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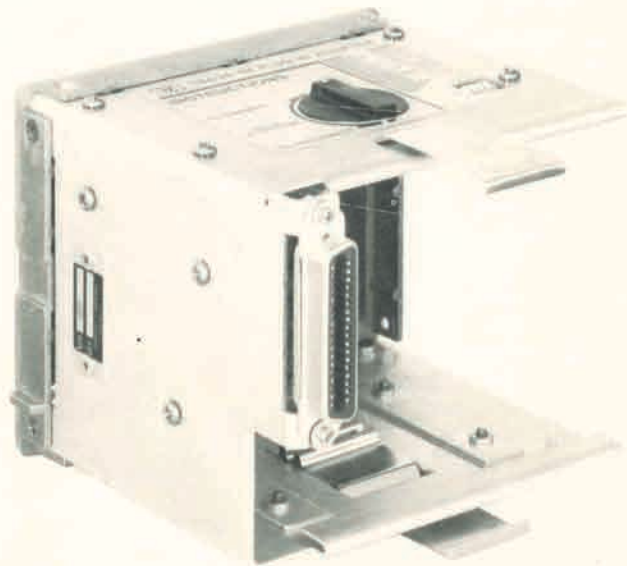
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11869A RF PLUG-IN ADAPTER



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11869A

RF PLUG-IN ADAPTER

SERIAL NUMBERS

This manual applies directly to HP Model 11869A RF Plug-in Adapter having serial number prefix 2019A.

With changes described in Section VII, this manual also applies to instruments with serial number prefixes lower than 2019A.

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

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CONTENTS

Section	Page
I GENERAL INFORMATION	1-1
1-1. Introduction.	1-1
1-4. Specifications and Typical Operating Characteristics	1-1
1-6. Safety Considerations.	1-1
1-7. General	1-1
1-9. Service	1-1
1-11. Instruments Covered by the Manual	1-1
1-16. Description	1-3
1-18. Option 004 Rear Panel RF Output	1-3
1-20. Special PROM Module	1-3
1-22. Latch Handle Kit.	1-3
1-24. Option 910, Extra Manual.	1-3
1-26. Recommended Test Equipment	1-3
 II INSTALLATION	
2-1. Introduction.	2-1
2-3. Initial Inspection.	2-1
2-5. Preparation For Use.	2-1
2-6. Power Requirements	2-1
2-8. Interconnections	2-1
2-10. Operating Environment	2-2
2-11. Temperature.	2-2
2-12. Humidity.	2-2
2-13. Altitude.	2-2
2-14. Installation Instructions	2-2
2-18. Storage and Shipment	2-7
2-19. Environment	2-7
2-21. Packaging.	2-7
2-22. Original Packaging.	2-7
2-23. Other Packaging	2-7

Section	Page
III OPERATION	3-1
3-1. Introduction.	3-1
 IV PERFORMANCE TESTS	
4-1. Introduction.	4-1
4-3. Equipment Required	4-1
4-5. Test Record	4-1
4-7. Performance Tests	4-1
4-8. Self Test	4-1
4-9. CW and Manual Gate	4-1
4-10. Multiband Operation (86290 only).	4-2
 V ADJUSTMENTS	
5-1. Introduction.	5-1
 VI REPLACEABLE PARTS	
6-1. Introduction	6-1
6-3. Abbreviations	6-1
6-5. Replaceable Parts List	6-1
6-9. Ordering Information.	6-1
6-12. PROM U6 For Special RF Plug-ins	6-2
 VII MANUAL BACKDATING CHANGES	
7-1. Introduction.	7-1
 VII SERVICE	
8-1. Introduction	8-1
8-3. Service Sheets.	8-1
8-5. Schematic Diagram Symbols	8-1
8-7. Mnemonics.	8-1
8-9. Theory of Operation	8-1

FIGURES

Figure	Page
1-1. HP Model 11869A RF Plug-in Adapter	1-0
1-2. Typical Serial Number Plate	1-3
2-1. Mounting Plug-in Into Mainframe	2-1
2-2. Bottom Position-Plate Mechanism.	2-2
2-3. Installation of RF Plug-in PROM into 11869A	2-3
2-4. Interface Signals on Connector P1	2-4
2-5. Interface Signals on Connector P2	2-5
2-6. Interface Signals on Connector P3	2-6
3-1. RF Plug-in Identification Switch	3-1
6-1. Mechanical Parts	6-6

Figure	Page
8-1. Schematic Diagram Notes	8-2
8-2. Overall Troubleshooting Block Diagram.	8-7
8-3. Self-Test Block Diagram	8-11
8-4. Plug-in Decoder and Special Plug-in PROM.	8-11
8-5. Logic Board A1 Parts Location	8-12
8-6. Logic Board A1 Schematic	8-13
8-7. Connector Board A2 Parts Location	8-14
8-8. Connector Board A2 Schematic	8-15
8-9. Cable Interconnect Schematic	8-17
8-10. 11869A Major Assemblies.	8-19

TABLES

Table	Page
1-1. Typical Operating Characteristics of HP 11869A	1-2
1-2. Recommended Test Equipment	1-4
4-1. Performance Test Record	4-1
6-1. PROMs Available for Special RF Plug-ins	6-2

Table	Page
6-2. Reference Designations, Manufacturer's Codes, and Abbreviations	6-2
6-3. Replaceable Parts	6-4
8-1. 11869A Mnemonics.	8-5

SAFETY CONSIDERATIONS

GENERAL

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

WARNING

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

SAFETY SYMBOLS



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

CAUTION

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



Indicates hazardous voltages.

SERVICING

WARNING

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



Indicates earth (ground) terminal.

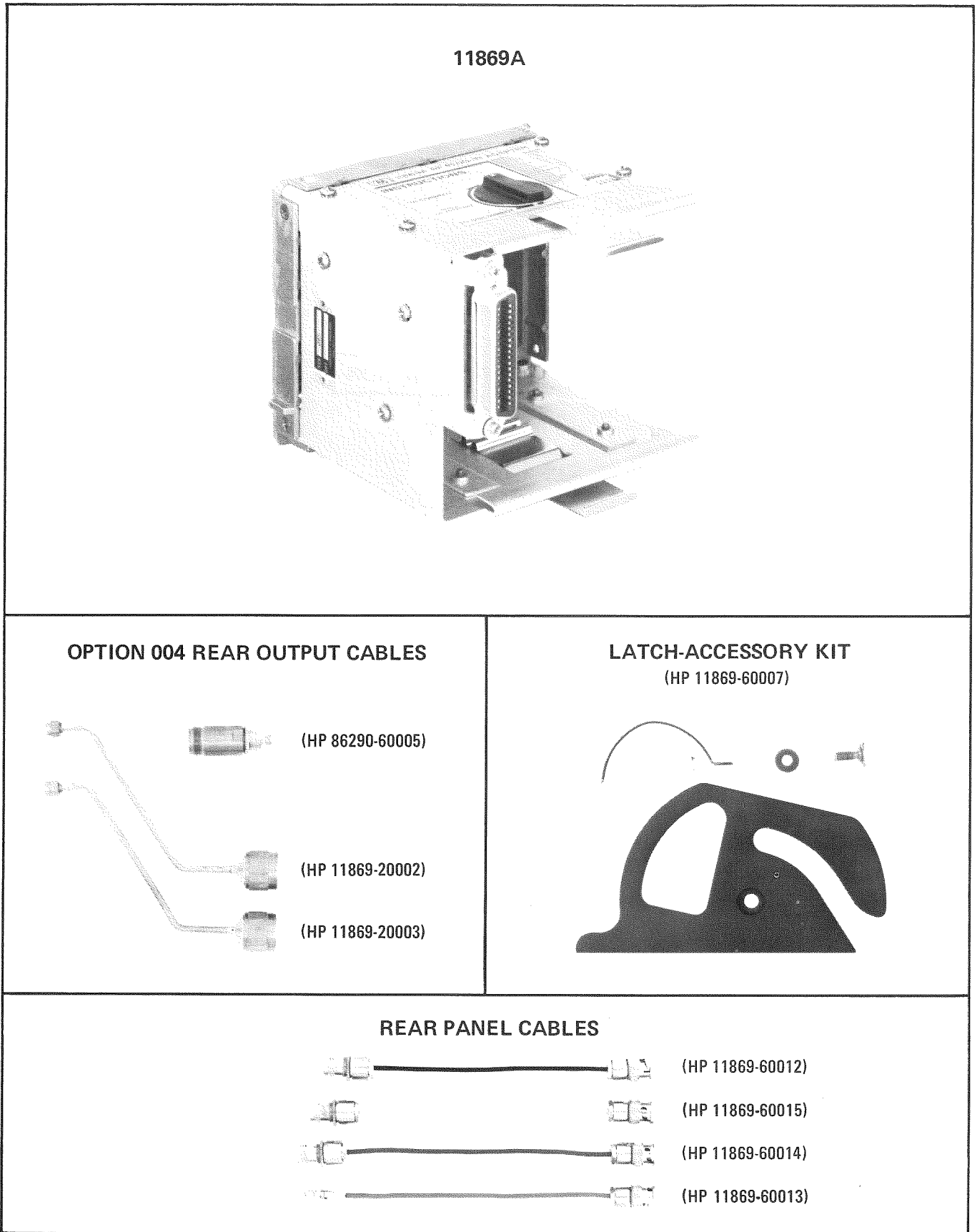


Figure 1-1. HP Model 11869A RF Plug-in Adapter

SECTION I GENERAL INFORMATION

1-1. INTRODUCTION

1-2. This Operating and Service Manual contains information required to install, operate, test, and service the Hewlett-Packard Model 11869A RF Plug-in Adapter. Figure 1-1 shows the instrument. This section covers instrument identification, description, options, accessories, specifications, and other basic information.

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

- a. **SECTION I, GENERAL INFORMATION**, presents a brief description of the instrument, the operating characteristics, and a list of recommended test equipment.
- b. **SECTION II, INSTALLATION**, presents information relative to initial inspection, preparation for use, mounting, packing, and shipping.
- c. **SECTION III, OPERATION**, presents instructions for operation of the instrument.
- d. **SECTION IV, PERFORMANCE TESTS**, presents procedures required to verify that performance of the instrument is in accordance with operating characteristics.
- e. **SECTION V, ADJUSTMENTS**. There are no adjustments in this instrument.
- f. **SECTION VI, REPLACEABLE PARTS**, presents information required to order all parts and assemblies.
- g. **SECTION VII, MANUAL BACKDATING CHANGES**, presents backdating information to make this manual compatible with earlier shipment configurations.
- h. **SECTION VIII, SERVICE**, presents circuit descriptions, schematic diagrams, compo-

nent location diagrams, and troubleshooting procedures to aid the user in maintaining the equipment.

1-4. SPECIFICATIONS AND TYPICAL OPERATING CHARACTERISTICS

1-5. There are no instrument specifications. Table 1-1 lists performance characteristics, which are not specifications but typical characteristics included as information for the user. To ensure that the instrument meets the performance characteristics listed in Table 1-1, the performance tests in Section IV should be performed.

1-6. SAFETY CONSIDERATIONS

1-7. General

1-8. The Model 11869A is a Safety Class 1 instrument and has been manufactured and tested according to international safety standards.

1-9. Service

1-10. Although the instrument has been manufactured in accordance with international safety standards, this manual contains information, cautions, and warnings which must be observed to ensure safe operation and to avoid damage to the instrument. Warnings and cautions appear as appropriate throughout the manual. Service should be performed only by qualified personnel.

1-11. INSTRUMENTS COVERED BY THE MANUAL

1-12. Attached to the side panel of the instrument is a serial number plate that is similar to that shown in Figure 1-2. The serial number is in two parts, a prefix and a suffix. The first four digits and the letter (e.g., 2009A) are the serial number prefix. The prefix is the same for all identical instruments; it is changed only when the instrument is modified. However, the numbers in the suffix are

Table 1-1. Typical Operating Characteristics of HP 11869A

11869A Adapter

The 11869A Adapter provides the electrical and mechanical interface between the 8350A and 86200 Series Plug-in. All of the 8350A's standard operating features including HP-IB remote programming are available. However, specific plug-in functions (output power level, RF on/off, etc.) cannot be controlled or remotely programmed by the 8350A mainframe.

Plug-ins With Rear Panel RF Output

Option 004 allows the adapter to be used in 86200 Plug-ins equipped with rear panel RF output. Supplied with Option 004 are two pre-shaped semi-rigid coax cables with the appropriate mating connectors so that the RF output can be extended to the rear panel of the adapter.

Rear Panel Description

On the rear panel of the 11869A are five hole plugs that pop out to allow connections to be made to the rear panel. Four of the holes are for low frequency (small diameter) cables while one is for high frequency (large diameter) RF cable. For user convenience four of the holes are labeled: EXT ALC IN, PULSE IN, FREQ REF, and RF OUT.

Three BNC cables are supplied to extend the plug-in rear panel inputs/outputs to the rear panel of the adapter. A separate cable (BNC/Multi-pin) is provided for connection of the plug-in FM input to the adapter/mainframe.

Plug-ins Compatible With the 11869A Adapter

The 11869A Adapter attaches to the back of the plug-in and is equipped with a switch for setting the specific interface code for the plug-in being used.

The following plug-ins will operate in the 8350A by using the 11869A adapter:

MODEL	FREQUENCY RANGE
86220A	.01—1.3 GHz
86222A/B	.01—2.4 GHz
86230B	1.8—4.2 GHz
86235A	1.7—4.3 GHz
86240A/B	2—8.4 GHz
86240C	3.6—8.6 GHz
86241A	3.2—6.5 GHz
86242A/C/D	5.9—9.0 GHz
86245A	5.9—12.4 GHz
86250B/C/D	8.0—12.4 GHz
86260A	12.4—18 GHz
86290A	2—18 GHz
86290B	2—18.6 GHz
86290A/B	2—22 GHz
Opt. H08	

Special Plug-ins

For factory modified 86200 Series Plug-ins with non-standard frequency coverage a special PROM must be inserted in the 11869A Adapter. Consult your local HP Sales and Service Office for further information.

Plug-ins Not Compatible With the 11869A Adapter

The 8621B RF Drawer and 86300 Series RF Modules are not compatible with the 11869A and will not operate in the 8350A.

Furnished

Three BNC cables for extending plug-in rear panel inputs/outputs to adapter rear panel; BNC/multi-pin cable for connecting plug-in FM input to adapter/mainframe; plug-in handle assembly for simplified installation in the 8350A mainframe.

Weight: Net, 0.9 kg (2 lb). Shipping, 2.7 kg (6 lb).

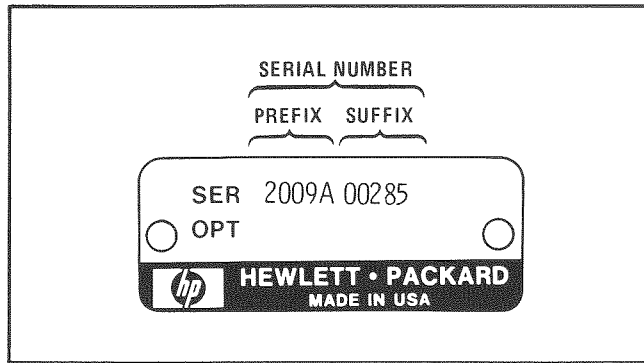


Figure 1-2. Typical Serial Number Plate

consecutive, regardless of changes in the prefix. The suffix is different for each instrument. The manual applies to instruments that have the serial number prefixes listed under SERIAL NUMBERS on the title page.

1-13. An instrument manufactured after the printing of this manual might have a serial number prefix that is not listed on the title page. This unlisted number prefix indicates that the instrument is different from that described in the manual. The manual for this newer instrument is accompanied by a yellow Manual Changes supplement, which contains “change information” that explains how to adapt the manual to a newer instrument.

1-14. In addition to change information, the supplement might contain information for correcting errors in the manual. Such “errata” information applies to all serial numbers.

1-15. 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 the print date and part number of the manual, both of which appear on the title page of the manual. Complimentary copies of the supplement are available from Hewlett-Packard. For information concerning a serial number prefix that is not listed in the title page or in the Manual Changes supplement, contact your nearest Hewlett-Packard office.

1-16. DESCRIPTION

1-17. The HP Model 11869A RF Plug-in Adapter provides a means for using the 86200 Series RF

Plug-ins (used in the 8620 mainframe) in the 8350A Sweep Oscillator mainframe. The 11869A adapter locks on to an 86200 Series RF Plug-in, then this assembly plugs into the plug-in compartment of an 8350A mainframe. This adapter provides frequency range information to the mainframe, self-test circuits, and various level shifting and interface functions.

1-18. OPTION 004 REAR PANEL RF OUTPUT

1-19. If the RF plug-in with which the 11869A adapter is to be used has Option 004 rear panel RF OUTPUT connector, you should order the Option 004 11869A. The option adds a rear panel cable kit to extend the RF OUTPUT from the rear panel of the 86200 Series RF Plug-in to the rear panel of the 11869A/8350A.

1-20. SPECIAL PROM MODULE

1-21. For RF Plug-ins with non-standard frequency coverage (model not listed in Table 1-1), a special plug-in PROM module must be installed in the 11869A. Consult your HP Sales and Service office for HP Part Number for individual specials.

1-22. LATCH HANDLE KIT

1-23. A kit containing an improved latch handle for the 86200 Series RF Plug-ins and mounting hardware is available by ordering HP Part Number 11869-60007.

1-24. OPTION 910, EXTRA MANUAL

1-25. The standard instrument is supplied with one Operating and Service Manual. Option 910 instruments are supplied with two manuals.

1-26. RECOMMENDED TEST EQUIPMENT

1-27. Equipment required for testing the instrument is listed in Table 1-2. Other equipment may be substituted if it meets the critical specifications indicated in the table.

Table 1-2. Recommended Test Equipment

EQUIPMENT	CRITICAL SPECIFICATIONS	USE*
86200 Series RF Plug-in	Any RF Plug-in listed in Table 1-1 will check the interface, however, the 86290A/B is recommended so the band changing function may be checked.	P,T
8350A Sweep Oscillator	No substitute	P,T
Equipment for Residual FM test	See Operating and Service manual for RF Plug-in used.	P,T
1740A Oscilloscope	Dual Channel, Frequency input to 100 MHz	T
*P = Performance Test T = Troubleshooting		

SECTION II INSTALLATION

2-1. INTRODUCTION

2-2. This section includes instructions for initial inspection, preparation for use, and storage/shipping instructions for the HP Model 11869A RF Plug-in Adapter.

2-3. INITIAL INSPECTION

2-4. Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically. The contents of the shipment should be as shown in Figure 1-1. Procedures for checking electrical performance are given in Section IV. If the contents are incomplete, if there is mechanical damage or defect, or if the instrument does not pass the electrical performance test, 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 Hewlett-Packard 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 11869A RF Plug-in Adapter is properly installed, it obtains all power through the rear interface connectors from the HP Model 8350A Sweep Oscillator mainframe.

2-8. Interconnections

2-9. An 86200 Series RF Plug-in is connected into the front interface connector of the Model 11869A RF Plug-in Adapter and locked in place with the top and bottom clamps. This RF Plug-in Assembly (Plug-in Adapter and 86200 Series Plug-in) is then installed in the 8350A Sweep Oscillator. (See Figure 2-1.) Connection is made when the two plug-in adapter interface connectors mate with the mainframe connectors. Input and output interface signals are shown in Figures 2-4, 2-5, and 2-6.

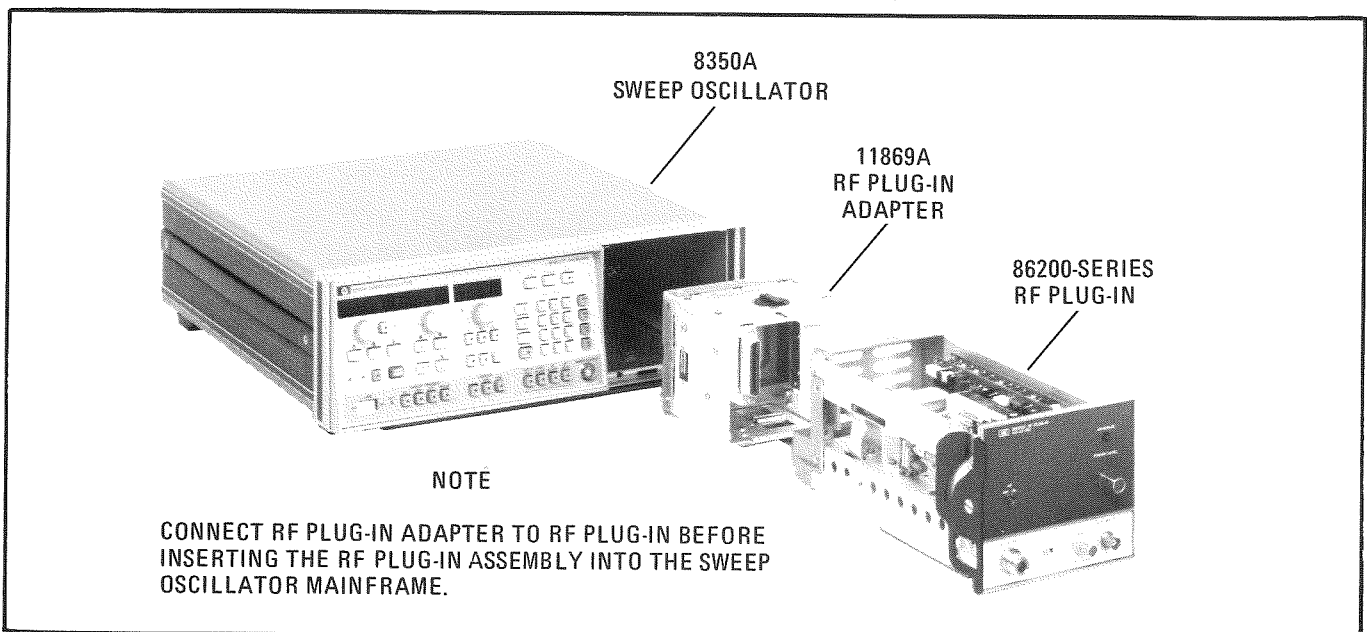


Figure 2-1. Mounting Plug-in Into Mainframe

2-10. Operating Environment

2-11. Temperature. The instrument may be operated in temperatures from 0 degrees C to +55 degrees C.

2-12. Humidity. The instrument may be operated in environments with relative humidity up to 95%. However, the instrument should be protected from temperature extremes which cause condensation within the instrument.

2-13. Altitude. The instrument may be operated at altitudes up to 4572 meters (15,000 feet).

2-14. INSTALLATION INSTRUCTIONS

2-15. To connect the 11869A to an 86200 Series Plug-in (Figure 2-1), do the following:

- a. On the 11869A, set the top and bottom black actuator knobs (Figure 2-2) to "TO DISCONNECT" position. (This extends the clamps.)

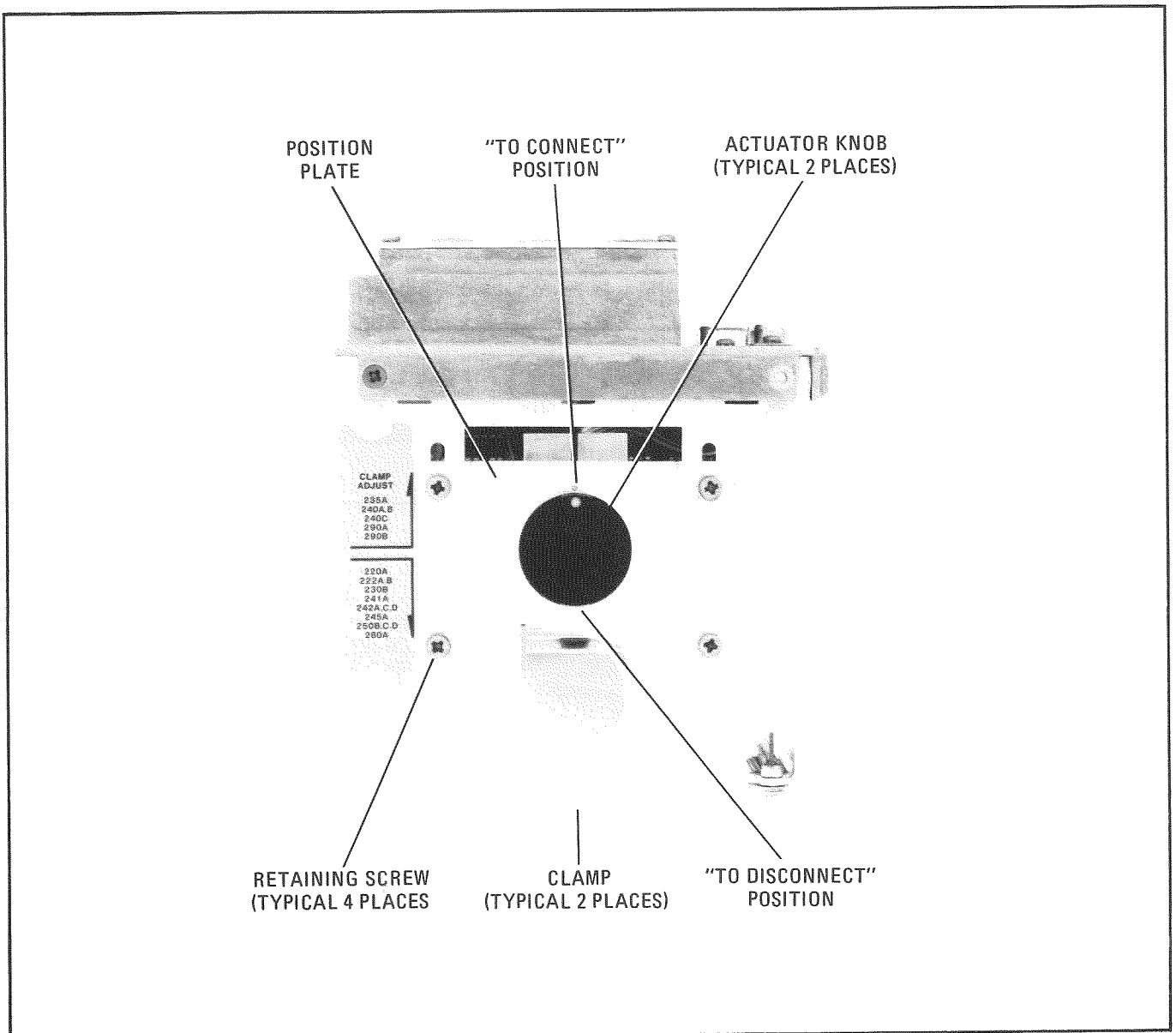


Figure 2-2. Bottom Position - Plate Mechanism

- b. Look at the CLAMP ADJUST instructions on the bottom of the 11869A adapter and select the position required for the RF Plug-in being used. (If the correct position is selected, go to the next step.) Loosen the four retaining screws (Figure 2-2), slide the position plate to the proper position, then tighten the four retaining screws.
- c. For Option 004 instruments, mount the RF OUTPUT connector to the rear panel of the 11869A (if not already installed).
- d. Disconnect the attached interconnect RF cable from the 11869A rear-panel RF OUTPUT connector (if it is attached).
- e. Select the correct RF cable for the plug-in being used. (Part number 11869-20003 is for the 86290A/B and part number 11869-20002 is used for all others.) Connect the interconnect RF cable to the rear panel RF OUT connector of the RF Plug-in.

NOTE

If the 86200 Series Plug-in has Option 004 Rear Panel RF Output, perform steps c through f. If the instrument does not have Option 004, go to step g.

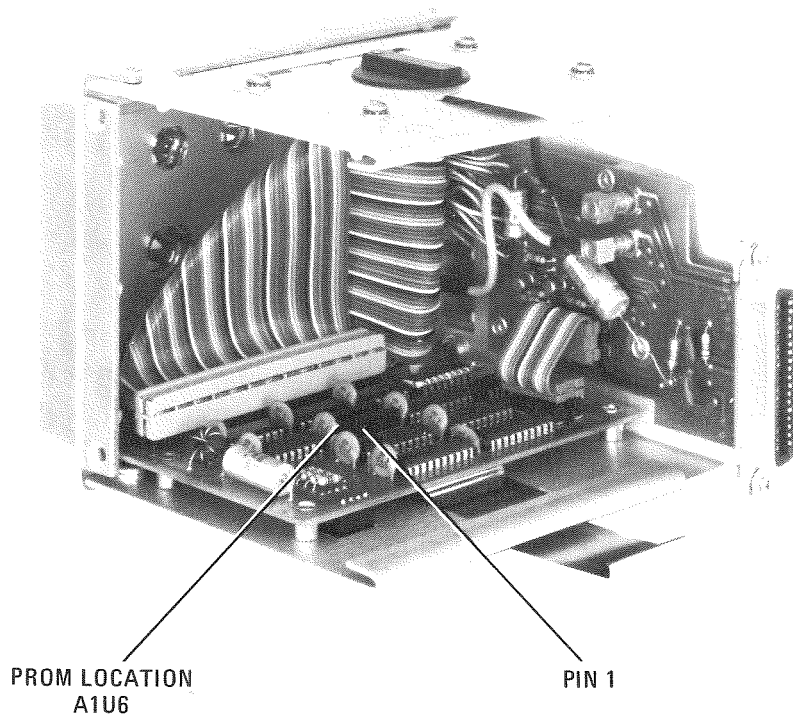


Figure 2-3. Installation of RF Plug-in PROM into 11869A

- f. Set the RF Plug-in in an upright position on a flat work surface. Support the free end of the cable about one inch from the flat work surface, then tighten the cable connector nut to the rear panel of the RF Plug-in. (This should allow the cable to line up with the RF OUTPUT connector in the 11869A adapter when they are mated.)
- g. At the top of the 11869A, set the four rocker switches to the code that corresponds with the 86200 Series RF Plug-in that is being used. If the exact model number is not in the list above the rocker switches, the RF Plug-in is a "SPECIAL" (example: 86260B, 86260C, 86260A Option H22, etc.) and the switches must be set at 1111. Also, the appropriate PROM must be installed in the 11869A A1 Logic Board in position A1U6. See Figure 2-3 for installation instructions for the PROM.

CAUTION

Do not exert excessive turning pressure on the actuator knob (Figure 2-2) or damage to the clamp mechanism may result. Be sure the Clamp Position Plate is in the correct position and that the interface connectors are mated properly.

- h. Mate the 86200 Series Plug-in to the front interface connector of the 11869A. Be sure the top and the bottom frames of the two units abut.
- i. At the top of the 11869A, rotate the black actuator knob to the "TO CONNECT" position, locking the two units together on the top.
- j. At the bottom of the 11869A, rotate the black actuator knob so it points to the rear, locking the two units together on the bottom.

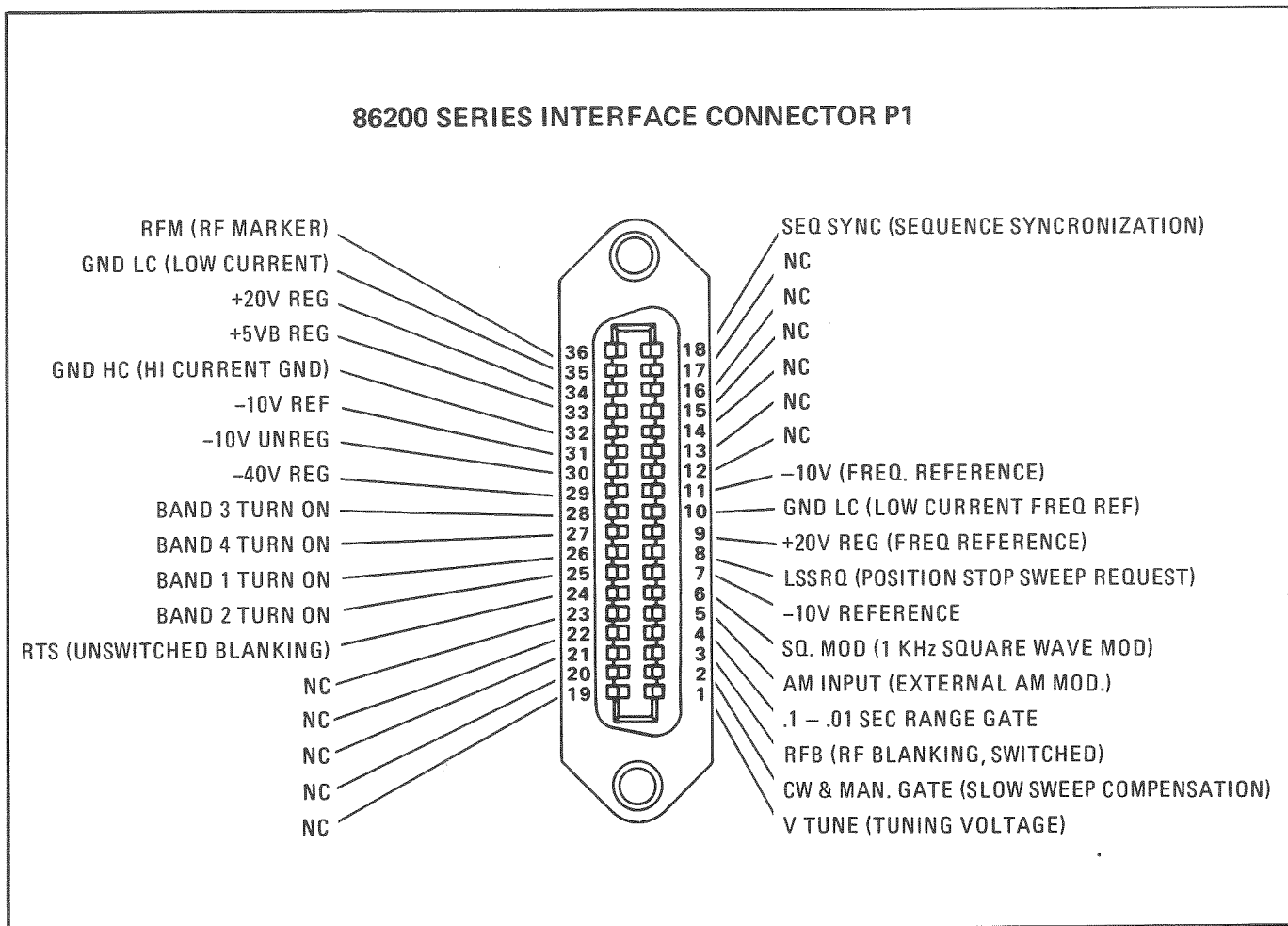


Figure 2-4. Interface Signals on Connector P1

- k. For Option 004 instruments, mate the RF OUT interconnect cable from the RF Plug-in to the RF OUTPUT connector on the inside rear of the 11869A adapter. Use a 5/16 inch open end wrench to tighten the connector.
- l. Connect the appropriate interconnect cables from the rear panel of the 11869A to the rear panel connectors of the 86200 Series RF Plug-in. If rear panel FM input is used, connect W6 from the FM connector to P2, position A3 at the rear of the 11869A. Secure the unused cables to the inside of the 11869A frame.
- m. Remove the latching handle from the side of the 86200 Series Plug-in and install the new one contained in Latch-Accessory Kit, HP Part Number 11869-60007, shipped with the 11869A.

2-16. To install the 11869A/86200 Series Plug-in assembly into the 8350A mainframe, do the following:

- a. Pull out the retaining handle on the left side of the plug-in.
- b. Install the plug-in assembly into the 8350A plug-in compartment.
- c. Push down the retaining handle to the locked position to lock the plug-in assembly into the 8350A. (All interconnections are now made between plug-in and mainframe.)

2-17. Whenever an 86200 Series Plug-in (except 86290A/B) is adapted for use in an 8350A mainframe, it is recommended that the frequency calibration adjustment be performed to improve frequency accuracy. (Refer to the 8350A Operating and Service manual for procedures.)

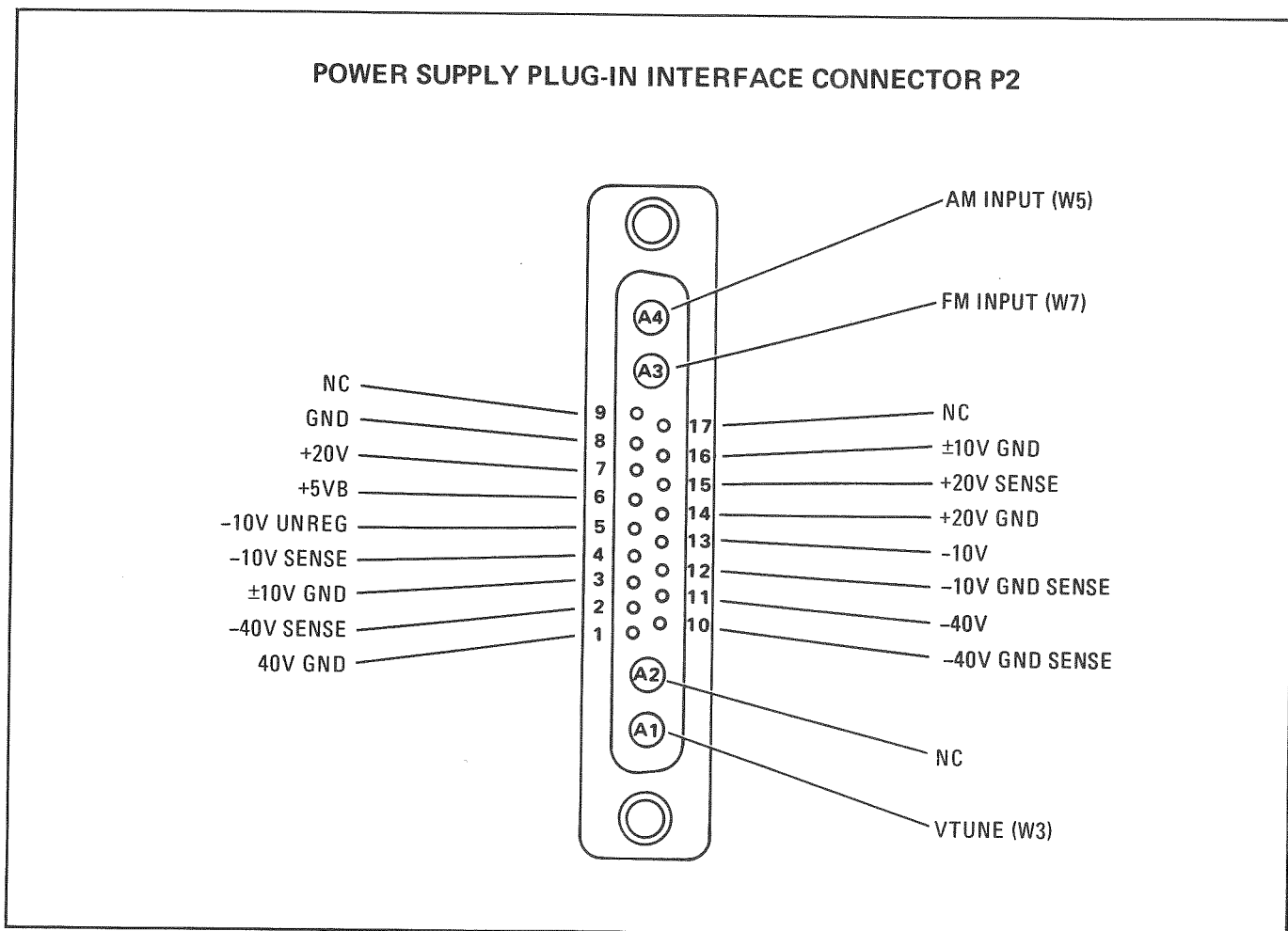


Figure 2-5. Interface Signals on Connector P2

PLUG-IN INTERFACE CONNECTOR P3

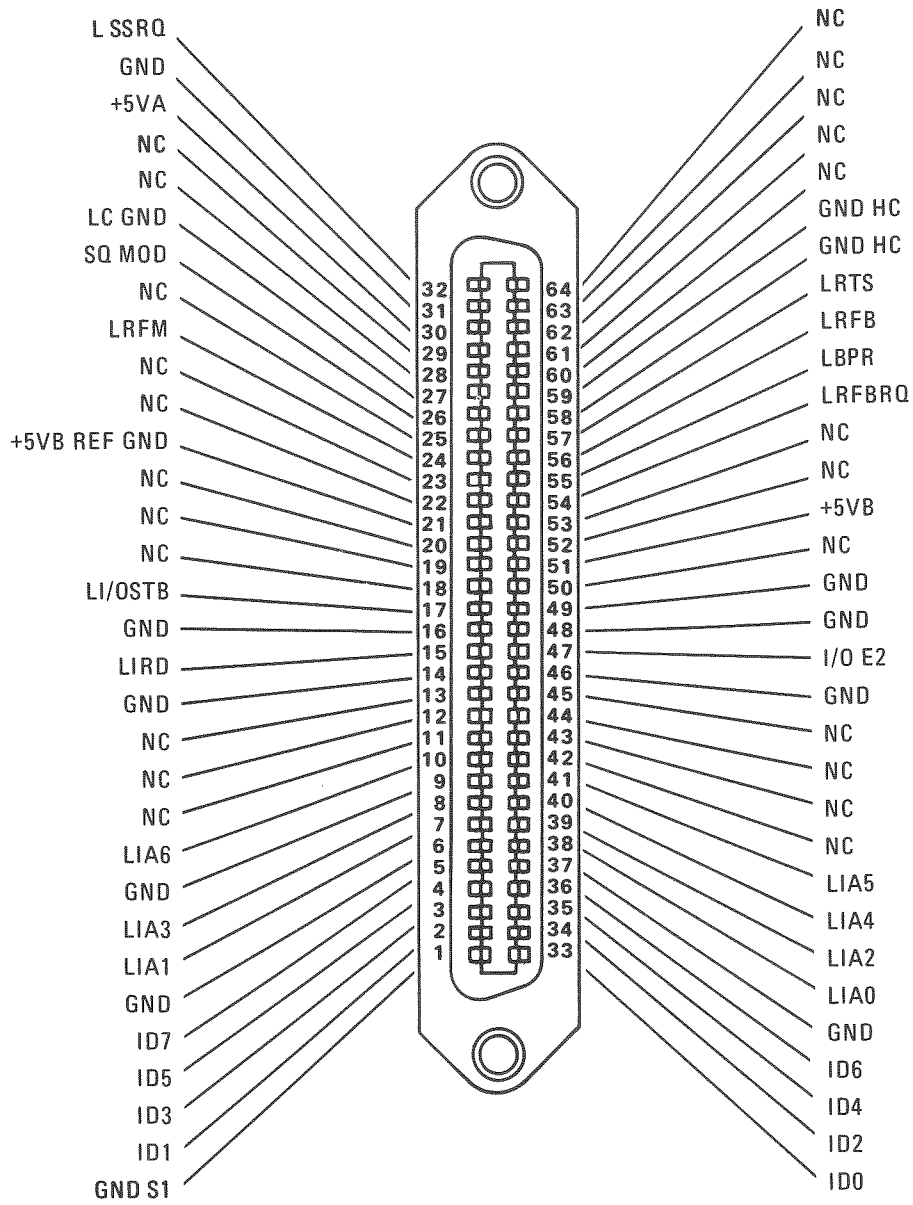


Figure 2-6. Interface Signals on Connector P3

2-18. STORAGE AND SHIPMENT**2-19. Environment**

2-20. The instrument may be stored or shipped in environments within the following limits:

Temperature -40 degrees C to +75
degrees C
Humidity Up to 95%
Altitude Up to 25,000 feet

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

2-21. Packaging

2-22. Original Packaging. Containers and materials identical to 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 assure careful handling. In any correspondence, refer to the instrument by model number and full serial number.

2-23. Other packaging. The following general instructions should be used for repackaging with commercially available materials:

- a. Wrap instruments in heavy paper or plastic. (If shipping to Hewlett-Packard office or service center, attach a 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 (3 to 4-inch layer) 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.

SECTION III OPERATION

3-1. INTRODUCTION

3-2. The HP 11869A RF Plug-in Adapter has no operating controls except the four identification switches (A1S1, Figure 3-1) located on the top panel. These switches are set for the RF Plug-in that is mated to the 11869A. See Section II for instructions for setting these switches.

3-3. The settings of A1S1 switches are interogated at Power-On, when the 8350A undergoes

an Instrument Preset (local front panel INSTR PRESET pressed), or when an HP-IB "IP" command is received. Any change in switch settings will affect the 8350A START/STOP frequency.

3-4. For additional operating instruction for the 8350A/11869A/86200 Series Plug-in Sweep Oscillator, refer to the 8350A Operating and Service Manual.

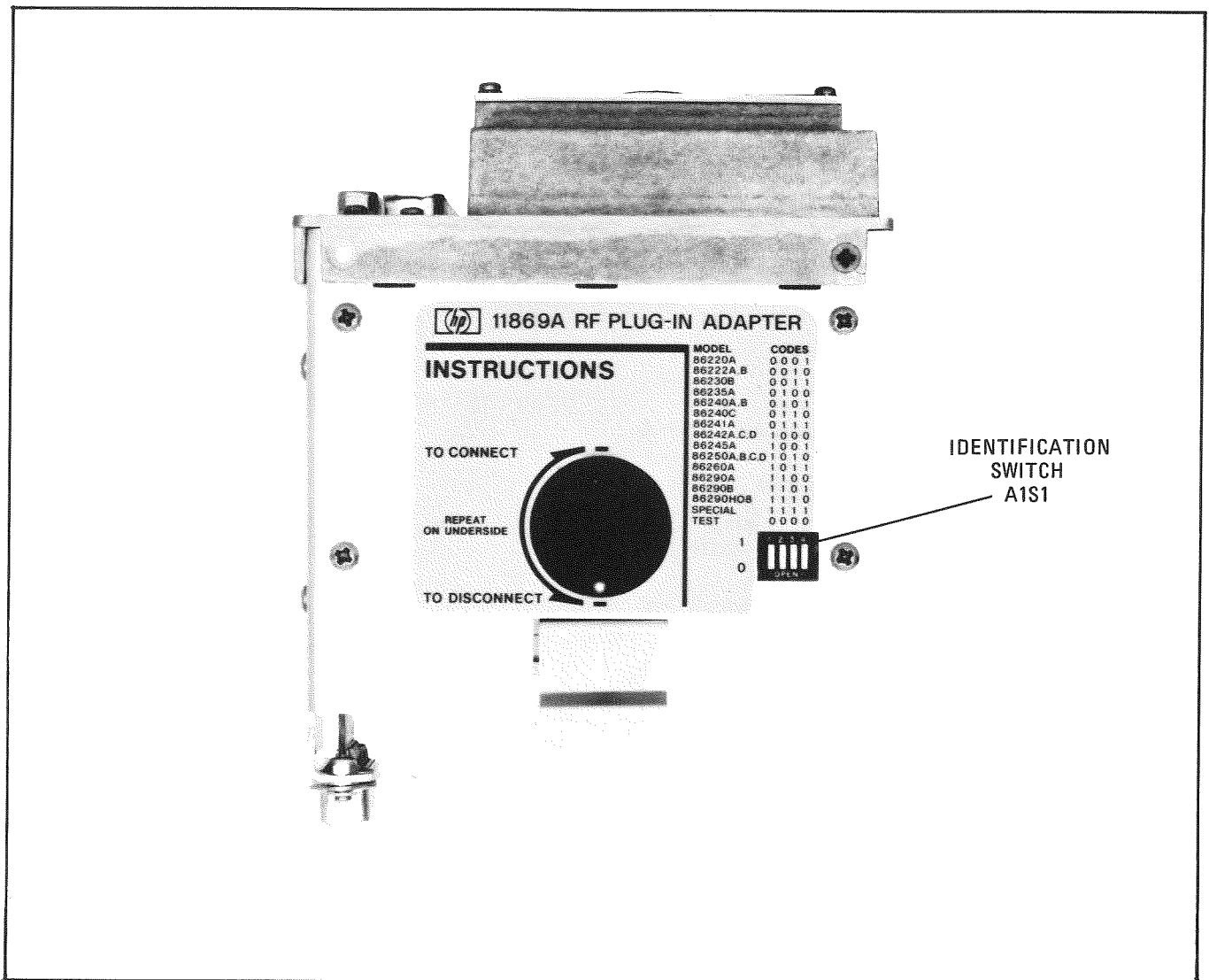


Figure 3-1. RF Plug-in Identification Switch

SECTION IV PERFORMANCE TESTS

4-1. INTRODUCTION

4-2. The procedures in this section test the instruments electrical performance using the Operating Characteristics of Table 1-1 as the performance standards. All tests can be performed without access to the interior of the instrument.

4-3. EQUIPMENT REQUIRED

4-4. Equipment required for the performance tests consists of the following:

- a. 8350A Sweep Oscillator
- b. 86200 Series RF Plug-in (Only the 86290 will exercise all signal lines.)

4-5. TEST RECORD

4-6. Results of the performance tests may be tabulated on the Test Record (Table 4-1) at the end of the procedures.

4-7. PERFORMANCE TESTS

4-8. Self Test

- a. Connect the 11869A to the selected 86200 Series Plug-in and install the assembly into an 8350A Sweep Oscillator. (Selection of an 86290 RF Plug-in is preferred so that the multiband switching circuits in the 11869A can be checked.)
- b. On the 8350A, press INSTR PRESET button. This initiates a series of self-tests

within the instrument, including one in the 11869A. If the error message "E001" appears on the left-side FREQUENCY readout, the 11869A did not pass self-test. If no error message appeared, the sweep oscillator and RF plug-in passed all of the self-tests. (For a complete list of error messages, refer to the 8350A Operating and Service Manual.)

4-9. CW and Manual Gate

- a. To test the "CW and Manual Gate" signal, perform the Residual FM test in CW mode as described in the Operating and Service Manual of the RF Plug-in being used.

NOTE

If the "CW and Manual Gate" signal from the 11869A is not correct, excessive residual FM will be present.

4-10. Multiband Operation (86290 only)

- a. If an 86290 RF Plug-in is being used, select START frequency of 2 GHz, a STOP frequency of 18 GHz, and fast sweep mode.
- b. Check for proper band changing as described in the Operating and Service Manual for the 86290 RF Plug-in.

NOTE

If proper band switching does not occur, suspect the "0.01—0.1 RANGE", "SEQ SYNC", or "LSSRQ"(stop sweep) signals from the 11869A.

Table 4-1. Performance Test Record

Paragraph Number	Description	Lower Limit	Measured Value	Upper Limit
4-8	Self Test Self-test error messages (11869A error message is E001.)	No Error messages	—	
4-9	CW and Manual Gate Residual FM Test of 86200 Series RF Plug-in	See RF Plug-in Manual	—	
4-10	Multiband Operation (86290 RF Plug-in Only) Band Changing Test	See 86290 O & S Manual	—	

SECTION V ADJUSTMENTS

5-1. INTRODUCTION

5-2. There are no adjustments on the 11869A RF Plug-in Adapter.

SECTION VI REPLACEABLE PARTS

6-1. INTRODUCTION

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

WARNING

Any service or adjustment performed with the covers of the 8350A removed should only be performed by qualified service personnel. A shock hazard exists with the covers removed.

6-3. ABBREVIATIONS

6-4. Table 6-2 lists abbreviations used in the parts list and schematics. In some cases, two forms of the abbreviation are used, one in all capital letters, and one in partial or no capitals. This occurs because the abbreviations in the parts list are always all capitals. However, in the schematics, other abbreviation forms are used with both lower case and upper case letters.

6-5. REPLACEABLE PARTS LIST

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

- a. Electrical assemblies and their components in alpha-numerical order by reference designation.
- b. Chassis-mounted parts in alpha-numerical order by reference designation.
- c. Miscellaneous parts.

6-7. The information given for each part consists of the following:

- a. The Hewlett-Packard part number.
- b. Part number check digit (CD).
- c. The total quantity (Qty) in the major assembly (A1 or A2).
- d. The description of the part.
- e. A typical manufacturer of the part in a five-digit code.
- f. The manufacturer's number for the part

6-8. The total quantity for each part is given only once — at the first appearance of the part number in the list for each major assembly.

NOTE

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

6-9. ORDERING INFORMATION

6-10. To order a part listed in the replaceable parts table, quote the Hewlett-Packard Part number (with the check digit) indicating the quantity required, and address the order to the nearest Hewlett-Packard office. The check digit will ensure accurate and timely processing of your order.

6-11. To order a part that is not listed in the replaceable parts table, include the instrument model number, instrument serial number, description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard office.

6-12. PROM U6 FOR SPECIAL RF PLUG-INS

(those not listed on the top of the 11869A) require a special PROM to be inserted into the 11869A Adapter. Table 6-1 shows some of the most common specials and the HP part number. To order a PROM that is not listed in Table 6-1, contact your nearest HP Sales and Service Office.

6-13. Factory modified "Special" 86200 Series Plug-ins with non-standard frequency coverage

Table 6-1. PROMs Available for Special RF Plug-ins

HP MODEL NUMBER	FREQUENCY RANGE	HP PART NUMBER
86260B	10.0 to 15.5 GHz	86260-80001
86260C	17.0 to 22.0 GHz	86260-80002

Table 6-2. Reference Designators, Manufacturer's Codes, and Abbreviations (1 of 2)

REFERENCE DESIGNATIONS			
A. Assembly	(LED), Signaling Device (Audible or Visible)	MP. Miscellaneous Mechanical Part	TC. Thermocouple
AT. Attenuator, Isolator, Limiter, Termination	E Miscellaneous Electrical Part	P Electrical Connector (Movable Portion), Plug	TP Test Point
B Fan, Motor	F Fuse	Q Silicon Controlled Rectifier (SCR), Transistor, Triode Thyristor	U Integrated Circuit, Microcircuit
BT Battery	FL Filter	R Resistor	V Electron Tube
C Capacitor	H Hardware	RT Thermistor	VR Breakdown Diode (Zener), Voltage Regulator
CP Coupler	HY Circulator	S Switch	W Cable, Transmission Path, Wire
CR Diode, Diode Thyristor, Step Recovery Diode (SCR), Varactor	J Electrical Connector (Stationary Portion), Jack	T Transformer	X Socket
DC Directional Coupler	K Relay	TB Terminal Board	Y Crystal Unit (Piezoelectric, Quartz)
DL Delay Line	L Coil, Inductor		Z Tuned Cavity, Tuned Circuit
DS Annunciator, Lamp, Light Emitting Diode	M Meter		

MANUFACTURERS CODE LIST			
MFR. NO.	MANUFACTURER NAME	ADDRESS	ZIP CODE
00000	ANY SATISFACTORY SUPPLIER		
01295	TEXAS INSTR INC SEMICONDCMPNT DIV	DALLAS	TX 75222
04713	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX	AZ 85062
06001	GE CO ELEK CAP & BAT PROD DEPT	IRMO	SC 29063
11236	CTS OF BERNE INC	BERNE	IN 46711
24546	CORNING GLASS WORKS (BRADFORD)	BRADFORD	PA 16701
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO	CA 94304
56289	SPRAGUE ELECTRIC CO	NORTH ADAMS	MA 01247

Table 6-2. Reference Designators, Manufacturer's Codes, and Abbreviations (2 of 2)

11869A ABBREVIATIONS		
<p>A</p> <p>A Across Flats, Acrylic, Air (Dry Method), Ampere ASSY Assembly</p> <p>B</p> <p>BFR Before, Buffer BRS Brass</p> <p>C</p> <p>COM Commercial, Common CONT Contact, Continuous, Control, Controller</p> <p>D</p> <p>D Deep, Depletion, Depth, Diameter, Direct Current DCDR Decoder DEG Degree DR Dram, Drill, Drilled, Drive, Drum</p> <p>F</p> <p>F Fahrenheit, Farad, Female, Film (Resistor), Fixed, Flange, Flint, Fluorine, Frequency FL Flash, Flat, Fluid FXD Fixed</p> <p>G</p> <p>GEN General, Generator</p> <p>H</p> <p>HD Hand, Hard, Head, Heavy Duty HEX Hexadecimal, Hexagon, Hexagonal</p>	<p>I</p> <p>IC Collector Current, Integrated Circuit ID Identification, Inside Diameter IN Inch, Indium INP Input INV Invert, Inverter</p> <p>K</p> <p>K Kelvin, Key, Kilo, Potassium</p> <p>L</p> <p>LKG Leakage, Locking LS Loudspeaker, Low Power Schottky, Series Inductance</p> <p>M</p> <p>M Male, Maximum, Mega, Mil, Milli, Mode, Momentary, Mounting Hole Centers, Mounting Hole Diameter MA Milliampere MACH Machined MTLC Metallic MW Milliwatt</p> <p>O</p> <p>OCTL Octal</p> <p>P</p> <p>PC Picocoulomb, Piece, Printed Circuit PD Pad, Palladium, Pitch Diameter, Power Dissipation PLSTC Plastic POS Position, Positive</p>	<p>POZI Pozidriv Recess PRP Purple, Purpose</p> <p>R</p> <p>RES Research, Resistance, Resistor, Resolution RKR Rocker RVT Rivet, Riveted</p> <p>S</p> <p>SI Silicon, Square Inch SLDR Solder STL Steel</p> <p>T</p> <p>TA Ambient Temperature, Tantalum TC Thermoplastic THD Thread, Threaded TRIG Trigger, Triggerable, Triggering, Trigonometry TTL Tan Translucent, Transistor Transistor Logic</p> <p>U</p> <p>UF Microfarad</p> <p>V</p> <p>VDC Volts, Direct Current</p> <p>W</p> <p>W Watt, Wattage, White, Wide, Width, Wire</p>

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1	11869-60010	6	1	BOARD ASSEMBLY=LOGIC	28480	11869-60010
A1C1	0160-005A	0	1	CAPACITOR=FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A1C2	0160-2055	9	13	CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C3	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C4	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C5	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C6	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C7	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C8	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C9	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C10	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C11	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1C12	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A1J1	1251-5902	5	2	CONNECTOR 32=PIN M POST TYPE	28480	1251-5902
A1J2	1200-0626	3	2	SOCKET=IC 20=CONT DIP DIP=SLDR	28480	1200-0626
A1L1	08503-80001	9	1	COIL=TOROID	28480	08503-80001
A1MP1	0380-0111	0	4	STANDOFF=RVT=ON .25=IN=LG 6=32THD	00000	ORDER BY DESCRIPTION
A1MP2	0380-0111	0		STANDOFF=RVT=ON .25=IN=LG 6=32THD	00000	ORDER BY DESCRIPTION
A1MP3	0380-0111	0		STANDOFF=RVT=ON .25=IN=LG 6=32THD	00000	ORDER BY DESCRIPTION
A1MP4	0380-0111	0		STANDOFF=RVT=ON .25=IN=LG 6=32THD	00000	ORDER BY DESCRIPTION
A1R1	0757-0442	9	11	RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A1R2	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A1R3	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A1R4	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A1R5	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A1R6	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A1S1	3101-2063	8	1	SWITCH=RKR DIP=RKR=ASSY 4=1A .05A 30VDC	28480	3101-2063
A1U1	1820-1216	3	1	IC OCCR TTL LS 3=TO=8=LINE 3=INP	01295	8N74LS138N
A1U2	1820-1416	5	2	IC SCHMITT=TRIG TTL LS INV HEX 1=INP	01295	8N74LS14N
A1U3	1820-1416	5		IC SCHMITT=TRIG TTL LS INV HEX 1=INP	01295	8N74LS14N
A1U4	1810-0338	7	1	NETWORK=RES 16=DIP100.0 OHM X 8	11236	761-3=R100
A1U5	1820-1491	6	1	IC BFR TTL LS NON=INV HEX 1=INP	01295	8N74LS367AN
A1U6				(SEE PARAGRAPH 6=12)		
A1U7	1820-2075	4	1	IC MISC TTL LS	01295	8N74LS245N
A1U8	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2=INP	01295	8N74LS03N
A1U9	1820-1730	6	2	IC FF TTL LS D=TYPE POS=EDGE=TRIG COM	01295	8N74LS273N
A1U10	1820-1730	6		IC FF TTL LS D=TYPE POS=EDGE=TRIG COM	01295	8N74LS273N
A1U11	1820-1917	1	1	IC BFR TTL LS LINE DRVR OCTL	01295	8N74LS240N
A1U12	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	8N74LS244N
A1XU6	1200-0507	9	1	SOCKET=IC 16=CONT DIP=SLDR	28480	1200-0507
A2	11869-60011	7	1	BOARD ASSEMBLY=CONNECTOR (INCLUDES CHASSIS MOUNTED P1)	28480	11869-60011
A2C1	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A2C2	0160-2055	9		CAPACITOR=FXD .01UF +80=20% 100VDC CER	28480	0160-2055
A2C3	0180-0269	5	1	CAPACITOR=FXD 1UF+50=10% 150VDC AL	56289	30D105G1508A2
A2C4	0180-0291	3	1	CAPACITOR=FXD 1UF+=10% 35VDC TA	56289	150D105X9035A2
A2C5	0180-233A	3	1	CAPACITOR=FXD 650UF+=20% 13VDC TA	06001	69F2330G7
A2CR1	1901-0033	2	1	DIODE=GEN PRP 180V 200MA DO=7	28480	1901-0033
A2J1	1200-0626	3	1	SOCKET=IC 20=CONT DIP DIP=SLDR	28480	1200-0626
A2J2	1250-0257	1	2	CONNECTOR=RF SMB M PC 50=OHM	28480	1250-0257
A2J3	1250-0257	1		CONNECTOR=RF SMB M PC 50=OHM	28480	1250-0257
A2MP1	0380-0600	2	3	STANDOFF=RVT=ON .219=IN=LG 6=32THD	00000	ORDER BY DESCRIPTION
A2MP2	0380-0600	2		STANDOFF=RVT=ON .219=IN=LG 6=32THD	00000	ORDER BY DESCRIPTION
A2MP3	0380-0600	2		STANDOFF=RVT=ON .219=IN=LG 6=32THD	00000	ORDER BY DESCRIPTION
A2Q1	1854-0477	7	2	TRANSISTOR NPN 2N2222A SI TO=18 PD=500MW	04713	2N2222A
A2Q2	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO=18 PD=500MW	04713	2N2222A
A2Q3	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO=18 PD=400MW	04713	2N2907A
A2R1	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A2R2	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A2R3	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A2R4	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A2R5	0757-0442	9		RESISTOR 10K 1% .125W F TC0+=100	24546	C4=1/8=TO=1002=F
A2R6	0757-0463	4	1	RESISTOR 82.5K 1% .125W F TC0+=100	24546	C4=1/8=TO=8252=F
A2R7	0698-3434	9	1	RESISTOR 34.8 1% .125W F TC0+=100	24546	C4=1/8=TO=3488=F
A2R8	0757-0421	4	1	RESISTOR 825 1% .125W F TC0+=100	24546	C4=1/8=TO=825R=F

See introduction to this section for ordering information

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
MP1	0361=1088	2	4	RIVET, NYLON SLIDE BLIND DR PIN	28480	0361=1088
MP2	0361=1088	2		RIVET, NYLON SLIDE BLIND DR PIN	28480	0361=1088
MP3	0361=1088	2		RIVET, NYLON SLIDE BLIND DR PIN	28480	0361=1088
MP4	0361=1088	2		RIVET, NYLON SLIDE BLIND DR PIN	28480	0361=1088
MP5	7121=0551	1		LABEL=TOP	28480	7121=0551
MP6	11869=40001	3	2	ADAPTER KNOB	28480	11869=40001
MP7	11869=40001	3		ADAPTER KNOB	28480	11869=40001
MP8	11869=00002	0		CLIP=MOUNTING	28480	11869=00002
MP9	11869=00002	0		CLIP=MOUNTING	28480	11869=00002
MP10	2360=0117	6		SCREW=MACH 6=32 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP11	2360=0117	6		SCREW=MACH 6=32 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP12	2360=0117	6	SCREW=MACH 6=32 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION	
MP13	2360=0117	6	SCREW=MACH 6=32 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION	
MP14	2360=0117	6	SCREW=MACH 6=32 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION	
MP15	2360=0117	6	SCREW=MACH 6=32 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION	
MP16	2360=0117	6	SCREW=MACH 6=32 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION	
MP17	2360=0117	6		00000	ORDER BY DESCRIPTION	
MP18	2360=0117	6		00000	ORDER BY DESCRIPTION	
MP19	2360=0117	6		00000	ORDER BY DESCRIPTION	
MP20	2360=0117	6		00000	ORDER BY DESCRIPTION	
MP21	3050=0227	3		4	WASHER=FL MTLG NO. 6 .149=IN=ID	28480
MP22	3050=0227	3	WASHER=FL MTLG NO. 6 .149=IN=ID		28480	3050=0227
MP23	3050=0227	3	WASHER=FL MTLG NO. 6 .149=IN=ID		28480	3050=0227
MP24	3050=0227	3	WASHER=FL MTLG NO. 6 .149=IN=ID		28480	3050=0227
MP25	11869=00004	2	SLIDE=ADAPTER		28480	11869=00004
MP26	6960=0001	3	4	PLUG=HOLE DOME=HD FOR .375=D=HOLE STL	28480	6960=0001
MP27	6960=0001	3		PLUG=HOLE DOME=HD FOR .375=D=HOLE STL	28480	6960=0001
MP28	6960=0001	3		PLUG=HOLE DOME=HD FOR .375=D=HOLE STL	28480	6960=0001
MP29	6960=0001	3		PLUG=HOLE DOME=HD FOR .375=D=HOLE STL	28480	6960=0001
MP30	6960=0046	6		PLUG=HOLE DOME=HD FOR .688=D=HOLE BRS	28480	6960=0046
MP31	2200=0107	6	4	SCREW=MACH 4=40 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP32	2200=0107	6		SCREW=MACH 4=40 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP33	2200=0107	6		SCREW=MACH 4=40 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP34	2200=0107	6		SCREW=MACH 4=40 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP35	0590=0076	1		NUT=HEX=PLSTC LKG 4=40=THD .143=IN=THK	28480	0590=0076
MP36	0590=0076	1	NUT=HEX=PLSTC LKG 4=40=THD .143=IN=THK	28480	0590=0076	
MP37	0590=0076	1		28480	0590=0076	
MP38	0590=0076	1		28480	0590=0076	
MP39	11869=00003	1		PANEL=EAR	28480	11869=00003
MP40	0050=2032	9		CASTING=ALUMINUM, REAR FRAME	28480	0050=2032
MP41	2200=0105	4	4	SCREW=MACH 4=40 .312=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP42	2200=0105	4		SCREW=MACH 4=40 .312=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP43	2200=0105	4		SCREW=MACH 4=40 .312=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP44	2200=0105	4		SCREW=MACH 4=40 .312=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP45	7120=2359	9		LABEL=SERIAL	28480	7120=2359
MP46	2360=0181	4	4	SCREW=MACH 6=32 .25=IN=LG 82 DEG	00000	ORDER BY DESCRIPTION
MP47	2360=0181	4		SCREW=MACH 6=32 .25=IN=LG 82 DEG	00000	ORDER BY DESCRIPTION
MP48	2360=0181	4		SCREW=MACH 6=32 .25=IN=LG 82 DEG	00000	ORDER BY DESCRIPTION
MP49	2360=0181	4		SCREW=MACH 6=32 .25=IN=LG 82 DEG	00000	ORDER BY DESCRIPTION
MP50	11869=00001	9		DECK=ADAPTER	28480	11869=00001
MP51	0590=0106	8	2	NUT=HEX=PLSTC LKG 2=56=THD .143=IN=THK	00000	ORDER BY DESCRIPTION
MP52	3050=0098	6		WASHER=FL MTLG NO. 2 .094=IN=ID	28480	3050=0098
MP53	3050=0098	6		WASHER=FL MTLG NO. 2 .094=IN=ID	28480	3050=0098
MP54	3050=0098	6		WASHER=FL MTLG NO. 2 .094=IN=ID	28480	3050=0098
MP55	3050=0098	6		WASHER=FL MTLG NO. 2 .094=IN=ID	28480	3050=0098
MP56	0520=0130	1	2	SCREW=MACH 2=56 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP57	0520=0130	1		SCREW=MACH 2=56 .375=IN=LG PAN=HD=POZI	00000	ORDER BY DESCRIPTION
MP58	0590=0106	8		NUT=HEX=PLSTC LKG 2=56=THD .143=IN=THK	00000	ORDER BY DESCRIPTION
MP59	7121=1050	7		LABEL=BOTTOM	28480	7121=1050
P1	1251=0484	8		1	CONNECTOR 36=PIN F MICRO RIBBON	28480
P2	1251=3502	7	CONNECTOR 21=PIN M D SERIES		28480	1251=3502
P3	1251=5901	4	CONNECTOR 64=PIN M MICRO RIBBON		28480	1251=5901
W	116	1	1	CABLE ASSEMBLY=16=PIN M RECTANGULAR	28480	116
W1	11869=60001	5		CONNECTOR 16=PIN M RECTANGULAR	28480	11869=60001
W1P1	1251=2615	1		CONNECTOR 16=PIN M RECTANGULAR	28480	1251=2615
W1P2	1251=2615	1		CABLE ASSEMBLY=64=PIN M MICRO RIBBON	28480	1251=2615
W2	11869=60002	6		(INCLUDES CHASSIS P3)	28480	11869=60002
W1P1	1251=5899	9	CONNECTOR 64=PIN F POST TYPE	28480	1251=5899	
W3	11869=60003	7	1	COAX CABLE, BROWN (VTUNE)	28480	11869=60003
W4	11869=60004	8		CABLE ASSEMBLY=17=PIN (INCLUDES CHASSIS P2)	28480	11869=60004
W5	11869=60005	9	1	COAX CABLE=YELLOW (AM INPUT)	28480	11869=60005
W6	11869=60012	6		COAX CABLE=BLUE (FREQ. REF.)	28480	11869=60012

See introduction to this section for ordering information

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
W7	11869-60013	9	1	COAX CABLE=VIOLET(FM INPUT)	28480	11869-60013
W8	11869-60014	0	1	COAX CABLE=GREY (PULSE IN)	28480	11869-60014
W9	11869-60015	1	1	COAX CABLE, INSULATED (WHITE) (EXT. ALC INPUT)	28480	11869-60015
W10	11869-20002	2	1	RF CABLE,REAR OUTPUT (OPT. 004) (ALL EXCEPT 86290A/B)	28480	11869-20002
W10P1	1250-1119	6	2	CONNECTOR=RF N M UNMTD 50-OHM	28480	1250-1119
W10P2	1250-1353	0	2	CONNECTOR=RF SMA M UNMTD 50-OHM	28480	1250-1353
W11	11869-20003	3	1	RF CABLE,REAR OUTPUT (OPT. 004) (86290A/B ONLY)	28480	11869-20003
W11P1	1250-1119	6		CONNECTOR=RF N M UNMTD 50-OHM	28480	1250-1119
W11P2	1250-1353	0		CONNECTOR=RF SMA M UNMTD 50-OHM	28480	1250-1353
	11869-60006	0		ADAPTER KIT (INCLUDES LATCH ACCESSORY KIT AND CABLES W6, W7, W8, W9)	28480	11869-60007
	11869-60007	1		LATCH ACCESSORY KIT (INCLUDES THE FOLLOWING)	28480	1460-1186 08621-20050 11869-20001 3050-0028
	1460-1186	2		SPRING	28480	
	08621-20052	7		SCREW LATCH	28480	
	11869-20001	1		LATCH-ADAPTER	28480	
	3050-0001	1		WASHER		
	11869-60008			CABLE KIT-OPT 004 (INCLUDES THE FOLLOWING)		
(W10)	11869-20002	2		RF CABLE, REAR-OPT 004 (ALL EXCEPT 86290A/B)		11869-20002
(W11)	11869-20003	3		RF CABLE, REAR-OPT. 004 (86290A/B ONLY)		11869-20003
(J1)	86290-60005	7		CONNECTOR ASSY (TYPE N) (RF OUTPUT)		86290-60005

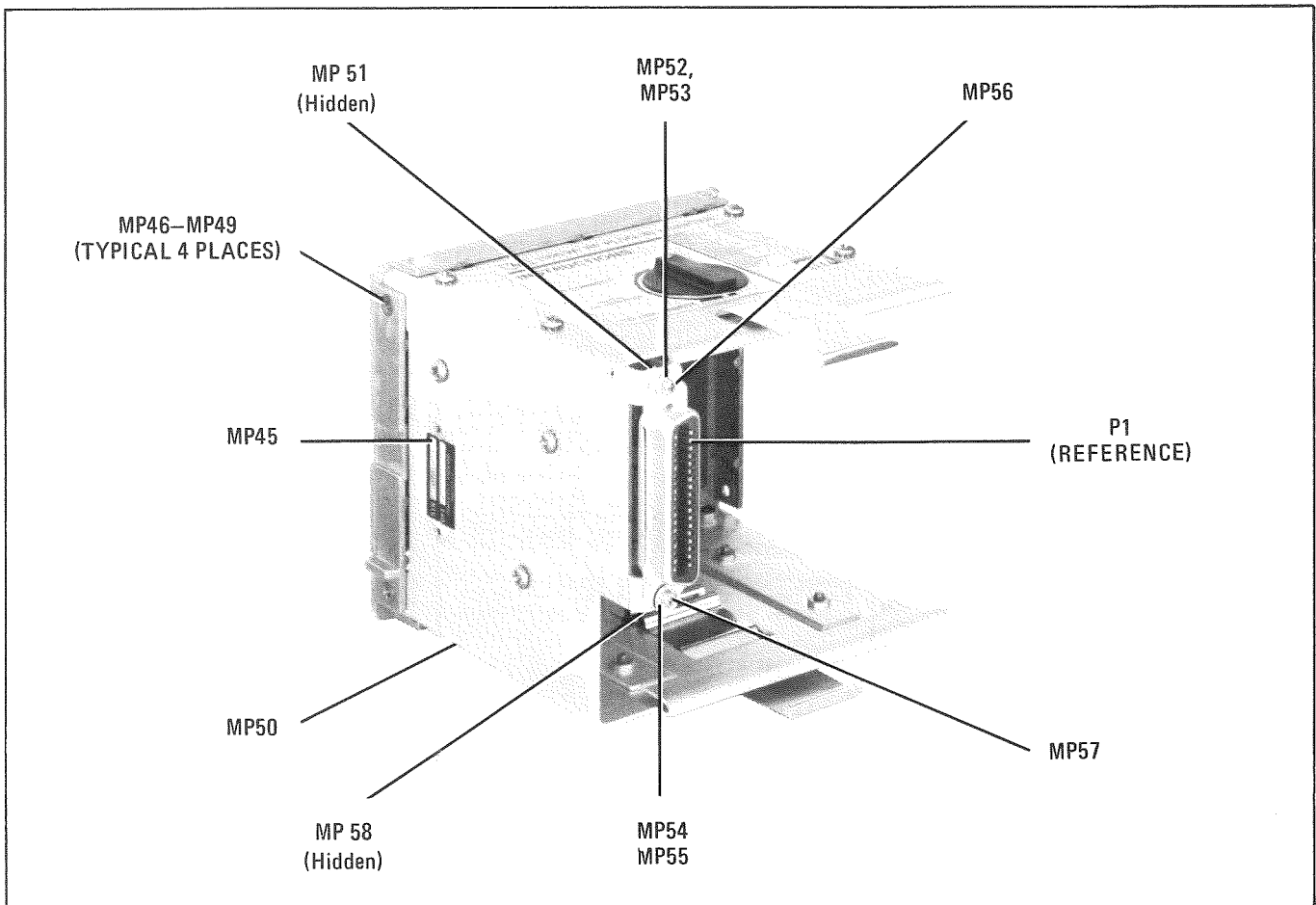


Figure 6-1. Mechanical Parts (1 of 2)

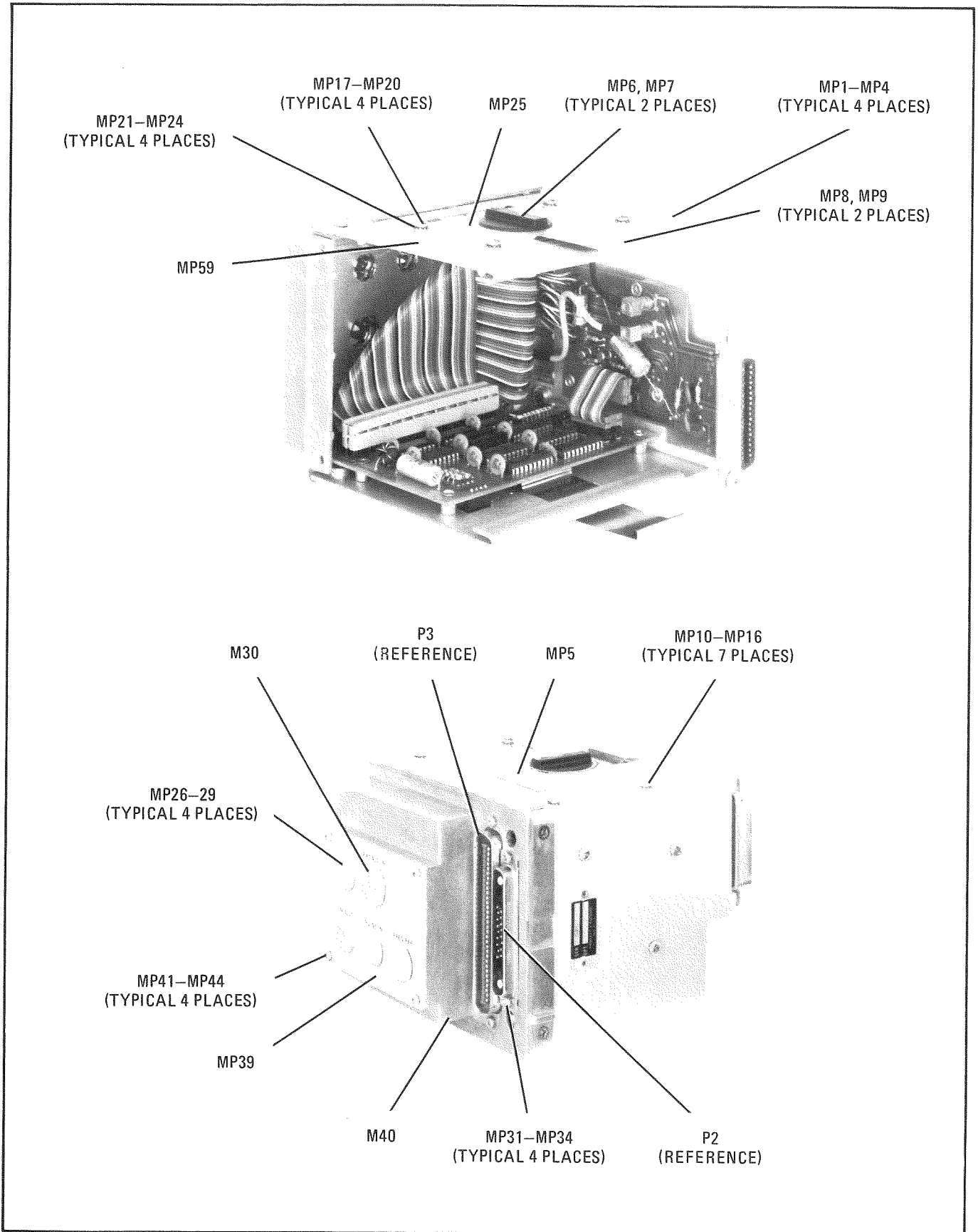


Figure 6-1. Mechanical Parts (2 of 2)

SECTION VII

MANUAL BACKDATING CHANGES

7-1. INTRODUCTION

7-2. This manual has been written for and applies directly to instruments with serial numbers prefixed as indicated on the title page. Earlier versions of the instrument (serial number prefixes lower than the one indicated on the title page) may be slightly different in design or appearance. The purpose of this section of the manual is to document these differences. With the information provided in this section, this manual can be corrected so that it applies to any earlier version or configuration of the instrument. Later versions of the instrument (serial number prefixes higher than the one indicated on the title page) are documented in a yellow Manual Changes Supplement.

7-3. Since there are no earlier versions of the HP Model 11869A RF Plug-in Adapter, there is no change information provided here. This manual applies directly to instruments with serial numbers prefixed as indicated on the title page. If your instrument serial number is different than the one on the title page, it will be documented in a yellow Manual Changes Supplement. Complimentary copies of this supplement can be obtained from your nearest Hewlett-Packard Office. Refer to **INSTRUMENTS COVERED BY MANUAL** in Section I for more information about serial number coverage.

SECTION VIII

SERVICE

8-1. INTRODUCTION

8-2. This section contains information for troubleshooting and repairing the Model 11869A RF Plug-in Adapter. This information includes theory of operation, block diagrams, schematics, parts location diagrams, and troubleshooting procedure.

WARNING

Troubleshooting inside the 11869A with the top or bottom cover removed from the 8350A and the ac power connected should be avoided whenever possible. Any procedure requiring a cover to be removed from the instrument and ac power connected to it **SHOULD BE PERFORMED ONLY BY QUALIFIED SERVICE PERSONNEL WHO ARE AWARE OF THE HAZARDS INVOLVED.** With the ac power cable connected to the instrument, the ac line voltage is present on the terminals of the line power module on the rear panel, and at the front panel **LINE** switch, whether the switch is on or off. The ac line voltage on these terminals can, if contacted, produce fatal electrical shock. You must also be aware that capacitors inside the instrument may remain charged even though the instrument has been disconnected from its ac power source.

8-3. SERVICE SHEETS

8-4. Circuit descriptions, parts locations diagrams, troubleshooting procedures, and schematics for the PC board assemblies are contained in Service Sheets. Each Service Sheet pertains to a particular one of the PC board assemblies.

8-5. SCHEMATIC DIAGRAM SYMBOLS

8-6. Definitions of the schematic diagram symbols, and other information you may need to help you interpret the schematic diagrams are provided in Figure 8-1.

8-7. MNEMONICS

8-8. The mnemonics used in this adapter are listed in Table 8-1. This list includes a signal description and interface pins to external connectors.

8-9. THEORY OF OPERATION

8-10. The 11869A adapts the 86200 Series RF Plug-ins so they may be used with the 8350A Sweep Oscillator mainframe. Some signals and power lines go directly through the 11869A without any modification. However, some signals must have amplification or level shifting circuits in the signal path to make them adaptable to the next circuit. This is the case with the "CW & MAN GATE" and ".01 - .1 s RANGE" signal lines. The signal lines either going out or coming into the 11869A are shown in Figure 8-2.

8-11. Another function of the 11869A is to decode and transmit to the mainframe the model number code of the RF Plug-in being used. This is interpreted into the correct frequency sweep range in the 8350A mainframe.

8-12. Also, the 11869A contains a self-test circuit that responds to the mainframe when a self-test sequence is initiated by the operator, or by power turn-on.

SCHEMATIC DIAGRAM NOTES











R, L, C	Resistance is in ohms, inductance is in microhenries, capacitance is in picofarads, unless otherwise noted.
P/O	Part of.
	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.
	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.
	Assembly ground.
	Indicates "WARNING: HAZARDOUS VOLTAGE."
	Male contact, cable plug (P) or cable receptacle (J)
	Female contact, cable plug (P) or cable receptacle (J)

Figure 8-1. Schematic Diagram Notes (1 of 3)

SCHEMATIC DIAGRAM NOTES (Cont'd)

GENERAL LOGIC ELEMENTS



AND Gate



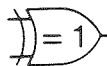
OR Gate



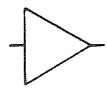
NAND Gate



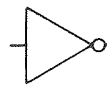
NOR Gate



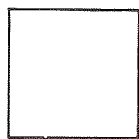
EXCLUSIVE OR Gate



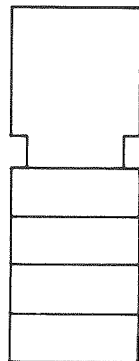
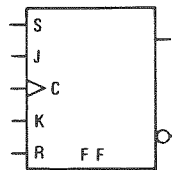
BUFFER



INVERTER

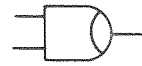


General Element, e.g.

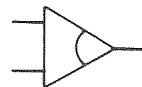
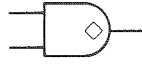


Common Control Block: Used to represent Integrated Circuit (IC).
(See Sheet 4 of this Figure.)

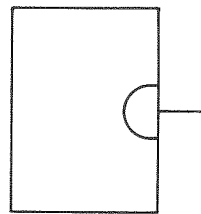
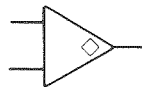
OPEN-COLLECTOR OUTPUT from logic element is indicated by open-collector symbol: (or ♦.



open-collector output AND Gate



open-collector Output Buffer



open-collector Output General Element

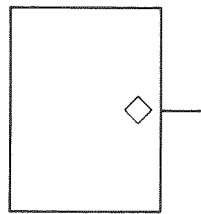
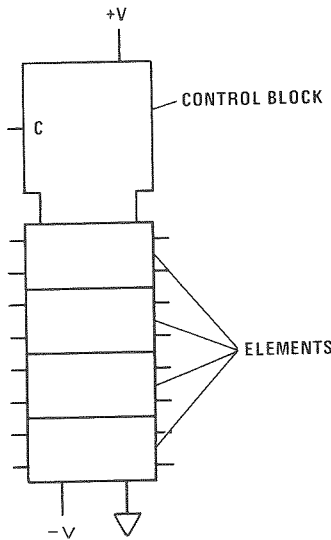


Figure 8-1. Schematic Diagram Notes (2 of 3)

SCHEMATIC DIAGRAM NOTES (Cont'd)



CONTROL BLOCK: All controlling inputs (gates, clocks, inhibits, etc.) connect to the control block.

ELEMENTS: Can be one or more of any logic function (flip-flop, counter, gate, RAM, etc.). Data inputs are on left side of element, data outputs on the right.

Positive logic is assumed. The more positive voltage level is HIGH and = Logic 1. The less positive voltage level is LOW and = Logic 0.

If a control line label contains a virgule (/), the indicated action or mnemonic to the left of the virgule is the active state of the line; and the indicated action or mnemonic to the right of the virgule is the non-active state of the line. For example: RD/WR means the active state of the line is RD (read) and the non-active state is WR (write).

Active-high inputs and outputs are indicated by the absence of a negation (o) symbol.

Active-low inputs and outputs are indicated by the presence of a negation (o) symbol.

Edge-sensitive inputs are indicated by the presence of a dynamic input symbol (>).

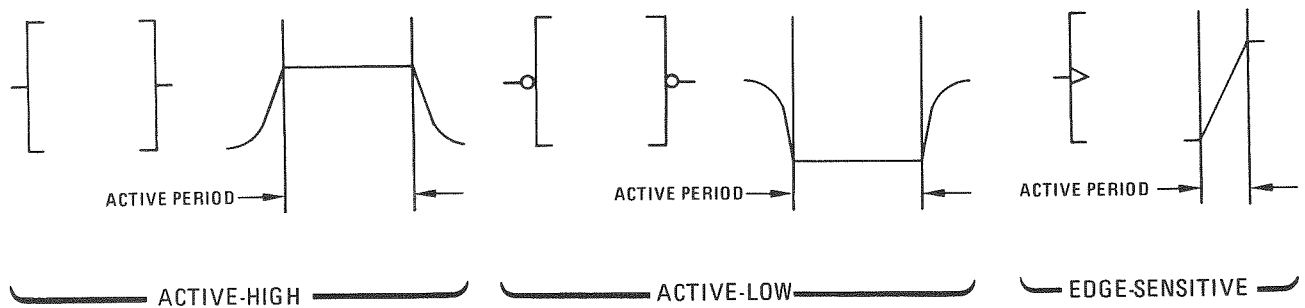


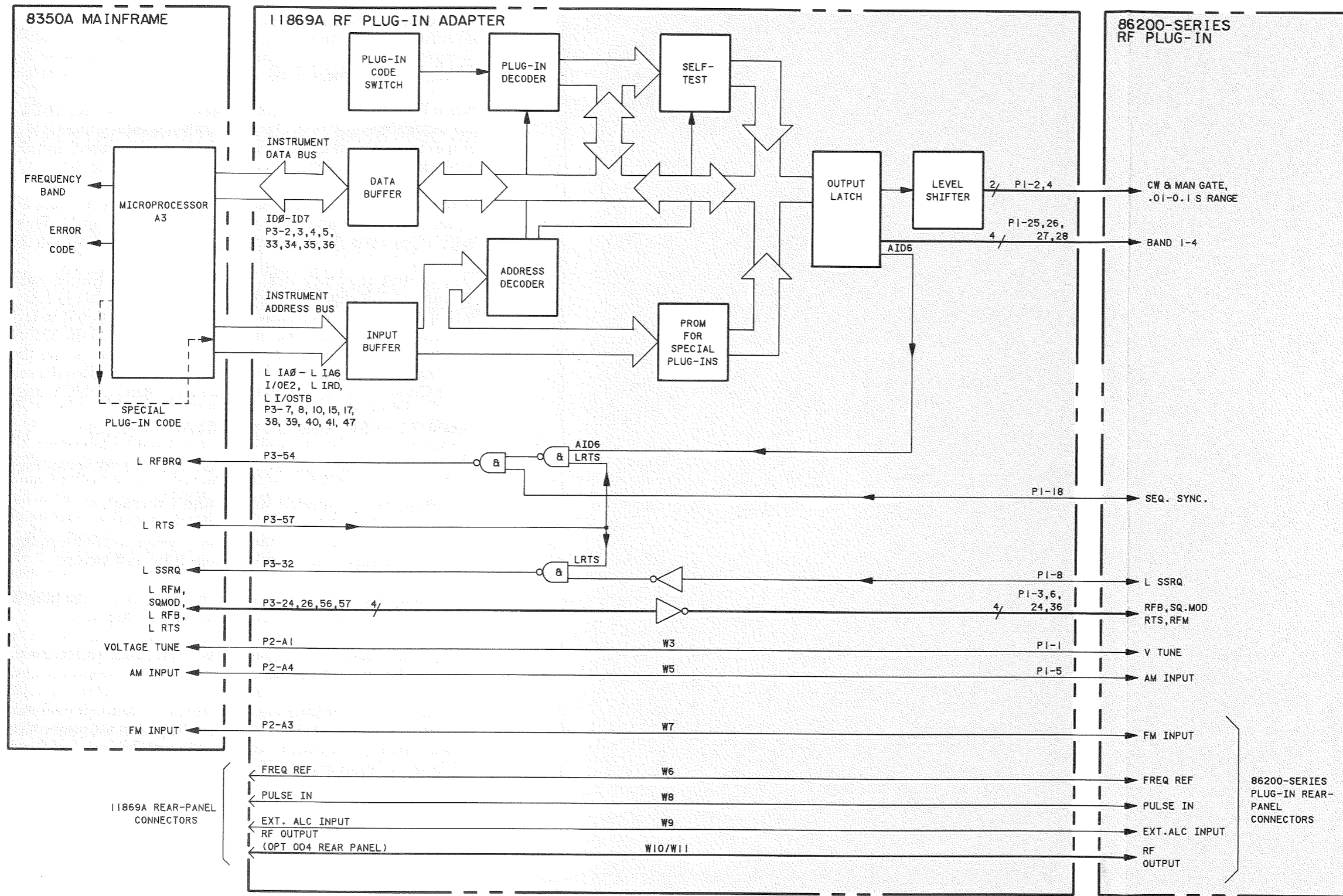
Figure 8-1. Schematic Diagram Notes (3 of 3)

Table 8-1. 11869A Mnemonics (1 of 2)

MNEMONIC	DESCRIPTION	11869A TO 8350A	8350A CONNECTOR	11869A TO RF PLUG-IN
AM INPUT	Amplitude Modulation Input	P2-A4	J3-A4	P1-5
BAND 1	Band 1 Turn On	—	—	P1-26
BAND 2	Band 2 Turn On	—	—	P1-25
BAND 3	Band 3 Turn On	—	—	P1-28
BAND 4	Band 4 Turn On	—	—	P1-27
L BPR	LOW = Blanking Pulse Request	P3-55	J2-55	—
CW & MAN. GATE	CW Filter Turn-On	—	—	P1-2
FM INPUT	Frequency Modulation Input	P2-A3	J3-A3	FM INPUT
L IA \emptyset	LOW = Instrument Address Line \emptyset (LSB)	P3-38	J2-38	—
L IA1	LOW = Instrument Address Line 1	P3-7	J2-7	—
L IA2	LOW = Instrument Address Line 2	P3-39	J2-39	—
L IA3	LOW = Instrument Address Line 3	P3-8	J2-8	—
L IA4	LOW = Instrument Address Line 4	P3-40	J2-40	—
L IA5	LOW = Instrument Address Line 5	P3-41	J2-41	—
L IA6	LOW = Instrument Address Line 6	P3-10	J2-10	—
ID \emptyset	Instrument Data Line \emptyset (LSB)	P3-33	J2-33	—
ID1	Instrument Data Line 1	P3-2	J2-2	—
ID2	Instrument Data Line 2	P3-34	J2-34	—
ID3	Instrument Data Line 3	P3-3	J2-3	—
ID4	Instrument Data Line 4	P3-35	J2-35	—
ID5	Instrument Data Line 5	P3-4	J2-4	—
ID6	Instrument Data Line 6	P3-36	J2-36	—
ID7	Instrument Data Line 7	P3-5	J2-5	—
I/OE2	HIGH = I/O Enable for RF Plug-in	P3-47	J2-47	—
L I/O STB	LOW = INPUT/OUTPUT Strobe	P3-17	J2-17	—
L IRD	LOW = Instrument Bus Read (High = Write)	P3-15	J2-15	—
L RFB	LOW = RF Blank	P3-56	J2-56	P1-3
L RFBRQ	LOW = RF Blank Request	P3-54	J2-54	—
L RFM	LOW = RF Marker	P3-24	J2-24	P1-36
L RTS	LOW = Retrace Strobe	P3-57	J2-57	—
SEQ SYNC	Blanking During Band Change	—	—	P1-18
L SSRQ	LOW = Stop Sweep Request	P3-32	J2-32	P1-8
SQ MOD	Squarewave Modulation	P3-26	J2-26	P1-6

Table 8-1. 11869A Mnemonics (2 of 2)

MNEMONIC	DESCRIPTION	11869A TO 8350A	8350A CONNECTOR	11869A TO RF PLUG-IN
V TUNE	Tuning Voltage	P2-A1	J3-A1	P1-1
.01—0.1 RANGE	Fast Sweep Correction Turn-On	—	—	P1-4
−10V REG	−10V Regulated Supply	P2-13	J3-13	P1-31
−10V UNREG	−10V Unregulated supply	P2-5	J3-5	P1-30
−10V REF (SENSE)	−10V Sense Line (Frequency Reference)	P2-4	J3-4	P1-11
−10V REF (thru R6)	−10V Reference to Sweep Speed Adjust Circuit	—	—	P1-7
−40V	−40V Supply	P2-11	J3-11	P1-29
+5 VB	+5 VB Supply	P2-6	J3-6	P1-33
+20V REF	+20V Frequency Reference	P2-7	J3-7	P1-9
+20V REG	+20V Regulated Supply	P2-7	J3-7	P1-34
+20V Sense	+20V Sense Line	P2-15	J3-15	—
−40V GND	−40V Ground Return	P2-1	J3-1	—
−10V GND	−10V Ground Return	P2-3	J3-3	—
+5VB GND	+5VB Ground Return	P2-8	J3-8	—
−40V GND SENSE	−40V Ground Sense	P2-10	J3-10	—
−10V GND SENSE	−10V Ground Sense	P2-12	J3-12	—
+20V GND	+20V Ground Return	P2-14	J3-14	—
−10V GND	−10V Ground Return	P2-16	J3-16	—
LC GND	Low Current Ground	—	—	P1-35
GND FREQ REF	Frequency reference ground	—	—	P1-10
HC GND	High Current Ground	—	—	P1-32



Serial Prefix: 2019A Date: August 25, 1980

Figure 8-2. Overall Troubleshooting Block Diagram

A1 LOGIC BOARD THEORY

SELF-TEST CIRCUIT (I)

When Power Turn-on occurs or when the INSTR PRESET key on the 8350A is pressed, a self-test sequence is initiated. One of the self-test subroutines is to determine if the plug-in is making proper connections to the 8350A, if it can be addressed, and if it can read data back to the 8350A. A block diagram of this circuit is shown in Figure 8-1.

When the 11869A is interrogated, the Instrument Address Bus produces a high AIRD (read) signal to U7 pin 1 and a high EN6 pulse at U10 pin 11. This allows the test-word data on the Instrument Data Bus to pass through U7 and to load into the flip-flops of U10.

The self-test sequence next reads back the test-word data to the 8350A as follows. The Instrument Address Bus produces a low EN4 (enable 4) at U12 pins 1 and 19, and a low AIRD (write) at U7 pin 1. This allows the self-test word stored in U10 to be transmitted back through U12 and U7 and out to the Instrument Data Bus to the 8350A mainframe. If the self-test word matches the one sent out by the 8350A, the plug-in passes the self-test. If the word is different than that transmitted from the 8350A, the plug-in failed the self-test, and the 8350A produces an Error Code E001 on the front panel left FREQUENCY digital display.

DATA BUFFER AND OUTPUT LATCH (B)(E)

The three main commands supplied to the 86200 Series Plug-ins by the A1 board are:

1. Drive the band select lines, Band 1 through 4.
2. Make line “.01 — .1 s Range” (fast sweep) available to the plug-in. This signal changes the delay compensation in the plug-in for fast sweep.
3. Make line “CW & MAN GATE” available to the plug-in. This line switches a capacitor across the YIG tuned oscillator in the plug-in.

These functions must be generated in logic commands from the 8350A on the Instrument Data Bus and the Instrument Address Bus.

To decode one of the forgoing commands, the following sequence occurs. Let us assume that the command from the 8350A is to turn on Band 1 in the plug-in. Instrument data line ID0 would be high and ID1 through ID3 would be low at the input of Data Buffer U7. A high (read) signal AIRD from Input Buffer U2 is applied to U7 pin 1 and opens the input of Data Buffer U7, allowing the data word that commands “Band 1 turn on” to pass through U7 to the input of

A1 LOGIC BOARD THEORY (Cont'd.)

Output Latch U9. EN2 (enable 2) gate from address decoder U1, produced by the address bus word, strobes U9 to load the data word into U9. The data word is latched in U9 and continues to transmit the "Band 1" command to the plug-in until another band selection command is received from the 8350A.

STOP SWEEP AND SEQUENTIAL SYNC CIRCUITS FOR MULTI-BAND PLUG-INS (G)

Stop Sweep

When using a multi-band RF plug-in, the sweep must be stopped during band changes. This is accomplished by U8C and U8D circuits. An LSSRQ (low stop sweep request) low level is applied to the input of U8D when band change occurs. If the second input to U8C, LRTS (low return sweep), is high indicating the sweep is forward and not in the return sweep mode, then an LSSRQ (low stop sweep request) low signal is produced at the output of U8C. This signal then stops the sweep momentarily until band change is complete.

RF Blanking Request

If a multiband plug-in is installed in the 8350A, a high bit is loaded into Output Latch U9 from instrument data line AID6. This bit is held in U9 and applied to one input of U8B AND gate. This allows an LRFBRQ (low RF blanking request) to be produced at the output of U8A to blank the RF output during band change of a multiband plug-in. LRTS (low return sweep) at the other input of U8B goes low during a return sweep, thus inhibiting LRFBRQ, then goes high during the forward sweep mode, causing the output of U8B to go low and pin 1 of U8A to go high. This allows a SEQ SYNC (sequential synchronization) pulse to generate an RF blanking request (LRFBRQ) during band change. This blanking request is used to generate the SYNC TRIG pulse in the 8350A used to trigger a Model 8410 Network Analyzer.

PLUG-IN MODEL DECODER (B)(D)

The frequency range of the plug-in model installed in the 11869A is displayed on the 8350A front panel LEDs. The plug-in model code that produces this display is generated as follows. The proper code that matches the installed plug-in is selected at switch S1 on the top of the 11869A adapter. (See Figure 8-4.) At the time the 8350A is ready to process the frequency range data, it sends the address code that produces a high EN1 (enable 1) from U1 Address Decoder to U5 pins 1 and 15, and a low AIRD (write) from U2 to U7 pin 1. This allows plug-in data from switch S1 in the plug-in decoder circuit to flow through U5 and U7 out the Instrument Data Bus to the 8350A. In the 8350A, the plug-in data is processed into the appropriate frequency range and display.

A1 LOGIC BOARD THEORY (Cont'd.)

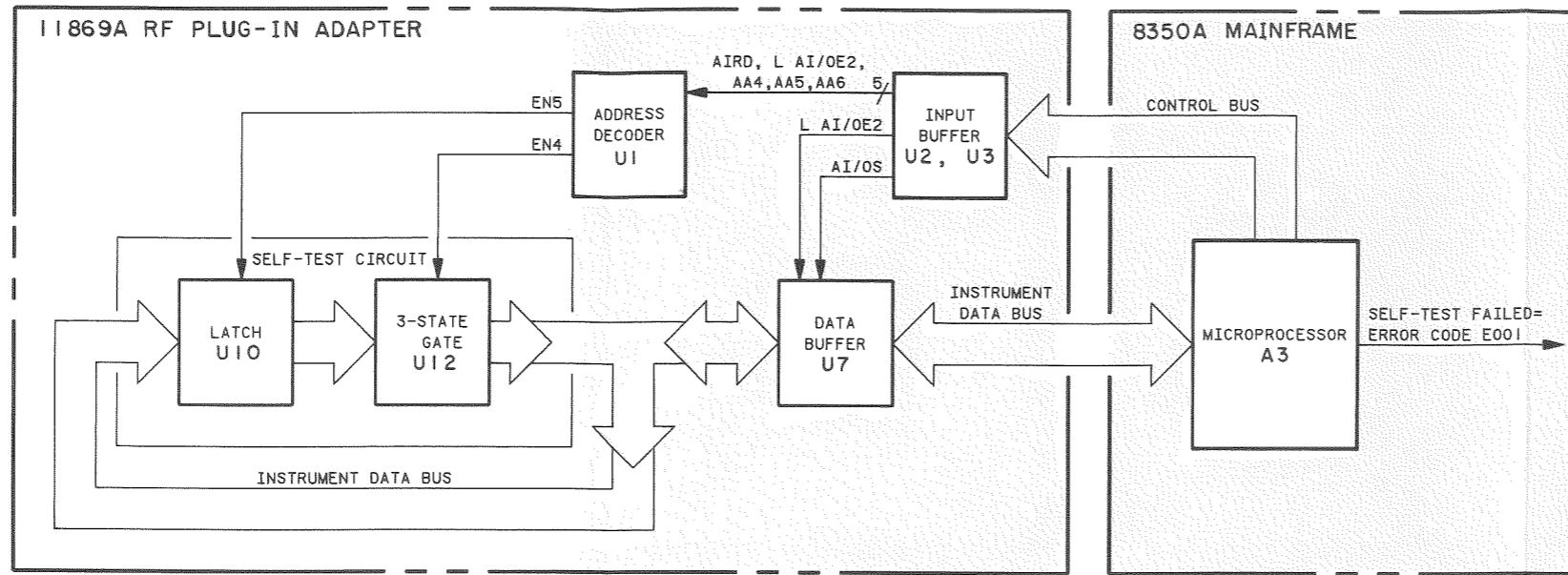
A "TEST" position (0000) on identification switch A1S1 produces a 0 to +10 volt ramp to the 86200 Series RF Plug-in and a 0 GHz to 10 GHz frequency display on the 8350A. The main purpose for this position is for troubleshooting. However, in the case where an RF Plug-in with a special frequency range (one not listed in Table 1-1) is to be used, and the special PROM described in the next paragraph is not available. The "TEST" position on the identification switch may be used and the displayed frequency information may be scaled mathematically. For example, if the Plug-in frequency range is 8 GHz to 15 GHz and the 8350A readout is 0 GHz to 10 GHz in "TEST," then the frequency scaling would be:

V TUNE	8350A FREQUENCY READOUT	ACTUAL FREQUENCY OF RF PLUG-IN
0V	0 GHz	8.0 GHz
+5V	5 GHz	11.5 GHz
+10V	10 GHz	15.0 GHz

PROM FOR SPECIAL PLUG-INS (F)

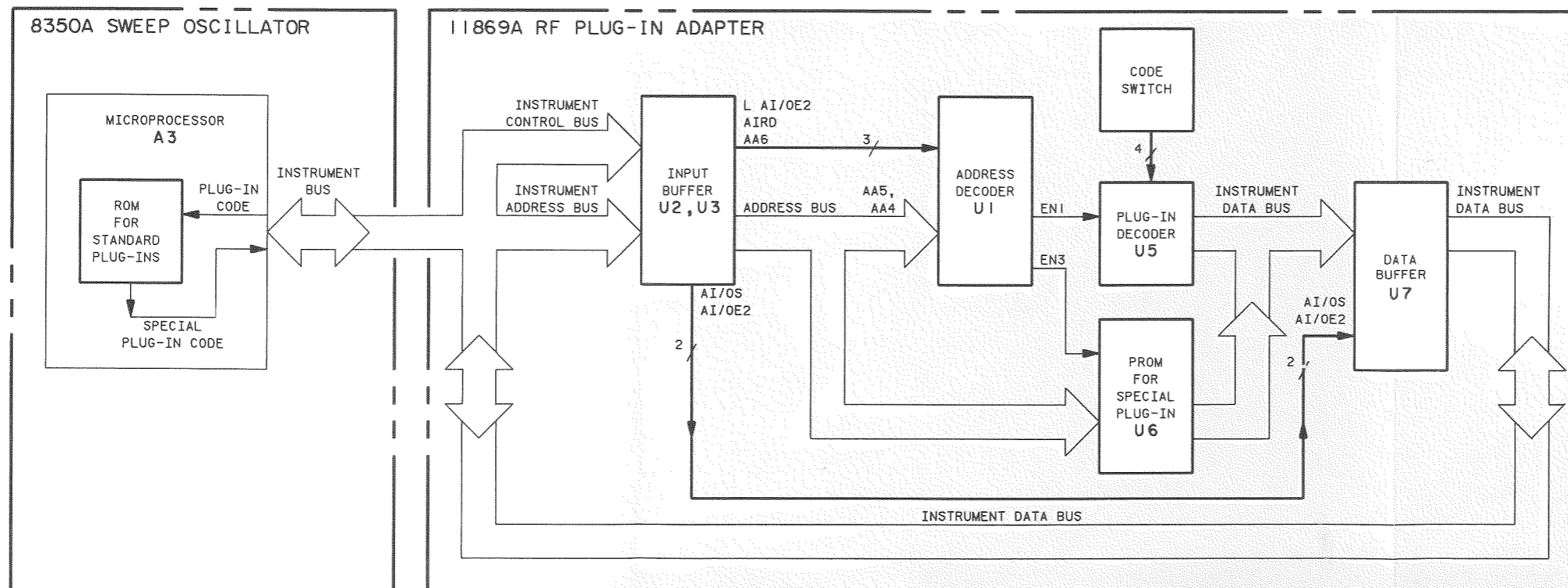
When a "SPECIAL" plug-in code is read from the Plug-in Decoder to the 8350A, the 8350A then initiates another series of commands to read the frequency range data out of the PROM plugged into U6 socket in the 11869A (Figure 8-4). The PROM contains the frequency range data for the special plug-in. All of the frequency range data for all of the special plug-ins cannot be stored in the 8350A mainframe. Therefore, provision is made to plug a PROM into the U6 socket of the 11869A that contains the frequency information required by the 8350A mainframe for that particular plug-in. A matching PROM is required for each "Special" plug-in.

When the 8350A is ready to process the PROM information, it places a low AIRD (write) at U7 pin 1 and it puts a binary code on instrument address lines LIA4 through LIA6 that produces a low EN3 (enable 3) at U6 pin 15 to enable U6. Address lines LIA0 through LIA3 pass the address through U3 to the input of the PROM in U6. The PROM then transmits out the word that corresponds to the address at its input. Several data words must be processed from the PROM, U6 to transmit all of the frequency information out to the 8350A mainframe. This data is obtained by applying a series of different addresses to U6, then reading each data word at the 8350A.



Serial Prefix: 2019A Date: August 25, 1980

Figure 8-3. Self-Test Block Diagram



Serial Prefix: 2019A Date: August 25, 1980

Figure 8-4. Plug-in Decoder and Special Plug-in PROM

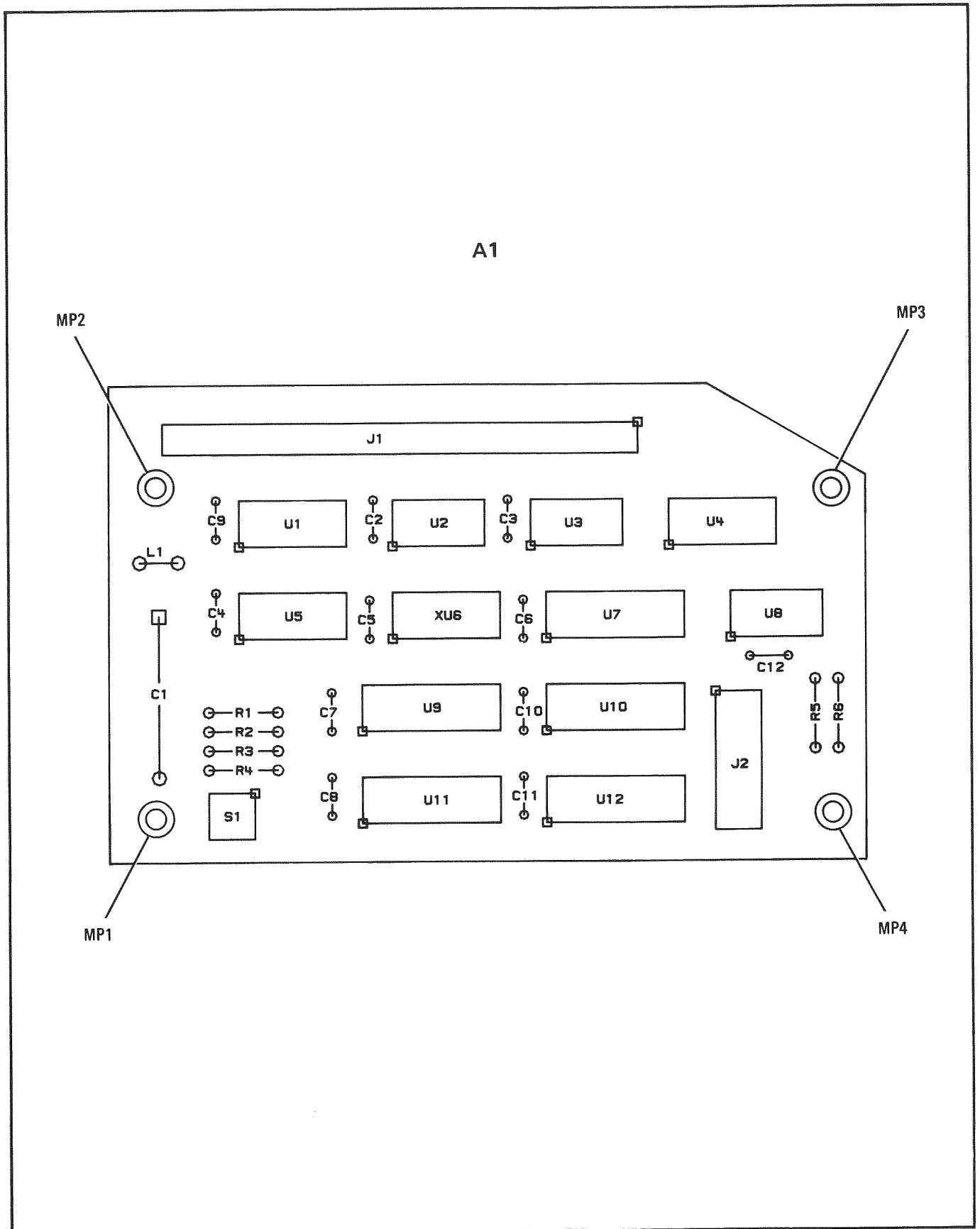
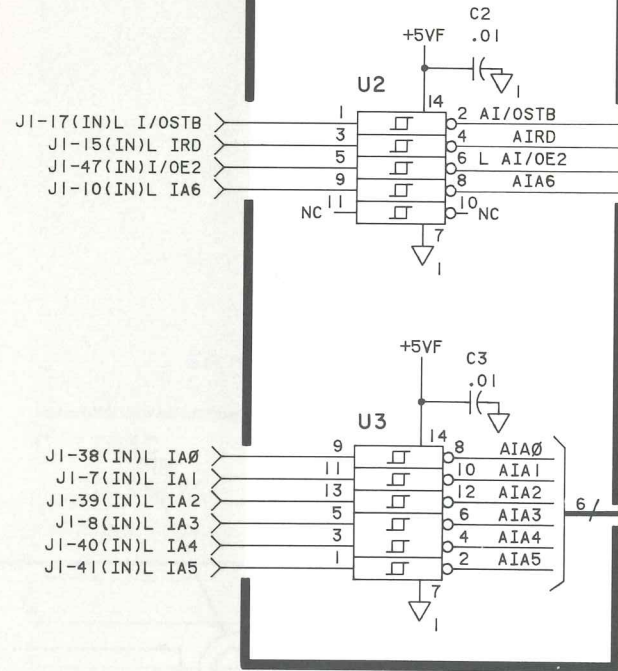


Figure 8-5. Logic Board A1 Parts Location

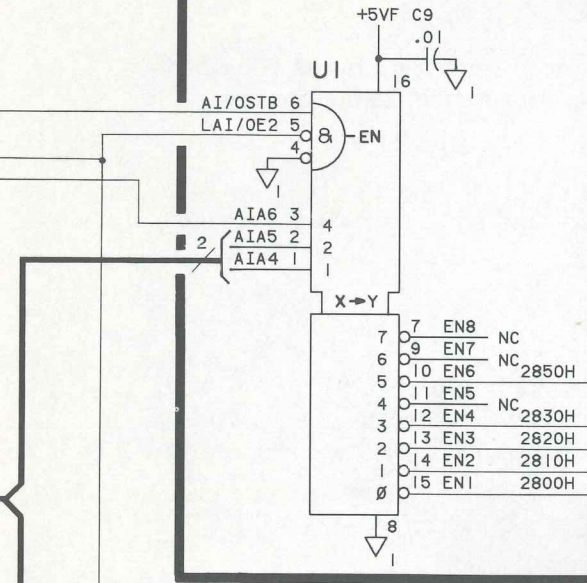
A1 LOGIC

11869-60010

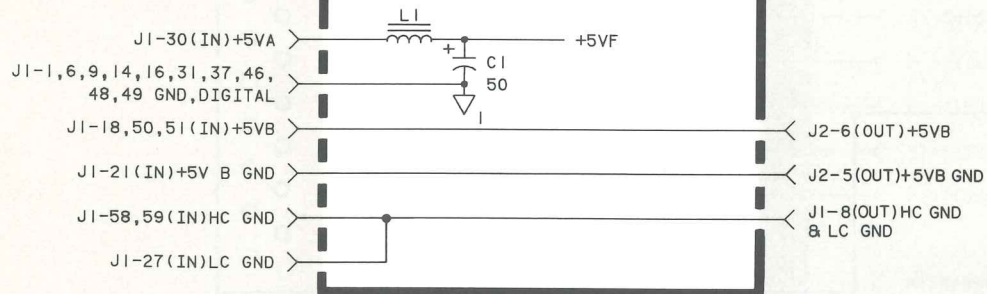
(A) INPUT BUFFER



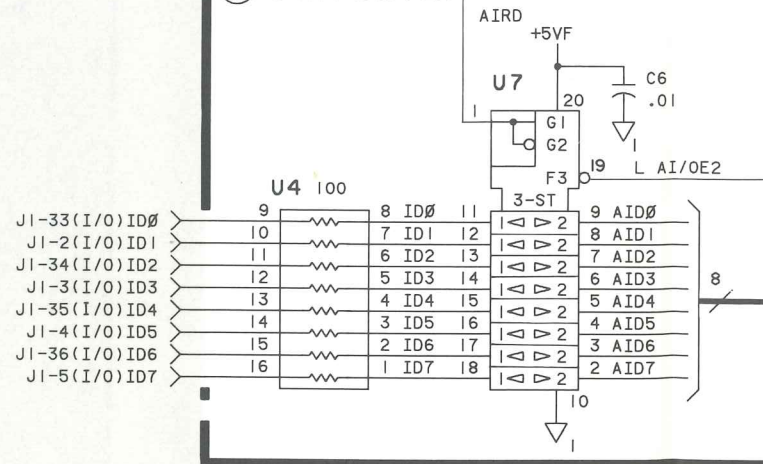
(C) ADDRESS DECODER



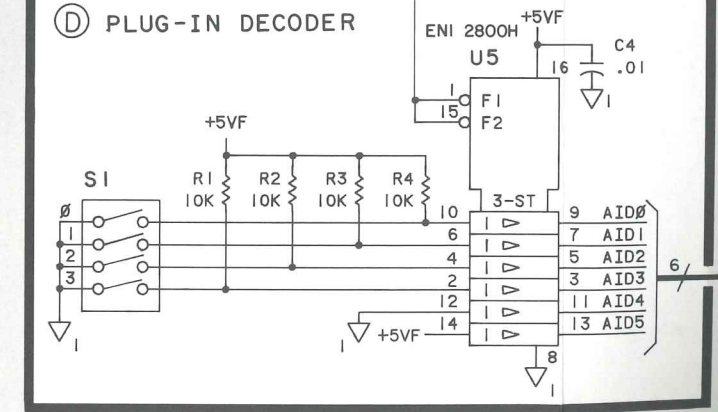
(J) SUPPLY FILTERING

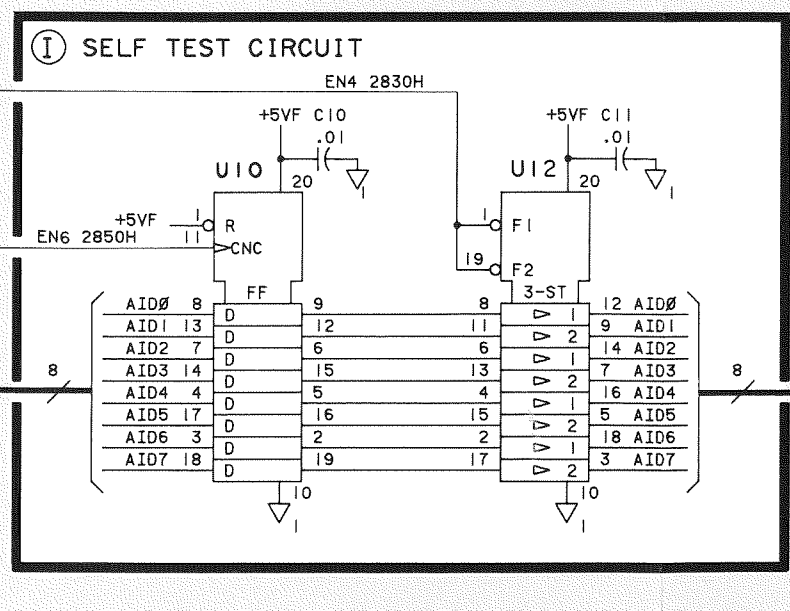
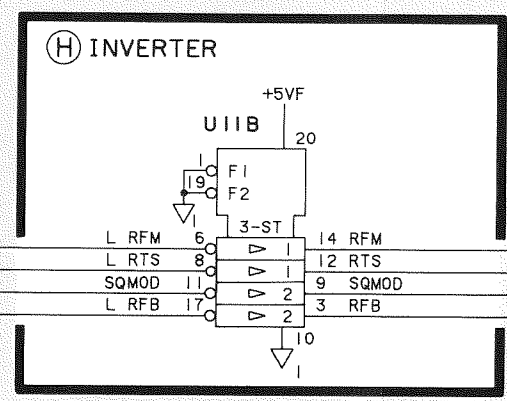
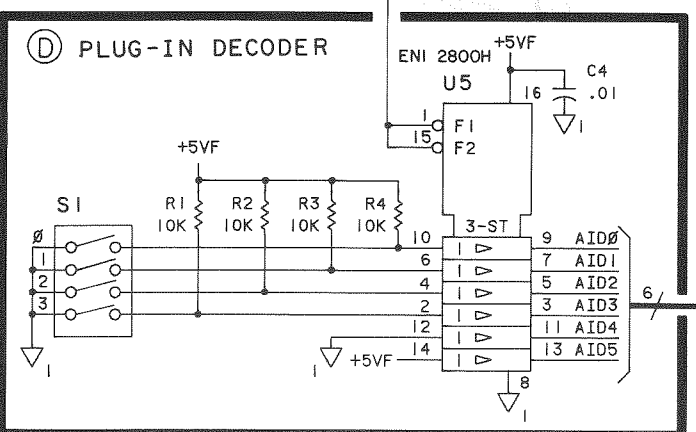
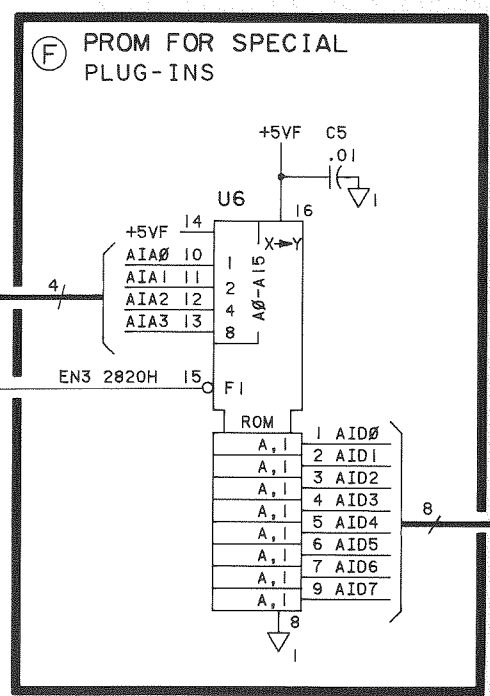
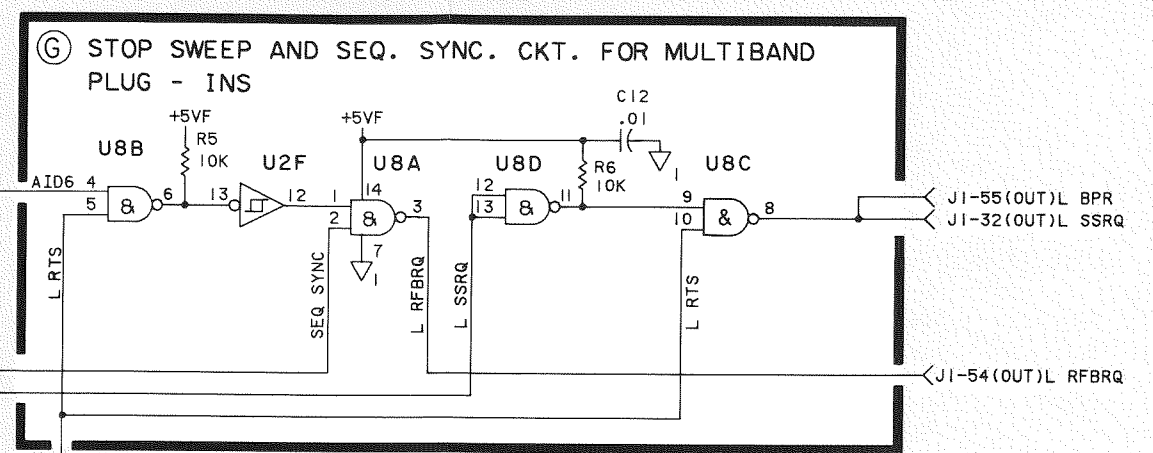
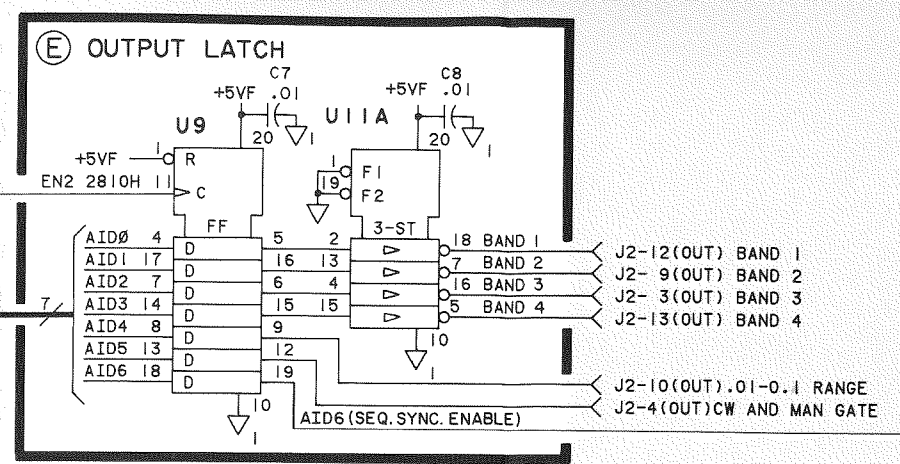
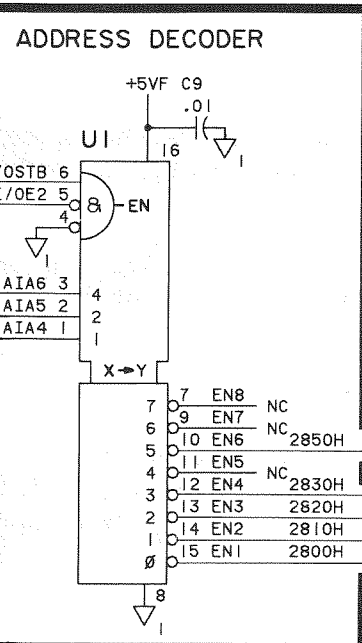


(B) DATA BUFFER



(D) PLUG-IN DECODER





A1

Figure 8-6. Logic Board A1 Schematic

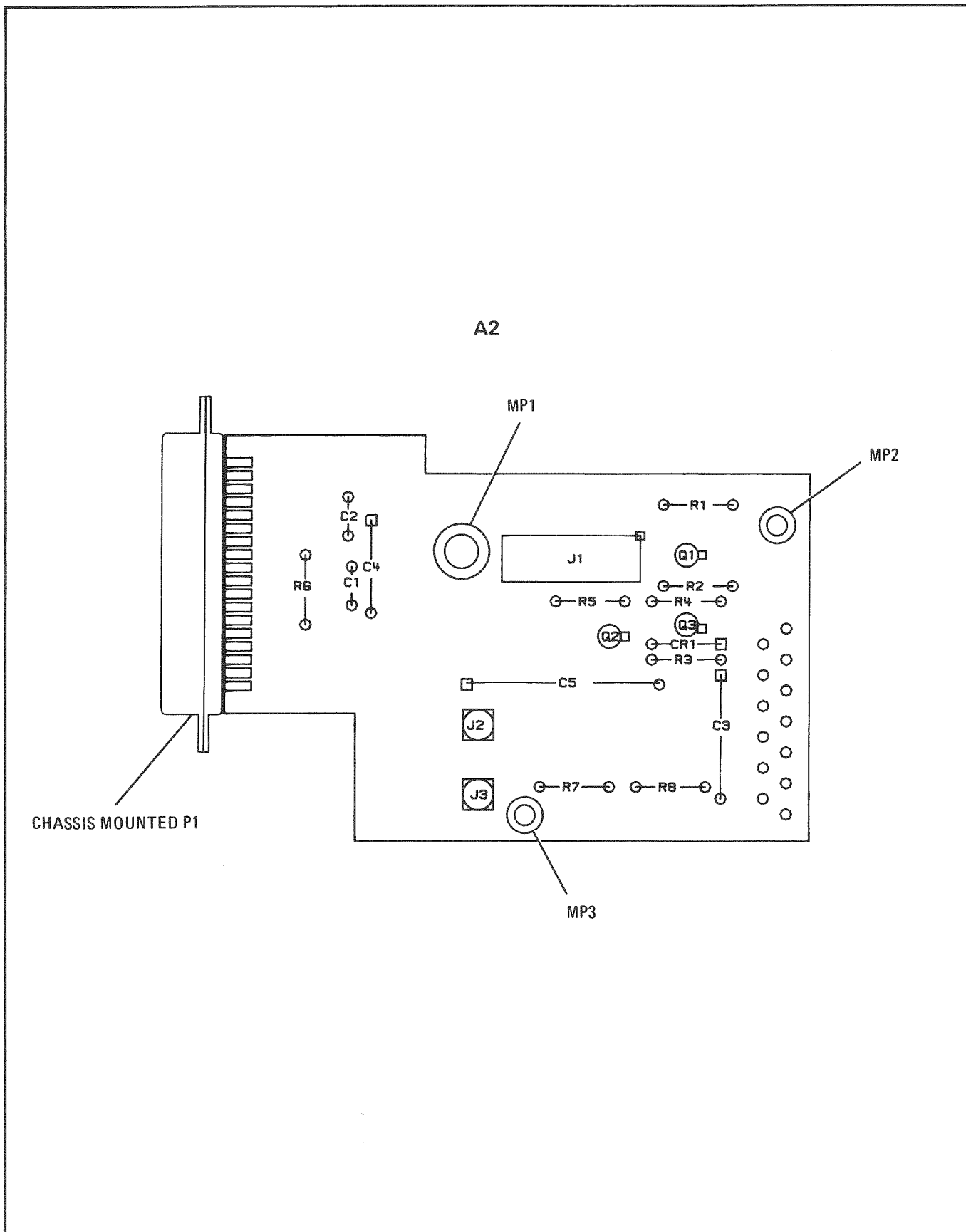
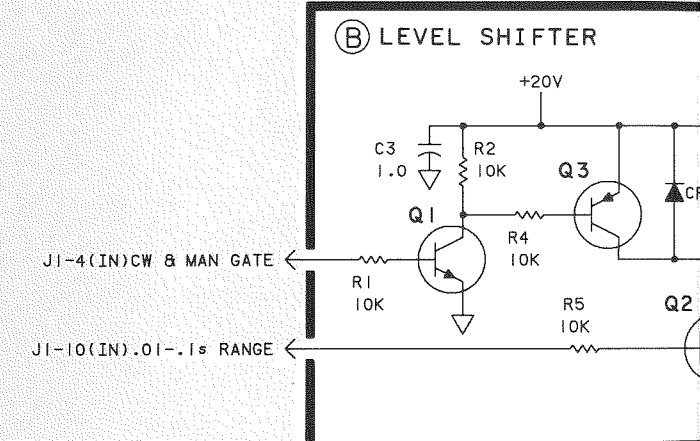
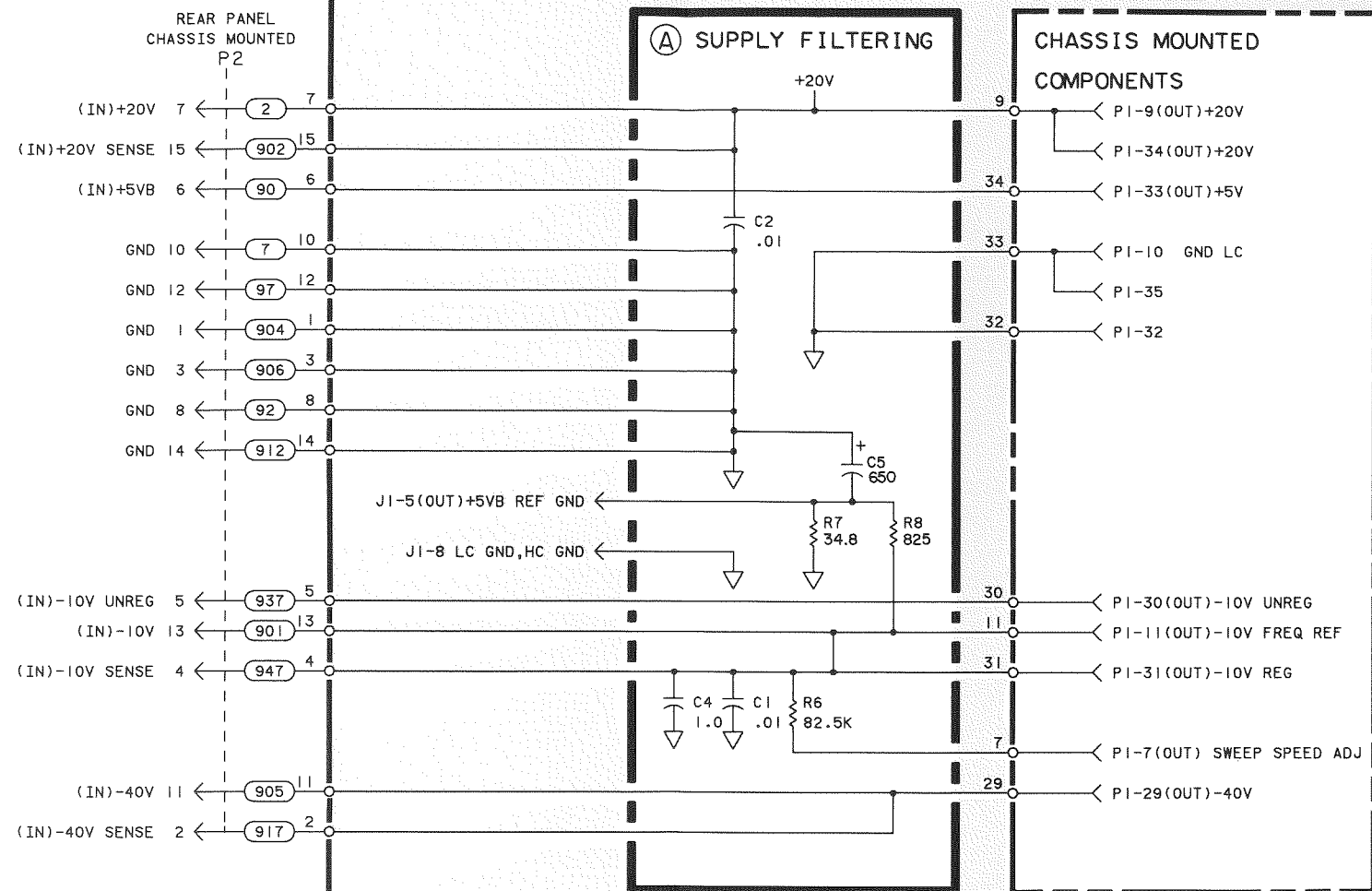
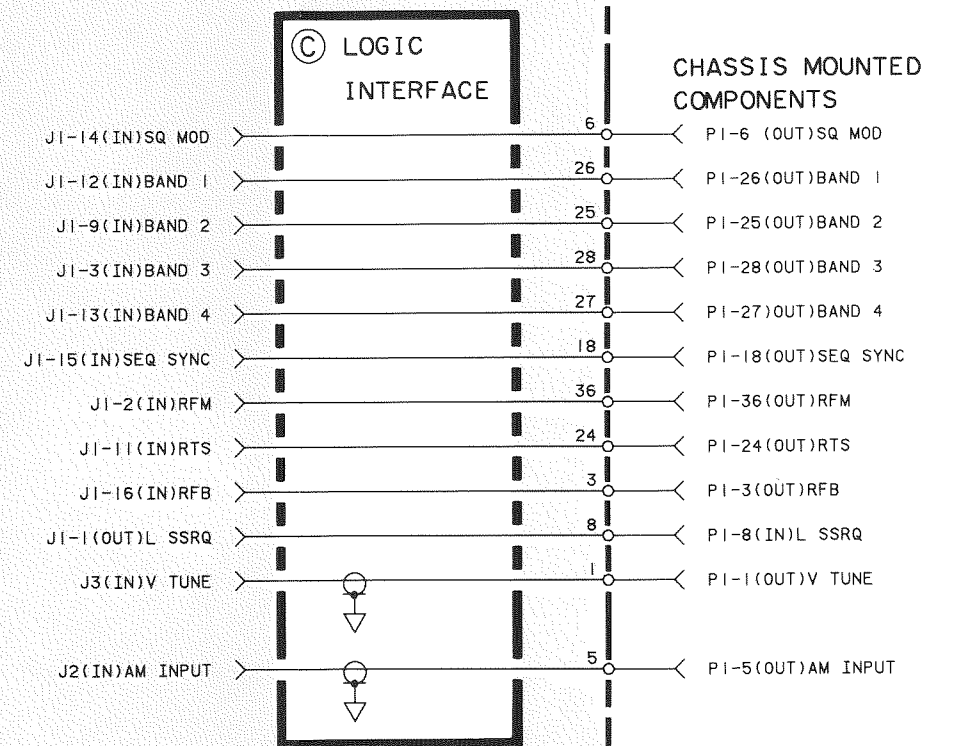
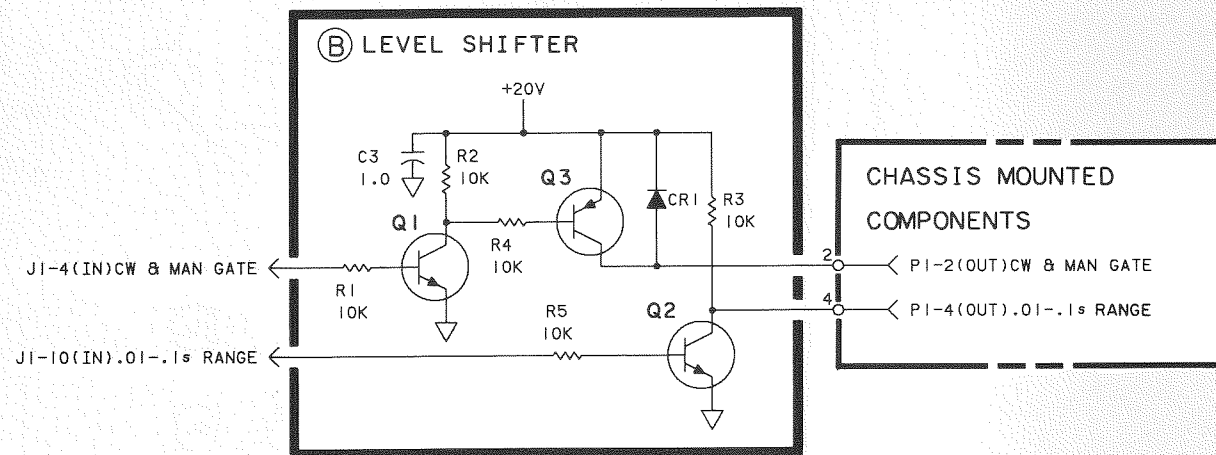
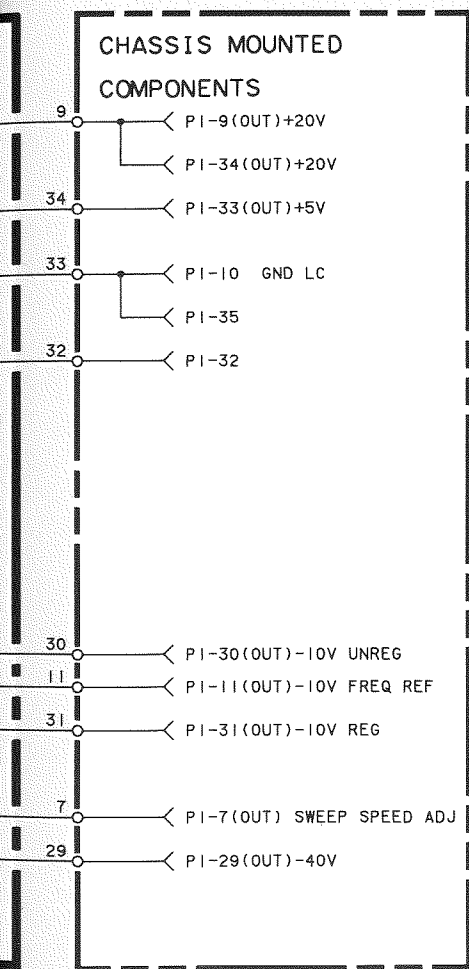


Figure 8-7. Connector Board A2 Parts Location

A2 CONNECTOR BOARD 11869-60011





A2

Figure 8-8. Connector Board A2 Schematic

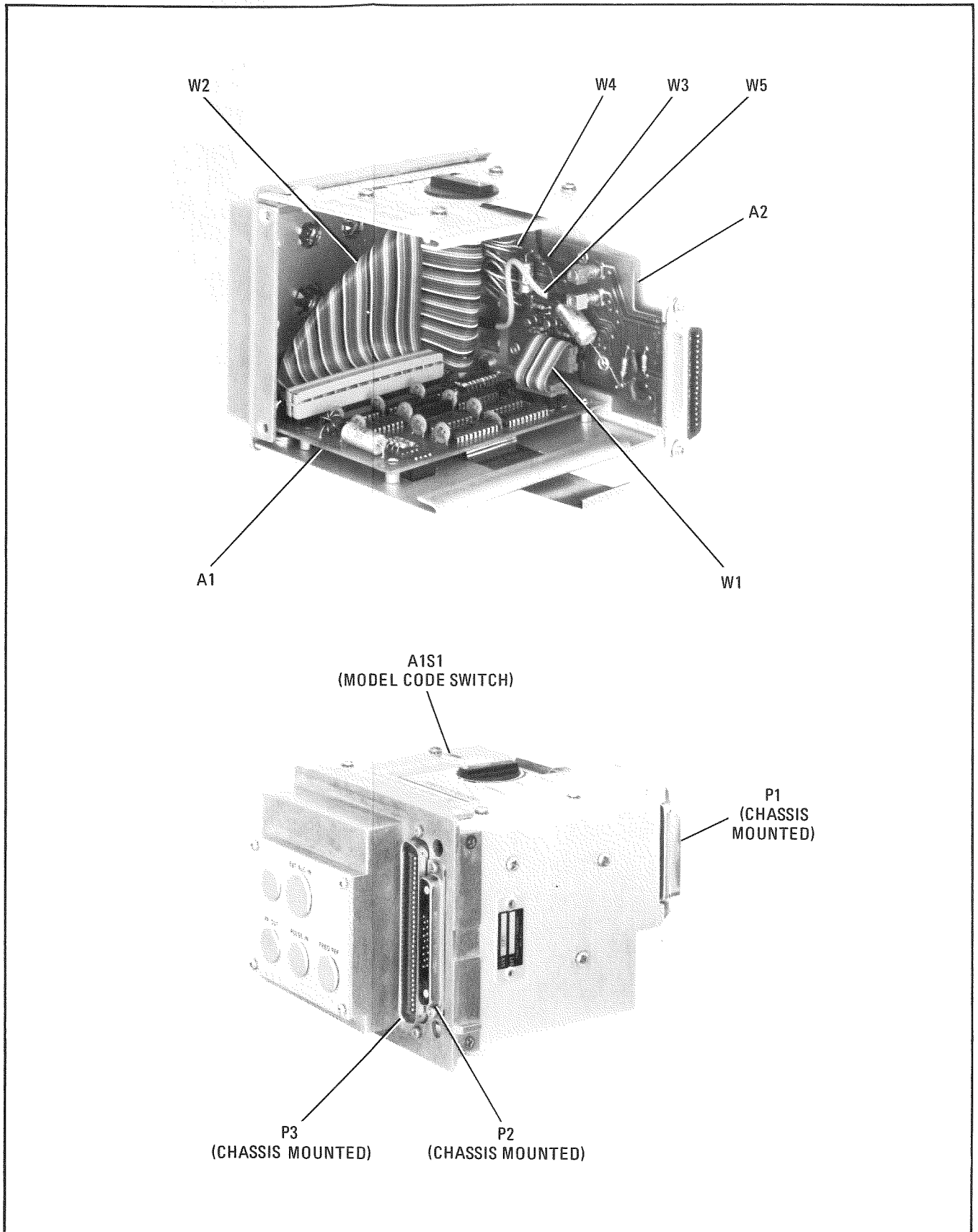


Figure 8-10. 11869A Major Assemblies