

## Errata

**Title & Document Type: 86260C RF Plug-In Manual Supplement**

**Manual Part Number: 86260-90089**

**Revision Date: January 1984**

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### HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. We have made no changes to this manual copy. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP86260C is now model number Agilent 86260C.

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**86260C**  
**RF PLUG-IN**  
**17-22 GHz**  
**OPTION 004**

SUPPLEMENT  
PART NO. 86260-90089

JANUARY 1984

THIS SUPPLEMENT APPLIES  
TO INSTRUMENTS WITH A  
SERIAL PREFIX OF 2406A

USE THIS SUPPLEMENT WITH  
MANUAL PART NO. 86260-90012  
PRINTED AUGUST 1975



**HEWLETT  
PACKARD**

## INTRODUCTION

This Manual Supplement describes the differences in the 86260C RF Plug-in compared to the 86260A. In addition, this supplement describes the manual changes necessary to document the instrument.

## DESCRIPTION

The Model 86260C RF Plug-in, when compared with the Model 86260A RF Plug-in, has a higher frequency range: 17 to 22 GHz. All other specifications and supplementary performance characteristics published in the 86260A Operating and Service Manual also apply to the 86260C.

## MANUAL CHANGES NECESSARY TO DOCUMENT THE HP 86260C

The following manual changes assume that the corrections from the current Manual Changes Supplement are incorporated first, then the changes in this supplement are incorporated in the manual. The primary changes in this supplement are (1) the frequency BAND set to "17 to 22 GHz," (2) the START frequency set to 17 GHz, (3) the CW frequency set to 19.5 GHz, (4) the STOP frequency set to 22 GHz, and (5) component number changes due to the change in frequency range.

### All Sections:

Change all references from 86260A to 86260C, and delete all references to 8620B.

Delete all references to Option 005.

### Page 1-0, Figure 1-1:

Change the frequency range shown on the instrument and on the scale to "17 to 22 GHz," and delete the scale for the 8620B. Change the caption for the top scale to: "Scale for 8620C, 86260-00035."

Add "PROM for 11869A (not shown), 86260-80002" to the bottom of the illustration.

### Page 1-2, Paragraph 1-22:

In the second sentence, change the frequency range to "17 to 22 GHz."

### Page 1-3, Paragraph 1-32:

Delete Paragraphs 1-32, 1-33, 1-34, and 1-35.

### Page 1-3, Paragraph 1-37:

Change text to read:

"1-37. A 17 to 22 GHz scale is supplied for use with the 8620C mainframe. The HP Part Number for this scale is 86260-00035. A PROM, HP Part Number 86260-80002, plugs into an HP 11869A RF Plug-in Adapter when the 86260C is used in an HP 8350A Sweep Oscillator. The 86260C PROM supplies the 8350A with frequency band information. A female type N TO APC 3.5 adapter, HP Part Number 1250-1745, will also be supplied."

### CAUTION

**Use caution when mating an SMA connector to an APC-3.5. Push the connectors straight together, with the male contact concentric with the female. DO NOT overtighten or rotate either center conductor; turn only the outer nut of the male. An out of spec connector can permanently damage its mate. Connector dimensions can be measured with a connector gauge (e.g. Maury AL 27A) before use.**

Page 1-4, Figure 1-3:

Change Part Numbers for YIG Oscillator to 0955-0119.

Page 1-5, Table 1-1:

Change Frequency Range to: Calibrated: 17 to 22 GHz.

Delete Source SWR Specification.

Page 1-6, Table 1-2:

Change Frequency Range to: Usable: 17 to 22 GHz.

Page 1-8, Table 1-3:

Change the Sweep Oscillator entries as follows:

Critical Specifications: Use only Recommended HP Models. Note that the 11869A is required to adapt the 86260C to the 8350A mainframe.

Recommended Model: HP 8620A, HP 8620C, HP 83501A/11869A.

Change Frequency Range of Spectrum Analyzer to: 17 to 40 GHz.

Change the recommended Model for the Oscilloscope to HP 180C/1801A/1820C.

Change Range of Frequency Counter, Frequency Meter, Power Meter and Thermistor Mount, Directional Coupler, and Crystal Detector to: 17 to 22 GHz.

Change the Frequency Counter to Model 5340A Option 005.

Change Frequency Meter to Model K532A.

Change DC Digital Voltmeter to HP 3455A.

Add to Power Meter description, "(for Power Meter Leveling)" and change thermistor mount to Model K486A.

Change Directional Coupler to HP K752C.

Change Crystal Detector to HP K422A (2 required).

Change DC Power Supply to HP 6214A.

Add the following instruments:

Power Meter and Sensor (for Power measurement), Frequency: 17 to 22 GHz, Range: +10 dBm to -20 dBm, HP Model 436A with Sensor Model 8485A.

RF Adapter, Type N(m) to SMA(m), HP Part Number 1250-1337.

Coax to Waveguide Adapter (2 required), K Band to APC-3.5 (f), HP Model K281C.

Type-N (m) to SMA (f) Adapter, HP Part Number 1250-1250.

Waveguide Directional Coupler, Coupled Arm Coupling: 10 dB, HP Model K752C.

Frequency Response Test Set: Range: 10 MHz to 22 GHz, includes CRT display and RF Detectors, detector connectors are BNC male; Models 8755C, 11664C, and 182T.

Waveguide Section; Length = 6 inches, R-Band (WR-28), Flange = UG-599/U; Baytron Model 3Ka-60/6.

Waveguide Transition: Transition: K to R Band, Flanges: R= UG-599/U, K = UG-595/U; Baytron Model 3K-69/Ka.

Page 1-10, Figure 1-1:

Delete Item 4.

Page 2-1, Table 2-1:

Change the "RF output J2" Industry Identification description and part number to: "APC 3.5, 5061-5316."

Page 3-2, Paragraph 3-21:

Change text as follows:

"3-21. A dc voltage which is an analog of one-half the frequency is available for referencing or phase-locking external equipment to the plug-in. The dc voltage is 8.5 to 11 Volts (0.5 V/GHz) corresponding to one-half the frequency range."

Page 3-3, Figure 3-1:

Change the description of item 7 to read: "APC 3.5 50Ω RF Connector, not correctly shown in the above photo."

Page 3-4, Figure 3-2:

Change item 4 FREQ REF connector J5 to the following description: "Provides 8.5 to 11 Volt ramp signal from the Plug-in. The signal is used as a dc analog of one-half the frequency."

Page 3-5, Figure 3-3:

In test setup, replace "10 dB Attenuator" with "Coax to Waveguide Adapter."

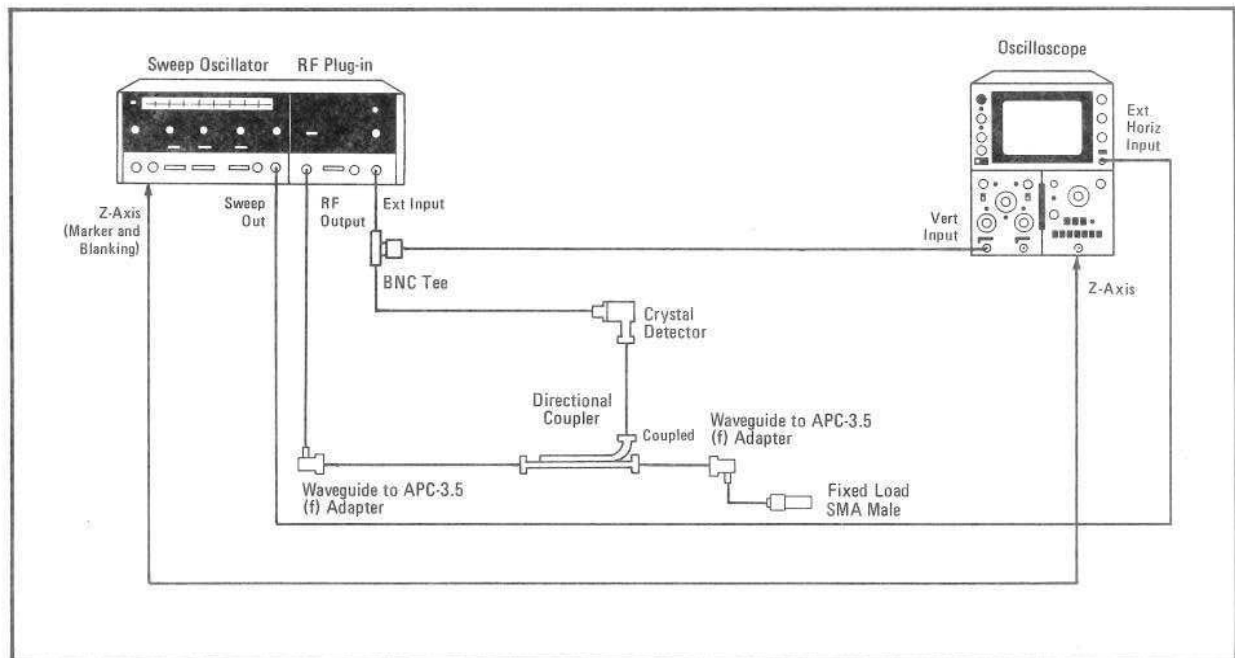
In EQUIPMENT list, change Crystal Detector to HP K421A, delete 10 dB Attenuator, and add Coax to Waveguide Adapter, HP K281C.

Page 3-6, Figure 3-3 (2 of 2):

In step 1, change BAND frequency to "17 to 22 GHz."

Page 3-8, Figure 3-7:

Change the test setup for Crystal Leveling to the test setup following:



P/O Figure 3-7.

Change Oscilloscope to HP 180C/1801A/1820C.

Change Crystal Detector to HP K422A.

Delete 10 dB Attenuator.

Change Directional Coupler to HP K752C.

Change Termistor Mount to HP K486A.

Add Coaxial to Waveguide Adapter, HP K281C.

Add Type-N (m) to SMA (m) Adapter, HP Part Number 1250-1337.

Add SMA male Load, HP Part Number 0960-0053.

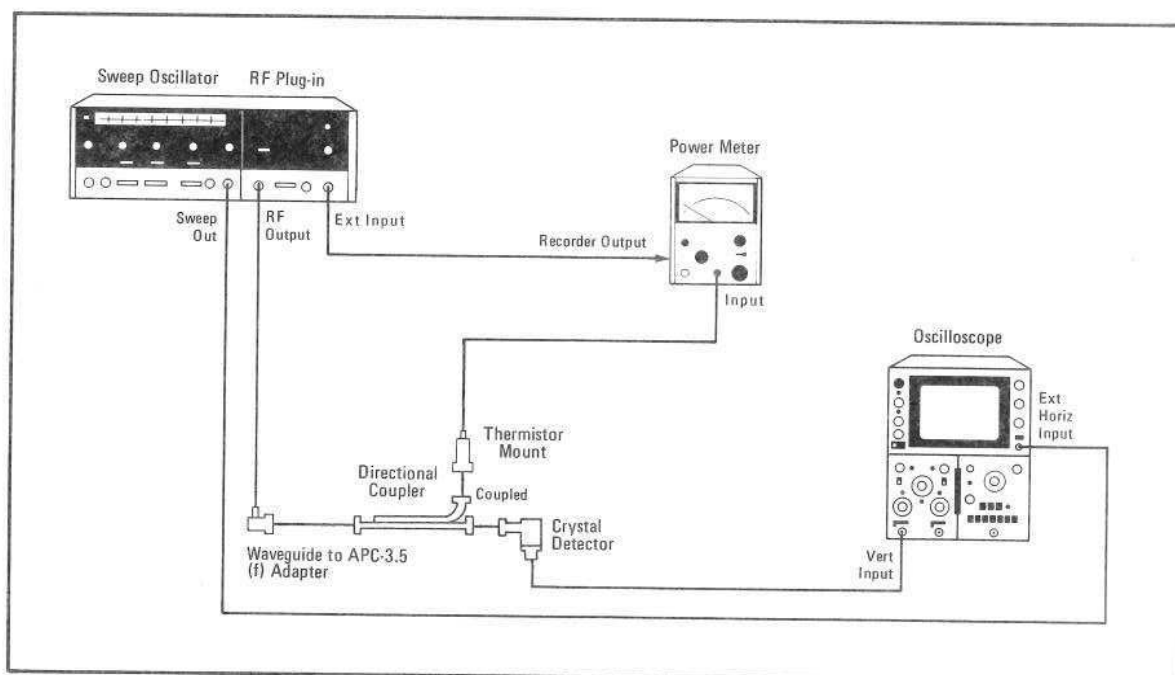
Delete NOTE at the end of EQUIPMENT list.

Page 3-9, Figure 3-7 (2 of 2):

In step 2, change BAND to "17 to 22 GHz", change START (green) to 17 GHz, and change STOP (red) to 22 GHz.

Page 3-10, Figure 3-8 (1 of 2):

Change the test setup for power meter leveling to the test setup following:



P/O Figure 3-8.

Change Oscilloscope to HP 180C/1801A/1820C.

Change Thermistor Mount to HP K486A.

Delete 10 dB Attenuator.

Add Directional Coupler, HP K752C.

Add Crystal Detector, HP K422A.

Add Coaxial to Waveguide Adapter, HP K281C.

Add Type-N (m) to SMA (m) Adapter, HP Part Number 1250-1337.

In step 2, change BAND to "17 to 22 GHz", change START (green) to 17 GHz, and change STOP (red) to 22 GHz.

Page 4-1, Paragraph 4-7:

Change the frequency range to "17.0 to 22.0 GHz".

Page 4-2, Figure 4-1:

Delete 10 dB Attenuator.

Page 4-2, Paragraph 4-7:

Under EQUIPMENT, delete 10 dB Attenuator and add "Option 005" to Frequency Counter description.

In step b, change BAND to 17.0 to 22.0 GHz, change START pointer to 17.0 GHz, change CW pointer to 19.5 GHz, and change STOP pointer to 22.0 GHz.

Page 4-3, Paragraph 4-7:

In step d, change the CW setting to 17.0 GHz and the counter indication to 17.000 GHz  $\pm 50$  MHz.

In step e, change the CW setting to 19.5 GHz and the counter indication to 19.500 GHz  $\pm 50$  MHz.

In step f, change the CW setting to 22.0 GHz and the counter indication to 22.000 GHz  $\pm 50$  MHz.

Change the last sentence in step g to: "Frequency Counter should indicate 17.000 GHz  $\pm 70$  MHz."

Change the last sentence in step h to: "Frequency Counter should indicate 22.000 GHz  $\pm 70$  MHz."

Page 4-3, Figure 4-2:

Change test setup as shown in the attached Figure 4-2A.

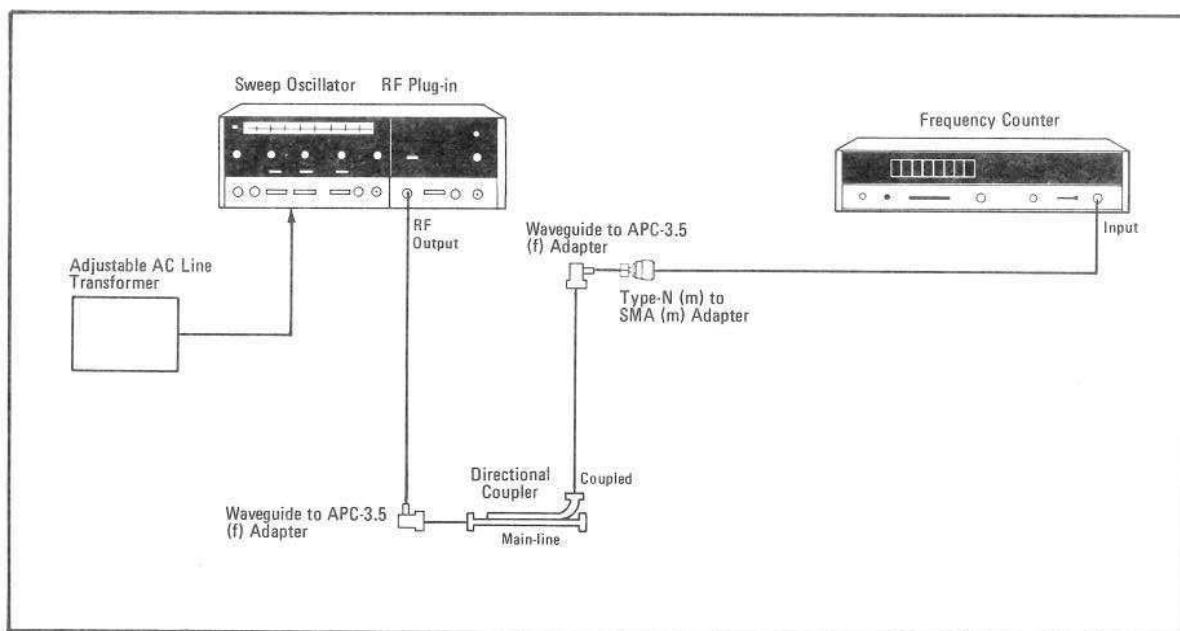


Figure 4-2A. Frequency Stability Test Setup



Page 4-4, Paragraph 4-8:

Change Frequency Counter to Model 5340A Option 005.

Change Thermistor Mount to Model K486A.

Change Directional Coupler to Model K752C.

Delete 10 dB Attenuator.

Add Type-N (m) to SMA (m) Adapter (2 required), HP Part Number 1250-1337.

Add Coaxial to Waveguide Adapter (2 required), HP K281C.

Page 4-5, Figure 4-3:

Delete 10 dB Attenuator.

Page 4-5, Paragraph 4-9:

Under EQUIPMENT, delete 10 dB attenuator.

In step a, change BAND to "17.0 to 22.0 GHz", and change CW Pointer to "19.5 GHz".

Page 4-6, Paragraph 4-10:

Change frequency range under SPECIFICATIONS as follows: "Maximum leveled power: 17.0 to 22.0 GHz >10 dBm (10 mW)."

Page 4-7, Figure 4-5:

Change test setup as shown on the attached Figure 4-5A.

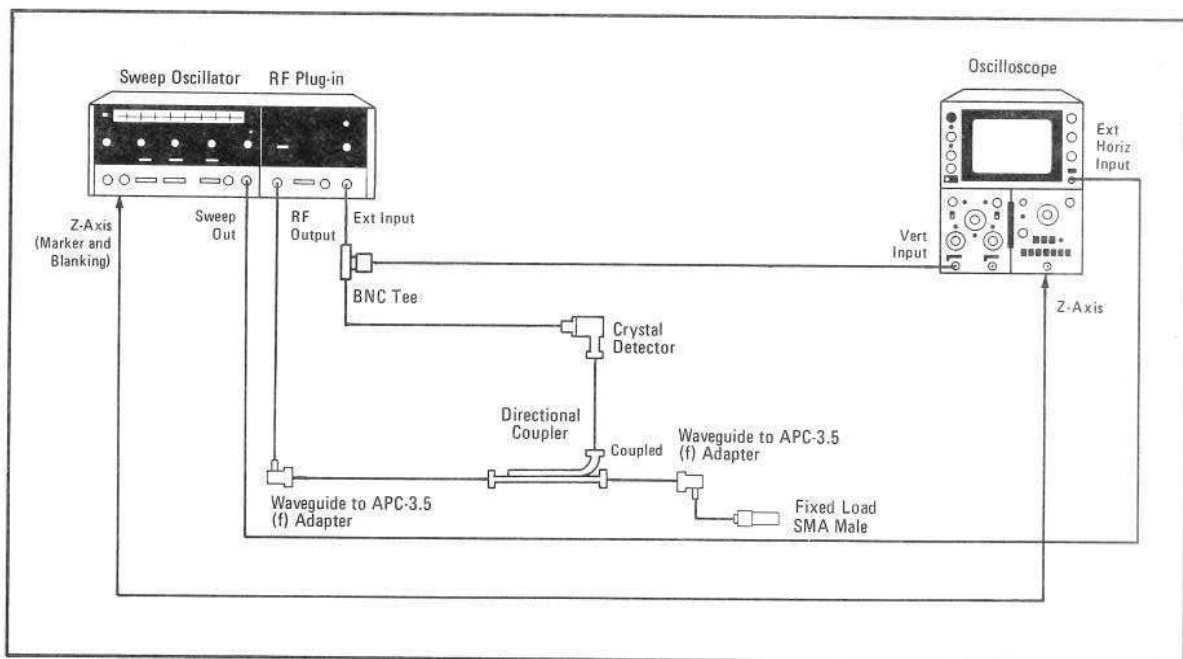


Figure 4-5A. Crystal Detector Leveling Test Setup

## Page 4-7, Paragraph 4-10:

Under EQUIPMENT, change thermistor mount to HP K486A; change Oscilloscope to HP 180C/1801A/1820C; change Crystal Detector to HP K422A; change Directional Coupler to K752C; add coaxial to waveguide adapter, HP K281C; add Type-N (m) to SMA (m) Adapter, HP Part Number 1250-1337; and delete 10 dB Attenuator.

## Page 4-8, Paragraph 4-10:

In step b, change BAND to "17.0 to 22.0 GHz", START pointer to "17.0 GHz", CW pointer to "19.5 GHz", and STOP pointer to "22.0 GHz".

## Page 4-9, Figure 4-6:

Change test setup as shown on the attached Figure 4-6A.

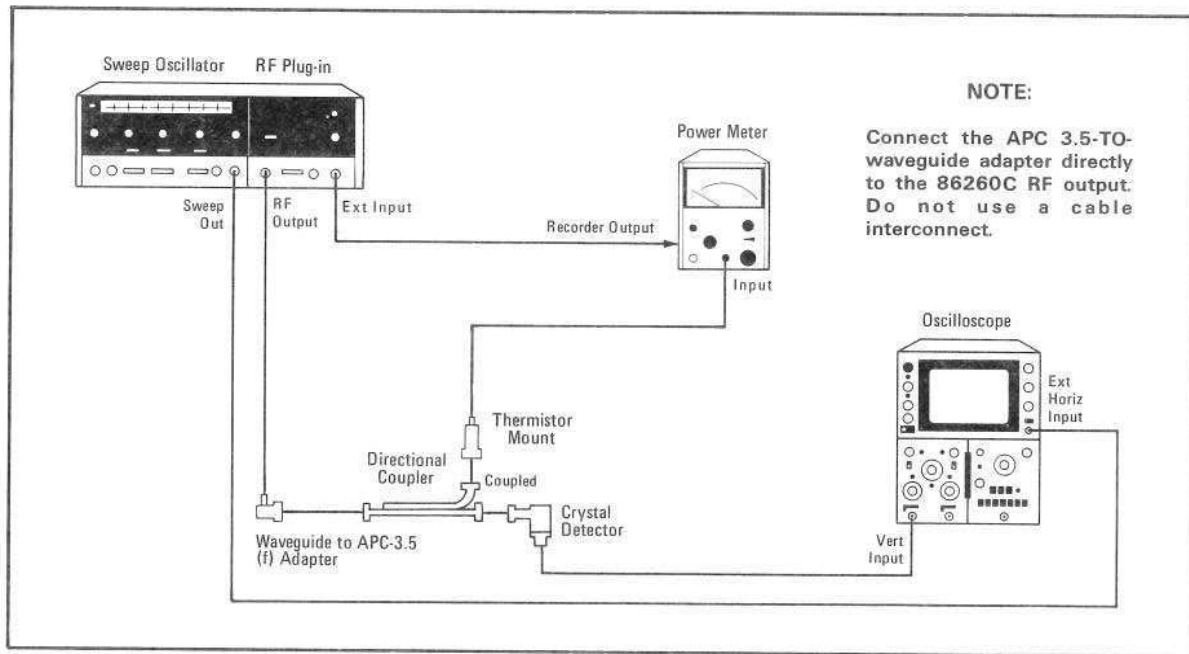


Figure 4-6A. Power Meter Leveling Test Setup

## Page 4-9, Paragraph 4-10:

In step h, change BAND to "17.0 to 22.0 GHz", START pointer to "17.0 GHz", CW pointer to "19.5 GHz", and STOP pointer to "22.0 GHz".

## Page 4-10, Paragraph 4-11:

Change DESCRIPTION to:

"The swept output RF signal passes through an R-Band waveguide section that filters out the 17 to 22 GHz fundamental and passes only the second and third harmonics of the signal. These are displayed on the Frequency Response Test Set to determine if harmonics are down from the fundamental by the specified amount."

Page 4-11, Figure 4-7:

Change the test setup as shown in attached Figure 4-7A.

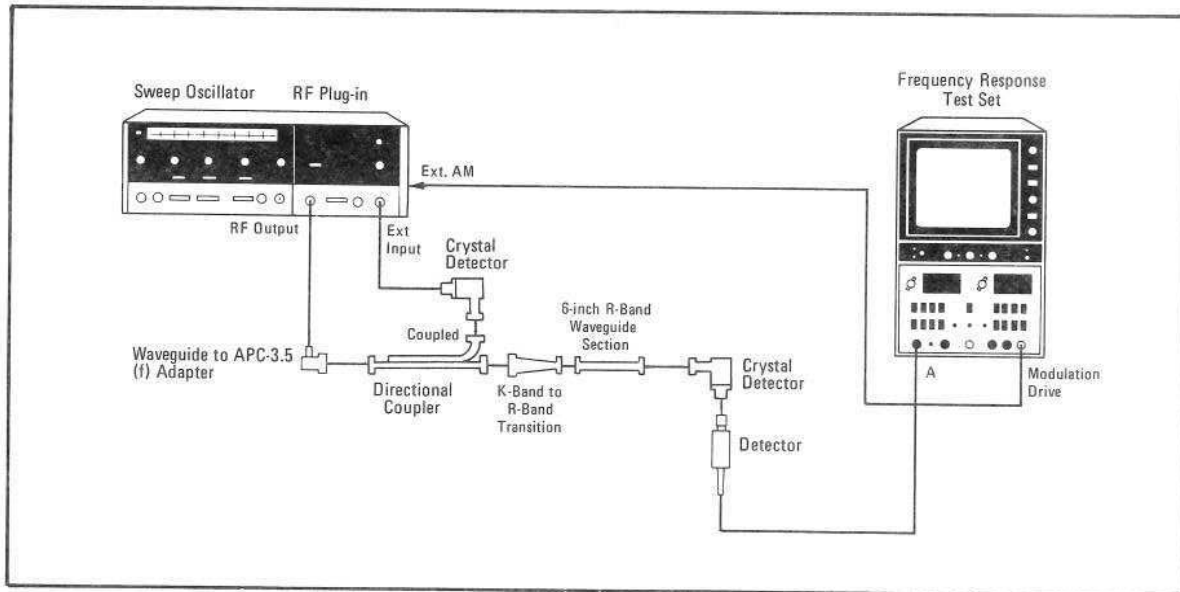


Figure 4-7A. Spurious Signal Test Setup

Page 4-11, Paragraph 4-11:

Delete all EQUIPMENT except Sweep Oscillator and RF Section.

Add the following EQUIPMENT:

Type-N (m) to SMA (m) Adapter, HP Part Number 1250-1337.

Coaxial to Waveguide Adapter, HP K281C

Directional Coupler, HP K752C

Crystal Detector, HP K422A

Crystal Detector, HP R422A

R-Band Waveguide Section, Baytron Model 3Ka-60/6

Waveguide Transition, (K to R Band), Baytron Model 3K-69/Ka

Frequency Response Test Set, HP Models 8755C, 11664C, 182T

Change procedure step a to: "a. Connect equipment as shown in Figure 4-7."

In step b, change BAND to "17.0 to 22.0 GHz", change CW pointer to "19.5 GHz", and change POWER LEVEL to +10 dBm. Change 86260A ALC to EXT.

Page 4-12, Paragraph 4-11:

Change step c as follows:

“c. Set 8620C LINE switch to ON; press START/STOP pushbutton.”

Delete NOTE under step c.

Change step d as follows:

“d. Observe harmonics and spurious signals on the Frequency Response Test Set CRT display. Note that the feedthrough of the 22 GHz fundamental appears on the right side of the CRT display. The top of this trace is used as reference level to measure harmonic levels down from that reference.

Page 4-13, Figure 4-8:

Replace the 10 dB Attenuator with two adapters, a Type-N (m) to SMA (m) adapter, and a Waveguide to APC-3.5 (f) adapter.

Page 4-13, Paragraph 4-12:

Under EQUIPMENT, delete the 10 dB attenuator, change the Crystal Detector to HP K422A, add a Type-N (m) to SMA (m) adapter HP Part Number 1250-1337, and add a coaxial to waveguide adapter HP K281C.

In step b, change BAND to “17.0 to 22.0 GHz”, and change CW pointer to “19.5 GHz”.

Page 4-14 and 4-15, Paragraph 4-13:

Delete Paragraph 4-13.

Page 4-14, Figure 4-9:

Delete Figure 4-9.

Page 4-16, Figure 4-10:

Delete Figure 4-10.

Page 4-17, Figure 4-11:

Delete Figure 4-11.

Page 4-18, Figure 4-12:

Delete 10 dB Attenuator.

Page 4-18, Paragraph 4-14:

Under EQUIPMENT, delete 10 dB Attenuator.

In step a, change BAND to “17.0 to 22.0 GHz”, and CW to “19.5 GHz”.

In step b, delete “through 10 dB attenuator”.

Page 4-20, Figure 4-14:

Change test setup as shown in the attached Figure 4-14A.

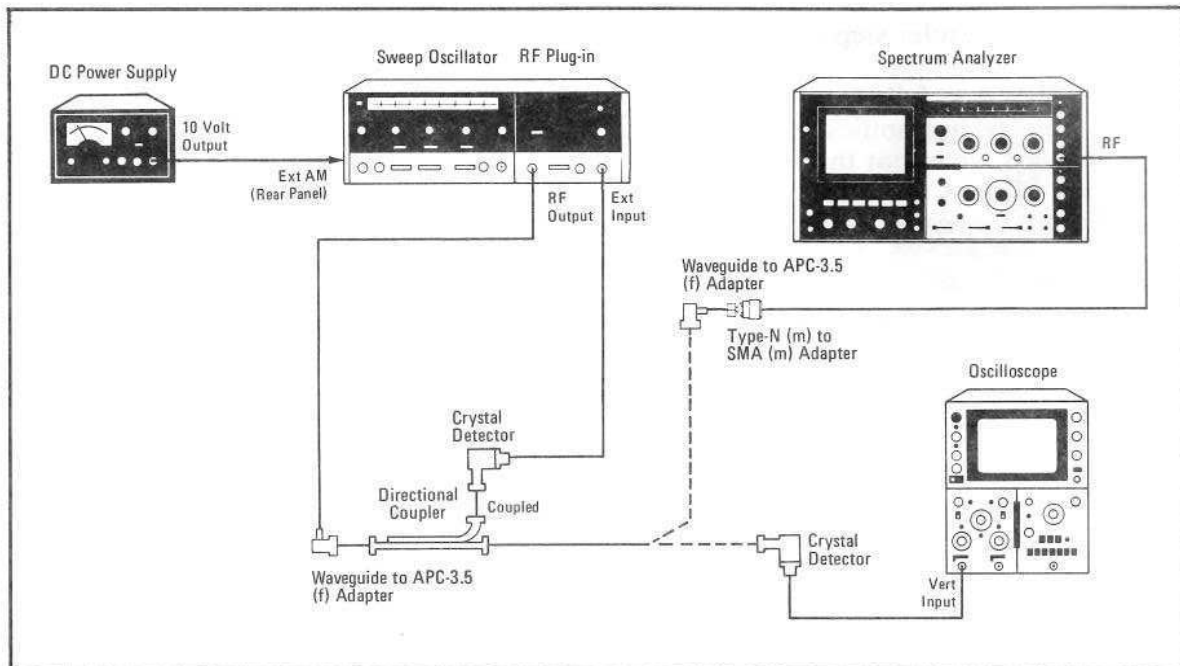


Figure 4-14A. Amplitude Modulation Test Setup

Page 4-20, Paragraph 4-15:

Under EQUIPMENT, change Crystal Detector to HP K422A (2 required), Oscilloscope to 180C/1801A/1820C, and Directional Coupler to HP K752C, add Type-N (m) to SMA (m) Adapter (2 required), HP Part Number 1250-1337, and add APC-3.5 coaxial to Waveguide adapter (2 required), HP K281C.

In step b, change BAND to "17.0 to 22.0 GHz", CW pointer to "19.5 GHz", START pointer to "17.0 GHz", and STOP pointer to "22.0 GHz".

Page 4-21, Paragraph 4-15:

Change step d Frequency Band of 8555A to "17 to 22 GHz".

Page 4-23, Table 4-1:

Paragraph 4-7:

Change step d to: "d. CW pointer to 17.0 GHz; Lower limit, 16.950 GHz; Upper Limit, 17.050 GHz."

Change step e to: "e. CW pointer to 19.5 GHz; Lower limit, 19.450; Upper limit, 19.550 GHz."

Change step f to: "f. CW pointer to 22.0 GHz; Lower limit, 21.950 GHz; Upper limit, 22.050 GHz."

Change step g to: "g. START-STOP, MANUAL control counterclockwise; Lower limit, 16.930 GHz; Upper limit, 17.070 GHz."

Change step h to: "h. START-STOP, MANUAL control clockwise; Lower limit, 21.930 GHz; Upper limit, 22.070 GHz."

Page 5-3, Paragraph 5-13:

Under EQUIPMENT, change Digital Voltmeter to HP 3455A.

Page 5-6, Paragraph 5-14:

Under EQUIPMENT, change Digital Voltmeter to HP 3455A, and change Frequency Counter to HP 5340A, Option 005.

Change the counter indication in step b to 17.000 GHz  $\pm$ 70 MHz.

Change the counter indication in step c to 22.000 GHz  $\pm$ 70 MHz.

Page 5-7, Table 5-3:

Replace Table 5-3 with Table 5-3A included in this supplement.

Table 5-3A. Frequency Tracking Adjustment

Set CW for DVM Indication at 86260B-A1TP2 (Vdc)	Frequency Counter Indications (GHz)	Compromise Adjustment
0.000 $\pm$ 0.005	17.000 $\pm$ 0.025	} A1R3
2.000 $\pm$ 0.005	18.000 $\pm$ 0.025	
4.000 $\pm$ 0.005	19.000 $\pm$ 0.025	
6.000 $\pm$ 0.005	20.000 $\pm$ 0.025	
8.000 $\pm$ 0.005	21.000 $\pm$ 0.025	} A1R6
10.000 $\pm$ 0.005	22.000 $\pm$ 0.025	

Page 5-7, Paragraph 5-15:

Under EQUIPMENT, change Digital Voltmeter to HP 3455A, and change Oscilloscope to HP 180C/1801A/1820C.

Page 6-4, Table 6-2:

Change A1 to HP Part Number 86260-60056

Change A1R3 and A1R6 to HP Part Number 2100-3109, Resistor Variable, 2K 10% 17T.

Change A1R9 to HP Part Number 0757-0467, Resistor, 121K 1% .12W.

Change A1R11 to HP Part Number 0811-1175, Resistor, 4.22K 0.12W

Change A1R12 to HP Part Number 0757-0122, Resistor, 27.1K 1% .12W.

Change A1R15 to HP Part Number 0698-3150, Resistor, 2.37K 1% 0.12W

Change A1R17 to HP Part Number 0698-3558, Resistor, 4.02K 1% .12W.

Change A1R19 to HP Part Number 0698-7798, Resistor, 5.25K 0.25% 0.12W.

Change A1R25 to HP Part Number 0698-7050, Resistor 4.48K .5% .12W.

Change A1R26 to HP Part Number 0698-3152, Resistor, 3.48K 1% 0.12W.

Page 6-5, Table 6-2:

Change A1R36 to HP Part Number 0698-3408, Resistor, 9.88K 0.1% 0.1W.

Change A1R33 to HP Part Number 0757-0280 CD 3, R 1K% 0.12W.

Change A1R34 to HP Part Number 2100-3103 CD 6, R VT 10K 1T.

Change A1R35 to HP Part Number 0757-0279 CD 0, R 3.16K 1% 0.12W.

Page 6-7, Table 6-2:

Change A4 to HP Part Number 86260-60062, Includes 0955-0119 YIG Oscillator and selected Value of Zener Diode A1CR5.

Change A5 to HP Part Number 0955-0118, Isolator-Modulator, 17 to 22 GHz.

Add after J1, HP Part Number 1251-1039, Connector, Lock Ring

Change W1 to HP Part Number 86260-20071, CABLE ASSY: RF OUTPUT

Add after XA3, HP Part Number 1251-2205, Connector Polarizing Key

Under "Miscellaneous", change knob: lever switch from 0370-1810 to 0370-0929.

Change HP Part Number 86260-00008 to 86260-00035, Scale: For use with 8620C Mainframe.

Page 6-8, Table 6-2:

Change PANEL: FRONT, LOWER to HP Part Number 86260-00072.

Add HP Part Number 86260-80002, PROM for 11869A RF Plug-in Adapter.

Page 6-9, Figure 6-1:

Delete MP1, MP2, MP3, MP4, MP5, and MP8 from the photo above.

Change MP1 to HP and Mfr. Part Number: 5061-5316, 3.5mm Connector Assy.

Change MP2 to HP and Mfr. Part Number: 83595-20004, Spacer: Flat, Connector.

Change entries for MP3, MP4, MP5, and MP8 to read: "Not Assigned."

Page 6-10, Figure 6-2:

Change item 30 to HP Part Number 0370-1097.

Change item 37 to HP Part Number 0370-0929.

Change item 38 to HP Part Number 86260-00053.

Page 8-8, Figure 8-10:

Change Oscilloscope to HP 180C/1801A/1820C.

Change DC Digital Voltmeter to HP 3455A.

Change START pointer to 17.0 GHz.

Change CW pointer to 19.5 GHz.

Change STOP pointer to 22.0 GHz.

Page 8-9, Figure 8-11:

Change test setup as shown in the attached Figure 8-11A.

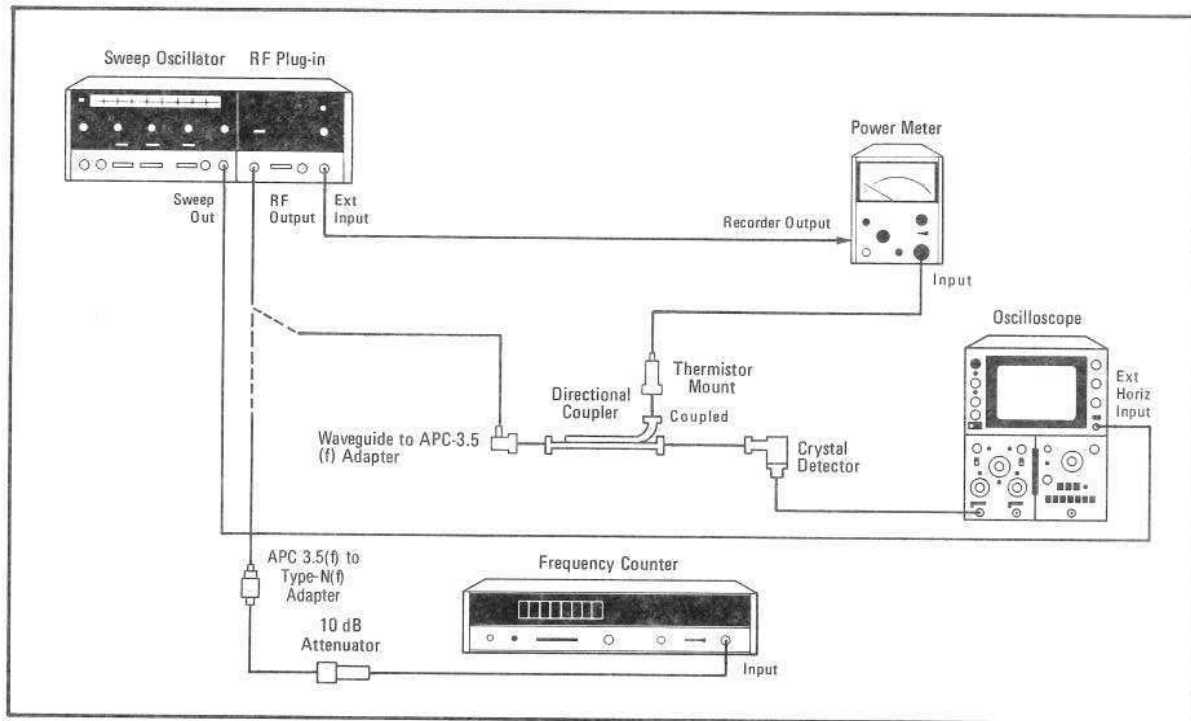


Figure 8-11A. Troubleshooting Test Setup

Change DC Digital Voltmeter to HP 3455A.

Change Frequency Counter to HP 5340A Option 005.

Change Oscilloscope to HP 180C/1801A/1820C.

Change Directional Coupler to HP K752C.

Change thermistor mount to HP K486A.

Add Crystal Detector, HP K422A.

Add coaxial to Waveguide Adapter, HP K281C.

Add Type-N (m) to SMA (m) Adapter, HP 1250-1337.

Page 8-11, Table 8-1 (2 of 2):

In the bottom block, change step 1 in "Possible Cause" column to: "1. CW frequency set below 17.0 GHz".

Page 8-11, Figure 8-12:

At the top of drawing, change A1 YIG DRIVER to HP Part Number 86260-60056.

Page 8-12:

Under "FREQUENCY REFERENCE AMPLIFIER", change the last sentence to: "The output voltage is proportional to one-half the frequency; 0.5V/GHz."



## Page 8-13, Figure 8-14:

Change part number of A1 at top of page to 86260-60056.

Change A1R3 and A1R6 to 2000 Ohms.

Change A1R9 to 121K Ohms.

Change A1R11 to 4220 Ohms.

Change A1R12 to 27.1K Ohms.

Change A1R15 to 2370 Ohms.

Change A1R17 to 4020 Ohms.

Change A1R19 to 5250 Ohms.

Change A1R25 to 4480 Ohms.

Change A1R26 to 3480 Ohms.

Change A1R33 to 1K.

Change A1R34 to 10K.

Change A1R35 to 3.16K.

Change A1R36 to 9880 Ohms.

## Page A-1:

Delete entire Appendix A. Option 001 is not available on the 86260C.

## Page B-1:

Under page 6-7, Table 6-2, add the entries:

W2, HP Part Number 86260-20020, Cable Assembly, RF Rear output

J6, HP Part Number 86260-20072, Bushing, APC 3.5 Panel.

Under page 6-8, Table 6-2, delete the entry to delete the lower front panel.

Add entries:

HP Part Number 2190-0458, Washer, Flat.

HP Part Number 08691-20121, Plug Button.

## Page C-1:

Delete entire Appendix C. Option 001 is not available on the 86260C.

## Page D-1:

Delete entire Appendix D.

## Page E-1:

Delete entire Appendix E.

