HP 83572A/B
RF PLUG-IN
(Including Options 001 and 006)

SERIAL NUMBERS

This manual applies directly to any HP Model 83572A RF Plug-In having a serial number with the prefix 2343A, or to any HP Model 83572B having a serial number with the prefix 2346A.

With changes described in Section VII, this manual also applies to any Model 83572A with a serial number prefixed 2304A or lower.

For additional information about serial numbers, refer to INSTRUMENTS COVERED BY MANUAL in Section I.

1400 FOUNTAINGROVE PARKWAY, SANTA ROSA, CA 95401 U.S.A.

MANUAL PART NUMBER: 83572-90010
Microfiche Part Number: 83572-90011

Printed: SEPTEMBER 1984

HEWLETT PACKARD

MANUAL CHANGES

NOTE

Manual change supplements are revised as often as necessary to keep manuals as current and accurate as possible. Hewlett-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.

MANUAL IDENTIFICATION

HP Number: HP 83572A/B
Date Printed: September 1984
Part Number: 83572-90010

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.

Two types of information are included:

UPDATES - APPLY TO ALL SERIAL NUMBERS.

NUMBERED CHANGES - UPDATES THAT ARE SERIAL NUMBER PREFIX RELATED.

The information is in the following order: UPDATES, NUMBERED CHANGES in sequential order with applicable illustrations as close as possible to each numbered change.

To use this supplement, make all UPDATES and all appropriate serial number related CHANGES indicated in the following tables.

▶ = NEW ITEM

JULY 16, 1985

HEWLETT PACKARD

Printed in U.S.A.

▶ = NEW ITEM

HP 83572A

Serial Prefix or Number	Make Manual Changes
2417A	1, 2
2432A	1-3
▶ 2531A	1-3, 5

HP 83572B

Serial Prefix or Number	Make Manual Changes
2417A	1
2419A	1, 2
2429A	1-3
▶ 2528A	1-4

UPDATES

▶ Page 4-6, Paragraph 4-15:
Change the specifications for Power Variation to ±0.2 dB.

Page 6-12, Table 6-3:
Change A1RPG1 part number to 0960-0683, CD1 (recommended replacement).

Page 6-13, Table 6-3:
Change A3 to 83525-60080, CD 6, DIGITAL INTERFACE ASSEMBLY (does not include A3U1 and A3U2).
Change A3U1 and A3U2 to HP Service Kit Part Number 83572-60074, CD 5, (recommended replacement).
NOTE that A3U1 and A3U2 are not separately replaceable.
Add A3XU1 and A3XU2, 1200-0541, CD 1, SOCKET-IC 24-CONT DIP DIP-SLDR (recommended Addition).

Page 6-15, Table 6-3:
Change A4U1 to HP Part Number 1826-1058, CD 3, IC OP AMP GP 8-TO-99 PKG, Mfr. Code 06665, Mfr. Part Number OP-02CJ.

Page 6-23, Table 6-3:
Change MP2 DISPLAY WINDOW Part Number to 83522-20028, CD 5.

CHANGE 1

This change introduces Rev. 6 firmware.

Page 6-13, Table 6-3:

Change A3 to 83525-60080, CD 6, DIGITAL INTERFACE ASSEMBLY (does not include A3U1 and A3U2).

Change A3U1 and A3U2 to HP Service Kit part number 83572-60074, CD 5. NOTE that A3U1 and A3U2 are not separately replaceable.

CHANGE 2

This change increases the YO bias adjustment range.

Page 6-20, Table 6-3:

Change A7 board assembly part number to 83572-60050, CD 7.

Page 6-21, Table 6-3:

Change A7R36 to HP Part Number 2100-3759, CD 8, RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN, Mfr. Part Number 3292X-DM3-202.

Change A7R38 to HP Part Number 0698-3158, CD 4, RESISTOR 23.7K 1% .125W F TC=0±100, Mfr. Part Number C4-1/8-TO-2372-F.

Add A7R75, 0757-0421, CD 4, RESISTOR 825 1% .125W F TC=0±100, 24546, C4-1/8-TO-825R-F.

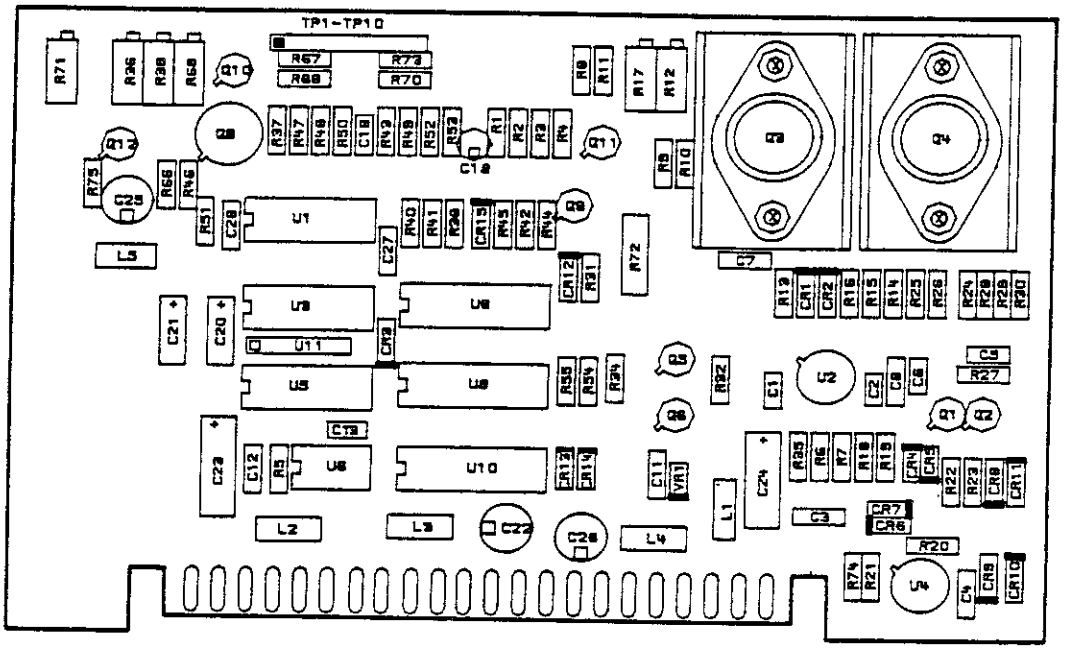
Page 8-81, Figure 8-49:

Replace with *Figure 8-49, A7 Bias, Component Locations (CHANGE 2)* from this document.

Page 8-81, Figure 8-55:

Replace with *Figure 8-55, A7 Bias Schematic Diagram (CHANGE 2)* from this document.

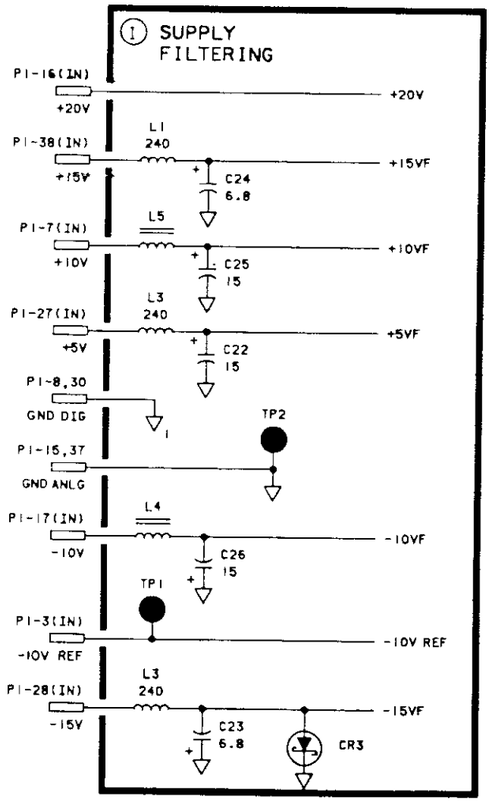
A7

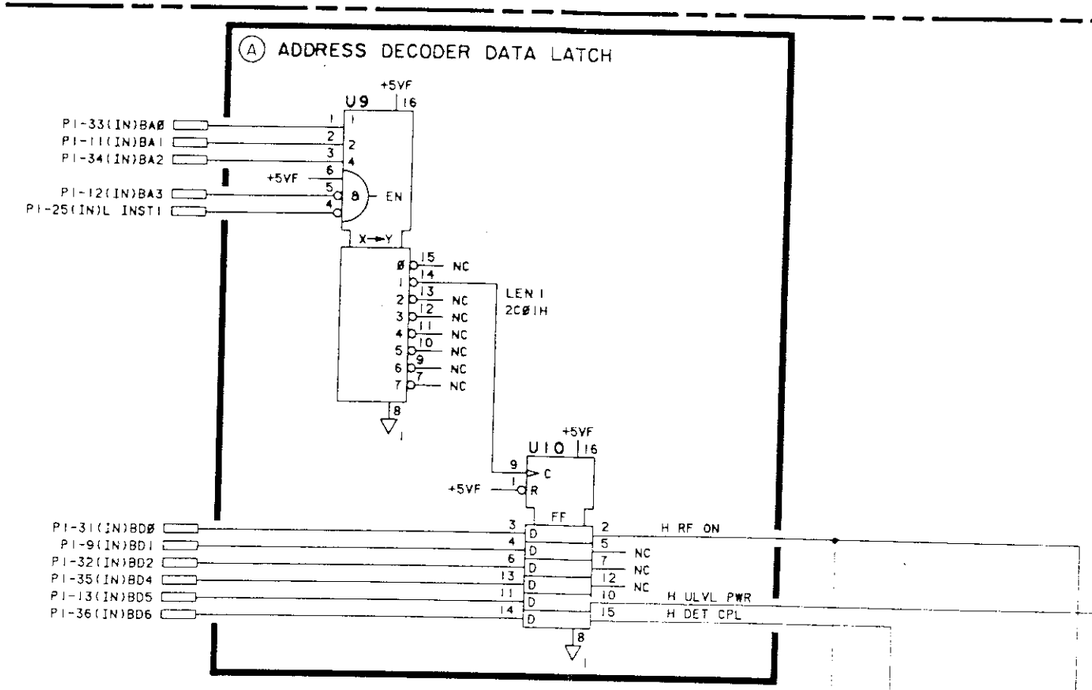


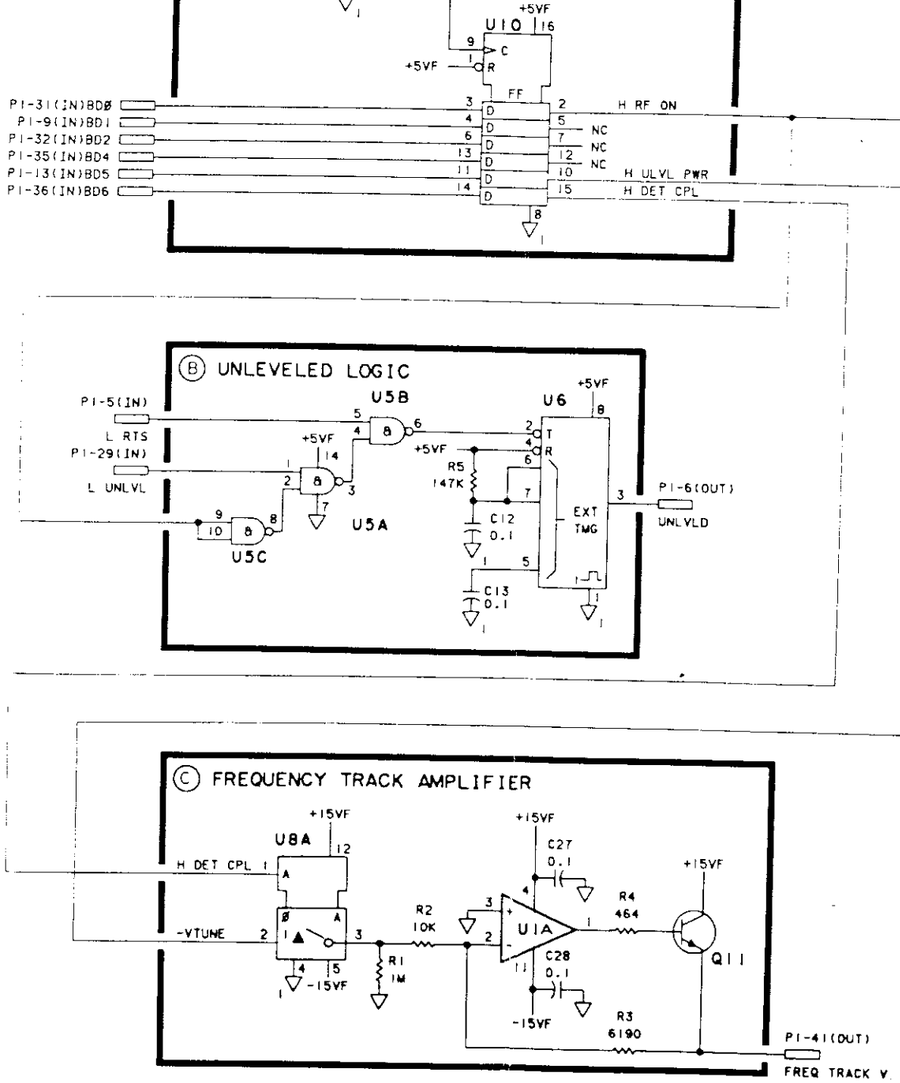
HP P/N 83572-60050

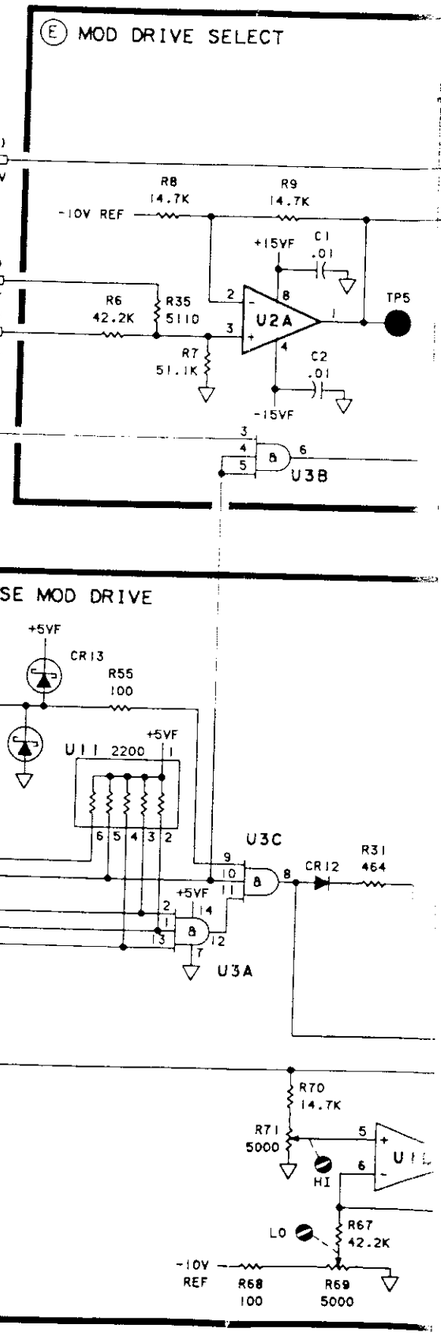
Figure 8-49. A7 Bias Component Locations (CHANGE 2)

A7 BIAS
83572-60050









SERIAL PREFIX: 2417A (83572A); 2419A (83572B)

A8 MOTHERBOARD

F MOD SCALING AMPLIFIER

G MODULATOR DRIVE

H YIG BIAS

U8B,C

U3B

P1-23(OUT)
L PULSE

PIN SWITCH

GND ANLG

A9 MC

A10 P1
(OPTION

P/O A

NOTE:
Q2 IS A CHASSIS MOUNTED PART

Figure 8-55. A7 Bias Schem

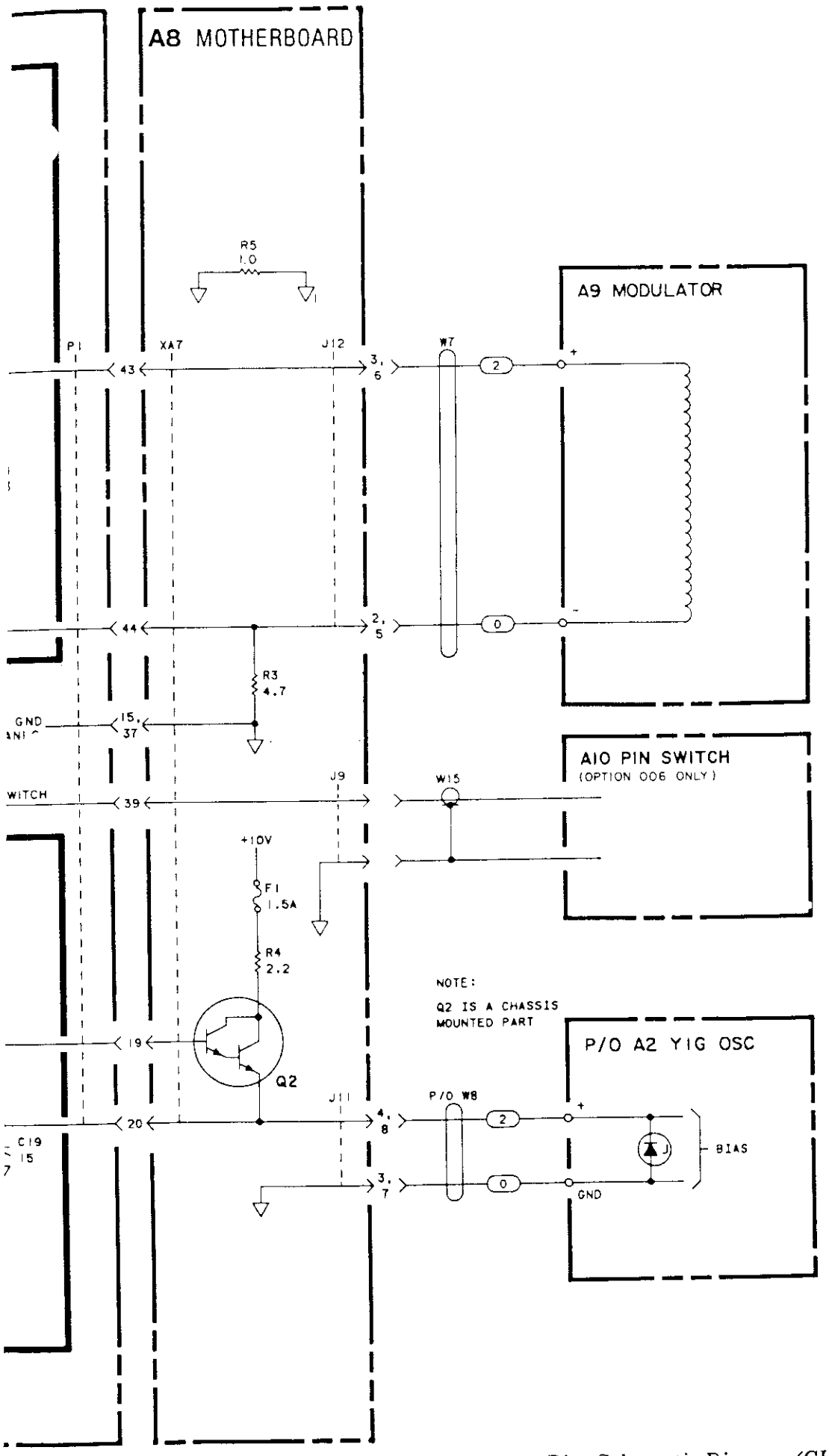


Figure 8-55. A7 Bias Schematic Diagram (CHANGE 2)

CHANGE 3

This change incorporates a new YO Driver.

Page 6-18, Table 6-3:

Change A6 to HP and Mfr. Part Number 83572-60051, CD 8.

Page 8-75, Figure 8-47:

Change the A6 YO Driver part number in the top left-hand corner to 83572-60051.

Change the SERIAL PREFIX in the lower left-hand corner to 2432A for the HP 83572A and 2429A for the HP 83572B.

Connect pin 5 of U8B (**Block D**) to pin 17 of U5 (**Block G**). Relabel pin 3 of U5, "BD5." Connect pin 3 of U5 to the "DATA BUS" line.

▶ CHANGE 4

This change documents a new Front Panel Casting and Dress Panel (83572B ONLY).

Page 6-23, Table 6-3:
Change MP9, FRONT PANEL-DRESS to HP and Mfr. Part Number 83572-00006, CD 6.
Change MP10, FRONT PANEL-MACHINE to HP and Mfr. Part Number 83572-20023, CD 0.
Change MP13, LATCH SCREW to HP and Mfr. Part Number 83525-20069, CD 7.

Page 6-24, Table 6-3:
Change Item 7, RETAINER-PUSH ON to HP and Mfr. Part Number 0510-1267, CD 7.
Delete Item 35, SCREW-SET.

▶ CHANGE 5

This change documents a new Front Panel Casting and Dress Panel (83572A ONLY).

Page 6-23, Table 6-3:

Change MP9, FRONT PANEL-DRESS to HP and Mfr. Part Number 83572-00001, CD 2.
Change MP10, FRONT PANEL-MACHINE to HP and Mfr. Part Number 83572-20023, CD 0.
Change MP13, LATCH SCREW to HP and Mfr. Part Number 83525-20069, CD 7.

Page 6-24, Table 6-3:

Change Item 7, RETAINER-PUSH ON to HP and Mfr. Part Number 0510-1267, CD 7.
Delete Item 35, SCREW-SET.

CONTENTS

CONTENTS (Cont'd)

ILLUSTRATIONS

ILLUSTRATIONS (Cont'd)

TABLES

SAFETY CONSIDERATIONS

GENERAL

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. This product has been designed and tested in accordance with international standards.

SAFETY SYMBOLS

Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual (refer to Table of Contents).

Indicates hazardous voltages.

Indicates earth (ground) terminal.

WARNING The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.

CAUTION The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

SAFETY EARTH GROUND

This is a Safety Class I product (provided with a protective earthing terminal). An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and be secured against any unintended operation.

BEFORE APPLYING POWER

Verify that the product is configured to match the available main power source per the input power configuration instructions provided in this manual.

If this product is to be energized via an autotransformer, make sure the common terminal is connected to the neutral (grounded) side of mains supply.

SERVICING

WARNING

Any servicing, adjustment, maintenance, or repair of this product must be performed only by qualified personnel.

Adjustments described in this manual may be performed with power supplied to the product while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.

Capacitors inside this product may still be charged even when disconnected from its power source.

To avoid a fire hazard, only fuses with the required current rating and of the specified type (normal blow, time delay, etc.) are to be used for replacement.

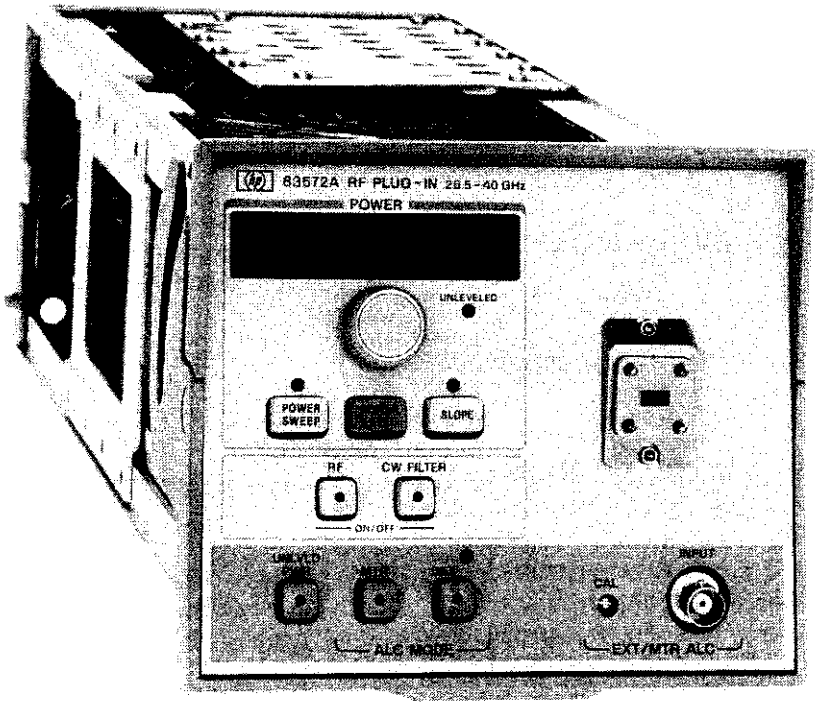


Figure 1-1. Model 83572A RF Plug-In

SECTION I
GENERAL INFORMATION

1-1. INTRODUCTION

1-2. This Operating and Service Manual contains information required to install, operate, test, adjust, and service the Hewlett-Packard model 83572A/B RF Plug-In. The information provided here applies to both the 83572A and the 83572B unless specified otherwise. Figure 1-1 shows the model 83572A.

1-3. This manual is divided into eight major sections which provide the following information:

a. SECTION I, GENERAL INFORMATION, includes a brief description of the instrument, safety considerations, specifications, supplemental characteristics, instrument identification, options available, accessories available, and a list of recommended test equipment.

b. SECTION II, INSTALLATION, provides information for initial inspection, preparation for use, storage, and shipment.

c. SECTION III, OPERATION, explains the frequency resolution characteristics of the RF Plug-In in CW and swept frequency modes. Operating instructions include FM switch parameter settings, and crystal and power meter leveling instructions. A description of front and rear panel features and Plug-In error codes is also given.

d. SECTION IV, PERFORMANCE TESTS, presents procedures required to verify that performance of the RF Plug-In is in accordance with published specifications.

e. SECTION V, ADJUSTMENTS, presents procedures required to properly adjust and align the model 83572A/B RF Plug-In after repair.

f. SECTION VI, REPLACEABLE PARTS, provides information required to order all parts and assemblies.

g. SECTION VII, MANUAL BACKDATING CHANGES, provides backdating information required to make this manual compatible with earlier shipment configurations of the model 83572A.

h. SECTION VIII, SERVICE, provides an overall instrument block diagram with troubleshooting and repair procedures. Each assembly within the instrument is covered on a separate Service Sheet which contains a circuit description, schematic diagram, component location diagram, and troubleshooting information to aid in the proper maintenance of the instrument.

1-4. Supplied with this manual is an Operating Information Supplement. This is simply a copy of the first three sections of the manual, which should be kept with the instrument for use by the instrument operator.

1-5. On the title page of this manual is a Microfiche part number. This number may be used to order 10- by 15-centimeter (4- by 6-inch) microfilm transparencies of the manual. Each microfiche contains up to 60 photo duplicates of the manual pages. The microfiche package also includes the latest Manual Changes sheet as well as all pertinent Service Notes.

1-6. Refer any questions regarding this manual, the Manual Changes sheet, or the instrument to the nearest HP Sales/Service Office. Always identify the instrument by model number, complete name, and complete serial number in all correspondence. Refer to the inside rear cover of this manual for a worldwide listing of HP Sales/Service Offices.

1-7. SPECIFICATIONS

1-8. Listed in Table 1-1 are the specifications for the model 83572A and 83572B RF Plug-Ins. Where the specifications for the model 83572A and 83572B are different, they are listed separately. Where the specifications for both instruments are the same, only one listing is supplied.

These specifications are the performance standards, or limits, against which the instrument may be tested. Table 1-2 lists the 83572A/B supplemental performance characteristics. Supplemental performance characteristics are not specifications but are typical characteristics included as additional information for the user.

1-9. SAFETY CONSIDERATIONS

1-10. This product has been manufactured and tested in accordance with international safety standards. Before operation, this product and related documentation must be reviewed for familiarization with safety markings and instructions. A complete listing of Safety Considerations precedes Section I of this manual.

1-11. INSTRUMENTS COVERED BY MANUAL

1-12. Attached to the rear panel of the instrument is a serial number plate. A typical serial number plate is shown in Figure 1-2. The serial number is in two parts. The first four digits followed by a letter comprise the serial number prefix. The last five digits form the sequential suffix that is unique to each instrument. The content of this manual applies directly to instruments having a serial number prefix that is listed on the title page of this manual under SERIAL NUMBER.

1-13. An instrument manufactured after the printing of this manual may have a serial prefix that is not listed on the title page. An unlisted serial prefix indicates that the instrument is different from those documented in this manual. In this case, the manual for the instrument is supplied with a Manual Changes supplement that contains information which documents the differences.

1-14. In addition to change information, the Manual Changes supplement may contain information for correcting errors in the manual. To keep this manual as current as possible, Hewlett-Packard recommends that you periodically request the latest Manual Changes supplement. The supplement for this manual is keyed to the manual's print date and part number, both of which appear on the title page. Complimentary copies of the Manual Changes supplement are available on request from Hewlett-Packard.

1-15. For information concerning a serial number prefix that is not listed on the title page or in the Manual Changes Supplement, contact your nearest Hewlett-Packard Sales/Service Office.

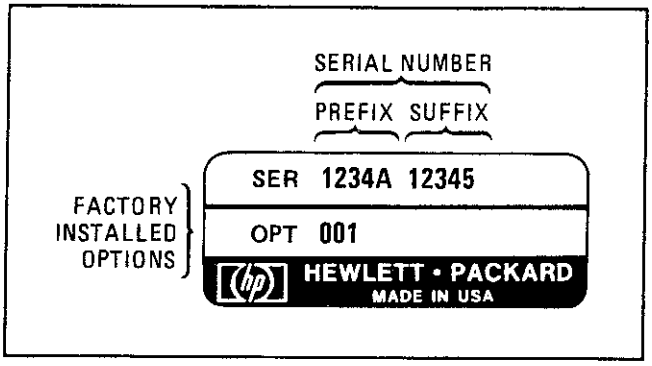


Figure 1-2. Typical Serial Number Plate

1-16. DESCRIPTION

1-17. The model 83572A/B is an RF Plug-In which has been designed for use with the model 8350A/B Sweep Oscillator. The model 83572A/B covers the frequency range of 26.5 to 40.0 GHz in a single band. A YIG Oscillator is used as the tunable RF frequency source.

1-18. The model 83572A/B front panel functional controls, pushbuttons, and the rotary pulse generator (RPG) are monitored by the model 8350A/B through the RF Plug-In interface circuits. The model 8350 generates a tuning voltage according to the mode of operation (CW, START/STOP, CF/ΔF). This signal is scaled and offset by the Plug-In to provide a voltage ramp (in swept modes) proportional to the YIG Oscillator frequency. The model 83572A/B tuning circuits accept the tuning ramp output from the model 8350 and convert it to a current which drives the YIG Oscillator.

1-19. The standard model 83572A offers an unleveled RF output power of at least +3 dBm (typically +4 to +5 dBm). The standard Model 83572B offers an unleveled RF output power of at least +7 dBm (typically +8 dBm). The RF output power level is controlled by the model 83572A/B RPG, by the model 8350A/B data entry controls (keypad and step keys), or through HP-IB (Hewlett-Packard Interface Bus) control via the model 8350. A front panel LED indicates when the RF output is unleveled. Front panel pushbuttons select either unleveled power (UNLVLD

PWR), power meter leveling (MTR), or external crystal detector leveling (DET). A front panel EXT/MTR ALC input connector and gain control (CAL) are provided to use with an external leveling loop. Calibrated externally leveled power can be achieved with a standard model 83572A/B, by making internal adjustments to calibrate the instrument to an appropriate external coupler and crystal detector connected to the waveguide output. Refer to Section V, Adjustments, for the calibration procedure. The calibrated externally leveled output power mode is accessed by pressing [SHIFT] [DET]. In the SHIFT DET mode the CAL light above the DET pushbutton is lit, and the displayed power level is calibrated across the entire frequency band.

1-20. The RF output may be turned off with the [RF] ON/OFF pushbutton. An internal switch is set to select whether the RF is on or off at turn-on. RF power ON is indicated by the LED in the center of the pushbutton. Additionally, in CW mode, the [CW FILTER], when selected, places a capacitor across the YIG Oscillator tuning coil to filter high frequency noise which would appear at the RF output. All front panel functions, with the exception of the EXT/MTR ALC CAL adjustment, may be set or altered via the HP-IB bus connection on the model 8350. HP-IB is Hewlett-Packard's hardware, software, documentation, and support for IEEE-488 and IEC-625, worldwide standards for interfacing instruments.

1-21. The RF output may be externally amplitude or frequency modulated. An external modulation signal is applied to the 8350A/B rear panel AM INPUT or FM INPUT connector. FM coupling (direct coupled or cross-over) and sensitivity are selected by an internal configuration switch in the model 83572A/B. Refer to Section III, Operation, of this manual for detailed information on the configuration switch.

1-22. OPTIONS

1-23. The 83572A Option 001 offers calibrated externally leveled output power of at least +2 dBm in the SHIFT DET mode, the 83572B Option 001 at least +6 dBm. In this mode the CAL light above the DET pushbutton is lit, and the displayed power level is calibrated across the entire frequency band. The Option 001 incorporates a 10-dB directional coupler, a crystal detector, a BNC cable calibrated to the Plug-In. and a package of hex screws for attaching the waveguide flanges. Figure 1-3 illustrates the front panel attachments of the Option 001.

1-24. In the 83572A Option 001 a power sweep function allows the RF output power to be swept at least 7 dB, in the 83572B at least 11 dB, during CW or swept frequency modes. Power sweep is selected with the front panel [POWER SWEEP] pushbutton. Slope compensation control up to 5 dB/GHz (7 dB total calibrated dynamic range in the 83572A, 11 dB in the 83572B) is also available by selecting the [SLOPE] pushbutton and rotating the model 83572A/B RPG or manipulating the model 8350A/B data entry controls. LEDs above the [POWER SWEEP] and [SLOPE]

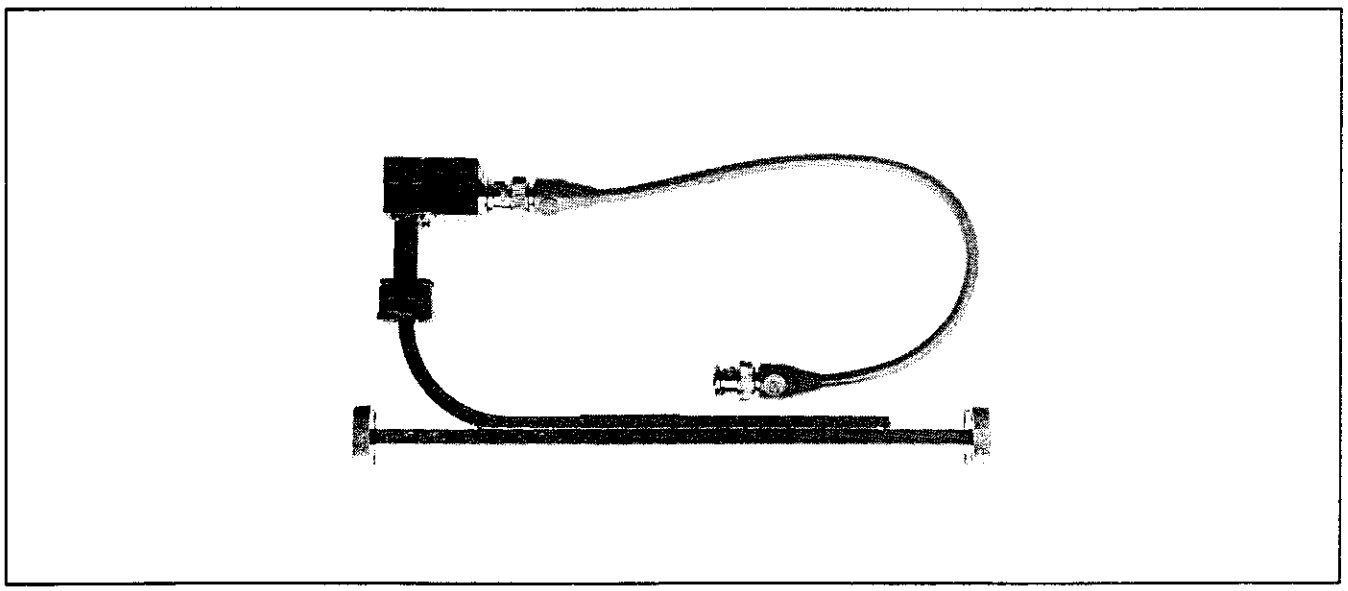


Figure 1-3. Option 001 Front Panel Attachments

pushbuttons indicate when these functions are operative. The power sweep function and slope compensation may both be selected and modified through HP-IB control with the model 8350.

1-25. The 83572A/B Option 006 provides internal squarewave modulation and external pulse and squarewave modulation capablities, as well as RF amplitude markers. Internal squarewave modulation can be accessed by the 8350 front panel or through HP-IB. The modulation frequency is preset with a jumper in the 8350 either to 1 kHz or to 27.8 kHz for compatibility with Hewlett-Packard scalar network analyzers. For external pulse or squarewave modulation, a rear panel BNC connector accepts a modulating signal up to 1 MHz.

1-26. EQUIPMENT REQUIRED BUT NOT SUPPLIED

1-27. To have a complete operating Sweep Oscillator unit, the model 83572A/B RF Plug-In must be installed in a model 8350A/B Sweep Oscillator mainframe. Refer to Section II, Installation, of this manual for a detailed description of RF Plug-In installation.

1-28. EQUIPMENT AVAILABLE

1-29. Service Accessories

1-30. A service accessory kit (HP part number 08350-60020) is available for servicing the model 83572A/B RF Plug-In and the model 8350A/B Sweep Oscillator. HP part numbers for the individual pieces of the kit are provided in Table 1-3. The accessory kit includes:

- Two 44-pin printed circuit board extenders. These boards have keyed slots which allow them to be used in each of the keyed PC board receptacles in the model 83572A/B, and in the model 8350A/B as well.
- An RF Plug-In extender cable set that provides all electrical connections when the RF Plug-In is removed from the Sweep Oscillator. The RF Plug-In interface connector (P2) and the power supply interface connector (P1) are extended by separate cables.
- One hex balldriver for use in model 8350 front panel repairs.
- One 16-pin and one 20-pin I.C. test clip for probing integrated circuits.

1-31. A listing of service accessories available including service cables, wrenches, and extender boards is given in Table 1-3.

1-32. Model 8756A and Model 8755 Network Analyzers

1-33. The model 8350 Sweep Oscillator with the model 83572A/B RF Plug-In installed is compatible with the model 8756A programmable microprocessor-based network analyzer or the model 8755 network analyzer for broadband swept scalar measurements. The model 8350 provides internal 27.8 kHz squarewave amplitude modulation of the RF output (when the 83572A/B is an Option 006), eliminating unnecessary cable connections to the network analyzer or the use of an external modulator. The model 8350 can also produce alternate sweeps through use of the ALT n function which works in conjunction with the channel switching circuits in the model 8755C. This permits channel 1 on the 8755C to respond only to the model 8350 current state and channel 2 to the alternate state. A single cable (HP part number 8120-3174) connects between the model 8350 rear panel ALT SWP INTERFACE connector and the model 8755C front panel ALT SWP INTERFACE connector. Alternate sweep capability is also available between the 8756A and the 8350B through the HP 8756 System Interface.

1-34. Power Meters and Crystal Detectors

1-35. The RF output can be externally leveled using the HP model 432A Power Meter or negative polarity output crystal detectors. Refer to Section III, Operation, of this manual for detailed information on leveling techniques that may be used with the model 8350/RF Plug-In combination.

NOTE

The model 435A and 436A Power Meters should not be used for external leveling of the HP 83572A/B.

1-36. RECOMMENDED TEST EQUIPMENT

1-37. Equipment required for testing and adjusting the instrument is listed in Table 1-4. Other equipment may be substituted if it meets or exceeds the critical specifications indicated in the table.

Table 1-1. Specifications for Model 83572A/B Installed in Model 8350A/B (1 of 2)

NOTE

The specifications provided here apply to both the 83572A and the 83572B except in the cases where separate listings are given.

FREQUENCY[1]
Range: 26.5 to 40.0 GHz

Accuracy (25°C ±5°C)		**Stability**	
CW Mode:[2]	±100 MHz	With 10% Line Voltage Change:	±1 MHz
All Sweep Modes: (Sweep time ≥100 ms)	±150 MHz	With 10 dB Power Level Change:	±200 kHz
		With 3:1 Load SWR:	±100 kHz
Frequency Markers: (Sweep time ≥100 ms)	±150 MHz ±0.5% of sweep width	Residual FM, Peak: (10 Hz to 10 kHz Bandwidth) (CW Mode with CW Filter)	<60 kHz

POWER OUTPUT[1]
(25°C ±5°C)[3]

Minimum Unleveled Output Power:

83572A +3 dBm
83572B +7 dBm
Option 001 (at output of external leveling coupler) 1.0 dB less than standard
Option 006 (at waveguide output of plug-in) 1.5 dB less than standard
Option 001/006 (at output of external leveling coupler) 2.5 dB less than standard

Power Variation:

Externally Leveled:
Negative Crystal Detector ALC Mode:[4,5] ±0.2 dB
Power Meter ALC Mode:[6] ±0.2 dB

Residual AM in 100 kHz Bandwidth: (in dB below carrier) ≥50 dB

Spurious Signals: (in dB below carrier)
Inband: ≥50 dB

Output SWR

Unleveled: <2.0
Option 001 (externally leveled)[4]: <1.5

Resolution (displayed): 0.1 dB/GHz

Remote Programming (Settable): ±0.01 dB

Table 1-1. Specifications for Model 83572A/B Installed in Model 8350A/B (2 of 2)

MODULATION

External AM

Maximum Input: 15 V

Internal Square Wave Modulation (Option 006 Only)

Selectable (by internal jumper in 8350A/B) to 1 kHz or 27.8 kHz squarewave modulation. 27.8 kHz modulation ensures operation with Hewlett-Packard scalar network analyzers.

On/Off Ratio:
(25°C ±5°C) ≥20 dB

Symmetry: 50% ±5%

External FM

Maximum Deviation for Modulation Frequencies:

Modulation Frequency	Cross-Over Coupled	Direct Coupled[7]
DC to 100 Hz	±150 MHz	±6 MHz
100 Hz to 200 kHz	±3.5 MHz	±3.5 MHz

GENERAL SPECIFICATIONS

Minimum Sweep Time (over full range): 10 ms

RF Output Waveguide Connector: EIA size WR 28 waveguide. Mates with JAN UG-599 flange.

1. Unless otherwise noted, all specifications are at the RF OUTPUT waveguide connector and at 0° to 55°C.
2. Approach desired frequency from low end of band.
3. For temperatures greater than 30°C, output power typically degrades 0.1 dB/°C.
4. Sweep time ≥100 msec.
5. Excludes coupler and detector variation. For external leveling crystal detector output should be between −10 mV and −200 mV.
6. Use HP Model 432A/B/C Power Meter. Sweep duration ≥100 seconds.
7. Crossover-coupled and direct-coupled external FM capabilities are selectable by internal switch in the RF Plug-In.

Table 1-2. Supplemental Performance Characteristics for Model 83572A/B Installed in Model 8350A/B (1 of 2)

NOTE

Values in this table are not specifications, but are intended to provide information useful in applying the instrument by giving typical but non-warranted performance parameters.

NOTE

The performance characteristics provided here apply to both the 83572A and the 83572B except in the cases where separate listings are given.

FREQUENCY CHARACTERISTICS[1]

Accuracy (25°C ±5°C)		Stability	
CW Mode:[2]	±20 MHz	With Temperature:	±8 MHz/°C
Manual Sweep:	≤±100 MHz	With Time: (in a 10-minute period after one hour warmup at the same frequency setting)	±4 MHz
All Sweep Modes: (sweep time 10 ms to 100 ms)	≤±100 MHz		
Sweep Mode Linearity:	≤±50 MHz	Residual FM, Peak: (10 Hz to 10 KHz bandwidth) (CW Mode with CW Filter)	<10 kHz

OUTPUT CHARACTERISTICS[1]

Power Output:
Stability with Temperature: ±0.1 dB/°C

Range of Power Level Control
Unleveled Output: 30 dB
Externally Leveled **(Option 001)**:
83572A 7 dB
83572B 11 dB
Option 001/006 1.5 dB less

Power Level Accuracy (25°C)
Option 001 (externally leveled): ±1.5 dB

Power Variation
Unleveled Output: ±3 dB

Spurious Signals
(in dB below carrier)
Second Harmonic: ≥20 dB

Output SWR:
Unleveled: <1.6
Option 001 (externally leveled): <1.3

Power Sweep (Option 001 only)[3]
Calibrated Range
83572A ≥7 dB
83572B ≥11 dB
Option 001/006 1.5 dB less
Accuracy (including linearity): ±1.5 dB

Slope Compensation (Option 001 only)[3]
Linearity: <0.2 dB
Calibrated Range: up to 5 dB/GHz
For Full Sweep Width
83572A 7 dB
83572B 11 dB
Option 001/006 1.5 dB less

Table 1-2. Supplemental Performance Characteristics for Model 83572A/B Installed in Model 8350A/B (2 of 2)

MODULATION CHARACTERISTICS

External AM

Frequency Response: DC to 10 kHz

Input Impedance: 30k Ohms nominal

Range of Amplitude Control: Unleveled 30 dB

Externally Leveled **(Option 001)**:
83572A 7 dB
83572B 11 dB
(Option 001/006) 1.5 dB less

Sensitivity: Externally leveled (Option 001): 1 dB/V

External Pulse and Square Wave Modulation (Option 006 only, unleveled output)

TTL Compatible: Logic HIGH=RF ON, Logic LOW=RF OFF

Rise Time: 300 ns

Fall Time: 50 ns

Minimum Pulse Width: 500 ns

Modulation Rate: 500 Hz to 1 MHz

On/Off Ratio: 26 dB

External FM

Frequency Response (DC to 200 kHz): ±3 dB

Sensitivity (switch selectable):

FM Mode: −20 MHz/V

Phase-Lock Mode: −6 MHz/V

Direct Coupled: −20 MHz/V

Input Impedance: 2k Ohms nominal

GENERAL CHARACTERISTICS

Weight: Net 5.1 kg (11.3 lb.), Shipping 8.4 kg (18.6 lb.)

83572-60071 DC1 DIRECTIONAL COUPLER 10 dB

Frequency (GHz)	26.5 to 40	Directivity	≥36 dB
Mean Coupling Accuracy[4]	≤±.8 dB	SWR (Main Guide)	≤1.05
Coupling Variation	≤±.6 dB	SWR (Auxiliary Arm)	≤1.2

1. Unless otherwise noted, all characteristics are at the RF OUTPUT connector and at 0° to 55°C.
2. Approach desired frequency from low end of band.
3. Power sweep and slope compensation total must not exceed 7 dB for the 83572A or 11 dB for the 83572B (1.5 dB less for Option 001/006).
4. Mean coupling is the average of the maximum and minimum coupling values.

Table 1-3. Service Accessories Available

Name	HP Part Number	Description
44-pin printed circuit board extender	08350-60031*	Extends printed circuit boards
RF Plug-in Extender Cables	08350-60034* 08350-60035*	Extends RF Plug-in Interface connector (P2) Extends RF Plug-in Power Supply Interface connector (P1)
Adjustment Tool	8830-0024	Fits miniature adjustment slot on potentiometers
Wrenches	08555-20097 8710-0946	5/16 in slotted box/open end 15/64 in open end
Service Cables	8120-1578 83525-60019	18 in Coax with SMA (m) connector on each end 10 in Coax with SMB snap on (f) and SMA (m)
Hex Balldriver	8710-0523*	Removes front panel hold down plate hex screws in 8350A/B
IC Test Clip	1400-0734* 1400-0979*	16-pin IC test clip 20-pin IC test clip

*These items are included in a Service Accessories Kit HP Part No. 08350-60020 (2 board extenders are included in this kit).

Table 1-4. Recommended Test Equipment (1 of 2)

Instrument	Critical Specifications	Recommended Model	Use*
Sweep Oscillator	No substitute	HP 8350A/B	P,A,T
Digital Voltmeter (DVM)	Range: −50V to +50V Accuracy: ±0.01% Input Impedance: ≥10M Ohms	HP 3456A	A,T
Oscilloscope	Dual Channel Bandwidth: DC to 100 MHz Vertical Sensitivity: ≤5mV/DIV Horizontal Sweep Rate: ≤0.1 uS/DIV External Sweep Capability	HP 1740A	P,A,T
Oscilloscope Probes	1:1 General Purpose Probe 10:1 Probe	HP 10008B HP 10040A	A,T A,T
Spectrum Analyzer	Frequency Range: 18.6 to 40.0 GHz Residual FM: <100 Hz peak Compatible with HP 11970A External Harmonic Mixer	HP 8566A	P,A,T
Microwave Power Amplifier	No Substitute	HP 11975A	P,A,T
External Harmonic Mixer	No Substitute	HP 11970A	P,A,T
Crystal Detector	Frequency Response: 26.5 to 40.0 GHz Maximum Input Power: 100 mW Waveguide connector size WR28	HP R422A	P,A
Frequency Meter	Frequency Accuracy: ≤0.12% Calibration Increments: ≤10 MHz Frequency Range: 26.5 to 40.0 GHz Waveguide connector size WR28	HP R532A	P,A
Function Generator	Frequency Range: 0.1 Hz to 10 MHz Sinewave and squarewave output Output Level: 10 Vp-p into 50 Ohms Output Level Flatness: <±3% from 10 Hz to 100 kHz <±10% from 100 kHz to 10 MHz	HP 3312A	P,A,T
Power Meter	Power Range: −20 to +10 dBm (No substitute when used for external power meter leveling.)	HP 432A	P,A
Power Sensor	Frequency Range: 26.5 to 40.0 GHz Maximum SWR: ≤2.0 Waveguide connector size WR28	HP R486A	P,A

Table 1-4. Recommended Test Equipment (2 of 2)

Instrument	Critical Specifications	Recommended Model	Use*
Directional Coupler	Frequency Range 26.5 to 40.0 GHz Nominal Coupling: 10 dB Maximum Coupling Variation: ±0.6 dB Minimum Directivity: 40 dB Waveguide connector size WR28	HP R752C	P
RMS Voltmeter	dB Range: −20 to −70 dBm (0 dBm = 1 mW into 600 Ohms) Frequency Range: 10 Hz to 10 MHz Accuracy: ±5% of full scale	HP 3400A	P
Vane Attenuator	Frequency Range: 26.5 to 40.0 GHz Incremental Attenuation 0 to 50 dB Calibration Accuracy: ≤±0.1 dB Waveguide connector size WR28	HP R382A	P,A,T
Adjustable Short	Frequency Range: 26.5 to 40.0 GHz Waveguide connector size WR28	HP R920B	P
60 cm (24 in) cable	Limits bandwidth to approx 100 Hz	HP 11170B	P
Adjustable AC Line Transformer	100–120V 220–240V	General Radio W5MTB W10HM73	P
Line Monitor	120V 240V	RCA WV 120B RCA WV 503A	P
PC Board Extender	44-pin, extends printed circuit boards	HP Part No. 08350-60031	A,T

*P = Performance Test; A = Adjustments; T = Troubleshooting

SECTION II
INSTALLATION

2-1. INTRODUCTION

2-2. This section provides installation instructions for the HP 83572A/B RF Plug-In. This section also includes information about initial inspection, damage claims, preparation for use, packaging, storage, and shipment.

2-3. INITIAL INSPECTION

2-4. Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically. The contents of the shipment should be as shown in Figure 1-1. Procedures for checking electrical performance are given in Section IV, Performance Tests, of this Operating and Service Manual. If the instrument combination does not pass the electrical Performance Tests, refer to Section V, Adjustments, of this manual. If, after the adjustments have been made, the instrument combination still fails to meet specifications, and a circuit malfunction is suspected, refer to troubleshooting procedures in Section VIII, Service, in this manual. If the instrument does not pass the above electrical tests, if the shipment contents are incomplete, or if there is mechanical damage or defect, notify the nearest Hewlett-Packard Office. If the shipping container is damaged, or if the cushioning material shows signs of stress, notify the carrier as well as the Hewlett-Packard Office. Keep the shipping materials for the carrier's inspection. The HP Office will arrange for repair or replacement without waiting for claim settlement.

2-5. PREPARATION FOR USE

2-6. Power Requirements

2-7. When the HP 83572A/B RF Plug-In is properly installed, it obtains all power through the rear panel interface connector from the Model 8350A/B Sweep Oscillator.

2-8. RF Plug-In Configuration Switch

2-9. The HP 83572A/B RF Plug-In has a configuration switch (A3S1) located on the A3 Digital Interface Board. This switch must be preset prior to RF Plug-In operation in the Model 8350. The configuration switch is an 8-section multiple switch. Each separate switch section corresponds to a separate RF Plug-In feature such as instrument number (83572A or 83572B), Option installed, FM sensitivity selection, FM input coupling selection (direct coupled or cross-over), or RF power level at power on (maximum or off). Refer to Section III, Operation, in this manual for a complete description of the configuration switch and instructions on how to set the switch sections.

2-10. Interconnections

2-11. There are two rear panel interconnections from the HP 83572A/B RF Plug-In to the HP 8350A/B Sweep Oscillator. These are the RF Plug-In Interface connector (P2) and the Power Supply Interface connector (P1). A complete listing of pins and associated signals for these connectors is provided in Figures 2-1 and 2-2.

2-12. Mating Connectors

2-13. The externally mounted connectors on the HP 83572A/B are listed in Table 2-1. Opposite each connector is an industry identification, the HP part number of a mating connector, and the part number of an alternate source for the mating connector. For HP part numbers of the externally mounted connectors themselves, refer to Section VI, Replaceable Parts, of this manual.

2-15. Temperature. The instrument may be operated in temperatures from 0°C to +55°C.

2-16. Humidity. The instrument may be operated in environments with humidity from 5% to 80% relative at +25°C to +40°C. The instrument should be protected from temperature extremes which may cause condensation within the instrument.

Table 2-1. HP 83572A/B Mating Connectors

HP 83572A/B Connector		Mating Connector	
Connector Name	**Industry Identification**	**HP Part No.**	**Alternate Source**
W1 RF OUTPUT WAVEGUIDE	JAN UG – 599 flange	–	–
J1 EXT/MTR ALC INPUT	BNC (f)	1250-0256 Straight cable	Specialty Connector 25-P118-1
J2 PULSE IN (Opt. 006)	BNC (f)	1250-0256 Straight Cable	Specialty Connector 25-P118-1

2-17. Altitude. The instrument may be operated at altitudes up to 4572 meters (15,000 feet).

2-18. Cooling. When the HP 83572A/B RF plug-in is properly installed in the HP 8350A/B sweep oscillator, it obtains all of its cooling airflow by forced ventilation from the fan in the HP 8350A/B. A diagram showing the various cooling airflow paths within the sweep oscillator is given in Section II, Installation, of the HP 8350A/B sweep oscillator Operating and Service Manual. Ensure that all airflow passages in the HP 8350 and the HP 83572A/B are clear before installing the RF plug-in in the sweep oscillator.

2-19. Installation Instructions

2-20. To operate as a completely functional sweep oscillator, the HP 83572A/B RF plug-in must be installed in an HP 8350A/B sweep oscillator. To install the HP 83572A/B RF plug-in in the HP 8350A/B sweep oscillator:

a. Set the HP 8350A/B mainframe LINE switch to OFF.

b. Remove all connectors and accessories except the waveguide flange cover from the front and rear panel connectors of the HP 83572A/B to prevent them from being damaged.

c. Position the RF plug-in unit latching handle in the fully raised position. The latching handle should spring easily into the raised position and be held by spring tension.

d. Ensure that the HP 8350A/B RF plug-in channel is clear. Align the RF plug-in in the channel and slide it carefully into place toward the rear of the channel. It should slide easily without binding.

e. The drawer latch handle slot will engage with the locking pin just before the RF plug-in is fully seated in position.

f. Press the latch handle downward, while still pushing in on the RF plug-in, until the drawer latch is fully closed and the front panel of the RF plug-in is aligned with the sweep oscillator front panel.

2-21. STORAGE AND SHIPMENT

2-22. Environment

2-23. The instrument may be stored or shipped in environments within the following limits:

Temperature ..... −40°C to +75°C
Humidity..... 5% to 95% relative at 0° to +40°C
Altitude ..... Up to 15240 meters (50,000 feet)

2-24. The instrument should also be protected from temperature extremes which may cause condensation in the instrument.

2-25. Packaging

2-26. Original Packaging. Containers and materials identical to those used in factory packaging are available through Hewlett-Packard offices. A diagram and listing of packaging

materials used for the HP 83572A/B is shown in Figure 2-3. If the instrument is being returned to Hewlett-Packard for servicing, attach a tag indicating the type of service required, return address, model number, and full serial number (located on the rear panel serial plate). Mark the container FRAGILE to ensure careful handling. In any correspondence refer to the instrument by model number and full serial number.

2-27. Other Packaging. The following general instructions should be used for repackaging with commercially available packaging materials:

a. Wrap the instrument in heavy paper or plastic. If shipping to a Hewlett-Packard Office or Service Center, attach a tag indicating the type of service required, return address, model number, and full serial number.

b. Use a strong shipping container.

c. Use enough shock-absorbing material around all sides of the instrument to provide a firm cushion and to prevent movement inside the container. Protect the control panel with cardboard. If the instrument is an Option 001, disconnect the front panel attachments and pack them in additional shock-absorbing material.

d. Seal the shipping container securely.

e. Mark the shipping container FRAGILE to ensure careful handling.

f. In any correspondence, refer to the instrument by model number and full serial number.

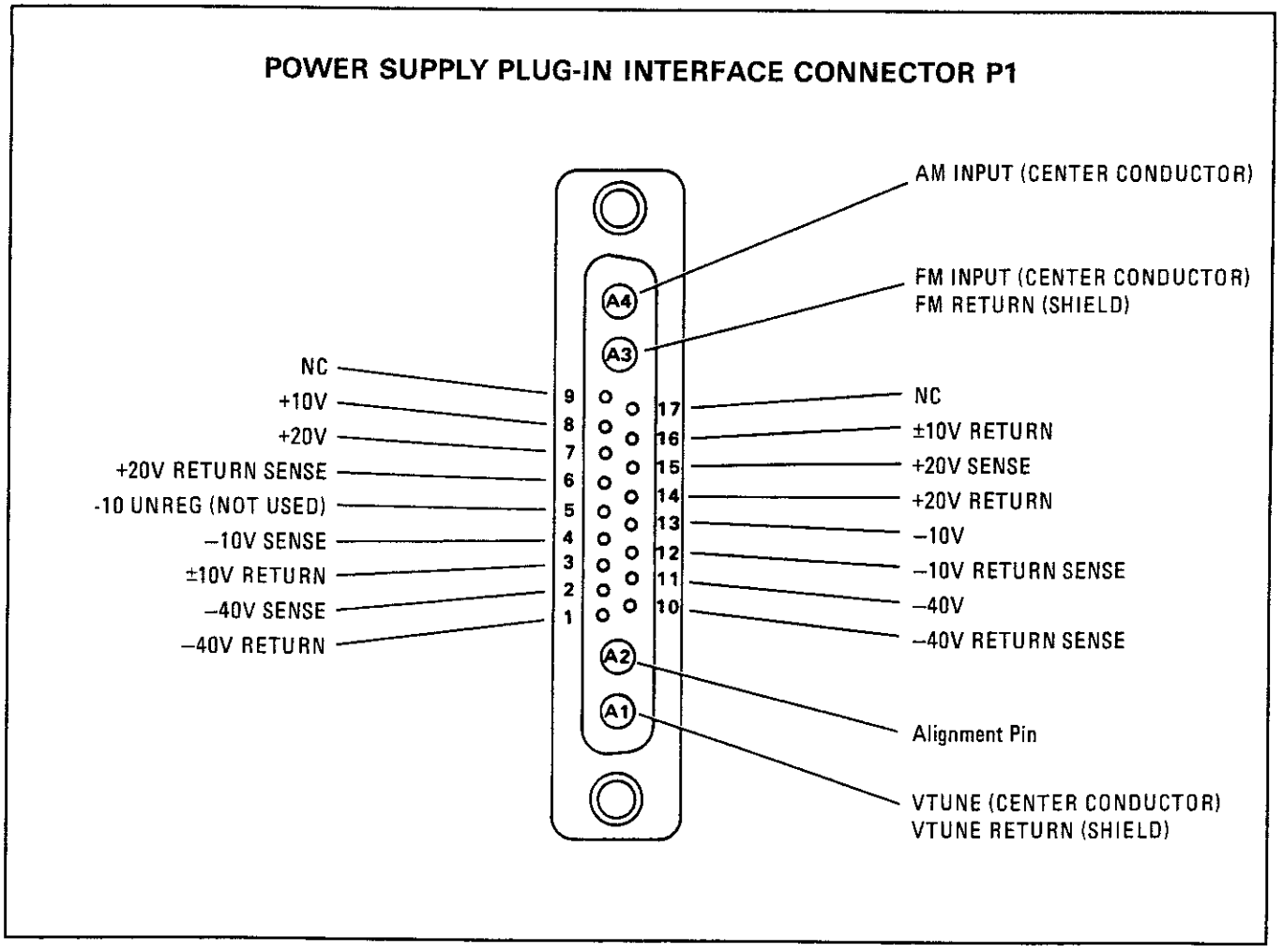


Figure 2-1. Interface Signals on Connector P1

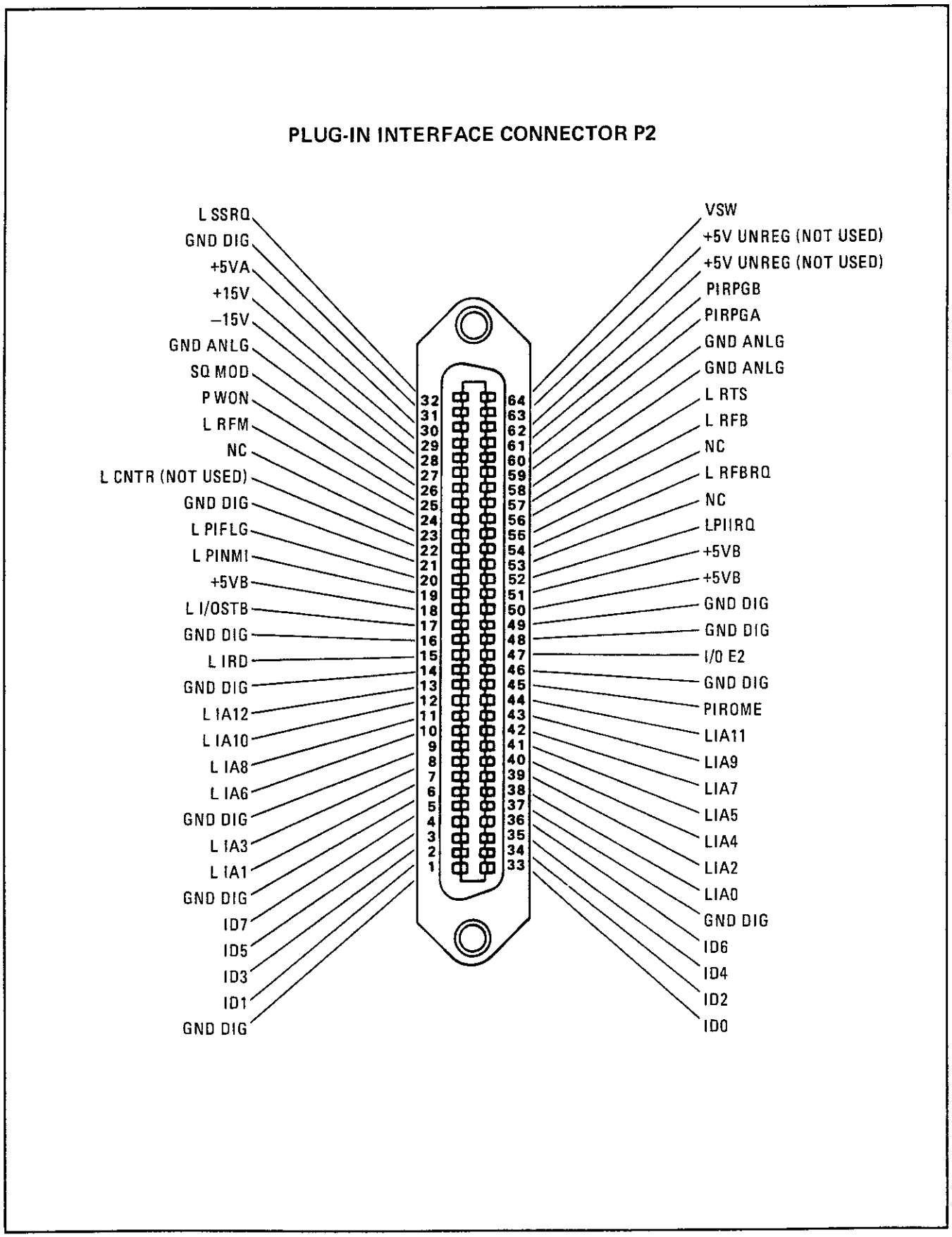
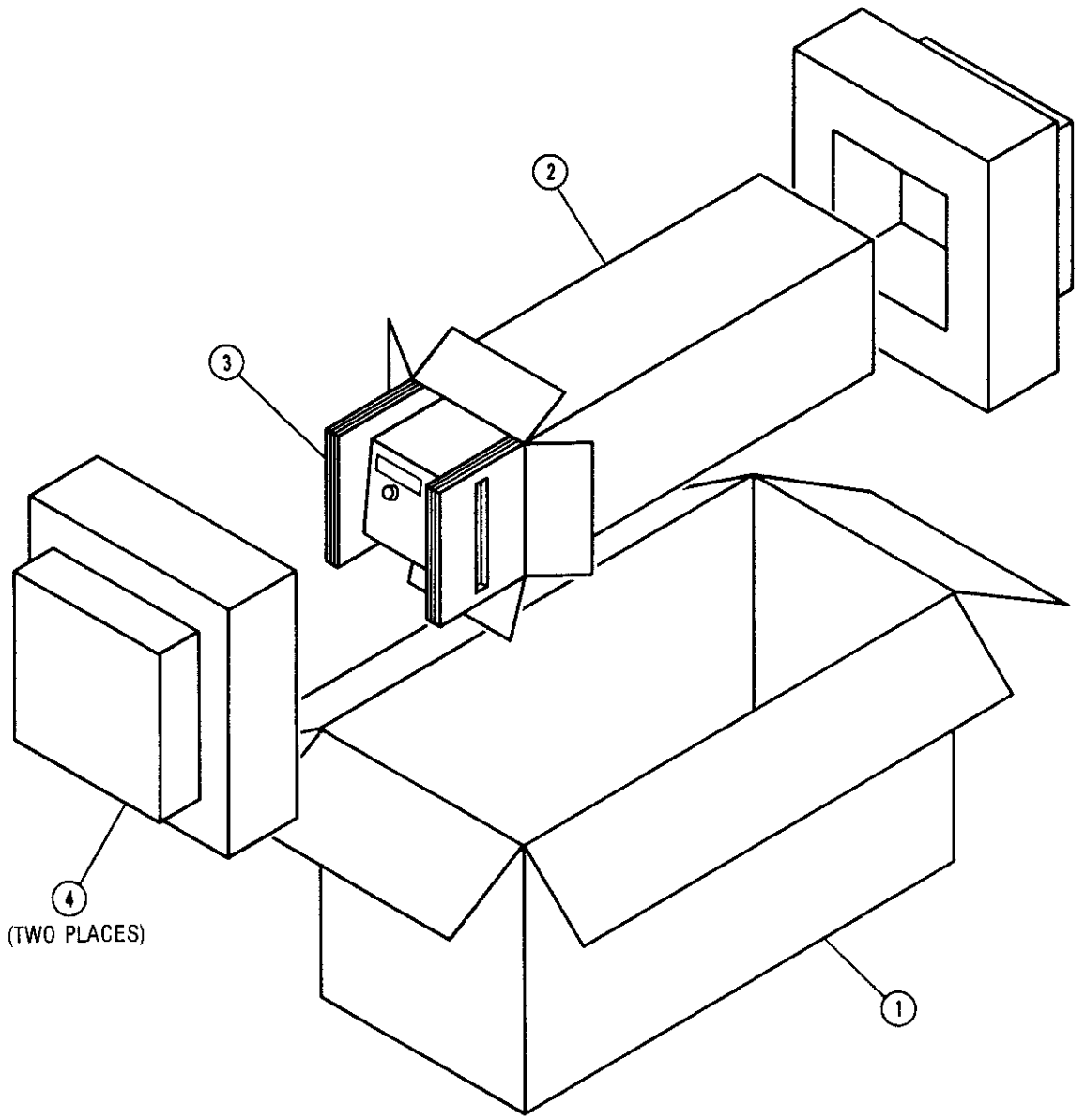


Figure 2-2. Interface Signals on Connector P2



Item	Quantity	HP Part Number	C D	Description
1	1	9211-3515	6	Outer Carton
2	1	9211-3514	5	Inner Carton
3	2	9220-3409	6	Side Pads – Corrugated Cardboard
4	2	9220-3406	3	Foam Pads
	1	9222-0352	6	Poly Bag – to cover instrument

Figure 2-3. Packaging for Shipment Using Factory Packaging Materials

SECTION III
OPERATION

3-1. INTRODUCTION

3-2. This section is divided into several parts. Front and rear panel features are shown with descriptions. Operator's Checks are referenced, with information on RF plug-in error codes. Operating Instructions provide crystal detector and power meter leveling procedures, and configuration switch settings. Operator's Maintenance provides information on fuses and service tags.

3-3. PANEL FEATURES

3-4. Front and rear panel features are described in Figures 3-1 and 3-2 respectively.

3-5. OPERATOR'S CHECKS

3-6. The Operator's Checks (Local and Remote) in the Operating and Service Manual for the HP 8350A/B sweep oscillator provide a quick evaluation of the main functions of both the 8350A/B and the RF plug-in. Change the test setup for the Local Operator's Check by deleting the attenuator and using an R-band detector. The Local Operator's Check verifies both the sweep oscillator and the RF plug-in; therefore, if the correct indications are not obtained, the trouble may be in either of the units. Error codes E050 to E059 are indications of RF plug-in errors: further information on RF plug-in error codes is provided in Section VIII of this manual. If the RF plug-in is suspected, follow the troubleshooting information in Section VIII to isolate the problem.

3-7. OPERATING INSTRUCTIONS

3-8. Unleveled Power

3-9. The unleveled power mode can be accessed by pressing either **[INSTR PRESET]** or **[UNLVLD PWR]**. The power level can be changed with the step keys, the keyboard, or the POWER knob. The change is nonlinear and generally will not correspond with the power displayed in the POWER display. The CAL adjust is enabled in this mode. It can be used to adjust the POWER display equal to a power meter reading in either CW or swept frequency modes. The output power will remain unleveled in this mode.

3-10. External Leveling

3-11. External Crystal Detector Leveling

3-12. The RF output power may be leveled externally using a directional coupler and a negative output crystal detector. The directional coupler samples a portion of the RF output signal, and the crystal detector produces a DC voltage proportional to the RF output power level. The detector output voltage is compared with an internal reference voltage, and the difference voltage is amplified by the ALC amplifier before being applied as modulator drive to a ferrite modulator which changes the output power level. Figure 3-3 illustrates and describes a typical crystal detector leveling setup.

3-13. Calibrated External Crystal Detector Leveling (Option 001)

3-14. The Option 001 calibrated external leveling includes an external R-band 10-dB coupler, an R-band crystal detector, and a BNC cable, calibrated together at the factory to the individual HP 83572A/B RF plug-in. This leveling system uses the Option 001 coupler to sample a portion of the RF output signal with the crystal detector to produce a DC voltage proportional to the RF output power level. The detector output voltage is compared with an internal reference voltage. The difference voltage is then amplified by the ALC amplifier before being applied as modulator drive to a ferrite modulator, which changes the output to keep a constant RF output power level. With Option 001, the power level at the output of the Option 001 coupler is the same as the front panel POWER display at all available power levels and all frequencies. This mode can be accessed only by pressing **[SHIFT] [DET]**. In this mode the CAL light above the DET pushbutton is lit, and the CAL adjust is disabled.

3-15. External Power Meter Leveling

3-16. RF output power may also be leveled with a power meter and a directional coupler as shown in Figure 3-4. A sweep time of 100 seconds must

be used with this leveling method. A sample of the RF output signal is routed to a power meter which produces a DC output voltage proportional to the RF input signal level. This DC voltage is applied to the HP 83572A/B ALC circuits and compared with an internal reference voltage. A difference voltage is produced and amplified by the ALC amplifier before being applied as modulator drive to a ferrite modulator.

3-17. External FM

3-18. The HP 83572A/B RF output signal can be frequency modulated using an external modulating signal applied to the HP 8350A/B rear panel FM INPUT connector. The external FM function provides a means of obtaining an output frequency that varies under the control of an external modulating signal. A positive-going voltage at the FM INPUT causes the output frequency to decrease, while a negative-going voltage causes the output frequency to increase. The sensitivity and coupling of the modulating signal can be set with configuration switch A3S1. Figure 3-5 lists the available configuration switch settings. The configuration switch settings override the HP 8350A/B sweep oscillator's nonvolatile memory settings at instrument preset.

3-19. External Amplitude Modulation

3-20. Pulse Modulation (Option 006)

3-21. The Option 006 provides the squarewave modulation capabilities necessary for the HP 8350/83572 to function with the HP 8755 or 8756 scalar network analyzer. For compatibility with the HP 8755 or 8756, the internal squarewave modulation frequency is preset to 27.8 kHz with a jumper on the sweep generator board of the HP 8350A/B. The on/off ratio of internal squarewave modulation is greater than 20 dB. The ⌐¬ MOD key on the front panel of the 8350A/B activates the internal squarewave modulation feature.

3-22. The PULSE IN connector on the rear panel of the HP 83572A/B Option 006 allows the RF signal to be pulsed or squarewave modulated by an external signal. The PULSE IN input is normally at a TTL HIGH level (approximately +3 volts DC). When a TTL LOW signal (approximately 0 volts DC) is applied, the RF output is turned off. The on/off power ratio is typically greater than 26 dB. With unleveled power, a pulse repetition rate of up to 1 MHz is achievable. See the specifications and supplemental performance characteristics in Section I for more details on the modulation characteristics when using this input.

3-23. Amplitude Modulation

3-24. The AM INPUT on the rear panel of the HP 8350A/B allows the RF signal to be externally amplitude modulated. In the unleveled power mode, amplitude changes as wide as 30 dB are available, not proportional to the modulating input voltage. AM frequency response is typically limited to 10 kHz.

3-25. In all the externally leveled modes, amplitude changes can be achieved as wide as 7 dB, which are logarithmically proportional to the modulating input voltage (1 dB/volt nominal). Again, frequency response is typically limited to 10 kHz. For maximum depth of modulation (i.e. maximum modulation index), the RF power level should be set to the middle of the control range (−1.5 dBm for an HP 83572A with calibrated power control from +2 dBm to −5 dBm; +0.5 dBm for an HP 83572B with calibrated power control from +6 dBm to −5 dBm). The center of the power control range can be selected with the front panel power controls or by applying a DC bias voltage on the external modulating signal. A positive (+) DC voltage into the AM INPUT causes an increase in RF output power, and a negative (−) DC voltage causes a decrease in RF output power.

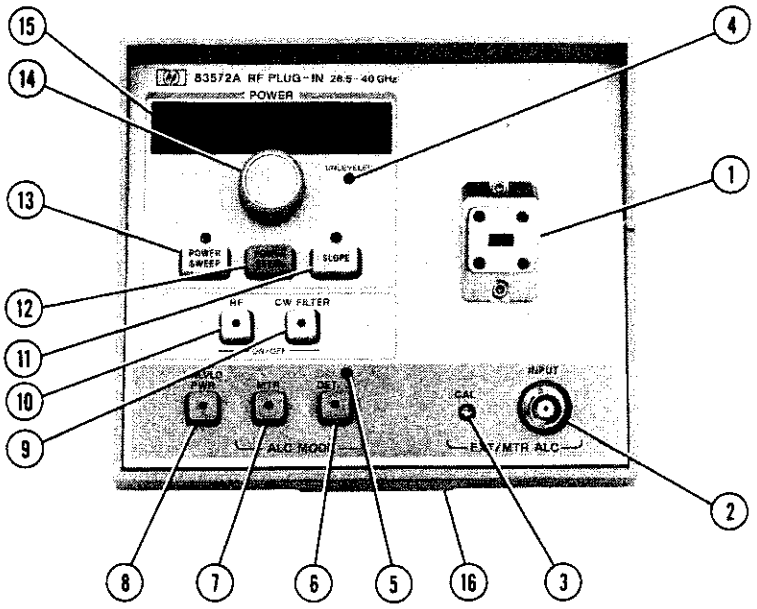
3-26. OPERATOR'S MAINTENANCE

3-27. Fuses

3-28. Power circuits for the HP 83572A/B are fused in the HP 8350A/B sweep oscillator mainframe. Refer to the HP 8350A/B Operating and Service Manual for fuse replacement information.

3-29. Blue Service Tags

3-30. If the HP 83572A/B requires service, it may be sent to the nearest Hewlett-Packard service organization as described in Section II. Before returning the instrument, fill out and attach one of the blue service tags included at the end of this section. Record any error codes noted in the FAILURE SYMPTOMS/SPECIAL CONTROL SETTINGS section of the tag.



FRONT PANEL FEATURES

1. RF output waveguide connector (EIA size WR 28 waveguide) mates with JAN UG-599 flange.

2. BNC connector for power meter or external crystal detector leveling inputs (including Option 001).

3. ALC CAL adjustment, for setting power level in external power meter or crystal detector leveling.

4. UNLEVELED lamp lights when output power is unleveled.

5. CAL lamp lights when **[SHIFT] [DET]** is pressed or enabled. In this mode Option 001 calibration is enabled and CAL adjust is disabled.

6. External crystal detector leveling selection.

7. Power meter leveling control selection (HP 432 power meter only).

8. Unleveled power control selection.

9. CW filter enables an oscillator tuning voltage filter in CW mode.

10. RF on/off key. Turns RF power on or off. Used for zeroing a power meter or referencing an X-Y recorder.

11. SLOPE provides a linear increase in power with frequency (dB/GHz) to compensate for system/cable losses at higher frequencies (Option 001 only).

12. POWER LEVEL provides control of output power.

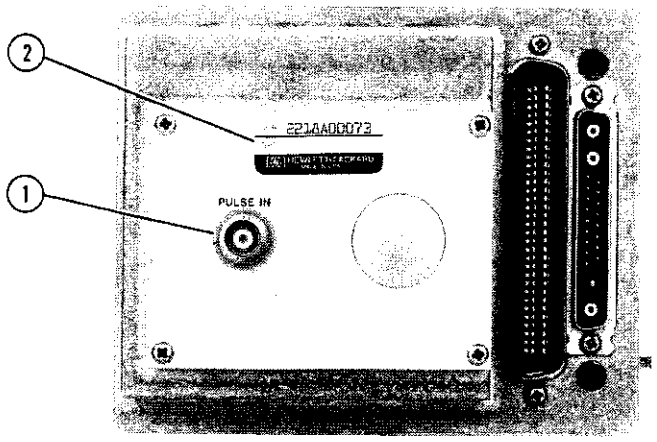
13. POWER SWEEP sweeps power at a CW frequency. POWER LEVEL sets the starting point; POWER SWEEP sets the power sweep width in dB (Option 001 only).

14. Power control knob for controlling power sweep, power level, or slope.

15. Display provides readout of selected power mode in dBm, dB/GHz, or dB/SWP to 0.1 dB.

16. Latch handle is used to remove, install, and latch the RF plug-in in the sweep oscillator mainframe.

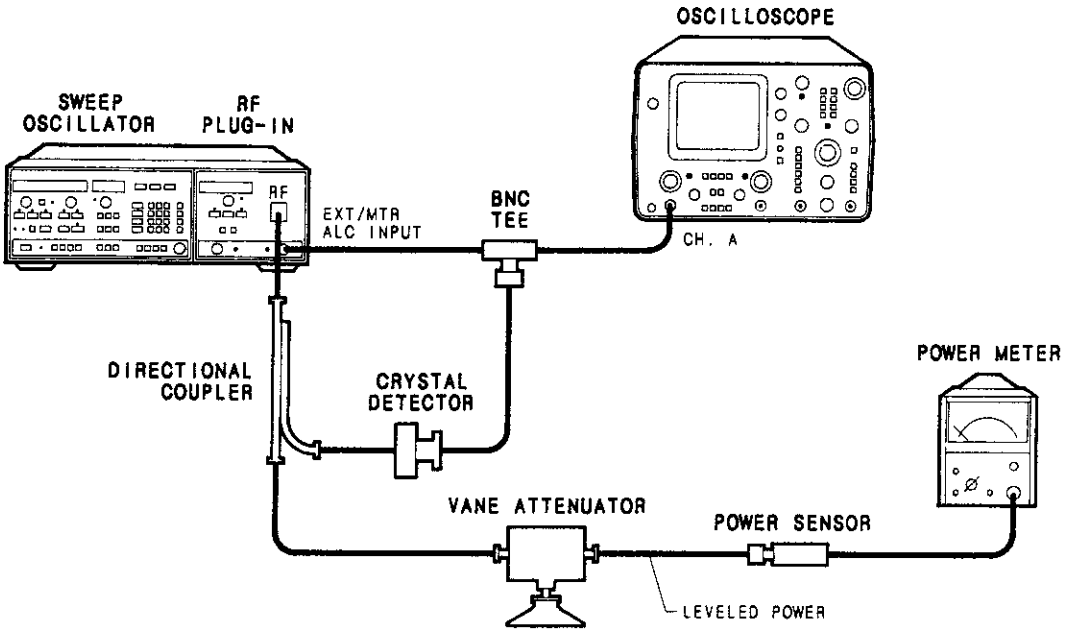
Figure 3-1. Front Panel Features



REAR PANEL FEATURES

1. PULSE IN connector is used to input external pulse or squarewave modulation signals (Option 006 only).
2. Serial number plate has a ten digit serial number (used in any correspondence concerning the RF plug-in), as well as Option number if applicable.

Figure 3-2. Rear Panel Features



EXTERNAL CRYSTAL DETECTOR LEVELING

EQUIPMENT:

Sweep Oscillator	HP 8350A/B
RF Plug-In	HP 83572A/B
Oscilloscope	HP 1740A
Power Meter	HP 432A
Power Sensor	HP R486A
Crystal Detector	HP R422A
Directional Coupler	HP R752C
Vane Attenuator	HP R382A

PROCEDURE:

NOTE

Crystal output signal must be between −10 mVdc and −200 mVdc.

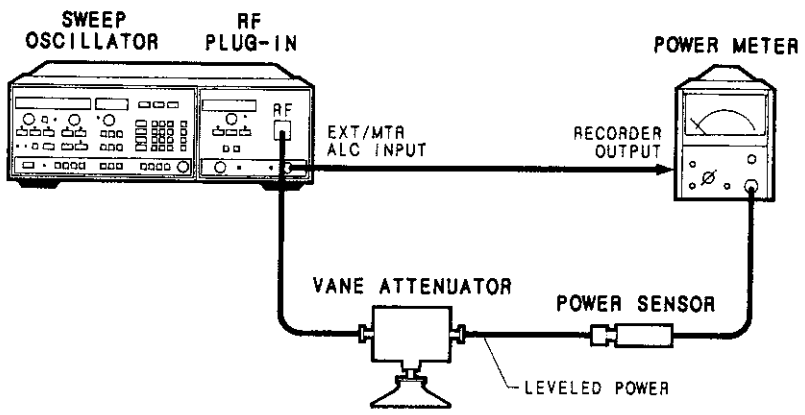
1. Connect the equipment as shown in the test setup.
2. Switch on the 8350A/B LINE power and press **[INSTR PRESET]**. The START and STOP indicators should be on. On the 83572A/B, press ALC MODE **[DET]**.
3. Set the vane attenuator to 10 dB.
4. Set the power meter range to −5 dBm (83572A), or 0 dBm (83572B).
5. If the RF plug-in is an HP 83572A, adjust the EXT/MTR ALC CAL for a power meter reading of −3 dB (this corresponds to +2 dBm at the output of the waveguide coupler). If the RF plug-in is an HP 83572B, adjust the EXT/MTR ALC CAL for a power meter reading of −4 dB (this corresponds to +6 dBm at the output of the waveguide coupler).

NOTE

The power level at the output of the directional coupler is typically 1.0 dB less than at the RF output of the plug-in.

6. To use leveled RF power for testing external equipment, make a connection at the point in the test setup marked "Leveled Power".

Figure 3-3. External Crystal Detector Leveling



EXTERNAL POWER METER LEVELING

EQUIPMENT:

Sweep Oscillator	HP 8350A/B
RF Plug-In	HP 83572A/B
Power Meter	HP 432A
Thermistor Mount	HP R486A
Vane Attenuator	HP R382A

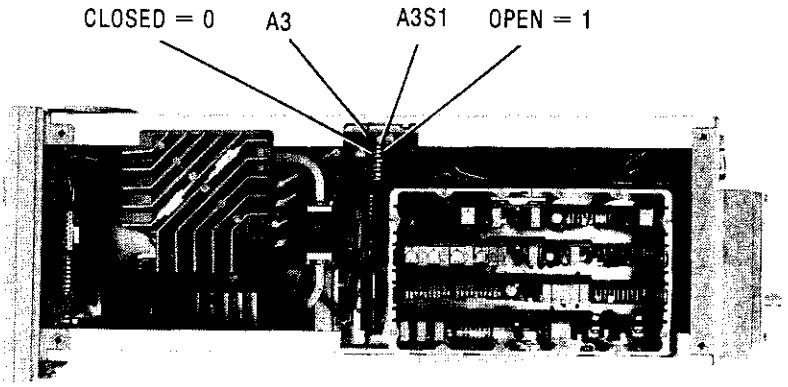
NOTE

For power meter leveling, a sweep rate of 100 sec/sweep should be used to ensure proper leveling, due to the slow response of the thermistor mount. The HP 435 and 436 power meters will not power meter level this plug-in. Only an HP 432 can be used.

PROCEDURE:

1. Connect the equipment as shown in the test setup.
2. Turn on the power to the sweep oscillator. Press **[INSTR PRESET] [SWEEP TIME] [1] [0] [0] [SEC]**.
3. On the 83572A/B, set the output power to maximum specified, and press ALC MODE **[MTR]**.
4. Set the vane attenuator to 10 dB.
5. Set the power meter range to −5 dBm (83572A), or 0 dBm (83572B).
6. If the RF plug-in is an HP 83572A, adjust the EXT/MTR ALC CAL for a power meter reading of −3 dB (this corresponds to +2 dBm at the RF output of the plug-in). If the RF plug-in is an HP 83572B, adjust the EXT/MTR ALC CAL for a power meter reading of −4 dB (this corresponds to +6 dBm at the RF output of the plug-in). Press 8350A/B SWEEP TRIGGER **[SINGLE]** key twice to set the single sweep mode and start a sweep.
7. To use leveled RF power for testing external equipment, make a connection at the point in the test setup marked "Leveled Power".

Figure 3-4. External Power Meter Leveling



Code Description	Switch Number 1	2	3	4	5	6	7	8
Instrument/Option								
Standard 83572A	0	0	0	X	X	X	X	X
Standard 83572B	1	0	0	X	X	X	X	X
83572A Option 001	0	1	0	X	X	X	X	X
83572B Option 001	1	1	0	X	X	X	X	X
83572A Option 006	0	0	1	X	X	X	X	X
83572B Option 006	1	0	1	X	X	X	X	X
83572A Option 001/006	0	1	1	X	X	X	X	X
83572B Option 001/006	1	1	1	X	X	X	X	X
No RF Power at INSTR PRESET	Z	Z	Z	1	X	X	X	X
Maximum RF Power at INSTR PRESET	Z	Z	Z	0	X	X	X	X
−6 MHz/V FM Sensitivity	Z	Z	Z	X	1	X	X	X
−20 MHz/V FM Sensitivity	Z	Z	Z	X	0	X	X	X
Direct-Coupled FM (−20 MHz/V)	Z	Z	Z	X	X	1	X	X
Cross-Over Coupled FM	Z	Z	Z	X	X	0	X	X

NOTES

1. Switch Positions
   1 = switch open = High
   0 = switch closed = Low (ground)
   X= don't care
   Z= determined by instrument and options installed
2. Switch is set at the factory as follows:

Switch No	1	2	3	4	5	6	7	8
Position	Z	Z	Z	0	0	0	X	X

Figure 3-5. Configuration Switch A3S1

SECTION IV
PERFORMANCE TESTS

4-1. INTRODUCTION

4-2. The procedures in this section test the electrical performance of the 83572 RF plug-in/ 8350 sweep oscillator combination with the specifications of the plug-in used as the performance standards. These specifications may be found in Section I of this manual. Due to the extended frequency range of the 83572A/B, the performance tests in the 8350A/B Operating and Service Manual do not apply. None of the tests require access to the interior of the 83572A/B RF plug-in.

NOTE

Allow the 83572A/B RF plug-in and the 8350A/B sweep oscillator to warm up for one hour prior to doing any performance tests.

4-3. EQUIPMENT REQUIRED

4-4. Equipment required for testing or adjusting the 83572A/B is listed in Section I, Table 1-4. Any equipment which satisfies the critical specifications listed in Table 1-4 may be substituted for the recommended model.

4-5. TEST RECORD

4-6. The Performance Test Record, Table 4-2, provides a tabulated index of the performance tests, their acceptable limits, and a column for recording actual measurements.

4-7. The test procedures should be performed in the order they are documented in this manual.

4-8. RELATED ADJUSTMENTS

4-9. Table 4-1 lists the performance tests, and references associated adjustments that are provided in Section V of this manual. If the result of a performance test is out of the specified limits, the associated adjustment may correct this condition.

4-10. CALIBRATION CYCLE

4-11. The performance tests listed in Table 4-1 should be performed at intervals of one year or less.

4-12. OPERATION VERIFICATION

4-13. Operation Verification is a subset of the performance tests, providing reasonable assurance that the 8350A/B sweep oscillator and the RF plug-in are operating properly and should meet the needs of an incoming inspection (80% verification). Paragraph 4-5 in the 8350B Operating and Service Manual specifies these tests and includes an HP-IB Operation Verification program for use with a 9825A/B desktop computer.

Table 4-1. Performance Tests and Associated Adjustments

Performance Test	83572A/B Adjustment Paragraph	8350B Adjustment Paragraph
4-14. Frequency Range and Accuracy		
CW Accuracy	5-14 through 5-16	5-19
Swept Frequency Accuracy	5-14 through 5-17	
Marker Accuracy	5-14 through 5-17	
4-15. Output Amplitude		
Minimum Unleveled Output Power	5-18	
Power Variation		
Crystal Detector Leveling	5-18 through 5-22	
Power Meter Leveling	5-18 through 5-23	
4-16. Residual AM	none	5-11
4-17. Frequency Stability	none	5-11
4-18. Residual FM	none	5-11
4-19. Spurious Signals	none	
4-20. Output SWR	none	
4-21. External Frequency Modulation	5-13 and 5-25	
4-22. AM ON/OFF Ratio and Square Wave Symmetry	5-26	

4-14. FREQUENCY RANGE AND ACCURACY TEST

SPECIFICATION:

Range: 26.5 to 40.0 GHz	
Accuracy (25°C ±5°C)	
CW Mode	±100 MHz
All Sweep Modes (Sweep Time ≥100 ms)	±150 MHz
Frequency Markers (Sweep Time ≥100 ms)	±150 MHz ±0.5% of sweep width

DESCRIPTION:

A spectrum analyzer is used to check frequency range and accuracy in the CW mode. An external harmonic mixer extends the frequency range of the spectrum analyzer into the 26.5 to 40 GHz range. A frequency meter is used to check swept frequency accuracy and markers in the START/STOP mode.

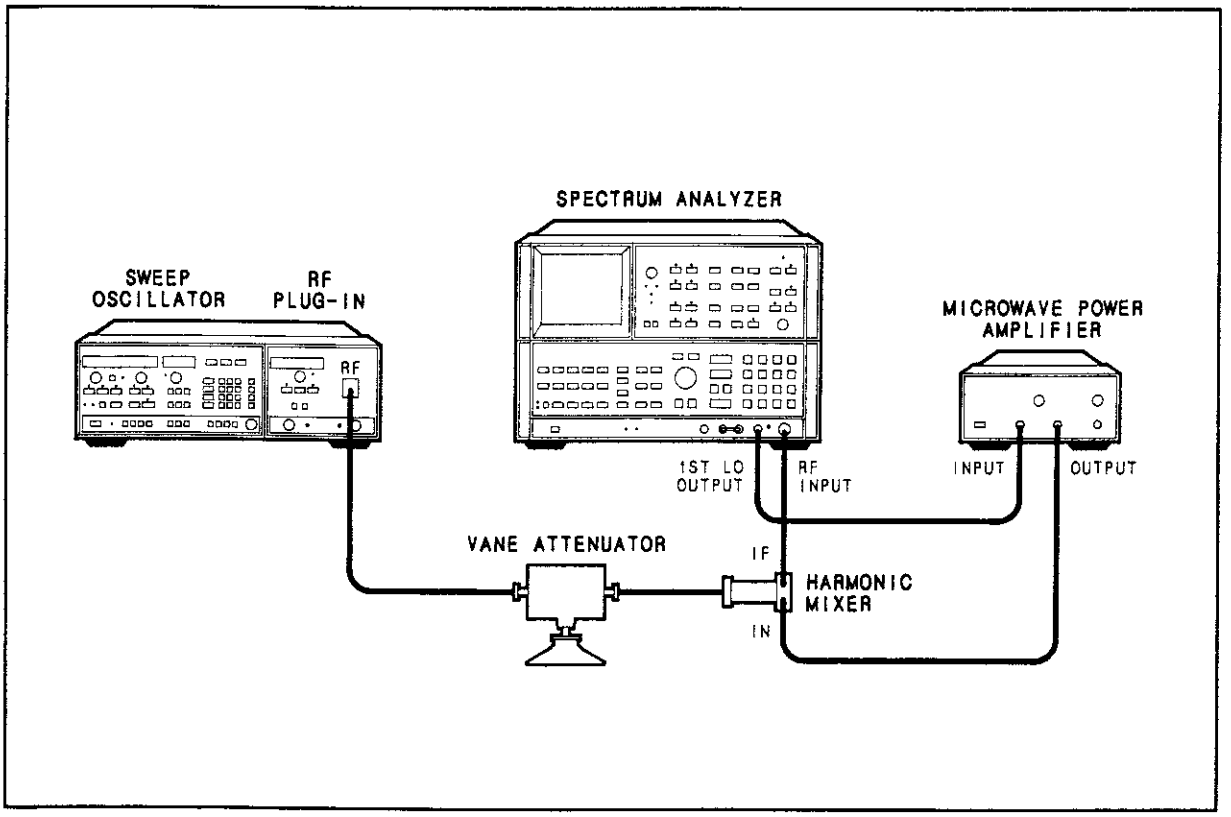


Figure 4-1. Frequency Range and CW Accuracy Test Setup

4-14. FREQUENCY RANGE AND ACCURACY TEST (Cont'd)

EQUIPMENT:

Spectrum Analyzer	HP 8566A
Microwave Power Amplifier	HP 11975A
External Harmonic Mixer	HP 11970A
Vane Attenuator	HP R382A
Frequency Meter	HP R532A
Oscilloscope	HP 1740A
Crystal Detector	HP R422A

NOTE

When the frequency range of the spectrum analyzer is extended using the external harmonic mixer, the response is unpreselected. Many signals are displayed, and a signal identification procedure is required. The signals of interest are an identical pair with a separation of 642.8 MHz, and the left one of the pair is frequency calibrated. To center the RF signal from the 83572A/B on the CRT of the spectrum analyzer, press 8566A [PEAK SEARCH] [SIGNAL TRACK] [SHIFT] [FREE RUN].

PROCEDURE

1. Connect the equipment as shown in Figure 4-1. Set the vane attenuator to 20 dB.

2. Set the spectrum analyzer controls as follows:

Press **[SHIFT]** [◢]	
CENTER FREQUENCY	26.5 GHz
FREQUENCY SPAN	300 MHz

3. Press 8350A/B **[INSTR PRESET]**. Note that the START frequency displayed is 26.5 GHz and the STOP frequency displayed is 40 GHz.

Frequency Range

4. Press 8350A/B **[CW] [2] [6] [.] [5] [GHz]**. If the frequency observed on the spectrum analyzer is greater than 26.50 GHz, rotate the 8350A/B CW control counterclockwise until the frequency on the spectrum analyzer is at or below 26.50 GHz. Enter the spectrum analyzer reading on the test record.

5. On the spectrum analyzer enter **[CENTER FREQUENCY] [4] [0] [GHz]**. Press 8350A/B **[4] [0] [GHz]**. If the frequency observed on the spectrum analyzer is lower than 40.00 GHz, rotate the 8350A/B CW control clockwise until the spectrum analyzer indicates a frequency of 40 GHz or above. Enter the spectrum analyzer reading on the test record.

Frequency Accuracy

6. Set the 8350A/B to the three following CW frequencies (28.00, 32.00, and 39.00 GHz), and check that the spectrum analyzer reading at each frequency is accurate ±100 MHz. Record the spectrum analyzer readings on the performance test record.

4-14. FREQUENCY RANGE AND ACCURACY TEST (Cont'd)

Swept Frequency Accuracy

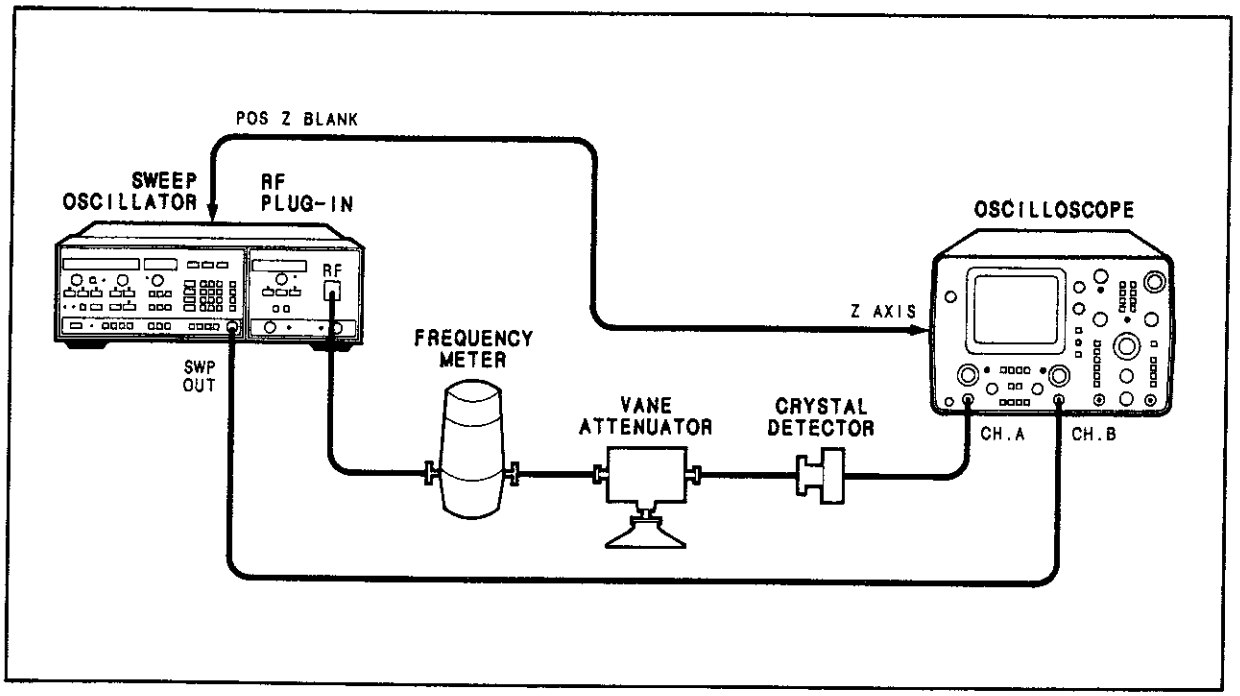


Figure 4-2. Swept Frequency Accuracy Test Setup

7. Connect the equipment as shown in Figure 4-2. Set the vane attenuator to 15 dB. Set the oscilloscope to A vs B mode; set channel A to 50 mV/DIV and channel B to 1V/DIV. Press 8350A/B **[INSTR PRESET] [SWEEP TIME] [1] [0] [5] [msec]**.

8. Set the frequency meter to position the lowest point of the dip at the start of the oscilloscope trace (left edge).

9. Verify the frequency meter indication is 26.5 GHz ±150 MHz. Enter the reading on the test record.

10. Set the frequency meter to position the lowest point of the dip at the end of the oscilloscope sweep (right edge of the trace).

11. Verify the frequency meter indication is 40 GHz ±150 MHz. Enter the reading on the test record.

Frequency Marker Accuracy

12. Press 8350A/B **[INSTR PRESET]** and set the sweep time to 105 msec.

13. On the 8350A/B enter three marker frequencies as follows:

    [M1] [2] [7] [GHz]
    [M2] [3] [3] [GHz]
    [M3] [3] [9] [GHz]

14. Set the frequency meter dip coincident with each marker and verify that the frequency meter indicates the marker frequency ±217 MHz (±150 MHz ± 0.5% of sweep width). Enter the frequency meter indications on the test record.

4-15. OUTPUT AMPLITUDE TEST

SPECIFICATION:

Power Output (25°C ±5°C)		
Minimum Unleveled Output Power	**83572A** **83572B**	+3 dBm +7 dBm
Option 001 (at output of external leveling coupler)	1.0 dB less than standard	
Option 006 (at waveguide output of plug-in)	1.5 dB less than standard	
Option 001/006 (at output of external leveling coupler)	2.5 dB less than standard	
Power Variation		
Externally Leveled		
Negative Crystal Detector (excluding coupler and detector variation)		±0.1 dB
Power Meter		±0.1 dB

DESCRIPTION:

The 8350A/B is set to a 100 second sweep time and the minimum power point is measured with a power meter.

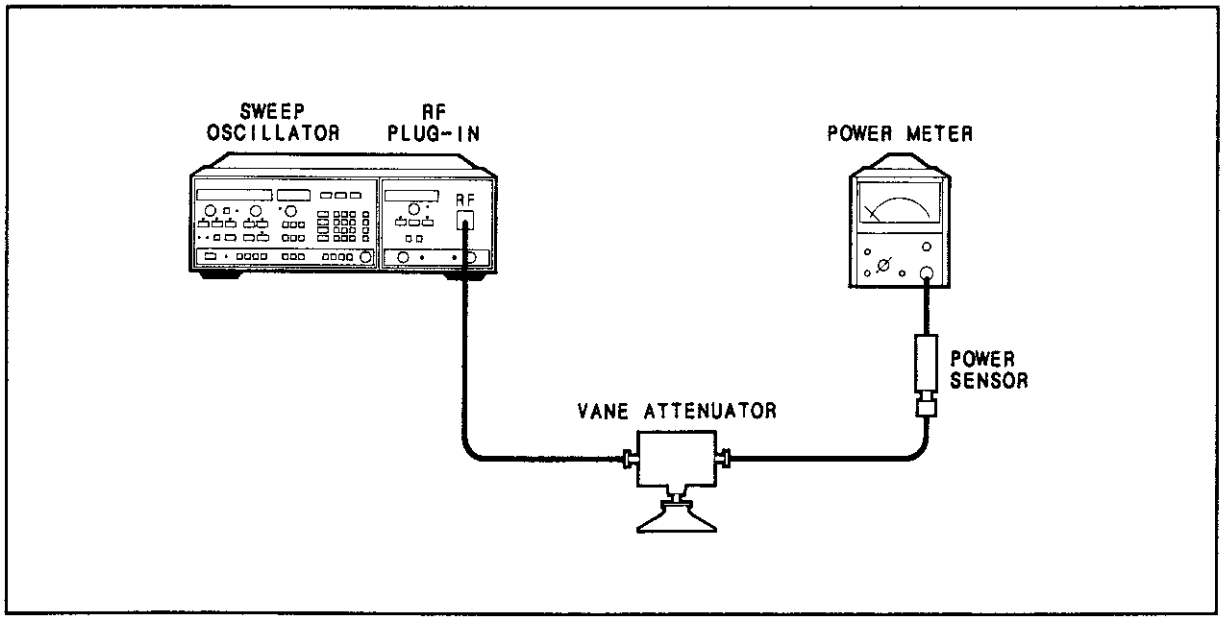


Figure 4-3. Output Amplitude Test Setup

4-15. OUTPUT AMPLITUDE TEST (Cont'd)

EQUIPMENT:

Power Meter	HP 432A
Power Sensor	HP R486A
Vane Attenuator	HP R382A
Oscilloscope	HP 1740A
Directional Coupler	HP R752C
Crystal Detector	HP R422A

PROCEDURE:

Minimum Unleveled Output Power

1. Connect the equipment as shown in Figure 4-3. Set the vane attenuator to 10 dB. Calibrate the power meter.

2. On the 8350A/B, make the following entries:

   [INSTR PRESET]
   [SINGLE TRIGGER]
   [SWEEP TIME] [1] [0] [0] [s]
   [POWER LEVEL] [1] [5] [dBm]

3. Press **[SINGLE]** to initiate a sweep and note the minimum power level indication on the power meter during the forward sweep. (Be aware of the calibration factor of the power sensor.) Add 10 dB to the power meter reading to account for the 10 dB loss through the attenuator. Enter this calculated power level on the test record.

Power Variation (Externally Leveled)

A. Negative Crystal Detector Leveling

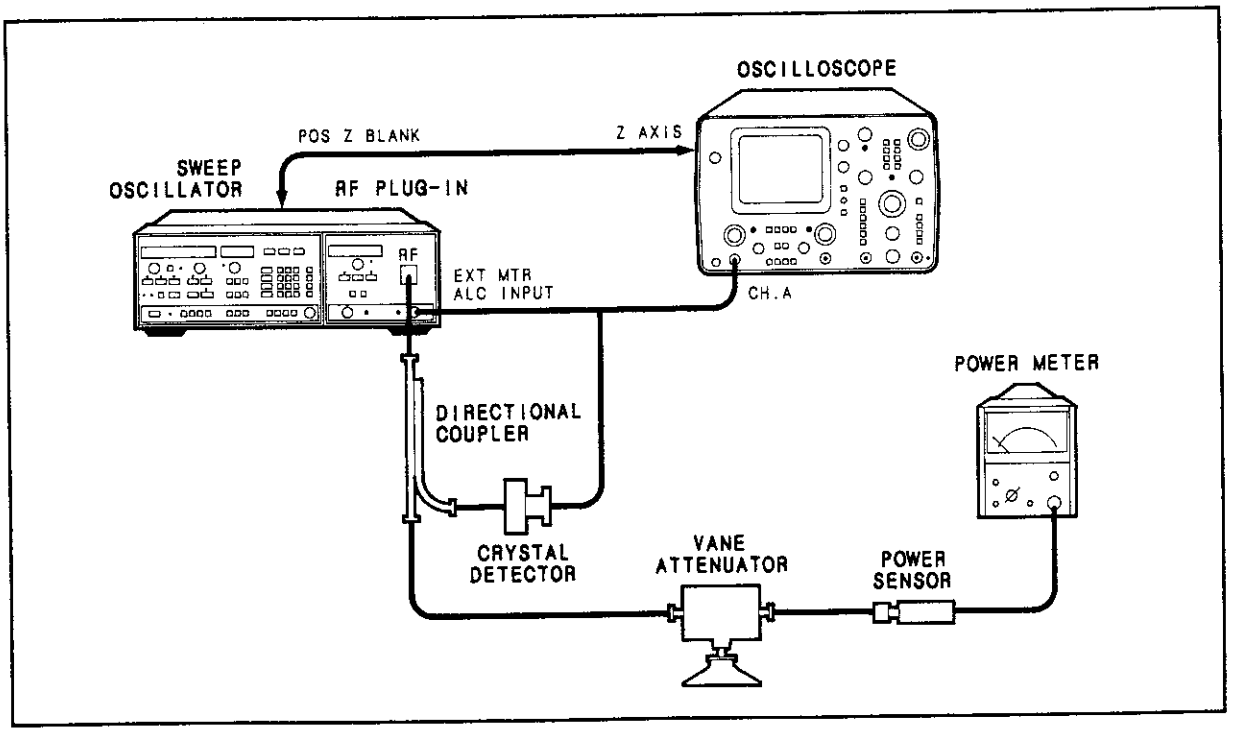


Figure 4-4. Crystal Detector Leveling Test Setup

4-15. OUTPUT AMPLITUDE TEST (Cont'd)

4. Connect the equipment as shown in Figure 4-4. Set the vane attenuator to 10 dB.

5. On the 8350A/B press **[INSTR PRESET] [TIME] [.] [1] [s] [CW]**. On the RF plug-in, reduce the displayed power level by 1 dB unless the instrument is an Option 001.

6. On the 83572A/B press **[EXT] ALC MODE**. Adjust the ALC CAL to calibrate the power meter reading with the plug-in POWER display, taking into account the 10 dB loss through the vane attenuator.

7. Vary the 83572A/B RF output power ±0.1 dB from this reference as noted on the power meter, and mark the level of the oscilloscope trace at both extremes.

8. Return the 83572A/B RF output power to its original setting. Press 8350A/B **[START]**. The entire trace on the oscilloscope should be within the window between the two marks.

B. Power Meter Leveling

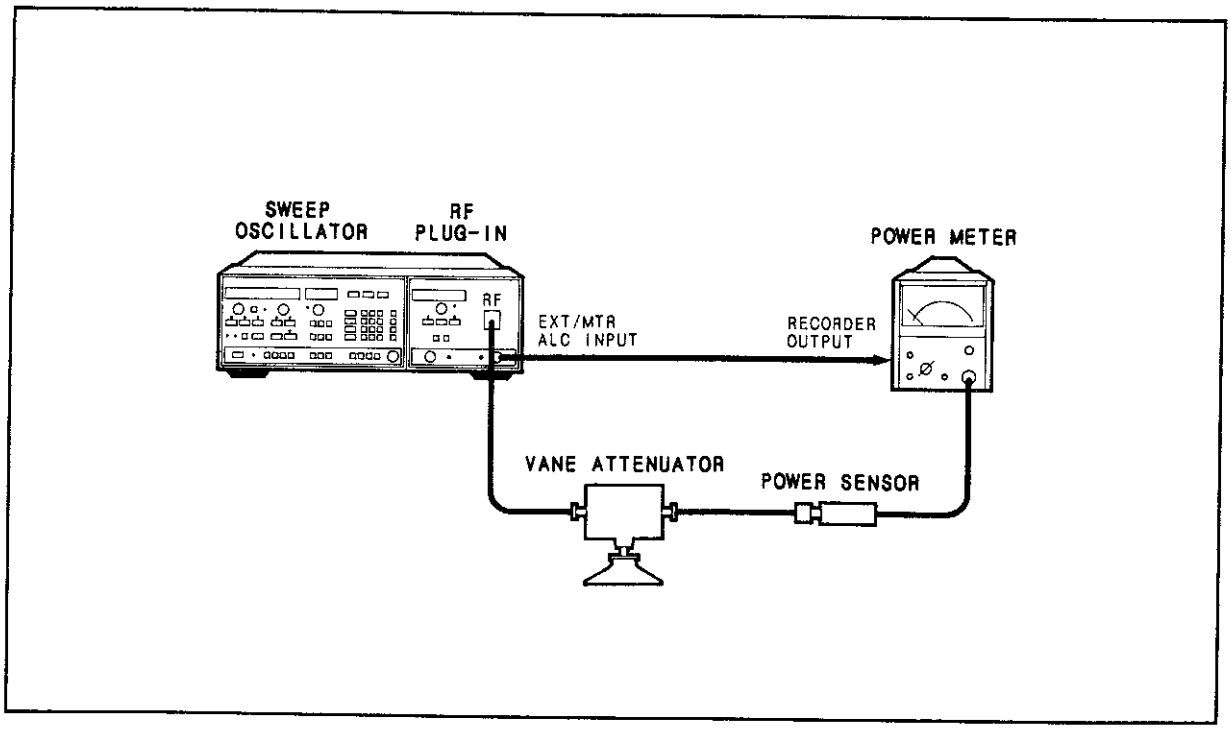


Figure 4-5. Power Meter Leveling Test Setup

9. Connect the equipment as shown in Figure 4-5. Set the vane attenuator to 10 dB.

10. Press 8350A/B **[INSTR PRESET] [TIME] [1] [0] [0] [s] [CW]**.

11. Press 83572A/B **[MTR] ALC MODE** and adjust the ALC CAL for a power meter reading equal to the plug-in POWER reading plus 10 dB (to account for the loss through the vane attenuator).

12. Press 8350A/B **[START]**. The entire sweep should be within a 0.2 dB window on the power meter.

4-16. RESIDUAL AM

SPECIFICATION:

In 100 kHz bandwidth: ≥50 dB below carrier

DESCRIPTION:

The RF output signal from the 83572A/B is amplitude modulated with a square wave applied from a function generator. The modulated signal is used to establish a reference on the RMS voltmeter that is 9 dB below the actual carrier signal. The 9 dB reduction occurs because of the voltmeter's response to the square wave and the square-law response of the crystal detector. The modulating signal is then removed and the magnitude of the residual AM component is measured with respect to the established reference.

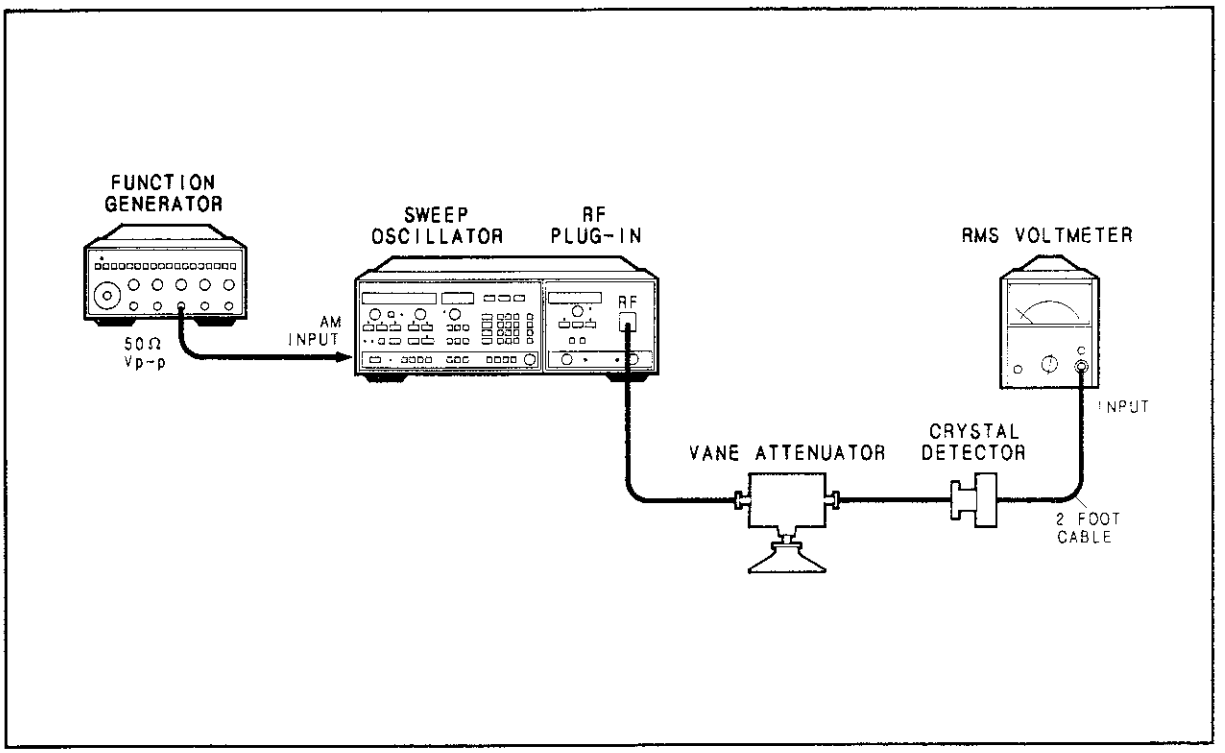


Figure 4-6. Residual AM Test Setup

EQUIPMENT:

RMS Voltmeter	HP 3400A
Crystal Detector	HP R422A
Vane Attenuator	HP R382A
60 cm (24 in) cable (Limits bandwidth to approximately 100 kHz)	HP 11170B
Function Generator	HP 3312A

4-16. RESIDUAL AM (Cont'd)

PROCEDURE:

1. Connect the equipment as shown in Figure 4-6. Set the vane attenuator to 20 dB.

2. Press 8350A/B **[INSTR PRESET] [CW]**, and disengage **[DISPL BLANK]**. Set the function generator for a 0 to −10 volt 1 kHz squarewave output.

NOTE

A 41 dB decrease in the RMS voltmeter indication corresponds to a 50 dB reduction in signal level. A correction factor of −9 dB is added because of the RMS voltmeter's response to a square wave and the square-law response of the crystal detector.

3. Vary the attenuation of the vane attenuator to obtain a reading on the RMS voltmeter of −28 dB ±3 dB. This ensures that the signal is in the square-law region of the crystal detector. Enter the voltmeter reading in the test record.

4. Disconnect the function generator from the 8350A/B. Change the range of the RMS voltmeter to obtain an on-scale reading. Calculate the difference between this and the reading noted in step 4, and add −9 dB to compensate for square-law inequities. The result should be at least 50 dB below the 83572A/B RF output signal. Enter this result in the test record.

4-17. FREQUENCY STABILITY TEST

SPECIFICATION:

With 10% line voltage change: ≤±1 MHz

With 10 dB power level change: ≤±200 kHz

With 3:1 load SWR: ≤±100 kHz

DESCRIPTION:

A spectrum analyzer is used to check changes in frequency due to line voltage changes, output power level changes, and load impedance changes.

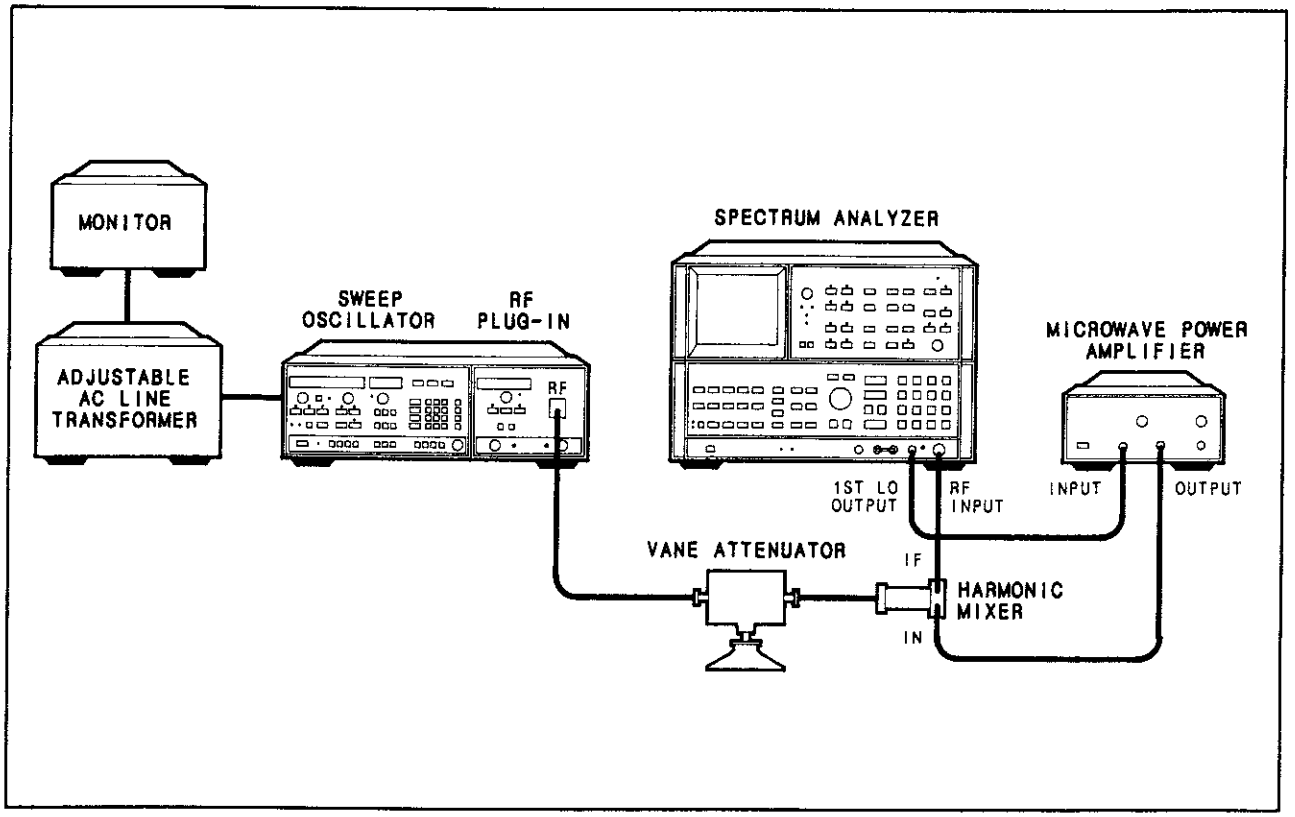


Figure 4-7. Frequency Change with Line Voltage Change

4-17. FREQUENCY STABILITY TEST (Cont'd)

EQUIPMENT:

Spectrum Analyzer ..... HP 8566A
Microwave Power Amplifier ..... HP 11975A
External Harmonic Mixer ..... HP 11970A
Vane Attenuator ..... HP R382A
Directional Coupler ..... HP R752C
Adjustable AC Line Transformer and Monitor
(Select for line voltage needed)
100–120 volt ..... General Radio W5MTB
120V Monitor ..... RCA WV 120B
220–240 volt ..... General Radio W10HM73
240V Monitor ..... RCA WV 503A
Adjustable Short ..... HP R920B

PROCEDURE:

Frequency Change with Line Voltage Change

1. Connect the equipment as shown in Figure 4-7 and set the 8350A/B LINE switch to ON. Set the vane attenuator to 20 dB.

2. Check the line voltage setting on the 8350A/B power module. Using the appropriate monitor, set the adjustable line transformer to the same voltage as the 8350. Press 8350A/B **[INSTR PRESET] [CW] [3] [3] [GHz].**

Table 4-3. High and Low Line Voltage Selection Table

Nominal Line Voltage	100V	120V	220V	240V
Low Line Voltage	90V	108V	198V	216V
High Line Voltage	105V	126V	231V	252V

3. Set the spectrum analyzer controls as follows:

Press **[SHIFT]** [◆]
CENTER FREQUENCY ..... 33 GHz
FREQUENCY SPAN ..... 500 MHz
Press **[PEAK SEARCH] [SIGNAL TRACK] [SHIFT] [FREE RUN].**

Wait five minutes to allow the RF output signal frequency to stabilize, then change the spectrum analyzer frequency span to 10 MHz. Note the RF output frequency on the spectrum analyzer, and enter this in the test record.

4. Set the adjustable line transformer to the low line voltage shown in Table 4-3, using the appropriate monitor for the selected nominal line voltage. Note the difference in frequency from the reading in step 3 (this should be $\leq \pm 1$ MHz), and enter this difference in the test record.

4-17. FREQUENCY STABILITY TEST (Cont'd)

5. Set the adjustable line transformer to the high line voltage shown in Table 4-3, using the appropriate monitor for the selected nominal line voltage. Note the difference in frequency from the reading in step 3 (this should be ≤±1 MHz), and enter this difference in the test record.

Frequency Change with 10 dB Power Level Change

6. Set the adjustable line transformer voltage to nominal. On the 83572A/B enter **[UNLVLD PWR] [POWER LEVEL] [1] [5] [dBm]**.

7. Slowly decrease the 83572A/B power level with the control knob until the RF power indication on the spectrum analyzer starts to decrease. On the 8350A/B enter **[SAVE] [1]**.

8. Note the signal amplitude on the spectrum analyzer, then use the 83572A/B power level control knob to decrease the actual RF power 10 dB. Enter **[SAVE] [2]**.

9. On the spectrum analyzer, set the frequency span to 5 MHz and recenter the signal.

10. On the 8350A/B, alternate between **[RECALL] [1]** and **[RECALL] [2]**. Note the actual frequency difference between the two recall registers (this should be ≤±200 kHz). Enter this difference in the test record.

Frequency Change With 3:1 Load SWR

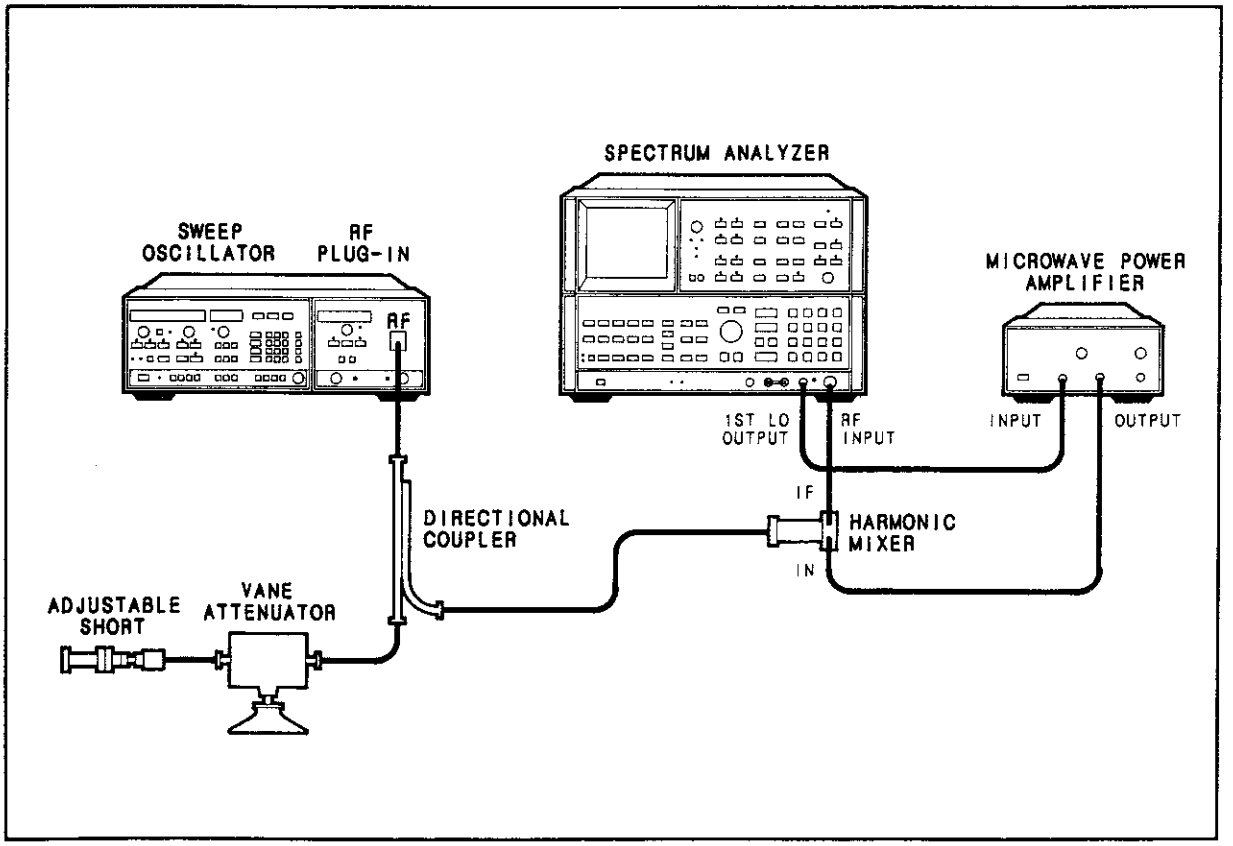


Figure 4-8. Frequency Change with 3:1 Load SWR Test Setup

4-17. FREQUENCY STABILITY TEST (Cont'd)

11. Connect the equipment as shown in Figure 4-8. Set the vane attenuator to 3 dB. Press 8350A/B **[INSTR PRESET] [CW] [3] [3] [GHz]**.

12. Set the spectrum analyzer controls as follows:

    Press **[SHIFT] [◢]**
    CENTER FREQUENCY ..... 33 GHz
    FREQUENCY SPAN ..... 300 MHz
    Press **[PEAK SEARCH] [SIGNAL TRACK] [SHIFT] [FREE RUN]**.

13. Reduce the spectrum analyzer frequency span to 2 MHz and recenter the signal.

14. Note the RF output frequency on the spectrum analyzer, and enter this in the test record.

15. Vary the adjustable short through its range while observing the spectrum analyzer for the greatest plus and minus frequency change (this should be $\leq \pm 100$ kHz). Note the frequency difference between the maximum plus and minus frequency changes, and enter this difference in the test record.

4-18. RESIDUAL FM TEST

SPECIFICATION:

(10 Hz to 10 kHz Bandwidth)
(CW Mode with CW Filter)

Peak: <60 kHz

DESCRIPTION:

The demodulation sensitivity of the spectrum analyzer is determined using slope detection. The filtered CW RF output of the 83572A/B is then displayed on the vertical axis using the zero-span mode of the spectrum analyzer. The residual FM of the 83572A/B corresponds directly to the vertical deviation of the spectrum analyzer display, measured in units of kHz/div.

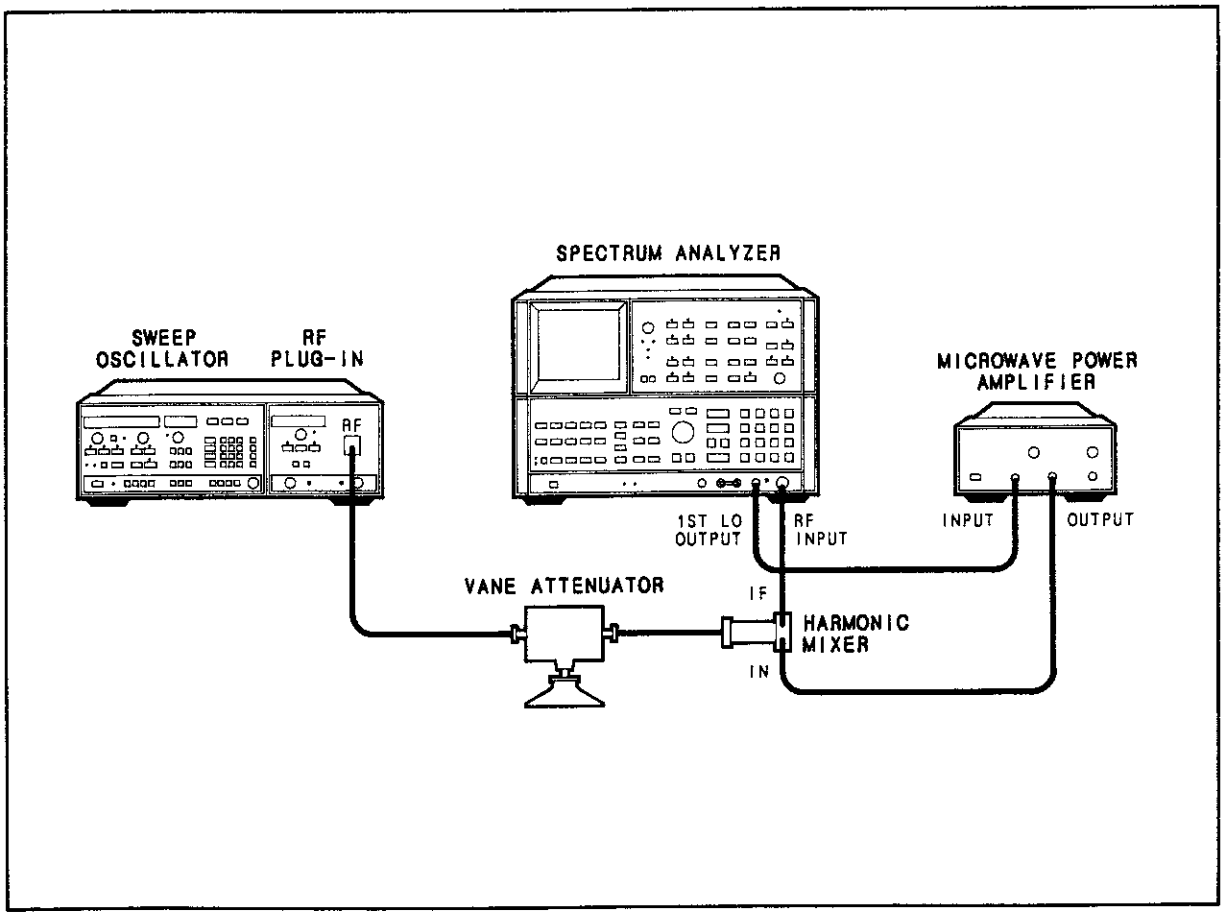


Figure 4-9. Residual FM Test Setup

EQUIPMENT:

Spectrum Analyzer	HP 8566A
Microwave Power Amplifier	HP 11975A
External Harmonic Mixer	HP 11970A
Vane Attenuator	HP R382A

4-18. RESIDUAL FM TEST (Cont'd)

PROCEDURE:

1. Connect the equipment as shown in Figure 4-9, but do not connect the mixer output yet. Set the vane attenuator to 20 dB.

2. Press 8350A/B **[INSTR PRESET] [CW] [4] [0] [GHz]**.

NOTE

To mimimize drift, allow five minutes warmup time before continuing with this test.

Slope Detection

3. On the spectrum analyzer, press **[INSTR PRESET]**, and set the controls as follows:

CENTER FREQUENCY	0.0 MHz
FREQUENCY SPAN	5 MHz
RESOLUTION BW	300 kHz
REFERENCE LEVEL	−10 dBm
LOG	10 dB/DIV
VIDEO BW	10 kHz
ATTENUATION	MANUAL

4. Center the L.O. feedthrough signal on the spectrum analyzer display and set the peak of the expanded trace at the reference level (top) graticule line by pressing the following key sequence:

[SHIFT] [PEAK SEARCH] [SIGNAL TRACK]
[ENTER dB/DIV] [1] [dB]
[MKR−REF LEVEL] [MARKER OFF]

5. Demodulation sensitivity is measured over an 8 dB section of the linear portion of the IF bandwidth skirt. To obtain a good display of this linear portion of the signal, make the following entries on the spectrum analyzer:

Press **[REF LEVEL]** [◆] [◆] [◆] [◆] [◆] [◆] [◆] [◆] [◆].
Press **[FREQ SPAN] [1] [MHZ]**.
Press **[CENTER FREQUENCY]** and adjust the center frequency to center one side of the filter on the CRT.
Press **[FREQ SPAN] [200] [kHz]**

6. Observe a linear ramp centered on the CRT display.

7. On the spectrum analyzer, press **[NORMAL]**, and adjust the RPG knob to place a marker 1 dB down from the top reference line. Press **[Δ]** to activate the delta marker function, and tune the second marker 1 dB above the bottom of the trace. The portion of the trace between the markers should be linear.

8. Observe the delta marker frequency (difference in frequency between the markers), and divide by 8 divisions. This will give a demodulation sensitivity typically of about 20 kHz/div.

4-18. RESIDUAL FM TEST (Cont'd)

Measuring Residual FM

9. Connect the HP 83572/8350 through the vane attenuator to the external mixer. Set the spectrum analyzer controls as follows:

   Press **[INSTR PRESET]**
   Press **[SHIFT]** [◄►]
   CENTER FREQUENCY ..... 40 GHz
   FREQUENCY SPAN ..... 100 MHz
   LOG ..... 10 dB/DIV
   REFERENCE LEVEL ..... +10 dBm
   RESOLUTION BW ..... 300 kHz

10. Both the upper and the lower sidebands of the 83572A/B 40 GHz signal are displayed on the spectrum analyzer CRT. Adjust the spectrum analyzer REFERENCE LEVEL to place the peak of the lower sideband signal trace at the reference level (top) graticule line.

11. Expand the spectrum analyzer display scale to 1 dB/DIV and repeat step 10 if necessary.

12. Reduce the FREQUENCY SPAN to 0 while keeping the signal centered on the CRT with the TUNING control.

13. Decrease the REFERENCE LEVEL by 8 dB and position the trace at midscreen by adjusting the CENTER FREQUENCY.

14. Reduce the sweep time to 1 sec. Observe the maximum peak-to-peak deviation in divisions of the spectrum analyzer trace. The peak deviation is one-half the peak-to-peak deviation. Multiply the peak deviation by the modulation sensitivity calculated in step 7 to arrive at the amount of residual FM.

    Residual FM (kHz)
    = (peak-to-peak deviation/2) X (demodulation sensitivity)
    = _____ kHz

15. Verify that the residual FM is less than 60 kHz peak, and enter in the test record.

4-19. SPURIOUS SIGNALS TEST

SPECIFICATION:

Inband: ≥50 dB below carrier

DESCRIPTION:

The RF output signal from the HP 83572A/B is displayed on a spectrum analyzer. When the frequency range of the spectrum analyzer is extended using an external harmonic mixer, the response is unpreselected and multiple signals are displayed. Responses are examined to determine whether they are true in-band spurious signals and to verify that they are at or below the specified level.

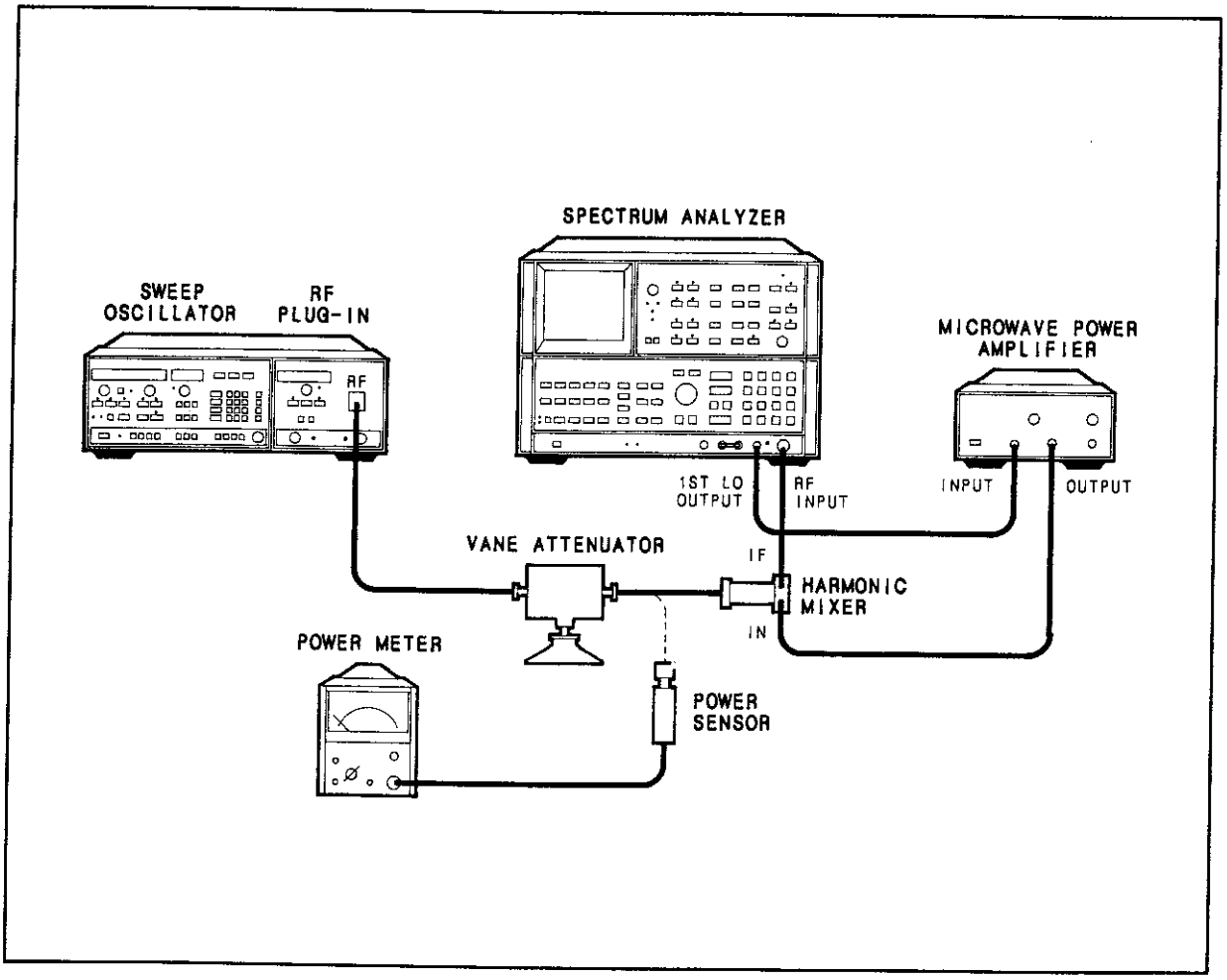


Figure 4-10. Spurious Signals Test Setup

EQUIPMENT:

Spectrum Analyzer	HP 8566A
Microwave Power Amplifier	HP 11975A
External Harmonic Mixer	HP 11970A
Vane Attenuator	HP R382A
Power Meter	HP 432A
Power Sensor	HP R486A
Directional Coupler	HP R752C
Crystal Detector	HP R422A

4-19. SPURIOUS SIGNALS TEST (Cont'd)

PROCEDURE:

1. Connect the equipment as shown in Figure 4-10, with the HP 83572A/B RF output connected through the external mixer to the spectrum analyzer. Set the vane attenuator to 20 dB.

2. On the 8350A/B, press **[INSTR PRESET] [SHIFT] [DET]** and adjust the POWER LEVEL for maximum leveled power. Then press **[CW] [3] [3] [.] [2] [5] [GHz]**.

3. On the spectrum analyzer make the following entries:

   Press **[SHIFT] [◄►]**
   START FREQ ..... 26.5 GHz
   STOP FREQ ..... 40 GHz
   FREQUENCY SPAN ..... 300 MHz
   RES BW ..... 1 MHz
   Press **[CENTER FREQUENCY]** and adjust the signal to the center of the display.

4. On the microwave power amplifier, adjust the output power level to maximize the signal, but do not exceed +16 dBm.

5. Calculate the reference level offset for the spectrum analyzer as follows: On the external harmonic mixer, find the average value of conversion loss from the table on the side panel. This is a minus dB value. Add +20 dB to this value to compensate for the loss through the vane attenuator. The total is the adjusted reference line offset.

   Example: −7 dB +20 dB = +13 dB adjusted reference line offset

6. On the spectrum analyzer press **[SHIFT] [REFERENCE LEVEL]**, and enter the adjusted reference line offset calculated above.

7. On the spectrum analyzer set the controls as follows:

   REFERENCE LEVEL ..... Adjust signal to top line
   LOG ..... 10 dB/DIV
   START FREQ ..... 26.5 GHz
   STOP FREQ ..... 40 GHz
   DISPLAY LINE ..... Adjust to center of CRT (5 divisions down from top)
   THRESHOLD ..... Adjust to 4 divisions above bottom line
   SAVE 1

8. On the 8350A/B press **[START]**. Set the SWEEP to **[MAN]**, and manually tune across the frequency range, verifying that the power is leveled across the band within ±2 dB.

9. On the spectrum analyzer make the following entries:

   START FREQ 26.5 GHz; STOP FREQ 32.928 GHz; SAVE 2

   START FREQ 30 GHz; STOP FREQ 36.428 GHz; SAVE 3

   START FREQ 33.572 GHz; STOP FREQ 40 GHz; SAVE 4

4-19. SPURIOUS SIGNALS TEST (Cont'd)

Storage registers 2, 3, and 4 in the spectrum analyzer store three frequency bands, covering the total range from 26.5 to 40 GHz. Each frequency band covers a span of 6.428 GHz. Each signal displayed on the spectrum analyzer appears twice, in the form of the upper and lower sideband mixing products. Therefore, any true in-band signal appears as an identical pair with a frequency spacing of 642.8 MHz, or exactly one division.

To examine a signal, use the spectrum analyzer **[NORMAL]** and **[Δ]** keys to place markers on the upper and lower sidebands (it may be necessary to narrow the frequency span for better resolution). If the frequency spacing is not 642.8 MHz, the signal is not a true in-band signal. Rather it is either a local oscillator or mixer induced harmonic product, and it should be ignored.

10. On the spectrum analyzer, press **[RECALL 2]**.

11. Manually tune the 83572A/B slowly from 26.5 to 40 GHz, checking for identical pairs of spurious signals that have a spacing of exactly one division. These are true spurious signals. Any spurious signal that is above the display line on the spectrum analyzer exceeds specifications. If a spurious signal is between the threshold and the display line, it is in the ambiguity region and must be checked further (see steps 14 to 20 below) to determine whether it exceeds specifications.

12. On the spectrum analyzer, press **[RECALL 3]** and repeat step 11.

13. On the spectrum analyzer, press **[RECALL 4]** and repeat step 11.

14. If any pair of spurious signals appears in the ambiguity region on the spectrum analyzer, note the displayed frequency of the 83572A/B. Also note the frequency of the lower sideband of the pair of signals.

15. Disconnect the harmonic mixer from the vane attenuator. Connect the power sensor to the vane attenuator as shown in Figure 4-10. Verify that the vane attenuator is set to 20 dB.

16. Use the power meter to measure the absolute power in dBm of the 83572A/B RF output signal. Note this reference power level.

17. Tune the 83572A/B to the frequency of the spurious signal noted in step 15. Adjust the vane attenuator to obtain a power meter reading at this frequency equal to the level noted in step 17.

    Example: If a fundamental signal at 29 GHz with an absolute power level of +3 dBm (−17 dBm at the output of the attenuator) causes a spurious signal at 30 GHz, tune the 83572A/B to 30 GHz and use the vane attenuator to set the power meter reading to −17 dBm.

18. Disconnect the power sensor from the vane attenuator. Do not change the vane attenuator setting or the 83572 frequency. Reconnect the harmonic mixer and spectrum analyzer. Center the lower sideband of the 83572A/B fundamental signal on the spectrum analyzer CRT and use the spectrum analyzer REFERENCE LEVEL to set the peak of the signal to the top of the screen. (In the example, this would give a reference level of −17 dBm.)

19. Tune the 83572A/B back to the frequency that originally caused the spurious signal (29 GHz in the example). Set the vane attenuator back to 20 dB.

20. Check the level of the spurious signals on the spectrum analyzer CRT. If the spurious signals are at least 50 dB below the top of the screen they are within specification.

4-20. OUTPUT SWR TEST

SPECIFICATION:

Unleveled: <2.0
Option 001 (externally leveled): <1.5

DESCRIPTION:

Output SWR is a measure of the impedance mismatch of the 83572A/B RF OUTPUT waveguide connector. The RF output signal is measured using a directional coupler, crystal detector, and oscilloscope. The signal at the oscilloscope contains (1) the incident signal from the oscillator, and (2) the reflected signal. The reflected signal is developed as follows: The incident signal travels down the waveguide, encounters the open end, and is reflected back to the source. If the reflected signal at the RF OUTPUT connector encounters a perfect source match, no signal is reflected back. However, the greater the mismatch, the greater the reflected signal. This reflected signal either adds to or subtracts from the incident signal. This variation is displayed on the oscilloscope.

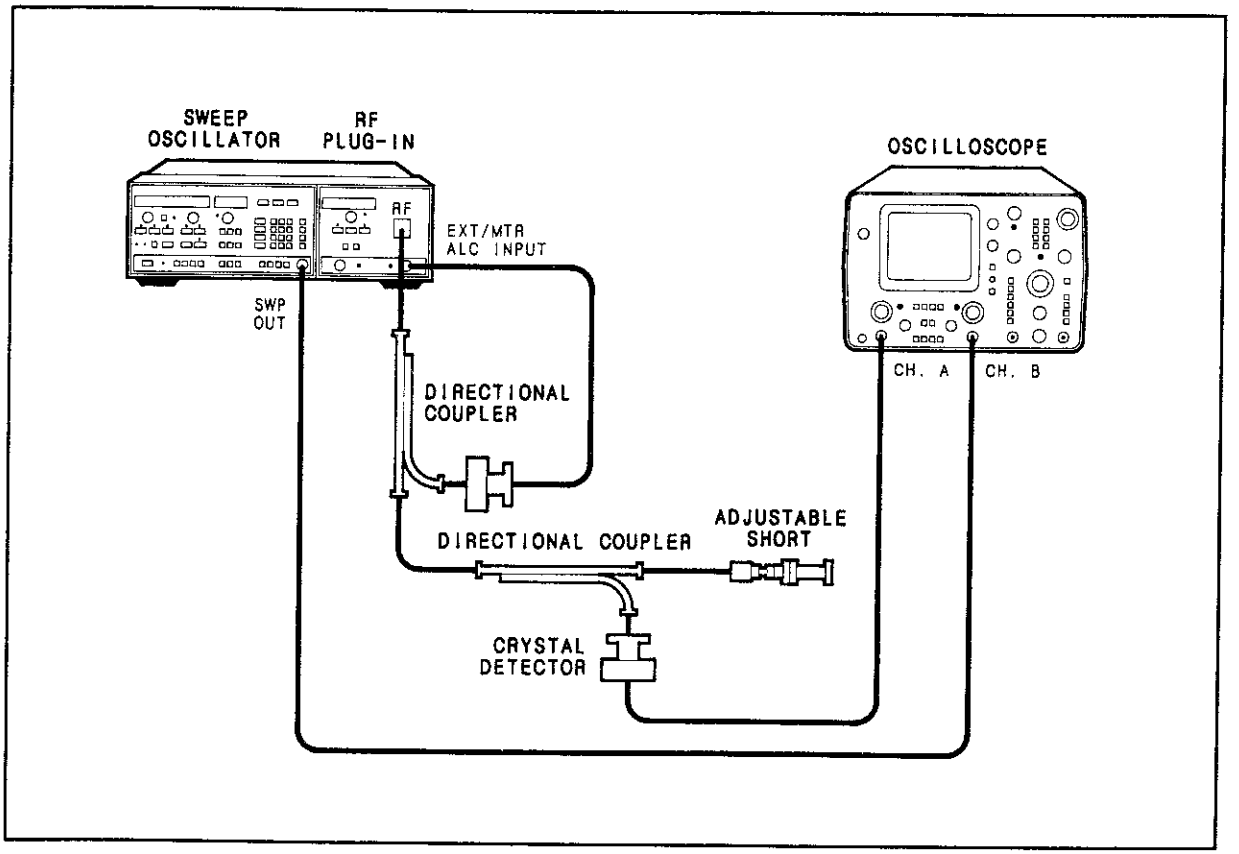


Figure 4-11. Output SWR Test Setup

EQUIPMENT:

Oscilloscope	HP 1740A
Crystal Detector	HP R422A
Directional coupler 26.5 to 40 GHz	HP R752C
Adjustable Short	HP R920B

4-20. OUTPUT SWR TEST (Cont'd)

PROCEDURE:

1. Connect equipment as shown in Figure 4-11. If the 83572A/B is not an Option 001, connect the directional coupler directly to the waveguide RF output connector.

2. Press 8350A/B **[INSTR PRESET] [DET]**. Set DISPL BLANKING off and RF BLANKING on.

3. Adjust the POWER control on the RF plug-in to obtain a maximum trace amplitude of −25 millivolts peak on the oscilloscope display, in order to keep the crystal detector in the square law output range.

4. Vary the adjustable short through its entire range and select points on the trace where V MAX and V MIN appear to have the greatest separation and calculate V MAX/V MIN for each point.

5. Convert the greatest V MAX/V MIN ratio noted in step 4 into source match SWR using the 1.0 dB loss line in Figure 4-12. The SWR should be less than 2.0 for a standard instrument or less than 1.5 for an Option 001. Enter the calculated SWR in the test record.

6. To check the output SWR of an Option 001 in the unleveled condition, remove the Option 001 directional coupler and crystal detector and connect the test coupler to the RF output of the plug-in.

7. On the 83572A/B, enter **[UNLVLD PWR]**.

8. Repeat steps 3 through 5. The SWR should be less than 2.0 for an Option 001 with unleveled power. Enter the calculated SWR in the test record.

4-20. OUTPUT SWR TEST (Cont'd)

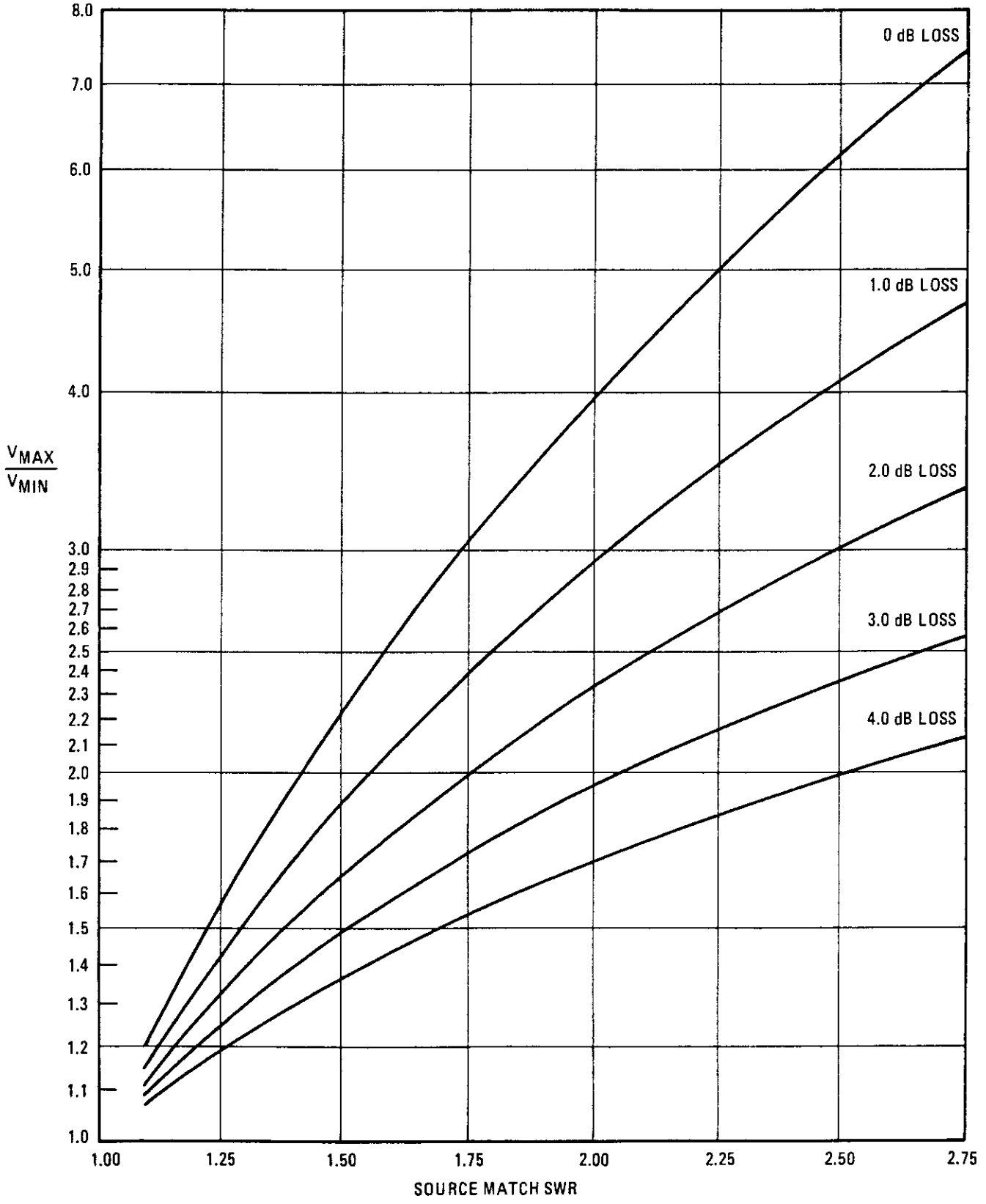


Figure 4-12. Conversion of Oscilloscope Trace to Source Match SWR

4-21. EXTERNAL FREQUENCY MODULATION TEST

SPECIFICATION:

Maximum Deviation for Modulation Frequencies:

Modulation Frequency	Cross-Over Coupled	Direct Coupled
DC to 100 Hz	≥±150 MHz	≥±6 MHz
100 Hz to 200 kHz	≥±3.5 MHz	≥±3.5 MHz

DESCRIPTION:

The RF output is modulated with an external signal at 100 Hz and at 200 kHz. The deviations are measured directly on a spectrum analyzer.

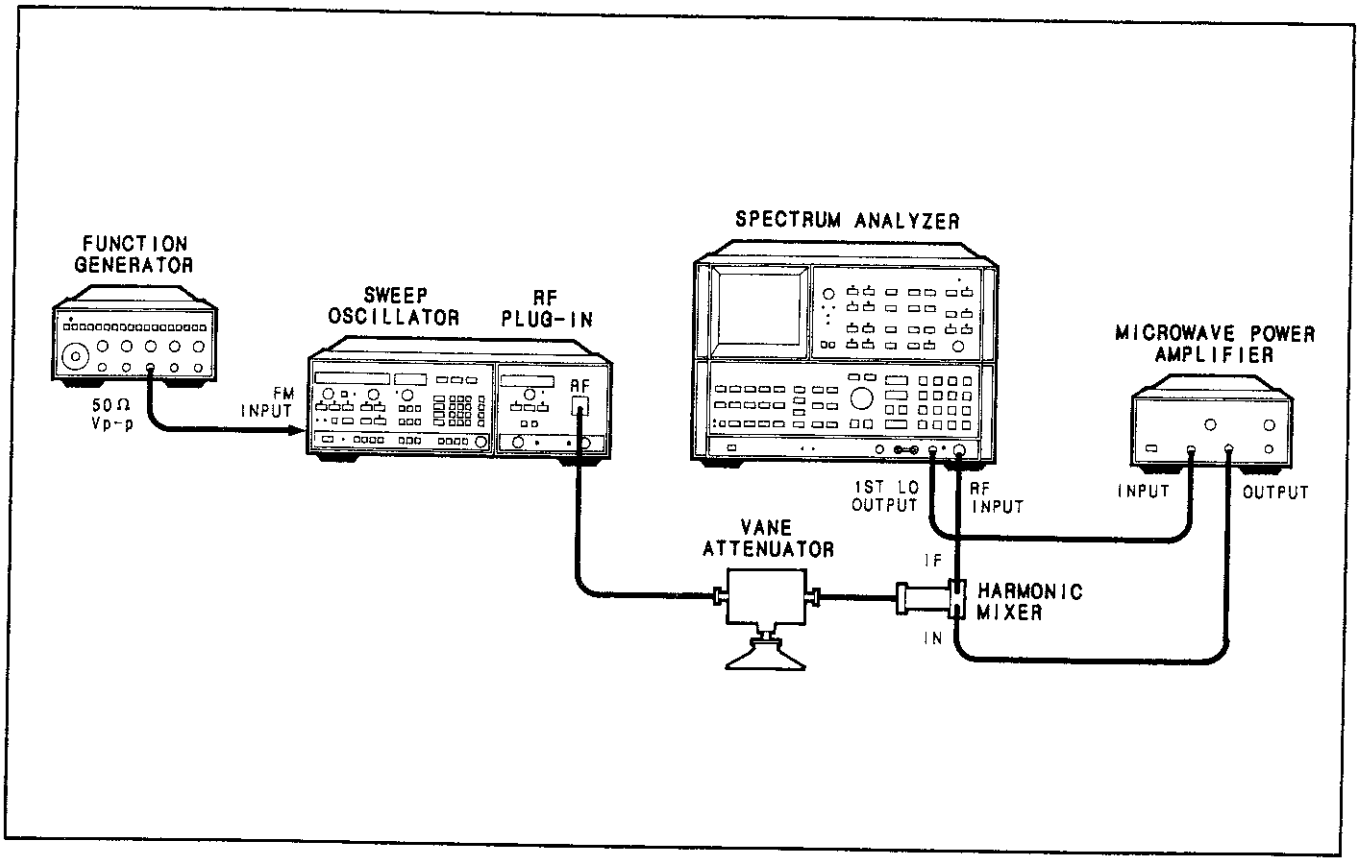


Figure 4-13. External Frequency Modulation Test Setup

4-21. EXTERNAL FREQUENCY MODULATION TEST (Cont'd)

EQUIPMENT:

Spectrum Analyzer	HP 8566A
Microwave Power Amplifier	HP 11975A
External Harmonic Mixer	HP 11970A
Function Generator	HP 3312A
Vane Attenuator	HP R382A

PROCEDURE:

Direct Coupled. 100 Hz Modulation

1. Ensure that the RF plug-in modulation sensitivity is set to −20 MHz/volt and the modulation coupling to DC. Refer to section III of this manual for information on setting the configuration switch. Connect the equipment as shown in Figure 4-13. Set the vane attenuator to 20 dB.

2. Press 8350A/B **[INSTR PRESET] [CW]** and turn off the RF plug-in **CW FILTER**.

3. On the spectrum analyzer, make the following entries:

Press **[SHIFT]** [◆]	
CENTER FREQUENCY	33.25 GHz
FREQUENCY SPAN	20 MHz

   Center the fundamental signal on the spectrum analyzer display.

4. Set the function generator frequency to 100 Hz sinewave and the amplitude full counterclockwise. Adjust the function generator amplitude control slowly clockwise while monitoring the display on the spectrum analyzer. Deviation from the center line should be symmetrical at first, then become non-symmetrical as deviation increases.

5. Note the point at which deviation becomes non-symmetrical or stops increasing (this should be ≥±6 MHz). Record the highest observed symmetrical deviation frequency on the test record. Disconnect the function generator.

Direct Coupled. 200 kHz Modulation

6. On the spectrum analyzer, press **[FREQUENCY SPAN] [1] [0] [MHz]**. Center the fundamental signal on the spectrum analyzer display.

7. Reconnect the function generator and set the frequency to 200 kHz sinewave and the amplitude full counterclockwise. Adjust the function generator amplitude slowly clockwise while monitoring the display on the spectrum analyzer. Note the point at which deviation becomes non-symmetrical or stops increasing (this should be ≥±3.5 MHz). Enter the highest observed symmetrical deviation frequency in the test record. Disconnect the function generator.

4-21. EXTERNAL FREQUENCY MODULATION TEST (Cont'd)

Crossover Coupled. 200 kHz Modulation

8. Turn the 8350A/B LINE switch off. Remove the RF plug-in and reset the configuration switch for crossover modulation coupling (refer to Section III of this manual). Reinstall the RF plug-in and turn the 8350A/B line switch on.

9. Leave the spectrum analyzer frequency span set to 10 MHz. Center the fundamental signal on the spectrum analyzer display. Reconnect the function generator. Leave the function generator frequency set to 200 kHz and set the amplitude full counterclockwise. Adjust the function generator amplitude control slowly clockwise while monitoring the display on the spectrum analyzer. Note the point at which deviation becomes non-symmetrical or stops increasing (this should be $\geq \pm 3.5$ MHz). Enter the highest observed symmetrical deviation frequency in the test record. Disconnect the function generator.

Crossover Coupled. 100 Hz Modulation

10. Set the spectrum analyzer frequency span to 500 MHz. Center the fundamental signal on the spectrum analyzer display. Reconnect the function generator and set its frequency to 100 Hz and amplitude full counterclockwise. Adjust the function generator amplitude control slowly clockwise while monitoring the display on the spectrum analyzer. Note the point at which deviation becomes non-symmetrical or stops increasing (this should be $\geq \pm 150$ MHz). Enter the highest observed symmetrical deviation frequency in the test record.

4-22. AM ON/OFF RATIO AND SQUARE WAVE SYMMETRY TEST (OPTION 006 or 001/006 ONLY)

SPECIFICATON:

AM On/Off Ratio: ≥ 20 dB

Symmetry: 50% ±5%

DESCRIPTION:

The AM ON/OFF ratio is checked on the amplitude axis of a video triggered spectrum analyzer display. The symmetry is checked by calculating the on/off time ratio on the frequency axis.

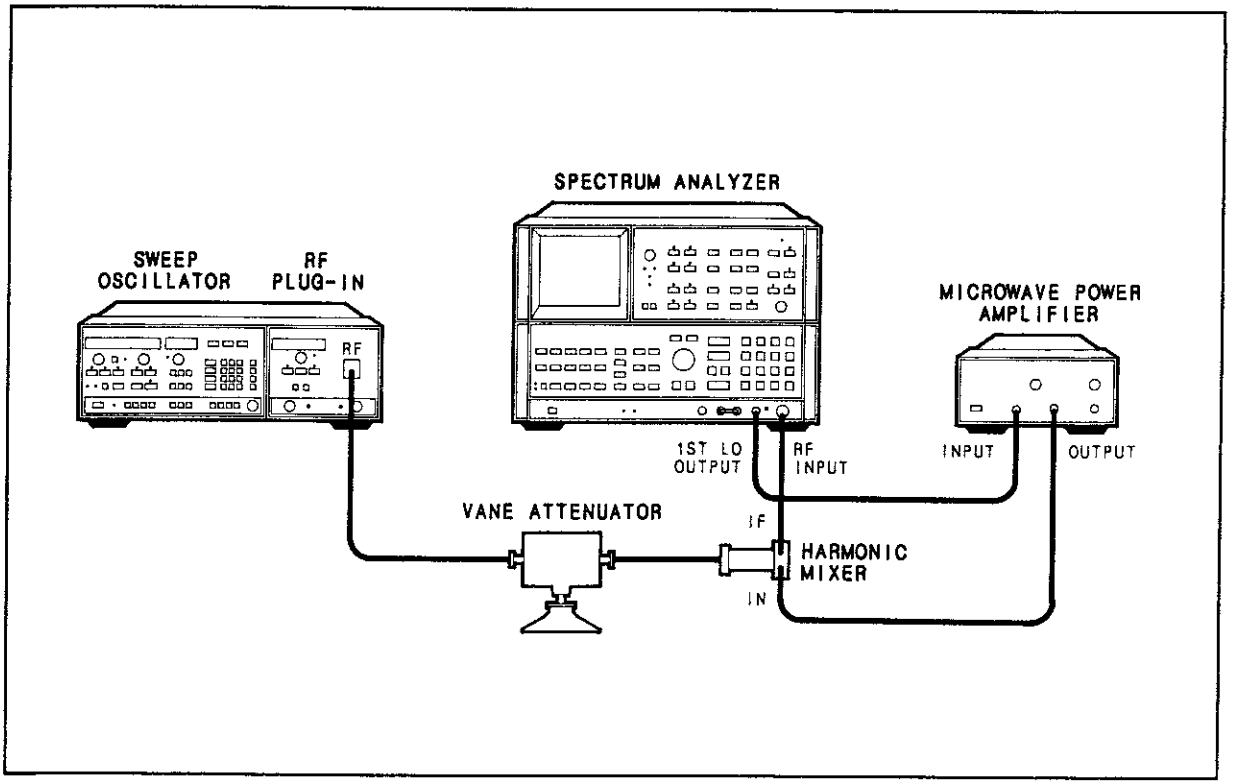


Figure 4-14. AM ON/OFF Ratio and Square Wave Symmetry Test Setup

EQUIPMENT:

Spectrum Analyzer	HP 8566A
Microwave Power Amplifier	HP 11975A
External Harmonic Mixer	HP 11970A
Vane Attenuator	HP R382A

4-22. AM ON/OFF RATIO AND SQUARE WAVE SYMMETRY TEST (Cont'd) (OPTION 006 or 001/006 ONLY)

PROCEDURE:

1. Connect the equipment as shown in Figure 4-14. Set the vane attenuator to 20 dB. Press 8350A/B **[INSTR PRESET] [CW] [⊔⊓ MOD]**.

2. Set the spectrum analyzer controls as follows:

   Press **[INSTR PRESET]**
   Press **[SHIFT] [◆]**
   CENTER FREQUENCY ..... 33.25 GHz
   FREQUENCY SPAN ..... 500 MHz

3. Adjust the spectrum analyzer TUNING control to center the signal on the CRT. Adjust the REFERENCE LEVEL to set the peak of the signal on the top graticule.

4. Make the following entries on the spectrum analyzer:

   [FREQUENCY SPAN] [1] [0] [MHz]
   [ENTER dB/DIV] [5] [dB]

5. Repeat step 3.

6. Set the spectrum analyzer controls as follows:

   RESOLUTION BW ..... 3 MHz
   VIDEO BW ..... 3 MHz
   SWEEP TIME ..... 100 us
   FREQUENCY SPAN ..... 0 MHz
   VIDEO TRIGGER ..... (Adjust LEVEL)

7 The AM on/off ratio is the amplitude difference between the on and off portions of the square wave. Verify that the on/off ratio is at least 20 dB. Enter the AM on/off ratio in the test record.

8. The symmetry of the square wave is the percentage of on time to off time. Verify that the symmetry of the modulated signal is 50% ±5%. Record the symmetry in the test record.

Table 4-2. Performance Test Record (1 of 2)

SPECIFICATION TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-14. Frequency Range and Accuracy					
CW Mode					
26.5–40 GHz: ±100 MHz	4.	Start frequency = 26.5 GHz			26.5 GHz
	5.	Stop frequency = 40 GHz	40 GHz	_____	
	6.	CW frequency = 28.00 GHz	27.90 GHz	_____	28.1 GHz
		CW frequency = 32.00 GHz	31.90 GHz	_____	32.1 GHz
		CW frequency = 39.00 GHz	38.90 GHz	_____	39.1 GHz
Swept Frequency Accuracy					
26.5–40 GHz: ±150 MHz	9.	Start frequency = 26.5 GHz	26.35 GHz	_____	26.65 GHz
	11.	Stop frequency = 40 GHz	39.85 GHz	_____	40.15 GHz
Marker Accuracy					
26.5–40 GHz:	14.	Sweep width: 26.5–40 GHz			
±150 MHz ±0.5% of sweep width		M1 = 27 GHz	26.783 GHz	_____	27.217 GHz
		M2 = 33 GHz	32.783 GHz	_____	33.217 GHz
		M3 = 39 GHz	38.783 GHz	_____	39.217 GHz
4-15. Output Amplitude					
Minimum Unleveled Output Power	3.	Power = +15 dBm			
83572A: Std			+3 dBm	_____	
Opt 001			+2 dBm	_____	
Opt 006			+1.5 dBm	_____	
Opt 001/006			+0.5 dBm	_____	
83572B: Std			+7 dBm	_____	
Opt 001			+6 dBm	_____	
Opt 006			+5.5 dBm	_____	
Opt 001/006			+4.5 dBm	_____	
Crystal Detector Leveled: ±0.1 dB	8.			_____	<0.2 dB
Power Meter Leveled: ±0.1 dB	12.			_____	<0.2 dB
4-16. Residual AM					
26.5–40 GHz: ≥50 dB	2.	CW frequency = 33 GHz			
	4.	In dB below carrier	≥50 dB	_____	
4-17. Frequency Stability					
+5 to −10% V Line Change:					
26.5–40 GHz: ±1 MHz	2.	CW frequency = 33 GHz			
	4.	Low line voltage		_____	±1 MHz
	5.	High line voltage		_____	±1 MHz
10 dB Power Change:					
26.5–40 GHz: ±200 kHz		CW frequency = 33 GHz			
	10.	Reduce power 10 dB		_____	±200 kHz
3:1 Load SWR					
26.5–40 GHz: ±100 kHz		CW frequency = 33 GHz			
	15.			_____	±100 kHz

Table 4-2. Performance Test Record (2 of 2)

SPECIFICATION TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-18. Residual FM					
26.5–40 GHz: <60 kHz	2.	CW frequency = 40 GHz			
	15.			_____	<60 kHz
4-19. Spurious Signals					
Inband: ≥50 dB		In dB below carrier			
	20.		≥50 dB	_____	
4-20. Output SWR					
Unleveled: <2.0		Range 26.5–40 GHz			
Leveled: <1.5	5.			_____	<2.0
				_____	<1.5
4-21. External FM					
Direct Coupled:	1.	A3S1: Close switch 5, open 6			
DC–100 Hz: ±6 MHz	5.		±6 MHz	_____	
Direct/Cross Over Coupling:					
100 Hz–200 kHz: ±3.5 MHz	7.		±3.5 MHz	_____	
	8.	A3S1: Close switch 6			
	9.		±3.5 MHz	_____	
Cross Over Coupled:					
DC–100 Hz: ±150 MHz	10.		±150 MHz	_____	
4-22. AM On/Off Ratio					
Squarewave Symmetry (Opt. 006 or Opt. 001/006)					
On/Off Ratio: ≥20 dB	2.	CW frequency = 33.25 GHz			
Symmetry: 50% ±5%	7.		<20 dB	_____	
	8.		45%	_____	55%

SECTION V
ADJUSTMENTS

5-1. INTRODUCTION

5-2. This section provides adjustment procedures for the HP 83572A/B RF Plug-In. These procedures should not be performed as routine maintenance but should be used (1) after replacement of a part or component, or (2) when performance tests show that the specifications of Table 1-1 cannot be met. Each procedure includes a test setup illustration and one or more adjustment location illustrations. Table 5-1 lists all of the adjustable components by reference designation, adjustment name, adjustment paragraph, and description.

NOTE

Allow the HP 83572A/B RF Plug-In and the 8350A/B Sweep Oscillator to warm up for one hour prior to making any adjustments.

5-3. SAFETY CONSIDERATIONS

5-4. Although this instrument has been designed in accordance with international safety standards, this manual contains information, cautions, and warnings which must be followed to ensure safe operation and to retain the instrument in safe condition. Service and adjustments should be performed only by a skilled person who is aware of the hazards involved.

WARNING

Adjustments in this section are performed with power supplied to the instrument while protective covers are removed. There are voltages at points in the instrument which can, if contacted, cause personal injury. Be extremely careful. Adjustments should be performed only by a skilled person who is aware of the hazards involved.

Capacitors inside the instrument may still be charged, even if the instrument has been disconnected from its source of supply.

NOTE

Use a non-metallic adjustment tool whenever possible.

5-5. EQUIPMENT REQUIRED

5-6. Table 1-4 lists the equipment required for the adjustment procedures. If the test equipment recommended is not available, other equipment may be used if its performance meets the critical specifications listed in Table 1-4. The specified equipment required for each adjustment is referenced in each procedure.

5-7. FACTORY-SELECTED COMPONENTS

5-8. Table 5-2 contains a list of factory-selected components that includes the reference designation, the related adjustment procedure, the allowable range of values, and the basis of selection. Nominal values are given for the factory-selected components, designated by an asterisk (*), on the schematic diagram and in the replacement parts list. HP Part Numbers for standard value replacement components are given in Table 5-3.

5-9. RELATED ADJUSTMENTS

5-10. Interactive adjustments are noted in the adjustment procedures. Table 5-4 indicates by paragraph numbers the adjustments that must be performed if an assembly has been repaired or replaced or if an adjustment has been made to an assembly. Table 5-5 lists the adjustment procedures included in this section of the manual.

5-11. ADJUSTMENT PROCEDURES

5-12. Adjustment procedures are given in the proper sequence to allow for interrelated adjustments. However, adjustments having to do with the ALC leveling loop (paragraphs 5-19 through 5-24) are interactive and should be performed as a group.

Table 5-1. Adjustable Components

Reference Designation	Adjustment Name	Adjustment Paragraph	Description
A3S1	Config. Switch	5-13	Selects Plug-In code. Presets power, FM sensitivity, and FM coupling.
A4R3	1 HI	5-19, 5-21	Calibrates high end of power range.
A4R5	1 LO	5-19, 5-21	Calibrates low end of power range.
A4R8	1MD	5-19, 5-21	Calibrates midrange power.
A4R9	PM	5-23	Sets power meter leveling calibration.
A4R11	GAIN	5-22	Sets the gain of the main ALC amplifier.
A4R47	OFS 1	5-19	Adjusts for zero offset through U7-Q6 log amplifier circuit.
A4R56	OFS 2	5-19	Adjusts for zero offset through U5 log amplifier circuit.
A4R59	OFS 3	5-19	Adjusts for zero offset through U8-Q1, Sample and Hold circuit.
A4R67	OFS 4	5-19	Adjusts for zero offset through U11 Main ALC amplifier.
A5R19	FM	5-25	Sets DC offset of U10 video amplifier.
A5R33	BP1	5-20	Breakpoint that works with SL1 (slope 1) for ALC flatness.
A5R35	BP 2	5-20	Breakpoint that works with SL2 (slope 2) for ALC flatness.
A5R37	BP 3	5-20	Breakpoint that works with SL3 (slope 3) for ALC flatness.
A5R39	BP 4	5-20	Breakpoint that works with SL4 (slope 4) for ALC flatness.
A5R41	SL 1	5-20	Slope adjustment for best ALC flatness.
A5R42	SL 2	5-20	Slope adjustment for best ALC flatness.
A5R43	SL 3	5-20	Slope adjustment for best ALC flatness.
A5R44	SL 4	5-20	Slope adjustment for best ALC flatness.
A5R49	SLP	5-20	Sets overall slope of internal leveling ALC.
A5R50	PWSP	5-24	Sets range for power sweep.
A6R14	HI	5-17	Sets delay compensation at high end of band.
A6R15	OFS	5-17	Sets delay compensation at low end of band.
A6R26	Z (zero)	5-17	Adjusts for offset inaccuracies out of the delay compensation circuit.
A6R33	−25V	5-14	Sets −25V reference.
A6R59	−10V	5-14	Sets −10V reference.
A6S1	OFFSET	5-16	Sets low end frequency.
A6S2	GAIN	5-16	Sets high end frequency.
A7R12	MAX P	5-18	Adjusts for maximum power across the band.
A7R17	MIN P	5-18	Adjusts for minimum power across the band.
A7R36	OFF	5-15	Low frequency bias adjustment for YO bias.
A7R39	TUN	5-15	High frequency bias adjustment for YO.
A7R69	LO	5-26	Optimizes ON/OFF ratio at low end of band.
A7R71	HI	5-26	Optimizes ON/OFF ratio at high end of band.

Table 5-2. Factory Selected Components

Reference Designator	Adjustment Paragraph	Allowable Range of Values	Basis of Selection
A4R49	5-21	9.09KΩ to 26.1KΩ	To optimize the 1LO adjustment on Opt. 001 or 001/006.
A4R54	5-21	3.3KΩ to 10KΩ	To center the range of the 1MD adjustment.
A5R31	–	90.9Ω to 250Ω	To make the FM coil sensitivity equal to the main coil sensitivity.
A6R38-49	None	Not replaceable	–
A7R48	None	Not replaceable	–

Table 5-3. HP Part Numbers of Standard Value Replacement Components

RESISTORS

RANGE: 10 to 464K Ohms
TYPE: Fixed-Film
WATTAGE: .125 at 125°C
TOLERANCE: ±1.0%

Value (Ω)	HP Part Number	CD	Value (Ω)	HP Part Number	CD	Value (Ω)	HP Part Number	CD
10.0	0757-0346	2	464	0698-0082	7	21.5K	0757-0199	3
11.0	0757-0378	0	511	0757-0416	7	23.7K	0698-3158	4
12.1	0757-0379	1	562	0757-0417	8	26.1K	0698-3159	5
13.3	0698-3427	0	619	0757-0418	9	28.7K	0698-3449	6
14.7	0698-3428	1	681	0757-0419	0	31.6K	0698-3160	8
16.2	0757-0382	6	750	0757-0420	3	34.8K	0757-0123	3
17.8	0757-0294	9	825	0757-0421	4	38.3K	0698-3161	9
19.6	0698-3429	2	909	0757-0422	5	42.2K	0698-3450	9
21.5	0698-3430	5	1.0K	0757-0280	3	46.4K	0698-3162	0
23.7	0698-3431	6	1.1K	0757-0424	7	51.1K	0757-0458	7
26.1	0698-3432	7	1.21K	0757-0274	5	56.2K	0757-0459	8
28.7	0698-3433	8	1.33K	0757-0317	7	61.9K	0757-0460	1
31.6	0757-0180	2	1.47K	0757-1094	9	68.1K	0757-0461	2
34.8	0698-3434	9	1.62K	0757-0428	1	75.0K	0757-0462	3
38.3	0698-3435	0	1.78K	0757-0278	9	82.5K	0757-0463	4
42.2	0757-0316	6	1.96K	0698-0083	8	90.9K	0757-0464	5
46.4	0698-4037	0	2.15K	0698-0084	9	100K	0757-0465	6
51.1	0757-0394	0	2.37K	0698-3150	6	110K	0757-0466	7
56.2	0757-0395	1	2.61K	0698-0085	0	121K	0757-0467	8
61.9	0757-0276	7	2.87K	0698-3151	7	133K	0698-3451	0
68.1	0757-0397	3	3.16K	0757-0279	0	147K	0698-3452	1
75.0	0757-0398	4	3.48K	0698-3152	8	162K	0757-0470	3
82.5	0757-0399	5	3.83K	0698-3153	9	178K	0698-3243	8
90.0	0757-0400	9	4.22K	0698-3154	0	196K	0698-3453	2
100	0757-0401	0	4.64K	0698-3155	1	215K	0698-3454	3
110	0757-0402	1	5.11K	0757-0438	3	237K	0698-3266	5
121	0757-0403	2	5.62K	0757-0200	7	261K	0698-3455	4
133	0698-3437	2	6.19K	0757-0290	5	287K	0698-3456	5
147	0698-3438	3	6.81K	0757-0439	4	316K	0698-3457	6
162	0757-0405	4	7.50K	0757-0440	7	348K	0698-3458	7
178	0698-3439	4	8.25K	0757-0441	8	383K	0698-3459	8
196	0698-3440	7	9.09K	0757-0288	1	422K	0698-3460	1
215	0698-3441	8	10.0K	0757-0442	9	464K	0698-3260	9
237	0698-3442	9	11.0K	0757-0443	0			
261	0698-3132	4	12.1K	0757-0444	1			
287	0698-3443	0	13.3K	0757-0289	2			
316	0698-3444	1	14.7K	0698-3156	2			
348	0698-3445	2	16.2K	0757-0447	4			
383	0698-3446	3	17.8K	0698-3136	8			
422	0698-3447	4	19.6K	0698-3157	3			

Table 5-4. Related Adjustments

Assembly Replaced or Repaired	Related Assemblies	Adjustment Required (by Paragraph Number)
A2 YIG Oscillator	A7, A6, A4, A5	5-15 through 5-23, 5-25
A3 Digital Interface	A3	5-13
A4 ALC	A4, A7, A5	5-18 through 5-24
A5 FM Driver	A4, A5	5-19 through 5-25
A6 YO Driver	A6	5-14, 5-16, and 5-17
A7 Bias	A7, A4, A6	5-14 through 5-15, 5-18 through 5-23, and 5-26

Table 5-5. Adjustment Procedures

Paragraph	Adjustments
5-13	A3S1 Configuration Switch
5-14	−10V/−25V Reference on A6 YO Driver
5-15	Oscillator Bias
5-16	Frequency Accuracy
5-17	Delay Compensation
5-18	Maximum and Minimum Power
5-19	ALC Adjustment
5-20	ALC Leveled Flatness
5-21	Power Calibration
5-22	ALC Gain Adjustment
5-23	Power Meter Leveling Calibration
5-24	Power Sweep
5-25	FM Driver
5-26	ON/OFF Ratio

5-13. CONFIGURATION SWITCH A3S1

REFERENCE:

Service Sheet: A3

DESCRIPTION:

Configuration Switch A3S1 is set at the factory for a specific combination of operating modes (refer to Table 5-6). Other operating modes can be selected by resetting the switch positions on A3S1.

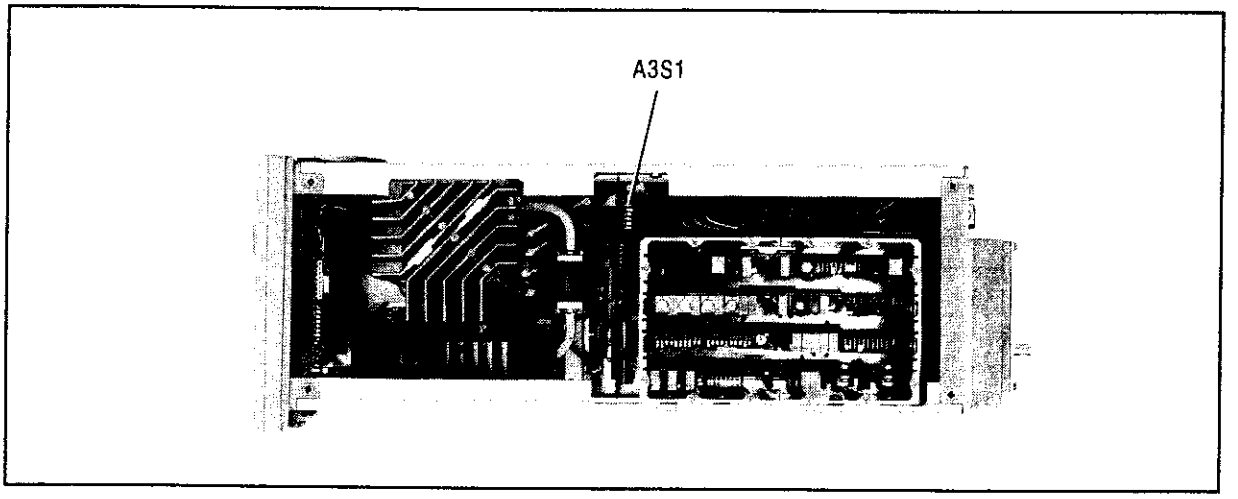


Figure 5-1. Configuration Switch A3S1 Location

PROCEDURE:

NOTE

Adjustment procedures and performance tests all assume that A3S1 is set to the factory setting. If adjustments are to be performed, set A3S1 to the factory setting until the adjustments are completed, then set A3S1 to any desired operating mode before putting the instrument back in service.

1. Refer to Table 5-6 and determine if the factory selected mode set at A3S1 is correct for your application.

2. Set configuration switch A3S1 (Figure 5-1) for the desired operating mode.

Table 5-6. Configuration Switch on A3 Digital Interface Board

Code Description	Switch Number 1	2	3	4	5	6	7	8
Instrument/Option								
Standard 83572A	0	0	0	X	X	X	X	X
Standard 83572B	1	0	0	X	X	X	X	X
83572A Option 001	0	1	0	X	X	X	X	X
83572B Option 001	1	1	0	X	X	X	X	X
83572A Option 006	0	0	1	X	X	X	X	X
83572B Option 006	1	0	1	X	X	X	X	X
83572A Option 001/006	0	1	1	X	X	X	X	X
83572B Option 001/006	1	1	1	X	X	X	X	X
No RF Power at INSTR PRESET	Z	Z	Z	1	X	X	X	X
Maximum RF Power at INSTR PRESET	Z	Z	Z	0	X	X	X	X
−6 MHz/V FM Sensitivity	Z	Z	Z	X	1	X	X	X
−20 MHz/V FM Sensitivity	Z	Z	Z	X	0	X	X	X
Direct-Coupled FM (−20 MHz/V)	Z	Z	Z	X	X	1	X	X
Cross-Over Coupled FM	Z	Z	Z	X	X	0	X	X

NOTES

1. Switch Positions
   1 = switch open = High
   0 = switch closed = Low (ground)
   X= don't care
   Z= determined by instrument and options installed
2. Switch is set at the factory as follows:

Switch No	1	2	3	4	5	6	7	8
Position	Z	Z	Z	0	0	0	X	X

3. With the configuration switch set for the Instrument Preset condition of "RF Power OFF", bias is removed from A2 YIG Oscillator. In addition, the 8350A/B microprocessor issues a blanking pulse to the Plug-In. L RFB (Low = RF Blank) biases the modulator on hard, closing off the RF signal path. When RF power is manually turned on, using the front panel pushbutton, L RFB remains low for a short period to allow the RF microcircuit components to reach full capacity before releasing the ALC amplifier. This prevents the ALC loop from correcting for a large error voltage at initial power up, and thus prevents overshoot.

5-14. −10V/−25V REFERENCE ON A6 YO DRIVER

REFERENCE:

Performance Test: Paragraph 4-14
Service Sheet: A6

DESCRIPTION:

The −25V power supply is used as a reference voltage for the YO linearity compensation circuit. The −10V REF in A6 is used as a reference voltage for the Offset DAC in A6, and for the Power Level Reference DAC on the A4 assembly; it is also used as an adjustment reference on the A7 Bias board.

EQUIPMENT:

Digital Voltmeter (DVM) ..... HP 3456A

PROCEDURE:

1. Connect the DVM to A6TP7 (Figure 5-2). Connect ground to A6TP5.
2. Adjust "−25" control A6R33 for −25.000 Vdc ±0.005 Vdc.
3. Connect the DVM to A6TP1.
4. Adjust "−10" control A6R59 for −10.00 Vdc ±0.001 Vdc

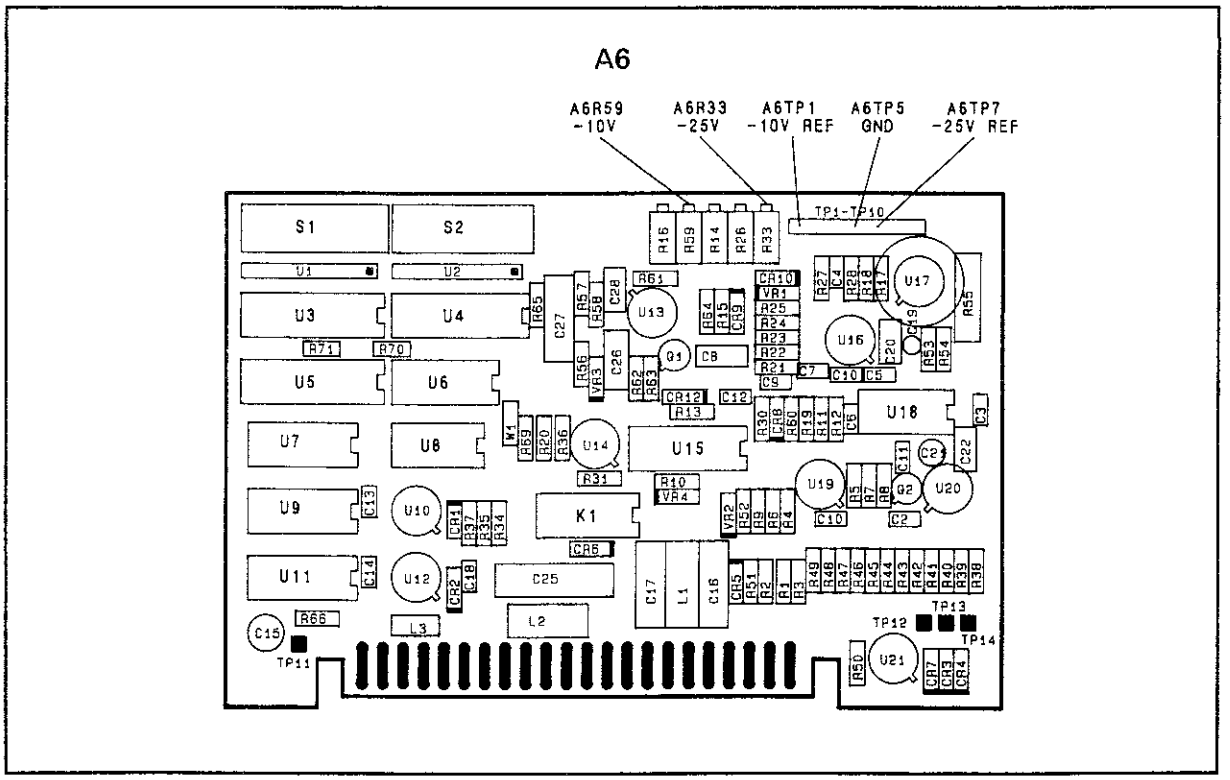


Figure 5-2. −25V and −10V Reference Points and Adjustments

5-15. OSCILLATOR BIAS

REFERENCE:

Service Sheet: A7

DESCRIPTION:

If the A2 YIG oscillator is replaced, it is necessary also to replace the factory-select resistors A6R38 to A6R49 on the YO driver assembly and A7R48 on the bias assembly. The resistors are individually selected for each YIG oscillator, and a replacement YIG oscillator is supplied from the factory as a kit that includes the factory-select resistors as well as cables W8 and W9. After a YIG oscillator replacement kit is installed, the protective crowbar (SCR) circuit must be checked with the oscillator disconnected, to ensure that the oscillator would be protected in the event of overvoltage.

Following the check of the crowbar circuit, the oscillator bias is adjusted at the low and high ends of the band in accordance with the voltage requirements noted on the YIG Oscillator. The OFFSET adjustment is performed at a CW frequency of 26.5 GHz, and the TUNE voltage adjustment is performed at 40 GHz.

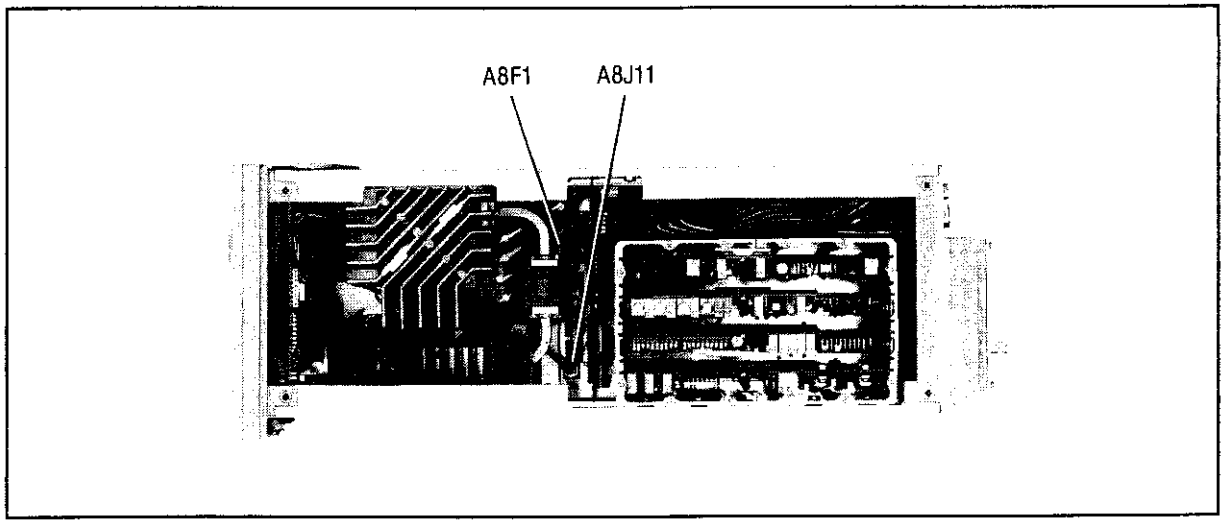


Figure 5-3. Wiring Harness Connector and Fuse Locations

EQUIPMENT:

Digital Voltmeter ..... HP 3456A

PROCEDURE:

1. Turn AC line power off. Disconnect the YO wiring harness from A8J11. Remove the fuse A8F1. (See Figure 5-3 for wiring harness connector and fuse locations). Return AC line power to the instrument.

2. Connect a jumper between A7TP4 and A7TP10.

3. On the 8350A/B enter **[CW] [2] [6] [.] [5] [GHz]**.

4. Connect the DVM to A7TP3 (Figure 5-4). Connect ground to A7TP2. Preset potentiometer A7R36 fully CCW.

5-15. OSCILLATOR BIAS (Cont'd)

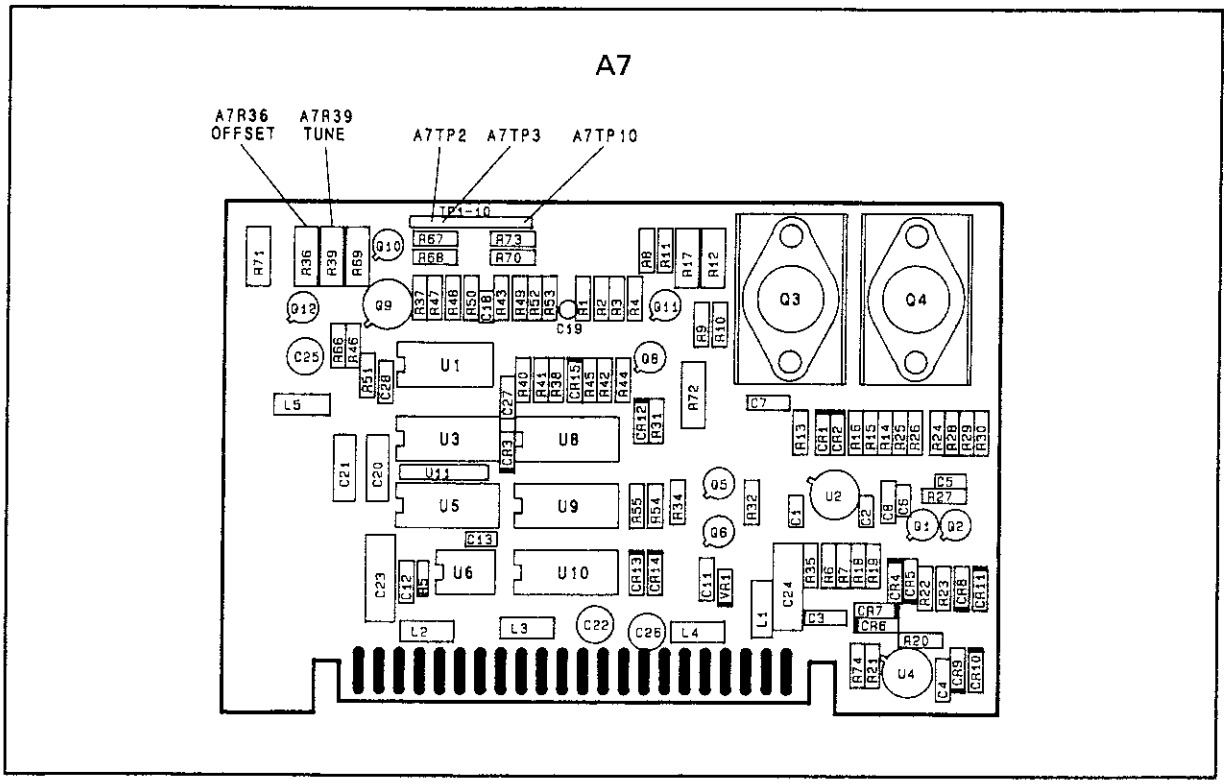


Figure 5-4. A7 Adjustment Locations

5. Adjust A7R36 (OFFSET) while observing the voltage at A7TP3. The voltage will increase until SCR Q9 fires, when it will immediately drop to 0V. Note the highest voltage before the SCR fires. This should be approximately 0.5 to 1.0 volt above the larger of the two voltages marked on the front of the YIG oscillator A2.

6. Turn off the AC line power. Remove the jumper between TP4 and TP10.

7. Turn on the AC line power. Adjust A7R36 (OFFSET) until the voltage at A7TP3 is equal to the larger of the two voltages marked on the front of the YIG oscillator.

8. On the 8350A/B, enter **[CW] [4] [0] [GHz]**. Adjust A7R39 (TUNE) until the voltage at A7TP3 is equal to the smaller of the two voltages marked on the front of the YIG oscillator.

9. Turn off the line power. Reconnect the YIG oscillator wiring harness to A8J11. Replace the fuse A8F1.

10. Turn on the AC line power. Set the 8350A/B to 26.5 GHz CW, and repeat step 7.

11. Set the 8350A/B to 40 GHz CW, and repeat step 8.

5-16. FREQUENCY ACCURACY

REFERENCE:

Service Sheet: A6

DESCRIPTION:

Frequency endpoints are adjusted using calibration modes provided through software. SHIFT 90 (low end) and SHIFT 91 (high end) initiate the frequency calibration mode in which the microprocessor reads the FREQ CAL switches on the A6 assembly and displays the byte in hexadecimal form in the POWER window. As the Plug-In RPG is adjusted, the Plug-In ROM reads the count, adjusts the POWER display, and updates the Offset DAC (low end) or Scaling DAC (high end) to correct the output frequency. When the spectrum analyzer and 8350A/B front panel FREQUENCY readings match, the hex digits displayed in the POWER window indicate the proper settings for the FREQ CAL switch, A6S1 or A6S2.

NOTE

When the 8566A spectrum analyzer with external mixing is used to measure frequency, there will be many signals displayed. The signals of interest will be an identical pair with a separation of 642.8 MHz, and the left one of the pair will be frequency calibrated. To center the RF signal from the HP 83572A/B on the CRT of the spectrum analyzer, press 8566A [PEAK SEARCH] [SIGNAL TRACK] [SHIFT] [FREE RUN].

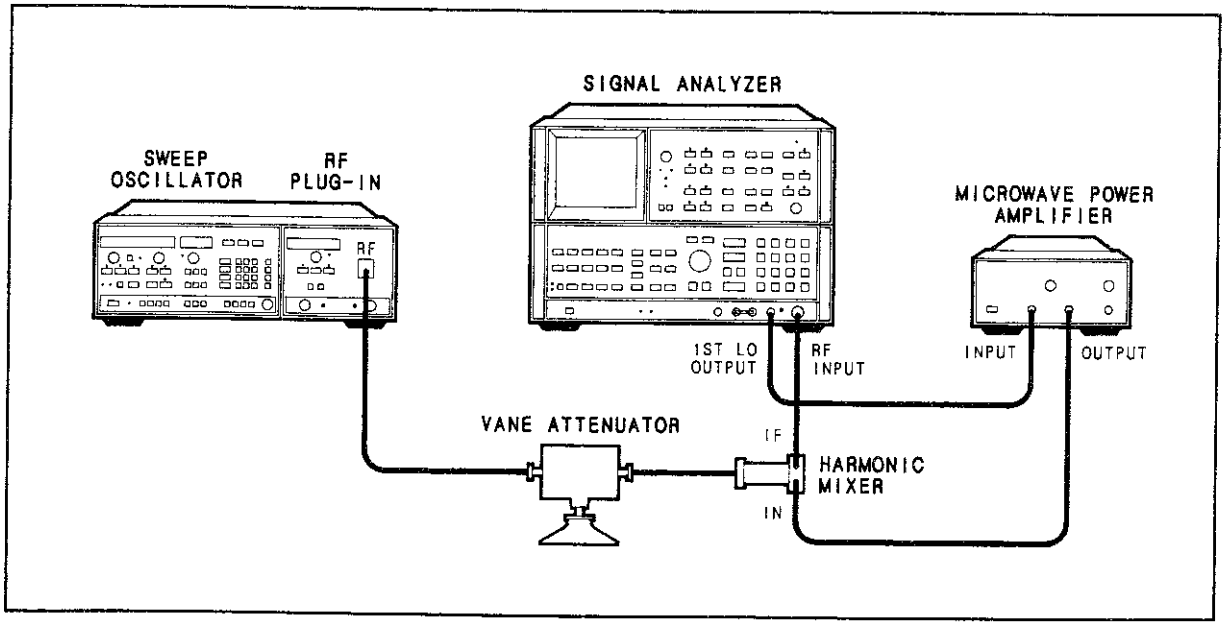


Figure 5-5. Frequency Accuracy Adjustment Setup

EQUIPMENT:

Spectrum Analyzer	HP 8566A
Microwave Power Amplifier	HP 11975A
External Harmonic Mixer	HP 11970A
Vane Attenuator	HP R382A

5-16. FREQUENCY ACCURACY (Cont'd)

PROCEDURE:

NOTE

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

1. Connect equipment as shown in Figure 5-5. Set the vane attenuator to 20 dB.

2. Press **[INSTR PRESET]**.

   Press **[CW] [2] [6] [.] [5] [GHz] [STEP SIZE] [5] [0] [0] [MHz]**.

   Press **[SAVE] [1]**.

   Press **[CW] [4] [0] [GHz]**.

   Press **[SAVE] [2]**

3. Press **[RECALL] [1] [RECALL] [2] [RECALL] [1]** and 26.500 GHz will be displayed in the FREQUENCY window.

4. Set up the signal analyzer to display the 26.5 GHz signal from the HP 83572A/B. On the 8566A, this is accomplished by the following entries:

   On the 8566A:

   Press **[SHIFT] [◆]**

   Press **[START FREQ] [2] [6] [GHz] [STOP FREQ] [2] [8] [GHz]**

   Press **[PEAK SEARCH] [SIGNAL TRACK]**

   Press **[SHIFT] [FREE RUN]** (Repeat this if necessary.)

5. On the 8350A/B, press **[SHIFT] [9] [0]**. This selects the low end frequency calibration mode.

6. Adjust the Plug-In RPG for a signal analyzer marker frequency of 26.5 GHz .

7. Set switch A6S1 (Figure 5-6) for the value displayed in the POWER window. Note the hex number for subsequent verification. Refer to the diagram in Figure 5-7.

8. Press **[INSTR PRESET]**, then **[RECALL] [1] [RECALL] [2] [RECALL] [1]**.

9. Verify that a setting of 26.500 GHz on the 8350A/B produces an indication of 26.500 GHz ± 30 MHz on the spectrum analyzer. If the frequency displayed does not meet this specification, press **[SHIFT] [9] [0]**. The hex digits now displayed in the POWER window correspond to the A6S1 switch settings. If this number does not agree with the number obtained in step 7, the switch was not set properly. Repeat the procedure.)

10. Press **[INSTR PRESET]**, then **[RECALL] [1] [RECALL] [2] [RECALL] [1]**. Step up the CW frequency, using the [◆] key, until 40.000 GHz is displayed in the FREQUENCY window. Tune the spectrum analyzer to 40.000 GHz.

11. Press **[SHIFT] [9] [1]**. This selects high end frequency calibration mode.

5-16. FREQUENCY ACCURACY (Cont'd)

12. Adjust the Plug-In RPG for a signal analyzer display of 40.000 GHz.

13. Set A6S2 (Figure 5-6) for the reading displayed in the POWER window. Note the hex number for subsequent verification.

14. Press **[INSTR PRESET]**, then **[RECALL] [1]**, and repeat from step 10, as required.

15. Verify that a setting of 40.000 GHz on the 8350A/B produces an indication of 40.000 GHz ± 30 MHz on the spectrum analyzer. If the frequency displayed does not meet this specification, press **[SHIFT] [9] [1]**. The hex digits now displayed in the POWER window correspond to the A6S2 switch settings. If this number does not agree with the number obtained in step 13, the switch was not set properly. Repeat the procedure starting with step 10.

16. Press **[INSTR PRESET] [RECALL] [1]**. Step the RF Plug-In and signal analyzer across the frequency range and check for signal analyzer readings that correspond with the HP 83572A/B displayed frequency ±100 MHz.

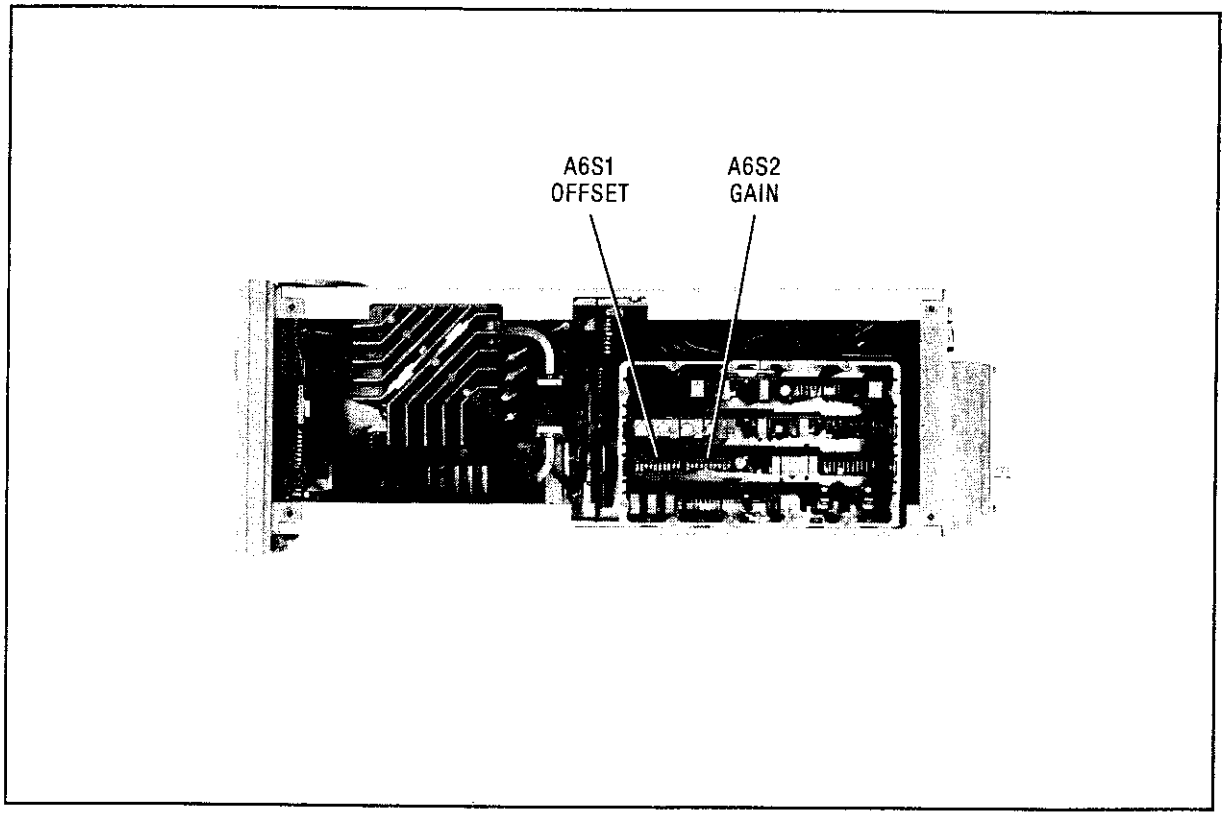


Figure 5-6. A6S1 and A6S2 Switch Locations

5-16. FREQUENCY ACCURACY (Cont'd)

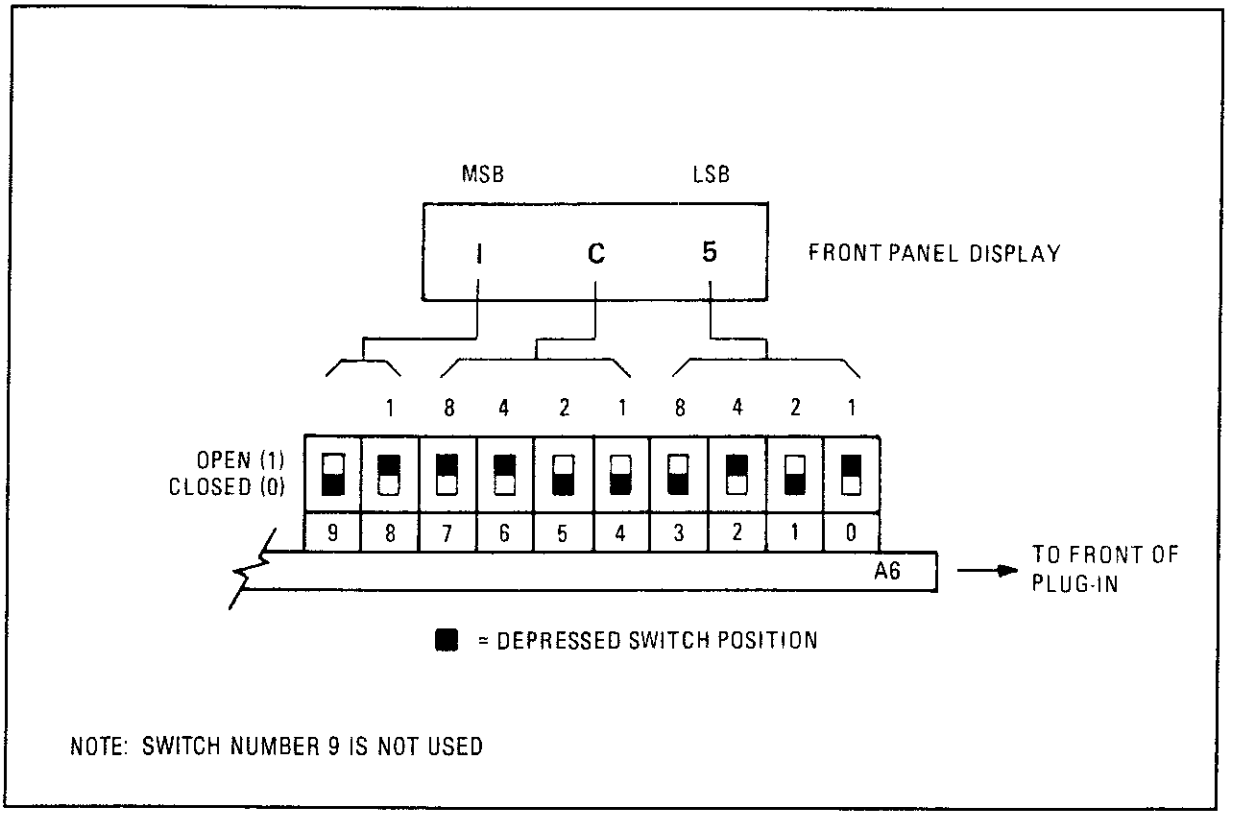


Figure 5-7. A6S1 and A6S2 Switch Configurations

5-17. DELAY COMPENSATION

REFERENCE:

Service Sheet: A6

DESCRIPTION:

This circuit compensates for the delay in the RF sweep output that occurs at faster sweep speeds. An external frequency meter is used to generate a frequency-dependent marker which is aligned with a tuning ramp-dependent marker generated from the 8350A/B Sweep Oscillator. Sweep time is decreased and delay due to hysteresis in the YO is observed as the difference between the two marker pips.

Delay compensation adjustments are made while observing the shift between marker pips at a sweep time of 10 milliseconds (worst case). At sweep times greater than 100 milliseconds, delay should not exceed ±61 MHz.

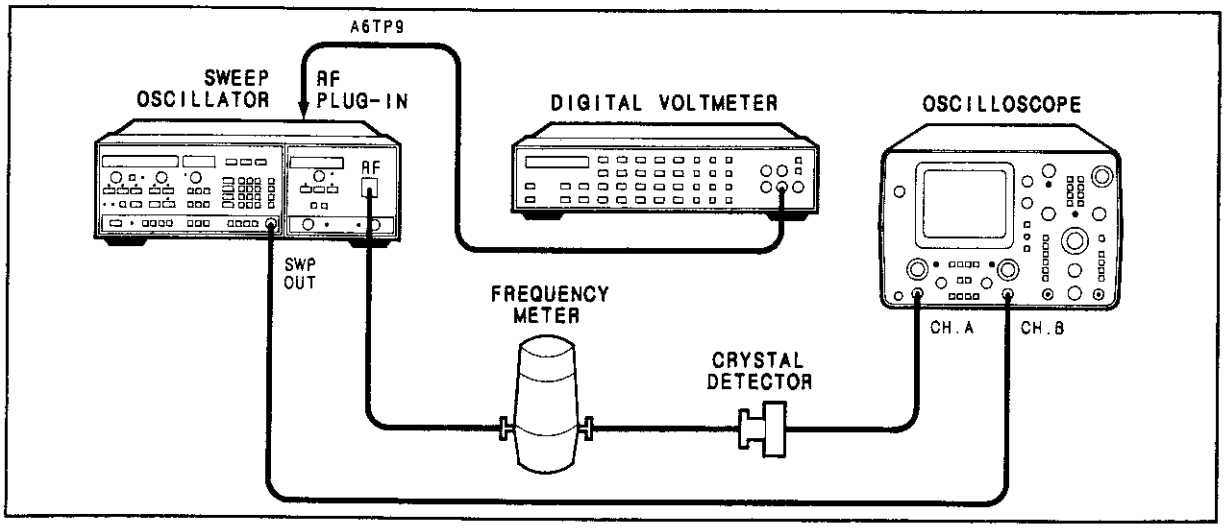


Figure 5-8. Delay Compensation Adjustment Setup

EQUIPMENT:

Digital Voltmeter	HP 3456A
Oscilloscope	HP 1740A
Frequency Meter 26.5 to 40 GHz	HP R532A
Crystal Detector	HP R422A

PROCEDURE:

NOTE

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

5-17. DELAY COMPENSATION (Cont'd)

1. Press 8350A/B **[INSTR PRESET]**.

2. Select **[CW]** mode. Using a DVM, measure and record the voltage at A6TP9.

3. Press **[CF] [ΔF] [0] [MHz]**.

4. Adjust "Z" control, A6R26, (Figure 5-9) for the same reading at A6TP9 that was obtained in step 2 above. Iterate steps 2, 3, and 4 until the voltage at A6TP9 is the same for both conditions.

5. Connect equipment as shown in Figure 5-8. Select oscilloscope A vs B mode to obtain a CRT trace of amplitude versus frequency.

6. On the 8350A/B, enter the front panel data as follows:

   Press **[INSTR PRESET]**
   Press **[M1] [2] [8] [GHz]**
   Press **[RF BLANK]**
   If the HP 83572A/B is Option 006, press **[AMPTD MKR]**
   Press **[TIME] [1] [s]**
   Press **[SAVE n] [1]**

7. On the 8350A/B, press **[M2] [3] [7] [GHz] [SAVE n] [2]**.

8 On the 8350A/B, press **[RECALL n] [1]**.

9. Expand the oscilloscope trace at the marker by centering the marker on the oscilloscope then setting the oscilloscope for a magnified horizontal trace. Set the frequency meter so that the peak of the pip is on the leading edge of the 28 GHz marker.

10. On the 8350A/B, step the sweep time down to 10 milliseconds and note the relative change in position between the two markers.

11. Adjust "LO" control A6R16 (Figure 5-9) to minimize the movement between markers while stepping the sweep time between 1 second and 10 milliseconds.

12. Verify that the delay is accurate by manually adjusting the sweep time from 10 milliseconds to 1 second. Reset A6R16 (LO) as necessary to provide the best overall delay setting (minimum delay per change in sweep time). The position of the frequency meter pip should typically stay within ±61 MHz as read on the frequency meter across the 10 millisecond to 1 second range.

13. Press 8350A/B **[RECALL n] [2]**.

14. Set the frequency meter so that the peak of the pip is coincident with the leading edge of the 37 GHz marker.

15. On the 8350A/B, step the sweep time down to 10 milliseconds and note the relative change in position between the two markers.

16. Adjust "HI" control A6R14 (Figure 5-9) to minimize the movement between markers while stepping the sweep time between 1 second and 10 milliseconds.

5-17. DELAY COMPENSATION (Cont'd)

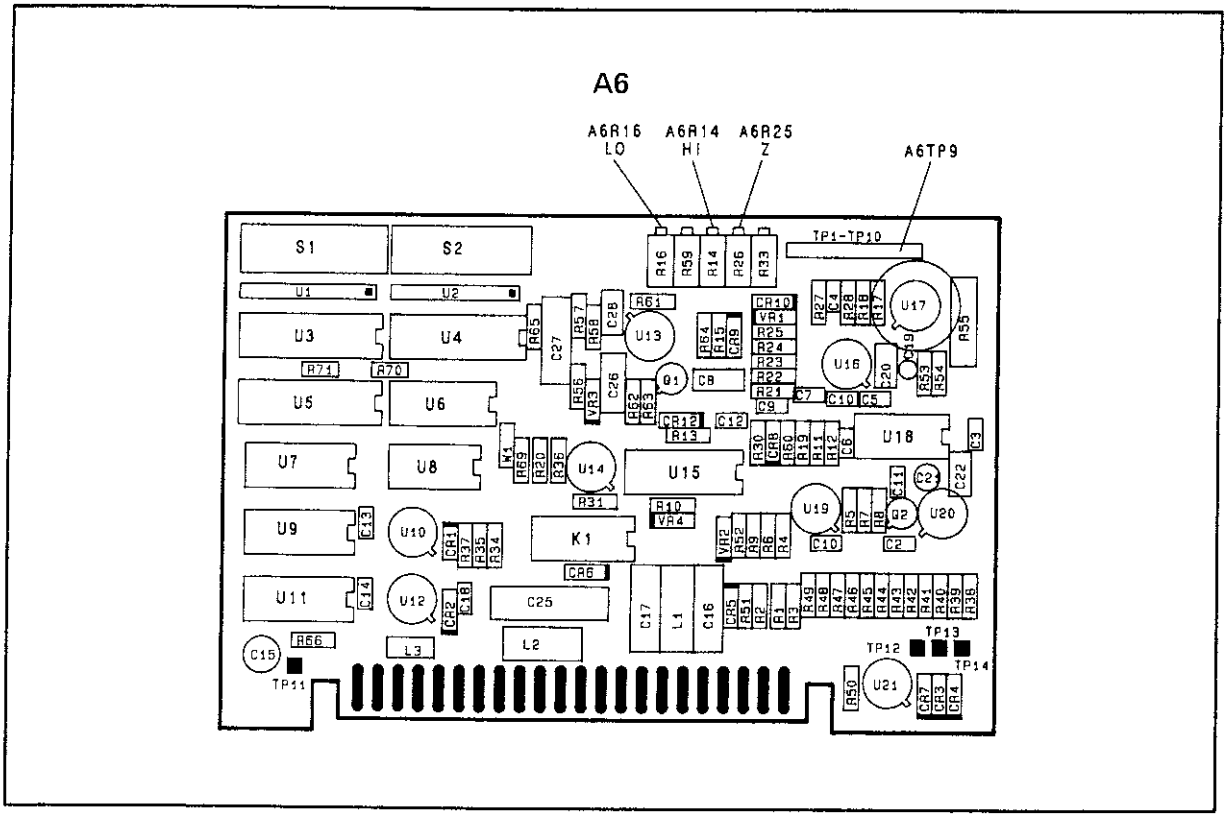


Figure 5-9. Delay Compensation Adjustment Location

17. Verify that the delay is accurate by manually adjusting the sweep time from 10 milliseconds to 1 second. Reset A6R14 (HI) as necessary to provide the best overall delay setting (minimum delay per change in sweep time). The position of the frequency meter pip should typically stay within ±61 MHz as read on the frequency meter across the 10 ms to 1 sec sweep speed range.

5-18. MAXIMUM and MINIMUM POWER

REFERENCE:

Service Sheet: A7

DESCRIPTION:

The scale and offset of the YO Bias assembly are adjusted to control the current to the modulator. This optimizes the output power from −25 dBm to maximum power over the full frequency range.

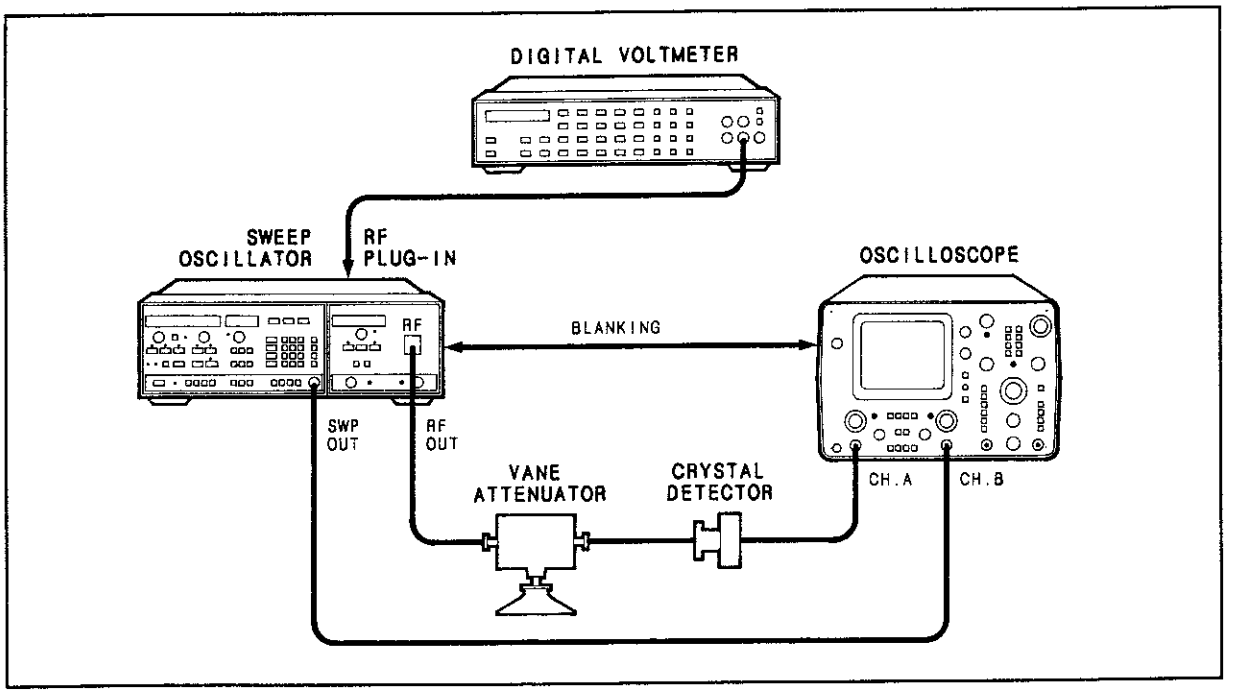


Figure 5-10. Maximum and Minimum Power Adjustment Setup

NOTE

The oscilloscope and crystal detector are used in this procedure to simplify the test setup for the standard HP 83572A/B, which does not have pulse modulation capabilities. However, if the instrument is an Option 006, it is easier to determine small power variations if a Model 8756A or 8755C Swept Amplitude Analyzer is used to display the RF output power.

EQUIPMENT:

Digital Voltmeter	HP 3456A
Oscilloscope	HP 1740A
Crystal Detector	HP R422A
Vane Attenuator	HP R382A

PROCEDURE:

1. Connect equipment as shown in Figure 5-10.
2. Press **[INSTR PRESET] [DET] [RF]** (RF Power off). Measure and note the dc voltage at A4TP6 with the digital voltmeter.

5-18. MAXIMUM and MINIMUM POWER (Cont'd)

3. Connect the digital voltmeter to A7TP5. On the HP 83572A/B press **[UNLVLD PWR] [RF]** (RF Power on). Set the HP 83572A/B POWER LEVEL to −25 dBm and adjust the EXT CAL control for the same voltage as noted in step 2.

4. Adjust A7R17 "MIN PWR" for minimum RF output power over the full frequency range as displayed on the oscilloscope.

NOTE

Since the HP R422A is a negative crystal detector, the displayed output is negative. Thus the minimum RF output power is displayed on the oscilloscope as minimum NEGATIVE voltage, and is the highest level displayed on the screen. Likewise, maximum RF output power is displayed as maximum negative voltage, and is the lowest level on the screen.

5. Adjust the HP 83572A/B POWER LEVEL control for +0 Vdc at A7TP5.

6. Adjust A7R12 "MAX PWR" for maximum RF output power over the full frequency range as displayed on the oscilloscope (maximum negative voltage).

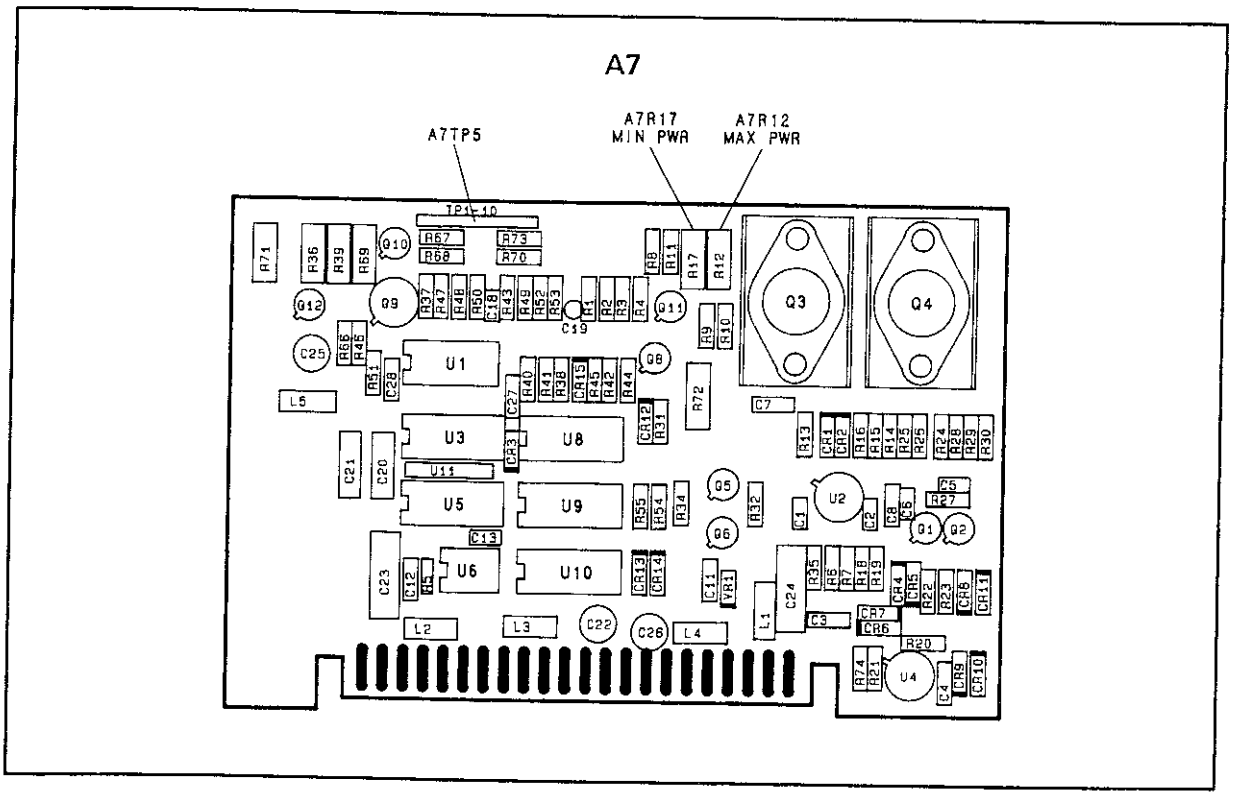


Figure 5-11. Maximum and Minimum Power Adjustment Locations

5-19. ALC ADJUSTMENT (Option 001 Only)

NOTE

Complete adjustment of the leveling loop requires several procedures to be performed in the order prescribed in Paragraphs 5-19 through 5-24. Deviation from this routine may cause improper leveling and/or flatness problems.

REFERENCE:

Service Sheet: A4

DESCRIPTION:

Adjustments compensate for DC offsets in the detected RF path and the main ALC amplifier. Power is roughly calibrated.

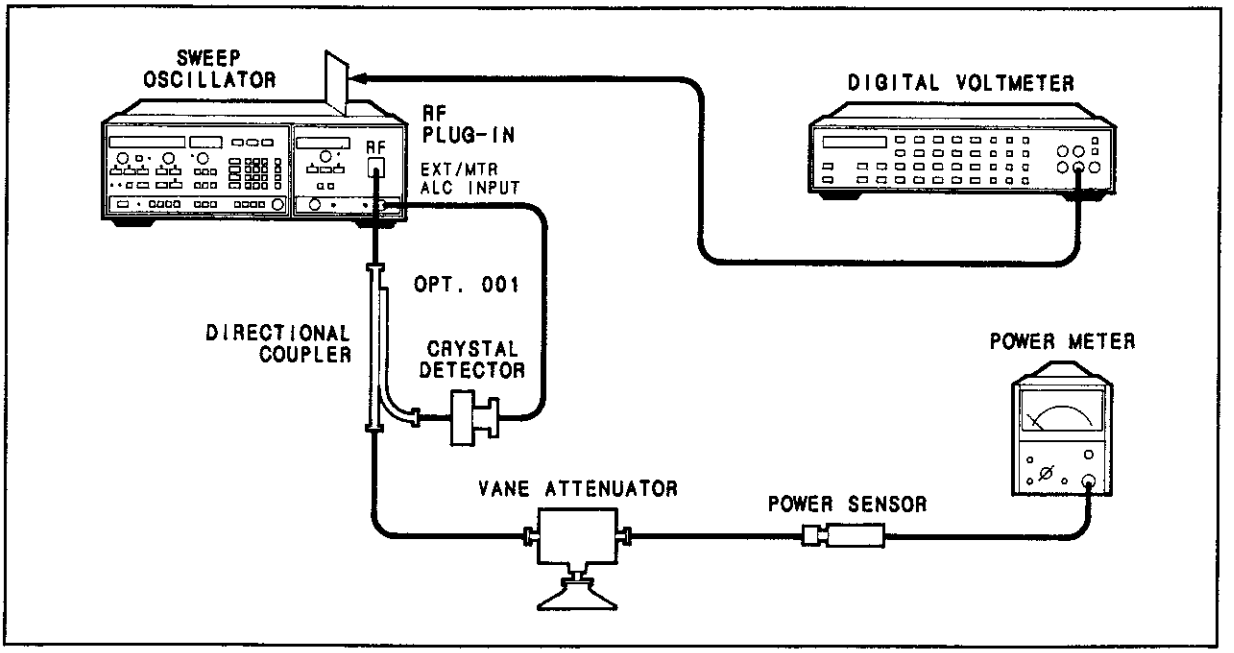


Figure 5-12. ALC Adjustment Setup

EQUIPMENT:

Digital Voltmeter	HP 3456A
Power Meter	HP 432A
Power Sensor	HP R486A
Vane Attenuator	HP R382A
Extender Board	HP 08350-60031

PROCEDURE:

NOTE

Turn AC power OFF when removing or installing PC boards.

5-19. ALC ADJUSTMENT (Option 001 Only) (Cont'd)

NOTE

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

1. Turn AC power off. Place the A4 ALC assembly on an extender board. Turn AC power on. Sweep the full range of the Plug-In at any leveled power. Set the vane attenuator to 5 dB.

2. Float the ground on the digital voltmeter and measure the voltage between A4TP12 and A4TP14 (Figure 5-13). Adjust A4R47 OFS 1 (offset 1) for 0.000V ±0.001V.

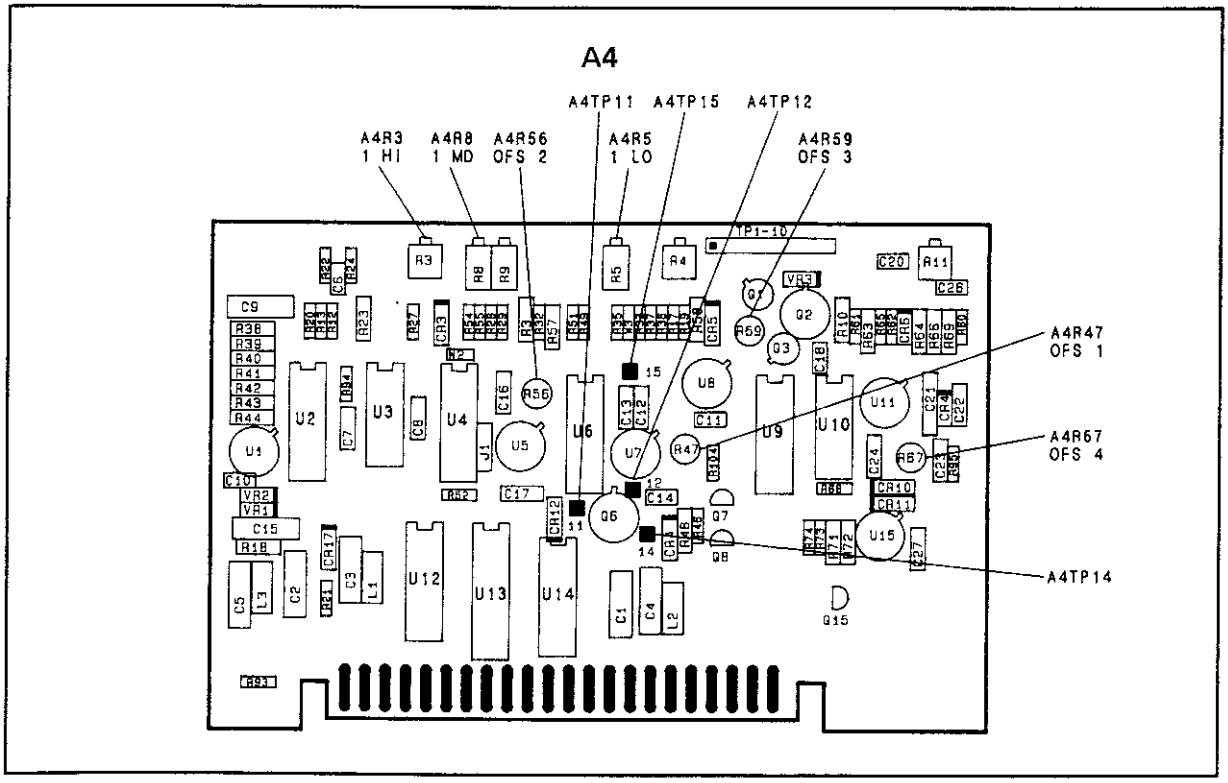


Figure 5-13. A4 ALC Board Adjustment Locations

3. Connect the DVM between A4TP12 and A4TP15. Adjust A4R59 OFS 3 (offset 3) for 0.000V ± 0.001V.

4. Attach a jumper from A4TP11 to ground. The UNLEVELED light will go on. Connect the DVM ground lead to chassis ground. Connect the DVM to A4TP5. Adjust A4R56 OFS 2 (offset 2) for 0.000V ± 0.001V. Remove the jumper.

5. Press 8350A/B **[CW] [2] [6] [.] [5] [GHz]**. Ensure that the power is leveled (UNLEVELED light off). If it is not, adjust CW to any leveled frequency. Connect the DVM to A4TP7 and adjust A4R67 OFS 4 (offset 4) for 0.000V ± 0.001V.

6. Turn the instrument LINE power off. Remove the A4 assembly from the extender board and reinsert A4 directly into the instrument. Turn on LINE power to the instrument. Connect the power meter sensor to the HP 83572A/B RF OUTPUT as shown in Figure 5-14.

5-19. ALC ADJUSTMENT (Option 001 Only) (Cont'd)

7. Press 8350A/B **[CW] [2] [6] [.] [5] [GHz]**. On the HP 83572A/B, press **[SHIFT] [DET]** and enter a power level of −5 dBm. Compensate for the calibration factor of the power sensor by checking the chart on the power sensor label and setting the CAL FACTOR % dial on the power meter accordingly. Adjust A4R5 "1 LO" for a power meter reading that agrees with the HP 83572A/B POWER display (allow for the 5 dB attenuator setting).

8. Set the HP 83572A/B for a POWER reading of 0 dBm. Adjust A4R8 "1 MD" for a power meter reading that agrees with the HP 83572A/B display (allow for the 5 dB attenuator setting).

9. Iterate steps 7 and 8 until both low and midpower ranges are calibrated. (A4R5 and A4R8 are interactive adjustments.)

10. **HP 83572A**

    Set the HP 83572A RF output power to +4 dBm. If the UNLEVELED light comes on, find a frequency where the power will stay leveled at +4 dBm and the light will not come on. Adjust A4R3 "1 HI" for a power meter reading that agrees with the 83572A POWER display. (Make allowances for the 5 dB attenuation.)

    HP 83572B

    Set the HP 83572B RF output power to +6 dBm. Adjust A4R3 "1 HI" for a power meter reading that agrees with the 83572B POWER display. (Make allowances for the 5 dB attenuation.)

11. This roughly calibrates the RF power. Fine calibration is documented in a later procedure.

5-20. ALC LEVELED FLATNESS (Option 001 Only)

NOTE 1

Complete adjustment of the leveling loop requires several procedures to be performed in the order prescribed in Paragraphs 5-19 through 5-24. Deviation from this routine may cause improper leveling and/or flatness problems.

REFERENCE:

Service Sheet: A5 **ALC Flatness Adjustments**

DESCRIPTION:

This adjustment only has an effect when the HP 83572A/B CAL light is on (SHIFT DET). Four parallel circuits on the A5 assembly provide adjustments for ALC flatness. BP1 through BP4 and SL1 through SL4 determine the shape of the flatness compensation signal.

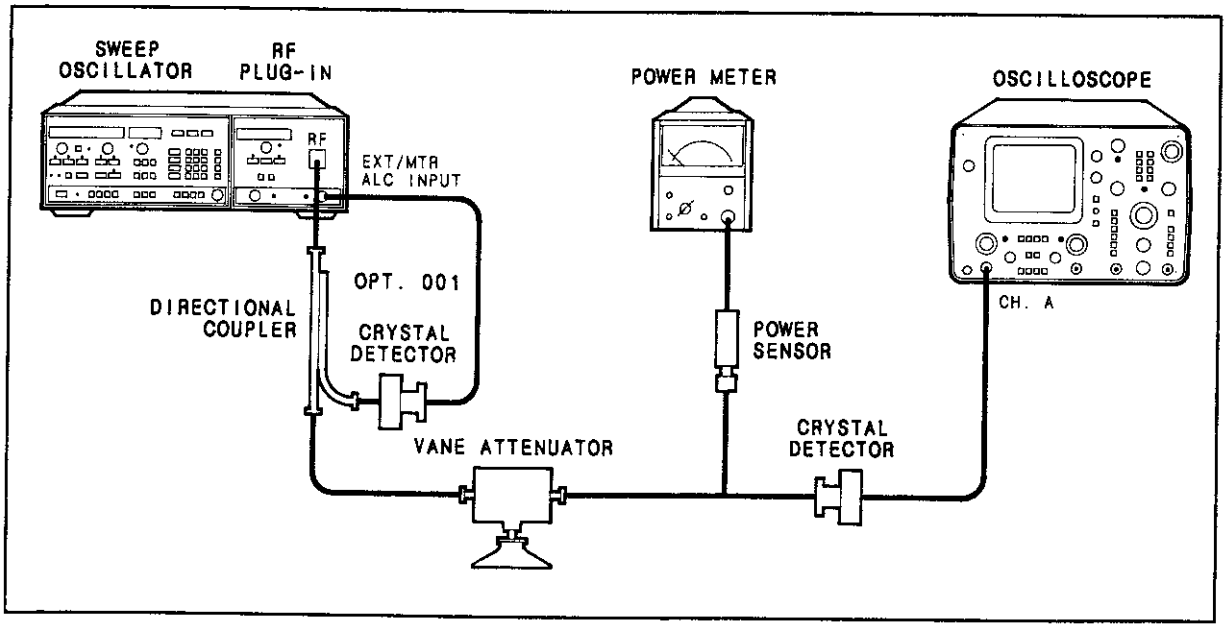


Figure 5-14. Internal Leveled Flatness Adjustment Setup

EQUIPMENT:

Sweep Oscillator	HP 8350A/B
Vane Attenuator	HP R382A
Power Meter	HP 432A
Power Sensor	HP R486A
Oscilloscope	HP 1740A
Crystal Detector	HP R422A

5-20. ALC LEVELED FLATNESS (Option 001 Only) (Cont'd)

TEST EQUIPMENT CALIBRATION:

NOTE 2

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

The following steps provide a calibrated flatness reference line for the R422A crystal detector with the vane attenuator at the specified maximum leveled output power of the HP 83572A/B RF Plug-In.

1. Remove the A5 FM Driver Assembly from the Plug-In. Set the vane attenuator to 14 dB. Connect the power meter and sensor through the vane attenuator to the RF Plug-In as shown in Figure 5-14.

2. Press 8350A/B **[INSTR PRESET] [CW] [2] [6] [.] [5] [GHz]**. Press **[SHIFT] [DET]** and note that the HP 83572A/B CAL lamp is on. Compensate for the calibration factor of the power sensor at this frequency by adjusting the CAL FACTOR % knob on the power meter.

   HP 83572A

   Adjust the RF POWER LEVEL to obtain a power meter reading of −12 dBm (+2 dBm at the output of the directional coupler). For Option 016 the power meter reading should be −13.5 dBm (+0.5 dBm at the output of the directional coupler).

   HP 83572B

   Adjust the RF POWER LEVEL to obtain a power meter reading of −8 dBm (+6 dBm at the output of the directional coupler). For Option 016 the power meter reading should be −9.5 dBm (+4.5 dBm at the output of the directional coupler).

3. Disconnect the power sensor and connect the oscilloscope through the crystal detector and vane attenuator to the RF Plug-In output. Set the oscilloscope to A vs B sweep mode. Set both input channels to dc coupled with Channel A to .005 VOLTS/DIV and Channel B to 1 VOLTS/DIV.

4. With the oscilloscope position controls, place the trace on the center left edge of the display.

5. Using a grease pencil, mark the screen exactly where the trace dot appears.

6. Disconnect the crystal detector, and reconnect the power sensor. Press 8350A/B **[CW] [3] [0] [GHz]**. Compensate for the calibration factor of the power sensor by adjusting the CAL FACTOR % knob on the power meter. Adjust the HP 83572A/B RF POWER LEVEL to obtain the same power meter reading as in step 2.

7. Disconnect the power sensor and reconnect the crystal detector to the RF Plug-In. With the grease pencil, mark the position of this second trace dot on the CRT.

8. Repeat this process at 33 GHz, 36 GHz, and 40 GHz. (The calibration factor of the power sensor must be compensated at all frequencies.) Then connect all the marks with the grease pencil. This line represents the frequency response of the crystal detector. When the RF output flatness of the Plug-In is adjusted, this line represents 0 dB variation.

5-20. ALC LEVELED FLATNESS (Option 001 Only) (Cont'd)

9. Press **[CW] [3] [3] [GHz]** (the middle of the frequency range). Set the HP 83572A/B power level to coincide with the calibration line on the oscilloscope.

10. Decrease the vane attenuator setting by 1.5 dB and note the deviation of the trace below the calibration line. Increase the vane attenuator setting by 3 dB. The trace should now indicate 1.5 dB deviation above the calibration line. These deviations are the flatness adjustment limits. Set the vane attenuator to return the trace to the calibration line.

PROCEDURE:

11. Replace the A5 FM Driver Assembly in the Plug-In. Connect the equipment as shown in Figure 5-14, with the crystal detector/oscilloscope monitoring the RF output. Press 8350A/B **[INSTR PRESET] [SHIFT] [DET]**. The trace displayed by the oscilloscope represents the flatness across the full sweep of the HP 83572A/B. Adjust the POWER LEVEL so the start of the oscilloscope trace coincides with the calibration line.

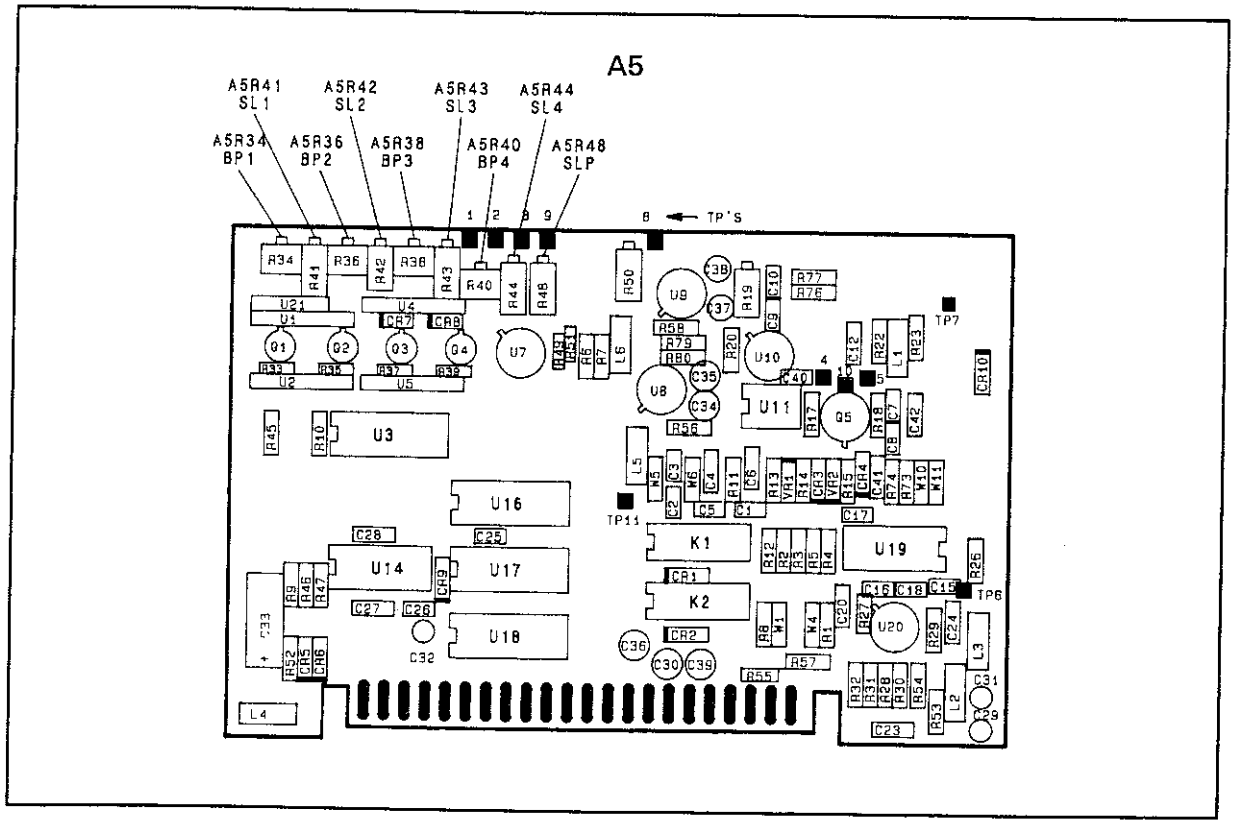


Figure 5-15. ALC Leveling Adjustment Locations

NOTE 3

The following step may be omitted if the display matches the grease pencil mark within ±1.5 dB as calibrated in step 11. If power flatness is significantly beyond these limits, it is best to remove all adjustments as described in the following step.

5-20. ALC LEVELED FLATNESS (Option 001 Only) (Cont'd)

12. Adjust A5R48 fully counterclockwise. Adjust all the breakpoint potentiometers fully clockwise against the stops: these are A5R34 (BP1), A5R36 (BP2), A5R38 (BP3), and A5R40 (BP4), illustrated in Figure 5-15. This effectively removes the circuit from the leveling loop.

13. BP1 – BP4 and SL1 – SL4 (Figure 5-15) are interactive adjustments used to remove RF power variations. Potentiometers BP1 to BP4 set the frequency breakpoints at which the slope adjustments SL1 to SL4 take effect. It may not be necessary to adjust all of the potentiometers.

14. While observing the display, adjust BP1 to set a breakpoint at the first point on the trace where flatness compensation is needed. Then adjust SL1 for best power flatness about that breakpoint.

15. Repeat this process using BP2 and SL2, BP3 and SL3, and BP4 and SL4 until the displayed trace is within ±1.5 dB of the grease pencil line across the screen.

16. Disconnect the crystal detector and oscilloscope, and connect the power sensor through the vane attenuator to the HP 83572A/B RF OUTPUT. Press [CW] and manually sweep the range of the Plug-In while monitoring power variations on the meter. Remember to compensate the power meter for the calibration factor of the power sensor – this can cause a difference of as much as 3 dB between frequencies. Any discrepancies between power meter and oscilloscope indications are due to measurement uncertainties. The power meter provides the more accurate indication of RF power flatness.

5-21. POWER CALIBRATION (Option 001)

NOTE

Complete adjustment of the leveling loop requires several procedures to be performed in the order prescribed in Paragraphs 5-19 through 5-24. Deviation from this routine may cause improper leveling and/or flatness problems.

REFERENCE:

Service Sheet: A4

DESCRIPTION:

Power is calibrated at a CW frequency which falls in the middle of the power variation range. Adjustments are made at three breakpoints over the leveled power range: −5 dBm, 0 dBm, and maximum leveled power.

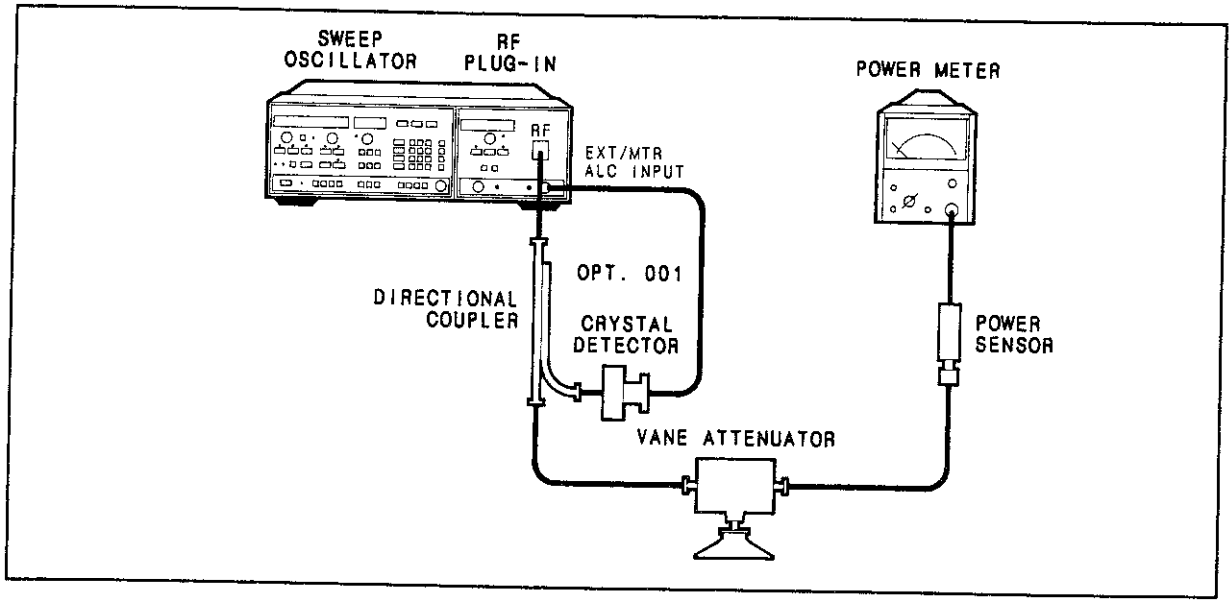


Figure 5-16. Power Calibration Adjustment Setup (Option 001)

EQUIPMENT:

Power Meter	HP 432A
Power Sensor	HP R486A
Vane Attenuator	HP R382A

PROCEDURE

NOTE

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

1. Connect equipment as shown in Figure 5-16. Set the vane attenuator to 5 dB. Press 8350A/B **[INSTR PRESET] [CW] [2] [6] [.] [5] [GHz]**. Enter **[SHIFT] [DET]** and note that the HP 83572A/B CAL lamp is on. Slowly tune the CW frequency across the band

5-21. POWER CALIBRATION (Option 001) (Cont'd)

and select a frequency where the power is approximately in the center of the power variation range (middle of the power meter variations). Ensure that the power meter CAL FACTOR % is adjusted to compensate for the calibration factor of the power sensor. Enter the frequency selected.

2. Set the HP 83572A/B output power for a front panel indication of −5 dBm. Adjust "1 LO" (A4R5) (see Figure 5-17) for a power meter reading of −10 dBm ± 0.1 dB (this corresponds to −5 dBm at the output of the directional coupler).

3. Set the HP 83572A/B output power for a front panel indication of 0 dBm. Adjust "1 MD" (A4R8) for a power meter reading of −5 dBm ± 0.1 dB (0 dBm at the output of the directional coupler).

4. Recheck the −5 dBm level and readjust A4R5 if necessary.

5. Set the HP 83572A/B output power for maximum leveled power as indicated by the front panel UNLEVELED light. Adjust "1 HI" (A4R3) for a power meter reading that corresponds with the HP 83572A/B POWER LEVEL display (e.g. if the POWER display is +4 dBm, the power meter should indicate −1 dBm; if the POWER display is +6 dBm, the power meter should indicate +1 dBm).

6. Step the HP 83572A/B RF output power in 1 dB intervals from −5 dBm to maximum leveled power. The power meter reading should match the HP 83572A/B front panel power setting within ±0.2 dB, typically.

7. Iterate steps 2 through 6 as necessary, and make adjustments for the best compromise over the power range.

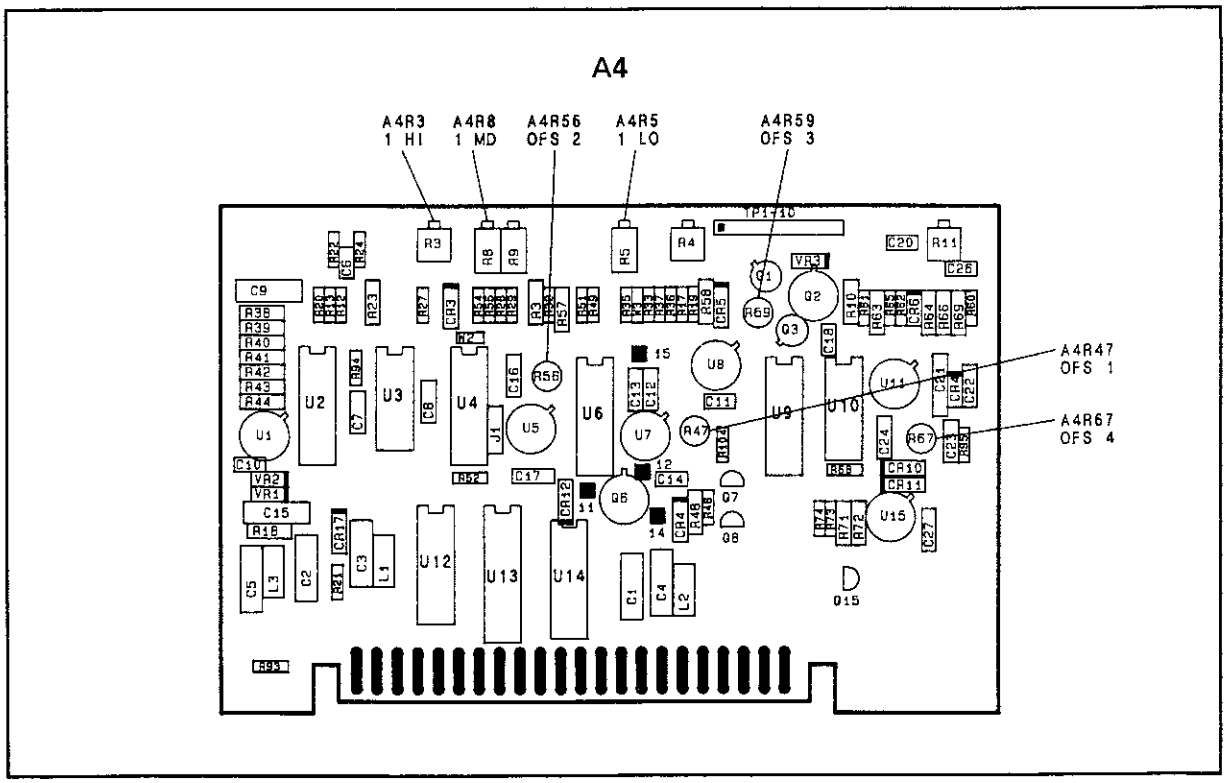


Figure 5-17. A4 ALC Board Adjustment Locations

5-22. ALC GAIN ADJUSTMENT (Option 001 Only)

NOTE

Complete adjustment of the ALC leveling loop requires several procedures to be performed in the order prescribed in Paragraphs 5-19 through 5-24. Deviation from this routine may cause improper leveling and/or flatness problems.

REFERENCE:

Performance test: Paragraph 4-14.
Service Sheet: A4

DESCRIPTION:

A4R11, at the inverting input of A4U11, adjusts the gain of the main ALC amplifier. A4R11 is adjusted for maximum gain without oscillations and minimum overshoot when RF power is turned on at the beginning of the sweep (with RF Blanking).

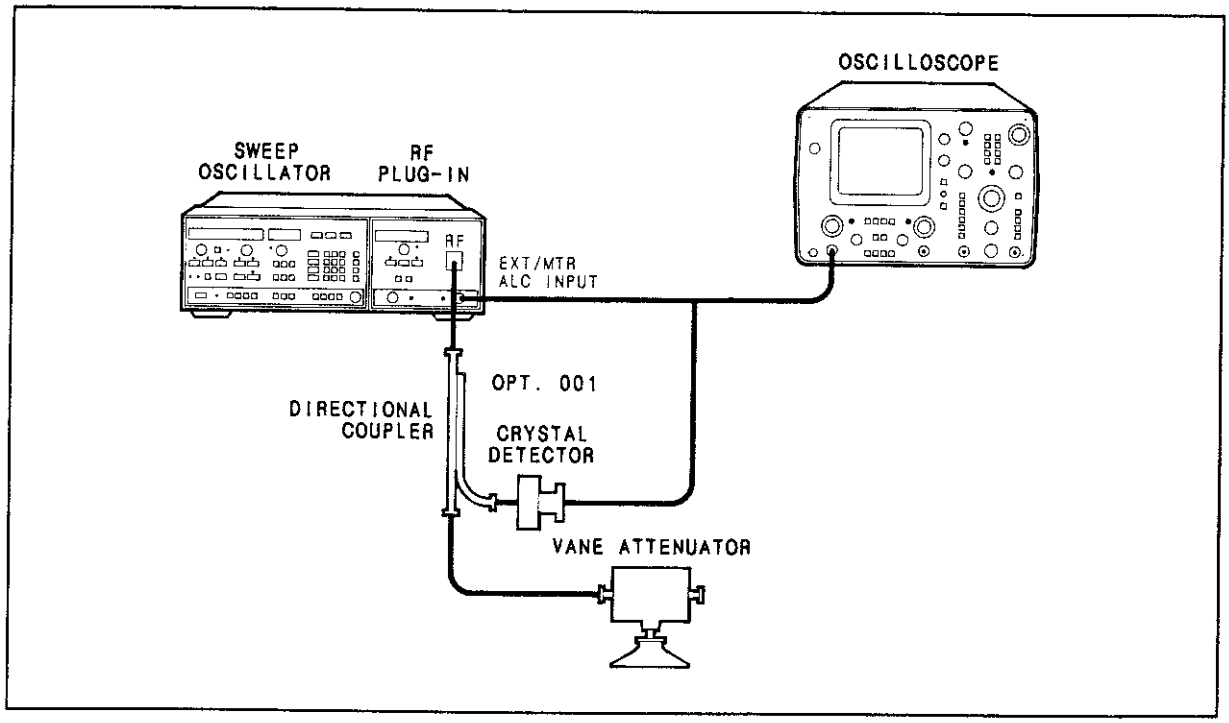


Figure 5-18. ALC Gain Adjustment Setup

EQUIPMENT

Sweep Oscillator	HP 8350A/B
Oscilloscope	HP 1740A
Vane Attenuator	HP R382A

PROCEDURE:

NOTE

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

5-22. ALC GAIN ADJUSTMENT (Option 001 Only) (Cont'd)

1. Connect equipment as shown in Figure 5-18.

2. Press 8350A/B **[INSTR PRESET] [SHIFT] [DET]**. Set the HP 83572A/B POWER LEVEL to the maximum power at which the UNLEVELED lamp is out.

3. Press 8350A/B **[RF BLANK]**.

4. Set the oscilloscope to display both the retrace and the forward sweep of the detected RF output.

5. Note the point on the oscilloscope where RF power is switched on. Adjust A4R11 (GAIN) (Figure 5-19) clockwise for maximum gain without overshoot when the RF power is switched on. Also verify that there are no oscillations during forward sweep and that the UNLEVELED lamp is off.

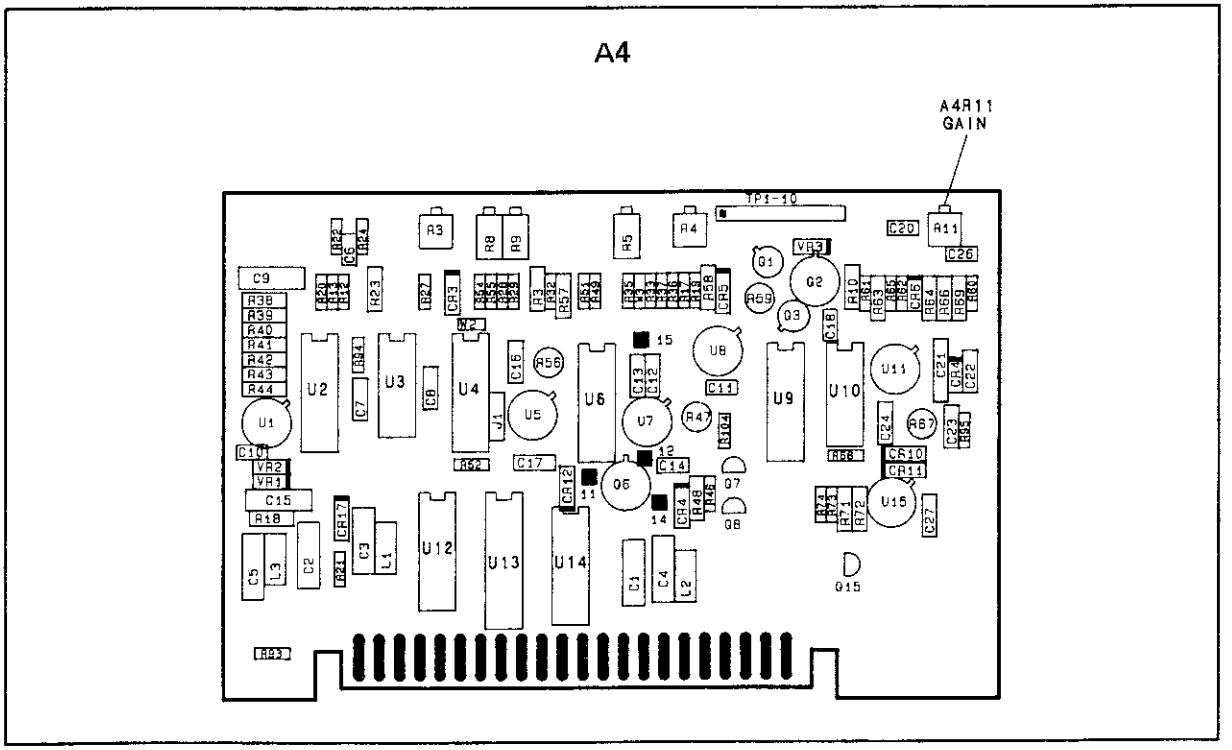


Figure 5-19. ALC Gain Adjustment Location

5-23. POWER METER LEVELING CALIBRATION

NOTE

Complete adjustment of the leveling loop for Power Meter leveling requires several procedures to be performed in the order prescribed in Paragraphs 5-19 through 5-24. Deviation from this routine may cause improper leveling and/or flatness problems.

REFERENCE:

Service Sheet: A4

DESCRIPTION:

The Power Meter Leveling gain potentiometer A4R9 (PM) calibrates the gain of the ALC loop to full-scale deflection of the power meter.

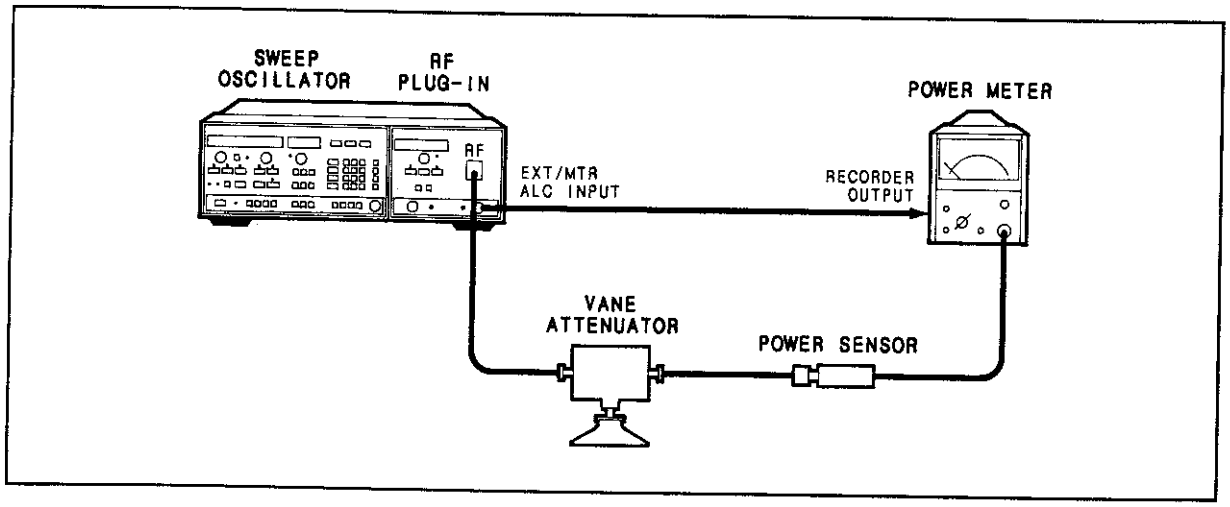


Figure 5-20. Power Meter Leveling Adjustment Setup

EQUIPMENT:

Sweep Oscillator	HP 8350A/B
Power Meter	HP 432A
Thermistor Sensor	HP R486A
Vane Attenuator	HP R382A

PROCEDURE:

1. Connect the equipment as shown in Figure 5-20. Set the vane attenuator to 10 dB. Set the power meter to the 0 dBm range. Press **[INSTR PRESET] [CW] [MTR]**.

2. Set HP 83572A/B POWER LEVEL to −5 dBm. Set the power meter RANGE switch to −10. Adjust HP 83572A/B EXT/MTR ALC CAL to obtain a power meter reading of −15 (RF output minus 10 dB attenuation).

3. Press 8350A/B **[POWER LEVEL] [STEP SIZE] [1] [dB]** and use [▲] to increase the HP 83572A/B POWER LEVEL by exactly 5.0 dB. Adjust A4R9 "PM" (Figure 5-21) for a power meter reading of −10. The HP 83572A/B front panel power indication should read +0 dBm.

5-22. POWER METER LEVELING CALIBRATION (Cont'd)

4. Use the 8350A/B [◀▬▶] key to step down 5 dB, and adjust the front panel CAL potentiometer for a −15 dBm reading on the power meter.

5. Iterate as required between 8350A/B power level settings of −5 and 0 dBm, adjusting the front panel CAL potentiometer and A4R9 respectively, until no further adjustment is necessary.

6. Press 8350A/B SWEEP TRIGGER **[SINGLE] [SWEEP TIME] [1] [0] [0] [SEC] [START]**.

7. Set the EXT/MTR ALC CAL control for approximately 5 dB less on the power meter. Set the power meter range to −5 dBm. Set the HP 83572A/B POWER LEVEL to its specified maximum leveled power (+3 dBm for the standard HP 83572A, +7 dBm for the standard HP 83572B). Set the EXT/MTR ALC CAL control for a corresponding power meter reading (−7 dBm for the standard HP 83572A, −3 dBm for the standard HP 83572B).

8. Press SWEEP TRIGGER **[SINGLE]** and observe the power meter indication. The deviation should be no greater than .4 dB over the full sweep.

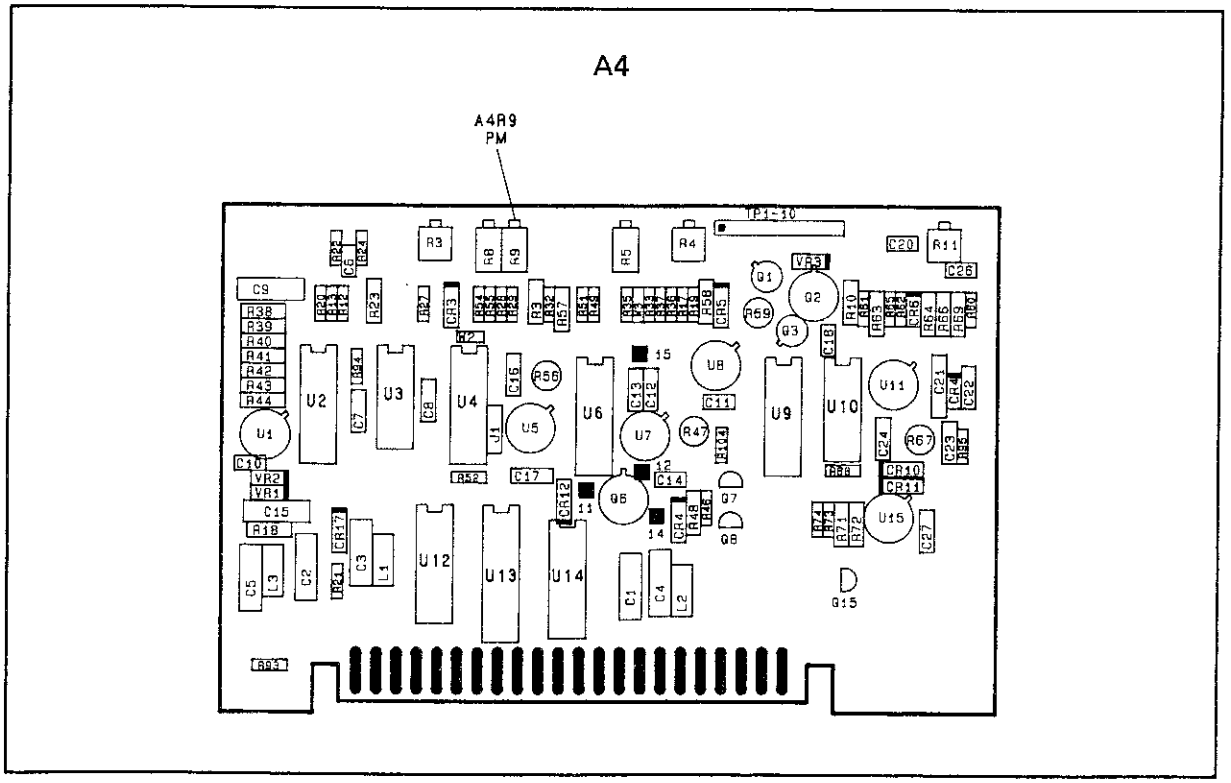


Figure 5-21. Power Meter Leveling Adjustment Location

5-24. POWER SWEEP (Option 001)

REFERENCE:

Service Sheet: A5

DESCRIPTION:

A power sweep mode of 7 dB (HP 83572A) or 11 dB (HP 83572B) is displayed on the power meter (1.5 dB less if the instrument is an Option 001/006). A5R50 is adjusted for the correct sweep and power slope.

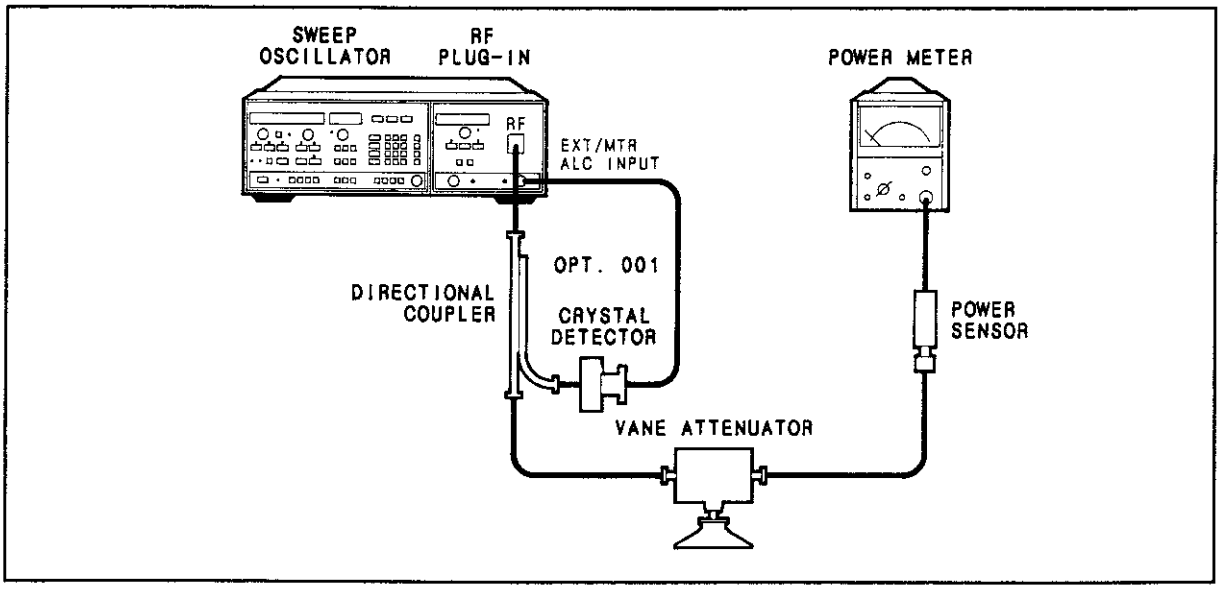


Figure 5-22. Power Sweep Adjustment Setup

EQUIPMENT:

Power Meter	HP 432A
Power Sensor	HP R486A
Vane Attenuator	HP R382A

PROCEDURE:

NOTE

ALC calibration adjustments must be checked before the power sweep adjustment is made.

NOTE

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

1. Connect the equipment as shown in Figure 5-22. Set the vane attenuator to 5 dB.
2. Set the power meter to the 0 dBm range.
3. Press 8350A/B **[SHIFT] [CW] [SHIFT] [DET] [POWER LEVEL] [−] [5] [dBm] [SWEEP TIME] [5] [s]**.

5-24. POWER SWEEP (Option 001) (Cont'd)

4. Adjust the HP 83572A/B POWER LEVEL for a convenient reference reading on the power meter. For an HP 83572A this reference must be at least 7 dB below the range selected (5.5 dB below if it is an Option 001/006). For an HP 83572B the reference must be at least 11 dB below the range selected (9.5 dB below if it is an Option 001/006).

5. **HP 83572A**

   Press **[POWER SWEEP] [7] [dB]**.
   (Or if the HP 83572A is an Option 001/006, press **[POWER SWEEP] [5] [.] [5] [dB]**.)

   HP 83572B

   Press **[POWER SWEEP] [1] [1] [dB]**.
   (Or if the HP 83572B is an Option 001/006, press **[POWER SWEEP] [9] [.] [5] [dB]**.)

6. While observing the power meter display of the RF output, adjust A5R50 PWSP (Figure 5-23) for 7 dB/sweep for the HP 83572A or 11 dB/sweep for the HP 83572B (1.5 dB less if the instrument is an Option 001/006).

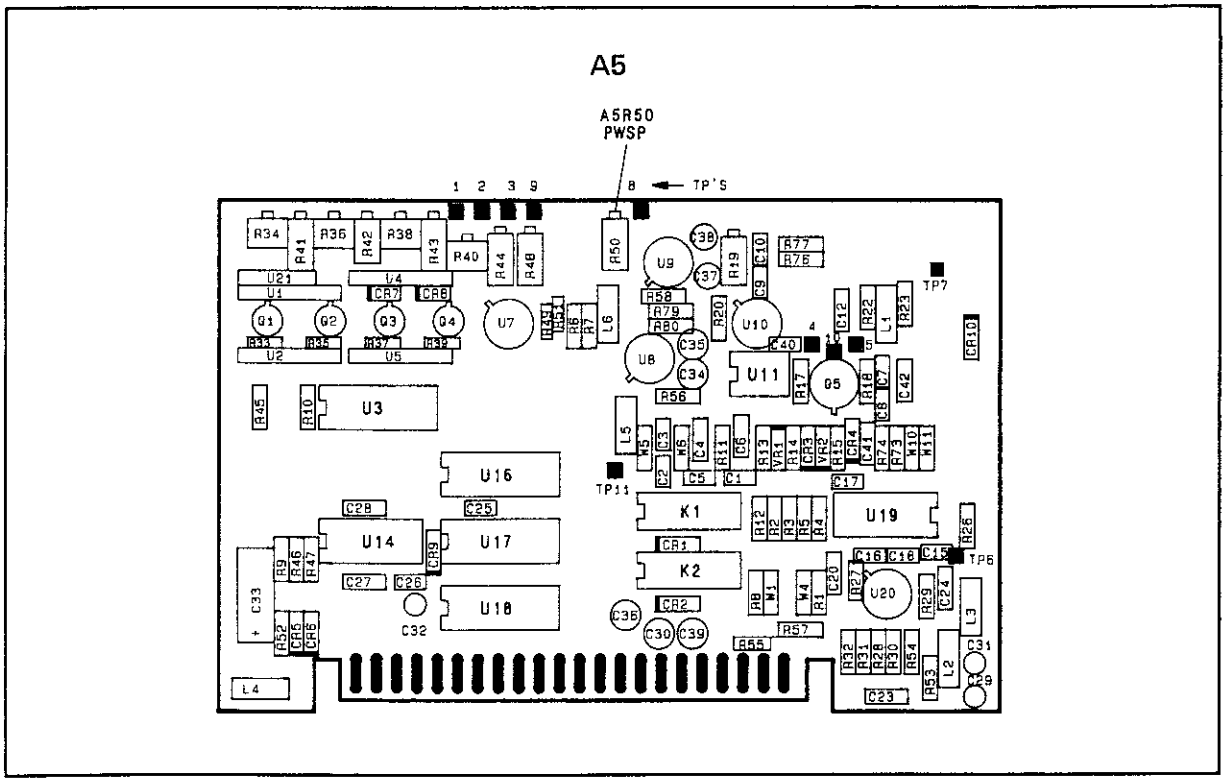


Figure 5-23. Power Sweep Adjustment Location

5-25. FM DRIVER

REFERENCE:

Service Sheet: A5

DESCRIPTION:

The FM Driver high frequency offset is adjusted for zero volts drive with no FM applied.

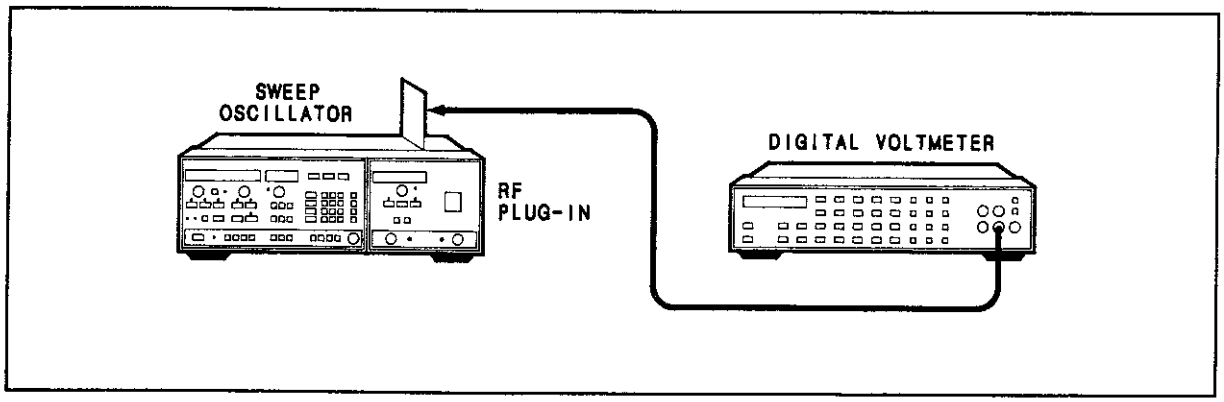


Figure 5-24. FM Driver Adjustment Setup

EQUIPMENT:

Digital Voltmeter HP3456A

PROCEDURE:

NOTE

Turn AC power OFF when removing or installing PC boards.

NOTE

This procedure assumes that A3S1 is set to the factory-set position (Table 5-6).

1. Place the A5 FM Driver on an extender board.
2. Set configuration switch A3S1 as follows (Table 5-6):

Switch No.	1	2	3	4	5	6	7	8
Position	Z	Z	Z	0	0	0	0	X

Positions: 1=Open; 0=Closed; X=Don't care; Z=According to the instrument (A or B) and the Options installed

NOTE

The A3S1 switch positions select the HP 83572A/B code, maximum RF power at power-up, −20 MHz/V FM sensitivity, and cross-over coupled FM (AC coupled).

3. Press 8350A/B **[INSTR PRESET]**.

5-25. FM DRIVER (Cont'd)

4. Connect the DVM between the A5 board connector pin 21 and A5TP7 (ground) (see Figure 5-25). Adjust A5R19 "FM OFFSET" for zero Vdc ± 0.1 mVdc.

5. Disconnect the DVM from the test points, remove the extender board, and reinstall the A5 FM Driver in the HP 83572A/B.

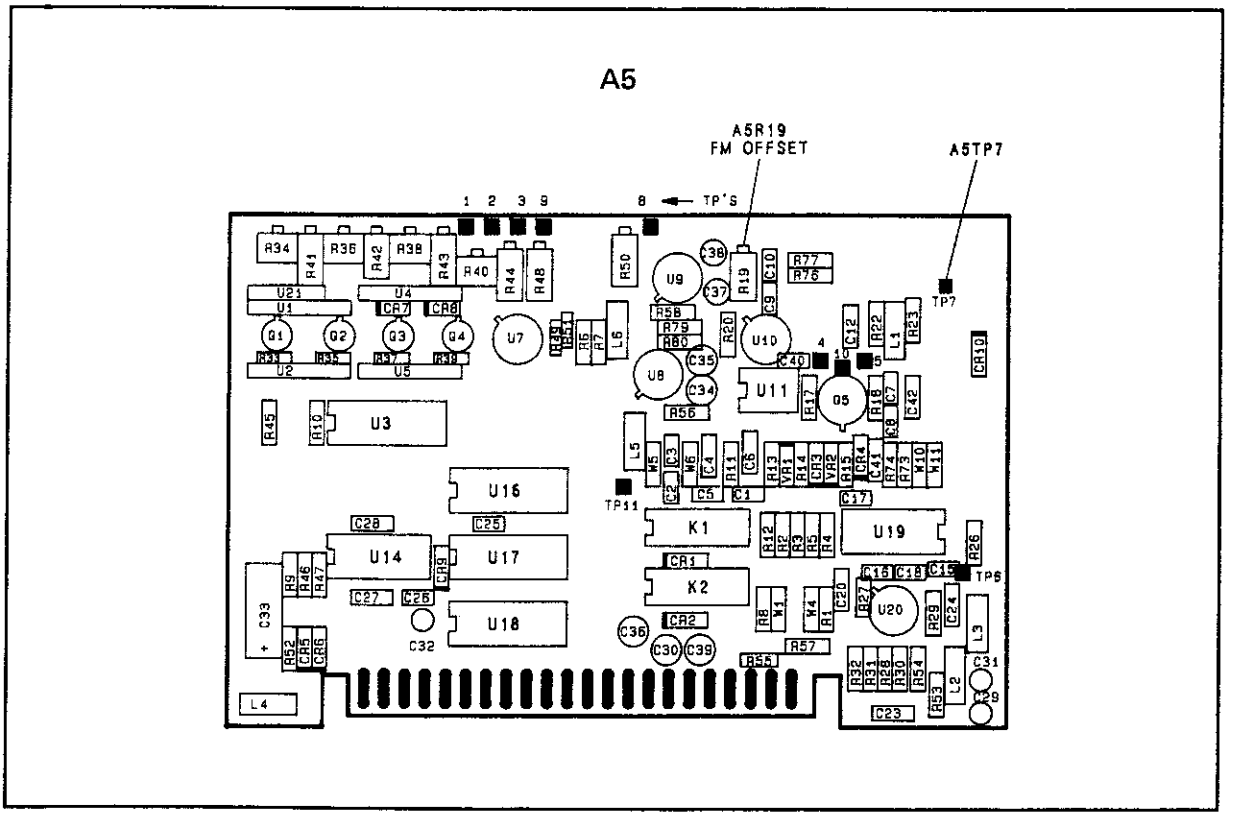


Figure 5-25. FM Driver Adjustment Locations

5-26. ON OFF Ratio (Option 006 Only)

REFERENCE:

Service Sheet: A7

DESCRIPTION:

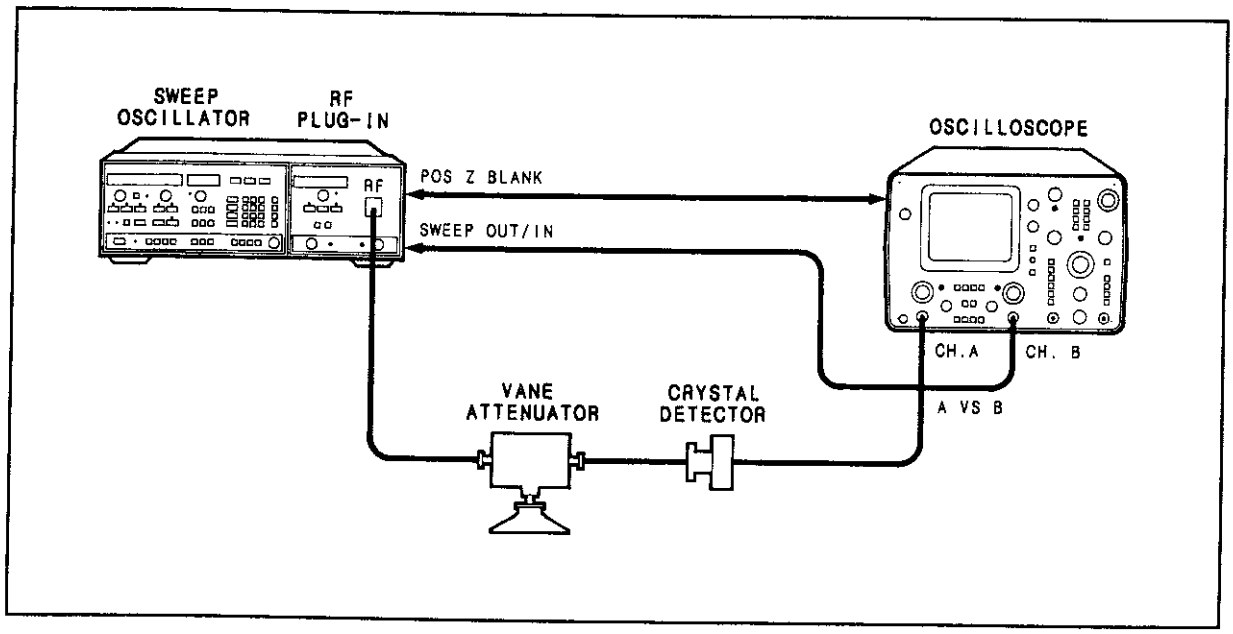


Figure 5-26. On Off Ratio Adjustment Setup

EQUIPMENT:

Oscilloscope	HP 1740A
Crystal Detector	HP R422A
Vane Attenuator	HP R382A

PROCEDURE:

1. Connect equipment as shown in Figure 5-26.
2. Press 8350A/B **[INSTR PRESET][⌐ MOD]**.
3. Adjust A7R69 (Figure 5-27) for the minimum difference between 0 Vdc and the top of the modulation envelope over the first two divisions of the oscilloscope trace.
4. Adjust A7R71 for the minimum difference between 0 Vdc and the top of the modulation envelope over the remainder of the oscilloscope trace.

5-26. ON OFF RATIO (Option 006 Only) (Cont'd)

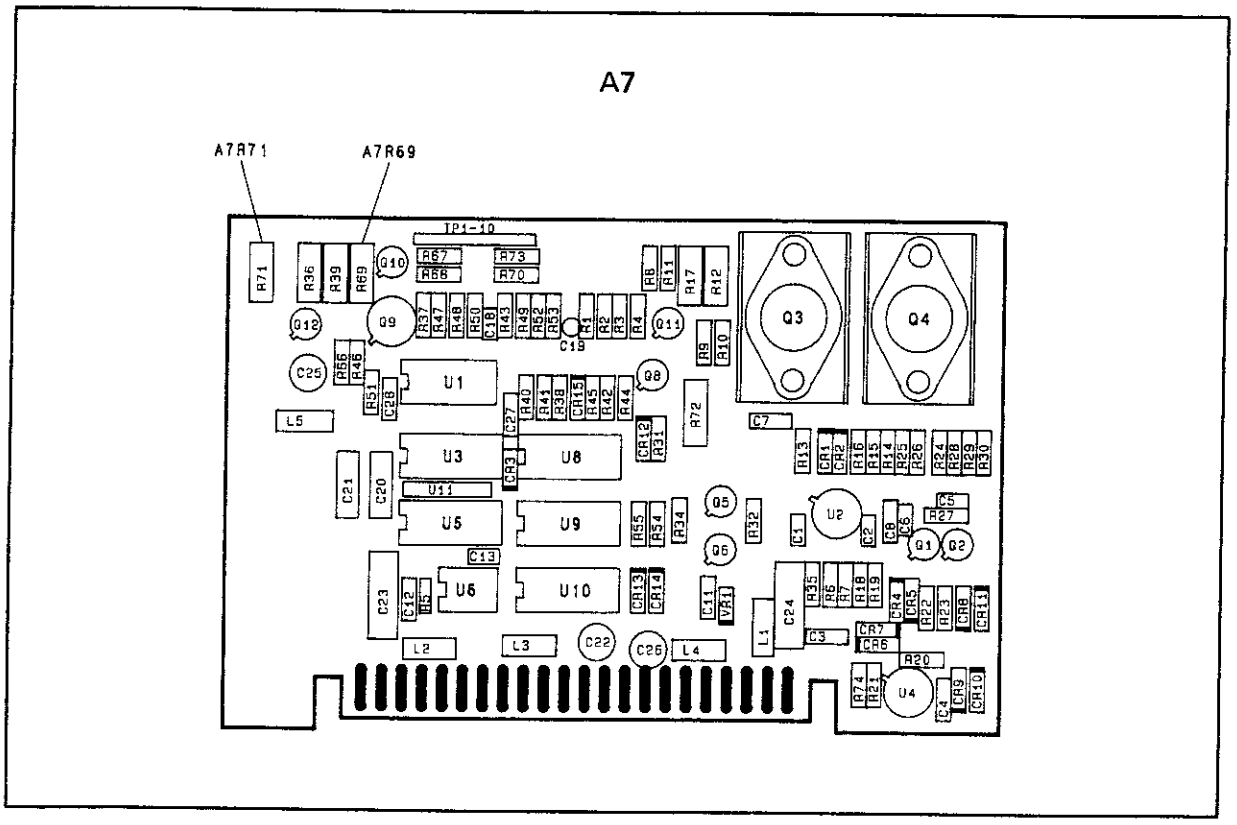


Figure 5-27. ON/OFF Ratio Adjustment Locations

SECTION VI
REPLACEABLE PARTS

6-1. INTRODUCTION

6-2. This section contains information for ordering parts. Table 6-1 lists the available exchange assemblies. Table 6-2 lists abbreviations used in the parts list and the names and addresses that correspond to the manufacturers' code numbers. Table 6-3 lists all replaceable parts in reference designator order.

6-3. EXCHANGE ASSEMBLIES

6-4. Table 6-1 lists assemblies within the instrument that may be replaced on an exchange basis, thus affording a considerable cost savings. Exchange factory repaired and tested assemblies are available only on a trade-in basis, therefore the defective assemblies must be returned for credit. For this reason, assemblies required for spare parts stock must be ordered by the new assembly part number.

6-5. ABBREVIATIONS

6-6. Table 6-2 contains three major sections: Reference Designations expands the designators used in the parts list; Abbreviations defines abbreviations used in the descriptions of replaceable parts; Manufacuters Code List references the name and address of a typical manufacturer with the code number provided in the parts list.

6-7. REPLACEABLE PARTS LIST

6-8. Table 6-3 is the list of replaceable parts and is organized as follows:

a. Electrical assemblies and their components in alpha-numerical order by reference designation.

b. Chassis-mounted parts in alpha-numerical order by reference designation.

c. Miscellaneous parts.

6-9. The information given for each part consists of the following:

a. The Hewlett-Packard part number.

b. Part number check digit (CD).

c. The total quantity (Qty) in the instrument.

d. The description of the part.

e. A typical manufacturer of the part in a five-digit code.

f. The manufacturer's number for the part.

6-10. The total quantity for each part is given only once—at the first appearance of the part number in the list.

NOTE

Total quantities for optional assemblies are totaled by assembly and not integrated into the standard list.

6-11. ILLUSTRATIONS

6-12. Figure 6-1, Mechanical Parts, provides the location of the replaceable mechanical parts listed in Table 6-3. These parts are denoted with the reference designation prefix "MP". Figure 6-2, Attaching Hardware, references the Hewlett-Packard part number for the hardware used with at least one location in the instrument.

6-13. ORDERING INFORMATION

6-14. To order a part listed in the Replaceable Parts List, quote the Hewlett-Packard part number with its check digit (CD), indicate the quantity, and address the order to the nearest Hewlett-Packard Office. The check digit will ensure accurate and timely processing of your order.

6-15. To order a part that is not listed in the Replaceable Parts List, include the instrument model number, instrument serial number, description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard Office.

6-16. SPARE PARTS KIT

6-17. Stocking spare parts for an instrument is often done to ensure quick return to service after a malfunction occurs. Hewlett-Packard has a Spare Parts Kit available for this purpose. The kit consists of selected replaceable assemblies and components for this instrument. The contents of the kit and the Recommended Spares list for this instrument may be obtained on request and the Spare Parts Kit may be ordered through your nearest Hewlett-Packard Office.

Table 6-1. Exchange Parts

Reference Designation	Description	New Part Number	Rebuilt-Exchange Part Number
A2 (83572A)	YIG oscillator replacement kit (includes W8 and W9 and twelve factory-select resistors for the A6 YO driver assembly plus one for the A7 bias assembly)	83572-60015	83572-60044
A2 (83572B)	Same as above	83572-60048	83572-60049

Table 6-2. Manufacturers Code List, Reference Designations, and Abbreviations (1 of 3)

83572A/B MANUFACTURERS CODE LIST

Mfr. No.	Manufacturer Name	Address		Zip Code
00545	NIPPON ELECTRIC CO	TOKYO	JP	
00000	ANY SATISFACTORY SUPPLIER			
01121	ALLEN-BRADLEY CO	MILWAUKEE	WI	53204
01295	TEXAS INSTR INC SEMICOND CMPNT DIV	DALLAS	TX	75222
03888	K D I PYROFILM CORP	WHIPPANY	NJ	07981
04713	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX	AZ	85008
06001	MEPCO ELECTRA CORP	COLUMBIA	SC	29063
06665	PRECISION MONOLITHICS INC	SANTA CLARA	CA	95050
07263	FAIRCHILD SEMICONDUCTOR·DIV	MOUNTAIN VIEW	CA	94042
11236	CTS OF BERNE INC	BERNE	IN	46711
13606	SPRAGUE ELECT CO SEMICONDUCTOR DIV	CONCORD	NH	03301
17856	SILICONIX INC	SANTA CLARA	CA	95054
18324	SIGNETICS CORP	SUNNYVALE	CA	94086
19701	MEPCO/ELECTRA CORP	MINERAL WELLS	TX	76067
20932	EMCON DIV ITW	SAN DIEGO	CA	92129
24355	ANALOG DEVICES INC	NORWOOD	MA	02062
24546	CORNING GLASS WORKS (BRADFORD)	BRADFORD	PA	16701
25088	SIEMANS CORP	ISELIN	NJ	08830
27014	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA	CA	95051
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO	CA	94304
3L585	RCA CORP SOLID STATE DIV	SOMERVILLE	NJ	
30983	MEPCO/ELECTRA CORP	SAN DIEGO	CA	92121
32997	BOURNS INC TRIMPOT PROD DIV	RIVERSIDE	CA	92507
34371	HARRIS SEMICON DIV HARRIS-INTERTYPE	MELBOURNE	FL	32901
34649	INTEL CORP	MOUNTAIN VIEW	CA	95051
56289	SPRAGUE ELECTRIC CO	NORTH ADAMS	MA	01247
73138	BECKMAN INSTRUMENTS INC HELIPOT DIV	FULLERTON	CA	92634
9N171	UNITRODE COMPUTER PRODUCTS CORP	METHUEN	MA	
91506	AUGAT INC	ATTLEBORO	MA	02703

Table 6-2. Manufacturers Code List, Reference Designations, and Abbreviations (2 of 3)

REFERENCE DESIGNATIONS

A ..... Assembly
AT ..... Attenuator, Isolator, Limiter, Termination
C ..... Capacitor
CR ... Diode, Diode Thyristor, Step Recovery Diode (SCR), Varactor
DC ..... Directional Coupler
DS .... Annunciator, Lamp, Light Emitting Diode (LED), Signaling Device (Audible or Visible)
E ..... Miscellaneous Electrical Part
F ..... Fuse
FL ..... Filter
H ..... Hardware
J ..... Electrical Connector (Stationary Portion), Jack
K ..... Relay
L ..... Coil, Inductor
MP ..... Miscellaneous Mechanical Part
P ..... Electrical Connector (Movable Portion), Plug
Q .... Silicon Controlled Rectifier (SCR), Transistor, Triode Thyristor
R ..... Resistor
S ..... Switch
T ..... Transformer
TP ..... Test Point
U ..... Integrated Circuit, Microcircuit
VR .... Breakdown Diode (Zener), Voltage Regulator
W ..... Cable, Transmission Path, Wire
X ..... Socket
Y ..... Crystal Unit (Piezoelectric, Quartz)
Z ... Tuned Cavity, Tuned Circuit

ABBREVIATIONS

A

A ..... Across Flats, Acrylic, Air (Dry Method), Ampere
ADJ ..... Adjust, Adjustment
ALC ..... Alcohol, Automatic Level Control
AMP ..... Amperage
AMPL ..... Amplifier
ANLG ..... Analog
ASSY ..... Assembly
ASTBL ..... Astable
ATTEN ..... Attenuation, Attenuator
AWG ..... American Wire Gage

B

BD ..... Board, Bundle
BE ..... Baume, Beryllium
BFR ..... Before, Buffer
BLK ..... Black, Blank, Block
BNC ..... Type of Connector
BSC ..... Basic
BVR ..... Reverse Breakdown Voltage

C

C ..... Capacitance, Capacitor, Center Tapped, Centistoke, Ceramic, Cermet, Circular Mil Foot, Closed Cup, Cold, Compression
CBL ..... Cable
CER ..... Ceramic
CH ..... Center Hole
CHAM ..... Chamfer
CHAN ..... Channel
COAX ..... Coaxial
COM ..... Commercial, Common
CONN ..... Connect, Connection, Connector
CONT ..... Contact, Continuous, Control, Controller
CONV ..... Converter
CP ..... Cadmium Plate, Candle Power, Centipoise, Conductive Plastic, Cone Point

D

D ..... Deep, Depletion, Depth, Diameter, Direct Current
D/A ..... Digital-to-Analog
DAP ..... Diallyl Phthalate
DB ..... Decibel, Double Break
DC ..... Direct Current, Double Contact
DBL ..... Double
DCDR ..... Decoder
DEG ..... Degree
DIA ..... Diameter
DIFF ..... Differential
DIP ..... Dual In-Line Package
DO ... Package Type Designation
DRVR ..... Driver

E

E ..... Enamel (Insulation, Enhancement, Extension)
E-MODE .... Enhancement Mode
EPROM ..... Eraseable Programmable Read Only Memory
EXCL ..... Excluding, Exclusive
EXT ..... Extended, Extension, External, Extinguish

F

F ..... Fahrenheit, Farad, Female, Film (Resistor), Fixed, Flange, Flint, Fluorine, Frequency
FEM ..... Female
FF ..... Flange, Female Connection; Flip Flop
FM .... Flange, Male Connection; Foam, Frequency Modulation
FT ..... Current Gain Bandwidth Product (Transition Frequency); Feet, Foot
FXD ..... Fixed

G

GEN ..... General, Generator
GL ..... Glass
GP ..... General Purpose, Group

H

H ..... Henry, Hermaphrodite, High, Hole Diameter, Hot, Hub Inside Diameter, Hydrogen
HD ..... Hand, Hard, Head, Heavy Duty
HEX ..... Hexadecimal, Hexagon, Hexagonal

I

IC ..... Collector Current, Integrated Circuit
ID ..... Identification, Inside Diameter

Table 6-2. Manufacturers Code List, Reference Designations, and Abbreviations (3 of 3)

IF ..... Forward Current, Intermediate Frequency
IMPD ..... Impedance
IN..... Inch, Indium
INP..... Input
INT..... Integral, Intensity, Internal
INTL..... Internal, International
INV..... Invert, Inverter

J

JFET ..... Effect Transistor

K

K..... Kilo, Potassium
KB ..... Knob

L

LED..... Light Emitting Diode
LG..... Length, Long
LIN..... Linear, Linear Taper, Linearity
LK ..... Link, Lock
LKG..... Leakage, Locking
LKWR..... Lockwasher
LS..... Loudspeaker, Low Power Schottky, Series Inductance
LUM..... Luminous

M

M ..... Male, Maximum, Mega, Mil, Milli, Mode, Momentary, Mounting Hole Centers, Mounting Hole Diameter
MA..... Milliampere
MACH ..... Machined
MAX..... Maximum
MCD ..... Millicandela
MICPROC..... Microprocessor
MISC..... Miscellaneous
MLD..... Mold, Molded
MM..... Magnetized Material (Restricted Articles Code); Millimeter
MOD..... Model, Modified, Modular, Modulated, Modulator
MOSFET..... Metal Oxide Semiconductor Field Effect Transistor
MTG ..... Mounting
MTR ..... Meter
MULTIPLXR..... Multiplexer
MUW..... Music Wire
MW..... Milliwatt

N

N-CHAN ..... N-Channel
N-CHAN ..... N-Channel Metal Oxide Semiconductor
NO..... Normally Open, Number
NPN..... Negative Positive Negative (Transistor)
NS..... Nanosecond, Non-Shorting, Nose

O

OCTL..... Octal
OD ..... Olive Drab, Outside Diameter
OP ..... Operational
OPT ... Optical, Option, Optional
OXD..... Oxide

P

PC..... Picocoulomb, Piece, Printed Circuit
PCB..... Printed Circuit Board
PD..... Pad, Palladium, Pitch Diameter, Power Dissipation
PKG..... Package
PL..... Phase Lock, Plain, Plate, Plug
PLSTC..... Plastic
PNP..... Positive Negative Positive (Transistor)
POLYE..... Polyester
POS..... Position, Positive
POZI..... Pozidriv Recess
PRCN..... Precision
PRP ..... Purple, Purpose
PT ..... Part, Pint, Platinum, Point, Pulse Time
PVC..... Polyvinyl Chloride
PW..... Power Wirewound, Pulse Width

Q

QUAD ..... Set of Four

R

RES..... Research, Resistance, Resistor, Resolution
RET ..... Retaining
RF..... Radio Frequency
RGLTR..... Regulator
RKR ..... Rocker
RND ..... Round
RPG..... Rotary Pulse Generator
RR..... Rear
RVT ..... Rivet, Riveted

S

SCR..... Screw, Scrub, Silicon Controlled Rectifier
SGL..... Single
SHFT..... Shaft
SI..... Silicon, Square Inch
SIG..... Signal, Significant
SIP..... Single In-Line Package
SKT..... Skirt, Socket
SLDR..... Solder
SM..... Samarium, Seam, Small, Square Meter, Sub Modular, Subminiature
SMB..... Subminiature, B Type (Snap-On Connector)
SQ..... Square
STL..... Steel
SZ..... Size

T

TA..... Ambient Temperature, Tantalum
TC ..... Thermoplastic
THD..... Thread, Threaded
THK ..... Thick
TO..... Package Type Designation, Troy Ounce
TPL..... Triple
TRIG ..... Trigger, Triggerable, Triggering, Trigonometry
TRMR..... Trimmer
TRN..... Turn, Turns
TTL..... Tan Translucent, Transistor Transistor Logic

U

UNCT..... Undercut
UF..... Microfarad

V

V..... Vanadium, Variable, Violet, Volt, Voltage
VA..... Volt Ampere
VDC ..... Volts, Direct Current
VID ..... Video

W

W..... Watt, Wattage, White, Wide, Width, Wire
WB..... Wide Band
WD ..... Width, Wood

X

XSTR..... Transistor

Y

YTM..... YIG Tuned Multiplier

Z

ZNR ..... Zener

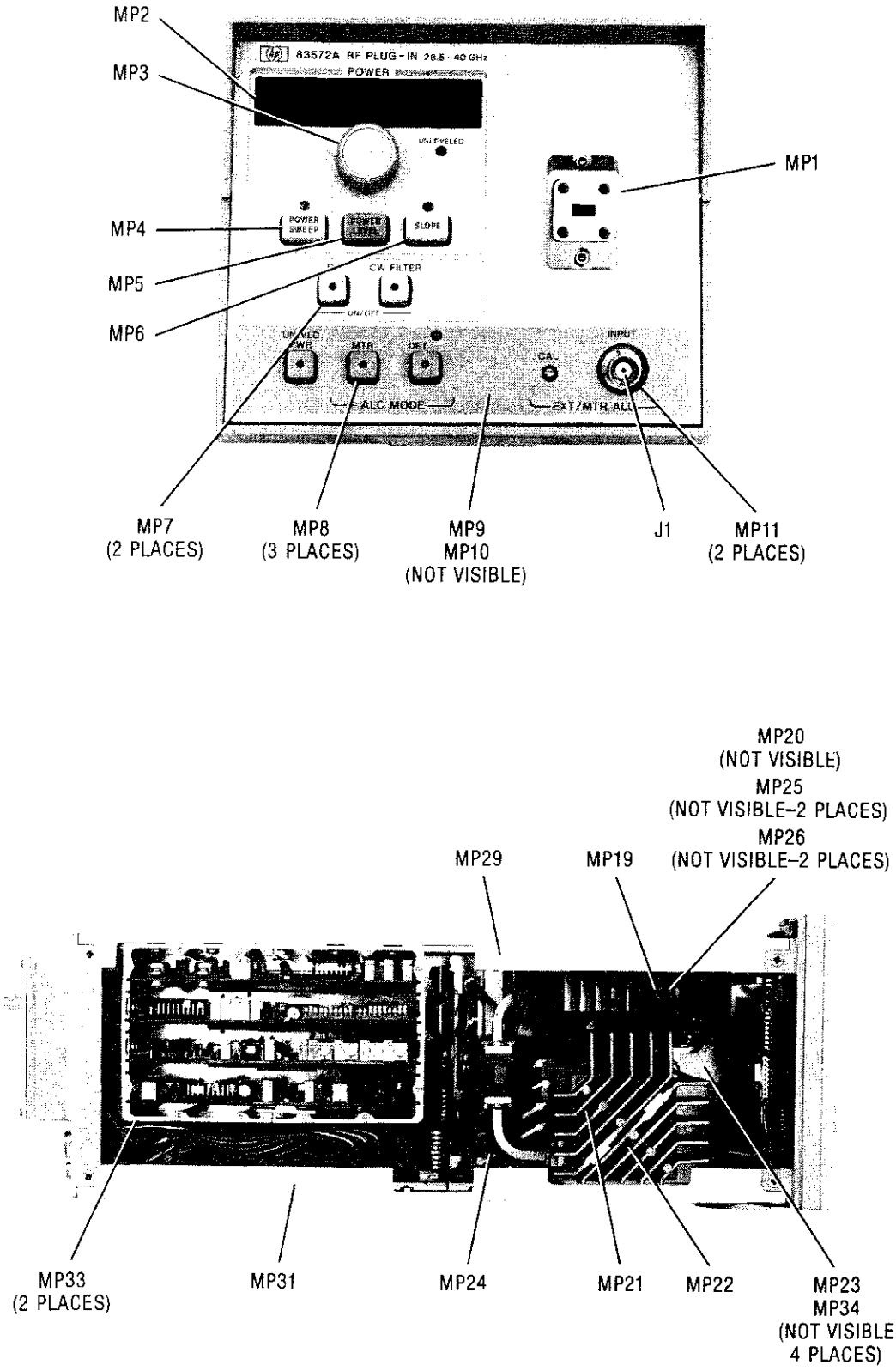


Figure 6-1. Mechanical Parts (1 of 3)

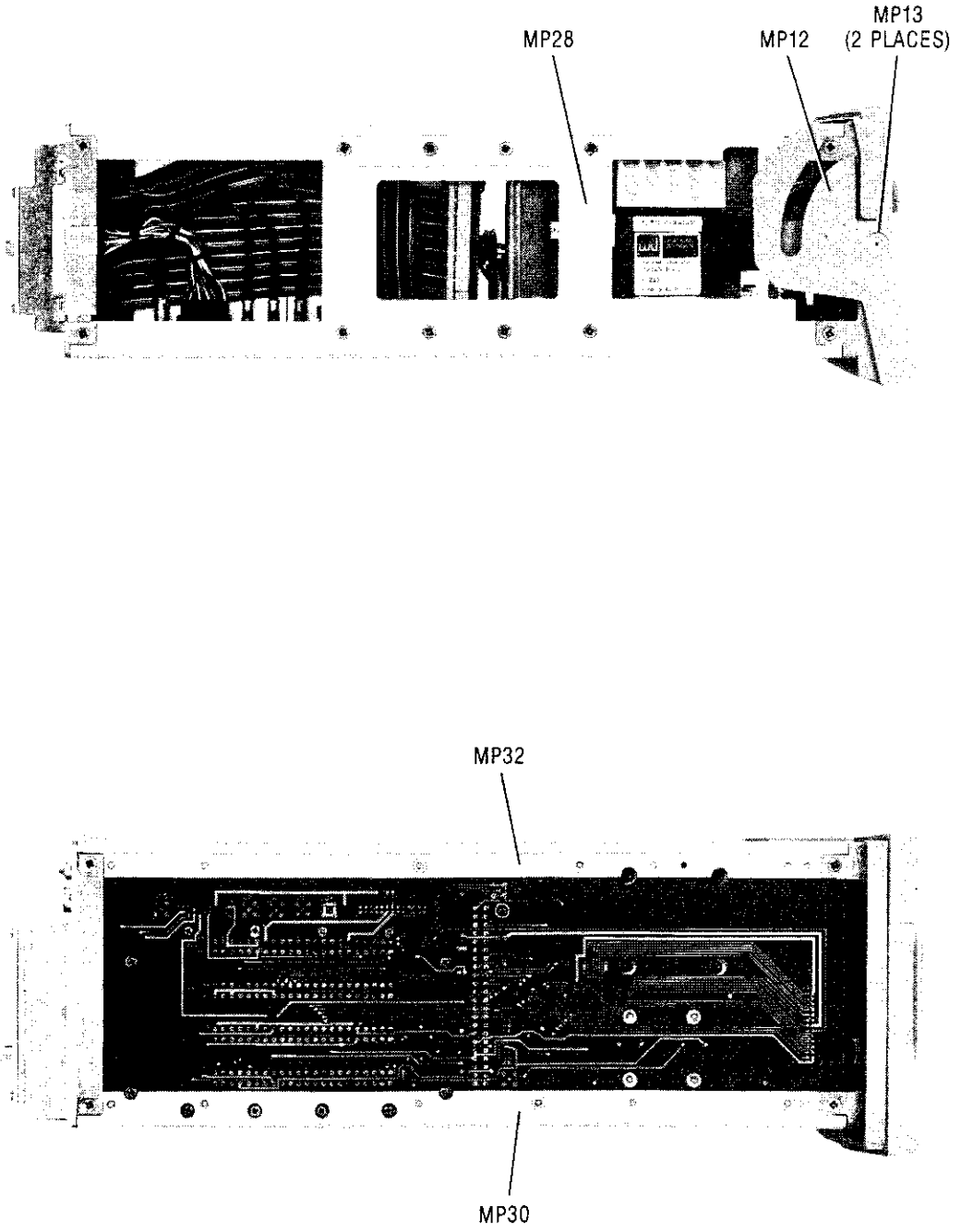


Figure 6-1. Mechanical Parts (2 of 3)

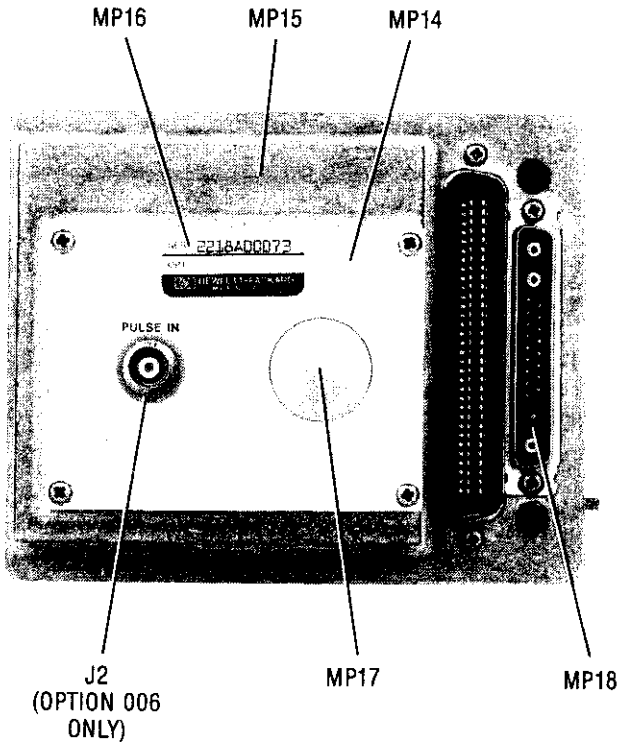
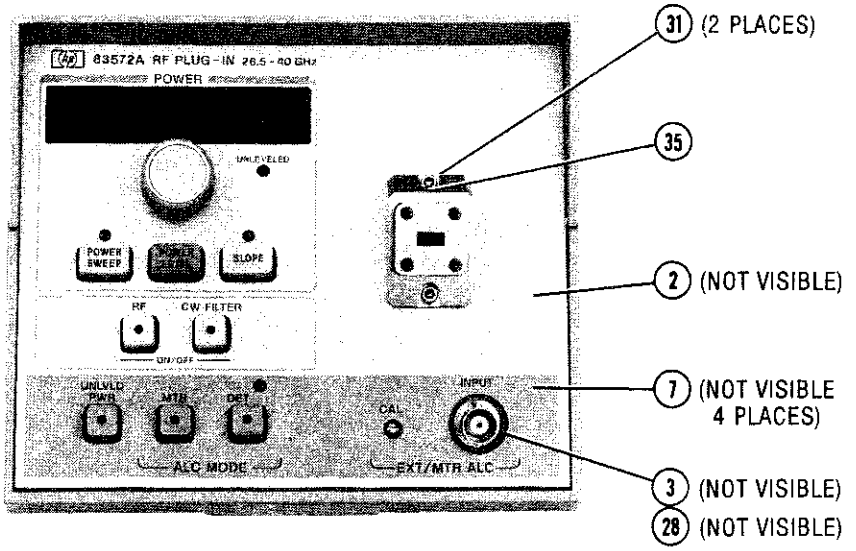


Figure 6-1. Mechanical Parts (3 of 3)



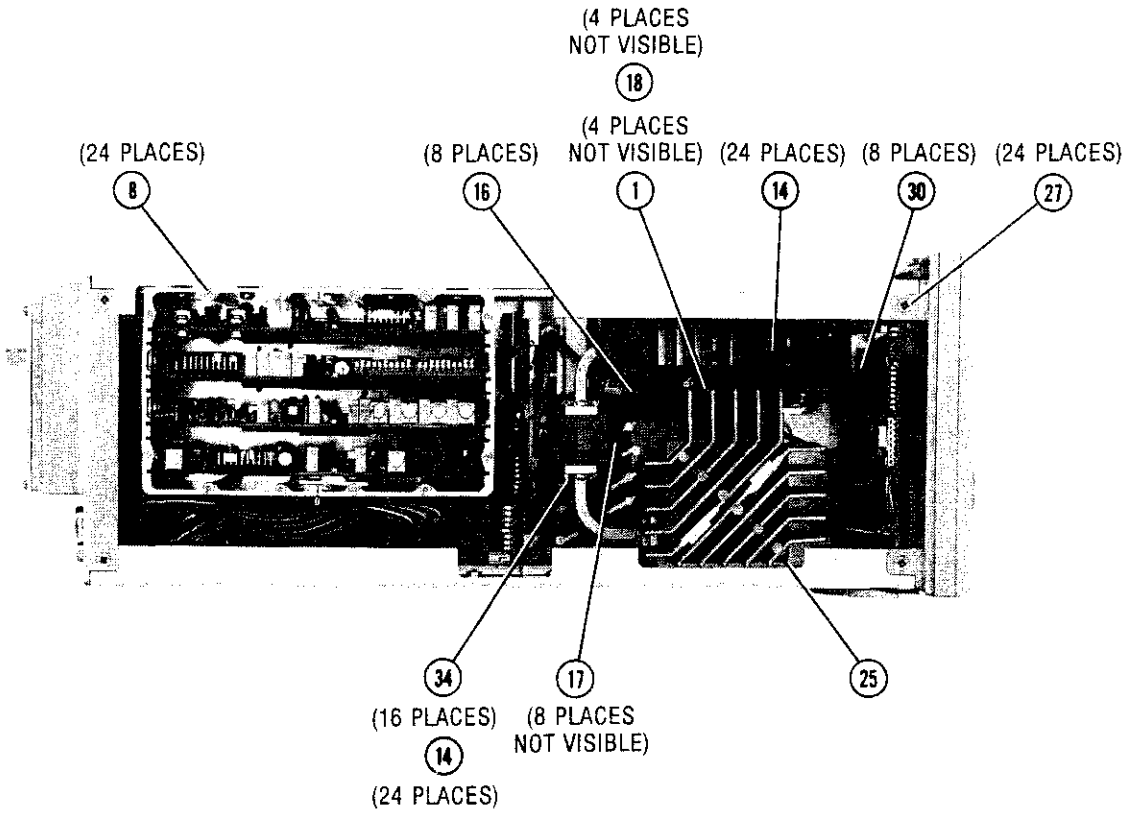


Figure 6-2. Attaching Hardware (1 of 3)

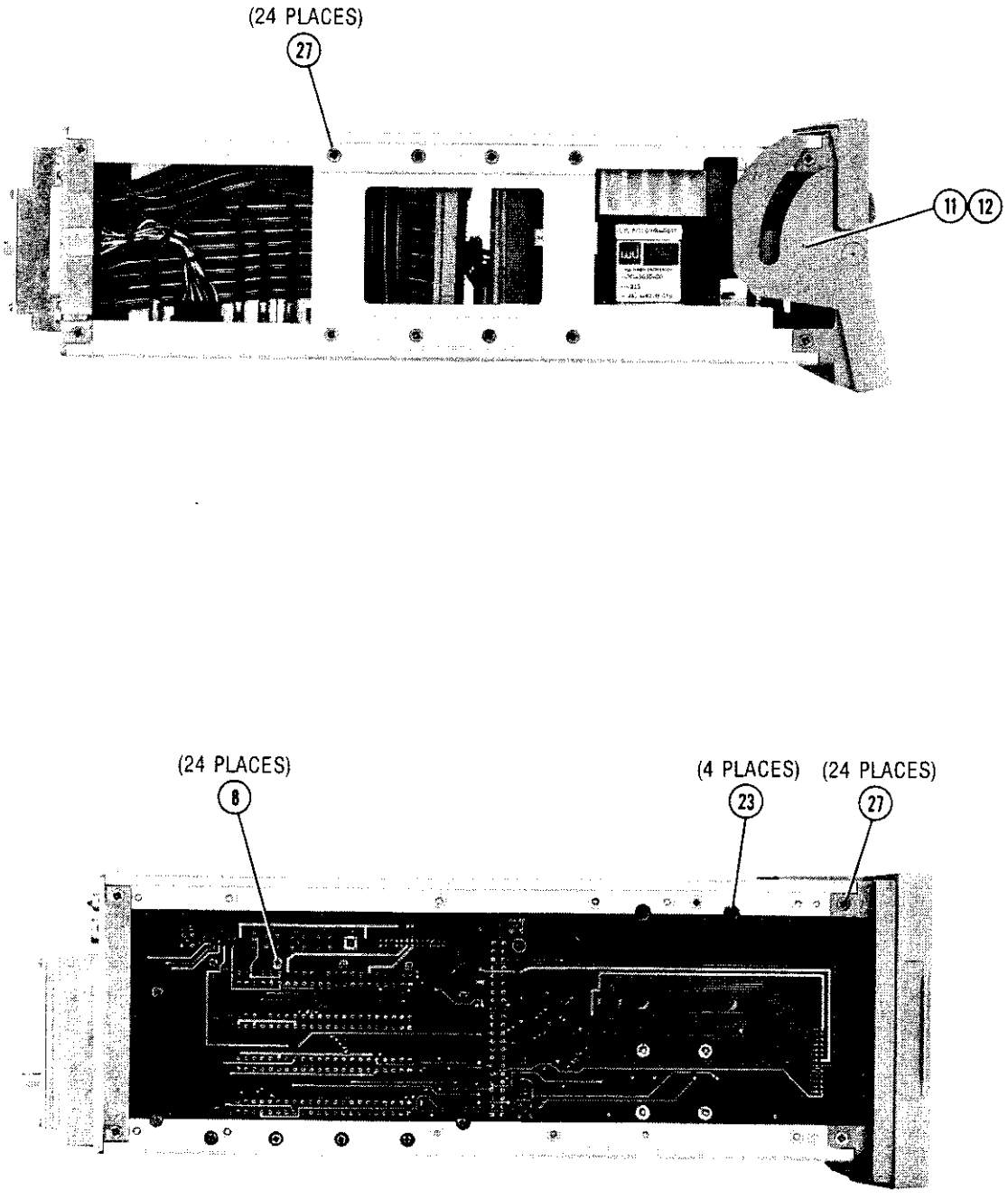
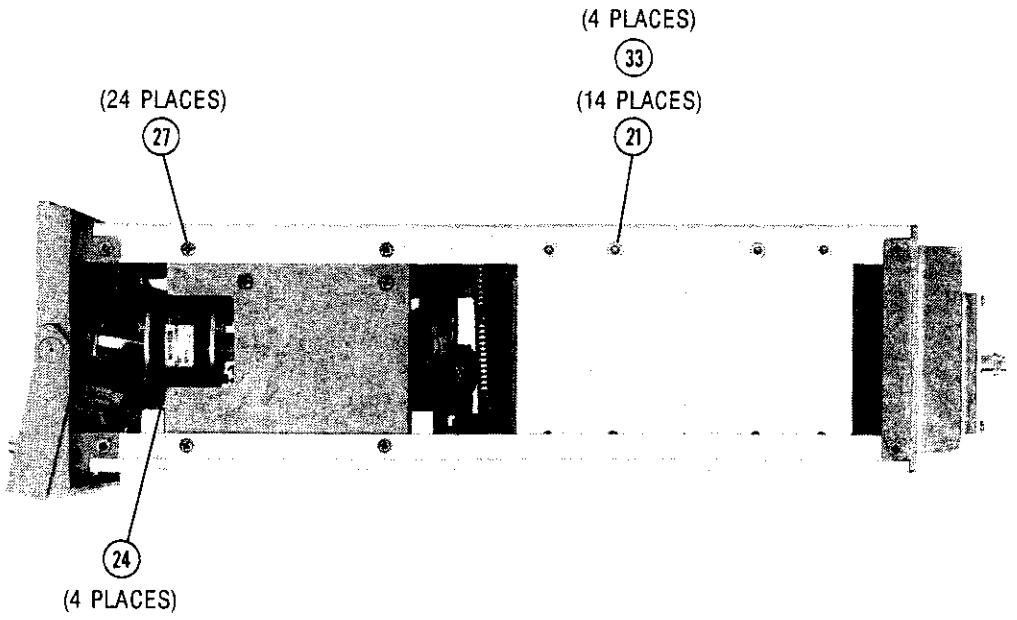


Figure 6-2. Attaching Hardware (2 of 3)



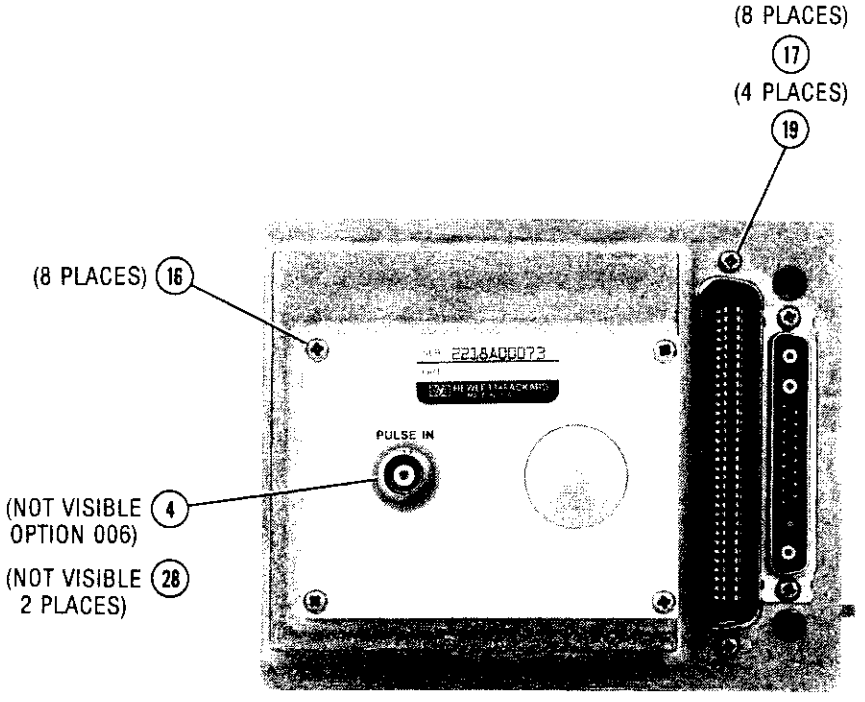


Figure 6-2. Attaching Hardware (3 of 3)

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1	83572-60008	5	1	BOARD ASSEMBLY-FRONT PANEL (DOES NOT INCLUDE A1RPG1 ROTARY PULSE GENERATOR)	28480	83572-60008
A1C1	0160-4084	8	27	CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A1C2	0160-3879	7	26	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A1C3	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A1C4	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A1DS1	1990-0670	0	5	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A1DS2	1990-0670	0		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A1DS3	1990-0670	0		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A1DS4	1990-0487	7	3	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A1DS5	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A1DS6	1990-0670	0		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A1DS7	1990-0670	0		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A1DS8	1990-0486	6	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A1DS9	1990-0699	3	3	LED-LIGHT BAR MODULE LUM-INT=7MCD	28480	1LM1-2350
A1DS10	1990-0699	3		LED-LIGHT BAR MODULE LUM-INT=7MCD	28480	1LM1-2350
A1DS11	1990-0699	3		LED-LIGHT BAR MODULE LUM-INT=7MCD	28480	1LM1-2350
A1DS12	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A1J1	1251-4736	1	3	CONNECTOR 26-PIN M RECTANGULAR	28480	1251-4736
A1MP1	0380-1233	9	4	SPACER-LED .450 LENGTH	00000	ORDER BY DESCRIPTION
A1MP2	2190-0016	3	1	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
A1MP3	2190-0067	4	1	WASHER-LK INTL T 1/4 IN .256-IN-ID	28480	2190-0067
A1MP4	2950-0072	3	1	NUT-HEX-DBL-CHAM 1/4-32-THD .062-IN-THK	00000	ORDER BY DESCRIPTION
A1MP5	2950-0001	8	1	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
A1Q1	1854-0019	3	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A1R1	2100-4022	0	1	RESISTOR-VAR 10K OHM 10% 1T	28480	2100-4022
A1R3	0698-3440	7	3	RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A1R4	0757-0398	4	4	RESISTOR 75 1% .125W F TC=0±100	24546	C4-1/8-T0-75R0-F
A1R5	0757-0398	4		RESISTOR 75 1% .125W F TC=0±100	24546	C4-1/8-T0-75R0-F
A1R6	0757-0398	4		RESISTOR 75 1% .125W F TC=0±100	24546	C4-1/8-T0-75R0-F
A1R7	0698-7236	7	6	RESISTOR 1K 1% .05W F TC=0+100	24546	C3-1/8-T0-1001-F
A1R8	0698-7224	3	8	RESISTOR 316 1% .05W F TC=0+100	24546	C3-1/8-TO-316R-F
A1R9	0698-7224	3		RESISTOR 316 1% .05W F TC=0±100	24546	C3-1/8-TO-316R-F
A1R10	0698-7224	3		RESISTOR 316 1% .05W F TC=0±100	24546	C3-1/8-TO-316R-F
A1R11	0698-7224	3		RESISTOR 316 1% .05W F TC=0±100	24546	C3-1/8-TO-316R-F
A1R12	0698-7224	3		RESISTOR 316 1% .05W F TC=0+100	24546	C3-1/8-TO-316R-F
A1R13	0698-7224	3		RESISTOR 316 1% .05W F TC=0±100	24546	C3-1/8-TO-316R-F
A1R14	0698-7224	3		RESISTOR 316 1% .05W F TC=0±100	24546	C3-1/8-TO-316R-F
A1R15	0698-7224	3		RESISTOR 316 1% .05W F TC=0±100	24546	C3-1/8-TO-316R-F
A1RPG1	5060-9444	7	1	ROTARY PULSE GENERATOR	28480	5060-9444
A1S1	5060-9436	7	8	PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S2	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S3	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S4	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S5	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S6	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S7	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S8	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1U1	1858-0047	5	2	TRANSISTOR ARRAY 16-PIN PLSTC DIP	13606	ULN-2003A
A1U2	1810-0124	9	1	NETWORK-RES 16-DIP200.0 OHM X 8	28480	1810-0124
A1U3	1990-0738	1	1	DISPLAY-NUMERIC .15 HIGH	28480	1990-0738
A1U4	1858-0047	5		TRANSISTOR ARRAY 16-PIN PLSTC DIP	13606	ULN-2003A
A1U5	1820-1416	5	5	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A1U6	1820-2150	6	1	IC-8279-5 C PKDI	34649	D8279-5
A1U8	1820-1196	8	4	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A1U9	1820-1730	6	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A1XU3	1251-5928	5	1	CONNECTOR 15-PIN M POST TYPE	28480	1251-5928
A1XU9	1200-0901	7	3	SOCKET-STRP 8-CONT SIP DIP-SLDR	28480	1200-0901
A1XU10	1200-0901	7		SOCKET-STRP 8-CONT SIP DIP-SLDR	28480	1200-0901
A1XU11	1200-0901	7		SOCKET-STRP 8-CONT SIP DIP-SLDR	28480	1200-0901

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2 (83572A)	**83572-60015**	**4**	**1**	**YIG OSCILLATOR REPLACEMENT KIT** (INCLUDES W8 AND W9 AND FACTORY SELECT RESISTORS FOR THE A6 YO DRIVER ASSEMBLY AND A7 BIAS ASSEMBLY)	**28480**	**83572-60015**
	83572-60044	9		REBUILT-EXCHANGE YIG OSCILLATOR REPLACEMENT KIT (83572A)	28480	83572-60044
A2 (83572B)	**83572-60048**	**3**	**1**	**YIG OSCILLATOR REPLACEMENT KIT** (INCLUDES W8 AND W9 AND FACTORY SELECT RESISTORS FOR THE A6 YO DRIVER ASSEMBLY AND A7 BIAS ASSEMBLY)	**28480**	**83572-60048**
	83572-60049	4		REBUILT-EXCHANGE YIG OSCILLATOR REPLACEMENT KIT (83572B)	28480	83572-60049
A3	**83572-60007**	**4**	**1**	**BOARD ASSEMBLY-DIGITAL INTERFACE**	**28480**	**83572-60007**
A3C1	0160-0127	2	6	CAPACITOR-FXD 1UF +20% 25VDC CER	28480	0160-0127
A3C2	0160-0127	2		CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A3C3	0160-0127	2		CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A3C4	0160-0127	2		CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A3C5	0160-3537	4	1	CAPACITOR-FXD 680PF ±5% 100VDC MICA	28480	0160-3537
A3C6	0180-0500	7	1	CAPACITOR-FXD 47UF±20% 20VDC TA	28480	0180-0500
A3J1	1251-5926	3	1	CONNECTOR-HEADER 50 M2R	28480	1251-5926
A3MP1	5040-6852	3	1	BOARD-EXTRACTOR (ORANGE)	28480	5040-6852
A3MP2	5000-9043	6	5	PIN	28480	5000-9043
A3R1	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-1621-F
A3R2	0698-3153	9	2	RESISTOR 3.83K 1% .125W F TC=0±100	24546	C4-1/8-T0-3831-F
A3R3	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0±100	24546	C4-1/8-T0-3831-F
A3R4	0698-7212	9	2	RESISTOR 100 1% .05W F TC=0±100	24546	C3-1/8-TO-100R-F
A3S1	3101-2243	6	1	SWITCH-DIP SPST 8 POSITION	28480	3101-2243
A3U1 & A3U2	83572-60070	1	1	EPROM REPLACEMENT KIT (U1 AND U2 ARE NOT SEPARATELY REPLACEABLE)	28480	83572-60070
A3U3	1826-0180	0	2	IC TIMER TTL MONO/ASTBL	01295	NE555P
A3U4	1820-2081	2	1	IC NMOS	04713	MC68A21P
A3U5	1820-2005	0	1	IC TIMER NMOS	S0545	UPD8253D
A3U6	1820-1202	7	1	IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A3U7	1820-1197	9	4	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A3U8	1820-1416	5		IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A3U9	1820-1216	3	6	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U10	1820-1416	5		IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A3U11	1820-1416	5		IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A3U12	1810-0338	7	3	NETWORK-RES 16-DIP100.0 OHM X 8	11236	761-3-R100
A3U13	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U14	1820-1491	6	1	IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A3U15	1820-1416	5		IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A3U16	1810-0338	7		NETWORK-RES 16-DIP100.0 OHM X 8	11236	761-3-R100
A3U17	1820-2075	4	2	IC MISC TTL LS	01295	SN74LS245N
A3U18	1820-2075	4		IC MISC TTL LS	01295	SN74LS245N
A3U19	1810-0338	7		NETWORK-RES 16-DIP100.0 OHM X 8	11236	761-3-R100
A4	**83572-60061**	**0**		**BOARD ASSY-AUTOMATIC LEVELING CONTROL**	**28480**	**83572-60061**
A4C1	0160-0127	2		CAPACITOR-FXD 1UF +20% 25VDC CER	28480	0160-0127
A4C2	0180-0374	3	4	CAPACITOR-FXD 10UF±10% 20VDC TA	56289	150D106X9020B2
A4C3	0180-0374	3		CAPACITOR-FXD 10UF±10% 20VDC TA	56289	150D106X9020B2
A4C4	0180-0374	3		CAPACITOR-FXD 10UF±10% 20VDC TA	56289	150D106X9020B2
A4C5	0180-0374	3		CAPACITOR-FXD 10UF±10% 20VDC TA	56289	150D106X9020B2
A4C6	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A4C7	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A4C8	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A4C9	0160-3821	9	1	CAPACITOR-FXD .33UF ±20% 50VDC CER	28480	0160-3821
A4C10	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A4C11	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A4C12	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A4C13	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A4C14	0160-3874	2	4	CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A4C15	0160-0127	2		CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A4C16	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A4C17	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A4C18	0160-0570	9	1	CAPACITOR-FXD 220PF ±20% 100VDC CER	20932	5024EM100RD221M
A4C20	0160-0574	3	3	CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A4C21	0160-0128	3	1	CAPACITOR-FXD 2.2UF ±20% 50VDC CER	28480	0160-0128

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5C26	0160-3874	2		CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A5C27	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A5C28	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A5C29	0180-2617	1	4	CAPACITOR-FXD 6.8UF±10% 35VDC TA	25088	D6R8GS1B35K
A5C30	0180-2617	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	25088	D6R8GS1B35K
A5C31	0180-2617	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	25088	D6R8GS1B35K
A5C32	0180-2617	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	25088	D6R8GS1B35K
A5C33	0180-2207	5	1	CAPACITOR-FXD 100UF±10% 10VDC TA	56289	150D107X9010R2
A5C34	0180-0474	4	10	CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A5C35	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A5C36	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A5C37	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A5C38	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A5C39	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A5C40	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A5C41	0160-2249	3		CAPACITOR-FXD 4.7PF ±.25PF 500VDC CER	28480	0160-2249
A5C42	0160-4801	7	3	CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A5CR1	1901-0033	2	17	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A5CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A5CR3	1901-0047	8	2	DIODE-SWITCHING 20V 75MA 10NS	28480	1901-0047
A5CR4	1901-0047	8		DIODE-SWITCHING 20V 75MA 10NS	28480	1901-0047
A5CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR8	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR9	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A5CR10	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5K1	0490-0916	6	2	RELAY-REED 1A 500MA 100VDC 5VDC-COIL	28480	0490-0916
A5K2	0490-1063	6	1	RELAY-.5A2A 5VDC	28480	0490-1063
A5L1	9100-1630	7	1	INDUCTOR RF-CH-MLD 51UH 5% .166DX.385LG	28480	9100-1630
A5L2	9100-1619	2	4	INDUCTOR RF-CH-MLD 6.8UH 10%	28480	9100-1619
A5L3	9100-1619	2		INDUCTOR RF-CH-MLD 6.8UH 10%	28480	9100-1619
A5L4	08503-80001	9	4	COIL-TOROID	28480	08503-80001
A5L5	9100-1619	2		INDUCTOR RF-CH-MLD 6.8UH 10%	28480	9100-1619
A5L6	9100-1619	2		INDUCTOR RF-CH-MLD 6.8UH 10%	28480	9100-1619
A5MP1	1205-0011	0	2	HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A5MP2	5000-9043	6		PIN	28480	5000-9043
A5MP3	4330-0145	9		INSULATOR-BEAD GLASS	28480	4330-0145
A5MP4	5040-6851	2	1	EXTRACTOR-TAB	28480	5040-6851
A5Q1	1854-0529	0	4	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0529
A5Q2	1854-0529	0		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0529
A5Q3	1854-0529	0		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0529
A5Q4	1854-0529	0		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0529
A5Q5	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A5R1	0698-0083	8	9	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A5R2	0757-0200	7	4	RESISTOR 5.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-5621-F
A5R3	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-5621-F
A5R4	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-5621-F
A5R5	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-5621-F
A5R6	0757-0439	4	2	RESISTOR 6.81K 1% .125W F TC=0+100	24546	C4-1/8-T0-6811-F
A5R7	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0±100	24546	C4-1/8-T0-6811-F
A5R8	0698-3158	4	2	RESISTOR 23.7K 1% .125W F TC=0±100	24546	C4-1/8-T0-2372-F
A5R9	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0±25	28480	0698-6360
A5R10	0757-0438	3	4	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A5R11	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+100	24546	C4-1/8-T0-4641-F
A5R12	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A5R13	0698-3446	3	5	RESISTOR 383 1% .125W F TC=0±100	24546	C4-1/8-T0-383R-F
A5R14	0757-0394	0	2	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A5R17	0757-0442	9	13	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A5R18	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A5R19	2100-3749	6		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	28480	2100-3749
A5R20	0757-0458	7	5	RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A5R22	0757-0419	0	2	RESISTOR 681 1% .125W F TC=0±100	24546	C4-1/8-T0-681R-F
A5R23	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-1621-F
A5R26	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A5R27	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A5R28	0757-0382	6	2	RESISTOR 16.2 1% .125W F TC=0±100	19701	MF4C1/8-T0-16R2-F
A5R29	0757-0382	6		RESISTOR 16.2 1% .125W F TC=0±100	19701	MF4C1/8-T0-16R2-F
A5R30	0757-0398	4		RESISTOR 75 1% .125W F TC=0±100	24546	C4-1/8-T0-75R0-F
A5R31*	0757-0401	0	5	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A5R32	0757-0403	2	3	RESISTOR 121 1% .125W F TC=0±100	24546	C4-1/8-T0-121R-F
A5R33	0698-7280	1	5	RESISTOR 68.1K 1% .05W F TC=0±100	24546	C3-1/8-T0-6812-F

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5R34	2100-2574	3	4	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A5R35	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0±100	24546	C3-1/8-T0-6812-F
A5R36	2100-2574	3		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A5R37	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0±100	24546	C3-1/8-T0-6812-F
A5R38	2100-2574	3		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A5R39	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0±100	24546	C3-1/8-T0-6812-F
A5R40	2100-2574	3		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A5R41	2100-3611	1		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-503
A5R42	2100-3611	1		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-503
A5R43	2100-3611	1		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-503
A5R44	2100-3611	1		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-503
A5R45	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A5R46	0757-0420	3	2	RESISTOR 750 1% .125W F TC=0±100	24546	C4-1/8-T0-751-F
A5R47	0757-0420	3		RESISTOR 750 1% .125W F TC=0±100	24546	C4-1/8-T0-751-F
A5R48	2100-3759	8	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	28480	2100-3759
A5R49	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0±100	24546	C3-1/8-T0-6812-F
A5R50	2100-3750	9	3	RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	28480	2100-3750
A5R51	0698-7274	3	1	RESISTOR 38.3K 1% .05W F TC=0±100	24546	C3-1/8-T0-3832-F
A5R52	0698-3160	8	2	RESISTOR 31.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-3162-F
A5R53	0757-0346	2	6	RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A5R54	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A5R55	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A5R56	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A5R57	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A5R58	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A5R73	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A5R74	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A5R76	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A5R77	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A5R79	0757-0403	2		RESISTOR 121 1% .125W F TC=0±100	24546	C4-1/8-T0-121R-F
A5R80	0698-0082	7	5	RESISTOR 464 1% .125W F TC=0±100	24546	C4-1/8-T0-4640-F
A5TP1	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5TP11	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A5U1	1810-0206	8	1	NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A5U2	1810-0208	0	1	NETWORK-RES 8-SIP68.0K OHM X 7	01121	208A683
A5U3	1826-0416	5	1	IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13331D
A5U4	1810-0205	7	1	NETWORK-RES 8-SIP4.7K OHM X 7	01121	208A472
A5U5	1810-0321	8	1	NETWORK-RES 8-SIP220.0K OHM X 7	01121	208A224
A5U7	1826-0092	3	1	IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A5U8	1826-0349	3	1	IC V RGLTR TO-39	07263	UA78M06HL
A5U9	1826-0558	6	2	IC-337H M1 NADJ	27014	LM337H
A5U10	1826-0546	2	1	IC-592 MI OP AMP	18324	NE592H
A5U11	1826-0476	7	1	IC SWITCH ANLG 8-DIP-P PKG	01295	TL601CP
A5U14	1826-0557	5	1	IC-348 C4 OP AMP	27014	LM348J
A5U16	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A5U17	1826-0699	6	1	IC-7524 C1 DAC	24355	AD7524AD
A5U18	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A5U19	1826-0700	0	1	IC-5195 M1 OP AMP	34371	HA1-5195-5
A5U20	1820-0224	1	1	IC OP AMP SPCL TO-99 PKG	27014	LH0002CH
A5U21	1810-0366	1	1	RESISTIVE NETWORK 22 OHM 6 PINS	01121	206A221
A5VR1	1902-3002	3	2	DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%	28480	1902-3002
A5VR2	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%	28480	1902-3002
A5W1	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A5W4	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A5W5	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A5W6	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A5W10	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A5W11	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6U11	1826-0752	2		IC-7542B C1 DAC	24355	AD7542BD
A6U12	1826-0471	2		IC-07C M1 OP AMP	28480	1826-0471
A6U13	1826-0471	2		IC-07C M1 OP AMP	28480	1826-0471
A6U14	1826-0471	2		IC-07C M1 OP AMP	28480	1826-0471
A6U15	1826-0417	6		IC-13333 C4 A SW	27014	LF13333D
A6U16	1826-0758	8	1	IC-534J MI MULTIPLIER	28480	1826-0758
A6U17	1826-0558	6		IC-337H M1 NADJ	27014	LM337H
A6U18	1826-0753	3	2	IC-34004B C4 OP AMP	04713	MC34004BL
A6U19	1826-0471	2		IC-07C M1 OP AMP	28480	1826-0471
A6U20	1826-0367	5	1	IC-78M05 MI P 5V	04713	MC78M05CG
A6U21	1826-0471	2		IC-07C M1 OP AMP	28480	1826-0471
A6VR1	1902-3036	3	2	DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	28480	1902-3036
A6VR2	1902-0244	9	2	DIODE-ZNR 30V 5% PD=1W IR=50A	28480	1902-0244
A6VR3	1902-0625	0	1	DIODE-ZNR 1N829 6.2V 5% DO-7 PD=.25W	04713	1N829
A6VR4	1902-3036	3		DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	28480	1902-3036
A6W1	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A7	**83572-60003**	**0**	**1**	**BOARD ASSEMBLY-BIAS**	**28480**	**83572-60003**
A7C1	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A7C2	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A7C3	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7C4	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7C5	0160-4805	1	2	CAPACITOR-FXD 47PF ±5% 100VDC CER 0±30	28480	0160-4805
A7C6	0160-4805	1		CAPACITOR-FXD 47PF ±5% 100VDC CER 0±30	28480	0160-4805
A7C7	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7C8	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7C9				NOT ASSIGNED		
A7C11	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7C12	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7C13	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A7C18	0160-4808	4	1	CAPACITOR-FXD 470PF ±5% 100VDC CER	28480	0160-4808
A7C19	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A7C20	0180-0291	3	2	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A7C21	0180-0291	3		CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A7C22	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A7C23	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A7C24	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A7C25	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A7C26	0180-0474	4		CAPACITOR-FXD 15UF±10% 20VDC TA	28480	0180-0474
A7C27	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7C28	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A7CR1	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A7CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A7CR3	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A7CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A7CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A7CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A7CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A7CR8	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A7CR9	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A7CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A7CR11	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A7CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A7CR13	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A7CR14	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A7CR15	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A7L1	9100-1641	0	3	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A7L2	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A7L3	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A7L4	08503-80001	9		COIL-TOROID	28480	08503-80001
A7L5	08503-80001	9		COIL-TOROID	28480	08503-80001
A7MP1	0590-0970	4	1	INSERT-NB 6-32	28480	0590-0970
A7MP2	5040-6853	4	1	EXTRACTOR-PC (BROWN)	28480	5040-6853
A7MP3	5000-9043	6		PIN	28480	5000-9043
A7MP4	83572-20018	3	2	HEAT DISSIPATOR	28480	83572-20018
A7MP5	2360-0115	4	4	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A7Q1	1854-0477	7	4	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A7Q2	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A7Q3	1854-0311	8	1	TRANSISTOR NPN 2N4240 SI TO-66 PD=35W	3L585	2N4240
A7Q4	1853-0414	0	1	TRANSISTOR PNP 2N6423 SI TO-66 PD=35W	04713	2N6423
A7Q5	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7Q6	1854-0809	9	1	TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A7Q8	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A7Q9	1884-0073	2	1	THYRISTOR-SCR TO-5 VRRM=100	28480	1884-0073
A7Q10	1853-0322	9	1	TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
A7Q11	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A7Q12	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A7R1	0698-8827	4	1	RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A7R2	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A7R3	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+100	19701	MF4C1/8-T0-6191-F
A7R4	0698-0082	7		RESISTOR 464 1% .125W F TC=0+100	24546	C4-1/8-T0-4640-F
A7R5	0698-3452	1	1	RESISTOR 147K 1% .125W F TC=0+100	24546	C4-1/8-T0-1473-F
A7R6	0698-3450	9	4	RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A7R7	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A7R8	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A7R9	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A7R10	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A7R11	0757-0463	4	1	RESISTOR 82.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-8252-F
A7R12	2100-3611	1		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-503
A7R13	0698-3161	9	2	RESISTOR 38.3K 1% .125W F TC=0+100	24546	C4-1/8-T0-3832-F
A7R14	0757-0440	7	3	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A7R15	0698-3159	5	1	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A7R16	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A7R17	2100-3750	9		RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	28480	2100-3750
A7R18	0757-0459	8	2	RESISTOR 56.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-5622-F
A7R19	0757-0459	8		RESISTOR 56.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-5622-F
A7R20	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A7R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A7R22	0698-4037	0	2	RESISTOR 46.4 1% .125W F TC=0+100	24546	C4-1/8-T0-46R4-F
A7R23	0698-4037	0		RESISTOR 46.4 1% .125W F TC=0+100	24546	C4-1/8-T0-46R4-F
A7R24	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A7R25	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A7R26	0698-3446	3		RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A7R27	0698-3446	3		RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A7R28	0698-3446	3		RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A7R29	0698-8814	9	2	RESISTOR 1.47 1% .125W F TC=0+100	28480	0698-8814
A7R30	0698-8814	9		RESISTOR 1.47 1% .125W F TC=0+100	28480	0698-8814
A7R31	0698-0082	7		RESISTOR 464 1% .125W F TC=0+100	24546	C4-1/8-T0-4640-F
A7R32	0757-0419	0		RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A7R33				NOT ASSIGNED		
A7R34	0698-3438	3	1	RESISTOR 147 1% .125W F TC=0+100	24546	C4-1/8-T0-147R-F
A7R35	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A7R36	2100-3611	1		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-503
A7R37	0698-3161	9		RESISTOR 38.3K 1% .125W F TC=0+100	24546	C4-1/8-T0-3832-F
A7R38	0698-3157	3	2	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A7R39	2100-0670	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-103
A7R40	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A7R41	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A7R42	0698-0082	7		RESISTOR 464 1% .125W F TC=0+100	24546	C4-1/8-T0-4640-F
A7R43	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A7R44	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A7R45	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A7R46	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC=0+100	24546	C4-1/8-T0-1781-F
A7R47	0698-3431	6	1	RESISTOR 23.7 1% .125W F TC=0+100	03888	PME55-1/8-T0-23R7-F
A7R48*				NOT REPLACEABLE-PART OF A2		
A7R49	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+100	24546	C4-1/8-T0-422R-F
A7R50	0757-0417	8	1	RESISTOR 562 1% .125W F TC=0+100	24546	C4-1/8-T0-562R-F
A7R51	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A7R52	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A7R53	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A7R54	0698-3446	3		RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A7R55	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A7R66	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A7R67	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A7R68	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A7R69	2100-3749	6		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	28480	2100-3749
A7R70	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A7R71	2100-3749	6		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	28480	2100-3749
A7R72	0698-3404	3	1	RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A7R73	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A7R74	0698-3437	2	1	RESISTOR 133 1% .125W F TC=0+100	24546	C4-1/8-T0-133R-F
A7TP1	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7TP2	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7TP3	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7TP4	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7TP5	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7TP6	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7TP7	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7TP8	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7TP9	1251-5238	0		CONNECTOR-HEADER 10 MIR	28480	1251-5238
A7U1	1826-0753	3		IC-34004B C4 OP AMP	04713	MC34004BL
A7U2	1826-0785	1	1	IC-772B C20 OP AMP	01295	TL072ACJG
A7U3	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	01295	SN74LS11N
A7U4	1826-0371	1	1	IC-256 MI OP AMP	27014	LF256H
A7U5	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A7U6	1826-0180	0		IC TIMER TTL MONO/ASTBL	01295	NE555P
A7U8	1826-0417	6		IC-13333 C4 A SW	27014	LF13333D
A7U9	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A7U10	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A7U11	1810-0365	0	1	RESISTIVE NETWORK- 2.2K OHM 6 PINS	01121	206A222
A7VR1	1902-0579	3	1	DIODE-ZNR 5.1V 5% PD=1W IR=10UA	28480	1902-0579
A8	**83572-60001**	**8**	**1**	**MOTHERBOARD ASSEMBLY (DOES NOT INCLUDE** R1&R2& ASSOCIATED HEAT SINK & INSULATOR)	**28480**	**83572-60001**
A8CR1	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A8F1	2110-0333	9	1	FUSE 1.5A 125V .25X.27	28480	2110-0333
A8J1	1251-4736	1		CONNECTOR 26-PIN M RECTANGULAR	28480	1251-4736
A8J2	1250-0257	1	7	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A8J3	1251-4736	1		CONNECTOR 26-PIN M RECTANGULAR	28480	1251-4736
A8J4	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A8J5	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A8J6	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A8J7	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A8J8	1251-6343	0	1	CONNECTOR-HEADER 18 M2R	28480	1251-6343
A8J9	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A8J10	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A8J11	1251-7856	2	1	CONNECTOR POST 8 MALE 2R	28480	1251-7856
A8J12	1251-7854	0	1	CONNECTOR POST 6 MALE 2R	28480	1251-7854
A8MP2	1251-2313	6	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A8MP3	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A8MP4	1251-7481	9	4	CONNECTOR-ACCESS CONT	28480	1251-7481
A8MP5	1251-7481	9		CONNECTOR-ACCESS CONT	28480	1251-7481
A8MP6	1251-7481	9		CONNECTOR-ACCESS CONT	28480	1251-7481
A8MP7	1251-7481	9		CONNECTOR-ACCESS CONT	28480	1251-7481
A8MP8	0380-0884	4	4	STANDOFF-RVT-ON .156-IN-LG 4-40THD	00000	ORDER BY DESCRIPTION
A8MP9	0380-0884	4		STANDOFF-RVT-ON .156-IN-LG 4-40THD	00000	ORDER BY DESCRIPTION
A8MP10	0380-0884	4		STANDOFF-RVT-ON .156-IN-LG 4-40THD	00000	ORDER BY DESCRIPTION
A8MP11	0380-0884	4		STANDOFF-RVT-ON .156-IN-LG 4-40THD	00000	ORDER BY DESCRIPTION
A8R3	0811-1082	1	1	RESISTOR- 4.7 OHM 5% 3W	28480	0811-1082
A8R4	0811-1080	9	1	RESISTOR- 2.2 OHM 5% 3W	28480	0811-1080
A8R5	0698-8812	7	1	RESISTOR 1 1% .125W F TC=0±100	28480	0698-8812
A8VR1	1902-0244	9		DIODE-ZNR 30V 5% PD=1W IR=5UA	28480	1902-0244
A8VR2	1902-0551	1	1	DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
A8XA3	1251-1365	6	5	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A8XA4	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A8XA5	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A8XA6	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A8XA7	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A9	**83572-60005**	**2**	**1**	**MODULATOR AND CABLE ASSEMBLY** (INCLUDES W7 CABLE ASSY-MOD/MOTHERBOARD)	**28480**	**83572-60005**
A10	**0955-0172**	**2**	**1**	**MICROWAVE SWITCH, R-BAND (OPT. 006)**	**28480**	**0955-0172**

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
AT1	0960-0658	0	1	ISOLATOR 26.5 - 40 GHZ	28480	0960-0658
CR1	1901-0033	2	2	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
CR3	R422A	4	1	WAVEGUIDE DETECTOR (OPT. 001)	28480	R422A
DC1	83572-60071	2	1	DIRECTIONAL COUPLER-10 DB (OPT. 001)	28480	83572-60071
J1	1250-0118	3	2	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM (ALC INPUT)	28480	1250-0118
J2	1250-0118	3		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM PULSE IN (OPT. 006)	28480	1250-0118
MP1	83572-20004	7	1	WAVEGUIDE MOUNT-FRONT PANEL	28480	83572-20004
MP2	4040-1695	1	1	WINDOW-DISPLAY .125-IN-THK	28480	4040-1695
MP3	0370-3023	8	1	KNOB RND .75-IN (JADE GRAY)	28480	0370-3023
MP4	5041-1925	3	1	KEY CAP-POWER SWEEP	28480	5041-1925
MP5	5041-1924	2	1	KEY CAP-POWER LEVEL	28480	5041-1924
MP6	5041-1926	4	1	KEY CAP-SLOPE	28480	5041-1926
MP7	5041-0285	6	2	KEY CAP-LIGHT	28480	5041-0285
MP8	5041-0318	6	3	KEY CAP-LIGHT	28480	5041-0318
MP9 (83572A)	83572-00001	2	1	FRONT PANEL-DRESS	28480	83572-00001
MP9 (83572B)	83572-00003	4	1	FRONT PANEL-DRESS	28480	83572-00003
MP10	83572-20009	2	1	FRONT PANEL-MACHINE	28480	83572-20009
MP11	5040-0345	7	2	INSULATOR-CONNECTOR	28480	5040-0345
MP12	83525-20040	4	1	LATCH	28480	83525-20040
	5021-3770	8	1	LATCH STANDOFF	28480	5021-3770
MP13	83525-20033	5	2	LATCH SCREW	28480	83525-20033
MP14	83570-00006	5	1	REAR PANEL	28480	83570-00006
MP15	0050-2032	9	1	CASTING-ALUM (REAR PANEL)	28480	0050-2032
MP16	7120-4300	4	1	LABEL-83572A IDENTIFICATION	28480	7120-4300
MP17	6960-0003	5	1	PLUG-HOLE DOME-HD FOR .75-D-HOLE STL	28480	6960-0003
MP18	11869-20020	4	1	ALIGNMENT PIN-CONNECTOR	28480	11869-20020
MP19	83572-20015	0	1	HEAT SINK-RIGHT SIDE	28480	83572-20015
MP20	83572-20012	7	1	RIGHT-ANGLED MOUNTING BRACKET	28480	83572-20012
MP21	83572-20016	1	1	HEAT SINK-OSCILLATOR (RIGHT)	28480	83572-20016
MP22	83572-20002	5	1	HEAT SINK-OSCILLATOR (LEFT)	28480	83572-20002
MP23	83572-20005	8	1	HEAT SINK-OSCILLATOR BASE	28480	83572-20005
MP24	83572-20020	7	1	HEAT SINK-OSCILLATOR (REAR)	28480	83572-20020
MP25	1200-0043	8	2	INSULATOR-XSTR ALUMINUM	28480	1200-0043
MP26	1200-0399	7	2	HEAT SINK-TRANSISTOR	28480	1200-0399
MP27	83570-00005	4	1	COVER-SCREEN BOX	28480	83570-00005
MP28	83570-00008	7	1	BRACKET-SUPPORT	28480	83570-00008
MP29	83572-20010	5	1	STRUT-RIGHT HAND (UPPER)	28480	83572-20010
MP30	83572-20011	6	1	STRUT-RIGHT HAND (LOWER)	28480	83572-20011
MP31	83572-20019	4	1	STRUT-LEFT HAND (UPPER)	28480	83572-20019
MP32	83572-20013	8	1	STRUT-LEFT HAND (LOWER)	28480	83572-20013
MP33	83570-20015	8	2	SHIELD	28480	83570-20015
MP34	83570-20024	9	4	SPACER-ROUND	28480	83570-20024
MP35				NOT ASSIGNED		
MP36	3030-0007	5	2	SCREW-SET 4-40 .125-IN-LG SMALL CUP-PT	28480	3030-0007
Q1	1855-0484	8	1	TRANSISTOR	28480	1855-0484
Q2	1854-0611	1	1	TRANSISTOR NPN 2N6055 SI DARL TO-3	04713	2N6055
R1	0811-2606	7	1	RESISTOR 16 1% 25W PW TC=0+30	28480	0811-2606
R2	0811-3336	2	1	RESISTOR 100 3% 25W PW TC=0±30	28480	0811-3336
W1	83572-20022	9	1	WAVEGUIDE, FRONT PANEL	28480	83572-20022
W2	8170-0071	4	1	WAVEGUIDE-STRAIGHT, 26.5 - 40 GHZ	28480	8170-0071
W3	8170-0070	3	2	WAVEGUIDE-BEND, 26.5 - 40 GHZ	28480	8170-0070
W4	8170-0070	3		WAVEGUIDE-BEND, 26.5 - 40 GHZ	28480	8170-0070
W5	83570-60009	4	1	CABLE ASSEMBLY-RIBBON (FRONT PANEL)	28480	83570-60009
W6	83570-60017	4	1	CABLE ASSEMBLY-COAX, EXT DETECTOR	28480	83570-60017
W7	83572-60010	9	1	CABLE ASSEMBLY-MOD/MOTHERBOARD, P/O A9	28480	83572-60010
W8	83572-60012	1	1	CABLE ASSEMBLY-OSC/MOTHERBOARD, P/O A2	28480	83572-60012
W9	83572-60013	2	1	CABLE ASSEMBLY-OSC/FM, P/O A2	28480	83572-60013
W10	83570-60061	8	1	CABLE ASSEMBLY-DIGITAL INTERFACE	28480	83570-60061
W11	83570-60012	9	1	CABLE ASSEMBLY-COAX, AM INPUT	28480	83570-60012
W12	83570-60013	0	1	CABLE ASSEMBLY-COAX, FM INPUT	28480	83570-60013
W13	83570-60014	1	1	CABLE ASSEMBLY-COAX, TUNING VOLTAGE	28480	83570-60014
W14	83570-60010	7	1	CABLE ASSEMBLY-POWER SUPPLY	28480	83570-60010
W15	83572-60011	0	1	CABLE ASSEMBLY-PIN SW/MTHRBD (OPT 006)	28480	83572-60011
W16	83572-60016	5	1	CABLE ASSEMBLY-COAX, PULSE IN (OPT 006)	28480	83572-60016
W17	11170A	6	1	CABLE ASSEMBLY-BNC (OPT 001)	28480	11170A

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				OPTION 001		
CR3	R422A	4	1	WAVEGUIDE DETECTOR	28480	R422A
DC1	83572-60071	2	1	DIRECTIONAL COUPLER - 10 DB	28480	83572-60071
W17	11170A	6	1	CABLE-BNC, 1-FT.	28480	11170A
	3030-0209	9	6	SCREW-SKT HD CAP 4-40 .5-IN-LG ALY STL	28480	3030-0209
				OPTION 006		
A10	0955-0172	2	1	**MICROWAVE SWITCH, R-BAND DELETE W2**	28480	0955-0172
J2	1250-0118	3	1	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0118
W15	83572-60011	0	1	CABLE ASSEMBLY-PIN SW/MOTHERBOARD	28480	83572-60011
W16	83572-60016	5	1	CABLE ASSEMBLY-PULSE IN	28480	83572-60016
				ATTACHING HARDWARE		
1	0340-0148	9	4	INSULATOR-FLG-BSHG NYLON	28480	0340-0148
2	0360-0355	2	1	TERMINAL-SLDR LUG PL-MTG FOR-#5-SCR	28480	0360-0355
3	0360-1190	5	1	TERMINAL-SLDR LUG PL-MTG FOR-#3/8-SCR	28480	0360-1190
4	0360-1632	0	1	TERMINAL-SLDR LUG LK-MTG FOR-#3/8-SCR	28480	0360-1632
5	0360-0089	9	2	TERMINAL-SLDR LUG PL-MTG FOR-#4-SCR	28480	0360-0089
6	0510-0089	8	1	RETAINER-RING BSC EXT .188-IN-DIA BE-CU	28480	0510-0089
7	0510-1148	2	4	RETAINER-PUSH ON KB-TO-SHFT EXT	28480	0510-1148
8	0624-0099	1	24	SCREW-TPG 4-40 .375-IN-LG PAN-HD-POZI	28480	0624-0099
9	0624-0268	6	15	SCREW-TPG 4-24 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
10	1400-1095	6	4	CLIP-FASTENER .400 X .300 X .090 HI; BE	28480	1400-1095
11	1460-1851	8	1	WIREFORM MUW BLK OXD	28480	1460-1851
12	1480-0337	5	1	PIN-ROLL .094-IN-DIA .188-IN-LG STL	28480	1480-0337
13	2190-0016	3	2	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
14	2190-0030	1	24	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0030
15	2190-0067	4	1	WASHER-LK INTL T 1/4 IN .256-IN-ID	28480	2190-0067
16	2200-0105	4	8	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
17	2200-0107	6	8	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
18	2200-0113	4	4	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
19	2260-0009	3	4	NUT-HEX-W/LKWR 4-40-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
20	2360-0113	2	10	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
21	2360-0115	4	14	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
22	2360-0117	6	2	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
23	2360-0127	8	4	SCREW-MACH 6-32 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
24	2360-0129	0	4	SCREW-MACH 6-32 1-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
25	2360-0135	8	1	SCREW-MACH 6-32 1.5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
26	2360-0210	0	2	SCREW-MACH 6-32 .625-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
27	2360-0333	8	24	SCREW-MACH 6-32 .25-IN-LG 100 DEG	28480	2360-0333
28	2950-0001	8	2	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
29	2950-0004	1	1	NUT-HEX-DBL-CHAM 1/4-20-THD .188-IN-THK	00000	ORDER BY DESCRIPTION
30	3030-0414	8	8	SCREW-SKT HD CAP 4-40 .375-IN-LG SST	00000	ORDER BY DESCRIPTION
31	3030-0947	2	2	SCREW-SET 1-72 .094-IN-LG SMALL CUP PT	28480	3030-0947
32	3050-0003	3	1	WASHER-FL NM NO. 6 .141-IN-ID .375-IN-OD	28480	3050-0003
33	3050-0227	3	4	WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
34	3030-0349	8	16	SCREW-SKT HD CAP 4-40 .312-IN-LG SST	00000	ORDER BY DESCRIPTION
35	3030-0007	5	1	SCREW-SET 4-40 .125-IN-LG SMALL CUP-PT	28480	3030-0007

See introduction to this section for ordering information
*Indicates factory selected value

SECTION VII
MANUAL BACKDATING CHANGES

7-1. INTRODUCTION

7-2. This manual has been written for and applies directly to instruments with serial numbers prefixed as indicated on the title page. Earlier versions of the 83572A only (with serial numbers prefixed lower than the one indicated on the title page) may be slightly different in design or appearance. The purpose of this section of the manual is to document these differences.

7-3. With the information provided in this section, this manual can be corrected so that it applies to any earlier version or configuration of the 83572A. Later versions of both instruments (with serial numbers prefixed higher than the ones on the title page) will be documented in a yellow Manual Changes Supplement.

7-4. To adapt this manual to an earlier instrument, refer to Table 7-1 and make the manual backdating changes listed opposite your instrument serial number or serial number prefix.

7-5. For additional information about serial number coverage, refer to INSTRUMENTS COVERED BY THE MANUAL in Section I.

Table 7-1. Manual Backdating Changes by Serial Number Prefix

Serial Prefix	Make Manual Change
2304A	A, B, C
2248A	A, B, C, D
2220A, 2218A	A, B, C, D, E

7-6. MANUAL CHANGE INSTRUCTIONS

CHANGE A
(A6 YO Driver Assembly)

Page 6-18, Table 6-3:
Change the part number of A6 YO driver assembly to 83572-60006, CD 3.

Page 6-19, Table 6-3:
Change A6R55 to part number 0757-1060, CD 9, RESISTOR 196 1% .5W F TC=0±100.
Delete A6R70.
Delete A6R71.

Page 8-75/8-76, Figure 8-42:
Replace Figure 8-42 with **Figure 7-1, A6 YO Driver Component Locations (CHANGE A)** from this section.

Page 8-75/8-76, Figure 8-47:
Change the A6 YO DRIVER part number in the top left-hand corner to 83572-60006.
Change the SERIAL PREFIX in the lower left-hand corner to 2304A.
In Block K, SUPPLY FILTERING, change the value of R55 to 196.
Replace Block G with **Figure 7-2, P/O A6 YO Driver Schematic (CHANGE A)** from this section.

CHANGE B
(Directional Coupler)

Page 1-8, Table 1-2:
Delete **83572-60071 DC1 DIRECTIONAL COUPLER 10 dB** and its associated list of characteristics.
Delete footnote 3.

Page 6-23, Table 6-3:
Change DC1 part number to R752C, CD 5.

Page 6-24, Table 6-3:
Change DC1 (Option 001) part number to R752C, CD 5.

CHANGE C
(A3 Digital Interface)

Page 6-13, Table 6-3:
Change A3U1 part number to 83572-80001, CD 0.
Change A3U2 part number to 83572-80002, CD 1.

CHANGE D
(A7 Bias)

Page 8-81/8-82, Figure 8-55:
In Block G MODULATOR DRIVE, add TP9 between R21 and R74.

CHANGE E
(A6 YO Driver and A7 Bias)

Page 6-19, Table 6-3:
Change A6R53 to HP Part Number 0698-0084, CD 9, RESISTOR 2.15K 1% .125W F TC=0±100, Mfr. Part Number C4-1/8-TO-2151-F.
Change A6R54 to HP Part Number 0757-0403, CD 2, RESISTOR 121 1% .125W F TC=0±100, Mfr. Part Number C4-1/8-TO-121R-F.

Page 6-21, Table 6-3:
Add A7R33, HP Part Number 0698-3443, CD 0, RESISTOR 287 1% .125W F TC=0±100, Mfr. Code 24546, Mfr. Part Number C4-1/8-TO-287R-F.
Change A7R72 to HP Part Number 0698-3441, CD 8, RESISTOR 215 1% .125W F TC=0±100, Mfr. Part Number C4-1/8-TO-215R-F.

Page 8-75/8-76, Figure 8-47:
In Block K SUPPLY FILTERING:
Change the value of R53 to 2150.
Change the value of R54 to 121.

Page 8-81/8-82, Table 8-55:
In Block D PULSE MOD DRIVE:
Change the value of R72 to 215 ohms.
Add R33, 287 ohms, between R72 and the collector of Q6.

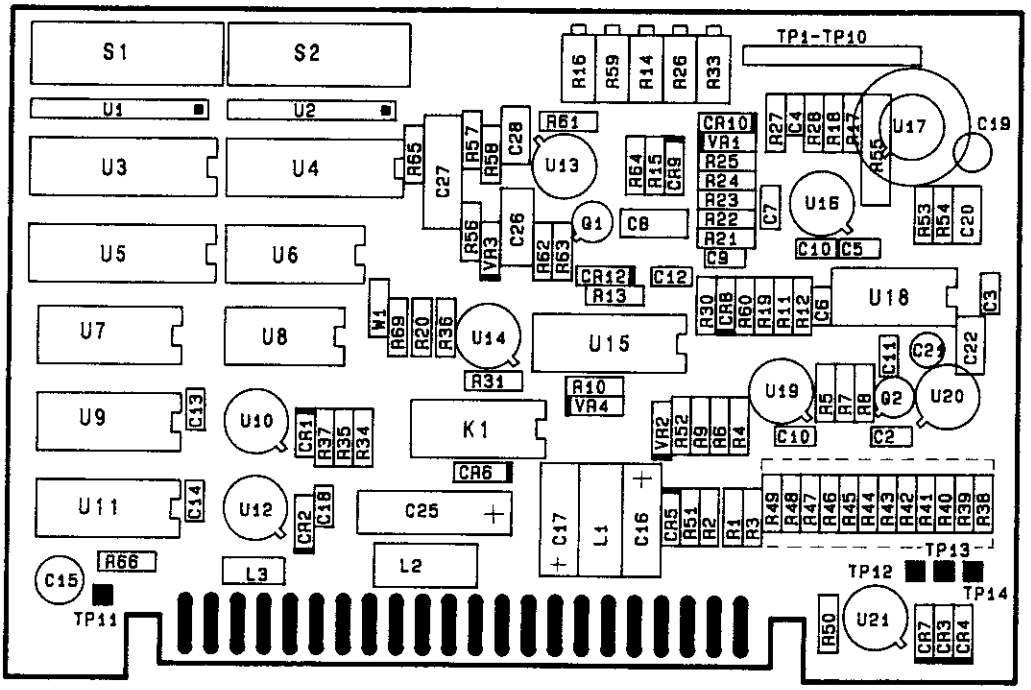


Figure 7-1. A6 YO Driver, Component Locations (CHANGE A)

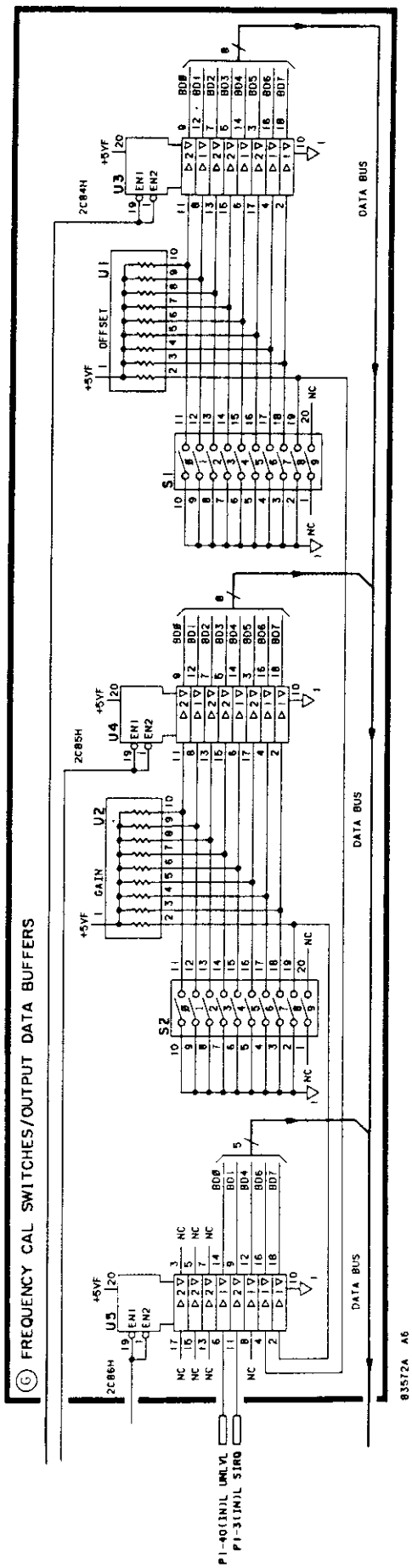


Figure 7-2. P/O A6 YO Driver Schematic (CHANGE A)