DETECTOR ADAPTER
HP 85025C

OPERATING AND SERVICE MANUAL
assistance

legal theory.

consequential damages, whether based on contract, tort, or any other
shall not be liable for any direct, indirect, special, incidental, or
remedies provided herein are buyers' sole and exclusive remedies. hp

exclusive remedies

purpose.

implied warranties of merchantability and fitness for a particular
no other warranty is expressed or implied, hp specifically disclaims the
environmental specifications for the product.

the foregoing warranty shall not apply to defects resulting from improper handling by buyer, buyer-

limitation of warranty

operation of the instrument, or software, or firmware will be uninterrupted or error free.

operation of this instrument when properly installed on the instrument. hp does not warrant that the

hp warrants that its software and firmware described by hp for use with an instrument will execute its

country.

however, buyer shall pay all shipping charges, duties, and taxes for products returned to hp from another

for warranty service or repair, this product must be returned to a service facility designated by hp. buyer

it is option, either repair or replace products which prove to be defective.

this Hewlett-Packard instrument product is warranted against defects in material and workmanship for a

warranty
DETECTOR ADAPTER
HP 8502SC
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Figure 2 shows an example of HP 85025C performance with an HP U4224A detector.

PERFORMANCE

Table I lists the HP 85025C typical operating characteristics.

TYPICAL OPERATING CHARACTERISTICS

Frequency range of the HP 8757A to that of the detector used.

The capability to use a standard detector extends the (DC) test signals. The ability to use a standard detector extends the HP 8755C or 8756A scalar network analyzers. The detector

partible with the HP 8755A scalar network analyzer (it is NOT com-

patible for display on the HP 8757A scalar network analyzer). The HP 85025 detector adapter is used to adapt any standard detector

DESCRIPTION

fully understand and meet the stated conditions.

Figures 1 and 2 show a typical HP 85025C detector adapter. The HP

fully understand and meet the stated conditions.

CAUTION

This indicates a mechanical hazard. CAUTION calls attention to an

processure, practice, etc., that, if not correctly per-

dangerous situation. Do not continue past a CAUTION

WARNING

This indicates a personal hazard. WARNING calls attention to a

safety symbols

This product was designed and tested in

CONSIDERATIONS

ADJUSTMENTS, and repair information is under the heading SERVICE.

The operating instructions are under the heading PERFORMANCE. The operating information is provided under the major heading OPERATION. OPERA-

the accessories that are supplied with it.

This manual contains information required to operate, test, and service the

GENERAL INFORMATION

HP 85025C General Information
RECOMMENDED TEST EQUIPMENT

1. A dual directional coupler (or two single direction couplers) on a di-

2. A dual directional coupler (or two single direction couplers) on a di-

3. An HP 8754A waveguide network analyzer (now HP 8757E).

4. An HP 8525A source (with source modulation; 2.0 or later). A

5. A source covering the frequency range of the detector(s) used.

6. For AC mode only: Either the source must be capable of 27.78 KHz

To make reflection and transmission measurements you will need:

EQUIPMENT REQUIRED BUT NOT SUPPLIED

SERVICE.

To order these accessories, refer to ORDERING PARTS under the major heading:

To order these accessories, refer to ORDERING PARTS under the major heading:

ACCESSORIES

Each HP 8525C detector adapter has a unique serial number. This manual ap-

Printed copies of the supplements are available from your local Hewlett-
### INITIAL INSPECTION

If the shipping container or cushioning material is damaged, keep it until the contents of the shipment are checked for completeness, and the instrument is checked both mechanically and electrically.

1. Check the package for completeness. Figure 1 shows the items you should receive.
2. Check connector, cable and body for mechanical damage.
3. Test the detector adapter electrically. Refer to OPERATOR'S VERIFICATION in this manual.

Notify your nearest Hewlett-Packard office if any of the following conditions exist:

* The instrument does not pass the operator's verification and the procedures under SERVICE do not correct the problem.
* The shipping contents are incomplete.
* There is mechanical damage or defect.

Also, notify the carrier if the shipping container is damaged or if the cushioning material shows signs of stress. Keep all shipping materials for the carrier's inspection. Hewlett-Packard will arrange for replacement without waiting for a claim settlement.

### Table 1. Typical Operating Characteristics

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>Cable length is 1.22 m (48 in).</td>
</tr>
<tr>
<td></td>
<td>Net 0.24 kg (0.5 lb); Shipping 1.0 kg (2.2 lb).</td>
</tr>
<tr>
<td>Height</td>
<td>Maximum Measurable Input Voltage: DC: ±3V, AC: 3V peak-to-peak.</td>
</tr>
</tbody>
</table>
+ Be sure that all connectors are clean and undamaged. A mechanism called detector trace jumps around when the connector is touched or moved, and the deflection of the connector makes low power level readings unstable. The analyser does not make reliable measurements unless the analyser is touched or moved.

The HP 8502C input connector is an SMA male type. This connector should mate with the same connector cable. You use two or more detector adapters. Place matching clips on both ends of the detector lead identification clips. Each detector requires approximately 0.5 Watt. Power for the detector adapter is supplied by the HP 8757A scalar network.

Figure 2. Example of HP 8502C performance with an HP U422A detector.
The instrument is not exposed to temperature extremes or to higher humidity.

Provide protection from temperature extremes. Condensation may occur within.

Altitude: Up to 7,620 m (25,000 ft).

Humidity: Up to 95%.

Temperature: 0 to 45°C.

The HP 85025C detector adapter operates within the following environmental limits:

**OPERATING ENVIRONMENT**

3. Connect the RF input by turning the male connector OUTER shell clockwise.

3. Secure the multi-pin connector in the analyzer by turning the OUTER shell clockwise.

2. Insert the multi-pin connector into the HP 8757A mating connector. The HP 85025C connector is keyed. Insert the plug with the key downward. The HP 85025C outer shell will lock clockwise.

1. Connect the detector adapter to the detector by turning the male connector clockwise.

Connecting the HP 85025C

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CONNECTOR MFR.</th>
<th>CONNECTOR TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5082-2240-00</td>
<td>Omni Spectra</td>
<td>SMC male</td>
</tr>
<tr>
<td>3282-2240-00</td>
<td>Omni Spectra</td>
<td>BNC male</td>
</tr>
<tr>
<td>050-674-6800-69</td>
<td>Seagateco</td>
<td>SMA female</td>
</tr>
</tbody>
</table>

*Table 2. Adapters*

*Do not install the detector or the probe until the detector is free of oil or grease.*

1. Do not install the detector or the probe until the detector is free of oil or grease.

4. Cause errors in DC mode at low power levels due to loss through the cable.

4. Cause errors in DC mode at low power levels due to loss through the cable.

b. Show the AC response of the probe detector, due to capacitance in the cable.

b. Show the AC response of the probe detector, due to capacitance in the cable.

Putting a length of coaxial cable between the detector and the HP 85025C
5. Any other information that may expedite service.

4. The type of service required.

3. The complete model and serial number of the instrument.

2. The technical contact person within your company, and their complete phone number.

1. Your company name and address.

If you ship the instrument to a Hewlett-Packard office or service center:

Returning Instrument for Service

5. Mark the shipping container "FRAGILE.

4. Seal the shipping container securely.

3. Inside the container:

   a. Pad the instrument to provide a firm cushion and to prevent movement of the instrument to provide a 76 to 102 mm (3 to 4 in) layer, around all sides of the instrument.

   b. Use shock-absorbing material, a 76 to 102 mm (3 to 4 in) layer, around all sides of the instrument.

   c. Use a strong shipping container. A double-wall cardboard box is 159-kg (350-lb) test material is adequate.

   d. Wrap the instrument in heavy paper.

Instructions:

Pack the instrument with commercially available materials. If you choose to package the instrument within your Hewlett-Packard office, fabricate your own packaging materials and materials identical to those used in factory packaging.

Provide protection from temperature extremes, which can cause condensation:

- Altitude: up to 7,620 m (25,000 ft).
- Humidity: up to 95%.

- Temperature: -25°C to +75°C

The instrument may be stored or shipped in environments within the following:

STORAGE AND SHIPMENT
The manual part number also appears on the back cover, in the lower left hand corner.
<table>
<thead>
<tr>
<th>USE*</th>
<th>RECOMMENDED MODEL</th>
<th>CRITICAL SPECIFICATIONS</th>
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<tbody>
<tr>
<td>0 A</td>
<td>HP 0960-0054</td>
<td></td>
</tr>
<tr>
<td>0 A</td>
<td>HP 8710-1300</td>
<td></td>
</tr>
<tr>
<td>0 S</td>
<td>HP 8720-0009</td>
<td></td>
</tr>
<tr>
<td>0 S</td>
<td>HP 8710-0978</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>HP 0970B</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>HP 8495A</td>
<td></td>
</tr>
<tr>
<td>0 A,5</td>
<td>HP 62128</td>
<td></td>
</tr>
<tr>
<td>0 A,5</td>
<td>HP 3465A</td>
<td></td>
</tr>
<tr>
<td>0 S</td>
<td>HP 1740A</td>
<td></td>
</tr>
<tr>
<td>0,4 A</td>
<td>HP 8350B</td>
<td></td>
</tr>
<tr>
<td>0,4 A</td>
<td>HP 8757A</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Recommended Test Equipment

*O=Operator's Check A=Adjustments S=Service

Short

Adjustment Tool

Wrench

Scrubdriver

Phillips

Detector

Step Attenuator

DC Power Supply

Digital Voltmeter

Oscilloscope

RF Source

Network Analyzer
DO NOT use a wrench unless it is a torque wrench set at 9.2 cm/kg (8 in/lb).

Tighten the HP 85025C connectors with fingers only.

Read and observe all CAUTIONS.

Ensure that your HP 8774A firmware is Revision 2.0 or greater.

OPERATING PRECAUTIONS

Figure 1 details the features of the HP 85025C.

FEATURES

detector adapter.

This section contains information concerning the operation of the HP 85025C.

INTRODUCTION

NEVER touch the detector or the HP 85025 center contacts.

detector.

As an extra precaution, discharge both the cable and the

the scalar network analyzer.

The detector to the detector adapter, or the HP 85025 to

whenever possible, turn the source and the HP 8774A off

before touching the detector connector.

the best method of preventing ESD is to wear a grounding

nylon, dry etr. paper adhesive tape, styrofoam and viny.

Materials conductive to static build-up include carpeting,

The HP 85025C detector adapter is susceptible to

CAUTION

OPERATION

HP 85025C Operation
A procedure for verifying the operation of the detector adapter is included in this manual under the heading OPERATOR'S CHECK. The operator's check provides a procedure for inspecting the operation of the detector adapter properly. This procedure should meet the needs of an incoming inspection.

**OPERATOR'S CHECK**

Before you connect a cable to the diode detector, always occur.

Do not apply more than 10 volts DC or 10 volts peak-to-peak to the HP 85025C. An electrical damage can occur.

Do not apply more than 9.2 cm/kg (6 in/lb) of torque when tightening the connectors. Greater surface torque may deform the mating surfaces.

**CAUTION**

**Figure 1, HP 85025C Features**

1. RF INPUT CONNECTOR. This connector (SMA male) accepts the RF signal from the detector to the network analyzer.
2. COARSE DC ZERO. This adjustment compensates for any large offset voltage.
3. MULTI-PIN CONNECTOR. This connector supports the necessary DC voltage for the operation of the HP 85025C, and feeds the detector adapter output signal to the network analyzer.

Hp 85025c operation
This is a general description of diode detector response. The exact values of A and B are determined by the diode detector you use.

**Figure 2. Response of a Typical Diode Detector**

Input Power (dBm) vs. Log (Vout). In this region, the output voltage is proportional to the input voltage. When an input signal is above B dBm, the diode is operating in the linear region. When an input signal is between A and B dBm, the diode is operating in the transition region. As the name implies, this region provides a smooth transition between the other two regions.

Diode detectors have three separate types (regions) of response to an input signal: (see Figure 2). Using Figure 2, when an input signal is below A dBm, the diode detector responds to an input signal that is proportional to the square of the input voltage. When an input signal is between A and B dBm, the diode detector responds to an input signal that is equivalent DC voltage. This chopped signal is amplified and passed to the detector analyzer. This signal, in turn, passes to the analyzer, amplified by the detector adapter. In AC detection, an RF or microwave signal is amplitude modulated with a 27.78 KHz squarewave whose peak-to-peak voltage corresponds to the magnitude of the RF signal at the detector input. This transformer is used to produce a 27.78 KHz squarewave. The detector used with the HP 85025C detector adapter has an HP 85025C demodulator in AC detection. In AC detection mode, the detector adapter provides a 27.78 KHz (AC mode) or a squarewave amplitude modulated RF signal. When 85025C detects the output of a diode detector whose input is either an AC or DC signal, the detector adapter provides an output that can be displayed on the HP 8574A scalar network analyzer. The HP 85025C operates in either AC or DC detection mode, the squarewave detector module's input signal is amplified by the detector adapter's amplifier.
Drift and temperature fluctuations are also a zeroing operation in DC mode that compromises the accuracy of the HP 8757A. To use DC detection, you must first set the DC measurement mode on the HP 8757A. There are several characteristics to consider. DC detection offers greater power measurement accuracy and ability to achieve greater sensitivity and immunity to noise and drift with time and thermal temperature. For the majority of measurements, AC detection is the preferred method. It is AC Detection Mode (Preset) to set the AC detection mode; AC detection is automatic. Select MODE AC/DC to turn AC mode on (AC JIBS). If the last measurement was in DC mode, press SYSTEM [MODE AC/DC] again if the HP 8757A is turned off, it remembers the PC connection, and you do not have to set AC detection on the analyzer unless DC was used in the previous measurement. Then, in DC mode, you can change either the detector or the detector adapter. Adjust detector/calibrations (detection/calibration) adapts the analyzer’s dynamic range to each detector/adapter (calibration) type. This procedure (external detector measurement calibration procedure) occurs whenever you select AC or DC detection. You should perform a firmware-based measurement with an external (separate) detector, whether because the HP 85025 C is selected. If you use a directional bridge capable of both AC and DC detection, you must use a directional bridge capable of both AC and DC measurement. Note: To do anything special to make an AC measurement, you need to disable AC mode with the HP 8757A and 85025 C. If you must pay special attention to system operation, however, you must perform the proper analyzer keystroke sequence.
Figure 5. External Detector Measurement Calibration Set Up

The external detector measurement calibration requires that you measure two data points at two points on the detector's response.

External Detector Measurement Calibration

The zeroing function.

The pre-measurement steps.

HP 85025C Operation
I3. Enter the power level incident on the detector (e.g., 24 dBm).

I2. Set the attenuator so that the power to the detector is in the square law region.

12. The analyzer displays ENTER POWER (LO).

II. Enter the power level incident on the detector (e.g., 6 dBm).

On the HP 8757A:

-10 to 0 dBm (e.g., 6 dBm). For best accuracy, use a power meter to set the power level. 

10. Set the power to a level in the detector’s square law region greater than 100 mW.

9. Select a frequency within the detector’s range.

On the source:

The analyzer displays ENTER POWER (HI).

8. Select [CONT].

On the HP 8757A:

7. Adjust COARSE ZERO (AR23) for a minimum signal on the analyzer.

On the HP 85025:

For minimum response.

IF you are using DC detection, the analyzer displays Adjust Course ZERO.

6. Select [DET A], or the appropriate input.

5. Select [DET PAR CAL].

4. Press [CAL] then [MORE] then [EXIT DET CAL].

AC vs DC Measurement (calibration below).

NOTE: A measurement calibration in one mode is not valid for the other (see

3. If you will be using AC detection, continue with step 4.

2. Press [RESET].

1. Connect the equipment as shown in Figure 5. Allow 30 minutes warm up.
The analyzer does not keep separate AC and DC calibration values.

Only one measurement calibration value is stored at one time for each input.

Uncalibrated operation below.

Use the default calibration value that is stored in the analyzer (see original).

Perform an external detector measurement calibration with a new detector/detector adapter. The new calibration value replaces the original.

Changing a stored measurement calibration:

Value in any of these ways:

- Enter the value you wish stored for that input and press [ENT].
- The analyzer displays DEF a VAL and the value stored for that input.

* [EXT DEF CAL], [CAL VALUE], [DEF A], (or the appropriate input).

[MORE], [CAL], [CAL Value], [Value Measurement].

If you change the detector or the detector adapter, you must perform a new measurement calibration.
depends on the diode detector used.

For higher power levels, the accuracy of the displayed signal level

input signal levels approaches the diode detector's noise floor.

As you increase the attenuation, the accuracy continues to decrease.

1. Connect the detector/detector adapter to the HP 8757A and set the

alyzer default calibration value.

2. Connect the detector/detector adapter to the HP 8757A and set the

alyzer default calibration value.

Example for a diode detector with a square law region below -15 dBm:

- The analyzer displays DET A CAL VAL and the stored default value.
- Press [CAL], [MORE], [EXIT DET CAL], [CAL VALUE], [DET A] (or the

alyzer default value:

Figure 6. Default Response Curve

<table>
<thead>
<tr>
<th>INPUT VOLTAGE</th>
<th>10</th>
<th>1</th>
<th>100</th>
<th>1000</th>
<th>10 V</th>
<th>1 V</th>
<th>10 mV</th>
<th>1 mV</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER DISPLAYED ON HP 8757A</td>
<td>-60</td>
<td>-40</td>
<td>-20</td>
<td>0</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>
2. Turn the analyzer on and press [PRESET]. Allow the instruments to warm up.

On the HP 8757A:

1. Connect the detector/detector adapter to the analyzer.

Coarse Zero:

Zeroring with no RF signal applied:

Zeroring also establishes the displayed noise level (noise floor of the system) and compensates for any small drift in the offset voltage. Zeroring also eliminates small DC voltages from the probe detector that would otherwise fluctuate. This is not required for AC detection. The zeroing operation must be performed for the effects of DC drift and temperature. When you perform DC mode measurements, it is important that you perform a zeroing operation.

Zeroring:

Correction factors match the port and the device. Perform a zeroing on the source (HP 8350B, 8344A or 8344A). Selecting DC mode with the software [MODE AC/DC] turns off the squarewave AC tones and DC lights up.

3. To turn on DC mode, press [MODE AC/DC] in the SYSTEM menu. (MODE AC/DC) in the SYSTEM menu.

The HP 8757A DC mode softkeys are enabled. You can access [det zero] and [cal]softkeys on the source (HP 8350B, 8344A or 8344A). The analyzer reads each input port and identifies the detector or detector adapter connected to it (AC/DC or AC only).

During preset:

2. Press [PRESET].

On the HP 8757A:

1. Connect the detector/detector adapter to the HP 8757A.
Refer to the HP 8757A Operating Manual for detailed information on softkeys.

**NOTE:** If the operating environment changes significantly, you should repeat the zeroging operation.

**NOTE:** For optimum performance, the outer conductor of the connector must be electrically connected to the outer conductor of the source RF output

**NOTE:** A device under test generates RF signals. If noise, autorzero is not

**NOTE:** To perform the zeroging repeat autorzero. Press [MANUAL] to perform the zeroging. Then press [MANUAL] to perform the zeroging. MANUAL ZERO, [MANUAL] is similar to zeroing a power meter. First, remove the RF signal from the detector. Repeat autorzero, [REP AZ ON/OFF], periodically repeats the autorzero.

8. After adjusting coarse zero, press the softkey [CONT]. The analyzer performs an autorzero.

7. Adjust coarse DC zero (AIR23) for a minimum signal on the analyzer.

6. Select the softkey that corresponds to the detector adapter that you wish to zero (e.g., [DET A]). The analyzer displays Adjust COARSE ZER0 for zero.

5. Select [COARSE ZER0].

4. Press [CAL] and select the softkey [DC DET ZER0].

3. Press [AUTO] and select the softkey [MODE DC/AC] to turn DC mode on.
Equipment

Figure 1. Equipment set up.

Sweep Oscillator

Network Analyzer

HP 8771A

HP 85230

Step Attenuator

Stop SWP

POS IBLANK

Sweep Out 1/10 V

Sweep In 0-10 V

HP 85230 System Interface

Performing without access to the interior of the detector adapter.

Introduction

Operator's Check

HP 85230 Operator's Check
12. Set the source output power level to ≥ 6 dBm. On sources which do not have +6 dBm capability, use the highest power level available.

11. Select a CW frequency within the detector's range.

On the source:

10. Press [CONT]

On the HP 8757A:

displayed on the HP 8757A.

9. Adjust coarse DC ZERO so that the minimum power level (noise floor) is

On the HP 85025C:

8. Set the step attenuator to its highest attenuation.

7. Turn RF power off.

On the source:

In ac mode, go to step 11.


Select [MORE], [EXTR DET CAL], [DET PWR CAL]

5. Press [CAL].

4. For DC operation, select the softkey [AC/DC] in the system menu. DC with

3. Press [SYSTEM].

2. Press [INSTR PRESET].

On the HP 8757A:

for 30 minutes.

I. Connect the equipment as shown in Figure 1. Allow the equipment to warm up.

Procedure

This test can be performed in both AC and DC modes.

The test used in actual day to day operation, the detector used in this procedure should be the same as the one used in adapter operation. The detector used in this test is recommended as a general check of pres. The test is recommended on the detector because this value is dependent on the detector.

Noise floor is the power level indicated on the HP 8757A with no signal.

Description

NOISE FLOOR MEASUREMENT

nr. 89.9999 operator's manual
The noise floor measurement is now complete.

18. Set the step attenuator to its highest attenuation.

17. Turn RF power off.

16. At the ENTER POWER (LO) prompt, press [-2] [4] [dBm] or enter the original power level. Less 30 dB attenuation.

15. Set the step attenuator to 30 dB.

14. At the ENTER POWER (HI) prompt, press [6] [dBm] or enter the highest power level that was attenuated.

13. Set the step attenuator to 0 dB.
The dynamic accuracy procedure is now complete.

5. Repeat step 4 until the signal is attenuated 50 dB or when the detector reaches -40 dBm, whichever comes first. At each step, the input power should be greater than 2 dB. If your results are not within this range, refer to TROUBLESHOOTING in the service section of this manual.

4. Using the step attenuator, attenuate the signal 10 dB. Note the deviation of the analyzer reading from the setting on the step attenuator.

This should result in a 0 dB reading.

CURSOR
[MEAS - MEM]
[MEAS << MEM]
[DISPLAY]

3. Press:

On the HP 8757A:

Highest power level available.

On sources which do not have +10 dBm output power capability, use the

2. Select a CW frequency within the detector’s range at +10 dBm output power.

On the source:

I. Perform the NOISE FLOOR MEASUREMENT if you have not done so.

Procedure

This test can be performed in both AC and DC modes.

To day operation.

The detector used in this procedure should be the same as that used in actual day operation. If one is unavailable, the equipment listed at the front of this section. If one is unavailable, the detector used in this procedure should be one of those mentioned in the equipment recommended in a general check of adapter operation. It is recommended that the test is dependent on the detector used in the test set up. This test is dependent on the detector used in the test set up. Because this detector absorbs power at the output of the attenuator, because this

Description

DYNAMIC ACCURACY PROCEDURE
EQUIPMENT

Figure 1. Detector Adapter Adjustment Access Points

You must remove the detector adapter's plastic outer shell to perform both adjustments. If the adjustments are unsuccessful in removing the inner metal sleeve, you must remove the detector adapter's plastic outer shell to perform both adjustments. If these adjustments are unsuccessful in removing the inner metal sleeve, perform both adjustments only after you have performed the connector inspection in the service section, and if the values found in the operator's manual are not within an acceptable range.

1. The gain null adjustment.
2. The 55 KHz null adjustment.

There are two adjustments in the HP 8525C:

ADJUSTMENTS

HP 8525C Adjustments
6. The cover assembly may be pulled apart to expose the metal housing.

5. Turn the detector adapter over and repeat steps 3 and 4.

4. Turn the screwdriver to snap apart the cover assembly.

3. At an angle, carefully insert the tip of a flat-head screwdriver into the seam of the cover assembly until it slips under the seam. Be sure your hand is not in the path of the screwdriver.

2. Hold the sides of the detector adapter near the cable end.

1. Place the detector adapter so its narrow side is on a flat surface. Attempting to remove the cover assembly may result in injury.

WARNING

Figure 2, Cover Removal.

COVER REMOVAL PROCEDURE
6. Select the softkey [AC/DC] in the system menu. DC lights up.

5. Press [SYSTEM].

4. Press [INSTA PRESET].

3. Set the DC power supply to 1 V. 000. 003 Y.

For 30 minutes, connected to the digital voltmeter (DVM). Allow the equipment to warm up.

2. Connect the equipment as shown in Figure 3. With the DC power supply procedure that precedes this adjustment.

1. Remove the plastic cover from the detector adapter using the cover REMOVAL PROCEDURE.

Figure 3. Adjustment Procedure Set Up.

DESIGNATION

INSTRUCTION

1. The display of the instrument is at its highest point. In the adjustment, the gain of the internal amplifier is adjusted to ensure a consistent relationship between the input voltage and power displayed. With the input of the detector adapter, the 55 KHz null potentiometer output is adjusted until the noise floor is at its highest point. With the input of the HP 85025C, the 55 KHz null potentiometer output is generated. Internal to the HP 85025C does not appear at the detector adapter's output. The first adjustment in this procedure ensures that the 55 KHz signal.
The detector adapter is now adjusted.

20. Adjust the gain potentiometer (shown in Figure I) until a 10.50 ± 0.05 dBm
power level is displayed on the HP 6757A.

19. Press [CURSOR].

18. Connect the DC power supply to the input of the HP 85020C.

17. Remove the short from the input of the detector adapter.

Gain Adjustment

After step 15 and 16 until there is no noticeable change in signal level.

15. Adjust the 55 KHz null potentiometer (shown in Figure I) until the signal level (noise floor) reaches its highest point.


55 KHz Null Adjustment

13. Select [CONT].

12. Adjust coarse DC ZERO so that the minimum power level (noise floor) is displayed on the HP 8757A.

11. Select the softkeys [DC DET ZERO], [COARSE ZERO], and then [DET A] in the cal menu.

10. Press [CAL].

9. Connect a short to the input of the HP 85020C.

[RESET CAL VAL].

[DET A]

[CAL VALUE]

[EXIT DET CAL]

8. Select:

7. Press [CAL] and select [MORE].

HP 85020C Adjustments
In AC mode, the signal is modulated at 27.8 kHz at the source. The detector's output, therefore, is the modulated square wave required by the analyzer.

Creating a 27.8 kHz square wave for input to the analyzer.

In DC mode, the detector's output is a constant voltage proportional to the power of the input signal. The 85025C's square wave and amplifier's this voltage level, for the analyzer to interpret and display.

The 85025C detector adapter accepts detected RF or microwave signals that are either 27.8 kHz modulated (AC mode) or unmodulated (DC mode). In either detection mode, the detector adapter provides a 27.8 kHz square wave signal.

 THEORY OF OPERATION

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

WARNING

TROUBLESHOOTING PROCEDURES in this section, consult specified range, refer to ADJUSTMENTS. If the problem persists, consult provided in this manual. If the results of this check are not within the provided in this manual. If the results of this check are not within the specified range, refer to ADJUSTMENTS. If the problem persists, consult

BEGIN TROUBLESHOOTING THE DETECTOR ADAPTER.

This section provides information concerning the troubleshooting and repair of the HP 85025C detector adapter.

INTRODUCTION
Figure 1. Overall Block Diagram

- Oscilloscope: HP 1740A
- 7/16 Inch Hex Nut Wrench: HP 8720-0009
- Phillips Screwdriver: HP 8710-0976
- DC Power Supply: HP 6213B
- Digital Voltmeter: HP 3456A
- Network Analyzer: HP 8751A
Supporting element. If a connector is dirty, refer to Figure 2 for cleaning instructions. First, if a connector fails the inspection, replace it. Periodically inspect all connectors; a bad connector can damage a good one on the equipment. Shadowless illumination: this type of magnifying glasses is the small defects you are trying to expose. A magnifying glass with integrated light, especially indirect desk lamp lighting, casts shadows that can mask extra power is not critical, but the light is very important. Normal room lighting provides illumination: use an illuminated, 4-power magnifying glass. The examining connectors for obvious problems such as damaged or corroded contacts, or rounded shoulders, or other signs of wear can degrade performance. Replace defective connectors. You can see with the magnifying glass can degrade performance. Replace defective connectors.
Figure 2. Cleaning Connectors.

**Correct**
- Use circular strokes for outer fibers.
- Radial strokes do not leave center collar.
- Fibers snage on edges of circular strokes leave torn cloth around a squeegee wooden cloth.

**Wrong**
- Small for the swabs.
- Cleaning areas that are too rod (such as a toothpick) for wrap thin foam or a lint-free.

Note: Do not clean the connector with compressed air before resorbing.
Instructions in Power Cable Replacement:

1. If there are any discontinuities, replace the cable by following the ground (frame).
2. Use the DVM to check for possible shorts between the connector pins and the corresponding wires. Table 1 lists the cable connector pins and the corresponding conductor numbers. Figure 1 shows the cable connector pins. The wire conductor positions inside the connector pins are the same as the corresponding numbers in the cable connector pin positions. The connector pin positions are marked with a colored dot on the outer plastic sheath of the cable. The conductor positions are marked with colored dots on the outer plastic sheath of the cable. The conductor positions are also marked with colored dots on the outer plastic sheath of the cable.
3. Use a digital voltmeter (DVM) to check the continuity of the power cable.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Conductor Pin</th>
<th>Conductor (Label)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+15V</td>
<td>5</td>
<td>Red (R)</td>
</tr>
<tr>
<td>12.6V</td>
<td>4</td>
<td>Blue (B)</td>
</tr>
<tr>
<td>Control</td>
<td>3</td>
<td>Yellow (Y)</td>
</tr>
<tr>
<td>Return</td>
<td>2</td>
<td>Green (G)</td>
</tr>
<tr>
<td>Control</td>
<td>1</td>
<td>White (W)</td>
</tr>
</tbody>
</table>

Table 1. Power Cable Conductors.

4. Disconnect the HP 85025C detector adapter from the network analyzer and perform the diagnostic procedures. Refer to the COVER REMOVAL PROCEDURE under the heading ADCUSMNTS.
5. Remove the plastic outer cover. Remove the plastic outer cover (Refer to the COVER REMOVAL PROCEDURE under the heading ADCUSMNTS).
6. To access the circuit board, perform this procedure in the order given. HP 85025C. To avoid troubleshooting errors and unnecessary repair costs, this section provides a sequential procedure for troubleshooting the circuit board.
c. If any of these voltages are not within specification, remove the detector adapter from the analyzer and check the +15V and -12.6V supplies from the HP 8757A. This step isolates the malfunction to either the HP 85025C or the HP 8757A.

Figure 3. Circuit Board Power Supply Check Points.

- a. Attach the HP 85025C to the HP 8757A network analyzer and turn the analyzer on.
- b. Check the power supply voltages shown in Figure 3. Because +15V and -12.6V are supplied by the analyzer, these voltages are specified in the analyzer manual. The +V should be +8.3 ± 0.5V; the -V should be -5 ± 0.5V.
- c. If any of these voltages are not within specification, remove the detector adapter from the analyzer and check the +15V and -12.6V supplies from the HP 8757A. This step isolates the malfunction to either the HP 85025C or the HP 8757A.

HP 85025C Service
Replace the clock, U2.

1. If the resistance measured in step 5 is greater than 20K ohms, check the clock, U2.

2. If the resistance measured in step 5 is less than 20K ohms, replace the clock, U2.

3. If the resistance measured in step 5 is 30K Ù 3K ohms, replace the comparator, U3.

4. Using an ohmmeter, measure the resistance between U3, pin 7 and U2, pin 10.

5. Remove the HP 85025C from the network analyzer.

Procedure:

6. Check the voltage at U3, pin 7. This voltage should be ±5V ±0.5V. If it is not within this range, troubleshooting the network analyzer.

7. Connect the HP 85025C detector adapter to the network analyzer.

8. Connect the HP 85025C detector adapter to the network analyzer.

9. Troubleshoot the network analyzer.

10. On the network analyzer, set the mode to AC.

11. Check the voltage at U3, pin 7. This voltage should be ±5V ±0.5V. If it is not within this range, go to step 5.

12. Check the voltage at U3, pin 7. This voltage should be ±1V ±0.5V. If it is not within this range, go to step 5.

13. If it is not 0V, replace the buffer amplifier, U6.

Component location diagram.

NOTE: For troubleshooting procedures 4, 5, and 6, refer to Figure 4.
e. Replace the cable, and install the new one by performing steps a through d.

f. Replace the old cable.

g. Remove the I/2 inch hex nut that fastens the cable to the end plate.

h. Indicated in Table I, note that the pads to which the wires are soldered are labeled as indicated in Table I. Unsolder the wires connected to the power cable/circuit board assembly.

i. Open the detector adapter using the instructions in accessing the circuit.

j. Check that the preamplifier works.

k. Replace the preamplifier.

l. Replace the detector.

m. If each of the signals measured in steps 6a, b, and c are correct, replace the preamplifier.

n. If any of the signals is incorrect, replace the clock. If the three signals coming from the clock now match those given in 6a, b, and c, the clock was defective. If not, replace the preamplifier.

o. Replace the clock.

p. Using an oscilloscope, measure the signal at U2. Pin 2 should be a 3.5 kHz square wave.

q. The signal present at U2, pin 2 should be the same as the signal in step 6. Using an oscilloscope, measure the signal at U2. Pin 1. The waveform should be a 1.5 kHz, 27.8 kHz square wave.

r. Replace the preamplifier/clock check.
Figure 4a. Component Location Diagram (top)

Figure 4b. Component Location Diagram (bottom)
To request information on a part that is not listed in Table 3, quickly:

- Address your inquiry to the nearest Hewlett-Packard office.
- Include a description and function of the part.
- Indicate the instrument serial number.
- Indicate the instrument model number.

ORDERING INSTRUCTIONS

- The manufacturer’s number for the part.
- The five digit code of a typical manufacturer (from Table 2).
- A description of the part.
- The total quantity (qty) in the instrument.
- The part number check digit (cd).
- The Hewlett-Packard part number.

Table 3 lists replaceable parts. The following information is given for each replaceable part:

3 lists all replaceable parts. 3 lists the manufacturers’ code numbers that are used in the parts list. Table 1 lists the abbreviations used in the parts list, and throughout this manual. Table 2 lists this section contains replaceable parts ordering information. Table 1 lists

INTRODUCTION

REPLACEABLE PARTS
### Table 2: Manfacturers Code List

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<thead>
<tr>
<th>ZIP CODE</th>
<th>ADDRESS</th>
<th>MANUFACTURER</th>
<th>CODE</th>
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<td>Riverside Ca</td>
<td>Bourns Inc Trimpot Prod Div</td>
<td>32997</td>
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<tr>
<td>94304</td>
<td>Palo Alto Ca</td>
<td>Hewlett-Packard Corp</td>
<td>28480</td>
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<tr>
<td>95051</td>
<td>San Jose Ca</td>
<td>National Semiconductor Corp</td>
<td>27014</td>
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<tr>
<td>90830</td>
<td>Iselin NJ</td>
<td>Semicon Corp</td>
<td>25085</td>
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<tr>
<td>16701</td>
<td>Bradford Pa</td>
<td>Combining Glass Works (Bradford)</td>
<td>24546</td>
</tr>
<tr>
<td>95805</td>
<td>Santa Clara Ca</td>
<td>Precision Monoliths Inc</td>
<td>99665</td>
</tr>
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<td>94778</td>
<td>Sunnyvale Ca</td>
<td>Pundit Corp</td>
<td>06383</td>
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<tr>
<td>85008</td>
<td>Phoenix Az</td>
<td>Motorola Semiconductor Products</td>
<td>04113</td>
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### Table 1: Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ZNR</td>
<td>Zener (diode)</td>
</tr>
<tr>
<td>M</td>
<td>Metal; Matte</td>
</tr>
<tr>
<td>VDC</td>
<td>Volt; Direct Current</td>
</tr>
<tr>
<td>VR</td>
<td>Volt; Voltage</td>
</tr>
<tr>
<td>MCT</td>
<td>Microstrip</td>
</tr>
<tr>
<td>U</td>
<td>Integrated Circuit</td>
</tr>
<tr>
<td>N</td>
<td>PIN; Trimmer</td>
</tr>
<tr>
<td>TMR</td>
<td>Package Type Designation</td>
</tr>
<tr>
<td>TO</td>
<td>Temperature Coefficient</td>
</tr>
<tr>
<td>TA</td>
<td>Tangentum</td>
</tr>
<tr>
<td>SM</td>
<td>Small</td>
</tr>
<tr>
<td>SIG</td>
<td>Signal; Referred to 1 mm</td>
</tr>
<tr>
<td>REG</td>
<td>Regulator</td>
</tr>
<tr>
<td>RF</td>
<td>Radio Frequency</td>
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<tr>
<td>R</td>
<td>Resistor</td>
</tr>
<tr>
<td>PP</td>
<td>Peak-to-Peak</td>
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<tr>
<td>Pkg</td>
<td>Package</td>
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<tr>
<td>PIC</td>
<td>Precision</td>
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<tr>
<td>NS</td>
<td>Nonscindens</td>
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<tr>
<td>MP</td>
<td>Milliosiemens Part</td>
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<td>Millimiteere</td>
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<tr>
<td>M</td>
<td>Miscellaneous</td>
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<td>MFR</td>
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<td>M33</td>
<td>M33, Mete</td>
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<tr>
<td>L</td>
<td>Inductor (cm³)</td>
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<tr>
<td>KG</td>
<td>Kilogram</td>
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<td>K</td>
<td>Kilohm (1000)</td>
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<td>Glass frit</td>
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<td>Fx</td>
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<td>ESD</td>
<td>Electrostatic Discharge</td>
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<td>Diq</td>
<td>Dual In-Line Package</td>
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<tr>
<td>DBM</td>
<td>Decibel</td>
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<td>Centimetre</td>
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<td>CD</td>
<td>Ceramic</td>
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<td>CE</td>
<td>Capacitor</td>
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<tr>
<td>AMP</td>
<td>Amplifier</td>
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<tr>
<td>ADJ</td>
<td>Adjuster</td>
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<tr>
<td>AC</td>
<td>Alternating Current</td>
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<tr>
<td>AS</td>
<td>Assembly</td>
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<td>Part Number</td>
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<tr>
<td>8500-0858</td>
<td>OIL FILTER &amp; AIR CLEANER</td>
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## INTERCONTINENTAL OPERATIONS

<table>
<thead>
<tr>
<th>Country</th>
<th>Contact Information</th>
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</thead>
<tbody>
<tr>
<td>England</td>
<td>Hewlett-Packard, Strathclyde Park, Runcorn, Cheshire</td>
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<tr>
<td>Canada</td>
<td>Hewlett-Packard Canada, Toronto, Ontario</td>
</tr>
<tr>
<td>France</td>
<td>Hewlett-Packard France, 92447 Les Ulis Cedex</td>
</tr>
<tr>
<td>Germany</td>
<td>Hewlett-Packard GmbH, Essen</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>Hewlett-Packard Australia, Suite 1456, 500 George Street, Sydney, NSW 2000</td>
</tr>
<tr>
<td>USA</td>
<td>Hewlett-Packard Company, 98245-0100</td>
</tr>
<tr>
<td>North America</td>
<td>Hewlett-Packard Co., Mountain View, CA 94044</td>
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## US FIELD OPERATIONS

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<th>State</th>
<th>Contact Information</th>
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<tr>
<td>Texas</td>
<td>Hewlett-Packard Co., 708 South Lamar Boulevard, Austin, TX 78704</td>
</tr>
<tr>
<td>Colorado</td>
<td>Hewlett-Packard Co., 18950 East Alton Parkway, Parker, CO 80134</td>
</tr>
<tr>
<td>California</td>
<td>Hewlett-Packard Co., 201 S. Hamilton Ave., Pasadena, CA 91101</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Hewlett-Packard Co., 2009 Princeton Pike, West Windsor Township, NJ 08550</td>
</tr>
<tr>
<td>Illinois</td>
<td>Hewlett-Packard Co., 200 North LaSalle Street, Chicago, IL 60601</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Hewlett-Packard Co., 1700 South Mathis Avenue, A-11, Southbridge, MA 01550</td>
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<tr>
<td>Virginia</td>
<td>Hewlett-Packard Co., 9216 Main Street, Alexandria, VA 22306</td>
</tr>
<tr>
<td>Nevada</td>
<td>Hewlett-Packard Co., 2240 Swenson Street, Henderson, NV 89074</td>
</tr>
<tr>
<td>Arizona</td>
<td>Hewlett-Packard Co., 30201 Corporate Parkway, Irvine, CA 92614</td>
</tr>
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</table>
NOTE

Manual Change Supplements are revised as often as necessary to keep manuals current and accurate. Hewlett-Packard recommends that you periodically order the latest edition of this supplement. Copies are available through any HP office. When ordering copies, quote the supplement part number from the bottom of this page, or the model number and print date from the title page of the manual.

This supplement contains important information for correcting manual errors and for adapting the manual to仪器 containing improvements made after the printing of the manual.

TO USE THIS SUPPLEMENT: Make all changes applicable to the serial prefix or number of your instrument as indicated in the following reference table.

Note that there may be more than one Title Page and/or Parts Cross-Reference Table included in this supplement. The last changes applicable to your instrument will contain the most current information for these specific pages.

- NEW ITEM, CHANGED ITEM
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<tr>
<td>2</td>
<td>All Serials</td>
</tr>
<tr>
<td>1</td>
<td>0300 and Above</td>
</tr>
</tbody>
</table>

**REFERENCE TABLE**

Make Manual Changes

Serial Prefix or Number

NEW ITEM = ■
<table>
<thead>
<tr>
<th>Numbered Changes Index</th>
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<tbody>
<tr>
<td>N/A</td>
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<td>85025-60035</td>
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<td>All Serials and above</td>
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<td>00300</td>
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**Note:** All items are marked with a box.
INSTRUCTIONS

Replace the existing manual pages with the pages provided in this change. These pages supersede the existing pages in the manual, provided that the serial number prefix of your instrument is the same or higher than the one indicated on this page. To keep your documentation applicable to all versions of instruments, place the superseded pages in the back of your manual for future reference. Note: the old manual title page may be discarded.

ADD — Add the pages to your manual as indicated. Do not remove any pages.

Replace the following pages:

Title Page
Page 11/12

Add the following page:
164/165 behind page 16
SERIAL NUMBERS

DETECTOR ADAPTER

HP 85025C
WARRANTY

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. Buyer shall prepare shipping charges to HP and HP shall pay shipping charges to return the products to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

LIMITATION OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper handling by Buyer, Buyer-supplied software or interconnecting, unauthorized modification or misuse, or operation outside of the environmental specifications for the product.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCLUSIVE REMEDIES

The remedies provided herein are buyer's sole and exclusive remedies. HP shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

ASSISTANCE

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.
Recommended replacement for all units regardless of serial number.

<table>
<thead>
<tr>
<th>Affected Numbers</th>
<th>New Description</th>
<th>Replace With HP Part Number</th>
<th>HP Part Number</th>
<th>Design Ref.</th>
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<tr>
<td>Above 00300</td>
<td>Same description</td>
<td>1826-9932</td>
<td>85025-60017</td>
<td>A1</td>
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<td>Above 00300</td>
<td>Same description</td>
<td>1826-7702</td>
<td>85025-60035</td>
<td>A1</td>
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</table>

Parts Cross-Reference Table

When replacing a part, cross-reference it to the following table. If the part does not appear in this table,
Replace the following pages:

Page 11/12, figure 8-2;
Change R9 to 50 K, and change R10 to 200 K.

INSTRUCTIONS

AD6 - Add the pages to your manual as indicated. Do not remove any pages.

Replace the following pages:

Change sheet page 16a/16b

This change changes the values of A/R9 and A/R10. The new values allow adjustment of the 55 kHz feedback despite the variations of the sampler F1.
provided at the back of this manual. For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are:


Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard Products.

ASSISTANCE

LEGAL THEORY.

CONSEQUENTIAL DAMAGES. WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER
SHALT NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, OR
THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. HP

EXCLUSIVE REMEDIES

PURPOSE.

IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR
NO OTHER WARRANTY IS EXRESSED OR IMPLIED. HP SPECIFICALLY DISCLAIMS THE
environmental specifications for the product.

The foregoing warranty shall not apply to defects resulting from improper handling by buyer. Buyer

LIMITATION OF WARRANTY

operation of the instrument, software, or firmware will be uninterrupted or error free.
HP warrants that the software and firmware described by HP for use with an instrument will execute its

from another country.

buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP
For warranty service or repair, this product must be returned to a service facility designated by HP.

will be its option, either repair or replace products which prove to be defective.

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for

WARRANTY
| All Serials | P-47L 200K 10% 1717 | 2000-4229 | 2100-4098 | 01R10 | A1R10 |
| All Serials above 00300 and | Resistor 51K 1% 05W | 0698-7777 | 0698-8161 | A1R9 | 01R9 |
| above 00300 and | Same description | 1826-1702 | 1826-0922 | A1J6 | 01J6 |
| | Same description | 85024-60035 | 85024-60017 | A1 | 01A |

**Parts Cross-Reference Table**

When replacing a part, cross-reference it to the following table. If the part does not appear in this table, use the original part number in Table 3.