

Errata

Title & Document Type: 8621B RF Section Operating and Service Manual

Manual Part Number: 08621-90034

Revision Date: January 1978

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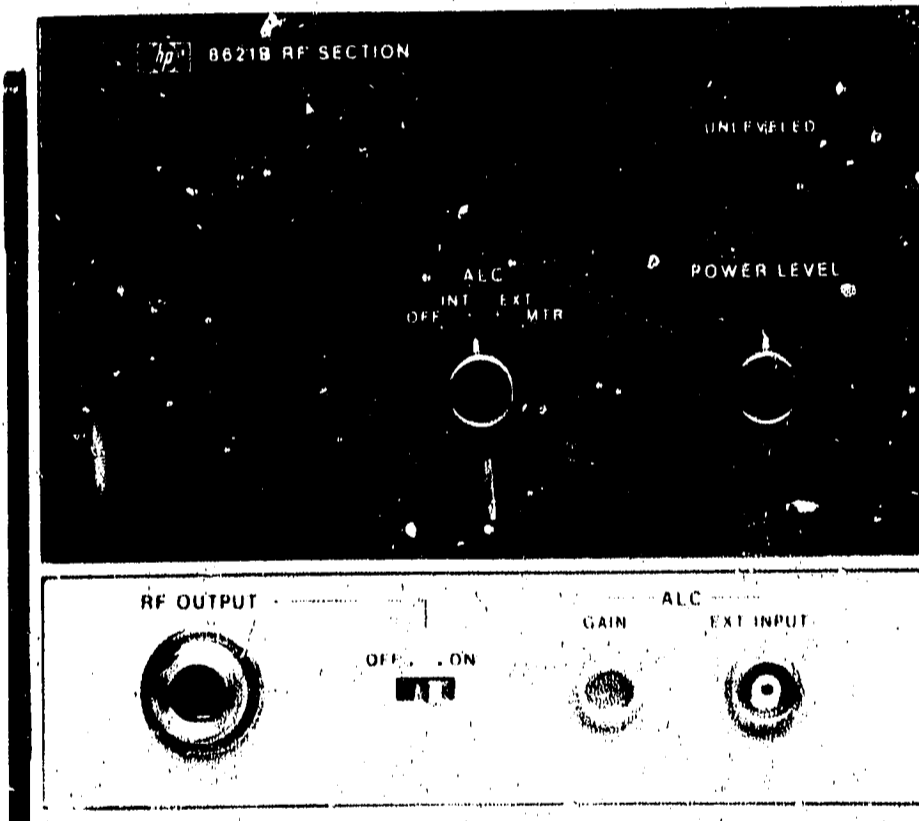
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Agilent Technologies

8621B RF SECTION



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SAFETY

This instrument has been designed and tested according to International Safety Requirements. To ensure safe operation and to keep the instrument safe, the information, cautions, and warnings in this manual must be heeded. Refer to Section I for general safety considerations applicable to this instrument.

CERTIFICATION

Hewlett-Packard Company certifies that this instrument met its published specifications at the time of shipment from the factory. Hewlett-Packard Company further certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.

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OPERATING AND SERVICE MANUAL

8621B

RF SECTION

Including Options 100, 010 and 004

SERIAL NUMBERS

This manual applies directly to HP Model 8621B RF Sections with serial numbers prefixed 1506A.

With changes described in Section VII, this manual also applies to instruments with serial numbers prefixed 1408A, 1401A, and 1233A.

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

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MANUAL PART NO. 08621-90034
Microfiche Part No. 08621-90035

Printed: JANUARY 1978

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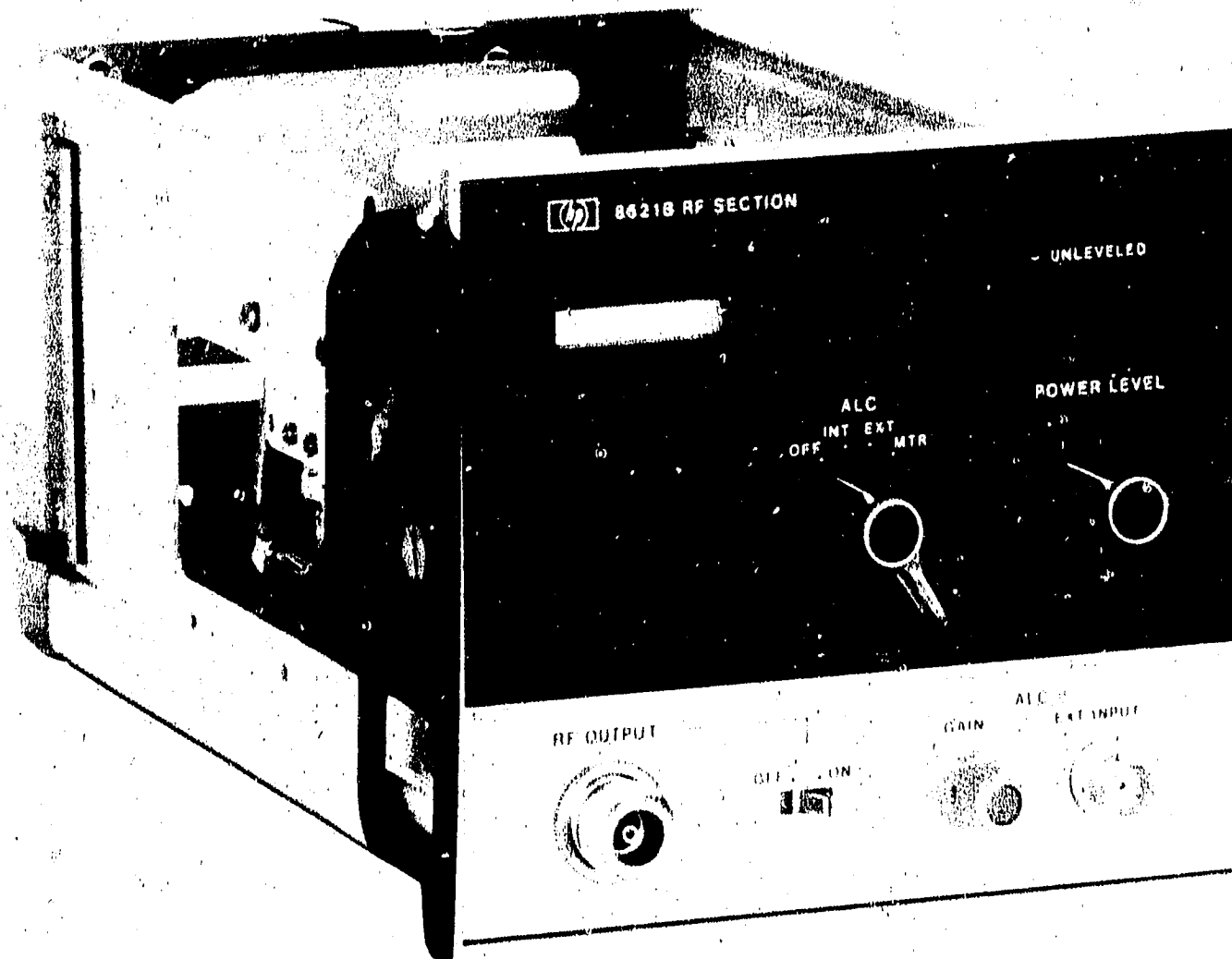


Figure 1-1. Model 8621B RF Section

SECTION I GENERAL INFORMATION

1-1. INTRODUCTION

1-2. This manual contains operating and service information for the Hewlett-Packard Model 8621B RF Section (Figure 1-1). The Model 8621B is an RF Section to be used with an 8620 Series Sweep Oscillator mainframe. Several frequency bands are available by using the various Hewlett-Packard Model 86300 series oscillator modules that plug into the Model 8621B. The mainframe, RF Section, and oscillator modules make up a complete electronically-tuned sweep signal source. Operating and service information for the mainframe and individual oscillator modules is contained in separate manuals.

1-3. This manual is divided into eight sections which provide information as follows:

a. SECTION I, GENERAL INFORMATION, contains the instrument description and specifications as well as the accessory and recommended test equipment list.

b. SECTION II, INSTALLATION, contains information relative to receiving inspection preparation for use, mounting, packing, and shipping.

c. SECTION III, OPERATION, contains operating instructions for the instrument.

d. SECTION IV, PERFORMANCE TESTS, contains information required to verify that instrument performance is in accordance with published specifications.

e. SECTION V, ADJUSTMENTS, contains information required to properly adjust and align the instrument after repair.

f. SECTION VI, REPLACEABLE PARTS, contains information required to order all parts and assemblies or effect exchange of assemblies.

g. SECTION VII, MANUAL CHANGES, normally contains backdating information to make this manual compatible with earlier equipment configurations.

h. SECTION VIII, SERVICE, contains descriptions of the circuits, schematic diagrams, parts location diagrams, and troubleshooting procedures to aid the user in maintaining the instrument.

1-4. Packaged with this manual is an Operating Information Supplement. This is simply the first three sections of this manual. This supplement should stay with the instrument for use by the instrument operator. Additional copies of the Operating Information Supplement may be ordered through your nearest Hewlett-Packard Sales Office; addresses are provided at the end of this manual.

1-5. On the front cover of this manual, below the regular manual part number is a "Microfiche" Part Number. This number may be used to order 4 x 6-inch microfilm transparencies of the manual. Each 4 x 6-inch microfiche contains up to 60 photo duplicates of the manual pages. The microfiche package also includes the latest Manual Changes supplement as well as all pertinent Service Notes.

1-6. SPECIFICATIONS

1-7. Critical instrument specifications are listed in Table 1-1. These specifications are the performance standards or limits against which the instrument may be tested.

1-8. SAFETY CONSIDERATIONS

1-9. General

1-10. This is a Safety Class I instrument and has been manufactured and tested according to international safety standards.

1-11. Operation

1-12. BEFORE APPLYING POWER, refer to SAFETY CONSIDERATIONS in Section I of the Operating and Service Manual for the Mainframe.

1-13. Service

1-14. Although the instrument has been designed in accordance with international safety standards, the information, cautions, and warnings in this manual must be followed to ensure safe operation and to keep the instrument safe. Service and adjustments should be performed only by qualified service personnel.

Table 1-1. Specifications for 8621B RF Section

SPECIFICATIONS

Frequency Range: Up to 12.4 GHz.

Oscillator Capacity: Any fundamental oscillator, or a 1.8 to 4.2 GHz fundamental oscillator and a 0.1 to 2 GHz heterodyne unit.

Frequency Reference Output (on rear panel): Approximately +1 volt 1 GHz signal output in fundamental oscillator bands.

FM Input (on rear panel):
Frequency Response: Refer to RF unit specifications.

Leveling Indicator: Front-panel indicator lights when output power is unlevelled over selected sweep range or when operating a non-leveling mode.

Equivalent Source Match: Refer to RF unit specifications.

Power Leveling Amplifier: Internal dc-coupled leveling amplifier provided.

Crystal Input: Approximately 25 to 350 mV for specified leveling at rated output; for use with positive or negative polarity detectors such as HP Model 780 series Directional Detectors, and HP Models 423 and 424 series Crystal Detectors. Polarity switch is provided in RF Sections.

Power Meter Input: Switch in RF Section selects proper compensation for Hewlett-Packard Models 431B, 431C, 432A/B/C.

Weight: Net, 1.0 kg (2 lbs)

OPTION 100, TWO OSCILLATORS

Oscillator Capacity: Any two fundamental oscillators; or any one fundamental oscillator, a 1.8 to 4.2 GHz fundamental oscillator, and a 0.1 to 2 GHz heterodyne unit.

All Other Specifications: Same as 8621B above.

OPTION 010
70-dB ATTENUATOR

Attenuation Range: 0 to 70-dB in 10-dB steps.
Insertion Loss: < 2 dB.
Flatness: Typically ± 0.5 ($\pm 0.01 \times$ attenuation in dB).
Source SWR: Internally Levelled < 1.75:1.

Attenuation Accuracy (including frequency response):
< ± 0.6 dB at 10 dB step; for all other settings,
< $\pm 5\%$ of attenuation selected.

Programming Inputs: 4-line binary logic open or contact closure to ground. Input available at 8620 Series main-frame PROGRAMMING connector.

OPTION 004, REAR RF OUTPUT

Connector: Type N.

1-15. Adjustment or repair of the opened instrument with the ac power connected should be avoided whenever possible but, when inevitable, should be performed only by skilled persons who know the hazard involved.

1-16. Capacitors inside the instrument may still be charged even though the instrument has been disconnected from its source of supply.

1-17. Whenever it is suspected that protection has been impaired, the instrument should be made inoperative and secured against any unintended operation.

WARNINGS

Any interruption of the protective (grounding) conductor, inside or outside the instrument, or disconnection of the protective earth terminal could make this instrument dangerous.

Servicing this instrument often requires working with the instrument's protective covers removed and with ac power connected. Be very careful; the energy at many points in the instrument may, if contacted, cause personal injury.

BEFORE SWITCHING THIS INSTRUMENT ON, ensure that all devices connected to the instrument are connected to the protective earth ground.

1-18. INSTRUMENT COVERED BY MANUAL

1-19. Attached to the instrument is a serial number plate (Figure 1-2). The serial number is in two parts. The first four digits and the letter are the serial number prefix; the last five digits are the suffix. The prefix is the same for all identical in-

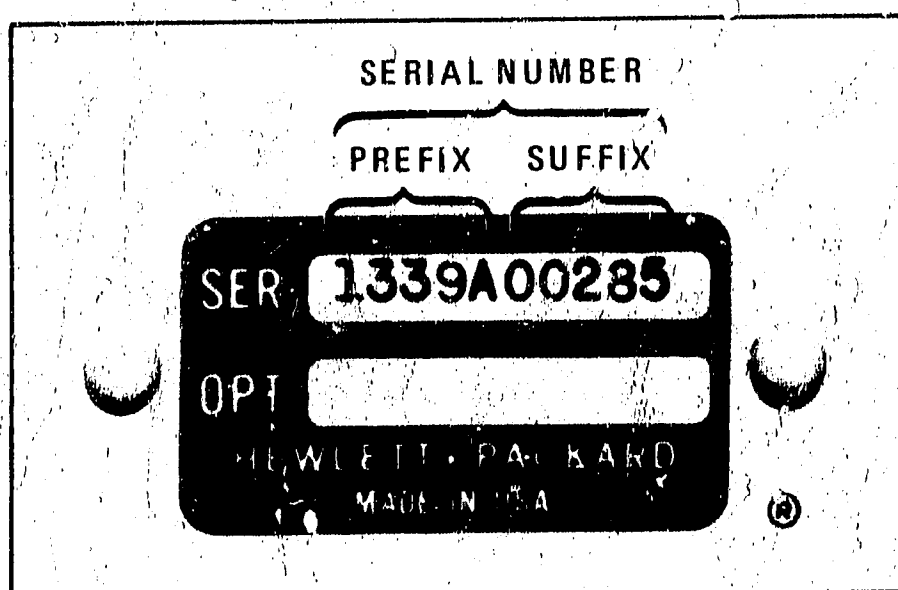


Figure 1-2. Serial Number Plate

struments; it changes only when a change is made to the instrument. The suffix, however, is assigned sequentially and is different for each instrument. The contents of this manual apply to instruments with the serial number prefix(es) listed under SERIAL NUMBERS on the title page.

1-20. An instrument manufactured after the printing of this manual may have a serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates the instrument is different from those described in this manual. The manual for this newer instrument is accompanied by a yellow Manual Changes supplement. This supplement contains "change information" that explains how to adapt the manual to the newer instrument.

1-21. In addition to change information, the supplement may contain information for correcting errors in the manual. To keep this manual as current and accurate as possible, Hewlett-Packard recommends that you periodically request the latest Manual Changes supplement. The supplement for this manual is identified with this manual's print date and part number, both of which appear on the manual's title page. Complimentary copies of the supplement are available from Hewlett-Packard.

1-22. 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 office.

1-23. DESCRIPTION

1-24. The Hewlett-Packard Model 8621B RF Section with an 8620 Series Sweep Oscillator mainframe, and the appropriate oscillator modules, forms a completely solid-state self-contained multi-band swept signal source. The Model 8621B houses up to two plug-in oscillator modules and one heterodyne unit. The heterodyne unit, when used with a Model 86330B Oscillator (1.8 to 4.2 GHz), extends the range of the sweep oscillator downward to cover the 0.1 to 2.0 GHz band. Also contained in the RF Section are the RF OUTPUT ON-OFF and POWER LEVEL controls, automatic level control (ALC) amplifier circuits for the RF oscillators, frequency-display lenses showing the frequency of the oscillator modules, and other switch and control functions.

1-25. OPTIONS

1-26. Options are available to (1) add switching for two fundamental oscillators, (2) add a 0 to 70-dB attenuator, and (3) add a rear panel RF output connector.

1-27. Option 100

1-28. The Option 100 RF Section permits the use of two fundamental oscillators in the 8621B by adding a coaxial RF switch to the RF output circuit. The RF switch connects the output of the working oscillator to the 8621B RF output connector. Appendix A provides a schematic diagram of the RF switching, service information, and the procedure for installing Option 100.

1-29. Option 010

1-30. The Option 010 RF Section contains a 0 to 70-dB attenuator. This allows the output RF signal to be manually controlled in 10-dB steps from the 8621B front panel, or remotely programmable through the PROGRAMMING connector on the 8620 Series mainframe. Appendix B provides a schematic diagram of the A5 Attenuator Board Assembly and A6 Attenuator, a circuit description, performance tests, service information, and the procedure for installing Option 010.

1-31. Option 004

1-32. The Option 004 RF Section has the Type N RF output connector on the rear panel instead of the front panel. Appendix C provides service information and the procedure for installing Option 004.

1-33. INSTALLATION OF COMBINED OPTIONS

1-34. To incorporate a combination of options such as an Option 004 and Option 010, refer to Appendices section in the rear of this manual. These Appendices also contain instructions for adding options to existing configurations.

1-35. EQUIPMENT REQUIRED BUT NOT SUPPLIED

1-35. To have a complete operating sweep oscillator unit, the Model 8621B RF Section must be plugged into an 8620 Series Sweep Oscillator mainframe. The 8621B must also contain at least one fundamental oscillator module. If the Model 86320B 0.1 to 2 GHz Heterodyne Unit is installed,

a Model 86330R or 86331B Oscillator Module must also be installed. Other optional configurations are described in Appendices.

1-37. EQUIPMENT AVAILABLE**1-38. Service Accessories**

1-39. A Service Accessories package for the 8621B RF Section is available for convenience in aligning and troubleshooting the mainframe, RF Section, and oscillator modules. This Service Accessories package contains a plug-in extender cable, an adjustment tool, a 36-pin service board, and a 50-pin service board. (See Figure 1-3). The package may be obtained from Hewlett-Packard by ordering Service Accessories package Part No. 08620-60124.

1-40. Network Analyzer

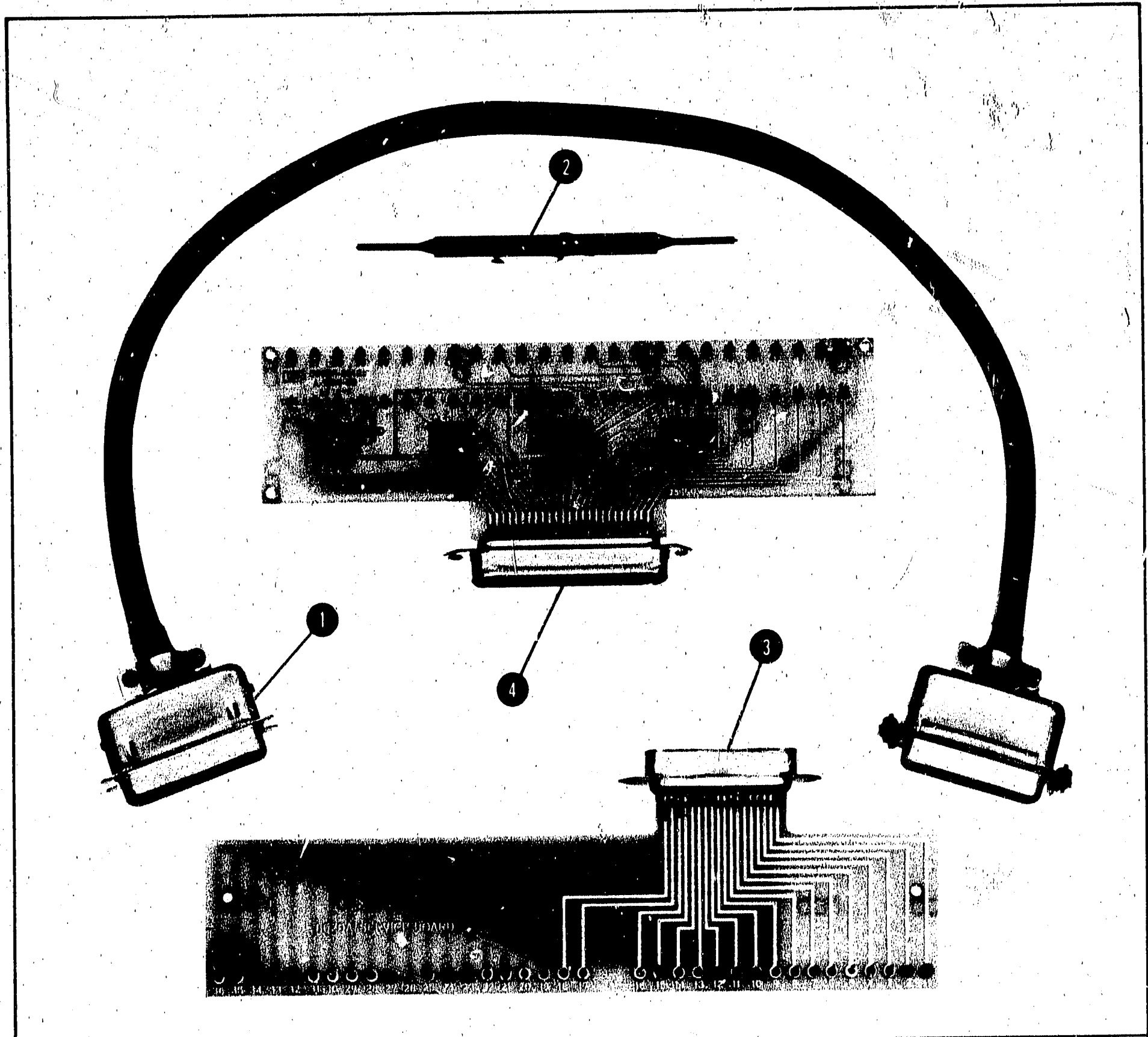
1-41. An 8620 Series Sweep Oscillator mainframe with a Model 8621B RF Section make up a Sweeper unit that is compatible with the Hewlett-Packard Model 8410B Network Analyzer System. The Sweeper unit combines with the Network Analyzer, a Model 8411A Frequency Converter, and an appropriate display plug-in, to form a phasemeter and a ratiometer. The phasemeter and ratiometer may be used for direct phase and amplitude ratio measurement of RF voltages. These measurements can be made on single frequencies or on swept frequencies in the Network Analyzer range of 110 MHz to 12.4 GHz.

1-42. Power Meters and Crystal Detectors

1-43. The Hewlett-Packard Model 431B, 431C, and 432A/B/C Power Meters may be used for external leveling of the 8620C/8621B Sweeper. External leveled power is also available using an HP 423A Crystal Detector. Section III contains detailed instructions for using the external power leveling systems.

1-44. RF Section 36-Pin Extender

1-45. A 36-pin extender is available for extending the RF Section approximately 1 inch. This 1 inch allows enough space for the A1 ALC Amplifier board to be placed on the 18-pin extender board. The 36-pin extender is used in place of the extender



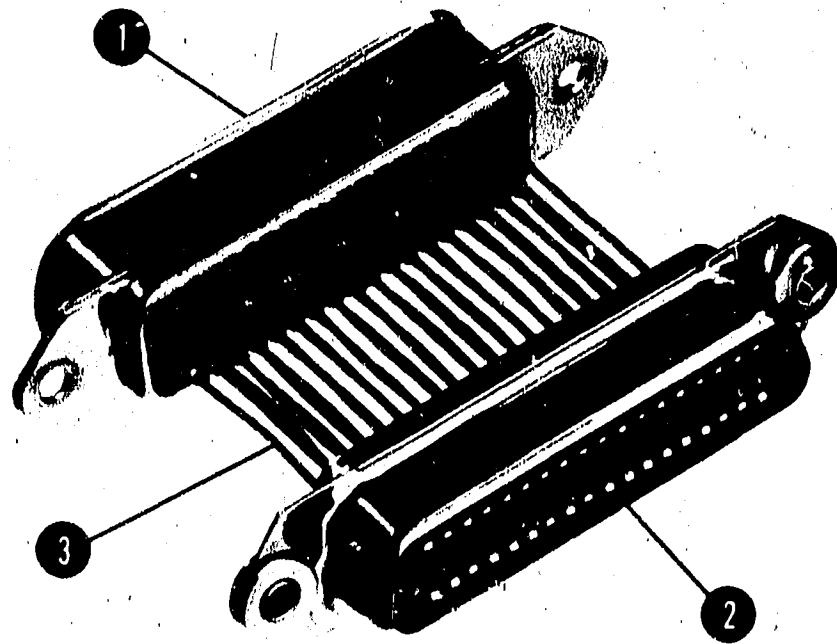
Item	Name	Part No.	Use
	Extender Cable	08620-60032	Moves RF Plug-in outside mainframe for alignment or service.
	Adjustment Tool	8830-0024	Fits miniature adjustment slot on potentiometers.
	36-Pin Service Board	08620-60037	Allows probing RF Section interface connector, or rear-panel programming connector on all mainframes except 8620C, during performance testing or troubleshooting of 8620 Series mainframes.
	50-Pin Service Board	08620-60125	Allows probing rear-panel programming connector during performance testing or troubleshooting of HP Model 8620C Sweep Oscillator mainframe.

Figure 1-3. Service Accessories, HP Part Number 08620-60124

cable (HP Part No. 08620-60032) when spurious signals interference may be a critical factor. The extender, shown in Figure 1-4, consists of two connectors and the interconnections, and may be obtained from Hewlett-Packard by ordering Part No. 08621-60056.

1-46. RECOMMENDED TEST EQUIPMENT

1-47. Equipment required to maintain the Model 8621B is listed in Table 1-2. Other equipment may be substituted if it meets or exceeds the critical specifications listed in the table.



- ① 36-Pin Male Connector (2 x 18) HP Part No. 1251-0483
- ② 36-Pin Female Connector (2 x 18) HP Part No. 1251-0484
- ③ 1-inch 20-Gage Wire HP Part No. 8151-0011

Figure 1-4. RF Section 36-Pin Extender, HP Part No. 08621-60056

Table 1-2. Recommended Test Equipment

Instrument	Critical Specifications	Recommended Model	Use*
Sweep Oscillator	No substitute mainframe	HP 8620A, B, C	P, A, T
Oscillator Module	For ALC adjustment and troubleshooting	HP 86300 series RF plug-in modules	A, T
DC Digital Voltmeter	Range: -50V to +50V Accuracy: 0.05%	HP 34800D/3484A	A, T
Oscilloscope	Vertical Bandwidth: 20 MHz minimum Vertical Sensitivity: 5 mV/Div. Horizontal Sweep Rate: 1 μ s/Div. minimum	HP 180C/1801A/ 1820C	T
DC Power Supply	Range: 0 to \pm 10 Vdc Current: 0.1 Ampere	HP 721A	P A, T
Power Meter and Thermistor Mount	Frequency: To match oscillator module installed in 8621B Range: +13 dBm to -20 dBm Recorder Output: Negative (-)	HP 432A/478A	T
Power Splitter	Frequency: To match oscillator module installed in 8621B Attenuation in each arm: 6 dB	HP 11667A	T
Crystal Detector (2 required)	Frequency: To match oscillator module installed in 8621B SWR: < 1.5 Output: Negative (-)	HP 423A	T
10-dB Attenuator (2 required)	SWR: < 1.3 Attenuation: 10 dB \pm 0.5 dB	HP 8491B, Opt. 010	T
3-dB Attenuator	SWR: < 1.3 Attenuation: 3 dB \pm 0.3 dB	HP 8491B, Opt. 003	T
50-Ohm Termination	Resistance: 50 ohms Connector: BNC Current: 0.1 Ampere	HP 1250-0207	P
36-Pin Extender	Mating Connectors to extend 8621B approximately 1 inch	HP 08621-60056	A, T
Alignment Tool**		HP 8830-0024	A
Extender Cable**		HP 08620-60032	T
RF Service Cable	Impedance: 50 ohms Connectors: SMA to SMA	HP 8120-1578	T
RF Connector Adapter	SMA Jack to SMA Jack	HP 1250-1158	T

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

** These parts are included in Service Accessories package Part No. 08620-60124. See Figure 1-3.

SECTION II INSTALLATION

2-1. INTRODUCTION

2-2. This section provides installation instructions for the Model 8621B RF Section and its accessories. This section also includes information about initial inspection and damage claims, preparation for using the RF Section, and 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 operation are given in Section III. If the contents are incomplete, if there is mechanical damage or defect, or if main functions of the RF Section do not pass the operator's checks, notify the nearest Hewlett-Packard office. If the shipping container is damaged, or the cushioning material shows signs of stress, notify the carrier as well as the Hewlett-Packard office. Keep the shipping materials for 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 Model 8621B RF Section is properly installed, it obtains all power through the rear connector from the 8620 Series Sweep Oscillator mainframe.

2-8. Interconnections

2-9. For the Model 8621B RF Section to operate, it must be plugged into an 8620 Series mainframe. Connection is made by pushing the RF Section into the mainframe so that 8621B interface connector J4 mates with the mainframe connector.

2-10. Mating Connectors

2-11. The mating connectors used in the HP Model 8621B RF Section are shown in Table 2-1. This table identifies each connector on the instrument, and gives the HP Part Number and the part number of an alternate source for the mating connector.

2-12. Operating Environment

2-13. **Temperature.** The instrument may be operated in temperatures from 0°C to +55°C.

Table 2-1. Model 8621B Mating Connectors

8621B Connector	Mating Connector			
	Name	Industry Identification	HP Part Number	Alternate Source
RF OUTPUT	Type N, Male, UG 21G/U		1250-0882	Specialty Connector 25 P117-2
EXT INPUT	BNC, Male, UG88/U		1250-0256	Specialty Connector 28 P118-1
FM	BNC, Male, UG88/U		1250-0256	Specialty Connector 28 P118-1
FREQ REF	BNC, Male, UG88/U		1250-0256	Specialty Connector 28 P118-1
Interface P1	Micro-Ribbon 36-Contact Rack and Panel Plug		1251-0484	TRW Cinch Div. 57-20360-375

Installation

2-14. Humidity. The instrument may be operated in environments with humidity up to 95%. However, the instrument should also be protected from temperature extremes which cause condensation within the instrument.

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

2-16. Oscillator Module Installation

2-17. The 86300 series oscillator modules may be installed in either position "2" or "3" of the 8621B RF Section. If the oscillator module is to be used with an 86320A Heterodyne Module or if there is only one oscillator installed, installation must be in position "2". Installation requires a 5/16-inch open-end wrench and a pozi-drive screwdriver.

2-18. To install oscillator module, proceed as follows:

- a. Set mainframe power switch to OFF.
- b. Remove 8621B RF Section from mainframe.
- c. Install Oscillator Module in either position "2" or "3" by placing oscillator module guide slot over guide block (Figure 2-1) on right side of 8621B (looking from front). Slide module into position. Secure with four pozi-drive screws along right side. Screws are inserted from outside of 8621B and are located at red arrowheads. (See Figure 2-2).

CAUTION

The four screws holding the oscillator module must be secure. The right side of the 8621B serves as part of the heat sink for the YIG-Tuned Oscillator. Failure to secure the oscillator module firmly with all four screws may cause overheating of the oscillator.

- d. Connect output cable assembly.
- e. Install applicable frequency scale in mainframe (refer to paragraph 2-22) and frequency-display lens in 8621B. (See Figure 3-12.)

2-19. Heterodyne Module Installation

2-20. Operation of the heterodyne module (HP 86320A) requires an oscillator module installed in

Position 2 of the 8621B RF Section. The oscillator in Position 2 may either be the HP Model 86330B (1.8–4.2 GHz) or the HP Model 86331B (1.7–4.3 GHz). Connection between the RF Section and the Heterodyne Module is made through the flexible heterodyne cable, part number 86320-60052. This cable should be disconnected from the RF Section and stored when the heterodyne unit is not used. Installation requires a 5/16-inch open-end wrench and a pozi-drive screwdriver.

2-21. To install heterodyne module, proceed as follows:

- a. Set mainframe power switch to OFF.
- b. Remove 8621B RF Section.
- c. Remove two screws holding back plate on RF Section and remove heterodyne cable.
- d. With 5/16-inch wrench, remove semi-rigid coaxial cable from output of oscillator module in Position 2.

CAUTION

Make sure the center pin of the connector plug engages the center contact of the connector receptacle. If the pin and contact do not engage properly, the connector will be damaged.

- e. With 5/16-inch wrench, connect 86320B output cable to middle port of heterodyne module, and connect 86320B input cable to bottom port. (See Figure 2-1.)

- f. Connect flexible heterodyne cable between Heterodyne Control Assembly and 8621B Master Board A2J5.

CAUTION

When connecting the heterodyne cable to the 8621B Master Board, ensure that pin 1 of the 16-pin connector on the heterodyne ribbon cable matches with A2J5 pin 1 on the Master Board. (Pin 1 is identified with a red stripe on the cable.) Incorrect connection will damage instruments.

- g. Connect 86320B input cable to oscillator module RF OUTPUT port, and connect 86320B output cable to DC Block.

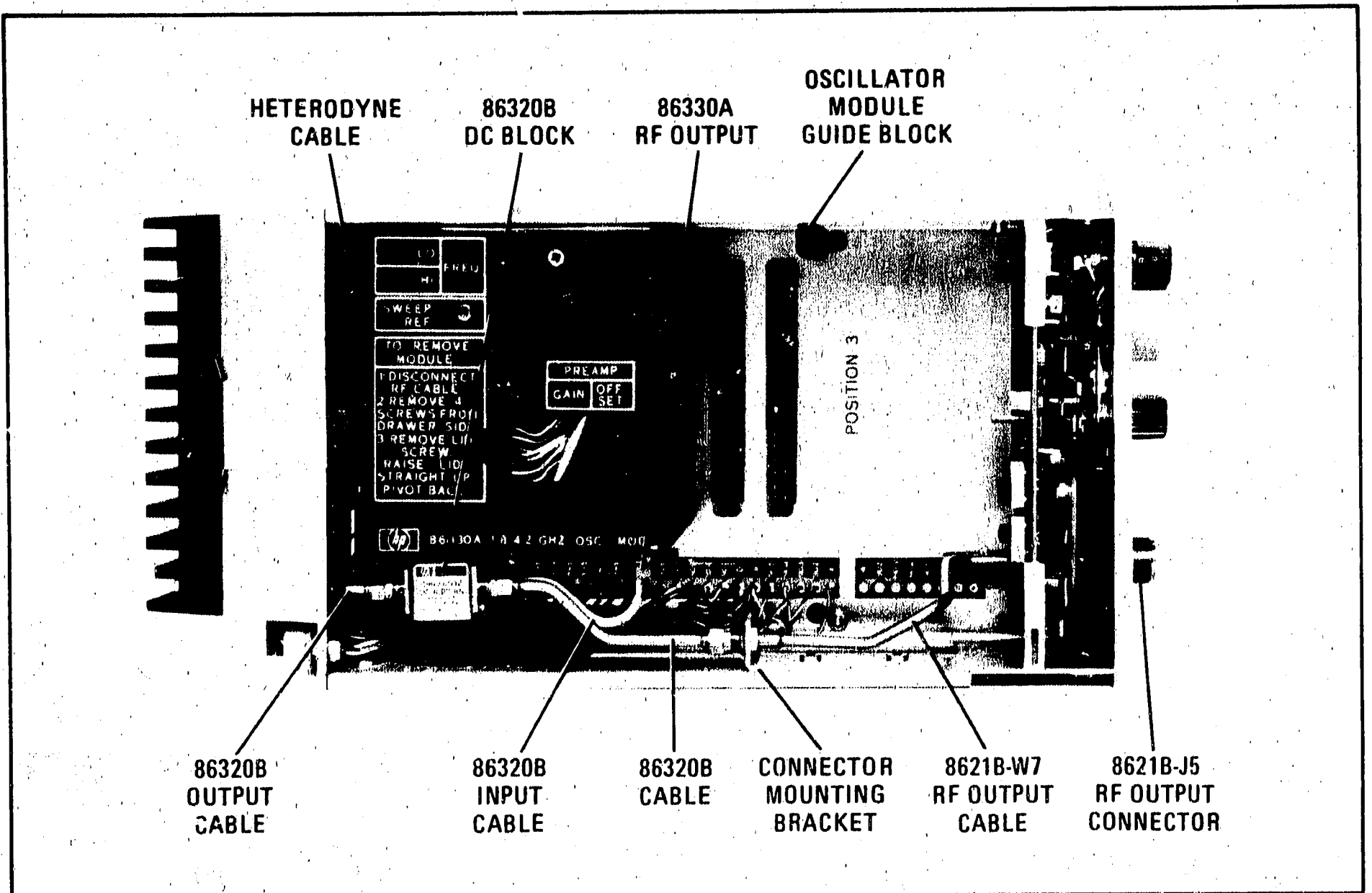


Figure 2-1. Cable Connections With Heterodyne Module Installed

NOTE

Before connecting the 86320B input and output cables to the oscillator module and DC Block, partially install the heterodyne module to hold the cables firm (See step j.)

h. Connect 86320B cable between DC Block and connector mounting bracket.

i. Connect 8621B-W7 between connector mounting bracket and RF OUTPUT connector J5.

j. Secure heterodyne module to RF Section using two screws removed in step c above.

k. Install 0.1 to 2 GHz frequency scale in position "1" of mainframe bandswitch. (The "1" is located on left-end piece of bandswitch drum). (See paragraph 2-22.)

l. Install 0.1–2.0 GHz frequency-display lens in BAND 1 of 8621B. Refer to Figure 3-12 for frequency-display lens removal and installation.

2-22. Frequency Scale Installation

2-23. To install frequency scale, proceed as follows:

a. Disengage mainframe front-panel latch handle (located inside RF Section compartment) by moving handle downward. Swing front panel forward and down.

b. Depress BAND Lever until desired drum position is accessible from inside mainframe.

NOTE

If necessary to remove a frequency scale, exert a pressure **OUTWARD**, away from drum on right-hand edge of scale.

c. Insert frequency scale so key (1/2-inch protrusion) fits into notch on left-hand side of drum. Then press on right-hand edge of frequency scale to snap it in place.

CAUTION

To prevent damage to frequency pointers when bandswitch drum is rotated, make certain that frequency scale is firmly in place and flush with band drum edges.

Installation

d. Return front panel to its normal closed position and lock in place by pushing up on latch handle while holding front panel in position.

2-24. Frequency-Display Lens Installation

2-25. The front panel frequency-display lenses are replaceable from the front. Figure 3-12 shows the lens removal and installation procedure.

2-26. Installation of Options

2-27. To install an option, refer to the installation instructions in Appendices section of this manual.

2-28. RF Section Installation

2-29. To install 8621B RF Section, proceed as follows:

a. Set 8620 Series mainframe line switch to off.

b. Position drawer latch handle (Figure 3-1) so rectangular cut-out is exposed to the front and slot is towards the rear.

c. Slide RF Section into place towards rear of compartment.

d. Drawer latch will start to move down when slot engages locking pin on mainframe.

e. Press latch handle downward while still pushing in on RF Section, until drawer latch is closed or flush with front panel.

2-30. STORAGE AND SHIPMENT

2-31. Environment

2-32. The instrument may be stored or shipped in environments within the following limits:

Temperature: -40°C to $+75^{\circ}\text{C}$
 Humidity: Up to 95%
 Altitude: Up to 15240 metres (50 000 feet)

The instrument should also be protected from temperature extremes which cause condensation within the instrument.

2-33. Packaging

2-34. Original Packaging. Containers and materials identical with those used in factory packaging are available through Hewlett-Packard offices. 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. Also, mark the container FRAGILE to ensure careful handling. In any correspondence, refer to the instrument by model number and full serial number.

2-35. Other Packaging. The following general instructions should be used for re-packaging with commercially available materials:

a. Wrap instrument in heavy paper or plastic. (If shipping to Hewlett-Packard office or service center, attach tag indicating type of service required, return address, model number, and full serial number.)

b. Use strong shipping container. A double-wall carton made of 350-pound test material is adequate.

c. Use enough shock-absorbing material (70 to 100 mm, 3 to 4-inch thick) around all sides of instrument to provide firm cushion and prevent movement inside container. Protect control panel with cardboard.

d. Seal shipping container securely.

e. Mark shipping container FRAGILE to assure careful handling.

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

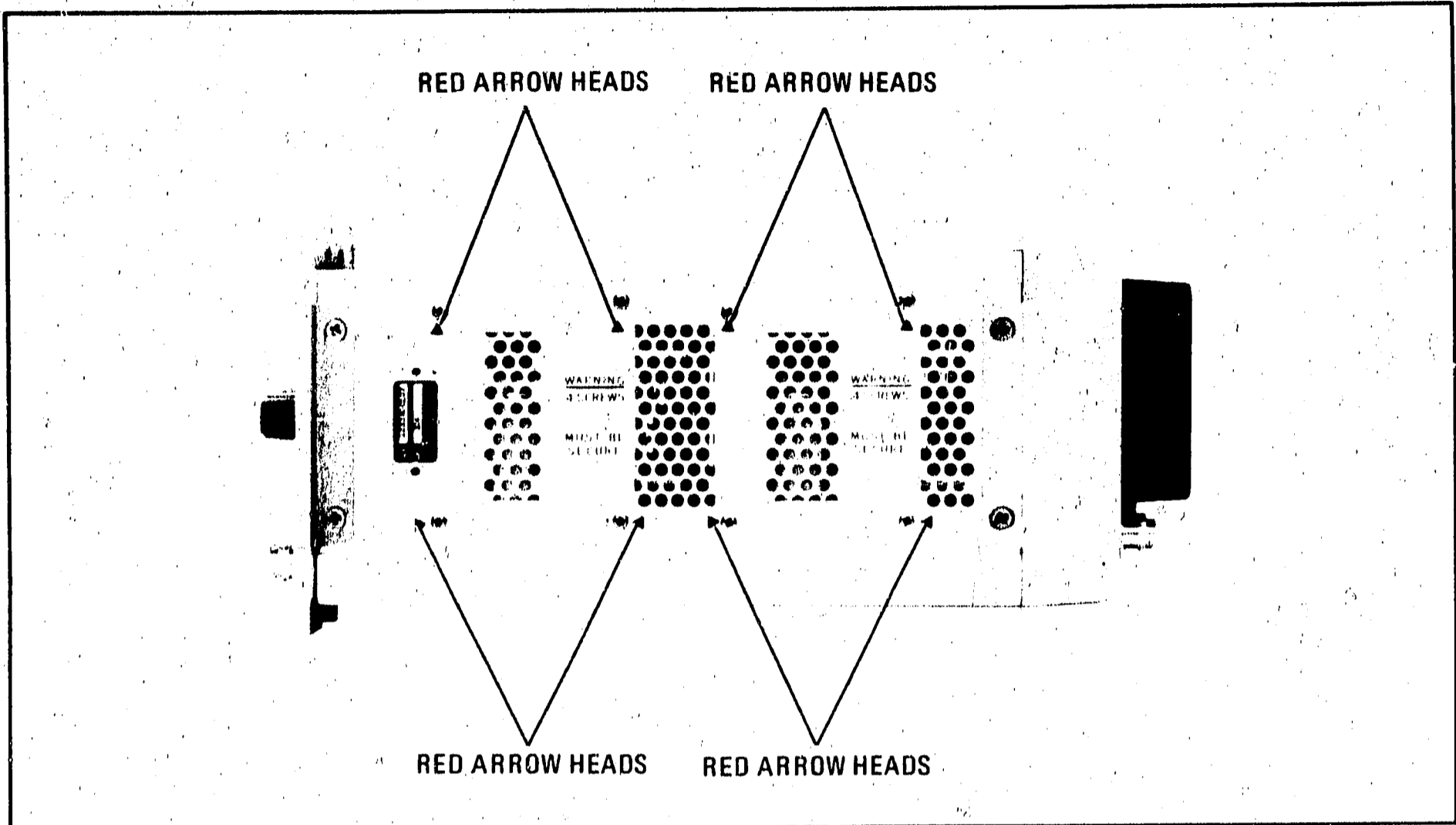


Figure 2-2. Right Side of RF Section

OPERATION

SECTION III OPERATION

3-1. INTRODUCTION

3-2. This operating section explains the function of the controls and indicators of the Model 8621B RF Section. It describes typical operating modes in a measurement system and covers operating maintenance such as replacement of frequency-display lamps and lenses.

3-3. PANEL FEATURES

3-4. Front and rear panel features are described in Figures 3-1 and 3-2. Description numbers match the numbers on the illustration.

3-5. OPERATOR'S CHECKS

3-6. The operator's checks (Figure 3-3) are supplied to allow the operator to make quick checks of the instrument's main functions prior to use. These checks assume that the 8621B RF Section is installed in an 8620C Sweep Oscillator mainframe. The checks cover the RF Section, oscillator modules, and mainframe; therefore, if the correct indications are not obtained, trouble may be in any one of the three units. If the RF Section is suspected, follow the troubleshooting chart in Section VIII to isolate the problem.

3-7. OPERATING INSTRUCTIONS

3-8. General Operating Procedure

3-9. Figure 3-4 shows general operating procedures with the Model 8620C/8621B Sweep Oscillator connected in a typical measurement test setup. Many other applications are possible but are not shown because the general operating procedure is the same.

3-10. Internal Leveling

3-11. The most convenient method of RF output leveling is internal leveling. The Model 86320B 0.1 to 2 GHz Heterodyne Unit has internal leveling capability built into the standard module. However, the HP 86300 series RF Oscillator Modules have internal leveling capability available as Option 001.

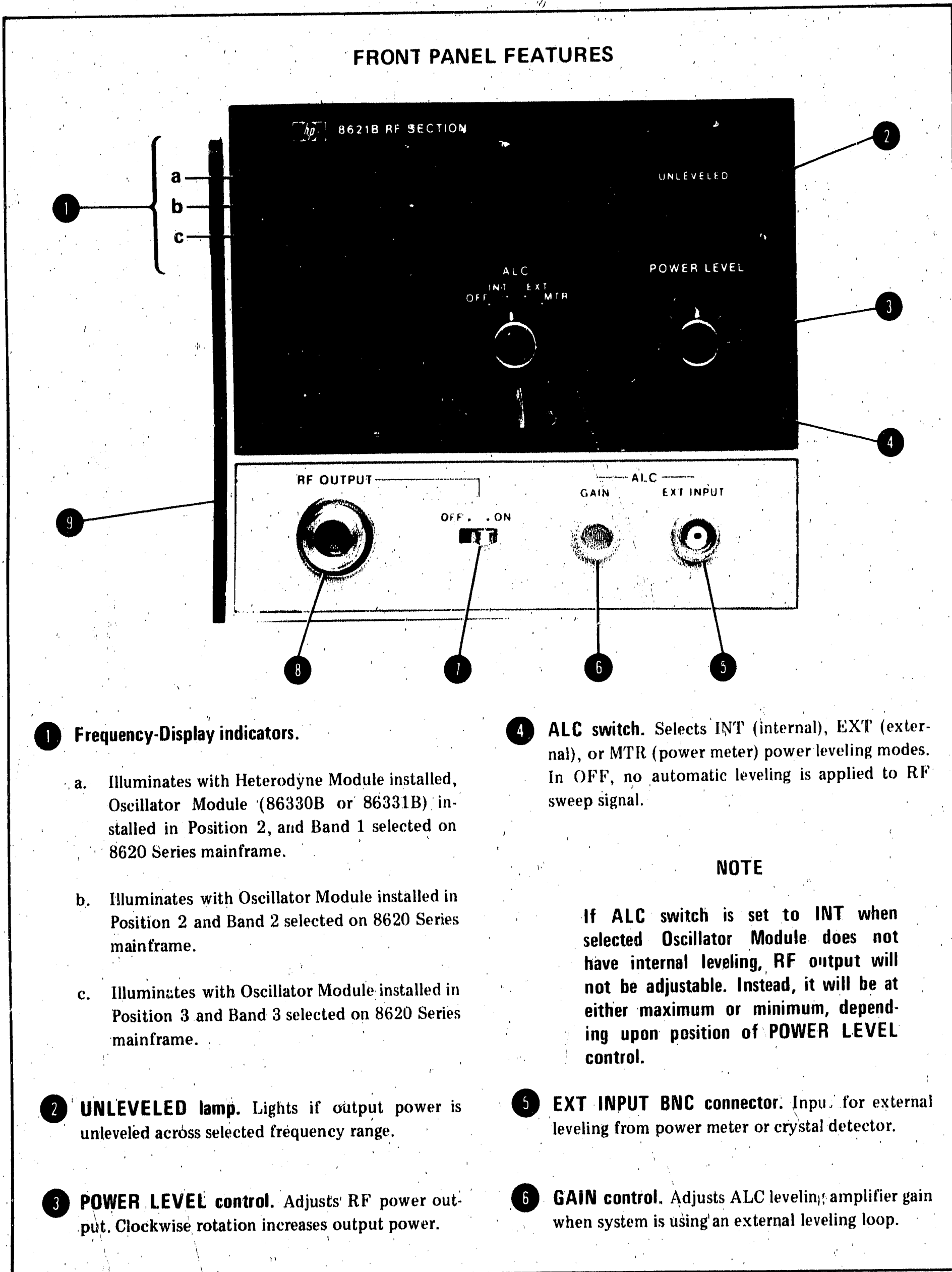
3-12. In internal leveling mode, a directional detector senses the RF level at the output of the oscillator module and applies a proportional dc voltage to the Automatic Level Control (ALC) circuit in the 8621B. To check the internal leveling mode, use the test setup and procedures in Figure 3-5.

3-13. External Power Meter Leveling

3-14. Power leveling can be obtained with a power meter and power splitting tee or directional coupler as shown in Figure 3-9. The power splitting tee or coupler applies RF energy (proportional to RF output) to a power meter. A dc voltage proportional to RF output power is applied from the power meter to the Automatic Level Control (ALC) circuits in the 8621B. A switch in the 8621B selects amplifier characteristics to match the power meter used (either HP Model 431B/C or HP Model 432A/B/C). The circuits in the 8621B cause the RF output to be raised or lowered to keep RF output at a constant level. The procedure to set up the ALC loop is given in Figure 3-9.

3-15. External Crystal Detector Leveling

3-16. Power may be leveled externally using a power splitter (or directional coupler) and crystal detector. This leveling system uses a power splitter to sample the RF output signal and a crystal detector to produce a dc voltage proportional to RF signal level. The detector voltage is compared with an internal reference voltage, and the difference voltage changes the output power level to keep it constant at the output. A polarity switch on the ALC board selects either positive (+) or negative (-) inputs to match output polarity of the crystal detector. Instead of a power splitter, a directional coupler may be used to sample the RF signal for the leveling loop. Directional couplers are usually narrow band, whereas the power splitter is flat over a wide frequency range. The advantage of a directional coupler is that it does not have a 6-dB loss like the power splitter therefore a higher maximum leveled power output may be obtained. To place the crystal detector leveling loop in operation, use the test setup and procedures in Figure 3-10.



1 Frequency-Display indicators.

- a. Illuminates with Heterodyne Module installed, Oscillator Module (86330B or 86331B) installed in Position 2, and Band 1 selected on 8620 Series mainframe.
- b. Illuminates with Oscillator Module installed in Position 2 and Band 2 selected on 8620 Series mainframe.
- c. Illuminates with Oscillator Module installed in Position 3 and Band 3 selected on 8620 Series mainframe.

2 UNLEVELED lamp. Lights if output power is unlevelled across selected frequency range.

3 POWER LEVEL control. Adjusts RF power output. Clockwise rotation increases output power.

4 ALC switch. Selects INT (internal), EXT (external), or MTR (power meter) power leveling modes. In OFF, no automatic leveling is applied to RF sweep signal.

NOTE

If ALC switch is set to INT when selected Oscillator Module does not have internal leveling, RF output will not be adjustable. Instead, it will be at either maximum or minimum, depending upon position of POWER LEVEL control.

5 EXT INPUT BNC connector. Input for external leveling from power meter or crystal detector.

6 GAIN control. Adjusts ALC leveling; amplifier gain when system is using an external leveling loop.

Figure 3-1. Front Panel Controls, Connectors and Indicators (1 of 2)

FRONT PANEL FEATURES

7 **RF OUTPUT ON-OFF switch.** Turns RF power on and off. This is useful when zeroing a power meter.

8 **RF OUTPUT.** Type-N 50-ohm RF output connector.

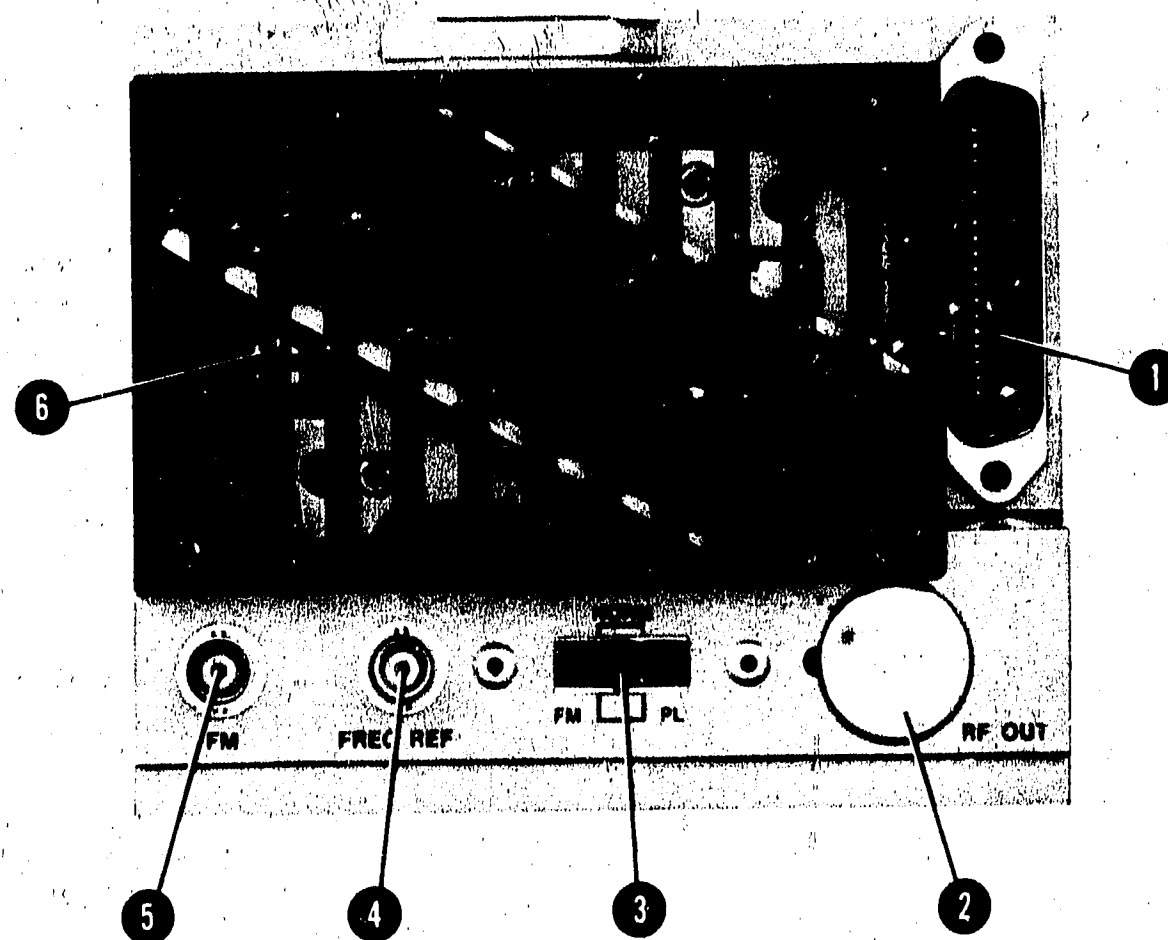
9 **Drawer Latching Handle.** Aids in installing and removing RF Section. After installing, handle locks to hold RF Section in place.

NOTE

The front panel changes when options 010 or 004 are added. (See Appendices B and C.)

Figure 3-1. Front Panel Controls, Connectors and Indicators (2 of 2)

REAR PANEL FEATURES



- 1 **Interface Connector J4.** Provides interconnection between 8620 Series mainframe and 8621B RF Section.
- 2 **RF OUT.** When Option 004 is installed, a Type-N 50-ohm RF OUT connector is mounted on the rear panel instead of the front panel. (See Appendix C.)
- 3 **FM-NORM-PL switch.** Operates in conjunction with FM input connector to provide optimum performance for normal sweep (NORM), frequency modulation (FM), or phase lock (PL) operation. If FM or PL modes of operation are not being used, switch must be in NORM POSITION.
- 4 **FREQ REF BNC connector.** Provides approximately +1 volt/GHz signal output for use as a frequency reference voltage.
- 5 **FM BNC connector.** Input connector for FM modulation signal or phase locking error signal.
- 6 **86320B Heat Sink.** Provides heat dissipation for 86320B Heterodyne Module.

NOTE

When no 86320B is installed, its heat sink casting is replaced with a metal plate.

Figure 3-2. Rear Panel Controls and Connectors

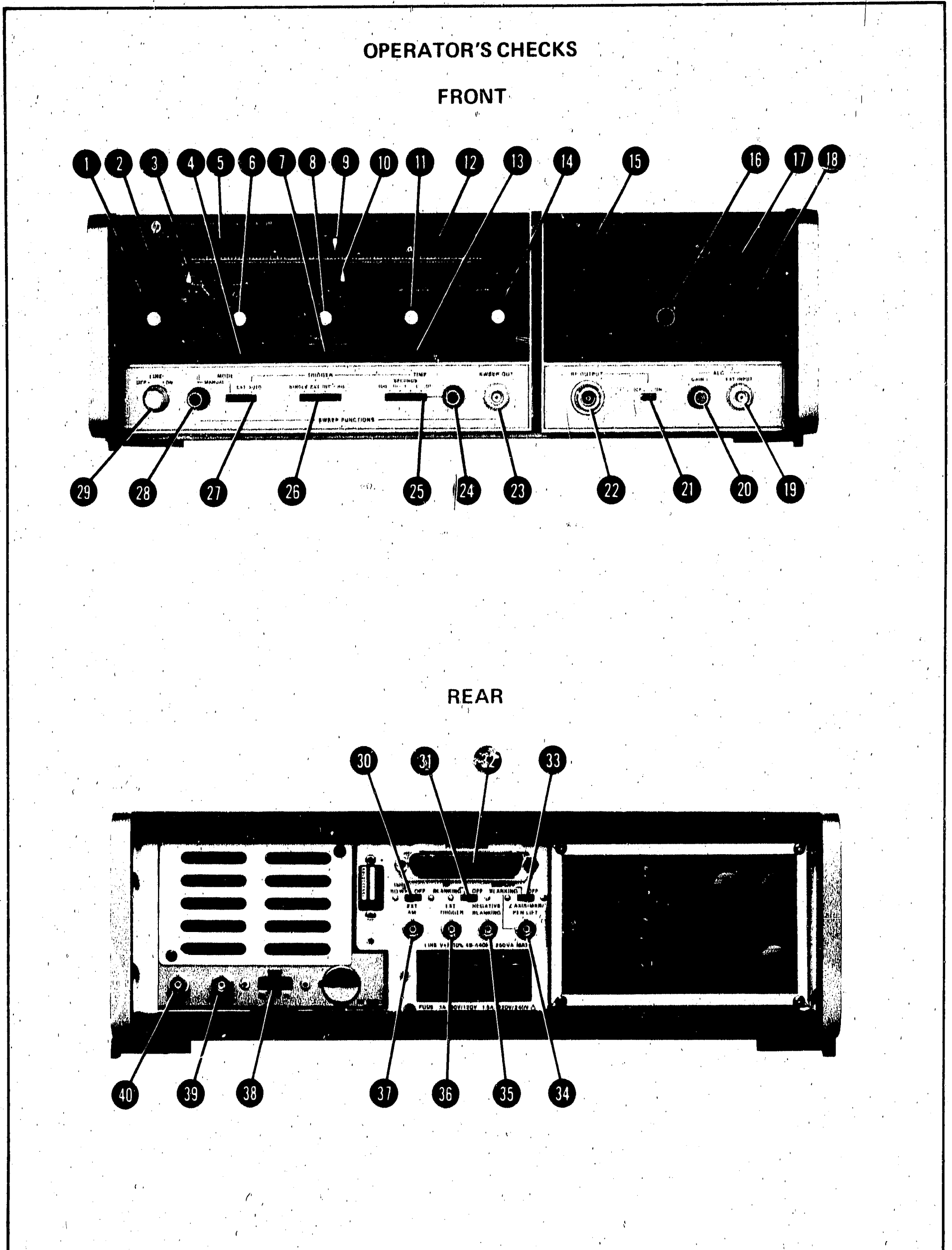
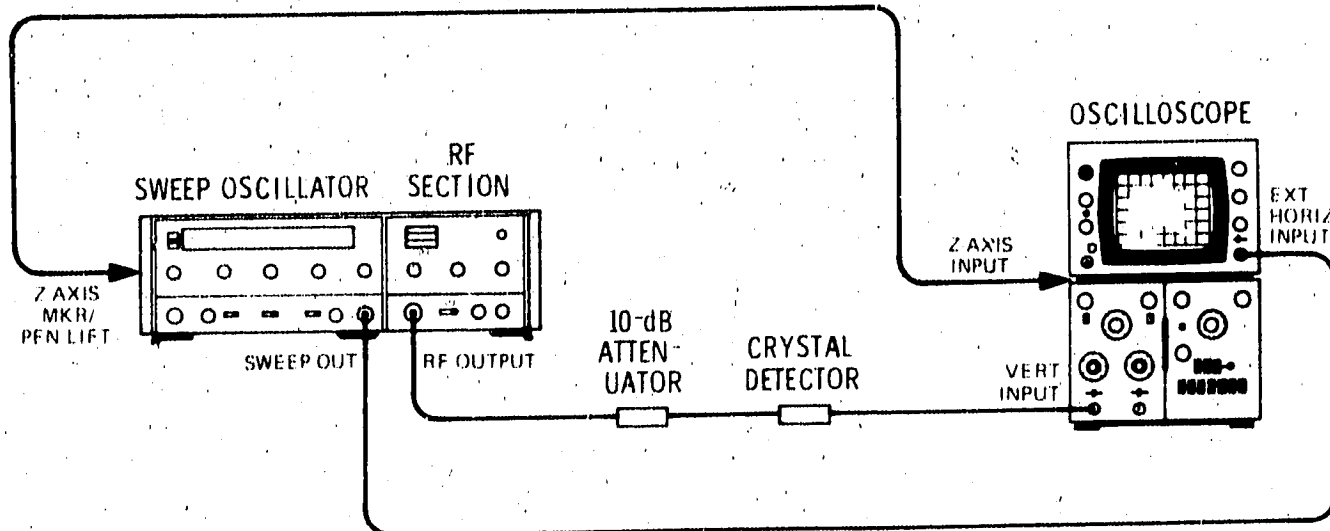


Figure 3-3. Operator's Checks (1 of 4)

OPERATOR'S CHECKS



EQUIPMENT:	Sweep Oscillator	HP 8620C
	Oscilloscope	HP 180C/1801A/1820C
	Crystal Detector (negative output)	HP 423A
	10-dB Attenuator	HP 84913, Option 010

NOTE

All procedures are written using the 8620C Sweep Oscillator. An 8620A or 8620B mainframe may be used but the control names will be different than those called out in the procedures.

1. Set controls as follows:

8620C:

BAND 2	Frequency of Oscillator Module
START MARKER pointer 5	Low frequency end of scale
STOP MARKER pointer 12	High frequency end of scale
CV MARKER pointer 9	Center scale
MARKERS 7	OFF
MODE 27	AUTO
TRIGGER 26	INT
TIME-SECONDS 25	0.1-.01
TIME-SECONDS Vernier 24	Fully clockwise
1 kHz SQWV/OFF (rear panel) 30	OFF
DISPLAY BLANKING/OFF (rear panel) 33	OFF
RF BLANKING/OFF (rear panel) 31	OFF

8621B:

RF OUTPUT 21 22	ON
POWER LEVEL 18	Fully clockwise
ALC 16	OFF
ALC GAIN 20	Fully clockwise
FM-NORM-PL (rear panel) 33	NORM (Normal)

Figure 3-3. Operator's Checks (2 of 4)

OPERATOR'S CHECKS

2. Press LINE pushbutton 29 to turn-on mainframe. With mainframe on, LINE 29 and FULL SWEEP 1 pushbuttons should light. A frequency-display lamp 15 should light on 8621B.
3. Check that oscillator installed in RF Section is sweeping correctly. This is indicated by continuous signal-level line below zero-volt dc level on oscilloscope.

NOTE

For the 0.1–2 GHz range, internal leveling is built into the standard heterodyne module. In all other oscillator ranges, Option 001 (which provides an internal directional detector) must be present in each oscillator module to obtain internal leveling. However, external leveling may be used on any oscillator module with or without Option 001.

4. If BAND 1 2 is selected (0.1 to 2 GHz) or if oscillator used has Option 001, internal leveling may be checked as follows:

Set 8621B ALC switch 16 to INT. Oscilloscope trace should be leveled and 8621B UNLEVELED light 17 should not be lit. (Refer to Figures 3-6 and 3-7 for typical oscilloscope display of unleveled and leveled RF Power Output.) If light is lit, reduce output power by turning 8621B POWER LEVEL control 18 counterclockwise until UNLEVELED light goes out. Oscilloscope trace should be leveled.
5. Set 8620C MARKERS switch 7 to INTEN position and three markers should appear on oscilloscope trace as intensity spots. Set MARKERS switch to AMPL position and markers should appear on oscilloscope trace as pips.
6. Press MARKER SWEEP pushbutton 14; pushbutton should light. CW Marker should appear at center of trace as indicated by white CW MARKER pointer 9. Sweep should begin at frequency setting of START MARKER pointer 5 and end at frequency setting of STOP MARKER pointer 12.
7. Set 8620C MODE switch 27 to MANUAL position and adjust MANUAL control 28. Trace dot should move across oscilloscope. Set MODE switch to AUTO.
8. Press 8620C CW pushbutton 8; pushbutton should light and trace on oscilloscope should be a dot. Move pointer 9 with CW control and dot should move across oscilloscope.
9. Press 8620C CW VERNIER pushbutton 11 and pushbutton should light. Adjusting CW VERNIER control moves white marker 10 above CW VERNIER control and dot on oscilloscope should also move across CRT at a very slow rate and through a narrow range. CW VERNIER slide switch 13 selects a 0.1 multiplier (X.1 position) for CW vernier scale; in X1 position, scale is read directly.

Figure 3-3. Operator's Checks (3 of 4)

OPERATOR'S CHECKS

10. Press 8620C ΔF pushbutton **6** and ΔF and CW **8** pushbuttons should light. Deviation from CW frequency is selected by ΔF control, and adjusting it moves white marker **3** above the control. ΔF slide switch **4** selects a 0.1 multiplier (X.1 position), 1.0 multiplier (X1 position), or 10 multiplier (X10 position).
11. Set 8621B ALC switch **16** to OFF, adjust 8620C ΔF control **6** between zero and maximum. Sweep trace should be displayed on oscilloscope and should change as ΔF control is adjusted.

Figure 3-3. Operator's Checks (4 of 4)

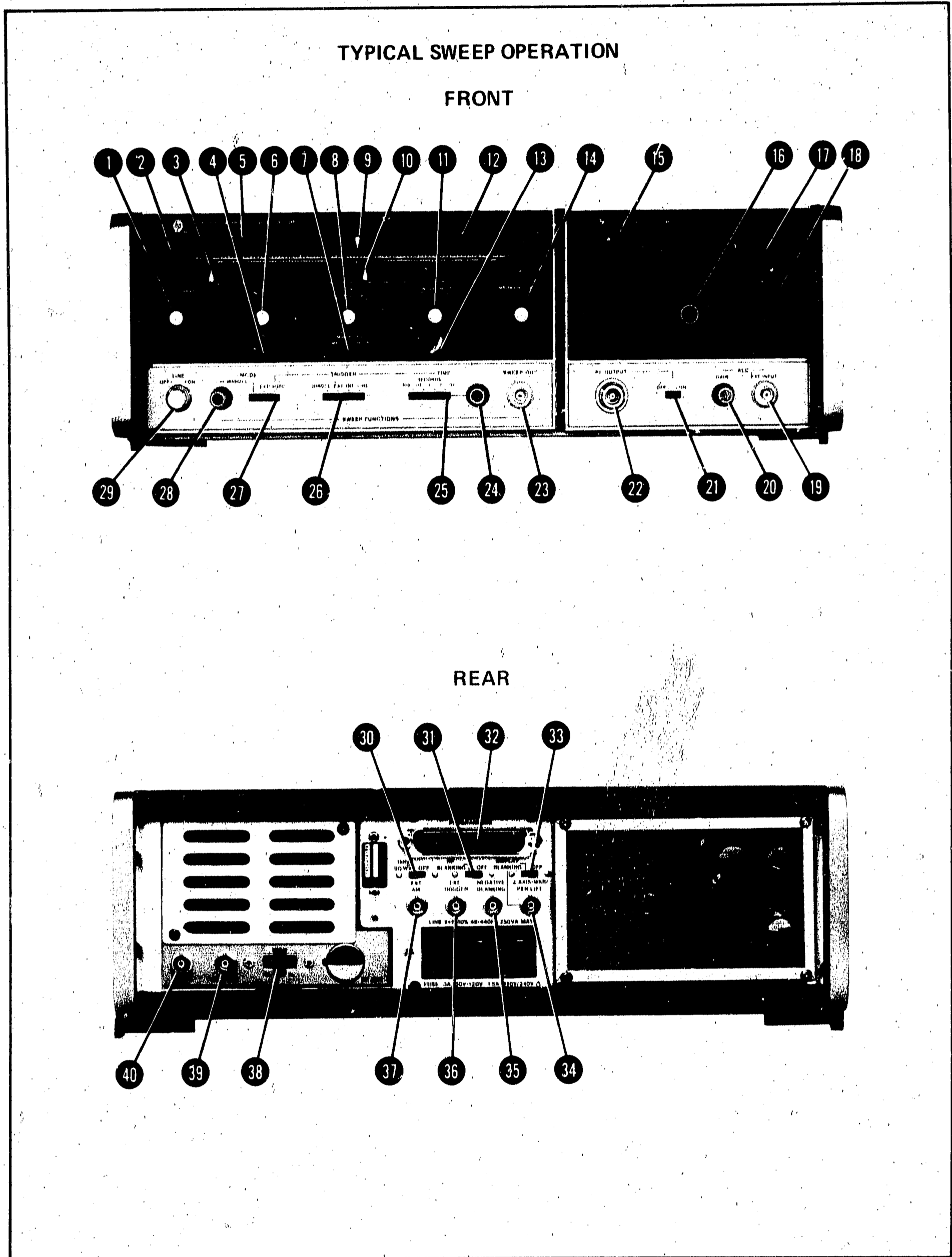
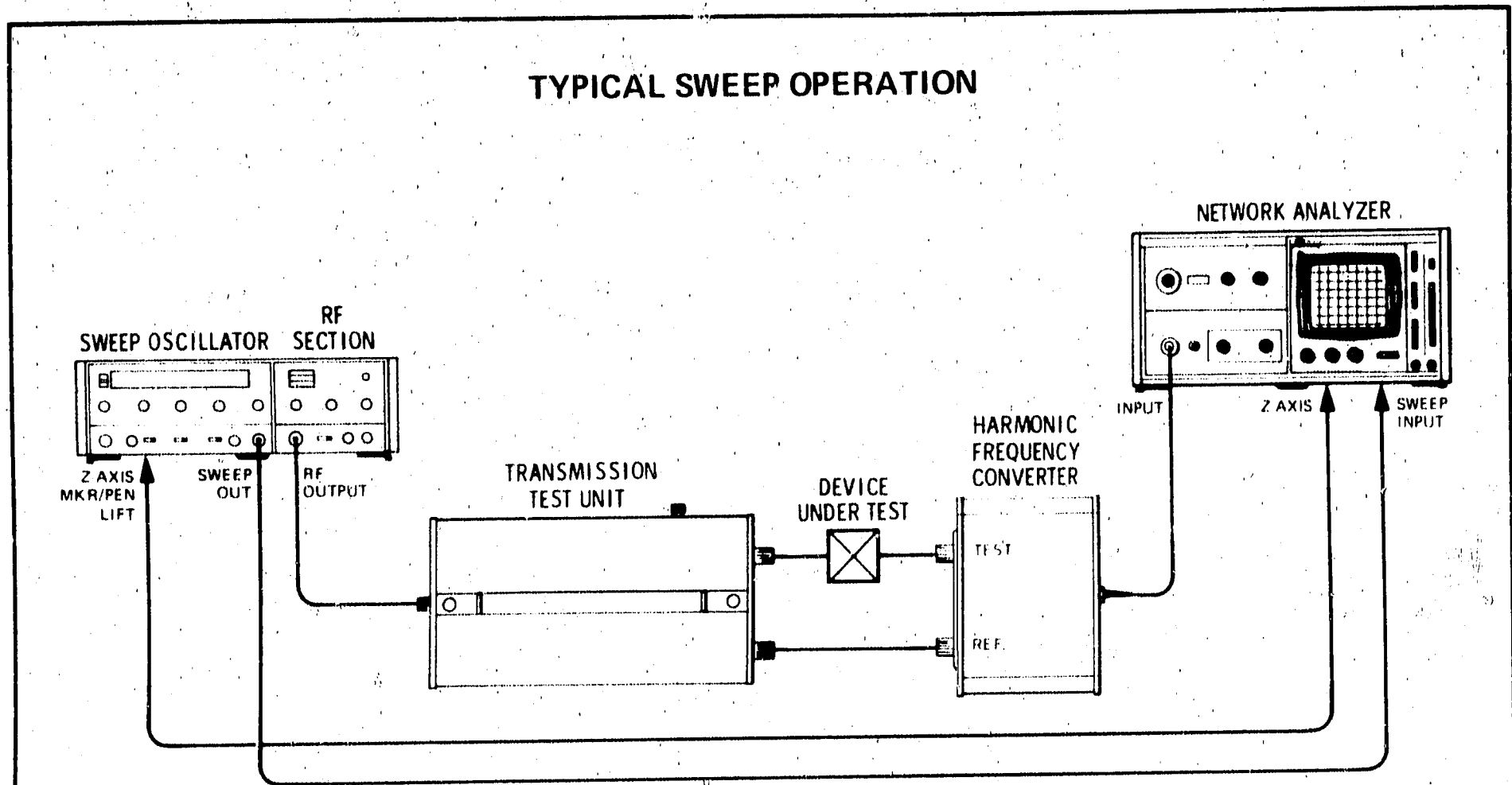


Figure 3-4. Typical Sweep Operation Using 8410B Network Analyzer (1 of 3)



EQUIPMENT:	Sweep Oscillator	HP 8620C
	Network Analyzer	HP 8410B/8412A
	Transmission Test Unit	HP 8740A
	Harmonic Frequency Converter	HP 8411A

1. Set controls as follows:

- 8620C:**
- BAND **2** Frequency of Oscillator Module
 - START MARKER pointer **5** Low frequency end of scale
 - STOP MARKER pointer **12** High frequency end of scale
 - CW MARKER pointer **9** Marker frequency selected
 - MARKERS **7** OFF
 - MODE **27** AUTO
 - TRIGGER **26** INT
 - TIME-SECONDS **25** 0.1-.01
 - TIME-SECONDS Vernier **24** Fully clockwise
 - 1 kHz SQWV/OFF (rear panel) **30** OFF
 - DISPLAY BLANKING/OFF (rear panel) **33** DISPLAY BLANKING
 - RF BLANKING/OFF (rear panel) **31** OFF
- 8621B:**
- RF OUTPUT **21** **22** ON
 - POWER LEVEL **18** Fully clockwise
 - ALC **16** OFF
 - ALC-GAIN **20** Fully clockwise
 - FM-NORM-PL (rear panel) **38** NORM (Normal)

Figure 3-4. Typical Sweep Operation Using 8410B Network Analyzer (2 of 3)

TYPICAL SWEEP OPERATION

2. Press LINE pushbutton 29 to turn-on mainframe; LINE 29 and FULL SWEEP 1 pushbuttons should light. One of the frequency-display lamps 15 should light on 8621B. In sweep mode, a ramp sweep voltage is supplied through SWEEP OUT front-panel connector 23 to display equipment.
3. Adjust 8621B POWER LEVEL control 18 for desired power level at 8410B Network Analyzer.

NOTE

Normal operation requires a sweep from low frequency to high frequency. However, the Model 8620C will also sweep from high to low frequency by setting START MARKER pointer 5 to high-frequency end of scale and setting STOP MARKER pointer 12 at low-frequency end of scale and pressing MARKER SWEEP pushbutton 14.

4. For normal sweep-mode operation, set 8620C MODE switch 27 to AUTO and the sweep signal is obtained from internal sweep oscillator. This is the only position of the MODE switch that allows TRIGGER 26 and TIME 25 switches to operate. However, if an external sweep source is used, set MODE switch to EXT position. The EXT SWEEP is routed through rear-panel PROGRAMMING connector 32 to MODE switch EXT position. If it is necessary to sweep band manually, set MODE to MANUAL position and adjust MANUAL control 28. In MANUAL position, a tuning voltage is supplied through SWEEP OUT front-panel connector 23 to display instrument.
5. For normal sweep operation, set 8620C TRIGGER switch 26 to INT position. This provides automatic repetitive sweep. If a single sweep is to be viewed, press TRIGGER switch to SINGLE position and release. Repeat this for each single sweep. TRIGGER EXT position connects trigger input circuit to rear-panel EXT TRIGGER connector 36. LINE position allows sweep to be triggered by line frequency.
6. Set 8620C TIME-SECONDS switch 25 to desired range, and adjust TIME-SECONDS Vernier control 24 to desired sweep time.
7. When sweep oscillator operates with a phase-locked system such as the Model 8410B/8411A Network Analyzer, the 8620C rear-panel DISPLAY BLANKING/OFF switch 33 must not be set to OFF. In DISPLAY BLANKING, a blanking pulse is supplied through Z-AXIS/MKR/PEN LIFT output connector 34 to network analyzer.
8. A marker is added to the sweep by selecting correct position of 8620C MARKERS slide switch 7. When using sweeper in a phase-locked system such as the Model 8410B/8411A Network Analyzer, set MARKERS slide switch to INTEN position. Marker should appear as high-intensity dot on trace of display instrument by intensity modulating the Z-axis. Intensity modulation signal is available at rear-panel Z-AXIS/MKR/PEN LIFT output 34.
9. Pressing ΔF pushbutton switch 6 lights both the ΔF and CW 8 pushbuttons. Center frequency is selected by CW MARKER control 8 and indicated by location of white pointer 9 on top dial. Amount of deviation from selected CW frequency is set by ΔF control. The ΔF scale is short scale directly above ΔF control.

Figure 3-4. Typical Sweep Operation Using 8410B Network Analyzer (3 of 3)

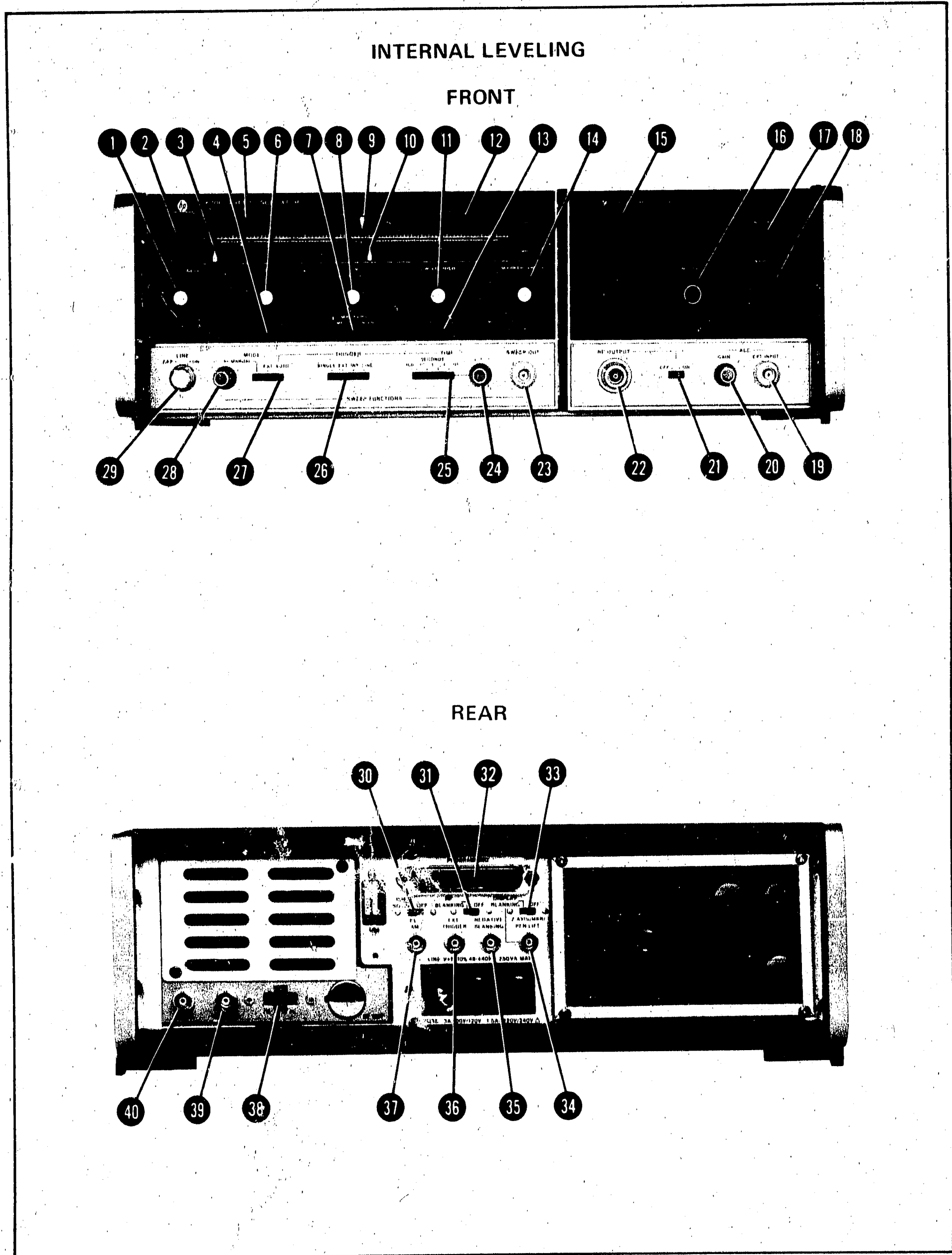
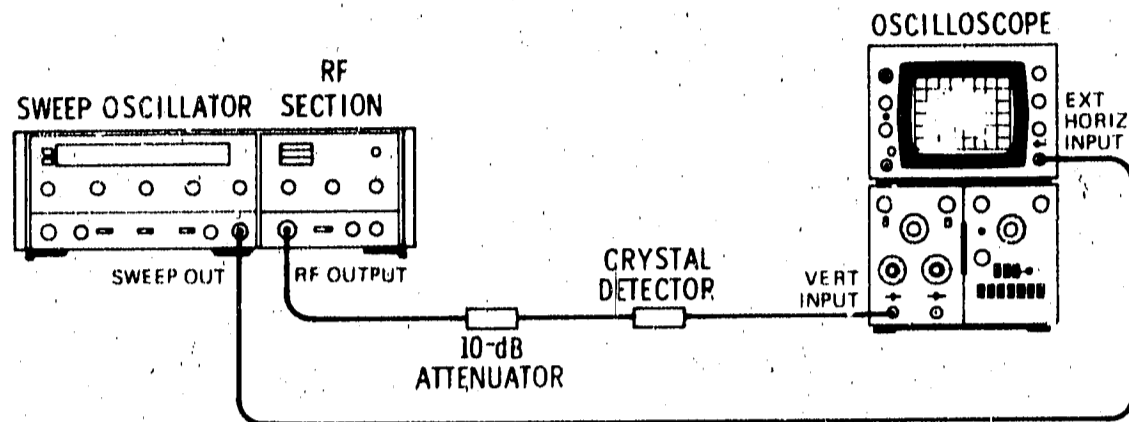


Figure 3-5. Internal Leveling (1 of 3)

INTERNAL LEVELING



EQUIPMENT:	Sweep Oscillator	HP 8620C
	Oscilloscope	HP 180C/1801A/1820C
	Crystal Detector (negative output)	HP 423A
	10-dB Attenuator	HP 8491B, Option 010

1. Connect equipment as shown above.

NOTE

The oscillator selected must have an internal directional detector to operate in internal leveling mode. If the RF module selected does not have the internal leveling option, the RF output will either be at maximum or minimum.

2. Set controls as follows:

8620C:	
BAND 2	Frequency of Oscillator Module
MARKERS 7	OFF
MODE 21	AUTO
TRIGGER 26	INT
TIME-SECONDS 25	0.1—.01
TIME-SECONDS Vernier 24	Fully clockwise
1 kHz SQWV/OFF (rear panel) 30	OFF
DISPLAY BLANKING/OFF (rear panel) 33	OFF
RF BLANKING/OFF (rear panel) 31	OFF
8621B:	
RF OUTPUT 21 22	ON
POWER LEVEL 18	Fully clockwise
ALC 16	INT
ALC-GAIN 20	Fully clockwise
FM-NORM-PL (rear panel) 38	NORM (Normal)

Figure 3-5. Internal Leveling (2 of 3)

INTERNAL LEVELING

3. Press LINE pushbutton 29 to turn-on mainframe; LINE 29 and FULL SWEEP 1 pushbuttons should light indicating FULL SWEEP mode is selected. A frequency-display lamp 15 should light on 8621B.
4. From fully clockwise position, slowly adjust POWER LEVEL control 18 counterclockwise until UNLEVELED lamp 17 goes out. This is adjustment point for maximum leveled power. Oscilloscope trace should be leveled as shown in Figure 3-7. Adjust ALC GAIN 20 to eliminate any ALC loop oscillations as shown in Figure 3-8.

Figure 3-5. Internal Leveling (3 of 3)

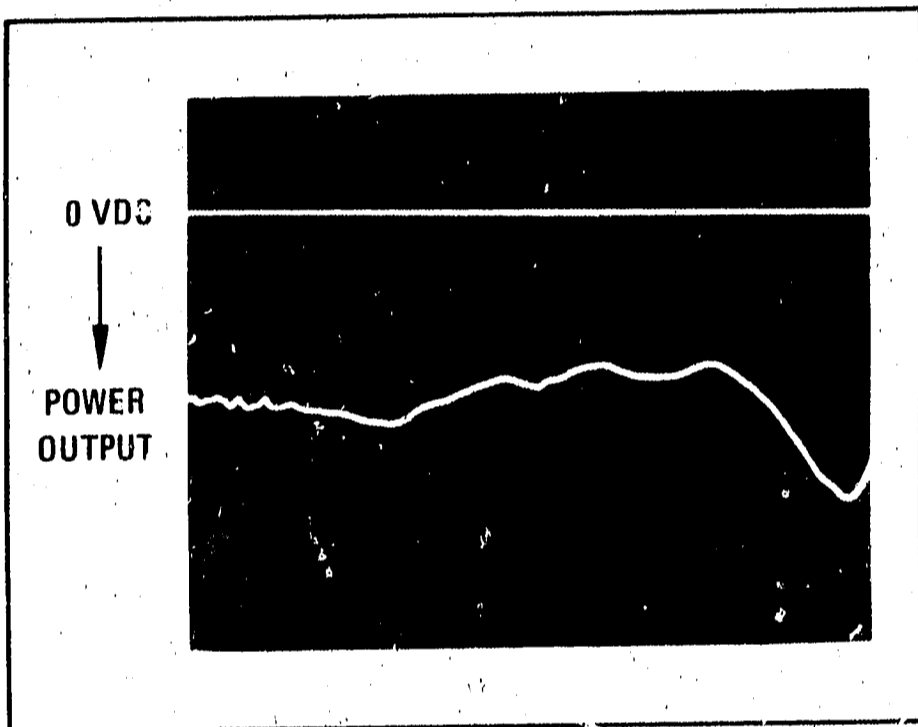


Figure 3-6. Unleveled RF Power Output

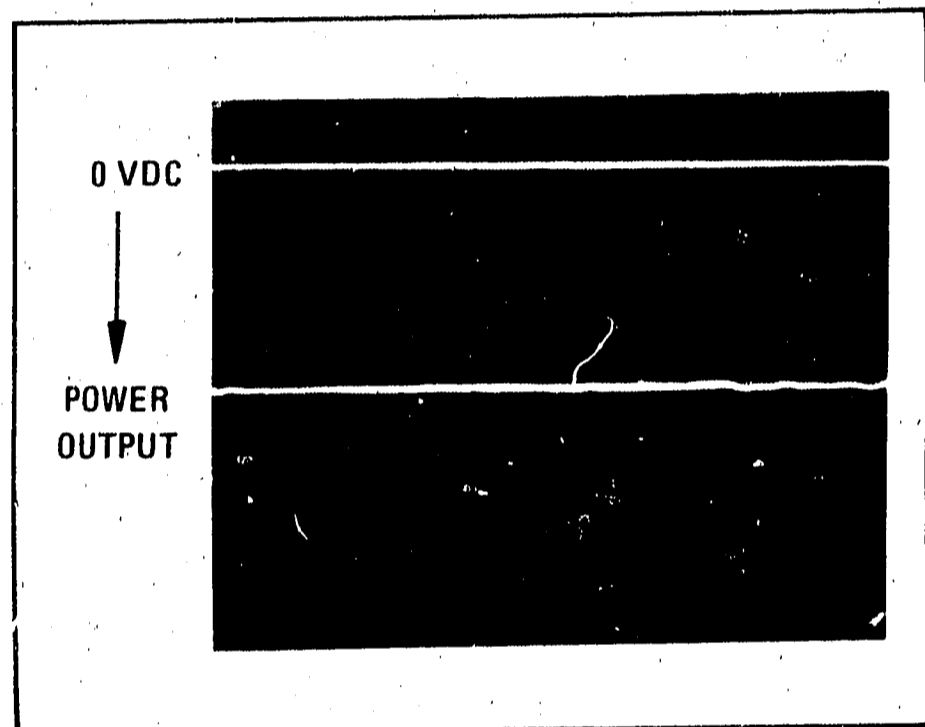


Figure 3-7. Leveled RF Power Output

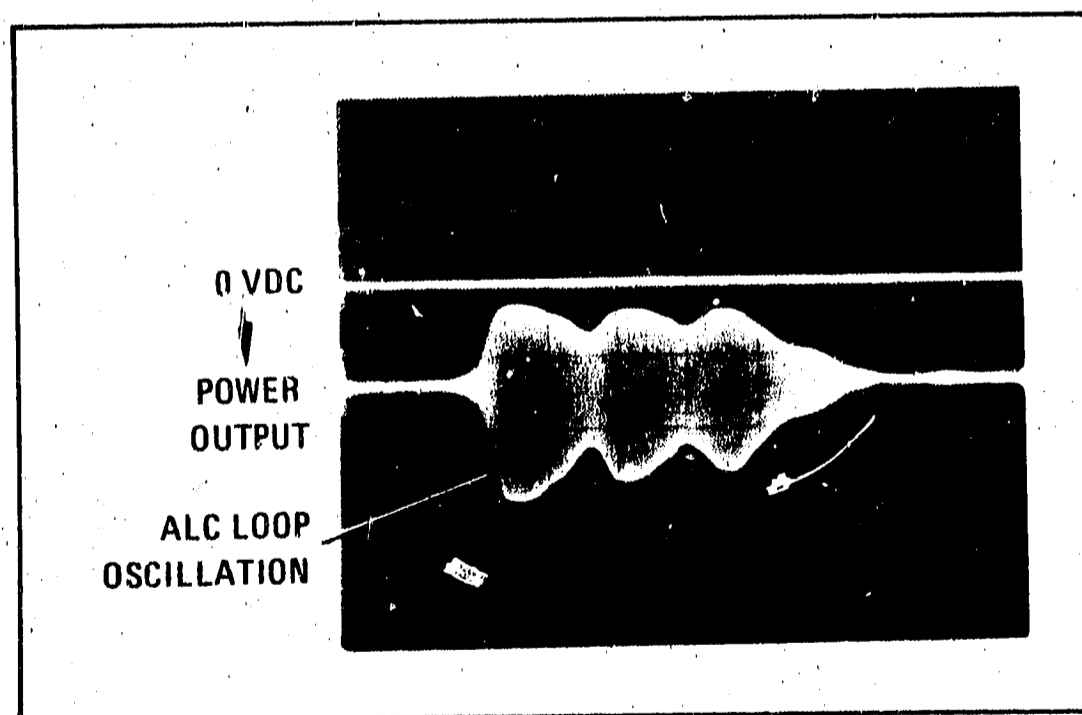


Figure 3-8. Oscillations Due to Excessive ALC Loop Gain

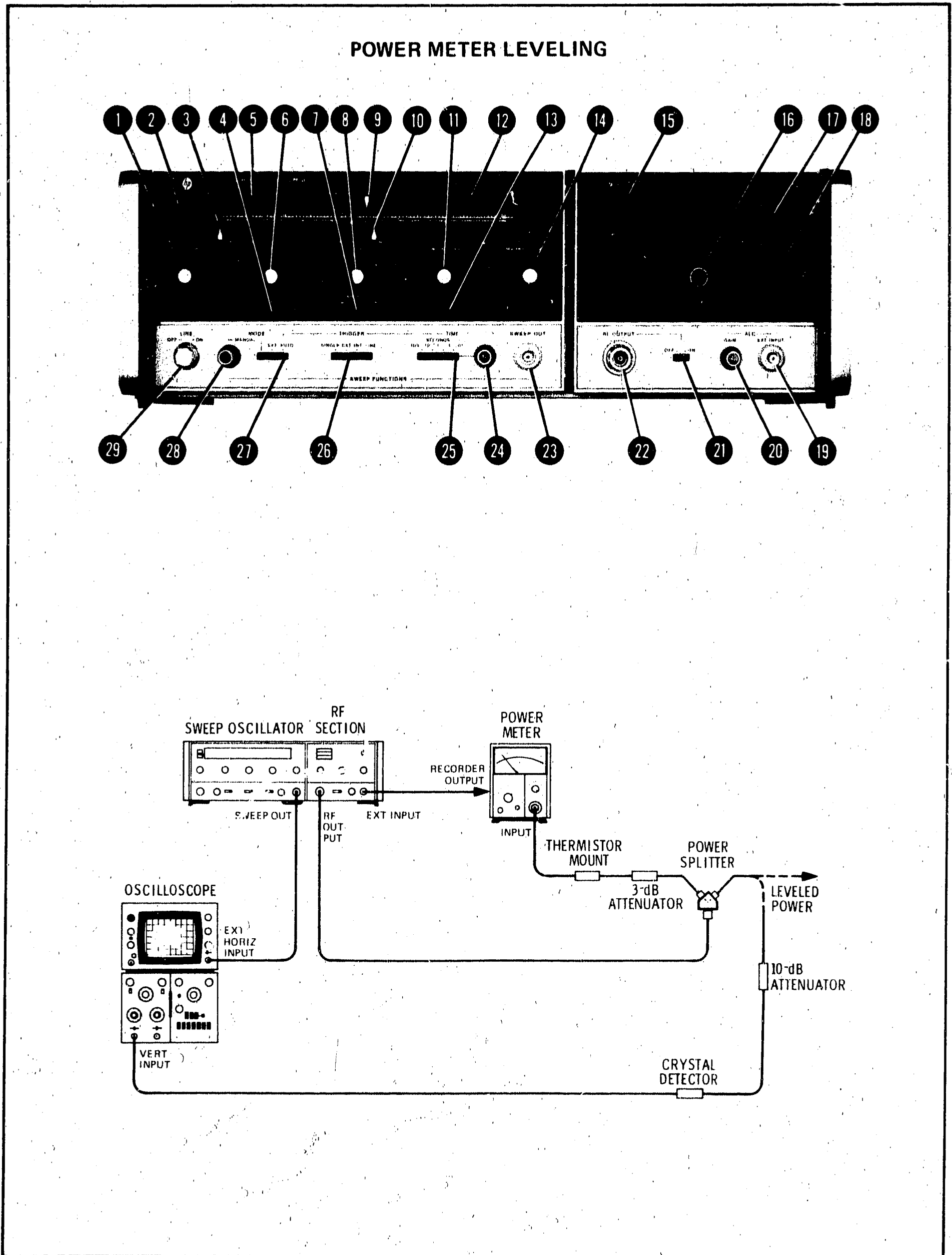


Figure 3-9. Power Meter Leveling (1 of 3)

POWER METER LEVELING

EQUIPMENT:	Sweep Oscillator	HP 8620C
	Oscilloscope	HP 180C/1801A/1820C
	Power Meter	HP 432A
	Power Splitter	HP 11667A
	Thermistor Mount	HP 478A
	Crystal Detector	HP 423A
	3-dB Attenuator	HP 8491A, Option 003
	10-dB Attenuator	HP 8491A, Option 010

NOTES

Power Meter switch S1 inside 8621B on ALC amplifier board must be set to either "431" or "432" to match power meter used.

Power meter leveling cannot be used at fast sweep rates. Leveling is limited by response time of the thermistor mount.

1. Connect equipment as shown in test setup.
2. Before inserting 8621B into mainframe, select either 431 or 432 position at power meter switch located at top of ALC amplifier board.
3. Set controls as follows:

8620C:

BAND 2	Frequency of Oscillator Module
MARKERS 7	OFF
MODE 27	AUTO
TRIGGER 26	INT
TIME-SECONDS 25	100-10
TIME-SECONDS Vernier 24	Fully clockwise
1 kHz SQWV/OFF (rear panel) 30	OFF
DISPLAY BLANKING/OFF (rear panel) 33	OFF
RF BLANKING/OFF (rear panel) 31	RF BLANKING

8621B:

RF OUTPUT 21 22	ON
POWER LEVEL 18	Fully clockwise
ALC 16	MTR (Power Meter)
ALC-GAIN 20	Fully counterclockwise
FM-NORM-PL (rear panel) 38	NORM((Normal)

4. Press 8620C LINE pushbutton 29 to turn-on mainframe; LINE 29 and FULL SWEEP 1 pushbuttons should light. A frequency-display lamp 15 should light on 8621B.

Figure 3-9. Power Meter Leveling (2 of 3)

POWER METER LEVELING

5. Select range on power meter to obtain indication near top 1/3 meter scale.
6. Adjust 8621B ALC GAIN control **20** clockwise until leveling across band occurs as shown in Figure 3-7. If trace is not leveled or is only partially leveled (as shown in Figure 3-6) with ALC GAIN fully clockwise, reduce RF OUTPUT power. This is done by adjusting POWER LEVEL control **18** counterclockwise until leveling occurs as shown in Figure 3-7. If oscillations appear on trace as shown in Figure 3-8, turn ALC GAIN control counterclockwise. With proper leveling across the band, the 8621B UNLEVELED light **17** should be out.

Figure 3-9. Power Meter Leveling (3 of 3)

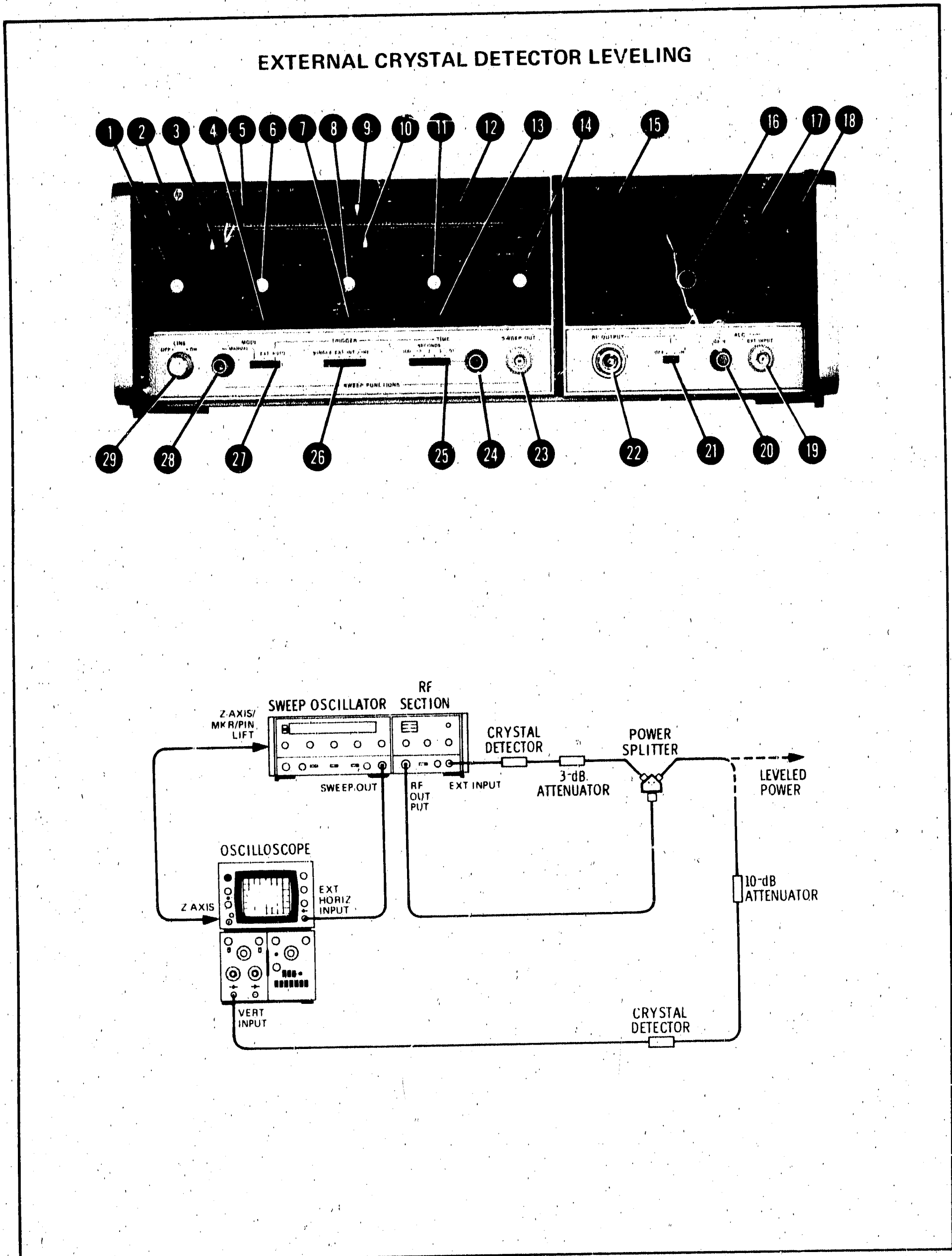


Figure 3-10. External Crystal Detector Leveling (1 of 2)

EXTERNAL CRYSTAL DETECTOR LEVELING

EQUIPMENT:	Sweep Oscillator	HP 8620C
	Oscilloscope	HP 180C/1801A/1820C
	Crystal Detector	HP 423A (2 required)
	3-dB Attenuator	HP 8491B, Option 003
	10-dB Attenuator	HP 8491B, Option 010
	Power Splitter	HP 11667A

1. Connect equipment as shown in test setup. Slide 8621B RF Section out about four inches from mainframe and set polarity switch at top of ALC board to either negative (-) or positive (+) to match the crystal detector being used in ALC loop. Slide 8621B into mainframe. The 8621B is factory adjusted for negative (-) output crystal detectors.

NOTE

Crystal output signal must be between 25 mVdc and 350 mVdc.

2. Set controls as follows:

8620C:

BAND 2	Frequency of Oscillator Module
MARKERS 7	OFF
MODE 27	AUTO
TRIGGER 26	INT
TIME-SECONDS 25	0.1-.01
TIME-SECONDS Vernier 24	Fully clockwise
1 kHz SQWV/OFF (rear panel) 30	OFF
DISPLAY BLANKING/OFF (rear panel) 33	OFF
RF BLANKING/OFF (rear panel) 31	RF BLANKING

8621:

RF OUTPUT 21 22	ON
POWER LEVEL 18	Fully clockwise
ALC 16	EXT
ALC-GAIN 20	Fully clockwise
FM-NORM-PL (rear panel) 38	NORM (Normal)

3. Press 8620C LINE pushbutton **29** to turn-on mainframe: LINE **29** and FULL SWEEP **1** pushbuttons should light. A frequency-display lamp **15** should light on 8621B.
4. Adjust 8621B ALC GAIN **20** and POWER LEVEL **18** controls fully clockwise for maximum RF power OUTPUT and maximum ALC loop gain. One of the conditions shown in Figures 3-6 through 3-8 should be displayed on oscilloscope. If trace is unlevelled, as shown in Figure 3-6 or just partially leveled and UNLEVELED light **17** is on, turn POWER LEVEL control **18** counterclockwise to reduce power output until trace is level across the band as shown in Figure 3-7. If ALC loop gain is too high, oscillations may occur as shown in Figure 3-8. To remove oscillations, reduce ALC loop gain by turning 8621B ALC GAIN control **20** counterclockwise.

Figure 3-10. External Crystal Detector Leveling (2 of 2)

3-17. OPERATOR'S MAINTENANCE

3-18. Operator maintenance on the 8621B consists of replacing defective front panel frequency-display lamps and installing the plastic lenses that show the frequency ranges of the oscillator modules.

3-19. Figure 3-11 shows the lamp removal and replacement procedure. Lighting of these lamps indicates both the band selected (oscillator in use) and the range of frequencies for the oscillator. For example, lighting the center lens with 1.8-4.2 GHz tells the operator that an oscillator module in Position 2 of the 8621B is operating (BAND 2 selected at the 8620 Series mainframe) and has a frequency range of 1.8 to 4.2 GHz. Should an

oscillator module with a frequency range of 8.0 to 12.4 GHz be placed in Position 3, a lens with that frequency range etched on it must be inserted in the (BAND 3) position.

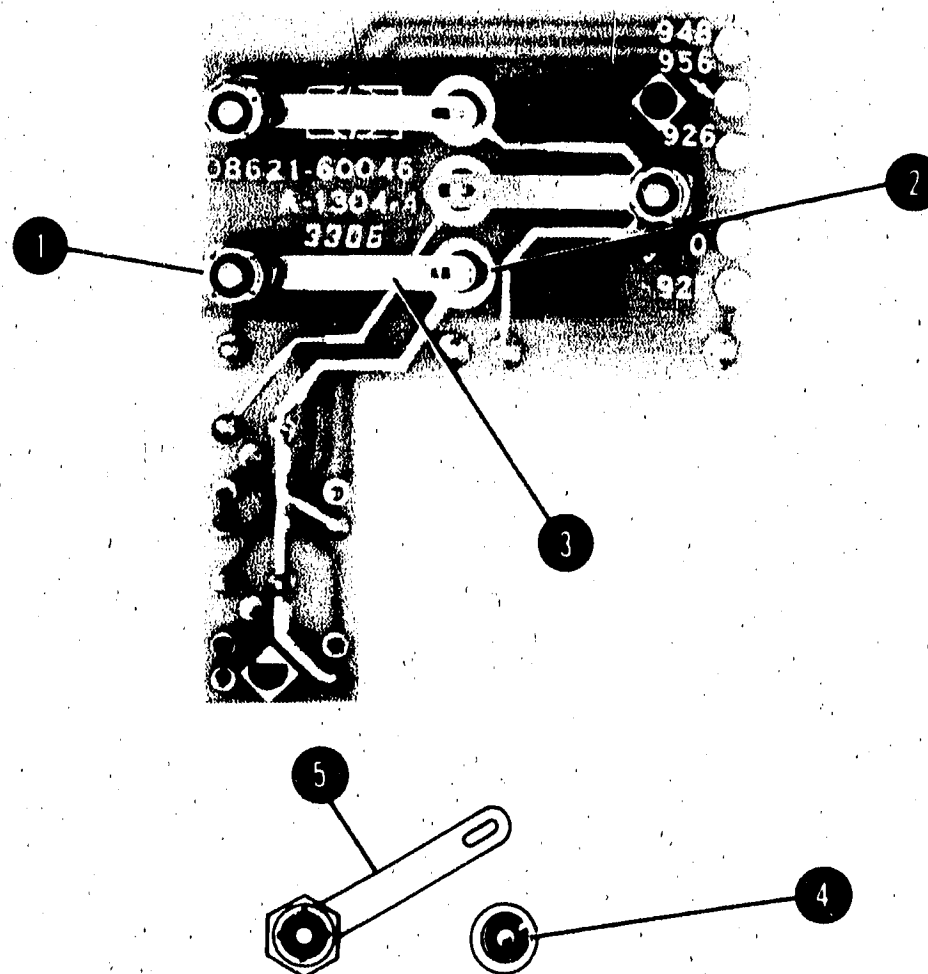
3-20. The frequency-display lenses are blocks of plastic and are supplied with the oscillator modules. The frequency range inscribed on the lens depends on the RF Oscillator Module. Figure 3-12 shows the removal and installation procedure. Table 3-1 gives the information needed to order frequency-display lenses.

3-21. Replacement of the UNLEVELED lamp is shown in Section VIII as a maintenance procedure. (See Figure 8-3).

Table 3-1. Frequency-Display Lenses

Oscillator Module	Frequency Range of Lens	HP Part Number
86320B	0.1-2.0 GHz	86320-00014
86330B	1.8-4.2 GHz	86330-00014
86331B	1.7-4.3 GHz	86331-00014
86341B	3.2-6.5 GHz	86341-00014
86342A	5.9-9.0 GHz	86342-00014
86350A	8.0-12.4 GHz	86350-00014
86351A	10.7-11.7 GHz	86351-00014
86352A	8.5-10.5 GHz	86352-00014
	Blank (no numbers etched on lens)	08621-00034

FREQUENCY DISPLAY LAMP REPLACEMENT



1. Remove power from 8621B RF Section by switching off mainframe.
2. Slide 8621B out of mainframe.
3. Remove A1 ALC Amplifier board (see Figure 8-10) to obtain access to A3 Lamp Assembly.
4. On Lamp Assembly do the following:
 - a. Slightly loosen 1/4-inch self-locking hex nut 1 for defective lamp.

CAUTION

Forcing the spring to turn when the lock nut is too tight may bend the spring.

- b. With screwdriver or fingernails, rotate spring 5 until base of bulb 4 is exposed. Spring is only tension holding bulb in place.

NOTE

To expose base of the bulb, it may be necessary to lift the spring slightly as it is turned. However, lifting the spring too far may bend it and reduce spring tension.

- c. With spring rotated, bulb slips out easily.

Figure 3-11. Frequency-Display Lamp Replacement (1 of 2)

FREQUENCY-DISPLAY LAMP REPLACEMENT

- d. Install new bulb and reposition spring **3** over base of bulb. Ensure that metal flange of bulb **2** is flush with printed circuit board.
- e. Tighten lock nut **1**.

Figure 3-11. Frequency-Display Lamp Replacement (2 of 2)

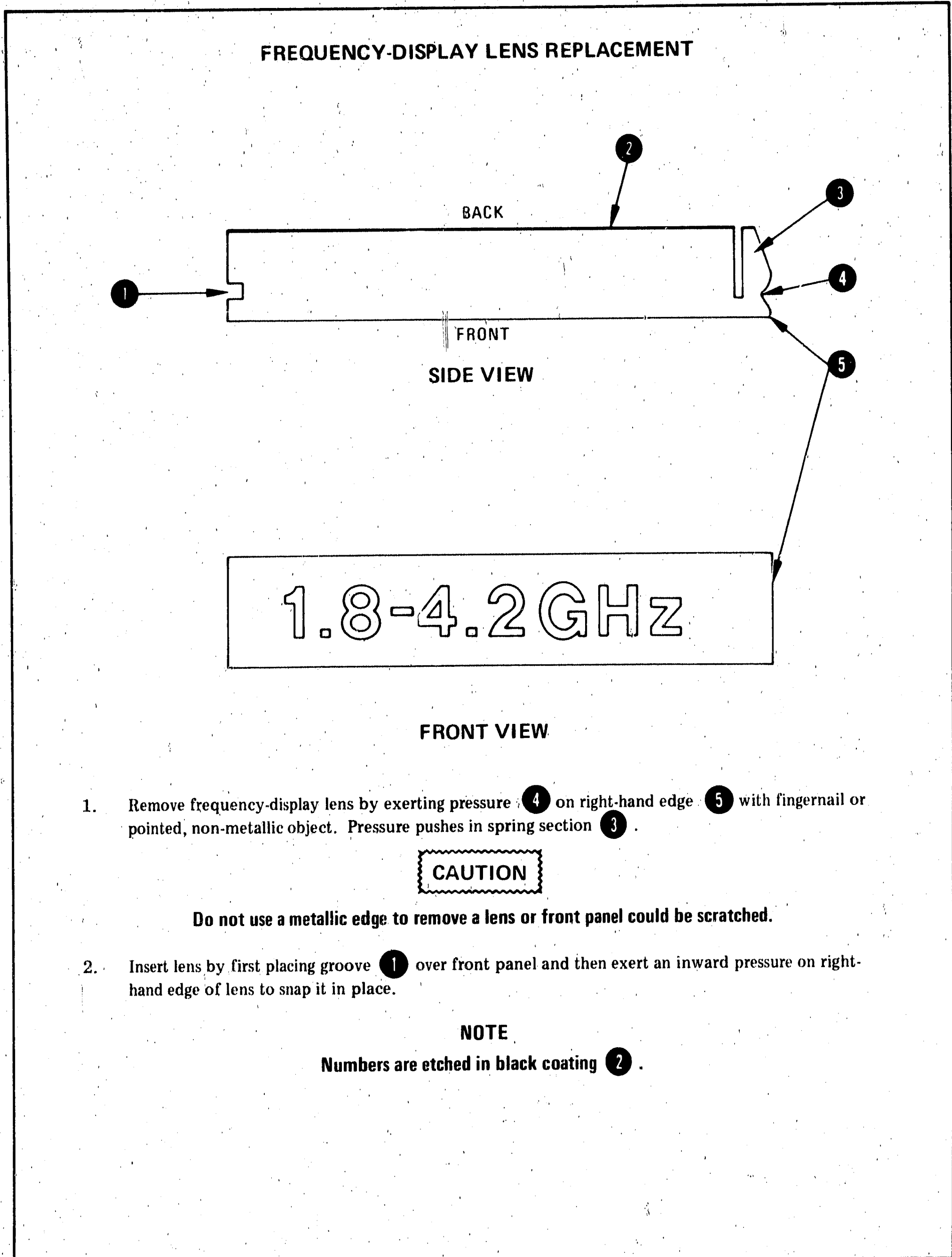


Figure 3-12. Frequency-Display Lens Removal and Installation

PERFORMANCE

CHECK

ADJUSTMENTS

SECTION IV PERFORMANCE TESTS

4-1. INTRODUCTION

4-2 There are no performance tests for the HP 8621B RF Section as a separate unit. Performance tests are done in conjunction with oscillator modules and a mainframe. The performance test

procedures are found in the operating and service manuals for the oscillator modules (HP 86300 series) and mainframes. Appendix B contains a performance test for testing the 70-dB programmable attenuator. This test checks the attenuation accuracy.

SECTION V ADJUSTMENTS

5-1. INTRODUCTION

5-2. This section provides adjustment procedures for the Model 8621B. Allow 30 minutes warmup time before performing any adjustments.

5-3. EQUIPMENT REQUIRED

5-4. Table 1-2 lists the equipment required for the adjustment procedure. If the test equipment

recommended is not available, other equipment may be used if its performance meets the critical specifications listed in the table.

5-5. LOCATION OF ADJUSTMENT

5-6. For the location of the adjustment, refer to Figure 8-17.

ADJUSTMENTS

5-7. EXTERNAL PREAMPLIFIER ALC OFFSET ADJUSTMENT

DESCRIPTION: The OFFSET adjustment of the ALC Amplifier is adjusted for crystal detector leveling. The OFFSET is adjusted for maximum power attenuation of the PIN Modulator with POWER LEVEL central in fully counterclockwise position.

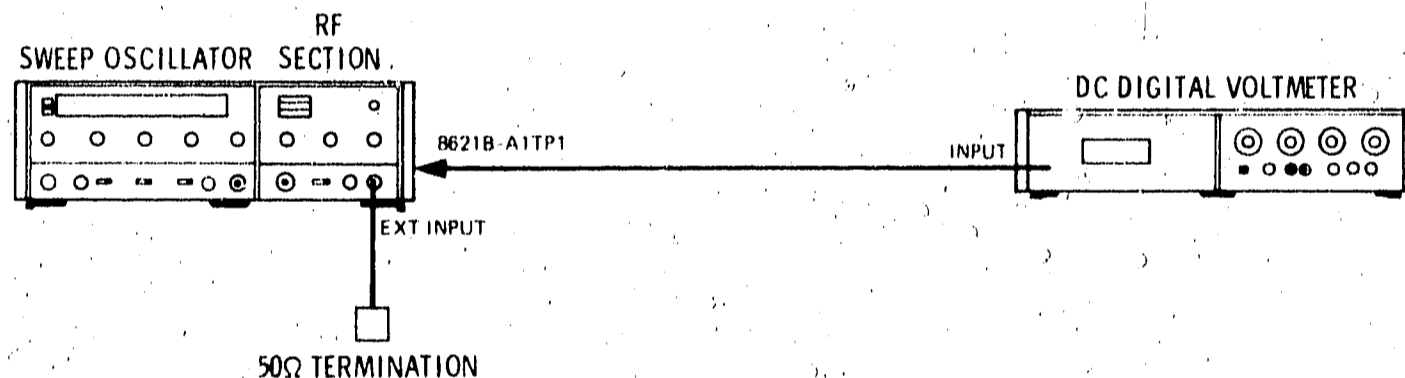


Figure 5-1. ALC Offset Adjustment Test Setup

EQUIPMENT:	Sweep Oscillator	HP 8620C
	DC Digital Voltmeter	HP 3480D/3484A
	50-ohm Termination	HP 1250-0207

- PROCEDURE:**
- a. To obtain access to OFFSET adjustment remove 8621B RF Section from main-frame and connect extender cable HP Part No. 08620-60032 (Figure 1-2) or 36-pin extender HP Part No. 08621-60056 (Figure 1-3).
 - b. Connect equipment as shown in Figure 5-1. Set crystal detector polarity switch A1S2 to either negative (−) or positive (+) to match crystal detector to be used. (See Figure 8-17 for location of OFFSET adjustment and Figure 8-18 for location of A1S2 polarity switch.)

ADJUSTMENTS

5-7. EXTERNAL PREAMPLIFIER ALC OFFSET ADJUSTMENT (Cont'd)

c. Set controls as follows:

8620C:

BAND Any selected range
LINE ON

8621B:

RF OUTPUT ON
ALC EXT
POWER LEVEL Fully counterclockwise

d. Press 8620C CW pushbutton.

e. Adjust ALC OFFSET adjustment A1R60 for +0.250 Vdc ±0.01 Vdc at A1TP1.

PARTS

LIST

SECTION VI

REPLACEABLE PARTS

6-1. INTRODUCTION

6-2. This section contains information for ordering parts. Table 6-1 lists abbreviations used in the parts list and throughout the manual. Table 6-2 lists all replaceable parts in reference designator order. Table 6-3 contains names and address that correspond to the manufacturer's code numbers.

6-3. ABBREVIATIONS

6-4. Table 6-1 lists abbreviations used in the parts list, schematics, and throughout the manual. In some cases, two forms of the abbreviation are given, one uses all capital letters, and one partial or no capitals. This occurs because the abbreviations in the parts list are always all capitals. However, in the schematics and other parts of the manual, other abbreviation forms are used with both lower case and upper case letters.

6-5. REPLACEABLE PARTS LIST

6-6. Table 6-2 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-numeric order by reference designation.
- c. Miscellaneous parts.

- d. Illustrated parts breakdown, if appropriate.

The information given for each part consists of the following:

- a. The Hewlett-Packard part number.
- b. The total quantity (Qty) in the instrument.
- c. The description of the part.
- d. The typical manufacturer of the part in a five-digit code.
- e. Manufacturer code number for the part.

NOTE

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

6-7. ORDERING INSTRUCTIONS

6-8. To order a part listed in the replaceable parts table, quote the Hewlett-Packard part number, indicate quantity required, and address the order to the nearest Hewlett-Packard office.

6-9. To order a part that is not listed in the replaceable parts table, include the instrument model number, instrument serial number, the description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard office.

Table 6-1. Reference Designations and Abbreviations

REFERENCE DESIGNATIONS

A assembly	E miscellaneous electrical part	P electrical connector (movable portion); plug	U integrated circuit; microcircuit
AT attenuator; isolator; termination	F fuse	Q transistor; SCR; triode thyristor	V electron tube
B fan; motor	FL filter	R resistor	VR voltage regulator; breakdown diode
BT battery	H hardware	RT thermistor	W cable; transmission path; wire
C capacitor	HY circulator	S switch	X socket
CP coupler	J electrical connector (stationary portion); jack	T transformer	Y crystal unit (piezo-electric or quartz)
CR diode; diode thyristor; varactor	K relay	TB terminal board	Z tuned cavity; tuned circuit
DC directional coupler	L coil; inductor	TC thermocouple	
DL delay line	M meter	TP test point	
DS annunciator; signaling device (audible or visual); lamp; LED	MP miscellaneous mechanical part		

ABBREVIATIONS

A ampere	COEF coefficient	EDP electronic data processing	INT internal
ac alternating current	COM common	ELECT electrolytic	kg kilogram
ACCESS accessory	COMP composition	ENCAP encapsulated	kH _z kilohertz
ADJ adjustment	COMPL complete	EXT external	kΩ kilohm
A/D analog-to-digital	CONN connector	F farad	kV kilovolt
AF audio frequency	CP cadmium plate	FET field-effect transistor	lb pound
AFC automatic frequency control	CRT cathode-ray tube	F/F flip-flop	LC inductance-capacitance
AGC automatic gain control	CTL complementary transistor logic	FH flat head	LED light-emitting diode
AL aluminum	CW continuous wave	FIL H fillister head	LF low frequency
ALC automatic level control	cm centimeter	FM frequency modulation	LG long
AM amplitude modulation	D/A digital-to-analog	FP front panel	LH left hand
AMPL amplifier	dB decibel	FREQ frequency	LIM limit
APC automatic phase control	dBm decibel referred to 1 mW	FXD fixed	LIN linear taper (used in parts list)
ASSY assembly	dc direct current	g gram	lin linear
AUX auxiliary	deg degree (temperature interval or difference)	GE germanium	LK WASH lock washer
avg average	° degree (plane angle)	GHz gigahertz	LO low; local oscillator
AWG American wire gauge	°C degree Celsius (centigrade)	GL glass	LOG logarithmic taper (used in parts list)
BAL balance	°F degree Fahrenheit	GRD ground(ed)	log logarithm(ic)
BCD binary coded decimal	K degree Kelvin	H henry	LPF low pass filter
BD board	DEPC deposited carbon	h hour	LV low voltage
BE CU beryllium copper	DET detector	HET heterodyne	m meter (distance)
BFO beat frequency oscillator	diam diameter	HEX hexagonal	mA milliampere
BH binder head	DIA diameter (used in parts list)	HD head	MAX maximum
BKDN breakdown	DIFF AMPL differential amplifier	HDW hardware	MΩ megohm
BP bandpass	div division	HF high frequency	MEG meg (10 ⁶) (used in parts list)
BPF bandpass filter	DPDT double-pole, double-throw	HG mercury	MET FLM metal film
BRS brass	DR drive	HI high	MET OX metallic oxide
BWO backward-wave oscillator	DSB double sideband	HP Hewlett-Packard	MF medium frequency; microfarad (used in parts list)
CAL calibrate	DTL diode transistor logic	HPF high pass filter	MFR manufacturer
ccw counter-clockwise	DVM digital voltmeter	HR hour (used in parts list)	mg milligram
CER ceramic	ECL emitter coupled logic	HV high voltage	MHz megahertz
CHAN channel	EMF electromotive force	Hz Hertz	mH millihenry
cm centimeter		IC integrated circuit	mho mho
CMO cabinet mount only		ID inside diameter	MIN minimum
COAX coaxial		IF intermediate frequency	min minute (time)
		IMPG impregnated minute (plane angle)
		in inch	MINAT miniature
		INCD incandescent	mm millimeter
		INCL include(s)	
		INP input	
		INS insulation	

NOTE

All abbreviations in the parts list will be in upper-case.

Table 6-1. Reference Designations and Abbreviations (cont'd)

MOD modulator	OD outside diameter	PWV peak working voltage	TD time delay
MOM momentary	OH oval head	RC resistance-capacitance	TERM terminal
MOS metal-oxide semiconductor	OP AMPL operational amplifier	RECT rectifier	TFT thin-film transistor
ms millisecond	OPT option	REF reference	TGL toggle
MTG mounting	OSC oscillator	REG regulated	THD thread
MTR meter (indicating device)	OX oxide	REPL replaceable	THRU through
mV millivolt	oz ounce	RF radio frequency	TI titanium
mVac millivolt, ac	Ω ohm	RFI radio frequency interference	TOL tolerance
mVdc millivolt, dc	P peak (used in parts list)	RH round head; right hand	TRIM trimmer
mVpk millivolt, peak	PAM pulse-amplitude modulation	RLC resistance-inductance-capacitance	TSTR transistor
mVp-p millivolt, peak-to-peak	PC printed circuit	RMO rack mount only	TTL transistor-transistor logic
mVrms millivolt, rms	PCM pulse-code modulation; pulse-count modulation	rms root-mean-square	TV television
mW milliwatt	PDM pulse-duration modulation	RND round	TVI television interference
MUX multiplex	pF picofarad	ROM read-only memory	TWT traveling wave tube
MY mylar	PH BRZ phosphor bronze	R&P rack and panel	U micro (10^{-6}) (used in parts list)
μ A microampere	PHL Phillips	RWV reverse working voltage	UF microfarad (used in parts list)
μ F microfarad	PIN positive-intrinsic-negative	S scattering parameter	UHF ultrahigh frequency
μ H microhenry	PIV peak inverse voltage	s second (time)	UNREG unregulated
μ mho micromho	pk peak	" second (plane angle)	V volt
μ s microsecond	PL phase lock	S-B slow-blow (fuse) (used in parts list)	VA voltampere
μ V microvolt	PLO phase lock oscillator	SCR silicon controlled rectifier; screw	Vac volts, ac
μ Vac microvolt, ac	PM phase modulation	SE selenium	VAR variable
μ Vdc microvolt, dc	PNP positive-negative-positive	SECT sections	VCO voltage-controlled oscillator
μ Vpk microvolt, peak	P/O part of	SEMICON semiconductor	Vdc volts, dc
μ Vp-p microvolt, peak-to-peak	POLY polystyrene	SHF superhigh frequency	VDCW volts, dc, working (used in parts list)
μ Vrms microvolt, rms	PORC porcelain	SI silicon	V(F) volts, filtered
μ W microwatt	POS positive; position(s) (used in parts list)	SIL silver	VFO variable-frequency oscillator
nA nanoampere	POSN position	SL slide	VHF very-high frequency
NC no connection	POT potentiometer	SNR signal-to-noise ratio	Vpk volts, peak
N/C normally closed	p-p peak-to-peak	SPDT single-pole, double-throw	Vp-p volts, peak-to-peak
NE neon	PP peak-to-peak (used in parts list)	SPG spring	Vrms volts, rms
NEG negative	PPM pulse-position modulation	SR split ring	VSWR voltage standing wave ratio
nF nanofarad	PREAMPL preamplifier	SPST single-pole, single-throw	VTO voltage-tuned oscillator
NI PL nickel plate	PRF pulse-repetition frequency	SSB single sideband	VTVM vacuum-tube voltmeter
N/O normally open	PRR pulse repetition rate	SST stainless steel	V(X) volts, switched
NOM nominal	ps picosecond	STL steel	W watt
NORM normal	PT point	SQ square	W/ with
NPN negative-positive-negative	PTM pulse-time modulation	SWR standing-wave ratio	WIV working inverse voltage
NPO negative-positive zero (zero temperature coefficient)	PWM pulse-width modulation	SYNC synchronize	WW wirewound
NRFR not recommended for field replacement		T timed (slow-blow fuse)	W/O without
NSR not separately replaceable		TA tantalum	YIG yttrium-iron-garnet
ns nanosecond		TC temperature compensating	Z _o characteristic impedance
nW nanowatt			
OBD order by description			

NOTE

All abbreviations in the parts list will be in upper-case.

MULTIPLIERS

Abbreviation	Prefix	Multiple
T	tera	10^{12}
G	giga	10^9
M	mega	10^6
k	kilo	10^3
da	deka	10
d	deci	10^{-1}
c	centi	10^{-2}
m	milli	10^{-3}
μ	micro	10^{-6}
n	nano	10^{-9}
p	pico	10^{-12}
f	femto	10^{-15}
a	atto	10^{-18}

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	08621-00045	1	BOARD ASSEMBLY, ALC AMPLIFIER.	28480	08621-00045
A1C1	0160-3094	8	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1C2	0180-0291	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1C3	0180-0197	5	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1C4	0180-0197	5	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1C5	0160-3240	1	CAPACITOR-FXD 39PF +-5% 500WVDC PURC	28480	0160-3240
A1C6	0160-2260	1	CAPACITOR-FXD 13PF +-5% 500WVDC CER	28480	0160-2260
A1C7	0160-3454	1	CAPACITOR-FXD 220PF +-10% 1000WVDC CER	28480	0160-3454
A1C8	0180-0197	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1C9	0160-2257	1	CAPACITOR-FXD 10PF +-5% 500WVDC CER	28480	0160-2257
A1C10	0160-0174	1	CAPACITOR-FXD .47UF +-80-20% 25WVDC CER	28480	0160-0174
A1C11	0160-3094	1	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1C12	0160-3459	1	CAPACITOR-FXD .02UF +-20% 100WVDC CER	28480	0160-3459
A1C13	0160-2260	1	CAPACITOR-FXD 24PF +-5% 500WVDC CER	28480	0160-2260
A1C14	0160-3094	1	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1C15	0160-3094	1	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1C16	0160-3094	1	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1C17	0160-3094	1	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1C18	0160-3094	1	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1C19	0160-3094	1	CAPACITOR-FXD .1UF +-10% 100WVDC CER	28480	0160-3094
A1CR1	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR2	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR3	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR4	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR5	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR6	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR7	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR8	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR9	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR10	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR11	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR12	1901-0050	15	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR13	1910-0016	5	DIODE-GE 60V 60MA 1US DU-7	28480	1910-0016
A1CR14	1910-0016	5	DIODE-GE 60V 60MA 1US DU-7	28480	1910-0016
A1CR15	1910-0016	5	DIODE-GE 60V 60MA 1US DU-7	28480	1910-0016
A1CR16	1902-0041	1	DIODE-ZNR 5.11V 5% DU-7 PD=.4W TC=-.009	19818	00 35622
A1CR17	1902-3203	1	DIODE-ZNR 14.7V 5% DU-7 PD=.4W TC=-.057	28480	1902-3203
A1CR18	1901-0050	1	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR19	1901-0050	1	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR20	1901-0050	1	DIODE-SWITCHING 80V 200MA 2NS DU-7	28480	1901-0050
A1CR21	1902-3182	1	DIODE-ZNR 12.1V 5% DU-7 PD=.4W TC=-.064	28480	1902-3182
A1L1	9140-0137	1	COIL-MED 1MH 5% Q=60 .19DX.44LG SRF=3MHZ	99800	2500-28
A1MP1	4040-0756	2	EXTRACTOR-PC 80 WHT POLYC .062-80-THKNS	28480	4040-0756
A1MP2	4040-0756	2	EXTRACTOR-PC 80 WHT POLYC .062-80-THKNS	28480	4040-0756
A1MP3	1480-0073	2	PIN:DRIVE 0.250" LG	00000	080
A1MP4	1480-0073	2	PIN:DRIVE 0.250" LG	00000	080
A1Q1	1853-0020	3	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1853-0020
A1Q2	1853-0050	6	TRANSISTOR PNP SI TO-18 PD=350MW	28480	1853-0050
A1Q3	1853-0020	3	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1853-0020
A1Q4	1853-0050	6	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0050
A1Q5	1854-0404	7	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A1Q6	1853-0050	6	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0050
A1Q7	1853-0050	6	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0050
A1Q8	1853-0050	6	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0050
A1Q9	1853-0020	3	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1853-0020
A1Q10	1854-0404	7	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A1Q11	1854-0404	7	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A1Q12	1854-0404	7	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A1Q13	1854-0404	7	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A1Q14	1853-0050	6	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0050
A1R1	0757-0436	1	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-1030-F
A1R2	0757-0438	9	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1R3	0757-0460	1	RESISTOR 61.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A1R4	0757-0442	18	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1R5	0757-0289	1	RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4-1/3-TC-1332-F
A1R6	0757-0438	9	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1R7	0696-0084	5	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A1R8	0696-0084	5	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A1R9	0757-0438	2	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A1R10	0696-0084	5	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F

See introduction to this section for ordering information

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1K11	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K12	0757-0438		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K13	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K14	0757-0438	3	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1K15	0757-0438		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1K16	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K17	0757-0442	5	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1K18	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K19	0757-0442		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1K20	0698-3158	3	RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
A1K21	0757-0442		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1K22	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K23	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K24	0757-0442	1	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K25	0757-0401	4	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1K26	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K27	0698-3454	5	RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A1K28	0698-3454		RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A1K29	0698-3454		RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A1K30	0698-3454		RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A1K31	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1K32	0698-3454		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A1K33	0757-0438		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1K34	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K35	0698-3454		RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A1K36	0698-3437	1	RESISTOR 133 1% .125W F TC=0+-100	24546	C4-1/8-T0-133R-F
A1K37	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K38	0698-3100	1	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1K39	0757-0438		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1K40	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K41	0757-0438		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1K42	0757-0438	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1K43	0698-4637	1	RESISTOR 46.4 1% .125W F TC=0+-100	24546	C4-1/8-T0-46R4-F
A1K44	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K45	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K46	0698-3158		RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
A1K47	0757-0442	2	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A1K48	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K49	0757-0438		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1K50	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K51	0757-0442		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A1K52	0757-0438	1	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A1K53	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K54	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K55	0698-0034		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A1K56	0698-3158		RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
A1K57	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1K58	0757-0442		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1K59	0757-0442		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1K60	2100-3162	1	RESISTOR-TRMR 200K 10% C SIDE-ADJ 17-TRN	32397	3006P-1-204
A1K61	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K62	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K63	0698-3158	1	RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A1K64	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K65	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1K66	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1K67	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1S1	3101-1274	2	SWITCH-SL SPDT-NS SUBMIN 2A 120VAC PC	10389	23-021-008
A1S2	3101-1274		SWITCH-SL SPDT-NS SUBMIN 2A 120VAC PC	10389	23-021-008
A1S3	3101-0573	1	SWITCH-RTRY LVR 1.25 IN CIR SPCG	28480	3101-0573
	08621-20067	1	SHAFT ASSEMBLY, ROTARY LEVER SWITCH	28480	08621-20067
	08621-00036	1	ACTUATOR, LEVER SWITCH	28480	08621-00036
	08621-20043	1	BUSHING	28480	08621-20043
A1U1	1826-0081	2	IC LM 318 OP AMP	27014	LM318H
A1U2	1826-0081		IC LM 318 OP AMP	27014	LM318H
A1U3	1826-0023	1	IC LM 301A OP AMP	27014	LM301A-I
A2	08621-60044	1	MASTER BOARD ASSEMBLY	28480	08621-60044
A2J1	1251-2026	5	CONNECTOR-PC EDGE 18-CUNT/ROW 2-ROWS	71785	252-18-30-300
A2J2	1251-2026		CONNECTOR-PC EDGE 18-CUNT/ROW 2-ROWS	71785	252-18-30-300
A2J3	1251-2026		CONNECTOR-PC EDGE 18-CUNT/ROW 2-ROWS	71735	252-18-30-300
A2J4	1251-2026		CONNECTOR-PC EDGE 18-CUNT/ROW 2-ROWS	71785	252-18-30-300
A2J5	1200-0507	1	SOCKET-IC 16-CUNT DIP-SLGR-TERMS	06776	1CN-163-S3W

See introduction to this section for ordering information

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A2AAL	1251-2026		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	71785	252-18-30-300
A3	08621-60046	1	BOARD ASSEMBLY, LAMP	28480	08621-60046
A3J31	2140-0259 08621-00023 08621-00034	3	LAMP-INCAND 32 12VDC 60MA T-1-BULB	71744	CM32
A3J32	2140-0259 08621-00023 08621-00034	3	LAMP-INCAND 32 12VDC 60MA T-1-BULB	28480	08621-00023
A3J33	2140-0259 08621-00023 08621-00034	3	LAMP-INCAND 32 12VDC 60MA T-1-BULB	28480	08621-00034
A3L1	08621-40003	1	BLOCK, LAMPHOLDER, J-SECTION, BLACK	28480	08621-40003
A3Q1	1854-0404		TRANSISTOR NPN SI TU-18 PD=360MW	29480	1854-0404
A3Q2	1854-0404		TRANSISTOR NPN SI TU-18 PD=360MW	28480	1854-0404
A3K1	0698-3399	2	RESISTOR 133 1% .5W F TC=0+-100	91637	MFF-1/2-10
A3K2	0698-3399		RESISTOR 133 1% .5W F TC=0+-100	91637	MFF-1/2-10
A3K3	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3K4	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3K5	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3K6	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A5	08621-60066	1	BOARD ASSEMBLY, ATTENUATOR	28480	08621-60066
A5C1	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	1500225X9020A2
A5C2	0180-0116		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	1500685X9035B2
A5C3	0180-0116		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	1500685X9035B2
A5C4	0180-0116		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	1500685X9035B2
A5C5	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	1500225X9020A2
A5CK1	1901-0025	15	DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK2	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK3	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK4	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK5	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK6	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK7	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK8	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK9	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK10	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK11	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK12	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK13	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK14	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5CK15	1901-0025		DIODE-GEN PRP 100V 200MA DU-7	28480	1901-0025
A5K1	0490-0875	4	RELAY 2C 12VDC-COIL 2A 30VDC	28480	0490-0875
A5K2	0490-0875		RELAY 2C 12VDC-COIL 2A 30VDC	28480	0490-0875
A5K3	0490-0875		RELAY 2C 12VDC-COIL 2A 30VDC	28480	0490-0875
A5K4	0490-0875		RELAY 2C 12VDC-COIL 2A 30VDC	28480	0490-0875
A5K1	0698-7236	3	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-G
A5K2	0698-7236		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-G
A5K3	0698-7236		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-G
A5K4	0698-7233	3	RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-G
A5K5	0698-7279	3	RESISTOR 61.9K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6192-G
A5K6	0698-3391	3	RESISTOR 21.5 1% .5W F TC=0+-100	19701	MF7C-1
A5K7	0698-7233		RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-G
A5K8	0698-7279		RESISTOR 61.9K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6192-G
A5K9	0698-3391		RESISTOR 21.5 1% .5W F TC=0+-100	19701	MF7C-1
A5K10	0698-7233		RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-G
A5K11	0698-7279		RESISTOR 61.9K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6192-G
A5K12	0698-3391		RESISTOR 21.5 1% .5W F TC=0+-100	19701	MF7C-1
A5U1	1820-0282	1	IC-DIGITAL SN7486N TTL QUAD 2 EXCL-OR	01295	SN7486N
A5U2	1820-0140	1	IC-DIGITAL TTL*	28480	1820-0140
CHASSIS PARTS					
U51	1990-0324	1	LED-VISIBLE LUM-INT=3000CD IF=50MA-MAX	28480	1990-0324
	1400-0825	1	CLIP-LED MTG 0.201-IN ID; 0.330-IN OD	28480	1400-0825
J1	1250-0136	1	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	24931	28JR129-1
J2	1250-0118	2	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	24931	28JR128-1
J3	1250-0118		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	24931	28JR128-1
J4	1251-0483	1	CONNECTOR 36-PIN M MICRO RIBBON	90949	57-10360-375
J5	08621-60053	1	CONNECTOR ASSEMBLY, APC-N, FEMALE (EXPLODED VIEW IN FIGURE 6-1).	28480	08621-60053

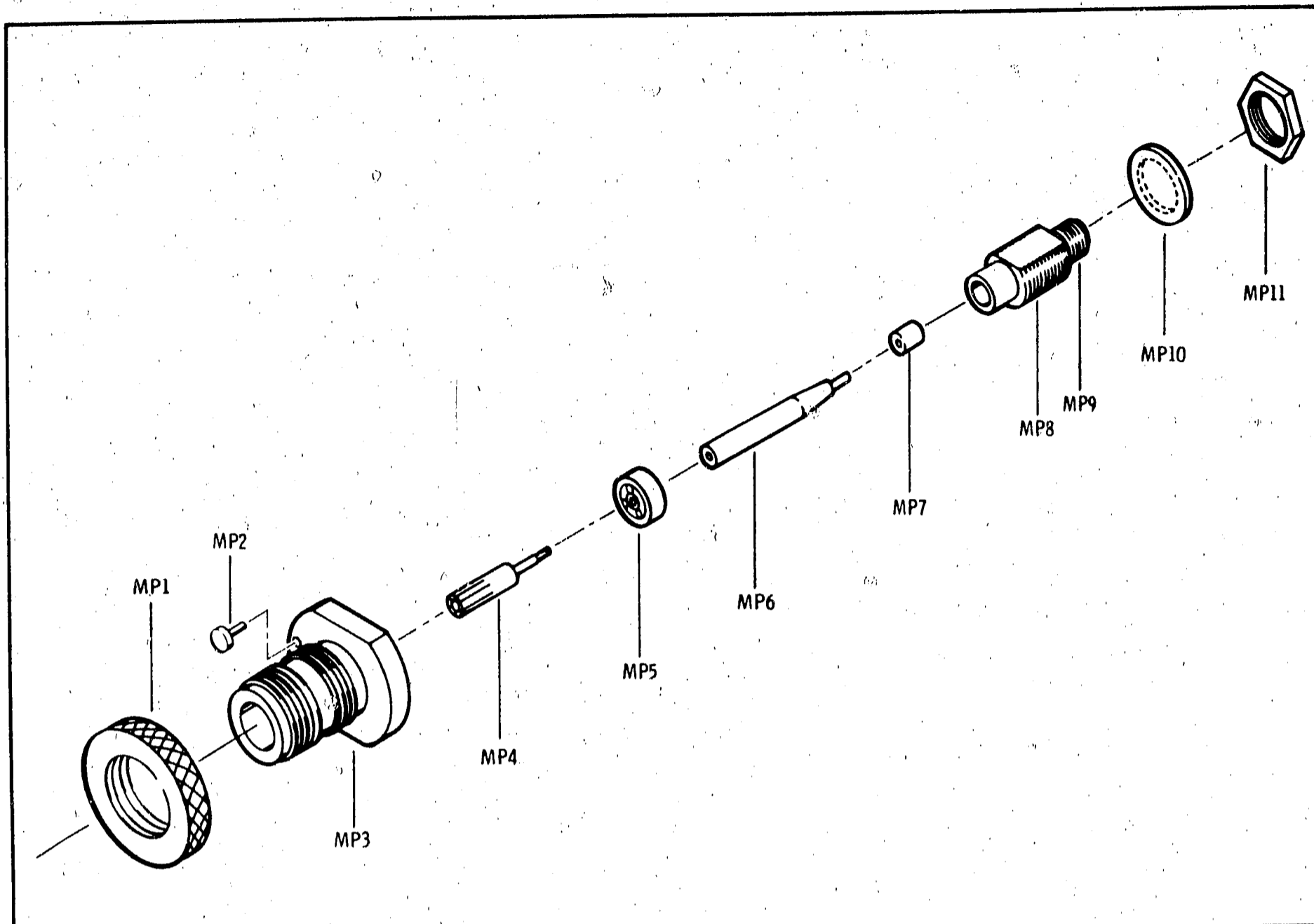
See introduction to this section for ordering information

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
R1	2100-2838	2	RESISTOR-VAR CONTROL CC 20K 10% LIN	01121	W
R2	2100-2838	2	RESISTOR-VAR CONTROL CC 20K 10% LIN	01121	W
S1	3101-0100	1	SWITCH-SL DP3T-NS STD .5A 125VAC/DC SLDR	82389	110-10310
S2	3101-0070	1	SWITCH-SL DPDT-NS MINTR .5A 125VAC/DC	79727	GF-126-0000
W1	08621-20015	1	CABLE ASSEMBLY, POSITION 2, MFG BRACKET.	28480	08621-20015
W2-			NOT ASSIGNED		
W7	08621-20060	1	CABLE ASSEMBLY, FRONT OUTPUT	28480	08621-20060
W8-			NOT ASSIGNED		
W13	08621-60048	1	CABLE, SHIELDED, YELLOW	28480	08621-60048
W14	08621-60047	1	CABLE, SHIELDED, BLUE	28480	08621-60047
			MISCELLANEOUS PARTS		
	0370-1001	1	KNOB-BASE-RND .375 IN JGK SGI-DECAL	28480	0370-1001
	0300-0793	1	SPACER-RND .156LG .093ID .125OD BRS	76854	15525-610
	1200-0147	3	INSULATOR-BSHG-FLG .115-ID	26365	974-302
	5040-0345	3	INSULATOR-CONNECTOR	28480	5040-0345
	00692-210	1	PIN, KEY(RF OUTPUT CONNECTOR)	28480	00692-210
	08731-210	1	NUT, LOCK FOR DRAWER LATCH	28480	08731-210
	0370-1101	1	KNOB-BASE-PTF .5 IN OBP OBP-DECAL	28480	0370-1101
			CABINET PARTS		
	1460-0297	1	SPRING-CPRSN .058-IN-OD .235-IN-LG SST	28480	1460-0297
	1460-1186	1	WIREFORM 2.22-LG MUW	28480	1460-1186
	6960-0010	1	PLUG-HOLE FL-HD FUR .625-D-HOLE STL	28480	6960-0027
	6960-0016	2	PLUG-HOLE TR-HD .125-DIA NYL	02768	207-080501-01-0101
	7120-2359	1	SERIAL PLATE .625-IN-WD 1.5-IN-LG AL	28480	7120-2359
	08621-00005	1	COVER, REAR	28480	08621-00005
	08621-00006	1	SPRING, GROUND	28480	08621-00006
	08621-00021	1	PANEL, UPPER FRONT (OLIVE BLACK)	28480	08621-00021
	08621-00022	1	PANEL, LOWER FRONT (MINT GRAY)	28480	08621-00022
	08621-00024	1	FRAME, DRAWER, LEFT	28480	08621-00024
	08621-00025	1	FRAME, DRAWER, RIGHT	28480	08621-00025
	08621-00033	1	BRACKET, CONNECTOR MOUNTING	28480	08621-00033
	08621-20002	1	FRAME, DRAWER, REAR	28480	08621-20002
	08621-20049	1	SUB-PANEL, FRONT	28480	08621-20049
	08621-20051	1	HANDLE, DRAWER LATCH	28480	08621-20051
	08621-20052	1	SCREW, DRAWER LATCH	28480	08621-20052
	08621-20053	3	NUT	28480	08621-20053
	08621-40002	2	GUIDE, OSCILLATOR MODULE	28480	08621-40002

Table 6-3. Code List of Manufactures

Mfr Code	Manufacturer Name	Address	Zip Code
00000	U.S.A. COMMON	ANY SUPPLIER OF THE U.S.	
01121	ALLEN-BRADLEY CO	MILWAUKEE WI	53212
01295	TEXAS INSTR INC SEMICOND CMPNT DIV	DALLAS TX	75231
02768	ILLINOIS TOOL WORKS INC FASTEX DIV	DES PLAINES IL	60016
06776	ROBINSON NUGENT INC	NEW ALBANY IN	47150
10349	CHICAGO SWITCH INC	CHICAGO IL	60647
15818	TELEPHONE SEMICONDUCTOR	MOUNTAIN VIEW CA	94040
19701	MEPCO/ELECTRA CORP	MINERAL WELLS TX	76067
24546	CORNING GLASS WORKS (BRADFORD)	BRADFORD PA	16701
24931	SPECIALTY CONNECTOR CO INC	INDIANAPOLIS IN	46227
26365	GRIES REPRODUCER CORP	NEW ROCHELLE NY	10862
27014	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA CA	95051
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO CA	94304
32997	BOURNS INC TRIMPOT PROD DIV	RIVERSIDE CA	92507
56289	SPRAGUE ELECTRIC CO	NORTH ADAMS MA	01247
71744	CHICAGO MINIATURE/DRAWF	CHICAGO IL	60640
71785	TRW ELEK COMPONENTS CINCH DIV	ELK GROVE VILLAGE IL	60007
76854	PAK IND INC SW DIV	CRYSTAL LAKE IL	60014
79727	C-W INDUSTRIES	WARMINSTER PA	18974
82389	SWITCHCRAFT INC	CHICAGO IL	60630
90449	AMPHENOL SALES DIV OF BUNKER-RAND	HAZELWOOD MO	63042
91637	DALE ELECTRONICS INC	COLUMBUS NE	68601
99800	AMER PROD IND INC DELEVAN DIV	AURORA NY	14052



Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
MP1	0873-1210	1	Nut: Lock	28480	0873-1210
MP2	00692-210	1	Pin: Key	28480	00692-210
MP3	08621-20055	1	Body: RF Connector (Type N)*	28480	08621-20055
MP4	1250-0915	1	Contact: RF Connector (Type N)*	02660	131-149
MP5	5040-0306	1	Insulator*	28480	5040-0306
MP6	08555-20093	1	Center Conductor*	28480	08555-20093
MP7	08761-2027	1	Insulator: RF Connector*	28480	08761-2027
MP8	08555-20094	1	Body: Bulkhead*	28480	08555-20094
MP9		1	SMA Connector for Internal Cable Connections		
MP10	2190-0104	1	Washer: Lock	00000	OBD
MP11	2950-0132	1	Nut: Hex 7/16-28	00000	OBD

*Part of J5 Connector Assembly, HP Part Number 08621-60053.

Figure 6-1. RF Output Connector J5 Exploded View

**BACK DATING
MANUAL
CHANGES**

SECTION VII MANUAL CHANGES

7-1. INTRODUCTION

7-2. This section contains information for adapting this manual to instruments for which the content does not apply directly.

7-3. To adapt this manual to your instrument, refer to Table 7-1 and make all of the manual changes listed opposite your instrument serial number. Perform these changes in the sequence listed.

7-4. If your instrument serial number is not listed on the title page of this manual, or in Table 7-1 below, it may be documented in a yellow MANUAL CHANGES supplement. For additional important information about serial number coverage, refer to INSTRUMENTS COVERED BY MANUAL in Section I.

Table 7-1. Manual Changes by Serial Number

Serial Prefix or Number	Make Manual Changes
1408A	A
1401A	A, B
1233A00361 through 1233A prefix	A, B, C
1233A00360 and below	A, B, C, D

7-5. MANUAL CHANGES INSTRUCTIONS

CHANGE A

Page 3-4, Figure 3-2:

Replace rear-panel photo in Figure 3-2 with Figure 7-1.

Change item 4 to read: "SWEEP REF BNC connector. Provides approximately +5 volt/octave signal from oscillator module. The signal is used as a sweep reference voltage to improve operation of phase-locked systems."

Page 3-5, Figure 3-3:

Change rear-panel FREQ REF title to SWEEP REF.

Page 3-9, Figure 3-4:

Change rear-panel FREQ REF title to SWEEP REF.

Page 3-13, Figure 3-5:

Change rear-panel FREQ REF title to SWEEP REF.

Page 8-17, Figure 8-13:

Delete RETRACE BLANKING connection from 8620C MAINFRAME block pins 18 and 24 and 95 wire.

Page 8-19, Figure 8-16:

Delete RETRACE BLANKING connection from 8620C MAINFRAME block pins 18 and 24 and 95 wire.

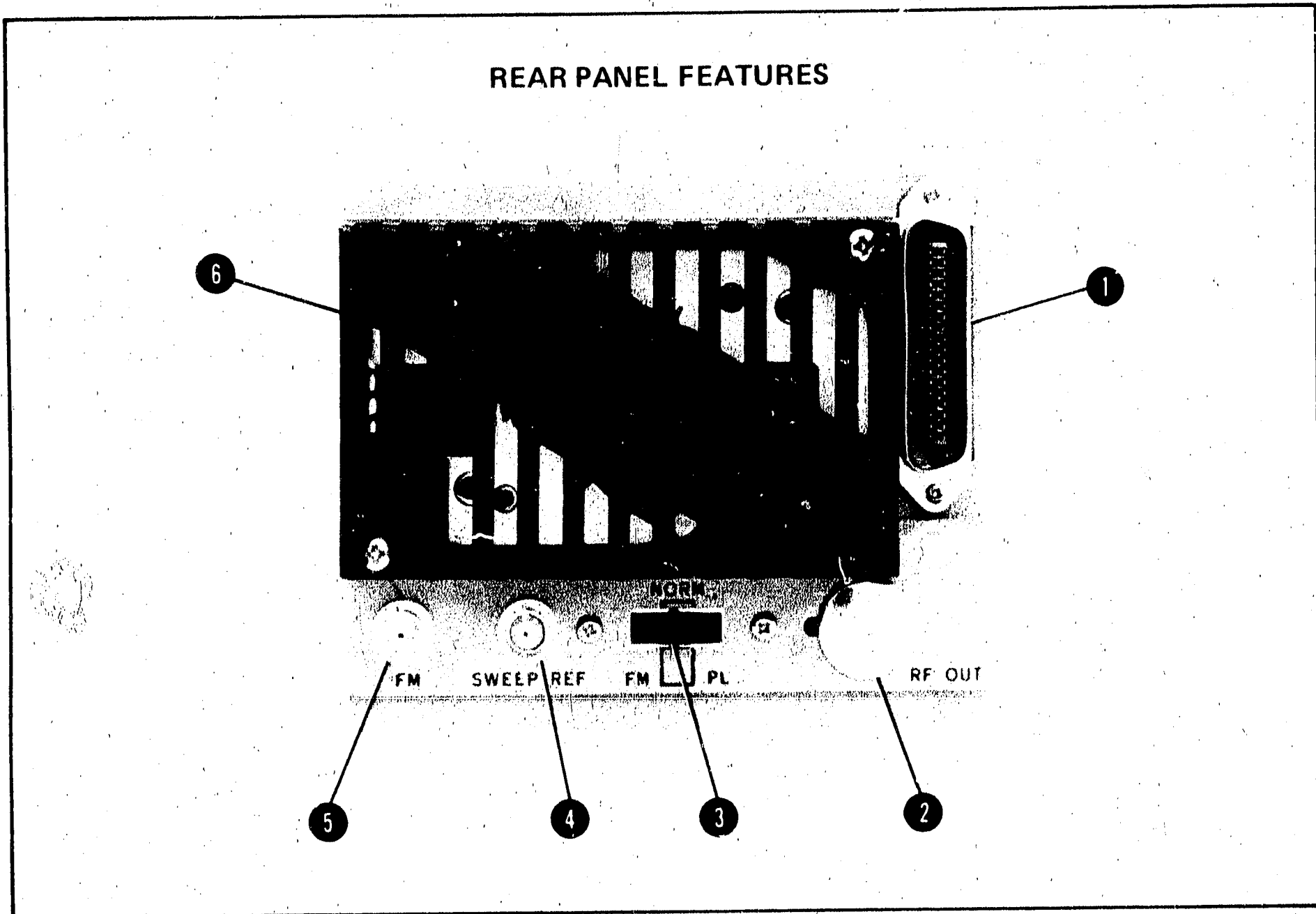


Figure 7-1. Rear Panel Control and Connectors (CHANGE A)

CHANGE A (Cont'd)

Page 8-19, Figure 8-16 (cont'd):

Change J3 FREQ REF to J3 SWEEP REF.

Change A2 Master Board FREQ REF to SWEEP REF.

Change titles on interconnecting lines at A2J1-A and A2J3-A to SWEEP REF.

CHANGE B

Page 6-6, Table 6-3:

Change A2J5 to HP Part Number 1200-0438, Socket: IC 16 Contact Dual Type, Brown.

NOTE

The recommended replacement and preferred stock part is
HP Part Number 1200-0507.

CHANGE C

Page 1-3, Table 1-3:

Change Option 010 Insertion Loss specification to: "Insertion Loss: <1.4 dB."

CHANGE D

Page 6-7, Table 6-3:

Change J1 to HP Part Number 1250-0118 Connector: BNC.

NOTE

The recommended replacement and preferred stock part is
HP Part Number 1250-0186.

SERVICE

INFORMATION

SECTION VIII SERVICE

8-1. INTRODUCTION

8-2. This section provides instructions for troubleshooting and repairing the Model 8621B RF Section.

8-3. PRINCIPLES OF OPERATION

8-4. Detailed circuit description for each individual schematic diagram is placed on the facing left-hand foldout page. This places material needed for printed-circuit-level diagnosis in one location and allows easy correlation between function and specific circuit.

8-5. RECOMMENDED TEST EQUIPMENT

8-6. Test equipment and accessories required to maintain the Model 8621B are listed in Table 1-2. If the equipment listed is not available, equipment that meets the minimum specification shown may be substituted.

8-7. TROUBLESHOOTING

8-8. Troubleshooting is generally divided into two maintenance levels in this manual. The first is the assembly level, which isolates the cause of a malfunction to a circuit or assembly. A troubleshooting flow diagram provides a simple step-by-step procedure to identify the defective assembly.

8-9. The second maintenance level isolates the trouble to the component level. Schematic dia-

grams are provided of each individual assembly to aid in troubleshooting down to the component level within the assembly.

8-10. REPAIR

8-11. Service Accessories

8-12. A Service Accessories package, HP Part No. 08620-60124 is available as an aid in maintaining the Model 8621B. This package is described and shown in Figure 1-3.

8-13. Cleaning Switches

CAUTION

When cleaning printed circuit switches, do not allow the switch to slide out of guides. The switch is very difficult to properly assemble back into the guides.

8-14. Board-mounted switches on switch assembly A1 may be cleaned while installed in the instrument without disassembling the switch. Since the switch is assembled with great precision, disassembly of the switch should not be attempted.

8-15. The recommended cleaning agent is isopropyl alcohol, HP Part No. 8500-0755. Spray the alcohol into the switch and slide the switch back and forth within the guides. Repeat this procedure several times and slide the switch back and forth until alcohol is evaporated.

SCHEMATIC DIAGRAM NOTES


For symbols not shown, refer to USA Standard Y32.2-1967, "Graphic Symbols for Electrical and Electronic Diagrams".

Logic Symbols used conform to MIL-STD-883B (Military Standard 806B) "Graphic Symbols for Logic Diagrams".


Resistance is in ohms, capacitance is in picofarads, and inductance is in microhenries unless otherwise noted.

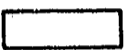
P/O = part of.

*Asterisk denotes a factory-selected value. Value shown is typical. Capacitors may be omitted or resistors jumpered.

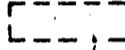
- 


Screwdriver adjustment





Panel control
- 


Encloses front panel designations





Encloses rear panel designation
- 


Circuit assembly borderline.
- 


Other assembly borderline.
- 


Heavy line with arrows indicates path and direction of main signal.
- 


Heavy dashed line with arrows indicates path and direction of main feedback.
- 

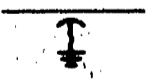
Wiper moves toward CW with clockwise rotation of control as viewed from shaft or knob.
- 


Numbers in stars on circuit assemblies show locations of test points.
- 


Encloses wire color code. Code used (MIL-STD-681) is the same as the resistor color code. First number identifies the base color, second number the wider stripe, and the third number identifies the narrower stripe, e.g., 947 denotes white base, yellow wide stripe, violet narrow stripe.
- 

Voltage regulator (breakdown diode).
- 

Denotes Field Effect transistor (FET) with N-type base.
- 

Denotes FET with P-type base.
- 

Feed-through capacitor (shunt capacitor, commonly used for bypassing high frequency currents to chassis).
- 

Hi Current Ground
- 

Low Current Ground

Figure 8-1 Schematic Diagram Notes (1 of 2)

SCHEMATIC DIAGRAM NOTES



Light Emitting Diode (LED)



Operational Amplifier (integrated circuit).

Relays shown are in de-energized position.

Voltages noted within circuits are measured with respect to chassis ground and have a $\pm 10\%$ tolerance.

Conditions for waveforms and dc voltages on schematics are as follows:

- a. Waveforms taken in FULL SWEEP; (FULL SWEEP pushbutton pressed).
- b. Controls on 8620C/8621B are set as follows:

8620C:

CW MARKER pointer	Center-scale
MARKERS	OFF
MODE	AUTO
TRIGGER	INT
TIME-SECONDS	0.1--.01
TIME-SECONDS Vernier	Fully counterclockwise
1 kHz SQWV/OFF (rear panel)	OFF
RF BLANKING/OFF (rear panel)	OFF
LINE	ON

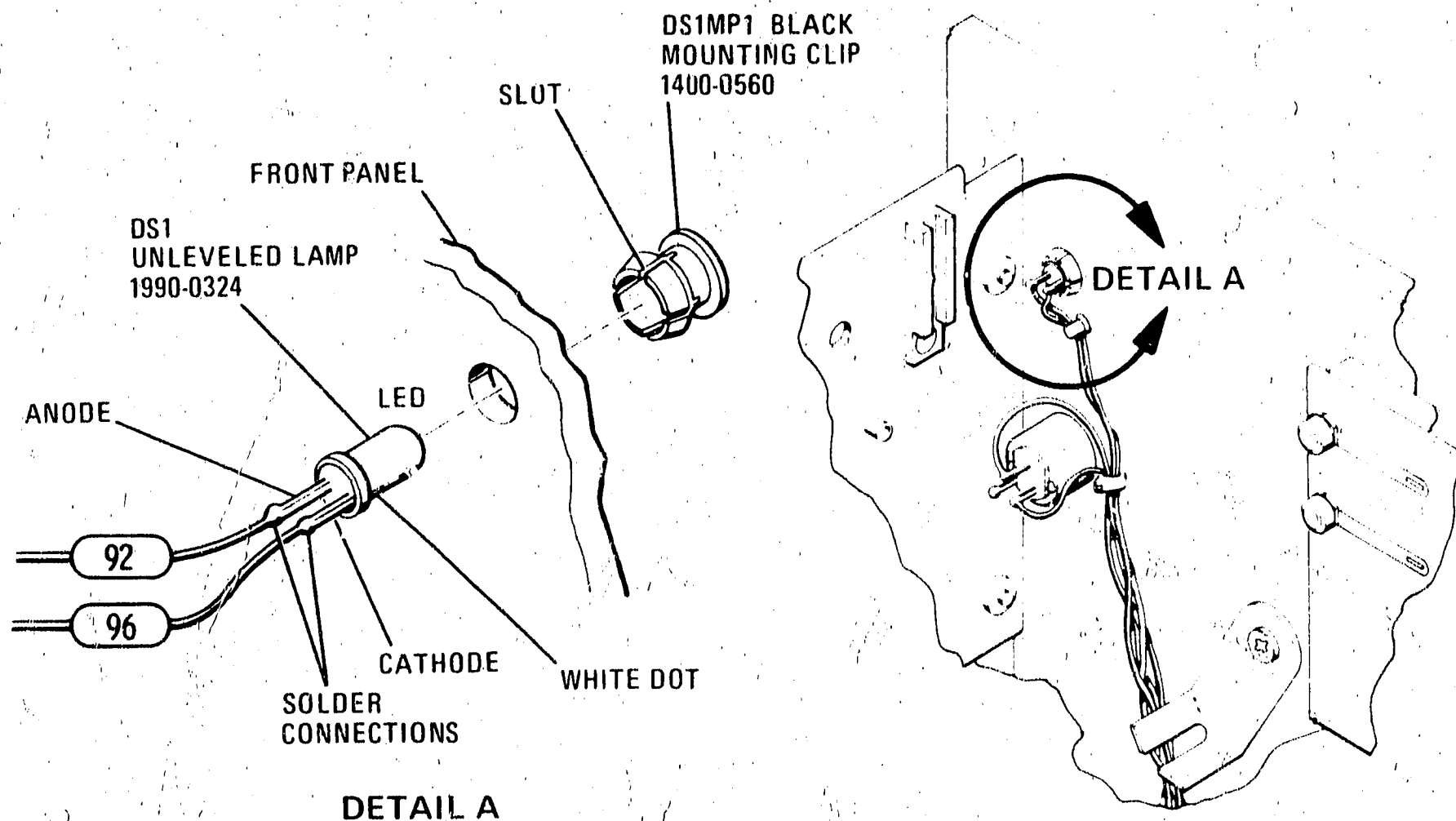
8621B:

RF OUTPUT	ON
ALC	OFF
POWER LEVEL	Fully clockwise
FM-NORM-PL (rear panel)	NORM

- c. DC Voltages measured in CW (CW pushbutton pressed). Other 8620C/8621B control settings same as noted in step a.

Figure 8-1. Schematic Diagram Notes (2 of 2)

UNLEVELED LAMP DS1 REPLACEMENT PROCEDURE



1. REMOVAL PROCEDURE:

- a. Remove RF Section from mainframe.
- b. Unsolder anode and cathode leads.
- c. Push DS1 out back of front panel with the thumb, or eraser-end of a pencil.

WARNING

If DS1 does not push out easily, protect the thumb with cardboard or cloth.

2. INSTALLATION PROCEDURE:

- a. Connect (solder) white-red wire to anode (long lead) of DS1.
- b. Connect (solder) white-blue wire to cathode (short lead) of DS1.

NOTE

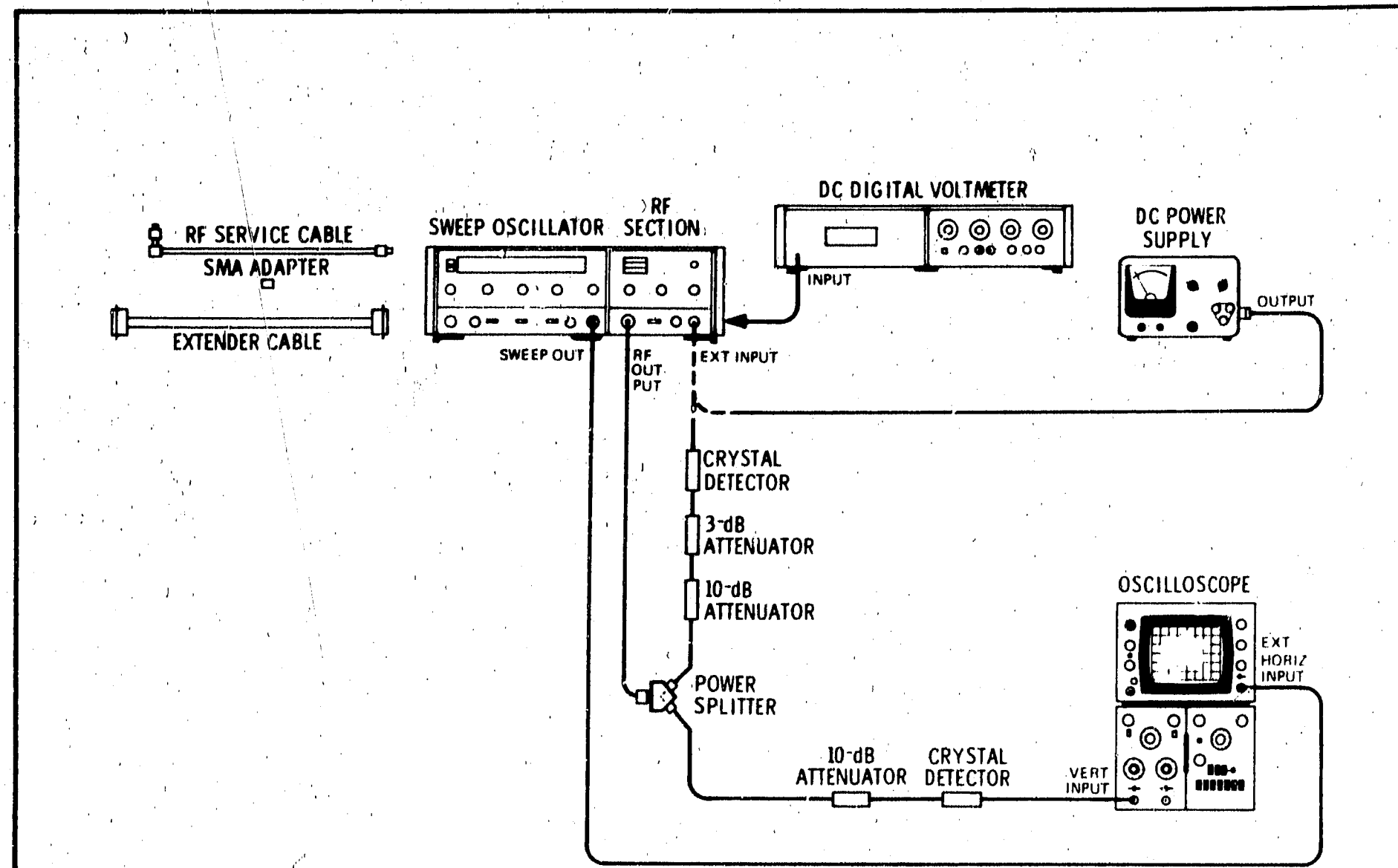
On some Light-Emitting Diodes (LED) the leads are the same length, and the cathode is distinguished by a white dot.

- c. Slide DS1 into Mounting Clip as far as possible. Put a thin-bladed screwdriver through slot in Mounting Clip and push on metal rim at the base of DS1 until lamp clicks into clip.

CAUTION

Do not push on the glass portion at the base of DS1 or the lamp may be broken.

Figure 8-2. Unlevelled Lamp Replacement



EQUIPMENT:

Sweep Oscillator	HP 8620C
DC Digital Voltmeter	HP 3480D/3484A
Oscilloscope	HP 180C/1801A/1820C
DC Power Supply	HP 721A
Power Splitter	HP 11667A
10-dB Attenuator	HP 8491B, Opt. 010 (2 required)
3-dB Attenuator	HP 8491B, Opt. 003
Crystal Detector (Negative Output)	HP 423A (2 required)
Extender Cable	HP 08620-60032
RF Service Cable	HP 8120-1578
RF Connector Adapter	HP 1250-1158

Figure 8-3. Troubleshooting Test Setup with Crystal Detector Leveling

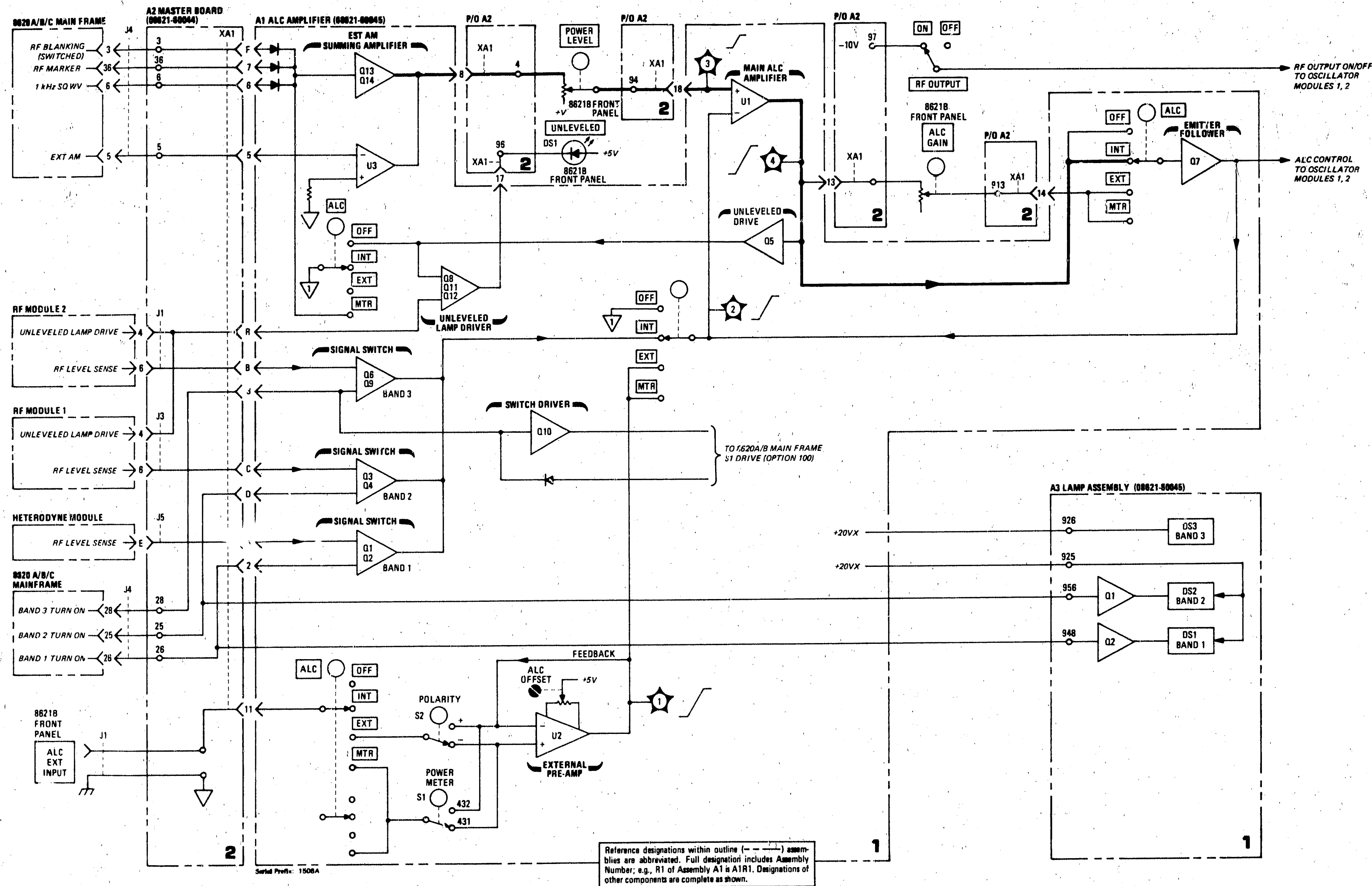
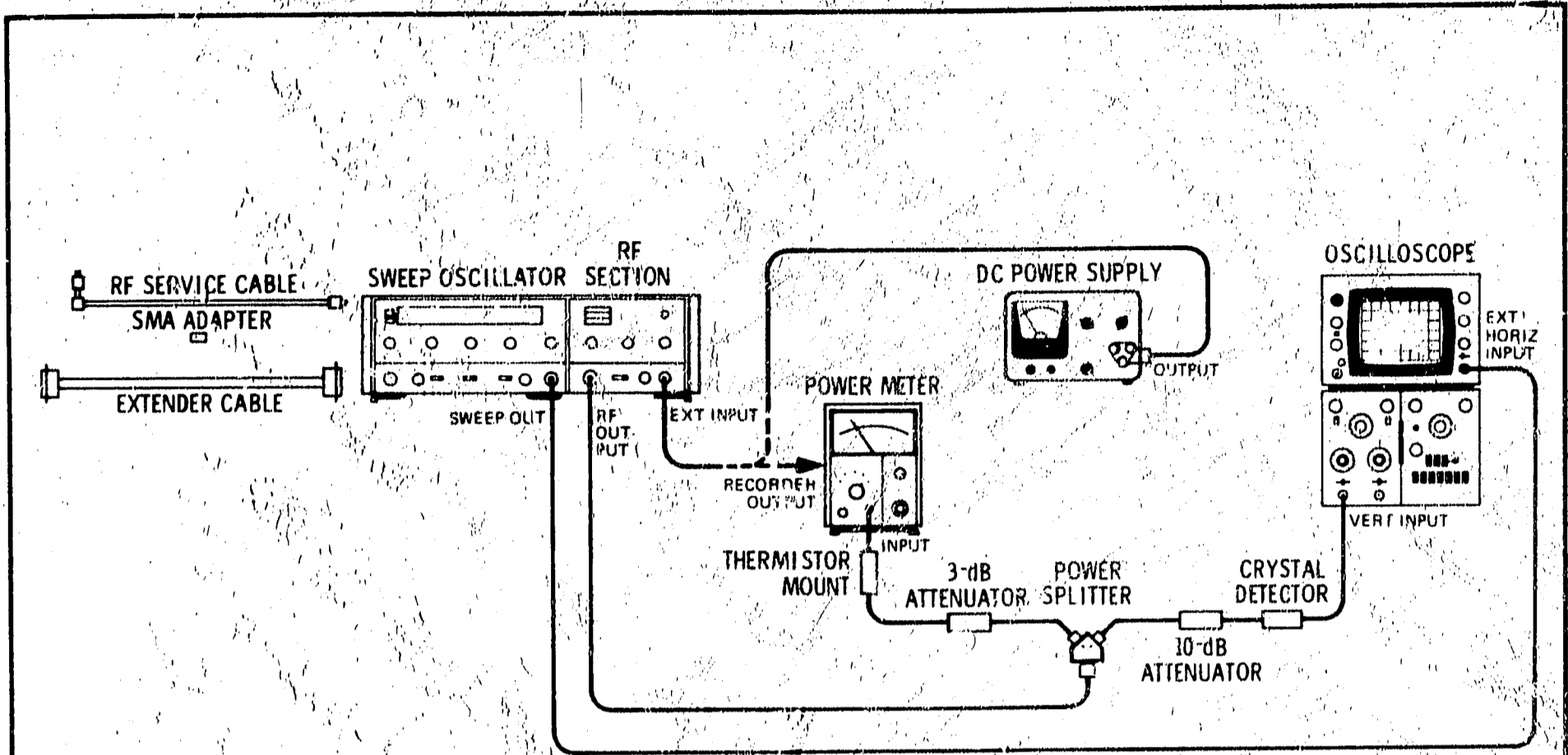


Figure 8-4. Troubleshooting Block Diagram



NOTE

Switch inside 8621B must be set to either "431" or "432" to match power meter used.

EQUIPMENT:	Sweep Oscillator	HP 8620C
	Oscilloscope	HP 180C/1801A/1820C
	Power Meter	HP 432A
	DC Power Supply	HP 721A
	Thermistor Mount	HP 478A
	Crystal Detector (negative output)	HP 423A
	10-dB Attenuator	HP 8491B, Option 010
	3-dB Attenuator	HP 8491B, Option 003
	Power Splitter	HP 11667A
	Extender Cable	HP 08620-60032
	RF Service Cable	HP 8120-1578
	RF Connector Adapter	HP 1250-1158

Figure 8-5. Troubleshooting Test Setup with Power Meter Leveling

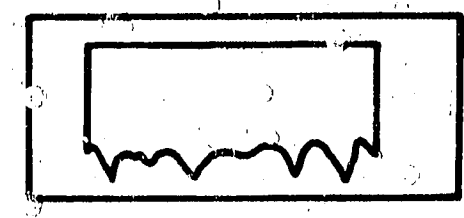
INITIAL SETTINGS & UNLEVELED RF OUTPUT

Connect equipment as shown in Figure 8-4 with crystal detector connected to EXT INPUT. Procedures require oscillator module installed in RF Section Position 2 (Band 2). Set controls as follows:

8620C: TIME-SECONDS
 BAND Frequency of Oscillator Module
 MARKER OFF
 MODE AUTO
 TRIGGER INIT
 TIME-SECONDS 1-.01
 TIME-SECONDS Vernier Fully clockwise
 RF BLANKING/OFF (rear panel) RF
 DISPLAY/BLANKING/OFF (rear panel) OFF
 1 kHz SQ WV/OFF (rear panel) OFF

8621B:
 RF OUTPUT ON
 POWER LEVEL Fully clockwise
 ALC OFF
 FM-NORM-PL (rear panel) NORM (Normal)

Press 8620C LINE pushbutton to turn instrument on. Mainframe LINE and FULL SWEEP pushbuttons should light, indicating FULL SWEEP is selected. The second frequency display lamp should light on RF Section. Oscilloscope should show trace of swept RF band and blanking line. (Typical trace shown.)



UNLEVELED POWER RANGE
 Adjust 8621B POWER LEVEL control through its range. Trace on oscilloscope should change smoothly from maximum unleveled power trace to zero-volt level.

RF ON-OFF SWITCH
 Set POWER LEVEL control fully clockwise. Trace of swept RF band should be displayed on oscilloscope. Set RF ON-OFF switch to OFF and trace should go to a line at zero Vdc level.

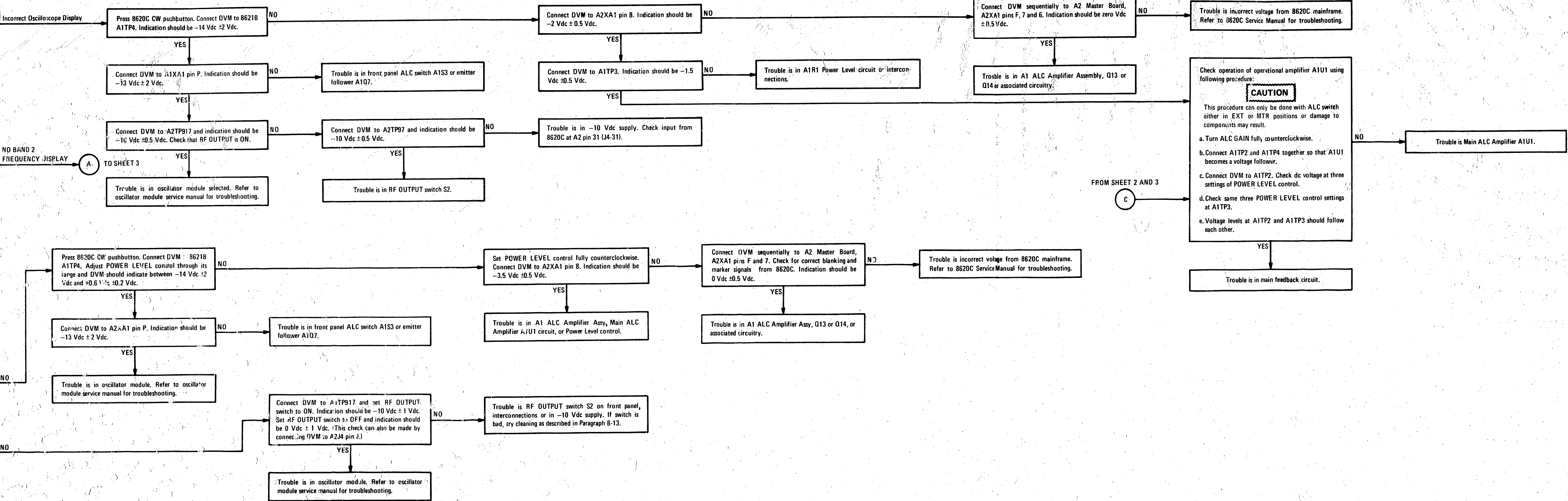
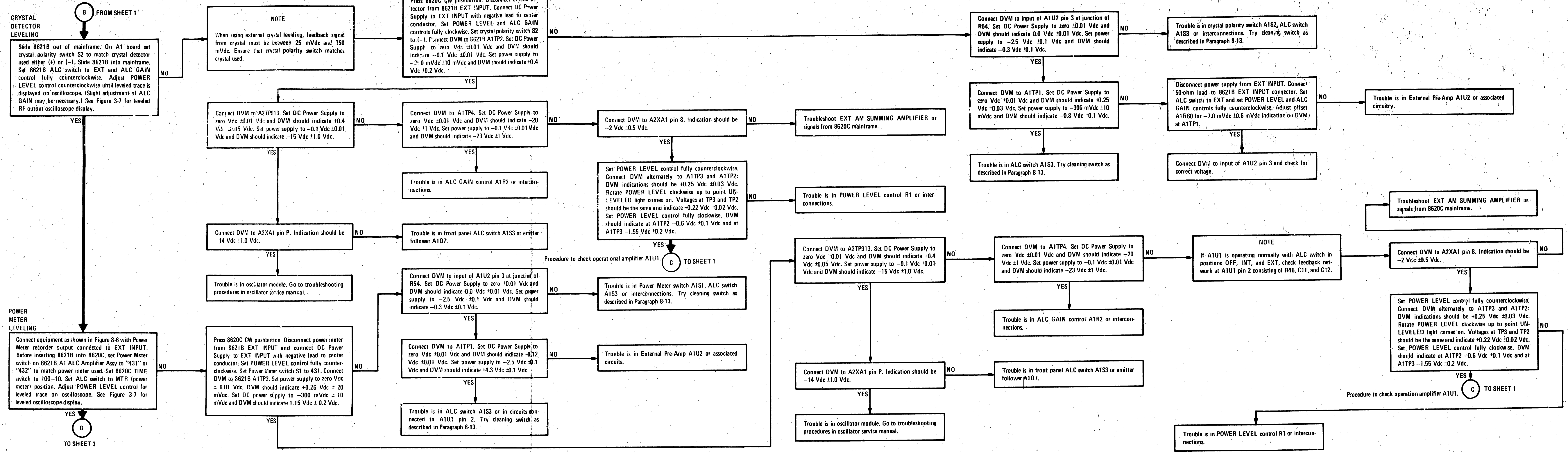


Figure 8-6. Troubleshooting Chart (1 of 3)



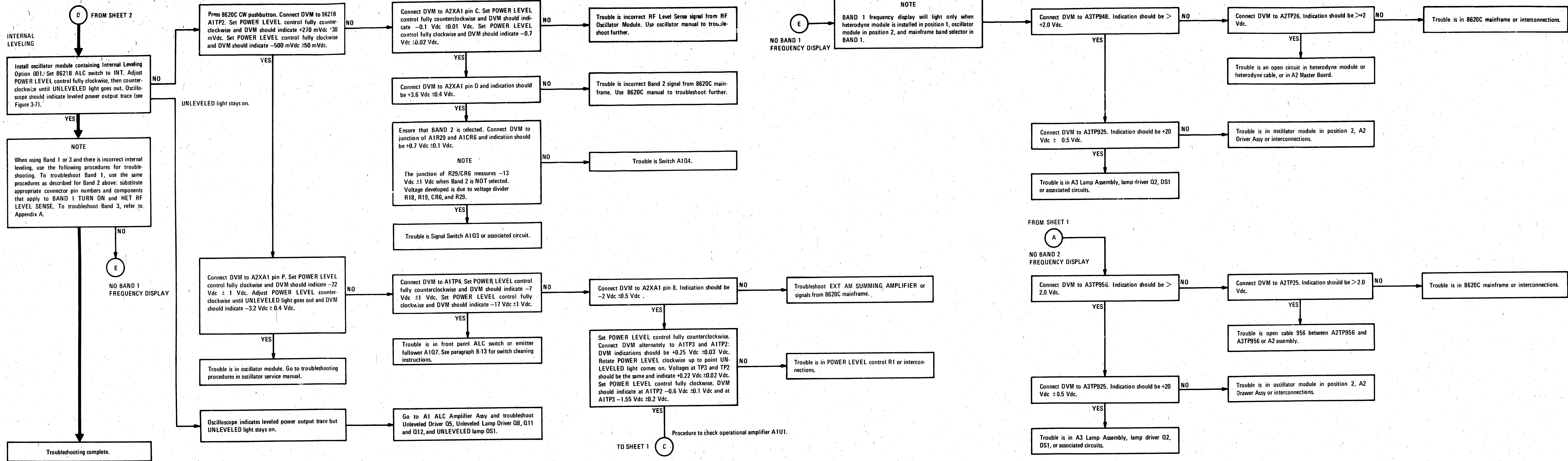


Figure 8-6. Troubleshooting Chart (3 of 3)

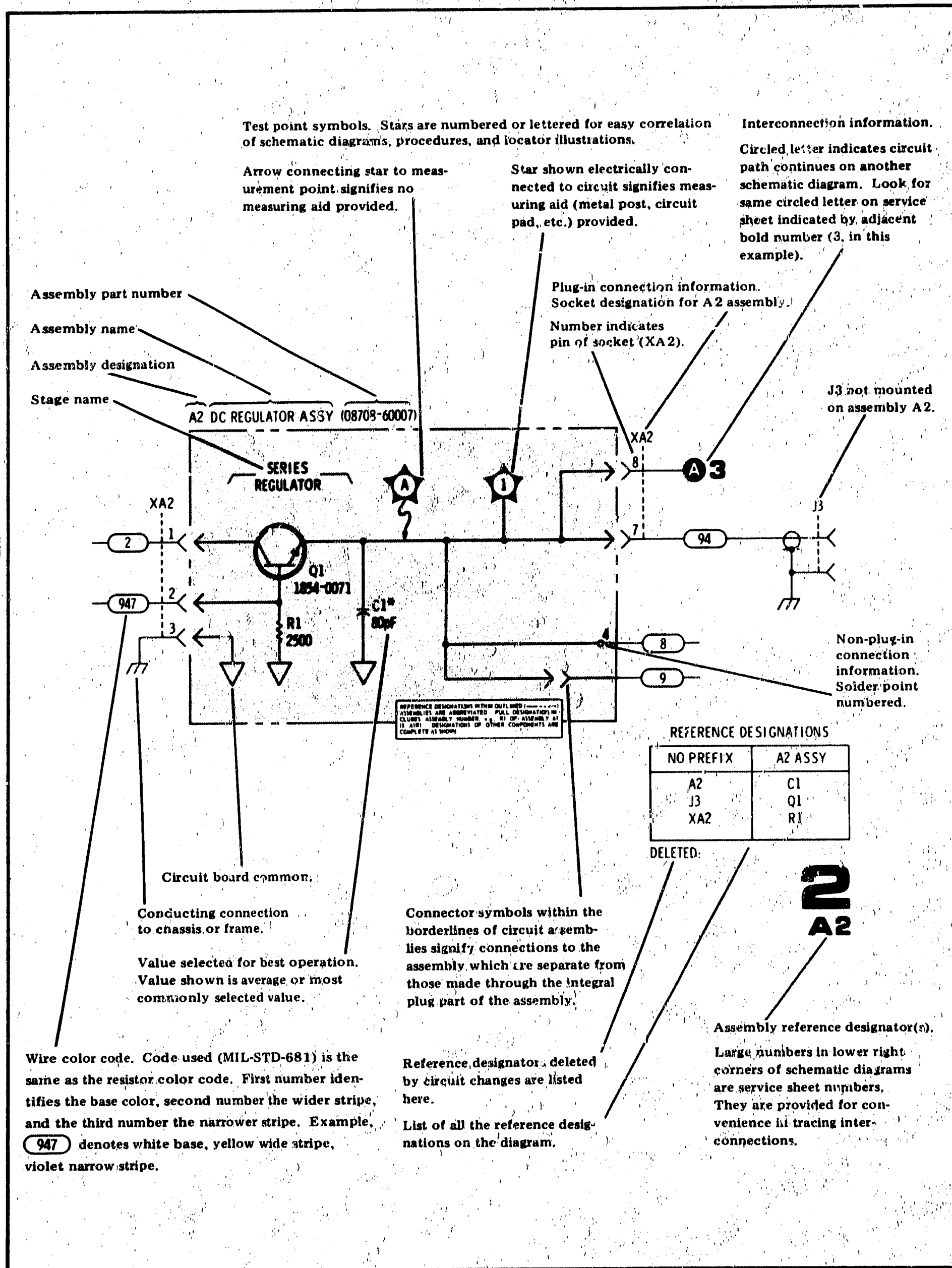


Figure 8-7. General Information on Schematic Diagrams

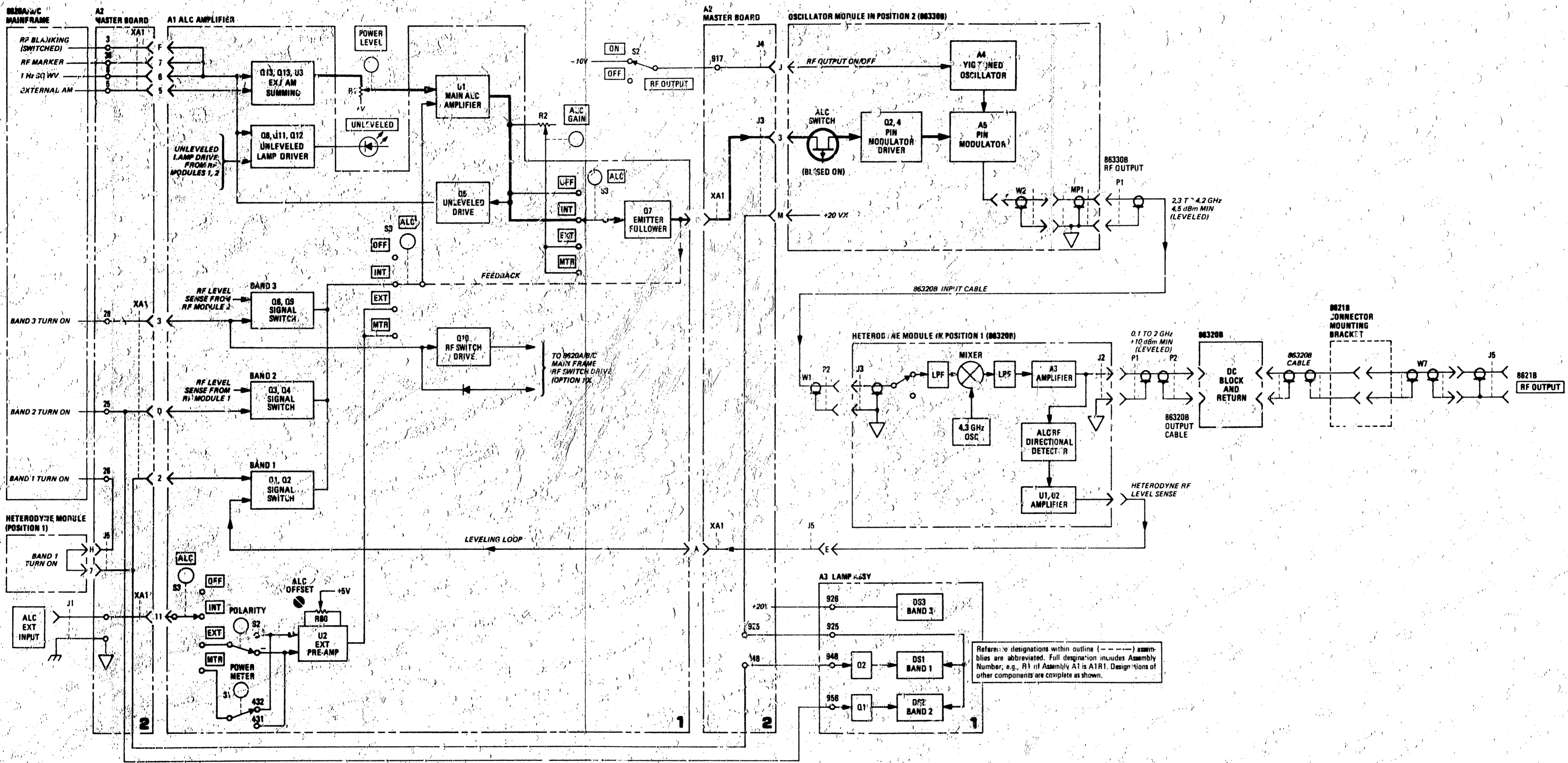


Figure 8-8. Functional Block Diagram

A1 ALC AMPLIFIER BOARD, INSTALLATION AND REMOVAL PROCEDURE

1. Removal of ALC Amplifier Board (Figure 8-9).

- a. Rotate ALC switch on front panel to MTR.

CAUTION

ALC switch decouples from A1 board only when ALC switch is in the MTR position.

- b. Lift white PC board extractors 2 against guides 1 to raise ALC board out of A2XA1 connector.

NOTE

If the ALC Amplifier Board is extended using an 18-pin Extender Board, the ALC switch A1S3 is rotated by using the Switch Lever 4 on the front of the A1 board. (See also Figure 10.)

2. Installation of ALC Amplifier Board (Figures 9-9 and 8-10).

- a. Rotate ALC knob on front panel to MTR position. (See position of Switch-Lever Actuator 3 in Figure 8-9).
- b. Using Switch Lever on A1 board (Figure 8-10), set ALC switch to MTR position.

CAUTION

ALC switch-lever actuator (front panel) engages the ALC switch lever (A1 board) *only* when both are in the MTR position.

- c. Place A1 board in guides 1. While lowering board into A2XA1 connector, ensure that Switch Lever 4 passes through slot 5 in Switch-Lever Actuator 3 before A1 board is pressed into connector A2XA1.

NOTE

To align the switch lever and switch-lever actuator correctly it may be necessary to reposition the ALC front-panel knob slightly while the A1 board is being lowered into place.

- d. Align A1 board with A2XA1 connector (pins A through V) and press down on white PC board extractors 2 to engage A1 board.

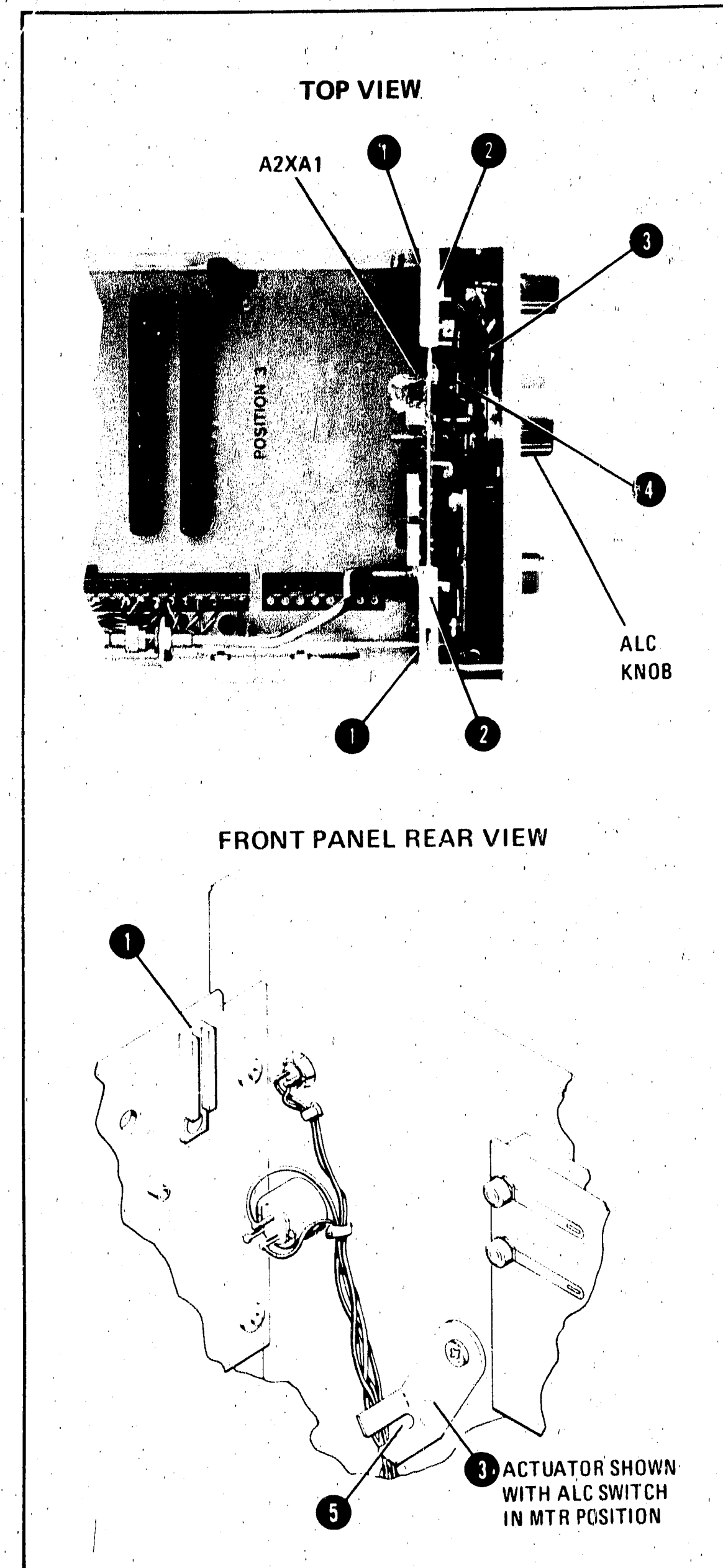


Figure 8-9. A1 ALC Amplifier Board, Installation and Removal

A1 ALC AMPLIFIER, CIRCUIT DESCRIPTION

EXT AM Summing

Transistors A1Q13 and A1Q14 form an inverting unity gain amplifier which sums the RF Blanking, RF markers and internal 1 kHz square wave signals from the 8620 mainframe. The input to A1Q13 is shorted to ground by the front-panel ALC switch when in MTR mode to prevent these signals from interrupting the RF output signal. The output of A1Q14 is applied to the top of the POWER LEVEL potentiometer, R1. External AM is processed by amplifier A1U3. The AM signal is amplified by approximately 0.667 and offset approximately -3.5 Volts. A1CR4 prevents the output of A1U3 from going above 0 Volts. The AM signal is then applied to the top of POWER LEVEL potentiometer R1.

Main ALC Amplifier

When the front-panel ALC switch is in the OFF position, A1C13 is shorted and A1R47 is the feedback resistor for operational amplifier A1U1. The circuit has a gain of approximately (9) nine and derives its input from R1, the front-panel POWER LEVEL potentiometer. In the other positions of the ALC switch, feedback to A1U1 is provided by either an internal crystal detector, external crystal detector or a power meter.

Diodes A1CR19 and A1CR20 and resistor A1R64 and coil A1L1 are also in the feedback circuit of A1U1. They prevent A1U1 from going into saturation during RF Blanking or Square Wave Modulation.

Transistor A1Q5 provides drive for the Unleveled Lamp Driver. If the voltage at TP4 exceeds -22 Volts, A1Q5 conducts, turning A1Q8 ON.

Unleveled Lamp Driver

The UNLEVELED LAMP, located on the front panel of the 8621B, can be turned on by any of three sources: When the ALC switch is in the OFF position the base of A1Q8 is grounded thru A1R6. A1Q8 is then biased ON, causing peak detector A1Q11 to conduct, turning ON A1Q12 which lights the LED DS1.

When the ALC switch is in any other position, A1Q8 only biased ON if A1Q5 is turned ON by a voltage greater than -22 V at TP4. The above sequence is repeated if A1Q8 is turned ON.

The signal applied to A1R15 is sampled from an RF Module modulator drive. If this voltage goes positive, indicating an unleveled condition, A1Q11 peak detector conducts and turns A1Q12 ON.

External Preampifier

Operational amplifier A1U2 has a small signal gain of 20. It is used to process the ALC feedback voltage from an external crystal detector or a power meter. Switch A1S2 is set to match the polarity of the external detector used and A1S1 is set to match the external power meter used for leveling.

Diodes A1CR15, A1CR14 and A1CR13 provide gain shaping for A1U2. When the voltage at TP1 exceeds -0.7 Volts, the gain of A1U2 is changed to approximately 4. When the voltage exceeds -1.4 Volts the gain is approximately 1 and if the voltage exceeds 2.1 Volts the gain is 0.

Switching

Transistor pairs A1Q6 and Q9, A1Q4 and Q3, A1Q2 and Q1 form an input switching network for internal leveling. The proper transistor is activated by the 8620 mainframe Band Select lines.

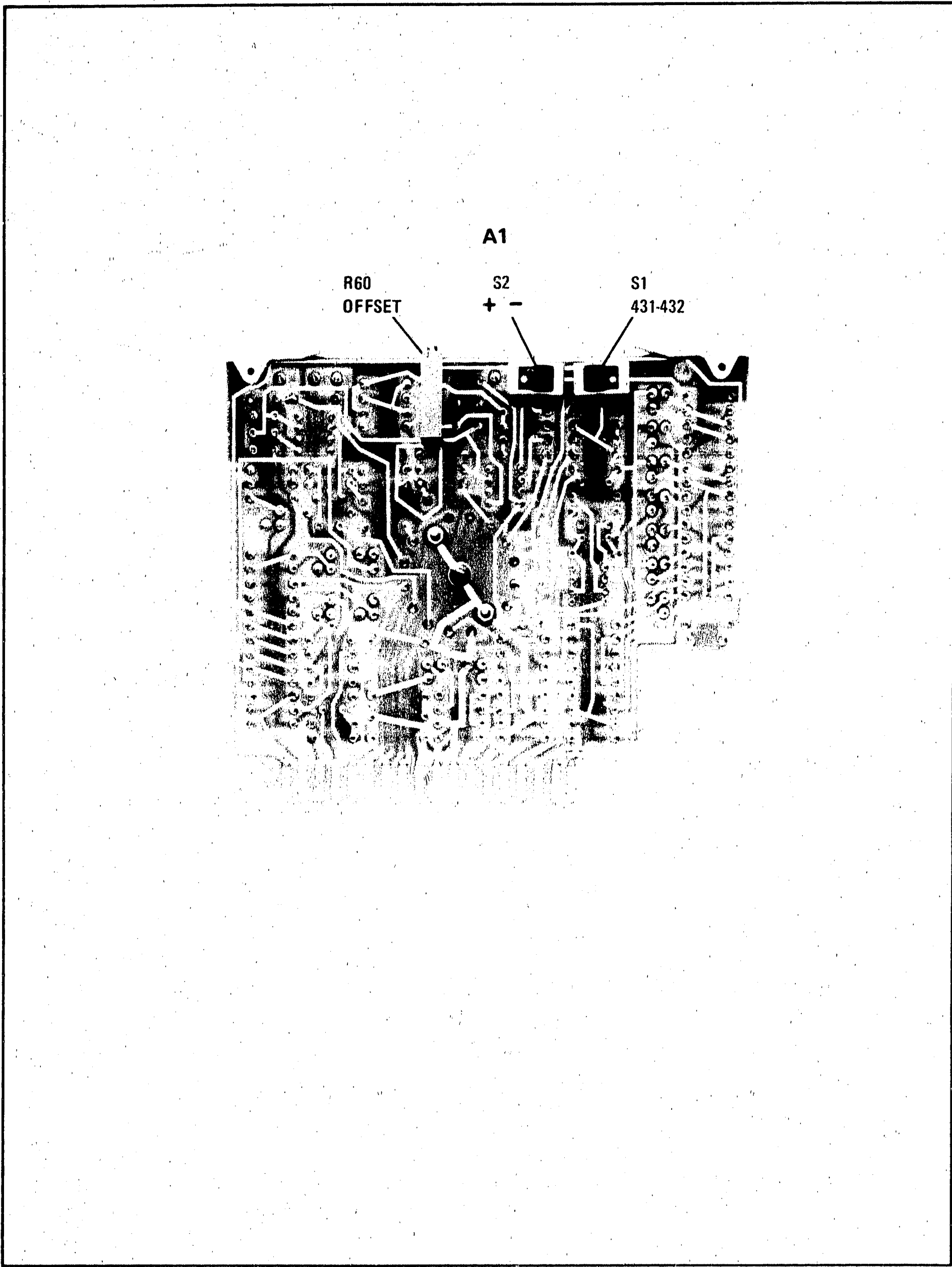


Figure 8-11. A1 ALC Amplifier Board, Component Location (2 of 2)

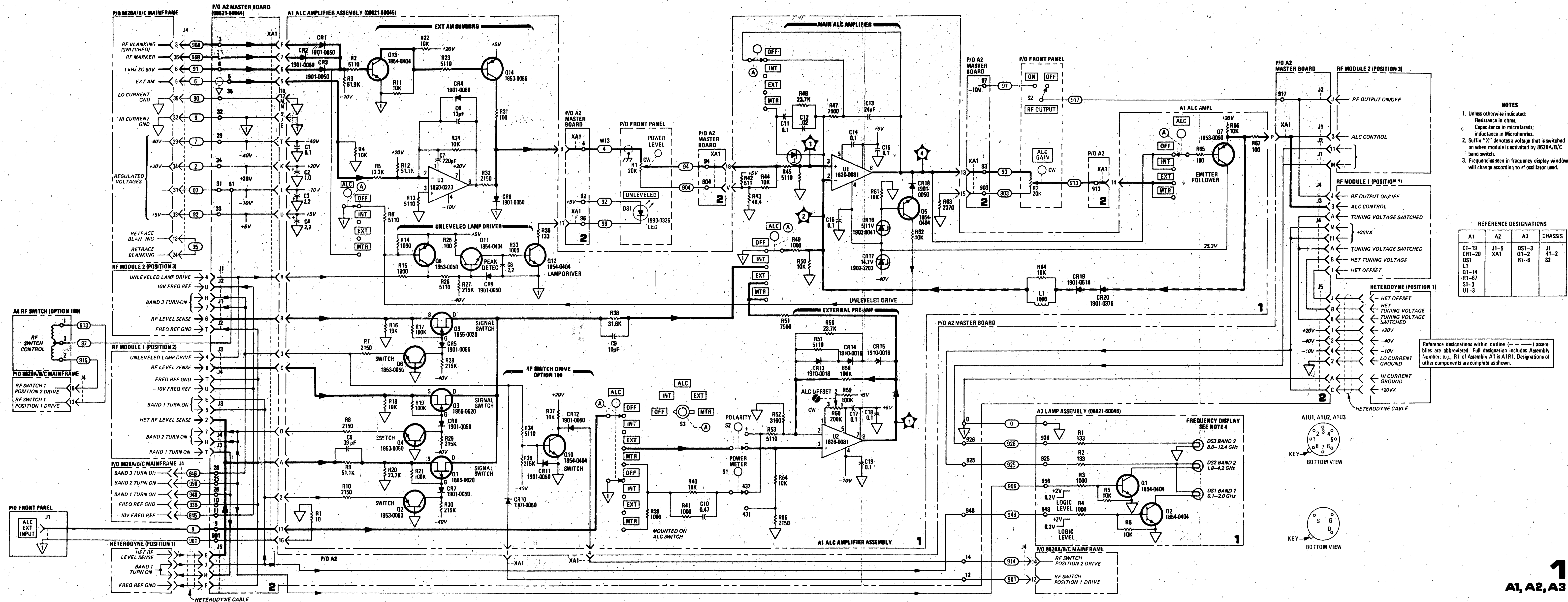


Figure 8-12. A1 ALC Amplifier Assembly, Schematic

NUMBERING LOGIC OF A2 MASTER BOARD TERMINALS (Figure 8-15)

Top of Master Board

The numbered terminals on the top and along the side of the A2 Master Board refer to wire color codes. The wires at these terminals connect directly to the rear panel interface connector J4, except for one wire (97) used with Option 100. These numbered terminals are provided for ease in re-assembling if several wires are disconnected simultaneously. Also when modifying the RF Section with the attenuator option (Option 010) interconnections are simplified by having the numbered

terminals. The terminals at the front, which are also numbered with wire color codes, provide interconnections between the front panel and master board.

Bottom of Master Board

The numbered terminals on the bottom and along the side of the A2 Master Board refer to pin numbers of the rear panel connector J4. The terminals at the front of the master board provide interconnections with the front panel and thus test points for troubleshooting the front panel. These terminals are numbered with wire color codes and Figure 8-14 shows the numbering system.

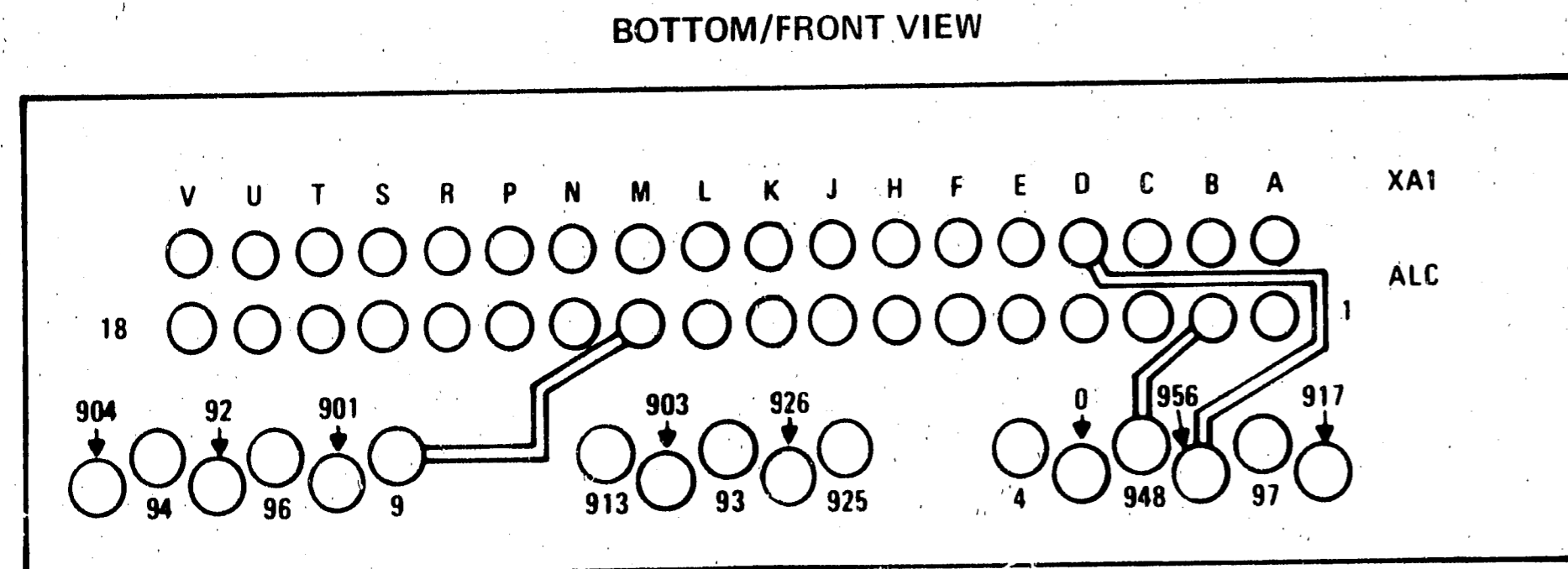


Figure 8-13. Master Board Terminal Identification

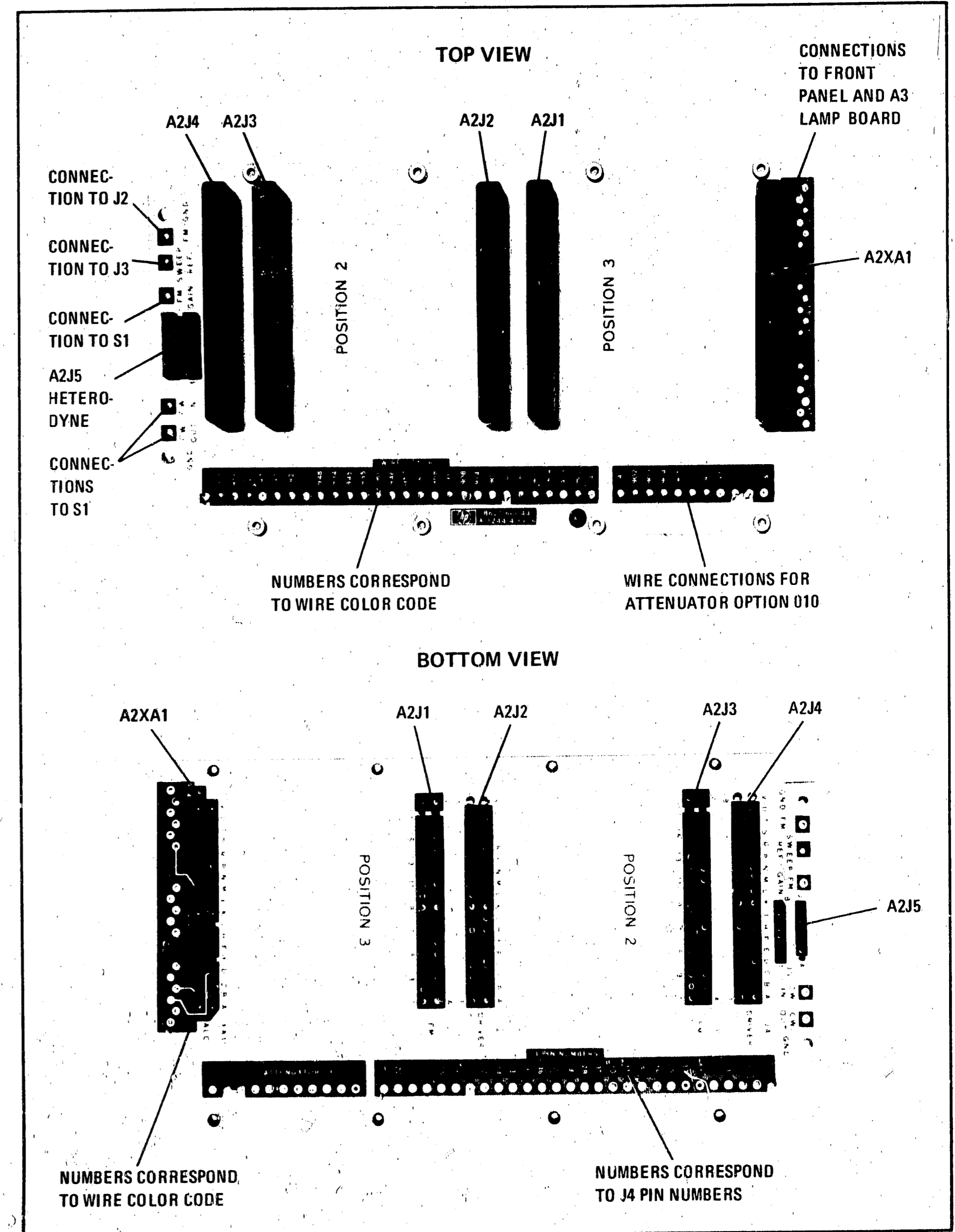


Figure 8-14. A2 Master Board Interconnection Identification

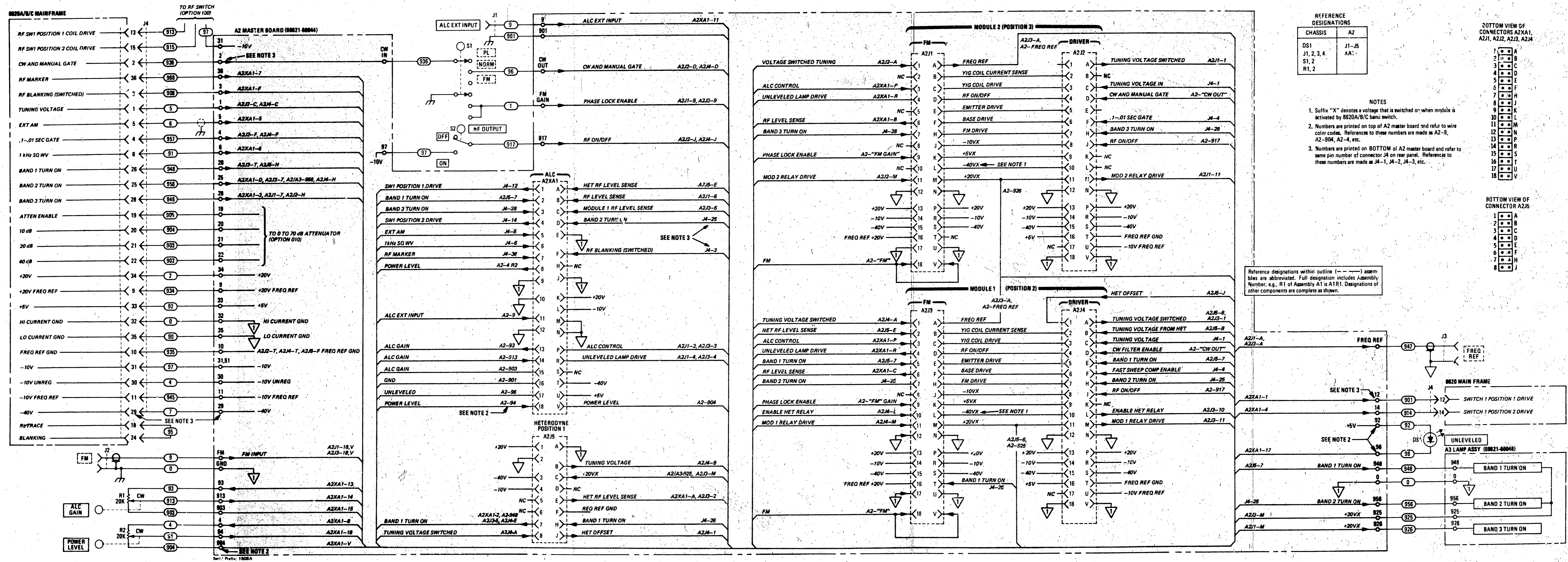


Figure 8-15. A2 Master Board Interconnect Diagram

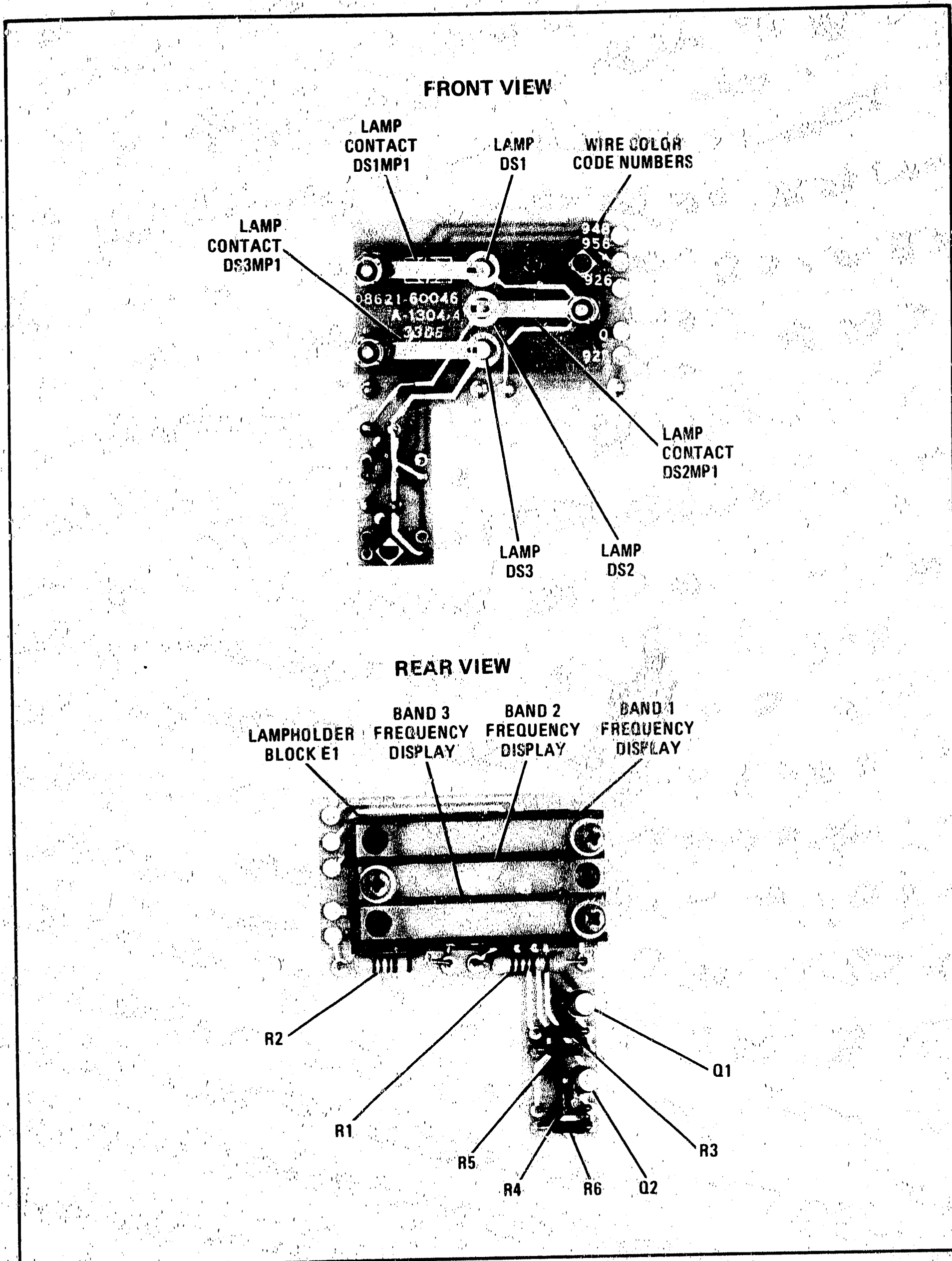


Figure 8-16. A3 Lamp Board, Component Location

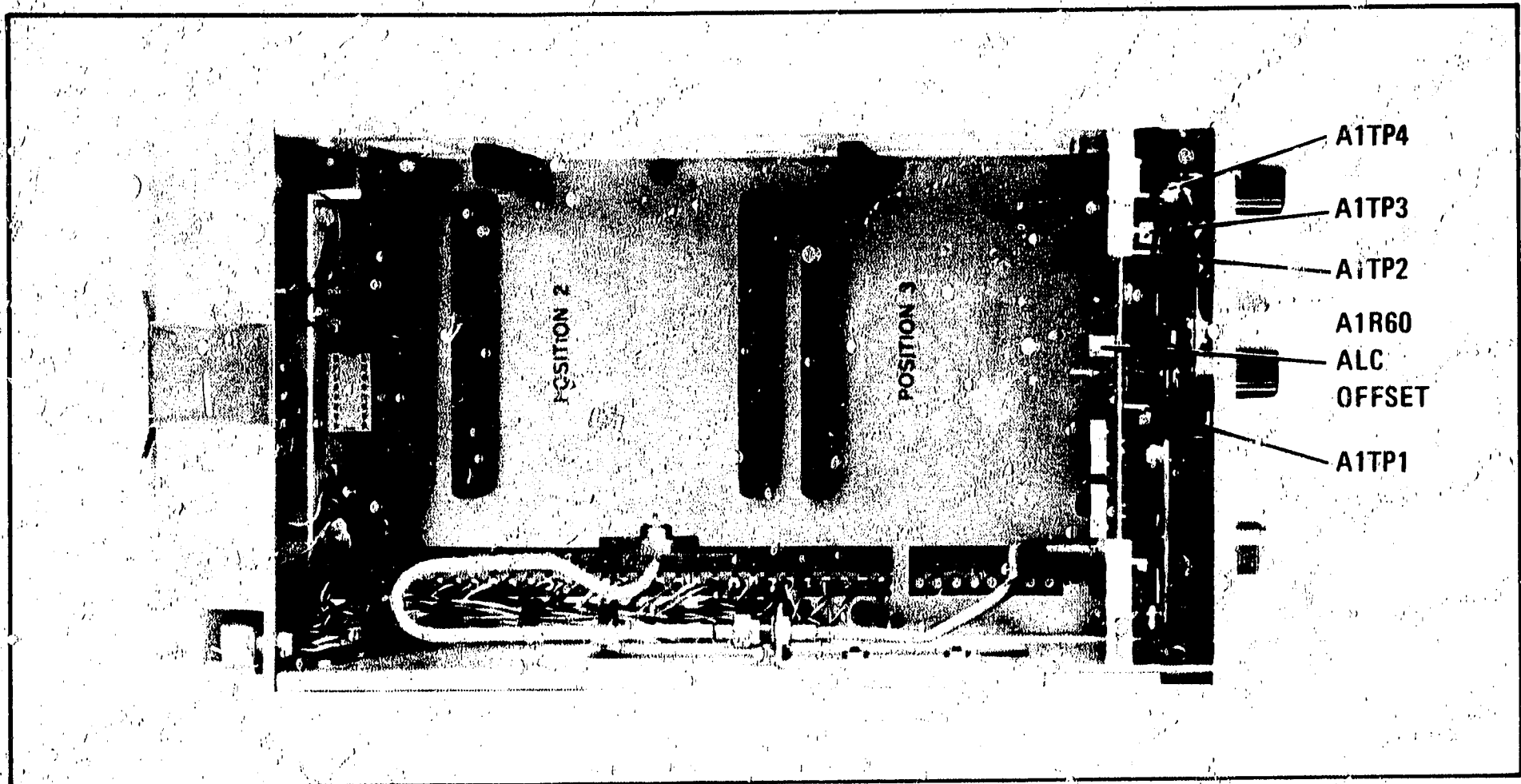


Figure 8-17. Location of Adjustment and Test Points

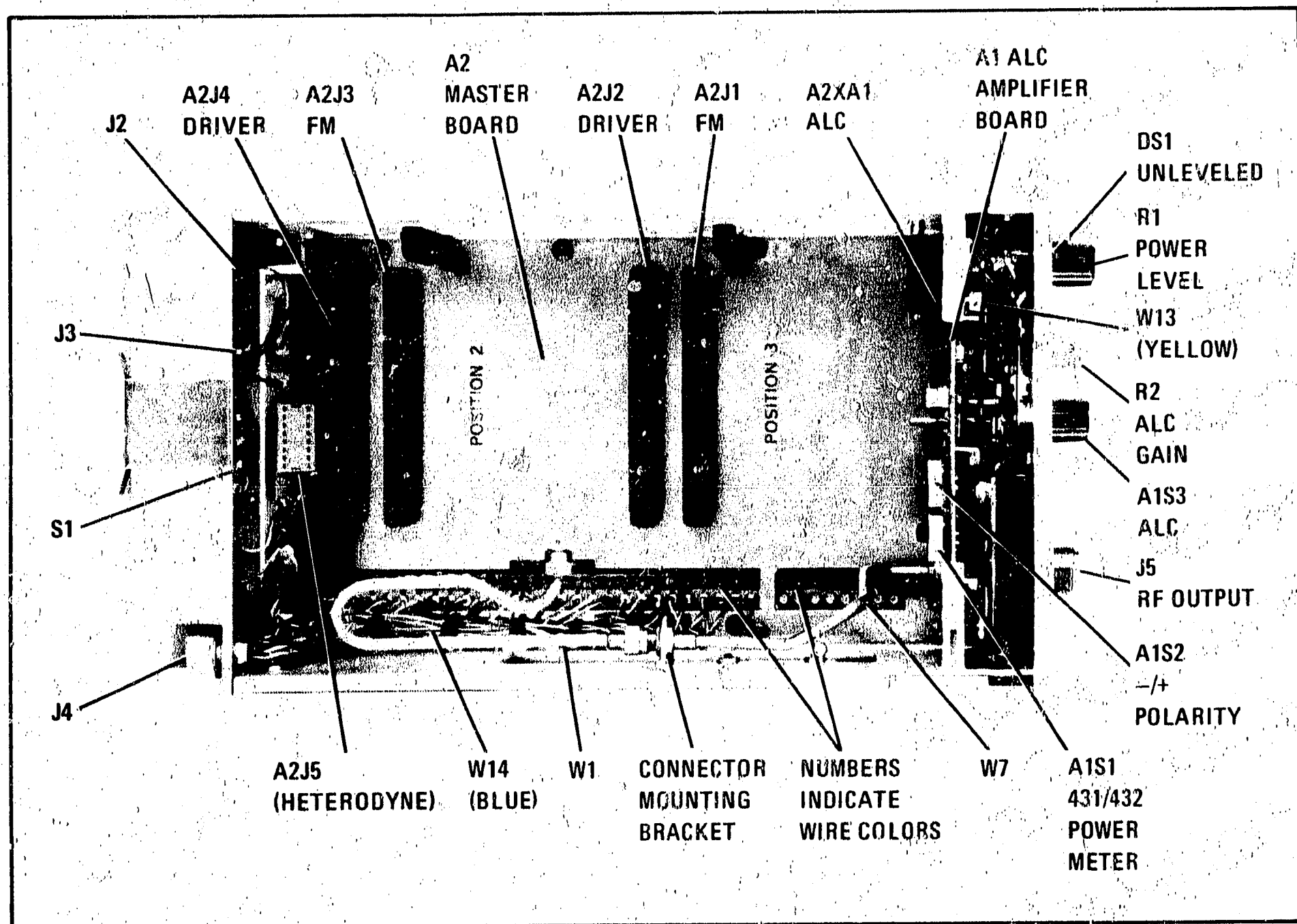


Figure 8-18. Top View, Major Assembly and Component Locations

APPENDIX

A

APPENDIX A OPTION 100 RF SWITCH

A-1. INTRODUCTION

A-2. This appendix describes the differences in HP Model 8621B RF Section with Option 100 installed. It also contains the changes required in the standard operating manual to document the option or combination of options. The components and assemblies used with the option are shown together with an installation procedure. The installation procedures contain all information necessary to install each option, combination of options, or the option in combination with an HP Model 86320B Heterodyne Module. Since the component and assembly configurations change with the 86320B installed, this appendix describes these differences. Combinations of more than one option also change the component and assembly configuration and these differences are also included.

A-3. Incorporating the 86320B Heterodyne Module

A-4. When ordering the 86320B, the four cables necessary to incorporate any Heterodyne installation are packaged with the instrument. However, if the 86320B is installed at the factory, only those cables required as original equipment are installed. For example, if the factory installed and shipped an 8621B Option 100 with an 86320B, then three 86320B cables would be included as original equipment (Figure A-11, Items 3, 5, and 6). If later on the RF Section is to be modified to include an Option 010, then an 86320B cable (Figure A-11, Item 4) must be ordered along with the other parts needed to install the Option 010 (Table A-5).

A-5. Cable and Assembly Mechanical Variations

A-6. Figure A-11 may be used to check for correct configuration and layout of hardware used for the option and the 86320B. This diagram is especially useful when removing an option. Manual Changes adapt the Operating and Service Manual to installed options only. When removing an option, manual changes can be made by adapting the manual to assemblies and components shown in Figure A-11. Table A-7 shows the parts required to adapt the instrument to any option configuration.

A-7. DESCRIPTION

A-8. The HP Model 8621B Option 100 provides a coaxial RF Switch to accommodate two oscillator modules. Figure A-11 shows the Option 100 configuration as well as the configuration with other options installed, with and without the 86320B Heterodyne Module. A circuit description of the RF Switching circuit is contained in paragraph A-41. Figure A-13 is a troubleshooting chart for the RF Switch Drive Circuits and Band 3 frequency display. The schematic in Figure A-12 shows only the electrical connections between the main-frame, RF Section and RF Switch required to actuate the RF Switch. Displayed on the schematic are the switching voltages necessary to select Band 2 and 3.

A-9. OPTION 100 INSTALLATION PROCEDURES

A-10. Installation of Option 100 modifies the 8621B RF Section to allow the use of two fundamental oscillators. Paragraph A-19 contains procedure steps necessary to install Option 100 in a standard 8621B RF Section. Paragraph A-20 contains the procedure to install Option 100 in RF Sections that have an 86320B Heterodyne Module installed. Paragraphs A-21 through A-35 contain installation procedures for modifying RF Sections that already contain options or options and Heterodyne Modules.

A-11. OPTION 100 MANUAL CHANGES

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

Delete W1.

Add W3 HP Part Number 08621-20056 Cable Assy: Position 3/RF Switch.

Add W4 HP Part Number 08621-20057 Cable Assy: RF Switch/Front RF Output.

Add W6 HP Part Number 08621-20059 Cable Assy: Position 2/RF Switch.

Delete W7.

Page 6-9, Table 6-3:

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00032 Bracket: RF Switch Mounting.

A-12. Option 100 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

Delete W1.

Add W3 HP Part Number 08621-20056 Cable Assy: Position 3/RF Switch.

Add W4 HP Part Number 08621-20057 Cable Assy: RF Switch/Front RF Output.

Delete W7.

Page 6-9, Table 6-3:

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00032 Bracket: RF Switch Mounting.

Page 8-15, Figure 8-9:

Replace RF Output section on Figure 8-9 with Figure A-1, Option 100.

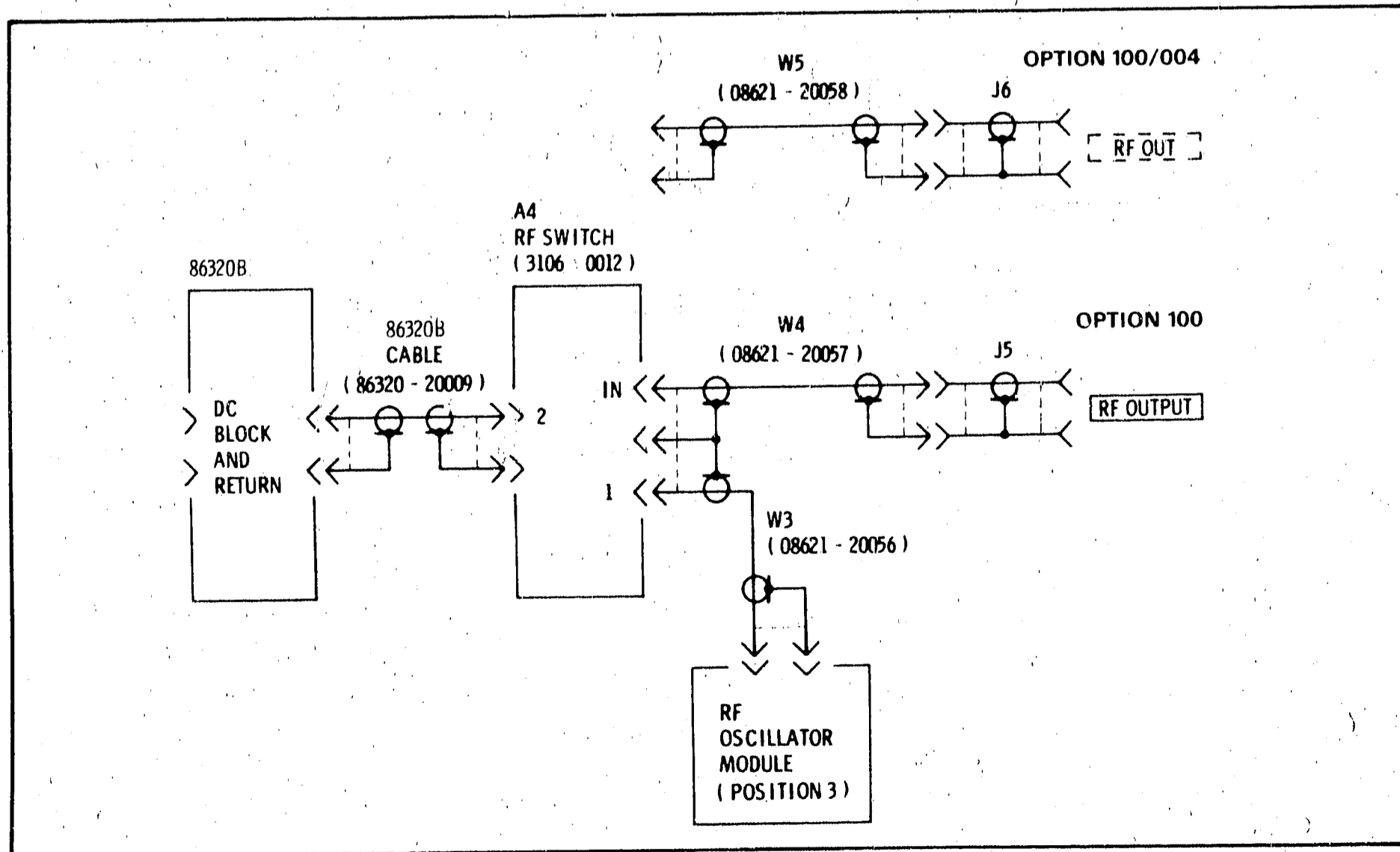


Figure A-1. Functional Block Diagram, Options 100 and 100/004

A-13. OPTION 100/010 MANUAL CHANGES

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table A-1.

Page 3-2, Figure 3-1:

Replace Figure 3-1 with Figure A-2.

Page 3-3, Figure 3-1:

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure A-3.

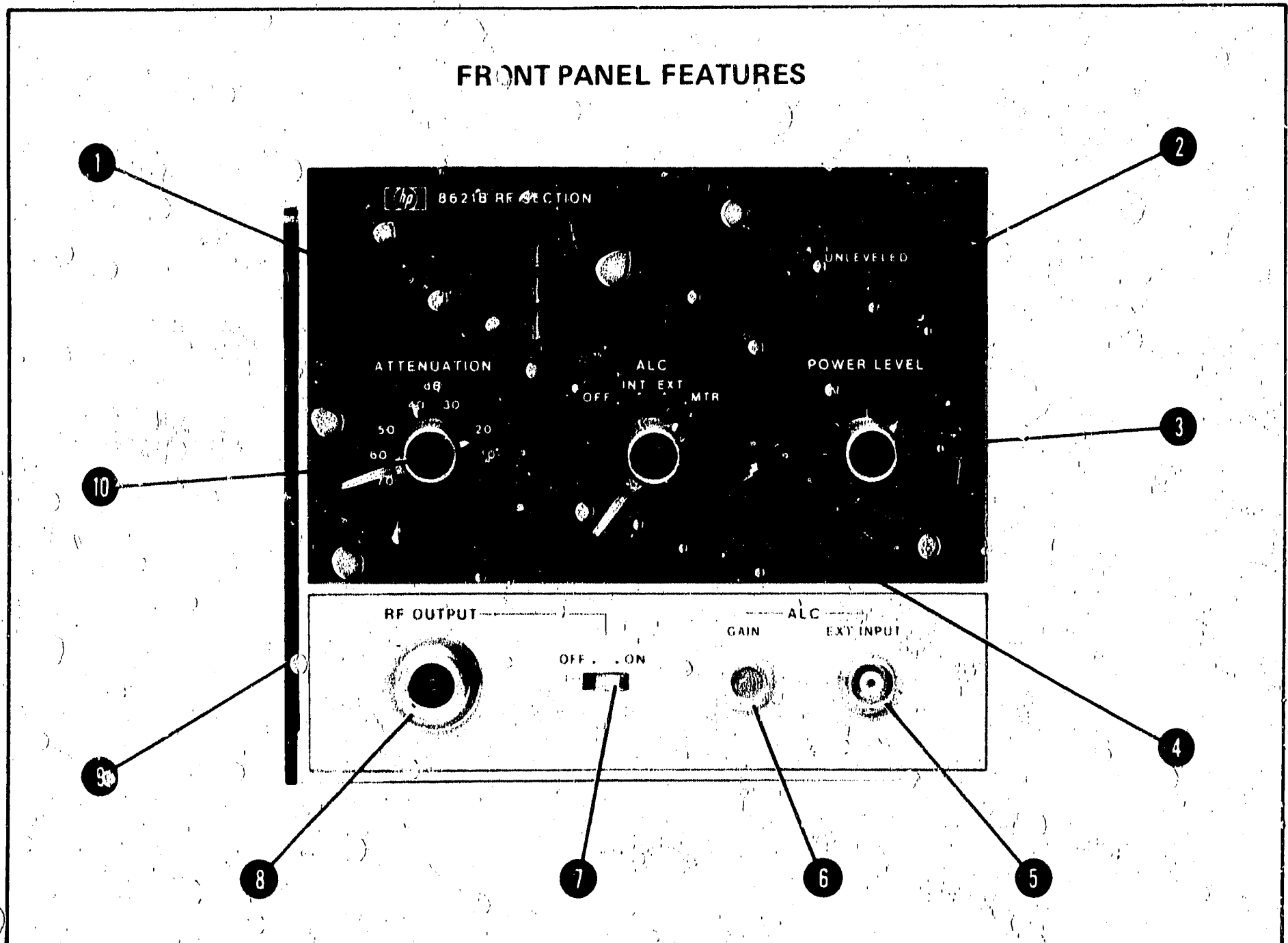


Figure A-2. Front Panel Features, Option 010

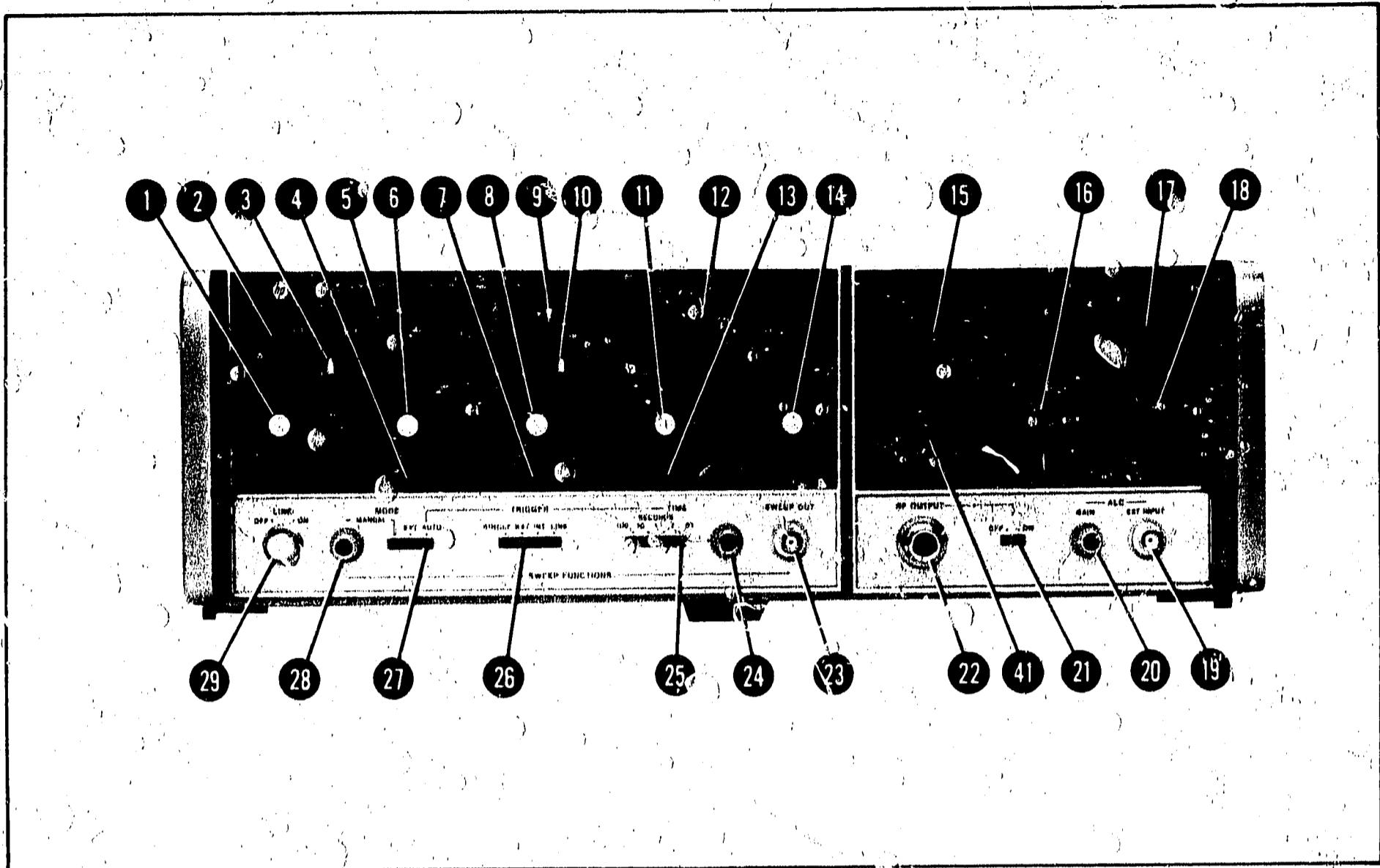


Figure A-3. Operator's Checks, Option 010

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB **31** 0 dB

Section III and V:

Add to all Operator's Checks and External Preamp ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure A-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add performance Test for Option 010, Figure A-4.

Add Table A-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18GHz.

*Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.

*Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.

*Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part Number 0370-1111 Knob: Bar.

*Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.

Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table A-5.)

Page 6-7, Table 6-3 (Cont'd):

Delete W7.

Add W9 HP Part Number 08621-20062 Cable Assy: Attenuator/Front RF Output.

Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026*.

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00008 Bracket: RF Switch Mounting.

A-14. Option 100/010 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table A-1.

Page 3-2, Figure 3-1:

Replace Figure 3-1 with Figure A-2.

Page 3-3, Figure 3-1:

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure A-3.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure A-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010; Figure A-4.

Add Table A-2, Performance Test Record for Option 010.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table A-5.)

Table A-1. Recommended Test Equipment, Option 010

Instrument	Critical Specifications	Recommended Model	Use*
Spectrum Analyzer	Frequency Range: 10.0 MHz to 18.0 GHz 12.4 to 40 GHz with external mixer	HP 141T/8552B/8555A	P
70-dB Attenuator	Stepped, 0 to 70 dB Maximum SWR: DC to 8 GHz = 1.35 8 to 12.4 GHz = 1.5 Maximum Residual Attenuation 0.4 dB +0.07 dB/GHz	HP 8495B	P

* P = Performance

1. OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST

2. Introduction

3. This performance test checks that the accuracy of the 0- to 70 dB Attenuator meets the specifications listed in Table 1-1. This test may be used for incoming inspection, after repair of the instrument, after installation of the Option 010, or for periodic evaluation.

4. Equipment Required

5. A complete list of test equipment required to perform this test is given in Table A-1. If the recommended equipment is not available, a substitute may be used if it meets or exceeds the critical specifications listed in the table.

6. Test Record

7. Table A-2 is a test record form provided to record results from the performance test. The table is keyed to the paragraph numbers and test titles in the procedures.

8. PERFORMANCE TEST

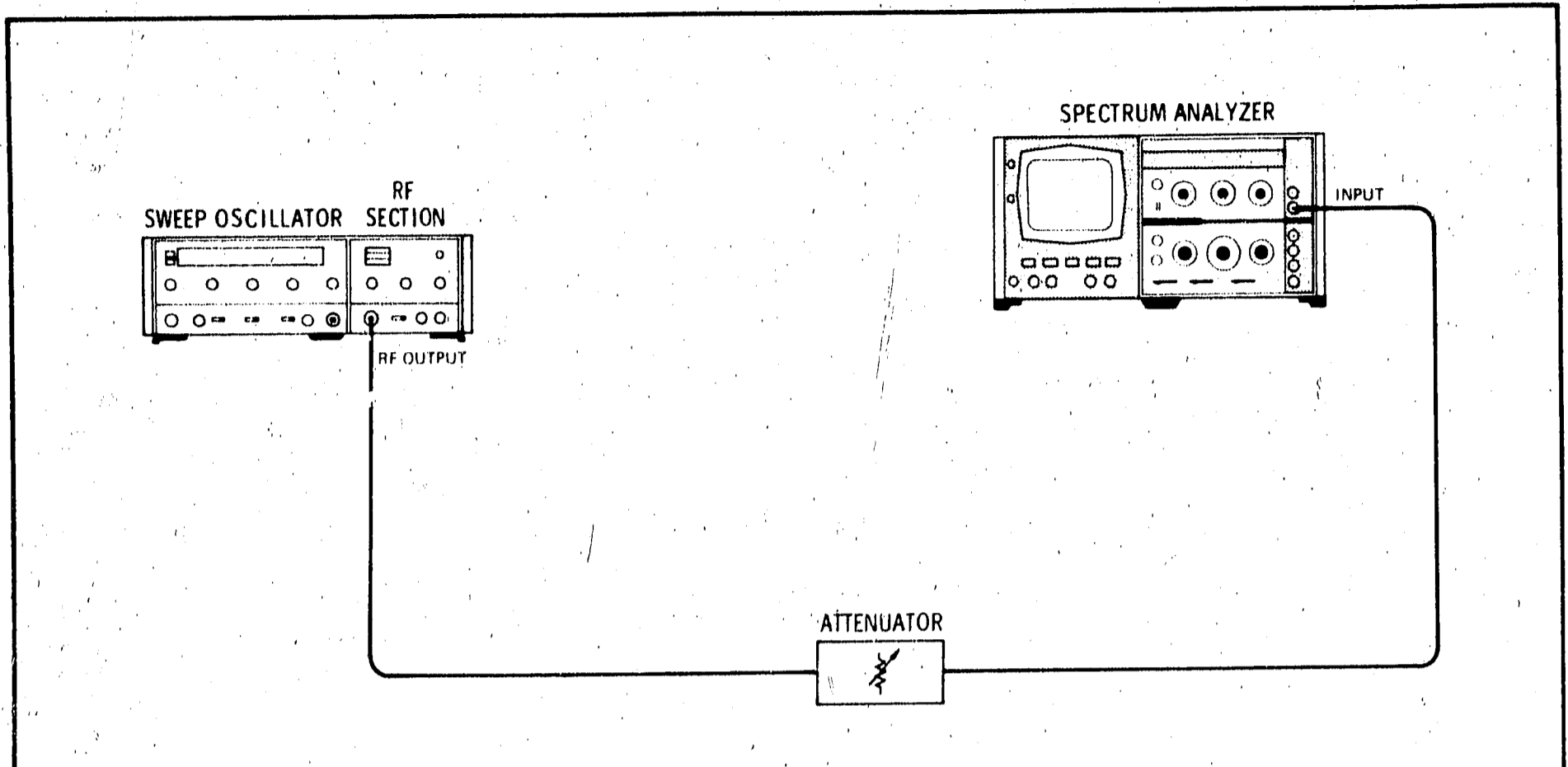
SPECIFICATIONS:

- <±0.6 dB at 10-dB step.
- <±5% of attenuation selected for all other settings.

DESCRIPTION:

Attenuation accuracy of the 0- to 70-dB Attenuator is measured so the difference between each attenuator setting and a reference level meets the specifications.

Figure A-4. Option 010 Attenuation Accuracy Performance Test (1 of 3)



Option 010 Attenuation Accuracy Test Setup

EQUIPMENT:

Sweep Oscillator	HP 8620C
70-dB Attenuator	HP 8495B
Spectrum Analyzer	HP 8555A/8552B/141T

PROCEDURE:

- a. Connect equipment as shown in test setup.
- b. Press 8620C LINE switch to ON; press 8620C CW pushbutton. Allow equipment to warm up for a minimum of 30 minutes.
- c. Set controls as follows:

8620C

BAND 2	RF Oscillator Frequency
CW MARKER pointer 9	Center-scale
1 kHz SQ WV/OFF (rear panel)	OFF
RF BLANKING/OFF (rear panel)	OFF
DISPLAY BLANKING/OFF (rear panel)	OFF

8621B

RF 7	ON
POWER LEVEL 3	Fully Clockwise
ATTENUATION 10	0 dB

Figure A-4. Option 010 Attenuation Accuracy Performance Test (2 of 3)

8555A:
 BANDWIDTH 100 kHz
 SCAN WIDTH2 MHz/DIV
 INPUT ATTENUATION 0 dB

8552B:
 SCAN TIME 1 SEC/DIV
 LOG REF LEVEL -20 dBm
 VIDEO FILTER 100 Hz
 SCAN MODE INT
 SCAN TRIGGER AUTO

8495B:
 Attenuation 70 dB

d. Center CW frequency display on Spectrum Analyzer. Set LOG REF LEVEL VERNIER for some convenient reference level.

e. Rotate 8621B 70-dB Attenuator to 10 dB and 9495B attenuation to 60 dB. RF displayed on Spectrum Analyzer should return to reference level ± 0.6 dB.

f. Rotate 8621B 70-dB Attenuator to 20 dB and 8495B Attenuation to 50 dB. RF displayed on Spectrum Analyzer should return to reference level ± 1.0 dB. (20 dB x 5% = 1.0 dB)

g. Set 8621B to 30 dB; 8495B to 40 dB, and RF should return to reference level ± 1.5 dB.

h. Set 8621B to 40 dB; 8495B to 30 dB, and RF should return to reference level ± 2.0 dB.

i. Set 8621B to 50 dB; 8495B to 20 dB, and RF should return to reference level ± 2.5 dB.

j. Set 8621B to 60 dB; 8495B to 10 dB, and RF should return to reference level ± 3.0 dB.

k. Set 8621B to 70 dB; 8495B to 0 dB, and RF should return to reference level ± 3.5 dB.

Figure A-4. Option 010 Attenuation Accuracy Performance Test (3 of 3)

Table A-2. Performance Test Record

Hewlett-Packard Model 8621B RF Plug-In, Option 010		Test Performed by _____		
Serial No. _____		Date: _____		
Para.	Description	Lower Limit	Measured Value	Upper Limit
8 (Figure A-4)	ATTENUATION ACCURACY			
	e. Attenuator at 10 dB	9.4 dB	_____	10.6 dB
	f. Attenuator at 20 dB	19.0 dB	_____	21.0 dB
	g. Attenuator at 30 dB	28.5 dB	_____	31.5 dB
	h. Attenuator at 40 dB	38.0 dB	_____	42.0 dB
	i. Attenuator at 50 dB	47.5 dB	_____	52.5 dB
	j. Attenuator at 60 dB	57.0 dB	_____	63.0 dB
k. Attenuator at 70 dB	66.5 dB	_____	73.5 dB	

Page 6-7, Table 6-3:

- Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.
- *Add A5 HP Part Number 08621-60066 Board Assy.: Attenuator.
- *Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.
- *Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.
- *Add A7MP1 HP Part Number 0370-1111 Knob: Bar.
- *Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.
- Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch;
- Delete W1.
- Delete W7.
- Add W9 HP Part Number 08621-20062 Cable Assy: Attenuator/Front RF Output.
- Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 6-9, Table 6-3:

- Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026*.
- Delete HP Part Number 08621-00033 Bracket: Connector Mounting.
- Add HP Part Number 08621-00008 Bracket: RF Switch Mounting.

Page 8-15, Figure 8-8:

Replace RF Output section on Figure 8-8 with Figure A-5, Option 100/010.

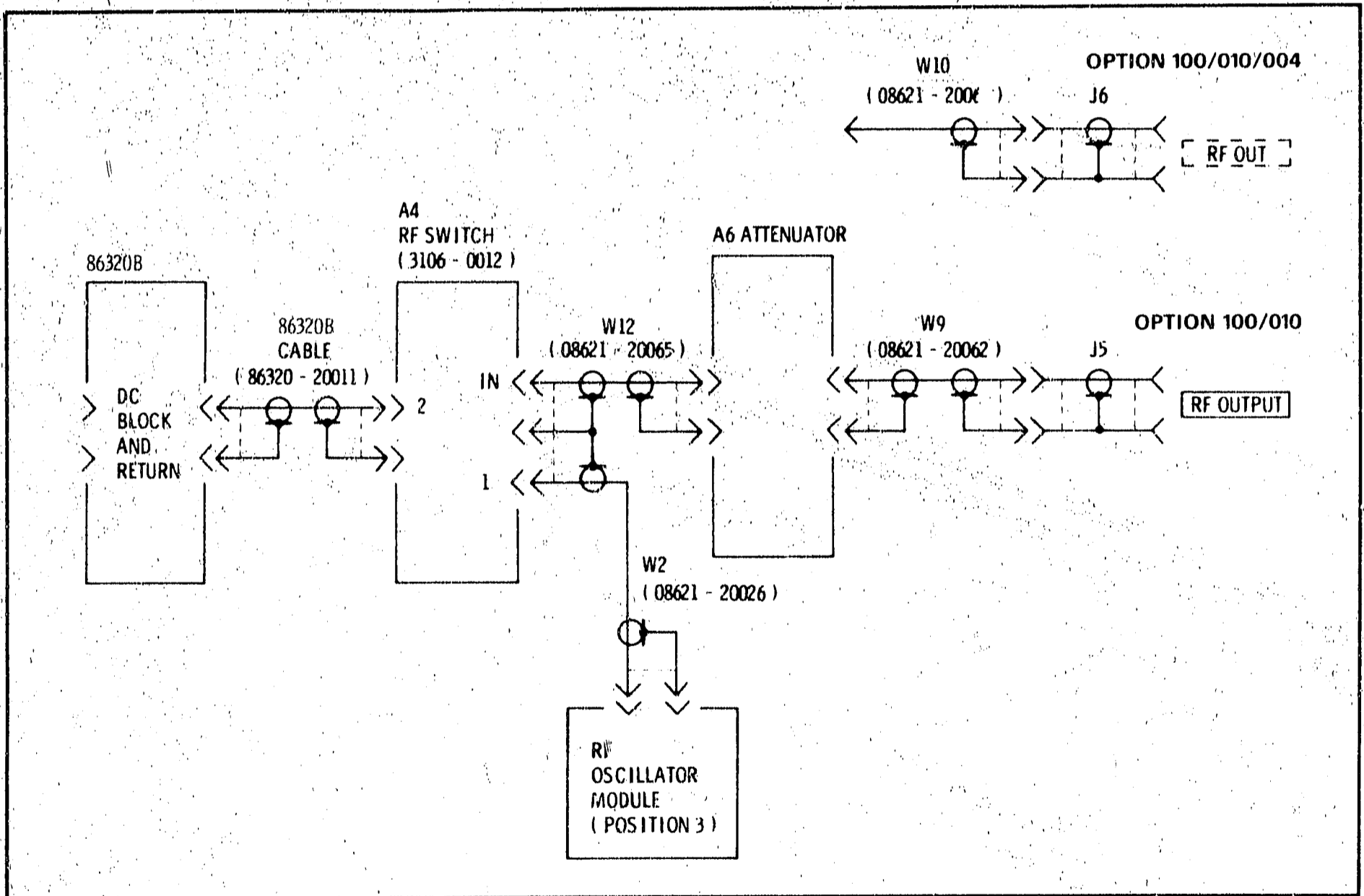


Figure A-5. Functional Block Diagram, Options 100/010 and 100/010/004 RF Output

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table A-5.)

A-15. OPTION 100/004 MANUAL CHANGES

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

Replace Figure 3-1 with Figure A-6.

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

Delete existing item **8** and add the following: **8** RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure A-7.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

Change J5 to J6 Rear Panel RF OUT.

Delete W1.

Add W3 HP Part Number 08621-20056 Cable Assy: Position 3/RF Switch.

Add W5 HP Part Number 08621-20058 Cable Assy: RF Switch/Rear RF Output.

Add W6 HP Part Number 08621-20059 Cable Assy: Position 2/RF Switch.

Delete W7.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00032 Bracket: RF Switch Mounting.

A-16. Option 100/004 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

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

Replace Figure 3-1 with Figure A-3.

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

Delete existing item **8** and add the following: **8** RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure A-7.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

Change J5 to J6 Rear Panel RF OUT.

Delete W1.

Add W3 HP Part Number 08621-20056 Cable Assy: Position 3/RF Switch.

Add W5 HP Part Number 08621-20058 Cable Assy: RF Switch/Rear RF Output.

Add W6 HP Part Number 08621-20059 Cable Assy: Position 2/RF Switch.

Delete W7.

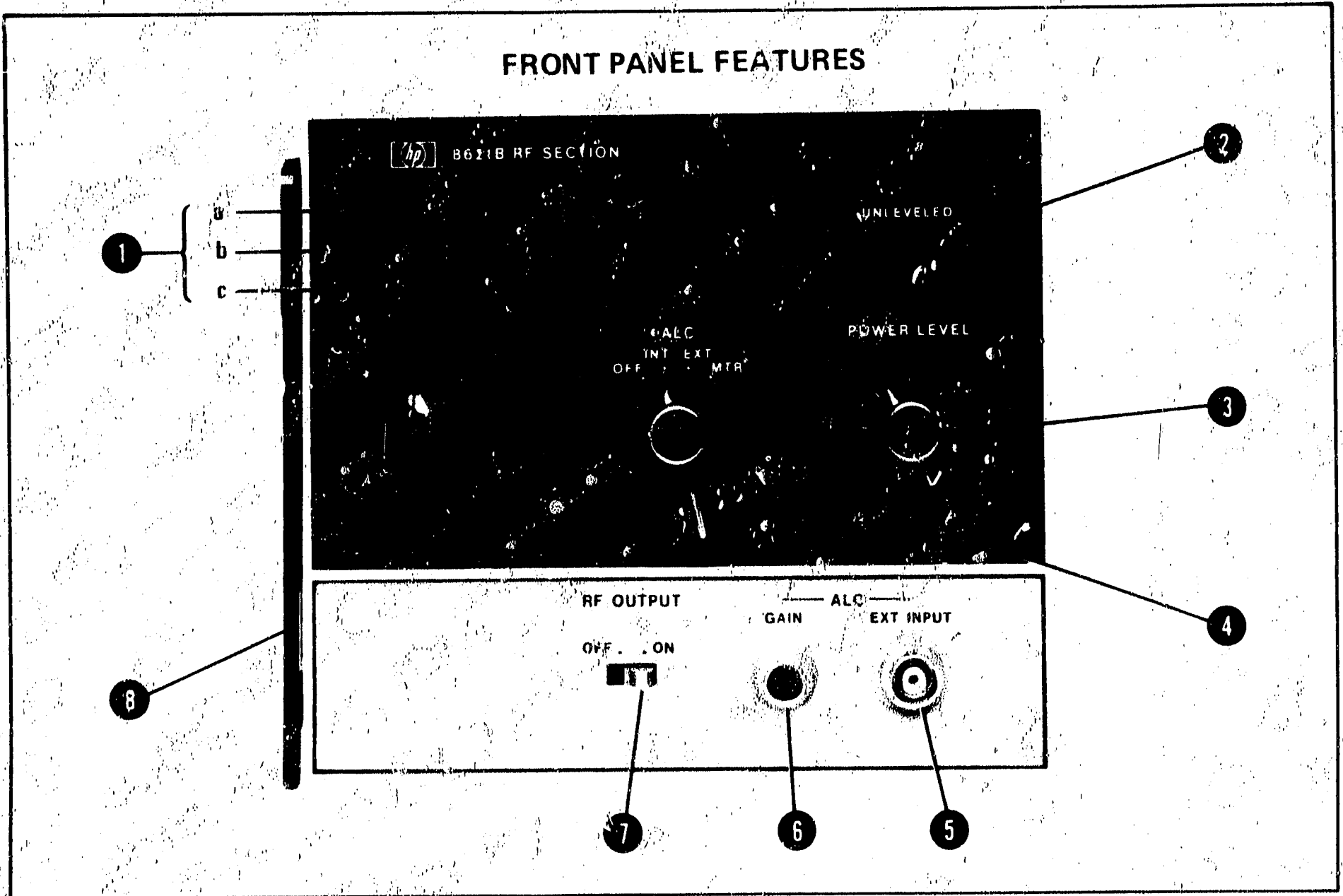


Figure A-6. Front Panel Controls, Connectors and Indicators, Option 004

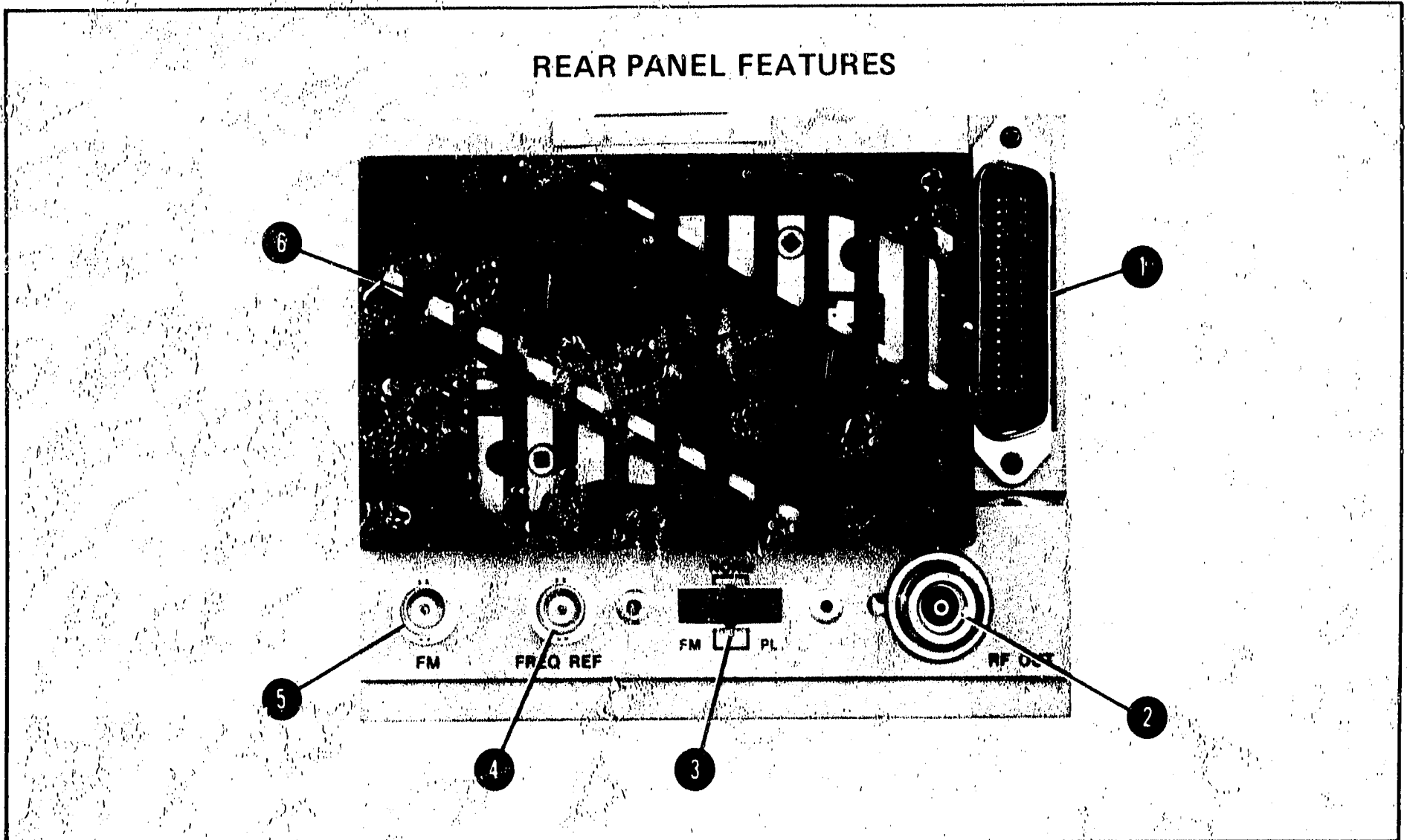


Figure A-7. Rear Panel Control and Connectors with 86320B Heterodyne Module, Option 004

Page 6-9, Table 6-3:

- Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.
- Delete HP Part Number 08621-00033 Bracket: Connector Mounting.
- Add HP Part Number 08621-00032 Bracket: RF Switch Mounting.

Page 8-15, Figure 8-8:

Replace RF Output section on Figure 8-8 with Figure A-1, Option 100/004.

A-17. OPTION 100/010/004 MANUAL CHANGES

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table A-1 (Option 010).

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

Replace Figure 3-1 with Figure A-2.

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

Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 100/010/004 no front panel figure is provided, use Figure A-2 (Option 010) and delete the RF Output connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure A-7.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure A-3.

Page 3-7, Figure 3-3.

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure A-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure A-4.

Add Table A-2 Performance Test Record for Option 010.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

*Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.

*Add A6 HP Part Number 08621-60012 Attenuator Assy: Programmable, 70-dB.

*Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part Number 0370-1111 Knob: Bar.

*Add A7S1 HP Part Number 3100-3237 Switch: Rotary Attenuator.

Change J5 to J6 Rear Panel RF OUT.

Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch.

Delete W7.

Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.

Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 6-9, Table 6-3:

Change HP Part Number 08621-0021 Panel: Upper Front to HP Part Number 08621-00026*

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00008 Bracket: RF Switch Mounting.

A-18. Option 100/010/004 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED**Page 1-3, Table 1-1, OPTION 010:**

Add the following NOTE:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table A-1 (Option 010).

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

Replace Figure 3-1 with Figure A-2.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table A-5.)

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

Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 100/010/004 no front panel figure is provided, use Figure A-2 (Option 010) and delete the RF Output connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure A-7.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure A-3.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure A-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 101 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure A-4.

Add Table A-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

*Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.

*Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.

*Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part Number 0370-1111 Knob: Bar.

*Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.

Change J5 to J6 Rear Panel RF OUT.

Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch.

Delete W1.

Delete W7.

Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.

Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 8-15, Figure 8-8:

Replace RF Output section on Figure 8-8 with Figure A-5, Option 100/010/004.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table A-5.)

A-19. OPTION 100 INSTALLATION IN STANDARD 8621B**EQUIPMENT REQUIRED**

Pozi-drive scredriver
 Wrench 1/4-in. X 5/16-in. slotted box end
 Soldering Iron

Table A-3. Parts Required to Install 8621B Option 001

Qty.	Reference Designator	Description	HP Part Number
1	W3	Cable Assy: Position 3 to RF Switch	08621-20056
1	W4	Cable Assy: Front Output	08621-20057
1	W6	Cable Assy: Position 2 to RF Switch	08621-20059
1	A4	RF Switch: DC to 18 GHz (Option 100)	3106-0012
1		Bracket: RF Switch Mounting	08621-00032
3		4-40 x 1/4-inch Pozi-drive Screw and Lock Washer	2200-0103
2		4-40 x 3/4-inch Pozi-drive Screw	2200-0151
2		Lock Nut	0590-0076

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove W1 from RF Oscillator Module connector mounting bracket. This cable is not used in the Option 100 modification but W1 is used in Option 100/010 and Option 100/010/004. (See Figure A-11.)
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.)
5. Remove RF output cable assembly W7 and connector mounting bracket (Figure 8-17). Remove bracket to allow space to disconnect W7. Remove two screws ① to release the bracket (Figure A-8). Disconnect W7 from SMA connector at rear of J5. Discard W7 and mounting bracket.

NOTE

It is not necessary to remove the RF OUTPUT connector assembly J5. All connections to output cables are made to a subminiature SMA connector at the rear of J5. (See Figure 6-1, MP9.)

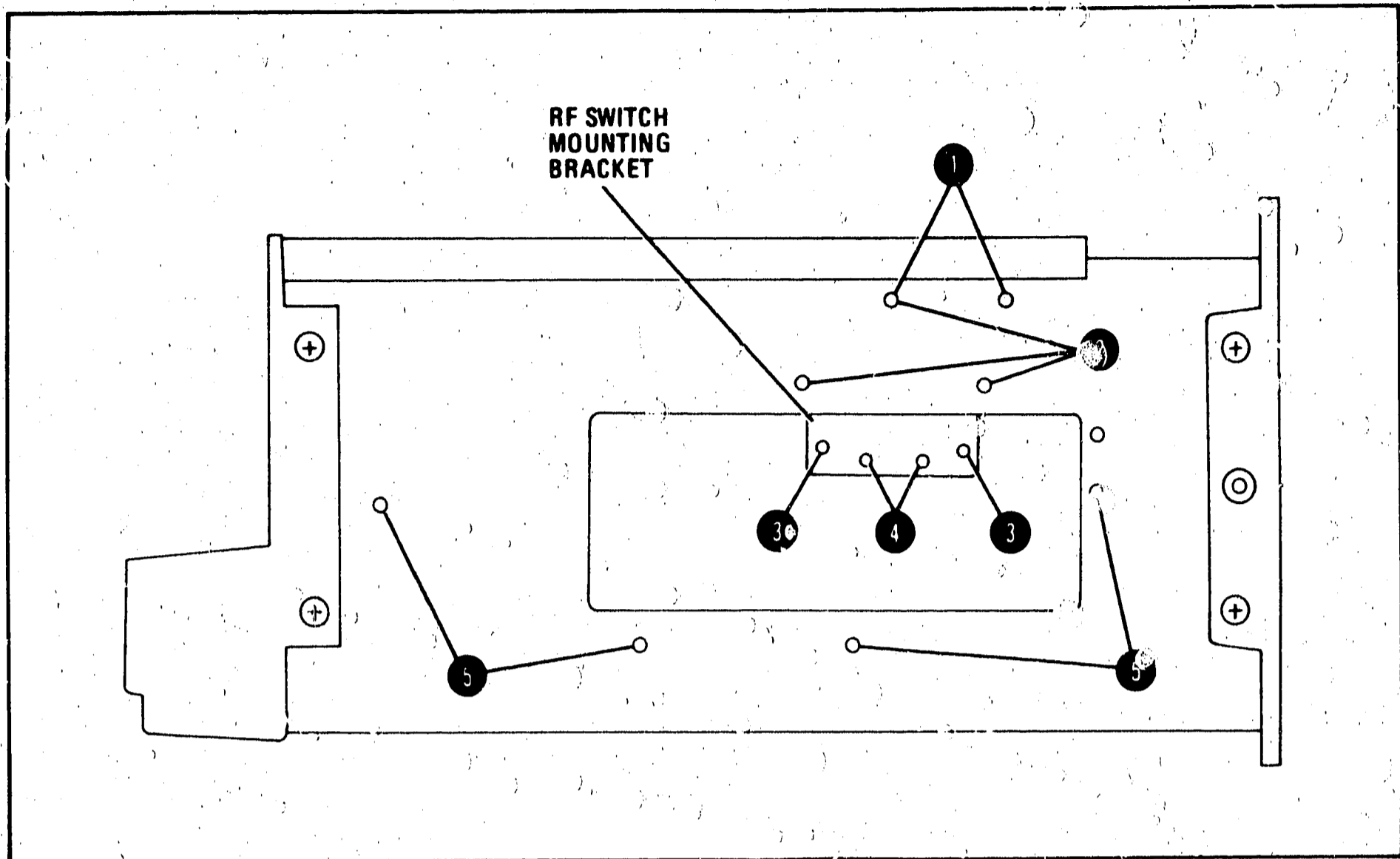
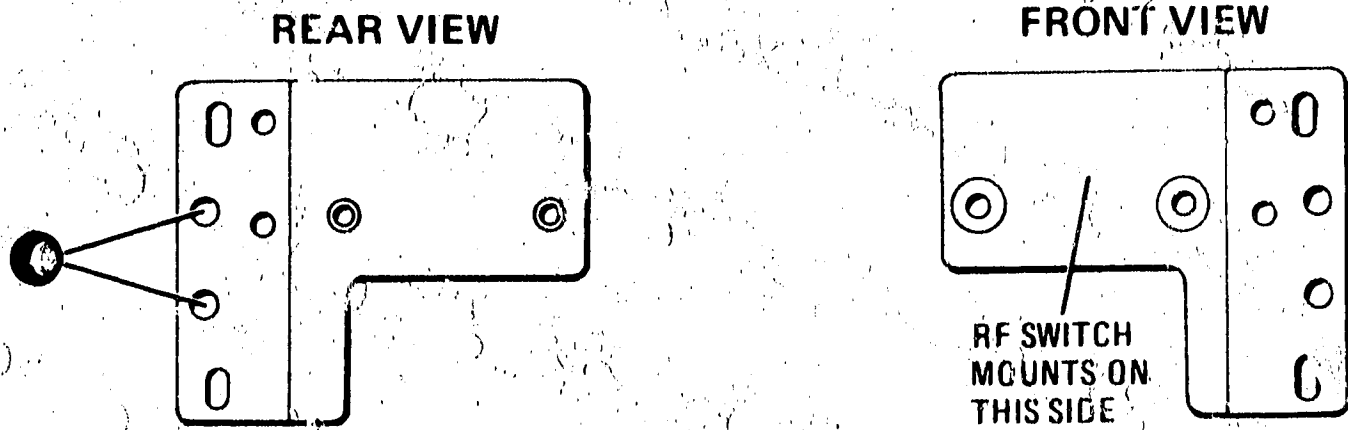


Figure A-8. Mounting Holes on Left-Side of 8621B, Option 100

6. Secure RF Switch A4 (Figure A-11) to mounting bracket (Figure A-11, Item 8) using holes either **3** or **4** depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is positioned towards rear of cabinet and Port 1 is nearest front panel (Figure A-9).
7. Connect short end of output cable W4 to RF Switch center connector. (Center connector is OUTPUT port and is labeled IN or COM.) Connect other end to J5 while holding switch and mounting bracket to left-side of RF Section frame.
8. Connect cable W3 to front connector (Port 1) on RF Switch and connect cable W6 to rear connector (Port 2).
9. Secure mounting bracket to left-side of RF Section frame with three screws using holes **2**.
10. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown below with black shrink tubing on the ends. Connect wires to RF Switch as follows: (See also Figure A-12 for the following RF Switch connections.)
 - a. Connect wire **913** (white-brown-orange) to switch terminal 1.
 - b. Connect wire **915** (white-brown-green) to switch terminal 2.
 - c. Connect wire **97** (white-violet) to center switch terminal 3 or C, depending on RF Switch used.
11. Install RF Oscillator Modules in 8621B positions 2 (RF Module 1) and 3 (RF Module 2). See paragraph 2-16 for Oscillator Module Installation.
12. Connect W6 to RF Output of RF Oscillator Module 1.
13. Connect W3 to RF Output of RF Oscillator Module 2.



BRACKET (08621-00008) FOR
OPTIONS 100/010 AND 100/010/004

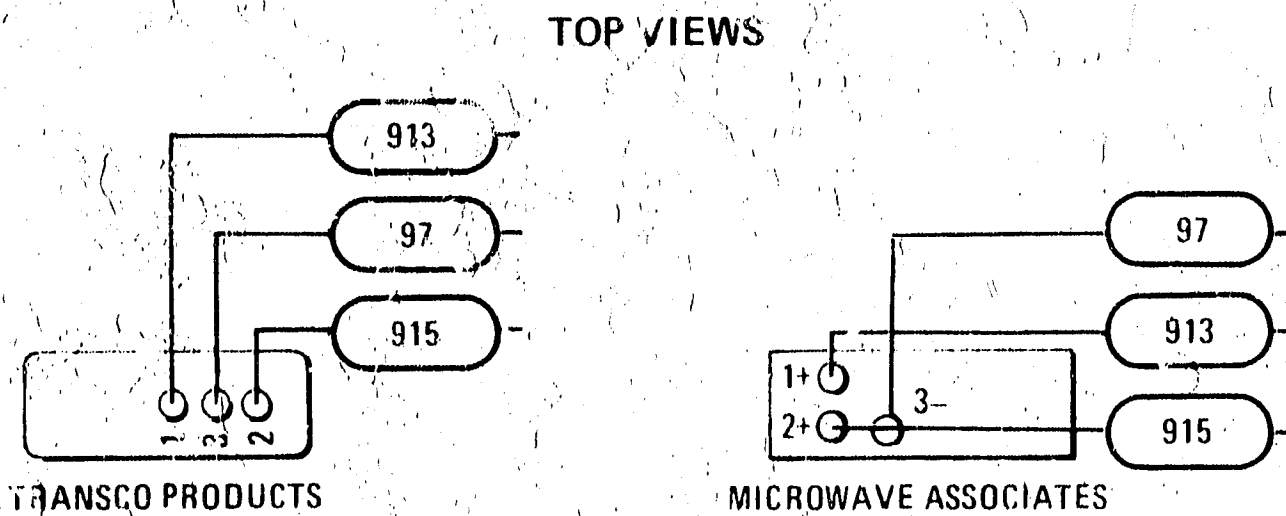
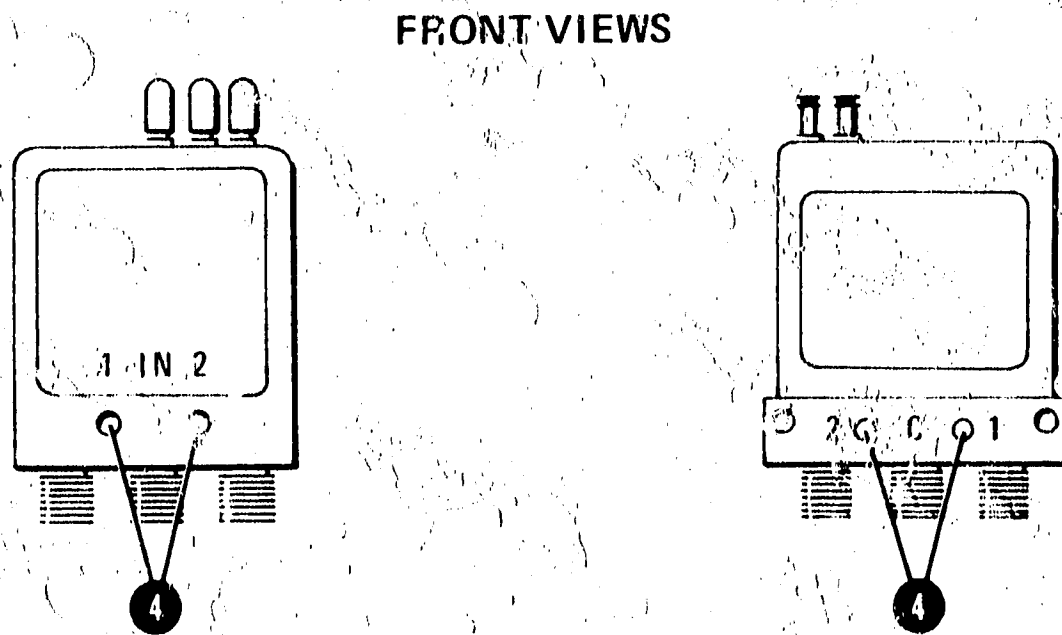


Figure A-9. RF Switches and RF Switch Mounting Bracket, Option 100

14. Install frequency-display lens (supplied with RF Module 1) in center position of lamp block A3. (See Figure 3-12 for Frequency-Display Lens Removal and Installation.)
15. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B lamp block A3. (See Figure 3-12.)

A-20 Option 100 INSTALLATION IN 8621B WITH 86320B HETERODYNE MODULE INSTALLED

EQUIPMENT REQUIRED

Pozi-drive screwdriver
 Wrench 1/4-in. x 5/16-in. slotted box end
 Soldering Iron

Table A-4. Parts Required to Install 8621B/86320B, Option 100

Qty.	Reference Designator	Description	HP Part Number
1	W3	Cable Assy: Position 3 to RF Switch	08621-20056
1	W4	Cable Assy: Front Output	08621-20057
1		86320B Cable Assy: DC Return to RF Switch	86320-20009
1	A4	RF Switch: DC to 18 GHz (Option 100)	3106-0012
1		Bracket: RF Switch Mounting	08621-00032
3		4-40 X 1/4-inch Pozi-drive Screw and Lock Washer	2200-0103
2		4-40 X 3/4-inch Pozi-drive Screw	2200-0151
2		Lock Nut	0590-0076

PROCEDURE

NOTE

The following procedure presumes that a Model 86320B Heterodyne Module is installed and that only the Option 100 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module installation as described in paragraph 2-21 before proceeding (omit steps h and i). Parts required to install an 86320B in an 8621B with Option 100, are listed in Table A-6 under Option 100.

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove 86320B RF cable (Figure A-11, Item 4) from DC return and connector mounting bracket. This cable is not used in this Option 100 modification but it is used in other configurations of Option 100 and Option 004.

4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.)
5. Remove RF output cable assembly W7 and connector mounting bracket (Figure A-11, Item 7). Remove bracket to allow space to disconnect W7. Remove two screws ① to release bracket. (See Figure A-8). Disconnect W7 from SMA connector at rear of J5. Discard W7 and mounting bracket.

NOTE

It is not necessary to remove the RF OUTPUT connector J5. All connections to output cables are made to an SMA connector at the rear of J5 (see Figure 6-1, MP9).

6. Secure RF Switch A4 (Figure A-11) to mounting bracket (Figure A-11, Item 8) using holes either ③ or ④. Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is positioned towards rear of cabinet and Port 1 is nearest front panel (Figure A-9).
7. Connect short end of output cable W4 to RF Switch center connector. (Center connector is output port and is labeled IN or COM.) Connect other end to J5 while holding switch and mounting bracket to left side of RF Section frame.
8. Secure mounting bracket to left-side of RF Section frame with three screws using holes ②.
9. Connect cable W3 to front connector (Port 1) on RF Switch and connect 86320B RF cable to rear connector (Port 2).
10. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown below with black shrink tubing on the ends. Connect wires to RF switch as follows: (See also Figure A-12 for the following RF Switch Connections.)
 - a. Solder wire ⑨13 (white-brown-orange) to switch terminal 1.
 - b. Solder wire ⑨15 (white-brown-green) to switch terminal 2.
 - c. Solder wire ⑨7 (white-violet) to center switch terminal 3 or C, depending on RF Switch used.
11. Connect output cable W4 to J5.
12. Install oscillator modules in positions 2 (RF Module 1) and 3 (RF Module 2) as follows:
 - a. Place guide slot located on oscillator module over guide block on right side of 8621B frame.
 - b. Press module firmly into FM and DRIVER connectors of 8621B A2 Master Board.
 - c. Secure four pozi-drive screws at red arrows and one pozi-drive lid screw in top of module.

CAUTION

The four screws holding the oscillator module must be secure. The right side of the 8621B services as part of the heat sink for the YIG-tuned oscillator. Failure to secure the oscillator module firmly with all four screws may cause overheating of the oscillator.

13. Connect 86320B RF input cable to RF output of RF oscillator module 1.
14. Connect W3 to RF output of RF oscillator module 2.
15. Connect 86320B RF cable (connected to Port 2 in Step 9) to 86320B DC Return.

16. Install frequency-display lens (supplied with RF Module 1) in center position of Lamp Block A3. (See Figure 3-12 for Frequency-Display Lens Removal and Installation.)
17. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B Lamp Block A3. (See Figure 3-12.)

A-21. OPTION 100 INSTALLATION IN 8621B WITH OPTION 010 INSTALLED

A-22. To change an Option 010 to an Option 100/010 requires the parts listed in Table A-7 (W2, W12, A4, and RF Switch Bracket). See Figure A-11 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe and remove A1 ALC board.
3. Disconnect W1 from connector mounting bracket.
4. Remove W11 and connector mounting bracket. (See Figures A-8 and A-9 for removing and installing brackets.)
5. Secure RF Switch A4 (Figure A-11) to mounting bracket (Figure A-11, Item 9) using holes either ③ or ④ depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is at the top of cabinet and Port 1 is at the bottom (Figure A-9).
6. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown in step 8. Black shrink tubing is on the ends. To locate these wires it will be necessary to remove the Attenuator A6. Remove four screws ⑤ shown in Figure A-8 and disconnect W9 from J5. After locating the three wires, reinstall A6 and W9.
7. Connect W12 to Attenuator A6 input (rear).
8. Connect three wires to RF Switch as follows: (See also Figure A-11 for the following RF Switch connections.)
 - a. Connect wire ⑨13 (white-brown-orange) to switch terminal 1.
 - b. Connect wire ⑨15 (white-brown-green) to switch terminal 2.
 - c. Connect wire ⑨7 (white-violet) to center switch terminal 3 or C, depending on RF Switch used.
9. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port IN or COM), and connect W1 to top connector (Port 2).
10. Secure mounting bracket to left-side of RF Section frame with two screws using holes ①. (See Figure A-8.)
11. Install RF Oscillator Module in position 3. (See paragraph 2-16 for Oscillator Module Installation.)
12. Connect W1 to RF output of RF Oscillator Module 1 (Position 2).
13. Connect W2 to RF output of RF Oscillator Module 2 (Position 3).
14. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B Lamp Block A3. (See Figure 3-12.)

A-23. OPTION 100 INSTALLATION IN 8621B WITH OPTION 010 AND HETERODYNE MODULE INSTALLED

A-24. To change an Option 010 to an Option 100/010 with 86320B installed, requires the parts listed in Figure A-11 (W2, W12, A4, and RF Switch bracket). See Figure A-11 for component and assembly layout and for parts identification.

A-25. The following procedure presumes that an Option 010 and a Model 86320B Heterodyne Module are installed and that only the Option 100 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module Installation as described in paragraph 2-19 (omitting steps h and i) before proceeding. See Table A-6 for the 86320A parts required to install an 86320B with an 8621B Option 100/010.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe and remove A1 ALC board.
3. Disconnect 86320B RF cable (Figure A-11, Item 4) from connector mounting bracket.
4. Remove W11 and connector mounting bracket. (Refer to Figures A-8 and A-9 for removing and installing brackets.)
5. Secure RF Switch A4 (Figure A-11) to mounting bracket (Figure A-11, Item 9) using holes either ③ or ④ depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is at the top of cabinet and Port 1 is at the bottom (Figure A-9).
6. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown in step 8. Black shrink tubing is on the ends. To locate these wires, it will be necessary to remove the Attenuator A6. Remove four screws ⑤ shown in Figure A-8 and disconnect W9 from J5. After locating the three wires, reinstall A6 and W9.
7. Connect W12 to Attenuator input (rear).
8. Connect three wires to RF Switch as follows: (See also Figure A-12 for the following RF Switch connections.)
 - a. Connect wire ⑨13 (white-brown-orange) to switch terminal 1.
 - b. Connect wire ⑨15 (white-brown-green) to switch terminal 2.
 - c. Connect wire ⑨7 (white-violet) to center switch terminal 3 or C, depending on RF Switch used.
9. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port IN or COM), and connect 86320B RF cable (disconnected in Step 3) to top connector (Port 2).
10. Secure mounting bracket to left-side of RF Section frame with two screws using holes ①. (See Figure A-8.)
11. Install RF Oscillator Module in position 3. (See paragraph 2-16 for Oscillator Module Installation.)
12. Connect W2 to RF output of RF Oscillator Module 2 (Position 3).
13. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B Lamp Block A3. (See Figure 3-12.)

A-26. OPTION 100 INSTALLATION IN 8621B WITH OPTION 004 INSTALLED

A-27. To change an Option 004 to an Option 100/004 requires the parts listed in Table A-7 (W3, W5, W6, A4, and RF Switch Bracket). See Figure A-11 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Disconnect W1 from connector mounting bracket and RF Oscillator. Discard W1.

4. Remove W8 and connector mounting bracket. (Refer to Figures A-8 and A-9 for removing and installing brackets.) Discard W8 and bracket.
5. Secure RF Switch A4 (Figure A-11) to mounting bracket (Figure A-11, Item 8) using holes either 3 or 4 depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is positioned toward rear of cabinet and Port 1 is nearest front panel.
6. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown below with black shrink tubing on the ends. Connect three wires to RF Switch as follows: (See also Figure A-12 for the following RF Switch connections.)
 - a. Connect wire 913 (white-brown-orange) to switch terminal 1.
 - b. Connect wire 915 (white-brown-green) to switch terminal 2.
 - c. Connect wire 97 (white-violet) to center switch terminal 3 or C, depending on RF Switch used.
7. Connect cable W3 to front connector (Port 1) on RF Switch, connect cable W5 to center connector (Port IN or COM), and connect W6 to rear connector (Port 2).
8. Secure mounting bracket to left-side of RF Section frame with three screws using holes 2. (See Figure A-8.)
9. Install RF Oscillator Module in position 3. (See paragraph 2-18 for Oscillator Module Installation.)
10. Connect W5 to rear output connector J6.
11. Connect W6 to RF Output of RF Oscillator Module 1 (Position 2).
12. Connect W3 to RF Output of RF Oscillator Module 2 (Position 3).
13. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B Lamp Block A3. (See Figure 3-12.)

A-28. OPTION 100 INSTALLATION IN 8621B WITH OPTION 004 AND HETERODYNE MODULE INSTALLED

A-29. To change an Option 004 to an Option 100/004 with 86320B installed, requires the parts shown in Figure A-11 (W3, W5, A4, and RF Switch bracket). See Figure A-11 for component and assembly layout and parts identification.

A-30. The following procedure presumes that an Option 004 and a Model 86320B Heterodyne Module are installed and that only the Option 100 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module Installation as described in paragraph 2-19 (omitting steps h and i) before proceeding. See Table A-6 for the 86320B parts required to install an 86320B with an 8621B Option 100/004.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Disconnect W8 from rear-panel connector J6 and remove connector mounting bracket and W8.

NOTE

It is not necessary to remove rear RF OUT connector J6. All connections are made to an SMA connector at the rear of J6. (See Figure 6-1, MP9.)

4. Secure RF Switch A4 (Figure A-11) to mounting bracket Figure A-11, Item 8) using holes either **3** or **4** depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is positioned towards rear of cabinet and Port 1 is nearest front panel.
5. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown below with black shrink tubing on the ends. Connect three wires to RF Switch as follows: (See also Figure A-12 for the following RF Switch connections.)
 - a. Connect wire **913** (white-brown-orange) to switch terminal 1.
 - b. Connect wire **915** (white-brown-green) to switch terminal 2.
 - c. Connect wire **97** (white-violet) to center switch terminal 3 or C, depending on RF Switch used.
6. Connect cable W3 to front connector (Port 1) on RF Switch, connect cable W5 to center connector (Port IN or COM), and connect 86320B RF cable (Figure A-11, Item 5) to rear connector (Port 2).
7. Secure mounting bracket to left-side of RF Section frame with three screws using holes **2**. (See Figure A-8.)
8. Install RF Oscillator Module in position 3. (See paragraph 2-16 for Oscillator Module Installation.)
9. Connect W5 to rear output connector J6.
10. Connect W3 to RF Output of RF Oscillator Module 2 (Position 3).
11. Connect 86320B cable to 86320B DC Return. (Figure A-11, Item 2).
12. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B Lamp Block A3. (See Figure 3-12.)

A-31. OPTION 100 INSTALLATION IN 8621B WITH OPTION 010/004 INSTALLED

A-32. To change an Option 010/004 to an Option 100/010/004 requires the parts listed in Table A-7 (W2, W12, A4, and RF Switch Bracket). See Figure A-11 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Disconnect W1 from connector mounting bracket.
4. Remove W11 and connector mounting bracket. (Refer to Figures A-8 and A-9 for removing and installing brackets.)
5. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown below with black shrink tubing on the ends. To locate these wires, it will be necessary to remove the Attenuator A6. Remove four screws **5** shown in Figure A-8, and disconnect W10 from J6. After locating the three wires, reinstall A6 and W10.
6. Secure RF Switch A4 (Figure A-11) to mounting bracket (Figure A-11, Item 9) using holes either **3** or **4** depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is positioned towards top of cabinet and Port 1 is at the bottom.
7. Connect W12 to Attenuator A6 input (rear).
8. Connect three wires to RF Switch as follows: (See also Figure A-12 for the following RF Switch connections.)

- a. Connect wire **913** (white-brown-orange) to switch terminal 1.
 - b. Connect wire **915** (white-brown-green) to switch terminal 2.
 - c. Connect wire **97** (white-violet) to center switch terminal 3 or C, depending on RF Switch used.
9. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port IN or COM), and connect W1 to top connector (Port 2).
 10. Secure mounting bracket to left-side of RF Section frame with two screws using holes **1**. (See Figure A-8.)
 11. Install RF Oscillator Module in position 3. (See paragraph 2-16 for Oscillator Module Installation.)
 12. Connect W1 to RF Output of RF Oscillator Module 1 (Position 2).
 13. Connect W2 to RF Output of RF Oscillator Module 2 (Position 3).
 14. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B Lamp Block A3. (See Figure 3-12.)

A-33. OPTION 100 INSTALLATION IN 8621B WITH OPTION 010/004 AND HETERODYNE MODULE INSTALLED

A-34. To change an Option 010/004 to an Option 100/010/004 with 86320B installed, requires the parts shown in Figure A-11 (W2, W12, A4, and RF Switch Bracket). See Figure A-11 for component and assembly layout and for parts identification.

A-35. The following procedure presumes that an Option 010/004 and a Model 86320B Heterodyne Module are installed and that only the Option 100 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module Installation as described in paragraph 2-19 (omitting steps h and i) before proceeding. See Table A-6 for the parts required to install an 86320B with an 8621B Option 100/010/004.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe and remove A1 ALC board.
3. Disconnect 86320B RF cable (Figure A-11, Item 4) from connector mounting bracket.
4. Remove W11 and connector mounting bracket. (Refer to Figures A-8 and A-9 for removing and installing brackets.)
5. Secure RF Switch A4 (Figure A-11) to mounting bracket (Figure A-11, Item 9) using holes either **3** or **4** depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is at the top of cabinet and Port 1 is at the bottom (Figure A-9).
6. Locate three wires that are tied in with cable connecting J4 to Master Board A2. Wires have color codes shown below with black shrink tubing on the ends. To locate these wires it will be necessary to remove the Attenuator A6. Remove four screws **5** shown in Figure A-8 and disconnect W10 from J6. After locating the three wires, reinstall A6 and W10.
7. Connect W12 to Attenuator input (rear).
8. Connect three wires to RF Switch as follows: (See also Figure A-12 for the following RF Switch connections.)
 - a. Connect wire **913** (white-brown-orange) to switch terminal 1.
 - b. Connect wire **915** (white-brown-green) to switch terminal 2.
 - c. Connect wire **97** (white-violet) to center switch terminal 3 or C, depending on RF Switch used.

9. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port IN or COM), and connect 86320B RF cable (disconnected in Step 3) to top connector (Port 2).
10. Secure mounting bracket to left-side of RF Section frame with two screws using holes (See Figure A-8.)
11. Install RF Oscillator Module in position 3. (See paragraph 2-16 for Oscillator Module Installation.)
12. Connect W2 to RF Output of RF Oscillator Module 2 (Position 3).
13. Install frequency-display lens (supplied with RF Module 2) in bottom position of 8621B Lamp Block A3. (See Figure 3-12.)

A-36. OPTION 100 TROUBLESHOOTING PROCEDURE

A-37. RF Switch and RF Switch Drive Troubleshooting

A-38. Figure A-13 provides a Troubleshooting Chart to identify troubles in the RF Switch Drive circuits. Use Figures A-12 and A-13 together with Figure 8-12 to troubleshoot the RF Switch and RF Switch Drive circuits. Before troubleshooting these circuits, ensure that Band 3 has been selected on the mainframe, an oscillator module is properly installed in the 8621B position 3, and the third (bottom) frequency-display lamp (Band 3) is lit on the 8621B front panel with the instrument turned on.

A-39. Band 3 Frequency-Display Troubleshooting

A-40. Figure A-13 provides a Troubleshooting Chart to identify troubles in the Band 3 frequency-display circuits. (For troubles in Bands 1 and 2 frequency-display, refer to Figure 8-6 Troubleshooting Chart.) Use the Troubleshooting Chart in Figure A-13 with Figure 8-12 to troubleshoot the Band 3 Frequency-Display circuits. Before troubleshooting, ensure that Band 3 has been selected. The Third frequency-display lamp should light on the 8621B front panel when the instruments are turned on.

A-41. OPTION 100 RF SWITCHING, CIRCUIT DESCRIPTION

A-42. General Description

A-43. The RF Switch A4 used in the 8621B Option 100 is a latching type. Once it has switched, no current or voltage is required to maintain the position selected.

A-44. The RF Switch Driver circuits, on the A7 Operations Control Assembly in the 8620A/B/C mainframe, control the operation of the RF Switch A4. The drivers for RF Switch Terminal 1 (Band 3 selected on the mainframe) are A7Q14/Q18. The drivers for RF Switch Terminal 2 (Bands 1 or 2 selected on the mainframe) are A7Q14/Q17. The control signal is the Band 3 Turn On. It is initiated by the 8620A/B/C Band Selector switch and applied to the A7 Band Decoder circuits. From the mainframe the control signal is routed to the 8621B A1 ALC Amplifier Assembly where it is processed to drive either the Band 1, 2 or Band 3 driver circuits. A positive voltage is required on the base of either A7Q13 or A7Q14 to energize A4. The following are the circuit descriptions when Band 3 is selected and when Band 3 is NOT selected.

A-45. Band 3 Selected

A-46. When Band 3 is selected on the mainframe, the Band 3 Turn On line is HI (+3.6V). The HI is applied to the base of 8621B A1Q10 and cathode of A1CR10. A +3.6V at the base of A1Q10 turns it ON. A LO on the collector allows A1CR12 to conduct. Conduction is through A1Q10, A1CR12, and A7R11 to +5V. The resulting -10V applied to the base of A7Q13 turns A7Q13 and A7Q17 OFF. The -10V at the collector of A7Q17 is applied to the RF Switch A4 pin 2, which causes no switching action.

A-47. However, a +3.6V applied to the cathode of A1CR10 reverse-biases A1CR10 and blocks current flow. The voltage divider at the base of A7Q14, consisting of A7R24, R25, and R26, provides a positive voltage on the base of A7Q14 turning it and A7Q18 ON. With A7Q18 ON, a +20V is applied to pin 1 of the RF Switch. A -10V is connected at the common terminal of A4 pin 3. The +20V at pin 1 and the -10V at pin 3 place a 30-volt potential across the Terminal 1 switching coil of A4 closing A4S1A. When A4S1A closes, A4S2 opens to remove the +20V. A4S3 is closed connecting the Terminal 2 switching coil to the 8620A/B/C Bands 1 and 2 RF Switch Drivers.

A-48. Bands 1 or 2 Selected

A-49. When Band 3 is NOT selected (Band 1 or 2 selected) on the mainframe, the Band 3 Turn On line is LO ($< 0.1V$). A LO at the base of A1Q10 turns it OFF and a LO on the Cathode of A1CR10 allows it to conduct. The Band 3 RF Switch Drivers are turned OFF and the Bands 1 and 2 RF Switch Drivers are ON. This action applies $-10V$ to pin 3 and $+20V$ to pin 2 of the RF Switch. With pin 2 at $+20V$, a 30-volt potential is across the Terminal 2 switching coil of A4 and A4S1B closes. A4S3 opens to remove the $+20V$ and A4S2 closes to connect Terminal 1 switching coil to the Band 3 RF Switch Drivers.

A-50. In the static state, a $-40V$ is used to bias A1Q10 OFF and A1CR10 ON. In this condition, the Band 3 RF Switch Drivers are OFF and $-10V$ is applied to A4 pin 1; and the Band 2 RF Switch Drivers are ON and $+20V$ is applied to A4 pin 2. This action latches the RF Switch into Terminal 2 and closes A4S1B.

Table A-5. Installation Kit for Option 010*

Reference Designator	HP Part Number	Description
A5	08621-60066	Attenuator Board Assembly
A6	08621-60012	70-dB Programmable Attenuator
A7	08621-60051	Wiring Harness
A7MP1	0370-1111	Bar Knob
A7S1	3100-3237	Attenuator Rotary Switch
	08621-00026	Upper Front Panel
*HP Part Number 08621-60055.		

Table A-6. Parts Required to Install 86320B Heterodyne Module in 8621B

86320B Part Numbers	8621B Option Configuration				
	Standard	100	100/010	010/004	100/010/004
5086-7144	X	X	X	X	X
86320-00014	X	X	X	X	X
86320-20007	X	X	X	X	X
86320-20009		X		X	
86320-20010	X	X	X	X	X
86320-20011	X		X		X
86320-60009	X	X	X	X	X

Reference	Part Number	Description
86320B (A4)	5086-7144	DC Return and Block
86320B (MP4)	86320-00014	Frequency-Display Lens, 0.1–2.0 GHz
86320B (W1)	86320-20007	RF Cable Input, (Supplied with 86320B)
86320B (W6)	86320-20009	RF Cable Output, DC Return to RF Switch
86320B (W8)	86320-20010	RF Cable Output, Heterodyne to DC Return
86320B (W5)	86320-20011	RF Cable Output, DC Return to RF Switch or Connector
86320B (W7)	86320-60009	DC Cable Assembly, Flexible, 86320B to 8621B

Table A-7. Material Required for Adding Options to Original Equipment

Original Equipment	New Option Configuration						
	100	010	004	100/010	100/004	010/004	100/010/004
Standard	W3, W4, W6, A4, 2	W9, W11, 1	W-8	W2, W9, W12, A4, 1, 4	W3, W5, W6, A4, 2	W10, W11, 1	W2, W10, W12, A4, 1
100		W1, W9, W11, 1, 3	W1, W8, 3	W1, W2, W9, W12, 1, 4	W5	W1, W10, W11, 1, 3	W2, W10, W12, 1, 4
100/010	W3, W4, W6, 2	W11, 3	W8, 3		W3, W5, W6, 2	W10, W11, 3	W10
100/004	W4, 5	W1, W9, W11, 1, 3, 5	W1, W8, 3	W1, W2, W9, W12, A4, 1, 4, 5		W1, W10, W11, 1, 3	W1, W2, W10, W12, A4, 1, 4
100/010/004	W3, W4, W6, 2, 5	W9, W11, 3, 5	W8, 3	W9, 5	W3, W5, W6, 2	W11, 3	

Ref.	Part Number	Description	Ref.	Part Number	Description
W1	08621-20015	Cable: Position 2	W10	08621-20063	Cable: Attn/RF Out
W2	08621-20026	Cable: Posit 3/RF Sw	W11	08621-20064	Cable: Mtg Brkt/Attn
W3	08621-20056	Cable: Position 3/RF Sw	W12	08621-20065	Cable: RF Sw/Attn
W4	08621-20057	Cable: RF Sw/RF Out	A4	3106-0012	RF Switch
W5	08621-20058	Cable: RF Sw/RF Out	1	08621-60055	Option 010 Installation Kit
W6	08621-20059	Cable: Posit 2/RF Sw	2	08621-00032	Bracket: RF Switch
W7	08621-20060	Cable: Front RF Out	3	08621-00033	Bracket: Connector
W8	08621-20061	Cable: Rear RF Out	4	08621-00008	Bracket: RF Switch
W9	08621-20062	Cable: Attn/RF Out	5	08621-00022	Panel: Lower Front

Note: To remove all options and convert to a standard 8621B, requires W1, W7, and bracket 3. (See Figure A-11 to make the conversion.)

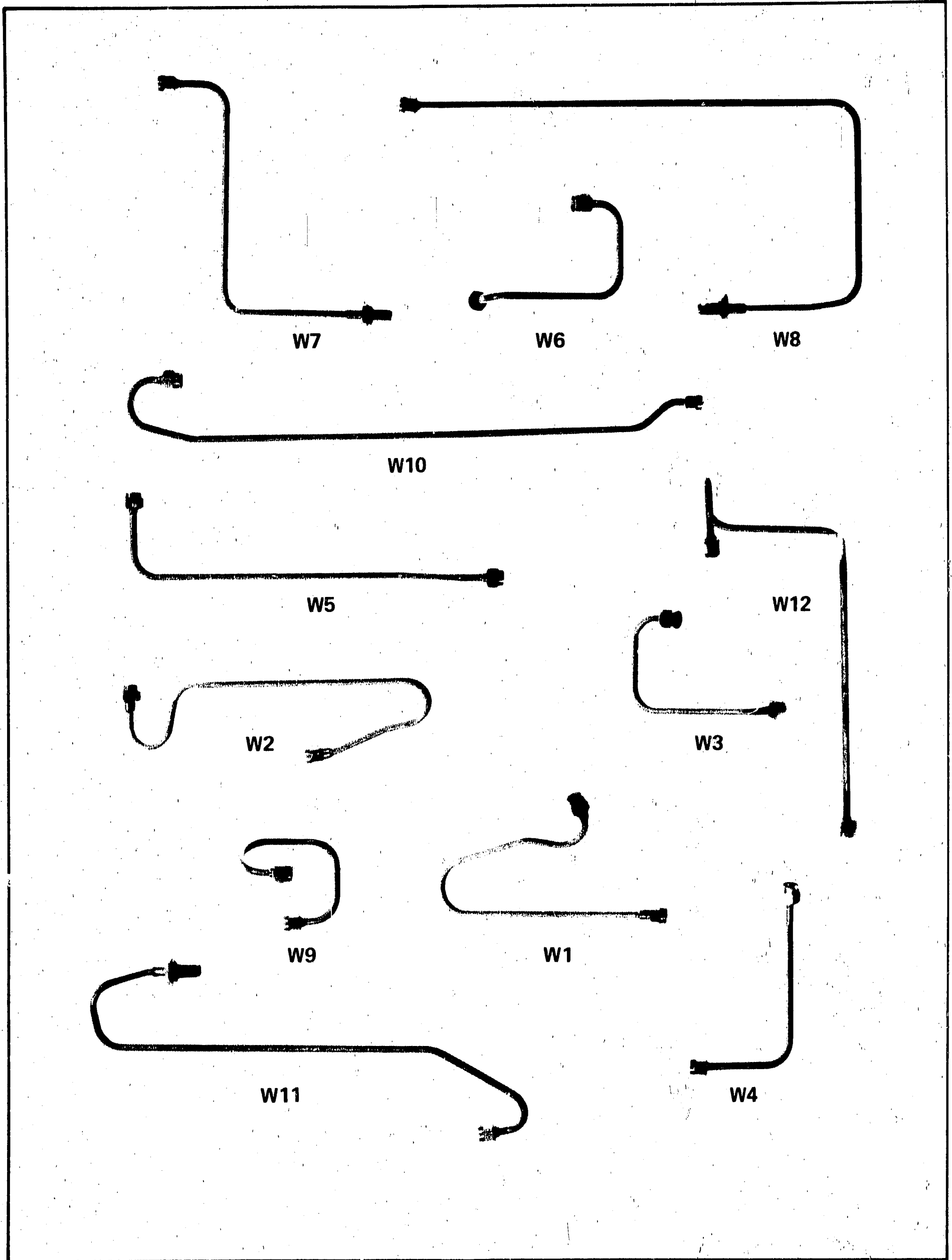


Figure A-10. Model 8621B RF Cable Assemblies

8621B Assembly Part Numbers

Ref Desig.	HP Part Number	Ref Desig.	HP Part Number
A4	3106-0012	W5	08621-20058
A6	08621-60012	W6	08621-20059
J5	08621-60053	W7	08621-20060
J6	08621-60053	W8	08621-20061
W1	08621-20015	W9	08621-20062
W2	08621-20026	W10	08621-20063
W3	08621-20056	W11	08621-20064
W4	08621-20057	W12	08621-20065

Assembly and Component Identification

Item No.	Part Number	Description
1	86320B	Heterodyne Module in Position 1
2	5086-7144	DC Return and Block
3	86320-20007	RF Input Cable, Oscillator to 86320B
4	86320-20011	RF Output Cable, DC Return to RF Switch or Coconnector Mounting Bracket
5	86320-20009	RF Output Cable, DC Return to RF Switch
6	86320-20010	RF Output Cable, 86320B to DC Return
7	08621-00033	Connector Mounting Bracket
8	08621-00032	RF Switch Mounting Bracket
9	08621-00008	RF Switch Mounting Bracket
10		RF Oscillator Module in Position 2
11		RF Oscillator Module in Position 3

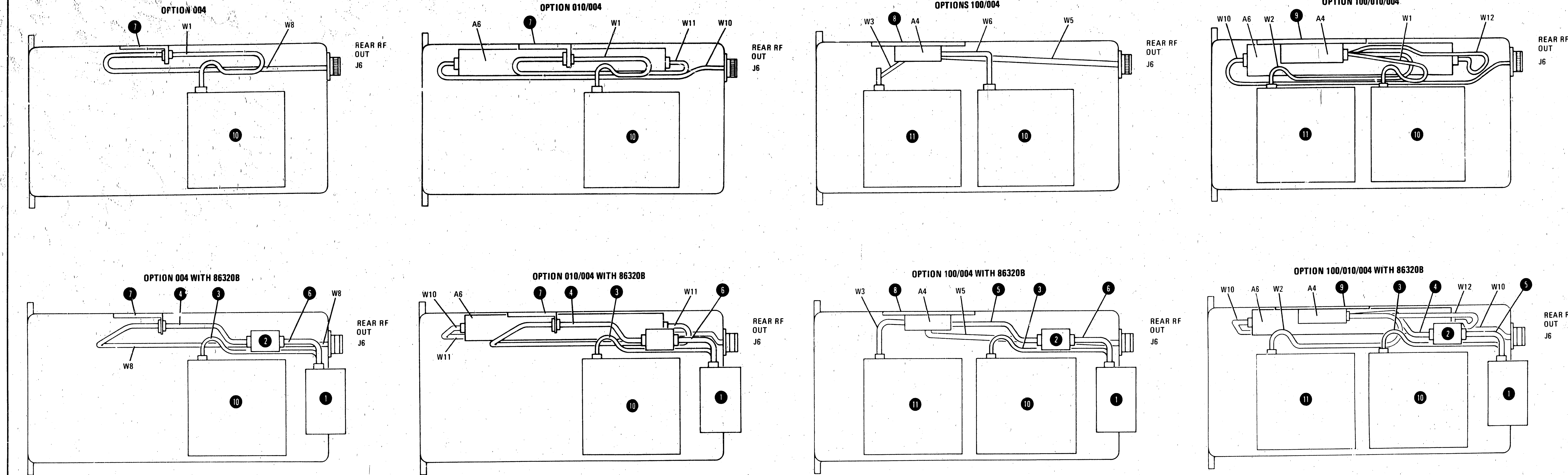


Figure A-11. Mechanical Variations of Assemblies and Components for Installation Identification (1 of 2)

Figure A-11. Mechanical Variations of Assemblies and Components for Installation Identification (2 of 2)

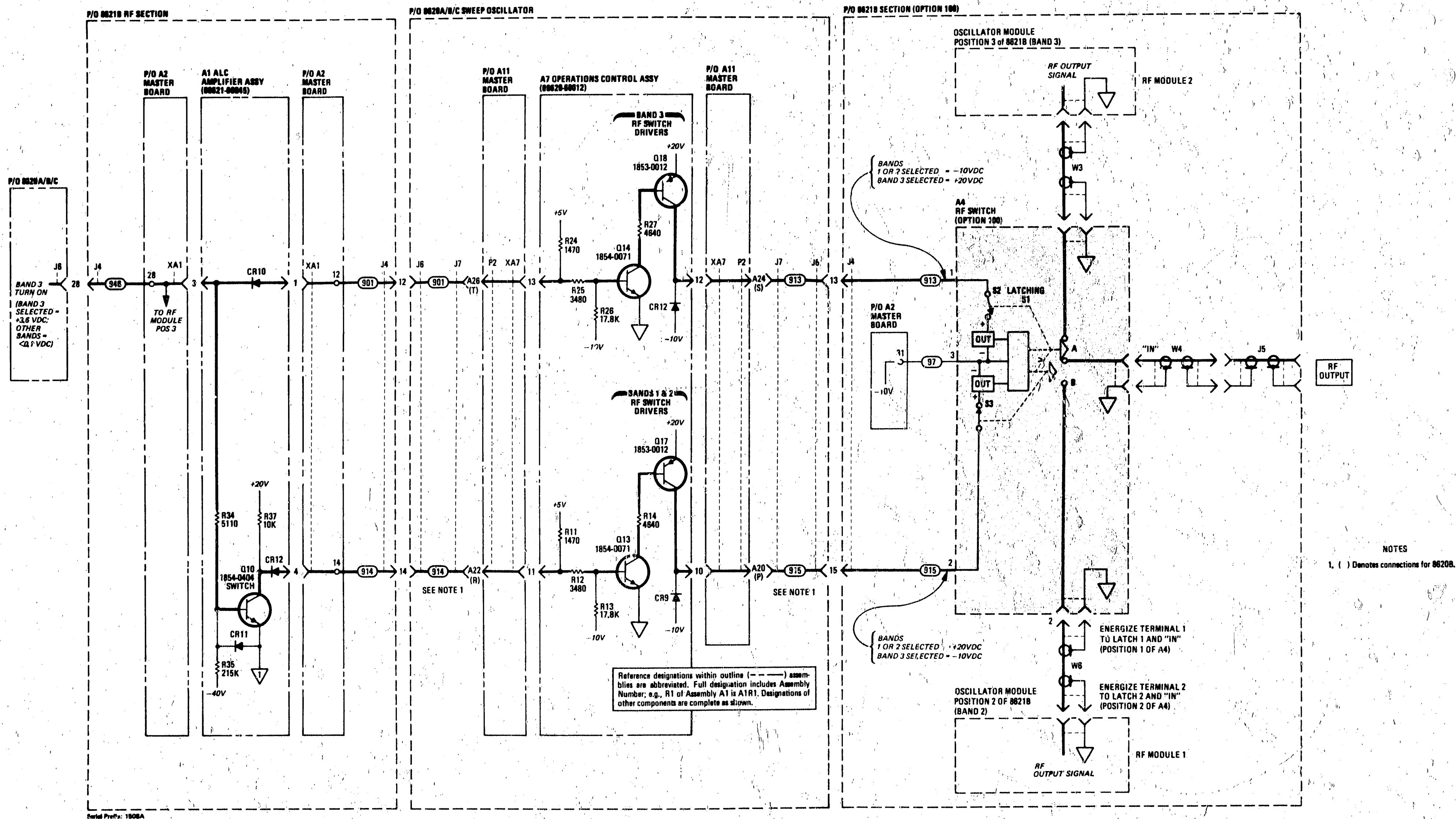


Figure A-12. Option 100 RF Switching Schematic

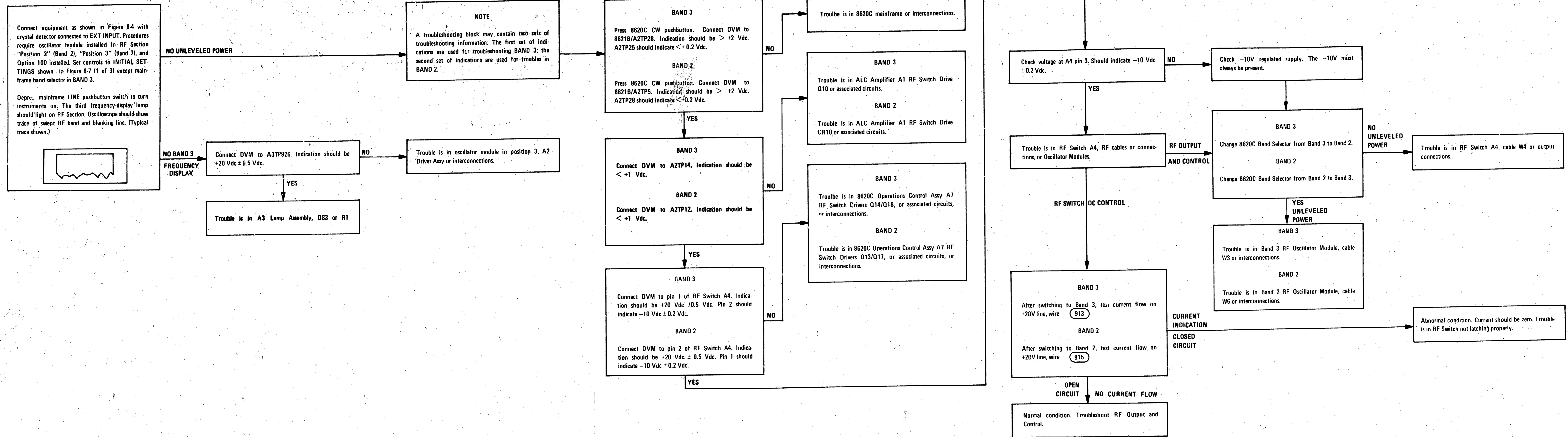


Figure A-13. RF Switch Drive Troubleshooting Chart Option 100

APPENDIX

B

APPENDIX B

OPTION 010, 0- TO 70- dB ATTENUATOR

B-1. INTRODUCTION

B-2 This appendix describes the differences in HP Model 8621B RF Section with Option 010 installed. It also contains the changes required in the standard operating manual to document the option or combination of options. The components and assemblies used with the option are shown together with an installation procedure. The installation procedures contain all information necessary to install the option, combination of options, or the options in combination with an HP Model 86320B Heterodyne Module. Since the component and assembly configurations change with the 86320B installed, this appendix describes these differences. Combinations of more than one option also change the component and assembly configuration and these differences are also included.

B-3. Incorporation of the 86320B Heterodyne Module

B-4. When ordering the 86320B, the four cables necessary to incorporate any Heterodyne installation are packaged with the instrument. However, if the 86320B is installed at the factory, only those cables required as original equipment are installed. For example, if the factory installed and shipped an 8621B Option 100 with an 86320B then three 86320B cables would be included as original equipment (Figure B-13, Items 3, 5, and 6). If later on the RF Section is to be modified to include an Option 010, then an 86320B cable (Figure B-13, Item 4) must be ordered along with the other parts needed to install the Option 010 (Table B-5).

B-5. Cable and Assembly Mechanical Variations

B-6. Figure B-13 may be used to check for correct configuration and layout of hardware used for the option and the 86320B. This diagram is especially useful when removing an option. Manual Changes adapt the Operating and Service Manual to installed options only. When removing an option, manual changes can be made by adapting the manual to assemblies and components shown in Figure B-13. Table B-7 shows the parts required to adapt the 8621B to any option configuration.

B-7. DESCRIPTION

B-8. The HP Model 8621B Option 010 provides a 0- to 70-dB Attenuator. A front-panel ATTENUATION control (Figure B-1 18), which is added when Option 010 is installed, allows manual control of the RF output signal in 10-dB steps. Figure B-13 shows the Option 010 configuration as well as the configuration with other options installed, with and without the 86320B Heterodyne Module. Figure B-15 is a schematic diagram of the A6 Attenuator and A5 Attenuator Board. A circuit description of the A5 Attenuator Board is contained in paragraph B-36.

B-9. OPTION 010 INSTALLATION PROCEDURES

B-10. Installation procedures for Option 010 provide instructions for installing a 0- to 70-dB programmable attenuator in 8621B RF Sections. Paragraph B-19 contains procedures for modifying standard RF Sections. Paragraph B-20 contains procedures for modifying RF Sections that have an 86320B Heterodyne Module installed. Paragraphs B-21 through B-35 contain procedures for modifying RF Sections that already have options or options and Heterodyne Modules installed. To perform these installations, an Installation Kit is required. The same kit applies to all installation procedures and can be obtained by ordering Option 010 Installation Kit, HP Part No. 08621-60055. Contents of this kit are listed in Table B-5.

B-11. OPTION 010 MANUAL CHANGES

Page 1-3, Table 1-1, Option 010:

Add the following note:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1.

Table B-1. Recommended Test Equipment, Option 010

Instrument	Critical Specifications	Recommended Model	Use*
Spectrum Analyzer	Frequency Range: 10.0 MHz to 18.0 GHz, 12.4 to 40 GHz with external mixer	HP 141T/8552B/8555A	P
70-dB Attenuator	Stepped, 0 to 70 dB Maximum SWR: DC to 8 GHz = 1.35 8 to 12.4 GHz = 1.5 Maximum Residual Attenuation 0.4 dB + 0.07 dB/GHz	HP 8495B	P
* P = Performance			

Page 3-2, Figure 3-1:

Replace Figure 3-1 with Figure B-1.

Page 3-3, Figure 3-1:

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure B-2.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Sections III and V:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

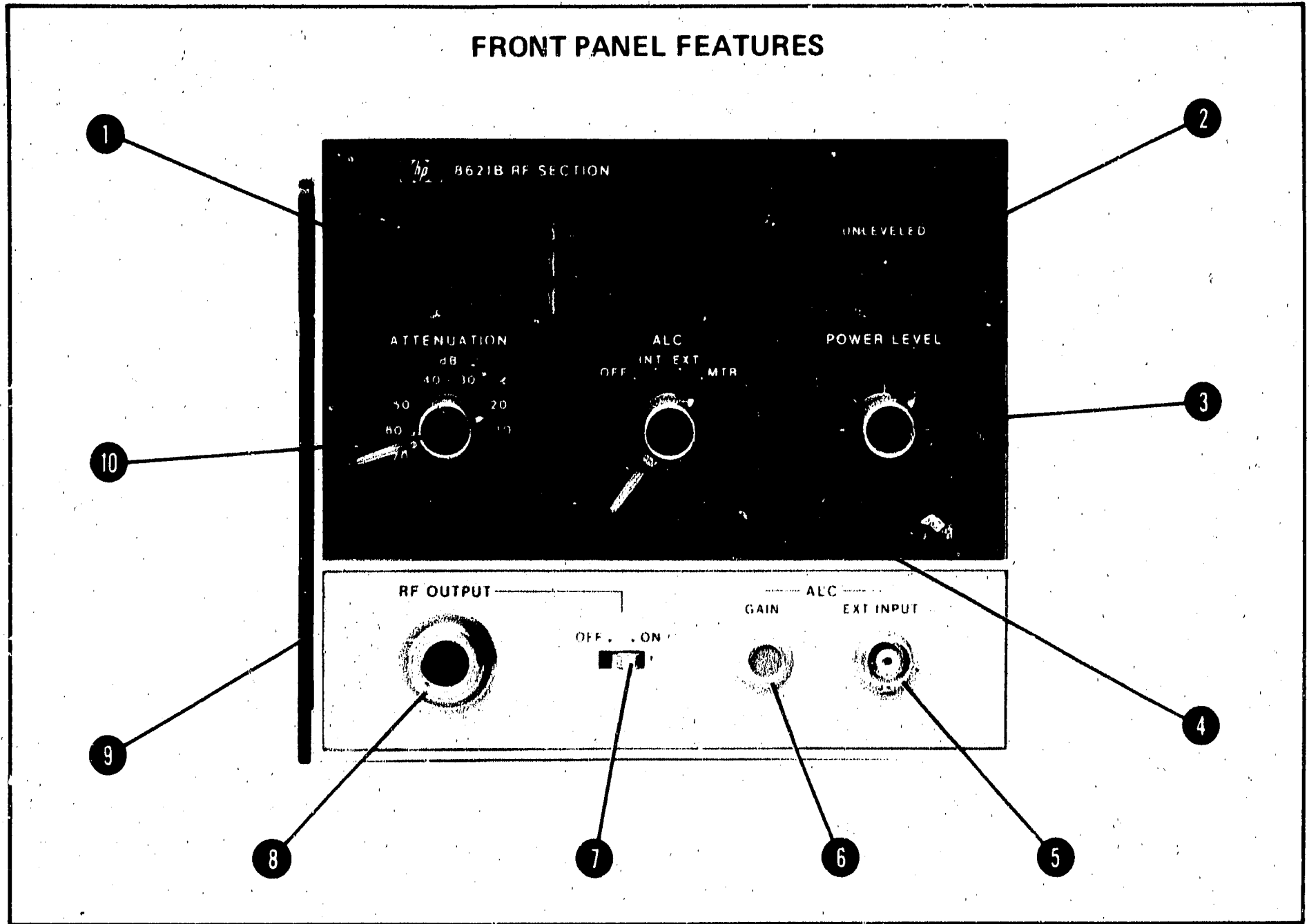


Figure B-1. Front Panel Features, Option 010

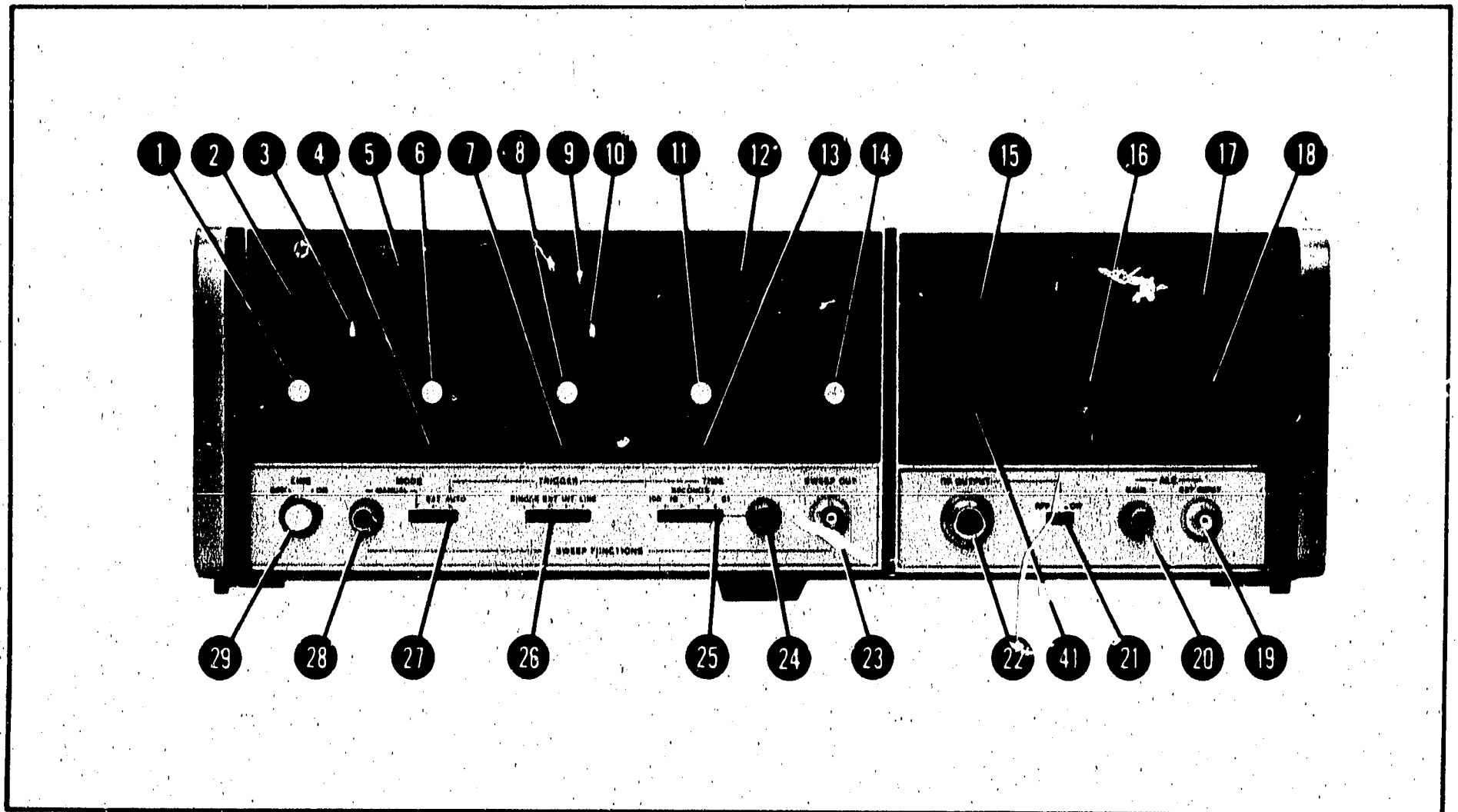


Figure B-2. Operator's Checks, Option 010

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure B-3.

Add Table B-2 Performance Test Record for Option 010.

Page 6-7, Table 6-3:

*Add A5 HP Part No. 08621-60066 Board Assembly: Attenuator.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table B-5.)

1. OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST**2. Introduction**

3. This performance test checks that the accuracy of the 0- to 70 dB Attenuator meets the specifications listed in Table 1-1. This test may be used for incoming inspection, after repair of the instrument, after installation of the Option 010, or for periodic evaluation.

4. Equipment Required

5. A complete list of test equipment required to perform this test is given in Table B-1. If the recommended equipment is not available, a substitute may be used if it meets or exceeds the critical specifications listed in the table.

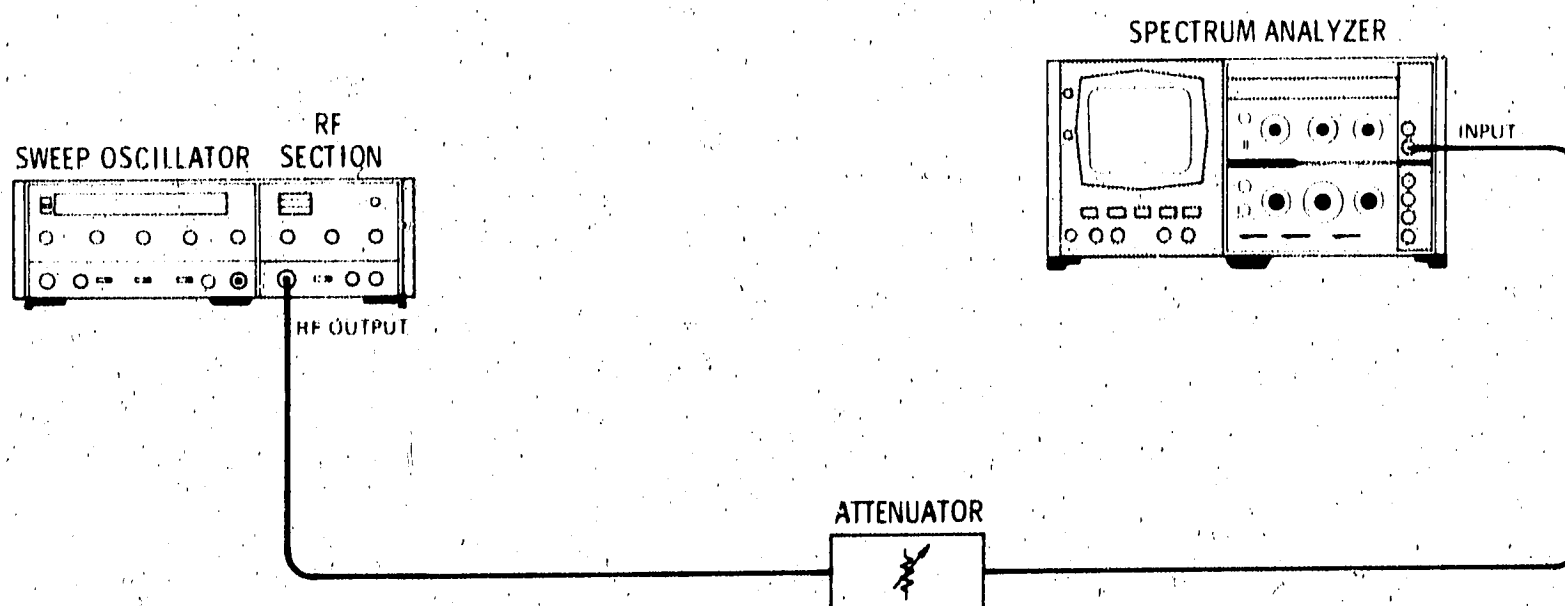
6. Test Record

7. Table B-2 is a test record form provided to record results from the performance test. The table is keyed to the paragraph numbers and test titles in the procedures.

8. PERFORMANCE TESTSPECIFICATIONS: $< \pm 0.6$ dB at 10-dB step. $< \pm 5\%$ of attenuation selected for all other settings.

DESCRIPTION:

Attenuation accuracy of the 0- to 70-dB Attenuator is measured so the difference between each attenuator setting and a reference level meets the specifications.



Option 010 Attenuation Accuracy Test Setup

Figure B-3. Option 010 Attenuation Accuracy Performance Test (1 of 3)

EQUIPMENT:

Sweep Oscillator	HP 8620C
70-dB Attenuator	HP 8495B
Spectrum Analyzer	HP 8555A/8552B/141T

PROCEDURE:

- a. Connect equipment as shown in test setup.
- b. Press 8620C LINE switch to ON; press 8620C CW pushbutton. Allow equipment to warm up for a minimum of 30 minutes.
- c. Set controls as follows:

8620C:

BAND 2	RF Oscillator Frequency
CW MARKER pointer 9	Center scale
1 kHz SQ WV/OFF (rear panel)	OFF
RF BLANKING/OFF (rear panel)	OFF
DISPLAY BLANKING (rear panel)	OFF

8621B:

RF 7	ON
POWER LEVEL 3	Fully Clockwise
ATTENUATION 10	0 dB

8555A:

BANDWIDTH	100 kHz
SCAN WIDTH	0.2 MHz/DIV
INPUT ATTENUATION	0 dB

8552B:

SCAN TIME	0.1 SEC/DIV
LOG REF LEVEL	-20 dBm
VIDEO FILTER	100 Hz
SCAN MODE	INT
SCAN TRIGGER	AUTO

8495B:

Attenuation	70 dB
-----------------------	-------

- d. Center CW frequency display on Spectrum Analyzer. Set LOG REF LEVEL VERNIER for some convenient reference level.
- e. Rotate 8621B 70-dB Attenuator to 10 dB and 8495B attenuation to 60 dB. RF displayed on Spectrum Analyzer should return to reference level ± 0.6 dB.
- f. Rotate 8621B 70-dB Attenuator to 20 dB and 8495B Attenuation to 50 dB. RF displayed on Spectrum Analyzer should return to reference level ± 1.0 dB (20 dB x 5% = 1.0 dB).

Figure B-3. Option 010 Attenuation Accuracy Performance Test (2 of 3)

- g. Set 8621B to 30 dB; 8495B to 40 dB, and RF should return to reference level ± 1.5 dB.
- h. Set 8621B to 40 dB; 8495B to 30 dB, and RF should return to reference level ± 2.0 dB.
- i. Set 8621B to 50 dB; 8495B to 20 dB, and RF should return to reference level ± 2.5 dB.
- j. Set 8621B to 60 dB; 8495B to 10 dB, and RF should return to reference level ± 3.0 dB.
- k. Set 8621B to 70 dB; 8495B to 0 dB, and RF should return to reference level ± 3.5 dB.

Figure B-3. Option 010 Attenuation Accuracy Performance Test (3 of 3)

Table B-2. Performance Test Record

Hewlett-Packard Model 8621B RF Plug-In, Option 010		Test Performed by _____		
Serial No. _____		Date: _____		
Para.	Description	Lower Limit	Measured Value	Upper Limit
8 (Figure B-3)	ATTENUATION ACCURACY			
	e. Attenuator at 10 dB	9.4 dB	_____	10.6 dB
	f. Attenuator at 20 dB	19.0 dB	_____	21.0 dB
	g. Attenuator at 30 dB	28.5 dB	_____	31.5 dB
	h. Attenuator at 40 dB	38.0 dB	_____	42.0 dB
	i. Attenuator at 50 dB	47.5 dB	_____	52.5 dB
	j. Attenuator at 60 dB	57.0 dB	_____	63.0 dB
	k. Attenuator at 70 dB	66.5 dB	_____	73.5 dB

Page 6-7, Table 6-3 (cont'd):

- *Add A6 HP Part No. 08621-60012 Attenuator Assy; Programmable, 70-dB.
- *Add A7 HP Part No. 08621-60051 Wiring Harness: Attenuator Switch.
- *Add A7MP1 HP Part No. 0370-1111 Knob: Bar.
- *Add A7S1 HP Part No. 3100-3237 Switch: Rotary, Attenuator.
- Delete W7.
- Add W9 HP Part No. 08621-20062 Cable Assembly: Attenuator/Front RF Output.
- Add W11 HP Part No. 08621-20064 Cable Assembly: Mounting Bracket/Attenuator.

Page 6-9, Table 6-3:

- Change HP Part No. 08621-00021 Panel: Upper Front to HP Part No. 08621-00026*.

*Part of Installation Kit for Option 010 HP Part No. 08621-60055. (See Table B-5.)

B-12. OPTION 010 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 1-3, Table 1-1, OPTION 010:

Add the following note:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1.

Page 3-2, Figure 3-1:

Replace Figure 3-1 with Figure B-1.

Page 3-3, Figure 3-1:

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure B-2.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure B-3.

Add Table B-2 Performance Test Record for Option 010.

Page 6-7, Table 6-3:

*Add A5 HP Part No. 08621-60066 Board Assembly: Attenuator.

Delete W1.

*Add A6 HP Part No. 08621-60012 Attenuator Assembly; Programmable, 70-dB.

*Add A7 HP Part No. 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part No. 0370-1111 Knob: Bar.

*Add A7S1 HP Part No. 3100-3237 Switch: Rotary, Attenuator.

Delete W7

Add W9 HP Part No. 08621-20062 Cable Assembly: Attenuator/Front RF Output.

Add W11 HP Part No. 08621-20064 Cable Assembly: Mounting Bracket/Attenuator.

*Part of Installation Kit for Option 010 HP Part No. 08621-60055. (See Table B-5.)

Page 1-9, Table 6-3:

Change HP Part No. 08621-00021 Panel: Upper Front to HP Part No. 08621-00026*.

Page 8-15, Figure 8-8: Replace RF Output section on Figure 8-8 with Figure B-4, Option 010.

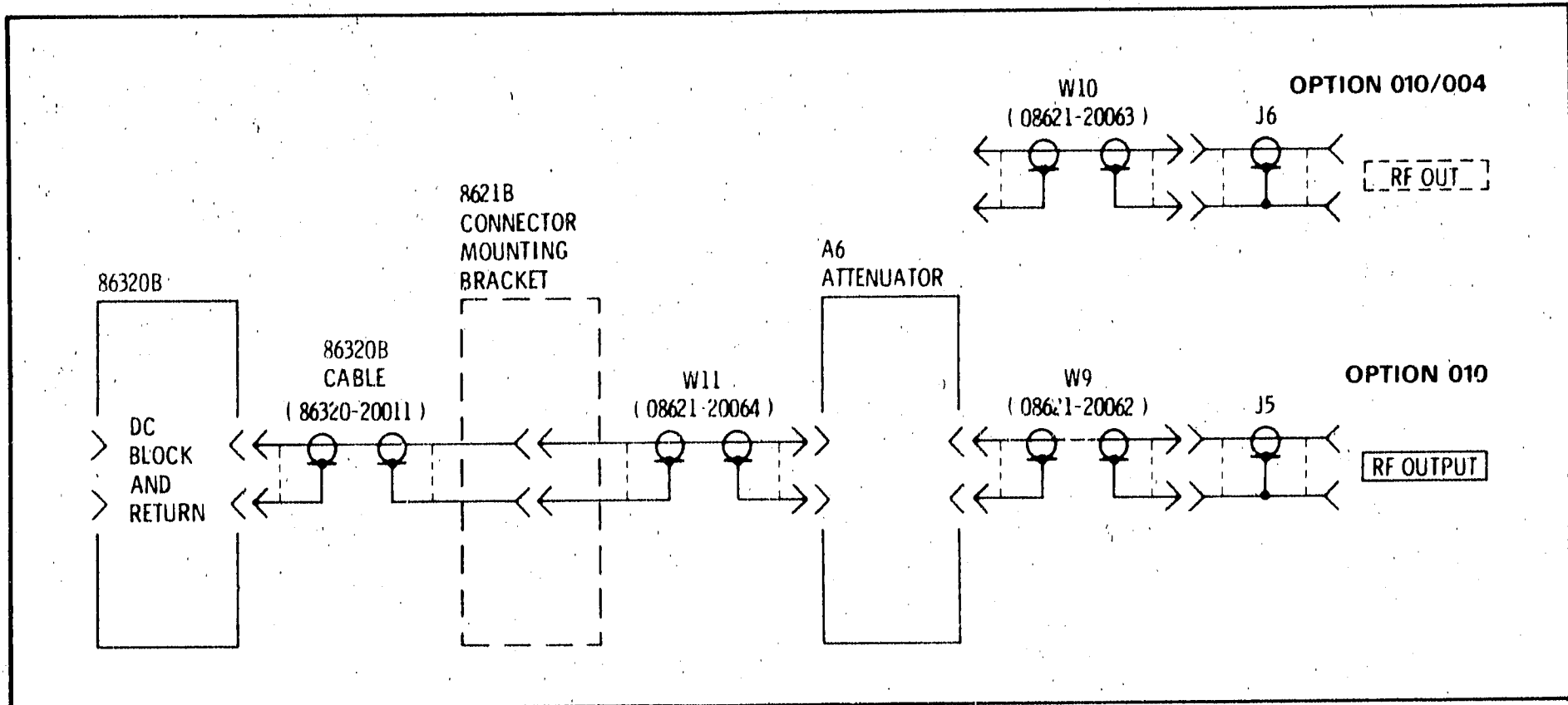


Figure B-4. Functional Block Diagram, Options 010 and 010/004 RF Output

B-13. OPTION 100/010 MANUAL CHANGES

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1.

Page 3-2, Figure 3-1:

Replace Figure 3-1 with Figure B-1.

Page 3-3, Figure 3-1:

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure B-2.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure B-3.

Add Table B-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

Add A4 HP Part No. 3106-0012 RF Switch: DC to 18 GHz.

*Add A5 HP Part No. 08621-60066 Board Assembly: Attenuator.

*Add A6 HP Part No. 08621-60012 Attenuator Assembly; Programmable, 70-dB.

*Add A7 HP Part No. 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part No. 0370-1111 Knob: Bar.

*Add A7S1 HP Part No. 3100-3237 Switch: Rotary, Attenuator.

Add W2 HP Part No. 08621-20026 Cable Assembly: Position 3/RF Switch.

Delete W7.

Add W9 HP Part No. 08621-20062 Cable Assembly: Attenuator/Front RF Output.

Add W12 HP Part No. 08621-20065 Cable Assembly: RF Switch/Attenuator.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00021 Panel: Upper Front to HP Part No. 08621-00026*.

Delete HP Part No. 08621-00033 Bracket: Connector Mounting.

Add HP Part No. 08621-00008 Bracket: RF Switch Mounting.

B-14. OPTION 100/010 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 1-3, Table 1-1, OPTION 010:

Add the following note:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1.

Page 3-2, Figure 3-1:

Replace Figure 3-1 with Figure B-1.

Page 3-3, Figure 3-1:

Add item ⑩ as follows: ⑩ Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure B-2.

*Part of Installation Kit for Option 010 HP Part No. 08621-60055. (See Table B-5).

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure B-3.

Add Table B-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

Add A4 HP Part No. 3106-0012 RF Switch: DC to 18 GHz.

*Add A5 HP Part No. 08621-60066 Board Assembly: Attenuator.

*Add A6 HP Part No. 08621-60012 Attenuator Assembly; Programmable, 70-dB.

*Add A7 HP Part No. 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part No. 0370-1111 Knob: Bar.

*Add A7S1 HP Part No. 3100-3237 Switch: Rotary, Attenuator.

Add W2 HP Part No. 08621-20026 Cable Assembly: Position 3/RF Switch.

Delete W1.

Delete W7.

Add W9 HP Part No. 08621-20062 Cable Assembly: Attenuator/Front RF Output.

Add W12 HP Part No. 08621-20065 Cable Assembly: RF Switch/Attenuator.

Page 6-9, Table 6-3:

Change HP Part No. 08621-00021 Panel: Upper Front to HP Part No. 08621-00026*.

Delete HP Part No. 08621-00033 Bracket: Connector Mounting.

Add HP Part No. 08621-00008 Bracket: RF Switch Mounting.

Page 8-15, Figure 8-8:

Replace RF Output section on Figure 8-8 with Figure B-5, Option 100/010.

B-15. OPTION 010/004 MANUAL CHANGES

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table B-5.)

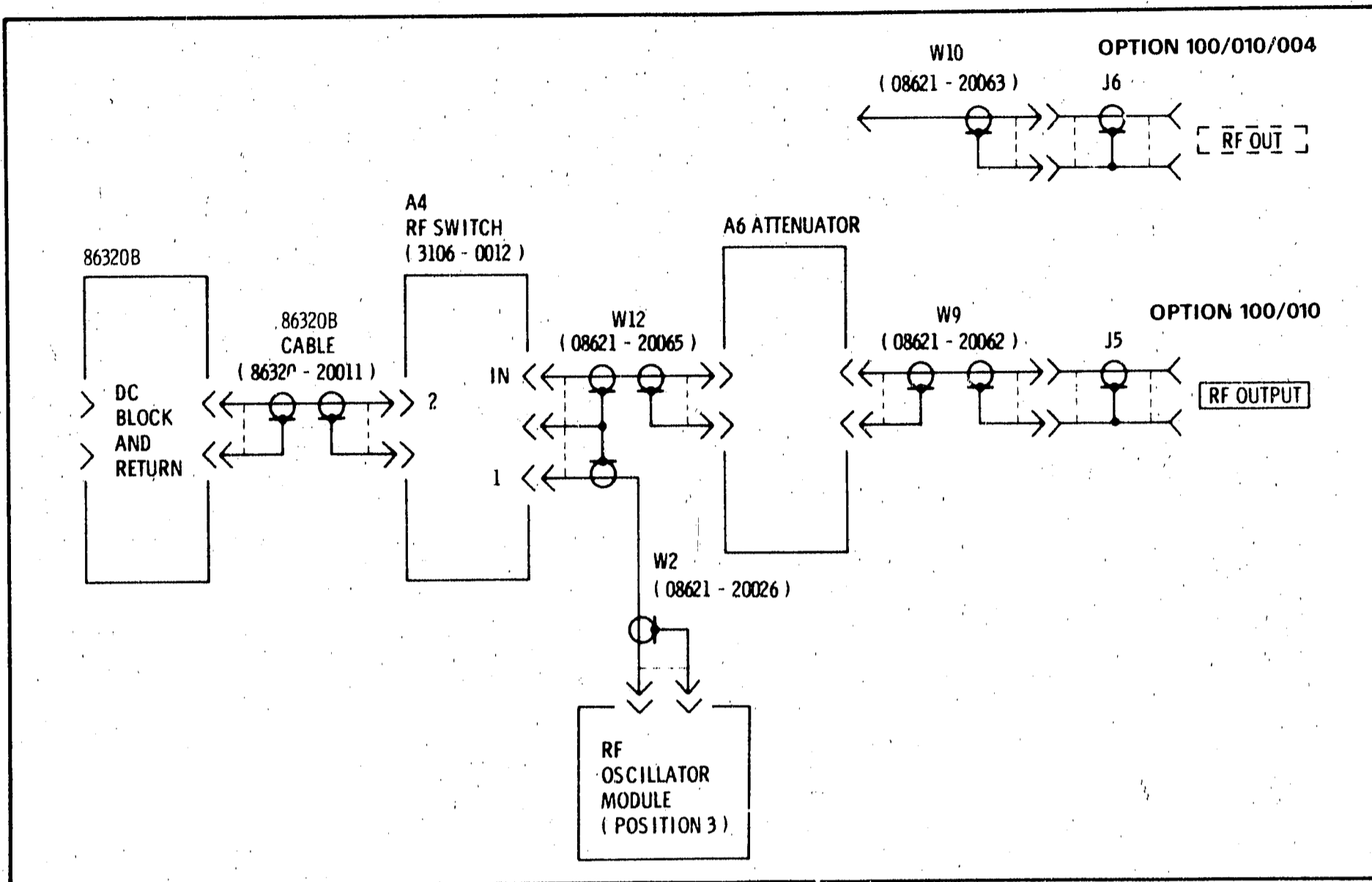


Figure B-5. Functional Block Diagram, Options 100/010 and 100/010/004 RF Output

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1 (Option 010).

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

Replace Figure 3-1 with Figure B-1.

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

Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 010/004 no front panel figure is provided, use Figure B-1 (Option 010) and delete the RF OUTPUT connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure B-6.

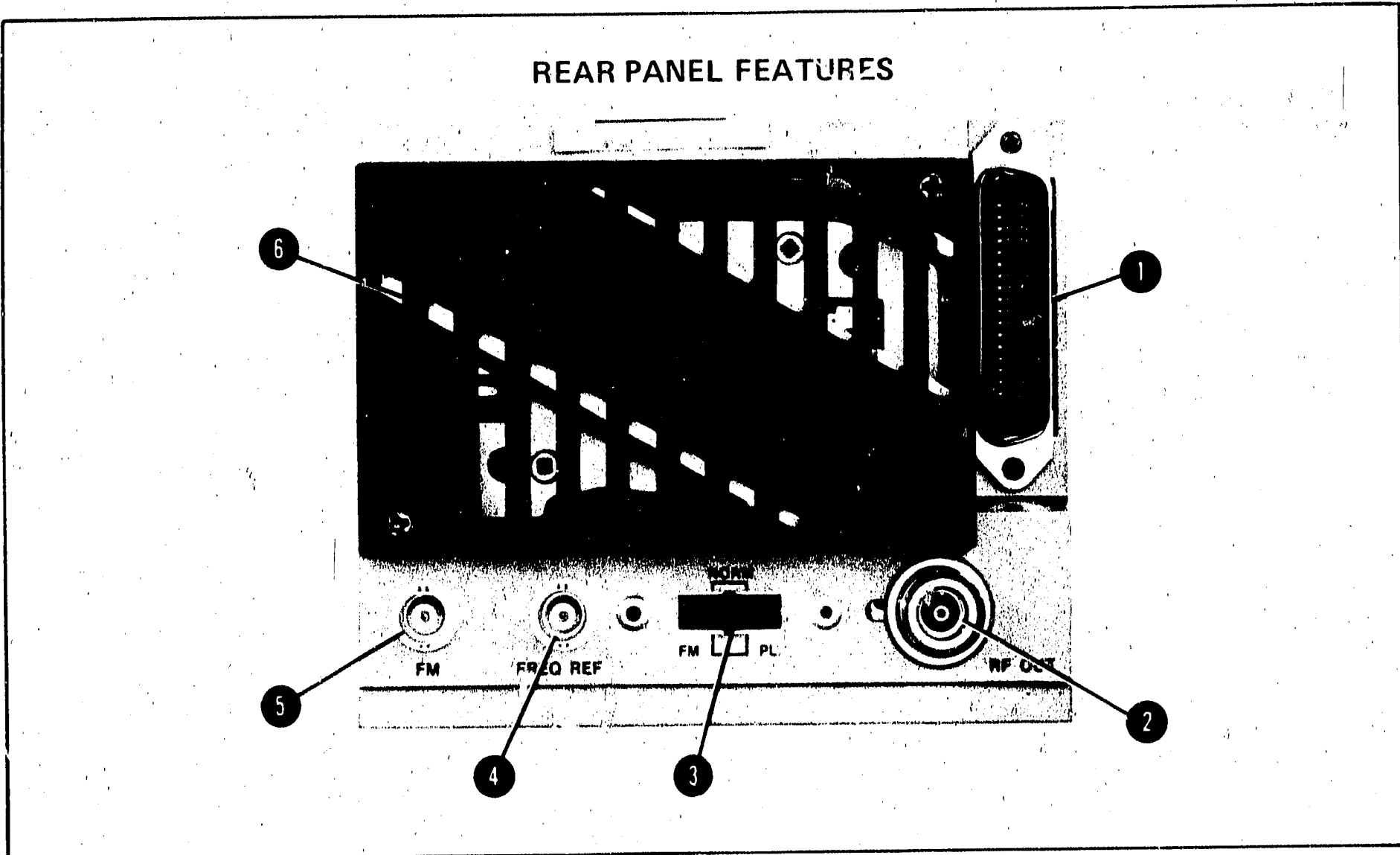


Figure B-6. Rear Panel Control and Connectors with 86320B Heterodyne Module, Option 004

Page 3-5, Figure 3-3:

- Replace FRONT panel with Figure B-2.
- Delete item 21 which is now on rear panel.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

- Add Performance Test for Option 010, Figure B-3.
- Add Table B-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

- *Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.
- *Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.
- *Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.
- *Add A7MP1 HP Part Number 0370-1111 Knob: Bar.
- *Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table B-5.)

Page 6-7, Table 6-3 (Cont'd):

Change J5 to J6 rear-panel RF OUT.

Delete W7.

Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.

Add W11 HP Part Number 08621-20064 Cable Assy: Mounting Bracket/Attenuator.

Page 6-9, Table 6-3:

*Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026.

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

B16. OPTION 010/004 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1 (Option 010).

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

Replace Figure 3-1 with Figure B-1.

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

Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 010/004 no front panel figure is provided, use Figure B-1 (Option 010) and delete the RF OUTPUT connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure B-6.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure B-2.

Delete item 21 which is now on rear panel.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table B-5.)

APPENDIX

B

CON'T

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure B-3.

Add Table B-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

*Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.

*Add A6 HP Part Number 08621-60012 Attenuator Assy: Programmable, 70-dB.

*Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part Number 0370-1111 Knob: Bar.

*Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.

Change J5 to J6 rear-panel RF OUT.

Delete W1.

Delete W7.

Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.

Add W11 HP Part Number 08621-20064 Cable Assy: Mounting Bracket/Attenuator.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026*.

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

Page 8-15, Figure 8-8: Replace RF Output section on Figure 8-8 with Figure B-4, Option 010/004.

B-17. OPTION 100/010/004 MANUAL CHANGES

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB insertion Loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1 (Option 010).

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

Replace Figure 3-1 with Figure B-1.

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

Delete existing item ⑧ and add the following: ⑧ RF OUT. With Option 004 installed, RF connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 100/010/004 no front panel figure is provided, use Figure B-1 (Option 010) and delete the RF Output connector.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table B-5.)

Page 3-3, Figure 3-1 (2 of 2) (Cont'd):

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure B-6.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure B-2.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure B-3.

Add Table B-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

*Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.

*Add A6 HP Part Number 08621-60012 Attenuator Assy: Programmable, 70-dB.

*Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part Number 0370-1111 Knob: Bar.

*Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.

Change J5 to J6 rear-panel RF OUT.

Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch.

Delete W7.

Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.

Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026*.

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00008 Bracket: RF Switch Mounting.

*Part of Installation Kit for Option 010 HP Part Number 08621-60051 (Table B-5.)

B-18. OPTION 100/010/004 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 1-3, Table 1-1, OPTION 010:

Add the following NOTE:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB insertion loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table B-1 (Option 010).

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

Replace Figure 3-1 with Figure B-1.

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

Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 100/010/004 no front panel figure is provided, use Figure B-1 (Option 010) and delete the RF Output connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure B-6.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure B-2.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB.

Section III and v for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure B-2 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure B-3.

Add Table B-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

- Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.
- *Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.
- *Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.
- *Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.
- *Add A7MP1 HP Part Number 0370-1111 Knob: Bar.
- *Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.
- Change J5 to J6 rear-panel RF OUT.
- Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch.
- Delete W1.
- Delete W7.
- Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.
- Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 6-9, Table 6-3:

- *Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026.
- Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.
- Delete HP Part Number 08621-00033 Bracket: Connector Mounting.
- Add HP Part Number 08621-00008 Bracket: RF Switch Mounting.

Page 6-15, Figure 8-8, Replace RF Output Section on Figure 8-8 with Figure B-5, Option 100/010/004.

B-19. OPTION 010 INSTALLATION IN STANDARD 8621B

EQUIPMENT REQUIRED

- Pozi-drive screwdriver
- Wrench 1/4-in. x 5/16-in. slotted box end
- Key Hex .050 (Allen 050) HP Part No. 8710-0857
- Wrench 7/16-inch slotted box end
- Transfer Tape, Scotch No. 467 1/2-inch (HP Part No. 0460-0284).

Table B-3. Parts Required to Install 8621B Option 010

Qty.	Reference Designator	Description	HP Part Number
1		Option 010 Installatin Kit (Table B-5).	08621-60055
1	W9	Cable Assembly: Front Output	08621-20062
1	W11	Cable Assy: Mounting Bracket to attenuator	08621-20064
4		4-40 x 5/16-inch Pozi-drive Screw and Lock Washer	2200-0105
1		Nut, Hex	2950-0043
1		Washer, Star Lock	2190-0016
		Tape, Transfer, Scotch No. 467 1/2-inch	0460-0284

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table B-5.)

PROCEDURE:

NOTE

See Figure B-13 for 8621B Option 010 configuration.

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Module from 8621B position 2 as follows:
 - a. Disconnect W1 from oscillator output connector.
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC Switch must be in MTR position.
5. Remove RF output cable assembly W7. Disconnect connector mounting bracket first and then W7. Disconnect W7 from SMA connector at rear of J5. Discard W7 and reinstall connector mounting bracket.

NOTE

It is not necessary to remove the RF OUTPUT connector J5. All connections to output cables are made with sub-miniature SMA connectors at the rear of J5. (See Figure 6-1, MP9.)

6. Remove Front Panel Assembly as follows: (See Figure B-7.)
 - a. Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - b. Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - c. Tilt front-panel assembly forward away from 8621B.
7. Remove upper front panel as follows:
 - a. Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - b. Remove POWER LEVEL and ALC front-panel knobs. Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - c. Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - d. Remove upper front panel using a large screwdriver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off. Discard upper front panel.

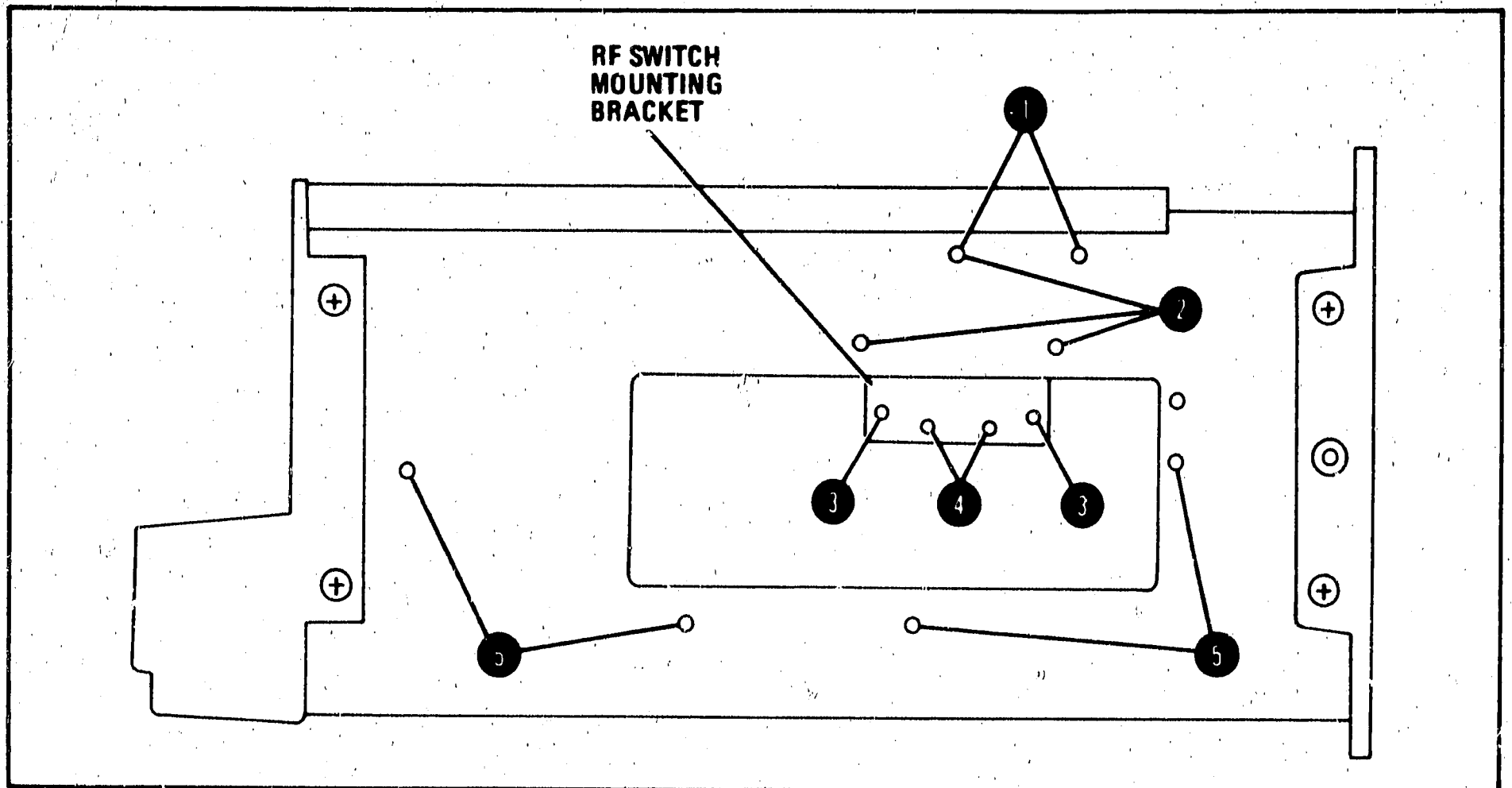


Figure 8-7. Mounting Holes on Left-Side of 8621B, Option 010

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

e. Clean residue of transfer tape from sub-panel.

8. Install upper front panel as follows:

a. Place three strips of transfer tape (Figure B-8) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

b. Strip paper backing from transfer tape.

c. Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.

9. Install UNLEVELED light removed in step 7a. (See Figure 8-2 for procedure.)

10. Install POWER LEVEL switch removed in step 7c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)

11. Install ALC control removed in step 7c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 7b. (See also Figure 8-9 for position of ALC actuator when in MTR position.)

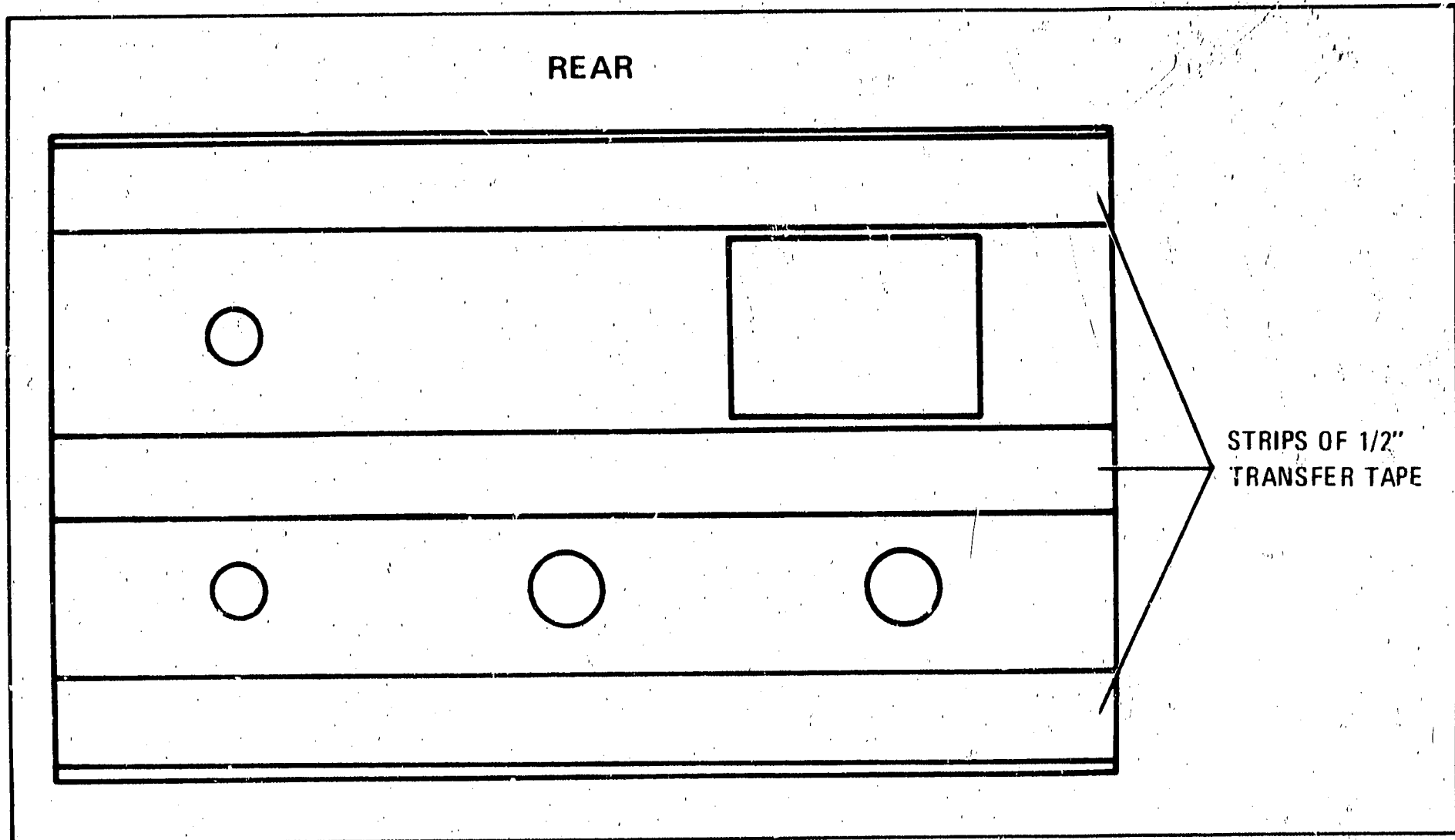


Figure B-8. Position of Transfer Tape on Upper Front Panel, Option 010

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-11 and A1 board installation procedure Figure 8-9.)

12. Install ATTENUATION switch A7S1 as follows:
 - a. Place star washer (HP Part No. 2190-0016) over switch shaft.
 - b. Rotate switch shaft fully counterclockwise to 70-db position.
 - c. Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - d. Rotate switch so hex nuts **1** are aligned at about 45° from perpendicular (Figure B-10).
 - e. Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - f. Set Attenuation knob pointer to 70 dB and tighten set screws.
13. Install Front Panel Assembly removed in step 6.
14. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
15. Install W9 finger tight to front RF OUTPUT connector J5.
16. Install Programmable Attenuator A6 as follows:
 - a. Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.

- b. Start W9 into attenuator front-output connector while holding attenuator against left-side frame.
 - c. Secure attenuator to left-side frame with four 4-40 x 5/16-inch screws and lock washers.
 - d. Tighten both connectors of W9.
17. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)
 18. Connect W11 to connector mounting bracket and rear input of attenuator. (Slide end with long threads into the bracket first, then make connection to attenuator.)
 19. Connect W1 to connector mounting bracket.
 20. Replace 8621B latching handle and spring removed in step 6. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
 21. Install Oscillator Module removed in step 3. Connect W1 to oscillator RF output.
 22. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 010.
 23. Check Attenuation Accuracy with Performance Test, Figure B-3.

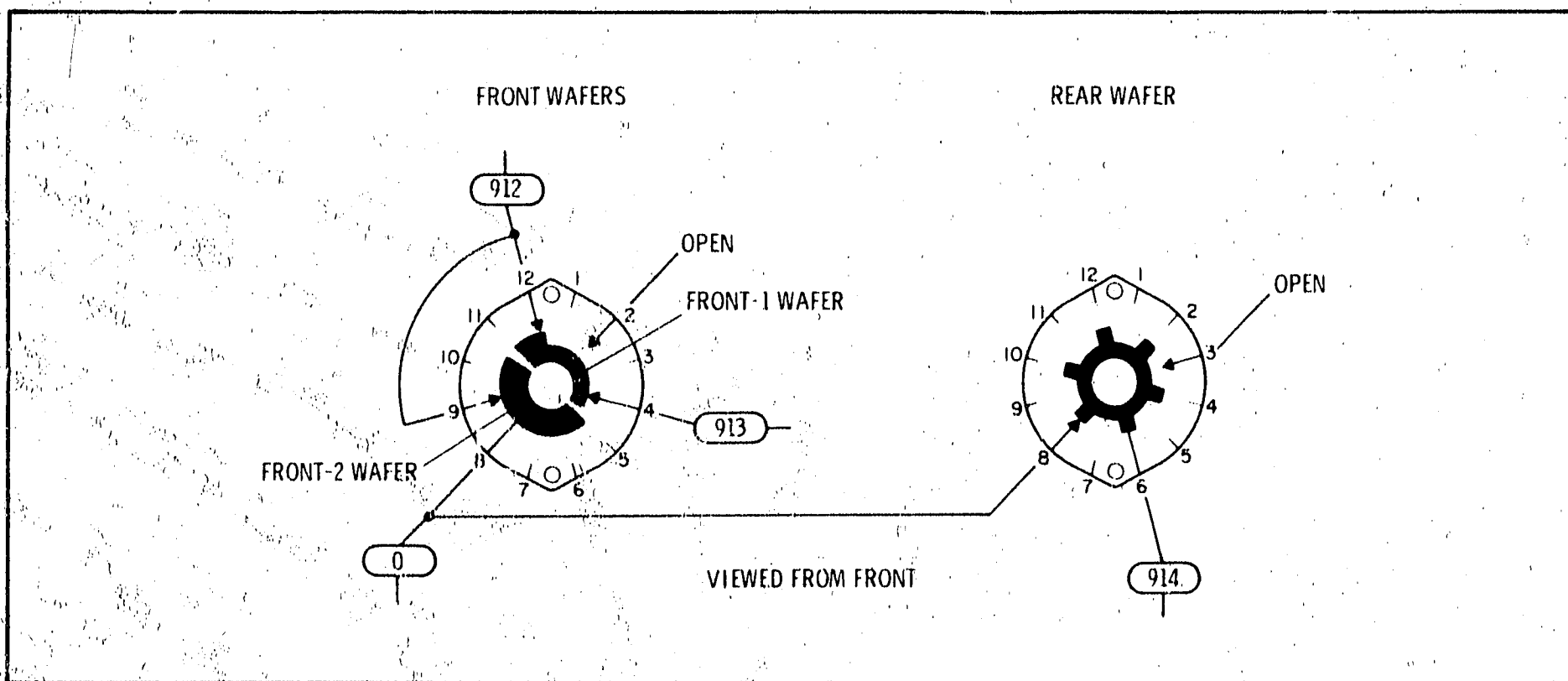


Figure B-9. Attenuation Switch A7S1 Contact Detail and Connections, Option 010

B-20. OPTION 010 INSTALLATION IN 8621B WITH 86320B HETERODYNE MODULE INSTALLED*Table B-4. Parts Required to Install 8621B/86320B, Option 010*

Qty.	Reference Designator	Description	HP Part Number
1		Option 010 Installation Kit (Table B-3)	08621-60055
1	W9	Cable Assembly: Front Output	08621-20062
1	W11	Cable Assembly: Mounting Bracket to Attenuator	08621-20064
4		4-40 x 5/16-inch Pozi-drive Screw and Lock Washer	2200-0105
1		Nut, Hex	2950-0043
1		Washer, Star Lock	2190-0016
		Tape, Transfer, Scotch No. 467 1/2 inch	0460-0284

EQUIPMENT REQUIRED

- Pozi-drive screwdriver
- Wrench 1/4-in. x 5/16-in. slotted box end
- Key Hex .050 (Allen 050) HP Part No. 8710-0857
- Wrench 7/16-inch slotted box end
- Transfer Tape, Scotch No. 467 1/2-inch (HP Part No. 0460-0284)

PROCEDURE**NOTES**

The following procedure presumes that a Model 86320B Heterodyne Module is installed and that only the Option 010 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module installation as described in paragraph 2-19 before proceeding (omit steps g, h, and i). Parts required to install an 86320B in an 8621B with Option 010, are listed in Table B-6 under Option 010.

See Figure B-13 for configurations of 8621B Option 010 with an 86320B Heterodyne Module.

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Module from 8621B position 2 as follows:
 - a. Disconnect 86320B RF input cable from oscillator output connector. (See Figure B-13, Item 3.)
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.

4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
5. Remove RF output cable assembly W7. Disconnect connector mounting bracket first and then W7. Disconnect W7 from SMA connector at rear of J5. Discard W7 and reinstall connector mounting bracket.

NOTE

It is not necessary to remove the RF OUTPUT connector J5. All connections to output cables are made with sub-miniature SMA connectors at the rear of J5. (See Figure 6-1, MP9.)

6. Remove Front Panel Assembly as follows: (See Figure B-7.)
 - a. Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - b. Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - c. Tilt front-panel assembly forward away from 8621B.
7. Remove upper front panel as follows:
 - a. Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - b. Remove POWER LEVEL and ALC front-panel knobs. Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - c. Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - d. Remove upper front panel using a large screwdriver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off. Discard upper front panel.

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

- e. Clean residue of transfer tape from sub-panel.
8. Install upper front panel as follows:
 - a. Place three strips of transfer tape (Figure B-8) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

- b. Strip paper backing from transfer tape.
- c. Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.

9. Install UNLEVELED light removed in step 7a. (See Figure 8-2 for procedure.)
10. Install POWER LEVEL switch removed in step 7c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)
11. Install ALC control removed in step 7c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 7b. (See also Figure 8-9 for position of ALC actuator when in MTR position).

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-11 and A1 board installation procedure Figure 8-9.)

12. Install ATTENUATION switch A7S1 as follows:
 - a. Place star washer (HP Part No. 2190-0016) over switch shaft.
 - b. Rotate switch shaft fully counterclockwise to 70-dB position.
 - c. Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - d. Rotate switch so hex nuts **1** are aligned at about 45° from perpendicular (Figure B-10).

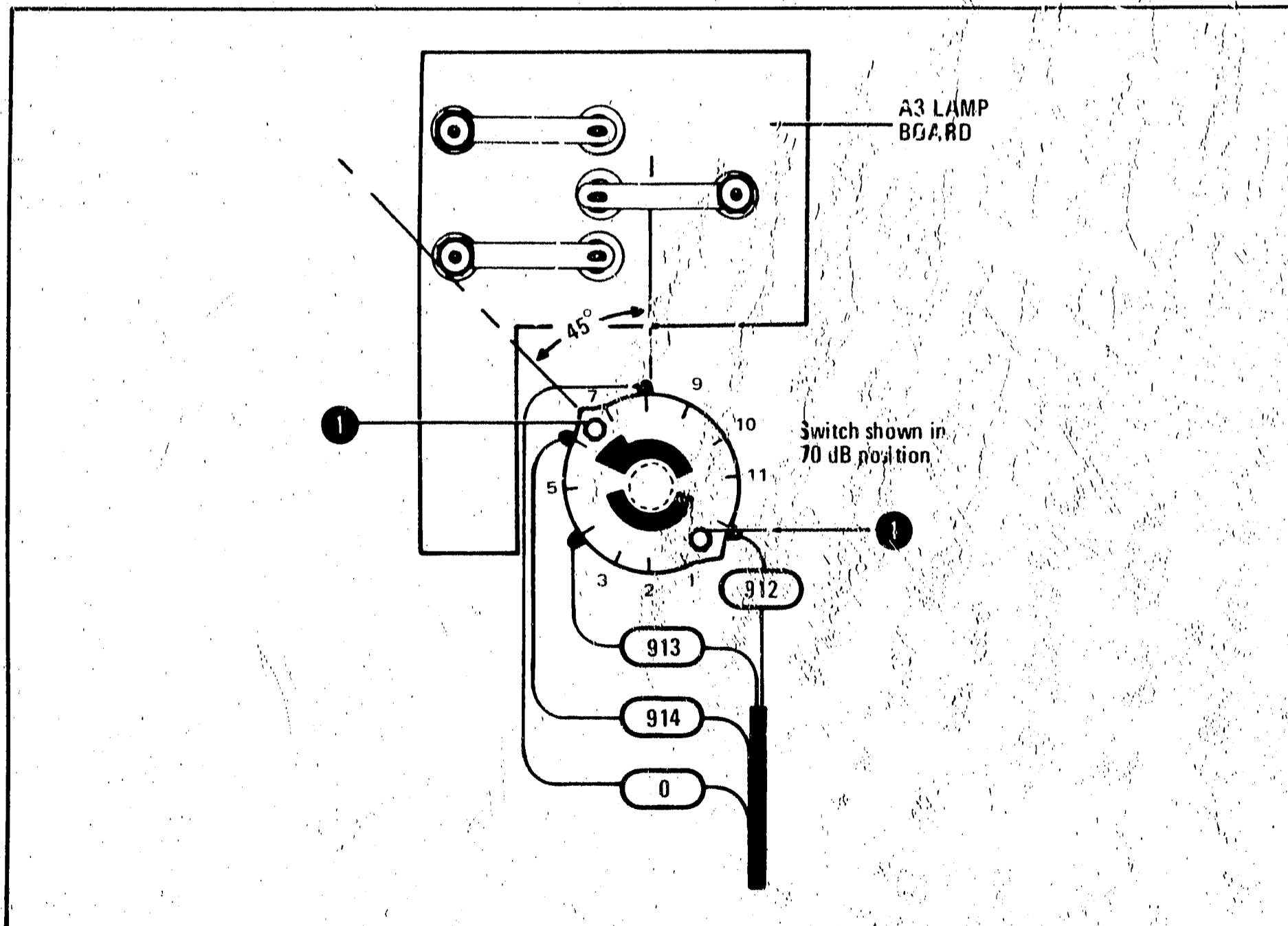


Figure B-10. Attenuation Switch Installation, Option 010

- e. Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - f. Set Attenuation knob pointer to 70 dB and tighten set screws.
13. Install Front Panel Assembly removed in step 6.
 14. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
 15. Install W9 finger tight to front RF OUTPUT connector J5.
 16. Install A6 Attenuator as follows:
 - a. Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.
 - b. Start W9 into attenuator front-output connector while holding attenuator against left-side frame.
 - c. Secure attenuator to left-side frame with four 4-40 x 5/16-inch screws and lock washers.
 - d. Tighten both connectors of W9.
 17. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)

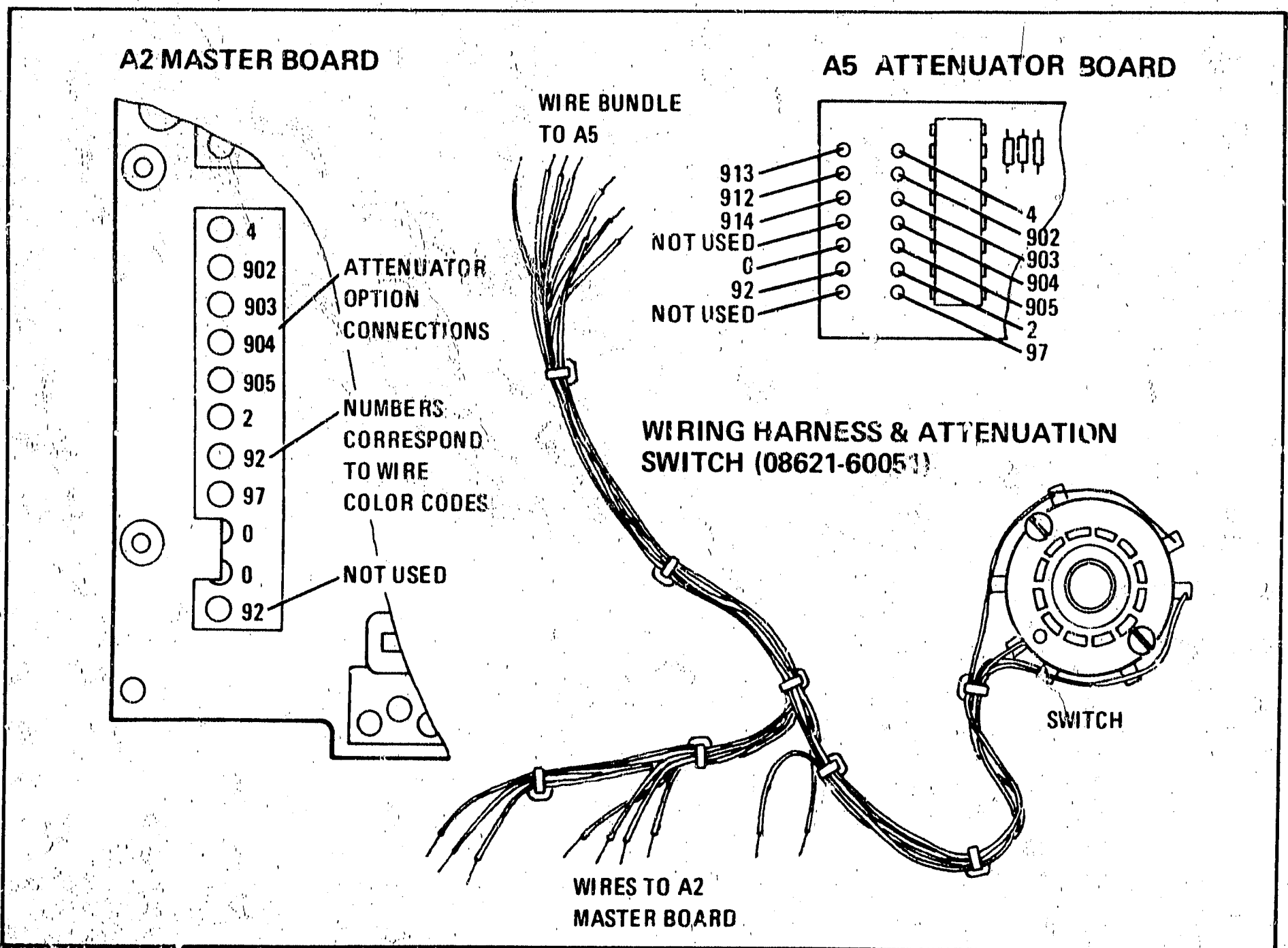


Figure B-11. Wiring Harness and Attenuation Switch Connections, Option 010

18. Connect W11 to connector mounting bracket and rear input of attenuator. (Slide end with long threads into the bracket first, then make connection to attenuator.)
19. Connect 86320B RF output cable (see Figure B-13, Item 4).
20. Replace 8621B latching handle and spring removed in step 6. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
21. Install Oscillator Module removed in step 3. Connect 86320B RF input cable to oscillator RF output.
22. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 010.
23. Check Attenuation Accuracy with Performance Test, Figure B-3.

B-21. OPTION 010 INSTALLATION IN 8621B WITH OPTION 100 INSTALLED

B-22. To change an Option 100 to an Option 100/010 requires the parts listed in Table B-7 (W1, W2, W9, W12, Option 010 Installation Kit, and mounting bracket). See Figure B-13 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 and interconnecting cables as follows:
 - a. Remove W3 and W6. Disconnect cables from oscillator output connectors and RF Switch A4. Discard cables. (To remove cables, loosen mounting bracket.)
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of modules. Use cover as pry against 8621B side frame to remove modules from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
5. Remove RF output cable assembly W4. Disconnect W4 from SMA connector at rear of J5. Discard W4.

NOTE

It is not necessary to remove the RF OUTPUT connector J5. All connections to output cables are made to a sub-miniature SMA connector at the rear of J5. (See Figure 6-1, MP9.)

6. Remove RF Switch A4 from switch mounting bracket. Discard this bracket. (Retain screws for re-mounting of switch.)

NOTE

It is not necessary to remove the RF OUTPUT connector J5. All connections to output cables are made with sub-miniature SMA connectors at the rear of J5. (See Figure 6-1, MP9.)

7. Remove Front Panel Assembly as follows: (See Figure B-7.)
 - a. Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - b. Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - c. Tilt front-panel assembly forward away from 8621B.
8. Remove upper front panel as follows:
 - a. Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - b. Remove POWER LEVEL and ALC front-panel knobs. Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - c. Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - d. Remove upper front panel using a large screwdriver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off. Discard upper front panel.

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

- e. Clean residue of transfer tape from sub-panel.
9. Install upper front panel as follows:
 - a. Place three strips of transfer tape (Figure B-8) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

- b. Strip paper backing from transfer tape.
- c. Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.
10. Install UNLEVELED light removed in step 8a. (See Figure 8-2 for procedure.)
11. Install POWER LEVEL switch removed in step 8c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)

12. Install ALC control removed in step 8c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 8b. (See also Figure 8-9 for position of ALC actuator when in MTR position).

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-1 and A1 board installation procedure Figure 8-9.)

13. Install ATTENUATION switch A7S1 as follows:
- a. Place star washer (HP Part No. 2190-0016) over switch shaft.
 - b. Rotate switch shaft fully counterclockwise to 70-dB position.
 - c. Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - d. Rotate switch so hex nuts **1** are aligned at about 45° from perpendicular (Figure B-10).
 - e. Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - f. Set Attenuation knob pointer to 70 dB and tighten set screws.
14. Install Front Panel Assembly removed in step 7.
15. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
16. Install W9 finger tight to front RF OUTPUT connector J5.
17. Install A6 Attenuator as follows:
- a. Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.
 - b. Start W9 into attenuator front-output connector while holding attenuator against left-side frame.
 - c. Secure attenuator to left-side frame with four #40 x 5/16-inch screws and lock washers.
 - d. Tighten both connectors of W9.
18. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)
19. Secure RF Switch A4 (Figure B-13) to mounting bracket (Figure B-13, Item 9) using holes either **3** or **4** depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is at the top of cabinet and Port 1 is at the bottom (Figure A-9).
20. Connect cable W12 to rear input of attenuator assembly A6.
21. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port IN or COM), and connect W1 to top connector (Port 2).
22. Secure mounting bracket to left-side of RF Section frame using holes **1**. (See Figure A-8.)

23. Install RF Oscillator Modules in positions 2 and 3. (See paragraph 2-16 for Oscillator Module Installation.)
24. Connect W1 to RF Output of RF Oscillator Module 1 (Position 2).
25. Connect W2 to RF Output of RF Oscillator Module 2 (Position 3).
26. Replace 8621B latching handle and spring removed in step 7a. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
27. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 100/010.
28. Check Attenuation Accuracy with Performance Test, Figure B-3.

B-23. OPTION 010 INSTALLATION IN 8621B WITH OPTION 100 AND HETERODYNE MODULE INSTALLED.

B-24. To change an Option 100 to an Option 100/010 with 86320B installed, requires the parts shown in Figure B-13 (W2, W9, W12, Option 010 Installation Kit, and mounting bracket). See Figure B-13 for component and assembly layout and for parts identification.

B-25. The following procedure presumes that an Option 100 and a Model 86320B Heterodyne Module are installed and that only the Option 010 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module Installation as described in paragraph 2-19 (omitting steps g, h, and i) before proceeding. See Table B-6 for the 86320B parts required to install an 86320B with an 8621B Option 100/010.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 and interconnecting cables as follows:
 - a. Disconnect 86320B RF input cable (Figure B-13, Item 3) from RF oscillator 1 and W3 from RF oscillator 2.
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Loosen switch mounting bracket. Disconnect from RF switch: W3, W4, and 86320B RF cable (Figure B-13, Item 5). Discard W3.
5. Remove 86320B RF cable from DC Return and discard cable.
6. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.

7. Remove RF output cable assembly W4. Disconnect W4 from SMA connector at rear of J5. Discard W4.

NOTE

It is not necessary to remove the RF OUTPUT connector J5. All connections to output cables are made to a sub-miniature SMA connector at the rear of J5. (See Figure 8-1, MP9.)

8. Remove RF Switch A4 from switch mounting bracket. Discard this bracket. (Retain screws for remounting of switch.)
9. Remove Front Panel Assembly as follows: (See Figure B-7.)
- Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - Tilt front-panel assembly forward away from 8621B.
10. Remove upper front panel as follows:
- Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - Remove POWER LEVEL and ALC front-panel knobs. Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - Remove upper front panel using a large screwdriver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off. Discard upper front panel.

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

- Clean residue of transfer tape from sub-panel.
11. Install upper front panel as follows:
- Place three strips of transfer tape (Figure B-3) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

- Strip paper backing from transfer tape.
 - Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.
12. Install UNLEVELED light removed in step 10a. (See Figure 8-2 for procedure.)

13. Install POWER LEVEL switch removed in step 10c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)
14. Install ALC control removed in step 10c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 10b. (See also Figure 8-9 for position of ALC actuator when in MTR position.)

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-11 and A1 board installation procedure Figure 8-9.)

15. Install ATTENUATION switch A7S1 as follows:
 - a. Place star washer (HP Part No. 2190-0016) over switch shaft.
 - b. Rotate switch shaft fully counterclockwise to 70-dB position.
 - c. Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - d. Rotate switch so hex nuts ① are aligned at about 45° from perpendicular (Figure B-10).
 - e. Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - f. Set Attenuation knob pointer to 70 dB and tighten set screws.
16. Install Front Panel Assembly removed in step 9.
17. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
18. Install W9 finger tight to front RF OUTPUT connector J5.
19. Install A6 Attenuator as follows:
 - a. Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.
 - b. Start W9 into attenuator front-output connector while holding attenuator against left-side frame.
 - c. Secure attenuator to left-side frame with four 4-40 x 5/16-inch screws and lock washers.
 - d. Tighten both connectors of W9.
20. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)
21. Secure RF Switch A4 (Figure B-13) to mounting bracket (Figure B-13, Item 9) using holes either ② or ③ depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is at the top of cabinet and Port 1 is at the bottom (Figure A-9).
22. Connect cable W12 to rear input of attenuator assembly A6.
23. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port IN or COM), and connect 86320B RF cable (Figure B-13, Item 4) to rear connector (Port 2).

24. Secure mounting bracket to left-side of RF Section frame using holes ①. (See Figure A-8.)
25. Connect 86320B RF cable from RF switch (rear connector Port 2) to DC Return.
26. Install RF Oscillator Modules in positions 2 and 3. (See Paragraph 2-16 for Oscillator Module Installation.)
27. Connect 86320B RF input cable to RF Output of RF Oscillator Module 1 (Position 2).
28. Connect W2 to RF Output of RF Oscillator Module 2 (Position 3).
29. Replace 8621B latching handle and spring removed in step 9. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
30. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 100/010.
31. Check Attenuation Accuracy with Performance Test, Figure B-3.

B-26. OPTION 010 INSTALLATION IN 8621B WITH OPTION 004 INSTALLED.

B-27. To change an Option 004 to an Option 010 004 requires the parts listed in Table B-7 (W10, W11, and Option 010 Installation Kit). See Figure B-13 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe and remove A1 ALC Amplifier Board (see Figures 8-9 and 8-11). ALC switch must be in MTR position.
3. Remove RF Oscillator Module from 8621B position 2 as follows:
 - a. Disconnect W1 from oscillator output connector.
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Loosen connector mounting bracket and remove rear RF output cable W8. Discard W8.
5. Remove Front Panel Assembly as follows: (See Figure B-7.)
 - a. Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - b. Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - c. Tilt front-panel assembly forward away from 8621B.

6. Remove upper front panel as follows:
 - a. Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - b. Remove POWER LEVEL and ALC front-panel knobs. Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - c. Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - d. Remove upper front panel using a large screwdriver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off. Discard upper front panel.

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

- e. Clean residue of transfer tape from sub-panel.
7. Install upper front panel as follows:
 - a. Place three strips of transfer tape (Figure B-8) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

- b. Strip paper backing from transfer tape.
 - c. Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.
8. Install UNLEVELED light removed in step 6a. (See Figure 8-2 for procedure.)
9. Install POWER LEVEL switch removed in step 6c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)
10. Install ALC control removed in step 6c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 6b. (See also Figure 8-9 for position of ALC actuator when in MTR position).

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-11 and A1 board installation procedure Figure 8-9.)

11. Install ATTENUATION switch A7S1 as follows:
 - a. Place star washer (HP Part No. 2190-0016) over switch shaft.
 - b. Rotate switch shaft fully counterclockwise to 70-dB position.
 - c. Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - d. Rotate switch so hex nuts ① are aligned at about 45° from perpendicular (Figure B-10).
 - e. Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - f. Set Attenuation knob pointer to 70 dB and tighten set screws.
12. Install Front Panel Assembly removed in step 5.
13. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
14. Install A6 Attenuator as follows:
 - a. Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.
 - b. Start W10 into attenuator front-output connector while holding attenuator against left-side frame.
 - c. Secure attenuator to left-side frame with four 4-40 x 5/16-inch screws and lock washers.
 - d. Connect W10 to rear RF OUT connector J6.
15. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)
16. Connect W11 to connector mounting bracket and rear input attenuator.
17. Replace 8621B latching handle and spring removed in step 5. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
18. Install Oscillator Module removed in step 3. Connect W1 to oscillator RF output.
19. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 010/004.
20. Check Attenuation Accuracy with Performance Test, Figure B-3.

B-28. OPTION 010 INSTALLATION IN 8621B WITH OPTION 004 AND HETERODYNE MODULE INSTALLED

B-29. To change an Option 004 to an Option 010/004 with 86320B installed, requires the parts shown in Figure B-13 (W10, W11, and Option 010 Installation Kit). See Figure B-13 for component and assembly layout and for parts identification.

B-30. The following procedure presumes that an Option 004 and a Model 86320B Heterodyne Module are installed and that only the Option 010 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module Installation as described in paragraph 2-15 (omitting steps g, h, and i) before proceeding. See Table B-6 for the 86320B parts required to install an 86320B with an 8621B Option 010/004.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe and remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
3. Remove RF Oscillator Module from 8621B position 2 as follows:
 - a. Disconnect 86320B RF input cable (Figure B-13, Item 3) from oscillator output connector.
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B sideframe to remove module from position 2.
4. Disconnect 86320B RF cable (Figure B-13, Item 4) from connector mounting bracket.
5. Remove RF output cable assembly W8. To disconnect W8, remove connector mounting bracket first and then W8. Disconnect W8 from SMA connector at rear of J6. Discard W8 and reinstall connector mounting bracket.

NOTE

It is not necessary to remove rear RF OUT connector J6. All connections to output cables are made to a sub-miniature SMA connector at the rear of J6. (See Figure 6-1, MP9.)

6. Remove Front Panel Assembly as follows: (See Figure B-7.)
 - a. Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - b. Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - c. Tilt front-panel assembly forward away from 8621B.
7. Remove upper front panel as follows:
 - a. Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - b. Remove POWER LEVEL and ALC front-panel knobs. (Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - c. Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - d. Remove upper front panel using a large screwdriver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off.

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

- e. Clean residue of transfer tape from sub-panel.
8. Install upper front panel as follows:
 - a. Place three strips of transfer tape (Figure B-8) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

- b. Strip paper backing from transfer tape.
- c. Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.
9. Install UNLEVELED light removed in step 7a. (See Figure 8-2 for procedure.)
10. Install POWER LEVEL switch removed in step 7c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)
11. Install ALC control removed in step 7c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 7b. (See also Figure 8-9 for position of ALC actuator when in MTR position.)

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-11 and A1 board installation procedure, Figure 8-9.)

12. Install ATTENUATION switch A7S1 as follows:
 - a. Place star washer (HP Part No. 2190-0016) over switch shaft.
 - b. Rotate switch shaft fully counterclockwise to 70-dB position.
 - c. Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - d. Rotate switch so hex nuts ① are aligned at about 45° from perpendicular (Figure B-10).
 - e. Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - f. Set Attenuation knob pointer to 70 dB and tighten set screws.
13. Install Front Panel Assembly removed in step 6.
14. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
15. Install A6 Attenuator as follows:
 - a. Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.
 - b. Start W10 into attenuator front-output connector while holding attenuator against left-side frame.
 - c. Secure attenuator to left-side frame with four 4-40 x 5/16-inch screws and lock washers.
 - d. Connect W10 to rear RF OUT connector J6.

16. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)
17. Connect W11 to connector mounting bracket and rear input attenuator.
18. Connect 86320B RF cable, removed in step 4, to connector mounting bracket.
19. Replace 8621B latching handle and spring removed in step 6. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
20. Install Oscillator Module removed in step 3. Connect 86320B input cable (Figure B-13) to oscillator RF output.
21. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 010/004.
22. Check Attenuation Accuracy with Performance Test, Figure B-3.

B-31. OPTION 010 INSTALLATION IN 8621B WITH OPTION 100/004 INSTALLED

B-32. To change an Option 100/004 to an Option 100/010/004 requires the parts listed in Table B-7 (W1, W2, W10, W12, Option 010 Installation Kit, and mounting bracket). See Figure B-13 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 and interconnecting cables as follows:
 - a. Remove W3 and W6. Disconnect cables from oscillator output connectors and RF Switch A4. Discard cables. (To remove cables, loosen mounting bracket.)
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of modules. Use cover as pry against 8621B side frame to remove modules from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
5. Remove rear RF output cable assembly W5. Disconnect W5 from SMA connector at rear of J6. Discard W5.

NOTE

It is not necessary to remove the rear RF OUT connector J6. All connections to output cables are made to a sub-miniature SMA connector at the rear of J6. (See Figure 6-1, MP9.)

6. Remove RF Switch A4 from switch mounting bracket. Discard this bracket. (Retain screws for re-mounting of switch.)

7. Remove Front Panel Assembly as follows: (See Figure B-7.)
 - a. Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - b. Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - c. Tilt front-panel assembly forward away from 8621B.
8. Remove upper front panel as follows:
 - a. Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - b. Remove POWER LEVEL and ALC front-panel knobs. Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - c. Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - d. Remove upper front panel using a large screwdriver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off. Discard upper front panel.

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

- e. Clean residue of transfer tape from sub-panel.
9. Install upper front panel as follows:
 - a. Place three strips of transfer tape (Figure B-8) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

- b. Strip paper backing from transfer tape.
- c. Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.
10. Install UNLEVELED light removed in step 8a. (See Figure 8-2 for procedure.)
11. Install POWER LEVEL switch removed in step 8c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)
12. Install ALC control removed in step 8c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 8b. (See also Figure 8-9 for position of ALC actuator when in MTR position).

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-11 and A1 board installation procedure, Figure 8-9.)

13. Install ATTENUATION switch A7S1 as follows:
 - a. Place star washer (HP Part No. 2190-0016) over switch shaft.
 - b. Rotate switch shaft fully counterclockwise to 70-dB position.
 - c. Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - d. Rotate switch so hex nuts ① are aligned at about 45° from perpendicular (Figure B-10).
 - e. Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - f. Set Attenuation knob pointer to 70 dB and tighten set screws.
14. Install Front Panel Assembly removed in step 7.
15. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
16. Install A6 Attenuator as follows:
 - a. Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.
 - b. Start W10 into attenuator front-output connector while holding attenuator against left-side frame.
 - c. Secure attenuator to left-side frame with four 4-40 x 5/16-inch screws and lock washers.
 - d. Connect W10 to rear RF OUT connector J6.
17. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)
18. Secure RF Switch A4 (Figure P-13) to mounting bracket (Figure B-13, Item 9) using holes either ③ or ④ depending on switch used. (See Figures A-8 and A-9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is at the top of cabinet and Port 1 is at the bottom (Figure A-9).
19. Connect cable W12 to rear input of attenuator assembly A6.
20. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port 2).
21. Secure mounting bracket to left-side of RF Section frame using holes ①. (See Figure A-8.)
22. Install RF Oscillator Modules in positions 2 and 3. (See paragraph 2-16 for Oscillator Module Installation.)
23. Connect W1 to RF Output of RF Oscillator Module 1 (Position 2).

24. Connect W2 to RF Output of RF Oscillator Module 2 (Position 3).
25. Replace 8621B latching handle and spring removed in step 7. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
26. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 100/010/004.
27. Check Attenuation Accuracy with Performance Test, Figure B-3.

B-33. OPTION 010 INSTALLATION IN 8621B WITH OPTION 100/004 AND HETERODYNE MODULE INSTALLED

B-34. To change an Option 010 to an Option 100/010/004 with 86320B installed, requires the parts shown in Figure B-13 (W2, W10, W12, Option 010 Installation Kit, and mounting bracket). See Figure B-13 for component and assembly layout and for parts identification.

B-35. The following procedure presumes that an Option 100/004 and a Model 86320B Heterodyne Module are installed and that only the Option 010 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module Installation as described in paragraph 2-19 (omitting steps g, h, and i) before proceeding. See Table B-6 for the 86320B parts required to install an 86320B with an 8621B Option 100/010/004.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 and interconnecting cables as follows:
 - a. Disconnect 86320B RF input cable (Figure B-13, Item 3) from RF oscillator 1 and W3 from RF oscillator 2.
 - b. Remove four pozi-drive screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozi-drive lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Loosen switch mounting bracket. Disconnect from RF switch: W3, W5, and 86320B RF cable (Figure B-13, Item 5). Discard W3.
5. Remove 86320B RF cable from DC Return and discard cable.
6. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11) ALC switch must be in MTR position.
7. Remove rear RF output cable assembly W5. Disconnect W5 from SMA Connector at rear of J6. Discard W5.

NOTE

It is not necessary to remove the rear RF OUT connector J6. All connections to output cables are made to a sub-miniature SMA connector at the rear of J6. (See Figure 6-1, MP9.)

8. Remove RF Switch A4 from switch mounting bracket. Discard this bracket. (Retain screws for remounting of switch.)
9. Remove Front Panel Assembly as follows: (See Figure B-7.)
 - a. Remove straight-slot screw holding 8621B latching handle ③. Remove handle and spring. Note placement and position of spring and hole ① for remounting spring during installation.
 - b. Remove four pozi-drive front-panel assembly mounting screws ② (two from each side).
 - c. Tilt front-panel assembly forward away from 8621B.
10. Remove upper front panel as follows:
 - a. Remove UNLEVELED light and mounting clip from front panel. Push light out with thumb or eraser-end of pencil. Clip is pushed out from the rear of the front panel. (See Figure 8-2.)
 - b. Remove POWER LEVEL and ALC front-panel knobs. Rotate POWER LEVEL control fully counterclockwise for access to set-screws. Rotate ALC control to MTR and note MTR position of ALC actuator. (See Figure 8-9.)
 - c. Remove POWER LEVEL and ALC controls from front panel. Remove nuts securing controls to front panel and note order and position of washers.
 - d. Remove upper front panel using a large screw driver. Push screwdriver through rear of Front Sub-Panel using hole for ATTENUATION dB switch A7S1. (Hole is located under Frequency-Display indicators.) When upper front panel has been lifted away from the sub-panel, use fingers to strip front panel off. Discard upper front panel.

NOTE

If separating the two panels is very difficult, force a piece of plastic or wood between them to help.

- e. Clean residue of transfer tape from sub-panel.
11. Install upper front panel as follows:
 - a. Place three strips of transfer tape (Figure B-8) to back of front panel. After tape has been placed on panel, apply pressure over entire paper backing (especially on edges).

NOTE

If insufficient pressure is applied, part of the adhesive substance may cling to the paper when the paper is peeled off.

- b. Strip paper backing from transfer tape.
- c. Install upper front panel (HP Part No. 08621-00026 supplied with Installation Kit, Table B-5) on sub-panel. Apply finger pressure along area where transfer tape was placed.
12. Install UNLEVELED light removed in step 10a. (See Figure 8-2 for procedure.)
13. Install POWER LEVEL switch removed in step 10c. Set POWER LEVEL knob pointer to the 7-o'clock white mark on front panel and tighten set screw. (Ensure that POWER LEVEL control R1 is fully counterclockwise.)

14. Install ALC control removed in step 10c. Before tightening a set screw, set ALC knob pointer to MTR and set ALC actuator to MTR position noted in step 10b. (See also Figure 8-9 for position of ALC actuator when in MTR position).

NOTE

To set ALC knob in a true MTR position, it may be necessary to install the A1 board and align the ALC actuator and ALC switch A1S3 together. (See Figure 8-11 and A1 board installation procedure, Figure 8-9.)

15. Install ATTENUATION switch A7S1 as follows:
- Place star washer (HP Part No. 2190-0016) over switch shaft.
 - Rotate switch shaft fully counterclockwise to 70-dB position.
 - Place switch in front panel with cable down towards chassis bottom (Figure B-11).
 - Rotate switch so hex nuts ① are aligned at about 45° from perpendicular (Figure B-10).
 - Tighten retaining hex-nut finger tight. Before tightening hex nut completely, install A1 board to ensure that components on board do not touch any part of switch. (If switch and board touch, rotate switch clockwise until there is no contact.)
 - Set Attenuation knob pointer to 70 dB and tighten set screws.
16. Install Front Panel Assembly removed in step 9.
17. Solder ten wires to A2 Master Board. (Refer to Figure B-11 for installation and Figure 8-1 Schematic Diagram Notes (1 of 2) for information on reading wire color codes.)
18. Install A6 Attenuator as follows:
- Position attenuator on left side of RF Section with A5 Attenuator Board up and 14 solder points toward the front.
 - Start W10 into attenuator front-output connector while holding attenuator against left-side frame.
 - Secure attenuator to left-side frame with four 4-40 x 5/16-inch screws and lock washers.
 - Connect W10 to rear RF OUT connector J6.
19. Solder twelve wires to A5 Attenuator Board. (Refer to Figure B-11 for installation.)
20. Secure RF Switch A4 (Figure B-13) to mounting bracket (Figure B-13, Item 9) using holes either ③ or ④ depending on switch used. (See Figures A8 and A9.) Mount RF Switch on mounting bracket so that when bracket is secured to left side of 8621B frame, Port 2 is at the top of cabinet and Port 1 is at the bottom (Figure A-9).
21. Connect cable W12 to rear input of attenuator assembly A6.
22. Connect cable W2 to bottom connector (Port 1) on RF Switch, connect cable W12 to center connector (Port IN or COM), and connect 86320B RF cable (Figure B-13) to rear connector (Port 2).
23. Secure mounting bracket to left-side of RF Section frame using holes ④. (See Figure A-9.)
24. Connect 86320B RF cable from RF switch to DC Return.

25. Install RF Oscillator Modules in positions 2 and 3. (See paragraph 2-16 for Oscillator Module Installation.)
26. Connect 86320B RF input cable, disconnected in step 3a, to RF Output of Oscillator Module 1 (Position 2).
27. Connect W2 to RF Output of RF Oscillator Module 2 (Position 3).
28. Replace 8621B latching handle and spring removed in step 9. (Be sure washer is placed between latch handle and side frame.) Reposition spring if it touches A5 circuit board. Secure latching handle with straight slot screw.
29. Attach stick-on label (supplied with kit) near 8621B serial number tag and mark label Option 100/010/004.
30. Check Attenuation Accuracy with Performance Test, Figure B-3.

B-36. A5 ATTENUATOR BOARD ASSEMBLY, CIRCUIT DESCRIPTION (OPTION 010)

B-37. Attenuation Decoder

B-38. Logic circuits contained in U2 (see Figure B-15) perform digital to binary decoding as well as switching the input to either local or remote selection of attenuation. Attenuation in 10-dB steps is selected either by the front-panel ATTENUATION control or by an externally programmed input. The output of U2 is in binary form which is required by the 10-, 20-, and 40-dB Attenuators.

B-39. 10-, 20-, and 40-dB Attenuator Drivers

B-40. Relay K4 and driver Q4 connect the 10-dB attenuator either into or out of the RF signal line. The position of the attenuator (in or out of the circuit) is sensed by one input of exclusive OR gate U1C. If the two inputs to the gate have different states, it indicates that the attenuator is in the wrong position and must be changed. However, as long as both inputs are at the same state (either high or low) the attenuator is set to the correct position and will not be changed. When the inputs to the exclusive OR gate are different, a high output is produced by the gate. This is applied to the base of Q1, energizing relay K1 and applying +20 volts and -10 volts unregulated to all attenuator driver circuits. At the same time, the three signals from decoder U2 are applied to the bases of Q2, Q3, and Q4. This causes the relays to be driven to a position that will make the two inputs of each exclusive OR gate the same: either both high or both low. If the attenuator is in the correct position, the attenuator relay is not activated. The circuit description for the Q4 circuit applies as well to identical Q2 and Q3 circuits.

*Table B-5. Installation Kit for Option 010**

Reference Designator	HP Part Number	Description
A5	08621-60066	Attenuator Board Assembly
A6	08621-60012	70-dB Programmable Attenuator
A7	08621-60051	Wiring Harness
A7MP1	0370-1111	Bar Knob
A7S1	3100-3237	Attenuator Rotary Switch
	08621-00026	Upper Front Panel

*HP Part Number 08621-60055.

Table B-6. Parts Required to Install 86320B Heterodyne Module in 8621C

86320B Part Numbers	8632B Option Configuration				
	Standard	010	100/010	010/004	100/010/004
5086-7144	X	X	X	X	X
86320-00014	X	X	X	X	X
86320-20007	X	X	X	X	X
86320-20009					
86320-20010	X	X	X	X	X
86320-20011	X	X	X	X	X
86320-60009	X	X	X	X	X

Reference	Part Number	Description
86320B (A4)	5086-7144	DC Return and Block
86320B (MP4)	86320-00014	Frequency-Display Lens, 0.1—2.0 GHz
86320B (W1)	86320-20007	RF Cable Input, (Supplied with 86320B)
86320B (W6)	86320-20009	RF Cable Output, DC Return to RF Switch
86320B (W8)	86320-20010	RF Cable Output, Heterodyne to DC Return
86320B (W5)	86320-20011	RF Cable Output, DC Return to RF Switch or Connector
		Mounting Bracket 8
86320B (W7)	86320-60009	DC Cable Assembly, Flexible, 86320B to 8621B

Table B-7. Material Required for Adding Options to Original Equipment

Original Equipment	New Option Configuration						
	100	010	004	100/010	100/004	010/004	100/040/004
Standard	W3, W4 W6, A4, 2	W9, W11, 1	W8	W2, W9, W12, A4, 1, 4	W3, W5, W6, A4, 2	W10, W11, 1	W2, W10, W12, A4, 1
010	W3, W4, W6, A4, 2		W8	W2, W12, A4, 4	W3, W5, W6, A4, 2	W10	W2, W10, W12, A4, 4
100/010	W3, W4 W6, 2	W11, 3	W8, 3		W3, W5, W6, 2	W10, W11, 3	W10
010/004	W3, W4 W6, A4, 2, 5	W9, 5	W8	W2, W9, W12, A4, 4, 5	W3, W5, W6, A4, 2		W2, W12, A4, 4
100/010/004	W3, W4, W6, 2, 5	W9, W11, 3, 5	W8, 3	W9, 5	W3, W5, W6, 2	W11, 3	

Ref.	Part Number	Description	Ref.	Part Number	Description
W1	08621-20015	Cable: Position 2	W10	08621-20063	Cable: Attn/RF Out
W2	08621-20026	Cable: Position 3/RF Sw	W11	08621-20064	Cable: Mtg Brkt/Attn
W3	08621-20056	Cable: Position 3/RF Sw	W12	08621-20065	Cable: RF Sw/Attn
W4	08621-20057	Cable: RF Sw/RF Out	A4	3106-0012	RF Switch
W5	08621-20058	Cable: RF Sw/RF Out	1	08621-60055	Option 010 Installation Kit
W6	08621-20059	Cable: Position 2/RF Sw	2	08621-00032	Bracket: RF Switch
W7	08621-20060	Cable: Front RF Out	3	08621-00033	Bracket: Connector
W8	08621-20061	Cable: Rear RF Out	4	08632-00008	Bracket: RF Switch
W9	08621-20062	Cable: Attn/RF Out	5	08621-00022	Panel: Lower Front

NOTE: To remove all options and convert to a standard 8621B, requires W1, W7, and bracket 3. (See Figure B-13 to make the conversion.)

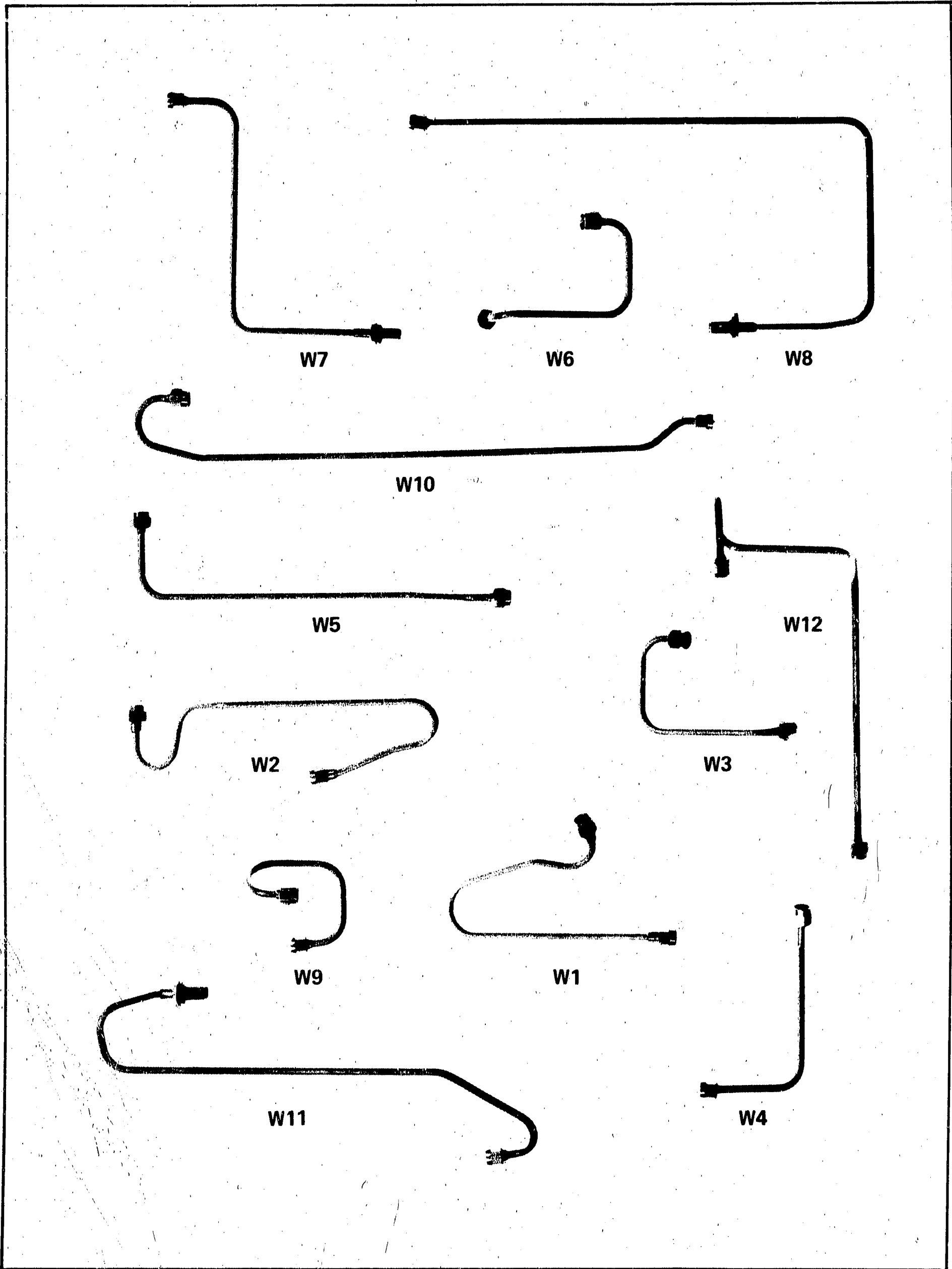


Figure B-12. Model 8621B RF Cable Assemblies

8621B Assembly Part Numbers

Ref Desig.	HP Part Number	Ref Desig.	HP Part Number
A4	3106-0012	W5	08621-20058
A6	08621-60012	W6	08621-20059
J5	08621-60053	W7	08621-20060
J6	08621-60053	W8	08621-20061
W1	08621-20015	W9	08621-20062
W2	08621-20026	W10	08621-20063
W3	08621-20056	W11	08621-20064
W4	08621-20057	W12	08621-20065

Assembly and Component Identification

Item No.	Part Number	Description
1	86320B	Heterodyne Module in Position 1
2	5086-7144	DC Return and Block
3	86320-20007	RF Input Cable, Oscillator to 86320B
4	86320-20011	RF Output Cable, DC Return to RF Switch or Connector Mounting Bracket
5	86320-20009	RF Output Cable, DC Return to RF Switch
6	86320-20010	RF Output Cable, 86320B to DC Return
7	08621-00033	Connector Mounting Bracket
8	08621-00032	RF Switch Mounting Bracket
9	08621-00008	RF Switch Mounting Bracket
10		RF Oscillator Module in Position 2
11		RF Oscillator Module in Position 3

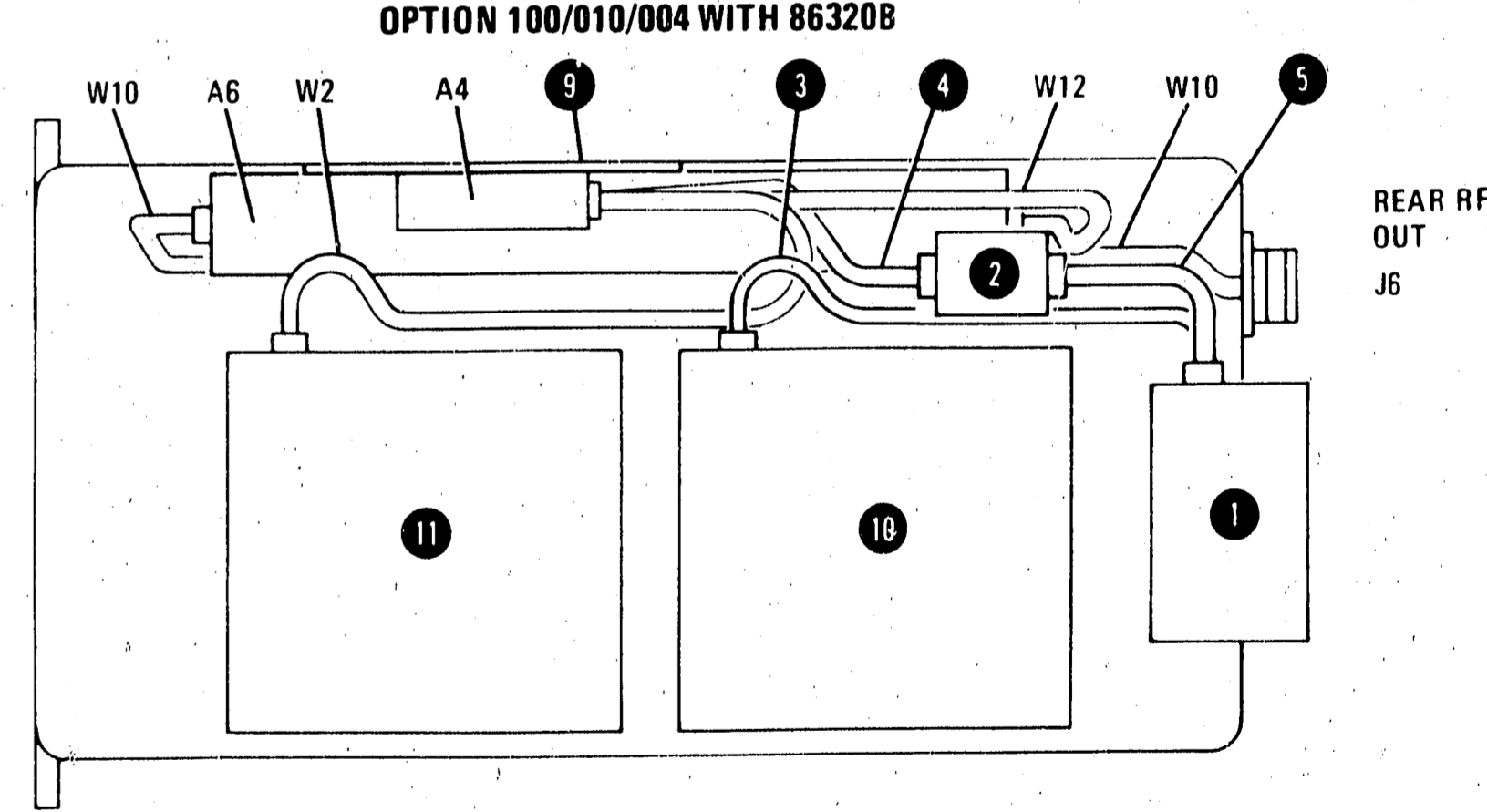
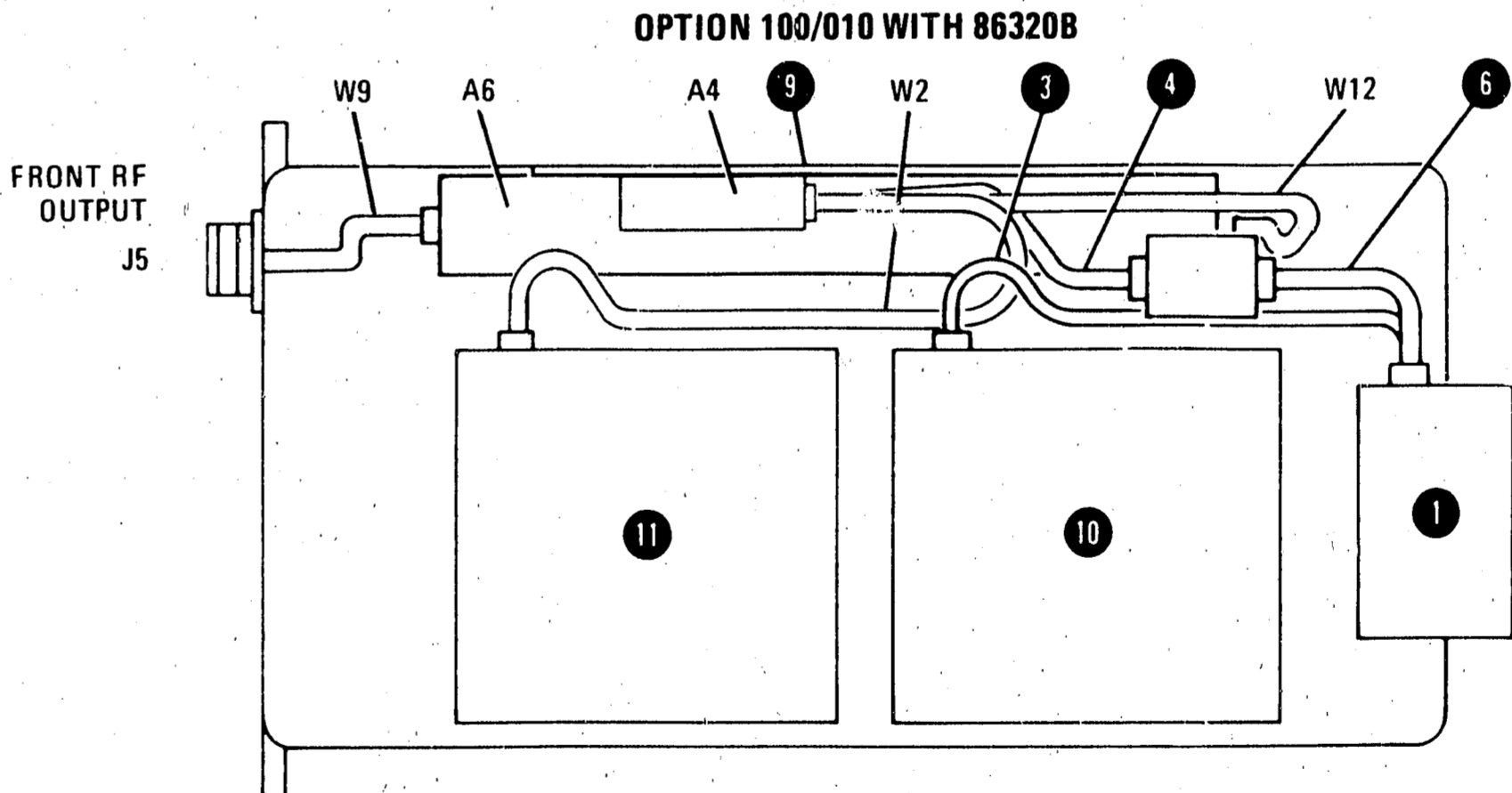
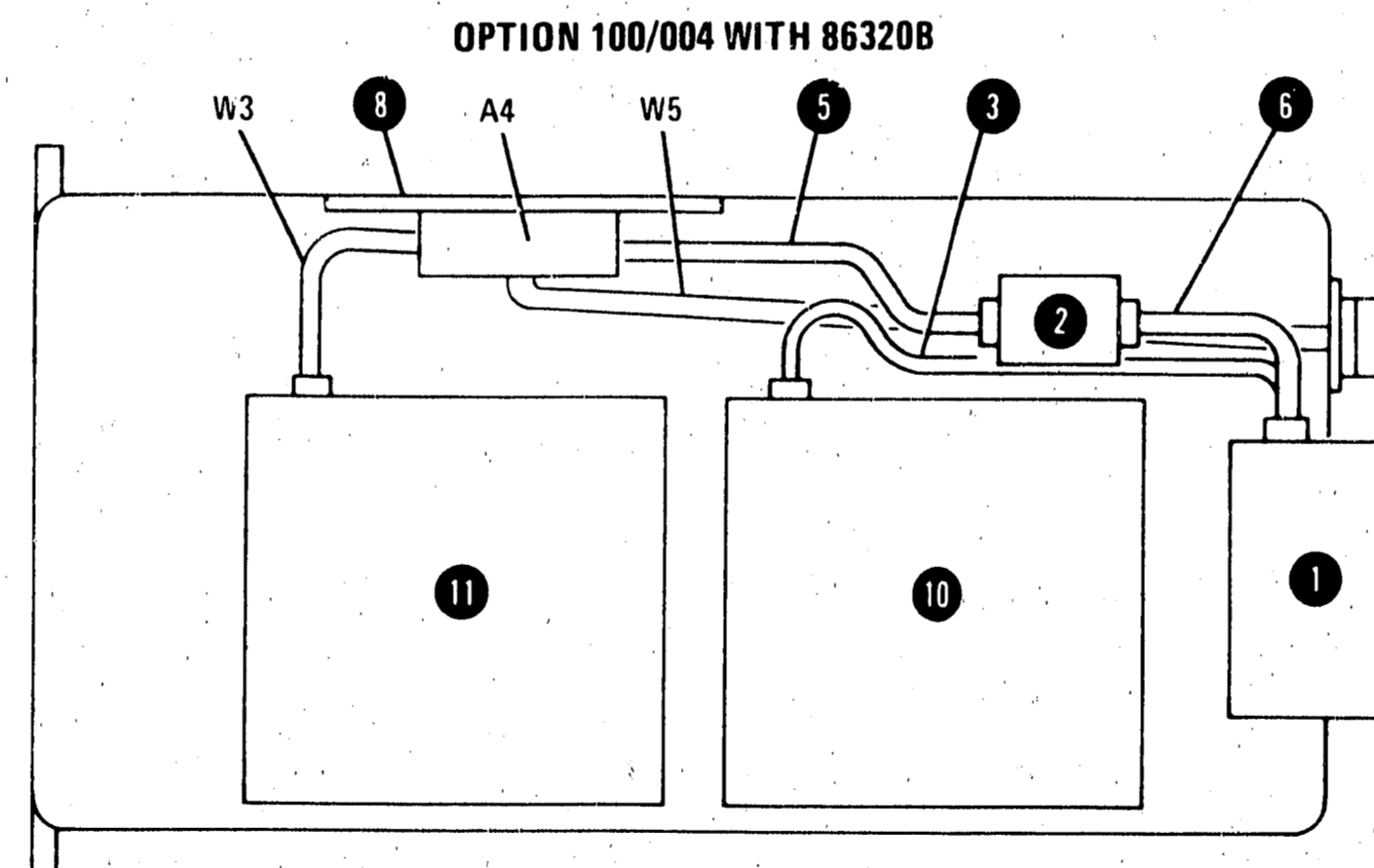
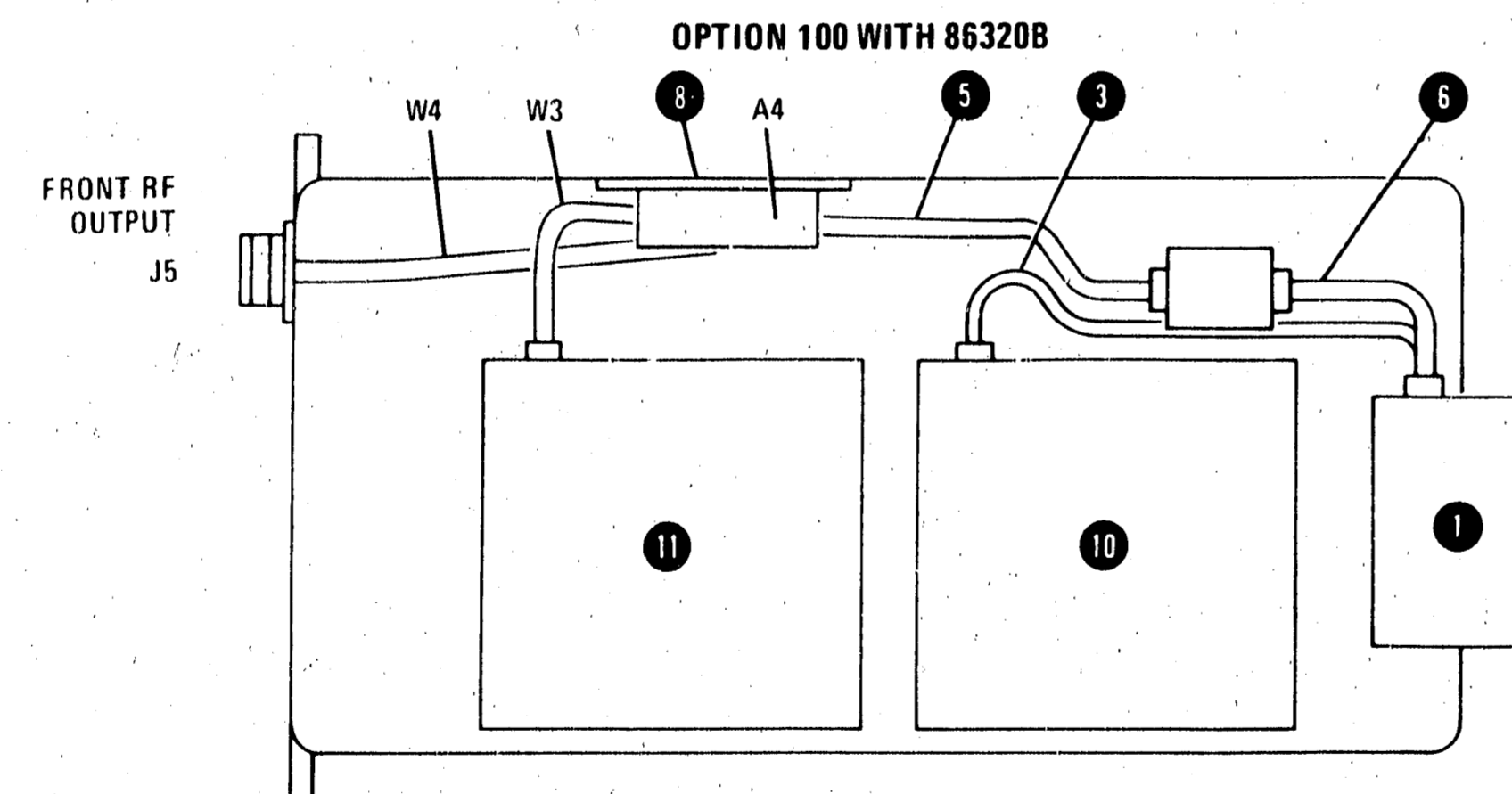
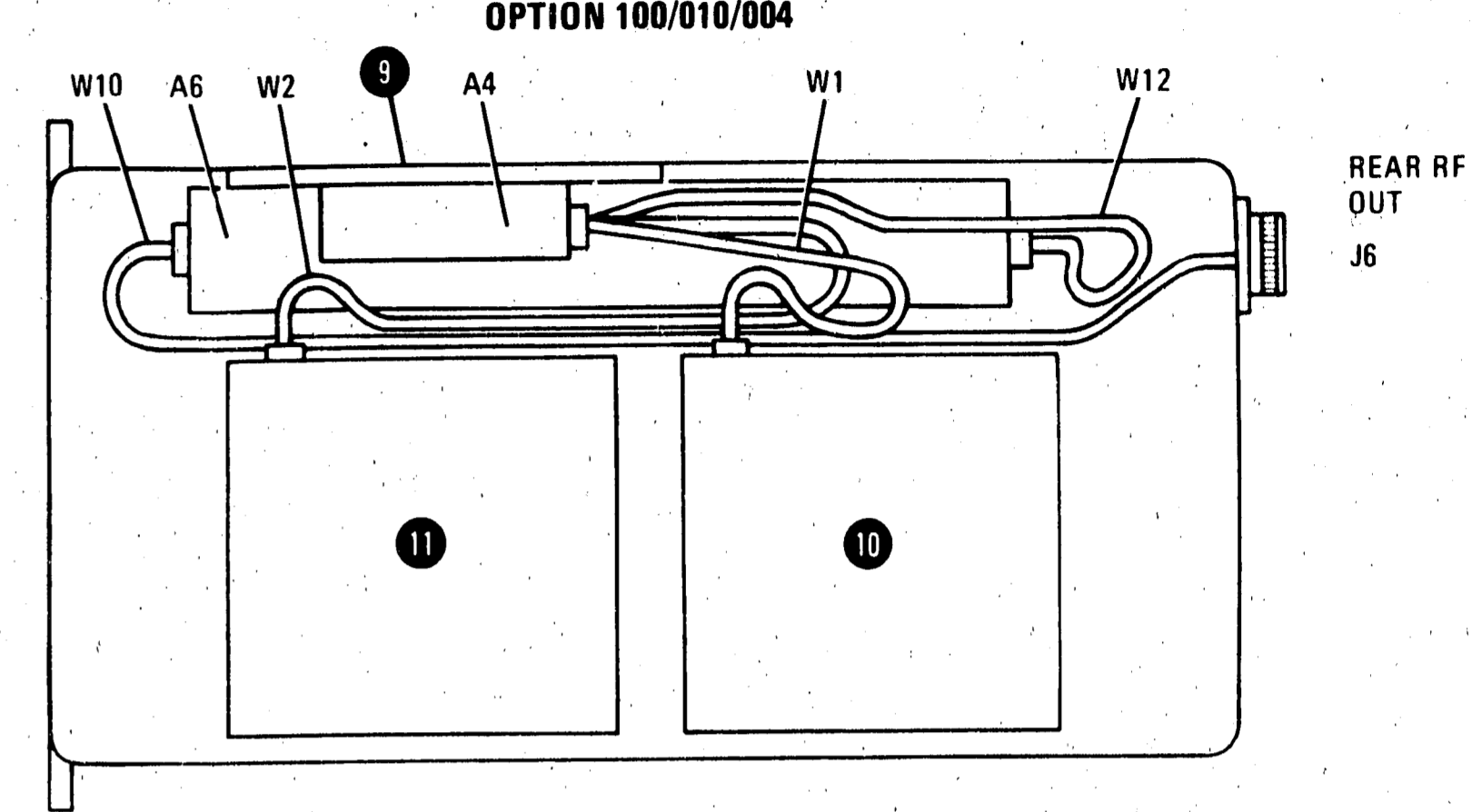
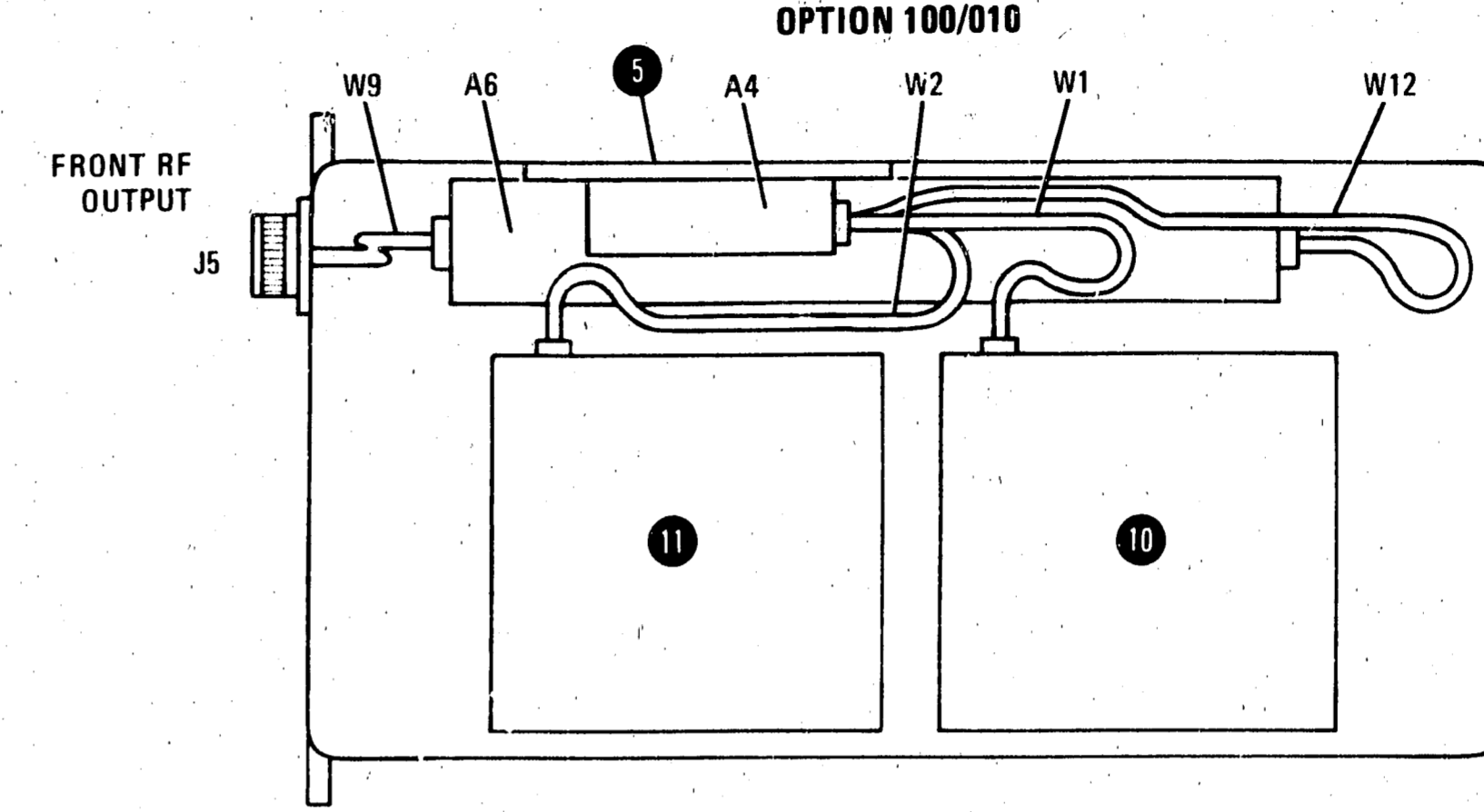
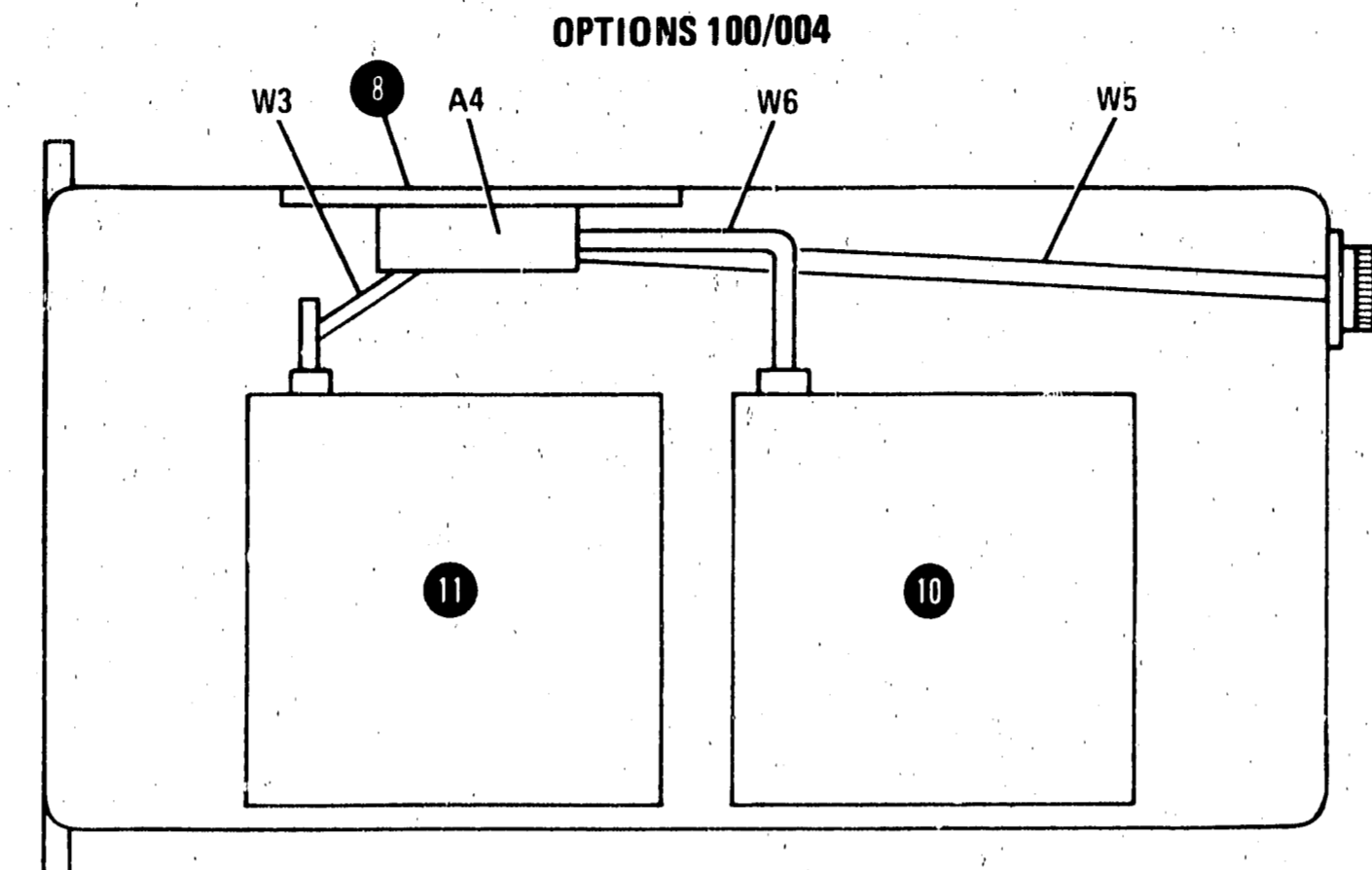
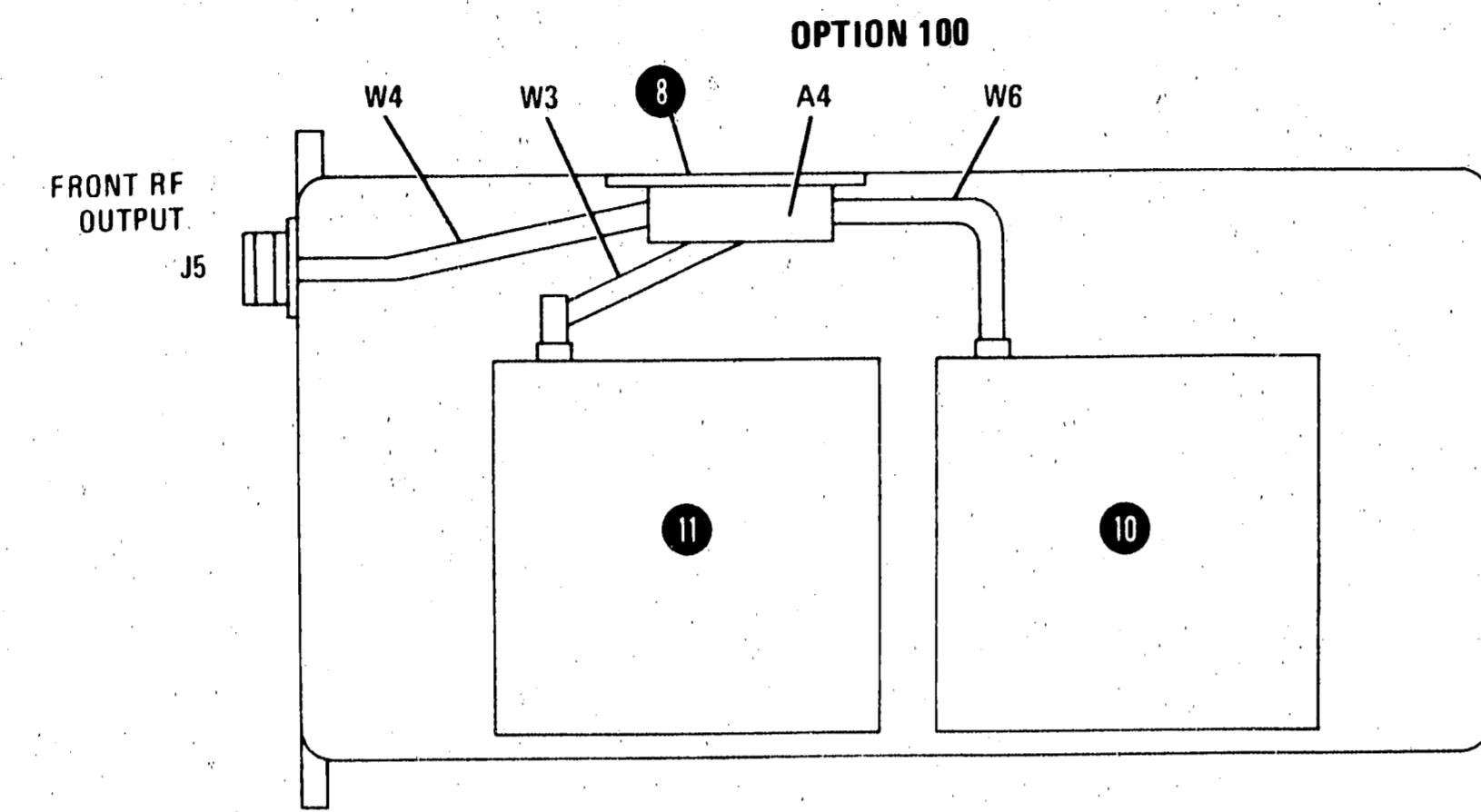


Figure B-13. Mechanical Variations of Assemblies and Components for Installation Identification (1 of 2)

Figure B-13. Mechanical Variations of Assemblies and Components for Installation Identification (2 of 2)

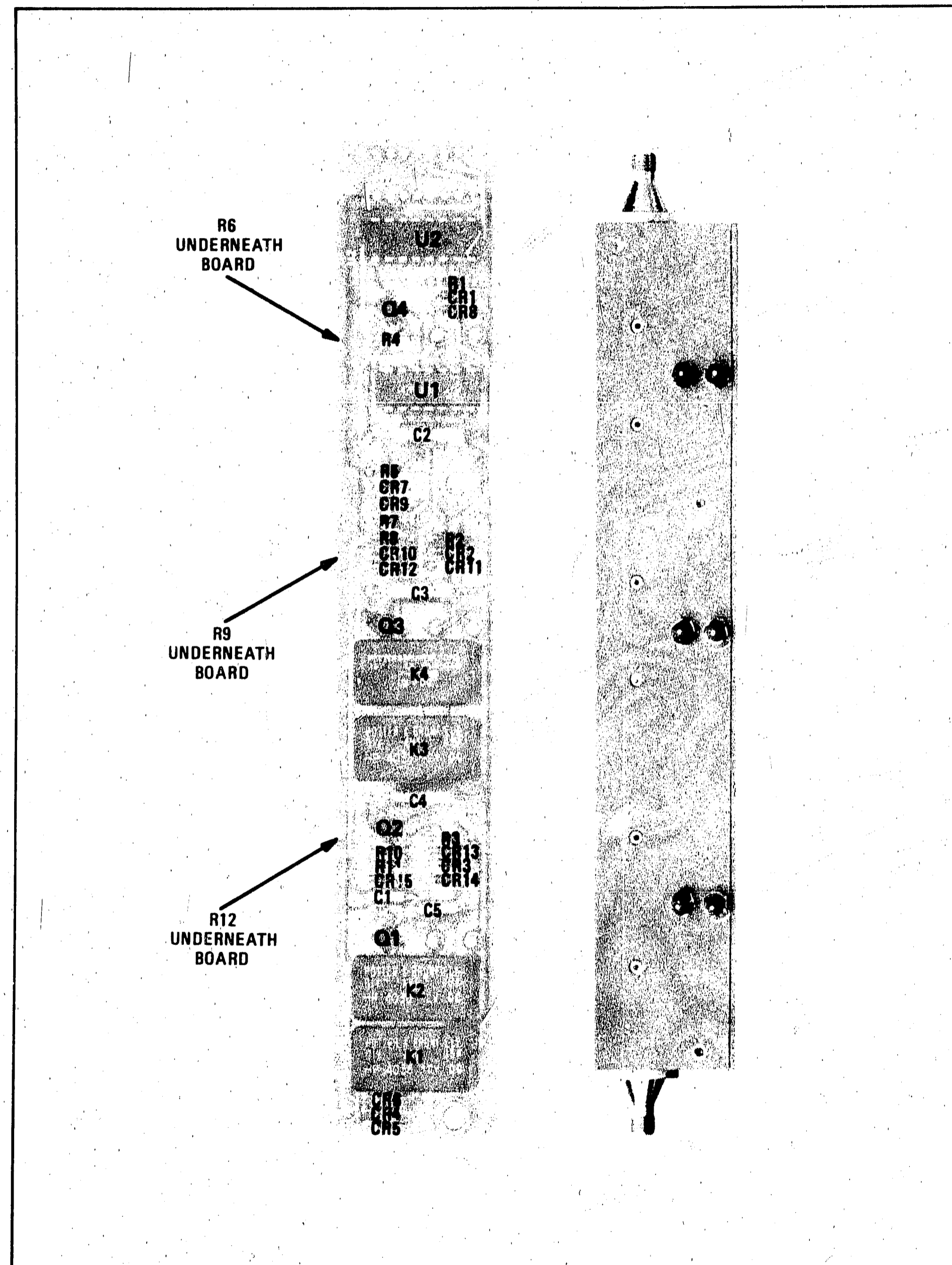


Figure B-14. A5 Attenuator Board and A6 Attenuator, Component Locations

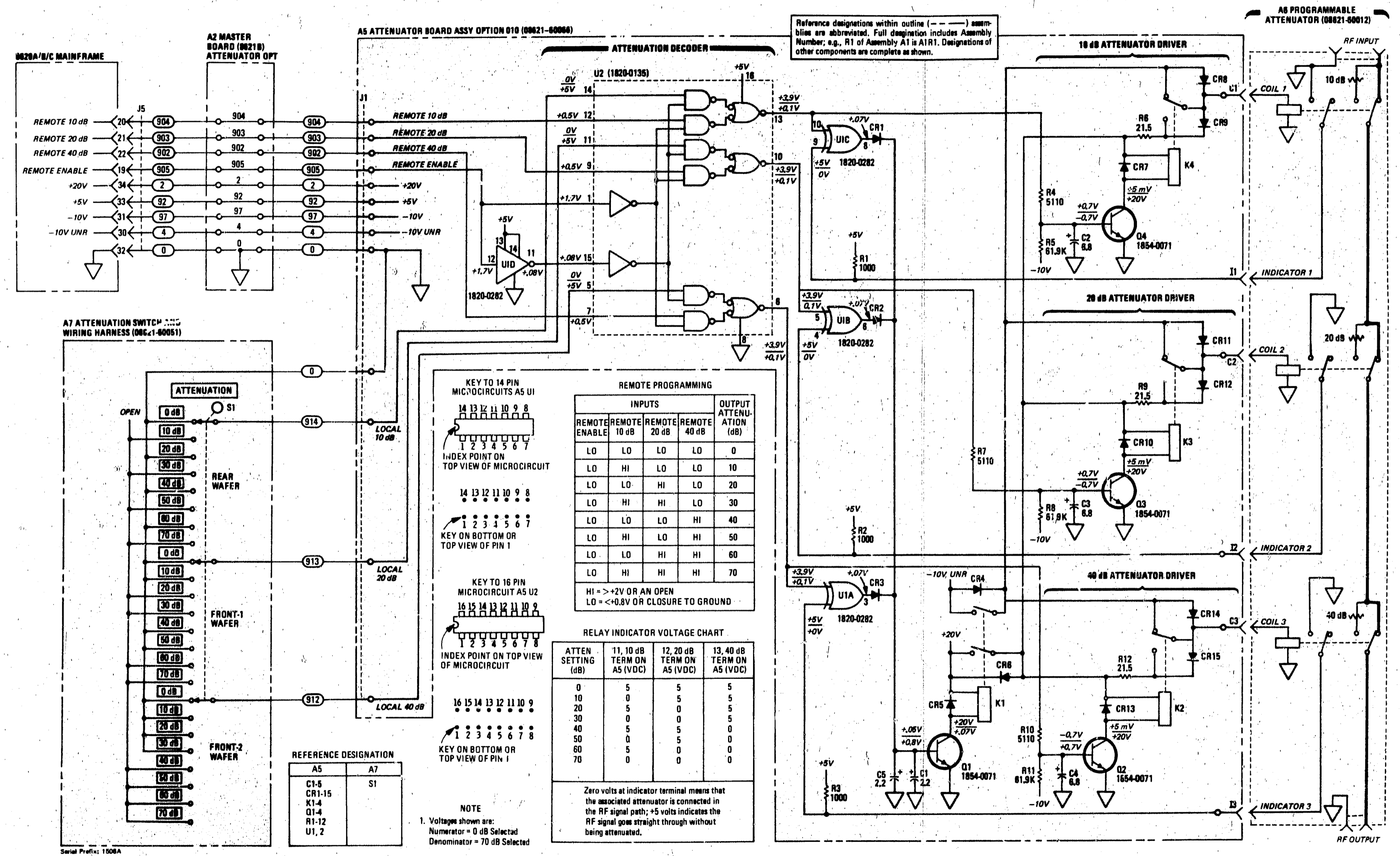


Figure B-15. A5 Attenuator Board and A6 Attenuator Schematic Option 010

APPENDIX

C

APPENDIX C OPTION 004 REAR PANEL OUTPUT

C-1. INTRODUCTION

C-2. This appendix describes the differences in HP Model 8621B RF Section with Option 004 installed. It also contains the changes required in the standard operating manual to document the option or combination of options. The components and assemblies used with the option are shown together with an installation procedure. The installation procedures contain all information necessary to install the option, combination of options, or the options in combination with an HP Model 86320B Heterodyne Module. Since the component and assembly configurations change with the 86320B installed, this appendix describes these differences. Combinations of more than one option also change the component and assembly configuration and these differences are also included.

C-3. Incorporating the 86320B Heterodyne Module

C-4. When ordering the 86320B, the four cables necessary to incorporate any Heterodyne installation are packaged with the instrument. However, if the 86320B is installed at the factory, only those cables required as original equipment are installed. For example, if the factory installed and shipped an 8621B Option 100 with an 86320B, then three 86320B cables would be included as original equipment (Figure C-10, Items 3, 5, and 6). If later on the RF Section is to be modified to include an Option 010, then an 86320B cable (Figure C-10, Item 4) must be ordered along with the other parts needed to install the Option 010 (Table C-5).

C-5. Cable and Assembly Mechanical Variations

C-6. Figure C-10 may be used to check for correct configuration and layout of hardware used for the option and the 86320B. This diagram is especially useful when removing an option. Manual Changes adapt the Operating and Service Manual to installed options only. When removing an option, manual changes can be made by adapting the manual to assemblies and components shown in Figure C-10. Table C-7 shows the parts required to adapt the 8621B to any option configuration.

C-7. DESCRIPTION

C-8. The HP Model 8621B Option 004 provides a Type-N RF Output connector mounted on the rear panel. The rear panel with Option 004 installed is shown in Figure C-2, and the front panel is in Figure C-1.

C-9. OPTION 004 INSTALLATION PROCEDURES

C-10. Option 004 Installation Procedures provide instructions for installing a rear-panel RF OUT connector J6 in 8621B RF Sections. Paragraph C-19 contains procedure steps for modifying standard RF Sections. Paragraph C-20 contains procedure steps for modifying RF Sections that have an 86320B Heterodyne Module installed. Paragraphs C-21 through C-35 contain procedures for modifying RF Sections already containing options or options and Heterodyne Modules.

C-11. OPTION 004 MANUAL CHANGES

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

Replace Figure 3-1 with Figure C-1.

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

Delete existing item ⑧ and add the following: ⑧ RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure C-2.

Page 6-7, Table 6-3:

Change J5 to J6 rear-panel RF OUT.

Add W8 HP Part Number 08621-20061 Cable Assy: Rear RF Output.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

C-12. OPTION 004 MANUAL CHANGES WITH 86320A HETERODYNE MODULE INSTALLED

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

Replace Figure 3-1 with Figure C-1.

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

Delete existing item ⑧ and add the following: ⑧ RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure C-2.

Page 6-7, Table 6-3:

Change J5 to J6 rear-panel RF OUT.

Add W8 HP Part Number 08621-20061 Cable Assy: Rear RF Output.

Delete W1.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

C-13. OPTION 010/004 MANUAL CHANGES

Page 1-3, Table 1-1, Option 010:

Add the following note:

NOTE

In oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table C-1 (Option 010).

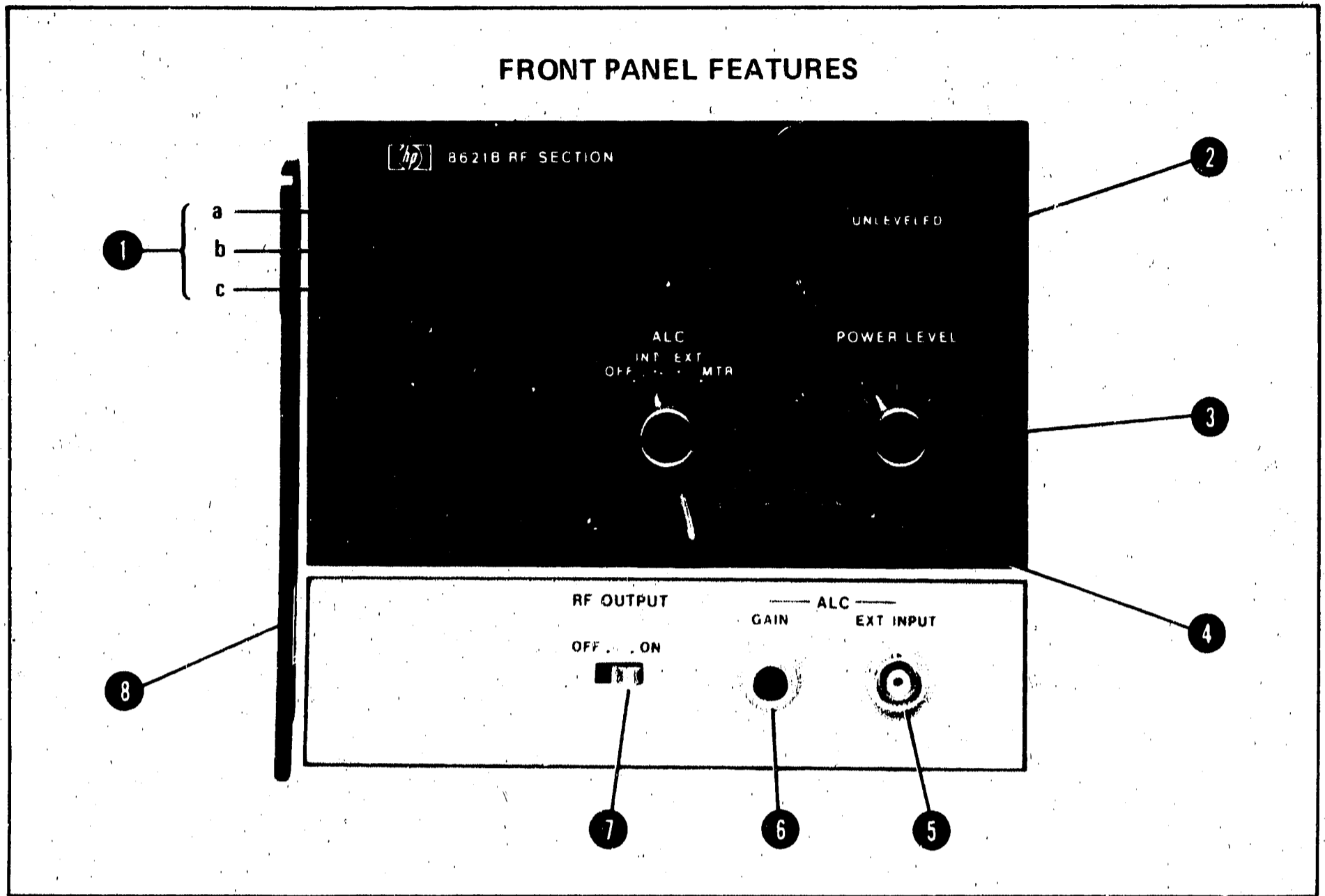


Figure C-1. Front Panel Controls, Connectors and Indicators, Option 004

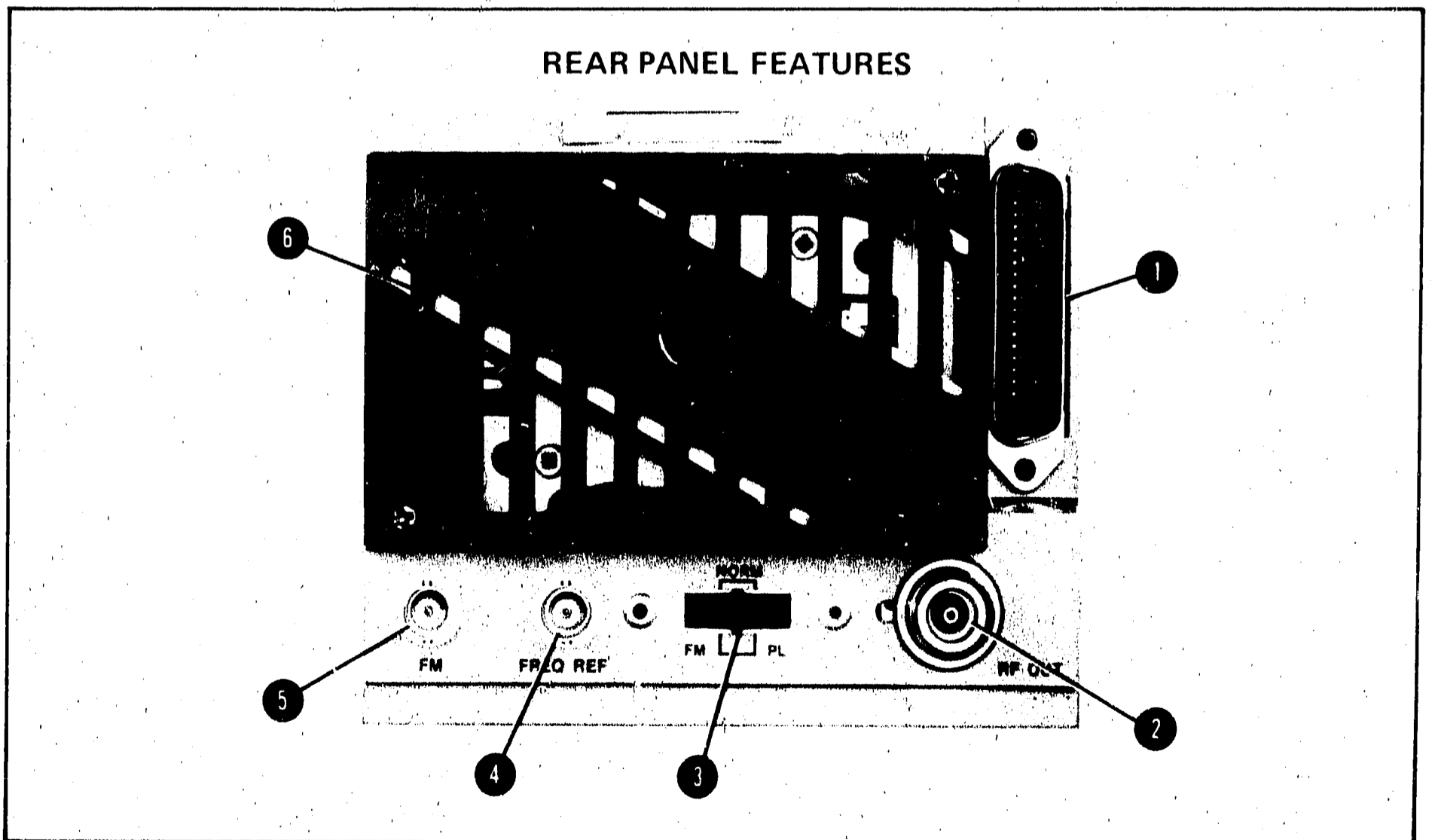


Figure C-2. Rear Panel Controls and Connectors with 86320B Heterodyne Module, Option 004

Table C-1. Recommended Test Equipment, Option 010

Instrument	Critical Specifications	Recommended Model	Use *
Spectrum Analyzer	Frequency Range: 10.0 MHz to 18.0 GHz 12.4 to 40 GHz with external mixer	HP 141T/8552B/8555A	P
70-dB Attenuator	Stepped, 0 to 70 dB Maximum SWR: DC to 8 GHz = 1.35 8 to 12.4 GHz = 1.5 Maximum Residual Attenuation: 0.4 dB + 0.7 dB/GHz	HP 8495B	P
*P = Performance			

Page 3-2, Figure 3-1 (1 of 2):
Replace Figure 3-1 with Figure C-4.

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

Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 010/004 no front panel figure is provided; use Figure C-4 (Option 010) and delete the RF OUTPUT connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-1:
Replace Figure 3-2 with Figure C-2.

Page 3-5, Figure 3-3:
Replace FRONT panel with Figure C-3.
Delete item 21 which is now on rear panel.

Page 3-7, Figure 3-3:
Add to Step 1 for 8621B controls as follows
ATTENUATION dB 31 0 dB

Section III and V for Option 010:
Add to all Operator's Checks and External Pre amplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure C-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:
Add Performance Test for Option 010, Figure C-5.
Add Table C-2, Performance Test Record for Option 010.

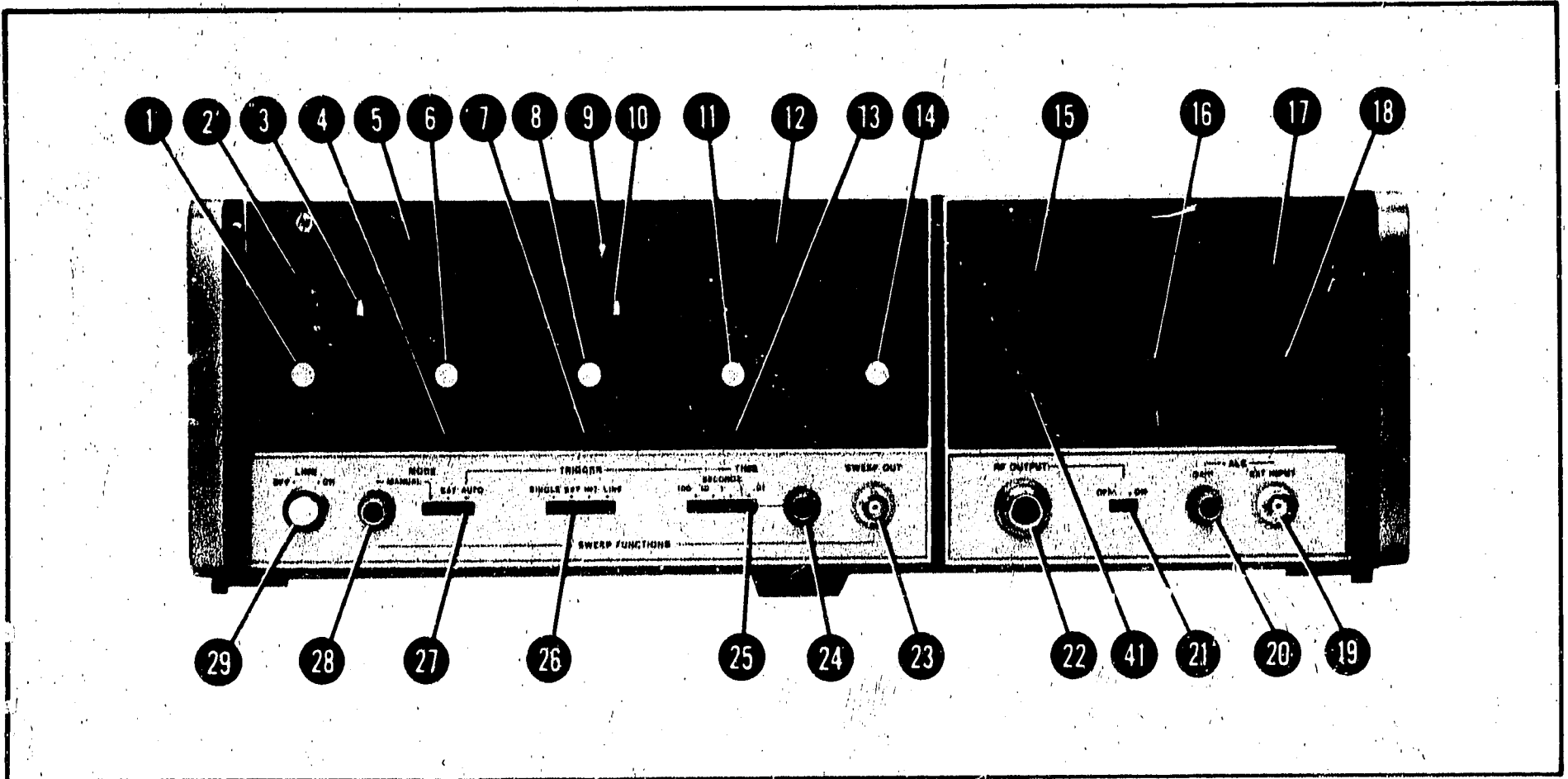


Figure C-3. Operator's Checks, Option 010

Page 6-7, Table 6-3:

- *Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.
- *Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70 dB.
- *Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.
- *Add A7MP1 HP Part Number 0370-1.111 Knob: Bar.
- *Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.
- Change J5 to J6 rear-panel RF OUT:
- Delete W7.
- Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.
- Add W11 HP Part Number 08621-20064 Cable Assy: Mounting Bracket/Attenuator.

Page 6-9, Table 6-3:

- *Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026.
- Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table C-5.)

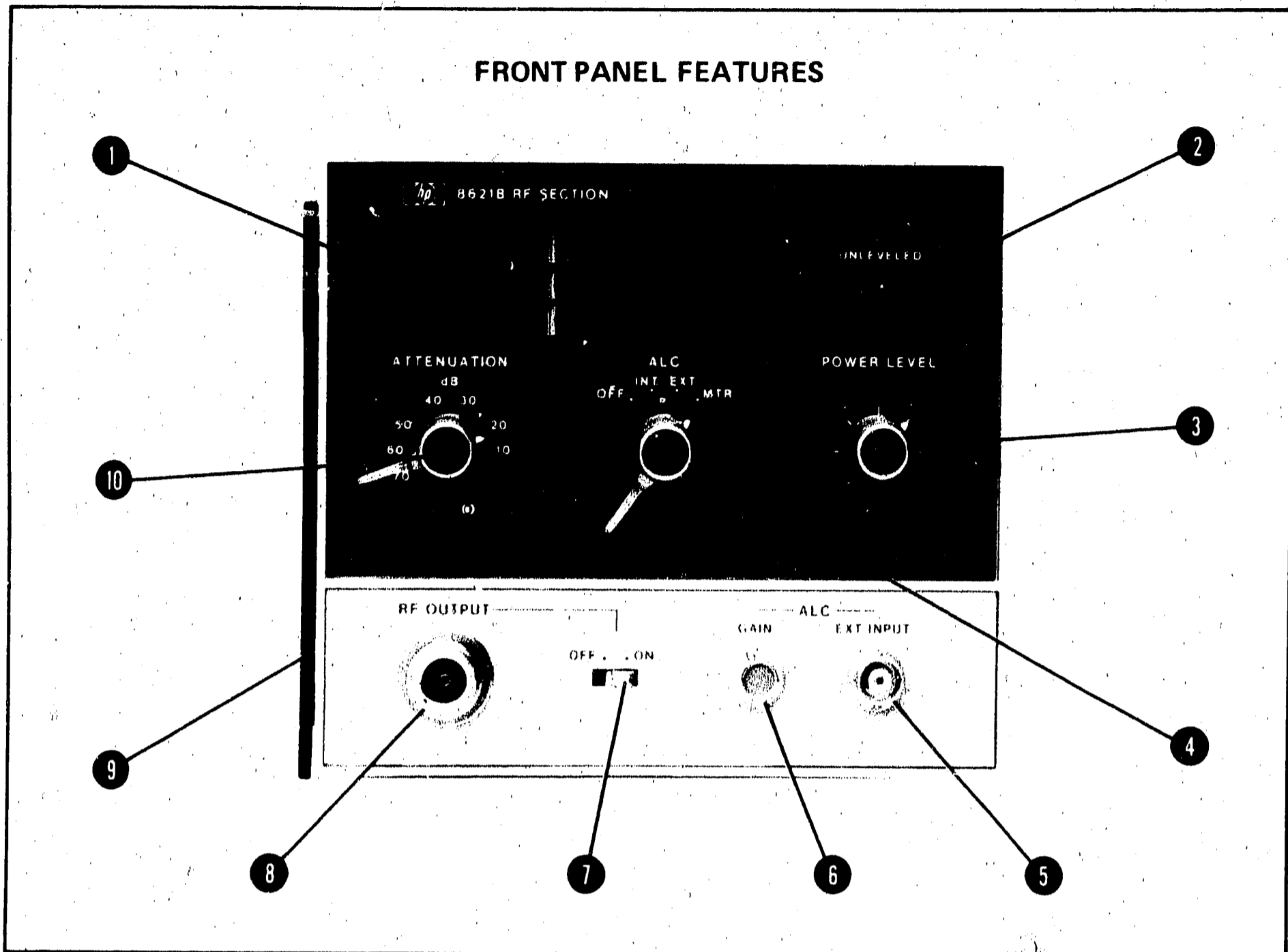


Figure C-4. Front Panel Features, Option 010

1. **OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST**
2. **Introduction**
3. This performance test checks that the accuracy of the 0- to 70 dB Attenuator meets the specifications listed in Table 1-1. This test may be used for incoming inspection, after repair of the instrument, after installation of the Option 010, or for periodic evaluation.
4. **Equipment Required**
5. A complete list of test equipment required to perform this test is given in Table C-1. If the recommended equipment is not available, a substitute may be used if it meets or exceeds the critical specifications listed in the table.
6. **Test Record**
7. Table C-2 is a test record form provided to record results from the performance test. The table is keyed to the paragraph numbers and test titles in the procedures.

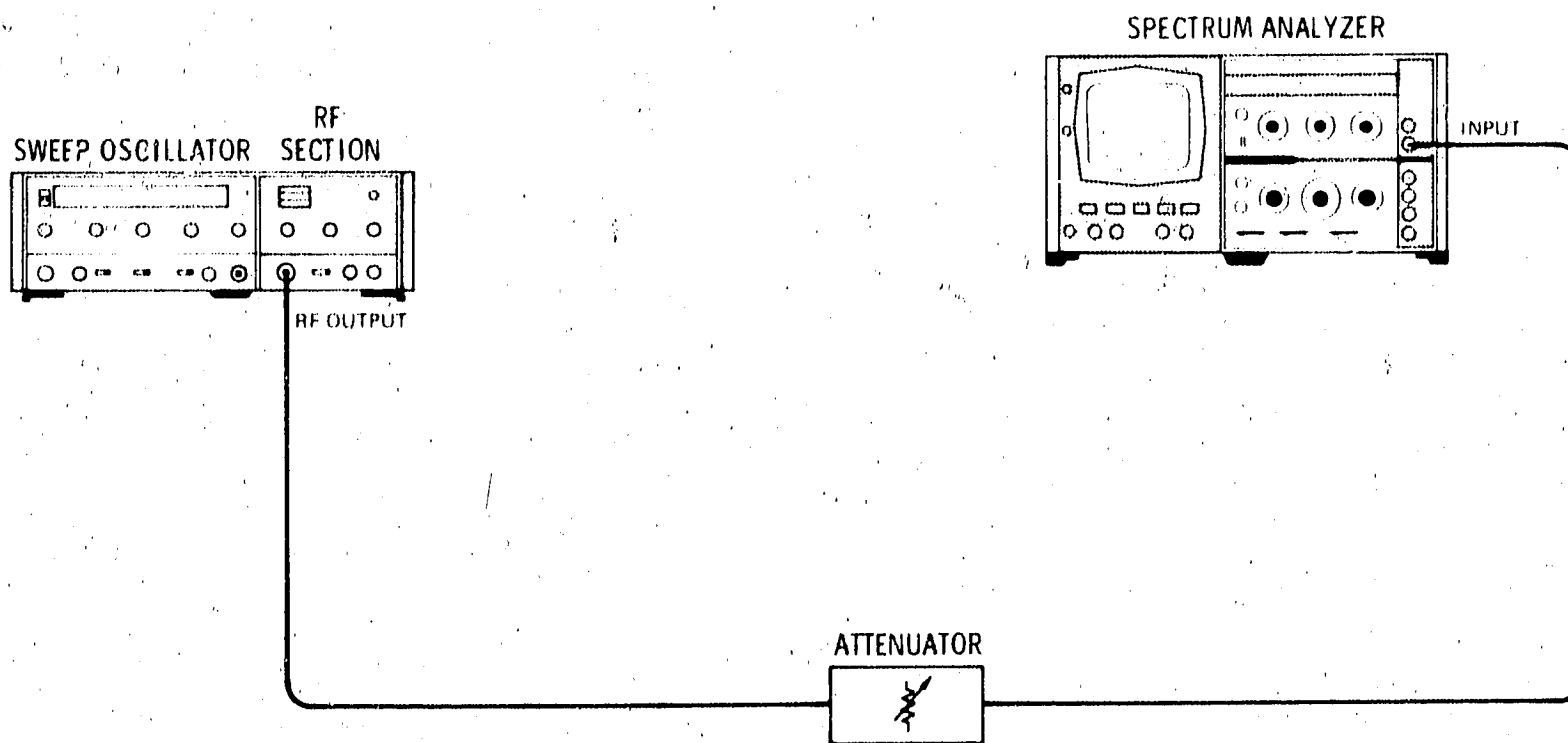
Figure C-5. Option 010 Attenuation Accuracy Performance Test (1 of 3)

8. PERFORMANCE TEST

SPECIFICATIONS: $< \pm 0.6$ dB at 10 dB step.
 $< \pm 5\%$ of attenuation selected for all other settings.

DESCRIPTION:

Attenuation accuracy of the 0- to 70-dB Programmable Attenuator is measured so the difference between each attenuator setting and a reference level meets the specifications.



Option 010 Attenuation Accuracy Test Setup

EQUIPMENT:

Sweep Oscillator	HP 8620C
70-dB Attenuator	HP 8495B
Spectrum Analyzer	HP 8555A/8552B/141T

PROCEDURE:

- a. Connect equipment as shown in test setup.
- b. Set 8620C LINE switch to ON; press 8620C CW pushbutton. Allow equipment to warm up for a minimum of 30 minutes.
- c. Set controls as follows:

8620C:

BAND 2	RF Oscillator Frequency
CW MARKER pointer 9	Center-scale
1 kHz SQ WV/OFF (rear panel)	OFF
RF BLANKING/OFF (rear panel)	OFF
DISPLAY BLANKING/OFF (rear panel)	OFF

Figure C-5. Option 010 Attenuation Accuracy Performance Test (2 of 3)

8621B:
 RF 7 ON
 POWER LEVEL 3 Fully Clockwise
 ATTENUATION 10 0 dB

8555A:
 BANDWIDTH 100 kHz
 SCAN WIDTH 0.2 MHz/DIV
 INPUT ATTENUATION 0 dB

8552B:
 SCAN TIME 0.1 SEC/DIV
 LOG REF LEVEL -20 dBm
 VIDEO FILTER 100 Hz
 SCAN MODE INT
 SCAN TRIGGER AUTO

8495B
 Attenuation 70 dB

- d. Center CW frequency display on Spectrum Analyzer. Set LOG REF LEVEL VERNIER for some convenient reference level.
- e. Rotate 8621B 70-dB Attenuator to 10 dB and 8495B attenuation to 60 dB. RF displayed on Spectrum Analyzer should return to reference level ± 0.6 dB.
- f. Rotate 8621B 70-dB Attenuator to 20 dB and 8495B Attenuation to 50 dB. RF displayed on Spectrum Analyzer should return to reference level ± 1.0 dB. (20 dB x 5% = 1.0 dB)
- g. Set 8621B to 30 dB; 8495B to 40 dB, and RF should return to reference level ± 1.5 dB.
- h. Set 8621B to 40 dB; 8495B to 30 dB, and RF should return to reference level ± 2.0 dB.
- i. Set 8621B to 50 dB; 8495B to 20 dB, and RF should return to reference level ± 2.5 dB.
- j. Set 8621B to 60 dB; 8495B to 10 dB, and RF should return to reference level ± 3.0 dB.
- k. Set 8621B to 70 dB; 8495B to 0 dB, and RF should return to reference level ± 3.5 dB.

Figure C-5. Option 010 Attenuation Accuracy Performance Test (3 of 3)

Table C-2. Performance Test Record

Hewlett-Packard Model 8621B RF Plug-In, Option 010		Test Performed by _____			
Serial No. _____		Date: _____			
Para.	Description	Lower Limit	Measured Value	Upper Limit	
8 (Figure C-5)	ATTENUATION ACCURACY				
	e.	Attenuator at 10 dB	9.4 dB	_____	10.6 dB
	f.	Attenuator at 20 dB	19.0 dB	_____	21.0 dB
	g.	Attenuator at 30 dB	28.5 dB	_____	31.5 dB
	h.	Attenuator at 40 dB	38.0 dB	_____	42.0 dB
	i.	Attenuator at 50 dB	47.5 dB	_____	52.5 dB
	j.	Attenuator at 60 dB	57.0 dB	_____	63.0 dB
	k.	Attenuator at 70 dB	66.5 dB	_____	73.5 dB

C-14. OPTION 010/004 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 1-3, Table 1-1, Option 010:
Add the following Note:

NOTE

In oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB Insertion Loss from output power specifications.

Page 1-4, Table 1-2:
Add recommended test equipment in Table C-1 (Option 010).

Page 3-2, Figure 3-1 (1 of 2):
Replace Figure 3-1 with Figure C-4.

Page 3-3, Figure 3-1 (2 of 2):
Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on the rear panel.

NOTE

For the combined 8621B Option 010/004 no front panel figure is provided; use Figure C-4 (Option 010) and delete the RF OUTPUT connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects, in 10-dB steps, attenuation of the RF output power.

Page 3-4, Figure 3-2:
Replace Figure 3-2 with Figure C-2.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure C-3.

Delete item 21 which is now on rear panel.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure C-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure C-5.

Add Table C-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

- *Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.
- *Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.
- *Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.
- *Add A7MP1 HP Part Number 0370-1111 Knob: Bar.
- *Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.
- Change J5 to J6 rear-panel RF OUT.
- Delete W1.
- Delete W7.
- Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.
- Add W11 HP Part Number 08621-20064 Cable Assy: Mounting Bracket/Attenuator.

Page 6-9, Table 6-3:

- *Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026.
- Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

Page 8-15, Figure 8-8: Replace RF Output section on Figure 8-8 with Figure C-6, Option 010/004.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055 (see Table C-5).

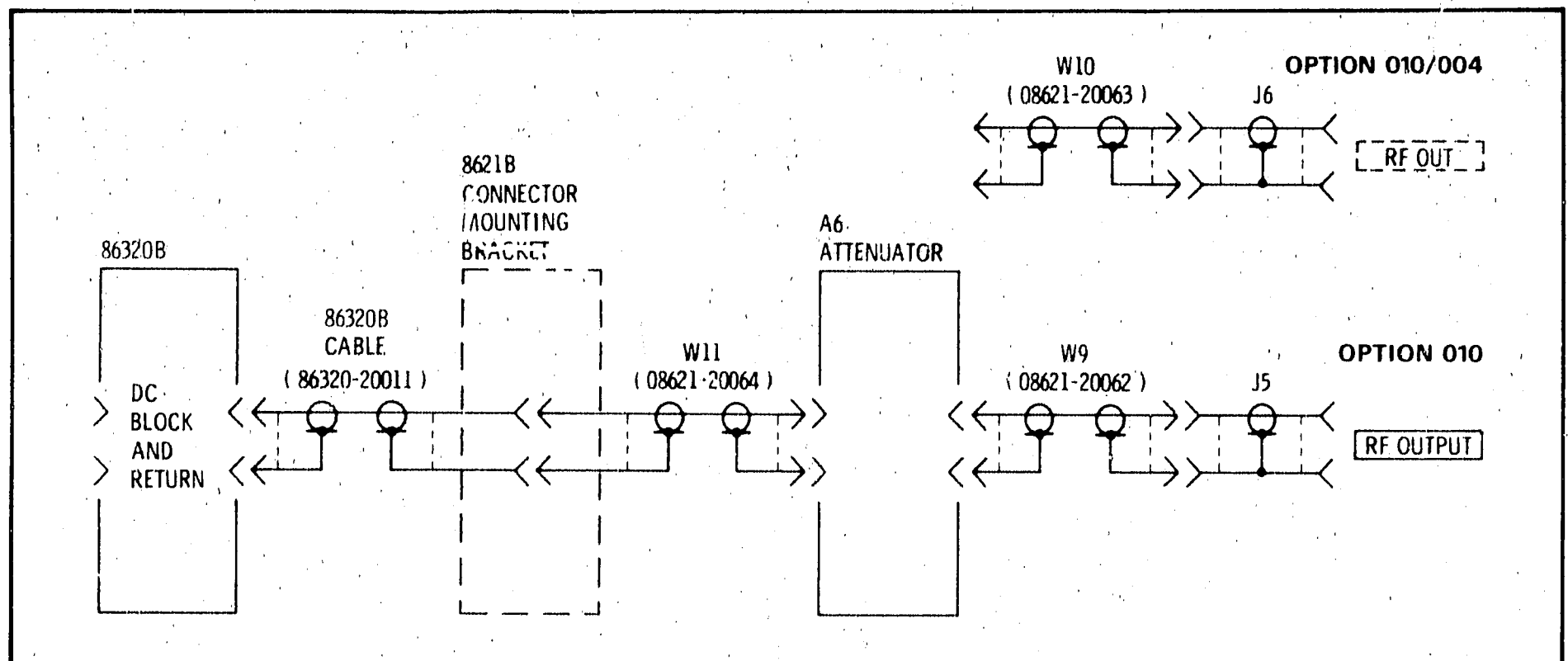


Figure C-6. Functional Block Diagram, Options 010 and 010/004 RF Output

C-15. OPTION 100/004 MANUAL CHANGES

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

Replace Figure 3-1 with Figure C-1.

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

Delete existing item **8** and add the following: **8** RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure C-2.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

Change J5 to J6 rear-panel RF OUT.

Delete W1.

Add W3 HP Part Number 08621-20056 Cable Assy: Position 3/RF Switch.

Add W5 HP Part Number 08621-20058 Cable Assy: RF Switch/Rear RF Output.

Add W6 HP Part Number 08621-20059 Cable Assy: Position 2/RF Switch.

Delete W7.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00032 Bracket: RF Switch Mounting.

C-16. OPTION 100/004 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

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

Replace Figure 3-1 with Figure C-1.

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

Delete existing item **8** and add the following: **8** RF OUT. With Option 004 installed, RF OUT connector J6 is mounted on rear panel.

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure C-2.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

Change J5 to J6 rear-panel RF OUT.

Delete W1.

Add W3 HP Part Number 08621-20056 Cable Assy: Position 3/RF Switch.

Add W5 HP Part Number 08621-20058 Cable Assy: RF Switch/Rear RF Output.

Add W6 HP Part Number 08621-20059 Cable Assy: Position 2/RF Switch.

Delete W7.

Page 6-9, Table 6-3:

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00032: RF Switch Mounting.

Page 8-15, Figure 8-8: Replace RF Output section on Figure 8-8 with Figure C-7, Option 100/004.

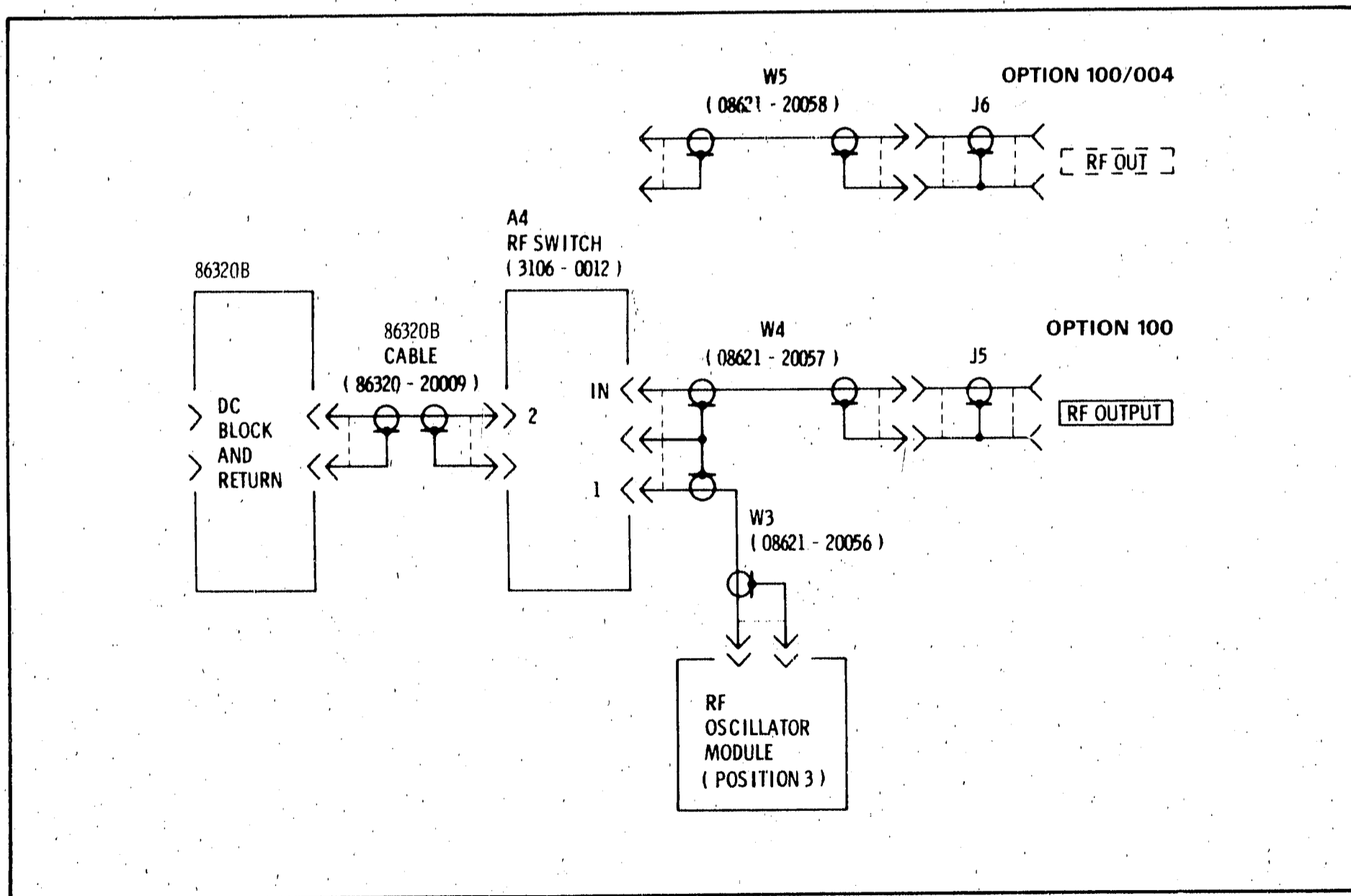


Figure C-7. Functional Block Diagram, Options 100 and 100/004

C-17. OPTION 100/010/004 MANUAL CHANGES

Page 1-3, Table 1-1, Option 010:
Add the following note:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB insertion loss from output power specifications.

Page 1-4, Table 1-2:
Add recommended test equipment in Table C-1 (Option 010).

Page 3-2, Figure 3-1 (1 of 2):
Replace Figure 3-1 with Figure C-4.

Page 3-3, Figure 3-1 (2 of 2):
Delete existing item 8 and add the following: 8 RF OUT. With Option 004 installed, RF connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 100/010/004 no front panel figure is provided; use Figure C-4 (Option 010) and delete the RF Output connector.

Add item 10 as follows: 10 Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

Page 3-4, Figure 3-2:
Replace Figure 3-2 with Figure C-2.

Page 3-5, Figure 3-3:
Replace FRONT panel with Figure C-3.

Page 3-7, Figure 3-3:
Add to Step 1 for 8621B controls as follows:
ATTENUATION dB 31 0 dB

Section III and V for Option 010:
Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure C-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:
Add Performance Test for Option 010, Figure C-5.
Add Table C-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

- Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.
- *Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.
- *Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.
- *Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.
- *Add A7MP1 HP Part Number 0370-1111 Knob: Bar.
- *Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.
- Change J5 to J6 rear-panel RF OUT.
- Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch.
- Delete W7.
- Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.
- Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 6-9, Table 6-3:

- *Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026.
- Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.
- Delete HP Part Number 08621-00033 Bracket: Connector Mounting.
- Add HP Part Number 08621-00008 Bracket: RF Switch Mounting.

C-18. OPTION 100/010/004 MANUAL CHANGES WITH 86320B HETERODYNE MODULE INSTALLED

Page 1-3, Table 1-1, Option 010:

Add the following note:

NOTE

In Oscillator Module Power Level and Power Variation Performance Test, subtract 2 dB insertion loss from output power specifications.

Page 1-4, Table 1-2:

Add recommended test equipment in Table C-1 (Option 010).

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

Replace Figure 3-1 with Figure C-4.

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

Delete existing item ⑧ and add the following: ⑧ RF OUT. With Option 004 installed, RF connector J6 is mounted on rear panel.

NOTE

For the combined 8621B Option 100/010/004 no front panel figure is provided; use Figure C-4 (Option 010) and delete the RF Output connector.

Add item ⑩ as follows: ⑩ Attenuation dB switch A7S1. Selects in 10-dB steps attenuation of the RF output power.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table C-5.)

Page 3-4, Figure 3-2:

Replace Figure 3-2 with Figure C-2.

Page 3-5, Figure 3-3:

Replace FRONT panel with Figure C-3.

Page 3-7, Figure 3-3:

Add to Step 1 for 8621B controls as follows:

ATTENUATION dB 31 0 dB

Section III and V for Option 010:

Add to all Operator's Checks and External Preamplifier ALC Offset Adjustment in instructions for initial control settings, to set ATTENUATION dB to 0 dB.

NOTE

For the Typical Sweep Operation and leveling checks, no front panel figure is provided; but Figure C-3 shows the addition of the ATTENUATION dB switch A7S1.

Page 4-1, OPTION 010 ATTENUATION ACCURACY PERFORMANCE TEST:

Add Performance Test for Option 010, Figure C-5.

Add Table C-2, Performance Test Record for Option 010.

Page 6-7, Table 6-3:

Add A4 HP Part Number 3106-0012 RF Switch: DC to 18 GHz.

*Add A5 HP Part Number 08621-60066 Board Assy: Attenuator.

*Add A6 HP Part Number 08621-60012 Attenuator Assy; Programmable, 70-dB.

*Add A7 HP Part Number 08621-60051 Wiring Harness: Attenuator Switch.

*Add A7MP1 HP Part Number 0370-1111 Knob: Bar.

*Add A7S1 HP Part Number 3100-3237 Switch: Rotary, Attenuator.

Change J5 to J6 rear-panel RF OUT.

Add W2 HP Part Number 08621-20026 Cable Assy: Position 3/RF Switch.

Delete W1.

Delete W7.

Add W10 HP Part Number 08621-20063 Cable Assy: Attenuator/Rear RF Output.

Add W12 HP Part Number 08621-20065 Cable Assy: RF Switch/Attenuator.

Page 6-9, Table 6-3:

*Change HP Part Number 08621-00021 Panel: Upper Front to HP Part Number 08621-00026.

Change HP Part Number 08621-00022 Panel: Lower Front to HP Part Number 08621-00027.

Delete HP Part Number 08621-00033 Bracket: Connector Mounting.

Add HP Part Number 08621-00008 Bracket: RF Switch Mounting.

Page 8-15, Figure 8-8:

Replace RF Output section on Figure 8-8 with Figure C-8, Option 100/010/004.

*Part of Installation Kit for Option 010 HP Part Number 08621-60055. (See Table C-5.)

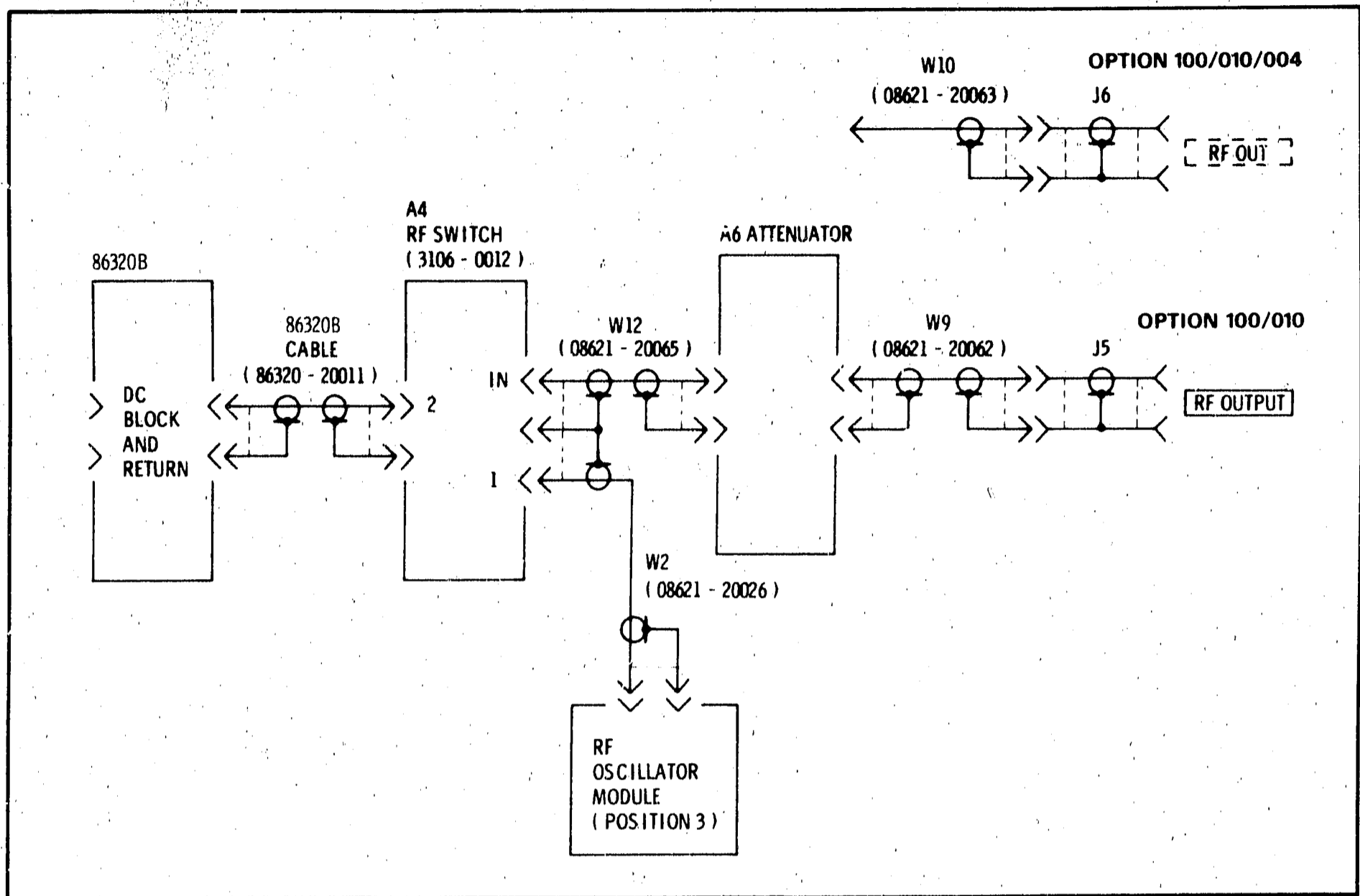


Figure C-8. Functional Block Diagram, Options 100/010 and 100/010/004 RF Output

C-19. OPTION 004 INSTALLATION IN STANDARD 8621B

EQUIPMENT REQUIRED:

- Pozi-driv screwdriver
- Wrench 1/4-in. x 5/16-in. slotted box end
- Adjustable slip-joint pliers
- Wrench 9/16-inch slotted box end

Table C-3. Parts Required to Install 8621B Option 004

Qty.	Reference Designator	Description	HP Part Number
1	W8	Cable Assembly: Rear RF OUT	08621-20061
1	J6	Connector Assembly: APC-N Female	08621-60053*

*Same part used in front panel RF OUTPUT connector J5. Not necessary to order.

PROCEDURE

NOTE

See Figure C-10 for the 8621B Option 004 configuration.

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.

3. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11). ALC switch must be in MTR position.
4. Disconnect W1 from connector mounting bracket.
5. Remove RF output cable assembly W7. To disconnect W7, remove connector mounting bracket first and then W7. Disconnect W7 from SMA connector at rear of J5. Discard W7 and reinstall connector mounting bracket.
6. Remove RF OUTPUT connector assembly J5 as follows:
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.
 - c. Note position of key pin when removing connector.
7. Remove plug-button from rear panel and install in front panel.
8. Install RF OUT connector J6 (removed in step 6) on rear panel as follows:
 - a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
 - c. Tighten 9/16-inch hex nut at rear of connector.
9. Place threaded end of cable W8 into mounting bracket and connect other end to J6. Connect W8 to mounting bracket and connect other end to J6. Connect W8 to mounting bracket using star washer and 5/16-inch hex nut provided.
10. Connect cable W1 to W8 at mounting bracket.

C-20. OPTION 004 INSTALLATION IN 8621B WITH 86320B HETERODYNE MODULE INSTALLED

Table C-4. Parts Required to Install 8621B/86320B, Option 004

Qty.	Reference Designator	Description	HP Part Number
1	W8	Cable Assembly: Rear RF OUT	08621-20061
1	J6	Connector Assembly: Type-N Female	08621-60053*
*Same part used in front panel RF OUTPUT connector J5. Not necessary to order.			

EQUIPMENT REQUIRED

- Pozi-driv screwdriver
- Wrench 1/4-in. x 5/16-in. slotted box end
- Adjustable slip-joint pliers
- Wrench 9/16-inch slotted box end or socket

PROCEDURE

NOTE

See Figure C-10 for the 8621B/86320B Option 004 configuration.

NOTE

The following procedure presumes that a Model 86320B Heterodyne Module is installed and that only the Option 004 is to be added. However, if an 86320B is also to be installed, complete the Heterodyne Module installation as described in paragraph 2-19 before proceeding. Parts required to install an 86320B in an 8621B with Option 004, are listed in Table C-6 under Option 004.

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
4. Disconnect 86320B RF cable (Figure C-10) from connector mounting bracket.
5. Remove RF output cable assembly W7. To disconnect W7, remove connector mounting bracket first and then W7. Disconnect W7 from SMA connector at rear of J5. Discard W7 and reinstall connector mounting bracket.
6. Remove RF OUTPUT connector assembly J5 as follows.
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.
 - c. Note position of key pin when removing connector.
7. Remove plug-button from rear panel and install in front panel.
8. Install RF OUT connector J6 (removed in step 6) on rear panel as follows.
 - a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
 - c. Tighten 9/16-inch hex nut at rear of connector with hex socket wrench.

NOTE

If a 9/16-inch socket or nut driver is not available, it will be necessary to remove the heterodyne module for access to the hex nut. To remove an 86320B Heterodyne Module, use the procedure in step 11, omitting step c.

9. Place threaded end of cable W8 into mounting bracket and connect other end to J6. Connect W8 to mounting bracket using star washer and 5/16-inch hex nut provided.
10. Connect 86320B RF cable (removed in step 4) to W8 at mounting bracket.
11. Remove 86320B Heterodyne Module as follows:

NOTE

This procedure presumes that RF Oscillator Module in position 2 has been removed. If it is necessary to remove the RF oscillator, refer to paragraph 8-20, step 3.

- a. Disconnect 86320B RF output cable (Figure C-10) at DC Return and Block.
- b. Remove two pozi-driv screws located in 86320B heatsink and slide heterodyne from 8621B frame.
- c. Remove flexible dc cable assembly (Table C-6) from 8621B A2J5.

C-21. OPTION 004 INSTALLATION IN 8621B WITH OPTION 100 INSTALLED

C-22. To change an Option 100 to an Option 100/004 requires the parts listed in Table C-7 (W5). See Figure C-10 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 as follows:
 - a. Disconnect cables W3 and W6 from oscillator output connectors.
 - b. Remove four pozidriv screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozidriv lid screw from top of module.
 - d. Lift cover of modules. Use cover as pry against 8621B side frame to remove modules from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
5. Disconnect either W3 or W6 from RF Switch A4 and then disconnect W4 from RF Switch center connector.
6. Remove RF output cable assembly W4. Disconnect W4 from SMA connector at rear of J5. Discard W4.
7. Remove RF OUTPUT connector assembly J5 as follows:
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.
 - c. Note position of key pin when removing connector.
8. Remove plug-button from rear panel and install in front panel.
9. Install RF OUT connector J6 (removed in step 7) on rear panel as follows:
 - a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
 - c. Tighten 9/16-inch hex nut at rear of connector.
10. Connect W5 to RF Switch center connector and to rear RF OUT connector J6.
11. Connect W3 or W6, removed in step 5, to RF Switch.

12. Install RF Oscillator Modules removed in step 3. (Refer to paragraph 2-16 for RF module installation.)

C-23. OPTION 004 INSTALLATION IN 8621B WITH OPTION 100 AND HETERODYNE MODULE INSTALLED

C-24. To change an Option 100 to an Option 100/004 with 86320B installed, requires the parts shown in Figure C-10 (W5). See Figure C-10 for component and assembly layout and for parts identification.

C-25. The following procedure presumes that an Option 100 and a Model 86320B Heterodyne Module are installed and that only the Option 004 is to be added. However, if an 86320B is also to be installed, complete the heterodyne module installation as noted in this procedure. See Table C-6 for the 86320B parts required to install an 86320B with an 8621B Option 100/004.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 as follows:
 - a. Disconnect W3 from RF oscillator 2 and heterodyne RF input cable (Figure C-10, Item 3), from RF oscillator 1.
 - b. Remove four pozidriv screws from right side of 8621B frame. These screws are located at red arrowheads (See Figure 2-2.)
 - c. Remove pozidriv lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove modules from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
5. Disconnect 86320B RF cable (Figure C-10, Item 5) from RF switch.
6. Remove RF output cable assembly W4. Disconnect W4 from SMA connector at rear of J5. Discard W4.
7. Remove RF OUTPUT connector assembly J5 as follows:
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.
 - c. Note position of key pin when removing connector.
8. Remove plug-button from rear panel and install in front panel.
9. Install RF OUT connector J6 (removed in step 7) on rear panel as follows:
 - a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
10. Connect W5 to RF Switch center connector and to rear RF OUT connector J6.
11. Install heterodyne module if it was removed or is to be added. (Refer to paragraph 2-19).

12. Connect 86320B RF cable, removed in step 5, to RF Switch.
13. Install RF Oscillator Modules removed in step 3. (Refer to paragraph 2-16 for RF module installation.)

C-26. OPTION 004 INSTALLATION IN 8621B WITH OPTION 010 INSTALLED

C-27. To change an Option 010 to an Option 010/004 requires the parts listed in Table C-7 (W10). See Figure C-10 for component and assembly layout and for parts identification.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe and remove A1 ALC Amplifier Board. ALC switch must be in MTR position.
3. Remove RF Oscillator Module from 8621B position 2 as follows:
 - a. Disconnect W1 from oscillator output connector.
 - b. Remove four pozidriv screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozidriv lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Remove W9 and RF OUTPUT connector J5 as follows:
 - a. Disconnect W11 from attenuator rear input connector.
 - b. Remove four screws holding attenuator to left side of 8621B frame.
 - c. With attenuator removed, remove and discard W9.
5. Remove RF OUTPUT connector assembly J5 as follows:
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.
 - c. Note position of key pin when removing connector.
6. Remove plug-button from rear panel and install in front panel.
7. Install RF OUT connector J6 (removed in step 5 on rear panel as follows):
 - a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
 - c. Tighten 9/16-inch hex nut at rear of connector.
8. Connect W10 to attenuator front output connector allowing W10 to run under attenuator to rear RF OUT connector J6.
9. Connect W10 to rear RF OUT connector J6 while holding attenuator to left side of RF Section frame.
10. Secure attenuator to frame using screws removed in step 4b.
11. Connect W11, removed in step 4a, to attenuator rear input connector.

12. Install oscillator module removed in step 3. Connect W1 to oscillator RF output.
13. Change label, near 8621B serial number tag, to Option 010/004.
14. Check Attenuation Accuracy with Performance Test, Figure C-5.

C-28. OPTION 004 INSTALLATION IN 8621B WITH OPTION 010 AND HETERODYNE MODULE INSTALLED

C-29. To change an Option 010 to an Option 010/004 with 86320B installed, requires the parts shown in Figure C-10 (W10). See Figure C-10 for component and assembly layout and for parts identification.

C-30. The following procedure presumes that an Option 010 and a Model 86320B Heterodyne Module are installed and that only the Option 004 is to be added. However, if an 86320B is also to be installed, complete the heterodyne installation as noted in this procedure. See Table C-6 for the 86320B parts required to install an 86320B with an 8621B Option 010/004.

PROCEDURE:

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Module from 8621B position 2 as follows:
 - a. Disconnect heterodyne RF input cable (Figure C-10) from oscillator output connector.
 - b. Remove four pozidriv screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozidriv lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11). ALC switch must be in MTR position.
5. Remove 86320B Heterodyne Module as follows:
 - a. Disconnect 86320B RF output cable (Figure C-10) at DC Return and Block.
 - b. Remove two pozidriv screws located in 86320B heatsink and slide heterodyne from 8621B frame.
6. Remove W9 and RF OUTPUT connector J5 as follows:
 - a. Disconnect W11 from attenuator rear input connector.
 - b. Remove four screws holding attenuator to left side of 8621B frame.
 - c. With attenuator removed, remove and discard W9.
7. Remove RF OUTPUT connector assembly J5 as follows:
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.
 - c. Note position of key pin when removing connector.
8. Remove plug-button from rear panel and install in front panel.
9. Install RF OUT connector J6 (removed in step 7) on rear panel as follows:

- a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
10. Connect W10 to attenuator front output connector allowing W10 to run under attenuator to rear RF OUT connector J6.
 11. Connect W10 to rear RF OUT connector J6 while holding attenuator to left side of RF Section frame.
 12. Secure attenuator to frame using screws removed in step 6b.
 13. Connect W11, removed in step 6a, to attenuator rear input connector.
 14. Install heterodyne module if it was removed or is to be added. (Refer to paragraph 2-19.)
 15. Connect 86320B RF output cable, removed in step 5a, to DC Return and Block.
 16. Install oscillator module removed in step 3. Connect 86320B RF input cable to oscillator RF output.
 17. Change label, near 8621B serial number tag, to Option 010/004.
 18. Check Attenuation Accuracy with Performance Test, Figure C-5.

C-31. OPTION 004 INSTALLATION IN 8621B WITH OPTION 100/010 INSTALLED.

C-32. To change an Option 100/010 to an Option 100/010/004 requires the parts listed in Table C-7 (W10). See Figure C-10 for component and assembly layout and for parts identification.

PROCEDURE:

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 as follows:
 - a. Disconnect cables W1 and W2 from oscillator output connectors.
 - b. Remove four pozidriv screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozidriv screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.
5. Remove W9 and RF OUTPUT connector J5 as follows:
 - a. Disconnect W11 from attenuator rear input connector.
 - b. Remove four screws holding attenuator to left side of 8621B frame.
 - c. With attenuator removed, remove and discard W9.
6. Remove RF OUTPUT connector assembly J5 as follows:
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.

- c. Note position of key pin when removing connector.
7. Remove plug-button from rear panel and install in front panel.
8. Install RF OUT connector J6 (removed in step 6) on rear panel as follows:
 - a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
 - c. Tighten 9/16-inch hex nut at rear of connector.
9. Connect W10 to attenuator front output connector allowing W10 to run under attenuator to rear RF OUT connector J6.
10. Connect W10 to rear RF OUT connector J6 while holding attenuator to left side of RF Section frame.
11. Secure attenuator to frame using screws removed in step 5b.
12. Connect W11, removed in step 5a, to attenuator rear input connector.
13. Install oscillator modules removed in step 3. Connect W1 to RF oscillator 1 and W2 to RF oscillator 2.
14. Change label, near 8621B serial number tag, to Option 100/010/004.
15. Check Attenuation Accuracy with Performance Test, Figure C-5.

C-33. OPTION 004 INSTALLATION IN 8621B WITH OPTION 100/010 AND HETERODYNE MODULE INSTALLED

C-34. To change an Option 100/010 to an Option 100/010/004 with 86320B installed, requires the parts shown in Figure C-10 (W10). See Figure C-10 for component and assembly layout and for parts identification.

C-35. The following procedure presumes that an Option 100/010 and a Model 86320B Heterodyne Module are installed and that only the Option 004 is to be added. However, if an 86320B is also to be installed, complete the heterodyne module installation as noted in this procedure. See Table C-6 for the 86320B parts required to install an 86320B with and 8621B Option 100/010/004.

PROCEDURE

1. Press 8620C Sweep Oscillator power switch OFF.
2. Remove 8621B RF Section from 8620C mainframe.
3. Remove RF Oscillator Modules from 8621B positions 2 and 3 as follows:
 - a. Disconnect 86320B RF input cable (Figure C-10) from RF oscillator module 1 and W2 from RF oscillator module 2.
 - b. Remove four pozidriv screws from right side of 8621B frame. These screws are located at red arrowheads. (See Figure 2-2.)
 - c. Remove pozidriv lid screw from top of module.
 - d. Lift cover of module. Use cover as pry against 8621B side frame to remove module from 8621B.
4. Remove A1 ALC Amplifier Board. (See Figures 8-9 and 8-11.) ALC switch must be in MTR position.

5. Remove 86320B Heterodyne Module as follows:
 - a. Disconnect 86320B RF output cable (Figure C-10) at DC Return and Block.
 - b. Remove two pozidriv screws located in 86320B heatsink and slide heterodyne from 8621B frame.
6. Remove W9 and RF OUTPUT connector J5 as follows:
 - a. Disconnect W11 from attenuator rear input connector.
 - b. Remove four screws holding attenuator to left side of 8621B frame.
 - c. With attenuator removed, remove and discard W9.
7. Remove RF OUTPUT connector assembly J5 as follows.
 - a. Loosen 9/16-inch hex nut at rear of J5.
 - b. Remove knurled nut on front panel. Be careful not to scratch front panel.
 - c. Note position of key pin when removing connector.
8. Remove plug-button from rear panel and install in front panel.
9. Install RF OUT connector J6 (removed in step 7) on rear panel as follows:
 - a. Insert connector into rear panel.
 - b. Install key pin and fasten J6 to rear panel with knurled nut.
10. Connect W10 to attenuator front output connector allowing W10 to run under attenuator to rear RF OUT connector J6.
11. Connect W10 to rear RF OUT connector J6 while holding attenuator to left side of RF Section frame.
12. Secure attenuator to frame using screws removed in step 6b.
13. Connect W11, removed in step 6a, to attenuator rear input connector.
14. Install heterodyne module if it was removed or is to be added. (Refer to paragraph 2-19.)
15. Connect 86320B RF OUTPUT cable, removed in step 5a, to DC Return and Block.
16. Install oscillator modules removed in step 3. Connect cables disconnected in step 3a.
17. Change label, near 8621B serial number tag, to Option 100/010/004.
18. Check Attenuation Accuracy with Performance Test, Figure C-5.

Table C-5. Installation Kit for Option 010*

Reference Designator	HP Part Number	Description
A5	08621-60066	Attenuator Board Assembly
A6	08621-60012	70-dB Programmable Attenuator
A7	08621-60051	Wiring Harness
A7MP1	0370-1111	Bar Knob
A7S1	3100-3237	Attenuator Rotary Switch
	08621-00026	Upper Front Panel

* HP Part Number 08621-60055.

Table C-6. Parts Required to Install 86320B Heterodyne Module in 8621B

86320B Part Numbers	8631B Option Configuration				
	Standard	004	100/004	010/004	100/010/004
5086-7144	X	X	X	X	X
86320-00014	X	X	X	X	X
86320-20007	X	X	X	X	X
86320-20009			X		
86320-20010	X	X	X	X	X
86320-20011	X	X		X	X
86320-60009	X	X	X	X	X

Reference	Part Number	Description
86320B (A4)	5086-7144	DC Return and Block
86320B (MP4)	86320-00014	Frequency-Display Lens, 0.1–2.0 GHz
86320B (W1)	86320-20007	RF Cable Input, (Supplied with 86320B)
86320B (W6)	86320-20009	RF Cable Output, DC Return to RF Switch
86320B (W8)	86320-20010	RF Cable Output, Heterodyne to DC Return
86320B (W5)	86320-20011	RF Cable Output, DC Return to RF Switch or Connector Mounting Bracket
86320B (W7)	86320-60009	DC Cable Assembly, Flexible, 86320B to 8621B

Table C-7. Material Required for Adding Options to Original Equipment

Original Equipment	New Option Configuration						
	100	010	004	100/010	100/004	010/004	100/010/004
Standard	W3, W4, W6, A4, 2	W9, W11, 1	W-8	W2, W9, W12, A4, 1, 4	W3, W5, W6, A4, 2	W10, W11, 1	W2, W10, W12, A4, 1
004	W3, W4, W6, A4, 2, 5	W9, W11, 1, 5		W2, W9, W12, A4, 1, 4, 5	W3, W5, W6, A4, 2	W10, W11, 1	W2, W10, W12, A4, 1, 4
100/004	W4, 5	W1, W9, W11, 1,	W1, W8, 3	W1, W2, W9, W12, A4, 1, 4, 5		W1, W10, W11, 1, 3	W1, W2, W10, W12, A4, 1, 4
010/004	W3, W4, W6, A4, 2, 5	W9, 5	W8	W2, W9, W12, A4, 4, 5	W3, W5, W6, A4, 2		W2, W12, A4, 4
100/010/004	W3, W4, W6, 2, 5	W9, W11, 3, 5	W8, 3	W9, 5	W3, W5, W6, 2	W11, 3	

Ref.	Part Number	Description	Ref.	Part Number	Description
W1	08621-20015	Cable: Position 2	W10	08621-20063	Cable: Attn/RF Out
W2	08621-20026	Cable: Position 3/RF Sw	W11	08621-20064	Cable: Mtg Brkt/Attn
W3	08621-20056	Cable: Position 3/RF Sw	W12	08621-20065	Cable: RF Sw/Attn
W4	08621-20057	Cable: RF Sw/RF Out	A4	3106-0012	RF Switch
W5	08621-20058	Cable: RF Sw/RF Out	1	08621-60055	Option 010 Installation Kit
W6	08621-20059	Cable: Position 2/RF Sw	2	08621-00032	Bracket: RF Switch
W7	08621-20060	Cable: Front RF Out	3	08621-00033	Bracket: Connector
W8	08621-20061	Cable: Rear RF Out	4	08632-00008	Bracket: RF Switch
W9	08621-20062	Cable: Attn/RF Out	5	08621-00022	Panel: Lower Front

NOTE: To remove all options and convert to a standard 8621B, requires W1, W7, and bracket 3. (See Figure C-10 to make the conversion.)

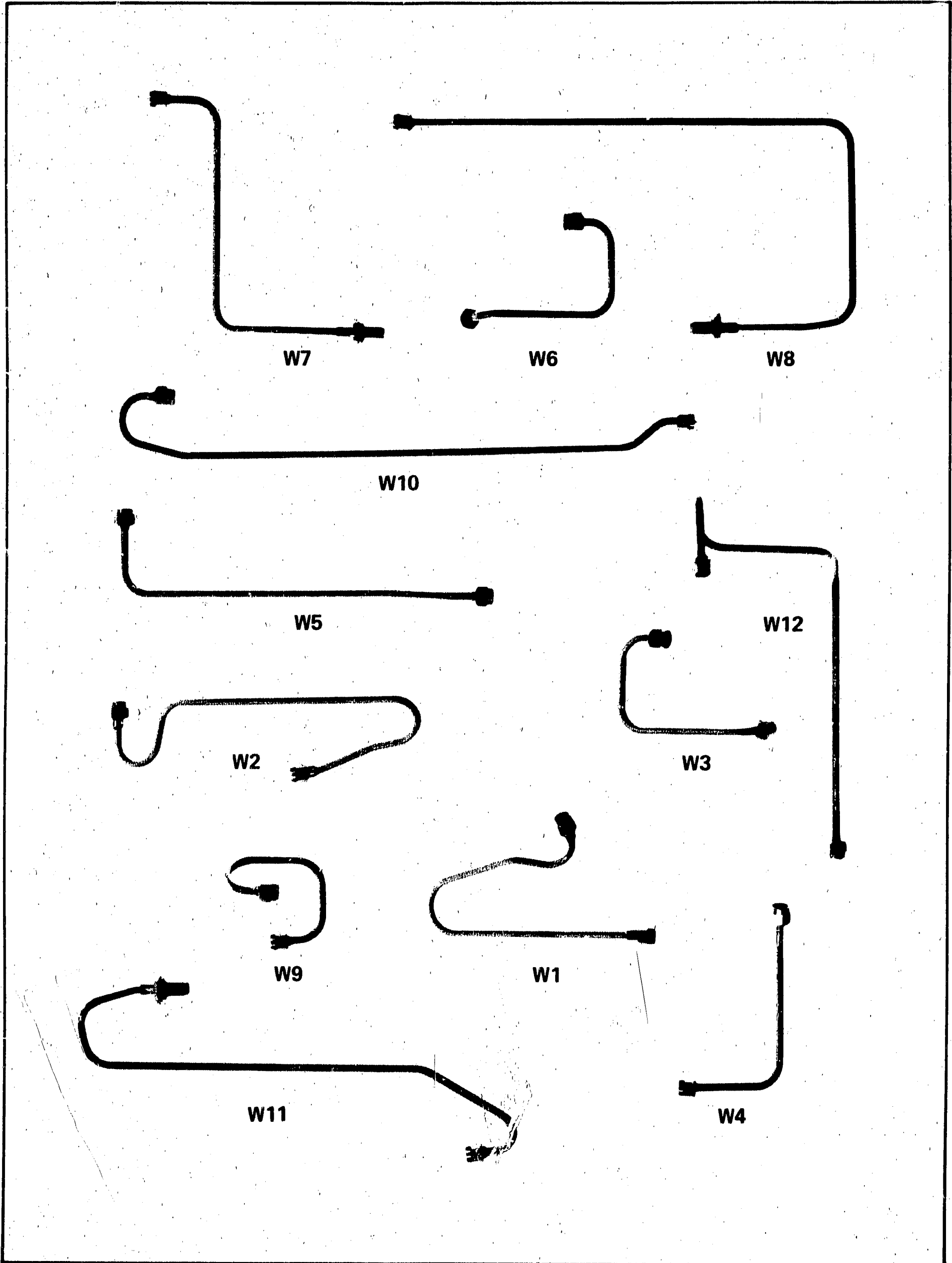


Figure C-9. Model 8621B RF Cable Assemblies

8621B Assembly Part Numbers

Ref Desig.	HP Part Number	Ref Desig.	HP Part Number
A4	3106-0012	W5	08621-20058
A6	08621-60012	W6	08621-20059
J5	08621-60053	W7	08621-20060
J6	08621-60053	W8	08621-20061
W1	08621-20015	W9	08621-20062
W2	08621-20026	W10	08621-20063
W3	08621-20056	W11	08621-20064
W4	08621-20057	W12	08621-20065

Assembly and Component Identification

Item No.	Part Number	Description
1	86320B	Heterodyne Module in Position 1
2	5086-7144	DC Return and Block
3	86320-20007	RF Input Cable, Oscillator to 86320B
4	86320-20011	RF Output Cable, DC Return to RF Switch or Connector Mounting Bracket
5	86320-20009	RF Output Cable, DC Return to RF Switch
6	86320-20010	RF Output Cable, 86320B to DC Return
7	08621-00033	Connector Mounting Bracket
8	08621-00032	RF Switch Mounting Bracket
9	08621-00008	RF Switch Mounting Bracket
10		RF Oscillator Module in Position 2
11		RF Oscillator Module in Position 3

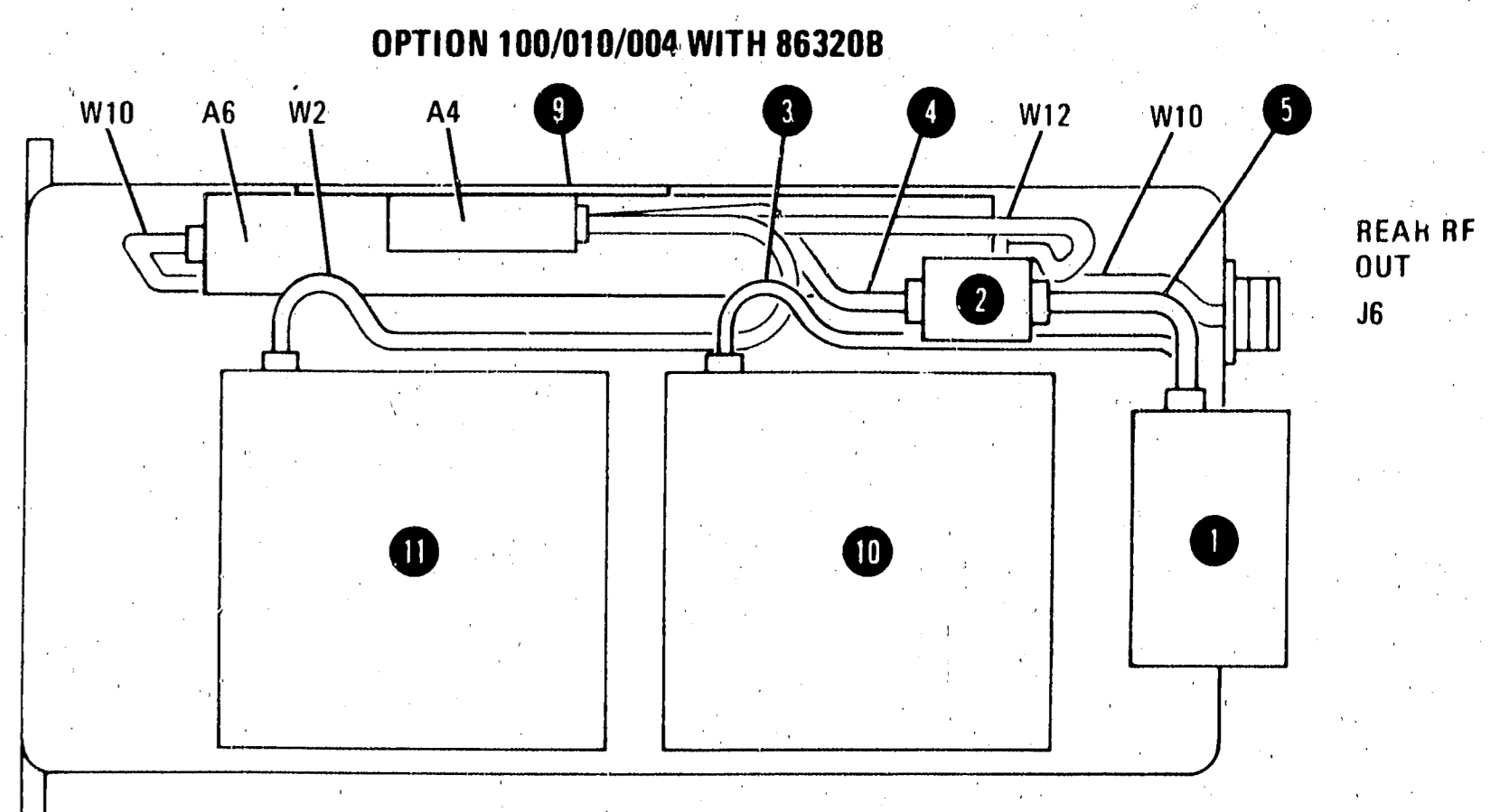
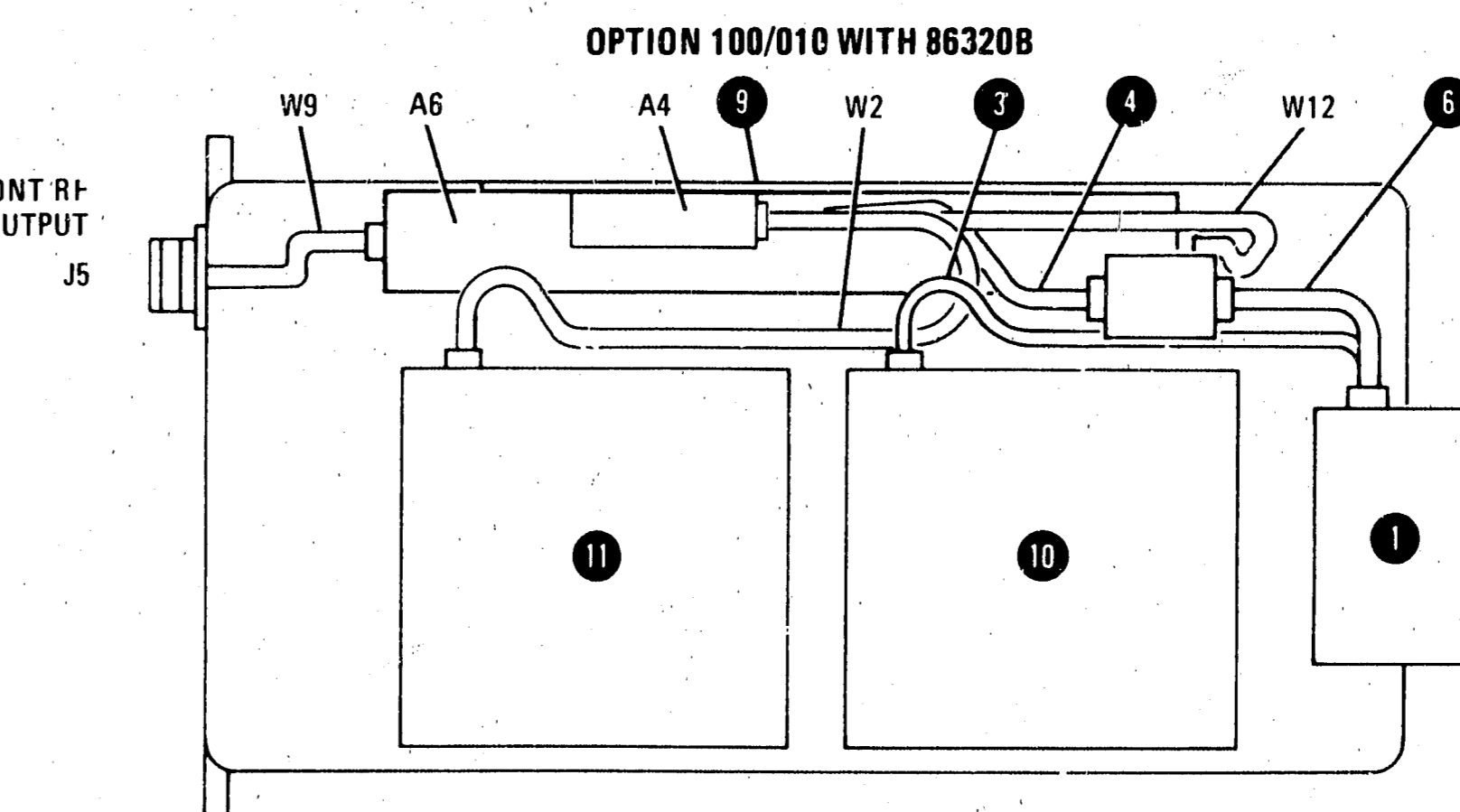
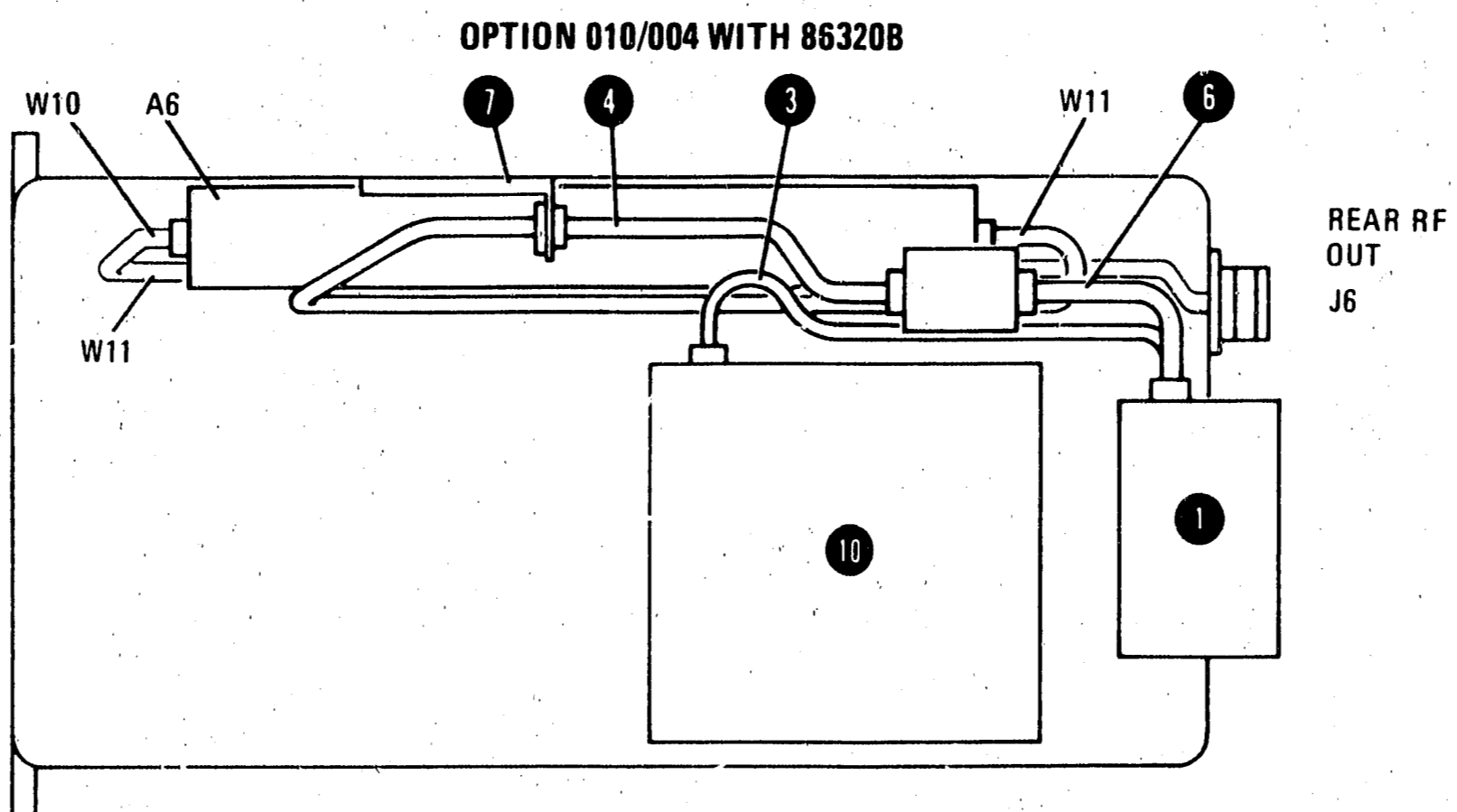
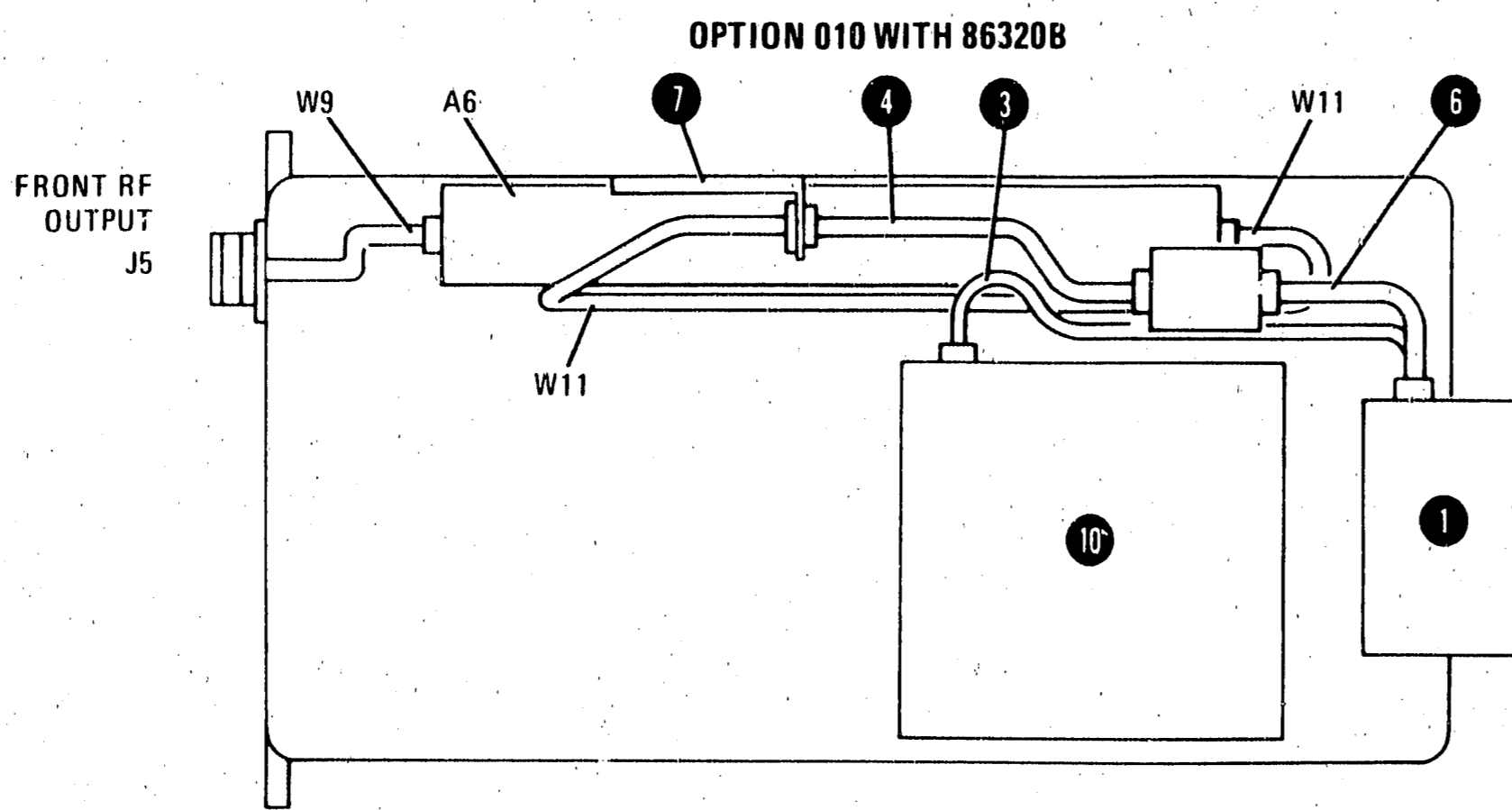
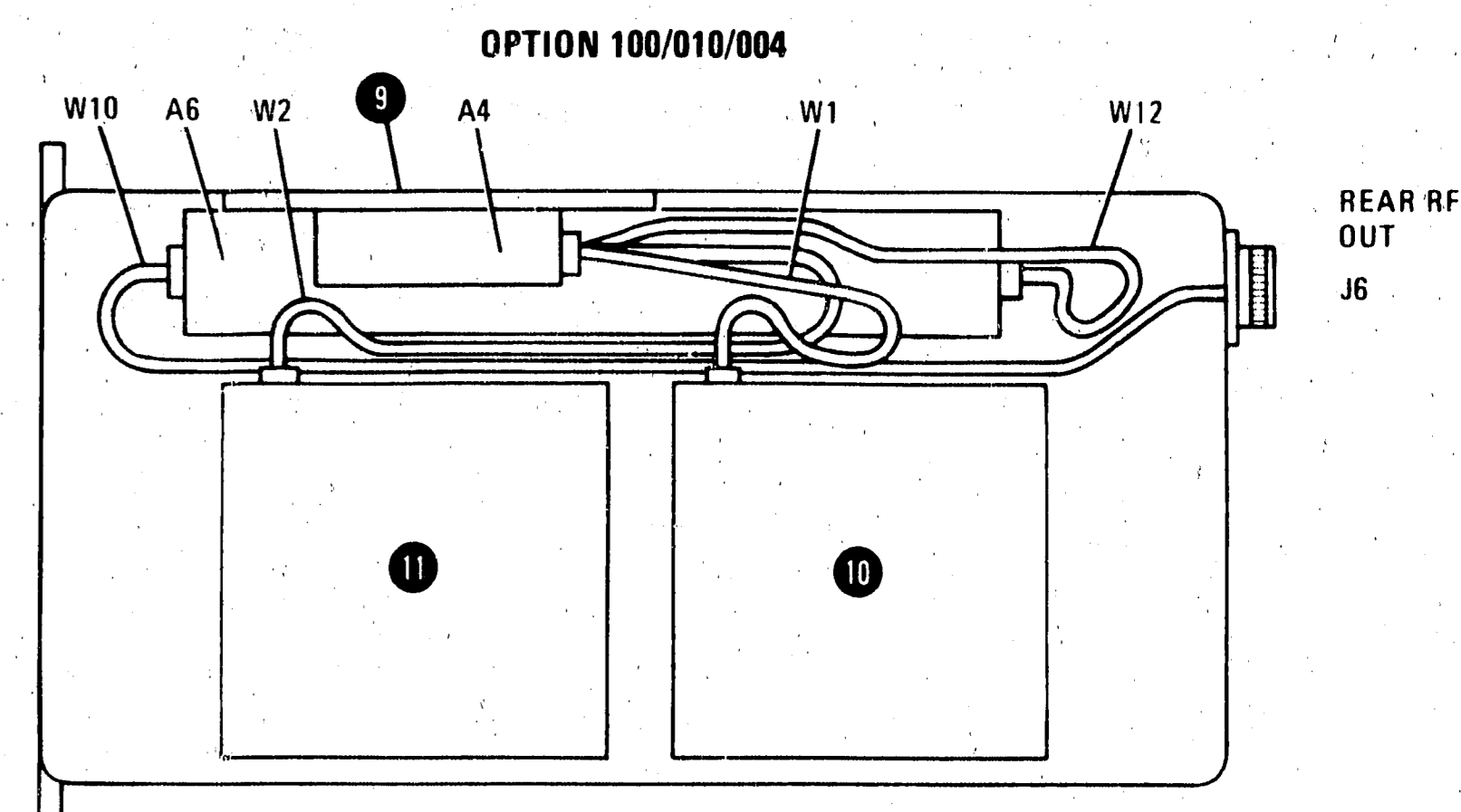
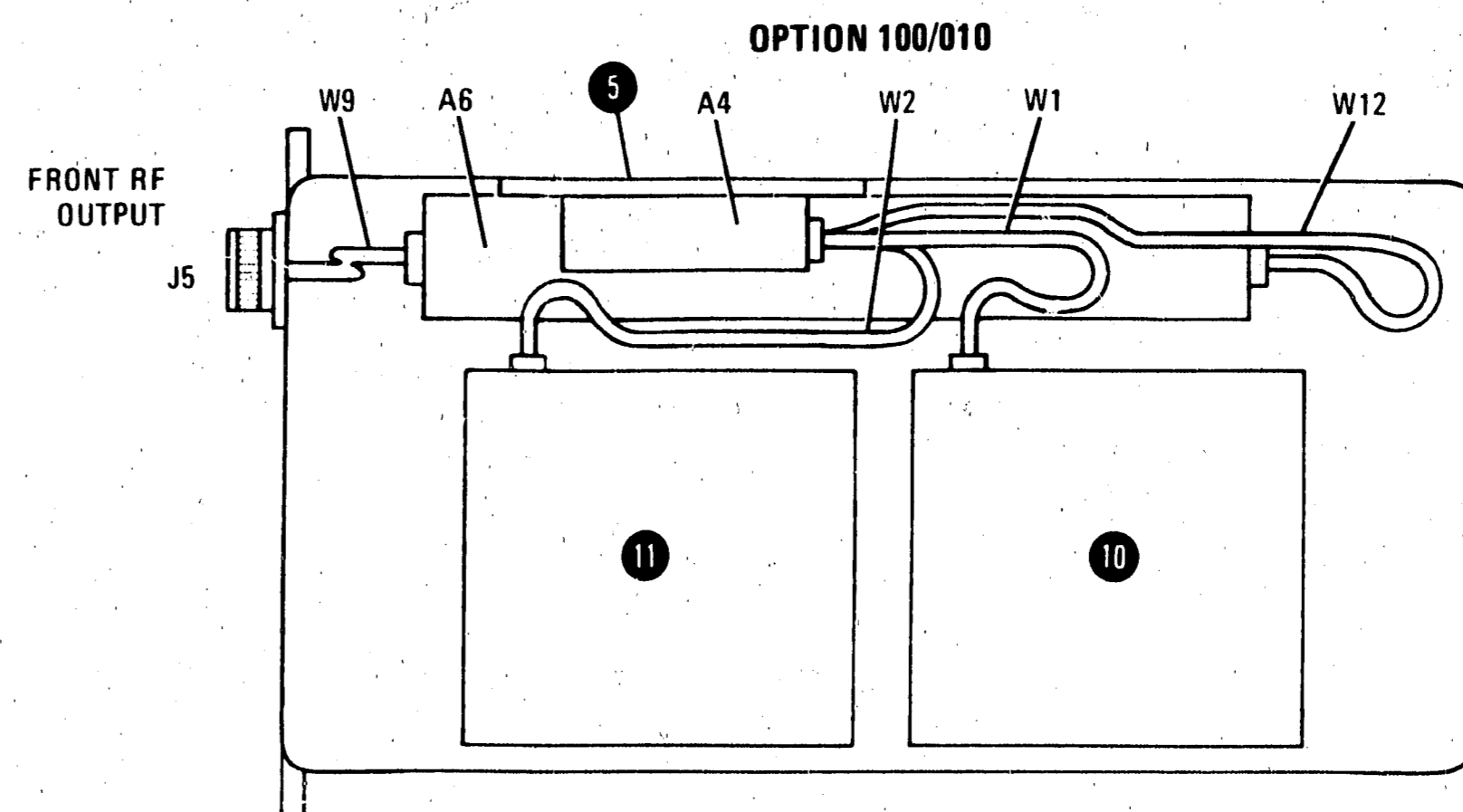
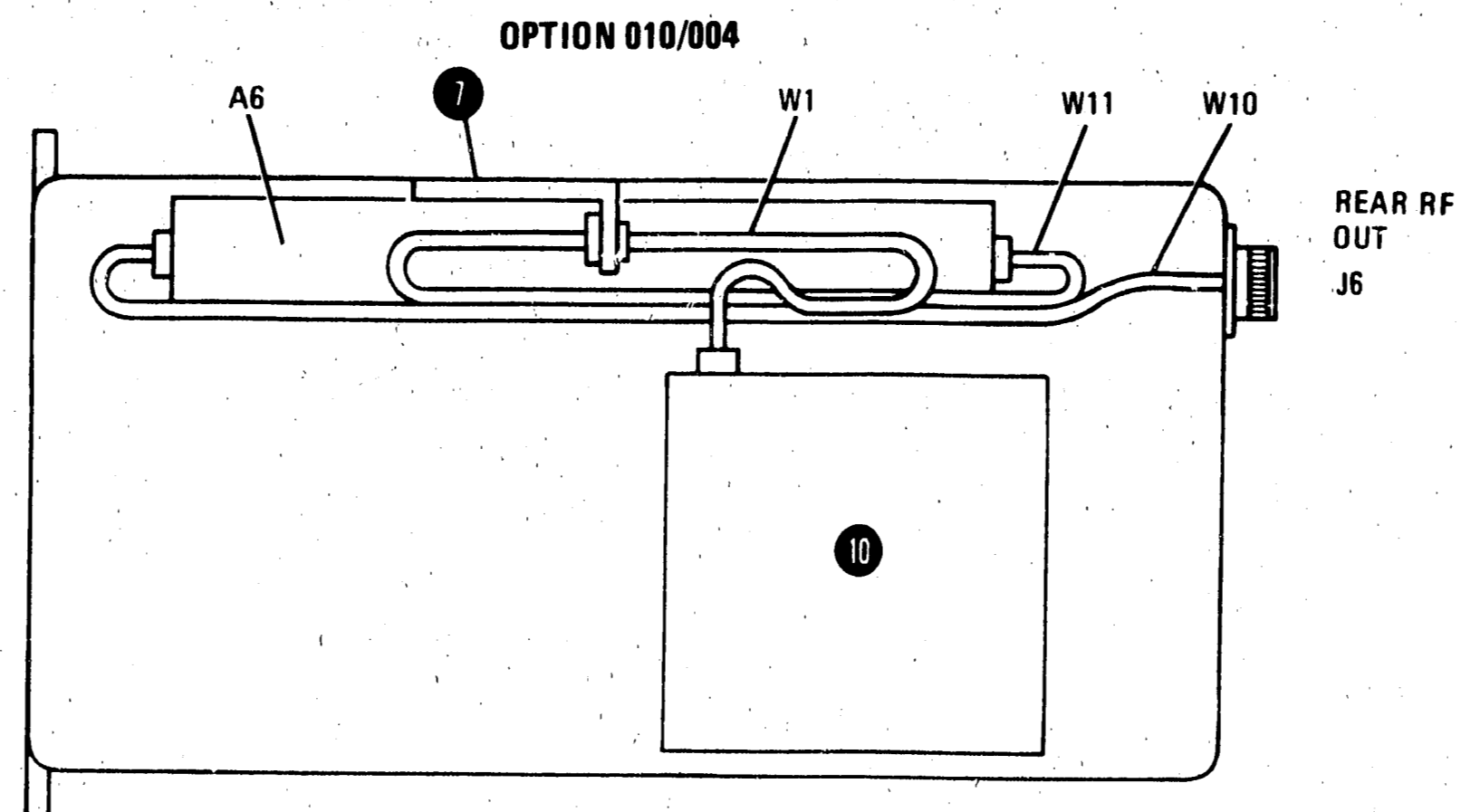
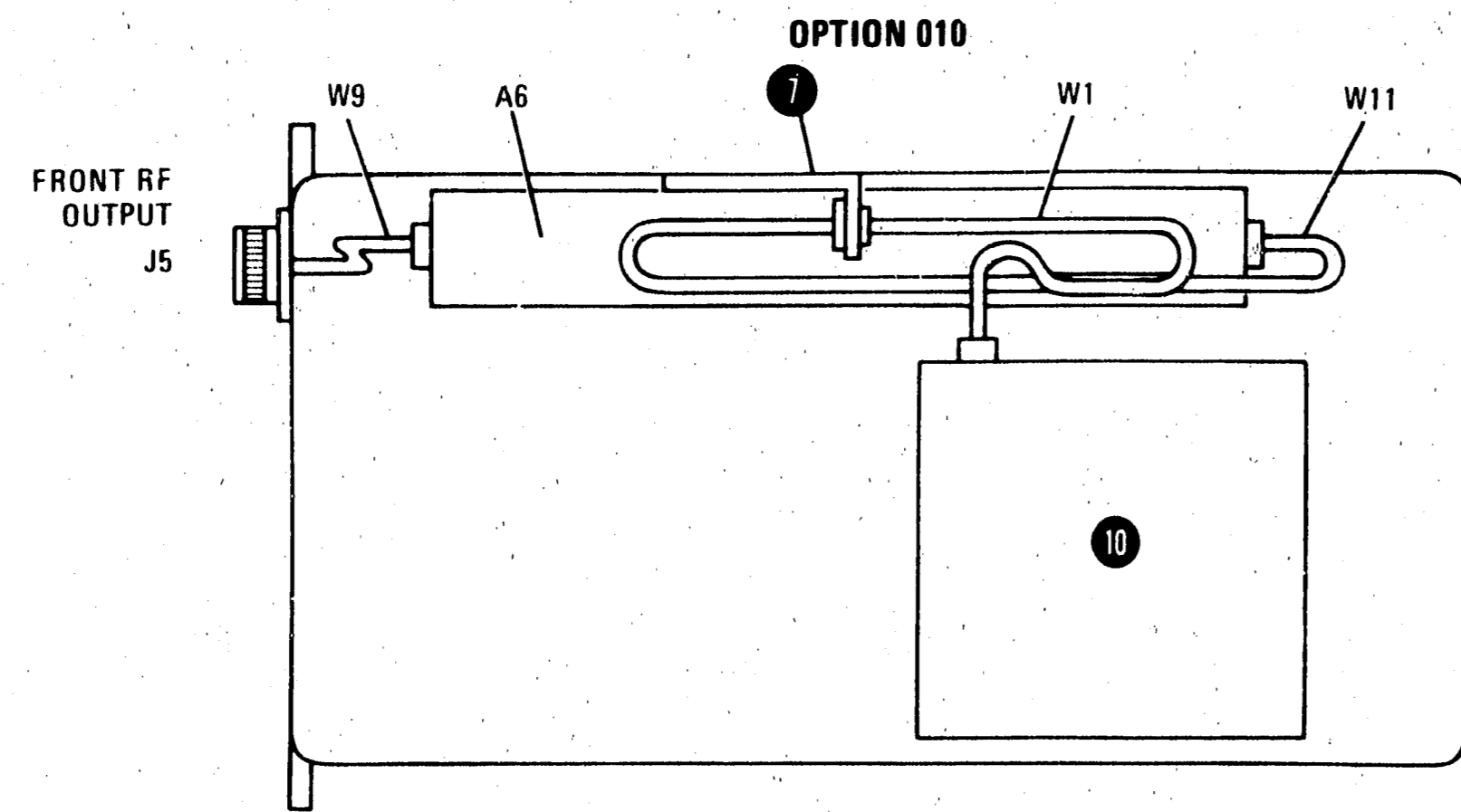


Figure C-10. Mechanical Variations of Assemblies and Components for Installation Identification (1 of 2)

Figure C-10. Mechanical Variations of Assemblies and Components for Installation Identification (2 of 2)