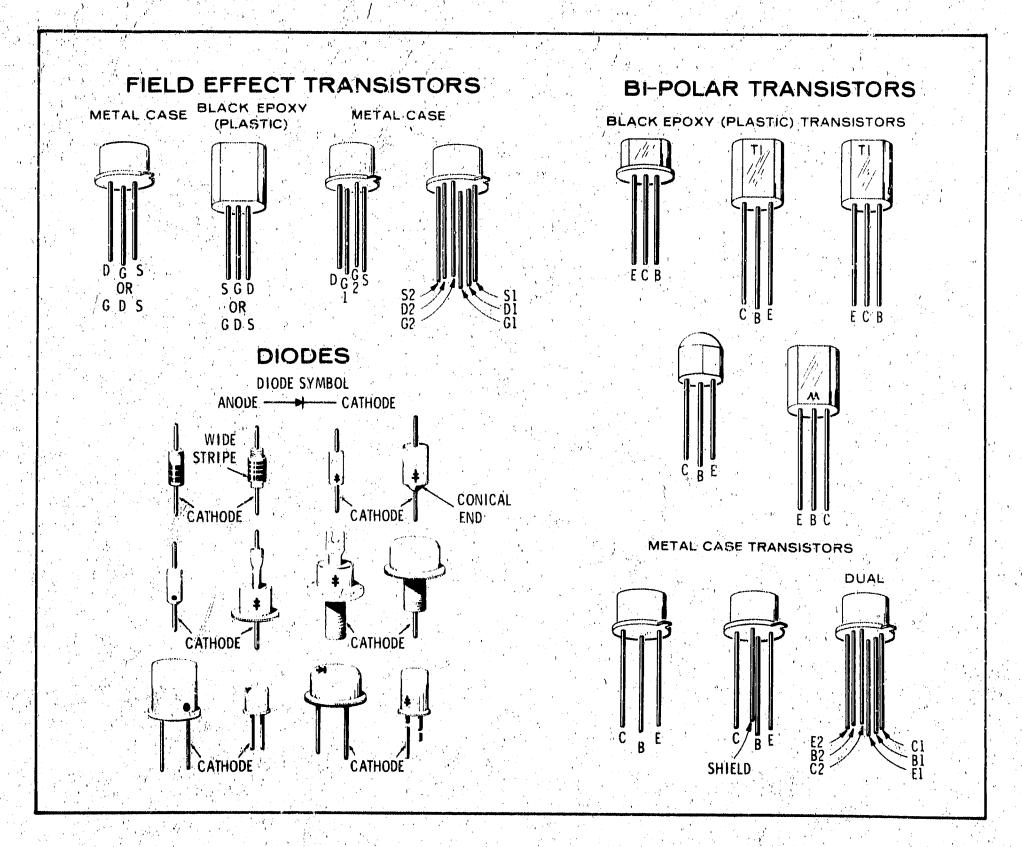


Figure 8-2. Examples of Diode and Transistor Marking Methods

If doubt exists as to polarity, an ohmmeter may be used to determine the proper connection. It is necessary to know the polarity of the ohms lead with respect to the common lead for the ohmmeter used. (For the HP Model 410B Vacuum Tube Voltmeter, the ohms lead is negative with respect to the common; for the HP Model 412A DC Vacuum Tube Voltmeter, the ohms lead is positive with respect to the common.) When the ohmmeter indicates the least diode resistance, the cathode of the diode is connected to the ohmmeter lead which is negative with respect to the other lead.

#### NOTE

Replacement instructions are the same as those listed for transistor replacement.

#### 8-33. SWITCHING INFORMATION.

8-34. The manner in which switch wafers are schematically presented in this manual is distinctly different from that used in previous Hewlett-Packard manuals. An exception to this is the overall wiring diagram, Figure 8-12, which uses the conventional wafer type of switch presentation. If the following information concerning the evolution of this

system of switch presentation is carefully studied, it will be seen that circuits are more easily understood and much more easily traced.

Service

8-35. One of the major objections to drawing switch wafer symbols as the wafer appears is that many lines must cross other lines on the schematics. This problem has not been completely eliminated by use of straight-line presentation, but it has been minimized and circuits are much easier to follow once the basic principles are understood.

8-36. Figure 8-3 illustrates the evolution of straight-line switch presentation from the pictorial view of a switch wafer. Part A shows the wafer as it actually appears. In parts B and C, when the wafer is viewed as being a flexible, stretchable material, the transition from wafer to straight-line presentation begins to be obvious. In part D the transition is complete and the wafer now appears to be a slide type switch. In part E the final result is shown. Note that those contacts which maintain contact with the metallic portion of the rotor regardless of switch position (in the illustration contact 7) are moved to the other side for clarification. Note too that lead lines and arrows to switch contacts are no longer required.

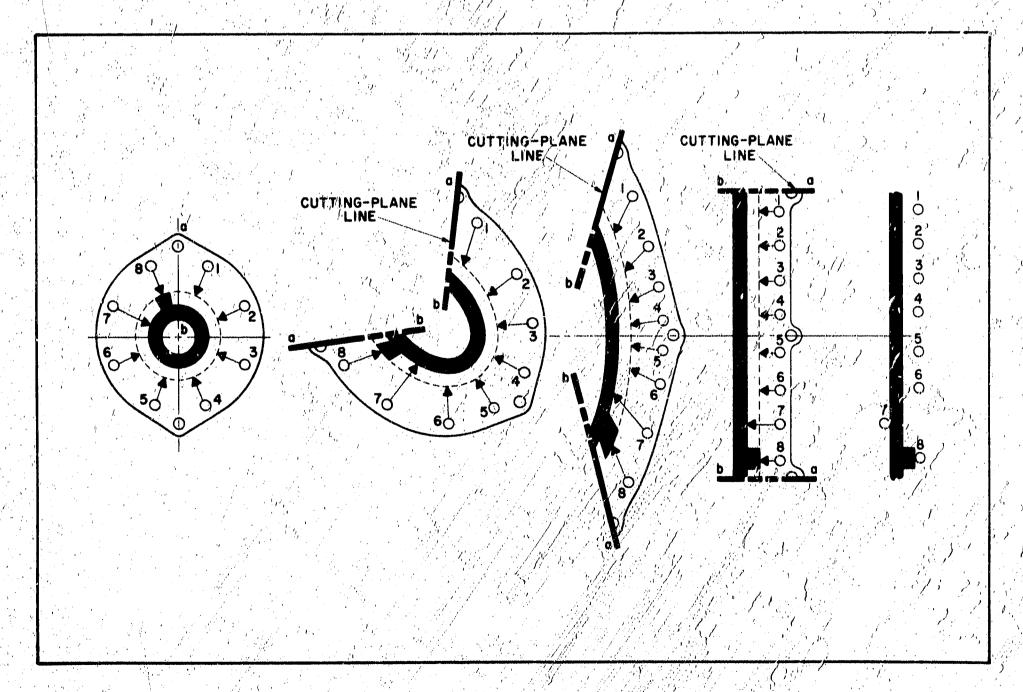


Figure 8-3. Evolution of Straight-Line Switch Presentation

8-37. In all schematics in this manual the switches, unless otherwise noted, are shown in the maximum CCW position. The physical layouts of the switches are shown as well as a straight-line presentation of switch action. It is important to note that in the straight-line presentation, the portion of a rotor mating with the bottom contact of a switch mates with the top contact of the switch when the switch is turned one step in the clockwise direction. Switch wafer SI-1F (P/O INPUT ATTENUATION

assembly A3 from the RF Section) is illustrated in three positions to demonstrate switch action (see Figure 8-4).

8-38. Figure 8-4 illustrates the difference between the old method of switch presentation and the straight line presentation. The example chosen represents the RF Section INPUT ATTENUATION switch.

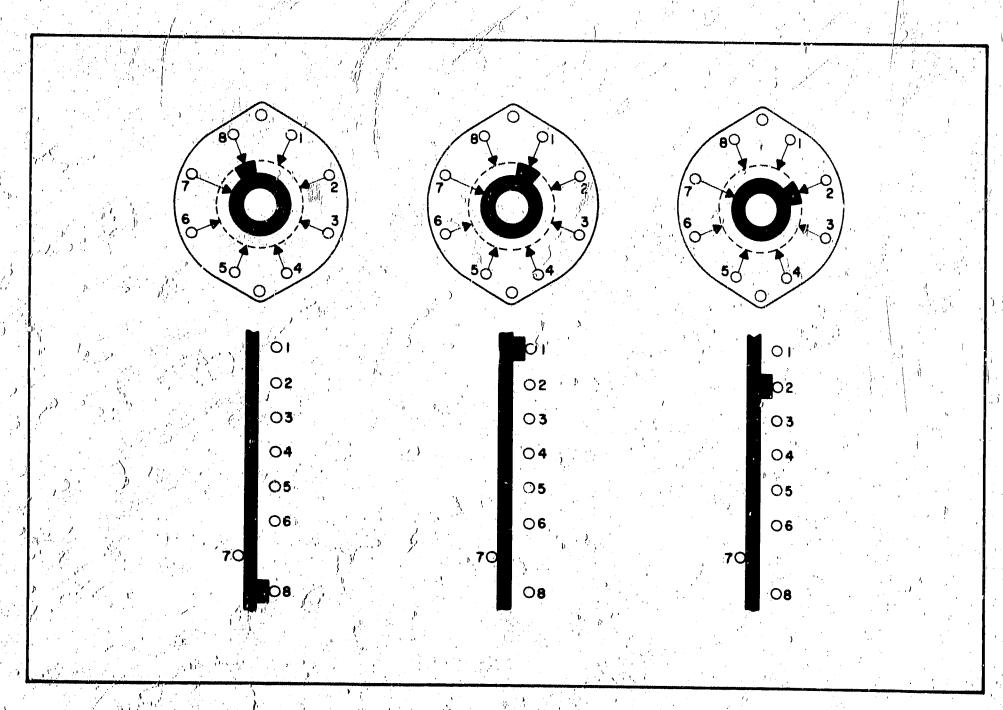


Figure 8-4. Three Positions of Index Light Selector Wafer

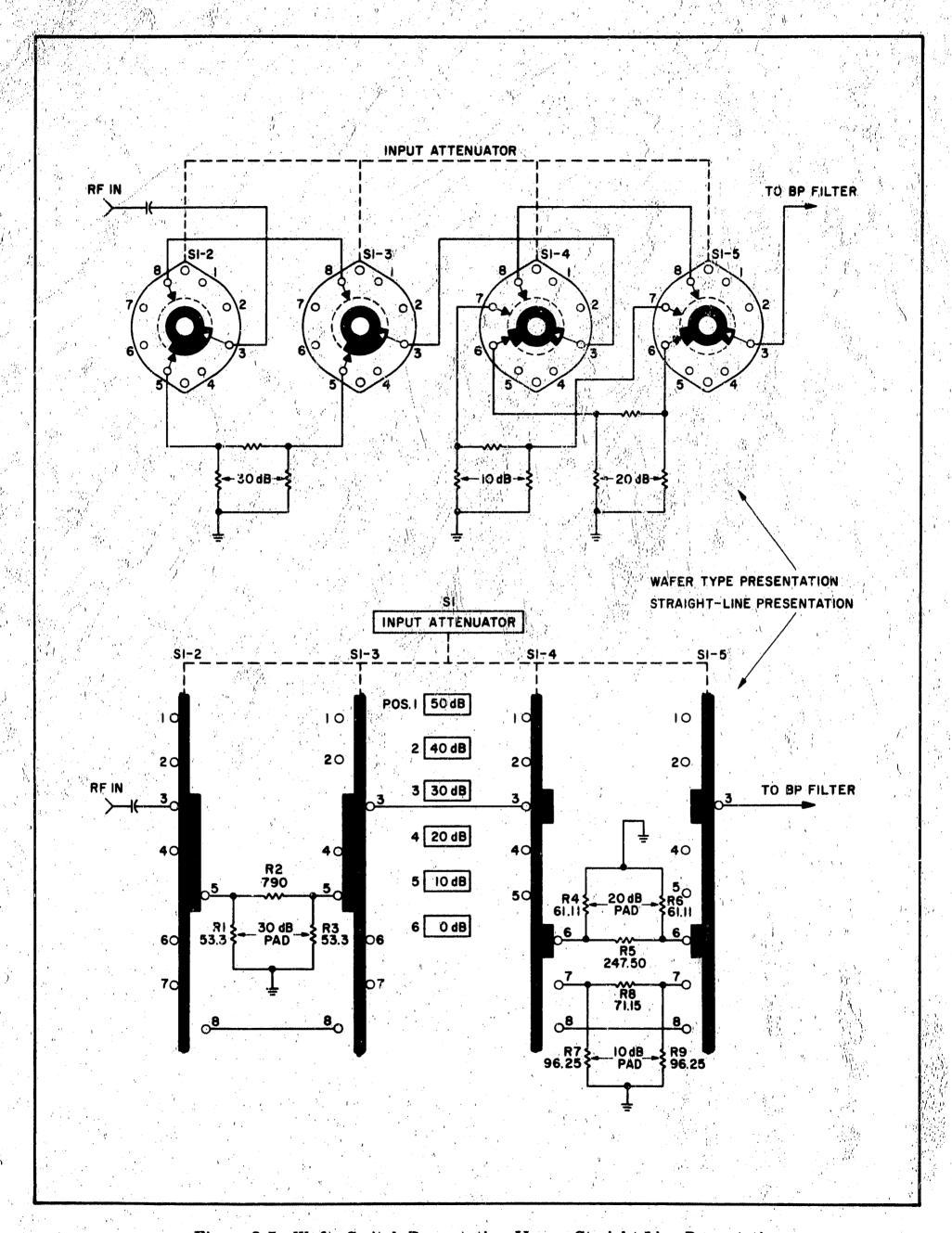


Figure 8-5. Wafer Switch Presentation Versus Straight-Line Presentation

Table 8-2. System Test and Troubleshooting Procedure

TEST	FAULT	PROCEDURE
1. Set POWER switch to ON. Power lamp on, fan operates. Proceed to test 2.	Light not on and/or fan inoperative	Check Display Section
2. Rotate INPUT ATTENUATION control and observe LOG REF LEVEL index lights  Lights operate properly.  Proceed to test 3.	None of the lights illuminate  Some, but not all lights illuminate	Check the -12.6 volt supply from Display Section. If voltage is present see Service Sheet 3. If voltage is not present, check the Display Section power supply. Check light bulbs on Service Sheet 5.
3. Set Analyzer controls as follows:  SCAN TIME PER DIVISION . 5 ms  SCAN MODE	SCANNING light does not illuminate	Check power supply circuits on Service Sheet 17.
4. Adjust Display Section for a baseline trace.  Baseline trace is normal, Proceed to test 5.	Trace does not appear	Connect the oscilloscope to the SCAN IN/OUT jack on the front panel of the analyzer and observe the waveform.  Oscilloscope control settings:  0.2V/Div 0 msec/Div 10:1 Prove  If the waveform is not present, check the scan amplifier and the scan generator (Service Sheet 14). If the waveform is present, check the horizontal deflection amplifier, Service Sheet 13. If trouble persists, check Display Section.

Table 8-2. System Test and Troubleshooting Procedure (cont'd)

TEST	FAULT	PROCEDURE
5. Set analyzer controls as follows: FREQUENCY BANDWIDTH 10 kHz FINE TUNE Centered SCAN WIDTH PER DIVISION SCAN WIDTH PER DIVISION SCAN WIDTH PER DIVISION 10 dB TUNING STABILIZER ON BASE LINE CLIPPER CCW LOG REF LEVEL O dBm LOG REF LEVEL Vernier CCW LOG/LINEAR LOG VIDEO FILTER SCAN TIME PER DIVISION 2 MILLISECONDS Connect CAL OUTPUT to RF INPUT and observe display. The 30 MHz signal should appear close to the center of the display CRT at a level of —30 dBm. If signal is correct, proceed to test 8.	Signal does not appear on Display Section CRT	Connect HP 8405A to CAL OUTPUT jack. The Vector Voltmeter should indicate approximately —30 dBm at 30 MHz. If the signal is not present refer to Service Sheet 15. Repair the calibration oscillator and repeat the test. If CAL OUTPUT is present proceed to test 6.
6. Set analyzer controls as follows:  BANDWIDTH 10 kHz  FINE TUNE Centered  SCAN WIDTH PER DIVISION  SCAN WIDTH PER DIVISION 20 kHz  INPUT ATTENUATION 0 dB  TUNING STABILIZER OFF  BASELINE CLIPPER ccw  LOG REF LEVEL 30 dBm  LOG REF LEVEL 40 dBm  LOG REF LEVEL Vernier ccw  LOG/LINEAR LOG  VIDEO FILTER OFF  SCAN TIME PER DIVISION  2 MILLISECONDS  Connect a 50 MHz -33 dBm signal from the 606B to the W6 jack behind the tuning dial assembly on the top of the RF Section using the 11592-60001 cable. Tune the 606B slightly around 50 MHz until the signal is centered. With the AMPL CAL centered the signal should read -30 dBm ±2 dBm.	If signal is correct  Signal is missing	Trouble in RF Section. See Systems Test and Troubleshooting Procedure in RF Section Manual  Proceed to Step 7

### NOTE

In steps 7a and 7b it is necessary to simulate the input impedance of the circuit following the point tested to ensure accuracy of the meter readings. Use the HP 1250-0837 jack-to-jack adapter, the HP 1250-0832 BNC to Sub-miniature adapter, the HP 11593A termination, the HP 11592-60002 cable and the HP 10218A Probe to BNC adapter to connect the specific jack to the HP 8405A.

Table 8-2. System Test and Troubleshooting Procedure (cont'd)

TEST	FAULT	PROCEDURE
7. Perform the following sub-tests until a malfunction has been found and corrected, then repeat test.		
7a. Connect HP 8405A to 8552A-A3J7 using the adapters tested	Signal is missing or incorrect	Refer to Service Sheet 3 and repair the 47 MHz local oscillator circuit.
above. Meter indications should indicate about -7 dBm at 47 MHz. If signal is correct, proceed to test 7b.		
7b. Connect the HP 8405A to terminal labeled 3 MHz under top cover of 8552 and set analyzer controls as follows:	Signal is missing or incorrect	Proceed to step 7c.
SCAN WIDTH ZERO INPUT ATTENUATION 0 dB LOG REF LEVEL -10 dBm CAL OUTPUT RF INPUT		
Tune analyzer for maximum signal. Signal should be about 8 mV rms at 3 MHz. If signal is correct, proceed to test 7c.		
7c. Connect the HP 8405A to 8552A-XA1-14/R with analyzer set as	Signal is missing or incorrect	Refer to Service Sheets 5 and 6 and repair the 3 MHz IF assembly.
in 7b, and tune analyzer for maximum. Signal level should be about 28 mV rms. If signal is correct, proceed to test 7d.		
7d. Connect the HP 8405A to 8552A-XA4-2 with analyzer set as in 7b,	Signal is missing or incorrect	Refer to Service Sheet 7 and repair the LC Bandwidth circuit.
and tune analyzer for maximum. Signal level should be about 26 mV rms. If signal is correct, proceed to test 7e.		
7e. Connect the HP 8405A to 8552A-XA8-2 with analyzer set as in 7b,	Signal is missing or incorrect	Refer to Service Sheets 8, 9, and 10 and repair the Crystal Filter circuit.
and tune analyzer for maximum. Signal level should be about 68 mV rms. If signal is correct, proceed to test 7f.		
10 0000 12.		

Table 8-2. System Test and Troubleshooting Procedure (cont'd)

TEST	FAULT	PROCEDURE
7f. Connect the HP 180A/1801A/ 1821A Channel A input to SCAN IN/OUT jack and the channel B input to 8552A XA7-B.  Oscilloscope control settings:  VOLTS/DIV 2V/Div TIME/DIV	Waveform B is missing or incorrect	Refer to Service Sheets 11 and 12 and repair the Lin/Log amplifier circuit.
7g. Connect the HP 180A/1801A/ 1821A Channel A input to 8552 XA7-5 and the Channel B input to 8552 XA6-E with analyzer set as in 7f.	Either wave- form is missing or incorrect	Refer to Service Sheet 13 and repair the vertical deflection circuit.
Oscilloscope control settings:  VOLTS/DIV 2V/Div TIME/DIV 2 msec/DIV 10:1 probes  If waveform is correct, trouble is in the Display Section or in interconnecting wiring. After making repairs, repeat test 5.		
8. Set analyzer controls as follows: FREQUENCY 40 MHz FINE TUNE Centered BANDWIDTH 300 kHz SCAN WIDTH 0—100 MHz SCAN WIDTH PER DIVISION 10 MHz INPUT ATTENUATION 10 dB RANGE — MHz 0—110 TUNING STABILIZER ON BASE LINE CLIPPER ccw SCAN TIME PER DIVISION	Sweep does not extend to full width of graticule.	CAL OUTPUT 30 MHz 2nd HARMONIC 90 MHz 60 MHz MARKER CENTER FRENERCY 30 MHz Calibrator Signal and Harmonics See Service Sheet 14. Check Scan Generator assembly.
Connect CAL OU FPUT to RF INPUT using a BNC to BNC cable. The display should be similar to that shown in the procedure column.	Not all sig- nals present or properly spaced	Same as above. Also refer to System Test and Troubleshooting Procedure in RF Section Manual, Service Sheet 13. First LO summing and shaping amplifier may be defective.

Table 8-2. System Test and Troubleshooting Procedure (cont'd)

Ĺ	TEST	FAULT	PROCEDURE
	Test 8 (cont'd)		
	Vary VERTICAL position to center baseline trace on bottom CRT graticule. Signal amplitude is unimportant in this test. Proceed to test 9.	Baseline trace does not vary.	See Service Sheet 13. Check vertical deflection circuit.
	9. Set LOG REF LEVEL maximum ccw. Set SCAN TIME PER DIVISION to 10 SECONDS and adjust focus and astigmatism. Adjust trace align to center trace on bottom CRT graticule. Proceed to test 10.	Focus and astigmatism inoperative or trace will not align	Refer to Display Section Manual and repair as required.
1	O. Turn FREQUENCY control and observe marker. Marker should move as FREQUENCY is tuned. Proceed to test 11.	Marker is missing	See System Test and Troubleshooting Procedure in RF Section Manual. Check the marker generator.
1	Tune FREQUENCY control to move the marker exactly under the signal three divisions from the left. The signal will null when the marker is tuned to the exact frequency of the signal. Set SCAN WIDTH PER DIVISION control to 0.05 MHz, BANDWIDTH to 10 kHz, and SCAN WIDTH to PER DIVISION. 30 MHz signal should appear close to the center graticule on the CRT. If correct signal is observed, proceed to test 12.	30 MHz signal does not appear on CRT	Check calibration and alignment of the analyzer.
12	2. Adjust FREQUENCY to center the 30 MHz signal on CRT, then reduce SCAN WIDTH PER DIVISION to 10 KHz and recenter the display with FINE TUNE control. Signal centers properly. Proceed to test 13.	Signal is unstable.  FINE TUNE does not vary signal position.	Refer to System Test and Troubleshooting Procedure in RF Section Manual and re- pair APC or reference signal circuits. See Service Sheet 4. Check 47 MHz Summing and Shaping Amplifier.
1:	3. Turn LOG REF LEVEL fully ccw. Top of signal should be —70 dB graticule. Rotate LOG REF LEVEL seven steps cw. CRT display should be as shown in the figure. The fault column lists these steps in numerical order beginning with the first step from the ccw position.	Each of the first 4 steps: no increase in gain, not 10 dB gain, or loss of signal.	See Service Sheet 5, 6, 17, 18
- 10 - 10 - 10			

Table 8-2. System Test and Troubleshooting Procedure (cont'd)

TEST	FAULT	PROCEDURE
13. (cont'd)		
		Les ner
		<b>'</b>
	•	UD
Set INPUT ATTENUATION to 30 dB		
and rotate LOG REF LEVEL cw for		
remaining two steps. Signal amplitude		CENTEN Z
should again reach the top CRT graticule.	574	FREQUENCY
should again reach the top Or 1 grandule.	Steps 5 & 6	
	same as above.	Check 3 MHz step gain amplifier
	Step 7 same	
	as above.	Check 3 MHz step gain amplifier
	Steps 8 & 9	
	same as above.	Check 3 MHz step gain amplifier
	All or most	
	levels incorrect	
	and cannot be	
INPUT ATTENUATION to 10 dB,	corrected by	
LOG REF LEVEL to 0 dBm. Ro-	adjustment.	Check Lin/Log amplifier
tate LOG REF LEVEL Vernier to	No change in	
full cw. Signal shown should in-	signal level or	
crease by 12 dB. Proceed to test	change is	
	incorrect.	Check variable gain amplifier
14. Set LOG REF LEVEL to -30	AMPL CAL	See Service Sheet 5
dBm (-30 +0). Adjust AMPL	does not vary	Check calibration amplifier.
CAL so that the top of the sig-	signal level.	
nal is exactly on the LOG REF		
(TOP) graticule of the CRT.		
Proceed to test 15.	, a f	The state of the s
15. Set LOG/LINEAR to LINEAR	AMPL CAL	See Service Sheets 12 and 15.
and LINEAR SENSITIVITY to	cannot be	Probable trouble is in linear amplifier
1 mV/DIV. The CRT deflection	adjusted for	compensation circuit or linear scale
should be adjusted by the AMPL	7.1 division	factor circuit.
CAL control to 7.1 divisions.	display.	
If display is correct, proceed to test 16.		
and the state of t		

Table 8-2. System Test and Troubleshooting Procedure (cont'd)

	TEST	FAULT	PROCEDURE
16.	Set analyzer controls as follows:		See Service Sheets 13 and 14.
	SCAN WIDTH 0—100 MHz SCAN WIDTH PER DIVISION 10 MHz BANDWIDTH 10 kHz LOG/LINEAR LOG LOG REF LEVEL —10 dBm		
	Turn BASE LINE CLIPPER full ccw.	Bottom 2	Check base line clipper circuit.
		divisions of CRT not blanked.	
	Switch SCAN TIME PER DIVISION	Scan does	Check scan generator circuit.
•	through its range	not occur in all posi-	
		tions.	
	Return SCAN TIME PER DIVISION to 2 MILLISECONDS.		
	Set SCAN WIDTH to PER DIVISION	DISPLAY UNCAL does not illuminate.	Refer to System Test and Troubleshooting Procedure in RF Section Manual and Service Sheet 16. Probable cause of trouble is in the analogic circuit or switching circuits.
		<b>.</b>	

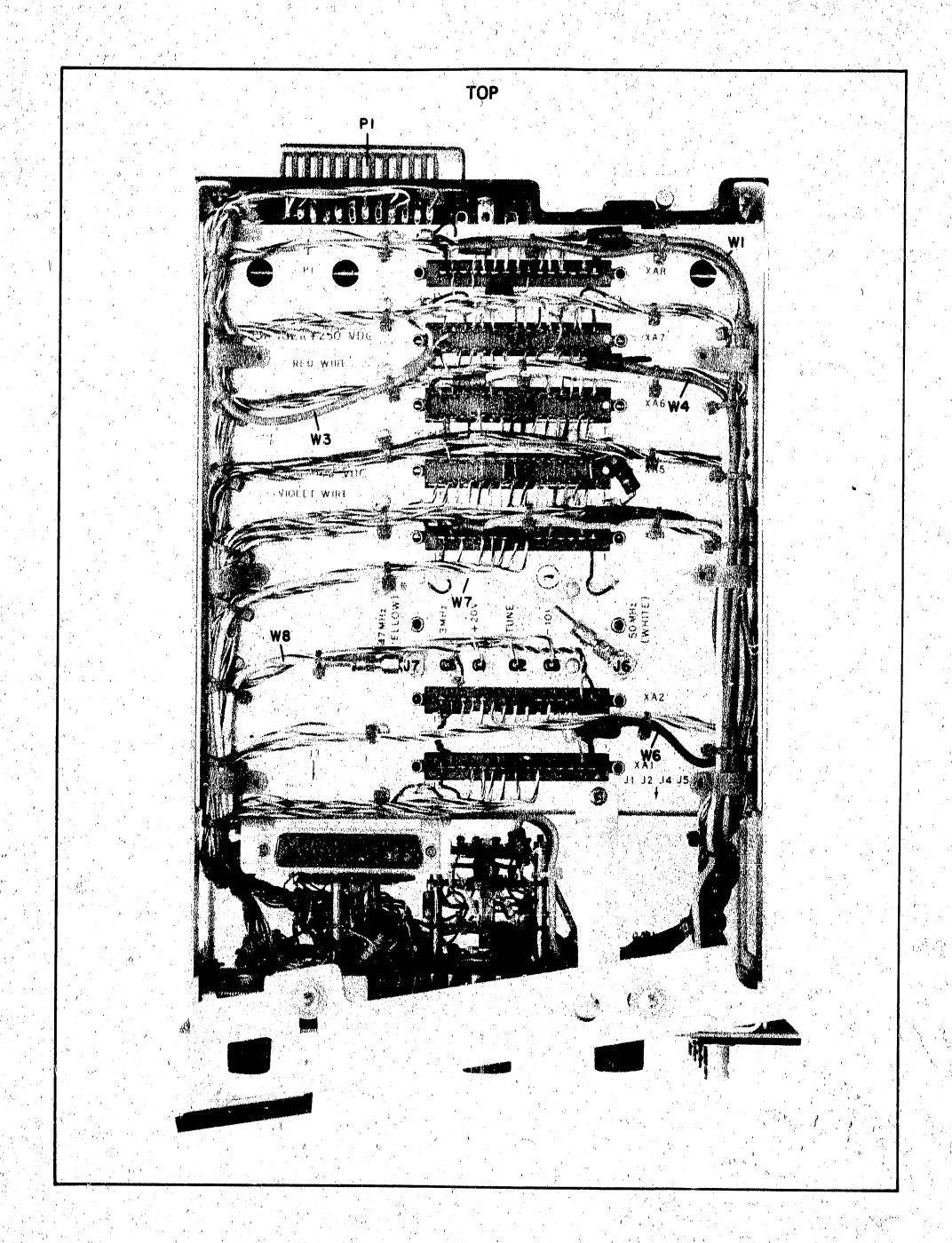
Service

	SCHEMATIC DIAGRAM NOTES  Refer to MIL Std 15B for Symbols Not Shown
	Resistance is in ohms and capacitance is in picofarads unless otherwise noted.
	P/O = part of.
	*Asterisk denotes a factory-selected value. Value shown is typical. Capacit may be omitted or resistors jumpered.
	Screwdriver adjustment. O Panel control.
	Encloses front panel designations. [] Encloses rear panel designation.
	Circuit assembly borderline.
	Other assembly borderline.
	Heavy line with arrows indicates path and direction of main signal.
	Heavy dashed line with arrows indicates path and direction of main feedback.
	Wiper moves toward CW with clockwise rotation of control as viewed from shaft or knob.
•	Numbers in circles on circuit assemblies show locations of test points.
	Encloses wire color code. Code used (MIL-STD-681) is the same as the resistor color code. First number identifies the base color, second number the wider stripe, and the third number identifies the narrower stripe. E.g., 947 denotes white base, yellow wide stripe, violet narrow stripe.
	Voltage regulator (breakdown diode).
	Denotes Field Effect transistor (FET) with N-type base.
	Denotes FET with P-type base.
	Denotes Capacitive diode (Varicap, varactor).
€	Denotes Silicon Controlled Rectifier.
	P-Type Metal Oxide Substrate FET (MOSFET)
	N-Type Metal Oxide Substrate FET (MOSFET)

Figure 8-6. Schematic Diagram Notes

Table 8-3. 8552A IF Section Assembly and Component Location

	Assembly	Schematic	Photo
<b>A1</b>	LC Filter	Service Sheet 7	Service Sheet 7
A2	3 MHz Amplifier	Service Sheet 5/6	Service Sheet 5/6
A3	50 MHz Converter	Service Sheet 3	Service Sheet 3
A4	Crystal Filter	Service Sheet 9/10	Service Sheet 9/10
			Service Sheet 4/15/17
A5	Power Supply	Service Sheet 4/15/17	
A6	Scan Generator	Service Sheet 14/16	Service Sheet 14/16
A7	Deflection Amplifier	Service Sheet 13	Service Sheet 13
A8	Log Amplifier	Service Sheet 11/12	Service Sheet 11/12
A9	Scan Time Switch	Service Sheet 2/14/15	Figure 8-7
A10	Log Ref Level	Service Sheet 2/5/8/10/16	Figure 8-7
<b>A11</b>	Video Filter Switch	Service Sheet 2/12/15	Figure 8-7
	Component	Schematic	Photo/Location
C1-3,5		Service Sheet 3	Figure 8-7
C4		Service Sheet 14	Figure 8-7
DS1-6		Service Sheet 16	Figure 8-7
DS7-8		Service Sheet 12	Front Panel
DS9		Service Sheet 14	Front Panel
F1-2		Service Sheet 17	Rear Panel
L1-4		Service Sheet 3	Rear Panel
R1-3		Service Sheet 3	Rear Panel
<b>R4</b>	HORIZONTAL GAIN	Service Sheet 13	Figure 8-7
<b>R6</b>	HORIZONTAL POSITION	Service Sheet 13	Figure 8-7
R7-8		Service Sheet 13	Figure 8-7
R9		Service Sheet 13	Figure 8-7
R10	BASE LINE CLIPPER	Service Sheet 13	Front Panel
R11	VERTICAL GAIN	Service Sheet 13	Figure 8-7
R12	Log/Lin Vernier	Service Sheet 6	Front Panel
R13-14		Service Sheet 12	Front Panel
R15	VERTICAL POSITION	Service Sheet 13	Front Panel
R16		Service Sheet 12	Figure 8-7
R17		Service Sheet 11	Figure 8-7
R18		Service Sheet 17	Figure 8-7
R19		Service Sheet 13	Figure 8-7
<b>S1</b>	LOG/LINEAR Switch	Service Sheet 12	Figure 8-7
<b>S2</b>	SINGLE (Scan) Switch	Service Sheet 14	Figure 8-7
<b>S3</b>	SCAN MODE Switch	Service Sheet 14	Figure 8-7
<b>S4</b>	SCAN TRIGGER Switch	Service Sheet 14	Figure 8-7
W1		Service Sheet 10/11	Figure 8-7
W2		Service Sheet 10	Figure 8-7
W3		Service Sheet 13	Figure 8-7
W4		Service Sheet 16	Figure 8-7
W5		Service Sheet 12	Figure 8-7
W6		Service Sheet 12	Figure 8-7
W7		Service Sheet 3	Figure 8-7
		Service Sheet 3	I Wigning O 77
<b>W8</b>		pervice piteer o	Figure 8-7



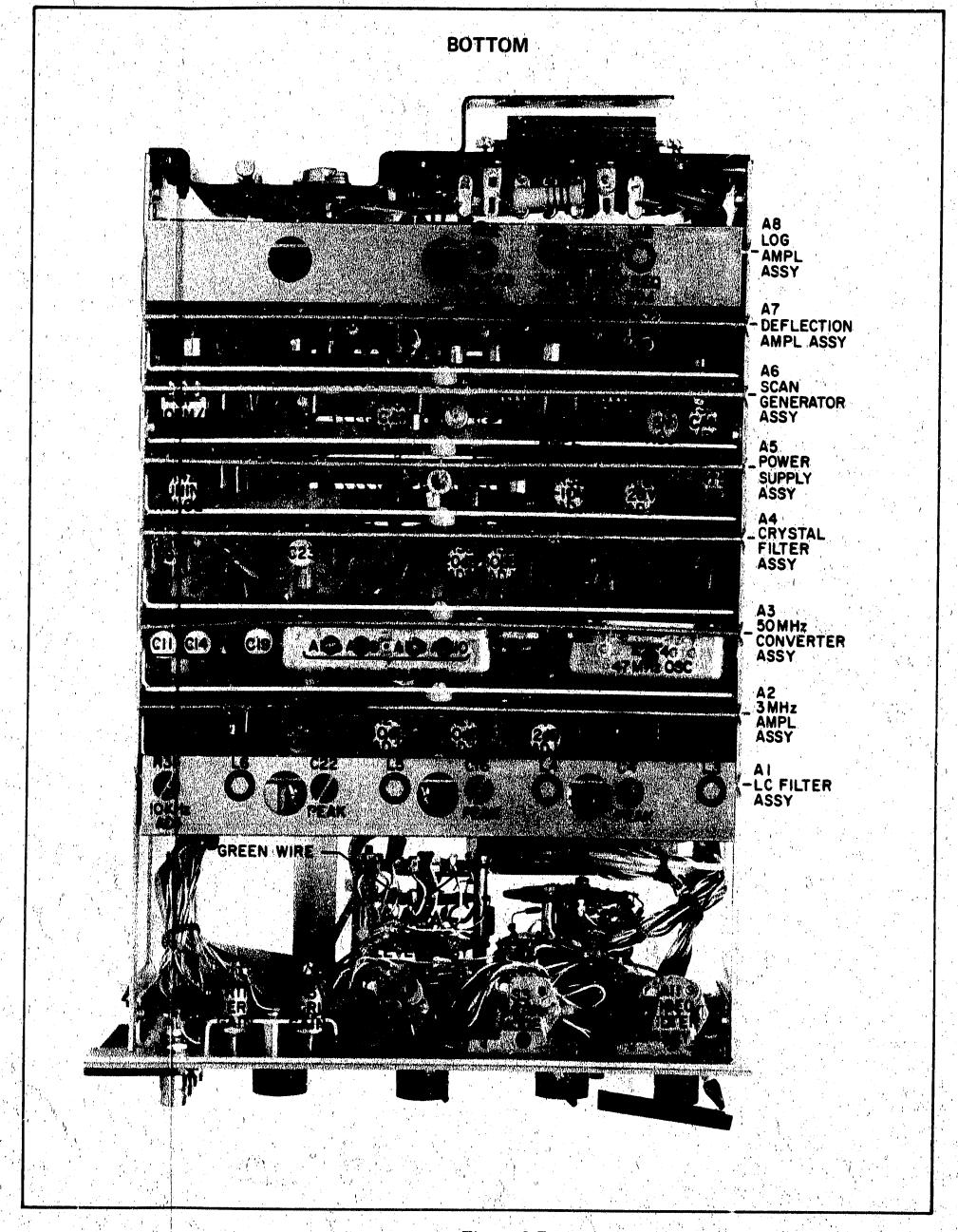


Figure 8-7. 8552A Assembly and Adjustment Locations

### 50 MHz CONVERTER ASSEMBLY

The 50 MHz Converter assembly consists of an IF amplifier, a bandpass filter, a 47 MHz oscillator, and a double balanced mixer. The broadband IF amplifier provides 10 dB of gain. The 47 MHz oscillator is varactor controlled; the frequency is fixed or swept dependent on the control voltage received from the RF Section.

### POWER SUPPLY ASSEMBLY

The summing and shaping amplifier combine and process dc levels and ramp signals from the RF Section. The RF Section may supply part or all input signals to the summing amplifier. The shaping amplifier converts any linear input to an exponential ramp to control the varactor in the 47 MHz oscillator. This action ensures that the frequency output is linear with respect to the input control voltage. The light driver is controlled by the VIDEO FILTER, SCAN TIME PER DIVISION switch, and the RF Section SCAN WIDTH PER DIVISION switch and BANDWIDTH switch. When the switch settings prevent accurate amplitude calibration of the analyzer the light driver turns on and lights the UNCAL DISPLAY lamp in the RF Section.

### 3 MHz IF AMPLIFIER

The 3 MHz IF Amplifier consists of a bandpass filter, a calibrated amplifier, a 10/20/30 dB step amplifier, a 0 to 12 dB variable amplifier and an emitter follower output stage. The input bandpass filter is tuneable and is adjusted to provide a 300 kHz bandpass centered at 3 MHz.

#### LC BANDWIDTH FILTER ASSEMBLY

The LC Bandwidth Filter Assembly contains four tuned filter circuits and an output circuit to provide a low impedance source to the crystal filter input circuit. The bandwidth of individual filter stages is controlled by the RF Section BAND-WIDTH switch which forward biases diodes to place resistors in parallel in the signal path. When the analyzer is operated in the 300 kHz bandwidth mode the four tuned stages are bypassed and only the output stage processes the signal. The four tuned stages provide selectable bandwidth of 100 kHz, 30 kHz, and 10 kHz.

#### CRYSTAL FILTER ASSEMBLY

The Crystal Filter Assembly consists of three filter stages, a step gain amplifier, and an output amplifier. When the analyzer is operated at bandwidths of 10 kHz or greater, the crystal filter stages are bypassed by relays. The three crystal filter stages provide selectable bandwidths of 3 kHz, 1 kHz, 300 Hz, 100 Hz, or 50 Hz.

### LOG/LIN AMPLIFIER ASSEMBLY

The Log/Lin Amplifier Assembly consists of an input emitter follower, eight log amplifiers (six of these amplifiers are used in the LINEAR mode), a linear scale factor amplifier, two summing and isolation amplifiers, and a linear detector. When the analyzer is operated in the LOG mode, the amplifier output is logarithmically proportional to the input signal. When the analyzer is operated in the LINEAR mode, the amplifier output is directly proportional to the input signal.

## SCAN CONTROL AND TRIGGER. CIRCUITS

These circuits control the operation of the scan generator assembly. With S3 in the INT position and S4 in the AUTO position a dc level (-12.6 volts) provides an enable signal to the scan generator flip flop (see 8). With either switch in any other position, the -12.0 volts is removed from the enabling circuit in the scan generator and a trigger must be provided to enable the flip-flop. In single sweep modes, closing the SINGLE switch enables the flip-flop for one sweep only.

### SCAN GENERATOR ASSEMBLY

The trigger circuit is enabled by the -12.6 volts from the control circuits. The trigger circuits drive the flip-flop. The scan time switch is used to select RC components to control the scan time of the scan generator circuits. A constant current source provides the current to charge the selected ramp capacitor to ensure that scan ramps are linear for all selected scan times. The scan ramp amplifier amplifies the input scan signal and applies it to the horizontal deflection amplifier and the RF Section scan width attenuator assembly. An output is also provided at the SCAN IN/OUT connector, on the IF Section front panel, in the INT and SINGLE modes of operation. The connector may also be used in the EXT mode of operation to apply a signal from an external scan generator.

The calibration oscillator is a multivibrator which provides a 30 MHz, -30 dBm signal for use in calibrating the analyzer. The harmonics of the fundamental frequency are also useful in evaluating analyzer performance.

The penlift circuit provides penlift operation to recording devices in all positions of the SCAN

4 8552A ASSEMBLY AND ADJUSTMENT LOCATIONS

TRIGGER switch except EXT and in the INT and SINGLE position of the SCAN MODE switch. In the EXT position of the SCAN MODE switch an external blanking input of -1.5 volts is required to blank the CRT.

### DEFLECTION AMPLIFIER ASSEMBLY

The vertical preamplifier and amplifier provide push-pull operation to the vertical deflection plates of the CRT. Vertical gain and position are also controlled by these circuits. The blanking circuits provide blanking operation using the retrace cycle. The base line clipper and clipper override circuits blank the CRT when the BASE LINE CLIPPER control is adjusted to activate the circuit. When a marker from the RF Section is present, the clipper override circuit is activated and the CRT is not blanked when the marker is present.

The horizontal amplifiers provide push-pull operation to the CRT horizontal circuits to provide the base line display. Horizontal gain and position are also controlled by these circuits.

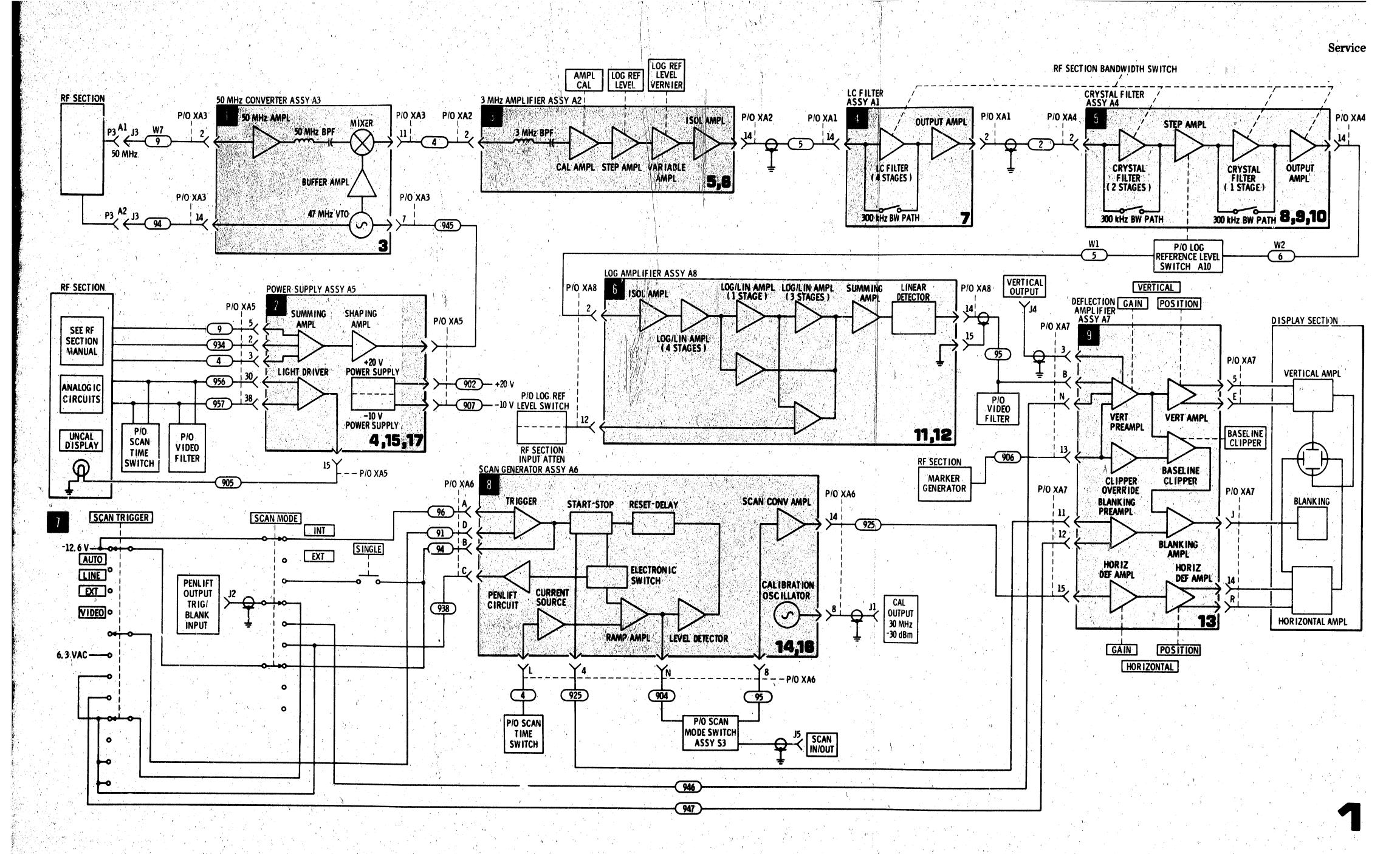
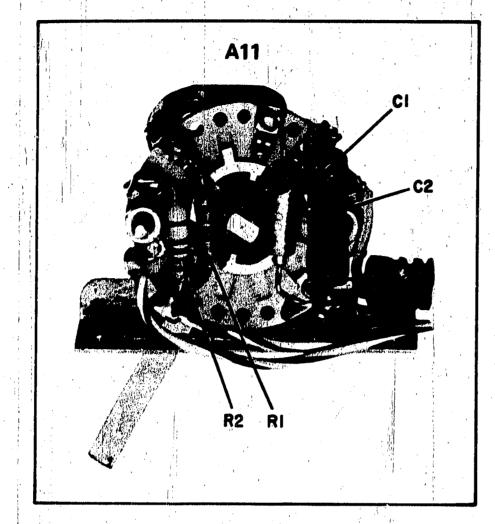


Figure 8-8. Block Diagram

## VIDEO FILTER ASSEMBLY A11 (08552-6022)

The video filter switch may be used to place either of two bypass capacitors across the detected output. When either filter is used the video bandwidth is reflected in the DISPLAY UNCAL analogic summing buss.



LOG REFERENCE LEVEL SWITCH ASSEMBLY A10

Figure 8-9. Video Filter Assembly A11

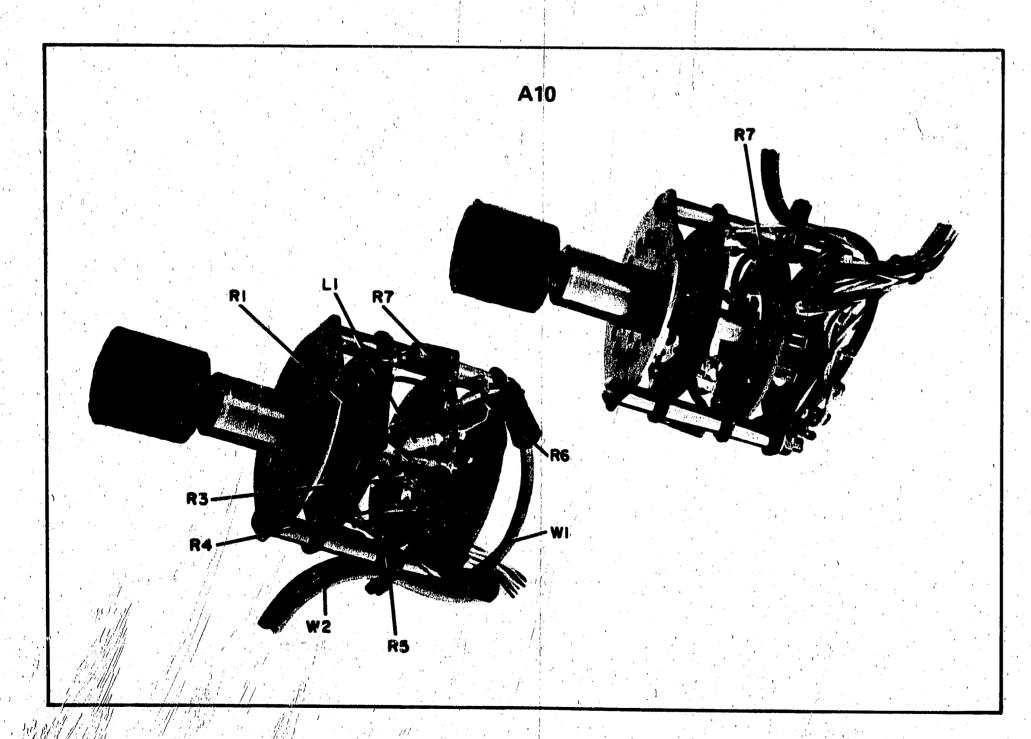


Figure 8-10. Log Reference Level Switch Assembly A10

SERVICE SHEET 1
Figure 8-8. Block Diagram

Switch wafers S1-1F, S1-2F, and 32-1R connect the 3 MHz IF Signal from the crastal filter circuit to the Log/Lin amplifier and provide attenuation to this signal when required.

Switch wafer S1-2R in conjunction with wafer S1-1R of the INPUT ATTENUATION control programs the gain compensation function of the linear scale factor amplifier in the Log/Lin amplifier when the analyzer is operating in the LINEAR mode.

Switch wafers S1-3F and S1-3R provide dc levels to enable or disable diode switches which, in turn, enable or disable step gain amplifiers in the 3 MHz IF and Crystal Filter Assemblies.

The various functions of the scan time switch assembly are as follows:

S1-1F selects the capacitor to be charged to generate the scan ramp.

S1-1R connects (or removes) a ground to R16 to partially control the operational parameters of constant current source Q6.

S1-2F selects the resistor to be used in the emitter circuit of constant current source Q6.

A1-2R selects the resistor (or resistors) to control the sweep reset (dead time) of the scan generator.

S1-3F and S1-3R provide current to the analogic scanning buss to aid in illuminating the DISPLAY UNCAL lamp when switch settings are not compatible with analyzer calibration requirements.

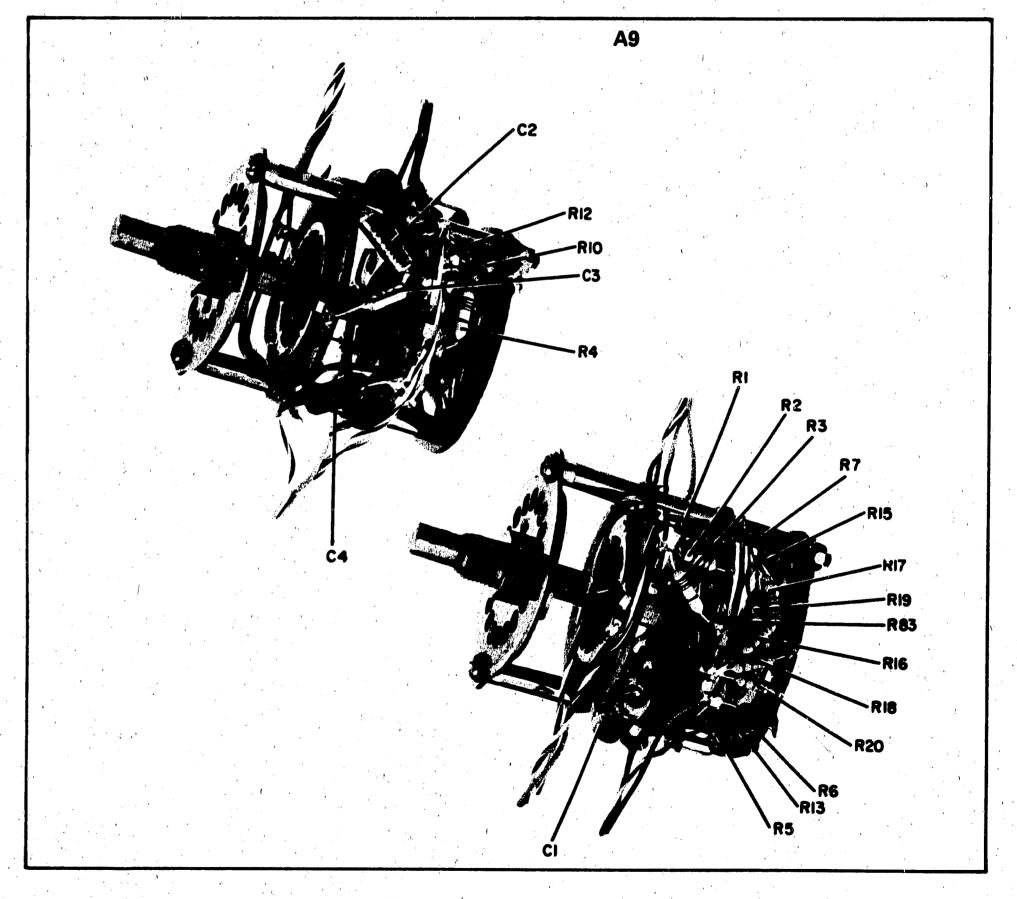


Figure 8-11. Scan Time Switch Assembly A9

Table 8-4. 8552A Jack Identification

Con- nector	Wire Color Code	Function	Con- nector	Wire Color Code	Function
<b>J</b> 3		RF Sect./IF Sect. Interconnection	P1		IF Sect./Display Sect. Interconnections
Pin 1	912	0.05 kHz Bandwidth	Pin 1	6	+20V
2	913	0.1 kHz Bandwidth	2	3	+100V
3	914	0.3 kHz Bandwidth	3		Open
4	915	1 kHz Bandwidth	4	92	+100V
5	4	Phase Lock Compensation	5		Open
6	3	Preset Scan Voltage	6 .	7	-100V
7	5	Linear Compensation Control Voltage	7		Open
8	6	Linear Compensation Control Voltage	8	0	Ground
9	938	Log Ref Level Lamp No. 4	9	2	+ 250V
10	945	Log Ref Level Lamp No. 5	10	0	Horizontal Deflection
11	946	Log Ref Level Lamp No. 6	11	905	Display Uncal Light
12	90	Sensing Ground	12	5	Vertical Deflection
13	. 8	Blanking for Tracking Generator	13	1	6.3 V AC
14			14		Open
24		Open	15	0	Ground
25	916	10 kHz Bandwidth	16	926	Blanking
26	917	30 kHz Bandwidth	17		Open
27	918	100 kHz Bandwidth	18	0	Ground
28	923	300 kHz Bandwidth	19		Open
29	96	Ampl Cal Adjustment	20	1 - 1 -	Open
30	957	Normal Analogic Line	21	97	-12.6V
31	934	Scan Voltage to 47 MHz Osc.	22	9	Horizontal Deflection
32	9	Fine Tune Voltage to	23	906	Marker
		47 MHz Osc.	24	9	Vertical Deflection
33	935	Log Ref Level Lamp No. 1			
34	936	Log Ref Level Lamp No. 2			
35	937	Log Ref Level Lamp No. 3	. '		
36	907	-10 volts			
37	902	+20 volts			
38	956	Video Filter Analogic Line	,		
39	958	Zero Scan Analogic Disable Line			
40		Open	. '		
41	3	0 to 8 V ramp-scan control to		Ì	
		tracking generator			
A1	9	W7 50 MHz IF			
A2	6	47 MHz Auxiliary Line			
A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					

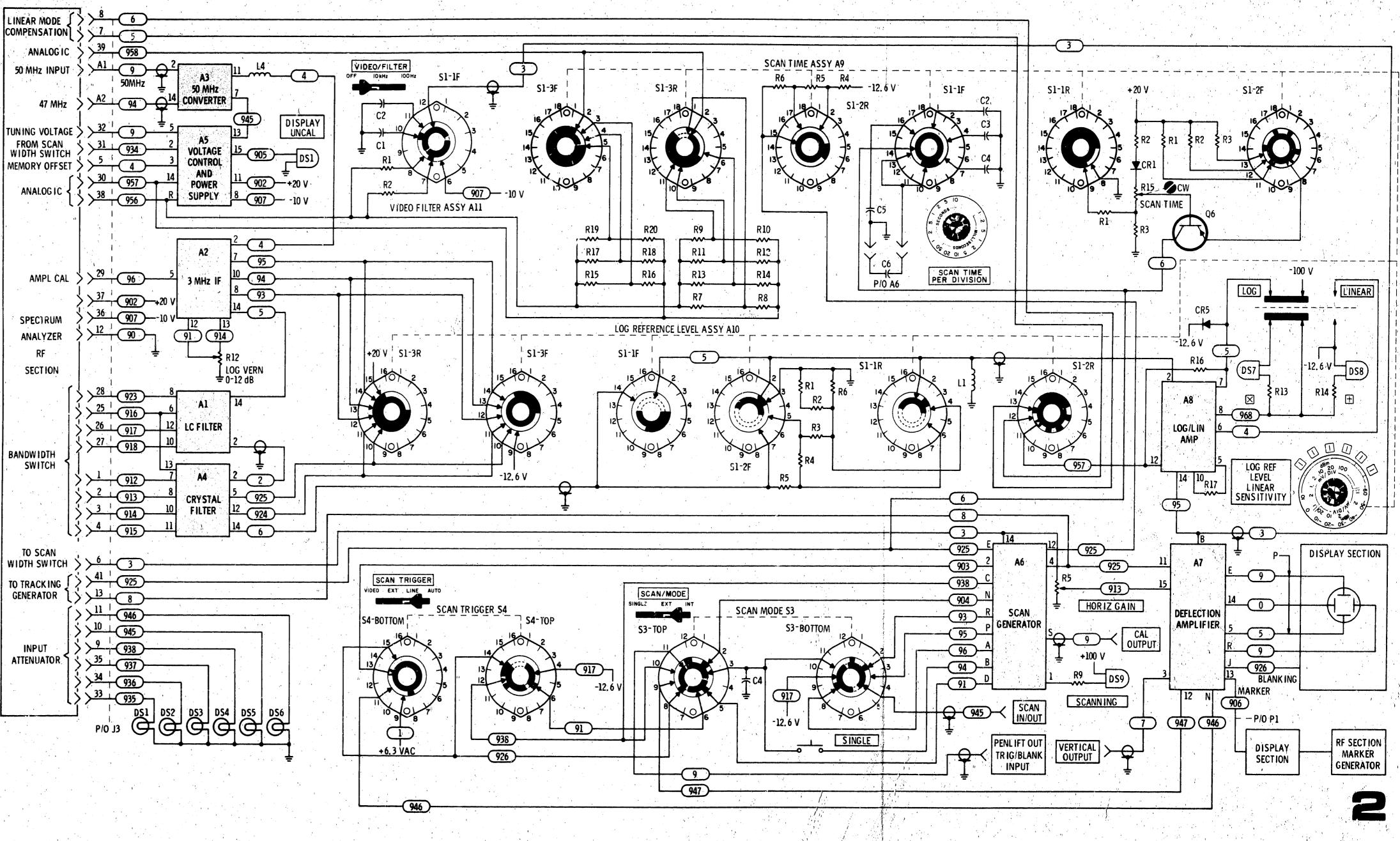


Figure 8-12. Overall Wiring and Switching Diagram

8-21

It is assumed that the procedures in Paragraphs 5-37, 5-38, and 5-39 of Section V could not be satisfactorily conducted. It is further assumed that the tuning input from A5, the 50 MHz input, and the correct operating voltages are present.

#### TROUBLESHOOTING PROCEDURE

When a malfunction has been isolated to the 50 MHz converter assembly, it should be removed from the mainframe and reinstalled using the extender board to provide easy access to all components. Test procedures follow the circuit description in each of the steps below.

#### EQUIPMENT REQUIRED

VHF Signal Generator				. HP 608F
Service Kit	•	1		HP 11592A
Vector Voltmeter .	•	n')	oli yi ili. Napa a	HP 8405A
Frequency Counter		H	P 52	45L/5251A

#### CONTROL SETTINGS

Unless otherwise specified in individual tests.

SCAN WIDTH		. ZERO
BANDWIDTH	in the second of the second	300 kHz
FREQUENCY	• • •	30 MHz
INPUT ATTENUATION		. 0 dB
TUNING STABILIZER	• • • •	. OFF

#### 50 MHz AMPLIFIER

Broadband amplifier Q1/Q2 has built in 44 MHz traps to suppress image responses. (44 MHz mixed with the 47 MHz oscillator signal would produce a false 3 MHz IF signal.) Input and output signals are applied through center tapped auto-transformers. Gain of the two-stage amplifier is typically 10 dB.

### TEST PROCEDURE

With a 30 MHz, -10 dBm signal from the HP 608F applied to the analyzer RF INPUT, and the HP 8405A connected to XA3-2, tune the analyzer FREQUENCY control for maximum signal. Nominal reading is 44 mV rms. Next, connect the HP 8405A to the 50 MHz amplifier output (input feedthru capacitor C1 to the 50 MHz bandpass filter, adjacent to T1). Meter should indicate a typical value of approximately 150 mV rms.

If the 50 MHz amplifier output is correct proceed to step .

If the 50 MHz amplifier is not providing the correct output, check Q1/Q2 and associated components.

#### NO'TE

After making repairs to the 50 MHz amplifier circuit proceed to step . If the test procedure in step is satisfactory concluded steps and may be omitted. If repair to the 50 MHz amplifier is required the 44 MHz Rejection Adjustments defined in Paragraph 5-39 of Section V should be made.

### 50 MHz BANDPASS FILTER

The 50 MHz Bandpass Filter consists of four tuned circuits wound on a common coil form. C5, C6, C9, and C10 are adjusted to center the bandpass at 50 MHz.

### TEST PROCEDURE

With a 30 MHz, -10 dBm signal from the HP 608F applied to the analyzer RF INPUT, and the HP 8405A connected to the bandpass filter output (feedthru capacitor C13 at the output of bandpass filter), tune the analyzer FREQUENCY control for maximum signal. Nominal voltage is 90 mV rms.

If bandpass filter output signal voltage is correct, proceed to step .

If bandpass filter output signal is low or missing, first try realignment in accordance with Paragraph 5-38 of Section V. If this does not correct the malfunction, replace the Bandpass Filter.

After bandpass filter replacement is completed, proceed to step 1. If the test results in step are satisfactory, step 2 may be omitted.

#### NOTE

If bandpass filter replacement is necessary, the new filter should be realigned in accordance with Paragraph 5-38 of Section V.

### 47 MHz LOCAL OSCILLATOR

Q1/Q2 oscillates at 46,700 kHz when 0 volts tuning voltage is applied to varactor C15. Depending on the RF Section used, the 47 MHz oscillator is operated at a fixed frequency of 47 MHz or is swept. See the appropriate RF Section manual for information on the modes of operation for the oscillator.

## SERVICE SHEET 2

Figure 8-12. Overall Wiring and Switching Diagram

### TEST PROCEDURE

Connect the HP 8405A Channel A probe to the 47 MHz local oscillator output at XA3-14 (use 50 ohm load) and the Channel B probe to the input of T4 (second feedthru capacitor from bottom of board on the local oscillator cover). Channel A should read approximately -7 dBm (100 mV into 50 ohms) and Channel B should read approximately 670 mV rms (approximately +10 dBm).

If the meter readings are correct proceed to step

The 47 MHz local oscillator is a sealed unit and field repairs are not practical. If the above readings are not obtained, replace the 47 MHz Local Oscillator Assembly A3A2.

Check the oscillator frequency by connecting the 5245L/5251A to XA3-14. Vary R42 on A5 to adjust the oscillator to 47 MHz.

#### NOTE

If it is necessary to replace the 47 MHz Oscillator Assembly, the checks and adjustments in Paragraph 5-37 of Section V should be performed.

### MIXER .

The 50 MHz IF signal mixes with the 47 MHz local oscillator output to produce a 3 MHz IF signal containing all of the modulation components of the 50 MHz signal. The 3 MHz IF is coupled out through T2 to the 3 MHz IF Amplifier Assembly. Conversion loss through the mixer is approximately 7 dB.

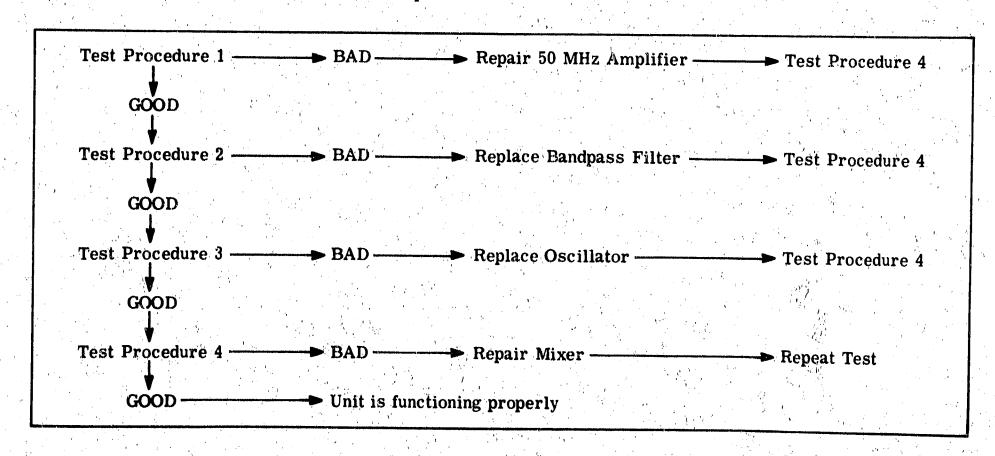
### TEST PROCEDURE

With a 30 MHz, -10 dBm signal from the HP 608F applied to the analyzer RF INPUT, and the HP 8405A connected to the mixer output at 3 MHz feedthru under chassis, tune the analyzer FREQUENCY control for maximum. Typical signal level is 44 mV rms.

If the proper signal level is not present check the mixer circuit.

If the proper signal level is present, the unit is functioning properly.

### Simplified Test Procedure Tree



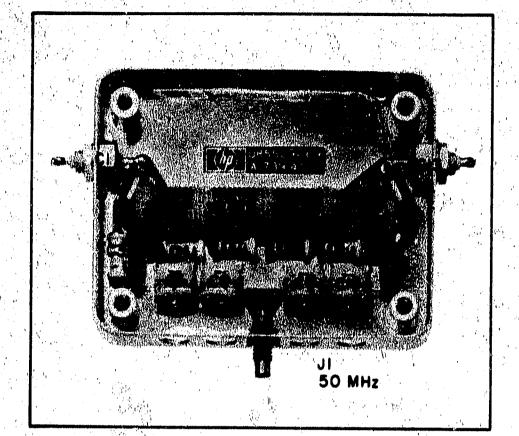


Figure 8-13. 50 MHz Bandpass Filter A3A1 Component Identification

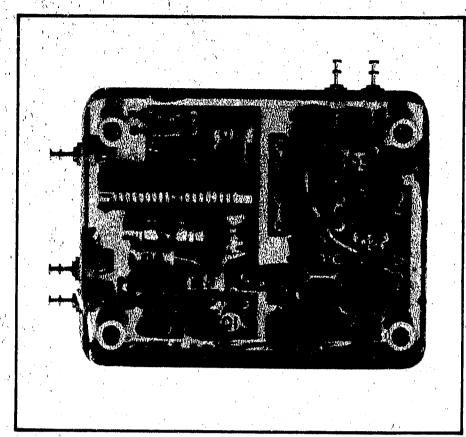


Figure 8-14. 47 MHz Local Oscillator Subassembly A3A2 Component Identification

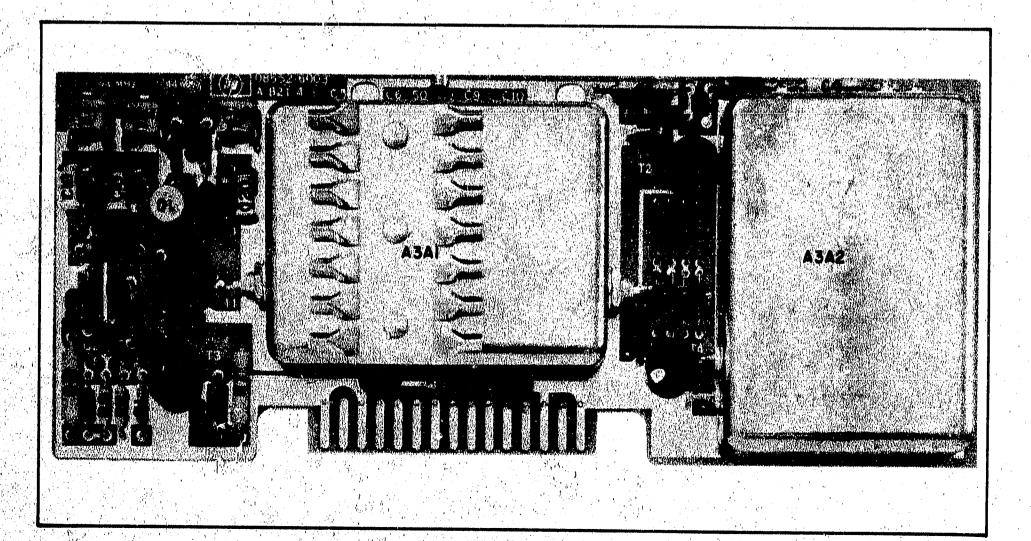


Figure 8-15. 50 MHz Converter Assembly A3, Component Identification

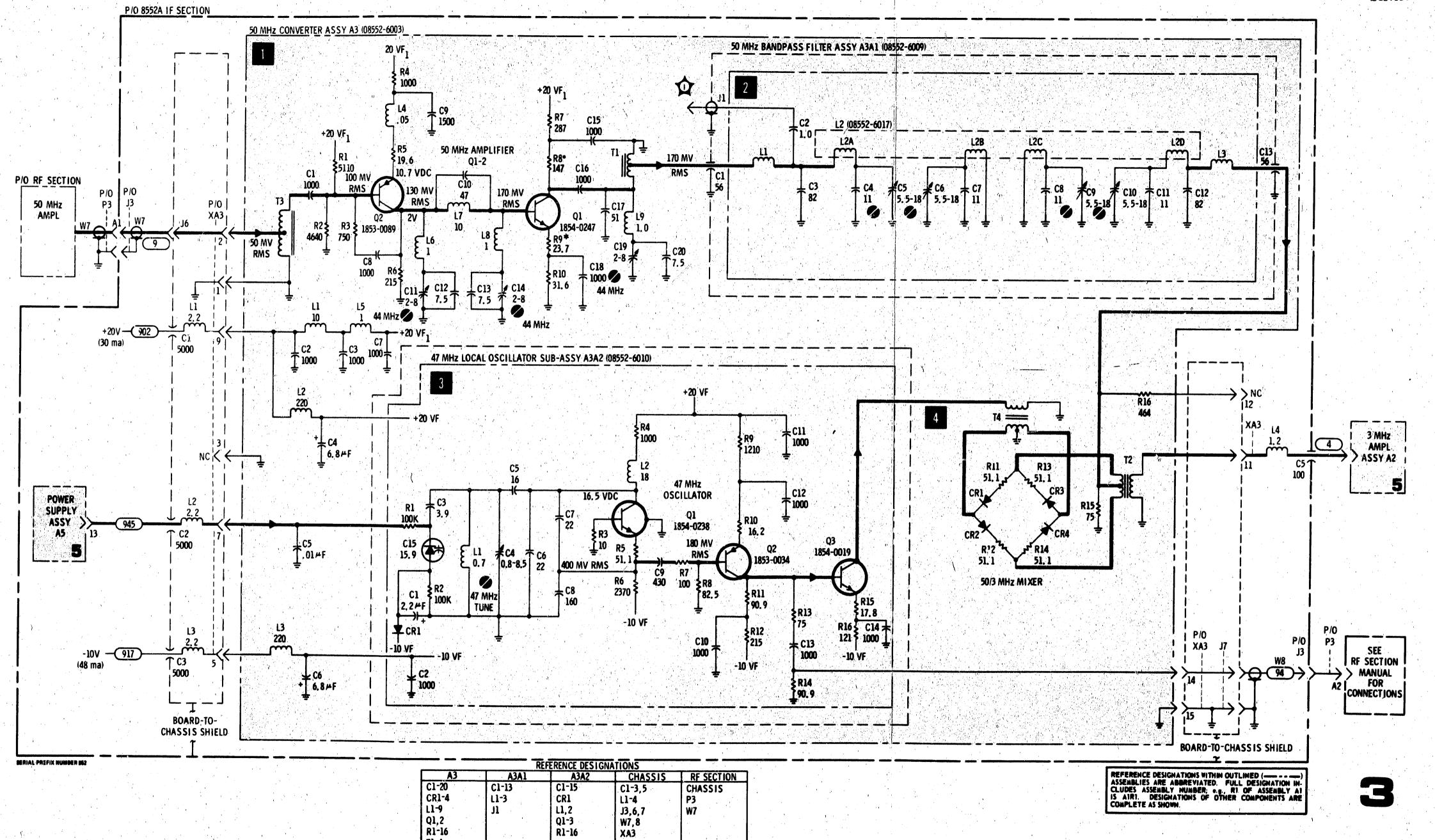


Figure 8-16. 50 MHz Converter

It is assumed that input dc voltages are present and correct and that the dc control level from the marker generator is present and correct.

#### TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the 47 MHz summing and shaping amplifier, remove power supply assembly A5 and reinstall it on the extender board to provide access to components and test points.

#### NOTE

See the appropriate RF Section manual for inputs to the summing and shaping circuits. Depending on the RF Section, the inputs will be a dc voltage or dc voltages and a ramp voltage.

#### **EQUIPMENT REQUIRED**

Digital Voltmeter . . . . . HP 3440A/3439A

#### CONTROL SETTINGS

Any



47 MHz SUMMING AND SHAPING AMPLIFIER

The summing and shaping amplifier combine and process dc levels and ramp signals from the RF Section. The RF Section may supply part or all input signals to the summing amplifier. The shaping amplifier converts any linear input to an exponential ramp to control the varactor in the 47 MHz oscillator. This action ensures that the frequency output is linear with respect to the input control voltage.

#### TEST PROCEDURE



Since only steady dc levels are involved, checking for voltages shown on the schematic should enable the technician to speedily locate defective components.

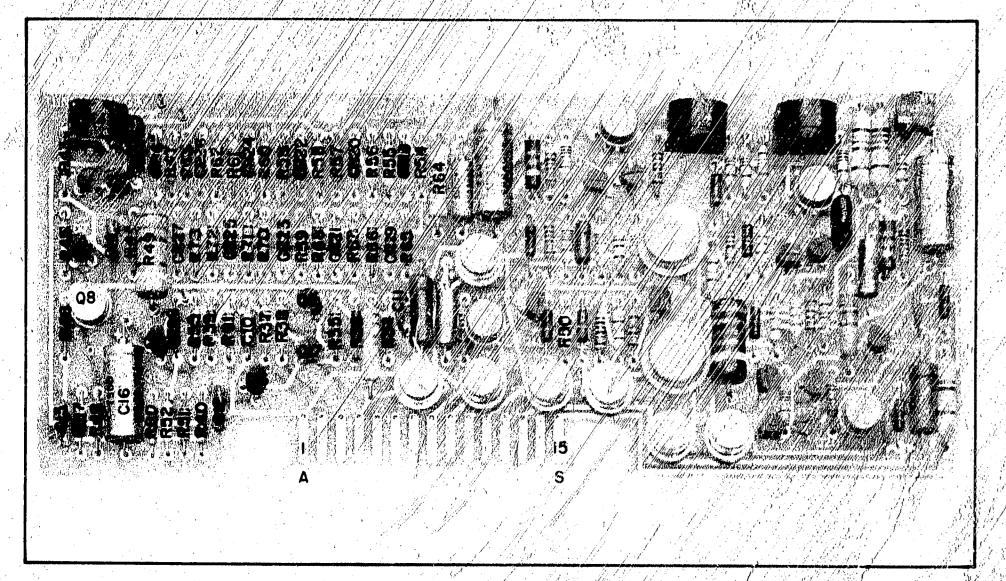


Figure 8-17. P/O Power Supply Assembly A5 Component Identification

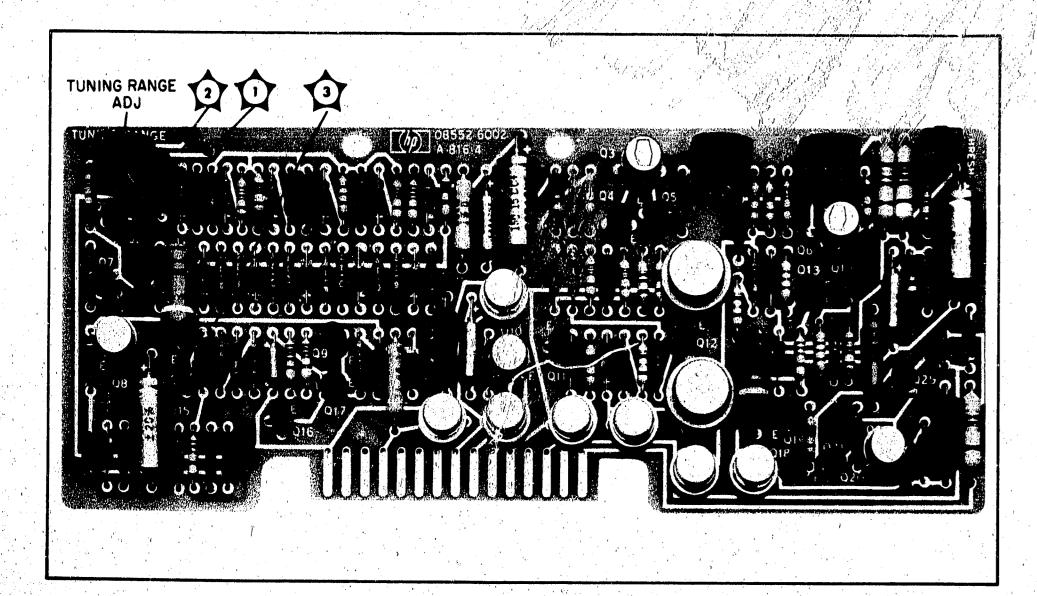


Figure 8-18. P/O Power Supply Assembly A5 Test Point and Adjustment Identification

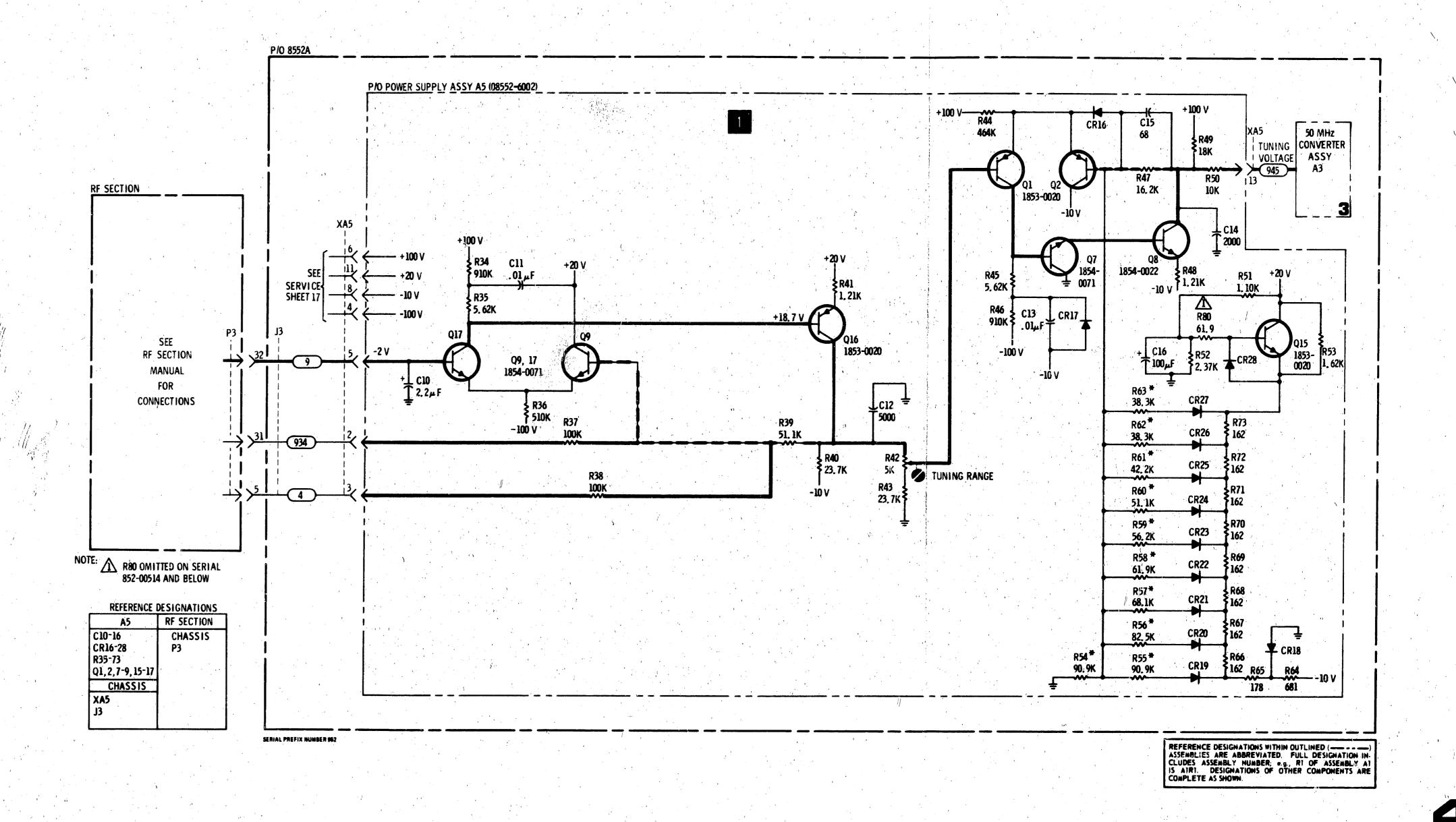


Figure 8-19. 47 MHz Oscillator Control

It is assumed that the 3 MHz input signal and the correct dc input voltages are present and that the output signal is missing or out of tolerance.

#### TROUBLESHOOTING PROCEDURE

When a malfunction has been isolated to the 3 MHz IF amplifier A2, the board should be removed from the IF Section assembly and reinstalled using the extender board to provide access to components. Connect the CAL OUTPUT to the RF INPUT.

#### NOTE

Part of the 3 MHz IF amplifier circuit is shown on Service Sheet 6. It will be necessary to utilize both service sheets to verify proper operation of the amplifier after repairs are completed.

#### EQUIPMENT REQUIRED

Vector	Voltm	eter	ľ		•					HP 8405A
Service	Kit			•,			•			HP 11592A

#### **CONTROL SETTINGS**

Unless otherwise specified in individual tests

INPUT ATTENUA?	<b>FIC</b>	N	•				•		0 dB
<b>SCAN WIDTH PER</b>	D	[V	IS	IC	N				. 20 kHz
LOG REF LEVEL				•	<b>.</b>	•,			—10 dBm
SCAN WIDTH					•				. ZERO
LOG/LINEAR	•	. •					./	•	LOG
FREQUENCY									

#### 3 MHz AMPLIFIER ASSEMBLY (General)

The 3 MHz amplifier assembly consists of a bandpass filter, a calibrated amplifier, a 10/20/30 dB step amplifier, a variable 0 to 12 dB amplifier, and an emitter follower output stage. The 0 to 12 dB amplifier and the emitter follower output stage are shown on Service Sheet 6.

#### 3 MHz BANDPASS FILTER

The 3 MHz bandpass filter is a two-section adjustable filter which is adjusted to provide a bandpass of 300 kHz centered at 3 MHz.

### TEST PROCEDURE

Connect the HP 8405A to TP A (Q1-b) and tune the analyzer for maximum signal. Meter should indicate approximately 6.0 mV rms. If the signal level is correct proceed to step . If the signal is low or missing, check the bandpass filter and R1.

### NOTE

If the bandpass filter circuit required repairs the adjustment procedure specified in Paragraph 5-35 of Section V should be performed.

### 3 MHz CALIBRATION AMPLIFIER

The gain of the 3 MHz calibrated amplifier is controlled by a variable capacitive voltage divider. The variable capacitive elements are varactors which are controlled by a dc level from the RF Section front panel screwdriver adjustment. This circuit is adjusted during the analyzer alignment procedure to compensate for overall gain requirements and to provide absolute amplitude calibration of the displayed signal. Circuit gain is nominally 10 dB and is adjustable by approximately ±4 dB.

### TEST PROCEDURE

Connect the HP 8405A to TP 1 (Q3-c) and tune analyzer for maximum signal. Meter reading is typically 27 mV rms. If this level is present turn the AMPL CAL adjustment to verify proper operation, return control setting to the level observed first, and proceed to step . If signal is missing or level is not as specified, check Q1/Q2/Q3 and associated components.

## 10/20/30 dB STEP AMPLIFIER AND CONTROL CIRCUITS

The gain of the 10/20/30 dB step amplifier is controlled by diode controlled bias networks in the emitter circuit of Q4. This amplifier actually provides the 30, 40, and 50 dB gain steps for the overall system. (The 10 and 20 dB steps are a function of the Crystal Filter Assembly.) Diodes CR1, CR3, and CR5 are reverse biased by the +20 volts applied from the LOG REF LEVEL assembly A10 at settings of -20 dBm or less. As the LOG REF LEVEL switch is rotated, the 30, 40, and 50 dB gain steps are enabled by removing the +20 volts and applying -12.6 volts first to CR1, then to CR1 and CR3, and finally in the 50 dB position to CR1, CR3, and CR5. As CR1, CR3, and CR5 are forward biased they in turn forward bias CR2, CR4, and CR6 to effectively parallel the bias networks in the emitter circuit of Q4. As each diode pair is forward biased the gain of the amplifier is increased by 10 dB. R21, R24, and R27 are adjusted for absolute amplitude calibration of the displayed signal.

### **SERVICE SHEET 4**

Figure 8-19. 47 MHz Oscillator Control

### TEST PROCEDURE

Connect the HP 8405A to TP2 and tune the analyzer for maximum signal. Rotate the LOG REF LEVEL control as indicated below and observe meter readings.

Signal levels shown are typical.

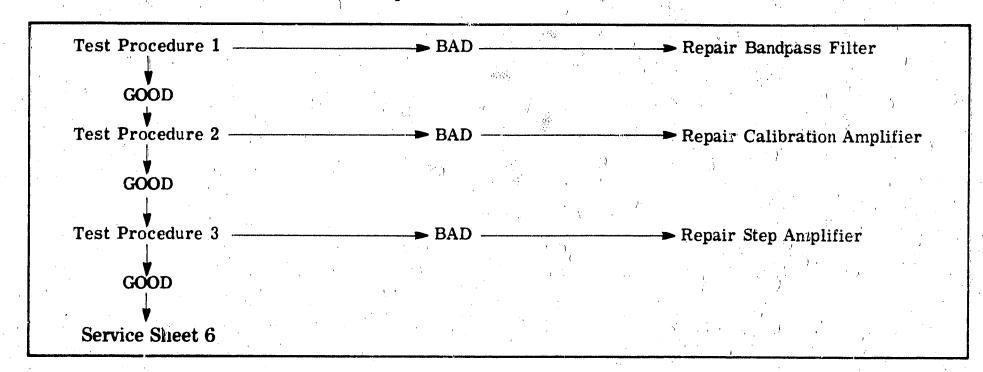
If correct levels are observed proceed to step on Service Sheet 6.

If correct levels are not obtained check the 10/20/30 dB step amplifier, bias networks or LOG REF LEVEL switch assembly as required.

#### NOTE

When repairs are required to the 3 MHz IF assembly additional tests specified in Paragraphs 5-32, 5-35, and 5-36 of Section V should be performed.

#### Simplified Test Procedure Tree



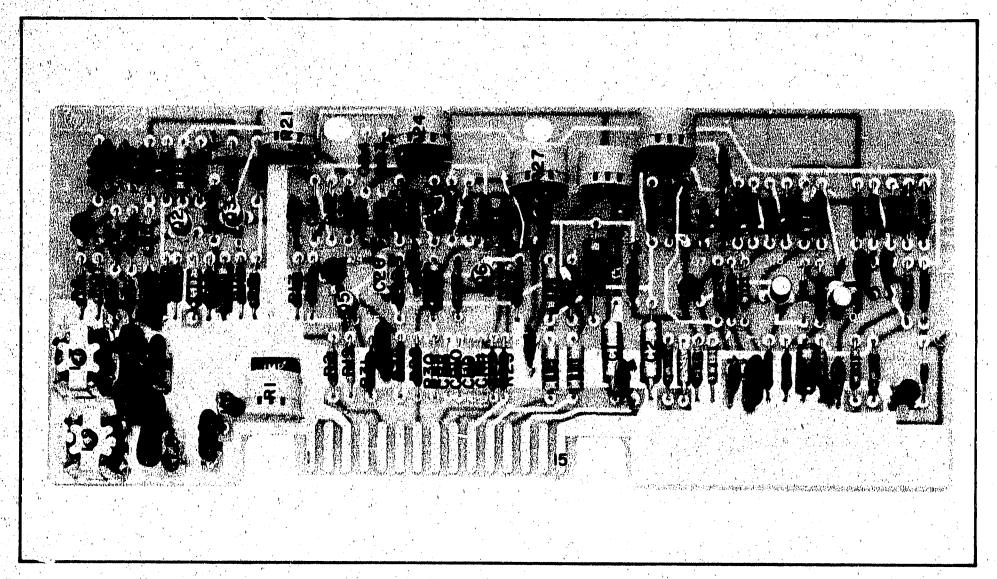


Figure 8-20. P/O 3 MHz Amplifier Assembly A2 Component Identification

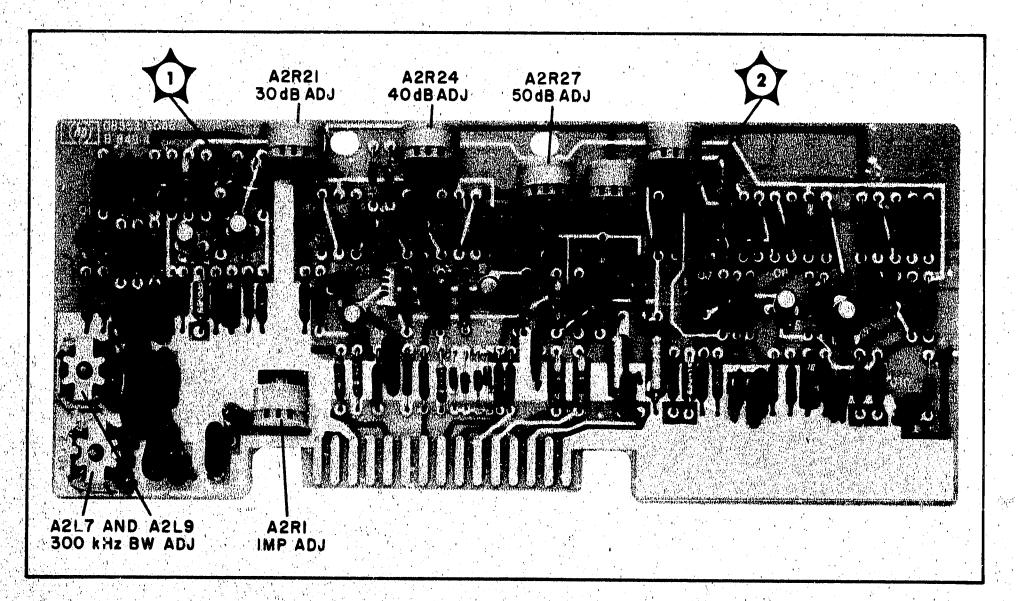


Figure 8-21. P/O 3 MHz Amplifier Assembly A2 Test Point and Adjustment Identification

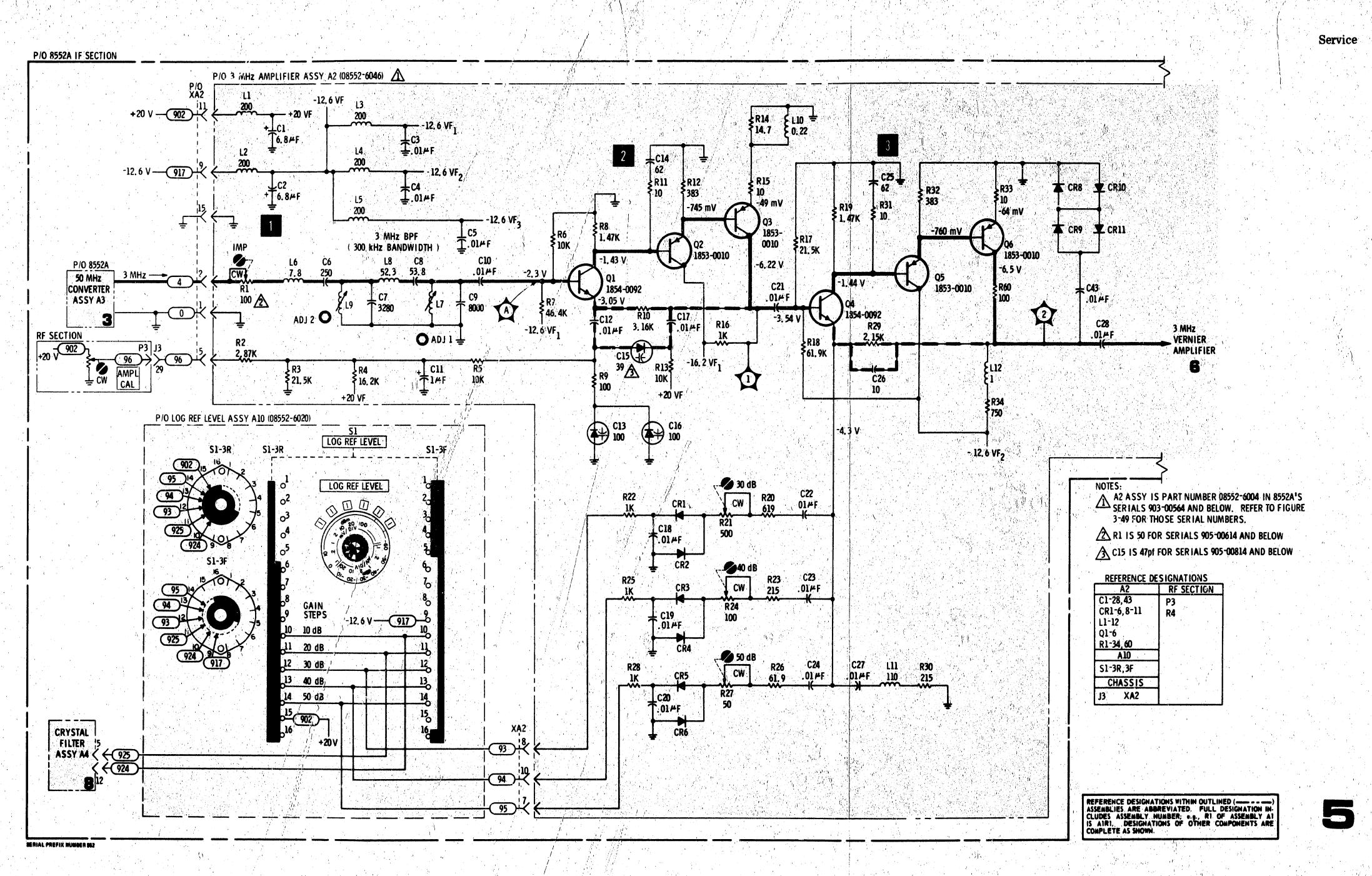


Figure 8-22. 3 MHz IF Amplifier (Sheet 1 of 2)

It is assumed that the 3 MHz input signal and the circuit dc input voltages are present and that the output signal is missing or out of tolerance.

#### TROUBLESHOOTING.

When a malfunction has been isolated to the 3 MHz IF amplifier A2, the board should be removed from the IF Section and reinstalled using the extender board to provide access to components. Connect the CAL OUTPUT to the RF INPUT.

#### NOTE

Part of the 3 MHz IF amplifier circuit is shown on Service Sheet 5. It will be necessary to utilize both service sheets to verify proper operation of the amplifier after repairs are completed.

#### EQUIPMENT REQUIRED

Vector	Voltmeter	 HP 8405A
Service	Kit	HP 11592A

#### CONTROL SETTINGS

Unless otherwise specified in individual tests.

INPUT ATTENUATION	0 dB
SCAN WIDTH PER DIVISION	20 kHz
LOG REF LEVEL	-10 dBm
SCAN WIDTH	ZERO
BANDWIDTH	. 300 kHz
LOG/LINEAR	LOG
FREQUENCY	. 30 MHz



#### 12 dB VARIABLE GAIN AMPLIFIER

The gain of the 0 to 12 dB amplifier is controlled by two varactor voltage dividers. One of these voltage dividers controls the level of the degenerative feedback from the output stage to the input stage;

the other controls the level of the signal applied to the 3 MHz amplifier output stage. The LOG REF EVEL · LINEAR SENSITIVITY vernier control, 11, on the front panel of the IF Section controls the gain of the variable gain amplifier. R1 is calibrated by adjustments located on the 3 MHz IF amplifier assembly. R44 calibrates the 12 dB maximum and R51 calibrates the 0 dB minimum.

### TEST PROCEDURE



Connect the HP 8405A to TP B (junction of C40/C41) and tune the analyzer for maximum signal level on the meter. Rotating the LINEAR SENSITIVITY vernier control to both extremes should produce typical readings of 30 mV rms to 130 mV rms. If the meter readings are correct proceed to step ....

If the meter readings are not correct repair the variable gain amplifier and repeat the test.

### 3 MHz IF AMPLIFIER OUTPUT CIRCUIT

The 3 MHz IF amplifier output circuit consists of an emitter follower. The purpose of this stage is to provide isolation between the variable gain IF amplifier and the LC Filter assembly.

### TEST PROCEDURE



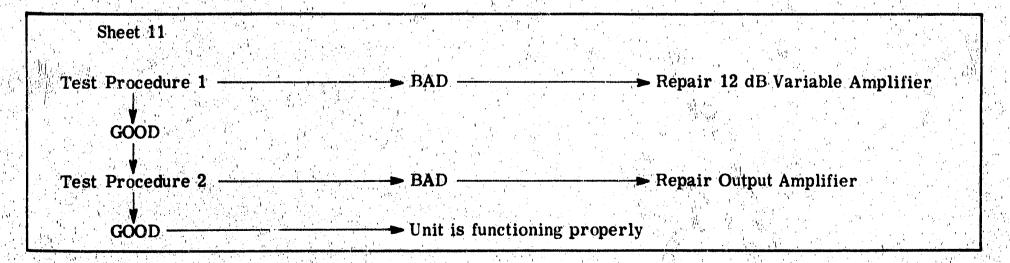
Connect the HP 8405A to TP 4 and tune the analyzer for maximum signal level on the meter. Typical reading is 30 mV rms with LOG/LIN vernier CCW. If the meter reading is correct the assembly is functioning properly.

If the meter reading is incorrect check Q10 and associated components.

#### NOTE

When repairs are required the tests specified in Paragraphs 5-32, 5-35, and 5-36 of Section V should be performed.

#### Simplified Test Procedure Tree



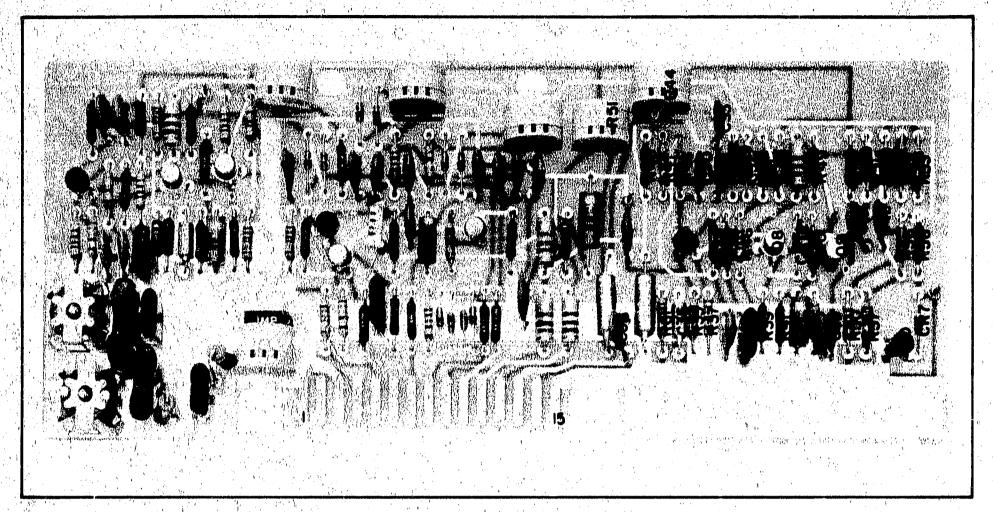


Figure 8-23. P/O 3 MHz IF Amplifier Assembly A2 Component Identification

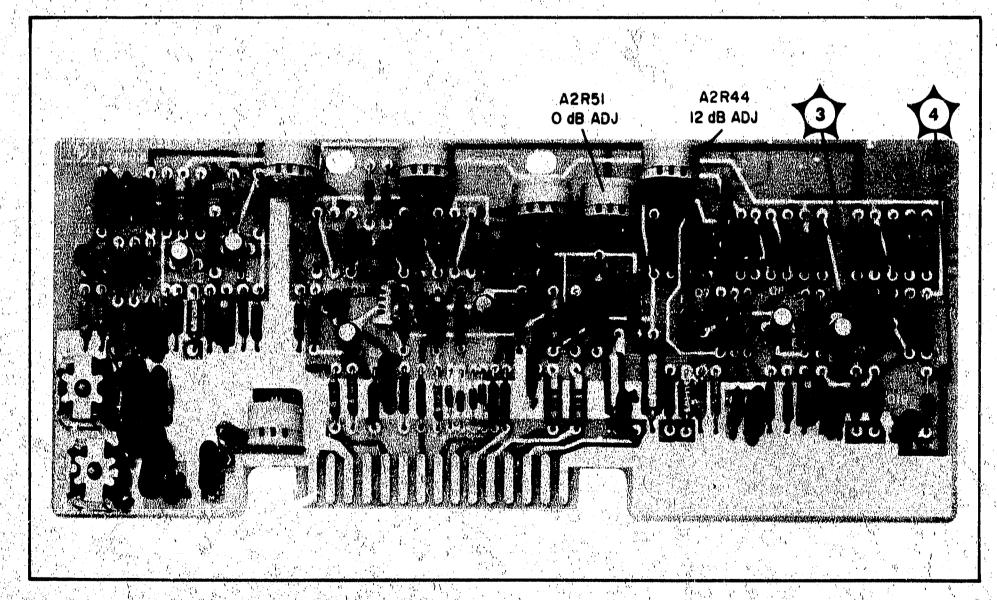


Figure 8-24. P/O 3 MHz IF Amplifier Assembly A2 Test Point and Adjustment Identification

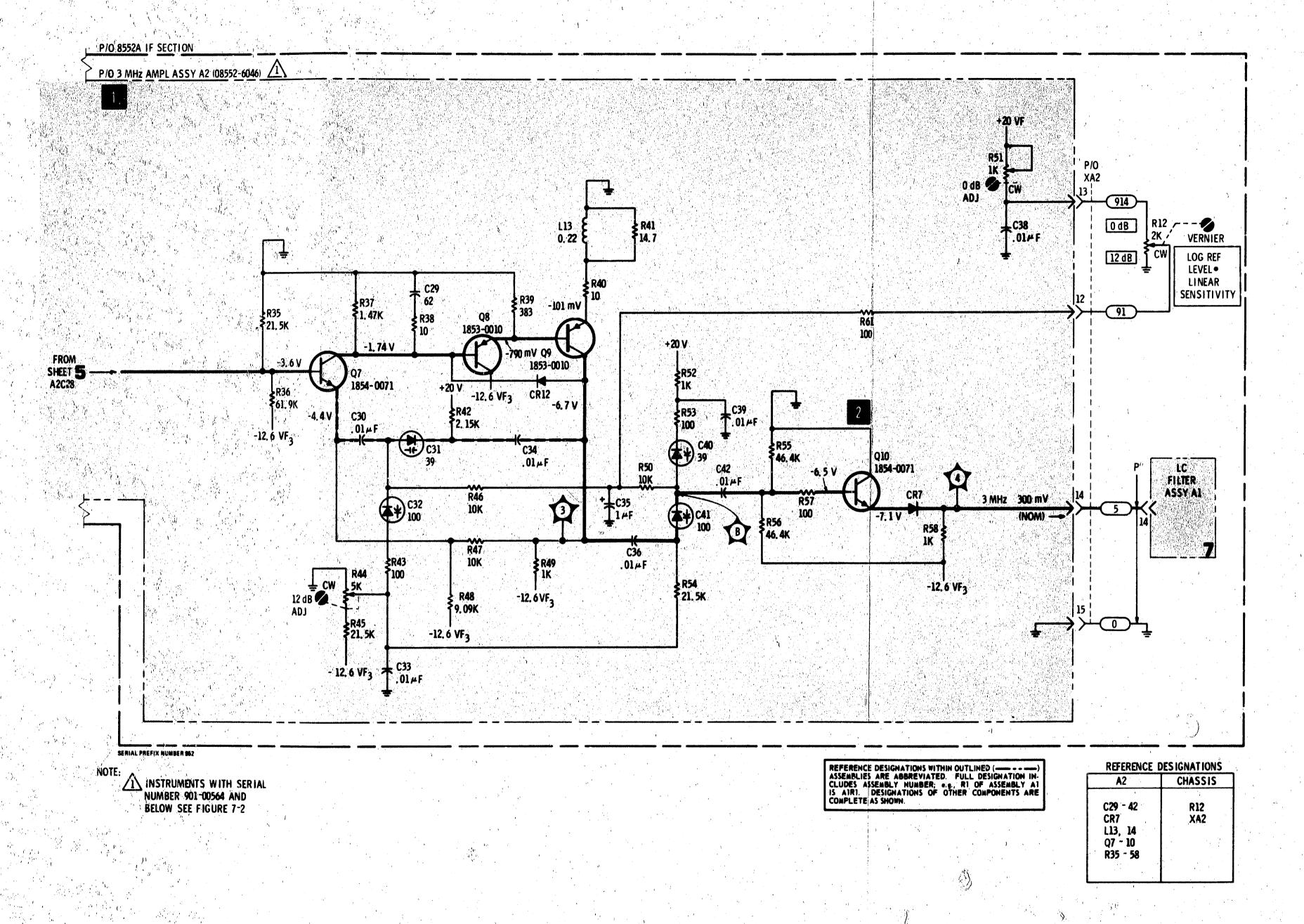




Figure 8-25) 3 MHz IF Amplifier (Sheet 2 of 2)

It is assumed that the 3 MHz signal from the 3 MHz IF amplifier and dc supply voltages are present and within tolerances, and that the output is missing or incorrect.

#### TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the LC Filter assembly it should be removed from the IF Section frame and reinstalled using the extender board to provide access to components.

#### EQUIPMENT REQUIRED

VHF Signal Generator						HP 608F
Vector Voltmeter		•	•	•		. HP 8405A
Service Kit	• •.	•.				HP 11592A
Digital Voltmeter		÷	• '	1	HP	3440A/3443A

#### **CONTROL SETTINGS**

Unless otherwise specified in individual tests.

SCAN WIDTH	ZERO
INPUT ATTENUATION	0 dB
TUNING STABILIZER	
SCAN WIDTH PER DIVI	
LOG REF LEVEL	
LOG/LINEAR	
FREQUENCY	30 MHz

### LC BAND WIDTH FILTER STACES

Q4, Q3, A2 and Q1 with associated components comprise four selectable-bandwidth, unity gain stages. The four stages are identical except that the fourth stage (Q1) has an adjustable resistor in the feedback path. This resistor is adjusted to provide compensation for losses incurred when narrow bandwidths are selected. When the 10 kHz bandwidth is selected the input signal is coupled to Q4 thru C1 and R4. When the 30 kHz bandwidth is selected the input signal is coupled to Q4 thru C1 and the parallel combination of R4 and R3. When the 100 kHz bandwidth is selected the signal is coupled to Q4 thru C1/R4 and C2/R5 in parallel. When the 300 kHz bandwidth is selected all four stages are bypassed and the signal is coupled directly to the output amplifier. Operation of Q3, Q2 and Q1 is identical to that described for Q4 except for reference designators.

### TEST PROCEDURE

With a 30 MHz, -10 dBm signal from the HP 608F applied to the analyzer RF INPUT, connect the HP 8405A to TP A, Q1 emitter. Tune the analyzer for

maximum with the BANDWIDTH switch in the 10 kHz position. Typical meter reading is 280 mV rms.

Rotate the BANDWIDTH switch to the 30, 100 and 300 kHz positions. The meter reading should be approximately the same for bandwidths of 10, 30 and 100 kHz, and drop to approximately 0 volt in the 300 kHz BANDWIDTH position.

If the signal is not present at any of the BAND-WIDTH settings the trouble is likely to be in one of the four stages. To isolate to a defective stage check for the presence of the signal at the emitter of Q2, then Q3, then Q4. Signal levels should approximate those specified for Q1 emitter. If the cause of the malfunction is not detected, proceed to step ...

If the signal is correct at some, but not all, bandwidth selections, trouble is likely to be in the switching or diode matrix. Proceed to step.

If the correct readings are observed proceed to step

### SWITCHING AND DIODE MATRIX

When the BANDWIDTH switch is in the 300 kHz position, -12.6 volts are applied to XA1-8. This dc level accomplishes the following:

- a. Overcomes the positive voltage applied through R42 to forward bias CR9 and CR12. This allows the input signal to be coupled directly to the output amplifier.
- b. Forward biases CR13 to provide a dc level to the relay driver in the Crystal Filter assembly. This causes the Crystal Filter circuits to be bypassed.
- c. Forward biases CR11 to disable the first selectable bandwidth stage Q4.
- d. Forward biases CE16 to reverse bias CR17 and disconnect the fourth selectable bandwidth stage Q1 from the output stage.

When the SCAN WIDTH switch is placed in the preset scan position, -12.6 volts is applied to XA1-8 and the LC bandwidth filter operates in the

300 kHz mode regardless of BANDWIDTH switch position.

When the BANDWIDTH switch is placed in the 100 kHz position —10 volts is applied to XA1-10/L. This —10 volts is applied to LC Filter diodes and also forward biases CR15 to operate the bypass relays in the Crystal Filter assembly. The diode bias voltage forward biases CR2, CR4, CR6, and CR8 to place resistors R5, R14, R23, and R33 in parallel with those already in the signal path. This effectively swamps the LC circuits to modify their Q factor and provide a bandpass of 100 kHz centered at 3 MHz.

When the BANDWIDTH switch is placed in the 30 kHz position —10 volts is applied to XA1-12/N. This —10 volts is applied to LC Filter diodes and also forward biases CR14 to operate the bypass relays in the Crystal Filter assembly. The diode bias voltage forward biases CR1, CR3, CR5, and CR7 to place resistances R3, R11, R20, and R31 in parallel with those already in the signal path. This effectively swamps the LC circuits to modify their Q factors and provide a bandpass of 30 kHz centered at 3 MHz.

When the BANDWIDTH switch is placed in the 10 kHz position the switching diodes are not used for signal steering and the LC filter provides a 10 kHz bandpass centered at 3 MHz.

### TEST PROCEDURE

Use the HP 3440A/3443A to check for voltages shown in the chart for XA1 contacts on Service Sheet 8 step .

If the correct readings are obtained at XA1 pins 6, 7, 12, 10, and 8, check the diode matrix. If correct readings are not obtained, check the BANDWIDTH switch, SCAN WIDTH switch, CR1, CR2, CR3, wiring, etc.

When correct readings are obtained recheck step then proceed to step .

### LC FILTER OUTPUT AMPLIFIER

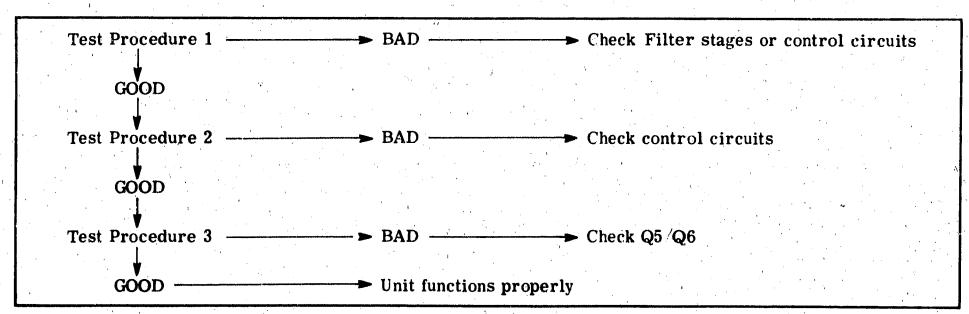
The output stage consists of Q5 and Q6. This stage provides unity gain and a low impedance output to drive the Crystal Filter assembly.

### TEST PROCEDURE

With a 30 MHz, -10 dBm signal from the HP 608F applied to the RF INPUT, connect the HP 8405A to TP 1. Tune the analyzer for maximum signal and observe the meter reading. Typical reading should be 280 mV rms.

If the correct signal level is observed assembly is functioning properly. If not, check Q5/Q6 and associated components.

### Simplified Test Procedure Tree



SERVICE SHEET 6

Figure 8-25. 3 MHz IF Amplifier (Sheet 2 of 2)

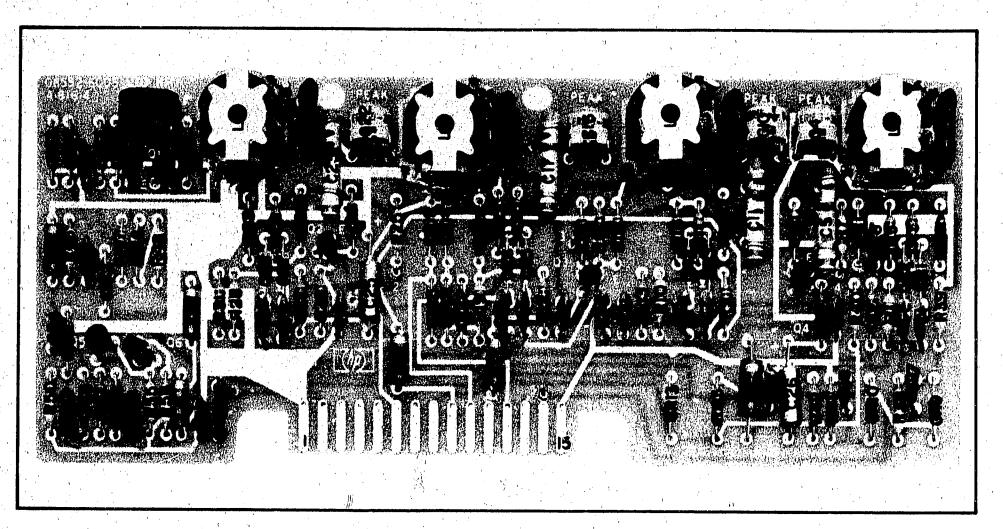


Figure 8-26. LC Filter Assembly A1 Component Identification

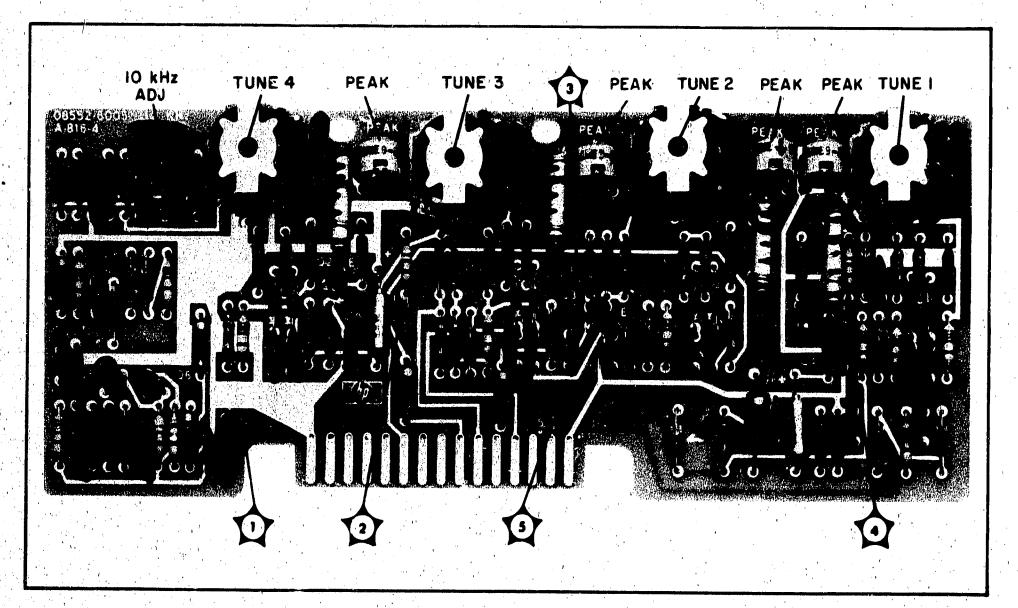


Figure 8-27. LC Filter Assembly A1 Test Point and Adjustment Identification

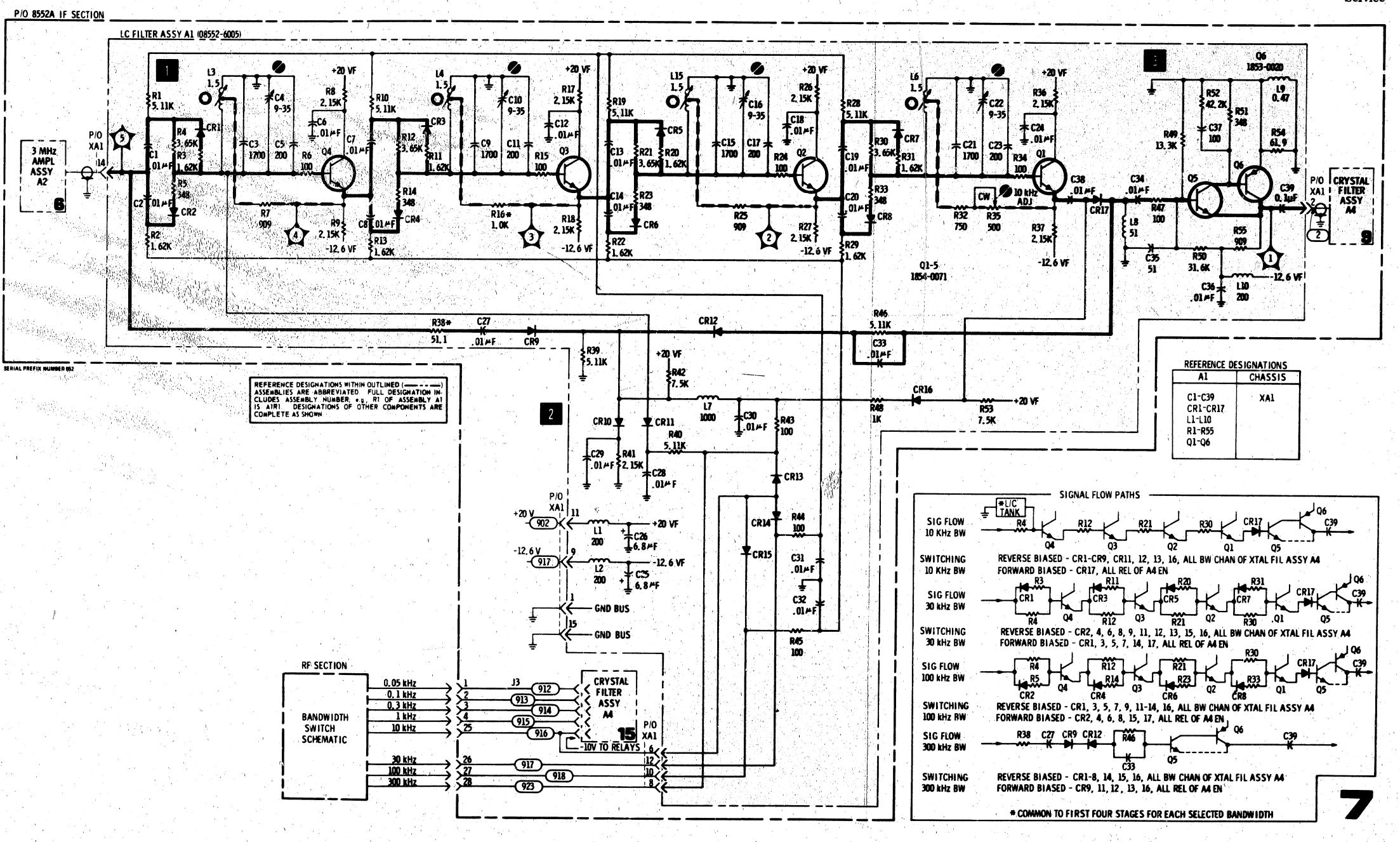


Figure 8-28. 3 MHz LC/BW Filter

### SERVICE SHEET 8

Normally, malfunctions which occur in the switching circuits will be detected and corrected while troubleshooting circuits shown on Service Sheets.

### TROUBLESHOOTING PROCEDURE

Since these switches function for voltage switching only, all components and wiring can be checked by monitoring voltage levels at the input connector to the 3 MHz IF amplifier, LC Filter assembly, and the Crystal Filter assembly.

### EQUIPMENT REQUIRED

Service Kit	•	 •		•	HP 11	592A /
Digital Voltmete	r	 •		HP 3	440A/3	443 <i>A</i> /

### CONTROL SETTINGS

As required to check dc levels.



This portion of the log reference level assembly applies +20 volts or -12.6 volts to enable or disable switches to control the gain of stages in the 3 MHz IF amplifier and Crystal Filter assemblies.

### TEST PROCEDURE

Use the HP 3440A/3443A Digital Voltmeter to verify switching voltages at pins of XA2 and XA4 for operation of LOG REF LEVEL switch. The voltages shown in the adjacent chart are typical.

If voltages are correct switch section is functioning properly.

If voltages are not correct check voltage inputs to switch, switch contacts and wiring.

	Pin	Log	Ref Le	vel Swit	ch Sett	ings (dl	3m)
. P 	of XA2	<b>/- 10</b>	- 20	- 30	- 40	- 50	- 60
	8	+20	+20	-12.6	-12.6	-12.6	-12.6
	10	+20	+20	+20	-12.6	-12.6	-12.6
***	7	+20	+20	+20	+20	-12.6	-12.6
	Pin of XA4						
	12	+20	-12.6	-12.6	-12.6	-12.6	-12.6
	5	+20	+20	-12.6	-12.6	-12.6	-12.6

### BANDWIDTH CONTROL

Pins 1-4, and 25-28 of J3 make contact with the RF Section. The RF Section BANDWIDTH switch provides positive or negative voltages to add, bypass or remove bandwidth shaping elements in the signal path.

### TEST PROCEDURE

Use the HP 3440A/3443A Digital Voltmeter to verify switching voltages at pins of XA1 and XA4 for operation of SCAN WIDTH switch and BAND-WIDTH switches. The voltages shown in the chart below are typical.

If all voltages are correct the portions of the SCAN WIDTH and BANDWIDTH switches shown on Service Sheet 8 are functioning properly.

If negative dc levels are missing check the RF Section.

Pin				Ba	ndwidth S	witch Sett	ings	e de la companya de l	in the second
of XA1	.05	0.1	0.3	1	3	10	30	100	300
8*	+ 5	+ 5	+ 5	+ 5	+ 5	+ 5	+ 5	+ 5	- 10
8**	- 10	- 10	- 10	- 10	- 10	- 10	- 10	- 10	- 10
10*	+20	+20	+20	+20	+20	+20	+20	- 10	+20
10**	+20	+20	+20	+20	+20	+20	+20	- 3	+20
12*	+20	+20	+20	+20	+20	+20	- 10	+20	+20
12**	+20	+20	+20	+20	+20	+20	0	+20	+20
6*	+ 5	+0.5	+0.5	+0.5	+0.5	- 10	- 10	- 10	- 10
6**	- 9	- 9	- 9	- 9	- 9	- 9	- 9	- 9	- 9
Pin			1						
of XA4					$N_{i,j}^{(i)} = \frac{1}{2}$				
	+0.5	+0.5	+0.5	+0.5	+0.5	- 9	- 9	- 9	- 9
XA4	+0.5 - 9	+0.5 - ,9	+0.5	+0.5 - 9	+0.5	- 9 - 9	- 9 - 9	- 9 - 9	- 9 - 9
XA4 13*							1,6	The second secon	
XA4 13* 13**	- 9	- 9	- 9	- 9	- 9	- 9	- 9	- 9.	- 9
XA4 13* 13** 11*	- 9 +20	- 9 +20	- 9 +20	- 9 +20	- 9 +20	- 9 +20	- 9 +20	- 9 +20	- 9 +20
XA4 13* 13** 11* 11**	- 9 +20 +20	- 9 +20 +20	- 9 +20 +20	- 9 +20 +0.9	- 9 +20 +20	- 9 +20 +20	- 9 +20 +20	- 9 +20 +20	- 9 +20 +20
XA4 13* 13** 11* 11** 10*	- 9 +20 +20 +20	- 9 +20 +20 +20	- 9 +20 +20 -10	- 9 +20 +0.9 +20	- 9 +20 +20 +20	- 9 +20 +20 +20	- 9 +20 +20 +20	- 9 +20 +20 +20	- 9 +20 +20 +20
XA4 13* 13** 11* 11** 10* 10** 8* 8**	- 9 +20 +20 +20 +20	- 9 +20 +20 +20 +20	- 9 +20 +20 -10 +0.8	- 9 +20 +0.9 +20 +20	- 9 +20 +20 +20 +20	- 9 +20 +20 +20 +20	- 9 +20 +20 +20 +20	- 9 +20 +20 +20 +20	- 9 +20 +20 +20 +20
XA4 13* 13** 11* 11** 10* 10** 8* 8** 7*	- 9 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 -10	- 9 +20 +20 - 10 +0.8 +20	- 9 +20 +0.9 +20 +20 +20	- 9 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20
XA4 13* 13** 11* 11** 10* 10** 8* 8**	- 9 +20 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 -10 +0.9	- 9 +20 +20 - 10 +0.8 +20 +20	- 9 +20 +0.9 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20 +20	- 9 +20 +20 +20 +20 +20 +20

\*\* Preset mode

\*ZERO or PER DIVISION mode

SERVICE SHEET 7

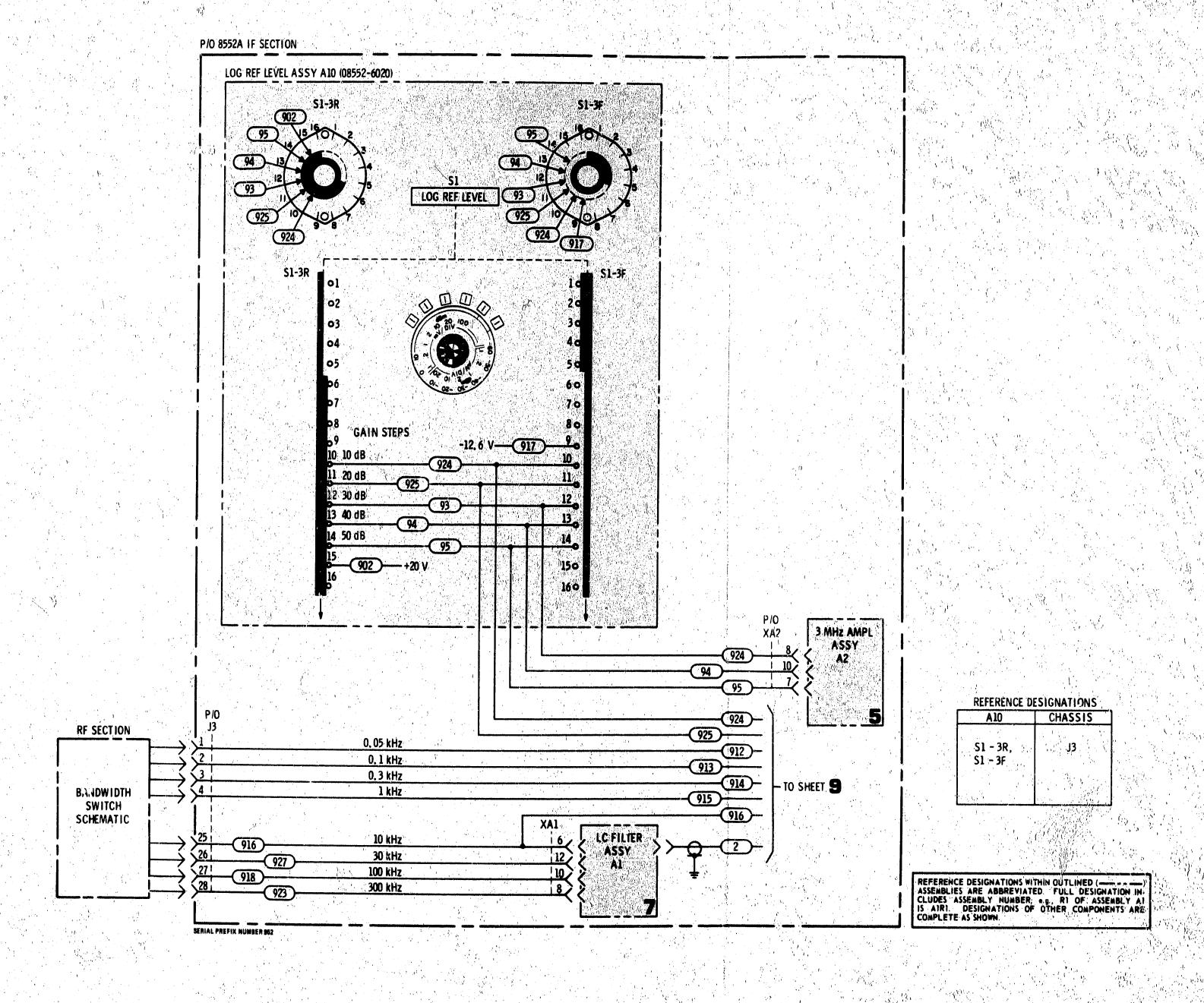


Figure 8-29. 3 MHz Crystal Filter Control Circuits

It is assumed that the 3 MHz IF signal from the LC Filter and the dc operating voltages are present and correct and that the 3 MHz output is missing or out of tolerance.

### TROUBLESHOOTING PROCEDURE

When rouble has been isolated to the 3 MHz Crystal Filter assembly, the assembly should be removed and reinstalled using the extender board to provide access to components. Test procedures follow descriptions of individual circuits. These Service Sheets (9 and 10) apply to Crystal Filter assemblies in IF Section with serial 352-00465 and above.

### EQUIPMENT REQUIRED

Service Kit		•					HP 11592	2.
Vector Voltmeter		•				•	. HP 8405	) /
Digital Voltmeter		•.	• 1	•	F	łΡ	3440A/3443	3
VHF Signal Generat	or	•	•.,;	4	• .•	•	HP 608	3]

#### CONTROL SETTINGS

NPUT ATTEN	UA	T	'IC	N	Ţ.	√ <b>₽</b> °	• -		•			•	0 dB
BANDWIDTH	•						•	•		•			. 3 kHz
LOG REF LEV													
SCAN WIDTH													
LOG/LINEAR		•				•	•		•	•			LOG
FREQUENCY	•			٠,	• .	•	•	•	•		•		30 MHz

# SELECTABLE BANDWIDTH CRYSTAL FILTER STAGES

Q9/Y1, Q3/Y2, (and Q8/Y3 on Service Sheet 10 are unity gain, crystal controlled, selectable bandwidth stages. These stages are bypassed by relay contacts when bandwidths of 10 kHz or greater are selected. The basic bandwidth of the crystal filters is 3 kHz. The bandwidth is altered by connecting R/C networks in parallel with the output load of the Crystal Filters. As the resistance of the added R/C network is decreased, the skirt frequencies are sharply attenuated. This effectively narrows the bandpass of the crystal filters without drastically reducing the amplitude of those frequencies closely centered about 3 MHz.

### TEST PROCEDURE

With the HP 606B output (30 MHz, -30 dBm) connected to the analyzer RF INPUT, measure the signal levels at TP A, TP B (and TP C on Service Sheet 10) at bandwidths of 3 kHz, 1 kHz, 0.3 kHz and .05 kHz with the HP 8405A. Readjust FINE TUNE for maximum signal during each measurement. Meter readings should be about 29 mV rms.

#### NOTE

FINE TUNE adjustment is very critical at narrow bandwidths and extreme care will be required to obtain correct measurements.

If the proper signal levels are observed, and the malfunction was detected while trying to adjust the crystal filters in accordance with Paragraph 5-34 proceed to step and if required, step ...

If signal is incorrect at TP A check the first crystal filter stage.

If the signal is correct at TP A but incorrect at TP B check the second crystal filter stage and isolation amplifier step .

If the signal is correct at TP B but incorrect at TP C check the third crystal stage and the step amplifier step 5.

If signal levels are correct and service is required because of gain rather than bandwidth problems proceed to steps 5, 5 and 7.

### ISOLATION AMPLIFIER Q1/Q2

Q1/Q2 and associated components comprise a unity gain amplifier which provides isolation between the first and second crystal filter stages to prevent interaction.

### TEST PROCEDURE

With the HP 608F connected as in step check the signal level at TP D (Q1-e) with the HP 8405A. If signal was present at TP A, but is not present at TP D, check Q1/Q2 and associated components.

### CRYSTAL FILTER BYPASS CIRCUIT

Relays K1, K2 and K3 are energized when the analyzer is operated at bandwidths of 10 kHz or wider. A -12.6 volt dc level is applied to the base of Q10 from the BANDWIDTH switch or from the diode matrix in the LC filter to turn on Q10 and supply an energizing current for the three relays. When the analyzer is operated at narrower bandwidths, the dc level at the base of Q10 is removed and the relays are de-energized.

### **SERVICE SHEET 8**

Figure 8-29. 3 MHz Crystal Filter Control Circuits

### TEST PROCEDURE

Connect the HP 3440A/3443A between ground and XA4-13. In the 300, 100, 30, and 10 kHz BANDWIDTH modes the voltage should be approximately -12.6 volts. To check Q10 operation connect the 3440A/3443A to the junction of R5/R9/R27. In the 300, 100, 30, and 10 kHz BANDWIDTH modes the voltage should be about -8.0 volts and in narrower bandwidths it should be 0 volts. Relay contact closure may be checked in-circuit with an ohmmeter.

## DIODE SWITCHING AND BANDWIDTH CONTROL NETWORKS

There are three diode switching and bandwidth control networks, one for each of the three crystal filter stages. (The third stage and network is on Service Sheet 10). When the analyzer is operated in the 3 kHz BANDWIDTH mode all of the switching diodes are reverse biased and the inherent characteristics of the filter plus the fixed output load determines the filter bandwidth. As the bandwidth is decreased R/C networks are placed in parallel with the output load of the crystal filter stages. As an example, R24 and C20 are placed across R12 in the output of the first crystal filter when the BANDWIDTH switch is placed in the 1 kHz

position by a -12.6 volt dc level which forward biases CR5. Operation of all three crystal filter stages is identical.

### TEST PROCEDURE

Using the HP 3440A/3443A check the dc level at XA4 pins 10 and 11. The meter should indicate approximately -12.6, volts when the BAND-WIDTH switch is set to the position shown adjacent to each pin and approximately +20 volts in all other switch positions.

If voltages are correct check the individual diode and R/C networks.

If voltages are incorrect see Service Sheet 8.

#### FACTORY SELECTED COMPONENTS

R12, R31 (and R66 on Service Sheet 10) are selected to provide optimum bandwidth at the 3 kHz bandwidth.

R86 (on Service Sheet 10) is selected to provide gain compensation for differences in Log/Lin amplifier assemblies.

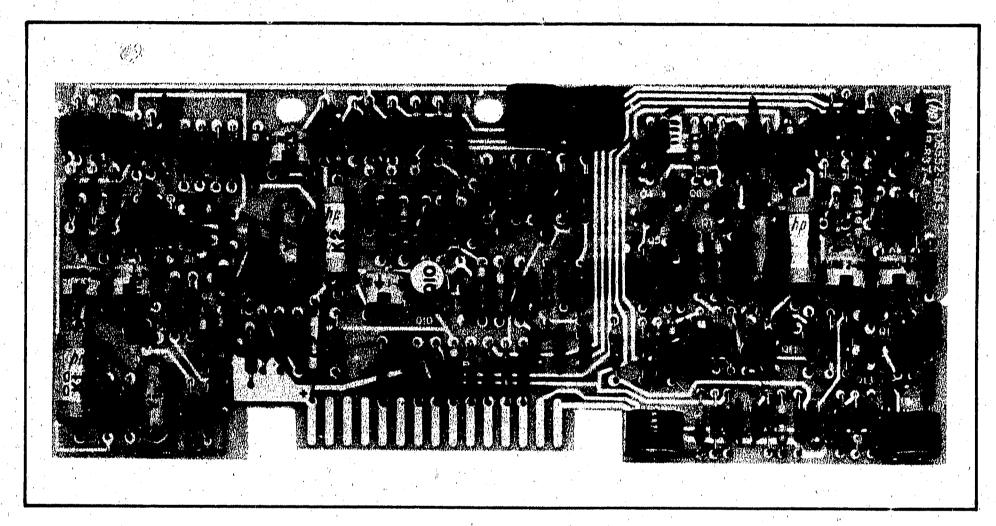


Figure 8-30. P/O Crystal Filter Assembly A4 Component Identification

P/O 8552A IF SECTION REFERENCE DESIGNATIONS PIO CRYSTAL FILTER ASSY A4 (08552-6045) R13 2.7 L1-6 Q1-3, 9, 10 A4 ASSY IS PART NO. 08552-6006
IN 8552A'S SERIALS 851-00464 AND
BELOW. REFER TO FIGURE 3-49 FOR
THOSE SERIAL NUMBERS.
R18 IS 14.7K; R20 IS 51.1K IN
SERIALS 903-00539 AND BELOW ₹C15 9-35 ₹R12\* 215K R31 + 215K >10 10 1 C22 T.01#F 上C11 上.01/F RELAY COIL R17 C18 R22 1. 21K . 01 AF \( \frac{1}{2} \) 2. 15K \( \frac{1}{2} \) 3 kHz 914 10 1 kHz 915 ;11 #.01#F #.01#F 

REFERENCE DESIGNATIONS WITHIN OUTLINED (-----)
ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER: e.g., R1 OF ASSEMBLY A1
IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE
COMPLETE AS SHOWN.



Service

It is assumed that the 3 MHz IF signal from the LC Filter and the dc operating voltages are present and correct and that the 3 MHz output is missing or out of tolerance.

#### TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the 3 MHz Crystal Filter assembly, the assembly should be removed and re-installed using the extender board to provide access to components. Test procedures follow descriptions of individual circuits. These Service Sheets (9 and 10) apply to Crystal Filter assemblies in 8552A with serials 852-00465 and above.

### EQUIPMENT REQUIRED

Service Kit		HP 11592A
<b>Vector Voltmeter</b>		
Digital Voltmeter		
VHF Signal Gener		
	0	

#### CONTROL SETTINGS

INPUT ATTEN	UA'	ΓIC	N								. OdB
BANDWIDTH			•		•		٠				3 kHz
LOG REF LEV	EL			•	•		٠				0 dBm
SCAN WIDTH		• •	•	• •		• •		• ' •		•	ZERO
LOG/LINEAR			•	•	•	• •	•		'4, '	• •	. LOG
FREQUENCY	• •		•			• •	•		• •		30 MHz

## SELECTABLE BANDWIDTH CRYSTAL FILTER STAGES

Described on Service Sheet 9.

ISOLATION AMPLIFIER Q1/Q2

Described on Service Sheet 9.

CRYSTAL FILTER BYPASS CIRCUIT

Described on Service Sheet 9.

DIODE SWITCHING AND BANDWIDTH CONTROL NETWORKS

Described on Service Sheet 9.

### 0 dB/10 dB/20 dB STEP AMPLIFIER

Q4/Q5/Q6/Q? and associated components comprise an amplifier which provides unity gain, 10 dB of gain or 20 dB of gain depending on the position of the LOG REF LEVEL control. When operated

as a unity gain amplifier its only purpose is to provide isolation between the second crystal filter stage and the third crystal stage to prevent interaction. Gain of the amplifier is controlled by bias networks in the emitter circuits of Q6 and Q7. The bias networks are switched into the circuit by diode switches which are enabled by a dc level from the LOG REF LEVEL assembly.

### TEST PROCEDURE

With the HP 608F output (30 MHz, -30 dBm) connected to the analyzer RF INPUT measure the signal level at TP E (Q7-e) with the HP 8405A at LOG REF LEVEL settings of -10 dBm, -20 dBm and -30 dBm. With the analyzer FINE TUNE adjusted for maximum signal the meter readings should be about 28 mV rms, 85 mV rms and 270 mV rms respectively.

If signal levels are correct, the step amplifier and diode-switched bias networks are functioning properly.

If signal levels are incorrect, check Q4/Q5/Q6/Q7 and associated components.

If the diode enabling dc levels are not present, check the Log Ref Level assembly Service Sheet 8.

## OUTPUT AMPLIFIER GAIN AND COMPENSATION CIRCUIT

Output amplifier Q11/Q12/Q13 provides isolation for the last crystal filter stage and gain compensation for narrow bandwidth circuit losses. The amplifier operates as a conventional feedback controlled amplifier but has supplementary circuits which may be switched in to attenuate the feedback and thus increase the gain. These supplementary circuits are switched into operation by diodes when the analyzer is operated in the 0.3 kHz, 0.1 kHz and .05 kHz BANDWIDTH modes.

### TEST PROCEDURE

With the HP 608F output (30 MHz, -30 dBm) connected to the analyzer RF INPUT, connect the HP 8405A to TP F (XA4-14) and tune the analyzer for maximum signal level at BANDWIDTH setting of 0.3 kHz. Meter should read about 29 mV rms. Rotate the BANDWIDTH control to the 0.1, 0.3, 1, and 3 kHz positions and adjust FINE TUNE at each setting. Maximum meter reading should remain about 29 mV rms for all bandwidths.

### SERVICE SHEET 9

Figure 8-31. 3 MHz Crystal Filter (Sheet 1 of 2)

## IF ATTENUATOR (P/O) LOG REFERENCE ASSEMBLY A10

The portion of the Log Reference assembly shown on Service Sheet 10 is a step attenuator which is used to control the level of the 3 MHz signal applied to the Lin/Log Amplifier.

### TEST PROCEDURE

Place the Crystal Filter assembly back in the chassis and install the Lin/Log Amplifier Assembly A8 on the extender board. Use the HP 8405A to monitor the signal level at TP G (XA8-2). Connect the HP 608F signal generator 30 MHz output to the analyzer RF INPUT. Starting at -10 dBm out-

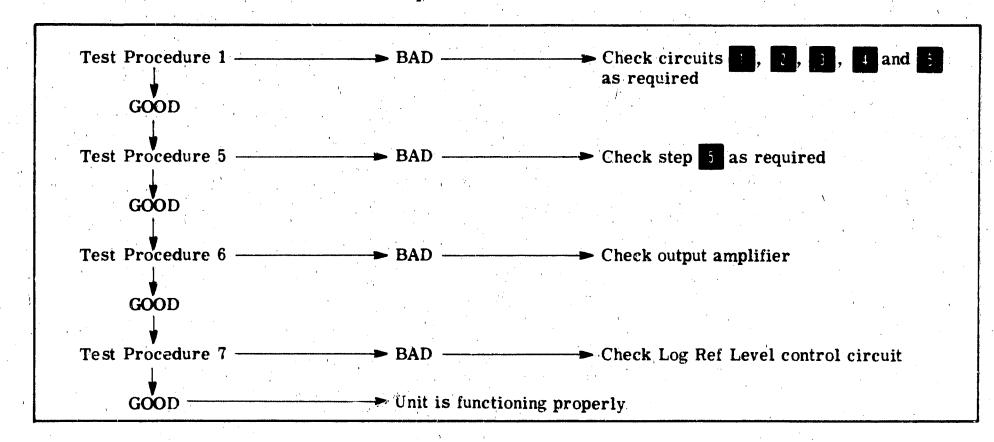
put from the HP 608F, decrease the output in 10 dB steps and track these steps with the LOG REF LEVEL control. (HP 608F—10 dBm; LOG REF LEVEL—10 dBm; HP 608F—20 dBm; LOG REF LEVEL—20 dBm, etc.) HP 8405A should indicate approximately 600 mV rms at all settings.

If levels at TP F (step ) were correct and the readings at TP G are not, check Log Ref Level assembly A10.

#### NOTE

After repairing any of the circuits on the Crystal Filter Assembly, the assembly should be adjusted in accordance with Paragraph 5-34 of Section V.

### Simplified Test Procedure Tree



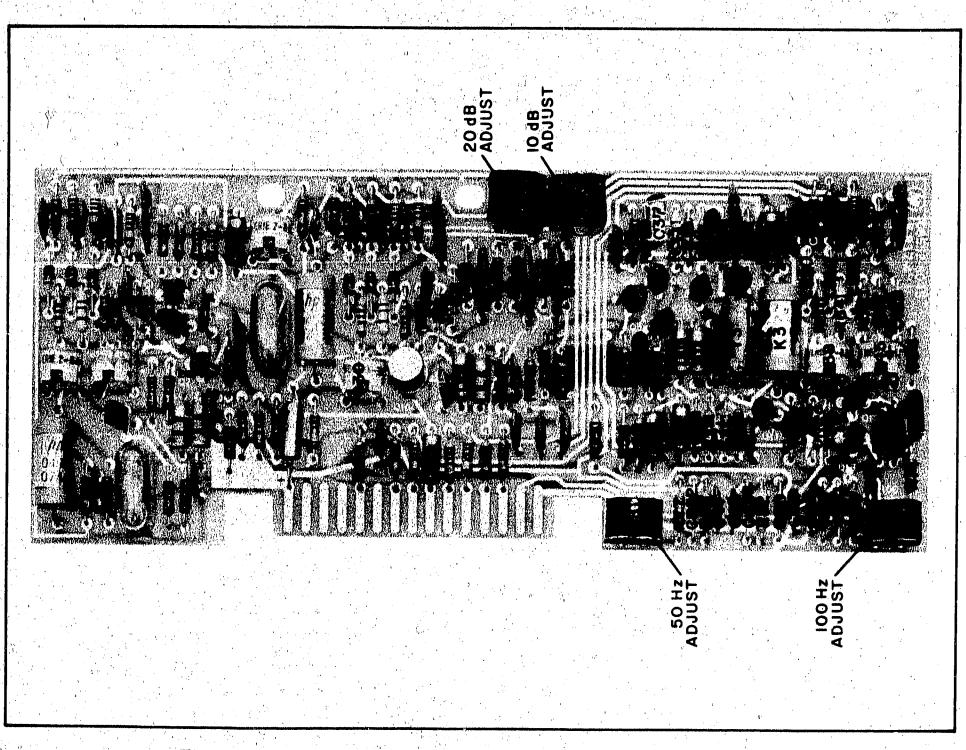
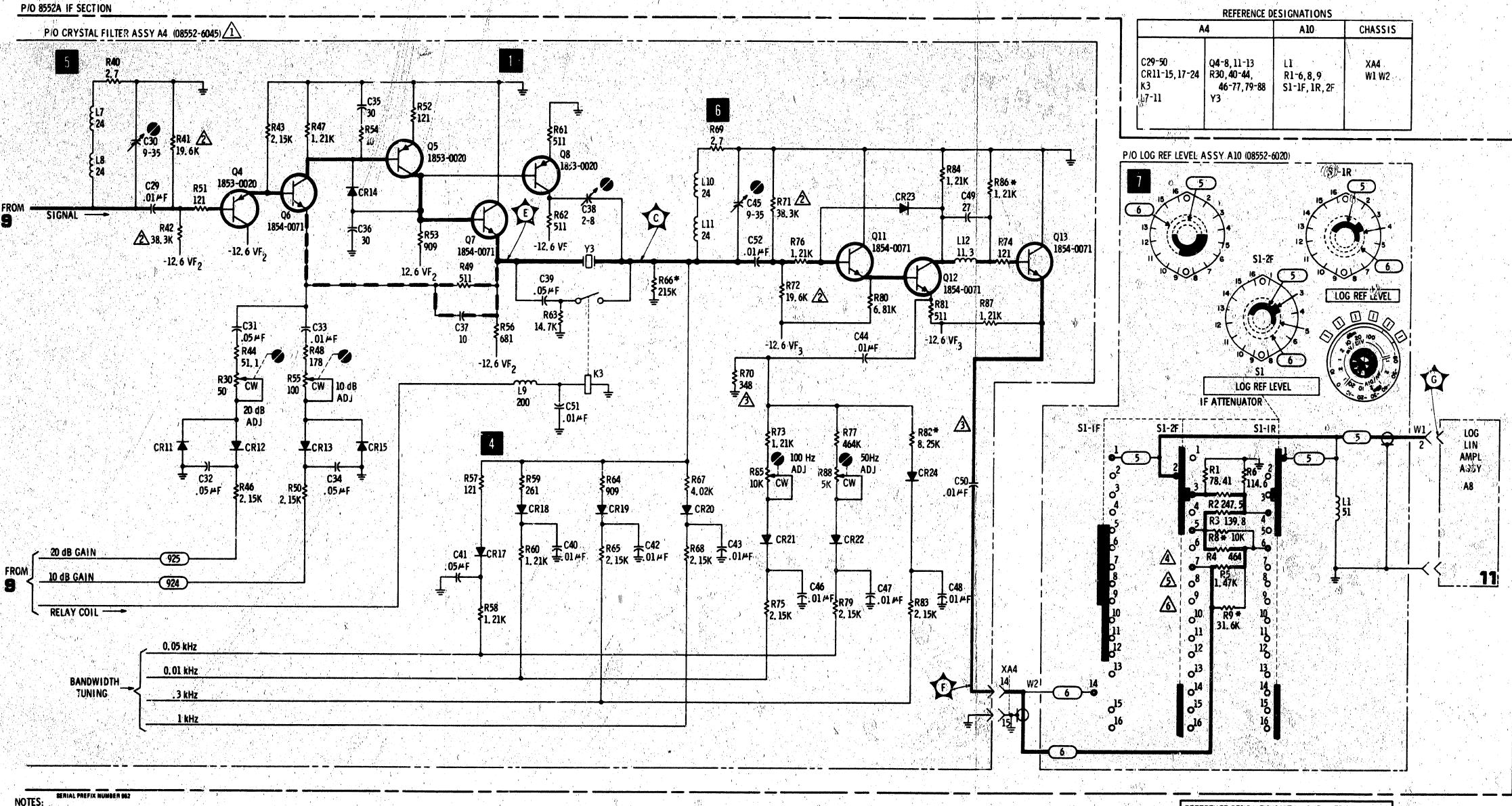


Figure 8-32. P/O Crystal Filter Assembly A4 Component Identification



A4 ASSY IS PART NUMBER 08552-6006 IN 8552A'S SERIAL 851-00464
AND BELOW. REFER TO FIGURE 7-4 FOR THOSE SERIAL NUMBERS.

2 R41, 72 IS 17.8; R42, 71 IS 34.8K ON SERIALS 903-00539 AND BELOW.

3 R70 IS 511 AND R82 IS 10K ON SERIALS 905-00589 AND BELOW.

R4 IS 444.3 OHMS ON SERIALS 905-00814 AND BELOW.

\$\frac{1}{5}\R8\pi, 10K AND R9\pi 31.6K WERE ADDED ON SERIALS 945-01840 AND ABOVE.

\$\frac{6}{6}\R4 IS 436.2 AND R5 IS 1.47K ON SERIALS 945-01859 AND BELOW.

10

Figure 8-33. 3 MHz Crystal Filter (Sheet 2 of 2)

### SERVICE SHEET 11

It is assumed that the 3 MHz signal from the crystal filter and dc operating voltages are present and correct, and that the output signal is not present or is out of tolerance.

### TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the Log/Lin Amplifier assembly, A8, it should be removed from the chassis and re-installed on the extender board to provide access to components. After repairing the assembly the procedures specified in Paragraphs 5-30 and 5-31 of Section V should be performed.

### NOTE

Since parts of the circuit appear on Service Sheet 12, Service Sheets 11 and 12 should be used jointly in troubleshooting the assembly.

## EQUIPMENT REQUIRED

Oscilloscope HP	180A/1801A/1821A
Digital Voltmeter	HP 3440A/3443A
Service Kit	HP 11592A
Vector Voltmeter	HP 8405A
Signal Generator	HP 608F

### CONTROL SETTINGS

Unless otherwise specified in individual tests.

SCAN WIDTH	. ZERO
INPUT ATTENUATION	0 dB
SCAN MODE	INT
FREQUENCY	. 30 MHz
BANDWIDTH	300 kHz
SCAN TRIGGER	. AUTO
LOG/LINEAR	700

# LIN/LOG AMPLIFIER AND CONTROL CIRCUITS (General)

This general discussion covers operation of circuits shown schematically on Service Sheets 11 and 12. The assembly is designed to provide one of two different types of video outputs. Most of the circuit elements are common to both modes of operation.

When the analyzer is operated in the LINEAR mode the Lin/Log amplifier provides a video output which varies in amplitude in direct proportion to the amplitude of the input rf voltage. The CRT display is calibrated in terms of volts (mV or  $\mu$ V).

When the analyzer is operated in the LOG mode the output video signal has a logarithmic relationship to the input rf signal. The CRT display is calibrated in terms of power (dBm).

# EMITTER FOLLOWER INPUT STAGE Q24

Emitter follower Q24 provides a high impedance input which prevents loading the output of the crystal filter assembly and also provides isolation between the input and the first Lin/Log amplifier.

# TEST PROCEDURE

With a 30 MHz, -60 dBm signal from the HP 608F connected to the analyzer RF INPUT, connect the HP 8405A to TP A (Q24-e), and tune the analyzer frequency for maximum meter deflection with the LOG REF LEVEL control set to -60 dBm.

If correct reading is not obtained, check Q24 and associated components. If Q24 and associated components check good and signal is still not present, check Q25 (see step ).

# LIN/LOG AMPLIFIERS IN LOG MODE

When the analyzer is operated in the LOG mode the Lin/Log amplifier has eight cascaded amplifier stages. The first seven amplifiers consist of a differential amplifier followed by an emitter follower. The output of the eighth differential amplifier is applied to the summing amplifier Q26 (see step on Service Sheet 12).

Operation of the first seven cascaded amplifier stages is identical, so only the first stage will be described. The output of the differential amplifier is split and applied to the emitter follower and, at a much lower level, to the base of the output half of the differential amplifier in the following stage. A 100 ohm resistor (R5) from the low level signal path to ground prevents parasitic oscillation. The emitter follower output of each stage provides the input signal to the following stage and signal currents to the summing bus.

The logarithmic relationship of the output signal to the input signal is provided by controlled limiting and saturation (in 10 dB steps) of the eight amplifiers in reverse order. A relatively low level signal (approximately -70 dBm) will saturate the last amplifier stage. An increase of 10 dB in the input signal will cause the seventh stage to saturate. Preceding amplifier stages saturate at each 10 dB increase in the rf input. Finally the first amplifier saturates when the input signal is equal to the LOG REF LEVEL control setting as referenced to the lit index light.

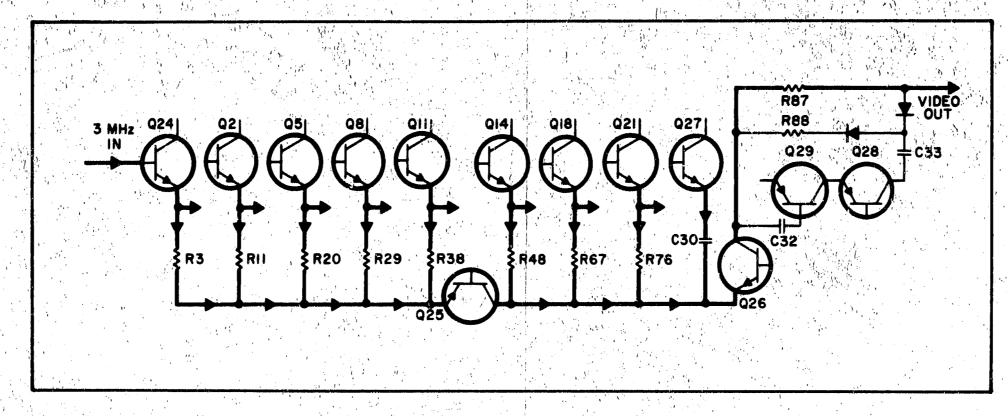


Figure 8-34. Simplified Diagram — Log Mode of Operation

The gain of each stage is 9 dB. When the last stage is saturated the total output of the eight stages consists of the output of the last stage plus the summing bus currents from all preceding stages. As preceding stages saturate each supplies a maximum of 3 mA to the summing bus. This corresponds to a a 10 dB increase in power input. In this manner, the combination of sequential amplifier limiting and current summing provides amplitude compression to force the output signal to remain logarithmically proportional to the input signal.

The simplified diagram above shows signal paths and major circuit components.

# TEST PROCEDURE

Connect the output of the HP 608F to the analyzer RF INPUT and adjust the signal generator for a 30 MHz, -60 dBm signal. Connect the HP 8405A to TP 1, set the analyzer LOG REF LEVEL control to -30 dBm, and tune the analyzer frequency for maximum signal level on the HP 8405A. Typical level is 58 mV rms.

If the signal is not present check Q23, Q1, Q2 and associated components.

If the correct signal is present, disconnect the HP 8405A and connect it to TP B (Q26-c Service Sheet 12). Rotate the LOG REF LEVEL control and observe the meter readings. Note that readings change by approximately 6 mV rms at adjacent steps.

If readings are correct, the Log portion of the Lin/Log amplifiers and the summing circuits are functioning properly.

If the readings are not correct isolate the defective stage by checking the signal level at TP2, TP3, etc. until the defective stage is found. After repairs are made, repeat the test.

If correct readings are obtained, proceed to step 1.

If not, proceed to following steps on Service Sheets

If not, proceed to following steps on Service Sheets 11 and 12 and repeat this step after repairs are made.

# SUMMING AND ISOLATION AMPLIFIERS

Q25 sums the output current from the input emitter follower and the output currents from the first four stages of the Lin/Log amplifier. It also provides isolation between the first four Lin/Log stages and following circuits.

Q26 (shown in Service Sheet 12) sums the output from Q25, the output currents from the fifth, sixth and seventh Lin/Log amplifiers and the signal output from the last Lin/Log amplifier. It also provides isolation between the Lin/Log amplifiers and the linear detector.

# TEST PROCEDURE

Connect the output of the HP 608F to the analyzer RF INPUT and adjust the signal generator for a

SERVICE SHEET 10

30 MHz, -60 dBm signal output. Connect the HP 8405A to TP C (Q25-e), set the analyzer LOG REF LEVEL control to -60 dBm, and tune the analyzer for maximum signal level on the HP 8405A. Typical level is 9 mV rms.

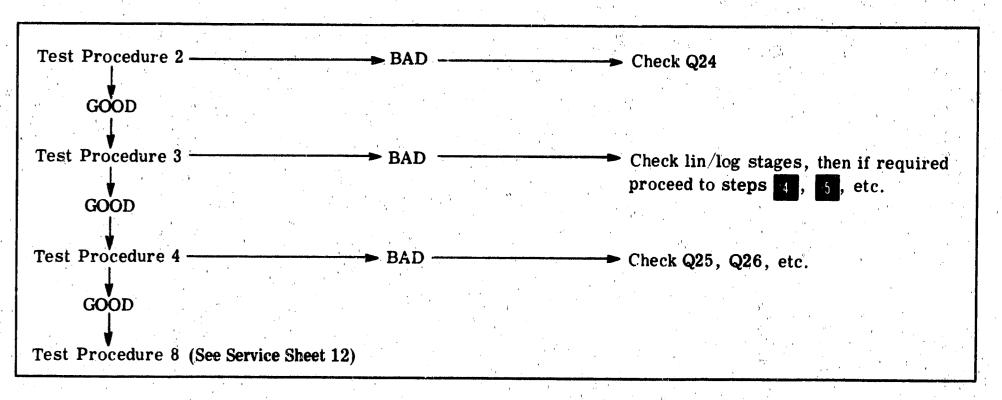
Check the signal level at TP D (Q25-c) with the HP 8405A. Typical level is 33 mV rms.

Check the signal level at TP B (Q26-c Service Sheet 12) with the HP 8405A. Typical level is 50 mV rms.

If correct readings are obtained the summing amplifiers are functioning properly.

If readings are incorrect, check Q25, Q26 and associated components.

### Simplified Test Procedure Tree



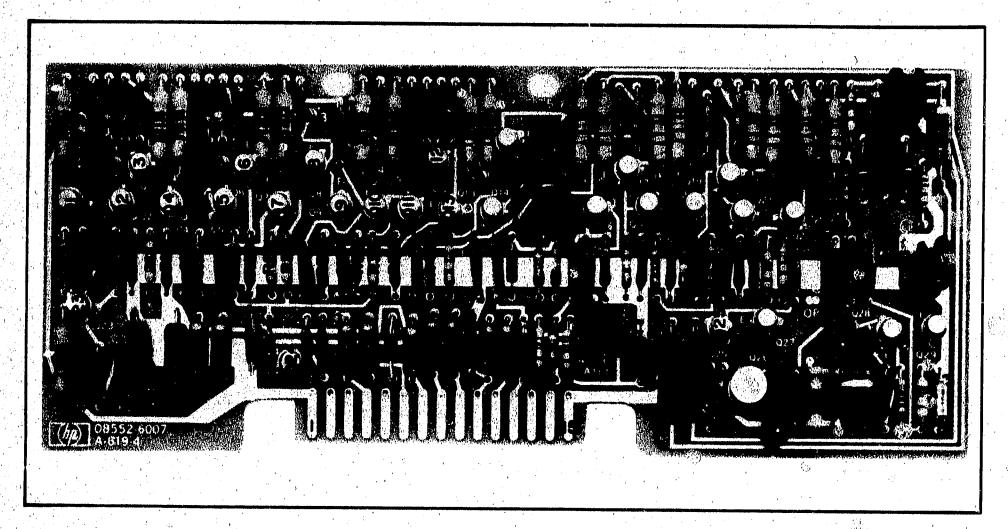
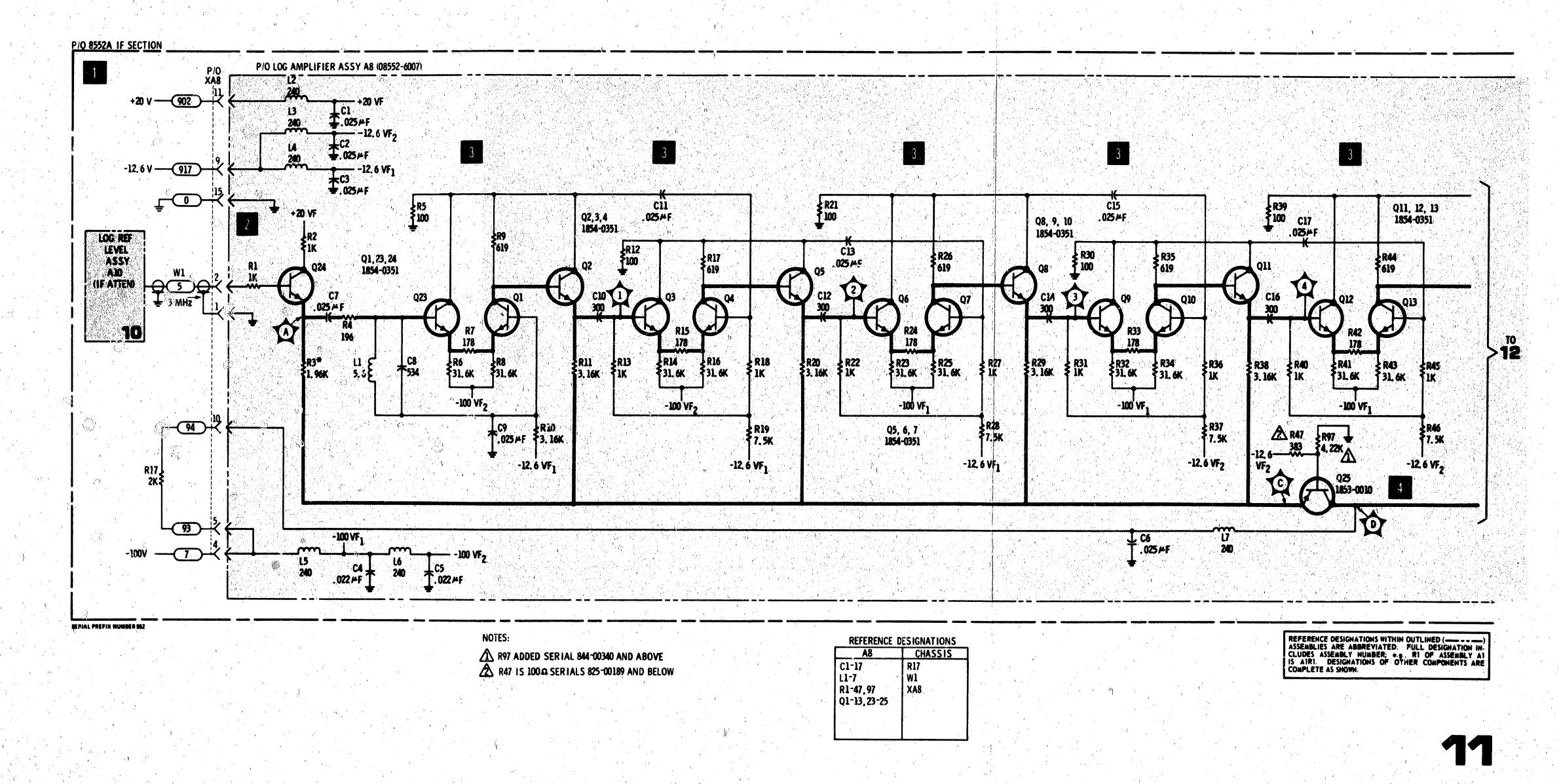


Figure 8-35. P/O Lin/Log Amplifier Assembly A8 Component Identification



Service

### **SERVICE SHEET 12**

It is assumed that the 3 MHz signal from the crystal filter and dc operating voltages are present and correct, and that the output signal is not present or is out of tolerance.

### TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the Lin/Log amplifier assembly it should be removed from the chassis and reinstalled on the extender board to provide access to components. After repairs the procedures in Paragraphs 5-30 and 5-31 of Section V should be performed.

### NOTE

Since parts of the circuit appear on Service Sheet 11, Service Sheets 11 and 12 should be used jointly in troubleshooting the assembly.

### EQUIPMENT REQUIRED

Volt-ohm-ammeter				•	٠,			HP 412	Α
Oscilloscope			H	2 1	8	<b>0A</b>	/1	801A/1821	A
Digital Voltmeter	•					HP	3	3440A/3443	A
Service Kit	•		٠.٠)					HP 11592	A
<b>Vector Voltmeter</b>								. HP 8405	Α
Signal Generator .					-			HP 608	F

# CONTROL SETTINGS Unless otherwise specified in individual

Unless otherwise specified in individual tests.

SCAN WIDTH	· ` • ' • . • .	 	. ZERO
INPUT ATTENUA	TION	 	0 dB
SCAN MODE		 	INT
FREQUENCY			30 MHz
BANDWIDTH			300 kHz
SCAN TRIGGER			LINE

# LIN/LOG AMPLIFIER AND CONTROL CIRCUIT (General)

See Service Sheet 11.

EMITTER FOLLOWER INPUT STAGE Q24

See Service Sheet 11.

LIN/LOG AMPLIFIERS IN LINEAR MODE

See Service Sheet 11 for LOG mode.

When the LOG/LINEAR switch is placed in the LINEAR position it accomplishes the following:

- a. Supplies -12.6 Vdc to illuminate the (LIN-EAR) lamp, DS7.
- b. Disables the last two log amplifiers by removing their 100 volt source.

  8-40

- c. Provides an added current source to Q15/Q17 to prevent the stage from saturating.
- d. Enables Q16, the linear scale factor ampliier.

Operation of the Lin/Log amplifiers for those stages ahead of Q15 is identical for LINEAR and LOG modes of operation. The output of current amplifier Q16 is 180 degrees out of phase with the signals in the summing bus and of sufficient amplitude to cancel them. In the LINEAR mode only the Q16 output drives the summing and isolation stage Q26.

Since the analyzer IF amplifier and attenuation are calibrated in 10 dB increments, compensation must be provided to maintain a linear relationship between the input RF signal and the output from the Lin/Log amplifier. The attenuator selector for the linear mode is calibrated in 1/2/10/20 steps so a fixed amount of compensation cannot be used for all steps. When the LINEAR SENSITIVITY control is stepped from 1 to 2, the current gain is 10 dB (approximately 3:1), but only 6 dB (2:1) is required. The surplus gain of 4 dB is subtracted from the gain of Q16 as follows: Diode CR2 is reverse biased by the +20 volts applied through R64 and R65 to effectively remove the ground return from R63. R63 no longer shunts R50 and the total current Q16 can control is deveased for a total variation of 8 dB (from the 14 dB gain level). The current gain of Q16 is thus 2:1, or 6 dB. When the LINEAR SENSITIVITY control is stepped from 2 to 10 the current gain is 10 dB (about 3:1). but 14 dB (5:1) is required. The additional 4 dB gain is provided as follows: A -12.6 Vdc level is applied to the junction of R64/R65 through contacts of the LOG REF LEVEL and INPUT AT-TENUATION controls to disable the +20 volts from R65 and forward bias CR2 to connect R63 to signal ground. This decreases the collector load of Q16 and Q16 can deliver more current. Under these conditions the current gain of Q16 is 5:1 or 14 dB.

# TEST PROCEDURE

This test procedure is based on the assumption that step on Service Sheet 11 has been satisfactorily conducted. Connect the output of the HP 608F (30 MHz, -30 dBm) to the analyzer RF INPUT. Connect the HP 8405A to TP B (Q26-c), set the LOG-LINEAR switch to LINEAR, the LINEAR SENSITIVITY control fully cw, and tune the analyzer for maximum signal level on the HP 8405A. Below are typical levels at various LINEAR SENSITIVITY and RF INPUT levels.

		Millivolts	<sup>/</sup> Div			
LINEAR SENSITIVITY RF INPUT level dBm Millivolts rms	2 -30 24	-30 47		. 2 -40 78	-5 4	
		Microvolts	/Div			
LINEAR SENSITIVITY RF INPUT level dBm Millivolts rms	20 -70 23	10 -70 45	2 -80 70	1 -90 50	. 2 -100 90	. 1 -100 108

If correct signal levels are observed, proceed to step

8. If not, check Q15/Q17/Q18 and associated components and proceed to steps 5, 6 and 7.

If required. After repairs repeat this test.

See Service Sheet 11 for information about Q26.

LINEAR SCALE FACTOR AMPLIFIER Q16

Operation of Q16 is described as part of step

# TEST PROCEDURE

Connect the output of the HP 608F to the analyzer RF INPUT and adjust the signal generator for a 30 MHz, -80 dBm signal output. Connect the HP 8405A to TP E (Q16-b), set the analyzer LINEAR SENSITIVITY control to  $20 \,\mu\text{V/DIV}$ , and tune the analyzer for maximum signal level on the HP 8405A. Check the 3 MHz signal level at base and emitter of Q16 with the LINEAR SENSITIVITY control set to 20, 10 and  $2 \,\mu\text{V/DIV}$  for the typical values shown below.

LINI	EAR SENSITIVITY	Q16 Base	Q16 Emitter
	$20 \mu V/DIV$	6 mV rms	4 mV rms
•	$10 \mu V/DIV$	38 mV rms	24 mV rms
	$2 \mu V/DIV$	70 mV rms	40 mV rms

If correct levels are observed, proceed to step .

If not, check Q16 and associated components, then proceed to step and if required, step .

# b LOG-LINEAR SWITCH

Operation of the LOG-LINEAR switch in the LIN-EAR mode is discussed in step . In the LOG mode the switch does the following:

- a. Provides a ground return to illuminate the (LOG) lamp DS8.
- b. Grounds the emitter of Q16 to disable Q16.

c. Enables the last two Log amplifiers by connecting them to the -100 volt source.

# TEST PROCEDURE

Since there are no active components in the assembly, continuity tests with the HP 412A should readily isolate the defective components.

# LINEAR STEP GAIN CONTROL

These switch sections control the compensation gain steps of Q16 which are necessary to maintain the linear relationship between input rf signal and Lin/Log amplifier output when the analyzer is operated in the LINEAR mode.

# TEST PROCEDURE

Since there are no active components in the assembly, continuity tests with the HP 412A should readily isolate defective components.

# 8 LINEAR DETECTOR

The linear detector includes a high gain amplifier with a high level of negative feedback. The feedback loop ensures that the detected output current is linear in relationship to input current to enhance the accuracy of the calibrated display. The output of Q28 is applied to CR3 and CR4 180 degrees out of phase with the signals applied to CR3 and CR4 by the output of Q26. The result is that positive half cycles from the collector of Q26 are cancelled when the inverted signal from Q28 forward biases CR3. When the Q26 output is negative the inverted signal from Q28 reverse biases CR3 and the negative signal from Q26 becomes the video output. Simultaneously CR4 is forward biased and the result is improved linearity of the output signal.

L13/C36 and L14/C37/C38 filter out the rf components of the video output.

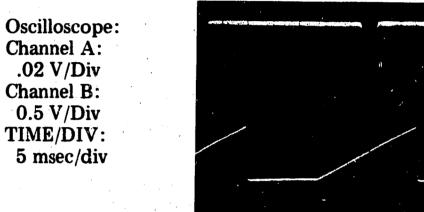
# SERVICE SHEET 11

Figure 8-36. Lin/Log Amplifiers (Sheet 1 of 2)

# TEST PROCEDURE

Connect the HP 608F set for 30 MHz, -30 dBm to the analyzer RF INPUT. Connect the HP 180A/1801A/1821A Channel A input to TP G (XA8-14) and the Channel B input to the SCAN IN/OUT jack on the front of the analyzer and observe the waveform.

### CONTROL SETTINGS:



Analyzer:
SCAN WIDTH: PER DIVISION
PER DIVISION: 20 kHz
BANDWIDTH: 30 kHz
LOG REF LEVEL: -10 dBm
LOG/LINEAR: LOG

If the waveforms are correct the Lin/Log amplifier assembly should be functioning properly. If not, check Q28, Q29, CR3, CR4 and associated components

Model 8552A

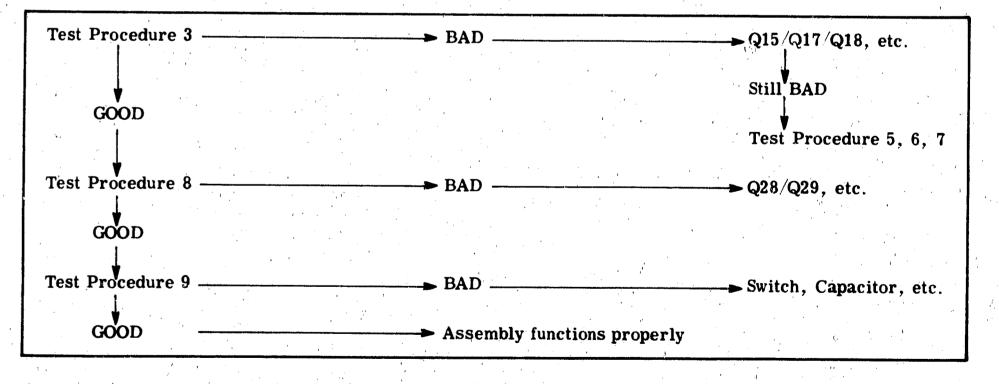
# VIDEO FILTER ASSEMBLY

The video filter switch is a lever type two-pole, three-position switch. The section shown on Service Sheet 12 switches bypass capacitors in the video circuit to bypass signal components down to 10 kHz (0.01  $\mu$ f) or 100 Hz (1.0  $\mu$ f). The remainder of the video filter switch assembly is shown on Service Sheet 15.

# TEST PROCEDURE

Use the HP 412A to make point-to-point continuity measurements. Switching the filters into the circuit produces an obvious change in the CRT display. If no change in display occurs when the switch is used, check for an open circuit or faulty capacitor.

# Simplified Test Procedure Tree (Cont'd from Service Sheet 11)



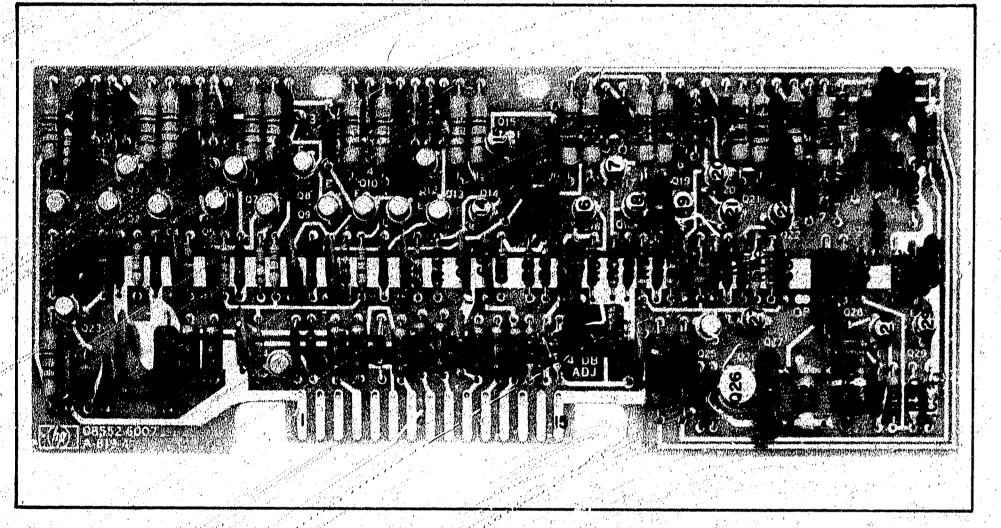
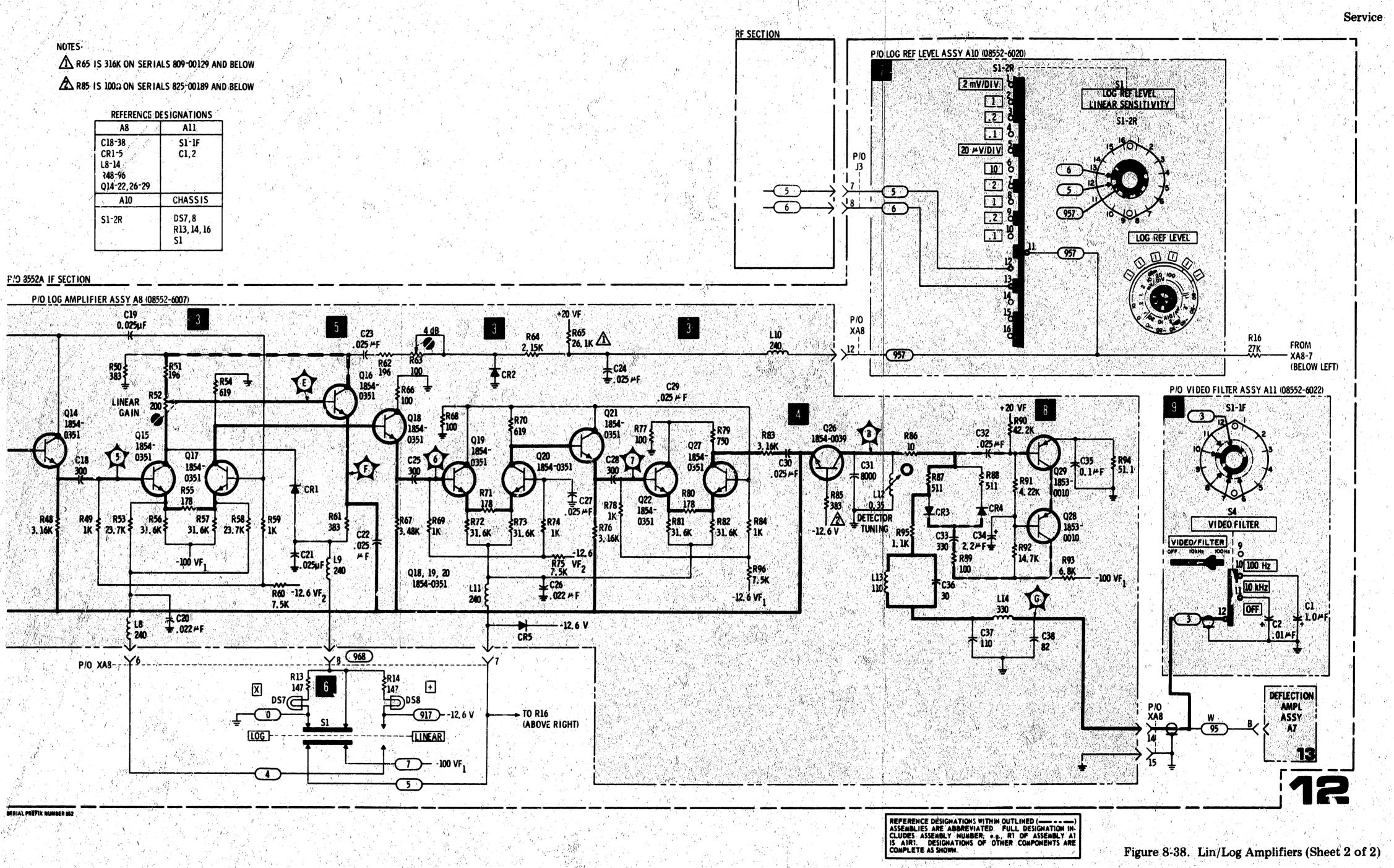


Figure 8-37, P/O Lin/Log Amplifier Assembly A8 Component Identification



## **SERVICE SHEET 13**

It is assumed that the video signal from the Log/ Lin assembly and dc supply voltages are present and correct but that the vertical deflection output signals are not correct.

### TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the Deflection Amplifier assembly, the assembly should be removed from the chassis and re-installed using an extender board to provide easy access to components. Test procedures follow the technical discussions of individual circuits.

### EQUIPMENT REQUIRED

CONTROL SETTINGS
Unless otherwise specified in individual tests.

SCAN WIDTH PER DIVISION	200 kHz
LOG REF LEVEL	
VIDEO FILTER	. OFF
SCAN TRIGGER	. LINE
INPUT ATTENUATION	. 'O dB
LOG-LINEAR	
SCAN MODE	. INT
SCAN TIME PER DIVISION . 2 MILLISE	CONDS
CAL OUTPUT connected to RI	INPUT
FREQUENCY	

# BLANKING AND BLANKING CONTROL CIRCUITS

Operation of the blanking preamplifier Q12/Q21 is controlled by the scan generator in the INT (internal) mode of operation and by an external source (via J2) in the EXT (external) mode. In the SINGLE mode a -12.6V dc level is applied to the trigger circuit in the scan generator to enable the circuit for one scan only.

Q12/Q21 act as a switch to control the operation of Q11. When Q11 is turned off the CRT is blanked. Blanking is also partially controlled by the baseline clipper and clipper override circuits. See step.

# TEST PROCEDURE

8-42

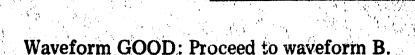
Connect the HP 180A/1801A/1821A to TP A (Q11-e) and observe the waveforms shown in A, B, and C below.

CONTROL SETTINGS:
(Waveform A)

Oscilloscope:

5V/Div 2 msec/Div 10:1 Probe

Analyzer: BASE LINE CLIPPER ccw

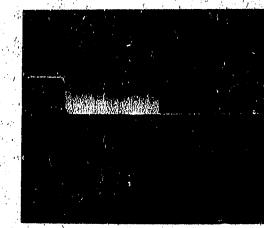


Waveform BAD: Check Q11/Q12/Q21 and associated components.

# CONTROL SETTINGS: (Waveform B)

Oscilloscope: Same as A.

Analyzer:
Same as A except
rotate BASE LINE
CLIPPER to
10 o'clock



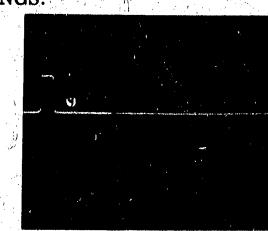
Waveform GOOD or BAD: Proceed to Waveform C.

# CONTROL SETTINGS:

Oscilloscope: Same as A.

(Waveform C)

Analyzer:
Same as above
except rotate
BALE LINE
CLIPPER full cw.



If waveform A was GOOD and B and C were BAD, trouble should be in the baseline clipper circuits.

If correct waveforms were obtained, blanking circuits and the baseline clipper circuit is functioning properly. Proceed to step

BASELINE CLIPPER AND CLIPPER OVER-RIDE CIRCUITS

Q3/Q13 operates as a comparator in which the video signal is compared to a reference level established by the BASE LINE CLIPPER control and the clipper override circuit.

When R10 is turned fully ccw and marker signals are not present, Q13 conducts heavily and the dc level at the junction of CR5/CR6 reaches approximately +14 volts dc. Under these conditions Q3 cannot conduct and the display CRT is unblanked except when blanking pulses are present.

When the BASE LINE CLIPPER control is turned in a clockwise direction, Q13 conduction decreases, the dc level at the junction of CR5/CR6 decreases, and Q3 conducts when the negative-going deflection pulses are more positive than the established threshold. When Q3 conducts the CRT display is blanked. When a marker signal appears, Q20 inverts the marker and the dc level at the base of Q13 rises. Q13 conduction increases and holds Q3 off while the marker is present regardless of the position of the BASE LINE CLIPPER control.

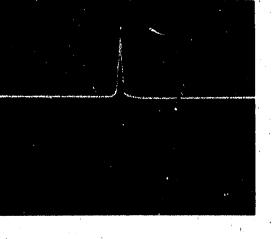
# TEST PROCEDURE

Operation of the BASE LINE CLIPPER is verified by the test procedure in step . To verify operation of the clipper override circuit connect the HP 180A/1801A/1821A to TP B (Q20-c) and observe the waveform.

### **CONTROL SETTINGS:**

Oscilloscope:
Same as step
a.

Analyzer: SCAN WIDTH: Preset Scan



Rotate the BASE LINE CLIPPER control and observe that marker signal remains regardless of BASE LINE CLIPPER control position.

Waveform GOOD: Clipper override functions properly.

Waveform BAD: Check Q20. (After verifying presence of marker input.)

# VERTICAL PREAMPLIFIER CIRCUIT

Q6/Q7/Q15/Q16 comprise a variable gain combining amplifier. Vertical gain control R11 directly controls conduction of Q6 and Q7 and establishes the common emitter bias of Q7 and Q15. The gain of Q15/Q16 is thus controlled by Q6/Q7 conduction. Q6 and Q7 also couples the marker signal to Q15 where it is combined with the video pulse from the Log/Lin amplifier assembly. The marker

signal is not inverted by Q6/Q7/Q15 and the output of Q15 consists of positive-going video pulses and negative-going marker pulses. Q5 inverts the video signals and supplies negative-going video (positive-going marker pulses) to the baseline clipper comparator and to the vertical deflection power amplifiers. Emitter follower Q17 provides isolation between a front panel VERTICAL OUT-PUT and the amplifier circuits.

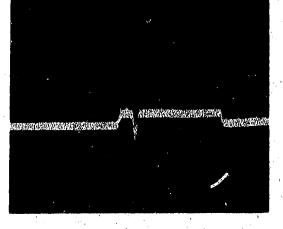
# TEST PROCEDURE

3-a. Connect the HP 180A/1801A/1821A to TP C (Q15-c) and observe the waveform.

### CONTROL SETTINGS:

Oscilloscope:
01 V/Div
2 msec/Div
1:1 Probes

Analyzer:
Same as basic
except frequency
50 MHz



Note positive-going video and negative-going marker pulses. Rotate vertical gain control to verify proper operation.

Waveform GOOD: Proceed to 3-b.

Waveform BAD: Check Q6/Q7/Q15/Q16 and associated components.

3-b. Connect the HP 180A/1801A/1821A to TP D (Q5-c) and observe the waveform.

### CONTROL SETTINGS:

Oscilloscope: 0.1 V/Div 2 msec/Div 10:1 Probe

2 msec/Div 10:1 Probe

Analyzer:
Same as basic

Waveform GOOD:

Proceed to step ...

Waveform BAD: Check Q5 and associated components.

# VERTICAL DEFLECTION POWER AMPLIFIERS

The vertical deflection signals from the vertical preamplifier are dc coupled through VR1 and R34

SERVICE SHEET 12

Figure 8-38. Lin/Log Amplifiers (Sheet 2 of 2)

to output driver stage Q2. VR1 also provides a dc offset level for the vertical signals and Q1 provides a temperature compensation for the voltage control circuit. Q8 inverts the deflection signals to provide negative-going signals at the Q8 collector to drive one of the CRT deflection plates. Q8 also provides a non-inverted signal which is emitter coupled to Q18. Q18 does not invert the signal and It appears at the collector of Q18 as positive-going deflection signals. Thus the signals at the emitters and bases of Q8 and Q18 are in phase and the collector signals are 180 degrees out of phase to provide push-pull deflection. VERTICAL POSI-TION control R15 controls the vertical position of the CRT trace by controlling the dc level of the pedestal on which the vertical deflection signals are applied to the CRT deflection plates.

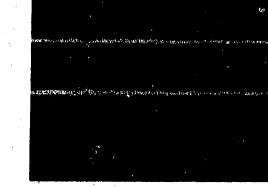
# TEST PROCEDURE

Connect the HP 180A/1801A/1821A Channel A input to TP E (Q8-c) and the Channel B input to TP F (Q18-c) and observe the waveforms.

### **CONTROL SETTINGS:**

Oscilloscope:
2V/Div
15 msec/Div
10:1 Probe

Analyzer:
5 msec
SCAN TIME



# HORIZONTAL DEFLECTION AMPLIFIER

Driver stage Q23 inverts the scan ramp and applies it to the base of Q22. Q22 inverts the signal and supplies the positive-going deflection signal. The scan ramp is also emitter coupled to Q14 which supplies the negative-going deflection signal. The signals at the emitters and bases of Q14 and Q22 are in phase but the collector signals are 180 degrees out of phase and provide push-pull deflection

signals to the display section to produce the baseline trace on the CRT. Controls are provided to vary the width and position of the CRT baseline trace.

### TEST PROCEDURE

Connect the HP 180A/1801A/1821A Channel A input to TP G (Q22-c) and the Channel B input to TP H (Q14-c) and observe the waveforms.

Waveform GOOD: Assembly functions properly.

If neither waveform is good, check Q1/Q2/Q8/Q10 and associated components.

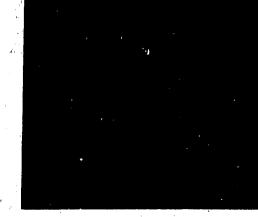
If Channel A waveform is good and Channel B waveform is bad, check Q9/Q18/Q19 and associated components.

### NOT

Olf repairs to the deflection amplifier assembly are required, the FRONT PANEL CHECK PROCEDURE, Paragraph 4-12 of Section IV should be performed.

# CONTROL SETTINGS

Oscilloscope:
2V/Div
5 msec/Div
10:1 Probes



Waveform GOOD: Unit functions properly

Waveform A GOOD and B BAD check Q4/Q14 and associated components.

Both waveforms BAD check Q23/Q22 and associated components.

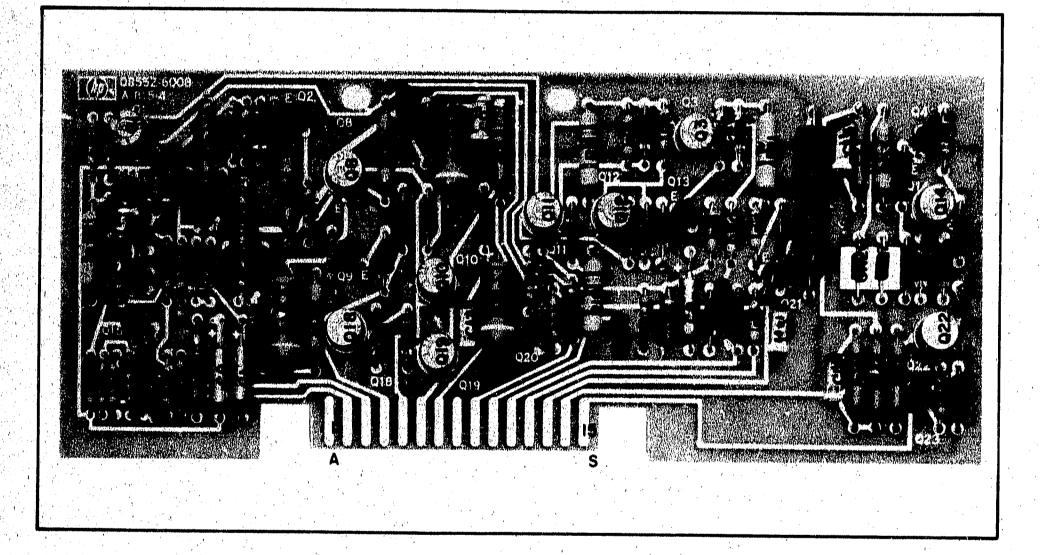


Figure 8-39. Deflection Amplifier Assembly A7 Component Identification

Service

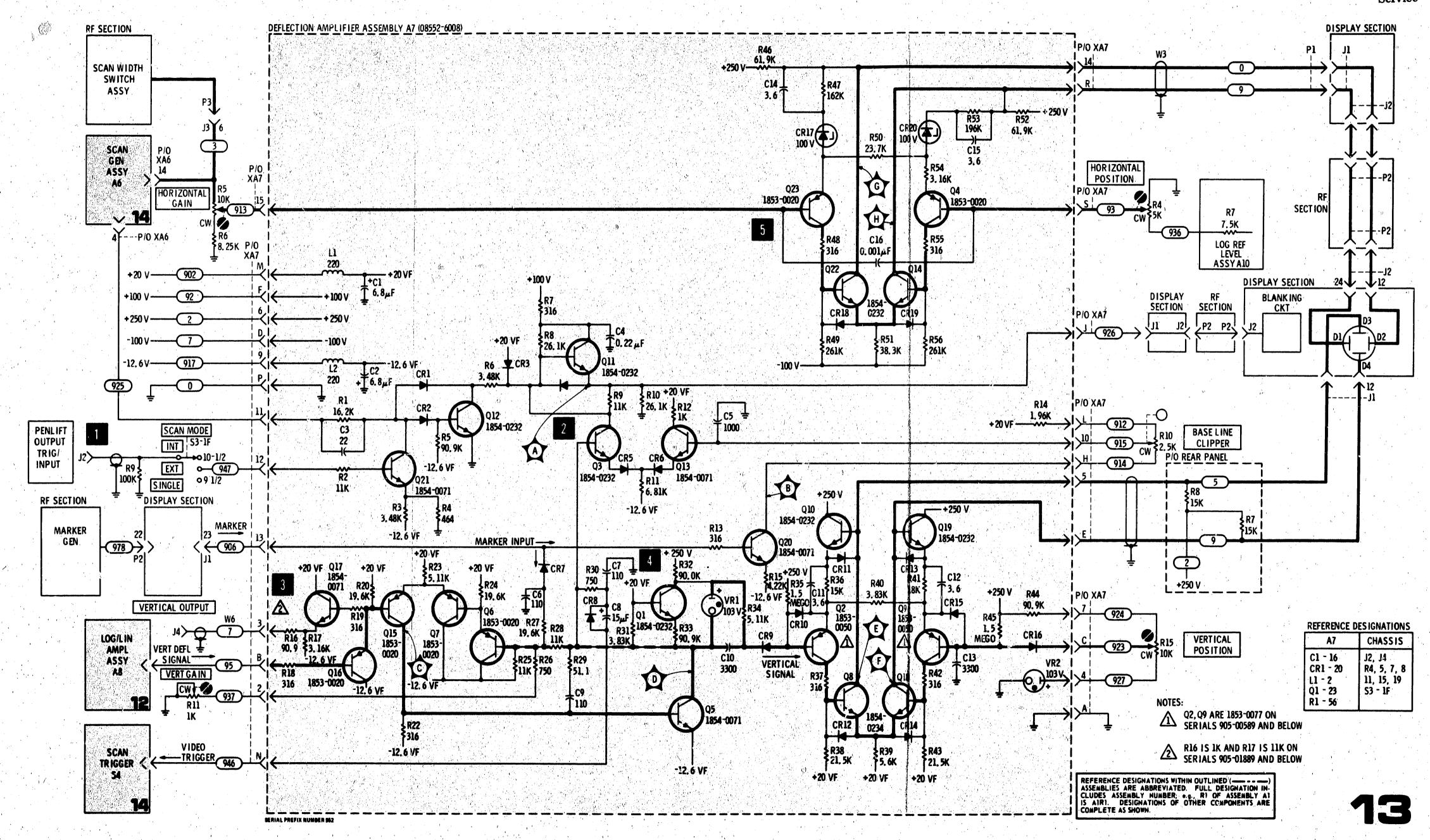


Figure 8-40. Vertical Deflection and Blanking

### **SERVICE SHEET 14**

It is assumed that the scan generator is not being triggered properly and that the correct operating voltages are present.

### TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the Scan Generator Assembly A6, it should be removed from the chassis and reinstalled using the extender board to provide easy access to components. Trouble-shooting information follows the technical discussion of circuit operation.

### NOT

Some circuits shown on Service Sheet 14 comprise a closed loop. Failure of any of the circuits will result in incorrect waveforms at all test points. However, gain or distortion problems should be easily isolated by observing the waveforms.

## EQUIPMENT REQUIRED

Oscilloscope			•		•	•		H	lP	1	8	0A	1/	18	301	l /	<b>\</b> /]	18	21	A
Service Kit		. '	•		٠						•		•		H	P	11	159	92	A
Volt-ohm-am	m	et	er	•	•	•			•		•	•	•		•	I	HP	4:	12	A
Digital Voltm	ie	tei					• 1	•	•			HI	P	34	140	) <i>[</i>	<b>A/</b> 3	344	43	A

# CONTROL SETTINGS Unless otherwise specified in individual tests.

BANDWIDTH	10 kHz
INPUT ATTENUATION	0 dB
CAL OUTPUT connected to .	RF INPUT
SCAN WIDTH PER DIVISION	20 kHz
SCAN WIDTH	PER DIVISION
FREQUENCY	, 30 MHz
SCAN TIME PER DIVISION.	2 MILLISECONDS
SCAN TRIGGER	AUTO
SCAN MODE	INT

# TRIGGER GENERATOR

These circuits control the operation of a flip-flop in the scan generator. When S3 is in the INT (internal) position and S4 is in the AUTO (automatic) position a dc level (-12.6 Vdc) forward biases CR7 to provide an enable signal to the scan generator. The trigger generator Q2/Q3 is passive in this mode and the scan generator cycle is controlled by the scan generator circuits only. With either switch in any other position the -12.6 volts is removed from CR7 and a trigger must be provided to initiate the scan cycle. In the SINGLE scan mode closing the SINGLE pushbutton switch applies the -12.6 volts to the junction of R13 and R14. The abrupt change in the dc level at the junction of R13 and R14 is coupled through C8 to enable the scan generator for one scan only or coupled through C7 to defeat the scan.

When the SCAN MODE switch is in the INT position and the SCAN TRIGGER switch is in the LINE, EXT, or VIDEO positions, Q2/Q3 provides the required triggers to initiate the scan generator cycle. Input triggering to the trigger circuit may be either positive or negative. Input triggers are inverted by Q3 and applied to Q2. Q2 functions as a phase splitter and the output may be taken from collector or emitter. When the input trigger is positive, Q2 is operated as an emitter follower to provide triggers of the right polarity to the scan generator circuit. Q1 disables the trigger circuits during the scan period.

## TEST PROCEDURE

Connect the HP 180A/1801A/1821A Channel A probe to Q3-base and the Channel B probe to TP 1 and observe the waveforms. If neither waveform is present first check switching, then Q2 circuit.

## CONTROL SETTINGS:

Oscilloscope	
Channel A:	
0.1 V/Div	
Channel B:	
0.5 V/Div	
msec/Div	
10:1 probes	

msec/Div 10:1 probes

Analyzer:
SCAN TRIGGER:

LINE SCAN MODE: INT

SCAN TIME PER DIVISION: 0.1 msec

If the Channel A waveform is correct and Channel B waveform is not, check Q2 circuit. If both waveforms are present and the scan generator is not being triggered check C10 and CR7.

Correct operation of Q2 should be verified by momentarily placing the NORM REV switch in the REV position. The Channel B waveform should be reversed in polarity. (180 degrees out of phase with Channel A). All switch contacts and wiring can be checked with the HP 412A Ohmmeter for continuity after removal of A6 and A7 assemblies.

# SCAN TIME SWITCH ASSEMBLY WAFERS 1 AND 2

Switch wafer S1-1 (front and rear) and S1-2) are used to select resistive and capacitive components in the ramp generator circuit. These components determine the scan time and the rate of change of

the scan ramp voltage. Switch wafer S1-2 rear is used to select a resistor (or resistors) in the delay circuit which determines the time between the end of one scan ramp and the start of the next. The CRT display is blanked for the duration of the delay period.

# TEST PROCEDURE

Switch contact, wiring, and component malfunctions may be readily detected by removing the scan generator assembly and making point-to-point measurements with the HP 412A ohmmeter. While an ohmmeter cannot measure capacitor values, observing meter deflection will normally reveal shorted or open capacitors when such capacitors are values such as used in this circuit.

# CONSTANT CURRENT SOURCE Q6

The current available at the collector of Q6 charges a capacitor selected by switch section S1-1F at a rate determined by resistive components selected by switch sections S1-1R and S1-2F.

# TEST PROCEDURE

Use the HP 3440A/3443A to measure the emitter and base voltages of Q6. At scan times of 10, 5 and 2 seconds the emitter should be at approximately +19.3 volts and the base should be at approximately +18.7 volts. At other scan time settings the readings should be +12.8 volts and +12.2 volts (approximately) for emitter and base respectively.

If correct readings are not obtained check Q6 and associated components.

# RAMP AMPLIFIER AND RAMP LEVEL DETECTOR CIRCUITS

U1 is a low gain linear amplifier. The high input impedance of the circuit prevents loading of the constant current source, Q6. The output ramp voltage is applied to the SCAN MODE switch. The output ramp from U1 also turns on transistor switch Q7 when the ramp voltage reaches a point high enough to overcome the voltage breakdown point of zener diode CR15 through the base-emitter junction of Q7. When Q7 conducts it turns on Q8 to turn off Q10 in the reset circuit.

# TEST PROCEDURE

4-a. Connect the HP 180A/1801A/1821A Channel A probe to TP 3 and the Channel B probe to TP 4 and observe the waveforms.

### **CONTROL SETTINGS:**

Oscilloscope:
0.5 V/Div
5 msec/Div
10:1 probes

5 msec/Div
10:1 probes

Analyzer:
SCAN TIME
PER DIVISION:
0.5 msec

Waveform GOOD: Proceed to 4-b.

Waveform BAD: Check U1 and associated components.

4-b. Connect the oscilloscope Channel A probe to Q7 base and the Channel B probe to TP 5 and observe the waveforms.

# CONTROL SETTINGS:

Same as 4-a except SCAN TIME PER DIVISION: 2 msec

Waveform GOOD: Proceed to step Waveform BAD: Check Q7/Q8 and associated components

# SWEEP RESET CIRCUIT

During the scan period of the scan generator Q10, Q11 and Q14 are all conducting. When the ramp level detector produces positive pulses they turn off Q10. When Q10 stops conducting Q14 and Q11 are also cut off. When Q14 is cut off flip-flop Q15/Q16 changes state (see step b) which in turn operates the ramp discharge switch (see step b) to end the scan cycle.

When Q10, Q11 and Q14 are turned off by the trigger from the level detector the Q11 collector voltage level rises in a positive direction and is ac coupled through C11 to hold off Q10. Q10 is held off for a period of time determined by the time constant of C11 and resistor (or resistors) selected by S1-2R. During the delay period the ramp capacitor is discharged and the display CRT is blanked.

# TEST PROCEDURE

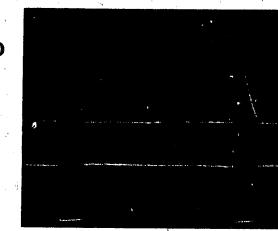
Connect the HP 180A/1801A/1821A Channel A probe to TP 5 and the channel B probe to Q14-c and observe the waveforms.

SERVICE SHEET 13

Figure 8-40. Deflection and Blanking

# CONTROL SETTINGS: Same as 4-b.

Waveform A GOOD & B BAD, check Q10/Q11/Q14 and associated components.
Both waveforms GOOD, proceed to step



# 5 SCAN CONTROL FLIP-FLOP

Scan control flip-flop Q15/Q16 controls the ramp discharge switch Q9/Q13 to initiate and end each scan cycle. The scan cycle is ended when the state of Q15/Q16 is changed by Q14 cutting off. The time delay of the reset circuit as mentioned in step is controlled by R/C selection. However, the scan cycle is not necessarily initiated when the reset delay is ended. When the analyzer is operated in the AUTO scan trigger mode the flip flop returns to the scan mode when the reset delay ends because a negative dc level is applied to the base of Q16 from the trigger generator. When the analyzer is operated in the LINE, EXT, or VIDEO scan trigger modes Q15/Q16 initiates the scan cycle on receipt of the first trigger after the end of the reset delay period.

When Q15/Q16 is in the scan state (Q16 off — Q15 on) Q12 is on (see step ) and Q9/Q13 are off (see step ). Between scans when Q16 is on and Q15 is off, Q12 is off and the positive dc level at the collector of Q15 provides blanking to the display CRT and turns on ramp discharge switch Q9/Q13.

## TEST PROCEDURE

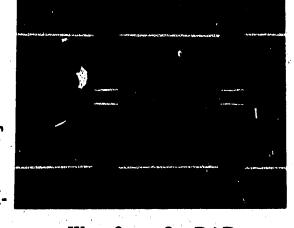
Connect the HP 180A/1801A/1821A Channel A probe to Q14-collector and Channel B probe to TP 2 and observe the waveforms.

### **CONTROL SETTINGS:**

Oscilloscope:
0.5V/Div
10 msec/Div
10:1 probes

Analyzer:
SCAN MODE to INT
SCAN TRIGGER to
AUTO
SCAN TIME PER DIVISION to 2 msec

Waveform 6-a GOOD: Check waveform 6-b.



Waveform 6-a BAD: Check Q15/Q16 and associated components

# Set SCAN TRIGGER to LINE and observe waveform 6-b.

Waveform 6b
GOOD:
Proceed to
step
Waveform 6 b

Waveform 6-b BAD:
Check Q15/Q16 circuit and verify trigger generator operation.



## RAMP DISCHARGE SWITCH

When Q15/Q16 is in the rest state (Q15 off), Q9 and Q13 are both conducting and the ramp capacitor discharges through Q9. When Q15/Q16 returns to the scan state Q9 and Q13 are turned off and the ramp capacitor begins to charge and provide the ramp signal to the ramp amplifier.

# TEST PROCEDURE

Connect the HP 180A/1801A/1821A Channel A probe to TP 2 and the Channel B probe to TP 3 and observe the waveforms.

## CONTROL SETTINGS:

Same as 6-b.

Waveform GOOD: Assembly functions properly

Waveform BAD: Check Q9/Q13 and associated components



# SCANNING LAMP DRIVER

When Q15 in the scan control flip-flop is on, the bias developed across R12 turns on Q12 to light the scanning lamp DS9.

# TEST PROCEDURE

If the CRT display is normal and the scanning lamp is inoperative, check the lamp DS9, Q12 and the input from the A5 power supply.

# SCAN RAMP AMPLIFIER

The scan ramp amplifier, U1, accepts the output of the ramp generator or an externally generated ramp and provides a 10 volt peak-to-peak (-5V to +5V) ramp for use in the horizontal deflection amplifier and the scan circuits. Adjustment of R49 5V Adj establishes a -5 volt dc level at the SCAN IN/OUT jack when an external ramp generator is used.

# SERVICE INFORMATION

## Service

# TEST PROCEDURE

Connect the HP 180A/1801A/1821A Channel A probe to Pin P-XA6 and the Channel B probe to Pin 14-XA6 and observe waveforms:

# CONTROL SETTINGS:

Oscilloscope: 0.5 V/Div 5 msec/Div 10:1 probes

Analyzer: SCAN MODE: INT SCAN TRIGGER

**AUTO** SCAN TIME PER DIVISION: 2 msec

Waveforms GOOD: Proceed to Service Sheet 13. Waveform A GOOD and B BAD: Check U1 and associated components.

Both waveforms BAD: Verify signal at TP-4 and check switching.

# PENLIFT CIRCUIT

Q4 and Q5 are off during the scan cycle. At the end of the scan cycle Q4 and Q5 turn on providing

a current path for the penlift coil in the recorder. When Q4 and Q5 turn off, CR8 and CR9 prevent the counter EMF voltage from the penlift coil from damaging Q5. Penlift output is provided in the following SCAN TRIGGER modes: AUTO, LINE and VIDEO. In the EXT mode a 2 to 20 volt trigger input is required. Penlift output is provided in the following scan modes: INTERNAL, with AUTO, LINE, and VIDEO scan triggers. SINGLE, regardless of SCAN TRIGGER settings. In the EXT scan mode a -1.5 volt input is required to blank the

# TEST PROCEDURE 10

Connect the HP 180A/1801A/1821A Channel A to the PENLIFT output and observe waveform.

# CONTROL SETTINGS:

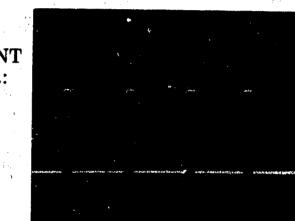
Oscilloscope: 5V/Div

1 msec

Analyzer: SCAN MODE: INT SCAN TRIGGER: AUTO SCAN TIME

PER DIVISION: 0.2 msec

Waveform BAD: Check Q4 and Q5.



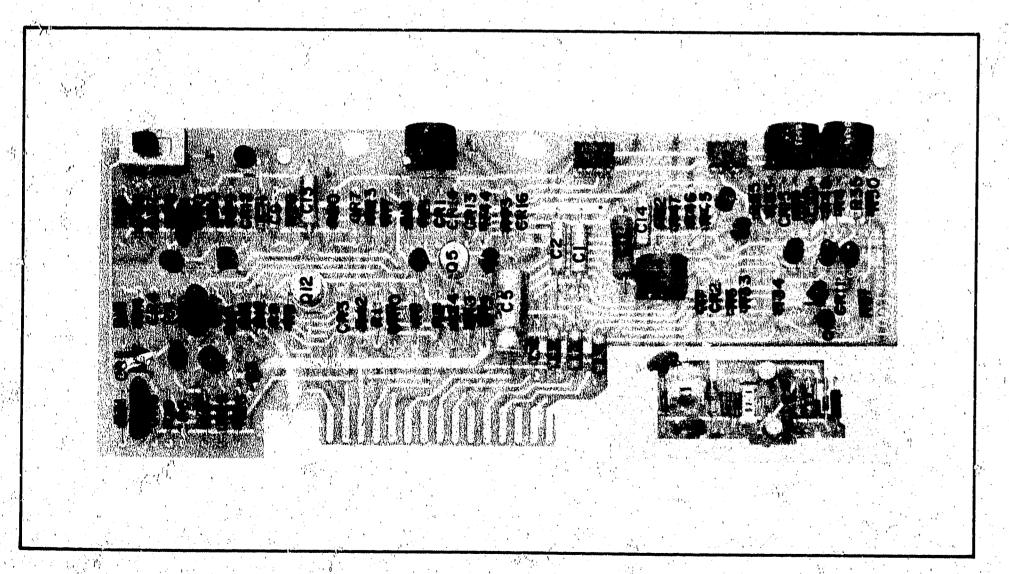


Figure 8-41. P/O Scan Generator Assembly AC Component Locations

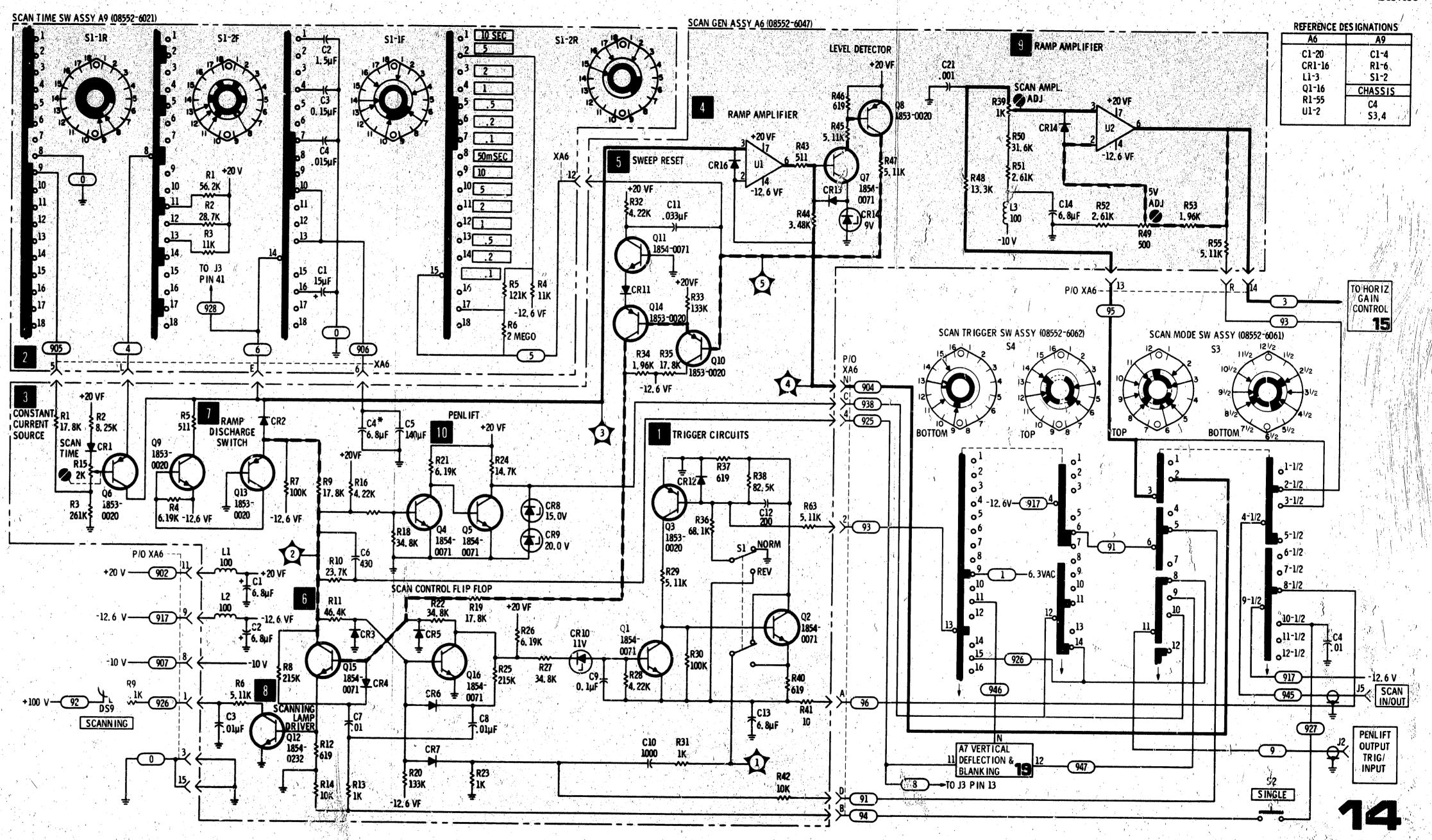


Figure 8-42. Scan Generator Assembly A6 08552-6047

### **SERVICE SHEET 15**

It is assumed that the DISPLAY UNCAL lamp is operating erratically or not at all and that the adjustment procedure in Paragraph 5-41 of Section V will not correct the problem.

### TROUBLESHOOTING PROCEDURE

When a malfunction has been isolated to the analogic light driver or switching matrix, the Power Supply Assembly should be removed and reinstalled using the extender board to provide access to components in the light driver circuit.

### **EQUIPMENT REQUIRED**

# ANALOGIC THRESHOLD AND LIGHT DRIVER CIRCUIT

The RF Section DISPLAY UNCAL light illuminates when the SCAN WIDTH, BANDWIDTH, IF Section SCAN TIME PER DIVISION and VIDEO FILTER switches are set at any combination of positions which do not permit accurate calibration of the analyzer. The DISPLAY UNCAL lamp is caused to illuminate by a simulated signal and has no actual connection to the signal processing circuits.

The SCAN TIME switch, the SCAN WIDTH switch, BANDWIDTH switch, and VIDEO FILTER switch all have wafers that are devoted exclusively to the analogic function. These switches control resistive networks that are connected from the -10 Vdc supply to the inputs of the analogic threshold and light driver circuit. In the SCAN WIDTH PER DIVISION mode of operation, these resistive networks are in parallel. At any time that the total resistance between the -10 Vdc supply and either input to the analogic circuit is low enough to bias Q20 or Q23 into conduction the light driver is enabled.

In the preset mode of operation only the SCAN TIME PER DIVISION switch and the VIDEO FILTER switch control the analogic circuit.

In the ZERO scan mode the analogic circuit is inoperative. (The VIDEO FILTER switch is still in the circuit but cannot, by itself, bias Q20 into conduction.)

# TEST PROCEDURE

1-a. Connect the HP 3440A/3443A to TP A (Q20-b) and set the analyzer controls as follows:

SCAN WIDTH		PER	DIVISION
BANDWIDTH			
VIDEO FILTER			
SCAN WIDTH PER DIVISION		and the second second	20 kHz
SCAN TIME PER DIVISION	1	MIT.T	ISECOND

The voltmeter should read about +580 mVdc DISPLAY UNCAL lamp off.

Place VIDEO FILTER switch in 10 kHz position. Meter should read about -600 mVdc — DISPLAY UNCAL remains on. Return VIDEO FILTER switch to OFF. Meter reads about +580 mVdc — DISPLAY UNCAL lamp off.

Place SCAN TIME PER DIVISION switch in 0.5 MILLISECONDS position. Meter should read about -2.4 volts — DISPLAY UNCAL on.

If meter readings are correct but DISPLAY UN-CAL does not illuminate, check DS1, Q18, Q20, Q22, and associated components.

If voltages are incorrect check switches, resistors, wiring, CR30, Q20, etc.

1-b. Connect the HP 3440A/3443A to TP B (Q25-b) and set the Analyzer controls as initially set in test 1-a. Meter should read about +165 mVdc.

Place VIDEO FILTER switch in the 10 kHz position. Meter should read about +50 mVdc — DIS-PLAY UNCAL on.

Place VIDEO FILTER switch in the 100 Hz position. Meter should read about -40 mVdc — DISPLAY UNCAL on. Return VIDEO FILTER switch to OFF. Meter reads about +165 mVdc — DISPLAY UNCAL off.

Place SCAN TIME PER DIVISION switch to 0.5 MILLISECONDS. Meter should read about -1.4 volts — DISPLAY UNCAL on. Return SCAN TIME PER DIVISION switch to 1 MILLISECOND. DISPLAY UNCAL off — meter reads about +165 mVdc.

Place BANDWIDTH switch to 3 kHz position. Meter reads approximately -58 mVdc — DISPLAY UNCAL on. Return BANDWIDTH switch to 10 kHz position. DISPLAY UNCAL off — meter reads about +165 mVdc.

If readings are correct but DISPLAY UNCAL does not illuminate, check Q23, DS1 and associated components.

If readings are incorrect check switches, resistors, wiring, etc.

### NOTE

A further aid to troubleshooting is Table 5-5 of Section V. Using the table in conjunction with the schematic should aid in localizing cause of malfunction to specific components.

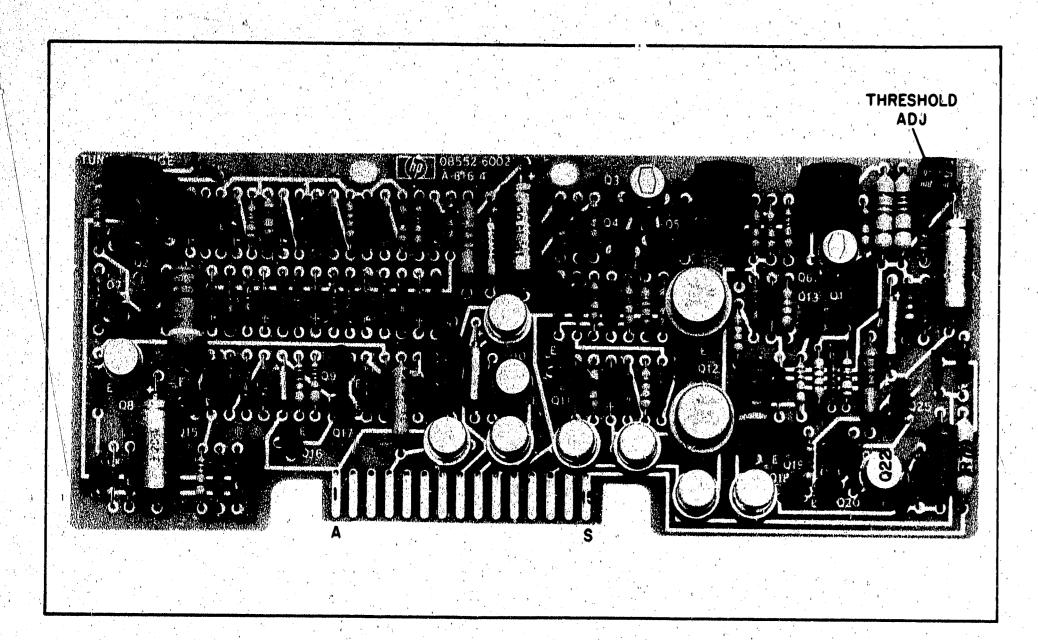


Figure 8-43. P/O Power Supply A5 Test Points and Component Locations

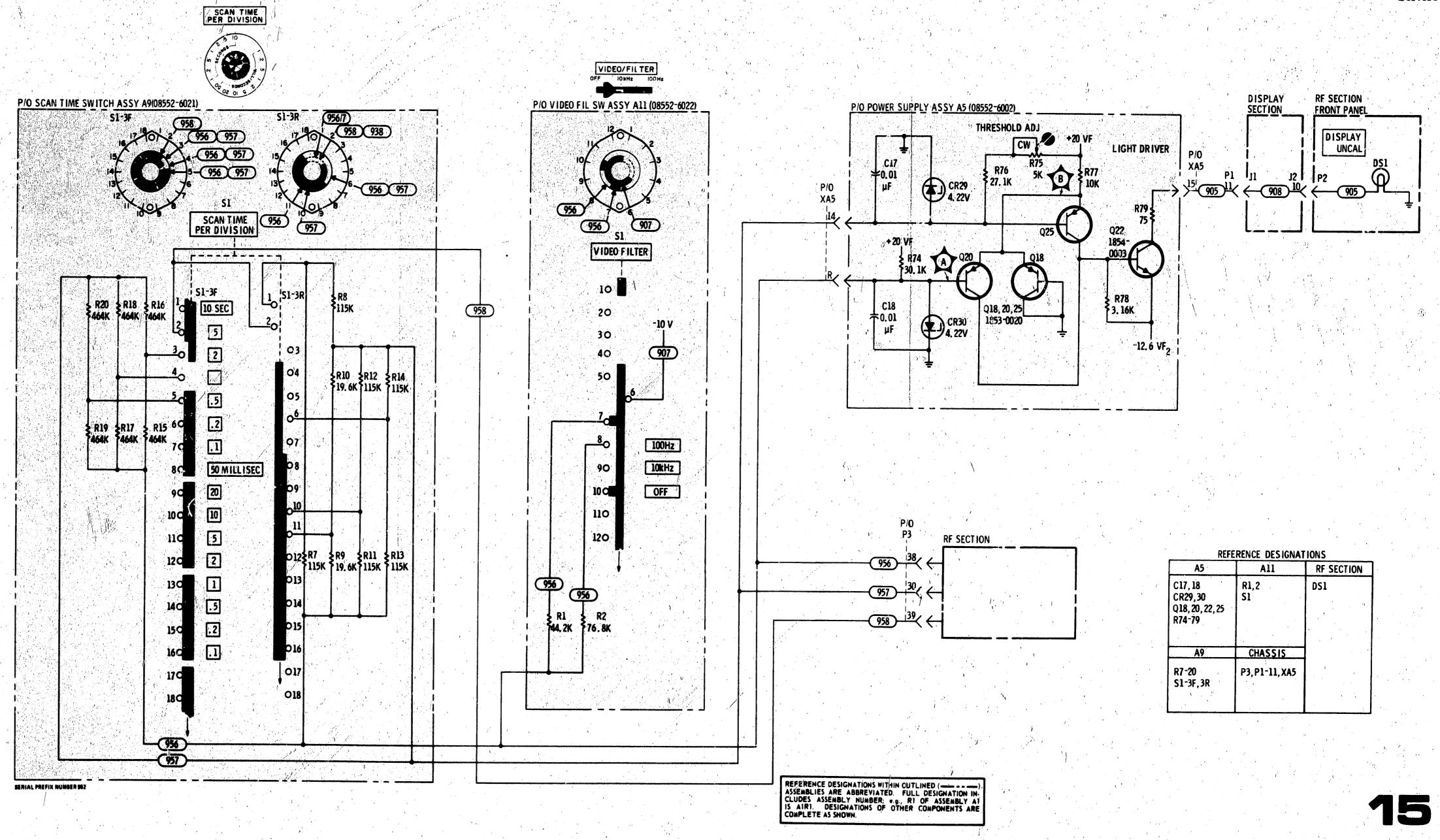


Figure 8-44. Analogic Switching Matrix

### **SERVICE SHEET 16**

It is assumed that the 30 MHz signal at the CAL OUTPUT jack is out of tolerance (and cannot be brought into tolerance by performing procedures specified in Para. 5-40 of Section V) or missing.

# TROUBLESHOOTING PROCEDURE

When it has been determined that the 30 MHz CAL OUTPUT signal is out of tolerance or missing the Scan Generator Assembly A6 should be removed from the frame and reinstalled on the extender board to provide access to components.

### **EQUIPMENT REQUIRED**

Vector Voltmeter	 HP 8405A
50-ohm Tee	
Frequency Counter	
Service Kit	

# CONTROL SETTINGS Any

# INDEX LIGHT SELECTOR WAFER

Index light selection wafer on the RF Section INPUT ATTENUATION control selects the index light associated with the LOG REF LEVEL/LINEAR SENSITIVITY control in the analyzer IF Section. In LOG mode, the selected index lamp is opposite the scale factor on the LOG REF LEVEL control that corresponds to full-scale deflection on the display. In LINEAR mode, the selected index light is opposite the LINEAR SENSITIVITY volts per division scale factor. Lights DS1 through DS6 provide a moveable index point, positioned by the RF Section INPUT ATTENUATION control, thus the analyzer's amplitude calibration is maintained for any INPUT ATTENUATION control setting.

# LINEAR AMPLIFIER COMPENSATION SELECTOR S1-R1

RF connections to pin 7 and 8 are part of an amplifier compensation programming circuit for 10 dB steps of INPUT ATTENUATION control when the analyzer is operated in the LINEAR mode. Refer to Service Sheet 12 for detailed circuit description.

## 30 MHz CALIBRATION OSCILLATOR

Q17/Q18 and associated components comprise a simple multivibrator designed to provide a 30 MHz, -30 dBm signal for use in calibrating the analyzer. The harmonics are also used in checking the analyzer.

### TEST PROCEDURE

Use the 50-ohm Tee to connect the HP 8405A and the HP 5245L/5251A to the CAL OUTPUT jack on the front panel of the analyzer.

Instruments should indicate 30 MHz ±0.3 MHz and -30 dBm ±0.3 dBm.\*

If indications are correct, the assembly is functioning properly.

If indications are incorrect, check Q17/Q18 and associated components and repeat test after repairing circuit.

<sup>\*</sup>Since the basic accuracy of the HP 8405A Vector Voltmeter is of the same order of magnitude as the desired 30 MHz Calibrator amplitude accuracy, amplitude calibration of the HP 8405A Vector Voltmeter at 30 MHz should be known in order to assure a valid measurement.

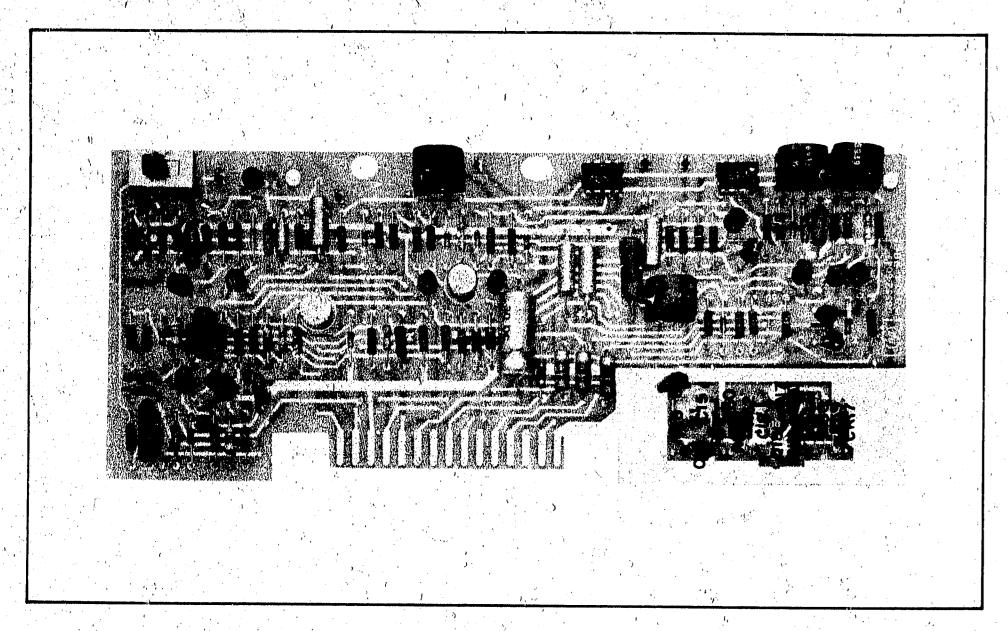
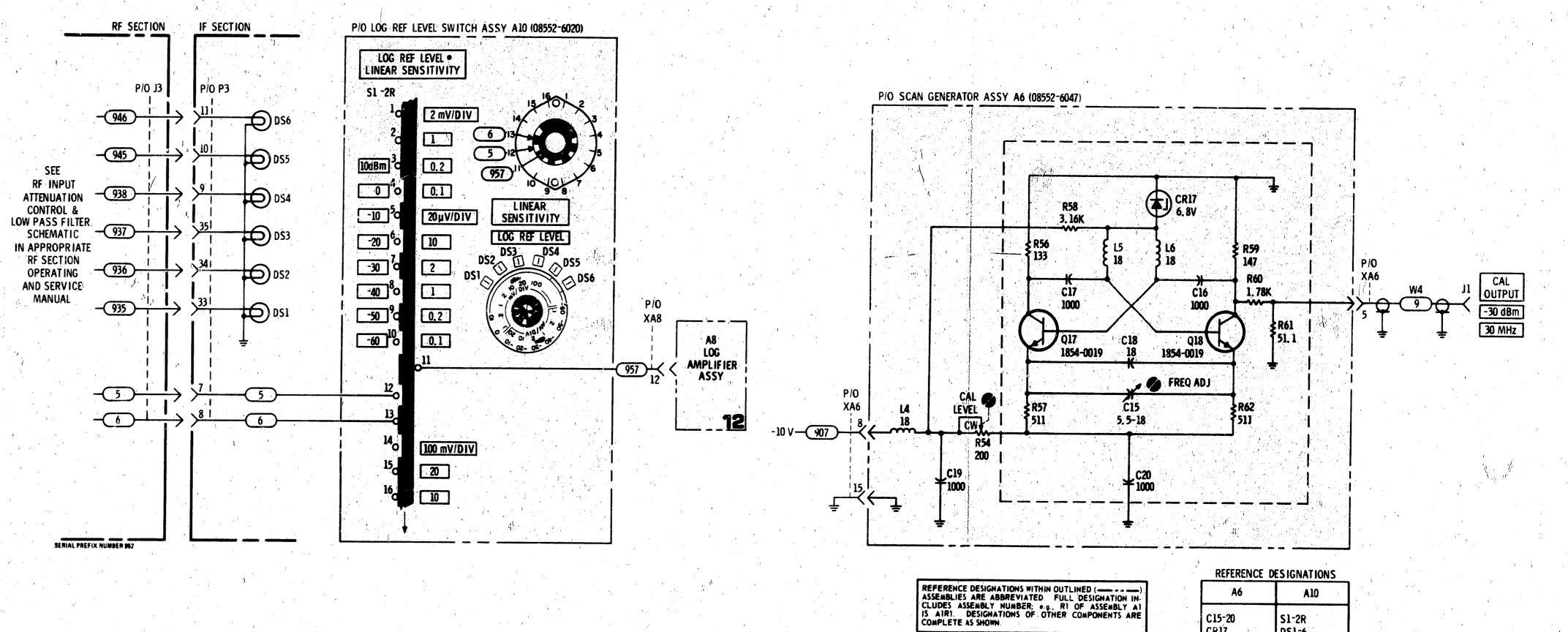


Figure 8-45. P/O Scan Generator Assembly A6 Component Identification



C15-20 S1-2R DS1-6 CHASSIS: Q17-18 J1 J3 R54, 56-62 W4 DS1-6

16

Figure 8-46. 30 MHz Calibration Oscillator

8-49

### **SERVICE SHEET 17.**

It is assumed that the -12.6 volt, -100 volt, and +100 volt inputs from the display unit are present and that one or more of the outputs (-12.6 volts, -10 volts, and +20 volts) is missing or out of tolerance.

# TROUBLESHOOTING PROCEDURE

When trouble has been isolated to the -10 Vdc or +20 Vdc regulators the Power Supply assembly A5 should be removed from the frame and reinstalled on the extender board to provide access to components.

## **EQUIPMENT REQUIRED**

Digital Volti	meter	•,	•	•	•	 •	•	HP	3	440	)A/3443A
Volt-ohm-an	nmeter				• '		•		•	•	HP 412A
Service Kit		•		•	•	 	•		•	.H	P 11592A

### CONTROL SETTINGS

Any

# VOLTAGE REGULATOR

The +20 and -10 volt regulators are conventional voltage regulation circuits. In each of them, a voltage divider from the output to ground is used as a sensing circuit to provide one input to a comparison amplifier. The other input to the comparison amplifier is a reference level established by diode clamping circuits.

When the current requirements of the external circuit increases, the regulated output voltage will decrease and cause a reduction in the dc input to the comparison amplifier. The comparison amplifier detects the unbalanced condition between its two inputs and provides an output to change the operating bias of the control amplifier. The control amplifier then causes the series regulator to con-

duct more heavily, providing more current to the external circuit to allow the voltage to return to the proper level.

The series regulator acts like a variable resistance in series with the power supply output. When the external circuit requires more current (as evidenced by a decrease in output voltage) the series regulator is caused to present less impedance to the current flow.

The Silicon Control Rectifiers CR4 and CR10 act as "crowbar" protectors to protect external circuits in the event of a shorted Series Regulator. Should a series regulator short, the output voltage would be limited only by the output of the rectifier and the current in the external circuit would increase in proportion to the increase in output voltage. When this occurs, the SCR's are turned on and they short out the regulator output voltage. The SCR's remain in conduction until the regulator output voltage has reached zero.

## TEST PROCEDURE

Voltage regulators function as a "closed loop." Generally, malfunction of almost any component may affect dc levels at all points in the circuit. For this reason, typical voltage levels would be little, if any, help in servicing the assembly.

The HP 3440A/3443A should be used to check for the presence or absence of dc levels at obvious points. The HP 412A should be used for point-topoint resistance measurements.

Generally, if the output is completely missing or consistently high, the series regulator should be checked first for an open or shorted condition. Also, if voltage is high the SCR crowbar should be checked.

Figure 8-47. P/O Power Supply Assembly A5 Component Identification

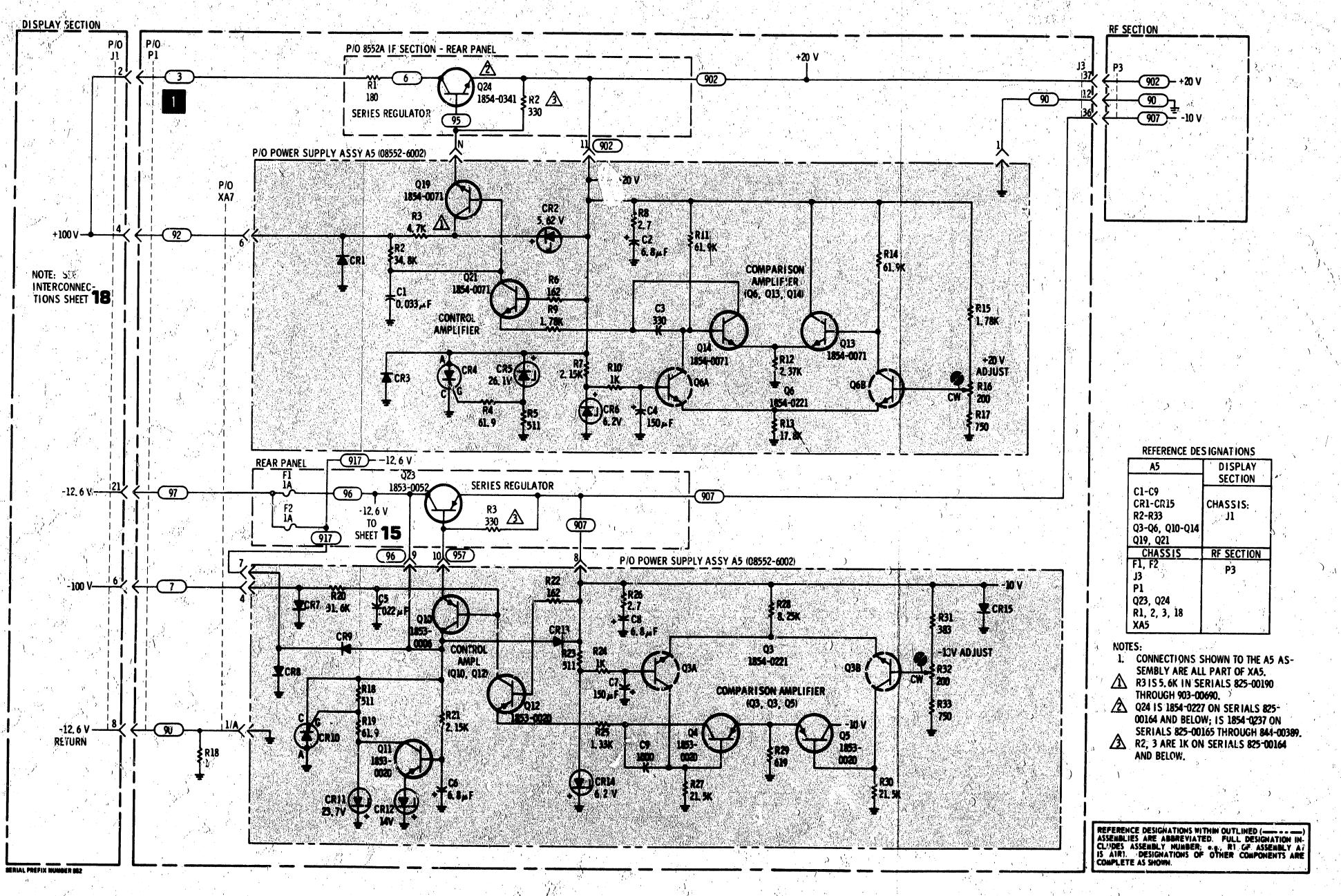
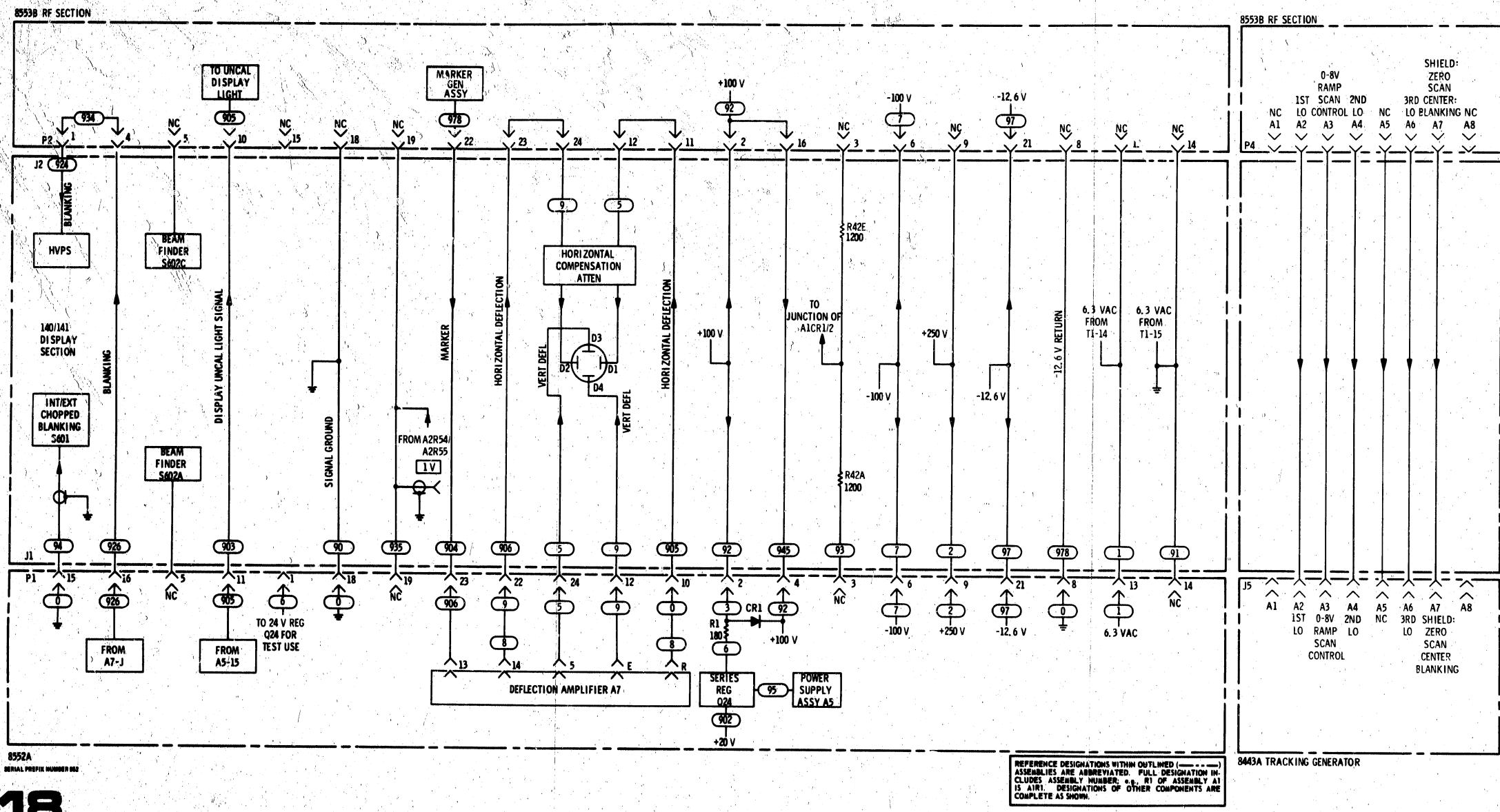


Figure 8-48. Voltage Regulator Circuits



13

SERVICE SHEET 18

Figure 8-49. RF Section/IF Section/Display Section Interconnections

# OIANUAL CHARGES

# MANUAL CHANGES

- MANUAL IDENTIFICATION -

Model Number: 8552A

Date Printed: May 1970

Part Number: 08552-90023

This supplement contains important information for correcting manual errors and for adapting the manual to instruments containing improvements made after the printing of the manual.

To use this supplement:

Make all ERRATA corrections

Make all appropriate serial number related changes indicated in the tables below.

	Make Manual Changes	Serial Prefix or Number	Make Manual Changes
All 952-02695 to 02744	ERRATA 1	2143A	1–24
952-02745 to -02791 991-02792 to -02844	1.2 1,2,3	- 2228A	1-25
991-02845 to -02944 991-02945 to -02994	1,2,3,4 1,2,3,4,5		
1101A 1110A03095 to -03294	1,2,3,4,5,6 1-7		
1110A03295 to -03544 1144A03545 to -03594	) <b>- 8</b>   <b>- 9</b>		$\lambda_{i,j}$
1144A03595 to -03694 1213A	1-10 1-11		
1220A03795 to -04294 1220A04295 to -04644	1-12 1-13		
1352A 1501A	- 4  - 5		
1509A04995 to -05044 1509A05045 thru 1509A05144	1–16 1–17		<b>9</b>
1509A05145 to -05044 1509A prefix	1-16 1-18		
1612A 1649A	1-19 1-20		
1716A	1-21		
2003A05705 to -05754	1–22		
2003A05755 to -05884	123		

### ► NEW ITEM

### NOTE

Manual change supplements are revised as often as necessary to keep manuals as current and accurate as possible. Hewests-Packard recommends that you periodically request the latest edition of this supplement. Free copies are available from all HP offices. When requesting copies quote the manual identification information from your supplement, or the model number and print date from the title page of the manual.

12 JULY 1982

10 Pages Text



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On title page, under SERIAL PREFIXES: Change "855-" to "844-".

Page 1-2, Table 1-1, under "Penlift Characteristics" add: (0 volts pen down).

Pages 4-6, 4-8, and 4-9, paragraphs 4-24, 4-25, and 4-26:
Add the following:

### MOJ 7

Some RY and LF Sections do not use all of the benchdidths provided in the IF Section. See your RF and LF Section manuals to find which benchdidths are used with each input section.

Page 4-8, Paragraph 4-25, change to read as follows:

3. Compute the bendwidth at the -60 dB graticule line (SCAN WIDTH PER DIVISION setting times the number of divisions separating the signal's slopes). Compute the 60 dB/3 dB IF bandwidth ratio using the 3 dB bandwidth found in Paragraph 4-24.

60 dB bandwidth 20

4. To check the remaining BANDWIDTH settings, refer to Table 4-3 for control settings and test limits. Compute the 60 dB/3 dB IT bandwidth ratios using the 3 dB bandwidths found in Paragraph 4-24. (NOTE: Table 4-3 is included at the back of this Manual Changes supplement.)

Page 4-13. Table 4-5:

Replace appropriate portion of Table 4-5 with P/O Table 4-5, Paragraph 4-25 (ERRATA), included in this Manual Changes supplement.
Under Paragraph 4-24, change to read:

1 kHz Bandwidth divisions 16

Page 5-2, Paragraph 5-23: Change "Table 5-4" to read "Table 5-5".

Page 5-12, Paragraph 5-31: Change Step 10 to read:

10. With the analyzer power off, remove the A7 Deflection Amplifier Assembly.

At the back of Section V add now Table 5-5 (ERRATA) included in this Manual Changes supplement.

Page 6-1, Table 6-1: Change A4 Crystal Filter Exchange Board Stock Number to 08552-60066.

Page 6-3, Table 6-3; Add to A1R7: (FACTORY SELECTED PART: TYPICAL VALUE SHOWN).

Page 6-4, Table 6-3: Change A 101 through A 104 to HP Part Number 1854-0404, TRANSISTOR NPM SI TO-18 PD-36084. Change A 1R16 to HP Part Number 0757-0422, R:FXD NET FLM 909 OHM 15 1/8W (FACTORY SELECTED PART; TYPICAL VALUE SHOWN).
Add to A1R25: (FACTORY SELECTED PART; TYPICAL VALUE SHOWN).

Page 6-7, Table 6-3: Change A2R42 to HP Part Number 0757-0199, R:FXD 21.5K OHM. Change A2R45 to HP Part Number 0698-0084, R:FXD 2.15K OHM

Page 6-9, Table 6-3: Change A3A1 "REPLACEMENT" to read "REPAIR".

Page 6-10, Table 6-3:

After A3A2, change "REP ACEMENT" to read "REPAIR".

Change A3A2L1 to EP Part Number 9100-2815, INDUCTOR: FXD 0.70 UH 5%.

Change A3A2Q1 to HP Part Number 1854-0485, Check Digit 7, TRANSISTOR NPN SI TO-104

PD=175MM (Recommended Replacement).

Page 6-17, Table 6-3: Change A5022 to HP Part Number 1854-6037, Check Digit 1, TRANSISTOR NPN 2N2219A SI TO-5 PD=80094 (Recommended Replacement).

Page 5-18, Table 5-3: Change A5R34 and A5R46 to HP Part Number 0698-8961, R:FXD MET FLM 909K 0HM 1% 1/8W (Preferred Replacement).

Page 6-23, Table 6-3: Change A702 and A709 to HP Part Number 1853-0451, TRANSISTOR PNP 2N3799 SI TO-18 PDx3609N.

Page 6-24, Table 6-3: Change A7R54 to HP Part Number 07:57-0200, Check Digit 7, RESISTOR 5.62K 1% .125W F TC=0--100.

Page 6-30. Table 6-3:
Change A10R8 to HP Part Number 0757-0440, Check Digit 7, R:FXD MET FLM 7.50K CHM 12 1/8W (FACTORY SELECTED PART).
Change A10R9 to HP Part Number 0698-3158, Check Digit 4, R:FXD MET FLM 23.7K CHM 15 1/8W (FACTORY SELECTED PART).

Page 6-31, Table 6-3: Change J1 to 1250-0102, Check Digit 5, CONNECTOR: BNC, FRONT MOUNTED (P/O W4).

Page 6-32, Table 6-3:
Change W4 to 08552-6027, Check Digit 5, CABLE ASSY: CAL OUTPUT (INCLUDES J1).
Delete all other W4 entries.
Delete 0403-0026, GLIDE: NYLON.
Add 6960-0079, Check Digit 5, PLUG: HOLD NYLON.
Change S3 description to SWITCH ASSY: SCAN TRIGGER.
Change S4 description to SWITCH ASSY: SCAN MODE.

Page 6-34, Table 6-4: Delete 0683-9145.

Page 6-35, Table 6-4: Add 0698-8961, R:FXD MET FLM 909K CHM 15 1/8W.

Page 6-36, Table 6-4: Change TQ for 0757-0280 to 31. Change TQ for 0757-0422 to 8.

Page 6-37, Table 6-4: Delete HP Part Number 1853-0050. Add HP Part Number 1853-0451, TRANSISTOR PNP 2N3799 SI TO-18 PD=360M. Add HP Part Number 1854-0485. TRANSISTOR NPN SI TO-104 PD=175MW. Add HP Part Number 1854-0637, TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW.

Page 8-2, Paragraph 8-17: Change "see Table 5-4" to "see Table 5-5".

Page 8-6, Paragraph 8-38: Change "Figure 8-4" to read "Figure 8-5".

Page 8-23, Figure 8-16: Change A3A2Q1 to HP Part Number 1854-0485.

Page 8-25, Figure 8-19, SERVICE SHEET 4: Change the value of A5R34 to 909K. Change the value of A5R46 to 909K.

Pages 8-30, 8-32, 8-34, and 8-36: Add the following:

### MOTE

Some MF and LF Sections do not use all of the bendwidths provided in the LF Section. See your MF and LF Section menuals to find which bendwidths are used with each input section.

Page 8-31, Figure 8-28, SERVICE SHEET 7:
Change A1R7 to A1R7\* (factory selected part).
Change the value of A1R16\* to 909.
Change A1R25 to A1R25\* (factory selected part).
Move CR9 to between R39 and connection to CR10.
Delete connection between Q6e/L9 and ground.

Page 8-37, Figure 8-33, SERVICE SHEET 10: Change value of A10R8\* to 7.5K. Change value of A10R9\* to 23.7K.

Page 8-43, Figure 8-40, SERVICE SHEET 13: Change A7Q2 and A7Q9 to HP Part Number 1853-0451. Add "-12.6" next to A1OR7 on Log Ref Level Assembly. Change value of R54 to 5.62K.

Page 8-45, Figure 8-42:
Replace appropriate sections of SERVICE SHEET 14 with partial schematic Figure 842 (ERRATA) included in this Manual Changes supplement.

Page 8-46, step 1, second paragraph: Change to read:

"Any time the total resistance between the -10 Vdc supply and either input to the snalogic circuit is low enough to bias Q20 or Q25 into conduction, the light driver is enabled."

Page 8\_47, Figure 8\_44: Change A5022 to HP Part Number 1854\_0637.

Page 8-49, Figure 8-46, SERVICE SHEET 16: Change KA6 pin 5 to pin S.

Page 5-15, Table 6-3: Change AMR73 to HP Part Number 0757-0280, Check Digit 3, R:FXD MET FLM 1.0K CHM. Page 6-35, Table 6-4:
Delete 0757-0274 (entire line)
Add 0757-0280, Check Digit 3, F:FXD MET FLM 1.0K CHM 15 1/8W.

Page 8-37, Figure 8-33: Change A4R73 to 1.0K OHM.

### CHANGE 2

Page 6-21, Table 6-3: Change A6R15 to HP Part Number 2100-1760, R:VAR 5K CHM.

Page 6-38. Table 6-4:
Delete 2100-1759 (entire line).
Change 2100-1760 TQ column to 4.

Page 8-45, Figure 8-42: Change R15 to 5K.

### CHANCE 3

At the back of Section V, make the following changes to Table (-5 (added in ERRATA): Delete A4R86 (entire file).

Add: (Component) A4R89; (Service Sheet) 10; (Basis of Selection) Crystal filter assy gain adjustment: 100 ohm to 10 kohm.

Pages 6-11 through 6-15, Table 6-3:
Replace A4 parts list with new A4 Replaceable Parts (CHANGE 3) included in this
Manuel Changes supplement.

## Page 8-35:

Replace Figure 8-30 with Figure 8-30 (CHANGE 3) included in this Manual Change? Supplement.

Replace Figure 8-31, SERVICE SHEET 9, with Figure 8-31 (CHANGE 3) included in this Manual Changes supplement.

### Page 8-37:

Replace Figure 8-32 with Figure 8-32 (CHANCE 3) included in this Manual Changes supplement.
Replace Figure 8-33, SERVICE SHEET 10, with Figure 8-33 (CHANCE 3) included in this Manual Changes supplement.

### 

Page 6-11, Table 6-3: Change A3A2R8 to HP Part Number 0757-0401, Check Digit 0, R:FXD MET FLM 100 OHM. Change A3A2R10 to HP Part Number 0757-0346, Check Digit 2, R:FXD MET FLM 10 OHM.

Page 6-36, Table 6-4:

Delete 0757-0382 (entire line).
Delete 0757-0399 (entire line).
Change 0757-0346 TQ column to 13.
Change 0757-0401 TQ column to 25.

Page 8-23, Figure 8-16: Change A3A2R8 to 100 CHM. Change A3A2R10 to 10 CHM.

### CHES 5

Page 6-22, Table 6-3:

Change A6U1 and A6U2 to HP Part Number 1826-0013, Check Digit 8.

Page 5-37, Table 6-4: Delete 1820-0216 (entire line). Add 1826-0013, Check Digit 8, IC OP AMP.

### CHANGE 6

Page 8-41, Figure 8-38, SERVICE SHEET 12:
Replace appropriate portions of schematic with P/O Figure 8-38 (CHANGE 6) included in this Manual Changes supplement. (The white-blue-gray wire connecting XA8-8 to J3-40 is 24 AWG.

### CHANGE 7

Pages 6-11 and 6-12, Table 6-3:
Change A4C14, A4C21, A4C24, A4C31, A4C32, A4C34, A4C39 and A4C41 to HP Part Number 0160-3460, C:FXD .05 UF.
Change A4C1, A4C3, A4C5-8, A4C10-13, A4C16-20, A4C22, A4C25-29, A4C33, A4C40, A4C42-44, A4C46-48 and A4C50-52 to HP Part Number 0160-2055, Check Digit 9, C:FXD .01UF.

Page 6-15. Table 6-3: Change A4R73 to HP Part Mumber 0757-0280, Check Digit 3, R:FXD 1K CHM. Change A4R82 to HP Part Number 0757-0200, Check Digit 7, R:FXD 5.62K CHM.

Page 6-23. Table 6-3: Change A7010 and A7019 to HP Part Number 1854-0234, (heck Digit 4,) (TSTR:SI NPN).

Page 6-30, Table 6-3:
Add A10810, HP Part Number 0757-0001, Check Digit 6, R:FXD MET FLM 15.3 OHM 15

Page 6-32, Table 6-3:

Change 313 to HP Part Number 0698-3399, Check Digit 5, R:FXD 133 OHM.

Change S1 to HP Part Number 3101-1560, Check Digit 8.

Page 6-33, Table 6-4:
Delete 0160-2917 (entire line).
Change 0160-2930 TQ to read 53.
Add 0160-2055, Check Digit 9, C:FXD CER .01 UF +80-20% 100VDCW.
Add 0160-3460, Check Digit 2, C:FXD CER .05UF +80-20% 100VDCW.

Page 5-35, Table 6-4: Change 0698-3400 TQ to read 1. Change 0757-0200 TQ to read 3. Change 0757-0274 TQ to read 13. Add 0698-3399, R:FXD MET FLM 133 CHM 1% 1/2W. Add 0757-0001, Check Digit 6, R:FXD MET FLM 13.3 CHM 1% 1/2W

Page 6-36, Table 6-4: Change 0757-0280 TO to reed 33. Change 0757-0441 TO to reed 3.

Page 8-37, Pigure 8-33; Change AAR73 to 1.0 kolm. Change AAR82 to 5.62 dom.

Page 8-41, Pigure 8-38, SERVICE SHLIT 12:
Replace appropriate portions of schematic with P/O Pigure 8-38 (CHANGE 7) included
in this Manyai Changes supplement (R13 changed and A108: J added),

### CHANCE 8

Page 6-19, Table 6-3: Add A5Z1, HP Part Number 9170-0016, BEAD: MAGNETIC SHIELDING.

Page 6-23, Table 6-3: Change A7Q2 and A7Q9 to HP Part Number 1853-0314, Check Digit 9. Change A7R7 to HP Part Number 0675-6811, Check Digit 4, R:FXD COMP 680 OHM 1% 1/8W.

Page 8-43, Figure 8-40, SERVICE SHEET 13: Change A7Q2 and Q9 to 1853-0314. Change A4R7 to 680 ohms.

Page 8-51, Figure 8-48, SERVICE SHEET 17:
Place ferrite bead symbol and designator 21 in base lead of A5Q10.

### CHARGE 9

Page 6-32, Table 6-3:
Add 08552-0001, Check Digit 5, FRONT PANEL-LIGHT GRAY.
Add 08552-00032, Check Digit 7, FRONT PANEL-MINT GRAY.
Add 08552-00104, Check Digit 4, PLATE: CONNECTOR-BLACK.
Add 08552-00131, Check Digit 7, PLATE: CONNECTOR-OLIVE BLACK.

### CHANGE 10

Pages 6-22 and 6-23. Table 6-3: Change A7C4 to HP Part Number 0180-0269. Check Digit 5. C:FXD ELECT 1.0 UF 150V. Change A7R7 to HP Part Number 0675-1021, Check Digit 8. R:FXD MET FLM 1.0K OHM.

Page 8-43, Figure 8-40, SERVICE SHEET 13: Change A7R7 to 1.0K and A7C4 to 1.0 UF.

## **CHANCE** 11

Page 6-28 and 6-32, Table 6-3:
Add A8898, HP Part Number 0757-0438, Check Digit 3, R:FXD MET FLM 5.11K CHM 1%
1/8W.
Add W9, HP Part Number 08552-60083, Check Digit 4, CABLE ASSY: 3 MHz.

Page 8-41, Figure 8-38, SERVICE SHEET 12:
Replace appropriate portions of schematic with P/O Figure 8-38 (CHANGE 11)
included in this Manual Changes supplement.

### CHANCE 12

Page 8-39, Figure 8-35, SERVICE SHEET 11: Exchange "E8" and "R10" on the photo.

## CHART 13

Page 6-31, Table 6-3:
Change J1 to 1250-0252, Check Digit 6, CONNECTOR: ENC. REAR MOUNTED (P/O W4).

### **CAME** 14

Page 6-16, Table 3-3:
Add A5C19, 3P Part Number 3160-2055, Check Digit 9, C:FXD 0.01 UF +80-205
10UNVDC:

Page 6-17, Table 6-3: Delete ASR18 (entire line). Page 6-33, Table 6-4:
Add 0160-2055, Check Digit 9, C:FXD 0.01 UF +80-20% 100WVDC.

Page 6-36, Table 6-4: Change 0757-0416 TQ to 16.

Page 8-51. Figure 8-48. SERVICE SHEET 17:

Change A5R18 to A5C19 .01 UF as shown in P/O Figure 8-48 (CHANGE 14) included in this Manual Changes supplement.

Add A5C19 in REFERENCE DESIGNATIONS table.

Add "Deleted: A5R18" directly under REFERENCE DESIGNATIONS table.

### CHANGE 15

Page 6-21, Table 6-3:
Change A6R23 to HP Part Number 0698-0083, Check Digit 8, R:FXD MET FLM 1.96K 1% 1/8W.
Change A6R42 to HP Part Number 0698-3157, Check Digit 3, R:FXD MET FLM 19.6K 1% 1/8W.

Page 8-45, Figure 8-42, SERVICE SHEET 14: Change value of R23 to 1.96K. Change value of R42 to 19.6K.

### CHANCE 16

Pages 6-3 and 6-4, Table 6-3: Change A1R7 and A1R25 to HP Part Number 0757-0421, Check Digit 4, R:FXD MET FLM 825 OHM 1% 1/8W.

Page 8-31, Figure 8-28: Change the value of A1R7 and A1R25 to 825 chas.

### CHANGE 17

Page 6-28, Table 6-3: Change A9 to HP Part Number 08552-00036, Check Digit 1, DIAL-KNOB ASSY: SCAN TIME.

Page 6-30, Table 6-3: Change A10 to HP Part Number 08552-00037, Check Digit 2, DIAL-KNOB ABBY: LOG REF FINE.

Page 6-31, Table 6-3: Change R10 to HP Part Number 08552-00035, Check Digit O, DIAL-KNOB ASSY: IF LEVEL.

CHANCE 18

Change Q23, SOCKET: TRANSISTOR, to HP Part Number 1200-0569, Check Digit 3. Change Q24, SOCKET: TRANSISTOR, to HP Part Number 1200-0569, Check Digit 3.

Page 6-37, Table 6-4: Change 1200-0168 to 1200-0569, Check Digit 3.

Page 6-39, Table 6-4: Change 08552-0025 TQ to 2.

### CHANCE 19

Page 6-22, Table 6-3: Change A6U1 and A6U2 to HP Part Number 1826-0261, Check Digit 8.

### MOTE

# The 1826-0261 is a high reliability replacement for the 1826-0013.

Page 6-28, Table 6-3: Add A8R99, HP Part Number 0698-0084, Check Digit 9, R:FXD MET FLM 2.15K OHM 1% 1/8W.

Page 8-41, Figure 8-38, SERVICE SHEET 12:
Add A8R99, 2.15K, on A8 LOG AMPLIFIER ASSY, between XA8 pin 8 and XA8 pin 9.
Connection XA8 pin 9 is on SERVICE SHEET 11.

### CHANCE 20

Page 1-6, Table 1-2: Change Tuning Tool, Slot, Normetallic, 2.5-inch shaft HP Part Number 8710-0722.

Page 5-21, Paragraph 5-35: Under EQUIPMENT, change Tuning Tool HP Part Number to 8710-0772.

Page 6-6, Table 6-3: Change AZL7 to HP Part Number 08552-80106, Check Digit 4. Change AZL9 to HP Part Number 08552-80107, Check Digit 5.

Page 6-40, Table 6-4: Change 08552-6011 to 08552-80106, Check Digit 4. Change 08552-6012 to 08552-80107, Check Digit 5.

### CHANCE 21

Page 6-25, Table 6-3: Change A8CR5 to HP Part Number 1901-1067, Check Digit 6. Add A8CR6, HP Part Number 1901-1067, Check Digit 6, DIODE: SILICON.

Page 6-37. Table 6-4:
Add 1901-1067. Check Digit 6, DIODE: SILICON.

Page 8-41. Figure 8-38, SERVICE SHEET 12:
Add A8CR6 in perallel with A8L11 so that smode of A8CR6 is connected to smode of A8CR5 (XA8-pin 7).

### CHARGE 22

Page 6-31. Table 6-3: Change Q24 to HP Part Number 1854-7311. Check Digit 8. TRANSISTOR NPN 2N4240 SI TO-66 PD=35W (Recommended Replacement).

Page 8-51, Figure 8-48: Change part number of +20V power supply transistor Q24 to 1854-0311 (Recommended Replacement).

### **GME** 23

Page 6-21, Table 6-3: Change A6844 to HP Part Number 0698-3154, Check Digit 0, RESISTOR 4.22K 15 .125W F TC=0+-100 (Recommended Replacement).

Page 8-45, Figure 8-42; Change value of R44 to 4220.

### CHANT 24

Page 6-22, Table 6-3:

Replace entire A7 Replaceable Parts list (A7 through A7U3) with new A7 Replaceable Parts (CHANGE 24) included in this Manual Changes supplement.

Page 8-43, Figure 8-39:
Replace Figure 8-39, Deflection Amplifier A7 Component Identification, with new Figure 8-39 (CHANGE 24) included in this Manual Changes supplement.

Page 8-43, Figure 8-40:
Replace Figure 8-40, Vertical Deflection and Blanking, with new Figure 8-40 (CHANGE 24) included in this Manual Changes supplement.

### POME 25

Page 6-24, Table 6-3: Change A8 to HP Part Number 08552-60192, Check Digit 6.

Page 8-39, Figure 8-36:
Change part number of LOG AMPLIFIER ASSY A8 to 08552-60192. At lower left of schematic, under -100V line, add new input line: -100VF1, wire 97, pin 3. On-board connection is common to L5 and C4.

Page 8-41, Figure 8-36: Change part number of LOG AMPLIFIER ASSY A8 to 08552-60192. At bottom of schematic, to left of -100VF1, change wire 7 to wire 97.

Table 4-3. Bandwidth Selectivity Checks (ERRATA)

BANDWIDTH	SCAN WIDTH PER DIVISION	SCAN TIME PER DIVISION	60 de Bandwidth Divisions	RATIO FREQUENCY 60 dR/3 dB BANDWIDTHS
100 kHz	0.5 MHz	50 MILLISECONDS		< 20
30 kHz	0.1 MHz	50 MILLISECONDS		< 20
10 kHz	0.05 MHz	50 MILLISECONDS		< 20
3 kHz	5 kHz	50 MILLISECONDS		< 20
l kHz	2 kHz	o.i SECONDS		<20
0.3 kHz	0.5 kHz	0.2 SECONDS		<25
0.1 kHz	0.2 kHz	0.2 SECONDS		< 25
.05 kHz	0.2 kHz	0.5 SECONDS		< 25 < 25

P/O Table 4-5. Performance Test Check Record (ERRATA)

Pere No.	Test Description	Measurement Unit	Min Actual Max
<b>428</b>	Bandwidth Selectivity Bandwidths 300 kHz 100 kHz 30 kHz 10 kHz 10 kHz 0.3 kHz 0.1 kHz 0.1 kHz	ratio ratio ratio ratio ratio ratio ratio ratio ratio ratio ratio ratio	20:1 20:1 20:1 20:1 20:1 20:1 20:1 20:1

Table 5-5. Factory Selected Components (ERRATA)

	And the second s						
Service Sheet	Busis of Selection						
<b>7</b>	Compensates for variations in A1L3 - 6, A1C3, 9, 15 and 21: 750 to 1200 ohms.						
7	Equalizes gain for 10 - 300 kHz bandwidths.						
<b>3</b>	, 50 MHz Converter gain adjustment: 18 to 52 ohms (4 ohm/dB change).						
9, 10	3 kHz bandwidth adjustment. 100K ohms to						
10	0.3 kHz bandwidth gain adjustment: ± 5K ohms.						
10	Crystal filter assembly gain adjustment: 880 to 4K ohms.						
4	Optimizes exponential tuning voltage curve for 47 MHz LO.						
11	Optimizes 10 dB gain step: ± 500 ohms.						
10	Ensures 10 dB/step attenuation: R8 - 6.81 to 16.2K, R9 - 21.5 to 51.1K						
	Short 7 7 3 9, 10 10 4 11						

# A4 Replaceable Parts List (1 of 4) (CHANGE 3)

Reference Designation	Part Number	Qty	Description	Mfr Code	Mfr. Part Numbe
<b>A4</b>	08552-6085		Board Assembly: Crystal Filter	28480	
A4C1	0160-2930	32	C:FXD Cer 0.01 µF +80 -20% 100 VDCW	91418	08552-6065
A4C2	0180-0116	1	C:FXD Elect 6.8 µF 10% 35 VDCW	56289	TA 150D685X- 9035B2-DYS
A4C3	0160-2930		C:FXD Cer 0.01 µF +80 -20% 100 VDCW	91418	TA
<b>%(C4</b> )	0180-0291	1	C:FXD Elect 1.0 µF 10% 35 VDCW	56289	150D105X- 9035A2-DYS
44C5C8	0160-2930		C:FXD Car 0.01 µF +80 -20% 100 VDCW	91418	TA
A4C9	0121-0059	3	C:VAR Cer 2-8 pF 300 VDCW	28480	0121-0059
A4C10-13	0160-2930		C:FXD Car 0.01 µF +80 -20% 100 VDCW	91418	TA
<b>V4C14</b>	0160-2917	8	C:FXD Car 0.05 µF +80 -20% 100 VDCW	84411	Type TA
N4C15	0121-0105	3	C:VAR Car 9-35 pF NPO	28480	0121-0105
MC16-20	0160-2930		C:FXD Car 0.01 µF +80 -20% 100 VDCW	91418	TA
WC21	C160-2917		C:FXD Cer 0.05 µF +80 -20% 100 VDCW	84411	Type TA
<b>4C22</b>	0160-2930		C:FXD Cer 0.01 µF +80 -20% 100 VDCW	91418	TA
V4C23 V4C24	0121-0059		C:VAR Cer 2-8 pF 300 VDCW	28480	0121-0059
	0160-2917		C:FXD Cer 0.05 μF +80 -20% 100 VDCW	84411	Type TA
AC25-29	0160-2930		C.FXD Cer 0.01 µF +80 -20% 100 VDCW	91418	TA
AC30	0121-0105		C:VAR Cer 9-35 pF NPO	28480	0121-0105
4C31, 32	0160-2917		C:FXD Cer 0.05 µF +80 -20% 100 VDCW	84411	Type TA
4C33 4C34	0160-2930		C:FXD Car 0.01 µF +80 -20% 100 VDCW	91418	TA
	0160-2917		C:FXD Cer 0.05 µF +80 -20% 100 VDCW	84411	Type TA
4C35, 38	0160-2199	2	C:FXD Mica 30 pF 5% 300 VDCW	28480	0160-2199
4C37	0160-2257	1	C:FXD Car 10 pF 5% 500 VDCW	72982	301-000-C0HO-
4C38	0121-0059		C:VAR Cer 2-8 pF 300 VDCW	20400	100J
4C39	0160-2917		C:FXD Car 0.05 µF +80 -20% 100 VDCW	28480 84411	0121-0059
ACAO	0160-2930		C:FXD Car 0.01 µF +80 -20% 100 VDCW	91418	Type TA
4C41	0160-2917		C:FXD Car 0.05 µF +80 -20% 100 VDCW	84411	Type TA
4C42-44	0160-2930		C:FXD Cer 0.01 µF +80 -20% 100 VDCW	91418	TA
4C45 4C46-48	0121-0106		C:VAR Car 9-35 pF NPO	28480	0121-0106
4C49	0160-2930 0160-2101		C:FXD Car 0.01 µF +80 -20% 100 VDCW	91418	TA
			C:FXD Mica 27 pF 2% 300 VDCW	72136	RDM15E270- G3C
4C50-52	0160-2630		C:FXD Car 0.01 µF +80 -20% 100 VDCW	91418	TA
KC53-55"	0160-2202	3	C:FXD Mice 75 pF 5% 300 VDCW	28490	0160-2202
ICR1-10	1901-0047	14	DIODE:SI 20 WV	28480	1901-0047
ICR11-13 ICR14	1901-0040	7	DIODE:SI 30 WV 30 mA	07263	FDG 1088
	1910:0016	1	DIODE:GERMANIUM 60 WIV	93332	D2361
ICR15	1901-0040		DIODE:SI 30 WV 30 mA	07263	FDG 1088
ICR16 ICR17—20	1901-0047		Not Assigned		
CR21-22	1901-0040		DIODE:SI 20 WV	28480	1901-0047
CR23	1901-0178	1	DIODE:SI 30 WV 30 mA DIODE:SI 15 WIV	07263 28480	FDG 10 <b>88</b> 1901-0179
			Factory selected port		

# A4 Replaceable Parts List (2 of 4) (CHANGE 3)

Reference Designation	Part Number	Gty	Description	Mfr Code	Mfr Part Numb
A4CR24	1901-0040		DIODE:SI 30 WV 30 mA		
A4K1-3	0490-0743	3	RELAY REED:SPST	07263	FDG 1088
A4L1-4	9140-0237	5	COIL/CHOKE 200 µH 5%	28480 28480	0490-0743
A4L5-8	9100-1622	6	COIL: 24.0 µH 5%	28480	9140-0237
A4L9	9140-0237		COIL/CHOKE: 400 µH 5%	28480	9100-1622 9140-0237
A4L10, 11	9100-1622		COIL: 24.0 µH 5%	28480	9100-1622
A4L12	9100-2475	1.	COIL: 11.3 to 2.5 µH	82142	10132-15
A4L13, 14	9140-0118	2	COIL:FXD 500 µH 5%	28480	9140-0118
4401, 2	1854-0071	8	TSTR:SI NPN (selected  om 2N3704)	28480	1854-0071
N4Q3-5	1863-0020		TSTR:SI PNP (selected from 2N3702)	28480	1853-0020
A408-7	1854-0071		TSTR:SI NPN (selected from 2N3704)	28480	1854-0071
<b>1408</b>	1853-0020		TSTR:SI PNP (selected from 2N3702)	28480	1853-0020
MQ10	1854-0071		TSTR:SI NPN (selected from 2N3704)	28480	1854-0071
N4011-13	1853-0001		TSTR:SI PNP (selected from 2N1132)	28480	1853-0001
	1854-0071		TSTR:SI NPN (selected from 2N3704)	28480	1854-0071
44R1, 2 44R3	0757-0403	9	R:FXD FLM 121 chm 1% 1/8W	28480	0757-0403
VR4	0757-0468	3	R:FXD FLM 51.1K ohm 1% 1/8W	28480	0757-0458
ZA6	0698-3156 0757-0384	3	R: FXD MET FLM 14.7 K ohm 1% 1/8W	28480	0898-3156
ARS	0757-0416	2	R:FXD FLM 51.1 ohm 1% 1/8W	28480	0757-0394
		8	R:FXD FLM 511 ohm 1% 1/8W	28480	0757-0416
487 488	0757-0403		R:FXD FLM 121 ohm 1% 1/8W	28480	0757-0403
AR9	0757-04:6 0757346		R:FXD FLM 511 ohm 1% 1/8W	28480	0757-0416
4R10, 11	0757-0403	3	R:FXD FLM 10 ohm 1% 1/8W	28480	0757-0346
4R12*	0757-0470	3	R:FXD FLM 121 ohm 1% 1/8W R:FXD MET FLM 162K ohm 1% 1/8W	28480 28480	0757-0403
4R13	0683-0275			20400	0757-0470
AR14	0698-3438	3	R:FXD COMP 2.7 ohm 5% 1/4W	01121	CB 27G5
4R15	0757-0274	3	R:FXD MET FLM 147 ohm 1% 1/8W	28480	0698-3438
4R18	0698-3444	12 3	R: FXD FLM 1.21K ohm 1% 1/8W	28480	0757-0274
4R17	0757-0274		R:FXD MET FLM 316 ohm 1% 1/8W	28480	0698-3444
			R:FXD FLM 1.21K ohm 1% 1/8W	28480	0757-0274
4R18 4R19	0757-0199 0757-0403	1	A: FXD FLM 21.5K ohm 1% 1/8W	28480	0757-0199
4R20	0757-0462		R:FXD FLM 121 ohm 1% 1/8W	28480	0757-0403
4R21	0757-0424	3	R:FXD MET FLM 75K ohm 1% 1/8W	28480	0757-0462
4R22	0698-0084	12	R:FXD MET FLM 1.10K ohm 1% 1/8W	28480	0757-0424
				28480	0698-0084
4R23 4R24	0757-0439	2	R:FXD MET FLM 6.81K ohm 1% 1/8W	28480	0757-0439
4R25	0608-3155	3	R:FXD MET FLM 4.64K ohm 1% 1/8W	28480	0698-3155
4R26	0698-0084 0757-0419		R:FXD MET FLM 2.15K ohm 1% 1/8W	284R0	0698-0084
6R27	0757-0346	3	R:FXD MET FLM 681 ohm 1% 1/8W	28430	0757-0419
			R:FXD MET FLM 10 ohm 1% 1/8W	28430	0757-0346
1A28, 29   IA30	0757-0416		R:FXD MET FLM 511 ohm 1% 1/8W	28/80	0757-0416
R31*	2100-1754 0757-0470	1	R:VAR WW 50 ohm 5% Type V 1W	28457	2100-1754
1R32	0008-3438	ing the will	R:FXD MET FLM 162K ohm 1% 1/8W	28480	0757-0470
(R33)	0757-0274		R:FXD MET FLM 147 ohm 1% 1/8W	28480	0698-3438
			R:FXD MET FLM 1.21K ohm 1% 1/8W	29480	0757-0274
			*Factory selected pert		

## A4 Replaceable Parts List (3 of 4) (CHANGE 3)

Reference Designation	Part Number	Gty	Description	Mfr Code	Mfr Part Numi
A4R34	0698-3444		R:FXD MET FLM 316 ohm 1% 1/8W	20/400	
A4R35	0757-0274		R:FXD FLM 1.21K ohm 1% 1/8W	28480 28480	0698-3444
A4R36	0757-0424		R:FXD MET FLM 1.10K chm 1% 1/8W	28480	0757-0274
A4R37	0698-0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0757-0424
A4R38	0898-3155		R:FXD MET FLM 4.64K ohm 1% 1/8W	28480	0698-0084 0698-3155
A4R39	0608-0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0698-0084
A4R40	0683-0275		R: FXD COMP 2.7 ohm 5% 1/4W	01121	CB 27G5
A4R41	0698-3159	. 2	R:FXD MET FLM 26:1K ohm 1% 1/8W	28480	0698-3159
A4R42	0757-0458		R:FXD FLM 51.1K ohm 1% 1/8W	28480	0757-0458
44R43	0698-0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0698-0084
<b>V4R44</b>	0757-0394		R:FXD MET FLM 51.1 ohm 1% 1/8W	28480	0757-0394
14R45	0698-3156		R:FXD MET FLM 14.7K ohm 1% 1/8W	28480	0698-3156
14R46	0698-0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0698-0084
MR47	0757-0274		R:FXD FLM 1.21K ohm 1% 1/8W	28480	0757-0274
<b>V4R48</b>	0608-3439	1	R:FXD MET FLM 178 ohm 1% 1/8W	28480	0698-3439
<b>4R49</b>	0757-0416		R:FXD MET FLM 511 ohm 1% 1/8W	28480	0757-0416
4R50	0698-0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0698-0084
4R51	0757-0403		R:FXD FLM 121 ohm 1% 1/8W	28480	0757-0403
4R52	0757-0403		R:FXD FLM 121 ohm 1% 1/8W	28480	0757-0403
<b>4863</b>	0757-0422	1	R:FXD MET FLM 909 ohm 1% 1/8W	28480	0757-0422
4R54	0757-0346		R:FXD FLM 10 ohm 1% 1/8W	28480	0757-0346
4P55	2100-1765	1	R:VAR WW 100 ohm 5% Type V 1W	28480	2100-1755
4R66	0757-0419		R:FXD MET FLM 681 ohm 1% 1/8W	28480	0757-0419
4 <b>85</b> 7	0698-3438		R:FXD MET FLM 147 ohm 1% 1/8W	28480	0698-3438
14858	0757-0274		R:FXD FLM 1.21K ohm 1% 1/8W	28480	0757-0274
4R59	0998-3444		R:FXD MET FLM 316 ohm 1% 1/8W	28480	0898-3444
4R60	0757-0274		R:FXD FLM 1.21K ohm 1% 1/8W	28480	0757-0274
4R61	0757-0416		R:FXD MET FLM 511 ohm 1% 1/8W	28480	0757-0416
4R62	0757-0416		R:FXD MET FLM 511 chm 1% 1/8W	28480	0757-0416
4R63	0898-3158		R:FXD MET FLM 14.7K ohm 1% 1/8W	28480	
4R64	0757-0424		R:FXD MET FLM 1.10K ohm 1% 1/8W	28480	0757-0424
4R65	0698-0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0698-0084
4R66* 4R67	0757-0470		R:FXD MET FLM 162K ohm 1% 1/8W	28480	0757-0470
4R68	0898-3155 0898-0084		R:FXD MET FLM 4.84K ohm 1% 1/8W	28480	0698-3155
	0000000		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0698-0084
4R69	0683-0275		R:FXD COMP 2.7 ohm 5% 1/4W	01121	CB 27G5
4R70 4R71	0698-3445	1	R:FXD MET FLM 348 ohm 1% 1/8W	28480	0698-3445
4R72	0757-0458		R:FXD FLM 51.1K ohm 1% 1/	28480	0757-0458
4873	0 <b>698</b> -3159 0757-0274		R:FXD MET FLM 26.1K ohm 1% 1/8W	28480	0698-3159
	V/5/4/4		R:FXD FLM 1.21K ohm 1% 1/8W	28480	0757-0274
4R74	0767-0403		R:FXD FLM 121 ohm 1% 1/8W	28480	0757-0403
4R75	0808-0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	28480	0698-0084
4R76 4R77	0757-0274		R:FXD FLM 1.21K ohm 1% 1/8W	29480	0757-0274
R78	0666-0082		R:FXD:FLM:464 ohm 1% 1/8W Not Assigned	28480	0898-0082
			*Factory selected part		



# A4 Replaceable Parts List (4 of 4) (CHANGE 3)

Reference Despitation	HP Part Number	(Cty	Description	Mfr Cade	Mfr Part Numbe
A4R79 A4R80	0698-0084 0757-0439		R:FXD MET FLM 21.5K olim 1% 1/8W R:FXD MET FLM 6.81K olim 1% 1/8W	28480	0698-0084
A4R81	0757-0416	a da da da da da da da da da da da da da	R:FXD MET FLM 511 ohm 1% 1/8W	28480 28480	0757-0439 0757-0418
A4R82	0757-0441		R:FXD MET FL:1 8.25K ohm 1% 1/8W	28480	0757-0441
A4R83	0898.0084		R:FXD MET FLM 2.15K ohm 1% 1/8W	284 <b>8</b> 0	// 0695 J084
A4R84	0757-0274	<b>)</b>	H:FXD FLN: 1.21K ohm 1% 1/8W	20480	0757-0274
A4R85	2100-1761	1	R:VAR WW, 10K ohm 5% Type V 1W	28480	2100-1761
A4R86	0757-0274		R:FXD FLM 1.21K ohm 1% 1/8W	28480	0757-0274
A4R87	0757-0274		R:FXD FLM 1.21% ohm 1% 1/8W	28480	0757-0274
A4R88	2100-1760	1 ):	R:VAR WW 5K ohm 5% Type V 1W	28480	2100-1760
A4R89	0757-0419	,)	R:FXD MET FLM 681 ohm 1% 1/8W	28480	0757-0419
A4Y1-3	0410-0411	y 1	CRYSTAL:QUARTZ, Matched Set	28480	0410-0411

# A7 Replaceable Parts List (1 of 2) (CHANGE 24)

Reference Designator	HP Part Mumber	0	Cty	Description	Mfr. Code	Mfr. Part Number
<b>47</b>	36652-40191	5		BOARD ASSY: DEFLECTION AMPLIFIER	28480	08552-60191
A7C1 A7C2 A7C3 A7C4 A7C4 A7C5	0180-0116 0180-0116 0180-2265 0180-0269 0160-3448	1 1 3 5 6	2 1 1 1	C:FXD ELECT 6.8UF 10% 35VDCW TA C:FXD ELECT 6.8UF 10% 35VG W TA C:FXC // PPF 500VDCW CER C:FXD 1UF 150VDCW AL C:FXD 1000PF 1060VDC CER	56289 56289 28480 56289 56289	150D645X90358 150D665X90358 0160-2265 30D105F1508A2 C067#251F102KS
A7C6 A7C7 A7C8 A7C9 A7C9 A7C10	0140-0194 0160-246 0160-2246 0160-0153 0160-0194	0 0 0 3	2	CIFXD 110PF ST MICA CIFXD 3.6PF SC VDC MICA CIFXD 3.6PF 500VDC MICA CIFXD MY 0.001UF 10% 200VDCW CIFXD .01511F 200VDC PE	72136 72982 72982 20480 56289	RDM15F111J3C 301-000-C0J0-369 301-000-C0JC-369 0160-0153 192P15392-PTS
A7C11 A7C12 A7C13 A7C14 A7C15	0160-2201 0180-0197 0160-3450 0180-0197 0140-0194	8001	2 2 1	C.FXD 51PF 300VDC MICA C:FXD 2:2UF 20V TA C:FXD 5000PF 250V CER C:FXD 2:2UF 20V TA C:FXD 110PF 5% MICA	72136 56289 28480 56289 72136	RDM15E510J1C 150D225X9020A 0160-3450 150D225X9020A RDM15F111J3C
A7C16 A7C17 A7C18 A7C18 A7C18 A7C20	0180-1746 0160-2256 0160-2256 0160-2201 0160-0155	5 2 2 7 6	1 2 1	C:FXD 15UF 20VDC TA C:FXD 3.6PF 500VDC CER C:FXD 3.6PF 500VDC CER C:FXD 51PF 300VDC MICA C:FXD 3300PF 200VDC PE	56289 72982 72982 72982 72136 28480	150D156X9020B 301-000-C0K0-919 301-000-C0K0-919 RDM15E510J1C 0160-0155
A7CR1 A7CR2 A7CR3 A7CR4 A7CR5	1901-0096 1901-0081 1901-0080 1901-0096 1903-0081	7 0 3 7 0	2 7 1	DIODE-SWITCHING 120V 50MA DIODE-SWITCHING 59V 75MA DIODE-SWITCHING 80V .2A DIODE-SWITCHING 120V 50 MA DIODE-SWITCHING 50V 75MA	01295 07263 28480 01295 07263	UG-888 FD1415 1901-0050 
A7CRE A7CRE A7CRE A7CRE A7CRE A7CRE	1901-0081 1901-0081 1902-0683 1902-0683	00 8 8 0	2	DIODE-SWITCHING SOV 75N DIODE-SWITCHING SOV 75MA DIODE-ZNR 100.0V 2% PD=1.0W DIODE-ZNR 100.0V 2% PD=1.0W DIODE-SWITCHING SOV 75MA	07263 07263 28480 28480 07263	FD1415 FD1415 1902-0643 1902-0643 FD1415
A7CH11 A ER12 A7CR13 A7CR14 A7CR18	1901-2081 1902-0025 1901-0040 1901-0040	0 4 1 1	6	DIODE-SWITCHING SOV 75MA DIODE-ZMA 10.0V 5% PD=,4W DIODE-SWITCHING SOV 50MA DIODE-SWITCHING SOV 50MA NOT ASSIGNED	07263 28480 07263 07263	FD1415 1902-0725 FDG1038 FDG1088
A7CR16 A7CR17 A7CR18 A7CR19 A7CR20	1901-0081 1901-0040 1901-0040 1901-0040 1901-0040	0 1 1 1		DIO E-SWITCHING SOV 75MA DIODE-SWITCHING SOV 50MA DIODE-SWITCHING SOV 50MA DIODE-SWITCHING SOV 50MA DIODE-SWITCHING SOV 50MA	07263 07263 07263 07263 07263	FD1415 FDG1088 FDG1088 FDG1088 FDG1088
A7K1		5		NOT ASSIGNED		
A7L1 A7L2	9140-0129 9140-0129	1	2	COIL FXD RF 220UH 5% COIL FXD RF 220UH 5%	28480 28480	9140-0129 9140-0129
A7MP1 A7MP2	205-0011 1208-0011	0	2	HEAT DISSIPATOR: FOR TO-5 AND TO-9 CASES HEAT DISSIPATOR: FOR TO-5 AND TO-9 CASES	98978 98878	TXBF-032-0258 TXBF-032-0258
A7Q) A7Q2 A7Q3 A7Q4 7Q5	1983-0034 1884-0404 7 1884-0232 1884-0232	2 2	11	TRANSISTOR PAP 2N3251 TRANSISTOR NPN SI TO-16 PD-360MM NOT ASSIGNED THANSISTOR NPN SI TO-39 PD-1W FT-15MHZ TRANSISTOR NPN SI TO-39 PD-1W FT-15MHZ	28480 28480 28480 28480	1853-0034 1854-0404 1854-0232 1854-0232
A7Q6 A7Q7 A7Q8 A7Q9 A7Q9	1854-0212 1854-0232 1854-0232 1854-0232 1854-0404	2 2 2 2 2 0		TRANSISTOR NPN SI TO-39 PO=1V FT=15MHZ TRANSISTOR NPN SI TO-39 PO=1W FT=15MHZ TRANSISTOR NPN SI TO-39 PO=1W FT=15MHZ TRANSISTOR NPN SI TO-39 PO=1W FT=15MHZ TRANSISTOR NPN SI TO-18 PO=350MW	28480 28480 284%) 284%) 28480	1854-0232 1854-0232 1854-0232 1854-0232 1854-0404
17012 17012 17013 17014 17018	1834-0404 1854-0232 1884-0232 1884-0257 1883-0007	0 2 2 2 2 7		TRANSISTOR NPN SI TO-18 PD-360MW TRANSISTOR N SI TO-39 PD-1W FT-15MHZ TRANSISTOR NPN SI TO-39 PD-1W FT+1 MHZ TRANSISTOR NPN SI TO-39 PD-1W FT-15MHZ TRANSISTOR NPN SN3251 SI TO-18 PD-360MW	23480 28480 38480 28480 80133	1854-0404 1854-0232 1854-0232 1854-0232 2N3251
7916 7917 7918 7919 7920	1883-0007 1884-0232 1884-0232 1884-0404 1884-0882	7 200		TRANSISTOR PNP 2N3251 SI TO-18 PD-360MW TRANSIST() NPN SI TO-39 PD-1W FT-15MHZ TRANSIST IR NPN SI TO-39 PD-1W FT-15MHZ TRANSIST IR NPN SI TO-18 PD-360MW TRANSIST IR NPN SI TO-18 PD-360MW TRANSISTOR NPN PD-300MW FT-200MHZ	80131 28480 28480 28480 28480	2N3251 1854-0232 1854-0404 1854-0882

# A7 Replaceable Parts List (2 of 2) (CHANGE 24)

Aeference Designator	HP Part Number	C	Oty	Description	Mfr. Code	Mfr. Pert Number
A7921 A7922	1454-0882 1854-0882			TRANSISTOR NPN PD=300MW FT=200MHZ TRANSISTOR NPN PD=300MW FT=200MHZ	28480 28480	1854-0882 1854-0882
A7R1 A7R2 A7R3 A7R4 A7R6	0757-0447 0757-0443 0698-3152 0698-0082 0757-0464	4 0 8 7 5	1 3 1 1	RESISTOR 16.2K 1% .125W F TC=0+-100 RESISTOR 11K 1% .125W F TC=0+-100 RESISTOR 3.46K 1% .125W F TC=0+-100 RESISTOR 464 1% .125W F TC=0+-100 RESISTOR 90.9K 1% .125W F TC=0+-100	28480 28480 28480 28480 28480	0757-0447 0757-0443 0698-3152 0698-0082 0757-0464
A786 A787 A788 A789 A7810	0698-3152 0698-3444 0698-3418 0757-0443 0698-3418	8 1 9 0 9	4 2	RESISTOR 3,44K 1% .125W F TC=0+-100 RESISTOR 316 1% .125W F TC=0+-100 RESISTOR 26.1K 1% .5W F TC=0+-100 RESISTOR 11K 1% .125W F TC=0+-100 RESISTOR 26.1K 1% .5W F TC=0+-100	28480 28480 28480 28480 28480	0698-3152 0698-3444 0698-3418 0757-0443 0698-3418
A7R11 A7R12 A7R13 A7R14 A7R15	0757-0439 0757-0280 0698-3444 0698-3154 0757-0460	4 3 1 0 7	-3 -2	RESISTOR 6.81K 1% .125W F TC=0+-100 RESISTOR 1K 1% .125W F TC=0+-100 RESISTOR 316 1% .125W F TC=0+-100 RESISTOR 4.22K 1% .125W F TC=0+-100 RESISTOR 61.9K 1% .125W F TC=0+-100	28480 28480 28480 28480 28480	0757-0439 0757-0280 0598-3444 0698-3154 0757-0460
A7R16 A7R17 A7R18 A7R18 A7R19 A7R20	0757-0470 0698-3158 0698-3444 0698-3458 0698-3421	3 1	1 1 2 1	RESISTOR 162K 1% .125W F TC=0←100 RESISTOR 23.7K 1% .125W F TC=0←100 RESISTOR 316 1% .125W F TC=0←100 RESISTOR 261K 1% .125W F TC=0←100 RESISTOR 38.3K 1% .5W F TC=0←100	26480 28480 28480 28480 28480	0757-0470 0698-3158 0698-3444 0698-3455 0698-3421
A7R21 A7R22 A7R23 A7R24 A7R25	0757-0200 0698-3444 0698-3465 0698-3465 0757-0460	7 1 4 2 7	1	RESISTOR 5.62K 1%.125W F TC=0+-100 RESISTOR 316 1%.125W F TC=0+-100 RESISTOR 261K 1%.125W F TC=0+-100 RESISTOR 196K 1%.125W F TC=0+-100 RESISTOR 61.9K 1%.125W / 'C=0+-100	28480 28480 28480 28480 28480	0757-0200 0698-3444 0698-3455 0698-3453 0757-0460
A7M26 A7M27 A7M28 A6M29 A6M30	0757 0463 0757 0443 0698-3132 0757-0290 0757-0290	40455	1 3 ,	RESISTOR 82.5K 1% .125 / F TC=0+-100 RESISTOR 11K 1% .125W F TC=0+-100 RESISTOR 261 1% .125W F TC=0+-100 RESISTOR 6.19K 1% .125W F TC=0+-100 RESISTOR 6.19K 1% .125W F TC=0+-100	28480 28480 28480 28480 28480	0757-0463 0757-0443 0498-3132 0757-0290 0757-0290
ABR31 P3R32 ABR33 A7R34 A7R36	0757-0270 0757-0280 0698-3152	3 >		RESISTOR 1K 1%.125W F TC=0+-100 RESISTOR 1K 1%.125W F TC=0+-100 RESISTOR 3.46K 1%.125W F TC=0+-100 NOT ASSIGNED NOT ASSIGNED	28480 28480 28480	0757-0280 0757-0280 0698-3152
A7R36 A7R37 A7R38 A7R36 A7R40	0698-3152 0757-0290 0:37-0400		,) 1	NOT ASSIGNED NOT ASSIGNED RESISTO(2 3.48K 1% .125W F TC=0+-100 RESISTOR 6.19K 1% .125W F TC=0+-100 RESISTOR 90.9 1% .125W F TC=0+-100	28480 23480 28480	0698-3152 0757-0290
7841 7842 7843 7844 7844	0606-3162 0787-0458	3	1	RESISTOR 46.4K 1% .125W F TC=0+-100 RESISTOR 51 K 1% .125W F TC=0+-100 NOT ASSIGNED NOT ASSIGNED RESISTON 100K 1% .125W F TC=0+-100	28480 28480	0757-0400 0698-3162 0757-0458
7846 7847 77 59 7856 7850	0698-3187 0787-0443 0767-0443 0787-0443 9787-0420	3 0 3 0	2	RESISTOR 19.6K 1% .125W F TC=0+-100 RESISTOR 11K 1% .125W F TC=0+-100 RESISTOR 750 1% .125W F TC=0+-100 RESISTOR 11K 1% .125W F TC=0+-100 RESISTOR 750 1% .125W F TC=0+-100	28480 28480 28480 28480 28480 28480	0757-0465 0698-3157 0757-0443 0757-0420 0757-0443
7851 7852 7853 7854 7859	0698-3480 0698-3480 0764-0012 0757-04/0 0757-04/4		1 2	RESISTOR 42.2K 1% .125W F TC=0+-100 RESISTOR 42.2K 1% .125W F TC=0+-100 RESISTOR 6.8K 5% 2W RESISTOR 4.32K 1% .125W F TC 0+-100 RESISTOR 4.32K 1% .125W F TC=0+-100	28480 28480 28480 28480 28480	0757-0420 0698-3450 0698-3450 0764-0012 0757-0436
7 (96 7 (867 7 (867 7 (868) 7 (868) 7 (868)	0698-3180 0787-0442 0891-3083 0898-2083 0898-3446		2 1 2	RESISTOR 2.37K 1% .125W → TC=0←100 RESISTOR 16K 1% .125W F TC=0←100 RESISTOR 1.96K 1% .125W F TC=0←100 RESISTOR 1.96K 1% .125W F TC=0←100 RESISTOR 383 1% .125W F TC=0←100	28480 28480 28480 28480 28480	0698-3150 0757-0442 0698-0083 0698-0083 0698-3446
7861 701 702 703	0608-3446 1821-0001 1826-0081	3 4 0		RESISTOR 363 1. 128W F TC=0-100 FRANSISTOR ARRAY 1- TN PLSTC DIP NOT ASSIGNED C OP AMP NS TO-99 PKG	28480 02738 12040	0698-3446 CA3046 LM318H
> 1	اله المعادل					

Figure 8-30. P/O Crystal Filler Assembly A4 Component Identification (CHANGE 3)



Figure 8-32. P/O Crystal Filter Assembly A4 Component Identification (CHANGE 3)

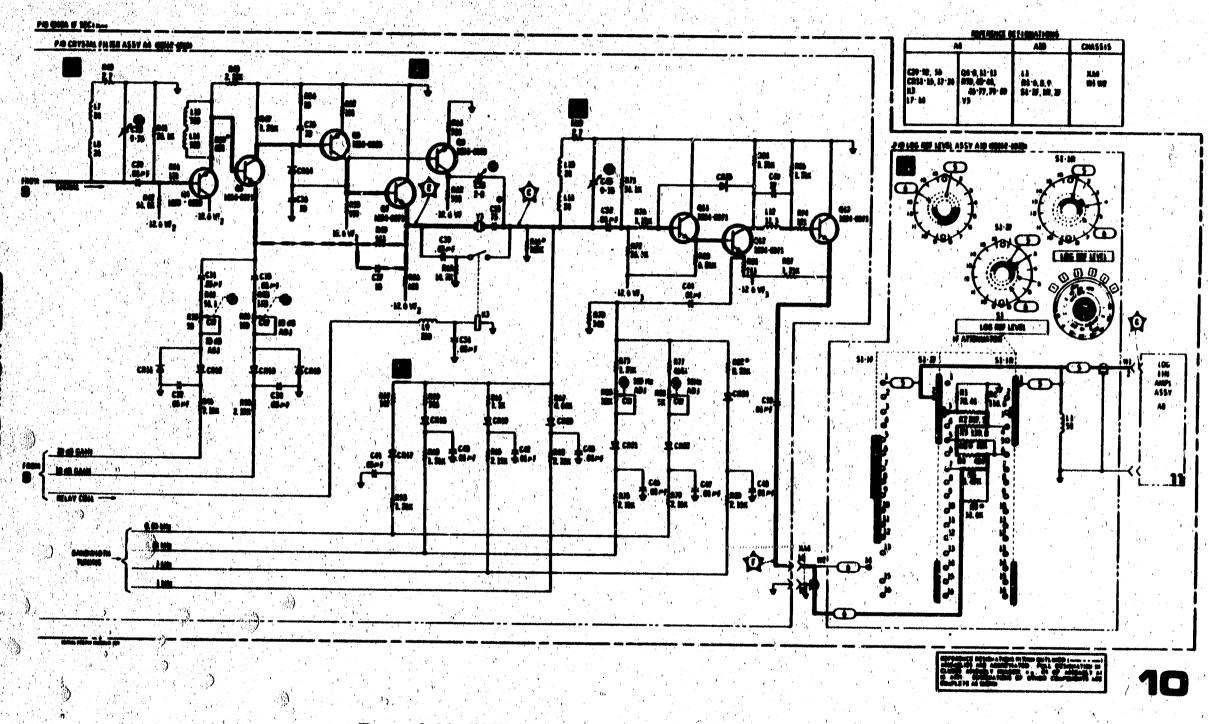
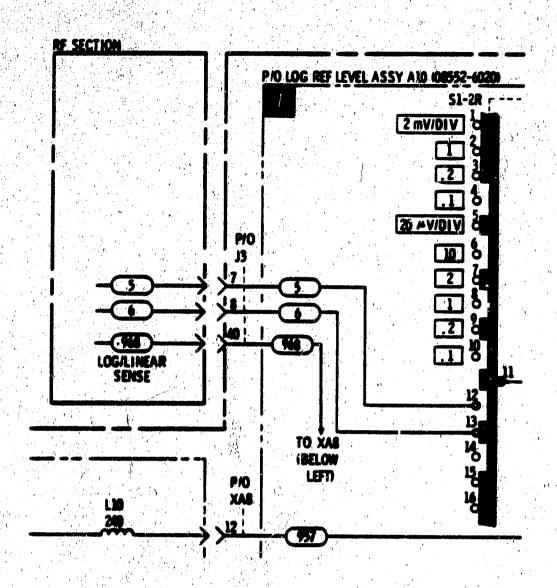


Figure 8-33. 3 MHz Crystal Filter (Sheet 2 of 2) (CHANGE 3)



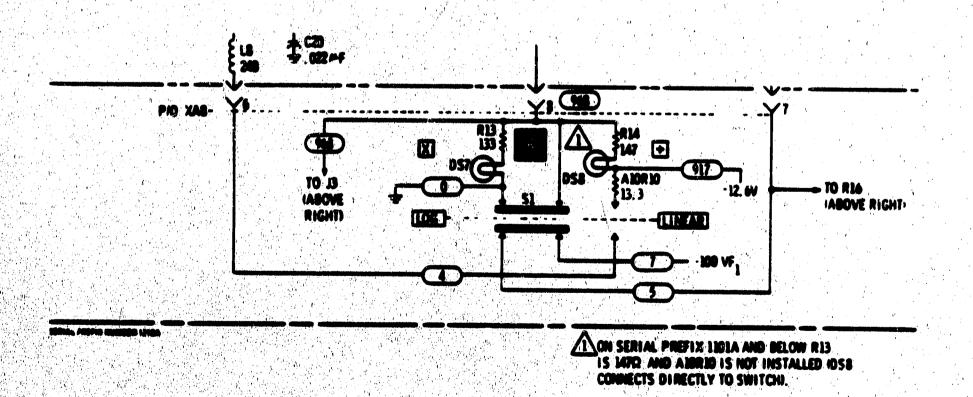
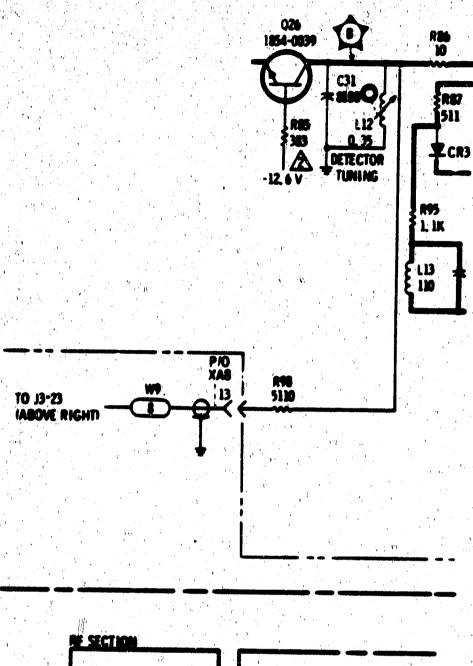


Figure 8-38. Lin/Log Amplifiers (Sheet 2 of 2) (CHANGE 7)





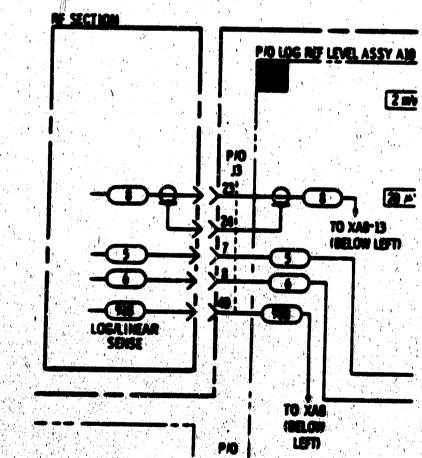


Figure 8-38. Log/Linear Amplifier (Sheet 2 of 2) (CHANGE 11)

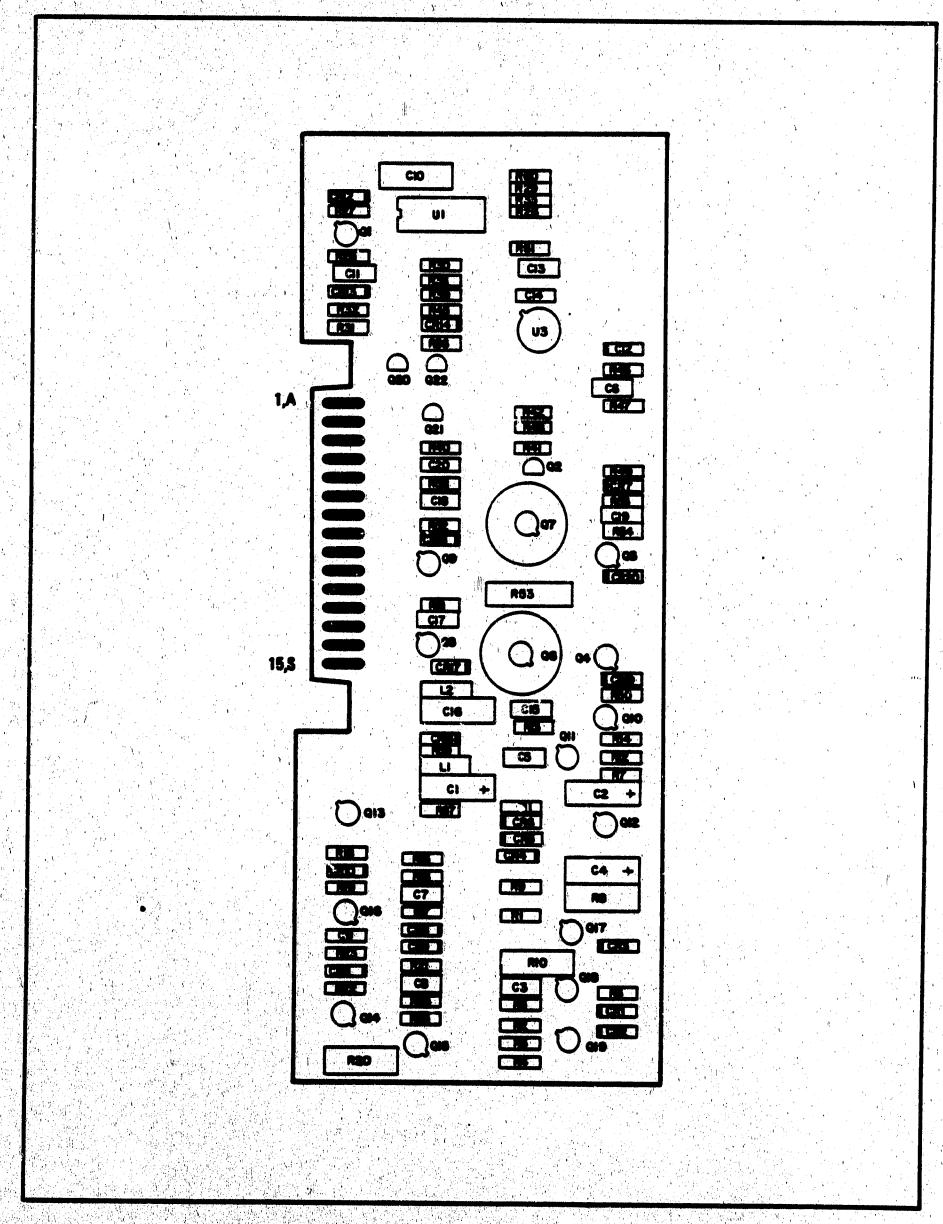


Figure 8-39. Deflection Amplifier Assembly A7 Component Identification (CHANGE 24)

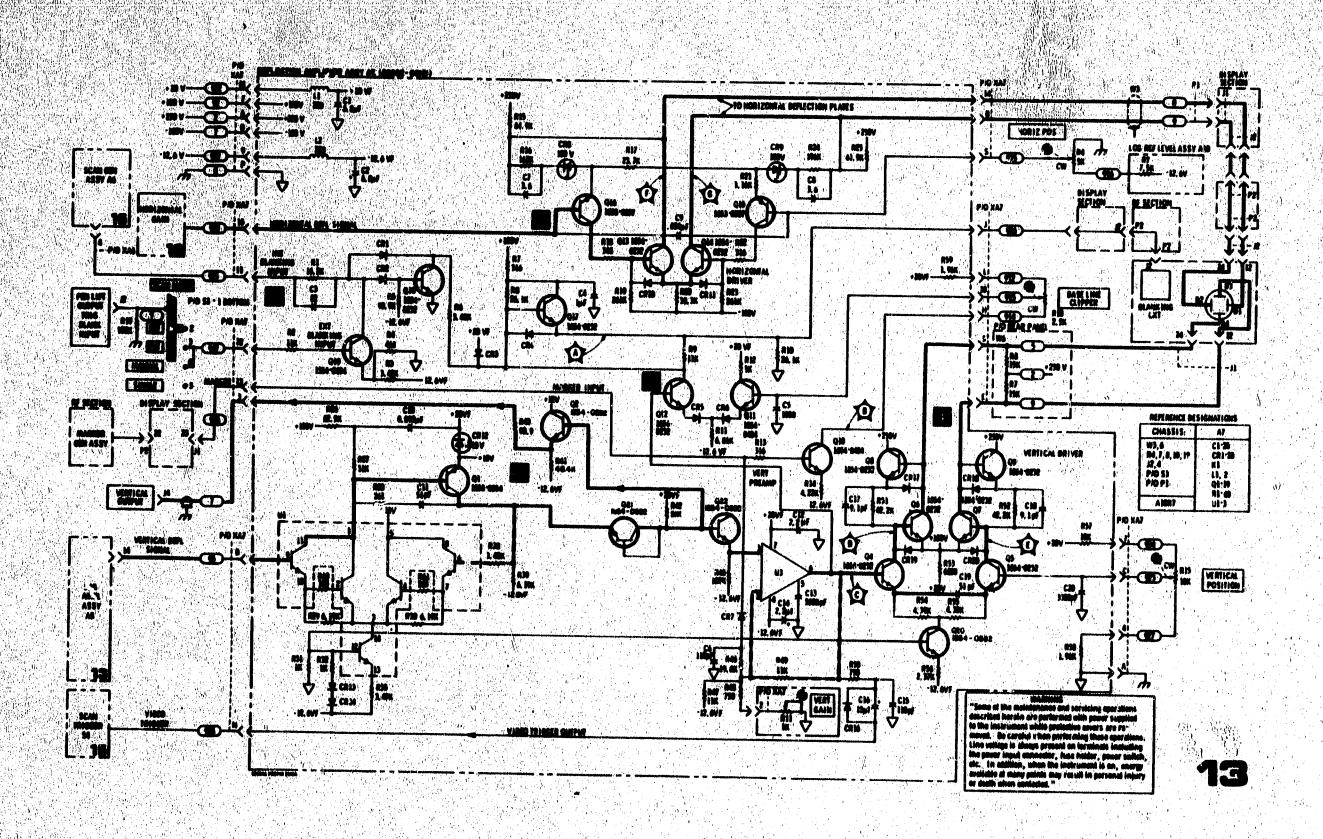
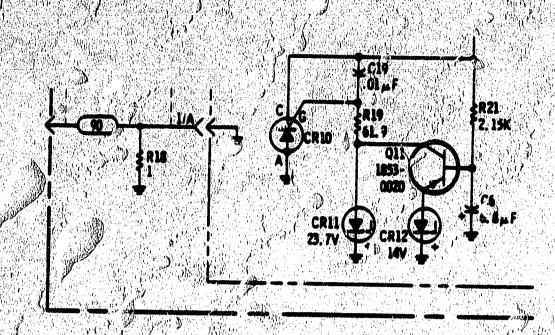
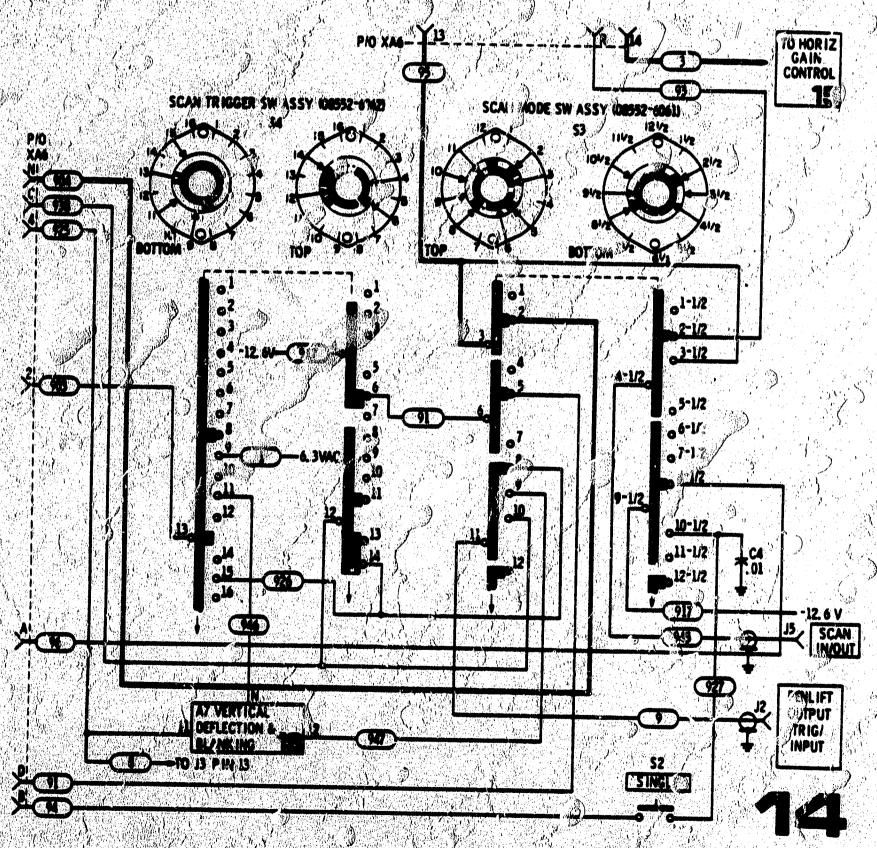


Figure 8-40. Vertical Deflection and Blanking (CHANGE 24)



P/O Figure 8-48. A5 Power Supply Assembly (CHANGE 14)



P/O Figure 8-42, Scan Generator Assembly A6 08552-6047 (ERRATA)

