Errata

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HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. We have made no changes to this manual copy. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A.

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Agilent Technologies

OPERATING MANUAL

ATTENUATOR CALIBRATION AND OPERATION VERIFICATION TEST SOFTWARE

For the HP 8340A/B and 8341A/B Synthesized Sweepers

HEWLETT PACKARD

ATTENUATOR CALIBRATION AND OPERATION VERIFICATION TEST SOFTWARE

REVISION A.03.00

This manual applies directly to the HP 8340A/B and HP 8341A/B attenuator calibration and operation verification test software, HP part numbers 08340-10009, 08340-10011, and 08340-10012, revision A.03.00.

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HEWLETT PACKARD

Attenuator Calibration and Operation Verification Test Software

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TESTS/UTILITIES

Chapter 1. General Information

INTRODUCTION

This manual provides information to assist you in using the Attenuator Calibration and Operation Verification (Atten Cal/Op Ver) test software for the HP 8340A/B and 8341A/B synthesized sweepers. The information in this manual includes:

- **GENERAL INFORMATION** provides a general overview of the software.
- **REQUIRED TEST EQUIPMENT** contains a list of the test equipment and accessories required to perform the tests supplied in the software. This section also contains the system controller requirements.
- **HOW TO CONFIGURE THE SOFTWARE** describes the mass storage and data storage requirements for the software, addressing, and test equipment HP-IB address requirements. This section also describes the modifications you can make to configure the software to match your test system.
- **TEST DEPENDENCE** describes the interdepence of the software tests.
- **RUNNING THE SOFTWARE** provides information about the system setup and how to initially load and run the test software. This section also contains a description of the 8340 family test system menu.
- **RUNNING THE CAL UTILITY** explains what the cal utility portion of the software is and how to use it.
- **TESTING AN HP 8340A/B OR 8341A/B** discusses the flow of the test software from the 8340 family test system menu to the test menu (the attenuator calibration or operation verification menu).
- **TESTS/UTILITIES** contains detailed information on how to run specific tests and utilities.

FORMAT OF THE TEST SOFTWARE DISCS

The format of the media on which the test software is supplied depends on the software part number ordered. Table 1-1 lists the part numbers (and their respective kits) available, the type of media, and the format of the media.

Table 1-1. Performance Test Software Options, Media, and Media Format

HP Part Number	Kit Part #	Floppy Media	Format	Bytes/Sector	Storage/Disc (Kbytes)
08340-10009	08340-60270	3.5"	Double Sided	1024	788
08340-10011	08340-60287	3.5"	Single Sided	256	270
08340-10012	08340-60288	5.25"	Double Sided	256	270

TEST CAPABILITY

The Attenuator Calibration and Operation Verification Test Software provides the capability to perform a semi-automated operation verification of the HP 8340A/B and 8341A/B synthesized sweepers in addition to a complete calibration (adjust and test) of the 90 dB step attenuator included with many of the synthesizers.

The operation verification portion of the test software is intended to provide a 90% confidence level of the operation of the synthesizer. The operation verification is designed for use as an incoming inspection of the synthesizers or as a verification of instrument operation after an instrument repair. The performance tests provided in the operation verification are CW frequency accuracy, output power accuracy and flatness, and maximum leveled power. In addition, a phase lock loop diagnostic, an ALC accuracy verification, and a utility for displaying the internal calibration data are also provided.

The attenuator calibration portion of the test software provides the capability to adjust and verify the performance of the internal 90 dB step attenuator included with many of the synthesizers. In addition to this, a semi-automated performance test for the frequency switching time specification is provided. Both the 90 dB step attenuator adjustment and frequency switching time performance test can only be performed using the automated tests supplied with this software. These tests should be used to supplement the manual adjustments and tests provided in the HP 8340A/B and 8341A/B operating and service manuals.

TEST RECORD AND DATA STORAGE

Depending on the test performed, the test results are presented in either tabular or graphical form. The test data includes test limits and the instrument's performance. During testing, you are given a choice of outputting the test data to either the system computer CRT or an external printer. Printed copies of the test data can be used as a permanent test record.

When a test completes, the measurement data obtained during the test is automatically stored on a disc that you have designated for measurement data storage (described in section 3). This allows you to recover and review the data at a later time. How to implement the measurement data review is mentioned in section 7 and described in section 8 (Test Menu Utility Softkey).

MAKE A COPY BEFORE USE

Before you run the test software or make any changes to its configuration, make a copy of the master discs. Store the master discs in a safe place and use the copy for daily testing.

When copying the software onto a fixed disc, (e.g. an HP 9133H, 9153A, or any disc with $\geq$ 750 Kbytes of storage), you must use the copy program, "Copy", on disc 1. The copy program changes the test software's labeling to allow it to run on a fixed disc. **If you do not use the copy program, the software will not run on a fixed disc.** The copy program also provides a convenient method to transfer the software onto a floppy disc.

When copying HP part number 08340-10009 onto another 3.5 inch, double sided microfloppy, you must specify the interleave factor and also the format to be used during initialization of your blank disc. The required interleave factor is 2 and the required format is 3 (1024 bytes/sector). The initialize command to execute from your computer's keyboard is:

INITIALIZE "Address of the disc drive containing your blank floppy",2,3

Example: *INITIALIZE ":,700,1",2,3*. This initializes a disc at HP-IB address 700, drive 1 and sets the disc's interleave factor to 2 and format to 1024 bytes/sector. If you do not initialize your blank 3.5 inch, double sided microfloppy in this manner, you will not have sufficient space on the disc to copy the software!

NOTE: You can only copy HP part number 08340-10009 to either a fixed disc drive with $\geq$ 750 Kbytes of storage, or another 3.5 inch, double sided disc that has been initialized as described above.

ANOMALY REPORTING

As with any software, an anomaly may occur. If you observe a software anomaly, notify the nearest Hewlett-Packard sales and service office. Use the software notification form at the end of this manual.

SOFTWARE SUPPORT INFORMATION

The software support provided by Hewlett-Packard for the attenuator calibration and operation verification test software, is limited to the correction of anomalies found while using this test software with the test equipment recommended in section 2 of this document. Any deviation from the recommended equipment is not supported by Hewlett-Packard.

The software modifications that the operator is allowed to perform are limited to the mass storage address, data storage address, and the test equipment address modifications described in section 3 of this document. Modifications made to the software beyond those described in section 3 are not supported by Hewlett-Packard.

Chapter 2. Required Test Equipment

INTRODUCTION

This section provides a comprehensive list of test equipment and accessories required to perform the tests in this software. Also provided is the system controller (technical computer, disc drive, and operating system) requirements.

TECHNICAL COMPUTER

Technical Computer: HP 9836A (HP 236) with $\geq$ 1 megabyte of memory.

The software is also directly compatible with the other HP 9000 Series 200 technical computers (with the exception of the HP Model 217 and 237) if they have $\geq$ 1 Mbyte of memory.

If you wish to use an HP 9000 series 300 computer, the software is compatible with the HP 98580A and 98581A systems.

DISC DRIVE

Disc Drive: HP 9133H or HP 9153A

The critical requirement of the disc drive used to run the performance software is that the disc drive is compatible with both the HP 9000 Series 200 or Series 300 technical computer you use, and the media you use to run the software.

The HP 9133H and 9153A are recommended because they eliminate the need to interchange test software discs, reducing the operator interaction, test time, and the potential for error while running the software. These disc drives also provide additional storage capability for other software you may have. They allow convenient storage of the test data on either the fixed disc or a 3.5 inch floppy, and simplify the task of making a working copy of the test software.

Although use of a fixed disc drive is recommended, if you decide to use the software on the media provided, the recommended disc drives are:

- HP part number 08340-10009 – HP 9122D
- HP part number 08340-10011 – HP 9122D or HP 9121D
- HP part number 08340-10012 – Internal disc drives provided on the HP 9836A.

OPERATING SYSTEM

The test software requires **HP Basic 3.0** and the HP Basic 3.0 binary extensions listed below, or **HP Basic 4.0** and the HP Basic 4.0 binary extensions listed below. If you are using one of the series 300 computers recommended above, you must use HP Basic 4.0. Also, use of a disc drive other than the recommended disc drives may require additional binary extensions.

Name	Description
GRAPH	Graphics
GRAPHX	Graphics Extensions
IO	I/O
MAT	Matrix Statements
KBD	Keyboard Extensions
CLOCK	Clock
MS	Mass Storage
ERR	Error Messages
CS80	CS80 Disc Driver
HPIB	HP-IB Interface Driver

NOTE: When HP Basic is loaded into your technical computer's memory, the binary extensions must also be loaded. The binary extensions can either be loaded by using the "LOAD BIN" command or by configuring your HP Basic operating system to include the binary extensions (this is the most convenient way). For more information regarding configuring an operating system, refer to your HP Basic user's guide under the heading **CONFIGURING BASIC SYSTEMS**.

TEST EQUIPMENT

Table 2-1 provides a comprehensive listing of the test equipment and accessories required to run the test software.

Local Oscillator[1,5] ..... HP 8340A/B Option H01
or HP 8340A/B Option 001
Spectrum Analyzer[1] ..... HP 3585A
Frequency Counter[2] ..... HP 5343A Option 011
Power Meter ..... HP 436A Option 022
Power Sensor ..... HP 8481A
Power Sensor ..... HP 8485A
Universal Counter[1] ..... HP 5316A
Amplifier[1] ..... HP 8447F
Step Attenuator (calibrated at 1 MHz)[1] ..... HP 355D
Printer ..... HP 2673A
or HP 2225A
Attenuator (10 dB)[1] ..... HP 8493C Option 010
Attenuator (20 dB) ..... HP 8493C Option 020
Mixer[1] ..... HP P/N 0955-0307
Low Pass Filter[1] ..... HP P/N 9135-0260

Adapters:

APC 3.5 (f) to APC 3.5 (f) (2 required)	HP P/N 5061-5311
APC 3.5 (f) to Type N (m)	HP P/N 1250-1744
APC 3.5 (f) to Type N (f)[3]	HP P/N 1250-1745
SMA (m) to BNC (f).	HP P/N 1250-1200
Type N (m) to BNC (f)[2]	HP P/N 1250-0780

Cables:

Semi-rigid coax, SMA(m) to SMA (m)	HP P/N 08340-20125
BNC (m) to BNC (m) (7 required)	HP P/N 8120-1840
3.5 inch Diskettes (Box of 10)[4]	HP 92192A or HP 91290A

In addition, a minimum of 5 HP-IB cables will be required to run the tests (includes connection to disc drive and printer).

1. Required for the Attenuator Calibration Tests only.
2. Required for the Operation Verification Tests only.
3. Required for testing an HP 8340A/B only.
4. Required for measurement data storage. HP 92192A: 3.5 inch, double-sided microfloppies; HP 91290A: 5.25 inch floppies.
5. Both the option 001 (no attenuator) and the option H01 (high power, with attenuator) provide the power required to drive the mixer used in the performance tests. The option H01 is the microwave source used in Hewlett-Packard's field service organization's standard microwave test station (microwave work station).

Chapter 3. How To Configure The Software

INTRODUCTION

This chapter describes the mass storage and data storage requirements, addressing, and test equipment requirements to run the software. Also included is a description of the modifications that you can make to configure the software to match your test system.

MASS STORAGE AND DATA STORAGE REQUIREMENTS

In this document, mass storage refers to the storage location of the test software, and the location of the user generated calibration data files (described in section 6). The test software includes all program files and data files supplied on the test software discs (with the exception of "Copy"). The total mass storage requirement is approximately 750 kbytes.

In this document, data storage refers to the storage location of the test result data files (measurement data). All tests (with the exception of CW frequency accuracy and the phase lock diagnostic) store the measurement data onto the designated data storage device. The data storage requirement (per instrument) is approximately 15 kbytes.

MASS STORAGE AND DATA STORAGE ADDRESSING

The software is factory-configured for use on an HP 9153A or 9122D set to HP-IB address 700, or on an HP 9133H configured for one volume and set to HP-IB address 700. With either of these disc drives, the mass storage device is drive 0 (fixed disc drive for the HP 9153A or 9133H), and the data storage device is drive 1 (floppy disc drive). If you wish to use a different HP-IB address for the disc drive, select a different number of volumes on the HP 9133H, or use a different disc drive, you may need to modify a few lines of code in the software for the software to run. See **MODIFYING MASS STORAGE AND DATA STORAGE ADDRESSING** for details on modifying the software. If you use the configuration described above, no modification is required.

MODIFYING MASS STORAGE AND DATA STORAGE ADDRESSING

Four system variables located in the overhead program (FS_MANAGER, subprogram Mass_stg_init) define two addresses (storage locations), one each for:

- The test software
- The measurement data files

Each address requires two system variables:

1. The directory pointer
2. The mass storage unit specifier

Table 3-1 lists the system variables, the address they define, and the type of system variable they are. Figure 3-1 provides a partial listing of the subprogram Mass_stg_init, which shows the current configuration of the system variables and their location.

The balance of this section describes the use of the directory pointer and the mass storage unit specifier in this software, and should give some insight as to the changes to the system variables required to accommodate different storage media. The descriptions supplied assume that you are familiar with the operation of your disc drive. Before making any changes, read through the directory pointer and mass storage unit specifier descriptions in this section and determine the modifications required. When you are ready to perform the modification, go to **PERFORMING THE MODIFICATION**, at the end of this section.

Table 3-1. System Variables

Name	Address Defined	System Variable Type
Manager_sys$	Test Software	Directory Pointer
Msus$	Test Software	Mass Storage Unit Specifier
Dut_dir$	Measurement Data Files	Directory Pointer
Dut_msus$	Measurement Data Files	Mass Storage Unit Specifier

Directory Pointer Description

The following describes the use of the directory pointer in the test software. Although Manager_sys$ is referred to specifically, the description also applies to Dut_dir$.

Manager_sys$ defines the directory pointer for the test software. Because the HP 9133H and 9153A do not use directories to organize information on the disc, the directory pointer, Manager_sys$, is set to the null string in the program (i.e., Manager_sys$=""). For a disc drive that uses directories and requires the directory pointer to be defined, change Manager_sys$ to reflect the label of the directory where the test software is stored (for example, Manager_sys$="/8340TEST/" or Manager_sys$="/APPLIC/8340TEST/"). Note that the slashes required for the directory pointer are included on both ends.

Mass Storage Unit Specifier Description

The following describes the use of the mass storage unit specifier in the test software. Although Msus$ is referred to specifically, the description also applies to Dut_msus$.

Msus$ is the mass storage unit specifier that defines the address for the test software. When using an HP 9133H set to one volume and HP-IB address 700 or an HP 9153A set to HP-IB address 700, Msus$ is set as follows:

```
Msus$=":,700,0"
```

This designates drive 0 as the storage location for the test software. When using other disc drives or another address, set Msus$ to reflect the address of your disc drive. Two examples could be; Msus$=":REMOTE 21,3" (when using a shared resource management system) or Msus$=":,700,0,0" (when using an HP 9133H set to more than one volume).

```
1362  SUB Mass_stg_init
1363  Mass_stg_init: !
1364    !
1386    !
1387    !  Manager_sys$       Directory pointer for Test System program
1388    !                     files and Cal Factor files.
1389    !                     Mass storage unit specifer for Test system
1390    !                     program files, Menu files, and Cal Factor
1391    !                     files.
1392    !  Dut_dir$
1393    !  Dut_msus$          Directory pointer for DUT data files.
1408    !                     Mass storage specifier for DUT data files.
1409    Manager_sys$=""
1410    Msus$ =":,700,0"
1411      !
1412    Dut_dir$ =""
1413    Dut_msus$=":,700,1"
1414      !
```

Figure 3-1. Subprogram Mass_stg_init, Partial Listing

Performing the Modification

After you determine the modifications required to the system variables, perform the following.

1. Boot up HP Basic with the appropriate binary extensions needed for your system. If using an HP 9133H, 9153A, or 9122D, the binary extensions listed under **OPERATING SYSTEM** in section 2 are all you need.
2. Insert the test software's disc 1, and LOAD "FS_MANAGER".
3. EDIT Mass_stg_init.
4. Scroll to the system variables to be modified and make the appropriate changes. ENTER each line after modifying.
5. Check the system variables to ensure that the modifications you made are correct.
6. If the storage media you are using for the test software is a floppy, PURGE "FS_MANAGER".
7. RE-STORE "FS_MANAGER".

HP-IB ADDRESSES OF THE TEST EQUIPMENT

The test software drives specific HP-IB test equipment. Table 3-2 lists the HP-IB test equipment compatible with the software. No substitution of test equipment, with the exception of those listed in Table 3-2, may be made. The procedure for modification is described in **CHANGING THE HP-IB ADDRESS ASSIGNMENTS.**

Also shown in Table 3-2 are the current HP-IB address assignments for the test equipment. If you wish to use a different address than shown, you must modify the software (see **CHANGING THE HP-IB ADDRESS ASSIGNMENTS.**) If you use the equipment and addresses listed in the table, no modification of the software is required.

Table 3-2. HP-IB Address Settings for the Test Equipment

Model Number	Description	HP-IB Address
HP 2225A or 2673A	Printer	01
HP 5343A	Frequency Counter	02
HP 3585A	Spectrum Analyzer	11
HP 436A	Power Meter	13
HP 5316A	Universal Counter	16
HP 8340A/B or 8341A/B	Device Under Test	19
HP 8340A/B	Local Oscillator	20

CHANGING THE HP-IB ADDRESS ASSIGNMENTS

The subprogram Asgn_test_equip (in the test program JANITOR, see Figure 3-2), contains the test equipment HP-IB address assignments. To change the assigned HP-IB, perform the procedure provided in **Performing the Modification**. JANITOR is located on disc 1 of HP part number 08340-10009, and on disc 2 of HP part number 08340-10011 and 08340-10012.

```
4161  SUB Asgn_test_equip
4162  Asgn_test_equip:  !
4163  ! ------------------------------------------------------------------------!
4164  !  This subprogram assigns addresses to the I/O path names in the
4165  !  /Hpib_codes/ common block.
4166  ! ------------------------------------------------------------------------!
4175  !
4176  Addr_definition:  !  HP-IB ADDRESS DEFINITON FOR TEST EQUIPMENT
4177  !
4178  ASSIGN @Dut TO 719          ! HP 8340A/B OR 8341A/B UNDER TEST
4179  ASSIGN @Hfsa TO 718         ! HP 8566A OR 8566B SPECTRUM ANALYZER
4180  ASSIGN @Lfsa TO 711         ! HP 3585A SPECTRUM ANALYZER
4181  ASSIGN @Cntr TO 702         ! HP 5343A FREQUENCY COUNTER
4182  ASSIGN @Pwrmtr TO 713       ! HP 436A POWER METER
4183  ASSIGN @Dvm TO 722          ! HP 3456A OR 3455A DIGITAL VOLTMETER
4184  ASSIGN @Fun_gen TO 705      ! HP 3325A FUNCTION GENERATOR
4185  ASSIGN @Rf_gen TO 717       ! HP 8662A RF SYNTHESIZER
4186  ASSIGN @Het TO 720          ! HP 8340A/B Option 001 LOCAL OSCILLATOR
4187  ASSIGN @Mod_an TO 714       ! HP 8902A OR 8901A MODULATION ANALYZER
4188  ASSIGN @Atn_drv TO 712      ! HP 11713A ATTENUATOR/RELAY DRIVER
4189  ASSIGN @Timer TO 716        ! HP 5316A COUNTER/TIMER
4190  ASSIGN @Pulse_gen TO 706
4191    !
4192    ! @D14                    ! SPARE
4193    ! @D15                    ! SPARE
4194    ! @D16                    ! SPARE
4195    !
4196  Prntr=701
4197  Key_bd=2
4198  Screen=1
4199    !
4200    ! Definition of system test equipment for use by instrument drivers.
4201    !
4202  Instr_selection:    !  TEST EQUIPMENT SELECTION
4203    !
4204  Dvm$="3456A"  !  Set Dvm$ to "3455A" for an HP 3455A DVM.
4205                !  Set Dvm$ to "3456A" for an HP 3456A DVM.
4206    !
4207  Mod_an$="8902A" ! Set Mod_an$ to "8901A" for an HP 8901A Mod. Analyzer.
4208                  ! Set Mod_an$ to "8902A" for an HP 8902A Mod. Analyzer.
4209    !
4210  SUBEND
```

Figure 3-2. Subprogram Asgn_test_equip, Partial Listing

Performing the Modification

After you determine the modifications required to the HP-IB address assignments, perform the following:

1. Boot up HP Basic with the appropriate binary extensions needed for your system. If using an HP 9133H, 9153A, or 9122D, the binary extensions listed under **OPERATING SYSTEM** in section 2 are all you need.
2. LOAD "JANITOR".
3. EDIT Asgn_test_equip.
4. To change the HP-IB address of a piece of test equipment, scroll to the line that ASSIGNs the address to the instrument you wish to modify. Make the address change and ENTER the line.

   Example: To change the device under test's HP-IB address assignment to 30, scroll to the "ASSIGN @Dut TO 719" line and change 719 to 730. After making the change, press ENTER on your computer's keyboard.
5. Check the HP-IB assignments to ensure that the modifications you made are correct. Also check that there are **no duplicate addresses**.
6. If the storage media you are using for the test software is a floppy, PURGE "JANITOR".
7. RE-STORE "JANITOR".

Chapter 4. Test Dependence

INTRODUCTION

Table 4-1 lists the tests provided in the test software. The table is divided into the tests available when you select the operation verification softkey and those available when you select the attenuator calibration softkey.

Table 4-1. Listing of Tests

Operation Verification	Attenuator Calibration
Cal Constants Phase Lock Diagnostics CW Frequency Accuracy ALC Accuracy Output Power Accuracy Maximum Leveled Power	Output Power Accuracy RF Attenuator Calibrate Frequency Switching Time Cal Constants

Some tests require that the user generated calibration data for the HP 8485A power sensor and the HP 355D step attenuator (IF attenuator) be on the disc assigned to hold this information. In addition, some tests must be run in sequence to allow the measurement data obtained during one test to be used for a later test. Table 4-1 is a test dependence flow chart that shows the test hierarchy. See chapter 3 for information on the software's mass and data storage addressing (i.e. on which disc the user generated calibration data and the measurement data resides).

TEST DEPENDENCE FLOW CHART

The flow chart in Figure 4-1 shows test interdependence. As shown in the flow chart, you must perform the power sensor cal, level 1 before you run the output power accuracy test, level 2, and that you must perform the IF attenuator cal, level 1 before you run the low output power accuracy test. In addition, you must perform the output power accuracy test before you run the tests in level 3.

The tests listed in Table 4-1 but not included in the flow chart may be performed in any order.

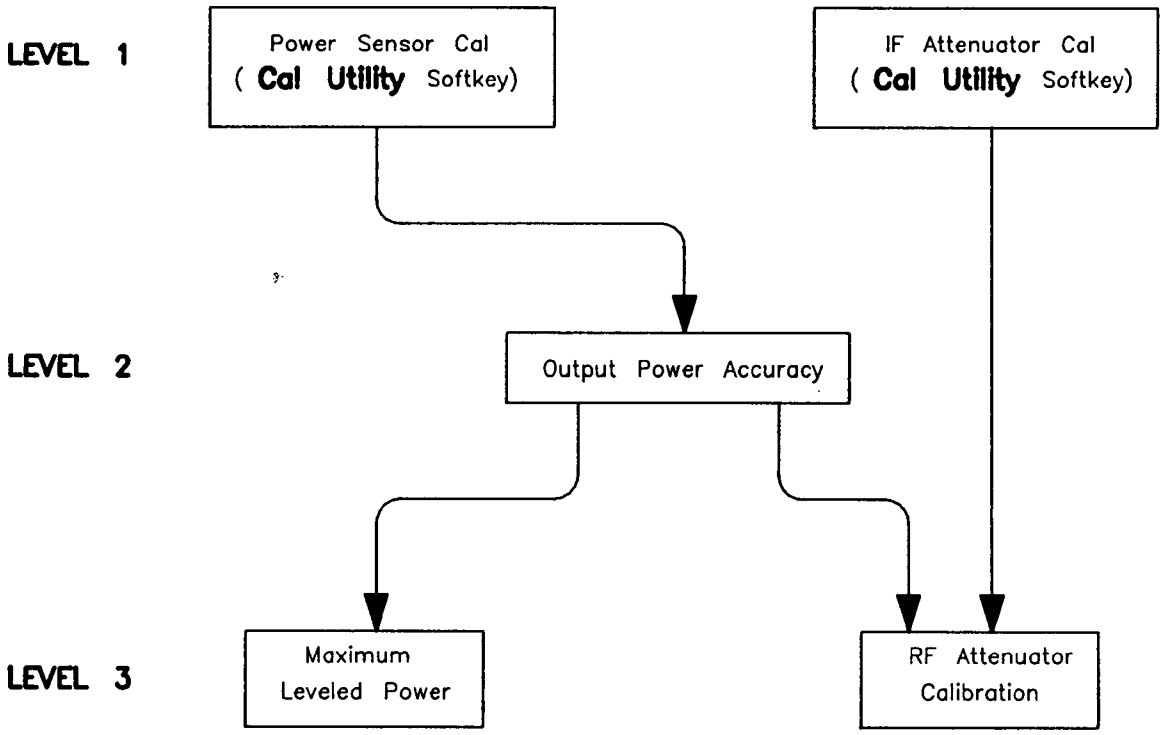

Figure 4-1. Test Dependence Flow Chart

Chapter 5. Running the Software

INTRODUCTION

This chapter provides information on the system setup, and how to initially load and run the test software. Also provided is a description of the 8340 FAMILY TEST SYSTEM menu.

SYSTEM SETUP

Figure 5-1 shows the system setup required to run the test software. Because the computer and disc drive are required to run the software, they are not repeated in the test equipment lists for the individual tests and utilities. Because the printer is common to all the tests and utilities, it, also, is not repeated.

The individual tests and utilities assume that all HP-IB connections are made to the computer, disc drive, DUT and the test equipment with HP-IB. These connections are not shown in the individual test setups.

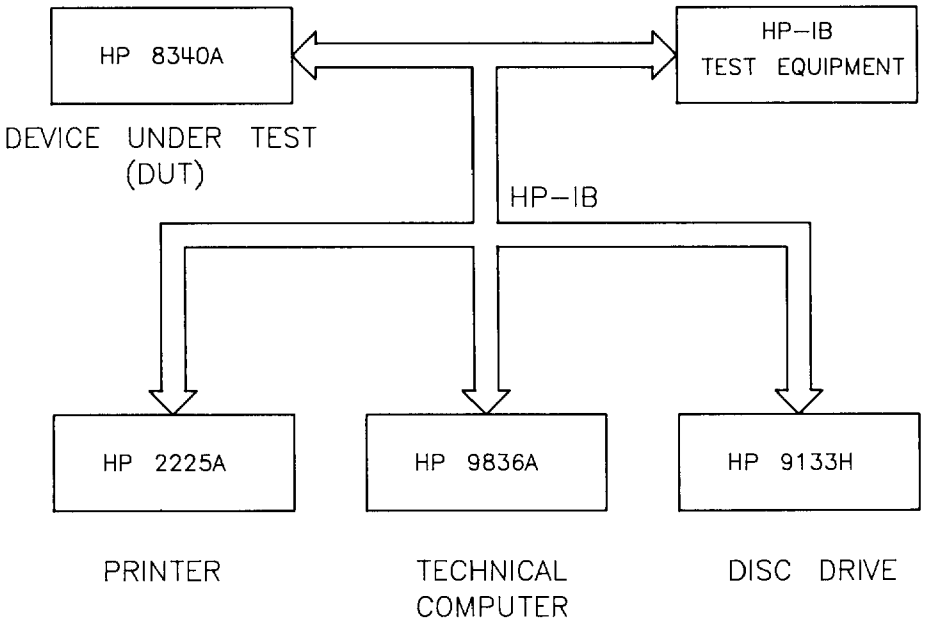

Figure 5-1. System Setup

LOADING THE SOFTWARE

To load the test software:

1. Load HP Basic and the binary extensions listed in **OPERATING SYSTEM**, in section 2, in your computer.

2. Insert an initialized disc in the drive you have designated as the data storage device (using unmodified software and an HP 9133H or 9153A this is drive 1,":,700,1").

   After running a test, the software automatically accesses the data disc and stores the measurement data.

   You can use one data disc for multiple instruments. Because the software keys on the last four digits of the serial number when it stores data, and does not distinguish between the different instrument models, if you decide to use one data disc for multiple instruments, maintain a separate data disc for HP 8340As, 8340Bs, 8341As, and 8341Bs. The reason for this is that if you have two different models with the same ending four digits, the software may write over a data file you wish to keep.

3. Connect your DUT (device under test) to the test system's HP-IB.

4. If you are running the software using floppy discs, insert disc 1 in the drive designated for mass storage (for unmodified software, this is disc drive 0, ":,700,0"). Type **LOAD "FS_MANAGER"**, press **[ENTER]** and then **[RUN]**.

5. If the Series 200 or 300 computer was disconnected from ac power, the program asks you to enter the date and the time in the format shown on the screen. The date and time are printed on each test data output. Skip this step if the computer does not ask for the date and time.

6. You have arrived at the 8340 FAMILY TEST SYSTEM menu. The choices offered are testing an HP 8340A, 8341A, 8340A Option H02, 8340B, 8341B, or running the cal (calibration) utility (see section 4 to determine if you must run the cal utility first).

After you select a test path, refer to either section 6, **RUNNING THE CAL UTILITY**, or section 7, **TESTING AN HP 8340A/B or 8341A/B**.

Chapter 6. Running the Cal Utility

INTRODUCTION

The cal utility portion of the software assists you in generating a calibration data file for your specific HP 355D step attenuator and HP 8485A power sensor. As mentioned in section 4, several tests require the data stored in these data files before the they can run. The data files you generate are stored and accessed on the storage media whose address is defined by Manager_sys$ and Msus$ (discussed in section 3). In unmodified software, the storage media address is ":,700,0".

Before running the cal utility, obtain the calibration data for your attenuator and power sensor. When the utility completes, the data you entered is stored on disc 1. The only time you need to re-run the cal utility is when the attenuator or power sensor is re-calibrated, or if you use a device for which you have not yet entered the data.

RUNNING THE CAL UTILITY

To run the Cal Utility:

1. Select the softkey **[Cal Utility]**.

   You are given a choice of entering the attenuator's calibration data (**[IF Attenuator]** softkey), or the power sensor's calibration data (**[Pwr Sensor Cal]** softkey). The softkey **[Exit]** returns you to the 8340 FAMILY TEST SYSTEM menu.

2. Make your selection and proceed to the appropriate entry paragraph below.

ENTERING THE IF ATTENUATOR (HP 355D) CALIBRATION DATA

1. Select the softkey **[IF Attenuator]**.

   A softkey menu that gives you the options of **[Start]**, **[Display]**, and **[Return]** is displayed.

   [Start] begins entry of the calibration data.
   [Return] returns to the CALIBRATION UTILITY menu.
   [Display] shows the calibration data stored in an IF attenuator data file.

2. When you select **[Start]**, the program requests the attenuator serial number, and the actual value of attenuation for the 10 dB through 70 dB steps (at a 1 MHz calibration frequency).

   When you enter the attenuator step values, enter the actual value (i.e., if the 10 db step is 10.02, enter 10.02). Also, enter positive values.

3. After you enter all the data, you have the opportunity to make corrections, if necessary.

4. Answer the rest of the questions supplied in the program and select **[Return]** to return to the CALIBRATION UTILITY menu.

ENTERING THE POWER SENSOR (HP 8485A) CALIBRATION DATA

1. Select the softkey **[Pwr Sensor Cal]**.

   A softkey menu that gives you the options of **[Start]**, **[Display]**, and **[Return]** is displayed.

   [Start] begins entry of the calibration data.
   [Return] returns to the CALIBRATION UTILITY menu.
   [Display] shows the calibration data stored in power sensor data file.

2. **Before** selecting **[Start]**, perform the 10 MHz calibration procedure described below.

3. When you select **[Start]**, the program requests the power sensor serial number, and the cal factors for each sensor data point.

   The 10 MHz data point is the value determined in the 10 MHz calibration procedure.

4. After you enter all the data, you have the opportunity to make corrections, if necessary.

   When making a correction, enter the frequency in error as shown in the **Freq** column, then enter the correct value.

5. Answer the rest of the questions supplied in the program and select **[Return]** to return to the CALIBRATION UTILITY menu.

10 MHZ CALIBRATION PROCEDURE

Test Equipment

Power Meter	HP 436A Option 022
Power Sensor	HP 8481A
Power Sensor	HP 8485A
Adapters:	
Precision 3.5 mm (f) – (f)[1]	HP Part No. 5061-5311
Precision 3.5 mm (f) – Type N (m)	HP Part No. 1250-1744
Precision 3.5 mm (f) – Type N (f)[1]	HP Part No. 1250-1745

1. Required for an HP 8340A/B only.

1. Connect the HP 8481A power sensor to the power meter and select WATT mode. Allow at least one half hour for warm up.

2. Set the power meter calibration factor switch to include 10 MHz.

3. Zero and calibrate the power meter before connecting the power sensor to the DUT.

4. Connect the HP 8481A power sensor to the DUT's RF output.

5. On the DUT, press **[INSTR PRESET][CW][1][0][MHz] [RF]** OFF.
6. Zero the power meter.
7. On the DUT, press the **[RF]** key ON, then press **[POWER LEVEL]**.
8. Using the front panel rotary knob, adjust the DUT's output power for a 1.0 milliwatt indication on the power meter.
9. Disconnect the HP 8481A power sensor from the DUT. Turn the power meter's line switch OFF.
10. Replace the HP 8481A with the HP 8485A power sensor. Turn the power meter's line switch back on and allow 15 minutes for the sensor to stabilize.
11. Zero and calibrate the power meter.
12. On the DUT, press **[RF]** OFF and connect the HP 8485A power sensor to the DUT.
13. Zero the power meter, then press the DUT's **[RF]** ON.
14. Adjust the power meter's calibration factor dial for a power meter indication of 1.0 milliwatt.

    The power meter calibration factor setting is the cal factor % that you should enter for the HP 8485A's 10 MHz data point.

Chapter 7. Testing an HP 8340A/B or 8341A/B

INTRODUCTION

Because the flow of the software is the same whether you are testing an HP 8340A/B or 8341A/B, this section discusses the flow of the test software from the 8340 FAMILY TEST SYSTEM menu to the test menu (either the operation verification or attenuator calibration menu), and does not differentiate between the different synthesizers. Once you are ready to run a specific test, go to section 8 for detailed instructions.

SELECTING THE TYPE OF TESTING

1. Select the appropriate softkey:

   [Test8340A],

   [Test8341A],

   [TestH02] (HP 8340A Option H02),

   [Test8340B], or

   [Test8341B].

   You have a choice of performing the operation verification **[OpVer]** or the attenuator calibration **[Cal]**. For either choice, the program proceeds as follows.

2. The computer tells you the model number and serial number it reads from the instrument's calibration constants, and ask you to verify that they are correct.

   If the number is incorrect verify the instrument's calibration data using the hard copy of the calibration data located underneath the DUT's top cover.

   If the number is correct, select **[YES]**.

NOTE: If a DUT is not connected to the computer's HP-IB, the program asks if you wish to continue without a DUT. The only time you should answer yes is when you wish to review measurement data from previously run tests. To review data, select **[Yes]** and respond to the program prompts until you reach the test menu (see step 9 below). Select the utility softkey (refer to section 8, **TEST MENU UTILITY SOFTKEY**, for a description of the utilities provided by this softkey).

3. Enter the DUT's serial prefix number (the first five alpha-numeric characters in the instrument's serial number, eg. 2231A).

   If measurement data for this instrument exists on the current data disc (from previously run tests), the computer does not ask for the serial prefix number.

4. Enter the DUT's option configuration (refer to the DUT rear panel serial tag).

   a. One at a time, enter the three digit option numbers (many instruments have only one option, or none at all).

   b. Once all options are entered, press **[ENTER]**. If the instrument is a standard (no options), just press **[ENTER]**.

   If test data for this instrument exists on the current data disc (from previously run tests), the computer does not ask for option information.

5. If you entered option information in step 4, the computer displays the options you entered (000 is displayed if no options were entered).

   If the list is correct, press **[Yes]**, if not, press **[No]** and re-enter the option configuration when prompted.

6. The computer now reads the rest of the instrument's calibration constants. If the computer offers the **[Menu]** softkey, go directly to step 7.

Calibration Constant Discrepancies

If there is a Cal Constants data file for this instrument on the data disc, and the file does not match the cal constants in the instrument, the computer displays:

DUT CAL #Cal Constant Name = ### BUT FILE = ###

[DUT OK] [NEITHER] [FILE OK]

The most common reason for this screen to be displayed is that someone has pressed **[SHIFT] [PEAK]** on the synthesizer. This function causes the synthesizer to automatically optimize its RF output power and to update the YTM GAIN, YTM OFFSET, and the YTM BX GAIN cal constants. If the cal constant displayed is one of those listed above, and the synthesizer does **not** have a front panel failure annunciator on, the cal constant in the DUT is probably fine. In any case, you must determine which cal constants are valid (one method is by examining the printed copy of the cal constants located underneath the synthesizer's top cover), or assume that the data disk (file) is allright.

Select the appropriate softkey in response to the prompt. If you select **[NEITHER]**, you must enter the correct cal constant value. After all cal constant discrepancies are taken care of, the program returns to normal operation.

7. The software gives you a choice of the following:

   [Menu] lets you access the test menu for the type of testing you selected (attenuator calibration or operation verification).

   [New Dut] tells the software you have connected a different DUT to the HP-IB. Note that if the model number of the new DUT is not the same as the previous one, the program automatically returns you to the 8340 FAMILY TEST SYSTEM menu.

8. If you select **[Menu]**, the program checks to see if a printer is connected to the HP-IB. If the program finds a printer, it gives you a selection of the HP 2225A (ThinkJet printer), the HP 2673A, or OTHER. Although other printers can be used, they may not be directly compatible with the program's alpha and graphics output.

9. The test menu name and the tests that can be run are displayed. Select the appropriate softkey:

   [Input #] lets you enter the number of the test you wish to run.

   [Auto Sequence] lets you select which tests to run automatically. When you select the tests (**[ON]** or **[All on]** then **[Execute]**), the program automatically loads the first test. At the end of each test, the next test is loaded. This saves returning to the test menu after each test.

   [LoopTest] lets you run the selected test (test the cursor is pointing to) as many times as you wish. You can change the cursor position with the computer's rotary knob, or up/down keys.

   [PrevPage] is not implemented in this software.

   [Utility] lets you access the test menu utilities (see section 8 for detailed information on how to use the utilities described below). The utilities you can choose from are:

   - Change the DUT option configuration cal constants (used when retrofitting options).
   - Display or print the stored measurement data from any of the tests you have run.
   - Display or print the test status for any instrument you have tested.

   [SELECT] selects the test at which the cursor is pointing. You can change the cursor position with the computer's rotary knob or up/down keys.

   [NextTest] automatically selects the next test to be run.

   [NextPage] is not implemented in this software.

   [Exit] exits you from this menu.

10. Select the desired test or utility and refer to the appropriate chapter.

Chapter 8. Tests/Utilities

This section contains detailed information on how to run specific tests and utilities.

8-1. Calibration Constants Utility

Description

This program is not a test, in that it does not verify conformance to a specification. It is a utility program that allows you to manipulate the calibration constants in the instrument or in the data disc file. The calibration constants stored in the instrument can be displayed, printed, transferred onto the data disc (image file), or compared with the image file on the data disc. The calibration constants stored on the data disc (image file) can be displayed, printed, transferred to the instrument, or compared with the calibration constants stored in the instrument.

Test Equipment

None required.

Procedure

1. Select the desired softkey:

   [COMPARE] compares current instrument cal constants with the image file. Select this key to meet the requirements for the operation verification.

   [ReadDUT] reads the DUT's cal constants into the computer's memory.

   [GetFILE] loads the cal constant image file for the DUT into the computer's memory.

   [EXIT] returns to the test menu.

2. Select from the softkeys above, plus the following:

   [PRINT] prints the cal constants currently in the computer's memory.

   [DISPLAY] displays the cal constants currently in memory.

   [Wrt DUT] writes the cal constants in the computer's memory to the instrument's WORKING Cal Constant memory, and stores the cal constants in the instrument's PROTECTED cal constant memory.

   [SavFILE] takes the cal constants in the computer's memory and creates a permanent image file on the data disc.

8-2. Phase Lock Diagnostic

Description

This program is not a test, in that it does not verify conformance to a specification. It is a diagnostic that tests the integrity of the phase lock loops internal to the synthesizer. The diagnostic causes the phase lock loop frequency to switch rapidly from one extreme to the next, while the synthesizer is polled for an unlock indication to determine if phase lock has been lost. If at any point during the test an unlock indication is detected, the diagnostic indicates which phase lock loop was unlocked.

Test Equipment

None required.

Procedure

1. Select the desired softkey:

   [Thrash] runs the diagnostic. Select this key to meet the requirements for the operation verification.

   [JANITOR] returns to the test menu.

8-3. CW Frequency Accuracy Test

Description

This test verifies the synthesizer CW mode frequency resolution and range specifications. Test frequencies are selected to exercise each frequency related circuit in the instrument, holding all remaining circuits constant. The test frequencies are grouped so that an abnormal indication points to the circuit most likely causing the problem.

To eliminate time base error from the measurement, the frequency counter's internal time base is used as the synthesizer's reference (the synthesizer's internal time base performance is tested separately in the internal time base aging rate performance test provided in the instrument's operating and service manual). During this test, the synthesizer's display and the counter's display should agree within the resolution of each instrument. This procedure does not test for CW frequency accuracy as a function of the time base accuracy.

Test Equipment

Frequency Counter	HP 5343A Option 011
Cables:	
SMA (m)-(m)	HP Part No. 08340-20125
BNC (m)-(m), 2 Required	HP Part No. 8120-1840
Adapters:	
3.5 mm (f) — (f), (2 Required)	HP Part No. 5061-5311
SMA (m) — BNC (f)	HP Part No. 1250-1200
Type-N (m) — SMA (f)[1]	HP Part No. 1250-1250

1. Required for an HP 8341A/B or 8340A H02 only.

Procedure

1. Select the desired softkey and respond to any prompts provided by the program. To get the test menu STATUS to indicate PASS, all three of the following tests must run and pass:

   [Setup] displays the CW frequency accuracy test setup.

   [M/N] tests only the M/N phase lock loop.

   [20/30] tests only the 20/30 phase lock loops.

   [Endpnt Accy] tests the synthesizer's frequency endpoints, and the YIG oscillator's frequency endpoints.

   [ALL] tests all of the above. Select this key to meet the requirements of the operation verification.

   [Print] changes the test data destination from the computer CRT to the system printer. For a printout of the test data, select the system printer. No data is stored for this test.

   [DONE] returns to the test menu.

2. If a test fails, select the desired softkey and respond to any prompts:

   [CarryOn] proceeds with the next step of the test.

   [Repeat] repeats the test that was run.

   [ABORT] returns to the menu in step 1.

8-4. ALC Accuracy Verification

Description

This program is not a test, in that it does not verify conformance to a specification. It is a verification of the operation of the automatic leveling control (ALC) circuitry, and is used to alert you to any problems in the ALC. A problem in this circuitry directly impacts the output power flatness and accuracy, which is specified.

Because the ALC is not frequency dependent, this test is performed at two frequency points (one in band 0, and one in band 1). By checking the ALC in these two bands, operation in the synthesizer's low frequency RF path and high frequency RF path is verified. At each frequency, the ALC is tested over its entire power range (from −20 dBm to maximum available leveled power).

Test Equipment

Power Meter	HP 436A Option 022
Power Sensor	HP 8485A
Adapters:	
3.5 mm (f) − (f)[1]	HP Part No. 5061-5311
3.5 mm (f) − Type-N (m)	HP Part No. 1250-1744

1. Required for an HP 8340A/B only.

Procedure

1. Select the desired softkey, and respond to any program prompts:

   [VERIFY] runs the ALC verification. Select this is key to meet the requirements of the operation verification.

   [SETUP] displays the ALC accuracy test setup.

   [JANITOR] returns to the test menu.

2. When the test completes, choose from:

   [Display] displays the test results

   [Print] prints a copy

   [DONE] returns to the above menu

8-5. Output Power Accuracy Test

Description

This test verifies that the instrument meets its RF output power flatness and accuracy specifications. It is performed across the synthesizer's entire frequency range, at three different power level settings. The data from this test is required by the maximum leveled output power test and the low output power accuracy test.

NOTE: This test does not run if the power sensor has not been characterized (see section 6). The data file generated for the power sensor must be on your fixed disc or on disc 1 of your floppy disc set.

Test Equipment

Power Meter	HP 436A Option 022
Power Sensor	HP 8485A
Adapters:	
3.5 mm (f) – (f)[1]	HP Part No. 5061-5311
3.5 mm (f) – Type-N (m)	HP Part No. 1250-1744

1. Required for an HP 8340A/B only.

Procedure

1. Select the desired softkey and respond to the program prompts:

   [SET UP] displays the output power accuracy test setup.

   [VERIFY] verifies the synthesizer output power accuracy performance. Select this key to meet the requirements for the operation verification.

   [SELECT] checks the output power accuracy for a specific frequency range. It lets you select the number of points and power level you wish to test.

   When the program requests the test parameters, enter only the number, not the unit. For example, when the program requests the start frequency, enter 4 (not 4 GHz). No data is stored when you select this softkey.

   [JANITOR] returns to the test menu.

2. When the test completes, choose from:

   [DISPLAY] displays the test results;

   [PRINT] prints a copy of the test results;

   [BEGIN] returns to the above menu; or

   [JANITOR] returns to the test menu.

8-6. Maximum Leveled Output Power Test

Description

This test verifies that the synthesizer meets its maximum leveled power specifications over a variety of sweep ranges, sweep modes, and sweep speeds. It uses the internal power meter and unleveled indication circuitry within the synthesizer to measure maximum leveled power. When the test completes,, the program uses the measurement data from this test and the data from the output power accuracy test to calculate the actual maximum leveled output power. The results from the calculations are compared with the maximum leveled output power specifications to determine if the instrument passed.

Because this test uses circuitry internal to the synthesizer to perform the measurements, the only test equipment required is a 20 dB attenuator to provide a 50Ω load on the instrument output (to improve measurement accuracy).

NOTE: The output power accuracy test data must be on the data disc **before** this test will run. If you have not run the output power accuracy test, return to the test menu and run that test first.

Test Equipment

20 dB Attenuator	HP 8493C Option 020
Adapters:	
3.5 mm (f) — (f)[1]	HP Part No. 5061-5311
3.5 mm (f) — Type-N (m)[2]	HP Part No. 1250-1744

1. Required for an HP 8340A/B only.
2. Required for an HP 8341A/B or 8340A H02 only.

Procedure

1. Select the desired softkey and respond to the program prompts:

   [FULL] runs the entire maximum leveled output power test. Select this key to meet the requirements for the operation verification.

   [SELECT] lets you select the sweep mode and sweep range you wish to test. When the program prompts you for the test condition, type the appropriate test number and press **[ENTER]**.

   [CORRECT] lets you see the power accuracy correction factors (from the output power accuracy test), which are used during the maximum leveled output power calculation. Examine the data and then press **[CONTINUE]** on the computer keyboard.

   [JANITOR] Returns to the test menu.

2. When the test completes, choose from:

   [DISPLAY] displays the test results;

   [PRINT] prints a copy of the test results;

   [RETEST] returns to the above menu; or

   [JANITOR] returns to the test menu.

8-7. Low Output Power Accuracy Test and RF Attenuator Calibration

Description

This test:

- Adjusts the instrument's attenuator calibration constants to compensate for errors in the 90 dB step attenuator (for those instruments equipped with a 90 dB step attenuator).
- Verifies power accuracy at each attenuator step.
- Sums the attenuator performance data with output power accuracy data and compares the results with the instrument's performance specifications.

NOTE: This test will not run unless the IF attenuator has been characterized (see section 6) and the output power accuracy test has been run. The data file generated for the IF attenuator must be on disc 1, and the data file for the output power accuracy test must be on the data disc you are using.

Test Equipment

Local Oscillator	HP 8340B Option HO1
Spectrum Analyzer	HP 3585A
Amplifier	HP 8447F
Step Attenuator (Calibrated at 1 MHz)	HP 355D
Attenuators:	
10 dB	HP 8493C Option 010
20 dB	HP 8493C Option 020
Mixer	HP Part No. 0955-0307
Low Pass Filter	HP Part No. 9135-0260
Adapters:	
3.5 mm (f)-(f)[1]	HP Part No. 5061-5311
3.5 mm (f) – Type-N (m)[2]	HP Part No. 1250-1744
SMA (m) – BNC (f)	HP Part No. 1250-1200
Cables:	
SMA (m)-(m)	HP Part No. 08340-20125
BNC (m)-(m) (7 Required)	HP Part No. 8120-1840

1. Required for an HP 8340A/B.
2. Required for an HP 8341A/B or 8340A H02.

NOTE: For maximum drive into the mixer LO port, connect the mixer directly to the LO (local oscillator) RF output.

NOTE: The test setup for the adjust and measure portions of the RF attenuator calibration is critical. The tests and adjustments are performed at low RF output power levels (to −90 dBm). A defective cable or adapter, or a loose cable connection in the test setup can cause a misadjustment of the instrument or failure of the low output power accuracy test. If the test results indicate that the instrument failed low output power accuracy, check the test setup and re-run the selected test (either adjust or measure).

NOTE: Instrument calibration constants tell the program whether an attenuator is installed. If an attenuator was installed after time of manufacture, calibration constant #59 should have been changed to reflect the addition. If this cal constant was not updated, the program tells you that no attenuator exists, though one is actually installed. To update the cal constants to reflect the correct option configuration, return to the test menu and select the **[Utility]** softkey. Refer to utility 8-20 and select the **[Chg Option]** softkey.

Problem Solver

If you run into difficulties during this test (due to an incorrect test setup, etc.), and the softkey menu gives you no ABORT selection, press **[Carry On]** or other continue command until you reach a menu that lets you abort the test. Do not do a full program break. If you break the program, some cal constants may already have been altered in the instrument. A controlled abort lets the program replace the instrument's original cal constants before exiting the test. A hard STOP does not do this, and when you run the program again, the program indicates:

DUT CAL #AT10 OFFSET = ### BUT FILE = ###

[DUT OK] **[NEITHER]** **[FILE OK]**

This screen tells you that a cal constant difference exists between the data disc image file and the instrument. It then lets you choose which is the correct cal constant. In this case, the image file is correct. For each cal constant discrepancy (sequentially) displayed, press **[FILE OK]**. After several cal constant discrepancies are displayed, the program returns to normal operation.

NOTE: The program repeats the **Set IF attenuator** statement for each measurement, even though the proper attenuation is set.

Procedure

1. Select the desired softkey and respond to the program prompts:

   [ADJUST] does everything. It adjusts the calibration constants, verifies power accuracy at every attenuator step, and sums the attenuator performance data with the output power accuracy data, comparing the results to instrument specifications.

   After you select this key, select **[ALL]** to adjust and measure all attenuator steps. If you select only one step, no data is stored.

   If you wish to calibrate the attenuator first, and then measure the low output power accuracy performance, select **[ADJUST]**.

   [MEASURE] is a subset of the ADJUST test. MEASURE verifies the low output power accuracy at every attenuator step, and sums the attenuator performance data with the output power accuracy data, comparing the results to instrument specifications.

   After you select this key, press **[ALL]** to measure all the attenuator steps and store the data. If you select only one step, no data is stored.

   Select the **MEASURE** softkey if you only wish to verify the low output power accuracy performance.

   [SPEC] is a subset of the above tests. SPEC simply takes existing attenuator performance data and sums it with output power accuracy data. The result is compared to instrument specifications

[Viewdat] lets you view the test result data. After you press this key, you have the choice of viewing the individual attenuator step data or viewing all the data.

[Hardcpy] is the same as Viewdat except the selected data is output to the printer.

[JANITOR] returns to the test menu.

8-8. Frequency Switching Time Test

Description

This test test verifies that the synthesizer meets its frequency switching time specification. It uses the synthesizer's rear panel negative blanking output and an HP 5316A to measure the time it takes the instrument to switch from one CW frequency to another. The frequencies tested are those that cause the worst case switching time delay.

Test Equipment

Universal Counter	HP 5316A
BNC Cable (m) – (m)	HP Part No. 8120-1840

Procedure

1. Set up the equipment as shown on the computer CRT.
2. Select **[CarryOn]**.

   The **[JANITOR]** softkey returns you to the test menu.

2. Select the desired softkey and respond to the program prompts:

   [FullTst] performs the entire frequency switching time test, and compares the measured data to the synthesizer's specifications. Select this softkey to meet the requirements of the performance test.

   When this test completes, the test results are displayed. Select **[Carry On]** and then either **[Re-Test]** (to return to the frequency switching time menu), or **[JANITOR]** (to return to the test menu).

   [Other] lets you select the two CW frequencies between which the test will switch. You have a choice of:

   [A to B] entering two frequency points;

   [A to A+d] entering one frequency point and the frequency step size;

   [FullTest] running the full test; or

   [Janitor] returning to the test menu.

   If you select **[A to B]** or **[A to A+d]**, the frequency you enter must be in MHz.

   [JANITOR] returns you to the test menu.

8-9. Test Menu Utility Softkey

Description

The test menu **[Utility]** softkey gives you the capability of:

- Changing the synthesizer's defined option configuration (option configuration defined by the cal constants) from your computer,
- Displaying data from previously run tests, or
- Displaying the test status of previously tested instruments.

Use the change option feature to simplify instrument reconfiguration after you add or delete an instrument option.

Test Equipment

None Required.

Procedure

1. After you select the test menu **[Utility]** softkey, the program displays the following softkey choices:

   [Chg Option] lets you change the synthesizer's defined option configuration.

   After you select this softkey, input each of the synthesizer's three-digit option strings (one at a time), pressing **[ENTER]** after each entry. After you have input the options, check the option list. When the option entry is complete,, the program automatically updates the calibration constants in the synthesizer, and the data file on the data disc, to reflect the option configuration you entered.

   [Dsp Data] lets you display or print the test data from previously run tests (see the NOTE below).

   The data displayed is for the instrument whose serial number is currently in the computer's memory, and for the type of testing you selected while in the TEST SELECTION menu (either the attenuator calibration or the operation verification).

   When you select this softkey, the program displays the test menu and lets you output all the test data (**[ALL DATA]**), output the data for one test (**[SELECT]**), or return to the UTILITIES menu (**[EXIT]**).

   The **[SELECT]** softkey outputs the data for the test at which the cursor points. Use the keyboards UP or DOWN arrow keys or the front panel knob on the keyboard to position the cursor.

   [Prt Status] lets you display or print the test status for the synthesizer whose serial number is currently in the computer's memory. The status displayed is for the type of testing you selected while in the TEST SELECTION menu (attenuator calibration or operation verification).

   [Exit] returns to the test menu.

2. If you have finished viewing the test data (or the test status) from the operation verification and wish to see the data from the attenuator calibration (or vice versa), you must return to the TEST SELECTION menu. Press the exit softkeys until you reach this menu and then press the appropriate softkey.

NOTE: To see an instrument's measurement data or test status, it is not necessary to have it connected to the HP-IB. The only requirements are that:

- the instrument's data disc is installed in the data disc drive,
- you know the instrument's serial number, and
- an instrument with a different serial number is not attached to the HP-IB.

To implement this feature, access the TEST SELECTION menu and select the type of testing for which you wish to see the data. If an instrument is not attached to the HP-IB, the program asks you if you wish to continue without one. Select [YES] and enter the instrument's serial number. Go to the test menu and select [Utility]. Now you can either display the test data or test status as described above.

NOTE: Because the measurement data is not stored for the CW frequency accuracy test, or the phase lock loop diagnostic, there is no data to view for these tests/diagnostics.

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Changes Added Jan 86
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SAFETY CONSIDERATIONS

GENERAL

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

SAFETY SYMBOLS

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

Indicates hazardous voltages.

Indicates earth (ground) terminal.

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

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

SAFETY EARTH GROUND

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

BEFORE APPLYING POWER

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

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

SERVICING

WARNING

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

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

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

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

For convenience, this Table encompasses the entire four volume manual set.

VOLUME 1 CONTENTS

VOLUME 1 CONTENTS (Cont'd)

TABLES

VOLUME 2 CONTENTS

TABLES

VOLUME 3 CONTENTS

TABLES

VOLUME 4 TABLES

IV Performance Tests

SECTION IV
PERFORMANCE TESTS

4-1. INTRODUCTION

4-2. The procedures in this section and the following section (Automated Test Procedures) test the 8340A's electrical performance using the specifications of Table 1-1 as the performance standards. All tests can be performed without access to the interior of the instrument. An HP-IB Operation Verification procedure is also provided at the end of this section to verify proper HP-IB operation of the instrument.

NOTE

The Automated Test Procedures provided include additional tests that would be impossible or too tedious to test with a manual procedure (Frequency Switching Time and RF Attenuator Performance). The automated tests also include several tests that allow adjustments to be made or calibration constants to be accessed or changed.

4-3. EQUIPMENT REQUIRED

4-4. Equipment required for the manual Performance Test Procedures documented in this section is listed in the Recommended Test Equipment table in Section I of this manual. Any equipment that satisfies the critical specifications given the table may be substituted for the recommended model listed. Additional test equipment required for the Automated Performance Tests is included in that section (following this section) as well as in the Recommended Test Equipment List in Section I.

4-5. TEST RECORD

4-6. Results of the manual Performance Test procedures may be tabulated on the test record card located at the end of this section. Results of the Automated Test Procedures are tabulated automatically at the end of each procedure. A complete test record card consists of the manual and automatic test results. Each test lists all of the tested specifications and their acceptable limits. The results recorded at incoming inspection can be used for comparison in periodic maintenance and troubleshooting and after repairs or adjustments have been made. Refer to the Automated Test Procedures section for more detailed information on how to access the data included in those tests.

4-7. CALIBRATION CYCLE

4-8. This instrument requires periodic verification of performance. The instrument should be checked using the following performance tests at least once every year.

Table 4-1. List of Manual Performance Tests[1]

Paragraph	Performance Test Title	Page
4-9	Internal Time Base Aging Rate	4-3
4-10	Frequency Range and CW Mode Accuracy	4-6
4-11	Sweep Time Accuracy	4-12
4-12	Swept Frequency Accuracy	4-14
4-13	Maximum Leveled Output Power and Power Accuracy	4-18
4-14	External Leveling	4-26
4-15	Spurious Signals Test (10 MHz to 22 GHz)	4-30
4-16	Spurious Signals Test (22 to 26.5 GHz)	4-33
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4-18	Power Sweep Test	4-43
4-19	Pulse Modulation ON/OFF Ratio Test	4-46
4-20	Pulse Modulation Rise and Fall Time Test	4-48
4-21	Pulse Modulation Accuracy Test	4-52
4-22	Pulse Modulation Video Feedthrough Test	4-56
4-23	Amplitude Modulation Test	4-60
4-24[2]	HP-IB Operation Verification Test	4-65

1. This list does not include the automated tests for Frequency Switching Time and RF Attenuator Performance, each of which are also required to complete the performance testing of the HP 8340A.
2. This is not a Performance Test. It is included as an additional aid to determine that the HP-IB circuitry is operating properly.

4-9. INTERNAL TIME BASE AGING RATE

NOTE

The overall accuracy of the Model 8340A 10 MHz internal time base is a function of time base calibration ± aging rate ± temperature effects ± line effects.

For greatest frequency accuracy, the time base should be allowed to warm up until the output frequency has stabilized (usually 7 to 30 days) before calibrating (adjusting the time base frequency to a known standard). After calibration, the change in time base frequency should remain within the aging rate if: the time base oven is not allowed to cool down, the instrument orientation with respect to the earth's magnetic field is maintained, and the instrument does not sustain any mechanical shock. Frequency changes due to orientation with respect to the earth's magnetic field and altitude changes will usually be nullified when the instrument is returned to its original position. Frequency changes due to mechanical shock will usually appear as a fixed frequency error.

If the instrument is disconnected from ac power allowing the time base oven to cool down, it may be necessary to readjust the time base frequency after a new warmup cycle; however, in most cases, the time base frequency will return to within ± 1 Hz of the original frequency.

Specification

Table 4-2. Internal Time Base Aging Rate Specifications

Aging Rate: $1x10^{-9}$ per day, $2.5x10^{-7}$ per year after 72-hour warm up if 8340A has been disconnected from ac power for less than 24 hours. Aging rate is achieved after 7 to 30 days warm-up if 8340A has been disconnected from ac power for greater than 24 hours.
Accuracy: Overall accuracy of internal time base is a function of time base calibration ± aging rate ± temperature effects ± line effects.

Description

A reference signal from the 8340A under test is connected to the oscilloscope's vertical input. A frequency standard (with long term stability greater than $1x10^{-10}$ is connected to the oscilloscope trigger input. The time required for a specific phase change is measured immediately and after a period of time. The aging rate is inversely proportional to the absolute value of the difference in the measured times.

4-9. INTERNAL TIME BASE AGING RATE (Cont'd)

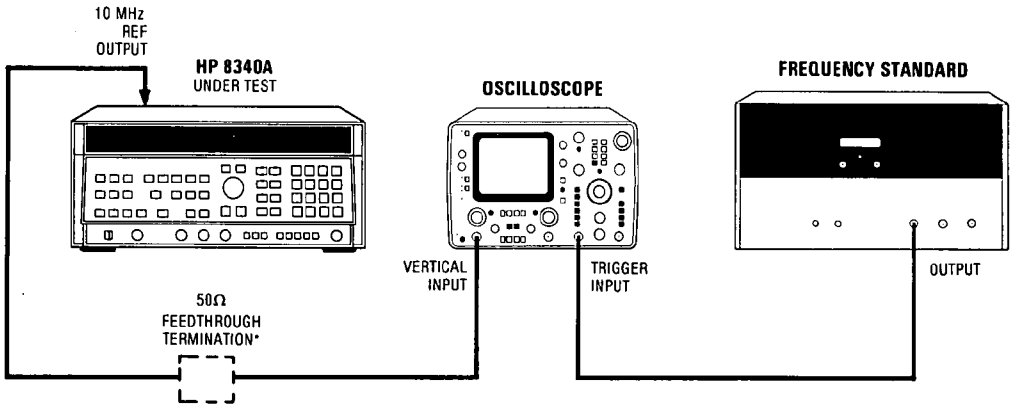


Figure 4-1. Internal Time Base Aging Rate Test Setup

Equipment

Frequency Standard..... HP 5061A
Oscilloscope*..... HP 1741A

* A 50 Ohm Feedthrough Termination (such as the HP 10100C) is required when using an oscilloscope without a 50 Ohm input. It is not required with the HP 1741A.

NOTE

Be sure the 8340A has had 30 days to warmup before beginning this test. If the 8340A was disconnected from the ac power line for less than 24 hours, only a 24 hour warmup is required.

Procedure

1. Connect the equipment as shown in Figure 4-1.

2. Adjust the oscilloscope external triggering controls for a stable display of the 8340A 10 MHz REF OUTPUT signal.

3. Measure the time required for a phase change of 360 degrees. Record the time (T1) in seconds.

   T1 =_____ seconds (s)

4. Wait for a period of time (from 3 to 24 hours) and remeasure the phase change time (repeat step 3). Record the period of time between measurements (T2) in hours and the new phase change time (T3) in seconds.

   T2 =_____ hours (h)

   T3 =_____ seconds (s)

4-9. INTERNAL TIME BASE AGING RATE (Cont'd)

5. Calculate the aging rate from the following equation:

Aging Rate = (1 cycle/f)(1/T1 − 1/T3)(T/T2)

Where: 1 cycle = the phase change reference for the time measurement. (in this case, 360 degrees)
f = 8340A Time Base output frequency (10 MHz)
T = specified time for aging rate (24 hours)
T1 = initial time measurement (s) for 360 degree (1 cycle change
T2 = time between measurements (h)
T3 = final time measurement (s) for a 360 degree (1 cycle) change

For example, if:

T1 = 351s
T2 = 3h
T3 = 349s

Then:

Aging Rate = (1 cycle/10 MHz)(1/351s − 1/349s)(24h/3h)

$= 1.306 \times 10^{-11}$ per day

6. Verify that the aging rate is less than 1×10^{-9} per day

NOTE

If the absolute frequencies of the frequency standard and the 8340A Time Base oscillator are extremely close, the measurement time in steps 3 and 4 (T1 and T3) can be reduced by measuring the time required for a phase change of less than 360 degrees. Change "1 cycle" in the equation accordingly (i.e., 180 degrees = 1/2 cycle, or 90 degrees = 1/4 cycle).

7. If the aging rate is not within the required tolerance, be sure sufficient warmup time has been allowed and that the environmental conditions have not changed throughout the test, then check the Time Base heater circuit and, if necessary, replace the Time Base. Refer to service and repair information for the A51 10 MHz Reference Oscillator in the Reference Loop − M/N Loop portion of Section VIII, Service.

4-10. FREQUENCY RANGE AND CW MODE ACCURACY

Specification

Table 4-3. Frequency Range and CW Mode Accuracy Specifications

Range: 0.01 to 26.50 GHz Resolution: n x 1 Hz Where n = harmonic multiplication number (1 to 4). Refer to Frequency Ranges and Bandswitch Points description in Table 1-1. Accuracy: Same as Time Base Accuracy (refer to Table 1-1).

Description

The 8340A RF output is fed to a frequency counter. The frequency counter internal time base is used as the reference for the 8340A to eliminate time base error from the measurement. The 8340A frequency display and the counter display should agree, within the resolution of each instrument. This procedure does not test for CW mode accuracy as a funtion of the time base accuracy.

NOTE

A fault in the 8340A could cause the two displays to be different. Any fault that would cause one of the phase lock loops to be unlocked would be indicated by a front-panel FAULT indication; however, all 8340A internal phase lock loops could be locked and the 8340A output frequency could be in error (i.e., a phase lock loop frequency divider bit could be stuck). If all the dividers work normally, then CW mode frequency accuracy is essentially guaranteed.

In the following procedure, the test frequencies are selected first to test the maximum frequency range and then to exercise each frequency related circuit throughout its CW range while holding all remaining circuits constant. The test frequencies are grouped so that an abnormal indication would point to the circuit most likely causing the problem.

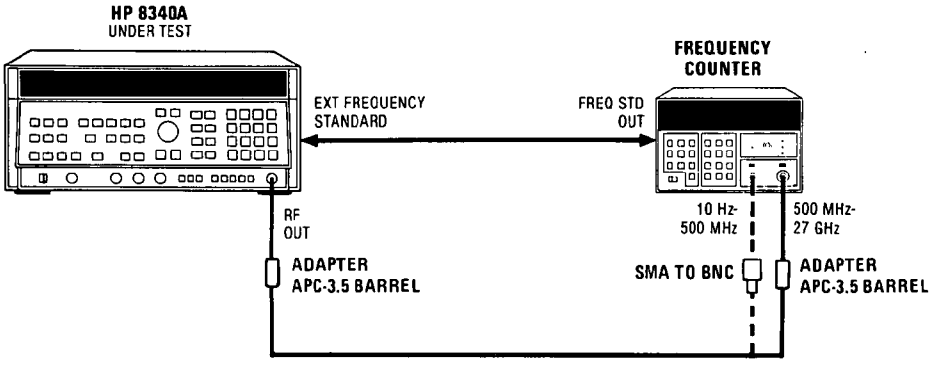


Figure 4-2. Frequency Range Test Setup

4-10. FREQUENCY RANGE AND CW MODE ACCURACY (Cont'd)

Equipment

Frequency Counter..... HP 5343A
Adapter..... HP P/N 5061-5311 (APC 3.5 Female to Female barrel)
Cable ..... HP P/N 8340-20124 (Semi-rigid SMA Male to SMA Male)

Procedure

1. Connect the equipment as shown in Figure 4-2. Connect the 8340A RF Output to the 10 MHz-500 MHz counter input. Allow at least 30 minutes warm up time. The 8340A under test and the Frequency Counter use the same frequency standard to eliminate time base error from the measurement. Set the 8340A rear panel FREQUENCY STANDARD switch to EXT.

2. Press 8340A **[INSTR PRESET]**, then **[CW]** and enter **[1] [0] [MHz]**. Press **[POWER LEVEL]** and enter **[−] [2] [0] [dBm]**. The counter should indicate 10 MHz ± 1Hz ± the resolution of the counter.

3. Connect the 8340A RF output to the 500 MHz-26.5 GHZ counter input. Press the 8340A **[CW]** key and enter **[2] [6] [.] [5] [GHz]**. The counter should indicate 26.5 GHz ± 4 Hz ± the resolution of the counter.

NOTE

Since the same time base is used for both the 8340A and the frequency counter, only the displayed frequency is checked. The actual frequency error is ± (8340A output frequency/10 MHz) X time base error ± 4 Hz.

4. Check the M/N Divider frequencies as follows:

NOTE

Pressing [SHIFT] [M1] **displays, from left to right, the:**
M divide number,
N divide number,
M/N Loop output frequency,
20/30 Loop output frequency.
Press [SHIFT] [M5] **to exit this diagnostic mode. The instrument continues to operate normally while in the diagnostic dispay mode.**

a. Press the **[CW]** key and enter **[2] [4] [9] [0] [MHz]**. Select a step size of 10 MHz by pressing **[SHIFT] [CF] [1] [0] [MHz]**. Press **[SHIFT] [M1]** to display, from left to right, the M divide number, the N divide number, the M/N Loop output frequency, and the 20/30 Loop output frequency. Press the **[CW]** key to display the CW frequency in the **[ENTRY DISPLAY]**.

b. Using the down arrow key, step down to 2 300.000000 MHz. Check the counter indication at each step. The counter should indicate the 8340A frequency ± 1Hz ± the resolution of the counter at each step.

4-10. FREQUENCY RANGE AND CW MODE ACCURACY (Cont'd)

NOTE

The above step sets and holds the N Divider to 13 and programs the M Divider through its full range of 8 to 27. Any frequency error as a result of a problem in the M Divider will probably be a multiple of 10 MHz.

c. If a significant frequency error is evident, note the conditions under which the error occured and continue this procedure to determine if any other conditions produce an error.

5. Check the M/N N Divider frequencies as follows:

a. Select a step size of 200 MHz by pressing **[SHIFT] [CF] [2] [0] [0] [MHz]**. Press **[CW]** to display the CW frequency in the **[ENTRY DISPLAY]**. The CW frequency should be 2 300.000000 MHz.

b. Using the up arrow key, step up to 6 900.000000 MHz. Check the counter indication at each step. the counter should indicate the 8340A frequency ± 1 Hz ± the resolution of the counter.

NOTE

The above step sets and holds the M Divider to 27 and programs the N Divider through its full range of 13 to 36. Any frequency error as a result of a problem in the M Divider will probably be a multiple of 10 MHz.

c. If a significant frequency error is evident, note the conditions under which the error occurred and continue this procedure to determine if any other conditions produce an error.

6. Check the 20/30 MHz N2 loop frequencies as follows:

a. Press **[INSTR PRESET]**. Press **[CF]** key and enter **[2] [3] [1] [0] [.] [5] [MHz]**. Press the **[ΔF]** key and enter **[1] [MHz]**. Select a step size of 1 kHz by pressing **[SHIFT] [CF] [1] [kHz]**.

b. Press **[SINGLE]** sweep key to set the 8340A to be phase-locked at the start of sweep (2.310 GHz). Press **[SHIFT] [M1]** to enter the diagnostic display mode. Press **[CF]** to display the center frequency in the **[ENTRY DISPLAY]**. The center frequency should be 2.310500 GHz.

c. Using the up arrow key, step the center frequency up to 2.310510 GHz. Check the counter indication at each step. The counter should indicate the 8340A start frequency (CF − 0.0005 GHz) ± 1 Hz ± the resolution of the counter.

4-10. FREQUENCY RANGE AND CW MODE ACCURACY (Cont'd)

NOTE

The above steps set the output of the M/N loop to 180 MHz where M=26 and N=13. The YO start frequency (2310 MHz) is then 20 to 30 MHz below the Nth harmonic (N=13) of 180 MHz (180 X 13 = 2340). The 20/30 MHz output is then 30 MHz. Since the ΔF frequency (1 MHz) is between 0.1 to 5 MHz, the 20/30 MHz frequency is derived from the PLL2 75 to 150 MHz VCO output divided by 5 (150 MHz / 5 = 30 MHz). The PLL2 VCO frequency is stepped down in 5 KHz steps which steps the 20/30 frequency from 30 MHz down to 29.990 MHz in 1 kHz steps. Since the M/N frequency remains constant and the 8340A output frequency is mixed with a harmonic (13th) of the M/N signal and the resultant output is phase compared to the 20/30 output, the 8340A output frequency must increase by 1 kHz/step to satisfy the 20/30 phase lock loop. This checks the least significant (BCD) N2 programming bits.

To observe the N2 PLL2 VCO frequency changes, repeat the N2 loop frequency check (Step 6a through 6c) pressing [SHIFT] [M3] in step 6b rather than [SHIFT] [M1]. [SHIFT] [M3] will display, from left to right, the PLL2 VCO frequency and the PLL3 Up Converter frequency (the PLL3 Up Converter frequency display will be 0 since the PLL3 is not used in the swept mode).

d. Select a step size of 10 kHz by pressing **[SHIFT] [CF] [1] [0] [kHz]**. Press **[CF]** to display the center frequency in the **[ENTRY DISPLAY]**; the display should indicate 2.310510 GHz.

e. Using the up arrow key, step the center frequency up to 2.310600 GHz. Check the counter indication at each step. The counter should indicate the 8340A start frequency (CF − 0.0005 GHz) ± 1 Hz ± the resolution of the counter.

NOTE

The above steps program the 20/30 frequency from 29.99 MHz to 29.90 MHz in 0.01 MHz steps and checks additional N2 Divider programming bits.

f. Select a step size of 100 kHz by pressing **[SHIFT] [CF] [1] [0] [0] [kHz]**. Press **[CF]** to dislay the center frequency in the **[ENTRY DISPLAY]**. The CF should be at 2.310600 GHz.

g. Using the up arrow key, step the center frequency up to 2.311500 GHz. Check the counter indication at each step. The counter should indicate the 8340A start frequency (CF − 0.0005 GHz) ± 1 Hz ± the resolution of the counter.

NOTE

The above steps program the 20/30 frequency from 29.9 to 29.0 in 0.1 MHz steps and check additional N2 Divider programming bits.

4-10. FREQUENCY RANGE AND CW MODE ACCURACY (Cont'd)

h. Select a step size of 1 MHz (i.e., press blue **[SHIFT]** key and then **[CF]** key and enter **[1] [MHz]**). Press **[CF]** to display the center frequency in the **[ENTRY DISPLAY]**. The CF should be at 2.311500 GHz.

i. Using the up arrow key, step the center frequency up to 2.320500 GHz. Check the counter indication at each step. The counter should indicate the 8340A start frequency (CF − 0.0005 GHz) ± 1 Hz ± the resolution of the counter.

NOTE

The above steps program the 20/30 frequency from 29.0 MHz to 21.0 MHz in 1 MHz steps. The last CF step programs the 20/30 to.30 MHz and the M/N frequency to 180.769231 MHz. This checks the remaining N2 Divider programming bits.

j. If a significant frequency error is evident, note the conditions under which the error occurred and continue this procedure to determine if any other conditions produce an error.

7. Check the 20/30 MHz N1 loop frequencies as follows:

a. Press **[INSTR PRESET]**. Select a step size of 10 kHz by pressing **[SHIFT] [CF] [1] [0] [kHz]**. Press **[CW]** and enter **[2] [3] [1] [9] [.] [9] [7] [MHz]**.

b. Press **[SHIFT] [M1]** to display, from left to right, the M divide number, the N divide number, the M/N Output frequency, and the 20/30 Output frequency.

c. Using the down arrow key, step the CW frequency down to 2 319.870000 MHz. Check the counter indication at each step. The counter should indicate the 8340A CW frequency ± 1 Hz ± the resolution of the counter.

NOTE

The above steps set the output of the M/N loop to 180 MHz where M=26 and N=13. The PLL1 VCO frequency is stepped up in 100 kHz steps. This steps the 20/30 frequency up from 20.03 MHz in 10 kHz steps to 20.13 MHz. The M/N frequency remains constant and the YO frequency is mixed with a harmonic (13th) of the M/N signal. The resultant output is phase compared to the 20/30 output. The 8340A output frequency must decrease by 10 kHz/step to satisfy the YO phase lock loop. This checks the least significant N1 programming bits.

d. Select a step size of 100 kHz by pressing **[SHIFT] [CF] [1] [0] [0] [kHz]**. Press the **[CW]** key to view the CW frequency in the **[ENTRY DISPLAY]**. The CW frequency should be at 2319.870000 MHz.

e. Using the down arrow key, step the CW frequency down to 2 318.970000 MHz. Check the counter indication at each step. The counter should indicate the 8340A CW frequency ± 1 Hz ± the resolution of the counter.

4-10. FREQUENCY RANGE AND CW MODE ACCURACY (Cont'd)

NOTE

The above steps program the 20/30 frequency from 20.13 up to 21.03 in 0.1 MHz steps and checks additional N1 Divider programming bits.

f. Select a step size of 1 MHz by pressing **[SHIFT] [CF] [1] [MHz]**. Press the **[CW]** key to view the CW frequency in the **[ENTRY DISPLAY]**. The CW frequency should be at 2318.970000 MHz.

g. Using the down arrow key, step the CW frequency down to 2310.970000 MHz. Check the counter indication at each step. The counter should indicate the 8340A CW frequency ± 1 Hz ± the resolution of the counter.

NOTE

The above steps program the 20/30 frequency from 21.03 MHz to 29.03 MHz in 1 MHz steps and check the remaining N1 Divider programming bits.

8. If frequency errors occurred, determine what frequency related circuit is most likely to have caused the symptom (i.e., M/N Loop or 20/30 Loop) then refer to the appropriate troubleshooting Functional Group in Section VIII, Service.

4-11. SWEEP TIME ACCURACY

Specification

Table 4-4. Sweep Time Accuracy Specifications

Range: 10 milliseconds to 200 seconds forward sweep times
Accuracy: ±5% (sweeptimes ≤ 50 seconds)

Description

The 8340A is swept from 3 GHz to 7 GHz at 6 different sweep times, ranging from 10 ms to 200 sec. The rear panel STOP SWEEP IN/OUT signal of the 8340A is used to trigger INPUT A and B on an HP 5316A Universal Counter used in the time interval mode. At the start of a sweep, the STOP SWEEP IN/OUT signal changes from TTL low to TTL high. This pulse triggers INPUT A on the Universal Counter (selected for leading edge triggering) and the count begins. At the end of a sweep, the STOP SWEEP IN/OUT signal changes from TTL high to TTL low. At this point, INPUT B is triggered (selected for trailing edge triggering) and the count is complete. After the Universal Counter has made several counts, an accurate reading of the 8340A sweep time is indicated on its display.

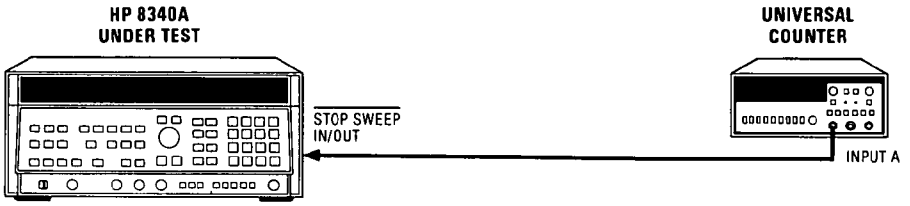


Figure 4-3. Sweep Time Accuracy Test Setup

Equipment

Universal Counter ..... HP 5316A

Procedure

1. Connect equipment as shown in Figure 4-3. Switch the 8340A POWER to ON. Allow the equipment to warm up for 30 minutes.

2. On the 8340A, press **[INSTR PRESET] [START FREQ] [3] [GHz] [STOP FREQ] [7] [GHz] [POWER LEVEL] [0] [dBm]**.

4-11. SWEEP TIME ACCURACY (Cont'd)

3. Set up the 5316A as follows:

TI A→B	IN
GATE TIME	MIN
LEVEL/SENSE (CHANNEL A and B)	+MAX
TRIGGER (CHANNEL A and B)	LEVEL
AC/DC (CHANNEL A and B)	DC
ATTN (CHANNEL A and B)	X1
FILTER	NORM
SEP/COM A	COM A
Channel A Triggering	Leading Edge
Channel B Triggering	Trailing Edge

NOTE

To ensure that an accurate sweep time indication is obtained from the 5316A in step 4, allow the 8340A to complete at least three sweeps.

4. On the 8340A, press **[SWEEP TIME] [1] [0] [msec]**. Verify that the sweep time displayed by the 5316A is within the limits shown in Table 4-5.

5. Repeat step 4 for values shown in Table 4-5.

Table 4-5. Sweep Time Accuracy Limits

Selected	Lower Limit	Upper Limit
10 msec	9.5 msec	10.5 msec
100 msec	95 msec	105 msec
1 sec	.95 sec	1.05 sec
10 sec	9.5 sec	10.5 sec
50 sec	47.5 sec	52.5 sec

4-12. SWEPT FREQUENCY ACCURACY

Specification

Table 4-6. Swept Frequency Accuracy Specifications

Center Frequency/Sweep Width Mode (CF/&F)

Readout Accuracy with respect to sweep out voltage (sweep time > 100 milliseconds):
$\Delta F \leq$ n x 5 MHz: ± 1% of indicated sweep width (ΔF) ± time base accuracy*
$\Delta F >$ n x 5 MHz to < n x 100 MHz: ± 2% of indicated sweep width (ΔF)
$\Delta F \geq$ n x 100 MHz: ± 1% of indicated sweep width (ΔF), or ± 50 MHz, whichever is less

Where n = harmonic multiplication number (1 to 4). Refer to Frequency Ranges and Bandswitch Points description in Table 1-1.

* Time Base affects Center Frequency accuracy only, not Sweep Width Accuracy.

Start/Stop Mode

Readout Accuracy with respect to sweep out voltage (sweep time > 100 milliseconds):
Same as Center Frequency/Sweep Width Mode.

Description

The HP 8340A (DUT) RF output is connected to the HP 8566A Spectrum Analyzer input. The spectrum analyzer is set for zero Hz span at a CW frequency within the 8340A swept frequency range. The spectrum analyzer VIDEO OUT (applied to the oscilloscope vertical input) will have a response as the 8340A output passes through the frequency that the spectrum analyzer is tuned to. The selected spectrum analyzer bandwidth filter will determine the shape of the response.

The 8340A SWEEP OUT, in series with a power supply, is applied to an oscilloscope's horizontal input. The input to the oscilloscope is clamped at ±0.7 V by two diodes to prevent overdriving the oscilloscope's input. The oscilloscope is calibrated by setting the 8340A and the spectrum analyzer to the same CW frequency (e.g., 20% of Band). To set the 8340A to have a SWEEP OUT voltage and at the same time a phase locked CW frequency that is proportional to a percentage of a swept frequency band, the START and STOP frequencies are selected, MANUAL SWEEP is selected, and a frequency equivalent to the desired percentage of band is selected (e.g., START 3 GHz, STOP 5 GHz, MANUAL 3.4 GHZ, for 20%). The power supply is adjusted for a DVM indication of zero volts and the oscilloscope horizontal position control is used to position the dot to the center graticule line. With the oscilloscope horizontal sensitivity set to 0.05 V/Division, the CRT horizontal axis is now calibrated to approximately 0.5% of the swept frequency range per division. The spectrum analyzer VIDEO OUT voltage to the oscilloscope is then maximum and the scope vertical position is adjusted to place the dot near the top of the CRT.

The 8340A can now be set to sweep any frequency range and the oscilloscope center graticule line will represent the calibrated percentage (e.g., 20%) of the sweep range. The

4-12. SWEPT FREQUENCY ACCURACY (Cont'd)

spectrum analyzer center frequency is set to a frequency that is the desired percentage (e.g., 20%) of the 8340A swept frequency range. If the 8340A swept frequency accuracy is perfect, the oscilloscope trace will be the response of the spectrum analyzer's bandwidth filter, centered on the CRT. If the trace is not centered, the spectrum analyzer center frequency is adjusted to position the response to the center of the oscilloscope CRT. The amount of spectrum analyzer frequency change is the 8340A Swept Frequency Accuracy error.

Since the circuitry that determines swept frequency accuracy is the same for both ΔF Mode and Start/Stop Mode, only Start/Stop Mode swept frequency accuracy is tested.

NOTE

The spectrum analyzer resolution bandwidth, and 8340A sweep time must be compatible to obtain the desired oscilloscope response.

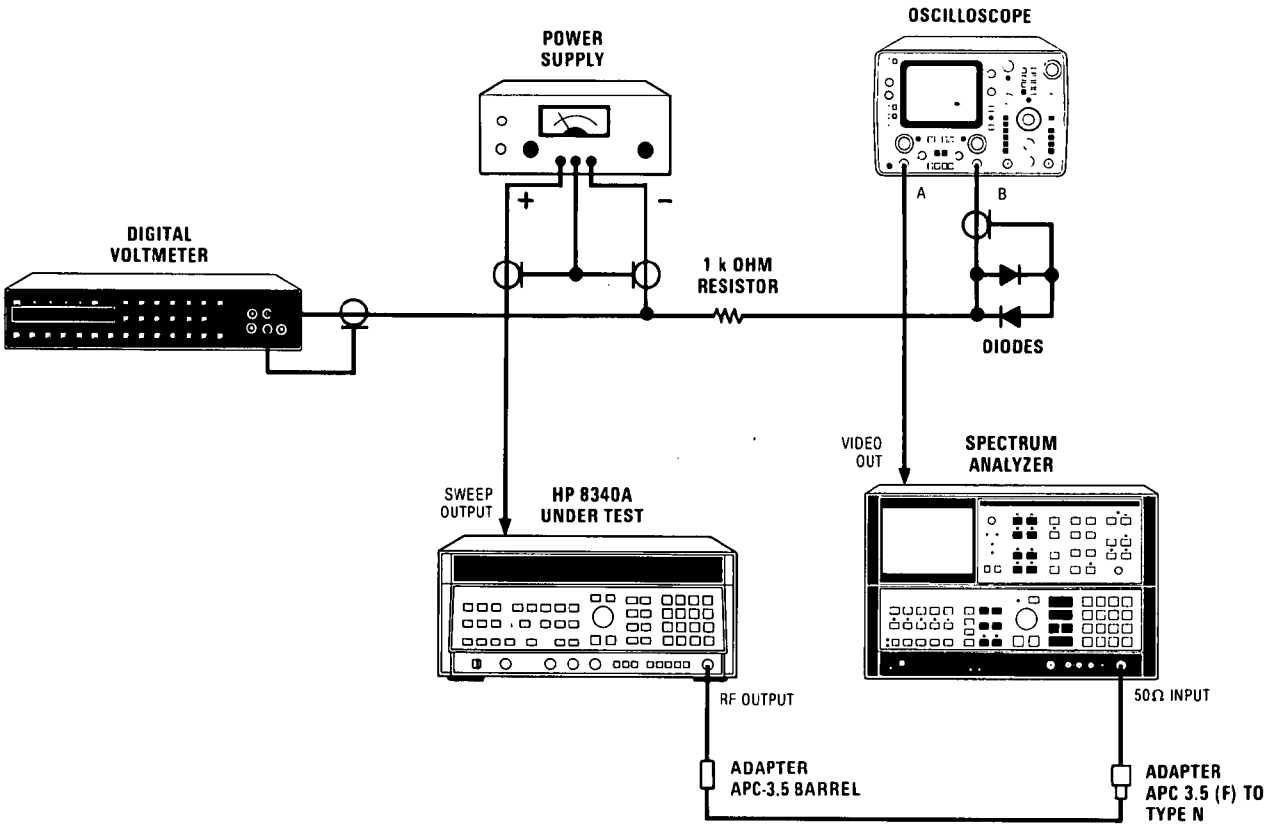


Figure 4-4. Swept Frequency Accuracy Test Setup

4-12. SWEPT FREQUENCY ACCURACY (Cont'd)

Equipment

Spectrum Analyzer	HP 8566A
Oscilloscope	HP 1741A
Power Supply	HP 6294A
Adapter	HP P/N 5061-5311 APC-3.5 (female) to APC 3.5 (female)
Adapter	HP P/N 1250-1743 Type N (male) to APC 3.5 (male)
Cable	HP P/N 08340-20124 (SMA male to SMA male)
Diode (2 required)	HP P/N 1901-0028
Digital Voltmeter	HP 3455A
1 KOhm Resistor	HP P/N 0757-0280

Procedure

1. Connect the equipment as shown in Figure 4-4 (with the power supply output set to 0 Vdc). Allow the equipment to warm up for one hour.

2. Press 8340A **[INSTR PRESET]**. Set the oscillocope to display amplitude versus sweep out voltage (A vs B). Set channel A sensitivity to 0.2V/Div.

3. Set the spectrum analyzer REFERENCE LEVEL to 20 dBm. Set CENTER FREQUENCY to 3.4 GHz for 20% (4 GHz for 50%, or 4.6 GHz for 80%). Set FREQUENCY SPAN to zero. Set RES BW (resolution bandwidth) to 3 MHz.

4. Set 8340A to have a sweep out voltage and at the same time, a phase locked CW frequency that is proportional to a percentage of band as follows:

   a. Press **[START]** and enter **[3] [GHz]**

   b. Press **[STOP]** and enter **[5] [GHz]**.

   c. Press **[MANUAL]** SWEEP and enter **[3] [.] [4] [GHz]** for 20% (4 GHz for 50%, or 4.6 GHz for 80%).

CAUTION

Do not adjust the power supply for greater than ±10 Vdc in this procedure.

5. Adjust the oscilloscope's Channel B sensitivity for 0.05 V/DIV and the horizontal position control for midrange. Adjust the power supply voltage for a DVM indication of 0 ±10 mVdc.

6. Adjust oscilloscope horizontal position control to position the dot on the center graticule. Adjust the oscilloscope vertical position to place the dot near the top of the CRT.

NOTE

The oscilloscope is now calibrated for 0.5%/Division and for the desired percentage of band (i.e., 20%, 50%, or 80%). Measurements can now be made at this percentage of band for any Start/Stop frequency and any frequency span.

4-12. SWEPT FREQUENCY ACCURACY (Cont'd)

Table 4-7. Swept Frequency Accuracy Test Frequencies

8340A			Spectrum Analyzer				Test Limit (kHz)
			Center Frequency (GHz)			Res BW (kHz)	
Start Freq (GHz)	Stop Freq (GHz)	Sweep Time (ms)	20% of Band	50% of Band	80% of Band		
2.3	2.300099	3000	2.3000198	2.3000495	2.3000792	0.3	±0.99
2.3	2.300101	3000	2.3000202	2.3000505	2.3000808	0.3	±1.01
2.3	2.300499	1000	2.3000998	2.3002495	2.3003992	1.0	±4.99
2.3	2.300501	1000	2.3001002	2.3002505	2.3004008	1.0	±5.01
2.3	2.30499	300	2.300998	2.302495	2.303992	3.0	±49.9
2.3	2.30501	300	2.301002	2.302505	2.304008	3.0	±100.02
2.3	2.31	300	2.302	2.305	2.308	3.0	±200
2.3	2.32	100	2.304	2.310	2.316	10	±400
2.3	2.33	100	2.306	2.315	2.324	10	±600
2.3	2.34	100	2.308	2.320	2.332	30	±800
2.3	2.349	100	2.3098	2.3245	2.3392	30	±998
2.3	2.3501	100	2.31002	2.32505	2.34008	30	±1020
2.3	2.36	100	2.312	2.33	2.348	30	±1200
2.3	2.37	100	2.314	2.335	2.356	30	±1400
2.3	2.38	100	2.316	2.34	2.364	30	±1600
2.3	2.39	100	2.318	2.345	2.372	30	±1800
2.3	2.3999	100	2.31998	2.34995	2.37992	30	±1980
2.3	2.4001	100	2.32002	2.35005	2.38008	100	±1001
2.3	2.799	100	2.3998	2.5495	2.6992	1000	±4990
2.3	2.801	100	2.4002	2.5505	2.7008	1000	±5010
2.3	7.29	100	3.298	4.795	6.292	3000	±49900
2.3	7.31	100	3.302	4.805	6.308	3000	±50000
2.3	8.3	100	3.500	5.300	7.100	3000	±50000
2.3	16.452	100	5.125	9.3625	13.6	3000	±50000
2.3	24.55	100	6.75	13.452	20.1	3000	±50000
2.3	26.5	100	7.14	14.4	21.66	3000	±50000

7. Refer to Table 4-7, press the 8340A **[START FREQ]** key and enter the start frequency shown in Table 4-7. Press the **[STOP FREQ]** key and enter the appropriate stop frequency. Press the **[SWEEP TIME]** key and enter the appropriate sweep time. Select the appropriate spectrum analyzer resolution bandwith. Set the spectrum analyzer center frequency to the appropriate frequency for the percentage of band being tested. Press the 8340A **[CONT]** key to return the 8340A to the swept mode.

8. Ideally, the oscilloscope response will be at the center graticule line, if not, adjust the spectrum analyzer center frequency to bring the oscilloscope response to the center graticule line. The difference between the original center frequency setting and present center frequency is the 8340A swept frequency error. This error should be within the test limit shown in Table 4-7.

9. Repeat steps 3 through 8 to test at 50% and 80% of band.

NOTE

If the swept frequency accuracy error exceeds the test limit, refer to the Sweep Gain and Delay Adjustments in Section V, Adustments.

4-13. MAXIMUM LEVELED OUTPUT POWER AND POWER ACCURACY TEST

Specification

Table 4-8. Maximum Leveled Output Power and Power Accuracy Specifications (1 of 2)

MAXIMUM LEVELED POWER (0°C to +35°C)	**Bands and Approximate Frequency Ranges (GHz)** (see Frequency Ranges and Bandswitch Points for complete description)					
	Band 0	**Band 1**	**Band 2**	**Band 3**	**Band 4**	
	0.01 to < 2.3	**2.3 to <7.0**	**7.0 to <13.5**	**13.5 to <20.0**	**20.0 to <23.0**	**23.0 to 26.5**
STANDARD INSTRUMENT	+10.0 dBm	+12.0 dBm	+10.0 dBm	+9.0 dBm	+3.0 dBm	+1.0 dBm
OPTION 001 (F.P. Out w/o Atten.)	+10.0 dBm	+13.0 dBm	+12.0 dBm	+11.0 dBm	+6.0 dBm	+4.0 dBm
OPTION 004 (R.P. Out w/Atten.)	+10.0 dBm	+11.0 dBm	+9.0 dBm	+7.0 dBm	+1.0 dBm	−1.0 dBm
OPTION 005 (R.P. Out w/o Atten.)	+10.0 dBm	+12.0 dBm	+11.0 dBm	+9.0 dBm	+4.0 dBm	+2.0 dBm

OUTPUT POWER ACCURACY[1]	**Bands and Approximate Frequency Ranges (GHz)** see Frequency Ranges and Bandswitch Points for complete description)		
	Band 0 0.01 to <2.3	**Bands 1−3 2.3 to <20**	**Band 4 20 to 26.5**
STANDARD INSTRUMENT			
+18 to +10 dBm[2]	−	± 1.8 dB	± 2.3 dB
+10 to −9.95 dBm	± 0.9 dB	± 1.5 dB	± 2.0 dB
−10 to −19.95 dBm	± 1.2 dB	± 2.0 dB	± 2.5 dB
−20 to −49.95 dBm	± 1.5 dB	± 2.3 dB	± 2.8 dB
−50 to −79.95 dBm	± 1.8 dB	± 2.6 dB	± 3.1 dB
−80 to −100 dBm	± 2.1 dB	± 2.9 dB	± 3.4 dB
OPTION 004 (Rear Panel Output w/Atten.)			
+18 to +10 dBm[2]	−	± 2.0 dB	± 2.5 dB
+10 to −11.95 dBm	± 1.0 dB	± 1.7 dB	± 2.2 dB
−12 to −21.95 dBm	± 1.3 dB	± 2.2 dB	± 2.7 dB
−22 to −51.95 dBm	± 1.6 dB	± 2.5 dB	± 3.0 dB
−52 to −81.95 dBm	± 1.9 dB	± 2.8 dB	± 3.3 dB
−82 to −100 dBm	± 2.2 dB	± 3.1 dB	± 3.6 dB
OPTION 001 (Front Panel Output w/o Atten.)			
+18 to +10 dBm[2]	−	± 1.6 dB	± 2.0 dB
+10 to −10 dBm	± 0.9 dB	± 1.3 dB	± 1.7 dB
−10 to −20 dBm	± 1.7 dB	± 2.1 dB	± 2.5 dB
OPTION 005 (Rear Panel Output w/o Atten.)			
+18 to +10 dBm[2]	−	± 1.8 dB	± 2.2 dB
+10 to −10 dBm	± 1.0 dB	± 1.5 dB	± 1.9 dB
−10 to −20 dBm	± 1.8 dB	± 2.3 dB	± 2.7 dB

4-13. MAXIMUM LEVELED OUTPUT POWER AND POWER ACCURACY TEST (Cont'd)

Table 4-8. Maximum Leveled Output Power and Power Accuracy Specifications (2 of 2)

FLATNESS (Internally leveled)

STANDARD INSTRUMENT	**Band 0 0.01 to <2.3**	**Bands 1–3 2.3 to <20**	**Band 4 20 to 26.5**
+18 to +10 dBm[2]	–	± 1.2 dB	± 1.7 dB
+10 to −9.95 dBm	± 0.6 dB	± 1.1 dB	± 1.6 dB
−10 to −19.95 dBm	± 0.9 dB	± 1.6 dB	± 2.1 dB
−20 to −49.95 dBm	± 1.2 dB	± 1.9 dB	± 2.4 dB
−50 to −79.95 dBm	± 1.4 dB	± 2.2 dB	± 2.7 dB
−80 to −100 dBm	± 1.7 dB	± 2.5 dB	± 3.0 dB
OPTION 004 (Rear Panel Output w/Atten.)			
+18 to +10 dBm[2]	–	± 1.4 dB	± 1.9 dB
+10 to −11.95 dBm	± 0.7 dB	± 1.3 dB	± 1.8 dB
−12 to −21.95 dBm	± 1.0 dB	± 1.8 dB	± 2.3 dB
−22 to −51.95 dBm	± 1.3 dB	± 2.1 dB	± 2.6 dB
−52 to −81.95 dBm	± 1.5 dB	± 2.4 dB	± 2.9 dB
−82 to −100 dBm	±1.8 dB	± 2.7 dB	± 3.2 dB
OPTION 001 (Front Panel Output w/o Atten.)			
+18 to +10 dBm[2]	–	± 1.0 dB	± 1.4 dB
+10 to −10 dBm	± 0.6 dB	± 0.9 dB	± 1.3 dB
−10 to −20 dBm	± 0.8 dB	± 1.5 dB	± 1.9 dB
OPTION 005 (Rear Panel Output w/o Atten.)			
+18 to +10 dBm[2]	–	± 1.2 dB	± 1.6 dB
+10 to −10 dBm	± 0.7 dB	± 1.1 dB	± 1.5 dB
−10 to −20 dBm	± 0.9 dB	± 1.7 dB	± 2.1 dB

NOTES

1. Internally leveled, AM off. The POWER dBm display monitors the actual output power, giving accurate readings when unleveled, externally leveled, or when amplitude modulating with a signal that has a dc component. The ENTRY DISPLAY shows the desired power level, or the desired external detector output voltage, exclusive of modulation.

2. The ALC loop typically operates up to +20 dB to enhance usability at those frequencies where leveled power greater than the maximum specified is available.

4-13. MAXIMUM LEVELED OUTPUT POWER AND POWER ACCURACY TEST (Cont'd)

Description

MAXIMUM LEVELED POWER

For maximum leveled power, a crystal detector and an oscilloscope are used to monitor the swept response. The 8340A is set to sweep a given frequency band. The power level is increased until the 8340A UNLEVELED indicator comes on, then decreased until the UNLEVELED indicator just goes out. The maximum leveled power may differ with sweep mode and sweep time. To find the worst case, the maximum leveled power is checked in three modes: single sweep with auto sweep time, single sweep with a two second sweep time, and continuous sweep. The worst case mode is selected, and a frequency marker is positioned at the minimum power point on the swept display. The 8340A is set to CW at the marker frequency and the power is measured using a power meter. The power meter indication should be greater than or equal to the maximum leveled power specification. This procedure is repeated for each frequency band.

FLATNESS

Flatness is measured with the RF output level at 0 dBm. Flatness is primarily a function of the RF path; therefore, the response will be essentially the same at all ALC levels. However, the response will most likely change when the RF Attenuator is stepped to a different attenuation level. (An automated test is available to adjust the RF attenuator correction factors and verify attenuator flatness; refer to Automated Test Procedures, following this section.)

A power meter is used to measure the RF signal level. An oscilloscope, connected to the power meter recorder output, is used to find the frequencies where the maximum and minimum points of the response occur. The 8340A is set to a slow sweep to allow the power meter to respond to any power variations. A marker is positioned at the maximum and minimum points on the oscilloscope display. The 8340A is then set to CW at each of the marker frequencies and the power indications are recorded. The maximum power level minus the minimum power level should be within the flatness specification.

ACCURACY

The absolute power level at the maximum and minimum points should be within the accuracy specification.

4-13. MAXIMUM LEVELED OUTPUT POWER AND POWER ACCURACY TEST (Cont'd)

Two different Power Sensors may be required to cover the complete frequency range. The HP 8481A Power Sensor is used from 10 MHz to 50 MHz and the HP 8485A Power Sensor is used for the other frequency bands covering 50 MHz to 26.5 GHz. The 8485A Power Sensor can be used down to 10 MHz, but if a minimum or maximum that is close to the test limits occurs in this frequency range, the 8481A Power Sensor should be used.

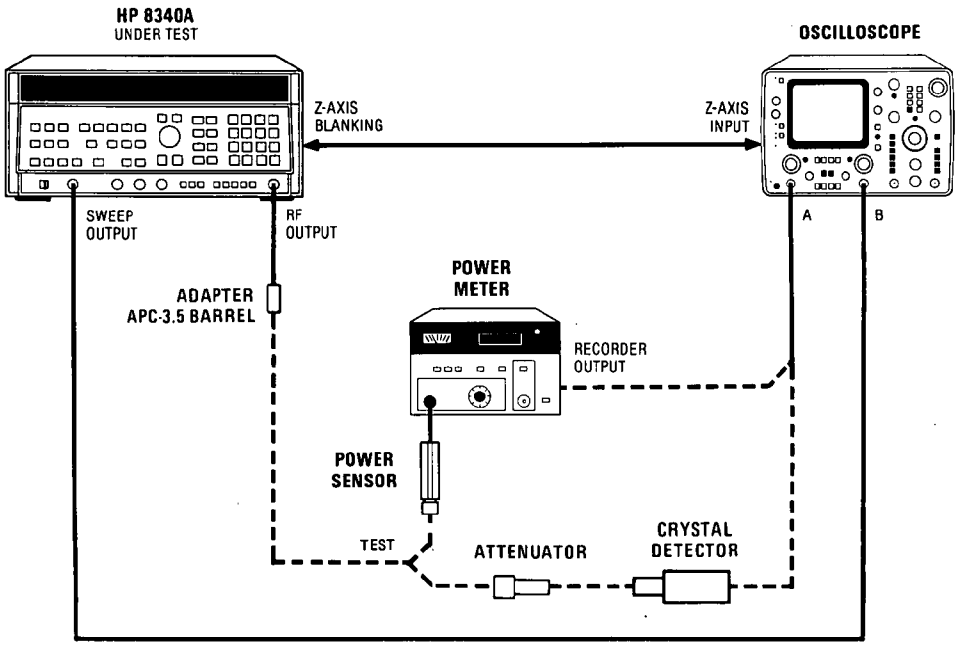


Figure 4-5. Maximum Leveled Output Power and Power Accuracy Test Setup.

Equipment

Oscilloscope	HP 1741A
Attenuator	HP 8493C Opt. 010
Crystal Detector	HP 33330C
Power Meter	HP 436A
Power Sensor	HP 8481A
Power Sensor	HP 8485A
Adapter (APC-3.5 female to female)	HP P/N 5061-5311

Procedure

MAXIMUM LEVELED POWER

1. Connect the equipment as shown in Figure 4-5. Connect the 10 dB pad and crystal detector to the 8340A RF output and connect the detector output to the oscilloscope channel A input. Allow at least 30 minutes warm up time.

2. Press **[INSTR PRESET]**. Press **[PEAK]** on. Press **[STOP FREQUENCY]** and enter **[2] [.] [3] [GHz]**. Adjust the oscilloscope to view the swept output of the crystal detector.

   In Band 0 (10 Mhz to 2.3 GHz), the crystal detector may pass a portion of the RF signal. This RF feedthrough may be visible on the low frequency portion of the oscilloscope trace.

4-13. MAXIMUM LEVELED OUTPUT POWER AND POWER ACCURACY TEST (Cont'd)

Also, as the power in Band 0 is increased toward maximum leveled, the level of the harmonics may increase and cause a perturbation in the swept response. This will cause the maximum power indication on the oscillosope to increase without causing the UNLEVELED indicator to light . Therefore, flatness is only specified at ≤ +10 dBm in Band 0.

3. Press the **[POWER LEVEL]** key and, using the front panel rotory knob, increase the power level until the UNLEVELED indicator comes on. Slowly decrease the power level until the UNLEVELED indicator just goes off. Note the ENTRY DISPLAY power indication.

NOTE

The maximum leveled power indication may differ with sweep mode and sweep time. To find the worst case; the maximum leveled power is checked in continuous sweep with auto sweep time (step 3), single sweep with auto sweep time (step 4), and single sweep with a two second sweep time (step 5).

4. Press **[SINGLE SWEEP]** repeatedly and repeat step 3.

5. Press **[SWEEP TIME]** and enter **[2] [sec]**. Repeat step 3.

6. Select the 8340A mode that gave the worst case maximum leveled power indication (lowest ENTRY DISPLAY indication). Press **[M2]** and position the marker, using the rotary knob, to the minimum power level point on the oscilloscope trace (for a negative polarity crystal detector, this is the highest point on the display, for a positive polarity detector, this is the lowest point on the display). Using the oscilloscope vertical position control, position the marker on a horizontal graticule line. Note the marker frequency. Press **[MANUAL]** and enter the frequency noted for M2. Due to SYTM tracking, the RF output level at a single frequency may be greater than in a swept mode; therefore, if the oscilloscope now indicates a higher power level than the swept response (for a positive polarity detector, the trace moves down), press **[POWER LEVEL]** and using the rotary knob adjust the power level to return the dot on the oscilloscope to the horizontal reference line for the minimum swept power point.

7. Disconnect the 10 dB pad and crystal detector and connect the Power Sensor to the 8340A RF output. Set the Power Meter's calibration factor switch to include the frequency noted for M2.

   To obtain the most accurate Power Meter reading, zero the Power Meter on the range being used. To zero the Power Meter, press the Power Meter RANGE HOLD, press 8340A **[RF]** off, zero the Power Meter, and press **[RF]** on.

   The Power Meter indication should be equal to or greater than the maximum leveled power specification. If the 8340A does not meet its maximum leveled power specification, refer to SRD Bias and SYTM Tracking adjustments in Section V.

8. Press the **[START FREQ]** key and enter the start frequency for the next band. Press the **[STOP FREQUENCY]** key and enter the stop frequency for the next band. Repeat steps 3 through 7 until all frequency bands have been checked.

4-13. MAXIMUM LEVELED OUTPUT POWER AND POWER ACCURACY TEST (Cont'd)

FLATNESS

9. Flatness is measured with the RF output level at 0 dBm. Flatness is primarily a function of the RF path; therefore, the response will be essentially the same at all ALC levels. Although the ALC accuracy is not specified separately, the ALC accuracy is typically <0.15 dB for RF output levels from +10 dBm to −9.95 dBm.

   To test ALC accuracy, step the 8340A RF power in 1 dB steps from +10 to −9.95 dBm (note, for instruments with front panel RF output, that as the power steps from −9.95 to −10 dBm, the RF attenuator is set to 10 dB and the ALC is set to 0 dBm). If the power meter indication is >0.15 dB from the ENTRY DISPLAY indication, refer to the ALC adjustments in Section V.

   If the ALC accuracy is tested, frequency response must be considered; therefore, use the 0 dBm power meter indication as a reference.

   Also it should be noted that the power level in the ENTRY DISPLAY is the requested power level. In normal ALC modes, the instrument processor duplicates the ENTRY DISPLAY power level in the POWER dBm display with 0.1 dB resolution; however, if AM is selected, the processor reads the ALC level with an A/D converter, calculates the associated power level, and displays the calculated value in the POWER dBm display.

10. Press **[INSTR PRESET]**. Press **[PEAK]** on. Press **[STOP FREQUENCY]** and enter **[2] [.] [3] [GHz]**. Press **[POWER LEVEL]** and enter **[0] [dBm]**.

11. Press the **[SWEEP TIME]** key and enter **[2] [sec]**.

12. Adjust the oscilloscope controls to view the Power Meter RECORDER OUTPUT voltage versus the 8340A SWEEP OUTPUT voltage (A versus B). The oscilloscope vertical gain and position must be changed as a function of the power meter range and RECORDER OUTPUT voltage.

13. Press Frequency Marker key **[M2]** and, using the rotary knob, vary the marker frequency to position the (intensified) marker on the lowest point on the oscilloscope trace. It may be necessary to adjust the oscilloscope INTENSITY to view the marker dot.

14. Note the marker frequency. Press the [MANUAL] key and enter the frequency noted for M2. Reset the power meter calibration factor switch to include this frequency. The power meter indication is the minimum power point. Record the power meter indication on the work sheet provided in Table 4-9.

NOTE

For Band 0 (10 MHz to 2.3 GHz), if the minimum or maximum power occured below 50 MHz, use the 8481A Power Sensor to measure the power level.

Table 4-9. Maximum Leveled Output Power Test Work Sheet

Frequency Range: 10 MHz to 2.3 GHz

		Power Meter Indication	8340A Entry Display	
Steps 13, 14	Minimum	_____	_____	
Step 15	Maximum	_____	_____	
Step 18	Flatness:			
	Maximum – Minimum	_____		(≤1.0 dB, Standard) (≤1.2 dB, Option 004) (≤1.0 dB, Option 001) (≤1.2 dB, Option 005)

Frequency Range: 2.3 GHz to 7.0 GHz

		Power Meter Indication	8340A Entry Display	
Steps 13, 14	Minimum	_____	_____	
Step 15	Maximum	_____	_____	
Step 18	Flatness:			
	Maximum – Minimum	_____		(≤2.2 dB, Standard) (≤2.6 dB, Option 004) (≤1.8 dB, Option 001) (≤2.2dB, Option 005)

Frequency Range: 7.0 GHz to 13.5 GHz

		Power Meter Indication	8340A Entry Display	
Steps 13, 14	Minimum	_____	_____	
Step 15	Maximum	_____	_____	
Step 18	Flatness:			
	Maximum – Minimum	_____		(≤2.2 dB, Standard) (≤2.6 dB, Option 004) (≤1.8 dB, Option 001) (≤2.2 dB, Option 005)

Frequency Range: 13.5 GHz to 20.0 GHz

		Power Meter Indication	8340A Entry Display	
Steps 13, 14	Minimum	_____	_____	
Step 15	Maximum	_____	_____	
Step 18	Flatness:			
	Maximum – Minimum	_____		(≤2.2 dB, Standard) (≤2.6 dB, Option 004) (≤1.8 dB, Option 001) (≤2.2 dB, Option 005)

Frequency Range: 20.0 GHz to 26.5 GHz

		Power Meter Indication	8340A Entry Display	
Steps 13, 14	Minimum	_____	_____	
Step 15	Maximum	_____	_____	
Step 18	Flatness:			
	Maximum – Minimum	_____		(≤3.2 dB, Standard) (≤3.6 dB, Option 004) (≤2.6 dB, Option 001) (≤3.0 dB, Option 005)

4-13. MAXIMUM LEVELED OUTPUT POWER AND POWER ACCURACY TEST (Cont'd)

15. Press the **[CONT]** key to return to the sweep mode. Press **[M1]** and, using the rotary knob, vary the marker frequency to position the marker on the highest point on the oscilloscope trace. Note the marker frequency. Press the **[MANUAL]** key and enter the frequency noted for M1. Reset the power meter calibration factor switch to include this frequency. The power meter indication is the maximum power point. Record the power meter indication on the work sheet.

16. Press the **[CONT]** key to return to the swept mode. Press the **[START FREQ]** key and enter the start frequency for the next frequency band. Press the **[STOP FREQ]** key and enter the stop frequency for the next frequency band.

17. Repeat steps 12 through 16 to measure the flatness until all frequency bands have been checked.

18. The maximum minus the minimum power meter indications should be within the flatness specifications. If the 8340A does not meet its flatness specification, refer to Flatness Adjustments in Section V.

ACCURACY

19. The absolute power level at the maximum and minimum points should be within the accuracy specification. This test may be repeated at other ALC power levels (+10 dBm to −9.95 dBm) to verify flatness and accuracy specifications over the ALC range.

4-14. EXTERNAL LEVELING

Specification

Table 4-10. External Leveling Specifications

XTAL: Allows the 8340A to be externally leveled by crystal detectors of positive or negative polarity.
METER: Allows power meter leveling with any HP power meter.
Range (XTAL or METER): 500 microvolts (−66 dBV) to 2.0 volts (+6 dBV)
Accuracy of voltage at EXT INPUT connector relative to the displayed level (leveling voltage is shown in ENTRY DISPLAY in dBV): ±0.5 dB ± 200 microvolts

Description

The 8340A external leveling circuit is designed to maintain a constant voltage at the EXT INPUT BNC. This is achieved by first selecting a voltage (in dBV) to which the EXT INPUT will be leveled. This establishes a reference voltage for the ALC. The voltage at the EXT INPUT is then routed through the external leveling circuitry to the ALC and compared to the reference. If a difference between the two voltages exist, the 8340A RF OUTPUT power will be adjusted to compensate for the difference.

The 8340A's external leveling circuit allows a positive or negative crystal detector to be used in the external leveling loop. A positive crystal detector (HP 33330C) is used in this test but a negative crystal detector may be substituted.

The 8340A XTAL Leveling mode is selected to verify the 8340A's external leveling specification. Nine different dBV values, ranging from +6 dBV to −66 dBV, are selected and the voltage accuracy at the EXT INPUT is checked with a DVM.

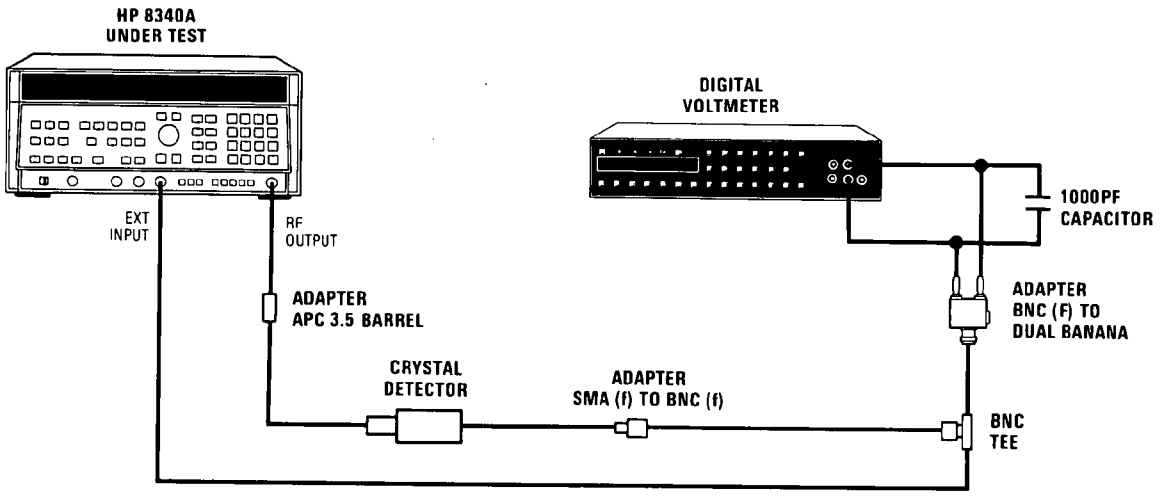


Figure 4-6. External Leveling Test Setup

4-14. EXTERNAL LEVELING (Cont'd)

Equipment

Digital Voltmeter (DVM)	HP 3455A
Crystal Detector	HP 33330C
Capacitor (1000 pF)	HP P/N 0160-4574
Adapters	
APC 3.5 Barrel	HP P/N 5061-5311
SMC(f) to BNC(f)	HP P/N 1250-0832
BNC(f) to Dual Banana	HP P/N 1251-2277
BNC Tee (m) (f) (f)	HP P/N 1250-0781
Attenuators (required for Option 001 or Option 005 8340A only)	
10 dB	HP 8493C Opt. 010
20 dB	HP 8493C Opt. 020

Procedure

1. Turn 8340A LINE switch ON. Press **[INSTR PRESET] [CW] [4] [.] [5] [GHz] [POWER LEVEL] [0] [dB(m)]**.

2. Connect equipment as shown in Figure 4-6 (note 1000 pF capacitor shunting DVM input). Allow the equipment to warm up for 30 minutes.

NOTE

In step 3, XTAL mode is selected. In this mode, the [dB(m)] **terminator key selects dBV. The dBV value selected corresponds to a voltage at which the 8340A EXT INPUT will be leveled (see Table 4-14). The selected dBV is displayed in the ENTRY DISPLAY.**

NOTE

If a negative-polarity crystal detector is being used for this test, the voltages given in Tables 4-11, 4-12, 4-13, and 4-14 will all be negative.

3. Press **[XTAL] [6] [dB(m)]**. DVM reading should be within the values shown on the first line in Table 4-11.

Table 4-11. External Leveling Limits (With No Attenuator)

dBV Selected	DVM Indication (V)		
	Lower Limit	Ideal	Upper Limit
+6	1.883	1.995	2.114
0	0.944	1.000	1.059
−10	0.2983	0.3162	0.3352
−20	0.0942	0.1000	0.1061

4-14. EXTERNAL LEVELING (Cont'd)

4. Repeat Step 3 for the remaining dBV values shown in Table 4-11.

5. Press the down step key to select 10 dB of attenuation (Option 001 and 005 instruments do not include an internal attenuator. For these instruments install a 10 dB attenuator between the RF output and detector).

6. Repeat Step 3 for values shown in Table 4-12.

Table 4-12. External Leveling Limits (With 10 dB Attenuator)

dBv Selected	DVM Indication (mV)		
	Lower Limit	Ideal	Upper Limit
−30	29.65	31.62	33.70
−40	9.24	10.00	10.79

7. Press the down step key to select 20 dB of attenuation (for Option 001 or 005 instruments, remove 10 dB attenuator installed in step 5 and replace it with a 20 dB attenuator).

8. Repeat Step 3 for values shown in Table 4-13.

Table 4-13. External Leveling Limits (With 20 dB Attenuator)

dBv Selected	DVM Indication (mV)		
	Lower Limit	Ideal	Upper Limit
−50	2.785	3.162	3.550
−60	0.744	1.000	1.259
−66	0.273	0.501	0.731

4-14. EXTERNAL LEVELING (Cont'd)

Table 4-14. dBV vs Voltage Reference Table

dBV	Voltage	dBV	Voltage
7	2.239 V	−12	0.2512 V
6	1.995 V	−19	0.1122 V
5	1.778 V	−20	0.1000 V
4	1.585 V	−21	89.13 mV
3	1.413 V	−29	35.48 mV
2	1.259 V	−30	31.62 mV
1	1.122 V	−31	28.18 mV
0	1.000 V	−39	11.22 mV
−1	0.8913 V	−40	10.00 mV
−2	0.7943 V	−41	8.913 mV
−3	0.7079 V	−49	3.548 mV
−4	0.6310 V	−50	3.162 mV
−5	0.5623 V	−51	2.818 mV
−6	0.5012 V	−59	1.122 mV
−7	0.4467 V	−60	1.000 mV
−8	0.3981 V	−61	0.8913 mV
−9	0.3548 V	−65	0.5623 mV
−10	0.3162 V	−66	0.5012 mV
−11	0.2818 V	−67	0.4467 mV

4-15. SPURIOUS SIGNALS TEST (10 MHz to 22 GHZ)

Specification

Table 4-15. Spurious Signals Test (10 MHz to 22 GHz) Specifications

SPURIOUS SIGNALS (Expressed in dB relative to the carrier level (dBc) at ALC level of 0 dBm)	**Bands and Approximate Frequency Ranges (GHz)** (See Frequency Ranges and Bandswitch Points for complete description.)				
	Band 0 0.01 to <2.3	**Band 1 2.3 to <7.0**	**Band 2 7.0 to <13.5**	**Band 3 13.5 to <20.0**	**Band 4 20.0 to 26.5**
Harmonics (up to 26.5 GHz)	< −35	< −35	< −35	< −35	< −35
Subharmonics and multiples thereof (up to 26.5 GHz)	–	–	< −25	< −25	< −20
Non-harmonically related spurious (CW and Manual Sweep mode only)	< −50	< −70	< −64	< −60	< −58
Power line related and spurious due to fan rotation within 5 Hz below line frequency, and multiples thereof (CW mode only, all power levels)					
STANDARD INSTRUMENT					
Offset <300 Hz from carrier	< −50	< −50	< −44	< −40	< −38
Offset 300 Hz to 1 kHz from carrier	< −60	< −60	< −54	< −50	< −48
Offset > 1 kHz from carrier	< −65	< −65	< −59	< −55	< −53
OPTION 003, 400 Hz					
Offset < 2 kHz from carrier	< −40	< −40	< −34	< −30	< −26
Offset 2 kHz to 8 kHz from carrier	< −50	< −50	< −44	< −40	< −36
Offset > 8 kHz from carrier	< −65	< −65	< −59	< −55	< −51

Description

The 8340A RF output signal is displayed on a spectrum analyzer to verify that the harmonic and non-harmonic spurious signals are at or below the specified level.

4-15. SPURIOUS SIGNALS TEST (10 MHz to 22 GHZ) (Cont'd)

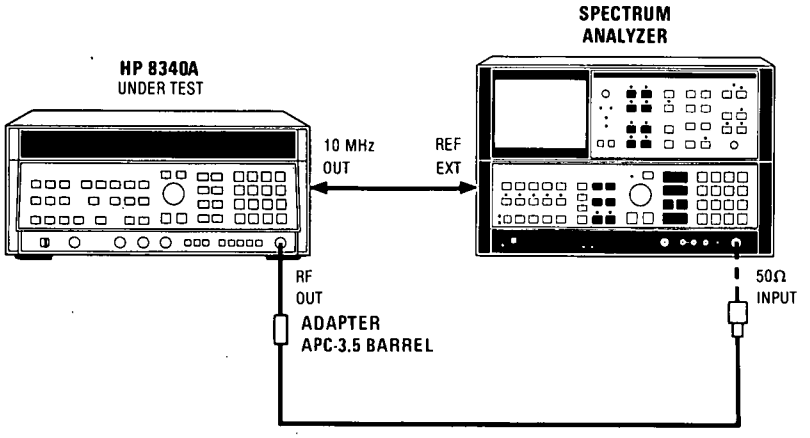


Figure 4-7. Spurious Signals Test Setup (10 MHz to 22 GHZ)

Equipment

Spectrum Analyzer	HP 8566A
Adapter (APC-3.5 female to female barrel)	HP P/N 5061-5311
Cable (SMA male to SMA male)	HP P/N 08340-20124

Procedure

1. Connect equipment as shown in Figure 4-7. The position of the 8340A under test can affect spurious responses; therefore, place the 8340A in its normal operating position (i.e., flat on its feet) for this test. Allow at least 30 minute warm up time.

2. Press the 8340A **[INSTR PRESET]**. Press the **[STOP FREQ]** key and enter **[2] [.] [3] [GHz]**.

3. Press the 8340A **[POWER LEVEL]** key and enter **[0] [dBm]**.
4. Press the **[CW]** key and enter any frequency of interest within the selected frequency range.

5. Set up the spectrum analyzer to view the 8340A RF output signal. Set the reference level to place the peak of the 8340A RF output signal on the reference level at the top graticule line.

4-15. SPURIOUS SIGNALS TEST (10 MHz to 22 GHZ) (Cont'd)

NOTE

When using a spectrum analyzer other than the HP 8566A, the spectrum analyzer may originate some mixing products that could appear on the display. If a signal is in question, increase the spectrum analyzer input attenuation by 10 dB, note if signal decreases in amplitude by 10 dB, then return the attenuator to its original position. If the signal in question comes from an external source, it will change by exactly 10 dB. If the signal in question originates in the spectrum analyzer, the level will either change by greater or less than 10 dB or may not change at all.

The 8340A rotary knob circuit may generate some noise spikes when the knob is rotated. These signals should disappear when rotation is stopped.

If a spurious signal is found and it appears out of specification, check the fundamental signal amplitude to ensure it is at 0 dBm. Then check spurious level by substituting a known amplitude signal on the spectrum analyzer.

6. Tune the spectrum analyzer across its full frequency range. Look for any spurious signals. For each spurious response determine what mechanism generated the spurious response and what specification applies.

   a. Is the spurious response in question an integer multiple of the 8340A RF output signal? If it is, the "harmonic" specification applies.

   b. Press the 8340A **[SHIFT]** key and then **[M2]** to display, from left to right, the YO harmonic number and the YO frequency. Is the spurious response in question an integer multiple of the YO frequency (and not a harmonic of the RF signal)? If it is the "subharmonic and multiples thereof" specification applies.

NOTE

Press the [CW] key to view the CW frequency in the ENTRY DISPLAY.

   c. If the spurious response in question does not meet one of the above criteria, the "non-harmonically related" specification applies.

7. Repeat steps 4 through 7 at any frequency of interest within this frequency band.

8. Press the 8340A **[STOP FREQ]** key and enter the stop frequency for the next frequency band. Press the **[START FREQ]** key and enter the start frequency for the next frequency band. Repeat steps 3 through 8 until all 8340A frequency bands have been tested up to 22 GHz.

4-16. SPURIOUS SIGNALS TEST (22 to 26.5 GHZ)

NOTE

Non-harmonically-related spurious responses, resulting from mixing products produced by two or more signals within the 8340A, follow a mathematical relationship to the signals that generated them. If the level of all such signals up to 22 GHz are within the specification, then no mixing products will be out of specification above 22 GHz. Therefore, no test is provided for non-harmonicly-related spurious signals above 22 GHz.

Specification

Table 4-16. Spurious Signals Test (20 to 26.5 GHz) Specifications

SPURIOUS SIGNALS (Expressed in dB relative to the carrier level (dBc) at ALC level of 0 dBm)	**Bands and Approximate Frequency Ranges** (See Frequency Ranges and Bandswitch Points for complete description.)
	Band 4 −20.0 to 26.5 GHz
Harmonics (up to 26.5 GHz)	<−35
Subharmonics and multiples thereof (up to 26.5 GHz)	<−20
Non-harmonically related spurious (CW and Manual Sweep mode only)	<−58
Power line related and spurious due to fan rotation within 5 Hz below line frequency, and multiples (CW mode only, all power levels)	
STANDARD INSTRUMENT	
Offset <300 Hz from carrier	<−38
Offset 300 Hz to 1 kHz from carrier	<−48
Offset >1 kHz from carrier	<−53
OPTION 003, 400 Hz	
Offset <2 kHz from carrier	<−26
Offset 2 kHz to 8 kHz from carrier	<−36
Offset >8 kHz from carrier	<−51

4-16. SPURIOUS SIGNALS TEST (22 to 26.5 GHZ) (Cont'd)

Description

The 8340A Under Test RF output signal is fed through a 20 dB pad and a high pass filter and is then down converted using a mixer and an 8340A as a Local Oscillator. The mixer output is fed to a low frequency spectrum analyzer.

The 8340A Under Test is set to a CW frequency. All possible harmonics of the RF signal and harmonics of the YO frequency that could fall within the 22 GHz to 26.5 GHz range are determined.

The Local Oscillator 8340A is set to a CW frequency 50 MHz below each harmonic. The specification is in dB below the carrier. To establish the carrier level at the IF, the 8340A Under Test is temporarily set to the frequency of the harmonic and a reference level is established on the Spectrum Analyzer. The 8340A Under Test is returned to the original CW frequency. The amplitude of the harmonic displayed on the Spectrum Analyzer is used to determine that the harmonic is at or below the specified level.

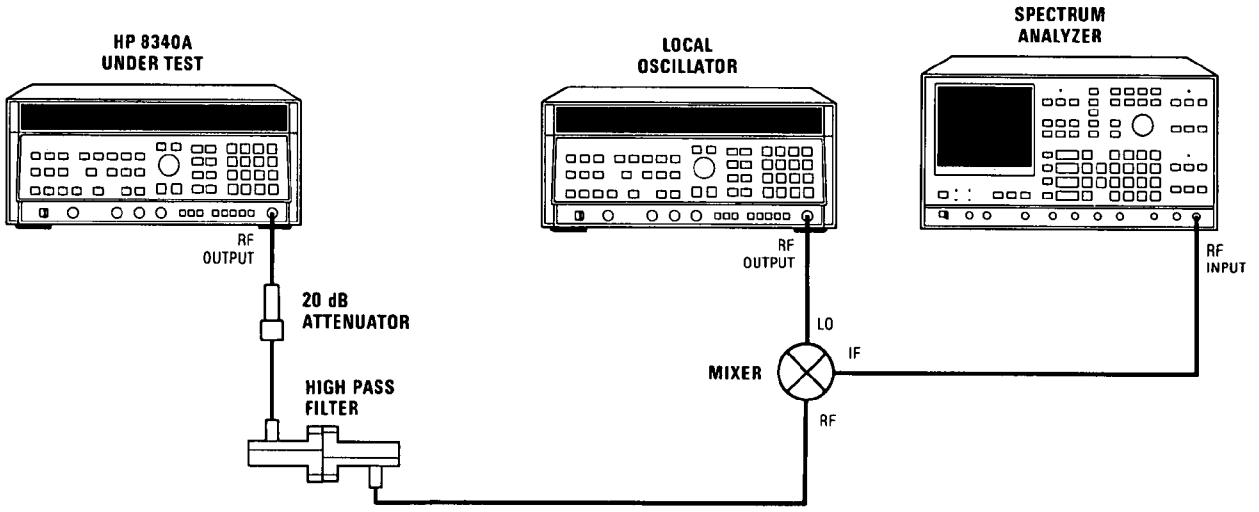


Figure 4-8. Spurious Signals Test Setup (22 to 26.5 GHZ)

Equipment

Local Oscillator	HP 8340A Opt 001
20 dB Attenuator	HP 8493C Opt 020
High Pass Filter (2 required)	HP K281C
Mixer	RHG DMS 1-26
Spectrum Analyzer	HP 3585A
Adapter (APC-3.5 female to female barrel)	HP P/N 5061-5311
Cable (SMA male to SMA male)	HP P/N 08340-20124

4-16. SPURIOUS SIGNALS TEST (22 to 26.5 GHZ) (Cont'd)

Procedure

1. Connect equipment as shown in Figure 4-8. Allow at least a 30 minute warm up time. Press the Local Oscillator 8340A **[INSTR PRESET]** and **[PEAK]** on.

2. Press the 8340A Under Test **[INSTR PRESET]**. Press **[POWER LEVEL]**. If the power level in the ENTRY DISPLAY is not 0 dBM, enter **[0] [dBm]**. Press the **[CW]** key and enter any CW frequency in the 10 MHz to 26.5 GHz range.

3. Determine all possible harmonic frequencies of the RF signal that could fall within the 22 to 26.5 GHz range. Press **[SHIFT] [M2]** to display from left to right; the band number (in the POWER dBm display) and the YO frequency. Determine all possible YO harmonic frequencies that could fall within the 22 to 26.5 GHz range.

4. Press the Local Oscillator 8340A **[CW]** key and enter a frequency 50 MHz below the harmonic frequency to be tested. Press the **[POWER LEVEL]** key and, using the rotary knob, increase the power level until the UNLEVELED indicator comes **ON**. Slowly decrease the power level until the UNLEVELED light just goes **OFF**.

5. Press the 8340A Under Test **[SAVE]** key enter **[1]** to save the current instrument state. Press **[CW]** and enter the harmonic frequency to be tested. Set the Spectrum Analyzer to view the 50 MHz IF signal with the peak of the signal at the top graticule line.

6. Press the 8340A Under Test **[RECALL]** key and enter **[1]** to recall the original instrument state. The amplitude of the harmonic displayed on the Spectrum Analyzer should be at or below the specified level.

7. Repeat steps 4 through 6 for each harmonic frequency determined in step 3.

8. Set the 8340A Under Test to another CW frequency and repeat steps 3 through 7.

4-17. SINGLE SIDEBAND PHASE NOISE

Specification

Table 4-17. Single-sideband Phase Noise Specifications

SPURIOUS SIGNALS [Expressed in dB relative to the carrier level (dBc)]	**Bands and Approximate Frequency Ranges (GHz)** see Frequency Ranges and Bandswitch Points for complete description)				
Single-sideband Phase Noise (dBc/1 Hz BW, CW Mode, all power levels)	**Band 0 0.01 to <2.3**	**Band 1 2.3 to <7.0**	**Band 2 7.0 to <13.5**	**Band 3 13.5 to <20.0**	**Band 4 20.0 to 26.5**
Offset 30 Hz from carrier	< −64	< −64	< −58	< −54	< −52
Offset 100 Hz from carrier	< −70	< −70	< −64	< −60	< −58
Offset 1 kHz from carrier	< −78	< −78	< −72	< −68	< −66
Offset 10 kHz from carrier	< −86	< −86	< −80	< −76	< −74
Offset 100 kHz from carrier	< −107	< −107	< −101	< −97	< −95

Description

This test is performed in three steps: SYSTEM CALIBRATION, PHASE NOISE MEASUREMENT, and PHASE NOISE CALCULATION. A second 8340A is used as a local oscillator (LO) to mix down the microwave frequency from the 8340A under test (DUT) to a 1 MHz IF. The IF signal is amplified and, for 30 Hz, 100 Hz and 1 kHz offsets, sent directly to a low frequency spectrum analyzer (HP 3585A). For 10 kHz and 100 kHz offsets, a 1 MHz notch filter is inserted between the amplifier and the 3585A to attenuate IF signal and obtain increased dynamic range on the 3585A. Phase noise is measured using the OFFSET and NOISE LVL functions of the 3585A.

SYSTEM CALIBRATION obtains the system's frequency response data (Cal Data (CD) and IF Cal Data (IFCD), measured in dBc). A zero dBm, 1 MHz IF is established and then the LO frequency is reduced to obtain 1.00003, 1.0001, and 1.001 MHz IFs. At each point, the power level at the peak of the IF is recorded as the Cal Data (CD). A 1 MHz notch filter is then inserted between the amplifier and the 3585A. The LO frequency is again reduced to obtain 1.01 and 1.1 MHz IFs, and the Cal Data for these points is recorded. The LO frequency is then increased to obtain a 1 MHz IF and the response due to the 1 MHz notch filter is recorded as the IF Cal Data (IFCD). This data is required for calculating the actual phase noise for the 10 kHz and 100 kHz offsets. Since it is not required for the 30 Hz, 100 Hz and 1 kHz offsets, IFCD is defined as zero at these points.

PHASE NOISE MEASUREMENT obtains phase noise data for DUT frequencies of 2.202, 6.902, 13.402, 19.502, and 26.032 GHz. These specific frequencies typically have the worst case phase noise for the 8340A. The DUT is adjusted for the test frequency and then the LO

4-17. SINGLE SIDEBAND PHASE NOISE (Cont'd)

frequency is adjusted to obtain a 1 MHz ±0.9 Hz IF. A signal to noise level (IF to phase noise level at 30 Hz, 100 Hz 1 kHz, 10 kHz, and 100 kHz offsets from IF) measurement is performed using the OFFSET and NOISE LVL functions of the 3585A and the results are recorded as the Measured Noise Level (MNL, measured in dBc).

PHASE NOISE CALCULATION takes the data obtained for MNL and adds and subtracts the calibration data and a 3 dB correction factor to obtain the actual phase noise. The formula that is used is:

$$\text{Actual Phase Noise} = \text{MNL} + \text{IFCD} - \text{CD} - 3\ \text{dB}$$

IFCD is the response of the 1 MHz notch filter at 1 MHz. Since the filter is not installed during the 10 Hz, 100 Hz and 1 kHz offset measurements, IFCD = 0. During the 10 kHz and 100 kHz offset measurements, the notch filter attenuates the IF causing the power difference between the IF and the phase noise to be smaller than it actually is, therefore IFCD must be added to MNL to correct for this. The system's frequency response (CD) causes the difference between the IF level and the phase noise level to be greater than it actually is, therefore CD must be subtracted from MNL. A factor of 3 dB is subtracted from MNL to correct for the LO's phase noise contribution.

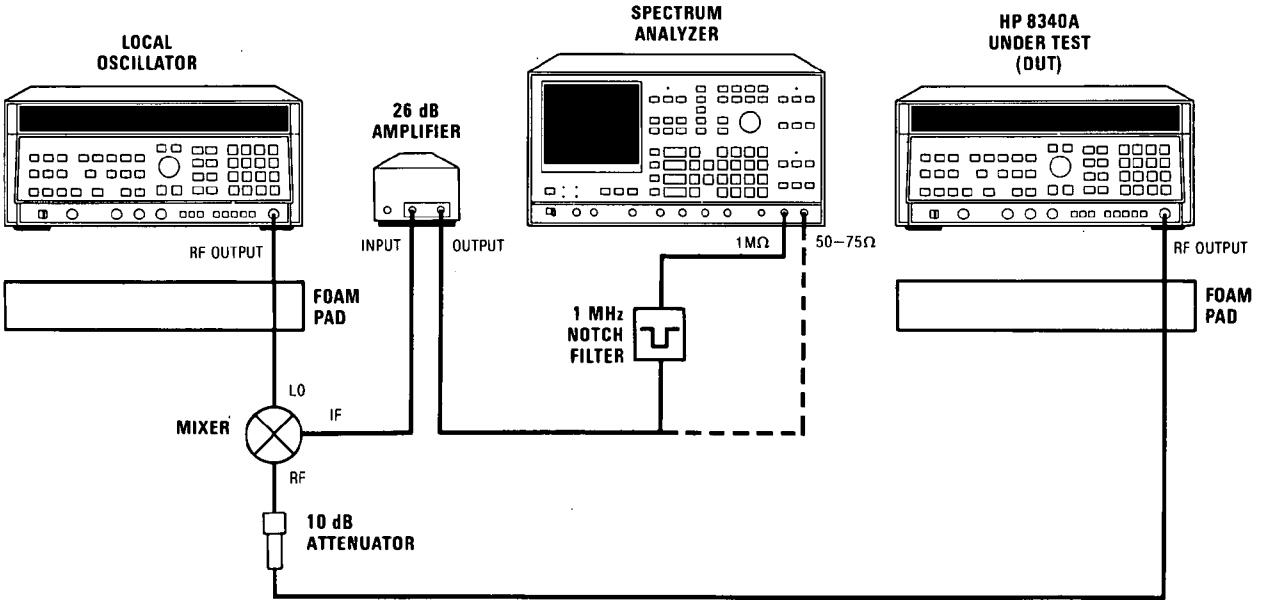


Figure 4-9. Single Sideband Phase Noise Test Setup

4-17. SINGLE SIDEBAND PHASE NOISE (Cont'd)

Equipment

Synthesized Sweeper	HP 8340A Opt. 001
Spectrum Analyzer	HP 3585A
Power Amplifier	HP 8447F
Attenuator	HP 8493C Opt. 010
Mixer	RHG DMS 1–26
Adapters	
APC 3.5 (f) to APC 3.5 (f)	HP P/N 1250-1749
SMA (m) to BNC (f)	HP P/N 1250-1200
Foam Pads	(Refer to note following step 1)
1 MHz Notch Filter	(See schematic in Recommended Test Equipment list, Section I)

Procedure

1. Connect equipment as shown in Figure 4-9 with the amplifier connected directly to the 3585A 50 Ohm input.

NOTE

The foam pads shown in Figure 4-9 are required to isolate the DUT and LO from mechanical vibrations which could induce phase noise.

NOTE

In this procedure, the LO is programmed for +10 dBm. At some points the LO may indicate an unleveled condition. This is to be expected and does not affect the phase noise measurement.

2. On the LO, press **[INSTR PRESET] [CW] [2] [.] [2] [0] [1] [GHz] [POWER LEVEL] [1] [0] [dB(m)] [PEAK]**.

3. On the DUT, press **[INSTR PRESET] [CW] [2] [.] [2] [0] [2] [GHz] [POWER LEVEL] [0] [dB(m)] [PEAK]**.

4. On the 3585A, press INSTR PRESET, CENTER FREQUENCY, 1 MHz, FREQUENCY SPAN, 1 MHz.

5. Switch the 3585A AUTO RANGE and REF LVL TRACK off.

6. Allow the equipment to warm up for 1 hour.

7. Adjust the 3585A marker to the peak of the IF.

8. On the 3585A, press COUNTER.

9. Adjust the frequency of the LO for a 3585A COUNTER reading of 1 MHz ±0.9 Hz. This removes any frequency offsets between the DUT and LO.

10. Adjust the output power of the DUT for 0 dBm at the peak of the IF. Select a REFERENCE LEVEL of 0 dBm on the 3585A.

4-17. SINGLE SIDEBAND PHASE NOISE (Cont'd)

SYSTEM CALIBRATION

30 Hz Offset Calibration

11. On the 3585A, press FREQUENCY SPAN, 250 Hz, RES BW, 3 Hz. Allow one sweep to occur. Ensure power at peak of IF is still 0 dBm.

12. Reduce LO frequency by 30 Hz (IF = 1.00003 MHz ±0.9 Hz).

13. Allow one sweep of the 3585A to occur. Adjust the 3585A marker to the peak of the IF. Record the marker power level (Cal Data) into Table 4-18.

Table 4-18. Phase Noise Calibration Data

Step	Offset (Hz)	Cal Data (dB)
13	30	CD =
14	100	CD =
16	1K	CD =
19	10K	CD =
21	100K	CD =
22	0	IFDC =

100 Hz Offset Calibration

14. Reduce the LO frequency by 70 Hz (IF = 1.0001 MHz ±0.9 Hz). Repeat step 13.

1 kHz Offset Calibration

15. On the 3585A, press FREQUENCY SPAN, 2500 Hz, RES BW, 30 Hz.

16. Reduce LO frequency by 900 Hz (IF = 1.001 MHz ±0.9 Hz). Repeat step 13.

10 kHz Offset Calibration

17. Connect 1 MHz Notch Filter as shown in Figure 4-9. Select 1 MOhm input impedance on the 3585A.

18. On the 3585A, press FREQUENCY SPAN, 25 kHz, RES BW, 100 Hz.

19. Reduce LO frequency by 9 kHz (IF = 1.01 MHz ±0.9 Hz). Repeat step 13.

100 kHz Offset Calibration

20. On the 3585A, press FREQUENCY SPAN, 250 kHz, RES BW, 1 kHz.

21. Reduce LO frequency by 90 kHz (IF = 1.1 MHz ±0.9 Hz). Repeat step 13.

IF Cal Data

22. Increase the LO frequency by 100 kHz (IF = 1 MHz ±0.9 Hz). Repeat step 13.

4-17. SINGLE SIDEBAND PHASE NOISE (Cont'd)

PHASE NOISE MEASUREMENT

23. Connect equipment as shown in Figure 4-9 with the amplifier connected directly to the 3585A 50 Ohm input. Return 3585A to 50 Ohm input impedance.

24. On the DUT, press **[POWER LEVEL] [0] [dB(m)]**. Select a 3585A REFERENCE LEVEL to place the peak of the IF at the top graticule of the display. Ensure IF = 1 MHz ±0.9 Hz. If necessary, adjust LO for a 3585A COUNTER reading of 1 MHz ±0.9 Hz.

25. On the 3585A, press FREQUENCY SPAN, 250 Hz, RES BW, 3 Hz. Step the RANGE until the overload light just turns on and then increment it one step. Allow one sweep to occur.

30 Hz Offset

26. On the 3585A, press MANUAL, CLEAR A, MKR→CF, COUNTER.

27. On the 3585A, press OFFSET, ENTER OFFSET, CF STEP SIZE, 30 Hz, MANUAL, STEP UP (key), NOISE LVL. The noise level measurement takes approximately 30 seconds. For an accurate reading, allow at least 2 measurements to be made before recording value. Record Measured Noise Level (MNL) into Table 4-19.

Table 4-19. Phase Noise Measurement Data

Step	Offset (Hz)	Measured Noise Level (MNL, dBc (1 Hz))				
		2.202 GHz	6.902 GHz	13.402 GHz	19.502 GHz	26.032 GHz
27	30					
29	100					
31	1K					
34	10K					
36	100K					

28. On the 3585A, press COUNTER, NOISE LVL, OFFSET, CONT. Return marker to peak of IF and ensure COUNTER reading is 1 MHz ±0.9 Hz. If necessary, adjust LO for a 1 MHz IF. If the IF drifted more than 6 Hz, steps 26 through 28 must be repeated.

100 Hz Offset

29. Repeat steps 26 through 28 with a CF STEP SIZE of 100 Hz substituted in step 27.

1 kHz Offset

30. On the 3585A, press FREQUENCY SPAN, 2.5 kHz, RES BW, 30 Hz.

31. Repeat steps 26 through 28 with a CF STEP SIZE of 1 kHz substituted in step 27.

4-17. SINGLE SIDEBAND PHASE NOISE (Cont'd)

10 kHz Offset

32. Connect the equipment as shown in Figure 4-9 with the 1 MHz Notch Filter connected. Select the 1 MOhm input impedance on the 3585A.

33. On the 3585A, press FREQUENCY SPAN, 25 kHz, RES BW, 100 Hz. Decrement the RANGE until the overload light just turns on and then increment it one step.

34. Repeat steps 26 through 28 with a CF STEP SIZE of 10 kHz substituted in step 27.

100 kHz Offset

35. On the 3585A, press FREQUENCY SPAN, 250 kHz, RES BW, 1 kHz.

36. Repeat steps 26 through 28 with a CF STEP SIZE of 100 kHz substituted in step 27.

37. Repeat steps 23 through 36 for the CW frequencies shown in Table 4-20.

Table 4-20. Phase Noise Test Frequencies

CW Frequency (GHz)	
DUT	**LO**
6.902	6.901
13.402	13.401
19.502	19.501
26.032	26.031

PHASE NOISE CALCULATION

38. Using the data obtained in Table 4-18 and Table 4-19, calculate and enter the Actual Phase Noise into Table 4-20.

For example: Assume the following data was obtained for the 30 Hz offset at 26.032 GHz

CD = 0 dB (obtained in step 13)
MNL = −50.8 dB (obtained in step 27)
IFCD is defined to be 0 for a 30 Hz offset (also for 100 Hz and 1 kHz)

Therefore

Actual Phase Noise = MNL + IFCD − CD − 3 dB
= −50.8 + 0 − 0 − 3
= −53.8

The value −53.8 would be entered into Table 4-21.

4-17. SINGLE SIDEBAND PHASE NOISE (Cont'd)

For example: Assume the following data was obtained for the 10 kHz offset at 2.202 GHz

CD = −25.6 dB (obtained in step 19)
IFCD = −44.2 dB (obtained in step 22)
MNL = −66.0 dB (obtained in step 34)

Therefore

Actual Phase Noise = MNL + IFCD − CD − 3 dB
= −66.0 + (−44.2) − (−25.6) − 3
= −87.6

The value −87.6 would be entered into Table 4-21.

Table 4-21. Phase Noise Test Results

Single Sideband Phase Noise (dBc/1 Hz)										
Offset (Hz)	2.202 GHz		6.902 GHz		13.402 GHz		19.502 GHz		26.032 GHz	
	Spec	Actual[1]	Spec	Actual[1]	Spec	Actual[1]	Spec	Actual[1]	Spec	Actual[1]
30	<−64		<−64		<−58		<−54		<−52	
100	<−70		<−70		<−64		<−60		<−58	
1K	<−78		<−78		<−72		<−68		<−66	
10K	<−86		<−86		<−80		<−76		<−74	
100K	<−107		<−107		<−101		<−97		<−95	

1. Actual = IFCD[2] − CD − MNL + 3dB
2. IFCD = 0 for 30 Hz, 100 Hz, and 1 kHz offsets
= value measured in step 22 (see Table 4-18) for 10K and 100 kHz offsets

4-18. POWER SWEEP TEST

Specification

Table 4-22. Power Sweep Test Specifications

Power Sweep

Range
Displayed: 0 to 40 dB/sweep
Actual: At least 10 dB at any given frequency (at least 20 dB in DECOUPLED mode; see Figure a below.)

Accuracy
Starting Power Level: Same as Output Power Accuracy
Power Sweep Width and Linearity: See Figure 2 in Table 1-1.

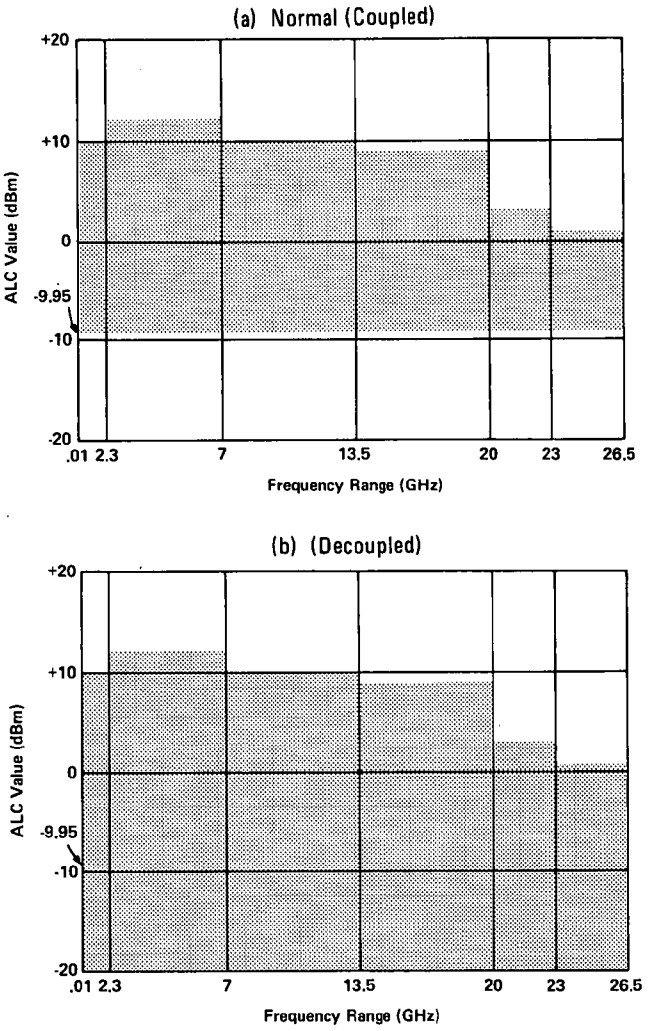


Figure A. Power Sweep Range

In normal operation (a), the ALC does not operate below −9.95 dBm (see Figure 2 in Table 1-1), and so the maximum power sweep range is the difference of −9.95 dBm and the maximum leveled power available at the frequency of interest (specified leveled power shown in diagram). In the DECOUPLED mode (b), the power sweep range is extended because the ALC can operate down to −20 dBm.

4-18. POWER SWEEP TEST (Cont'd)

Description

The 8340A under test is set to allow the ALC and the step attenuator to be operated independently (**[SHIFT] [PWR SWP]**). The 8340A is then set to do a 20 dB power sweep from −20 dBm to 0 dBm at a CW frequency. The 8340A is set to do a manual sweep. The 8340A output power is measured at the two end points, −20 dBm and 0 dBm, using a power meter.

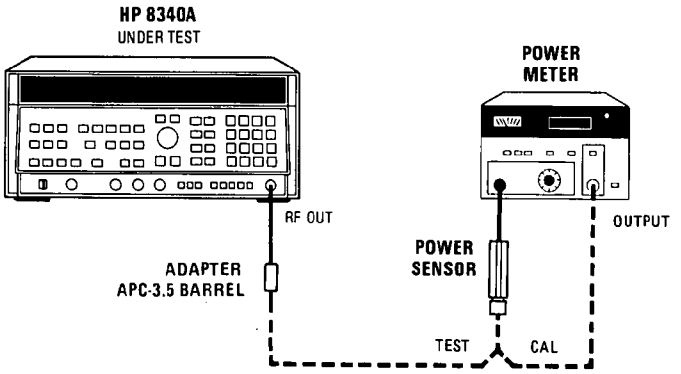


Figure 4-10. Power Sweep Test Setup

Equipment

Power Meter	HP 436A
Power Sensor	HP 8485A
Adapter (APC 3.5 female to female barrel)	HP P/N 5061-5311

Procedure

1. Connect equipment as shown in Figure 4-10. Connect the 8485A Power Sensor to the Power Meter. Allow at least 30 minutes warm up time. Set the Power Meter's calibration factor switch to include 1 GHz, then zero and calibrate the Power Meter before connecting the Power Sensor to the 8340A.

2. Press 8340A **[INSTR PRESET]**. Press the **[CW]** key and enter **[1] [GHz]**.

3. Press **[SHIFT] [PWR SWP]** to set the 8340A to allow the ALC and RF step attenuator to be independently controlled.

NOTE

The step up and step down keys control the RF attenuator. The numeric key pad and rotary knob control the ALC power level.

4-18. POWER SWEEP TEST (Cont'd)

4. Enter **[−] [2] [0] [dBm]** ALC power level to set the start of the power sweep at −20 dBM. Press **[PWR SWP]** and enter **[2] [1] [dBm]** to set the power sweep range to >20 dB (The maximum power sweep range is from −20 dBm to maximum power).

5. Press the **[MANUAL]** key. Turn the rotary knob counterclockwise to find the beginning of the power sweep (i.e., the power meter indication is at minimum and no longer changing). Record the power meter indication.

NOTE

The POWER dBm display will indicate the approximate output power during a very slow or manual sweep.

6. Rotate the rotary knob clockwise to find the end of the power sweep (i.e., the power meter indication is at maximum and no longer changing). Record the power meter indication.

7. The difference between the power meter indications recorded in step 5 and step 6 must be ≥20 dB.

8. Press the **[CW]** key and enter **[5] [GHz]**. Set the power meter's calibration factor switch to include this frequency. Repeat steps 5 through 7 at CW frequencies of 10, 15, and 26 GHz.

4-19. PULSE MODULATION ON/OFF RATIO TEST

Specification

Table 4-23. Pulse Modulation ON/OFF Ratio Test Specifications

For CW mode and RF frequencies ≥400 MHz only:
On/Off Ratio: >80 dB

Description

The 8340A under test is set to a CW frequency at 0 dBm. The RF output level is viewed on a spectrum analyzer. A reference level is set on the spectrum analyzer display, the 8340A PULSE key is pressed (ON).

NOTE

The 50 ohm termination on the 8340A PULSE input simulates the RF OFF state when PULSE is selected (ON).

The difference between the two spectrum analyzer displayed levels is the pulse ON/OFF ratio.

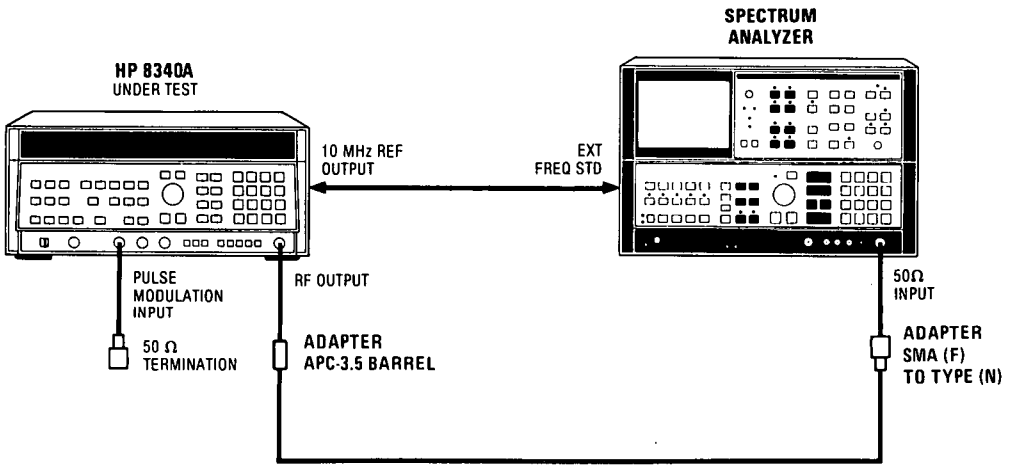


Figure 4-11. Pulse Modulation ON/OFF Ratio Test Setup

Equipment

Spectrum Analyzer	HP 8566A
50 Ohm Termination	HP 10100C
Cable SMA (m) to SMA (m)	HP P/N 08340-20124

4-19. PULSE MODULATION ON/OFF RATIO TEST (Cont'd)

Procedure

1. Connect equipment as shown in Figure 4-11. Allow at least 30 minutes warm up time.

2. Press 8340A **[INSTR PRESET]** then **[CW]** and enter **[1] [GHz]**. RF power level should be 0 dBm.

3. Set the spectrum analyzer CENTER FREQUENCY to equal the 8340A CW frequency, FREQUENCY SPAN 200 Hz, RES BW 30 Hz, PEAK SEARCH, MKR→CF, MKR→REF LVL, MKRΔ.

4. Press 8340A **[PULSE]** key (ON). The spectrum analyzer marker delta amplitude level should be greater than 80 dB.

5. Repeat steps 2 through 4 at CW frequencies of 3, 9, 15, and 22 GHz.

NOTE

For further verification of the ON/OFF Ratio, steps 2 through 4 may be repeated for other frequencies of interest.

4-20. PULSE MODULATION RISE AND FALL TIME TEST

Specification

Table 4-24. Pulse Modulation Rise and Fall Time Test Specification

For CW mode and frequencies ≥400 MHz only:
Rise (T_R) and Fall (T_F) Times: <25 nanoseconds

Description

The 8340A under test RF output frequency is down converted to 50 MHz using a mixer and a second 8340A as a local oscillator. The 50 MHz IF signal is amplified and applied to an oscilloscope. The 8340A under test is pulsed using a pulse generator. The pulse generator output is also applied to the oscilloscope. The oscilloscope is used to measure the pulse envelope rise and fall times. Refer to Figure 4-12 Pulse Definitions.

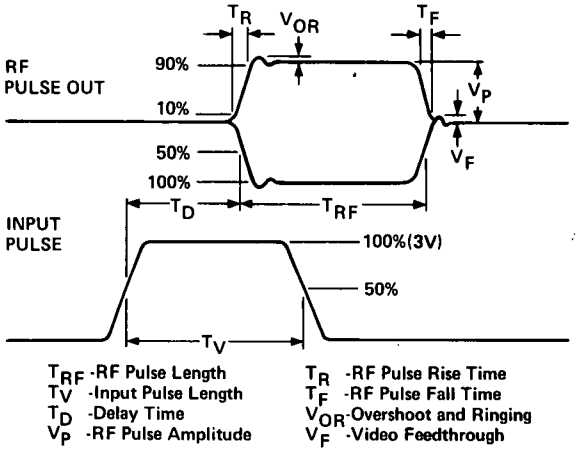


Figure 4-12. Pulse Definitions

Equipment

Local Oscillator	HP 8340A Opt. 001
Pulse Generator	HP 8012B
Amplifier	HP 8447F
Oscilloscope	HP 1741A
Adapter	HP P/N 5061-5311
10 dB Attenuator	HP 8493C Opt. 010
Mixer	RHG DMS 1-26
Low Pass Filter (LPF)	HP P/N 08340-60176

Procedure

1. Connect equipment as shown in Figure 4-13. Connect the mixer directly to the local oscillator RF output to obtain maximum LO drive to the mixer. Connect the BNC tee directly to the 8340A PULSE IN connector. Allow at least 30 minutes warm up time.

4-20. PULSE MODULATION RISE AND FALL TIME TEST (Cont'd)

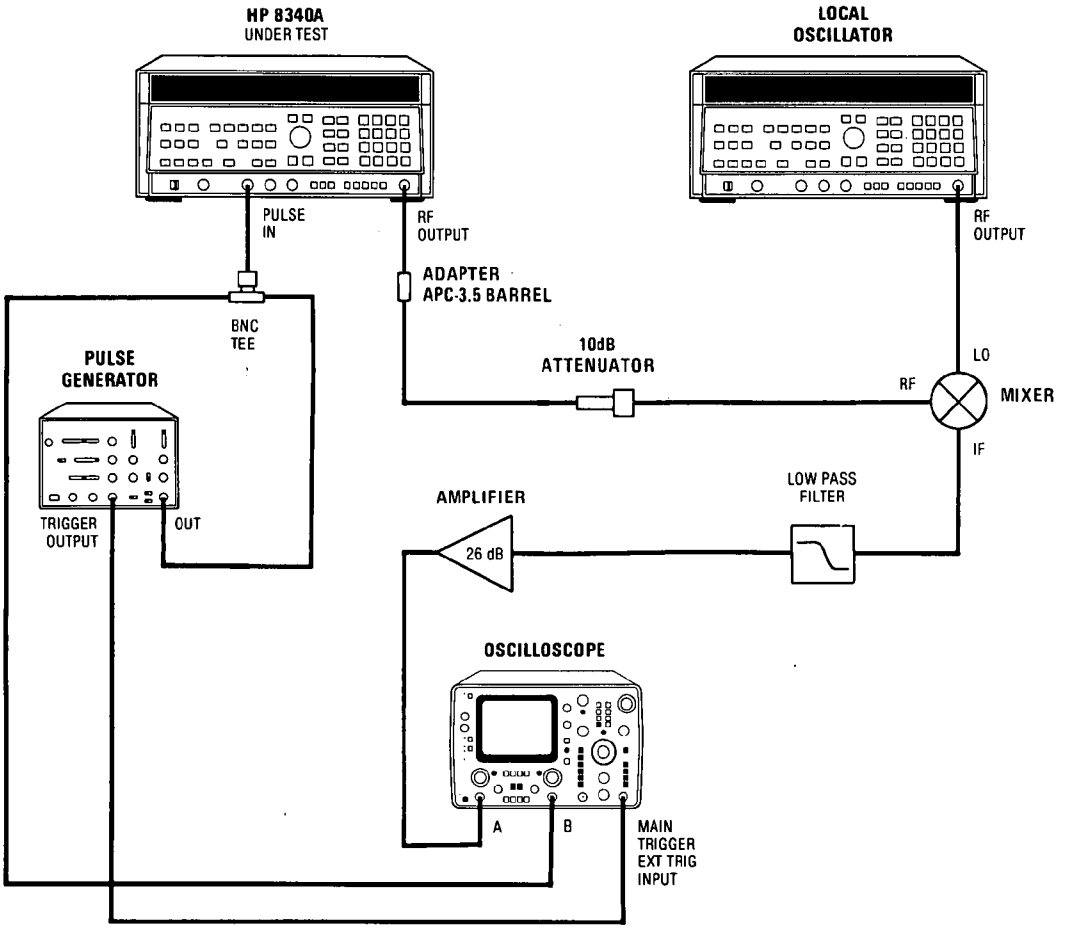


Figure 4-13. Pulse Modulation Rise and Fall Time Test Setup

2. Set up the 8012B Pulse Generator as follows:

OFFSET	OFF
POLARITY	+
OUTPUT	NORMAL
INT LOAD	IN
PULSE PERIOD slide switch	1μ–.1m
TRANSITION TIME slide switch	minimum (5n)
AMPLITUDE slide switch	top position (5.0)
PULSE DOUBLE/NORMAL	NORMAL
PULSE DELAY slide switch	minimum
Pulse Delay VERNIER	fully CCW
LEADING EDGE control	fully CCW
PULSE WIDTH slide switch	10n–1μ
TRAILING EDGE control	fully CCW

3. Set both oscilloscope channels A and B for 50 ohm input. Set the oscilloscope to view the pulse generator output waveform. Adjust the 8012B pulse width VERNIER for a 100 nanosecond pulse. Adjust the pulse period VERNIER for a 10 microsecond period.

4-20. PULSE MODULATION RISE AND FALL TIME TEST (Cont'd)

Adjust the amplitude VERNIER for about a 3V pulse amplitude (TTL level). Set the oscilloscope to trigger on this pulse (trigger on channel B)

4. Press **[INSTR PRESET]** on both the 8340A under test and the local oscillator 8340A. Press the 8340A under test **[CW]** key and enter **[1] [GHz]** and press the **[PULSE]** modulation key. Press the local oscillator 8340A **[CW]** key and enter **[.] [9] [5] [GHz]**. The IF frequency is then 50 MHz. Set the local oscillator 8340A for +10 dBm or maximum leveled output. The 8340A under test RF power should be 0 dBm.

NOTE

For best accuracy in this test, the Local Oscillator drive to the mixer should be ≥ +6 dBm. The 8340A Option 001 used as the LO will typically produce +6 dBm at any frequency, although it is only guaranteed to produce +4 dBm above 23 GHz. If +6 dBm is not available at a test frequency, try a slightly different frequency and be sure to have PEAK on.

5. Set the oscilloscope horizontal for 50 nanoseconds/division and select channel A input only. Adjust the channel A (pulsed IF input signal) vertical gain and position so that the pulse OFF is at the 0% graticule line and the pulse ON is at 100% graticule line. Select the horizontal MAG X10. The oscilloscope is now calibrated for 5 nanoseconds/division. Adjust the horizontal position control to position the modulation envelope so that the 10% point of the envelope rise time is at the center vertical graticule line similar to Figure 4-14.

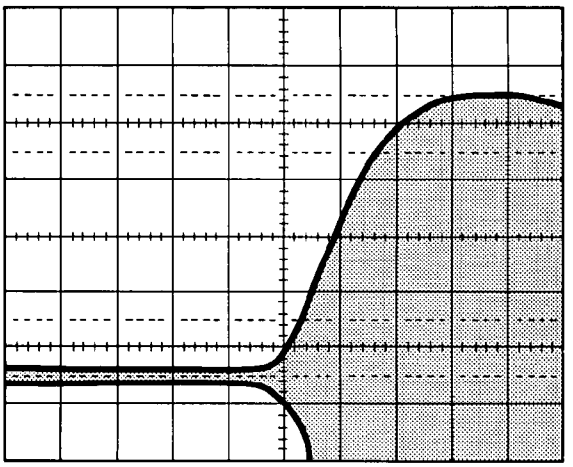


Figure 4-14. Pulse Modulation Rise Time Waveform.

6. The 90% point of the envelope rise time should be less than 25 nanoseconds (5 horizontal divisions) from the 10% point.

4-20. PULSE MODULATION RISE AND FALL TIME TEST (Cont'd)

7. Adjust the oscilloscope horizontal position control to view the modulation envelope fall time. Position the waveform so that the modulation envelope crosses the 90% graticule at a verticle graticule line similar to Figure 4-15.

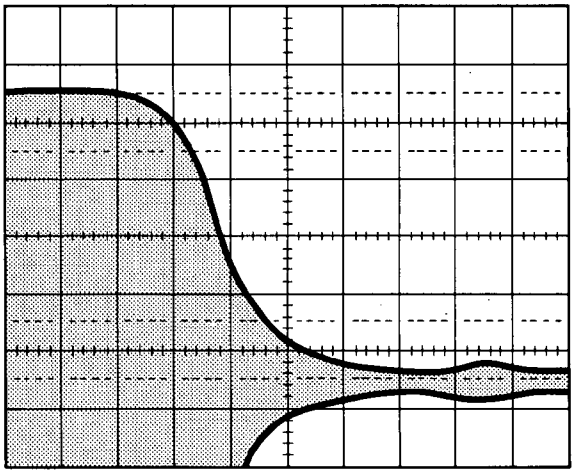


Figure 4-15. Pulse Modulation Fall Time Waveform.

8. The 10% point should be <25 nanoseconds (5 divisions) from the 90% point.

9. Repeat steps 5 through 8 at CW frequencies of 3, 9, 15, and 22 GHz. Set the local oscillator 8340A CW frequency to be 50 MHz below the 8340A under test frequency.

4-21. PULSE MODULATION ACCURACY TEST

Specification

Table 4-25. Pulse Modulation Accuracy Test Specifications

For CW mode and frequencies ≥400 MHz only:

Minimum Internally Leveled RF Pulse Width (TI, RFI): 100 nanoseconds

Pulse Repetition Frequency
Internally leveled: 100 Hz to 5 MHz

Accuracy of Internally Leveled RF Pulse VI, PI (relative to CW mode level):

NOTE

ALC attempts to hold pulse amplitude to same level as leveled CW signal.

Bands and Approximate Frequency Ranges (GHz) (see Frequency Ranges and Bandswitch Points for complete description)		
Pulse Width	**Band 0 0.4 to <2.3**	**Bands 1-4 2.3 to 26.5**
100 to <200 ns	+3/−0.3 dB*	+1.5/−0.3 dB*
200 to <500 ns	+1.5/−0.3 dB*	±0.3 dB
≥500 ns	±0.3 dB	±0.3 dB
* +15 to +55°C. Duty Cycle must be > 0.01%.		

Description

The 8340A under test RF output frequency is down converted to 50 MHz using a mixer and a second 8340A as a local oscillator. The 50 MHz IF signal is amplified and applied to an oscilloscope. The 8340A under test is pulsed using a pulse generator. The IF modulation envelope is positioned to convenient horizontal graticule lines. The pulse is turned OFF and the 8340A output power level is adjusted so that the IF carrier is at the horizontal graticule lines established when the 8340A was being pulsed. The change in 8340A output power level is the accuracy error of the leveled RF pulse.

Equipment

Local Oscillator ..... HP 8340A Opt. 001
Pulse Generator..... HP 8012B
Amplifier..... HP 8447F
Oscilloscope..... HP 1741A
Adapter ..... HP Part No. 5061-5311
10 dB Attenuator ..... HP 8493C Opt. 010
Mixer..... RHG DMS 1-26
Low Pass Filter (LPF) ..... HP P/N 08340-60176

4-21. PULSE MODULATION ACCURACY TEST (Cont'd)

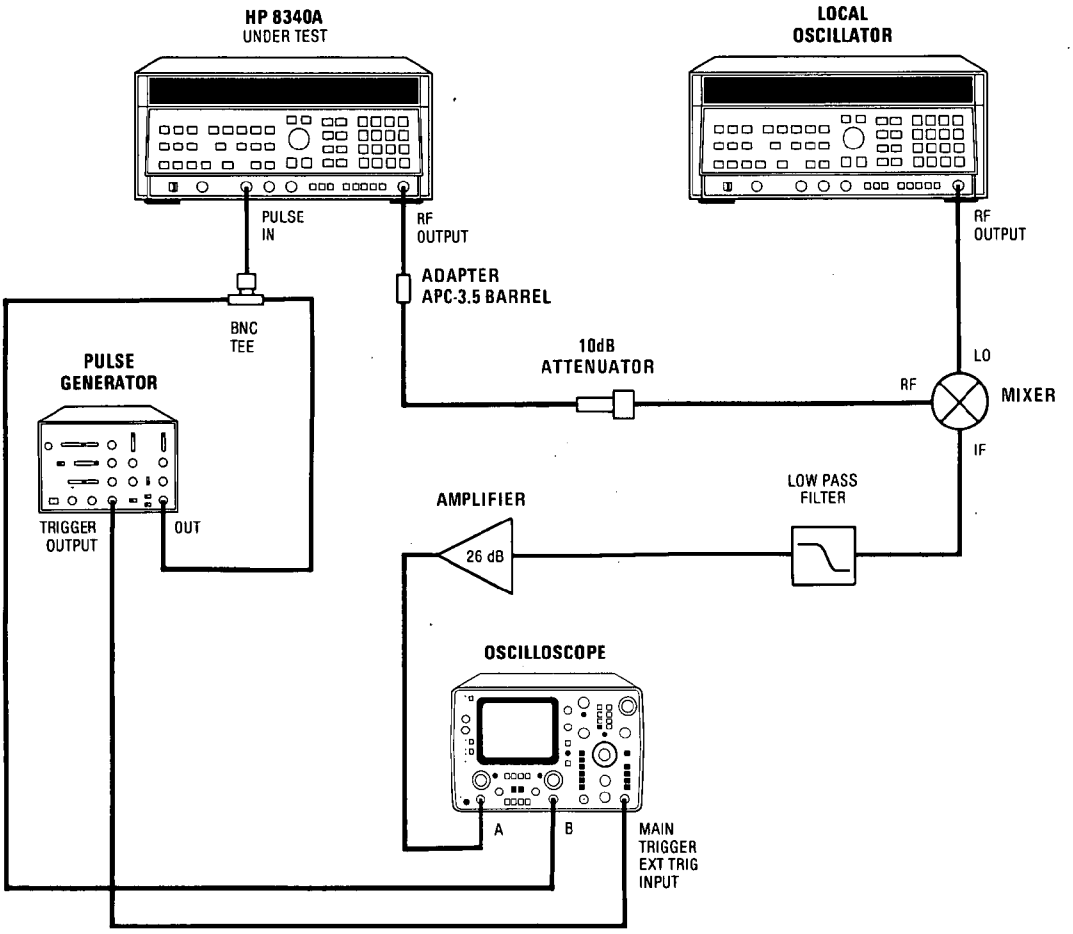


Figure 4-16. Pulse Modulation Accuracy Test Setup

Procedure

1. Connect equipment as shown in Figure 4-16. Connect the mixer directly to the LO 8340A RF output connector to obtain the maximum mixer LO input level. Connect the BNC tee directly to the 8340A PULSE IN connector. Allow at least 30 minutes warm up time.

4-21. PULSE MODULATION ACCURACY TEST (Cont'd)

2. Set up the 8012B Pulse Generator as follows:

PULSE PERIOD slide switch	1μ–.1m
TRANSITION TIME slide switch	minimum (5n)
AMPLITUDE slide switch	top position (5.0)
PULSE DOUBLE/NORMAL	NORMAL
PULSE DELAY slide switch	minimum
Pulse Delay VERNIER	fully CCW
LEADING EDGE control	fully CCW
PULSE WIDTH slide switch	10n-1μ
TRAILING EDGE control	fully CCW
OFFSET	OFF
POLARITY	+
OUTUT	NORMAL
INT LOAD	IN

3. Set both oscilloscope channels (A and B) for 50 Ohm input. Set the oscilloscope to view the pulse generator output waveform. Adjust the 8012B pulse width VERNIER for a 100 nanosecond pulse. Adjust the pulse period VERNIER for a 10 microsecond period. Adjust the amplitude VERNIER for about a 3V pulse amplitude (TTL level).

4. Press **[INSTR PRESET]** on both the 8340A under test and the local oscillator 8340A. Press the 8340A under test **[CW]** key and enter **[1] [GHz]**. Press **[POWER LEVEL]** and enter [–] **[1] [0] [dBm]**. Press the local oscillator 8340A **[CW]** key and enter **[.] [9] [5] [GHz]**. The IF frequency is then 50 MHz. Set the local oscillator 8340A for +10 dBm or maximum leveled output.

5. Set the oscilloscope horizontal for 50 nanoseconds/division and select channel A input only. Adjust the channel A (IF carrier input signal) vertical sensitivity to view the entire RF envelope.

NOTE

It may be necessary to reduce the vertical sensitivity and/or adjust the 8340A RF output level at some frequencies.

6. Press the **[PULSE]** key on the 8340A under test (pulse ON). Adjust the oscilloscope vertical position and sensitivity to place the modulation envelope on convenient horizontal graticule lines. Press the **[PULSE]** key to turn pulse OFF. Press the **[POWER LEVEL]** key on the 8340A under test. Note the power level in the **ENTRY DISPLAY**.

7. Adjust the 8340A under test power level using the rotary knob so that the IF carrier signal aligns with the horizontal graticule lines established in step 6 for the modulation envelope. Note the **ENTRY DISPLAY** power level.

8. The difference between the power levels noted in step 6 and 7 should be less than the specification for this pulse width and RF frequency.

9. Repeat steps 5 through 8 for pulse widths of 200, 500, and 1000 nanoseconds.

4-21. PULSE MODULATION ACCURACY TEST (Cont'd)

10. To test the Pulse Repetition Frequency range (100 Hz to 5 MHz), set the pulse generator period to 10 milliseconds (100 Hz) and pulse width to 1 microsecond (duty cycle of 0.01%). Repeat steps 5 through 8. Set the pulse generator period to 200 nanoseconds (5 MHz) and pulse width to 100 nanoseconds (minimum specified PW). Repeat steps 5 through 8.

11. Set the pulse generator period to 10 microseconds and pulse with to 100 nanoseconds. Repeat steps 5 through 10 at CW frequencies of 3, 9, 15, and 22 GHz. Set the local oscillator 8340A CW frequency to be 50 MHz below the 8340A under test frequency. For 8340A under test frequencies of 15 and 22 GHz press **[PEAK]** to ON.

4-22. PULSE MODULATION VIDEO FEEDTHROUGH TEST

Specification

Table 4-26. Pulse Modulation Video Feedthrough Test Specification

For CW mode and frequencies ≥400 MHz only: Video Feedthrough (V_F/V_P): 0.4 to <2.3 GHz (Band 0): <5% for output power levels ≤ +8 dBm) 2.3 to 26.5 GHz (Bands 1-4): ≤ 0.2%

Description

NOTE

Video feedthrough is any component of the pulse generator signal that appears at the 8340A RF output connector.

The 8340A under test is set to a CW frequency at 0 dBm. The 8340A is pulsed using a pulse generator. The pulsed RF output signal is fed through a 10 dB attenuator and a low pass filter that will pass only the low frequency (video feedthrough) component of the modulation envelope. The video feedthrough is measured using an oscilloscope. The measured voltage is related to the RF power by:

$$P = 10 \log (V^2/R/1 \text{ mW})$$

Where:

P = 8340A RF output level minus 10 dB, and

R = 50 Ohms.

Equipment

Pulse Generator	HP 8012B
Oscilloscope	HP 1741A
Adapter	HP 5061-5311
10 dB Attenuator	HP 8493C Opt. 010
Low Pass Filter (LPF)	HP P/N 08340-60176

Procedure

1. Connect equipment as shown in Figure 4-17. Attach the BNC tee directly to the 8340A PULSE input connector. Allow at least 30 minutes warm up time.

4-22. PULSE MODULATION VIDEO FEEDTHROUGH TEST (Cont'd)

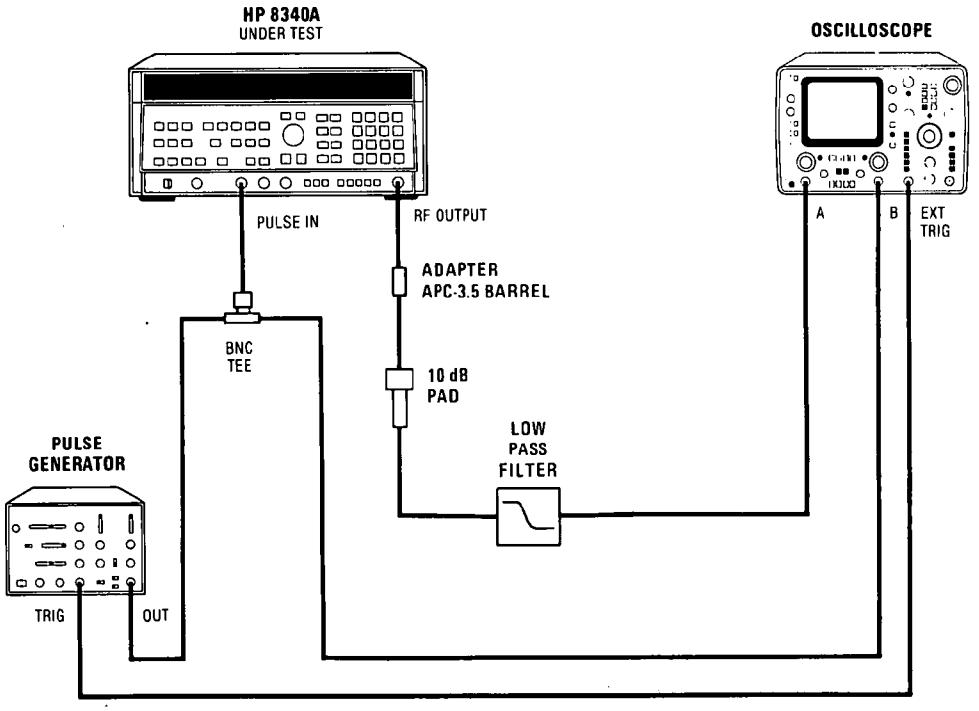


Figure 4-17. Pulse Modulation Video Feedthrough Test Setup

2. Set up the 8012B Pulse Generator as follows:

PULSE PERIOD slide switch	1μ–.1m
TRANSITION TIME slide switch	minimum (5n)
AMPLITUDE slide switch	top position (5.0)
PULSE DOUBLE/NORMAL	NORMAL
PULSE DELAY slide switch	minimum
Pulse Delay VERNIER fully	CCW
LEADING EDGE control	fully CCW
PULSE WIDTH slide switch	10n–1μ
TRAILING EDGE control	fully CCW
OFFSET	OFF
POLARITY	+
OUTPUT	NORMAL
INT LOAD	IN

3. Set both oscilloscope channels (A and B) to 50 Ohm input. Set the oscilloscope to view the pulse generator output waveform. Adjust the 8012B pulse width VERNIER for a 100 nanosecond pulse. Adjust the pulse period VERNIER for a 100 microsecond period. Adjust the amplitude VERNIER for about a 3V pulse amplitude (TTL level). Set the oscilloscope horizontal for 50 nanoseconds/division and select channel A input only.

4. Press **[INSTR PRESET]** on the 8340A under test. Press the 8340A **[CW]** key and enter **[.] [5] [GHz]**. Press the **[PULSE]** key (pulse ON).

5. Press the **[POWER LEVEL]** key enter the first power level, **[8] [dBm]**.

6. Adjust the oscilloscope channel A vertical sensitivity and vertical position to view the video feedthrough signal similar to Figure 4-18.

4-22. PULSE MODULATION VIDEO FEEDTHROUGH TEST (Cont'd)

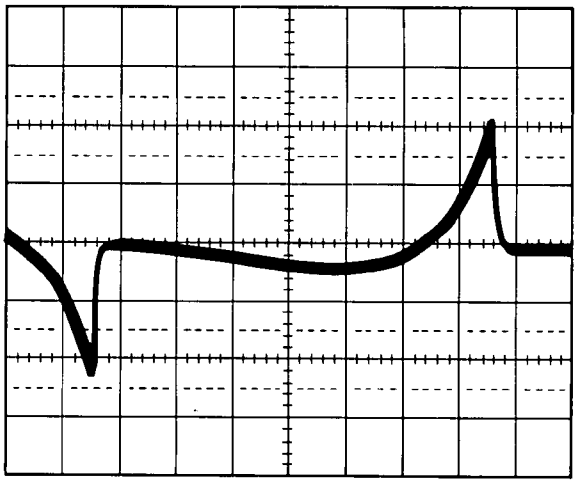


Figure 4-18. Pulse Modulation Video Feedthrough Waveform.

7. The test limits for the three power levels are shown in Table 4-27. (Note that the test limit is 5% of Vpk.)

Table 4-27. Pulse Modulation Video Feedthrough Test Limits

8340A RF Output Level (dBm)	P = (dBm)	Vpk	TEST LIMIT (pk voltage)
+8	−2	0.2511	12 mV
0	−10	0.0999	5 mV
−10	−20	0.03162	1.6 mV

The test limits are derived using the following equation:

$P = 10 \log (Vrms^2/R/1\ mW)$

Where:

P = 8340A RF output level −10 dB, and,

R = 50 Ohms.

Example:

4-22. PULSE MODULATION VIDEO FEEDTHROUGH TEST (Cont'd)

For 8340A set to 0 dBm the output of the 10 dB pad is −10 dBm.

$P = 10 \log (Vrms^2/R/1\ mW)$

$-10 = 10 \log (V^2/50/0.001)$ (divide through by 10)

$-1 = \log (V^2/50/0.001)$ (take antilog of both sides)

$10^{-1} = 0.1 = (V^2/50/0.001)$ (cross multiply)

$0.0001 = V^2/50$ (cross multiply again)

$\sqrt{0.005} = V = 0.0707$ rms

Test Limit = Vpk x 5% = 0.0707 x 1.414 x 5% = 5 mV

8. Repeat steps 6 and 7 for 8340A output power levels of 0 and −10 dBm.

9. Repeat steps 5 through 8 at CW frequencies of 1, 1.5, and 2 GHz.

NOTE

For 8340A frequencies above 2.3 GHz the video feedthrough is typically so small that it is difficult to measure. The following steps provide a means to verify that the video feedthrough is negligible.

10. Remove the 10 dB pad between the 8340A Under Test and the low pass filter. Press the 8340A **[CW]** key and enter any frequency from >2.3 GHz to 26.5 GHz. Press the **[POWER LEVEL]** key and enter **[−] [1] [0] [dBm]**.

11. Select the oscilloscope X5 vertical magnifier. The test limit is now 0.2 mV or 1 minor division on the oscilloscope.

12. Select several 8340A CW frequencies >2.3 GHz and verify that the video feedthrough is less than 1 minor division on the oscilloscope.

4-23. AMPLITUDE MODULATION TEST

Specification

Table 4-28. Amplitude Modulation Test Specifications

The following specifications apply when the 8340A is internally leveled, for waveforms whose envelope peak is at least 1 dB below maximum specified power. Unless noted, pulse modulation must be OFF; however, the 8340A is capable of simultaneous amplitude and pulse modulation. See Section III, Operation.

AM Depth: 0 to 90%

AM Sensitivity at 1 kHz rate and 30% depth: 100%/Volt ± 5%

AM Bandwidth relative t 1 kHz rate at 30% Depth:DC coupled, 3 dB point ≥ 100 kHz

AM Frequency Response (Flatness) Relative to a 1 kHz rate at 30% depth, DC to 10 kHz:
±0.20 dB

Description

AM sensitivity and accuracy is determined by simulating a modulation signal (i.e., setting the function generator to a dc voltage). The unmodulated 8340A RF output is measured using a power meter. A dc voltage representing ±30% modulation (±0.3 Vdc) is applied to the 8340A under test AM input. The power meter indication should change by:

20 log (1 + (dc voltage ± (0.05 times the dc voltage)))

The sensitivity and accuracy is tested at several 8340A CW frequencies.

The AM frequency response and bandwidth is measured by down converting the 8340A under test RF frequency to an IF frequency within the range of the modulation analyzer. The 8340A is amplitude modulated using a function generator. The modulation analyzer is set to indicate 0 dB at the reference modulation frequency of 1 kHz. The modulation frequency is varied and the flatness is indicated on the modulation analyzer. The modulating frequency is then set to the bandwidth specification (100 kHz) and the modulation analyzer should indicate > −3 dB. This shows that the actual 3 dB point will occur at a frequency >100 kHz.

Finally, the function generator output level is increased to obtain >90% modulation depth.

4-23. AMPLITUDE MODULATION TEST (Cont'd)

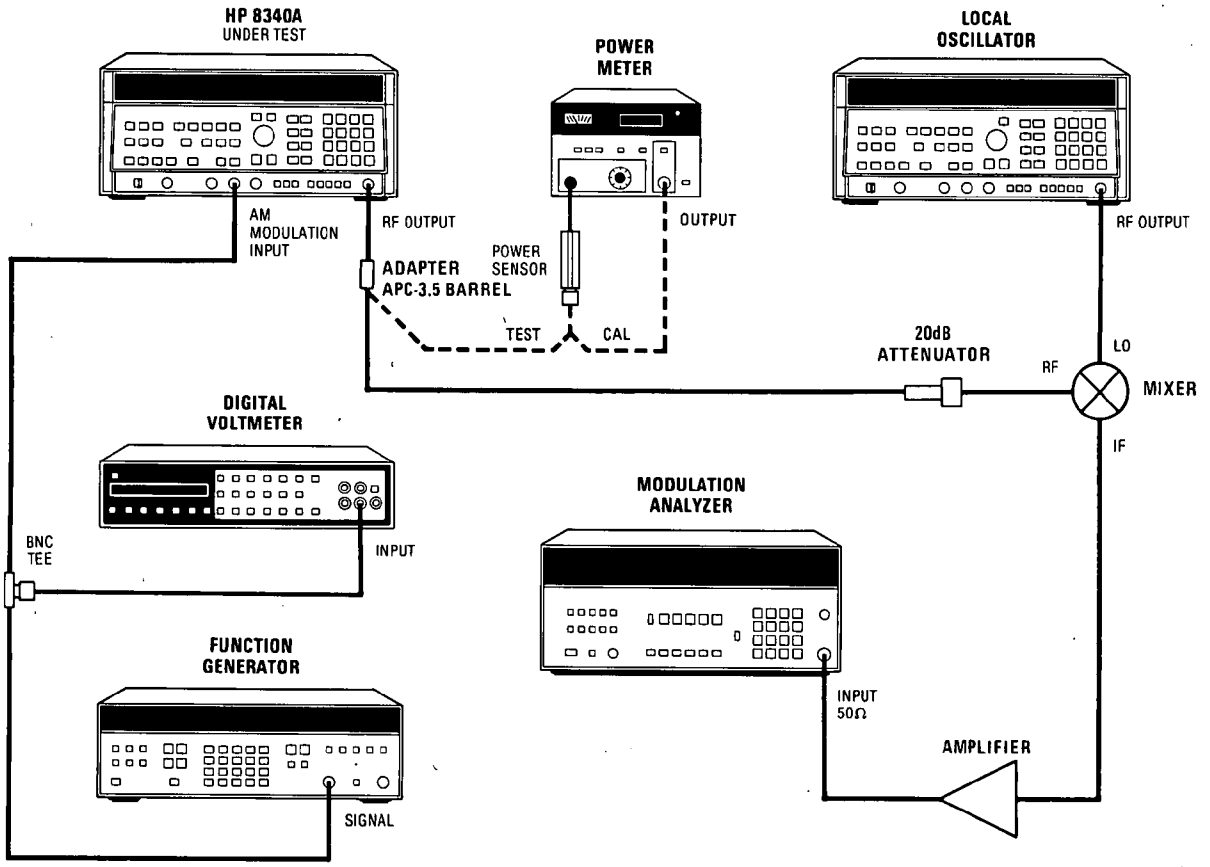


Figure 4-19. Amplitude Modulation Test Setup

Equipment

Local Oscillator	HP 8340A Opt. 001
Modulation Analyzer	HP 8901A
Function Generator	HP 3325A
Digital Voltmeter	HP 3455A
Amplifier	HP 8447F
Power Meter	HP 436A
Power Sensor	HP 8485A
Adapter (APC 3.5 female to female barrel)	HP Part No. 5061-5311
20 dB Attenuator	HP 8493C Opt. 020
Mixer	RHG DMS 1-26

Procedure

AM SENSITIVITY AND ACCURACY

1. Connect equipment as shown in Figure 4-19. Connect the mixer LO port at the local oscillator 8340A RF output. Connect the 8485A Power Sensor to the power meter. Allow at least 30 minutes warm up time. Set the power meter's calibration factor switch to

4-23. AMPLITUDE MODULATION TEST (Cont'd)

include 1.5 GHz, then zero and calibrate the power meter. Connect the power sensor to the 8340A under test RF output.

2. Press 8340A under test **[INSTR PRESET]**. Press the **[CW]** key and enter **[1] [.] [5] [GHz]**. Press the **[POWER LEVEL]** key and enter **[−] [5] [dBm]**.

NOTE

The function generator output impedance is 50 Ohms and its output indication accuracy assumes a 50 Ohm load. The 8340A AM input impedance is 600 Ohms; therefore, a high impedance DVM is used to measure and set the function generator output level.

3. Zero the power meter as follows:

   With power applied to the sensor, press the power meter RANGE HOLD. Press the 8340A **[RF]** key to turn the RF OFF. Zero the power meter. Press the **[RF]** key to turn the RF ON.

4. Using the DVM as an indicator, set the function generator to output 0 Vdc (If the function generator being used does not have this feature, use a dc power supply). Press the 8340A under test **[AM]** key (AM ON). Note the power meter indication.

5. Simulate +30% modulation by setting the function generator output to +0.3 volts dc as indicated on the DVM. The power meter indication should increase by 2.18 to 2.38 dB from the value noted in step 4.

   20 log (1 + (0.3 − (0.05 times 0.3))) = 2.18 dB

   to

   20 log (1 + (0.3 + (0.05 times 0.3))) = 2.38 dB

6. Simulate −30% modulation by setting the function generator output to −0.3 volts dc as indicated on the DVM. The power meter should decrease by 2.91 to 3.29 dB from the value noted in step 4.

   20 log (1 + (−0.3 − (0.05 times −0.3))) = −2.91 dB

   to

   20 log (1 + (−0.3 + (0.05 times −0.3))) = −3.29 dB

NOTE

The 8340A test power levels are selected to avoid power meter range changes at the +30 and −30% modulation settings.

7. Press the 8340A under test **[POWER LEVEL]** key and enter **[+] [5] [dBm]**. Press the **[AM]** key to turn AM OFF. Repeat steps 3 through 6 for this 8340A power level setting.

4-23. AMPLITUDE MODULATION TEST (Cont'd)

8. Press the 8340A under test **[CW]** key and enter **[4] [.] [5] [GHz]**. Press the **[AM]** key to turn AM OFF. Set the power meter's calibration factor switch to include 4.5 GHz. Repeat steps 3 through 6 for 8340A power level settings of −5 and +5 dBm.

AM FREQUENCY RESPONSE AND BANDWIDTH

9. Disconnect the power sensor and connect the 8340A under test RF output to the 20 dB attenuator.

10. Press the 8340A under test **[CW]** key and enter **[1] [.] [5] [GHz]**. Press the **[POWER LEVEL]** key and enter **[0] [dBm]**. Press the local oscillator INSTR PRESET, CW and enter 1.45 GHz. Press POWER LEVEL, enter 10 dBm, and press PEAK (ON). (The output may be unleveled; this will not affect the test.) The IF frequency is now 50 MHz.

NOTE

For best accuracy in the Amplitude Modulation test, the Local Oscillator drive to the mixer should be ≥ +6 dBm. The 8340A Option 001 used as the LO will typically produce +6 dBm at any frequency, although it is only guaranteed to produce +4 dBm above 23 GHz. If +6 dBm is not available at a test frequency, try a slightly different frequency and be sure to have PEAK on.

11. Set the function generator for a sine wave at a reference frequency of 1 kHz at 0.2121 Vrms (0.3 times 0.707) ±0.05 Vrms. For example: 0.25 Vrms, as indicated on the DVM, would fall in this range. Set the modulation analyzer input frequency to 50 MHz (by pressing FREQ 50 MHz), then press AM and AVE. The modulation analyzer should indicate about 21%. Note the DVM indication.

12. Press the dB key. As the modulating frequency is changed the modulation analyzer will indicate the flatness in dB relative to the 1 kHz reference.

13. Set the function generator to 100, 200, 500 Hz, then 1, 2, 5, and 10 kHz. Check the DVM indication and adjust the level of the modulating signal at each frequency to eliminate any flatness error of the function generator. Observe the flatness indication on the modulation analyzer. The flatness indication should be ≤ ±0.20 dB.

14. Check the AM bandwidth by setting the function generator to 100 kHz. Adjust the function generator output level to the value noted in step 11. The modulation analyzer should indicate ≥ −3 dB.

AM DEPTH

15. Set the function generator to 1 kHz. Set the modulation analyzer to indicate percent modulation by setting the controls as follows:

AUTOMATIC OPERATION	ON
AM	ON
RATIO %	OFF
RATIO dB	OFF
PEAK	+

4-23. AMPLITUDE MODULATION TEST (Cont'd)

Increase the function generator output amplitude to obtain >90% modulation depth.

16. Repeat steps 11 through 15 at 8340A RF frequencies of 3, 9, 15, and 22 GHz. Set the local oscillator 8340A CW frequency to be 50 MHz below the 8340A under test frequency.

4-24. 8340A HP-IB OPERATION VERIFICATION TEST

NOTE

This HP-IB test is an automated test; a Desktop Computer is required.

Two software listings are supplied. Table 4-30 gives a BASIC program listing for the HP 85F; Table 4-31 gives a BASIC program listing for the HP 9826A or 9836A and 4-16. The test procedure applies to either test program used.

Description

The test program given in Table 4-30 is written to verify the 8340A HP-IB interface by writing to and reading from the 8340A. The program also displays the 8340A status bytes similar to the format shown in Table 4-29, 8340A Status Byte Descriptions. Upon running the program the status bits displayed will change initially as the program outputs an IP (INSTR PRESET), S2 (Single sweep), and two TS (Take Sweep) commands. After about two passes through the output loop (program lines 120 to 300 for the HP 85F, program lines 130 to 350 for the HP 9826A/9836A), the status bits should all be zero's and the 8340A should be in LOCAL mode. The procedure instructs the operator to press specific 8340A front panel keys and perform certain functions which should set specific bits of the status bytes. This procedure will test most of the bits in the two status bytes. However, if the 8340A is working properly, the status bit for the Fault Indicator On, the Oven Cold, and the Self Test Failed will not be tested for the set state. By pressing a controller soft key, the program will test the data bits by outputting a series of binary numbers to the 8340A and reading back each number that it outputs. If a bit is held HIGH or LOW, the number read will not agree with the number written and the program will display an error message. This procedure does not test all of the HP-IB control lines.

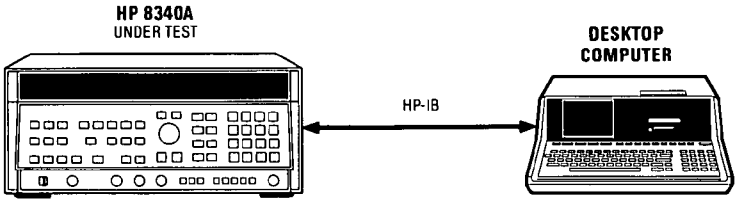


Figure 4-20. 8340A HP-IB Operation and Verification Test Setup

Equipment

Desktop Computer ..... HP 85F
(Includes HP 82937A HP-IB Interface and
I/O ROM HP P/N 00085-15002 and
HP 82936 ROM Drawer)
Plotter/Printer ROM ..... HP P/N 00085-15002

or

Desktop Computer ..... HP 9826A/9836A
(With BASIC language and 512K byte memory)

4-24. 8340A HP-IB OPERATION VERIFICATION TEST (Cont'd)

Procedure

1. Connect the equipment as shown in Figure 4-20. Enter the program shown in Table 4-30 if the HP 85F is used, or the program in Table 4-31 if the HP 9826A or 9836A is used. Press the RUN key. The program will display the 8340A status bytes similar to Table 4-29. After the program goes through the output loop routine about two times, all status bits should be "0" and the 8340A should be in LOCAL mode (front panel REMOTE indicator not ON).

2. Press the 8340A **[INSTR PRESET]** key. After going through the output loop about three times, status byte 1 decimal value should be 24 (bits 4 and 3 set).

NOTE

After pressing an 8340A front panel key, watch the displayed decimal value. When the decimal value changes, press the controller PAUSE key. Note the status bits that are set and press CONT.

3. Press the 8340A **[CW]** key. After the program goes through the output loop about three times all status bits should be "0"; however, status byte 1, bit 1, should have been set during one of the output loop passes. Enter **[1] [5] [GHz]** and the byte 1 status bits will change, but after about 2 passes all status bits should be "0".

4. Press the **[POWER LEVEL]** key and increase the 8340A output power level using the rotary knob until the UNLEVELED light comes on. Status byte 2 decimal value should be 64 (bit 6 set). Decrease the output power level until the UNLEVELED light goes out. All status bits should be "0".

5. Switch the 8340A rear panel FREQUENCY REFERENCE switch to EXT. Status byte 2 value should be 24 (bits 4 and 3 set). Return the switch to INT.

6. Press the controller softkey K1 (SYNTAX).

NOTE

There will be about a 6 second delay before the status bits change.

The program will output the character string "XYZ" to the 8340A. The 8340A should not recognize this string and should set status byte 1, bit 5 (SRQ on HP-IB Syntax Error).

7. Press the controller softkey K4 (DATA BIT). The program will test all data bits and display an error message if any bits fail the test, or if all bits pass the test, the program will display "ALL DATA BITS WORKING".

4-24. 8340A HP-IB OPERATION VERIFICATION TEST (Cont'd)

Table 4-29. 8340A Status Byte Description

STATUS BYTE (#1)								
BIT #	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
DECIMAL VALUE	**128**	**64**	**32**	**16**	**8**	**4**	**2**	**1**
FUNCTION	SRQ on New frequencies or Sweep Time in Effect	REQUEST SERVICE (RQS)	SRQ on HP-IB Syntax Error	SRQ on End of Sweep	SRQ on RF Settled	SRQ on Changed in Extended Status Byte	SRQ on Numeric Entry Completed (HP-IB or Front Panel)	SRQ on Any Front Panel Key Pressed
EXTENDED STATUS BYTE (#2)								
BIT #	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
DECIMAL VALUE	**128**	**64** (L)	**32** (L)	**16** (L)	**8**	**4**	**2**	**1** (L)
FUNCTION	Fault Indicator On	RF Unleveled	Power Failure	RF Unlocked	External Freq. Ref. Selected	Oven Cold	Over Modulation	Self Test Failed
(L) See Note 3								

Table 4-30. 8340A HP-IB Operation Verification Programming Listing (For Use With HP 85F)

```
10    ! 8340A HP-IB OPERATION VERIFICATION
20    !   VERIFICATION TEST
30    !
40    !       14 SEPT 82
50    !
60    I1=719
70    OUTPUT I1 ;"IP S2 TSTS"
80    !
90    ON KEY# 1,"SYNTAX" GOSUB 370
100   ON KEY# 4,"DATA BIT" GOSUB 400
110   LOCAL 7
120   OUTPUT I1 ;"OS"
130   DISP "8340A STATUS BYTE 1 AND 2"
140   DISP
150   DISP "BYTE -------BIT----------"
160   DISP " #  7  6  5  4  3  2  1  0 VALUE"
170   DISP "--------------------------------"
180   DISP
190   ENTER I1 USING "#,B" ; E,F
200   FOR I=1 TO 2
210   DISP I;
220   IF I=1 THEN N=E
230   IF I=2 THEN N=F
240   FOR J=7 TO 0 STEP -1
250   A=BIT(N,J)
260   DISP A;
270   NEXT J
280   DISP N
290   DISP
300   NEXT I
310   DISP USING "4/,A" ; " "
320   KEY LABEL
330   GOTO 120
340   !
350   !  Syntax Test
360   !
370   OUTPUT I1 ; "XYZ"
380   RETURN
390   !
400   !  Test Data Bits
410   !
420   CLEAR
430   DSP USNG "/,K" ; "    TEST DATA BITS"
440   FOR C=0 TO 7
450   B=2 ^C
460   OUTPUT I1 USING "K,B" , "TI",B
470   WAIT 100
480   ENTER I1 USING "#,B" , D
490   IF B#D THEN DISP "    DATA BIT";C;"NOT WORKING"
500   NEXT C
510   DISP "ALL DATA BITS WORKING"
520   DISP "PRESS CONT"
530   PAUSE
540   RETURN
550   END
```

Table 4-31. 8340A HP-IB Operation Verification Programming Listing (for use with HP 9826A or 9836A)

```
10      ! 8340A HP-IB OPERATION
20      !  VERIFICATION TEST
30      !
40      !    7 APRIL 83
50      !
60      I1=719
70      OUTPUT I1;"IP S2 TSTS"
80      !
90      OFF KEY
100     ON KEY 1 LABEL "SYNTAX" GOTO Syntax
110     ON KEY 4 LABEL "DATA BIT" GOTO Data_bit
120     LOCAL 7
130     OUTPUT 1;CHR$(12);
140     !
150 Read_status: !
160     OUTPUT I1;"OS"
170     !
180     PRINT TABXY(1,1);"8340A STATUS BYTE 1 AND 2"
190     PRINT
200     PRINT "BYTE ------BIT------------"
210     PRINT " #  7  6  5  4  3  2  1  0    VALUE"
220     PRINT "-----------------------------------"
230     PRINT
240     ENTER I1 USING "#,B";E,F
250     FOR I=1 TO 2
260       PRINT I;
270       IF I=1 THEN N=E
280       IF I=2 THEN N=F
290       FOR J=7 TO 0 STEP -1
300         A=BIT(N,J)
310         PRINT A;
320       NEXT J
330       PRINT USING "X,5D";N
340       PRINT
350     NEXT I
360     BEEP 200,.01
370     GOTO Read_status
380     !
390 Syntax: !
400     !
410     OUTPUT I1;"XYZ"
420     GOTO Read_status
430     !
440 Data_bit:!
450     !
460     OUTPUT 1;CHR$(12); ! Clear screen
470     DISP USING "/,K";"    TEST DATA BITS"
480     FOR C=0 TO 7
490       B=2^C
500       OUTPUT I1 USING "K,B";"TI",B
510       WAIT .1
520       ENTER I1 USING "#,B";D
530       IF B-D<1 THEN GOTO 550
540       IF B<>D THEN DISP "    DATA BIT ";C;" NOT WORKING"
550     NEXT C
560     !
570     PRINT "ALL DATA BITS WORKING"
580     DISP "PRESS CONTINUE"
590     PAUSE
600     DISP
610     GOTO Read_status
620     END
```

Table 4-32. 8340A Test Record Card (1 of 27)

Hewlett-Packard Model 8340A
Synthesized Sweeper

Date: _____

Serial Number: _____ **Tested By:** _____

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-9. Internal Time Base Aging Rate					
T_1 = Time for 360 degree phase change	3			_____ seconds	
T_2 = Time between T_1 and T_3	4			_____ hours	
T_3 = Time for 360 degree phase change				_____ seconds	
Calculated Aging Rate	5			_____ per day	

Table 4-32. 8340A Test Record Card (2 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-10. Frequency Range and CW Mode Accuracy					
Frequency Range Check					
10 MHz	2	Freq. ±1 Hz ± Counter Resolution		_____ MHz	
26.5 GHz	3	Freq. ±4 Hz ± Counter Resolution		_____ GHz	
M/N Divider Check	4b				
(M Divider)		Freq. ±1 Hz ± Counter Resolution			
M = 8 N = 13		2490 MHz		_____ MHz	
9		2480 MHz		_____ MHz	
10		2470 MHz		_____ MHz	
11		2460 MHz		_____ MHz	
12		2450 MHz		_____ MHz	
13		2440 MHz		_____ MHz	
14		2430 MHz		_____ MHz	
15		2420 MHz		_____ MHz	
16		2410 MHz		_____ MHz	
17		2400 MHz		_____ MHz	
18		2390 MHz		_____ MHz	
19		2380 MHz		_____ MHz	
20		2370 MHz		_____ MHz	
21		2360 MHz		_____ MHz	
22		2350 MHz		_____ MHz	
23		2340 MHz		_____ MHz	
24		2330 MHz		_____ MHz	
25		2320 MHz		_____ MHz	
26		2310 MHz		_____ MHz	
27		2300 MHz		_____ MHz	

Table 4-32. 8340A Test Record Card (3 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-10. Frequency Range and CW Mode Accuracy (cont'd)					
M/N Divider Check (N Divider)	5b	Freq. ±1 Hz ± Counter Resolution			
M = 27 N = 13		2300 MHz		_____ MHz	
14		2500 MHz		_____ MHz	
15		2700 MHz		_____ MHz	
16		2900 MHz		_____ MHz	
17		3100 MHz		_____ MHz	
18		3300 MHz		_____ MHz	
19		3500 MHz		_____ MHz	
20		3700 MHz		_____ MHz	
21		3900 MHz		_____ MHz	
22		4100 MHz		_____ MHz	
23		4300 MHz		_____ MHz	
24		4500 MHz		_____ MHz	
25		4700 MHz		_____ MHz	
26		4900 MHz		_____ MHz	
27		5100 MHz		_____ MHz	
28		5300 MHz		_____ MHz	
29		5500 MHz		_____ MHz	
30		5700 MHz		_____ MHz	
31		5900 MHz		_____ MHz	
32		6100 MHz		_____ MHz	
33		6300 MHz		_____ MHz	
34		6500 MHz		_____ MHz	
35		6700 MHz		_____ MHz	
36		6900 MHz		_____ MHz	

Table 4-32. 8340A Test Record Card (4 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-10. Frequency Range and CW Mode Accuracy (cont'd)					
20-30 Loop Check (N2 Divider)					
8340A ENTRY DISPLAY		8340A START Frequency			
CF Frequency:		Freq. ±1 Hz ± Counter Resolution			
2.310500 GHz	6b	2.310000 GHz		_____ GHz	
2.310501	6c	2.310001		_____ GHz	
2.310502		2.310002		_____ GHz	
2.310503		2.310003		_____ GHz	
2.310504		2.310004		_____ GHz	
2.310505		2.310005		_____ GHz	
2.310506		2.310006		_____ GHz	
2.310507		2.310007		_____ GHz	
2.310508		2.310008		_____ GHz	
2.310509		2.310009		_____ GHz	
2.310510		2.310010		_____ GHz	
2.310510	6d	2.310010		_____ GHz	
2.310520	6e	2.310020		_____ GHz	
2.310530		2.310030		_____ GHz	
2.310540		2.310040		_____ GHz	
2.310550		2.310050		_____ GHz	
2.310560		2.310060		_____ GHz	
2.310570		2.310070		_____ GHz	
2.310580		2.310080		_____ GHz	
2.310590		2.310090		_____ GHz	
2.310600		2.310100		_____ GHz	
2.310600	6f	2.310100		_____ GHz	
2.310700	6g	2.310200		_____ GHz	
2.310800		2.310300		_____ GHz	
2.310900		2.310400		_____ GHz	
2.311000		2.310500		_____ GHz	
2.311100		2.310600		_____ GHz	
2.311200		2.310700		_____ GHz	
2.311300		2.310800		_____ GHz	
2.311400		2.310900		_____ GHz	
2.311500		2.311000		_____ GHz	
2.311500	6h	2.311000		_____ GHz	
2.312500	6i	2.312000		_____ GHz	
2.313500		2.313000		_____ GHz	
2.314500		2.314000		_____ GHz	
2.315500		2.315000		_____ GHz	
2.316500		2.316000		_____ GHz	
2.317500		2.317000		_____ GHz	
2.318500		2.318000		_____ GHz	
2.319500		2.319000		_____ GHz	
2.320500		2.320000		_____ GHz	

Table 4-32. 8340A Test Record Card (5 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-10. Frequency Range and CW Mode Accuracy (cont'd)					
20-30 Loop Check (N1 Divider)					
8340A ENTRY DISPLAY CW Frequency:		Frequency Counter Indicator Freq. ±1 Hz ± Counter Resolution			
2319.97 MHz	7a				
2319.96	7c			_____ MHz	
2319.95				_____ MHz	
2319.94				_____ MHz	
2319.93				_____ MHz	
2319.92				_____ MHz	
2319.91				_____ MHz	
2319.90				_____ GHz	
2319.89				_____ MHz	
2319.88				_____ MHz	
2319.87				_____ MHz	
2319.87	7d			_____ MHz	
2319.77	7e			_____ MHz	
2319.67				_____ MHz	
2319.57				_____ MHz	
2319.47				_____ MHz	
2319.37				_____ MHz	
2319.27				_____ MHz	
2319.17				_____ MHz	
2319.07				_____ MHz	
2318.97				_____ MHz	
2318.97	7f			_____ MHz	
2317.97	7g			_____ MHz	
2316.97				_____ MHz	
2315.97				_____ MHz	
2314.97				_____ MHz	
2313.97				_____ MHz	
2312.97				_____ MHz	
2311.97				_____ MHz	
2310.97				_____ MHz	

Table 4-32. 8340A Test Record Card (6 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-11. Sweep Time Accuracy					
10 milliseconds	4		9.5 msec	_____ msec	10.5 msec
100 milliseconds			9.5 msec	_____ msec	105 msec
1 second			0.95 sec	_____ sec	1.05 sec
10 seconds			9.5 sec	_____ sec	10.5 sec
50 seconds			47.5 sec	_____ sec	52.5 sec

Table 4-32. 8340A Test Record Card (7 of 27)

SPECIFICATIONS TESTED Limits		Step	TEST Conditions		Lower Limit	Measured Value	Upper Limit
4-12. Swept Frequency Accuracy 20% of Band Accuracy		8					
8340A Start Freq. (GHz)	**8340A Stop Freq. (GHz)**		**20% of Band**	**Test Limit (KHz)**	**Spectrum Analyzer Center Freq. (GHz)**	**Spectrum Analyzer Center Freq. (GHz)**	**Spectrum Analyzer Center Freq. (GHz)**
2.3	2.300099		2.3000198	±0.99	2.30001881	_____	2.30002079
2.3	2.300101		2.3000202	±1.01	2.30001919	_____	2.30002121
2.3	2.300499		2.3000998	±4.99	2.30009481	_____	2.30010479
2.3	2.300501		2.3001002	±5.01	2.30009519	_____	2.30010521
2.3	2.30499		2.300998	±49.9	2.3009481	_____	2.3010479
2.3	2.30501		2.301002	±100.02	2.30090198	_____	2.30110202
2.3	2.31		2.302	±200	2.3018	_____	2.3022
2.3	2.32		2.304	±400	2.3036	_____	2.3044
2.3	2.33		2.306	±600	2.3054	_____	2.3066
2.3	2.34		2.308	±800	2.3072	_____	2.3088
2.3	2.349		2.3098	±998	2.308802	_____	2.310798
2.3	2.3501		2.31002	±1020	2.309	_____	2.31104
2.3	2.36		2.312	±1200	2.3108	_____	2.3132
2.3	2.37		2.314	±1400	2.3126	_____	2.3154
2.3	2.38		2.316	±1600	2.3144	_____	2.3176
2.3	2.39		2.318	±1800	2.3162	_____	2.3198
2.3	2.3999		2.31998	±1980	2.318	_____	2.32196
2.3	2.4001		2.32002	±1001	2.319019	_____	2.31021
2.3	2.799		2.3998	±4990	2.39481	_____	2.40479
2.3	2.801		2.4002	±5010	2.39519	_____	2.40521
2.3	7.29		3.298	±49900	3.2481	_____	3.3479
2.3	7.31		3.302	±50000	3.252	_____	3.352
2.3	8.3		3.500	±50000	3.45	_____	3.55
2.3	16.452		5.125	±50000	5.075	_____	5.175
2.3	24.55		6.75	±50000	6.70	_____	6.80
2.3	26.5		7.14	±50000	7.09	_____	7.19

Table 4-32. 8340A Test Record Card (8 of 27)

SPECIFICATION TESTED Limits		Step	TEST Conditions		Lower Limit	Measured Value	Upper Limit
4-12. Swept Frequency Accuracy (cont'd) 50% of Band Accuracy		8					
8340A Start Freq. (GHz)	**8340A Stop Freq. (GHz)**		**50% of Band**	**Test Limit (KHz)**	**Spectrum Analyzer Center Freq. (GHz)**	**Spectrum Analyzer Center Freq. (GHz)**	**Spectrum Analyzer Center Freq. (GHz)**
2.3	2.300099		2.3000495	±0.99	2.30004851	_____	2.30005049
2.3	2.300101		2.3000505	±1.01	2.30004949	_____	2.30005151
2.3	2.300499		2.3002495	±4.99	2.30024451	_____	2.30025449
2.3	2.300501		2.3002505	±5.01	2.30024549	_____	2.30025551
2.3	2.30499		2.302495	±49.9	2.3024451	_____	2.3025449
2.3	2.30501		2.302505	±100.02	2.30240498	_____	2.30260502
2.3	2.31		2.305	±200	2.3048	_____	2.3052
2.3	2.32		2.310	±400	2.3096	_____	2.3104
2.3	2.33		2.315	±600	2.3144	_____	2.3156
2.3	2.34		2.320	±800	2.3192	_____	2.3208
2.3	2.349		2.3245	±998	2.323502	_____	2.325498
2.3	2.3501		2.32505	±1020	2.32403	_____	2.32607
2.3	2.36		2.33	±1200	2.3288	_____	2.3312
2.3	2.37		2.335	±1400	2.3336	_____	2.3364
2.3	2.38		2.34	±1600	2.3384	_____	2.3416
2.3	2.39		2.345	±1800	2.3432	_____	2.3468
2.3	2.3999		2.34995	±1980	2.34797	_____	2.35193
2.3	2.4001		2.35005	±1001	2.349049	_____	2.351051
2.3	2.799		2.5495	±4990	2.54451	_____	2.55449
2.3	2.801		2.5505	±5010	2.54549	_____	2.55551
2.3	7.29		4.795	±49900	4.7451	_____	4.8449
2.3	7.31		4.805	±50000	4.755	_____	4.855
2.3	8.3		5.300	±50000	5.250	_____	5.350
2.3	16.452		9.3625	±50000	9.3125	_____	9.4125
2.3	24.55		13.452	±50000	13.402	_____	13.502
2.3	26.5		14.4	±50000	14.35	_____	14.45

Table 4-32. 8340A Test Record Card (9 of 27)

SPECIFICATIONS TESTED Limits		Step	TEST Conditions		Lower Limit	Measured Value	Upper Limit
4-12. Swept Frequency Accuracy (cont'd)							
80% of Band Accuracy		8					
8340A Start Freq. (GHz)	**8340A Stop Freq. (GHz)**		**80% of Band**	**Test Limit (KHz)**	**Spectrum Analyzer Center Freq. (GHz)**	**Spectrum Analyzer Center Freq. (GHz)**	**Spectrum Analyzer Center Freq. (GHz)**
				±0.99			
2.3	2.300099		2.3000792	±1.01	2.30007821	_____	2.30008019
2.3	2.300101		2.3000808	±4.99	2.30007979	_____	2.30008181
2.3	2.300499		2.3003992	±5.01	2.30039421	_____	2.30040419
2.3	2.300501		2.3004008	±49.9	2.30039579	_____	2.30040581
2.3	2.30499		2.303992	±100.02	2.3039421	_____	2.3040419
2.3	2.30501		2.304008	±200	2.30390798	_____	2.30410802
2.3	2.31		2.308	±400	2.3078	_____	2.3082
2.3	2.32		2.316	±600	2.3156	_____	2.3164
2.3	2.33		2.324	±800	2.3234	_____	2.3246
2.3	2.34		2.332	±998	2.3312	_____	2.3328
2.3	2.349		2.3392	±1020	2.338202	_____	2.340198
2.3	2.3501		2.34008	±1200	2.33906	_____	2.3411
2.3	2.36		2.348	±1400	2.3468	_____	2.3492
2.3	2.37		2.356	±1600	2.3546	_____	2.3574
2.3	2.38		2.364	±1800	2.3624	_____	2.3656
2.3	2.39		2.372	±1980	2.3702	_____	2.3738
2.3	2.3999		2.37992	±1001	2.37794	_____	2.3819
2.3	2.4001		2.38008	±4990	2.379079	_____	2.381081
2.3	2.799		2.6992	±5010	2.69421	_____	2.70419
2.3	2.801		2.7008	±49900	2.69579	_____	2.70581
2.3	7.29		6.292	±50000	6.2421	_____	6.3419
2.3	7.31		6.308	±50000	6.258	_____	6.358
2.3	8.3		7.1	±50000	7.05	_____	7.15
2.3	16.452		13.6	±50000	13.55	_____	13.65
2.3	24.55		20.1	±50000	20.55	_____	20.15
2.3	26.5		21.66		21.61	_____	21.71

Table 4-32. 8340A Test Record Card (10 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-13. Maximum Leveled Output Power and Power Accuracy					
Maximum Leveled Power Band 0					
ENTRY DISPLAY Power Indication	3	Continuous Sweep, Auto Sweep Time		_____ dBm	
	4	Single Sweep, Auto Sweep Time		_____ dBm	
	5	Single Sweep, 2 Second Sweep Time		_____ dBm	
Lowest power level recorded in step 3, 4, or 5	6			_____ dBm	
Minimum Power Frequency		M2 Frequency		_____ GHz	
Power Meter Indication	7	Standard Instrument (F.P. Out with Atten.)	+10 dBm	_____ dBm	
		Option 001 (F.P. Out No Atten.)	+10 dBm	_____ dBm	
		Option 004 (R.P. Out with Atten.)	+10 dBm	_____ dBm	
		Option 005 (R.P. Out No Atten.)	+10 dBm	_____ dBm	
Maximum Leveled Power Band 1					
ENTRY DISPLAY Power Indication	3	Continuous Sweep, Auto Sweep Time		_____ dBm	
	4	Single Sweep, Auto Sweep Time		_____ dBm	
	5	Single Sweep, 2 Second Sweep Time		_____ dBm	
Lowest power level recorded in step 3, 4, or 5	6			_____ dBm	
Minimum Power Frequency		M2 Frequency		_____ GHz	
Power Meter Indication	7	Standard Instrument (F.P. Out with Atten.)	+12 dBm	_____ dBm	
		Option 001 (F.P. Out No Atten.)	+13 dBm	_____ dBm	
		Option 004 (R.P. Out with Atten.)	+11 dBm	_____ dBm	
		Option 005 (R.P. Out No Atten.)	+12 dBm	_____ dBm	

Table 4-32. 8340A Test Record Card (11 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-13. Maximum Leveled Output Power and Power Accuracy (cont'd)					
Maximum Leveled Power Band 2					
ENTRY DISPLAY Power Indication	3	Continuous Sweep, Auto Sweep Time		_____ dBm	
	4	Single Sweep, Auto Sweep Time		_____ dBm	
	5	Single Sweep, 2 Second Sweep Time		_____ dBm	
Lowest power level recorded in step 3, 4, or 5	6			_____ dBm	
Minimum Power Frequency		M2 Frequency		_____ GHz	
Power Meter Indication	7	Standard Instrument (F.P. Out with Atten.)	+10 dBm	_____ dBm	
		Option 001 (F.P. Out No Atten.)	+12 dBm	_____ dBm	
		Option 004 (R.P. Out with Atten.)	+9 dBm	_____ dBm	
		Option 005 (R.P. Out No Atten.)	+11 dBm	_____ dBm	
Maximum Leveled Power Band 3					
ENTRY DISPLAY Power Indication	3	Continuous Sweep, Auto Sweep Time		_____ dBm	
	4	Single Sweep, Auto Sweep Time		_____ dBm	
	5	Single Sweep, 2 Second Sweep Time		_____ dBm	
Lowest Power level recorded in step 3, 4, or 5	6			_____ dBm	
Minimum Power Frequency		M2 Frequency		_____ GHz	
Power Meter Indication	7	Standard Instrument (F.P. Out with Atten.)	+9 dBm	_____ dBm	
		Option 001 (F.P. Out No Atten.)	+11 dBm	_____ dBm	
		Option 004 (R.P. Out with Atten.)	+7 dBm	_____ dBm	
		Option 005 (R.P. Out No Atten.)	+9 dBm	_____ dBm	

Table 4-32. 8340A Test Record Card (12 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-13. Maximum Leveled Output Power and Power Accuracy (cont'd)					
Maximum Leveled Power Band 4 (20-23 GHz) ENTRY DISPLAY Power Indication	3	Continuous Sweep, Auto Sweep Time		_____ dBm	
	4	Single Sweep, Auto Sweep Time		_____ dBm	
	5	Single Sweep, 2 Second Sweep Time		_____ dBm	
Lowest power level recorded in step 3, 4, or 5	6			_____ dBm	
Minimum Power Frequency		M2Frequency		_____ GHz	
Power Meter Indication	7	Standard Instrument (F.P. out with Atten.)	+3 dBm	_____ dBm	
		Option 001 (F.P. Out No Atten.0	+6 dBm	_____ dBm	
		Option 004 (R.P. Out with Atten.)	+1 dBm	_____ dBm	
		Option 005 (R.P. Out No Atten.)	+4 dBm	_____ dBm	
Maximum Leveled Power Band 4 (23-26.5 GHz) ENTRY DISPLAY Power Indication	3	Continuous Sweep, Auto Sweep Time		_____ dBm	
	4	Single Sweep, Auto Sweep Time		_____ dBm	
	5	Single Sweep, 2 Second Sweep Time		_____ dBm	
Lowest power level recorded in step 3, 4, or 5	6			_____ dBm	
Minimum Power Frequency		M2 Frequency		_____ GHz	
Power Meter Indication	7	Standard Instrument (F.P. Out with Atten.)	+1 dBm	_____ dBm	
		Option 001 (F.P. Out No Atten.)	+4 dBm	_____ dBm	
		Option 004 (R.P. Out with Atten.)	−1 dBm	_____ dBm	
		Option 005 (R.P. Out No Atten.)	+2 dBm	_____ dBm	

Table 4-32. 8340A Test Record Card (13 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-13. Maximum Leveled Output Power and Power Accuracy (cont'd)					
Flatness	9				
Band 0 Measurement					
Minimum Power Frequency	13	M2 Frequency		_____ GHz	
Minimum Power Level	14	M2 Power Level		_____ dBm	
Maximum Power Frequency	15	M1 Frequency		_____ GHz	
Maximum Power Level		M1 Power Level		_____ dBm	
Band 1 Measurement					
Minimum Power Frequency	13	M2 Frequency		_____ GHz	
Minimum Power Level	14	M2 Power Level		_____ dBm	
Maximum Power Frequency	15	M1 Frequency		_____ GHz	
Maximum Power Level		M1 Power Level		_____ dBm	
Band 2 Measurement					
Minimum Power Frequency	13	M2 Frequency		_____ GHz	
Minimum Power Level	14	M2 Power Level		_____ dBm	
Maximum Power Frequency	15	M1 Frequency		_____ GHz	
Maximum Power Level		M1 Power Level		_____ dBm	
Band 3 Measurement					
Minimum Power Frequency	13	M2 Frequency		_____ GHz	
Minimum Power Level	14	M2 Power Level		_____ dBm	
Maximum Power Frequency	15	M1 Frequency		_____ GHz	
Maximum Power Level		M1 Power Level		_____ dBm	
Band 4 Measurement					
Minimum Power Frequency	13	M2 Frequency		_____ GHz	
Minimum Power Level	14	M2 Power Level		_____ dBm	
Maximum Power Frequency	15	M1 Frequency		_____ GHz	
Maximum Power Level		M1 Power Level		_____ dBm	

Table 4-32. 8340A Test Record Card (14 of 27)

SPECIFICATIONS TESTED Limits	Step	Specifications	Lower Limit	Measured Value	Upper Limit
4-13. Maximum Leveled Output Power and Power Accuracy (cont'd)					
Flatness (Maximum minus Minimum Calculations)	18				
Band 0 Calculation		≤1.0 dB (Standard) ≤1.2 dB (Option 004) ≤1.0 dB (Option 001) ≤1.2 dB (Option 005)		_____ dB	
Band 1 Calculation		≤2.2 dB (Standard) ≤2.6 dB (Option 004) ≤1.8 dB (Option 001) ≤2.2 dB (Option 005)		_____ dB	
Band 2 Calculation		≤2.2 dB (Standard) ≤2.6 dB (Option 004) ≤1.8 dB (Option 001) ≤2.2 dB (Option 005)		_____ dB	
Band 3 Calculation		≤2.2 dB (Standard) ≤2.6 dB (Option 004) ≤1.8 dB (Option 001) ≤2.2 dB (Option 005)		_____ dB	
Band 4 Calculation		≤3.2 dB (Standard) ≤3.6 dB (Option 004) ≤2.6 dB (Option 001) ≤3.0 dB (Option 005)		_____ dB	

Table 4-32. 8340A Test Record Card (15 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-14. External Leveling		(Using Positive Crystal Detector)			
Leveling Voltage (dBv)					
+6	3		1.883 V	_____ V	2.114 V
0			0.944 V	_____ V	1.059 V
−10			0.2983 V	_____ V	0.3352 V
−20			0.0942 V	_____ V	0.1061 V
−30			29.65 mV	_____ mV	33.70 mV
−40			9.24 mV	_____ mV	10.79 mV
−50			2.785 mV	_____ mV	3.550 mV
−60			0.744 mV	_____ mV	1.259 mV
−66			0.273 mV	_____ mV	0.731 mV

Table 4-32. 8340A Test Record Card (16 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-15. Spurious Signals (10 MHz to 22 GHz)					
Frequency of Interest Selected	4				
	6	Refer to Table 4-15 for Specifications			
4-16. Spurious Signals (22 to 26.5 GHz)					
Frequency of Interest Selected	2				
	6	Refer to Table 4-16 for Specifications			

Table 4-32. 8340A Record Card (17 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-17. Single Sideband Phase Noise Calculated Phase Noise from Steps 11 through 38 (Using Tables 4-18, 4-19, and 4-21)	38				
2.202 GHz					
Offset = 30 Hz				_____ dBc	<− 64 dBc
100 Hz				_____ dBc	<− 70 dBc
1 kHz				_____ dBc	<− 78 dBc
10 kHz				_____ dBc	<− 86 dBc
100 kHz				_____ dBc	<−107 dBc
6.902 GHz					
Offset = 30 Hz				_____ dBc	<− 64 dBc
100 Hz				_____ dBc	<− 70 dBc
1 kHz				_____ dBc	<− 78 dBc
10 kHz				_____ dBc	<− 86 dBc
100 kHz				_____ dBc	<−107 dBc
13.402 GHz					
Offset = 30 Hz				_____ dBc	<− 58 dBc
100 Hz				_____ dBc	<− 64 dBc
1 kHz				_____ dBc	<− 72 dBc
10 kHz				_____ dBc	<− 80 dBc
100 kHz				_____ dBc	<−101 dBc
19.502 GHz					
Offset = 30 Hz				_____ dBc	<− 54 dBc
100 Hz				_____ dBc	<− 60 dBc
1 kHz				_____ dBc	<− 68 dBc
10 kHz				_____ dBc	<− 76 dBc
100 kHz				_____ dBc	<− 97 dBc
26.032 GHz					
Offset = 30 Hz				_____ dBc	<− 52 dBc
100 Hz				_____ dBc	<− 58 dBc
1 kHz				_____ dBc	<− 66 dBc
10 kHz				_____ dBc	<− 74 dBc
100 kHz				_____ dBc	<− 95 dBc

Table 4-32. 8340A Test Record Card (18 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-18. Power Sweep					
1 GHz					
Start Level	5			_____ dBm	
End Level	6			_____ dBm	
Power Sweep Range	7	Must be ≥20 dB difference	20 dB	_____ dB	
5 GHz					
Start Level	5			_____ dBm	
End Level	6			_____ dBm	
Power Sweep Range	7	Must be ≥20 dB difference	20 dB	_____ dB	
10 GHz					
Start Level	5			_____ dBm	
End Level	6			_____ dBm	
Power Sweep Range	7	Must be ≥20 dB difference	20 dB	_____ dB	
15 GHz					
Start Level	5			_____ dBm	
End Level	6			_____ dBm	
Power Sweep Range	7	Must be ≥20 dB difference	20 dB	_____ dB	
26 GHz					
Start Level	5			_____ dBm	
End Level	6			_____ dBm	
Power Sweep Range	7	Must be ≥20 dB difference	20 dB	_____ dB	

Table 4-32. 8340A Record Card (19 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-19. Pulse Modulation ON/OFF Ratio					
1 GHz	4	Δ Amplitude must be >80 dB	80 dB	_____ dB	
3 GHz			80 dB	_____ dB	
9 GHz			80 dB	_____ dB	
15 GHz			80 dB	_____ dB	
22 GHz			80 dB	_____ dB	
4-20. Pulse Modulation Rise and Fall Time					
1 GHz					
Rise Time	6	Rise Times: 90% point should be		_____ nsec	25 nsec
Fall Time	8	<25 nanoseconds from 10% point		_____ nsec	25 nsec
3 GHz					
Rise Time	6			_____ nsec	25 nsec
Fall Time	8	Fall Times: 10% point should be <25 nanoseconds from 90% point		_____ nsec	25 nsec
9 GHz					
Rise Time	6			_____ nsec	25 nsec
Fall Time	8			_____ nsec	25 nsec
15 GHz					
Rise Time	6			_____ nsec	25 nsec
Fall Time	8			_____ nsec	25 nsec
22 GHz					
Rise Time	6			_____ nsec	25 nsec
Fall Time	8			_____ nsec	25 nsec

Table 4-32. 8340A Test Record Card (20 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-21. Pulse Modulation Accuracy					
8340A CW Freq. = 1 GHz PRF = 100 kHz					
Pulse Width = 100 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+3 dB
Pulse Width = 200 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB
Pulse Width = 500 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 1000 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Repetition Freq. Range 8340A CW Freq. = 1 GHz	10				
Minimum PRF PRF = 100 Hz PW = 1 microsecond	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Maximum PRF PRF = 5 MHz PW = 100 nanosceonds	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+3 dB
8340A CW Freq. = 3 GHz PRF = 100 kHz					
Pulse Width = 100 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB
Pulse Width = 200 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 500 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 1000 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB

Table 4-32. 8340A Test Record Card (21 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-21. Pulse Modulation Accuracy, (cont'd)					
Pulse Repetition Freq. Range 8340A CW Freq. = 3 GHz	10				
Minimum PRF PRF = 100 Hz PW = 1 microsecond	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>− 0.3 dB	_____ dB	<+0.3 dB
Maximum PRF PRF = 5 MHz PW = 100 nanoseconds	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB
8340A CW Freq. = 9 GHz PRF = 100 kHz					
Pulse Width = 100 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3dB	_____ dB	<+1.5 dB
Pulse Width = 200 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 500 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 1000 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Repetition Freq. Range 8340A CW Freq. = 9 GHz	10				
Minimum PRF PRF = 100 Hz PW = 1 microsecond	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Maximum PRF PRF = 5 MHz PW = 100 nanoseconds	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB

Table 4-32. 8340A Test Record Card (22 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-21. Pulse Modulation Accuracy, (cont'd)					
8340A CW Freq. = 15 GHz PRF = 100 kHz					
Pulse Width = 100 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB
Pulse Width = 200 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 500 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 1000 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Repetition Freq. Range 8340A CW Freq. = 15 GHz	10				
Minimum PRF PRF = 100 Hz PW = 1 microsecond	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Maximum PRF PRF = 5 MHz PW = 100 nanoseconds	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB
8340A CW Freq. = 22 GHz PRF = 100 kHz					
Pulse Width = 100 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB
Pulse Width = 200 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 500 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Pulse Width = 1000 nsec	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB

Table 4-32. 8340A Test Record Card (23 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-21. Pulse Modulation Accuracy, (cont'd)					
Pulse Repetition Freq. Range 8340A CW Freq. = 22 GHz	10				
Minimum PRF PRF = 100 Hz PW = 1 microsecond	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+0.3 dB
Maximum PRF PRF = 5 MHz PW = 100 nanoseconds	6	ENTRY DISPLAY Power Level		_____ dBm	
	7	ENTRY DISPLAY Power Level		_____ dBm	
	8	Δ Power between steps 6 and 7	>−0.3 dB	_____ dB	<+1.5 dB

Table 4-32. 8340A Test Record Card (24 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-22. Pulse Modulation Video Feedthrough					
8340A CW Freq. = 0.5 GHz	7	Oscilloscope peak-to-peak			
Power Level = +8 dBm		voltage		_____ mV	<12 mV
0 dBm				_____ mV	<5 mV
−10 dBm				_____ mV	<1.6 mV
8340A CW Freq. = 1 GHz	7				
Power Level = +8 dBm				_____ mV	<12 mV
0 dBm				_____ mV	<5 mV
−10 dBm				_____ mV	<1.6 mV
8340A CW Freq. = 1.5 GHz	7				
Power Level = +8 dBm				_____ mV	<12 mV
0 dBm				_____ mV	<5 mV
−10 dBm				_____ mV	<1.6 mV
8340A CW Freq. = 2 GHz	7				
Power Level = +8 dBm				_____ mV	<12 mV
0 dBm				_____ mV	<5 mV
−10 dBm				_____ mV	<1.6 mV
8340A CW Freq. = >2.3 GHz	10				
Power Level = −10 dBm				_____ mV	<0.2 mV
(Any Frequency Selected)					

Table 4-32. 8340A Test Record Card (25 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-23. Amplitude Modulation					
AM Sensitivity					
8340A Freq. = 1.5 GHz	2				
Power = −5 dBm					
	4	Power Meter Indication		_____ dB	
+30% Modulation	5	Power Meter Change	>2.18 dB	_____ dB	<2.38 dB
−30% Modulation	6	Power Meter Change	>2.91 dB	_____ dB	<3.29 dB
8340A Freq. = 1.5 GHz	7				
Power = +5 dBm					
	4	Power Meter Indication		_____ dB	
+30% Modulation	5	Power Meter Change	>2.18 dB	_____ dB	<2.38 dB
−30% Modulation	6	Power Meter Change	>2.91dB	_____ dB	<3.29 dB
8340A Freq. = 4.5 GHz	8				
Power = −5 dBm					
	4	Power Meter Indication		_____ dB	
+30% Modulation	5	Power Meter Change	>2.18 dB	_____ dB	<2.38 dB
−30% Modulation	6	Power Meter Change	>2.91 dB	_____ dB	<3.29 dB
8340A Freq. = 4.5 GHz	8				
Power = +5 dBm					
	4	Power Meter Indication	>2.18 dB	_____ dB	
+30% Modulation	5	Power Meter Change	>2.91 dB	_____ dB	<2.38 dB
−30% Modulation	6	Power Meter Change		_____ dB	<3.29 dB
8340A Freq. = 1.5 GHz					
AM Frequency Response	11	Note DVM Indication		_____ Vrms	
Funct. Gen. = 1 kHz	12	Flatness (read on Modulation		_____ dB	≤±0.2 dB
100 Hz	13	Analyzer)		_____ dB	≤±0.2 dB
200 Hz				_____ dB	≤±0.2 dB
500 Hz				_____ dB	≤±0.2 dB
2 kHz				_____ dB	≤±0.2 dB
5 kHz				_____ dB	≤±0.2 dB
10 kHz				_____ dB	≤±0.2 dB
AM Bandwidth	14	Modulation Analyzer	≥−3 dB	_____ dB	
Funct. Gen. = 100 kHz		Indication			
Adjust output level to that noted in Step 11					
AM Depth					
Funct. Gen. = 1kHz	15	Maximum Modulation Depth	>90%	_____ %	

Table 4-32. 8340A Test Record Card (26 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-23. Amplitude Modulation (cont'd)					
8340A Freq. = 3 GHz					
AM Frequency Response	11	Note DVM Indication		_____ Vrms	
Funct. Gen. = 1 kHz	12	Flatness (read on Modulation		_____ dB	≤±0.2 dB
100 Hz	13	Analyzer)		_____ dB	≤±0.2 dB
200 Hz				_____ dB	≤±0.2 dB
500 Hz				_____ dB	≤±0.2 dB
2 kHz				_____ dB	≤±0.2 dB
5 kHz				_____ dB	≤±0.2 dB
10 kHz				_____ dB	≤±0.2 dB
AM Bandwidth Funct. Gen. = 100 kHz Adjust output level to that noted in Step 11	14	Modulation Analyzer Indication	≥−3 dB	_____ dB	
AM Depth Funct. Gen. = 1 kHz	15	Maximum Modulation Depth	>90%	_____ %	
8340A Freq. = 9 GHz					
AM Frequency Response	11	Note DVM Indication		_____ Vrms	
Funct. Gen. = 1 kHz	12	Flatness (read on Modulation		_____ dB	≤±0.2 dB
100 Hz	13	Analyzer)		_____ dB	≤±0.2 dB
200 Hz				_____ dB	≤±0.2 dB
500 Hz				_____ dB	≤±0.2 dB
2 kHz				_____ dB	≤±0.2 dB
5 kHz				_____ dB	≤±0.2 dB
10 kHz				_____ dB	≤±0.2 dB
AM Bandwidth Funct. Gen. = 100 kHz Adjust output level to that noted in Step 11	14	Modulation Analyzer Indication	≥−3 dB	_____ dB	
AM Depth Funct. Gen. = 1 kHz	15	Maximum Modulation Depth	>90%	_____ %	
8340A Freq. = 15 GHz					
AM Frequency Response	11	Note DVM Indication		_____ Vrms	
Funct. Gen. = 1 kHz	12	Flatness (read on Modulation		_____ dB	≤±0.2 dB
100 Hz	13	Analyzer)		_____ dB	≤±0.2 dB
200 Hz				_____ dB	≤±0.2 dB
500 Hz				_____ dB	≤±0.2 dB
2 kHz				_____ dB	≤±0.2 dB
5 kHz				_____ dB	≤±0.2 dB
10 kHz				_____ dB	≤±0.2 dB
AM Bandwidth Funct. Gen. = 100 kHz Adjust output level to that noted in Step 11	14	Modulation Analyzer Indication	≥−3 dB	_____ dB	
AM Depth Funct. Gen. = 1 kHz	15	Maximum Modulation Depth	>90%	_____ %	

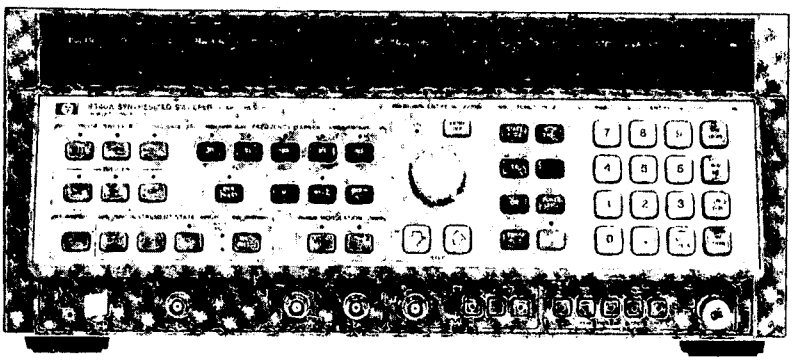
Table 4-32. 8340A Test Record Card (27 of 27)

SPECIFICATIONS TESTED Limits	Step	TEST Conditions	Lower Limit	Measured Value	Upper Limit
4-23. Amplitude Modulation (cont'd)					
8340A Freq. = 22 GHz					
AM Frequency Response	11	Note DVM Indication		_____ Vrms	
Funct. Gen. = 1 kHz	12	Flatness (read on Modulation Analyzer)		_____ dB	≤±0.2 dB
100 Hz	13			_____ dB	≤±0.2 dB
200 Hz				_____ dB	≤±0.2 dB
500 Hz				_____ dB	≤±0.2 dB
2 kHz				_____ dB	≤±0.2 dB
5 kHz				_____ dB	≤±0.2 dB
10 kHz				_____ dB	≤±0.2 dB
AM Bandwidth	14	Modulation Analyzer Indication	≥−3 dB	_____ dB	
Funct. Gen. = 100 kHz Adjust output level to that noted in Step 11					
AM Depth					
Funct. Gen. = 1 kHz	15	Maximum Modulation Depth	>90 %	_____ %	

Automated Test Procedures

AUTOMATED TEST PROCEDURE

8340A SYNTHESIZED SWEEPER



HEWLETT PACKARD

WARRANTY

Refer to the warranty information in the HP 8340A Service Manual (HP Part Number 08340-90020).

HP 8340A
AUTOMATED TEST PROCEDURE

REVISION A

This manual applies directly to software revision A. Any revision to this software may be backward compatible. If not, a revised manual will show the appropriate instrument serial number(s) and associated software revision(s).

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

MANUAL PART NO. 08340-90155
P/O 08340-90020

Printed: DECEMBER 1983

HEWLETT PACKARD

SOFTWARE CONSIDERATIONS

REVISIONS

The overhead program and all subprograms display their revision level and date. Periodically contact the nearest HP Sales/Service Office to obtain the most recent version of this software.

ANOMOLY REPORTING

As with all software, an anomoly may occur. Notify the nearest Hewlett-Packard Sales/Service Office when a software anomoly is observed.

8340A AUTOMATED TEST PROCEDURES

GENERAL INFORMATION

Introduction

This Automated Test Procedure document contains information to perform the automated tests. This document is part of the 8340A Operating and Service Manual (HP Part No. 08340-90015). It is available separately as part of the test program (HP Part No. 08340-10009). This document is normally inserted in the 8340A Operating and Service Manual after Section IV.

Refer to the 8340A Operating and Service Manual for instructons applicable to the complete performance tests and adjustments.

Most of the procedures required to verify the 8340A operation are provided in the (non-automated) test procedures in Section IV, Performance Tests of the 8340A Service Manual. Frequency switching time and verification of the 8340A RF attenuator can only be measured using an automated test. Checking performance manually would be impractical. Although a manual test for frequency response is provided in Section IV, an automated test for frequency response is also provided. The RF attenuator test uses data generated by the frequency response test. The automated frequency response test may be used in lieu of the manual procedure.

The automated 8340A test programs included in this manual are for use with a 9826A/9836A Desktop Computer. The test programs are available on two discs. The operating instructions are included in this manual. The manual and the test program discs are available by ordering HP Part Number 08340-10009.

Equipment Required

The equipment required for each test is shown in the test procedures. The following is a list of equipment required to run all of the tests in this manual. Refer to 8340A Service Manual, Table 1-2 for equipment required to perform the manual test procedures.

Desktop Computer	HP 9826A/9836A
Power Meter	HP 436A
Power Sensor	HP 8481A
Power Sensor	HP 8485A

Universal Counter	HP 5316A
Local Oscillator	HP 8340A Opt. 001
(This unit is in addition to the 8340A under test and is only needed for the RF ATTEN CAL & ADJ)	
Spectrum Analyzer	HP 3585A
Mixer	RHG DMS 1-26
20 dB Attenuator	HP 8493C Opt. 020
10 dB Attenuator	HP 8493C Opt. 010
Semi-rigid Cable	HP Part No. 08340-20124
Step Attenuator	HP 355D
(calibrated at 1 MHz)	
Low Pass Filter	HP Part No. 08340-60176
Amplifier	HP 8447F
Printer	HP 2673A
Digital Voltmeter	HP 3455A

Test Program Disc File Structure

The test program disc #1 contains an overhead program called JANITOR, a group of subprograms called DRIVERS, and a group of subprograms, called LIBRARY. JANITOR loads the DRIVER and LIBRARY routines and displays a menu of tests. The operator should then insert disc #2, which contains the test programs, and select a test from the menu. JANITOR will call the test (which is a sub-program). The discs contain the following programs and sub-programs:

DISC #1

JANITOR	Overhead program.
DRIVERS	Group of subprograms used by various tests.
LIBRARY	Group of subprograms used by various tests.

NOTE

The following two programs (CALFACTORS and REFATN_CAL) are separate programs that are used to generate data files read by test subprograms. These programs should be run and the data files generated before running Tests #1 and #2 in JANITOR.

DISC #2

CALFACTORS	Separate program that allows the operator to input the Power Sensor calibration data. The program writes the data to a disc file that is read by Pwracc.
REFATN_CAL	Separate program that allows the operator to input the IF Attenuator calibration data. The program writes the data to a disc file that is read by At_cal.
Pwracc	Power accuracy and Flatness verification test. Uses a Power Meter to measure the frequency response. Pwracc outputs a graph and stores the measured data on a disc file for use by At_cal.
At_cal	RF Attenuator cal constant adjust and verify test. This test is used to verify the performance of the RF Attenuator and can be used to automatically adjust the RF Attenuator calibration constants in memory.
Cal_co	Sub-program to read the calibration constants from 8340A memory into computer memory. The calibration constants can then be stored on a disc file, displayed on the CRT, printed out, or written into the 8340A memory.
Fre_sw	Frequency Switching Time Test. This test measures the time required to step CW frequency.

Before running any program, a backup copy of the master discs should be made.

Copying the Master Disc

To make a copy of the disc using a 9826A Desktop Computer:

1. Load BASIC 2.0.
2. Load each file one at a time from the master disc
3. STORE the file on the object disc.

To make a copy of the discs using a 9836A:

1. Load BASIC 2.0.
2. Insert the master disc in the right hand disc drive and an initialized object disc in the left hand disc drive
3. Type COPY ":INTERNAL,4,0" TO ":INTERNAL,4,1".

Test Record

The test programs output graphs that include test limit lines and the 8340A performance. The test limits are the instrument specifications reduced by the measurement uncertainty. Hardcopies of these graphs may be used as a test record.

A test record card is provided in the 8340A Service Manual, Section IV. The graphs generated by the automated tests should be added to the test record for the manual tests.

Test Equipment HP-IB Addressed

The HP-IB address for each instrument is coded in DRIVERS. The lines of code from DRIVERS shown in table 1 show the address assignments. Before running any test it will be necessary to set the instruments to the addresses shown or change the code to reflect the address of the instruments being used.

NOTE

DRIVERS includes address assignments for instruments in addition to those used in these procedures. These additional instruments will be used in later software versions that will include additional tests.

Table 1. HP-IB Assignments

```
1086 System_config:SUB System_config(INTEGER Ok)
1088     ! ****************************************
1090     ! THIS SUBPROGRAM ASSIGNS I/O PATH NAMES
1092     ! AND PERFORMS INITIALIZATION OF SYSTEM
1094     ! PERIPHERALS AND ASSIGNS VALUES TO THE
1096     ! /Peripherals/ COMMON BLOCK
1098     ! ****************************************
1100     !
1102     COM /Hpib_codes/
@Dut,@Hfsa,@Lfsa,@Cntr,@Pwrmtr,@Dvm,@Fun_gen,@Rf_gen,@H
et,@Mod_an,@Atn_dvr
1104     COM /Hpib_codes/ @Timer,@D13,@D14,@D15,@D16
1106     COM /Peripherals/ Prt,Kbd,Crt
1108     COM /Menu_variables/ INTEGER
Test_num,Select_test,Menu_end,Test_station,
Sys_2
```

```
1110     !
1112     ASSIGN @Dut TO 719          ! 8340 UNDER TEST
1114     ASSIGN @Hfsa TO 718         ! 8566/8568
1116     ASSIGN @Lfsa TO 711         ! 3585 SIG ANAL
1118     ASSIGN @Cntr TO 717         ! 5343A COUNTER
1120     ASSIGN @Pwrmtr TO 713       ! 436A POWER METER
1122     ASSIGN @Dvm TO 728          ! 3455A DVM
1124     ASSIGN @Fun_gen TO 705      ! 3325 FUN GEN
1126     ASSIGN @Rf_gen TO 715       ! 8662 RF SYNTH
1128     ASSIGN @Het TO 720          ! REFERENCE 8340
1130     ASSIGN @Mod_an TO 714       ! 8901 MOD. ANAL
1132     ASSIGN @Atn_dvr TO 712      ! 11713 ATTEN DVR
1134     ASSIGN @Timer TO 716        ! 5316 COUNT/TIMER
1136     !
1138     Prt=703
1140     Kbd=2
1142     Crt=1
1144     !
```

Running the Test Programs

CAUTION

This program will automatically write the protected calibration data into the working area. (For more information, refer to Calibration Constants in Service Manual Section VIII.) To avoid loosing any updated data in the working calibration constant area, write the current working data into the protected area as follows:

Press [SHIFT] [MHz] [1] [4] [Hz]

[SHIFT] [kHz] [5] [3] [4] [9] [Hz]

[INSTR PRESET]

The ENTRY DISPLAY should indicate "CALIBRATION STORED".

To run a test, load BASIC 2.0 then load and run JANITOR.

The program will display:

JANITOR

6.1

If the computers internal clock has not been set, JANITOR will request that the operator set the clock.

JANITOR will load DRIVERS and LIBRARY. If an 8340A set to HP-IB address 19 is not connected to the computer with I/O card set to 7, the following will be displayed:

```
          DRIVERS REV ;1983.080
          SYSTEM      ;INT FS 4/83
          DUT         ;8340A
          LIBRARY REV ;1983.080
**************************************************
**                                              **
**       <<<<<<<<<<< WARNING >>>>>>>>>>>        **
**          NO "DUT" CONNECTED TO HP-IB         **
**                                              **
**************************************************
```

If you plan on testing an 8340A then connect it to the HP-IB, and verify that the HP-IB address is 719. Then press "ENTER" to proceed.

If you wish to use "JANITOR" for other than testing then enter the full serial number of the 8340A that you wish information on.

FULL SERIAL # OF DUT

These programs are actually Hewlett-Packard production test programs. The 8340A production facility at Network Measurements Division has several automated test stations all connected to a central disc operating system (SRM). Many of the features of the production disc system are not implemented for use with the INTERNAL disc. Therefore, this JANITOR cannot be used for other than testing. Connect the 8340A and press ENTER.

If the 8340A under test is connected to the computer the program will read the instrument serial number suffix (calibration constant #61) and display the following (where XXX is the serial number):

IS "DUT" SERIAL # XXX ? use keys

YES				NO

If the serial number is incorrect, press the NO softkey (k4). The program will display:

INPUT SERIAL NUMBER (suffix only)?

Input the serial number. JANITOR will then display:

********** SETUP OPTION WORD **********

Press the appropriate softkey for each option. After responding to all option information requests, the program will display:

IS OPTION LIST CORRECT

Press the softkey labeled YES. The program will ask for NEW or OLD attenuator. The 8340A RF attenuator in most instruments is a 90 dB step attenuator (NEW). A few of the very early instruments (below S/N 00071) contain a 70 dB step attenuator (OLD). After responding to the attenuator information request, JANITOR will write the new serial number into calibration constant #61 and the attenuator configuration into calibration constant #59. JANITOR will again display:

IS "DUT" SERIAL # XXX ? use keys

If the serial number is correct press the YES softkey (k0). JANITOR will display:

INPUT SERIAL PREFIX (ie. 2124A)

Enter the prefix. JANITOR will display the following MENU:

8340A 2215A00106 DRIVERS;1983.080 Page 1 of 1

TEST#	TEST LIST REV << >>	STATUS
1	Power Accuracy	------
2	RF Atten Cal & Adj	------
3	Cal Constants	------
4	Freq Switch Time	------

04/06/83 14:36 0

TURN PG	NXT TEST	REPEAT	AUTO/OFF	< DONE >
SELECT		NOTE	NEW DUT	Utility

Insert test disc #2. Press the SELECT softkey (k5). JANITOR will display:

WHAT TEST DO YOU WANT TO RUN

Input the number corresponding to the desired test and press ENTER. The JANITOR program will load and run the test. If the correct disc is not in the disc drive, insert disc #2 and press CONTINUE.

Refer to the appropriate instructions in this manual for the test selected.

CAUTION

These tests only operate under the EXACT conditions shown. Any substitution of equipment or program modifications are the responsibility of the user.

POWER ACCURACY

Description

Power Accuracy may be used to verify the 8340A RF output accuracy and flatness response at +10, 0, and -10 dBm. The program will measure the response using an 8485A Power Sensor and 436A Power Meter. The program will output a graph showing the test limits and the measured response. The graph will display the accuracy test limit as a solid line and the flatness test limit as as a dashed line. The program stores the measured data on a disc file for later use by At_cal (RF Atten Cal & Adj).

Before running the accuracy test, the Power Sensor calibration data must be on a disc file. A separate program (CALFACTORS) is provided to allow the operator to input the calibration data and generate the appropriate disc file.

Equipment

Desktop Computer	HP 9826A/9836A
Power Sensor	HP 8485A
Power Meter	HP 436A

Procedure

NOTE

This procedure assumes that BASIC 2.0 has been loaded into the computer, that JANITOR has been loaded, that Power Accuracy (TEST# 1) has been selected from JANITOR, and that the Power Sensor calibration data file is on the disc (See CALFACTORS).

1. The program will display the following menu:

```
-------------------------------------------------
        OUTPUT POWER ACCURACY VERIFICATION
          REV. a   07.05.83     S/N : 0106
-------------------------------------------------

o  SET UP : Test set up instructions.

o  VERITY : Measure Output Power Accuracy from
   10 MHz to 26.5 GHz. Stores data.

o  SELECT : Measure accuracy in selected frequency
   range and power. Does not store data.

o JANITOR : returns to overhead menu.

--------- select a key ---------
```

SET UP		VERIFY		SELECT
			JANITOR	

2. Press softkey k0 (SET UP). The program will display the test setup diagram and :

   CALIBRATE 436 METER PER MANUAL INSTRUCTIONS !!!

3. Connect the HP 8485A Power Sensor to the Power Meter. Allow at least 30 minutes warm up. Set the Power Meter's calibration factor switch for 100%, then zero and calibrate the Power Meter before connecting the Power Sensor to the 8340A. Press OK softkey (k0) when ready. The program will return to the Power Accuracy menu.

4. Press softkey k2 (VERIFY). The program will display:

   Enter the 8485A sensor ID# [5 digits]?

5. Enter the last 5 digits of the Power Sensor serial number (should be the same as the Power Sensor data file on the disc). The program will zero the Power Meter and display:

   measuring OUTPUT ACCURACY at +9.0 dBm

   The program will measure the accuracy and flatness at +9, 0, and -10 dBm, record the data on a disc file (file name Pwraccxxxx, where xxxx is the instrument serial number) and display the following:

```
------------------------------------------------
         OUTPUT ACCURACY TEST RESULTS :
------------------------------------------------
       REV : a   07.05.83     S/N : 0106

================================================
     RESULT :   instrument PASSED
================================================

  select soft key below :

DISPLAY    :   plot output on CRT
PRINT      :   plot output on PRINTER
BEGIN      :   goto OUTPUT ACCURACY MENU
JANITOR    :   return to JANITOR menu
```

DISPLAY	PRINT	BEGIN		JANITOR

6. Select the appropriate softkey to DISPLAY the data graph, PRINT a hardcopy of the graph, or return to JANITOR.

   The program will display two graphs for each power level. One graph for 10 MHz to 3 GHz and one graph for 3 GHz to 26.5 GHz. The +9 dBm graph will not display the measured power from 20 to 26.5 GHz because +9 dBm is greater than the maximum power available.

   For the measurements at -10 dBm, the program decouples the RF attenuator and ALC. Measurements at -10 dBm are made with ALC at -10 dBm.

RF ATTEN CAL & ADJ

NOTE

Power Accuracy must be run before running this test. Also the IF attenuator calibration data must be on a disc file (run REFATN_CAL).

Description

The RF Attenuator Calibration and Adjustment test may be used to verify the performance of the 8340A RF attenuator or to adjust the appropriate calibration constants, stored in 8340A memory. These calibration constants are used by the 8340A to compensate for the offset and slope of the RF attenuator.

The test sub-program (At_cal) measures the 0 dB RF attenuator step and the 10 dB step and then outputs the 0 dB graph and the corrected 10 dB graph. The difference between the 0 dB step data and the data for each subsequent step is the uncorrected response of the step being measured.

The test program loads the flatness data from the disc file that was generated by Pwracc. This data is added algebraically to the uncorrected response of the step being measured. The program outputs the graph of the resultant response.

The attenuator 0 dB step performance (REFERENCE TRACE) should be used to check the equipment setup. Any large perturbations on the trace are probably due to improper connections.

Since this test uses flatness data, Power Accuracy must be run before running this test. The program also loads the calibration data for the IF attenuator from a disc file. Run REFATN_CAL to generate the attenuator calibration data file before running this test.

The calibrated IF attenuator is initially set to 70 dB. As the program tests each step of the RF attenuator, 10 dB is removed from the calibrated IF attenuator.

As each step of the RF attenuator is measured, the program will output a graph showing the test limits and the corrected data.

Equipment

Local Oscillator (Other that the 8340 under test.)	HP 8340A Opt. 001
Spectrum Analyzer	HP 3585A
Mixer	RHG DMS 1-26
20 dB Attenuator	HP 8493C Opt. 020
10 dB Attenuator	HP 8493C Opt. 010
Semi-rigid Cable	HP Part No. 08340-20124
Step Attenuator (calibrated at 1 MHz)	HP 355D
Low Pass Filter	HP Part No. 08340-60176
Amplifier	HP 8447F
Printer	HP 2673A

Procedure

NOTE

This procedure assumes that BASIC 2.0 has been loaded into the computer, that JANITOR has been loaded, and that RF Atten Cal & Adj (TEST# 2) has been selected from JANITOR.

1. The program will display the following menu:

```
------------------------------------------------
** ATTENUATOR CALIBRATION AND VERIFICATION **

       REV. e        6.29.83
------------------------------------------------

  SELECT A KEY BELOW :

     k2. ADJUST - push to calibrate attenuator.
     k4. VERIFY - push to run attenuator
                  verification.

     k5. Viewdata - displays data on 9826
     k6. Hardcopy - for a hardcopy of the data
     k7.  ***   -special data loader key.
     k9. JANITOR -  return to JANITOR
```

		ADJUST		VERIFY
Viewdata	Hardcopy	***		JANITOR

2. Press softkey k4 (VERIFY). The program will display the following equipment setup.

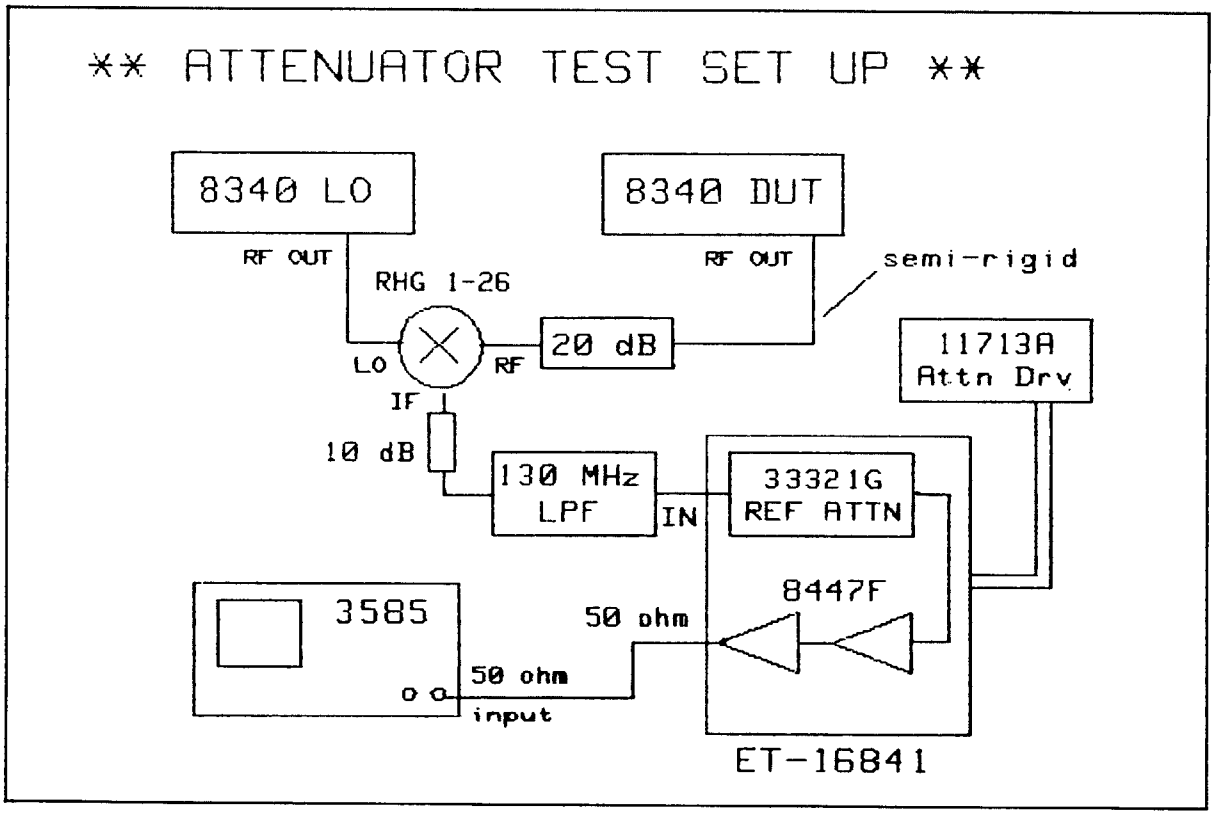


Figure 1. Factory Attenuator Test Set Up.

3. The Hewlett-Packard production facility uses an Electronic Tool (ET) to further automate this test. The 33321G is a high frequency remote controllable step attenuator similar to the 8340A A63 RF Attenuator. An HP 355D step attenuator is used in lieu of the 33321G and 11713A Attenuator/Switch Driver. The ET-16841 includes the step attenuator, the 8447F amplifier and coaxial switches that provide additional capability used in other tests. For this test the 355D step attenuator and 8447F amplifier can be connected as shown below:

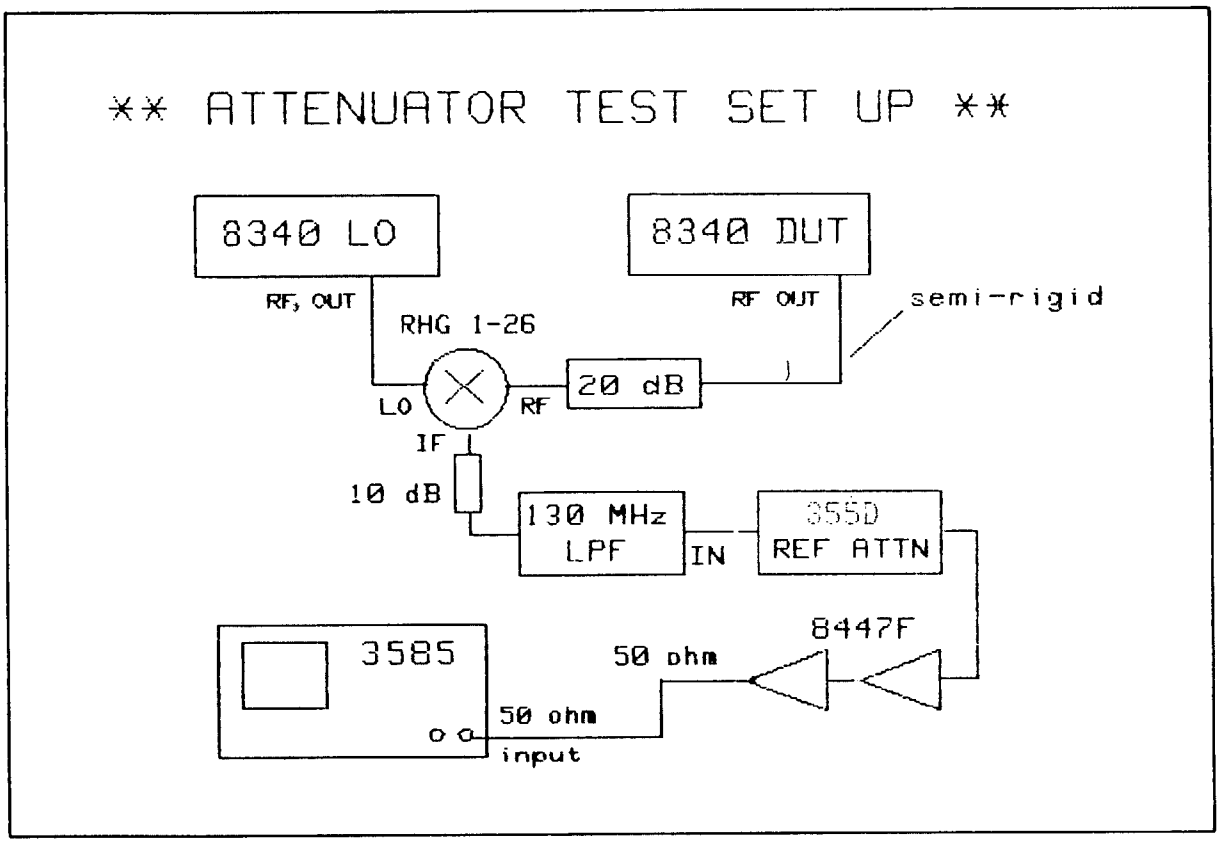


Figure 2. Actual Attenuator Test Set Up.

Connect the equipment as shown above. Connect the mixer directly to the LO 8340A RF output connector to obtain maximum LO input level. Connect the 20 dB attenuator at the mixer RF input (Note this attenuator will be removed when testing the 80 and 90 dB steps). Use a good semi-rigid cable (with no sharp bends) from the 8340A under test RF output, to the 20 dB attenuator. Allow at least 30 minutes warm up time.

4. Connect the 3585A 10 MHz standard output to both the 8340A under test and LO 8340A FREQUENCY STANDARD EXT inputs. Press sofkey k0 (continue). The program will display the following:

ENTER the full serial number of the Reference Attenuator as printed on the CALIBRATION STICKER (ex. SR0991)

?

5. Enter the serial number or identification number of the calibrated IF attenuator. This number should be the same as the name of the attenuator data file on the disc.

   The program will display the following menu:

*** ATTENUATOR CALIBRATION ***

SELECT A KEY BELOW :

k0. ALL measures all steps starting with the 10 dB step.

sh k0. Measure ALL - No hardcopy.

k1-k3,k5-8 measures the indicated step.

k4. MORE for more keys ...

k9. EXIT returns to the cal /verify menu.

ALL	10 dB	20 dB	30 dB	MORE
40 dB	50 dB	60 dB	70 dB	EXIT

6. Press softkey k0 (ALL). The program will display:

Set calibrated IF attenuator to: 70

*** PRESS CONTINUE WHEN READY ***

NOTE

The program will repeat the "Set IF attenuator" statement for each measurement, even though the proper attenuation has already been set.

7. Set the IF attenuator to 70 dB and press CONTINUE.

8. The program will measure the 0 dB RF attenuator step. The IF attenuator is set to 60. The program will measure the 10 dB step and then output both graphs. A typical 0 dB step graph is shown below:

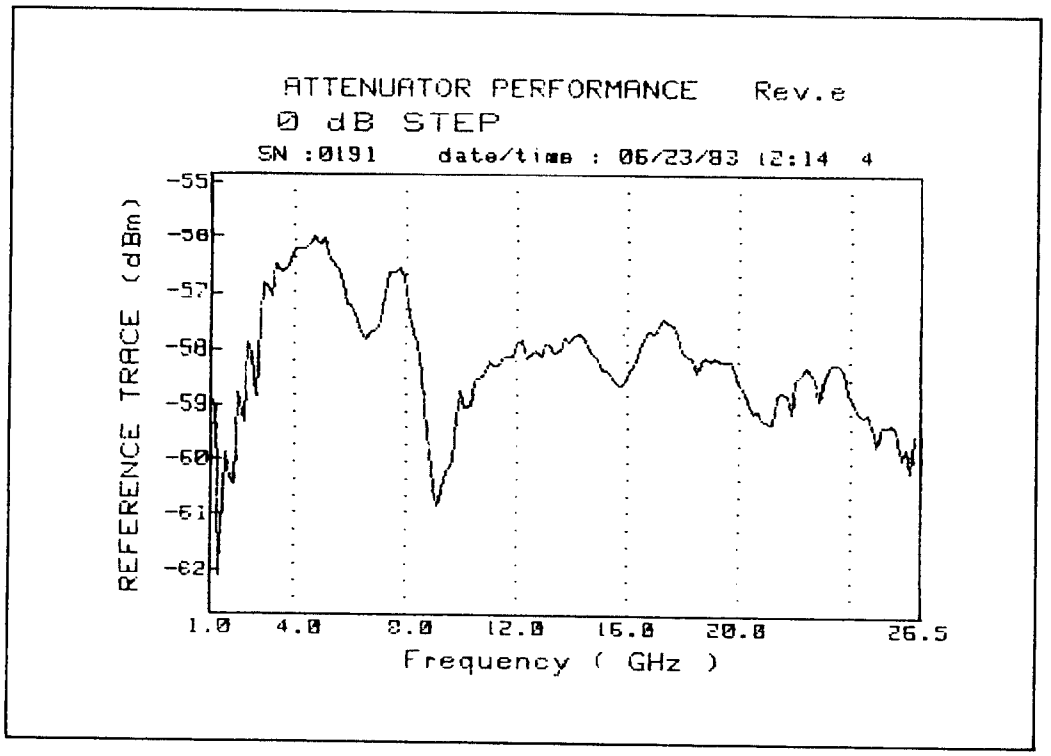


Figure 3. Typical 0 db Graph Displayed.

9. The 0 dB graph is the response of the test setup. Check the 0 dB graph to ensure that the equipment has been properly setup. Note the power level at about 4 GHz (minimum mixer conversion loss). The power level should be about -55 dBm. Greater than 10 dB difference may indicate an incorrect fixed attenuator or that the IF attenuator is not set to 70. Any large perturbations in the trace may be due to improper connections. If the 0 dB trace is abnormal, correct the problem, press CONTINUE and then the ABORT softkey. The program will return to the ATTENUATOR VERIFICATION menu. Press softkey k4 (Recal). The program will remeasure the 0 dB step and output the 0 dB and 10 dB step graphs.

10. The program will measure the 20 through 70 dB RF attenuator steps. At each step the IF attenuation is reduced by 10 dB. To test the 8340A RF Attenuator 80 (and 90) dB step the program will display:

REMOVE the 20 dB pad on the RF port
of the mixer

-push continue when ready

When all RF attenuator steps have been tested, the program will reduce the RF power by 10 dB (using ALC) and measure the -100 dBm performance. After all tests have been completed, press softkey k9 (JANITOR) to return to the JANITOR menu.

11. If softkey k2 (ADJUST) is selected in step 5, the program will run similar to the above; however, at each RF attenuator step the program will:

    a. Measure the attenuator response using the current 8340A calibration constant data and output a graph of attenuation relative to the 0 dB step.

    b. Calculate new calibration constants and output the calculated calibration constants.

    c. Use the new calibration constants to verify the attenuator performance. If the performance meets the specifications, upon returning to JANITOR, the program will update the calibration constants in 8340A memory.

    d. The program will output the verification graph.

CAL CONSTANTS

NOTE

For a detailed description of the 8340A calibration constants, refer to the 8340A Service manual Section VIII under "General Service Information".

Description

The Cal_co sub-program is not a test; it is included as a utility. This sub-program can read the calibration constants from 8340A memory, write the calibration constants to a disc file, read the calibration constant disc file (image file), compare the image disc file to the calibration constants in 8340A memory, and write the calibration constants in computer memory to 8340A memory.

A hardcopy of the calibration constants is supplied inside the 8340A, along with instructions to enter the calibration constants manually from the front panel. However, if a copy of the calibration constants is stored on a disc file, and the calibration constants in the 8340A are lost (i.e., the battery on the memory board dies or is removed during battery replacement) this subprogram can read the image disc file and restore the instrument's calibration constants.

This sub-program may also be used to generate a new hardcopy of the calibration constants to store inside the instrument after a recalibration.

Equipment

Desktop Computer	HP 9826A/9836A
Printer	HP 2673A

Procedure

NOTE

This procedure assumes that BASIC 2.0 has been loaded into the computer, that JANITOR has been loaded, and that Cal Constants (TEST# 3) has been selected from JANITOR.

1. The program will display the following menu:

```
**************************************************
            CALIBRATION CONSTANTS
**************************************************

     k0    Compare Cal. Constants to IMAGE
     k2    UTILITIES
     k4    JANITOR
```

SELECT OPTION WITH SPECIAL FUNCTION KEYS.

COMPARE		UTILITIES		JANITOR

NOTE

This program uses computer softkeys for branching. The softkey options are visible at the bottom of the screen. These softkeys are turned on and off during program execution.

COMPARE (k0)

If the disc does not contain an image file for this instrument, the program will display

NO FILE FOUND ON DISC - PRESS CONTINUE

Press CONTINUE and the program will restart.

If an image file is on the disc, the program reads the calibration constants from the 8340A and compares them with the calibration constant image file on the disc. The program will display a pass/fail message and turn off keys k5 (DISC) and k6 (DUT) if they were turned on previously.

UTILITIES (k2)

Turns off key (k2) and turns on keys k5 (DISC) and k6 (DUT). If calibration constants are already in computer memory, k7 (DISPLAY), k8 (PRINT), and k9, k19 (WRITE) are turned on.

JANITOR (k4)

Returns to the JANITOR menu.

DISC (k5)

Reads the image file from disc and turns on keys k7 (DISPLAY), k8 (PRINT), and k9, k19 (WRITE).

DUT (k6)

Reads the calibration constants from the 8340A and turns on keys k7 (DISPLAY), k8 (PRINT), and k9 ,k19 (WRITE).

DISPLAY (k7)

Displays the calibration constants that are in computer memory one page at a time. Keys k0 (COMPARE) and k4 (JANITOR) are turned on.

If a compare has been run and passed, "PASSED all Cal Constants" is displayed

and key k2 (UTILITIES) is turned on.

If a compare has been run and failed, "FAILED Cal. Constants test" is displayed and keys k7 (DISPLAY), k8 (PRINT) and k9, k19 (WRITE) are turned on.

PRINT (k8)

Prints a hardcopy of the calibration constants in computer memory. Keys k0 (COMPARE) and k4 (JANITOR) are turned on.

If a compare has been run and passed, "PASSED all Cal Constants" is displayed and key k2 (UTILITIES) is turned on.

If a compare has been run and failed, "FAILED Cal. Constants test" is displayed and keys k7 (DISPLAY), k8 (PRINT) and k9, k19 (WRITE) is turned on.

WRITE (k9, k19)

Softkey k9 writes the calibration constants in computer memory to the 8340A user area and copies the user area into the backup area.

Softkey k19 (**SHIFT k9**) writes the calibration constants in computer memory to the disc image file.

FREQ SWITCH TIME

Specification

Less than 50 milliseconds to be within the CW frequency accuracy specification.

8340A switching time is defined as the time from when the 8340A receives the last character of the data message string (i.e., the "Z" in HZ, KZ, MZ, GZ, or the P or N in UP/DN) to the time the 8340A microprocessor will accept another character.

Description

The test program is written to step frequency up and down between two CW frequencies. When the 8340A receives the data messsage to step frequency, the 8340A processor sets NEG BLANKING low (-5V) and then proceeds to set up the new frequency. The processor checks that all internal phase lock loops are locked and that the RF power level has stabilized. When the processor has finished setting up the new frequency, it sets NEG BLANKING high (0V). The period of the NEG BLANKING waveform is equivalent to switching time plus the computer programming time.

The Time Interval Counter triggers on two succesive transitions of the same polarity; therefore, the counter, connected to the 8340A rear-panel NEG BLANKING BNC, measures the period of the NEG BLANKING waveform.

The specification does not include controller programming time. The programming time per frequency step for the HP 9826A computer has been determined to be 2 milliseconds. The test program reduces the measured time by this value.

The program displays the setup instructions. After completing the setup instructions, the operator presses a "Continue" softkey. The program then displays a menu to select either a "FullTest" which uses predetermined frequencies and step sizes or "Other" which allows the operator to input any two test frequencies.

If "FullTest" is selected the program requests that the operator select either hard copy printout or CRT printout. The program then measures switching time between several pairs of frequencies and outputs the test results. The test frequencies are selected to exercise the 20-30 loop, the M/N loop, and the effect of band crossings. The test results show the performance of each step measured. If any subtest fails

to meet the specification, the program prints an asterisk (*) on each side of the failing switching time.

If "Other" is selected rather than "FullTest", the program requests that the operator input the test frequencies. The program then measures at those frequencies and outputs the test results to the CRT. The operator may then enter additional test frequencies or select "FullTest" or "EXIT".

Equipment

Desktop Computer	HP 9826A/9836A
Universal Counter	HP 5316A

Procedure

NOTE

This procedure assumes that BASIC 2.0 has been loaded into the computer, that JANITOR has been loaded, and that Freq Switch Time (TEST# 4) has been selected from JANITOR.

1. The program will display the following Frequency Switching Time Test Setup instructions.

```
**************************************************
          FREQUENCY SWITCHING TIME
                Rev. e  1.25.83
**************************************************
```

FOR FULL TEST PRESS "FullTest" SOFTKEY

(Data will be stored)

>>>>||<<<<

FOR TESTING AT OTHER POINTS PRESS "Other" SOFTKEY

(Data will not be stored)

FullTest			Other	

3. Press softkey k0 (FullTest). The program will display:

   DO YOU WISH A HARD COPY? (default=no)

   Enter "Y" for hard copy or press ENTER (no hardcopy).

4. The program will measure switching time and output the data. A failing subtest is shown with an asterisk (*) on each side of the failing test results.

5. Press the appropriate softkey to continue testing or to exit the program.

NOTE

If softkey k3 (Other) is selected, in step 3, the program allows the operator to input test frequencies. After inputing the desired test frequecies, the program will measure and output the data to the CRT.

```
**************************************************
       FREQUENCY SWITCHING TIME TEST SET-UP
              Rev. e  1.25.83
**************************************************
```

1. Connect CH.A of the 5316A counter to the DUT NEG BLANKING on the rear panel with a BNC.

2. Set these buttons to the following positions:

   - OUT - a. TRIGGER LEVEL (CH.A & CH.B)
   - OUT - b. ATTN X1 (CH.A & CH.B)
   - OUT - c. FILTER NORM
   - IN - d. AC (CH.A & CH.B)
   - IN - e. SEP

3. Set the 'GATE TIME' pot to 'MIN'

PRESS "Continue" SOFTKEY WHEN DONE

Continue				
				JANITOR

2. Perform the setup as instructed (AC/DC set to DC) and press softkey k0 (Continue). The program will display the following:

CALFACTORS

Description

This program is used to write the 8485A Power Sensor calibration data to a disc file for use by Pwracc. The program allows the operator to input the calibration data taken from the 8485A Power Sensor calibration sticker. The program also asks for calibration data at 10 MHz which is below the normal 8485A operating range. This data must be generated manually before running the program. A procedure to generate the 10 MHz data is given in this procedure.

Equipment

Desktop Computer	HP 9826A/9836A
Power Meter	HP 436A
Power Sensor	HP 8481A
Power Sensor	HP 8485A

Procedure

10 MHz Calibration

1. Connect the HP 8481A Power Sensor to the Power Meter. Allow at least 30 minutes warm up. Set the Power Meter's calibration factor switch to include 10 MHz, then zero and calibrate the Power Meter before connecting the Power Sensor to the 8340A.

2. Connect the 8481A Power Sensor to the 8340A RF output.

3. Press 8340A **[INSTR PRESET]**. Press **[CW]** and enter **[1] [0] [MHz]**. Press **[RF]** off. Zero the Power Meter. Press **[RF]** on. Press **[POWER LEVEL]** and using the rotary knob, adjust the 8340A power level to obtain a 1.0 milliwatt indication on the Power Meter.

4. Disconnect the 8481A Power Sensor from the 8340A. Turn the Power Meter line switch to off. Replace the 8481A Power Sensor with the 8485A Power Sensor. Turn the Power Meter line switch to on. Zero and calibrate the Power Meter.

5. Connect the 8485A Power Sensor to the 8340A RF output.

6. Adjust the Power Meter calibration factor switch for a Power Meter indication of 1.0 milliwatt. The Power Meter calibration factor switch setting is the 10 MHz calibration data.

Power Sensor Calibration Data Input

7. Load BASIC 2.0. Load CALFACTORS and press RUN. The program will display the following:

```
CAL FACTOR LOADER :

USE CAL DATA FROM PRINTOUT THAT COMES WITH THE
SENSOR EXCEPT FOR THE 10MHZ POINT, WHICH IS TAKEN
FROM A MANUAL PROCEDURE.....
```

```
WHAT IS THE 8485A SERIAL #  [LAST 5 digits]?
```

8. Input the last 5 digits of the 8485A serial number. The disc file name generated by this program will be "8485Axxxxx" where xxxxx is the serial number entered. The program will display:

```
ENTER CAL FACTOR FOR .01 [XX.XX%]?
```

9. Enter the 10 MHz calibration data. The program will then ask for the calibration data for 50 MHz through 26.5 GHz. This data can be read from the 8485A calibration sticker. Enter the appropriate calibration factors. After all calibration data has been entered, the program will display the data and:

```
ARE THESE CORRECT? [Y/N]
```

10. If all the data is correct, input "Y" and the program will write the data to a disc file. If the displayed data in not correct, enter "N" and the program will display:

    ENTER FREQUENCY THAT IS INCORRECT :?

11. Enter the frequency point to be corrected. The program will display:

    ENTER CORRECT CAL FACTOR FOR XX.X ?

12. Enter the correct cal factor. The program will display:

    ARE THESE CORRECT ? [Y/N]

13. If the data is correct enter "Y" and the disc file will be generated (File name 8485Axxxxx). If the data is still incorrect, enter "N" and the program will return to the "ENTER FREQUENCY THAT IS INCORRECT :?" question. This will be repeated until the data is correct and the disc file has been generated.

NOTE

To load test programs, refer to "Running The Test Programs".

REFATN_CAL

Description

This program is used to write the calibrated IF attenuator data to a disc file for use by At_cal. The program allows the operator to input the calibration data for each 10 dB step.

Equipment

Desktop Computer	. . . . .	HP 9826A/9836A

Procedure

1. Load BASIC 2.0. Load REFATN_CAL and press RUN. The program will display:

```
*** ATTENUATOR CAL NUMBER FILE CREATE ***

Enter the serial no. of the attenuator as
     printed on the CALIBRATION STICKER :
```

2. Enter the IF attenuator identification number or serial number (8 characters or less). The characters entered will be used as the file name for the disc data file generated by the program. The program will display:

```
INPUT CALIBRATED VALUE FOR THE 10 dB STEP ?
```

3. Input the calibration data for each step (10 through 70). After all calibration data has been entered, the program will display the data and:

```
EVERYTHING LOOK OK ?
```

4. If the data is not correct enter "N" and the program will return to the "INPUT CALIBRATION VALUE FOR THE 10 dB STEP" question. If the data is correct, enter "Y" and the program will display:

```
*** ATTENUATOR CAL NUMBER FILE CREATE ***

  ...select

     k0. Store on Ganglia
     k4. Store on internal drive
```

Ganglia				internal

5. Insert the disc you want the data stored on (preferably the disc containing the At cal test) and press softkey k4 (internal). ("Ganglia" is a term used by Hewlett-Packard that represents the production SRM disc system.) Softkey k0 is not implemented in this system. The program will write the data to a disc file and display:

   ATTENUATOR CONSTANTS STORED

   WOULD YOU LIKE TO MAKE ANOTHER COPY (Y/N)?

6. If you want to make another copy, enter "Y" and the program will return to the "...select" statement. If "N" is entered the program will terminate.

NOTE

To load test programs, refer to "Running The Test Programs".

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SECTION V
ADJUSTMENTS

5-1. INTRODUCTION

5-2. This section provides adjustment procedures for the HP 8340A Synthesized Sweeper. These procedures should not be performed as routine maintenance but should be used (1) after replacement of a part or component, or (2) when performance tests show that the specifications of Table 1-1 cannot be met. Before attempting any adjustment, allow 1 hour warm-up time for the instrument. Table 5-1 lists the adjustment procedures by paragraph number in the order they appear in this Section. Table 5-2 lists all adjustable components by reference designator, name, and the function adjusted by each. Table 5-3 lists all factory selected components. Table 5-4 lists adjustment procedures that interact between assemblies. This table lists the adjustment paragraphs that must be checked when an assembly is adjusted, parts replaced, or the assembly replaced.

5-3. SAFETY CONSIDERATIONS

5-4. Although this instrument has been designed in accordance with international safety standards, this manual contains information, cautions, and warnings which must be followed to ensure safe operation and to retain the instrument in safe condition. Service and adjusstments should be performed only be qualified service personnel.

WARNING

Adjustments in this section are performed with power supplied to the instrument while protective covers are removed. There are voltages at many points in the instrument which can, if contacted, cause personal injury. Be extremely careful. Adustments should be performed only by trained service personnel.

Power is still applied to this instrument with the LINE switch in STANDBY. There is no OFF position on the LINE switch. Before removing or installing any assembly or printed circuit board, remove the power cord from the rear of both instruments.

Capacitors inside the instrument may still be charged, even if the instrument has been disconnected from its source of supply. Use a non-metallic adjustment tool whenever possible.

5-5. EQUIPMENT REQUIRED

5-6. Table 1-4 lists the equipment required for the adjustment procedures. If the test equipment recommended is not available, other equipment may be used if its performance meets the "Critical Specifications" listed in the table. The test setup used for an adjustment procedure is referenced in each procedure.

5-7. ADJUSTMENT TOOLS

5-8. For adjustments requiring a non-metallic tuning tool, use fiber tuning tool, HP Part Number 8710-0033. In situations not requiring non-metallic tuning tools, an ordinary small screwdriver or other suitable tool is sufficient. However, use of a non-metallic adjustment tool whenever possible is recommended. Never try to force any adjustment control in the instrument. This is especially critical when tuning variable slug-tuned inductors and variable capacitors.

5-9. FACTORY SELECTED COMPONENTS

5-10. Factory selected components are identified with an asterisk on the schematic diagram. The range of their values and functions are listed in Table 5-3. Part Numbers for selected values are located in Table 5-5.

5-11. RELATED ADJUSTMENTS

5-12. Any adjustments which interact with or are related to other adjustments are indicated in the adjustment procedures. It is important that adjustments so noted are performed in the order indicated to ensure that the instrument meets its specifications.

5-13. LOCATION OF TEST POINTS AND ADJUSTMENTS

5-14. Illustrations showing the locations of assemblies containing adjustments and locations of thos adjustments within the assemblies are contained within the adjustment procedures where they apply. Also, major assembly and component location illustrations are located at the rear of Volumes 3 and 4 of this manual.

5-15. ACCESSING AND STORING CALIBRATION CONSTANTS

5-16. Introduction

5-17. The HP 8340A contains three memory areas reserved for calibration constants. These areas are (1) working, (2) protected, and (3) default. A detailed description of these memory areas is contained in Section 8 under the heading "Calibration Constants." When performing adjustments in Section 5, some calibration constants in the "working memory area" are changed or "adjusted" to optimize performance parameters. Once these calibration constants are set for best instrument performance, the new values should be copied from the "working memory area" to the "protected memory area." This calibration data then may be used later in case of loss of valid calibration constants data in the "working memory area."

5-18. Procedure to Access Calibration Constants

5-19. In the adjustment procedures, calibration constants stored in HP 8340A working memory will be changed (adjusted). A calibration constant can be accessed by pushing the following key sequence:

[SHIFT] [GHz] [number of the Calibration Constant, 0 to 99]
[SHIFT] [MHz] [1] [2] [Hz]
[SHIFT] [kHz] [2] [2] [Hz]

The ENTRY DISPLAY will indicate the calibration constant number on the left and the present value on the right. Use the STEP keys to select a different calibration constant number. The ENTRY keyboard or the front panel rotary knob can be used to change the value. After the new value has been entered, press the **[Hz]** key to retain the new values in "working memory area."

5-20. Procedure to Store the Calibration Constants

5-21. After adjustments of the calibration constants are completed, the data thus stored in the "working memory area" should be copied to the "protected memory area" by pressing the following key sequence:

[SHIFT] [MHz] [1] [4] [Hz]
[SHIFT] [kHz] [5] [3] [4] [9] [Hz]
Wait for "CALIBRATION RESTORED" to be displayed in the ENTRY DISPLAY and then press **[INSTR PRESET]**.

Table 5-1. Adjustment Procedures in Paragraph Order

[1] This Adjustment is not applicable to instruments equipped with Option 006, Delete Pulse Modulation.

Table 5-2. Adjustable components in Alpha-Numeric Order (1 of 5)

Reference Designator	Adjustment Name	Adjustment Paragraph Number	Adjustment Function
A8C4	PEAK	5-32	Peaks 100 MHz amplifier.
A8R8	BAL	5-32	Adjusts balance in Sampler.
A14A1R11	G1		Factory adjustment only. Sets gate bias on Bands 1 - 4 Power Amplifier.
A14A1R13	G3L		
A14A1R14	G2		
A14A1R15	G3R		
A14A1R16	G4L		
A14A1R18	G4R		
A16A1R4	G1		Factory adjustment only. Sets gate bias on Band 0 - 4 Modulator Splitter.
A16A1R6	G2		
A21R21	ON DELAY	5-39	Sample/Hold on delay is set to 100 to 180 nsec width at TP1.
A21R23	OFF DELAY	5-39	Sample/Hold off delay is set to 60 to 130 nsec width at TP1.
A24R1	OFF A	5-35, 5-37	Sets offset of modulator voltage clamp at beginning of band.
A24R2	OFF B	5-35, 5-37	Sets offset of modulator voltage clamp at end of band.
A24R3	X2A	5-35	Sets SRD Bias at maximum power at beginning of Band 2.
A24R4	X2B	5-35	Sets SRD bias at maximum power at end of Band 2.
A24R5	X2C	5-35, 5-37	Adjusts the relationship between bias voltage and power.
A24R6	X3A	5-35	Sets SRD Bias at maximum power at beginning of Band 3.
A24R7	X3B	5-35	Sets SRD Bias at maximum power at end of Band 3.

Table 5-2. Adjustable Components in Alpha-Numeric Order (2 of 2)

Reference Designator	Adjustment Name	Adjustment Paragraph Number	Adjustment Function
A24R8	X3C	5-35, 5-37	Adjusts the relationship between bias voltage and power.
A24R9	X4A	5-35	Sets SRD Bias at maximum power at beginning of Band 4.
A24R10	X4B	5-35	Sets SRD Bias at maximum power at end of Band 4.
A24R11	X4C	5-36, 5-37	Adjusts the relationship between bias voltage and power.
A24R12	MIN	5-36 5-37	Sets minimum SRD Bias voltage.
A25R24	+20	5-36	Adjusts for +20 dBm.
A25R33	L-20	5-36	Adjusts for −20 dBm in Band 0.
A25R34	H-20	5-36	Adjusts for −20 dBm in Bands 1 through 4.
A25R38	L+10	5-36	Adjusts for +10 dBm in Band 0.
A25R39	H+10	5-36	Adjusts for +10 dBm in Bands 1 through 4.
A25R58	BAL	5-39	Adjusted to balance out charge injection in Sample/Hold circuit.
A25R80	EX−	5-36	Adjusts offset of U10 for negative input. (This must be adjusted before A25R84 EX+.
A25R84	EX+	5-36	Adjusts offset of U6 for positive input. (A25R80 EX− must be adjusted before making this adjustment.)
A25R88	EXHI	5-36	Sets high power level in External Leveling mode.
A25R108	LOFS	5-36, 5-38	Adjusts the logger output in Band 0 to equal the logger output in Bands 1 through 4 at 0 dBm.
A26R7	BAL	5-39	Adjusted to balance out charge injection in Sample/Hold circuit.
A26R43	HET	5-37	Adjusts ALC Loop Gain for Band 0.
A26R45	X1	5-37	Adjusts Loop Gain for Band 1.
A26R47	X2	5-37	Adjusts ALC Loop Gain for Band 2.
A26R49	X3	5-37	Adjusts ALC Loop Gain for Band 3.

Table 5-2. Adjustable Components in Alpha-Numeric Order (3 of 5)

Reference Designator	Adjustment Name	Adjustment Paragraph Number	Adjustment Function
A26R51	X4	5-37	Adjusts ALC Loop Gain for Band 4.
A26R88	MO	5-35, 5-37	Offsets current into Modulator Driver.
A26R91	AM GAIN	5-36	Sets gain of AM Modulation for 70.7% Modulation.
A26R96	SLOW PULSE	5-36a	Adjusts Slow Pulse rise/fall time, overshoot.
A27R4	BKPT1	5-38	Sets break point 1.
A27R8	BKPT2	5-38	Sets break point 2.
A28R1	OFF	5-35, 5-37	Sets overall offset for SYTM tracking.
A28R2	BP1	5-35, 5-37	Sets slope of the 13.5 GHz break point.
A28R3	BP2	5-35, 5-37	Sets slope of 20 GHz break point.
A28R4	BP3	5-35, 5-37	Sets slope of adjustable break point.
A28R5	BP3FRQ	5-35, 5-37	Sets frequency of adjustable break point. (Approximate range is 22 to 26.5 GHz.)
A28R6	DYO	5-35	Sets delay offset.
A28R7	DYS	5-35	Sets delay slope.
A28R8	GAIN	5-35, 5-37	Sets overall SYTM tracking gain.
A28R9	LKCK	5-35	Sets threshold of low frequency kick pulse.
A28R10	HKCK	5-35	Sets threshold of high frequency kick pulse.
A28R85	+10 ADJ	5-35	Sets +10V Reference Voltage.
A28R113	B1OFF	5-35, 5-37	Sets offset of Band 1.
A30C1	400 MHz	5-25	Peaks 400 MHz Amplifier.
A30C2	400 MHz	5-25	Peaks 400 MHz Amplifier.

Table 5-2. Adjustable Components in Alpha-Numeric Order (4 of 5)

Reference Designator	Adjustment Name	Adjustment Paragraph Number	Adjustment Function
A30C3	400 MHZ	5-25	Sets Quadrupler to 400 MHz output.
A30C4	100 MHZ	5-25	Sets 100 MHz Oscillator Frequency.
A32A2C1	FREQ ADJ	5-26	Adjusts frequency of oscillator for range of 355 to 395 MHz.
A32A2C5	PWR	5-26	Adjusts power output of VCO $\geq$0 dBm at output of A32.
A35R3	+22 ADJ	5-22	Sets regulated +22 V power supply output voltage.
A36L7	50 kHz NULL	5-27	Adjusts for maximum null at 50 kHz.
A36L8	50 kHz NULL	5-27	Adjusts for maximum null at 50 kHz.
A38L11	165 MHZ NULL	5-27	Adjusts for maximum null of 165 MHz signal.
A38L12	160 MHZ NULL	5-27	Adjusts for maximum null of 160 MHz signal.
A38L13	170 MHZ NULL	5-27	Adjusts for maximum null of 170 MHz signal.
A39C50	160 MHZ PEAK	5-27	Peaks 160 MHz output of X1.6 multiplier.
A39L11	VCO CENTER FREQUENCY	5-27	Centers PLL3 VCO frequency for range of 160 to 166 MHz output.
A39L16	160 MHZ PEAK	5-27	Peaks circuit at 160 MHz. Interacts with L17.
A39L17	160 MHZ PEAK	5-27	Peaks circuit at 160 MHz. Interacts with L16.
A40R2	150 MHZ ADJUST	5-27	Adjusts VCO TUNE voltage at 150 MHz.
A40R4	100 MHZ ADJUST	5-27	Adjusts VCO TUNE voltage at 100 MHz.
A43R9	0.3 MHZ ADJUST	5-27	Sets discriminator gain at 0.3 MHz.
A43R25	0.5 MHZ ΔF	5-27	Adjusts 20/30 sweep frequency ΔF accuracy.
A43R27	5 MHZ ΔF	5-27	Adjusts 20/30 sweep frequency ΔF accuracy.
A43R41	0.2 MHZ ADJUST	5-27	Sets pretune DAC offset at 0.2 MHz.

Table 5-2. Adjustable Components in Alpha-Numeric Order (5 of 5)

Reference Designator	Adjustment Name	Adjustment Paragraph Number	Adjustment Function
A48C1	Response	5-30	Adjusts Sampler Drive Amplifier output network for best response.
A48C2	Response	5-30	Adjusts Sampler Drive Amplifier output network for best response.
A48R1	IF GAIN	5-30	Adjusts IF gain for 0 to +8 dBm output from Output Amplifier.
A51	COURSE	5-23	Adjusts 10 MHz Reference Oscillator frequency.
A51	FINE	5-23	Adjusts 10 MHz Reference Oscillator frequency.
A54R14	PGN	5-28	Adjusts pretune gain for +2.10V/GHz.
A54R22	POFF	5-28	Adjusts pretune offset for −2.5V/GHz at output of Summing Amplifier.
A54R30	CGN	5-31	Adjusts gain compensation for YO delay.
A54R32	COFF	5-31	Adjusts offset compensation for YO delay.
A54R36	PW	5-31	Adjusts pulse width of YO Retrace Kick Pulse.
A55R4	GAIN	5-29	Adjusts input level of Pretune signal for −2.34V/GHz at TP5.
A55R47	OFFSET	5-29	Sets crossover point of Summing Amplifier.
A57R32	10V END OF SWP ADJ	5-33	Adjusts marker ramp for 10V at end of sweep.
A57R33	MAN GAIN	5-33	Adjusts output range of manual sweep DAC.
A58R4	SWP TIME	5-34	Adjusts sweep time of ramp generator.
A58R13	SWP GAIN	5-34	Adjusts gain of summing amplifier for +2V/GHz ramp.
A58R33	RESET	5-34	Adjusts Reset DAC for minimum at error test point.

Table 5-3. Factory Selected Components

Reference Designator	Range of Values	Adjustment Paragraph Number	Function of Component
A25C11	Either 0 or 1000 PF	5-36	Selected for optimum Log-Amp speed and stability
A25R36	4640 - 9090 Ohms	5-36	Adjusts temperature compensation of HI Band detector.
A25R37	3830 - 6190 Ohms	5-36	
A25R109	1620 - 3830 Ohms	5-36	Adjusts temperature compensation of LO Band detector.
A25R115	4640 - 9090 Ohms	5-36	
A30C8	5.6 - 11 PF	5-25	Sets range of C4 so midposition is 100 MHz.
A30L4	0.22 - 0.68 mH	5-25	Centers Oscillator at 100 MHz.
A30R67	110 - 825 Ohms	5-25	Part of attenuator to set 400 MHz output at −10 dBm.
A30R68	6.8 - 61.9 Ohms	5-25	Part of attenuator to set 400 MHz output at −10 dBm.
A30R69	110 - 825 Ohms	5-25	Part of attenuator to set 400 MHz output at −10 dBm.
A39C49	8.2 - 16 PF	5-27	Sets range of C50 so midposition is 160 MHz.
A48C22	100 - 160 PF	5-30	Selected to tune RLC network at input of Buffer Amplifier to 25 MHz passband.
A48R22	6.2 - 23.7 Ohms	5-30	Selected to adjust resistance of RLC network at input of Buffer Amplifier for passband bandwidth of 18 to 32 MHz.

Table 5-4. Adjustment Interdependence Between Assemblies (1 of 4)

Assembly Adjusted or Replaced	Associated Adjustments That Must Be Made	Procedure Paragraphs
A1 Alpha Display	None	
A2 Display Driver	None	
A3 Display Processor	None	
A4 Not Assigned		
A5 Keyboard	None	
A6 Keyboard Interface	None	
A7 Lower Keyboard	None	
A8 3.7 GHz Oscillator	Band Zero ALC Loop Gain	5-32; 5-37, steps 19 thru 21.
A9 Band Zero Pulse Modulator	None	
A10 Directional Coupler	Flatness Adjustment	5-38, steps 10 thru 31.
A11 Bands 1-4 Detector	A25R36 and A25R37; Hi Band and Lo Band ALC Adjustment; Flatness; ADC Adjustment; Pulse	5-36, steps 1 thru 9, 15 thru 20; 5-38, steps 24 thru 31, 33 thru 37; 5-39.
A12 Band Zero Detector	Lo Band ALC, ADC, Flatness, A25R109, and A25R115.	5-36, steps 1 thru 4, 10 thru 14, 15 thru 20; 5-38, steps 29 thru 31, 36, and 37.
A13 SYTM	SYTM Tracking and SRD Bias Adjustment	5-35 and 5-37
A14 Band 1 - 4 Power Ampl.	SRD Bias and ALC Loop Gain.	5-35 and 5-37, A24 and A26 adjustments only.
A15 Band Zero Low-Pass Filter	None	
A16 Band 1 - 4 Modulator/Splitter	SRD Bias and ALC Loop Gain.	5-35 and 5-37, A24 and A26 adjustments only.

Table 5-4. Adjustment Interdependence Between Assemblies (2 of 4)

Assembly Adjusted or Replaced	Associated Adjustments That Must Be Made	Procedure Paragraphs
A17 Band Zero Mixer	None	
A18 Band Zero Power Ampl.	None	
A19 Capacitor Assembly	None	
A20 RF Section Filter	None	
A21 Pulse Modulator Driver	Pulse Adjustment	5-39.
A22 Not Assigned		
A23 Not Assigned		
A24 Attenuator Driver/SRD Bias	SRD Bias Adjustment	5-35 and 5-37, A24 adjustments only.
A25 ALC Detector	ALC, ADC, Pulse, and External Leveling Adjustment	5-36; 5-38, steps 33 thru 37; 5-39.
A26 Linear Modulator	Loop Gain, SRD Bias, Integrator Gate Balance.	5-37; 5-39, steps 14 and 15.
A27 Level Control	Flatness, ALC, and ADC Adjustment	5-36 and 5-38.
A28 SYTM Driver	SYTM Tracking and SRD Bias Adjustment	5-35 and 5-37.
A29 Reference Phase Detector	None	
A30 100 MHz VCXO	A30C1 thru C4	5-25.
A31 M/N Phase Detector	None	
A32 M/N VCO	A32A2C1, A32A2C5	5-26.
A33 M/N Output	None	
A34 Reference–M/N Mother Board	None	

Table 5-4. Adjustment Interdependence Between Assemblies (3 of 4)

Assembly Adjusted or Replaced	Associated Adjustments That Must Be Made	Procedure Paragraphs
A35 Rectifier	+22V Supply	5-22.
A36 PLL1 VCO	A36L7, A36L8	5-27, steps 44 thru 61
A37 PLL1 Divider	None	
A38 PLL1 IF	A38L11 thru A38L13.	5-27, steps 62 thru 76
A39 PLL3 Upconverter	A39C50, A39L4, L16, L17	5-27, steps 32 thru 43
A40 PLL2 VCO	PLL2 Adjustments	5-27, steps 1 thru 31.
A41 PLL2 Phase Detector	None	
A42 PLL2 Divider	None	
A43 PLL2 Discriminator	PLL2 Adjustments	5-27, steps 1 thru 31.
A44 YIG Oscillator	YO Adjustment, Delay Adjustment, and YTM Delay.	5-29; 5-31; and 5-35, steps 13 thru 24.
A45 Pre-Leveler	YTM Bias	5-35 and 5-37, A24 adjustments only.
A46 7 GHz Low-Pass Filter	None	
A47 Sense Resistor Assembly	YO Adjustment and Delay, and YTM Adjustment and Delay.	5-29, 5-31, 5-35, and 5-37.
A48 YO Loop Sampler	Sampler Adjustment	5-30
A49 YO Loop Phase Detector	None	
A50 YO Loop Interconnect	None	
A51 Reference Oscillator	10 MHz Standard Adjustment	5-23
A52 Positive Regulator	None	

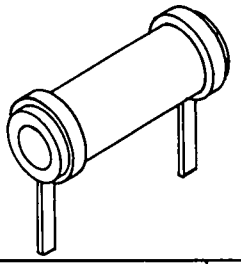
Table 5-4. Adjustment Interdependence Between Assemblies (4 of 4)

Assembly Adjusted or Replaced	Associated Adjustments That Must Be Made	Procedure Paragraphs
A53 Negative Regulator	None	
A54 YO Pretune DAC/Delay Compensation	YO Pretune, YO Main Driver, and YO Delay Compensation, SYTM Delay Compensation.	5-28, 5-29, 5-31, 5-35 and 5-37.
A55 YO Driver	YO Adjustment	5-29.
A56—15V Regulator	None	
A57 Marker/ Bandcross	Marker Bandcrossing Adjustment	5-33.
A58 Sweep Generator	Sweep Generator Adjustment	5-34.
A59 Digital Interface	None	
A60 Processor	None	
A61 Memory	None	
A62 Main Mother Board	None	
A63 70 dB RF Attenuator	Flatness RF Attenuator Calibration	5-38, steps 10 thru 31. For RF Attenuator Calibration, see manual supplement titled "Automated Test Procedures".

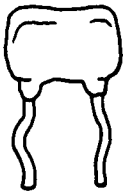
Table 5-5. HP Part Numbers of Standard Value Components (1 of 4)

CAPACITORS

RANGE: 1 to 24 pF
TYPE: Tubular
TOLERANCE:
1 to 9.1 pF = ±.25 pF
10 to 24 pF = ±5%



RANGE: 27 to 680 pF
TYPE: Dipped Mica
TOLERANCE: ±5%



Value (pF)	HP Part Number	C D	Value (pF)	HP Part Number	C D
1.0	0160-2236	8	27	0160-2306	8
1.2	0160-2237	9	30	0160-2199	2
1.5	0150-0091	8	33	0160-2150	5
1.8	0160-2239	1	36	0160-2308	5
2.0	0160-2240	4	39	0140-0190	7
2.2	0160-2241	5	43	0160-2200	6
2.4	0160-2242	6	47	0160-2307	4
2.7	0160-2243	7	51	0160-2201	7
3.0	0160-2244	8	56	0140-0191	8
3.3	0150-0059	8	62	0140-0205	5
3.6	0160-2246	0	68	0140-0192	9
3.9	0160-2247	1	75	0160-2202	8
4.3	0160-2248	2	82	0140-0193	0
4.7	0160-2249	3	91	0160-2203	9
5.1	0160-2250	6	100	0160-2204	0
5.6	0160-2251	7	110	0140-0194	1
6.2	0160-2252	8	120	0160-2205	1
6.8	0160-2253	9	130	0140-0195	2
7.5	0160-2254	0	150	0140-0196	3
8.2	0160-2255	1	160	0160-2206	2
9.1	0160-2256	2	180	0140-0197	4
10.0	0160-2257	3	200	0140-0198	5
11.0	0160-2258	4	220	0160-0134	1
12.0	0160-2259	5	240	0140-0199	6
13.0	0160-2260	8	270	0140-0210	2
15.0	0160-2261	9	300	0160-2207	3
16.0	0160-2262	0	330	0160-2208	4
18.0	0160-2263	1	360	0160-2209	5
20.0	0160-2264	2	390	0140-0200	0
22.0	0160-2265	3	430	0160-0939	4
24.0	0160-2266	4	470	0160-3533	0
			510	0160-3534	1
			560	0160-3535	2
			620	0160-3536	3
			680	0160-3537	4

Table 5-5. HP Part Numbers of Standard Value Components (2 of 4)

RESISTORS

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

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

Table 5-5. HP Part Numbers of Standard Value Components (3 of 4)

RESISTORS

RANGE: 10 to 1.47M Ohms
TYPE: Fixed-Film
WATTAGE: .5 at 125°C
TOLERANCE: ±1%

Value (Ω)	HP Part Number	C D	Value (Ω)	HP Part Number	C D	Value (Ω)	HP Part Number	C D	Value (Ω)	HP Part Number	C D
10.0	0757-0984	4	215	0698-3401	0	4.64K	0698-3348	4	110K	0757-0859	2
11.0	0575-0985	5	237	0698-3102	8	5.11K	0757-0833	2	121K	0757-0860	5
12.1	0757-0986	6	261	0757-1090	5	5.62K	0757-0834	3	133K	0757-0310	0
13.3	0757-0001	6	287	0757-1092	7	6.19K	0757-0196	0	147K	0698-3175	5
14.7	0698-3388	2	316	0698-3402	1	6.81K	0757-0835	4	162K	0757-0130	2
16.2	0757-0989	9	348	0698-3403	2	7.50K	0757-0836	5	178K	0757-0129	9
17.8	0698-3389	3	383	0698-3404	3	8.25K	0757-0837	6	196K	0757-0063	0
19.6	0698-3390	6	422	0698-3405	4	9.09K	0757-0838	7	215K	0757-0127	7
21.5	0698-3391	7	464	0698-0090	7	10.0K	0757-0839	8	237K	0698-3424	7
23.7	0698-3392	8	511	0757-0814	9	12.1K	0757-0841	2	261K	0757-0064	1
26.1	0757-0003	8	562	0757-0815	0	13.3K	0698-3413	4	287K	0757-0154	0
28.7	0698-3393	9	619	0757-0158	4	14.7K	0698-3414	5	316K	0698-3425	8
31.6	0698-3394	0	681	0757-0816	1	16.2K	0757-0844	5	348K	0757-0195	9
34.8	0698-3395	1	750	0757-0817	2	17.8K	0698-0025	8	383K	0757-0133	5
38.3	0698-3396	2	825	0757-0818	3	19.6K	0698-3415	6	422K	0757-0134	6
42.2	0698-3397	3	909	0757-0819	4	21.5K	0698-3416	7	464K	0698-3426	9
46.4	0698-3398	4	1.00K	0757-0159	5	23.7K	0698-3417	8	511K	0757-0135	7
51.1	0757-1000	7	1.10K	0757-0820	7	26.1K	0698-3418	9	562K	0757-0868	3
56.2	0757-1001	8	1.21K	0757-0821	8	28.7K	0698-3103	9	619K	0757-0136	8
61.9	0757-1002	9	1.33K	0698-3406	5	31.6K	0698-3419	0	681K	0757-0869	4
68.1	0757-0794	4	1.47K	0757-1078	9	34.8K	0698-3420	3	750K	0757-0137	9
75.0	0757-0795	5	1.62K	0757-0873	0	38.3K	0698-3421	4	825K	0757-0870	7
82.5	0757-0796	6	1.78K	0698-0089	4	42.2K	0698-3422	5	909K	0757-0138	0
90.0	0757-0797	7	1.96K	0698-3407	6	46.4K	0698-3423	6	1M	0757-0059	4
100	0757-0198	2	2.15K	0698-3408	7	51.1K	0757-0853	6	1.1M	0757-0139	1
110	0757-0798	8	2.37K	0698-3409	8	56.2K	0757-0854	7	1.21M	0757-0871	8
121	0757-0799	9	2.61K	0698-0024	7	61.9K	0757-0309	7	1.33M	0757-0194	8
133	0698-3399	5	2.87K	0698-3101	7	68.1K	0757-0855	8	1.47M	0698-3464	5
147	0698-3400	9	3.16K	0698-3410	1	75.0K	0757-0856	9			
162	0757-0802	5	3.48K	0698-3411	2	82.5K	0757-0857	0			
178	0698-3334	8	3.83K	0698-3412	3	90.9K	0757-0858	1			
196	0757-1060	9	4.22K	0698-3346	2	100K	0757-0367	7			

Table 5-5. HP Part Numbers of Standard Value Components (4 of 4)

FIXED COIL					
Tolerance: 10% Unshielded					
Value	**HP Part Number**	**C D**	**Value**	**HP Part Number**	**C D**
1 MH	9140-0137	1	390 NH	9100-2254	3
5 MH	9140-0072	3	470 NH	9100-2255	4
10 MH	9140-0131	5	560 NH	9100-2232	7
24 MH	9100-2867	4	680 NH	9140-0141	7
50 NH	9100-2891	4	820 NH	9100-2257	6
51 NH	9135-0073	3	1.2 UH	9100-2258	7
68 NH	9135-0081	3	1.8 UH	9100-2260	1
100 NH	9100-2247	4	2.2 UH	9140-0098	3
120 NH	9100-2248	5	3.3 UH	9140-0111	1
			4.7 UH	9140-0144	0
150 NH	9100-2249	6			
180 NH	9100-2250	9	5.6 UH	9100-1618	1
220 NH	9100-2251	0			
270 NH	9100-2252	1			
330 NH	9100-0368	6			

5-22. +22 VDC POWER SUPPLY, A35

Reference:

Performance Test: None
Service Section: Power Supplies

Description:

The +22V supply is adjusted for +22 Vdc.

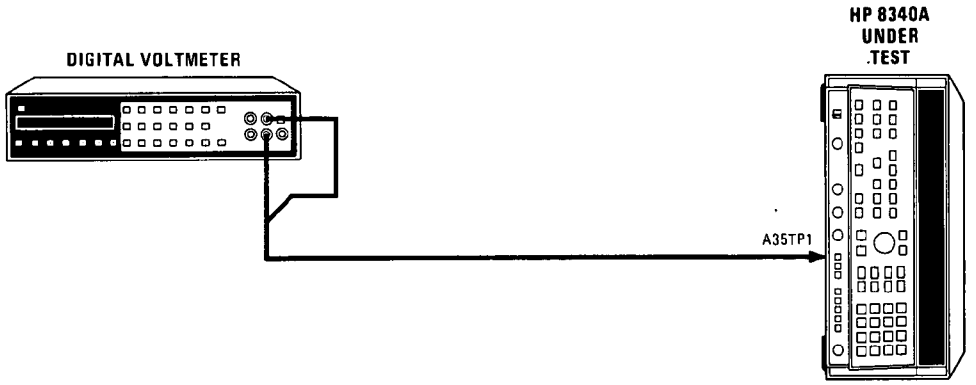


Figure 5-1. +22 Volt Power Supply Adjustments Setup

Equipment Required:

Digital Voltmeter ..... HP 3455A

Procedure:

1. Position 8340A in the test position and connect equipment as shown in Figure 5-1.
2. Set LINE switch to ON.
3. The yellow +22V indicator on A35 should be lit.
4. The DVM indication should be +22.000 ±0.010 Vdc. If the indication is out of tolerance, adjust A35R3 +22 ADJ control for the specified voltage.

5-22. +22 VDC POWER SUPPLY, A35 (Cont'd)

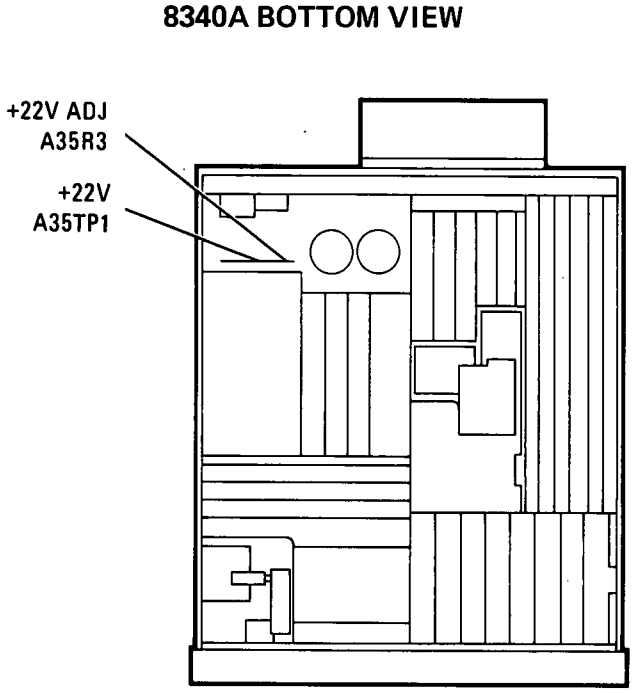


Figure 5-2. +22V Power Supply Adjustment Locations

5-23. 10 MHz STANDARD ADJUSTMENT, A51

Reference:

Performance Test: None
Service Section: Reference – M/N Loops

Description:

The internal 10 MHz time base is adjusted for frequency accuracy. This procedure does not adjust for long-term drift or aging rate. It adjusts only short-term accuracy. To properly adjust the time base, a frequency standard whose accuracy is known to be better than that of the 8340A Time Base is required. Refer to Frequency Reference specifications in Section I, Table 1-1 for aging rate specifications for the internal time base.

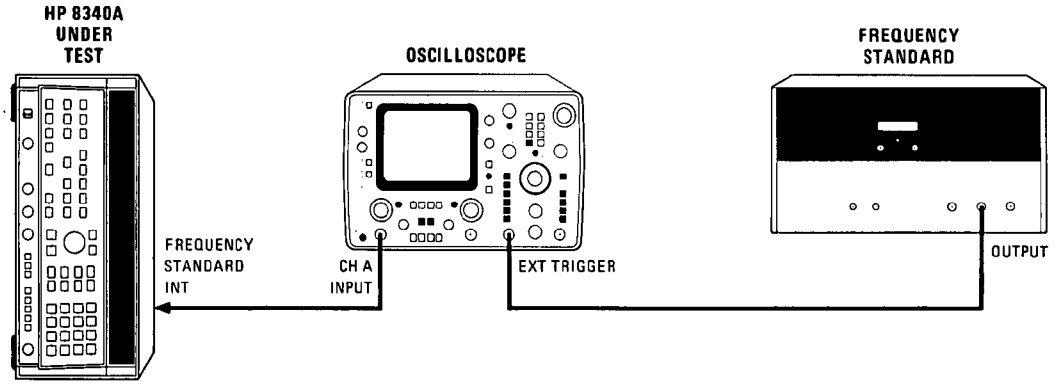


Figure 5-3. 10 MHz Standard Adjustment Setup

Equipment Required:

Oscilloscope ..... HP 1741A
Frequency Standard ..... any 1, 2, 5, or 10 MHz Frequency Standard with aging rate of $\pm 1 \times 10^{-9}$/day or better such as HP 5061A

Procedure:

NOTE

Primary power must have been applied to the instrument for at least 30 days before adjusting the internal time base. If the instrument was disconnected from ac power less than 24 hours (after it had its initial 30 day warmup), the warmup time is 24 hours before adjusting internal time base.

NOTE

If front-panel red OVEN annunciator is lighted, do not make internal time base adjustments. This annunciator lights when the oven for the reference crystal oscillator is not at operating temperature. A cold oven can take 30 minutes to reach operating temperature; a warm oven that suddenly goes cold has lost power and requires service. Section VIII (Service) describes the action required to repair a faulty oven.

5-23. 10 MHz STANDARD ADJUSTMENT, A51 (Cont'd)

1. Connect equipment as shown in Figure 5-3 as follows:

   a. At the 8340A, disconnect jumper from rear-panel FREQUENCY STANDARD INT connector.

   b. Connect oscilloscope CH A to the 8340A FREQUENCY STANDARD INT connector. (If the oscilloscope being used does not have a 50 Ohm input like the Model 1741A, connect Channel A through a 50 Ohm feedthrough.)

   c. Set switch adjacent to the INT connector to INT position.

   d. Connect a frequency standard whose accuracy is known to be better than that of the internal time base, such as an HP 5061A Cesium Beam, to the EXT TRIGGER input of the oscilloscope.

   e. Set LINE switch to ON.

2. Set oscilloscope controls as follows:

TIME/DIV	0.05μsec
CHAN A VOLTS/DIV	0.5
MAG x 10 pushbutton	OUT
DISPLAY A pushbutton	IN
TRIGGER COMP A/B	A
INT/EXT trigger pushbutton	IN
EXT Divide By 10	OUT
SWEEP VERNIER control	CAL
TRIGGER HOLDOFF	Fully Counterclockwise
AC/DC trigger pushbutton	OUT (AC)
POS/NEG trigger pushbutton	OUT (POS)
Main TRIGGER LEVEL control	Centered

3. Adjust Main TRIGGER LEVEL control as necessary to display sine-wave signal on oscilloscope.

4. Remove dust cap screws used to seal the adjustments from A51 10 MHz Standard.

5. Adjust A51 COARSE frequency adjust for minimum sideways movement of the displayed signal. Adjust A51 FINE frequency adjust for no sideways movement of displayed signal. Refer to Figure 5-4 for location of A51 10 MHz Standard.

6. Observe the sine wave signal on the oscilloscope for 100 seconds. The sine wave trace should move less than 1 cycle or 360 degrees.

7. Disconnect oscilloscope and reinstall dust cover screws over A51 adjustments. Reconnect rear panel cable between FREQUENCY STANDARD INT and EXT connectors.

5-23. 10 MHz STANDARD ADJUSTMENT, A51 (Cont'd)

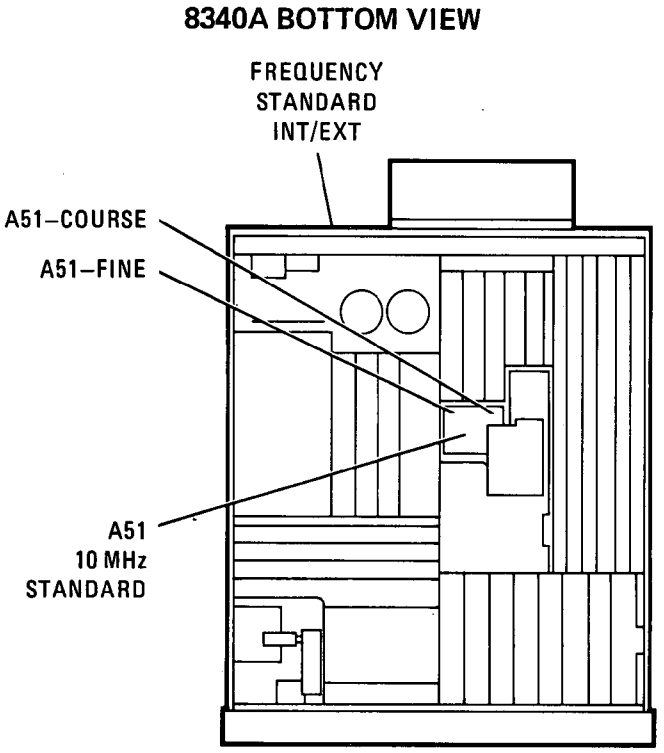


Figure 5-4. 10 MHz Standard Adjustments Location

5-24. THIS TEST HAS BEEN OMITTED

5-25. 100 MHz VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR (VCXO), A30

Reference:

Performance Test: None
Service Section: Reference – M/N Loops

Description:

The open loop frequency and maximum power output of the 100 MHz VCXO is centered around 100 MHz. The 400 MHz signal is adjusted for maximum 400 MHz output with minimum spurious output. The 400 MHz output is set to −10 dBm by selecting proper resistor values for the attenuator network A30R67, R68, and R69.

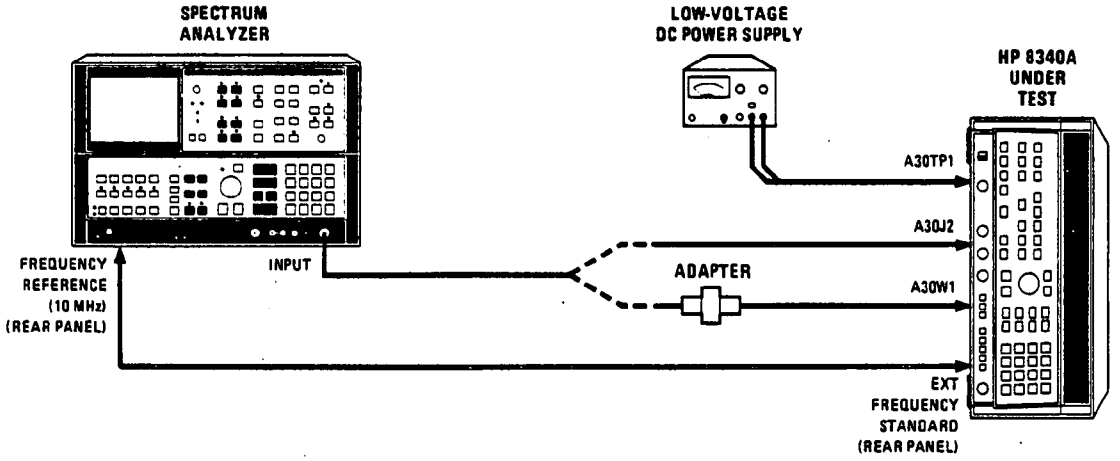


Figure 5-6. 100 MHz VCXO Adjustment Setup

Equipment Required:

Spectrum Analyzer	HP 8566A
Low-Voltage DC Power Supply	HP 6294A
BNC to SMB Snap-On Test Cable (2 required)	HP P/N 85680-60093
Adapter, SMB Snap-On Male-to-Male	HP P/N 1250-0069

Procedure:

1. Position HP 8340A in the Test Position as shown in Figure 5-6 with bottom cover removed. Connect equipment as shown in Figure 5-6. On the HP 8340A rear panel, disconnect BNC cable connected between INT and EXT Frequency Standard connectors, set INT/EXT switch to EXT, then connect cable from EXT connector to Spectrum Analyzer Frequency Reference (10 MHz) rear-panel connector. Allow instruments to warm up for one-half hour.

5-25. 100 MHz VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR (VCXO), A30 (Cont'd)

2. Set Spectrum Analyzer controls as follows:

CENTER FREQ	100 MHz
REF LEVEL	3 dBm
ATTEN	+20 dB
LOG SCALE	1 dB/DIV
RES BW	300 Hz
VBW	300 Hz
FREQ SPAN	20 KHz
SWEEP TIME	1 SEC.
MARKER ENTRY	Press PEAK SEARCH
MARKER ENTRY	Press MKR→CF
MARKER MODE	Press SIGNAL TRACK

100 MHz OUTPUT ADJUSTMENT

3. Set LINE switch to ON and press **[INSTR PRESET]**.

4. At rear panel of 8340A, disconnect 10 MHz Frequency Standard cable at EXT FREQUENCY STANDARD connector.

5. Jumper −10 Vdc from A53TP5 (−10V) to A30TP1 TUNE test point. Refer to Figure 5-7 for location of A30 and adjustments.

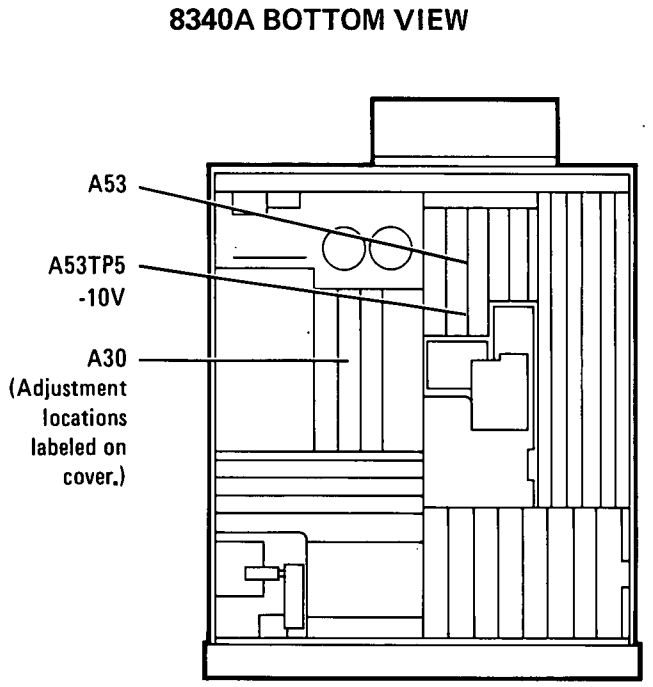


Figure 5-7. Location of A30 100 MHz VCXO Adjustments

5-25. 100 MHz VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR (VCXO), A30 (Cont'd)

6. Disconnect cable W35 from A30J2 100 MHz OUT. Connect Spectrum Analyzer RF Input to A30J2.

7. Adjust A30C4 100 MHz ADJ through its full range while monitoring frequency indication on Spectrum Analyzer. Adjustment should provide a minimum adjustment range of plus and minus 300 Hz centered about 100 MHz. If adjustment does not provide sufficient range, select new values for factory selected components A30C8 and A30L4. A30L4 is used to center the adjustment about 100 MHz and A30C8 is used to adjust the range of A30C4. Refer to Table 5-3 for range of values. Refer to Table 5-5 for HP Part Numbers.

8. Adjust A30C4 100 MHz ADJ for Spectrum Analyzer indication of 100.0000 MHz ±0.0001 MHz.

9. Disconnect cable A30W1 at A31J1 400 MHz IN and connect the open end of this cable (A30W1) to the Spectrum Analyzer input using a BNC to SMB Snap-on test cable and SMB male-to-male adapter. Set Spectrum Analyzer controls to view a 400 MHz signal.

10. The 400 MHz output should be −10 dBm ±3 dB.

11. Disconnect jumper from −10 Vdc at A53TP5 and connect the jumper from A30TP1 TUNE test point to ground. Connect Spectrum Analyzer to A30J2. Adjust Spectrum Analyzer to view 100 MHz.

12. Frequency indication on Spectrum Analyzer should be less than 100 MHz. If not, repeat Steps 6 and 7.

13. Remove the jumper from A30TP1 to ground and connect A30TP1 TUNE to the output of an external low-voltage DC power supply. Set power supply for an output of −25 Vdc. Verify TUNE test point A30TP1 is at −25 Vdc.

14. Frequency indication on Spectrum Analyzer should be greater than 100 MHz. If not, repeat Steps 6 and 7 and verify that the oscillator range is 100 MHz ±300 Hz. Disconnect power supply from A30TP1. Reconnect 10 MHz signal cable from Spectrum Analyzer to 8340A rear-panel EXT FREQUENCY STANDARD.

400 MHz OUTPUT ADJUSTMENT

15. Set Spectrum Analyzer to 500 MHz center frequency and 100 MHz frequency span per division.

16. Connect Spectrum Analyzer to A30W1 cable. Adjust A30C3, A30C2, and A30C1 400 MHz adjustments, in that order, to maximize the 400 MHz signal and minimize all harmonics of 100 MHz. Harmonics at 100, 300, 500, 600, 700, and 900 MHz must be greater than 40 dB down from the 400 MHz signal. Harmonics at 200 MHz must be greater than 25 dB down from the 400 MHz signal. Harmonics at 800 MHz must be greater than 15 dB down from the 400 MHz signal. It may be necessary to perform the adjustments more than once. This should be done in the order stated each time through the adjustments.

5-25. 100 MHz VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR (VCXO), A30 (Cont'd)

17. The amplitude of the 400 MHz signal should be −10 dBm ±3 dB. This amplitude is set by selecting attenuator network resistors A30R67, A30R68, and A30R69.

Table 5-6. Selection Chart for Attenuator Resistors

Attenuation (dB)	Resistors (Ohms) R67	R68	R69
0	Open	Short	Open
1	825	6.8	825
2	422	12.1	422
3	261	17.8	261
4	215	23.7	215
5	178	31.6	178
6	162	38.3	162
7	133	46.4	133
8	121	51.1	121
9	110	61.9	110

NOTE

HP Part Numbers for resistors may be found in Table 5-5.

18. If the amplitude of the 400 MHz signal is not within 3 dB of −10 dBm, note the amplitude and change the values of A30R67, A30R68, and A30R69 as necessary to adjust the amplitude to −10 dBm ±3 dB. Table 5-6 contains a list of attenuations in 1 dB steps and the corresponding values for the attenuator network resistors to adjust the level to −10 dBm. Refer to A30 service section for location of resistors.

19. Check the level of the 100 MHz harmonics as displayed on the Spectrum Analyzer. Harmonics at 100, 300, 500, 600, 700, and 900 MHz must be greater than 40 dB down from the 400 MHz signal. Harmonics at 200 MHz must be greater than 25 dB down from the 400 MHz signal. Harmonics at 800 MHz must be greater than 15 dB down from the 400 MHz signal. If not, repeat step 15.

20. Set the 8340A LINE switch to STANDBY. Disconnect equipment from 8340A and reconnect the two cables. Disconnect the 10 MHz Frequency Standard cable at the rear of the 8340A, reconnect jumper cable between INT and EXT, and set switch to INT. Set 8340A LINE switch to ON.

5-26. M/N LOOP, A32, A33, AND A32A1

Reference:

Performance Test: Frequency Range and CW Mode Accuracy
Service Section: Reference - M/N Loops

Description:

The M/N VCO tuning range is centered and the output level is set and checked to ensure an adequate RF output level across the band of the M/N output.

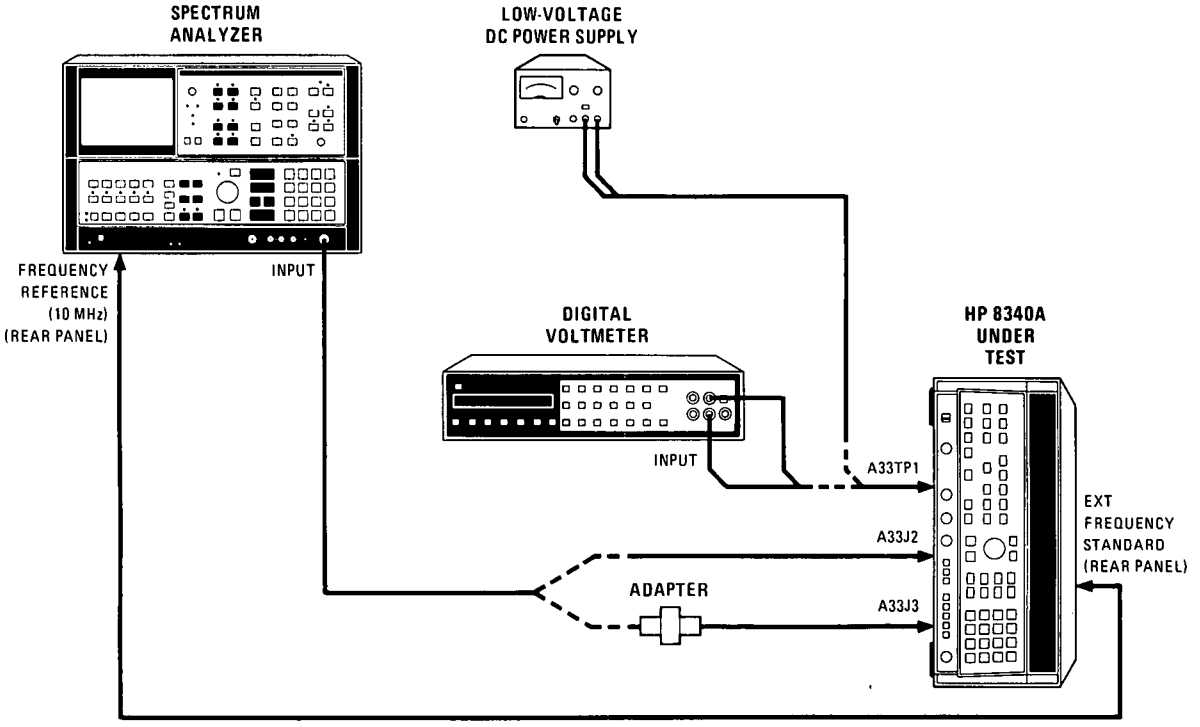


Figure 5-8. M/N Loop Adjustment Setup

Equipment Required:

Spectrum Analyzer	HP 8566A
Digital Voltmeter (DVM)	HP 3455A
Low-Voltage DC Power Supply	HP 6294A
BNC to SMB Snap-On Test Cable	HP P/N 85680-60093
Adapter, SMB Snap-On Male-to-Male	HP P/N 1250-0069

Procedure:

1. Position the 8340A in the test position as shown in Figure 5−8 with bottom cover removed. Connect equipment as shown in Figure 5-8. On the 8340A rear panel, disconnect BNC cable connected between INT and EXT Frequency Standard connectors, set INT/EXT switch to EXT, then connect cable from EXT connector to Spectrum Analyzer Frequency Reference (10 MHz) rear-panel connector. Allow one−half hour warm up time.

5-26. M/N LOOP, A32, A33, AND A32A1 (Cont'd)

2. Set LINE switch to ON and press **[INSTR PRESET]**. Connect jumper between A59TP4 DLI and A59TP5 +5V to disable the UNLK indicator circuit.

3. Disconnect cable from A33J2 M/N OUT and connect this output to Spectrum Analyzer RF INPUT. Set Spectrum Analyzer as follows:

CENTER FREQ	197.419
REF LEVEL	3 dBm
ATTEN	+20 dB
LOG SCALE	1 dB/DIV
RES BW	300 Hz
VBW	300 Hz
FREQ SPAN	5 KHz
SWEEP TIME	1 SEC.
MARKER ENTRY	Press PEAK SEARCH
MARKER ENTRY	Press MKR→CF
MARKER MODE	Press SIGNAL TRACK

4. Press 8340A **[CW]** then enter **[6] [0] [9] [0] [MHz]**.

5. The M/N output frequency indicated on Spectrum Analyzer should be 197.419 MHz ±1 count.

NOTE

To display the frequencies that the processor programs, press 8340A under Test [SHIFT][M1]. It will display from left to right: the M divide number, the N divide number, the M/N output frequency, and the 20/30 output frequency.

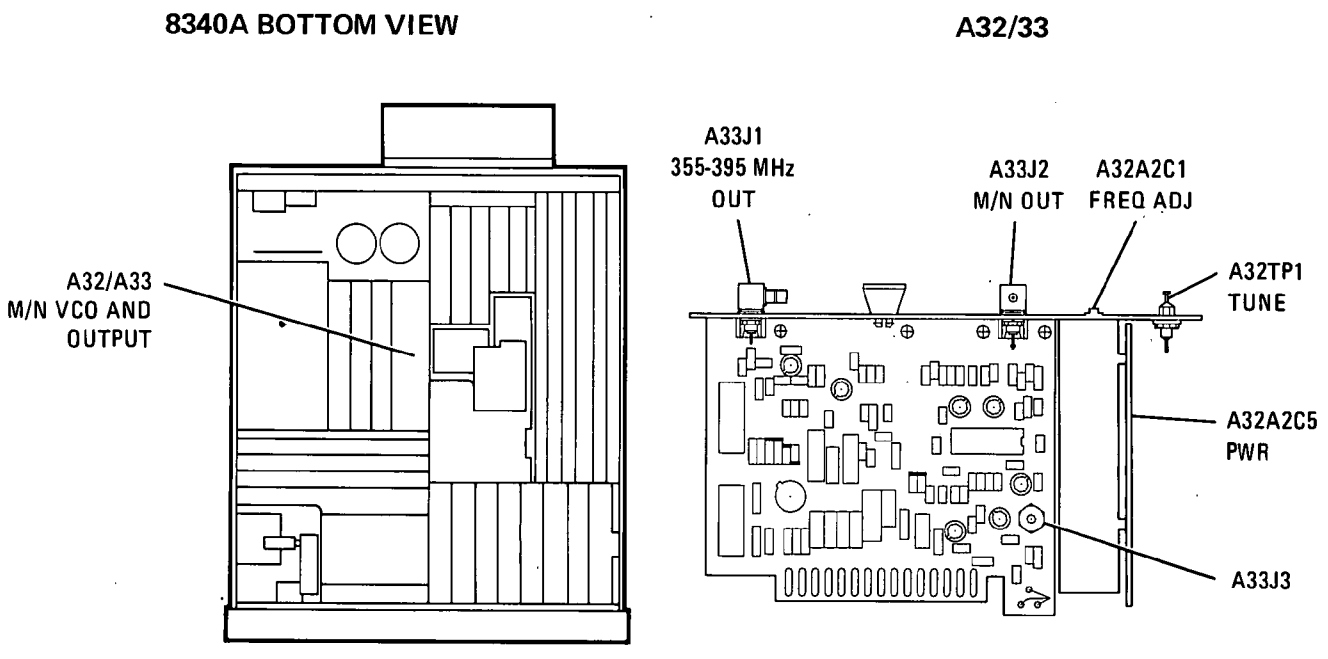


Figure 5-9. Location of M/N Loop Adjustments

5-26. M/N LOOP, A32, A33, AND A32A1 (Cont'd)

6. Connect DVM to A32TP1 TUNE test point. Refer to Figure 5-9 for location of A32 assembly.

7. Loosen locknut on A32A2C1 FREQ ADJ control and adjust A32A2C1 for DVM reading of −35.0 Vdc ±0.5 Vdc. Retighten A32A2C1 locknut. Verify that DVM reading is still within tolerance.

8. Press 8340A **[CW]** then enter **[2] [3] [0] [0] [MHz]**.

9. Set Spectrum Analyzer for Center Frequency of 179.230 MHz. Frequency indicated on Spectrum Analyzer should be 179.230 MHz ±1 count and the DVM should read −2.8 Vdc ±0.5 Vdc.

10. Set 8340A LINE switch to STANDBY.

11. Disconnect DVM from A32 assembly. Remove A32/A33 assembly from instrument and place on extender board.

12. Disconnect A32 output cable A32A1W1 from A33J3 (Figure 5-9) and connect this cable using SMB male-to-male adapter to the input of the Spectrum Analyzer. Set 8340A LINE switch to ON and press **[INSTR PRESET]** pushbutton.

13. Set Spectrum Analyzer Center Frequency to 375 MHz, Frequency Span to 10 MHz/ Division, and Reference Level to +5 dBm.

CAUTION

Do not apply a positive voltage to A32TP1 or damage may occur to the VCO tuning diodes.

14. Connect the low-voltage power supply to the 8340A as follows: Positive lead to ground (do this first). Negative lead to A32TP1 TUNE test point. Set the output of the supply for −35.0 Vdc ±0.5 Vdc.

15. Adjust A32A2C5 PWR for a VCO output level of 0 dBm ±2 dB as indicated on Spectrum Analyzer. Refer to Figure 5-9 for location of adjustment.

16. Slowly reduce the dc voltage output of the external low-voltage power supply connected to A32TP1 TUNE test point while monitoring the VCO output level on the Spectrum Analyzer and voltage level on DVM.

17. The VCO output level should be greater than −2 dBm between 395 MHz (−35 Vdc) and 355 MHz (−2.8 Vdc).

18. Repeat Steps 2 through 9 to check frequency accuracy.

19. Set 8340A LINE switch to STANDBY. Disconnect all test equipment from A32/A33 assembly. Reconnect cable A32A1W1 to A33J3.

20. Reinstall A32/A33 M/N Output Assembly in instrument and remove jumper from A59TP4 to A59TP5 (UNLK indicator disable).

21. Disconnect cable from 8340A rear-panel EXT FREQUENCY STANDARD, reconnect BNC cable between INT and EXT connectors, and set adjacent switch to INT.

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43

Reference:

Performance Test: Frequency Range and CW Mode Accuracy
Service Section: 20/30 Loops

Description:

Phase Lock Loop 2 is adjusted by selecting a very narrow span width and adjusting A40 and A43 for proper voltages at designated test points. If PLL2 will not phase lock (UNLK indicator is lit and **[SHIFT] [EXT]** diagnostic indicates N2 is at fault), the A41 PLL2 Phase Detector must be disabled and a slightly different procedure used to initially set the A40 and A43 adjustments.

Phase Lock Loop 3 is adjusted for maximum multiplier output level at 160 MHz. The VCO is adjusted by setting up proper voltage levels at A39TP3.

Phase Lock Loop 1 40 kHz LPF is properly adjusted using a function generator and spectrum analyzer with an active probe. The response of PLL1 is adjusted for maximum rejection of signals between 160 and 166 MHz using a signal generator and spectrum analyzer.

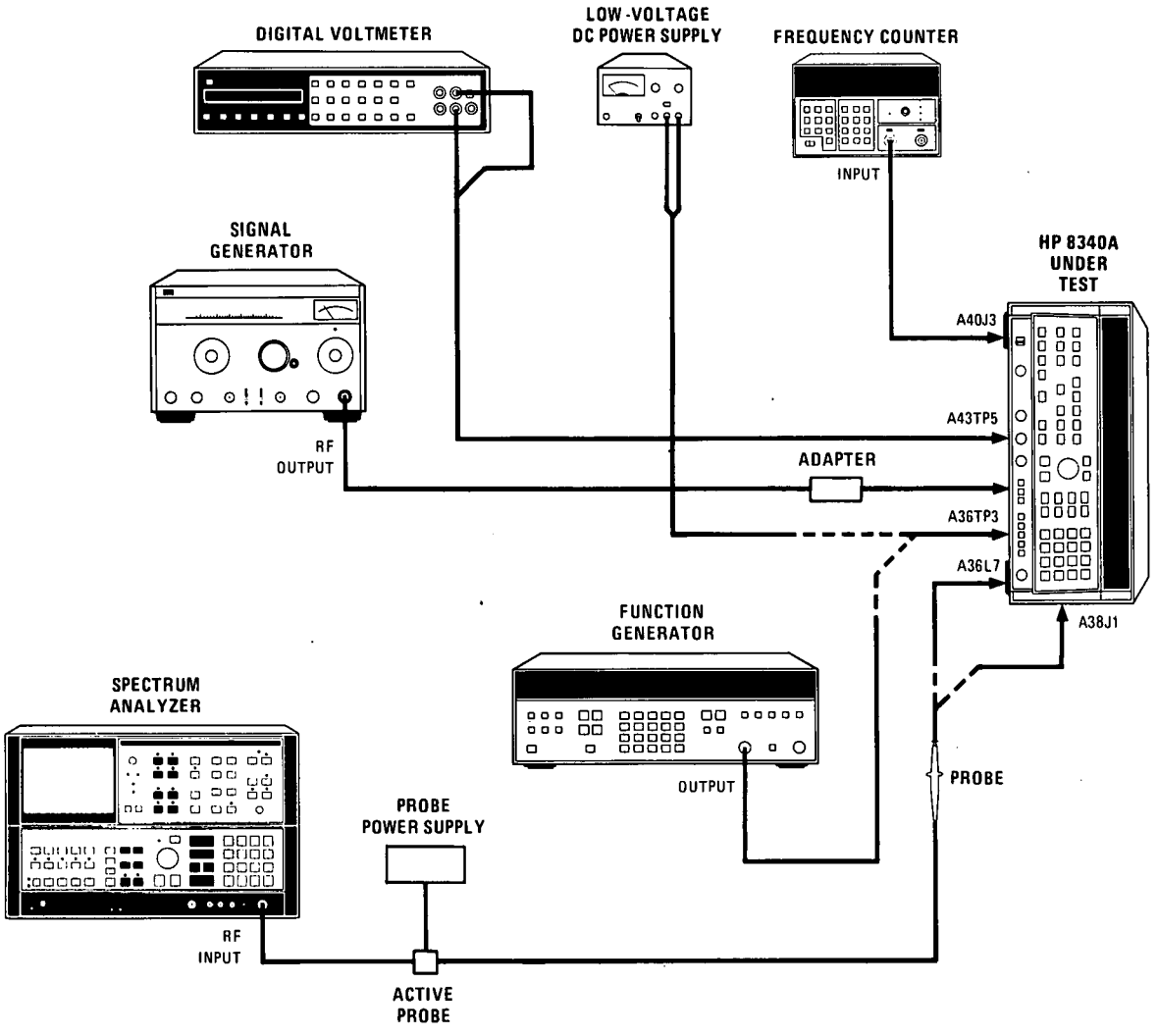


Figure 5-10. 20/30 Loop Phase Lock Adjustments Setup

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43 (Cont'd)

Equipment Required:

Spectrum Analyzer	HP 8566A
Active Probe	HP 1121A
Probe Power Supply	HP 1122A
Signal Generator	HP 8654A
Low-Voltage DC Power Supply	HP 6294A
Digital Voltmeter (DVM)	HP 3455A
Function Generator	HP 3325A
BNC to SMB Snap-On Test Cable	HP 85680-60093
Adapter, SMB Snap-On Male-to-Male	HP 1250-0069

Procedure:

PHASE LOCK LOOP 2

NOTE

If PLL2 is phase locked (UNLK annunciator not lit), proceed to step 12. If the UNLK annunciator is lit, determine if PLL2 (N2) is phase locked as follows: (a) Press [SHIFT] then [EXT], (b) Observe ENTRY display and if N2 is blinking, PLL2 is unlocked. With PLL2 unlocked, proceed to step 1. If some other oscillator circuit caused the UNLK indication, proceed to step 12.

1. Position 8340A in test position as shown in Figure 5-10 with bottom cover removed. Connect equipment as shown in Figure 5-10 and allow one-half hour warm up time. Set LINE switch to STANDBY. Remove A41 PLL2 Phase Detector from its connector on the motherboard. (It is not necessary to completely remove the A41 assembly from the instrument.)

2. Set LINE switch to ON and press **[INSTR PRESET]**.

3. Remove cable from A40J3 .15−6MHz OUT FOR $\Delta F \leq .1$ MHZ and connect Frequency Counter to A40J3 using BNC to SMB snap-on test cable.

4. Press **[CW]** then enter **[3] [0] [MHz]** to set the N2 oscillator to 150 MHz.

5. Connect DVM to A43TP5 VCO TUNE located on top cover of A43.

6. Adjust A40R2 150 MHz adjustment for a DVM indication of +3.0 Vdc ±0.5 Vdc. Refer to Figure 5-11 for location of adjustments.

7. Adjust A43R9 .3 MHz adjustment for a Frequency Counter indication of 0.300 MHz ±0.001 MHz (N2 frequency divided by 500).

8. Press **[CW]** then enter **[1] [9] [.] [9] [9] [9] [9] [9] [9] [MHz]** to set the N2 oscillator to 100 MHz.

9. Adjust A40R4 100 MHz adjustment for a DVM indication of +15.0 Vdc ±0.5 Vdc.

10. Adjust A43R41 .2 MHz adjustment for a Frequency Counter indication of 0.200 MHz ±0.001 MHz (N2 frequency divided by 500).

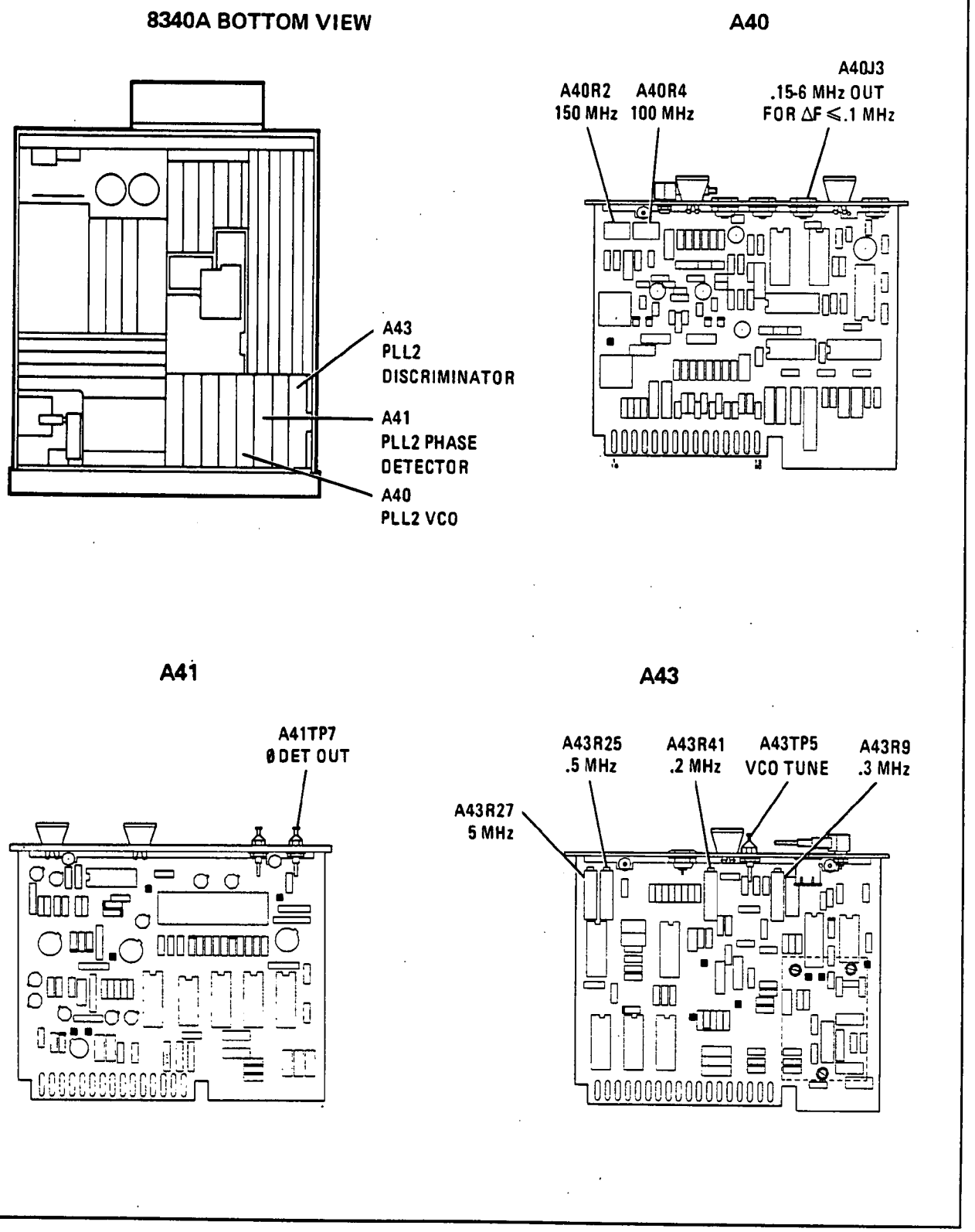


Figure 5-11. Location of PLL2 Adjustments

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43 (Cont'd)

11. Set LINE switch to STANDBY. Reinstall A41 PLL2 Phase Detector. Disconnect Frequency Counter from A40J3 and reconnect A39W1 cable to A40J3 (.15 −6 MHz OUT FOR $\Delta F \leq .1$ MHz) connector.

12. Set LINE switch to ON. Press **[INSTR PRESET]**.

13. Press **[CW]** then enter **[3] [0] [MHz]** to set the N2 oscillator to 150 MHz.

14 Connect DVM to A43TP5 VCO TUNE located on top cover of A43.

15 Adjust A40R2 150 MHz adjustment for a DVM indication of +3.00 Vdc ±0.05 Vdc.

16. Connect DVM to A41TP7 ϕ DET OUT on top cover of A41.

17. Adjust A43R9 .3 MHz adjustment for a DVM indication of +3.50 Vdc ±0.05 Vdc.

18. Press **[CW]** then enter **[1] [9] [.] [9] [9] [9] [9] [9] [9] [MHz]** to set the N2 oscillator to 100 MHz.

19. Connect DVM to A43TP5 VCO TUNE located on top cover of A43.

20. Adjust A40R4 100 MHz adjustment for a DVM indication of +15.00 Vdc +0.05 Vdc.

21. Connect DVM to A41TP7 ϕ DET OUT located on top cover of A41.

22. Adjust A43R41 .2 MHz adjustment for a DVM indication of 3.50 Vdc ±0.05 Vdc.

23. Repeat Steps 12 through 22 until no further adjustment is required.

24. Set 8566A Spectrum Analyzer as follows:

    a. Press **[INSTR PRESET]**
    b. Set CENTER FREQ to 29.5 MHz
    c. Set SPAN to 200 kHz

25. Connect jumper between A59TP4 DL1 and A59TP5 +5V to disable the UNLK indicator circuit.

26. Set HP 8340A as follows:

    a. Press **[INSTR PRESET]**
    b. Press **[START FREQ]** then enter **[2] [0] [MHz]**
    c. Press **[STOP FREQ]** then enter **[2] [0] [.] [5] [MHz]**
    d. Press **[SHIFT]**, then **[XTAL]** (This stops frequency at end of sweep without retrace).
    e. Press **[SINGLE]** Sweep

27. Disconnect cable W39 from A36J1 OUT 20-30 MHz and connect Spectrum Analyzer RF INPUT to A36J1 through an SMB snap-on to BNC cable. Adjust A43R25 0.5 MHz ΔF to center the signal on the Spectrum Analyzer screen.

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43 (Cont'd)

28. Set 8566A Spectrum Analyzer as follows:

    a. Set CENTER FREQ to 25 MHz
    b. Set SPAN to 500 kHz

29. Set 8340A as follows:

    a. Press **[INSTR PRESET]**
    b. Press **[START FREQ]** then enter **[2] [0] [MHz]**
    c. Press **[STOP FREQ]** then enter **[2] [5] [MHz]**
    d. Press **[SHIFT]**, then **[XTAL]**
    e. Press **[SINGLE]** Sweep

30. Adjust A43R27 5 MHz ΔF to center the signal on the Spectrum Analyzer screen.

31. Disconnect Spectrum Analyzer from A36J1 and reconnect W39 to A36J1 OUT 20–30 MHz.

PHASE LOCK LOOP 3

32. Set LINE switch to STANDBY. Remove A39 PLL3 Up Converter and install it on extender board.

33. Set LINE switch to ON. Press **[INSTR PRESET]**. Press **[CW]** then enter **[5] [GHz]**. Press **[SHIFT] [M3]** to display the PLL2 and PLL3 frequencies.

34. Connect Spectrum Analyzer to Test Connector A39J3 on P.C. board. Tune Spectrum Analyzer center frequency to 160 MHz. Set reference level to −20 dBm and set scale to 1 dB per division.

35. Adjust A39L16, A39L17, and A39C50 160 MHz PEAK for maximum signal level at 160 MHz. Iteration of L16 and L17 adjustment may be necessary. Refer to Figure 5-12 for location of adjustments.

    If A39C50 does not have sufficient range, select the value of A39C49 for proper range. (Refer to Table 5-3.)

36. At the 8340A, select the following:

    a. Press **[CF]** then enter **[6] [.] [6] [2] [7] [2] [5] [0] [GHz]**.
    b. Press **[ΔF]** then enter **[1] [0] [0] [kHz]**.
    c. Press **[SINGLE]** SWEEP.

37. Tune Spectrum Analyzer to a center frequency of 6 MHz. Set scale to 10 dB per division.

38. The 6 MHz signal displayed should be at least −42 dBm. If not, repeat Steps 33 through 37.

39. Connect DVM to A39TP3.

40. Adjust A39L11 PLL3 VCO ADJ for DVM indication of −7.0 Vdc ±0.1 Vdc. The voltage may not change with initial adjustment but will change once the phase lock loop locks.

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43 (Cont'd)

41. Press 8340A **[CF]** then enter **[5] [GHz]**. Press **[SINGLE]** SWEEP pushbutton to initiate a sweep.

42. DVM indication should be −3.0 Vdc ±0.5 Vdc.

43. Set LINE switch to STANDBY. Disconnect test equipment and reinstall A39 PLL3 Up Converter in instrument.

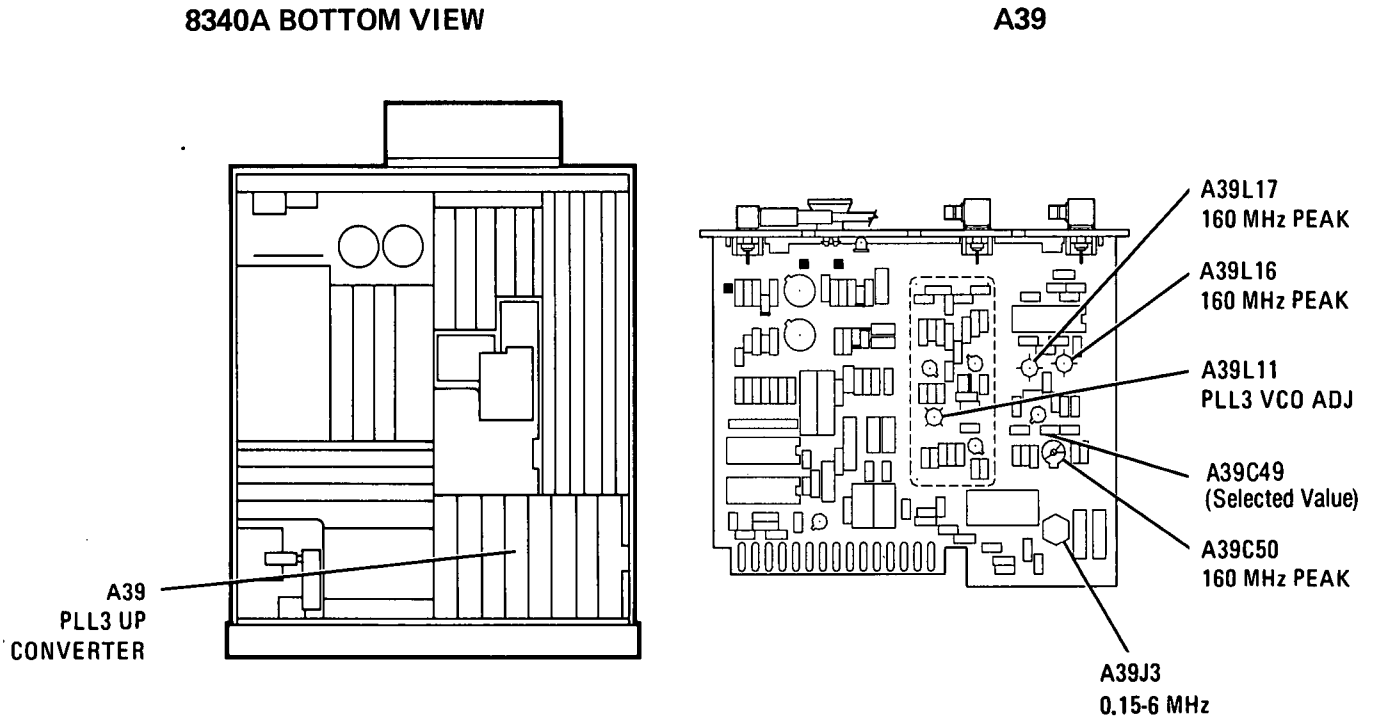


Figure 5-12. Location of PLL3 Adjustments

PHASE LOCK LOOP 1

44. Set LINE switch to STANDBY. Place A36 PLL1 VCO on an extender board. Remove all cables connected to A36.

45. Set Function Generator controls as follows:

FUNCTION	Sine Wave
FREQ	20 kHz
AMPL	−7.7 dBm

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43 (Cont'd)

46. Set Spectrum Analyzer controls as follows:

INSTR PRESET	Press
START FREQ	10 kHz
STOP FREQ	60 kHz
REFERENCE LINE	0 dBm
RES BW	300 Hz
VIDEO BW	1 kHz
SWEEP TIME	1.2 SEC
SCALE	10 dB/DIV
MARKER MODE	NORMAL

47. Set Spectrum Analyzer Marker to 20 kHz.

48. Connect active probe to Spectrum Analyzer input and connect probe to output of 40 kHz LPF on A36 (see Figure 5-13). (This is the terminal on A36L7 next to A36C24.)

49. Adjust Function Generator amplitude to place the 20 kHz signal displayed on the Spectrum Analyzer at the 0 dBm reference line.

50. Set Function Generator to 50 kHz.

51. Set Spectrum Analyzer Marker to 50 kHz.

52. Adjust A36L7 and A36L8 50 kHz NULL adjustments to null the 50 kHz signal displayed on the Spectrum Analyzer. Refer to Figure 5-13 for location of adjustments.

53. Note the level of the 50 kHz signal. This level should be at least 65 dB down from the level of the 20 kHz response. Disconnect test equipment from A36 assembly.

54. Disconnect active probe from Spectrum Analyzer and connect Spectrum Analyzer input to A36J2 OUT 200−300 MHz using a BNC to SMB snap-on test cable. Set LINE switch to ON.

55. Set Spectrum Analyzer as follows:

INSTR PRESET	Press
START FREQ	150 MHz
STOP FREQ	470 MHz
REF LINE	+10 dBm
MARKER	PEAK SEARCH

56. Connect an external low-voltage dc power supply positive lead to A36TP3 and the negative lead to any convenient chassis ground. Set external power supply for +16.0 Vdc ±0.1 Vdc.

57. Oscillator frequency should be 310 MHz ±10 MHz as indicated on the Spectrum Analyzer. If not, remove metal shield from A36 assembly and increase or decrease spacing between turns of A36L4 and increase or decrease the area of the single turn of A36L5 to properly tune the oscillator.

58. Change power supply voltage to +4.0 Vdc ±0.1 Vdc.

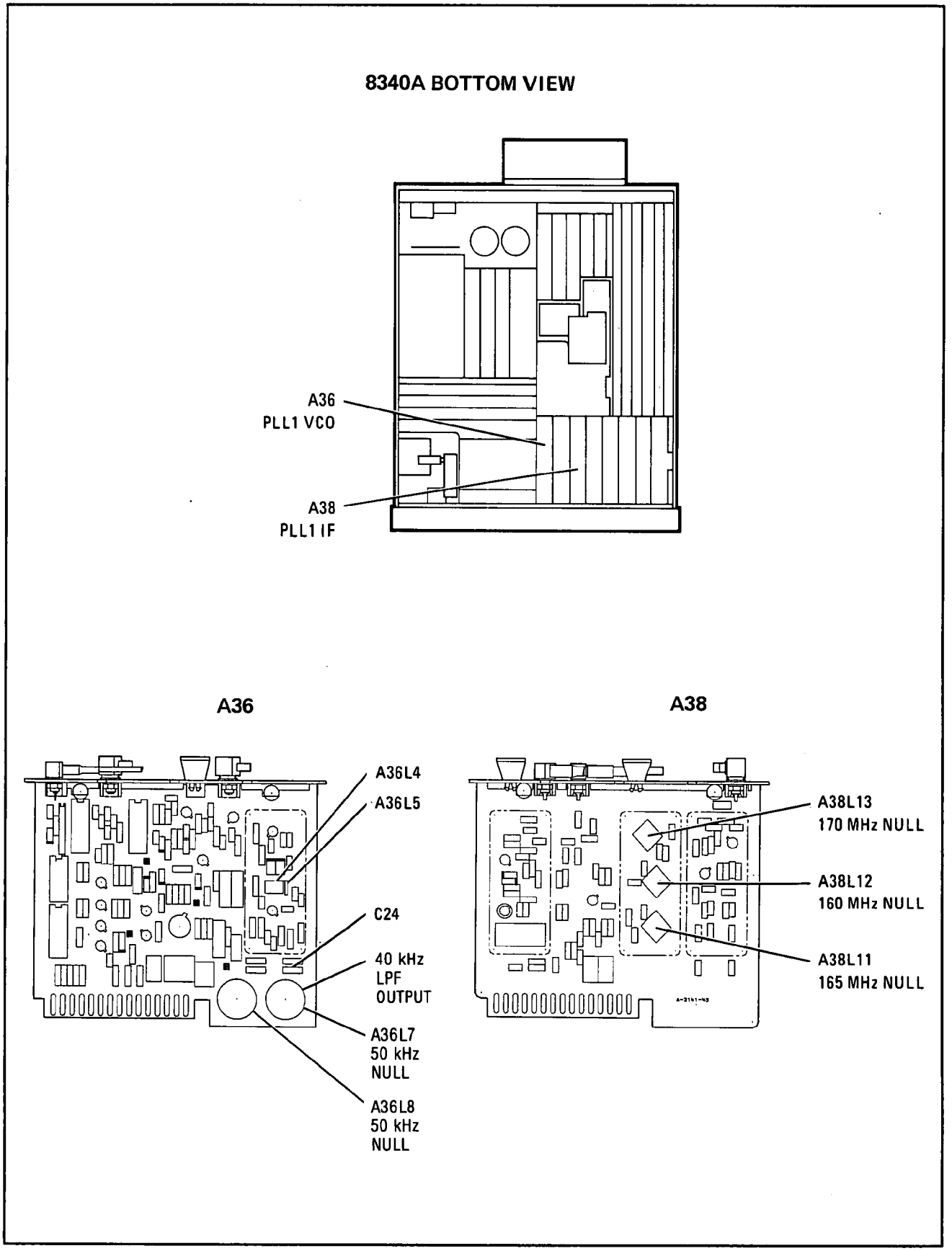


Figure 5-13. Location of PLL1 Adjustments

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43 (Cont'd)

59. Oscillator frequency should drop below 200 MHz with an amplitude greater than −7 dBm.

60. Repeat Steps 56 through 59 if necessary to meet requirements.

61. Set LINE switch to STANDBY. Reinstall metal shield on A36 if removed, reinstall A36 PLL1 VCO assembly in instrument, and reconnect all cables.

62. Remove A38 PLL1 IF assembly from instrument and install it on an extender board. Connect all cables to A38.

63. Set LINE switch to ON and press **[INSTR PRESET]**. Press **[CW]** then enter **[1] [3] [.] [9] [7] [MHz]**.

64. Connect Spectrum Analyzer to A38J1 OUT PLL1 IF. Set Spectrum Analyzer controls as follows:

INSTR PRESET	Press
CENTER FREQ	170 MHz
FREQ SPAN	200 kHz
RES BW	3 kHz
VBW	3 kHz
SWP	100 ms
REF LEVEL	−10 dBm
ATT	0 dB
SCALE/DIV	10 dB/DIV
MARKER	NORMAL

65. Disconnect cable from A36J2 OUT 200−300 MHZ and connect the cable to Signal Generator using BNC to SMB snap-on test cable and adapter.

66. Adjust A38L11 165 MHz NULL, A38L12 160 MHz NULL, and A38L13 170 MHz NULL fully clockwise.

67. Set Signal Generator for an output of 330.3 MHz ±0.2 MHz at 0 dBm.

68. Adjust A38L13 170 MHz NULL to null the 170 MHz signal on the Spectrum Analyzer.

69. Change Signal Generator frequency to 325.3 MHz ±0.2 MHz. Set Spectrum Analyzer CENTER FREQ to 165 MHz.

70. Adjust A38L11 165 MHz NULL to null the 165 MHz signal on the Spectrum Analyzer.

71. Change Signal Generator frequency to 320.3 MHz ±0.2 MHz. Set Spectrum Analyzer CENTER FREQ to 160 MHz.

72. Adjust A38L12 160 MHz NULL to null the 160 MHz signal on the Spectrum Analyzer.

73. Set the Spectrum Analyzer CENTER FREQ to 140 MHz. Tune the Signal Generator to 300.3 MHz ±0.2 MHz. Note the amplitude of the 140 MHz response on the Spectrum Analyzer.

5-27. 20/30 LOOP PHASE LOCK, A36, A38, A39, A40, AND A43 (Cont'd)

74. Set the Spectrum Analyzer as follows:

INSTR PRESET	Press
START FREQ	130 MHz
STOP FREQ	170 MHz
MARKER	NORMAL
MARKER frequency	140 MHz

Slowly tune the Signal Generator from 320.3 to 326.3 MHz while monitoring the display on the Spectrum Analyzer.

75. The amplitude of the signal response between 160 and 166 (Signal Generator frequency of 320.3 to 326.3 MHz) should be at least 60 dB below the response at 140 MHz (Signal Generator frequency of 300.3 MHz) noted in Step 73.

76. Set LINE switch to STANDBY. Reinstall A38 PLL1 IF assembly in instrument and reconnect all cables.

5-28. YO PRETUNE DAC, A54

Reference:

Performance Test: None
Service Section: Sweep Generator - YO Loop

Description:

This procedure makes gain and offset adjustments to the pretune voltage such that the lowest output voltage from the DAC will tune the YO to its lowest frequency (2.3 GHz), and the highest voltage out of the DAC (full scale) will tune the YO to its highest frequency (7 GHz).

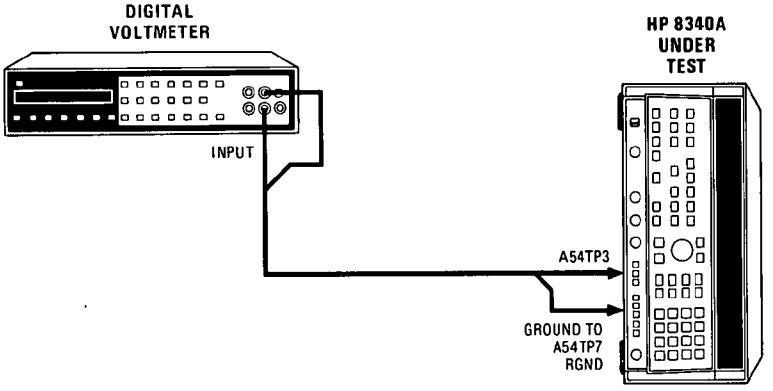


Figure 5-14. YO Pretune DAC Gain Test Setup

Equipment Required:

Digital Voltmeter (DVM) ..... HP 3455A

Procedure:

1. Position the 8340A in the Test Position as shown in Figure 5-14 with bottom cover removed. Connect equipment as shown in Figure 5-14 and allow one-half hour warm up time. Be sure to connect DVM ground to A54TP7 REF. Ground.

2. Set the 8340A Under test as follows:

   a. Press **[INSTR PRESET]**
   b. Press **[CW]** then enter **[2] [.] [3] [GHz]** to tune the YO to 2.3 GHz (minimum DAC output).

3. Adjust A54R22 POFF control (Figure 5-15) for −5.75 ±0.001 Vdc.

4. Press 8340A Under Test **[CW]** then enter **[6] [9] [9] [9] [.] [9] [9] [9] [9] [9] [MHz]** to set the YO close to 7 GHz (maximum DAC output).

5. Adjust A54R14 PGN control (Figure 5-15) for −17.5 ±0.001 Vdc.

5-28. YO PRETUNE DAC, A54 (Cont'd)

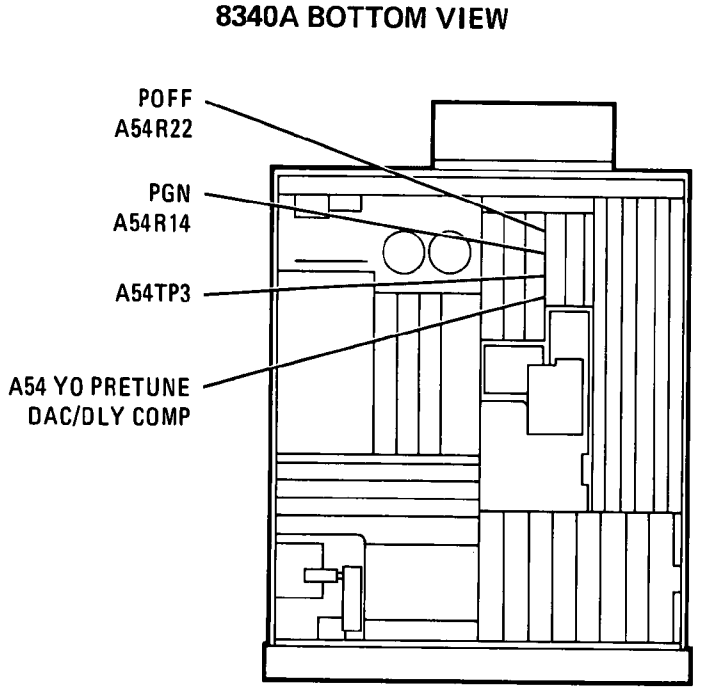


Figure 5-15. YO Pretune DAC Gain Adjustments Location

5-29. YO MAIN DRIVER, A55

Reference:

Performance Test: None
Service Section: Sweep Generator – YO Loop

Description:

The FM coil in the YO is disabled. The Main Coil Driver circuit gain and offset are then adjusted for the correct output frequency.

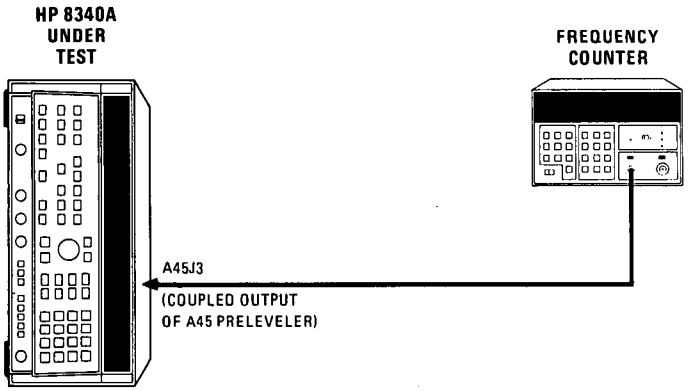


Figure 5-16. YO Main Driver A55 Test Setup

Equipment Required:

Frequency Counter..... HP 5343A

Procedure:

1. Position 8340A in the Test Position as shown in Figure 5-16 with bottom cover removed. Connect equipment as shown in Figure 5-16 and allow one-half hour warm up time.
2. Remove cable W38 from A49J2 and connect a 50 Ohm load to the end of the cable.
3. Set the 8340A Under Test as follows:
   a. Press **[INSTR PRESET]**
   b. Press **[CW]** then enter **[2] [.] [3] [GHz]**.
4. Adjust A55R47 OFFSET (Figure 5-17) for an indication at the Frequency Counter of 2.3 GHz ±1 MHz.
5. Press 8340A **[CW]** then enter **[6] [.] [9] [9] [9] [GHz]**.

5-29. YO MAIN DRIVER , A55 (Cont'd)

6. Adjust A55R4 GAIN (Figure 5-17) for an indication on the Frequency Counter of 6.999 GHz ±1 MHz.

7. Repeat steps 3 through 6 until no further adjustments are necessary.

8. Disconnect Frequency Counter and reconnect cable to A45J3 Preleveler Output. Remove 50 Ohm load from cable W37 and reconnect the cable to A49J2.

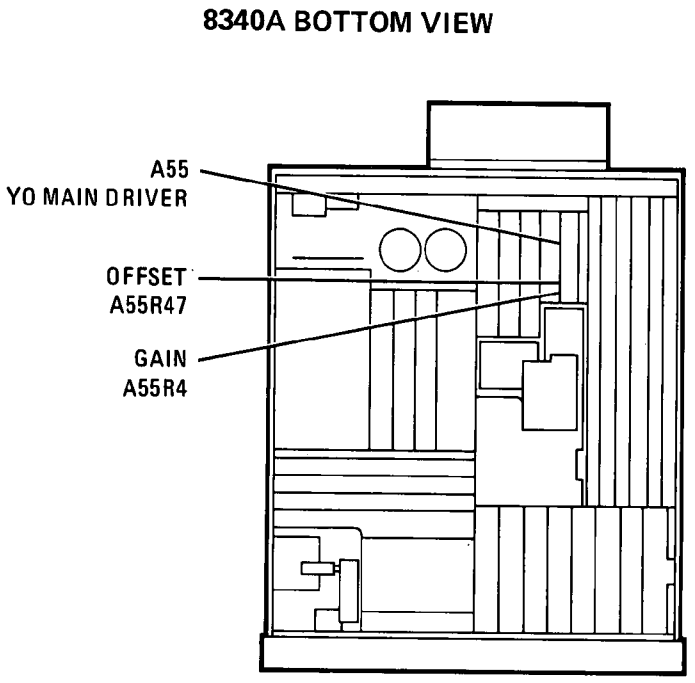


Figure 5-17. YO Main Driver A55 Adjustments Location

5-30. YO LOOP ADJUSTMENTS

Reference:

Performance Test: None
Service Section: Sweep Generator – YO Loop

Description:

This procedure adjusts the sampler drive circuitry and the IF gain.

NOTE

The YO frequency adjustment in Paragraph 5-29 must be completed before these adjustments are made.

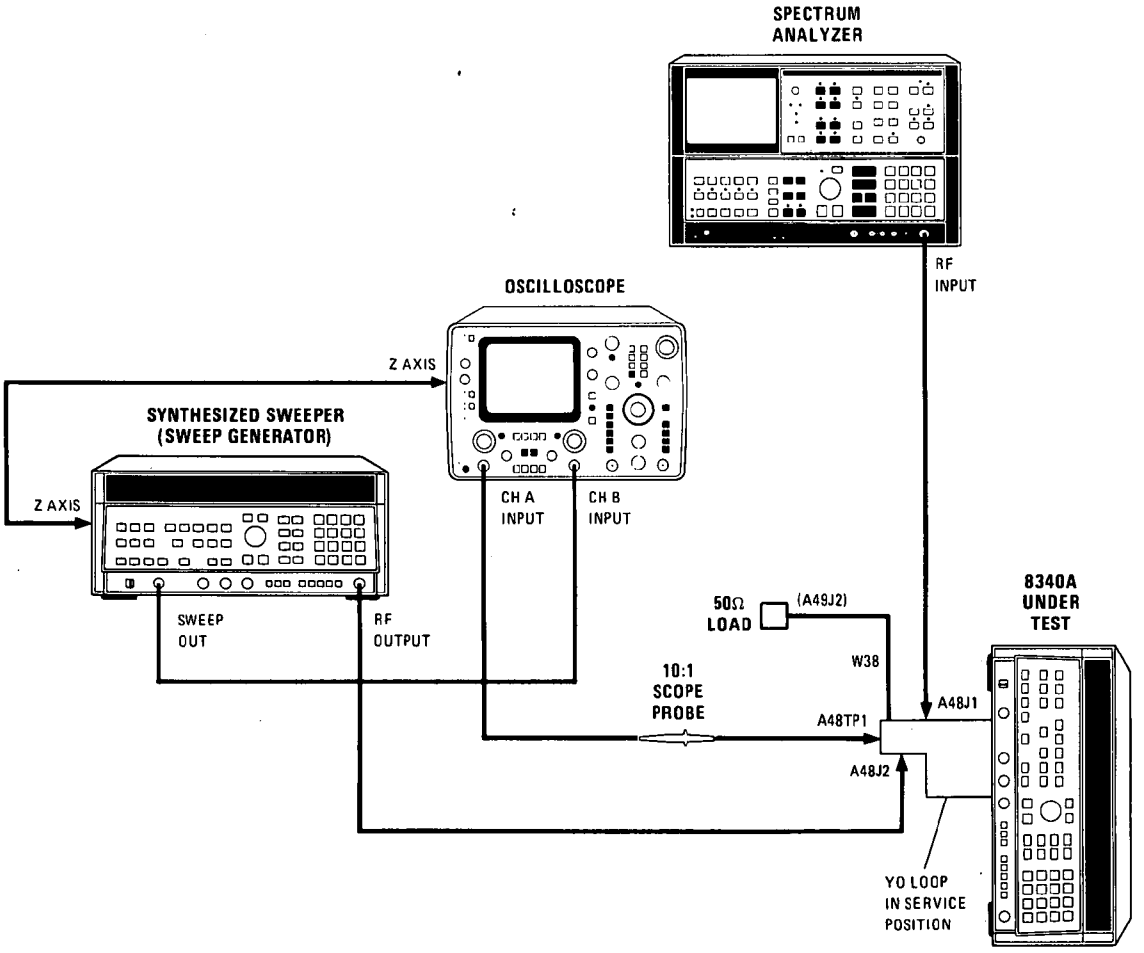


Figure 5-18. YO Loop Adjustment Setup

5-30. YO LOOP ADJUSTMENTS (Cont'd)

Equipment Required:

Spectrum Analyzer	HP 8566A
Synthesized Sweeper	HP 8340A
Oscilloscope	HP 1741A
10:1 Divider Probe	HP 10004D
BNC to SMB Snap-On Test Cable (2 required)	85680-60093

Procedures:

YO LOOP RESPONSE ADJUSTMENT

1. Put 8340A under test in the Test Position. Disconnect rigid cable going into A45 Preleveler RF Output through the mother board. Put the YO Loop section in the Service Position. Disconnect all cables that connect to A48 and A49 PC boards. Remove A48 YO Loop Sampler assembly cover. Connect a 50 Ohm load to W38 at the end that connects to A49J2.

2. Connect equipment as shown in Figure 5-18 except do not connect the Spectrum Analyzer. Set LINE to ON and allow 1/2 hour warmup.

3. Set the Sweep Generator 8340A as follows:

   a. Press **[INSTR PRESET]**
   b. Press **[CF]** (center frequency) then enter **[1] [8] [7] [MHz]**
   c. Press **[ΔF]** then enter **[2] [0] [0] [MHz]**
   d. Press **[POWER LEVEL]** then enter **[3] [dBm]**
   e. Press **[SWEEP TIME]** then enter **[1] [0] [msec]**.

4. At the oscilloscope, set the controls as follows:

   a. Select A vs. B mode
   b. Set Channel A to 0.05 VOLTS/DIV (with 10:1 Probe)
   c. Set Channel B to 1 VOLT/DIV (typically)
   d. Select DC coupled on both channels.

5. On the oscilloscope, adjust channel B VOLTS/DIV (used as horizontal gain in A vs. B mode) for a trace of 10 horizontal divisions on the screen. Adjust oscilloscope POSITION control to center display trace.

6. Press Sweep Generator 8340A **[M1]** and enter **[1] [6] [0] [MHz]**. Press **[M2]** and enter **[2] [1] [0] [MHz]**.

7. Adjust A48C1 and A48C2 response adjustments (Figure 5-19) for a trace on the oscilloscope similar to Figure 5-20. Adjust for flattest response from 160 MHz to 210 MHz. The amplitude of the response should be at least 0.4 Volts peak-to-peak.

5-30. YO LOOP ADJUSTMENTS (Cont'd)

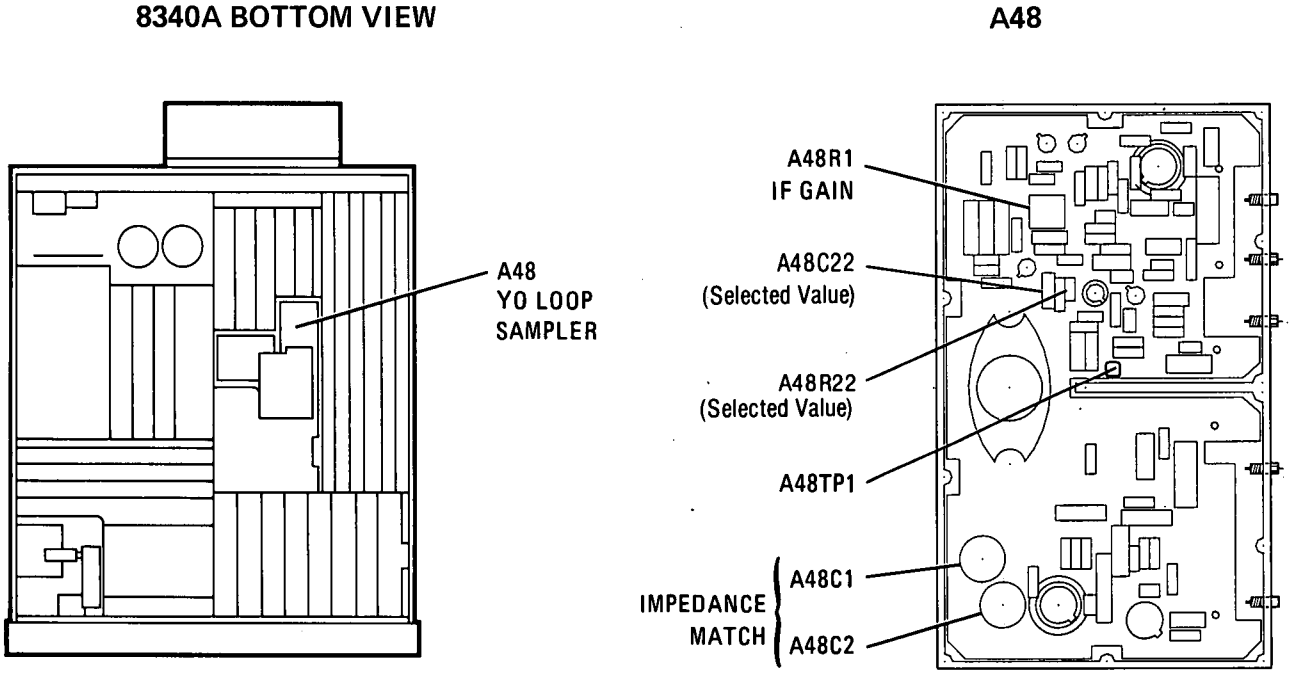


Figure 5-19. Location of YO Loop Adjustments

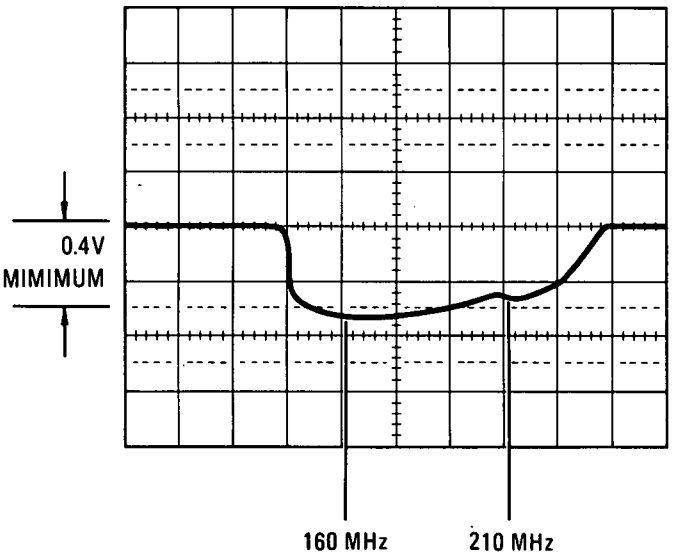


Figure 5-20. Typical Swept Frequency Response at A48TP1

5-30. YO LOOP ADJUSTMENTS (Cont'd)

IF GAIN ADJUSTMENT

8. Verify that the 50 Ohm load is still connected to W38 at the end that was connected to A49J2. Disconnect oscilloscope probe from A48TP1.

9. Connect the Spectrum Analyzer to A48J1.

10. Set the 8340A under Test as follows:

    a. Press **[INSTR PRESET]**
    b. Press **[CW]** then enter **[4]** [.] **[5]** **[GHz]**
    c. Connect a jumper between A59TP4 and A59TP5. (This disables the UNLK annunciator circuit.)

11. Set the Sweep Generator 8340A as follows:

    a. Press **[INSTR PRESET]**
    b. Press **[POWER LEVEL]** then enter **[3]** **[dBm]**
    c. Press **[CW]** then enter **[1]** **[8]** **[6]** **[MHz]**
    d. Press **[SHIFT]** then **[CW]**; press **[STEP]** keys to select 1 kHz resolution.

12. On the Spectrum Analyzer, make the following settings:

    a. Press **[INSTR PRESET]**
    b. Set CENTER FREQ to 30 MHz
    c. Set FREQUENCY SPAN to 60 MHz
    d. Press Marker **[PEAK SEARCH]** then **[SIGNAL TRACK]**.
    e. Set REF LEVEL to +10dBm.

13. Press Sweep Generator 8340A **[CW]** then adjust rotary knob to set a frequency that will produce a center frequency readout on the Spectrum Analyzer of 25.0 MHz. (See Figure 5-21.) Turn off **[SIGNAL TRACK]** on Spectrum Analyzer.

14. On the 8340A under test, adjust A48R1 IF GAIN control for a 25 MHz signal displayed on the Spectrum Analyzer of approximately 4 dBm.

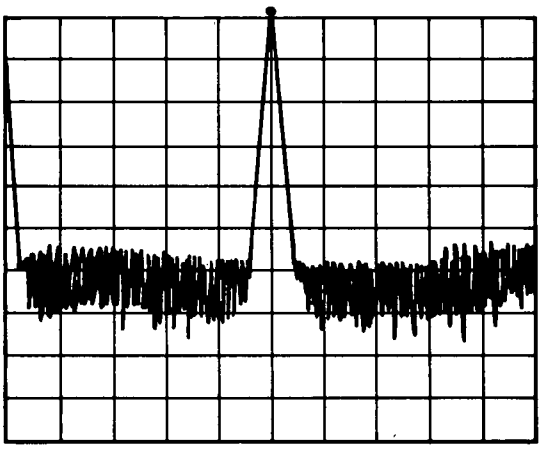


Figure 5-21. YO Loop Gain at A48J1

5-30. YO LOOP ADJUSTMENTS (Cont'd)

15. On the Spectrum Analyzer, make the following settings:

    a. Press **[INSTR PRESET]**
    b. Set CENTER FREQUENCY to 50 MHz
    c. Set FREQUENCY SPAN to 100 MHz
    d. Set REFERENCE LEVEL to +10 dBm
    e. Select 5 dB/DIV
    f. Select MAX HOLD on Trace B

NOTE

If Sweep Generator 8340A frequency is changed too quickly in Step 15, drop outs will occur on the Spectrum Analyzer display. If this happens, slowly adjust the Sweep Generator frequency so that the IF response passes over the drop outs and eliminates them.

16. Slowly tune the Sweep Generator 8340A using the rotary knob while monitoring the display on the Spectrum Analyzer. (Maximum hold may be used on the 8566A Spectrum Analyzer to trace out the IF response as frequency is changed.) Verify that the IF frequency response falls within the limits shown in Figure 5-22. If it does not, select new values for A48C22 and A48R22 to adjust the shape of the response (particularly in the 20 to 30 MHz region). Readjust A48R1 IF GAIN control if necessary.

17. Set 8340A under Test LINE to STANDBY. Disconnect all test cables going into 8340A under test.

18. Remove jumper between A59TP4 and A59TP5.

19. Reinstall A48 cover and reinstall YO Assembly into instrument; reconnect all cables.

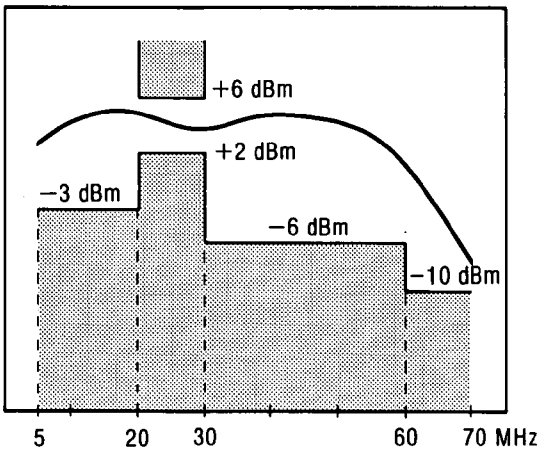


Figure 5-22. IF Frequency Response Limits

5-31. YO DELAY COMPENSATION, A54

Reference:

Performance Test: Swept Frequency Accuracy
Service Section: Sweep Generator - YO Loop

Description:

In this procedure, the programmable width of the YO kick pulse is calibrated. Then the YO delay is adjusted so the marker position tracks from the slowest to the fastest sweep speeds.

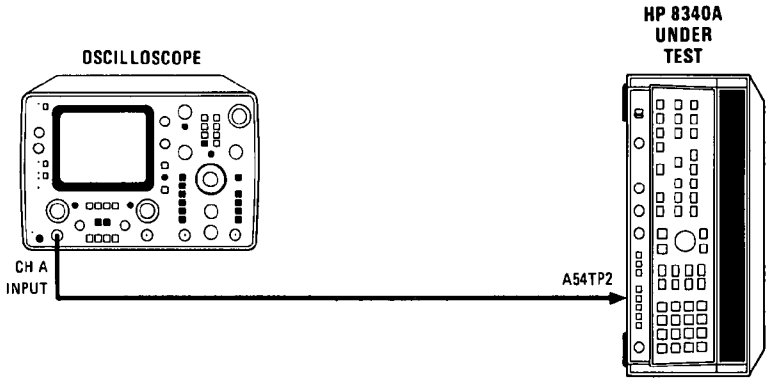


Figure 5-23. YO Kick Pulse Test Setup

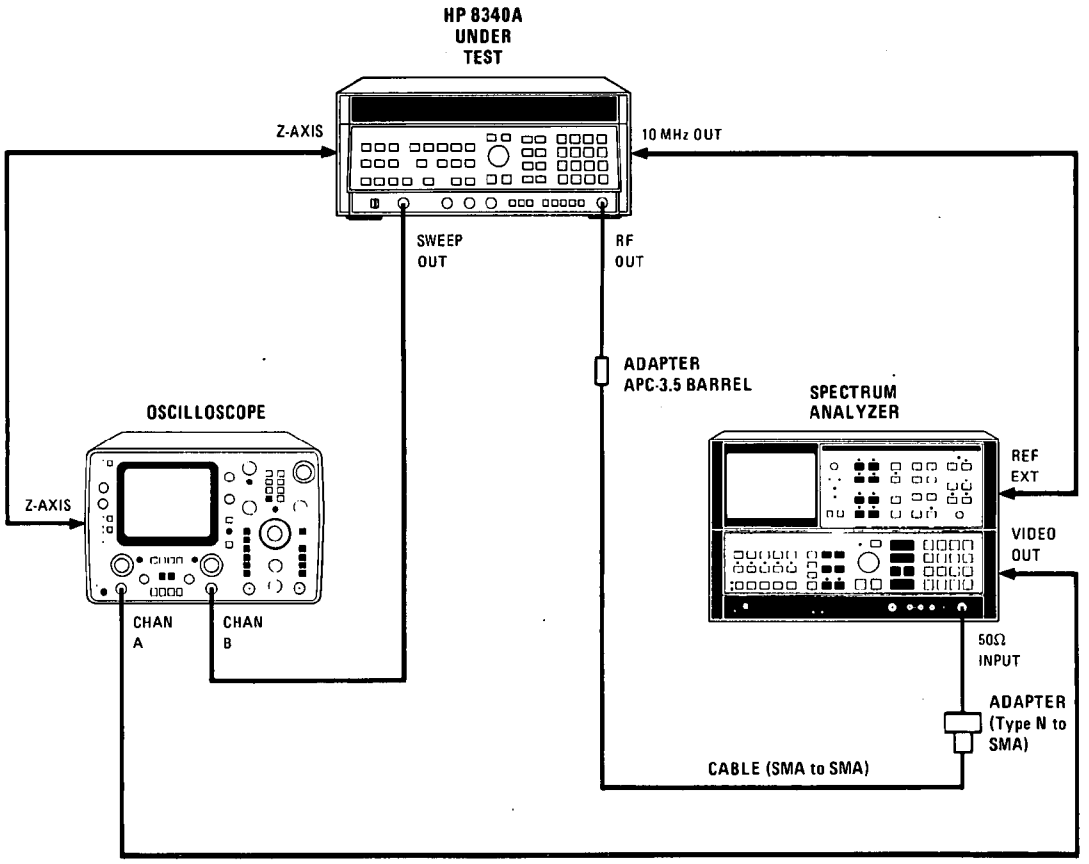


Figure 5-24. YO Delay Compensation Test Setup

5-31. YO DELAY COMPENSATION, A54 (Cont'd)

Equipment Required:

Spectrum Analyzer	HP 8566A
Oscilloscope	HP 1741A
Adapter, APC-3.5 female to female barrel	HP P/N 5061-5311
Cable, SMA male to SMA male	HP P/N 08340-20124

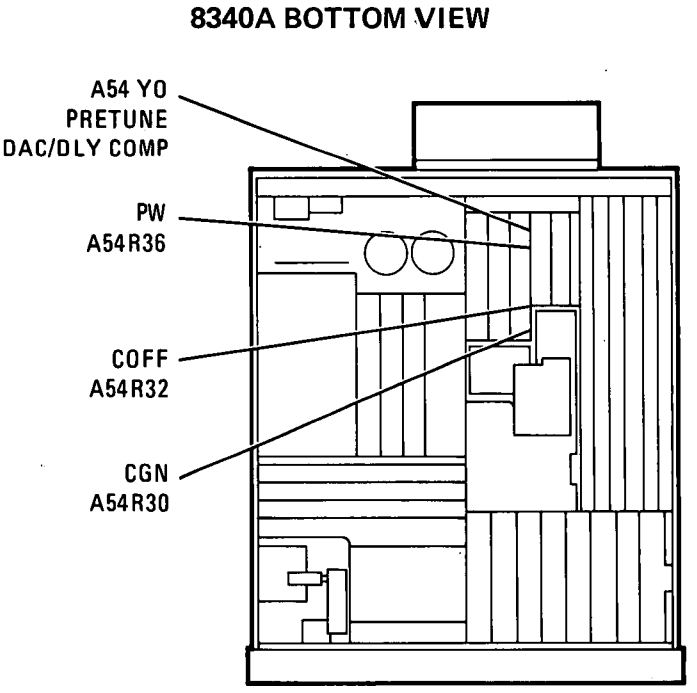


Figure 5-25. YO Delay Compensation Adjustments Location

Procedure:

1. Position the 8340A in the Test Position as shown in Figure 5-23 with bottom cover removed. Connect equipment as shown in Figure 5-23 and allow one-half hour warm up time.

YO KICK PULSE ADJUSTMENT

2. On the 8340A, make the following settings:

   a. Press **[INSTR PRESET]**
   b. Press **[START FREQ]** then enter **[2] [.] [3] [GHz]**
   c. Press **[STOP FREQ]** then enter **[6] [.] [9] [9] [9] [GHz]**.

3. Adjust A54R36 PW control (Figure 5-25) for a 12.5 msec pulse on the oscilloscope.

YO DELAY ADJUSTMENT

4. Connect equipment as shown in Figure 5-24.

5-31. YO DELAY COMPENSATION, A54 (Cont'd)

5. Set the 8340A Under Test as follows:

   a. Press **[INSTR PRESET]**
   b. Press **[START FREQ]** then enter **[6]** [.] **[9]** **[GHz]**
   c. Press **[STOP FREQ]** then enter **[1]** **[3]** [.] **[5]** **[GHz]**
   d. Press **[M1]** then enter **[7]** [.] **[2]** **[GHz]**
   e. Press **[AMTD MKR]** on.
   f. Press **[SAVE]** then enter **[2]**
   g. Press **[SWEEP TIME]** then enter **[2]** **[0]** **[0]** **[msec]**
   h. Press **[SAVE]** then enter **[1]**
   i. Press Frequency Marker **[OFF]**
   j. Press **[M2]** then enter **[1]** **[3]** [.] **[2]** **[GHz]**
   k. Press **[SAVE]** then enter **[3]**
   l. At ENTRY pad, press **[AUTO]** (sweep time)
   m. Press **[SAVE]** then enter **[4]**
   n. Press **[RECALL]** then enter **[1]**

6. At the Spectrum Analyzer, make the following settings:

   a. Press **[INSTR PRESET]**
   b. Press **[CENTER FREQUENCY]** then enter 7.2 GHz
   c. Press **[FREQUENCY SPAN]** then enter 0 Hz
   d. Press **[SINGLE]** Sweep

7. At the 1741A Oscilloscope, make the following settings:

   a. Select A vs. B Mode
   b. Set Channel A Volts/Division to 0.5 V/DIV
   c. Set Channel B Volts/Division to 0.1 V/DIV

8. Press 8340A Under Test **[RF]** to turn RF power off.

9. On oscilloscope, position marker to center screen with horizontal position control. Press oscilloscope MAG X 10. Reposition the beginning of the marker at center line of screen with horizontal position control. (See Figure 5-26.)

10. Press 8340A **[RF]** to turn RF power on.

11. Press Spectrum Analyzer CENTER FREQUENCY key then use rotary knob to set Center Frequency so the peak of the blip is at the center line of the oscilloscope screen. (See Figure 5-27.)

12. Press 8340A **[RECALL]** then enter **[2]**. Press **[RF]** to turn RF power off.

13. Adjust oscilloscope horizontal position to place the beginning of the marker at the center line of the screen.

14. Press 8340A **[RF]** key to turn RF power on. Adjust A54R32 COFF to set the peak of the blip at the center line of the oscilloscope screen.

15. Press 8340A **[RECALL]** then enter **[3]**.

16. Press Spectrum Analyzer CENTER FREQUENCY then enter 13.2 GHz.

5-31. YO DELAY COMPENSATION, A54 (Cont'd)

17. Set oscilloscope Channel B Volts/Division switch to 2 V/DIV.

18. Press 8340A **[RF]** to turn RF power off.

19. Adjust the oscilloscope horizontal position control so the beginning of the marker is at the center line of the screen.

20. Press 8340A **[RF]** to turn RF power on.

21. Press Spectrum Analyzer CENTER FREQUENCY and adjust frequency using rotary knob so the peak of the blip is at the center line of the oscilloscope screen.

22. Press 8340A **[RECALL]** then enter **[4]**. Press **[RF]** to turn RF power off.

23. Adjust oscilloscope horizontal position to place beginning of the marker at the center line of the screen.

24. Press 8340A **[RF]** key to turn RF power on. Adjust A54R30 CGN to set the peak of the blip at the center line of the oscilloscope screen.

25. Press **[RECALL]**, then enter **[1]**. Repeat steps 7 through 24 until no further adjustment of A54R30 CGN and A54R32 COFF is necessary.

26. Disconnect all test equipment and reconnect cables.

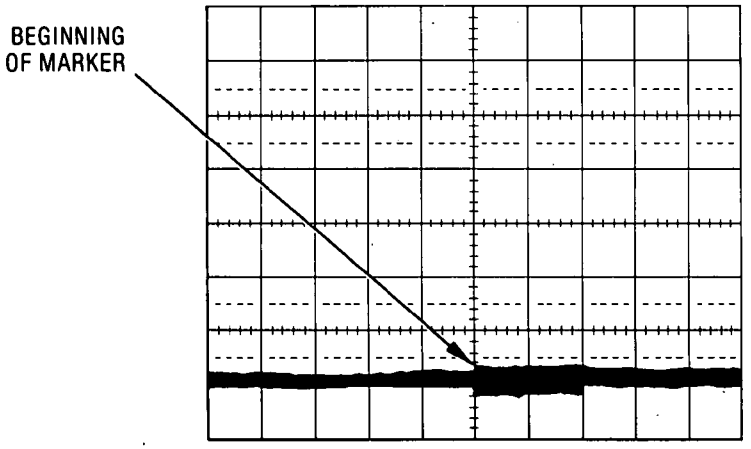


Figure 5-26. Z-Axis Marker Waveform

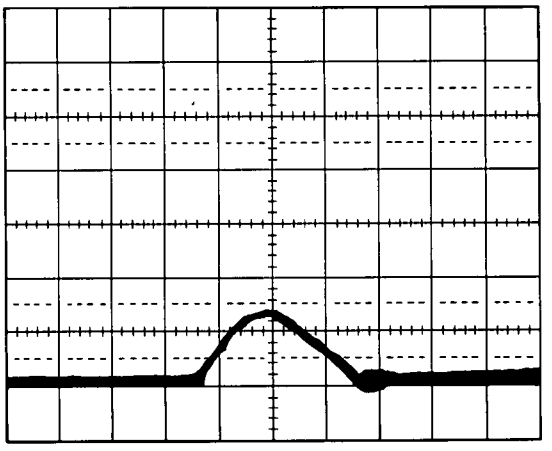


Figure 5-27. Amplitude Marker Waveform

5-32. 3.7 GHz OSCILLATOR, A8

NOTE

This procedure is provided primarily for those cases when the A8A1 circuit board has been repaired or replaced.

Reference:

Performance Test: None
Service Section: RF Section (Power Level Control)

Description:

This procedure monitors the output current of the 100 MHz RF Amplifier that provides the LO signal for the sampler and adjusts for maximum output. The oscillator phase–lock loop is then opened by removing jumper A8E3 and the balance is adjusted at the output of the sampler to obtain a symetrical square wave of approximately 35 Volts peak–to–peak to drive the phase–lock amplifier.

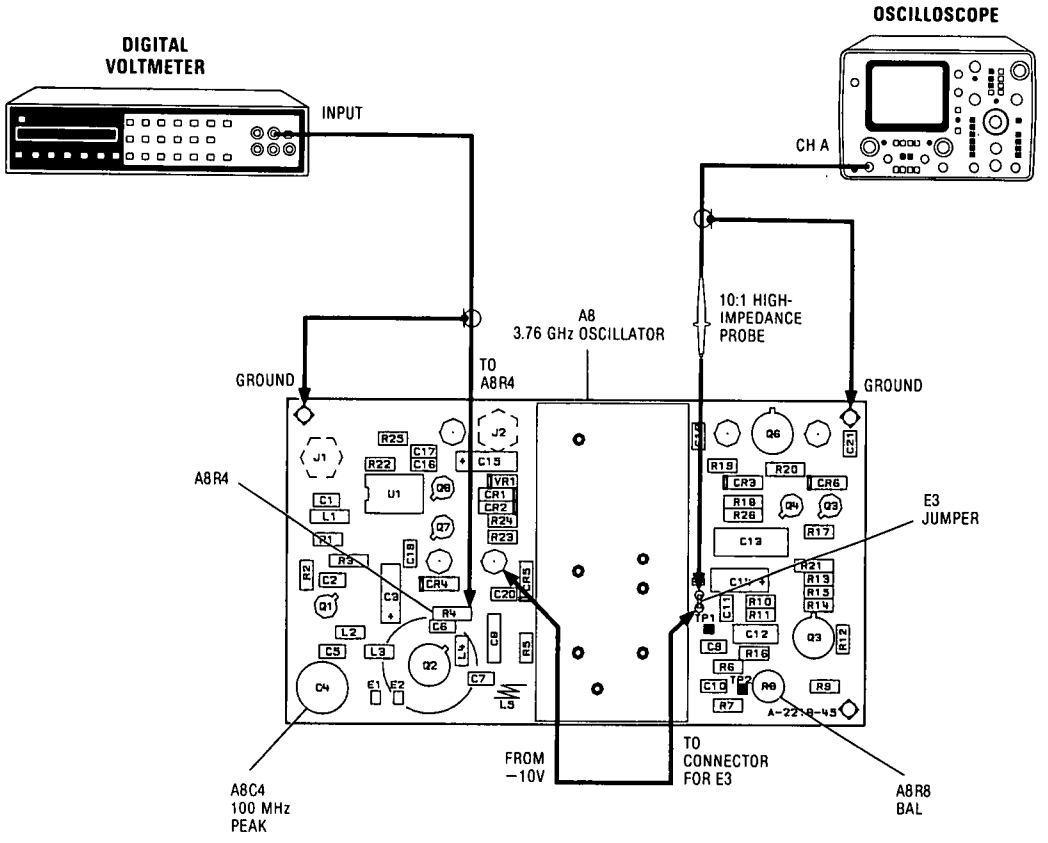


Figure 5-28. A8 3.7 GHz Oscillator Test Setup

5-32. 3.7 GHz OSCILLATOR, A8 (Cont'd)

Equipment Required

Digital Voltmeter	HP 3455A
Oscilloscope	HP 1741A
10:1 Divider Probe	HP 10004D

Procedure

1. Connect DVM to A8R4 as shown in Figure 5-28.
2. Adjust A8C4 100 MHz Peak for minimum indication on DVM. (This is maximum current through A8R4 and A8Q2.)
3. Turn off HP 8340A and remove DVM connections from A8R4.
4. Remove jumper A8E3. Connect a jumper from the −10 Volt terminal to the lower connection point for E3 as shown in Figure 5-28. (This applies −10 Volts to the Oscillator.)
5. Connect the Oscilloscope 10:1 high-impedanced probe to the upper connection point for E3 as shown in Figure 5-28.
6. Adjust A8R8 BAL control for a 50% duty cycle square wave with approximately 35 Volts peak-to-peak signal.
7. Turn off 8340A, remove the −10 Volt jumper and oscilloscope probe connections, and reinstall jumper A8E3 in its original position.

5-33. MARKER/BANDCROSS, A57

Reference:

Performance Test: None
Service Section: Controller

Description:

This procedure adjusts the manual sweep for a range of 0 to 10 Volts and sets the end of sweep at 10 Volts.

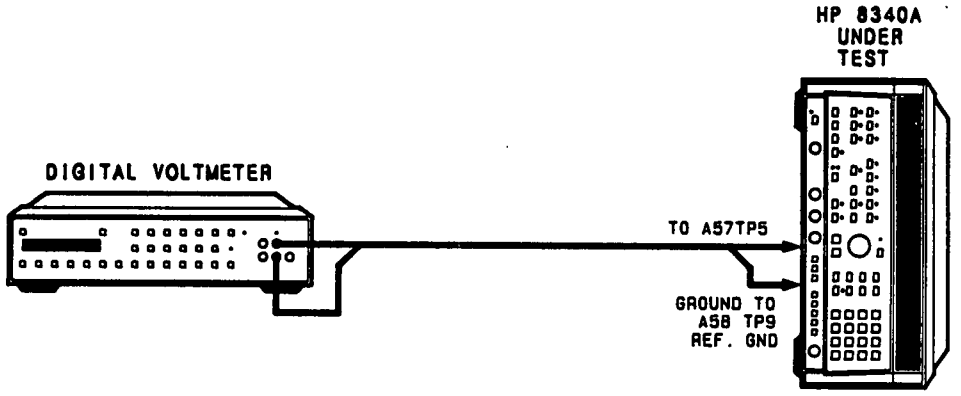


Figure 5-29. Marker Band Crossing Test Setup

Equipment Required:

Digital Voltmeter ..... HP 3455A

Procedure:

MANUAL SWEEP GAIN

1. Position the HP 8340A in the Test Position and connect equipment as shown in Figure 5-29. Allow one-half hour for warmup.
2. Set the HP 8340A Under Test as follows:
   a. Press **[INSTR PRESET]**
   b. Press **[START]** then enter **[4] [GHz]**
   c. Press **[STOP]** then enter **[5] [GHz]**
   d. Press **[MANUAL]** Sweep
   e. Press **[SHIFT] [GHz]** then enter **[1] [3] [Hz]**, **[SHIFT] [MHz]** then enter **[2] [Hz]**, and **[SHIFT] [kHz]** then enter **[1] [0] [0] [0] [Hz]**. (This writes decimal 1,000 to IO address 13, R2.)
3. Adjust A57R33 MAN GAIN control (Filgure 5-29) for 10.0000 ±0.0005 Vdc at A57TP5 as indicated on DVM.

5-33. MARKER/BANDCROSS, A57 (Cont'd)

END OF SWEEP ADJUSTMENT

4. Set the 8340A Under Test as follows:

   a. Press **[INSTR PRESET]**
   b. Press **[START FREQ]** then enter **[4] [GHz]**
   c. Press **[STOP FREQ]** then enter **[5] [GHz]**
   d. Press **[SHIFT]** then **[XTAL]** to stop the sweep at the end of band (5 GHz).

5. Connect DVM to A57TP5 SWEEP OUT.

6. Adjust A57R32 EOS control (Figure 5-30) for an indication on the DVM of 10.000 ±0.0008 Vdc.

7. Press **[CONT]** Sweep key after each adjustment is made for an update of end of sweep indication.

8. Repeat steps 6 and 7 until no further adjustment is needed.

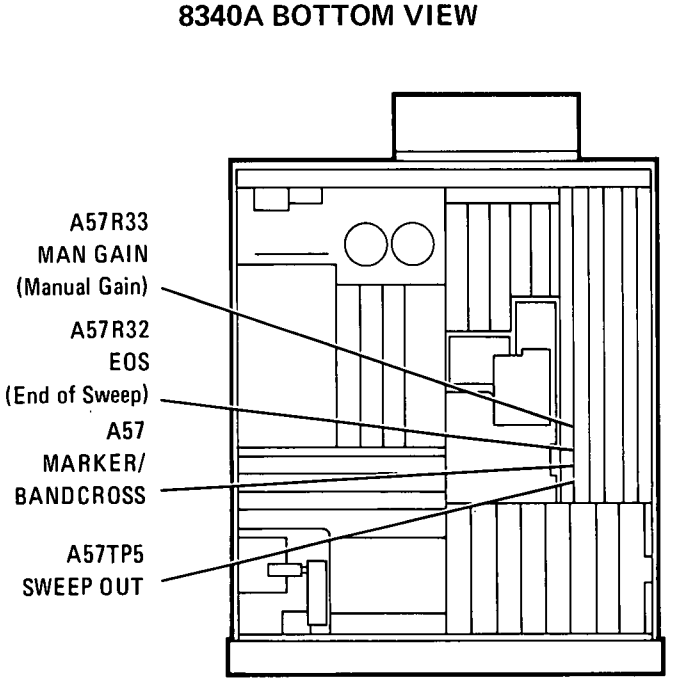


Figure 5-30. Marker Band Crossing Adjustments Location

5-34. SWEEP GENERATOR, A58

Reference:

Performance Test: Swept Frequency Accuracy
Service Section: Sweep Generator - YO Loop

Description:

The first section adjusts the gain of the sweep ramp amplifier. The next section adjusts the reset error. The last section adjusts the relationship between the VSWP ramp signal and the marker ramp.

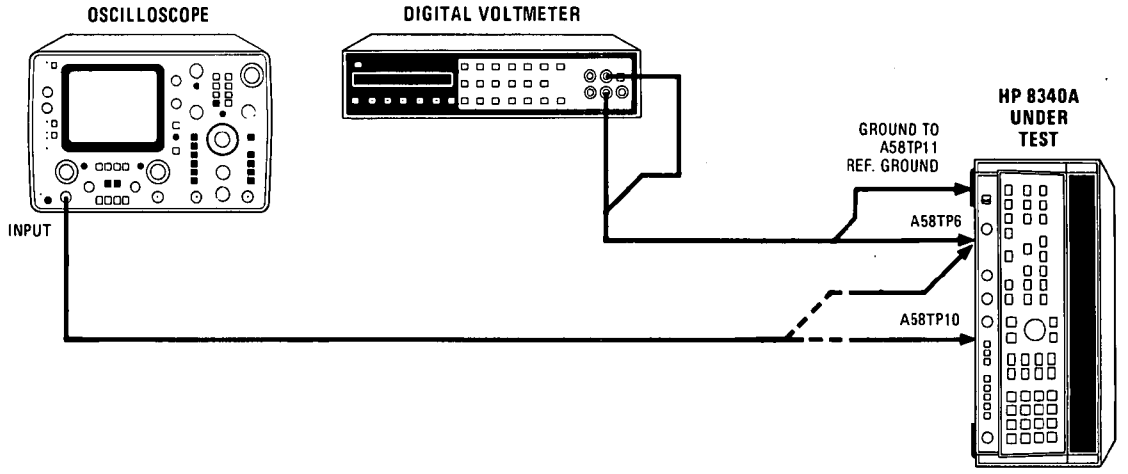


Figure 5-31. Sweep Generator Test Setup

Equipment Required:

Oscilloscope	HP 1741A
Digital Voltmeter (DVM)	HP 3455A

Procedure:

1. Position the 8340A in the Test Position as shown in Figure 5-31 with bottom cover removed. Connect oscilloscope to A58TP6. Allow one-half hour warm up time.

SWEEP RAMP GAIN ADJUSTMENT

2. Press 8340A **[INSTR PRESET]** then **[START FREQ]**. Enter **[2] [.] [3] [GHz]**.
3. Press 8340A **[STOP FREQ]** then enter **[7] [GHz]**.
4. Press **[SWEEP TIME]** then enter **[1] [0] [msec]**.
5. Adjust A58R4 SWP TIME control (Figure 5-32) for a 10 mSec ramp on oscilloscope (Figure 5-33).

5-34. SWEEP GENERATOR, A58 (Cont'd)

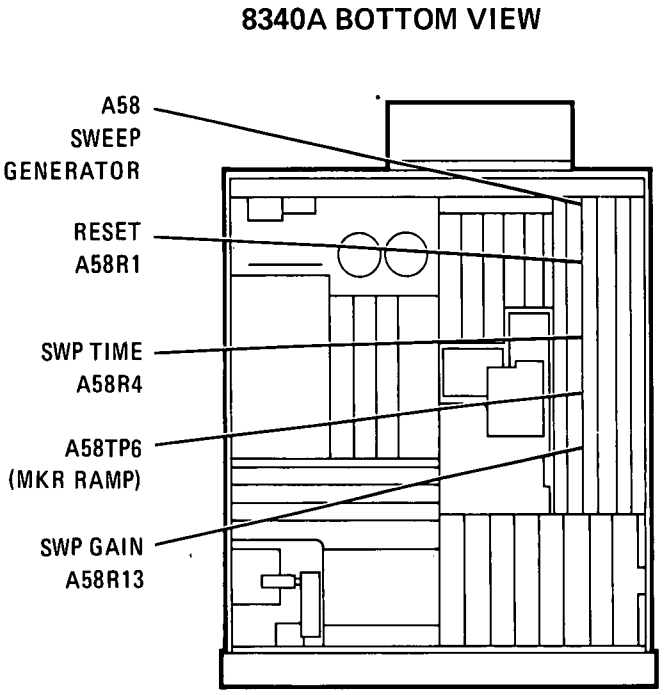


Figure 5-32. Sweep Generator Adjustments Location

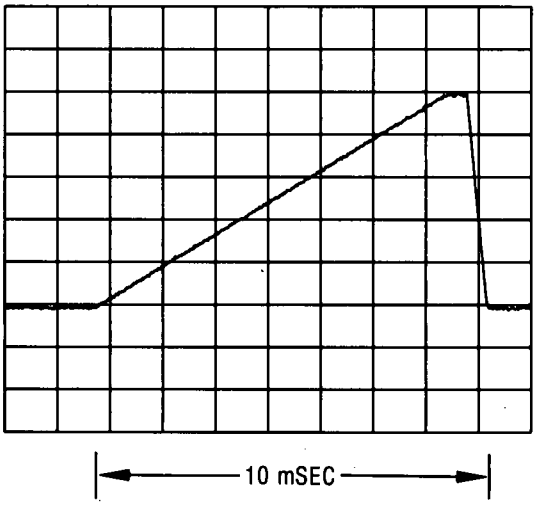


Figure 5-33. Sweep Ramp at A58TP6

5-34. SWEEP GENERATOR, A58 (Cont'd)

RESET ERROR ADJUSTMENT

6. Connect oscilloscope to A58TP10.

7. Press 8340A **[INSTR PRESET]**.

8. Adjust A58R33 RESET control (Figure 5-32) for as close as possible to zero Volt average on the oscilloscope. (See Figure 5-34.)

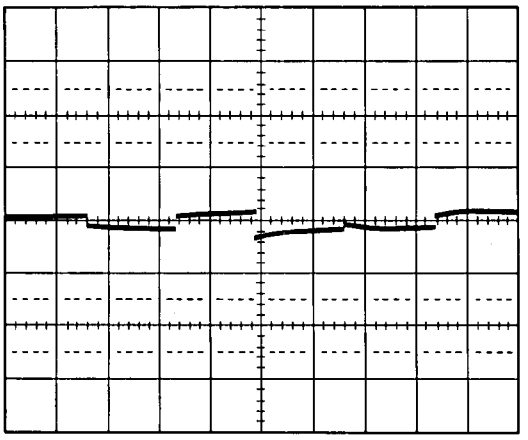


Figure 5-34. Reset Pulse Adjusted to Zero Volt Average

SWEEP GAIN ADJUSTMENT

9. Connect DVM to A58TP6 MKR RMP and connect DVM ground to A58TP11 REF. Ground.

10. Set the 8340A controls as follows:

    a. Press **[INSTR PRESET]**
    b. Press **[START FREQ]** then enter **[2]** [.] **[3]** **[GHz]**
    c. Press **[STOP FREQ]** then enter **[7]** **[GHz]**
    d. Press **[SHIFT]** then **[XTAL]** to stop the sweep at the end of sweep (7 GHz).

11. Record reading at DVM.

12. Connect DVM to A58TP14 VSWP.

13. Adjust A58R13 SWP GAIN control so that the DVM reading at A58TP14 = 94% of Reading at A58TP6 taken in step 11.
    EXAMPLE:

    a. DVM reading in step 11 at A58TP6 = 9.9884 Volts
    b. (0.94)(9.9884V)=9.38909 Volts
    c. Adjust A58R13 for DVM reading at A58TP14 of 9.38909 Volts.

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS

NOTE

If equipment and the program are available to do the automated Unleveled Power Test and Adjustment described in manual supplement titled "Automated Test Procedures," it should be used instead of these procedures in Paragraph 5-35.

Reference:

Performance Test: Maximum Leveled Output Power and Accuracy

Service Section: RF Section

Description:

The A28 SYTM Driver Assembly is adjusted to cause the STYM frequency response to track the YO frequency. When the YO frequency is in the center of the SYTM passband, the power loss through the SYTM is minimum; therefore, SYTM tracking is adjusted while viewing power out versus frequency and adjusting the SYTM tracking for maximum power out. The SRD bias is also adjusted for maximum power out. Since either adjustment may cause squegging (a power drop-out at the peak of the bandpass caused by an undesired oscillation of the SYTM's bias circuit), the tracking and SRD bias adjustments are made at the same time.

Sometimes you cannot tell by just the unleveled trace that the instrument is squegging. Sometimes, as the SRD bias is adjusted, the unleveled power will start to rise and then it will fall off. When it starts to fall off, it is an indication of possible squegging (usually in Band 2).

In Bands 2, 3, and 4, squegging occurs in the SRD diode circuit and is a function of SRD bias, power output, and tracking. In Band 1, squegging occurs in the SYTM YIG sphere and is a function of input power to SYTM.

Kick pulses are generated at retrace for the SYTM. These kick pulses are used so that the magnetics of the SYTM will always start from the same condition. The pulses have the effect of temporarily tuning the SYTM above the stop frequency and then below the start frequency. Since the kick pulses also affect delay, the kick pulse amplitudes are adjusted in this procedure.

NOTE

The following adjustments should be checked or adjusted before making the adjustments in this procedure: Power Supplies, 20/30 Loop, M/N Loop, Pretune, YO Loop, and Sweep Time.

5-35. UNLEVELED OUTPUT ADJUSTMENTS (Cont'd)

HO2 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION HO2.

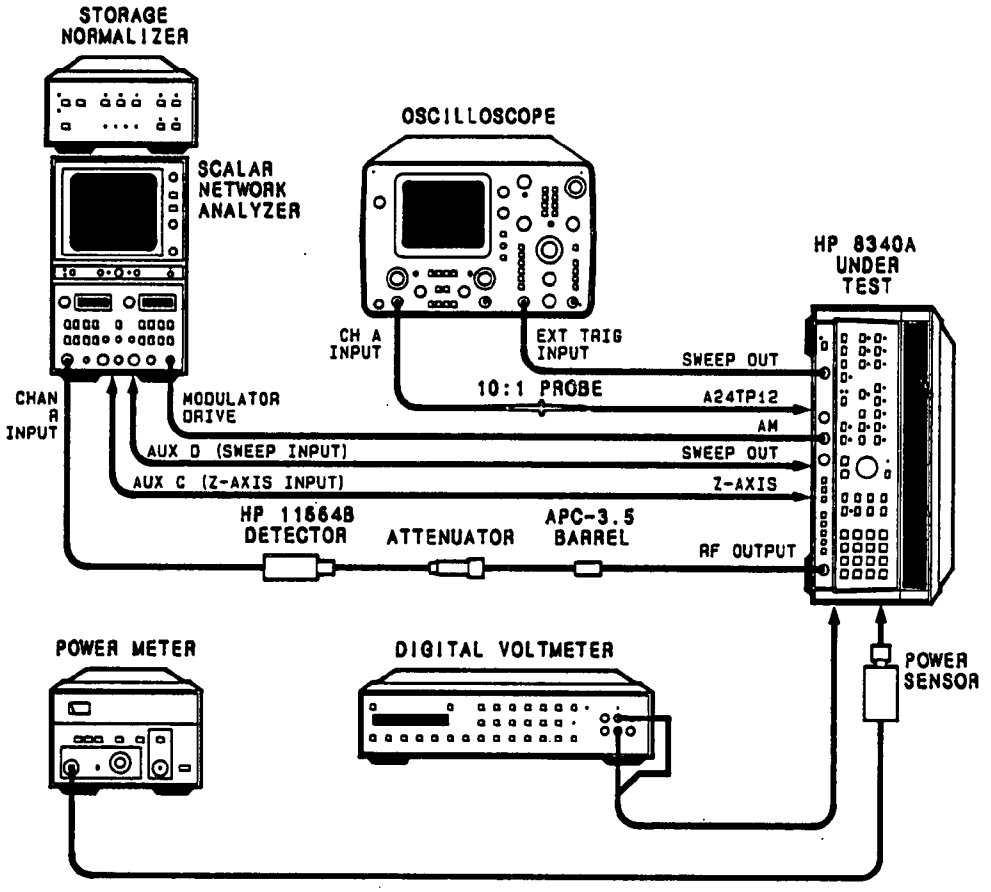


Figure 5-35. SYTM Tracking and Delay, and Unleveled SRD Bias Adjustment Test Setup

Equipment Required:

Frequency Response Test Set	HP 8755C
Detector	HP 11664B
Storage Normalizer	HP 8750A
Oscilloscope	HP 1741A
10:1 Divider Probe	HP 10004D
Digital Voltmeter	HP 3455A
Power Meter	HP 436A
Power Sensor	HP 8485A
10 dB Attenuator	HP 8493C Option 010

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

HO2 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION HO2.

Procedure:

1. Place the 8340A in the Test Position and connect equipment as shown in Figure 5-35. Connect Digital Voltmeter (DVM) to 8340A rear-panel 1 V/GHz output connector. Allow one-half hour warmup time.
2. Press 8340A **[CW]** then enter **[1] [0] [MHz]**.
3. Adjust A28R85 +10 ADM control for an indication on the DVM of 10 mV ±1 mV.

INITIAL SETTINGS

NOTE

Once these initial settings have been made it will be necessary to complete this procedure and the SRD Bias adjustments.

If the A24 Assembly or the SYTM has been replaced, set A24R5 X2C, A24R8 X3C, and A24R11 X4C controls fully counterclockwise and center A24R12 MIN control.

4. Set A24R1 (OFF A) (Figure 5-36) and A24R2 (OFF B) controls fully clockwise.
5. Set A26R88 (MO) fully clockwise.
6. The A26 Assembly contains an ALC Loop gain control for each band. These controls may not require adjustment at this point; however, if the A26 Assembly has been replaced, these controls should be centered initially to ensure that a reasonable power level is obtained before making SYTM tracking adjustments. Center loop gain controls HET, X1, X2, X3, and X4 on the A26 Linear Modulator board **only if the ALC circuits require adjustment.**

SYTM TRACKING AND UNLEVELED SRD BIAS ADJUSTMENTS

7. Connect oscilloscope 10:1 probe to SRD BIAS test point, A24TP12. Press 8340A **[INSTR PRESET]**. Power level should be 0 dBm. Press **[START FREQ]** and enter **[6] [.] [9] [GHz]**. Press **[STOP FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[SWEEP TIME]** and enter **[2] [0] [0] [msec]**. Press **[XTAL]** leveling key to obtain non-leveled operation. The 8755C Modulation output must be connected to the 8340A AM INPUT. Press **[SHIFT] [PULSE]** keys.

   The 8755A display of output power versus frequency should be similar to Figure 5-37 and the oscilloscope SRD bias display should be similar to Figure 5-38.

   Turning the X2A/B, X3A/B, or X4A/B controls clockwise when in the appropriate band will increase the SRD bias and be closer to the squegging region. If squegging occurs, turn the above controls CCW.

THIS PAGE SUPERSEDES MANUAL CHANGE SUPPLEMENT PAGE C-82, IN CHANGE 3

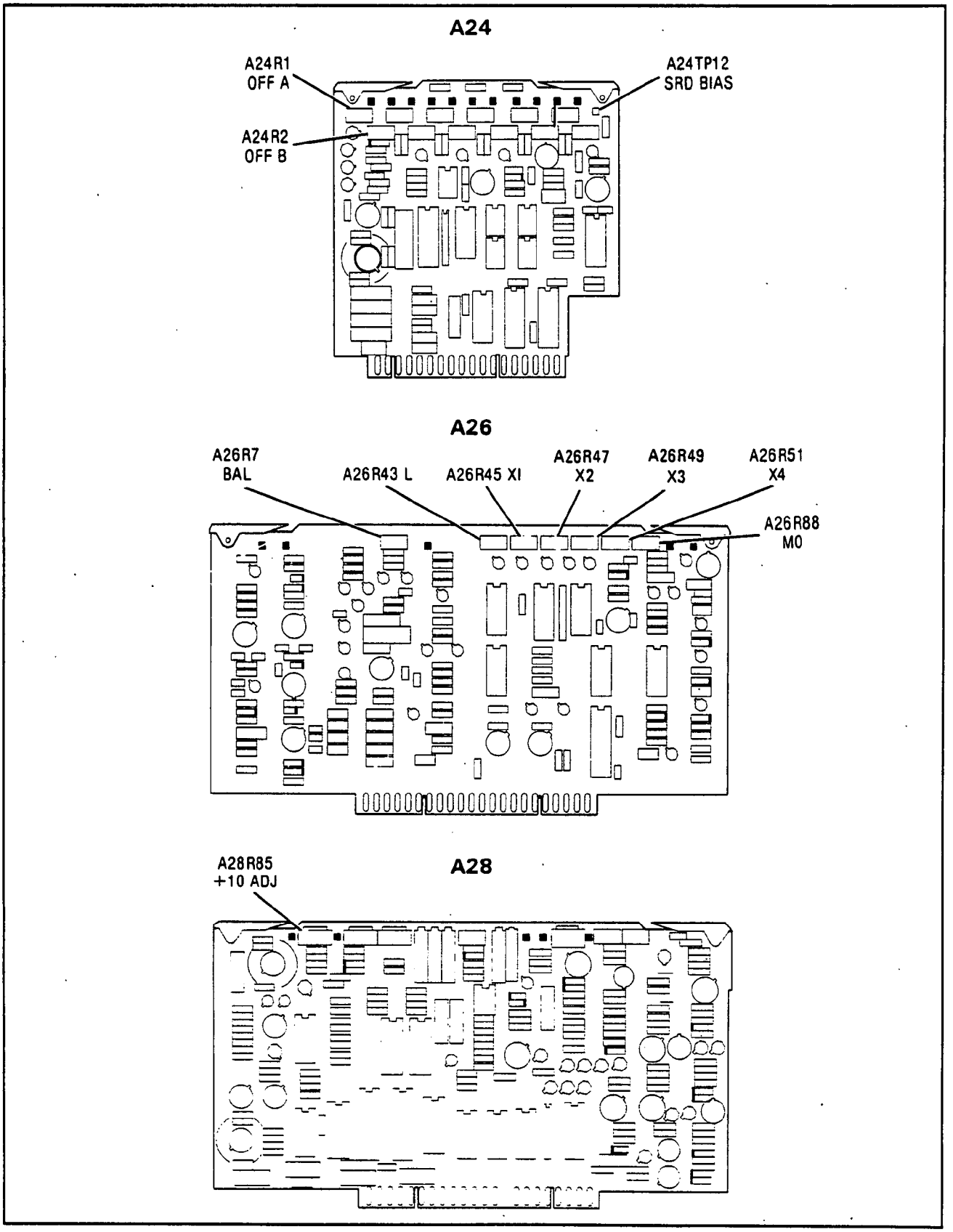
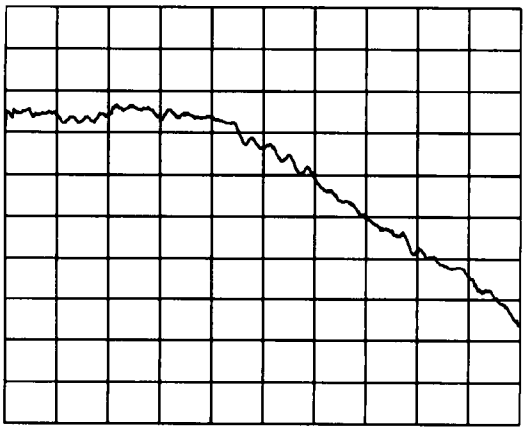


Figure 5-36. SRD Bias Adjustments Locations

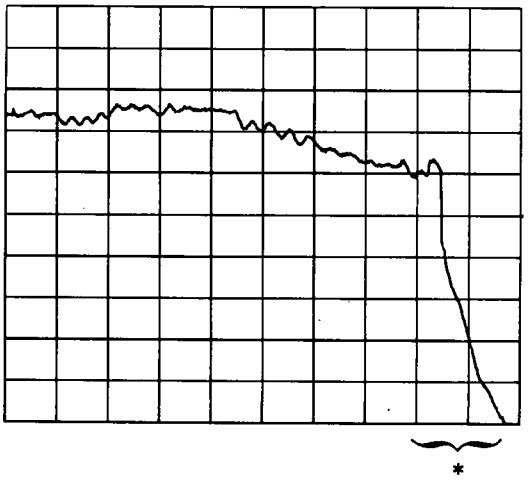
5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

NOTE

If the oscilloscope trace is flat or slopes down, the following adjustments will be more difficult to optimize. Therefore, adjust A24R3 (X2A) and A24R4 (X2B) in Band 2 only for maximum output power, but also for a slight upward slope with no squegging (a power drop-out at the peak of the bandpass caused by an undesired oscillation of the SYTM bias circuit). A slight adjustment of either control (X2A or X2B) will affect the slope considerably and should have little affect on the output power. Detailed instructions for these adjustments are given in the following steps.



WAVEFORM A
(NO SQUEGGING)



WAVEFORM B
*(TYPICAL SQUEGGING AREAS)

Figure 5-37. 8755C Display of Power Out Versus Frequency

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

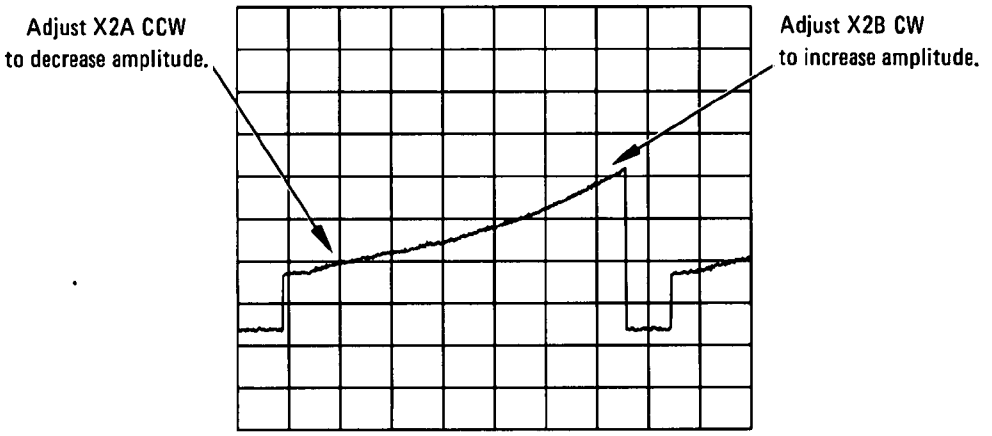


Figure 5-38. Oscilloscope Display of SRD Bias Waveform.

NOTE

The following steps assume that pressing [INSTR PRESET] will set the power level to 0 dBm. If the 8340A Under Test programs the power to other than 0 dBm during INSTR PRESET, change calibration constant Number 56 to 0. Record the original Power value so that you can restore it after all adjustments are made.

NOTE

In the following steps, adjust for maximum power in each band with no squegging.

8. Set 8755C to 1 dB/DIV. Access 8340A Calibration Constant Number 10 by entering the following: **[SHIFT] [GHz] [1] [0] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. (Refer to Paragraph 5-15.) Use the rotary knob or the ENTRY keyboard and set Calibration Constant Number 10 to 1024.

9. For Band 2 (6.9 to 13.5 GHz), adjust A28R1 (OFF) (Figure 5-39) and A24R3 (X2A) for maximum power at the low frequency end. Adjust A28R8 (GAIN) and A24R4 (X2B) for maximum power at the high frequency end. These adjustments will interact so iterate for optimum settings. Observe the oscilloscope SRD Bias display for a slightly upward slope. Re-adjust X2A and/or X2B slightly if necessary to obtain the correct slope. Once the tracking has been optimized, store the trace in the 8750A Storage Normalizer by setting both 8755C inputs to R, setting the dB/DIV and offset of both 8755C channels the same. Press 8750A CH 1 INPUT, STORE INPUT, and RECALL. Activate the Auto Track function by pressing **[SHIFT] [PEAK]**. Iterate using A28R1 (OFF) and **[SHIFT] [PEAK]** to get the best overall results. When adjusting A28R1 (OFF), be sure to try both directions from the original optimized setting.

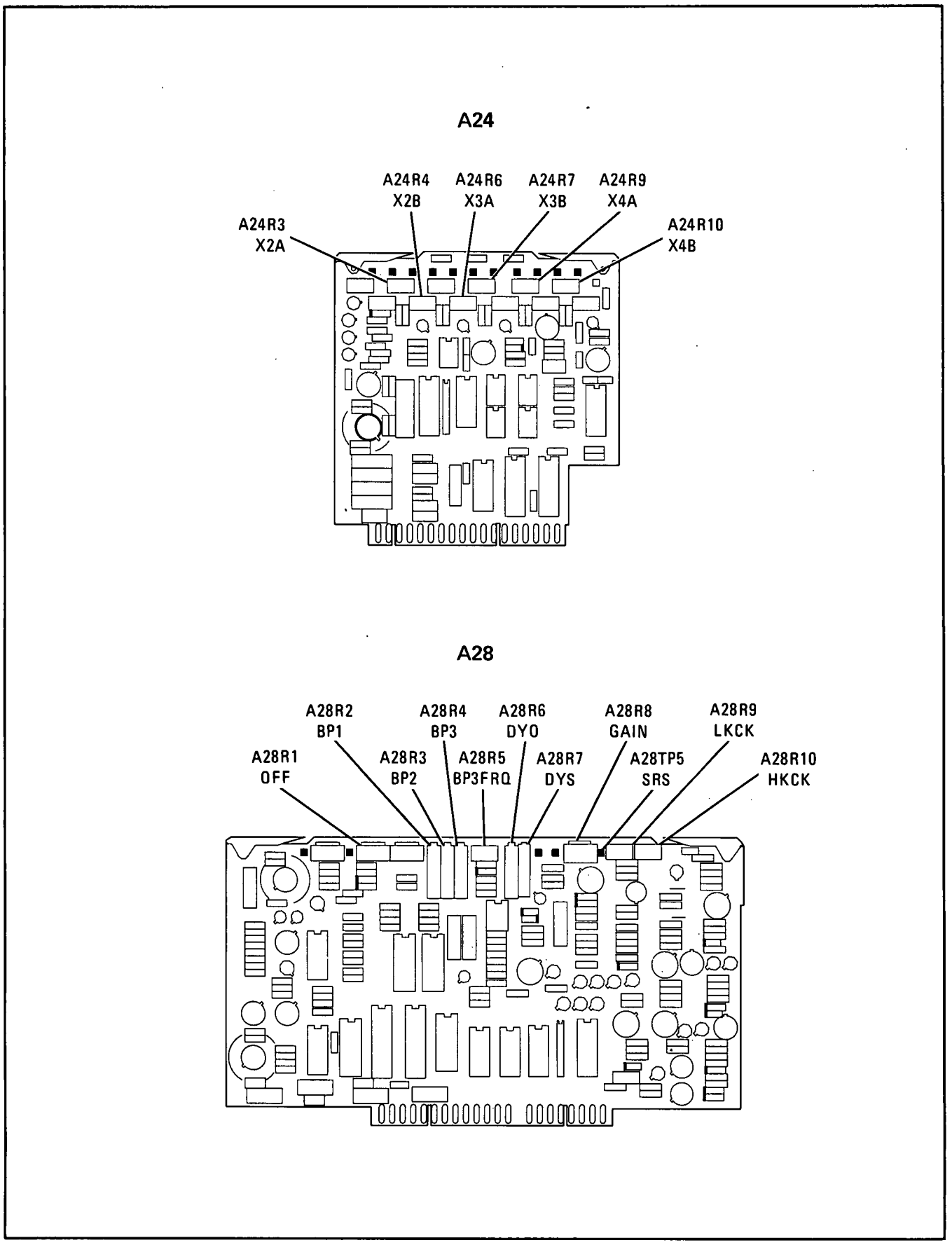


Figure 5-39. Bias, A24, and Tracking and Delay Compensation, A28 Adjustments Location

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

10. For Band 1, press **[START FREQ]** and enter **[2] [.] [3] [GHz]**. Press **[STOP FREQ]** and enter **[7] [.] [0] [GHz]**. Adjust A28R113 (B1 OFF) for maximum power at the low frequency end. Access Calibration Constant Number 9 by entering the following: **[SHIFT] [GHz] [9] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 9 for maximum power at the high frequency end.

    Fundamental band sphere squegging may occur with these adjustments. The cause is different from the squegging in other bands. It is a function of input power to the SYTM and cannot be adjusted out. Normal operation of the instrument is below the power level where this occurs so it can be overlooked when making adjustments.

11. For Band 3, press **[START FREQ]** and enter **[1] [3] [.] [3] [5] [GHz]**. Press **[STOP FREQ]** and enter **[2] [0] [GHz]**. Adjust A24R6 (X3A) and Calibration Constant Number 11 for maximum power at the low frequency end. Access Calibration Constant Number 11 by entering the following: **[SHIFT] [GHz] [1] [1] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust A28R2 (BP1) and A24R7 (X3B) for maximum power at the high frequency end. Once the tracking has been optimized, store the trace in the 8750A Storage Normalizer by setting both 8755C inputs to R, setting the dB/DIV and offset of both 8755C channels the same. Press 8750A CH 1 INPUT, STORE INPUT, and RECALL. Activate the Auto Track function by pressing **[SHIFT] [PEAK]**. Iterate using the Auto Track function and A28R2 (BP1) to match the stored trace as closely as possible. The adjustment of A28R2 should be tried in both directions from the original optimized settings.

12. For Band 4, press **[START FREQ]** and enter **[1] [9] [.] [8] [GHz]**. Press **[STOP FREQ]** and enter **[2] [6] [.] [5] [GHz]**. Access Calibration Constant Number 12 by entering the following: **[SHIFT] [GHz] [1] [2] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust A24R9 (X4A) and Calibration Constant Number 12 for maximum power at the low frequency end, A28R3 (BP2) for maximum power at the center, and A28R4 (BP3), A28R5 (BP3FRQ), and A24R10 (X4B) for maximum power at the high frequency end. Once the tracking in Band 4 has been optimized, store the trace in the 8750A Storage Normalizer by setting both 8755C inputs to R, setting the dB/DIV and offset of both 8755C channels the same. Press 8755C CH 1 INPUT, STORE INPUT, and RECALL. Activate the Auto Track function by pressing **[SHIFT] [PEAK]**. Compare the resulting trace to the stored trace and readjust A28R3 (BP2), A28R4 (BP3), and A28R5 (BP2FRQ) as before. Substitute **[SHIFT] [PEAK]** for the adjustment of Calibration Constant Number 12.

    The adjustments of A28R3, A28R4, and A28R5 should be tried in both directions during the iteration process with auto tracking. In some cases, better results are obtained by adjusting a control away from the optimum position then pressing **[SHIFT] [PEAK]** for Auto Tracking code.

SYTM DELAY COMPENSATION ADJUSTMENTS BY BAND

Description:

Delay compensation is adjusted for minimum change in SYTM frequency tracking between a slow sweep and a fast sweep. Since the kick pulses affect delay, the kick pulse amplitude is adjusted as well.

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

NOTE

SYTM kick pulses are generated at a SYTM retrace to reset SYTM magnetic state. The kick pulse has the effect of temporarily tuning the SYTM above the stop frequency and then below the start frequency. The following adjustments ensure that the pulse amplitude is sufficient to kick the SYTM frequency above and below the stop and start frequencies. The positive going voltage of the SRS waveform corresponds to the low frequency kick and the negative going voltage of the SRS waveform corresponds to the high frequency kick.

13. Connect the oscilloscope 10:1 probe to A28TP5 (SRS). Set oscilloscope to trigger at the end of the sweep ramp (i.e., NEG TRIGGER on 8340A SWEEP OUT signal). Set oscilloscope Channel A V/DIV switch to 0.1 (with 10:1 probe).

14. Press **[SAVE]** and enter **[1]** to save the instrument state set up in step 12. Temporarily set the 8340A to CW at 2.3 GHz (Press **[CW]** and enter **[2] [.] [3] [GHz]**). Press **[CONT]** Sweep key to give a sweep ramp for oscilloscope trigger. The oscilloscope should display a horizontal trace. Use the vertical position control to position the trace one division down from the top graticule line. This position represents the start frequency. Enter **[2] [6] [.] [5] [GHz]** and note the position of the oscilloscope trace. This represents the stop frequency. Press **[RECALL] [1]** to return to the previous instrument state.

NOTE

The range for the delay compensation calibration constants is 0 through 131. If the calibration constants do not provide enough range for the delay compensation, Calibration Constant Number 8 may be lowered, A28R6 and A28R7 readjusted in Band 4, and all of the delay compensation calibration constants will require readjustment. If the SYTM has been replaced, set Calibration Constant Number 8 to 120 initially.

15. Store the Band 4 trace of the 200 msec sweep in the 8750A Storage Normalizer by setting both 8755C inputs to channel R, setting the dB/Div and offset of both 8755C channels the same, press 8750A CH1 INPUT, STORE INPUT, and RECALL.

16. Press 8340A **[SWEEP TIME]** and **[AUTO]** to obtain the fastest sweep time for that frequency range.

17. Adjust A28R10 (HKCK) until the high frequency kick is about 300mV lower than the 26.5 GHz calibration line (Figure 5-40). Press **[SINGLE]** SWEEP key repetitively while adjusting A28R6 (DYO) and A28R7 (DYS) to match current 8755C trace with the stored trace to within 0.5 dB. Press **[CONT]** SWEEP and adjust A28R9 (LKCK) until the continuous sweep trace matches the stored trace to within 0.5 dB. Iterate between continuous sweep adjustments and single sweep adjustments to obtain the best match between the two 8755C traces. If the low frequency kick pulse cannot be made to fall above the 2.3 GHz calibration line and match the continuous sweep and single sweep traces, readjust A28R10 (HKCK) and repeat the procedure. The peaks of the oscilloscope kick pulse trace should be below the high frequency point (negative peak) and above the low frequency point (positive peak). Refer to the kick pulse waveform shown in Figure 5-40.

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

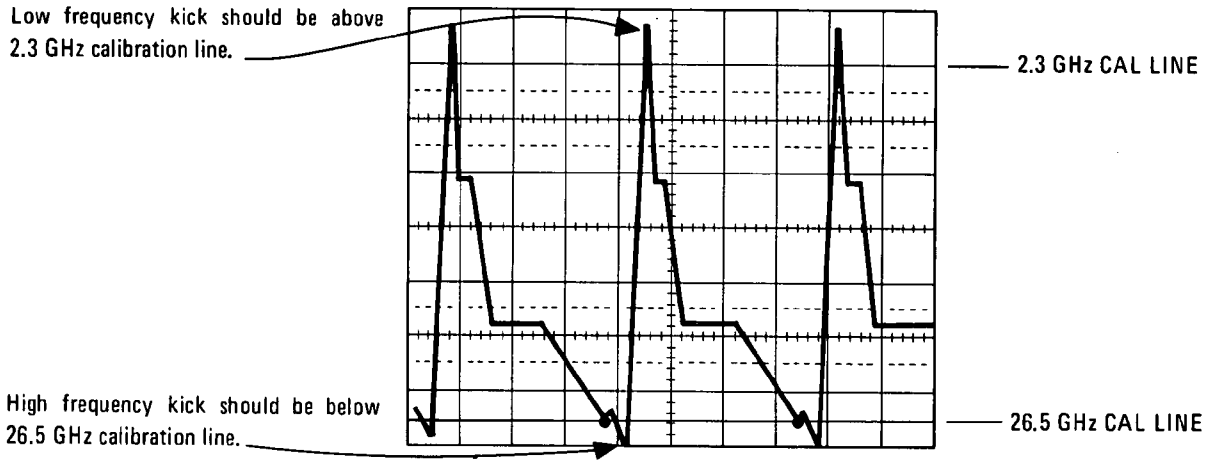


Figure 5-40. SYTM Kick Pulse Waveform.

18. Press **[START FREQ]** and enter **[1] [3] [.] [3] [5] [GHz]**. Press **[STOP FREQ]** and enter **[2] [0] [GHz]**. Press **[SWEEP TIME]** and enter **[2] [0] [0] [msec]**. Store this response using the storage normalizer as described in step 16 above. Press **[SWEEP TIME]** and **[AUTO]**. Access Calibration Constant Number 7 by entering the following: **[SHIFT] [GHz] [7] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 7 to obtain the best match between the current trace and the stored trace. (Calibration Constant Number 7 must be within the range of zero to 131.)

19. Press **[START FREQ]** and enter **[6] [.] [9] [GHz]**. Press **[STOP FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[SWEEP TIME]** and enter **[2] [0] [0] [msec]**. Store this response using the storage normalizer as described in step 15 above. Press **[SWEEP TIME]** and **[AUTO]**. Access Calibration Constant Number 6 by entering the following: **[SHIFT] [GHz] [6] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 6 to obtain the best match between the current trace and the stored trace. (Calibration Constant Number 6 must be within the range of zero to 131.)

20. Press **[START FREQ]** and enter **[2] [.] [3] [GHz]**. Press **[STOP FREQ]** and enter **[7] [GHz]**. Press **[SWEEP TIME]** and enter **[2] [0] [0] [msec]**. Store this response using the storage normalizer as described in step 15 above. Press **[SWEEP TIME]** and **[AUTO]**. Access Calibration Constant Number 5 by entering the following: **[SHIFT] [GHz] [5] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 5 to match the current trace with the stored trace at the high frequency end. Typically the low frequency will not match within 0.5 dB. The traces are typically different because the fundamental band squegging may occur on the slow sweep and not on the fast sweep. (Calibration Constant Number 5 must be within the range of zero to 131.)

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

HO2 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION HO2.

SYTM DELAY COMPENSATION ADJUSTMENTS AT FULL SWEEP MULTIBAND

21. Press **[INSTR PRESET]**. Press **[START FREQ]** and enter **[2] [.] [3] [GHz]**. Press **[SWEEP TIME]** and enter **[1] [sec]**. Press **[XTAL]** LEVELING. Press **[SHIFT] [PULSE]**.

NOTE

The complete unleveled multiband response cannot be viewed on the 8755C at 1 dB/Div resolution. In the following steps it will be necessary to adjust the 8755C offset to position a portion of the trace on the display before storing the trace using the storage normalizer.

22. Press **[SAVE] [1]** to store the HP 8340A 1 sec. instrument state. Press **[SWEEP TIME]** and **[AUTO]** to obtain the fastest sweep time for that range. Press **[SAVE] [2]** to store the HP 8340A fast sweep instrument state. Press **[RECALL] [1]** to return to the 1 sec. instrument state.

    The response of Band 2 is about from the second to the fifth horizontal division. Adjust both 8755C reference levels to view the swept trace from the second to the fifth horizontal division. Store this trace using the storage normalizer as described in step 15 above. Press **[RECALL] [2]**. Access Calibration Constant Number 2 by entering the following: **[SHIFT] [GHz] [2] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 2 for the best match between the current trace and the stored trace of Band 2. (Calibration Constant Number 2 must be within the range of zero to 131.)

23. Press **[RECALL] [1]**. The response of Band 3 is about from the fifth to the seventh horizontal division. Adjust both 8755C reference levels to view the swept trace from the fifth to the seventh horizontal division. Store this trace using the storage normalizer as described in step 15 above. Press **[RECALL] [2]**. Access Calibration Constant Number 3 by entering the following: **[SHIFT] [GHz] [3] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 3 for the best match between the current trace and the stored trace of Band 3. (Calibration Constant Number 3 must be within the range of zero to 131.)

24. Press **[RECALL] [1]**. The response of Band 4 is about from the seventh to the tenth horizontal division. Adjust both 8755C reference levels to view the swept trace from the seventh to the tenth horizontal division. Store this trace using the storage normalizer as described in step 15 above. Press **[RECALL] [2]**. Access Calibration Constant Number 4 by entering the following: **[SHIFT] [GHz] [4] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 4 for the best match between the current trace and the stored trace of Band 4. (Calibration Constant Number 4 must be within the range of zero to 131.)

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

H02 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION H02.

UNLEVELED SQUEGGING TEST USING THE 8566A SPECTRUM ANALYZER

Description:

The HP 8340A Under Test RF output signal is down converted using a Local Oscillator HP 8340A and a mixer. The IF output of the mixer is fed to a spectrum analyzer. Any squegging of the HP 8340A under test will appear as a spurious response on the IF signal.

This test should be performed after adjusting the SYTM tracking and delay, and the SRD unleveled bias. Since unleveled squegging can be difficult to see using the 8755C, this test is performed to determine if additional adjustments are required.

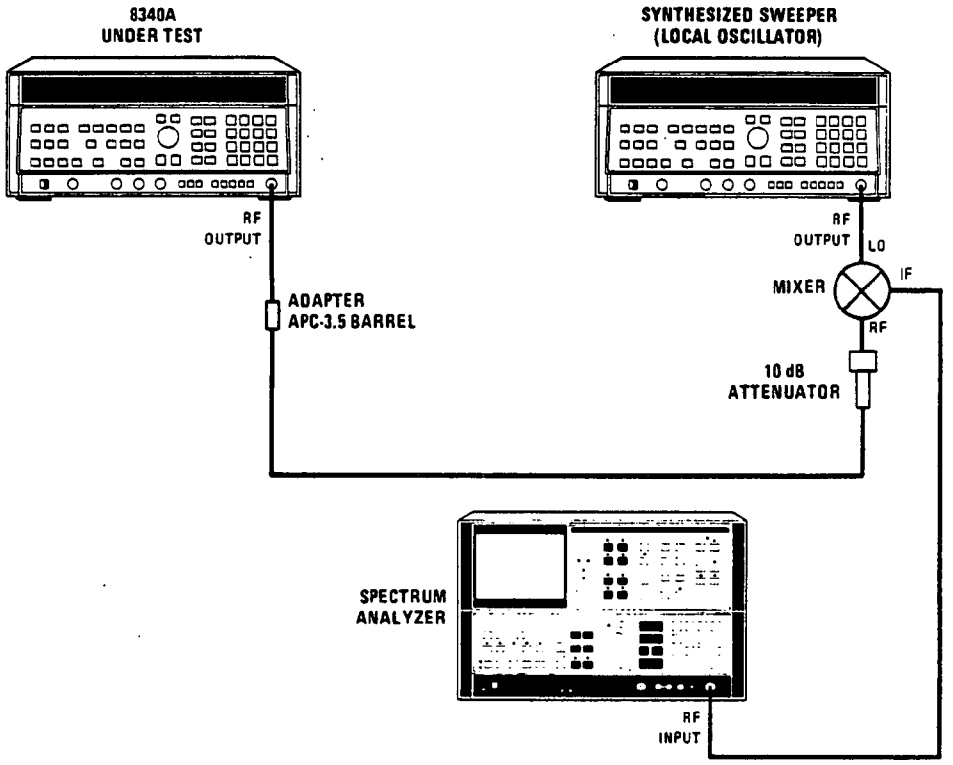


Figure 5-41. Unleveled Squegging Test Setup.

Equipment Required:

Synthesized Sweeper	HP 8340A (Opt. 001)
10 dB Attenuator	HP 8493C Option 010
Mixer	RHG DMS 1 - 26
Spectrum Analyzer	HP 8566A

25. Connect equipment as shown in Figure 5-41. Connect the mixer at the Local Oscillator (LO) HP 8340A RF output connector to obtain maximum mixer LO input level. Allow at least 30 minutes warm up time.

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

26. Press the Local Oscillator 8340A **[INSTR PRESET]**. Press **[START FREQ]** and enter **[6] [.] [4] [GHz]**. Press **[STOP FREQ]** and enter **[1] [2] [.] [9] [GHz]**. Press **[POWER LEVEL]** and enter **[1] [0] [dBm]**. Press **[SHIFT] [CF]** and enter **[1] [0] [0] [MHz]** for a step size of 100 MHz. Press **[MANUAL]** SWEEP and enter **[6] [.] [4] [GHz]** to set the Local Oscillator to CW at 6.4 GHz. Press **[PEAK]** to turn on peaking.

27. Press the 8340A Under Test **[INSTR PRESET]**. Press **[START FREQ]** and enter **[7] [GHz]**. Press **[STOP FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[POWER LEVEL]** and enter **[2] [0] [dBm]**. UNLEVELED indicator should be on. Press **[SHIFT] [CF]** and enter **[1] [0] [0] [MHz]** for a step size of 100 MHz. Press **[MANUAL]** SWEEP and enter **[7] [GHz]**. The mixer IF frequency is now 600 MHz.

28. Set the Spectrum Analyzer for a FULL SPAN of 0−2.5 GHz. Set RES BW for 300 kHz. Set VIDEO BW for 100 kHz. Set START FREQ to 590 MHz. Set STOP FREQ to 800 MHz. Set REFERENCE LEVEL to −10 dBm. Set ATTEN to 0 dB. Press HOLD to retain these settings. The 600 MHz IF signal should be near the left side of the Spectrum Analyzer CRT.

29. Using the STEP UP key on both the 8340A Under Test and the Local Oscillator 8340A, step through Band 2, observing the Spectrum Analyzer display at each step. There may be responses due to mixing products. These will appear as low level signals. A squegging response will appear as a higher amplitude signal as shown in Figure 5-42. If squegging occurs at 8340A frequencies below 10 GHz, adjust A24R3 (X2A) slightly CCW to eliminate the squegging. If squegging occurs at frequencies above 10 GHz, adjust A24R4 (X2B) to eliminate the squegging. Note, if the control is adjusted and there is no effect on the response, the response is probably a mixing product.

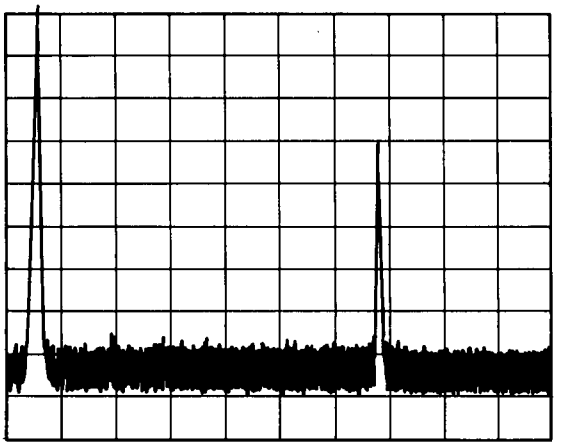


Figure 5-42. Unleveled Squegging Displayed on Spectrum Analyzer

30. For Band 3, press the Local Oscillator 8340A **[START FREQ]** and enter **[1] [2] [.] [9] [GHz]**. Press **[STOP FREQ]** and enter **[1] [9] [.] [4] [GHz]**. Press **[MANUAL]** and enter **[1] [2] [.] [9] [GHz]**.

31. Press the 8340A Under Test **[POWER LEVEL]** and enter **[2] [0] [dBm]**. Press **[START FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[STOP FREQ]** and enter **[2] [0] [GHz]**. Press **[MANUAL]** and enter **[1] [3] [.] [5] [GHz]**.

5-35. UNLEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

32. Using the step keys as described in step 30, step through Band 3. If squegging occurs below 15 GHz, adjust A24R6 (X3A) slightly CCW to eliminate the squegging. If squegging occurs above 15 GHz, adjust A24R7 (X3B).

33. For Band 4, press the Local Oscillator 8340A **[START FREQ]** and enter **[1] [9] [.] [4] [GHz]**. Press **[STOP FREQ]** and enter **[2] [5] [.] [9]**. Press **[MANUAL]** and enter **[1] [9] [.] [4] [GHz]**.

34. Press the 8340A Under Test **[START FREQ]** and enter **[2] [0] [GHz]**. Press **[STOP FREQ]** and enter **[2] [6] [.] [5] [GHz]**. Press **[POWER LEVEL]** and enter **[2] [0] [dBm]**. Press **[MANUAL]** and enter **[2] [0] [GHz]**.

35. Using the step keys as described in step 29, step through Band 4. If squegging occurs below 23 GHz, adjust A24R9 (X4A) slightly CCW to eliminate the squegging. If squegging occurs above 23 GHz, adjust A24R10 (X4B).

NOTE

If adjustments of the calibration constants were made in this procedure, the data thus stored in the "working memory area" should be copied to the "protected memory area" by pressing the following key sequence: [SHIFT] [MHz] [1] [4] [Hz] [SHIFT] [kHz] [5] [3] [4] [9] [Hz] [INSTR PRESET].

5-36. ALC ADJUSTMENTS

Reference:

Performance Test: Maximum Leveled Output Power and Accuracy
Service Section: RF Section

LOGGER TEMPERATURE COMPENSATION

Description:

NOTE

The following logger temperature compensation procedure should only be done if either A11 or A12 Detector is replaced.

The logger in A25 has temperature compensation in both high and low bands. This procedure calculates the values for the four factory-selected resistors in the temperature compensation circuit.

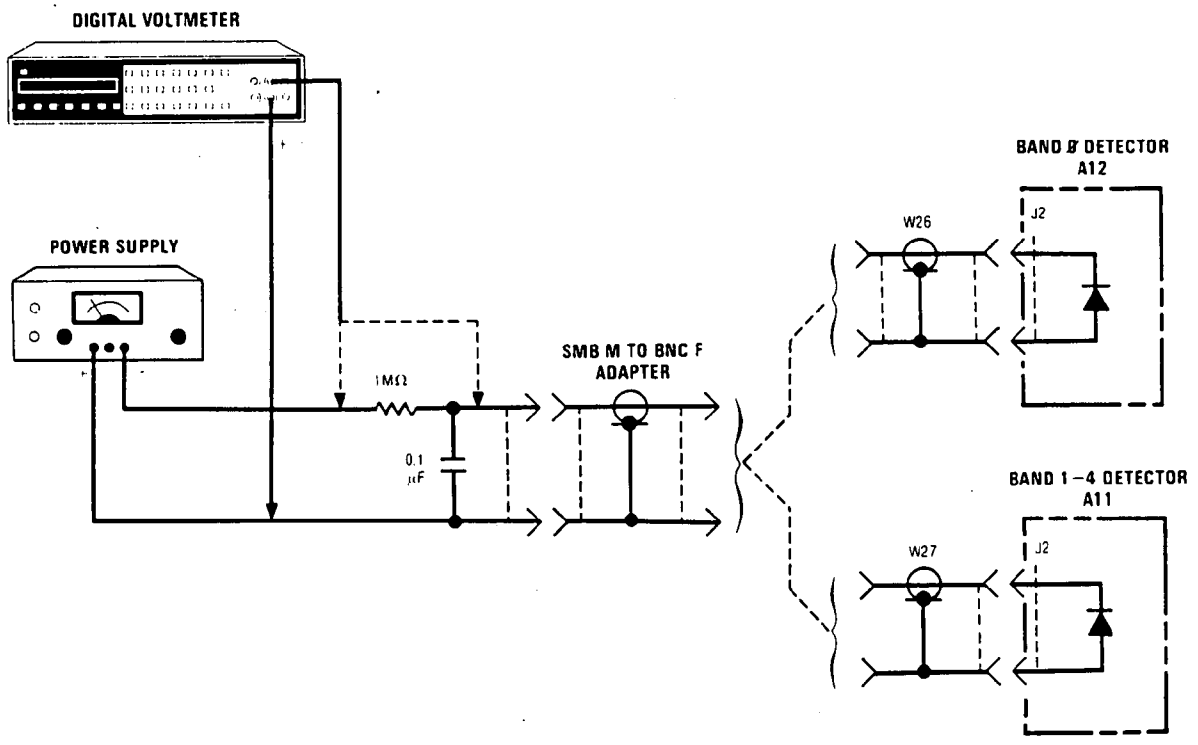


Figure 5-43. Logger Temperature Compensation Test Setup

5-36. ALC ADJUSTMENTS (Cont'd)

Equipment Required:

Power Supply	HP 6294A
Digital Voltmeter (DVM)	HP 3455A
1 Megohm Resistor	HP Part Number 0757-0059
0.1 UF Capacitor	HP Part Number 0160-0168
Extender Board	HP Part Number 08350-60031

Procedure:

1. Disconnect AC power cable from the 8340A Under Test and allow it to cool for at least two hours.

2. Disconnect cables W26 and W27 from A25J2 and A25J1 respectively (Figure 5-44), and remove A25 PC board from the instrument.

A25

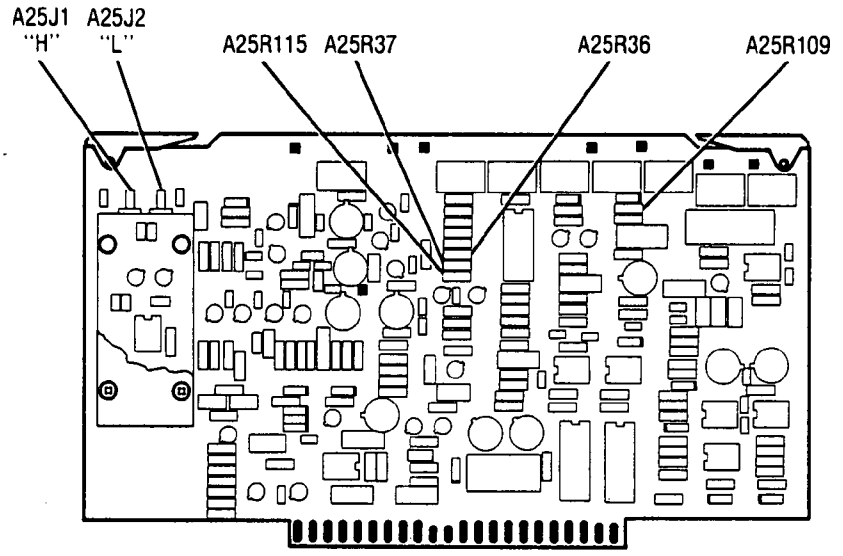


Figure 5-44. ALC Detector A25 Temperature Compensation Adjustments Location

3. Install Extender Board in place of A25.

4. Set DVM for Ohms measurement and connect the input between pins 4 and 26 of the extender board. Note the resistance measured. This value is thermistor resistance, R_T, and will be used for calculations in later steps.

5-36. ALC ADJUSTMENTS

Reference:

Performance Test: Maximum Leveled Output Power and Accuracy
Service Section: RF Section

LOGGER TEMPERATURE COMPENSATION

Description:

NOTE

The following logger temperature compensation procedure should only be done if either A11 or A12 Detector is replaced.

The logger in A25 has temperature compensation in both high and low bands. This procedure calculates the values for the four factory-selected resistors in the temperature compensation circuit.

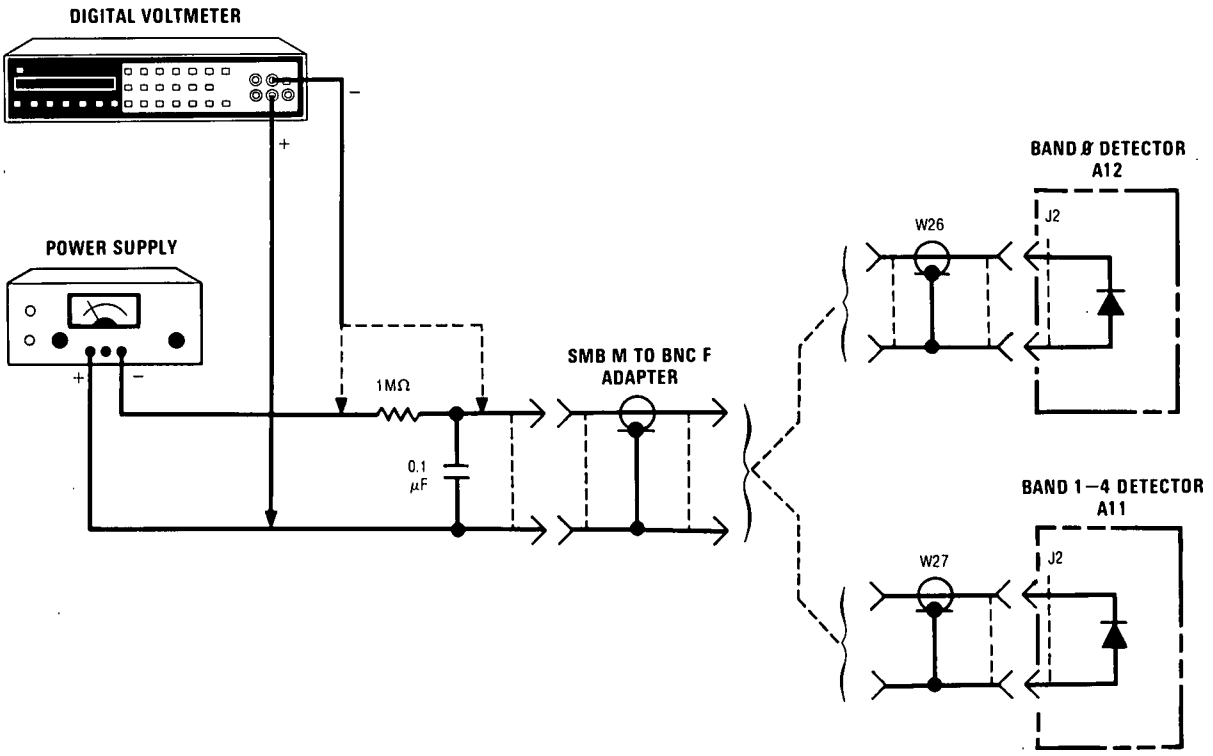


Figure 5-43. Logger Temperature Compensation Test Setup

5-36. ALC ADJUSTMENTS (Cont'd)

Equipment Required:

Power Supply	HP 6294A
Digital Voltmeter (DVM)	HP 3455A
1 Megohm Resistor	HP Part Number 0757-0059
0.1 UF Capacitor	HP Part Number 0160-0168
Extender Board	HP Part Number 08350-60031

Procedure:

1. Disconnect AC power cable from the 8340A Under Test and allow it to cool for at least two hours.

2. Disconnect cables W26 and W27 from A25J2 and A25J1 respectively (Figure 5-44), and remove A25 PC board from the instrument.

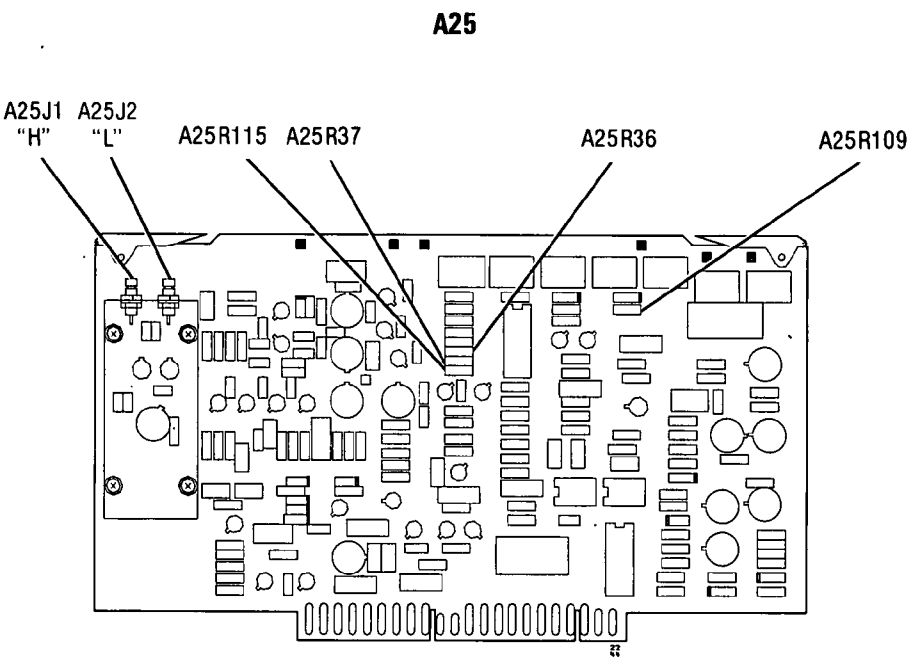


Figure 5-44. ALC Detector A25 Temperature Compensation Adjustments Location

3. Install Extender Board in place of A25.

4. Set DVM for Ohms measurement and connect the input between pins 4 and 26 of the extender board. Note the resistance measured. This value is thermistor resistance, R_T, and will be used for calculations in later steps.

5-36. ALC ADJUSTMENTS (Cont'd)

5. Connect equipment as shown in Figure 5-43 with cable W27 connector connected to SMB-to-BNC adapter.

6. Connect the DVM across the output terminals of the Power Supply and adjust the power supply output for 5.00 ±0.01 Vdc. Move the DVM connections back to the SMB-to-BNC adapter as shown in Figure 5-43.

7. Note indication on DVM. This value is V_{VM} for high band and will be used for calculations in step 8.

8. Calculate "Corrected Video Resistance in Hi Band", R_{VH}, as follows:

$$R_{VH} = (R_{VM} - 100) \times 24000/(R_T + 4000)$$

where:

R_{VH} = Corrected Video Resistance in High Band

$R_{VM} = V_{VM}$ x 200 Ohms/mV

V_{VM} = Value measured in step 7 above.

R_T = Thermistor Resistance measured in step 4 above.

9. Use the value of R_{VH} found in step 8 above and select resistance values for A25R36 and A25R37 from Table 5-7.

10. Disconnect high band detector A11 cable W27 from SMB-to-BNC adapter and connect low band detector A12 cable W26 to adapter as shown in Figure 5-43.

11. Connect DVM at output of Power Supply and check that the output is still at 5.00 ±0.01 Vdc. Move the DVM connections back to the SMB-to-BNC adapter as shown in Figure 5-43.

12. Note indication on DVM. This value is V_{VM} for low band and will be used for calculations in step 13.

13. Calculate "Corrected Video Resistance in Low Band", R_{VL}, as follows:

$$R_{VL} = (R_{VM} - 680) \times 24000/(R_T + 4000)$$

where:

R_{VL} = Corrected Video Resistance in Low Band

$R_{VM} = V_{VM}$ x 200 Ohms/mV

V_{VM} = Value measured in step 12 above.

R_T = Thermistor Resistance measured in step 4 above.

14. Use the value of R_{VL} found in step 13 above and select resistance values for A25R109 and A25R115 from Table 5-8.

5-36. ALC ADJUSTMENTS (Cont'd)

Table 5-7. Selected Values of High Band Temperature Compensation Resistors in A25

R_{VH} (Ohms)	A25R36 (Ohms)	A25R37 (Ohms)
800-870	9090	6190
870-950	8250	5620
950-1050	7500	5620
1050-1160	6810	5110
1160-1270	6190	4640
1270-1380	5620	4220
1380-1490	5110	4220
1490-1600	4640	3830

Table 5-8. Selected Values of Low Band Temperature Compensation Resistors in A25

R_{VL} (Ohms)	A25R109 (Ohms)	A25R115 (Ohms)
800-870	3830	9090
870-950	3480	8250
950-1050	3160	7500
1050-1160	2870	6810
1160-1270	2370	6190
1270-1380	2150	5620
1380-1490	1960	5110
1490-1600	1620	4640

5-36. ALC ADJUSTMENTS (Cont'd)

ALC ADJUSTMENTS

Description:

The ALC detectors have a linear region. Below the linear region the detector response is non-linear. The ALC circuit attempts to compensate for the non-linear regions such that the overall response of the ALC loop is linear over a 40 dB range from −20 dBm to +20 dBm. Since there is a separate detector and modulator for high band (Bands 1−4) and low band (Band 0), there are separate adjustments for high band and low band.

The 8340A is set to a CW frequency within the band to be adjusted. The RF attenuator and ALC is set for de-coupled operation (controlled separatly). The RF output level is set using the ENTRY keys. The power is measured with a power meter and if necessary adjustments are made until the power meter indication is correct at each 8340A power level.

Equipment Required:

Power Meter	HP 436A
Power Sensor	HP 8485A

Procedure:

NOTE

The ALC circuit contains several adjustment controls and the adjustment includes changing calibration constants stored in memory. All of the adjustments in each band interact with each other. In addition, the high band 0 dBm adjustment affects the low band, and the high band +18 dBm adjustment affects the low band. Before making any adjustments, check the operation of the ALC circuit as described below and make adjustments only if necessary.

NOTE

ALC accuracy problems for levels above +10 dBm may be due to parasitic oscillations in the log converter. If so, these may usually be cured by removing capacitor A25C11. This capacitor should be left in place if no oscillations occur to give best log amplifier rise time.

NOTE

In the following procedures, do not put P.C. boards on extender boards.

15. Connect equipment as shown in Figure 5-45. Calibrate and zero the power meter. Allow one hour warmup time. Connect the power sensor to the 8340A RF output. Press 8340A **[INSTR PRESET]**. Press **[CW]** and enter **[4] [.] [5] [GHz]**. Press 8340A **[RF]** key to turn the RF OFF and zero the power meter. To ensure that the power meter is properly zeroed, select "WATT" mode, and press the ZERO button two or three times. After the power meter is zeroed, the power meter should indicate ≤ 0.02 on the most sensitive range. Press **[RF]** to turn the RF ON. Press **[PEAK]** to center the SYTM frequency response to the YO signal. Press **[SHIFT] [PWR SWP]** to decouple the RF

5-36. ALC ADJUSTMENTS (Cont'd)

attenuator and ALC. Enter **[0] [dBm]**. If the display does not indicate ATTEN=0 dB, press STEP keys as necessary to select 0 dB attenuation.

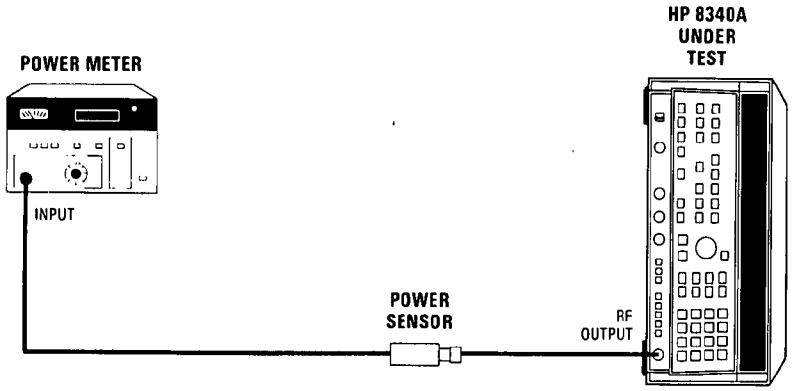


Figure 5-45. ALC Adjustment Test Setup

NOTE

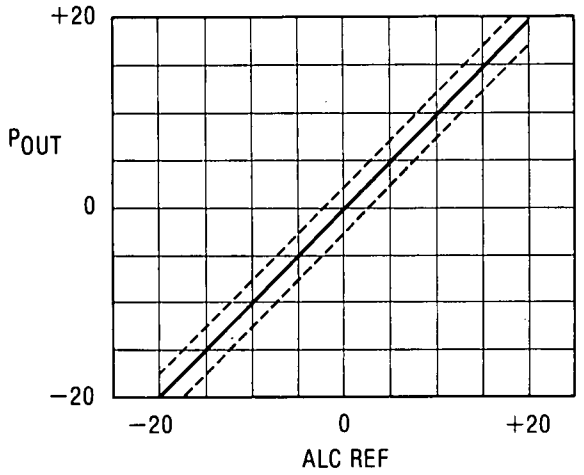
When the power level is changed significantly, it may take as long as one minute for the power meter indication to be accurate. After making a power level change, wait until the power meter indication stabilizes before making any adjustments.

16. Refer to Table 5-9 below, enter the appropriate 8340A power level and check the power meter indication. Check the indication at each power level and note the amount of error before making any adjustments. If necessary, adjust the appropriate controls shown in the table to adjust the power level to be within the test limit shown.

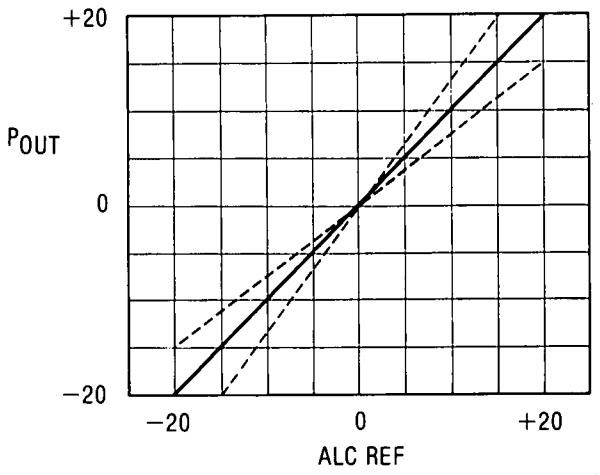
    Adjustments are iterative. Adjust in the following order:

    0 dBm, −10 dBm, −20 dBm, −10 dBm, 0 dBm, +10 dBm, +18 dBm, and +10 dBm.

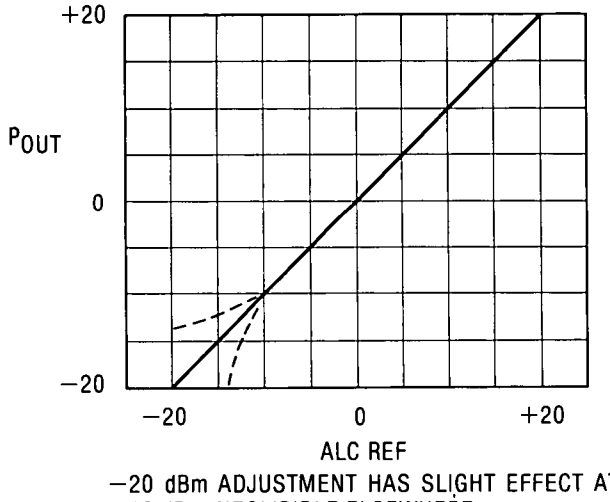
    See Figure 5-46 for more information that may help to reduce the number of iterations required. For example, if the +18 dBm indication is 0.1 dB low (+17.9 dBm), adjust for 0.05 dB high (+18.05 dBm). Then when the +10 is adjusted to +10 dBm, the +18 will move close to the correct level.



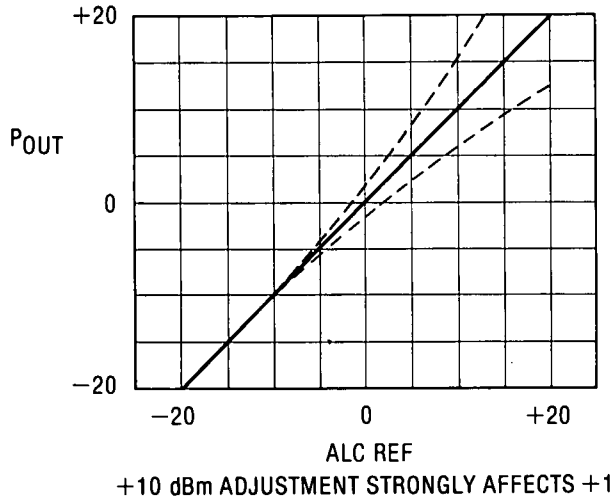
0 dBm ADJUSTMENT OFFSETS ENTIRE CURVE BY THE SAME AMOUNT.



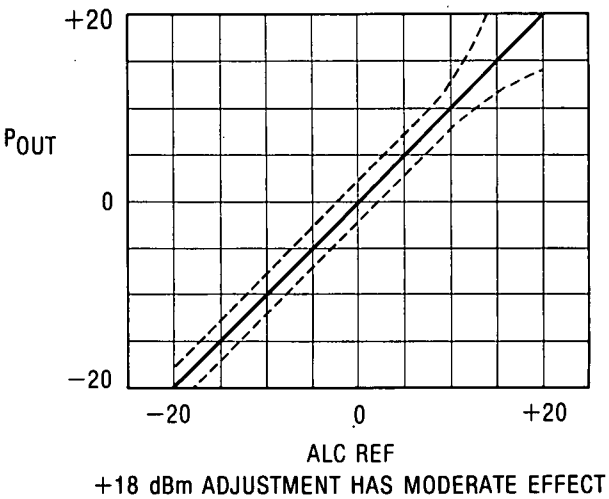
−10 dBm ADJUSTMENT ROTATES CURVE AROUND THE 0 dBm POINT. THUS IT STRONGLY AFFECTS −20 AND +18 dBm POINTS.



−20 dBm ADJUSTMENT HAS SLIGHT EFFECT AT −10 dBm, NEGLIBIBLE ELSEWHERE.



+10 dBm ADJUSTMENT STRONGLY AFFECTS +18 dBm, SLIGHTLY AFFECTS 0, NEGLIGIBLE ELSEWHERE.



+18 dBm ADJUSTMENT HAS MODERATE EFFECT ON +10 dBm, SLIGHTLY LESS EFFECT AT ALL LOWER POWERS.

Figure 5-46. Typical ALC Adjustment Response Curves

5-36. ALC ADJUSTMENTS (Cont'd)

Table 5-9. High Band ALC Adjustment

8340A Power Level	Associated Adjustment	Check Limit	Adjustment Limit
−20 dBm	A25R34 (H-20)	0.3 dB	0.2 dB
−10 dBm	Calibration Constant #47*	0.1 dB	0.02 dB
0 dBm	Calibration Constant #44*	0.1 dB	0.02 dB
10 dBm	A25R39 (H+10)	0.1 dB	0.02 dB
18 dBm	A25R24 (+18)**	0.2 dB	0.05 dB

* Access Calibration Constant Number 47 by entering the following: **[SHIFT] [GHz] [4] [7] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Use **[STEP]** key to change Cal. Constant Number to 44.

** On some boards, this adjustment is labeled "+20."

5-36. ALC ADJUSTMENTS (Cont'd)

17. If all power meter indications are within the test limits, check at power levels from −20 dBm to +20 dBm in 5 dB steps.

18. Press **[CW]** and enter **[1] [.] [5] [GHz]**. Press **[SHIFT] [PWR SWP]** to decouple the RF attenuator and ALC. Enter **[0] [dBm]**. Press **[RF]** to turn the RF OFF. Zero the power meter as described in step 1. The low band (Band 0) contains broadband noise. If the power meter is properly zeroed, the broadband noise will be compensated and power measurements will be more accurate. Press **[RF]** to turn the RF ON.

19. Refer to Table 5-10 below, enter the appropriate 8340A power level and check the power meter indication. Check the indication at each power level and note the amount of error before making any adjustments. If necessary adjust the appropriate controls shown in the table to adjust the power level to be within the test limits.

    Adjustments are iterative. Adjust in the following order:

    0 dBm, −10 dBm, −20 dBm, −10 dBm, 0 dBm, and +10 dBm.

Table 5-10. Low Band ALC Adjustment

8340A Power Level	Associated Adjustment	Check Limit	Adjustment Limit
−20 dBm	A25R33 (L-20)	0.3 dB	0.2 dB
−10 dBm	Calibration Constant #46*	0.1 dB	0.02 dB
0 dBm	A25R108 (LOFS)	0.1 dB	0.02 dB
10 dBm	A25R38 (L+10)	0.1 dB	0.02 dB
There is no low band +20 dBm adjustment.			
* Access Calibration Constant Number 46 by entering the following: **[SHIFT] [GHz] [4] [6] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**.			

20. If all power meter indications are within the test limit, check at power levels from −20 dBm to +10 dBm in 5 dB steps.

NOTE

If adjustments of the calibration constants were made in this procedure, the data thus stored in the "working memory area" should be copied to the "protected memory area" by pressing the following key sequence: [SHIFT] [MHz] [1] [4] [Hz] [SHIFT] [kHz] [5] [3] [4] [9] [Hz] [INSTR PRESET].

5-36. ALC ADJUSTMENTS (Cont'd)

EXTERNAL LEVELING ADJUSTMENTS

NOTE

The negative external Xtal leveling adjustments include two variable resistor adjustments (+6 dBV and −60 dBV) and two calibration constant adjustments (−30 dBV and 0 dBV). These adjustments interact similar to the ALC adjustments. See Figure 5−47 for more information that may help to reduce the number of iterations required. Note that the curve rotates about the −30 dBV level.

21. Connect a negative Xtal detector to the 8340A RF output. Connect a BNC Tee at the detector output. Connect a BNC cable from one output of the Tee to the 8340A LEVELING EXT INPUT. Connect another BNC cable from the BNC Tee to a DVM. Set the DVM for a floating input. If using an HP 3455A or 3456A DVM, put a 0.1 UF capacitor across its terminals.

    Make adjustments in the following order:

    −30 dBV, 0 dBV, +6 dBV, 0 dBV, −30 dBV, and −60 dBV.

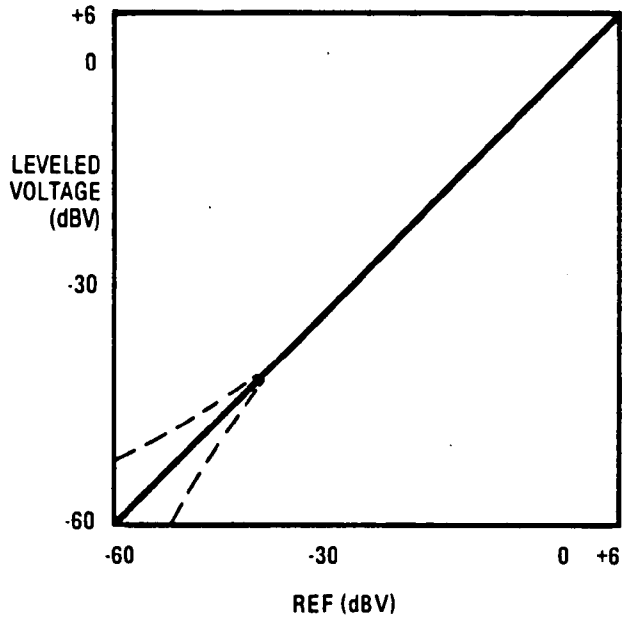
22. Press **[INSTR PRESET]**. Press **[CW]** and enter **[4] [.] [5] [GHz]**. Press **[XTAL]** LEVELING. The ENTRY DISPLAY should indicate ATN: 0 dB, REF −30.00 dBV. Adjust calibration constant Number 45 for a DVM indication of −31.6 mV ± 0.3 mV. Access Calibration Constant Number 45 by entering the following: **[SHIFT] [GHz] [4] [5] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**.

23. Press **[POWER LEVEL]** and enter **[0] [dBm]**. Adjust calibration constant Number 48 for a DVM indication of −1.00 volts ± 0.01 volts. Access Calibration Constant Number 48 by entering the following: **[SHIFT] [GHz] [4] [8] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**.

24. Press **[POWER LEVEL]** and enter **[6] [dBm]**. The ENTRY DISPLAY REF level should be +6 dBV. Adjust A25R88 (EXHI) for a DVM indication of −2.00 volts ±0.02 volts. The +6 dB adjustment will affect the 0 dBV level as well. To minimize the number of iterations, over adjust the +6 dBV level, then when the 0 dBV level is adjusted, the +6 dBV level will be close. For example, if the +6 dBV indication is 0.1V low, adjust for 0.15V high.

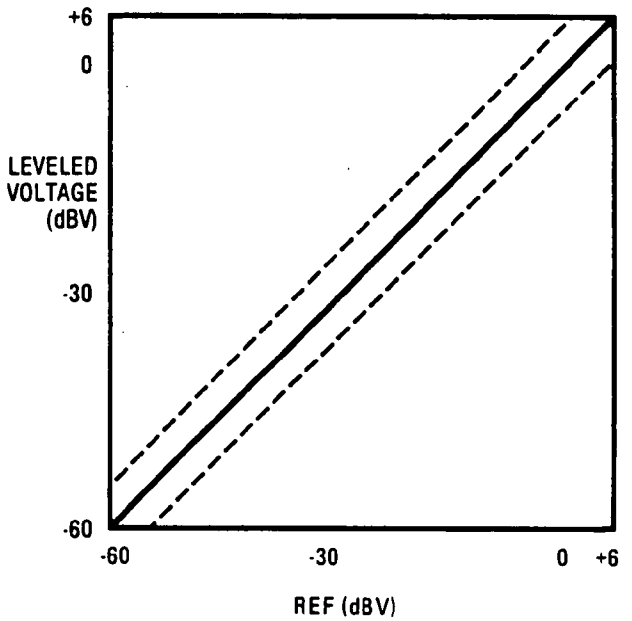
25. Press **[XTAL]** and enter **[−] [6] [0] [dBm]**. Use the down **[STEP]** key to set the RF attenuator to 20 dB. If the 8340A does not include an RF attenuator, connect a 20 dB pad between the RF output and the Xtal detector. Adjust A25R80 (EX−) for a DVM indication of −1.000 mV ±0.01 mV. Repeat all negative external leveling adjustments, in the order given, until all DVM indications are within ±1%. Note: Return the RF attenuator to zero except for the −60 dBV adjustment.

26. Connect a positive Xtal detector in place of the negative Xtal detector. With the RF attenuator set to 20 dB and the REF set to −60 dBV, adjust A25R84 (EX+) for +1.000 mV ±0.01 mV.



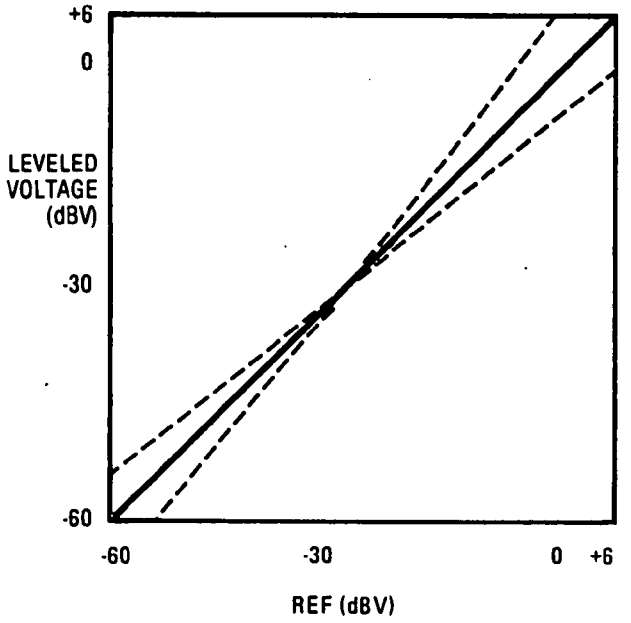
−60 dBV ADJUSTMENT HAS NEGLIGIBLE EFFECT ELSEWHERE.

(EX-/EX+)



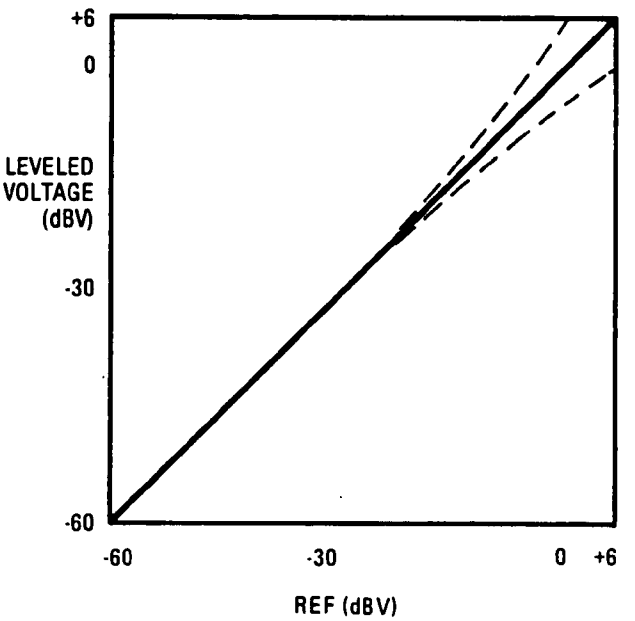
−30 dBV ADJUSTMENT OFFSETS ENTIRE CURVE BY THE SAME AMOUNT.

(CAL No. 45)



0 dBv ADJUSTMENT ROTATES CURVE ABOUT THE −30 dBV POINT. THUS IT AFFECTS −60 AND +6 dBV STRONGLY.

(CAL No. 48)



+6 dBV ADJUSTMENT HAS STRONG EFFECT ON 0 dBV, NEGLIGIBLE ELSEWHERE.

(A25R88)

Figure 5-47. Typical External Leveling Response Curves

5-36. ALC ADJUSTMENTS (Cont'd)

ADJUST AM OFFSET

27. Connect Power Sensor to 8340A RF OUTPUT. Press **[INSTR PRESET]**. Press **[CW]** and enter **[1] [GHz]**.Power level should be 0 dBm. Disconnect any AM inputs. Access Calibration Constant Number 43 by entering the following: **[SHIFT] [GHz] [4] [3] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 43 for no more than 0.05 dB change in power meter indication when turning AM on then off.

NOTE

If adjustments of the calibration constants were made in this procedure, the data thus stored in the "working memory area" should be copied to the "protected memory area" by pressing the following key sequence: [SHIFT] [MHz] [1] [4] [Hz] [SHIFT] [kHz] [5] [3] [4] [9] [Hz] [INSTR PRESET].

AM GAIN ADJUSTMENT

28. Set up the following equipment as shown in Figure 5-48a with the power supply set to 0.0 Vdc. Allow the equipment to warm up for at least 30 minutes.

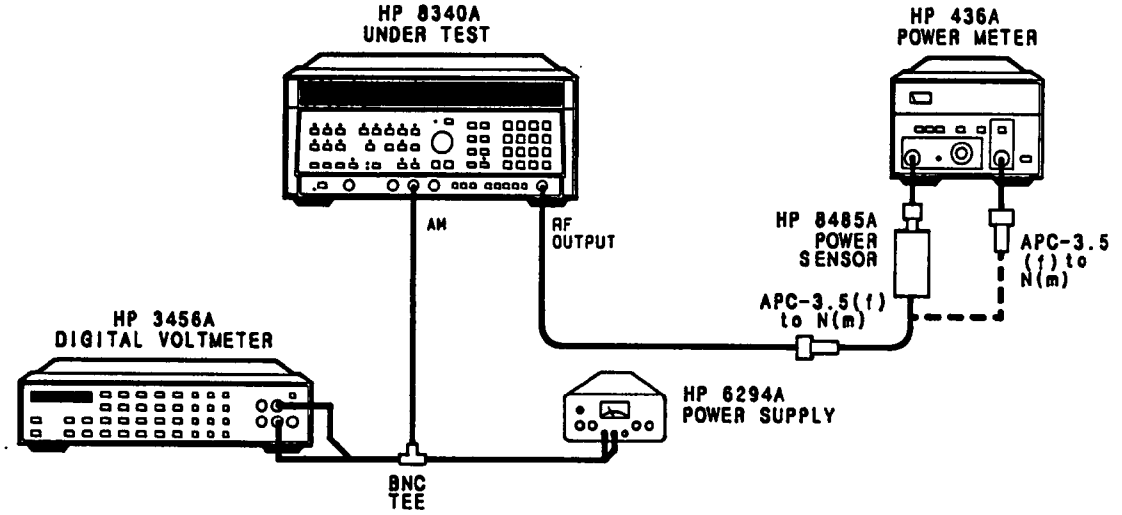


Figure 5-48a. AM GAIN Adjustment Test Setup

29. Calibrate the power meter and then set the calibration factor switch for a 1.5 GHz measurement. Connect the power sensor to the HP 8340A RF output.

30. Press the following key sequence on the HP 8340A:

[INSTR PRESET]
[CW] [1] [.] [5] [GHz]
[POWER LEVEL] [−] [5] [dBm]
[AM].

31. Adjust the power supply for 0.0 Vdc. press **dB[REF]** on the power meter (the power meter will now indicate the power level changes from this reference).

32. Adjust power supply for +0.3 Vdc. Power meter indication should be between 2.18 to 2.38 dB. If the indication is not in this range, adjust A26R91 (AM GAIN) for a power meter indication within the given range.

5-36. ALC ADJUSTMENTS (Cont'd)

33. Adjust power supply for −0.3 Vdc. Power meter indication should be between −2.91 and −3.29 dB. If the indication not in this range, adjust A26R91 (AM GAIN) for a power meter indication within the given range.

34. Repeat steps 32 and 33 until the power level requirements are met for each step.

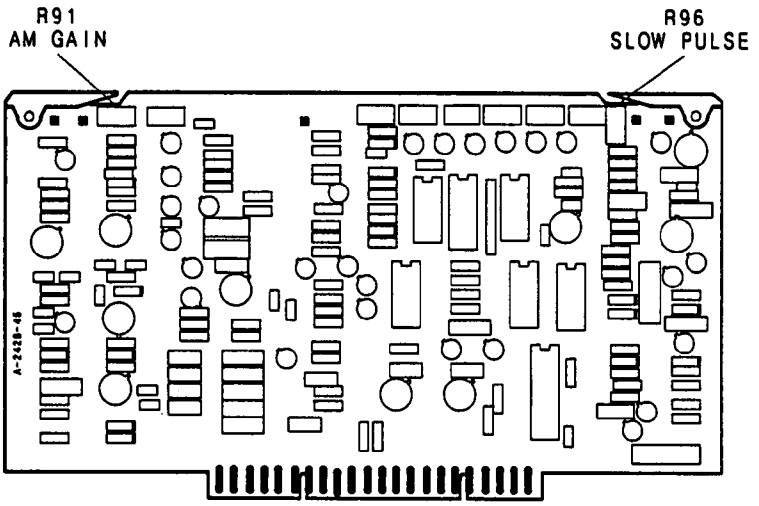


Figure 5-48b. AM Gain and Slow Pulse Adjustment Locations

5-36a. SLOW PULSE MODULATION ADJUSTMENT

Specification

Table 5-10b. Pulse Modulation Rise and Fall Time Adjustment Tolerances

Overshoot: <20%
Rise (T_R) and Fall (T_F) Times: 1 to 6 microseconds

Description

This adjustment optimizes pulse overshoot and Rise/Fall time in the instrument's "Slow Pulse" circuitry (located on the A26 linear modulator assembly). Slow pulse allows the HP 8340A to modulate its RF output at a 27.8 kHz rate. The 27.8 kHz signal is provided by connecting the modulation drive from an HP 8755C or 8756A network analyzer to the DUT's AM input.

The slow pulse circuitry is activated by pressing **[SHIFT] [PULSE]** on the front panel.

The HP 8340A under test RF output frequency is down converted to 50 MHz using a mixer and a second HP 8340A as a local oscillator. The 50 MHz IF signal is amplified and applied to an oscilloscope. The HP 8340A under test is pulsed using a 27.8 modulator drive from an HP 8755C. The modulator drive is also applied to the oscilloscope. the oscilloscope is used to measure the pulse envelope rise and fall times. Refer to Figure 5-49a Pulse Definitions.

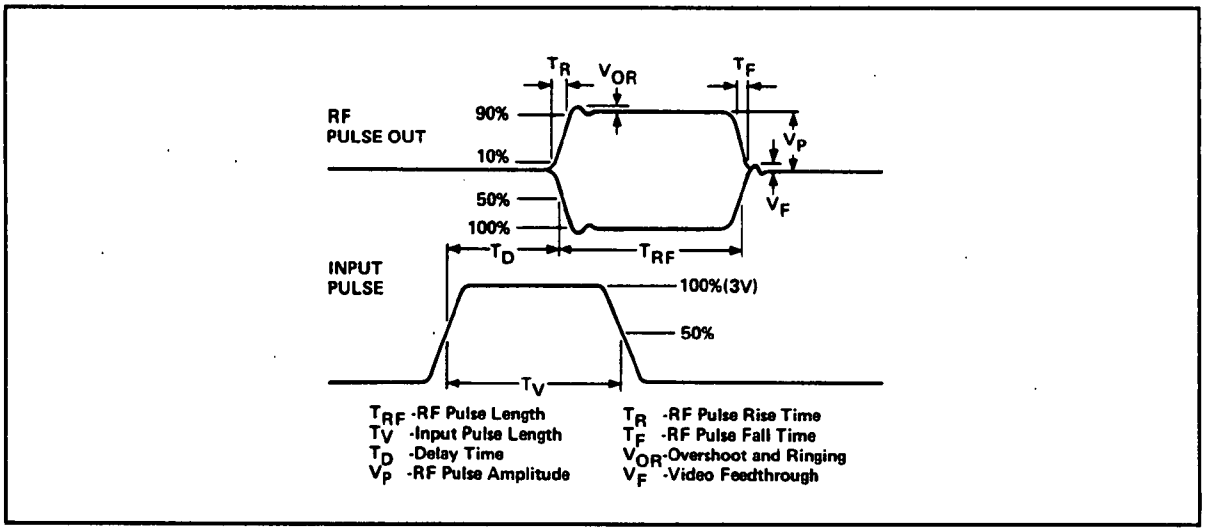


Figure 5-49a. Pulse Definitions

Equipment

Local Oscillator	HP 8340A Opt. 001
Network Analyzer	HP 8755C
Display	HP 182T
Amplifier	HP 8447F
Oscilloscope	HP 1741A
Adapter	HP P/N 5061-5311
10 dB Attenuator	HP 8493C Opt. 010
Mixer	RHG DMS 1-26
Low Pass Filter (LPF)	HP P/N 08340-60176

5-36a. SLOW PULSE MODULATION ADJUSTMENT (Cont'd)

Procedure

1. Connect equipment as shown in Figure 5-49b. Connect the mixer directly to the local oscillator RF output to obtain maximum LO drive to the mixer. connect the BNC tee directly to the HP 8340A AM connector. Allow at least 30 minutes warm up time.

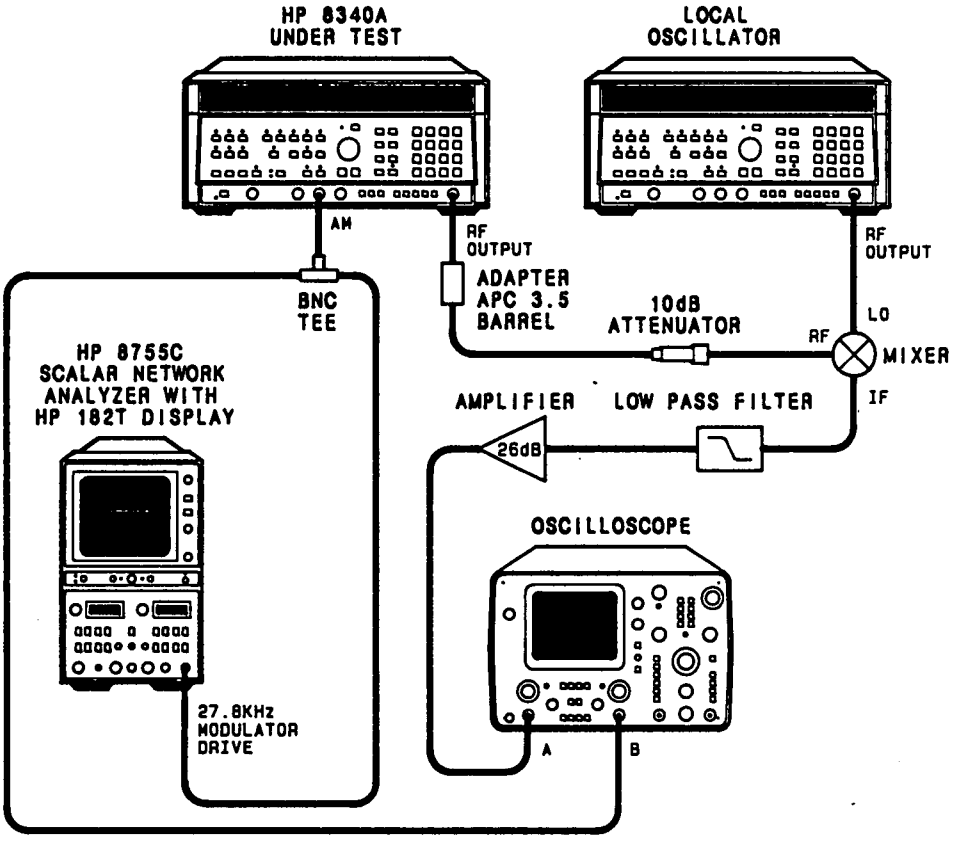


Figure 5-49b. Pulse Modulation Rise and Fall Time Test Setup

2. Set the oscilloscope up as follows:

   Channel A — 50 Ohm input. when the signal is present on the oscillocope, adjust vertical position and gain so the lower portion of the signal is at the 0% graticule, and the top of the pulse is at the 100% graticule. Use the averaged amplitude of the signal when setting up the 100% point, not the peak value.

   Channel B — DC input, 5V/div.

   Horizontal Controls — Chop Mode, trigger on Channel B, 2 usec/div.

5-36a. SLOW PULSE MODULATION ADJUSTMENT (Cont'd)

3. Press **[INSTR PRESET]** on both the HP 8340A under test and the local oscillator HP 8340A. Press the HP 8340A under test **[CW]** key and enter **[2] [GHz]** and press **[SHIFT] [PULSE]**. Press the local oscillator HP 8340A **[CW]** key and enter **[1] [.] [9] [5] [GHz]**. The IF frequency is then 50 MHz. Set the local oscillator HP 8340A for +10 dBm or maximum leveled output. The HP 8340A under test RF power should be 0 dBm.

NOTE

For best accuracy in this test, the Local Oscillator drive to the mixer should be ≥ +6 dBm. The HP 8340A Option 001 used as the LO will typically produce +6 dBm at any frequency, although it is only guaranteed to produce +4 dBm above 23 GHz. If +6 dBm is not available at a test frequency, try a slightly different frequency and be sure to have PEAK on.

4. Select oscilloscope channel A input only. Adjust the horizontal sweep period so the entire pulse width is visible on the oscillosope display. Adjust the vertical gain and position so that the pulse OFF is at the 0% graticule line and the pulse ON is a 100% graticule line. The ON portion of the pulse that is nearer to the trailing edge of the pulse should be used as the 100% reference point. The overshoot component of the pulse will then be clearly seen exceeding the 100% graticule.

5. Overshoot should not exceed 20%. Note the actual Overshoot value for later reference.

6. Repeat steps 4 and 5 at DUT frequencies of 3 through 26.0 GHz at 1 GHz steps, noting the overshoot at each frequency point. Make a last measurement at 26.5 GHz. At each frequency point, set the local oscillator HP 8340A CW frequency to be 50 MHz below that of the DUT.

7. Review the worst case Overshoot value; if it is within 20%, proceed to step 9. If the worst case Overshoot is out of tolerance, set the DUT and LO to the worst case frequencies and adjust A26R96 until the Overshoot meets tolerance.

8. Repeat steps 4 through 7 until overshoot is within tolerance at all frequency points.

9. Adjust the oscilloscope as in step 4 except the horizontal period should be adjusted so only the rising edge of the pulse is viewed. Refer to Figure 5-49c. Set the 10% point of the modulation envelope at the center vertical graticule line.

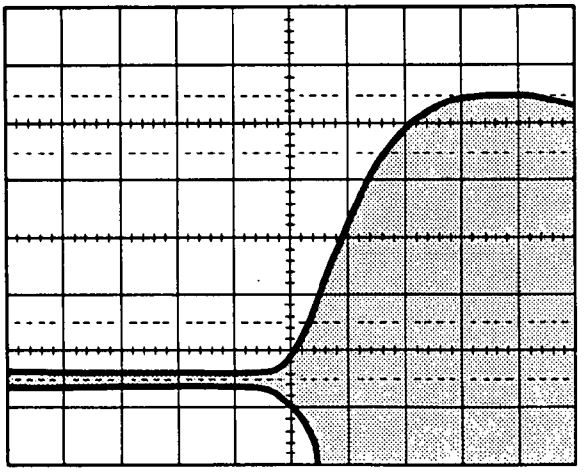


Figure 5-49c. Pulse Modulation Rise Time Waveform

5-36a. SLOW PULSE MODULATION ADJUSTMENT (Cont'd)

10. Set the DUT CW frequency to 2 GHz and the LO CW frequency to 1.95 GHz. Take note of the rise time for future reference. Rise time should be within 1 to 6 microseconds (10% to 90% points).

11. Repeat steps 9 and 10 at DUT frequencies of 3 through 26.0 GHz at 1 GHz steps, noting the rise time at each frequency point. Make a last measurement at 26.5 GHz. At each frequency point, set the local oscillator HP 8340A CW freequency to be 50 MHz below that of the DUT.

12. Take note of the worst case rise time, if this point is within 1 to 6 microseconds, proceed to step 14. If this point is out of tolerance, adjust A26R96 until tolerance is met.

13. Repeat steps 4 through 12 until overshoot and rise time at all listed frequencies are within tolerance. (Tolerances given for rise and fall time, as well as overshoot, are not warranted specifications.)

14. Adjust the oscilloscope horizontal position control to view the modulation envelope fall time. Position the waveform so that the 90% point of the modification envelope crosses a convenient vertical graticule. Refer to Figure 5-49d.

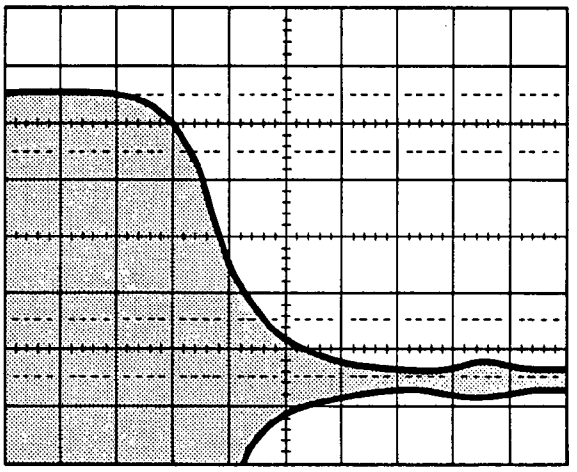


Figure 5-49d. Pulse Modulation Fall Time Waveform.

15. Set the DUT CW frequency to 2 GHz and the LO CW frequency to 1.95 GHz. Take note of the fall time for future reference. Fall time should be within 1 to 6 microseconds (10% to 90% points).

16. Repeat steps 14 and 15 at DUT frequencies of 3 through 26.0 GHz at 1 GHz steps, noting the fall time at each frequency point. Make a last measurement at 26.5 GHz. At each frequency point, set the local oscillator HP 8340A CW frequency to be 50 MHz below that of the DUT.

17. Take note of the worst case fall time, if this point is within 1 to 6 microseconds, this test has been completed. If this point is out of tolerance, adjust A26R96 until tolerance is met.

18. Repeat steps 4 through 17 until overshoot, rise time, and fall time at all listed frequencies are within tolerance.

5-37. LEVELED RF OUTPUT ADJUSTMENTS

H02 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION H02.

Reference:

Performance Test: Maximum Leveled Output Power and Accuracy
Service Section: RF Section

Description:

In this procedure, the RF Output signal is checked in leveled mode. A Frequency Response Test Set (8755C) is used to check for signal flatness and for the possible occurrence of "squegging." Squegging is an undesirable parasitic oscillation in the RF output signal.

In the next procedure, the ALC loop gain in each band is adjusted for optimum operation.

Next, a section is given using an HP 8340A internal program called "Auto Track." This program automatically sets the SYTM tracking.

A final section checks the RF Output signal with a Spectrum Analyzer (8566A) for squegging in any of the bands and allows a last fine adjustment to eliminate any squegging that is observed.

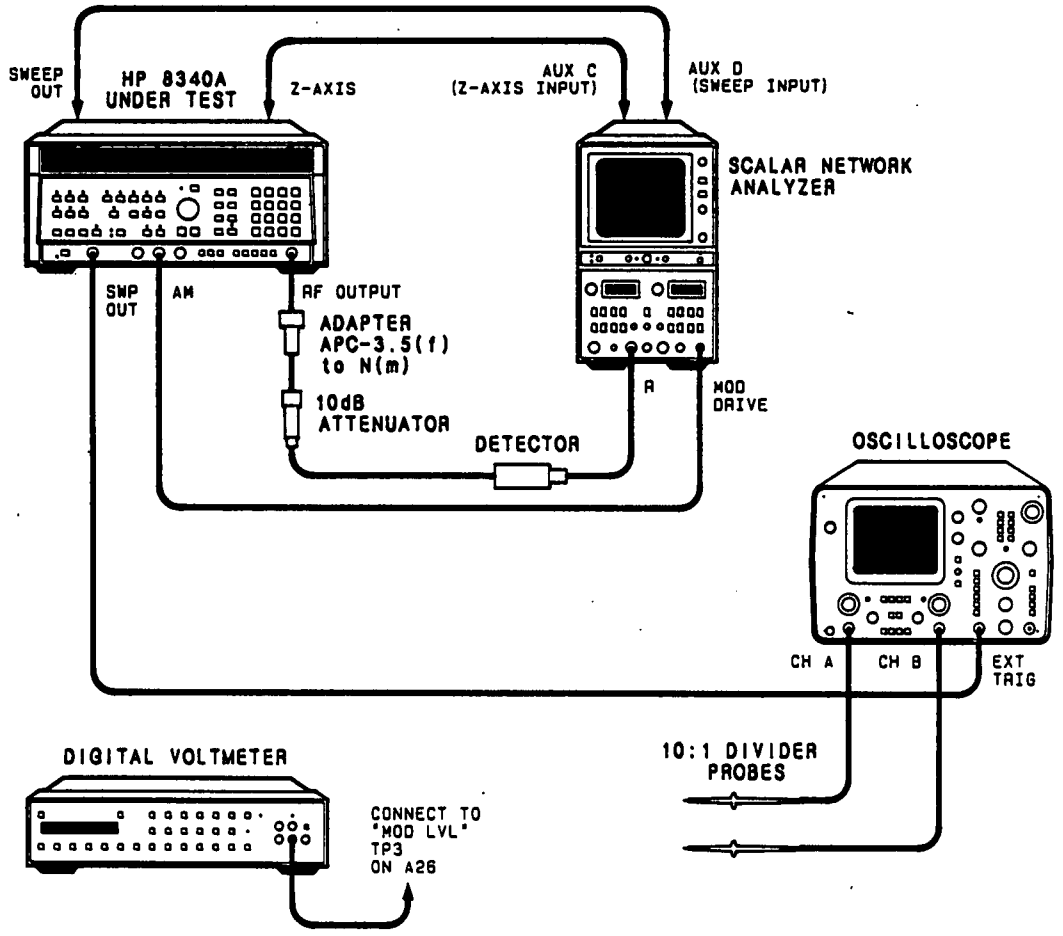


Figure 5-49. Leveled Power SRD Bias Adjustment Test Setup

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

HO2 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION HO2.

Equipment Required:

Frequency Response Test Set	HP 8755C
Detector	HP 11664B
Oscilloscope	HP 1741A
10:1 Divider Probe (2 Required)	HP 10004D
Digital Voltmeter	HP 3455A
10 dB Attenuator	HP 8493C Option 010

Procedures:

MODULATOR OFFSET

1. Connect equipment as shown in Figure 5-49. Connect the DVM to A26TP3 (MOD LVL). Preset A26R88 (MO) fully clockwise (Figure 5-50). Allow at least 30 minutes warm up.

2. Press the HP 8340A **[INSTR PRESET]**. Press **[CW]** and enter **[8] [GHz]**. Press **[SHIFT] [METER]** to bypass the ALC circuit and allow direct control of the linear modulator circuit.

SEE CHANGES ⇒

3. Adjust the front panel rotary knob for a DVM indication of 0.00 volts, then note the POWER dBm display indication. Adjust A26R88 (MO) CCW to decrease the POWER dBm indication by 0.2 dB.

LEVELED BIAS

4. Disconnect the DVM and connect oscilloscope CHAN A probe to A26TP3 (MOD LVL). Connect CHAN B probe to A24TP12 (SRD).

5. Press HP 8340A **[INSTR PRESET]**. Press **[SHIFT] [CF]** and enter **[2] [0] [0] [MHz]** for a step size of 200 MHz. Press **[SWEEP TIME]** and enter **[5] [0] [msec]**. Press **[SHIFT] [PWR SWP]** to decouple the RF attenuator and ALC, and enter **[−] [2] [0] [dBm]**. Press **[PWR SWP]** and enter **[4] [0] [dB]**. Press **[AM]** ON. Press **[CW]** and enter **[8] [GHz]**. This puts the HP 8340A in power sweep from −20 to +20 dB at any frequency selected.

   Save this instrument state by pressing **[SAVE] [1]**.

   Set A24R1 (OFF A) (Figure 5-50) and A24R2 (OFF B) controls fully counter clockwise.

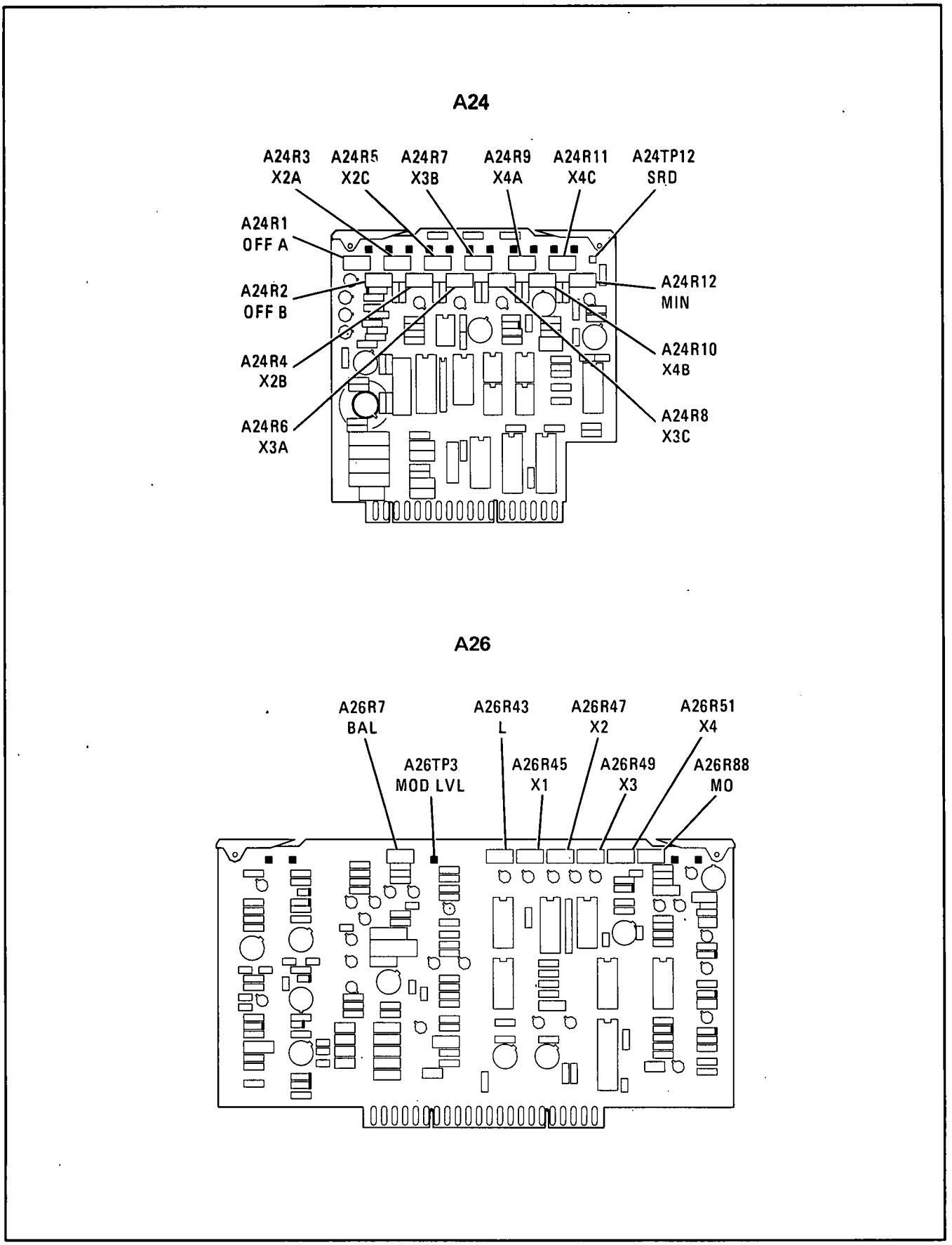
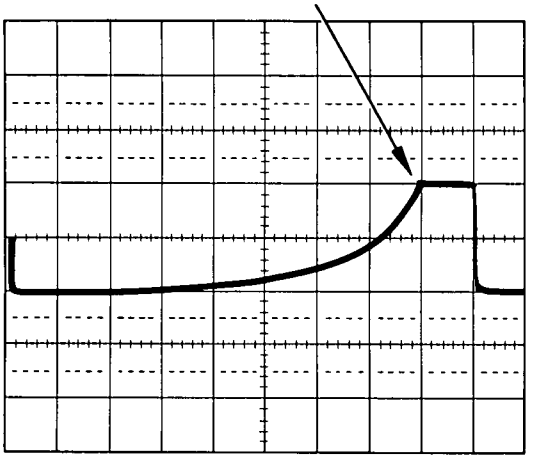
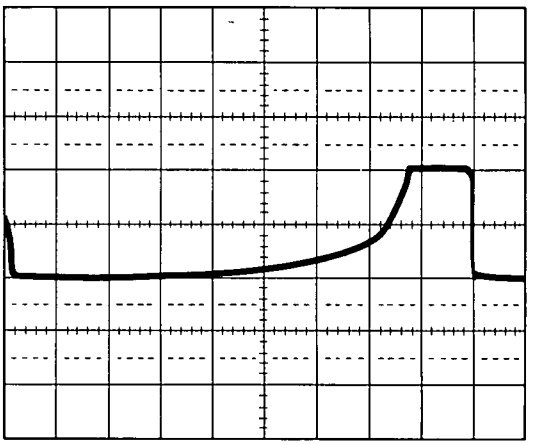


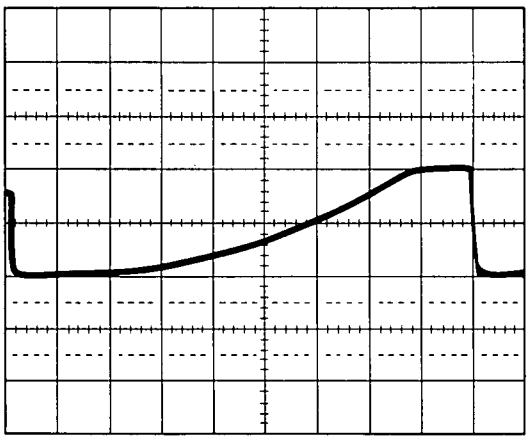
Figure 5-50. SRD Bias Adjustments on A24 and A26



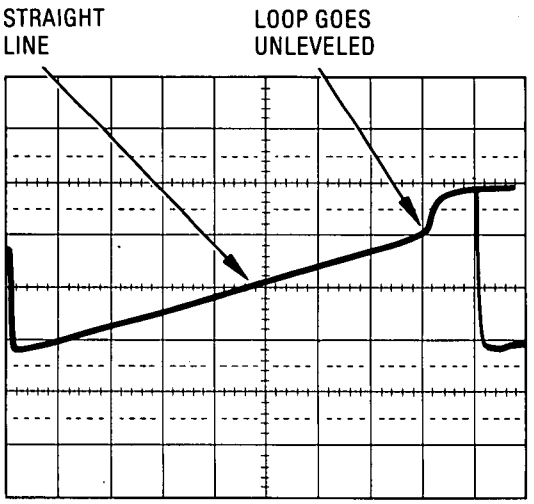
A. BEST CH B SRD BIAS



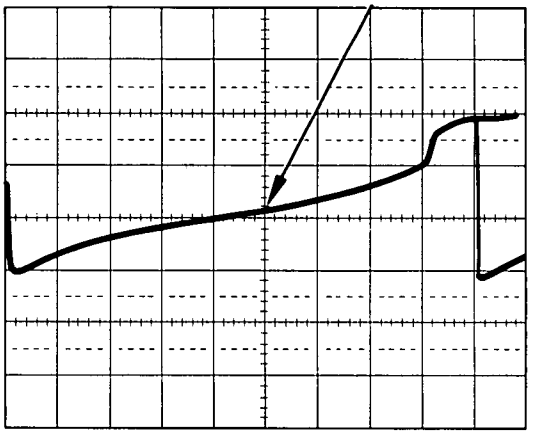
B. ACCEPTABLE CH B SRD BIAS.
(ADJUST OFFSET A CONTROL CLOCKWISE
TO IMPROVE WAVEFORM.)



C. BAD CH B SRD BIAS
(ADJUST OFFSET A CONTROL COUNTER-
CLOCKWISE TO IMPROVE WAVEFORM.)

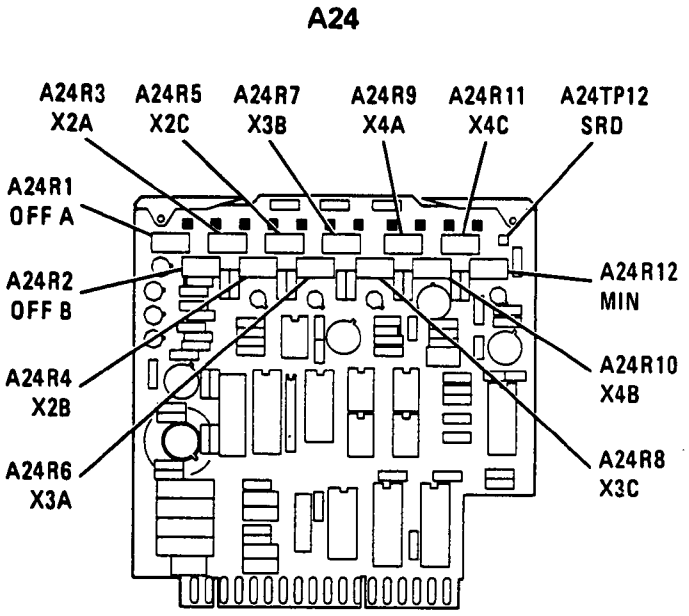


D. GOOD CH A MOD LVL



E. BAD CH A MOD LVL

Figure 5-51. Typical MOD LVL and SRD BIAS Waveforms



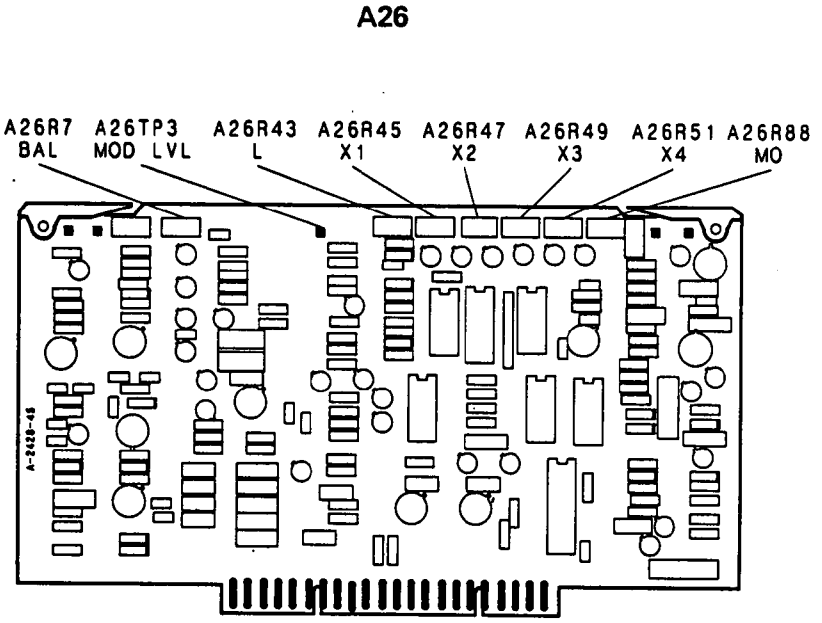


Figure 5-50. SRD Bias Adjustments on A24 and A26

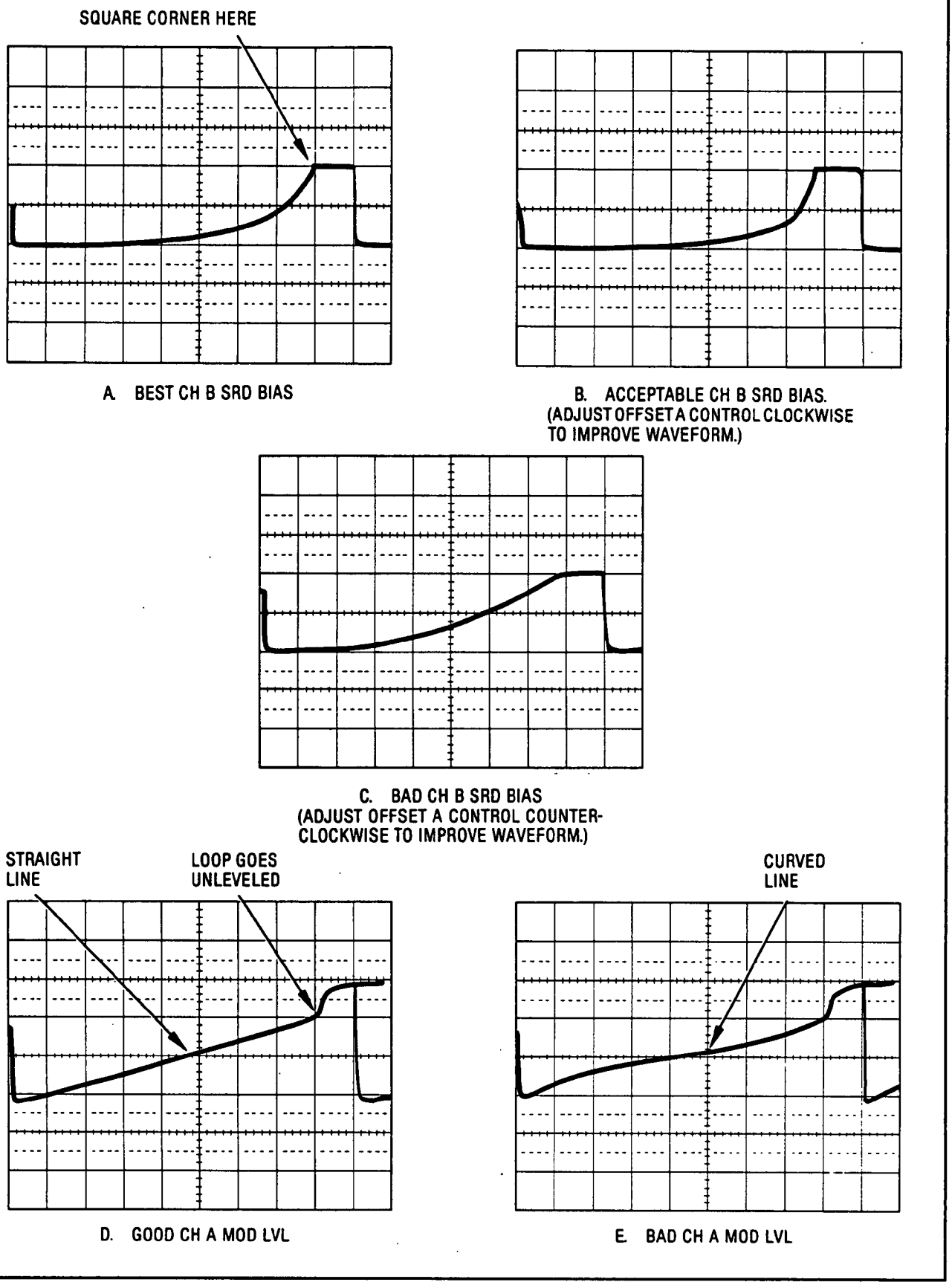


Figure 5-51. Typical MOD LVL and SRD BIAS Waveforms

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

H02 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION H02.

6. Set the oscilloscope as follows:

DISPLAY	CHOP, TRIGGER ON A
CH A	0.05V/Div DC COUPLED
CH B	0.1V/Div DC COUPLED
TRIGGER	EXT. NEG.
TIME/Div	5 ms

The oscilloscope display should look similar to Figure 5-52.

NOTE

It may be necessary to adjust the oscilloscope sweep vernier to view the entire sweep on the CRT.

LEVELED POWER SRD BIAS ADJUSTMENT

7. Center A24R12 MIN control and A24R5 X2C control. Adjust A24R1 OFF A for optimum display as shown in Figure 5-51, Waveform A, B, and C.

8. Press HP 8340A **[CW]** and enter **[1] [0] [.] [6] [GHz]**. Adjust A24R2 OFF B for optimum trace as shown in Figure 5-51, Waveforms A, B, and C. Using the **[STEP]** keys, step through Band 2 from 7 to 13.4 GHz and check for an optimum SRD Bias trace (Figure 5-51, Waveforms D and E) at each step. If not optimum, adjust A24R2 OFF B if the HP 8340A frequency is closer to 13.5 GHz, or adjust A24R1 OFF A if the frequency is closer to 7 GHz. If an adjustment is made, step through the entire band again, making sure every step is optimized or acceptable if all steps cannot be optimized.

9. Set oscilloscope EXT TRIGGER to POS. TRIGGER, DISPLAY A, and set CH A to .02 V/DIV.

10. Press HP 8340A **[INSTR PRESET]**. Press **[START FREQ]** and enter **[7] [GHz]**. Press **[STOP FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[SHIFT] [PWR SWP]** and enter **[−] [2] [0] [dBm]**. Press **[SWEEP TIME]** and enter **[5] [0] [msec]**.

    Save this instrument state by pressing **[SAVE] [2]**.

11. The oscilloscope display should be similar to Figure 5-52. Adjust A24R12 MIN control so that the highest peak on the oscilloscope display is minimum.

12. Press **[RECALL] [1]** then press **[CW]** and enter **[1] [0] [.] [6] [GHz]**. Change oscilloscope EXT TRIGGER to NEG. TRIGGER, DISLAY CHOP: CH A to .05 V/DIV, and CH B to 0.1 V/DIV. Adjust A24R5 X2C to minimize the MOD LEVEL voltage at the start of the power sweep and keep the MOD LEVEL power sweep trace straight with no steps or "bows" as it sweeps up. Using the **[STEP]** keys, step through band 2 from 7 to 13.4 GHz and readjust A24R5 X2C if necessary to improve the MOD LEVEL trace. Also, adjust A24R1 OFF A and A24R2 OFF B if necessary to optimize the SRD Bias as in step 8 above. If any adjustments are made, step through band 2 again until the SRD bias and the MOD LEVEL trace is optimized. It will not be possible to adjust the MOD LEVEL trace for optimum at each step, so adjust for best compromise trace all across Band 2. (See Figure 5-51.)

13. A24R8 X3C and A24R11 X4C are adjusted in Bands 3 and 4 respectively. They are adjusted the same as in Band 2 to minimize the MOD LEVEL voltage at the start of the

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

H02 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION H02.

power sweep and keep the MOD LEVEL trace straight with no "bows" as it sweeps up. (Refer to Figure 5-51.) Press **[RECALL] [1]** then **[CW]** and enter **[1] [7] [.] [5] [GHz]**. Adjust A24R8 X3C for a MOD LEVEL trace as described above. Using the **[STEP]** keys, step through Band 3 from 13.5 to 19.9 GHz and readjust if necessary to achieve the best MOD LEVEL trace across Band 3.

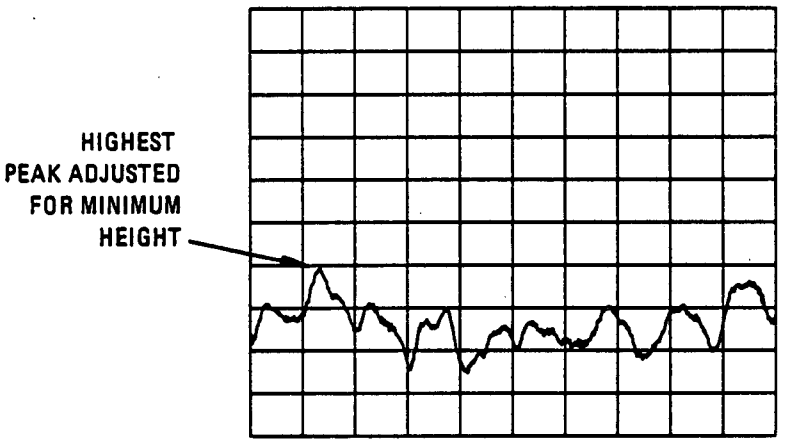


Figure 5-52. Oscilloscope Display at A26TP3 MOD LVL with no Squegging

NOTE

The SRD bias trace is adjusted in Band 2 with A24R1 OFF A and A24R2 OFF B for optimum. It should not require any other adjustments in Bands 3 or 4, unless the SRD bias trace is bad as shown in Figure 5-51. If either the OFF A or OFF B controls are adjusted in Bands 3 or 4, then each band will have to be rechecked, starting with Band 2 at 7 GHz and stepping through each band.

14. Press **[RECALL] [1]**, **[CW] [2] [3] [.] [3] [GHz]** and adjust A24R11 X4C for a MOD LEVEL trace as described above. Using the **[STEP]** keys, step through Band 4 from 20.1 to 26.5 GHz and readjust if necessary for best MOD LEVEL trace all across Band 4.

15. Remove oscilloscope probes from the HP 8340A. Connect the HP 8340A to the 8755C as shown in Figure 5-49. Press HP 8340A **[INSTR PRESET]** and **[RECALL] [2]**. Press **[SHIFT] [PWR SWP]** and enter **[2] [0] [dBm]**. Press **[SHIFT] [PULSE]**. Press **[SWEEP TIME] [AUTO]**.

    Adjust 8755C reference level to view the Band 2 response at 1 dB/DIV. Using the front panel rotary knob and the 8755C reference level controls, vary the ALC level from +20 dBm to −20 dBm. Look for squegging as shown in Figure 5-53. If any squegging occurs, adjust A24R5 X2C counterclockwise to eliminate the squegging.

16. Press **[START FREQ] [1] [3] [.] [5] [GHz]**, **[STOP FREQ] [2] [0] [GHz]**, **[SHIFT] [PWR SWP] [2] [0] [dBm]**. Vary the ALC level as in step 15 and check for squegging. If squegging occurs, adjust A24R8 X3C counterclockwise to eliminate the squegging.

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

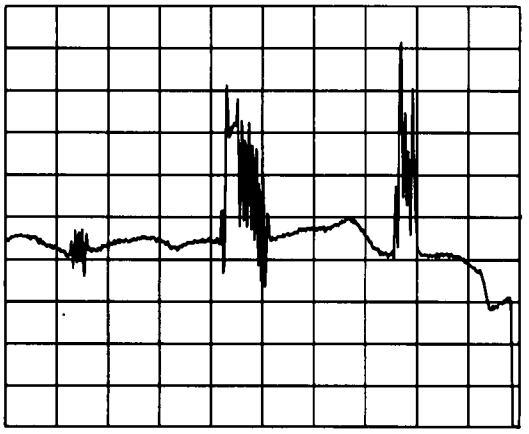


Figure 5-53. 8755C Display with Squegging Present

17. Press **[START FREQ] [2] [0] [GHz]**, **[STOP FREQ] [2] [6] [.] [5] [GHz]**, **[SHIFT] [PWR SWP] [2] [0] [dBm]**. Vary the ALC level as in step 15. If any squegging occurs, adjust A24R11 X4C counterclockwise to eliminate the squegging.

18. Press **[SHIFT] [PWR SWP] [0] [dBm]** and adjust the 8755C REF LEVEL to view Band 4 at 1 dB/DIV. Press **[START FREQ]** and using the front panel rotary knob, move the START FREQ up to 26 GHz and down to 14 GHz while watching the 8755C display for squegging. If any squegging is seen, stop at the START FREQ where it occurs. If the squegging occurs in Band 3 (13.5 to 20 GHz), adjust A24R8 X3C counterclockwise until squegging is gone. If squegging occurs in Band 4 (20 to 26.5 GHz), adjust A24R11 X4C counterclockwise until the squegging is gone. Press **[SHIFT] [PWR SWP] [−] [5] [dBm]** and change the start frequency as above; adjust out squegging if any occurs. Press **[SHIFT] [PWR SWP] [−] [1] [0] [dBm]** and change the start frequency as above; adjust out sqegging if any occurs. Press **[SHIFT] [PWR SWP] [−] [1] [5] [dBm]** and change the start frequency as above; adjust out squegging if it occurs.

LINEAR MODULATOR ALC LOOP GAIN ADJUSTMENTS

Description:

The following adjustments are performed to set the ALC Loop Gain for each band. The adjustment is done in the power sweep (PWR SWP) mode, while sweeping the ALC Loop from −20 dBm to maximum power (or +20 dBm).

NOTE

If the A26 Assembly has not been replaced, adjustments may not be necessary.

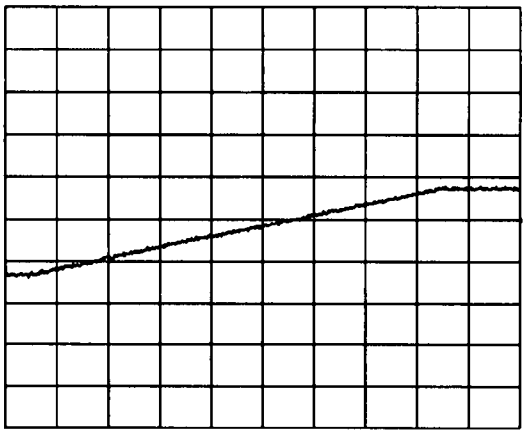
19. Connect the 8340A SWEEP OUT to the oscilloscope EXT TRIGGER. Connect CH A probe to A26TP3 (MOD LVL). Connect CH B probe to A25TP2 (DET). Set up the oscillosope as follows:

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

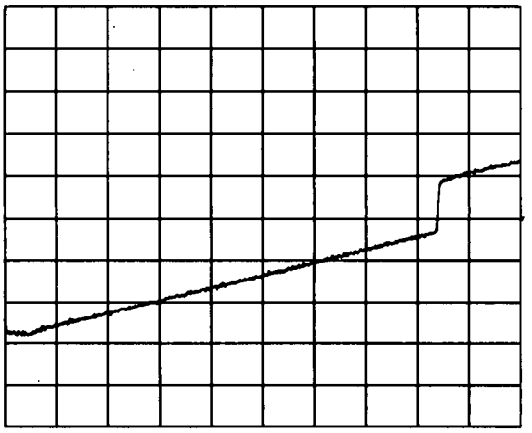
DISPLAY	CHOP
CH A	0.05V/Div DC COUPLED
CH B	0.05V/Div DC COUPLED
TRIGGER	EXT NEG
TIME/Div	5 ms
SWEEP VERNIER	ON

20. Press the 8340A **[INSTR PRESET]**. Press **[SWEEP TIME]** and enter **[5] [0] [msec]**. Press **[SHIFT] [PWR SWP]** and enter **[−] [2] [0] [dBm]**. Press **[PWR SWP]** and enter **[4] [0] [dBm]**. Press **[SHIFT] [CF] [2] [0] [0] [MHz]**. Press **[AM]** to turn it ON. Press **[CW]** and enter **[1] [0] [MHz]**.

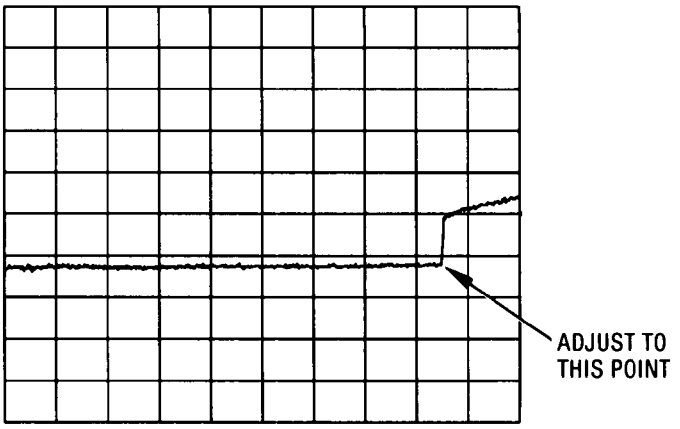
    The oscilloscope display should be similar to Figure 5-54, Waveforms A and B. It may be necessary to adjust the SWEEP VERNIER to view the entire power sweep.



A. TYPICAL DET WAVEFORM



B. TYPICAL MOD LVL WAVEFORM



C. TYPICAL MOD LVL MINUS DET WAVEFORM

Figure 5-54. Typical MOD LVL and DET Waveforms for ALC Loop Gain Adjustment

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

NOTE

In step 21 through 25, the oscilloscope display will be adjusted for the most horizontal line. This adjustment is only concerned with the trace up to where it deviates from a flat line. (See Figure 5-54, waveform C.) This point on the display will change position with frequency.

21. On the oscilloscope, invert Channel B and select DISPLAY A+B mode. Using the 8340A **[STEP]** keys, step the CW frequency through Band 0 from 10 MHz to 2.21 GHz and adjust A26R43 HET for the most horizontal line across Band 0.

22. Press **[CW]** and enter **[2] [.] [3] [GHz]**. Using the **[STEP]** keys, step the CW frequency through Band 1 from 2.3 to 6.9 GHz and adjust A26R45 X1 for the most horizontal line across Band 1.

23. Press **[CW]** and enter **[7] [GHz]**. Using the **[STEP]** keys, step the CW frequency through Band 2 from 7.0 to 13.4 GHz and adjust A26R47 X2 for the most horizontal line across Band 2.

24. Press **[CW]** and enter **[1] [3] [.] [5] [GHz]**. Using the **[STEP]** keys, step the CW frequency through Band 3 from 13.5 to 19.9 GHz and adjust A26R49 X3 for the most horizontal line across Band 3.

25. Press **[CW]** and enter **[2] [0] [GHz]**. Using the **[STEP]** keys, step the CW frequency through Band 4 and adjust A26R51 X4 for the most horizontal line across Band 4.

NOTE

A26R7 BAL is adjusted in the Pulse Adjustment procedure and A26R88 MO is adjusted in the Leveled Power SRD Bias Adjustment procedure.

SYTM TRACKING USING AUTO TRACK

Description:

Auto Tracking is an internal program that sets Calibration Constants 9 through 12 and 50 through 53 to optimize the tracking. The program takes about 5 to 10 seconds to run and is invoked using **[SHIFT] [PEAK]**.

When **[SHIFT] [PEAK]** is pressed, the HP 8340A adjusts the Calibration Constants to give tracked performance. The tracking adjustments made to the A28 SYTM Driver should be adjusted in connection with the auto-tracking routine to give optimum tracking performance.

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

Equipment Required:

Frequency Response Test Set	HP 8755C
Detector	HP 11664B
Storage Normalizer	HP 8750A
Oscilloscope	HP 1741A
10:1 Divider Probe	HP 10004D
Digital Voltmeter	HP 3455A
Power Meter	HP 436A
Power Sensor	HP 8485A
10 dB Attenuator	HP 8493C Option 010

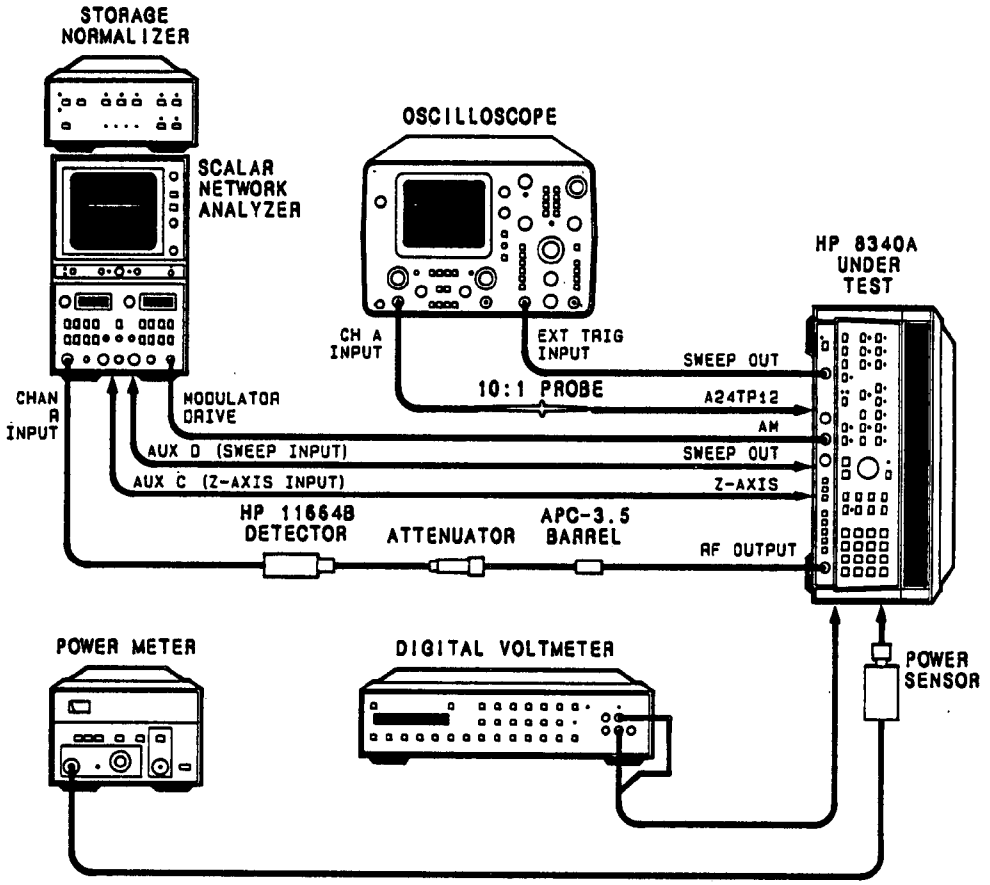


Figure 5-55. SYTM Tracking and Delay, and Leveled SRD Bias Adjustment Setup

26. Connect equipment for SYTM tracking as shown in Figure 5-55. Allow at least 30 minutes warm up.

27. Press HP 8340A **[INSTR PRESET]** then press **[SHIFT] [PULSE]**. Press **[START FREQ]** and enter **[6] [.] [9] [GHz]**. Press **[STOP FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[SWEEP TIME]** and enter **[2] [0] [0] [msec]**. Press **[XTAL]** leveling key to obtain non-leveled operation. Display CH R on both channels at 1 dB/Div so that one channel can be stored and then compared to the other channel. Store the Band 2 response using the storage normalizer by pressing 8750A CH1 INPUT, STORE INPUT, and RECALL.

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

28. Press **[SHIFT] [PEAK]**. After about 10 seconds, the CH 2 trace should match the stored CH 1 trace within approximatly 0.5 dB. If the difference is less than 1 dB, proceed to step 33, otherwise continue with step 29.

29. Adjust the low end of Band 2 with A28R1 OFF and the high end with the auto track routine (**[SHIFT] [PEAK]**) until the unleveled power trace for Band 2 is optimized.

30. Store the optimized trace using the storage normalizer as described in step 27.

31. Set Calibration Constant Number 10 to 1024 as follows. Press **[SHIFT] [GHz] [1] [0] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]** and enter **[1] [0] [2] [4] [Hz]**.

32. Adjust A28R8 GAIN until the trace on the 8755C matches the stored trace. Go to step 28 and repeat auto-track routine until no further adjustments are necessary.

33. For Band 1, press **[START FREQ]** and enter **[2] [.] [3] [GHz]**. Press **[STOP FREQ]** and enter **[7] [GHz]**.

34. Adjust the low end of Band 1 with A28R113 B1 OFF and the high end of Band 1 with Calibration Constant Number 9. Calibration Constant Number 9 may be accessed as follows. Press **[SHIFT] [GHz] [9] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [KHz] [2] [2] [Hz]**. Use the rotary knob to optimize the high end. Adjust both A28R113 B1 OFF and Calibration Constant Number 9 until the optimum trace is present on the 8755C. Do not worry about sections that drop out due to squegging; they will not present a problem with leveled output power over the specified power range of the instrument.

35. Store the optimized trace using the storage normalizer as described in step 27. Press **[ENTRY OFF]** to disable the rotary knob.

36. Press **[SHIFT] [PEAK]** and wait until the auto tracking is complete. If the resulting trace is greater than 1 dB from the stored trace, adjust A28R113 B1 OFF and repeat this step until the trace is within 1 dB of the stored trace.

37. For Band 3, press **[START FREQ]** and enter **[1] [3] [.] [3] [5] [GHz]**. Press **[STOP FREQ]** and enter **[2] [0] [GHz]**.

38. Adjust the low end of Band 3 with Calibration Constant Number 11. Calibration Constant Number 11 may be accessed by pressing **[SHIFT] [GHz] [1] [1] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [KHz] [2] [2] [Hz]**. Adjust the high end of Band 3 with A28R2 BP1. Iterate adjusting the low end and the high end until the optimum trace is present on the 8755C.

39. Store the optimized trace using the storage normalizer as described in step 27. Press **[ENTRY OFF]** to disable the rotary knob.

40. Press **[SHIFT] [PEAK]** and wait until the auto tracking is complete. If the resulting trace is greater than 1 dB from the stored trace, adjust A28R2 BP1. Repeat this step until the trace is within 1 dB of the stored trace.

41. For Band 4, press **[START FREQ]** and enter **[1] [9] [.] [8] [GHz]**. Press **[STOP FREQ]** and enter **[2] [6] [.] [5] [GHz]**.

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

42. Adjust the low end of Band 4 with Calibration Constant Number 12. Calibration Constant Number 12 may be accessed as follows. Press **[SHIFT] [GHz] [1] [2] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [KHz] [2] [2] [Hz]**. Adjust the middle of Band 4 using A28R3 BP2. Adjust the high end of Band 4 using A28R4 BP3 and A28R5 BP3FRQ. Iterate all of these adjustments until the optimum trace is present on the 8755C.

43. Store the optimized trace using the storage normalizer as described in step 27. Press **[ENTRY OFF]** to disable the rotary knob.

44. Press **[SHIFT] [PEAK]** and wait until the auto tracking is complete. If the trace is greater than 1 dB from the stored trace, iterate the adjustments using autotracking (**[SHIFT] [PEAK]**), A28R3 BP2, A28R4 BP3, and A28R5 BP3FRQ until the trace is within 1 dB of the stored trace.

45. Press **[SHIFT] [MHz] [1] [4] [Hz] [SHIFT] [KHz] [5] [3] [4] [9] [Hz] [INSTR PRESET]** to copy the new Calibration Constant values permanently in "protected memory area".

LEVELED SQUEGGING TEST USING THE 8566A SPECTRUM ANALYZER

Description:

The 8340A Under Test RF output signal is down converted using a Local Oscillator 8340A and a mixer. The IF output of the mixer is fed to a spectrum analyzer. Any squegging of the 8340A under test will appear as a spurious response on the IF signal.

This test should be performed after SYTM tracking and delay, and SRD unleveled bias adjustments.

Equipment Required:

Synthesized Sweeper	HP 8340A (Opt 001)
10 dB Attenuator	HP 8493C Option 010
Mixer	RHG DMS 1-26
Spectrum Analyzer	HP 8566A

46. Connect equipment as shown in Figure 5-56. Connect the mixer LO input port directly to the LO 8340A RF output connector to obtain maximum mixer LO input level. Allow at least 30 minutes warm up time.

47. Press the LO 8340A **[INSTR PRESET]**. Press **[START FREQ]** and enter **[6] [.] [4] [GHz]**. Press **[STOP FREQ]** and enter **[1] [2] [.] [9] [GHz]**. Press **[POWER LEVEL]** and enter **[1] [0] [dBm]**. Press **[SHIFT] [CF]** and enter **[1] [0] [0] [MHz]** for a step size of 100 MHz. Press **[MANUAL]** SWEEP and enter **[6] [.] [4] [GHz]** to set the LO to CW at 6.4 GHz.

48: Press the 8340A Under Test **[INSTR PRESET]**. Press **[START FREQ]** and enter **[7] [GHz]**. Press **[STOP FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[POWER LEVEL]** and using the front panel rotary knob, adjust for maximum leveled power (just before the UNLEVELED light comes on). Press **[SHIFT] [CF]** and enter **[1] [0] [0] [MHz]** for a step size of 100 MHz. Press **[MANUAL]** SWEEP and enter **[7] [GHz]**. The mixer IF frequency is now 600 MHz.

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

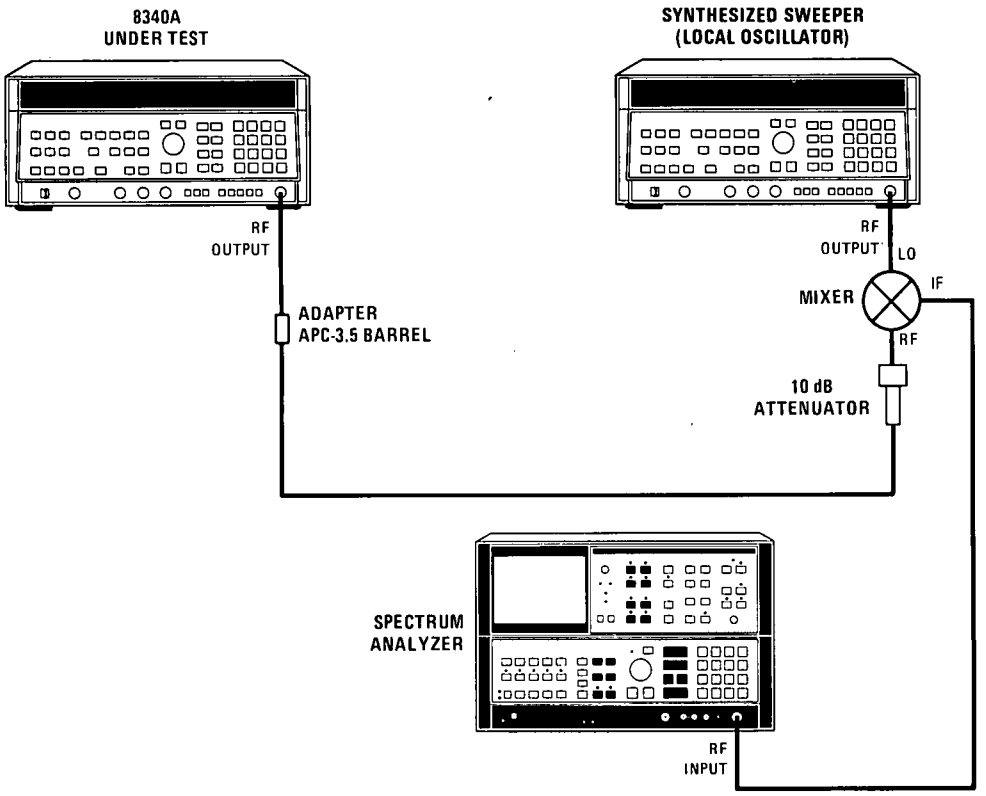


Figure 5-56. Leveled Squegging Test Setup.

49. Set the spectrum analyzer for FULL SPAN of 0-2.5 GHz. Set RES BW for 300 kHz. Set VIDEO BW for 100 kHz. Set START FREQ to 590 MHz. Set STOP FREQ to 800 MHz. Set REFERENCE LEVEL to −10 dBm. Set ATTEN to 0 dB. Press HOLD to retain these settings. The 600 MHz IF signal should be near the left side of the spectrum analyzer CRT.

50. Using the STEP UP key on both the 8340A Under Test and the LO 8340A, step through Band 2 observing the spectrum analyzer display at each step. There may be responses due to mixing products. These will appear as low level signals. A squegging response will appear as a higher amplitude signal as shown in Figure 5-57. If squegging occurs, adjust A24R5 (X2C) slightly CCW to eliminate the squegging. Note, if the control is adjusted and there is no effect on the response, the response is probably a mixing product.

NOTE

Test for squegging at power levels from maximum leveled power to −20 dBm in 5 dB increments.

51. Press 8340A Under Test **[SHIFT] [PWR SWP]** and enter the maximum ALC power level that will be a 5 dB increment below max leveled power (i.e., 15, 10, 5). Repeat step 50 at this power level. Enter the next 5 dB increment and repeat step 50 until the test for squegging has been performed from maximum leveled power to −20 dBm.

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

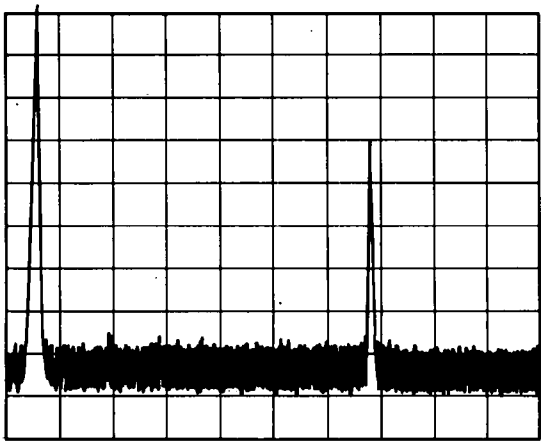


Figure 5-57. Squegging Displayed on Spectrum Analyzer

52. For Band 3, press the LO 8340A **[START FREQ]** and enter **[1] [2] [.] [9] [GHz]**. Press **[STOP FREQ]** and enter **[1] [9] [.] [4] [GHz]**. Press **[MANUAL]** and enter **[1] [2] [.] [9] [GHz]**.

53. Press the 8340A Under Test **[START FREQ]** and enter **[1] [3] [.] [5] [GHz]**. Press **[STOP FREQ]** and enter **[2] [0] [GHz]**. Press **[POWER LEVEL]** and using the front panel rotary knob, adjust for maximum leveled power. Press **[MANUAL]** and enter **[1] [3] [.] [5] [GHz]**.

54. Using the step keys as described in step 50, step through Band 3. If squegging occurs, adjust A24R8 (X3C) slightly CCW to eliminate the squegging.

NOTE

Test for squegging at power levels from maximum leveled power to −20 dBm in 5 dB increments.

55. Press 8340A Under Test **[SHIFT] [PWR SWP]** and enter the maximum ALC power level that will be a 5 dB increment below max leveled power (i.e., 10, 5). Repeat step 54 at this power level. Enter the next 5 dB increment and repeat step 54 until the test for squegging has been performed from maximum leveled power to −20 dBm.

56. For Band 4, press the LO **[START FREQ]** and enter **[1] [9] [.] [4] [GHz]**. Press **[STOP FREQ]** and enter **[2] [5] [.] [9] [GHz]**. Press **[MANUAL]** and enter **[1] [9] [.] [4] [GHz]**.

57. Press the 8340A Under Test **[START FREQ]** and enter **[2] [0] [GHz]**. Press **[STOP FREQ]** and enter **[2] [6] [.] [5] [GHz]**. Press **[CONT]** and **[POWER LEVEL]**. Adjust the 8340A front panel rotary knob for maximum leveled power. Press **[MANUAL]** and enter **[2] [0] [GHz]**.

58. Using the step keys as described in step 50, step through Band 4. If squegging occurs, adjust A24R11 (X4C) slightly CCW to eliminate the squegging.

5-37. LEVELED RF OUTPUT ADJUSTMENTS (Cont'd)

NOTE

Test for squegging at power levels from maximum leveled power to −20 dBm in 5 dB increments.

59. Press 8340A Under Test **[SHIFT] [PWR SWP]** and enter the maximum ALC power level that will be a 5 dB increment below max leveled power (i.e., 5, 0, −5). Repeat step 58 at this power level. Enter the next 5 dB increment and repeat step 58 until the test for squegging has been performed from maximum leveled power to −20 dBm.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT

Reference:

Performance Test: Maximum Leveled Output Power and Accuracy
Service Section: RF Section

Description:

This procedure tests the 8340A for leveled power flatness. If the 8340A meets the requirements in this procedure, flatness adjustments are not necessary. Flatness is checked in the 10 MHz to 2.4 GHz band by finding the minimum and maximum power points across the frequency band using an oscilloscope to view the power meter recorder output while sweeping. A marker is positioned at the minimum and maximum points. The 8340A is set to Manual Sweep at the marker frequencies and the power is measured. Flatness is the maximum deviation from the power level at 100 MHz for the 0.01 to 2.4 GHz range and at 2.4 GHz for the 2.4 to 26.5 GHz range. Flatness corrections are made by modifying the Calibration Constants data.

In the 2.4 to 26.5 GHz bands, an 8755C Frequency Response Test Set and directional coupler are used to display the swept frequency signal. Errors due to frequency response of the test equipment are subtracted from the measurement by the Storage Normalizer.

NOTE

If equipment and the program are available to run the automated test on flatness described in manual supplement titled "Automated Test Procedures", it may be used instead of these procedures in Paragraph 5-38.

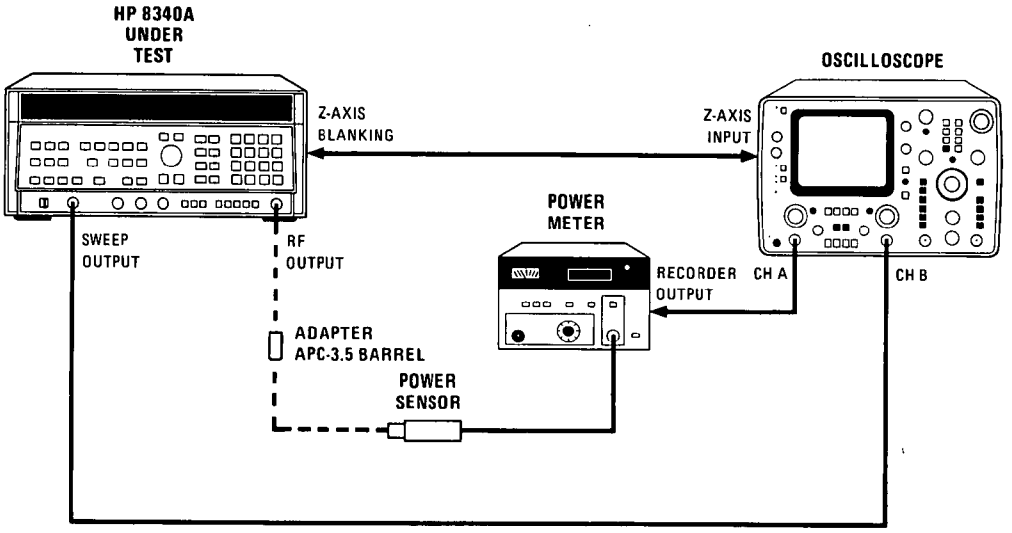


Figure 5-58. Flatness Verification Test Setup

Equipment Required:

Oscilloscope	HP 1741A
Power Meter	HP 436A
Power Sensor	HP 8481A
Power Sensor	HP 8485A
Adapter (APC-3.5 fem. to fem.)	HP Part Number 5061-5311

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

HO2 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION HO2.

Procedure:

10 MHz to 2.4 GHz FLATNESS VERIFICATION

1. Connect the equipment as shown in Figure 5-58. Connect the HP 8485A Power Sensor to the power meter. Allow at least 30 minutes warm up time. Set the power meter calibration factor switch for 2.4 GHz, then zero and calibrate the power meter before connecting the power sensor to the HP 8340A Under Test.

2. Press HP 8340A **[INSTR PRESET]**. Press the **[STOP FREQ]** key and enter **[2] [.] [4] [GHz]**. Adjust oscilloscope horizontal position and gain to obtain a full CRT horizontal trace.

3. Press the **[SWEEP TIME]** key and enter an appropriate sweep time (for an oscilloscope, enter 2 to 5 seconds dependent upon CRT illumination).

4. Adjust the oscilloscope controls to view the power meter RECORDER OUTPUT voltage versus the HP 8340A SWEEP OUTPUT voltage (A versus B). The oscilloscope vertical gain and position must be changed as a function of the power meter range and RECORDER OUTPUT voltage.

5. Press Frequency Marker key **[M2]** and, using the rotary knob, vary the marker frequency to position the (intensified) marker on the lowest point on the oscilloscope trace. It may be necessary to adjust the oscilloscope INTENSITY to view the marker dot.

6. Note the marker frequency. Press the **[MANUAL]** key and enter the frequency noted for M2. Set the power meter calibration factor switch for this frequency. The power meter indication is the minimum power point. Record this power meter indication.

NOTE

If the minimum or maximum power occured below 50 MHz, use the 8481A Power Sensor to measure the power level.

7. Press the **[CONT]** key to return to the power sweep mode. Press **[M1]** and, using the rotary knob, vary the marker frequency to position the marker on the highest point on the oscilloscope trace. Note the marker frequency. Press the **[MANUAL]** key and enter the frequency noted for M1. Set the power meter calibration factor switch for this frequency. The power meter indication is the maximum power point. Record the power meter indication.

8. Press **[M3]** and enter **[1] [0] [0] [MHz]**. Set the power meter calibration factor for 100 MHz. The power meter indication is the power level at 100 MHz used for reference in the remainder of this test. Record the indication.

9. Calculate the power flatness by comparing the minimum power point (step 6) and the maximum power point (step 7) against the 100 MHz reference (step 8). To meet the specification in the 10 MHz to 2.4 GHz band (Band 0), the power meter indications relative to the 100 MHz reference power level should be within ±0.5 dB in a standard instrument and within ±0.6 dB in an Option 004 or 006 instrument. If the flatness specification is not met, proceed to step 24 and make power flatness adjustments.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

H02 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION H02.

2.4 to 26.5 GHz FLATNESS

Calculate Total Coupler Slope and Sensor Slope

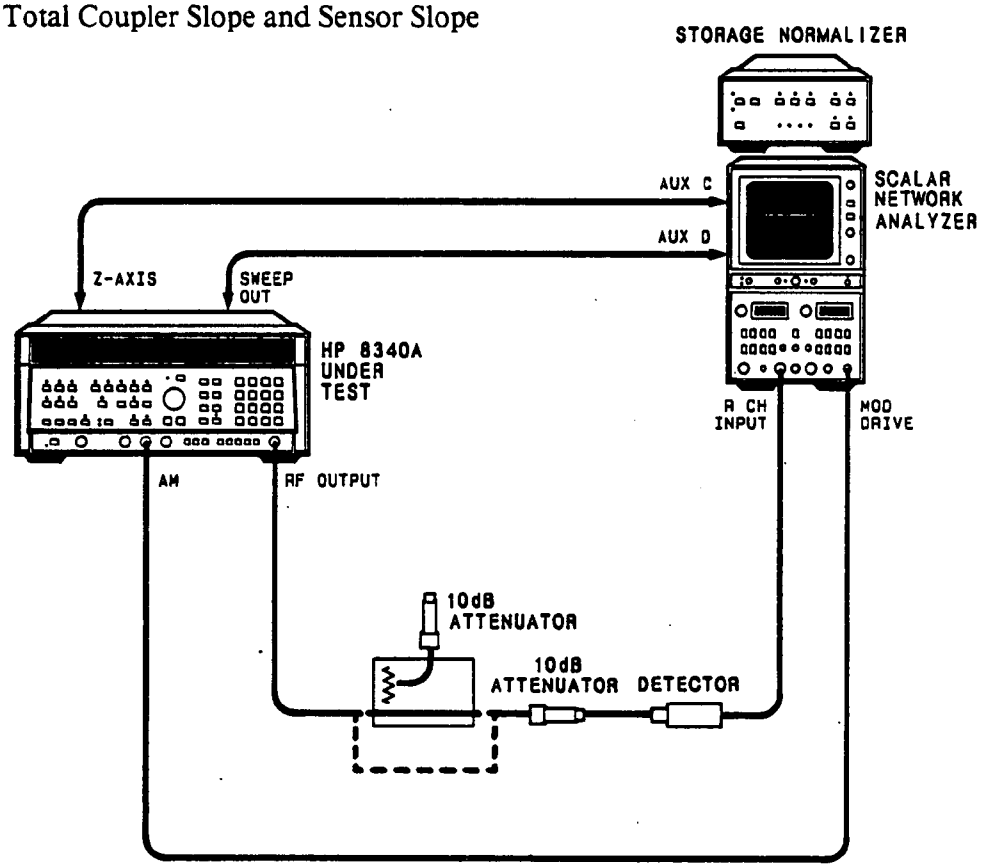


Figure 5-59. Coupler Slope Characterization Test Setup

Equipment Required:

Frequency Response Test Set	HP 8755C
Detector	HP 11664B
Storage Normalizer	HP 8750A
10 dB Attenuator (2 required)	HP 8493C Opt. 010
Directional Coupler	HP Part Number 0955-0125

10. Connect equipment as shown in Figure 5-59. Connect 10 dB Attenuator and 11664B Detector directly to HP 8340A RF Output. Allow at least 30 minutes warm up. Press HP 8340A **[INSTR PRESET]**. Press **[START FREQ]** and enter **[2] [.] [4] [GHz]**. Stop frequency should be 26.5 GHz. Press **[SHIFT] [PULSE]**.

11. Set the 8755C input to channel R, center the trace at 1 dB/Div. Store this trace in the HP 8750A Storage Normalizer by pressing 8750A [CH1] [INPUT], [STORE INPUT].

12. Insert the directional coupler and the second 10 dB attenuator as shown in Figure 5-59. Press 8750A [INPUT − MEMORY]. Press HP 8340A **[SLOPE]** ON. Adjust the HP 8340A front panel rotary knob for the best straight line on the 8755C trace. Note the HP 8340A ENTRY DISPLAY value for slope. This is the correction factor for the coupler which will be used in subsequent steps.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

H02 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION H02.

13. Calculate a correction factor for the power sensor as follows:

    Use a calculator to find the best straight line approximation to the CAL FACTOR curve in percent, or find the end points (0.05 and 26.5 GHz) using a straight edge for the best straight line approximation on the CAL FACTOR curve located on the body of the power sensor.

    Convert both end points to dB using the following equation:

    Endpoint (dB) = -10 log (endpoint (%)/100)

    Calculate the slope as follows:

    Slope (dB/GHz) = [26.5 GHz endpoint (dB) $-$ 0.05 GHz endpoint (dB)]/26.45

14. Calculate the total correction value by adding the coupler correction factor from step 12 and the power sensor correction factor from step 13. Note this value for later use.

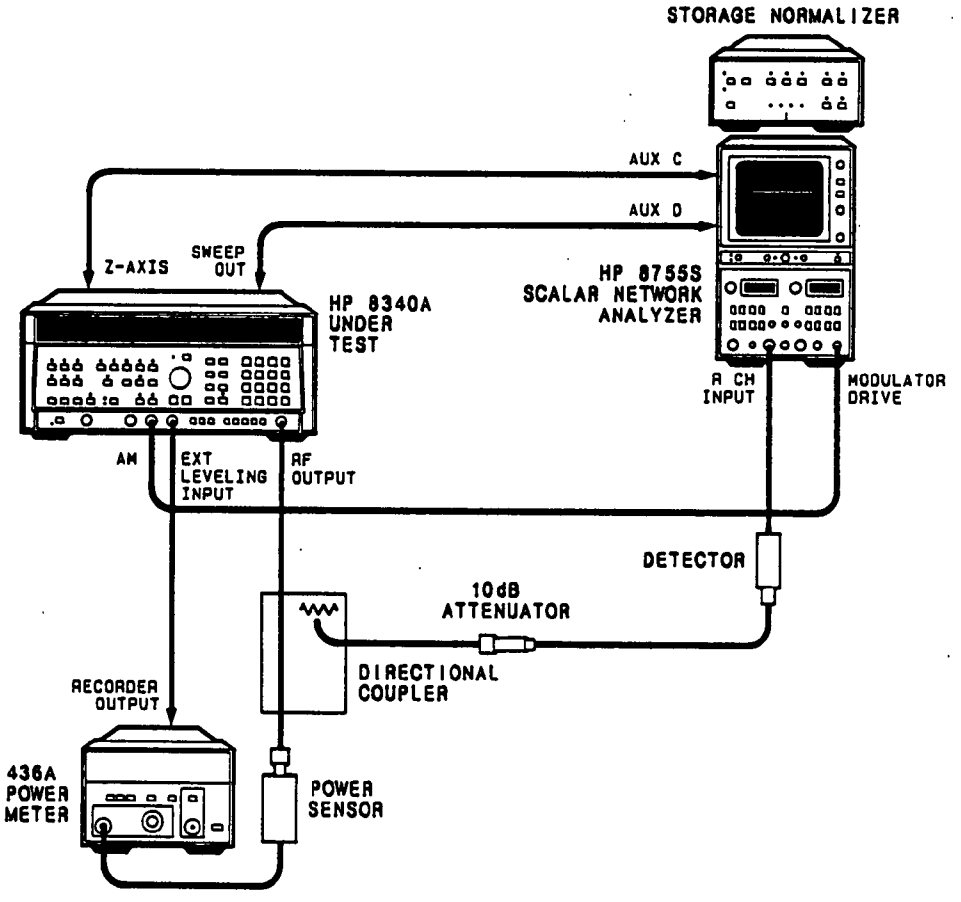


Figure 5-60. Flatness Adjustment Equipment Test Setup

15. Connect the equipment as shown in Figure 5-60. Press HP 8340A **[CW]** and enter **[5] [GHz]**. Press **[RF]** to turn RF power off. Zero the power meter. Press **[RF]** to turn RF power on. The power level should be 0 dBm. Press the 436A [RANGE HOLD].

16. Press HP 8340A **[CONT]**. Set the 8755C to display R on channel 1 at 1 dB/DIV. Set reference level at about -27 dB to center the trace. Press HP 8340A **[METER]** leveling and enter **[−] [6] [dBm]** (dBV). Press **[SWEEP TIME]** and enter **[5] [0] [sec]**.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

HO2 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION HO2.

17. Press 8750A [CH1] [INPUT] and [STORE INPUT]. Press HP 8340A **[SINGLE]** SWEEP and verify that the HP 8340A is sweeping by watching the green SWEEP LED. At the end of the 50 second single sweep, the 8750A STORE LED should be ON. Press HP 8340A **[SINGLE]** SWEEP again and the 8750A STORE INPUT LED should go OFF. The reference trace is now stored in the 8750A.

18. Press HP 8340A **[SWEEP TIME]** and **[AUTO]**. Press **[INT]** LEVELING. Press **[SHIFT] [PWR SWP]** and enter **[0] [dBm]**. Press **[CONT]** SWEEP. Press **[SLOPE]** and enter the calculated correction value for the directioanl coupler and power sensor noted in step 14. Terminate the entry with **[dBm]**.

19. Press 8750A [INPUT − MEMORY]. The trace on the 8755C should be only the flatness of the HP 8340A in internal leveling mode.

20. Press Frequency Marker key **[M1]** and, using the rotary knob, vary the marker frequency to position the intensified marker to the following positions and note the frequency of each:

    a. Highest spot in 2.4 to 20 GHz range
    b. Second highest spot in 2.4 to 20 GHz range
    c. Lowest spot in 2.4 to 20 GHz range
    d. Second lowest spot in 2.4 to 20 GHz range
    e. Highest spot in 20 to 26.5 GHz range
    f. Second highest spot in 20 to 26.5 GHz range
    g. Lowest spot in 20 to 26.5 GHz range
    h. Second lowest spot in 20 to 26.5 GHz range.

21. Disconnect directional coupler from HP 8340A RF OUTPUT port and connect the HP 8485 Power Sensor directly to the RF OUTPUT port.

22. Press to release HP 8340A **[SLOPE]** to turn slope OFF. Verify that **[INT]** leveling switch is still on. Press **[MANUAL]** Sweep, set frequency, and make power meter measurements at 2.4 GHz then at each of the frequencies noted for peaks and valleys in step 20. Before making each measurement, be sure to set the calibration factor of the power meter to the value shown on the body of the power sensor for the frequency being measured. Record power meter reading at each frequency setting.

23. Calculate the power flatness to see if the specifications are met in the 2.4 to 26.5 GHz range as shown in Table 5-11.

    If the flatness is not met in either of these ranges, proceed to step 24 and make power flatness adjustments.

FLATNESS ADJUSTMENTS

NOTE

Flatness adjustments should be performed if the ALC circuit has been adjusted, or if any assembly in the RF path from the directional coupler to the output connector (including the output connector) has been replaced. If only the ALC has been readjusted, proceed with step 28. Before making the following adjustments, check flatness using the Flatness Verification procedure.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

H02 NOTE

THIS PAGE DOES NOT APPLY TO INSTRUMENTS EQUIPPED WITH OPTION H02.

Table 5-11. Flatness in 2.4 to 26.5 GHz Range

Option	Flatness (dB) Relative to 2.4 GHz Reference	
	Band 1-3 (2.4 to 20 GHz)	Band 4 (20 to 26.5 GHz)
Standard	±1.1	±1.6
Option 001	±0.9	±1.3
Option 004	±1.3	±1.8
Option 005	±1.1	±1.5

24. The frequency response correction should still be in 8750A memory from the flatness verification procedures in the previous steps. If it is not, perform the previous steps 10 through 19.

25. Press HP 8340A **[INSTR PRESET]**, **[START]**, then enter **[2] [.] [4] [GHz]**. Press **[SWEEP TIME]** and **[AUTO]**. Press **[INT]** LEVELING. Press **[SHIFT] [PWR SWP]** and enter **[0] [dBm]**. Press **[CONT]** SWEEP. Press **[SLOPE]** and enter the calculated correction value for the directional coupler and power sensor found in step 14. Terminate the entry with **[dBm]**. Press **[SHIFT] [PULSE]**.

26. Press 8750A [INPUT – MEMORY]. Access the HP 8340A Calibration Constant Number 14 by entering the following:

    [SHIFT] [GHz] [1] [4] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]

    Use the **[STEP]** keys to select the Calibration Constant Number and use the front panel rotary knob to change the value.

27. Refer to Figure 5-61 and make adjustments as follows:

    Adjust Calibration Constant Number 14 for the flattest trace from 2.4 to 9 GHz.

    Adjust Calibration Constant Number 15 and A27R4 BKPT1 for the flattest trace from 9 to 20 GHz.

    Adjust Calibration Constant Number 16 and A27R8 BKPT2 for flattest trace from 20 to 26.5 GHz.

    Repeat these adjustments until the flattest trace is obtained from 2.4 to 26.5 GHz.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

H02 NOTE

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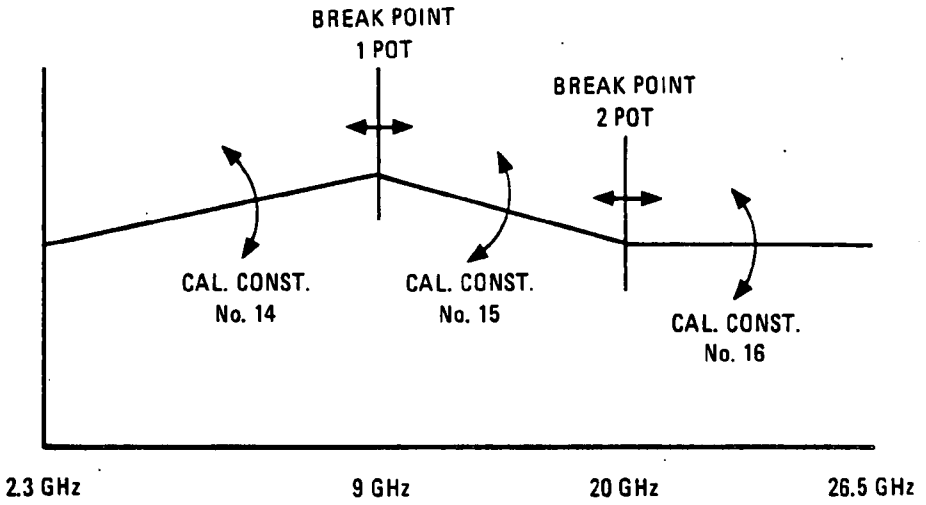


Figure 5-61. Relationship of Flatness Adjustments Diagram

28. Disconnect the directional coupler from the HP 8340A and connect the power sensor to the HP 8340A RF output. Set the power meter CAL FACTOR switch for 2.4 GHz. Press HP 8340A **[CW]** and enter **[2] [.] [4] [GHz]**. Press **[SLOPE]** to turn if OFF and **[SHIFT] [PULSE]** (turns AM LED OFF). Adjust Calibration Constant Number 44 for 0 dBm on the power meter.

29. Press HP 8340A **[CW]** and enter **[1] [0] [0] [MHz]**. Set the power meter CAL FACTOR switch to 100%. Note the power meter indication. This power level will be P3 in the following equation.

    Press HP 8340A **[CW]** and enter **[2] [.] [3] [9] [GHz]**. Set the power meter CAL FACTOR switch to include 2.39 GHz. Note the power meter indication. This value will be used as P4 in the following equation.

Calculate the value of P using the following equation:

$$P = (1.044 \times P3) - (0.044 \times P4)$$

30. Access Calibration Constant Number 13 by entering the following: **[SHIFT] [GHz] [1] [3] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 13 for a power meter indication of P. Then adjust A25R108 LOFS (Figure 5-62) for a 0 dBm power meter indication.

31. Perform the Flatness Verification procedure to ensure that the HP 8340A meets its flatness specification.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

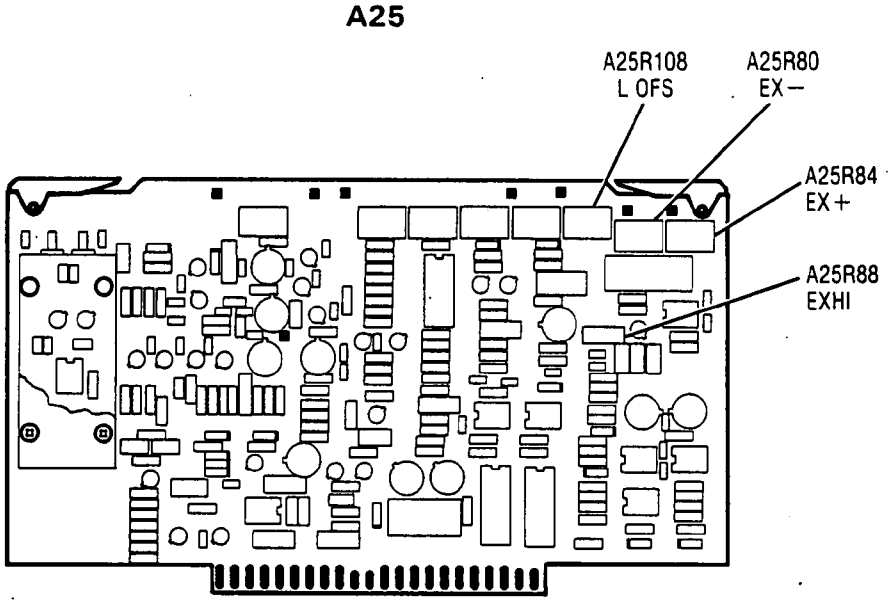


Figure 5-62. Flatness and External Leveling Adjustments Location

ADJUST AM OFFSET

32. Connect Power Meter Sensor to 8340A RF OUTPUT. Press **[INSTR PRESET]**. Press **[CW]** and enter **[4] [.] [5] [GHz]**. Power level should be 0 dBm. Access Calibration Constant Number 43 by entering the following: **[SHIFT] [GHz] [4] [3] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 43 for no more than 0.05 dB change in power meter indication when turning AM ON and OFF.

ADJUST ADC CALIBRATION CONSTANTS

33. Press **[SHIFT] [PWR SWP]** to decouple the RF attenuator and ALC. RF attenuator should be at 0 dB, ALC power should be at 0 dBm, and the CW frequency should be 4.5 GHz. Press **[AM]** ON.

34. With the **[ENTRY]** keys, select +5 dBm through −20 dBm in 1 dB increments and at each position check that the **[ENTRY DISPLAY]** ALC level and the **[POWER dBm]** indications are within 0.1 dB of each other.

35. If the indications are out of tolerance, adjust Calibration Constant Number 42 in the high power range and adjust Calibration Constant Number 40 in the low power range. Access Calibration Constant Number 42 by entering the following: **[SHIFT] [GHz] [4] [2] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Use the **[STEP]** key to change to Calibration Constant Number 40. After adjustments, recheck the +5 through −20 dBm range to verify that all points are within tolerance.

36. Press **[CW]** and enter **[1] [.] [5] [GHz]**. Press **[SHIFT] [PWR SWP]**. With **[ENTRY]** keys, select +5 dBm through −20 dBm in 1 dB increments and at each position check that the **[ENTRY DISPLAY]** ALC level and **[POWER dBm]** indications are within 0.1 dB of each other.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

37. If the indications are out of tolerance, adjust Calibration Constant Number 39 primarily for low level power settings. Access Calibration constant Number 39 by entering the following: **[SHIFT] [GHz] [3] [9] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Again recheck the +5 dBm to −20 dBm range to verify that all points are within tolerance.

NOTE

If adjustments of the Calibration constants were made in this procedure, the data thus stored in the "working memory area" should be copied to the "protected memory area" by pressing the following key sequence: [SHIFT] [MHz] [1] [4] [Hz] [SHIFT] [kHz] [5] [3] [4] [9] [Hz]. Wait for "CALIBRATION RESTORED" to be displayed in the ENTRY display, then press [INSTR PRESET].

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

A25

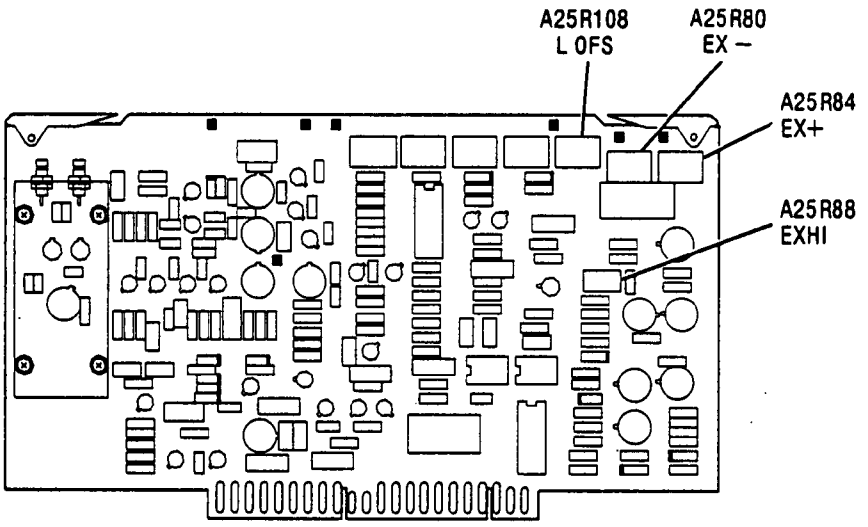


Figure 5-62. Flatness and External Leveling Adjustments Location

ADJUSTMENT AM OFFSET

32. Connect Power Meter Sensor to HP 8340A RF OUTPUT. Press **[INSTR PRESET]**. Press **[CW]** and enter **[4] [.] [5] [GHz]**. Power level should be 0 dBm. Access Calibration Constant Number 43 by entering the following: **[SHIFT] [GHz] [4] [3] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Adjust Calibration Constant Number 43 for no more than 0.05 dB change in power meter indication when turning AM ON and OFF.

ADJUST ADC CALIBRATION CONSTANTS

33. Press **[SHIFT] [PWR SWP]** to decouple the RF attenuator and ALC. RF attenuator should be at 0 dB, ALC power should be at 0 dBm, and the CW frequency should be 4.5 GHz. Press **[AM]** ON.

34. With the **[ENTRY]** keys, select +5 dBm through −20 dBm in 1 dB increments and at each position check that the **[ENTRY DISPLAY]** ALC level and the **[POWER dBm]** indications are within 0.1 dB of each other.

35. If the indications are out of tolerance, adjust Calibration Constant Number 42 in the high power range and adjust Calibration Constant Number 42 by entering the following: **[SHIFT] [GHz] [4] [2] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFTD] [kHz] [2] [2] [Hz]**. Use the **[STEP]** key to change to Calibration Constant Number 40. After adjustments, recheck the +5 through −20 dBm range to verify that all points are within tolerance.

36. Press **[CW]** and enter **[1] [.] [5] [GHz]**. Press **[SHIFT] [PWR SWP]**. With **[ENTRY]** keys, select +5 dBm through 4mm20 dBm in 1 dB increments and at each position check that the **[ENTRY DISPLAY]** ALC level and **[POWER dBm]** indications are within 0.1 dB of each other.

5-38. FLATNESS VERIFICATION AND ADJUSTMENT (Cont'd)

37. If the indications are out of tolerance, adjust Calibration Constant Number 39 primarily for low level power settings. Access Calibration constant Number 39 by entering the following: **[SHIFT] [GHz] [3] [9] [Hz] [SHIFT] [MHz] [1] [2] [Hz] [SHIFT] [kHz] [2] [2] [Hz]**. Again recheck the +5 dBm to −20 dBm range to verify that all points are within tolerance.

NOTE

If adjustments of the Calibration constants were made in this procedure, the data thus stored in the "working memory area" should be copied to the "protected memory area" by pressing the following key sequence: [SHIFT] [MHz] [1] [4] [Hz] [SHIFT] [kHz] [5] [3] [4] [9] [Hz]. Wait for "CALIBRATION RESTORED" to be displayed in the ENTRY display, then press [INSTR PRESET].

5-39. PULSE ADJUSTMENTS

NOTE

THIS ADJUSTMENT IS NOT APPLICABLE TO INSTRUMENTS EQUIPPED WITH OPTION 006, DELETE PULSE MODULATION

Reference:

Performance Test: Pulse Modulation Rise, Fall, and Delta Time; Pulse Modulation Accuracy; and Pulse Modulation Video Feedthrough

Service Section: RF Section

Description

The detector sample-and-hold balance is adjusted for best continuity across the trailing edge of the pulse waveform. The timing is adjusted for maximum negative level.

The integrator gate balance is set for the flattest pulse envelope.

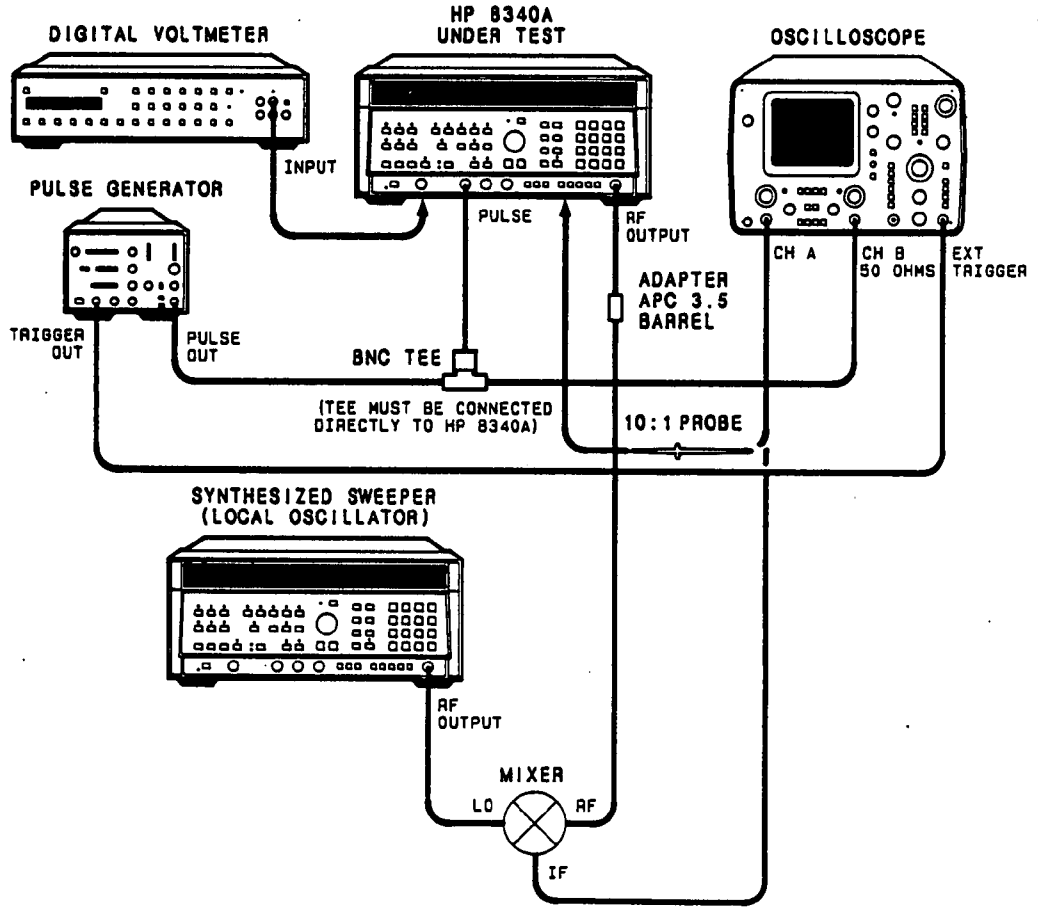


Figure 5-63. Pulse Adjustment Setup

5-39. PULSE ADJUSTMENTS (Cont'd)

NOTE

The following adjustments are required if any of the following four assemblies have been replaced or if any of the controls listed after each assembly have been adjusted or replaced.

A11 High Band Detector (Bands 1 - 4)
A21 Pulse Modulator Assembly, A21R21 (ON DELAY), A21R23 (OFF DELAY)
A25 ALC Detector Assembly, A25R58 (BAL)
A26 Linear Modulator Assembly, A26R7 (BAL)

Equipment Required:

Synthesized Sweeper	HP 8340A Opt. 001
Pulse Generator	HP 8012B
Oscilloscope	HP 1741A
10:1 Divider Probe	HP 10004D
Mixer	RHG DMS 1 - 26
Digital Voltmeter	HP 3455A

Procedure:

DETECTOR SAMPLE AND HOLD BALANCE ADJUSTMENT

1. Connect equipment as shown in Figure 5-63. Allow at least 30 minutes warmup.

NOTE

The A21, A25, and A26 PC boards must not be placed on extender boards in this adjustment procedure. Also, the cables connected to detectors A11 and A12 are especially designed for low capacitance and only these cables may be used during adjustment procedures.

2. Set the oscilloscope as follows:

DISPLAY	CHOP
MODE	MAIN
MAG X5	ON
CH A	0.005 V/Div AC COUPLED
CH B	5 V/Div 50 Ohms
TIME/Div	2 µsec

Connect CH A probe to A26TP2 (DET)

3. Set the pulse generator for a pulse width of 4 microseconds, a pulse period of 10 microseconds, and amplitude = +3 Volts high and 0 Volts low.

4. Press the HP 8340A Under Test **[INSTR PRESET]**. Press **[PULSE]** ON. Press **[CW]** and enter **[5] [GHz]**. Press **[SHIFT] [PWR SWP]** and enter **[0] [dBm]**. Use the step keys to step in 10 dB RF attenuation. If the HP 8340A does not include an RF attenuator, connect a 10 dB pad to the RF output. Set A21R21 (ON DELAY) and A21R23 (OFF DELAY) fully counterclockwise. (See Figure 5-64.)

Check that the HP 8340A Under Test is leveled (the UNLEVELED light is not lit).

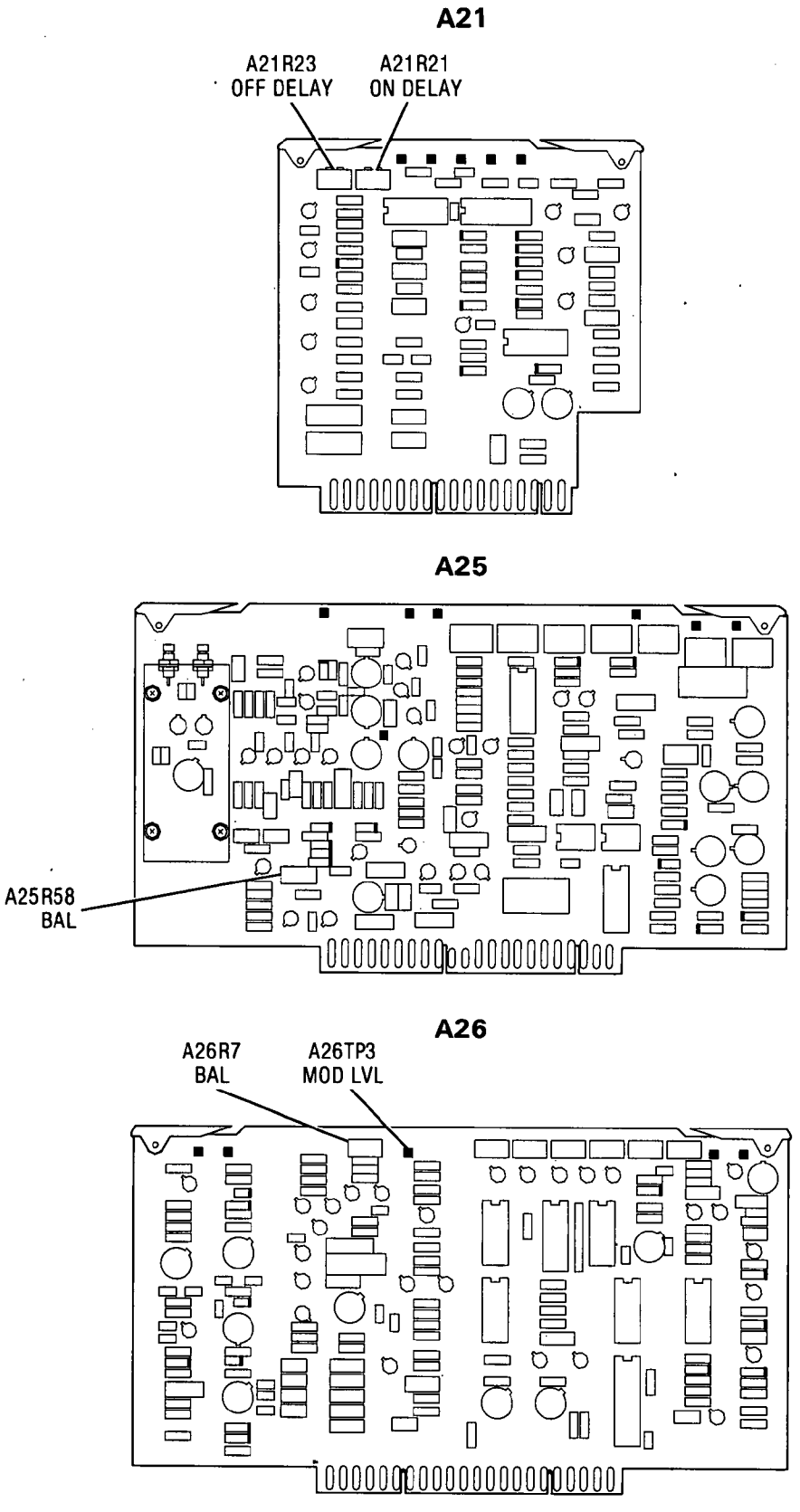


Figure 5-64. Pulse Adjustments Location

5-39. PULSE ADJUSTMENTS (Cont'd)

5. Set the oscilloscope to 1 usec/Div. The CH A trace should be similar to Figure 5-65.

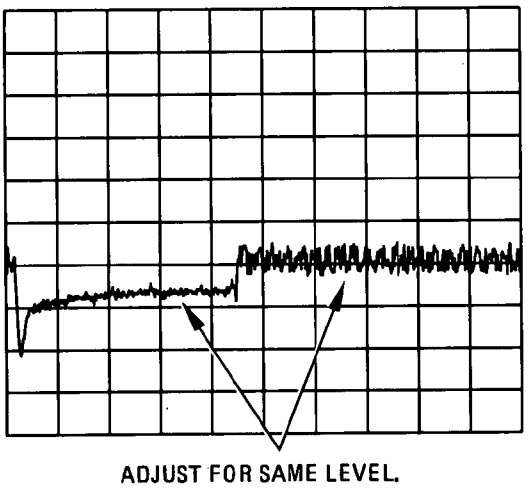


Figure 5-65. Typical A26TP2 (DET) Pulse Waveform.

6. Adjust A25R58 (BAL) control for best continuity across the pulse trailing edge. (NOTE: A25 must not be on an extender board when viewing trace.)

SAMPLE AND HOLD TIMING ADJUSTMENT

7. Set the pulse generator for a pulse width of 120 nanoseconds. Press the 8340A Under Test **[SHIFT] [PWR SWP]** and enter **[−] [1] [0] [dBm]**. Then press **[SHIFT] [SLOPE]** and use the **[STEP]** keys to set attenuator to −10 dB.

8. Connect DVM to A26TP3 MOD LVL. Adjust A21R21 ON DELAY and A21R23 OFF DELAY for the most negative reading.

9. At the 8340A Under Test, make settings as follows:

   a. Press **[SHIFT] [PWR SWP]** and use **[STEP]** keys to set attenuator to −10 dB.
   b. Use keys to enter **[0] [dBm]**.
   c. Press **[CW]** and enter **[5] [GHz]**.

10. Set the oscilloscope to 0.2 usec/DIV and adjust the Pulse Generator to a 1 usec pulse.

11. Connect the output IF port of the mixer to CH A of oscilloscope and set oscilloscope to 50 Ohm input and .005 V/DIV.

12. At the Local Oscillator, make settings as follows:

   a. Press **[CW]** and enter **[4] [.] [9] [5] [GHz]**.
   b. Press **[POWER LEVEL]** and enter **[1] [0] [dBm]**.

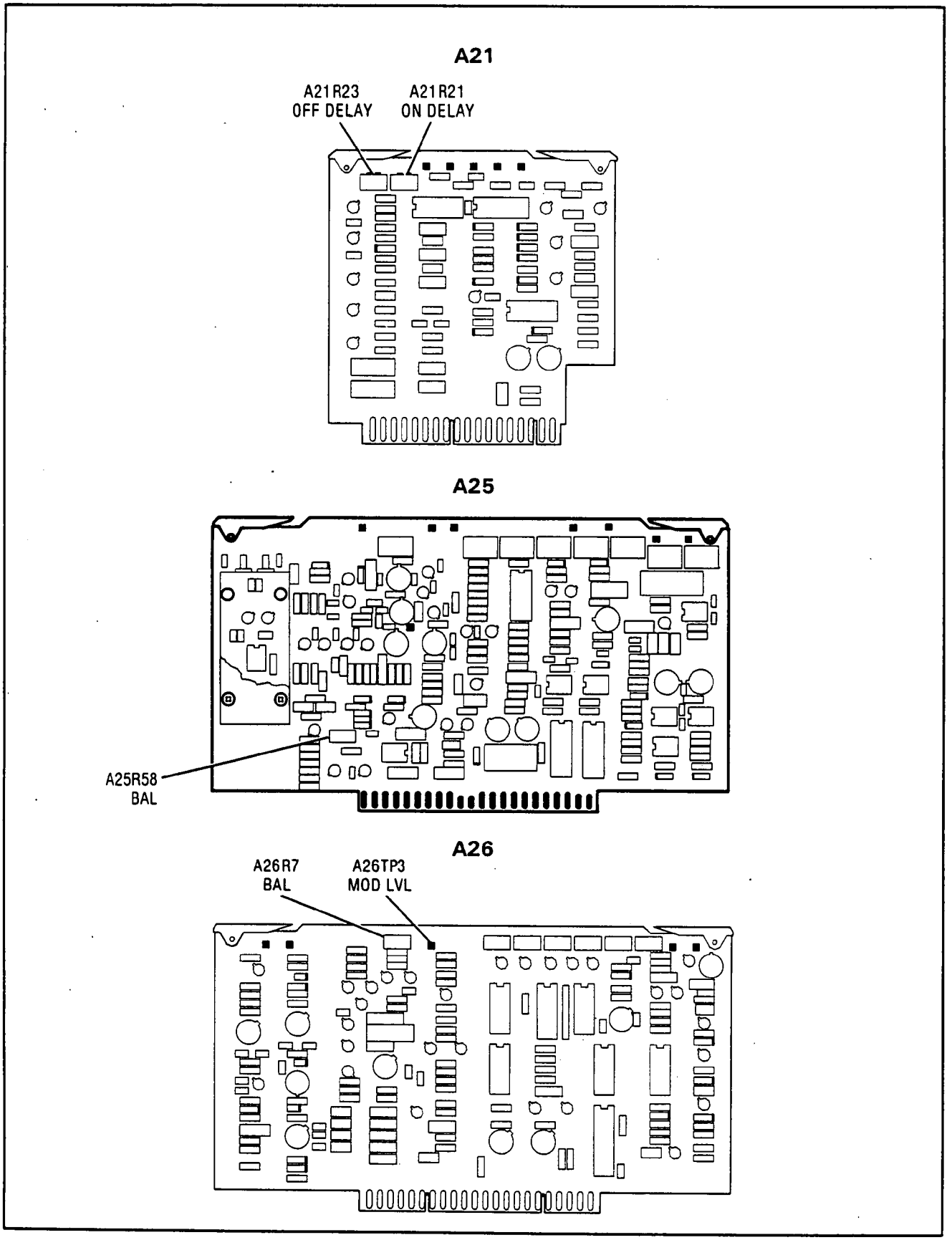


Figure 5-64. Pulse Adjustments Location

5-39. PULSE ADJUSTMENTS (Cont'd)

5. Set the oscilloscope to 1 usec/Div. The CH A trace should be similar to Figure 5-65.

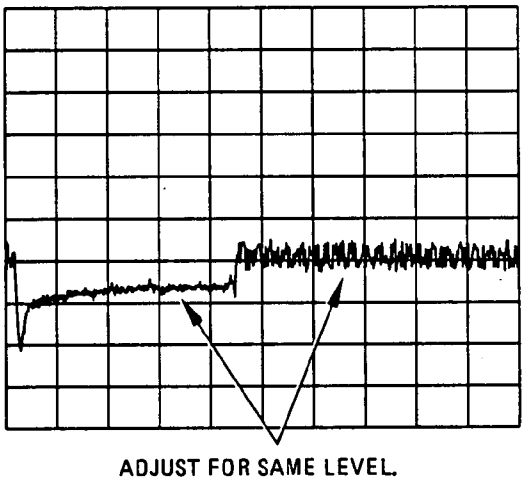


Figure 5-65. Typical A26TP2 (DET) Pulse Waveform.

6. Adjust A25R58 (BAL) control for best continuity across the pulse trailing edge. (NOTE: A25 must not be on an extender board when viewing trace.)

SAMPLE AND HOLD TIMING ADJUSTMENT

7. Set the pulse generator for a pulse width of 120 nanoseconds. Press the 8340A Under Test **[SHIFT] [PWR SWP]** and enter **[−] [1] [0] [dBm]**. Then press **[SHIFT] [SLOPE]** and use the **[STEP]** keys to set attenuator to −10 dB.

8. Connect DVM to A26TP3 MOD LVL. Adjust A21R21 ON DELAY and A21R23 OFF DELAY for the most negative reading.

9. At the 8340A Under Test, make settings as follows:

   a. Press **[SHIFT] [PWR SWP]** and use **[STEP]** keys to set attenuator to −10 dB.
   b. Use keys to enter **[0] [dBm]**.
   c. Press **[CW]** and enter **[5] [GHz]**.

10. Set the oscilloscope to 0.2 usec/DIV and adjust the Pulse Generator to a 1 usec pulse.

11. Connect the output IF port of the mixer to CH A of oscilloscope and set oscilloscope to 50 Ohm input and .005 V/DIV.

12. At the Local Oscillator, make settings as follows:

   a. Press **[CW]** and enter **[4] [.] [9] [5] [GHz]**.
   b. Press **[POWER LEVEL]** and enter **[1] [0] [dBm]**.

5-39. PULSE ADJUSTMENTS (Cont'd)

13. Turn pulse ON and then OFF alternately by pressing **[PULSE]** pushbutton. Adjust A25R58 BAL control so that the peak-to-peak amplitude of the envelope displayed on the oscilloscope is the same value with pulse on and pulse off.

INTEGRATOR GATE BALANCE ADJUSTMENT

14. Set the pulse generator for a pulse width of 5 microseconds and a pulse period of 20 microseconds. Set oscilloscope to 1 usec/Div.

15. Press 8340A Under Test **[SHIFT] [AM]** and adjust A26R7 BAL for the flattest pulse envelope on the CH A display.

    Press **[AM]** OFF and the pulse envelope should be flatter.

5-40. YO LOOP GAIN AND PHASE MARGIN TEST AND ADJUSTMENT

Reference:

Performance Test: None
Service Section: Sweep Generator – YO Loop

Description:

This procedure selects a value of resistor A49R18 to place the YO Loop gain and phase within specified limits to prevent the YO Loop from oscillating while still providing sufficient gain in the YO Loop.

NOTE

This procedure should be performed only after a YO failure or repair, or after replacing any assembly in the YO Loop.

NOTE

The YO Driver A55 should be aligned as described in Paragraph 5-29 prior to this procedure.

Equipment Required:

Spectrum Analyzer	3585A
Special Test Fixture	Fabricated Locally

Procedure:

1. Fabricate special test fixture as shown in Figure 5-66.
2. Place the YO Loop in the Service Position and remove the cover from A49 Phase Detector board. Remove jumper A49W1 from Phase Detector board.
3. Connect Special Test Fixture and Spectrum Analyzer to YO Loop as shown in Figure 5-67.
4. On the Special Test Fixture, set S1 to position 1 and set S2 to J2 position. The YO Loop should now be locked as indicated by A50DS1 (green LED) being lit.
5. On the 8340A, press **[INSTR PRESET] [CW] [3] [GHz]**.
6. On the 3585A Spectrum Analyzer, make the following settings:

INSTR PRESET	Press
TRACKING GENERATOR AMPLITUDE	Fully Clockwise (0 dBm)
INPUT IMPEDANCE	1 Megohm
AUTO RANGE	OFF
REF. LVL. TRK	OFF
START FREQ.	0 Hz
STOP FREQ.	100 kHz
dB/div.	1 dB/div.
REF. LEVEL	−25 dBm
RANGE (use STEP keys)	−15 dBm

5-40. YO LOOP GAIN AND PHASE MARGIN TEST AND ADJUSTMENTS (Cont'd)

7. A trace similar to Figure 5-68, Waveform A should be displayed on the Spectrum Analyzer.

8. On the 3585A Spectrum Analyzer, press [STORE A→B] to store the trace from A into Trace B. On the Special Test Fixture, set switch S1 to position 2. The 3585A Spectrum Analyzer should display the two traces similar to Figure 5-68, Waveform B.

9. Using the rotary knob on the Spectrum Analyzer, move the marker to the point where the two traces cross. Observe the marker frequency on the Spectrum Analyzer. The marker (crossover frequency) should be between 45 and 55 kHz.

10. If the crossover frequency is below 45 kHz, then the value of A49R18 on the A49 YO Phase Detector board should be decreased in value to increase the crossover frequency. If the crossover frequency is above 55 kHz, then the value of A49R18 should be increased to lower the crossover frequency.

11. If the crossover frequency is good, then the phase margin is checked next. Make sure the marker is at the crossover frequency, then set switch S1 on the Special Test Fixture to position 1. On the Spectrum Analyzer, press Marker [OFFSET], then marker [ENTER OFFSET]. The offset should now display 0 dB. On the Special Test Fixture, set switch S2 to the [SHORT] position. (The A50DS1 green LED should be off.) Read the offset in dB and insert the dB measurement into the following formula to determine the phase margin in degrees:

    K=10 ((dB measurement)/20)

    Phase Margin=ACS((2−K^2)/2)

    NOTE: ACS is arccosine function; phase margin is in degrees.

    0 dB = 60 degree phase margin; −2.3 dB = 45 degree phase margin; +2 dB = 75 degrees phase margin.

    The phase margin should be between 45 degrees and 75 degrees.

GAIN AT 2 KHZ

12. On the Spectrum Analyzer, make the following settings:

INSTR PRESET	Press
INPUT IMPEDANCE	1 Megohm
AUTO RANGE	OFF
REF. LVL. TRK	OFF
REF. LEVEL	−15 dBm
RANGE (use STEP keys)	−15 dBm
RBW	3 Hz
VBW	1 Hz
MANUAL SWEEP	2 kHz

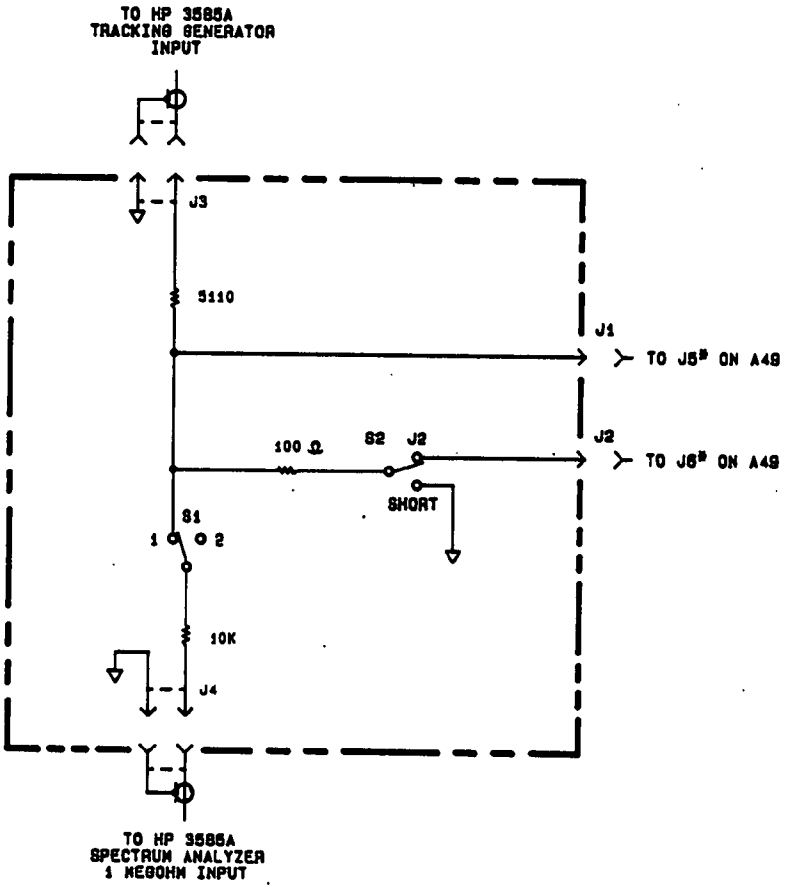
13. On the Special Test Fixture, set switch S2 to J2 and set switch S1 to position 1.

5-40. YO LOOP GAIN AND PHASE MARGIN TEST AND ADJUSTMENTS (Cont'd)

14. On the Spectrum Analyzer, press marker [OFFSET] then marker [ENTER OFFSET] and change switch S1 on the Special Test Fixture to position 2. Observe the offset measurement in dB on the Spectrum Analyzer. This is the gain at 2 kHz and should be >37 dB.

15. Disconnect all test equipment from the 8340A, reinstall jumper W1 on A49 Phase Detector board, and reinstall the YO Loop into the 8340A.

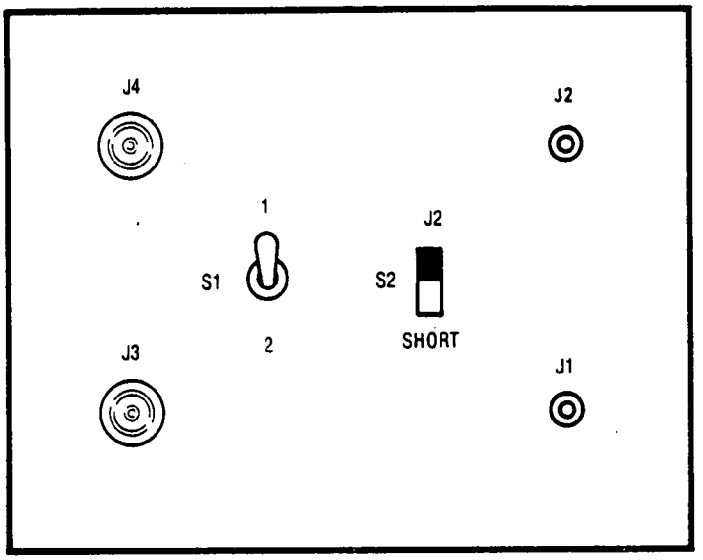
SPECIAL TEST FIXTURE SCHEMATIC DIAGRAM



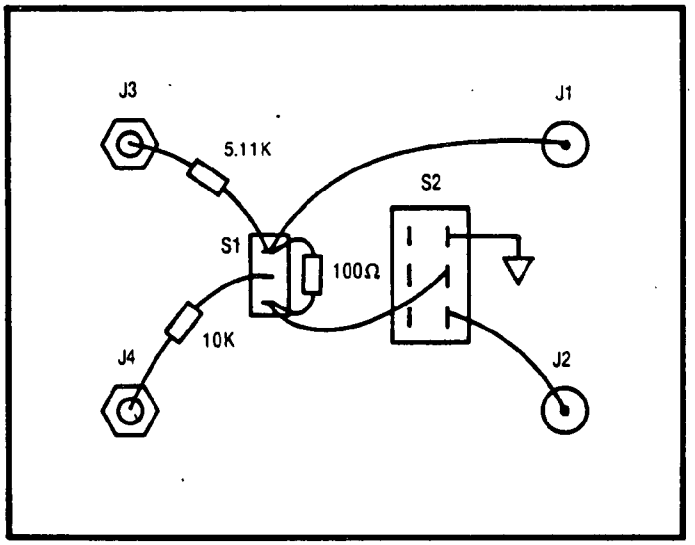
*NOTE
ON 8340A INSTRUMENTS WITH SERIAL PREFIX BELOW 2337A, A49J5 IS A49J1 AND A49J6 IS A49J2.

Figure 5-66. Special Test Fixture Fabrication Instructions (1 of 2)

TOP VIEW



BOTTOM VIEW



YO Special Test Fixture Material List

Qty	Description	HP Part Number	Qty	Description	HP Part Number
1	BUD BOX 2.75 X 2.1	7100-1207	2	CHASSIS MOUNT SNAP ON (M)	1250-0691
1	SWITCH SPDT (TOGGLE)-	3101-0163	2	LOCK WASHER	2190-0124
1	SWITCH DPDT (SLIDE)	3101-0070 (only requires a SPDT)	2	NUT	2950-0078
2	CHASSIS MOUNT BNC (F)	1250-0212	1	10kΩ ¼W RESISTOR	0757-0442
2	LOCK WASHER	2190-0016	1	100Ω ¼W RESISTOR	0757-0401
2	NUT	2950-0001	1	5.11kΩ ¼W RESISTOR	0757-0438

Figure 5-66. Special Test Fixture Fabrication Instructions (2 of 2)

5-40. YO LOOP GAIN AND PHASE MARGIN TEST AND ADJUSTMENTS (Cont'd)

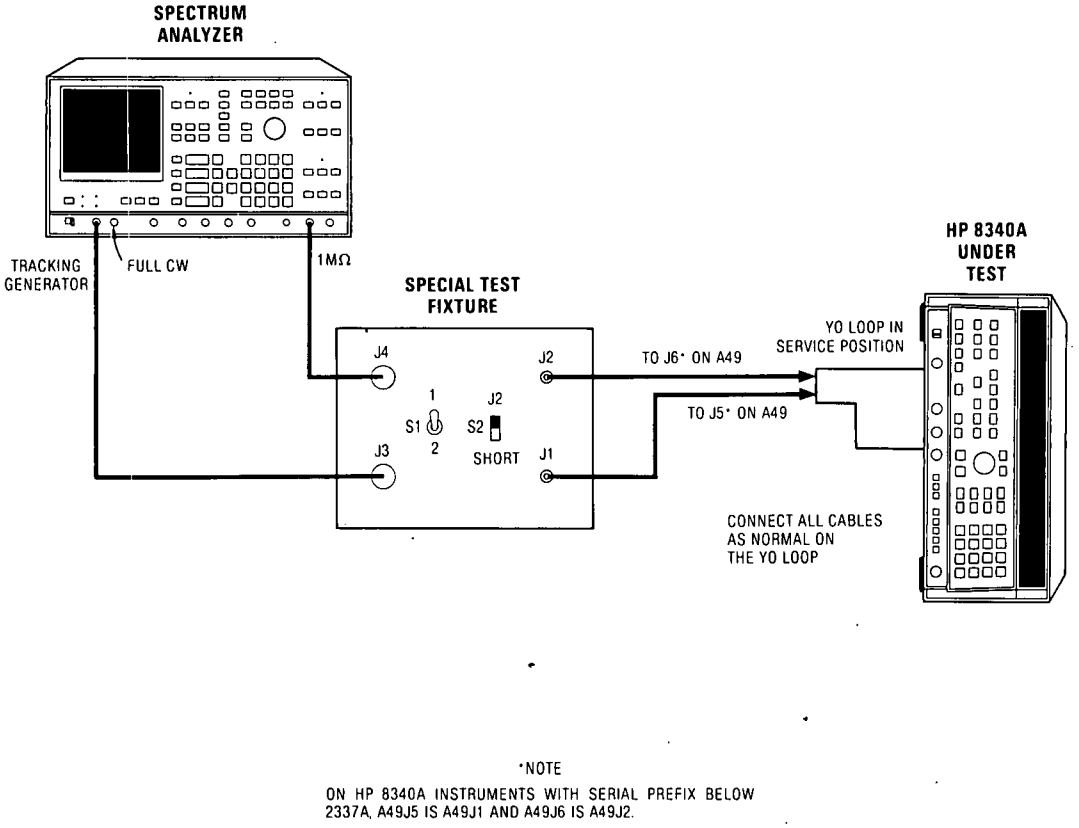


Figure 5-67. YO Loop Gain Test Setup

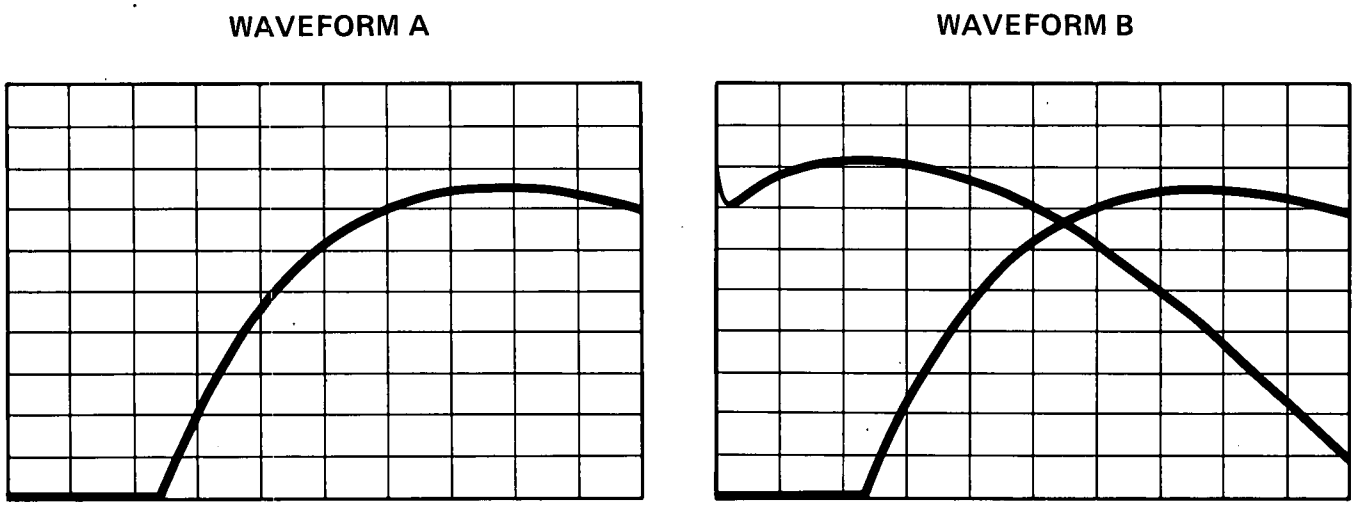


Figure 5-68. Spectrum Analyzer Waveforms of YO Loop Gain

VI Replaceable Parts

SECTION VI
REPLACEABLE PARTS

6-1. INTRODUCTION

6-2. This section contains information for ordering parts. Table 6-2 lists 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 adjustments performed with the protective covers removed should only be done by qualified service personnel. A shock hazard exists with the covers removed.

6-3. EXCHANGE ASSEMBLIES

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

6-5. ABBREVIATIONS

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

6-7. REPLACEABLE PARTS LIST

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

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

b. Miscellaneous electrical and chassis-mounted parts in alpha-numerical order by reference designation.

c. Option configuration instruments.

d. Miscellaneous mechanical and chassis parts.

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

a. The Hewlett-Packard part number.

b. Part number Check Digit (CD).

c. The total quantity (Qty.) in the major assembly (A1, A2, or A3, etc.).

d. The description of the part.

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

f. The manufacturer's part number for the part.

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

NOTE

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

6-11. ORDERING INFORMATION

6-12. To order a part listed in the replaceable parts table, quote the Hewlett-Packard Part Number (with Check Digit), indicate the quantity required, and address the order to the nearest Hewlett-Packard office. Including the Check Digit will ensure accurate and timely processing of your order.

6-13. To order a part that is not listed in the Replaceable Parts List, include the instrument model number, instrument serial number, description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard office.

Table 6-1. Exchange Parts

Description	New Part Number	CD	Rebuilt-Exchange Part Number	CD
A8 Band 0 3.7 GHz Oscillator	5086-7309	3	5086-6309	1
A9 Band 0 Pulse Modulator	5086-7372	0	5086-6372	8
A13 Band 0-4 SYTM	5086-7308	2	5086-6308	1
A14 Band 1-4 Power Amplifier (2.3 to 7.0 GHz)	5086-7307	1	5086-6307	9
A16 Band 1-4 Modulator/Splitter	5086-7304	8	5086-6304	6
A17 Band 0 Mixer	5086-7374	2	5086-6374	0
A18 Band 0 Power Amplifier (0.01 to 2.4 GHz)	5086-7217	2	5086-6217	0
A44 YIG Oscillator	5086-7323	1	5086-6323	9
A45 Pre-Leveler	5086-7305	9	5086-6305	7

Table 6-2. Manufacturer's Code List, Reference Designations, and Abbreviations (1 of 4)

MANUFACTURER'S CODE LIST

Mfr. No.	Manufacturer Name	Address		Zip Code
00000	ANY SATISFACTORY SUPPLIER			
0003J	NIPPON ELECTRIC CO.	TOKYO	JA	
00046	UNITRODE COMPUTER PRODUCTS CORP.	METHUEN	MA	53204
01121	ALLEN-BRADLEY CO.	MILWAUKEE	WI	53204
01295	TEXAS INSTR. INC. SEMICOND CMPNT. DIV.	DALLAS	TX	75222
01921	RCA CORP SOLID STATE DIV.	SOMERVILLE	NJ	08876
02111	SPECTROL ELECTRONICS CORP.	CITY OF IND	CA	91745
03888	KDI PYROFILM CORP.	WHIPPANY	NJ	07981
04713	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX	AZ	85062
06001	GE CO ELEK CAP & BAT PROD. DEPT.	IRMO	SC	29063
06665	PRECISION MONOLITHICS INC.	SANTA CLARA	CA	95050
07263	FAIRCHILD SEMICONDUCTOR DIV.	MOUNTAIN VIEW	CA	94042
11236	CTS OF BERNE INC.	BERNE	IN	46711
13606	SPRAGUE ELECT. CO. SEMICONDUCTOR DIV.	CONCORD	NH	03301
16179	OMNI SPECTRA INC.	FARMINGTON	MI	03504
17856	SILICONIX INC.	SANTA CLARA	CA	95054
18324	SIGNETICS CORP.	SUNNYVALE	CA	94086
19701	MEPCO/ELECTRA CORP.	MINERAL WELLS	TX	76067
20932	EMCON DIV. ITW	SAN DIEGO	CA	92129
24355	ANALOG DEVICES INC.	NORWOOD	MA	02062
24546	CORNING GLASS WORKS (BRADFORD)	BRADFORD	PA	16701
25088	SIEMENS CORP.	ISELIN	NJ	08830
27014	NATIONAL SEMICONDUCTOR CORP.	SANTA CLARA	CA	95051
28480	HEWLETT-PACKARD CO. CORPORATE HQ.	PALO ALTO	CA	94304
30983	MEPCO/ELECTRA CORP.	SAN DIEGO	CA	92121
32997	BOURNS INC. TRIMPOT PROD. DIV.	RIVERSIDE	CA	92507
34371	HARRIS SEMICON DIV HARRIS-INTERTYPE	MELBOURNE	FL	32901
34649	INTEL CORP.	MOUNTAIN VIEW	CA	95051
51642	CENTRE ENGINEERING INC.	STATE COLLEGE	PA	16801
56289	SPRAGUE ELECTRIC CO.	NORTH ADAMS	MA	01247
72116	ELECTRO MOTIVE CORP. SUB IEC	WILLIMANTIC	CT	06226
73138	BECKMAN INSTRUMENTS INC. HELIPOT DIV.	FULLERTON	CA	92634
74970	JOHNSON E F CO.	WASECA	MN	56093

Table 6-2. Manufacturers Code List, Reference Designations, and Abbreviations (2 of 4)

REFERENCE DESIGNATIONS

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

ABBREVIATIONS

ADC ..... Analog-to-Digital Converter
ADJ ..... Adjust, Adjustment
AG ..... Silver
AL ..... Aluminum
AMP ..... Amperage
ANDZ ..... Anodized
ANLG ..... Analog
ASTBL ..... Astable
AWG ..... American Wire Gage

B

BCD .... Binary Coded Decimal
BCKT ..... Bracket
BD ..... Board, Bundle
BE ..... Baume, Beryllium
BFR ..... Before, Buffer
BIN ..... Bin Box (Container), Binary
BNC ..... Type of Connector
BSC ..... Basic
BSHG ..... Bushing
BVR ..... Reverse Breakdown Voltage

C

C ..... Capacitance, Capacitor, Center Tapped, Centistoke, Ceramic, Cermet, Circular Mil Foot, Closed Cup, Cold, Compression
CAL ..... Calibrate, Calibration
CBL ..... Cable
CER ..... Ceramic
CHAM ..... Chamfer
CHAN ..... Channel
CNTR ..... Container, Counter
COM .... Commercial, Common
CONN ... Connect, Connection, Connector
CONT .... Contact, Continuous, Control, Controller
CRP ..... Crepe, Crimp
CTR ..... Center
CU ..... Copper, Cubic
CURRNT ..... Current

D

D ..... Deep, Depletion, Depth, Diameter, Direct Current
DAC ..... Dacron
DAP ..... Diallyl Phthalate
DB ..... Decibel, Double Break
DBL ..... Double
DCDR ..... Decoder
DECD ..... Decade
DEG ..... Degree
DIVR ..... Divider
DO ..... Package Type Designation
DRVR ..... Driver
DUAL ..... Two

E

ECL .... Emitter-Coupled Logic
EFF ..... Effective
ENCDR ..... Encoder
EXCL ..... Excluding, Exclusive
EXT ..... Extended, Extension, External, Extinguish
EXTR ..... Extractor

F

F ... Fahrenheit, Farad, Female, Film (Resistor), Fixed, Flange, Flint, Fluorine, Frequency
FDTHRU ..... Feed Through
FET ..... Field-Effect Transistor
FF ..... Flange, Female Connection; Flip Flop
FL ..... Flash, Flat, Fluid
FLEX ..... Flexible
FLG ..... Flange
FLTR ..... Filter, Floater
FRTD ..... Flame Retardant
FT .... Current Gain Bandwidth Product (Transition Frequency); Feet, Foot
FXD ..... Fixed

G

GEN ..... General, Generator

Table 6-2. Manufacturers Code List, Reference Designations, and Abbreviations (3 of 4)

GHZ..... Gigahertz
GL..... Glass
GP.... General Purpose, Group
GRN..... Green
GRV..... Grooved

H

H..... Henry, Hermaphrodite, High, Hole Diameter, Hot, Hub Inside Diameter, Hydrogen
HD..... Hand, Hard, Head, Heavy Duty
HEX... Hexadecimal, Hexagon, Hexagonal
HGT..... Height
HLCL..... Helical
HS... Heat Sealed, Heat Shrink, High Speed

I

IC..... Collector Current, Integrated Circuit
ID..... Identification, Inside Diameter
IMPD..... Impedance
IN..... Inch, Indium
INP..... Input
INS... Insert, Inside, Insulation, Insulator
INT..... Integral, Intensity, Internal
INTL.... Internal, International
INV..... Invert, Inverter
IR..... Insulation Resistance, Iridium

K

K..... Kelvin, Key, Kilo, Potassium
KB..... Knob

L

LCH..... Latch
LED..... Light Emitting Diode
LG..... Length, Long
LKG..... Leakage, Locking
LKWR..... Lockwasher
LS.... Loudspeaker, Low Power Schottky, Series Inductance
LUM..... Luminous

M

M..... Male, Maximum, Mega, Mil, Milli, Mode, Momentary, Mounting Hole Centers, Mounting Hole Diameter
MA..... Milliampere
MAGTD..... Magnitude
MCD..... Millicandela
MIN..... Miniature, Minimum, Minor, Minute
MIR..... Mirror
MLD..... Mold, Molded
MM..... Magnetized Material (Restricted Articles Code); Millimeter
MNT..... Minute (Angle)
MO... Metal Oxide, Milliounce, Molybdenum
MOM..... Momentary, Motherboard
MONO..... Monostable
MONOSTBL..... Monostable
MTG..... Mounting
MTLC..... Metallic
MULTR..... Multiplier
MW..... Milliwatt

N

NB..... Niobium
NCH..... Notched
NEG..... Negative
NH..... Nanohenry
NM... Nanometer, Nonmetallic
NOR..... Logic Not-OR
NPN..... Negative Positive Negative (Transistor)
NS..... Nanosecond, Non-Shorting, Nose
NTD..... Non-Time-Delay
NYL..... Nylon (Polyamide)

O

OCTL..... Octal
OD..... Olive Drab, Outside Diameter
OP AMP..... Operational Amplifier

P

PC..... Picocoulomb, Piece, Printed Circuit
P.C..... Printed Circuit
PCB..... Printed Circuit Board
PD..... Pad, Palladium, Pitch Diameter, Power Dissipation
PF..... Picofarad; Pipe, Female Connection; Power Factor
PKG..... Package
PL-MTG..... Plate Mounting
PLSTC..... Plastic
PN..... Part Number
PNP..... Positive Negative Positive (Transistor)
POLYC..... Polycarbonate
POLYE..... Polyester
POLYI..... Polyimide
POS..... Position, Positive
POZI..... Pozidriv Recess
PRCN..... Precision
PRESCR..... Pre-Scaler
PRIM..... Primary
PRL..... Parallel
PRP..... Purple, Purpose
P/S..... Power Supply
PT..... Part, Pint, Platinum, Point, Pulse Time
PVC..... Polyvinyl Chloride

Q

QUAD..... Set of Four

R

RBN..... Ribbon
RCVR..... Receiver
RECT..... Rectangle, Rectangular, Rectifier
RES..... Research, Resistance, Resistor, Resolution
RETRIG..... Retriggerable
RFI..... Radio Frequency Interference
RGLTR..... Regulator
RGTR..... Register
RND..... Round
RVT..... Rivet, Riveted

S

SCR..... Screw, Scrub, Silicon Controlled Rectifier
SEC..... Second, Secondary
SEN..... Sense, Sensing

Table 6-2. Manufacturers Code List, Reference Designations, and Abbreviations (4 of 4)

SENS..... Sensitive, Sensitivity
SER..... Serial, Series
SGL..... Single
SHF..... Shift, Super High Frequency
SHFT..... Shaft
SHLDR..... Shoulder
SI..... Silicon, Square Inch
SIG..... Signal, Significant
SIP..... Single In-Line Package
SKT..... Skirt, Socket
SLDR..... Solder
SM.... Samarium, Seam, Small, Square Meter, Sub Modular, Subminiature
SMB..... Subminiature, B Type (Snap-On Connector)
SNP..... Snap
SPCL..... Special
SQ..... Square
SST..... Stainless Steel
STDF..... Standoff
STRP..... Strapped, Strip
SYNTH..... Synthetic
SZ..... Size

T

T..... Tab Width, Taper, Teeth, Temperature, Tera, Tesla, Thermoplastic (Insulation), Thickness, Time, Timed, Tooth, Turns Ratio, Typical
TA..... Ambient Temperature, Tantalum
TC..... Thermoplastic
TERMS..... Terminals
TFE... Polytetrafluro - ethylene, Teflon
THD..... Thread, Threaded
THK..... Thick
THKNS..... Thickness
TPL..... Triple
TR..... Rise Time, Truss
TRIG..... Trigger, Triggerable, Triggering, Trigonometry
TRMR..... Trimmer
TRN..... Turn, Turns
TTL..... Tan Translucent, Transistor Transistor Logic

U

UCD..... Microcandela
UF..... Microfarad
UNCT..... Undercut
UVEROM..... Ultraviolet Erase Read Only Memory

V

VCO..... Voltage Controlled Oscillator
VCXO..... Voltage Controlled Crystal Oscillator
VDC..... Volts, Direct Current
VVC..... Voltage Variable Capacitor

W

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

X

XSTR..... Transistor

Y

YTM.... YIG-Tuned Modulator

Z

ZNR..... Zener

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1	**08340-60007**	**6**	**1**	**ALPHA DISPLAY ASSEMBLY**	**28480**	**08340-60007**
				NOTE A1J1, HP Part Number 1251-6798, must be cut to length prior to replacement.		
A1J1	1251-6798	9	1	CONNECTOR PC 36-CONT M	03206	65647-136
A1U1-7	1990-0553	8	7	DISPLAY ANNUNCIATOR .15-IN-HIGH	01542	QDSP-2049, CAT C
A2	**08340-60182**	**8**	**1**	**DISPLAY DRIVER ASSEMBLY**	**28480**	**08340-60182**
A2C1	0160-2055	9	2	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C2	0160-4084	8	2	CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A2C3	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C4	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A2C5	0160-4535	4	1	CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A2CR1	1901-0033	2	2	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A2CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A2DS1	1990-0699	3	3	L.E.D. (RED) 7 MCD	01542	1LM1-2350
				NOTE A2DS2-6, 8, 9 and 12 are matched for luminous intensity at the factory. Any single LED may be ordered separately by the part number given for each but its luminous intensity may not match that of the others on the assembly. A complete matched set may be ordered as HP Part Number 1990-0887, CD1.		
A2DS2	1990-0700	7	3	L.E.D. (YELLOW) 5 MCD	01542	1LM1-2450
A2DS3	1990-0697	1	5	L.E.D. (YELLOW) 2 MCD	01542	1LM1-2400
A2DS4	1990-0697	1		L.E.D. (YELLOW) 2 MCD	01542	1LM1-2400
A2DS5	1990-0697	1		L.E.D. (YELLOW) 2 MCD	01542	1LM1-2400
A2DS6	1990-0697	1		L.E.D. (YELLOW) 2 MCD	01542	1LM1-2400
A2DS7	1990-0699	3		L.E.D. (RED) 7 MCD	01542	1LM1-2350
A2DS8	1990-0700	7		L.E.D. (YELLOW) 5 MCD	01542	1LM1-2450
A2DS9	1990-0697	1		L.E.D. (YELLOW) 2 MCD	01542	1LM1-2400
A2DS10	1990-0696	0	2	LED-LIGHT BAR MODULE LUM-INT=3MCD	01542	1LM1-2300
A2DS11	1990-0696	0		LED-LIGHT BAR MODULE LUM-INT=3MCD	01542	1LM1-2300
A2DS12	1990-0700	7		L.E.D. (YELLOW) 5 MCD	01542	1LM1-2450
A2DS13	1990-0699	3		L.E.D. (RED) 7 MCD	01542	1LM1-2350
A2J1	1251-6063	1	1	CONNECTOR-PC 10 FEMALE IR	28480	1251-6063
				NOTE HP Part Number 1251-6798 (A2J2-4, 6-10, 12 and 14-17) must be cut to length prior to replacement.		
A2J2	1200-0681	0	15	SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J3	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J4	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J5	1251-6787	6	3	SOCKET-STRIP 6 CONTACT	28480	1251-6787
A2J6	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J7	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J8	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J9	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J10	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J11	1251-6787	6		SOCKET-STRIP 6 CONTACT	28480	1251-6787
A2J12	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J13	1251-6788	7	1	SOCKET-STRIP 16 CONTACT	28480	1251-6788
A2J14	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J15	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J16	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J17	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2J18	1251-6787	6		SOCKET-STRIP 6 CONTACT	28480	1251-6787
A2MP1	08340-20060	7	10	STANDOFF PRIM	28480	08340-20060
A2MP2	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP3	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP4	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP5	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP6	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP7	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP8	08340-20060	7		STANDOFF PRIM	28480	08340-20060

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2MP9	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP10	08340-20060	7		STANDOFF PRIM	28480	08340-20060
A2MP11	08340-20061	8	8	STANDOFF-SEC	28480	08340-20061
A2MP12	08340-20061	8		STANDOFF-SEC	28480	08340-20061
A2MP13	08340-20061	8		STANDOFF-SEC	28480	08340-20061
A2MP14	08340-20061	8		STANDOFF-SEC	28480	08340-20061
A2MP15	08340-20061	8		STANDOFF-SEC	28480	08340-20061
A2MP16	08340-20061	8		STANDOFF-SEC	28480	08340-20061
A2MP17	08340-20061	8		STANDOFF-SEC	28480	08340-20061
A2MP18	08340-20061	8		STANDOFF-SEC	28480	08340-20061
A2MP19	08340-20063	0	2	STANDOFF-SHORT	28480	08340-20063
A2MP20	08340-20063	0		STANDOFF-SHORT	28480	08340-20063
A2MP21	08340-20066	3	6	SPACER POST	28480	08340-20066
A2MP22	08340-20066	3		SPACER POST	28480	08340-20066
A2MP23	08340-20066	3		SPACER POST	28480	08340-20066
A2MP24	08340-20066	3		SPACER POST	28480	08340-20066
A2MP25	08340-20066	3		SPACER POST	28480	08340-20066
A2MP26	08340-20066	3		SPACER POST	28480	08340-20066
A2MP27-43	1200-0172	4	17	INSULATOR-XSTR DAP-GL	28480	1200-0172
A2MP44	1200-0173	5	5	INSULATOR-XSTR DAP-GL	28480	1200-0173
A2MP45	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A2MP46	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A2MP47	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A2MP48	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
				NOTE		
				HP Part Number 1200-0681 (A2P1,2) must be cut to length prior to replacement.		
A2P1	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2P2	1200-0681	0		SOCKET-STRP 20-CONT DIP-SLDR	28480	1200-0681
A2P3	1251-6786	5	1	CONNECTOR-SINGLE CONTACT .02	28480	1251-6786
A2Q1	1853-0442	4	5	TRANSISTOR PNP 2N3867 SI TO-5 PD=1W	04713	2N3867
A2Q2	1853-0442	4		TRANSISTOR PNP 2N3867 SI TO-5 PD=1W	04713	2N3867
A2Q3	1853-0442	4		TRANSISTOR PNP 2N3867 SI TO-5 PD=1W	04713	2N3867
A2Q4	1853-0442	4		TRANSISTOR PNP 2N3867 SI TO-5 PD=1W	04713	2N3867
A2Q5	1853-0442	4		TRANSISTOR PNP 2N3867 SI TO-5 PD=1W	04713	2N3867
A2Q6	1854-0477	7	17	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q7	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q8	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q9	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q10	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q11	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q12	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q13	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q14	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q15	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q16	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q17	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q18	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q19	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q20	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q21	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2Q22	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A2R1	0757-0416	7	3	RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A2R2	0757-0279	0	4	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A2R3	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A2R4	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A2R5	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A2R6	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A2R7	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0±100	24546	C4-1/8-T0-2610-F
A2R8	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A2R9	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A2R10				NOT ASSIGNED		
A2R11	0698-3446	3	3	RESISTOR 383 1% .125W F TC=0±100	24546	C4-1/8-T0-383R-F
A2R12	0698-3441	8	3	RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A2R13	0698-3447	4	5	RESISTOR 422 1% .125W F TC=0±100	24546	C4-1/8-T0-422R-F
A2R14	0698-3447	4		RESISTOR 422 1% .125W F TC=0±100	24546	C4-1/8-T0-422R-F
A2R15	0698-3447	4		RESISTOR 422 1% .125W F TC=0±100	24546	C4-1/8-T0-422R-F
A2R16	0698-3447	4		RESISTOR 422 1% .125W F TC=0±100	24546	C4-1/8-T0-422R-F
A2R17	0757-0419	0	2	RESISTOR 681 1% .125W F TC=0±100	24546	C4-1/8-T0-681R-F
A2R18	0698-3441	8		RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A2R19	0698-3447	4		RESISTOR 422 1% .125W F TC=0±100	24546	C4-1/8-T0-422R-F
A2R20	0698-3446	3		RESISTOR 383 1% .125W F TC=0±100	24546	C4-1/8-T0-383R-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2R21	0757-0419	0		RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A2R22	0698-3441	8		RESISTOR 215 1% .125W F TC=0+100	24546	C4-1/8-T0-215R-F
A2R23	0698-3446	3		RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A2R24	0698-7193	5	8	RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R25	0698-7193	5		RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R26	0698-7193	5		RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R27	0698-7193	5		RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R28	0698-7193	5		RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R29	0698-7193	5		RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R30	0698-7193	5		RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R31	0698-7193	5		RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A2R32	0698-3274	5	1	RESISTOR 10K 1% .125W F TC=0+25	28480	0698-3274
A2R33	0698-7244	7	8	RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2R34	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2R35	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2R36	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2R37	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2R38	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2R39	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2R40	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+100	24546	C3-1/8-T0-2151-F
A2TP1	0360-2050	8	7	TERMINAL TEST POINT PCB	28480	0360-2050
A2TP2	0360-2050	8		TERMINAL TEST POINT PCB	28480	0360-2050
A2TP3	0360-2050	8		TERMINAL TEST POINT PCB	28480	0360-2050
A2TP4	0360-2050	8		TERMINAL TEST POINT PCB	28480	0360-2050
A2TP5	0360-2050	8		TERMINAL TEST POINT PCB	28480	0360-2050
A2TP6	0360-2050	8		TERMINAL TEST POINT PCB	28480	0360-2050
A2TP7	0360-2050	8		TERMINAL TEST POINT PCB	28480	0360-2050
A2U1	1810-0364	9	1	NETWORK-RES 6-SIP470.0 OHM X 5	01121	206A471
A2U2	1810-0340	1	1	NETWORK-RES 10-SIP24.0 OHM X 5	01121	210B240
A2U3	1820-2266	5	1	IC DRVR TTL	18324	NE590F
A2U4	1820-1226	5	3	IC SHF-RGTR TTL ASYNCHRO SERIAL-IN	28480	1820-1226
A2U5	1820-1226	5		IC SHF-RGTR TTL ASYNCHRO SERIAL-IN	28480	1820-1226
A2U6	1810-0374	1	2	NETWORK-RES 8-SIP1.0K OHM X 4	01121	208B102
A2U7	1810-0374	1		NETWORK-RES 8-SIP1.0K OHM X 4	01121	208B102
A2U8	1820-1226	5		IC SHF-RGTR TTL ASYNCHRO SERIAL-IN	28480	1820-1226
A2U9	1820-1729	3	1	IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A2U10	08340-60017	8	3	MATCHED DISPLAY SET	28480	08340-60017
A2U11	08340-60017	8		MATCHED DISPLAY SET	28480	08340-60017
A2U12	08340-60017	8		MATCHED DISPLAY SET (MUST BE ORDERED AS A SET, MATCHED FOR LUMINOUS INTENSITY)	28480	08340-60017
A2VR1	1902-3036	3	3	DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	28480	1902-3036
A2VR2	1902-3036	3		DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	28480	1902-3036
A2VR3	1902-3036	3		DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	28480	1902-3036
A2VR4	1902-0064	1	1	DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.05%	28480	1902-0064

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3	**08340-60008**	**7**	**1**	**DISPLAY PROCESSOR ASSEMBLY**	**28480**	**08340-60008**
A3C1	0160-3875	3	2	CAPACITOR-FXD 22PF ±5% 200VDC CER 0±30	28480	0160-3875
A3C2	0160-3875	3		CAPACITOR-FXD 22PF ±5% 200VDC CER 0±30	28480	0160-3875
A3C3	0180-0552	9	1	CAPACITOR-FXD 220UF±20% 10VDC TA	28480	0180-0552
A3C4	0160-2055	9	3	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C5	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C6	0160-4084	8	5	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A3C7	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C8	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A3C9				NOT ASSIGNED		
A3C10	0180-0228	6	2	CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A3C11	0180-0116	1	1	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A3C12	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A3C13	0180-0228	6		CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A3C14	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A3C15	0180-3240	8	5	CAPACITOR-AL 220 UF 10VDC	28480	0180-3240
A3C16	0180-3240	8		CAPACITOR-AL 220 UF 10VDC	28480	0180-3240
A3C17	0180-3240	8		CAPACITOR-AL 220 UF 10VDC	28480	0180-3240
A3C18	0180-3240	8		CAPACITOR-AL 220 UF 10VDC	28480	0180-3240
A3C19	0180-3240	8		CAPACITOR-AL 220 UF 10VDC	28480	0180-3240
A3C20	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A3C21	0160-3879	7	2	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A3C22	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A3C23	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A3CR1	1901-0033	2	2	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3J1	1251-6787	6	1	SOCKET STRIP-6 CONTACT	28480	1251-6787
A3J2	1251-5746	5	1	CONNECTOR 50-PIN M POST TYPE	28480	1251-5746
A3L1				NOT ASSIGNED		
A3L2	08340-80001	2	1	COIL-TOROID	28480	08340-80001
A3L3	9100-1788	6	2	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A3L4	9100-1788	6		CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A3MP1	0340-0162	7	1	INSULATOR-XSTR ALUMINUM	28480	0340-0162
A3MP2	0590-0526	6	1	INSERT-NB 4-40	28480	0590-0526
A3MP3				NOT ASSIGNED		
A3MP4	1205-0085	8	1	HEAT SINK TO-66-CS	28480	1205-0085
A3MP5	2200-0105	4	2	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP6	2200-0105	4		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
				NOTE HP Part Number 1251-6798 (A3P1-5) must be cut to length prior to replacement.		
A3P1	1251-6798	9	5	CONNECTOR-PC 36 MALE IR	28480	1251-6798
A3P2	1251-6798	9		CONNECTOR-PC 36 MALE IR	28480	1251-6798
A3P3	1251-6798	9		CONNECTOR-PC 36 MALE IR	28480	1251-6798
A3P4	1251-6798	9		CONNECTOR-PC 36 MALE IR	28480	1251-6798
A3P5	1251-6798	9		CONNECTOR-PC 36 MALE IR	28480	1251-6798
A3Q1	1853-0413	9	1	TRANSISTOR PNP 2N6049 SI TO-66 PD=75W	28480	1853-0413
A3Q2	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A3R1	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A3R2	0698-7260	7	2	RESISTOR 10K 1% .05W F TC=0±100	24546	C3-1/8-T0-1002-F
A3R3	0698-3159	5	1	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A3R4	0698-3396	2	1	RESISTOR 38.3 1% .5W F TC=0+100	28480	0698-3396
A3R5	0811-1553	1	1	RESISTOR .68 5% 2W PW TC=0±800	75042	BWH2-11/16-J
A3R6	0811-1666	7	1	RESISTOR 1 5% 2W PW TC=0±800	75042	BWH2-1R0-J
A3R7				NOT ASSIGNED		
A3R8	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A3R9	0757-0458	7	4	RESISTOR 51.1K 1% .125W F TC=0±100	24546	C4-1/8-T0- 112-F
A3R10	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-3162-F
A3R11	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A3R12	0698-3150	6	1	RESISTOR 2.37K 1% .125W F TC=0±100	24546	C4-1/8-T0-2371-F
A3R13	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A3R14	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A3R15	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-5112-F
A3R16	0698-7260	7		RESISTOR 10K 1% .05W F TC=0±100	24546	C3-1/8-T0-1002-F
A3TP1-8				NOT ASSIGNED		
A3TP9	0360-2050	8	8	TERMINAL TEST POINT, PCB	28480	0360-2050
A3TP10	0360-2050	8		TERMINAL TEST POINT, PCB	28480	0360-2050
A3TP11	0360-2050	8		TERMINAL TEST POINT, PCB	28480	0360-2050
A3TP12	0360-2050	8		TERMINAL TEST POINT, PCB	28480	0360-2050

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3TP13	0360-2050	8		TERMINAL TEST POINT, PCB	28480	0360-2050
A3TP14	0360-2050	8		TERMINAL TEST POINT, PCB	28480	0360-2050
A3TP15	0360-2050	8		TERMINAL TEST POINT, PCB	28480	0360-2050
A3TP16	0360-2050	8		TERMINAL TEST POINT, PCB	28480	0360-2050
A3U1	1820-2865	0	1	IC-8-BIT MICROCOMPUTER; 11MHZ OPERATION	28480	1820-2865
A3U2	1820-1975	1	1	IC SHF-RGTR TTL LS NEG-EDGE-TRIG PRL-IN	01295	SN74LS165N
A3U3	1820-1287	8	1	IC BFR TTL LS NAND QUAD 2-INP	01295	SN74LS37N
A3U4	1820-0668	7	2	IC BFR TTL NON-INV HEX 1-INP	01295	SN7407N
A3U5	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A3U6	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A3U7	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A3U8	1820-0668	7		IC BFR TTL NON-INV HEX 1-INP	01295	SN7407N
A3U9	1820-1425	6	1	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	SN74LS132N
A3U10	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A3U11	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A3U12	1810-0398	9	1	NETWORK-RES 10-SIP22.0K OHM X 9	11236	750-101-R22K
A3VR1	1902-1359	9	1	DIODE-ZNR 4.3V 2% PD=5W IR=10UA	28480	1902-1359
A3Y1	0410-1295	8	1	CRYSTAL-10.92 MHZ	28480	0410-1295

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4				NOT ASSIGNED		
A5	08340-60010	1	1	KEYBOARD	28480	08340-60010
A5DS1	1990-0858	6	18	L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS2	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS3	1990-0857	5	1	L.E.D. (GREEN) 150 UCD	28480	1990-0857
A5DS4	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS5	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS6	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS7	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS8	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS9	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS10	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS11	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS12	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS13	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS14	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS15	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS16	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS17	1990-0856	4	2	L.E.D. (RED) 150 UCD	28480	1990-0856
A5DS18	1990-0856	4		L.E.D. (RED) 150 UCD	28480	1990-0856
A5DS19				NOT ASSIGNED		
A5DS20	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS21	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5DS22	1990-0858	6		L.E.D. (YELLOW) 150 UCD	28480	1990-0858
A5J1	1251-6799	0	1	CONNECTOR HEADER 36 MIR	28480	1251-6799
A5J2	1251-6787	6	2	SOCKET STRIP-6 CONTACT	28480	1251-6787
A5J3	1251-6787	6		SOCKET STRIP-6 CONTACT	28480	1251-6787
A5MP1	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A5MP2	5041-2732	2	1	KEY CAP "CONT"	28480	5041-2732
A5MP3	5041-2735	5	1	KEY CAP "FREE RUN"	28480	5041-2735
A5MP4	5041-2738	8	1	KEY CAP "LOCAL"	28480	5041-2738
A5MP5	5041-2733	3	1	KEY CAP "SINGLE"	28480	5041-2733
A5MP6	5041-2736	6	1	KEY CAP "LINE"	28480	5041-2736
A5MP7	5041-2739	9	1	KEY CAP "SAVE"	28480	5041-2739
A5MP8	5041-2734	4	1	KEY CAP "MANUAL"	28480	5041-2734
A5MP9	5041-2737	7	1	KEY CAP "EXT"	28480	5041-2737
A5MP10	5041-2731	1	1	KEY CAP "ALT"	28480	5041-2731
A5MP11	5041-2740	2	1	KEY CAP "RECALL"	28480	5041-2740
A5MP12	5041-2712	8	1	KEY CAP "M1"	28480	5041-2712
A5MP13	5041-2713	9	1	KEY CAP "M2"	28480	5041-2713
A5MP14	5041-2725	3	1	KEY CAP "MKR SWP"	28480	5041-2725
A5MP15	5041-0720	4	1	KEY CAP "INST PREST"	28480	5041-0720
A5MP16	5041-2714	0	1	KEY CAP "M3"	28480	5041-2714
A5MP17	5041-0692	9	1	KEY CAP "OFF"	28480	5041-0692
A5MP18	5041-2715	1	1	KEY CAP "M4"	28480	5041-2715
A5MP19	5041-2718	4	1	KEY CAP "MKR DELTA"	28480	5041-2718
A5MP20	5041-2729	7	1	KEY CAP "PULSE"	28480	5041-2729
A5MP21	5041-2716	2	1	KEY CAP "M5"	28480	5041-2716
A5MP22	5041-2726	4	1	KEY CAP "MKR TO CF"	28480	5041-2726
A5MP23	5041-2748	0	1	KEY CAP "AM"	28480	5041-2748
A5MP24	5041-2748	0	1	KEY CAP "ENTRY OFF"	28480	5041-2748
A5MP25	5041-2748	0	2	KEY CAP "ARROW DOWN"	28480	5041-2747
A5MP26	5041-2748	0		KEY CAP "ARROW UP"	28480	5041-2747
A5MP27	5041-2719	5	1	KEY CAP "START FREQ"	28480	5041-2719
A5MP28	5041-2721	9	1	KEY CAP "CF"	28480	5041-2721
A5MP29	5041-2724	2	1	KEY CAP "CW"	28480	5041-2724
A5MP30	5041-2727	5	1	KEY CAP "SWEEP TIME"	28480	5041-2727
A5MP31	5041-2720	8	1	KEY CAP "STOP FREQ"	28480	5041-2720
A5MP32	5041-2722	0	1	KEY CAP "DELTA FREQ"	28480	5041-2722
A5MP33	5041-2723	1	1	KEY CAP "PWR LVL"	28480	5041-2723
A5MP34	5041-2745	7	1	KEY CAP "SHIFT"	28480	5041-2745
A5MP35	5041-0643	0	1	KEY CAP "7"	28480	5041-0643
A5MP36	5041-0640	7	1	KEY CAP "4"	28480	5041-0640
A5MP37	5041-0637	2	1	KEY CAP "1"	28480	5041-0637
A5MP38	5041-0646	3	1	KEY CAP "0"	28480	5041-0646
A5MP39	5041-0644	1	1	KEY CAP "8"	28480	5041-0644
A5MP40	5041-0641	8	1	KEY CAP "5"	28480	5041-0641
A5MP41	5041-0638	3	1	KEY CAP "2"	28480	5041-0638
A5MP42	5041-0647	4	1	KEY CAP "DECIMAL"	28480	5041-0647
A5MP43	5041-0645	2	1	KEY CAP "9"	28480	5041-0645
A5MP44	5041-2747	9	1	KEY CAP "6"	28480	5041-2747
A5MP45	5041-0639	4	1	KEY CAP "3"	28480	5041-0639

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5MP46	5041-2747	9	1	KEY CAP "BACK SPACE"	28480	5041-2748
A5MP47	5041-2741	3	1	KEY CAP "GHz/DB(M)"	28480	5041-2741
A5MP48	5041-2742	4	1	KEY CAP "MHZ/SEC)"	28480	5041-2742
A5MP49	5041-2743	5	1	KEY CAP "KHZ/MSEC)"	28480	5041-2743
A5MP50	5041-2744	6	1	KEY CAP "HZ AUTO"	28480	5041-2744
A5MP51	5040-8858	3	21	LED STDF STRP, 2 PER	28480	5040-8858
A5R1	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A5R2	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A5R3	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-1621-F
A5S1 - 39	5060-9436	7	49	PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S40				NOT ASSIGNED		
A5S41	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S42	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S43	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S44	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S45	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S46	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S47	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S48	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S49	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5S50	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A5U1	1810-0203	5	3	NETWORK-RES 8-SIP 470.0 OHM X 7	01121	208A471
A5U2	1810-0203	5		NETWORK-RES 8-SIP 470.0 OHM X 7	01121	208A471
A5U3	1810-0203	5		NETWORK-RES 8-SIP 470.0 OHM X 7	01121	208A471

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

ERRATA (ALL SERIALS)

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6	**08340-60011**	**2**	**1**	**KEYBOARD INTERFACE**	**28480**	**08340-60011**
A6C1	0180-0197	8	2	CAPACITOR-FXD 2.2UF+10% 20VDC TA	56289	150D225X9020A2
A6C2	0160-2055	9	10	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C3	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C4	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C5	0160-4084	8	7	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A6C6	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A6C7	0180-0116	1	1	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A6C8	0160-0162	5	1	CAPACITOR-FXD .022UF ±10% 200VDC POLYE	28480	0160-0162
A6C9	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A6C10	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A6C11	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C13	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C14	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C15	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A6C16	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A6C17	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A6C18	0180-0228	6	1	CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A6C19	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A6C20	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C21	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C22	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A6C23	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A6C24	0180-2731	0	1	CAPACITOR-FXD 2.2UF±10% 20VDC TA	28480	0180-2731
A6C25	0160-3879	7	4	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A6C26	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A6C27	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A6C28	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A6CR1	1901-0050	3	1	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A6CR2	1901-0518	8	2	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A6CR3	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A6J1	1251-4634	8	2	CONNECTOR HEADER 20 M2R	28480	1251-4634
A6J2	1251-6868	4	1	CONNECTOR HEADER 5 M IR	28480	1251-6868
A6J3	1251-5746	5	1	CONNECTOR HEADER 50 M2R	28480	1251-5746
A6J4	1251-6793	4	1	CONNECTOR HEADER 3 M IR	28480	1251-6793
A6L1	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A6MP1	0380-0043	7	6	SPACER-RVT-ON .375-IN-LG .14-IN-ID	28480	0380-0043
A6MP2	0380-0043	7		SPACER-RVT-ON .375-IN-LG .14-IN-ID	28480	0380-0043
A6MP3	0380-0043	7		SPACER-RVT-ON .375-IN-LG .14-IN-ID	28480	0380-0043
A6MP4				NOT ASSIGNED		
A6MP5	0380-0043	7		SPACER-RVT-ON .375-IN-LG .14-IN-ID	28480	0380-0043
A6MP6	0380-0043	7		SPACER-RVT-ON .375-IN-LG .14-IN-ID	28480	0380-0043
A6MP7	0380-0111	0	1	STANDOFF-RVT-ON .25-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
A6P1	1251-6787	6	5	SOCKET STRIP 6 CONTACT	28480	1251-6787
A6P2	1251-6799	0	2	CONNECTOR HEADER 36 M IR	28480	1251-6799
A6P3	1251-6799	0		CONNECTOR HEADER 36 M IR	28480	1251-6799
A6R1	0683-6855	3	1	RESISTOR 6.8M 5% .25W FC TC=-900/+1100	01121	CB6855
A6R2	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A6R3	0757-0464	5	1	RESISTOR 90.9K 1% .125W F TC=0+100	03292	C4-1/8-T0-9092-F
A6R4	0698-3155	1	2	RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4-1/8-T0-4641-F
A6R5	0698-3449	6	1	RESISTOR 28.7K 1% .125W F TC=0±100	24546	C4-1/8-T0-2872-F
A6R6	0698-3162	0	1	RESISTOR 46.4K 1% .125W F TC=0+100	24546	C4-1/8-T0-4642-F
A6R7	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0±100	28480	0757-0123
A6R8	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A6R9	0757-0438	3	3	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A6R10	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A6R11	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A6R12	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4-1/8-T0-4641-F
A6TP1	0360-0535	0	15	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP11	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6TP12	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP13	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP14	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6TP15	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A6U1	1820-1851	2	2	IC ENCDR TTL LS	01295	SN74LS148N
A6U2	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A6U3	1820-1272	1	1	IC BFR TTL LS NOR QUAD 2-INP	01295	SN74LS33N
A6U4	1820-1112	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A6U5	1826-0180	0	1	IC TIMER TTL MONO/ASTBL	01295	NE555P
A6U6	1820-1730	6	4	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A6U7	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A6U8	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A6U9	1820-1437	0	1	IC MV TTL LS MONOSTBL DUAL	01698	SN74LS221N
A6U10	1820-1851	2		IC ENCDR TTL LS	01295	SN74LS148N
A6U11	1820-1917	1	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A6U12	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A6U13	1820-2270	1	2	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	34335	AM25LS2569DC
A6U14	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A6U15	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A6U16	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A6U17	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A6U18	1820-2270	1		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	34335	AM25LS2569DC
A6U19	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A6U20	1820-1437	0	1	IC MV TTL LS MONOSTBL DUAL	01295	SN74LS221N
A6U21	1810-0280	8	2	NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A6U22	1810-0280	8		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A6U23	1810-0206	8	1	NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7	**08340-60012**	**3**	**1**	**LOWER KEYBOARD**	**28480**	**08340-60012**
A7DS1	1990-0670	0	8	L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7DS2	1990-0670	0		L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7DS3	1990-0670	0		L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7DS4	1990-0670	0		L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7DS5	1990-0670	0		L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7DS6	1990-0670	0		L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7DS7	1990-0670	0		L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7DS8	1990-0670	0		L.E.D. (YELLOW) 1 MCD	28480	1990-0670
A7J1	1251-4634	8		CONNECTOR HEADER 20 M2R	28480	1251-4634
A7MP1	5041-0318	6	8	KEY CAP-QUARTER LT PIPE	28480	5041-0318
A7S1	5060-9436	7	8	PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7S2	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7S3	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7S4	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7S5	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7S6	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7S7	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7S8	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A7U1	1810-0272	8	1	NETWORK-RES 10-SIP330.0 OHM X 9	01121	210A331

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8	**5086-7309**	**3**	**1**	**BAND O 3.7 GHz OSCILLATOR** 5086-7309 INCLUDES A8A1 PC BOARD AND A8A2 3.7 GHZ OSCILLATOR MICROCIRCUIT.)	**28480**	**5086-7309**
	5086-6309	1	1	EXCHANGE 5086-7309 OSCILLATOR	28480	5086-6309
A8A1	08340-60041	8	2	3.7 GHZ OSCILLATOR PC BOARD	28480	08340-60041
A8A1C1	0160-3874	2	1	CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A8A1C2	0160-3877	5	2	CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A8A1C3	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A8A1C4	0121-0046	2	1	CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304322 9/35PF N650
A8A1C5	0160-3877	5		CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A8A1C6	0160-3878	6	7	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A8A1C7	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A8A1C8	0160-2150	5	1	CAPACITOR-FXD 33PF ±5% 300VDC MICA	28480	0160-2150
A8A1C9	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A8A1C10	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A8A1C11	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A8A1C12	0160-0134	1	1	CAPACITOR-FXD 220PF ±5% 300VDC MICA	28480	0160-0134
A8A1C13	0170-0040	9	1	CAPACITOR-FXD .047UF ±10% 200VDC POLYE	56289	292P47392
A8A1C14	0180-2904	9	1	CAPACITOR-FXD .1UF±10% 75VDC TA	28480	0180-2904
A8A1C15	0180-2205	3	1	CAPACITOR-FXD .33UF±10% 35VDC TA	56289	150D334X9035A2
A8A1C16	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A8A1C17	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A8A1C18	0160-0574	3	4	CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A8A1C19	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A8A1C20	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A8A1C21	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A8A1C22	0180-0630	4		CAPACITOR-FXD 4.7UF ±20% 50VDC TA	28480	0180-0630
A8A1CR1	1901-0033	2	6	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A8A1CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A8A1CR3	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A8A1CR4	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A8A1CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A8A1CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A8A1E1	1460-1489	8	1	JUMPER .022 LG	28480	1460-1489
A8A1E2	9170-0029	3	2	CORE-SHIELDING BEAD	28480	9170-0029
A8A1E3	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A8A1J1	1250-1611	3	2	CONNECTOR-RF M SMB-PC	28480	1250-1611
A8A1J2	1250-1611	3		CONNECTOR-RF M SMB-PC	28480	1250-1611
A8A1L1	9100-2891	4	1	INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A8A1L2	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A8A1L3	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH 10% .105DX.26LG	28480	9100-2250
A8A1L4	9100-2247	4	1	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A8A1L5	85660-80010	2	1	COIL-40 NH	28480	85660-80010
A8A1MP1				NOT ASSIGNED		
A8A1MP2	1205-0011	0	1	HEAT SINK- TO-5 (FOR Q2)	28480	1205-0011
A8A1MP3	1251-3172	7	7	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND (SOCKETS FOR MICROCIRCUITS)	28480	1251-3172
A8A1MP4	1200-0173	5	1	INSULATOR-TRANSISTOR TO-5 (FOR Q2)	28480	1200-0173
A8A1MP5	1251-2194	1	1	CONNECTOR-SGL CONT SKT .021-IN-BSC-SZ (SOCKETS FOR JUMPER WIRE)	28480	1251-2194
A8A1MP6				NOT ASSIGNED		
A8A1MP7	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A8A1Q1	1854-0686	0	1	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A8A1Q2	1854-0378	7	1	TRANSISTOR NPN 2N5109 SI TO-39 PD=800MW	3L585	2N5109
A8A1Q3	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A8A1Q4	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A8A1Q5	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A8A1Q6	1854-0248	0	1	TRANSISTOR-DUAL NPN 2N4044 TO-77	22229	2N4044
A8A1Q7	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A8A1Q8	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A8A1R1	0698-7224	3	1	RESISTOR 316 1% .05W F TC=0+100	24546	C3-1/8-TO-316R-F
A8A1R2	0698-7188	8	2	RESISTOR 10 1% .05W F TC=0+100	24546	C3-1/8-TO-10R-F
A8A1R3	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0+100	24546	C4-1/8-T0-751-F
A8A1R4	0698-3429	2	1	RESISTOR 19.6 1% .125W F TC=0+100	03888	PME55-1/8-T0-19R6-F
A8A1R5	0698-7203	8	1	RESISTOR 42.2 1% .05W F TC=0+100	24546	C3-1/8-TO-42R2-F
A8A1R6	0698-7276	5	2	RESISTOR 46.4K 1% .05W F TC=0+100	24546	C3-1/8-T0-4642-F
A8A1R7	0698-7276	5		RESISTOR 46.4K 1% .05W F TC=0+100	24546	C3-1/8-T0-4642-F
A8A1R8	2100-2030	6	1	RESISTOR-TRMR 20K 10% C TOP-ADJ 1-TRN	73138	82PR20K
A8A1R9	0698-7288	9	2	RESISTOR 147K 1% .05W F TC=0+100	24546	C3-1/8-T0-1473-F
A8A1R10	0698-7277	6	2	RESISTOR 51.1K 1% .05W F TC=0+100	24546	C3-1/8-T0-5112-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8A1R11	0698-7219	6	1	RESISTOR 196 1% .05W F TC=0±100	24546	C3-1/8-TO-196R-F
A8A1R12	0698-7284	5	2	RESISTOR 100K 1% .05W F TC=0±100	24546	C3-1/8-T0-1003-F
A8A1R13	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0±100	24546	C3-1/8-T0-5112-F
A8A1R14	0698-7288	9		RESISTOR 147K 1% .05W F TC=0±100	24546	C3-1/8-T0-1473-F
A8A1R15	0698-7211	8	1	RESISTOR 90.9 1% .05W F TC=0±100	24546	C3-1/8-TO-90R9-F
A8A1R16	0698-7281	2	1	RESISTOR 75K 2% .05W F TC=0±100	24546	C3-1/8-T0-7502-G
A8A1R17	0698-7216	3	1	RESISTOR 147 1% .05W F TC=0±100	24546	C3-1/8-TO-147R-F
A8A1R18	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A8A1R19	0698-7236	7	1	RESISTOR 1K 1% .05W F TC=0±100	24546	C3-1/8-T0-1001-F
A8A1R20	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4-1/8-T0-4221-F
A8A1R21	0698-3161	9	1	RESISTOR 38.3K 1% .125W F TC=0±100	24546	C4-1/8-T0-3832-F
A8A1R22	0698-7284	5		RESISTOR 100K 1% .05W F TC=0±100	24546	C3-1/8-T0-1003-F
A8A1R23	0698-7244	7	1	RESISTOR 2.15K 1% .05W F TC=0±100	24546	C3-1/8-T0-2151-F
A8A1R24	0698-7188	8		RESISTOR 10 1% .05W F TC=0±100	24546	C3-1/8-TO-10R-F
A8A1R25	0698-7205	0	1	RESISTOR 51.1 1% .05W F TC=0±100	24546	C3-1/8-TO-51R1-F
A8A1R26	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0±100	24546	C4-1/8-T0-121R-F
A8A1TP1	0360-0535	0	2	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A8A1TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A8A1U1	1826-0180	0	1	IC TIMER TTL MONO/ASTBL	01295	NE555P
A8A1VR1	1902-3301	5	1	DIODE-ZNR 34.8V 5% DO-35 PD=.4W	28480	1902-3301
A8A2				3.7GHZ OSCILLATOR (NOT SEPARATELY REPLACEABLE; ORDER A8.)		
A8C1	9135-0002	8	5	FILTER-LOW PASS SOLDER-TERMS	33095	51-744-018
A8C2	9135-0002	8		FILTER-LOW PASS SOLDER-TERMS	33095	51-744-018
A8C3	9135-0002	8		FILTER-LOW PASS SOLDER-TERMS	33095	51-744-018
A8C4	9135-0002	8		FILTER-LOW PASS SOLDER-TERMS	33095	51-744-018
A8C5	9135-0002	8		FILTER-LOW PASS SOLDER-TERMS	33095	51-744-018
A8MP1	08340-20082	3	1	BOX 3.7 GHZ OSC.	28480	08340-20082
A8MP2	08340-00020	7	1	LID 3.7 GHZ OSC.	28480	08340-00020
A8MP3	08340-20055	0	1	DONUT RFI SHIELD	28480	08340-20055
A8MP4	2200-0103	2	14	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A8MP5	0520-0131	2	4	SCREW-MACH 2-56 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A8MP6	2190-0045	8	4	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
A8MP7	2580-0002	4	5	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	00000	ORDER BY DESCRIPTION
A8MP8	2190-0009	4	5	WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
A8MP9	1400-0510	8	1	CLAMP-CABLE .15-DIA .62-WD NYL	28480	1400-0510
A8MP10	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A8MP11	2190-0124	4	2	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A8W1	08340-60097	4	1	WIRE ASSEMBLY-A8 TO A20J3	28480	08340-60097

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9	**5086-7372**	**0**	**1**	**BAND 0 PULSE MODULATOR**	**28480**	**5086-7372**
	5086-6372	8	1	EXCHANGE 5086-7372 BAND O PULSE MOD.	28480	5086-6372
A10	**0955-0125**	**5**	**1**	**DIRECTIONAL COUPLER**	**28480**	**0955-0125**
A11	**08340-60130**	**6**	**1**	**BAND 1-4 DETECTOR**	**28480**	**08340-60130**
A12	**5086-7318**	**4**	**1**	**BAND 0 DETECTOR** (5086-7318 DOES NOT INCLUDE A12W1)	**28480**	**5086-7318**
A12W1	08340-60122	6	1	WIRE ASSEMBLY- A12 TO A62J34	28480	08340-60122
A13	**5086-7308**	**2**	**1**	**BAND 1-4 SWITCHED YIG TUNED MULTIPLIER** (5086-7308 INCLUDES A13A1 PC BOARD AND A13A2 MICROCIRCUIT.)	**28480**	**5086-7308**
	5086-6308	0		EXCHANGE 5086-7308 SYTM	28480	5086-6308
A13A1	5061-1090	5	1	SYTM BIAS BOARD ASSEMBLY	28480	5061-1090
A13A1C1	0160-3456	6	1	CAPACITOR-FXD 1000PF ±10% 1KVDC CER	28480	0160-3456
A13A1CR1	1901-0033	2	1	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A13A1J1	1200-0482	9	1	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A13A1J2	1251-3172	7	4	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1J3	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1J4	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1J5	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1MP1	0380-1272	6	2	SPACER-RVT-ON .125-IN-LG .098-IN-ID	00000	ORDER BY DESCRIPTION
A13A1R1	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A13A1TP1	0360-0535	0	1	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A13A1VR1	1902-0175	5	1	DIODE-ZNR 100V 5% PD=1W IR=5UA	28480	1902-0175
A13A2				YTM MICROCIRCUIT (NOT SEPARATELY REPLACEABLE; ORDER A13.)		
A13MP1	5021-3567	1	2	SYTM MOUNTING BLOCK	28480	5021-3567
A13MP2	5086-3460	9	1	CENTER BODY ASSEMBLY	28480	5086-3460
A13MP3	0520-0129	8	2	SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A13MP4	3030-0349	8	2	SCREW-SKT HD CAP 4-40 .312-IN-LG SST	00000	ORDER BY DESCRIPTION
A13MP5	2190-0890	1	2	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9	5086-7372	0	1	BAND 0 PULSE MODULATOR	28480	5086-7372
	5086-6372	8	1	EXCHANGE 5086-7372 BAND O PULSE MOD.	28480	5086-6372
A10	0955-0125	5	1	DIRECTIONAL COUPLER	28480	0955-0125
A11	08340-60130	6	1	BAND 1-4 DETECTOR	28480	08340-60130
A12	5086-7434	5	1	BAND 0 SPLITTER/DETECTOR (DOES NOT INCLUDE A12W1)	28480	5086-7434
	08340-60240	9	1	BAND 0 SPLITTER/DETECTOR REPLACEMENT KIT (REQUIRED FOR INSTRUMENTS WITH SERIAL PREFIX 2430A AND BELOW. INCLUDES 5086-7434, REQ'D HARDWARE, AND SERVICE NOTE)	28480	08340-60240
A12W1	08340-60122	6	1	WIRE ASSEMBLY- A12 TO A62J34	28480	08340-60122
A13	5086-7308	2	1	BAND 1-4 SWITCHED YIG TUNED MULTIPLIER (5086-7308 INCLUDES A13A1 PC BOARD AND A13A2 MICROCIRCUIT.)	28480	5086-7308
	5086-6308	0		EXCHANGE 5086-7308 SYTM	28480	5086-6308
A13A1	5061-1090	5	1	SYTM BIAS BOARD ASSEMBLY	28480	5061-1090
A13A1C1	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A13A1CR1	1901-0033	2	1	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A13A1J1	1200-0482	9	1	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A13A1J2	1251-3172	7	4	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1J3	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1J4	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1J5	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A13A1MP1	0380-1272	6	2	SPACER-RVT-ON .125-IN-LG .098-IN-ID	00000	ORDER BY DESCRIPTION
A13A1R1	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A13A1TP1	0360-0535	0	1	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A13A1VR1	1902-0175	5	1	DIODE-ZNR 100V 5% PD=1W IR=5UA	28480	1902-0175
A13A2				YTM MICROCIRCUIT (NOT SEPARATELY REPLACEABLE; ORDER A13.)		
A13MP1	5021-3567	1	2	SYTM MOUNTING BLOCK	28480	5021-3567
A13MP2	5086-3460	9	1	CENTER BODY ASSEMBLY	28480	5086-3460
A13MP3	0520-0129	8	2	SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A13MP4	3030-0349	8	2	SCREW-SKT HD CAP 4-40 .312-IN-LG SST	00000	ORDER BY DESCRIPTION
A13MP5	2190-0890	1	2	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14	**5086-7307**	**1**	**1**	**BAND 1-4 POWER AMPLIFIER** (5086-7307 INCLUDES A14A1 PC BOARD AND A14A2 MICROCIRCUIT.)	**28480**	**5086-7307**
	5086-6307	9	1	EXCHANGE 5086-7307 BAND 1-4 PWR AMP	28480	5086-6307
A14A1	5061-1059	6	1	BAND 1-4 POWER AMP BIAS BOARD	28480	5061-1059
A14A1C1	0160-0174	9	2	CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A14A1C2	0180-1704	5	4	CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C3	0180-1704	5		CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C4	0180-0228	6	1	CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A14A1C5	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A14A1C6	0180-1704	5		CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C7	0180-1704	5		CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C8	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A14A1C9	0160-4084	8	1	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A14A1E1	1251-3172	7	2	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A14A1E2	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A14A1J1	1200-0507	9	1	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0507
A14A1MP1				NOT ASSIGNED		
A14A1MP2	0380-0322	5	8	SPACER-RVT-ON .062-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A14A1MP3				NOT ASSIGNED		
A14A1MP4	1200-0172	4	1	INSULATOR-XSTR DAP-GL	28480	1200-0172
A14A1MP5	1200-0173	5	1	INSULATOR-XSTR DAP-GL	28480	1200-0173
A14A1Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A14A1Q2	1853-0213	7	1	TRANSISTOR PNP 2N4236 SI TO-5 PD=1W	04713	2N4236
A14A1R1	0698-3443	0	2	RESISTOR 287 1% .125W F TC=0±100	24546	C4-1/8-T0-287R-F
A14A1R2	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0±100	24546	C4-1/8-T0-751-F
A14A1R3	0698-3441	8	3	RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A14A1R4	0698-3441	8		RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A14A1R5	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A14A1R6	0757-0198	2	1	RESISTOR 100 1% .5W F TC=0±100	28480	0757-0198
A14A1R7	0757-0417	8	2	RESISTOR 562 1% .125W F TC=0±100	24546	C4-1/8-T0-562R-F
A14A1R8	0757-0400	9	2	RESISTOR 90.9 1% .125W F TC=0±100	24546	C4-1/8-T0-90R9-F
A14A1R9	0757-0400	9		RESISTOR 90.9 1% .125W F TC=0±100	24546	C4-1/8-T0-90R9-F
A14A1R10	0698-3441	8		RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A14A1R11	2100-1738	9	6	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R12				NOT ASSIGNED		
A14A1R13	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R14	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R15	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R16	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R17				NOT ASSIGNED		
A14A1R18	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R19	0757-0442	9	6	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A14A1R20				NOT ASSIGNED		
A14A1R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A14A1R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A14A1R23	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A14A1R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A14A1R25				NOT ASSIGNED		
A14A1R26	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A14A1R27	0757-0417	8		RESISTOR 562 1% .125W F TC=0±100	24546	C4-1/8-T0-562R-F
A14A1R28	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0±100	24546	C4-1/8-T0-121R-F
A14A1R29				NOT ASSIGNED		
A14A1R30	0698-0084	9	2	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A14A1R31	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A14A1U1	1826-0527	7	1	IC V RGLTR-ADJ-NEG 1.2/37V TO-220 PKG	28480	1826-0527
A14A1VR1	1902-0551	1	1	DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
A14A1VR2	1902-0029	8	1	DIODE-ZNR 12V 5% PD=1W IR=5UA	28480	1902-0029
A14A2				POWER AMPL. MICROCIRCUIT (NOT SEPARATELY REPLACEABLE; ORDER A14.)		
A14MP1	0340-0614	4	1	INSULATOR-XSTR POLYI HD-ANDZ	28480	0340-0614
A14MP2	0590-0106	8	1	NUT-HEX-PLSTC LKG 2-56-THD .143-IN-THK	00000	ORDER BY DESCRIPTION
A14MP3	2200-0119	0	2	SCREW-MACH 4-40 1-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A14MP4	2260-0009	3	2	NUT-HEX-W/LKWR 4-40-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
A14MP5	5001-1600	7	1	HEAT SINK/BRACKET	28480	5001-1600
A14MP6	5021-0950	0	1	BOARD INSULATOR	28480	5021-0950
A14MP7	5021-2519	1	1	FET AMP INSULATOR	28480	5021-2519

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14	5086-7407	2	1	BAND 1-4 POWER AMPLIFIER (5086-7407 INCLUDES A14A1 PC BOARD AND A14 MICROCIRCUIT.)	28480	5086-7407
				NOTE Order power amp replacement kit, HP Part Number 08340-60204, CD5.		
	5086-6407	0	1	EXCHANGE 5086-7407 BAND 1-4 PWR AMP	28480	5086-6407
				NOTE Order exchange 5086-7407 power amp replacement kit, HP Part Number 08340-60196 CD4		
A14A1	5061-5326	8	1	BAND 1-4 POWER AMP BIAS BOARD	28480	5061-5326
A14A1C1	0160-0174	9	2	CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A14A1C2	0180-1704	5	4	CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C3	0180-1704	5		CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C4	0180-0228	6	1	CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A14A1C5	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A14A1C6	0180-1704	5		CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C7	0180-1704	5		CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A14A1C8	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A14A1C9	0160-4084	8	1	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A14A1C10	0160-3879	7	1	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A14A1E1-E12	1251-3172	7	12	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A14A1J1	1200-0507	9	1	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0507
A14A1MP1	0380-0322	5	8	SPACER-RVT-ON .062-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A14A1MP2	1200-0173	5	1	INSULATOR-XSTR DAP-GL	28480	1200-0173
A14A1MP3	0340-0614	4	1	INSULATOR-XSTR POLYI HD-ANDZ	28480	0340-0614
A14A1MP4	0590-0106	8	1	NUT-HEX-PLSTC LKG 2-56-THD .143-IN-THK	00000	ORDER BY DESCRIPTION
A14A1MP5	5001-1600	7	1	HEAT SINK/BRACKET	28480	5001-1600
A14A1MP6	5021-0950	0	1	BOARD INSULATOR	28480	5021-0950
A14A1MP7	5021-2519	1	1	INSULATOR	28480	5021-2519
A14A1Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A14A1Q2	1853-0213	7	1	TRANSISTOR PNP 2N4236 SI TO-5 PD=1W	04713	2N4236
A14A1Q3	1853-0281	9	1	TRANSISTOR NPN 2N2194 SI TO-5 PD=800MW	01698	2N2194
A14A1R1	0698-3443	0	2	RESISTOR 287 1% .125W F TC=0+100	24546	C4-1/8-T0-287R-F
A14A1R2	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0+100	24546	C4-1/8-T0-751-F
A14A1R3	0698-3441	8	3	RESISTOR 215 1% .125W F TC=0+100	24546	C4-1/8-T0-215R-F
A14A1R4	0698-3441	8		RESISTOR 215 1% .125W F TC=0+100	24546	C4-1/8-T0-215R-F
A14A1R5	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A14A1R6	0757-0198	2	1	RESISTOR 100 1% .5W F TC=0+100	28480	0757-0198
A14A1R7	0757-0417	8	2	RESISTOR 562 1% .125W F TC=0+100	24546	C4-1/8-T0-562R-F
A14A1R8	0757-0400	9	2	RESISTOR 90.9 1% .125W F TC=0+100	24546	C4-1/8-T0-90R9-F
A14A1R9	0757-0400	9		RESISTOR 90.9 1% .125W F TC=0+100	24546	C4-1/8-T0-90R9-F
A14A1R10	0698-3441	8		RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A14A1R11	2100-1738	9	6	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R12				NOT ASSIGNED		
A14A1R13	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R14	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R15	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R16	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R17				NOT ASSIGNED		
A14A1R18	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14A1R19	0757-0442	9	6	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A14A1R20				NOT ASSIGNED		
A14A1R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A14A1R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A14A1R23	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A14A1R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A14A1R25				NOT ASSIGNED		
A14A1R26	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A14A1R27	0757-0417	8		RESISTOR 562 1% .125W F TC=0+100	24546	C4-1/8-T0-562R-F
A14A1R28	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0+100	24546	C4-1/8-T0-121R-F
A14A1R29				NOT ASSIGNED		
A14A1R30	0698-0084	9	2	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A14A1R31	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A14A1R32	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A14A1R33	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14A1R34	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-TO-5111-F
A14A1R35	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-TO-3161-F
A14A1U1	1826-0527	9	1	IC V RGLTR-ADJ-NEG 1.2/37V TO-220 PKG	28480	1826-0527
A14A1VR1	1902-0551	1	1	DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
A14A1VR2	1902-0029	8	1	DIODE-ZNR 12V 5% PD=1W IR=5UA	28480	1902-0029

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15	9135-0191	6	1	BAND 0 LOW PASS FILTER	28480	9135-0191
A16	5086-7304	0	1	BAND 1-4 MODULATOR/SPLITTER	28480	5086-7304
	5086-6304	8	1	EXCHANGE 5086-7304 BAND 1-4 MOD/SPL	28480	5086-6304
A16A1	5061-5323	5	1	BAND 1-4 MODULATOR/SPLITTER BIAS BOARD	28480	5061-5323
A16A1C1	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A16A1C2	0180-1704	5	2	CAPACITOR-FXD 47UF+-10% 6VDC TA	56289	150D476X9006B2
A16A16C3	0180-1704	5		CAPACITOR-FXD 47UF+-10% 6VDC TA	56289	150D476X9006B2
A16A1J1	1200-0482	9	1	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A16A1J2	1250-1849	9	1	CONNECTOR-RF FEEDTHRU CAPACITOR; 50 OHMS	28480	1250-1849
A16A1MP1	2200-0107	6	4	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A16A1MP2	0380-0321	4	5	SPACER-RVT-ON .125-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A16A1MP3				NOT ASSIGNED		
A16A1MP4				NOT ASSIGNED		
A16A1MP5	1251-3172	7	1	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A16A1Q1	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A16A1R1	0698-3441	8	2	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A16A1R2	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A16A1R3	0698-3443	0	2	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A16A1R4	2100-1738	9	2	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A16A1R5	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A16A1R6	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A16A1R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A16A1R8	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A16A1R9	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1001-F
A16A1VR1	1902-0551	1	1	DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
A17	5086-7374	2	1	BAND 0 MIXER	28480	5086-7374
	5086-6374	0		EXCHANGE 5086-7374 BAND 0 MIXER	28480	5086-6374
A18	5086-7217	2	1	BAND 0 POWER AMPLIFIER (5086-7217 INCLUDES A18 MICROCIRCUIT AND A18A1 PC BOARD BUT DOES NOT INCLUDE A18A2 BAND 0 SPLITTER.)	28480	5086-7217
	5086-6217	0		EXCHANGE 5086-7217 BAND 0 PWR AMPLIFIER	28480	5086-6217
A18A1	5060-0325	5	1	BAND 0 POWER AMP BIAS BOARD	28480	5060-0325
A18A1R1	0698-3445	2	1	RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
A18A1R2	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A18A1R3	0698-3437	2	1	RESISTOR 133 1% .125W F TC=0+-100	24546	C4-1/8-T0-133R-F
A18A1R4	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A18A1R5	0757-0417	8	1	RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
A18A1R6	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A18A1R7	0757-1090	5		RESISTOR 261 1% .5W F TC=0+-100	28480	0757-1090
A18A1R8*	0698-3102	8	1	RESISTOR 237 1% .5W F TC=0+-100	28480	0698-3102
A18A1R8*	0698-3334	8	1	RESISTOR 178 1% .5W F TC=0+-100	28480	0698-3334
A18A1R8*	0698-3401	0	1	RESISTOR 215 1% .5W F TC=0+-100	28480	0698-3401
A18A1R8*	0757-1060	9	1	RESISTOR 196 1% .5W F TC=0+-100	28480	0757-1060
A18A1R8*	0757-1090	5	2	RESISTOR 261 1% .5W F TC=0+-100	28480	0757-1090
A18A1R8*	0757-1092	7	1	RESISTOR 287 1% .5W F TC=0+-100	28480	0757-1092
A18A1R9	0757-0794	4	1	RESISTOR 68.1 1% .5W F TC=0+-100	28480	0757-0794
A18A1R10				R10 IS FACTORY SELECTED FROM THE FOLLOWING VALUES:		
	0757-0795	5		RESISTOR 75 1% .5W F TC=0+-100	19701	MF-1/2-T0-75R0-F
	0757-0796	6		RESISTOR 82.5 1% .5W F TC=0+-100	28480	0757-0796
	0757-0797	7		RESISTOR 90.9 1% .5W F TC=0+-100	28480	0757-0797
	0757-1000	7		RESISTOR 51.1 1% .5W F TC=0+-100	28480	0757-1000
	0757-1001	8		RESISTOR 56.2 1% .5W F TC=0+-100	28480	0757-1001
	0757-1002	9		RESISTOR 61.9 1% .5W F TC=0+-100	28480	0757-1002
A18A1W1	08340-60099	6	1	WIRE ASSEMBLY A18A1 TO A20J4 (NOT INCLUDED WITH A18 OR A18A1)	28480	08340-60099

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A18A2	5086-7349	1	1	BAND 0 SPLITTER	28480	5086-7349
A18MP1	5020-8550	0	1	DIELECTRIC SPACER	28480	5020-8550

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15	9135-0191	6	1	BAND 0 LOW PASS FILTER	28480	9135-0191
A16	5086-7304	0	1	BAND 1-4 MODULATOR/SPLITTER	28480	5086-7304
	5086-6304	8	1	EXCHANGE 5086-7304 BAND 1-4 MOD/SPL	28480	5086-6304
A16A1	5061-5323	5	1	BAND 1-4 MODULATOR/SPLITTER BIAS BOARD	28480	5061-5323
A16A1C1	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A16A1C2	0180-1704	5	2	CAPACITOR-FXD 47UF+-10% 6VDC TA	56289	150D476X9006B2
A16A16C3	0180-1704	5		CAPACITOR-FXD 47UF+-10% 6VDC TA	56289	150D476X9006B2
A16A1J1	1200-0482	9	1	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A16A1J2	1250-1849	9	1	CONNECTOR-RF FEEDTHRU CAPACITOR; 50 OHMS	28480	1250-1849
A16A1MP1	2200-0107	6	4	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A16A1MP2	0380-0321	4	5	SPACER-RVT-ON .125-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A16A1MP3				NOT ASSIGNED		
A16A1MP4				NOT ASSIGNED		
A16A1MP5	1251-3172	7	1	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A16A1Q1	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A16A1R1	0698-3441	8	2	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A16A1R2	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A16A1R3	0698-3443	0	2	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A16A1R4	2100-1738	9	2	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A16A1R5	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A16A1R6	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A16A1R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A16A1R8	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A16A1R9	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1001-F
A16A1VR1	1902-0551	1	1	DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
A17	5086-7374	2	1	BAND 0 MIXER	28480	5086-7374
	5086-6374	0		EXCHANGE 5086-7374 BAND 0 MIXER	28480	5086-6374
A18	5086-7217	2	1	BAND 0 POWER AMPLIFIER (5086-7217 INCLUDES A18 MICROCIRCUIT AND A18A1 PC BOARD BUT DOES NOT INCLUDE A18A2 BAND 0 SPLITTER.)	28480	5086-7217
	5086-6217	0		EXCHANGE 5086-7217 BAND 0 PWR AMPLIFIER	28480	5086-6217
A18A1	5060-0325	5	1	BAND 0 POWER AMP BIAS BOARD	28480	5060-0325
A18A1R1	0698-3445	2	1	RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
A18A1R2	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A18A1R3	0698-3437	2	1	RESISTOR 133 1% .125W F TC=0+-100	24546	C4-1/8-T0-133R-F
A18A1R4	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A18A1R5	0757-0417	8	1	RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
A18A1R6	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A18A1R7	0757-1090	5		RESISTOR 261 1% .5W F TC=0+-100	28480	0757-1090
A18A1R8*	0698-3102	8	1	RESISTOR 237 1% .5W F TC=0+-100	28480	0698-3102
A18A1R8*	0698-3334	8	1	RESISTOR 178 1% .5W F TC=0+-100	28480	0698-3334
A18A1R8*	0698-3401	0	1	RESISTOR 215 1% .5W F TC=0+-100	28480	0698-3401
A18A1R8*	0757-1060	9	1	RESISTOR 196 1% .5W F TC=0+-100	28480	0757-1060
A18A1R8*	0757-1090	5	2	RESISTOR 261 1% .5W F TC=0+-100	28480	0757-1090
A18A1R8*	0757-1092	7	1	RESISTOR 287 1% .5W F TC=0+-100	28480	0757-1092
A18A1R9	0757-0794	4	1	RESISTOR 68.1 1% .5W F TC=0+-100	28480	0757-0794
A18A1R10				R10 IS FACTORY SELECTED FROM THE FOLLOWING VALUES:		
	0757-0795	5		RESISTOR 75 1% .5W F TC=0+-100	19701	MF-1/2-T0-75R0-F
	0757-0796	6		RESISTOR 82.5 1% .5W F TC=0+-100	28480	0757-0796
	0757-0797	7		RESISTOR 90.9 1% .5W F TC=0+-100	28480	0757-0797
	0757-1000	7		RESISTOR 51.1 1% .5W F TC=0+-100	28480	0757-1000
	0757-1001	8		RESISTOR 56.2 1% .5W F TC=0+-100	28480	0757-1001
	0757-1002	9		RESISTOR 61.9 1% .5W F TC=0+-100	28480	0757-1002
A18A1W1	08340-60099	6	1	WIRE ASSEMBLY A18A1 TO A20J4 (NOT INCLUDED WITH A18 OR A18A1)	28480	08340-60099

See introduction to this section for ordering information

*Units are factory selected parts

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A18MP1	5020-8550	0	1	DIELECTRIC SPACER	28480	5020-8550

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A19	08340-60258	9	1	CAPACITOR ASSEMBLY (RECOMMENDED REPLACEMENT)	28480	08340-60258
A19C1	0160-2055	9	2	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A19C2	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A19C3	0160-6143	4	2	CAPACITOR-FXD .22UF +-20% 160VDC CER	28480	0160-6143
A19C4	0160-5647	1	1		28480	0160-5647
A19C5	0180-2603	5	2	CAPACITOR-FXD 7200UF+75-10% 50VDC AL	28480	0180-2603
A19C6	0180-2603	5		CAPACITOR-FXD 7200UF+75-10% 50VDC AL	28480	0180-2603
A19C7	0180-2671	7	3	CAPACITOR-FXD .012F+75-10% 30VDC AL	00853	500123U030AC2A
A19C8	0180-2671	7		CAPACITOR-FXD .012F+75-10% 30VDC AL	00853	500123U030AC2A
A19C9	0180-2671	7		CAPACITOR-FXD .012F+75-10% 30VDC AL	00853	500123U030AC2A
A19C10	0160-6143	4		CAPACITOR-FXD .22UF +-20% 200VDC CER	28480	0160-6143
A19CR1	1901-0662	3	4	DIODE-PWR RECT 100V 6A	04713	MR751
A19CR2	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A19CR3	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A19CR4	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A19CR5	1901-0935	3	4	DIODE-PWR RECT 45V 8A	28480	1901-0935
A19CR6	1901-0935	3		DIODE-PWR RECT 45V 8A	28480	1901-0935
A19CR7	1901-0935	3		DIODE-PWR RECT 45V 8A	28480	1901-0935
A19CR8	1901-0935	3		DIODE-PWR RECT 45V 8A	28480	1901-0935
A19DS1	1990-0486	6	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A19MP1	2190-0011	8	10	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0011
A19MP2	2680-0129	8	10	SCREW-MACH 10-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A19MP3	2360-0113	2	3	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A19MP4	08340-00019	4	1	CAP SHIELD	28480	08340-00019
A19R1	0764-0016	8	2	RESISTOR 1K 5% 2W MO TC=0+-200	28480	0764-0016
A19R2	0698-3407	6	1	RESISTOR 1.96K 1% .5W F TC=0+-100	28480	0698-3407
A19R3	0757-1078	9	1	RESISTOR 1.47K 1% .5W F TC=0+-100	28480	0757-1078
A19R4	0764-0016	8		RESISTOR 1K 5% 2W MO TC=0+-200	28480	0764-0016
A19TP1	0360-0535	0	1	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A20	**08340-60027**	**0**	**1**	**RF SECTION FILTER**	**28480**	**08340-60027**
A20C1	0180-2614	8	2	CAPACITOR-FXD 100UF+10% 30VDC TA	56289	150D107X9030S2
A20C2	0160-4835	7	2	CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A20C3	0180-2614	8		CAPACITOR-FXD 100UF±10% 30VDC TA	56289	150D107X9030S2
A20C4	0180-0094	4	2	CAPACITOR-FXD 100UF+75-10% 25VDC AL	56289	30D107G025DD2
A20C5	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A20C6	0180-0094	4		CAPACITOR-FXD 100UF+75-10% 25VDC AL	56289	30D107G025DD2
A20C7	0180-0116	1	1	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A20J1	1200-0482	9	2	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A20J2	1200-0482	9		SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A20J3	1251-6794	5	1	CONNECTOR HEADER 5 M IR	28480	1251-6794
A20J4	1251-6795	6	1	CONNECTOR HEADER 3 M IR	28480	1251-6795
A20L1	08340-80001	2	4	COIL-TOROID	28480	08340-80001
A20L2	08340-80001	2		COIL-TOROID	28480	08340-80001
A20L3	08340-80001	2		COIL-TOROID	28480	08340-80001
A20L4	08340-80001	2		COIL-TOROID	28480	08340-80001
A20L5	9100-0539	3	1	INDUCTOR (MISC ITEM)	28480	9100-0539
A20MP1	0380-0773	0	4	SPACER-RVT-ON .5-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A20Q1	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A20Q2	1854-0361	8	1	TRANSISTOR NPN 2N4239 SI TO-5 PD=6W	04713	2N4239
A20R1	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A20R2	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A20R3	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0±100	19701	MF4C1/8-T0-6191-F
A20R4	0757-1090	5	1	RESISTOR 261 1% .5W F TC=0±100	28480	0757-1090
A20R5	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F

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

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A20	08340-60261	4	1	RF SECTION FILTER ASSEMBLY	28480	08340-60261
A20C1	0180-2614	8	2	CAPACITOR-FXD 100UF ± 10% 30VDC TA	56289	150D107X9030S2
A20C2	0160-4835	7	2	CAPACITOR-FXD .1UF ± 10% 50VDC CER	28480	0160-4835
A20C3	0180-2614	8		CAPACITOR-FXD 100UF ± 10% 30VDC TA	56289	150D107X9030S2
A20C4	0180-0094	4	2	CAPACITOR-FXD 100UF +75-10% 25VDC AL	56289	30D107G025DD2
A20C5	0160-4835	7		CAPACITOR-FXD .1UF ± 10% 50VDC CER	28480	0160-4835
A20C6	0180-0094	4		CAPACITOR-FXD 100UF +75-10% 25VDC AL	56289	30D107G025DD2
A20C7	0180-0116	1	1	CAPACITOR-FXD 6.8UF ± 10% 35VDC TA	56289	150D685X9035B2
A20J1	1200-0482	9	2	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A20J2	1200-0482	9		SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A20J3	1251-6794	5	1	CONNECTOR HEADER 5 M IR	28480	1251-6794
A20J4	1251-6795	6	1	CONNECTOR HEADER 3 M IR	28480	1251-6795
A20L1	08340-80001	2	4	COIL-TOROID	28480	08340-80001
A20L2	08340-80001	2		COIL-TOROID	28480	08340-80001
A20L3	08340-80001	2		COIL-TOROID	28480	08340-80001
A20L4	08340-80001	2		COIL-TOROID	28480	08340-80001
A20L5	9100-0539	3	2	INDUCTOR 10 µH	28480	9100-0539
A20L6	9100-0539	3		INDUCTOR 10 µH	28480	9100-0539
A20MP1	0380-0773	0	4	SPACER-RVT-ON .5-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A20Q1	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A20Q2	1854-0361	8	1	TRANSISTOR NPN 2N4239 SI TO-5 PD=6W	04713	2N4239
A20R1	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A20R2	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A20R3	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0±100	19701	MF4C1/8-T0-6191-F
A20R4	0757-1090	5	1	RESISTOR 261 1% .5W F TC=0±100	28480	0757-1090
A20R5	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A21	**08340-60160**	**2**	**1**	**PULSE MODULATOR DRIVER**	**28480**	**08340-60160**
A21C1*	0160-4492	2	1	CAPACITOR-FXD 18PF ±5% 200VDC CER 0±30	28480	0160-4492
A21C2	0160-4084	8	4	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A21C3	0160-0127	2	2	CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A21C4	0160-0127	2		CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A21C5	0160-0574	3	1	CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A21C6	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A21C7	0160-4822	2	1	CAPACITOR-FXD 1000PF ±5% 100VDC CER	28480	0160-4822
A21C8	0160-4823	3	1	CAPACITOR-FXD 820PF ±5% 100VDC CER	28480	0160-4823
A21C9	0160-4808	4	1	CAPACITOR-FXD 470PF ±5% 100VDC CER	02798	0160-4808
A21C10	0160-0573	2	1	CAPACITOR-FXD 4700PF ±20% 100VDC CER	28480	0160-0573
A21C11	0160-4809	5	1	CAPACITOR-FXD 390PF ±5% 100VDC CER	28480	0160-4809
A21C12	0160-4386	3	1	CAPACITOR-FXD 33PF ±5% 200VDC CER 0±30	28480	0160-4386
A21C13	0160-4387	4	1	CAPACITOR-FXD 47PF ±5% 200VDC CER 0±30	28480	0160-4387
A21C14	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A21C15	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A21C16	0180-0229	7	1	CAPACITOR-FXD 33UF+10% 10VDC TA	56289	150D336X9010B2
A21C17	0180-0116	1	1	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A21CR1	1901-0050	3	9	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR7	1901-0539	3	1	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A21CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A21L1	9100-3562	8	2	COIL-4.7 UH 5%	28480	9100-3562
A21L2	9100-3562	8		COIL-4.7 UH 5%	28480	9100-3562
A21L3	9140-0138	2	1	INDUCTOR RF-CH-MLD 180UH 5% .166DX.385LG	28480	9140-0138
A21L4	9140-0129	1	2	INDUCTOR RF-CH-MLD 220UH 5% .166DX.385LG	28480	9140-0129
A21L5	9100-3912	2	1	INDUCTOR RF-CH-MLD 15UH 5% .166DX.385LG	28480	9100-3912
A21L6	9140-0129	1		INDUCTOR RF-CH-MLD 220UH 5% .166DX.385LG	28480	9140-0129
A21L7	9140-0237	2	1	INDUCTOR RF-CH-MLD 200UH 5% .166DX.385LG	28480	9140-0237
A21MP1	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A21MP2	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-BD-THKNS	28480	4040-0749
A21MP3, 4	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A21Q1	1854-0809	9	7	TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A21Q2	1853-0018	0	2	TRANSISTOR PNP SI TO-72 PD=200MW FT=1GHZ	28480	1853-0018
A21Q3	1853-0018	0		TRANSISTOR PNP SI TO-72 PD=200MW FT=1GHZ	28480	1853-0018
A21Q4	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A21Q5	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A21Q6	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A21Q7	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A21Q8	1853-0405	9	1	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A21Q9	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A21Q10	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A21Q11	1855-0251	7	2	TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251
A21Q12	1855-0251	7		TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251
A21R1	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A21R2	0757-0416	7	3	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A21R3	0757-0280	3	4	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A21R4	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A21R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A21R6	0698-3440	7	2	RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A21R7	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A21R8	0698-3444	1	2	RESISTOR 316 1% .125W F TC=0±100	24546	C4-1/8-T0-316R-F
A21R9	0698-3440	7		RESISTOR 196 1% .125W F TC=0±100	24546	C4-1/8-T0-196R-F
A21R10	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A21R11	0757-0394	0	2	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A21R12	0757-0346	2	1	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A21R13	0757-0465	6	2	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A21R14	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A21R15	0757-0317	7	1	RESISTOR 1.33K 1% .125W F TC=0±100	24546	C4-1/8-T0-1331-F
A21R16	0698-3152	8	1	RESISTOR 3.48K 1% .125W F TC=0+100	24546	C4-1/8-T0-3481-F
A21R17	0757-0458	7	1	RESISTOR 51.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-5112-F
A21R18	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0+100	24546	C4-1/8-T0-2610-F
A21R19	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0±100	24546	C4-1/8-T0-681R-F
A21R20	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A21R21	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A21R22	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A21R23	2100-3273	1	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
A21R24	0698-3441	8	1	RESISTOR 215 1% .125W F TC=0+100	24546	C4-1/8-T0-215R-F
A21R25	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A21R26	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A21R27	0757-0402	1	2	RESISTOR 110 1% .125W F TC=0+100	24546	C4-1/8-T0-111-F
A21R28	0757-0402	1		RESISTOR 110 1% .125W F TC=0+100	24546	C4-1/8-T0-111-F
A21R29	0757-0418	9	2	RESISTOR 619 1% .125W F TC=0+100	24546	C4-1/8-T0-619R-F
A21R30	0698-3444	1		RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A21R31	0757-0422	5	2	RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A21R32	0757-0422	5		RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A21R33-36				NOT ASSIGNED		
A21R37	0757-0418	9		RESISTOR 619 1% .125W F TC=0+100	24546	C4-1/8-T0-619R-F
A21R38	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC=0+100	24546	C4-1/8-T0-1781-F
A21R39				NOT ASSIGNED		
A21R40	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4-1/8-T0-1782-F
A21R41	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-T0-1471-F
A21R42	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A21R43	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A21R44	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A21R45	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A21TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A21TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A21TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A21TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A21TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A21U1	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A21U2	1820-1423	4	1	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A21U3	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P

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

New Page - Do Not Remove Original A21 Parts List

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A21	08341-60002	2	1	PULSE MODUALTOR DRIVER (OPTION 006)	28480	08340-60002
A21C1	0180-0291	3	1	CAPACITOR-FXD 1UF +-10% 35VDC TA	28480	0180-0291
A21MP1	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A21MP2	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-BD-THKNS	28480	4040-0749
A21MP3,4	1480-0073	6	1	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A21Q1	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	02037	2N2907A
A21R1	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A21R2	0757-0417	8	1	RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
A21R3	0698-3445	2	1	RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
A21R4	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A21R5	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A21R6	0698-3440	7	2	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A21R7	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A21R8	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A21R9	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A21TP1-3	0360-0535	0	3	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

See introduction to this section for ordering information

*Units are factory selected

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A22				NOT ASSIGNED		
A23				NOT ASSIGNED		
A24	08340-60158	8	1	ATTENUATOR DRIVER/SRD BIAS	28480	08340-60158
A24C1	0180-0116	1	4	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A24C2	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A24C3	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A24C4	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A24C5	0160-4835	7	6	CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A24C6	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A24C7	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A24C8	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A24C9	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A24C10	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A24C11	0180-0228	6	1	CAPACITOR-FXD 22UF+10% 15VDC TA	56289	150D226X9015B2
A24C12	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A24C13	0180-0049	9	1	CAPACITOR-FXD 20UF+75-10% 50VDC AL	56289	30D206G050CC2
A24C14	0160-3335	0	1	CAPACITOR-FXD 470PF ±10% 100VDC CER	28480	0160-3335
A24C15	0160-4787	8	1	CAPACITOR-FXD 22PF ±5% 100VDC CER 0±30	28480	0160-4787
A24C16	0160-4812	0	1	CAPACITOR-FXD 220PF ±5% 100VDC CER	28480	0160-4812
A24C17, 18				NOT ASSIGNED		
A24C19	0160-0575	4	5	CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A24C20	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A24C21	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A24C22	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A24C23	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A24C24	0160-4389	6		CAPACITOR-FXD 100PF ±5PF 100VDC CER	28480	0160-4389
A24CR1	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A24CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A24L1	9140-0129	1	4	INDUCTOR RF-CH-MLD 220UH 5% .166DX.385LG	28480	9140-0129
A24L2	9140-0129	1		INDUCTOR RF-CH-MLD 220UH 5% .166DX.385LG	28480	9140-0129
A24L3	9140-0129	1		INDUCTOR RF-CH-MLD 220UH 5% .166DX.385LG	28480	9140-0129
A24L4	9140-0129	1		INDUCTOR RF-CH-MLD 220UH 5% .166DX.385LG	28480	9140-0129
A24L5	9100-0539	3	1	INDUCTOR (MISC ITEM)	28480	9100-0539
A24MP1				NOT ASSIGNED		
A24MP2	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A24MP3	4040-0752	9	1	EXTR-PC BD YEL POLYC .062-BD-THKNS	28480	4040-0752
A24MP4	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A24MP5, 6				NOT ASSIGNED		
A24MP7	1205-0033	6	1	HEAT SINK TO-5/TO-39-CS	28480	1205-0033
A24Q1	1853-0281	9	4	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q2	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q3	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q4	1855-0386	9	3	TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A24Q5	1855-0386	9		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A24Q6	1855-0386	9		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A24Q7	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A24Q8	1855-0420	2	1	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A24Q9	1853-0213	4	1	TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0213
A24Q10	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	28480	1853-0281
A24R1	2100-3274	2	2	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A24R2	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A24R3	2100-3353	8	9	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R4	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R5	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R6	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R7	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R8	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R9	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R10	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R11	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A24R12	2100-3351	6	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	28480	2100-3351
A24R13	0698-3453	2	6	RESISTOR 196K 1% .125W F TC=0+100	24546	C4-1/8-T0-1963-F
A24R14	0698-3453	2		RESISTOR 196K 1% .125W F TC=0±100	24546	C4-1/8-T0-1963-F
A24R15	0698-3453	2		RESISTOR 196K 1% .125W F TC=0±100	24546	C4-1/8-T0-1963-F
A24R16	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+100	24546	C4-1/8-T0-1963-F
A24R17	0698-3453	2		RESISTOR 196K 1% .125W F TC=0±100	24546	C4-1/8-T0-1963-F
A24R18	0698-3453	2		RESISTOR 196K 1% .125W F TC=0±100	24546	C4-1/8-T0-1963-F
A24R19	0698-3449	6	3	RESISTOR 28.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-2872-F
A24R20	0698-3449	6		RESISTOR 28.7K 1% .125W F TC=0±100	24546	C4-1/8-T0-2872-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A24R21	0698-3449	6		RESISTOR 28.7K 1% .125W F TC=0±100	24546	C4-1/8-T0-2872-F
A24R22				NOT ASSIGNED		
A24R23	0757-0442	9	9	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R25	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R26	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R27	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R28	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R29	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R30	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R31	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A24R32	0757-0443	0	1	RESISTOR 11K 1% .125W F TC=0±100	24546	C4-1/8-T0-1102-F
A24R33	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0±100	24546	C4-1/8-T0-2871-F
A24R34	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A24R35	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A24R36	0698-3156	2	2	RESISTOR 14.7K 1% .125W F TC=0±100	24546	C4-1/8-T0-1472-F
A24R37	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0±100	24546	C4-1/8-T0-1472-F
A24R38	0698-7278	7	1	RESISTOR 56.2K 1% .05W F TC=0±100	28480	0698-7278
A24R39	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0±100	24546	C4-1/8-T0-51R1-F
A24R40	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-3162-F
A24R41	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A24R42	0698-6624	5	1	RESISTOR 2K .1% .125W F TC=0±25	28480	0698-6624
A24R43	0811-3575	1	1	RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A24R44	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A24R45	0698-8827	4	1	RESISTOR 1M 1% .125W F TC=0±100	28480	0698-8827
A24R46	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A24R47	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4-1/8-T0-2611-F
A24R48	0698-3162	0	1	RESISTOR 46.4K 1% .125W F TC=0±100	24546	C4-1/8-T0-4642-F
A24R49	0699-0068	1	1	RESISTOR- 1.47 MEGOHM 1% .12W	28480	0699-0068
A24R50	0757-0465	6	5	RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A24R51	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A24R52	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A24R53	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A24R54	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A24R55	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A24R56	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-5110-F
A24R57	0757-0441	8	1	RESISTOR 8.25K 1% .125W F TC=0±100	24546	C4-1/8-T0-8251-F
A24R58	0757-0444	1	1	RESISTOR 12.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1212-F
A24R59	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC=0±100	24546	C4-1/8-T0-1781-F
A24R60	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A24R61	0698-7205	0	1	RESISTOR 51.1 1% .125W F TC=0±100	24546	C4-1/8-T0-51R1-F
A24TP1	0360-0535	0	12	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP11	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24TP12	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A24U1	1826-0785	1	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A24U2	1826-0828	3	2	IC-15G M1 OP AMP	06665	OP-15GJ
A24U3	1826-0828	3		IC-15G M1 OP AMP	06665	OP-15GJ
A24U4	1826-0261	8	1	IC OP AMP LOW-NOISE TO-99 PKG	28480	1826-0261
A24U5	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A24U6	1810-0395	6	1	NETWORK-RES 8-SIP47.0K OHM X 7	11236	750-81-R47K
A24U7	1826-0138	8	2	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A24U8	1820-0535	7	4	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A24U9	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A24U10	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A24U11	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A24U12	1826-0138	8		IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A24U13	1906-0074	1	1	DIODE-ARRAY 50V 400MA	28480	1906-0074
A24U14	1820-1491	6	1	IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A24U15	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A25	08340-60243	2	1	ALC DETECTOR	28480	08340-60243
A25C1	0160-4535	4	8	CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25C2	0160-0575	4	5	CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A25C3	0160-4385	2	1	CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	28480	0160-4385
A25C4	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A25C5	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25C6	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25C7	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A25C8	0160-4387	4	1	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A25C9	0160-3879	7	4	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A25C10	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A25C11*	0160-3878	6	5	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A25C12	0160-4389	6	1	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A25C13	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A25C14	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A25C15	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A25C16	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A25C17	0160-4084	8	4	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A25C18	0160-3874	2	1	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	28480	0160-3874
A25C19	0160-3873	1	3	CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A25C20	0160-3873	1		CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A25C21	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A25C22	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A25C23	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A25C24	0160-4789	0	1	CAPACITOR-FXD 15PF 100VDC	28480	0160-4789
A25C25	0160-0153	4	1	CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A25C26	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A25C27	0160-3875	3	1	CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A25C28	0180-2208	6	1	CAPACITOR-FXD 220UF+-10% 10VDC TA	56289	150D227X9010S2
A25C29	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25C30	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25C31	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A25C32	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25C33-35				NOT ASSIGNED		
A25C36	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A25C37	0160-3830	0	1	CAPACITOR-FXD 5UF +-10% 20VDC MET-POLYC	28480	0160-3830
A25C38	0160-3873	1		CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A25C39				NOT ASSIGNED		
A25C40	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A25C41	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25C42	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A25CR1	1901-0539	3	5	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A25CR2	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A25CR3	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A25CR4	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A25CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A25CR6	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A25CR7	1901-0376	6	1	DIODE-GEN PRP 35V 50MA DO-35 (RECOMMENDED REPLACEMENT)	28480	1901-0376
A25CR8	1901-0376	6	4	DIODE-GEN PRP 35V 50MA DO-35 (RECOMMENDED REPLACEMENT)	28480	1901-0376
A25CR9	1901-0033	2	3	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A25CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A25CR11	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A25CR12	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A25J1	1250-0691	7	2	CONNECTOR-RF M SMB	28480	1250-0691
A25J2	1250-0691	7		CONNECTOR-RF M SMB	28480	1250-0691
A25L1	9100-3562	8	2	COIL-4.7 UH 5%	28480	9100-3562
A25L2	9100-3562	8		COIL-4.7 UH 5%	28480	9100-3562
A25MP1				NOT ASSIGNED		
A25MP2	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A25MP3	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753
A25MP4	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A25MP5	08340-20184	6	1	COMPARTMENT FILTER	28480	08340-20184
A25MP6	08340-20054	9	1	COVER-FILTER	28480	08340-20054
A25MP7	08340-00054	7	1	COVER-FILTER	28480	08340-00054
A25MP8-15	2200-0103	2	8	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A25MP16, 17	2190-0124	4	2	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A25MP18, 19	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A25Q1	1855-0276	6	2	TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
A25Q2	1855-0276	6		TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
A25Q3	1854-0477	7	3	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A25Q4	1853-0405	9	3	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A25Q5	1854-0295	7	2	TRANSISTOR-DUAL NPN PD=400MW	28480	1854-0295
A25Q6	1853-0075	9	1	TRANSISTOR-DUAL PNP PD=400MW	28480	1853-0075
A25Q7	1854-0345	8	4	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A25Q8	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A25Q9	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A25Q10	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A25Q11	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A25Q12	1855-0235	7	2	TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	28480	1855-0235
A25Q13	1854-0546	1	2	TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A25Q14	1854-0546	1		TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A25Q15	1855-0235	7		TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	28480	1855-0235
A25Q16	1854-0295	7		TRANSISTOR-DUAL NPN PD=400MW	28480	1854-0295
A25Q17	1854-0475	5	2	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A25Q18	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A25Q19	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A25Q20	1854-0688	2	1	TRANSISTOR-DUAL NPN TO-71	28480	1854-0688
A25Q21	1854-0475	5		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A25Q22	1853-0269	3	1	TRANSISTOR-DUAL PNP 2N3809 PD=600MW	01295	2N3809
A25Q23	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A25Q24	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A25Q25	1855-0414	4	1	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A25Q26	1853-0316	1	1	TRANSISTOR-DUAL PNP PD=500MW	28480	1853-0316
A25Q27	1855-0386	9	3	TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A25Q28	1855-0386	9		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A25Q29	1855-0386	9		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A25Q30	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A25Q31	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A25R1	0698-7284	5	3	RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A25R2	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A25R3	0698-7212	9	3	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-TO-100R-F
A25R4	0698-8827	4	2	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A25R5	0698-7264	1	1	RESISTOR 14.7K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1472-F
A25R6	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-TO-100R-F
A25R7	0698-3429	2	2	RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A25R8	0698-0082	7	3	RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A25R9	0757-0280	3	4	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A25R10	0757-0420	3	2	RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A25R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A25R12	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A25R13	0757-0424	7	2	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A25R14	0698-3154	0	4	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A25R15	0698-7209	4	3	RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-TO-75R0-F
A25R16	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A25R17	0757-0424	7		RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A25R18	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A25R19	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-TO-100R-F
A25R20	0698-7209	4		RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-TO-75R0-F
A25R21	0698-7209	4		RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-TO-75R0-F
A25R22	0698-0083	8	3	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A25R23	0698-8821	8	1	RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A25R24	2100-0589	6	1	RESISTOR-TRMR 10 10% C SIDE-ADJ 1-TRN	28480	2100-0589
A25R25	0698-7188	8	1	RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-TO-10R-F
A25R26	0757-0459	8	1	RESISTOR 56.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5622-F
A25R27	0757-0419	0	2	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A25R28	0698-3161	9	1	RESISTOR 38.3K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3832-F
A25R29	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A25R30	0757-0460	1	1	RESISTOR 61.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A25R31	0698-3157	3	4	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A25R32	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A25R33	2100-1762	9	4	RESISTOR-TRMR 20K 5% WW SIDE-ADJ 1-TRN	28480	2100-1762
A25R34	2100-1762	9		RESISTOR-TRMR 20K 5% WW SIDE-ADJ 1-TRN	28480	2100-1762
A25R35	0811-3596	6	1	RESISTOR- 320 OHM 2% .12W	28480	0811-3596
A25R36*	0757-0438	3	4	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A25R37*	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A25R38	2100-1759	4	2	RESISTOR-TRMR 2K 5% WW SIDE-ADJ 1-TRN	28480	2100-1759
A25R39	2100-1759	4		RESISTOR-TRMR 2K 5% WW SIDE-ADJ 1-TRN	28480	2100-1759
A25R40	0757-0418	9	2	RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A25R41	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A25R42	0698-6320	8	3	RESISTOR 5K .1% .125W F TC=0+-25	03888	PME55-1/8-T9-5001-B
A25R43	0757-0317	7	1	RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A25R44	0698-6320	8		RESISTOR 5K .1% .125W F TC=0+-25	03888	PME55-1/8-T9-5001-B
A25R45	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A25R46	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A25R47	0698-3438	3	1	RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A25R48	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A25R49	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A25R50	0698-6377	5	1	RESISTOR 200 .1% .125W F TC=0+-25	28480	0698-6377
A25R51	0757-0199	3	2	RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A25R52	0699-1056	9	1	RESISTOR- 825 OHM .1% .12W	28480	0699-1056
A25R53	0757-0274	5	2	RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A25R54	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A25R55	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A25R56	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A25R57	0698-3439	4	1	RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A25R58	2100-3351	6	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	28480	2100-3351
A25R59	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A25R60	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A25R61	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A25R62	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A25R63	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A25R64	0811-3575	1	2	RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A25R65	0698-6624	5	2	RESISTOR 2K .1% .125W F TC=0+-25	28480	0698-6624
A25R66	0811-3576	2	1	RESISTOR- 533 OHM 2% .12W	28480	0811-3576
A25R67	0699-0793	9	1	RESISTOR- 33.2K OHM .1% .12W	28480	0699-0793
A25R68	0757-0464	5	1	RESISTOR 90.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-9092-F
A25R69	0698-6376	4	2	RESISTOR 200K .1% .125W F TC=0+-25	19701	MF4C1/8-T9-2003-B
A25R70	0698-6376	4		RESISTOR 200K .1% .125W F TC=0+-25	19701	MF4C1/8-T9-2003-B
A25R71	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A25R72	0698-3160	8	1	RESISTOR 31.6K .1% .125W F TC=0+-25	28480	0698-3160
A25R73	0757-0346	2	3	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A25R74	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A25R75	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A25R76	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A25R77	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A25R78	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A25R79	0698-3453	2	2	RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
A25R80	2100-1762	9		RESISTOR-TRMR 20K 5% WW SIDE-ADJ 1-TRN	28480	2100-1762
A25R81	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A25R82	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A25R83	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
A25R84	2100-1762	9		RESISTOR-TRMR 20K 5% WW SIDE-ADJ 1-TRN	28480	2100-1762
A25R85	0698-3446	3	1	RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A25R86	0757-1094	9	2	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A25R87	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A25R88	2100-0552	3	1	RESISTOR-TRMR 50 10% C SIDE-ADJ 1-TRN	28480	2100-0552
A25R89	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A25R90	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A25R91	0757-0465	6	4	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A25R92	0698-3458	7	1	RESISTOR 348K 1% .125W F TC=0+-100	28480	0698-3458
A25R93	0699-0794	0	1	RESISTOR- 1.07K OHM .1% .12W	28480	0699-0794
A25R94	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A25R95	0698-6362	8	1	RESISTOR 1K .1% .125W F TC=0+-25	28480	0698-6362
A25R96	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A25R97	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A25R98	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A25R99	0698-6320	8		RESISTOR 5K .1% .125W F TC=0+-25	03888	PME55-1/8-T9-5001-B
A25R100	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+-25	28480	0698-6624
A25R101	0811-3575	1		RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A25R102	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A25R103	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A25R104	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A25R105	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A25R106	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+-100	28480	0757-0440
A25R107	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0+-100	28480	0757-0123
A25R108	2100-1760	7	1	RESISTOR-TRMR 5K 5% WW SIDE-ADJ 1-TRN	28480	2100-1760
A25R109*	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A25R110	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A25R111	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A25R112	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A25R113	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A25R114				NOT ASSIGNED		
A25R115*	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A25R116	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A25R117	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A25TP1	0360-0535	0	7	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25U1	1826-0845	4	1	IC OP AMP PRCN TO-99 PKG	06665	OP-07EJ
A25U2	1826-0306	2	2	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A25U3	1826-0932	0	3	IC OP AMP GP DUAL CHIP PKG	28480	1826-0932
A25U4	1826-0785	1	2	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A25U5	1826-0785	1		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A25U6	1826-0932	0		IC OP AMP GP DUAL CHIP PKG	28480	1826-0932
A25U7	1826-0932	0		IC OP AMP GP DUAL CHIP PKG	28480	1826-0932
A25U8	1826-0601	0	1	IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A25U9	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A25U10	1826-0471	2	1	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A25R49	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A25R50	0698-6377	5	1	RESISTOR 200 .1% .125W F TC=0+25	28480	0698-6377
A25R51	0757-0199	3	2	RESISTOR 21.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-2152-F
A25R52	0699-1056	9	1	RESISTOR- 825 OHM .1% .12W	28480	0699-1056
A25R53	0757-0274	5	2	RESISTOR 1.21K 1% .125W F TC=0+100	24546	C4-1/8-T0-1211-F
A25R54	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A25R55	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A25R56	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A25R57	0698-3439	4	1	RESISTOR 178 1% .125W F TC=0+100	24546	C4-1/8-T0-178R-F
A25R58	2100-3351	6	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	28480	2100-3351
A25R59	0757-0418	9		RESISTOR 619 1% .125W F TC=0+100	24546	C4-1/8-T0-619R-F
A25R60	0698-0082	7		RESISTOR 464 1% .125W F TC=0+100	24546	C4-1/8-T0-4640-F
A25R61	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A25R62	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-5621-F
A25R63	0698-0082	7		RESISTOR 464 1% .125W F TC=0+100	24546	C4-1/8-T0-4640-F
A25R64	0811-3575	1	2	RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A25R65	0698-6624	5	2	RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A25R66	0811-3576	2	1	RESISTOR- 533 OHM 2% .12W	28480	0811-3576
A25R67	0699-0793	9	1	RESISTOR- 33.2K OHM .1% .12W	28480	0699-0793
A25R68	0757-0464	5	1	RESISTOR 90.9K 1% .125W F TC=0+100	24546	C4-1/8-T0-9092-F
A25R69	0698-6376	4	2	RESISTOR 200K .1% .125W F TC=0+25	19701	MF4C1/8-T9-2003-B
A25R70	0698-6376	4		RESISTOR 200K .1% .125W F TC=0+25	19701	MF4C1/8-T9-2003-B
A25R71	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0+100	24546	C4-1/8-T0-2871-F
A25R72	0698-3160	8	1	RESISTOR 31.6K .1% .125W F TC=0+25	28480	0698-3160
A25R73	0757-0346	2	3	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A25R74	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A25R75	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A25R76	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+100	24546	C4-1/8-T0-4641-F
A25R77	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+100	24546	C4-1/8-T0-3831-F
A25R78	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A25R79	0698-3453	2	2	RESISTOR 196K 1% .125W F TC=0+100	24546	C4-1/8-T0-1963-F
A25R80	2100-1762	9		RESISTOR-TRMR 20K 5% WW SIDE-ADJ 1-TRN	28480	2100-1762
A25R81	0757-0419	0		RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A25R82	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A25R83	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+100	24546	C4-1/8-T0-1963-F
A25R84	2100-1762	9		RESISTOR-TRMR 20K 5% WW SIDE-ADJ 1-TRN	28480	2100-1762
A25R85	0698-3446	3	1	RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A25R86	0757-1094	9	2	RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-T0-1471-F
A25R87	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A25R88	2100-0552	3	1	RESISTOR-TRMR 50 10% C SIDE-ADJ 1-TRN	28480	2100-0552
A25R89	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A25R90	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+100	24546	C4-1/8-T0-3481-F
A25R91	0757-0465	6	5	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A25R92	0698-3458	7	1	RESISTOR 348K 1% .125W F TC=0+100	28480	0698-3458
A25R93	0699-0794	0	1	RESISTOR- 1.07K OHM .1% .12W	28480	0699-0794
A25R94	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A25R95	0698-6362	8	1	RESISTOR 1K .1% .125W F TC=0+25	28480	0698-6362
A25R96	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A25R97	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A25R98	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A25R99	0698-6320	8		RESISTOR 5K .1% .125W F TC=0+25	03888	PME55-1/8-T9-5001-B
A25R100	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A25R101	0811-3575	1		RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A25R102	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4-1/8-T0-1782-F
A25R103	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-T0-1471-F
A25R104	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+100	24546	C4-1/8-T0-1211-F
A25R105	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A25R106	0698-3158	4	1	RESISTOR 23.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-2372-F
A25R107	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A25R108	2100-1760	7	1	RESISTOR-TRMR 5K 5% WW SIDE-ADJ 1-TRN	28480	2100-1760
A25R109*	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A25R110	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+100	24546	C3-1/8-T0-1003-F
A25R111	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A25R112	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A25R113	0757-0420	3		RESISTOR 750 1% .125W F TC=0+100	24546	C4-1/8-T0-751-F
A25R114				NOT ASSIGNED		
A25R115*	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A25R116	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-2152-F
A25R117	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A25TP1	0360-0535	0	7	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A25TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A25U1	1826-0845	4	1	IC OP AMP PRCN TO-99 PKG	06665	OP-07EJ
A25U2	1826-0306	2	2	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A25U3	1826-0471	2	4	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A25U4	1826-0785	1	2	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A25U5	1826-0785	1		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A25U6	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A25U7	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A25U8	1826-0601	0	1	IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A25U9	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A25U10	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26	**08340-60156**	**4**	**1**	**LINEAR MODULATOR**	**28480**	**08340-60156**
A26C1	0160-4811	9	1	CAPACITOR-FXD 270PF ±5% 100VDC CER	28480	0160-4811
A26C2	0160-4385	2	1	CAPACITOR-FXD 15PF ±5% 200VDC CER 0±30	28480	0160-4385
A26C3	0160-0575	4	10	CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C4	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C5	0160-4791	4	1	CAPACITOR-FXD 10PF ±5% 100VDC CER 0±30	28480	0160-4791
A26C6	0160-0153	4	1	CAPACITOR-FXD 1000PF ±10% 200VDC POLYE	28480	0160-0153
A26C7	0160-0162	5	1	CAPACITOR-FXD .022UF ±10% 200VDC POLYE	28480	0160-0162
A26C8	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C9	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C10	0160-4389	6	2	CAPACITOR-FXD 100PF ±5PF 200VDC CER	28480	0160-4389
A26C11	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C12	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C13	0160-4386	3	1	CAPACITOR-FXD 33PF ±5% 200VDC CER 0±30	28480	0160-4386
A26C14	0160-4389	6		CAPACITOR-FXD 100PF ±5PF 200VDC CER	28480	0160-4389
A26C15	0160-0156	7	1	CAPACITOR-FXD 3900PF ±10% 200VDC POLYE	28480	0160-0156
A26C16	0160-3878	6	1	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A26C17	0160-4535	4	8	CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C18	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C19	0160-4835	7	2	CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A26C20	0160-5098	6	2	CAPACITOR-CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C21	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A26C22	0160-5098	6		CAPACITOR-CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C23	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C24	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C25	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C26	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C27	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C28	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C29	0160-4825	5	1	CAPACITOR-FXD 560PF ±5% 100VDC CER	28480	0160-4825
A26C30	0160-3879	7	1	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A26C31	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C32	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C33	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C34	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C35	0160-4819	7	1	CAPACITOR-FXD 2200PF ±5% 100VDC CER	28480	0160-4819
A26C36	0160-4810	8	1	CAPACITOR-FXD 330PF ±5% 100VDC CER	28480	0160-4810
A26CR1	1901-0033	2	9	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR3	1901-0050	3	5	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26CR4	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR7	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A26CR8	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A26CR9	1901-0050	3		DIODE-SWITCHING 180V 200MA 2NS DO-35	28480	1901-0050
A26CR10	1901-0050	3		DIODE-SWITCHING 180V 200MA 2NS DO-35	28480	1901-0050
A26CR11	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR12	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901 0050
A26L1	9100-1643	2	1	INDUCTOR RF-CH-MLD 300UH 5% .2DX.45LG	28480	9100-1643
A26L2	9140-0112	2	5	INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L3	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L4	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L5	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L6	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L7	9100-1666	9	1	INDUCTOR RF-CH-MLD 3.6MH 5%	28480	9100-1666
A26MP1	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A26MP2	4040-0754	1	1	EXTR-PC BD BLU POLYC .062-BD-THKNS	28480	4040-0754
A26MP3, 4	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A26Q1	1855-0420	2	1	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A26Q2	1855-0414	4	10	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q3	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q4	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q5	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q6	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q7	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A26Q8	1853-0388	7	1	TRANSISTOR-DUAL PNP PD=600MW	28480	1853-0388
A26Q9	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q10	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26Q11	1853-0281	9	5	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q12	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q13	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q14	1855-0421	3	4	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q15	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A26Q16	1855-0386	9	2	TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A26Q17	1854-0477	7	4	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q18	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q19	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q20	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q21	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q22	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q23	1855-0386	9		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A26Q24	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A26Q25	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A26Q26	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q27	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q28	1855-0278	8	1	TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A26Q29	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q30	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q31	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26R1	0698-6362	8	2	RESISTOR 1K .1% .125W F TC=0+25	28480	0698-6362
A26R2	0698-3450	9	2	RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A26R3	0698-8861	6	2	RESISTOR 6.66K .1% .125W F TC=0+25	28480	0698-8861
A26R4	0757-0346	2	2	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A26R5	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4-1/8-T0-1782-F
A26R6	0757-0442	9	8	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R7	2100-3274	2	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A26R8	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0+100	24546	C4-1/8-T0-2871-F
A26R9	0757-0280	3	11	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R11	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A26R12	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R13	0757-0279	0	2	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A26R14	0698-3458	7	2	RESISTOR 348K 1% .125W F TC=0+100	28480	0698-3458
A26R15	0757-0465	6	6	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R16	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A26R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R18	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A26R19	0698-6323	1	1	RESISTOR 100 .1% .125W F TC=0+25	28480	0698-6323
A26R20	0698-6317	3	2	RESISTOR 500 .1% .125W F TC=0+25	03888	PME55-1/8-T9-500R-B
A26R21	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A26R22	0698-4433	0	1	RESISTOR 2.26K 1% .125W F TC=0+100	24546	C4-1/8-T0-2261-F
A26R23	0698-6624	5	1	RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A26R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R25	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A26R26	0698-6363	9	2	RESISTOR 40K .1% .125W F TC=0+25	28480	0698-6363
A26R27	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A26R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R29	0698-6363	9		RESISTOR 40K .1% .125W F TC=0+25	28480	0698-6363
A26R30	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A26R31	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A26R32	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A26R33	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R34	0698-8827	4	6	RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R35	0698-3458	7		RESISTOR 348K 1% .125W F TC=0+100	28480	0698-3458
A26R36	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R37	0698-6364	0	1	RESISTOR 50 OHM .1% .125W	28480	0698-6364
A26R38	0698-6317	3		RESISTOR 500 .1% .125W F TC=0+25	03888	PME55-1/8-T9-500R-B
A26R39	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R40	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R41	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R42	0698-6362	8		RESISTOR 1K .1% .125W F TC=0+25	28480	0698-6362
A26R43	2100-3353	8	3	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R44	0757-0462	3	2	RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A26R45	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R46	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A26R47	2100-3354	9	2	RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	28480	2100-3354
A26R48	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A26R49	2100-3355	0		RESISTOR-TRMR 100K 10% C SIDE-ADJ 1-TRN	28480	2100-3355
A26R50	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A26R51	2100-3355	0		RESISTOR-TRMR 100K 10% C SIDE-ADJ 1-TRN	28480	2100-3355
A26R52	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R53	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26	08340-60156	4	1	LINEAR MODULATOR	28480	08340-60156
				NOTE Q11, Q12, Q13, C35, C36, R31, R95, R96, R97, AND R98 MUST ALL BE CHANGED TO RECOMMENDED REPLACEMENT VALUES AT THE SAME TIME.		
A26C1	0160-4811	9	1	CAPACITOR-FXD 270PF ±5% 100VDC CER	28480	0160-4811
A26C2	0160-4385	2	1	CAPACITOR-FXD 15PF ±5% 200VDC CER 0±30	28480	0160-4385
A26C3	0160-0575	4	10	CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C4	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C5	0160-4791	4	1	CAPACITOR-FXD 10PF ±5% 100VDC CER 0±30	28480	0160-4791
A26C6	0160-0153	4	1	CAPACITOR-FXD 1000PF ±10% 200VDC POLYE	28480	0160-0153
A26C7	0160-0162	5	1	CAPACITOR-FXD .022UF ±10% 200VDC POLYE	28480	0160-0162
A26C8	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C9	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C10	0160-4389	6	2	CAPACITOR-FXD 100PF ±5PF 200VDC CER	28480	0160-4389
A26C11	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C12	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C13	0160-4386	3	1	CAPACITOR-FXD 33PF ±5% 200VDC CER 0±30	28480	0160-4386
A26C14	0160-4389	6		CAPACITOR-FXD 100PF ±5PF 200VDC CER	28480	0160-4389
A26C15	0160-0156	7	1	CAPACITOR-FXD 3900PF ±10% 200VDC POLYE	28480	0160-0156
A26C16	0160-3878	6	1	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A26C17	0160-4535	4	8	CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C18	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C19	0160-4835	7	2	CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A26C20	0160-5098	6	2	CAPACITOR-CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C21	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A26C22	0160-5098	6		CAPACITOR-CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C23	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C24	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C25	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C26	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C27	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C28	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A26C29	0160-4825	5	1	CAPACITOR-FXD 560PF ±5% 100VDC CER	28480	0160-4825
A26C30	0160-3879	7	1	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A26C31	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C32	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C33	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C34	0160-0575	4		CAPACITOR-FXD .047UF ±20% 50VDC CER	28480	0160-0575
A26C35	0160-4825	5	2	CAPACITOR-FXD 560PF ±5% 100VDC CER	28480	0160-4825
A26C36	0160-4825	5		CAPACITOR-FXD 560PF ±5% 100VDC CER	28480	0160-4825
A26CR1	1901-0033	2	9	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR3	1901-0050	3	5	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26CR4	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR7	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A26CR8	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A26CR9				NOT ASSIGNED		
A26CR10	1901-0050	3		DIODE-SWITCHING 180V 200MA 2NS DO-35	28480	1901-0050
A26CR11	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR12	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26L1	9100-1643	2	1	INDUCTOR RF-CH-MLD 300UH 5% .2DX.45LG	28480	9100-1643
A26L2	9140-0112	2	5	INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L3	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L4	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L5	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L6	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L7	9100-1666	9	1	INDUCTOR RF-CH-MLD 3.6MH 5%	28480	9100-1666
A26MP1	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A26MP2	4040-0754	1	1	EXTR-PC BD BLU POLYC .062-BD-THKNS	28480	4040-0754
A26MP3, 4	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A26Q1	1855-0420	2	1	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A26Q2	1855-0414	4	10	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q3	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q4	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q5	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26Q6	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q7	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A26Q8	1853-0388	7	1	TRANSISTOR-DUAL PNP PD=600MW	28480	1853-0388
A26Q9	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q10	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q11	1853-0405	9	3	TRANSISTOR NPN SI TO-39 PD=1W FT=25 MHZ	02037	2N4209
A26Q12	1853-0405	9		TRANSISTOR NPN SI TO-39 PD=1W FT=25 MHZ	02037	2N4209
A26Q13	1853-0405	9		TRANSISTOR NPN SI TO-39 PD=1W FT=25 MHZ	02037	2N4209
A26Q14	1855-0421	3	4	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q15	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A26Q16	1855-0386	9	2	TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A26Q17	1854-0477	7	4	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q18	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q19	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q20	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q21	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q22	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q23	1855-0386	9		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A26Q24	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A26Q25	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A26Q26	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q27	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q28	1855-0278	8	1	TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A26Q29	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q30	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q31	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26R1	0698-6362	8	2	RESISTOR 1K .1% .125W F TC=0+25	28480	0698-6362
A26R2	0698-3450	9	2	RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A26R3	0698-8861	6	2	RESISTOR 6.66K .1% .125W F TC=0+25	28480	0698-8861
A26R4	0757-0346	2	2	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A26R5	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4-1/8-T0-1782-F
A26R6	0757-0442	9	9	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R7	2100-3274	2	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A26R8	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0+100	24546	C4-1/8-T0-2871-F
A26R9	0757-0280	3	10	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R11	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A26R12	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R13	0757-0279	0	2	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A26R14	0698-3458	7	2	RESISTOR 348K 1% .125W F TC=0+100	28480	0698-3458
A26R15	0757-0465	6	6	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R16	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A26R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R18	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A26R19	0698-6323	1	1	RESISTOR 100 .1% .125W F TC=0+25	28480	0698-6323
A26R20	0698-6317	3	2	RESISTOR 500 .1% .125W F TC=0+25	03888	PME55-1/8-T9-500R-B
A26R21	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A26R22	0698-4433	0	1	RESISTOR 2.26K 1% .125W F TC=0+100	24546	C4-1/8-T0-2261-F
A26R23	0698-6624	5	1	RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A26R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R25	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A26R26	0698-6363	9	2	RESISTOR 40K .1% .125W F TC=0+25	28480	0698-6363
A26R27	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A26R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R29	0698-6363	9		RESISTOR 40K .1% .125W F TC=0+25	28480	0698-6363
A26R30	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A26R31	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R32	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A26R33	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R34	0698-8827	4	6	RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R35	0698-3458	7		RESISTOR 348K 1% .125W F TC=0+100	28480	0698-3458
A26R36	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R37	0698-6364	0	1	RESISTOR 50 OHM .1% .125W	28480	0698-6364
A26R38	0698-6317	3		RESISTOR 500 .1% .125W F TC=0+25	03888	PME55-1/8-T9-500R-B
A26R39	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R40	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R41	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R42	0698-6362	8		RESISTOR 1K .1% .125W F TC=0+25	28480	0698-6362
A26R43	2100-3353	8	3	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R44	0757-0462	3	2	RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A26R45	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R46	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A26R47	2100-3354	9	2	RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	28480	2100-3354
A26R48	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26	08340-60212	5	1	LINEAR MODULATOR	28480	08340-60212
A26C1	0160-4811	9	1	CAPACITOR-FXD 270PF +-5% 100VDC CER	28480	0160-4811
A26C2	0160-4385	2	1	CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	28480	0160-4385
A26C3	0160-0575	4	0	CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C4	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C5	0160-4791	4	1	CAPACITOR-FXD 10PF +-5% 100VDC CER 0+-30	28480	0160-4791
A26C6	0160-0153	4	1	CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A26C7	0160-0162	5	1	CAPACITOR-FXD .022UF +-10% 200VDC POLYE	28480	0160-0162
A26C8	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C9	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C10	0160-4389	6	2	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A26C11	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C12	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C13	0160-4386	3	1	CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	28480	0160-4386
A26C14	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A26C15	0160-0156	7	1	CAPACITOR-FXD 3900PF +-10% 200VDC POLYE	28480	0160-0156
A26C16	0160-3878	6	1	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A26C17	0160-4535	4	8	CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C18	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C19	0160-4835	7	2	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A26C20	0160-5098	6	2	CAPACITOR-CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C21	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A26C22	0160-5098	6		CAPACITOR-CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C23	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C24	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C25	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C26	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C27	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C28	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A26C29	0160-4825	5	1	CAPACITOR-FXD 560PF +-5% 100VDC CER	28480	0160-4825
A26C30	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A26C31	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C32	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C33	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C34	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A26C35				NOT ASSIGNED		
A26C36	0160-4825	5	1	CAPACITOR-FXD 560PF +-5% 100VDC CER	28480	0160-4825
A26CR1	1901-0033	2	9	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR3	1901-0050	3	5	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26CR4	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR7	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A26CR8	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A26CR9				NOT ASSIGNED		
A26CR10	1901-0050	3		DIODE-SWITCHING 180V 200MA 2NS DO-35	28480	1901-0050
A26CR11	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR12	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A26CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A26L1	9100-1643	2	1	INDUCTOR RF-CH-MLD 300UH 5% .2DX.45LG	28480	9100-1643
A26L2	9140-0112	2	5	INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L3	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L4	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L5	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L6	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A26L7	9100-1666	9	1	INDUCTOR RF-CH-MLD 3.6MH 5%	28480	9100-1666
A26MP1	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A26MP2	4040-0754	1	1	EXTR-PC BD BLU POLYC .062-BD-THKNS	28480	4040-0754
A26MP3, 4	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A26Q1	1855-0420	2	1	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A26Q2	1855-0414	4	0	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q3	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q4	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q5	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q6	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q7	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A26Q8	1853-0388	7	1	TRANSISTOR-DUAL PNP PD=600MW	28480	1853-0388
A26Q9	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q10	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q11	1853-0405	9	3	TRANSISTOR NPN SI TO-39 PD=1W FT=25 MHZ	02037	2N4209
A26Q12	1853-0405	9		TRANSISTOR NPN SI TO-39 PD=1W FT=25 MHZ	02037	2N4209
A26Q13	1853-0405	9		TRANSISTOR NPN SI TO-39 PD=1W FT=25 MHZ	02037	2N4209
A26Q14	1855-0421	3	4	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q15	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A26Q16	1855-0386	9	2	TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392

See introduction to this section for ordering information.

Indicates factory selected value.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26Q17	1854-0477	7	5	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q18	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q19	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q20	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q21	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q22	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q23	1855-0386	9		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A26Q24	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A26Q25	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A26Q26	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q27	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A26Q28	1855-0278	8	1	TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A26Q29	1855-0421	3		TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A26Q30	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A26Q31	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26Q32	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A26R1	0698-6362	8	2	RESISTOR 1K .1% .125W F TC=0+-25	28480	0698-6362
A26R2	0698-3450	9	2	RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A26R3	0698-8861	6	2	RESISTOR 6.66K .1% .125W F TC=0+-25	28480	0698-8861
A26R4	0757-0346	2	2	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A26R5	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A26R6	0757-0442	9	9	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R7	2100-3274	2	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A26R8	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A26R9	0757-0280	3	0	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R11	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A26R12	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R13	0757-0279	0	2	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A26R14	0698-3458	7	2	RESISTOR 348K 1% .125W F TC=0+-100	28480	0698-3458
A26R15	0757-0465	6	6	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A26R16	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A26R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R18	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A26R19	0698-6323	1	1	RESISTOR 100 .1% .125W F TC=0+-25	28480	0698-6323
A26R20	0698-6317	3	2	RESISTOR 500 .1% .125W F TC=0+-25	03888	PME55-1/8-T9-500R-B
A26R21	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A26R22	0698-4433	0	1	RESISTOR 2.26K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2261-F
A26R23	0698-6624	5	1	RESISTOR 2K .1% .125W F TC=0+-25	28480	0698-6624
A26R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R25	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A26R26	0698-6363	9	2	RESISTOR 40K .1% .125W F TC=0+-25	28480	0698-6363
A26R27	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A26R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R29	0698-6363	9		RESISTOR 40K .1% .125W F TC=0+-25	28480	0698-6363
A26R30	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A26R31	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R32	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A26R33	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R34	0698-8827	4	6	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A26R35	0698-3458	7		RESISTOR 348K 1% .125W F TC=0+-100	28480	0698-3458
A26R36	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A26R37	0698-6364	0	1	RESISTOR 50 OHM .1% .125W	28480	0698-6364
A26R38	0698-6317	3		RESISTOR 500 .1% .125W F TC=0+-25	03888	PME55-1/8-T9-500R-B
A26R39	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R40	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A26R41	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R42	0698-6362	8		RESISTOR 1K .1% .125W F TC=0+-25	28480	0698-6362
A26R43	2100-3353	8	3	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R44	0757-0462	3	2	RESISTOR 75K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7502-F
A26R45	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R46	0698-0084	9	3	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A26R47	2100-3354	9	2	RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	28480	2100-3354
A26R48	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A26R49	2100-3355	0		RESISTOR-TRMR 100K 10% C SIDE-ADJ 1-TRN	28480	2100-3355
A26R50	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A26R51	2100-3355	0		RESISTOR-TRMR 100K 10% C SIDE-ADJ 1-TRN	28480	2100-3355
A26R52	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R53	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A26R54	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A26R55	0811-3619	4	1	RESISTOR- 260 OHM 2% .12W	28480	0811-3619
A26R56	0757-0816	1	1	RESISTOR 681 OHM 1% .5W F TC=0+-100	28480	0757-0816
A26R57	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A26R58	0698-8861	6		RESISTOR 6.66K .1% .125W F TC=0+-25	28480	0698-8861
A26R59	0757-0462	3		RESISTOR 75K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7502-F
A26R60	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A26R61	0698-3159	5	2	RESISTOR 26.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2612-F
A26R62	0698-3159	5		RESISTOR 26.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2612-F
A26R63	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A26R54	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0±100	24546	C4-1/8-T0-1782-F
A26R55	0811-3619	4	1	RESISTOR- 260 OHM 2% .12W	28480	0811-3619
A26R56	0757-0816	1	1	RESISTOR 681 OHM 1% .5W F TC=0+100	28480	0757-0816
A26R57	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R58	0698-8861	6		RESISTOR 6.66K .1% .125W F TC=0+25	28480	0698-8861
A26R59	0757-0462	3		RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A26R60	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC=0±100	24546	C4-1/8-T0-3481-F
A26R61	0698-3159	5	2	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A26R62	0698-3159	5		RESISTOR 26.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-2612-F
A26R63	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A26R64	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R65	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A26R66	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A26R67	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A26R68	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R69	0698-8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698-8827
A26R70	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A26R71	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R72	0698-8959	3	1	RESISTOR 619K 1% .125W F TC=0+100	28480	0698-8959
A26R73	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R74	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R75	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-5621-F
A26R76	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R77	0757-0460	1		RESISTOR 61.9K 1% .125W F TC=0+100	24546	C4-1/8-T0-6192-F
A26R78	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R79	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A26R80	0757-1094	9	2	RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A26R81	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+100	24546	C4-1/8-T0-3481-F
A26R82	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R83	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A26R84	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R85	0698-3429	2	1	RESISTOR 19.6 1% .125W F TC=0±100	03888	PME55-1/8-T0-19R6-F
A26R86	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-1962-F
A26R87	0811-3575	1	1	RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A26R88	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R89	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A26R90	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A26R91	2100-3350	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
A26R92	0757-0418	9	1	RESISTOR 619 OHM 1% .125W F TC=0+100	03292	C4-1/8-T0-619R-F
A26R93	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0+100	28480	0757-0123
A26R94	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	03292	C4-1/8-T0-1003-F
A26R95	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0±100	03292	C4-1/8-T0-7501-F
A26R96	0757-0401	0		RESISTOR 100 OHM 1% .125W F TC=0+100	28480	0757-0401
A26R97	0757-0420	3	1	RESISTOR 750 OHM 1% .125W F TC=0±100	03292	C4-1/8-T0-751-F
A26R98	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	03292	C4-1/8-T0-1001-F
A26TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26U1	1826-0601	0	3	IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U2	1826-1007	2	1	IC- 27G M1 OP AMP	28480	1826-1007
A26U3	1826-0306	2	3	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U4	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A26U5	1810-0371	8	1	RESISTIVE NETWORK-100K OHM 8 PINS	01121	208A104
A26U6	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U7	1826-0828	3	1	IC- 15G M1 OP AMP	06665	OP-15GJ
A26U8	1826-0601	0		IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U9	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U10	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A26U11	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A26U12	1826-0601	0		IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U13	1826-0026	3	2	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A26U14	1826-0026	3		IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A26U15	1820-1730	6	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A26W1	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26R49	2100-3355	0		RESISTOR-TRMR 100K 10% C SIDE-ADJ 1-TRN	28480	2100-3355
A26R50	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0±100	24546	C4-1/8-T0-4222-F
A26R51	2100-3355	0		RESISTOR-TRMR 100K 10% C SIDE-ADJ 1-TRN	28480	2100-3355
A26R52	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R53	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A26R54	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0±100	24546	C4-1/8-T0-1782-F
A26R55	0811-3619	4	1	RESISTOR- 260 OHM 2% .12W	28480	0811-3619
A26R56	0757-0816	1	1	RESISTOR 681 OHM 1% .5W F TC=0+100	28480	0757-0816
A26R57	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R58	0698-8861	6		RESISTOR 6.66K .1% .125W F TC=0+25	28480	0698-8861
A26R59	0757-0462	3		RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A26R60	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC=0±100	24546	C4-1/8-T0-3481-F
A26R61	0698-3159	5	2	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A26R62	0698-3159	5		RESISTOR 26.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-2612-F
A26R63	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A26R64	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A26R65	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A26R66	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A26R67	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0±100	24546	C4-1/8-T0-1472-F
A26R68	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R69	0698-8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698-8827
A26R70	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A26R71	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A26R72	0698-8959	3	1	RESISTOR 619K 1% .125W F TC=0±100	28480	0698-8959
A26R73	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	28480	0698-8827
A26R74	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R75	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-5621-F
A26R76	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A26R77	0757-0460	1		RESISTOR 61.9K 1% .125W F TC=0±100	24546	C4-1/8-T0-6192-F
A26R78	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A26R79	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A26R80	0757-1094	9	2	RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A26R81	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+100	24546	C4-1/8-T0-3481-F
A26R82	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A26R83	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A26R84	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A26R85	0698-3429	2	1	RESISTOR 19.6 1% .125W F TC=0±100	03888	PME55-1/8-T0-19R6-F
A26R86	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-1962-F
A26R87	0811-3575	1	1	RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A26R88	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R89	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A26R90	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A26R91	2100-3350	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
A26R92	0757-0418	9	1	RESISTOR 619 OHM 1% .125W F TC=0+100	03292	C4-1/8-TO-619R-F
A26R93	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0+100	28480	0757-0123
A26R94	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	03292	C4-1/8-TO-1003-F
A26R95	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0±100	03292	C4-1/8-TO-2611-F
A26R96*	0698-3429	2	1	RESISTOR 19.6 OHM 1% .125W F TC=0+100	28480	0698-3429
A26R97	0698-3443	0	1	RESISTOR 287 OHM 1% .125W F TC=0+100	03292	C4-1/8-TO-287R-F
A26R98	0698-0082	7	1	RESISTOR 464 OHM 1% .125W F TC=0±100	03292	C4-1/8-TO-4640-F
A26TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26U1	1826-0601	0	3	IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U2	1826-1007	2	1	IC- 27G M1 OP AMP	28480	1826-1007
A26U3	1826-0306	2	3	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U4	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A26U5	1810-0371	8	1	RESISTIVE NETWORK-100K OHM 8 PINS	01121	208A104
A26U6	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U7	1826-0828	3	1	IC- 15G M1 OP AMP	06665	OP-15GJ
A26U8	1826-0601	0		IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U9	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U10	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A26U11	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A26U12	1826-0601	0		IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U13	1826-0026	3	2	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A26U14	1826-0026	3		IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A26U15	1820-1730	6	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A26W1	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26R64	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R65	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R66	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A26R67	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A26R68	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A26R69	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A26R70	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R71	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R72	0698-8959	3	1	RESISTOR 619K 1% .125W F TC=0+-100	28480	0698-8959
A26R73	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A26R74	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A26R75	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A26R76	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A26R77	0757-0460	1		RESISTOR 61.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A26R78	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A26R79	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A26R80	0757-1094	9	2	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A26R81	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A26R82	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R83	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R84	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A26R85	0698-3429	2	1	RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A26R86	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A26R87	0811-3575	1	1	RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A26R88	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A26R89	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A26R90	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A26R91	2100-3350	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
A26R92	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-TO-2151-F
A26R93	0757-0444	1	1	RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1212-F
A26R94	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1003-F
A26R95	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0+-100	03292	C4-1/8-TO-2611-F
A26R96	2100-3757	6	1	RESISTOR-TRMR 100 10% C SIDE-ADJ 17 TRN	04568	67XR100
A26R97	0698-3443	0	1	RESISTOR 287 OHM 1% .125W F TC=0+-100	03292	C4-1/8-TO-287R-F
A26R98	0698-0082	7	1	RESISTOR 464 OHM 1% .125W F TC=0+-100	03292	C4-1/8-TO-4640-F
A26R99	0757-0441	8	1	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-TO-8251-F
A26R100	0698-0084	9		RESISTOR 2.15K 1% .125w F TC=0+-100	24546	C4-1/8-TO-2151-F
A26TP1-5	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26U1	1826-0601	0	3	IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U2	1826-1007	2	1	IC- 27G M1 OP AMP	28480	1826-1007
A26U3	1826-0306	2	3	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U4	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A26U5	1810-0371	8	1	RESISTIVE NETWORK-100K OHM 8 PINS	01121	208A104
A26U6	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U7	1826-0828	3	1	IC- 15G M1 OP AMP	06665	OP-15GJ
A26U8	1826-0601	0		IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U9	1826-0306	2		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	LM339AJ
A26U10	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A26U11	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A26U12	1826-0601	0		IC OP AMP PRCN TO-99 PKG	06665	OP-16FJ
A26U13	1826-0026	3	2	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A26U14	1826-0026	3		IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A26U15	1820-1730	6	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A26W1	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A27	**08340-60022**	5	1	**LEVEL CONTROL**	**28480**	**08340-60022**
A27C1	0160-4084	8	16	CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C2	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C3	0160-3878	6	3	CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A27C4	0160-3876	4	3	CAPACITOR-FXD 47PF +20% 200VDC CER	28480	0160-3876
A27C5	0160-3879	7	18	CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C6	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C7	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C8	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C9	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A27C10	0160-3876	4		CAPACITOR-FXD 47PF +20% 200VDC CER	28480	0160-3876
A27C11	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C12	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C13	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A27C14	0160-3876	4		CAPACITOR-FXD 47PF +20% 200VDC CER	28480	0160-3876
A27C15	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C16	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C17	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C18	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C19	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C20	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C21	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C22				NOT ASSIGNED		
A27C23	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C24	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C25				NOT ASSIGNED		
A27C26	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C27	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C28	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C29				NOT ASSIGNED		
A27C30	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C31	0180-2661	5	2	CAPACITOR-FXD 1UF+10% 50VDC TA	25088	D1R0GS1A50K
A27C32	0160-4846	0	1	CAPACITOR-FXD 1500PF +5% 100VDC CER	28480	0160-4846
A27C33	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C34	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C35	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C36				NOT ASSIGNED		
A27C37	0160-3879	7		CAPACITOR-FXD .01UF +20% 100VDC CER	28480	0160-3879
A27C38	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C39	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C40	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C41	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C42	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C43	0180-0630	4	2	CAPACITOR-FXD 4.7UF+20% 50VDC TA	28480	0180-0630
A27C44	0180-2661	5		CAPACITOR-FXD 1UF+10% 50VDC TA	25088	D1R0GS1A50K
A27C45	0180-0630	4		CAPACITOR-FXD 4.7UF+20% 50VDC TA	28480	0180-0630
A27C46	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C47	0180-2617	1	2	CAPACITOR-FXD 6.8UF+10% 35VDC TA	25088	D6R8GS1B35K
A27C48	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C49	0180-2697	7	1	CAPACITOR-FXD 10UF+10% 25VDC TA	28480	0180-2697
A27C50	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C51	0180-2617	1		CAPACITOR-FXD 6.8UF+10% 35VDC TA	25088	D6R8GS1B35K
A27C52	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A27C53	0180-0500	7	1	CAPACITOR-FXD 47UF+20% 20VDC TA	28480	0180-0500
A27C54	0160-3875	3	2	CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A27C55	0160-3875	3		CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A27CR1	1901-0050	3	8	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27CR8	1901-0518	8	5	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A27CR9	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A27CR10	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A27CR11	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A27CR12	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A27CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A27DS1	1990-0486	6	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A27L1	9140-0210	1	4	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A27L2	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A27L3	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A27L4	9140-0114	4	1	INDUCTOR RF-CH-MLD 10UH 10% .166DX.385LG	28480	9140-0114
A27L5	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A27MP1	1200-0173	5	2	INSULATOR-XSTR DAP-GL	28480	1200-0173
A27MP2	1205-0011	0	1	HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A27MP3	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A27MP4, 5	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A27MP6	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-BD-THKNS	28480	4040-0755
A27Q1	1826-0730	6	1	IC V RGLTR-V-REF-FXD 10V TO-5 PKG	28480	1826-0730
A27Q2	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A27Q3	1826-0512	2	1	IC 78M15C V RGLTR TO-39	04713	MC78M15CG
A27R1	0698-6360	6	7	RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A27R2	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A27R3	0698-6977	1	1	RESISTOR 30K .1% .125W F TC=0+25 (RECOMMENDED REPLACEMENT)	28480	0698-6977
A27R4	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN (RECOMMENDED REPLACEMENT)	28480	2100-3353
A27R5	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A27R6	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A27R7	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4-1/8-T0-1782-F
A27R8	2100-3207	1	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	28480	2100-3207
A27R9	0698-6630	3	1	RESISTOR 20K .1% .125W F TC=0+25	28480	0698-6630
A27R10	0698-6320	8	2	RESISTOR 5K .1% .125W F TC=0+25	03888	PME55-1/8-T9-5001-B
A27R11	0698-6347	9	1	RESISTOR 1.5K .1% .125W F TC=0+25	28480	0698-6347
A27R12	0698-6631	4	2	RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698-6631
A27R13	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A27R14				NOT ASSIGNED		
A27R15	0757-0442	9	6	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A27R16	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A27R17	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A27R18	0698-6320	8		RESISTOR 5K .1% .125W F TC=0+25	03888	PME55-1/8-T9-5001-B
A27R19	0698-6362	8	1	RESISTOR 1K .1% .125W F TC=0+25	28480	0698-6362
A27R20	0757-0418	9	1	RESISTOR 619 1% .125W F TC=0+100	24546	C4-1/8-T0-619R-F
A27R21	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+100	24546	C4-1/8-T0-825R-F
A27R22	0698-3446	3	3	RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A27R23	0699-0118	2	1	RESISTOR- 20K OHM .1% .1W	28480	0699-0118
A27R24	0699-0144	4	2	RESISTOR- 10K OHM .1% .1W	28480	0699-0144
A27R25	0699-0144	4		RESISTOR- 10K OHM .1% .1W	28480	0699-0144
A27R26	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A27R27				NOT ASSIGNED		
A27R28	0698-6353	7	8	RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R29	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R30	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R31	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R32	0698-8191	5	1	RESISTOR 12.5K .1% .125W F TC=0+25	19701	MF4C1/8-T9-1252-B
A27R33	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R34	0698-6977	1	1	RESISTOR 30K .1% .125W F TC=0+25	28480	0698-6977
A27R35	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R36	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R37				NOT ASSIGNED		
A27R38	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A27R39	0757-0346	2	2	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A27R40	0757-0280	3	5	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A27R41	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A27R42	0757-0458	7	1	RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A27R43	0698-6631	4		RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698-6631
A27R44	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A27R45	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A27R46	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A27R47	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A27R48	0757-0398	4	2	RESISTOR 75 1% .125W F TC=0+100	24546	C4-1/8-T0-75R0-F
A27R49	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A27R50	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A27R51	0757-0422	5	2	RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A27R52	0698-3446	3		RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A27R53	0757-0422	5		RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A27R54	0698-3446	3		RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A27R55	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A27R56	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A27R57	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A27R58	0757-0444	1	1	RESISTOR 12.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1212-F
A27R59	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A27R60	0757-0398	4		RESISTOR 75 1% .125W F TC=0+100	24546	C4-1/8-T0-75R0-F
A27R61	0698-6358	2	3	RESISTOR 100K .1% .125W F TC=0+25	28480	0698-6358
A27R62	0698-6358	2		RESISTOR 100K .1% .125W F TC=0+25	28480	0698-6358

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

ERRATA (ALL SERIALS)

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A27R63	0698-6358	2		RESISTOR 100K .1% .125W F TC=0±25	28480	0698-6358
A27R64				NOT ASSIGNED		
A27R65	0811-3575	1	1	RESISTOR- 3K OHM 2% .12W	28480	0811-3575
A27R66	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A27R67	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A27R68	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A27R69	0698-8824	1	1	RESISTOR 562K 1% .125W F TC=0±100	28480	0698-8824
A27R70	0698-3150	6	1	RESISTOR 2.37K 1% .125W F TC=0±100 STANDARD INSTRUMENT OPTION 004 AND 005, R.P. RF OUT, REPLACE A27R70 WITH A SHORT CIRCUIT	24546	C4-1/8-T0-2371-F
A27R71	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0±100 STANDARD INSTRUMENT OPTION 004 AND 005 INSTRUMENTS DELETE A27R71	24546	C4-1/8-T0-2611-F
A27RT1	0837-0105	1	1	THERMISTOR BEAD 200K-OHM TC=-4.9%/C-DEG	28480	0837-0105
A27TP1-21	0360-0535	0	21	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A27U1	1820-1435	8	1	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS669N
A27U2	1826-0026	3	2	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A27U3	1826-0026	3		IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A27U4	1826-0092	3	3	IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A27U5	1826-0092	3		IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A27U6	1820-1415	4	1	IC SCHMITT-TRIG TTL LS NAND DUAL 4-INP	01295	SN74LS13N
A27U7	1826-0471	2	3	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A27U8	1826-0798	6	3	IC-5018 C1 DAC	18324	NE5018F
A27U9	1826-0798	6		IC-5018 C1 DAC	18324	NE5018F
A27U10	1826-0798	6		IC-5018 C1 DAC	18324	NE5018F
A27U11	1826-0881	8	1	IC-8560 C1 ADC	28480	1826-0881
A27U12	1820-1491	6	3	IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A27U13	1820-1196	8	5	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A27U14	1826-0921	7	2	D/A 10-BIT 16 CBRZ/SDR CMOS (RECOMMENDED REPLACEMENT)	07050	MP7533MP
A27U15	1820-1491	6		IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A27U16	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A27U17	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A27U18	1826-0092	3		IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A27U19	1820-1297	0	1	IC GATE TTL LS EXCL-NOR QUAD 2-INP	01295	SN74LS266N
A27U20	1820-1216	3	2	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A27U21	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A27U22	1820-1491	6		IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A27U23	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A27U24	1826-0921	7		D/A 10-BIT 16 CBRZ/SDR CMOS (RECOMMENDED REPLACEMENT)	07050	MP7533MP
A27U25	1826-0609	8	1	IC MULTIPLXR ANLG 16-DIP-C PKG	06665	MUX08FQ
A27U26	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A27U27	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A27U28	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A27U29	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A27U30	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A27U31	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A27U32	1810-0318	3	4	RESISTIVE NETWORK- 6 PINS	01121	206A102
A27U33	1810-0318	3		RESISTIVE NETWORK- 6 PINS	01121	206A102
A27U34	1810-0318	3		RESISTIVE NETWORK- 6 PINS	01121	206A102
A27U35	1810-0318	3		RESISTIVE NETWORK- 6 PINS	01121	206A102
A27VR1	1902-3171	7	1	DIODE-ZNR 11V 5% DO-35 PD=.4W TC=+.062%	28480	1902-3171

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A28	**08340-60159**	**8**	**1**	**SYTM DRIVER**	**28480**	**08340-60159**
A28C1				NOT ASSIGNED		
A28C2	0160-4841	5	25	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C3	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C4	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C5	0160-4801	7	3	CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A28C6	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	02798	CAC325U1042050A
A28C7	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C8	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C9	0160-4801	7		CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A28C10, 11	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	02798	CAC325U1042050A
A28C12				NOT ASSIGNED		
A28C13	0160-0163	6	2	CAPACITOR-FXD .033UF ±10% 200VDC POLYE	28480	0160-0163
A28C14	0160-0163	6		CAPACITOR-FXD .033UF ±10% 200VDC POLYE	28480	0160-0163
A28C15	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C16	0160-4801	7		CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A28C17	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C18	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C19	0160-4805	1	1	CAPACITOR-FXD 47PF ±5% 100VDC CER 0+30	28480	0160-4805
A28C20	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C21	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C22	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C23	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C24	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C25	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C26	0160-4833	5	1	CAPACITOR-FXD .022UF ±10% 100VDC CER	28480	0160-4833
A28C27				NOT ASSIGNED		
A28C28	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C29	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C30	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C31	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C32	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C33	0180-0269	5	4	CAPACITOR-FXD 1UF+50-10% 150VDC AL	56289	30D105G150BA2
A28C34	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C35	0180-0269	5		CAPACITOR-FXD 1UF+50-10% 150VDC AL	56289	30D105G150BA2
A28C36	0180-0269	5		CAPACITOR-FXD 1UF+50-10% 150VDC AL	56289	30D105G150BA2
A28C37	0180-0269	5		CAPACITOR-FXD 1UF+50-10% 150VDC AL	56289	30D105G150BA2
A28C38	0160-4841	5		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4841
A28C39	0160-0300	3	1	CAPACITOR-FXD 2700PF ±10% 200VDC POLYE	28480	0160-0300
A28C40	0160-3572	7	1	CAPACITOR-FXD 330PF ±10% 500VDC CER	28480	0160-3572
A28C41	0160-4574	1	1	CAPACITOR-FXD 1000PF ±10% 100VDC CER	28480	0160-4574
A28CR1	1901-0033	2	3	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A28CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A28CR3	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A28CR4	1901-0518	8	4	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A28CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A28CR6	1901-0028	5	2	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A28CR7	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A28CR8	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A28CR9	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A28CR10-14	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A28CR15				NOT ASSIGNED		
A28CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A28CR17				NOT ASSIGNED		
A28CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A28L1	9140-0144	0	4	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A28L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A28L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A28L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A28MP1	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A28MP2	1205-0011	0	2	HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A28MP3-8				NOT ASSIGNED		
A28MP9, 10	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A28MP11	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-BD-THKNS	28480	4040-0747
A28Q1	1854-0361	8	1	TRANSISTOR NPN 2N4239 SI TO-5 PD=6W	04713	2N4239
A28Q2	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A28Q3	1855-0421	3	1	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A28Q4	1855-0414	4	13	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q5	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q6	1853-0038	4	3	TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0038
A28Q7	1854-0475	5	3	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A28Q8	1853-0316	1	1	TRANSISTOR-DUAL PNP PD=500MW	28480	1853-0316
A28Q9	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q10	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A28Q11	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q12	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q13	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q14	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q15	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q16	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q17	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q18	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q19	1854-0475	5		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A28Q20	1854-0809	9	3	TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A28Q21	1855-0278	8	2	TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A28Q22	1855-0278	8		TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	03714	2N5116
A28Q23	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A28Q24	1854-0475	5		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A28Q25	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A28Q26	1853-0038	4		TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0038
A28Q27	1853-0038	4		TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0038
A28R1	2100-4004	8	4	RESISTOR-TRMR 10K 5% WW SIDE-ADJ 1-TRN	28480	2100-4004
A28R2	2100-3094	4	2	RESISTOR-TRMR 100K 10% C SIDE-ADJ 17-TRN	02111	43P104
A28R3	2100-3094	4		RESISTOR-TRMR 100K 10% C SIDE-ADJ 17-TRN	02111	43P104
A28R4	2100-3161	6	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	02111	43P203
A28R5	2100-3352	7	2	RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	28480	2100-3352
A28R6	2100-3054	6	1	RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	02111	43P503
A28R7	2100-3056	8	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A28R8	2100-4004	8		RESISTOR-TRMR 10k 5% WW SIDE-ADJ 1-TRN	28480	2100-4004
A28R9	2100-3352	7		RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	28480	2100-3352
A28R10	2100-3274	2	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A28R11	0698-3637	4	1	RESISTOR 820 5% 2W MO TC=0+200	28480	0698-3637
A28R12	0698-6353	7	2	RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A28R13	0698-6624	5	6	RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A28R14	0757-0440	7	3	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A28R15	0757-0288	1	1	RESISTOR 9.09K 1% .125W F TC=0+100	19701	MF4C1/8-T0-9091-F
A28R16	0757-0346	2	22	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R17	0757-0279	0	2	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A28R18	0698-3487	2	1	RESISTOR 255 1% .125W F TC=0+100	24546	C4-1/8-T0-255R-F
A28R19	0757-0462	3	1	RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A28R20	0757-0424	7	1	RESISTOR 1.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1101-F
A28R21	0698-3447	4	2	RESISTOR 422 1% .125W F TC=0+100	24546	C4-1/8-T0-422R-F
A28R22	0757-0405	4	2	RESISTOR 162 1% .125W F TC=0+100	24546	C4-1/8-T0-162R-F
A28R23	0698-6360	6	10	RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R24	0698-3162	0	5	RESISTOR 46.4K 1% .125W F TC=0+100	24546	C4-1/8-T0-4642-F
A28R25	0698-3159	5	3	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A28R26	0698-3150	6	1	RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A28R27	0757-0442	9	5	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A28R28	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A28R29	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R30	0698-3442	9	1	RESISTOR 237 1% .125W F TC=0+100	24546	C4-1/8-T0-237R-F
A28R31	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A28R32	0757-0438	3	3	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A28R33	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A28R34	0698-3447	4		RESISTOR 422 1% .125W F TC=0+100	24546	C4-1/8-T0-422R-F
A28R35	0698-3268	7	1	RESISTOR 11.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-1152-F
A28R36	0698-8038	9	1	RESISTOR 5.9K .25% .125W F TC=0+50	19701	MF4C1/8-T2-5901-C
A28R37	0757-0447	4	1	RESISTOR 16.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-1622-F
A28R38	0757-0394	0	2	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A28R39	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R40	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R41	0698-3153	9	2	RESISTOR 3.83K 1% .125W F TC=0+100	24546	C4-1/8-T0-3831-F
A28R42	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R43	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R44	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R45	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R46	0698-3157	3	4	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A28R47	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A28R48	0757-0440	7		RESISTOR 7.5K .1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A28R49	0698-6320	8	2	RESISTOR 5K .1% .125W F TC=0+25	03888	PME55-1/8-T9-5001-B
A28R50	0757-0280	3	7	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A28R51	0757-0439	4	2	RESISTOR 6.81K 1% .125W F TC=0+100	24546	C4-1/8-T0-6811-F
A28R52	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4-1/8-T0-1782-F
A28R53	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R54	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R55	0698-6631	4	4	RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698-6631
A28R56	0698-3450	9	1	RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F

See introduction to this section for ordering information
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Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A28R57	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A28R58	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A28R59	0698-6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698-6624
A28R60	0698-6631	4		RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698-6631
A28R61	0698-6631	4		RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698-6631
A28R62	0698-6631	4		RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698-6631
A28R63	0698-6353	7		RESISTOR 50K .1% .125W F TC=0+25	28480	0698-6353
A28R64	0698-3162	0		RESISTOR 46.4K 1% .125W F TC=0+100	24546	C4-1/8-T0-4642-F
A28R65	0757-0802	5	1	RESISTOR 162 1% .5W F TC=0+100	28480	0757-0802
A28R66	0698-3156	2	2	RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A28R67	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R68	0698-8039	0	1	RESISTOR 8.87K .1% .125W F TC=0+25	19701	MF4C1/8-T9-8871-B
A28R69	0698-8498	5	1	RESISTOR 1.02K .1% .125W F TC=0+25	28480	0698-8498
A28R70	0698-8061	8	1	RESISTOR 8.25K .1% .125W F TC=0+25	19701	MF4C1/8-T9-8251-B
A28R71	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A28R72	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A28R73	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A28R74	0698-6363	9	2	RESISTOR 40K .1% .125W F TC=0+25	28480	0698-6363
A28R75	0698-6363	9		RESISTOR 40K .1% .125W F TC=0+25	28480	0698-6363
A28R76	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R77	0698-0084	9	2	RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A28R78	0698-3162	0		RESISTOR 46.4K 1% .125W F TC=0+100	24546	C4-1/8-T0-4642-F
A28R79	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R80	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R81	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A28R82	0757-0405	4		RESISTOR 162 1% .125W F TC=0+100	24546	C4-1/8-T0-162R-F
A28R83	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A28R84	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A28R85	2100-4004	8		RESISTOR-TRMR 10k 5% WW SID-ADJ 1-TRN	28480	2100-4004
A28R86	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R87	0698-6320	8		RESISTOR 5K .1% .125W F TC=0+25	03888	PME55-1/8-T9-5001-B
A28R88	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698-6360
A28R89	0698-3162	0		RESISTOR 46.4K 1% .125W F TC=0+100	24546	C4-1/8-T0-4642-F
A28R90	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R91	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R92	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A28R93	0698-3160	8	5	RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A28R94	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A28R95	0698-3162	0		RESISTOR 46.4K 1% .125W F TC=0+100	24546	C4-1/8-T0-4642-F
A28R96	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A28R97	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R98	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R99	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R100	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A28R101	0698-3449	6	1	RESISTOR 28.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-2872-F
A28R102	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R103	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A28R104	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A28R105	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R106	0698-3159	5		RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A28R107	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A28R108	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A28R109	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A28R110	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+100	24546	C4-1/8-T0-3831-F
A28R111	0757-0458	7	1	RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A28R112	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A28R113	2100-4004	8		RESISTOR-TRMR 10K 5% WW SIDE-ADJ 1-TRN	28480	2100-4004
A28R114	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A28R115	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A28R116	0757-0443	0	1	RESISTOR 11K 1% .125W F TC=0+100	24546	C4-1/8-T0-1102-F
A28R117	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A28R118-122	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R123	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0+100	03292	CT4-1/8-TO-2611-F
A28R124, 125	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A28R126	0698-8827	4	1	RESISTOR 1M 1% .125W F TC=0+100	03292	CT4
A28R127	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A28R128	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+100	02995	5033R-1/8-TO-6191-F
A28R129	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+100	03292	CT4-1/8-TO-1003-F
A28R130	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A28R131	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+100	24546	C4-1/8-T0-6811-F
A28R132	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A28R133	0698-3159	5		RESISTOR 26.1K 1% .125W TC=0+100	24546	C4-1/8-T0-2612-F
A28R134	0698-4037	0	1	RESISTOR 46.4 1% .125W F TC=0+100	03292	LO4D
A28R135	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F

See introduction to this section for ordering information
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Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A28TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28U1	1826-0471	2	5	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A28U2	1826-0616	7	1	IC OP AMP PRCN QUAD 14-DIP-C PKG	06665	OP-11EY
A28U3	1820-1934	2	2	IC CONV 8-B-D/A 16-DIP-C PKG	06665	DAC-08EQ
A28U4	1820-1934	2		IC CONV 8-B-D/A 16-DIP-C PKG	06665	DAC-08EQ
A28U5	1826-0785	1	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A28U6	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A28U7	1826-0026	3	2	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A28U8	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A28U9	1826-0853	4	1		28480	1826-0853
A28U10	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A28U11	1826-0512	2	1	IC 78M15C V RGLTR TO-39	04713	MC78M15CG
A28U12	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	01295	SN74LS11N
A28U13	1820-2056	1	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS378N
A28U14	1820-1997	7	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A28U15	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A28U16	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A28U17	1826-0759	9	3	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A28U18	1826-0759	9		IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A28U19	1826-0759	9		IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A28U20	1810-0395	6	1	NETWORK-RES 8-SIP47.0K OHM X 7	11236	750-81-R47K
A28U21	1810-0535	6	1	NETWORK-RES 16-DIP2.5K OHM X 8	28480	1810-0535
A28U22	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A28U23	1826-0026	3		IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A28VR1	1902-3171	7	1	DIODE-ZNR 11V 5% DO-35 PD=.4W TC=+.062%	28480	1902-3171
A28VR2	1902-0175	5	1	DIODE-ZNR 100V 5% PD=1W IR=5UA	28480	1902-0175
A28W1	1460-1489	8	2	WIREFORM BE CU AG	28480	1460-1489
A28W2	1460-1489	8		WIREFORM BE CU AG	28480	1460-1489

See introduction to this section for ordering information
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Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A29	**08340-60034**	**9**	**1**	**REFERENCE PHASE DETECTOR**	**28480**	**08340-60034**
A29C1	0180-0197	8	6	CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A29C2	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A29C3	0180-1746	5	4	CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A29C4	0160-3879	7	6	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A29C5	0140-0190	7	1	CAPACITOR-FXD 39PF ±5% 300VDC MICA	72136	DM15E390J0300WV1CR
A29C6	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A29C7	0160-2055	9	24	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C8	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A29C9	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A29C10	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C11	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A29C12	0160-2199	2	1	CAPACITOR-FXD 30PF ±5% 300VDC MICA	28480	0160-2199
A29C13	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A29C14	0160-2204	0	3	CAPACITOR-FXD 100PF ±5% 300VDC MICA	28480	0160-2204
A29C15	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A29C16	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C17	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C18	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C19	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C20	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C21	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C22	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C23	0180-0553	0	2	CAPACITOR-FXD 22UF+20% 25VDC TA	28480	0180-0553
A29C24	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C25	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C26	0160-2204	0		CAPACITOR-FXD 100PF ±5% 300VDC MICA	28480	0160-2204
A29C27	0140-0193	0	4	CAPACITOR-FXD 82PF ±5% 300VDC MICA	72136	DM15E820J0300WV1CR
A29C28	0180-0553	0		CAPACITOR-FXD 22UF+20% 25VDC TA	28480	0180-0553
A29C29	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C30	0140-0193	0		CAPACITOR-FXD 82PF ±5% 300VDC MICA	72136	DM15E820J0300WV1CR
A29C31	0180-1746	5		CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A29C32	0170-0066	9	1	CAPACITOR-FXD .027UF ±10% 200VDC POLYE	28480	0170-0066
A29C33	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C34	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C35	0140-0193	0		CAPACITOR-FXD 82PF ±5% 300VDC MICA	72136	DM15E820J0300WV1CR
A29C36	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C37	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C38	0140-0193	0		CAPACITOR-FXD 82PF ±5% 300VDC MICA	72136	DM15E820J0300WV1CR
A29C39	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A29C40	0180-1746	5		CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A29C41	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C42	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C43	0160-2206	2	1	CAPACITOR-FXD 160PF ±5% 300VDC MICA	28480	0160-2206
A29C44	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C45	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C46	0140-0210	2	3	CAPACITOR-FXD 270PF ±5% 300VDC MICA	72136	DM15F271J0300WV1CR
A29C47	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C48	0140-0210	2		CAPACITOR-FXD 270PF ±5% 300VDC MICA	72136	DM15F271J0300WV1CR
A29C49	0160-2201	7	1	CAPACITOR-FXD 51PF ±5% 300VDC MICA	28480	0160-2201
A29C50	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C51	0140-0210	2		CAPACITOR-FXD 270PF ±5% 300VDC MICA	72136	DM15F271J0300WV1CR
A29C52	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C53	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A29C54	0180-0183	2	1	CAPACITOR-FXD 10UF+75-10% 50VDC AL	56289	30D106G050CB2
A29C55	0180-1746	5		CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A29C56	0180-0229	7	1	CAPACITOR-FXD 33UF+10% 10VDC TA	56289	150D336X9010B2
A29C57	0160-2204	0		CAPACITOR-FXD 100PF ±5% 300VDC MICA	28480	0160-2204
A29C58	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A29C59	0160-3878	6	2	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A29C60	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A29C61	0160-3454	4	1	CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A29C62	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A29CR1	1901-0518	8	6	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A29CR2	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A29CR3	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A29CR4	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A29CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A29CR6	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A29J1	1250-0544	9	5	CONNECTOR- RF MALE SMB	28480	1250-0544
A29J2	1250-0544	9		CONNECTOR- RF MALE SMB	28480	1250-0544
A29J3	1250-0544	9		CONNECTOR- RF MALE SMB	28480	1250-0544

See introduction to this section for ordering information
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Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A29J4	1250-0544	9		CONNECTOR- RF MALE SMB	28480	1250-0544
A29J5	1250-0544	9		CONNECTOR- RF MALE SMB	28480	1250-0544
A29L1	9140-0238	3	2	INDUCTOR RF-CH-MLD 82UH 5% .166DX.385LG	28480	9140-0238
A29L2	9140-0238	3		INDUCTOR RF-CH-MLD 82UH 5% .166DX.385LG	28480	9140-0238
A29L3	9140-0143	9	2	INDUCTOR RF-CH-MLD 3.3UH 10% .105DX.26LG	28480	9140-0143
A29L4	9140-0143	9		INDUCTOR RF-CH-MLD 3.3UH 10% .105DX.26LG	28480	9140-0143
A29L5	9100-2261	2	1	INDUCTOR RF-CH-MLD 2.7UH 10% .105DX.26LG	28480	9100-2261
A29L6	9140-0114	4	1	INDUCTOR RF-CH-MLD 10UH 10% .166DX.385LG	28480	9140-0114
A29L7	9100-2255	4	4	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A29L8	9100-0368	6	1	INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A29L9	9100-2257	6	3	INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A29L10	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A29L11	9100-2257	6		INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A29L12	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A29L13	9100-2257	6		INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A29L14	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A29L15	9100-2256	5	1	INDUCTOR RF-CH-MLD 560NH 10% .105DX.26LG	28480	9100-2256
A29L16	9100-2891	4	1	INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A29MP1	1205-0250	9	1	THERMISTOR LINK TO-5/TO-39	28480	1205-0250
A29MP2	2190-0124	4	1	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A29MP3	2200-0101	0	3	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A29MP4	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A29MP5	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A29MP6	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A29MP7	08340-20090	3	1	COVER-PC REF. PHASE DETECTOR	28480	08340-20090
A29MP8	86701-40001	9	2	EXTRACTOR-PC BOARD	28480	86701-40001
A29MP9	86701-40001	9		EXTRACTOR-PC BOARD	28480	86701-40001
A29Q1	1854-0019	3	3	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A29Q2	1854-0019	3		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A29Q3	1854-0019	3		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A29Q4	1855-0049	1	1	TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	28480	1855-0049
A29Q5	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A29Q6	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A29Q7	1853-0034	0	1	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A29R1	0757-0399	5	2	RESISTOR 82.5 1% .125W F TC=0+100	24546	C4-1/8-T0-82R5-F
A29R2	0757-0417	8	1	RESISTOR 562 1% .125W F TC=0+100	24546	C4-1/8-T0-562R-F
A29R3	0757-0416	7	4	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A29R4	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A29R5	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A29R6	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A29R7	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0+100	24546	C4-1/8-T0-751-F
A29R8	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A29R9	0757-0399	5		RESISTOR 82.5 1% .125W F TC=0+100	24546	C4-1/8-T0-82R5-F
A29R10	0698-7222	1	1	RESISTOR 261 1% .05W F TC=0+100	24546	C3-1/8-T0-261R-F
A29R11	0698-7219	6	1	RESISTOR 196 1% .05W F TC=0+100	24546	C3-1/8-T0-196R-F
A29R12	0757-0442	9	5	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A29R13	0698-3453	2	3	RESISTOR 196K 1% .125W F TC=0+100	24546	C4-1/8-T0-1963-F
A29R14	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A29R15	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+100	24546	C4-1/8-T0-1963-F
A29R16	0757-0441	8	2	RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A29R17	0698-3438	3	2	RESISTOR 147 1% .125W F TC=0+100	24546	C4-1/8-T0-147R-F
A29R18	0757-0346	2	6	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A29R19	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A29R20	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A29R21	0698-3438	3		RESISTOR 147 1% .125W F TC=0+100	24546	C4-1/8-T0-147R-F
A29R22	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4-1/8-T0-1782-F
A29R23	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A29R24	0698-3154	0	5	RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A29R25	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A29R26	0757-0280	3	5	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A29R27	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A29R28	0698-3450	9	1	RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A29R29	0698-3449	6	1	RESISTOR 28.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-2872-F
A29R30	0757-0444	1	2	RESISTOR 12.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1212-F
A29R31	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A29R32	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A29R33	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A29R34	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A29R35	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A29R36	0757-0444	1		RESISTOR 12.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1212-F
A29R37	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-5621-F
A29R38	0757-0421	4	2	RESISTOR 825 1% .125W F TC=0+100	24546	C4-1/8-T0-825R-F
A29R39	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A29R40	0757-0394	0	2	RESISTOR 51.1 1% .125W F TC=0±100	24546	C4-1/8-T0-51R1-F
A29R41	0698-3446	3	2	RESISTOR 383 1% .125W F TC=0±100	24546	C4-1/8-T0-383R-F
A29R42	0698-0085	0	3	RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4-1/8-T0-2611-F
A29R43	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A29R44	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A29R45	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A29R46	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4-1/8-T0-4221-F
A29R47	0698-3453	2		RESISTOR 196K 1% .125W F TC=0±100	24546	C4-1/8-T0-1963-F
A29R48	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A29R49	0698-7285	6	1	RESISTOR 110K 1% .05W F TC=0±100	24546	C3-1/8-T0-1103-F
A29R50	0698-3157	3	2	RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-1962-F
A29R51	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-1962-F
A29R52	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A29R53	0698-3440	7	2	RESISTOR 196 1% .125W F TC=0±100	24546	C4-1/8-T0-196R-F
A29R54	0698-7234	5	1	RESISTOR 825 1% .05W F TC=0±100	24546	C3-1/8-T0-825R-F
A29R55	0698-7257	2	1	RESISTOR 7.5K 1% .05W F TC=0±100	24546	C3-1/8-T0-7501-F
A29R56	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0±100	24546	C4-1/8-T0-51R1-F
A29R57	0698-3446	3		RESISTOR 383 1% .125W F TC=0±100	24546	C4-1/8-T0-383R-F
A29R58	0698-7246	9	1	RESISTOR 2.61K 1% .05W F TC=0±100	24546	C3-1/8-T0-2611-F
A29R59	0698-3440	7		RESISTOR 196 1% .125W F TC=0±100	24546	C4-1/8-T0-196R-F
A29R60				NOT ASSIGNED		
A29R61	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A29R62	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC=0±100	24546	C4-1/8-T0-1781-F
A29R63	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4-1/8-T0-2611-F
A29R64	0698-3132	4	2	RESISTOR 261 1% .125W F TC=0±100	24546	C4-1/8-T0-2610-F
A29R65	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4-1/8-T0-2611-F
A29R66	0757-0421	4		RESISTOR 825 1% .125W F TC=0±100	24546	C4-1/8-T0-825R-F
A29R67	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A29R68	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A29R69	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A29R70	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A29R71	0757-0274	5	1	RESISTOR 1.21K 1% .125W F TC=0±100	24546	C4-1/8-T0-1211-F
A29R72	0698-3132	4		RESISTOR 261 1% .125W F TC=0±100	24546	C4-1/8-T0-2610-F
A29R73	0757-0317	7	1	RESISTOR 1.33K 1% .125W F TC=0±100	24546	C4-1/8-T0-1331-F
A29R74	0757-0289	2	1	RESISTOR 13.3K 1% .125W F TC=0±100	19701	MF4C1/8-T0-1332-F
A29R75	0698-7236	7	1	RESISTOR 1K 1% .05W F TC=0±100	24546	C3-1/8-T0-1001-F
A29T1	08552-6044	1	2	TRANSFORMER-RF 5 PIN	28480	08552-6044
A29T2	08552-6044	1		TRANSFORMER-RF 5 PIN	28480	08552-6044
A29TP1	0360-0535	0	1	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A29U1	1858-0032	8	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A29U2	1820-0328	6	1	IC GATE TTL NOR QUAD 2-INP	01295	SN7402N
A29U3	1820-1383	5	1	IC CNTR ECL BCD POS-EDGE-TRIG	04713	MC10138L
A29U4	1820-0802	1	1	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A29U5	1820-0223	0	1	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A29U6	1820-0429	8	1	IC V RGLTR TO-39	18324	LM309H
A29VR1	1902-3082	9	1	DIODE-ZNR 4.64V 5% DO-35 PD=.4W	28480	1902-3082
A29VR2	1902-3256	9	1	DIODE-ZNR 23.7V 5% DO-35 PD=.4W	28480	1902-3256
A29W1	08340-60101	1	1	CABLE ASSEMBLY- A29	28480	08340-60101

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A30	**08340-60035**	**0**	**1**	**100 MHz VCXO**	**28480**	**08340-60035**
A30C1	0121-0495	5	3	CAPACITOR-V TRMR-AIR 1.9-15.7PF 175V	74970	187-0309-125
A30C2	0121-0495	5		CAPACITOR-V TRMR-AIR 1.9-15.7PF 175V	74970	187-0309-125
A30C3	0121-0495	5		CAPACITOR-V TRMR-AIR 1.9-15.7PF 175V	74970	187-0309-125
A30C4	0121-0493	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0306-125
A30C5	0180-0049	9	1	CAPACITOR-FXD 20UF+75-10% 50VDC AL	56289	30D206G050CC2
A30C6	0160-3456	6	5	CAPACITOR-FXD 1000PF +10% 1KVDC CER	28480	0160-3456
A30C7	0160-3454	4	19	CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C8*	0160-2253	9	1	CAPACITOR-FXD 6.8PF ±.5PF 100VDC CER	28480	0160-2253
A30C9	0160-4084	8	1	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A30C10	0140-0191	8	1	CAPACITOR-FXD 56PF ±5% 300VDC MICA	72136	DM15E560J0300WV1CR
A30C11	0160-2204	0	1	CAPACITOR-FXD 100PF ±5% 300VDC MICA	28480	0160-2204
A30C12	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C13	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C14	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C15	0160-2261	9	8	CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C16	0160-2261	9		CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C17	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C18	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C19	0160-2261	9		CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C20	0160-2261	9		CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C21	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C22	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C23	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C24	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C25	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C26	0160-2261	9		CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C27	0160-2261	9		CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C28	0160-3872	0	2	CAPACITOR-FXD 2.2PF ±.25PF 200VDC CER	28480	0160-3872
A30C29	0160-3872	0		CAPACITOR-FXD 2.2PF ±.25PF 200VDC CER	28480	0160-3872
A30C30	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C31	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C32	0160-2261	9		CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C33	0160-2261	9		CAPACITOR-FXD 15PF ±5% 500VDC CER 0±30	28480	0160-2261
A30C34	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C35	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C36	0160-3878	6	7	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A30C37	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A30C38	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A30C39	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C40	0160-2238	0	1	CAPACITOR-FXD 1.5PF ±.25PF 500VDC CER	28480	0160-2238
A30C41	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A30C42	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A30C43	0180-0116	1	2	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A30C44	0160-2253	9	1	CAPACITOR-FXD 6.8PF ±.25PF 500VDC CER	28480	0160-2253
A30C45	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A30C46	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A30C47	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C48	0160-3456	6		CAPACITOR-FXD 1000PF ±10% 1KVDC CER	28480	0160-3456
A30C49	0160-3456	6		CAPACITOR-FXD 1000PF ±10% 1KVDC CER	28480	0160-3456
A30C50	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A30C51	0160-4299	7	1	CAPACITOR-FXD 2200PF ±20% 250VDC CER	56289	C067F251F222MS22-CDH
A30C52	0160-3456	6		CAPACITOR-FXD 1000PF ±10% 1KVDC CER	28480	0160-3456
A30C53	0160-3456	6		CAPACITOR-FXD 1000PF ±10% 1KVDC CER	28480	0160-3456
A30C54	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C55	0160-3454	4		CAPACITOR-FXD 220PF ±10% 1KVDC CER	28480	0160-3454
A30C56	0160-2437	1	1	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A30CR1	0122-0245	5	1	DIODE-VVC 1N5139 6.8PF 10%	01281	1N5139
A30CR2				NOT ASSIGNED		
A30CR3	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A30CR4	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A30E1	9170-0029	3	1	CORE-SHIELDING BEAD	28480	9170-0029
A30J1	1250-0544	9	3	CONNECTOR-RF MALE SMB	28480	1250-0544
A30J2	1250-0544	9		CONNECTOR-RF MALE SMB	28480	1250-0544
A30J3	1250-0544	9		CONNECTOR-RF MALE SMB	28480	1250-0544
A30L1				NOT ASSIGNED		
A30L2	9100-2250	7	1	INDUCTOR RF-CH-MLD 180NH 10% .105DX.26LG	28480	9100-2250
A30L3	9140-0158	6	3	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A30L4*	9100-0368	6	1	INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A30L5	9100-2538	6	1	INDUCTOR RF-CH-MLD 1UH 10% .161DX.385LG	28480	9100-2538
A30L6	9100-2251	0	4	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A30L7	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A30L8	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A30L9	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A30L10-13				NOT ASSIGNED		
A30L14	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A30L15	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A30L16	9140-0158	6		INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A30L17	9140-0158	6		INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A30L18	9140-0144	0	2	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A30L19	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A30MP1				NOT ASSIGNED		
A30MP2				NOT ASSIGNED		
A30MP3	2190-0009	4	1	WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
A30MP4	2190-0124	4	1	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A30MP5	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A30MP6	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A30MP7	2200-0103	2	3	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A30MP8	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A30MP9	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A30MP10	2580-0002	4	1	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	00000	ORDER BY DESCRIPTION
A30MP11	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A30MP12	4330-0145	9	1	INS. BEAD GL.062L	28480	4330-0145
A30MP13	08340-20091	4	1	COVER-PC VCXO	28480	08340-20091
A30MP14	86701-40001	9	2	EXTRACTOR-PC BOARD	28480	86701-40001
A30MP15	86701-40001	9		EXTRACTOR-PC BOARD	28480	86701-40001
A30MP16	86701-00045	7	1	SHIELD	28480	86701-00045
A30MP17	0460-0683	1	1	TAPE-FILM 1.5	28480	0460-0683
A30MP18	0460-1303	4	1	TAPE-SILICON SPONGE	28480	0460-1303
A30MP19	6960-0059	1	1	PLUG-HOLE RND-HD FOR .187-D-HOLE NYL	28480	6960-0059
A30Q1	1854-0345	8	9	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q5	1854-0247	9	1	TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A30Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q8	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q9	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30Q10	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A30Q11	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A30R1	0757-0279	0	3	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A30R2	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A30R3	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A30R4	0757-0422	5	6	RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A30R5	0698-3155	1	2	RESISTOR 4.64K 1% .125W F TC=0+100	24546	C4-1/8-T0-4641-F
A30R6	0698-7224	3	1	RESISTOR 316 1% .05W F TC=0+100	24546	C3-1/8-T0-316R-F
A30R7	0757-0346	2	2	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A30R8	0757-0422	5		RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A30R9	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A30R10	0757-0401	0	7	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A30R11	0757-0394	0	5	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A30R12	0757-0416	7	6	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A30R13	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A30R14	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A30R15	0757-0422	5		RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A30R16	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A30R17	0698-3150	6	8	RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R18	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R19	0698-7198	0	2	RESISTOR 26.1 1% .05W F TC=0+100	24546	C3-1/8-T0-26R1-F
A30R20	0698-3443	0	5	RESISTOR 287 1% .125W F TC=0+100	24546	C4-1/8-T0-287R-F
A30R21	0698-3429	2	3	RESISTOR 19.6 1% .125W F TC=0+100	03888	PME55-1/8-T0-19R6-F
A30R22	0698-3443	0		RESISTOR 287 1% .125W F TC=0+100	24546	C4-1/8-T0-287R-F
A30R23	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R24	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A30R25	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R26	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A30R27	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A30R28	0757-0422	5		RESISTOR 909 1% .125W F TC=0+100	24546	C4-1/8-T0-909R-F
A30R29	0698-7198	0		RESISTOR 26.1 1% .05W F TC=0+100	24546	C3-1/8-T0-26R1-F
A30R30	0698-3443	0		RESISTOR 287 1% .125W F TC=0+100	24546	C4-1/8-T0-287R-F
A30R31	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+100	03888	PME55-1/8-T0-19R6-F
A30R32	0698-3443	0		RESISTOR 287 1% .125W F TC=0+100	24546	C4-1/8-T0-287R-F
A30R33	0698-3443	0		RESISTOR 287 1% .125W F TC=0+100	24546	C4-1/8-T0-287R-F
A30R34	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+100	03888	PME55-1/8-T0-19R6-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A30R35	0698-7223	2	1	RESISTOR 287 1% .05W F TC=0±100	24546	C3-1/8-TO-287R-F
A30R36	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R37	0757-0422	5		RESISTOR 909 1% .125W F TC=0±100	24546	C4-1/8-T0-909R-F
A30R38	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A30R39	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R40	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A30R41	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A30R42	0698-0084	9	3	RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A30R43	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4-1/8-T0-4641-F
A30R44	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A30R45	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F
A30R46	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A30R47	0757-0439	4	2	RESISTOR 6.81K 1% .125W F TC=0±100	24546	C4-1/8-T0-6811-F
A30R48	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A30R49	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A30R50	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0±100	24546	C4-1/8-T0-6811-F
A30R51	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A30R52	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A30R53	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A30R54	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0±100	24546	C4-1/8-T0-51R1-F
A30R55	0757-0422	5		RESISTOR 909 1% .125W F TC=0±100	24546	C4-1/8-T0-909R-F
A30R56	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R57	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A30R58	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A30R59	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A30R60	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A30R61	0757-0397	3	1	RESISTOR 68.1 1% .125W F TC=0+100	24546	C4-1/8-T0-68R1-F
A30R62	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A30R63-66				NOT ASSIGNED		
A30R67*	0698-3437	2	2	RESISTOR 133 1% .125W F TC=0+100	24546	C4-1/8-T0-133R-F
A30R68*	0698-4037	0	1	RESISTOR 46.4 1% .125W F TC=0±100	24546	C4-1/8-T0-46R4-F
A30R69*	0698-3437	2		RESISTOR 133 1% .125W F TC=0±100	24546	C4-1/8-T0-133R-F
A30T1	08553-6012	5	3	TRANSFORMER-RF (BLUE)	28480	08553-6012
A30T2	08553-6012	5		TRANSFORMER-RF (BLUE)	28480	08553-6012
A30T3	08553-6012	5		TRANSFORMER-RF (BLUE)	28480	08553-6012
A30TP1				NOT ASSIGNED		
A30TP2	0360-0535	0	3	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A30TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A30TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A30W1	08340-60102	2	1	CABLE ASSEMBLY- A30	28480	08340-60102
A30Y1	0410-1086	5	1	CRYSTAL- 100.0 MHZ	28480	0410-1086

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A31	08340-60036	1	1	M/W PHASE DETECTOR	28480	08340-60036
A31C1	0160-4299	7	4	CAPACITOR-FXD 2200PF ±20% 250VDC CER	56289	C067F251F222MS22-CDH
A31C2	0160-0574	3	6	CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A31C3	0160-4299	7		CAPACITOR-FXD 2200PF ±20% 250VDC CER	56289	C067F251F222MS22-CDH
A31C4	0180-0100	3	1	CAPACITOR-FXD 4.7UF±10% 35VDC TA	56289	150D475X9035B2
A31C5	0160-0572	1	2	CAPACITOR-FXD 2200PF ±20% 100VDC CER	28480	0160-0572
A31C6	0160-0572	1		CAPACITOR-FXD 2200PF ±20% 100VDC CER	28480	0160-0572
A31C7	0160-3876	4	2	CAPACITOR-FXD 47PF ±20% 200VDC CER	28480	0160-3876
A31C8	0160-3877	5	1	CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A31C9	0160-3876	4		CAPACITOR-FXD 47PF ±20% 200VDC CER	28480	0160-3876
A31C10	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A31C11	0160-3873	1	1	CAPACITOR-FXD 4.7PF ±.5PF 200VDC CER	28480	0160-3873
A31C12	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A31C13	0160-3878	6	3	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A31C14	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A31C15	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A31C16	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A31C17	0180-0197	8	1	CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A31C18	0160-4299	7		CAPACITOR-FXD 2200PF ±20% 250VDC CER	56289	C067F251F222MS22-CDH
A31C19	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A31C20	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A31C21	0160-4299	7		CAPACITOR-FXD 2200PF ±20% 250VDC CER	56289	C067F251F222MS22-CDH
A31C22	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A31J1	1250-0690	6	1	CONNECTOR-RF MALE SMB	28480	1250-0690
A31L1	9100-1641	0	2	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A31L2	9100-2259	8	1	INDUCTOR RF-CH-MLD 1.5UH 10% .105DX.26LG	28480	9100-2259
A31L3	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A31L4	9100-2891	4	1	INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A31L5				NOT ASSIGNED		
A31L6	9100-2248	5	3	INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A31L7	9100-2248	5		INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A31L8	9100-2248	5		INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A31MP1, 2				NOT ASSIGNED		
A31MP3	0520-0129	8	13	SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP4	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP5	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP6	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP7	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP8	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP9	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP10	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP11	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP12	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP13	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP14	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP15	0520-0129	8		SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP16	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP17	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP18	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP19	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP20	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP21	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP22	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP23	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP24	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP25	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP26	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP27	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP28	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A31MP29	1205-0285	0	5	HEAT SINK SGL DIP	28480	1205-0285
A31MP30	1205-0285	0		HEAT SINK SGL DIP	28480	1205-0285
A31MP31	1205-0285	0		HEAT SINK SGL DIP	28480	1205-0285
A31MP32	1205-0285	0		HEAT SINK SGL DIP	28480	1205-0285
A31MP33	1205-0285	0		HEAT SINK SGL DIP	28480	1205-0285
A31MP34	2190-0014	1	3	WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A31MP35	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A31MP36	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A31MP37	2190-0124	4	6	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A31MP38	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A31MP39	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A31MP40	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A31MP41	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A31MP42	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A31MP43	2190-0890	1	10	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP44	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP45	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP46	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP47	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP48	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP49	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP50	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP51	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP52	2190-0890	1		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A31MP53	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP54	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP55	2200-0103	2	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP56	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A31MP57	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A31MP58	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A31MP59	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A31MP60	08340-20092	5	1	COVER-PC M/N PHASE DETECTOR	28480	08340-20092
A31MP61	85660-20068	4	2	GROUND LUG	28480	85660-20068
A31MP62	85660-20068	4		GROUND LUG	28480	85660-20068
A31MP63	86701-00032	2	1	HEAT SINK-IC	28480	86701-00032
A31MP64	86701-00033	3	1	BRACKET-HEAT SINK	28480	86701-00033
A31MP65	86701-40001	9	1	EXTRACTOR-PC BOARD	28480	86701-40001
A31MP66	1200-0172	4	1	INSULATOR-XSTR DAP-GL	28480	1200-0172
A31Q1	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A31Q2	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A31Q3	1854-0345	8	2	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A31Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A31R1	0698-3154	0	5	RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A31R2	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4-1/8-T0-4221-F
A31R3	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4-1/8-T0-4221-F
A31R4	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4-1/8-T0-4221-F
A31R5	0698-7267	4	1	RESISTOR 19.6K 1% .05W F TC=0±100	24546	C3-1/8-T0-1962-F
A31R6	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A31R7	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A31R8	0698-7192	4	2	RESISTOR 14.7 1% .05W F TC=0+100	24546	C3-1/8-T0-14R7-F
A31R9	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A31R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A31R11	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A31R12	0698-7212	9	1	RESISTOR 100 1% .05W F TC=0+100	24546	C3-1/8-T0-100R-F
A31R13	0698-3157	3	2	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A31R14	0757-0416	7	4	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A31R15	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A31R16	0698-7248	1	3	RESISTOR 3.16K 1% .05W F TC=0+100	24546	C3-1/8-T0-3161-F
A31R17	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0±100	24546	C3-1/8-T0-3161-F
A31R18	0698-7223	2	1	RESISTOR 287 1% .05W F TC=0+100	24546	C3-1/8-T0-287R-F
A31R19	0698-7256	1	1	RESISTOR 6.81K 1% .05W F TC=0+100	24546	C3-1/8-T0-6811-F
A31R20	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0±100	24546	C3-1/8-T0-3161-F
A31R21	0698-7220	9	2	RESISTOR 215 1% .05W F TC=0+100	24546	C3-1/8-T0-215R-F
A31R22	0698-7220	9		RESISTOR 215 1% .05W F TC=0±100	24546	C3-1/8-T0-215R-F
A31R23	0698-7192	4		RESISTOR 14.7 1% .05W F TC=0+100	24546	C3-1/8-T0-14R7-F
A31R24	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A31R25	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A31R26	0757-0441	8	2	RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A31R27	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0±100	24546	C4-1/8-T0-8251-F
A31R28	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-1962-F
A31R29	0698-3162	0	1	RESISTOR 46.4K 1% .125W F TC=0±100	24546	C4-1/8-T0-4642-F
A31R30	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A31TP1	0360-0535	0	7	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A31TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A31TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A31TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A31TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A31TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A31TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A31U1	1820-1344	8	1	IC PL LOOP 14-DIP-C PKG	04713	MC12040L
A31U2	1826-0092	3	1	IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A31U3	1810-0251	3	3	NETWORK-RES 10-SIP MULTI-VALUE	28480	1810-0251
A31U4	1820-1225	4	2	IC FF ECL D-M/S DUAL	04713	MC10231P
A31U5	1810-0204	6	6	NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A31U6	1820-0821	4	2	IC CNTR ECL BIN UP/DOWN SYNCHRO	28480	1820-0821
A31U7	1820-0802	1	4	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A31U8	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A31U9	1820-0806	5	2	IC GATE ECL OR-NOR DUAL 4-5-INP	04713	MC10109P
A31U10	1820-0820	3	2	IC FF ECL J-BAR K-BAR COM CLOCK DUAL	04713	MC10135L
A31U11	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A31U12	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A31U13	1810-0251	3		NETWORK-RES 10-SIP MULTI-VALUE	28480	1810-0251
A31U14	1820-1225	4		IC FF ECL D-M/S DUAL	04713	MC10231P
A31U15	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A31U16	1820-0821	4		IC CNTR ECL BIN UP/DOWN SYNCHRO	28480	1820-0821
A31U17	1810-0251	3		NETWORK-RES 10-SIP MULTI-VALUE	28480	1810-0251
A31U18	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A31U19	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A31U20	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	MC10109P
A31U21	1820-0820	3		IC FF ECL J-BAR K-BAR COM CLOCK DUAL	04713	MC10135L
A31U22	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A31U23	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A31U24	0955-0063	0	1	MIXER-DOUBLER 5-500 MH	28480	0955-0063
A31VR1	1902-3082	9	1	DIODE-ZNR 4.64V 5% DO-35 PD=.4W	28480	1902-3082
A31W1	08340-60103	3	1	CABLE ASSEMBLY- A31	28480	08340-60103
A31W2	08340-60104	4	1	CABLE ASSEMBLY- A31	28480	08340-60104

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A32	**08340-60091**	**8**	**1**	**M/N VCO ASSEMBLY**	**28480**	**08340-60091**
				(08340-60091 INCLUDES A32A1 M/N VCO PC BD AND A32A2 VCO)		
A32/A33	08340-60092	9	1	M/N-VCO/OUTPUT ASSEMBLY (INCLUDES A32 M/N VCO ASSY. AND A33 M/N OUTPUT ASSY)	28480	08340-60092
A32A1				M/N VCO PC BOARD ASSEMBLY (NSR)		
A32A1C1	0160-3878	6	21	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A32A1C2	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A32A1C3	0160-3879	7	2	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A32A1C4	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A32A1C5	0180-0116	1	1	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A32A1C6	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A32A1C7	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A32A1C8	0160-3873	1	3	CAPACITOR-FXD 4.7PF ±.5PF 200VDC CER	28480	0160-3873
A32A1C9	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A32A1C10	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A32A1C11	0180-2161	0	1	CAPACITOR-FXD .75UF±10% 50VDC TA	56289	150D754X9050A2
A32A1J1	1251-0600	0	3	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A32A1J2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A32A1J3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A32A1L1	9100-0346	0	2	INDUCTOR RF-CH-MLD 50NH 20% .105DX.26LG	28480	9100-0346
A32A1L2	9100-0346	0		INDUCTOR RF-CH-MLD 50NH 20% .105DX.26LG	28480	9100-0346
A32A1L3	86701-20051	7	1	INDUCTOR	28480	86701-20051
A32A1L4	9140-0158	6	3	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A32A1MP1	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A32A1Q1	1854-0686	0	1	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A32A1Q2	1854-0610	0	1	TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A32A1R1	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A32A1R2	0698-7219	6	1	RESISTOR 196 1% .05W F TC=0+100	24546	C3-1/8-TO-196R-F
A32A1R3	0698-7193	5	1	RESISTOR 16.2 1% .05W F TC=0+100	24546	C3-1/8-TO-16R2-F
A32A1R4	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A32A1R5	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-1621-F
A32A1R6	0698-7262	9	1	RESISTOR 12.1K 1% .05W F TC=0+100	24546	C3-1/8-T0-1212-F
A32A1R7	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A32A1R8	0698-7254	9	1	RESISTOR 5.62K 1% .05W F TC=0+100	24546	C3-1/8-T0-5621-F
A32A1R9	0698-7205	0	2	RESISTOR 51.1 1% .05W F TC=0+100	24546	C3-1/8-TO-51R1-F
A32A1R10	0698-7265	2	1	RESISTOR 16.2K 1% .05W F TC=0±100	24546	C3-1/8-T0-1622-F
A32A1R11	0698-7250	5	1	RESISTOR 3.83K 1% .05W F TC=0+100	24546	C3-1/8-T0-3831-F
A32A1R12	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A32A1R13	0757-0400	9	1	RESISTOR 90.9 1% .125W F TC=0±100	24546	C4-1/8-T0-90R9-F
A32A1W1	08340-60105	5	1	CABLE ASSEMBLY-COAX A32	28480	08340-60105
A32A1W2				NOT ASSIGNED		
A32A1W3	86701-20050	6	1	CABLE-JUMPER	28480	86701-20050
	1251-2313	6	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A32A2				M/N VCO (NSR)		

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A33	08340-60038	3	1	M/N OUTPUT	28480	08340-60038
A33C1	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C2	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C3	0160-3874	2	3	CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A33C4	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C5	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C6	0160-3873	1		CAPACITOR-FXD 4.7PF ±.5PF 200VDC CER	28480	0160-3873
A33C7	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C8	0160-3873	1		CAPACITOR-FXD 4.7PF ±.5PF 200VDC CER	28480	0160-3873
A33C9	0160-4491	1		CAPACITOR-FXD 8.2PF ±.5PF 200VDC CER	28480	0160-4491
A33C10	0160-4490	0	1	CAPACITOR-FXD 1.8PF ±.25PF 200VDC CER	28480	0160-4490
A33C11				NOT ASSIGNED		
A33C12	0160-2261	9	1	CAPACITOR-FXD 15PF ±5% 500VDC CER 0+30	28480	0160-2261
A33C13	0160-2290	4	2	CAPACITOR-FXD .15UF ±10% 80VDC POLYE	28480	0160-2290
A33C14	0160-2290	4		CAPACITOR-FXD .15UF ±10% 80VDC POLYE	28480	0160-2290
A33C15	0140-0196	3	1	CAPACITOR-FXD 150PF ±5% 300VDC MICA	72136	DM15F151J0300WV1CR
A33C16	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C17	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C18	0160-3874	2		CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A33C19	0160-3876	4	1	CAPACITOR-FXD 47PF ±20% 200VDC CER	28480	0160-3876
A33C20	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C21	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C22	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C23	0160-4351	2	1	CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4351
A33C24	0160-0161	4	2	CAPACITOR-FXD .01UF ±10% 200VDC POLYE	28480	0160-0161
A33C25	0160-0153	4	1	CAPACITOR-FXD 1000PF ±10% 200VDC POLYE	28480	0160-0153
A33C26	0160-0161	4		CAPACITOR-FXD .01UF ±10% 200VDC POLYE	28480	0160-0161
A33C27	0160-3534	1	1	CAPACITOR-FXD 510PF ±5% 100VDC MICA	28480	0160-3534
A33C28	0160-0298	8	1	CAPACITOR-FXD 1500PF ±10% 200VDC POLYE	28480	0160-0298
A33C29	0180-0197	8	2	CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A33C30	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C31	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A33C32	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C33	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C34	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33C35	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A33CR1	1901-0040	1	4	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A33CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A33CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A33CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A33J1	1250-0690	6	2	CONNECTOR-RF MALE SMB	28480	1250-0690
A33J2	1250-0690	6		CONNECTOR-RF MALE SMB	28480	1250-0690
A33J3	1250-1889	7	1	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A33L1	9135-0073	3	8	INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A33L2	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A33L3	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A33L4	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A33L5				NOT ASSIGNED		
A33L6	9100-1634	1	1	INDUCTOR RF-CH-MLD 75UH 5% .166DX.385LG	28480	9100-1634
A33L7	9100-1635	2	1	INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A33L8	9100-1620	5	1	INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG	28480	9100-1620
A33L9	9140-0210	1	1	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A33L10	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A33L11	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A33L12	9135-0079	9		INDUCTOR RF-CH-MLD 100NH 5.5% .102DX.26LG	28480	9135-0079
A33L13	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A33L14	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A33MP1	1200-0172	4	7	INSULATOR-XSTR DAP-GL	28480	1200-0172
A33MP2	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A33MP3	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A33MP4	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A33MP5	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A33MP6	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A33MP7	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A33MP8	2190-0009	4	1	WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
A33MP9	2190-0124	4	4	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A33MP10	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A33MP11	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A33MP12	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A33MP13	2200-0101	0	4	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A33MP14	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A33MP15	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A33MP16	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A33MP17	2580-0002	4	1	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	00000	ORDER BY DESCRIPTION
A33MP18	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A33MP19	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A33MP20	3050-0082	8	1	WASHER-FL NM NO. 4 .116-IN-ID .188-IN-OD	28480	3050-0082
A33MP21	4330-0145	9	2	INSULATOR-BEAD GLASS	28480	4330-0145
A33MP22	4330-0145	9		INSULATOR-BEAD GLASS	28480	4330-0145
A33MP23	08340-20093	6	1	COVER-PC M/N OUTPUT	28480	08340-20093
A33MP24	85660-20068	4	2	GROUND LUG	28480	85660-20068
A33MP25	85660-20068	4		GROUND LUG	28480	85660-20068
A33MP26	86701-40001	9	1	EXTRACTOR-PC	28480	86701-40001
A33Q1	1854-0345	8	7	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A33Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A33Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A33Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A33Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A33Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A33Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A33R1	0698-7212	9	4	RESISTOR 100 1% .05W F TC=0+100	24546	C3-1/8-TO-100R-F
A33R2	0698-7248	1	5	RESISTOR 3.16K 1% .05W F TC=0+100	24546	C3-1/8-TO-3161-F
A33R3	0698-7243	6	4	RESISTOR 1.96K 1% .05W F TC=0+100	24546	C3-1/8-TO-1961-F
A33R4	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+100	24546	C3-1/8-TO-51R1-F
A33R5	0698-7223	2	3	RESISTOR 287 1% .05W F TC=0+100	24546	C3-1/8-TO-287R-F
A33R6	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+100	24546	C3-1/8-TO-3161-F
A33R7	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+100	24546	C3-1/8-TO-1961-F
A33R8	0757-0316	6	1	RESISTOR 42.2 1% .125W F TC=0+100	24546	C4-1/8-TO-42R2-F
A33R9	0698-7218	5	1	RESISTOR 178 1% .05W F TC=0+100	24546	C3-1/8-TO-178R-F
A33R10	0698-7188	8	3	RESISTOR 10 1% .05W F TC=0+100	24546	C3-1/8-TO-10R-F
A33R11	0698-7212	9		RESISTOR 100 1% .05W F TC=0+100	24546	C3-1/8-TO-100R-F
A33R12	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-TO-51R1-F
A33R13	0698-7212	9		RESISTOR 100 1% .05W F TC=0+100	24546	C3-1/8-TO-100R-F
A33R14	0757-1094	9	4	RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-TO-1471-F
A33R15	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-TO-1471-F
A33R16	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-TO-1471-F
A33R17	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-TO-1471-F
A33R18	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+100	19701	MF4C1/8-T0-6191-F
A33R19	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+100	24546	C3-1/8-TO-3161-F
A33R20	0698-7222	1	1	RESISTOR 261 1% .05W F TC=0+100	24546	C3-1/8-TO-261R-F
A33R21	0698-7223	2		RESISTOR 287 1% .05W F TC=0+100	24546	C3-1/8-TO-287R-F
A33R22	0698-7188	8		RESISTOR 10 1% .05W F TC=0+100	24546	C3-1/8-TO-10R-F
A33R23	0698-7229	8	2	RESISTOR 511 1% .05W F TC=0+100	24546	C3-1/8-TO-511R-F
A33R24	0698-7212	9		RESISTOR 100 1% .05W F TC=0+100	24546	C3-1/8-TO-100R-F
A33R25	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+100	24546	C3-1/8-TO-3161-F
A33R26	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+100	24546	C3-1/8-TO-1961-F
A33R27	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+100	24546	C3-1/8-TO-3161-F
A33R28	0698-7229	8		RESISTOR 511 1% .05W F TC=0+100	24546	C3-1/8-TO-511R-F
A33R29	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+100	24546	C3-1/8-TO-1961-F
A33R30	0698-7195	7	1	RESISTOR 19.6 1% .05W F TC=0+100	24546	C3-1/8-TO-19R6-F
A33R31	0698-7227	6	1	RESISTOR 422 1% .05W F TC=0+100	24546	C3-1/8-TO-422R-F
A33R32	0698-7188	8		RESISTOR 10 1% .05W F TC=0+100	24546	C3-1/8-TO-10R-F
A33R33	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-TO-1001-F
A33R34	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-TO-3161-F
A33R35	0698-7223	2		RESISTOR 287 1% .05W F TC=0+100	24546	C3-1/8-TO-287R-F
A33R36	0698-7210	7	1	RESISTOR 82.5 1% .05W F TC=0+100	24546	C3-1/8-TO-82R5-F
A33R37	0698-3442	9	1	RESISTOR 237 1% .125W F TC=0+100	24546	C3-1/8-TO-257R-F
A33U1	1826-0059	2	1	IC OP AMP GP TO-99 PKG	01295	LM201AL
A33U2	1820-2642	1	1	IC CNTR ECL BIN DUAL	28480	1820-2642
A33VR1	1902-3070	5	2	DIODE-ZNR 4.22V 5% DO-35 PD=.4W	28480	1902-3070
A33VR2	1902-3070	5		DIODE-ZNR 4.22V 5% DO-35 PD=.4W	28480	1902-3070
A33W1	08340-60123	7	1	JUMPER WIRE ASSEMBLY	28480	08340-60123

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A34	**08340-60039**	**4**	**1**	**REFERENCE M/N MOTHERBOARD**	**28480**	**08340-60039**
A34C1	0160-2437	1	12	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C2	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C3	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C4	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C5	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C6	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C7	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C8	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C9	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C10	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C11	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C12	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A34C13	0160-4083	7	2	CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083
A34C14	0160-4083	7		CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083
A34E1-9	9170-0029	3	12	CORE-SHIELDING BEAD	28480	9170-0029
A34E10-12				NOT ASSIGNED		
A34E13-26	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A34MP1	8150-0014	3	1	WIRE-24 AWG 1 X 24	28480	8150-0014
A34MP2	2190-0007	2	2	WASHER-LK INTL T NO. 6 .141-IN-ID	28480	2190-0007
A34MP3	2420-0003	7	2	NUT-HEX-DBL-CHAM 6-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
A34MP4	2190-0843	4	12	WASHER-LK INTL T NO. 8 .165-IN-ID	28480	2190-0843
A34MP5	2580-0002	4	12	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	00000	ORDER BY DESCRIPTION
A34MP6	8150-0447	6	1	WIRE-24 AWG 300V 0	28480	8150-0447
A34MP7	85660-00037	5	1	INSULATOR- 15 PIN (FOR XA33)	28480	85660-00037
A34MP8	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A34MP9	0890-0983	5		TUBING-HEAT SINK .125ID	28480	0890-0983
A34MP10	8150-0464	7	3	WIRE-24 AWG 300V 97	28480	8150-0464
A34MP11	8150-0454	5	3	WIRE-24 AWG 300V 7	28480	8150-0454
A34MP12	8150-0449	8	2	WIRE-24 AWG 300V 2	28480	8150-0449
A34MP13	8150-0451	2	3	WIRE-24 AWG 300V 4	28480	8150-0451
A34MP14	8150-0472	7	2	WIRE-24 AWG 300V 907	28480	8150-0472
A34MP15	8150-0464	7		WIRE-24 AWG 300V 97	28480	8150-0464
A34MP16	8150-0454	5		WIRE-24 AWG 300V 7	28480	8150-0454
A34MP17	8150-0449	8		WIRE-24 AWG 300V 2	28480	8150-0449
A34MP18	8150-0451	2		WIRE-24 AWG 300V 4	28480	8150-0451
A34MP19	8150-0451	2		WIRE-24 AWG 300V 4	28480	8150-0451
A34MP20	8150-0464	7		WIRE-24 AWG 300V 97	28480	8150-0464
A34MP21	8150-0472	7		WIRE-24 AWG 300V 907	28480	8150-0472
A34MP22	8150-0454	5		WIRE-24 AWG 300V 7	28480	8150-0454
A34MP23	8150-0461	4	1	WIRE-24 AWG 300V 94	28480	8150-0461
A34XA29	1251-4423	3	1	CONNECTOR-PC EDGE 15-CONT/ROW 1-ROW	28480	1251-4423
	85660-00051	3	1	INSULATOR- 15 PIN (FOR XA29	28480	85660-00051
A34XA30	1251-4174	1	1	CONNECTOR-PC EDGE 15-CONT/ROW 1-ROW	28480	1251-4174
	85660-00050	2	1	INSULATOR- 15 PIN (FOR XA30)	28480	85660-00050
A34XA31	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A34XA32				NOT ASSIGNED		
A34XA33	1251-5020	8	1	CONNECTOR-PC 15 IR	28480	1251-5020
A34XA34A	5060-0112	8	1	CONNECTOR- 15 CONTACT DIP	28480	5060-0112
A34XA34B	5060-0112	8		CONNECTOR- 15 CONTACT DIP	28480	5060-0112

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A35	08340-60259	0	1	RECTIFIER	28480	08340-60259
A35C1	0160-6143	4	1	CAPACITOR-FXD .22UF +-20% 160VDC	28480	0160-6143
A35C2	0160-6499	3	3	CAPACITOR-FXD 1UF +-20% 63VDC MET-POLYE	28480	0160-6499
A35C3	0160-6499	3		CAPACITOR-FXD 1UF +-20% 63VDC MET-POLYE	28480	0160-6499
A35C4	0160-6499	3		CAPACITOR-FXD 1UF +-20% 63VDC MET-POLYE	28480	0160-6499
A35C5	0160-2055	9	2	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A35C6	0160-0128	3	1	CAPACITOR-FXD 2.2UF +-20% 50VDC CER	28480	0160-0128
A35C7	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A35C8	0160-3094	8	2	CAPACITOR-FXD .1UF +-10% 100VDC CER	28480	0160-3094
A35C9	0160-3094	8		CAPACITOR-FXD .1UF +-10% 100VDC CER	28480	0160-3094
A35C10	0180-2129	0	1	CAPACITOR-FXD 10UF+-10% 50VDC TA	56289	150D106X9050R2
A35CR1	1901-0662	3	6	DIODE-PWR RECT 100V 6A	04713	MR751
A35CR2	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A35CR3	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A35CR4	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A35CR5	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A35CR6	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A35CR7	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A35DS1	1990-0487	7	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A35F1	2110-0425	0	1	FUSE 2A 125V .25X.27	28480	2110-0425
A35MP1, 2				NOT ASSIGNED		
A35MP3	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A35MP4	1200-0081	4	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0081
A35MP5	2200-0107	6	4	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A35MP6	6040-0454	0		THERMAL COMPOUND SYNTH	28480	6040-0454
A35MP7	08340-00009	2	1	HEAT SINK RECTIFIER	28480	08340-00009
A35P1	1251-2313	6	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A35P2	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A35Q1	1884-0018	5	2	THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A35Q2	1884-0018	5		THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A35R1	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A35R2	0698-3406	5	1	RESISTOR 1.33K 1% .5W F TC=0+-100	28480	0698-3406
A35R3	2100-3123	0	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 17-TRN	02111	43P501
A35R4	0698-0082	7	1	RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A35R5	0757-0346	2	1	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A35R6	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A35R7	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A35TP1-5	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A35U1	1906-0239	0	1	DIODE-CT-RECT 45V 30A	01281	SD-241
A35U2	1826-0423	4	1	IC V RGLTR TO-3	27014	LM317K
A35VR1	1902-0197	1	1	DIODE-ZNR 82V 5% PD=1W IR=5UA	28480	1902-0197
A35VR2	1902-1249	6	1	DIODE-ZNR 24.9V 5% DO-15 PD=1W TC=+.081%	28480	1902-1249
A35VR3	1902-0202	9	1	DIODE-ZNR 15V 5% PD=1W IR=5UA	28480	1902-0202

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A36	**08340-60042**	**9**	**1**	**PLL1 VCO**	**28480**	**08340-60042**
A36C1	0160-0574	3	8	CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A36C2	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A36C3	0160-3875	3	3	CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A36C4	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A36C5	0160-3877	5	1	CAPACITOR-FXD 100PF +20% 200VDC CER	28480	0160-3877
A36C6	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A36C7	0160-3875	3		CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A36C8	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A36C9	0160-3878	6	3	CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A36C10	0160-3874	2	5	CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A36C11	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A36C12	0160-3874	2		CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A36C13	0160-3874	2		CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A36C14	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A36C15	0160-3874	2		CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A36C16	0160-3874	2		CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A36C17	0160-3875	3		CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A36C18	0160-4084	8	1	CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A36C19	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A36C20	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A36C21	0160-4953	0	4	CAPACITOR-CER .027 UF 50VDC	28480	0160-4953
A36C22	0160-4953	0		CAPACITOR-CER .027 UF 50VDC	28480	0160-4953
A36C23	0160-4953	0		CAPACITOR-CER .027 UF 50VDC	28480	0160-4953
A36C24	0160-4951	8	3	CAPACITOR-FXD .033UF +5% 50VDC CER	28480	0160-4951
A36C25	0160-4952	9	1	CAPACITOR-FXD .039UF +5% 50VDC CER	28480	0160-4952
A36C26	0160-0158	9	1	CAPACITOR-FXD 5600PF +10% 200VDC POLYE	28480	0160-0158
A36C27	0180-0116	1	2	CAPACITOR-FXD 6.8UF+10% 35VDC TA	56289	150D685X9035B2
A36C28	0180-0116	1		CAPACITOR-FXD 6.8UF+10% 35VDC TA	56289	150D685X9035B2
A36C29	0180-0291	3	1	CAPACITOR-FXD 1UF+10% 35VDC TA	56289	150D105X9035A2
A36C30	0180-0197	8	2	CAPACITOR-FXD 2.2UF+10% 20VDC TA	56289	150D225X9020A2
A36C31	0160-4953	0		CAPACITOR-CER .027 UF 50VDC	28480	0160-4953
A36C32	0160-4298	6	1	CAPACITOR-FXD 4700PF +20% 250VDC CER	56289	C067F251H472MS22-CDH
A36C33	0160-4951	8		CAPACITOR-FXD .033UF +5% 50VDC CER	28480	0160-4951
A36C34	0160-4951	8		CAPACITOR-FXD .033UF +5% 50VDC CER	28480	0160-4951
A36C35	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574.
A36C36	0180-0197	8		CAPACITOR-FXD 2.2UF+10% 20VDC TA	56289	150D225X9020A2
A36CR1	1901-0040	1	5	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A36CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A36CR3	0122-0072	6	2	DIODE-VVC 2.2PF 5% C3/C25-MIN=4.5	04713	BB105B
A36CR4	0122-0072	6		DIODE-VVC 2.2PF 5% C3/C25-MIN=4.5	04713	BB105B
A36CR5	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A36CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A36CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A36J1	1250-0690	6	2	CONNECTOR-RF MALE SMB	28480	1250-0690
A36J2	1250-0690	6		CONNECTOR-RF MALE SMB	28480	1250-0690
A36L1	9100-2257	6	2	INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A36L2	9100-2891	4	1	INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A36L3	9100-2257	6		INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A36L4	85660-80004	4	1	INDUCTOR- 30 NH	28480	85660-80004
A36L5	85660-80005	5	1	INDUCTOR- 4 NH	28480	85660-80005
A36L6	9100-2258	7	2	INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A36L7	85660-80008	8	2	INDUCTOR-ADJ .4 MH	28480	85660-80008
A36L8	85660-80008	8		INDUCTOR-ADJ .4 MH	28480	85660-80008
A36L9	9100-1647	6	1	INDUCTOR RF-CH-MLD 470UH 5% .2DX.45LG	28480	9100-1647
A36L10	9100-1788	6	3	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A36L11	9100-1788	6		CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A36L12	9100-1788	6		CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A36L13	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A36L14	9100-2254	3	2	INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A36L15	9100-2254	3		INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A36L16	9100-2247	4	1	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A36MP1	2190-0124	4	6	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A36MP2	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A36MP3	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A36MP4	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A36MP5	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A36MP6	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A36MP7	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A36MP8	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A36MP9	86701-40001	9	1	EXTRACTOR PC BOARD	28480	86701-40001

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A36MP10	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A36MP11	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A36MP12	08340-20094	7	1	COVER-PC PLL1 VCO	28480	08340-20094
A36MP13	85660-00038	6	1	SHIELDING CAN	28480	85660-00038
A36MP14	85660-20068	4	3	GROUND LUG	28480	85660-20068
A36MP15	85660-20068	4		GROUND LUG	28480	85660-20068
A36MP16	85660-20068	4		GROUND LUG	28480	85660-20068
A36Q1	1855-0420	2	4	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A36Q2	1854-0023	9	3	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0023
A36Q3	1854-0345	8	4	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A36Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A36Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A36Q6	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A36Q7	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A36Q8	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A36Q9	1854-0023	9		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0023
A36Q10	1854-0023	9		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0023
A36Q11	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A36R1	0757-0395	1	2	RESISTOR 56.2 1% .125W F TC=0+100	24546	C4-1/8-T0-56R2-F
A36R2	0757-0280	3	11	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R3	0757-0317	7	1	RESISTOR 1.33K 1% .125W F TC=0+100	24546	C4-1/8-T0-1331-F
A36R4	0757-0441	8	2	RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A36R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R6	0757-0123	3	4	RESISTOR 34.8K 1% .125W F TC=0+100	28480	0757-0123
A36R7	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A36R8	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R9	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A36R10	0757-0460	1	1	RESISTOR 61.9K 1% .125W F TC=0+100	24546	C4-1/8-T0-6192-F
A36R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R12	0698-0082	7	1	RESISTOR 464 1% .125W F TC=0+100	24546	C4-1/8-T0-4640-F
A36R13	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A36R14	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R15	0757-0402	1	2	RESISTOR 110 1% .125W F TC=0+100	24546	C4-1/8-T0-111-F
A36R16	0698-7195	7	1	RESISTOR 19.6 1% .05W F TC=0+100	24546	C3-1/8-T0-19R6-F
A36R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R18	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+100	24546	C4-1/8-T0-4641-F
A36R19	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A36R20	0757-0395	1		RESISTOR 56.2 1% .125W F TC=0+100	24546	C4-1/8-T0-56R2-F
A36R21	0698-3438	3	2	RESISTOR 147 1% .125W F TC=0+100	24546	C4-1/8-T0-147R-F
A36R22	0698-3438	3		RESISTOR 147 1% .125W F TC=0+100	24546	C4-1/8-T0-147R-F
A36R23	0757-0458	7	2	RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A36R24	0757-0289	2	3	RESISTOR 13.3K 1% .125W F TC=0+100	19701	MF4C1/8-T0-1332-F
A36R25	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+100	19701	MF4C1/8-T0-1332-F
A36R26	0757-0416	7	4	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A36R27	0757-0123	3		RESISTOR 34.8K 1% .125W F TC=0+100	28480	0757-0123
A36R28	0757-0123	3		RESISTOR 34.8K 1% .125W F TC=0+100	28480	0757-0123
A36R29	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A36R30	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A36R31	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A36R32	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+100	19701	MF4C1/8-T0-1332-F
A36R33	0698-3159	5	1	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A36R34	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+100	19701	MF4C1/8-T0-6191-F
A36R35	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-5112-F
A36R36	0757-0402	1		RESISTOR 110 1% .125W F TC=0+100	24546	C4-1/8-T0-111-F
A36R37	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A36R38	0757-0123	3		RESISTOR 34.8K 1% .125W F TC=0+100	28480	0757-0123
A36R39	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A36R40	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A36R41	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A36R42	0698-7188	8	1	RESISTOR 10 1% .05W F TC=0+100	24546	C3-1/8-T0-10R-F
A36R43	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R44	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R45	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R46	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R47	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A36R48	0757-0462	3	4	RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A36R49	0757-0462	3		RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A36R50	0757-0462	3		RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A36R51	0757-0462	3		RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A36TP1	0360-0535	0	4	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A36TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A36TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A36TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A36U1	1810-0204	6	1	NETWORK-RES 8-SIP 1.0K OHM X 7	01121	208A102
A36U2	1820-0802	1	1	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A36U3	1820-1888	5	1	IC PRESCR ECL	04713	MC12013L
A36U4	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A36U5	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A36U6	1826-0092	3	1	IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A36VR1	1902-3048	7	1	DIODE-ZNR 3.48V 5% DO-35 PD=.4W	28480	1902-3048
A36W1	08340-60106	6	1	CABLE ASSEMBLY- A36	28480	08340-60106

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A37	**08340-60043**	**0**	**1**	**PLL1 DIVIDER**	**28480**	**08340-60043**
A37C1	0160-0574	3	8	CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C2	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C3	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C4	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C5	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C6	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C7	0160-0570	9	2	CAPACITOR-FXD 220PF ±20% 100VDC CER	20932	5024EM100RD221M
A37C8	0160-0570	9		CAPACITOR-FXD 220PF ±20% 100VDC CER	20932	5024EM100RD221M
A37C9	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C10	0160-4084	8	1	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A37C11	0160-3875	3	1	CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A37C12	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A37C13	0180-2207	5	1	CAPACITOR-FXD 100UF±10% 10VDC TA	56289	150D107X9010R2
A37CR1	1901-0040	1	2	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A37CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A37DS1	1990-0485	5	1	LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	5082-4984
A37J1	1250-0690	6	1	CONNECTOR-RF MALE SMB	28480	1250-0690
A37L1	9100-2255	4	1*	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A37L2	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A37MP1	0520-0128	7	2	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A37MP2	0520-0128	7		SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A37MP3	0590-0533	5	2	THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A37MP4	0590-0533	5		THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A37MP5	1205-0285	0	1	HEAT SINK SGL DIP	28480	1205-0285
A37MP6	2190-0014	1	2	WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A37MP7	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A37MP8	2190-0124	4	4	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A37MP9	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A37MP10	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A37MP11	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A37MP12	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A37MP13	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A37MP14	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A37MP15	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A37MP16	08340-20083	4	1	COVER-PC PLL1 DIVIDER	28480	08340-20083
A37MP17	85660-00012	6	1	HEAT SINK- BOTTOM	28480	85660-00012
A37MP18	85660-20068	4	2	GROUND LUG	28480	85660-20068
A37MP19	85660-20068	4		GROUND LUG	28480	85660-20068
A37MP20	86701-40001	9	2	EXTRACTOR-PC BOARD	28480	86701-40001
A37MP21	86701-40001	9		EXTRACTOR-PC BOARD	28480	86701-40001
A37Q1	1853-0405	9	1	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A37Q2	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A37Q3	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A37R1	0757-0280	3	19	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R2	0698-3431	6	1	RESISTOR 23.7 1% .125W F TC=0+100	03888	PME55-1/8-T0-23R7-F
A37R3	0757-0403	2	2	RESISTOR 121 1% .125W F TC=0+100	24546	C4-1/8-T0-121R-F
A37R4	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A37R6	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A37R7	0757-0416	7	5	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A37R8	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A37R9	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A37R10	0698-3440	7	4	RESISTOR 196 1% .125W F TC=0±100	24546	C4-1/8-T0-196R-F
A37R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R12	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A37R13	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A37R14	0698-3440	7		RESISTOR 196 1% .125W F TC=0±100	24546	C4-1/8-T0-196R-F
A37R15	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A37R16	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R17	0698-3440	7		RESISTOR 196 1% .125W F TC=0±100	24546	C4-1/8-T0-196R-F
A37R18	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R19	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A37R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A37R21	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A37R23	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A37R24	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A37R25	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A37R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R27	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R29	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R30	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A37R31	0698-3440	7		RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A37R32	0757-0403	2		RESISTOR 121 1% .125W F TC=0+100	24546	C4-1/8-T0-121R-F
A37R33	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A37R34	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37R35	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A37TP1	0360-0535	0	14	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP11	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP12	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP13	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37TP14	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A37U1	1820-0909	9	2	IC MULTR TTL	01295	SN74167N
A37U2	1820-0909	9		IC MULTR TTL	01295	SN74167N
A37U3	1820-0808	7	1	IC GATE ECL NOR DUAL 3-INP	04713	MC10111P
A37U4	1820-1225	4	1	IC FF ECL D-M/S DUAL	04713	MC10231P
A37U5	1820-1320	0	1	IC RCVR ECL LINE RCVR TPL 2-INP	04713	MC10216L
A37U6	1810-0204	6	4	NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A37U7	1820-0802	1	1	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A37U8	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A37U9	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A37U10	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A37U11	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A37U12	1820-0821	4	1	IC CNTR ECL BIN UP/DOWN SYNCHRO	04713	MC10136L
A37U13	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A37U14	1820-0817	8	3	IC FF ECL D-M/S DUAL	04713	MC10131P
A37U15	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A37U16	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A37VR1	1902-3059	0	1	DIODE-ZNR 3.83V 5% DO-35 PD=.4W	28480	1902-3059
A37W1	08340-60107	7	1	CABLE ASSEMBLY- A37	28480	08340-60107

See introduction to this section for ordering information
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Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A38	**08340-60044**	**1**	**1**	**PLL1 IF**	**28480**	**08340-60044**
A38C1	0160-3878	6	5	CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A38C2	0160-0574	3	12	CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C3	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A38C4	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A38C5	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C6	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A38C7	0160-3875	3	4	CAPACITOR-FXD 22PF ±5% 200VDC CER 0+30	28480	0160-3875
A38C8	0160-3875	3		CAPACITOR-FXD 22PF ±5% 200VDC CER 0+30	28480	0160-3875
A38C9	0160-3875	3		CAPACITOR-FXD 22PF ±5% 200VDC CER 0+30	28480	0160-3875
A38C10	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C11	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A38C12	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C13	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C14	0160-3876	4	1	CAPACITOR-FXD 47PF +20% 200VDC CER	28480	0160-3876
A38C15	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C16	0160-3653	5	1	CAPACITOR-FXD 33PF +5% 200VDC CER 0+30	28480	0160-3653
A38C17	0160-3878	6		CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A38C18	0160-3874	2		CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A38C19	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A38C20	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C21	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A38C22	0160-0574	3		CAPACITOR-FXD .022UF ±20% 100VDC CER	28480	0160-0574
A38C23	0160-3874	2		CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A38C24	0160-3875	3		CAPACITOR-FXD 22PF ±5% 200VDC CER 0+30	28480	0160-3875
A38C25	0160-3565	8	3	CAPACITOR-FXD 6.8PF ±.5PF 100VDC CER	28480	0160-3565
A38C26*	0160-3874	2	4	CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A38C27	0160-3565	8		CAPACITOR-FXD 6.8PF ±.5PF 100VDC CER	28480	0160-3565
A38C28	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A38C29	0160-3874	2		CAPACITOR-FXD 10PF ±.5PF 200VDC CER	28480	0160-3874
A38C30	0160-3565	8		CAPACITOR-FXD 6.8PF ±.5PF 100VDC CER	28480	0160-3565
A38C31	0160-3873	1	1	CAPACITOR-FXD 4.7PF ±.5PF 200VDC CER	28480	0160-3873
A38C32	0160-4289	5	1	CAPACITOR-FXD 15PF ±5% 100VDC CER 0+30	51642	150100C0G150J
A38CR1	1901-0535	9	2	DIODE-SM SIG SCHOTTKY	28480	1901-0535
A38CR2	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A38J1	1250-0690	6	1	CONNECTOR-RF MALE SMB	28480	1250-0690
A38L1	9100-2256	5	3	INDUCTOR RF-CH-MLD 560NH 10% .105DX.26LG	28480	9100-2256
A38L2	9100-2247	4	5	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A38L3	9100-2248	5	3	INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A38L4	9100-2248	5		INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A38L5	9100-2891	4	3	INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A38L6	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A38L7	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A38L8	9100-1788	6	2	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A38L9	9100-1788	6		CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A38L10	9100-0368	6	1	INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A38L11	85660-80006	6	2	INDUCTOR- 120 NH	28480	85660-80006
A38L12	85660-80009	9	1	INDUCTOR- 100 NH	28480	85660-80009
A38L13	85660-80006	6		INDUCTOR- 120 NH	28480	85660-80006
A38L14	9100-2251	0	1	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A38L15	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A38L16	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A38L17	9100-2248	5		INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A38L18	9100-2256	5		INDUCTOR RF-CH-MLD 560NH 10% .105DX.26LG	28480	9100-2256
A38L19	9100-2256	5		INDUCTOR RF-CH-MLD 560NH 10% .105DX.26LG	28480	9100-2256
A38L20	9100-2891	4		INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A38L21	9100-2891	4		INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A38MP1				NOT ASSIGNED		
A38MP2	2190-0124	4	6	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A38MP3	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A38MP4	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A38MP5	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A38MP6	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A38MP7	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A38MP8	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A38MP9	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A38MP10	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A38MP11	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A38MP12	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A38MP13	08340-20084	5	1	COVER-PC PLL1 IF	28480	08340-20084
A38MP14	85660-00038	6	2	SHIELDING CAN	28480	85660-00038

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A38MP15	85660-00038	6		SHIELDING CAN	28480	85660-00038
A38MP16	85660-00040	0	1	SHIELDING CAN	28480	85660-00040
A38MP17	85660-20068	4	3	GROUND LUG	28480	85660-20068
A38MP18	85660-20068	4		GROUND LUG	28480	85660-20068
A38MP19	85660-20068	4		GROUND LUG	28480	85660-20068
A38MP20	86701-40001	9	2	EXTRACTOR-PC BOARD	28480	86701-40001
A38MP21	86701-40001	9		EXTRACTOR-PC BOARD	28480	86701-40001
A38Q1	1854-0345	8	4	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A38Q2	1854-0378	7	1	TRANSISTOR NPN 2N5109 SI TO-39 PD=800MW	3L585	2N5109
A38Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A38Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A38Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A38R1	0757-0394	0	3	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A38R2	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC=0+100	24546	C4-1/8-T0-3481-F
A38R3	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+100	24546	C4-1/8-T0-825R-F
A38R4	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A38R5	0698-3429	2	3	RESISTOR 19.6 1% .125W F TC=0+100	03888	PME55-1/8-T0-19R6-F
A38R6	0698-3438	3	1	RESISTOR 147 1% .125W F TC=0+100	24546	C4-1/8-T0-147R-F
A38R7	0698-3446	3	1	RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A38R8	0698-3440	7	2	RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A38R9	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A38R10	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A38R11	0757-0397	3	1	RESISTOR 68.1 1% .125W F TC=0+100	24546	C4-1/8-T0-68R1-F
A38R12	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A38R13	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A38R14	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+100	24546	C4-1/8-T0-3481-F
A38R15	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+100	24546	C4-1/8-T0-511R-F
A38R16	0698-3444	1	2	RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A38R17	0757-0346	2	1	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A38R18	0698-3444	1		RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A38R19	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A38R20	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+100	03888	PME55-1/8-T0-19R6-F
A38R21	0757-0280	3	5	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A38R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A38R23	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A38R24	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+100	03888	PME55-1/8-T0-19R6-F
A38R25	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A38R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A38R27	0698-3440	7		RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A38U1	0955-0063	0	1	MIXER-DOUBLER 5-500 MH	28480	0955-0063
A38W1	08340-60108	8	1	CABLE ASSEMBLY- A38	28480	08340-60108
A38W2	08340-60113	5	1	CABLE ASSEMBLY- A38	28480	08340-60113

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A39	**08340-60045**	**2**	**1**	**PLL3 UPCONVERTER**	**28480**	**08340-60045**
A39C1	0160-0574	3	16	CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C2	0160-0572	1	2	CAPACITOR-FXD 2200PF +20% 100VDC CER	28480	0160-0572
A39C3	0160-0572	1		CAPACITOR-FXD 2200PF +20% 100VDC CER	28480	0160-0572
A39C4	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C5	0160-4084	8	3	CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A39C6	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A39C7	0180-0291	3	2	CAPACITOR-FXD 1UF+10% 35VDC TA	56289	150D105X9035A2
A39C8	0160-0161	4	2	CAPACITOR-FXD .01UF +10% 200VDC POLYE	28480	0160-0161
A39C9	0160-0161	4		CAPACITOR-FXD .01UF +10% 200VDC POLYE	28480	0160-0161
A39C10	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C11	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C12	0180-0228	6	3	CAPACITOR-FXD 22UF+10% 15VDC TA	56289	150D226X9015B2
A39C13	0180-0291	3		CAPACITOR-FXD 1UF+10% 35VDC TA	56289	150D105X9035A2
A39C14	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C15	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C16	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C17	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A39C18	0160-3749	0	2	CAPACITOR-FXD 330PF +10% 50VDC CER	28480	0160-3749
A39C19	0160-3877	5	3	CAPACITOR-FXD 100PF +20% 200VDC CER	28480	0160-3877
A39C20	0160-3749	0		CAPACITOR-FXD 330PF +10% 50VDC CER	28480	0160-3749
A39C21	0180-0228	6		CAPACITOR-FXD 22UF+10% 15VDC TA	56289	150D226X9015B2
A39C22	0160-3876	4	1	CAPACITOR-FXD 47PF +20% 200VDC CER	28480	0160-3876
A39C23	0180-0228	6		CAPACITOR-FXD 22UF+10% 15VDC TA	56289	150D226X9015B2
A39C24	0160-3877	5		CAPACITOR-FXD 100PF +20% 200VDC CER	28480	0160-3877
A39C25	0160-0571	0	2	CAPACITOR-FXD 470PF +20% 100VDC CER	28480	0160-0571
A39C26	0160-3877	5		CAPACITOR-FXD 100PF +20% 200VDC CER	28480	0160-3877
A39C27	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C28	0160-0571	0		CAPACITOR-FXD 470PF +20% 100VDC CER	28480	0160-0571
A39C29	0160-3878	6	1	CAPACITOR-FXD 1000PF +20% 100VDC CER	28480	0160-3878
A39C30	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C31	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C32	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C33	0160-3875	3	3	CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A39C34	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C35	0160-3872	0	2	CAPACITOR-FXD 2.2PF +.25PF 200VDC CER	28480	0160-3872
A39C36	0160-3872	0		CAPACITOR-FXD 2.2PF +.25PF 200VDC CER	28480	0160-3872
A39C37	0160-3565	8	1	CAPACITOR-FXD 6.8PF +.5PF 100VDC CER	28480	0160-3565
A39C38	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C39	0160-3874	2	3	CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A39C40	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C41	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C42	0160-0574	3		CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A39C43	0160-3873	1	2	CAPACITOR-FXD 4.7PF +.5PF 200VDC CER	28480	0160-3873
A39C44	0160-3875	3		CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A39C45	0160-3874	2		CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A39C46	0160-3874	2		CAPACITOR-FXD 10PF +.5PF 200VDC CER	28480	0160-3874
A39C47	0160-3873	1		CAPACITOR-FXD 4.7PF +.5PF 200VDC CER	28480	0160-3873
A39C48	0160-3875	3		CAPACITOR-FXD 22PF +5% 200VDC CER 0+30	28480	0160-3875
A39C49*	0160-4521	8	1	CAPACITOR-FXD 12PF +5% 200VDC CER 0+30	28480	0160-4521
A39C50	0121-0452	4	1	CAPACITOR-V TRMR-AIR 1.3-5.4PF 175V	74970	187-0103-028
A39CR1	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A39CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A39CR3	0122-0072	6	1	DIODE-VVC 2.2PF 5% C3/C25-MIN=4.5	04713	BB105B
A39CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A39CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A39DS1	1990-0485	5	1	LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	5082-4984
A39J1	1250-0690	6	2	CONNECTOR-RF MALE SMB	28480	1250-0690
A39J2	1250-0690	6		CONNECTOR-RF MALE SMB	28480	1250-0690
A39J3	1250-0257	1	1	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A39L1	9140-0179	1	2	INDUCTOR RF-CH-MLD 22UH 10% .166DX.385LG	28480	9140-0179
A39L2	9140-0179	1		INDUCTOR RF-CH-MLD 22UH 10% .166DX.385LG	28480	9140-0179
A39L3	9100-1788	6	2	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A39L4	9100-1788	6		CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A39L5	9100-2258	7	7	INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A39L6	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A39L7	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A39L8	9100-2257	6	1	INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A39L9	9100-2254	3	1	INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A39L10	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A39L11	85660-80006	6	3	INDUCTOR- 120 NH	28480	85660-80006
A39L12	9100-2255	4	1	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A39L13	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A39L14	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A39L15	9135-0073	3	2	INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A39L16	85660-80006	6		INDUCTOR- 120 NH	28480	85660-80006
A39L17	85660-80006	6		INDUCTOR- 120 NH	28480	85660-80006
A39L18	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A39L19	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A39L20	9100-2251	0	1	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A39L21	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A39L22	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A39MP1	1200-0172	4	5	INSULATOR-XSTR DAP-GL	28480	1200-0172
A39MP2	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A39MP3	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A39MP4	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A39MP5	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A39MP6	2190-0124	4	6	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A39MP7	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A39MP8	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A39MP9	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A39MP10	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A39MP11	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A39MP12	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A39MP13	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A39MP14	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A39MP15	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A39MP16	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A39MP17	08340-20085	6	1	COVER-PC PLL1 UPCONVERTER	28480	08340-20085
A39MP18	85660-00042	2	1	SHIELDING CAN	28480	85660-00042
A39MP19	85660-20068	4	3	GROUND LUG	28480	85660-20068
A39MP20	85660-20068	4		GROUND LUG	28480	85660-20068
A39MP21	85660-20068	4		GROUND LUG	28480	85660-20068
A39MP22	86701-40001	9	1	EXTRACTOR-PC BOARD	28480	86701-40001
A39MP23	3050-0082	8	1	WASHER-FL NM NO. 4 .116-IN-ID .188-IN-OD	28480	3050-0082
A39Q1	1854-0345	8	4	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A39Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A39Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A39Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A39Q5	1855-0327	8	1	TRANSISTOR J-FET 2N4416 N-CHAN D-MODE	01295	2N4416
A39R1	0698-3440	7	3	RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A39R2	0757-0394	0	2	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A39R3	0698-0083	8	3	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A39R4	0757-0418	9	1	RESISTOR 619 1% .125W F TC=0+100	24546	C4-1/8-T0-619R-F
A39R5	0757-0280	3	5	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A39R6	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A39R7	0698-3159	5	2	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A39R8	0698-3159	5		RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4-1/8-T0-2612-F
A39R9	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A39R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A39R11	0757-0438	3	3	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A39R12	0757-0441	8	3	RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A39R13	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A39R14	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A39R15	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+100	24546	C4-1/8-T0-422R-F
A39R16	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A39R17	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+100	24546	C4-1/8-T0-8251-F
A39R18	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A39R19	0757-0346	2	4	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A39R20	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A39R21	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A39R22	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+100	24546	C4-1/8-T0-825R-F
A39R23	0757-0466	7	1	RESISTOR 110K 1% .125W F TC=0+100	24546	C4-1/8-T0-1103-F
A39R24	0698-3156	2	2	RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A39R25	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A39R26	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A39R27	0698-3440	7		RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A39R28	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A39R29	0757-0397	3	2	RESISTOR 68.1 1% .125W F TC=0+100	24546	C4-1/8-T0-68R1-F
A39R30	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A39R31	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+100	24546	C4-1/8-T0-1472-F
A39R32	0698-7219	6	1	RESISTOR 196 1% .05W F TC=0+100	24546	C3-1/8-T0-196R-F
A39R33	0757-0397	3		RESISTOR 68.1 1% .125W F TC=0+100	24546	C4-1/8-T0-68R1-F
A39R34	0698-3440	7		RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A39R35	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A39R36	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A39R37	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A39R38	0698-7192	4	1	RESISTOR 14.7 1% .05W F TC=0±100	24546	C3-1/8-TO-14R7-F
A39R39	0698-7230	1	2	RESISTOR 562 1% .05W F TC=0±100	24546	C3-1/8-TO-562R-F
A39R40	0698-7188	8	1	RESISTOR 10 1% .05W F TC=0±100	24546	C3-1/8-TO-10R-F
A39R41	0698-7200	5	2	RESISTOR 31.6 1% .05W F TC=0±100	24546	C3-1/8-TO-31R6-F
A39R42	0698-7236	7	2	RESISTOR 1K 1% .05W F TC=0±100	24546	C3-1/8-T0-1001-F
A39R43	0698-7248	1	1	RESISTOR 3.16K 1% .05W F TC=0±100	24546	C3-1/8-T0-3161-F
A39R44	0698-7236	7		RESISTOR 1K 1% .05W F TC=0±100	24546	C3-1/8-T0-1001-F
A39R45	0698-7230	1		RESISTOR 562 1% .05W F TC=0±100	24546	C3-1/8-TO-562R-F
A39R46	0698-7218	5	2	RESISTOR 178 1% .05W F TC=0±100	24546	C3-1/8-TO-178R-F
A39R47	0698-7200	5		RESISTOR 31.6 1% .05W F TC=0±100	24546	C3-1/8-TO-31R6-F
A39R48	0698-7218	5		RESISTOR 178 1% .05W F TC=0±100	24546	C3-1/8-TO-178R-F
A39R49	0698-7207	2	1	RESISTOR 61.9 1% .05W F TC=0±100	24546	C3-1/8-TO-61R9-F
A39TP1	0360-0535	0	3	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A39TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A39TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A39U1	1826-0092	3	1	IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A39U2	1826-0261	8	1	IC OP AMP LOW-NOISE TO-99 PKG	28480	1826-0261
A39U3	1820-1383	5	1	IC CNTR ECL BCD POS-EDGE-TRIG	04713	MC10138L
A39U4	1810-0205	7	1	NETWORK-RES 8-SIP4.7K OHM X 7	01121	208A472
A39U5	1820-0817	8	1	IC FF ECL D-M/S DUAL	04713	MC10131P
A39U6	1820-0802	1	1	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A39U7	0955-0063	0	1		28480	0955-0063
A39W1	08340-60109	9	1	CABLE ASSEMBLY- A39	28480	08340-60109

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A40	**08340-60046**	**3**	**1**	**PLL2 VCO**	**28480**	**08340-60046**
A40C1	0160-0300	3	1	CAPACITOR-FXD 2700PF +10% 200VDC POLYE	28480	0160-0300
A40C2	0160-0155	6	1	CAPACITOR-FXD 3300PF ±10% 200VDC POLYE	28480	0160-0155
A40C3	0160-0154	5	1	CAPACITOR-FXD 2200PF ±10% 200VDC POLYE	28480	0160-0154
A40C4	0160-3879	7	4	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A40C5	0160-4084	8	14	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C6	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A40C7	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A40C8	0160-3878	6	6	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A40C9	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C10	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A40C11	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A40C12	0160-4525	2	1	CAPACITOR-FXD 29PF ±5% 200VDC CER 0±30	28480	0160-4525
A40C13	0160-4524	1	1	CAPACITOR-FXD 24PF ±5% 200VDC CER 0±30	51642	200-200-NP0-240J
A40C14	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A40C15	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A40C16	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A40C17	0160-3878	6		CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A40C18	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C19	0160-0127	2	1	CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A40C20	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C21	0160-0571	0	1	CAPACITOR-FXD 470PF ±20% 100VDC CER	28480	0160-0571
A40C22	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C23	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C24	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C25	0160-3877	5	1	CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A40C26	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C27	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C28	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C29	0180-2141	6	2	CAPACITOR-FXD 3.3UF±10% 50VDC TA	56289	150D335X9050B2
A40C30	0180-2141	6		CAPACITOR-FXD 3.3UF±10% 50VDC TA	56289	150D335X9050B2
A40C31	0180-1715	8	1	CAPACITOR-FXD 150UF±10% 6VDC TA	56289	150D157X9006R2
A40C32	0180-1746	5	2	CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A40C33	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C34	0180-0229	7	1	CAPACITOR-FXD 33UF±10% 10VDC TA	56289	150D336X9010B2
A40C35	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C36	0180-1746	5		CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A40C37	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40C38	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A40CR1	0122-0078	2	4	DIODE-VVC BVR=30V Q=225-MIN	28480	0122-0078
A40CR2	0122-0078	2		DIODE-VVC BVR=30V Q=225-MIN	28480	0122-0078
A40CR3	0122-0078	2		DIODE-VVC BVR=30V Q=225-MIN	28480	0122-0078
A40CR4	0122-0078	2		DIODE-VVC BVR=30V Q=225-MIN	28480	0122-0078
A40J1	1250-0544	9	5	CONNECTOR-RF MALE SMB	28480	1250-0544
A40J2	1250-0544	9		CONNECTOR-RF MALE SMB	28480	1250-0544
A40J3	1250-0544	9		CONNECTOR-RF MALE SMB	28480	1250-0544
A40J4	1250-0544	9		CONNECTOR-RF MALE SMB	28480	1250-0544
A40J5	1250-0544	9		CONNECTOR-RF MALE SMB	28480	1250-0544
A40L1	85660-80031	7	2	INDUCTOR	28480	85660-80031
A40L2	85660-80031	7		INDUCTOR	28480	85660-80031
A40L3	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A40L4	9100-3358	0	2	INDUCTOR RF-CH-MLD 162NH 5% .2DX.385LG	28480	9100-3358
A40L5	9100-3358	0		INDUCTOR RF-CH-MLD 162NH 5% .2DX.385LG	28480	9100-3358
A40L6	9100-2251	0	1	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A40L7	9140-0158	6	2	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A40L8	9100-2247	4	8	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L9	9100-2891	4	2	INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A40L10	9100-2891	4		INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A40L11	9140-0158	6		INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A40L12	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L13	9100-2258	7	1	INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A40L14	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH 10% .105DX.26LG	28480	9100-2250
A40L15	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L16	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L17	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L18	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L19	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L20	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A40L21	9100-1618	1	3	INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A40L22	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A40L23	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A40MP1	1200-0172	4	4	INSULATOR-XSTR DAP-GL	28480	1200-0172

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A40MP2	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A40MP3	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A40MP4	1200-0172	4		INSULATOR-XSTR DAP-GL	28480	1200-0172
A40MP5	2190-0124	4	1	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A40MP6	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A40MP7	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A40MP8	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A40MP9	08340-20086	7	1	COVER-PC PLL2 VCO	28480	08340-20086
A40MP10	86701-40001	9	2	EXTRACTOR-PC BOARD	28480	86701-40001
A40MP11	86701-40001	9		EXTRACTOR-PC BOARD	28480	86701-40001
A40Q1	1854-0610	0	2	TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A40Q2	1854-0610	0		TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A40Q3	1854-0345	8	2	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A40Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A40Q5	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A40Q6	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A40R1	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0+100	24546	C4-1/8-T0-2611-F
A40R2	2100-3273	1	2	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
A40R3	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+100	24546	C4-1/8-T0-1621-F
A40R4	2100-3273	1		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
A40R5	0757-0447	4	1	RESISTOR 16.2K 1% .125W F TC=0±100	24546	C4-1/8-T0-1622-F
A40R6	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A40R7	0698-7205	0	2	RESISTOR 51.1 1% .05W F TC=0±100	24546	C3-1/8-T0-51R1-F
A40R8	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0±100	24546	C3-1/8-T0-51R1-F
A40R9	0757-0346	2	4	RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A40R10	0698-7228	7	2	RESISTOR 464 1% .05W F TC=0±100	24546	C3-1/8-T0-464R-F
A40R11	0698-7228	7		RESISTOR 464 1% .05W F TC=0+100	24546	C3-1/8-T0-464R-F
A40R12	0698-7188	8	1	RESISTOR 10 1% .05W F TC=0±100	24546	C3-1/8-T0-10R-F
A40R13	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A40R14	0757-0398	4	4	RESISTOR 75 1% .125W F TC=0±100	24546	C4-1/8-T0-75R0-F
A40R15	0757-0398	4		RESISTOR 75 1% .125W F TC=0±100	24546	C4-1/8-T0-75R0-F
A40R16	0757-0418	9	1	RESISTOR 619 1% .125W F TC=0+100	24546	C4-1/8-T0-619R-F
A40R17	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A40R18	0757-0419	0	3	RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A40R19	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A40R20	0757-0400	9	1	RESISTOR 90.9 1% .125W F TC=0±100	24546	C4-1/8-T0-90R9-F
A40R21	0757-0398	4		RESISTOR 75 1% .125W F TC=0+100	24546	C4-1/8-T0-75R0-F
A40R22	0757-0398	4		RESISTOR 75 1% .125W F TC=0±100	24546	C4-1/8-T0-75R0-F
A40R23	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A40R24	0698-4037	0	1	RESISTOR 46.4 1% .125W F TC=0+100	24546	C4-1/8-T0-46R4-F
A40R25	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A40R26	0757-0280	3	5	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A40R27	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A40R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A40R29	0757-0316	6	1	RESISTOR 42.2 1% .125W F TC=0+100	24546	C4-1/8-T0-42R2-F
A40R30	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A40R31	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A40R32	0698-3446	3	1	RESISTOR 383 1% .125W F TC=0+100	24546	C4-1/8-T0-383R-F
A40R33	0698-3444	1	2	RESISTOR 316 1% .125W F TC=0±100	24546	C4-1/8-T0-316R-F
A40R34	0757-0419	0		RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A40R35	0698-3444	1		RESISTOR 316 1% .125W F TC=0±100	24546	C4-1/8-T0-316R-F
A40R36	0757-0419	0		RESISTOR 681 1% .125W F TC=0+100	24546	C4-1/8-T0-681R-F
A40R37	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A40R38	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A40R39	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A40R40	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A40R41	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A40R42	0757-0397	3	1	RESISTOR 68.1 1% .125W F TC=0+100	24546	C4-1/8-T0-68R1-F
A40R43	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0±100	24546	C4-1/8-T0-2610-F
A40R44	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A40T1	08553-6012	5	1	TRANSFORMER-RF (BLUE)	28480	08553-6012
A40TP1	0360-0535	0	1	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A40U1	1820-1383	5	2	IC CNTR ECL BCD POS-EDGE-TRIG	04713	MC10138L
A40U2	1820-1383	5		IC CNTR ECL BCD POS-EDGE-TRIG	04713	MC10138L
A40U3	1820-2047	0	1	IC DIVR ECL QUINARY	52648	SP8622BDG
A40U4	1810-0205	7	1	NETWORK-RES 8-SIP4.7K OHM X 7	01121	208A472
A40U5	1820-0802	1	3	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A40U6	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A40U7	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A40W1	08340-60110	2	1	CABLE ASSEMBLY- A40	28480	08340-60110

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A41	**08340-60162**	**4**	**1**	**PLL2 PHASE DETECTOR**	**28480**	**08340-60162**
A41C1	0180-0197	8	4	CAPACITOR-FXD 2.2UF+10% 20VDC TA	56289	150D225X9020A2
A41C2	0160-0574	3	1	CAPACITOR-FXD .022UF +20% 100VDC CER	28480	0160-0574
A41C3	0160-3879	7	3	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A41C4	0160-0127	2	2	CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A41C5	0160-0127	2		CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A41C6				NOT ASSIGNED		
A41C7	0160-5609	5	1	CAPACITOR- MPC 10.0 UF 50VDC	28480	0160-5609
A41C8	0160-4084	8	4	CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A41C9	0160-0573	2	1	CAPACITOR-FXD 4700PF +20% 100VDC CER	28480	0160-0573
A41C10	0160-2199	2	1	CAPACITOR-FXD 30PF ±5% 300VDC MICA	28480	0160-2199
A41C11	0180-0291	3	3	CAPACITOR-FXD 1UF+10% 35VDC TA	56289	150D105X9035A2
A41C12	0180-0291	3		CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A41C13	0160-4535	4	1	CAPACITOR-FXD 1UF +10% 50VDC CER	28480	0160-4535
A41C14	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A41C15	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A41C16	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A41C17	0180-0291	3		CAPACITOR-FXD 1UF+10% 35VDC TA	56289	150D105X9035A2
A41C18	0160-4084	8		CAPACITOR-FXD .1UF +20% 50VDC CER	28480	0160-4084
A41C19	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A41C20	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A41C21	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A41C22	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A41C23	0160-2437	1	2	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A41C24	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A41CR1	1901-0033	2	2	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A41CR2	1901-0376	6	2	DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A41CR3	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A41CR4	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A41CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A41CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A41L1	9100-1651	2	1	INDUCTOR RF-CH-MLD 750UH 5% .2DX.45LG	28480	9100-1651
A41L2	9140-0144	0	3	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A41L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A41L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A41MP1	2190-0009	4	2	WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
A41MP2	2190-0009	4		WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
A41MP3	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A41MP4	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A41MP5	2580-0002	4	2	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	00000	ORDER BY DESCRIPTION
A41MP6	2580-0002	4		NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	00000	ORDER BY DESCRIPTION
A41MP7	08340-20087	8	1	COVER-PC 2 PHASE DETECTOR	28480	08340-20087
A41MP8	86701-40001	9	2	EXTRACTOR-PC BOARD	28480	86701-40001
A41MP9	86701-40001	9		EXTRACTOR-PC BOARD	28480	86701-40001
A41Q1	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A41Q2	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A41Q3	1855-0386	9	1	TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A41Q4	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	02037	2N2907A
A41Q5	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	02037	2N2222A
A41Q6	1854-0404	0	2	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A41Q7	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A41Q8	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A41Q9	1853-0007	7	2	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A41Q10	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A41R1	0757-0280	3	5	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A41R2	0757-0317	7	2	RESISTOR 1.33K 1% .125W F TC=0+100	24546	C4-1/8-T0-1331-F
A41R3	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A41R4	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+100	24546	C4-1/8-T0-1331-F
A41R5	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-TO-1961-F
A41R6	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+100	24546	C4-1/8-T0-196R-F
A41R7	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0+100	28480	0757-0123
A41R8	0698-0082	7	1	RESISTOR 464 1% .125W F TC=0+100	24546	C4-1/8-T0-4640-F
A41R9	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A41R10	0698-3260	9	1	RESISTOR 464K 1% .125W F TC=0±100	28480	0698-3260
A41R11	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+100	19701	MF4C1/8-T0-6191-F
A41R12	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0+100	24546	C4-1/8-T0-751-F
A41R13	0698-0084	9	3	RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A41R14	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A41R15	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A41R16	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A41R17	0757-0444	1	1	RESISTOR 12.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1212-F
A41R18	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4-1/8-T0-2151-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A41R19	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A41R20	0698-3445	2	3	RESISTOR 348 1% .125W F TC=0+100	24546	C4-1/8-T0-348R-F
A41R21	0698-3445	2		RESISTOR 348 1% .125W F TC=0+100	24546	C4-1/8-T0-348R-F
A41R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A41R23	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A41R24	0698-3450	9	1	RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4222-F
A41R25	0757-0462	3	1	RESISTOR 75K 1% .125W F TC=0+100	24546	C4-1/8-T0-7502-F
A41R26	0757-0467	8	1	RESISTOR 121K 1% .125W F TC=0+100	24546	C4-1/8-T0-1213-F
A41R27	0698-3266	5	1	RESISTOR 237K 1% .125W F TC=0+100	24546	C4-1/8-T0-2373-F
A41R28	0698-3460	1	1	RESISTOR 422K 1% .125W F TC=0+100	28480	0698-3460
A41R29	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A41R30	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A41R31	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A41R32	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A41R33	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0+100	24546	C4-1/8-T0-2611-F
A41R34	0698-3445	2		RESISTOR 348 1% .125W F TC=0+100	24546	C4-1/8-T0-348R-F
A41R35	0757-0346	2	1	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A41R36	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-7501-F
A41TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A41TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A41TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A41TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A41TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A41U1	1826-0026	3	1	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A41U2	1826-0459	6	1	IC OP AMP 14-DIP-C PKG	27014	LH0042CD
A41U3	1826-0471	2	1	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A41U4	1826-0059	2	1	IC OP AMP GP TO-99 PKG	01295	LM201AL
A41U5	1820-0429	8	1	IC V RGLTR TO-39	18324	LM309H
A41U6	1820-1212	9	1	IC FF TTL LS J-K NEG-EDGE-TRIG	01295	SN74LS112AN
A41U7	1820-1425	6	1	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	SN74LS132N
A41U8	1820-1194	6	2	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS193N
A41U9	1820-1194	6		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS193N
A41U10	1826-0448	3	1	IC- 7533C P1 DAC	24355	AD7520LN(SEL)
A41VR1				NOT ASSIGNED		
A41VR2	1902-0041	4	2	DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A41VR3	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A41VR4	1902-3002	3	1	DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%	28480	1902-3002

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A42	**08340-60048**	**5**	**1**	**PPL2 DIVIDER**	**28480**	**08340-60048**
A42C1	0160-3877	5	2	CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A42C2	0160-3879	7	2	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A42C3	0160-4084	8	12	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C4	0160-3877	5		CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A42C5	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C6	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C7	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C8	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A42C9	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C10	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C11	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C12	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C13	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C14	0160-0570	9	1	CAPACITOR-FXD 220PF ±20% 100VDC CER	20932	5024EM100RD221M
A42C15	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C16	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C17	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A42C18	0180-1746	5	2	CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A42C19	0180-1746	5		CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A42CR1	1901-0743	1	2	DIODE-PWR RECT 1N4004 400V 1A DO-41	01295	1N4004
A42CR2	1901-0743	1		DIODE-PWR RECT 1N4004 400V 1A DO-41	01295	1N4004
A42J1	1250-0544	9	1	CONNECTOR-RF MALE SMB	28480	1250-0544
A42L1	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH 10% .105DX.26LG	28480	9100-2250
A42L2	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A42L3	9100-1618	1	2	INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A42L4	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A42MP1	2190-0124	4	1	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A42MP2	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A42MP3	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A42MP4	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A42MP5	08340-20088	9	1	COVER-PC PLL2 DRIVER	28480	08340-20088
A42MP6	86701-40001	9	2	EXTRACTOR-PC BOARD	28480	86701-40001
A42MP7	86701-40001	9		EXTRACTOR-PC BOARD	28480	86701-40001
A42Q1	1854-0546	1	1	TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A42Q2	1854-0019	3	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A42R1	0757-0276	7	1	RESISTOR 61.9 1% .125W F TC=0+100	24546	C4-1/8-T0-6192-F
A42R2	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A42R3	0757-0280	3	7	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A42R4	0757-0395	1	1	RESISTOR 56.2 1% .125W F TC=0+100	24546	C4-1/8-T0-56R2-F
A42R5	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A42R6	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A42R7	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A42R8	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A42R9	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A42R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A42R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A42R12	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A42R13	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A42R14	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A42TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A42TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A42TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A42TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A42TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A42U1	1820-1888	5	1	IC PRESCR ECL	04713	MC12013L
A42U2	1820-0681	4	1	IC GATE TTL S NAND QUAD 2-INP	01295	SN74S00N
A42U3	1820-0629	0	2	IC FF TTL S J-K NEG-EDGE-TRIG	01295	SN74S112N
A42U4	1820-1251	6	5	IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A42U5	1820-0909	9	2	IC MULTR TTL	01295	SN74167N
A42U6	1820-0909	9		IC MULTR TTL	01295	SN74167N
A42U7	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A42U8	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A42U9	1820-0686	9	1	IC GATE TTL S AND TPL 3-INP	01295	SN74S11N
A42U10	1820-0629	0		IC FF TTL S J-K NEG-EDGE-TRIG	01295	SN74S112N
A42U11	1820-0261	6	1	IC MV TTL MONOSTBL	01295	SN74121N
A42U12	1820-1196	8	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A42U13	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A42U14	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A42U15	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A42U16	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A42W1	08340-60111	3	1	CABLE ASSEMBLY- A42	28480	08340-60111

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A43	**08340-60049**	**6**	**1**	**PLL2 DISCRIMINATOR**	**28480**	**08340-60049**
A43C1	0160-4084	8	10	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C2	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C3	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C4	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A43C5	0180-0197	8	2	CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A43C6	0180-0197	8		CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A43C7	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C8	0180-0229	7	1	CAPACITOR-FXD 33UF±10% 10VDC TA	56289	150D336X9010B2
A43C9	0160-3879	7	3	CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A43C10	0160-2199	2	2	CAPACITOR-FXD 30PF ±5% 300VDC MICA	28480	0160-2199
A43C11	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C12	0160-0571	0	1	CAPACITOR-FXD 470PF ±20% 100VDC CER	28480	0160-0571
A43C13	0160-0127	2	2	CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A43C14	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C15	0160-4605	9	1	CAPACITOR-CER 36 PF 500VDC	28480	0160-4605
A43C16	0160-2252	8	1	CAPACITOR-FXD 6.2PF ±.25PF 500VDC CER	28480	0160-2252
A43C17	0160-3877	5	2	CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A43C18	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C19	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C20	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A43C21	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C22	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A43C23	0160-0161	4	1	CAPACITOR-FXD .01UF ±10% 200VDC POLYE	28480	0160-0161
A43C24	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A43C25	0160-3456	6	1	CAPACITOR-FXD 1000PF ±10% 1KVDC CER	28480	0160-3456
A43C26	0160-2199	2		CAPACITOR-FXD 30PF ±5% 300VDC MICA	28480	0160-2199
A43C27	0160-3877	5		CAPACITOR-FXD 100PF ±20% 200VDC CER	28480	0160-3877
A43C28	0160-0127	2		CAPACITOR-FXD 1UF ±20% 25VDC CER	28480	0160-0127
A43C29	0160-2437	1	1	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A43CR1	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A43CR2	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A43J1	1250-0544	9	1	CONNECTOR-RF MALE SMB	28480	1250-0544
A43L1	9140-0144	0	4	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A43L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A43L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A43L4	9140-0392	0	1	INDUCTOR RF-CH-MLD 22UH 3% .166DX.385LG	28480	9140-0392
A43L5	9100-1629	4	1	INDUCTOR RF-CH-MLD 47UH 5% .166DX.385LG	28480	9100-1629
A43L6	9100-1666	9	1	INDUCTOR RF-CH-MLD 3.6MH 5% .23DX.57LG	28480	9100-1666
A43L7	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A43MP1				NOT ASSIGNED		
A43MP2				NOT ASSIGNED		
A43MP3	1205-0250	9	1	THERMAL LINK SGL TO-5/TO-39-CS	28480	1205-0250
A43MP4	2190-0009	4	1	WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
A43MP5	2190-0124	4	1	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A43MP6	2200-0101	0	5	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A43MP7	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A43MP8	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A43MP9	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A43MP10	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A43MP11	2200-0164	5	1	SCREW-MACH 4-40 .188-IN-LG UNCT 82 DEG	00000	ORDER BY DESCRIPTION
A43MP12	2580-0002	4	1	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	00000	ORDER BY DESCRIPTION
A43MP13	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A43MP14	08340-00037	6	1	SHIELD-PLL2 DISCRIMINATOR	28480	08340-00037
A43MP15	08340-20089	0	1	COVER-PC 2 DISCRIMINATOR	28480	08340-20089
A43MP16	86701-40001	9	1	EXTRACTOR-PC BOARD	28480	86701-40001
A43Q1	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A43Q2	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A43Q3	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A43Q4	1855-0413	3	1	TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A43Q5	1853-0269	3	1	TRANSISTOR-DUAL PNP 2N3809 PD=600MW	01295	2N3809
A43Q6	1853-0007	7	1	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A43Q7	1854-0019	3	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A43Q8	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A43Q9	1854-0247	9	1	TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A43Q10	1853-0388	7	1	TRANSISTOR-DUAL PNP PD=600MW	28480	1853-0388
A43Q11	1853-0034	0	1	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A43R1	0757-0346	2	1	RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A43R2	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC=0±100	24546	C4-1/8-T0-2152-F
A43R3	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0±100	28480	0757-0123

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A43R4	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A43R5	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0+100	24546	C4-1/8-T0-2610-F
A43R6	0699-0078	3	3	RESISTOR-FXD 2.1K OHM .1% .1W	28480	0699-0078
A43R7	0699-0078	3		RESISTOR-FXD 2.1K OHM .1% .1W	28480	0699-0078
A43R8	0699-0078	3		RESISTOR-FXD 2.1K OHM .1% .1W	28480	0699-0078
A43R9	2100-1739	0	1	RESISTOR-TRMR 5K 10% WW SIDE-ADJ 20-TRN	02660	3810P-502
A43R10	0699-0082	9	1	RESISTOR-FXD 215 OHM .1% .1W	28480	0699-0082
A43R11	0757-0280	3	9	RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R12	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R13	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R14	0698-3153	9	2	RESISTOR 3.83K 1% .125W F TC=0+100	24546	C4-1/8-T0-3831-F
A43R15	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R16	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0+100	24546	C4-1/8-T0-2871-F
A43R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R18	0698-3445	2	1	RESISTOR 348 1% .125W F TC=0+100	24546	C4-1/8-T0-348R-F
A43R19	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+100	24546	C4-1/8-T0-422R-F
A43R20	0757-1094	9	2	RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-T0-1471-F
A43R21	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A43R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R23	0698-3152	8	1	RESISTOR 3.48K 1% .125W F TC=0+100	24546	C4-1/8-T0-3481-F
A43R24	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-T0-1471-F
A43R25	2100-1972	3	1	RESISTOR-TRMR 20K 10% WW SIDE-ADJ 20-TRN	02660	3810P-203
A43R26	0699-0081	8	1	RESISTOR-FXD 390.1K OHM .1% .12W	28480	0699-0081
A43R27	2100-2851	9	1	RESISTOR-TRMR 2K 10% WW SIDE-ADJ 20-TRN	02660	3810P-202
A43R28	0699-0080	7	1	RESISTOR-FXD 39K OHM .1% .12W	28480	0699-0080
A43R29	0698-3499	6	3	RESISTOR 40.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4022-F
A43R30	0698-3499	6		RESISTOR 40.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4022-F
A43R31	0698-3499	6		RESISTOR 40.2K 1% .125W F TC=0+100	24546	C4-1/8-T0-4022-F
A43R32	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+100	24546	C4-1/8-T0-3831-F
A43R33	0699-0084	1	1	RESISTOR-FXD 6.19K OHM .1% .1W	28480	0699-0084
A43R34	0699-0083	0	1	RESISTOR-FXD 681 OHM .1% .1W	28480	0699-0083
A43R35	0757-0400	9	1	RESISTOR 90.9 1% .125W F TC=0+100	24546	C4-1/8-T0-90R9-F
A43R36	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A43R37	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+100	24546	C4-1/8-T0-2151-F
A43R38	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R39	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R40	0699-0079	4	1	RESISTOR-FXD 4.667K OHM .1% .1W	28480	0699-0079
A43R41	2100-1799	2	1	RESISTOR-TRMR 500 10% WW SIDE-ADJ 20-TRN	02660	3810P-501
A43R42	0698-8831	0	1	RESISTOR 13.4K .1% .125W F TC=0+10	28480	0698-8831
A43R43	0757-0274	5	1	RESISTOR 1.21K 1% .125W F TC=0+100	24546	C4-1/8-T0-1211-F
A43R44	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0+100	24546	C4-1/8-T0-2611-F
A43R45	0698-3150	6	1	RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4-1/8-T0-2371-F
A43R46	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A43R47	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A43R48	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4-1/8-T0-51R1-F
A43R49	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A43R50	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A43TP1	0360-0535	0	6	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A43TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A43TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A43TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A43TP5				See A43C29		
A43TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A43TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A43U1	1826-0582	6	2	IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A43U2	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A43U3	1826-0471	2	1	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A43U4	1820-0223	0	2	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A43U5	1820-0429	8	1	IC V RGLTR TO-39	18324	LM309H
A43U6	1820-1194	6	1	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS193N
A43U7	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A43U8	1826-0353	9	1	IC 786L15 V RGLTR TO-39	07263	UA78L15ACH
A43U9	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A43U10	1826-0059	2	1	IC OP AMP GP TO-99 PKG	01295	LM201AL
A43U11	1826-0448	3	1	IC CONV 10-B-D/A 16-DIP-P PKG	24355	AD7520LN(SEL)
A43U12	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A43U13	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
A43VR1	1902-0692	1	1	DIODE-ZNR 6.3V 1% DO-7 PD=.4W TC=+.001%	28480	1902-0692
A43W1	08340-60112	4	1	CABLE ASSEMBLY- A43	28480	08340-60112

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A44	5086-7538	0	1	YIG OSCILLATOR 2.3 60 7.0 GHz (INCLUDES A44 YIG OSCILLATOR AND A44A1 BIAS ASSEMBLY.)	28480	5086-7538
	5086-6538	8	1	REBUILT EXCHANGE YIG OSCILLATOR ASSEMBLY	28480	5086-6538
A44A1	5061-1289	6	1	YIG OSCILLATOR BIAS BOARD (NOT SEPARATELY REPLACEABLE.)	28480	5061-1089

See introduction to this section for ordering information

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A45	**5086-7305**	**9**	**1**	**PRE-LEVELER** (5086-7305 INCLUDES A45 PRE-LEVELER AND A45A1 BIAS BOARD.)	**28480**	**5086-7305**
	5086-6305	7	1	EXCHANGE 5086-7305 PRE-LEVELER	28480	5086-6305
A45A1	5061-1057	4	1	PRE-LEVELER BIAS BOARD	28480	5061-1057
A45A1C1	0160-4084	8	2	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A45A1C2	0160-4084	8		CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A45A1C3	0180-1704	5	2	CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A45A1C4	0180-1704	5		CAPACITOR-FXD 47UF±10% 6VDC TA	56289	150D476X9006B2
A45A1C5	0160-3878	6	1	CAPACITOR-FXD 1000PF ±20% 100VDC CER	28480	0160-3878
A45A1J1	1200-0482	9		SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A45A1MP1	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A45A1R1	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A45A1R2	0698-0082	7	2	RESISTOR 464 1% .125W F TC=0±100	24546	C4-1/8-T0-4640-F
A45A1R3	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4-1/8-T0-2611-F
A45A1R4	0757-0467	8	1	RESISTOR 121K 1% .125W F TC=0±100	24546	C4-1/8-T0-1213-F
A45A1R5	0698-0082	7		RESISTOR 464 1% .125W F TC=0±100	24546	C4-1/8-T0-4640-F
A45A1R6	0698-3441	8	1	RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A45A1R7	2100-2497	9	1	RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	82PR2K
A45A1R8	2100-2060	2	1	RESISTOR-TRMR 50 20% C TOP-ADJ 1-TRN	73138	82PR50
A45A1R9	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A45A1U1	1820-0223	0	1	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A45A1VR1	1902-0551	1	1	DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
A45MP1	0380-0019	7	3	SPACER-RND .188-IN-LG .116-IN-ID	28480	0380-0019
A45MP2	0520-0130	1	3	SCREW-MACH 2-56 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A45	0955-0097	1	1	DIRECTIONAL COUPLER	28480	0955-0097
A45	08340-60207	8	1	REPLACEMENT KIT FOR 5086-7305 (AND 5086-6305) PRE-LEVELER. (INCLUDES DIRECTIONAL COUPLER, 15 DB ATTENUATOR, AND REQUIRED CABLES)		

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A46	9135-0165	4	1	7.0 GHZ LOW PASS FILTER	28480	9135-0165
A47	08340-60094	1	1	SENSE RESISTOR ASSEMBLY	28480	08340-60094
				NOTE See Figure 6-1 for mechanical parts location.		
A47C1	0160-4835	7	1	CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A47MP1	0340-0162	7	1	INSULATOR-XSTR ALUMINUM	28480	0340-0162
A47MP2	08340-60128	2	1	CBL AY SEN RES S	28480	08340-60128
A47MP3	0360-0268	6	1	TERMINAL-SLDR LUG LK-MTG FOR-#6-SCR	28480	0360-0268
A47MP4	08340-60129	3	1	CBL AY SEN RES L	28480	08340-60129
A47MP5	0400-0009	9	1	GROMMET-RND .125-IN-ID .25-IN-GRV-OD	28480	0400-0009
A47MP6	0400-0011	3	2	GROMMET-RND .375-IN-ID .5-IN-GRV-OD	28480	0400-0011
A47MP7	0400-0011	3		GROMMET-RND .375-IN-ID .5-IN-GRV-OD	28480	0400-0011
A47MP8	0520-0127	6	10	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP9	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP10	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP11	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP12	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP13	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP14	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP15	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP16	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP17	0520-0127	6		SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP18	0624-0305	2	4	SCREW-TPG 6-20 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP19	0624-0305	2		SCREW-TPG 6-20 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP20	0624-0305	2		SCREW-TPG 6-20 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP21	0624-0305	2		SCREW-TPG 6-20 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP22	0890-0094	9	1	TUBING-FLEX .051-ID TFE .016-WALL	00000	ORDER BY DESCRIPTION
A47MP23	1200-0043	8	1	INSULATOR-XSTR ALUMINUM	28480	1200-0043
A47MP24	1200-0456	7	1	SOCKET-XSTR 2-CONT TO-3	28480	1200-0456
A47MP25	1200-0457	8	1	SOCKET-XSTR 2-CONT TO-66	28480	1200-0457
A47MP26-28	2190-0006	1	3	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0006
A47MP29	2190-0014	1	10	WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP30	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP31	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP32	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP33	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP34	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP35	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP36	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP37	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP38	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A47MP39	2200-0103	2	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP40	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP41	2360-0113	2	2	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP42	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP43	2360-0203	1	4	SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP44	2360-0203	1		SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP45	2360-0203	1		SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP46	2360-0203	1		SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A47MP47	3050-0003	3	4	WASHER-FL NM NO. 6 .141-IN-ID .375-IN-OD	28480	3050-0003
A47MP48	3050-0003	3		WASHER-FL NM NO. 6 .141-IN-ID .375-IN-OD	28480	3050-0003
A47MP49	3050-0003	3		WASHER-FL NM NO. 6 .141-IN-ID .375-IN-OD	28480	3050-0003
A47MP50	3050-0003	3		WASHER-FL NM NO. 6 .141-IN-ID .375-IN-OD	28480	3050-0003
A47MP51	3050-0005	5	4	WASHER-SHLDR NO. 6 .14-IN-ID .375-IN-OD	28480	3050-0005
A47MP52	3050-0005	5		WASHER-SHLDR NO. 6 .14-IN-ID .375-IN-OD	28480	3050-0005
A47MP53	3050-0005	5		WASHER-SHLDR NO. 6 .14-IN-ID .375-IN-OD	28480	3050-0005
A47MP54	3050-0005	5		WASHER-SHLDR NO. 6 .14-IN-ID .375-IN-OD	28480	3050-0005
A47MP55	3050-0227	3	4	WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
A47MP56	3050-0227	3		WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
A47MP57	3050-0227	3		WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
A47MP58	3050-0227	3		WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
A47MP59	6960-0016	0	4	PLUG-HOLE TR-HD FOR .125-D-HOLE NYL	28480	6960-0016
A47MP60	6960-0016	0		PLUG-HOLE TR-HD FOR .125-D-HOLE NYL	28480	6960-0016
A47MP61	6960-0016	0		PLUG-HOLE TR-HD FOR .125-D-HOLE NYL	28480	6960-0016
A47MP62	6960-0016	0		PLUG-HOLE TR-HD FOR .125-D-HOLE NYL	28480	6960-0016
A47MP63	08340-00033	2	1	BCKT CURRNT SENS	28480	08340-00033
A47MP64	08340-00046	7	1	BOX-CURRNT SENS	28480	08340-00046
A47MP65	08340-00048	9	1	MTG PLATE	28480	08340-00048
A47Q1	1854-0237	7	1	TRANSISTOR NPN SI TO-66 PD=20W FT=10MHZ	28480	1854-0237
A47Q2	1854-0080	8	1	TRANSISTOR NPN SI TO-3 PD=100MW FT=300 MHZ	02037	SJ1515

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A47R1	0811-3571	7	4	RESISTOR 60 1% 12W PW TC=0±2	28480	0811-3571
A47R2	0811-3571	7		RESISTOR 60 1% 12W PW TC=0±2	28480	0811-3571
A47R3	0811-3571	7		RESISTOR 60 1% 12W PW TC=0±2	28480	0811-3571
A47R4	0811-3571	7		RESISTOR 60 1% 12W PW TC=0±2	28480	0811-3571
A47R5	0811-1100	4	1	RESISTOR 3 1% 12W PW TC=0±5	28480	0811-1100
A47R6	0811-3597	7	1	RESISTOR 97.5 .25% 25W PW TC = 0 ±2	28480	0811-3597
A47W1	08340-60128	2	1	CBL AY SEN RES S	28480	08340-60128
A47W2	08340-60129	3	1	CBL AY SEN RES L	28480	08340-60129
A47W3	8151-0010	1	1	WIRE 16AWG 1X16	28480	8151-0010

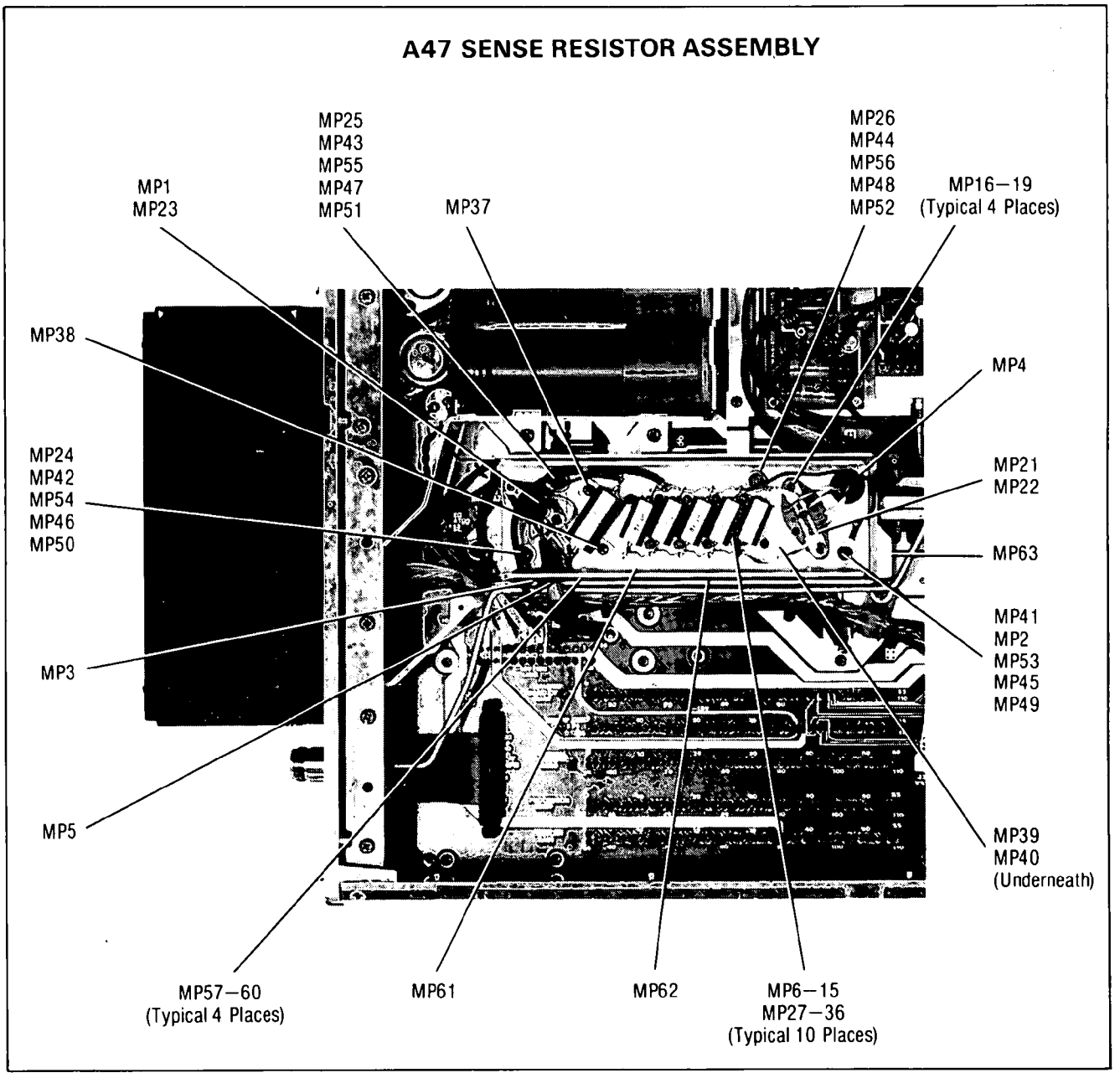


Figure 6-1. A47 Sense Resistor Assembly Mechanical Parts Location

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A48			1	SAMPLER AMPIFIER, NOT SEPERATELY REPLACEABLE, ORDER 08340-60260 CD3 (INCLUDES A48, A49, AND HOUSING)		
A48C1	0121-0046	2	2	CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304322 9/35PF N650
A48C2	0121-0046	2		CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304322 9/35PF N650
A48C3	0180-0197	8	2	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A49C4	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A48C5	0160-2055	9	11	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C6	0160-2150	5	1	CAPACITOR-FXD 33PF +-5% 300VDC MICA	28480	0160-2150
A48C7	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C8	0160-3878	6	3	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A48C9	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A48C10	0160-2264	2	1	CAPACITOR-FXD 20PF +-5% 500VDC CER 0+-30	28480	0160-2264
A48C11	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A48C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C13	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A48C14	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C15	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C16				NOT ASSIGNED		
A48C17	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C18	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A48C19	0160-3879	7	4	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A48C20	0160-0939	4	1	CAPACITOR-FXD 430PF +-5% 300VDC MICA	28480	0160-0939
A48C21	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C22	0140-0195	2	1	CAPACITOR-FXD 130PF +-5% 300VDC MICA	72136	DM15F131J0300WV1CR
A48C23	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C24	0140-0193	0	2	CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A48C25	0140-0193	0		CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A48C26	0160-2308	5	1	CAPACITOR-FXD 36PF +-5% 300VDC MICA	28480	0160-2308
A48C27	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C28	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C29	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A48C30	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A48C31	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A48C32	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A48E1	1251-3172	7	3	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A48E2	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A48E3	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A48J1				SEE "MISCELLANEOUS YO LOOP PARTS" AT THE END OF TABLE 6-3.		
A48J2				SEE "MISCELLANEOUS YO LOOP PARTS" AT THE END OF TABLE 6-3.		
A48L1				STRIP LINE ON P.C. BOARD		
A48L2	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A48L3	9100-1623	8	1	INDUCTOR RF-CH-MLD 27UH 5% .166DX.385LG	28480	9100-1623
A48L4	9100-2251	0	1	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A48L5	9100-2258	7	2	INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A48L6	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258
A48L7	9135-0073	3	1	INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG (RECOMMENDED REPLACEMENT)	28480	9135-0073
A48L8, 9				STRIP LINE ON P. C. BOARD		
A48L10	9140-0539	7	1	INDUCTOR RF-CH-MLD 3UH 5% .105DX.26LG	28480	9140-0539
A48L11	9100-0368	6	1	INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A48L12	9100-2249	6	2	INDUCTOR RF-CH-MLD 150NH 10% .105DX.26LG	28480	9100-2249
A48L13	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH 10% .105DX.26LG	28480	9100-2250
A48L14	9100-2249	6		INDUCTOR RF-CH-MLD 150NH 10% .105DX.26LG	28480	9100-2249
A48MP1				NOT ASSIGNED		
A48MP2	1205-0011	0	2	HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A48MP3				NOT ASSIGNED		
A48MP4				NOT ASSIGNED		
A48MP5	1205-0011	0		HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A48MP6, 7	4330-0145	9	2	INSULATOR-BEAD GLASS	28480	4330-0145
A48Q1	1854-0247	9	3	TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A48Q2	1854-0345	8	3	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A48Q3	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A48Q4	1855-0235	7	1	TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	28480	1855-0235
A48Q5	1853-0015	7	1	TRANSISTOR PNP SI PD=200MW FT=500MHZ	28480	1853-0015
A48Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A48Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A48Q8	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
				NOTE A48R1, R28, AND R29 MUST BE REPLACED AT THE SAME TIME		
A48R1	2100-3212	8	1	RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN (RECOMMENDED REPLACEMENT)	28480	2100-3212
A48R2	0757-0394	0	5	RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A48R3	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A48R4	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A48R5	0757-0424	7	3	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A48R6	0757-0280	3	3	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A48R7	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A48R8	0757-0796	6	1	RESISTOR 82.5 1% .5W F TC=0+-100	28480	0757-0796
A48R9	0757-0399	5	1	RESISTOR 82.5 1% .125W F TC=0+-100	24546	C4-1/8-T0-82R5-F
A48R10	0698-3457	6	1	RESISTOR 316K 1% .125W F TC=0+-100	28480	0698-3457
A48R11	0757-0470	3	1	RESISTOR 162K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1623-F
A48R12				NOT ASSIGNED		
A48R13	0698-7216	3	1	RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-TO-147R-F
A48R14				NOT ASSIGNED		
A48R15	0757-0424	7		RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A48R16	0757-0398	4	1	RESISTOR 75 1% .125W F TC=0+-100	24546	C4-1/8-T0-75R0-F
A48R17	0757-0424	7		RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A48R18	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A48R19	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A48R20	0698-7224	3	1	RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-TO-316R-F
A48R21	0698-7212	9	1	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-TO-100R-F
A48R22	0698-7195	7	1	RESISTOR 19.6 1% .05W F TC=0+-100	24546	C3-1/8-TO-19R6-F
A48R23	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A48R24	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A48R25	0698-0082	7	1	RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A48R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A48R27	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A48R28	0698-3438	3	1	RESISTOR 147 1% .125W F TC=0+ 100 (RECOMMENDED REPLACEMENT)	24546	C4-1/8-T0-147R-F
A48R29	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+-100 (RECOMMENDED REPLACEMENT)	24546	C3-1/8-TO-422R-F
A48R30	0757-0346	2	2	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A48R31	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A48R32	0698-3439	4	2	RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A48R33	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A48R34	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A48R35	0698-3439	4		RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A48R36	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A48R37	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A48R38	0757-0276	7	2	RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A48R39	0757-0276	7		RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A48R40	0757-0189	2		RESISTOR 31.6 1% .125W F TC=0+-100	24546	C4-1/8-T0-31R6-F
A48R41	0698-7196	8	1	RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-TO-21R5-F
A48R42	0757-0294	9	1	RESISTOR 17.8 1% .125W F TC=0+-100	24546	C4-1/8-TO-17R8-F
A48TP1	0360-0535	0	1	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A48U1	5086-7292	3	1	SAMPLER	28480	5086-7292

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A49			1	YO LOOP PHASE DETECTOR. NOT SEPERATELY REPLACEABLE, ORDER 08340-60260 CD3 (INCLUDES A48, A49, AND HOUSING)		
A49C1	0160-4805	1	2	CAPACITOR-FXD 47PF +-5% 100VDC CER 0+-30	28480	0160-4805
A49C2	0160-4805	1		CAPACITOR-FXD 47PF +-5% 100VDC CER 0+-30	28480	0160-4805
A49C3	0160-4526	3	1	CAPACITOR-FXD 42PF +-5% 200VDC CER 0+-30	28480	0160-4526
A49C4	0160-4767	4	1	CAPACITOR-FXD 20PF +-5% 200VDC CER 0+-30	28480	0160-4767
A49C5	0160-4918	7	2	CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A49C6	0160-4832	4	2	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A49C7	0160-4918	7		CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A49C8	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A49C9	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A49C10	0180-0197	8	2	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A49C11	0160-0575	4	7	CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A49C12	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A49C13	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A49C14	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A49C15	0160-0571	0	2	CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A49C16	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A49C17	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A49C18	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A49C19	0160-3879	7	2	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A49C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A49C21	0160-4535	4	4	CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A49C22	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A49C23	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A49C24	0160-3405	5	1	CAPACITOR-FXD 2UF +-10% 50VDC MET-POLYC	28480	0160-3405
A49C25				NOT ASSIGNED		
A49C26	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A49C27	0160-3402	2	1	CAPACITOR-FXD 1UF +-5% 50VDC MET-POLYC	28480	0160-3402
A49C28	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A49C29	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A49C30	0160-0164	7	1	CAPACITOR-FXD .039UF +-10% 200VDC POLYE	28480	0160-0164
A49C31	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A49C32	0160-4807	3	1	CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A49C33	0160-5098	6	1	CAPACITOR-FXD .22UF +-10% 50VDC CER	16299	CAC05X7R224J050A
A49C34	0160-4835	7	1	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A49C35				NOT ASSIGNED		
A49CR1	1901-0539	3	3	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A49CR2	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A49CR3	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A49J1-4				NOT ASSIGNED		
A49J5	1250-1889	7	2	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A49J6	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A49L1	9100-0368	6	2	INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A49L2	9100-2254	3	2	INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A49L3	9100-2254	3		INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A49L4	9100-0368	6		INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A49L5	9100-1641	0	2	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A49L6	9100-3912	2	1	INDUCTOR RF-CH-MLD 15UH 5% .166DX.385LG	28480	9100-3912
A49L7	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A49L8	9140-0398	6	2	INDUCTOR RF-CH-MLD 12UH 5% .166DX.385LG	28480	9140-0398
A49L9	9140-0398	6		INDUCTOR RF-CH-MLD 12UH 5% .166DX.385LG	28480	9140-0398
A49L10	9100-3313	7	2	INDUCTOR RF-CH-MLD 22UH 5% .166DX.385LG	28480	9100-3313
A49L11	9100-3313	7		INDUCTOR RF-CH-MLD 22UH 5% .166DX.385LG	28480	9100-3313
A49Q1	1854-0295	7	1	TRANSISTOR-DUAL NPN PD=400MW	28480	1854-0295
A49Q2	1855-0278	8	1	TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A49R1	0757-0401	0	6	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A49R2	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A49R3	0698-3440	7	4	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A49R4	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A49R5	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A49R6	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A49R7	0698-3132	4	2	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A49R8	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A49R9	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A49R10	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A49R11	0757-0418	9	2	RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A49R12	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A49R13	0698-3154	0	3	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A49R14	0757-0470	3	1	RESISTOR 162K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1623-F
A49R15	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A49R16	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A49R17	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A49R18	0757-0274	5	1	RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A49R19	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A49R20	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A49R21	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A49R22	0757-0442	9	4	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A49R23	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A49R24	0757-0424	7	1	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A49R25	0698-3429	2	2	RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A49R26	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A49R27	0698-3444	1	2	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A49R28				NOT ASSIGNED		
A49R29	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A49R30	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A49R31	0757-0401	0		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A49R32	2100-0554	5	1	RESISTOR-TRMR 500 10% C TOP-ADJ 1-TRN	28480	2100-0554
A49R33	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A49R34	0683-4755	8	1	RESISTOR 4.7M 5% .25W FC TC=-900/+1100	01121	CB4755
A49R35	0757-0288	1	1	RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
A49R36	0757-0290	5	2	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A49R37	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A49R38	0698-3156	2	2	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A49R39	0757-0290	5		RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A49R40	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A49R41	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A49R42	0757-0346	2	1	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A49R43	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A49R44	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A49R45	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A49R46	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A49R47	0757-0466	7	1	RESISTOR 110K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1103-F
A49R48	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A49R49	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A49R50	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A49R51				NOT ASSIGNED		
A49R52	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A49TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49U1	1826-0932	0	2	IC OP AMP PRCN 8-DIP-C PKG	06665	OP-27FZ
A49U2	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A49U3	1826-0932	0		IC OP AMP PRCN 8-DIP-C PKG	06665	OP-27FZ
A49U4	1826-0987	5	1	IC OP AMP PRCN 8-DIP-C PKG	28480	1826-0987
A49U5	1820-1344	8	1	IC PL LOOP 14-DIP-C PKG	04713	MC12040L
A49U6	1826-1145	9	1	SAMPLE AND HOLD 14-CERDIP	28480	1826-1145
A49U7	1826-0026	3	1	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A49U8	1820-0817	8	1	IC FF ECL D-M/S DUAL	04713	MC10131P
A49U9	1810-0204	6	1	NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A49U10	1820-0802	1	1	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A49VR1	1902-0049	2	2	DIODE-ZNR 6.19V 5% DO-35 PD=.4W	28480	1902-0049
A49VR2	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	28480	1902-0049
A49VR3	1902-3104	6	2	DIODE-ZNR 5.62V 5% DO-35 PD=.4W	28480	1902-3104
A49VR4	1902-3104	6		DIODE-ZNR 5.62V 5% DO-35 PD=.4W	28480	1902-3104
A49VR5	1902-3036	3	1	DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	28480	1902-3036
A49VR6	1902-3082	9	1	DIODE-ZNR 4.64V 5% DO-35 PD=.4W	28480	1902-3082
A49W1	1258-0124	7	1	PIN-PROGRAMING DUMPER .30 CONTACT	91506	8136-475G1
A49W2	8151-0014	5	13	WIRE 24AWG 1X24	28480	8151-0014
A49W3	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W4	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W5	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W6	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W7	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W8	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W9	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W10	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W11	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W12	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W13	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49W14	8151-0014	5		WIRE 24AWG 1X24	28480	8151-0014
A49X1	1251-4932	9	2	CONNECTOR-SGL CONT SKT .021-IN-BSC-SZ	91506	LSG-1AG14-1

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A50	08340-60219	2	1	YO LOOP INTERCONNECT	28480	08340-60219
A50C1	0180-2614	8	3	CAPACITOR-FXD 100UF+-10% 30VDC TA	56289	150D107X9030S2
A50C2	0160-4835	7	2	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A50C3	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A50C4	0180-2614	8		CAPACITOR-FXD 100UF+-10% 30VDC TA	56289	150D107X9030S2
A50C5	0180-2614	8		CAPACITOR-FXD 100UF+-10% 30VDC TA	56289	150D107X9030S2
A50C6-16	0160-3036	8	11	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
A50DS1	1990-0485	5	1	LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	5082-4984
A50L1	9100-2262	3	1	INDUCTOR RF-CH-MLD 3.9UH 10% .105DX.26LG	28480	9100-2262
A50L2	9100-1618	1	4	INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A50L3	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A50L4	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A50L5	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A50R1	0757-0280	3	4	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R2	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R3	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A50R4	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A50R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R6	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50TP1-11	0360-2050	8	11	TEST POINT	28480	0360-2050
A50U1	1858-0047	5	1	TRANSISTOR ARRAY 16-PIN PLSTC DIP	13606	ULN-2003A
A50W1	8120-3120	5	1	CABLE	28480	8120-3120
A50W2	08340-60209	0	1	CABLE RBN 16 PIN (INCLUDES W2P1,P2)	28480	08340-60209
A50X1-11	1251-2313	6	11	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A51	08340-60183	9	1	10 MHZ REFERENCE OSCILLATOR	28480	08340-60183
	0960-0477	1	1	CRYSTAL OSCILLATOR FREQ. = 10.00 MHZ	28480	0960-0477
	1251-4223	1	5	CONN-POST TYPE ,100-PIN-SPCG	28480	1251-4223
	1251-6594	3	1	CONTACT-CONN U/W POST TYPE FEM CRP	28480	1251-6594

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

SERIAL PREFIX: 2339A

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A52	**08340-60179**	**3**	**1**	**POSITIVE REGULATOR**	**28480**	**08340-60179**
A52C1	0160-5338	7	1	CAPACITOR-FXD .33UF +10% 50VDC CER	28480	0160-5338
A52C2	0180-0116	1	4	CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C3	0160-4807	3	1	CAPACITOR-FXD 33PF ±5% 100VDC CER 0±30	28480	0160-4807
A52C4	0180-1746	5	2	CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A52C5	0180-0228	6	3	CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A52C6	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C7	0180-1746	5		CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A52C8	0160-4005	3		CAPACITOR-FXD 1UF±20% 100VDC CER	28480	0160-4005
A52C9	0160-4835	7	1	CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A52C10	0180-2811	7		CAPACITOR-FXD 10UF±20% 35VDC TA	28480	0180-2811
A52C11	0160-4834	6	1	CAPACITOR-FXD .047UF ±10% 100VDC CER	28480	0160-4834
A52C12	0160-4005	3	1	CAPACITOR-FXD 1UF ±20% 100VDC CER	28480	0160-4005
A52C13	0180-2617	1	1	CAPACITOR-FXD 6.8UF ±10% 35VDC TA	28480	0180-2617
A52C14	0180-0228	6		CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A52C15	0180-0228	6		CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A52C16	0160-4386	3	1	CAPACITOR-FXD 33PF ±5% 200VDC CER 0±30	28480	0160-4386
A52C17	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C18	0180-0116	1		CAPACITOR-FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C19	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A52C20-22	0160-4084	8	3	CAPACITOR-FXD .1UF ±20% 50VDC CER	28480	0160-4084
A52CR1-3				NOT ASSIGNED		
A52CR4	1901-0033	2	9	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR7	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR8	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR9	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR10	1901-0662	3	4	DIODE-PWR RECT 100V 6A	04713	MR751
A52CR11	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A52CR12	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A52CR13	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR14	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR15	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A52CR16	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A52DS1-3	1990-0487	7	3	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A52DS4	1990-0486	6	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A52F1	2110-0618	3	1	FUSE 5A 125V NTD .25X.27	28480	2110-0618
A52F2	2110-0332	8	1	FUSE 3A 125V .25X.27	28480	2110-0332
A52F3	2110-0249	6	1	FUSE 12A 250V NTD 1.25X.25 UL	28480	2110-0249
A52MP1	08340-20073	2	1	MTG BLOCK DIODE	28480	08340-20073
A52MP2	0520-0129	8	1	SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A52MP3	2190-0014	1	1	WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
A52MP4	2950-0014	3	1	NUT-HEX-DBL-CHAM 1/4-28-THD .219-IN-THK	00000	ORDER BY DESCRIPTION
A52MP5	5040-6847	6	1	EXTRACTOR, RED	28480	5040-6847
A52MP6,7	1251-2313	6	4	CONN. SGL CONN. .	28480	1251-2313
A52MP8				NOT ASSIGNED		
A52MP9	1251-2313	6		CONN.SGL CONN.	28480	1251-2313
A52MP10	5000-9043	6	1	PIN:P.C. BOARD EXTRACTOR	28480	5000-9043
A52MP11	2110-0643	4	1	FUSEHOLDER-CLIP TYPE 15A 250 V	28480	2110-0643
A52MP12				NOT ASSIGNED		
A52MP13	8150-0014	3	1	WIRE 22AWG BL 300V PVC 7X30 105C	28480	8150-0014
A52MP14	2190-0027	6	1	WASHER-LK INTL T 1/4 IN .256-IN-ID	28480	2190-0027
A52Q1	1884-0018	5	2	THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A52Q2	1884-0018	5		THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A52Q3	1854-0477	7	4	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A52Q4	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A52Q5	1853-0213	7	1	TRANSISTOR PNP 2N4236 SI TO-5 PD=1W	04713	2N4236
A52Q6	1854-0404	0	3	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A52Q7	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A52Q8	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A52Q9	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A52Q10	1854-0441	5	1	TRANSISTOR NPN SI PD=5.8W FT=800KHZ	28480	1854-0441
A52Q11	1884-0046	9	1	THYRISTOR-SCR VRRM=50	03508	C230F
A52Q12	1854-0637	1	1	TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
A52Q13	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A52Q14	1853-0314	9	1	TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A52Q15	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A52Q16	1853-0034	0	1	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A52R1	0812-0021	8	1	RESISTOR .47 5% 3W PW TC = 0+90	91637	CW2B1-3-T2-47/100-J
A52R2	0811-4507	1	1	RESISTOR .56 5% 3W PW TC = 0±90	28480	0811-4507

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A52R3	0811-4506	0	3	RESISTOR .27 5% 3W PW TC = 0 +90	28480	0811-4506
A52R4	0811-4506	0		RESISTOR .27 5% 3W PW TC = 0 +90	28480	0811-4506
A52R5	0811-4506	0		RESISTOR .27 5% 3W PW TC = 0 +90	28480	0811-4506
A52R6	0757-0401	0	7	RESISTOR 100 1% .125W F TC = 0 +100	24546	C4-1/8-T0-101-F
A52R7	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 +100	24546	C4-1/8-T0-101-F
A52R8	0757-0416	7	3	RESISTOR 511 1% .125W F TC = 0 +100	24546	C4-1/8-T0-511R-F
A52R9	0757-0442	9	7	RESISTOR 10K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1002-F
A52R10	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC = 0 +100	24546	C4-1/8-T0-51R1-F
A52R11	0698-3150	6	1	RESISTOR 2.37K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2371-F
A52R12	0698-3442	9	2	RESISTOR 237 1% .125W F TC = 0 +100	24546	C4-1/8-T0-237R-F
A52R13	0757-0438	3	5	RESISTOR 5.11K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-5111-F
A52R14	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1621-F
A52R15	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-5111-F
A52R16	0757-0280	3	5	RESISTOR 1K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1001-F
A52R17	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-5111-F
A52R18	0698-8817	2	3	RESISTOR 2.61 1% .125W F TC = 0 +100	28480	0698-8817
A52R19	0757-0346	2	3	RESISTOR 10 1% .125W F TC = 0 +100	24546	C4-1/8-T0-10R0-F
A52R20	0698-3444	1	3	RESISTOR 316 1% .125W F TC = 0 +100	24546	C4-1/8-T0-316R-F
A52R21	0698-3447	4	1	RESISTOR 422 1% .125W F TC = 0 +100	24546	C4-1/8-T0-422R-F
A52R22	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-7501-F
A52R23	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1002-F
A52R24	0698-3407	6	2	RESISTOR 1.96K 1% .5W F TC = 0 +100	28480	0698-3407
A52R25	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1002-F
A52R26	0698-3407	6		RESISTOR 1.96K 1% .5W F TC = 0 +100	28480	0698-3407
A52R27	0698-3449	6	1	RESISTOR 28.7K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2872-F
A52R28	0757-0461	2	1	RESISTOR 68.1K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-6812-F
A52R29*	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-3831-F
A52R30	0698-3442	9		RESISTOR 237 1% .125W F TC = 0 +100	24546	C4-1/8-T0-237R-F
A52R31	0698-8817	2		RESISTOR 2.61 1% .125W F TC = 0 +100	28480	0698-8817
A52R32	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 +100	24546	C4-1/8-T0-316R-F
A52R33	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 +100	24546	C4-1/8-T0-10R0-F
A52R34	0698-3445	2	1	RESISTOR 348 1% .125W F TC = 0 +100	24546	C4-1/8-T0-348R-F
A52R35	0757-0440	7		RESISTOR 7.5K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-7501-F
A52R36	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2611-F
A52R37	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC = 0 +100	19701	MF4C1/8-T0-6191-F
A52R38	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-4641-F
A52R39	0757-0279	0	4	RESISTOR 3.16K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-3161-F
A52R40	0698-6348	0	1	RESISTOR 3K .1% .125W F TC = 0 +25	28480	0698-6348
A52R41	0698-0084	9	5	RESISTOR 2.15K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2151-F
A52R42	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2151-F
A52R43	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2151-F
A52R44	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2151-F
A52R45	0698-8827	4	5	RESISTOR 1M 1% .125W F TC = 0 +100	28480	0698-8827
A52R46	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 +100	28480	0698-8827
A52R47	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 +100	28480	0698-8827
A52R48	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 +100	28480	0698-8827
A52R49	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1003-F
A52R50	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1961-F
A52R51	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 +100	24546	C4-1/8-T0-511R-F
A52R52	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 +100	24546	C4-1/8-T0-511R-F
A52R53	0757-0465	6	1	RESISTOR 100K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1003-F
A52R54	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1002-F
A52R55	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1002-F
A52R56	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 +100	28480	0698-8827
A52R57	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-2151-F
A52R58	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1002-F
A52R59	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-5111-F
A52R60	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-5111-F
A52R61	0757-0420	3	1	RESISTOR 750 1% .125W F TC = 0 +100	24546	C4-1/8-T0-751-F
A52R62	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-3161-F
A52R63	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 +100	24546	C4-1/8-T0-101-F
A52R64	0757-0159	5	1	RESISTOR 1K 1% .5W F TC = 0 +100	28480	0757-0159
A52R65	0698-8466	7	1	RESISTOR 942 .5% .125W F TC = 0 +50	28480	0698-8466
A52R66	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-3161-F
A52R67	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-3161-F
A52R68	0698-8464	5	1	RESISTOR 12.6K .5% .125W F TC = 0 +50	28480	0698-8464
A52R69	0698-8817	2		RESISTOR 2.61 1% .125W F TC = 0 +100	28480	0698-8817
A52R70	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 +100	24546	C4-1/8-T0-316R-F
A52R71	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 +100	24546	C4-1/8-T0-10R0-F
A52R72	0698-3443	0	1	RESISTOR 287 1% .125W F TC = 0 +100	24546	C4-1/8-T0-287R-F
A52R73	0698-0090	7	1	RESISTOR 464 1% .5W F TC = 0 +100	28480	0698-0090
A52R74	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 +100	24546	C4-1/8-T0-101-F
A52R75	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 +100	24546	C4-1/8-T0-101-F
A52R76	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 +100	24546	C4-1/8-T0-101-F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A52R77	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 +100	24546	C4-1/8-T0-101-F
A52R78	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 ±100	24546	C4-1/8-T0-1001-F
A52R79	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 ±100	24546	C4-1/8-T0-1001-F
A52R80	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 ±100	24546	C4-1/8-T0-1001-F
A52R81	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1001-F
A52R82	0698-7220	9	1	RESISTOR 215 1% .05W F TC=0+100	28480	0698-7220
A52R83	0698-3437	2	1	RESISTOR 133 1% .125W F TC=0±100	28480	0698-3437
A52TP1	0360-0535	0	7	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52U1	1820-0223	0	2	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A52U2	1826-0742	0	1	IC V RGLTR-V-REF-FXD 10V TO5 PKG	28480	1826-0742
A52U3	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
A52U4	1826-0138	8	2	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A52U5	1820-1531	5	1	IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	3L585	CD4013AF
A52U6	1826-0138	8		IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A52VR1	1902-3252	5	1	DIODE-ZNR 22.6V 2% DO-35 PD=.4W	28480	1902-3252
A52VR2	1902-3193	3	2	DIODE-ZNR 13.3V 5% DO-35 PD=.4W	28480	1902-3193
A52VR3	1902-0049	2	2	DIODE-ZNR 6.19V 5% DO-35 PD=.4W	28480	1902-0049
A52VR4	1902-0041	4	1	DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A52VR5	1902-3160	4	1	DIODE-ZNR 10V 2% DO-35 PD=.4W TC=+.06%	28480	1902-3160
A52VR6	1902-3193	3		DIODE-ZNR 13.3V 5% DO-35 PD=.4W	28480	1902-3193
A52VR7	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	28480	1902-0049

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A53	08340-60161	4	1	NEGATIVE REGULATOR	28480	08340-60161
A53C1	0160-4807	3	1	CAPACITOR-FXD 33PF ±5% 100VDC CER 0±30	28480	0160-4807
A53C2	0160-4804	0		CAPACITOR-FXD 56PF ±5% 100VDC CER 0±30	28480	0160-4804
A53C3	0160-4535	4	2	CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A53C4	0160-4834	6	2	CAPACITOR-FXD .047UF ±10% 100VDC CER	28480	0160-4834
A53C5	0180-0228	6	2	CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A53C6	0180-1746	5	1	CAPACITOR-FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A53C7	0180-0291	3	2	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A53C8	0180-0291	3		CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A53C9				NOT ASSIGNED		
A53C10	0160-4535	4		CAPACITOR-FXD 1UF ±10% 50VDC CER	28480	0160-4535
A53C11	0160-4834	6		CAPACITOR-FXD .047UF ±10% 100VDC CER	28480	0160-4834
A53C12	0180-0228	6		CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A53C13	0180-2610	4	1	CAPACITOR-FXD 10UF±10% 75VDC TA	00904	T110A106K075AS
A53C14	0180-0374	3	1	CAPACITOR-FXD 10UF±10% 20VDC TA	56289	150D106X9020B2
A53C15, 16	0160-4835	7	2	CAPACITOR-FXD .1UF±10% 50VDC CER	02798	CAC04X7R104K050A
A53CR1	1901-0033	2	9	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR3	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR4	1901-1068	5	2	DIODE-SCHOTTKY SM SIG	28480	1901-1068
A53CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR7	1901-0662	3	4	DIODE-PWR RECT 100V 6A	04713	MR751
A53CR8	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A53CR9	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A53CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR11	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR12	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A53CR13	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR14	1901-0518	8	1	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A53CR15	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A53CR16	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A53CR17	1901-1068	5		DIODE-SCHOTTKY SM SIG	28482	1901-1068
A53DS1	1990-0487	7	3	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A53DS2	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A53DS3	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A53E1	1251-2313	6	4	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A53E2	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A53E3	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A53E4	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A53F1	2110-0425	0	1	FUSE 2A 125V .25X.27	28480	2110-0425
A53F2	2110-0332	8	1	FUSE 3A 125V .25X.27	28480	2110-0332
A53F3	2110-0056	3	1	FUSE 6A 250V NTD 1.25X.25 UL IEC	75915	312006
A53MP1	2110-0643	4	1	FUSEHOLDER-CLIP TYPE 15A 250 V	28480	2110-0643
A53MP2	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A53MP3	2200-0105	4	1	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A53MP4	5040-6852	3	1	EXTRACTOR, ORANGE	28480	5040-6852
A53MP5	5000-9043	6	1	PIN:P.C. BOARD EXTRACTOR	28480	5000-9043
A53MP6	85662-00029	7	1	HEAT SINK	28480	85662-00029
A53MP7				NOT ASSIGNED		
A53MP8	1205-0011	0	1	HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A53MP9	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A53Q1	1884-0244	9	1	THYRISTOR-SCR VRRM=400	3L585	S2600D
A53Q2	1854-0404	0	2	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A53Q3	1854-0271	9	1	TRANSISTOR NPN SI TO-39 PD=1W FT=150MHZ	28480	1854-0271
A53Q4	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A53Q5	1884-0018	5	2	THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A53Q6	1884-0018	5		THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A53Q7	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A53R1	0811-1079	6	3	RESISTOR .68 5% 3W PW TC=0±90	91637	CW2B1-3-T2-68/100-J
A53R2	0811-1079	6		RESISTOR .68 5% 3W PW TC=0±90	91637	CW2B1-3-T2-68/100-J
A53R3	0811-1220	9	1	RESISTOR 1.5 5% 3W PW TC=0±50	05524	CW-2B-39
A53R4	0757-0416	7	2	RESISTOR 511 1% .125W F TC=0±100	03292	C4-1/8-T0-511R-F
A53R5	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0±100	03292	C4-1/8-T0-4641-F
A53R6	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A53R7	0757-0159	5	2	RESISTOR 1K 1% .5W F TC=0±100	28480	0757-0159
A53R8	0757-0279	0	5	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A53R9	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A53R10	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4-1/8-T0-3161-F
A53R11	0698-8817	2	2	RESISTOR 2.61 1% .125W F TC=0±100	28480	0698-8817
A53R12	0698-3444	1	5	RESISTOR 316 1% .125W F TC=0±100	24546	C4-1/8-T0-316R-F
A53R13	0757-0346	2	3	RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A53R14	0698-3442	9	1	RESISTOR 237 1% .125W F TC=0+100	24546	C4-1/8-T0-237R-F
A53R15	0811-1080	9	2	RESISTOR 2.2 5% 3W PW TC=0+50	28480	0811-1080
A53R16	0698-3444	1		RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A53R17	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A53R18	0811-1080	9		RESISTOR 2.2 5% 3W PW TC=0+50	28480	0811-1080
A53R19	0698-3444	1		RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A53R20	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A53R21	0698-3444	1		RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A53R22	0811-1079	6	1	RESISTOR .68 5% 3W PW TC=0+90	28480	0811-1079
A53R23	0757-0416	7		RESISTOR 511 1% .125W F TC=0+100	03292	C4-1/8-T0-511R-F
A53R24	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC=0+100	03292	C4-1/8-T0-2152-F
A53R25	0757-0401	0		RESISTOR 100 1% .125W F TC=0+100	24546	C4-1/8-T0-101-F
A53R26	0757-0159	5		RESISTOR 1K 1% .5W F TC=0+100	28480	0757-0159
A53R27	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A53R28	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4-1/8-T0-3161-F
A53R29	0698-8464	5	1	RESISTOR 12.6K .5% .125W F TC=0+50	28480	0698-8464
A53R30	0698-3410	1	1	RESISTOR 3.16K 1% .5W F TC=0+100	28480	0698-3410
A53R31	0698-8817	2		RESISTOR 2.61 1% .125W F TC=0+100	28480	0698-8817
A53R32	0698-3444	1		RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A53R33	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A53R34	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0+100	24546	C4-1/8-T0-751-F
A53R35	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0+100	24546	C4-1/8-T0-2610-F
A53R36	0757-0442	9	9	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A53R37	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A53R38	0698-0084	9	4	RESISTOR 2.15K 1% .125W F TC=0+100	03292	C4-1/8-T0-2151-F
A53R39	0698-8827	4	4	RESISTOR 1M 1% .125W F TC=0+100	03292	CT4
A53R40	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+100	03292	C4-1/8-T0-2151-F
A53R41	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	03292	CT4
A53R42	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+100	03292	C4-1/8-T0-2151-F
A53R43	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	03292	CT4
A53R44	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+100	03292	C4-1/8-T0-2151-F
A53R45	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+100	03292	CT4
A53R46	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 +100	24546	C4-1/8-T0-1002-F
A53R47	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A53R48	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A53R49	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A53R50	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+100	24546	C4-1/8-T0-4221-F
A53R51	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A53R52	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A53R53	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A53R54	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A53R55, 56	0757-0274	5	2	RESISTOR 1.21K 1% .125W F TC=0+100	03292	CT4-1/8-T0-1211-F
A53TP1	0360-0535	0	6	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53U1	1826-0523	5	1	IC 337 V RGLTR TO-3	27014	LM337K
A53U2	1826-0138	8	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A53U3	1820-0223	0	2	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A53U4	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
A53VR1	1902-3171	7	1	DIODE-ZNR 11V 5% DO-35 PD=.4W TC=+.062%	28480	1902-3171
A53VR2	1902-0049	2	1	DIODE-ZNR 6.19V 5% DO-35 PD=.4W	28480	1902-0049
A53VR3	1902-3330	0	1	DIODE-ZNR 44.2V 2% DO-35 PD=.4W	28480	1902-3330
A53VR4	1902-0025	4	1	DIODE-ZNR 10V 5% DO-35 PD=.4W TC=+.06%	28480	1902-0025
A53VR5	1902-3083	0	1	DIODE-ZNR 4.64V 2% DO-35 PD=.4W	28480	1902-3083
A53VR6	1902-3291	2	1	DIODE-ZNR 31.6V 2% DO-35 PD=.4W	28480	1902-3291
A53VR7	1902-0041	4	1	DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A53VR8	1902-0244	9	1	DIODE-ZNR 30V 5% PD=1W IR=5UA	28480	1902-0244

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

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A54	08340-60217	0	1	YO PRETUNE DAC/DELAY COMPENSATION	28480	08340-60217
A54C1	0160-4535	4	9	CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C2	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C3	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C4	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C5	0160-3670	6	1	CAPACITOR-FXD .1UF +-20% 200VDC CER	28480	0160-3670
A54C6	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C7	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C8	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C9	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C10	0160-4835	7	15	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C11	0160-3402	2	1	CAPACITOR-FXD 1UF +-5% 50VDC MET-POLYC	28480	0160-3402
A54C12	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C13	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C14				NOT ASSIGNED		
A54C15	0160-4261	3	1	CAPACITOR-FXD .22UF +-10% 50VDC	84411	HEW 249
A54C16	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C17	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C18, 19				NOT ASSIGNED		
A54C20	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C21	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C22	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C23	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C24	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C25	0160-4805	1	1	CAPACITOR-FXD 47PF +-5% 100VDC CER 0+-30	28480	0160-4805
A54C26	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A54C27	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C28	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C29	0160-5098	6	1	CAPACITOR-FXD .22UF +-10% 50VDC CER	16299	CAC05X7R224J050A
A54C30	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C31	0160-4787	8	1	CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	28480	0160-4787
A54C32	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C33	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C34	0160-3829	7	1	CAPACITOR-FXD .47UF +-10% 50VDC	28480	0160-3829
A54C35	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A54C36	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54CR1	1901-0033	2	2	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A54CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A54CR3				NOT ASSIGNED		
A54CR4	1901-0518	8	3	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54CR6	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54L1	9140-0144	0	5	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A54L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A54L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A54L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A54L5	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A54MP1	5040-6848	7	1	EXTRACTOR	28480	5040-6848
A54MP2				NOT ASSIGNED		
A54MP3				NOT ASSIGNED		
A54MP4				NOT ASSIGNED		
A54MP5	1205-0011	0	3	HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A54MP6	1205-0011	0		HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A54MP7	1205-0011	0		HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A54MP8	5000-9043	6	1	PIN:P.C. BOARD EXTRACTOR	28480	5000-9043
A54Q1				NOT ASSIGNED		
A54Q2	1853-0038	4	1	TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0038
A54Q3	1855-0278	8		TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A54Q4	1855-0278	8		TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A54R1	0698-3440	7	2	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A54R2	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A54R3	0757-0442	9	10	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R4	0698-3156	2	2	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A54R5	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A54R6	0698-3446	3	2	RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A54R7	0698-3445	2	1	RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
A54R8	0699-0059	0	1	RESISTOR 5K .1% .1W F TC=0+-5	28480	0699-0059
A54R9	0698-6406	1	1	RESISTOR 8.54K .1% .1W F TC=0+4	28480	0698-6406
A54R10	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A54R11	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A54R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R13	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R14	2100-3123	0	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 17-TRN	02111	43P501
A54R15	0757-0346	2	4	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A54R16	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A54R17	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A54R18	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A54R19	0757-0420	3	1	RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A54R20	0699-0797	3	1	RESISTOR 7.65K .1% .1W F TC=0+4	28480	0699-0797
A54R21	0699-0642	7	1	RESISTOR 10K .1% .1W F TC=0+-5	28480	0699-0642
A54R22	2100-3154	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	02111	43P102
A54R23	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A54R24	0698-8500	0	1	RESISTOR 16.58K .1% .1W F TC=0+4	28480	0698-8500
A54R25	0699-0747	3	2	RESISTOR 4K .05% .1W F TC=0+-10	28480	0699-0747
A54R26	0699-0747	3		RESISTOR 4K .05% .1W F TC=0+-10	28480	0699-0747
A54R27	0698-3430	5	5	RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A54R28	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A54R29	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R30	2100-3161	6	2	RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	02111	43P203
A54R31	0698-3136	8	2	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A54R32	2100-3054	6	1	RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	02111	43P503
A54R33	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A54R34	0698-3158	4	1	RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
A54R35	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A54R36	2100-3161	6		RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	02111	43P203
A54R37	0757-0461	2	2	RESISTOR 68.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6812-F
A54R38	0757-0461	2		RESISTOR 68.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6812-F
A54R39	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R40	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R41	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A54R42	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R43	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R44				NOT ASSIGNED		
A54R45	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R46	0757-0447	4	1	RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A54R47	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A54R48	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A54R49	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A54R50	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A54R51	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A54R52	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A54R53	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A54TP1	0360-0535	0	7	TEST POINT	28480	0360-0535
A54TP2	0360-0535	0		TEST POINT	28480	0360-0535
A54TP3	0360-0535	0		TEST POINT	28480	0360-0535
A54TP4	0360-0535	0		TEST POINT	28480	0360-0535
A54TP5	0360-0535	0		TEST POINT	28480	0360-0535
A54TP6	0360-0535	0		TEST POINT	28480	0360-0535
A54TP7	0360-0535	0		TEST POINT	28480	0360-0535
A54U1	1826-0367	5	1	IC 78M05C V RGLTR TO-39	04713	MC78M05CG
A54U2	1826-0471	2	3	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A54U3	1826-0512	2	1	IC 78M15C V RGLTR TO-39	04713	MC78M15CG
A54U4	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A54U5	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A54U6	1826-0308	4	1	IC CONV 12-B-D/A 24-DIP-C PKG	24355	AD562KD/BIN
A54U7	1820-0138	6	1	IC OP AMP GP 14-DIP-C PKG	29832	S52
A54U8	1826-0026	3	1	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A54U9	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A54U10	1810-0206	8	2	NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A54U11	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A54U12	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A54U13	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A54U14	1826-0785	1	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A54U15	1826-0798	6	1	IC CONV 8-B-D/A	18324	NE5018F
A54U16	1826-0928	4	1	D/A 8-BIT 22-CERDIP BPLR	02910	NE5118F
A54VR1	1902-0692	1	1	DIODE-ZNR 6.3V 1% DO-7 PD=.4W TC=+.001%	28480	1902-0692

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A55	08340-60215	8	1	YO DRIVER	28480	08340-60215
A55C1	0180-2140	5	2	CAPACITOR-FXD 5.6UF+-10% 50VDC TA	56289	150D565X9050R2
A55C2	0160-4833	5	1	CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A55C3	0180-2139	2	1	CAPACITOR-FXD 10UF+-20% 60VDC TA	06001	69F177G7
A55C4	0160-3877	5	1	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A55C5				NOT ASSIGNED		
A55C6	0160-4834	6	4	CAPACITOR-FXD .047UF +-10% 100VDC CER	28480	0160-4834
A55C7	0160-4834	6		CAPACITOR-FXD .047UF +-10% 100VDC CER	28480	0160-4834
A55C8	0160-0302	5	1	CAPACITOR-FXD .018UF +-10% 200VDC POLYE	28480	0160-0302
A55C9-11				NOT ASSIGNED		
A55C12	0160-4834	6		CAPACITOR-FXD .047UF +-10% 100VDC CER	28480	0160-4834
A55C13	0160-4834	6		CAPACITOR-FXD .047UF +-10% 100VDC CER	28480	0160-4834
A55C14	0160-4261	3	2	CAPACITOR-FXD .22UF +-10% 50VDC	84411	HEW 249
A55C15	0160-4261	3		CAPACITOR-FXD .22UF +-10% 50VDC	84411	HEW 249
A55C16	0160-3879	7	7	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A55C17	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A55C18	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A55C19	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A55C20	0180-2140	5		CAPACITOR-FXD 5.6UF+-10% 50VDC TA	56289	150D565X9050R2
A55C21	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A55C22	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A55C23	0180-2505	6	2	CAPACITOR-FXD 1UF+-10% 75VDC TA	56289	150D105X9075B2
A55C24	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A55C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A55C26	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A55C27-29				NOT ASSIGNED		
A55C30	0180-2505	6		CAPACITOR-FXD 1UF+-10% 75VDC TA	56289	150D105X9075B2
A55C31	0180-0230	0	1	CAPACITOR-FXD 1UF+-20% 50VDC TA	56289	150D105X0050A2
A55C32				NOT ASSIGNED		
A55C33	0180-2148	3	1	CAPACITOR-FXD .47UF+-20% 50VDC TA	56289	150D474X0050A2
A55C34	0160-4835	7	1	CAPACITOR-FXD .1UF+-10% 50VDC CER	02798	CACO4X7R104K050A
A55CR1	1901-0033	2	6	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A55CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A55CR3	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A55CR4, 5				NOT ASSIGNED		
A55CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A55CR7	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A55CR8	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A55CR9	1901-0050	3	3	DIODE-SWITCHING 80V 200MA 2NS DO-35	00046	1N4150
A55CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	00046	1N4150
A55CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	00046	1N4150
A55MP1	5040-6851	2	1	EXTRACTOR	28480	5040-6851
A55MP2	5000-9043	6	1	PIN:P.C. BOARD EXTRACTOR	28480	5000-9043
A55Q1	1855-0278	8	2	TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A55Q2	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A55Q3	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A55Q4	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A55Q5	1853-0007	7	2	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A55Q6	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A55Q7	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A55Q8	1854-0022	8	1	TRANSISTOR NPN SI TO-39 PD=700MW	07263	S17843
A55Q9	1853-0038	4	1	TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0038
A55Q10	1853-0012	4	1	TRANSISTOR PNP 2N2904A SI TO-39 PD=600MW	01295	2N2904A
A55Q11	1854-0232	2	1	TRANSISTOR NPN SI TO-39 PD=1W FT=15MHZ	28480	1854-0232
A55Q12	1854-0361					
A55Q13	1855-0278	8		TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A55Q14	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A55R1	0757-0276	7	1	RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A55R2	0699-0961	3	1	RESISTOR 720 .1% .1W F TC=0+4	28480	0699-0961
A55R3	0699-0059	0	1	RESISTOR 5K .1% .1W F TC=0+-5	28480	0699-0059
A55R4	2100-3056	8	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A55R5	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A55R6	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A55R7	0757-0467	8	1	RESISTOR 121K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1213-F
A55R8	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A55R9	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A55R10	0757-0465	6	2	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A55R11	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A55R12				NOT ASSIGNED		
A55R13	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A55R14	0757-0442	9	6	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A55R15	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A55R16-19				NOT ASSIGNED		
A55R20	0757-0294	9	1	RESISTOR 17.8 1% .125W F TC=0+-100	19701	MF4C1/8-T0-17R8-F
A55R21	0757-0458	7	1	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A55R22	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A55R23	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A55R24	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825H-F

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A55R25, 26				NOT ASSIGNED		
A55R27	0757-0346	2	6	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A55R28	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A55R29	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A55R30, 31				NOT ASSIGNED		
A55R32	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A55R33	0757-0443	0	3	RESISTOR 11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1102-F
A55R34-37				NOT ASSIGNED		
A55R38	0757-0441	8	1	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A55R39				NOT ASSIGNED		
A55R40	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A55R41	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A55R42	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A55R43	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A55R44	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A55R45	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A55R46	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A55R47	2100-3103	6	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A55R48	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A55R49	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A55R50	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A55R51	0757-0443	0		RESISTOR 11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1102-F
A55R52	0757-0443	0		RESISTOR 11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1102-F
A55R53	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A55R54				NOT ASSIGNED		
A55R55	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A55R56-59				NOT ASSIGNED		
A55R60	0757-0814	9	1	RESISTOR 511 1% .5W F TC=0+-100	28480	0757-0814
A55R61	0698-3442	9	1	RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F
A55R62	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A55R63	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A55R64	0757-0280	3	1	RESISTOR 1.2M 1% 1W CF TC=0-500	05524	MCS1/2-1204-F
A55R65	0698-3152	8	1	RESISTOR 3.48K 1% .125W F TC=0+-100	03292	CT4-1/8-TO-3481-F
A55R66	0757-0274	5	1	RESISTOR 1M 1% .5W CF TC=0-500	05524	DCS1/2-1004-F
A55R67	0698-3440	7		RESISTOR 196 1 % .125W F TC=0+-100	24546	C4-1/8-TO-196R-F
A55R68	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-TO-5111-F
A55R69	0757-0420	3	1	RESISTOR 4.62K 1% .5W CF TC=0-500	05524	PCS1/2-4621-F
A55TP1	0360-0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A55TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A55TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A55TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A55TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A55U1	1826-0783	9	2	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A55U2	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A55U3	1826-0226	5	1	IC V RGLTR TO-39	07263	78M12HC
A55U4	1826-0558	6	1	IC 337 V RGLTR TO-39	27014	LM337H
A55U5	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A55VR1	1902-0197	1	1	DIODE-ZNR 82V 5% PD=1W IR=5UA	28480	1902-0197
A55VR2	1902-0625	0	1	DIODE-ZNR 1N829 6.2V 5% DO-7 PD=.25W	04713	1N829

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A56	**08340-60029**	**2**	**1**	**-15V REGULATOR**	**28480**	**08340-60029**
A56C1	0180-2505	6	1	CAPACITOR-FXD 1UF+10% 75VDC TA	56289	150D105X9075B2
A56C2	0180-2129	0	1	CAPACITOR-FXD 10UF+10% 50VDC TA	56289	150D106X9050R2
A56C3	0180-0291	3	1	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A56CR1	1901-0033	2	1	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A56CR2	1901-0662	3	2	DIODE-PWR RECT 100V 6A	04713	MR751
A56CR3	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A56DS1	1990-0487	7	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A56E1	1251-2313	6	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A56E2	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A56F1	2110-0047	2	1	FUSE 1A 125V .25X.27	71400	GMW-1
A56MP1	5040-6849	8	1	EXTRACTOR, P.C. BOARD	28480	5040-6849
A56MP2	5000-9043	6	1	PIN:P.C. BOARD EXTRACTOR	28480	5000-9043
A56MP3	08340-00030	9	1	HEAT SINK	28480	08340-00030
A56MP4	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A56MP5	2200-0105	4	1	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A56Q1	1884-0244	9	1	THYRISTOR-SCR VRRM=400	3L585	S2600D
A56Q2	1855-0414	4	1	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A56R1	0811-1084	3	2	RESISTOR 22 5% 3W PW TC=0+30	28480	0811-1084
A56R2	0698-3444	1	1	RESISTOR 316 1% .125W F TC=0+100	24546	C4-1/8-T0-316R-F
A56R3	0757-0346	2	1	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A56R4	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0+100	24546	C4-1/8-T0-2610-F
A56R5	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A56R6	0811-1084	3		RESISTOR 22 5% 3W PW TC=0+30	28480	0811-1084
A56R7	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0±100	24546	C4-1/8-T0-121R-F
A56TP1	0360-0535	0	2	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A56TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A56U1	1826-0523	5	1	IC 337 V RGLTR TO-3	27014	LM337K
A56VR1	1902-3224	1	1	DIODE-ZNR 17.8V 5% DO-35 PD=.4W	28480	1902-3224
A56VR2	1902-3182	0	1	DIODE-ZNR 12.1V 5% DO-35 PD=.4W	28480	1902-3182
A56VR3	1902-0025	4	1	DIODE-ZNR 10V 5% DO-35 PD=.4W TC=+.06%	28480	1902-0025
A56VR4	1902-3197	7	1	DIODE-ZNR 13.7V 2% DO-35 PD=.4W	28480	1902-3197

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A57	**08340-60014**	5	1	**MARKER/BANDCROSS**	28480	**08340-60014**
A57C1	0180-0291	3	2	CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A57C2	0180-0291	3		CAPACITOR-FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A57C3	0180-0197	8	1	CAPACITOR-FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A57C4	0160-4832	4	18	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C5	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C6	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C7	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C8	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C9	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C10	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C11	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C12	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C13	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C14	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C15	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C16	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C17	0160-4823	3	1	CAPACITOR-FXD 820PF ±5% 100VDC CER	28480	0160-4823
A57C18	0160-4801	7	1	CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A57C19	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C20	0160-4807	3	3	CAPACITOR-FXD 33PF ±5% 100VDC CER 0±30	28480	0160-4807
A57C21	0160-4819	7	2	CAPACITOR-FXD 2200PF ±5% 100VDC CER	28480	0160-4819
A57C22	0160-4819	7		CAPACITOR-FXD 2200PF ±5% 100VDC CER	28480	0160-4819
A57C23	0160-4807	3		CAPACITOR-FXD 33PF ±5% 100VDC CER 0±30	28480	0160-4807
A57C24	0160-4807	3		CAPACITOR-FXD 33PF ±5% 100VDC CER 0±30	28480	0160-4807
A57C25	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C26	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C27	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57C28	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A57CR1	1901-0535	9	4	DIODE-SM SIG SCHOTTKY	28480	1901-0535
A57CR2	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A57CR3	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A57CR4	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A57CR5	1901-0033	2	6	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A57CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A57CR7	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A57CR8	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A57CR9	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A57CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A57L1	9100-3562	8	2	INDUCTOR RF-CH-MLD 4.7UH 5% .166DX.385LG	28480	9100-3562
A57L2	9100-3562	8		INDUCTOR RF-CH-MLD 4.7UH 5% .166DX.385LG	28480	9100-3562
A57L3	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A57MP1, 2	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A57MP3	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-BD-THKNS	28480	4040-0755
A57P1	1251-7469	3	1	CONN - POST TYPE	28480	1251-7469
A57Q1	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A57Q2	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A57Q3	1854-0361	8	1	TRANSISTOR NPN 2N4239 SI TO-5 PD=6W	04713	2N4239
A57R1	0757-0280	3	8	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A57R2	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A57R3	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A57R4	0757-0442	9	4	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A57R5	0698-3441	8	1	RESISTOR 215 1% .125W F TC=0±100	24546	C4-1/8-T0-215R-F
A57R6	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A57R7	0757-0402	1	1	RESISTOR 110 1% .125W F TC=0±100 (Recommended Replacement)	24546	C4-1/8-T0-110R-F
A57R8				NOT ASSIGNED		
A57R9	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0±100	24546	C4-1/8-T0-121R-F
A57R10	0690-1021	0	2	RESISTOR 1K 10% 1W CC TC=0±647	01121	GB1021
A57R11	0690-1021	0		RESISTOR 1K 10% 1W CC TC=0±647	01121	GB1021
A57R12	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A57R13	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A57R14-16				NOT ASSIGNED		
A57R17	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-T0-1961-F
A57R18	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0±100	24546	C4-1/8-T0-51R1-F
A57R19	0757-0288	1	3	RESISTOR 9.09K 1% .125W F TC=0±100	19701	MF4C1/8-T0-9091-F
A57R20	0757-0443	0	3	RESISTOR 11K 1% .125W F TC=0±100	24546	C4-1/8-T0-1102-F
A57R21	0757-0288	1		RESISTOR 9.09K 1% .125W F TC=0±100	19701	MF4C1/8-T0-9091-F
A57R22	0757-0288	1		RESISTOR 9.09K 1% .125W F TC=0±100	19701	MF4C1/8-T0-9091-F
A57R23	0757-0443	0		RESISTOR 11K 1% .125W F TC=0±100	24546	C4-1/8-T0-1102-F
A57R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A57R25	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A57R26	0757-0465	6	2	RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A57R27	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+100	24546	C4-1/8-T0-825R-F
A57R28	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	24546	C4-1/8-T0-1003-F
A57R29	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A57R30	0757-0443	0		RESISTOR 11K 1% .125W F TC=0+100	24546	C4-1/8-T0-1102-F
A57R31	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4-1/8-T0-1961-F
A57R32	2100-3757	6	1	RESISTOR-TRMR 100 10% C SIDE-ADJ 17-TRN	28480	2100-3757
A57R33	2100-3757	6	1	RESISTOR-TRMR 100 10% C SIDE-ADJ 17-TRN (Recommended Replacement)	28480	2100-3757
A57R34	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A57R35	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A57R36	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A57R37	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A57R38	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	24546	C4-1/8-T0-1001-F
A57R39	0757-0346	2	2	RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A57R40	0757-0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4-1/8-T0-10R0-F
A57R41	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A57TP1	0360-2050	8	5	TEST POINT	28480	0360-2050
A57TP2	0360-2050	8		TEST POINT	28480	0360-2050
A57TP3	0360-2050	8		TEST POINT	28480	0360-2050
A57TP4	0360-2050	8		TEST POINT	28480	0360-2050
A57TP5	0360-2050	8		TEST POINT	28480	0360-2050
A57U1	1820-1194	6	2	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS193N
A57U2	1818-0135	8	2	IC NMOS 1024 (1K) STAT RAM 360-NS 3-S	04713	MCM68A10L
A57U3	1820-1984	2	2	IC CONV 10-B-D/A 16-DIP-C PKG	24355	AD561KD
A57U4	1820-1984	2		IC CONV 10-B-D/A 16-DIP-C PKG	24355	AD561KD
A57U5	1820-1437	0	1	IC MV TTL LS MONOSTBL DUAL	01295	SN74LS221N
A57U6	1826-0098	9	1	IC COMPARATOR PRCN TO-99 PKG	27014	LM211H
A57U7	1826-0471	2	3	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A57U8	1820-2075	4	2	IC MISC TTL LS	01295	SN74LS245N
A57U9	1820-1196	8	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A57U10	1820-1194	6		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	SN74LS193N
A57U11	1820-1112	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A57U12	1820-1425	6	1	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	SN74LS132N
A57U13	1820-1272	1	1	IC BFR TTL LS NOR QUAD 2-INP	01295	SN74LS33N
A57U14	1826-0081	0	2	IC OP AMP WB TO-99 PKG	27014	LM318H
A57U15	1818-0135	8		IC NMOS 1024 (1K) STAT RAM 360-NS 3-S	04713	MCM68A10L
A57U16	1820-2075	4		IC MISC TTL LS	01295	SN74LS245N
A57U17	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A57U18	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A57U19	1820-1298	1	1	IC MUXR/DATA-SEL TTL LS 8-TO-1-LINE	01295	SN74LS251N
A57U20	1820-1144	6	2	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A57U21	1820-1144	6		IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A57U22	1826-0081	0		IC OP AMP WB TO-99 PKG	27014	LM318H
A57U23	1820-1730	6	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A57U24	1820-1491	6	1	IC BFR TTL LS NON-INV HEX 1-INP	01295	SN74LS367AN
A57U25	1820-1216	3	2	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A57U26	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A57U27	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A57U28	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A57U29	1820-1201	6	1	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A57U30	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A57U31	1810-0583	4	1	NETWORK-RES 16-DIP10.0K OHM X 8	28480	1810-0583
A57VR1	1902-3104	6	3	DIODE-ZNR 5.62V 5% DO-35 PD=.4W	28480	1902-3104
A57VR2	1902-3104	6		DIODE-ZNR 5.62V 5% DO-35 PD=.4W	28480	1902-3104
A57VR3	1902-3104	6		DIODE-ZNR 5.62V 5% DO-35 PD=.4W	28480	1902-3104
A57VR4	1902-0579	3	2	DIODE-ZNR 5.1V 5% PD=1W IR=10UA	28480	1902-0579
A57VR5	1902-3357	1	1	DIODE-ZNR 56.2V 5% DO-7 PD=.4W TC=+.081%	28480	1902-3357
A57VR6	1902-0579	3		DIODE-ZNR 5.1V 5% PD=1W IR=10UA	28480	1902-0579

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

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A58	08340-60298	7	1	SWEEP GENERATOR	28480	08340-60298
A58C1	0180-0291	1	1	CAPACITOR-FXD 1UF ±10% 35VDC TA	28480	0180-0291
A58C2	0160-4835	7	38	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C3				NOT ASSIGNED		
A58C4	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C5	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C6, 7				NOT ASSIGNED		
A58C8	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C9	0160-4832	4	8	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C10	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C11	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C12	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C13	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C14	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C15	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C16	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C17	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C18	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C19	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C20	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C21	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C22	0160-4810	8	1	CAPACITOR-FXD 330PF ±5% 100VDC CER	28480	0160-4810
A58C23	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C24	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C25	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C26	0160-4825	5	1	CAPACITOR-FXD 560PF ±5% 100VDC CER	28480	0160-4825
A58C27				NOT ASSIGNED		
A58C28	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C29	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C30	0160-5662	0	1	CAPACITOR-FXD 5UF ±10% 50VDC NET-POLYC	28480	0160-5662
A58C31	0160-4265	7	1	CAPACITOR-FXD .47UF ±20% 50VDC	84411	HEW 386
A58C32	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C33	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C34	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C35	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C36	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C37	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C38	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C39	0160-4807	3	1	CAPACITOR-FXD 33PF ±5% 100VDC CER 0±30	28480	0160-4807
A58C40	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C41	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C42	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C43	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C44	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C45	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C46	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C47	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C48	0180-1731	8	1	CAPACITOR-FXD 4.7UF ±10% 50VDC TA	28480	0180-1731
A58C49	0180-0374	3	1	CAPACITOR-FXD 10UF ±10% 20VDC TA	56289	150D106X9020B2
A58C50	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C51	0180-0116	1	3	CAPACITOR-FXD 6.8UF ±10% 35VDC TA	28480	0180-0116
A58C52	0180-0116	1		CAPACITOR-FXD 6.8UF ±10% 35VDC TA	28480	0180-0116
A58C53	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C54	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C55	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C56	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C57	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A58C58	0180-0116	1		CAPACITOR-FXD 6.8UF ±10% 35VDC TA	28480	0180-0116
A58C59	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C60	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58C61	0160-4835	7		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-4835
A58CR1	1901-1098	1	2	DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A58CR2	1901-0586	0	9	DIODE-GEN PRP 30V 25MA TO-72	28480	1901-0586
A58CR3	1901-0586	0		DIODE-GEN PRP 30V 25MA TO-72	28480	1901-0586
A58CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A58CR5	1901-0518	8	2	DIODE-SM SIG SCHOTTKY	28480	1901-0518

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A58CR6	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A58CR7	1901-0033	2	2	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A58CR8				NOT ASSIGNED		
A58CR9	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A58L1	9140-0210	1	4	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A58L2	9100-0539	3	1	INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	28480	9100-0539
A58L3	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A58L4	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A58L5	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A58MP1	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753
A58MP2	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-BD-THKNS	28480	4040-0747
A58MP3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A58MP4,5				NOT ASSIGNED		
A58MP6	1205-0011	0	1	HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A58MP7	1200-0172	4	2	INSULATOR-XSTR DAP-GL	28480	1200-0172
A58MP8	0380-1221	5	1	STANDOFF-RUT-ON .25-IN-LG 2-56 THD	28480	0380-1221
A58MP9	08340-00068	3	1	DAC SHIELD	28480	08340-00068
A58MP10	0520-0126	5	1	SCREW-MACH 2-56 .125-IN-LG 100DEG	28480	0520-0126
A58MP11	2190-0112	0	1	WASHER LK .088-IN-DIA	28480	2190-0112
A58P1	1251-7469	3	1	CONN - POST TYPE	28480	1251-7469
A58Q1	1855-0420	2	10	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q2	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q3	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q4	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q5	1855-0278	8	1	TRANSISTOR J-FET 2N5116 P-CHAN D-MODE	17856	2N5116
A58Q6	1855-0386	2		TRANSISTOR J-FET 2N4392 N-CHAN D-MODE	04713	2N4392
A58Q7	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q8	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q9	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q10	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q11	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q12	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A58Q13	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A58Q14	1854-0361	8	1	TRANSISTOR NPN 2N4239 SI TO-5 PD=6W	02037	2N4239
A58R1	2100-3154	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	02111	43P102
A58R2	0757-0280	3	9	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R3	0757-0416	7	2	RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A58R4	2100-3123	0	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 17-TRN	02111	43P501
A58R5	0757-0465	6	3	RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A58R6	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-1621-F
A58R7	0698-3155	1	2	RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4-1/8-T0-4641-F
A58R8	0757-0401	0	3	RESISTOR 100 1% .125W F TC=0 ±100	24546	C4-1/8-TO-101F
A58R9	0699-0747	3	2	RESISTOR 4K .05% .1W F TC=0±10	28480	0699-0747
A58R10	0757-0442	9	14	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R11	0698-8960	6	1	RESISTOR 750K 1% .125W F TC=0±100	28480	0698-8960
A58R12	0699-0747	3		RESISTOR 4K .05% .1W F TC=0±10	28480	0699-0747
A58R13	2100-3095	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 17-TRN	02111	43P201
A58R14	0757-0346	2	9	RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R15	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R16	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R17	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0±100	24546	C4-1/8-T0-7501-F
A58R18	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R19	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC=0±100	24546	C4-1/8-T0-5621-F
A58R20	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A58R21	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R22	0757-1101	9	1	RESISTOR 360 1% .125W F TC=0±100	24546	C4-1/8-T0-361-F
A58R23	0698-3260	9	1	RESISTOR 464K 1% .125W F TC=0±100	28480	0698-3260
A58R24	0757-0458	7	2	RESISTOR 51.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-5112-F
A58R25	0698-3484	9	1	RESISTOR 6.65K 1% .125W F TC=0±100	24546	C4-1/8-T0-6651-F
A58R26	0698-4503	5	1	RESISTOR 66.5K 1% .125W F TC=0±100	24546	C4-1/8-T0-6652-F
A58R27	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4-1/8-T0-2611-F
A58R28	0698-3453	2	1	RESISTOR 196K 1% .125W F TC=0±100	24546	C4-1/8-T0-1963-F
A58R29	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0±100	19701	MF4C1/8-T0-6191-F
A58R30	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0±100	24546	C4-1/8-T0-2871-F

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A58R31	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0±100	24546	C4-1/8-T0-5112-F
A58R32	0698-5093	0	1	RESISTOR 390K 1% .125W F TC=0±100	28480	0698-5093
A58R33				NOT ASSIGNED		
A58R34	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A58R35				NOT ASSIGNED		
A58R36	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC=0±100	24546	C4-1/8-T0-2152-F
A58R37	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R38	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R39	0698-3432	7	1	RESISTOR 26.1 1% .125W F TC=0±100	03888	PME55-1/8-T0-26R1-F
A58R40				NOT ASSIGNED		
A58R41	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R42	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R43	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0±100	24546	C4-1/8-T0-1782-F
A58R44	0757-0459	8	1	RESISTOR 56.2K 1% .125W F TC=0±100	24546	C4-1/8-T0-5622-F
A58R45	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4-1/8-T0-4641-F
A58R46	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R47	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R48	0698-3430	5	1	RESISTOR 21.5 1% .125W F TC=0±100	03888	PME55-1/8-T0-21R5-F
A58R49	0757-0289	2	1	RESISTOR 13.3K 1% .125W F TC=0±100	19701	MF4C1/8-T0-1332-F
A58R50	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R51				NOT ASSIGNED		
A58R52	0699-0683	6	3	RESISTOR 10K .01% .1W F TC=0±15	28480	0699-0683
A58R53	0699-0683	6		RESISTOR 10K .01% .1W F TC=0±15	28480	0699-0683
A58R54	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R55	0699-2456	5		RESISTOR 1K .01% .1W F TC=0±15	28480	0699-2456
A58R56	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R57	0699-2455	4	1	RESISTOR 9K .01% .1W F TC=0±15	28480	0699-2455
A58R58	0699-0684	7	2	RESISTOR 8.1K .01% .1W F TC=0±15	28480	0699-0684
A58R59	0699-0275	2	1	RESISTOR 1K .01% .1W F TC=0±15	28480	0699-0275
A58R60	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4-1/8-T0-1003-F
A58R61	0699-0684	7		RESISTOR 8.1K .01% .1W F TC=0±15	28480	0699-0684
A58R62	0699-0682	5	1	RESISTOR 900 .01% .1W F TC=0±15	28480	0699-0682
A58R63	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A58R64	0757-0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4-1/8-T0-10R0-F
A58R65	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R66	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R67	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R68	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R69	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R70	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R71	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R72	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A58R73	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R74	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R75	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R76	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R77	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R78	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A58R79	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-TO-511R-F
A58R80	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC=0±100	24546	C4-1/8-TO-1781-F
A58R81	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-TO-5111-F
A58R82				NOT ASSIGNED		
A58R83	0757-0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-TO-101-F
A58R84	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-TO-1001-F
A58TP1	0360-0535	0	14	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP11	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP12	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP13	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A58TP14	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A58U1	1826-1048	1	9	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U2	1820-1984	2	1	IC CONV 10-B-D/A 16-DIP-C PKG	24355	AD561KD
A58U3	1810-0206	8	7	NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A58U4	1826-0138	8	3	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A58U5	1826-0938	6	1	D/A 10-bit 18-CERDIP BPLR	28480	1826-0938
A58U6	1826-1048	1		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U7	1826-1048	1		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U8	1826-1048	1		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U9	1813-0041	5	1	IC OP AMP TO-99 PKG	27014	LH0042CH
A58U10	1826-0785	1	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	01295	TL072ACJG
A58U11	1826-0684	9	1	IC CONV 12-B-D/A 18 DIP-C PKG	28480	1826-0684
A58U12	1826-1048	1		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U13	1826-1140	4	1	IC SMPL/HOLD 14 CERDIP	02180	SMP-10FT
A58U14	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A58U15	1826-0783	9	1	IC OP AMP LOW-NOIS 8-DIP-C PKG	52063	XR5534ACN
A58U16	1826-1048	1		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U17	1826-1048	1		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U18	1826-1048	1		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-1048
A58U19	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A58U20	1820-1196	8	6	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A58U21	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A58U22	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A58U23	1820-2550	0	2	IC DCDR TTL LS 3-TO-8-LINE	01295	SN74LS137N
A58U24	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A58U25	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A58U26	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A58U27	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A58U28	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A58U29	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A58U30	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A58U31	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A58U32	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A58U33	1820-1425	6	1	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	SN74LS132N
A58U34	1820-2550	0		IC DCDR TTL LS 3-TO-8-LINE	01295	SN74LS137N
A58U35	1826-0138	8		IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A58U36	1810-0371	8	1	NETWORK-RES 8-SIP100.0K OHM X7	01121	208A104
A58U37	1826-0138	8		IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A58VR1	1902-0625	0	1	DIODE-ZNR 1N829 6.2V 5% DO-7 PD=.25W	04713	1N829

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A59	**08340-60153**	**2**	**1**	**DIGITAL INTERFACE** **NOTE** **08340-60153 is recommended replacement for 08340-60013. Refer to change 4.**	**28480**	**08340-60153**
A59C1	0180-0228	6	1	CAPACITOR-FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A59C2	0160-4557	0	3	CAPACITOR-FXD .1UF ±20% 50VDC CER	16299	CAC04X7R104M050A
A59C3	0160-4557	0		CAPACITOR-FXD .1UF ±20% 50VDC CER	16299	CAC04X7R104M050A
A59C4	0160-4557	0		CAPACITOR-FXD .1UF ±20% 50VDC CER	16299	CAC04X7R104M050A
A59C5				NOT ASSIGNED		
A59C6	0160-4832	4	11	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C7	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C8	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C9	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C10	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C11	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C12	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C13	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C14	0180-0437	9	1	CAPACITOR-FXD 39UF±10% 10VDC TA NPOL	28480	0180-0437
A59C15				NOT ASSIGNED		
A59C16	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C17	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59C18	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A59CR1	1901-0033	2	3	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A59CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A59CR3	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A59L1	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A59MP1	4040-0756	3	1	EXTR-PC BD WHT POLYC .062-BD-THKNS	28480	4040-0756
A59MP2, 3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A59MP4	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753
A59P1	1251-7469	3	1		28480	1251-7469
A59R1	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0+100	24546	C4-1/8-T0-1471-F
A59R2	0757-0462	3	1	RESISTOR 75K 1% .125W F TC=0±100	24546	C4-1/8-T0-7502-F
A59R3	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-2152-F
A59R4	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4-1/8-T0-4221-F
A59R5	0757-0442	9	7	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A59R6	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-3162-F
A59R7	0698-3446	3	3	RESISTOR 383 1% .125W F TC=0±100	03292	C4-1/8-T0-383R-F
A59R8	0698-3446	3		RESISTOR 383 1% .125W F TC=0±100	03292	C4-1/8-T0-383R-F
A59R9	0698-3446	3		RESISTOR 383 1% .125W F TC=0±100	03292	C4-1/8-T0-383R-F
A59R10	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-TO-1961-F
A59R11	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A59R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A59R13	0757-0463	4	1	RESISTOR 82.5K 1% .125W F TC=0+100	24546	C4-1/8-T0-8252-F
A59R14	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4-1/8-TO-1961-F
A59R15-21				NOT ASSIGNED		
A59R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A59R23-24				NOT ASSIGNED		
A59R25	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A59R26	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A59R27	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A59R28	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4-1/8-T0-1962-F
A59R29	0757-0422	5	3	RESISTOR 909 1% .125W F TC=0±100	03292	CT4-1/8-TO-909R-F
A59R30	0757-0422	5		RESISTER 909 1% .125W F TC=0±100	03292	CT4-1/8-TO-909R-F
A59R31	0757-0422	5		RESISTOR 909 1% .125W F TC=0±100	03292	CT4-1/8-TO-909R-F
A59R32	0757-0438	3	2	RESISTOR 5.11K 1% .125W F TC=0±100	03292	CT4-1/8-TO-5111-F
A59R33	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	03292	CT4-1/8-TO-5111-F
A59TP1	0360-0535	0	10	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59U1	1820-1918	2	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS241N
A59U2	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A59U3	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A59U4	1820-1440	5	2	IC LCH TTL LS QUAD	01295	SN74LS279N
A59U5	1820-1905	7	1	IC GATE TTL LS NOR DUAL 5-INP	07263	74LS260PC
A59U6	1820-1297	0	1	IC GATE TTL LS EXCL-NOR QUAD 2-INP	01295	SN74LS266N
A59U7	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A59U8	1820-2485	0	1	IC RCVR TTL LS BUS OCTL	01295	SN75160N
A59U9	1820-0577	7	1	IC INV TTL HEX 1-INP	01295	SN7416N
A59U10	1820-1196	8	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A59U11	1820-1210	7	2	IC GATE TTL LS AND-OR-INV DUAL 2-INP	01295	SN74LS51N
A59U12	1820-1216	3	3	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A59U13	1826-0138	8	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A59U14	1820-2483	8	1	IC RCVR TTL LS BUS OCTL	01295	SN75161NA
A59U15	1820-2748	8	1		28480	1820-2748
A59U16	1820-2075	4	1	IC MISC TTL LS	01295	SN74LS245N
A59U17	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A59U18	1820-1917	1	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A59U19	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A59U20	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A59U21	1820-2735	3	1	IC TIMER TTL	52063	XR-2242CN
A59U22	1820-1440	5		IC LCH TTL LS QUAD	01295	SN74LS279N
A59U23	1820-1858	9	2	IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A59U24	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A59U25	1820-1210	7		IC GATE TTL LS AND-OR-INV DUAL 2-INP	01295	SN74LS51N
A59U26	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A59U27	1810-0280	8	1	NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A59W1	1460-1489	8	3	WIREFORM BE CU AG	28480	1460-1489
A59W2	1460-1489	8		WIREFORM BE CU AG	28480	1460-1489
A59W3	1460-1489	8		WIREFORM BE CU AG	28480	1460-1489

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A59	08340-60226	1	1	DIGITAL INTERFACE	28480	08340-60226
A59C1	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A59C2	0160-4557	0	3	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A59C3	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A59C4	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A59C5				NOT ASSIGNED		
A59C6	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C7	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C8	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C9	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C11	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C12	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C13	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C14				NOT ASSIGNED		
A59C15				NOT ASSIGNED		
A59C16	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C17	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59C18	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A59CR1	1901-0033	2	3	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A59CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A59CR3	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A59L1	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A59MP1	4040-0756	3	1	EXTR-PC BD WHT POLYC .062-BD-THKNS	28480	4040-0756
A59MP2, 3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A59MP4	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753
A59P1	1251-7469	3	1		28480	1251-7469
A59R1	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A59R2	0757-0462	3	1	RESISTOR 75K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7502-F
A59R3	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A59R4	0698-3154	0	1	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A59R5	0757-0442	9	5	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A59R6	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A59R7	0698-3446	3	3	RESISTOR 383 1% .125W F TC=0+-100	03292	C4-1/8-T0-383R-F
A59R8	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	03292	C4-1/8-T0-383R-F
A59R9	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	03292	C4-1/8-T0-383R-F
A59R10	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A59R11	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A59R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A59R13				NOT ASSIGNED		
A59R14	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1961-F
A59R15-21				NOT ASSIGNED		
A59R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A59R23-24				NOT ASSIGNED		
A59R26-28				NOT ASSIGNED		
A59R29	0757-0422	5	3	RESISTOR 909 1% .125W F TC=0+-100	03292	CT4-1/8-TO-909R-F
A59R30	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	03292	CT4-1/8-TO-909R-F
A59R31	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	03292	CT4-1/8-TO-909R-F
A59R32				NOT ASSIGNED		
A59R33	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+-100	03292	CT4-1/8-TO-5111-F
A59TP1	0360-0535	0	0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A59U1				NOT ASSIGNED		
A59U2	1820-0577	7	2	IC INV TTL HEX 1-INP	01295	SN7416N
A59U3	1820-1416	5	1	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A59U4	1820-1440	5	2	IC LCH TTL LS QUAD	01295	SN74LS279N
A59U5	1820-1905	7	1	IC GATE TTL LS NOR DUAL 5-INP	07263	74LS260PC
A59U6	1820-1297	0	1	IC GATE TTL LS EXCL-NOR QUAD 2-INP	01295	SN74LS266N
A59U7	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A59U8				NOT ASSIGNED		
A59U9	1820-0577	7		IC INV TTL HEX 1-INP	01295	SN7416N
A59U10	1820-1196	8	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A59U11	1820-1210	7	2	IC GATE TTL LS AND-OR-INV DUAL 2-INP	01295	SN74LS51N
A59U12	1820-1216	3	3	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A59U13	1826-0138	8	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A59U14-17				NOT ASSIGNED		
A59U17	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS174N
A59U18	1820-1917	1	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A59U19	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A59U20				NOT ASSIGNED		
A59U21				NOT ASSIGNED		
A59U22	1820-1440	5		IC LCH TTL LS QUAD	01295	SN74LS279N
A59U23	1820-1858	9	2	IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A59U24	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A59U25	1820-1210	7		IC GATE TTL LS AND-OR-INV DUAL 2-INP	01295	SN74LS51N
A59U26	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A59U27	1810-0280	8	1	NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A59W1	1460-1489	8	3	WIREFORM BE CU AG	28480	1460-1489
A59W2	1460-1489	8		WIREFORM BE CU AG	28480	1460-1489
A59W3	1460-1489	8		WIREFORM BE CU AG	28480	1460-1489

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

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A60	08340-60299	8	1	PROCESSOR ASSEMBLY	28480	08340-60299
A60	08340-60331	9	1	PROCESSOR ASSEMBLY SERVICE KIT	28480	08340-60331
A60BT1	1420-0331	3	1	BATTERY 3.4V 1.75A-HR LITHIUM THIONYL	28480	1420-0331
A60C1	0180-0374	3	3	CAPACITOR-FXD 10UF ±10% 20VDC TA	56289	150D106X9020B2
A60C2	0180-0374	3		CAPACITOR-FXD 10UF ±10% 20VDC TA	56289	150D106X9020B2
A60C3	0180-0374	3		CAPACITOR-FXD 10UF ±10% 20VDC TA	56289	150D106X9020B2
A60C4	0160-4835	7	19	CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C5	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C6	0180-0291	3	1	CAPACITOR-FXD 1UF ±10% 35VDC TA	56289	150D105X9035A2
A60C7	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C8	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C9	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C10	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C11	0160-4832	4	11	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C12	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C13	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C14	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C15	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C16	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C17	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C18	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C19	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C20	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C21	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C22	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C23	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C24	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A60C25	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C26	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C27	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C28	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C29	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C30	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C31	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C32	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C33	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60C34	0160-4801	7	1	CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A60C35	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A60CR1	1901-0376	6	2	DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A60CR2	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A60CR3	1901-0518	8	1	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A60CR4	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A60CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A60CR6	1901-1098	1	2	DIODE-SWITCHING 50V 200MA 4NS	02682	1N4150
A60CR7	1901-1098	1		DIODE-SWITCHING 50V 200MA 4NS	02682	1N4150
A60DS1	1990-1149	0	16	LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS2	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS3	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS4	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS5	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS6	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS0	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS8	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS9	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS10	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS11	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS12	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS13	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS14	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS15	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS16	1990-1149	0		LED-LAMP IF=7MA-MAX BVR=5V	28480	1990-1149
A60DS17	1990-1148	9	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-1148
A60L1	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A60MP1	4040-0754	1	1	EXTR PC BD BLU	28480	4040-0754
A60MP2	4040-0748	3	1	EXTR PC BD BLK	28480	4040-0748
A60MP3,4	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A60MP5	1400-1267	4	1	CLIP BTRY AA	28480	1400-1267
A60P1	1251-7469	3	1	CONN-POST TYPE .100-PIN-SPCG 110-CONT	28480	1251-7469
A60Q1	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A60Q2	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A60Q3	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A60R1	0757-0873	0	1	RESISTOR 1.62K 1% .5W F TC=0±100	28480	0757-0873
A60R2	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A60R3	0757-0442	9	10	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R4	0698-3157	3	2	RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-1962-F
A60R5	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R6	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0±100	19701	MF4C1/8-T0-6191-F
A60R7	0698-3152	8	1	RESISTOR 3.48K 1% .125W F TC=0±100	24546	C4-1/8-T0-3481-F
A60R8	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0±100	24546	C4-1/8-T0-3831-F
A60R9	0698-3260	9	3	RESISTOR 464K 1% .125W F TC=0±100	28480	0698-3260
A60R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4-1/8-T0-1001-F
A60R11	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R13	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R14	0698-3260	9		RESISTOR 464K 1% .125W F TC=0±100	28480	0698-3260
A60R15	0698-3260	9		RESISTOR 464K 1% .125W F TC=0±100	28480	0698-3260
A60R16	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0±100	24546	C4-1/8-T0-101-F
A60R17	0757-0438	3	3	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A60R18	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A60R19	0757-0416	7	2	RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A60R20	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R22				NOT ASSIGNED		
A60R23	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R24	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R25	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A60R26	0698-3155	1	2	RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4-1/8-T0-4641-F
A60R27	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4-1/8-T0-4641-F
A60R28	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4-1/8-T0-511R-F
A60R29	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A60R30	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4-1/8-T0-1962-F
A60TP1-TP26	0360-0535	0	26	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A60U1	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A60U2	1810-0206	8	1	NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A60U3	1813-0196	1	1	XTAL-CLOCK-OSCILLATOR 14.7456-MHZ	28480	1813-0196
A60U4	1820-3449	8	1	IC-PARALLEL INTERFACE/TIMER/8MHZ/MC68000	28480	1820-3449
A60U5	1820-3172	4	1	IC FF CMOS/74HC J-K BAR POS-EDGE-TRIG	28480	1820-3172
A60U6	1820-3513	7	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	BS75161AN
A60U7	1820-3431	8	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	BS75160AN
A60U8	1820-3401	2	1	IC BFR TTL ALS OR QUAD 2-INP	28480	1820-3401
A60U9	1810-0276	2	2	NETWORK-RES 10-SIP1.5K OHM X 9	01121	210A152
A60U10	08340-80005	6	1	IO DECODER	28480	08340-80005
A60U11	1820-2548	6	1	IC GENERAL PURPOSE INTERFACE BUS ADAPTER	28480	1820-2548
A60U12	1810-0276	2		NETWORK-RES 10-SIP1.5K OHM X 9	01121	210A152
A60U13	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A60U14	1820-1997	7	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A60U15	1810-0279	5	4	NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A60U16	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A60U17	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A60U18	1820-2675	0	2	IC RCVR TTL LS BUS OCTL	01295	SN74LS646N
A60U19	1820-2675	0		IC RCVR TTL LS BUS OCTL	01295	SN74LS646N
A60U20	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	01295	SN74LS11N
A60U21	1820-2102	8	1	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A60U22	1820-1997	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A60U23	08340-80007	8	1	DECODER	28480	08340-80007
A60U24	1820-1851	2	1	IC ENCDR TTL LS	01295	SN74LS148N
A60U25	1820-2656	7	1	IC GATE TTL ALS NAND QUAD 2-INP	01295	SN74ALS00N
A60U26	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A60U27	1820-4570	8	1	IC -MPU; CLK FREQ=8MHZ, INSTRUCTION	28480	1820-4570
A60U28	1820-1492	7	1	IC BFR TTL LS INV HEX 1-INP	01698	SN74LS368AN
A60U29	08340-80006	7	1	MEMORY DECODER	28480	08340-80006
A60U30	1810-0205	7	1	NETWORK-RES 8-SIP4.7K OHM X 7	01121	208A472
A60U31	1810-0279	5		NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A60U32	1818-4227	7	2	IC EPROM 2KX8	28480	1818-4227
A60U33	1818-4227	7		IC EPROM 2KX8	28480	1818-4227
A60U34-A60737	08340-60323	9	1	PROGRAMMED UVEPROM SERVICE KIT (Contains 4 UVEPROMS, 4 sockets, and instructions) UVEPROMS not separately replaceable	28480	08340-60323
A60U35						

■ *Table 6-3. Replaceable Parts*

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A60U38	1818-3183	2	2	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	28480	1818-3183
A60U39	1818-3183	2		IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	28480	1818-3183
A60U40	1251-4787	2	1	SHUNT-DIP 8-POSITION	28480	1251-4787
A60VR1	1902-3107	9	1	DIODE-ZNR 5.76V 2% DO-35 PD=.4W	28480	1902-3107
A60X1	1200-0607	0	1	SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0607

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A61	**08340-60151**	**1**	**1**	**MEMORY**	**28480**	**08340-60151**
A61BT1	1420-0275	4	2	BATTERY 2.8V .7A-HR LI/I-PIN	28480	1420-0275
A61BT2	1420-0275	4		BATTERY 2.8V .7A-HR LI/I-PIN	28480	1420-0275
A61C1	0180-0229	7	14	CAPACITOR-FXD 33UF ±10% 10VDC TA	28480	0180-0229
A61C2	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C3	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A61C4	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A61C5	0180-0374	3		CAPACITOR-FXD 10UF ±10% 20VDC TA	28480	0180-0374
A61C6	0160-4804	0		CAPACITOR-FXD 56PF ±5% 100VDC CER 0±30	28480	0160-4804
A61C7	0160-4804	0		CAPACITOR-FXD 56PF ±5% 100VDC CER 0±30	28480	0160-4804
A61C8	0160-4801	7		CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A61C9	0160-4801	7		CAPACITOR-FXD 100PF ±5% 100VDC CER	28480	0160-4801
A61C10	0160-4832	4	1	CAPACITOR-FXD .01UF±10% 100VDC CER	28480	0160-4832
A61C11	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C12	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C13	0160-4832	4		CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C14	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A61C15	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A61C16	0160-3879	7	1	CAPACITOR-FXD .01UF±20% 100VDC CER	28480	0160-3879
A61C17	0160-3879	7		CAPACITOR-FXD .01UF ±20% 100VDC CER	28480	0160-3879
A61C18	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C19	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C20	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C21	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
A61C22	0160-4833	5		CAPACITOR-FXD .022UF ±10% 100VDC CER	28480	0160-4833
A61C23	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A61C24	0160-4835	7		CAPACITOR-FXD .1UF ±10% 50VDC CER	28480	0160-4835
A61CR1	1901-0518	8	11	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A61CR2	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A61CR3	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A61CR4	1901-0376	6	4	DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A61CR5	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A61CR6	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A61CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR15	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR19	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR20	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35		
A61CR21	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR22	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR23	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A61CR24	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR25	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR26	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A61CR27	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A61CR28	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A61DS1	1990-0486	6	16	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS2	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS3	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS4	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS5	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS6	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS7	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS8	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS9	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS10	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS11	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS12	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS13	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS14	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS15	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A61DS16	1990-0486	6		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A61L1	9100-1788	6	1	CHOKE-WIDE BAND ZMAX=680 OHM @ 180 MHZ	02114	VK200 20/48
A61MP1	4040-0754	1	1	EXTR-PC BD BLU POLYC .062-IN-BD-THKNS	28480	4040-0754
A61MP2	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-IN-BD-THKNS	28480	4040-0749
A61MP3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A61MP4				NOT ASSIGNED		
A61MP5	1251-7356	7		CONN-POST TYPE .150-IN-PIN-SPCG 24-CONT	28480	1251-7356
A61MP6	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A61MP7	0380-1489	7		SPACER SNAP IN .375-IN-LG; .280 IN OD	28480	0380-1489
A61MP8	0380-1489	7		SPACER SNAP IN .375-IN-LG; .280 IN OD	28480	0380-1489
A61MP9	0380-1489	7		SPACER SNAP IN .375-IN-LG; .280 IN OD	28480	0380-1489
A61MP10	0380-1489	7		SPACER SNAP IN .375-IN-LG; .280 IN OD	28480	0380-1489
A61P1	1251-7469	3	1	CONN-POST TYPE .100-PIN-SPCG 100-CONT	28480	1251-7469
A61Q1	1853-0281	9	3	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	28480	1853-0281
A61Q2	1853-0034	0		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A61Q3	1855-0251	7	1	TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251
A61Q4	1854-0477	7	3	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A61Q5	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	28480	1853-0281
A61Q6	1855-0251	7		TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251
A61Q7	1855-0251	7	2	TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251
A61Q8	1853-0034	0		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A61Q9	1855-0251	7		TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251
A61Q10	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	28480	1853-0281
A61Q11	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	28480	1854-0477
A61R1				NOT ASSIGNED		
A61R2	0757-0442	9	8	RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A61R3	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A61R4	0757-0438	3	5	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A61R5	0757-0458	7	2	RESISTOR 51.1K 1% .125W F TC=0±100	28480	0757-0458
A61R6	0757-0438	3	3	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A61R7				NOT ASSIGNED		
A61R8	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A61R9	0757-0873	0	1	RESISTOR 1.62K 1% .5W F TC=0±100	28480	0757-0873
A61R10	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4-1/8-T0-5111-F
A61R11	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+100	28480	0757-0280
A61R12	0698-0084	9	3	RESISTOR 2.15K 1% .125W F TC=0+100	28480	0698-0084
A61R13	0757-0416	7		RESISTOR 511 1% .125W F TC=0±100	28480	0757-0416
A61R14	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+100	28480	0757-0394
A61R15	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	28480	0757-0280
A61R16	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A61R17	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A61R18	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4-1/8-T0-5111-F
A61R19	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A61R20	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A61R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+100	24546	C4-1/8-T0-1002-F
A61R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A61R23				NOT ASSIGNED		
A61R24	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	28480	0757-0280
A61R25	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A61R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	28480	0757-0280
A61R27	0757-0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4-1/8-T0-1002-F
A61R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	28480	0757-0280
A61R29	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+100	28480	0757-0280
A61R30	0757-0280	3		RESISTOR 1K 1% .125W F TC=0±100	28480	0757-0280
A61R31	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+100	28480	0757-0465
A61R32	0757-0465	6		RESISTOR 100K 1% .125W F TC=0±100	28480	0757-0465
A61TP1	0360-0535	0	9	TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP8	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP9	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP10	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP11	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE		
A61TP12	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP13	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP14	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP15	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP16	0360-0535	0		TERMINAL-TEST POINT .336IN ABOVE	00000	ORDER BY DESCRIPTION
A61TP17	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A61TP18	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	00000	ORDER BY DESCRIPTION
A61U1	1820-1446	1		IC SHF-RGTR TTL LS R-S PRL-IN PRL-OUT	28480	1820-1446
A61U2	1820-1204	9	1	IC GATE TTL LS NAND DUAL 4-INP	28480	1820-1204
A61U3	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	28480	1820-1112
A61U4	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A61U5	1810-0273	9	2	NETWORK-RES 10-SIP 470.0 OHM X 9	28480	1810-0273
A61U6	1810-0273	9		NETWORK-RES 10-SIP 470.0 OHM X 9	28480	1810-0273
A61U7	1820-1202	7		IC GATE TTL LS NAND TTL 3-INP	28480	1820-1202
A61U8	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	28480	1820-1197
A61U9	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A61U10	1820-1730	6	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A61U11	1820-1730	6	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A61U12	1820-1205	0	2	IC GATE TTL LS AND DUAL 4INP	28480	1820-1205
A61U13	1820-1419	8	2	IC COMPTR TTL LS MAGTD 4-BIT	28480	1820-1419
A61U14	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE TRIG COM	01295	SN74LS175N
A61U15	1818-1968	7		IC CMOS 16384 (16K) STAT RAM 250-NS 3-S	28480	1818-1968
A61U16	08340-60178	2		PROGRAMMED 128K UVEROM SET (FOR U16 AND U21, NOT SEPARATELY REPLACEABLE)	28480	08340-60178
A61U17	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	28480	1820-1203
A61U18	1820-1419	8		IC COMPTR TTL LS MAGTD 4-BIT	28480	1820-1419
A61U19	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A61U20	1818-1968	7		IC CMOS 16384 (16K) STAT RAM 250-NS 3-S	28480	1818-1968
A61U21	08340-60178	2		PROGRAMMED 128K UVEROM SET (FOR U16 AND U21, NOT SEPARATELY REPLACEABLE)	28480	08340-60178
A61U22	1810-0338	7		NETWORK-RES 16-DIP 100.0 OHM X 8	28480	1810-0338
A61U23	1810-0338	7		NETWORK-RES 16-DIP 100.0 OHM X 8	28480	1810-0338
A61VR1	1902-0041	4	1	DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A61VR2	1902-3107	9		DIODE-ZNR 5.76V 2% DO-35 PD=.4W	28480	1902-3107

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

PAGES 6-127 THROUGH 6-130 HAVE BEEN INTENTIONALLY OMITTED

REPLACEMENT PAGE SERIAL PREFIX: 2506A

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A62				MOTHERBOARD NOTE: THIS ASSEMBLY IS NOT FIELD REPLACEABLE. A FAULTY MOTHERBOARD MUST BE REPLACED AT THE FACTORY.		
A62C1	0180-3205	5	1	CAPACITOR-FXD 4200UF +75-10% 75VAC AL	28480	0180-3205
A62C2	0180-3017	7	2	CAPACITOR-FXD .045F +75-10% 25VDC AL	28480	0180-3017
A62C3	0180-3017	7		CAPACITOR-FXD .045F +75-10% 25VDC AL	28480	0180-3017
A62C4				NOT ASSIGNED		
A62C5	0160-3879	7	1	CAPACITOR-FXD .017F ±20% 100VDC CER	28480	0160-3879
A62C6	0180-0374	3	1	CAPACITOR-FXD 10UF ±10% 20VDC TA	56289	150D106X9020B2
A62C7	0180-2681	5	1	CAPACITOR-FXD 1UF ±10% 50VDC TA	25088	D140GS1A50K
A62CR1	1901-0028	5	2	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A62CR2	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A62CR3	1901-0033	2	1	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A62DS1	1990-0486	6	1	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4684
A62J1				(NOT REPLACEABLE P/O MB)		
A62J2	1251-5799	8	1	CONNECTOR 20-PIN M POST TYPE	28480	1251-5799
A62J3	1251-6868	4	2	CONNECTOR 5-PIN M POST TYPE	28480	1251-6868
A62J4	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	28480	1250-0543
A62J5	1250-1889	7	14	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J6	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J7	1251-7482	0	1		28480	1251-7482
A62J8	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J9	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J10	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J11	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J12				NOT ASSIGNED		
A62J13	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J14	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J15	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J16	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J17				NOT ASSIGNED		
A62J18	1200-0482	9	2	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A62J19	1200-0482	9		SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0482
A62J20	1200-0483	0	1	SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0483
A62J21	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J22-24				NOT ASSIGNED		
A62J25	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J26	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J27	1250-1889	7		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1889
A62J28				NOT ASSIGNED		
A62J29	1251-6868	4		CONNECTOR 5-PIN M POST TYPE	28480	1251-6868
A62J30	1251-6795	6	2	CONNECTOR 3-PIN M POST TYPE	28480	1251-6795
A62J31	1251-8458	2	1	CONNECTOR 36-PIN M POST TYPE	28480	1251-8458
A62J32	1251-6794	5	1	CONNECTOR 5-PIN M POST TYPE	28480	1251-6794
A62J33				NOT ASSIGNED		
A62J34	1251-6795	6		CONNECTOR 3-PIN M POST TYPE	38480	1251-6795
A62K1	0490-0618	5	1	RELAY 2C 24VDC-COIL 5A 115VAC	28480	0490-0618
A62L1	85660-80007	7	8	INDUCT P/S FLTR	28480	85660-80007
A62L2	85660-80007	7		INDUCT P/S FLTR	28480	85660-80007
A62L3	85660-80007	7		INDUCT P/S FLTR	28480	85660-80007
A62L4	85660-80007	7		INDUCT P/S FLTR	28480	85660-80007
A62L5	85660-80007	7		INDUCT P/S FLTR	28480	85660-80007
A62L6	85660-80007	7		INDUCT P/S FLTR	28480	85660-80007
A62L7	85660-80007	7		INDUCT P/S FLTR	28480	85660-80007
A62L8	85660-80007	7		INDUCT P/S FLTR	28480	85660-80007
A62MP1	1251-2313	6	1	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A62MP2	08340-20052	7	1	HEAT SINK	28480	08340-20052
A62MP3	1251-1115	4	20	POLARIZING KEY-PC EDGE CONN	28480	1251-1115
A62MP4	1251-5595	2	2	POLARIZING KEY-POST CONN (AL2J2)	28480	1251-5595
A62MP5	85660-00026	2	1	SHOCK MNT BOTTOM	28480	85660-00026
A62MP6	1520-0205	2	2	SHOCK MOUNT .47-EFF-HGT	28480	1520-0205
A62MP7	2200-1015	4	1	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A62MP8				NOT ASSIGNED		
A62MP9				NOT ASSIGNED		
A62MP10				NOT ASSIGNED		
A62MP11	0890-0048	3	1	TUBING-FLEX .02-ID TFE .01-WALL	00000	ORDER BY DESCRIPTION
A62P1	1251-0600	0	2	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A62P2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A62Q1	1854-0618	8	2	TRANSISTOR NPN SI DARL TO-3 PD=150W	04713	MJ3000
A62Q2	1854-0294	6	1	TRANSISTOR NPN SI TO-3 PD=115W FT=500KHZ	28480	1854-0294
A62Q3	1854-0618	8		TRANSISTOR NPN SI DARL TO-E PD=150W	04713	MJ3000
A62Q4	1854-0679	1	1	TRANSISTOR NPN 2N5885 SI TO-3 PD=200W	04713	2N5885
A62R1	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4-1/8-T0-1471-F
A62R2	0757-0836	5	1	RESISTOR 7.57K 1% .5W F TC=0±100	28480	0757-0836
A62R3	0698-3404	3	1	RESISTOR 383 1% .5W F TC=0±100	28480	0698-3404
A62R4	0757-0436	1	1	RESISTOR 4.32K 1% .125W F TC=0±100	24546	C4-1/8-T0-4321-F
A62R5, 6				NOT ASSIGNED		
A62R7	0698-7229	8	7	RESISTOR 511 1% .05W F TC=0±100	24546	C3-1/8-TO-511R-F
A62R8	0698-7229	8		RESISTOR 511 1% .05W F TC=0±100	24546	C3-1/8-TO-511R-F
A62R9	0698-7229	8		RESISTOR 511 1% .05W F TC=0±100	24546	C3-1/8-TO-511R-F
A62R10	0698-7229	8		RESISTOR 511 1% .05W F TC=0±100	24546	C3-1/8-TO-511R-F
A62R11	0698-7229	8		RESISSTOR 511 1% .05W F TC=0±100	24546	C3-1/8-TO-511R-F
A62R12	0698-7229	8		RESISTOR 511 1% .05W F TC=0±100	24546	C3-1/8-TO-511R-F
A62R13	0698-7229	8		RESISTOR 511 1% .05W F TC=0±100	24546	C3-1/8-TO-511R-F
A62U1	1826-0423	4	1	IC V RGLTR TO-3	27014	LM317K
A62W1	08340-60057	6	1	CBL RBN 50 PN	28480	08340-60057
A62XA19	1251-1626	2	1	CONNECTOR-PC EDGE 12-CONT/ROW 2-ROWS	28480	1251-1626
A62XA21	1251-2134	9	3	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-1626
A62XA24	1251-2134	9		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2134
A62XA25	1251-1887	7	3	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1887
A62XA26	1251-1887	7		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1887
A62XA27	1251-7187	2	1	CONNECTOR-PC EDGE 31-CONT/ROW 2-ROWS	28480	1251-7187
A62XA28	1251-1887	7		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1998
A62XA35	1251-2026	8	5	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A62XA36	1251-2035	9	6	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A62XA37	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A62XA38	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A62XA39	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A62XA40	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A62XA41	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A62XA42	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A62XA43	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A62XA52	1251-2582	1	1	CONNECTOR-PC EDGE 24-CONT/ROW 2-ROWS	28480	1251-2582
A62XA53	1251-2134	9		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2134
A62XA54	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A62XA55	1251-1886	6	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-1886
A62XA56	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A62XA57	1251-7472	8	5	CONNECTOR - POST TYPE	28L480	1251-7472
A62XA58	1251-7472	8		CONNECTOR - POST TYPE	28480	1251-7472
A62XA59	1251-7472	8		CONNECTOR - POST TYPE	28480	1251-7472
A62XA60	1251-7472	8		CONNECTOR - POST TYPE	28480	1251-7472
A62XA61	1251-7472	8		CONNECTOR - POST TYPE	28480	1251-7472

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				MISCELLANEOUS ELECTRICAL PARTS		
A63	08340-60175	9	1	90 DB PROGRAMMABLE ATTENUATOR	28480	08340-60175
AT1	0960-0638	8	1	PERIPHERAL MODE ISOLATOR	28480	0960-0638
AT2	0955-0090	3	1	ATTENUATOR 15 DB	28480	0955-0090
▶ AT3	0960-0701	4	1	3.7 GHZ ISOLATOR	28480	0960-0701
B1	08340-60055	4	1	FAN ASSEMBLY (STANDARD) (INCL B1W1) 08340-60055 INCLUDES THE FOLLOWING PARTS:	28480	08340-60055
	0360-0535	0	2	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
	0890-0029	0	1	TUBING-HS .187-D/.093-RCVD .02-WALL	28480	0890-0029
	0890-0983	5		TUBING-HS .125-D/.062-RCVD .02-WALL	28480	0890-0983
	1251-4223	1	2	CONNECTOR-CONT F .025	28480	1251-4223
	1251-6796	7	1	CONNECTOR HOUSING-3 FEMALE IR	28480	1251-6796
	1400-0249	0	1	CABLE TIE .062-.625-DIA .091-WD NYL	06383	PLT1M-8
	1520-0230	3	4		28480	1520-0230
	2190-0017	4	2	WASHER-LK HLCL NO. 8 .168-IN-ID	28480	2190-0017
	2200-0770	9	10	SCREW-MACH 4-40 .188-IN-LG 100 DEG	00000	ORDER BY DESCRIPTION
	2360-0119	8	4	SCREW-MACH 6-32 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0196	1	4	SCREW-MACH 6-32 .375-IN-LG 100 DEG	00000	ORDER BY DESCRIPTION
	2510-0135	7	2	SCREW-MACH 8-32 2.25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2680-0137	8	1	SCREW-MACH 10-32 .188-IN-LG PAN-HD-SLT	00000	ORDER BY DESCRIPTION
	3160-0371	1	1	FAN-TBAX 180-CFM 115V 50/60-HZ	28480	3160-0371
	8150-0011	0	1	WIRE 22AWG G 300V PVC 7X30	105C	284808150-0011
	8150-0447	6	1	WIRE 24AWG BK 300V PVC 7X32 80C	28480	8150-0447
	08340-00012	7	1	HOUSING FAN (TOP)	28480	08340-00012
	08340-00013	8	1	HOUSING FAN (BOTTOM)	28480	08340-00013
	08340-00014	9	1	HOUSING FAN (GRILLE)	28480	08340-00014
	08340-00016	1	1	BASE PLATE	28480	08340-00016
	08340-00017	2	1	GRILL AIR FILTER	28480	08340-00017
	08340-00018	3	1	FILTER-AIR	28480	08340-00018
	85660-20092	4	4	SNUBBER-SHOCK MOUNT	28480	85660-20092
C1	0160-4065	5	1	CAPACITOR-FXD .1UF ±20% 250VAC(RMS)	28480	0160-4065
C2	0160-4819	7	1	CAPACITOR-FXD 2200PF ±5% 100VDC CER	28480	0160-4819
C3	0160-4832	4	1	CAPACITOR-FXD .01UF ±10% 100VDC CER	28480	0160-4832
C4	0160-4063	3	1	CAPACITOR-FXD 0.39 UF 21.0 VDC	28480	0160-4063
CR1	1901-0179	7	2	DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
CR2	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
DS1	1990-0858	6	1	LED-LAMP LUM-INT=150UCD IF=25MA MAX	28480	1990-0858
	1450-0615	9	1	LAMPHOLDER	28480	1450-0615
	08340-40002	9	1	L.E.D. MOUNT	28480	08340-40002
F1	2110-0002	9	1	FUSE 2A 250V NTD 1.25X.25 UL (REQUIRED FOR 240V OPERATION)	75915	312002
F1	2110-0003	0	1	FUSE 3A 250V NTD 1.25X.25 UL (REQUIRED FOR 200V OPERATION)	75915	312003
F1	2110-0010	9	1	FUSE 5A 250V NTD 1.25X.25 UL (REQUIRED FOR 100V OPERATION)	75915	312005
F1	2110-0055	2	1	FUSE 4A 250V NTD 1.25X.25 UL (REQUIRED FOR 120V OPERATION)	75915	312004
FL1	08340-60257	8	1	LINE MODULE-FILTERED, REPLACEMENT KIT (INCLUDES 2 METAL RETAINERS)	28480	08340-60257
J1/J1W1	08340-60071	4	1	CABLE ASSY-COAX (SWP OUT)	28480	08340-60071
	0590-1251	6	4	NUT-SPCLY 15/32-32-THD .1-IN-THK .562-WD	00000	ORDER BY DESCRIPTION
	1250-0870	4	3	CONNECTOR-RF BNC FEM SGL-HOLE-RR 50-OHM	28480	1250-0870
J2				SEE J2W1		
J2W1	08340-60066	7	1	CABLE ASSY-COAX (PULSE)	28480	08340-60066
	0590-1251	6		NUT-SPCLY 15/32-32-THD .1-IN-THK .562-WD	00000	ORDER BY DESCRIPTION
	1250-0870	4		CONNECTOR-RF BNC FEM SGL-HOLE-RR 50-OHM	28480	1250-0870
J3				SEE J3W1		
J3W1	08340-60069	0	1	CABLE ASSY-COAX (AM)	28480	08340-60069
	0590-1251	6		NUT-SPCLY 15/32-32-THD .1-IN-THK .562-WD	00000	ORDER BY DESCRIPTION
	1250-0870	4		CONNECTOR-RF BNC FEM SGL-HOLE-RR 50-OHM	28480	1250-0870
J4				SEE J4W1		
J4W1	08340-60068	9	1	CABLE ASSY-COAX (EXT INPUT)	28480	08340-60068
	00310-48801	0	2	WASHER-SHOULDERED	28480	00310-48801
	0590-1251	6		NUT-SPCLY 15/32-32-THD .1-IN-THK .562-WD	00000	ORDER BY DESCRIPTION
	0360-1158	5	1	LUG	28480	0360-1158
	1250-1091	3	1	CONNECTOR-RF BNC FEM SGL-HOLE-RR 50-OHM	28480	1250-1091
J5 (HP 8340B)	5061-5316	6	1	RF OUTPUT CONNECTOR ASSEMBLY	28480	5061-1100
J5 (HP 8341B STD)	08341-60001	1	1	RF OUTPUT CONNECTOR ASSEMBLY (TYPE N)	28480	08341-60001
J5 (8341B OPT 003)	08340-60221	6	1	RF OUTPUT CONNECTOR ASSEMBLY (TYPE N)	28480	08340-60221

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
J6	1250-0083	1	8	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	0360-1632	0	4	TERMINAL-SLDR LUG LK-MTG FOR-#3/8-SCR	28480	0360-1632
	2950-0001	8	2	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J7	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	0360-1632	0		TERMINAL-SLDR LUG LK-MTG FOR-#3/8-SCR	28480	0360-1632
	2950-0001	8		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J7W1	08340-60070	3	1	CABLE ASSY-COAX (A62J8 TO R.P. J7)	28480	08340-60070
J8	1250-0102	5	3	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0102
	2190-0068	5	3	WASHER-LK INTL T 1/2 IN .505-IN-ID	28480	2190-0068
	2950-0054	1	3	NUT-HEX-DBL-CHAM 1/2-28-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
J8W1	08340-60086	1	1	CABLE ASSY-COAX (A29J5 TO R.P. J8)	28480	08340-60086
J9	1250-0102	5		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0102
	2190-0068	5		WASHER-LK INTL T 1/2 IN .505-IN-ID	28480	2190-0068
	2950-0054	1		NUT-HEX-DBL-CHAM 1/2-28-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
J9W1	08340-60089	4	1	CABLE ASSY-COAX (A51J1 TO R.P. J9)	28480	08340-60089
J10	1250-0102	5		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0102
	2190-0068	5		WASHER-LK INTL T 1/2 IN .505-IN-ID	28480	2190-0068
	2950-0054	1		NUT-HEX-DBL-CHAM 1/2-28-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
J10W1	08340-60085	0	1	CABLE ASSY-COAX (A29J1 TO R.P. J10)	28480	08340-60085
J11	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	2190-0016	3	4	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
J12	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
J13	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	0360-1632	0		TERMINAL-SLDR LUG LK-MTG FOR-#3/8-SCR	28480	0360-1632
J14	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
J15	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
J16	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	0360-1632	0		TERMINAL-SLDR LUG LK-MTG FOR-#3/8-SCR	28480	0360-1632
J17	1251-6781	0	1	CONNECTOR 3-PIN M CIRC AUDIO (INCLUDES MOUNTING HARDWARE)	28480	1251-6781
J18	1251-0064	0	1	CONNECTOR 25-PIN F D SERIES	28480	1251-0064
	1251-2942	7	2	MOUNTING HARDWARE KIT	28480	1251-2942
J19	08340-60127	1	1	CONNECTOR-TYPE N (R.P. AUX OUT)	28480	08340-60127
	2190-0104	0	1	WASHER-LK INTL T 7/16 IN .439-IN-ID	28480	2190-0104
	2950-0132	6	1	NUT-HEX-DBL-CHAM 7/16-28-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J20				(REFER TO OPTION 004 AND 005 LISTINGS)		
J21				SEE J21W1		
J21W1	8120-3653	9	1	CABLE ASSY-RIBBON (HP-IB) (INCLUDES J21 & MOUNTING HARDWARE)	28480	8120-3653
J22	1250-1091	3	1	BODY-RF CONNECTOR BNC FEMALE; STRAIT	03316	28JS124-1
	0360-1158	5	1	TERMINAL-SLDR LUG PL-MTG .062-HOLE-ID	05313	5413-21
	00310-48801	0	2	WASHER-SHOULDERED; INSULATOR	28480	00310-48801
	0590-1251	6	1	NUT-SPCLY 15/32-32-THD .1-IN-THK .562-WD	03699	
RPG1	08340-60197	5	1	ROTARY PULSE GENERATOR REPLACEMENT KIT (INCLUDES LOCKING TANGS, CONNECTOR HOUSING, NUT AND WASHER)	28480	08340-60197
S1	3101-2193	5	1	SWITCH-TGL SUBMIN SPDT 2A 250VAC	28480	3101-2193
S2	3101-0163	5	1	FREQUENCY STANDARD SWITCH KIT (INCLUDES MOUNTING HARDWARE)	28480	3101-0163
T1	9100-4133	1	1	TRANSFORMER	28480	9100-4133
				NOTE: The complete transformer assembly (including the wiring harness and all attached lugs) may be ordered as 08340-60124 CD8. Individual lugs for the transformer wiring harness may be ordered separately as indicated below.		
				TRANSFORMER WIRE SOLDER LUGS:		
	0360-0037	7	6	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	28480	0360-0037
	0360-0042	4	2	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	28480	0360-0042
	0360-0043	5	1	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	28480	0360-0043
W1	08340-60062	3	1	CABLE ASSY-RIBBON A7J1 TO A6J1	28480	08340-60062
W2	NONE	1		WIRE ASSY-RF MODULE(GND) TO FRONT PANEL		
W3	08340-20198	2	1	CABLE ASSY-RIGID COAX W51 TO A16J2	28480	08340-20198
W4	08340-20116	4	1	CABLE ASSY-RIGID COAX A16J1 TO J19	28480	08340-20116
W5	08340-20241	6	1	CABLE ASSY-RIGID COAX A17J2 TO A16J7	28480	08340-20241

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
W6	08340-20108	4	1	CABLE ASSY-RIGID COAX A16J6 TO A14J1	28480	08340-20108
W7	08340-20110	8	1	CABLE ASSY-RIGID COAX A14J1 TO AT1J1	28480	08340-20110
W8	08340-20111	9	1	CABLE ASSY-RIGID COAX AT1J2 TO A13J1	28480	08340-20111
W9	08340-20114	2	1	CABLE ASSY-RIGID COAX A8A2J1 TO A9J1	28480	08340-20114
W10	08340-20268	7	1	CABLE ASSY-RIGID COAX A9J2 TO A15J1	28480	08340-20268
W11				NOT ASSIGNED		
W12	08340-20107	3	1	CABLE ASSY-RIGID COAX A17J3 TO A18J1	28480	08340-20107
W13	08340-20223	4	1	CABLE ASSY-RIGID COAX A18J2 TO A12J1 (NOT USED IN HP 8341B OPTION 003)	28480	08340-20223
W14	08340-20224	5	1	CABLE ASSY-RIGID COAX A12J2 TO A13J2	28480	08340-20224
W15				NOT ASSIGNED		
W16	08340-20221	2	1	CABLE ASSY-RIGID COAX A13J3 TO A10J1	28480	08340-20221
W17				NOT ASSIGNED		
W18	08340-20119	7	1	CABLE ASSY-RIGID COAX A10J3 TO A63J1 (STD.)	28480	08340-20119
W19	08340-20117	5	1	CABLE ASSY-RIGID COAX A63J2 TO J5 (STD.)	28480	08340-20117
W20	08340-20122	2	1	CABLE ASSY-RIGID COAX A63J2 TO J20 (004)	28480	08340-20122
W21	08340-20121	1	1	CABLE ASSY-RIGID COAX A10J3 TO J5 (001)	28480	08340-20121
W22	08340-20120	0	1	CABLE ASSY-RIGID COAX A10J3 TO J20 (005)	28480	08340-20120
W23	08340-60118	0	1	CABLE ASSY-COAX A30J3 TO A8A1J1	28480	08340-60118
W24	08340-60117	9	1	CABLE ASSY-COAX A62J14 TO A8A1J2	28480	08340-60117
W25	08340-60119	1	1	CABLE ASSY-COAX A62J10 TO A9J3	28480	08340-60119
W26	08340-60115	7	1	CABLE ASSY-COAX A12J3 TO A25J2	28480	08340-60115
W27	08340-60114	6	1	CABLE ASSY-COAX A11J2 TO A25J1	28480	08340-60114
W28	08340-60126	0	1	CABLE ASSY-COAX A62J13 TO A16J3	28480	08340-60126
W29	08340-60125	9	1	CABLE ASSY-COAX A62J25 TO A16J4	28480	08340-60125
W30	08340-60080	5	1	CABLE ASSY-COAX A16A1J2 TO A16J5	28480	08340-60080
W31	08340-60060	1	1	CABLE ASSY-RIBBON A62J19 TO A20J1/A16A1	28480	08340-60060
W32	08340-60058	7	1	CABLE ASSY-RIBBON A20J2 TO A14A1J1	28480	08340-60058
W33	08340-60061	2	1	CABLE ASSY-RIBBON A62J18 TO A13A1J1	28480	08340-60061
W34	08340-60116	8	1	CABLE ASSY-COAX A29J4 TO A37J1	28480	08340-60116
W35	08340-60081	6	1	CABLE ASSY-COAX A39J2 TO A30J2	28480	08340-60081
W36	08340-60073	8	1	CABLE ASSY-COAX A29J3 TO A42J1	28480	08340-60073
W37	08340-60075	8	1	CABLE ASSY-COAX A49J1 TO A44J1	28480	08340-60075
W38	08340-60074	7	1	CABLE ASSY-COAX A49J2 TO A62J6	28480	08340-60074
W39	08340-60078	1	1	CABLE ASSY-COAX A36J1 TO A49J3	28480	08340-60078
W40	08340-60072	5	1	CABLE ASSY-COAX A48J1 TO A49J4	28480	08340-60072
W41	08340-60084	9	1	CABLE ASSY-COAX A33J2 TO A48J2	28480	08340-60084
W42	08340-20246	1	1	CABLE ASSY-RIGID COAX A44J2 TO A45J1	28480	08340-20246
W43	08340-20196	0	1	CABLE ASSY-RIGID COAX AT2J2 TO A46J1	28480	08340-20196
W44	08340-20101	7	1	CABLE ASSY-RIGID COAX A46J2 TO A48U1J1	28480	08340-20101
W45	NONE	1		WIRE ASSY-STAR GND TO LUG BY A62J29		
W46	08340-60184	0	1	WIRE ASSY (ALSO INCLUDES W47 AND J7W1)	28480	08340-60184
W47	08340-60082	7	1	CABLE ASSY-COAX A62J27 TO A62J4	28480	08340-60082
W48	08340-60079	2	1	CABLE ASSY-COAX A62J5 TO A62J11	28480	08340-60079
W49	08340-60088	3	1	CABLE ASSY-COAX J9 TO J10	28480	08340-60088
W50	08340-60065	6	1	WIRE ASSY-A6J4 TO POWER SWITCH	28480	08340-60065
W51	08340-20195	9	1	CABLE ASSY-RIGID COAX A45J3 TO W3	28480	08340-20195
W52	08340-20233	6	1	CABLE ASSY-RIGID COAX A15J2 TO AT3J1	28480	08340-20233
W53	08340-20227	8	1	CABLE ASSY-RIGID COAX AT3J2 TO A17J1	28480	08340-20227
W54	08340-20239	2	1	CABLE ASSY-RIGID COAX A18J2 TO A64J1 (ONLY USED IN HP 8341B OPTION 003)	28480	08340-20239
W55	08340-20242	7	1	CABLE ASSY-RIGID COAX A64J2 TO A12J1 (ONLY USED IN HP 8341B OPTION 003)	28480	08340-20242
W56	08340-60233	0	1	CABLE ASSY-COAX J22 TO A62J17	28480	08340-60233
W57	08340-60239	6	1	CABLE ASSY-COAX A62J24 TO A44A1J3	28480	08340-60239

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
W6	08340-20108	4	1	CABLE ASSY-RIGID COAX A16J6 TO A14J1	28480	08340-20108
W7	08340-20110	8	1	CABLE ASSY-RIGID COAX A14J1 TO AT1J1	28480	08340-20110
W8	08340-20111	9	1	CABLE ASSY-RIGID COAX AT1J2 TO A13J1	28480	08340-20111
W9	08340-20114	2	1	CABLE ASSY-RIGID COAX A8A2J1 TO A9J1	28480	08340-20114
W10	08340-20268	7	1	CABLE ASSY-RIGID COAX A9J2 TO A15J1	28480	08340-20268
▶ W11				NOT ASSIGNED		
W12	08340-20107	3	1	CABLE ASSY-RIGID COAX A17J3 TO A18J1	28480	08340-20107
W13	08340-20223	4	1	CABLE ASSY-RIGID COAX A18J2 TO A12J1 (NOT USED IN HP 8341B OPTION 003)	28480	08340-20223
W14	08340-20224	5	1	CABLE ASSY-RIGID COAX A12J2 TO A13J2	28480	08340-20224
W15				NOT ASSIGNED		
W16	08340-20221	2	1	CABLE ASSY-RIGID COAX A13J3 TO A10J1	28480	08340-20221
W17				NOT ASSIGNED		
W18	08340-20119	7	1	CABLE ASSY-RIGID COAX A10J3 TO A63J1(STD	28480	08340-20119
W19	08340-20117	5	1	CABLE ASSY-RIGID COAX A63J2 TO J5 (STD.)	28480	08340-20117
W20	08340-20122	2	1	CABLE ASSY-RIGID COAX A63J2 TO J20 (004)	28480	08340-20122
W21	08340-20121	1	1	CABLE ASSY-RIGID COAX A10J3 TO J5 (001)	28480	08340-20121
W22	08340-20120	0	1	CABLE ASSY-RIGID COAX A10J3 TO J20 (005)	28480	08340-20120
W23	08340-60118	0	1	CABLE ASSY-COAX A30J3 TO A8A1J1	28480	08340-60118
W24	08340-60117	9	1	CABLE ASSY-COAX A62J14 TO A8A1J2	28480	08340-60117
W25	08340-60119	1	1	CABLE ASSY-COAX A62J10 TO A9J3	28480	08340-60119
W26	08340-60115	7	1	CABLE ASSY-COAX A12J3 TO A25J2	28480	08340-60115
W27	08340-60114	6	1	CABLE ASSY-COAX A11J2 TO A25J1	28480	08340-60114
W28	08340-60126	0	1	CABLE ASSY-COAX A62J13 TO A16J3	28480	08340-60126
W29	08340-60125	9	1	CABLE ASSY-COAX A62J25 TO A16J4	28480	08340-60125
W30	08340-60080	5	1	CABLE ASSY-COAX A16A1J2 TO A16J5	28480	08340-60080
W31	08340-60060	1	1	CABLE ASSY-RIBBON A62J19 TO A20J1/A16A1	28480	08340-60060
W32	08340-60058	7	1	CABLE ASSY-RIBBON A20J2 TO A14A1J1	28480	08340-60058
W33	08340-60061	2	1	CABLE ASSY-RIBBON A62J18 TO A13A1J1	28480	08340-60061
W34	08340-60116	8	1	CABLE ASSY-COAX A29J4 TO A37J1	28480	08340-60116
W35	08340-60081	6	1	CABLE ASSY-COAX A39J2 TO A30J2	28480	08340-60081
W36	08340-60073	6	1	CABLE ASSY-COAX A29J3 TO A42J1	28480	08340-60073
W37	08340-60075	8	1	CABLE ASSY-COAX A49J1 TO A44J1	28480	08340-60075
W38	08340-60074	7	1	CABLE ASSY-COAX A49J2 TO A62J6	28480	08340-60074
W39	08340-60078	1	1	CABLE ASSY-COAX A36J1 TO A49J3	28480	08340-60078
W40	08340-60072	5	1	CABLE ASSY-COAX A48J1 TO A49J4	28480	08340-60072
W41	08340-60084	9	1	CABLE ASSY-COAX A33J2 TO A48J2	28480	08340-60084
W42	08340-20197	1	1	CABLE ASSY-RIGID COAX A44J2 TO A45J1	28480	08340-20197
W43	08340-20196	0	1	CABLE ASSY-RIGID COAX AT2J2 TO A46J1	28480	08340-20196
W44	08340-20101	7	1	CABLE ASSY-RIGID COAX A46J2 TO A48U1J1	28480	08340-20101
W45	NONE	1		WIRE ASSY-STAR GND TO LUG BY A62J29		
W46	08340-60184	0	1	WIRE ASSY (ALSO INCLUDES W47 AND J7W1)	28480	08340-60184
W47	08340-60082	7	1	CABLE ASSY-COAX A62J27 TO A62J4	28480	08340-60082
W48	08340-60079	2	1	CABLE ASSY-COAX A62J5 TO A62J11	28480	08340-60079
W49	08340-60088	3	1	CABLE ASSY-COAX J9 TO J10	28480	08340-60088
W50	08340-60065	6	1	WIRE ASSY-A6J4 TO POWER SWITCH	28480	08340-60065
W51	08340-20195	9	1	CABLE ASSY-RIGID COAX A45J3 TO W3	28480	08340-20195
▶ W52	08340-20233	6	1	CABLE ASSY-RIGID COAX A15J2 TO AT3J1	28480	08340-20233
▶ W53	08340-20227	8	1	CABLE ASSY-RIGID COAX AT3J2 TO A17J1	28480	08340-20227
W54	08340-20239	2	1	CABLE ASSY-RIGID COAX A18J2 TO A64J1 (ONLY USED IN HP 8341B OPTION 003)	28480	08340-20239
W55	08340-20242	7	1	CABLE ASSY-RIGID COAX A64J2 TO A12J1 (ONLY USED IN HP 8341B OPTION 003)	28480	08340-20242
W56	08340-60233	0	1	CABLE ASSY-COAX J22 TO A62J17	28480	08340-60233
W57	08340-60239	6	1	CABLE ASSY-COAX A62J24 TO A44A1J3	28480	08340-60239

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				OPTION CONFIGURATIONS		
				OPTION 001:		
				FRONT PANEL RF OUTPUT-NO ATTENUATOR		
				DELETE THE FOLLOWING:		
	08340-00028	5	2	ATTENUATOR MOUNTING PLATE	28480	08340-00028
A63	08340-60175	9		90 DB PROGRAMMABLE ATTENUATOR	28480	08340-60175
W18	08340-20119	7	2	CABLE ASSY-RIGID COAX A63J2 TO J5	28480	08340-20119
W19	08340-20117	5	3	CABLE ASSY-RIGID COAX A10J3 TO A63J1	28480	08340-20117
				ADD THE FOLLOWING:		
				CABLE ASSY-RIGID COAX A10J3 TO J5		
				OPTION 003:		
				OPERATION AT 400 HZ LINE FREQUENCY		
				DELETE THE FOLLOWING:		
B1	08340-60055	4	1	FAN ASSEMBLY	28480	08340-60055
				ADD THE FOLLOWING:		
B1	08340-60137	3	1	400 HZ FAN ASSEMBLY	28480	08340-60137
				OPTION 004:		
				REAR PANEL RF OUTPUT WITH ATTENUATOR		
				DELETE THE FOLLOWING:		
	08340-20076	5	2	RF CONNECTOR BRACKET	28480	08340-20076
W19	08340-20117	5		CABLE ASSY-RIGID COAX A10J3 TO A63J1	28480	08340-20117
	08340-20078	7		BEZEL-KEYBOARD FINISH	28480	08340-20078
				ADD THE FOLLOWING:		
W20	08340-20122	2	1	CABLE ASSY-RIGID COAX A63J2 TO J20	28480	08340-20122
	83592-20063	2	2	PLUG BUTTON-FRONT PANEL	28480	83592-20063
	83595-20004	4	2	FRONT PANEL CONNECTOR SPACER	28480	83595-20004
	08340-20080	1		BEZEL-KEYBOARD FINISH	28480	08340-20080
	1400-0053			CLAMP-CABLE .172-DIA .375-WD NYL		
	2200-0145			SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI		
	2190-0019			WASHER-LK HLCL NO. 4 .115-IN-ID		
	3050-0105			WASHER-FL MTLC NO. 4 .125-IN-ID		
				OPTION 005:		
				REAR PANEL RF OUTPUT-NO ATTENUATOR		
				DELETE THE FOLLOWING:		
	08340-00028	5		ATTENUATOR MOUNTING PLATE	28480	08340-00028
	08340-20076	5		RF CONNECTOR BRACKET	28480	08340-20076
W18	08340-20119	7		CABLE ASSY-RIGID COAX A63J2 TO J5	28480	08340-20119
W19	08340-20117	5		CABLE ASSY-RIGID COAX A10J3 TO A63J1	28480	08340-20117
A63	08340-60175	9		90 DB PROGRAMMABLE ATTENUATOR	* 28480	08340-60175
	08340-20078	7		BEZEL-KEYBOARD FINISH	28480	08340-20078
				ADD THE FOLLOWING:		
W22	08340-20120	0	1	CABLE ASSY-RIGID COAX	28480	08340-20120
	83595-20004	4		FRONT PANEL CONNECTOR SPACER	28480	83595-20004
	83592-20063	2		PLUG BUTTON-FRONT PANEL	28480	83592-20063
	08340-20080	1		BEZEL-KEYBOARD FINISH	28480	08340-20080
	1400-0053			CLAMP-CABLE .172-DIA .375-WD NYL		
	2200-0145			SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI		
	2190-0019			WASHER-LK HLCL NO. 4 .115-IN-ID		
	3050-0105			WASHER-FL MTLC NO. 4 .125-IN-ID		
				OPTION 806:		
				CHASSIS SLIDE KIT		
				DELETE THE FOLLOWING:		
	5060-9917	9	1	CHASSIS COVER (SIDE) PERFORATED	28480	5060-9917
	5086-9862	7	1	CHASSIS COVER (SIDE)	28480	5086-9862
				ADD THE FOLLOWING:		
	08340-60136	2	1	SLIDE RACK MOUNT KIT	28480	08340-60136
				OPTION 850:		
				INTERFACE CABLE FOR OPERATION		
				WITH HP 8410B/C		
				ADD THE FOLLOWING:		
	08410-60146	9	1	INTERCONNECT CABLE	28480	08410-60146
				OPTION 908:		
				RACK FLANGES WITHOUT HANDLES		
				ADD THE FOLLOWING:		
	5061-0078	7	1	RACK FLANGES WITHOUT HANDLES KIT	28480	5061-0078

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

Table 6-3. Model 8340A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				OPTION 913: **RACK FLANGES WITH HANDLES**		
	5061-2072	5	1	ADD THE FOLLOWING: RACK FLANGES WITH HANDLES KIT	28480	5061-2072

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

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				MISCELLANEOUS MECHANICAL & CHASSIS PARTS		
1	0340-0923	8	10	INSULATOR-BSHG NYLON	28480	0340-0923
2	0360-0037	7	10	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	28480	0360-0037
3	0360-0042	4	3	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	28480	0360-0042
4	0400-0082	8	2	GROMMET-CHAN NCH .09-IN-GRV-WD	28480	0400-0082
5	0400-0219	3	3	GROMMET-RND .5-IN-ID .093-IN-GRV-WD	28480	0400-0219
6	0520-0127	6	4	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
7	0570-0632	3	10	SCREW-SPCL 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
8	0590-1251	6	4	NUT-HEX 15/32-32	00000	ORDER BY DESCRIPTION
9	1200-0043	8	5	INSULATOR-XSTR ALUMINUM	28480	1200-0043
10	1400-0031	8	3	CLAMP-CABLE .375-DIA .5-WD NYL	28480	1400-0031
11	1400-0249	0	9	CABLE TIE .062-.625-DIA .091-WD NYL	06383	PLT1M-8
12	1400-0510	8	4	CLAMP-CABLE .15-DIA .62-WD NYL	28480	1400-0510
13	1400-0907	7	2	CLAMP-CABLE .187-DIA .5-WD FRTD-NYLON	95987	3/16-HFR
14	1520-0205	2	3	SHOCK MOUNT .31 HGT.	28480	1520-0205
15	2190-0003	8	14	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
16	2190-0006	1	15	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0006
17	2190-0008	3	1	WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
18	2190-0011	8	6	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0011
19	2190-0045	8	4	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
20	2200-0103	2	4	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
21	2200-0105	4	106	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
22	2200-0107	6	1	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
23	2200-0141	8	1	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
24	2200-0149	6	10	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
25	2200-0153	2	4	SCREW-MACH 4-40 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
26	2200-0166	7	3	SCREW-MACH 4-40 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
27	2360-0111	0	5	SCREW-MACH 6-32 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
28	2360-0113	2	13	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
29	2360-0114	3	5	SCREW-MACH 6-32 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
30	2360-0115	4	37	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
31	2360-0116	5	4	SCREW-MACH 6-32 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
32	2360-0117	6	10	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
33	2360-0119	8	10	SCREW-MACH 6-32 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
34	2360-0122	3	1	SCREW-MACH 6-32 .5-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
35	2360-0197	2	11	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
35A	2360-0193	8	4	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
36	2360-0331	6	9	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	28480	2360-0331
37	2360-0333	8	26	SCREW-MACH 6-32 .25-IN-LG 100 DEG	28480	2360-0333
38	2360-0334	9	9	SCREW-MACH 6-32 .312-IN-LG 100 DEG	28480	2360-0334
39	2360-0360	1	2	SCREW-MACH 6-32 .438-IN-LG 100 DEG	28480	2360-0360
40	2420-0002	6	2	NUT-HEX-DBL-CHAM 6-32-THD .109-IN-THK	28480	2420-0002
41	0515-1331	5	16	SCREW-MACH M4x0.7x6mm FH 90	28480	0515-1331
42	0515-0896	5	8	SCREW-MACH M4x0.7x10mm FH 90	28480	0515-0896
43	2680-0129	8	6	SCREW-MACH 10-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
44	3050-0066	8	2	WASHER-FL MTLC NO. 8 .147-IN-ID	28480	3050-0066
45	3050-0105	6	4	WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0105
46	3050-0227	3	7	WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
47	1250-0915	8	1	CONTACT-RF CONN SER APC-N FEMALE	9D949	131-149
48	1250-1577	0	1	CONNECTOR-RF FEMALE TYPE N	28480	1250-1577
49	2190-0104	0	1	WASHER-LK INTL T 7/16 IN .439-IN-ID	28480	2190-0104
50	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
51	2950-0132	6	1	NUT-HEX-DBL-CHAM 7/16-28-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
52	5040-0306	0	1	INSULATOR	28480	5040-0306
53	08340-00011	6	1	PANEL-REAR (AUX OUTPUT)	28480	08340-00011
54	08340-00056	9	1	DEFLECTOR-AIR	28480	08340-00056
55	08555-20093	5	1	CONTACT JACK	28480	08555-20093
56	08555-20094	6	1	BODY-BULKHEAD	28480	08555-20094
57	08761-2027	4	1	INSULATOR	28480	08761-2027
58	5021-5805	4	1	FRAME-FRONT (METRIC)	28480	5021-5805
59	08340-00076	3	1	CENTER DIVIDER	28480	08340-00076
60	08340-00002	5	1	CHASSIS-RF MOD (REAR)	28480	08340-00002
61	08340-00003	6	1	BRACKET-20-30 MOUNT	28480	08340-00003
62	08340-00004	7	1	BRACKET-MOUNT TRANS	28480	08340-00004
63	08340-00005	8	1	SUPPORT-MOM BOARD	28480	08340-00005
64	08340-00020	7	1	DIVIDER PROCESSOR	28480	08340-00020
65	08340-00029	6	1	GUIDE PLATE-PC BOARDS	28480	08340-00029
66	08340-00031	0	1	SUPPORT-PC PROCESSOR	28480	08340-00031
67	08340-20051	6	1	SUPPORT-REAR CENTER	28480	08340-20051
68	08340-20234	7	1	FRAME (REAR) MOD (METRIC)	28480	08340-20234
69	08340-20054	9	1	SUPPORT-FRONT CENTER DIVIDER	28480	08340-20054
70	08340-20056	1	1	GUIDE-POWER SUPPLY	28480	08340-20056

Figure 6-2. Miscellaneous Mechanical & Chassis Parts (1 of 9)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
71	08340-20236	9	1	STRUT-CORNER (TOP) (METRIC)	28480	08340-20236
72	08340-20238	1	3	STRUT-CORNER MOD (METRIC)	28480	08340-20238
73	85660-00004	6	1	BRACKET-PIVOT PROCESSOR	28480	85660-00004
74	85660-20190	3	1	HOUSING-20-30 MHZ	28480	85660-20190
75	86701-20006	2	1	GUIDE-FRONT PC	28480	86701-20006
76	0360-0037	7	6	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	28480	0360-0037
77	1251-4223	1	10	CONTACT-CONN U/W-POST-TYPE FEM CRP	28480	1251-4223
78	1251-6594	3	1	CONNECTOR HOUSING-5 FEMALE IR	28480	1251-6594
79	8120-0579	2	1	CABLE-SHLD 22AWG 5-CNDCT JGK-JKT	28480	8120-0579
80	8150-0005	2		WIRE 22AWG BK 300V PVC 7X30 105C	28480	8150-0005
81	5001-0440	1	2	TRIM-SIDE F.F	28480	5001-0440
82	5040-7201	8	4	FOOT-BOTTOM	28480	5040-7201
83	5040-7202	9	1	TRIM STRIP (TOP)	28480	5040-7202
84	5061-9435	8	1	COVER FM TOP (METRIC)	28480	5061-9435
85	5061-9447	2	1	COVER FM BOTTOM (METRIC)	28480	5061-9447
86	5061-9462	1	1	COVER SIDE (METRIC)	28480	5061-9462
87	5061-9517	7	1	COVER FM PERFORATED (METRIC)	28480	5061-9517
88	5061-2033	8	1	INFO TRAY ASSY KIT	28480	5061-2033
89	08340-00086	5	1	DRESS PANEL-KEYBOARD (8340B ONLY)	28480	08340-00086
89	08341-00004	8	1	DRESS PANEL-KEYBOARD (8341B ONLY)	28480	08341-00004
90	08340-00074	1	1	HOLDER-PC COVER	28480	08340-00074
91	08340-00040	1	1	HOLDER-POWER SUPPLY BOARDS	28480	08340-00040
92	08340-00060	5	1	PLATE-CAP HOLDER	28480	08340-00060
93	08340-00061	6	1	HOLDER-CAP HOLDER	28480	08340-00061
94	08340-90246	8	1	INFO CARD #1	28480	08340-90246
95	08340-90247	9	1	INFO CARD #2	28480	08340-90247
96	85660-00025	1	1	SHOCK MOUNT (TOP)	28480	85660-00025
97	85660-00027	3	1	INSULATOR-HEAT SINK	28480	85660-00027
98	86701-00028	6	1	SPRING-FLAT	28480	86701-00028
99	1990-0720	1	1	DISPLAY-SPECIAL .1 HI	28480	1990-0720
100	8160-0226	0	12	RFI RND STR .050D	28480	8160-0226
101	08340-00006	9	1	SUPPORT-PC RECT.	28480	08340-00006
102	08340-00008	1	1	CHASSIS RF MOD (FRONT)	28480	08340-00008
103	08340-00064	9	1	POCKET (Holds Cal. Constant Data)	28480	08340-00064
104	6960-0009	1	1	Hole Plug .531-D-HOLE	28480	6960-0009
105	0380-0644	4	2	Standoff-Hex .400-IN-LG 6-32 THD	28480	0380-0644
106	2200-0164	5	10	SCREW-MACH 4-40 .188-IN-LG	28480	2200-0164
107	5021-3208	7	1	Housing-machined	28480	5021-3208
108	86701-00029	7	1	Baffle-Air Top	28480	86701-00029
109	86701-00024	2	1	Skoop Air	28480	86701-00024
110	86701-00030	0	1	Baffle-Air Bottom	28480	86701-00030
111	08340-00067	2		COVER-RECT. BOARD	28480	08340-00067
112	08340-00018	3		Fan Filter	28480	08340-00018
113	08340-00017	2		Grill Air	28480	08340-00017
114	3030-0152	1	2	SCREW-SET 4-40 .312-IN-LG SMALL CUP PT	28480	3030-0152
115	08340-00016	1	1	Fan Housing-Bottom	28480	08340-00016
116	08340-00012	7	1	Fan Housing-Top	28480	08340-00012
117	08340-00014	9		Fan Grill Housing	28480	08340-00014
118	1520-0230	3	4	Shock Mount	28480	1520-0230
119	08340-00016	1	1	Base Plate-Fan	28480	08340-00016
120	85660-20092	4	4	Snubber-Shock Mount	28480	85660-20092
121	2360-0196	1	4	Screw-Mach 6-32 .375-IN-LG 100 DEG	28480	2360-0196
122	2190-0009	4	2	WASHER-LK INT T NO. 8 .168-IN-ID	28480	2190-0009
123	2510-0051	6	2	SCREW-MACH 8-32 .625-IN-LG PAN-HD-POZI	28480	2510-0051
124	0360-0043	5		TERMINAL-SLDR LUG PL-MTG FOR-NO. 6-SCR	28480	0360-0043
125	1251-6796	7		CONN-POST TYPE	28480	1251-6796
126	0360-1632	0	4	TERMINAL-SLDR LUG LK-MTG FOR-#3/8-SCR	28480	0360-1632
127	0362-0227	1	2	CONNECTOR-SGL CONT SKT 1.14-MM-BSC-SZ	28480	0362-0227
128	1250-0083	1	8	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
129	1250-0102	5	3	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0102
130	1251-0064	0	1	CONNECTOR 25-PIN F D SERIES	28480	1251-0064
131	1251-2942	7	2	CONNECTOR-RACK & PANEL LOCK	28480	1251-2942
132	1251-3653	9	26	CONNECTOR CONTACT FEMALE .025	28480	1251-3653
133	1251-6781	0	1	CONNECTOR RECEPTACLE 3 MALE CONTACT	28480	1251-6781
134	1251-7374	9	1	CONNECTOR HOUSING-28 FEMALE 2R	28480	1251-7374
135	2190-0016	3	4	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
136	2190-0068	5	3	WASHER-LK INTL T 1/2 IN .505-IN-ID	28480	2190-0068
137	2190-0104	0	1	WASHER-LK INTL T 7/16 IN .439-IN-ID	28480	2190-0104
138	2950-0001	8	8	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
139	2950-0054	1	3	NUT-HEX-DBL-CHAM 1/2-28-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
140	08340-00082	1	1	REAR PANEL	28480	08340-00082

Figure 6-2. Miscellaneous Mechanical & Chassis Parts (2 of 9)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
141	3101-0163	5	1	SWITCH KIT	28480	3101-0163
142	9222-0090	9	1	Plastic Jacket (Holds Cal. Constant Data)	28480	9222-0090
143	08340-00070	7	1	BRACKET	28480	08340-00070
▶144	08340-00089	4	1	A18 MOUNTING PLATE	28480	08340-00089
▶145	08340-00090	7	1	A16 MOUNTING PLATE	28480	08340-00090
▶146	08340-00079	6	1	A17 MOUNTING PLATE	28480	08340-00079
▶147	2200-0164	5	2	SCREW-MACH 4-40 .188-IN-LG UNCT 82 DEG	00000	ORDER BY DESCRIPTION
▶148	2200-0165	6	5	SCREW-MACH 4-40 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION

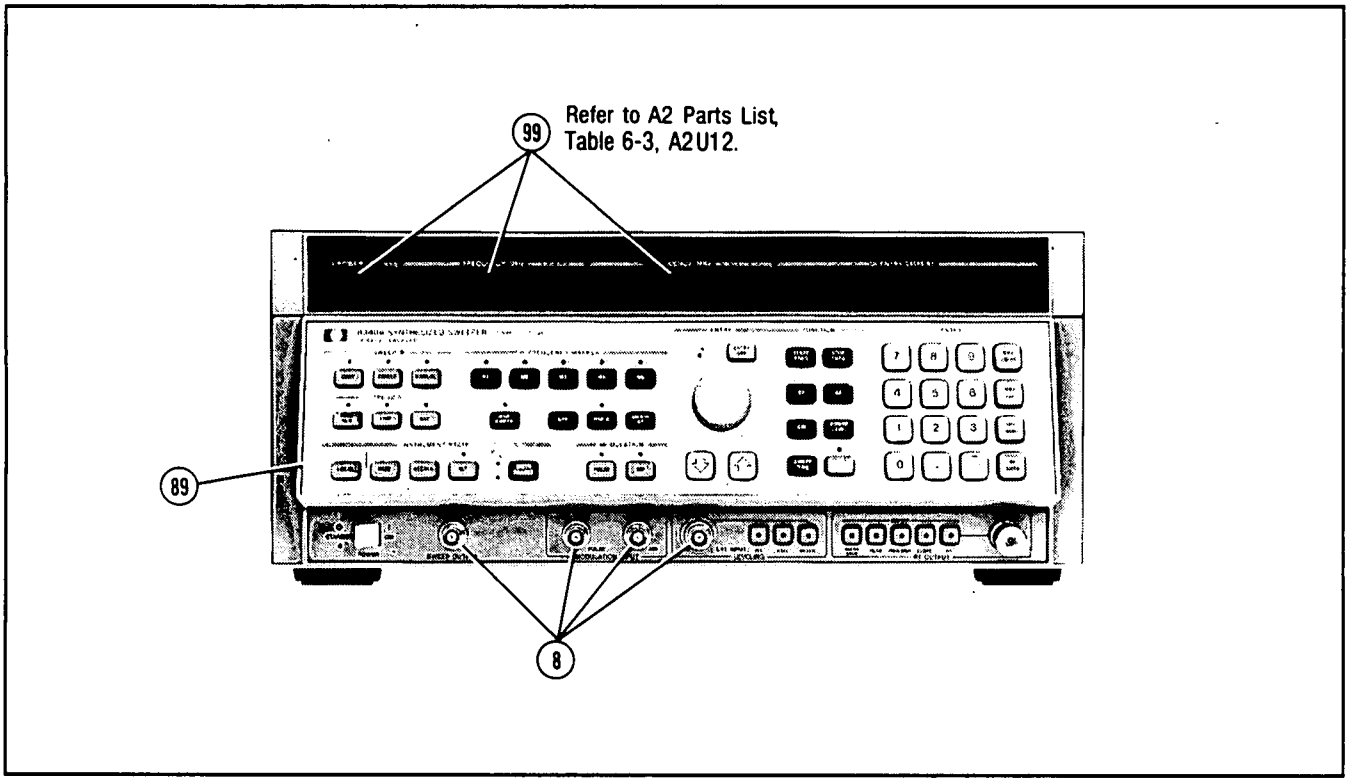


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (3 of 9)

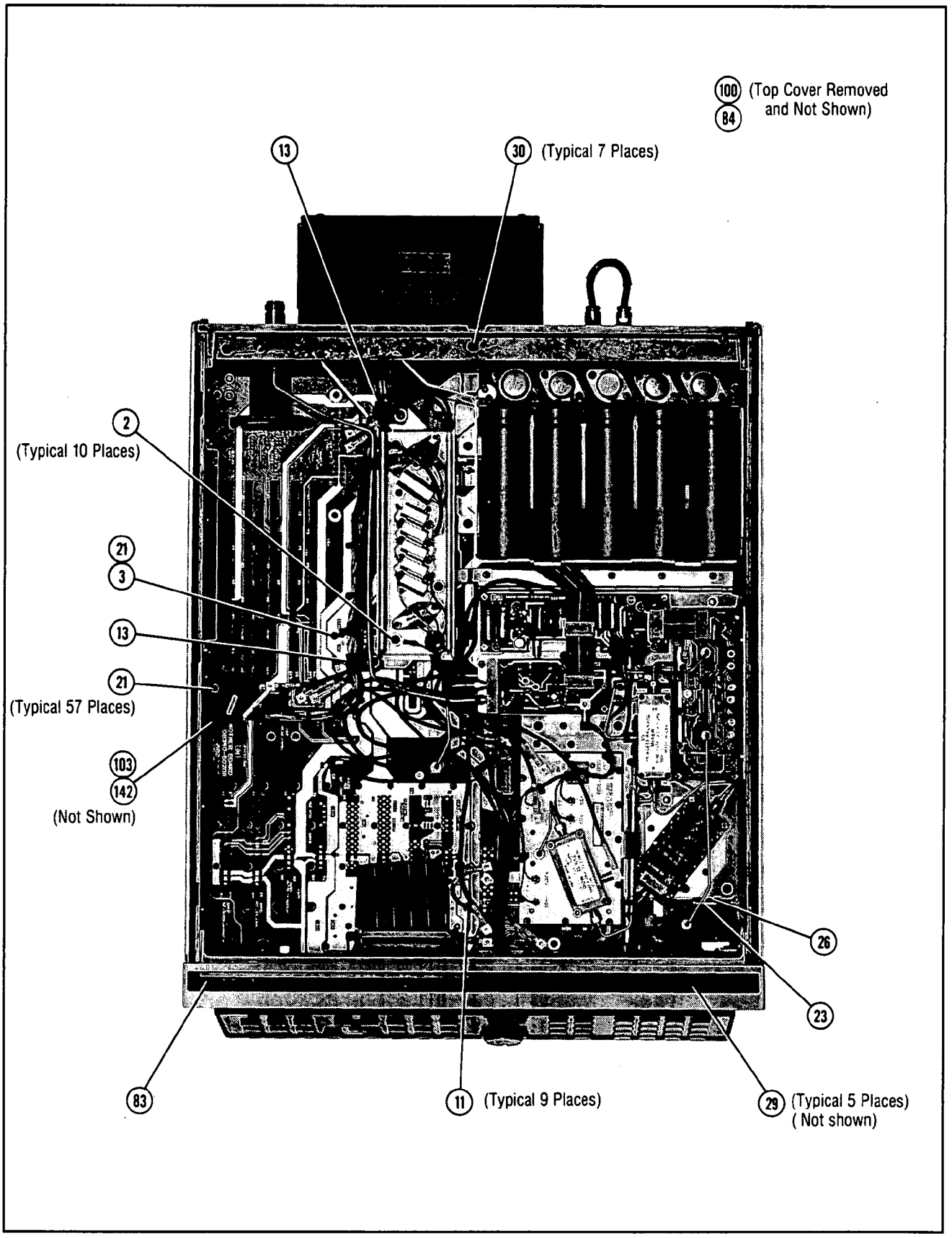


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (4 of 9)

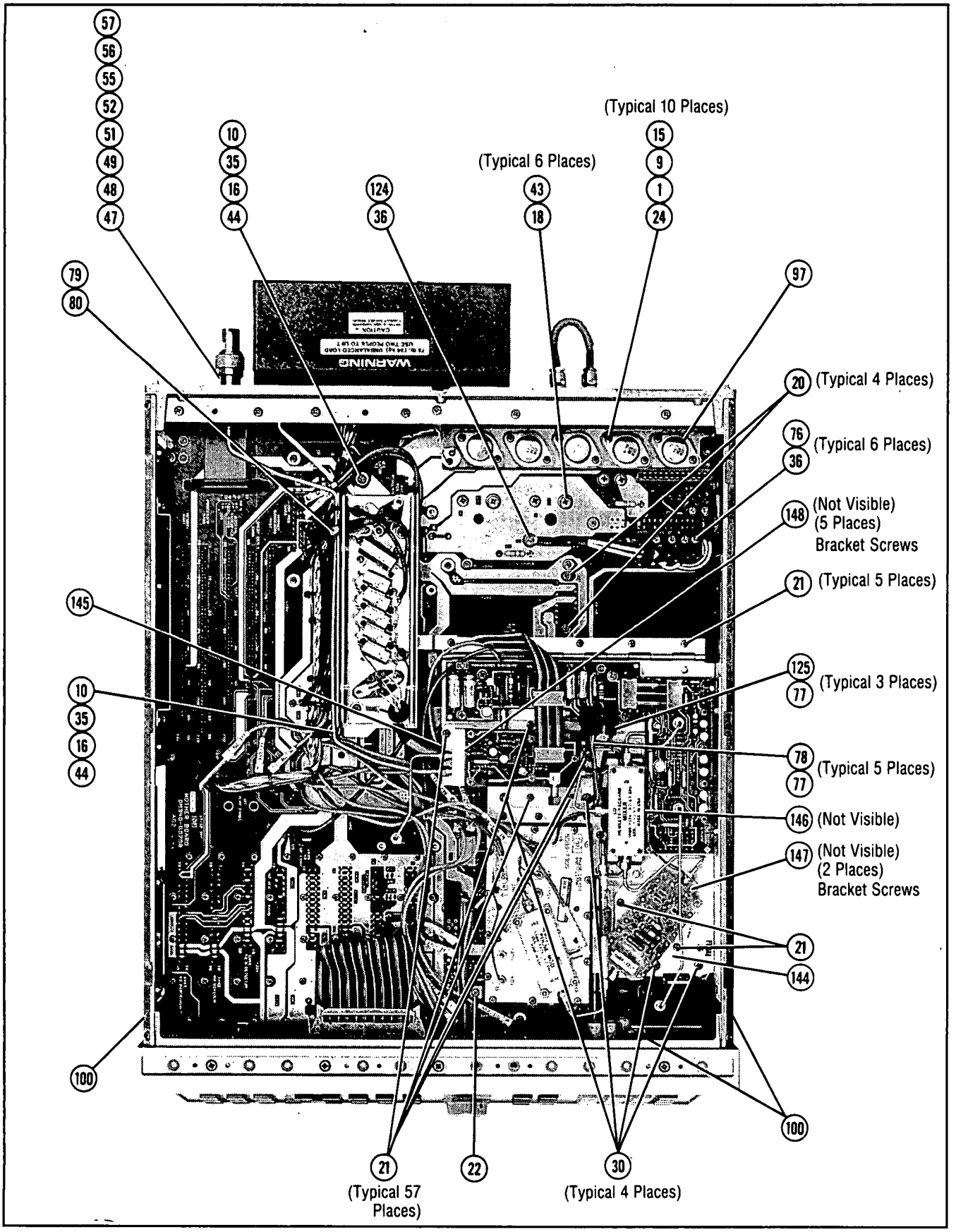


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (5 of 9)

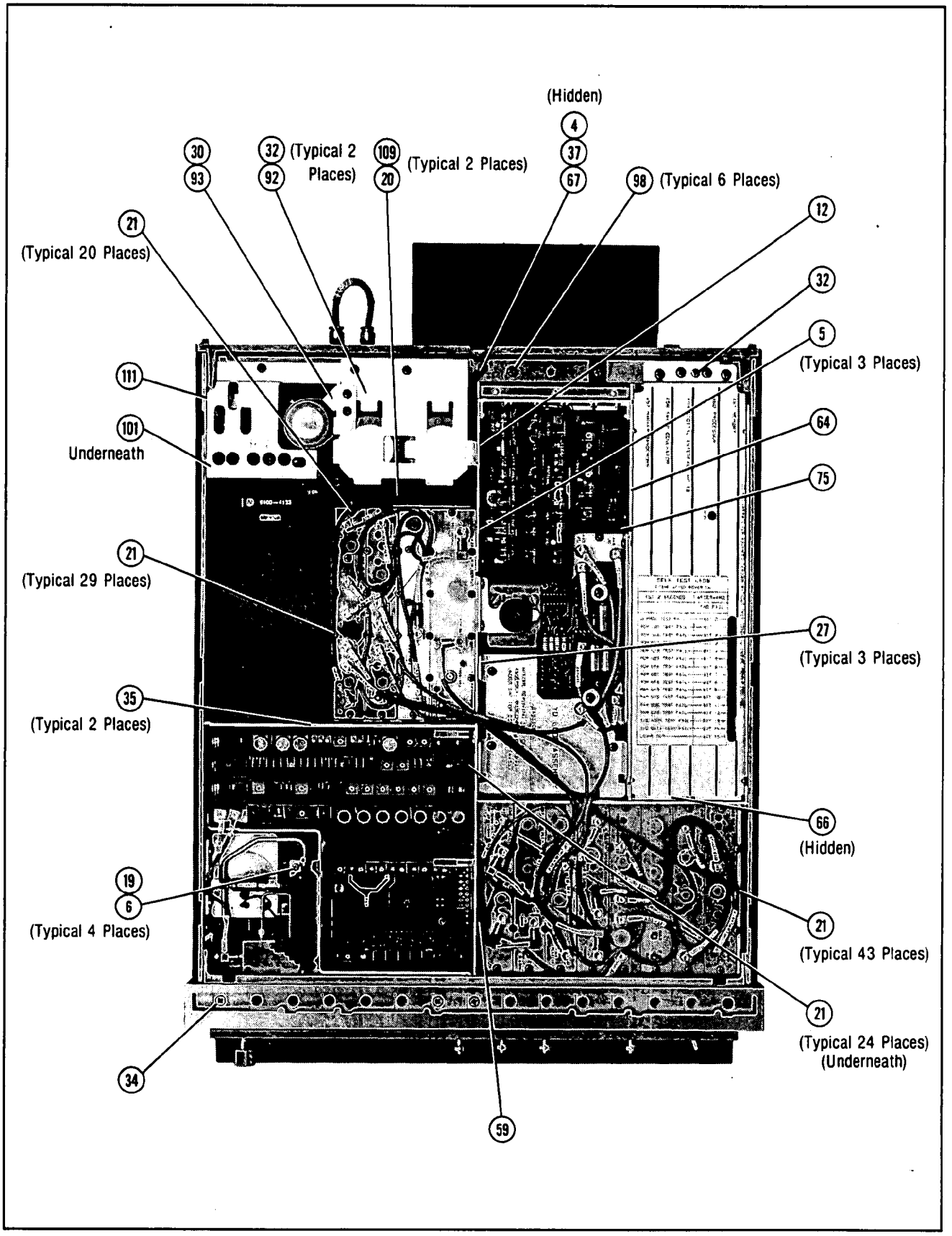


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (6 of 9)

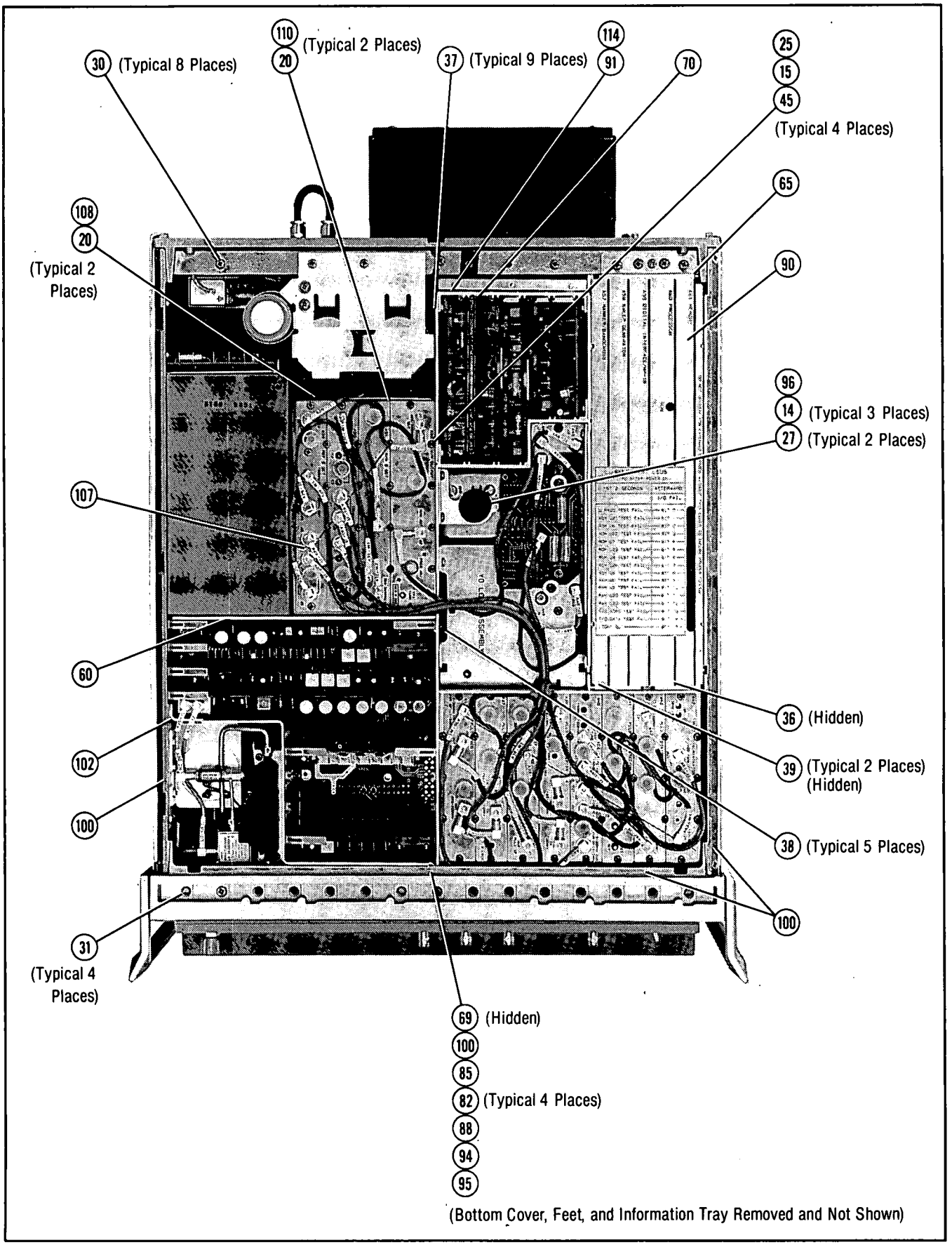


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (7 of 9)

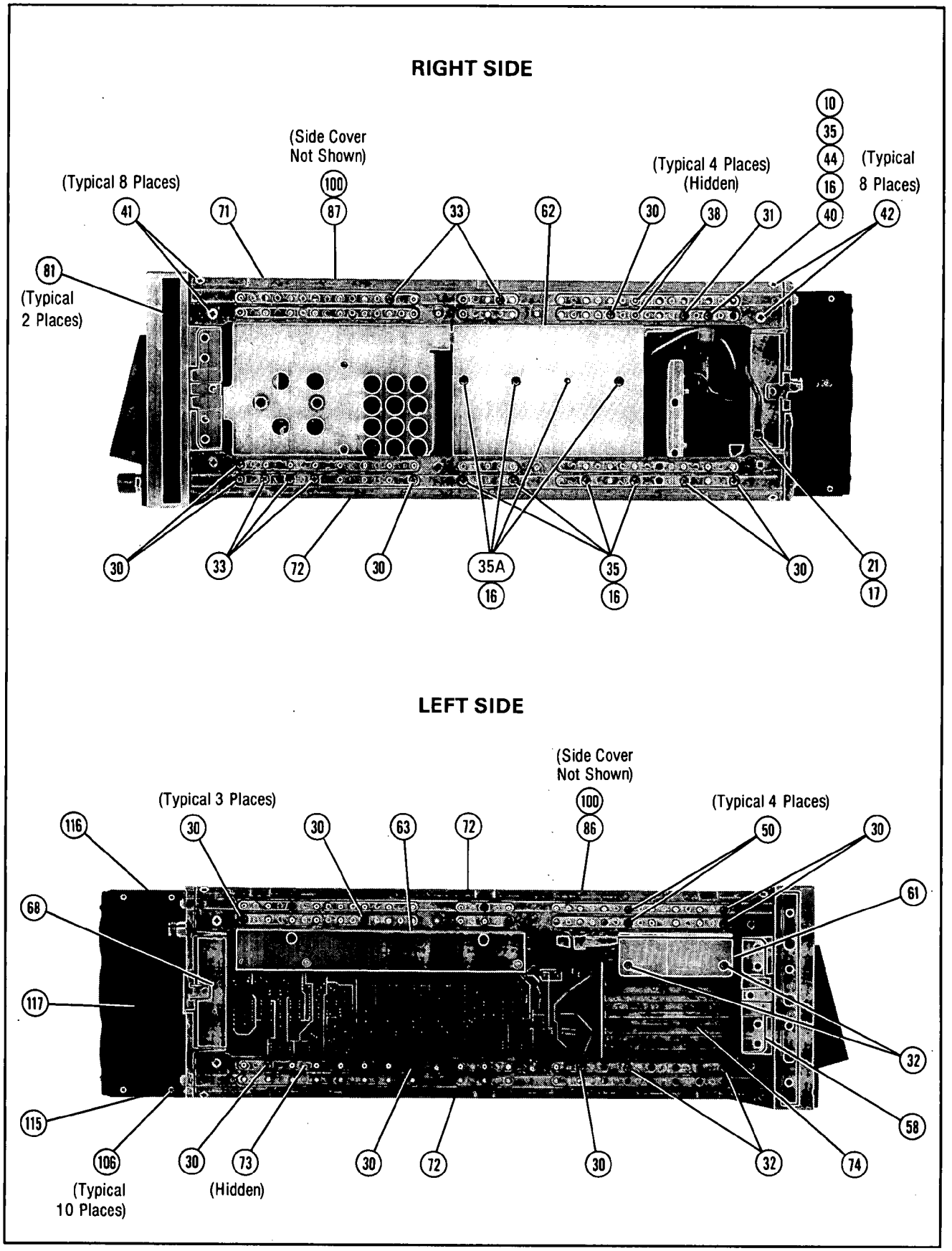


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (8 of 9)

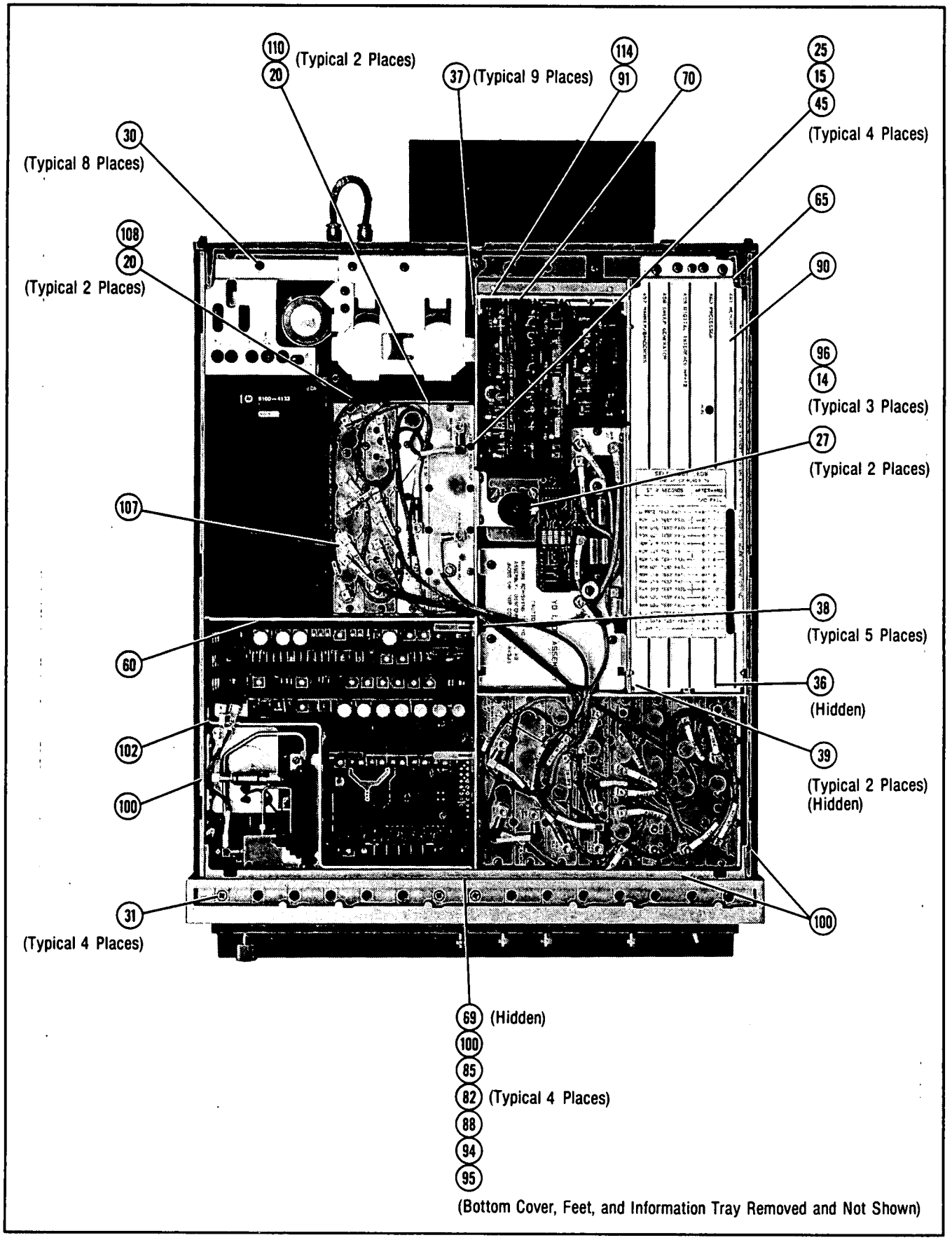


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (7 of 9)

SERIAL PREFIX: 2447A

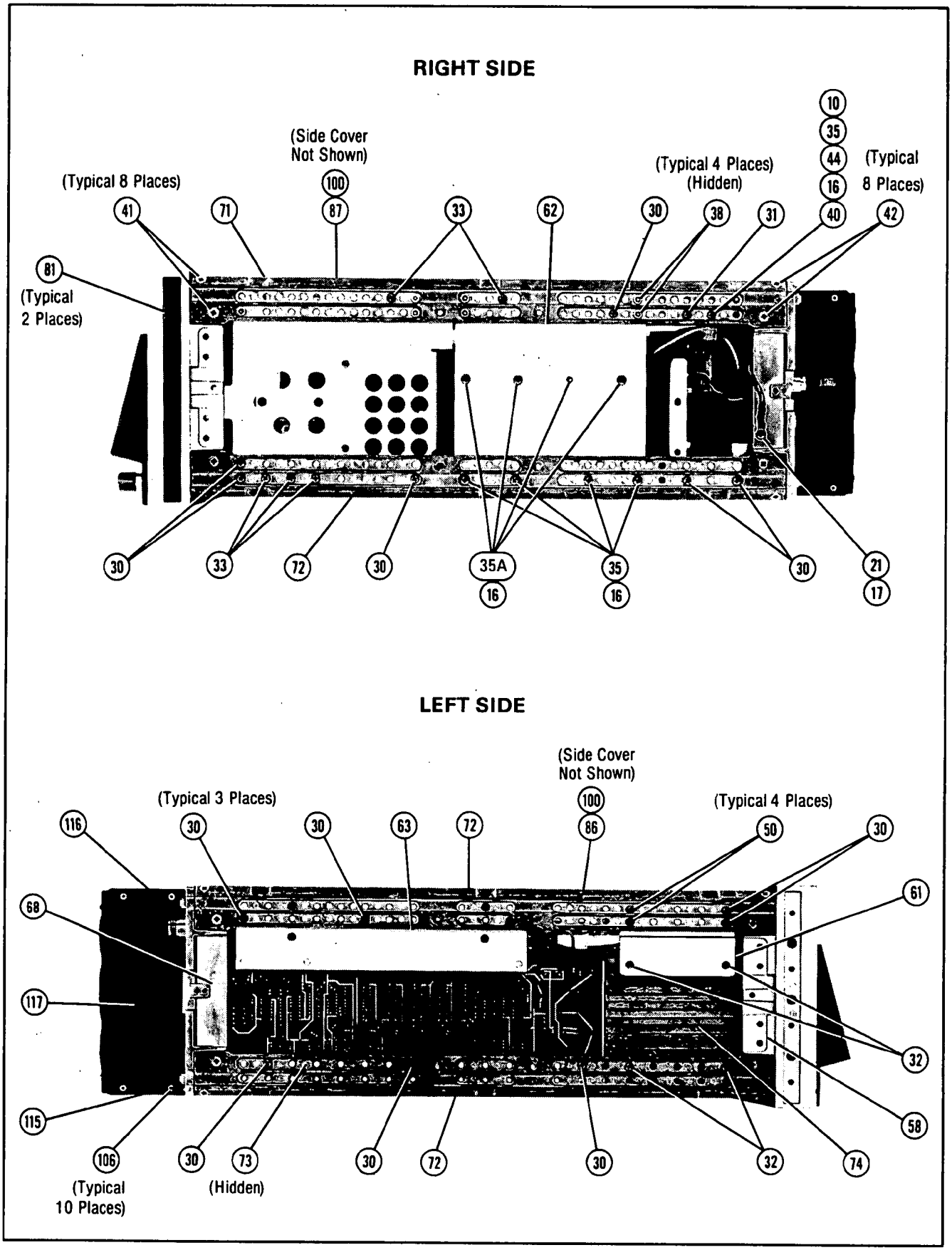
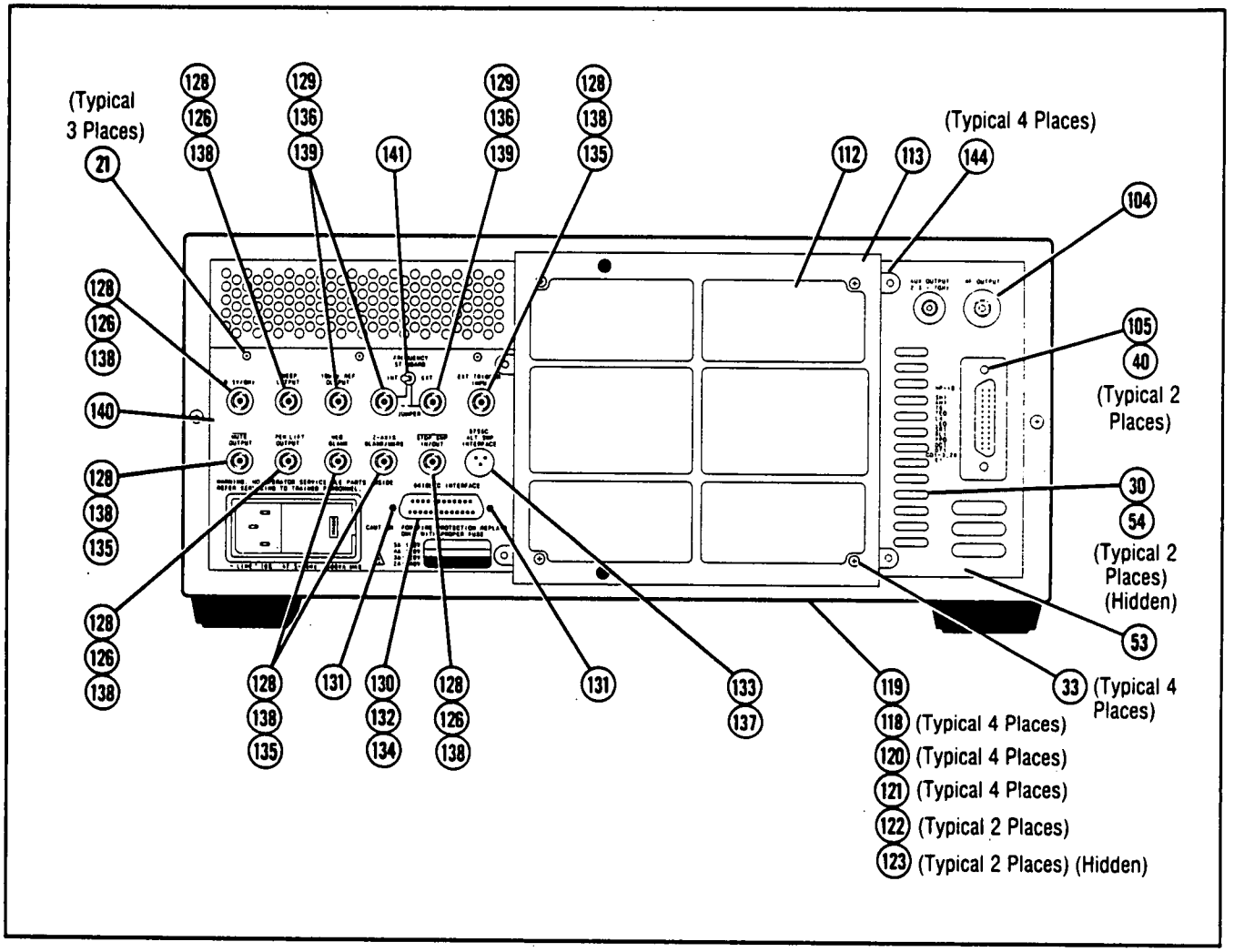


Figure 6-2. Miscellaneous Mechanical & Chassis Parts (8 of 9)



■ *Figure 6-2. Miscellaneous Mechanical & Chassis Parts (9 of 9)*

Table 6-3. HP 8340A/41A Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				FRONT PANEL ATTACHING HARDWARE		
1	0360-0005	9	1	TERMINAL-SLDR LUG PL-MTG FOR-#8-SCR	28480	0360-0005
2	0510-1148	2	2	RETAINER-PUSH ON KB-TO-SHFT EXT	28480	0510-1148
3	0624-0264	2	16	SCREW-TPG 4-40 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
4	1400-0249	0	2	CABLE TIE .062-.625-DIA .091-WD NYL	06383	PLT1M-8
5	2190-0016	3	2	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
6	2200-0105	4	7	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
7	2200-0113	4	5	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
8	2200-0115	6	6	SCREW-MACH 4-40 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
9	2260-0009	3	2	NUT-HEX-W/LKWR 4-40-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
10	2950-0043	8	2	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
11	08340-00024	1	1	SUB-PANEL KEYBOARD	28480	08340-00024
12	08340-00025	2	1	DRESS PANEL (LOWER)	28480	08340-00025
13	08340-00026	3	1	SUB-PANEL (LOWER) KEYBOARD	28480	08340-00026
14	08340-20080	1	1	BEZEL-KEYBOARD FIN	28480	08340-20080
15	1450-0615	9	1	RETAINER	28480	1450-0615
16	08340-40002	9	1	LED MOUNT	28480	08340-40002
17	0370-2992	8	1	KNOB-BASE 1-1/8 JGK .252-IN-ID	28480	0370-2992
18	0590-1251	6	4	NUT-SPLCY 15/32-32-THD .1-IN-THK .562-W	28480	0590-1251
19	00310-48801	0	2	WASHER SHOULDER	28480	00310-48801
20	0360-1158	5	1	LUG	28480	0360-1158

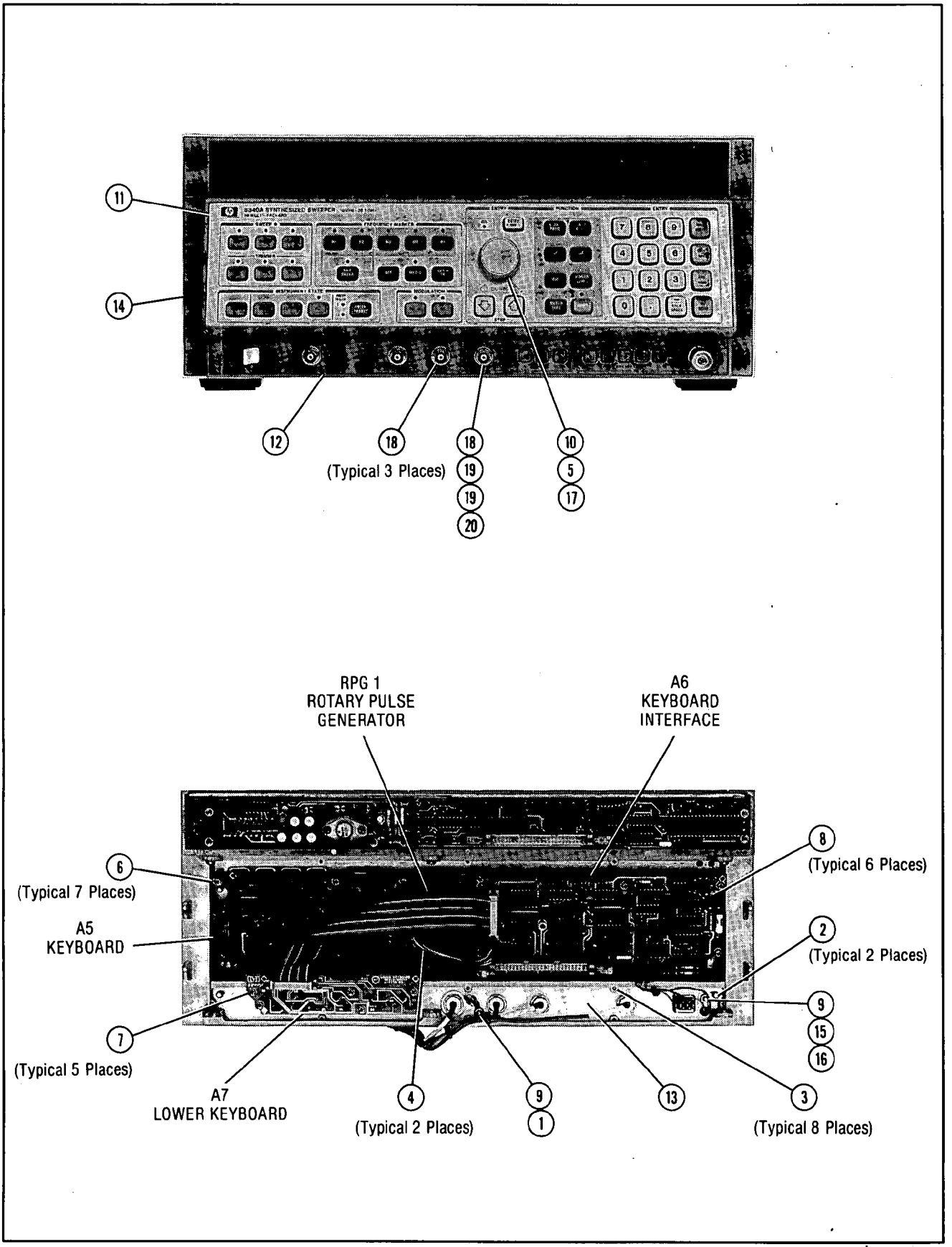


Figure 6-3. Front Panel Attaching Hardware (2 of 2)

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				DISPLAY ASSEMBLY ATTACHING HARDWARE		
1	0050-2141	1	1	CASTING-AL CTR DISPLAY	28480	0050-2141
				NOTE **Replace with service kit 08340-60195.**		
2	0520-0127	6	5	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
3	0520-0136	7	2	SCREW-MACH 2-56 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
4	0520-0139	0	8	SCREW-MACH 2-56 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
5	0520-0174	3	8	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
6	0570-0189	5	6	SCREW-MACH 0-80 .125-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
7	2190-0014	1	7	WASHER-LK INTL T NO. 2 .089-IN-ID	28480	2190-0014
8	2190-0045	8	8	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
9	3050-0098	6	8	WASHER-FL MTLC NO. 2 .094-IN-ID	28480	3050-0098
10	4040-1912	5	1	WINDOW-DISPLAY	28480	4040-1912
11	08340-00036	5	1	INSULATOR-HEAT CONDUCTIVE	28480	08340-00036
12	08340-20057	2	1	FRAME-DISPLAY/MACH	28480	08340-20057
				NOTE **Replace with service kit 08340-60195.**		
13	2360-0115	4	3	SCREW	28480	2360-0115

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

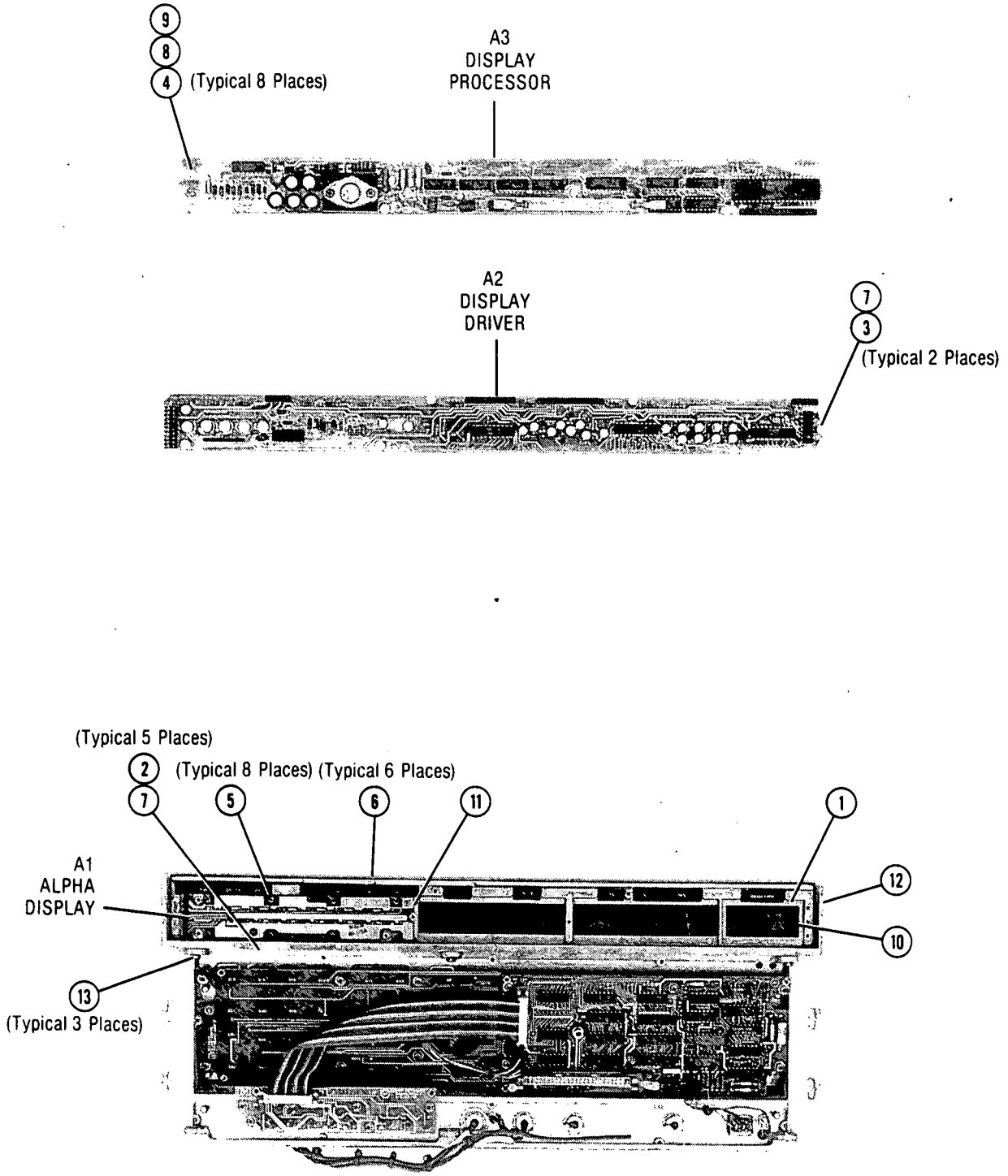


Figure 6-4. Display Assembly Attaching Hardware (2 of 2)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				YO LOOP SECTION ATTACHING HARDWARE		
1	0520-0164	1	2	SCREW-MACH 2-56 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
2	2200-0103	2	1A	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
3	1250-0691	7	4	A49J3,J4 A48J1,2-CONNECTOR-RF MALE SMB	28480	1250-0691
4	1250-0258	2	2	A49J1,J2 CONNECTOR-RF MALE SMB	28480	1250-0258
5	3050-0907	6	4	WASHER-SHLDR NO. 10 .194-IN-ID	28480	3050-0907
6	0360-0452	0	2	TERMINAL-SLDR LUG PL-MTG FOR-#10-SCR	28480	0360-0452
7	2190-0124	4	2	WASHER-LK INTL T NO. 10.195-IN-ID	28480	2190-0124
7	2200-0147	4	2	SCREW-MACH 4-40 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
8	2200-0165	6	23	SCREW-MACH 4-40 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
8	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
9	2360-0331	6	4	SCREW-MACH 6-32 .25-IN-LG PANHD POZI	28480	2360-0331
10	85660-20100	5	2	EXTRACTOR	28480	85660-20100
11	85660-20088	8	2	STUD-YTO LOOP	28480	85660-20088
12	3050-0105	6	2	WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0105
12	0520-0134		2	SCREW-MACH	00000	ORDER BY DESCRIPTION
13	2190-0045		2	WASHER	28480	2190-0045
14	3050-0098		2	WASHER-FL	28480	3050-0098
14	08340-00075	2	1	DECK-YO LOOP	28480	08340-00075
15	08340-00070		1	BRACKET-COUPLER MOUNTING	28480	08340-00070
15	08340-00049	0	1	COVER-SAMPLER	28480	08340-00049
16	0515-1400		2	SCREW	28480	0515-1400
16	08340-00050	3	1	COVER-PHASE LOCK	28480	08340-00050
17	08340-20204	1	1	HOUSING-YT P/L	28480	08340-20204
20	86701-00054	8	1	SPACER-SAMPLER	28480	86701-00054
21	2190-0003	8	2	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
22	1250-1142	5	1	WASHER-LK INTL T 1/2 IN .26-IN-ID	28480	1250-1142
23	1250-1143	6	1	NUT-RF CONNECTOR-SERIES SM A	28480	1250-1143

Figure 6-5. YO Loop Section Attaching Hardware (1 of 4)

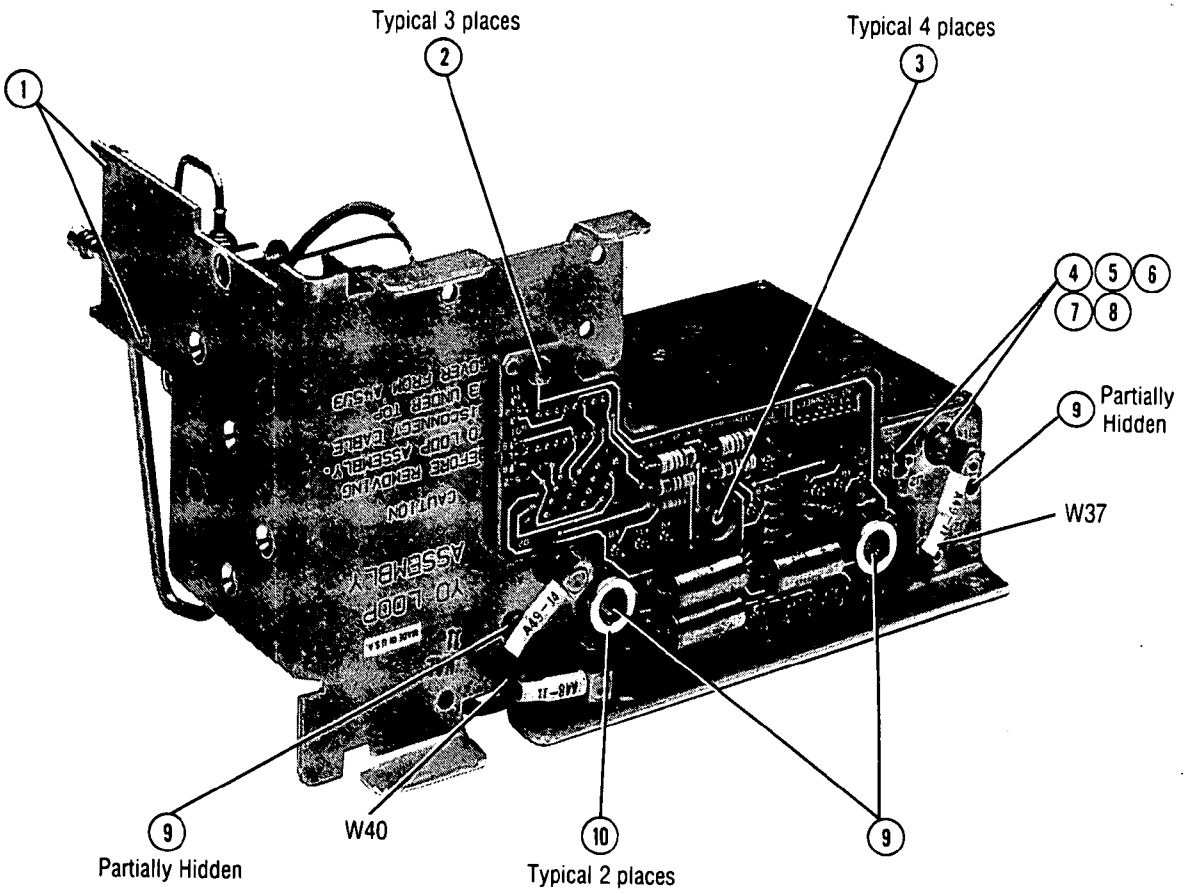


Figure 6-5. YO Loop Section Attaching Hardware (2 of 4)

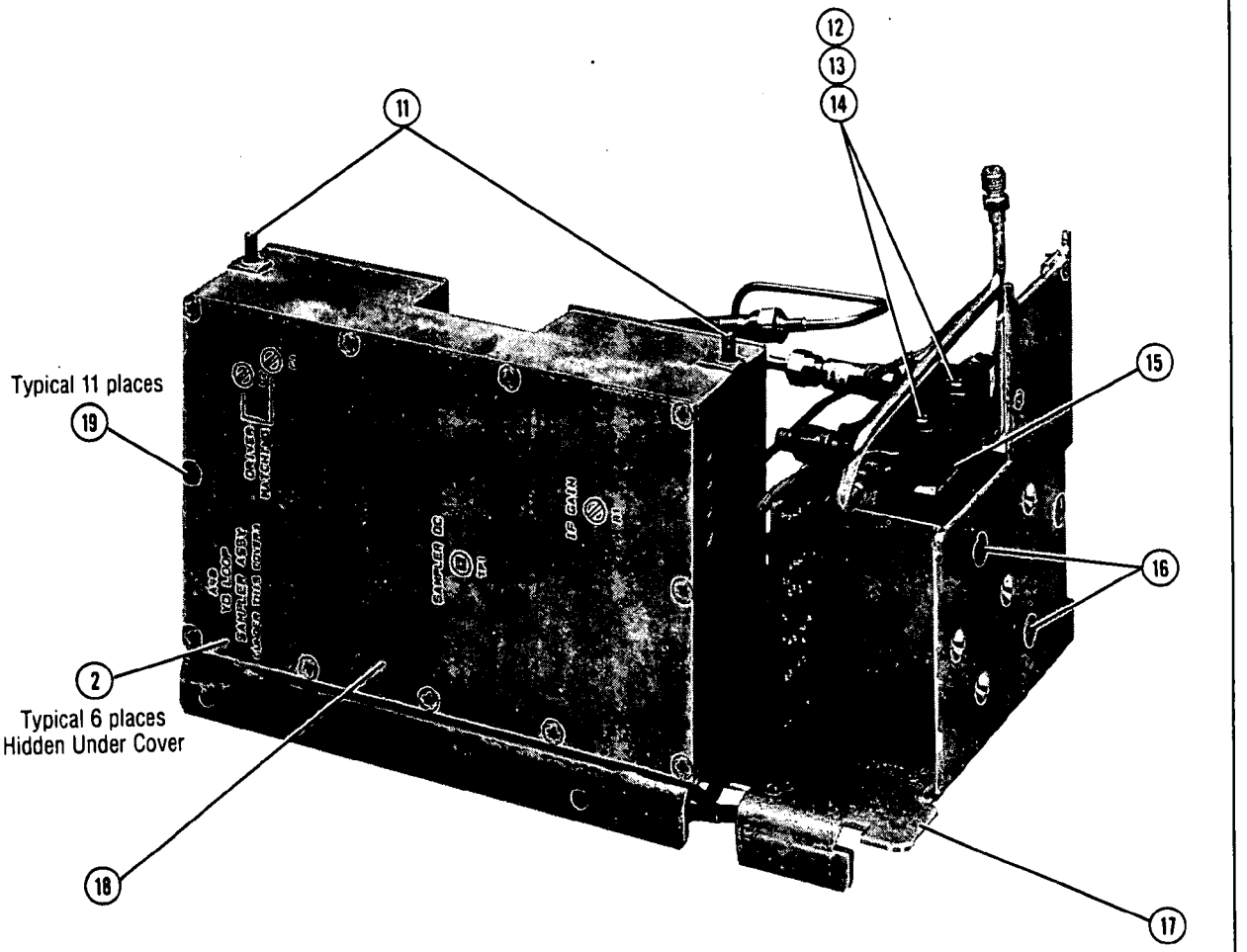
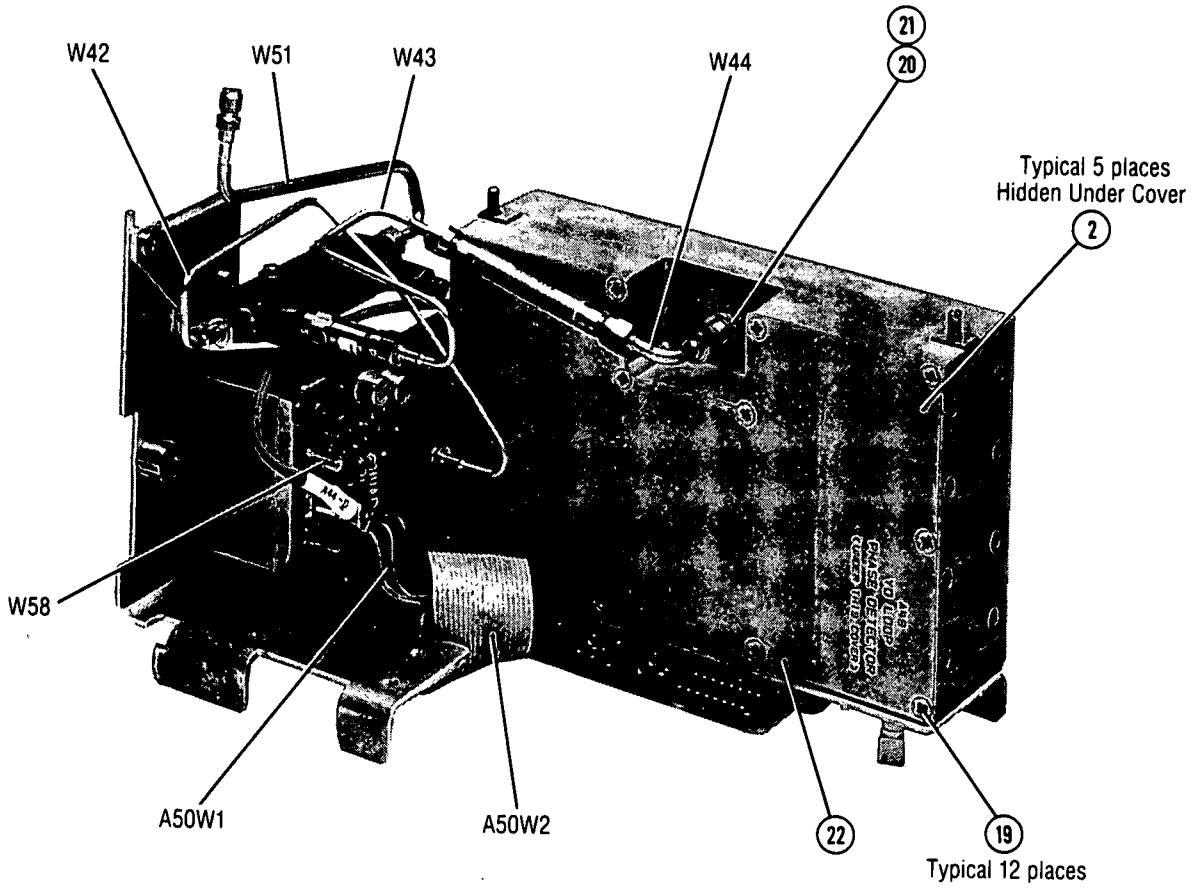


Figure 6-5. YO Loop Section Attaching Hardware (3 of 4)



CAUTION: W51 Must be disengaged from W3 before removing the YO Loop from the instrument or damage to these cables will result. Refer to Figure 8I-8, View C, in the RF Section (Volume 4).

Figure 6-5. YO Loop Section Attaching Hardware (4 of 4)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				RF SECTION ATTACHING HARDWARE		
				(REFER TO FIGURE 6-3.)		
1	0520-0128	7	2	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2	0520-0136	7	4	SCREW-MACH 2-56 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
3	2190-0003	8	20	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
4	2190-0006	1	4	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0006
5	2190-0045	8	6	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
6	2200-0091	7	8	SCREW-MACH 4-40 .562-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
7	2200-0105	4	5	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
8	2200-0141	8	1	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
9	2200-0143	0	7	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
10	2200-0166	7	1	SCREW-MACH 4-40 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
11	2260-0001	5	4	NUT-HEX-DBL-CHAM 4-40-THD .094-IN-THK	28480	2260-0001
12	2360-0115	4	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
13	2360-0207	5	8	SCREW-MACH 6-32 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
14	2360-0334	9	6	SCREW-MACH 6-32 .312-IN-LG 100 DEG	28480	2360-0334
15	08340-00007	0	1	DECK-MICROCIRCUIT MOUNT	28480	08340-00007
16	08340-00045	6	1	BRACKET-PMI MOUNT	28480	08340-00045

Figure 6-6. RF Section Attaching Hardware (1 of 2)

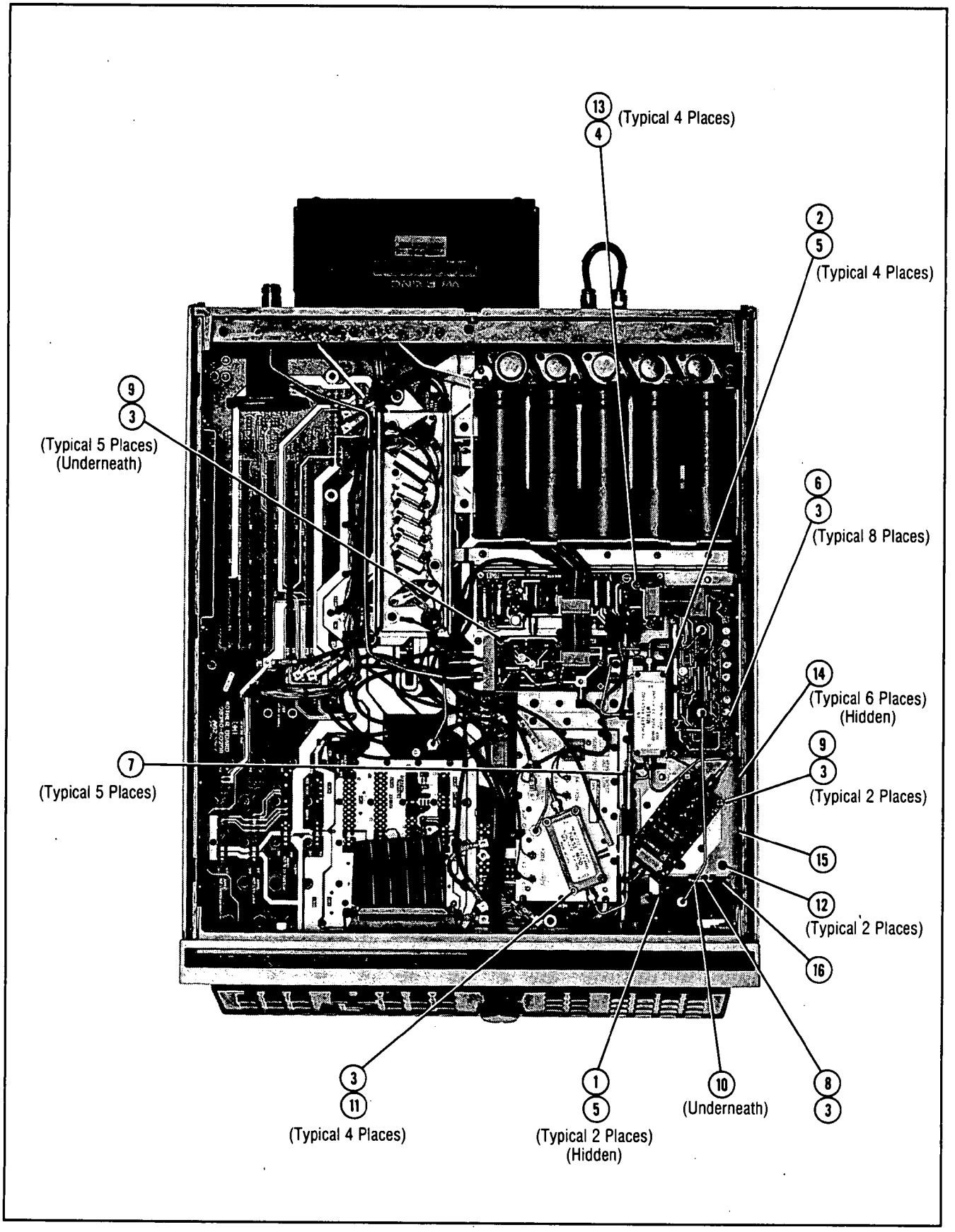


Figure 6-6. RF Section Attaching Hardware (2 of 2)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				REFERENCE-M/N SECTION ATTACHING HARDWARE		
1	2200-0103	2	6	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2	2200-0105	4	24	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
3	5021-3208	7	1	HOUSING-MACH	28480	5021-3208
4	08340-60039	4	1	BOARD ASSY-REF ASSY MO	28480	08340-60039
5	86701-00024	2	1	SCOOP-AIR	28480	86701-00024
6	86701-00029	7	1	BAFFLE-AIR (TOP)	28480	86701-00029
7	86701-00030	0	1	BAFFLE-AIR (BOTTOM)	28480	86701-00030

Figure 6-7. Reference – M/N Section Attaching Hardware (1 of 2)

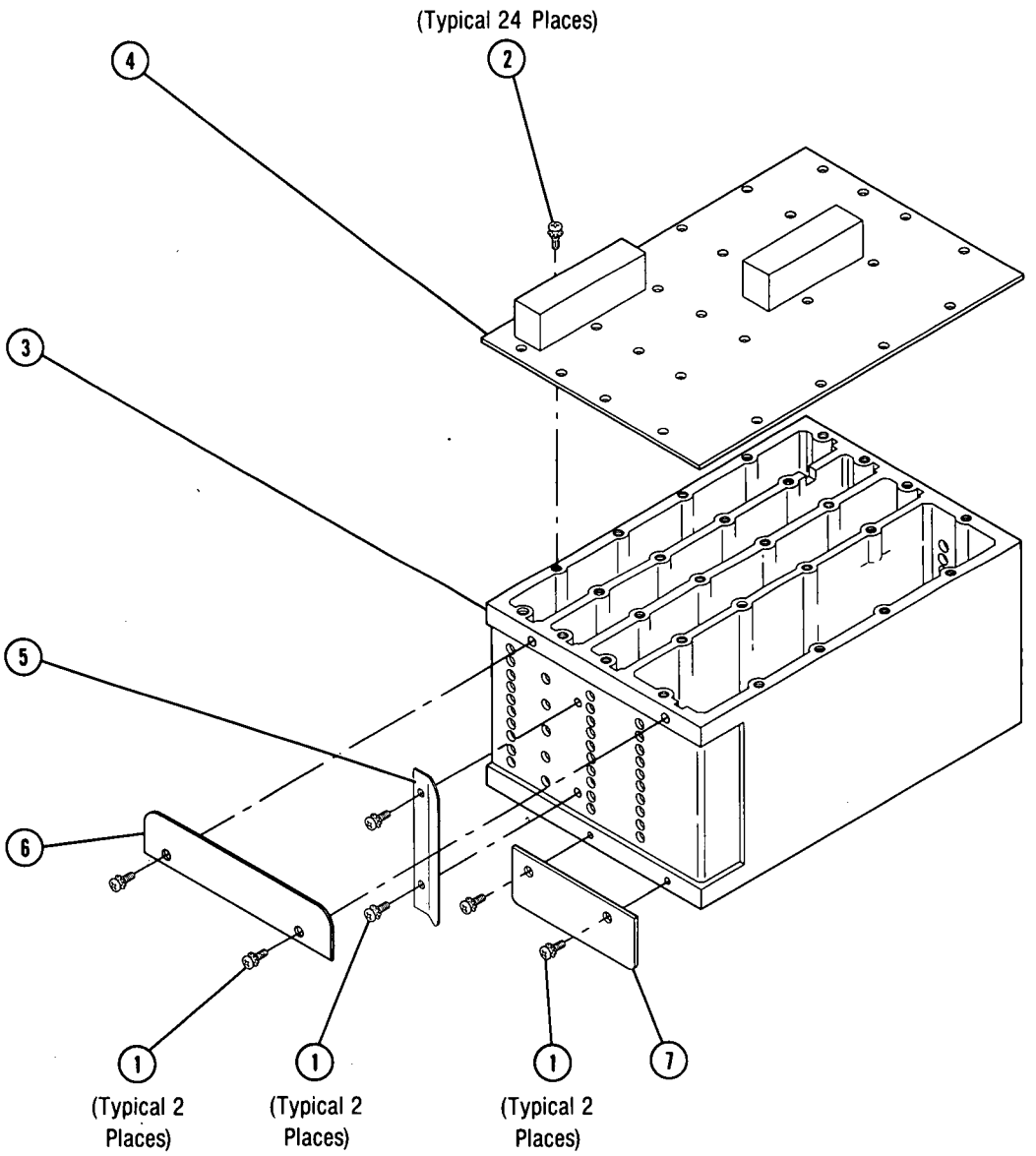


Figure 6-7. Reference — M/N Section Attaching Hardware (2 of 2)

VII Manual Backdating Changes

SECTION VII
MANUAL BACKDATING CHANGES

7-1. INTRODUCTION

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

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

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

7-5. The letter given for each change in this section appears to be backwards in Table 7-1. This is because new backdating sections will be sent along with the traditional Manual Changes Supplement (Change Sheet). These new changes must be added to this section with the most recent occurring **first**. Thus the changes must be lettered starting at the back of the section, advancing toward the front. When you update your manual with replacement pages from the Manual Changes Supplement, also update this section with the new backdating changes, Table 7-1, and Table 7-2. Table 7-2 provides a summary of changes by assembly.

7-6. For additional important information about serial number coverage, refer to INSTRUMENTS COVERED BY THE MANUAL in Section I.

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

Serial Prefix	Make Manual Changes
2344A	N
2343A	M and N
2342A	L through N
2339A	K through N
2330A	J through N
2329A	I through N
2320A	H through N
2319A	G through N
2314A	F through N
2305A	E through N
2303A	D through N
2248A	C through N
2240A	B through N
2215A to 2205A	A through N

Table 7-2. Summary of Changes by Component

Prefix or Serial Number	Assembly	Components	Prefix or Serial Number	Assembly	Components
2109A00070 to 2109A00074 2205A0010 to 2205A00105 2215A00106 to 2215A00110	A54	Delete C37	2319A	A41*	Chg: R16,Q5,Q6 Add: CR5, CR6
			2320A	A26*	Extensive
			2329A	A53*	Extensive
			2330A	A28*	Extensive
2240A	A24*	Add: Q10, Change R38	2339A	A51*	Change: W1P1
				A62*	
	A53	Change C2	2342A	A16A1	120pf Cap. added to J2 (caused spec. chg)
2303A	A53	Change: R1,2,3,4			
	A59*	Change: R7,8,9 Add: R19,30,31, 32,33	2343A	A52*	Extensive
			2344A	A49*	Extensive
	A60	Change: C10	2346A	A2	Add C5
2305A	A8A1	Add: A8A1C22	2349A	A26	Chg: C35, C36, R95,R96,R97,R98, R31,Q11-13
	B1, Fan Assy	Chg Fan Housing			
2314A	A6	Change: U9, R3	2406A	A58*	Extensive
	A61*	Extensive			

*Assembly Part Number Changed

CHANGE N

Change N applies directly to the A2 Display Driver assembly, HP Part Number 08340-60009. The existing manual may be changed to apply directly to the 08340-60009 by performing the following manual changes.

Page 6-7, Table 6-3:
  Change the A2 assembly HP and Mfr. Part Number to 08340-60009, CD8.
  Delete A2C5.

Page 8-587, Figure 8H-11:
  Delete C5 (upper-left corner of diagram).

Page 8-589, Figure 8H-12:
  Change the A2 assembly part number at the top-left of the schematic to 08340-60009.
  Delete A2C5 (bottom-center of A2 schematic).

CHANGE M

Change M is extensive and only applies to the A49 YO Loop Phase Detector, HP Part Number 08340-60031. The following pages apply directly to the 08340-60031 and should be used when servicing this assembly.

Refer to the following Parts List, Theory, Component Location Diagram and Schematic for backdated information.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A49	08340--60031	6	1	YP LOOP PHASE DETECTOR	28480	08340--60031
A49C1	0160--4805	1	2	CAPACITOR--FXD 47PF ±5% 100VDC CER 0±30	28480	0160--4805
A49C2	0160--4805	1		CAPACITOR--FXD 47PF ±5% 100VDC CER 0±30	28480	0160--4805
A49C3	0160--4526	3	1	CAPACITOR--FXD 42PF ±5% 200VDC CER 0±30	28480	0160--4526
A49C4	0160--4767	4	1	CAPACITOR--FXD 20PF ±5% 200VDC CER 0±30	28480	0160--4767
A49C6	0160--4832	4	6	CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A49C8	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A49C9	0180--0116	1	1	CAPACITOR--FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A49C10	0180--0197	8	2	CAPACITOR--FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A49C11	0160--4918	7	4	CAPACITOR--FXD .022UF ±10% 50VDC CER	28480	0160--4918
A49C12	0160--4918	7		CAPACITOR--FXD .022UF ±10% 50VDC CER	28480	0160--4918
A49C13	0180--0197	8		CAPACITOR--FXD 2.2UF±10% 20VDC TA	56289	150D225X9020A2
A49C14	0160--4835	7	1	CAPACITOR--FXD .1UF ±10% 50VDC CER	28480	0160--4835
A49C15	0160--4918	7		CAPACITOR--FXD .022UF ±10% 50VDC CER	28480	0160--4918
A49C15	0160--4932	5	2	CAPACITOR--FXD 750PF ±5% 100VDC CER	28480	0160--4932
A49C16	0160--4932	5		CAPACITOR--FXD 750PF ±5% 100VDC CER	28480	0160--4932
A49C17	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A49C18	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A49C19	0160--0162	5	1	CAPACITOR--FXD .022UF ±10% 200VDC POLYE	28480	0160--0162
A49C20	0160--4787	8	3	CAPACITOR--FXD 22PF ±5% 100VDC CER 0±30	28480	0160--4787
A49C21	0160--2290	4	1	CAPACITOR--FXD .15UF ±10% 80VDC POLYE	28480	0160--2290
A49C22	0160--4787	8		CAPACITOR--FXD 22PF ±5% 100VDC CER 0±30	28480	0160--4787
A49C23	0160--0164	7	1	CAPACITOR--FXD .039UF ±10% 200VDC POLYE	28480	0160--0164
A49C24	0160--3787	6	1	CAPACITOR--FXD 1UF ±10% 50VDC MET--POLYC	28480	0160--3787
A49C25	0160--4535	4	2	CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A49C26	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A49C27	0160--4787	8		CAPACITOR--FXD 22PF ±5% 100VDC CER 0±30	28480	0160--4787
A49C28	0160--3879	7	2	CAPACITOR--FXD .01UF ±20% 100VDC CER	28480	0160--3879
A49C29	0160--3879	7		CAPACITOR--FXD .01UF ±20% 100VDC CER	28480	0160--3879
A49C30	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A49C31	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A49C76	0160--4918	7		CAPACITOR--FXD .022UF ±10% 50VDC CER	28480	0160--4918
A49CR1	1901--0050	3	4	DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A49CR2	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A49CR3	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A49CR4	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A49E1	1251--4932	9	2	CONNECTOR--SGL CONT SKT .021--IN--BSC--SZ	91506	LSG--1AG14--1
A49E2	1251--4932	9		CONNECTOR--SGL CONT SKT .021--IN--BSC--SZ	91506	LSG--1AG14--1
A49J1	A250--0257	3	2		28480	A250--0257
A49J2	A250--0257	3			28480	A250--0257
A49L1	9100--0368	6	2	INDUCTOR RF--CH--MLD 330NH 10% .105DX.26LG	28480	9100--0368
A49L2	9100--2254	3	2	INDUCTOR RF--CH--MLD 390NH 10% .105DX.26LG	28480	9100--2254
A49L3	9100--2254	3		INDUCTOR RF--CH--MLD 390NH 10% .105DX.26LG	28480	9100--2254
A49L4	9100--0368	6		INDUCTOR RF--CH--MLD 330NH 10% .105DX.26LG	28480	9100--0368
A49L5	9100--1641	0	2	INDUCTOR RF--CH--MLD 240UH 5% .166DX.385LG	28480	9100--1641
A49L6	9100--1620	5	3	INDUCTOR RF--CH--MLD 15UH 10% .166DX.385LG	28480	9100--1620
A49L7	9100--1641	0		INDUCTOR RF--CH--MLD 240UH 5% .166DX.385LG	28480	9100--1641
A49L8	9100--1620	5		INDUCTOR RF--CH--MLD 15UH 10% .166DX.385LG	28480	9100--1620
A49L9	9100--1620	5		INDUCTOR RF--CH--MLD 15UH 10% .166DX.385LG	28480	9100--1620
A49MP1	1200--0173	5	1	INSULATOR--XSTR DAP--GL	28480	1200--0173
A49Q1	1854--0475	5	1	TRANSISTOR--DUAL NPN PD=750MW	28480	1854--0475
A49R1	0698--7212	9	3	RESISTOR 100 1% .05W F TC=0±100	24546	C3--1/8--TO--100R--F
A49R2	0698--7212	9		RESISTOR 100 1% .05W F TC=0±100	24546	C3--1/8--TO--100R--F
A49R3	0698--7219	6	2	RESISTOR 196 1% .05W F TC=0±100	24546	C3--1/8--TO--196R--F
A49R4	0757--0394	0	1	RESISTOR 51.1 1% .125W F TC=0±100	24546	C4--1/8--TO--51R1--F
A49R5	0698--7212	9		RESISTOR 100 1% .05W F TC=0±100	24546	C3--1/8--TO--100R--F
A49R6	0698--7219	6		RESISTOR 196 1% .05W F TC=0±100	24546	C3--1/8--TO--196R--F
A49R7	0698--3122	2	2	RESISTOR 412 1% .125W F TC=0±100	03888	PME55--1/8--T0--4120--F
A49R8	0698--3122	2		RESISTOR 412 1% .125W F TC=0±100	03888	PME55--1/8--T0--4120--F
A49R9	0698--3440	7	2	RESISTOR 196 1% .125W F TC=0±100	24546	C4--1/8--T0--196R--F
A49R10	0698--3440	7		RESISTOR 196 1% .125W F TC=0±100	24546	C4--1/8--T0--196R--F
A49R11	0757--0438	3	2	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A49R12	0698--3445	2	2	RESISTOR 348 1% .125W F TC=0±100	24546	C4--1/8--T0--348R--F
A49R13	0698--3445	2		RESISTOR 348 1% .125W F TC=0±100	24546	C4--1/8--T0--348R--F
A49R14	0698--3154	0	1	RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4--1/8--T0--4221--F
A49R15	0757--0442	9	1	RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A49R16	0698--3156	2	1	RESISTOR 14.7K 1% .125W F TC=0±100	24546	C4--1/8--T0--1472--F
A49R17	0757--0278	9	1	RESISTOR 1.78K 1% .125W F TC=0±100	24546	C4--1/8--T0--1781--F
A49R18	0757--0317	7	1	RESISTOR 1.33K 1% .125W F TC=0±100	24546	C4--1/8--T0--1331--F
A49R19	0698--0085	0	2	RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4--1/8--T0--2611--F
A49R20	0757--0288	1	2	RESISTOR 9.09K 1% .125W F TC=0±100	19701	MF4C1/8--T0--9091--F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A49R21	0698--7236	7	1	RESISTOR 1K 1% .05W F TC=0±100	24546	C3--1/8--T0--1001--F
A49R22	0698--7277	6	1	RESISTOR 51.1K 1% .05W F TC=0±100	24546	C3--1/8--T0--5112--F
A49R23	0698--3155	1	1	RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4--1/8--T0--4641--F
A49R24	0698--7267	4	1	RESISTOR 19.6K 1% .05W F TC=0±100	24546	C3--1/8--T0--1962--F
A49R25	0757--0416	7	3	RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A49R26	0757--0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A49R27	0698--4020	1	1	RESISTOR 9.53K 1% .125W F TC=0±100	24546	C4--1/8--T0--9531--F
A49R28	0698--0085	0		RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4--1/8--T0--2611--F
A49R29	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A49R30	0698--7266	3	1	RESISTOR 17.8K 1% .05W F TC=0±100	24546	C3--1/8--T0--1782--F
A49R31	0698--7248	1	1	RESISTOR 3.16K 1% .05W F TC=0±100	24546	C3--1/8--T0--3161--F
A49R32	0698--7241	4	2	RESISTOR 1.62K 1% .05W F TC=0±100	24546	C3--1/8--T0--1621--F
A49R33	0698--7241	4		RESISTOR 1.62K 1% .05W F TC=0±100	24546	C3--1/8--T0--1621--F
A49R34	0757--0288	1		RESISTOR 9.09K 1% .125W F TC=0±100	19701	MF4C1/8--T0--9091--F
A49R35	0757--0403	2	1	RESISTOR 121 1% .125W F TC=0±100	24546	C4--1/8--T0--121R--F
A49R36	0757--0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A49R37	0757--0346	2	1	RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A49R38	0757--0401	0	1	RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A49TP1	0360--0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP2	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP3	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP4	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49TP5	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A49U1	1826--0783	9	3	IC OP AMP LOW--NOISE 8--DIP--C PKG	52063	XR5534ACN
A49U2	1826--0422	3	1	IC SMPL/HOLD TO--99 PKG	27014	LF298H
A49U3	1826--0092	3	1	IC OP AMP GP DUAL TO--99 PKG	28480	1826--0092
A49U4	1826--0783	9		IC OP AMP LOW--NOISE 8--DIP--C PKG	52063	XR5534ACN
A49U5	1826--0512	2	1	IC 78M15C V RGLTR TO--39	04713	MC78M15CG
A49U6	1820--1344	8	1	IC PL LOOP 14--DIP--C PKG	04713	MC12040L
A49U7	1826--0783	9		IC OP AMP LOW--NOISE 8--DIP--C PKG	52063	XR5534ACN
A49U8	1810--0204	6	1	NETWORK--RES 8--SIP1.0K OHM X 7	01121	208A102
A49U9	1820--0802	1	1	IC GATE ECL NOR QUAD 2--INP	04713	MC10102P
A49VR1	1902--1260	1	2	DIODE--ZNR 1N5525C 6.2V 2% DO--7 PD=.4W	04713	1N5525C
A49VR2	1902--1260	1		DIODE--ZNR 1N5525C 6.2V 2% DO--7 PD=.4W	04713	1N5525C
A49VR3	1902--3082	9	1	DIODE--ZNR 4.64V 5% DO--35 PD=.4W	28480	1902--3082
A49VR4	1902--3036	3	2	DIODE--ZNR 3.16V 5% DO--7 PD=.4W TC=--.064%	28480	1902--3036
A49VR5	1902--3036	3		DIODE--ZNR 3.16V 5% DO--7 PD=.4W TC=--.064%	28480	1902--3036
A49W1	1258--0124	7	1	PIN--PROGRAMING DUMPER .30 CONTACT	91506	8136--47SG1

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

A49 YO LOOP PHASE DETECTOR, CIRCUIT DESCRIPTION

Introduction

The A49 YO Loop Phase Detector Board recieves as inputs the Sampler IF signal and the 20/30 signal from the A36 PLL1 VCO. These signals are phase-compared and the result is integrated to provide the YO Tune signal as well as the FM Coil signal, which are its main outputs. It also generates the High Unlock YO (HULY) signal.

The A54 YO Pretune DAC/Delay Compensation board generates the Pretune voltage required to tune the A44 YO main coil to approximately the desired frequency. A portion of the YO output is coupled back to a sampler (A48U1) where the YO signal is mixed with the Nth harmonic of the output of the A33 M/N Output assembly. This generates a difference signal of 20 to 30 MHZ (Sampler IF) which is input to the A49 YO Loop Phase Detector where it is phase compared to the 20/30 MHz reference signal from the A36 PLL1 VCO. The resulting error signal tunes the YO to achieve phase lock.

The YO frequency is related to the M/N output frequency and the 20/30 MHz reference loop frequency in the following manner:

$$YOFo = (N)(Fm/n) - F20/30$$

Where:

YOFo = YO Output Frequency (MHz)
N = N Number Input to the M/N Loop
(harmonic near to which the YO Loop is tuned)
Fm/n = M/N Loop Output Frequency (MHz)
F20/30 = 20/30 Loop Output Frequency (MHz)
(the 20/30 frequency can be changed in 1 Hz steps)

The YO Tune output from the A49 YO Loop Phase Detector board is routed to the A55 YO Driver board where it is summed with the Pretune voltage from the A54 Pretune DAC/Delay Compensation board. This sum is then applied to the YO main coil. The YO FM Coil output from the A49 YO Loop Phase Detector board is routed to the A44A1 YO Bias board and applied to the YO FM coil.

70 MHz Low Pass Filter A

The 20/30 MHz Sampler IF into the A49 YO Loop Phase Detector board is passed through the 70 MHz Low Pass Filter to remove any unwanted frequencies which may have been introduced during the sampling process.

IF Limiter B And 20/30 Limiter C

Each of the two input signals (Sampler IF IN and 20/30 REF IN) are passed through a limiter to establish ECL signal levels.

Phase/Frequency Detector D

The two signals (Sampler IF IN and 20/30 REF IN) are applied to the phase/frequency detector (U6). The function of U6 is to output a pulse which is related to the phase difference of the two input signals. The width of this pulse is directly proportional to the amount of phase difference. If the Sampler IF signal leads the 20/30 REF signal, a negative pulse appears at U6 pin 3 (TP 2), the width of which is proportional to the amount of phase difference. If the 20/30 REF signal leads the Sampler IF signal, a negative pulse appears at U6 pin 12 (TP 3). In each case, the other output pin remains at an ECL HIGH level (approximately -.6V). If the inputs are in phase, one of the detector outputs is an ECL HIGH (approximately -.6v) with long narrow negative spikes and the other is an ECL HIGH with short spikes. Because of the finite rise time of the circuitry involved, there will also be an amplitude modulation envelope on the negative going spikes for very large signals injected into the loop during test. The detector outputs are averaged in a 1.5 MHz low pass filter (L8, L9, C15, C16 in Differential Amplifier Block E) before being applied to the differential amplifier.

Differential Amplifer E

The outputs of the 1.5 MHz filters are applied directly to Differential Amplifier Q1. The output of this differential amplifier is directly related to the difference between the Sampler IF and the 20/30 MHz REF signals. The collector supply to this differential amplifier is provided by a 15V three terminal regulator U5 in Power Supplies (Block K) which is referenced to the instrument REF ground system. This was done to transform the remainder of the YO FM Coil Drive circuitry from the normal chassis ground to the clean controlled reference ground system.

The output of the Differential Amplifer (DAMP) is also routed to the A50 YO Loop Interconnect board through a low capacitance DC feedthrough to provide an external test point.

Loop Integrators F

Integrators U4 and U7 and the Phase-Lag Filter determine the frequency response of the loop.

Integrator U4 has a pole at f=0 and a zero at f=4000 Hz (R17 and C19). Integrator U7 has a pole at f=0 and a zero at f=400 Hz (R19

and C21). The Phase-Lag Filter (on FM Coil Driver Block I) has a pole at 400 Hz (cancelling the zero of integrator U7) and a zero at 4000 Hz (R20, R21, and C23). The YO has an inherent pole at f=0 Hz.

The combined frequency response has a slope of -60 dB/decade until f=4000 Hz where the slope changes to -20 dB/decade. The unity-gain crossover frequency (Loop Bandwidth) is set to nominally 50 kHz by varying the gain of integrator U7. The effect of this frequency response is to provide high gain at frequencies below 4000 Hz and thus reduce (proportional to the loop gain) the YO close-in phase noise and line-related spurs.

R18 is a selected resistor which may be adjusted upward in value to reduce the Loop Bandwidth or downward to increase the Loop Bandwidth.

If the A55 YO Driver board is misadjusted (Offset and Gain adjustments), there will be a DC offset voltage at the INTG output. There is normally a small offset at any given frequency due to non-linearities in the YO tracking, but the values should vary about zero volts. If the average value is different from zero, it will limit the capture range of the loop.

Test Jumper G

A test Jumper is provided for troubleshooting. By removing the jumper, the YO Phase Lock Loop can be opened and an external signal injected to exercise the YO.

Sample And Hold H

The purpose of the Sample and Hold (U2 and associated circuitry) is to apply the integrated output of the phase-detector to the YO to tune and achieve phase lock and to then hold this dc voltage during the sweep to prevent the YO Loop from interfering with the YO sweep. This is called Lock and Roll.

The Sample and Hold has two modes of operation:

* Sample Mode. This is the essentially the ''no-memory'' mode where the input to the Sample and Hold circuit is used directly to tune and phase lock the YO. This occurs:

  When the instrument is in the CW mode or in the Swept mode for sweep widths less than 5 MHZ. This means that the YO is phase locked during the entire sweep for sweep widths less than 5 MHZ.

  Just prior to the sweep in the Swept mode for sweep widths

greater than 5 MHZ. This tunes and phase locks the YO at the beginning of each sweep.

* Hold Mode. This is used for sweep widths of greater than 5 MHZ. The YO is allowed to achieve phase lock at the beginning of each sweep. Afterwards the Hold mode is enabled which causes this dc tuning voltage to be held constant (using C24) while the YO is swept. This sequence is repeated at the beginning of each sweep.

The mode of operation of U2 is selected by the control signal HLEY (High = Lock Enabled) from the A59 Digital Interface Board through the A50 YO Loop Interconnect board. When this signal is less than 3.0V, the Sample mode is enabled; when HLEY is less than 3.0V, the Hold mode is enabled.

FM Coil Driver I

The FM Coil Driver provides the tune signal for the YO FM Coil. It consists of two parts:

* 100 Hz High Pass Filter. This filter allows only the high frequency portion (greater than 100 Hz) of the error voltage signal to be applied to the YO FM Coil. (The YO Tune circuitry on the A55 YO Driver board has a 100 Hz Low Pass Filter applying only the low frequency portion of the error signal to the Main Coil.) There is also a ground transformation (provided by C26, R33, and R34) from Reference ground to FM GND.

* Output Amplifier. This circuit amplifies and filters the high frequency portion of the error signal to provide the drive current (through R36) to the YO FM Coil. A Phase-Lag Filter is incorporated in the feedback of the amplifier which completes the YO Loop frequency response and improves the overall noise performance of the YO Loop. The output voltage signal is clamped (by VR4 and VR5) to a maximum of ±3.8V to prevent the op-amp from becoming saturated during phase lock.

Unlocked Detectors J

The output of integrator U7 in Loop Integrators (Block F) is a voltage representing the amount of frequency or phase error between the YO actual output and what it is supposed to be based upon the M/N and 20/30 frequencies. This output voltage is divided by 12 and presented to the comparators of the Unlock Detector.

Comparator U3B compares the output to -0.51V which is equivalent to approximately -6.1V at the output of integrator U7 in Loop

Integrators (Block F). Comparator U3A compares the output to +0.51V which is equivalent to approximately +6.1V at the output of integrator U7 in Loop Integrators (Block F).

The outputs of these two comparators are wire OR'ed together. When the input to the Unlock Detector circuit exceeds approximately ±6.1 V one of the comparators will pull up to +20 V which will pull HULY up to 4.64 V (where it is clamped by zener diode VR3). This High Unlock (HULY) signal is routed (via the A50 Loop Interconnect board) to the A59 Digital Interface board where the processor is able to detect this error condition. This signal is also routed through A50R6, and U1B and U1C (darlington open collector inverters) on the A50 YO Loop Interconnect board, where it causes a green LED (A50 DS1) to light whenever the YO Loop is LOCKED.

When the output of the integrator U7 in Loop Integrator (Block F) is within approximately 6.1 V, both comparator outputs will pull down to -10 V and will thus reverse bias the two diodes CR3 and CR4. The HULY signal will then be pulled LOW by R29, being limited to -0.6V by the (forward biased) zener diode VR3.

Power Supplies K

This circuitry filters the supplies used on this board. The -5.2VFA supply routed to the analog circuitry is separately filtered from the -5.2VFB supply for the digital circuitry to prevent crosstalk. The +15VF supply is derived from the +20VF supply through U5 (see Differential Amplifier (Block E). The chassis ground is isolated from the Reference ground through R38.

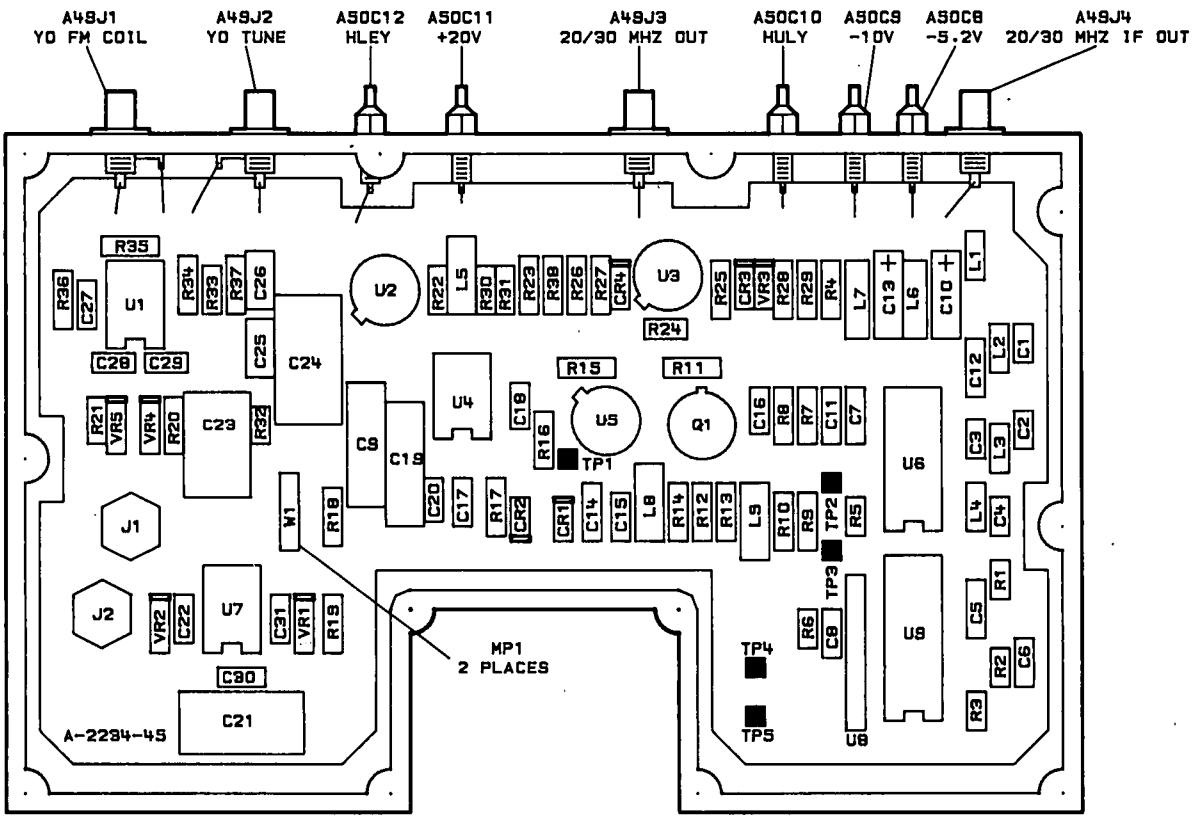


Figure 7M-1. A49 YO Loop Phase Detector, Component Location Diagram

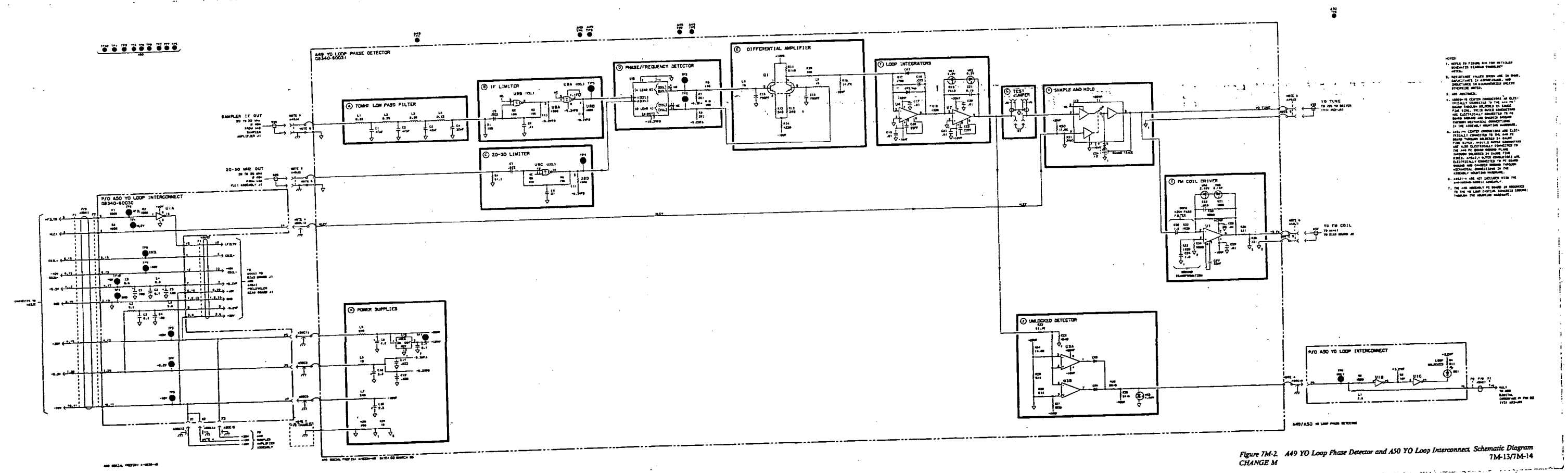


Figure 7M-2. A49 YO Loop Phase Detector and A50 YO Loop Interconnect, Schematic Diagram
CHANGE M

CHANGE L

Change L is extensive and primarily applies to the A52 Positive Regulator assembly, HP Part Number 08340-60004. However, Change L also eliminates a 50 Ohm terminator, shipped in later instruments as an accessory. The existing manual may be changed to reflect the lack of the 50 Ohm terminator by performing the following manual change.

Page 1-ix, Figure 1-1:
Delete the 50 Ohm terminator, HP Part Number 1250-1854, from the illustration of supplied accessories.

The following pages apply directly to the 08340-60004 and should be used when servicing this assembly.

Refer to the following A52 Parts List, Theory, Component Location Diagram and Schematic for backdated information.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A52	08340--60004	3	1	POSITIVE REGULATOR	28480	08340--60004
A52C1	0160--5338	7	1	CAPACITOR--FXD .33UF ±10% 50VDC CER	28480	0160--5338
A52C2	0180--0116	1	4	CAPACITOR--FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C3	0160--4807	3	1	CAPACITOR--FXD 33PF ±5% 100VDC CER 0±30	28480	0160--4807
A52C4	0180--1746	5	2	CAPACITOR--FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A52C5	0180--0228	6	3	CAPACITOR--FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A52C6	0180--0116	1		CAPACITOR--FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C7	0180--1746	5		CAPACITOR--FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A52C8	0180--2811	7	2	CAPACITOR--FXD 10UF±20% 35VDC TA	28480	0180--2811
A52C9	0160--4835	7	1	CAPACITOR--FXD .1UF ±10% 50VDC CER	28480	0160--4835
A52C10	0180--2811	7		CAPACITOR--FXD 10UF±20% 35VDC TA	28480	0180--2811
A52C11	0160--4834	6	1	CAPACITOR--FXD .047UF ±10% 100VDC CER	28480	0160--4834
A52C12	0160--4005	3	1	CAPACITOR--FXD 1UF ±20% 100VDC CER	28480	0160--4005
A52C13	0160--4804	0	1	CAPACITOR--FXD 56PF ±5% 100VDC CER 0±30	28480	0160--4804
A52C14	0180--0228	6		CAPACITOR--FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A52C15	0180--0228	6		CAPACITOR--FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A52C16	0160--4814	2	1	CAPACITOR--FXD 150PF ±5% 100VDC CER	28480	0160--4814
A52C17	0180--0116	1		CAPACITOR--FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C18	0180--0116	1		CAPACITOR--FXD 6.8UF±10% 35VDC TA	56289	150D685X9035B2
A52C19	0160--4832	4	1	CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A52CR4	1901--0033	2	9	DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR5	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR6	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR7	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR8	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR9	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR10	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR10	1901--0662	3	4	DIODE--PWR RECT 100V 6A	04713	MR751
A52CR11	1901--0662	3		DIODE--PWR RECT 100V 6A	04713	MR751
A52CR12	1901--0662	3		DIODE--PWR RECT 100V 6A	04713	MR751
A52CR13	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR14	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A52CR16	1901--0662	3		DIODE--PWR RECT 100V 6A	04713	MR751
A52DS1	1990--0487	7	3	LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4584
A52DS2	1990--0487	7		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4584
A52DS3	1990--0487	7		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4584
A52DS4	1990--0486	6	1	LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A52F1	2110--0618	3	1	FUSE 5A 125V NTD .25X.27	28480	2110--0618
A52F2	2110--0332	8	1	FUSE 3A 125V .25X.27	28480	2110--0332
A52F3	2110--0249	6	1	FUSE 12A 250V NTD 1.25X.25 UL	28480	2110--0249
A52MP1	86701--20036	8	1	MTG BLOCK DIODE	28480	86701--20036
A52MP2	0520--0129	8	1	SCREW--MACH 2--56 .312--IN--LG PAN--HD--POZI	00000	ORDER BY DESCRIPTION
A52MP3	2190--0014	1	1	WASHER--LK INTL T NO. 2 .089--IN--ID	28480	2190--0014
A52MP4	2950--0014	3	1	NUT--HEX--DBL--CHAM 1/4--28--THD .219--IN	THK	00000 ORDER BY DESCRIPTION
A52MP5	5040--6847	6	1	EXTRACTOR, RED	28480	5040--6847
A52MP6	1200--2313	9	1		28480	1200--2313
A52MP6	5000--9043	6	1	PIN:P.C. BOARD EXTRACTOR	28480	5000--9043
A52MP7	2110--0643	4	1	FUSEHOLDER--CLIP TYPE 15A 250 V	28480	2110--0643
A52MP8	1200--0173	5	1	INSULATOR--XSTR DAP--GL	28480	1200--0173
A52MP10	8150--0014	3	1	WIRE 22AWG BL 300V PVC 7X30 105C	28480	8150--0014
A52MP12	2190--0027	6	1	WASHER--LK INTL T 1/4 IN .256--IN--ID	28480	2190--0027
A52Q1	1884--0018	5	2	THYRISTOR--SCR 2N4186 VRRM=200	04713	2N4186
A52Q2	1884--0018	5		THYRISTOR--SCR 2N4186 VRRM=200	04713	2N4186
A52Q3	1854--0477	7	4	TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A52Q4	1854--0477	7		TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A52Q5	1853--0213	7	1	TRANSISTOR PNP 2N4236 SI TO--5 PD=1W	04713	2N4236
A52Q6	1854--0404	0	3	TRANSISTOR NPN SI TO--18 PD=360MW	28480	1854--0404
A52Q7	1854--0404	0		TRANSISTOR NPN SI TO--18 PD=360MW	28480	1854--0404
A52Q8	1854--0404	0		TRANSISTOR NPN SI TO--18 PD=360MW	28480	1854--0404
A52Q9	1854--0477	7		TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A52Q10	1854--0441	5	1	TRANSISTOR NPN SI PD=5.8W FT=800KHZ	28480	1854--0441
A52Q11	1884--0046	9	1	THYRISTOR--SCR VRRM=50	03508	C230F
A52Q12	1854--0637	1	1	TRANSISTOR NPN 2N2219A SI TO--5 PD=800MW	01295	2N2219A
A52Q13	1853--0281	9	1	TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A52Q14	1853--0314	9	1	TRANSISTOR PNP 2N2905A SI TO--39 PD=600MW	04713	2N2905A
A52Q15	1854--0477	7		TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A52Q16	1853--0034	0	1	TRANSISTOR PNP SI TO--18 PD=360MW	28480	1853--0034
A52R1	0812--0021	8	1	RESISTOR .47 5% 3W PW TC=0±90	91637	CW2B1--3--T2--47/100--J
A52R2	0811--4507	1	1		28480	0811--4507
A52R3	0811--4506	0	3		28480	0811--4506
A52R4	0811--4506	0			28480	0811--4506
A52R5	0811--4506	0			28480	0811--4506

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A52R6	0757--0401	0	7	RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A52R7	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A52R8	0757--0416	7	3	RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A52R9	0757--0442	9	7	RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A52R10	0757--0394	0	1	RESISTOR 51.1 1% .125W F TC=0±100	24546	C4--1/8--T0--51R1--F
A52R11	0698--3150	6	1	RESISTOR 2.37K 1% .125W F TC=0±100	24546	C4--1/8--T0--2371--F
A52R12	0698--3442	9	2	RESISTOR 237 1% .125W F TC=0±100	24546	C4--1/8--T0--237R--F
A52R13	0757--0438	3	5	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A52R14	0757--0428	1	1	RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4--1/8--T0--1621--F
A52R15	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A52R16	0757--0280	3	5	RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A52R17	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A52R18	0698--8817	2	3	RESISTOR 2.61 1% .125W F TC=0±100	28480	0698--8817
A52R19	0757--0346	2	3	RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A52R20	0698--3444	1	3	RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A52R21	0698--3447	4	1	RESISTOR 422 1% .125W F TC=0±100	24546	C4--1/8--T0--422R--F
A52R22	0757--0440	7	2	RESISTOR 7.5K 1% .125W F TC=0±100	24546	C4--1/8--T0--7501--F
A52R23	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A52R24	0698--3407	6	2	RESISTOR 1.96K 1% .5W F TC=0±100	28480	0698--3407
A52R25	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A52R26	0698--3407	6		RESISTOR 1.96K 1% .5W F TC=0±100	28480	0698--3407
A52R27	0698--3449	6	1	RESISTOR 28.7K 1% .125W F TC=0±100	24546	C4--1/8--T0--2872--F
A52R28	0757--0461	2	1	RESISTOR 68.1K 1% .125W F TC=0±100	24546	C4--1/8--T0--6812--F
A52R29	0698--3154	0	1	RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4--1/8--T0--4221--F
A52R30	0698--3442	9		RESISTOR 237 1% .125W F TC=0±100	24546	C4--1/8--T0--237R--F
A52R31	0698--8817	2		RESISTOR 2.61 1% .125W F TC=0±100	28480	0698--8817
A52R32	0698--3444	1		RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A52R33	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A52R34	0698--3445	2	1	RESISTOR 348 1% .125W F TC=0±100	24546	C4--1/8--T0--348R--F
A52R35	0757--0440	7		RESISTOR 7.5K 1% .125W F TC=0±100	24546	C4--1/8--T0--7501--F
A52R36	0698--0085	0	1	RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4--1/8--T0--2611--F
A52R37	0757--0290	5	1	RESISTOR 6.19K 1% .125W F TC=0±100	19701	MF4C1/8--T0--6191--F
A52R38	0698--3155	1	1	RESISTOR 4.64K 1% .125W F TC=0±100	24546	C4--1/8--T0--4641--F
A52R39	0757--0279	0	4	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A52R40	0698--6348	0	1	RESISTOR 3K .1% .125W F TC=0±25	28480	0698--6348
A52R41	0698--0084	9	5	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A52R42	0698--0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A52R43	0698--0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A52R44	0698--0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A52R45	0698--8827	4	5	RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A52R46	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A52R47	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A52R48	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A52R49	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A52R50	0698--0083	8	1	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4--1/8--T0--1961--F
A52R51	0757--0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A52R52	0757--0416	7		RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A52R53	0757--0465	6	1	RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A52R54	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A52R55	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A52R56	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A52R57	0698--0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A52R58	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A52R59	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A52R60	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A52R61	0757--0420	3	1	RESISTOR 750 1% .125W F TC=0±100	24546	C4--1/8--T0--751--F
A52R62	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A52R63	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A52R64	0757--0159	5	1	RESISTOR 1K 1% .5W F TC=0±100	28480	0757--0159
A52R65	0698--8466	7	1	RESISTOR 942 .5% .125W F TC=0±50	28480	0698--8466
A52R66	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A52R67	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A52R68	0698--8464	5	1	RESISTOR 12.6K .5% .125W F TC=0±50	28480	0698--8464
A52R69	0698--8817	2		RESISTOR 2.61 1% .125W F TC=0±100	28480	0698--8817
A52R70	0698--3444	1		RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A52R71	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A52R72	0698--3443	0	1	RESISTOR 287 1% .125W F TC=0±100	24546	C4--1/8--T0--287R--F
A52R73	0698--0090	7	1	RESISTOR 464 1% .5W F TC=0±100	28480	0698--0090
A52R74	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A52R75	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A52R76	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A52R77	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A52R78	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A52R79	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A52R80	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A52R81	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A52TP1	0360--0535	0	7	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP2	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP3	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP4	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP5	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP6	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52TP7	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A52U1	1820--0223	0	2	IC OP AMP GP TO--99 PKG	3L585	CA301AT
A52U2	1826--0742	0	1		28480	1826--0742
A52U3	1820--0223	0		IC OP AMP GP TO--99 PKG	3L585	CA301AT
A52U4	1826--0138	8	2	IC COMPARATOR GP QUAD 14--DIP--P PKG	01295	LM339N
A52U5	1820--1531	5	1	IC FF CMOS D--TYPE POS--EDGE--TRIG DUAL	3L585	CD4013AF
A52U6	1826--0138	8		IC COMPARATOR GP QUAD 14--DIP--P PKG	01295	LM339N
A52VR1	1902--3252	5	1	DIODE--ZNR 22.6V 2% DO--35 PD=.4W	28480	1902--3252
A52VR2	1902--3193	3	2	DIODE--ZNR 13.3V 5% DO--35 PD=.4W	28480	1902--3193
A52VR3	1902--0049	2	2	DIODE--ZNR 6.19V 5% DO--35 PD=.4W	28480	1902--0049
A52VR4	1902--0041	4	1	DIODE--ZNR 5.11V 5% DO--35 PD=.4W	28480	1902--0041
A52VR5	1902--3160	4	1	DIODE--ZNR 10V 2% DO--35 PD=.4W TC=+.06%	28480	1902--3160
A52VR6	1902--3193	3		DIODE--ZNR 13.3V 5% DO--35 PD=.4W	28480	1902--3193
A52VR7	1902--0049	2		DIODE--ZNR 6.19V 5% DO--35 PD=.4W	28480	1902--0049

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

A52 POSITIVE REGULATOR CIRCUIT DESCRIPTION

Introduction

The A52 Positive Regulator contains circuitry for the +20V linear reference supply, the +12V digital supply, the +5.2V digital (and microcircuit) supply, voltage accuracy sensing circuitry for these supplies, and ON/STANDBY and SHUTDOWN functions. The +20V linear reference supply is a self-starting regulator having a precision reference to accurately set the output potential. With the exception of the independent +22V standby supply (described in the A35 theory of operation), all supplies are slaved to the +20V output. The +12V, +5.2V, -10V and -40V supplies are directly slaved while the -5.2V and -15V supplies are indirectly slaved (refer to Figure 7L-2 , 8340A Power Supply Logic Block Diagram).

These supplies fall into two basic categories; critical supplies (+20V, +5.2V, -10V, -40V) with a specified periodic and random deviation (PARD) less than 100 microvolts peak (used for low-noise analog or microcircuit power), and non-critical supplies (+12V, -5.2V, -15V) with a specified PARD less than 5mV peak (used for digital and non-critical analog power).

+10V/+4.9V REFERENCE A

Zener regulator VR5 creates a stable +10V reference (+10VR) for use in the +20V Regulator (Block B), Standby/Overtemperature Shutdown (Block E), and voltage sense circuitry on the A52 Positive Regulator Assembly. VR5 bias is supplied through R26 by +20V UNREG. The accuracy and stability of VR5 is not critical; however, a large error in the voltage across VR5 can cause problems with the power Up/Down circuitry. If +10VR is incorrect, check for excessive supply loading. Trouble is indicated if the value of +10V REF changes significantly as the LINE switch is cycled. The +4.9V reference (+4.9VR) isgenerated by divider network R39 and R40. This signal is used as a reference for the comparators in the Standby/Overtemp Shutdown (Block E) and Voltage Sense (Block L) circuits on the A52 Positive Regulator Assembly.

+20V Regulator B

The +20V regulator is the master regulator for the 8340A power supply system. Except for the +22V standby supply (which is ON continuously), all instrument supplies are either powered from the +20V regulator directly (eg. +12V regulator), or use it as a reference (see FIGURE 7L-2).

Q12, Q13, and Q14 comprise the startup current source for the +20V regulator. Q12 and R14, driven from the Internal +10V

Reference (Block A) form a 6mA (nominal) current sink. C19 damps out Q12 oscillations due to excessive line length. Q13 and Q14 are connected as a Wilson current mirror with local feedback (R6 and R7) to ensure current sharing. Output current from the collector of Q14 is 6mA.

In standby, the output of U4D pin 13 (Standby/Overtemp Shutdown) is LOW, and current from Q14 is shorted to ground. When the instrument is ON, both U4D pin 13 and U4C pin 14 are open (they have open collector outputs) and current from Q14 is delivered to the base of chassis mounted darlington pass transistor Q3, acting as an emitter follower. This causes the +20V output to begin increasing.

When +20V output exceeds +10V, precision +10.00V reference U2 goes into regulation, and U1 begins to function. TP3, aside from allowing a check of U2, provides a very accurate +10.00V reference for instrument troubleshooting.

The DC feedback loop (error correction circuit) receives the +20V output through voltage divider R13 and R15 and compares it to the output of U2 by U1. The error voltage generated on the output of U1 (pin 6) is fed through CR5, R11, R8 and CR4 to the base of emitter follower pass transistor A62Q3, completing the loop. Due to the placement of CR5, U1 cannot source current to A62Q3. U1 therefore, robs base current as +20V out exceeds 20 Volts, acting as negative feedback to regulate the output voltage.

R16 and C5 form a noise filter to clean up broadband noise on integrated reference voltage source U2. They also slow down the startup transient, acting as a soft-start circuit. C4 (in conjunction with R13), C3, R12 and C2, R10 and C1, R18 and C6, are loop frequency compensation components.

R1 and R2 form the current sense resistor for the foldback current limit circuit consisting of R8, CR4, R9, and Q8. As the current from A62Q3 (Darlington pass transistors) exceeds 2.4 Amps, the voltage at the emitter of Q8 decreases sufficiently to turn Q8 on. This allows current to flow through Q8, robbing base current from A62Q3, and thus reduces the current from A62Q3. R8, R9, and CR4 sets the voltage at which Q8 turns on.

Foldback current limit is used on all critical supplies for several reasons. First, a high current supply (such as the +5.2V supply capable of delivering 10 Amps) is easily capable of damaging a PC board if an ohmic short develops on the end of a long run of PC trace. 10 Amps through 20 mil PC traces will burn them right off the board. Foldback current limit reduces this output current capability of the supply as it's output voltage drops (as in driving a dead short). A second and equally

important consideration is power dissipation in the pass transistor for this critical supply. The purpose of the foldback circuit is to have power dissipation less with the supply shorted, than with the supply in normal operation. Table 7L-1 lists the maximum output current capability of each supply, and short circuit output current in foldback.

Table 7L-1. Power Supply Output Current Capability

SUPPLY	MAXIMUM OUT	SHORT CIRCUIT CURRENT
+20	2.4A	< .5 A
+12	1.8A	NO FOLDBACK (>2A)
+5	10 A	< 3 A
-5	1.8A	NO FOLDBACK (>2A)
-10	6.0A	< 3 A
-15	1.8A	NO FOLDBACK (>2A)
-40	1.7A	< .5 A

CR10 protects instrument loads from reverse polarity power in the event of a short between the +20V output and some negative polarity power supply.

+20V Crowbar/Power On Indicator C

VR1 and R20 monitor the +20V regulator output. When this voltage exceeds approximately 23V, the drop across R20 is large enough to gate crowbar SCR Q1 ON and short the supply output to ground. This circuit is useful for protecting instrument loads in many fault conditions. If the +20V crowbar circuit did not exist and pass transistor A62Q3 should short, for example, the +20V output voltage would increase to the level of +20V UNREG (approximately 35V); this would easily destroy most circuitry tied to the +20V supply bus.

Yellow LED DS2, mounted close to TP4, and current limit resistor R21 give a visual indication of the status of the +20V power supply. By observing this indicator along with the indicators for the other supplies, the status of all the instrument power supplies can be easily determined.

Reference Oscillator Supply D

When HSTD is asserted HIGH by the microprocessor, Q4 conducts, turning saturated series switch Q5 ON. This brings the +20V Reference Oscillator Supply output up to power ON the A51 10 MHz Reference Oscillator.

Standby/Overtemp Shutdown E

In STANDBY mode LSBY is pulled LOW by the front panel ON/STANDBY switch. This drives U4D pin 13 (the open collector output of quad comparator U4, Standby/Overtemp Shutdown Block E) LOW which in turn, through CR7, pulls the base of chassis mounted +20V pass transistor Q3 to ground. The +20V supply is shut down, along with all other supplies that are slaved to it. Also notice that CR13 pulls the CLK input to D-type flip flop U5 LOW (U5 is a positive edge triggered CMOS D-type flip flop).

When the ON/STANDBY switch is flipped to the ON position, LSBY rises to +22V, back biasing CR6. The voltage across C9 rises exponentially toward 5V. When it passes 4.9V, U4D pin 13 goes HIGH (open) and the base of chassis mounted Q3 is released. The +20V supply starts itself. CR13 now causes the CLK input to U5 to go HIGH (but not to exceed the 10V Vcc). This transition clocks a zero into the flip flop (due to the D input, which is tied low), resetting any overtemperature condition that may have occured. During initial power-up, C10 and R53 reset U5 to ensure that the instrument is always in operational status (with overtemp flag cleared) when initially energized.

The main heat sink temperature sensor is a normally open bi-metallic switch that closes when the heat sink reaches 100 degrees C. The sensor is tied from LHSOT to ground, so that a switch closure pulls LHSOT LOW and forces U4B pin 1 HIGH, which in turn sets flip flop U5. Q output goes HIGH, forcing U4A pin 2 HIGH and turning ON red overtemp indicator LED DS4. Q NOT output goes LOW forcing U4C pin 14 LOW which in turn pulls the base of chassis mounted Q3 to ground, shutting the instrument power supplies down. U5 has now latched this overtemp condition, and subsequent removal of LHSOT (as when the heat sink cools back down) does not cause the instrument to restart. The only way to clear this overtemp condition is to turn the ON/STANDBY switch to STANDBY, and then back to ON.

This overtemp protocol was specifically chosen for several reasons. First of all, a fault condition that allows the main heat sink to reach 100 degrees C indicates that something is drastically wrong (e.g. the fan has stopped, etc.). The possibility of a fire is not out of the question. Therefore, it was decided that once the overtemp condition is detected and the instrument has shut down, it should take a specific operator intervention before the instrument will restart. This should call attention to a possibly hazardous situation. Because the over temperature detector latches when overtemp is detected, the 8340A will not cycle ON and OFF repetedly if there is a condition that causes overheating. This eliminates cycling at excessively high temperatures which could affect the reliability of the

instrument.

Grounds and Commons F

Ground distribution is very critical on this board to achieve the PARD specification for the +20V and +5.2V regulators. Right at the edge connector finger power ground (plain ground), sense ground (ground 1), and +20V ground (ground 2) are separated. This is to isolate power ground currents from sensitive circuitry in the regulators.

+5.2V Regulator G

+20V provides the reference voltage, and powers the loop error correction amplifier U3. R67 and R68 drop +20 Volts to 4.01 Volts. C14 is a noise filter, and also acts as a soft-start element (it slows down the power supply turn-on transient). +5.2V out is sensed remotely on the A62 Main Motherboard at the main 5V power distribution point. +5.2V SENSE(+) comes back onto the board, into voltage divider R65, R66, and is compared to the generated 4V reference by error amp U3. The error voltage is fed to emitter follower Q7, then to darlington driver Q10, and then to the chassis mounted pass transistor, Q4. The +5.2V SENSE(-) comes from the central ground distribution point (STAR ground) on the A62 Main Motherboard to provide ground reference.

Loop frequency compensation uses the feedforward technique, with C13 (in parallel with R65) and C16, R63, R64 and C12. R69 and C15 lower output impedance and provide a minimum load capacitance. Foldback current limit operates in essentially the same manner as in the +20V supply. The current sense resistor is the parallel combination of R3, R4, and R5. Foldback is accomplished with pre-bias from R61 and R62, and Q6 is the active element.

+5.2V Crowbar/Protection H

When +5.2V OUT exceeds approximately 6.2V, VR3 conducts, providing gate current for crowbar SCR Q11. It latches ON and shorts the +5.2V output to ground, protecting load circuits from the overvoltage condition. CR12 protects against reverse polarity applied to the load due to some instrument fault, and yellow LED, DS1 provides a visual indication of the operational status of the supply.

Microprocessor Protection I

VR4 senses the -5.2V supply, and anytime its level is more positive than -4.5V, Q3 is turned ON. This shorts the adjustment terminal of A62U1 (the +12V regulator in +12V Regulator Block E) to ground, pulling +12V output down to +1.3V. This circuit

prevents the microprocessor from being damaged by excessive power dissipation. For this reason, after work has been done on either the +12V or -5.2V Regulators, it is critical that the operation of this circuit be checked prior to turning the instrument ON with the microprocessor board in the instrument.

+12V Regulator J

A62U1 is an adjustable three-terminal regulator. Output voltage is adjusted by the selection of the feedback resistors R29, R30 and A62R14. R30 and A62R14 are fixed values whle R29 is a factory select. Through proper selection of R29, compensation for variations in regulator characteristics is obtained. The nominal value of R29 is 4.22K and is appropriate for most of the regulators. However, it may be necessary to substitute an alternate value. Increasing R29 increases the +12V output. A62R14 is mounted on the A62 Main Motherboard in parallel to R29 to ensure that the regulator has a ground reference path before it's feedback is connected (as in inserting the A52 Positive Regulator Assembly with the power ON).

Input capacitor A62C7 is required for stability of the regulator. A62C6 is a noise filter and increases the ripple rejection of the regulator and lowers it's output impedance. A26CR3 is required to protect the regulator from damage due to charge stored on C6 in the event of a short from the +12V output to ground. CR11 protects the +12V power supply's loads from reverse polarity power inn the event of a short between +12V and some negatine power supply. R31 and C17 reduce the output impedance of the supply, and provide a minimum capacitive load to guarantee stability regardless of load configuration.

+12V Crowbar/Power On Indicator K

When +12V OUT exceeds approximately 13.5 Volts, VR2 conducts, providing gate current for crowbar SCR Q2, latching it ON and shorting the supply output to ground. This protects load circuits from damage due to the overvoltage condition. Yellow LED, DS3 gives a visual indication of the status of the +12V power supply. It will begin to light when the output of A62U1 is approximately +7.6V.

Voltage Sense L

U6A, U6D, and U6B sense the level of the +5.2V, +12V and +20V power supplies. When one of these supplies goes out of regulation it's comparator output goes LOW, shorting delay capacitor C8 to ground. This forces HPUP LOW and asserts LIPS LOW. CR9, CR14 and CR15 are provided to easily isolate which supply caused the low voltage indication.

The cathode of CR8, High Negative Up (HNUP) goes to the A53 Negative Regulator and A56 -15V Supply boards. This line is pulled LOW in the event any of these supplies go out of regulation.

When all supplies come into regulation, C8 is released and it's voltage increases as it is charged by R49. After some 300mS it's level passes VREF at 4.9 volts and U6C pin 14 goes LOW. This asserts HPUP HIGH via Q16 and sets LIPS HIGH via Q15. These signals are used by the processor (and several other circuits) to control instrument activity and to ensure proper initialization.

A52 POSITIVE REGULATOR, TROUBLESHOOTING

If all supplies appear to be down, the first priority is to troubleshoot the +20V Regulator (Block B). If this supply is down the rest of the instrument will be shut down. Look at +20V OUT. If it is in crowbar (approxximately 0.8V to 1.0V), checck error amp U1 and follow the feedback path to see where it is broken; also check the crowbar circuit itself. If +20V OUT is at ground, (e.g. less than .3V), the problem is probably not that the supply has been crowbarred. The startup current source should be checked next. Find out if Q14 collector is sourcing any current, and where it is going. Check for internal +10V reference. (measure across VR5 in the +10V/+4.9V Reference, Block A) to see that this supply is up. Also check VREF at the junction of R39 and R40 in the +10V/+4.9V Reference (Block A), and at U4 in the Standby/Overtemp Shutdown (Block E).

Check for a shorted Q8 (current limit device in +20V Regulator, Block B). If the collector of Q14 is held LOW by U4C pin 14, the level will be lower than if U4D pin 13 is holding it LOW (this tells you whether the instrument thinks it's in STANDBY or OVERTEMP shutdown mode). If it is shutdown by U4D pin 13, something is wrong with it or R58, R59, C9, or LSBY. If it's shutdown by U4C pin 14, trace the signal back to find where the problem lies.

If the value of +20V OUT is incorrect, check the +10.00V precision reference (U2), and the values of divider resistors R13, R15, and the leakage currents of tantalum capacitors C4 and C5. If the supply has excessive temperature drift in VOUT, again check leakage currents in C4 and C5 (I1 = K * C * E where C is capacitance, E is rated working voltage, and K is .01 at 25 degrees C and .2 at 85 degrees C. For C4, I1$\leq$3.3 microamps at 25 degrees C and 66 microamps at 85 degrees C. For C5, I1$\leq$3 microamps at 25 degrees C and 60 microamps at 85 degrees C). If leakage is excessive, one or both parts must be replaced. Leakage in C4 and C5 is the primary limit on the temperature stability of

+20V OUT.

If the +12V regulator is down, remember that this supply comes up only when the +5.2V and -5.2V supplies are both operating properly. If the A53 Negative Regulator board is not installed, nothing will get the +12V supply up. The best way to tell which circuit caused the shutdown is to measure the base of Q3 in the Microprocessor Protection circuit (Block I). If it is turned ON (.6V or greater), then VR4 is open or the -5.2V supply is down. If it is OFF, then U6B pin 1 in Voltage Sense (Block L) has caused the problem. Trace backwards to find out why.

If the +20V switched supply doesn't come up (or won't shut down), check driver Q4 and pass element Q5 in Reference Oscillator Supply (Block D). Ensure that HSTD is getting to the board properly.

The +5.2V supply exhibits many problems in common with the +20V supply. If VOUT is slightly off value or excessively temperature sensitive, look at leakage current in C14 ((3.3 microamps at 25 degrees C and 66 microamps at 85 degrees C), and the values of R65 thru R68. If the supply is down, check the power supply to U3 in +5.2V Regulator (Block G). Check it's operation, look at Q7 and Q10, and check for shorted Q6. If the supply is in crowbar, follow the feedback loop around and look for opens, or check Q11 and VR3 for shorts.

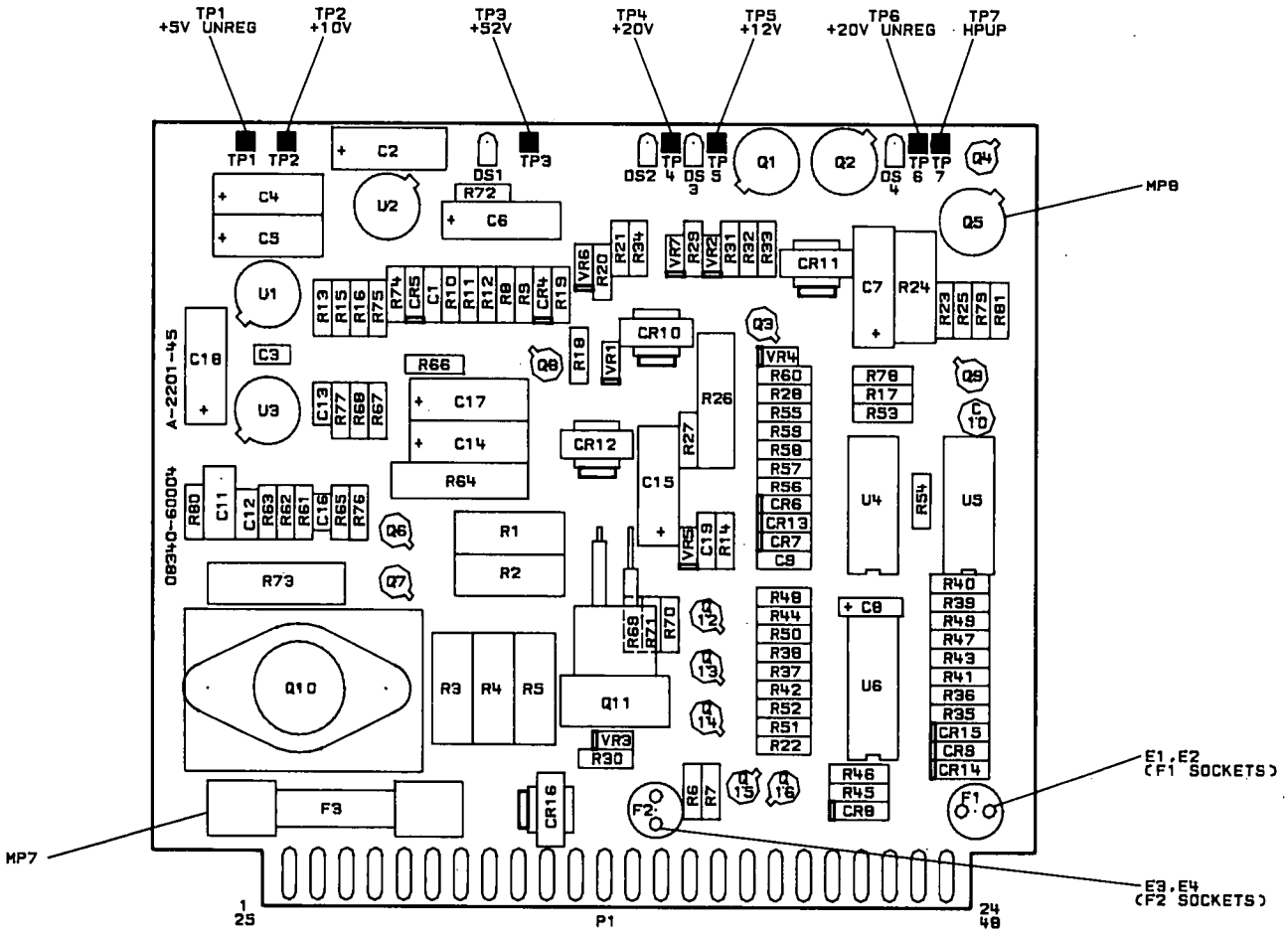


Figure 7L-1. A52 Positive Regulator, Component Location Diagram

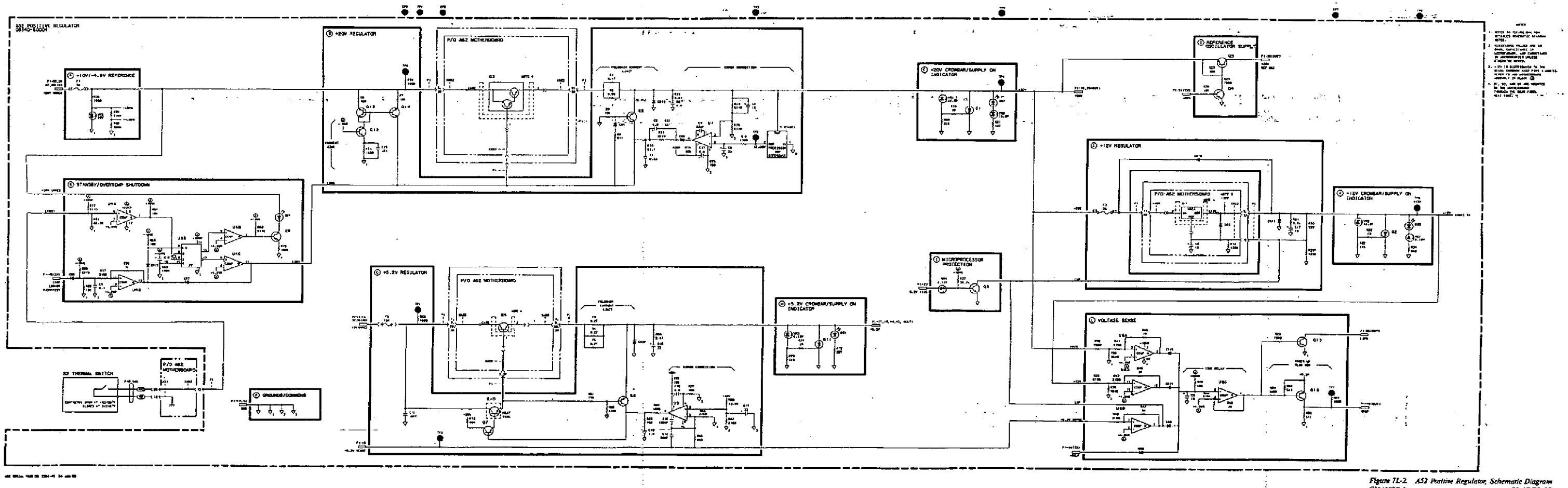


Figure 7L-2. A52 Positive Regulator, Schematic Diagram
CHANGE L 7L-17/7L-18

CHANGE K

Change K applies directly to the A16A1 Band 1-4 Modulator /Splitter assembly, HP Part Number 5061-1058. The existing manual may be changed to apply directly to the 5061-1058 by performing the following manual changes.

Page 1-6, Table 1-1:
Change the ON/OFF RATIO specification to read:
400 MHz to < 2.3 GHz, > 80dB.
2.3 GHz to 3.2 GHz, > 65 dB.
> 3.2 GHz to 26.5 GHz, > 80 dB.

Page 6-25/26, Table 6-3:

Change the A16A1 assembly to HP and Mfr. Part Number 5061-1058, CD5.
Change the A16A1J2 connector HP and Mfr. Part Number to 1250-0543, CD8.

NOTE

The recommended replacement for HP Part Number 1250-0543 is 1250-1849 CD9. This new connector contains a 120pF capacitor that improves the ON/OFF Ratio to >80dB from 2.3 GHz to 3.2 GHz.

REPLACEMENT PAGE

CHANGE J

Change J applies directly to the A51 10 MHz Reference Oscillator assembly (HP Part Number 08340-60064) and A62 Motherboard assembly (HP Part Number 08340-60001). The existing manual may be changed to apply directly to these assemblies by performing the following manual changes.

Page 6-103, Table 6-3:

Change the A51 assembly HP and Mfr. Part Number to 08340-60064, CD5.
Delete the entries for HP Part Numbers 1251-4223 and 1251-6594.
Add the following entries:
1251-4293, CD5, QTY 2, GUIDE PIN-MICRO CONN, 28480, 1251-4293.
1251-4294, CD6, QTY 5, CONTACT-CONN U/W-MICRO MALE CRP, 28480, 1251-4294.
1251-4296, CD8, QTY 1, STRAIN RELIEF-MICRO 8 CONT CONN, 28480, 1251-4296.
1251-4298, CD0, QTY 1, CONNECTOR 8-PIN H MICRO SERIES, 28480, 1251-4298.

Page 6-131, Table 6-3:
Change the A62 Motherboard assembly HP and Mfr. Part Number to 08340-60001, CD0.
Change the A62J31 HP and Mfr. Part Number to 1251-7355, CD6.

Page 6-136, Table 6-3:
Under MISCELLANEOUS ELECTRICAL PARTS, change the W46 entry HP and Mfr. Part Number to 08340-60098, CD5.

Page 8-153, Figure 8B-16:
Change the part number of the A51 10 MHz Reference Oscillator to 08340-60064.

Page 8-399, Figure 8E-2:
Change the orientation of J18 by 90 degrees.

Pages 8-401 through 8-413, Table 8E-1:
Refer to the attached Motherboard Wiring List for backdated information.

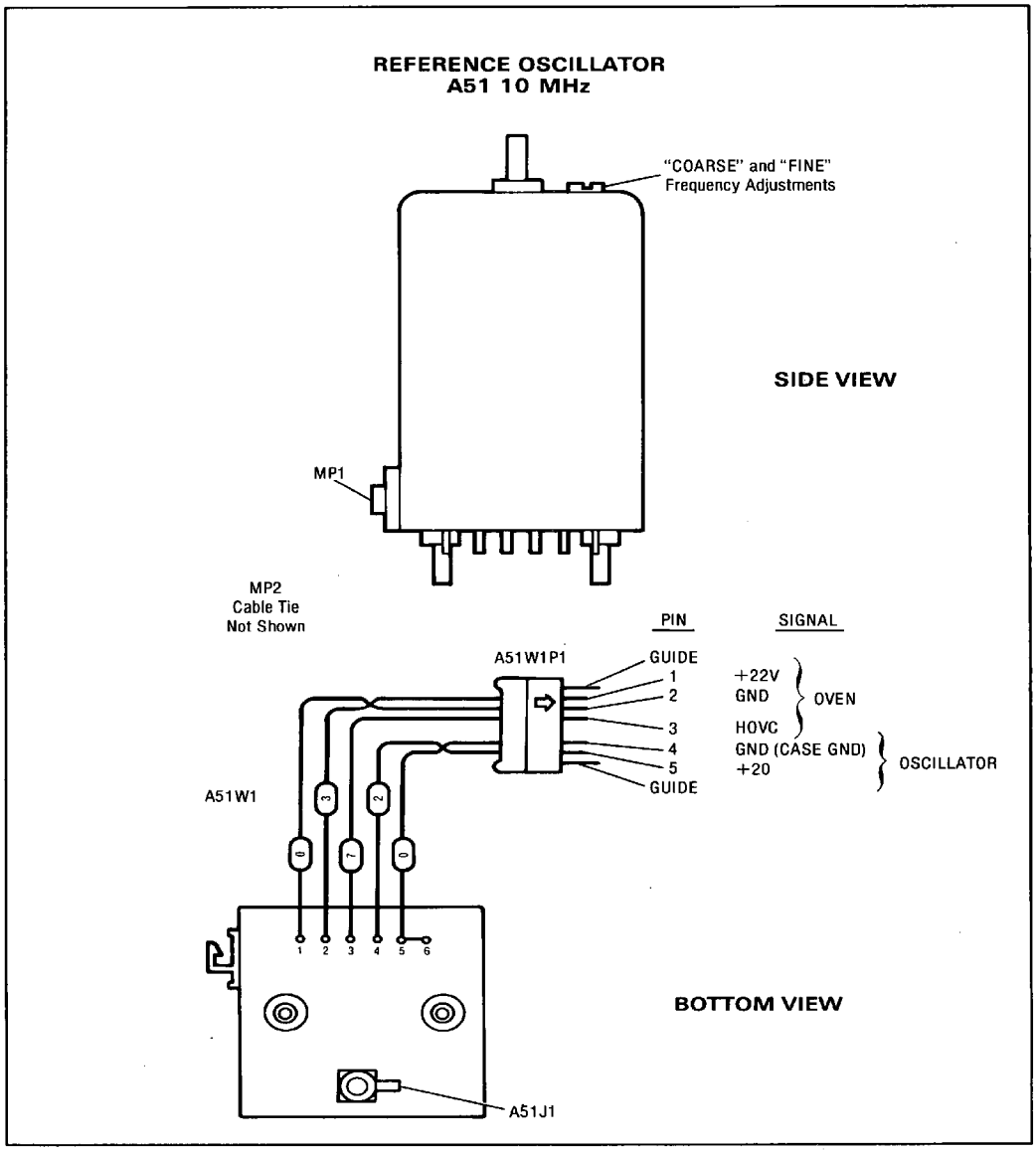


Figure 8B-16. A51 10 MHz Reference Oscillator, Component Location Diagram

CHANGE J

Table 8E-1. Motherboard Wiring List (1 of 7)

MNEMONIC	DESCRIPTION	TYPE	LEVELS	SOURCE	REF M/N LOOP XR4P1	REF M/N LOOP XR4P2	28/38 LOOP XR5P1	28/38 LOOP XR27P1	28/38 LOOP XR6P1	28/38 LOOP XR5B1P1	28/38 LOOP XR4A1P1	28/38 LOOP XR4J1P1	28/38 LOOP XR4J2P1	28/38 LOOP XR4J3P1	SWEEP GENERATOR Y/O LOOP XR54P1	SWEEP GENERATOR Y/O LOOP XR55P1	SWEEP GENERATOR Y/O LOOP XR56P1	CONTROLLER XR57P1	CONTROLLER XR58P1	CONTROLLER XR60P1	CONTROLLER XR61P1	RF SECTION XR21P1	RF SECTION XR22P1 NOTE B	RF SECTION XR23P1 NOTE B	RF SECTION XR24P1	RF SECTION XR25P1	RF SECTION XR26P1	RF SECTION XR27P1	RF SECTION XR28P1	POWER SUPPLIES XR13P1	POWER SUPPLIES XR53P1	POWER SUPPLIES XR52P1	POWER SUPPLIES XR53P1	POWER SUPPLIES XR56P1	MISCELLANEOUS A62 MOTHERBOARD CONNECTORS	T1 WIRE COLORS	A62 MOTHERBOARD CORX CONNECTORS J4-J6,J8-J17,J21-J27	A62 MOTHERBOARD COMPONENTS	GROUNDS AND GROUND PLANES	MNEMONICS
ADR0 — ADR4	INSTRUMENT I/O ADDRESS BUS BIT 0 INSTRUMENT I/O ADDRESS BUS BIT 1 INSTRUMENT I/O ADDRESS BUS BIT 2 INSTRUMENT I/O ADDRESS BUS BIT 3 INSTRUMENT I/O ADDRESS BUS BIT 4	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL TTL TTL TTL TTL	XA60P1-17 XA60P1-73 XA60P1-18 XA60P1-74 XA60P1-19														17 73 18 74 19	17 73 18 74 19	17 73 18 74 19																A62J1 PIN 23 A62J1 PIN 24 A62J1 PIN 25 A62J1 PIN 26 A62J1 PIN 27					ADR0 ADR1 ADR2 ADR3 ADR4
AM IN AM RTN	AMPLITUDE MODULATION INPUT AMPLITUDE MODULATION GROUND RETURN	ANALOG GROUND	±1V MAX. 0V	A67J15 CENTER A67J15 SHIELD. NOTE 10															8														A62J18 - SMC CENTER A62J19 - SMC SHIELD AND GUARD TRACE AROUND AM IN					AM IN AM RTN
ATN ATNAT1 ATNAT2 ATNAT3 ATNAT4	IEEE 488 ATTENTION (ATN) ATTENUATOR ATTENUATION CARD 1 ATTENUATOR ATTENUATION CARD 2 ATTENUATOR ATTENUATION CARD 3 ATTENUATOR ATTENUATION CARD 4	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL OPEN COLLECTOR OPEN COLLECTOR OPEN COLLECTOR OPEN COLLECTOR	XA60P1-8 XA24P1-30 XA24P1-29 XA24P1-28 XA24P1-27																					30 29 28 27										A67J20 PIN 9 A67J20 PIN 5 A67J20 PIN 10					ATN ATNAT1 ATNAT2 ATNAT3 ATNAT4
ATN COIL+	ATTENUATOR SOLENOID COILS SUPPLY	POWER SUPPLY	+5V	XA24P1-7																					7								A67J20 PIN 8					ATN COIL+
ATNTH1 ATNTH2 ATNTH3 ATNTH4	ATTENUATOR THROUGH CARD 1 ATTENUATOR THROUGH CARD 2 ATTENUATOR THROUGH CARD 3 ATTENUATOR THROUGH CARD 4	DIGITAL DIGITAL DIGITAL DIGITAL	OPEN COLLECTOR OPEN COLLECTOR OPEN COLLECTOR OPEN COLLECTOR	XA24P1-12 XA24P1-11 XA24P1-10 XA24P1-9																					12 11 10 9									A67J20 PIN 13 A67J20 PIN 12 A67J20 PIN 11 A67J20 PIN 4					ATNTH1 ATNTH2 ATNTH3 ATNTH4
BVSWP DAV	BUFFERED 0-10V SWEEP RAMP IEEE 488 DATA VALID (DAV)	ANALOG DIGITAL	10V/SWEEP TTL	XA59P1-40 XA59P1-8													40			9								31						A67J7 PIN 11					BVSWP DAV
DI00 DI01 DI02 DI03 DI04 DI05 DI06 DI07 DI08	INSTRUMENT I/O DATA BUS BIT 0 INSTRUMENT I/O DATA BUS BIT 1 INSTRUMENT I/O DATA BUS BIT 2 INSTRUMENT I/O DATA BUS BIT 3 INSTRUMENT I/O DATA BUS BIT 4 INSTRUMENT I/O DATA BUS BIT 5 INSTRUMENT I/O DATA BUS BIT 6 INSTRUMENT I/O DATA BUS BIT 7 INSTRUMENT I/O DATA BUS BIT 8	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL TTL TTL TTL TTL TTL TTL TTL TTL	XA60P1-20. NOTE 9 XA60P1-76. NOTE 9 XA60P1-21. NOTE 9 XA60P1-77. NOTE 9 XA60P1-22. NOTE 9 XA60P1-78. NOTE 9 XA60P1-23. NOTE 9 XA60P1-79. NOTE 9 XA60P1-24. NOTE 9	THRU R7 TO PIN 2	9	1 19 2 20 3 21 4 22			21 3 22 4 23 5 24 6 25	21 3 22 4 23 5 24 6 25	10 29 11 30 12 31 13 32		20 76 21 77 22 78 23 79 24	20 76 21 77 22 78 23 79 24	20 76 21 77 22 78 23 79 24	20 76 21 77 22 78 23 79 24					8 27 10 28 11 29 12 30 13				15 37 16 38 17 39 18 40	22 53 23 54 24 55 25 56 26	11 34 12 35 13 36 14 57 15					A62J1 PIN 1 A62J1 PIN 3 A62J1 PIN 4 A62J1 PIN 5 A62J1 PIN 6 A62J1 PIN 7 A62J1 PIN 8 A62J1 PIN 9 A62J1 PIN 10 A62J1 PIN 11 A62J1 PIN 12					DI00 DI01 DI02 DI03 DI04 DI05 DI06 DI07 DI08
DB0 DB9	INSTRUMENT I/O DATA BUS BIT 0 INSTRUMENT I/O DATA BUS BIT 9	DIGITAL DIGITAL	TTL TTL	XA60P1-76: NOTE 9 XA60P1-25: NOTE 9	THRU R8 TO PIN 17 THRU R9 TO PIN 3	23 7				7 28	7 28	14 33		80 25	80 25	80 25	80 25					14 32	15			35	27 58	16					A62J1 PIN 13 A62J1 PIN 14					DB1 DB9
DB10 DB11	INSTRUMENT I/O DATA BUS BIT 10 INSTRUMENT I/O DATA BUS BIT 11	DIGITAL DIGITAL	TTL TTL	XA60P1-81: NOTE 9 XA60P1-81: NOTE 9	THRU R10 TO PIN 18	25				8	8	15		81 34	81 26	81 27	81 83					18 34										A62J1 PIN 15 A62J1 PIN 16 A62J1 PIN 17 A62J1 PIN 18					DB10 DB11
DB12 DB13 DB14 DB15	INSTRUMENT I/O DATA BUS BIT 12 INSTRUMENT I/O DATA BUS BIT 13 INSTRUMENT I/O DATA BUS BIT 14 INSTRUMENT I/O DATA BUS BIT 15	DIGITAL DIGITAL DIGITAL DIGITAL	TTL TTL TTL TTL	XA60P1-26: NOTE 9 XA60P1-82: NOTE 9 XA60P1-27: NOTE 9 XA60P1-83: NOTE 9								34 18 35 17		28 82 27 83	28 82 27 83	28 82 27 83	28 82 27 83															A62J1 PIN 19 A62J1 PIN 20 A62J1 PIN 21 A62J1 PIN 22					DB12 DB13 DB14 DB15
DETLVL DETOUT DET S/H+ DET S/H—	DETECTED LEVEL INPUT TO A.D.C. DETECTED LEVEL INPUT TO LINEAR MOD BOARD DETECTOR SAMPLE/HOLD CONTROL DETECTOR SAMPLE/HOLD CONTROL	ANALOG ANALOG DIGITAL DIGITAL	—0.2V/4B, 0V=0dB —0.2V/4B, 0V=0dB +4.5V/—3.5V +3.5V/+4.5V	XA25P1-33 XA25P1-32 XA21P1-3 XA21P1-21						19	27										3 21				33 32 2 24	10		29						A62J27 PIN 1 A62J27 PIN 3 A62J27 PIN 5 A62J27 PIN 7 A62J27 PIN 2 A62J27 PIN 4 A62J27 PIN 6 A62J27 PIN 8					DETLVL DETOUT DET S/H+ DET S/H—
DIV N2	500 KHZ DIVIDED OUTPUT FROM PLL2 DIVIDER	DIGITAL	TTL (LOW TRUE)	XA42P1-27																																		DIV N2
DI01 DI02 DI03 DI04 DI05 DI06 DI07 DI08	IEEE 488 I/O DATA BUS BIT 1 IEEE 488 I/O DATA BUS BIT 2 IEEE 488 I/O DATA BUS BIT 3 IEEE 488 I/O DATA BUS BIT 4 IEEE 488 I/O DATA BUS BIT 5 IEEE 488 I/O DATA BUS BIT 6 IEEE 488 I/O DATA BUS BIT 7 IEEE 488 I/O DATA BUS BIT 8	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL TTL TTL TTL TTL TTL TTL TTL	XA59P1-57 XA59P1-58 XA59P1-59 XA59P1-60 XA59P1-61 XA59P1-62 XA59P1-63 XA59P1-64														57 58 59 60 61 62 63 64																				DI01 DI02 DI03 DI04 DI05 DI06 DI07 DI08
EOI EXDET EXDETR	IEEE 488 END OR IDENTIFY (EOI) EXTERNAL DETECTOR INPUT EXTERNAL DETECTOR INPUT GROUND RETURN	DIGITAL ANALOG GROUND	TTL 0.5MV—2V 0V	XA59P1-7 A62J18 CENTER A62J18 SHIELD. NOTE 10														7							44 43								A62J18 - SMC CENTER A62J19 - SMC SHIELD AND GUARD TRACE AROUND EXDET					EOI EXDET EXDETR

CHANGE J

Refer to Table 8E-1. Motherboard Wiring List (7 of 7) for NOTES

MNEMONIC	DESCRIPTION	TYPE	LEVELS	SOURCE	REF M/N LOOP		20/30 LOOP								SWEEP GENERATOR Y/O LOOP			CONTROLLER				RF SECTION								POWER SUPPLIES					MISCELLANEOUS A62 MOTHERBOARD CONNECTORS	T1 WIRE COLORS	A62 MOTHERBOARD COAX CONNECTORS J4-J6, J8-J17, J21-J27	A62 MOTHERBOARD COMPONENTS	GROUNDS AND GROUND PLANES	MNEMONICS
					XR34P1	XR34P2	XR35P1	XR37P1	XR38P1	XR39P1	XR40P1	XR41P1	XR42P1	XR43P1	XR54P1	XR55P1	XR88P1	XR57P1	XR59P1	XR60P1	XR61P1	XR21P1	XR22P1 NOTE 8	XR23P1 NOTE 8	XR24P1	XR25P1	XR26P1	XR27P1	XR28P1	XR19P1	XR35P1	XR52P1	XR53P1	XR56P1						
EXT TRIG	EXTERNAL TRIGGER INPUT	TTL/ANALOG	EXT SOURCE LVL	A62J31-4, 18														108																	A62J31 PINS 4, 18					EXT TRIG
FAN1	SWITCHED FAN POWER	AC LINE	110 VAC	A62K1-7																															A62J30 PIN 3			A62K1 PIN 7		FAN1
FAN2	SWITCHED FAN POWER	AC LINE	110 VAC	A62K1-10																															A62J30 PIN 1			A62K1 PIN 10		FAN2
FAN3	PRIMARY FAN POWER	AC LINE	110 VAC	A62 SQ PIN P2																																		A62K1 PIN 5; A62P2		FAN3
FAN4	PRIMARY FAN POWER	AC LINE	110 VAC	A62 SQ PIN P1																																		A62K1 PIN 14; A62P1		FAN4
FPNLSWP	FRONT PANEL SWEEP RAMP	ANALOG	10V/SWEEP	XA57P1-43														43																			A62J9 - SMC CENTER			FPNLSWP
FPNLSWP RTN	FRONT PANEL SWEEP RAMP GROUND RETURN	GROUND	0V	XA57P1-99														99																			A62J9 - SMC SHIELD AND GUARD TRACE AROUND FPNLSWP			FPNLSWP RTN
GND	ANALOG GROUND	GROUND	0V	A62 STAR GND		10, 11	1, 5 - 8, 10, 11, 14, 16, 19 - 22, 26, 29	8, 9, 10, 13 - 17, 24, 27 - 35	1 - 11, 14 - 28, 29, 30	2 - 11, 13, 14, 17 - 26, 28, 29	2 - 8, 10, 14, 17, 21, 25, 29	1, 3, 5, 10, 11, 14, 16, 18, 21, 22, 25, 28, 29	10, 17, 20, 28, 35	11 - 14, 17, 27, 29, 35	5, 23	5, 6, 20, 21						8, 26	5, 6, 14, 23, 24, 32	9, 28	8	9, 10, 31	4, 38	6, 37	8, 28	10, 22	4, 22	19, 39, 43	4 - 16, 33 - 38	5, 20	A62J2 PINS 2, 19; A62J3 PINS 2, 4	WHT, WHT		A62C1 (−), A62C2 (−); THRU A62C5 TO −40V; A62C6 (−), A62C7 (−); A62DS1 CATHODE; THRU A62R3 TO +5V UNREG; THRU A62R4 TO +12V UI ADJ	NOTES 2 THRU 5	GND
GNDHPIB	IEEE 488 GROUND	GROUND	0V	CONNECTED TO REAR PANEL																															A62J7 PINS 12, 14, 16, 18, 20, 22, 23, 24					GNDHPIB
GND PLANE	DIGITAL GROUND	GROUND	0V	INSTRUMENT GROUND													1, 34, 44 - 48, 55, 58, 70, 71, 75, 89, 93, 101, 110	1, 29 - 31, 34, 40, 55, 56, 70 - 72, 75, 84 - 86, 88, 110	1, 40 - 44, 55, 56, 75, 96, 97, 110	1, 40 - 44, 55, 56, 70 - 72, 75, 96 - 100, 110	1, 34, 40 - 44, 55, 56, 70 - 72, 75, 89, 96 - 100, 110			6, 24	28			7, 19, 38, 50							A62J1 PINS 1, 21, 29, 28 THRU 41; A62J1 PINS 46, 48, 50; A62J19 PINS 1, 9; A62J20 PIN 1; A62J31 PIN 12				GND NOTE 1	GND PLANE
HADCEN	A.D.C. CONVERT ENABLE	DIGITAL	TTL (HIGH TRUE)	XA21P1-1																		1						8												HADCEN
HCEN	YO DELAY COMPENSATION ENABLE	DIGITAL	TTL (HIGH TRUE)	XA59P1-67												14			67																					HCEN
HENDKICK	YO AND YTM KICK PULSE COMPLETE	DIGITAL	TTL (HIGH TRUE)	XA28P1-18																					31				18											HENDKICK
HFILYO	FILTER YO ENABLE	DIGITAL	TTL (HIGH TRUE)	XA59P1-72													47, 72		72																A62J2 PIN 6					HFILYO
HINT	INTERNAL/EXTERNAL LEVELING CONTROL	DIGITAL	TTL (HIGH TRUE)	XA28P1-42																						42	41													HINT
HIPMOD DRV	HIGH BAND PULSE MODULATOR DRIVE	ANALOG	PIN DIODE CURRENT	XA21P1-36																		36															A62J25 - SMC CENTER			HIPMOD DRV
HLWB	ALC LOOP BAND WIDTH CONTROL	DIGITAL	TTL (HIGH TRUE)	XA26P1-33																		8					33													HLWB
HLB0	ENCODED BAND INFO BIT 0	DIGITAL	TTL (HIGH TRUE)	XA27P1-46																					20		29	46	31											HLB0
HLB1	ENCODED BAND INFO BIT 1	DIGITAL	TTL (HIGH TRUE)	XA27P1-16																					21		30	16	32											HLB1
HLB2	ENCODED BAND INFO BIT 2	DIGITAL	TTL (HIGH TRUE)	XA27P1-47																					22		31	47	33											HLB2
HLEY	LOCK ENABLE FOR YO LOOP	DIGITAL	TTL (HIGH TRUE)	XA59P1-51															51																A62J2 PIN 3					HLEY
HLE2	LOCK ENABLE TO PLL2	DIGITAL	TTL (HIGH TRUE)	XA59P1-53								2	2	2					53																					HLE2
HMRKR	MARKER ASSERTED	DIGITAL	TTL (HIGH TRUE)	XA57P1-2, 12														2, 12									43													HMRKR
HMTR	EXTERNAL METER LEVELING CONTROL	DIGITAL	TTL (HIGH TRUE)	XA28P1-13																						28	13													HMTR
HNUP	NEGATIVE POWER SUPPLIES UP SIGNAL	DIGITAL	TTL (HIGH TRUE)	XA53P1-17; XA56P1-1, 18																												44	17	1, 18						HNUP
HOVC	INTERNAL 10 MHZ STANDARD TEMP ERROR	ANALOG	−3V — OVEN WARM	A62J3-3															10		85														A62J3 PIN 3					HOVC
HPLSEN	PULSE MODULATION ENABLED	DIGITAL	TTL (HIGH TRUE)	XA26P1-2																		2				3	2													HPLSEN
HPME	PROGRAM ENABLE (USED FOR PROGRAMING)	DIGITAL	TTL (HIGH TRUE)	SEE A61 CKT DESCRIPTION																	60																			HPME
HPUP	POSITIVE POWER SUPPLIES UP SIGNAL	DIGITAL	TTL (HIGH TRUE)	XA52P1-46															86	95	86											46			A62J1 PIN 22					HPUP
HRFON	RF OUTPUT POWER ON	DIGITAL	TTL (HIGH TRUE)	XA57P1-105														105				27					24													HRFON
HSP	SWEEP IN PROGRESS	DIGITAL	TTL (HIGH TRUE)	XA57P1-13												22	13	13	13										26											HSP
HSTD	INTERNAL 10 MHZ STANDARD ENABLE	DIGITAL	TTL (HIGH TRUE)	XA59P1-69															69													21								HSTD
HSTM	START MEMORY FETCH CYCLE	DIGITAL	TTL (HIGH TRUE)	XA60P1-45																45	46																			HSTM
HULH	3.7 GHZ OSCILLATOR UNLOCKED	DIGITAL	TTL (HIGH TRUE)	A62J19-18														49, 104	105																A63J19 PIN 18					HULH
HULM	M/N OSCILLATOR UNLOCKED	DIGITAL	TTL (HIGH TRUE)	XA34P1-8	8														104																					HULM
HULR	REFERENCE OSCILLATOR UNLOCKED	DIGITAL	TTL (HIGH TRUE)	XA34P2-14		14													49																					HULR
HULY	YO 2-7 GHZ OSCILLATOR UNLOCKED	DIGITAL	TTL (HIGH TREU)	A62J2-18															50																A63J19 PIN 16					HULY
HUL1	PLL1 OSCILLATOR UNLOCKED	DIGITAL	TTL (HIGH TRUE)	XA37P1-26; XA39P1-1, 15				26		1, 15									106																					HUL1
HUL2	PLL2 OSCILLATOR UNLOCKED	DIGITAL	TTL (HIGH TRUE)	XA41P1-4								4							107																					HUL2
HXREF	EXTERNAL REFERENCE ENABLE	DIGITAL	TTL (HIGH TRUE)	A62J31-17													108		98																A62J31 PIN 17					HXREF
IFC	IEEE 488 INTERFACE CLEAR (IFC)	DIGITAL	TTL (LOW TRUE)	A62J7-17															3																A62J7 PIN 17					IFC
LALTEN	ALTERNATE MODE ENABLED	DIGITAL	TTL (LOW TRUE)	XA57P1-80														80																	A62J31 PINS 9, 23					LALTEN
LALTSEL	CURRENT INST. STATE (FORE/BACK GROUND)	DIGITAL	TTL (LOW TRUE)	XA57P1-59														59																	A62J31 PINS 10, 34					LALTSEL
LATTN	ATENUATOR INSTALLED SENSING	DIGITAL	TTL (LOW TRUE)	A62J20-14																								39							A63J20 PIN 14					LATTN
LBX	BAND CROSS	DIGITAL	TTL (LOW TRUE)	XA57, 58, 59 P1-69													69	69	63																					LBX
LCHNG	INSTRUMENT STATE CHANGED	DIG. OPEN COLL.	TTL (LOW TRUE)	NOTE 9													100		48									21												LCHNG

MNEMONIC	DESCRIPTION	TYPE	LEVELS	SOURCE	REF M/N LOOP		20/30 LOOP								SWEEP GENERATOR Y/O LOOP			CONTROLLER				RF SECTION								POWER SUPPLIES					MISCELLANEOUS A62 MOTHERBOARD CONNECTORS	T1 WIRE COLORS	A62 MOTHERBOARD COAX CONNECTORS J4-J6, J8-J17, J21-J27	A62 MOTHERBOARD COMPONENTS	GROUNDS AND GROUND PLANES	MNEMONICS
					XR34P1	XR34P2	XR36P1	XR37P1	XR38P1	XR39P1	XR40P1	XR41P1	XR42P1	XR43P1	XR54P1	XR55P1	XR56P1	XR57P1	XR59P1	XR60P1	XR61P1	XR21P1	XR22P1 NOTE 8	XR23P1 NOTE 8	XR24P1	XR25P1	XR26P1	XR27P1	XR28P1	XR19P1	XR35P1	XR52P1	XR53P1	XR56P1						
LCK1 LCK2 LCK3 LCK4	DATA STROBE TO PLL2 COUNTERS (0, R2:) DATE STROBE TO PLL2 DIR. DIVIDER (0, R0:) DATA STROBE TO PLL2 PRETUNE DAC (0, R1:) DATE STROBE TO PLL1 VCO GAIN SWTCH (0, R3:)	DIGITAL DIGITAL DIGITAL DIGITAL	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA59P1-54 XA59P1-109 XA59P1-108 XA59P1-62			THRU R11 TO PIN 4	6					19 1	19					54 109 108 62																					LCK1 LCK2 LCK3 LCK4
LDETBW LHET LHIBND LHSOT LHSOT RTN	DETECTOR LOW BAND WIDTH CONTROL HETRODYNE BAND ENABLED FUNDAMENTAL OR MULTIPLED BAND ENABLED HEAT SINK OVER TEMPERATURE SENSOR HEAT SINK OVER-TEMP SENSOR GND RETURN	DIGITAL DIGITAL DIGITAL DIGITAL GROUND	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) 0V	XA26P1-9 XA27P1-20 XA26P1-2 A62J31-26 A62J31-12																		29				39 27	9 14 23	20		12					A62J34 PIN 2 A62J19 PINS 7, 8 A62J19 PIN 15 A62J31 PIN 26 A62J31 PIN 12				GND PLACE	LDETBW LHET LHIBND LHSOT LHSOT RTN
LIDA0 LIDA1 LIDA2 LIDA3 LIDA4 LIDA5	PROCESSOR/MEMORY PRIVATE BUS BIT 0 PROCESSOR/MEMORY PRIVATE BUS BIT 1 PROCESSOR/MEMORY PRIVATE BUS BIT 2 PROCESSOR/MEMORY PRIVATE BUS BIT 3 PROCESSOR/MEMORY PRIVATE BUS BIT 4 PROCESSOR/MEMORY PRIVATE BUS BIT 5	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA60P1-54 XA60P1-109 XA60P1-53 XA60P1-108 XA60P1-52 XA60P1-107																54 109 53 108 52 107	54 109 53 108 52 107																			LIDA0 LIDA1 LIDA2 LIDA3 LIDA4 LIDA5
LIDA6 LIDA7 LIDA8 LIDA9 LIDA10	PROCESSOR/MEMORY PRIVATE BUS BIT 6 PROCESSOR/MEMORY PRIVATE BUS BIT 7 PROCESSOR/MEMORY PRIVATE BUS BIT 8 PROCESSOR/MEMORY PRIVATE BUS BIT 9 PROCESSOR/MEMORY PRIVATE BUS BIT 10	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA60P1-51 XA60P1-106 XA60P1-50 XA60P1-105 XA60P1-49																51 106 50 105 49	51 106 50 105 49																			LIDA6 LIDA7 LIDA8 LIDA9 LIDA10
LIDA11 LIDA12 LIDA13 LIDA14 LIDA15	PROCESSOR/MEMORY PRIVATE BUS BIT 11 PROCESSOR/MEMORY PRIVATE BUS BIT 12 PROCESSOR/MEMORY PRIVATE BUS BIT 13 PROCESSOR/MEMORY PRIVATE BUS BIT 14 PROCESSOR/MEMORY PRIVATE BUS BIT 15	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA60P1-104 XA60P1-48 XA60P1-103 XA60P1-47 XA60P1-102																104 48 103 47 102	104 48 103 47 102																			LIDA11 LIDA12 LIDA13 LIDA14 LIDA15
LINE TRIG	LINE TRIGGER SENSING 5V SECONDARY	RECTIFIED AC	LINE FREQ 7-10V	A62-CR1 CATHODE/A62R1																																		A62CR1 CATHODE: THRU A62R1 TO PWR ON LED		LINE TRIG
LIPS LMNE LMODHLD LOMD LOPMOD DRV	INSTRUMENT — PRESET M/N OSCILLATOR LOCK ENABLED LINEAR MODULATOR SAMPLE/HOLD OVER-MODULATION DETECTED LOW BAND PULSE MODULATOR DRIVE	DIG. OPEN COLL. DIGITAL DIGITAL DIG. OPEN COLL. ANALOG	TTL (LOW TRUE) TTL (LOW TRUE) TTL TTL (LOW TRUE) CURRENT SOURCE	XA52P1-38/A62J1-19 XA59P1-88 XA21P1-2 XA25P1-6 XA21P1-16	2												14	57, 69 14	14 86	14	14	2 16					1 6	48		36					A62J1 PIN 19		A62J10 - SMC CENTER			LIPS LMNE LMODHLD LOMD LOPMOD DRV
LRETRACE LRSP LSBY LSOB LSPLD	RETRACE RESET SWEEP CONTROL STANDBY CONTROL STAY OFF BUSS SIGNAL SWEEP L.E.D. CONTROL OFF/ON	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL (LOW TRUE) TTL (LOW TRUE) 0V TO +22V TTL (LOW TRUE) TTL	XA57P1-58 XA59P1-85 A62J1-20 XA60P1-46 XA58P1-67													86	58	85	48	48									45					A62J31 PINS 11, 25 A62J1 PIN 20					LRETRACE LRSP LSBY LSOB LSPLD
LSSP LSRQ LSTEPUP LSTP LUNLVL	STEP SWEEP SERVICE REQUEST STEP UP FOR EXTERNAL FOOT SWITCH PROCESSOR STOPPED INSTRUMENT UNLEVELED	DIG. OPEN COLL. DIG. OPEN COLL. DIGITAL DIGITAL DIG. OPEN COLL.	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA57P1-107 NOTE 9 A62J31-14 XA59P1-65 XA26P1-36													67 54	107 54	69 65	69 65															A62J1 PIN 44					LSSP LSRQ LSTEPUP LSTP LUNLVL
LVLCOR LVLREF LVSX LWRT LYOKICK LYSP	LEVELING CORRECTION A.L.C. LEVEL REFERENCE DISABLE YO SWEEPS WRITE TO RAM Y.O. SWEEP	ANALOG ANALOG DIGITAL DIGITAL DIGITAL	1.25dB/v 0V=0dB .2V/dB 0V=0dBM TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA25P1-14 XA27P1-30 XA58P1-69 XA60P1-101 XA59P1-11											6 21	7	68			101	101					14 13	38	52 62 30							A62J31 PINS 5, 19 A62J1 PIN 46 A62J1 PIN 28; A62J31 PIN 14 A62J1 PIN 43					LVLCOR LVLREF LVSX LWRT LYOKICK LYSP
MAR15IN MAR15OUT	MEMORY ADDRESS BIT 15 (IN) MEMORY ADDRESS BIT 15 (OUT)	DIGITAL DIGITAL	TTL TTL	SEE A61 CKT DESCRIPTION SEE A61 CKT DESCRIPTION															11		6 64								41											MAR15IN MAR15OUT
MKR RMP	SWEEP RAMP TO MARKER BANDCROSS BOARD	ANALOG	0 TO 10V/SWEEP	XA58P1-96													96	96																						MKR RMP

CHANGE J

Refer to Table 8E-1. Motherboard Wiring List (7 of 7) for NOTES

Table 8E-1. Motherboard Wiring List (4 of 7)

MNEMONIC	DESCRIPTION	TYPE	LEVELS	SOURCE	REF M/N LOOP		20/30 LOOP									SWEEP GENERATOR Y/O LOOP			CONTROLLER				RF SECTION								POWER SUPPLIES					MISCELLANEOUS A62 MOTHERBOARD CONNECTORS	T1 WIRE COLORS	A62 MOTHERBOARD CORK CONNECTORS J4-J6, J8-J17, J21-J27	A62 MOTHERBOARD COMPONENTS	GROUNDS AND GROUND PLANES	MNEMONICS
					XR54P1	XR54P2	XR53P1	XR37P1	XR53P1	XR53P1	XR40P1	XR41P1	XR42P1	XR43P1	XR54P1	XR55P1	XR56P1	XR57P1	XR58P1	XR59P1	XR61P1	XR21P1	XR22P1 NOTE 8	XR23P1 NOTE 8	XR24P1	XR25P1	XR26P1	XR27P1	XR28P1	XR1SP1	XR2SP1	XR2FP1	XR3SP1	XR6SP1						
MOD RTN	ALC MODULATORS GROUND RETURN	GROUND	0V	XA26P1-21																							21											MOD RTN
MODHI MODLO MODLVL	HIGH BAND MODULATOR DRIVE LOW BAND MODULATOR DRIVE MODULATOR LEVEL	ANALOG ANALOG ANALOG	CURRENT SOURCE CURRENT SOURCE 0 TO −3 LEVELD	XA26P1-20 XA26P1-22 XA26P1-32																							20 22 32	61						A62J13 - SMC SHIELD A62J14 - SMC SHIELD AND GUARD TRACE AROUND MODHI AND MODLO				MODHI MODLO MODLVL
MUTE	PLOTTER MUTE CONTROL	DIGITAL	TTL (HIGH TRUE)	XA27P1-31															61															A62J13 - SMC CENTER A62J14 - SMC CENTER				MUTE
M1 M2 M4 M8 M5	M NUMBER TO M/N OSCILLATOR BIT 1 M NUMBER TO M/N OSCILLATOR BIT 2 M NUMBER TO M/N OSCILLATOR BIT 3 M NUMBER TO M/N OSCILLATOR BIT 4 M NUMBER TO M/N OSCILLATOR BIT 5	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL (HIGH TRUE) TTL (HIGH TRUE) TTL (HIGH TRUE) TTL (HIGH TRUE) TTL (HIGH TRUE)	XA58P1-33 XA58P1-88 XA58P1-32 XA58P1-87 XA58P1-31	6 5 3 4 1														33 88 32 87 31																		M1 M2 M3 M4 M5
MDAC NEG BLANK NRFD	IEEE 488 NOT DATA ACCEPTED (NDAC) NEGATIVE BLANKING SIGNAL IEEE 488 NOT READY FOR DATA (NRFD)	DIGITAL DIGITAL DIGITAL	TTL 0, −5V TTL	XA58P1-4 XA57P1-41 XA58P1-6															41															A62J7 PIN 18 A62J31 PINS 1, 15 A62J27 PIN 13				MDAC NEG BLANK NRFD
N1 N2	N NUMBER TO M/N OSCILLATOR BIT 1 N NUMBER TO M/N OSCILLATOR BIT 2	DIGITAL DIGITAL	TTL TTL	XA58P1-68 XA58P1-103	18 14															5 48 103																	N1 N2
N2 TUNE N2 TUNE TRN	TUNING SIGNAL TO PLL2 VCO GROUND RETURN	ANALOG GROUND	0V TO +7V 0V	XA41P1-33 XA41P1-8						53 8			58 10																							N2 TUNE N2 TUNE TRN
N3 N4 N5 N8	N NUMBER TO M/N OSCILLATOR BIT 3 N NUMBER TO M/N OSCILLATOR BIT 4 N NUMBER TO M/N OSCILLATOR BIT 5 N NUMBER TO M/N OSCILLATOR BIT 8	DIGITAL DIGITAL DIGITAL DIGITAL	TTL TTL TTL TTL	XA58P1-67 XA58P1-102 XA58P1-66 XA89P1-101	13 12 11 10															47 102 66 101																	N3 N4 N5 N8
PEN LIFT PEN LIFT RTN	PLOTTER PEN LIFT PLOTTER PEN LIFT GROUND RETURN	OPEN COLLECT. GROUND	CLAMP AT 56V 0V	XA27P1-108 XA67P1-105															108 105																	PEN LIFT PEN LIFT RTN
PH1	PLL1 PHASE DETECTOR OUTPUT	ANALOG	0V TO +5V	A62R12			24	THRU R12 TO PIN 11																									A62J31 PINS 6, 20 A62J31 PIN 21				PH1
PH2	PLL1 PHASE DETECTOR OUTPUT	ANALOG	0V TO +5V	A62R13			25	THRU R13 TO PIN 12																													PH2
PINSIAS PLS IN PLS IN RTN	SYTM P.I.N. DIODE BIAS EXTERNAL PULSE INPUT EXTERNAL PULSE GROUND RETURN	DIGITAL DIGITAL GROUND	−4V TO +12V TTL 0V	XA24P1-24 A62J28 CENTER NOTE 10																		18 17		34									A62J18 PIN 10				PINSIAS PLS IN PLS IN RTN
PMOD RTN	PULSE MODULATOR DRIVE GROUND RETURN	GROUND	0V	XA21P1-15																		35													A62J10/25 - SMC SHIELD AND GUARD TRACE AROUND KIPMOD AND LOPMOD DRV				PMOD RTN
PRETUNE	YO PRETUNE	ANALOG	−2.5V/GC 0 = 20C	XA64P1-24											24	8, 23											27 NOTE 8							A63J5 - SMC CENTER				PRETUNE
PWR ON LED	+5 VAC 2 THROUGH CR1 AND R1 TO DS1	POWER SUPPLY	+.78V ANODE — ON	A63R1																																A62DS1 ANODE: THRU A62R1 TO LINE TRIG			PWR ON LED
Q1B Q1E	TRANSISTOR Q1 BASE TRANSISTOR Q1 EMITTER	ANALOG ANALOG		XA53-8 XA53-7, 8, 25, 28																											4 7, 9 25, 28				Q1B Q1E
Q2B Q2E Q3B Q3C Q4B Q4E	TRANSISTOR Q2 BASE TRANSISTOR Q2 EMITTER TRANSISTOR Q3 BASE TRANSISTOR Q3 COLLECTOR TRANSISTOR Q3 EMMITTER TRANSISTOR Q4 BASE	ANALOG ANALOG ANALOG ANALOG ANALOG ANALOG		XA53P1-21 XA53P1-1, 19 XA53-7 XA52-6, 30 XA52-8, 22 XA52-3, 27																											21 1, 19				Q2B Q2E Q3B Q3C Q4B Q4C
Q4C	TRANSISTOR Q4 COLLECTOR	ANALOG		XA52-1, 2, 25, 26																									7 8, 30 5, 32 3, 27								
Q4E	TRANSISTOR Q4 EMITTER	ANALOG		XA52-4, 5, 28, 29																									1, 2 23, 29								Q4E
REN RFSWP	IEEE 488 REMOTE ENABLE (REN) SWEEP RAMP TO R.F. OUTPUT SECTION	DIGITAL ANALOG	TTL (LOW TRUE) 10V/SWEEP	A62J7-10 XA57P1-42															42		2						17							A62J7 PIN 10				REN RFSWP

CHANGE J

Refer to Table 8E-1. Motherboard Wiring List (7 of 7) for NOTES

MNEMONIC	DESCRIPTION	TYPE	LEVELS	SOURCE
RGND	REFERENCE GROUND	GROUND	0V	STAR GND POINT
RPNLSWP RPNLSWP RTN	REAR PANEL SWEEP OUTPUT REAR PANEL SWEEP GROUND RETURN	ANALOG GROUND	10V/SWEEP 0V	XA57P1-44 XA57P1-100
RSTAT	READ STATUS I/O STROBE (15, R3:)	DIGITAL	TTL (LOW TRUE)	XA27P1-45
SIOA SIOB SR FBK SR PWR	I/O STROBE (FIRST HALF ADDRESSES) I/O STROBE (SECOND HALF ADDRESSES) YO SENSE RESISTOR FEEDBACK YO SENSE RESISTOR POWER	DIGITAL DIGITAL ANALOG ANALOG	TTL (LOW TRUE) TTL (LOW TRUE) −5V TO −17V −5V TO −17V	XA60P1-15 XA60P1-16 XA55P1-12, 27 XA56P1-13, 28
SRD BIAS SRD BIAS CONT SRQ STAT10	STEP RECOVERY DIODE BIAS STEP RECOVERY DIODE BIAS CONTROL IEEE 488 SERVICE REQUEST (SRQ) STATUS WORD INPUT BIT 10	ANALOG DIGITAL DIGITAL DIGITAL	−10V/2K TO +5V 0 TO −5 LEVELED TTL TTL (LOW TRUE)	XA24P1-25 XA26P1-18 A62J7-19 XA23P1-22
SW1 SW2	PLL1 15-30 MHZ ON/OFF CONTROL PLL1 .15 TO .3 MHZ/3-6 MHZ CONTROL	DIGITAL DIGITAL	TTL TTL	XA42P1-32 XA42P1-14
SYTM COIL + SYTM COIL − SYTM GND SYTMDB SYTMDC SYTMHTR SYTMRES SYTMTHRM	POSITIVE INPUT TO SYTM COIL NEGATIVE INPUT TO SYTEM COIL SYTM GROUND SYTM DRIVE TRANSISTOR BASE SYTM DRIVE TRANSISTOR COLLECTOR REGULATOR HEATER DRIVE TO SYTM SYTM CURRENT SENSE FEED BACK TEMP FEED BACK THERMISTOR IN SYTM	ANALOG ANALOG GROUND ANALOG ANALOG ANALOG ANALOG ANALOG	−40V TO −25V −40V 0V −22 TO −39 −.6 TO −6V 0 TO +20V −.9V LOW BND CW APPROX. −5V	XA28P1-42 A62J18-12 A62J18-13, 14, 15 XA28P1-19 XA28P1-20 XA24P1-19 XA28P1-44 A62J18-9
TCREF THERM1 THERM2 TYOKP	ALC TEMP COMPENSATED REFERENCE LOW BAND DETECTOR THERMISTOR LOW BAND DETECTOR THERMISTOR TRIGGER YO KICK PULSE	ANALOG ANALOG ANALOG DIGITAL	−.2V/dB 0V=0dBM −1V TO −8V −10V TTL (LOW TRUE)	XA25P1-35 A62J34-3 A62J34-1 XA59P1-100
VCOMP VSWP	YO DELAY COMPENSATION VOLTAGE YO SWEEP RAMP	ANALOG ANALOG	−25 MHZ/VOLT 0V TO 10V/SWEEP	XA54P1-27 XA58P1-97
WBAND WCDAC WLEVEL WMOD WPDAC WRDAC	BAND INFO I/O STROBE (10, R2:) DELAY COMPENSATION DAC DATA STROBE (5, R3:) ALC REFERENCE DAC DATA STROBE (10, R1:) MODULATION DATA STROBE (10, R0:) PRE-TUNE DAC DATA STROBE (3, R2:) RESET DAC DATA STROBE (1, R2:)	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA27P1-43 XA59P1-30 XA27P1-12 XA27P1-59 XA58P1-68 XA59P1-29
WSPAT WSPTM WYOKW WYTMCTL WYTMSLP W11R2	SWEEP ATTENUATOR DATA STROBE (1, R0:) SWEEP TIME DAC DATA STROBE (1, R1:) YO KICK PULSE WIDTH DATA STROBE (5, R1:) YTM CONTROL SIGNALS STROBE (11, R1:) YTM DRIVE SLOPE DAC DATA STROBE (11, R1:) EXTRA I/O STROBE (11, R2:)	DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL DIGITAL	TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE) TTL (LOW TRUE)	XA59P1-84 XA59P1-28 XA59P1-89 XA27P1-14 XA27P1-44 XA27P1-15
YO COIL + YO COIL − YO TUNE YOXISTB	POSITIVE INPUT TO YO COIL NEGATIVE INPUT TO YO COIL LOW FREQ PHASE LOCK TO YO DRIVER YO DRIVE TRANSISTOR BASE	ANALOG POWER SUPPLY ANALOG ANALOG	−40V TO −20V −40V 0V ±5V −30V TO −39V	XA55P1-18, 30 A62J2-8, 13 XA55P1-24 XA55P1-29
Z-AXIS BLANK	Z-AXIS BLANKING/MARKER	DIGITAL	+5V/−5V	XA57P1-87
1.4V/GHZ 5 MHZ CLK 20/30 SWP 500 KHZ REF 8410 TRIG	1.4V PER GHZ REFERENCE 5 MHZ CLOCK TO HP/IB CHIP 20/30 MHZ REFERENCE OSCILLATOR SWEEP PLL2 500 KHZ REFERENCE SYNCRONIZING TRIGGER TO 8410S INTERFACE	ANALOG DIGITAL ANALOG DIGITAL DIGITAL	+1.4V/GHZ TTL 0V TO +10V TTL TTL	XA28P1-7 XA60P1-34 XA58P1-41 XA42P1-9 XA57P1-82

MNEMONIC	REF M/N LOOP XR34P1	REF M/N LOOP XR34P2	20/30 LOOP XR36P1	XR37P1	XR38P1	XR39P1	XR40P1	XR41P1	XR42P1	XR43P1	SWEEP GENERATOR Y/O LOOP XR54P1	XR55P1	XR58P1	CONTROLLER XR57P1	XR59P1	XR60P1	XR61P1
RGND										20	7, 25	10, 11 25, 28	42,43,98	48, 46, 101			
RPNLSWP RPNLSWP RTN														44 100			
RSTAT																	
SIOA SIOB SR FBK SR PWR												12, 27 13, 28	15 16	15 16	15 16	15 16	
SRD BIAS SRD BIAS CONT SRQ STAT10															8		
SW1 SW2			23				24 22		32 14								
SYTM COIL + SYTM COIL − SYTM GND SYTMDB SYTMDC SYTMHTR SYTMRES SYTMTHRM																	
TCREF THERM1 THERM2 TYOKP																	
VCOMP VSWP											18 27 28 NOTE 7	9	30 97		100		
WBAND WCDAC WLEVEL WMOD WPDAC WRDAC											28 36				30		
WSPAT WSPTM WYOKW WYTMCTL WYTMSLP W11R2											8		29 84 28		68 28 84 28 89		
YO COIL + YO COIL − YO TUNE YOXISTB												18, 30 24 29					
Z-AXIS BLANK																	
1.4V/GHZ 5 MHZ CLK 20/30 SWP 500 KHZ REF 8410 TRIG								20	9	1			41	87 82	34	34	

MNEMONIC	RF SECTION XR21P1	XR22P1 NOTE 8	XR23P1 NOTE 8	XR24P1	XR25P1	XR26P1	XR27P1	XR28P1	POWER SUPPLIES XR19P1	XR35P1	XR52P1	XR53P1	XR56P1
RGND				38	12, 34	11, 34	18, 28 48, 60	21, 43					
RPNLSWP RPNLSWP RTN													
RSTAT			32	23			45	10					
SIOA SIOB SR FBK SR PWR							42						
SRD BIAS SRD BIAS CONT SRQ STAT10			22	25 13 4		18							
SW1 SW2													
SYTM COIL + SYTM COIL − SYTM GND SYTMDB SYTMDC SYTMHTR SYTMRES SYTMTHRM				35 19 2				42 5, 27 19 20 44					
TCREF THERM1 THERM2 TYOKP					35 4 28	12							
VCOMP VSWP													
WBAND WCDAC WLEVEL WMOD WPDAC WRDAC			33	33		44	43 12 59	29					
WSPAT WSPTM WYOKW WYTMCTL WYTMSLP W11R2			15				14 44 15	8 30					
YO COIL + YO COIL − YO TUNE YOXISTB													
Z-AXIS BLANK													
1.4V/GHZ 5 MHZ CLK 20/30 SWP 500 KHZ REF 8410 TRIG				6				7					

MISCELLANEOUS A62 MOTHERBOARD CONNECTORS	T1 WIRE COLORS	A62 MOTHERBOARD CORX CONNECTORS J4-J6, J8-J17, J21-J27	A62 MOTHERBOARD COMPONENTS	GROUNDS AND GROUND PLANES	MNEMONICS
A62J29 PIN 1; A62J32 PIN 1		A62J11 - SMC SHIELD AND GUARD TRACES AROUND PRETUNE, VSWP, YO TUNE, AND SYTMRES A62J27 - SMC SHIELD AND GROUND TRACES NEAR 20/30 SWP AND VSWP A62J4, J5, J6 - SMC SHIELD AND STANDOFF FOR LUG NEAR A62J29			RGND
		A62J8 - SMC CENTER A62J8 - SMC SHIELD AND GUARD TRACE AROUND RPNLSWP			RPNLSWP RPNLSWP RTN
					RSTAT
A62J1 PIN 49 A62J1 PIN 47 A62J29 PIN 2 A62J29 PIN 3					SIOA SIOB SR FBK SR PWR
A62J18 PIN 2 A62J7 PIN 19					SRD BIAS SRD BIAS CONT SRQ STAT10
					SW1 SW2
A62J18 PIN 4; A62J32 PIN 3 A62J18 PIN 12 A62J18 PINS 13 THRU 15; A62J32 PIN 2 A62J32 PIN 2 A62J32 PIN 4 A62J18 PIN 8 A62J32 PIN 8 A62J18 PIN 9					SYTM COIL+ SYTM COIL− SYTM GND SYTMDB SYTMDC SYTMHTR SYTMRES SYTMTHRM
A62J34 PIN 3 A62J34 PIN 1					TCREF THERM1 THERM2 TYOKP
		A62J27 - SMC CENTER			VCOMP VSWP
					WBAND WCDAC WLEVEL WMOD WPDAC WRDAC
					WSPAT WSPTM WYOKW WYTMCTL SYTMSLP W11R2
A62J2 PINS 6, 18; A62J29 PIN 8 A62J2 PINS 8, 13 A62J29 PIN 4		A62J6 - SMC CENTER			YO COIL + YO COIL − YO TUNE YOXISTB
A62J31 PINS 2, 18					Z-AXIS BLANK
A62J31 PIN 7					1.4V/GHZ 5 MHZ CLK 20/30 SWP 500 KHZ REF 8410 TRIG

CHANGE J

Refer to Table 8E-1. Motherboard Wiring List (7 of 7) for NOTES

Table 8E-1. Motherboard Wiring List (6 of 7)

MNEMONIC	DESCRIPTION	TYPE	LEVELS	SOURCE	REF M/N LOOP XR34P1	XR34P2	20/30 LOOP XR36P1	XR37P1	XR38P1	XR39P1	XR40P1	XR41P1	XR42P1	XR43P1	SWEEP GENERATOR Y/O LOOP XR54P1	XR55P1	XR56P1	CONTROLLER XR57P1	XR58P1	XR60P1	XR61P1	RF SECTION XR21P1	XR22P1 NOTE 8	XR23P1 NOTE 8	XR24P1	XR25P1	XR26P1	XR27P1	XR28P1	POWER SUPPLIES XR19P1	XR35P1	XR52P1	XR53P1	XR56P1	MISCELLANEOUS A62 MOTHERBOARD CONNECTORS	T1 WIRE COLORS	A62 MOTHERBOARD COAX CONNECTORS J4-J6, J8-J17, J21-J27	A62 MOTHERBOARD COMPONENTS	GROUNDS AND GROUND PLANES	MNEMONICS
+1.0 V/GHZ +1.0 V/GHZ RTN +6V AC1	+1.0V/GHZ FREQUENCY REFERENCE +1.0V/GHZ FREQUENCY REFERENCE GROUND RETURN +6V TRANSFORMER SECONDARY	ANALOG GROUND TI SEC.	1.0V/GHZ 0V 7 VAC	XA28P1-17 XA28P1-39 A62 LUG (5)																									17 39		8 - 10 26 - 28				A62J31 PIN 27 A62J21 PIN 13	GRN				+1.0V/GHZ +1.0V/GHZ RTN +6V AC1
+6V AC2	+6V TRANSFORMER SECONDARY (GREEN)	TI SEC.	7 VAC	A62 LUG (5)																											12 - 14 30 - 32					GRN		A62CR1 ANODE		+6V AC2
+5V SENSE (+) +5V SENSE (−) +5V UNREG	+5.2 VOLT SUPPLY POSITIVE SENSE +5.2 VOLT SUPPLY POSITIVE SENSE UNREGULATED SUPPLY TO +5V	POWER SUPPLY POWER SUPPLY POWER SUPPLY	+5.2V 0V +7V TO +9V	XA52P1-15 XA52P1-39 XA35P1-1, 2, 3, 19, 20, 21																											1 - 3 19 - 21	15 39 13, 14 37, 38			A62J1 PINS 31 THRU 37; A62J31 PIN 3			A62C2 (+); A62C3 (+); THRU A62R3 TO GND	NOTE 2	+5 SENSE (+) +5V SENSE (−) +6V UNREG
+5.2V	REGULATED +5.2 VOLT SUPPLY	POWER SUPPLY	+5.2V	XA52P1-17, 18, 41, 42		4, 5	THRU L1 TO 15, 30	THRU L3 TO 18, 36		THRU L7 TO 15, 30	15, 30	15, 30	18, 36	18, 36	2, 20	2, 17	36,37,92	38, 37, 82	36, 37, 92	38, 37, 92	38, 37, 82	6, 23	2, 20	3, 21	3	6, 28	4, 28	3, 34	2, 24			17, 18 41, 42			A62J2 PINS 4, 17; A62J19 PINS 3, 11					+5.2V
+12V +12V UNREG +12V U1 ADJ	REGULATED +12 VOLT SUPPLY UNREGULATED SUPPLY TO +12V +12V REGULATOR ADJUSTMENT TERMINAL	POWER SUPPLY POWER SUPPLY POWER SUPPLY	+12V +20V +10.5V	XA52P1-9, 33 XA52P1-11, 28 XA52P1-10			THRU L2 TO 13, 28		THRU L6 TO 13, 28								91	91	91	91	91			2, 20								9, 33 11, 35 10			A62J1 PIN 2			A62CR3 CATHODE; A62U1 CASE A62C7 (+); A62U1 PIN 1 C6 (+); CR3 ANODE; U1 PIN 2; THRU A62R4 TO GND		+12V +12V UNREG +12V U1 ADJ
+20V	REGULATED +20 VOLT SUPPLY	POWER SUPPLY	+20V	XA52P1-16, 40		2, 3					13, 28	13, 28	15, 34	15, 34	1, 18	1, 18	35, 90	35, 90	36, 90	35, 90	35	4, 22	1, 19	1, 19	1	5, 27	3, 28	2, 33	1, 23			16, 40	29		A62J2 PINS 9, 12; A62J18 PIN 8; A62J19 PINS 2, 10					+20V
+20V AC1 +20V AC2 +20V REF OSC +20V UNREG	TRANSFORMER SECONDARY FOR +20V SUPPLY TRANSFORMER SECONDARY FOR +20V SUPPLY SWITCHED +20V SUPPLY TO 10 MHZ REF. UNREGULATED SUPPLY TO +20V	POWER SUPPLY POWER SUPPLY POWER SUPPLY POWER SUPPLY	28.4 VAC 28.4 VAC 0V/+20V +31.2V	A62 LUG (2) A62 LUG (2) XA52P1-20 XA35P1-7, 25																										1, 13 2, 14 9, 21	7, 25	20 23, 24 47, 48			A62J3 PIN 1	RED RED				+20V AC1 +20V AC2 +20V REF OSC +20V UNREG
+21 VPP +22V −.25 V/GHZ −5.2V −7V REF −10V	PROGRAMMING SUPPLY REGULATED +22 VOLT SUPPLY −.25 VOLTS/GHZ OUTPUT FREQUENCY REGULATED −5.2 VOLT SUPPLY −7V REFERENCE SUPPLY REGULATED −10 VOLT SUPPLY	POWER SUPPLY POWER SUPPLY POWER SUPPLY POWER SUPPLY POWER SUPPLY POWER SUPPLY	+5V/+21V 22V −.25V/GHZ −5.2V −7V −10V	SEE A81 CKT DESCRIPTION XA36P1-18, 36 XA28P1-40 XA53P1-18, 36 XA43P1-8 XA53P1-12, 13, 31, 32		12, 13 8, 9	THRU L8 TO 12, 27		THRU L4 TO 12, 27	THRU L6 TO 12, 27	12, 27	7 12, 27	15, 33	9 15, 33	4, 22	4, 19	93 39, 94	93 39, 94	93 39, 94	93 38, 84	3, 58 90 93 39, 84	7, 25	4, 22	4 5, 23	5	7, 29	5, 27	51 1, 32 4, 35	40 3, 25		18, 36	22	18, 36 12, 13 31, 32	4, 19	A62J1 PIN 30; A62J3 PIN 5 A62J19 PIN 14 A62J1 PIN 42; A62J2 PINS 1, 20; A62J19 PINS 4, 12 A62J2 PINS 10, 11; A62J18 PIN 7; A62J19 PINS 5, 13			A62CR2 CATHODE; A62K1 PIN 2		+21 VPP +22V −.25V/GHZ −5.2V −7V REF −10V
−10V AC1	TRANSFORMER SECONDARY FOR −10V SUPPLY	POWER SUPPLY	13.9 VAC	A62 LUG (8)																										3, 4 15, 16						BLU				−10V AC1
−10V AC2	TRANSFORMER SECONDARY FOR −10V SUPPLY	POWER SUPPLY	13.9 VAC	A62 LUG (8)																										5, 6 17, 18						BLU				−10V AC2
−10V RETURN	−10V SUPPLY SERIES PASS COLLECTOR	POWER SUPPLY	+8.4V AT 13.3 GHZ	XA53P1-2, 20																										7, 8 19, 20			2, 20							−10V RETURN
−10V UNREG	UNREGULATED SUPPLY TO +10V	POWER SUPPLY	−10V	XA19P1-11, 12, 23, 24																										11, 12 23, 24			9, 10 27, 28							−10V UNREG
−15V −40V −40V AC1 −40V AC2	REGULATED −15V SUPPLY REGULATED −40V SUPPLY TRANSFORMER SECONDARY FOR −40V SUPPLY TRANSFORMER SECONDARY FOR −40V SUPPLY	POWER SUPPLY POWER SUPPLY POWER SUPPLY	−15V −40V 42.8 VAC 42.8 VAC	XA56P1-15, 30 XA53P1-11, 30 A62 LUG (4) A62 LUG (4)		6, 7					11, 28				8 3	3, 19	38	38	38	38	38		3, 21	7, 25				5, 38	4 5, 27		15, 33 16, 34		11, 30	15, 30 3, 18	A62J2 PINS 8, 13; A62J19 PIN 6	YEL YEL		THRU A62C5 TO GND		−15V −40V −40V AC1 −40V AC2
−40V RETURN −40V SENSE (+) −40V SENSE (−) −40V UNREG	−40V SUPPLY SERIES PASS COLLECTOR −40V SUPPLY POSITIVE SENSE −40V SUPPLY NEGATIVE SENSE UNREGULATED SUPPLY TO −40V	POWER SUPPLY POWER SUPPLY POWER SUPPLY POWER SUPPLY	12.7V AT 13.3 GHZ 0V −40V −40V	XA53P1-3, 22 XA53P1-5 XA53P1-23 XA35P1-6, 24		6, 7					11, 29				3	3, 18							3, 21	7, 25					5, 27		8, 23 6, 24		3, 22 5 23 6, 24	3, 18	A62J2 PINS 8, 13; A62J19 PIN 6			C1 (+): THRU R2 TO −40V UNREG THRU A62C5 TO GND C1 (−): THRU R2 TO −40V RETURN	NOTE 2	−40V RETURN −40V SENSE (+) −40V SENSE (−) −40V UNREG
A62J12 CENTER A62J12 SHIELD A62J17 CENTER A62J17 SHIELD A62J21 CENTER A62J21 SHIELD	EXTRA SHIELDED CABLE CONNECTOR TO XA23 EXTRA SHIELDED CABLE CONNECTOR TO XA23 EXTRA SHIELDED CABLE CONNECTOR TO XA23 EXTRA SHIELDED CABLE CONNECTOR TO XA23 EXTRA SHIELDED CABLE CONNECTOR TO XA22 EXTRA SHIELDED CABLE CONNECTOR TO XA22			XA23P1-38 XA23P1-35 XA23P1-18 XA23P1-17 XA22P1-11 XA22P1-29																			11 29	38 35 18 17													A62J12 CENTER A62J12 SHIELD A62J17 CENTER A62J17 SHIELD A62J21 CENTER A62J21 SHIELD			A62J12 CENTER A62J12 SHIELD A62J17 CENTER A62J17 SHIELD A62J21 CENTER A62J21 SHIELD
A62J22 CENTER A62J22 SHIELD A62J23 CENTER A62J23 SHIELD A62J24 CENTER A62J24 SHIELD	EXTRA SHIELDED CABLE CONNECTOR TO XA22 EXTRA SHIELDED CABLE CONNECTOR TO XA22 EXTRA SHIELDED CABLE CONNECTOR TO XA22 EXTRA SHIELDED CABLE CONNECTOR TO XA22 EXTRA SHIELDED CABLE CONNECTOR TO XA22 EXTRA SHIELDED CABLE CONNECTOR TO XA22			XA22P1-10 XA22P1-28 XA22P1-9 XA22P1-27 XA22P1-16 XA22P1-34																			10 28 9 27	16 24													A62J22 CENTER A62J22 SHIELD A62J23 CENTER A62J23 SHIELD A62J24 CENTER A62J24 SHIELD			A62J22 CENTER A62J22 SHIELD A62J23 CENTER A62J23 SHIELD A62J24 CENTER A62J24 SHIELD

Refer to Table 8E-1. Motherboard Wiring List (7 of 7) for NOTES

CHANGE I

Change I is extensive and only applies to the A28 SYTM Driver assembly, **HP Part Number 08340-60025**. The following pages apply directly to the 08340-60025 and should be used when servicing this assembly.

Refer to the following A28 Parts List, Theory, Component Location Diagram and Schematic for backdated information.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A28	08340--60025	8	1	SYTM DRIVER	28480	08340--60025
A28C2	0160--4841	5	21	CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C3	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C4	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C5	0160--4801	7	3	CAPACITOR--FXD 100PF ±5% 100VDC CER	28480	0160--4801
A28C7	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C8	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C9	0160--4801	7		CAPACITOR--FXD 100PF ±5% 100VDC CER	28480	0160--4801
A28C13	0160--0163	6	2	CAPACITOR--FXD .033UF ±10% 200VDC POLYE	28480	0160--0163
A28C14	0160--0163	6		CAPACITOR--FXD .033UF ±10% 200VDC POLYE	28480	0160--0163
A28C15	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C16	0160--4801	7		CAPACITOR--FXD 100PF ±5% 100VDC CER	28480	0160--4801
A28C17	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C18	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C19	0160--4805	1	1	CAPACITOR--FXD 47PF ±5% 100VDC CER 0±30	28480	0160--4805
A28C20	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C21	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C22	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C23	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C24	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C25	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C26	0160--4833	5	1	CAPACITOR--FXD .022UF ±10% 100VDC CER	28480	0160--4833
A28C28	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C29	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C30	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C31	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C32	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C33	0180--0269	5	4	CAPACITOR--FXD 1UF+50--10% 150VDC AL	56289	30D105G150BA2
A28C34	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C35	0180--0269	5		CAPACITOR--FXD 1UF+50--10% 150VDC AL	56289	30D105G150BA2
A28C36	0180--0269	5		CAPACITOR--FXD 1UF+50--10% 150VDC AL	56289	30D105G150BA2
A28C37	0180--0269	5		CAPACITOR--FXD 1UF+50--10% 150VDC AL	56289	30D105G150BA2
A28C38	0160--4841	5		CAPACITOR--FXD .1UF +80--20% 50VDC CER	28480	0160--4841
A28C39	0160--0300	3	1	CAPACITOR--FXD 2700PF ±10% 200VDC POLYE	28480	0160--0300
A28C40	0160--3572	7	1	CAPACITOR--FXD 330PF ±10% 500VDC CER	28480	0160--3572
A28C41	0160--4574	1	1	CAPACITOR--FXD 1000PF ±10% 100VDC CER	28480	0160--4574
A28CR1	1901--0033	2	3	DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A28CR2	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A28CR3	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A28CR4	1901--0518	8	4	DIODE--SM SIG SCHOTTKY	28480	1901--0518
A28CR5	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A28CR6	1901--0028	5	2	DIODE--PWR RECT 400V 750MA DO--29	28480	1901--0028
A28CR7	1901--0028	5		DIODE--PWR RECT 400V 750MA DO--29	28480	1901--0028
A28CR8	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A28CR9	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A28CR10	1901--0050	3	4	DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A28CR11	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A28CR16	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A28CR18	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A28L1	9140--0144	0	4	INDUCTOR RF--CH--MLD 4.7UH 10% .105DX.26LG	28480	9140--0144
A28L2	9140--0144	0		INDUCTOR RF--CH--MLD 4.7UH 10% .105DX.26LG	28480	9140--0144
A28L3	9140--0144	0		INDUCTOR RF--CH--MLD 4.7UH 10% .105DX.26LG	28480	9140--0144
A28L4	9140--0144	0		INDUCTOR RF--CH--MLD 4.7UH 10% .105DX.26LG	28480	9140--0144
A28MP1	4040--0750	7	1	EXTR--PC BD RED POLYC .062--BD--THKNS	28480	4040--0750
A28MP2	1205--0011	0	2	HEAT SINK TO--5/TO--39--CS	28480	1205--0011
A28MP3	1200--0173	5	5	INSULATOR--XSTR DAP--GL	28480	1200--0173
A28MP4	1480--0073	6	2	PIN--ROLL .062--IN--DIA .25--IN--LG BE--CU	28480	1480--0073
A28MP5	4040--0747	2	1	EXTR--PC BD GRA POLYC .062--BD--THKNS	28480	4040--0747
A28Q1	1854--0361	8	1	TRANSISTOR NPN 2N4239 SI TO--5 PD=6W	04713	2N4239
A28Q2	1854--0404	0	1	TRANSISTOR NPN SI TO--18 PD=360MW	28480	1854--0404
A28Q3	1855--0421	3	1	TRANSISTOR J--FET 2N5114 P--CHAN D--MODE	17856	2N5114
A28Q4	1855--0414	4	13	TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q5	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q6	1853--0038	4	3	TRANSISTOR PNP SI TO--39 PD=1W FT=100MHZ	28480	1853--0038
A28Q7	1854--0475	5	3	TRANSISTOR--DUAL NPN PD=750MW	28480	1854--0475
A28Q8	1853--0316	1	1	TRANSISTOR--DUAL PNP PD=500MW	28480	1853--0316
A28Q9	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q10	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q11	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q12	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q13	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q14	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q15	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A28Q16	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q17	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q18	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q19	1854--0475	5		TRANSISTOR--DUAL NPN PD=750MW	28480	1854--0475
A28Q20	1854--0809	9	3	TRANSISTOR NPN 2N2369A SI TO--18 PD=360MW	28480	1854--0809
A28Q21	1855--0278	8	1	TRANSISTOR J--FET 2N5116 P--CHAN D--MODE	17856	2N5116
A28Q22	1854--0809	9		TRANSISTOR NPN 2N2369A SI TO--18 PD=360MW	28480	1854--0809
A28Q23	1854--0809	9		TRANSISTOR NPN 2N2369A SI TO--18 PD=360MW	28480	1854--0809
A28Q24	1854--0475	5		TRANSISTOR--DUAL NPN PD=750MW	28480	1854--0475
A28Q25	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A28Q26	1853--0038	4		TRANSISTOR PNP SI TO--39 PD=1W FT=100MHZ	28480	1853--0038
A28Q27	1853--0038	4		TRANSISTOR PNP SI TO--39 PD=1W FT=100MHZ	28480	1853--0038
A28R1	2100--4004	8	4		28480	2100--4004
A28R2	2100--3094	4	2	RESISTOR--TRMR 100K 10% C SIDE--ADJ 17--TRN	02111	43P104
A28R3	2100--3094	4		RESISTOR--TRMR 100K 10% C SIDE--ADJ 17--TRN	02111	43P104
A28R4	2100--3161	6	1	RESISTOR--TRMR 20K 10% C SIDE--ADJ 17--TRN	02111	43P203
A28R5	2100--3352	7	2	RESISTOR--TRMR 1K 10% C SIDE--ADJ 1--TRN	28480	2100--3352
A28R6	2100--3054	6	1	RESISTOR--TRMR 50K 10% C SIDE--ADJ 17--TRN	02111	43P503
A28R7	2100--3056	8	1	RESISTOR--TRMR 5K 10% C SIDE--ADJ 17--TRN	02111	43P502
A28R8	2100--4004	8			28480	2100--4004
A28R9	2100--3352	7		RESISTOR--TRMR 1K 10% C SIDE--ADJ 1--TRN	28480	2100--3352
A28R10	2100--3274	2	1	RESISTOR--TRMR 10K 10% C SIDE--ADJ 1--TRN	28480	2100--3274
A28R11	0698--3637	4	1	RESISTOR 820 5% 2W MO TC=0+200	28480	0698--3637
A28R12	0698--6353	7	2	RESISTOR 50K .1% .125W F TC=0+25	28480	0698--6353
A28R13	0698--6624	5	6	RESISTOR 2K .1% .125W F TC=0+25	28480	0698--6624
A28R14	0757--0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+100	24546	C4--1/8--T0--7501--F
A28R15	0757--0288	1	1	RESISTOR 9.09K 1% .125W F TC=0+100	19701	MF4C1/8--T0--9091--F
A28R16	0757--0346	2	12	RESISTOR 10 1% .125W F TC=0+100	24546	C4--1/8--T0--10R0--F
A28R17	0757--0279	0	2	RESISTOR 3.16K 1% .125W F TC=0+100	24546	C4--1/8--T0--3161--F
A28R18	0698--3487	2	1	RESISTOR 255 1% .125W F TC=0+100	24546	C4--1/8--T0--255R--F
A28R19	0757--0462	3	1	RESISTOR 75K 1% .125W F TC=0+100	24546	C4--1/8--T0--7502--F
A28R20	0757--0424	7	1	RESISTOR 1.1K 1% .125W F TC=0+100	24546	C4--1/8--T0--1101--F
A28R21	0698--3447	4	1	RESISTOR 422 1% .125W F TC=0+100	24546	C4--1/8--T0--422R--F
A28R22	0757--0405	4	2	RESISTOR 162 1% .125W F TC=0+100	24546	C4--1/8--T0--162R--F
A28R23	0698--6360	6	10	RESISTOR 10K .1% .125W F TC=0+25	28480	0698--6360
A28R24	0698--3162	0	5	RESISTOR 46.4K 1% .125W F TC=0+100	24546	C4--1/8--T0--4642--F
A28R25	0698--3159	5	1	RESISTOR 26.1K 1% .125W F TC=0+100	24546	C4--1/8--T0--2612--F
A28R26	0698--3150	6	1	RESISTOR 2.37K 1% .125W F TC=0+100	24546	C4--1/8--T0--2371--F
A28R27	0757--0442	9	4	RESISTOR 10K 1% .125W F TC=0+100	24546	C4--1/8--T0--1002--F
A28R28	0698--6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698--6624
A28R29	0698--6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698--6360
A28R30	0698--3442	9	1	RESISTOR 237 1% .125W F TC=0+100	24546	C4--1/8--T0--237R--F
A28R31	0698--6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698--6624
A28R32	0757--0438	3	3	RESISTOR 5.11K 1% .125W F TC=0+100	24546	C4--1/8--T0--5111--F
A28R33	0698--0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+100	24546	C4--1/8--T0--1961--F
A28R34	0698--3438	3	1	RESISTOR 147 1% .125W F TC=0+100	24546	C4--1/8--T0--147R--F
A28R35	0698--3268	7	1	RESISTOR 11.5K 1% .125W F TC=0+100	24546	C4--1/8--T0--1152--F
A28R36	0698--8038	9	1	RESISTOR 5.9K .25% .125W F TC=0+50	19701	MF4C1/8--T2--5901--C
A28R37	0757--0447	4	1	RESISTOR 16.2K 1% .125W F TC=0+100	24546	C4--1/8--T0--1622--F
A28R38	0757--0394	0	2	RESISTOR 51.1 1% .125W F TC=0+100	24546	C4--1/8--T0--51R1--F
A28R39	0698--6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698--6360
A28R40	0698--6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698--6360
A28R41	0698--3153	9	2	RESISTOR 3.83K 1% .125W F TC=0+100	24546	C4--1/8--T0--3831--F
A28R42	0757--0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4--1/8--T0--10R0--F
A28R43	0757--0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4--1/8--T0--10R0--F
A28R44	0757--0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4--1/8--T0--10R0--F
A28R45	0757--0346	2		RESISTOR 10 1% .125W F TC=0+100	24546	C4--1/8--T0--10R0--F
A28R46	0698--3157	3	3	RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4--1/8--T0--1962--F
A28R47	0698--3157	3		RESISTOR 19.6K 1% .125W F TC=0+100	24546	C4--1/8--T0--1962--F
A28R48	0698--6320	8	3	RESISTOR 5K .1% .125W F TC=0+25	03888	PME55--1/8--T9--5001--B
A28R49	0698--6320	8		RESISTOR 5K .1% .125W F TC=0+25	03888	PME55--1/8--T9--5001--B
A28R50	0757--0280	3	7	RESISTOR 1K 1% .125W F TC=0+100	24546	C4--1/8--T0--1001--F
A28R51	0757--0439	4	1	RESISTOR 6.81K 1% .125W F TC=0+100	24546	C4--1/8--T0--6811--F
A28R52	0698--3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+100	24546	C4--1/8--T0--1782--F
A28R53	0698--6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698--6360
A28R54	0698--6360	6		RESISTOR 10K .1% .125W F TC=0+25	28480	0698--6360
A28R55	0698--6631	4	4	RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698--6631
A28R56	0698--3450	9	1	RESISTOR 42.2K 1% .125W F TC=0+100	24546	C4--1/8--T0--4222--F
A28R57	0698--6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698--6624
A28R58	0698--6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698--6624
A28R59	0698--6624	5		RESISTOR 2K .1% .125W F TC=0+25	28480	0698--6624
A28R60	0698--6631	4		RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698--6631
A28R61	0698--6631	4		RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698--6631
A28R62	0698--6631	4		RESISTOR 2.5K .1% .125W F TC=0+25	28480	0698--6631

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A28R63	0698--6353	7		RESISTOR 50K .1% .125W F TC=0±25	28480	0698--6353
A28R64	0698--3162	0		RESISTOR 46.4K 1% .125W F TC=0±100	24546	C4--1/8--T0--4642--F
A28R65	0757--0802	5	1	RESISTOR 162 1% .5W F TC=0±100	28480	0757--0802
A28R66	0698--3156	2	2	RESISTOR 14.7K 1% .125W F TC=0±100	24546	C4--1/8--T0--1472--F
A28R67	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A28R68	0698--8039	0	1	RESISTOR 8.87K .1% .125W F TC=0±25	19701	MF4C1/8--T9--8871--B
A28R69	0698--8498	5	1	RESISTOR 1.02K .1% .125W F TC=0±25	28480	0698--8498
A28R70	0698--8061	8	1	RESISTOR 8.25K .1% .125W F TC=0±25	19701	MF4C1/8--T9--8251--B
A28R71	0698--3157	3		RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4--1/8--T0--1962--F
A28R72	0757--0394	0		RESISTOR 51.1 1% .125W F TC=0±100	24546	C4--1/8--T0--51R1--F
A28R73	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A28R74	0698--6363	9	2	RESISTOR 40K .1% .125W F TC=0±25	28480	0698--6363
A28R75	0698--6363	9		RESISTOR 40K .1% .125W F TC=0±25	28480	0698--6363
A28R76	0698--6360	6		RESISTOR 10K .1% .125W F TC=0±25	28480	0698--6360
A28R77	0698--0084	9	2	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A28R78	0698--3162	0		RESISTOR 46.4K 1% .125W F TC=0±100	24546	C4--1/8--T0--4642--F
A28R79	0698--6360	6		RESISTOR 10K .1% .125W F TC=0±25	28480	0698--6360
A28R80	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A28R81	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A28R82	0757--0405	4		RESISTOR 162 1% .125W F TC=0±100	24546	C4--1/8--T0--162R--F
A28R83	0757--0440	7		RESISTOR 7.5K 1% .125W F TC=0±100	24546	C4--1/8--T0--7501--F
A28R84	0698--0084	9		RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A28R85	2100--4004	8			28480	2100--4004
A28R86	0698--6360	6		RESISTOR 10K .1% .125W F TC=0±25	28480	0698--6360
A28R87	0698--6320	8		RESISTOR 5K .1% .125W F TC=0±25	03888	PME55--1/8--T9--5001--B
A28R88	0698--6360	6		RESISTOR 10K .1% .125W F TC=0±25	28480	0698--6360
A28R89	0698--3162	0		RESISTOR 46.4K 1% .125W F TC=0±100	24546	C4--1/8--T0--4642--F
A28R90	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A28R91	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A28R92	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A28R93	0698--3160	8	4	RESISTOR 31.6K 1% .125W F TC=0±100	24546	C4--1/8--T0--3162--F
A28R94	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A28R95	0698--3162	0		RESISTOR 46.4K 1% .125W F TC=0±100	24546	C4--1/8--T0--4642--F
A28R96	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A28R97	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A28R98	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A28R99	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A28R100	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A28R101	0698--3449	6	1	RESISTOR 28.7K 1% .125W F TC=0±100	24546	C4--1/8--T0--2872--F
A28R102	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A28R103	0698--3160	8		RESISTOR 31.6K 1% .125W F TC=0±100	24546	C4--1/8--T0--3162--F
A28R104	0698--3160	8		RESISTOR 31.6K 1% .125W F TC=0±100	24546	C4--1/8--T0--3162--F
A28R105	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A28R106	0698--0085	0	2	RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4--1/8--T0--2611--F
A28R107	0698--3160	8		RESISTOR 31.6K 1% .125W F TC=0±100	24546	C4--1/8--T0--3162--F
A28R109	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A28R110	0698--3153	9		RESISTOR 3.83K 1% .125W F TC=0±100	24546	C4--1/8--T0--3831--F
A28R111	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A28R112	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A28R113	2100--4004	8			28480	2100--4004
A28R114	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A28R115	0698--0085	0		RESISTOR 2.61K 1% .125W F TC=0±100	24546	C4--1/8--T0--2611--F
A28R116	0757--0443	0	1	RESISTOR 11K 1% .125W F TC=0±100	24546	C4--1/8--T0--1102--F
A28R117	0698--3156	2		RESISTOR 14.7K 1% .125W F TC=0±100	24546	C4--1/8--T0--1472--F
A28R118	0757--0465	6	1	RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A28TP1	0360--0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP2	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP3	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP4	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28TP5	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A28U1	1826--0471	2	5	IC OP AMP LOW--DRIFT TO--99 PKG	28480	1826--0471
A28U2	1826--0616	7	1	IC OP AMP PRCN QUAD 14--DIP--C PKG	06665	OP--11EY
A28U3	1820--1934	2	2	IC CONV 8--B--D/A 16--DIP--C PKG	06665	DAC--08EQ
A28U4	1820--1934	2		IC CONV 8--B--D/A 16--DIP--C PKG	06665	DAC--08EQ
A28U5	1826--0785	1	1	IC OP AMP LOW--BIAS--H--IMPD DUAL 8--DIP--C	01295	TL072ACJG
A28U6	1826--0471	2		IC OP AMP LOW--DRIFT TO--99 PKG	28480	1826--0471
A28U7	1826--0026	3	2	IC COMPARATOR PRCN TO--99 PKG	01295	LM311L
A28U8	1826--0471	2		IC OP AMP LOW--DRIFT TO--99 PKG	28480	1826--0471
A28U9	1826--0853	4	1		28480	1826--0853
A28U10	1826--0471	2		IC OP AMP LOW--DRIFT TO--99 PKG	28480	1826--0471
A28U11	1826--0512	2	1	IC 78M15C V RGLTR TO--39	04713	MC78M15CG
A28U12	1820--1203	8	1	IC GATE TTL LS AND TPL 3--INP	01295	SN74LS11N
A28U13	1820--2056	1	1	IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS378N
A28U14	1820--1997	7	2	IC FF TTL LS D--TYPE POS--EDGE--TRIG PRL--IN	01295	SN74LS374N

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A28U15	1820--1997	7		IC FF TTL LS D--TYPE POS--EDGE--TRIG PRL--I	N01295	SN74LS374N
A28U16	1820--1216	3	1	IC DCDR TTL LS 3--TO--8--LINE 3--INP	01295	SN74LS138N
A28U17	1826--0759	9	3	IC COMPARATOR GP QUAD 14--DIP--C PKG	04713	LM339J
A28U18	1826--0759	9		IC COMPARATOR GP QUAD 14--DIP--C PKG	04713	LM339J
A28U19	1826--0759	9		IC COMPARATOR GP QUAD 14--DIP--C PKG	04713	LM339J
A28U20	1810--0395	6	1	NETWORK--RES 8--SIP47.0K OHM X 7	11236	750--81--R47K
A28U21	1810--0535	6	1	NETWORK--RES 16--DIP2.5K OHM X 8	28480	1810--0535
A28U22	1826--0471	2		IC OP AMP LOW--DRIFT TO--99 PKG	28480	1826--0471
A28U23	1826--0026	3		IC COMPARATOR PRCN TO--99 PKG	01295	LM311L
A28VR1	1902--3171	7	1	DIODE--ZNR 11V 5% DO--35 PD=.4W TC=+.062%	28480	1902--3171
A28VR2	1902--0175	5	1	DIODE--ZNR 100V 5% PD=1W IR=5UA	28480	1902--0175
A28W1	1460--1489	8	2	WIREFORM BE CU AG	28480	1460--1489
A28W2	1460--1489	8		WIREFORM BE CU AG	28480	1460--1489

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

Model 8340A - Service

A28 SYTM DRIVER, CIRCUIT DESCRIPTION

Introduction

The SYTM Driver provides the correct amount of current to the SYTM coil to track the YO frequency under all conditions. Since the SYTM uses an open-loop tracking scheme, all differences in tracking conditions must be compensated for by the SYTM driver without the benefit of feedback. The SYTM driver also provides the rest of the instrument with voltages that are proportional to frequency (-0.25 V/GHz, +1.0/+0.5 V/GHz, +1.4 v/GHz).

Offset Compensation A

The offset compensation circuitry adds a correction current independant of frequency. The offset, adjusted by R1, affects the entire operating range of the SYTM and has a range of ±200 MHz. A separate offset adjusted by R113 is active only in band 1 (switched by Q4) and has a range of ±150 MHz that is superimposed on the setting of R1.

Delay Compensation B

The SYTM magnet responds to any change in coil current, by setting up eddy currents to oppose the change. During a sweep, while the input current is ramping, the eddy currents set up a magnetic field that partially cancels the magnetic field required to tune the SYTM passband. A compensation current proportional to (A+BFs)dF/dt (where Fs is a term that represents the frequency change from the start of sweep, dF/dt corresponds to the sweep rate, and where A and B are constants) is added to the current driving the SYTM in order to offset the effects of the eddy currents. Since the eddy currents take time to set up, the start of the compensation ramp needs to be rounded. Although the transient response of the eddy currents doesn't appear to follow an exponential function, using a low-pass filter on the delay compensation adaquately accounts for the transient response.

The delay DAC (U3) gives the instrument processor control over the gain of the delay correction. When the processor writes to IO address 10,R2: a strobe (WBAND) is generated on the A27 Level Control Board. WBAND comes onto the SYTM driver through P1 Pin 29. When WBAND is pulsed, U14 latches the information on bits 3 through 10 of the Data Bus. The latched bits form the binary input to the delay DAC (U3). The reference input to the delay DAC is the sum of inputs coresponding to the A and BFs terms discussed in the first paragraph of this section. When Q10 is closed the voltage across C13 is self-adjusting to give 0V output from U5A. When Q10 is opened, the output of U5A is proportional to the -0.25 V/GHz line, offset by the voltage across C13. When

the instrument is sweeping, this generates a ramp that is referenced to the frequency at the time Q10 was opened. Q10 is open when HSP (P1 Pin 26) is high. The output voltage at U5A is summed into U2A through R7 (DYS) to give the BFs term for the delay compensation. The offset term A is adjusted through R6 (DYO) and summed into U2A as well. If the 8340A is sweeping 19.8 GHz to 26.5 GHz and if R6 (DYO) and R7 (DYS) are both turned fully counter-clockwise, then the output of U2A pin 1 will ramp up to about +9.7 V. R55 converts the output of U2A into the reference current (Iref) for the delay DAC (U3). Iref causes an equal current to flow from a series of binary weighted switches in U3. The binary switches are driven by the latched bits from U14. The internal binary weighted switches source the current from U3 pin 4 when the latched bits corresponding to the switches are HIGH.

When the latched bits are LOW the current is sourced from U3 pin 2. Thus when all of the latched bits are HIGH, U3 pin 4 will sink a current equal to Iref and U3 pin 2 will not sink any current. When all of the bits are LOW U4 pin 2 will sink a current equal to Iref and U3 pin 4 will not sink any current. The amount of current sunk by U3 pin 4 (I1) and U3 pin 2 (I2) will vary between the two extremes in proportion to the latched binary code with the sum of I1 and I2 equal to Iref. The voltage present at U2C pin 8 is equal to I1^*2K. In terms of the input current this becomes Iref^*N^*2K where N is the ratio of the binary input to the full scale binary input to the DAC. This gives (A+BFs)dF/dt to compensate for the eddy current delay. Q9 switches the delay compensation into the compensation summing amplifier at appropriate times. Q9 is on when HSP (P1 pin 26) is HIGH. Since HSP is also HIGH in CW the delay DAC (U3) is programmed to 0 by the processor because no delay compensation is required in CW operation. R46, R47 and C26 form a low-pass filter that rounds the first part of the delay compensation waveform.

Slope Compensation C

The slope compensation circuits generate a correction current proportional to frequency. The slope DAC (U4) provides microprocessor control over the slope correction and enables the 8340A to do the required self-peaking (see Block H description). When the processor writes to I/O address 11,R1: a strobe (WYTMSLP) is generated on the A27 Level Control Board. WYTMSLP comes onto the SYTM driver through P1 pin 30 and causes U15 to latch the binary input for U4. The reference input for U4 is the PRETUNE signal that has been scaled and inverted by U2B to give +1.4 V/GHz ±1%. This voltage is also output from P1 pin 7 and is used for the ramp bias of the step recovery diode in the SYTM.

The voltage present at U2D pin 14 is equal to the combined

effects of I1 (current sunk by U4 pin 4) and I2 (current sunk by U4 pin 2). The two current effects can be considered independantly and then added for the final result. To consider the effects separately, set one equal to zero and look at the effects of the other. No current will flow through R57 due to I1 so the voltage at U2D pin 14 due to I1 will be equal to -2K^I1. No current will flow through R58 due to I2 so the voltage at pin 14 due to I2 will be 2K^*I2. The voltage at U2D pin 14 due to both currents will be 2K^*(I2-I1). I1+I2=Iref and I1=N^*Iref (where N is the ratio of the binary input to the full scale binary input to the DAC). This gives a final result for the output voltage of U2D pin 14 to be PRETUNE^*4/8.9±1.3%)^*(1-2^*N). The output voltage of U2D pin 14 can vary by as much as ±7.97V which is summed into the compensation amplifier in Block G through R56. The output voltage on pins 2 and 4 of U4 can vary between -7.97V and 0V which is within the output voltage compliance of U4 (-8.1V and +21V). The DAC provides ±4% slope adjustment in band 1, ±2% in band 2, ±1.3% in band 3 and ±1% in band 4.

Since bits 0 through 2 are ignored when the data is latched into U15 from the data bus the binary pattern present at the input of the delay DAC increments once for every eight increments of the data on the Data Bus. Whenever the RPG is connected to U4 it will take eight pulses of the RPG to change the DAC by one bit. This will give a less sensitive feel to the RPG.

In addition to the correction provided by the slope DAC, three breakpoints are provided to correct for the non-linearities of the SYTM magnet B-H curve. R20, R21, R22, R18 and R17 form a voltage divider used in conjunction with CR1 and CR2 to set fixed frequency breakpoints at 13.7 GHz (±2%) and 20 GHz (±2%). R2 and R3 vary the effect of the breakpoints adding as much as 3.1% and 3.2% respectively. R4, R5 and CR3 form a breakpoint that can be varied in frequency (anywhere above 23.2 GHz) as well as adjusted to add as much as 4.0% to the slope. All percentage increases in slope are referenced to the frequency where the breakpoint begins to take effect.

Programmable Scaler D

The Pretune line comes to the SYTM driver board on P1 Pin 22. It is a voltage proportional to YO frequency and is adjusted to give -2.5 v/GHz with an accuracy of ±6.5mV ±7uV/degrees C -25ppm/degrees C.

The programmable scaler uses a precision resistor array (U21) to attenuate the PRETUNE voltage giving a voltage that is proportional to SYTM frequency. The overall accuracy depends on the accuracy of the PRETUNE line as well as that of the resistor

array. Hence, the specifications for the resistor array are important to the accuracy of the -0.25 V/GHz and +1.0/+0.5 V/GHz lines as well as to the tuning of the SYTM. The array consists of eight 2.5K resistors with a 5% absolute tolerance, .01% tracking tolerance relative to R1 (giving a worst case tolerance of .02% for any resistor ratio). The array also has a 2ppm/degrees C tracking temperature coefficient between any two resistors.

The latched band information (P1 Pins 31, 32, and 33 in Block I) is used as the input for a 3 by 8 decoder (U16). The outputs of the decoder are input into comparators (U19) that drive the gates of FETs to switch the appropriate node of the scaler. Band 1 is the node activated during the fundamental band of the 8340A. When this node is selected the impedance looking into the scaler is 1.6K. The output voltage is given by:

$$Vout=PRETUNE(1\pm0.047\%\pm4.7ppm/degrees\ C)/10$$

Over a 45 degrees C temperature rise at 7 GHz, the worst case error is 3.9mV which represents an error of ±16 MHz.

Band 2 is the node activated during the 2nd harmonic band of the 8340A. When this node is selected the impedance looking into the scaler is 1.3K. The output voltage is given by:

$$Vout=2\wedge*PRETUNE(1\pm0.032\%\pm3.2ppm/degrees\ C)/10$$

Over a 45 degrees C temperature rise at 13.5 GHz, the worst case error is 6.7mV which represents an error of ±27 MHz.

Band 3 is the node activated during the 3rd harmonic band of the 8340A. When this node is selected the impedance looking into the scaler is 2.6K. The output voltage is given by:

$$Vout=3\wedge*PRETUNE(1\pm0.03\%\pm3ppm/degrees\ C)/10$$

Over a 45 C temperature rise at 20 GHz, the worst case error is 9.8mV which represents an error of ±40 MHz.

Band 4 is the node activated during the 4th harmonic band of the 8340A. When this node is selected the impedance looking into the scaler is 2K. The output voltage is given by:

$$Vout=4\wedge*PRETUNE(1\pm0.024\%\pm2.4ppm/degrees\ C)/10$$

Over a 45 degrees C temperature rise at 26.5 GHz, the worst case error is 12.5mV which represents an error of ±50 MHz.

-0.25 V/GHz E

The -0.25 V/GHz line is the most widely used signal on the SYTM driver board. During HIBAND (Bands 1-4) it is a buffered version of the voltage out of the programmable scaler. U6 has a low offset voltage (1.6mV max over 0 C-70 C) and keeps the output within 1.6mV (6.4 MHz) of the input signal. During LOBAND ,Band 0, (Q11 closed and Q18 open) the instrument frequency is equal to the YO frequency offset by 3.7 GHz. The -0.25 V/GHz line uses the PRETUNE voltage, scales it down to -0.25 v/GHz and adds an offset voltage that equals .25 v/GHz^*3.7 GHz or .925V. This signal is generated using the +10V reference, offset R68, R69, and R70, and PRETUNE. When the LOBAND signal is adjusted at 10 MHz by trimming the +10V reference with R85 (Block K) the -0.25 V/GHz line will be accurate within 7 MHz of the ideal value at 2.2 GHz (including the resolution of the 12 bit PRETUNE DAC).

The worst-case error of 30 MHz occurs at 2.3 GHz over a 45 degrees C temperature change.

Q11 and Q18 switch between the LOBAND and HIBAND conditions. A sample and hold circuit (Q5 and U5B) is used to remove the discontinuities that are present due to changing the band number and PRETUNE at different times.

Q6 is capable of sourcing 2mA and sinking 40mA. The normal load requires sinking 7mA and sourcing 0.32mA. R65 limits the amount of output current to protect Q6 in the event the output is shorted. R27 along with the +20V supply provide the sourcing capability. C16 is required to stabalize the loop during the sample mode. The holding capacitor (C14) is a mylar capacitor with an insulation resistance of 15,000 megohms. U5B has a maximum input bias current of 8nA over 0 degrees C to 70 degrees C (100 pA at 25 degrees C). Q5 has a maximum drain cutoff current of 0.1nA. The maximum droop is 260 mV/sec. A normal holding interval is about 5 msec resulting in a maximum droop of 1.3mV during the holding interval. This value drops substancially at instrument temperatures lower than 70 degrees C. The maximum droop at room temperature is 20 mV/sec or 0.1mV during a holding interval of 5 msec. When the circuit is in the hold mode (Q5 open) R32 and diodes CR4 and CR5 keep U6 from saturation and making the output of U6 a buffered version of the input to U6. The output of U6 is used as a pullup voltage for the comparators driving the FET's in Blocks D (Programmable Scaler) and E (-0.25 V/GHz). The output of U6 also drives the guard trace described in the Current Driver description (Block H). Without the clamping provided in the hold mode, the input diode protection of U6 would shunt current along the input disturbing the desired SYTM tuning. Because U6 doesn't saturate, the transition from hold to sample occurs with a minimal perturbation. R33 attenuates the amplitude of the hold-to-sample perturbation. R30 eliminates the ringing of the perturbation.

+1.0/+0.5 V/GHz F

This block provides a voltage proportional to instrument frequency that is sent to the rear panel. The standard configuration has a sensitivity of +1.0 v/GHz. This limits at around +19V (+20V supply tolerance and 0.4V saturation across Q7). The +1.0 v/GHz sensitivity is necessary to interface with 8410 Series Network Analyzer. The limit of +19V doesn't matter in this case because the 8410 only covers up to 18.6 GHz. For applications involving the entire frequency range, 2 jumpers (W1 and W2) on the SYTM driver board can be removed to change the sensitivity to +0.5 v/GHz.

Q8 and R37 provide a current source that limits at approximately +19.7 volts. The current is on the order of 1.2mA (not exact because the transistor parameters of each half will differ due to the difference in their power dissipation). This current in conjunction with R41 will give about a +5 volt offset from the output of U10. This removes the effect of op amp limiting which happens as low as +17V for U10. C19 insures that the 0dB gain crossover for the loop has a slope of -6dB/octave. Q7 is a dual npn transistor, one side Q7B is used as a drive transistor for the output, the other side is used in conjunction with R38 to limit the output current to 7.8mA. CR6 and CR7 protect the circuitry from voltages that may inadvertantly be applied to the output. R73 and the -10V supply provide pulldown capabilities for the output. R75 with R40 and R39 cause the output to be referenced to the ground potential at the rear panel. R42, R43, C20 and C21 are used for high frequency noise rejection of the power supplies.

Compensation Summing Amplifier G

The currents that are generated by the slope, offset and delay compensation circuitry are amplified by a factor of 25 by U1 and injected into the collector of the drive transistor A47Q2. The effect of R13 is that of paralleling R13 across the sense resistors on the A47 assembly plus adding an additional current equal to the voltage at the emitter of Q1 divided by R13. Q1 is used to buffer the output of U1 to allow the amplifier to have a higher output voltage capability. R11 and the -10 volt supply provide a sink capability. The compensation summing amplifier U1 is able to pull the passband of the SYTM over the range of -220 MHz to +625 MHz. Q3 is a p-channel FET used to switch the compensation out during kick pulses (see Block J). Q2, R116 and R117 drive the gate of Q3 to +20 volts to turn it OFF and to 0 volts to turn it ON.

Current Driver H

When considering the errors of the current driver, only the temperature effects need be considered since the steady-state errors are adjusted out when the instrument is calibrated.

The temperature errors indicate the need for a self peaking routine for the 8340A. The 1dB passband is on the order of 25-30 MHz in band 4, assuming the instrument is calibrated to center the tracking in the middle of the passband, the errors that could result from a temperature drift would cause power losses greater than any tolerable level.

The sensitivity of the input node of the current driver is 4 MHz/mV. The impedance of the line can be as much as 2.6K. In order to keep the errors due to leakage currents less than 1 MHz, the leakage currents must be kept below 100nA, otherwise potential problems could exist. To avoid the problems, guard traces are placed around the sensitive traces. The guard traces are driven by a buffered version of the same voltage.

A triple darlington configuration (Q26, Q27, and drive transistor A47Q2) is used to remove the effects of the variation of the beta of the drive transistor due to temperature. With the triple darlington configuration, the base current into the OP-07 (U22) is less than 15uA so any variations in this current due to temperature would influence the tracking by less than 1MHz. R110 and R100 are used to keep a small amount of current flowing through Q26 and Q27.

Due to the inductance of the SYTM coil, a voltage spike is generated when the current ramp is reset. The zener diode, VR2 prevents this voltage kick from exceeding the breakdown voltage for the transistors by controlling the maximum allowed rate of change of current from the driver. CR10 protects the base-emitter junction of Q26 from large voltages that could cause a breakdown. CR11 is a low capacitance diode that is placed in series with VR2 to reduce the effect of the zener diode's junction capacitance. R111 is added to eliminate the ringing that would otherwise be present at retrace. There is also a zener diode protection circuit on the SYTM bias board. This circuit clamps the inductive voltage at a higher voltage (about 140V) than the one on the driver board (about 125V). The primary purpose for this cicuit is to protect the drive transistor located on the A47 Sense Resistor assembly in the event that someone removes the A28 SYTM Driver board while the instrument is under power.

The breakdown voltage of the drive transistor is 400V. Q26 and Q27 have breakdown voltages of 160V so the clamping circuit on the bias board would also protect them if the clamping circuit on the driver board fails. Due to the method employed by the

clamping circuit on the SYTM driver, the sense resistors always give an indication of the amount of current flowing through the coil. This voltage is used by the kick pulse comparators to sense the amount of current in the coil. If the clamping circuit on the driver board fails, there would be no negative (in frequency) kick pulse and the delay compensation wouldn't be as effective. However the rest of the circuit would work because the clamping circuit on the SYTM bias board would protect the transistors.

Since the sensitivity of the SYTM's can vary from 14.2 mA/GHz to 16 mA/GHz, the gain of the current driver must be able to accomodate that range. The SYTM driver can tune between 14 mA/GHz and 16.5 mA/GHz.

The output drive stage is limited in current drive capability due to the voltage rails. The critical factors are:

Maximum voltage across the sense resistors	798V
Maximum saturation voltage of transistors	2.25V
Additional drop due to wiring from 40V sense	0.22V
Minimum voltage across drive strip	39.45V
Inductance of coil	about 0.6H
Maximum sweep rate	600 MHz/msec
Resistance of coil at 25 degrees C	about 42 ohms
TC of coil resistance	+0.545%/degrees C
Current not sensed in sense resistors	about 12mA

C39, C40, and R101 are used to match the frequency response of the SYTM coil to the frequency response of the YO coil. The sweep output on the front and rear panels is also matched.

During a bandswitch the -0.25 V/GHz voltage is more accurate for holding the SYTM at the desired current than is the normal attenuated PRETUNE voltage (see Block H). At these times the -0.25 V/GHz line is gated by Q12 to override the attenuated PRETUNE voltage to hold the SYTM and avoid the undesired kick pulses that would be present due to the discontinuities on the attenuated PRETUNE line. When the instrument is in Band 0 the SYTM magnet is tuned to about 4GHz to keep the yig sphere from interferring with the output. Tuning the SYTM to 4GHz is accomplished by closing Q17. R109, Q21, and Q25 will be discussed under Kick Pulses (Block J).

Digital Control I

The following digital control signals are used on the SYTM driver board:

HSP: (P1 Pin 26) A signal from the A59 Digital Interface board

that is high when the instrument is sweeping and low at bandcrossings and retrace. HSP is used to generate the DELAY and DLY RES signals which control Q10 and Q9 in Block B.

WBAND: (P1 pin 29) (10,R2:) Block B - A strobe from the A27 Level Control board used by U14 to latch data from the Data Bus for U3 (delay DAC).

WYTMSLP: (P1 pin 30) (11,R1:) Block C - A strobe from the A27 Control board used by U15 to latch data from the data bus for U4 (slope DAC).

WYTMCTL: (P1 pin 8) (11,R3:) Block I - A strobe from the A27 Level Control board used by U13 to latch S/H from Data Bit 3, SYTMSEL from Data Bit 4, KICK TRIGGER from Data Bit 5.

KICK TRIGGER: (U13 pin 7 Block I) Initiates the SYTM kick pulse in Block J when set momentarily HIGH. KICK TRIGGER is a pulse that is about 20 usec wide.

SYTMSEL: (U17B pin 1) controls the gate signal for Q12 in Block H.

S/H (DB3), LYTMKICK, and LYOKICK (P1 pin 41): Used by U12A (Block I) to generate the sample signal which controls Q5 in Block E.

HLB0 (P1 pin 31), HLB1 (P1 pin 32) and HLB2 (P1 pin 33): Give latched band information decoded by U16 to control Q13, Q14, Q15, and Q16 in Block D, to generate the HET signal which controls Q17 in Block H, and to generate the LO Band and HI Band signals which control Q11 and Q18 in Block E.

HENDKICK: (U12B pin 6 Block I) A signal that is HIGH when both the SYTM and YO kick pulses are OFF and it is routed to the A24 Attenuator Driver board to be read by the processor. If HENDKICK remains LOW for more than 90 msec the processor ignores it and activates the fault light indicating a KICK error.

U17, U18, and U19 are open collector quad comparators used to drive all of the FET switches on the board (except Q3, Q21 and Q25). The inputs to the FETs are TTL level signals. The outputs are pulled to -15V for low output and pulled up to the level set by the pullup resistor connected to the individual comparators. R93 and R94 set the switching threshold of 1.3V for the comparators.

Kick Pulses J

In order to set up a uniform past history for each sweep and to force the SYTM to settle faster, a sequence of kick pulses is used at the end of each sweep with a start frequency less than 22.5 GHz. Sweeps with start frequencies greater than 22.5 GHz are not kicked. When kicked, the STYM is kicked positive in frequency until a predetermined current is reached, then the SYTM is kicked negative in frequency until a second predetermined current is reached, it then is allowed to settle from that point. The kick pulses minimize the differences between the various sweep conditions (continuous, line, external, single, and alternate). They are not needed at bandcrossings because the SYTM's past history at bandcrossings is similar to that provided by the kick pulses.

When Q21 and Q25 in Block H are both open the base current to the triple darlington is removed and the drive current decays to zero current resulting in a negative (in frequency) kick pulse. With Q25 open and Q21 closed the driver saturates and the current heads towards its maximum steady-state value giving a positive kick pulse.

The frequency to which the SYTM is tuned is proportional to the current through the SYTM coil. The current through the coil is sensed by sensing the voltage on the sense resistor (at P1 pin 44). This voltage is compared with adjustable preset levels by the two comparators (U7, U23) that drive Q21 and Q25.

It is necessary to deactivate the comparators when kick pulses are not desired so they don't interfere with the normal tuning of the SYTM. LM311's were chosen for the comparators because of the strobe pin that allows the comparators to be deactivated. In the deactivated state, the comparators will have a high output. Normal operation of the current driver requires Q25 to be an n-channel FET (normally ON) and Q21 to be a p-channel FET (normally OFF). The outputs of the comparators are used in the control of the strobe. The comparators are deactivated when 3 to 5mA of current is drawn out of pin 6. Hence, U23 is deactivated when Q24A is turned ON. Likewise, U7 is deactivated when Q19A is turned ON. Q19B and Q24B are used as current mirrors with the necessary gain to insure that Q19A and Q24A have 3 to 5mA in the OFF state. R114 and R82 set the current ratio between Q19A and Q19B. R115 and R108 set the ratio between Q24A and Q24B.

Q21 is turned OFF when the gate voltage is more positive than -11V but the gate voltage shouldn't exceed +15V due to a 30 volt Vgs breakdown specification for Q21. When the comparator is in the HIGH state R81 pulls the comparator output up to +5.2V. R83 feeds this level into the base of Q19A to latch the comparator into the HIGH state. In order for the comparator to become active Q19A must be turned OFF. This is accomplished by pulling the base

voltage down below 0.6V. When the kick pulse is desired, Q20 is momentarily turned ON which pulls the voltage down at the base of Q19A turning Q19A OFF and thus activating the comparator. If the voltage on the sense resistor is more positive than the voltage set by R10, the output of comparator U7 will go LOW (-15V) turning Q21 ON and keeping Q19A OFF. CR8 keeps the output of U7 from pulling the base of Q19A below -0.4V. The comparator remains in this state until the voltage on the sense resistor reaches the threshold set by R10. The output of the comparator then switches to +5.2V turning Q21 OFF and Q19A ON which latches the comparator into the HIGH state until Q20 is again pulsed ON.

Q25 is turned OFF when the gate voltage goes to -15V and turned ON when the voltage is pulled up to the level of Q25's source voltage. U23 has an open collector output so the gate of Q25 is pulled up to the same voltage as the source by R103 in Block H. Again the the output of the comparator (U23) is used to latch itself into its HIGH state. In order to activate U23, Q24A must be turned OFF. This is accomplished by pulsing Q23 ON. The comparator then switches to its active mode and if the voltage sensed at the sense resistor is more negative than the level set by R9, the output of the comparator goes to -15V which turns Q25 OFF and turns Q22 ON. When Q22 is ON it keeps U23 in the active mode by keeping Q24A OFF. CR9 keeps Q22 from pulling the base of Q24A below -0.4V. The 11 volt zener (VR1 in Block H) insures that the output of the op amp won't go negative enough to turn Q22 OFF when the comparator is in the LOW state. R102 is chosen in conjuntion with the 11 volt zener to insure that Q22 will be able to pull the base of Q24A to 0 volts.

Thus, when a kick pulse trigger (KICK T) is sent by the microprocessor (by setting the common point of R107 and R104 to a HIGH TTL logic level) both comparators are activated and Q25 is turned OFF while Q21 is turned ON (R9 and R10 are adjusted to levels out of the normal SYTM operating range). Q21 remains ON causing the current to the coil to increase until the threshold set by R10 is reached. U7 then turns Q21 OFF and latches in this state. The coil current then decreases until the threshold set by R9 is reached. U23 then turns Q25 ON and latches in this state. Both comparators remain in their latched state until another trigger pulse is sent. U23 is in it's active mode during both kick pulses. LYTMKICK is a TTL level signal that is LOW when Q24A is OFF indicating when the kick pulses are active. LYTMKICK (offset by a diode drop) is also used to switch out the compensation during the kick pulses (see section G). If the compensation were left in it would be able to interfere with the current sense level to the extent that the negative kick pulse wouldn't shut OFF.

Voltage Reference K

The +10 VREF and -10 VREF are generated for cases where accurate supply voltages are needed. The +10V reference is adjusted by R85 to null the offset error in Band 0 of the +1.0/+0.5 V/GHz lines (see Block F). It has a maximum temperature drift of 25 ppm/degrees C. R84 is used to reduce the loading on the +10V reference (U5). U13, R86, R87 and R88 form a voltage inverter creating a -10V reference supply.

Power Supplies L

The power supplies coming to the board are: the +20V supply (P1 pins 1 and 23), the +5.2V supply (P1 pins 2 and 24), the -10V supply (P1 pins 3 and 25), the -15V supply (P1 pin 4) and the -40V supply (P1 pins 5 and 27). All supplies coming onto the board (except the -40V supply) are filtered by low-pass filters consisting of a 4.7uH inductor in series with the supply followed by a 1uF capacitor shunting across the supply to power ground. The -40V supply (P1 pins 5 and 27) is used as a reference voltage in block H (Current Driver) and is not shown in block L of the schematic.

U11 regulates the +20V supply and provides a +15V supply to the rest of the board.

TROUBLESHOOTING PROCEDURE

NOTE

Perform the following tests shown in Roman numerals. If one of the steps fail, perform the associated substeps shown in uppercase alpha characters. If one of the steps in uppercase alpha characters fail, perform the associated substeps shown in numeric characters.

I. Check the voltages on the power supplies. P1 Pins 1,23 should be +20V +-0.2V, P1 Pins 2,24 should be +5.2V +-0.05V, P1 Pins 3,25 should be -10V +-0.1V, P1 Pin 4 should be -15V +-0.2V, P1 Pins 5,27 should be -40V +-.7V, U9 Pin 6 should about +10V adjustable by R85 and U10 pin 6 should be the negative of U9 Pin 6 +-1.3mV.

II. Set 8340A to CW 10MHz and adjust R85 (Block K) until the voltage out of the +1.0 V/GHz backpanel connector reads 10mV +-1.5mV.

A. If +1.0 V/GHz line won't adjust to 10mV at 10MHz then check U9 pin 6. Output should vary around +10V as R85 is varied.

B. Check the -0.25 V/GHz line, R85 should be able to adjust it to 2.5mV +-0.05mV. If OK then check P1 Pin 17, it should read 10mV +-1.5mV when adjusted by R85. If it is correct at P1 Pin 17 then the rear panel BNC isn't connected to the +1.0 V/GHz line.

1. R41 (Block F) should have about 5V across it.

2. U8 (Block F) shouldn't be saturated.

3. R38 should have less than 0.4V across it. If R38 has 0.4V or more, check the +1.0 V/GHz line for an output short.

C. Check PRETUNE line at P1 Pin 22. It should read -9.25V +-4mV.

1. Pull out A28 SYTM driver board and verify that the PRETUNE line is valid on the A54 YO Pretune board (TP3). Troubleshoot or adjust as necessary.

D. The gate of Q11 should have the same voltage as U6 pin 6 and the gate of Q18 should be about -15V.

1. U16 Pin 13 (Block I) should be LOW. U16 Pins 12, 11, and 10 should be HIGH.

a. U16 pins 1 and 3 should be LOW. U16 Pin 2 should be HIGH. If not, pull out SYTM driver board and verify the latched band information on the A27 Level Control board; otherwise replace U16.

E. The gate of Q5 should have the same voltage as U7 pin 6.

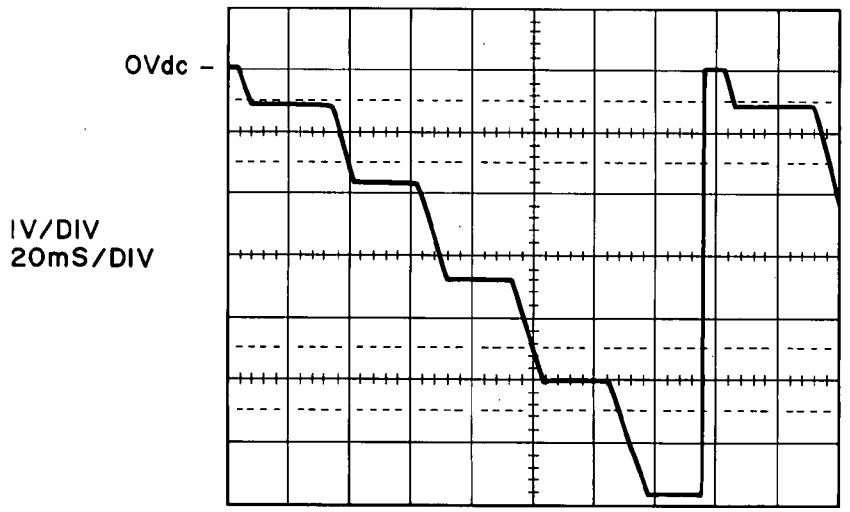
1. U14 Pin 1 should be low, it is an input to a three input and gate whose output U14 Pin 12 should also be low.

a. If U14 Pin 1 isn't low check latch U15 for correct
a. If U12 Pin 1 (Block I) isn't LOW check latch U13 for correct operation
by using the signature analyzer test described Assembly. IO channel 11 subchannel 3 is the address of the strobe used with U15. This test may also be done the strobe used with U13. This test may also be done 'SHIFT GHz 11 Hz SHIFT MHz 3 Hz SHIFT KHz 8 Hz'. U15 'SHIFT GHz 11 Hz, SHIFT MHz 3 Hz, SHIFT KHz 8 Hz'. U13 Pin 2 should be HIGH. Then enter '65527 Hz' U13 Pin 2 should now be LOW. If either condition fails, it indicates a problem with either the Data Bus or U13.

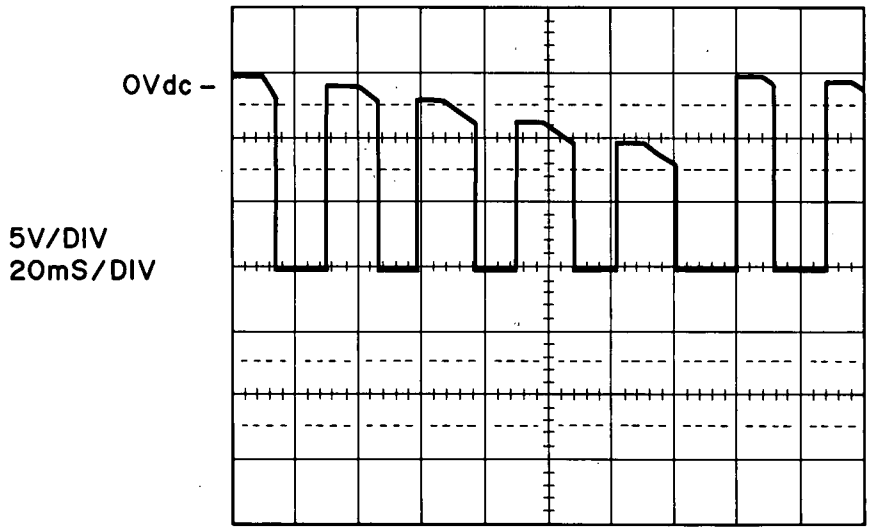
III. Connect voltmeter rear panel to +1.0 V/GHz BNC. It should vary with the instrument frequency up to about 19V. Check test point A28 TP4 labeled V/GHz to verify correct operation. The voltage at TP4 should read -0.25 v/GHz times the instrument frequency. The voltage readings should be within the following limits at room temperature:

Frequency	-0.25 V/GHz	+1.0 V/GHz
2.2 GHz	+-4mV	+-22mV
5 GHz	+-3mV	+-25mV
10 GHz	+-4mV	+-34mV
15 GHz	+-5mV	+-52mV
18 GHz	+-5mV	+-58mV
22 GHz	+-6mV	
26 GHz	+-6mV	

Check the waveform at TP4 (V/GHz) during a full-band sweep. There should be no discontinuities during a bandswitch. It should look like:



A. Check the voltage at the gate of Q5 during the sweep, it should have the the following waveform:



B. Check PRETUNE line at P1 Pin 22. It should read -2.5 v/GHz (relative to YO frequency).

1. Pull out A28 SYTM driver board and verify that the PRETUNE line is valid on the A54 YO Pretune board (TP3). Troubleshoot or align where necessary.

C. In CW operation, the gate of Q12 (Block H) should be at -15V. In band 0, Q11 should be at the same level as U6 pin 6 while Q13, Q14, Q15, Q16 and Q18 should be at -15V. In band 1, Q15 and Q18 should be at the same level as U6 pin 6 while Q11, Q13, Q14 and Q16 should be at -15V. In band 2, Q16 and Q18 should be at the same level as U6 pin 6 while Q11, Q13, Q14 and Q15 should be at -15V. In band 3, Q13 and Q18 should be at the same level as U6 pin 6 while Q11, Q14, Q15 and Q16 are at -15V. In band 4, Q14 and Q18 should be at the same level as U6 pin 6 while Q11, Q13, Q15 and Q16 are at -15V.

1. Check latched band information on U16 (Block I) Pins 1, 2 and 3 (P1 Pins 31, 32 and 33). Pin 1 should be HIGH in bands 0, 2 and 4 and LOW in bands 1 and 3. Pin 2 should be HIGH in bands 1 and 2 and LOW in the other bands. Pin 3 should be HIGH in bands 3 and 4 and LOW in the other bands.

2. Pull out SYTM driver board and verify the latched band information on the A27 Level Control board.

3. Verify U16, all outputs should be high except for pin 14 in band 0, pin 13 in band 1, pin 12 in band 2, pin 11 in band 3 and pin 10 in band 4.

D. Check U22 (Block H) to see if it is saturated. If saturated the voltages on pins 2 and 3 will differ. Since there is input diode protection, current will shunt along the input path through the programmable scaler causing an error voltage to be added to the V/GHz lines.

1. Measure the voltage at A28 TP 5 labeled "SRS" to determine the current flowing through the SYTM coil. If the voltage is around 8V or more. the SYTM output current drive is saturated. Check for collector to emitter shorts in Q26 , Q27 and the drive transistor A47Q2 on the sense resistor bracket. If the drive transistor is shorted the same voltage that appeared on the "SRS" test point should appear on A62XA28 Pin 20 with the A28 SYTM driver removed. Also verify that the gate of Q21 is at +5V in CW operation.

2. If the output of U22 is against the negative supply rail check to make sure that Q25 is on during CW operation.

a. Measure the base-emitter voltages of Q26, Q27 and the drive transistor. Replace the trasnsitors that have abnormal base-emitter voltages. Normal base-emitter voltages should be about -0.6V.

E. Check U6 (Block E), U5B and Q6 if still having problems with the -0.25 V/GHz line.

IV. Look at the waveform at TP 5 labeled "SRS" during a sweep.
R9 (Block J) should adjust the height of the negative kick pulse (about -9V),
R10 should adjust the depth of the positive kick pulse (about 0V),
and R8 (Block H) should adjust the overall amplitude of the waveform.

A. Check the emitters of Q24A and Q19A to verify that the pulse trigger is reaching that point.

1. If no kick pulses are present check pin 7 of U13 (Block I) for a positive trigger pulse.

B. Check the inputs and ouputs of U23 and U7 to see if they become active at all.

C. If only a positive kick pulse is present, check P1 Pin 42 (SYTM COIL+). The voltage should drop to -125V +-7V. If it drops to about -140V it means that the diode on the SYTM bias board is clamping the coil voltage. Check VR2 and CR11 in Block H. If it drops less, the zener diode on the SYTM bias board may be breaking down at too low a voltage.

V. Look at TP1 "CMP" (Block G) and verify that R1 (Block A), R2, R3, R4 and R5 (Block C) can affect output at 26.5 GHz. Verify that U4 (Block C) and R1 (Block A) can both increase and decrease the compensation.

VI. Look at the voltage across C26 (TP2 Block B) during sweep. It should look like a ramp with an offset. The knee should be rounded. This waveform should restart at each bandcrossing. The overall amplitude should vary with sweep time. R6 (DVO) should vary the height of the knee and R7 (DVS Block B) should vary the slope of the ramp.

A. If there is no signal check Q9, it should be gated by HSP via U18 pin 14. Check U2 pin 10 and U2A pin 1.

B. If there is no slope, or if the slope doesn't reset at bandcrossings, check Q10 (gated by HSP via U18 pin 1). Also check U5A pin 1.

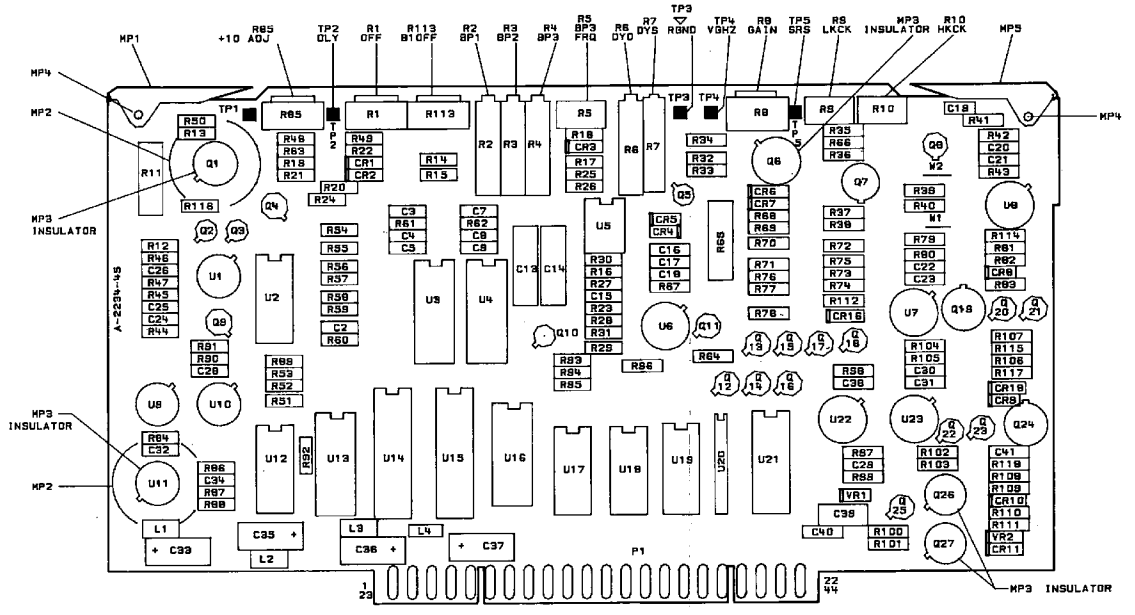


Figure 71-1. A28 SYTM Driver, Component Location Diagram

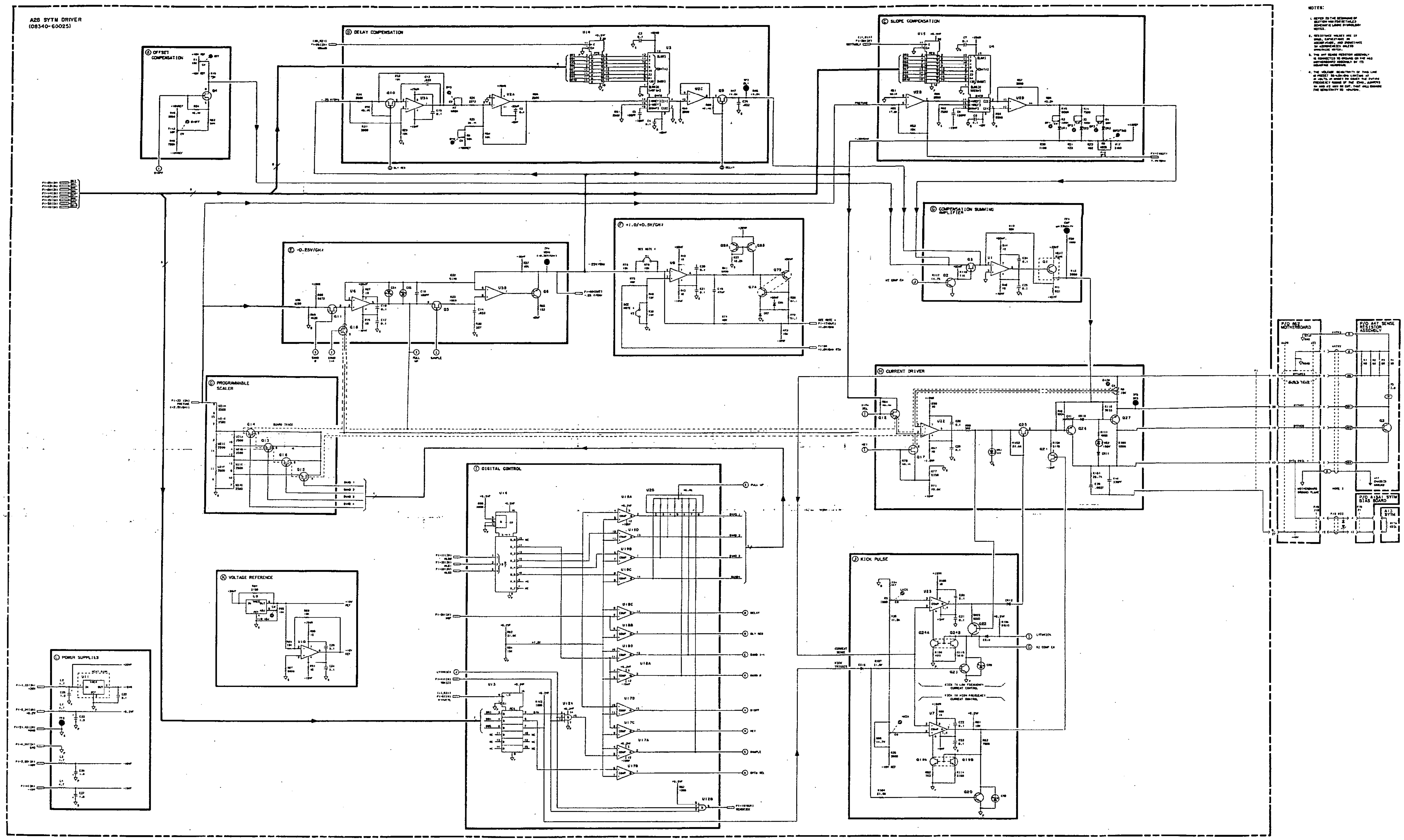


Figure 7I-2. A28 SYTM Driver, Schematic Diagram
CHANGE 1

CHANGE H

Change H is extensive and only applies to the A53 Negative Regulator assembly, **HP Part Number 08340-60005**. The following pages apply directly to the 08340−60005 and should be used when servicing this assembly.

Refer to the following A53 Parts List, Theory, Component Location Diagram, and Schematic for backdated information.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A53	08340--60005	4	1	NEGATIVE REGULATOR	28480	08340--60005
A53C1	0160--4807	3	2	CAPACITOR--FXD 33PF ±5% 100VDC CER 0±30	28480	0160--4807
A53C2	0160--4807	3		CAPACITOR--FXD 33PF ±5% 100VDC CER 0±30	28480	0160--4807
A53C3	0160--4535	4	2	CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A53C4	0160--4834	6	2	CAPACITOR--FXD .047UF ±10% 100VDC CER	28480	0160--4834
A53C5	0180--0228	6	2	CAPACITOR--FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A53C6	0180--1746	5	1	CAPACITOR--FXD 15UF±10% 20VDC TA	56289	150D156X9020B2
A53C7	0180--0291	3	2	CAPACITOR--FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A53C8	0180--0291	3		CAPACITOR--FXD 1UF±10% 35VDC TA	56289	150D105X9035A2
A53C10	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A53C11	0160--4834	6		CAPACITOR--FXD .047UF ±10% 100VDC CER	28480	0160--4834
A53C12	0180--0228	6		CAPACITOR--FXD 22UF±10% 15VDC TA	56289	150D226X9015B2
A53C13	0180--2610	4	1	CAPACITOR--FXD 10UF±10% 75VDC TA	00904	T110A106K075AS
A53C14	0180--0374	3	1	CAPACITOR--FXD 10UF±10% 20VDC TA	56289	150D106X9020B2
A53CR1	1901--0033	2	10	DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR2	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR3	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR4	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR5	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR6	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR7	1901--0662	3	4	DIODE--PWR RECT 100V 6A	04713	MR751
A53CR8	1901--0662	3		DIODE--PWR RECT 100V 6A	04713	MR751
A53CR9	1901--0028	5	1	DIODE--PWR RECT 400V 750MA DO--29	28480	1901--0028
A53CR10	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR11	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR12	1901--0662	3		DIODE--PWR RECT 100V 6A	04713	MR751
A53CR13	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR14	1901--0518	8	1	DIODE--SM SIG SCHOTTKY	28480	1901--0518
A53CR15	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A53CR16	1901--0662	3		DIODE--PWR RECT 100V 6A	04713	MR751
A53DS1	1990--0487	7	3	LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4584
A53DS2	1990--0487	7		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4584
A53DS3	1990--0487	7		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4584
A53E1	1251--2313	6	4	CONNECTOR--SGL CONT SKT .04--IN--BSC--SZ RND	28480	1251--2313
A53E2	1251--2313	6		CONNECTOR--SGL CONT SKT .04--IN--BSC--SZ RND	28480	1251--2313
A53E3	1251--2313	6		CONNECTOR--SGL CONT SKT .04--IN--BSC--SZ RND	28480	1251--2313
A53E4	1251--2313	6		CONNECTOR--SGL CONT SKT .04--IN--BSC--SZ RND	28480	1251--2313
A53F1	2110--0425	0	1	FUSE 2A 125V .25X.27	28480	2110--0425
A53F2	2110--0332	8	1	FUSE 3A 125V .25X.27	28480	2110--0332
A53F3	2110--0056	3	1	FUSE 6A 250V NTD 1.25X.25 UL IEC	75915	312006
A53MP1	2110--0643	4	1	FUSEHOLDER--CLIP TYPE 15A 250 V	28480	2110--0643
A53MP2	0590--0526	6	1	THREADED INSERT--NUT 4--40 .065--IN--LG SST	28480	0590--0526
A53MP3	2200--0105	4	1	SCREW--MACH 4--40 .312--IN--LG PAN--HD--POZI	00000	ORDER BY DESCRIPTION
A53MP4	5040--6852	3	1	EXTRACTOR, ORANGE	28480	5040--6852
A53MP5	5000--9043	6	1	PIN:P.C. BOARD EXTRACTOR	28480	5000--9043
A53MP6	85662--00029	7	1	HEAT SINK	28480	85662--00029
A53MP7	1200--0173	5	2	INSULATOR--XSTR DAP--GL	28480	1200--0173
A53MP8	1205--0011	0	1	HEAT SINK TO--5/TO--39--CS	28480	1205--0011
A53MP9	1200--0173	5		INSULATOR--XSTR DAP--GL	28480	1200--0173
A53Q1	1884--0244	9	1	THYRISTOR--SCR VRRM=400	3L585	S2600D
A53Q2	1854--0404	0	2	TRANSISTOR NPN SI TO--18 PD=360MW	28480	1854--0404
A53Q3	1854--0271	9	1	TRANSISTOR NPN SI TO--39 PD=1W FT=150MHZ	28480	1854--0271
A53Q4	1854--0404	0		TRANSISTOR NPN SI TO--18 PD=360MW	28480	1854--0404
A53Q5	1884--0018	5	2	THYRISTOR--SCR 2N4186 VRRM=200	04713	2N4186
A53Q6	1884--0018	5		THYRISTOR--SCR 2N4186 VRRM=200	04713	2N4186
A53Q7	1854--0477	7	1	TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A53R1	0812--0021	8	3	RESISTOR .47 5% 3W PW TC=0±90	91637	CW2B1--3--T2--47/100--J
A53R2	0812--0021	8		RESISTOR .47 5% 3W PW TC=0±90	91637	CW2B1--3--T2--47/100--J
A53R3	0812--0021	8		RESISTOR .47 5% 3W PW TC=0±90	91637	CW2B1--3--T2--47/100--J
A53R4	0757--0421	4	1	RESISTOR 825 1% .125W F TC=0±100	24546	C4--1/8--T0--825R--F
A53R5	0757--0439	4	1	RESISTOR 6.81K 1% .125W F TC=0±100	24546	C4--1/8--T0--6811--F
A53R6	0757--0401	0	3	RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A53R7	0757--0159	5	2	RESISTOR 1K 1% .5W F TC=0±100	28480	0757--0159
A53R8	0757--0279	0	5	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A53R9	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A53R10	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A53R11	0698--8817	2	2	RESISTOR 2.61 1% .125W F TC=0±100	28480	0698--8817
A53R12	0698--3444	1	5	RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A53R13	0757--0346	2	3	RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A53R14	0698--3442	9	1	RESISTOR 237 1% .125W F TC=0±100	24546	C4--1/8--T0--237R--F
A53R15	0811--1080	9	2	RESISTOR 2.2 5% 3W PW TC=0±50	28480	0811--1080

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A53R16	0698--3444	1		RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A53R17	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A53R18	0811--1080	9		RESISTOR 2.2 5% 3W PW TC=0±50	28480	0811--1080
A53R19	0698--3444	1		RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A53R20	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A53R21	0698--3444	1		RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A53R22	0811--1079	6	1	RESISTOR .68 5% 3W PW TC=0±90	28480	0811--1079
A53R23	0757--0280	3	4	RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A53R24	0698--3449	6	1	RESISTOR 28.7K 1% .125W F TC=0±100	24546	C4--1/8--T0--2872--F
A53R25	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A53R26	0757--0159	5		RESISTOR 1K 1% .5W F TC=0±100	28480	0757--0159
A53R27	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A53R28	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A53R29	0698--8464	5	1	RESISTOR 12.6K .5% .125W F TC=0±50	28480	0698--8464
A53R30	0698--3410	1	1	RESISTOR 3.16K 1% .5W F TC=0±100	28480	0698--3410
A53R31	0698--8817	2		RESISTOR 2.61 1% .125W F TC=0±100	28480	0698--8817
A53R32	0698--3444	1		RESISTOR 316 1% .125W F TC=0±100	24546	C4--1/8--T0--316R--F
A53R33	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A53R34	0757--0420	3	1	RESISTOR 750 1% .125W F TC=0±100	24546	C4--1/8--T0--751--F
A53R35	0698--3132	4	1	RESISTOR 261 1% .125W F TC=0±100	24546	C4--1/8--T0--2610--F
A53R36	0757--0442	9	9	RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R37	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R38	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R39	0683--1065	7	4	RESISTOR 10M 5% .25W CC TC=--900/+1100	01121	CB1065
A53R40	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R41	0683--1065	7		RESISTOR 10M 5% .25W CC TC=--900/+1100	01121	CB1065
A53R42	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R43	0683--1065	7		RESISTOR 10M 5% .25W CC TC=--900/+1100	01121	CB1065
A53R44	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R45	0683--1065	7		RESISTOR 10M 5% .25W CC TC=--900/+1100	01121	CB1065
A53R47	0757--0465	6	1	RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A53R48	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R49	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R50	0698--3154	0	1	RESISTOR 4.22K 1% .125W F TC=0±100	24546	C4--1/8--T0--4221--F
A53R51	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A53R52	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A53R53	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A53R54	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A53TP1	0360--0535	0	6	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP2	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP3	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP4	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP5	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53TP6	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A53U1	1826--0523	5	1	IC 337 V RGLTR TO--3	27014	LM337K
A53U2	1826--0138	8	1	IC COMPARATOR GP QUAD 14--DIP--P PKG	01295	LM339N
A53U3	1820--0223	0	2	IC OP AMP GP TO--99 PKG	3L585	CA301AT
A53U4	1820--0223	0		IC OP AMP GP TO--99 PKG	3L585	CA301AT
A53VR1	1902--3171	7	1	DIODE--ZNR 11V 5% DO--35 PD=.4W TC=+.062%	28480	1902--3171
A53VR2	1902--0049	2	1	DIODE--ZNR 6.19V 5% DO--35 PD=.4W	28480	1902--0049
A53VR3	1902--3330	0	1	DIODE--ZNR 44.2V 2% DO--35 PD=.4W	28480	1902--3330
A53VR4	1902--0025	4	1	DIODE--ZNR 10V 5% DO--35 PD=.4W TC=+.06%	28480	1902--0025
A53VR5	1902--3083	0	1	DIODE--ZNR 4.64V 2% DO--35 PD=.4W	28480	1902--3083
A53VR6	1902--3291	2	1	DIODE--ZNR 31.6V 2% DO--35 PD=.4W	28480	1902--3291
A53VR7	1902--0041	4	1	DIODE--ZNR 5.11V 5% DO--35 PD=.4W	28480	1902--0041
A53VR8	1902--0244	9	1	DIODE--ZNR 30V 5% PD=1W IR=5UA	28480	1902--0244

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

A53 NEGATIVE REGULATOR, CIRCUIT DESCRIPTION

The A53 assembly contains all circuitry for the -10V, -5.2V, and -40V power supplies, as well as voltage sensing circuitry to flag the A52 Positive Regulator board should one of these supplies go out of tolerance.

NOTE

The -10V and -40V supplies are critical, low-noise supplies as described in the A52 Positive Regulator circuit description section. They are limited to a PARD (100^109V peak. The -5.2V supply is primarily a digital (ECL) supply, and has a PARD specification of 5mV.

-10V Regulator A

+20 VREF (P1 pin 29) comes onto the board from the A52 Positive Regulator. It is used as a reference through voltage divider chain R8, R9, and R10, and it powers up error amp U4. C5 is the soft-start element (it slows down the -20V supply turn-on transient). CR6 protects the input stage of U5 during startup. The DC feedback loop is completed through R7, CR5, and darlington driver (chassis mounted) Q1. The topology of this regulator is somewhat unique. The pass element (chassis mounted Q1) is in the ground leg, not the Vout leg. This circuit is regulating ground, and forcing -10V to float 10 Volts away from it, rather than the more standard technique of regulating Vout. This allows the use of an NPN pass transistor used as an emitter follower rather than in the common emitter configuration, which is more sensitive to supply loading.

C1, C4, R6, and C3 are frequency compensation components. R11 and C6 provide a minimum load capacitance and lower output impedance. Foldback current limiting is used here as on the +5.2 and +20V supplies. The parallel combination of R1, R2, and R3 forms the current sense resistor. CR4 compensates for the extra Vbe in the monolithic darlington pass transistor (Chassis Mounted Q1). Q4 is the active element, and foldback is accomplished through pre-bias from R4 and R5.

-10V Crowbar/Supply On Indicator B

Should -10V OUT exceed approximately 11V, VR1 will conduct, providing gate current to crowbar SCR Q6. It will latch ON, protecting load circuits from the overvoltage condition. Yellow LED DS3 provides a visual indication of the -10V supply operational status. CR7 in -10V Regulator circuit (Block A)

protects load circuits from reverse polarity power should a short develop between the -10V OUT and some high current positive supply output.

-5.2V Regulator C

U1 is a monolithic three-terminal adjustable negative regulator. The adjustment terminal is nominally 1.25V above the output terminal, so Vout is programmed by the following relationship:

$$Vout = -1.25 [1 + R16/R17]$$

C14 increases ripple rejection for U1. CR15 provides a discharge path for C14 when Vout is shorted to ground. C8 is required by the regulator for stability, and C7 is required to reduce the apparent electrical length of the supply input leads. R15 lowers the power dissipation in U1 by reducing it's operating junction temperature. R18 and C9 provide a minimum capacitive load for the supply.

-5.2V Crowbar/Supply On Indicator D

When -5.2V OUT exceeds approximately 6.2 volts, VR2 conducts, providing gate current for crowbar SCR Q1, latching it ON and shorting -5.2V OUT to ground. Yellow LED DS1 provides a visual indication of the operational status of the supply, and CR8 is provided to protect load circuits from damage due to reverse polarity power in the event of some instrument fault.

-40V Regulator E

+20V REF provides reference (through divider R27, R28, R29) for the regulator, and powers error amplifier U3. VR4 limits the negative supply to U3 at -10V. C12 is the soft-start element, slowing down the power supply turn-on transient. CR11 protects the input stage of U3 during startup. The forward path is completed through R26, CR10, darlington driver Q3, and pass transistor (chassis mounted) Q2. CR9 protects the base-collector junction of Q3 during startup (when Ic of chassis mounted Q2 is low enough, its beta is less than 1, and the base-collector junction of Q3 can be forward biased). Then if a large current flows, Q3 will be destroyed.

Feedback is completed off the board using remote sense at the main -40V distribution point on the A62 Main Motherboard. -40V SENSE comes back onto the board to complete the loop. Ground reference (Ground 2) connects to main ground on the board at the edge finger to reduce the perturbations in the supply due to noise currents in the ground trace on the board. R31 and C13 provide a minimum load capacitance.

-40V Crowbar/Suppply On Indicator F

When -40V OUT exceeds appproximately 44.2 volts, VR3 conducts providing gate current for Q5 which latches ON, shorting the supply to ground and protecting load circuits from the overvoltage condition. Yellow LED DS2 provides a visual indication of supply operational status, and CR12 in -40V Regulator circuit (Block E) protects load circuits from damage due to reverse polarity supply power in the event of some instrument fault condition.

Voltage Sense H

VR5 in -4.64V Reference (Block G) provides a -4.64V reference to compare with each supply output. Should any supply be out of regulation (low output), the corresponding comparator output will go LOW, forcing U2D pin 13 HIGH which turns ON Q7 to pull HNUP LOW (the logic level on HNUP is: HIGH = +20V; LOW = +.2V).

U2A monitors the -10V supply, U2B monitors the -5.2V supply, and U2C monitors the -40V supply. The input common mode range of U2 includes it's negative supply (U2A pin 12, connected to -10V). However, if Vin goes more negative than U2A pin 12, the device will destroy itself. The problem is that in the event of a crowbar (or short to ground) on the -10V supply, U2 pin 12 is pulled up to ground. The -40V supply, however, is still up, and can source sufficient current to destroy U2. Clamp diode CR14 and current limit resistor R51 prevent this problem from occuring. Now U2C pin 8 follows the -10V supply at U2 pin 12 when it is shorted. Diodes CR1, CR2, and CR3 isolate the outputs of U2A, U2B and U2C. This will allow checking each supply independently for low output.

Grounds And Commons I

This block attempts to depict schematically the critical power and signal ground distribution system implemented on the board. Caution has been used in deciding which load goes where, and in isolating critical ground paths from non-critical or high current ground paths on the board.

A53 NEGATIVE REGULATOR, TROUBLESHOOTING

Operation and troubleshooting of the negative regulators are virtually the same as their positive counterparts.

If nothing is working, look at +20V REF and check the levels of op-amp power supplies (U3 and U4). Also verify that the -10V UNREG and -40V UNREG lines are operating correctly. Realize that the -5.2V Regulator (Block C) is dependent upon the -10V supply; if the -10V supply is down, so is the -5.2V supply. In this case, repair the -10V supply before troubleshooting the -5.2V supply. The same is true of the -40V and -15V supplies, with minor differences. In this case, if the -15V supply crowbars it throws the -40V supply into foldback current limit. You have to separate out which supply is forcing both supplies down (if it is the -15V supply, R1 in the -10V Regulator (Block A) should indicate a healthy current through A56U1. If the -40V supply failed, there should be almost no current into A56U1.

When a supply fails to energize, first measure its output voltage. If the voltage is in the area of -0.8 to -1.0 volt, the supply is in crowbar.

CAUTION

Do not remove the crowbar and operate the supply without it. This could cause severe damage to the instrument if the supply is faulty and the crowbar has tripped to protect the instrument.

Possible failures could involve the crowbar circuit or the supply itself. If the supply output is at ground, the pass element could be open, or in a discrete regulator the feedback loop could be open somewhere (-10V and -40V supplies). If the adjustment terminal of A56U1 is open, -5.2V OUT goes to about -9V (and hopefully the crowbar fires). In the -10 and -40V supplies, if the current limit transistor shorted, V OUT, would drop to ground (essentially).

If the supply output has incorrect voltage, or is excessively temperature sensitive, examine the feedback loop very carefully. For the discrete supplies, leakage currents of soft-start capacitors C5 and C12 have a strong effect on supply output tolerance and temperature drift. For the -5.2V supply, tolerance and drift are constrained primarily by the monolithic regulator U1.

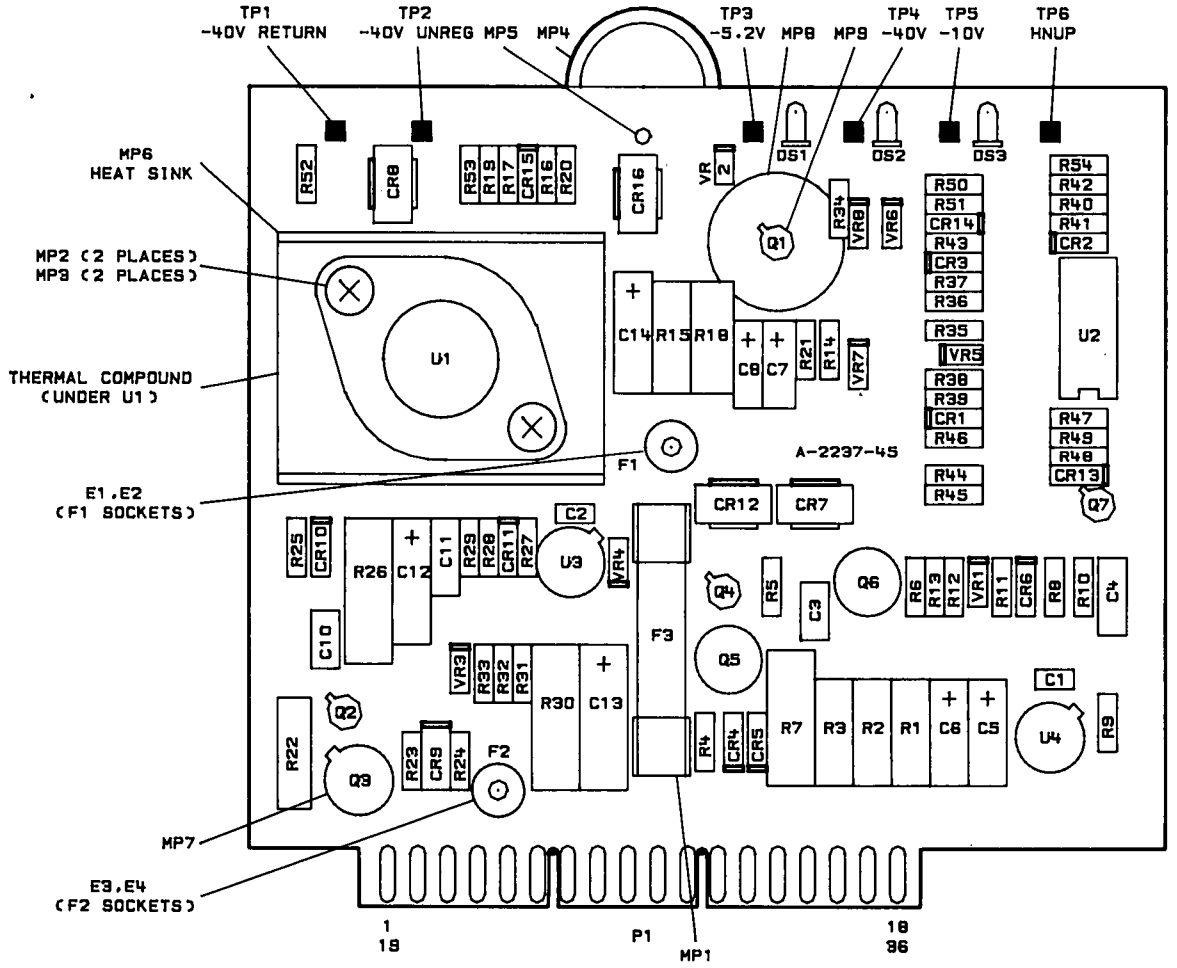


Figure 7H-1. A53 Negative Regulator, Component Location Diagram

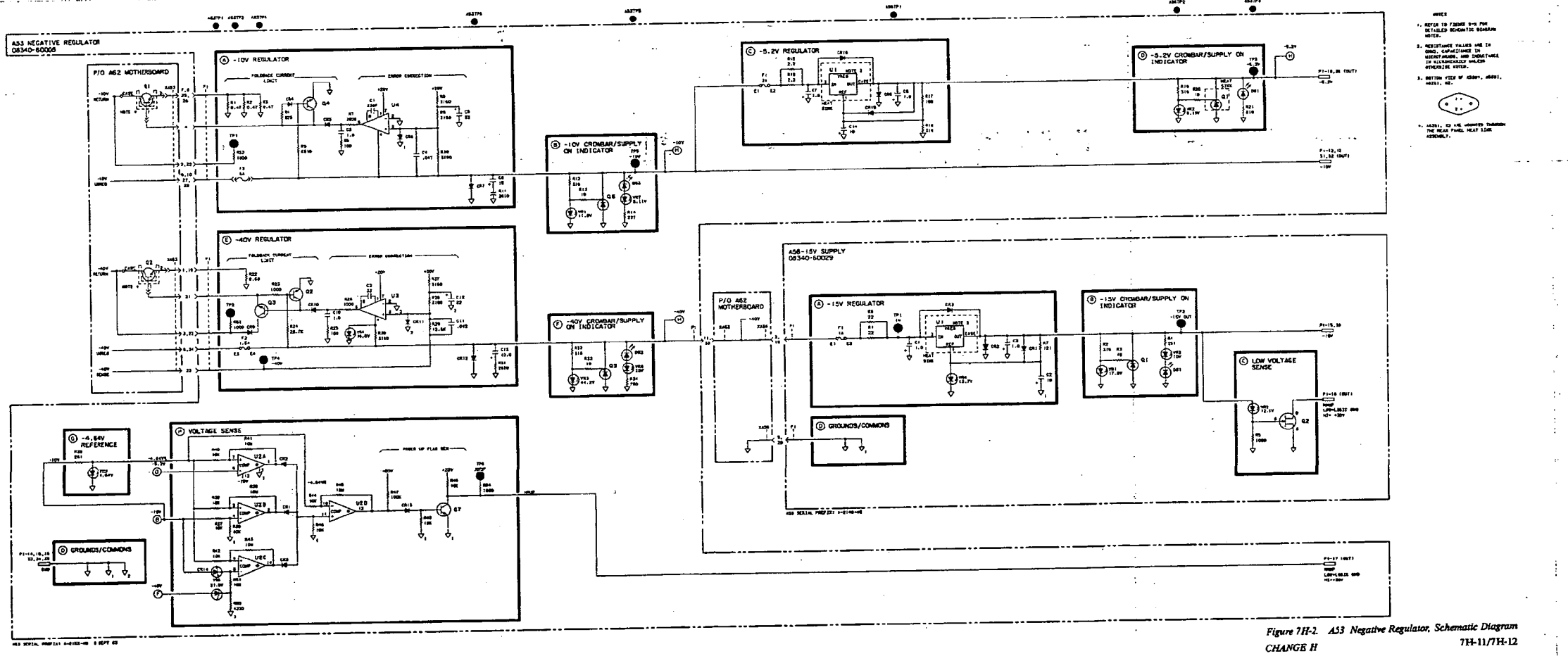


Figure 7H-2. A53 Negative Regulator, Schematic Diagram

CHANGE G

Change G is extensive and only applies to the A26 ALC Modulator, **HP Part Number 08340-60021**. The following pages apply directly to the 08340−60021 and should be used when servicing this assembly.

Refer to the following A26 Parts List, Theory, Component Location Diagram, and Schematic for backdated information.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26	08340--60021	4	1	LINEAR MODULATOR	28480	08340--60021
A26C1	0160--4811	9	1	CAPACITOR--FXD 270PF ±5% 100VDC CER	28480	0160--4811
A26C2	0160--4385	2	1	CAPACITOR--FXD 15PF ±5% 200VDC CER 0±30	28480	0160--4385
A26C3	0160--0575	4	10	CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C4	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C5	0160--4791	4	1	CAPACITOR--FXD 10PF ±5% 100VDC CER 0±30	28480	0160--4791
A26C6	0160--0153	4	1	CAPACITOR--FXD 1000PF ±10% 200VDC POLYE	28480	0160--0153
A26C7	0160--0162	5	1	CAPACITOR--FXD .022UF ±10% 200VDC POLYE	28480	0160--0162
A26C8	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C9	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C10	0160--4389	6	2	CAPACITOR--FXD 100PF ±5PF 200VDC CER	28480	0160--4389
A26C11	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C12	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C13	0160--4386	3	1	CAPACITOR--FXD 33PF ±5% 200VDC CER 0±30	28480	0160--4386
A26C14	0160--4389	6		CAPACITOR--FXD 100PF ±5PF 200VDC CER	28480	0160--4389
A26C15	0160--0156	7	1	CAPACITOR--FXD 3900PF ±10% 200VDC POLYE	28480	0160--0156
A26C16	0160--3878	6	1	CAPACITOR--FXD 1000PF ±20% 100VDC CER	28480	0160--3878
A26C17	0160--4535	4	8	CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C18	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C19	0160--4835	7	2	CAPACITOR--FXD .1UF ±10% 50VDC CER	28480	0160--4835
A26C20	0160--5098	6	2	CAPACITOR--CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C21	0160--4835	7		CAPACITOR--FXD .1UF ±10% 50VDC CER	28480	0160--4835
A26C22	0160--5098	6		CAPACITOR--CER .22UF 50VDC	16299	CAC05X7R224J050A
A26C23	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C24	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C25	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C26	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C27	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C28	0160--4535	4		CAPACITOR--FXD 1UF ±10% 50VDC CER	28480	0160--4535
A26C29	0160--4825	5	1	CAPACITOR--FXD 560PF ±5% 100VDC CER	28480	0160--4825
A26C30	0160--3879	7	1	CAPACITOR--FXD .01UF ±20% 100VDC CER	28480	0160--3879
A26C31	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C32	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C33	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26C34	0160--0575	4		CAPACITOR--FXD .047UF ±20% 50VDC CER	28480	0160--0575
A26CR1	1901--0033	2	9	DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR2	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR4	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR5	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR6	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR7	1901--0539	3	2	DIODE--SM SIG SCHOTTKY	28480	1901--0539
A26CR8	1901--0539	3		DIODE--SM SIG SCHOTTKY	28480	1901--0539
A26CR9	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR10	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR11	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26CR12	1901--0033	2		DIODE--GEN PRP 180V 200MA DO--7	28480	1901--0033
A26L1	9100--1643	2	1	INDUCTOR RF--CH--MLD 300UH 5% .2DX.45LG	28480	9100--1643
A26L2	9140--0112	2	5	INDUCTOR RF--CH--MLD 4.7UH 10%	28480	9140--0112
A26L3	9140--0112	2		INDUCTOR RF--CH--MLD 4.7UH 10%	28480	9140--0112
A26L4	9140--0112	2		INDUCTOR RF--CH--MLD 4.7UH 10%	28480	9140--0112
A26L5	9140--0112	2		INDUCTOR RF--CH--MLD 4.7UH 10%	28480	9140--0112
A26L6	9140--0112	2		INDUCTOR RF--CH--MLD 4.7UH 10%	28480	9140--0112
A26MP1	4040--0750	7	1	EXTR--PC BD RED POLYC .062--BD--THKNS	28480	4040--0750
A26MP2	4040--0754	1	1	EXTR--PC BD BLU POLYC .062--BD--THKNS	28480	4040--0754
A26MP3	1480--0073	6	1	PIN--ROLL .062--IN--DIA .25--IN--LG BE--CU	28480	1480--0073
A26Q1	1855--0420	2	1	TRANSISTOR J--FET 2N4391 N--CHAN D--MODE	01295	2N4391
A26Q2	1855--0414	4	10	TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q3	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q4	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q5	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q6	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q7	1853--0451	5	2	TRANSISTOR PNP 2N3799 SI TO--18 PD=360MW	01295	2N3799
A26Q8	1853--0388	7	1	TRANSISTOR--DUAL PNP PD=600MW	28480	1853--0388
A26Q9	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q10	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q11	1853--0281	9	5	TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A26Q12	1853--0281	9		TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A26Q13	1853--0281	9		TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A26Q14	1855--0421	3	4	TRANSISTOR J--FET 2N5114 P--CHAN D--MODE	17856	2N5114
A26Q15	1854--0404	0	1	TRANSISTOR NPN SI TO--18 PD=360MW	28480	1854--0404
A26Q16	1855--0386	9	2	TRANSISTOR J--FET 2N4392 N--CHAN D--MODE	04713	2N4392
A26Q17	1854--0477	7	2	TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26Q18	1853--0281	9		TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A26Q19	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q20	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26Q21	1855--0421	3		TRANSISTOR J--FET 2N5114 P--CHAN D--MODE	17856	2N5114
A26Q22	1855--0421	3		TRANSISTOR J--FET 2N5114 P--CHAN D--MODE	17856	2N5114
A26Q23	1855--0386	9		TRANSISTOR J--FET 2N4392 N--CHAN D--MODE	04713	2N4392
A26Q24	1854--0475	5	1	TRANSISTOR--DUAL NPN PD=750MW	28480	1854--0475
A26Q25	1853--0451	5		TRANSISTOR PNP 2N3799 SI TO--18 PD=360MW	01295	2N3799
A26Q26	1854--0477	7		TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A26Q27	1853--0281	9		TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A26Q28	1855--0278	8	1	TRANSISTOR J--FET 2N5116 P--CHAN D--MODE	17856	2N5116
A26Q29	1855--0421	3		TRANSISTOR J--FET 2N5114 P--CHAN D--MODE	17856	2N5114
A26Q30	1855--0414	4		TRANSISTOR J--FET 2N4393 N--CHAN D--MODE	04713	2N4393
A26R1	0698--6362	8	2	RESISTOR 1K .1% .125W F TC=0±25	28480	0698--6362
A26R2	0698--3450	9	3	RESISTOR 42.2K 1% .125W F TC=0±100	24546	C4--1/8--T0--4222--F
A26R3	0698--8861	6	2	RESISTOR 6.66K .1% .125W F TC=0±25	28480	0698--8861
A26R4	0757--0346	2	2	RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A26R5	0698--3136	8	1	RESISTOR 17.8K 1% .125W F TC=0±100	24546	C4--1/8--T0--1782--F
A26R6	0757--0442	9	9	RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R7	2100--3274	2	1	RESISTOR--TRMR 10K 10% C SIDE--ADJ 1--TRN	28480	2100--3274
A26R8	0698--3151	7	1	RESISTOR 2.87K 1% .125W F TC=0±100	24546	C4--1/8--T0--2871--F
A26R9	0757--0280	3	10	RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R10	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R11	0757--0438	3	2	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A26R12	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R13	0757--0279	0	2	RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A26R14	0698--3458	7	2	RESISTOR 348K 1% .125W F TC=0±100	28480	0698--3458
A26R15	0757--0465	6	6	RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A26R16	0698--3157	3	1	RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4--1/8--T0--1962--F
A26R17	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R18	0757--0346	2		RESISTOR 10 1% .125W F TC=0±100	24546	C4--1/8--T0--10R0--F
A26R19	0698--6323	1	1	RESISTOR 100 .1% .125W F TC=0±25	28480	0698--6323
A26R20	0698--6317	3	2	RESISTOR 500 .1% .125W F TC=0±25	03888	PME55--1/8--T9--500R--B
A26R21	0698--6360	6	1	RESISTOR 10K .1% .125W F TC=0±25	28480	0698--6360
A26R22	0698--4433	0	1	RESISTOR 2.26K 1% .125W F TC=0±100	24546	C4--1/8--T0--2261--F
A26R23	0698--6624	5	1	RESISTOR 2K .1% .125W F TC=0±25	28480	0698--6624
A26R24	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R25	0757--0428	1	2	RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4--1/8--T0--1621--F
A26R26	0698--6363	9	2	RESISTOR 40K .1% .125W F TC=0±25	28480	0698--6363
A26R27	0757--0428	1		RESISTOR 1.62K 1% .125W F TC=0±100	24546	C4--1/8--T0--1621--F
A26R28	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R29	0698--6363	9		RESISTOR 40K .1% .125W F TC=0±25	28480	0698--6363
A26R30	0757--0401	0	3	RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A26R31	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A26R32	0757--0279	0		RESISTOR 3.16K 1% .125W F TC=0±100	24546	C4--1/8--T0--3161--F
A26R33	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R34	0698--8827	4	6	RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A26R35	0698--3458	7		RESISTOR 348K 1% .125W F TC=0±100	28480	0698--3458
A26R36	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A26R37	0699--1055	8	1	RESISTOR-- 54.9 OHM .1% .12W	28480	0699--1055
A26R38	0698--6317	3		RESISTOR 500 .1% .125W F TC=0±25	03888	PME55--1/8--T9--500R--B
A26R39	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R40	0757--0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A26R41	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R42	0698--6362	8		RESISTOR 1K .1% .125W F TC=0±25	28480	0698--6362
A26R43	2100--3353	8	2	RESISTOR--TRMR 20K 10% C SIDE--ADJ 1--TRN	28480	2100--3353
A26R44	0757--0460	1	2	RESISTOR 61.9K 1% .125W F TC=0±100	24546	C4--1/8--T0--6192--F
A26R45	2100--3353	8		RESISTOR--TRMR 20K 10% C SIDE--ADJ 1--TRN	28480	2100--3353
A26R46	0698--0084	9	1	RESISTOR 2.15K 1% .125W F TC=0±100	24546	C4--1/8--T0--2151--F
A26R47	2100--3354	9	4	RESISTOR--TRMR 50K 10% C SIDE--ADJ 1--TRN	28480	2100--3354
A26R48	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R49	2100--3354	9		RESISTOR--TRMR 50K 10% C SIDE--ADJ 1--TRN	28480	2100--3354
A26R50	0698--3450	9		RESISTOR 42.2K 1% .125W F TC=0±100	24546	C4--1/8--T0--4222--F
A26R51	2100--3354	9		RESISTOR--TRMR 50K 10% C SIDE--ADJ 1--TRN	28480	2100--3354
A26R52	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R53	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A26R54	0698--3450	9		RESISTOR 42.2K 1% .125W F TC=0±100	24546	C4--1/8--T0--4222--F
A26R55	0811--3619	4	1	RESISTOR-- 260 OHM 2% .12W	28480	0811--3619
A26R56	0698--0083	8	2	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4--1/8--T0--1961--F
A26R57	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A26R58	0698--8861	6		RESISTOR 6.66K .1% .125W F TC=0±25	28480	0698--8861
A26R59	0757--0462	3	1	RESISTOR 75K 1% .125W F TC=0±100	24546	C4--1/8--T0--7502--F
A26R60	0698--3152	8	2	RESISTOR 3.48K 1% .125W F TC=0±100	24546	C4--1/8--T0--3481--F
A26R61	0698--3159	5	2	RESISTOR 26.1K 1% .125W F TC=0±100	24546	C4--1/8--T0--2612--F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26R62	0698--3159	5		RESISTOR 26.1K 1% .125W F TC=0±100	24546	C4--1/8--T0--2612--F
A26R63	0757--0401	0		RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A26R64	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R65	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R66	0757--0440	7	1	RESISTOR 7.5K 1% .125W F TC=0±100	24546	C4--1/8--T0--7501--F
A26R67	0698--3156	2	1	RESISTOR 14.7K 1% .125W F TC=0±100	24546	C4--1/8--T0--1472--F
A26R68	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A26R69	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A26R70	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R71	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R72	0698--8959	3	1	RESISTOR 619K 1% .125W F TC=0±100	28480	0698--8959
A26R73	0698--8827	4		RESISTOR 1M 1% .125W F TC=0±100	28480	0698--8827
A26R74	0757--0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A26R75	0757--0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A26R76	0757--0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A26R77	0757--0460	1		RESISTOR 61.9K 1% .125W F TC=0±100	24546	C4--1/8--T0--6192--F
A26R78	0757--0465	6		RESISTOR 100K 1% .125W F TC=0±100	24546	C4--1/8--T0--1003--F
A26R79	0698--0083	8		RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4--1/8--T0--1961--F
A26R80	0757--1094	9	2	RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4--1/8--T0--1471--F
A26R81	0698--3152	8		RESISTOR 3.48K 1% .125W F TC=0±100	24546	C4--1/8--T0--3481--F
A26R82	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R83	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A26R84	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A26R85	0698--3429	2	1	RESISTOR 19.6 1% .125W F TC=0±100	03888	PME55--1/8--T0--19R6--F
A26R86	0757--0447	4	1	RESISTOR 16.2K 1% .125W F TC=0±100	24546	C4--1/8--T0--1622--F
A26R87	0811--3575	1	1	RESISTOR-- 3K OHM 2% .12W	28480	0811--3575
A26R88	2100--3354	9		RESISTOR--TRMR 50K 10% C SIDE--ADJ 1--TRN	28480	2100--3354
A26R89	0757--0416	7	1	RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A26R90	0757--1094	9		RESISTOR 1.47K 1% .125W F TC=0±100	24546	C4--1/8--T0--1471--F
A26TP1	0360--0535	0	5	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP2	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP3	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP4	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26TP5	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A26U1	1826--0601	0	3	IC OP AMP PRCN TO--99 PKG	06665	OP--16FJ
A26U2	1826--1007	2	1	IC-- 27G M1 OP AMP	28480	1826--1007
A26U3	1826--0306	2	3	IC COMPARATOR GP QUAD 14--DIP--C PKG	27014	LM339AJ
A26U4	1820--1216	3	1	IC DCDR TTL LS 3--TO--8--LINE 3--INP	01295	SN74LS138N
A26U5	1810--0371	8	1	RESISTIVE NETWORK--100K OHM 8 PINS	01121	208A104
A26U6	1826--0306	2		IC COMPARATOR GP QUAD 14--DIP--C PKG	27014	LM339AJ
A26U7	1826--0828	3	1	IC-- 15G M1 OP AMP	06665	OP--15GJ
A26U8	1826--0601	0		IC OP AMP PRCN TO--99 PKG	06665	OP--16FJ
A26U9	1826--0306	2		IC COMPARATOR GP QUAD 14--DIP--C PKG	27014	LM339AJ
A26U10	1820--1197	9	1	IC GATE TTL LS NAND QUAD 2--INP	01295	SN74LS00N
A26U11	1826--0161	7	1	IC OP AMP GP QUAD 14--DIP--P PKG	04713	MLM324P
A26U12	1826--0601	0		IC OP AMP PRCN TO--99 PKG	06665	OP--16FJ
A26U13	1826--0026	3	2	IC COMPARATOR PRCN TO--99 PKG	01295	LM311L
A26U14	1826--0026	3		IC COMPARATOR PRCN TO--99 PKG	01295	LM311L
A26U15	1820--1730	6	1	IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS273N

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

A26 LINEAR MODULATOR, CIRCUIT DESCRIPTION

Introduction

The A26 Linear Modulator assembly compares the detected RF power level against the level reference voltage, and drives the RF modulators to correct any errors. This closes the ALC loop and levels the RF power. The amplitude modulation (AM) input is logged and added to the level reference on this assembly.

External AM Log Converter A

U12 buffers the front panel "AM MODULATION INPUT" with approximately unity gain. U1 and Q24 form the log converter. (See Figure 8I-33 for a simplified diagram of the External AM Log Converter.) U12 drives a current through R23 to U1; a constant bias current Ib (through R26) establishes the operating point of the logger. U1's output will drive the emitter of Q24A until its collector current equals the total input current. The base-to-emitter voltage is then logarithmically related to the input voltage. This voltage is sensed through Q24B to the output. U2 buffers the log converter's high output impedance, and has a voltage gain of about 10. FETs Q23 and Q1 switch out the log converter when AM is not selected.

ALC Loop Integrator B

The ALC loop summing node is at the source of FET Q16. At this point, the detected RF power level voltage (DETOUT) is summed with the reference power level voltage (TCREF). When the loop is closed and leveled, these signals should be equal and opposite, thus perfectly cancelling. If they do not cancel, the error current is integrated by U8 and changes the RF modulation level to correct the power level. FET Q9 can be closed to double the TCREF sensitivity in the open-loop mode (SH meter). The marker pulses (HMRKR) and logged external AM (if enabled) are also added to the summing node.

U8 is the main ALC amplifier, forming an integrator with capacitor C6 (ALC Loop BW = 100kHz). C15 is switched in parallel with C6 by FET Q20 in any externally leveled mode (ALC Loop BW = 20kHz). Under a variety of conditions, C7 is also connected in parallel with C6 (ALC Loop BW = 7 kHz; see Figure 8I-34). Q17 clamps the negative voltage excursions of U8 to about -3.9 V when the loop goes unleveled. Likewise, Q18 clamps the positive excursions to about +0.5 V. U11B and Q25 alter the bias on these clamps when HRFON goes low to turn the RF power OFF, clamping the MODLVL voltage at about -3.0V. When external power meter leveling is selected, FET switch Q30 is closed to put C23 across Q25's control line. This makes the "turn-on" time at bandswitches or

beginning of sweep very slow and avoids ALC overshoot due to slow power meter response times. (Leveled ALC Loop BW is not affected.) Q10 is normally OFF, but can be turned ON to shunt R17 across the integrating capacitors C6, C7, and C15. This makes U8 an inverting amplifier instead of an integrator for the open-loop mode.

Overmodulation/Unleveled Detectors C

The MODLVL voltage will remain within certain bounds when the RF power is leveled. If MODLVL exceeds these bounds, comparators detect the condition and send the information to the microprocessor. Q27 and U14 detect excessive amplitude modulation. When MODLVL falls below about -3.6 V, Q27 turns ON, trips U14, and sends LOMD to A27 for the microprocessor to read. Likewise, Q26 and U13 detect the MODLVL when the RF modulators are no longer attenuating and the RF power is unleveled. If MODLVL rises above about +0.2 V, Q26 will turn ON and trigger U13 to send LUNLVL to A27. Both functions are disabled by Q28 when HCMPEN (High = Comparators Enable) goes LOW.

ALC Modulator Switch D

FET swtiches Q21 and Q22 select either the Band 0 (P/O A8) or Band 1-4 (P/O A16) RF modulators to be driven by the Modulator Driver. In Band 0, U4PW14 goes low, causing U11D pin 14 to go to ground to turn Q21 ON. At the same time, U11C pin 8 goes high to turn Q22 OFF. Note that U11C also biases the high band switch (P/O A16) OFF in Band 0. (Refer to RF Schematic.) In Bands 1-4, the situation is reversed: Q21 is OFF, and Q22 is ON. R62 sinks a fixed current from the exponential current mirror in Band 0, as described above. In Band 1, R61 sinks this current; in Bands 2-4, R60 in parallel with R61 sinks the bias current.

ALC Loop Function Switch Drivers E

U15 latchs digital information from the microprocessor to control the major ALC functions. Many of U15's outputs are used on other boards in the ALC loop. HMTR and HINT determine the primary leveling mode. These two lines, with decoders U10C and U10B, drive comparators to control the Main ALC Amplifier. See Table 8I-2 for their functions. The other lines and comparators control functions for loop bandwidth, enable amplitude modulation, and enable the OVERMODULATION/UNLEVELED comparators. U9C controls the A12 Band 0 Detector bandwidth.

Bandswitch Drivers F

U4 decodes the band information from HLB0, HLB1, and HLB2. Each output goes LOW for the selected band, causing the output of each

respective comparator to go HIGH for the selected band. U10A senses the Band 0 and Band 1 lines, but actually drives U11A pin 1 HIGH during Bands 2-4 to alter the modulator bias for the multiplying bands.

ALC Modulator Driver G

The ALC loop gain is adjustable for each band separately. Q2, Q3, Q4, Q5, and Q6 select the MODLVL to pass through an adjustment for Band 0 through 4 respectively. U7 buffers this voltage for Bands 2-4 and sends it to the A24 assembly for use in biasing the Step Recovery Diode in the A13 SYTM. Each of the five adjustments drives the emitter of Q15 one at a time. Q15 forms a common-base current summing node. Q7 and Q8 form an "exponential current mirror" to drive current through the RF modulators.

The exponential function is desirable to linearize the RF modulators' attenuation characteristics. (See Figure 8I-35.) The RF attenuation of the modulator is a very non-linear function of drive current. If plotted on log-log paper, however, the plot is straight over the high current end of its range. Therefore, converting the MODLVL voltage to an exponential current would best fit the modulators' characteristics at high attenuation levels. To track the modulator curve better at low attenuation, simply subtracting a fixed current from the exponential current mirror's output will "bend" the modulation curve on log-log paper. This gives the desired result; RF attenuation in dB is proportional to the MODLVL voltage. In Bands 2-4, non linearities in the power transfer characteristics of the A13 SYTM require additional modulator drive shaping.

R54 and CR9 bias Q15's emitter at about 0.0V. Q15 is a common-base current summing node. Q15's collector current is the same as the emitter current. Q8, with R85 and R55, form an exponential current mirror; current through Q8A causes a voltage drop across R85 and R55. This causes Q8B's base-to-emitter voltage to change linearly, causing Q8B's collector current to change exponentially. Q7 is added in a Darlington configuration to buffer Q8B. R86, R87, R88 "MO" (Modulator Offset), and R44 provide a bias current to the exponentiator input (Q15 emitter) so that when "mod level" (TP3) is at 0 volts, the exponentiator will be outputting some current. This current equals the current being shunted from the modulators by R61 and R62. Q14 increases the bias in bands 2 - 4, compensating for the increased shunt current through Q29 and R60 in those bands.

Power Supply H

Power supply filtering consists of ordinary LC filters. R80 and R81 generate the +1.5VF reference for TTL comparators.

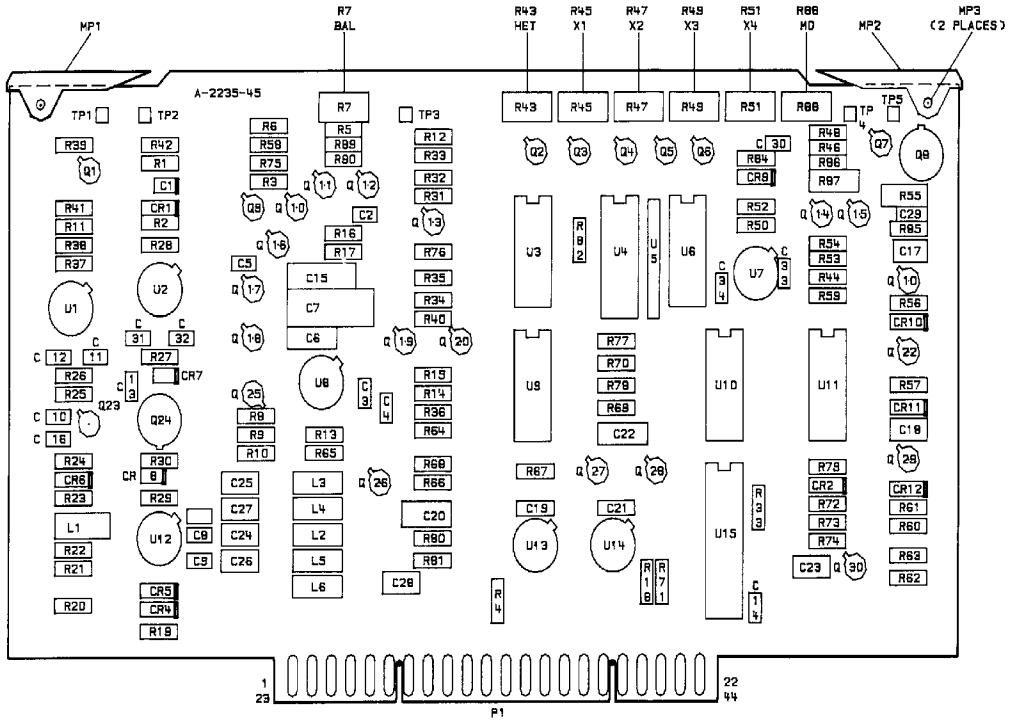


Figure 7G-1. A26 ALC Modulator, Component Location Diagram

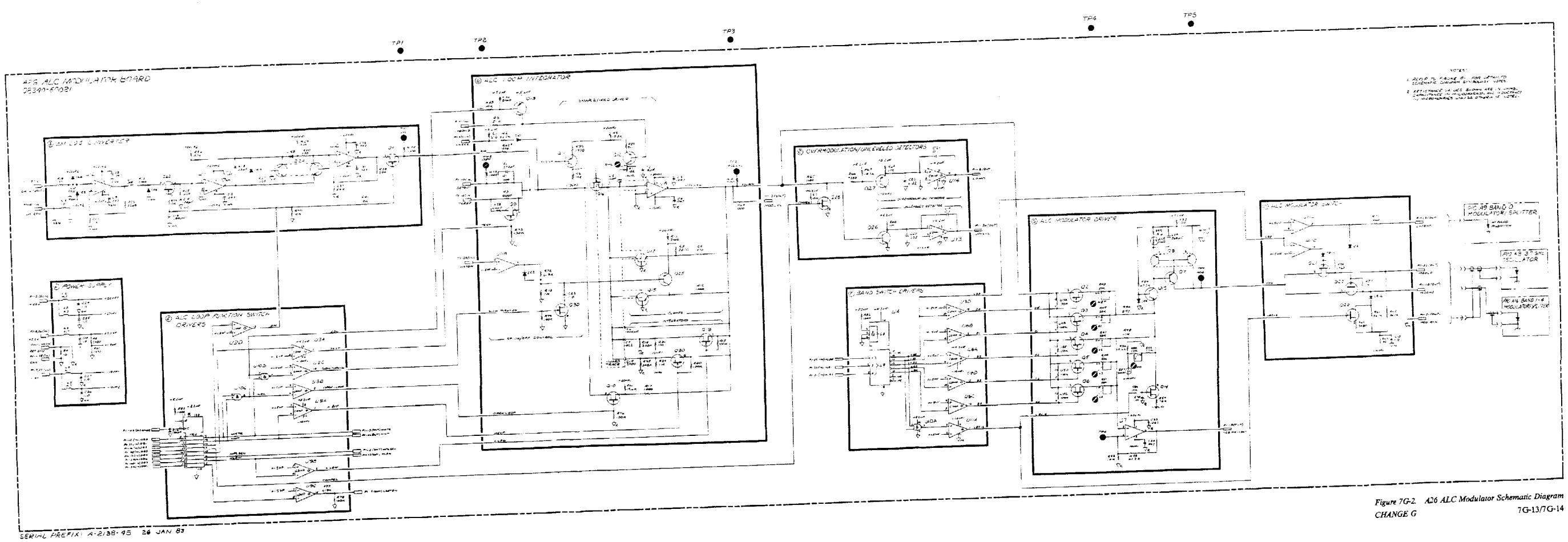


Figure 7G-2. A26 ALC Modulator Schematic Diagram

CHANGE F

Change F applies directly to the A41 PLL2 Phase Detector assembly, **HP Part Number 08340-60047**. The existing manual may be changed to apply directly to the 08340-60047 by performing the following manual changes.

Page 6-85, Table 6-3:
Change A41 to HP Part Number 08340-60047, CD4.
Delete A41CR5 and CR6.
Change A41R16 to HP Part Number 0757-0439, CD4, RESISTOR 6.81K 1% .125W F TC=0±100, 24546, C4-1/8-TO-6811-F.
Change A41Q4 to HP Part Number 1853-0322, CD9, TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW, 01295, 2N2946A.
Change A41Q5 to HP Part Number 1854-0552, CD4, TRANSISTOR, NPN 2N2432A SI TO-18 PD=300MW, 01295, 2N2432A.

Page 8-243/8-244, Figure 8C-27:
Delete CR5 and CR6.

Page 8-247/8-248, Figure 8C-28:
Change A41 to HP Part Number 08340-60047.
Delete A41CR5 and CR6 (Block **B**), connect the emitters of Q4 and Q5 together and connect to the trace previously going to the cathode of CR5.
Change the value of A41R16 to 6810 ohms (Block **B**).

CHANGE E

Change E is extensive and only applies to the A61 Memory assembly, **HP Part Number 08340-60019**. The following pages apply directly to the 08340-60019 and should be used when servicing this assembly.

Refer to the following A61 Parts List, Theory, Component Location Diagram, and Schematic for backdated information.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A61	08340--60019	0	1	MEMORY	28480	08340--60019
A61BT1	1420--0275	4	2	BATTERY 2.8V .85A--HR LI/S--DIOX PIN	28480	1420--0275
A61BT2	1420--0275	4		BATTERY 2.8V .85A--HR LI/S--DIOX PIN	28480	1420--0275
A61C1	0160--4832	4	14	CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C2	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C3	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C4	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C5	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C6	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C7	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C8	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C9	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C10	0160--4835	7	1	CAPACITOR--FXD .1UF ±10% 50VDC CER	28480	0160--4835
A61C11	0160--4804	0	1	CAPACITOR--FXD 56PF ±5% 100VDC CER 0±30	28480	0160--4804
A61C12	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C13	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C14	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C15	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C16	0180--0229	7	1	CAPACITOR--FXD 33UF±10% 10VDC TA	S6289	150D336X9010B2
A61C17	0160--4832	4		CAPACITOR--FXD .01UF ±10% 100VDC CER	28480	0160--4832
A61C18	0160--4801	7	1	CAPACITOR--FXD 100PF ±5% 100VDC CER	28480	0160--4801
A61CR1	1901--0518	8	11	DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR2	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR3	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR4	1901--0050	3	4	DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A61CR5	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A61CR6	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR7	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR8	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR9	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR10	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A61CR11	1901--0050	3		DIODE--SWITCHING 80V 200MA 2NS DO--35	28480	1901--0050
A61CR12	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR13	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR14	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61CR15	1901--0518	8		DIODE--SM SIG SCHOTTKY	28480	1901--0518
A61DS1	1990--0486	6	16	LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS2	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS3	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS4	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS5	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS6	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS7	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS8	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS9	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS10	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS11	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS12	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS13	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS14	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS15	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61DS16	1990--0486	6		LED--LAMP LUM--INT=1MCD IF=20MA--MAX BVR=5V	28480	5082--4684
A61L1	9100--1788	6	1	CHOKE--WIDE BAND ZMAX=680 OHM@ 180 MHZ	02114	VK200 20/48
A61MP1	4040--0754	1	1	EXTR--PC BD BLU POLYC .062--BD--THKNS	28480	4040--0754
A61MP2	4040--0749	4	1	EXTR--PC BD BRN POLYC .062--BD--THKNS	28480	4040--0749
A61MP3	1480--0073	6	1	PIN--ROLL .062--IN--DIA .25--IN--LG BE--CU	28480	1480--0073
A61MP4	1200--0173	5	1	INSULATOR--XSTR DAP--GL	28480	1200--0173
A61P1	1251--7469	3	1		28480	1251--7469
A61Q1	1855--0251	7	3	TRANSISTOR MOSFET N--CHAN E--MODE TO--39 SI	28480	1855--0251
A61Q2	1855--0251	7		TRANSISTOR MOSFET N--CHAN E--MODE TO--39 SI	28480	1855--0251
A61Q3	1853--0034	0	1	TRANSISTOR PNP SI TO--18 PD=360MW	28480	1853--0034
A61Q4	1854--0477	7	3	TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A61Q5	1854--0477	7		TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A61Q6	1854--0477	7		TRANSISTOR NPN 2N2222A SI TO--18 PD=500MW	04713	2N2222A
A61Q7	1853--0281	9	2	TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A61Q8	1853--0281	9		TRANSISTOR PNP 2N2907A SI TO--18 PD=400MW	04713	2N2907A
A61Q9	1855--0251	7		TRANSISTOR MOSFET N--CHAN E--MODE TO--39 SI	28480	1855--0251
A61R1	0757--0394	0	4	RESISTOR 51.1 1% .125W F TC=0±100	24546	C4--1/8--T0--51R1--F
A61R2	0757--0394	0		RESISTOR 51.1 1% .125W F TC=0±100	24546	C4--1/8--T0--51R1--F
A61R3	0757--0458	7	1	RESISTOR 51.1K 1% .125W F TC=0±100	24546	C4--1/8--T0--5112--F
A61R4	0757--0442	9	5	RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F

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

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A61R5	0698--0083	8	2	RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4--1/8--T0--1961--F
A61R6	0757--0438	3	3	RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A61R7	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A61R8	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A61R9	0764--0015	7	1	RESISTOR 560 5% 2W MO TC=0±200	28480	0764--0015
A61R10	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A61R11	0757--0416	7	1	RESISTOR 511 1% .125W F TC=0±100	24546	C4--1/8--T0--511R--F
A61R12	0757--0280	3	3	RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A61R13	0757--0394	0		RESISTOR 51.1 1% .125W F TC=0±100	24546	C4--1/8--T0--51R1--F
A61R14	0757--0438	3		RESISTOR 5.11K 1% .125W F TC=0±100	24546	C4--1/8--T0--5111--F
A61R15	0698--0083	8		RESISTOR 1.96K 1% .125W F TC=0±100	24546	C4--1/8--T0--1961--F
A61R16	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A61R17	0698--3157	3	1	RESISTOR 19.6K 1% .125W F TC=0±100	24546	C4--1/8--T0--1962--F
A61R18	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A61R19	0757--0442	9		RESISTOR 10K 1% .125W F TC=0±100	24546	C4--1/8--T0--1002--F
A61R20	0757--0401	0	1	RESISTOR 100 1% .125W F TC=0±100	24546	C4--1/8--T0--101--F
A61R21	0757--0394	0		RESISTOR 51.1 1% .125W F TC=0±100	24546	C4--1/8--T0--51R1--F
A61R22	0757--0280	3		RESISTOR 1K 1% .125W F TC=0±100	24546	C4--1/8--T0--1001--F
A61TP1	0360--0535	0	9	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP2	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP3	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP4	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP5	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP6	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP7	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP8	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61TP9	0360--0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A61U1	1820--1195	7	7	IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS175N
A61U2	1820--1446	1	1	IC SHF--RGTR TTL LS R--S PRL--IN PRL--OUT	01295	SN74LS395AN
A61U3	1820--1195	7		IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS175N
A61U4	1820--1195	7		IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS175N
A61U5	1818--1968	7	2		28480	1818--1968
A61U6 A61U7 A61U8 A61U9				NOTE IF EPROMS A61U6--9 OR A61U21--24 FAIL, REPLACE THE COMPLETE A61 MEMORY ASSEMBLY WITH REBUILT ASSEMBLY 08340--60152, CD2		
A61U10	1810--0273	9	2	NETWORK--RES 10--SIP470.0 OHM X 9	01121	210A471
A61U11	1820--1730	6	2	IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS273N
A61U12	1810--0338	7	2	NETWORK--RES 16--DIP100.0 OHM X 8	11236	761--3--R100
A61U13	1906--0075	2	2	DIODE--ARRAY 40V 400MA	28480	1906--0075
A61U14	1810--0273	9		NETWORK--RES 10--SIP470.0 OHM X 9	01121	210A471
A61U15	1820--1195	7		IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS175N
A61U16	1820--1195	7		IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS175N
A61U17	1820--1216	3	1	IC DCDR TTL LS 3--TO--8--LINE 3--INP	01295	SN74LS138N
A61U18	1820--1195	7		IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS175N
A61U19	1820--1195	7		IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS175N
A61U20	1818--1968	7			28480	1818--1968
A61U21 A61U22 A61U23 A61U24				NOTE IF EPROMS A61U6--9 OR A61U21--24 FAIL, REPLACE THE COMPLETE A61 MEMORY ASSEMBLY WITH REBUILT ASSEMBLY 08340--60152, CD2		
A61U25	1810--0338	7		NETWORK--RES 16--DIP100.0 OHM X 8	11236	761--3--R100
A61U26	1906--0075	2		DIODE--ARRAY 40V 400MA	28480	1906--0075
A61U27	1820--1730	6		IC FF TTL LS D--TYPE POS--EDGE--TRIG COM	01295	SN74LS273N
A61VR1	1902--0041	4	1	DIODE--ZNR 5.11V 5% DO--35 PD=.4W	28480	1902--0041

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

A61 MEMORY ASSEMBLY, CIRCUIT DESCRIPTION

The A61 MEMORY board contains all the firmware (stored in ROM) to run the 8340A and the calibration data and Save/Recall registers (stored in RAM).

The normal sequence of operations is diagrammed in Figure 8-482A.

Figure 8-482A. Memory Operation Timing Diagram.

To be supplied.

1. The processor places an address on the LIDA BUS.
2. The address is latched on the Memory Board by the rising edge of HSTM, (High Start Memory) and the location is accessed.
3. The processor reads data or instruction on LIDA BUS after setting LSOB (Low Stay Off Bus) false (HIGH).
4. The processor executes the instruction or processes the retrieved data word.
5. The processor initiates the sequence once again.

Bus Damper A

Each LIDA BUS line is terminated by a 100 ohm impedance matching resistor (part of U12 or U25) and a diode clamp (part of U13 or U26). This eliminates transient overshoot due to bus impedance mismatch, and protects the inputs from high energy static discharge.

The clamp voltage is generated by Q8 and Q9 in the POWER SUPPLY section (Block H). In this arrangement VCLAMP follows VP, the battery supply to the RAMs. This guarantees that no input to the CMOS RAMs can exceed their VCC value, eliminating the parasitic SCR latch-up problem common to CMOS devices.

Address Latch B

The rising edge of HSTM latches the address on the LIDA BUS into the 16-bit latch U3,U4,U18,U19. Bit 14 selects between ROM and RAM. Bits 12 and 13 select between the 4 pairs of ROM chips. Bits 0 thru 1 select a specific location in a pair of ROM or RAM chips. Due to the specifics of processor architecture, bit 15 does not contain valid address information, and is ignored. The

latched address lines are called the MAR BUS.

Digital Signature Circuit C

This circuit generates the Start and Stop clock signals for a Signature Analyzer during Memory Board testing. A complete description of these tests is given in the A60 Processor documentation.

Shift register U2 is cleared at the start of auto-test software by executing a write to ROM address @03777. A right-shift is forced after each phase of auto-test by executing a write to RAM address @57767.

Note that a write to ROM address @03777 will alter the contents of RAM location @77777, and the write to address @57767 will alter RAM location @77767. This is due to the incomplete decoding scheme used during write operations.

Memory Select D

Decoder U17 uses MAR bits 12 and 13 to select which of the 4 pair of ROMs are to be accessed (LCS1 thru LCS4). During a valid ROM access MAR 14 is LOW (addresses less than or equal to @37777). This line is used to enable the decoder U17 During a RAM access MAR 14 is HIGH (addresses greater than or equal to @40000) and U17 is disabled, pulling all ROM chip select lines (LCS1 thru LCS4) to the HIGH, inactive state. Note that all addresses above @40000 are decoded as valid RAM addresses. HPME is used by the EPROM programmer as a programming strobe, and is not connected in the 8340A. Test point TP5 is the chip select line for the first pair of ROMs, which contain all self-test software. This can be useful during instrument turn-on and troublesooting if Self Test appears to get stuck.

CR6, CR7, and Q4, Q5, Q6, and Q7 decode the VPP/OE' line to the ROMs. This line must go to +25 Volts during EPROM programming, to 0 Volts during a read operation, and to +5 Volts at all other times. VPP/OE' is driven LOW when MAR14 is LOW and LSOB is HIGH. Note that and/or Q4 may be destroyed if the +25 Volt program voltage is present during a read operation to ROM.

Q1, Q2, and Q3 form a discrete NAND gate that is constantly power up by the RAM backup battery. Inputs are the memory cycle strobe HSTM and the LIPS line. A low on LIPS effectively isolates the RAM from invalid Buss activity during instrument power cycling. The output of this gate is the LRAMCE line, tied to the chip select pin on the RAM' Note that every memory cycle, whether to

ROM or RAM, initiates a read cycle in RAM. U16A,B, and C decode MAR14, LWRT, and processor handshake LSOB to drive LRAMEN low true and output RAM contents to the Bus only when a valid RAM read cycle occurs. Also note that, as a consequence of this decoding scheme, a write operation to any location in memory (whether in ROM or RAM space) maps into a write to some location RAM.

ROM E

Eight EPROMs hold all the Main Controller firmware. Each EPROM contains 4096, 8 bit bytes. They are connected in pairs to make up the 16 bit data words required. The total storage space provided in ROM is 16K, 16 bit words. Self-test firmware resides in the first two ROMs, U6 and U21.

The table below details ROM control lines and their states during operation:

	VPP/OE' (20)	CS' (18)	LIDA BUS	MAR BUS
To program EPROMs	+25V	LOW	data in	valid
To read EPROMs	low	LOW	data out	valid
All other times	xx	HIGH	xx	xx

RAM F

System RAM consists of two chips, U5 and U20, each containing 2048, 8 bit bytes, connected in parallel to form the 16 bit data words required. These RAMs are ultra low power CMOS devices. Power dissipation is low enough that at room temperature the on-board battery will maintain data integrity for 10 years. Over the worst case instrument temperature range and RAM current drain data integrity is guaranteed for the normal 1 year instrument calibration interval. Nonvolatility is required because the RAM is used to store instrument calibration data and the Save/Recall registers, as well as stack and normal processor workspace.

The table below details RAM control lines and their states during operation:

	LRAMCE CS',18	LRAMEN OE',20	LWRT	LIDA BUSS	MAR BUSS
To write RAM	LOW	HIGH	LOW	data in	valid
To read RAM	LOW	HIGH	HIGH	data out	valid
All other times	xx	HIGH	HIGH	xx	xx

Note that any write operation (whether in ROM or RAM address space) is mapped into a write to some location in RAM. This includes writes to the Self Test Indicators, and the Digital

Signature Circuit, which are decoded as writes to ROM. The Main Controller is very careful to execute these writes to locations in RAM whose nonvolatility is not required.

Self Test Indicator G

On controller initiation, the LIPS line clears latches U11 and U27. This turns on all indicator LEDs to verify that they are in working order.

The register is loaded by any write to the first block of ROM (locations @00000 to @07777). The Main Controller always uses location @03777, which maps into RAM location @77777. Altering the contents of this location does not compromise the integrity of any nonvolatile data.

A complete description of the coding used for the indicator LEDs is given in the A60 Processor Documentation.

Power Supply H

+5VF is the instrument main 5V power supply. It is decoupled at the edge connector by L1 and C20 to isolate current spikes, generated by Memory Board operation, from the rest of the instrument.

+25VPP (PGM) is the programming potential required by the EPROMs during programming, and is provided by the EPROM programmer. Except during programming this line must be at +5 Volts. In the 8340A the PGM line is tied directly to the +5V main supply on the Motherboard.

+5VP is the CMOS RAM VCC line. To maintain nonvolatility of RAM contents, on board batteries maintain +5VP at or above 2.0 Volts. The RAMs, then, are always powered up, even when the board is removed from the instrument. Careful handling of the Memory board is a must. The first rule is: Never set the board on a conductive surface - you may short +5VP to ground.

Batteries BT1 and BT2 are connected to +5VP thru steering diodes CR1 and CR2. While the instrument is in STANDBY mode (and connected to a live AC mains) the +22V power supply is up. All other supplies are powered down. Resistor R9 and zener diode VR1 drop the +22V in to 5.11V and the +5VP line is sourced from this regulator. CR3 is reverse biased in STANDBY and has essentially 0V across it when the instrument is ON (and the +5V supply is up). Its purpose is to ensure that the +5VP line tracks the main +5VF supply in the event of a failure in the +22V standby supply. Note that shorting +5VP to ground while +5VF is active will destroy CR3. The batteries supply +5VP at about +2.5V only when

the instrument is disconnected from the AC mains, or the Memory Board is removed from the instrument.

To ensure RAM integrity for the 1 year instrument calibration interval, total battery current (sum of currents from BT1 and BT2) must not exceed 19uA. Battery current is determined by measuring the voltages across R1 and R2:

$$I(batt) = V(R1)/51.1 + V(R2)/51.1 .$$

If the current drain exceeds 19uA, usually one of the RAMs or one of the VMOS FETs (Q1, Q2, Q9) is defective and must be replaced.

Because RAM contents are guaranteed only when VCC is greater than or equal to 2.0 Volts, a battery is considered fully discharged when the voltage measured directly across it reaches 2.2 Volts. Regardless of their apparant state of charge, batteries should always replaced and their current drain measured when the instrument is calibrated. This is necessary to guarantee retention of calibration factors for the 1 year normal calibration interval under worst case conditions.

Q9 is a source follower set to track the backup supply +5VP. It then sets the potential at the base of the active clamp Q8. Clamp voltage VCLAMP will always be low enough to ensure that no RAM input line will exceed its VCC (+5VP). This eliminates the parasitic SCR latchup problem inherent in CMOS devices.

In normal operation VCLAMP is required to sink current only. However, during a very fast LIDA BUS transition from HIGH to LOW, charge pump due to the junction capacitance of the clamp diodes (part of U13 or U26) requires VCLAMP to source current for a short time. C23 lowers VCLAMP output impedance, and allows it to source the required current without changing the clamp level.

The clamp circuit is easily tested by sourcing current into it (connect a 347 ohms resistor from the +12V instrument supply to the VCLA line at some point), and measuring its compliance. VCLAMP at 20mA not exceed +3.9 Volts, and the change in clamp voltage from ICLAMP=0 to ICLAMP=20mA should not exceed 0.20Volts.

SIGNAL LIST AND DICTIONARY

LIPS	Low Instrument PreSet
HSTM	Hi STart Memory
LCS1-4	Low Chip Select 1-4 selects one of 4 pairs of ROMs
LSOB	Low Stay Off the Buss
LRAMCE	Low RAM Chip Enable
LRAMEN	Low RAM output ENable
LIDA0-15	Low Instrument Data and Address Bus bit 0-15

MAR0-15	Memory Address Register bus bit 0-15
LWRT	Low WRiTe
T0-3	Test clock bit 0-3 signature analyzer clocks
VPP/OE'	Program Voltage / Output Enable for ROMs
HPME	High PrograM Enable

MEMORY MAP

	OCTAL ADDRESS FIRST	LAST
ROM U6,U21	00000	07777
ROM U7,U22	10000	17777
ROM U8,U23	20000	27777
ROM U9,U24	30000	37777
RAM U5,U20	74000	77777

TROUBLESHOOTING

Troubleshooting for the A61 Memory Board is included along with the A60 Processor Board documentation.

Note: Calibration factors, stored in RAM, are required to meet instrument performance specifications. While loss of cal data does not impair the physical operation of the instrument, the loss in performance must still be considered an instrument failure.

Several situations have been identified that can cause the loss or alteration of RAM contents:

1. Placing the board, component side up, on a conductive surface (ie metal benchtop, screwdriver,...)

2. Shorting the main +5V power supply to ground when the +12V supply is active causes a glitch on the HSTM strobe. Occasion- ally the LWRT line will drop to the valid LOW threshold on the RAM (VIL) before HSTM has returned LOW. This executes a write the RAM location pointed to by the address latch.

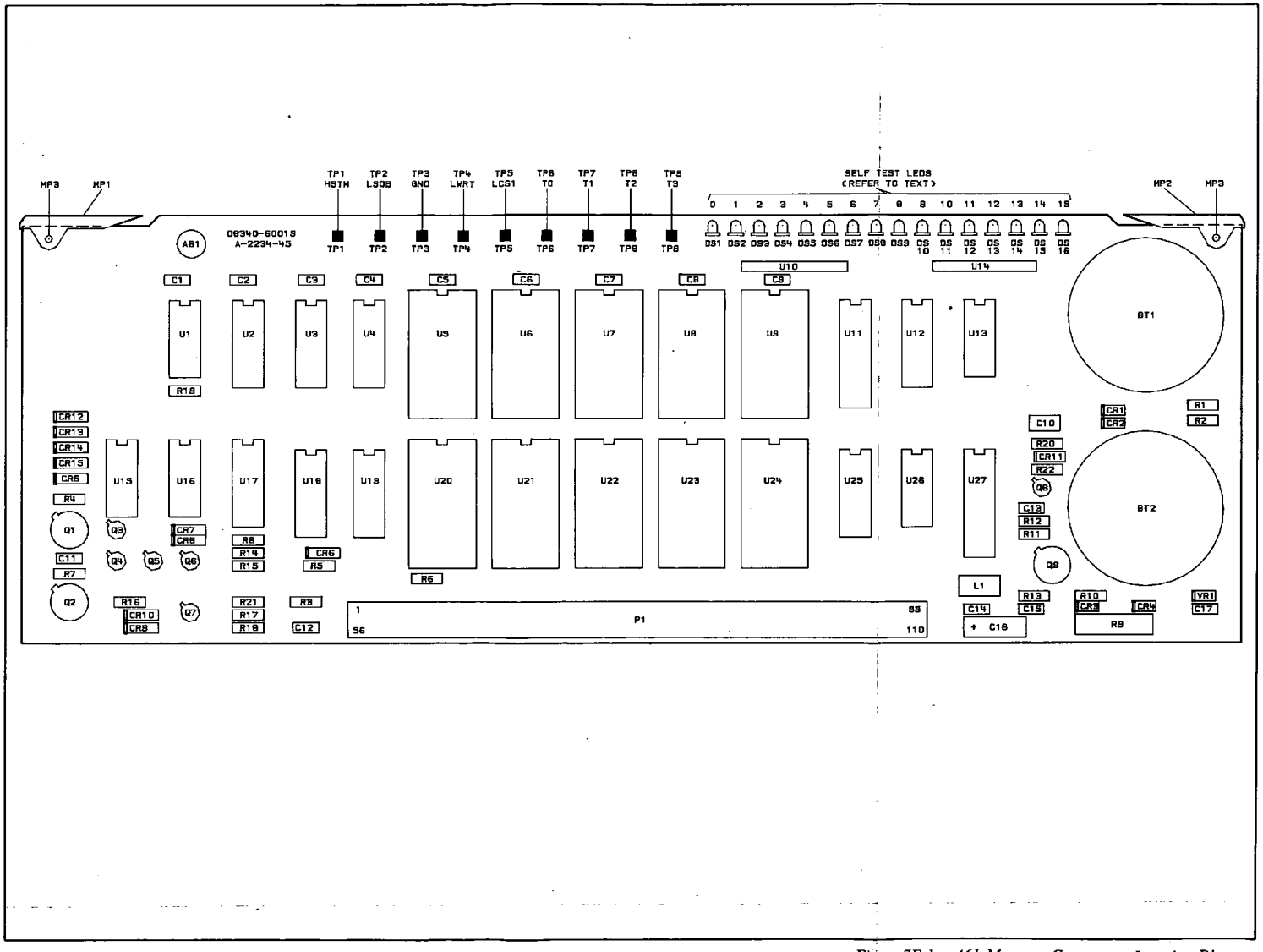
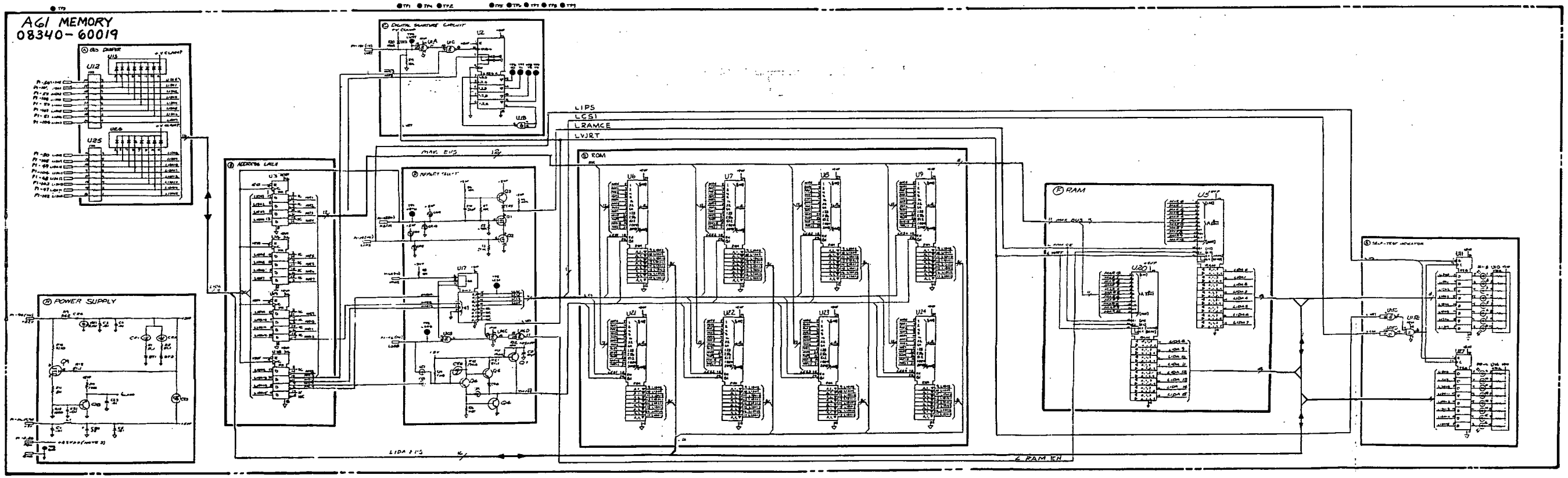


Figure 7E-1. A61 Memory, Component Location Diagram



SERIAL PREFIX: A-2237-45 28 SEPT 82

Figure 7E-2. A61 Memory, Schematic Diagram
CHANGE E 7E-13/7E-14

CHANGE D

Change D applies directly to the A8A1 3.7 GHz Oscillator PC Board assembly, **HP Part Number 08340-60041**. The existing manual may be changed to apply directly to the 08340-60041 by performing the following manual changes.

Page 6-19, Table 6-3:
Delete A8A1C22.

Page 8-735, Figure 8I-10:
Delete A8A1C22.

Page 8-845/8-846, Figure 8I-42:
Delete A8A1C22 (bottom right).

CHANGE C

Change C applies directly to the A53 Negative Regulator assembly, **HP Part Number 08340-60005**, and the A59 Digital Interface assembly, **HP Part Number 08340-60013**. The existing manual may be changed to apply directly to the above-mentioned assemblies by performing the following manual changes.

Page 6-109, Table 6-3:
Change A53R1-3 to HP Part Number 0812-0021, CD8, RESISTOR .47 5% 3W PW TC=0±90, 91637, CW2B1-3-T2-47/100-J.
Change A53R4 to HP Part Number 0757-0412, CD4 RESISTOR 825 1% .125W F TC=0±100, 24546, C4-1/8-TO-825R-F.

Page 6-123, Table 6-3:
Change A59 to HP Part Number 08340-60013, CD4.
Change A59R7, R8, and R9 to HP Part Number 0698-3132, CD4, RESISTOR 261 1% .125W F TC=0±100, 24546, C4-1/8-TO-2610-F.
Delete A59R29, R30, R31, R32, and R33.

Page 6-125, Table 6-3:
Change A60C10* to A60C10, HP Part Number 0160-4802, CD8, CAPACITOR-FXD 82 PF ±5% 100VDC CER 0±30, 28480, 0160-4802.

Page 8-473/8-474, Figure 8G-5:
Refer to the following A59 Digital Interface Component Location Diagram and Schematic Diagram for backdated information.

Page 8-535/8-536, Figure 8G-12:
Change the value of A60C10* (Block **B**) to 82 pF.

Page 8-939/8-940, Figure 8J-13:
Change the value of A53 R1-3 (Block **A**) to .47 ohms.
Change the value of A53R4 (Block **A**) to 825 ohms.

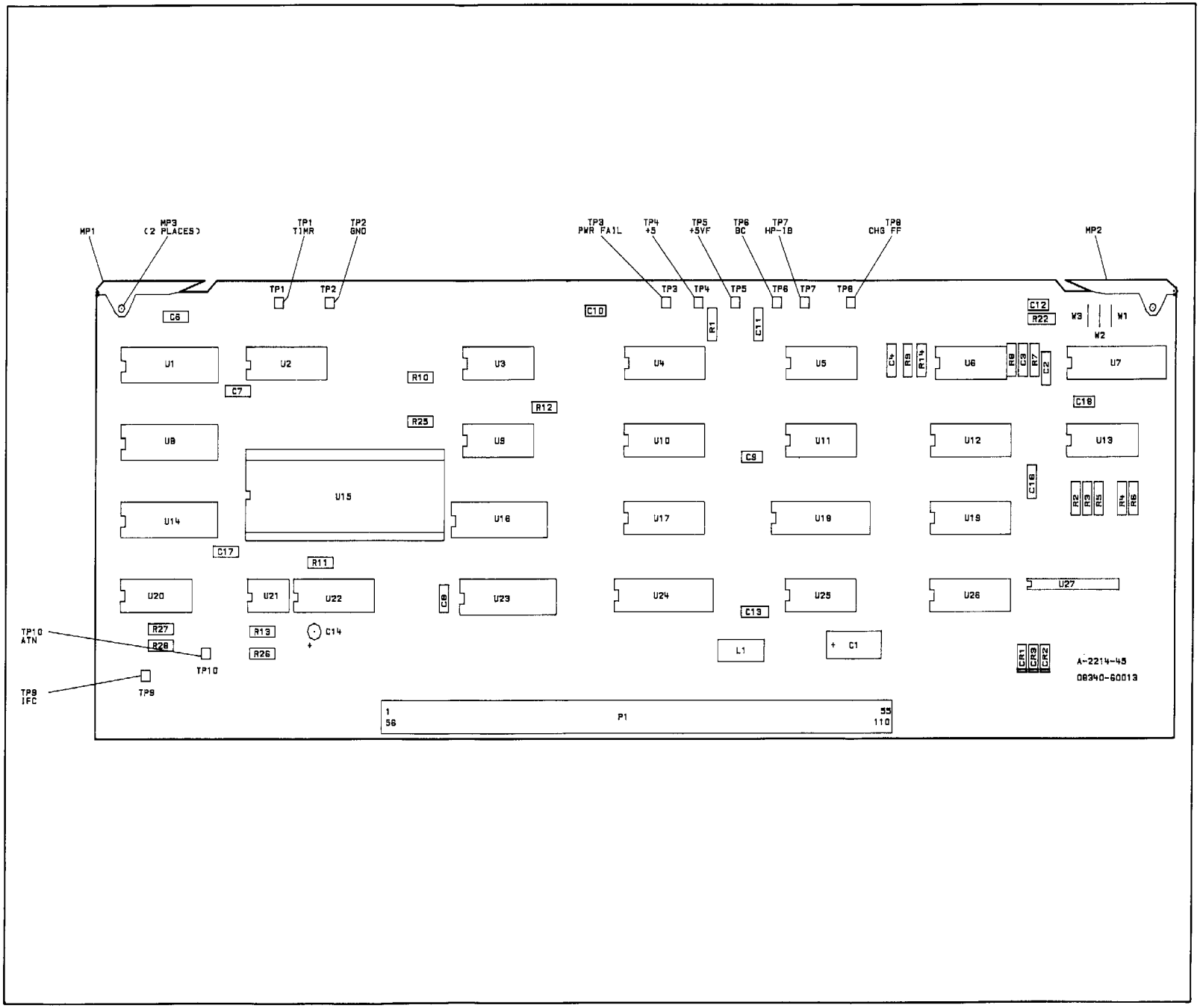


Figure 7C-1. A59 Digital Interface, Component Location Diagram

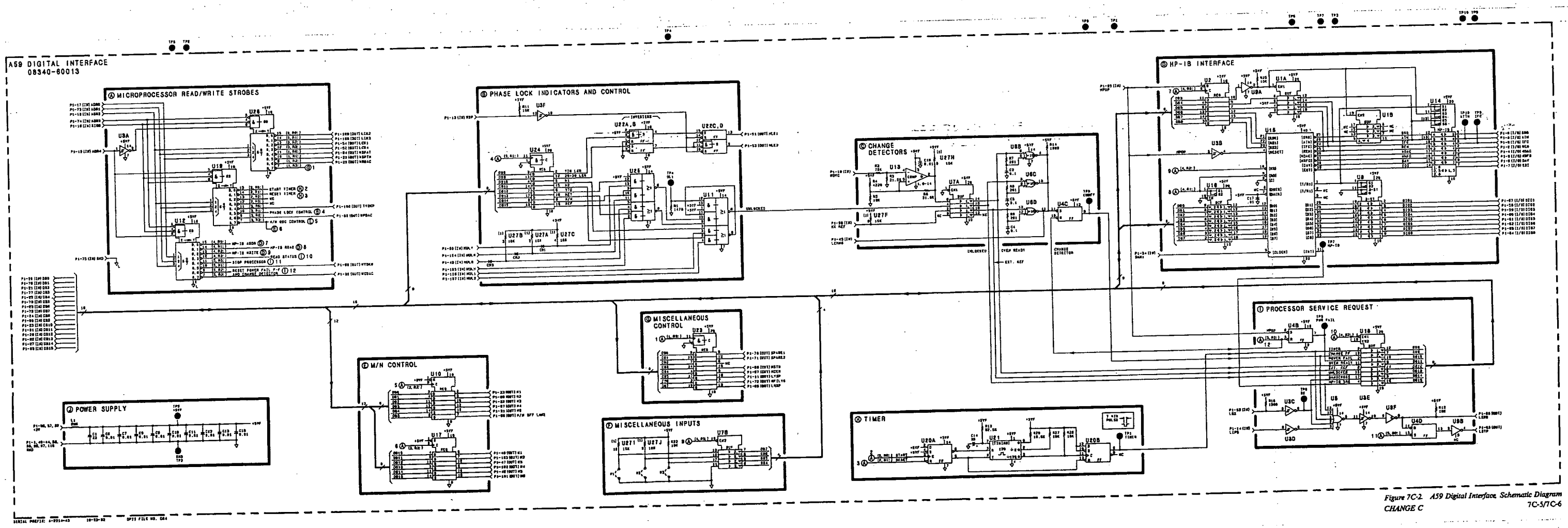


Figure 7C-2. A59 Digital Interface, Schematic Diagram
CHANGE C

CHANGE B

Change B applies directly to the A21 Pulse Modulator Driver assembly, **HP Part Number 08340-60024**. The existing manual may be changed to apply directly to the 08340-60024 by performing the following manual changes.

Page 6-31, Table 6-3:
Change A21 to HP Part Number 08340-60024, CD7.
Delete A21CR11 and CR12.

Page 8-859, Figure 8I-25
Delete CR11 and CR12 (lower right).

Page 8-761/8-762, Figure 8I-26:
Remove the component reference designations "CR11" and "CR12" (Block **C**). Enlarge the circles around FETs Q11 and Q12 to encompass each diode.

NOTE

In the 08340-60024 version of the A21 assembly, diodes were built into FETs Q11 and Q12. The addition of CR11 and CR12 became necessary when the FET manufacturer eliminated this internal diode without changing the part number. If A21Q11 or Q12 in a 08340-600024 assembly fail, replace both FETs. The assembly must then be modified per the following instructions to add CR11 and CR12.

A21 Pulse Modulator Assembly (HP P/N 08340-60024) Modification

DESCRIPTION

On A21 Pulse Modulator Assemblies installed in 8340As with serial prefix 2240A and below, A21Q11 and A21Q12 (HP P/N 1855-0251) contain protection diodes which are internal to the IC package. These diodes are no longer internal to the IC package and must be added externally when replacing either A21Q11 or A21Q12. These diodes are needed to pull down the HIPMOD DRV and LOPMOD DRV lines when inactive.

When replacing either A21Q11 or A21Q12, both FETs must be replaced by HP P/N 1855-0251 (part number did not change) and an external diode must be connected from the source to gate of both A21Q11 and A21Q12. The procedure for doing this is given below.

Parts Included in 08340-60160 Modification Kit

Qty.	Description	HP Part Number
2	Transistor MOSFET N-Channel	1855-0251
2	Diode-Switching 80V 200ma 2ns DO-35	1901-0050
4	Test Point	1251-6786
1	Label (08340-60160)	7120-4606
1	Service Note (same as this procedure)	8340A-2

WARNING

When connected to ac mains, there are voltages at points inside the instrument that can cause personal injury or even death. Any servicing of this instrument with protective covers removed should be performed only by trained personnel who are aware of the hazard involved.

CAUTION

This section contains procedures in which one must handle assemblies that contain static sensitive components. Handle any printed circuit board by the edges and never touch finger contacts. Service this instrument only at a work station that is equipped with an anti-static surface. Any persons working on this instrument should wear a grounding strap that provides a path to ground of no less than 1 Megohms and no more than 2.5 Megohms. All anti-static safeguards must conform to state and federal safety standards and statutes.

PROCEDURE

1. Switch the 8340A LINE switch to STANDBY and remove the A21 Pulse Modulator Assembly.

2. Remove A21Q11 and A21Q12 (Refer to Figure 8I-25, A21 Pulse Modulator Driver, Component Location Diagram).

3. Solder test points supplied with this kit onto A21 Assembly as shown in Figure 7-11. The test points are inserted from the component side of the assembly and are soldered onto the source and gate pads of both Q11 and Q12.

4. Install A21Q11 and A21Q12 supplied with this kit. The gate and source leads of FETs will need to be trimmed prior to soldering them into the holes of the test points.

5. On the circuit side of the A21 Assembly, install one of the diodes supplied with this kit from the gate to the source of A21Q11. The anode of the diode is connected to source of Q11 and the cathode is connected to gate. The leads of the diode should be wrapped around the test points and soldered.

6. Install the other diode supplied with this kit from the gate to the source of A21Q12 per step 5.

7. Install the 08340-60160 label over the 08340-60024 number on the assembly.

8. Reinstall the A21 Assembly into the 8340A.

9. No adjustments are required as a result of this modification.

MANUAL CHANGES

For Manual P/N 08340-90020, make the following changes.

Page 6-31, Table 6-3:
Change A21 to HP Part Number 08340-60160.
Add A21CR11 and A21CR12, HP P/N 1901-0050, CD3, Diode-Switching 80V 200ma 2ns DO−35.

Page 8-759, Figure 8I-25:
Add the following note to the Component Location Diagram:

NOTE

CR11 and CR12 have been added across Q11 and Q12, respectively. These components are mounted on the circuit side of the p.c. board.

Page 8-761/762, Figure 8I-26:
In Block **C** OUTPUT MULTIPLEXER, move the diodes drawn across the gate to source junctions of A21Q11 and A21Q12 to the outside of the circle drawn around the FETs. Re-label the diodes CR11 (across Q11) and CR12 (across Q12).

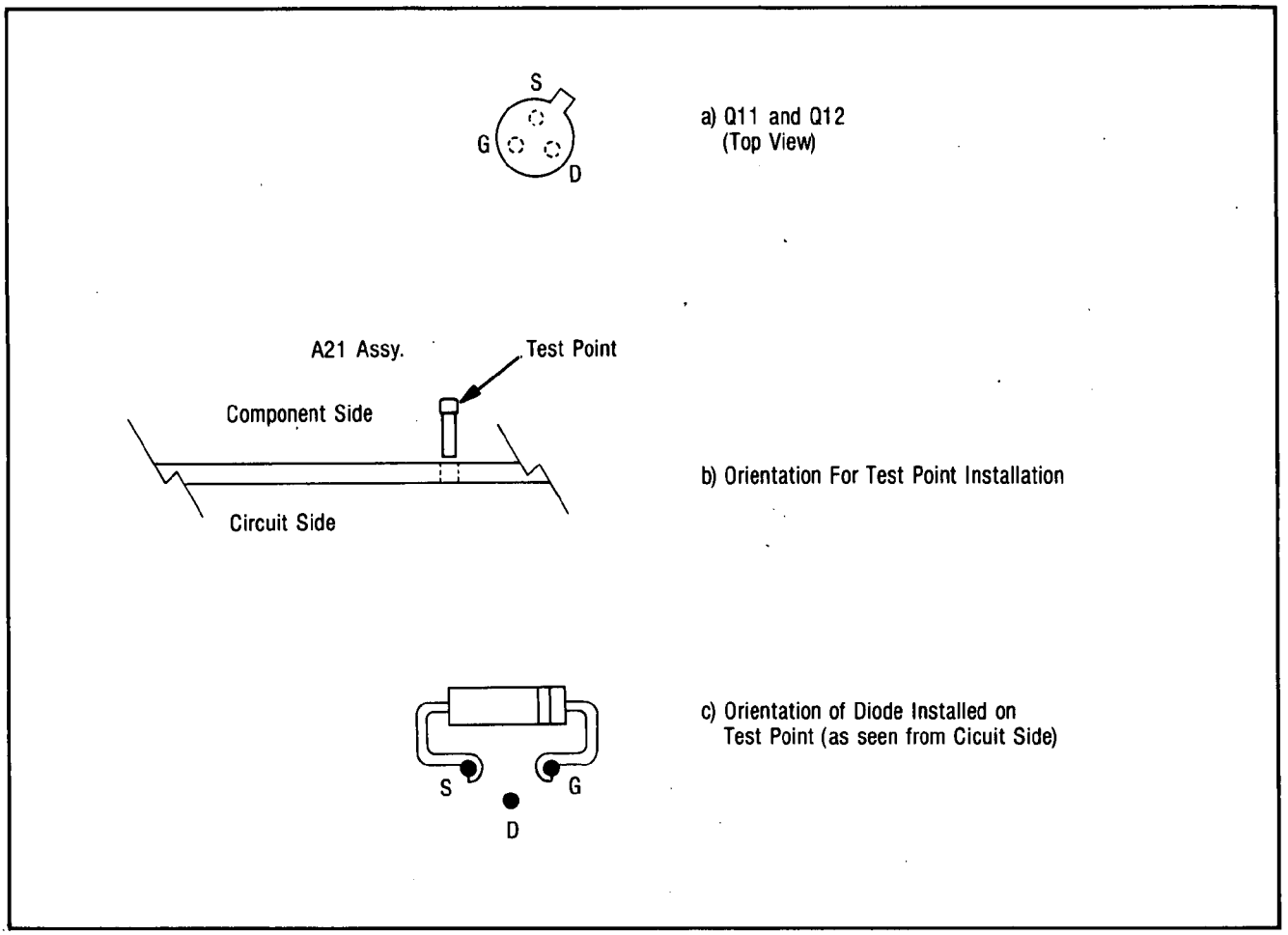


Figure 7B-1. A21Q11 and A21Q12 Pin Configuration and Orientation for Test Point Installation