Errata

Title & Document Type: 8780A Service Manual (option H02, H03 at end of manual)

Manual Part Number: 08780-90036

Revision Date: December 1990

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.

About this Manual

We've added this manual to the Agilent website in an effort to help you support your product. This manual provides the best information we could find. It may be incomplete or contain dated information, and the scan quality may not be ideal. If we find a better copy in the future, we will add it to the Agilent website.

Support for Your Product

Agilent no longer sells or supports this product. You will find any other available product information on the Agilent Test & Measurement website:

www.tm.agilent.com

Search for the model number of this product, and the resulting product page will guide you to any available information. Our service centers may be able to perform calibration if no repair parts are needed, but no other support from Agilent is available.

Agilent Technologies

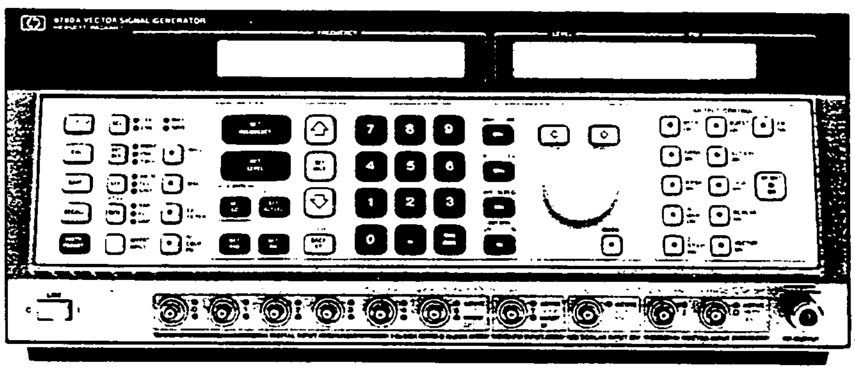
HP 8780A

VECTOR SIGNAL GENERATOR

eference No.
8780-90036

SERVICE MANUAL

HP 8780A
VECTOR SIGNAL GENERATOR
10.0 MHz - 3.0 GHz



HP Part No. 08780-90036
Binder Part No. 9282-1080

HEWLETT® PACKARD

Service Manual

HP 8780A Vector Signal Generator

10.0 MHz – 3.0 GHz

SERIAL NUMBERS

This manual applies directly to instruments with serial numbers prefixed 2635A and above.

For additional important information about serial numbers, see INSTRUMENTS COVERED BY THIS MANUAL in Section 1 of the OPERATING MANUAL.

Sections 1 through 4 are contained in the HP 8780A Operating Manual.

HP Part No. 08780-90036

1501 Page Mill Road, Palo Alto California
Printed in USA

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Frequency Modulation Subsystem

RF Output Subsystem

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HP 8780A

Herstellerbescheinigung

Hiermit wird bescheinigt, dass dieses Gerät/System in Übereinstimmung mit den Bestimmungen von Postverfügung 1046/84 funkenstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes/Systems angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Zusatzinformation für Mess- und Testgeräte:

Werden Mess- und Testgeräte mit ungeschirmten Kabeln und/oder in offenen Messaufbauten verwendet, so ist vom Betreiber sicherzustellen, dass die Funk-Entstörbestimmungen unter Betriebsbedingungen an seiner Grundstücksgrenze eingehalten werden.

Manufacturer's Declaration

This is to certify that this product meets the radio frequency interference requirements of Directive FTZ 1046/1984. The German Bundespost has been notified that this equipment was put into circulation and has been granted the right to check the product type for compliance with these requirements.

Note: If test and measurement equipment is operated with unshielded cables and/or used for measurements on open set-ups, the user must ensure that under these operating conditions, the radio frequency interference limits are met at the border of his premises.

CERTIFICATION

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

WARRANTY

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

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

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

LIMITATION OF WARRANTY

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

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

EXCLUSIVE REMEDIES

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

ASSISTANCE

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

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.

SAFETY CONSIDERATIONS

GENERAL

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation.

This product is a Safety Class I instrument (provided with a protective earth terminal).

BEFORE APPLYING POWER

Verify that the product is set to match the available line voltage and the correct fuse is installed.

SAFETY EARTH GROUND

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.

WARNINGS

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting the protective earth terminal will cause a potential shock hazard that could result in personal injury. (Grounding one conductor of a two conductor outlet is not sufficient protection.) In addition, verify that a common ground exists between the unit under test and this instrument prior to energizing either unit.

Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

If this instrument is to be energized via an auto-transformer (for voltage reduction) make sure the common terminal is connected to neutral (that is, the grounded side of the mains supply).

Servicing instruction are for use by service-trained personnel only. To avoid dangerous electric shock, do not perform any servicing unless qualified to do so. Adjustments described in the manual are performed with power supplied to the instrument while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

For continued protection against fire hazard, replace the line fuse(s) only with 250V fuse(s) of the same current rating and type (for example, normal blow, time delay, etc.) Do not use repaired fuses or short-circuited fuseholders.

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 (see Table of Contents for page references).

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.

5 ADJUSTMENTS

5-1. Introduction

This section contains adjustments that are used to return the Vector Generator to peak performance. Adjustments are not required on any fixed periodic basis, and normally are performed only after a repair or when a performance test has indicated that some parameters are out of specification.

To determine which adjustments to perform after repair or replacement of an assembly, refer to paragraph 5-5, Post-Repair Adjustments. Most replacement assemblies are preadjusted at the factory and should not require adjustment.

Allow a one hour warm-up period prior to performing any of the adjustments.

5-2. Safety Considerations

This paragraph contains important information that must be followed for your protection and to avoid damage to the equipment being used. In addition, important safety information precedes any adjustment step where a hazard may be present.

Warning 

Adjustments described in this section are performed with power applied to the instrument and with protective covers removed. Maintenance should be performed only by service-trained personnel who are aware of the hazards involved (for example, fire and electrical shock). When the maintenance procedure can be performed without power, the power should be removed.

For additional safety information, refer to the Safety Considerations page found at the beginning of this manual.

5-3. Equipment Required

Most of the adjustment procedures include a list of recommended test equipment. The test equipment is also identified on the adjustment setup diagrams. A full listing of all recommended test equipment used in servicing the Vector Generator can be found in Table 1-3 of the Operating Manual. If substitutions must be made for the models recommended in the adjustment procedures, the test equipment must meet the critical specifications listed in Table 1-3.

5-4. Factory Selected Components

Factory selected components are identified on the schematic diagrams and replaceable parts list with an asterisk (*) immediately following the reference designation. Table 5-1 lists the reference designation, the service sheet where the component is shown, the range of values, and the procedure for selecting the part.

Table 5-1. Factory Selected Components

Reference Designator	Service Sheet	Range of Values	Procedure for Selection
A11W3	BD6	Jumper Wire (0Ω)	Installed between A11J2-1 and A11J2-4 for instruments with Option 001

5-5. Post-Repair Adjustments

Table 5-2 lists the adjustments related to repair of any of the Vector Generator assemblies and also to the performance tests in Section 4 of the Operating Manaul. Replacement assemblies are preadjusted at the factory and should not require adjustment after installation.

Table 5-2. Post-Repair Adjustments

Assembly Repaired	Related Adjustment and Performance Test	Reference Service Sheet
A13 IF Multiplier Deck	5-7, 4-8	BD4
A14 LO Multiplier Deck	5-8, 4-8	BD4
A15 RF Output Deck	5-9, 4-10	BD4

5-6. Adjustment Locations

A foldout, located in Section 8 on the lettered service sheets, contains illustrations showing most adjustment locations. In addition, the printed circuit board Component Location diagrams on the numbered service sheets show the individual adjustment points.

5-7. A13 IF MULTIPLIER SRD BIAS ADJUSTMENT

Reference

Service Sheet BD4

Description

The conversion efficiency of the frequency multiplier on the A13 IF Multiplier Deck is optimized by adjusting the bias of the Step Recovery Diode (SRD) harmonic generator. The conversion efficiency for the eighth harmonic of the input signal to the deck is optimized.

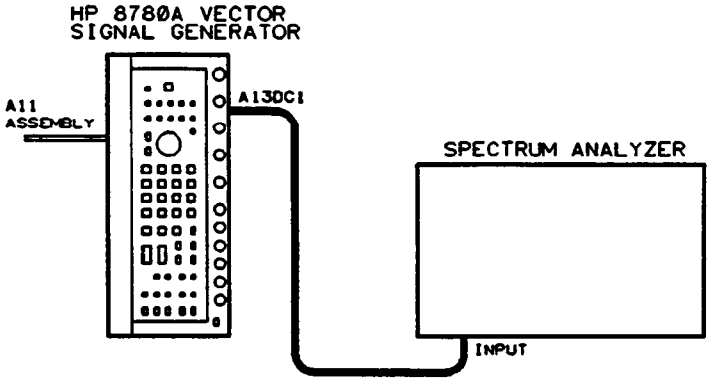

Figure 5-1. IF Multiplier SRD Adjustment Setup

Equipment

Spectrum Analyzer..... HP 8566B

Caution

The A11 Microprocessor Assembly contains static-sensitive components. Use proper ESD precautions when handling the assembly in the following procedure.

Procedure

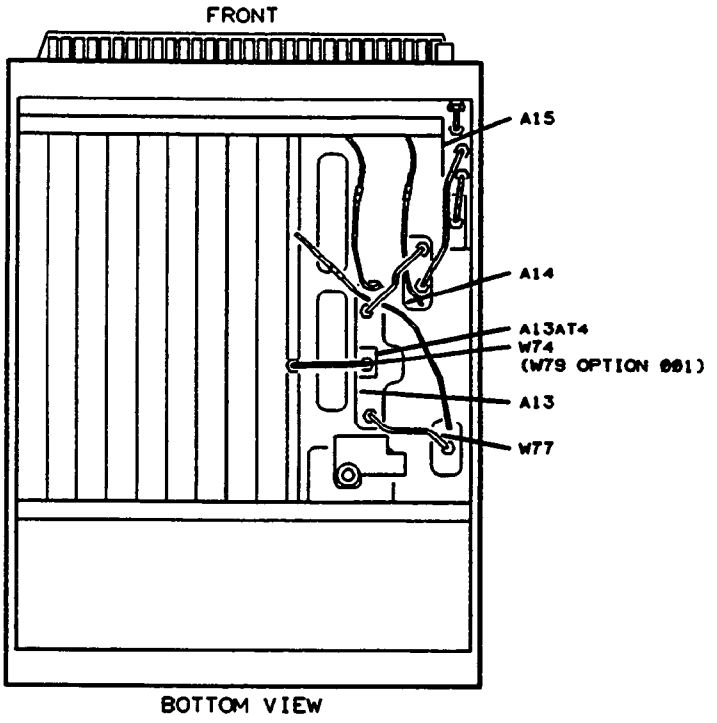

Figure 5-2. Test Connections: A13 IF Multiplier Deck

1. Place the Vector Generator on its left side (facing the front panel), remove the top and bottom covers, and place the A11 Microprocessor Assembly in the service position. This will provide access to the adjustments at the top of the instrument and the RF output of the deck at the bottom of the instrument.

2. Connect the spectrum analyzer to A13DC1 coupled port on the A13 IF Multiplier Deck. This point is accessed from underneath the instrument. The A13DC1 coupled port is connected to the cable (W77) that runs from the A13 IF Multiplier Deck to the A15 RF Output Deck.

3. Set the spectrum analyzer center frequency to 8 GHz and the reference level to +20 dBm. The frequency span should be 50 MHz or less and the vertical sensitivity should be 1 dB per division.

4. Set A13A2R8, SRD BIAS, fully counter-clockwise.

5. While observing the 8 GHz signal displayed on the spectrum analyzer, turn A13A2R8, SRD BIAS, slowly clockwise until the displayed signal is at its maximum level.

6. Continue turning the the adjustment clockwise until the displayed signal level drops by 0.5 dB.

7. Disconnect the spectrum analyzer and reconnect the cable (W77) to the A13 IF Multiplier Deck. Return the A11 Microprocessor Assembly to the normal operating position and install the top and bottom covers.

5-8. A14 LO MULTIPLIER SRD BIAS ADJUSTMENT

Reference

Service Sheet BD4

Description

The conversion efficiency of the frequency multipliers on the A14 LO Multiplier Deck are optimized by adjusting the bias of the two Step Recovery Diode (SRD) harmonic generators. The conversion efficiency for the eighth harmonic of the input signal to the deck is optimized for each of the two harmonic generators.

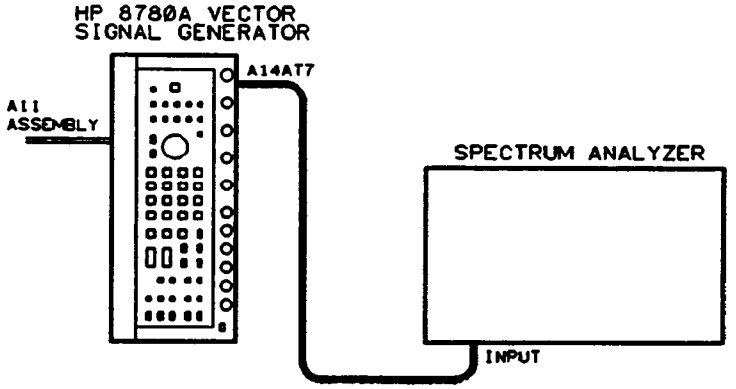

Figure 5-3. LO Multiplier SRD Adjustment Setup

Equipment

Spectrum Analyzer..... HP 8566B

Caution

The A11 Microprocessor Assembly contains static-sensitive components. Use proper ESD precautions when handling the assembly during the following procedure.

Procedure

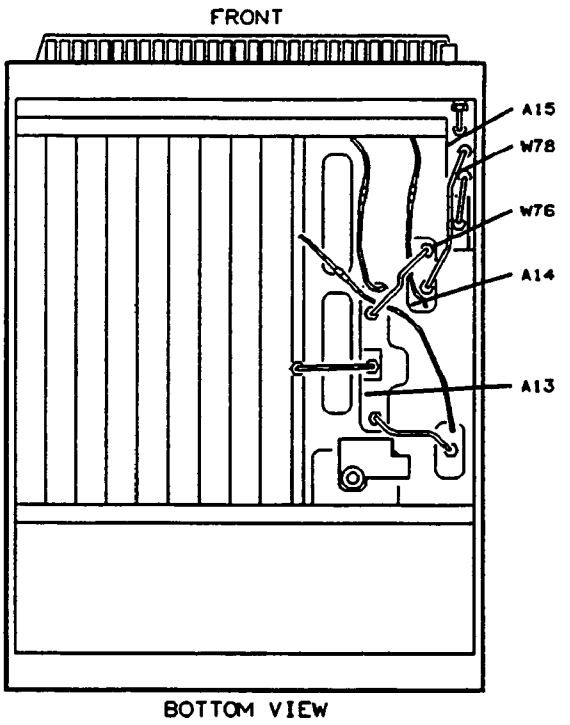

Figure 5-4. Test Connections: A14 LO Multiplier Deck

1. Place the Vector Generator on its left side (facing the front panel), remove the top and bottom covers, and place the A11 Microprocessor assembly in the service position. This will provide access to the adjustment at the top of the instrument and the RF output of the deck at the bottom of the instrument.

2. Connect the spectrum analyzer to the A14AT7 coupler/filter assembly on the A14 LO Multiplier Deck. This point is accessed from the bottom of the instrument. The connection should be made in place of cable W78 that runs from the A14 LO Multiplier Deck to the A15 RF Output Deck.

3. Press the Vector Generator PRESET key and set the frequency to 0 Hz.

4. Set the spectrum analyzer center frequency to 8 GHz and the reference level to +20 dBm. The frequency span should be 50 MHz or less and the vertical sensitivity should be 2 dB per division.

5. Set A14A2R16, 8-9.5, fully counter-clockwise.

6. While observing the 8 GHz signal displayed on the spectrum analyzer, adjust A14A2R16, 8-9.5, slowly clockwise until the signal is at the maximum level.

7. Continue turning the adjustment clockwise until the displayed signal level drops by 0.5 dB. The spectrum analyzer reference level and vertical sensitivity should be adjusted to provide the necessary amplitude resolution.

8. Set the Vector Generator to 1.6 GHz.

9. Set the spectrum analyzer center frequency to 9.6 GHz. Readjust the vertical sensitivity and reference level as required to view the 9.6 GHz signal.

10. Set A14A2R21, 9.5-11, fully counter-clockwise.

11. While observing the 9.6 GHz signal displayed on the spectrum analyzer, adjust A14A2R21, 9.5-11, slowly clockwise until the signal is at the maximum level.

12. Continue turning the adjustment clockwise until the displayed signal level drops by 0.5 dB.

13. Disconnect the spectrum analyzer and reconnect the cable (W78) to the A14 LO Multiplier Deck. Return the A11 Microprocessor Assembly to the normal operating position and install the top and bottom covers.

5-9. A15 RF OUTPUT HARMONIC DISTORTION ADJUSTMENT

Reference

Service Sheet BD4

Description

The harmonic distortion of the RF output signal is minimized with this adjustment. The Vector Generator is tuned to 140 MHz at a high power level and the RF output amplifier is adjusted for minimum harmonic levels.

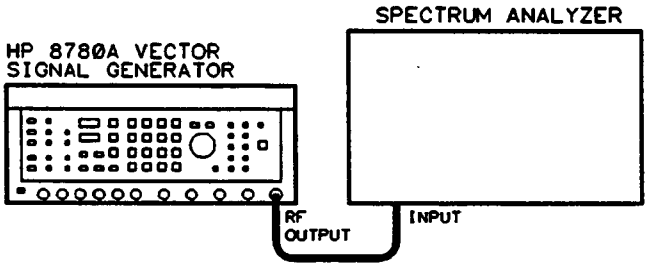

Figure 5-5. Harmonic Distortion Adjustment Setup

Equipment

Spectrum Analyzer..... HP 8566B

Caution

The A11 Microprocessor Assembly contains static-sensitive components. Use proper ESD precautions when handling the assembly in the following procedure.

Procedure

1. Remove the top cover of the instrument and the three screws holding down the A11 Microprocessor Assembly. Place the A11 assembly in the service position by swinging the assembly up and securing it with a strap to one of the transformer mounting screws.

2. Connect the spectrum analyzer to the Vector Generator RF output connector.

3. Press the PRESET key on the Vector Generator.

4. Set the Vector Generator to 140 MHz at an output level of +7 dBm. If the instrument has Option 064 installed, use an output level of +12 dBm.

5. Press the CAL key on the Vector Generator to execute a self-calibration.

6. Set the spectrum analyzer start frequency to 140 MHz and the stop frequency to 2.5 GHz. Set the reference level to +20 dBm.

7. Once the Vector Generator self-calibration is complete, adjust A15A1R46, HD2 MIN, to minimize the second harmonic of the 140 MHz signal. This adjustment will have little affect on the third harmonic. All harmonics should be more than 39 dB below the 140 MHz signal level.

8. Disconnect the spectrum analyzer and return the A11 Microprocessor Assembly to the normal operating position. Install the top cover.

6 REPLACEABLE PARTS

6-1. Introduction

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

6-2. Abbreviations

Table 6-1 lists abbreviations used in the parts list, block diagrams, and throughout the manual. Standard abbreviations may be in upper or lower-case letters. However, the replaceable parts list is a computer printout using only upper-case letters. Thus, abbreviations in the replaceable parts list are in upper-case letters only.

6-3. Replaceable Parts List

Table 6-2 is the list of replaceable parts and is organized as follows:

a. Major electrical assemblies in alphanumeric order by reference designation.
b. Chassis-mounted, or non-assembly, parts in alphanumeric order by reference designation.

The information given for each part consists of the following:

- Reference designation
- Hewlett-Packard part number
- Part number check digit (CD)
- Total quantity (Qty) used in the instrument
- Part description
- Five-digit code that represents a typical manufacturer
- Manufacturer's part number

Note

The total quantity for each part is given only once, at the first appearance of the part number in the list. Quantities for parts on optional assemblies are totaled by assembly and not integrated into the standard list.

6-4. Factory Selected Parts (*)

Parts marked with an asterisk are factory selected parts. (That is, they are selected in factory testing.) The value shown in the parts list is a nominal value only.

6-5. Parts List Backdating

Parts marked with daggers ( ) are different in some instruments. The replaceable parts list applies directly to only one instrument configuration. This configuration is identified by a serial number prefix described on the title page of the manual. Refer to Section 7 for parts information on instruments with lower prefixes.

6-6. Parts List Updating

Instruments made after the publication of this manual may have different parts than ones shown in the replaceable parts list. These instruments will have serial number prefixes higher than the one described on the title page. Refer to the MANUAL CHANGES supplement that accompanies these instruments for parts information. The MANUAL CHANGES supplement also contains instructions for correcting errors in the replaceable parts list.

6-7. Ordering Information

When ordering a part listed in the replaceable parts list, include the Hewlett-Packard part number, the check digit, and the quantity required. Address the order to the nearest Hewlett-Packard office. The check digit (CD) will ensure accurate and timely processing of your order.

Note

Within the USA, it is more expedient to order directly from the HP Parts Center. Ask your nearest HP office for information and forms for the "Direct Mail Order System".

6-8. Parts Identification

Most mechanical parts are identified in Figures 6-1 through 6-25. These figures are located in the section labeled parts identification. Some electrical parts are shown in figures associated with the block diagrams in Section 8.

To identify a part not shown in Sections 6, 7, or 8, or in the MANUAL CHANGES supplement, contact the parts identification section of your nearest Hewlett-Packard service center. Be prepared to identify the instrument by model and serial number, and to describe the part by type, function, and location within the instrument.

6-9. Recommended Spares List

Stocking spare parts for an instrument is often done to ensure quick return to service after a malfunction occurs. Hewlett-Packard prepares a "Recommended Spares" list for this instrument. The contents of the list are based on failure reports and repair data. Quantities given are for one year of parts support. A complimentary copy of the "Recommended Spares" list may be requested from your nearest Hewlett-Packard office.

When stocking parts to support more than one Generator or to support a variety of Hewlett-Packard instruments, it may be more economical to work from one consolidated list rather than simply adding together stocking quantities from the individual instrument lists. Hewlett-Packard will prepare consolidated "Recommended Spares" lists for any number or combination of instruments. Contact your nearest Hewlett-Packard office for details.

6-10. Restored Assemblies

Restored assemblies are those that may be purchased on an exchange basis, thus affording a considerable cost saving. 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.

Table 6-1. Reference Designations and Abbreviations (1 of 2)

REFERENCE DESIGNATIONS

A . . . . . assembly
AT . . . attenuator; isolator; termination
B . . . . . fan; motor
BT . . . . . battery
C . . . . . capacitor
CP . . . . . coupler
CR . . . . . diode; diode thyristor; varactor
DC . . . . directional coupler
DL . . . . . delay line
DS . . . . . annunciator; signaling device (audible or visual); lamp; LED
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 . . . . . transistor; SCR; triode thyristor
R . . . . . resistor
RT . . . . . thermistor
S . . . . . switch
T . . . . . transformer
TB . . . . . terminal board
TC . . . . . thermocouple
TP . . . . . test point
U . . . . . integrated circuit; microcircuit
V . . . . . electron tube
VR . . . . voltage regulator; breakdown diode
W . . . . cable; transmission path; wire
X . . . . . socket
Y . . . . . crystal unit (piezo-electric or quartz)
Z . . . . tuned cavity; tuned circuit

ABBREVIATIONS

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

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

Table 6-1. Reference Designations and Abbreviations (2 of 2)

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

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

MULTIPLIERS

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

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1	08780-60040	9	1	FRONT PANEL ASSEMBLY	28480	08780-60040
A1A1				NOT ASSIGNED		
A1A2	08780-60001	2	1	KEY BOARD ASSEMBLY	28480	08780-60001
A1A2DS1	1990-0858	6	30	LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS2	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS3	1990-1085	3	16	LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS4	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS5	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS6	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS7	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS8	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS9	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS10	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS11	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS12	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS13	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS14	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS15	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS16	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS17	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS18	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS19	1990-0671	1	2	LED-LAMP LUM-INT=200UCD IF=5MA-MAX	28480	HLMP-6620
A1A2DS20	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS21	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS22	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS23	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS24	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS25	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS26	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A2DS27	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS28	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS29	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2DS30	1990-1085	3		LED-LAMP LUM-INT=200UCD IF=4MA-MAX	01556	HLMP-6720
A1A2J1	1251-8262	6	4	CONN-POST TYPE .100-PIN-SPCG 50-CONT	28480	1251-8262
A1A2M1	1251-5595	2	33	POLARIZING KEY-POST CONN	28480	1251-5595
A1A2M2	1251-5595	2		POLARIZING KEY-POST CONN	28480	1251-5595
A1A2M3	5040-8858	3	1	LED STDF STRIP	28480	5040-8858
A1A2R1	1810-0441	3	3	NETWORK-RES 14-DIP470.0 OHM	11236	760-1-R470
A1A2S1	5060-9436	7	55	PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0442	7	1	KEY-HALF BLUE	28480	5041-0442
A1A2S2	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4596	0	1	KEY-LCL	28480	5041-4596
A1A2S3	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4621	2	1	KEY-SET FREQ	28480	5041-4621
A1A2S4	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0747	5	2	KEY-ARROW UP	28480	5041-0747
A1A2S5	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4616	5	1	KEY-7	28480	5041-4616
A1A2S6	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4617	6	1	KEY-8	28480	5041-4617
A1A2S7	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4618	7	1	KEY-9	28480	5041-4618
A1A2S8	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4601	8	1	KEY-GHZ	28480	5041-4601
A1A2S9	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4600	7	2	KEY-ARROW LEFT	28480	5041-4600
A1A2S10	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4600	7		KEY-ARROW RIGHT	28480	5041-4600
A1A2S11	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7	16	KEY QUARTER	28480	5041-0252
A1A2S12	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252

See introduction to this section for ordering information
*Indicates factory selected value
†Backdating information in Section VII

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A1A2S13	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S14	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4599	3	1	KEY-CAL	28480	5041-4599
A1A2S15	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4598	2	1	KEY-EXTCLK	28480	5041-4598
A1A2S16	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S17	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4622	3	1	KEY-SET LEVEL	28480	5041-4622
A1A2S18	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4607	4	1	KEY-SET INCR	28480	5041-4607
A1A2S19	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4613	2	1	KEY-4	28480	5041-4613
A1A2S20	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4614	3	1	KEY-5	28480	5041-4614
A1A2S21	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4615	4	1	KEY-6	28480	5041-4615
A1A2S22	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1796	6	1	KEY-MHZ	28480	5041-1796
A1A2S23	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S24	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S25	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4655	2	1	KEY-SAVE	28480	5041-4655
A1A2S26	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4597	1	1	KEY-CLK	28480	5041-4597
A1A2S27	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S28	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S29	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S30	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4608	5	1	KEY RF OUT. ON	28480	5041-4608
A1A2S31	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1790	0	1	KEY-RECALL	28480	5041-1790
A1A2S32	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4595	9	1	KEY-DATA	28480	5041-4595
A1A2S33	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S34	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4604	1	1	KEY-QSETIQ	28480	5041-4604
A1A2S35	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4605	2	1	KEY-SET ALTLVL	28480	5041-4605
A1A2S36	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0747	5		KEY-ARROW DOWN	28480	5041-0747
A1A2S37	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4610	9	1	KEY-1	28480	5041-4610
A1A2S38	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4611	0	1	KEY-2	28480	5041-4611
A1A2S39	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4612	1	1	KEY-3	28480	5041-4612
A1A2S40	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1795	5	1	KEY-KHZ	28480	5041-1795
A1A2S41	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S42	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S43	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0720	4	1	KEY-INSTR PRESET	28480	5041-0720
A1A2S44	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0243	6	1	KEY-QTR SEAMIST	28480	5041-0243
A1A2S45	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A2S46	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4603	0	1	KEY-SETI.Q	28480	5041-4603
A1A2S47	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4606	3	1	KEY-SET FM	28480	5041-4606
A1A2S48	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-2837	8	1	KEY-BACK SP	28480	5041-2837
A1A2S49	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4620	1	1	KEY-.	28480	5041-4620
A1A2S50	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4619	8	1	KEY-0	28480	5041-4619
A1A2S51	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4609	6	1	KEY-CHGSIGN	28480	5041-4609
A1A2S52	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-4602	9	1	KEY-HZ	28480	5041-4602
A1A2S53	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S54	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2S55	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0252	7		KEY QUARTER	28480	5041-0252
A1A2U1	0960-0713	8	1	ROTARY PULSE GENERATOR TWO CHANNEL	28480	0960-0713

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A1A3	08780-60020	5	1	FRONT PANEL INTERFACE	28480	08780-60020
A1A3C1	0180-0291	3	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A1A3C2	0160-4835	7	9	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C3	0160-3334	9	2	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A1A3C4	0160-4808	4	2	CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A1A3C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C7	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C8	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C9	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C10	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A1A3C11	0160 4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A1A3C12	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C13	0160-4574	1	2	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A1A3C14	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A1A3C15	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3C16	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A1A3DS1	1990-0858	6	17	LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS2	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS3	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS4	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS5	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS6	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS7	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS8	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS9	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS10	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS11	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS12	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS13	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS14	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS15	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS16	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3DS17	1990-0858	6		LED-LAMP LUM-INT=15UCD IF=25MA-MAX	28480	1990-0858
A1A3J1	1251-8599	2	1	CONN-POST TYPE .100-PIN-SPCG 10-CONT	76381	3591-6002
A1A3J2	1251-8105	6	2	CONN-POST TYPE .100-PIN-SPCG 16-CONT	18873	66506-320
A1A3J3	1251-8262	6	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	76381	3596-6002
A1A3J4	1251-8601	7	1	CONN-POST TYPE .100-PIN-SPCG 34-CONT	76381	3594-6002
A1A3J5	1251-8105	6		CONN-POST TYPE .100-PIN-SPCG 16-CONT	18873	66506-320
A1A3M1	1400-1025	2	17	MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M2	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M3	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M4	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M5	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M6	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M7	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M8	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M9	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M10	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M11	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M12	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M13	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M14	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M15	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M16	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M17	1400-1025	2		MOUNT- L.E.D. .120 IN ID; .187 IN OD	32559	908-150
A1A3M18	0361-0242	8	4	RIVET-SEMITUB OVH .089DIA .125LG	28480	0361-0242
A1A3M19	1251-5595	2	9	POLARIZING KEY-POST CONN	28480	1251-5595
A1A3M20	8150-0005	2	1	WIRE 22AWG BK 300V PVC 7X30 105C	28480	8150-0005

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A3M21	8150-1542	4	1	WIRE 22AWG R 300V PVC 7X30 80C	08452	F-1110-5120-DL
A1A3R1	1810-0441	3	2	NETWORK-RES 14-DIP 470.0 OHM X 13	32997	4114R-002-471S
A1A3R2	1810-0441	3		NETWORK-RES 14-DIP 470.0 OHM X 13	32997	4114R-002-471S
A1A3R3	0698-3132	4	1	RESISTOR 261 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R4	0698-3152	8	1	RESISTOR 3.48K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R5	0757-1094	9	1	RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A1A3R6	0837-0220	1	1	THERMISTOR ROD 10K-OHM TC=-3.83%/C-DEG	75263	AL1545-6240-73-S6
A1A3R7	0698-0084	9	3	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R8	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R9	0757-0288	1	1	RESISTOR 9.09K 1% .125W TF TC=0+-100	06341	MR24
A1A3R10	0698-3156	2	1	RESISTOR 14.7K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R11	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R12	1810-0279	5	1	NETWORK-RES 10-SIP 4.7K OHM X 9	C1433	750-101
A1A3R13	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R14	0757-0200	7	1	RESISTOR 5.62K 1% .125W TF TC=0+-100	19701	SFR25H
A1A3R15	0757-0438	3	3	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R16	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3R17	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A1A3S1	3101-2867	0	1	SWITCH-RKR SUBMIN SPDT .02A 20VAC/DC	28480	3101-2867
A1A3U1	1826-0772	6	1	IC V RGLTR-ADJ-POS 1.2/32V TO-92 PKG	28480	1826-0772
A1A3U2	1820-3344	2	6	IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A1A3U3	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A1A3U4	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A1A3U5	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A1A3U6	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A1A3U7	1820-1417	6	2	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS26N
A1A3U8	1820-1417	6		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS26N
A1A3U9	1820-1437	0	1	IC MV TTL LS MONOSTBL DUAL	01295	SN74LS221N
A1A3U10	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A1A4	5061-1190	6	2	LCD DRIVER ASSEMBLY	28480	5061-1190
A1A5	5061-1190	6		LCD DRIVER ASSEMBLY	28480	5061-1190

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2	08780-60021	6	1	SUM LOOP FRAME	28480	08780-60021
	08780-69021	4	1	SUM LOOP FRAME (RESTORED 08780-60021)	28480	08780-69021
A2C1	0160-2437	1	3	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A2C2	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A2C3	0160-6260	6	1	CAPACITOR-FDTHRU 100PF 20% 200V CER	33095	54-713-001-101M
A2C4	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A2M1	0515-0894	3	4	SCREW-MACH M2.5 X 0.45 6MM-LG PAN-HD	28480	0515-0894
A2M2	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A2M3	0515-0924	0	14	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A2M4	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A2M5	0515-1057	2	6	SCREW-MACH M2.5 X 0.45 18MM-LG PAN-HD	28480	0515-1057
A2M6	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A2M7	08780-00049	2	1	GASKET SUMLP TOP	28480	08780-00049
A2M8	08780-00050	5	1	GASKET SUMLP BOT	28480	08780-00050
A2M9	08780-20052	9	1	FRAME OUPT SUML	28480	08780-20052
A2M10	08780-20112	2	1	SHLD SUMLOOP TOP	28480	08780-20112
A2M11	08780-20113	3	1	SHLD SUMLOOP TOP	28480	08780-20113
A2M12				NOT ASSIGNED		
A2M13				NOT ASSIGNED		
A2M14	1250-1425	7	1	CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	98291	50-053-0269-220
A2M15	1250-1626	0	2	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1626
A2M16	1250-1998	9	2	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A2M17	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A2M18	2190-0034	5	1	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A2M19	2190-0124	4	6	WASHER-LK INTL T NO. 10 .195-IN-ID	16179	500222
A2M20	2190-0584	0	2	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A2M21	2950-0078	9	7	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A2M22-A2M24				NOT ASSIGNED		
A2M25	5001-6518	6	1	COVER FRONT	28480	5001-6518
A2M26	5001-6519	7	1	COVER REAR	28480	5001-6519
A2M27	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A2M28	8160-0562	7	1	RFI GASKET	28480	8160-0562
A2M29	9170-0847	3	2	BEAD-SHIELDING	02114	56-590-65/3B PARYLENE COATED
A2M30	5021-4533	3	1	DIVIDER FRAME	28480	5021-4533

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A1						
(2715A AND BELOW)	08780-60035	2	1	UHF OSCILLATOR BD AY	28480	08780-60035
(2716A AND ABOVE)	08780-60206	9	1	UHF OSCILLATOR BD AY	28480	08780-60206
A2A1C1	0180-0197	8	5	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A2A1C2	0160-4802	8	1	CAPACITOR-FXD 82PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A820J
A2A1C3	0160-3874	2	2	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A2A1C4	0160-3874	2		CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A2A1C5	0160-6307	2	2	CAPACITOR-FXD 2PF +-.1PF 500VDC PORC	1A027	MA282R0B
A2A1C6	0160-6307	2		CAPACITOR-FXD 2PF +-.1PF 500VDC PORC	1A027	MA282R0B
A2A1C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A2A1C8	0160-6306	1	2	CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A2A1C9	0160-6306	1		CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A2A1C10	0160-3878	6	19	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C11	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C12	0160-4385	2	2	CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D150J
A2A1C13	0160-4385	2		CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D150J
A2A1C14	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A2A1C15				NOT ASSIGNED		
A2A1C16				NOT ASSIGNED		
A2A1C17	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C18	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C19	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C20	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C21	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A2A1C22	0160-0690	4	5	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A2A1C23	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C24				NOT ASSIGNED		
A2A1C25	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A2A1C26	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C27	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C28	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A2A1C29	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C30	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A2A1C31	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C32	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C33	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C34	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C35				NOT ASSIGNED		
A2A1C36				NOT ASSIGNED		
A2A1C37	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C38	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C39	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C40-A2A1C43				NOT ASSIGNED		
A2A1C44	0160-4498	8	2	CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A2A1C45	0160-4498	8		CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A2A1C46	0160-5903	2	1	CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	MA12C0G2D240J
A2A1C47	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A2A1C48	0121-0558	1	2	CAPACITOR-V TRMR-CER .25-.7PF 250V	05525	9401-0 PC
A2A1C49	0121-0558	1		CAPACITOR-V TRMR-CER .25-.7PF 250V	05525	9401-0 PC
A2A1C50	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1C51	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A2A1C52	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A2A1C53	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A1CR1	0122-0165	8	4	DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A2A1CR2	0122-0165	8		DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A2A1CR3	0122-0165	8		DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A2A1CR4	0122-0165	8		DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A2A1L1	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH +-10%	99800	1537-30
A2A1L2	9100-1630	7	2	INDUCTOR RF-CH-MLD 51UH +-5%	99800	1537-62
A2A1L3	9140-0144	0	2	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A2A1L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A2A1L5	9135-0079	9	4	INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A1L6	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A2A1L7	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A2A1L8	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A2A1L9				NOT ASSIGNED		
A2A1L10				NOT ASSIGNED		
A2A1L11	9100-2247	4	10	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L12	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L13-A2A1L16				NOT ASSIGNED		
A2A1L17	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L18	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L19				NOT ASSIGNED		
A2A1L20	9100-1630	7		INDUCTOR RF-CH-MLD 51UH +-5%	99800	1537-62
A2A1L21				NOT ASSIGNED		
A2A1L22	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L23	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L24				NOT ASSIGNED		
A2A1L25	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L26				NOT ASSIGNED		
A2A1L27	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L28-A2A1L30				NOT ASSIGNED		
A2A1L31	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1L32	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A1M1	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A2A1M2	8151-0014	5	1	WIRE 24AWG 1X24	92194	299
A2A1Q1	1854-1044	6	5	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A2A1Q2	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A2A1Q3	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A2A1Q4	1853-0459	3	2	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A2A1Q5	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A2A1Q6	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A2A1Q7	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A2A1R1	0698-7236	7	2	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R2	0698-7244	7	1	RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R3	0698-7192	4	2	RESISTOR 14.7 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R4	0698-7192	4		RESISTOR 14.7 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R5	0757-0178	8	1	RESISTOR 100 1% .25W TF TC=0+-100	19701	5043R
A2A1R6	0698-3437	2	2	RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A1R7	0698-4588	6	2	RESISTOR 383 1% .25W TF TC=0+-100	12498	NAS
A2A1R8	0698-4588	6		RESISTOR 383 1% .25W TF TC=0+-100	12498	NAS
A2A1R9	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A1R10	0698-7229	8	2	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R11	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R12	0698-7253	8	2	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R13	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R14	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R15	0698-7255	0	1	RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R16	0699-1854	5	2	RESISTOR 121 1% .05W F TC=0+-50	05545	CMF-50-2-121-1%
A2A1R17	0699-1854	5		RESISTOR 121 1% .05W F TC=0+-50	05545	CMF-50-2-121-1%
A2A1R18	0699-1850	1	2	RESISTOR 68.1 1% .05W F TC=0+-50	05545	CMF-50-2-68.1-1%
A2A1R19				NOT ASSIGNED		
A2A1R20	0699-1850	1		RESISTOR 68.1 1% .05W F TC=0+-50	05545	CMF-50-2-68.1-1%
A2A1R21	0699-1851	2	1	RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A2A1R22	0699-1848	7	4	RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A2A1R23	0699-1858	9	2	RESISTOR 11 1% .05W F TC=0+-50	05545	CMF-50-2-11-1%
A2A1R24	0699-1848	7		RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A2A1R25	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A2A1R26	0699-1852	3	3	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A2A1R27	0699-1915	9	4	RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A2A1R28				NOT ASSIGNED		
A2A1R29	0699-1853	4	12	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R30	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A1R31	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R32	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R33	0698-4579	5	3	RESISTOR 261 1% .25W TF TC=0+-100	12498	NAS
A2A1R34	0699-1848	7		RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A2A1R35	0699-1858	9		RESISTOR 11 1% .05W F TC=0+-50	05545	CMF-50-2-11-1%
A2A1R36	0699-1848	7		RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A2A1R37	0699-1849	8	2	RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A2A1R38	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A2A1R39	0699-1849	8		RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A2A1R40	0698-4579	5		RESISTOR 261 1% .25W TF TC=0+-100	12498	NAS
A2A1R41	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A2A1R42	0698-4579	5		RESISTOR 261 1% .25W TF TC=0+-100	12498	NAS
A2A1R43	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A2A1R44				NOT ASSIGNED		
A2A1R45	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R46	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R47	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R48	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R49	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R50	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R51	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R52	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A1R53	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A2A1R54	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A2A1R55	0698-7200	5	2	RESISTOR 31.6 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R56	0698-7200	5		RESISTOR 31.6 1% .05W TF TC=0+-100	2M627	CRB20
A2A1R57	0698-7220	9	1	RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A2A1TP1	0360-0535	0	7	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A1TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A1TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A1TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A1TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A1TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A1TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A2	08780-60034	1	1	SUM LOOP BOARD AY	28480	08780-60034
A2A2C1	0180-0116	1	3	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A2A2C2				NOT ASSIGNED		
A2A2C3	0160-4806	2	1	CAPACITOR-FXD 39PF +-5% 100VDC CER 0+-30	28480	0160-4806
A2A2C4	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A2A2C5				NOT ASSIGNED		
A2A2C6	0160-5348	9		CAPACITOR-FXD 51PF +-5% 100VDC CER 0+-30	09969	RPA10C0G510J100
A2A2C7	0160-4803	9	1	CAPACITOR-FXD 68PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A680J
A2A2C8	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	K7253	TAAB33K10RX
A2A2C9	0160-4835	7	7	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A2A2C10	0160-4918	7	2	CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A2A2C11	0121-0061	1	1	CAPACITOR-V TRMR-CER 5.5-18PF 350V	09535	538-016 A 5.5-18
A2A2C12	0160-5909	8	2	CAPACITOR-FXD .047UF +-10% 50VDC CER	12474	CAC03X7R473K050A
A2A2C13	0160-5909	8		CAPACITOR-FXD .047UF +-10% 50VDC CER	12474	CAC03X7R473K050A
A2A2C14	0160-4829	9	3	CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A2A2C15	0160-4829	9		CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A2A2C16				NOT ASSIGNED		
A2A2C17	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A2A2C18	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A2A2C19	0160-3878	6	6	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A2C20	0160-0690	4	2	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A2A2C21-A2A2C23				NOT ASSIGNED		
A2A2C24	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A2C25-A2A2C28				NOT ASSIGNED		
A2A2C29	0160-4574	1	3	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2A2C30	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A2C31	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A2C32	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A2C33				NOT ASSIGNED		
A2A2C34				NOT ASSIGNED		
A2A2C35	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2A2C36	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A2A2C37	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A2A2C38	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A2A2C39	0160-0576	5	9	CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C40	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A2A2C41	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C42	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C43	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A2A2C44	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A2A2C45						
(2635A AND BELOW)	0160-5348	9	2	CAPACITOR-FXD 51PF +-5% 100VDC CER 0+-30	09969	RPA10C0G510J100
(2641A AND ABOVE)	0160-5412	8	1	CAPACITOR-FXD 16PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A160J
A2A2C46						
(2635A AND BELOW)	0160-4814	2	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	DA12C0G2A151J
(2641A AND ABOVE)	0160-4802	8	1	CAPACITOR-FXD 82PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A820J
A2A2C47	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A2A2C48	0160-4829	9		CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A2A2C49				NOT ASSIGNED		
A2A2C50	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C51	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A2A2C52	0160-4831	3		CAPACITOR-FXD 4700PF +-10% 100VDC CER	28480	0160-4831
A2A2C53				NOT ASSIGNED		
A2A2C54	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C55	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C56	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C57	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C58	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A2A2C59	0160-5913	4	1	CAPACITOR-FXD 36PF +-5% 200VDC CER 0+-30	06383	MA12C0G2D360J
A2A2C60	0160-4918	7		CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A2A2C61	0160-4491	1	1	CAPACITOR-FXD 8.2PF +-.5PF 200VDC CER	06383	FD12C0G2D8R2J

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A2C62	0121-0452	4	1	CAPACITOR-V TRMR-AIR 1.3-.4PF 175V	74970	187-0103-028
A2A2C63	0160-4521	8	3	CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D120J
A2A2C64	0160-4521	8		CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D120J
A2A2C65	0160-4521	8		CAPACITOR-FXD 12PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D120J
A2A2C66						
(2643A AND BELOW)				NOT ASSIGNED		
(2644A AND ABOVE)	0160-4831	3	2	CAPACITOR-FXD 4700PF +-10% 100VDC CER	28480	0160-4831
A2A2CR1	1901-0050	3	13	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR2-						
A2A2CR8				NOT ASSIGNED		
A2A2CR9						
(2643A AND BELOW)	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
(2644A AND ABOVE)				NOT ASSIGNED		
A2A2CR10						
(2643A AND BELOW)	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
(2644A AND ABOVE)				NOT ASSIGNED		
A2A2CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR13-						
A2A2CR16				NOT ASSIGNED		
A2A2CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR19	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR20	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR21	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR22	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR23	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR24	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR25	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2CR26	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A2A2DS1	1990-0652	8	1	LED-LAMP ARRAY LUM-INT=200UCD IF=5MA-MAX	28480	1990-0652
A2A2L1	9140-0114	4	5	INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A2A2L2				NOT ASSIGNED		
A2A2L3	9140-0143	9	1	INDUCTOR RF-CH-MLD 3.3UH +-10%	91637	IM-2 3.3UH 10%
A2A2L4	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A2A2L5	9100-1613	6	1	INDUCTOR RF-CH-MLD 470NH +-20%	99800	1537-06
A2A2L6	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A2A2L7	9140-0144	0	6	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A2A2L8-						
A2A2L10				NOT ASSIGNED		
A2A2L11	9100-2247	4	5	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A2L12	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A2L13	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A2L14	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A2A2L15				NOT ASSIGNED		
A2A2L16				NOT ASSIGNED		
A2A2L17	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A2A2L18				NOT ASSIGNED		
A2A2L19						
(2635A AND BELOW)	9100-2254	3	1	INDUCTOR RF-CH-MLD 390NH +-10%	32159	1A3903M+-10%
(2641A AND ABOVE)	9100-2252	1	2	INDUCTOR RF-CH-MLD 270NH +-10%	32159	1A2703M+-10%
A2A2L20						
(2635A AND BELOW)	9100-2249	6	2	INDUCTOR RF-CH-MLD 150NH +-10%	32159	1A1503M+-10%
(2641A AND ABOVE)	9135-0071	1	1	INDUCTOR RF-CH-MLD 62NH +-5.806%	24226	10M062X-1
A2A2L21	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A2L22				NOT ASSIGNED		
A2A2L23				NOT ASSIGNED		
A2A2L24	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A2A2L25				NOT ASSIGNED		
A2A2L26	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A2A2L27				NOT ASSIGNED		
A2A2L28	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A2A2L29	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A2A2L30	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A2A2L31	9100-2252	1		INDUCTOR RF-CH-MLD 270NH +-10%	32159	1A2703M+-10%
A2A2L32	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A2L33						
(2635A AND BELOW)	9100-2249	6		INDUCTOR RF-CH-MLD 150NH +-10%	32159	1A1503M+-10%
(2641A AND ABOVE)	9100-2251	0	1	INDUCTOR RF-CH-MLD 220NH +-10%	32159	1A2203M+-10%
A2A2L34	9135-0143	8	1	FILTER-LINE CEE-22-TERMS	28480	9135-0143
A2A2M1	5021-4541	3	1	SPACER PC GROUND	28480	5021-4541
A2A2M2	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A2A2Q1	1854-0637	1	1	TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
A2A2Q2	1853-0314	9	1	TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A2A2Q3	1855-0414	4	1	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	17856	2N4393
A2A2Q4	1854-0345	8	3	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A2A2Q5-A2A2Q8				NOT ASSIGNED		
A2A2Q9	1854-1044	6	2	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A2A2Q10	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A2A2Q11	1854-0810	2	1	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A2A2Q12	1853-0405	9	1	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A2A2Q13	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A2A2Q14	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A2A2R1	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A2A2R2	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A2A2R3	0757-0458	7	3	RESISTOR 51.1K 1% .125W TF TC=0+-100	12498	CT4
A2A2R4				NOT ASSIGNED		
A2A2R5	0757-0460	1	1	RESISTOR 61.9K 1% .125W TF TC=0+-100	12498	CT4
A2A2R6	0757-0458	7		RESISTOR 51.1K 1% .125W TF TC=0+-100	12498	CT4
A2A2R7	0698-0084	9	3	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R8	0698-3441	8	3	RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A2A2R9	0757-0442	9	5	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R10	0757-0438	3	6	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R11	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R12	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R13	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A2A2R14	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R15	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R16	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R17	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R18	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R19				NOT ASSIGNED		
A2A2R20	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A2A2R21	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A2A2R22				NOT ASSIGNED		
A2A2R23	0698-7209	4	2	RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R24	0698-7209	4		RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R25				NOT ASSIGNED		
A2A2R26	0698-7212	9	2	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R27	0698-7233	4	4	RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R28				NOT ASSIGNED		
A2A2R29	0757-0274	5	2	RESISTOR 1.21K 1% .125W TF TC=0+-100	12498	CT4
A2A2R30	0757-0274	5		RESISTOR 1.21K 1% .125W TF TC=0+-100	12498	CT4
A2A2R31				NOT ASSIGNED		
A2A2R32	0698-3437	2	7	RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A2R33				NOT ASSIGNED		
A2A2R34				NOT ASSIGNED		
A2A2R35	0757-0399	5	7	RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R36				NOT ASSIGNED		
A2A2R37	0757-0399	5		RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R38	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A2A2R39	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R40	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R41	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A2R42				NOT ASSIGNED		
A2A2R43	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R44						
(2644A AND ABOVE)	0757-0298	3	1	RESISTOR 22K 2% .25W TF TC=0+-100	K8479	H4
(2643A AND BELOW)	0757-0444	1	1	RESISTOR 12.1K 1% .125W TF TC=0+-100	19701	SFR25H

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A2R45						
(2643A AND BELOW)	0757-0465	6	7	RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
(2644A AND ABOVE)	0757-0463	4	2	RESISTOR 82.5K 1% .125W TF TC=0+-100	12498	CT4
A2A2R46						
(2643A AND BELOW)	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
(2644A AND ABOVE)	0757-0463	4		RESISTOR 82.5K 1% .125W TF TC=0+-100	12498	CT4
A2A2R47	0757-0416	7	1	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R48	0699-1851	2	4	RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A2A2R49	0699-1850	1	2	RESISTOR 68.1 1% .05W F TC=0+-50	05545	CMF-50-2-68.1-1%
A2A2R50	0699-1851	2		RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A2A2R51	0699-1852	3	2	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A2A2R52	0699-1915	9	3	RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A2A2R53	0699-1853	4	8	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A2R54	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	545	CMF-50-2-21.5-1%
A2A2R55	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A2R56	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A2R57-						
A2A2R61				NOT ASSIGNED		
A2A2R62	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A2A2R63	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A2A2R64				NOT ASSIGNED		
A2A2R65				NOT ASSIGNED		
A2A2R66	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A2A2R67						
(2635A AND BELOW)	0698-3156	2	1	RESISTOR 14.7K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
(2641A AND ABOVE)	0757-0288	1	1	RESISTOR 9.09K 1% .125W TF TC=0+-100	06341	MR24
A2A2R68	0698-7222	1	1	RESISTOR 261 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R69				NOT ASSIGNED		
A2A2R70	0757-1090	5	2	RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A2A2R71				NOT ASSIGNED		
A2A2R72	0757-0399	5		RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R73	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A2R74	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A2R75	0757-0399	5		RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R76	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A2A2R77	0757-1090	5		RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A2A2R78	0699-1849	8	2	RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A2A2R79	0699-1849	8		RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A2A2R80				NOT ASSIGNED		
A2A2R81	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A2A2R82				NOT ASSIGNED		
A2A2R83	0757-0458	7		RESISTOR 51.1K 1% .125W TF TC=0+-100	12498	CT4
A2A2R84	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A2A2R85	0757-0279	0	1	RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A2A2R86						
(2635A AND BELOW)	0757-0280	3	3	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
(2641A AND ABOVE)	0757-0401	0	2	RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R87	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A2A2R88	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A2R89	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A2R90	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A2R91	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A2A2R92						
(2635A AND BELOW)	0757-0394	0	6	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
(2641A AND ABOVE)	0698-3438	3	2	RESISTOR 147 1% .125W TF TC=0+-100	K8479	H8
A2A2R93	0698-3438	3		RESISTOR 147 1% .125W TF TC=0+-100	K8479	H8
A2A2R94	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A2R95	0757-0399	5		RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R96	0757-0405	4	1	RESISTOR 162 1% .125W TF TC=0+-100	06001	NK4
A2A2R97	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A2R98	0757-0399	5		RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R99	0699-1851	2		RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A2A2R100	0699-1850	1		RESISTOR 68.1 1% .05W F TC=0+-50	05545	CMF-50-2-68.1-1%
A2A2R101	0699-1851	2		RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A2A2R102	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A2A2R103	0698-3442	9	1	RESISTOR 237 1% .125W TF TC=0+-100	K8479	H8
A2A2R104	0698-8821	8	1	RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A2A2R105	0698-3430	5	1	RESISTOR 21.5 1% .125W TF TC=0+-100	K8479	H8
A2A2R106	0698-7206	1	1	RESISTOR 56.2 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R107-A2A2R109				NOT ASSIGNED		
A2A2R110	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A2A2R111	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A2A2R112	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A2A2R113	0757-0399	5		RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R114	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R115	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R116	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A2A2R117	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A2A2R118	2100-1984	7	1	RESISTOR-TRMR 100 10% TKF TOP-ADJ 1-TRN	09969	3321
A2A2R119	0698-3266	5	1	RESISTOR 237K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R120	1810-0037	3	1	NETWORK-RES 16-DIP 1.0K OHM X 8	32997	4116R-001-102
A2A2R121	1810-0903	2	1	NETWORK-RES 16-DIP 2.4K OHM X 8	03764	4116B-0B0-242
A2A2R122	1810-0248	8	1	NETWORK-RES 16-DIP 2.0K OHM X 8	32997	4116R-001-202
A2A2R123	0698-8812	7	2	RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A2A2R124	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A2A2R125	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R126	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R127 (2635A AND BELOW)				NOT ASSIGNED		
(2641A AND ABOVE)	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A2A2R128 (2643A AND BELOW)				NOT ASSIGNED		
(2644A AND ABOVE)	0698-7238	9	1	RESISTOR 1.21K 1% .05W TF TC=0+-100	2M627	CRB20
A2A2R129 (2643A AND BELOW)				NOT ASSIGNED		
(2644A AND ABOVE)	0698-7238	9	1	RESISTOR 1.21K 1% .05W TF TC=0+-100	2M627	CRB20
A2A2T1	9100-4435	6	1	TRANSFORMER-RF 1:1 OHM RATION; FOPR	02745	T1-6T
A2A2TP1	0360-0535	0	11	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP8	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP9	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP10	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2TP11	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A2A2U1	1820-2934	4	1	IC PRESCR ECL	04713	MC12009P
A2A2U2	0955-0247	2	1	U-WAVE MIXER 2 GHZ MAX	28480	0955-0247
A2A2U3	1820-3126	8	2	IC CNTR ECL HEXADEC SYNCHRO	04713	MC10136P
A2A2U4	1820-3126	8		IC CNTR ECL HEXADEC SYNCHRO	04713	MC10136P
A2A2U5	1820-2102	8	1	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A2A2U6	1826-0547	3	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A2A2U7	1820-1411	0	1	IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A2A2U8				NOT ASSIGNED		
A2A2U9				NOT ASSIGNED		
A2A2U10	1826-0753	9	1	IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL074ACN
A2A2U11	1820-0802	1	2	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A2A2U12	1820-0817	8	2	IC FF ECL D-M/S DUAL	04713	MC10131P
A2A2U13	1826-0783	9	1	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A2A2U14	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A2A2U15	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3	08780-60022	7	1	REFERENCE LOOP FRAME	28480	08780-60022
	08780-69022	5	1	REFERENCE LOOP FRAME (RESTORED 08780-60022)	28480	08780-69022
A3C1	0160-2437	1	3	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A3C2	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A3C3	0160-6260	6	1	CAPACITOR-FDTHRU 100PF 20% 200V CER	33095	54-713-001-101M
A3C4	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A3M1	0515-0886	3	4	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A3M2	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A3M3	0515-0924	0	14	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A3M4	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A3M5	0515-1430	5	1	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-1430
A3M6	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A3M7	08780-00026	5	1	SHLD RF REF TOP	28480	08780-00026
A3M8	08780-00027	6	1	SHLD RF REF BOTT	28480	08780-00027
A3M9	08780-00047	0	1	INSULATOR PLATE	28480	08780-00047
A3M10	08780-20053	0	1	FRAME RF REFRNCE	28480	08780-20053
A3M11				NOT ASSIGNED		
A3M12				NOT ASSIGNED		
A3M13	1250-1998	9	5	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A3M14	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A3M15	2190-0034	5	5	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A3M16	2190-0584	0	16	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A3M17	2950-0078	9	5	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A3M18	5001-6518	6	1	COVER FRONT	28480	5001-6518
A3M19	5001-6519	7	1	COVER REAR	28480	5001-6519
A3M20	5021-4533	3	1	DIVIDER FRAME	28480	5021-4533
A3M21	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A3M22	8160-0562	7	1	RFI GASKET	28480	8160-0562
A3M23	9170-0847	3	2	BEAD-SHIELDING	02114	56-590-65/3B PARYLENE COATED

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A3A1						
(2716A AND BELOW)	08780-60035	2	1	UHF OSCILLATOR BD AY	28480	08780-60035
(2725A AND ABOVE)	08780-60206	9	1	UHF OSCILLATOR BD AY	28480	08780-60206
A3A1C1	0180-0197	8	5	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A3A1C2	0160-4802	8	1	CAPACITOR-FXD 82PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A820J
A3A1C3	0160-3874	2	2	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A3A1C4	0160-3874	2		CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A3A1C5	0160-6307	2	2	CAPACITOR-FXD 2PF +-.1PF 500VDC PORC	1A027	MA282R0B
A3A1C6	0160-6307	2		CAPACITOR-FXD 2PF +-.1PF 500VDC PORC	1A027	MA282R0B
A3A1C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A3A1C8	0160-6306	1	2	CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A3A1C9	0160-6306	1		CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A3A1C10	0160-3878	6	19	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C11	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C12	0160-4385	2	2	CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D150J
A3A1C13	0160-4385	2		CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D150J
A3A1C14	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A3A1C15				NOT ASSIGNED		
A3A1C16				NOT ASSIGNED		
A3A1C17	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C18	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C19	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C20	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C21	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A3A1C22	0160-0690	4	5	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A3A1C23	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C24				NOT ASSIGNED		
A3A1C25	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A3A1C26	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C27	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C28	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A3A1C29	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C30	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A3A1C31	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C32	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C33	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C34	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C35				NOT ASSIGNED		
A3A1C36				NOT ASSIGNED		
A3A1C37	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C38	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C39	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C40-A3A1C43				NOT ASSIGNED		
A3A1C44	0160-4498	8	2	CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A3A1C45	0160-4498	8		CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A3A1C46	0160-5903	2	1	CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	MA12C0G2D240J
A3A1C47	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A3A1C48	0121-0558	1	2	CAPACITOR-V TRMR-CER .25-.7PF 250V	05525	9401-0 PC
A3A1C49	0121-0558	1		CAPACITOR-V TRMR-CER .25-.7PF 250V	05525	9401-0 PC
A3A1C50	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1C51	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A3A1C52	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A3A1C53	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A1CR1	0122-0165	8	4	DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A3A1CR2	0122-0165	8		DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A3A1CR3	0122-0165	8		DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A3A1CR4	0122-0165	8		DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A3A1L1	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH +-10%	99800	1537-30
A3A1L2	9100-1630	7	2	INDUCTOR RF-CH-MLD 51UH +-5%	99800	1537-62
A3A1L3	9140-0144	0	2	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A3A1L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A3A1L5	9135-0079	9	4	INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1L6	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A3A1L7	9135-0079	9		INDUCTOR 100NH +-5.5% ? 6D-MMX6.6LG-MM	24226	10M0100X-1
A3A1L8	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A3A1L9				NOT ASSIGNED		
A3A1L10				NOT ASSIGNED		
A3A1L11	9100-2247	4	10	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L12	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L13-A3A1L16				NOT ASSIGNED		
A3A1L17	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L18	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L19				NOT ASSIGNED		
A3A1L20	9100-1630	7		INDUCTOR RF-CH-MLD 51UH +-5%	99800	1537-62
A3A1L21				NOT ASSIGNED		
A3A1L22	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L23	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L24				NOT ASSIGNED		
A3A1L25	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L26				NOT ASSIGNED		
A3A1L27	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L28-A3A1L30				NOT ASSIGNED		
A3A1L31	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1L32	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A1M1	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A3A1M2	8151-0014	5	1	WIRE 24AWG 1X24	92194	299
A3A1Q1	1854-1044	6	5	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A3A1Q2	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A3A1Q3	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A3A1Q4	1853-0459	3	2	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A3A1Q5	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A3A1Q6	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A3A1Q7	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A3A1R1	0698-7236	7	2	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R2	0698-7244	7	1	RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R3	0698-7192	4	2	RESISTOR 14.7 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R4	0698-7192	4		RESISTOR 14.7 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R5	0757-0178	8	1	RESISTOR 100 1% .25W TF TC=0+-100	19701	5043R
A3A1R6	0698-3437	2	2	RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A3A1R7	0698-4588	6	2	RESISTOR 383 1% .25W TF TC=0+-100	12498	NAS
A3A1R8	0698-4588	6		RESISTOR 383 1% .25W TF TC=0+-100	12498	NAS
A3A1R9	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A3A1R10	0698-7229	8	2	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R11	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R12	0698-7253	8	2	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R13	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R14	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R15	0698-7255	0	1	RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R16	0699-1854	5	2	RESISTOR 121 1% .05W F TC=0+-50	05545	CMF-50-2-121-1%
A3A1R17	0699-1854	5		RESISTOR 121 1% .05W F TC=0+-50	05545	CMF-50-2-121-1%
A3A1R18	0699-1850	1	2	RESISTOR 68.1 1% .05W F TC=0+-50	05545	CMF-50-2-68.1-1%
A3A1R19				NOT ASSIGNED		
A3A1R20	0699-1850	1		RESISTOR 68.1 1% .05W F TC=0+-50	05545	CMF-50-2-68.1-1%
A3A1R21	0699-1851	2	1	RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A3A1R22	0699-1848	7	4	RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A3A1R23	0699-1858	9	2	RESISTOR 11 1% .05W F TC=0+-50	05545	CMF-50-2-11-1%
A3A1R24	0699-1848	7		RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A3A1R25	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A3A1R26	0699-1852	3	3	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A3A1R27	0699-1915	9	4	RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A3A1R28				NOT ASSIGNED		
A3A1R29	0699-1853	4	12	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R30	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1R31	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R32	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R33	0698-4579	5	3	RESISTOR 261 1% .25W TF TC=0+-100	12498	NA5
A3A1R34	0699-1848	7		RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A3A1R35	0699-1858	9		RESISTOR 11 1% .05W F TC=0+-50	05545	CMF-50-2-11-1%
A3A1R36	0699-1848	7		RESISTOR 422 1% .05W F TC=0+-50	05545	CMF-50-2-422-1%
A3A1R37	0699-1849	8	2	RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A3A1R38	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A3A1R39	0699-1849	8		RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A3A1R40	0698-4579	5		RESISTOR 261 1% .25W TF TC=0+-100	12498	NA5
A3A1R41	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A3A1R42	0698-4579	5		RESISTOR 261 1% .25W TF TC=0+-100	12498	NA5
A3A1R43	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A3A1R44				NOT ASSIGNED		
A3A1R45	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R46	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R47	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R48	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R49	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R50	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R51	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R52	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A1R53	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A3A1R54	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A3A1R55	0698-7200	5	2	RESISTOR 31.6 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R56	0698-7200	5		RESISTOR 31.6 1% .05W TF TC=0+-100	2M627	CRB20
A3A1R57	0698-7220	9	1	RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A3A1TP1	0360-0535	0	7	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A1TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A1TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A1TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A1TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A1TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A1TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A2	08780-60036	3	1	RF REFERENCE BOARD ASSY	28480	08780-60036
A3A2C1				NOT ASSIGNED		
A3A2C2	0160-4835	7	21	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C3	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C4	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C7	0180-0116	1	3	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A3A2C8				NOT ASSIGNED		
A3A2C9	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A3A2C10-A3A2C12			1	NOT ASSIGNED		
A3A2C13	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A3A2C14				NOT ASSIGNED		
A3A2C15	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C16	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C17	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C18	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C19	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C20	0160-0127	2	3	CAPACITOR-FXD 1UF +-20% 50VDC CER	04222	SR835E105MAA
A3A2C21	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C22	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C23	0160-4574	1	4	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A3A2C24	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C25	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C26	0160-5909	8	1	CAPACITOR-FXD .047UF +-10% 50VDC CER	12474	CAC03X7R473K050A
A3A2C27	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C28						
(2805A AND BELOW)	0160-5348	9	2	CAPACITOR-FXD 51PF +-5% 100VDC CER 0+-30	09969	RPA10C0G510J100
(2809A AND ABOVE)	0160-4804	0	3	CAPACITOR-FXD 56PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A560J
A3A2C29						
(2805A AND BELOW)	0160-5348	9		CAPACITOR-FXD 51PF +-5% 100VDC CER 0+-30	09969	RPA10C0G510J100
(2809A AND ABOVE)	0160-4804	0		CAPACITOR-FXD 56PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A560J
A3A2C30	0160-4803	9	2	CAPACITOR-FXD 68PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A680J
A3A2C31				NOT ASSIGNED		
A3A2C32				NOT ASSIGNED		
A3A2C33	0160-4789	0	2	CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A150J
A3A2C34				NOT ASSIGNED		
A3A2C35	0160-3334	9	5	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A3A2C36	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A3A2C38	0160-4802	8	1	CAPACITOR-FXD 82PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A820J
A3A2C39	0160-4789	0		CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A150J
A3A2C40	0160-4801	7	3	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A3A2C41	0160-4350	1	2	CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	09969	RPE111-120C0G680J200V
A3A2C42	0160-4350	1		CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	09969	RPE111-120C0G680J200V
A3A2C43	0160-0127	2		CAPACITOR-FXD 1UF +-20% 50VDC CER	04222	SR835E105MAA
A3A2C44	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A3A2C45	0160-0127	2		CAPACITOR-FXD 1UF +-20% 50VDC CER	04222	SR835E105MAA
A3A2C46	0160-4814	2	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	DA12C0G2A151J
A3A2C47	0160-4803	9		CAPACITOR-FXD 68PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A680J
A3A2C48	0160-4768	5	2	CAPACITOR-FXD 470PF +-5% 100VDC CER	06383	FD12C0G2A471J
A3A2C49	0160-4764	1	2	CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	FD12C0G2A151J
A3A2C50	0160-4768	5		CAPACITOR-FXD 470PF +-5% 100VDC CER	06383	FD12C0G2A471J
A3A2C51	0160-4764	1		CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	FD12C0G2A151J
A3A2C52	0160-3874	2	2	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A3A2C53	0160-3874	2		CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A3A2C54	0160-5254	6	1	CAPACITOR-FXD 1.5PF +-.25PF 100VDC CER	06383	MA12C0G2A1R5C
A3A2C55	0160-0576	5	7	CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A3A2C56	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A3A2C57-A3A2C59				NOT ASSIGNED		
A3A2C60	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A2C61	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A3A2C62	0160-3878	6	2	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A2C63				NOT ASSIGNED		
A3A2C64				NOT ASSIGNED		
A3A2C65	0160-0690	4	2	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A3A2C66	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A3A2C67	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A3A2C68	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C69	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C70	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C71	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C72	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A3A2C73	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A3A2C74	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A3A2C75	0160-4804	0		CAPACITOR-FXD 56PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A560J
A3A2C76	0180-2815	1	1	CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A3A2C77	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A3A2C78	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A3A2C79				NOT ASSIGNED		
A3A2C80	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A3A2C81	0160-4524	1	1	CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D240J
A3A2C82	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A3A2C83-A3A2C97				NOT ASSIGNED		
A3A2C98	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A3A2C99	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A3A2C100	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A3A2C101	0180-2617	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A3A2C102	0160-5904	3	1	CAPACITOR-FXD 30PF +-5% 200VDC CER 0+-30	06383	MA12C0G2D300J
A3A2C103	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A3A2CR1	1901-0518	8	3	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A2CR2				NOT ASSIGNED		
A3A2CR3	1902-0680	7	1	DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	04713	1N827
A3A2CR4				NOT ASSIGNED		
A3A2CR5	1901-0050	3	6	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A3A2CR6	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A2CR7				NOT ASSIGNED		
A3A2CR8	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A2CR9-A3A2CR16				NOT ASSIGNED		
A3A2CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A3A2CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A3A2CR19-A3A2CR20				NOT ASSIGNED		
A3A2CR21	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A3A2CR22	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A3A2CR23	1902-0949	1	1	DIODE-ZNR 4.3V 5% DO-35 PD=.4W TC=+.017%	28480	1902-0949
A3A2CR24	1901-0189	9	1	DIODE-STEP RECOVERY	28480	1901-0189
A3A2CR25	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A3A2CR26	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	1N4148
A3A2DS1	1990-0652	8	1	LED-LAMP ARRAY LUM-INT=200UCD IF=5MA-MAX	28480	1990-0652
A3A2DS2	1990-0685	7	1	LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A3A2L1	9140-0114	4	3	INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A3A2L2	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A3A2L3				NOT ASSIGNED		
A3A2L4	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A3A2L5	9140-0105	3	1	INDUCTOR RF-CH-MLD 8.2UH +-10%	32159	28202M +-10%
A3A2L6	9140-0144	0	4	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A3A2L7	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH +-10%	32159	1A1803M+-10%
A3A2L8	9100-2247	4	3	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A2L9	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A3A2L10-A3A2L14				NOT ASSIGNED		

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A2L15	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A2L16	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A3A2L17				NOT ASSIGNED		
A3A2L18	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A3A2L19	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A3A2M1	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	28480	0360-0124
A3A2M2	0380-1238	4	4	STANDOFF-RVT-ON 10-MM-LG M3.0 X 0.5-THD	28480	0380-1238
A3A2M3	1251-1556	7	4	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	00779	6-330808-5
A3A2M4	1251-3172	7	8	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A3A2M5	5021-4541	3	1	SPACER PC GROUND	28480	5021-4541
A3A2M6	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A3A2M7	9170-0029	3	1	CORE-SHIELDING BEAD	28480	9170-0029
A3A2Q1				NOT ASSIGNED		
A3A2Q2	1854-1044	6	1	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A3A2Q3	1854-0597	2	1	TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A3A2Q4	1854-0345	8	1	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A3A2Q5	1853-0430	0	2	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A3A2Q6	1855-0276	6	1	TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	04713	2N4416A
A3A2Q7	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A3A2Q8	1855-0420	2	1	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A3A2Q9	1855-0421	3	1	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A3A2Q10	1854-0810	2	2	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A3A2Q11	1853-0459	3	1	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A3A2Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A3A2R1	0757-0416	7	2	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R2	2100-2497	9	2	RESISTOR-TRMR 2K 10% TKF TOP-ADJ 1-TRN	09969	3321
A3A2R3	0757-0278	9	1	RESISTOR 1.78K 1% .125W TF TC=0+-100	12498	CT4
A3A2R4	0757-0288	1	2	RESISTOR 9.09K 1% .125W TF TC=0+-100	06341	MR24
A3A2R5	0698-3156	2	2	RESISTOR 14.7K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R6	0698-3156	2		RESISTOR 14.7K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R7	0757-0288	1		RESISTOR 9.09K 1% .125W TF TC=0+-100	06341	MR24
A3A2R8	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R9	0757-0416	7		RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R10	0757-0447	4	1	RESISTOR 16.2K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A3A2R11	0698-3158	4	1	RESISTOR 23.7K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R12	0757-0465	6	5	RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A3A2R13	0757-0280	3	2	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A3A2R14	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A3A2R15	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A3A2R16	0698-0084	9	5	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R17	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R18	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R19	0757-0438	3	4	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R20	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R21	0757-0444	1	3	RESISTOR 12.1K 1% .125W TF TC=0+-100	19701	SFR25H
A3A2R22	0757-0444	1		RESISTOR 12.1K 1% .125W TF TC=0+-100	19701	SFR25H
A3A2R23	0757-0442	9	3	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R24	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R25	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R26	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A3A2R27	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A3A2R28				NOT ASSIGNED		
A3A2R29	0757-0458	7	1	RESISTOR 51.1K 1% .125W TF TC=0+-100	12498	CT4
A3A2R30				NOT ASSIGNED		
A3A2R31	0698-3452	1	1	RESISTOR 147K 1% .125W TF TC=0+-100	K8479	H8
A3A2R32	0757-0444	1		RESISTOR 12.1K 1% .125W TF TC=0+-100	19701	SFR25H
A3A2R33	0757-0465	6		RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A3A2R34	0757-0418	9	1	RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R35	0698-3440	7	3	RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A3A2R36	0757-0279	0	1	RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A3A2R37	0757-1094	9	3	RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A3A2R38	0698-3441	8	1	RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A3A2R39	0757-0394	0	1	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A3A2R40	0698-7198	0	1	RESISTOR 26.1 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A2R41	0698-7284	5	3	RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A3A2R42	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A3A2R43	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R44	0757-1094	9		RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A3A2R45	0757-0289	2	1	RESISTOR 13.3K 1% .125W TF TC=0+-100	12498	CT4
A3A2R46	0698-8821	8	1	RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A3A2R47	0757-1090	5	2	RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A3A2R48	0699-1852	3	2	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A3A2R49	0698-7209	4	4	RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R50	0698-7223	2	5	RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R51	0698-7194	6	2	RESISTOR 17.8 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R52	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R53				NOT ASSIGNED		
A3A2R54	0698-7188	8	2	RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A3A2R55	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A3A2R56	0698-7209	4		RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R57				NOT ASSIGNED		
A3A2R58	0757-1094	9		RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A3A2R59	0698-7209	4		RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R60	0699-1851	2	3	RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A3A2R61	0698-7224	3	1	RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R62	0698-7209	4		RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R63	0698-7235	6	1	RESISTOR 909 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R64	0698-7247	0	1	RESISTOR 2.87K 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R65-A3A2R69				NOT ASSIGNED		
A3A2R70	0757-1090	5		RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A3A2R71	0699-2059	4	3	RESISTOR 51.1 1% .05W TF TC=0+-100	91637	CMF-50-2-51.1-1%
A3A2R72	0698-3443	0	2	RESISTOR 287 1% .125W TF TC=0+-100	K8479	H8
A3A2R73	0757-0294	9	2	RESISTOR 17.8 1% .125W TF TC=0+-100	06424	NK4H
A3A2R74	0698-7203	8	1	RESISTOR 42.2 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R75	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A3A2R76	0699-1853	4	4	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A2R77	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A2R78	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A2R79	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A3A2R80	0699-1915	9	1	RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A3A2R81	0699-1851	2		RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A3A2R82	0699-1850	1	1	RESISTOR 68.1 1% .05W F TC=0+-50	05545	CMF-50-2-68.1-1%
A3A2R83	0699-1851	2		RESISTOR 100 1% .05W F TC=0+-50	05545	CMF-50-2-100-1%
A3A2R84	0699-2059	4		RESISTOR 51.1 1% .05W TF TC=0+-100	91637	CMF-50-2-51.1-1%
A3A2R85	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R86	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R87				NOT ASSIGNED		
A3A2R88	0757-0401	0	2	RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A3A2R89	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A3A2R90	0698-7239	0	1	RESISTOR 1.33K 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R91	0698-3150	6	1	RESISTOR 2.37K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R92	0698-8812	7	1	RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A3A2R93				NOT ASSIGNED		
A3A2R94	2100-2497	9		RESISTOR-TRMR 2K 10% TKF TOP-ADJ 1-TRN	09969	3321
A3A2R95	2100-1738	9	1	RESISTOR-TRMR 10K 10% TKF TOP-ADJ 1-TRN	09969	3321
A3A2R96	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A3A2R97	0698-7220	9	1	RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R98	0698-7277	6	1	RESISTOR 51.1K 1% .05W TF TC=0+-100	06001	NK3
A3A2R99				NOT ASSIGNED		
A3A2R100	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A3A2R101	0698-7229	8	1	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R102	0698-7272	1	1	RESISTOR 31.6K 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R103	0698-7257	2	1	RESISTOR 7.5K 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R104	0698-7254	9	1	RESISTOR 5.62K 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R105	0699-2059	4		RESISTOR 51.1 1% .05W TF TC=0+-100	91637	CMF-50-2-51.1-1%
A3A2R105A	0360-0124	3	4	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	28480	0360-0124
A3A2R106	0698-7205	0	1	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R107	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R108	0698-7194	6		RESISTOR 17.8 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A2R109	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R110	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R111	0757-0294	9		RESISTOR 17.8 1% .125W TF TC=0+-100	06424	NK4H
A3A2R112	0698-3443	0		RESISTOR 287 1% .125W TF TC=0+-100	K8479	H8
A3A2R113	0757-0346	2	1	RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A3A2R114	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A3A2R115	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A3A2R116	0698-7214	1	1	RESISTOR 121 1% .05W TF TC=0+-100	2M627	CRB20
A3A2R117	0757-0424	7	1	RESISTOR 1.1K 1% .125W TF TC=0+-100	19701	SFR25H
A3A2RT1	0837-0239	2	1	THERMISTOR TUB WITH AXL LEADS 1K-OHM	6E259	DG125-102J
A3A2S1	3101-2419	8	1	SWITCH-SL DPDT SUBMIN .5A 125VAC PC	28480	3101-2419
A3A2T1	9100-4435	6	1	TRANSFORMER-RF 1:1 OHM RATION; FOPR	02745	T1-6T
A3A2T2						
(2805A AND BELOW)	08780-80030	9	1	R F TRANSFORMER	28480	08780-80030
(2809A AND ABOVE)	08780-80065	0	1	R F TRANSFORMER	28480	08780-80065
A3A2T3				NOT ASSIGNED		
A3A2T4	86701-60082	8	1	RF TRANSFMR-GRN	28480	86701-60082
A3A2TP1	0360-0535	0	14	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP8	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP9	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP10	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP11	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP12	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP13	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2TP14	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A3A2U1	0955-0336	0	1	U-WAVE MIXER 1 GHZ MAX	15542	TFM-2P
A3A2U2	1826-0639	4	1	D/A 8-BIT 16-PLASTIC CMOS	24355	AD7524JN
A3A2U3	1820-1411	0	1	IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A3A2U4	1820-1202	7	1	IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A3A2U5	9100-4346	8	1	PHASE DETECTOR OUTPUT VOLTAGE:1000MV DC	15542	RPD-1
A3A2U6	1826-0600	9	2	IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL074ACN
A3A2U7	1826-0175	3	1	IC COMPARATOR GP DUAL 14-DIP-P PKG	27014	LM319N
A3A2U8	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A3A2U9	1826-1019	6	1	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A3A2U10	1820-1423	4	1	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A3A2U11	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A3A2U12	1826-0600	9		IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL074ACN
A3A2U13	1826-0783	9	2	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A3A2U14	1900-0040	9	1	DIODE-GM LD QUAD RINGS	05704	MA-4E402L
A3A2U15	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A3A2U16	1826-0772	6	1	IC V RGLTR-ADJ-POS 1.2/32V TO-92 PKG	28480	1826-0772

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4	08780-60023	8	1	TIMEBASE FRAME	28480	08780-60023
	08780-69023	6	1	TIMEBASE FRAME (RESTORED 08780-60023)	28480	08780-69023
A4C1	0160-2437	1	10	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C2	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C3	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C4	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C5	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C6	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C7	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C8	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C9	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4C10	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A4M1	0403-0285	9	2	BUMPER FOOT-ADH MTG 12.7-MM-WD	28480	0403-0285
A4M2	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A4M3	0515-0924	0	18	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A4M4	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A4M5	0515-1430	5	1	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-1430
A4M6	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A4M7	08780-20054	1	1	FRAME TB PROCSSR	28480	08780-20054
A4M8-A4M10				NOT ASSIGNED		
A4M11	0905-0790	5	4	O-RING .237-IN-ID .103-IN-XSECT-DIA EPR	83259	2-108 E515-80
A4M12	1250-1998	9	8	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A4M13	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A4M14	2190-0034	5	8	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A4M15	2190-0584	0	20	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A4M16	2950-0078	9	8	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A4M17	5001-6518	6	1	COVER FRONT	28480	5001-6518
A4M18	5001-6519	7	1	COVER REAR	28480	5001-6519
A4M19	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A4M20	5021-4533	3	2	DIVIDER FRAME	28480	5021-4533
A4M21	5021-4533	3		DIVIDER FRAME	28480	5021-4533

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A4A1	08780-60137	5	1	TIMEBASE DIVIDER BD AY	28480	08780-60137
A4A1C1	0160-3879	7	30	CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C3	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C5	0160-4385	2	1	CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D150J
A4A1C6	0180-0491	5	1	CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2S02-106-M7-S52
A4A1C7	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C8	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C9				NOT ASSIGNED		
A4A1C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C11	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C12	0160-4498	8	2	CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A4A1C13	0160-0690	4	1	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A4A1C14	0160-4498	8		CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A4A1C15				NOT ASSIGNED		
A4A1C16	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C17	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C18	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C19	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C21				NOT ASSIGNED		
A4A1C22	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C23	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C24	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C26	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C27	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C28	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C29	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C30	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C31	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C32	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C33	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C34	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C35				NOT ASSIGNED		
A4A1C36	0180-2617	1	6	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3S02-685-K0-S52
A4A1C37	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C38	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3S02-685-K0-S52
A4A1C39	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C40	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3S02-685-K0-S52
A4A1C41	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C42	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3S02-685-K0-S52
A4A1C43	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3S02-685-K0-S52
A4A1C44	0160-4389	6	1	CAPACITOR-FXD 100PF +-5% 200VDC CER	06383	FD12C0G2D101J
A4A1C45	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A4A1C46	0160-4767	4	1	CAPACITOR-FXD 20PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D200J
A4A1C47	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3S02-685-K0-S52
A4A1CR1	1902-0943	5	1	DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A4A1CR2	1901-0518	8	1	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A4A1DS1	1990-0685	7	1	LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A4A1FL1	1GA1-8012	6	1	SAW 400MHZ FILTR	28480	1GA1-8012
A4A1L1	9140-0144	0	9	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1L2	9100-2248	5	2	INDUCTOR RF-CH-MLD 120NH +-10%	32159	1A1203M+-10%
A4A1L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1L5	9100-2250	9	2	INDUCTOR RF-CH-MLD 180NH +-10%	32159	1A1803M+-10%
A4A1L6	9100-2249	6	2	INDUCTOR RF-CH-MLD 150NH +-10%	32159	1A1503M+-10%
A4A1L7	9100-2249	6		INDUCTOR RF-CH-MLD 150NH +-10%	32159	1A1503M+-10%
A4A1L8	9100-2250	9		INDUCTOR RF-CH-MLD 180NH +-10%	32159	1A1803M+-10%
A4A1L9	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1L10	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A1L11	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1L12				NOT ASSIGNED		
A4A1L13	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1L14	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1L15				NOT ASSIGNED		
A4A1L16	9135-0081	3	1	INDUCTOR RF-CH-MLD 68NH +-5%	06560	0101S0-056J
A4A1L17	9135-0069	7	1	INDUCTOR 30NH +-5% 2.6D-MMX6.6LG-MM Q=60	24226	10M030X-1
A4A1L18	9135-0070	0	1	INDUCTOR 24NH +-6.25% 2.6D-MMX6.6LG-MM	24226	10M024X-1
A4A1L19	9135-0071	1	1	INDUCTOR RF-CH-MLD 62NH +-5.806%	24226	10M062X-1
A4A1L20	9100-2248	5		INDUCTOR RF-CH-MLD 120NH +-10%	32159	1A1203M+-10%
A4A1L21	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A1M1	0340-0614	4	1	INSULATOR-XSTR POLYI HD-ANDZ	28480	0340-0614
A4A1M2	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A4A1M3	0590-1076	3	1	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A4A1M4	5040-6938	6	1	SPACER CHOPPER	28480	5040-6938
A4A1M5	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A4A1Q1	1854-0597	2	5	TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A1Q2	1854-0810	2	1	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A4A1Q3	1854-0597	2		TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A1Q4	1854-0597	2		TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A1Q5	1854-0597	2		TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A1Q6	1854-0597	2		TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A1Q7	1854-0809	9	1	TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A4A1R1	0698-7198	0	2	RESISTOR 26.1 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R2	0698-3440	7	6	RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A4A1R3	0757-0401	0	2	RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A4A1R4	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A4A1R5	0698-7244	7	2	RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R6	0698-7247	0	2	RESISTOR 2.87K 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R7	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A4A1R8	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A4A1R9	0698-7218	5	2	RESISTOR 178 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R10	0698-7200	5	1	RESISTOR 31.6 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R11	0698-7218	5		RESISTOR 178 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R12	0698-7198	0		RESISTOR 26.1 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R13	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R14	0698-7247	0		RESISTOR 2.87K 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R15	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A4A1R16	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A4A1R17						
(2716A AND BELOW)	0698-7210	7	6	RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
(2725A AND ABOVE)	0698-7211	8	2	RESISTOR 90.9 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R18						
(2716A AND BELOW)	0698-7213	0	1	RESISTOR 110 1% .05W TF TC=0+-100	2M627	CRB20
(2725A AND ABOVE)	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R19						
(2716A AND BELOW)	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
(2725A AND ABOVE)	0698-7211	8		RESISTOR 90.9 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R20	0698-7212	9	2	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R21	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R22	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R23	0757-0403	2	3	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A4A1R24	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A4A1R25	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R26	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A4A1R27	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R28	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A4A1R29	0698-7222	1	1	RESISTOR 261 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R30				NOT ASSIGNED		
A4A1R31	0698-7224	3	1	RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R33	0698-7220	9	1	RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R34	0698-7232	3	1	RESISTOR 681 1% .05W TF TC=0+-100	2M627	CRB20
A4A1R35	0757-0442	9	1	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A4A1R36	0757-0438	3	2	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A4A1R37	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A4A1T1	86701-60082	8	4	RF TRANSFMR-GRN	28480	86701-60082
A4A1T2	86701-60082	8		RF TRANSFMR-GRN	28480	86701-60082
A4A1T3	86701-60082	8		RF TRANSFMR-GRN	28480	86701-60082
A4A1T4	86701-60082	8		RF TRANSFMR-GRN	28480	86701-60082
A4A1U1	1813-0213	3	3	IC WIDEBAND AMPL TO-39 PKG	04713	MWA130
A4A1U2	1813-0213	3		IC WIDEBAND AMPL TO-39 PKG	04713	MWA130
A4A1U3	1813-0213	3		IC WIDEBAND AMPL TO-39 PKG	04713	MWA130
A4A1U4	1826-0393	7	1	IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	28480	1826-0393
A4A1U5	1820-1224	3	1	IC RCVR ECL LINE RCVR TPL 2-INP	04713	MC10216P
A4A1U6	1820-2934	4	1	IC PRESCR ECL	04713	MC12009P
A4A1U7	1820-3125	7	1	IC XLTR ECL ECL-TO-TTL QUAD	04713	MC10125P
A4A1U8	1820-2691	0	1	IC FF TTL F D-TYPE POS-EDGE-TRIG	07263	74F74PC
A4A1U9	1820-2685	2	1	IC GATE TTL F NOR QUAD 2-INP	07263	74F02PC

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A2	08780-60157	9	1	TIMEBASE LOOP BD AY	28480	08780-60032
A4A2C1	0180-0374	3	7	CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A2C2	0160-4805	1	2	CAPACITOR-FXD 47PF +-5% 100VDC CER 0+-30	28480	0160-4805
A4A2C3	0160-4787	8	4	CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A220J
A4A2C4	0160-4787	8		CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A220J
A4A2C5	0160-4813	1	1	CAPACITOR-FXD 180PF +-5% 100VDC CER	06383	DA12C0G2A181J
A4A2C6	0160-4829	9	1	CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A4A2C7	0160-4800	6	1	CAPACITOR-FXD 120PF +-5% 100VDC CER	06383	DA12C0G2A121J
A4A2C8	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A4A2C9	0160-4786	7	2	CAPACITOR-FXD 27PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A270J
A4A2C10	0160-5491	3	1	CAPACITOR-FXD 240PF +-5% 100VDC CER	12474	CAC02C0G241J100A
A4A2C11	0160-4835	7	11	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C12	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C13	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C14	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A2C15	0160-3334	9	16	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C16	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C17	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A2C18	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C19	0160-4787	8		CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A220J
A4A2C20	0160-4787	8		CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A220J
A4A2C21	0160-4805	1		CAPACITOR-FXD 47PF +-5% 100VDC CER 0+-30	28480	0160-4805
A4A2C22	0160-4786	7		CAPACITOR-FXD 27PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A270J
A4A2C23	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C24	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C26	0160-4807	3	2	CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A4A2C27	0160-5898	4	1	CAPACITOR-FXD 1.8PF +-.25PF 200VDC CER	06383	MA12C0G2D1R8C
A4A2C28	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A4A2C29	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C30	0160-4812	0	1	CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A4A2C31	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C32	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C33	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C34	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C35	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C36	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C38	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A2C39	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C40	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C41	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A2C42	0160-4802	8	1	CAPACITOR-FXD 82PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A820J
A4A2C43	0160-4814	2	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	DA12C0G2A151J
A4A2C44				NOT ASSIGNED		
A4A2C45	0160-4789	0	1	CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A150J
A4A2C46	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C47						
(2715A AND BELOW)	0121-0452	4	1	CAPACITOR-V TRMR-AIR 1.3-5.4PF 175V	74970	187-0103-028
(2716A AND ABOVE)	0121-0451	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A4A2C48	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C49	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A2C50	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C51	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	12344	T110B156K020AS
A4A2C52	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C53	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C54	0160-0127	2	1	CAPACITOR-FXD 1UF +-20% 50VDC CER	04222	SR835E105MAA
A4A2C55	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A2C56	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A2C57	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A4A2C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A2CR1	1902-0943	5	4	DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC= .037%	28480	1902-0943
A4A2CR2	1901-1085	6	3	DIODE-SCHOTTKY SM SIG	28480	5082-2835
A4A2CR3	1902-0943	5		DIODE ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A4A2CR4	1901-1085	6		DIODE-SCHOTTKY SM SIG	28480	5082-2835
A4A2CR5	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A4A2CR6	1901-0179	7	2	DIODE-SWITCHING 15V 50MA 750PS DO-7	07263	FD777
A4A2CR7	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	07263	FD777
A4A2CR8	0122-0085	1	1	DIODE-VVC 2.2PF 7% C3/C25-MIN=4.5	S0545	1S2208(B)
A4A2CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A4A2CR10	1901-1085	6		DIODE-SCHOTTKY SM SIG	28480	5082-2835
A4A2CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A4A2CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A4A2CR13	1902-0943	5		DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A4A2CR14	1902-0943	5		DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A4A2DS1	1990-0685	7	4	LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A4A2DS2	1990-0685	7		LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A4A2E1	9170-0029	3	2	CORE-SHIELDING BEAD	28480	9170-0029
A4A2E2	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A4A2L1	9140-0144	0	9	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L2	9100-2247	4	10	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L3	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L4	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L5	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L6	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L7	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L8	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L9	9100-1616	9	1	INDUCTOR RF-CH-MLD 1.5UH +-10%	99800	1537-16
A4A2L10	9140-0096	1	1	INDUCTOR RF-CH-MLD 1UH +-10%	91637	IM-4 1UH 10%
A4A2L11	9100-2254	3	1	INDUCTOR RF-CH-MLD 390NH +-10%	32159	1A3903M+-10%
A4A2L12				NOT ASSIGNED		
A4A2L13	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L14	9100-0368	6	2	INDUCTOR RF-CH-MLD 330NH +-10%	32159	1A-3303M +-10%
A4A2L15	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L16	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A4A2L17	9100-0368	6		INDUCTOR RF-CH-MLD 330NH +-10%	32159	1A-3303M +-10%
A4A2L18	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L19	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L20	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L21	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L22	9100-2809	4	1	INDUCTOR 100NH +-10% .312D-INX.609LG-IN	08111	JFD-LF4W010
A4A2L23	9100-2252	1	1	INDUCTOR RF-CH-MLD 270NH +-10%	32159	1A2703M+-10%
A4A2L24	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L25				NOT ASSIGNED		
A4A2L26	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L27	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L28	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A4A2L29	9100-2256	5	1	INDUCTOR RF-CH-MLD 560NH +-10%	32159	1A5603M+-10%
A4A2M1	0340-0669	9	2	INSULATOR-XSTR SLBL-ORG-POLYM	28480	0340-0669
A4A2M2	0360-0077	5	8	TERMINAL-STUD SGL-TUR SWGFRM-MTG	00866	1601-HP
A4A2M3	0380-1513	8	2	STANDOFF-RVT-ON 5-MM-LG M3.0 X 0.5-THD	28480	0380-1513
A4A2M4	1251-3172	7	8	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A4A2M5	8150-0013	2	1	WIRE 22AWG G/W 300V PVC 7X30 105C	28480	8150-0013
A4A2M6	8150-2275	2	1	WIRE 26AWG G 42V SIL RBR 66X44 105C	28480	8150-2275
A4A2Q1	1854-0977	2	2	TRANSISTOR NPN SI DARL TO-92 PD=625MW	04713	MPS-A14
A4A2Q2	1854-0345	8	2	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A4A2Q3	1853-0430	0	1	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A4A2Q4	1854-0977	2		TRANSISTOR NPN SI DARL TO-92 PD=625MW	04713	MPS-A14
A4A2Q5	1854-0597	2	3	TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A2Q6	1854-0597	2		TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A2Q7	1854-0597	2		TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A4A2Q8	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A4A2Q9	1853-0412	8	2	TRANSISTOR PNP SI DARL TO-92 PD=625MW	04713	MPSA65
A4A2Q10	1853-0412	8		TRANSISTOR PNP SI DARL TO-92 PD=625MW	04713	MPSA65

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A2R1	0698-7288	9	4	RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A4A2R2	0698-7212	9	2	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R3	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R4	0698-7219	6	1	RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R5	0698-7244	7	3	RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R6	0698-7251	6	2	RESISTOR 4.22K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R7	0698-7251	6		RESISTOR 4.22K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R8	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R9	0698-3439	4	2	RESISTOR 178 1% .125W TF TC=0+-100	K8479	H8
A4A2R10	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A4A2R11	0757-0394	0	2	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A4A2R12	0698-3434	9	1	RESISTOR 34.8 1% .125W TF TC=0+-100	K8479	H8
A4A2R13	0757-0290	5	1	RESISTOR 6.19K 1% .125W TF TC=0+-100	K8479	H8
A4A2R14	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A4A2R15	0698-7223	2	2	RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R16	0698-7194	6	1	RESISTOR 17.8 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R17	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R18	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R19	0698-7247	0	1	RESISTOR 2.87K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R20	0698-3439	4		RESISTOR 178 1% .125W TF TC=0+-100	K8479	H8
A4A2R21	0698-3400	9	1	RESISTOR 147 1% .5W TF TC=0+-100	19701	5053R
A4A2R22	0698-7205	0	3	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R23	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R24	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A4A2R25	0698-8820	7	1	RESISTOR 4.64 1% .125W F TC=0+-100	28480	0698-8820
A4A2R26	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A4A2R27	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R28	0698-7229	8	1	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R29	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R30	0698-7260	7	3	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R31	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R32	0698-7216	3	1	RESISTOR 147 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R33	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R34	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A4A2R35	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R36	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A4A2R37	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A4A2R38	0757-0280	3	1	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A4A2R39	0698-0082	7	1	RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A4A2R40	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R41	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R42	0698-7275	4	2	RESISTOR 42.2K 1% .05W TF TC=0+-100	06001	NK3
A4A2R43	0698-7221	0	1	RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R44	0757-0279	0	2	RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A4A2R45	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A4A2R46	0698-7250	5	1	RESISTOR 3.83K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R47	0698-7275	4		RESISTOR 42.2K 1% .05W TF TC=0+-100	06001	NK3
A4A2R48						
(2715A AND BELOW)	0698-7284	5	5	RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
(2716A AND ABOVE)	0698-7277	6	1	RESISTOR 51.1K 1% .05W TF TC=0+-100	06001	NK3
A4A2R49	0757-0279	0		RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A4A2R50						
(2715A AND BELOW)	0698-7236	7	6	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
(2716A AND ABOVE)	0698-7228	7	1	RESISTOR 464 1% .05W TF TC=0+-100	2M627	CRB20
A4A2R51						
(2715A AND BELOW)				NOT ASSIGNED		
(2716A AND ABOVE)	0699-1762	4	1	RESISTOR 562K 1% .05W TF TC=0+-100	19701	5023R
A4A2R52	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A4A2S1	1990-0685	7		LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A4A2S2	1990-0685	7		LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A4A2T1	86701-60082	8	1	RF TRANSFMR-GRN	28480	86701-60082
A4A2TP1	0360-0535	0	3	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A2TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A2TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A2U1	9100-4346	8	1	PHASE DETECTOR OUTPUT VOLTAGE:1000MV DC	15542	RPD-1
A4A2U2	1813-0213	3	1	IC WIDEBAND AMPL TO-39 PKG	04713	MWA130
A4A2U3	1826-0716	8	1	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A4A2U4	1826-1019	6	1	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A4A2U5	1826-0412	1	1	IC COMPARATOR PRCN DUAL 8-DIP-P PKG	27014	LM393N
A4A2W1	8159-0005	0	2	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A4A2W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A4A2Y1	0410-1855	6	1	CRYSTAL-QUARTZ 100.0 MHZ HC-43/U-HLDR	00809	0410-1855

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A3	08780-60031	8	1	TIMEBASE MICROPROCESSOR	28480	08780-60031
A4A3C1	0160-3334	9	5	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A3C2	0160-5699	3	2	CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A200J
A4A3C3	0160-5699	3		CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A200J
A4A3C4	0160-0127	2	1	CAPACITOR-FXD 1UF +-20% 50VDC CER	04222	SR835E105MAA
A4A3C5	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A3C6	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A3C7	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A3C8	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A4A3C9				NOT ASSIGNED		
A4A3C10	0180-0374	3	1	CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A4A3DS1	1990-0652	8	1	LED-LAMP ARRAY LUM-INT=200UCD IF=5MA-MAX	28480	1990-0652
A4A3L1				NOT ASSIGNED		
A4A3L2	9140-0142	8	1	INDUCTOR RF-CH-MLD 2.2UH +-10%	91637	IM-2 2.2UH 10%
A4A3M1	0340-0669	9	1	INSULATOR-XSTR SLBL-ORG-POLYM	28480	0340-0669
A4A3M2	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A4A3R1	0757-0280	3	1	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A4A3R2	1810-0126	1	1	NETWORK-RES 14-DIP 10.0K OHM X 13	32997	4114R-002-103S
A4A3TP1	0360-0535	0	7	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A3TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A3TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A3TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A3TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A3TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A3TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A4A3U1	1820-2075	4	4	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS245N
A4A3U2	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS245N
A4A3U3	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS245N
A4A3U4	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS245N
A4A3U5	1820-2974	2	1	IC-8MHZ MPU W/PIGGYBACK SOCKET;ROM-LESS	07653	Z8613RS
A4A3Y1	0410-0587	9	1	CRYSTAL-QUARTZ 7.373 MHZ	28480	0410-0587
A4A3Y1A	1200-0758	2	1	SOCKET-XTAL 2-CONT HC-25/U DIP-SLDR	28480	1200-0758

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5	08780-60024	9	1	FRACTIONAL N FRAME	28480	08780-60024
A5	08780-69024	7	1	FRACTIONAL N FRAME (RESTORED 08780-60024)	28480	08780-69024
A5C1	0160-2437	1	2	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A5C2	0160-6260	6	1	CAPACITOR-FDTHRU 100PF 20% 200V CER	33095	54-713-001-101M
A5C3	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A5M1	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A5M2	0515-0924	0	14	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A5M3	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A5M4	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A5M6	08780-20055	2	1	FRAME FRAC N	28480	08780-20055
A5M7				NOT ASSIGNED		
A5M8	08780-80036	5	1	PAD-DAMPING	28480	08780-80036
A5M9	1250-1425	7	2	CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	98291	50-053-0269-220
A5M10	1250-1998	9	3	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A5M11	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A5M12	2190-0034	5	5	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A5M13	2190-0124	4	7	WASHER-LK INTL T NO. 10 .195-IN-ID	16179	S00222
A5M14	2190-0584	0	16	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A5M15	2950-0078	9	5	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A5M16	5001-6518	6	1	COVER FRONT	28480	5001-6518
A5M17	5001-6519	7	1	COVER REAR	28480	5001-6519
A5M18	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A5M19	8160-0562	7	1	RFI GASKET	28480	8160-0562

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A1	08780-60003	4	1	FRACTIONAL N RF BD AY	28480	08780-60003
A5A1C1	0160-5370	7	2	CAPACITOR-FXD 2.2UF +-5% 50VDC MET-POLYC	28480	0160-5370
A5A1C2	0160-5370	7		CAPACITOR-FXD 2.2UF +-5% 50VDC MET-POLYC	28480	0160-5370
A5A1C3	0180-2619	3	2	CAPACITOR-FXD 22UF+-10% 15VDC TA	01766	202L1602-226-K0-552
A5A1C4 (2635A AND BELOW) (2641A AND ABOVE)	0160-3872	0	3	CAPACITOR-FXD 2.2PF +-.25PF 200VDC CER NOT ASSIGNED	06383	FD12C0G2D2R2C
A5A1C5	0160-3878	6	5	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A5A1C6	0160-3878			CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A5A1C7	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A5A1C8	0180-0553	0	2	CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A5A1C9 (2635A AND BELOW) (2641A AND ABOVE)	0160-3872	0		CAPACITOR-FXD 2.2PF +-.25PF 200VDC CER NOT ASSIGNED	06383	FD12C0G2D2R2C
A5A1C10	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A5A1C11	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A5A1C12	0160-4387	4	4	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D470J
A5A1C13	0160-4524	1	6	CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D240J
A5A1C14	0160-4350	1	1	CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	09969	RPE111-120C0G680J200V
A5A1C15	0180-0553	0		CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A5A1C16	0180-2617	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A1C17	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	01766	202L1602-226-K0-552
A5A1C18	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A1C19	0160-4524	1		CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D240J
A5A1C20	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A5A1C21	0160-4524	1		CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D240J
A5A1C22	0160-4524	1		CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D240J
A5A1C23	0160-4524	1		CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D240J
A5A1C24	0160-4524	1		CAPACITOR-FXD 24PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D240J
A5A1C25	0160-6468	6	1	CAPACITOR-FXD 4.7PF +-.1PF 500VDC PORC	1A027	MA284R7B
A5A1C26	0160-6408	4	2	CAPACITOR-FXD 3.9PF +-.1PF 500VDC PORC	1A027	MA283R9B
A5A1C27	0121-0452	4	1	CAPACITOR-V TRMR-AIR 1.3-5.4PF 175V	74970	187-0103-028
A5A1C28	0160-6408	4		CAPACITOR-FXD 3.9PF +-.1PF 500VDC PORC	1A027	MA283R9B
A5A1C29	0160-6426	6	1	CAPACITOR-FXD 10PF +-1% 500VDC PORC	1A027	MA28100F
A5A1C30				NOT ASSIGNED		
A5A1C31	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D470J
A5A1C32	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D470J
A5A1C33	0160-3873	1	2	CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	06383	FD12C0G2D4R7D
A5A1C34	0160-4385	2	1	CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D150J
A5A1C35	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D470J
A5A1C36	0160-3874	2	1	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A5A1C37				NOT ASSIGNED		
A5A1C38	0160-3872	0		CAPACITOR-FXD 2.2PF +-.25PF 200VDC CER	06383	FD12C0G2D2R2C
A5A1C39	0160-3873	1		CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	06383	FD12C0G2D4R7D
A5A1C40	0160-4789	0	1	CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A150J
A5A1CR1	1901-1085	6	1	DIODE-SCHOTTKY SM SIG	28480	5082-2835
A5A1CR2	1902-0951	5	2	DIODE-ZNR 5.1V 5% DO-35 PD=.4W TC=+.035%	28480	1902-0951
A5A1CR3	1902-0943	5	2	DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A5A1CR4	1902-0943	5		DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A5A1CR5	1902-0951	5		DIODE-ZNR 5.1V 5% DO-35 PD=.4W TC=+.035%	28480	1902-0951
A5A1CR6	0122-0171	6	2	DIODE-VVC 11.8PF .8% C3/C25-MIN=4.5	00115	1SV1164-T1
A5A1CR7	0122-0171	6		DIODE-VVC 11.8PF .8% C3/C25-MIN=4.5	00115	1SV1164-T1
A5A1L1	9100-1619	2	2	INDUCTOR RF-CH-MLD 6.8UH +-10%	99800	1537-32
A5A1L2	9100-1619	2		INDUCTOR RF-CH-MLD 6.8UH +-10%	99800	1537-32
A5A1L3	9100-2247	4	6	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A5A1L4	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A5A1L5	9135-0078	8	1	INDUCTOR RF-CH-MLD 82NH +-5.61%	24226	10M082X-1
A5A1L6	9135-0095	9	1	INDUCTOR 143NH +-5.245% 2.6D-MMX6.6LG-MM	24226	10M140X-1
A5A1L7	9135-0071	1	1	INDUCTOR RF-CH-MLD 62NH +-5.806%	24226	10M062X-1
A5A1L8	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A5A1L9	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A5A1L10	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Descriptio	Mfr Code	Mfr Part Number
A5A1L11	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A5A1L12	08780-20131	5	1	CBL COAX OSC	28480	08780-20131
A5A1L13	9100-2252	1	1	INDUCTOR RF-CH-MLD 270NH +-10%	32159	1A2703M+-10%
A5A1L14	9135-0074	4	1	INDUCTOR RF-CH-MLD 47NH +-6.17%	24226	10M047X-1
A5A1Q1	1854-1044	6	2	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A5A1Q2	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A5A1Q3	1853-0459	3	3	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A1Q4	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A1Q5	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A1Q6	1854-0811	3	2	TRANSISTOR NPN SI PD=625MW FT=100MHZ	28480	1854-0811
A5A1Q7	1854-0811	3		TRANSISTOR NPN SI PD=625MW FT=100MHZ	28480	1854-0811
A5A1Q8	1854-0597	2	1	TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A5A1R1	0757-1094	9	1	RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A1R2	0698-3444	1	4	RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A5A1R3	0698-3444	1		RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A5A1R4	0698-3152	8	2	RESISTOR 3.48K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A1R5	0698-3150	6	1	RESISTOR 2.37K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A1R6	0698-3444	1		RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A5A1R7	0698-7210	7	2	RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R8	0698-7224	3	2	RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R9	0698-3102	8	2	RESISTOR 237 1% .5W TF TC=0+-100	19701	5053R
A5A1R10						
(2635A AND BELOW)	0698-7196	8	8	RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4	8	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R11						
(2635A AND BELOW)	0698-7196	8		RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R12						
(2635A AND BELOW)	0698-7196	8		RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R13						
(2635A AND BELOW)	0698-7196	8		RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R14	0698-7212	9	9	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R15	0698-7208	3	2	RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R16	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R17	0698-3444	1		RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A5A1R18	0698-3152	8		RESISTOR 3.48K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A1R19	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R20	0698-7205	0	1	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R21	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R22	0698-7208	3		RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R23	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R24	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R25	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R26	0698-3102	8		RESISTOR 237 1% .5W TF TC=0+-100	19701	5053R
A5A1R27-A5A1R29				NOT ASSIGNED		
A5A1R30	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R31	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R32						
(2635A AND BELOW)	0698-7196	8		RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R33						
(2635A AND BELOW)	0698-7196	8		RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R34						
(2635A AND BELOW)	0698-7196	8		RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R35						
(2635A AND BELOW)	0698-7196	8		RESISTOR 21.5 1% .05W TF TC=0+-100	2M627	CRB20
(2641A AND ABOVE)	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A5A1R36	0757-0438	3	2	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A1R37	0698-3136	8	2	RESISTOR 17.8K 1% .125W TF TC=0+-100	06424	NK4H
A5A1R38	0698-3151	7	2	RESISTOR 2.87K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A1R39	0698-7223	2	3	RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R40	0698-7194	6	1	RESISTOR 17.8 1% .05W TF TC=0+-100	2M627	CRB20

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A1R41	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R42	0698-3151	7		RESISTOR 2.87K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A1R43	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A1R44	0698-3136	8		RESISTOR 17.8K 1% .125W TF TC=0+-100	06424	NK4H
A5A1R45	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R46	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R47	0698-7202	7	1	RESISTOR 38.3 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R48	0698-7211	8	1	RESISTOR 90.9 1% .05W TF TC=0+-100	2M627	CRB20
A5A1R49	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A5A1TP1	0360-0535	0	3	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A1TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A1TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A1U1	0955-0063	0	1	U-WAVE MIXER 500 MHZ MAX	33399	MS83H
(2644A AND BELOW)	0363-0040	8	1	RFI STRIP-FINGERS BE-CU ZINC PLATED	28480	0363-0040
(2650A AND ABOVE)	08780-20149	5	1	CONTACT	28480	08780-20149
A5A1U2	0955-0250	7	1	U-WAVE POWER SPLITTER 650 MHZ MAX	28480	0955-0250
A5A1U3	1826-0716	8	1	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A5A1W1	8151-0013	4	4	WIRE 22AWG 1X22	92194	298
A5A1W2	8151-0013	4		WIRE 22AWG 1X22	92194	298
A5A1W3	8151-0013	4		WIRE 22AWG 1X22	92194	298
A5A1W4	8151-0013	4		WIRE 22AWG 1X22	92194	298

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A2	08780-60200	3	1	FRACTIONAL N (ANALOG AND DIGITAL) BOARD ASSY	28480	08780-60200
A5A2C1	0160-4835	7	33	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C2	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C3	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C4	0180-2617	1	28	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C5	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C7	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C8	0180-2815	1	3	CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A5A2C9	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C10	0160-4801	7	7	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A5A2C11	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C12	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C13	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C14	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C15	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C16	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C17	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C18	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C19				NOT ASSIGNED		
A5A2C20				NOT ASSIGNED		
A5A2C21	0180-2815	1		CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A5A2C22	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C23	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A5A2C24	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A5A2C25	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C26	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C27	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C28	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C29	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C30	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C31	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C32	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C33	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C34	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C35	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C36	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C37	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C38	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C39	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C40	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A5A2C41	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A5A2C42	0160-5910	1	1	CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A5A2C43	0140-0199	6	1	CAPACITOR-FXD 240PF +-5% 300VDC MICA	08116	HP15241J3C1
A5A2C44	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C45	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C46	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C47	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C48	0160-5901	0	1	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	MA12C0G2D100D
A5A2C49	0160-4795	8	1	CAPACITOR-FXD 4.7PF +-.5PF 100VDC CER	06383	DA12C0G2A4R7D
A5A2C50	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A5A2C51	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C52	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C53	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C54	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C55	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C56	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C57	0180-2815	1		CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A5A2C58	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C59				NOT ASSIGNED		
A5A2C60	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5A2C61	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C62	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C63	0160-2208	4	1	CAPACITOR-FXD 330PF +-5% 300VDC MICA	08116	HP15331J3C1
A5A2C64	0160-3533	0	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA	09023	CD15FC471J03
A5A2C65	0160-5898	4	1	CAPACITOR-FXD 1.8PF +-.25PF 200VDC CER	06383	MA1.^C0G2D1R8C
A5A2C66	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C67	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C68	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C69	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C70	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C71	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A5A2C72	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C73	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C74	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C75-A5A2C78				NOT ASSIGNED		
A5A2C79	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C80	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C81	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C82	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C83-A5A2C85				NOT ASSIGNED		
A5A2C86	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2C87				NOT ASSIGNED		
A5A2C88	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A2C89	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A5A2C90	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	01766	202L3502-685-K0-552
A5A2CR1	1901-0518	8	17	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR2	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR3	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR4	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR6	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR7	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR8	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR9-A5A2CR10				NOT ASSIGNED		
A5A2CR11	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR12	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR13	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR14	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR15	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR16	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR17	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR18	1901-0050	3	5	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5A2CR19	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5A2CR20	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5A2CR21	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5A2CR22	1902-0680	7	2	DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	04713	1N827
A5A2CR23	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	04713	1N827
A5A2CR24	1902-0945	7	2	DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A5A2CR25	1902-0945	7		DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A5A2CR26	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR27	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5A2CR28	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A5A2L1	9100-3922	4	16	INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L4	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L5	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L6	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L7	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L8	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L9				NOT ASSIGNED		
A5A2L10	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A2L11	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L12	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L13	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L14	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L15	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L16	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2L17	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	23880	14067
A5A2M1	0340-0614	4	1	INSULATOR-XSTR POLYI HD-ANDZ	28480	0340-0614
A5A2M2	0515-0897	6	1	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0897
A5A2M3	0590-1076	3	1	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A5A2M4	1200-0081	4	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0081
A5A2M5	5021-4541	3	1	SPACER PC GROUND	28480	5021-4541
A5A2M6	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A5A2Q1	1854-0809	9	6	TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A5A2Q2	1854-0810	2	9	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q3	1855-0276	6	2	TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	04713	2N4416A
A5A2Q4	1855-0081	1	3	TRANSISTOR J-FET N-CHAN D-MODE SI	28480	1855-0081
A5A2Q5	1855-0081	1		TRANSISTOR J-FET N-CHAN D-MODE SI	28480	1855-0081
A5A2Q6	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q7	1855-0276	6		TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	04713	2N4416A
A5A2Q8	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q9	1853-0459	3	4	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A2Q10	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A2Q11	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q13	1855-0082	2	2	TRANSISTOR J-FET P-CHAN D-MODE SI	28480	1855-0082
A5A2Q14	1855-0213	1	2	TRANSISTOR-JFET DUAL N-CHAN D-MODE TO-78	28480	1855-0213
A5A2Q15	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q16	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q17	1855-0082	2		TRANSISTOR J-FET P-CHAN D-MODE SI	28480	1855-0082
A5A2Q18	1854-0477	7	4	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A5A2Q19	1855-0081	1		TRANSISTOR J-FET N-CHAN D-MODE SI	28480	1855-0081
A5A2Q20	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A2Q21	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q22	1855-0213	1		TRANSISTOR-JFET DUAL N-CHAN D-MODE TO-78	28480	1855-0213
A5A2Q23	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A2Q24	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2Q25	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A5A2Q26	1855-0517	8	1	TRANSISTOR MOSFET P-CHAN E-MODE TO-220	9M011	IRF9532
A5A2Q27	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A5A2Q28	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A5A2Q29	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A5A2Q30	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A5A2Q31	1853-0405	9	1	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A5A2Q32	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A5A2Q33	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A5A2Q34	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A5A2Q35	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A5A2Q36	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A5A2R1-A5A2R4				NOT ASSIGNED		
A5A2R5	0698-0082	7	11	RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R6				NOT ASSIGNED		
A5A2R7	0698-4037	0	7	RESISTOR 46.4 1% .125W TF TC=0+-100	D8439	MK2
A5A2R8	0698-4037	0		RESISTOR 46.4 1% .125W TF TC=0+-100	D8439	MK2
A5A2R9	0698-4037	0		RESISTOR 46.4 1% .125W TF TC=0+-100	D8439	MK2
A5A2R10	0698-4037	0		RESISTOR 46.4 1% .125W TF TC=0+-100	D8439	MK2
A5A2R11	0757-0394	0	7	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A5A2R12	0757-0280	3	10	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R13	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R14	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R15	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R16	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R17	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A2R18	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R19	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R20	0698-4037	0		RESISTOR 46.4 1% .125W TF TC=0+-100	D8439	MK2
A5A2R21	0698-4037	0		RESISTOR 46.4 1% .125W TF TC=0+-100	D8439	MK2
A5A2R22	0698-4037	0		RESISTOR 46.4 1% .125W TF TC=0+-100	D8439	MK2
A5A2R23	0757-0442	9	10	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R24	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R25	0698-3153	9	1	RESISTOR 3.83K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R26	0757-1094	9	1	RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R27-A5A2R30				NOT ASSIGNED		
A5A2R31	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R32	0698-3152	8	2	RESISTOR 3.48K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R33	0757-0278	9	1	RESISTOR 1.78K 1% .125W TF TC=0+-100	12498	CT4
A5A2R34	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R35	0698-3152	8		RESISTOR 3.48K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R36	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R37				NOT ASSIGNED		
A5A2R38	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R39	1810-0203	5	3	NETWORK-RES 8-SIP 470.0 OHM X 7	C1433	750-81
A5A2R40	1810-0203	5		NETWORK-RES 8-SIP 470.0 OHM X 7	C1433	750-81
A5A2R41				NOT ASSIGNED		
A5A2R42	1810-0203	5		NETWORK-RES 8-SIP 470.0 OHM X 7	C1433	750-81
A5A2R43-A5A2R47				NOT ASSIGNED		
A5A2R48	0698-3439	4	1	RESISTOR 178 1% .125W TF TC=0+-100	K8479	H8
A5A2R49	0698-3447	4	2	RESISTOR 422 1% .125W TF TC=0+-100	K8479	H8
A5A2R50	0757-0428	1	1	RESISTOR 1.62K 1% .125W TF TC=0+-100	19701	SFR25H
A5A2R51	0757-0316	6	2	RESISTOR 42.2 1% .125W TF TC=0+-100	06424	NK4H
A5A2R52	0757-0316	6		RESISTOR 42.2 1% .125W TF TC=0+-100	06424	NK4H
A5A2R53	0757-0382	6	1	RESISTOR 16.2 1% .125W TF TC=0+-100	D8439	MK2
A5A2R54	0698-3160	8	1	RESISTOR 31.6K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R55				NOT ASSIGNED		
A5A2R56	0757-0418	9	3	RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R57	0698-0084	9	3	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R58	0757-0444	1	1	RESISTOR 12.1K 1% .125W TF TC=0+-100	19701	SFR25H
A5A2R59	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R60	0698-3441	8	1	RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A5A2R61	0698-3447	4		RESISTOR 422 1% .125W TF TC=0+-100	K8479	H8
A5A2R62	0757-0346	2	2	RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A5A2R63	0757-0346	2		RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A5A2R64	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R65	0698-0083	8	6	RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R66	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A5A2R67	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A5A2R68	0757-0416	7	2	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R69	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A5A2R70	0757-0416	7		RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R71	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A5A2R72	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A5A2R73	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R74	0757-0403	2	1	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R75	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R76	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R77	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R78	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R79	0698-3136	8	1	RESISTOR 17.8K 1% .125W TF TC=0+-100	06424	NK4H
A5A2R80	0757-0439	4	1	RESISTOR 6.81K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R81	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R82	0698-3156	2	1	RESISTOR 14.7K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R83	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R84	0757-0447	4	1	RESISTOR 16.2K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R85	0757-0438	3	4	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R86	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R87	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A5A2R88	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5A2R89	0698-3442	9	1	RESISTOR 237 1% .125W TF TC=0+-100	K8479	H8
A5A2R90	0757-0401	0	1	RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R91	0757-0422	5	1	RESISTOR 909 1% .125W TF TC=0+-100	19701	SFR25H
A5A2R92-A5A2R95				NOT ASSIGNED		
A5A2R96	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R97	0757-0274	5	5	RESISTOR 1.21K 1% .125W TF TC=0+-100	12498	CT4
A5A2R98	0757-0274	5		RESISTOR 1.21K 1% .125W TF TC=0+-100	12498	CT4
A5A2R99	0699-0489	0	1	RESISTOR 16.15K .1% .1W F TC=0+-5	28480	0699-0489
A5A2R100				NOT ASSIGNED		
A5A2R101	0757-0274	5		RESISTOR 1.21K 1% .125W TF TC=0+-100	12498	CT4
A5A2R102	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R103	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R104	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R105	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R106	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R107	0757-0290	5	2	RESISTOR 6.19K 1% .125W TF TC=0+-100	K8479	H8
A5A2R108	0757-0290	5		RESISTOR 6.19K 1% .125W TF TC=0+-100	K8479	H8
A5A2R109	0698-3443	0	1	RESISTOR 287 1% .125W TF TC=0+-100	K8479	H8
A5A2R110	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R111	0757-0274	5		RESISTOR 1.21K 1% .125W TF TC=0+-100	12498	CT4
A5A2R112	0757-0274	5		RESISTOR 1.21K 1% .125W TF TC=0+-100	12498	CT4
A5A2R113	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R114				NOT ASSIGNED		
A5A2R115	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R116	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R117	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R118	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A5A2R119	0698-3446	3	1	RESISTOR 383 1% .125W TF TC=0+-100	K8479	H8
A5A2R120	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R121	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R122	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R123-A5A2R126				NOT ASSIGNED		
A5A2R127	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R128	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A5A2R129	1810-0902	1	1	RESISTOR ARRAY	28480	1810-0902
A5A2R130	0698-8816	1	1	RESISTOR 2.15 1% .125W F TC=0+-100	28480	0698-8816
A5A2R131	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A5A2R132	2100-0580	7	1	RESISTOR-TRMR 500K 10% TKF TOP-ADJ 1-TRN	32997	3386P-Y46-504
A5A2R133	0698-8823	0	1	RESISTOR 8.25 1% .125W F TC=0+-100	28480	0698-8823
A5A2TP1	0360-0535	0	6	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A2TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A2TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A2TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A2TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A2TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A5A2U1	ISD6-0001	9	1		28480	1820-2004
A5A2U2	1DK9-0002	5	1	F/N DIVIDER	28480	1DK9-0002
A5A2U3	1820-0817	8	2	IC FF ECL D-M/S DUAL	04713	MC10131P
A5A2U4	1820-0810	1	1	IC RCVR ECL LINE RCVR TPL 2-INP	04713	MC10116P
A5A2U5	1820-3126	8	2	IC CNTR ECL HEXADEC SYNCHRO	04713	MC10136P
A5A2U6	1820-3126	8		IC CNTR ECL HEXADEC SYNCHRO	04713	MC10136P
A5A2U7	1826-0547	3	5	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A5A2U8	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A5A2U9	1DL1-0002	0	1	API 2-5 RE-SYNC	28480	1DL1-0002
A5A2U10	1DL1-0001	9	1	API RE-SYNC	28480	1DL1-0001
A5A2U11	1826-0574	6	2	IC OP AMP LOW-DRIFT TO-99 PKG	07263	UA714LHC
A5A2U12	1826-0574	6		IC OP AMP LOW-DRIFT TO-99 PKG	07263	UA714LHC
A5A2U13	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A5A2U14				NOT ASSIGNED		
A5A2U15	1826-0021	8	1	IC OP AMP GP TO-99 PKG	27014	LM310H

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A2U16	1826-0175	3	1	IC COMPARATOR GP DUAL 14-DIP-P PKG	27014	LM319N
A5A2U17				NOT ASSIGNED		
A5A2U18	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A5A2U19	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A5A2U20	1820-0802	1	2	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A5A2U21	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A5A2U22	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A5A2U23	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6	08780-60025	0	1	FM FRAME RF	28480	08780-60025
	08780-69025	8	1	FM FRAME RF (RESTORED 08780-60025)	28480	08780-69025
A6C1	0160-6260	6	1	CAPACITOR-FDTHRU 100PF 20% 200V CER	33095	54-713-001-101M
A6FL1	9135-0174	5	3	FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A6FL2	9135-0174	5		FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A6FL3	9135-0174	5		FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A6M1	0403-0374	7	1	BUMPER FOOT-ADH MTG .5-IN-WD .12-IN-HGT	76381	SJ-5008 BLACK
A6M2	0515-0907	9	4	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-0907
A6M3	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A6M4	0515-0924	0	14	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A6M5	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A6M6	0515-1108	4	15	SCREW-MACH M2.5 X 0.45 12MM-LG PAN-HD	28480	0515-1108
A6M7	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A6M8				NOT ASSIGNED		
A6M9	08780-20056	3	1	FRAME FM RF	28480	08780-20056
A6M10	08780-20107	5	1	COVER-VCO TOP	28480	08780-20107
A6M11	08780-20108	6	1	COVER-VCO BOTTOM	28480	08780-20108
A6M12				NOT ASSIGNED		
A6M13				NOT ASSIGNED		
A6M14	1250-1998	9	10	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A6M15	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A6M16	2190-0036	7	10	WASHER-LK INTL T 13/16 IN .818-IN-ID	78189	1233-03
A6M17	2190-0584	0	16	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A6M18	2950-0078	9	10	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A6M19-A6M21				NOT ASSIGNED		
A6M22	5001-6518	6	1	COVER FRONT	28480	5001-6518
A6M23	5001-6519	7	1	COVER REAR	28480	5001-6519
A6M24	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A6M25	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A6M26	8160-0562	7	1	RFI GASKET	28480	8160-0562

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A6A1	08780-60014	7	1	FM VOLTAGE CONTROLLED OSCILLATOR BD AY	28480	08780-60014
A6A1C1				NOT ASSIGNED		
A6A1C2	0160-6306	1		CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A6A1C3	0160-6306	1		CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A6A1C4	0160-6306	1	4	CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A6A1C5	0160-6306	1		CAPACITOR-FXD 1.5PF +-.1PF 500VDC PORC	1A027	MA281R5B
A6A1C6	0180-0553	0	3	CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A6A1C7	0160-3878	6	12	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C8	0160-4498	8	2	CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A6A1C9	0160-4385	2	1	CAPACITOR-FXD 15PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D150J
A6A1C10	0180-0553	0		CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A6A1C11	0180-0491	5	6	CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A6A1C12	0160-4498	8		CAPACITOR-FXD 5.6PF +-.5PF 200VDC CER	06383	FD12C0G2D5R6D
A6A1C13	0180-0553	0		CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A6A1C14	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A6A1C15	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C16	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C17	0160-0690	4	4	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A6A1C18				NOT ASSIGNED		
A6A1C19	0160-4574	1	6	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A1C20	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A1C21	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C22	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C23	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A6A1C24	0160-4832	4	5	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A1C25	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A1C26	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A1C27	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C28	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C29	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A6A1C30	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A1C31	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A1C32	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A1C33	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C34	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A6A1C35	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A1C36	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A6A1C37	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A1C38	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A1C39				NOT ASSIGNED		
A6A1C40	0121-0558	1	1	CAPACITOR-V TRMR-CER .25-.7PF 250V	05525	9401-0 PC
A6A1C41	0160-4789	0	1	CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A150J
A6A1C42	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A6A1C43	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A6A1C44	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C45	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A6A1C46	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C47	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1C48	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A6A1CR1	0122-0165	8	2	DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A6A1CR2	0122-0165	8		DIODE-VVC 2.3PF .5% C3/C25-TYP=5 BVR=30V	11045	KV31S1
A6A1CR3	1901-0050	3	1	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A1L1	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH +-10%	32159	1A1803M+-10%
A6A1L2	9135-0079	9	14	INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L3	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L4	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L5	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L6	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L7	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L8	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L9	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L10	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6A1L11	9140-0144	0	2	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A6A1L12	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A6A1L13	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L14	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L15	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L16	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1L17	9135-0079	9		INDUCTOR 100NH +-5.5% 2.6D-MMX6.6LG-MM	24226	10M0100X-1
A6A1Q1	1854-1044	6	5	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A6A1Q2	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A6A1Q3	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A6A1Q4	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A6A1Q5	1854-1044	6		TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A6A1R1	0698-7201	6	1	RESISTOR 34.8 1% .05W TF TC=0+-100	2M627	CRB20
A6A1R2	0698-7205	0	1	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A6A1R3	0698-3132	4	2	RESISTOR 261 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A6A1R4	0698-3132	4		RESISTOR 261 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A6A1R5	0757-0403	2	2	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A1R6	0757-0280	3	2	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A6A1R7	0698-7212	9	3	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A6A1R8	0698-3402	1	1	RESISTOR 316 1% .5W TF TC=0+-100	19701	5053R
A6A1R9	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A1R10	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A6A1R11	0699-2005	0	2	RESISTOR 75 1% .05W F TC=0+-100	91637	CMF-50-2-75-1%
A6A1R12	0699-2001	6	1	RESISTOR 133 1% .05W F TC=0+-100	91637	CMF-50-2-133-1%
A6A1R13	0699-2005	0		RESISTOR 75 1% .05W F TC=0+-100	91637	CMF-50-2-75-1%
A6A1R14	0699-2002	7	4	RESISTOR 147 1% .05W F TC=0+-100	91637	CMF-50-2-147-1%
A6A1R15	0699-2004	9	2	RESISTOR 38.3 1% .05W F TC=0+-100	91637	CMF-50-2-38.3-1%
A6A1R16	0699-2002	7		RESISTOR 147 1% .05W F TC=0+-100	91637	CMF-50-2-147-1%
A6A1R17	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A6A1R18	0699-2003	8	2	RESISTOR 287 1% .05W F TC=0+-100	91637	CMF-50-2-287-1%
A6A1R19	0699-1855	6	1	RESISTOR 17.8 1% .05W F TC=0+-50	05545	CMF-50-2-17.8-1%
A6A1R20	0699-2003	8		RESISTOR 287 1% .05W F TC=0+-100	91637	CMF-50-2-287-1%
A6A1R21	0699-1915	9	6	RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A6A1R22	0699-1853	4	16	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R23	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R24	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R25	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R26	0699-1852	3	4	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A6A1R27	0757-1090	5	3	RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A6A1R28	0699-2002	7		RESISTOR 147 1% .05W F TC=0+-100	91637	CMF-50-2-147-1%
A6A1R29	0699-2004	9		RESISTOR 38.3 1% .05W F TC=0+-100	91637	CMF-50-2-38.3-1%
A6A1R30	0699-2002	7		RESISTOR 147 1% .05W F TC=0+-100	91637	CMF-50-2-147-1%
A6A1R31	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A6A1R32	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R33	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R34	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R35	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R36	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A6A1R37	0757-1090	5		RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A6A1R38	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A6A1R39*	0699-1849	8	1	RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A6A1R40	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A6A1R41	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A6A1R42	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R43	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R44	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R45	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R46	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A6A1R47	0757-1090	5		RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A6A1R48	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A6A1R49	0757-0394	0	1	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A6A1R50	0699-1915	9		RESISTOR 82.5 1% 1.05W F TC=0+-100	28480	0699-1915
A6A1R51	0699-1852	3		RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A6A1R52	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R53	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R54	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A6A1R55	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6A1R56	0757-0802	5	1	RESISTOR 162 1% .5W TF TC=0+-100	K8479	H2
A6A1R57	0698-7236	7	1	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A6A1TP1	0360-0535	0	3	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A1TP2				NOT ASSIGNED		
A6A1TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A1TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A1U1	1826-0772	6	1	IC V RGLTR-ADJ-POS 1.2/32V TO-92 PKG	28480	1826-0772
A6A1U2	1826-1099	2	1	IC V RGLTR-ADJ-NEG TO-92 PKG	27014	LM337LZ

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6A2	08780-60013	6	1	FM PHASE LOCK LOOP BD AY	28480	08780-60013
A6A2C1	0160-4574	1	6	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A2C2	0160-4832	4	41	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C3				NOT ASSIGNED		
A6A2C4				NOT ASSIGNED		
A6A2C5	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C6	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C7	0160-4831	3	1	CAPACITOR-FXD 4700PF +-10% 100VDC CER	28480	0160-4831
A6A2C8				NOT ASSIGNED		
A6A2C9	0160-5909	8	2	CAPACITOR-FXD .047UF +-10% 50VDC CER	12474	CAC03X7R473K050A
A6A2C10				NOT ASSIGNED		
A6A2C11	0160-5910	1	2	CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A6A2C12	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C13	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C15-A6A2C17				NOT ASSIGNED		
A6A2C18	0160-5904	3	1	CAPACITOR-FXD 30PF +-5% 200VDC CER 0+-30	06383	MA12C0G2D300J
A6A2C19	0160-4803	9	1	CAPACITOR-FXD 68PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A680J
A6A2C20	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A2C21	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A2C22-A6A2C24				NOT ASSIGNED		
A6A2C25	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C26	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C27	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C28	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C29	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C30	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C31	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C32	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A2C33				NOT ASSIGNED		
A6A2C34				NOT ASSIGNED		
A6A2C35	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C36	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C37	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C38	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C39	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C40	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A2C41	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C42	0180-2207	5	1	CAPACITOR-FXD 100UF+-10% 10VDC TA	K7253	TAAC100K10RX
A6A2C43	0160-4835	7	3	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6A2C44				NOT ASSIGNED		
A6A2C45	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6A2C46	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6A2C47	0160-5910	1		CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A6A2C48	0160-5909	8		CAPACITOR-FXD .047UF +-10% 50VDC CER	12474	CAC03X7R473K050A
A6A2C49	0160-0127	2	2	CAPACITOR-FXD 1UF +-20% 50VDC CER	04222	SR835E105MAA
A6A2C50	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C51	0160-0127	2		CAPACITOR-FXD 1UF +-20% 50VDC CER	04222	SR835E105MAA
A6A2C52				NOT ASSIGNED		
A6A2C53				NOT ASSIGNED		
A6A2C54	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C55	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C56	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C57	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C58	0160-4801	7	2	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A6A2C59	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C60	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A6A2C61	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C62	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C63	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C64	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6A2C65	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C66	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C67				NOT ASSIGNED		
A6A2C68	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C69				NOT ASSIGNED		
A6A2C70	0180-0116	1	7	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A6A2C71	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C72	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A6A2C73	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C74	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A6A2C75	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C76	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A6A2C77	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C78				NOT ASSIGNED		
A6A2C79				NOT ASSIGNED		
A6A2C80	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A6A2C81	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A6A2C82				NOT ASSIGNED		
A6A2C83	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C84	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C85	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C86	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A6A2C87	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C88	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6A2C89				NOT ASSIGNED		
A6A2C90	0160-4797	0	1	CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	06383	MA12C0G2A3R3C
A6A2C91	0180-0553	0	1	CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A6A2C92	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A6A2C93	0160-6294	6	1	CAPACITOR-FXD 1000PF +-5% 50VDC CER	28480	0160-6294
A6A2CR1	1901-1085	6	6	DIODE-SCHOTTKY SM SIG	28480	5082-2835
A6A2CR2-A6A2CR4				NOT ASSIGNED		
A6A2CR5	1901-1085	6		DIODE-SCHOTTKY SM SIG	28480	5082-2835
A6A2CR6	1901-1085	6		DIODE-SCHOTTKY SM SIG	28480	5082-2835
A6A2CR7				NOT ASSIGNED		
A6A2CR8	1901-1085	6		DIODE-SCHOTTKY SM SIG	28480	5082-2835
A6A2CR9	1901-1085	6		DIODE-SCHOTTKY SM SIG	28480	5082-2835
A6A2CR10	1901-0050	3	7	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A2CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A2CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A2CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A2CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A2CR15	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A2CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A6A2CR17				NOT ASSIGNED		
A6A2CR18	1901-1085	6		DIODE-SCHOTTKY SM SIG	28480	5082-2835
A6A2DS1	1990-0685	7	2	LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A6A2DS2	1990-0685	7		LED-LAMP LUM-INT=200UCD	28480	HLMP-6620
A6A2K1	0490-1295	6	4	RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A6A2K2	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A6A2K3	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A6A2K4	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A6A2L1	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A6A2L2	9100-2247	4	5	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A6A2L3				NOT ASSIGNED		
A6A2L4				NOT ASSIGNED		
A6A2L5	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A6A2L6	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A6A2L7	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A6A2L8	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A6A2L9	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH +-10%	32159	1A1803M+-10%
A6A2M1	4330-0145	9	1	INSULATOR-BEAD GLASS	28480	4330-0145
A6A2M2	5021-4541	3	1	SPACER PC GROUND	28480	5021-4541

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6A2Q1	1854-0597	2	1	TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A6A2Q2	1854-0810	2	2	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A6A2Q3	1853-0459	3	2	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A6A2Q4	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A6A2Q5	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A6A2R1	0698-7260	7	7	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R2	0698-7271	0	2	RESISTOR 28.7K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R3	0698-7210	7	9	RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R4				NOT ASSIGNED		
A6A2R5	0698-7248	1	2	RESISTOR 3.16K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R6	0698-7232	3	1	RESISTOR 681 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R7				NOT ASSIGNED		
A6A2R8	0698-7239	0	1	RESISTOR 1.33K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R9	0698-0090	7	1	RESISTOR 464 1% .5W TF TC=0+-100	19701	5053R
A6A2R10	0698-7213	0	1	RESISTOR 110 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R11	0698-7204	9	1	RESISTOR 46.4 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R12	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R13	0698-7288	9	1	RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A6A2R14	0698-3260	9	2	RESISTOR 464K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R15-A6A2R18				NOT ASSIGNED		
A6A2R19	0698-7284	5	2	RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A6A2R20	0698-7212	9	4	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R21	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R22-A6A2R26				NOT ASSIGNED		
A6A2R27	0698-7255	0	1	RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R28	0698-8820	7	1	RESISTOR 4.64 1% .125W F TC=0+-100	28480	0698-8820
A6A2R29	0698-8822	9	1	RESISTOR 6.81 1% .125W F TC=0+-100	28480	0698-8822
A6A2R30				NOT ASSIGNED		
A6A2R31	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R32	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R33				NOT ASSIGNED		
A6A2R34	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R35	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R36	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R37	0757-0403	2	8	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R38	0698-7218	5	2	RESISTOR 178 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R39	0698-3132	4	2	RESISTOR 261 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A6A2R40	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R41				NOT ASSIGNED		
A6A2R42				NOT ASSIGNED		
A6A2R43	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R44	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R45				NOT ASSIGNED		
A6A2R46				NOT ASSIGNED		
A6A2R47	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R48	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R49	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R50	0698-7253	8	1	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R51	0698-7276	5	1	RESISTOR 46.4K 1% .05W TF TC=0+-100	06001	NK3
A6A2R52	0698-3459	8	1	RESISTOR 383K 1% .125W TF TC=0+-100	K8479	H8
A6A2R53	0698-7275	4	1	RESISTOR 42.2K 1% .05W TF TC=0+-100	06001	NK3
A6A2R54	0698-3260	9		RESISTOR 464K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R55	0698-7248	1		RESISTOR 3.16K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R56-A6A2R59				NOT ASSIGNED		
A6A2R60	0698-7265	2	4	RESISTOR 16.2K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R61	0698-7265	2		RESISTOR 16.2K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R62	0698-7265	2		RESISTOR 16.2K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R63	0698-7265	2		RESISTOR 16.2K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R64	0698-7254	9	3	RESISTOR 5.62K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R65	0698-7254	9		RESISTOR 5.62K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R66	0698-7254	9		RESISTOR 5.62K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R67	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A6A2R68				NOT ASSIGNED		
A6A2R69				NOT ASSIGNED		

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6A2R70	0698-7279	8	1	RESISTOR 61.9K 1% .05W TF TC=0+-100	06001	NK3
A6A2R71	0757-0279	0	1	RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A6A2R72	2100-1986	9	1	RESISTOR-TRMR 1K 10% TKF TOP-ADJ 1-TRN	73138	82PR1K
A6A2R73	0698-7236	7	6	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R74				NOT ASSIGNED		
A6A2R75	0698-7218	5		RESISTOR 178 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R76	0698-3132	4		RESISTOR 261 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A6A2R77	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R78	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R79	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R80	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R81	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R82	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R83	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R84	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R85	0698-7267	4	2	RESISTOR 19.6K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R86	0698-7267	4		RESISTOR 19.6K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R87-A6A2R89				NOT ASSIGNED		
A6A2R90	0757-0280	3	1	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A6A2R91	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A6A2R92	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R93	0698-7205	0	4	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R94	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R95				NOT ASSIGNED		
A6A2R96	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R97	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R98				NOT ASSIGNED		
A6A2R99	0698-7224	3	1	RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R100				NOT ASSIGNED		
A6A2R101	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R102	0698-7210	7		RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R103	0698-7271	0		RESISTOR 28.7K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R104	0698-7234	5	2	RESISTOR 825 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R105	0698-7234	5		RESISTOR 825 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R106	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R107	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R108				NOT ASSIGNED		
A6A2R109	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R110	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A6A2R111	0698-7211	8	1	RESISTOR 90.9 1% .05W TF TC=0+-100	2M627	CRB20
A6A2RT1	0837-0239	2	1	THERMISTOR TUB WITH AXL LEADS 1K-OHM	6E259	DG125-102J
A6A2T1	9100-4435	6	1	TRANSFORMER-RF 1:1 OHM RATION; FOPR	02745	T1-6T
A6A2TP1	0360-0535	0	16	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP4				NOT ASSIGNED		
A6A2TP5				NOT ASSIGNED		
A6A2TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP7				NOT ASSIGNED		
A6A2TP8	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP9	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP10	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP11	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP12	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP13				NOT ASSIGNED		
A6A2TP14	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP15	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP16				NOT ASSIGNED		
A6A2TP17	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP18				NOT ASSIGNED		
A6A2TP19	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP20	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A6A2TP21	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2TP22	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A6A2U1	1820-3704	8	1	IC PRESCR ECL	3L585	CA3199E
A6A2U2	1820-2096	9	2	IC CNTR TTL LS BIN DUAL 4-BIT	01295	SN74LS393N
A6A2U3	1820-3536	4	1	IC SHF-RGTR TTL LS SYNCHRO PAR/SERIAL-IN	01295	SN74LS597N
A6A2U4	1820-0535	7	2	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A6A2U5	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A6A2U6	1820-3423	8	2	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A6A2U7	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A6A2U8	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A6A2U9	1826-1021	0	1	ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A6A2U10	1820-0822	5	1	IC CNTR ECL DECD UP/DOWN SYNCHRO	04713	MC10137L
A6A2U11	1820-1888	5	1	IC PRESCR ECL	04713	MC12013L
A6A2U12	1820-2849	0	1	IC FF ECL/10KH D-M/S DUAL	04713	MC10H131P
A6A2U13	1826-0783	9	2	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A6A2U14	1826-1019	6	1	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A6A2U15	1820-2879	6	1	IC MISC CMOS 14-BIT	04713	MC145151P
A6A2U16	1820-1224	3	1	IC RCVR ECL LINE RCVR TPL 2-INP	04713	MC10216P
A6A2U17	1820-1632	7	1	IC CNTR ECL BIN ASYNCHRO POS-EDGE-TRIG	04713	MC10178P
A6A2U18	1820-3125	7	1	IC XLTR ECL ECL-TO-TTL QUAD	04713	MC10125P
A6A2U19	1820-1991	1	2	IC CNTR TTL LS DECD DUAL 4-BIT	07263	74LS390PC
A6A2U20	1820-2096	9		IC CNTR TTL LS BIN DUAL 4-BIT	01295	SN74LS393N
A6A2U21	1826-1099	2	1	IC V RGLTR-ADJ-NEG TO-92 PKG	27014	LM337LZ
A6A2U22	1826-0716	8	2	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A6A2U23	1820-1423	4	1	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A6A2U24	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A6A2U25	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A6A2U26	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A6A2U27	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A6A2U28	1820-1991	1		IC CNTR TTL LS DECD DUAL 4-BIT	07263	74LS390PC

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A7	08780-60026	1	1	FM BASEBAND FRAME	28480	08780-60026
	08780-69026	9	1	FM BASEBAND FRAME (RESTORED 08780-60026)	28480	08780-69026
A7FL1	9135-0174	5	5	FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A7FL2	9135-0174	5		FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A7FL3	9135-0174	5		FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A7FL4	9135-0174	5		FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A7FL5	9135-0174	5		FILTER-LOW PASS LEADS-TERMS	28480	9135-0174
A7M1	0515-0886	3	4	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A7M2	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A7M3	0515-0924	0	14	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A7M4	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A7M5	0515-1430	5	1	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-1430
A7M6	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A7M7	08662-20009	3	1	MASS CKT BD	28480	08662-20009
A7M8	08780-00016	3	1	GASKET RFI	28480	08780-00016
A7M9	08780-00026	5	1	SHLD RF REF TOP	28480	08780-00026
A7M10	08780-00027	6	1	SHLD RF REF BOTT	28480	08780-00027
A7M11	08780-00047	0	1	INSULATOR PLATE	28480	08780-00047
A7M12	08780-20057	4	1	FRAME FM B BAND	28480	08780-20057
A7M13				NOT ASSIGNED		
A7M14				NOT ASSIGNED		
A7M15	08780-80034	3	1	LABEL INSULATOR	28480	08780-80034
A7M16	0905-0790	5	4	O-RING .237-IN-ID .103-IN-XSECT-DIA EPR	83259	2-108 E515-80
A7M17	1250-1998	9	9	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A7M18	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A7M19	2190-0034	5	9	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A7M20	2190-0584	0	16	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A7M21	2950-0078	9	9	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A7M22	5001-6518	6	1	COVER FRONT	28480	5001-6518
A7M23	5001-6519	7	1	COVER REAR	28480	5001-6519
A7M24				NOT ASSIGNED		
A7M25				NOT ASSIGNED		
A7M26	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A7M27	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A7M28	8160-0562	7	1	RFI GASKET	28480	8160-0562

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7A1	08780-60012	5	1	FM RF BOARD ASSY	28480	08780-60012
A7A1C1-A7A1C5				NOT ASSIGNED		
A7A1C6	0160-3334	9	16	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C7	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C8				NOT ASSIGNED		
A7A1C9	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C10	0121-0452	4	1	CAPACITOR-V TRMR-AIR 1.3-5.4PF 175V	74970	187-0103-028
A7A1C11	0160-4797	0	1	CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	06383	MA12C0G2A3R3C
A7A1C12	0160-4790	3	2	CAPACITOR-FXD 12PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A120J
A7A1C13	0160-4814	2	2	CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	DA12C0G2A151J
A7A1C14	0160-4801	7	3	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A7A1C15	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C16-A7A1C21				NOT ASSIGNED		
A7A1C22	0160-3878	6	4	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A7A1C23	0160-0690	4	1	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12C0G2A1R0D
A7A1C24	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A7A1C25	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A7A1C26				NOT ASSIGNED		
A7A1C27	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A7A1C28	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C29	0180-2815	1	3	CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A7A1C30	0160-4814	2		CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	DA12C0G2A151J
A7A1C31	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A7A1C32	0160-4768	5	2	CAPACITOR-FXD 470PF +-5% 100VDC CER	06383	FD12C0G2A471J
A7A1C33	0160-4768	5		CAPACITOR-FXD 470PF +-5% 100VDC CER	06383	FD12C0G2A471J
A7A1C34	0160-4764	1	2	CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	FD12C0G2A151J
A7A1C35	0160-4764	1		CAPACITOR-FXD 150PF +-5% 100VDC CER	06383	FD12C0G2A151J
A7A1C36	0160-3874	2	2	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A7A1C37	0160-3874	2		CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	FD12C0G2D100D
A7A1C38	0160-4795	8	1	CAPACITOR-FXD 4.7PF +-.5PF 100VDC CER	06383	DA12C0G2A4R7D
A7A1C39	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C40	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C41	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C42	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C43	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A7A1C44	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A7A1C45	0180-0491	5	8	CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1C46	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1C47				NOT ASSIGNED		
A7A1C48				NOT ASSIGNED		
A7A1C49	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1C50				NOT ASSIGNED		
A7A1C51				NOT ASSIGNED		
A7A1C52	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C53				NOT ASSIGNED		
A7A1C54	0160-5909	8	1	CAPACITOR-FXD .047UF +-10% 50VDC CER	12474	CAC03X7R473K050A
A7A1C55	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C56	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C57	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C59	0160-4790	3		CAPACITOR-FXD 12PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A120J
A7A1C60-A7A1C66				NOT ASSIGNED		
A7A1C67	0180-2619	3	2	CAPACITOR-FXD 22UF+-10% 15VDC TA	01766	202L1602-226-K0-552
A7A1C68	0180-2815	1		CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A7A1C69	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1C70	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	01766	202L1602-226-K0-552
A7A1C71	0180-2815	1		CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A7A1C72				NOT ASSIGNED		

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7A1C73	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1C74	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1C75	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1C76	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C77	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A1C78	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	01766	202L2502-106-M7-552
A7A1CR1-A7A1CR3				NOT ASSIGNED		
A7A1CR4	0122-0085	1	1	DIODE-VVC 2.2PF 7% C3/C25-MIN=4.5	S0545	1S2208(B)
A7A1CR5	1901-0179	7	2	DIODE-SWITCHING 15V 50MA 750PS DO-7	07263	FD777
A7A1CR6	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	07263	FD777
A7A1CR7	1901-0189	9	1	DIODE-STEP RECOVERY	28480	1901-0189
A7A1CR8				NOT ASSIGNED		
A7A1CR9	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A1CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A1CR11	1902-0949	1	1	DIODE-ZNR 4.3V 5% DO-35 PD=.4W TC=+.017%	28480	1902-0949
A7A1E1	9170-0029	3	2	CORE-SHIELDING BEAD	28480	9170-0029
A7A1E2	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A7A1L1	9140-0144	0	7	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A1L2	9100-2256	5	2	INDUCTOR RF-CH-MLD 560NH +-10%	32159	1A5603M+-10%
A7A1L3	9100-2256	5		INDUCTOR RF-CH-MLD 560NH +-10%	32159	1A5603M+-10%
A7A1L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A1L5	9100-2809	4	1	INDUCTOR 100NH +-10% .312D-INX.609LG-IN	08111	JFD-LF4W010
A7A1L6				NOT ASSIGNED		
A7A1L7				NOT ASSIGNED		
A7A1L8	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A7A1L9	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A7A1L10	9100-3922	4	1	INDUCTOR-FIXED 120-1300 HZ	23880	14067
A7A1L11	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A1L12	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A1L13				NOT ASSIGNED		
A7A1L14				NOT ASSIGNED		
A7A1L15	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A1L16				NOT ASSIGNED		
A7A1L17				NOT ASSIGNED		
A7A1L18	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A1L19	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A1L20	9100-2248	5	1	INDUCTOR RF-CH-MLD 120NH +-10%	32159	1A1203M+-10%
A7A1M1	0360-0077	5	8	TERMINAL-STUD SGL-TUR SWGFRM-MTG	00866	1601-HP
A7A1M2	0360-0124	3	4	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	28480	0360-0124
A7A1M3	0380-1238	4	4	STANDOFF-RVT-ON 10-MM-LG M3.0 X 0.5-THD	28480	0380-1238
A7A1M4	0380-1513	8	2	STANDOFF-RVT-ON 5-MM-LG M3.0 X 0.5-THD	28480	0380-1513
A7A1M5	0403-0549	8	2	CONN-SINGLE CONT	76381	SJ-5302
A7A1M6	8150-2275	2	1	WIRE 26AWG G 42V SIL RBR 66X44 105C	28480	8150-2275
A7A1M7	0403-0549	8		BUMPER FOOT-ADH MTG .312-IN-WD	76381	SJ-5302
A7A1Q1	1854-0345	8	2	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A7A1Q2	1854-1044	6	1	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A7A1Q3	1853-0430	0	2	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A7A1Q4	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A7A1Q5	1853-0459	3	1	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A7A1Q6	1854-0597	2	1	TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A7A1Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A7A1Q8	1854-0977	2	1	TRANSISTOR NPN SI DARL TO-92 PD=625MW	04713	MPS-A14
A7A1R1	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R2	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R3	0698-3441	8	2	RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A7A1R4						
(2716A AND BELOW)	0698-7216	3	2	RESISTOR 147 1% .05W TF TC=0+-100	2M627	CRB20
(2725A AND ABOVE)	0698-7212	9	6	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R5-A7A1R7				NOT ASSIGNED		
A7A1R8	0698-7236	7	2	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R9	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R10-A7A1R13				NOT ASSIGNED		

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7A1R14	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R15	0698-7208	3	1	RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R16	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R17	0698-7210	7	1	RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R18	0699-1852	3	1	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A7A1R19	0699-1853	4	4	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A7A1R20	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A7A1R21	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A7A1R22	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A7A1R23	0757-1060	9	1	RESISTOR 196 1% .5W TF TC=0+-100	K8479	H2
A7A1R24				NOT ASSIGNED		
A7A1R25	0698-7216	3		RESISTOR 147 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R26	0698-3435	0	1	RESISTOR 38.3 1% .125W TF TC=0+-100	K8479	H8
A7A1R27	0698-7202	7	1	RESISTOR 38.3 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R28	0698-7223	2	3	RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R29	0698-7194	6	1	RESISTOR 17.8 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R30	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R31	0757-0290	5	1	RESISTOR 6.19K 1% .125W TF TC=0+-100	K8479	H8
A7A1R32	0698-7205	0	2	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R33				NOT ASSIGNED		
A7A1R34	0698-7240	3	1	RESISTOR 1.47K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R35				NOT ASSIGNED		
A7A1R36	0698-7255	0	1	RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R37	0698-7257	2	1	RESISTOR 7.5K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R38	0698-7270	9	1	RESISTOR 26.1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R39	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R40	0698-3444	1	2	RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A7A1R41	0698-3444	1		RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A7A1R42	0698-0083	8	1	RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A7A1R43	0698-7209	4	1	RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R44	0698-7223	2		RESISTOR 287 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R45	0698-0084	9	1	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A7A1R46	0698-7198	0	2	RESISTOR 26.1 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R47	0757-0346	2	4	RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A7A1R48	0757-0346	2		RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A7A1R49	0698-7198	0		RESISTOR 26.1 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R50	0698-3433	8	1	RESISTOR 28.7 1% .125W TF TC=0+-100	K8479	H8
A7A1R51				NOT ASSIGNED		
A7A1R52				NOT ASSIGNED		
A7A1R53	0698-7215	2	1	RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R54	0698-7241	4	2	RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R55	0698-7241	4		RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R56	0698-7204	9	1	RESISTOR 46.4 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R57	0757-0397	3	1	RESISTOR 68.1 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A7A1R58	0698-7188	8	1	RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A7A1R59	0757-0399	5	1	RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A7A1R60	0698-3440	7	3	RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A7A1R61	0757-0394	0	1	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A7A1R62	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R63	0698-7251	6	1	RESISTOR 4.22K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R64	0698-7214	1	1	RESISTOR 121 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R65	0698-7217	4	1	RESISTOR 162 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R66	0698-7248	1	1	RESISTOR 3.16K 1% .05W TF TC=0+-100	2M627	CRB20
A7A1R67	2100-2497	9	1	RESISTOR-TRMR 2K 10% TKF TOP-ADJ 1-TRN	09969	3321
A7A1R68	0757-0346	2		RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A7A1R69	0757-0346	2		RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A7A1R70	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A7A1R71	0698-3440	7		RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A7A1R72	2100-1788	9	1	RESISTOR-TRMR 500 10% TKF TOP-ADJ 1-TRN	09969	3321
A7A1R73	0698-7288	9	1	RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A7A1R74	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A7A1RT1	0837-0239	2	1	THERMISTOR TUB WITH AXL LEADS 1K-OHM	6E259	DG125-102J

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7A1TP1	0360-0535	0	2	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A1TP2-A7A1TP5				NOT ASSIGNED		
A7A1TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A1U1	1855-0573	6	1	TRANSISTOR-JFET MTCHD PR N-CHAN D-MODE	02886	U440
A7A1U2	1900-0040	9	1	DIODE-GM LD QUAD RINGS	05704	MA-4E402L
A7A1U3	1826-0520	2	1	IC OP AMP LOW-BIAS-H-IMPD 8-DIP-P PKG	01295	TL071BCP
A7A1U4	1826-0783	9	1	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A7A1U5	1826-1099	2	1	IC V RGLTR-ADJ-NEG TO-92 PKG	27014	LM337LZ
A7A1W1	8159-0005	0	3	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A7A1W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A7A1W3	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A7A1Y1	0410-0482	3	1	CRYSTAL-QUARTZ 100.000 MHZ	28480	0410-0482

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A7A2	08780-60011	4	1	FM BASEBAND BOARD ASSY	28480	08780-60011
A7A2C1	0160-4835	7	14	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C2	0180-0183	2	5	CAPACITOR-FXD 10UF+75-10% 50VDC AL	56289	30D106G050CB2-DSM
A7A2C3	0160-5910	1	4	CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A7A2C4	0180-0183	2		CAPACITOR-FXD 10UF+75-10% 50VDC AL	56289	30D106G050CB2-DSM
A7A2C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C6	0180-0183	2		CAPACITOR-FXD 10UF+75-10% 50VDC AL	56289	30D106G050CB2-DSM
A7A2C7	0160-5910	1		CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A7A2C8	0180-0183	2		CAPACITOR-FXD 10UF+75-10% 50VDC AL	56289	30D106G050CB2-DSM
A7A2C9	0180-0183	2		CAPACITOR-FXD 10UF+75-10% 50VDC AL	56289	30D106G050CB2-DSM
A7A2C10	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C11	0160-4799	2	2	CAPACITOR-FXD 2.2PF +-.25PF 100VDC CER	06383	MA12C0G2A2R2C
A7A2C12	0160-4799	2		CAPACITOR-FXD 2.2PF +-.25PF 100VDC CER	06383	MA12C0G2A2R2C
A7A2C13	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A7A2C14	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C15	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C16	0160-4790	3	1	CAPACITOR-FXD 12PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A120J
A7A2C17	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C18	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C19-A7A2C29				NOT ASSIGNED		
A7A2C30	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C31	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C32	0160-3334	9	3	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A2C33	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C34	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C35	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C36				NOT ASSIGNED		
A7A2C37	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C38	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A7A2C39	0160-4792	5	1	CAPACITOR-FXD 8.2PF +-.5PF 100VDC CER	06383	DA12C0G2A8R2D
A7A2C40	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A2C41	0160-3879	7	6	CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A7A2C42	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A7A2C43	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A7A2C44	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A7A2C45	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A7A2C46	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	06383	FD12X7R2A103M
A7A2C47	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A7A2C48	0160-5910	1		CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A7A2C49-A7A2C51				NOT ASSIGNED		
A7A2C52	0160-5910	1		CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A7A2CR1				NOT ASSIGNED		
A7A2CR2	1901-0050	3	14	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR15	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A7A2CR16				NOT ASSIGNED		
A7A2CR17	1901-0639	4	3	DIODE-PIN	28480	5082-3080
A7A2CR18	1901-0639	4		DIODE-PIN	28480	5082-3080
A7A2CR19	1901-0639	4		DIODE-PIN	28480	5082-3080

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7A2K1	0490-1295	6	6	RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A7A2K2	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A7A2K3	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A7A2K4	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A7A2K5	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A7A2K6	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A7A2L1	9140-0114	4	2	INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A7A2L2	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A7A2L3	9140-0144	0	4	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A2L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A2L5	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A2L6	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A7A2M1-A7A2M4				NOT ASSIGNED		
A7A2M5	5021-4541	3	1	SPACER PC GROUND	28480	5021-4541
A7A2Q1	1855-0468	8	1	TRANSISTOR J-FET N-CHAN TO-18	28480	1855-0468
A7A2Q2	1854-0637	1	1	TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
A7A2Q3	1853-0430	0	1	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A7A2Q4	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A7A2Q5	1855-0420	2	4	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A7A2Q6	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A7A2Q7	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A7A2Q8	1858-0032	8	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A7A2Q9	1853-0314	9	1	TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A7A2Q10	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A7A2Q11	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A7A2R1	0698-7221	0	4	RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R2	0698-7241	4	2	RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R3	0698-7241	4		RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R4	0698-7221	0		RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R5	0698-7288	9	2	RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A7A2R6	0698-7252	7	4	RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R7	0698-7252	7		RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R8	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A7A2R9	0757-0395	1	2	RESISTOR 56.2 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A7A2R10	0698-7229	8	1	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R11				NOT ASSIGNED		
A7A2R12	0698-7248	1	4	RESISTOR 3.16K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R13	0698-7248	1		RESISTOR 3.16K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R14	0698-7248	1		RESISTOR 3.16K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R15	0698-7248	1		RESISTOR 3.16K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R16	0698-7260	7	8	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R17	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R18	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R19	0698-7276	5	1	RESISTOR 46.4K 1% .05W TF TC=0+-100	06001	NK3
A7A2R20	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R21	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R22	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R23	0698-8827	4	4	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A7A2R24	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A7A2R25	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A7A2R26	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A7A2R27	0698-7227	6	1	RESISTOR 422 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R28	0698-7225	4	2	RESISTOR 348 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R29	0698-7247	0	2	RESISTOR 2.87K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R30	0698-7225	4		RESISTOR 348 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R31	0698-7247	0		RESISTOR 2.87K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R32	0698-7219	6	1	RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R33	0698-7209	4	2	RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R34	0698-7188	8	7	RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A7A2R35	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7A2R36	0698-7259	4	1	RESISTOR 9.09K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R37	0698-7210	7	1	RESISTOR 82.5 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R38	0698-7231	2	2	RESISTOR 619 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R39	0698-7217	4	2	RESISTOR 162 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R40	0757-0394	0	1	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A7A2R41				NOT ASSIGNED		
A7A2R42	0698-7238	9	1	RESISTOR 1.21K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R43	0757-0395	1		RESISTOR 56.2 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A7A2R44	0698-7206	1	2	RESISTOR 56.2 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R45	0698-7217	4		RESISTOR 162 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R46	0757-0398	4	1	RESISTOR 75 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A7A2R47	0698-7209	4		RESISTOR 75 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R48	0698-7206	1		RESISTOR 56.2 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R49	0698-7214	1	3	RESISTOR 121 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R50	0698-7214	1		RESISTOR 121 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R51	0698-7198	0	1	RESISTOR 26.1 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R52	0698-7221	0		RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R53	0698-7221	0		RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R54	0698-7190	2	1	RESISTOR 12.1 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R55	0698-7228	7	2	RESISTOR 464 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R56	0698-7228	7		RESISTOR 464 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R57	0698-7236	7	1	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R58	0698-7245	8	2	RESISTOR 2.37K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R59	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A7A2R60	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A7A2R61	0698-7245	8		RESISTOR 2.37K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R62	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A7A2R63	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A7A2R64	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R65-A7A2R74				NOT ASSIGNED		
A7A2R75	0698-7269	6	2	RESISTOR 23.7K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R76						
(2716A AND BELOW)	0698-7256	1	2	RESISTOR 6.81K 1% .05W TF TC=0+-100	2M627	CRB20
(2725A AND ABOVE)	0698-7258	3	2	RESISTOR 8.25K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R77						
(2716A AND BELOW)	0698-7256	1		RESISTOR 6.81K 1% .05W TF TC=0+-100	2M627	CRB20
(2725A AND ABOVE)	0698-7258	3		RESISTOR 8.25K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R78	0698-7269	6		RESISTOR 23.7K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R79	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R80	0698-7249	2	1	RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R81	0698-7243	6	2	RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R82	0698-0082	7	3	RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A7A2R83	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A7A2R84	0698-0082	7		RESISTOR 464 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A7A2R85	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R86	0698-7214	1		RESISTOR 121 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R87	0757-0424	7	1	RESISTOR 1.1K 1% .125W TF TC=0+-100	19701	SFR25H
A7A2R88-A7A2R91				NOT ASSIGNED		
A7A2R92	0698-7267	4	1	RESISTOR 19.6K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R93	0698-7237	8	4	RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R94	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R95	0698-7253	8	1	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R96	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R97	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R98	0698-7239	0	1	RESISTOR 1.33K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R99	0698-7255	0	2	RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R100	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R101	0698-7226	5	1	RESISTOR 383 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R102	0698-7252	7		RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R103	0698-7252	7		RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R104	0698-7261	8	2	RESISTOR 11K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R105	0698-7261	8		RESISTOR 11K 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R106	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A7A2R107	0698-7231	2		RESISTOR 619 1% .05W TF TC=0+-100	2M627	CRB20
A7A2R108	0698-7204	9	1	RESISTOR 46.4 1% .05W TF TC=0+-100	2M627	CRB20

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A7A2TP1	0360-0535	0	6	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A2TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A2TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A2TP4-A7A2TP8				NOT ASSIGNED		
A7A2TP9	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A2TP10	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A2TP11	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A7A2U1	1820-0535	7	4	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A7A2U2	1826-0539	3	2	IC 317 V RGLTR TO-39	27014	LM317H
A7A2U3	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A7A2U4	1826-0558	6	1	IC 337 V RGLTR TO-39	27014	LM337H
A7A2U5	1826-0539	3		IC 317 V RGLTR TO-39	27014	LM317H
A7A2U6	1826-1021	0	2	ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A7A2U7	1826-0600	9	1	IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL074ACN
A7A2U8	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A7A2U9	1820-3423	8	4	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A7A2U10	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A7A2U11	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A7A2U12	1826-1021	0		ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A7A2U13				NOT ASSIGNED		
A7A2U14	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A7A2U15	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A7A2U16	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A7A2U17	1826-0861	4	1	D/A 10-BIT 16-PLASTIC CMOS	24355	AD7533LN
A7A2U18	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A7A2U19	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8	08780-60007	8	1	BASEBAND FILTER FRAME AND FILTER I AND Q CHANNEL BD AY	28480	08780-60007
	08780-69007	6	1	BASEBAND FILTER FRAME AND FILTER I AND Q CHANNEL BD AY (RESTORED 08780-60007)	28480	08780-69007
A8C1	0160-4574	1	4	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A8C2	0160-4829	9	4	CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A8C3				NOT ASSIGNED		
A8C4	0160-4522	9	4	CAPACITOR-FXD 13PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D130J
A8C5	0160-4522	9		CAPACITOR-FXD 13PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D130J
A8C6				NOT ASSIGNED		
A8C7				NOT ASSIGNED		
A8C8	0160-4492	2	4	CAPACITOR-FXD 18PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D180J
A8C9	0160-4492	2		CAPACITOR-FXD 18PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D180J
A8C10				NOT ASSIGNED		
A8C11	0160-4523	0	8	CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C12	0160-4523	0		CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C13	0160-4523	0		CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C14	0160-4523	0		CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C15	0160-3029	9	4	CAPACITOR-FXD 7.5PF +-.5PF 100VDC CER	06383	FD11C0G2A7R5D
A8C16	0160-3334	9	27	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C17	0160-4386	3	8	CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C18	0160-4386	3		CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C19	0160-4386	3		CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C20	0160-4386	3		CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C21	0160-3029	9		CAPACITOR-FXD 7.5PF +-.5PF 100VDC CER	06383	FD11C0G2A7R5D
A8C22	0160-4808	4	10	CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C23	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A8C24	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C26	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C27	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C28	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C29	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C30-A8C33				NOT ASSIGNED		
A8C34	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A8C35	0160-4829	9		CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A8C36	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C38	0160-4386	3		CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C39	0160-4386	3		CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C40	0160-4386	3		CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C41	0160-4386	3		CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D330J
A8C42	0160-3029	9		CAPACITOR-FXD 7.5PF +-.5PF 100VDC CER	06383	FD11C0G2A7R5D
A8C43	0160-4523	0		CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C44	0160-4523	0		CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C45	0160-4523	0		CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C46	0160-4523	0		CAPACITOR-FXD 16PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D160J
A8C47	0160-3029	9		CAPACITOR-FXD 7.5PF +-.5PF 100VDC CER	06383	FD11C0G2A7R5D
A8C48				NOT ASSIGNED		
A8C49	0160-4492	2		CAPACITOR-FXD 18PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D180J
A8C50	0160-4492	2		CAPACITOR-FXD 18PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D180J
A8C51				NOT ASSIGNED		
A8C52				NOT ASSIGNED		
A8C53	0160-4522	9		CAPACITOR-FXD 13PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D130J
A8C54				NOT ASSIGNED		
A8C55	0160-4522	9		CAPACITOR-FXD 13PF +-5% 200VDC CER 0+-30	06383	FD12C0G2D130J
A8C56	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C57	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C59				NOT ASSIGNED		
A8C60				NOT ASSIGNED		
A8C61	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C62	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C63	0180-2141	6	1	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	12344	T110B33SK050AS

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8C64	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A8C65	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	K7253	TAAB22K16RX
A8C66	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A8C67				NOT ASSIGNED		
A8C68	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A8C69	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C70	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C71	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C72	0160-3336	1	5	CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A8C73	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A8C74				NOT ASSIGNED		
A8C75	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A8C76	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A8C77	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C78	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A8C79	0160-4812	0	16	CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C80	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C81	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C82	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C83	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C84	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C85	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C86	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C87	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C88	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C89	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C90	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C91	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C92	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C93	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C94	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A8C95	0160-4829	9		CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A8C96	0160-4829	9		CAPACITOR-FXD 680PF +-10% 100VDC CER	28480	0160-4829
A8C97	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C98	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C99	0160-5969	0	2	CAPACITOR-FXD 3.3PF +-.25PF 50VDC CER	06383	C2012C0G1H3R3C
A8C100	0160-5974	7	2	CAPACITOR-FXD 8.2PF +-.5PF 50VDC CER	06383	C2012C0G1H8R2D-T
A8C101	0160-5970	3	2	CAPACITOR-FXD 3.9PF +-.25PF 50VDC CER	06383	C2012C0G1H3R9C
A8C102	0160-5969	0		CAPACITOR-FXD 3.3PF +-.25PF 50VDC CER	06383	C2012C0G1H3R3C
A8C103	0160-5974	7		CAPACITOR-FXD 8.2PF +-.5PF 50VDC CER	06383	C2012C0G1H8R2D-T
A8C104	0160-5970	3		CAPACITOR-FXD 3.9PF +-.25PF 50VDC CER	06383	C2012C0G1H3R9C
A8C105	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C106	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C107	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C108	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C109	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C110	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C111	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C112	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C113	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C114	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C115	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C116	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C117	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C118	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8C119	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A8C120	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A8CR1	1901-0050	3	18	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR10				NOT ASSIGNED		

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR12				NOT ASSIGNED		
A8CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR14	1906-0275	4	1	DIODE-ARRAY	13606	TND908
A8CR15				NOT ASSIGNED		
A8CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR19	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR20	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR21	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR22	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A8CR23	1901-0518	8	2	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A8CR24	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A8J1	1250-1998	9	8	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J2	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J3	1250-1425	7	2	CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	98291	50-053-0269-220
A8J4	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J5	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J6	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J7	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J8	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	98291	50-053-0269-220
A8J9	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J10	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A8J11	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A8K1	0490-1480	1	16	RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K2	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K3	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K4	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K5	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K6	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K7	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K8	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K9	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K10	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K11	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K12	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K13	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K14	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K15	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8K16	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A8L1	9100-2256	5	2	INDUCTOR RF-CH-MLD 560NH +-10%	32159	1A5603M+-10%
A8L2	9135-0078	8	4	INDUCTOR RF-CH-MLD 82NH +-5.61%	24226	10M082X-1
A8L3	9140-0353	3	2	INDUCTOR RF-CH-MLD 430NH 1% .105DX.26LG	28480	9140-0353
A8L4	9135-0076	6	2	INDUCTOR RF-CH-MLD 39NH +-6%	06560	010150-054J
A8L5	9140-0519	3	2	INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A8L6				NOT ASSIGNED		
A8L7	9100-2248	5	2	INDUCTOR RF-CH-MLD 120NH +-10%	32159	1A1203M+-10%
A8L8				NOT ASSIGNED		
A8L9	9135-0078	8		INDUCTOR RF-CH-MLD 82NH +-5.61%	24226	10M082X-1
A8L10	9135-0077	7	2	INDUCTOR 36NH +-6.389% 2.6D-MMX6.6LG-MM	24226	10M036X-1
A8L11	9100-2255	4	4	INDUCTOR RF-CH-MLD 470NH +-10%	32159	1A4703M+-10%
A8L12	9135-0078	8		INDUCTOR RF-CH-MLD 82NH +-5.61%	24226	10M082X-1
A8L13	9140-0353	3		INDUCTOR RF-CH-MLD 430NH 1% .105DX.26LG	28480	9140-0353
A8L14	9135-0076	6		INDUCTOR RF-CH-MLD 39NH +-6%	06560	010150-054J
A8L15	9140-0519	3		INDUCTOR RF-CH-MLD 220NH 5% .105DX.26LG	28480	9140-0519
A8L16				NOT ASSIGNED		
A8L17	9100-2248	5		INDUCTOR RF-CH-MLD 120NH +-10%	32159	1A1203M+-10%
A8L18				NOT ASSIGNED		
A8L19	9135-0078	8		INDUCTOR RF-CH-MLD 82NH +-5.61%	24226	10M082X-1
A8L20	9100-2255	4		INDUCTOR RF-CH-MLD 470NH +-10%	32159	1A4703M+-10%
A8L21	9100-2256	5		INDUCTOR RF-CH-MLD 560NH +-10%	32159	1A5603M+-10%
A8L22	9135-0077	7		INDUCTOR 36NH +-6.389% 2.6D-MMX6.6LG-MM	24226	10M036X-1
A8L23				NOT ASSIGNED		
A8L24				NOT ASSIGNED		
A8L25	9100-2255	4		INDUCTOR RF-CH-MLD 470NH +-10%	32159	1A4703M+-10%

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8L26	9100-2255	4		INDUCTOR RF-CH-MLD 470NH +-10%	32159	1A4703M+-10%
A8M1	0380-0979	8	4	SPACER-RND .094-IN-LG .188-IN-ID	28480	0380-0979
A8M2	0515-0907	9	4	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-0907
A8M3	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A8M4	0515-0924	0	10	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A8M5	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A8M6	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A8M7	0590-1076	3	4	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A8M8	08780-00016	3	1	GASKET RFI	28480	08780-00016
A8M9	08780-00028	7	2	SHIELD FILTER	28480	08780-00028
A8M10	2190-0124	4	12	WASHER-LK INTL T NO. 10 .195-IN-ID	16179	500222
A8M11	2190-0584	0	12	WASHER-LK MLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A8M12	2950-0078	9	10	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A8M13	5001-0195	3	4	GASKET RFI 330	28480	5001-0195
A8M14	5001-0196	4	4	GASKET RFI 125	28480	5001-0196
A8M15	5001-6518	6	1	COVER FRONT	28480	5001-6518
A8M16	5001-6519	7	1	COVER REAR	28480	5001-6519
A8M17	5021-4541	3	2	SPACER PC GROUND	28480	5021-4541
A8M18	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A8Q1	1855-0630	6	2	TRANSISTOR J-FET N-CHAN TO-18 SI	02886	2N4391
A8Q2	1855-0630	6		TRANSISTOR J-FET N-CHAN TO-18 SI	02886	2N4391
A8Q3	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A8Q4	1858-0088	4	4	TRANSISTOR ARRAY 14-PIN PLSTC TO-116	04713	MPQ7091
A8Q5	1858-0088	4		TRANSISTOR ARRAY 14-PIN PLSTC TO-116	04713	MPQ7091
A8Q6	1858-0088	4		TRANSISTOR ARRAY 14-PIN PLSTC TO-116	04713	MPQ7091
A8Q7	1858-0088	4		TRANSISTOR ARRAY 14-PIN PLSTC TO-116	04713	MPQ7091
A8R1	0698-8821	8	12	RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R2	0698-7197	9	6	RESISTOR 23.7 1% .05W TF TC=0+-100	2M627	CRB20
A8R3	0698-3441	8	6	RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A8R4	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R5	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R6	0698-7191	3	2	RESISTOR 13.3 1% .05W TF TC=0+-100	2M627	CRB20
A8R7	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R8	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A8R9	0698-7260	7	18	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R10	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R11	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R12	0757-0317	7	4	RESISTOR 1.33K 1% .125W TF TC=0+-100	K8479	H8
A8R13	0698-7246	9	4	RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A8R14	0757-0280	3	4	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A8R15	0698-6624	5	6	RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A8R16	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A8R17	0698-7188	8	2	RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A8R18	0698-8819	4	4	RESISTOR 3.83 1% .125W F TC=0+-100	28480	0698-8819
A8R19	0698-3444	1	2	RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A8R20	0698-8819	4		RESISTOR 3.83 1% .125W F TC=0+-100	28480	0698-8819
A8R21	0757-0399	5	2	RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A8R22	0698-4400	1	2	RESISTOR 93.1 1% .125W TF TC=0+-100	06001	NK4
A8R23	0757-0438	3	2	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R24	0698-7197	9		RESISTOR 23.7 1% .05W TF TC=0+-100	2M627	CRB20
A8R25	0698-7236	7	9	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R26	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A8R27	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R28	0757-0442	9	6	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R29	0698-7253	8	12	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R30	0698-6320	8	4	RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A8R31	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R32	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R33	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R34	0699-1786	2	2	RESISTOR 55.55 .1% .125W F TC=0+-25	03007	5033R
A8R35	0698-6317	3	2	RESISTOR 500 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A8R36	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R37	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R38	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R39	0698-7197	9		RESISTOR 23.7 1% .05W TF TC=0+-100	2M627	CRB20
A8R40	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8R41	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R42	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A8R43	0698-7191	3		RESISTOR 13.3 1% .05W TF TC=0+-100	2M627	CRB20
A8R44	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R45	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A8R46	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R47	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R48				NOT ASSIGNED		
A8R49				NOT ASSIGNED		
A8R50	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R51	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+	2M627	CRB20
A8R52	0698-7246	9		RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A8R53	0757-0317	7		RESISTOR 1.33K 1% .125W TF TC=0+-100	K8479	H8
A8R54	0698-7188	8		RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A8R55	0698-8819	4		RESISTOR 3.83 1% .125W F TC=0+-100	28480	0698-8819
A8R56	0698-8819	4		RESISTOR 3.83 1% .125W F TC=0+-100	28480	0698-8819
A8R57	0698-3444	1		RESISTOR 316 1% .125W TF TC=0+-100	K8479	H8
A8R58	0698-4400	1		RESISTOR 93.1 1% .125W TF TC=0+-100	06001	NK4
A8R59	0757-0399	5		RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A8R60				NOT ASSIGNED		
A8R61	0698-7197	9		RESISTOR 23.7 1% .05W TF TC=0+-100	2M627	CRB20
A8R62	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R63	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A8R64	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R65	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R66	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R67	0698-6320	8		RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A8R68	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R69	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R70	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R71	0698-6317	3		RESISTOR 500 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A8R72	0699-1786	2		RESISTOR 55.55 .1% .125W F TC=0+-25	03007	5033R
A8R73	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A8R74	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A8R75	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A8R76	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R77	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R78	0698-7243	6	24	RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R79	0698-7268	5	16	RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R80	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R81	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R82	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R83	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R84	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R85	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R86	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R87	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R88	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R89	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R90	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R91	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R92	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R93	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R94	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R95	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R96	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R97	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R98	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R99	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R100	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R101	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R102	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R103	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R104	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R105	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8R106	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R107	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R108	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R109	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R110	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A8R111	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R112	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R113	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R114	0698-7268	5		RESISTOR 21.5K 1% .05W TF TC=0+-100	2M627	CRB20
A8R115	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R116	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R117	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R118	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R119	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R120	0698-7237	8	2	RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R121	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R122	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R123	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R124	0698-8644	8	2	RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R125	0698-8644	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R126				NOT ASSIGNED		
A8R127	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R128	0698-7197	9		RESISTOR 23.7 1% .05W TF TC=0+-100	2M627	CRB20
A8R129	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R130	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A8R131	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R132	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A8R133	0698-7246	9		RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A8R134	0757-0317	7		RESISTOR 1.33K 1% .125W TF TC=0+-100	K8479	H8
A8R135	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A8R136	0698-6320	8		RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A8R137	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R138	0698-7197	9		RESISTOR 23.7 1% .05W TF TC=0+-100	2M627	CRB20
A8R139	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R140	0698-8821	8		RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A8R141	0698-3441	8		RESISTOR 215 1% .125W TF TC=0+-100	K8479	H8
A8R142	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A8R143	0698-6320	8		RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A8R144	0757-0441	8	2	RESISTOR 8.25K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R145	0757-0394	0	2	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A8R146	0757-0441	8		RESISTOR 8.25K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R147	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A8R148	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R149	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8R150	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R151	0698-7246	9		RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A8R152	0757-0317	7		RESISTOR 1.33K 1% .125W TF TC=0+-100	K8479	H8
A8R153	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R154	0698-7249	2	2	RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A8R155	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A8R156	0698-8817	2	4	RESISTOR 2.61 1% .125W F TC=0+-100	28480	0698-8817
A8R157	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R158	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R159	0698-8817	2		RESISTOR 2.61 1% .125W F TC=0+-100	28480	0698-8817
A8R160	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R161	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R162	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R163	0698-8817	2		RESISTOR 2.61 1% .125W F TC=0+-100	28480	0698-8817
A8R164	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R165	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R166	0698-8817	2		RESISTOR 2.61 1% .125W F TC=0+-100	28480	0698-8817
A8R167	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A8R168	0698-0085	0	2	RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R169	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A8R170	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A8R171	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A8TP1	0360-0535	0	7	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A8TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A8TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A8TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A8TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A8TP6				NOT ASSIGNED		
A8TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A8TP8	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A8U1	1820-3423	8	7	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A8U2	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A8U3	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A8U4	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A8U5	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A8U6	1826-0547	3	5	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A8U7	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A8U8	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A8U9	1820-1934	2	2	D/A 8-BIT 16-CERDIP BPLR	06665	DAC-08EQ
A8U10	1820-1934	2		D/A 8-BIT 16-CERDIP BPLR	06665	DAC-08EQ
A8U11	1826-1334	8	2	D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A8U12	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A8U13	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A8U14	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A8U15	1826-0547	3		IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A8U16	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A8U17	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A8U18	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A8U19	1820-1201	6	1	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A8U20	1820-0471	0	1	IC INV TTL HEX 1-INP	01295	SN7406N
A8U21	1826-0759	9	2	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A8U22	1826-0759	9		IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A8U23	1826-1012	9	1	ANALOG SWITCH 4 SPST 16 -CERDIP	34371	HI1-0201-4
A8U24	1826-0716	8	1	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A8U25	1826-0853	4	1	IC V RGLTR-V-REF-FXD 9.95/10.05V TO-99	28480	1826-0853
A8W1	8159-0005	0	26	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W3	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W4	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W5	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W6	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W7				NOT ASSIGNED		
A8W8	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W9	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W10	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W11	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W12	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W13	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W14	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W15	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W16				NOT ASSIGNED		
A8W17	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W18	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W19	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W20	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W21	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W22	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W23	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W24	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W25	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W26	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W27	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A8W28	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9	08780-60008	9	1	DAC AND SWITCH FRAME AND DAC SWITCH BD AY (EXCEPT OPTION 064)	28480	08780-60008
	08780-69008	7	1	DAC AND SWITCH FRAME AND DAC SWITCH BD AY (RESTORED 08780-60008)	28480	08780-69008
A9C1	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A9C2	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A9C3	0180-0374	3	3	CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A9C4				NOT ASSIGNED		
A9C5	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A9C6	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A9C7	0160-3334	9	63	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C8	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C9	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C10	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C11	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C12	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C13	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C14	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C15	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C16	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C17	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C18	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C19	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C20	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C21	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C22	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C23	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C24	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C26	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C27	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C28				NOT ASSIGNED		
A9C29	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C30				NOT ASSIGNED		
A9C31	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C32				NOT ASSIGNED		
A9C33	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C34				NOT ASSIGNED		
A9C35	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C36				NOT ASSIGNED		
A9C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C38				NOT ASSIGNED		
A9C39	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C40				NOT ASSIGNED		
A9C41	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C42				NOT ASSIGNED		
A9C43	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C44	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C45	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C46	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C47	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C48	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C49	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C50	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C51	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C52	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C53	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C54	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C55	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C56	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C57	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C59	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C60	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A9C61	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C62	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C63	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C64	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C65	0180-0291	3	2	CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A9C66	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C67	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C68	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C69	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C70	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C71				NOT ASSIGNED		
A9C72	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C73				NOT ASSIGNED		
A9C74	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C75	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C76	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C77				NOT ASSIGNED		
A9C78	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C79				NOT ASSIGNED		
A9C80	0160-3336	1	6	CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C81	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C82	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C83	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C84	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C85	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C86	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A9C87	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C88	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C89	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C90	0160-5699	3	2	CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A200J
A9C91	0160-5699	3		CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A200J
A9CR1	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9CR3-A9CR10				NOT ASSIGNED		
A9CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9J1	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A9K1	0490-1295	6	2	RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A9K2	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A9L1	9140-0690	1	1	INDUCTOR RF-CH-MLD 22UH +-10%	04072	9360-08
A9M1	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A9M2	0515-0924	0	10	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A9M3	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A9M4	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A9M5	08780-00016	3	1	GASKET RFI	28480	08780-00016
A9M6	1205-0011	0	1	HEAT SINK TO-5/TO-39-CS	13103	2226B
A9M7	1250-1998	9	10	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9M8	2190-0034	5	10	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A9M9	2190-0124	4	10	WASHER-LK INTL T NO. 10 .195-IN-ID	16179	500222
A9M10	2190-0584	0	12	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A9M11	2950-0078	9	10	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A9M12	5001-6518	6	1	COVER FRONT	28480	5001-6518
A9M13	5001-6519	7	1	COVER REAR	28480	5001-6519
A9M14	5021-4541	3	2	SPACER PC GROUND	28480	5021-4541
A9M15	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A9M16	8160-0562	7	1	RFI GASKET	28480	8160-0562
A9Q1	1855-0413	3	6	TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q2	1855-0449	5	6	TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q3	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q4	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q5	1853-0430	0	12	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9Q6	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q7	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q8	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q9	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q10	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q11	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q12	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q13	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q14	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q15	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q16	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q17	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q18	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q19	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q20	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q21	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q22	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q23	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q24	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q25	1854-0477	7	2	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A9Q26	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A9R1	0683-5115	6	1	RESISTOR 510 5% .25W CF TC=0-400	2M627	R-25J
A9R2	0698-6347	9	1	RESISTOR 1.5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R3	0698-6362	8	11	RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R4	0698-7212	9	1	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A9R5	0698-6631	4	8	RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R6	0757-0420	3	9	RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R7	0699-0163	7	2	RESISTOR 466 .1% .125W F TC=0+-25	28480	0699-0163
A9R8	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R9	0698-6965	7	6	RESISTOR 505 .1% .125W TF TC=0+-25	12498	NE55
A9R10	0698-0083	8	6	RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R11	0698-6323	1	6	RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R12	0698-7243	6	2	RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A9R13	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R14	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R15	0698-6344	6	4	RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R16	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R17	0698-6965	7		RESISTOR 505 .1% .125W TF TC=0+-25	12498	NE55
A9R18	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R19	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R20	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R21	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R22	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R23	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R24	0698-6965	7		RESISTOR 505 .1% .125W TF TC=0+-25	12498	NE55
A9R25	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R26	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R27	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R28	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R29	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R30	0698-8644	3	2	RESISTOR 2.273K .1% .125W TF TC=0+-25	19701	5033R
A9R31	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R32	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R33	0699-0163	7		RESISTOR 466 .1% .125W F TC=0+-25	28480	0699-0163
A9R34	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R35	0698-6965	7		RESISTOR 505 .1% .125W TF TC=0+-25	12498	NE55
A9R36	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R37	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R38	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A9R39	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R40	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R41	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R42	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R43	0698-6965	7		RESISTOR 505 .1% .125W TF TC=0+-25	12498	NE55
A9R44	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R45	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9R46	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R47	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R48	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R49	0698-6965	7		RESISTOR 505 .1% .125W TF TC=0+-25	12498	NE55
A9R50	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R51	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R52	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R53	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R54	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R55	0698-8644	3		RESISTOR 2.273K .1% .125W TF TC=0+-25	19701	5033R
A9R56	1810-0348	9	6	NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R57	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R58	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R59	0698-7208	3	3	RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A9R60	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R61	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R62				NOT ASSIGNED		
A9R63				NOT ASSIGNED		
A9R64	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R65	0698-7208	3		RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A9R66	0698-7208	3		RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A9R67	0757-0418	9	6	RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R68	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R69	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R70	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R71	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R72	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R73	0698-7220	9	12	RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R74	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R75	0757-0421	4	6	RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R76	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R77	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R78	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R79	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R80	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R81	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R82	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R83	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R84	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R85	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R86	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R87	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R88	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R89	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R90	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R91	0757-0403	2	1	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A9R92	0698-7251	6	1	RESISTOR 4.22K 1% .05W TF TC=0+-100	2M627	CRB20
A9R93	0698-7236	7	3	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A9R94	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R95	0698-7225	4	1	RESISTOR 348 1% .05W TF TC=0+-100	2M627	CRB20
A9R96-A9R99				NOT ASSIGNED		
A9R100	0757-0394	0	2	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A9R101				NOT ASSIGNED		
A9R102	0698-7229	8	3	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A9R103	0698-7252	7	2	RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A9R104	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R105	0698-7246	9	2	RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A9R106	0698-7241	4	2	RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A9R107-A9R112				NOT ASSIGNED		
A9R113	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A9R114				NOT ASSIGNED		
A9R115	0698-7252	7		RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A9R116	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A9R117	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9R118	0698-7246	9		RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A9R119	0698-7241	4		RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A9R120				NOT ASSIGNED		
A9R121				NOT ASSIGNED		
A9R122	0757-0442	9	1	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R123	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R124	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A9R125	0698-7253	8	2	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A9R126	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A9R127	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A9R128	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A9R129	0757-0280	3	8	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R130	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R131	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R132	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R133	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R134	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R135	0698-7199	1	12	RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R136	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R137	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R138	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R139	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R140	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R141	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R142	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R143	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R144	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R145	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R146	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R147	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R148	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R149	0698-7235	6	2	RESISTOR 909 1% .05W TF TC=0+-100	2M627	CRB20
A9R150	0698-7235	6		RESISTOR 909 1% .05W TF TC=0+-100	2M627	CRB20
A9TP1	1251-0600	0	3	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A9TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A9TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A9U1	1820-3423	8	13	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U2	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U3	1826-1334	8	8	D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U4	1826-0716	8	7	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U5	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U6	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U7	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U8	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U9	1826-0544	0	1	IC V RGLTR-V-REF-FXD 2.5V 8-DIP-C PKG	28480	1826-0544
A9U10	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U11	1826-1019	6	1	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A9U12	1NB7-8056	9	2	SWITCH-HYBRID	28480	1NB7-8056
A9U13	1NB7-8056	9		SWITCH-HYBRID	28480	1NB7-8056
A9U14	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U15	1826-0783	9	2	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A9U16	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U17	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U18	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U19	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U20	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U21	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U22	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U23	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U24	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U25	1826-0558	6	1	IC 337 V RGLTR TO-39	27014	LM337H
A9U26	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U27	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U28	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U29	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U30	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9U31	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U32	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U33	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U34	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U35	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A9U36	1820-0471	0	1	IC INV TTL HEX 1-INP	01295	SN7406N
A9U37	1820-3595	5	1	IC LCH ECL/100K D-TYPE COM RESET HEX	S4013	HD100150
A9U38	1820-2877	4	1	IC FF ECL/100K D-M/S POS-EDGE-TRIG COM	07263	100151DC
A9U39	1820-2767	1	2	IC FF ECL/100K D-M/S NEG-EDGE-TRIG	07263	100131DC
A9U40	1820-2767	1		IC FF ECL/100K D-M/S NEG-EDGE TRIG	07263	100131DC
A9VR1	1902-0591	9	2	DIODE-ZNR 4.7V 5% PD=1W IR=10UA	28480	1902-0591
A9VR2	1902-0591	9		DIODE-ZNR 4.7V 5% PD=1W IR=10UA	28480	1902-0591
A9VR3	1902-0946	8	6	DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR4	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR5	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR6	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR7	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR8	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9	08780-60018	1	1	DAC/SWITCH BD AY (OPTION 064)	28480	08780-60018
	08780-69018	9	1	DAC/SWITCH BD AY (RESTORED 08780-60018 OPTION 064)	28480	08780-69018
A9C1	0160-3334	9	63	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C2	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C3	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C4	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C5	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C6	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C7	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C8	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C9	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C10	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C11	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C12	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C13	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C14	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C15	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C16	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C17	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C18	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C19	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C20	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C21	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C22	0160-5699	3	2	CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A200J
A9C23	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C24	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C26	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C27	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C28	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C29	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C30	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C31	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C32	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C33	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C34	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C35	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C36	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C38	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C39	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C40	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C41	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C42	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C43	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C44	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C45	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C46	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C47	0160-5699	3		CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	06383	DA12C0G2A200J
A9C48	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C49	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C50	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C51	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C52	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C53	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C54	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C55	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C56	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C57	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C59	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C60	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9C61	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C62	0180-0374	3	3	CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A9C63	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A9C64	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A9C65	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A9C66	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A9C67	0180-0291	3	2	CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A9C68	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A9C69	0160-3336	1	3	CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C70	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C71	0160-3336	1		CAPACITOR-FXD 100PF +-10% 50VDC CER	06383	DA12X7R1H101K
A9C72	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C73	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C74	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9C75	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A9CR1	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A9J1	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A9J2	1250-1998	9	11	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J3	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J4	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J5	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J6	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J7	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J8	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J9	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J10	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J11	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9J12	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A9K1	0490-1295	6	2	RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A9K2	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A9M1	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A9M2	0515-0924	0	10	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A9M3	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A9M4	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A9M5	1205-0011	0	1	HEAT SINK TO-5/TO-39-CS	13103	22268
A9M6	2190-0034	5	11	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A9M7	2190-0584	0	12	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A9M8	2950-0078	9	11	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A9M9	8160-0562	7	1	RFI GASKET	28480	8160-0562
A9Q1	1855-0413	3	6	TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q2	1855-0449	5	6	TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q3	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q4	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q5	1853-0430	0	12	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q6	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q7	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q8	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q9	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q10	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q11	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q12	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q13	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q14	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q15	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q16	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A9Q17	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q18	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q19	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q20	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q21	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q22	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449
A9Q23	1855-0413	3		TRANSISTOR J-FET P-CHAN D-MODE TO-18 SI	27014	2N5116
A9Q24	1855-0449	5		TRANSISTOR J-FET 2N5434 N-CHAN D-MODE	28480	1855-0449

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9R1	0757-0442	9	1	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R2	0683-5115	6	1	RESISTOR 510 5% .25W CF TC=0-400	2M627	R-25J
A9R3	0698-7229	8	3	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A9R4	0698-6362	8	9	RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R5	0698-6347	9	1	RESISTOR 1.5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R6	0698-7212	9	1	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A9R7	0698-7236	7	2	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A9R8	0698-6631	4	8	RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R9	0757-0280	3	10	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R10	0757-0420	3	9	RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R11	0698-6344	6	6	RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R12	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R13	0698-6355	9	6	RESISTOR 400 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R14	0698-6323	1	6	RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R15	0698-0083	8	8	RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R16	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R17	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R18	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R19	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R20	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R21	0698-6355	9		RESISTOR 400 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R22	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R23	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R24	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R25	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R26	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R27	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R28	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R29	0698-6355	9		RESISTOR 400 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R30	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R31	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R32	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R33	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R34	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R35	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R36	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R37	0698-6355	9		RESISTOR 400 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R38	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R39	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R40	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R41	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R42	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R43	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R44	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R45	0698-6355	9		RESISTOR 400 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R46	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R47	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R48	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R49	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R50	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R51	0698-6344	6		RESISTOR 900 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R52	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R53	0698-6355	9		RESISTOR 400 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R54	0698-6323	1		RESISTOR 100 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R55	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R56	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R57	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R58	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R59	0698-7235	6	2	RESISTOR 909 1% .05W TF TC=0+-100	2M627	CRB20
A9R60	0699-0467	4	2	RESISTOR 1.8K .1% .1W F TC=0+-10	28480	0699-0467
A9R61	0698-7231	2	2	RESISTOR 619 1% .05W TF TC=0+-100	2M627	CRB20
A9R62	0698-6631	4		RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A9R63	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A9R64	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R65	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9R65	0698-7235	6		RESISTOR 909 1% .05W TF TC=0+-100	2M627	CRB20
A9R67	0699-0467	4		RESISTOR 1.8K .1% .1W F TC=0+-10	28480	0699-0467
A9R68	0698-7231	2		RESISTOR 619 1% .05W TF TC=0+-100	2M627	CRB20
A9R69				NOT ASSIGNED		
A9R70	8159-0005	0	3	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A9R71				NOT ASSIGNED		
A9R72	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A9R73				NOT ASSIGNED		
A9R74	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A9R75	0757-0418	9	6	RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R76	0698-7199	1	12	RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R77	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R78	0698-7220	9	12	RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R79	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R80	0757-0421	4	6	RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R81	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R82	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R83	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R84	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R85	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R86	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R87	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R88	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R89	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R90	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R91	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R92	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R93	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R94	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R95	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R96	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R97	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R98	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R99	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R100	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R101	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R102	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R103	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R104	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R105	0757-0418	9		RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R106	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R107	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A9R108	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R109	0698-7220	9		RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A9R110	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A9R111	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R112	0757-0403	2	1	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A9R113	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A9R114	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A9R115	0698-7252	7	2	RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A9R116	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R117	0698-7241	4	2	RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A9R118	0698-7246	9	2	RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A9R119	0757-0394	0	2	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A9R120	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A9R121	0698-7252	7		RESISTOR 4.64K 1% .05W TF TC=0+-100	2M627	CRB20
A9R122	0698-6362	8		RESISTOR 1K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A9R123	0698-7241	4		RESISTOR 1.62K 1% .05W TF TC=0+-100	2M627	CRB20
A9R124	0698-7246	9		RESISTOR 2.61K 1% .05W TF TC=0+-100	2M627	CRB20
A9R125	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A9R126	1810-0348	9	8	NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R127	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R128	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R129	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R130	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A9R131	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R132	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R133	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A9R134	0757-0420	3		RESISTOR 750 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R135	0698-7208	3	2	RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A9R136	0698-7208	3		RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A9R137	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9R138	0698-0083	8		RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A9TP2	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A9U1	1820-3423	8	13	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U2	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U3	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U4	1826-1334	8	8	D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U5	1826-0716	8	7	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U6	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U7	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U8	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U9	1826-0544	0	1	IC V RGLTR-V-REF-FXD 2.5V 8-DIP-C PKG	28480	1826-0544
A9U10	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U11	1826-1019	6	1	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A9U12	1NB7-8056	9	2	SWITCH-HYBRID	28480	1NB7-8056
A9U13	1NB7-8056	9		SWITCH-HYBRID	28480	1NB7-8056
A9U14	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U15	1826-0783	9	2	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A9U16	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U17	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U18	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U19	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U20	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U21	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U22	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U23	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U24	1826-0558	6	1	IC 337 V RGLTR TO-39	27014	LM337H
A9U25	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U26	1820-3595	5	1	IC LCH ECL/100K D-TYPE COM RESET HEX	S4013	HD100150
A9U27	1820-2877	4	2	IC FF ECL/100K D-M/S POS-EDGE-TRIG COM	07263	100151DC
A9U28	1820-3066	5	1	IC SHF-RGTR ECL/100K D-TYPE PRL-IN	07263	100141DC
A9U29	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U30	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U31	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U32	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U33	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U34	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U35	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A9U36	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A9U37	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A9U38	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A9U39	1820-4185	1	1	IC DRVR TTL LS LINE HI-CUR GATED QUAD	27014	DS3658N
A9U40	1820-2877	4		IC FF ECL/100K D-M/S POS-EDGE-TRIG COM	07263	100151DC
A9VR1	1902-0591	9	2	DIODE-ZNR 4.7V 5% PD=1W IR=10UA	28480	1902-0591
A9VR2	1902-0591	9		DIODE-ZNR 4.7V 5% PD=1W IR=10UA	28480	1902-0591
A9VR3	1902-0946	8	6	DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR4	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR5	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR6	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR7	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A9VR8	1902-0946	8		DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10	08780-60009	0	1	BUFFER FRAME AND BUFFER MAP BD AY (EXCEPT OPTION 064)	28480	08780-60009
	08780-69009	8	1	BUFFER FRAME AND BUFFER MAP BD AY (RESTORED 08780-60009)	28480	08780-69009
A10C1	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A10C2	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A10C3	0180-2141	6	1	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	12344	T110B335K050AS
A10C4	0180-0374	3	3	CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A10C5	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A10C6	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A10C7	0160-4835	7	6	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C8	0160-3334	9	61	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C9	0160-4807	3	10	CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C10	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C11	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C12	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C13	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C14	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C15	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C16	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C17	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C18	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C19	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C20	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C21	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C22	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C23	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C24	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C26	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C27	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C28	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C29	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C30	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C31	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C32	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C33	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C34	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C35	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C36	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C38	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C39	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C40	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C41	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C42	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C43				NOT ASSIGNED		
A10C44	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C45	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C46	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C47	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C48	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C49	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C50	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C51	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C52	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C53	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C54	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C55	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C56	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C57	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C59	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C60	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10C61	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C62	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C63				NOT ASSIGNED		
A10C64	0160-5901	0	1	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	06383	MA12C0G2D100D
A10C65				NOT ASSIGNED		
A10C66				NOT ASSIGNED		
A10C67	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C68	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C69	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C70	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C71	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C72	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C73	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C74	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C75	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C76	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C77	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C78	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C79	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C80	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C81	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C82	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C83	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C84	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C85	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C86	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C87	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C88	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C89-A10C92				NOT ASSIGNED		
A10C93	0160-4799	2	1	CAPACITOR-FXD 2.2PF +-.25PF 100VDC CER	06383	MA12C0G2A2R2C
A10CR1	1906-0098	9	28	DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR2	1906-0098	9		DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR3	1906-0098	9		DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR4	1906-0098	9		DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR5	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR6	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR7	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR8	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR9	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR10	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR11	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR12	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR13	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR14	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR15	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR16	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR17	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098
A10CR18	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10CR19	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098
A10CR20	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098
A10CR21	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR22	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR23	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR24	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR25	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR26	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR27	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR28	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR29	1901-0050	3	14	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR30	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR31	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR32	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR33	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR34	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR35	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR36	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR37	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR38	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR39	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR40	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR41	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR42	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR43	1901-0028	5	5	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR44	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR45-A10CR99				NOT ASSIGNED		
A10CR100	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR101	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR102	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10J1	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A10J2	1250-1998	9	13	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J3	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J4	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J5	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J6	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J7	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J8	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J9	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J10	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J11	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J12	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J13	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J14	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10K1	0490-1480	1	2	RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A10K2	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A10K3	0490-1295	6	2	RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A10K4	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-OEI
A10L1-A10L4				NOT ASSIGNED		
A10L5	9140-0690	1	2	INDUCTOR RF-CH-MLD 22UH +-10%	04072	9360-08
A10L6	9140-0690	1		INDUCTOR RF-CH-MLD 22UH +-10%	04072	9360-08

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10M1	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A10M2	0515-0924	0	10	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A10M3	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A10M4	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A10M5	08780-00016	3	1	GASKET RFI	28480	08780-00016
A10M6	08780-20060	9	1	FRAME-BUFFER	28480	08780-20060
A10M7				NOT ASSIGNED		
A10M8	1205-0037	0	12	HEAT SINK TO-18-CS	98978	TXBF-019-025B
A10M9	2190-0034	5	13	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A10M10	2190-0584	0	12	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A10M11	2950-0078	9	13	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A10M12	5001-6518	6	1	COVER FRONT	28480	5001-6518
A10M13	5001-6519	7	1	COVER REAR	28480	5001-6519
A10M14	7120-8121	5	2	LABEL-BLANK .62-IN-WD 1.62-IN-LG AL	28480	7120-8121
A10M15	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
A10M16	8160-0562	7	1	RFI GASKET	28480	8160-0562
A10Q1	1853-0430	0	12	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q2	1854-1066	2	6	TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q3	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q4	1853-0281	9	8	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q5	1854-0477	7	6	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q6	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q7	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q8	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q9	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q10	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q11	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q12	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q13	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q14	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q15	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q16	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q17	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q18	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q19	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q20	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q21	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q22	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q23	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q24	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q25	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q26	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q27	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q28	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q29	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q30	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q31	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q32	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10R1	0757-1000	7	6	RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R2	0683-2205	9	6	RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R3	0698-7215	2	12	RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R4	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R5	0698-7233	4	6	RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R6	0698-7255	0	6	RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R7	0698-7253	8	11	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R8	0698-7229	8	6	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R9	0698-7205	0	10	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R10	0698-7219	6	12	RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R11	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R12	0698-7236	7	18	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R13	0698-7244	7	6	RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R14	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R15	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10R16	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R17	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R18	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R19	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R20	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R21	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R22	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R23	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R24	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R25	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R26	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R27	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R28	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R29	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R30	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R31	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R32	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R33	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R34	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R35	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R36	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R37	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R38	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R39	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R40	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R41	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R42	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R43	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R44	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R45	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R46	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R47	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R48	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R49	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R50	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R51	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R52	0698-6320	8	1	RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A10R53	0698-6360	6	1	RESISTOR 10K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A10R54	0698-5350	2	1	RESISTOR 2.613K .1% .125W TF TC=0+-25	19701	5033R
A10R55	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R56	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R57	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R58	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R59	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R60	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R61	0698-7212	9	6	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A10R62	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R63	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R64	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R65	0698-7224	3	6	RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R66	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R67	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R68	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R69	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R70	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R71	0698-8827	4	4	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A10R72	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A10R73	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A10R74	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R75	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R76	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A10R77	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R78	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R79	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R80	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10R81	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R82	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R83	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R84	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R85	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R86	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R87	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R88	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R89	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A10R90	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A10R91	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A10R92	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R93	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R94	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A10R95	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R96	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R97	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R98	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R99	0698-6631	4	1	RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A10R100	0698-7239	0	1	RESISTOR 1.33K 1% .05W TF TC=0+-100	2M627	CRB20
A10R101	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R102	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R103	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R104	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R105	1810-0276	2	2	NETWORK-RES 10-SIP 1.5K OHM X 9	C1433	750-101
A10R106	1810-0276	2		NETWORK-RES 10-SIP 1.5K OHM X 9	C1433	750-101
A10R107	1810-0204	6	2	NETWORK-RES 8-SIP 1.0K OHM X 7	C1433	750-81
A10R108	1810-0204	6		NETWORK-RES 8-SIP 1.0K OHM X 7	C1433	750-81
A10R109	0698-7249	2	12	RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R110	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R111	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R112	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R113	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R114	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R115	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R116	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R117	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R118	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R119	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R120-A10R132				NOT ASSIGNED		
A10R133	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R134-A10R136				NOT ASSIGNED		
A10R137	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R138	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R139-A10R142				NOT ASSIGNED		
A10R143	1810-0348	9	4	NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R144	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R145	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R146	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R147	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R148	0698-7260	7	2	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A10R149	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A10R150	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R151	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R152	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R153	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R154	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R155	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R156	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R157	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R158	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R159	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R160	0698-7251	6	1	RESISTOR 4.22K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10R161	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R162	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R163	0698-7208	3	1	RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R164	0757-0394	0	4	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A10R165	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A10R166	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A10R167	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A10R168	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R169	0757-0438	3	4	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A10R170	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A10R171	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A10R172	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A10TP1	1251-0600	0	9	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC SZ SQ	12360	94-155-1010-01-03-00
A10TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10U1	1820-2898	9	3	IC GATE ECL/100K EXCL-OR/NOR QUINT	07263	100107DC
A10U2	1820-2898	9		IC GATE ECL/100K EXCL-OR/NOR QUINT	07263	100107DC
A10U3	1826-0413	2	2	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
A10U4	1826-1019	6	2	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A10U5	1826-0025	2	4	IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM208AH
A10U6	1826-0025	2		IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM208AH
A10U7	1820-3423	8	2	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A10U8	1826-0716	8	1	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A10U9	1826-0853	4	1	IC V RGLTR-V-REF-FXD 9.95/10.05V TO-99	28480	1826-0853
A10U10	1820-0471	0	1	IC INV TTL HEX 1-INP	01295	SN7406N
A10U11	1820-2898	9		IC GATE ECL/100K EXCL-OR/NOR QUINT	07263	100107DC
A10U12	1820-2614	7	1	IC GATE ECL/100K OR-NOR QUINT 3-INP	07263	100102DC
A10U13	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A10U14	1826-0865	8	1	D/A 12-BIT 18-PLASTIC CMOS	24355	AD7541KN
A10U15	1820-3960	8	2	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS596N
A10U16	1820-3960	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS596N
A10U17	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
A10U18	1826-1019	6		ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A10U19	1826-0025	2		IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM208AH
A10U20	1826-0025	2		IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM208AH

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10	08780-60019	2	1	BUFFER BOARD ASSY (OPTION 064)	28480	08780-60019
A10	08780-69019	0	1	BUFFER BOARD ASSY (RESTORED 08780-60019 OPTION 064)	28480	08780-69019
A10C1	0160-3334	9	68	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C2	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C3	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C4	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C5	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C6	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C7	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C8	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C9	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C10	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C11	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C12	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C13	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C14	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C15	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C16	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C17	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C18	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C19	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C20	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C21	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C22	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C23	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C24	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C26	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C27	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C28	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C29	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C30	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C31	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C32	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C33	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C34	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C35	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C36	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C38	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C39	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C40	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C41	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C42	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C43	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C44	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C45	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C46	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C47	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C48	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C49	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C50	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C51	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C52	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C53	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C54	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C55	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C56	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C57	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C59	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C60	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10C61	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C62	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C63	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C64	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C65	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C66	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C67	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C68	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A10C69				NOT ASSIGNED		
A10C70	0160-4835	7	7	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C71	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C72	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C73	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C74	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C75	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C76	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A10C77	0160-4807	3	10	CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C78	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C79	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C80	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C81	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C82	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C83	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C84	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C85	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C86	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A10C87	0180-2141	6	1	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	12344	T110B335K050AS
A10C88	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A10C89	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A10C90	0180-0374	3	3	CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A10C91	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A10C92	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	K7253	TAAB10K20RX
A10CR1	1901-0050	3	14	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR3	1906-0098	9	32	DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR4	1906-0098	9		DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR5	1906-0098	9		DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR6	1906-0098	9		DIODE-MATCHED 1V P/O SET A	28480	1906-0098
A10CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR9	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR10	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR11	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR12	1906-0098	9		DIODE-MATCHED 1V P/O SET B	28480	1906-0098
A10CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR15	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR16	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR17	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR18	1906-0098	9		DIODE-MATCHED 1V P/O SET C	28480	1906-0098
A10CR19	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10CR20	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR21	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR22	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR23	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR24	1906-0098	9		DIODE-MATCHED 1V P/O SET D	28480	1906-0098
A10CR25	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR26	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR27	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098
A10CR28	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098
A10CR29	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098
A10CR30	1906-0098	9		DIODE-MATCHED 1V P/O SET E	28480	1906-0098
A10CR31	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR32	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR33	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR34	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR35	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR36	1906-0098	9		DIODE-MATCHED 1V P/O SET F	28480	1906-0098
A10CR37	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR38	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A10CR39	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR40	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR41	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR42	1906-0098	9		DIODE-MATCHED 1V P/O SET G	28480	1906-0098
A10CR43	1906-0098	9		DIODE-MATCHED 1V P/O SET H	28480	1906-0098
A10CR44	1906-0098	9		DIODE-MATCHED 1V P/O SET H	28480	1906-0098
A10CR45	1906-0098	9		DIODE-MATCHED 1V P/O SET H	28480	1906-0098
A10CR46	1906-0098	9		DIODE-MATCHED 1V P/O SET H	28480	1906-0098
A10J1	1252-0926	5	1	CONN-RECT D-SUBMIN 37-CKT 37-CONT	00779	842824-1
A10J2	1250-1998	9	15	CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J3	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J4	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J5	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J6	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J7	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J8	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J9	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J10	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J11	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J12	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J13	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J14	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J15	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31
A10J16	1250-1998	9		CONNECTOR-RF SMC M PC 50-OHM	05783	50-051-0339-31

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10K1	0490-1480	1	2	RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A10K2	0490-1480	1		RELAY 2C 26VDC-COIL 1A 28VDC	02570	172Y-26
A10K3	0490-1295	6	3	RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A10K4	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A10K5	0490-1295	6		RELAY 2C 5VDC-COIL .5A 125VAC	5N615	G2VN-234-US-DC5-0EI
A10M1	0515-0912	6	2	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A10M2	2190-0034	5	15	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A10M3	0515-0924	0	10	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A10M4	2190-0584	0	12	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
A10M5	0515-1008	3	14	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
A10M6	2950-0078	9	15	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A10M7	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.9MM-THK	00000	ORDER BY DESCRIPTION
A10M8	1205-0037	0	14	HEAT SINK TO-18-CS	98978	TXBF-019-025B
A10M9	8160-0562	7	1	RFI GASKET	28480	8160-0562
A10Q1	1853-0430	0	14	TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q2	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q3	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q4	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q5	1854-1066	2	7	TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q6	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q7	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q8	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q9	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q10	1853-0281	9	7	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q11	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q12	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q13	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q14	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q15	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q16	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q17	1854-0477	7	7	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q18	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q19	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q20	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q21	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q22	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q23	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q24	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q25	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q26	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q27	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q28	1854-1066	2		TRANSISTOR-DUAL NPN PD=300MW	00115	NE73416D
A10Q29	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q30	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q31	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q32	1853-0430	0		TRANSISTOR PNP 2N4959 SI TO-72 PD=200MW	04713	2N4959
A10Q33	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A10Q34	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10Q35	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A10R1	0757-1000	7	7	RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R2	0683-2205	9	7	RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R3	0698-7233	4	7	RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R4	0698-7215	2	14	RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R5	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R6	0698-7224	3	7	RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R7	0698-7255	0	7	RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R8	0698-7253	8	19	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R9	0698-7229	8	9	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R10	0698-7205	0	15	RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R11	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R12	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R13	0698-7219	6	14	RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R14	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R15	0698-7236	7	13	RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10R16	0698-7244	7	7	RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R17	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R18	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R19	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R20	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R21	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R22	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R23	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R24	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R25	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R26	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R27	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R28	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R29	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R30	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R31	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R32	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R33	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R34	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R35	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R36	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R37	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R38	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R39	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R40	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R41	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R42	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R43	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R44	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R45	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R46	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R47	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R48	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R49	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R50	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R51	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R52	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R53	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R54	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R55	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R56	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R57	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R58	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R59	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R60	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R61	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R62	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R63	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R64	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R65	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R66	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R67	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R68	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R69	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R70	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R71	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R72	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R73	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R74	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R75	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R76	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R77	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R78	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R79	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R80	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10R81	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R82	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R83	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R84	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R85	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R86	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R87	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R88	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R89	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R90	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R91	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R92	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R93	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R94	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R95	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R96	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R97	0757-1000	7		RESISTOR 51.1 1% .5W TF TC=0+-100	K8479	H2
A10R98	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	19701	(CR-25) 1-4-5P-22E
A10R99	0698-7233	4		RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A10R100	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R101	0698-7215	2		RESISTOR 133 1% .05W TF TC=0+-100	2M627	CRB20
A10R102	0698-7224	3		RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A10R103	0698-7255	0		RESISTOR 6.19K 1% .05W TF TC=0+-100	2M627	CRB20
A10R104	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R105	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R106	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R107	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R108	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R109	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R110	0698-7219	6		RESISTOR 196 1% .05W TF TC=0+-100	2M627	CRB20
A10R111	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R112	0698-7244	7		RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A10R113	8159-0005	0	3	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A10R114				NOT ASSIGNED		
A10R115	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A10R116				NOT ASSIGNED		
A10R117	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A10R119	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R120	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R121				NOT ASSIGNED		
A10R122				NOT ASSIGNED		
A10R123	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R124	0698-7205	0		RESISTOR 51.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R125	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R126	0698-8827	4	2	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A10R127	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A10R128	0698-7212	9	2	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A10R129	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R130	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R131	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R132	0698-6631	4	1	RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A10R133	0698-7239	0	1	RESISTOR 1.33K 1% .05W TF TC=0+-100	2M627	CRB20
A10R134	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A10R135	0698-6320	8	1	RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A10R136	0698-5350	2	1	RESISTOR 2.613K .1% .125W TF TC=0+-25	19701	5033R
A10R137	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R138	0698-6360	6	1	RESISTOR 10K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A10R139	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R140	1810-0276	2	2	NETWORK-RES 10-SIP 1.5K OHM X 9	C1433	750-101
A10R141	1810-0276	2		NETWORK-RES 10-SIP 1.5K OHM X 9	C1433	750-101
A10R142	1810-0204	6	2	NETWORK-RES 8-SIP 1.0K OHM X 7	C1433	750-81
A10R143	1810-0204	6		NETWORK-RES 8-SIP 1.0K OHM X 7	C1433	750-81
A10R144	0698-7249	2	15	RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R145	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R146	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A10R147	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R148	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R149	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R150	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R151	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R152	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R153	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R154	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R155	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R156	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R157	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R158	0698-7249	2		RESISTOR 3.48K 1% .05W TF TC=0+-100	2M627	CRB20
A10R159	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R160	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A10R161	1810-0348	9	6	NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R162	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R163	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R164	0698-7208	3	4	RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R165	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R167	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R168	1810-0348	9		NETWORK-RES 10-SIP 68.0 OHM X 5	C1433	750-103-R68
A10R169	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A10R170				NOT ASSIGNED		
A10R171	0698-7208	3		RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R172	0698-7236	7		RESISTOR 1K 1% .05W TF TC=0+-100	2M627	CRB20
A10R173	0698-7208	3		RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A10R174	0698-7208	3		RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A10TP1	1251-0600	0	4	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	12360	94-155-1010-01-03-00
A10U1	1820-2767	1	1	IC FF ECL/100K D-M/S NEG-EDGE-TRIG	07263	100131DC
A10U2	1820-2898	9	3	IC GATE ECL/100K EXCL-OR/NOR QUINT	07263	100107DC
A10U3	1820-2898	9		IC GATE ECL/100K EXCL-OR/NOR QUINT	07263	100107DC
A10U4	1826-0853	4	1	IC V RGLTR-V-REF-FXD 9.95/10.05V TO-99	28480	1826-0853
A10U5	1820-4185	1	1	IC DRVR TTL LS LINE HI-CUR GATED QUAD	27014	DS3658N
A10U6	1820-2898	9		IC GATE ECL/100K EXCL-OR/NOR QUINT	07263	100107DC
A10U7	1820-2614	7	2	IC GATE ECL/100K OR-NOR QUINT 3-INP	07263	100102DC
A10U8	1820-2614	7		IC GATE ECL/100K OR-NOR QUINT 3-INP	07263	100102DC
A10U9	1820-3960	8	2	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS596N
A10U10	1820-3960	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS596N
A10U11	1820-3423	8	2	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A10U12	1820-3423	8		IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A10U13	1826-0448	3	1	D/A 10-BIT 16-PLASTIC CMOS	24355	AD7533LN(SEL)
A10U14	1826-0716	8	1	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A10U15	1826-0413	2	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
A10U16	1826-1019	6	1	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A11	08780-60004	5	1	MAIN MICROPROCESSOR (DOES NOT INCLUDES U3, U4, U5)	28480	08780-60004
	08780-69004	3	1	MAIN MICROPROCESSOR (RESTORED 08780-60004 INCLUDES U3 U4, U5)	28480	08780-69004
A11B1	1420-0314	2	1	BATTERY 3V .16A-HR LITHIUM POLYCARBON	08712	BR-2325
A11B1B	1400-1210	7	1	HOLDER-BAT 1-WD	10582	BH906
A11C1	0160-4557	0	22	CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C2	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C3	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C4	0160-4653	7	1	CAPACITOR-FXD .1UF +-5% 100VDC MET-POLYP	84411	HEW-505
A11C5	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A11C6	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	K7253	TAAB6R8K35RX
A11C7	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C8	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C9	0180-0229	7	2	CAPACITOR-FXD 33UF+-10% 10VDC TA	K7253	TAAB33K10RX
A11C10	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	K7253	TAAB33K10RX
A11C11	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C12	0160-4801	7	2	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A11C13	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A11C14	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C15	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C16	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C17	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C18	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C19	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C20	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C21	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C22	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C23	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C24	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C25	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C26	0160-4810	8	8	CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C27	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C28	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C29	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C30	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C31	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C32	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C33	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A11C34	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C35	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C36	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C37	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	16299	CAC04X7R104M050A
A11C38	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A11C39	0160-4830	2	2	CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A11C40	0160-4830	2		CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A11CR1	1901-0539	3	1	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A11CR2	1901-1085	6	1	DIODE-SCHOTTKY SM SIG	28480	5082-2835
A11CR3	1901-0376	6	5	DIODE-GEN PRP 35V 50MA DO-35	9N171	1N3595
A11CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	1N3595
A11CR5	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	1N3595
A11CR6	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	1N3595
A11CR7	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	1N3595
A11CR8	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A11CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A11CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A11CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A11DS1	1990-0671	1	1	LED-LAMP LUM-INT=200UCD IF=5MA-MAX	28480	HLMP-6620
A11DS2	1990-0652	8	2	LED-LAMP ARRAY LUM-INT=200UCD IF=5MA-MAX	28480	1990-0652
A11DS3	1990-0652	8		LED-LAMP ARRAY LUM-INT=200UCD IF=5MA-MAX	28480	1990-0652
A11J1	1251-8474	2	1	CONN-POST TYPE .100-PIN-SPCG 34-CONT	76381	3594-5002
A11J2	1251-8934	9	1	CONN-POST TYPE .100-PIN-SPCG 3-CONT	18873	65806-071
A11J3	1252-0925	4	1	CONN-POST TYPE .100-PIN-SPCG 24-CONT	00779	102160-5
A11J4	1251-8028	2	1	CONN-POST TYPE .156-PIN-SPCG 6-CONT	27264	09-75-1061
A11J5	1251-8929	2	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	18873	65863-207

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A11L1	9140-0114	4	2	INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A11L2	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A11L3	9140-0251	0	1	INDUCTOR 10UH 15% .31DX1LG	28480	9140-0251
A11M1	0380-0043	7	3	SPACER-RVT-ON .375-IN-LG .14-IN-ID	28480	0380-0043
A11M2	0380-1092	8	6	STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A11M3	0590-1076	3	3	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A11M4	1251-5595	2	2	POLARIZING KEY-POST CONN	28480	1251-5595
A11Q1	1855-0414	4	3	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	17856	2N4393
A11Q2	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	17856	2N4393
A11Q3	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	17856	2N4393
A11R1	0757-0442	9	1	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R2	0698-0084	9	10	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R3	0757-0280	3	13	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R4	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R5	0698-6376	4	2	RESISTOR 200K .1% .125W TF TC=0+-25	12498	NE55
A11R6	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R7	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R8	0757-0438	3	2	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R9				NOT ASSIGNED		
A11R10	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R11	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R12	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R13	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A11R14	0757-0465	6	1	RESISTOR 100K 1% .125W TF TC=0+-100	12498	CT4
A11R15				NOT ASSIGNED		
A11R16	0698-6353	7	2	RESISTOR 50K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A11R17	0699-0730	4	2	RESISTOR 1M .1% .125W F TC=0+-25	28480	0699-0730
A11R18	0699-0730	4		RESISTOR 1M .1% .125W F TC=0+-25	28480	0699-0730
A11R19	0757-0440	7	1	RESISTOR 7.5K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R20	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R21	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R22	0698-6353	7		RESISTOR 50K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A11R23	0698-6332	2	3	RESISTOR 300K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A11R24	0698-6332	2		RESISTOR 300K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A11R25	0698-6332	2		RESISTOR 300K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A11R26	0698-6376	4		RESISTOR 200K .1% .125W TF TC=0+-25	12498	NE55
A11R27	0757-0421	4	2	RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A11R28				NOT ASSIGNED		
A11R29				NOT ASSIGNED		
A11R30	0757-0421	4		RESISTOR 825 1% .125W TF TC=0+-100	19701	SFR25H
A11R31	1810-0235	3	1	NETWORK-RES 16-DIP 2.2K OHM X 15	11236	761-1-R2.2K
A11R32	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R33				NOT ASSIGNED		
A11R34	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R35	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R36	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R37	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R38	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R39	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R40	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R41	0757-0416	7	3	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R42	0757-0401	0	12	RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R43	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R44	1810-0338	7	1	NETWORK-RES 16-DIP 100.0 OHM X 8	32997	4116R-001-101
A11R45	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R46	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R47	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R48	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R49	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R50	0757-0346	2	2	RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A11R51	0757-0346	2		RESISTOR 10 1% .125W TF TC=0+-100	06424	NK4H
A11R52	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R53	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R54	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R55	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A11R56	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R57	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R58	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R59	0757-0401	0		RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A11R60	0699-0073	8	1	RESISTOR 10M 1% .125W F TC=0+-150	28480	0699-0073
A11R61	0757-0416	7		RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R62	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R63	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11R64-A11R100				NOT ASSIGNED		
A11R101	0757-0416	7		RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A11R102	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A11S1	3101-2172	0	1	SWITCH-TGL DIP-RKR-ASSY SPDT .05A 30VDC	28480	3101-2172
A11TP1	0360-0535	0	21	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP8	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP9	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP10	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP11	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP12	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP13	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP14	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP15	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP16	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP17	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP18	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP19	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP20	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11TP21	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A11U1	1820-2711	5	5	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS541N
A11U2	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S4013	HM6264LP-15
A11U3†						
(2635A)	08780-80024	1	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80024
(2641A)	08780-80044	5	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80044
(2643A THRU 2650A)	08780-80047	8	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80047
(2708A THRU 2716A)	08780-80050	3	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80050
(2725A)	08780-80056	9	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80056
(2738A)	08780-80062	7	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80062
(2746A AND ABOVE)	08780-80066	1	1	EPROM-PROGRAMMED (EXCEPT OPTION 064) †NOTE: RECOMMENDED REPLACEMENT FOR ALL SERIAL PREFIX NUMBERS IS LAST ENTRY.	28480	08780-80066
A11U3M1	1200-0567	1	3	SOCKET-IC 28-CONT DIP DIP-SLDR	00779	641605-1
A11U3Z†						
(2643A THRU 2708A)	08780-80039	8	1	EPROM-PROGRAMMED (OPTION 064)	28480	08780-80039
(2715A)	08780-80053	6	1	EPROM-PROGRAMMED (OPTION 064)	28480	08780-80053
(2725A AND ABOVE)	08780-80059	2	1	EPROM-PROGRAMMED (OPTION 064) †NOTE: RECOMMENDED REPLACEMENT FOR ALL SERIAL PREFIX NUMBERS IS LAST ENTRY.	28480	08780-80059
A11U4†						
(2635A)	08780-80025	2	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80025
(2641A)	08780-80045	6	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80045
(2643A THRU 2650A)	08780-80048	9	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80048
(2708A THRU 2716A)	08780-80051	4	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80051
(2725A)	08780-80057	0	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80057
(2738A)	08780-80063	8	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80063
(2746A AND ABOVE)	08780-80067	2	1	EPROM-PROGRAMMED (EXCEPT OPTION 064) †NOTE: RECOMMENDED REPLACEMENT FOR ALL SERIAL PREFIX NUMBERS IS LAST ENTRY.	28480	08780-80067
A11U4M1	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	00779	641605-1
A11U4Z†						
(2643A THRU 2708A)	08780-80040	1	1	EPROM-PROGRAMMED (OPTION 064)	28480	08780-80040
(2715A)	08780-80054	7	1	EPROM-PROGRAMMED (OPTION 064)	28480	08780-80054
(2725A AND ABOVE)	08780-80060	5	1	EPROM-PROGRAMMED (OPTION 064) †NOTE: RECOMMENDED REPLACEMENT FOR ALL SERIAL PREFIX NUMBERS IS LAST ENTRY.	28480	08780-80060

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A11U5†						
(2635A)	08780-80026	3	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80026
(2641A)	08780-80046	7	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80046
(2643A THRU 2650A)	08780-80049	0	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80049
(2708A THRU 2716A)	08780-80052	5	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80052
(2725A)	08780-80058	1	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80058
(2738A)	08780-80064	9	1	EPROM-PROGRAMMED (EXCEPT OPTION 064)	28480	08780-80064
(2746A AND ABOVE)	08780-80068	3	1	EPROM-PROGRAMMED (EXCEPT OPTION 064) †NOTE: RECOMMENDED REPLACEMENT FOR ALL SERIAL PREFIX NUMBERS IS LAST ENTRY.	28480	08780-80068
A11U5M1	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	00779	641605-1
A11U5Z†						
(2643A THRU 2708A)	08780-80041	2	1	EPROM-PROGRAMMED (OPTION 064)	28480	08780-80041
(2715A)	08780-80055	8	1	EPROM-PROGRAMMED (OPTION 064)	28480	08780-80055
(2725A AND ABOVE)	08780-80061	6	1	EPROM-PROGRAMMED (OPTION 064) †NOTE: RECOMMENDED REPLACEMENT FOR ALL SERIAL PREFIX NUMBERS IS LAST ENTRY.	28480	08780-80061
A11U6	1820-1858	9	2	IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A11U7	08780-80027	4	1	PAL PROGRAMMED	28480	08780-80027
A11U8	08780-80028	5	1	PAL PROGRAMMED	28480	08780-80028
A11U9	1820-2711	5		IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS541N
A11U10	1820-2711	5		IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS541N
A11U11	1820-2711	5		IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS541N
A11U12	1820-2075	4	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS245N
A11U13	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A11U14	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A11U15	1826-0138	8	1	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A11U16	1826-0316	4	1	V REF TO-5	27014	LH0070-1H
A11U17	1826-1021	0	2	ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A11U18	1826-1021	0		ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A11U19	1820-1425	6	1	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	SN74LS132N
A11U20				NOT ASSIGNED		
A11U21	1820-1212	9	2	IC FF TTL LS J-K NEG-EDGE-TRIG	01295	SN74LS112AN
A11U22	1820-1212	9		IC FF TTL LS J-K NEG-EDGE-TRIG	01295	SN74LS112AN
A11U23	1826-1221	2	1	IC COMPARATOR PRCN 8-DIP-C PKG	28480	1826-1221
A11U24	1826-0547	3	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-P	01295	TL072ACP
A11U25	1826-1048	1	1	IC OP AMP PRCN 8-DIP-C PKG	06665	OP-07CZ
A11U26	1820-1427	8	1	IC DCDR TTL LS 2-TO-4-LINE DUAL 2-INP	01295	SN74LS156N
A11U27	1820-3538	6	1	IC SER-XMTR/RCVR NMOS ASYNCHRO DUAL	18324	SCN2681AC1N40
A11U28	1820-2983	3	2	IC-PERIPHERAL INTERFACE ADAPTER;CLK=2MHZ	28480	1820-2983
A11U29	08780-80029	6	1	PAL PROGRAMMED	28480	08780-80029
A11U30	1820-2705	7	1	IC-8-BIT/16-BIT SYSTEM TIMING CONTROLLER	28480	1820-2705
A11U31	1820-2549	7	1	IC-8291A P HPIB	28480	1820-2549
A11U32	1820-2983	3		IC-PERIPHERAL INTERFACE ADAPTER;CLK=2MHZ	28480	1820-2983
A11U33	1820-2624	9	1	IC-MPU; CLK FREQ=2MHZ, ENHANCED 6800	28480	1820-2624
A11U33A	1200-0654	7	1	SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
A11U34	1820-1216	3	2	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A11U35	1820-2024	3	2	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A11U36	1820-3513	7	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	DS75161AN
A11U37	1820-3431	8	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	DS75160AN
A11U38	1820-1199	1	2	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A11U39	1820-1206	1	1	IC GATE TTL LS NOR TPL 3-INP	01295	SN74LS27N
A11U40	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A11U41	1820-1430	3	1	IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG	01295	SN74LS161AN
A11U42	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A11U43	1820-3536	4	1	IC SHF-RGTR TTL LS SYNCHRO PAR/SERIAL-IN	01295	SN74LS597N
A11U44	1820-3423	8	1	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A11U45	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A11U46	1820-2096	9	1	IC CNTR TTL LS BIN DUAL 4-BIT	01295	SN74LS393N
A11U47	1820-1281	2	1	IC DCDR TTL LS 2-TO-4-LINE DUAL	01295	SN74LS139AN
A11U48	1820-2024	3		IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A11U49	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A11U50	1820-2711	5		IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS541N
A11W1				NOT ASSIGNED		
A11W2	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A11Y1	1813-0130	3	1	CLOCK-OSCILLATOR-XTAL 16-MHZ 0.05%	04713	RASCO PLUS-16MHZ
A11Y1A	0340-0944	3	1	INSULATOR-IC NYLON BLACK	28480	0340-0944

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A12				NOT ASSIGNED		

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A13	08780-60027	2	1	IF MULTIPLIER DECK (EXCEPT OPTION 002)	28480	08780-60027
	08780-69027	0	1	IF MULTIPLIER DECK (RESTORED 08780-60027	28480	08780-69027
	08780-60030	7	1	IF MULTIPLIER DECK (OPTION 002)	28480	08780-60030
	08780-69030	5	1	IF MULTIPLIER DECK (RESTORED 08780-60030 OPTION 002)	28480	08780-69030
A13AT1				NOT ASSIGNED		
A13AT2	08780-67009	4	1	IF MULTIPLIER	28480	08780-67009
A13AT3						
(2746A AND BELOW)	0960-0705	8	1	U-WAVE ISOLATOR 12 GHZ MAX	28480	0960-0705
(2805A AND ABOVE)	0955-0418	9	1	U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0955-0418
A13AT4	0955-0248	3	1	U-WAVE MIXER 16 GHZ MAX	28480	0955-0248
A13DC1	0955-0132	4	1	U-WAVE DIRECTIONAL COUPLER 12.7 GHZ MAX	99899	25966
A13FL1	08780-60076	1	1	FILTER AY 8GHZ	28480	08780-60076
A13A1	08780-60016	9	1	IF INTERFACE ASSEMBLY	28480	08780-60016
A13A1C1	0180-2141	6	1	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	12344	T110B335K050AS
A13A1CR1	1901-0050	3	1	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A13A1J1	1251-8599	2	1	CONN-POST TYPE .100-PIN-SPCG 10-CONT	76381	3591-6002
A13A1J2	1251-8600	6	1	CONN-POST TYPE .100-PIN-SPCG 16-CONT	76381	3599-5002
A13A1J3	1250-1255	1	1	CONNECTOR-RF SMB M PC 50-OHM	98291	51-051-0000
A13A1M1	1251-5595	2	2	POLARIZING KEY-POST CONN	28480	1251-5595
A13A1M2	8150-0459	0	1	WIRE 24AWG W/R 300V PVC 7X32 80C	28480	8150-0459
A13A1Q1	1853-0264	8	1	TRANSISTOR PNP SI PD=310MW FT=100MHZ	04713	2N5401
A13A1R1	0757-0416	7	2	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A13A1R2	0757-0279	0	3	RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A13A1R3	0757-0279	0		RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A13A1R4	0757-1094	9	1	RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A13A1R5-A13A1R7				NOT ASSIGNED		
A13A1R8	2100-3207	1	1	RESISTOR-TRMR 5K 10% TKF SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A13A1R9	0757-0416	7		RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A13A1R10	0757-0279	0		RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A13A1TP1	0360-0535	0	4	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A13A1TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A13A1TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A13A1TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A13A1U1	1820-0535	7	1	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A13A2	08780-60123	9	1	AMPLIFIER/DOUBLER ASSY	28480	08780-60123
A13A2A1	08780-60015	8	1	1 GHZ DOUBLER BOARD ASSY	28480	08780-60015
A13A2C1	0160-3878	6	4	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A13A2C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A13A2C3	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A13A2C4				NOT ASSIGNED		
A13A2C5				NOT ASSIGNED		
A13A2C6	0160-0690	4	1	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12COG2A1R0D
A13A2C7	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A13A2CR1	1900-0069	2	4	DIODE QUAD MATCHED	02064	QSCH-1348
A13A2CR2	1900-0069	2		DIODE QUAD MATCHED	02064	QSCH-1348
A13A2CR3	1900-0069	2		DIODE QUAD MATCHED	02064	QSCH-1348
A13A2CR4	1900-0069	2		DIODE QUAD MATCHED	02064	QSCH-1348
A13A2E1-A13A2E4				NOT ASSIGNED		
A13A2E5	9170-0029	3	4	CORE-SHIELDING BEAD	28480	9170-0029
A13A2E6	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A13A2E7	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A13A2E8	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A13A2J1	1250-1220	0	2	CONNECTOR-RF SMC M PC 50-OHM	06877	82SMC-50-0-3/111
A13A2J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	06877	82SMC-50-0-3/111
A13A2L1				NOT ASSIGNED		
A13A2L2				NOT ASSIGNED		
A13A2L3	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A13A2L4	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A13A2M1	8150-0459	0	1	WIRE 24AWG W/R 300V PVC 7X32 80C	28480	8150-0459
A13A2Q1	1854-1044	6	1	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A13A2R1	0757-0280	3	6	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A13A2R2	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A13A2R3	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A13A2R4				NOT ASSIGNED		
A13A2R5	0699-1855	6	1	RESISTOR 17.8 1% .05W F TC=0+-50	05545	CMF-50-2-17.8-1%
A13A2R6				NOT ASSIGNED		
A13A2R7	0699-1852	3	1	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A13A2R8	0699-1853	4	4	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A13A2R9	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A13A2R10	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A13A2R11	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A13A2R12	0699-1849	8	1	RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A13A2R13	0699-1856	7	2	RESISTOR 215 1% .05W F TC=0+-50	05545	CMF-50-2-215-1%
A13A2R14	0699-1857	8	1	RESISTOR 23.7 1% .05W F TC=0+-50	05545	CMF-50-2-23.7-1%
A13A2R15	0699-1856	7		RESISTOR 215 1% .05W F TC=0+-50	05545	CMF-50-2-215-1%
A13A2R16	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A13A2R17	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A13A2R18	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A13A2TL1	08780-20111	1	1	MIXER INPUT COND	28480	08780-20111
A13A2TL2	08780-20110	0	1	DBLR GROUND COND	28480	08780-20110
A13A3	1NB7-8090	1	1	POWER AMPLIFIER (EXCEPT OPTION 002)	28480	1NB7-8090
A13A4	0955-0328	0	1	U-WAVE AMPLIFIER 3 GHZ MAX (OPTION 002)	14482	6206-001H

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14	08780-60028	3	1	LO DECK	28480	08780-60028
	08780-69028	1		LO DECK (RESTORED 08780-60028)	28480	08780-69028
A14AT1				NOT ASSIGNED		
A14AT2	08780-67007	2	1	LO LOW MULTIPLR	28480	08780-67007
A14AT3	08780-67008	3	1	LO HIGH MULTIPLR	28480	08780-67008
A14AT4						
(2746A AND BELOW)	0960-0704	7	8	U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0960-0704
(2805A AND ABOVE)	0955-0418	9	2	U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0955-0418
A14AT5						
(2746A AND BELOW)	0960-0704	7		U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0960-0704
(2805A AND ABOVE)	0955-0418	9		U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0955-0418
A14AT6	08780-67006	1	1	L.O. SWITCH AY	28480	08780-67006
A14AT7	08780-67010	7	1	FILTER/COUPLER	28480	08780-67010
A14FL1	08780-60072	7	1	FLTR AY2-2.8GHZ	28480	08780-60072
A14FL2	08780-60073	8	1	FLTR AY 8-9.5GHZ	28480	08780-60073
A14FL3	08780-60074	9	1	FLTR AY 9.5-11	28480	08780-60074
A14A1	08780-60017	0	1	LO INTERFACE BOARD ASSY	28480	08780-60017
A14A1C1	0180-0291	3	6	CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A14A1C2	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A14A1C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A14A1C4	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A14A1C5	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A14A1C6	0180-0197	8	3	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A14A1C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A14A1C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	K7253	TAAA2R2K20RX
A14A1C9				NOT ASSIGNED		
A14A1C10	0160-4835	7	1	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A14A1C11	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A14A1CR1	1901-0028	5	2	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A14A1CR2				NOT ASSIGNED		
A14A1CR3	1901-0050	3	9	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR10	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A14A1CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A14A1J1	1250-1255	1	4	CONNECTOR-RF SMB M PC 50-OHM	98291	51-051-0000
A14A1J2	1250-1255	1		CONNECTOR-RF SMB M PC 50-OHM	98291	51-051-0000
A14A1J3	1250-1255	1		CONNECTOR-RF SMB M PC 50-OHM	98291	51-051-0000
A14A1J4	1250-1255	1		CONNECTOR-RF SMB M PC 50-OHM	98291	51-051-0000
A14A1J5	1251-8248	8	1	CONN-POST TYPE .100-PIN-SPCG 26-CONT	76381	3593-6002
A14A1J6	1251-8599	2	1	CONN-POST TYPE .100-PIN-SPCG 10-CONT	76381	3591-6002
A14A1J7	1251-8600	6	1	CONN-POST TYPE .100-PIN-SPCG 16-CONT	76381	3599-5002
A14A1L1	9100-1616	9	2	INDUCTOR RF-CH-MLD 1.5UH +-10%	99800	1537-16
A14A1L2	9100-1618	1	3	INDUCTOR RF-CH-MLD 5.6UH +-10%	99800	1537-30
A14A1L3	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH +-10%	99800	1537-30
A14A1L4	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH +-10%	99800	1537-30
A14A1L5	9100-1616	9		INDUCTOR RF-CH-MLD 1.5UH +-10%	99800	1537-16
A14A1M1	0590-1076	3	1	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A14A1M2	1251-5595	2	2	POLARIZING KEY-POST CONN	28480	1251-5595
A14A1M3	6040-0239	9	1	LUBRICANT-GREASE SIL	05820	120
A14A1M4	8150-0459	0	1	WIRE 24AWG W/R 300V PVC 7X32 80C	28480	8150-0459
A14A1Q1	1853-0314	9	2	TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A14A1Q2	1853-0314	9		TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A14A1Q3	1854-0810	2	1	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A14A1Q4	1855-0406	4	1	TRANSISTOR J-FET P-CHAN D-MODE SI	32293	IT110

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14A1R1	0698-7221	0	3	RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R2	0698-7237	8	7	RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R3	0757-0442	9	4	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A14A1R4	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R5	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R6	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R7	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R8	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R9	0698-7237	8		RESISTOR 1.1K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R10	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A14A1R11	0698-8827	4	1	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A14A1R12	0698-7221	0		RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R13	0757-1094	9	4	RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A14A1R14	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A14A1R15	0698-3400	9	4	RESISTOR 147 1% .5W TF TC=0+-100	19701	5053R
A14A1R16	2100-3207	1	2	RESISTOR-TRMR 5K 10% TKF SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A14A1R17	0698-7221	0		RESISTOR 237 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R18	0757-1094	9		RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A14A1R19	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A14A1R20	0698-3400	9		RESISTOR 147 1% .5W TF TC=0+-100	19701	5053R
A14A1R21	2100-3207	1		RESISTOR-TRMR 5K 10% TKF SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A14A1R22	0757-0279	0	2	RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A14A1R23	0698-3400	9		RESISTOR 147 1% .5W TF TC=0+-100	19701	5053R
A14A1R24	0757-1094	9		RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A14A1R25	0757-0279	0		RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A14A1R26	0698-3400	9		RESISTOR 147 1% .5W TF TC=0+-100	19701	5053R
A14A1R27	0757-1094	9		RESISTOR 1.47K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A14A1R28	0757-0416	7	2	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A14A1R29	0757-0416	7		RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A14A1R30	0698-7260	7	1	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A14A1R31	0698-7212	9	1	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A14A1TP1	0360-0535	0	6	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A14A1TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A14A1TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A14A1TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A14A1TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A14A1TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A14A1U1	1826-1216	5	1	IC V RGLTR-ADJ-POS 1.2/33V TO-220 PKG	10960	LT350AT
A14A1U1A	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
A14A1U1B	1205-0353	3	1	HEAT SINK SGL PLSTC-PWR-CS	13103	6073B
A14A1U2	1820-3423	8	1	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A14A1U3	1826-1021	0	1	ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A14A1U4	1820-0535	7	1	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A14A1U5	1820-0471	0	1	IC INV TTL HEX 1-INP	01295	SN7406N
A14A1VR1	1902-0968	4	1	DIODE-ZNR 27V 5% DO-35 PD=.4W TC=+.095%	28480	1902-0968
A14A1VR2	1902-0956	0	1	DIODE-ZNR 8.2V 5% DO-35 PD=.4W TC=+.065%	28480	1902-0956

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14A2	08780-60123	9	1	DOUBLER AY	28480	08780-60123
A14A2A1	08780-60015	8	1	1 GHZ DOUBLER BOARD ASSY	28480	08780-60015
A14A2C1	0160-3878	6	4	CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A14A2C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A14A2C3	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A14A2C4				NOT ASSIGNED		
A14A2C5				NOT ASSIGNED		
A14A2C6	0160-0690	4	1	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	06383	FD12COG2A1R0D
A14A2C7	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	06383	FD12X7R2A102M
A14A2CR1	1900-0069	2	4	DIODE QUAD MATCHED	02064	QSCH-1348
A14A2CR2	1900-0069	2		DIODE QUAD MATCHED	02064	QSCH-1348
A14A2CR3	1900-0069	2		DIODE QUAD MATCHED	02064	QSCH-1348
A14A2CR4	1900-0069	2		DIODE QUAD MATCHED	02064	QSCH-1348
A14A2E1-A14A2E4				NOT ASSIGNED		
A14A2E5	9170-0029	3	4	CORE-SHIELDING BEAD	28480	9170-0029
A14A2E6	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A14A2E7	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A14A2E8	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A14A2J1	1250-1220	0	2	CONNECTOR-RF SMC M PC 50-OHM	06877	82SMC-50-0-3/111
A14A2J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	06877	82SMC-50-0-3/111
A14A2L1				NOT ASSIGNED		
A14A2L2				NOT ASSIGNED		
A14A2L3	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A14A2L4	9100-2247	4		INDUCTOR RF-CH-MLD 100NH +-10%	32159	1A1003M+-10%
A14A2M1	8150-0459	0	1	WIRE 24AWG W/R 300V PVC 7X32 80C	28480	8150-0459
A14A2Q1	1854-1044	6	1	TRANSISTOR NPN SI PD=580MW	S0545	NE21935
A14A2R1	0757-0280	3	6	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A14A2R2	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A14A2R3	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A14A2R4				NOT ASSIGNED		
A14A2R5	0699-1855	6	1	RESISTOR 17.8 1% .05W F TC=0+-50	05545	CMF-50-2-17.8-1%
A14A2R6				NOT ASSIGNED		
A14A2R7	0699-1852	3	1	RESISTOR 348 1% .05W F TC=0+-50	05545	CMF-50-2-348-1%
A14A2R8	0699-1853	4	4	RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A14A2R9	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A14A2R10	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A14A2R11	0699-1853	4		RESISTOR 21.5 1% .05W F TC=0+-50	05545	CMF-50-2-21.5-1%
A14A2R12	0699-1849	8	1	RESISTOR 90.9 1% .05W F TC=0+-50	05545	CMF-50-2-90.9-1%
A14A2R13	0699-1856	7	2	RESISTOR 215 1% .05W F TC=0+-50	05545	CMF-50-2-215-1%
A14A2R14	0699-1857	8	1	RESISTOR 23.7 1% .05W F TC=0+-50	05545	CMF-50-2-23.7-1%
A14A2R15	0699-1856	7		RESISTOR 215 1% .05W F TC=0+-50	05545	CMF-50-2-215-1%
A14A2R16	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A14A2R17	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A14A2R18	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A14A2TL1	08780-20111	1	1	MIXER INPUT COND	28480	08780-20111
A14A2TL2	08780-20110	0	1	DBLR GROUND COND	28480	08780-20110
A14A3	1NB7-8052	5	1	POWER AMPLIFIER	28480	1NB7-8052

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15	08780-60029	4	1	RF OUTPUT DECK (EXCEPT OPTION 064)	28480	08780-60029
	08780-69029	2	1	RF OUTPUT DECK (RESTORED 08780-60029)	28480	08780-69029
	08780-60128	4	1	RF OUTPUT DECK (OPTION 064)	28480	08780-60128
	08780-69128	2	1	RF OUTPUT DECK (RESTORED 08780-60128 OPTION 064)	28480	08780-69128
A15AT1						
(2746A AND BELOW)	0960-0705	8	2	U-WAVE ISOLATOR 12 GHZ MAX	28480	0960-0705
(2805A AND ABOVE)	0955-0418	9	3	U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0955-0418
A15AT2						
(2746A AND BELOW)	0960-0705	8		U-WAVE ISOLATOR 12 GHZ MAX	28480	0960-0705
(2805A AND ABOVE)	0955-0418	9		U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0955-0418
A15AT3	08780-67004	9	1	DUAL MODULATR AY	28480	08780-67004
A15AT4	0955-0241	6	3	U-WAVE ISOLATOR 14.3 GHZ MAX	12168	T-007S01
A15AT5	0955-0241	6		U-WAVE ISOLATOR 14.3 GHZ MAX	12168	T-007S01
A15AT6	08780-67003	8	1	I Q COMBINER AY	28480	08780-67003
A15AT7	0955-0241	6		U-WAVE ISOLATOR 14.3 GHZ MAX	12168	T-007S01
A15AT8	08780-67002	7	1	OUTPUT MIXER AY	28480	08780-67002
A15AT9						
(2805A AND ABOVE)	0955-0418	9		U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0955-0418
(2746A AND BELOW)	0960-0704	7	1	U-WAVE ISOLATOR 12.4 GHZ MAX	28480	0960-0704
A15AT10*	0955-0242	7	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0242
A15AT10*	0955-0243	8	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0243
A15AT10*	0955-0244	9	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0244
A15AT10*	0955-0245	0	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0245
A15AT10*	0955-0246	1	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0246
A15AT10*	0955-0301	9	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0301
A15AT10*	0955-0316	6	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0316
A15AT10*	0955-0317	7	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0317
A15AT10*	0955-0318	8	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0318
A15AT10*	0955-0319	9	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0319
A15AT10*	0955-0320	2	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0320
A15AT10*	0955-0321	3	1	U-WAVE ATTENUATOR 18 GHZ MAX	28480	0955-0321
A15AT11	08780-60093	2	1	PROG ATTEN 110DB	28480	08780-60093
A15AT12	08780-67012	9	1	PIN ATTEN (OPTION 064)	28480	08780-67012

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15DC1				NOT ASSIGNED		
A15W1				NOT ASSIGNED		
A15A1	08780-60010	3	1	RF OUTPUT DECK INTFC BD AY (EXCEPT OPTION 064)	28480	08780-60010
A15A1C1	0180-1819	3	2	CAPACITOR-FXD 100UF+75-10% 50VDC AL	00494	50T101U10X25M
A15A1C2	0180-0291	3	10	CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C4	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C5				NOT ASSIGNED		
A15A1C6	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C7	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C8	0160-4574	1	3	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A15A1C9	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C10	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A15A1C11	0160-4918	7	3	CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A15A1C12	0160-4918	7		CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A15A1C13	0180-1819	3		CAPACITOR-FXD 100UF+75-10% 50VDC AL	00494	50T101U10X25M
A15A1C14	0160-4918	7		CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A15A1C15	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C16	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A15A1C17	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C18	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C19	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1CR1	1901-0028	5	4	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR2	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR3	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR4	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR5	1901-0050	3	9	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR14	1901-0527	9	1	DIODE-CUR RGLTR 75V DO-7	28480	1901-0527
A15A1J1	1251-8930	5	1	CONN-POST TYPE .100-PIN-SPCG 34-CONT	18873	66429-175
A15A1J2						
(2716A AND BELOW)	1200-0508	0	1	SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0508
(2725A AND ABOVE)	1200-1204	5	1	SOCKET-IC 14-CONT DIP DIP-SLDR	01417	2-641609-2
A15A1J3	1250-0836	2	2	CONNECTOR-RF SMC M PC 50-OHM	06877	85SMC-50-0-1
A15A1J4	1250-0836	2		CONNECTOR-RF SMC M PC 50-OHM	06877	85SMC-50-0-1
A15A1L1	9140-0114	4	5	INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L2	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L3	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L4	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L5	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1M1	0380-1092	8	7	STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M2	0515-0924	0	3	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A15A1M3	1251-3172	7	13	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A15A1M4	1251-5595	2	2	POLARIZING KEY-POST CONN	28480	1251-5595
A15A1M5	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A15A1Q1	1854-0475	5	1	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A15A1Q2	1853-0459	3	1	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A15A1Q3	1855-0517	8	1	TRANSISTOR MOSFET P-CHAN E-MODE TO-220	9M011	IRF9532
A15A1Q4	1858-0032	8	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A15A1R1	0757-0466	7	1	RESISTOR 110K 1% .125W TF TC=0+-100	12498	CT4
A15A1R2	0757-0280	3	11	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R3	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R4	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R5	0698-0085	0	5	RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15A1R6	0698-3438	3	1	RESISTOR 147 1% .125W TF TC=0+-100	K8479	H8
A15A1R7	0698-3154	0	2	RESISTOR 4.22K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R8	0757-0428	1	2	RESISTOR 1.62K 1% .125W TF TC=0+-100	19701	SFR25H
A15A1R9	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R10	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R11	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R12	0757-0428	1		RESISTOR 1.62K 1% .125W TF TC=0+-100	19701	SFR25H
A15A1R13	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R14	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R15	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R16	0757-0278	9	1	RESISTOR 1.78K 1% .125W TF TC=0+-100	12498	CT4
A15A1R17	0698-3152	8	2	RESISTOR 3.48K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R18	1810-0889	3	1	RESISTOR 200M 5% 2W MO TC=0+-200	28480	1810-0889
A15A1R19	0698-6320	8	1	RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R20	0698-3266	5	1	RESISTOR 237K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R21	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R22	0698-3152	8		RESISTOR 3.48K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R23	0698-6317	3	2	RESISTOR 500 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R24	0698-6317	3		RESISTOR 500 .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R25	0698-6624	5	4	RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A15A1R26	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A15A1R27	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A15A1R28	0757-0403	2	3	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R29	0698-4423	8	1	RESISTOR 1.37K 1% .125W TF TC=0+-100	06001	NK4
A15A1R30	0757-0419	0	1	RESISTOR 681 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R31	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R32	0698-3390	6	1	RESISTOR 19.6 1% .5W TF TC=0+-100	19701	5053R
A15A1R33	0698-6624	5		RESISTOR 2K .1% .125W TF TC=0+-25	12498	NE55
A15A1R34	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R35	0757-0422	5	1	RESISTOR 909 1% .125W TF TC=0+-100	19701	SFR25H
A15A1R36	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R37	0698-8813	8	1	RESISTOR 1.21 1% .125W F TC=0+-100	28480	0698-8813
A15A1R38	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R39	0757-0442	9	1	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R40	0757-0447	4	1	RESISTOR 16.2K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R41	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R42	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R43	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R44	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R45	0698-3151	7	1	RESISTOR 2.87K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R46	2100-3349	2	1	RESISTOR-TRMR 100 10% TKF SIDE-ADJ 1-TRN	32997	3386X-Y46-101
A15A1R47	0757-0416	7	1	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R48	0698-3154	0		RESISTOR 4.22K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1TP1	0360-0535	0	2	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A15A1TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A15A1U1	1820-3344	2	4	IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U2	1826-0783	9	1	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A15A1U3	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U4	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U5	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U6	1826-0716	8	2	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A15A1U7	1826-0544	0	1	IC V RGLTR-V-REF-FXD 2.5V 8-DIP-C PKG	28480	1826-0544
A15A1U8	1820-4185	1	1	IC DRVR TTL LS LINE HI-CUR GATED QUAD	27014	DS3658N
A15A1U9	1820-4186	2	1	IC DRVR TTL LS PRPHL HI-CUR GATED QUAD	27014	DS3669N
A15A1U10	1826-1021	0	1	ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A15A1U11				NOT ASSIGNED		
A15A1U12	1826-1334	8	2	D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A15A1U13	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A15A1U14	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A15A1U15	1826-0527	9	1	IC 337 V RGLTR TO-220	27014	LM337T
A15A1U15A	0590-1076	3	3	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A15A1U15B	1205-0353	3	2	HEAT SINK SGL PLSTC-PWR-CS	13103	6073B
A15A1U15C	2190-0644	3	2	INTERNAL STAR WASHER	28480	2190-0644

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15A1U16	1826-1216	5	1	IC V RGLTR-ADJ-POS 1.2/33V TO-220 PKG	10960	LT350AT
A15A1U16A	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A15A1U16B	1205-0353	3		HEAT SINK SGL PLSTC-PWR-CS	13103	6073B
A15A1U16C	2190-0644	3		INTERNAL STAR WASHER	28480	2190-0644

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15A1	08780-60202	5	1	SUMP INTFC BD AY (OPTION 064)	28480	08780-60202
A15A1C1	0180-1819	3	2	CAPACITOR-FXD 100UF+75-10% 50VDC AL	00494	50T101U10X25M
A15A1C2	0180-0291	3	6	CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C4	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C5				NOT ASSIGNED		
A15A1C6	0180-2661	5	4	CAPACITOR-FXD 1UF+-10% 50VDC TA	01766	221M5002-105-K3-552
A15A1C7	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C8	0160-4574	1	2	CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A15A1C9	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C10	0160-4574	1		CAPACITOR-FXD 1000PF +-10% 100VDC CER	28480	0160-4574
A15A1C11	0160-4918	7	3	CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A15A1C12	0160-4918	7		CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A15A1C13	0180-1819	3		CAPACITOR-FXD 100UF+75-10% 50VDC AL	00494	50T101U10X25M
A15A1C14	0160-4918	7		CAPACITOR-FXD .022UF +-10% 50VDC CER	28480	0160-4918
A15A1C15-A15A1C19				NOT ASSIGNED		
A15A1C20	0160-5910	1	1	CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A15A1C21	0180-2683	1	2	CAPACITOR-FXD 4.7UF+-20% 35VDC TA	12474	MD6-035-475-20/9038
A15A1C22	0160-4835	7	9	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C23	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C24	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C25	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C26	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C27	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C28	0180-2683	1		CAPACITOR-FXD 4.7UF+-20% 35VDC TA	12474	MD6-035-475-20/9038
A15A1C29	0180-0553	0	1	CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A15A1C30	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	K7253	TAAA1R0K35RX
A15A1C31	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	01766	221M5002-105-K3-552
A15A1C32	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	01766	221M5002-105-K3-552
A15A1C33	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	01766	221M5002-105-K3-552
A15A1C34-A15A1C39				NOT ASSIGNED		
A15A1C40	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C41	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C42	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15A1C43	0160-0576	5	2	CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A15A1C44	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	06383	FD12X7R1H104M
A15A1CR1	1901-0028	5	8	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR2	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR3	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR4	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR5	1901-0050	3	10	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR13				NOT ASSIGNED		
A15A1CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A15A1CR15	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR16	1901-0539	3	1	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A15A1CR17	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR18				NOT ASSIGNED		
A15A1CR19				NOT ASSIGNED		
A15A1CR20	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR21	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A15A1CR22	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15A1J1	1251-8930	5	1	CONN-POST TYPE .100-PIN-SPCG 34-CONT	18873	66429-175
A15A1J2	1200-1204	5	1	SOCKET-IC 14-CONT DIP DIP-SLDR	01417	2-641609-2
A15A1J3	1250-0836	2	2	CONNECTOR-RF SMC M PC 50-OHM	06877	85SMC-50-0-1
A15A1J4	1250-0836	2		CONNECTOR-RF SMC M PC 50-OHM	06877	85SMC-50-0-1
A15A1L1	9140-0114	4	5	INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L2	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L3	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L4	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1L5	9140-0114	4		INDUCTOR RF-CH-MLD 10UH +-10%	91637	IM-4 10UH 10%
A15A1M1	1200-0147	3	4	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
A15A1M2	1205-0353	3	1	HEAT SINK SGL PLSTC-PWR-CS	13103	6073B
A15A1M3	1251-3172	7	14	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A15A1M4	1251-5595	2	2	POLARIZING KEY-POST CONN	28480	1251-5595
A15A1M5	2190-0644	3	1	INTERNAL STAR WASHER	28480	2190-0644
A15A1M6	0380-1092	8	7	STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M7	0380-1092	8		STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M8	0380-1092	8		STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M9	0380-1092	8		STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M10	0380-1092	8		STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M11	0380-1092	8		STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M12	0380-1092	8		STANDOFF-RVT-ON 3.18-MM-LG M3.0 X	28480	0380-1092
A15A1M13	0515-0924	0	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0924
A15A1M14	0590-1076	3	1	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A15A1Q1	1854-0810	2	1	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A15A1Q2	1858-0077	1	1	TRANSISTOR ARRAY 14-PIN PLSTC TO-116	04713	MPQ2222P
A15A1Q3	1858-0071	5	2	TRANSISTOR ARRAY PLSTC TO-116	04713	MPQ3798
A15A1Q4	1858-0071	5		TRANSISTOR ARRAY PLSTC TO-116	04713	MPQ3798
A15A1R1	0757-0466	7	1	RESISTOR 110K 1% .125W TF TC=0+-100	12498	CT4
A15A1R2	0757-0280	3	6	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R3	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R4	0698-3434	9	2	RESISTOR 34.8 1% .125W TF TC=0+-100	K8479	H8
A15A1R5	0698-6631	4	1	RESISTOR 2.5K .1% .125W TF TC=0+-25	12498	NE55
A15A1R6	0698-7220	9	1	RESISTOR 215 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R7	0698-3154	0	2	RESISTOR 4.22K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R8	0757-0428	1	2	RESISTOR 1.62K 1% .125W TF TC=0+-100	19701	SFR25H
A15A1R9	0698-0085	0	5	RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R10	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R11	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R12	0757-0428	1		RESISTOR 1.62K 1% .125W TF TC=0+-100	19701	SFR25H
A15A1R13	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R14	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R15	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R16	0698-3151	7	1	RESISTOR 2.87K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R17				NOT ASSIGNED		
A15A1R18	1810-0889	3	1	RESISTOR 200M 5% 2W MO TC=0+-200	28480	1810-0889
A15A1R19	0698-6320	8	3	RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R20	0757-0123	3	1	RESISTOR 34.8K 1% .125W TF TC=0+-100	06424	NK4H
A15A1R21	0698-3451	0	1	RESISTOR 133K 1% .125W TF TC=0+-100	K8479	H8
A15A1R22-A15A1R31				NOT ASSIGNED		
A15A1R32	0698-3442	9	1	RESISTOR 237 1% .125W TF TC=0+-100	K8479	H8
A15A1R33-A15A1R40				NOT ASSIGNED		
A15A1R41	0757-0442	9	4	RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R42	0698-3434	9		RESISTOR 34.8 1% .125W TF TC=0+-100	K8479	H8
A15A1R43-A15A1R47				NOT ASSIGNED		
A15A1R48	0698-3154	0		RESISTOR 4.22K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R49	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R50	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R51	0757-0442	9		RESISTOR 10K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R52	0757-0464	5	1	RESISTOR 90.9K 1% .125W TF TC=0+-100	12498	CT4
A15A1R53	0698-3449	6	1	RESISTOR 28.7K 1% .125W TF TC=0+-100	K8479	H8

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15A1R54	0698-0083	8	1	RESISTOR 1.96K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R55	0757-0403	2	3	RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R56	0698-3446	3	2	RESISTOR 383 1% .125W TF TC=0+-100	K8479	H8
A15A1R57				NOT ASSIGNED		
A15A1R58	0757-0278	9	2	RESISTOR 1.78K 1% .125W TF TC=0+-100	12498	CT4
A15A1R59				NOT ASSIGNED		
A15A1R60	0757-0399	5	1	RESISTOR 82.5 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R61	2100-1754	9	1	RESISTOR-TRMR 50 5% WW SIDE-ADJ 1-TRN	32997	3345W-DW9-500
A15A1R62	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R63	0698-7275	4	1	RESISTOR 42.2K 1% .05W TF TC=0+-100	06001	NK3
A15A1R64	0698-7260	7	18	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R65	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R66	0757-0989	9	1	RESISTOR 16.2 1% .5W TF TC=0+-100	K8479	H2
A15A1R67	0698-8819	4	1	RESISTOR 3.83 1% .125W F TC=0+-100	28480	0698-8819
A15A1R68	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R69	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R70	0698-8821	8	1	RESISTOR 5.62 1% .125W F TC=0+-100	28480	0698-8821
A15A1R71	0698-3390	6	1	RESISTOR 19.6 1% .5W TF TC=0+-100	19701	5053R
A15A1R72	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R73	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R74	0698-8823	0	1	RESISTOR 8.25 1% .125W F TC=0+-100	28480	0698-8823
A15A1R75	0757-1002	9	1	RESISTOR 61.9 1% .5W TF TC=0+-100	K8479	H2
A15A1R76	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R77	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R78	0757-0180	2	1	RESISTOR 31.6 1% .125W TF TC=0+-100	D8439	MK2
A15A1R79	0757-0397	3	1	RESISTOR 68.1 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R80	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R81	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R82	0757-0394	0	2	RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A15A1R83	0757-0405	4	2	RESISTOR 162 1% .125W TF TC=0+-100	06001	NK4
A15A1R84	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R85	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R86	0757-0394	0		RESISTOR 51.1 1% .125W TF TC=0+-100	K8479	H8
A15A1R87	0757-0405	4		RESISTOR 162 1% .125W TF TC=0+-100	06001	NK4
A15A1R88	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R89	0757-0398	4	1	RESISTOR 75 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R90	0698-3446	3		RESISTOR 383 1% .125W TF TC=0+-100	K8479	H8
A15A1R91				NOT ASSIGNED		
A15A1R92				NOT ASSIGNED		
A15A1R93	0757-0403	2		RESISTOR 121 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A15A1R94	0757-0444	1	1	RESISTOR 12.1K 1% .125W TF TC=0+-100	19701	SFR25H
A15A1R95	0698-0085	0		RESISTOR 2.61K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R96	0757-0278	9		RESISTOR 1.78K 1% .125W TF TC=0+-100	12498	CT4
A15A1R97	0757-0438	3	1	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R98				NOT ASSIGNED		
A15A1R99	0698-6320	8		RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R100	0698-6320	8		RESISTOR 5K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R101	0698-7848	7	5	RESISTOR 1.25K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R102	0698-7848	7		RESISTOR 1.25K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R103	0698-7848	7		RESISTOR 1.25K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R104	0698-7848	7		RESISTOR 1.25K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R105	0698-7848	7		RESISTOR 1.25K .1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A15A1R106	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R107	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R108	0698-7222	1	1	RESISTOR 261 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R109	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R110	0757-0440	7	1	RESISTOR 7.5K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15A1R111	2100-1760	7	1	RESISTOR-TRMR 5K 5% WW SIDE-ADJ 1-TRN	32997	3345W-CL4-502
A15A1R112				NOT ASSIGNED		
A15A1R113				NOT ASSIGNED		
A15A1R114	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A15A1R115	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R116	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A15A1R117	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15A1TP1				NOT ASSIGNED		
A15A1TP2	0360-0535	0	3	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A15A1TP3				NOT ASSIGNED		
A15A1TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A15A1TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A15A1U1	1820-4186	2	1	IC DRVR TTL LS PRPHL HI-CUR GATED QUAD	27014	DS3669N
A15A1U2	1820-4185	1	1	IC DRVR TTL LS LINE HI-CUR GATED QUAD	27014	DS3658N
A15A1U3	1826-1021	0	1	ANALOG MULTIPLEXER CHNL 16 -DIP-P	17856	DG508ACJ
A15A1U4	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A15A1U5	1826-0716	8	5	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A15A1U6	1820-3344	2	4	IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U7	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U8	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U9	1826-1019	6	1	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
A15A1U10	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A15A1U11	1826-0539	3	1	IC 317 V RGLTR TO-39	27014	LM317H
A15A1U12	1820-3344	2		IC SHF-RGTR CMOS/74HC ASYNCHRO SERIAL-IN	04713	MC74HC595N
A15A1U13	1826-1334	8	2	D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A15A1U14	1826-1334	8		D/A 12-DGT 20-PLASTIC BPLR	03797	AM6012PC
A15A1U15	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A15A1U16	1826-0544	0	1	IC V RGLTR-V-REF-FXD 2.5V 8-DIP-C PKG	28480	1826-0544
A15A1U17				NOT ASSIGNED		
A15A1U18				NOT ASSIGNED		
A15A1U19	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A15A1U20	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A15A1U21	1826-1099	2	1	IC V RGLTR-ADJ-NEG TO-92 PKG	27014	LM337LZ
A15A1U22				NOT ASSIGNED		
A15A1U23	1826-1216	5	1	IC V RGLTR-ADJ-POS 1.2/33V TO-220 PKG	10960	LT350AT
A15A1VR1	1902-0945	7	2	DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A15A1VR2	1902-0945	7		DIODE-ZNR 3V 5% DO-35 PD=.4W TC=-.043%	28480	1902-0945
A15A1W1	8159-0005	0	2	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A15A1W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	55210	L-2007-1
A15A2	08780-67001	6	1	OUTPUT AMPLIFIER ASSEMBLY	28480	08780-67001
A15A3	08780-67011	8	1	POWER AMPLIFIER (OPTION 064)	28480	08780-67011

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A16	10811-60132	7	1	10MHZ TIMEBASE QUARTZ CRYSTAL REFERENCE OSCILLATOR	28480	10811-60102
	10811-69132			RESTORED A16		
A17	08780-60005	6	1	POWER DISTRIBUTION BD ASSY (DOES NOT INCLUDE A17Q2 THROUGH A17Q6)	28480	08780-60005
A17C1	0180-3284	0	2	CAPACITOR-FXD .015F+75-10% 15VDC AL	19701	3120BA153U015HH
A17C2	0180-3303	4	2	CAPACITOR-FXD 8700UF+75-10% 40VDC AL	56289	36DE872G040EA2P
A17C3	0180-3303	4		CAPACITOR-FXD 8700UF+75-10% 40VDC AL	56289	36DE872G040EA2P
A17C4	0180-3284	0		CAPACITOR-FXD .015F+75-10% 15VDC AL	19701	3120BA153U015HH
A17C5	0180-3760	7	1	CAPACITOR-FXD 6500UF+75-10% 50VDC AL	56289	36DE652G050AM2P
A17C6	0160-5910	1	1	CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A17C7-A17C9				NOT ASSIGNED		
A17C10	0180-2821	9	1	CAPACITOR-FXD 22UF+-20% 35VDC TA	01766	202L3502-226-M6-552
A17C11	0180-0094	4	1	CAPACITOR-FXD 100UF+75-10% 25VDC AL	00494	25T101U8X18M
A17C12	0180-2208	6	1	CAPACITOR-FXD 220UF+-10% 10VDC TA	56289	150D227X9010S2-DYS
A17C13	0160-4005	3	3	CAPACITOR-FXD 1UF +-20% 100VDC CER	09969	RPE114-130Z5U105M100V
A17C14	0160-4005	3		CAPACITOR-FXD 1UF +-20% 100VDC CER	09969	RPE114-130Z5U105M100V
A17C15	0160-4005	3		CAPACITOR-FXD 1UF +-20% 100VDC CER	09969	RPE114-130Z5U105M100V
A17C16-A17C19				NOT ASSIGNED		
A17C20	0180-2620	6	1	CAPACITOR-FXD 2.2UF+-10% 50VDC TA	01766	221M5002-225-K3-552
A17CR1	1901-0418	7	4	DIODE-PWR RECT 400V 1.5A	28480	1901-0418
A17CR2	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
A17CR3	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
A17CR4	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
A17CR5	1901-0328	8	6	DIODE-PWR RECT 400V 1A 6US	03508	A14D
A17CR6	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
A17CR7	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
A17CR8	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
A17CR9	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
A17CR10	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
A17CR11	1901-0028	5	2	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A17CR12	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A17J1	1251-8601	7	2	CONN-POST TYPE .100-PIN-SPCG 34-CONT	76381	3594-6002
A17J2	1251-8248	8	1	CONN-POST TYPE .100-PIN-SPCG 26-CONT	76381	3593-6002
A17J3	1252-0871	9	1	CONN-POST TYPE .100-PIN-SPCG 5-CONT	28480	1252-0871
A17J4	1251-8262	6	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	76381	3596-6002
A17J5	1251-8601	7		CONN-POST TYPE .100-PIN-SPCG 34-CONT	76381	3594-6002
A17J6	1252-1211	3	1	CONN-POST TYPE .156-PIN-SPCG 9-CONT	03445	2630-10A102-4
A17J7	1251-8828	0	2	CONN-POST TYPE .100-PIN-SPCG 40-CONT	76381	3595-6002
A17J8	1251-8828	0		CONN-POST TYPE .100-PIN-SPCG 40-CONT	76381	3595-6002
A17J9	1251-8105	6	1	CONN-POST TYPE .100-PIN-SPCG 16-CONT	18873	66506-320
A17J10	1251-8911	2	1	CONN-POST TYPE .100-PIN-SPCG 60-CONT	71785	254-01-06-002
A17J11	1251-8961	2	1	CONN-POST TYPE .100-PIN-SPCG 2-CONT	18873	65454-103
A17L1	9100-2248	5	1	INDUCTOR RF-CH-MLD 120NH +-10%	32159	1A1203M+-10%
A17M1	1252-1118	9	10	CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M2	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M3	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M4	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M5	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M6	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M7	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M8	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M9	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M10	1252-1118	9		CONNECTOR-SGL CONT SKT .065-IN-BSC-SZ	01417	2-50871-1
A17M11	0590-1076	3	22	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17M12	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17M13	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17M14	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17M15	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076

See introduction to this section for ordering information
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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A17H116	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H117	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H118	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H119	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H120	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H121	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H122	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H123				NOT ASSIGNED		
A17H124	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H125	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H126	0515-0886	3	7	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A17H127	0515-0886	3		SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A17H128	0515-0886	3		SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A17H129	0515-0886	3		SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A17H130	0515-0886	3		SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A17H131	0515-0886	3		SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A17H132	0515-0886	3		SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
A17H133	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H134	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H135	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H136	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H137	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H138	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H139	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H140	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A17H141	0380-1634	4	2	STANDOFF-RVT-ON 10.4-MM-LG M3.0 X	05791	P3410
A17H142	1251-5595	2	12	POLARIZING KEY-POST CONN	28480	1251-5595
A17H143	8150-0483	0	1	WIRE 24AWG W/R/G 300V PVC 7X32 80C	28480	8150-0483
A17H144	8150-1540	2	1	WIRE 22AWG BK 300V PVC 7X30 80C	08452	F-1110-5120-DL
A17Q1	1884-0310	0	7	THYRISTOR-SCR TO-220AB	04713	MCR69-3
A17Q2	1855-0618	0	5	TRANSISTOR MOSFET N-CHAN E-MODE TO-3 SI	04713	IRF140
A17Q3	1855-0618	0		TRANSISTOR MOSFET N-CHAN E-MODE TO-3 SI	04713	IRF140
A17Q4	1855-0618	0		TRANSISTOR MOSFET N-CHAN E-MODE TO-3 SI	04713	IRF140
A17Q5	1855-0618	0		TRANSISTOR MOSFET N-CHAN E-MODE TO-3 SI	04713	IRF140
A17Q6	1855-0618	0		TRANSISTOR MOSFET N-CHAN E-MODE TO-3 SI	04713	IRF140
A17Q7	1884-0310	0		THYRISTOR-SCR TO-220AB	04713	MCR69-3
A17Q8	1884-0310	0		THYRISTOR-SCR TO-220AB	04713	MCR69-3
A17Q9	1884-0310	0		THYRISTOR-SCR TO-220AB	04713	MCR69-3
A17Q10	1884-0310	0		THYRISTOR-SCR TO-220AB	04713	MCR69-3
A17Q11	1884-0310	0		THYRISTOR-SCR TO-220AB	04713	MCR69-3
A17Q12	1884-0310	0		THYRISTOR-SCR TO-220AB	04713	MCR69-3
A17R1	0698-0084	9	2	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A17R2	0698-0084	9		RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A17R3	0757-0279	0	2	RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A17R4	0757-0279	0		RESISTOR 3.16K 1% .125W TF TC=0+-100	12498	CT4
A17R5	0757-0200	7	1	RESISTOR 5.62K 1% .125W TF TC=0+-100	19701	SFR25H
A17R6	0812-0045	6	12	RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R7	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R8	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R9	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R10	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R11	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R12	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R13	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R14	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R15	0698-7288	9	5	RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A17R16	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A17R17	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A17R18	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A17R19	0698-7288	9		RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A17R20	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R21	0811-1659	8	2	RESISTOR .27 5% 2W PW TC=0+-800	11502	SPH
A17R22	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R23	0812-0045	6		RESISTOR .15 5% 3W PW TC=0+-90	01686	T2B-79
A17R24	0811-1662	3	1	RESISTOR .47 5% 2W PW TC=0+-800	11502	SPH
A17R25	0811-1659	8		RESISTOR .27 5% 2W PW TC=0+-800	11502	SPH

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A17R26	0698-7199	1	6	RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A17R27	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A17R28	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A17R29	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A17R30	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A17R31	0698-7199	1		RESISTOR 28.7 1% .05W TF TC=0+-100	2M627	CRB20
A17R32	0698-7212	9	1	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A17R33	0698-8818	3	1	RESISTOR 3.16 1% .125W F TC=0+-100	28480	0698-8818
A17R34-A17R39				NOT ASSIGNED		
A17R40	1810-0235	3	1	NETWORK-RES 16-DIP 2.2K OHM X 15	11236	761-1-R2.2K
A17RT1	0837-0126	6	1	THERMISTOR DISC 1K-OHM TC=-4.4%/C-DEG	6E259	STD-0163
A17U1	1820-2075	4	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS245N
A17VR1	1902-0969	5	1	DIODE-ZNR 30V 5% DO-35 PD=.4W TC=+.095%	28480	1902-0969
A17VR2	1902-0970	4	1	DIODE-ZNR 27V 5% DO-35 PD=.4W TC=+.095%	28480	1902-0968
A17VR3	1902-0963	9	2	DIODE-ZNR 16V 5% DO-35 PD=.4W TC=+.088%	28480	1902-0963
A17VR4	1902-0963	9		DIODE-ZNR 16V 5% DO-35 PD=.4W TC=+.088%	28480	1902-0963
A17VR5	1902-0952	6	2	DIODE-ZNR 5.6V 5% DO-35 PD=.4W TC=+.046%	28480	1902-0952
A17VR6	1902-0952	6		DIODE-ZNR 5.6V 5% DO-35 PD=.4W TC=+.046%	28480	1902-0952
A17VR7	1902-0943	5	1	DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A17VR8	1902-0960	6	1	DIODE-ZNR 12V 5% DO-35 PD=.4W TC=+.077%	11707	1N963B
A17VR9	1902-0961	7	1	DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.082%	28480	1902-0961

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A18	08780-60006	7	1	POWER CONTROL BD ASSY	28480	08780-60006
	08780-69006	5	1	POWER CONTROL BD ASSY (RESTORED 08780-60006)	28480	08780-69006
A18C1				NOT ASSIGNED		
A18C2	0160-4835	7	13	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C3	0180-0100	3	1	CAPACITOR-FXD 4.7UF+-10% 35VDC TA	K7253	TAAB4R7K35RX
A18C4	0160-4801	7	5	CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A18C5	0160-5910	1	1	CAPACITOR-FXD .47UF +80-20% 25VDC CER	06383	MA14Y5V1H474Z
A18C6	0160-4810	8	9	CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C7	0160-4812	0	2	CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A18C8	0180-2141	6	1	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	12344	T110B335K050AS
A18C9	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C10	0160-4813	1	1	CAPACITOR-FXD 180PF +-5% 100VDC CER	06383	DA12C0G2A181J
A18C11	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C12	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A18C13	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A18C14	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C15	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A18C16	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C17	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	06383	DA12C0G2A101J
A18C18	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C19				NOT ASSIGNED		
A18C20	0160-3334	9	2	CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A18C21	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	06383	DA12X7R1H103K
A18C22				NOT ASSIGNED		
A18C23	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C24	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C25	0160-4810	8		CAPACITOR-FXD 330PF +-5% 100VDC CER	06383	DA12C0G2A331J
A18C26	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C27	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C28	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C29	0180-0553	0	4	CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A18C30	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C31	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C32	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C33	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C34	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C35	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C36	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C37	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C38				NOT ASSIGNED		
A18C39	0180-0553	0		CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A18C40	0180-0141	2	1	CAPACITOR-FXD 50UF+75-10% 50VDC AL	00494	50T50R(U)10X20M
A18C41	0180-0553	0		CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A18C42	0180-0553	0		CAPACITOR-FXD 22UF+-20% 25VDC TA	01766	202L2502-226-M6-552
A18C43	0180-2817	3	1	CAPACITOR-FXD 47UF+-20% 10VDC TA	28480	0180-2817
A18C44	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A18C45	0180-2815	1	1	CAPACITOR-FXD 100UF+-20% 10VDC TA	28480	0180-2815
A18C46-A18C49				NOT ASSIGNED		
A18C50	0160-5098	6	1	CAPACITOR-FXD .22UF +-10% 50VDC CER	04222	SA405C224KAA
A18C51	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	06383	DA12C0G2A221J
A18CR1	1901-0050	3	6	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A18CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A18CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A18CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A18CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A18CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A18CR7-A18CR20				NOT ASSIGNED		
A18CR21	1906-0275	4	2	DIODE-ARRAY	13606	TND908
A18CR22	1906-0275	4		DIODE-ARRAY	13606	TND908

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A18DS1	1990-1096	6	2	LED-LAMP ARRAY IF=30MA-MAX BVR=5V	01556	HLMP-6854
A18DS2	1990-1096	6		LED-LAMP ARRAY IF=30MA-MAX BVR=5V	01556	HLMP-6854
A18J1	1250-0835	1	3	CONNECTOR-RF SMC M PC 50-OHM	24931	37JR104-2
A18J2	1250-0835	1		CONNECTOR-RF SMC M PC 50-OHM	24931	37JR104-2
A18J3	1250-0835	1		CONNECTOR-RF SMC M PC 50-OHM	24931	37JR104-2
A18J4	1251-8912	3	1	CONN-POST TYPE .100-PIN-SPCG 60-CONT	18873	66527-530
A18K1	0490-1483	4	1	RELAY-REED 1A 500MA 100VDC 5VDC-COIL	04488	PRMA 1A05 DYAD
A18L1	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH +-10%	91637	IM-2 4.7UH 10%
A18L2	9100-2257	6	2	INDUCTOR RF-CH-MLD 820NH +-10%	32159	1A 8203M +-10%
A18L3	9100-2257	6		INDUCTOR RF-CH-MLD 820NH +-10%	32159	1A 8203M +-10%
A18M1	1205-0312	4	1	HEAT SINK SGL TO-3-CS	13103	60148
A18M2				NOT ASSIGNED		
A18M3	0590-1076	3	3	THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A18M4	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A18M5	0590-1076	3		THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG	28480	0590-1076
A18M6	0515-0912	6	3	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A18M7	0515-0912	6		SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A18M8	0515-0912	6		SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
A18M9	1251-2313	6	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A18M10	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A18M11	0380-1238	4	2	STANDOFF-RVT-ON 10-MM-LG M3.0 X 0.5-THD	28480	0380-1238
A18M12	0890-0212	3	2	TUBING-FLEX .032-ID TFE .012-WALL	28480	0890-0212
A18M13	0380-1239	5	2	STANDOFF-RVT-ON 12-MM-LG M3.0 X 0.5-THD	28480	0380-1239
A18M14	1251-1556	7	2	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	00779	6-330808-5
A18M15	0515-1508	8	2	SCREW-MACH M3 X 0.5 4MM-LG PAN-HD	28480	0515-1508
A18M16	08780-00029	8	1	SHLD IF REF TOP	28480	08780-00029
A18Q1	1854-0810	2	4	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A18Q2	1853-0459	3	1	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A18Q3	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A18Q4	1854-0637	1	1	TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
A18Q5	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A18Q6	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A18Q7	1855-0490	6	1	TRANSISTOR MOSFET N-CHAN E-MODE TO-3 SI	04713	MTM10N10 SELECTED
A18R1	0698-7243	6	6	RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A18R2	0698-7188	8	1	RESISTOR 10 1% .05W TF TC=0+-100	D8439	MK1
A18R3	0698-7229	8	4	RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A18R4	0757-0416	7	1	RESISTOR 511 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R5	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A18R6	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A18R7	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A18R8	0698-7284	5	8	RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R9	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A18R10	0698-7260	7	5	RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A18R11	0698-7244	7	1	RESISTOR 2.15K 1% .05W TF TC=0+-100	2M627	CRB20
A18R12	0698-8823	0	1	RESISTOR 8.25 1% .125W F TC=0+-100	28480	0698-8823
A18R13	0698-7250	5	1	RESISTOR 3.83K 1% .05W TF TC=0+-100	2M627	CRB20
A18R14	0698-7254	9	2	RESISTOR 5.62K 1% .05W TF TC=0+-100	2M627	CRB20
A18R15	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A18R16	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A18R17	0757-0280	3	2	RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A18R18	0757-0280	3		RESISTOR 1K 1% .125W TF TC=0+-100	12498	CT4
A18R19	0698-7232	3	2	RESISTOR 681 1% .05W TF TC=0+-100	2M627	CRB20
A18R20	0757-1090	5	1	RESISTOR 261 1% .5W TF TC=0+-100	K8479	H2
A18R21	0698-7232	3		RESISTOR 681 1% .05W TF TC=0+-100	2M627	CRB20
A18R22	0698-7253	8	3	RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A18R23				NOT ASSIGNED		
A18R24	0757-0443	0	2	RESISTOR 11K 1% .125W TF TC=0+-100	19701	SFR25H
A18R25	0698-3459	8	1	RESISTOR 383K 1% .125W TF TC=0+-100	K8479	H8
A18R26	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R27	0698-7227	6	1	RESISTOR 422 1% .05W TF TC=0+-100	2M627	CRB20
A18R28	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	K8479	H8
A18R29	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R30	0757-0417	8	1	RESISTOR 562 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A18R31	0698-3442	9	1	RESISTOR 237 1% .125W TF TC=0+-100	K8479	H8
A18R32	0757-0428	1	1	RESISTOR 1.62K 1% .125W TF TC=0+-100	19701	SFR25H
A18R33	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A18R34				NOT ASSIGNED		
A18R35				NOT ASSIGNED		
A18R36	0698-7251	6	1	RESISTOR 4.22K 1% .05W TF TC=0+-100	2M627	CRB20
A18R37	0698-3453	2	1	RESISTOR 196K 1% .125W TF TC=0+-100	K8479	H8
A18R38	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R39	0698-7222	1	2	RESISTOR 261 1% .05W TF TC=0+-100	2M627	CRB20
A18R40	0757-0290	5	2	RESISTOR 6.19K 1% .125W TF TC=0+-100	K8479	H8
A18R41	0757-0290	5		RESISTOR 6.19K 1% .125W TF TC=0+-100	K8479	H8
A18R42	0757-0418	9	1	RESISTOR 619 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R43-A18R45				NOT ASSIGNED		
A18R46	0698-7261	8	1	RESISTOR 11K 1% .05W TF TC=0+-100	2M627	CRB20
A18R47	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R48	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R49	0698-7224	3	1	RESISTOR 316 1% .05W TF TC=0+-100	2M627	CRB20
A18R50	0757-0438	3	2	RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R51	0698-6338	8	1	RESISTOR 5K 1% .125W TF TC=0+-25	2M627	CRB14 OR CRB25
A18R52-A18R54				NOT ASSIGNED		
A18R55	0757-0401	0	1	RESISTOR 100 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A18R56	0757-0443	0		RESISTOR 11K 1% .125W TF TC=0+-100	19701	SFR25H
A18R57	0757-0288	1	1	RESISTOR 9.09K 1% .125W TF TC=0+-100	06341	MR24
A18R58	0698-7233	4	1	RESISTOR 750 1% .05W TF TC=0+-100	2M627	CRB20
A18R59	0698-7279	8	1	RESISTOR 61.9K 1% .05W TF TC=0+-100	06001	NK3
A18R60	0698-7231	2	2	RESISTOR 619 1% .05W TF TC=0+-100	2M627	CRB20
A18R61	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R62	0698-7267	4	2	RESISTOR 19.6K 1% .05W TF TC=0+-100	2M627	CRB20
A18R63	0811-1661	2	1	RESISTOR .39 5% 2W PW TC=0+-800	11502	SPH
A18R64	0698-3390	6	1	RESISTOR 19.6 1% .5W TF TC=0+-100	19701	5053R
A18R65	0698-8812	7	6	RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A18R66	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A18R67				NOT ASSIGNED		
A18R68	0757-0440	7	1	RESISTOR 7.5K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R69	0757-0422	5	1	RESISTOR 909 1% .125W TF TC=0+-100	19701	SFR25H
A18R70	0698-3156	2	1	RESISTOR 14.7K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R71	0698-7234	5	3	RESISTOR 825 1% .05W TF TC=0+-100	2M627	CRB20
A18R72	0698-7281	2	1	RESISTOR 75K 2% .05W TF TC=0+-100	19701	5023R
A18R73	0698-7229	8		RESISTOR 511 1% .05W TF TC=0+-100	2M627	CRB20
A18R74	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R75	0698-7257	2	1	RESISTOR 7.5K 1% .05W TF TC=0+-100	2M627	CRB20
A18R76-A18R78				NOT ASSIGNED		
A18R79	0757-0397	3	1	RESISTOR 68.1 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R80	0698-0084	9	1	RESISTOR 2.15K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R81	0757-0289	2	1	RESISTOR 13.3K 1% .125W TF TC=0+-100	12498	CT4
A18R82	0698-7231	2		RESISTOR 619 1% .05W TF TC=0+-100	2M627	CRB20
A18R83	0698-3266	5	1	RESISTOR 237K 1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A18R84	0698-7226	5	1	RESISTOR 383 1% .05W TF TC=0+-100	2M627	CRB20
A18R85	0698-7284	5		RESISTOR 100K 1% .05W TF TC=0+-100	06001	NK3
A18R86	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A18R87				NOT ASSIGNED		
A18R88	0698-7222	1		RESISTOR 261 1% .05W TF TC=0+-100	2M627	CRB20
A18R89-A18R99				NOT ASSIGNED		
A18R100	0698-7208	3	1	RESISTOR 68.1 1% .05W TF TC=0+-100	2M627	CRB20
A18R101	0698-7212	9	3	RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A18R102	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A18R103				NOT ASSIGNED		
A18R104	0698-7212	9		RESISTOR 100 1% .05W TF TC=0+-100	2M627	CRB20
A18R105				NOT ASSIGNED		
A18R106				NOT ASSIGNED		
A18R107	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A18R108	0698-7253	8		RESISTOR 5.11K 1% .05W TF TC=0+-100	2M627	CRB20
A18R109	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A18R110-A18R125				NOT ASSIGNED		
A18R126	0698-7267	4		RESISTOR 19.6K 1% .05W TF TC=0+-100	2M627	CRB20
A18R127	0698-7254	9		RESISTOR 5.62K 1% .05W TF TC=0+-100	2M627	CRB20
A18R128	0698-7234	5		RESISTOR 825 1% .05W TF TC=0+-100	2M627	CRB20
A18R129	0698-7260	7		RESISTOR 10K 1% .05W TF TC=0+-100	2M627	CRB20
A18R130				NOT ASSIGNED		
A18R131				NOT ASSIGNED		
A18R132	0698-7243	6		RESISTOR 1.96K 1% .05W TF TC=0+-100	2M627	CRB20
A18R133-A18R200				NOT ASSIGNED		
A18R201	1810-0037	3	2	NETWORK-RES 16-DIP 1.0K OHM X 8	32997	4116R-001-102
A18R202	1810-0037	3		NETWORK-RES 16-DIP 1.0K OHM X 8	32997	4116R-001-102
A18R203	1810-0265	9	1	NETWORK-RES 16-DIP 680.0 OHM X 8	32997	4116R-001-681
A18R204	1810-0316	1	1	NETWORK-RES 16-DIP 10.0K OHM X 8	32997	4116R-001-103
A18R205	1810-0338	7	2	NETWORK-RES 16-DIP 100.0 OHM X 8	32997	4116R-001-101
A18R206	1810-0338	7		NETWORK-RES 16-DIP 100.0 OHM X 8	32997	4116R-001-101
A18R207-A18R301				NOT ASSIGNED		
A18R302	0698-3634	1	1	RESISTOR 470 5% 2W MO TC=0+-200	11502	GS-3
A18R303	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A18R304	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A18R305	0698-3624	9	2	RESISTOR 150 5% 2W MO TC=0+-200	11502	GS-3
A18R306	0764-0013	5	2	RESISTOR 56 5% 2W MO TC=0+-200	11502	GS-3
A18R307				NOT ASSIGNED		
A18R308				NOT ASSIGNED		
A18R309	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A18R310	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A18R311	0764-0013	5		RESISTOR 56 5% 2W MO TC=0+-200	11502	GS-3
A18R312	0698-3624	9		RESISTOR 150 5% 2W MO TC=0+-200	11502	GS-3
A18R313				NOT ASSIGNED		
A18R314				NOT ASSIGNED		
A18R315	0698-7288	9	1	RESISTOR 147K 1% .05W TF TC=0+-100	06001	NK3
A18R316-A18R501				NOT ASSIGNED		
A18R502	0698-7234	5		RESISTOR 825 1% .05W TF TC=0+-100	2M627	CRB20
A18R503-A18R509				NOT ASSIGNED		
A18R510	0757-0438	3		RESISTOR 5.11K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A18R511	0698-3437	2	3	RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A18R512	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A18R513	0698-3447	4	4	RESISTOR 422 1% .125W TF TC=0+-100	K8479	H8
A18R514	0698-3447	4		RESISTOR 422 1% .125W TF TC=0+-100	K8479	H8
A18R515	0698-3437	2		RESISTOR 133 1% .125W TF TC=0+-100	K8479	H8
A18R516	0698-7195	7	1	RESISTOR 19.6 1% .05W TF TC=0+-100	2M627	CRB20
A18R517	0698-3438	3	1	RESISTOR 147 1% .125W TF TC=0+-100	K8479	H8
A18R518	0698-3447	4		RESISTOR 422 1% .125W TF TC=0+-100	K8479	H8
A18R519	0698-3447	4		RESISTOR 422 1% .125W TF TC=0+-100	K8479	H8
A18TP1	0360-0535	0	17	TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP2	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP3	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP4	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP5	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP6	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP7	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP8	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP9	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP10	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP11	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP12	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP13	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP14	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP15	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A18TP16	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18TP17	0360-0535	0		TERMINAL-TEST POINT .330IN ABOVE	28480	0360-0535
A18U1	1826-0393	7	1	IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	28480	1826-0393
A18U2	1826-0716	8	7	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A18U3	1813-0213	3	1	IC WIDEBAND AMPL TO-39 PKG	04713	MWA130
A18U4	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A18U5	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A18U6	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A18U7	1826-0544	0	1	IC V RGLTR-V-REF-FXD 2.5V 8-DIP-C PKG	28480	1826-0544
A18U8	1826-0409	6	1	IC 723 V RGLTR 14-DIP-C	04713	MC1723L
A18U9	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A18U10	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A18U11	1826-0716	8		IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A18U12	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A18U13	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A18U14	1820-3423	8	1	IC SHF-RGTR TTL LS ASYNCHRO SERIAL-IN	01295	SN74LS595N
A18U15	1858-0088	4	2	TRANSISTOR ARRAY 14-PIN PLSTC TO-116	04713	MPQ7091
A18U16	1858-0088	4		TRANSISTOR ARRAY 14-PIN PLSTC TO-116	04713	MPQ7091
A18VR1	1902-0950	4	3	DIODE-ZNR 4.7V 5% DO-35 PD=.4W TC=+.025%	28480	1902-0950
A18VR2	1902-0950	4		DIODE-ZNR 4.7V 5% DO-35 PD=.4W TC=+.025%	28480	1902-0950
A18VR3	1902-0949	1	1	DIODE-ZNR 4.3V 5% DO-35 PD=.4W TC=+.017%	28480	1902-0949
A18VR4	1902-0948	0	1	DIODE-ZNR 3.9V 5% DO-35 PD=.4W TC=-.012%	28480	1902-0948
A18VR5	1902-0959	3	2	DIODE-ZNR 11V 5% DO-35 PD=.4W TC=+.076%	28480	1902-0959
A18VR6	1902-0959	3		DIODE-ZNR 11V 5% DO-35 PD=.4W TC=+.076%	28480	1902-0959
A18VR7	1902-0950	4		DIODE-ZNR 4.7V 5% DO-35 PD=.4W TC=+.025%	28480	1902-0950
A18VR8	1902-0946	8	1	DIODE-ZNR 3.3V 5% DO-35 PD=.4W TC=-.039%	28480	1902-0946
A18VR9	1902-0961	7	3	DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.082%	28480	1902-0961
A18VR10-A18VR14				NOT ASSIGNED		
A18VR15	1902-0961	7		DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.082%	28480	1902-0961
A18VR16	1902-0961	7		DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.082%	28480	1902-0961
A18VR17	1901-0951	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0951
A18VR18				NOT ASSIGNED		
A18VR19	1901-0951	3		DIODE-SM SIG SCHOTTKY	28480	1901-0951
A18VR20-A18VR26				NOT ASSIGNED		
A18VR27	1902-0970	8	1	DIODE-ZNR 33V 5% DO-35 PD=.4W TC=+.097%	28480	1902-0970

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
				CHASSIS PARTS		
B1				FAN-TBAX 108-CFM 24VDC SHOWN ON FIGURE 6-23		
C1	0160-4065	5	1	CAPACITOR-FXD .1UF +-20% 250VAC(RMS)	28480	0160-4065
C2	0160-6631	5	2	CAPACITOR-FXD 1UF +-10% 100VDC CER	28480	0160-6631
C3	0160-6631	5		CAPACITOR-FXD 1UF +-10% 100VDC CER	28480	0160-6631
CR1	1906-0212	9	2	DIODE-FW BRDG 400V 35A	04713	MDA3504
CR2	1906-0212	9		DIODE-FW BRDG 400V 35A	04713	MDA3504
F1			3			
(2805A AND BELOW)	2110-0055	2	1	FUSE 4A 250V NTD FE UL	07380	SS2-4A
(2809A AND ABOVE)	2110-0010	9	1	FUSE 5A 250V NTD FE UL	75915	312 005
F1	2110-0003	0	1	FUSE 3A 250V NTD FE UL	75915	312 003
J1				SHOWN ON FIGURE 6-6		
J2				SHOWN ON FIGURE 6-6		
J3				SHOWN ON FIGURE 6-6		
J4				SHOWN ON FIGURE 6-6		
J5				SHOWN ON FIGURE 6-6		
J6				SHOWN ON FIGURE 6-6		
J7				SHOWN ON FIGURE 6-6		
J8				SHOWN ON FIGURE 6-6		
J9				SHOWN ON FIGURE 6-6		
J10				SHOWN ON FIGURE 6-6		
J11				SHOWN ON FIGURE 6-6		
J12				SHOWN ON FIGURE 6-22		
J13				SHOWN ON FIGURE 6-22		
J14				SHOWN ON FIGURE 6-22		
J15				SHOWN ON FIGURE 6-22		
J16				SHOWN ON FIGURE 6-22		
J17				SHOWN ON FIGURE 6-22		
J18				SHOWN ON FIGURE 6-22		
J19				SHOWN ON FIGURE 6-22		
J20				SHOWN ON FIGURE 6-22		
J21				SHOWN ON FIGURE 6-22		
J22				SHOWN ON FIGURE 6-6		
R1	0698-8818	3	2	RESISTOR 3.16 1% .125W F TC=0+-100	28480	0698-8818
R2	0698-8818	3		RESISTOR 3.16 1% .125W F TC=0+-100	28480	0698-8818
S2	3101-0070	3	1	SWITCH-SL DPDT MINTR .5A 125VAC/DC	79727	GF-126-0000
T1				TRANSFORMER-POWER 100/120/220/240V SHOWN ON FIGURE 6-23		
U1				LINE MODULE-FILTERED SHOWN ON FIGURE 6-23		

See introduction to this section for ordering information
*Indicates factory selected value

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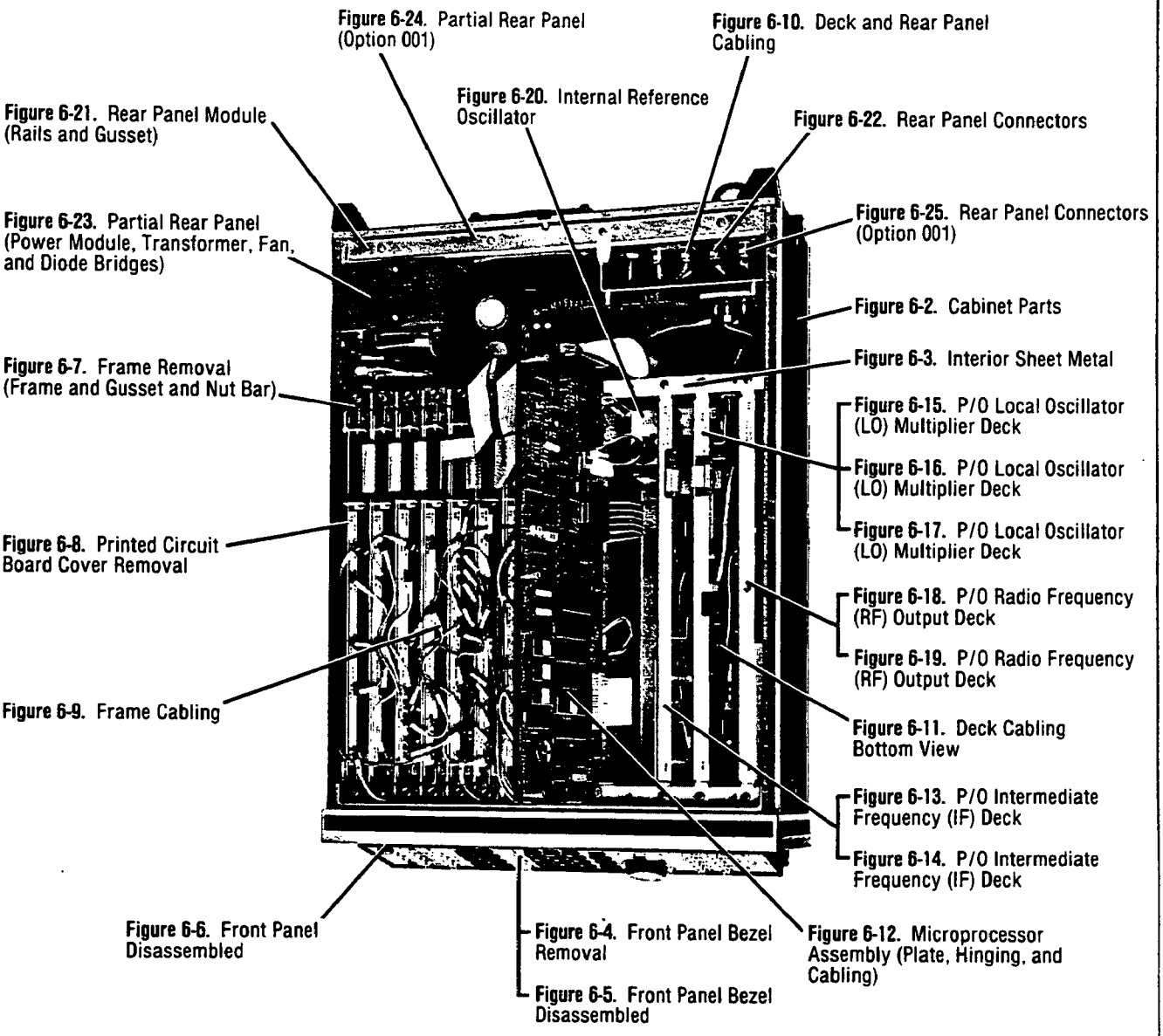

Figure 6-1. Figure Numbers of Major Sections

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-2				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	5041-6820	7	1	HANDLE CAP REAR	28480	5041-6820
2	5060-9805	4	1	STRAP HANDLE 21 INCH	28480	5060-9805
3	5060-9885	0	1	COVER SIDE	28480	5060-9885
4	5001-0440	1	1	TRIM STRIP SIDE	28480	5001-0440
5	5040-7221	2	1	STANDOFF REAR PANEL	28480	5040-7221
6	5040-7221	2	1	STANDOFF REAR PANEL	28480	5040-7221
7	5021-5806	5	1	FRAME REAR	28480	5021-5806
8	5041-6819	4	1	HANDLE CAP FRONT	28480	5041-6819
9	5021-5838	3	1	STRUT CORNER	28480	5021-5838
10	5021-5838	3	1	STRUT CORNER	28480	5021-5838
11	5061-9436	9	1	COVER TOP	28480	5061-9436
12	5061-9448	3	1	COVER BOTTOM	28480	5061-9448
13	5040-7201	8	1	FOOT FULL 1/2 MODULE	28480	5040-7201
14	5040-7221	2	1	STANDOFF REAR PANEL	28480	5040-7221
15	5040-7221	2	1	STANDOFF REAR PANEL	28480	5040-7221
16	1460-1345	5	1	TILT STAND SST	28480	1460-1345
17	5040-7201	8	1	FOOT FULL 1/2 MODULE	28480	5040-7201
18	5021-5805	4	1	FRAME FRONT	28480	5021-5805
19	5040-7202	9	1	TRIM STRIP TOP	28480	5040-7202
20	5021-5838	3	1	STRUT CORNER	28480	5021-5838
21	5021-5838	3	1	STRUT CORNER	28480	5021-5838
22	5060-9885	0	1	COVER SIDE	28480	5060-9885
23	1460-1345	5	1	TILT STAND SST	28480	1460-1345
24	5040-7201	8	1	FOOT FULL 1/2 MODULE	28480	5040-7201
25	5060-9805	4	1	STRAP HANDLE 21 INCH	28480	5060-9805
26	5041-6820	7	1	HANDLE CAP REAR	28480	5041-6820
27	5041-6819	4	1	HANDLE CAP FRONT	28480	5041-6819
28	5001-0440	1	1	TRIM STRIP SIDE	28480	5001-0440

See introduction to this section for ordering information
*Indicates factory selected value

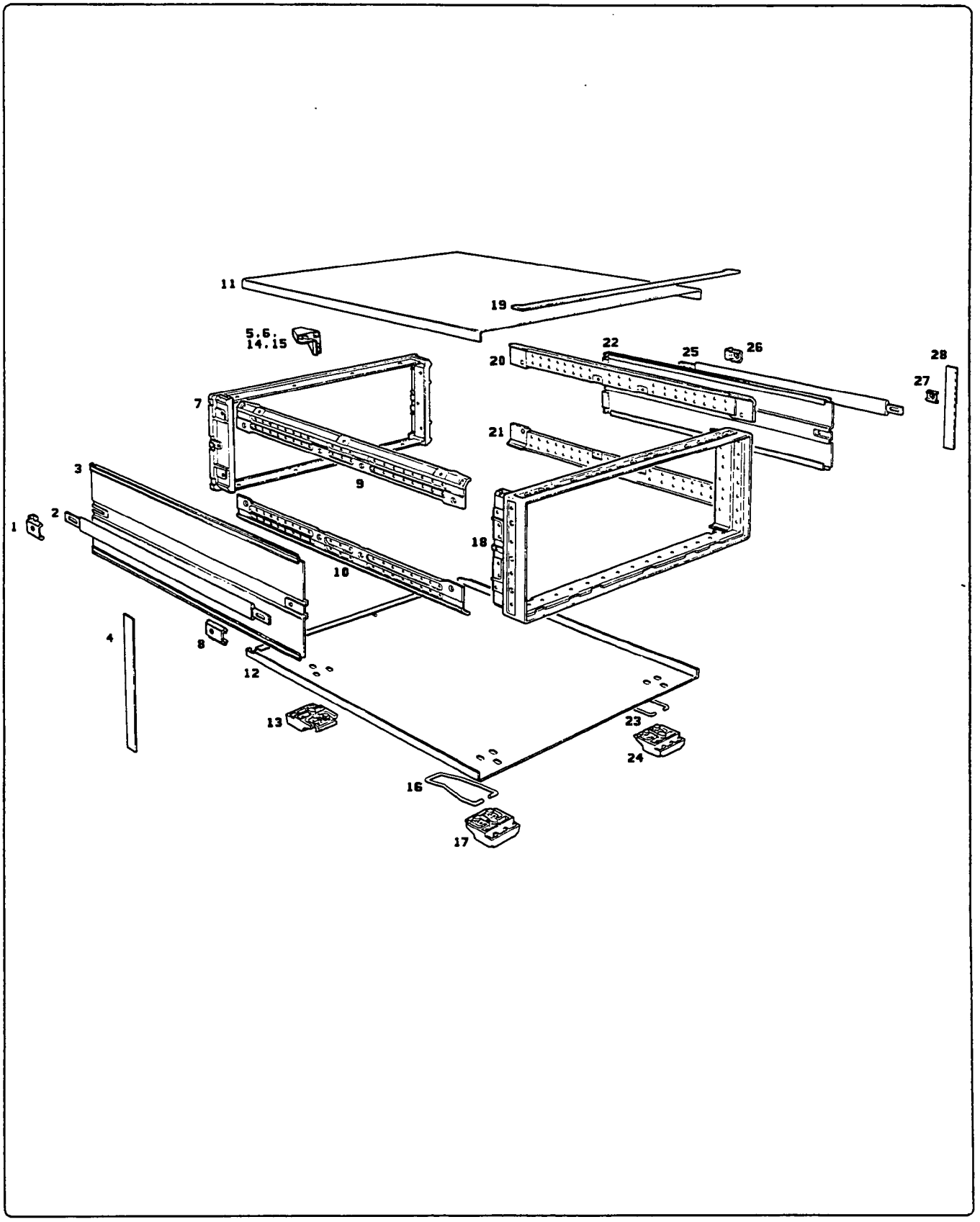

Figure 6-2. Cabinet Parts

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-3				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				SHOWN ON FIGURE 6-2		
2	08780-00022	1	1	AC COVER PLATE	28480	08780-00022
3	0515-1232	5	1	SCREW-MACH M3.5 X 0.6 8MM-LG PAN-HD	28480	0515-1232
4	0515-1232	5	1	SCREW-MACH M3.5 X 0.6 8MM-LG PAN-HD	28480	0515-1232
5	08780-20135	9	1	CAPTIVE NUT BAR	28480	08780-20135
6	08780-00005	0	1	GUSSET REAR	28480	08780-00005
7	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
8	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
9	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
10	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
11	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
12	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
13	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
14				SHOWN ON FIGURE 6-2		
15				SHOWN ON FIGURE 6-2		
16	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
17	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
18	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
19	08780-00006	1	1	SUPPORT DECK STRUCTURE	28480	08780-00006
20	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
21	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
22	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
23	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
24	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
25	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
26	08780-00004	9	1	GUSSET FRONT	28480	08780-00004
27	08780-20135	9	1	CAPTIVE NUT BAR	28480	08780-20135
28				SHOWN ON FIGURE 6-2		
29	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
30				SHOWN ON FIGURE 6-2		
31				SHOWN ON FIGURE 6-2		
32	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
33	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
34	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
35	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
36	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
37	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
38	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
39	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
40	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
41	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
42	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
43	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
44	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
45	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
46	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
47	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
48	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
49	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
50	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885

See introduction to this section for ordering information
*Indicates factory selected value

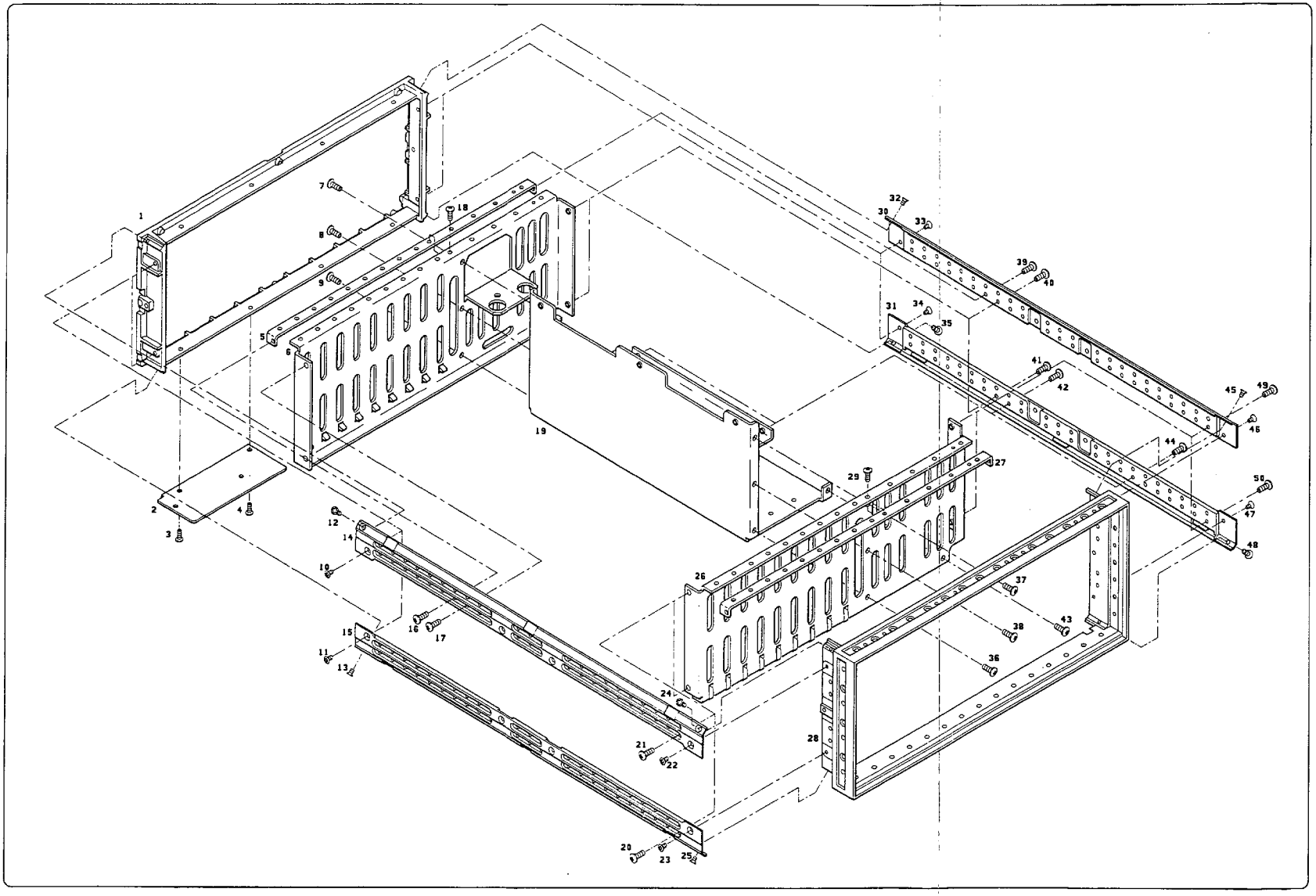

Figure 6-3. Interior Sheet Metal

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-4				NOTE:		
				THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				SHOWN ON FIGURE 6-2		
2				SHOWN ON FIGURE 6-6		
3				NSR P/O BEZEL		
4	0515-1107	3	1	SCREW-MACH M2.5 X 0.45 8MM-LG PAN-HD	28480	0515-1107
5	0515-1107	3	1	SCREW-MACH M2.5 X 0.45 8MM-LG PAN-HD	28480	0515-1107
6				SHOWN ON FIGURE 6-5		
7	0515-1107	3	1	SCREW-MACH M2.5 X 0.45 8MM-LG PAN-HD	28480	0515-1107
8	0515-1107	3	1	SCREW-MACH M2.5 X 0.45 8MM-LG PAN-HD	28480	0515-1107
9	0515-1107	3	1	SCREW-MACH M2.5 X 0.45 8MM-LG PAN-HD	28480	0515-1107
10	0515-1107	3	1	SCREW-MACH M2.5 X 0.45 8MM-LG PAN-HD	28480	0515-1107

See introduction to this section for ordering information
*Indicates factory selected value

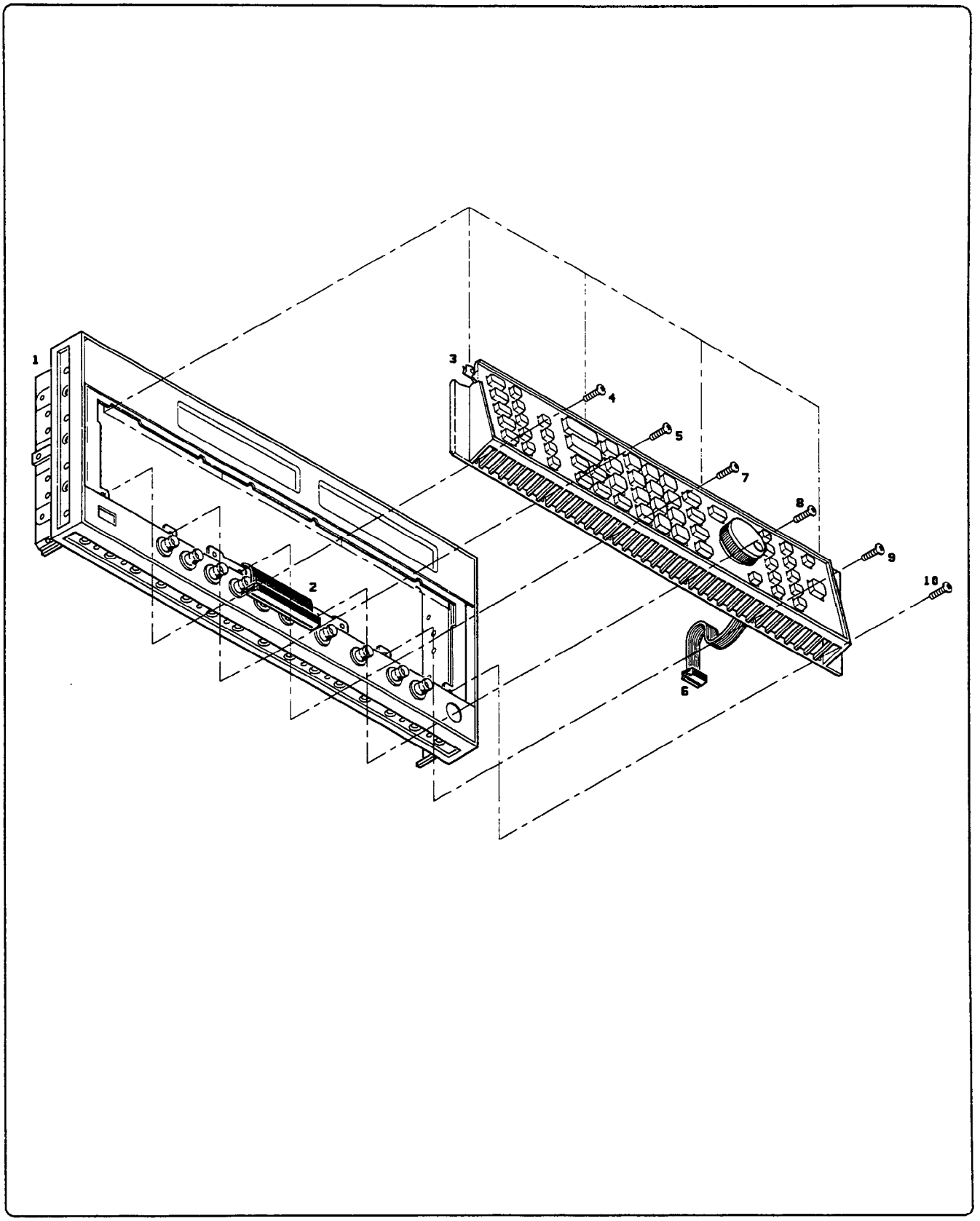

Figure 6-4. Front Panel Bezel Removal

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-5				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
2				A1A2 KEYBOARD		
3	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
4	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
5	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
6	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
7	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
8	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
9	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
10	08780-20021	2	1	BEZEL KEYBOARD	28480	08780-20021
11	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
12				NSR P/O ITEM 15		
13	0515-0169	5	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 10MM-LG	00000	ORDER BY DESCRIPTION
14	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
15	0960-0713	8	1	ROTARY PULSE GENERATOR TWO CHANNEL	28480	0960-0713
16	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
17				NSR P/O ITEM 15		
18				NSR P/O ITEM 15		
19	08780-00001	6	1	PANEL KEYBOARD	28480	08780-00001
20	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
21	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
22				NSR P/O ITEM 15		
23	01650-47401	7	1	KNOB-RPG	28480	01650-47401
24				NSR P/O ITEM 23		
25				NSR P/O ITEM 23		
26	08780-90002			ADHESIVE		
				NOTE: ADHESIVE REPLACES RETAINING CLIPS 8, 9, 14, 16, 20 AND 21 IN 2933A AND ABOVE		

See introduction to this section for ordering information
*Indicates factory selected value

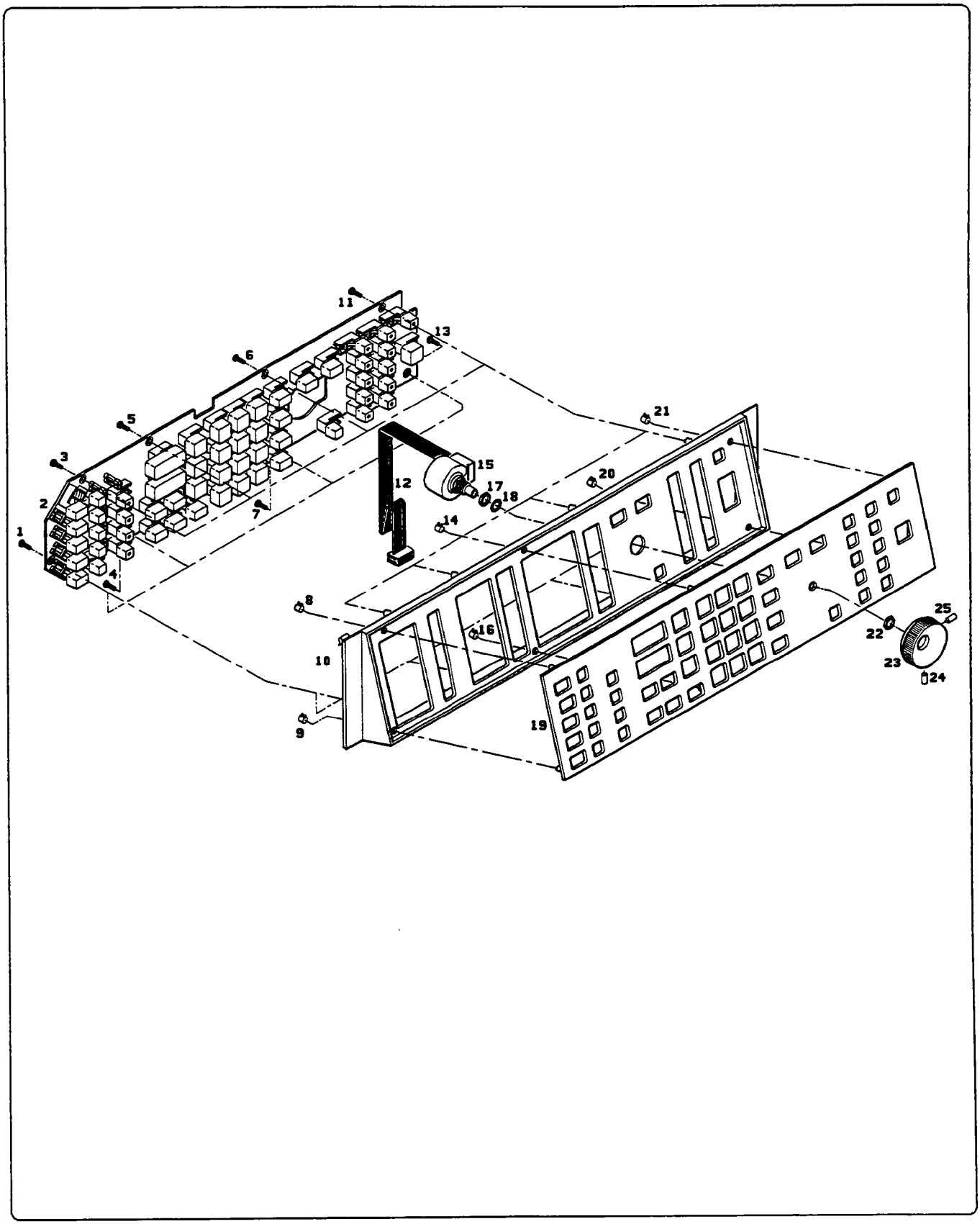

Figure 6-5. Front Panel Bezel Disassembled

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-6				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				SHOWN ON FIGURE 6-2		
2						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055
3						
(2809A AND BELOW)	2190-0047	0	1	WASHER-LK 82 CTSK EXT T NO. 6 .142-IN-ID	78189	1506-00
(2820A AND ABOVE)				PART IS DELETED		
4						
(2809A AND BELOW)	2190-0047	0	1	WASHER-LK 82 CTSK EXT T NO. 6 .142-IN-ID	78189	1506-00
(2820A AND ABOVE)				PART IS DELETED		
5						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055
6	2950-0001	8	1	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
7	2190-0016	3	1	WASHER-LK INTL T 3/8 IN .377-IN-ID	78189	1920-02
8	08780-00014	1	1	BRACKET OUTPUT CONNECTOR	28480	08780-00014
9						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055
10						
(2809A AND BELOW)	2190-0047	0	1	WASHER-LK 82 CTSK EXT T NO. 6 .142-IN-ID	78189	1506-00
(2820A AND ABOVE)				PART IS DELETED		
11						
(2635A AND ABOVE)				PART IS DELETED		
12						
(2635A AND ABOVE)				PART IS DELETED		
13	08684-20135	2	1	SLEEVE CONNECTOR MOUNTING	28480	08684-20135
14				W12 A1A2 KEYBOARD TO A1A3 INTERFACE (RIBBON) SHOWN ON FIGURE 6-9		
15						
(2635A AND ABOVE)				PART IS DELETED		
16						
(2635A AND ABOVE)				PART IS DELETED		
17						
(2809A AND BELOW)	08780-20022	3	1	SUPPORT CONNECTOR	28480	08780-20022
(2820A AND ABOVE)	5021-7084	5	1	SUPPORT CONNECTOR	28480	5021-7084
18						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055
19						
(2809A AND BELOW)	2190-0047	0	1	WASHER-LK 82 CTSK EXT T NO. 6 .142-IN-ID	78189	1506-00
(2820A AND ABOVE)				PART IS DELETED		
20	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
21	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
22	5061-1190	6	1	LCD DISPLAY	28480	5061-1190
23	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
24						
(2809A AND BELOW)	2190-0047	0	1	WASHER-LK 82 CTSK EXT T NO. 6 .142-IN-ID	78189	1506-00
(2820A AND ABOVE)				PART IS DELETED		
25						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055
26	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
27				A1A3 PANEL INTERFACE		
28						
(2809A AND BELOW)	2190-0047	0	1	WASHER-LK 82 CTSK EXT T NO. 6 .142-IN-ID	78189	1506-00
(2820A AND ABOVE)				PART IS DELETED		
29						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
30						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055
31						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)				PART IS DELETED		
32						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)				PART IS DELETED		
33						
(2809A AND BELOW)	0515-1422	5	1	SCREW-MACH M3.5 X 0.6 6MM-LG	28480	0515-1422
(2820A AND ABOVE)	0515-1055	0	1	SCREW-MACH M4 X 0.7 6MM-LG 90-DEG-FLH-HD	28480	0515-1055
34	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
35	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
36	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
37	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
38	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
39	5061-1190	6	1	LCD DISPLAY	28480	5061-1190
40	08780-20081	4	1	WINDOW DISPLAY	28480	08780-20081
41	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
42				J1 PART OF W1 FRONT PAN DIG0 TO A10J6 BUFFER FRAME. SHOWN ON FIGURE 6-9		
43	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
44	3050-1262	8	1	WASHER-SPR CRVD NO. 6 .161-IN-ID	86928	5804-27-2
45						
(2809A AND BELOW)		3	1	FRONT SUB PANEL For 2809A and Below Also Order	28480	08780-00024
(2820A AND ABOVE)	08780-00063	0	1	FRONT SUB PANEL Six (6) 0515-1055 Screws.	28480	08780-00063
46	08780-00044	7	1	DISPLAY PANEL	28480	08780-00044
47				J2 PART OF W2 FRONT PAN DIG1 TO A10J5 BUFFER FRAME. SHOWN ON FIGURE 6-9		
48	1600-0692	1	1	STAMPING-BE-CU CLIP WINDOW RETAINING	28480	1600-0692
49	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
50	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
51	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
52				J3 PART OF W3 FRONT PAN DIG2 TO A10J4 BUFFER FRAME. SHOWN ON FIGURE 6-9		
53	08780-00056	1	1	PANEL CONNECTOR (EXCEPT OPTION 064)	28480	08780-00056
	08780-00053	8	1	PANEL CONNECTOR (OPTION 064)	28480	08780-00053
54	08780-20081	4	1	WINDOW DISPLAY	28480	08780-20081
55				J4 PART OF W4 FRONT PAN DIG3 TO A10J3 BUFFER FRAME. SHOWN ON FIGURE 6-9		
56				J5 PART OF W5 FRONT PAN DIG4 TO A10J2 BUFFER FRAME. SHOWN ON FIGURE 6-9		
57	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
58				J6 PART OF W6 FRONT PAN DIG5 TO A10J1 BUFFER FRAME. SHOWN ON FIGURE 6-9		
59	08780-60042	1	1	OUTPUT CONNECTOR	28480	08780-60042
60	1600-0692	1	1	STAMPING-BE-CU CLIP WINDOW RETAINING	28480	1600-0692
61				J7 PART OF W7 FRONT PAN FM IN TO A7J6 FM BB FRAME. SHOWN ON FIGURE 6-9		
62	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
63	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
64	08780-00013	0	1	PANEL FRONT LOWER OPTION 001 ONLY	28480	08780-00013
65	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
66				J8 PART OF W8 FRONT PAN SCALAR IN TO A9J1 DAC FRAME. SHOWN ON FIGURE 6-9		
67	1600-0692	1	1	STAMPING-BE-CU CLIP WINDOW RETAINING	28480	1600-0692
68	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
69				J9 PART OF W9 FRONT PAN VECTOR IN I TO A8J5 FILTER FRAME. SHOWN ON FIGURE 6-9		
70	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
71				J10 PART OF W10 FRONT PAN VECTOR IN Q TO A8J10 FILTER FRAME. SHOWN ON FIGURE 6-9		
72	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
73	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
74	1600-0692	1	1	STAMPING-BE-CU CLIP WINDOW RETAINING	28480	1600-0692
75	0510-1148	2	1	RETAINER-PUSH-ON KB-TO-SHFT EXT	11591	669
76	3050-1262	8	1	WASHER-SPR CRVD NO. 6 .161-IN-ID	86928	5804-27-2

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
77	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
78	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
79	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
80				J22 PART OF W98 FRONT PAN DIG6 TO A10J7 DIG6 BUFFER FRAME (OPTION 064). SHOWN ON FIGURE 6-9		

See introduction to this section for ordering information
*Indicates factory selected value

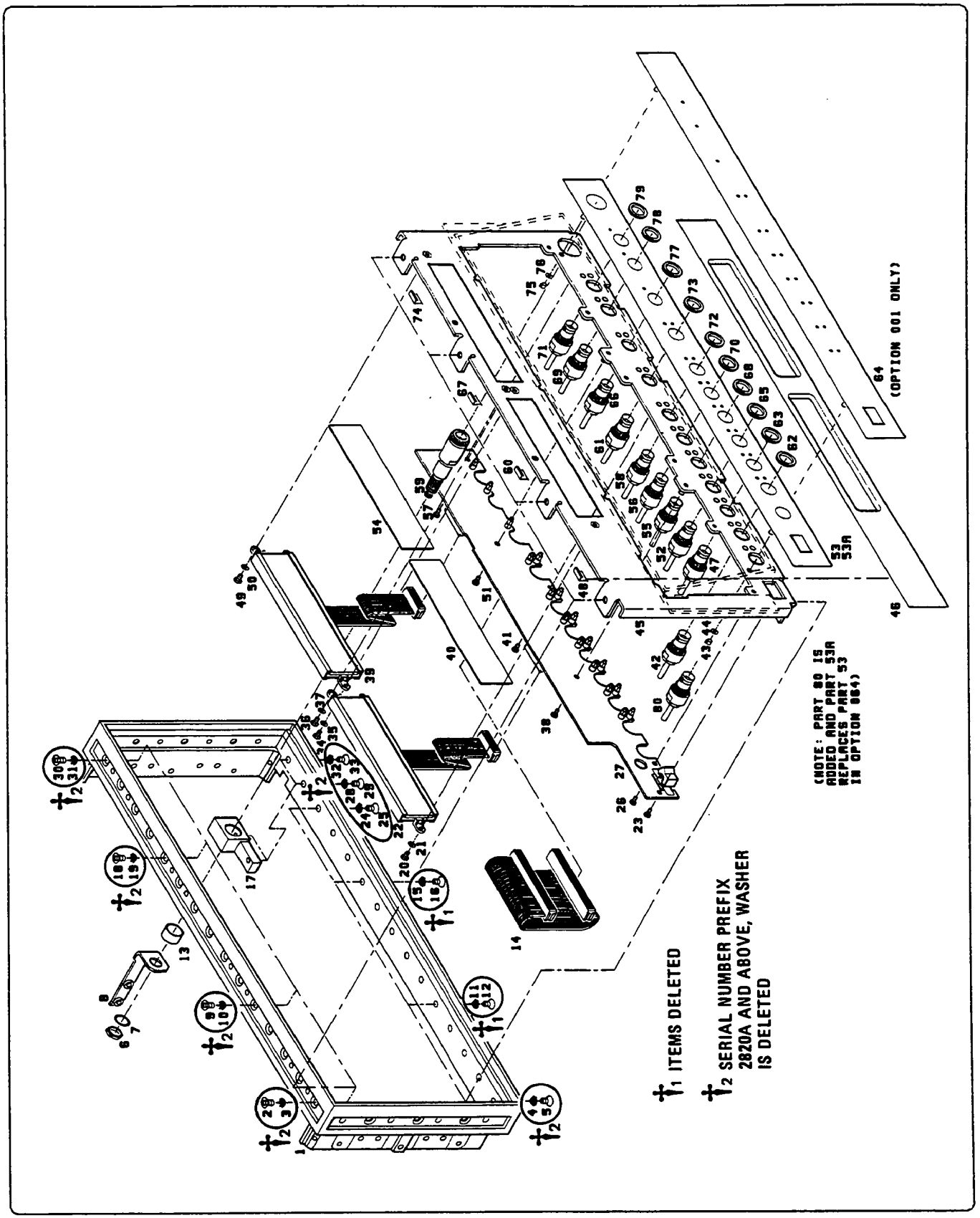

Figure 6-6. Front Panel Disassembled

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-7				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	0515-1115	3	1	SCREW-MACH M4 X 0.7 12MM-LG PAN-HD	28480	0515-1115
2				TABLE SHOWS ASSEMBLY AND FRAME PART NUMBERS.		
3				SHOWN ON FIGURE 6-3. CAPTIVE NUT BAR		
4				SHOWN ON FIGURE 6-3. GUSSETT REAR		
5				CABLES (IDENTIFICATION DIFFERENT FROM FRAME TO FRAME)		
6				CABLE (IDENTIFICATION DIFFERENT FROM FRAME TO FRAME)		
7				SHOWN ON FIGURE 6-3. GUSSETT FRONT		
8	0515-1115	3	1	SCREW-MACH M4 X 0.7 12MM-LG PAN-HD	28480	0515-1115
9				SHOWN ON FIGURE 6-3. CAPTIVE NUT BAR		

See introduction to this section for ordering information
*Indicates factory selected value

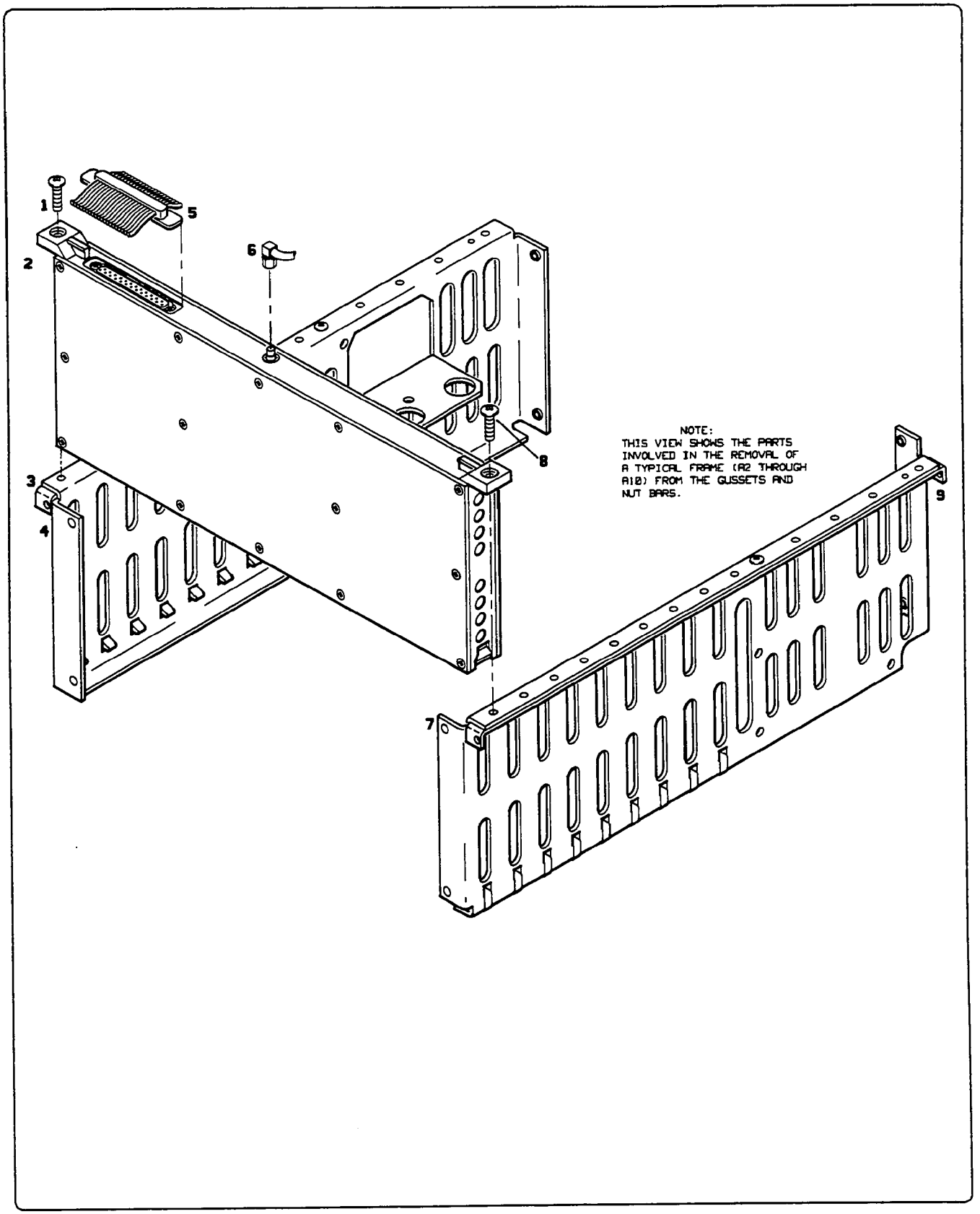

Figure 6-7. Frame Removal (Frame to Gusset and Nutbar)

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-8				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
2	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
3	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
4	5001-6518	6	1	COVER FRONT	28480	5001-6518
5	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
6	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
7	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
8	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
9	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
10	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
11	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
12	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
13	0515-1430	5	1	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-1430
14	0515-1430	5	1	SCREW-MACH M3 X 0.5 8MM-LG 90-DEG-FLH-HD	28480	0515-1430
15	5021-4533	3	1	NSR SPECIAL TOOL NEEDED TO REPLACE	28480	5021-4533
16	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
17	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
18	0515-1008	3	1	SCREW-MACH M3 X 0.5 20MM-LG	28480	0515-1008
19				SEE TABLE FRAME CASTING PART NUMBER IS DEPENDENT ON ASSEMBLY NUMBER		
20	8160-0472	8	1	RFI ROUND STRIP BE-CU SN-PL .093-IN-OD	10899	MS-06 N/C
21	5001-6519	7	1	COVER REAR	28480	5001-6519

See introduction to this section for ordering information
*Indicates factory selected value

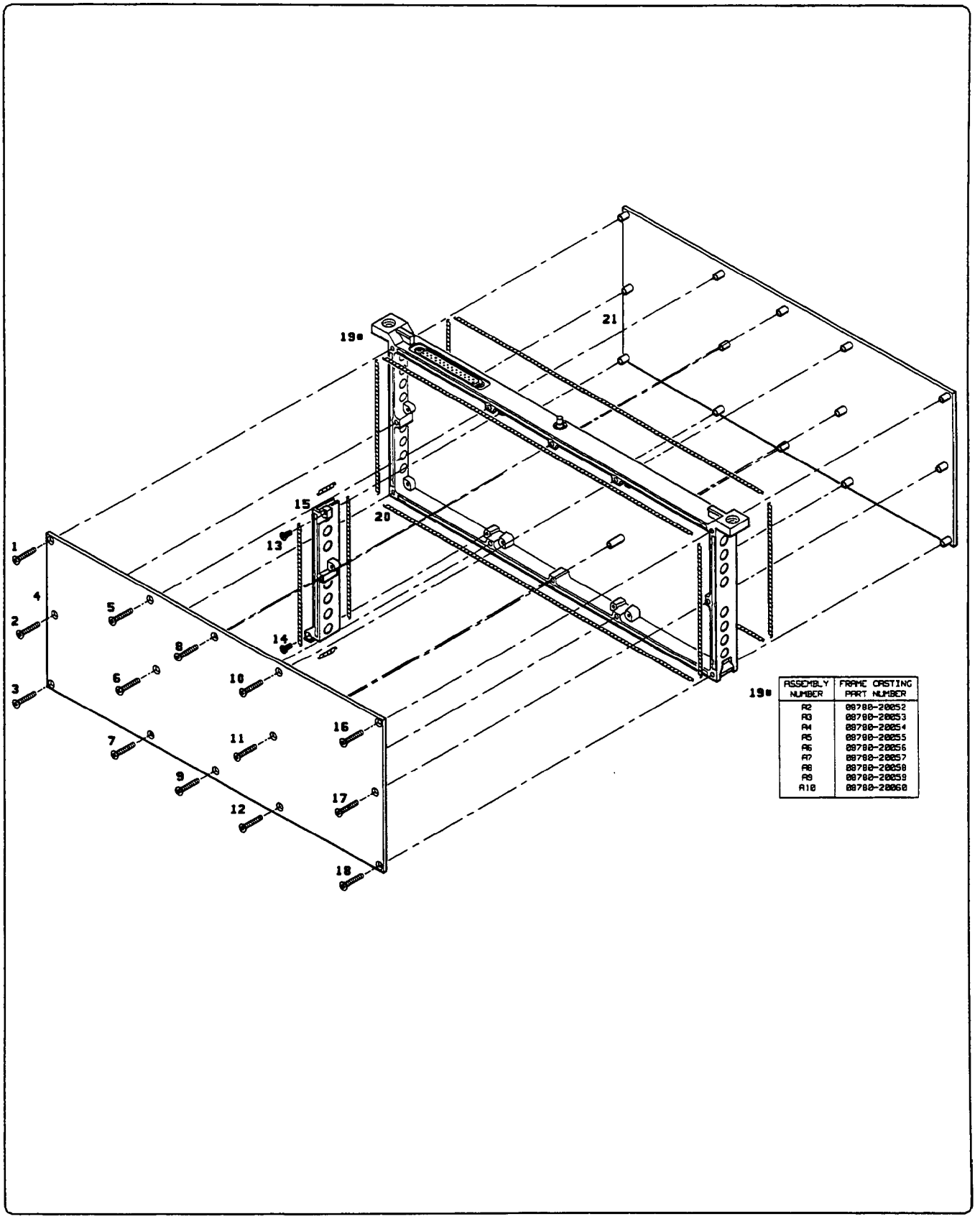

Figure 6-8. Printed Circuit Board Cover Removal

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-9				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
				HP 8780A CABLES		
W1						
(2715A AND BELOW)	08780-60055	6	1	FRONT PAN DIG0 TO A10J6 BUFFER FRAME DIG	28480	08780-60055
(2716A AND ABOVE)	08780-60111	5	1	FRONT PAN DIG0 TO A10J6 BUFFER FRAME DIG	28480	08780-60111
W2						
(2715A AND BELOW)	08780-60056	7	1	FRONT PAN DIG1 TO A10J5 BUFFER FRAME DIG	28480	08780-60056
(2716A AND ABOVE)	08780-60112	6	1	FRONT PAN DIG1 TO A10J5 BUFFER FRAME DIG	28480	08780-60112
W3						
(2715A AND BELOW)	08780-60057	8	1	FRONT PAN DIG2 TO A10J4 BUFFER FRAME DIG	28480	08780-60057
(2716A AND ABOVE)	08780-60113	7	1	FRONT PAN DIG2 TO A10J4 BUFFER FRAME DIG	28480	08780-60113
W4						
(2715A AND BELOW)	08780-60058	9	1	FRONT PAN DIG3 TO A10J3 BUFFER FRAME DIG	28480	08780-60058
(2716A AND ABOVE)	08780-60114	8	1	FRONT PAN DIG3 TO A10J3 BUFFER FRAME DIG	28480	08780-60114
W5						
(2715A AND BELOW)	08780-60059	0	1	FRONT PAN DIG4 TO A10J2 BUFFER FRAME DIG	28480	08780-60059
(2716A AND ABOVE)	08780-60115	9	1	FRONT PAN DIG4 TO A10J2 BUFFER FRAME DIG	28480	08780-60115
W6						
(2715A AND BELOW)	08780-60060	3	1	FRONT PAN DIG5 TO A10J1 BUFFER FRAME DIG	28480	08780-60060
(2716A AND ABOVE)	08780-60116	0	1	FRONT PAN DIG5 TO A10J1 BUFFER FRAME DIG	28480	08780-60116
W7						
(2715A AND BELOW)	08780-60061	4	1	FRONT PAN FM IN TO A7J6 FM BB FRAME	28480	08780-60061
(2716A AND ABOVE)	08780-60117	1	1	FRONT PAN FM IN TO A7J6 FM BB FRAME	28480	08780-60117
W8						
(2715A AND BELOW)	08780-60062	5	1	FRONT PAN SCALAR IN TO A9J1 DAC FRAME	28480	08780-60062
(2716A AND ABOVE)	08780-60118	2	1	FRONT PAN SCALAR IN TO A9J1 DAC FRAME	28480	08780-60118
W9	08780-60063	6	1	VECTOR IN I TO A8J5 FILTER FRAME STD AND OPT 001	28480	08780-60063
W10	08780-60064	7	1	VECTOR IN Q TO A8J10 FILTER FRAME STD AND OPT 001	28480	08780-60064
W11	08780-60044	3	1	A1A3 INTERFACE TO A1A4 DISPLAY (RIBBON)	28480	08780-60044
W12	08780-60043	2	1	A1A2 KEYBOARD TO A1A3 INTERFACE (RIBBON)	28480	08780-60043
W15	08780-60044	3	1	A1A3 INTERFACE TO A1A5 DISPLAY (RIBBON)	28480	08780-60044
W17	08780-60079	4	1	A2J2 SUM VCO TO A2J3 SUM VCO	28480	08780-60079
W18	08780-60080	7	1	A2J4 REF LOOP TO A3J2 REF LOOP	28480	08780-60080
W19	08780-60083	0	1	A2J5 FRAC N TO A5J1 FRAC N	28480	08780-60083
W20	08780-60053	4	1	A17 PWR DIST TO A2,A3,A4,A5 FRAMES (RIBBON)	28480	08780-60053
W21	08780-60080	7	1	A3J1 REF VCO TO A3J3 REF VCO	28480	08780-60080
W22	08780-60079	4	1	A3J4 REF 100 TO A4J8 REF 100	28480	08780-60079
W23	08780-60082	9	1	A3J5 20/40 TO A4J2 20/40	28480	08780-60082
W24	08780-60079	4	1	A4J3 400 MHZ TO A5J3 400 MHZ	28480	08780-60079
W25	08780-60081	8	1	A4J4 AUX 100 TO A7J7 AUX 100	28480	08780-60081
W26	08780-60080	7	1	A4J5 TB VCO TO A4J7 TB VCO	28480	08780-60080
W28	08780-60082	9	1	A4J1 10 MHZ TO A5J4 10 MHZ	28480	08780-60082
W29	08780-60082	9	1	A5J2 FRAC N VCO TO A5J5 FRAC N VCO	28480	08780-60082
W31	08780-60079	4	1	A6J2 CW VCO TO A7J1 CW VCO	28480	08780-60079
W32	08780-60079	4	1	A6J3 ACFM VCO TO A6J4 ACFM VCO	28480	08780-60079
W33	08780-60080	7	1	A6J5 CW REF TO A7J8 CW REF	28480	08780-60080
W34	08780-60081	8	1	A6J6 VCXO TO A7J2 VCXO	28480	08780-60081
W35	08780-60081	8	1	A6J7 100 MHZ TO A7J3 100 MHZ	28480	08780-60081
W36	08780-60081	8	1	A6J8 CW TUNE TO A7J4 CW TUNE	28480	08780-60081
W37	08780-60081	8	1	A6J9 DCFM TO A7J5 DCFM	28480	08780-60081
W38	08780-60079	4	1	A6J10 BB TO A7J9 BB	28480	08780-60079
W40	08780-60080	7	1	A8J2 IBB TO A9J2 IBB	28480	08780-60080
W44	08780-60080	7	1	A8J7 QBB TO A9J3 QBB	28480	08780-60080

See introduction to this section for ordering information
*Indicates factory selected value

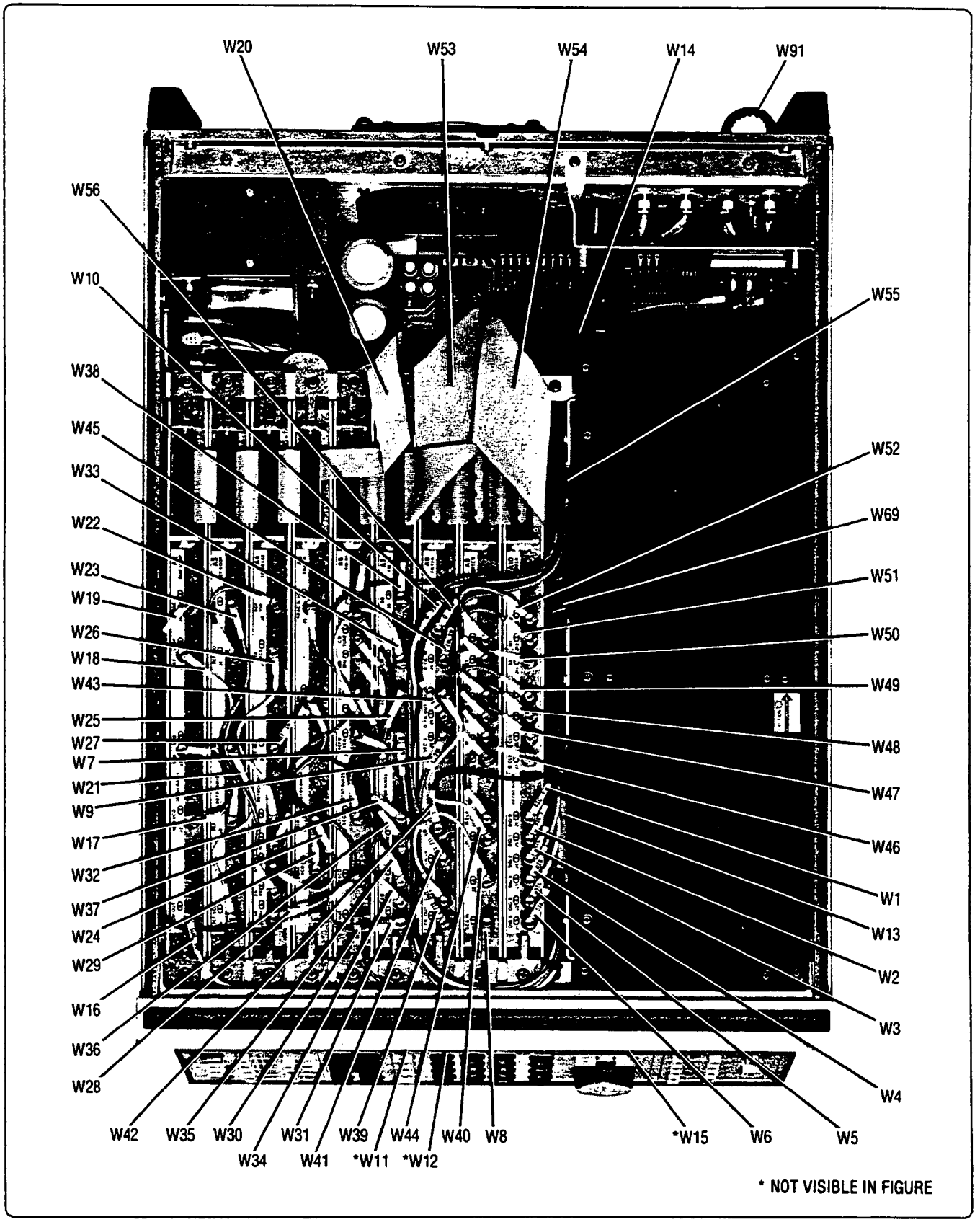

Figure 6-9. Frame Cabling

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
W46	08780-60079	4	1	A9J4 QCLK TO A10J7 QCLK	28480	08780-60079
W47	08780-60079	4	1	A9J5 ICLK TO A10J8 ICLK	28480	08780-60079
W48	08780-60079	4	1	A9J6 MR TO A10J9 MR	28480	08780-60079
W49	08780-60079	4	1	A9J7 D3 TO A10J10 D3	28480	08780-60079
W50	08780-60079	4	1	A9J8 D2 TO A10J11 D2	28480	08780-60079
W51	08780-60079	4	1	A9J9 D1 TO A10J12 D1	28480	08780-60079
W52	08780-60079	4	1	A9J10 D0 TO A10J13 D0	28480	08780-60079
W53	08780-60052	3	1	A17 PWR DIST TO A6, A7 FRAMES (RIBBON)	28480	08780-60052
W54	08780-60051	2	1	A17 PWR DIST TO A8,A9,A10 FRAME (RIBBON)	28480	08780-60051
W56	08780-60091	0	1	A8J9 Q OUT TO A15W6 RF OUTPUT DECK	28480	08780-60091

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-10				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
W13	08780-60045	4	1	A1A3 INTERFACE TO A11 MICROPROCESSOR (RIBBON)	28480	08780-60045
W14	08780-60047	6	1	A17 PWR DIST TO A11 MICROPROCESSOR (RIBBON)	28480	08780-60047
W27	08780-60089	6	1	A4J6 REF IN TO A18 POWER CONTROL	28480	08780-60089
W39	08780-60087	4	1	A8J1 I FIL OUT TO REAR PANEL EXT FLT I OUT STD AND OPT 001	28480	08780-60087
W41	08780-60086	3	1	A8J3 I FIL IN TO REAR PANEL EXT FLT I IN STD AND OPT 001	28480	08780-60086
W43	08780-60103	5	1	A8J6 Q FIL OUT TO REAR PANEL EXT FLT Q OUT STD AND OPT 001	28480	08780-60103
W45	08780-60102	4	1	A8J8 Q FIL IN TO REAR PANEL EXT FLT Q IN STD AND OPT 001	28480	08780-60102
W55	08780-60054	5	1	A17 PWR DIST TO A11 MICROPROCESSOR (6 WIRE)	28480	08780-60054
W59	08780-60095	4	1	A13 IF DECK TO A14 LO DECK (RIBBON)	28480	08780-60095
W60	08780-60049	8	1	A17 PWR DIST TO A14 LO DECK (RIBBON)	28480	08780-60049
W61	08780-60048	7	1	A17 PWR DIST TO A15 RF OUTPUT DECK (RIBBON)	28480	08780-60048
W62	08780-60109	1	1	RECTIFIER WIRE C W/V	28480	08780-60109
W63	08780-60107	9	1	RECTIFIER WIRE A W/BK/R	28480	08780-60107
W64	08780-60110	4	1	RECTIFIER WIRE D V	28480	08780-60110
W65	08780-60108	0	1	RECTIFIER WIRE B W/R	28480	08780-60108
W66	08780-60106	8	1	LINE MOD WIRE B W/BR/GY	28480	08780-60106
W67	08780-60105	7	1	LINE MOD WIRE A W/GY	28480	08780-60105
W68	08780-60104	6	1	INT EXT TIME BASE SW S2 BK AND W/R/G	28480	08780-60104
W69	08780-60046	5	1	HPIB REAR PANEL TO A11 MICROPROCESSOR (RIBBON) STD AND OPT 001	28480	08780-60046
W70	08780-60084	1	1	REAR PANEL 10MHZ TIMEBASE IN TO A18 PWR CONTROL STD AND OPT 001	28480	08780-60084
W71	08780-60088	5	1	REAR PANEL 10MHZ TIMEBASE OUT TO 10 MHZ REF OSC STD AND OPT 001	28480	08780-60088
W72	08780-60085	2	1	REAR PANEL 10MHZ TIMEBASE AUX OUT TO A18 PWR CONTROL STD AND OPT 001	28480	08780-60085
W73 (2725A AND BELOW)	08780-60096	5	1	REAR PANEL SYSTEM INTERFACE TO A11 MICROPROCESSOR STD AND OPT 001	28480	08780-60096
(2738A AND ABOVE)				PART IS DELETED		
W91	86701-60063	5	1	10MHZ TIMEBASE OUT TO IN	28480	86701-60063

See introduction to this section for ordering information
*Indicates factory selected value

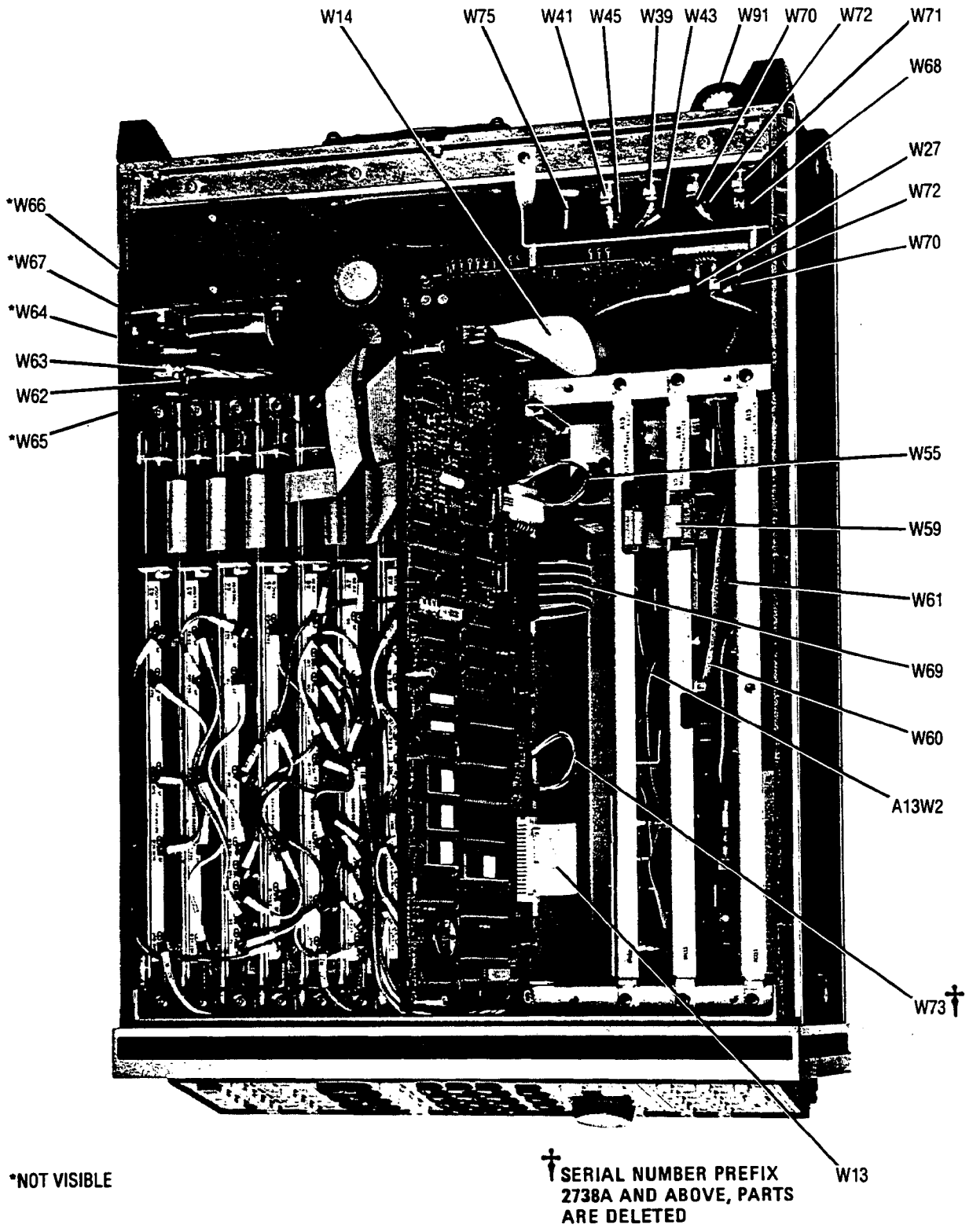

Figure 6-10. Deck and Rear Panel Cabling

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-11				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
W16	08780-60078	3	1	A2J1 SUM OUT TO A14W9	28480	08780-60078
W30	08780-60077	2	1	A6J1 FM OUT TO A13W3	28480	08780-60077
W42	08780-60090	9	1	A8J4 I OUT TO A15W10 RF OUTPUT DECK	28480	08780-60090
W57	08780-20061	0	1	CABLE ELBOW FROM A15W1 TO RF OUTPUT CONNECTOR	28480	08780-20061
W74	08780-20062	1	1	A13 IF DECK COHERENT CARRIER OUT TO COHERENT CARRIER CONNECTING CABLE	28480	08780-20062
W75	08780-20122	4	1	FROM COHERENT CARRIER CABLE TO REAR PANEL COHERENT CARRIER OUTPUT CONNECTOR	28480	08780-20122
W76	08780-20063	2	1	A13 IF DECK TO A14 LO DECK	28480	08780-20063
W77	08780-20064	3	1	A13 IF DECK TO A15 RF OUTPUT DECK	28480	08780-20064
W78	08780-20065	4	1	A14 LO DECK TO A15 OUTPUT DECK	28480	08780-20065
W79	08780-20106	4	1	A13 IF DECK COHERENT CARRIER TO REAR PANEL COHERENT CARRIER OPT 001	28480	08780-20106
W90	08780-60124	0	1	CBL AY LINE MDL POWER	28480	08780-60124
W93				DC POWER TO FAN (POS) RD		
W94				DC POWER TO FAN (NEG) BK		
				NOT SHOWN		
W58				NOT ASSIGNED		
W80	08780-60111	5	1	REAR PANEL DIG IN 0 TO A10J6 OPT 001	28480	08780-60111
W81	08780-60112	6	1	REAR PANEL DIG IN 1 TO A10J5 OPT 001	28480	08780-60112
W82	08780-60113	7	1	REAR PANEL DIG IN 2 TO A10J4 OPT 001	28480	08780-60113
W83	08780-60114	8	1	REAR PANEL DIG IN 3 TO A10J3 OPT 001	28480	08780-60114
W84	08780-60115	9	1	REAR PANEL DIG IN 4 I CLK TO A10J8 OPT 001	28480	08780-60115
W85	08780-60116	0	1	REAR PANEL DIG IN 5 Q CLK TO A10J7 OPT 001	28480	08780-60116
W86	08780-60117	1	1	REAR PANEL FM IN TO A7J6 FM IN OPT 001	28480	08780-60117
W87	08780-60118	2	1	REAR PANEL SCA IN TO A9J1 SCA IN OPT 001	28480	08780-60118
W88	08780-20114	4	1	STEP ATTENUATOR CABLE A15W1 TO REAR PANEL RF OUTPUT OPT 001	28480	08780-20114
W89	08780-20116	6	1	OUTPUT JUMPER OPT 001	28480	08780-20116
W92	8120-1378	1	1	CABLE ASSY 18AWG 3-CNDCT JGK-JKT	28480	8120-1378
W95	08780-20139	3	1	A13A4 AMPLIFIER OUTPUT TO COHERENT CARRIER CONNECTING CABLE W96 (OPTION 002)	28480	08780-20139
W96	08780-20140	6	1	FROM CABLE W95 TO REAR PANEL COHERENT CARRIER OUTPUT CONNECTOR (OPTION 002)	28480	08780-20140
W98						
(2715A AND BELOW)	08780-60127	3	1	FRONT PAN DIG6 TO A10J7 DIG6 BUFFER FRAME	28480	08780-60127
(2716A AND ABOVE)	08780-60139	7	1	FRONT PAN DIG6 TO A10J7 DIG6 BUFFER FRAME	28480	08780-60139

See introduction to this section for ordering information
*Indicates factory selected value

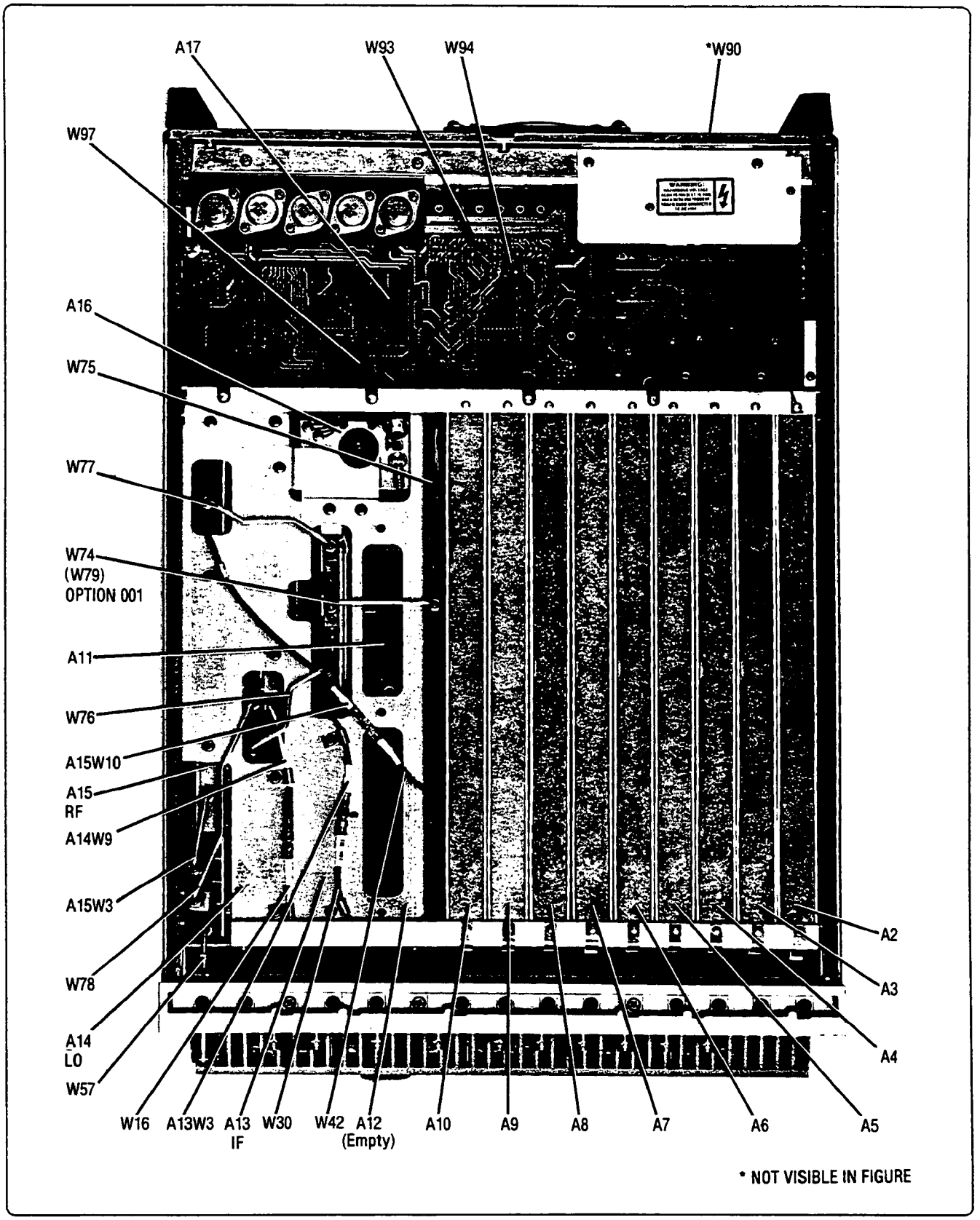

Figure 6-11. Deck Cabling Bottom View

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-12				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
2	0515-1508	8	1	SCREW-MACH M3 X 0.5 4MM-LG PAN-HD	28480	0515-1508
3	0515-1508	8	1	SCREW-MACH M3 X 0.5 4MM-LG PAN-HD	28480	0515-1508
4	08780-00040	3	1	INSULATOR PLATE	28480	08780-00040
5	0515-1508	8	1	SCREW-MACH M3 X 0.5 4MM-LG PAN-HD	28480	0515-1508
6	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
7	0515-1508	8	1	SCREW-MACH M3 X 0.5 4MM-LG PAN-HD	28480	0515-1508
8	0515-0912	6	1	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
9	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
10	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
11	5040-1497	2	1	HINGE MOLDED	28480	5040-1497
12	0515-0912	6	1	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
13	0515-1508	8	1	SCREW-MACH M3 X 0.5 4MM-LG PAN-HD	28480	0515-1508
14	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
15	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
16	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
17	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
18	0515-0912	6	1	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
19	5040-1497	2	1	HINGE MOLDED	28480	5040-1497
20	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
21	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
22	0515-0912	6	1	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
23	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
24	0515-1508	8	1	SCREW-MACH M3 X 0.5 4MM-LG PAN-HD	28480	0515-1508
25				W13 A1A3 INTERFACE TO A11 MICROPROCESSOR (RIBBON). SHOWN ON FIGURE 6-9		
26	0515-0912	6	1	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
27	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
28	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
29	08780-00006	1	1	SUPPORT DECK STRUCTURE	28480	08780-00006
30	5040-1497	2	1	HINGE MOLDED	28480	5040-1497
31				W73 REAR PANEL SYSTEM INTERFACE TO A11 MICROPROCESSOR. SHOWN ON FIGURE 6-10		
32	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
33	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
34	0515-0912	6	1	SCREW-MACH M3 X 0.5 8MM-LG PAN-HD	28480	0515-0912
35				W69 HPIB REAR PANEL TO A11 MICROPROCESSOR (RIBBON). SHOWN ON FIGURE 6-10		
36				W55 A17 PWR DIST TO A11 MICROPROCESSOR (6 WIRE). SHOWN ON FIGURE 6-10		
37				W14 A17 PWR DIST TO A11 MICROPROCESSOR (RIBBON). SHOWN ON FIGURE 6-10		

See introduction to this section for ordering information
*Indicates factory selected value

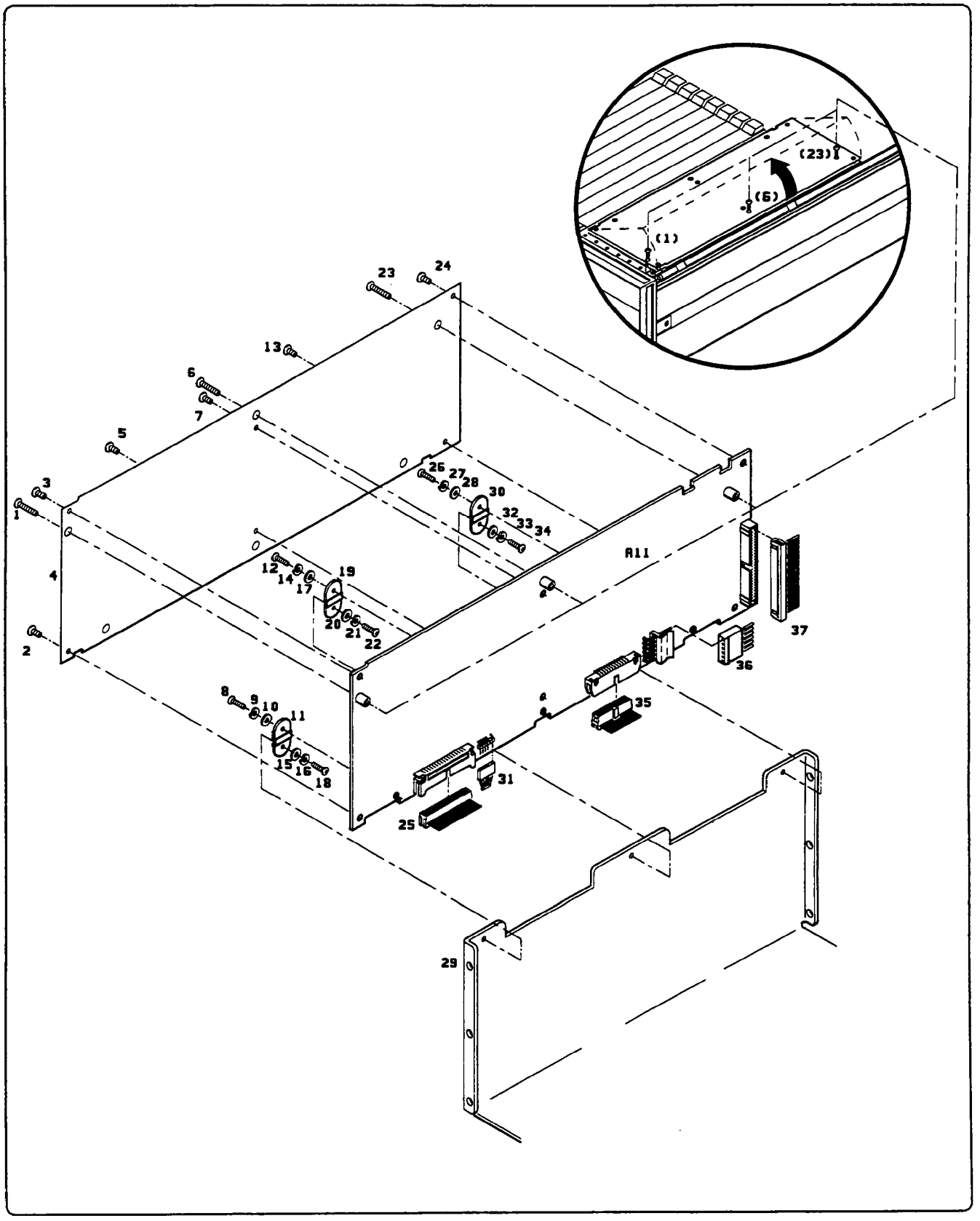

Figure 6-12. Microprocessor Assembly (Plate, Hinging, Cabling)

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-13				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
2	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
3	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
4	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
5	0515-1004	9	1	SCREW-MACH M2.5 X 0.45 20MM-LG	28480	0515-1004
6	0515-1004	9	1	SCREW-MACH M2.5 X 0.45 20MM-LG	28480	0515-1004
7	08780-00008	3	1	DECK STRUCTURE IF MULTIPLIER	28480	08780-00008
8	0515-1004	9	1	SCREW-MACH M2.5 X 0.45 20MM-LG	28480	0515-1004
9	0515-1004	9	1	SCREW-MACH M2.5 X 0.45 20MM-LG	28480	0515-1004
10	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
11	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
12	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
13	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
14	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
15	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
16	08780-20118	8	1	A13W1 AMPLIFIER/DOUBLER TO POWER AMPLIFIER	28480	08780-20118
17	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
18	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
19	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
20	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION
21				A13A3 POWER AMPLIFIER		
22	08780-60094	3	1	A13W3 FM OUT TO AMPLIFIER DOUBLER	28480	08780-60094
23	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
24	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
25	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
26	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION
27	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
28	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
29	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
30	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
31	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
32	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
33	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
34	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
35	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
36	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
37	08780-20023	4	1	HEATSINK POWER AMPLIFIER	28480	08780-20023
38	08780-20023	4	1	HEATSINK POWER AMPLIFIER	28480	08780-20023
39	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
40	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
41	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION
42	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION
43	0960-0055	1	1	CAP-COAX TO FIT M-SMA SHTG	28480	0960-0055
44						
(2746A AND BELOW)	08780-20077	8	1	A13W4 POWER AMPLIFIER TO IF MULTIPLIER	28480	08780-20077
(2805A AND ABOVE)	08780-20154	2	1	A13W4 POWER AMPLIFIER TO IF MULTIPLIER	28480	08780-20154
45				A13A1 IF INTERFACE		
46	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
47	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
48				A12 IF MULTIPLIER		
49	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
50	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
51	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
52	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
53	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918
54	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918

See introduction to this section for ordering information
*Indicates factory selected value

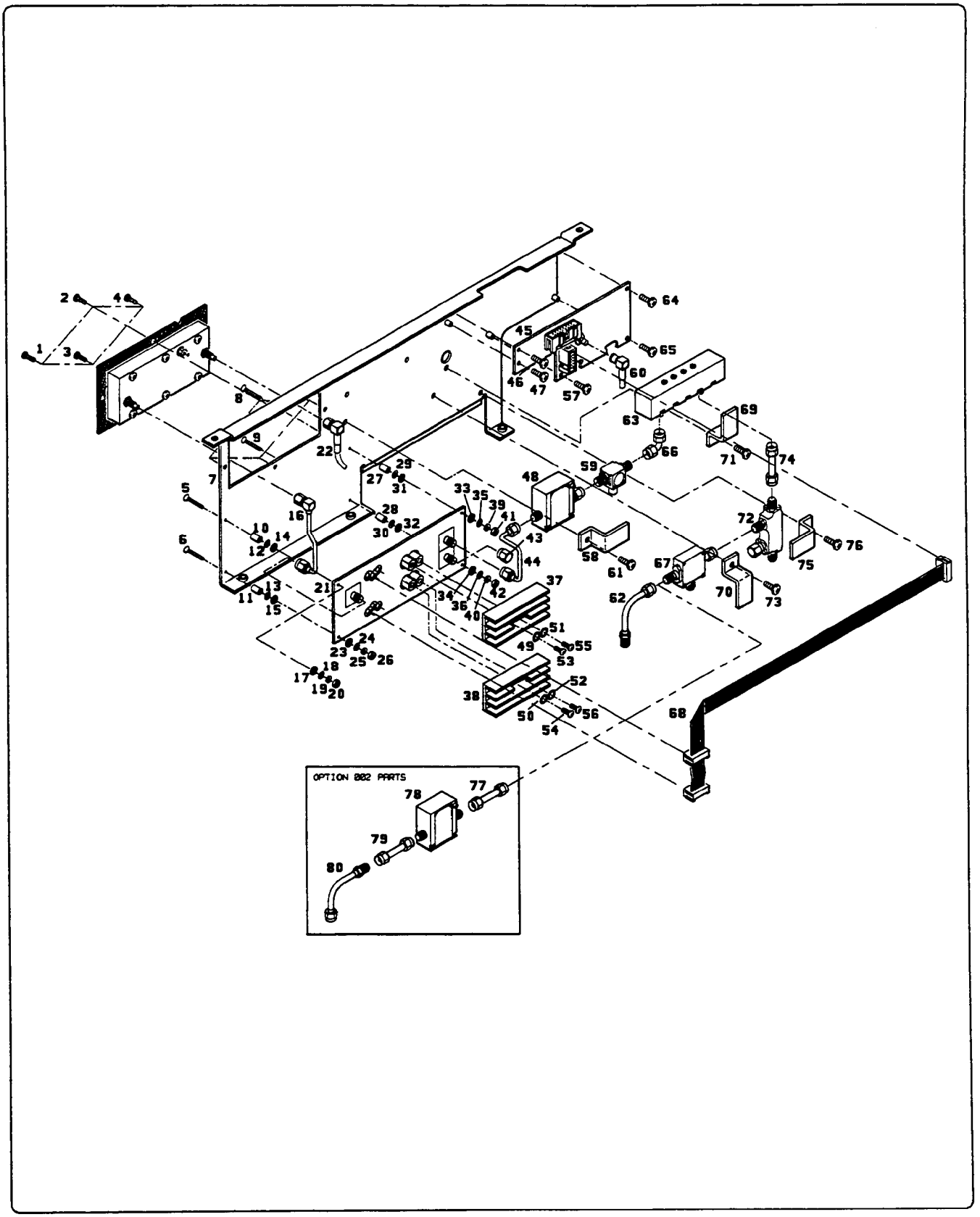

Figure 6-13. P/O Intermediate Frequency (IF) Deck

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
55	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918
56	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918
57	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
58	08780-00035	6	1	CLAMP IF MULTIPLIER	28480	08780-00035
59				AT3 ISOLATOR		
60	08780-60099	8	1	A13W5 SRD BIAS TO IF MULTIPLIER	28480	08780-60099
61	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
62	08780-20080	3	1	A13W6 LO DECK TO IF MIXER	28480	08780-20080
63				FL1 8 GHZ FILTER		
64	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
65	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
66	1250-1397	2	1	ADAPTER-COAX RTANG M-SMA M-SMA	05876	95-547-99024
67				AT4 IF DOUBLE BALANCED MIXER		
68	08780-60071	6	1	A13W2 BIAS TO POWER AMPLIFIER	28480	08780-60071
69	08780-00033	4	1	CLAMP 8 GHZ FILTER	28480	08780-00033
70	08780-00039	0	1	CLAMP IF DOUBLE BALANCED MIXER	28480	08780-00039
71	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
72				DC1 DIRECTIONAL COUPLER		
73	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
74	08780-20079	0	1	A13W8 8 GHZ FILTER TO COUPLER	28480	08780-20079
75	08780-00039	0	1	CLAMP DIRECTIONAL COUPLER	28480	08780-00039
76	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
77	08780-20138	2	1	A13W9 AT4 IF DOUBLE BAL MIXER TO A13A4	28480	08780-20138
78				AMPLIFIER (OPTION 002) A13A4 0.1-3.0 GHZ AMPLIFIER (OPTION 002)		
79				W95 A13A4 AMPLIFIER OUTPUT TO COHERENT CARRIER CONNECTING CABLE W96 (OPTION 002 SHOWN ON FIGURE 6-11		
80				W96 FROM CABLE W95 TO REAR PANEL COHERENT OUTPUT CONNECTOR (OPTION 002). SHOWN ON FIGURE 6-11		

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-14				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	08780-00048	1	1	PLATE BASE	28480	08780-00048
2	08780-20121	3	1	SCREEN RFI	28480	08780-20121
3				A13A2A1 1 GHZ AMPLIFIER/DOUBLER BOARD		
4	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
5	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
6	08780-20090	5	1	SPACER PRINTED CIRCUIT BOARD	28480	08780-20090
7	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
8	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
9	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
10	08780-00051	6	1	COVER 1 GHZ AMPLIFIER/DOUBLER	28480	08780-00051
11	08780-20090	5	1	SPACER PRINTED CIRCUIT BOARD	28480	08780-20090
12	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
13	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
14	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
15	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
16	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
17	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
18	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
19	2190-0009	4	1	WASHER-LK INTL T NO. 8 .168-IN-ID	U1453	1908
20	0160-2437	1	1	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
21	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
22				A13A2 AMPLIFIER/DOUBLER		

See introduction to this section for ordering information
*Indicates factory selected value

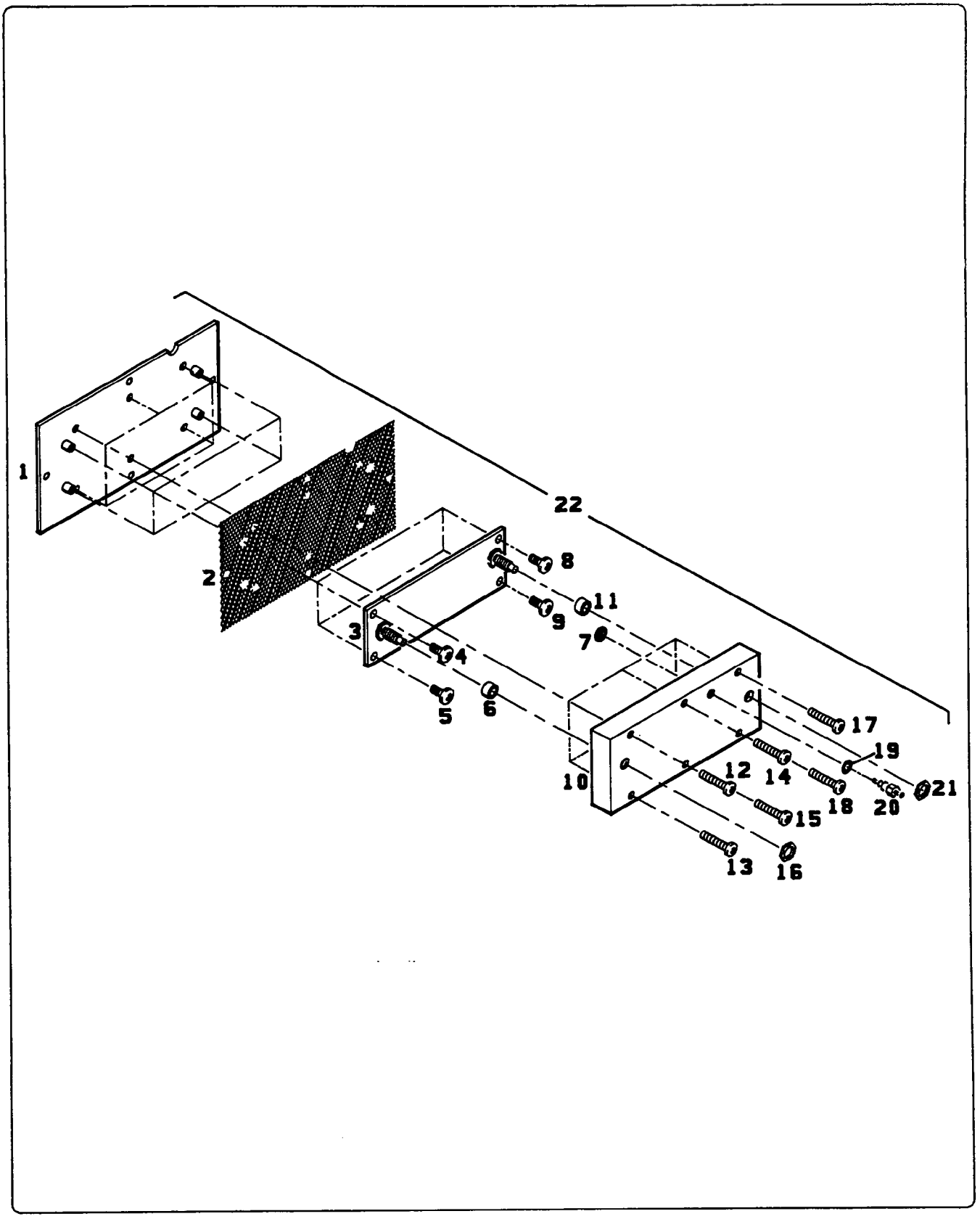

Figure 6-14. P/O Intermediate Frequency (IF) Deck

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-15				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	08780-00009	4	1	DECK SHEET METAL	28480	08780-00009
2	08780-60066	9	1	A14W1 RED 9.5-11.0 GHZ PIN DIODE DRIVE	28480	08780-60066
3	08780-60067	0	1	A14W2 ORANGE 8.0-9.5 GHZ PIN DIODE DRIVE	28480	08780-60067
4				AT6 PIN DIODE LO SWITCH		
5				FL2 8.0-9.5 GHZ FILTER		
6				FL3 9.5-11.0 GHZ FILTER		
7	08780-60068	1	1	A14W7 YELLOW LO LOW MULTIPLIER SRD BIAS	28480	08780-60068
8	08780-60069	2	1	A14W8 GREEN LO HIGH MULTIPLIER SRD BIAS	28480	08780-60069
9	08780-00033	4	1	CLAMP FOR FL3 9.5-11.0 GHZ FILTER	28480	08780-00033
10				AT7 FILTER COUPLER		
11	08780-20120	2	1	A14W3 FILTER/COUPLER TO A13 IF DECK	28480	08780-20120
12	08780-20078	9	1	A14W4 LO LOW ISOLATOR TO 8.0-9.5 GHZ FILTER	28480	08780-20078
13	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
14	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
15	08780-00033	4	1	CLAMP FOR FL2	28480	08780-00033
16	1250-1397	2	1	ADAPTER-COAX RTANG M-SMA M-SMA	05876	95-547-99024
17	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
18	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
19	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
20	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
21	0515-1667	0	1	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-1667
22				AT5 UWAVE ISOLATOR 12.4 GHZ MAX		
23				AT4 UWAVE ISOLATOR 12.4 GHZ MAX		
24				AT3 LO HIGH MULTIPLIER		
25				AT2 LO LOW MULTIPLIER		
26	08780-00035	6	1	CLAMP FOR AT3 LO HIGH MULTIPLIER	28480	08780-00035
27	08780-00035	6	1	CLAMP FOR AT2 LO LOW MULTIPLIER	28480	08780-00035
28	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
29	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
30	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
31	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146
32	08780-20119	9	1	A14W6 FILTER/COUPLER TO A15 RF DECK	28480	08780-20119

See introduction to this section for ordering information
*Indicates factory selected value

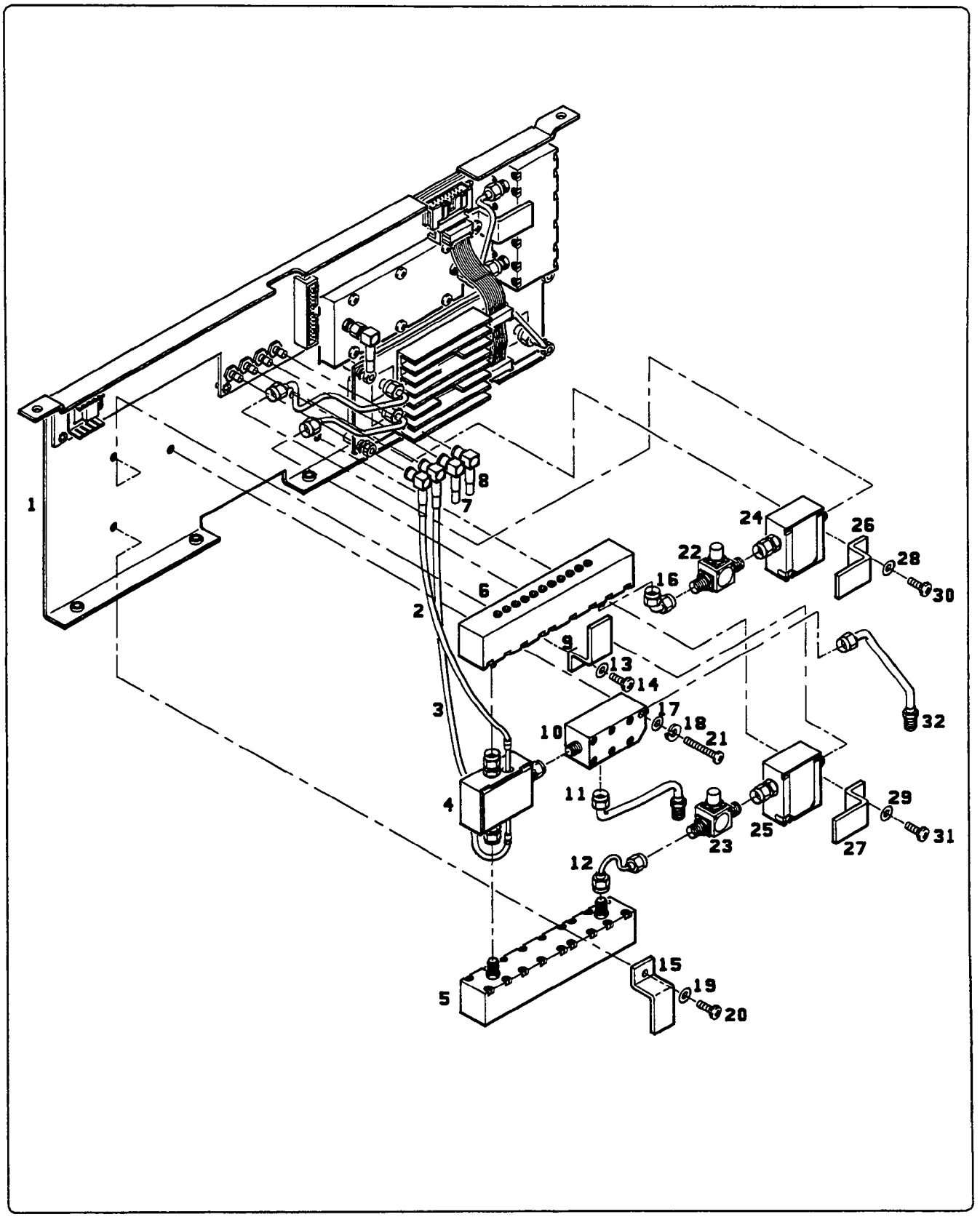

Figure 6-15. P/O Local Oscillator (LO) Multiplier Deck

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-16				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
2	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
3	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
4				SHOWN ON FIGURE 6-15.		
5	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
6				A14A1 LO INTERFACE BOARD		
7	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
8	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
9	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
10	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
11	08780-60065	8	1	A14W9 SUM VCO TO AMPLIFIER/DOUBLER	28480	08780-60065
12	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
13	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
14	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
15	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
16	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
17	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
18	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION
19	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION
20	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
21	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
22	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
23	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
24	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
25	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
26	08780-20069	8	1	A14W12 AMPLIFIER/DOUBLER TO 2-2.8 GHZ FILTER	28480	08780-20069
27	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
28	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
29				A14A3 POWER AMPLIFIER		
30						
(2746A AND BELOW)	08780-20067	6	1	A14W10 POWER AMPLIFIER TO LO HIGH MULTIPLIER	28480	08780-20067
(2805A AND ABOVE)	08780-20153	1	1	A14W10 POWER AMPLIFIER TO LO HIGH MULTIPLIER	28480	08780-20153
31	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
32	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
33	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
34	0380-1626	4	1	SPACER-RND .281-IN-LG .125-IN-ID	00000	ORDER BY DESCRIPTION
35	08780-60070	5	1	A14W14 POWER SUPPLY TO POWER AMPLIFIER	28480	08780-60070
36	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
37	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
38	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
39	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
40						
(2746A AND BELOW)	08780-20066	5	1	A14W11 POWER AMPLIFIER TO LO LOW MULTIPLIER	28480	08780-20066
(2805A AND ABOVE)	08780-20152	0	1	A14W11 POWER AMPLIFIER TO LO LOW MULTIPLIER	28480	08780-20152
41	08780-20023	4	1	HEATSINK POWER AMPLIFIER	28480	08780-20023
42	08780-20023	4	1	HEATSINK POWER AMPLIFIER	28480	08780-20023
43	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
44	0905-0478	6	1	O-RING .114-IN-ID .07-IN-XSECT-DIA EPR	28480	0905-0478
45	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
46	3050-0890	6	1	WASHER-FL MTLC 2.5 MM 2.78-MM-ID	28480	3050-0890
47	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
48	2190-0583	9	1	WASHER-LK HLCL 2.5 MM 2.6-MM-ID	28480	2190-0583
49	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION
50	0535-0008	3	1	NUT-HEX DBL-CHAM M2.5 X 0.45 2MM-THK	00000	ORDER BY DESCRIPTION

See introduction to this section for ordering information
*Indicates factory selected value

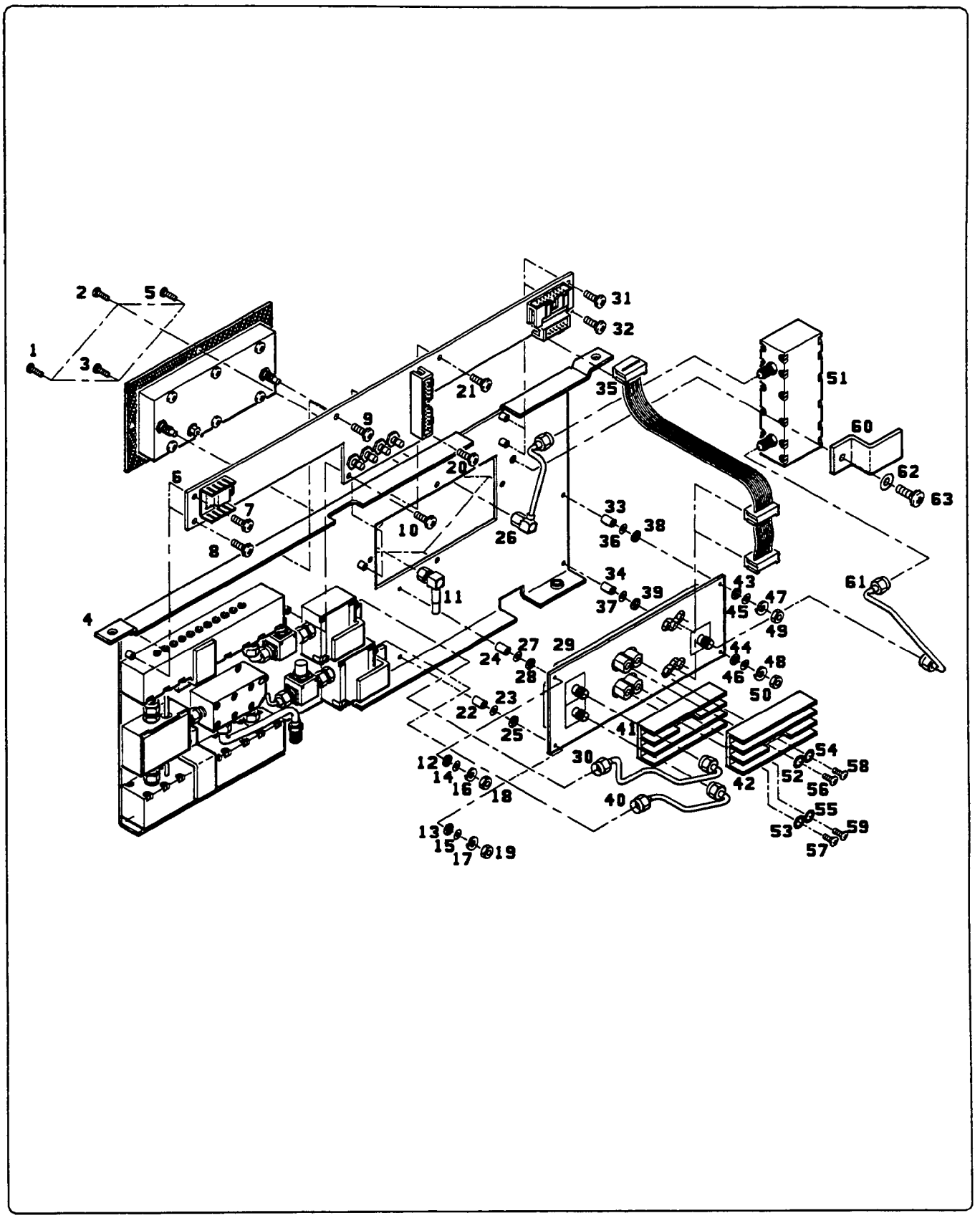

Figure 6-16. P/O Local Oscillator (LO) Multiplier Deck

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
51				FL1 FILTER 2-2.8 GHZ		
52	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
53	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
54	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
55	3050-0253	5	1	WASHER-SPR CRVD NO. 10 .195-IN-ID	78189	3502-10-25-0551
56	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918
57	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918
58	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918
59	0515-0918	2	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0918
60	08780-00034	5	1	CLAMP FOR FL1 FILTER 2-2.8 GHZ	28480	08780-00034
61	08780-20068	7	1	A14W13 FL1 FILTER TO POWER AMPLIFIER	28480	08780-20068
62	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
63	0515-1146	0	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG	28480	0515-1146

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-17				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	08780-00048	1	1	PLATE BASE	28480	08780-00048
2	08780-20121	3	1	SCREEN RFI	28480	08780-20121
3				A14A2A1 1GHZ AMPLIFIER/DOUBLER BOARD		
4	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
5	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
6	08780-20090	5	1	SPACER PRINTED CIRCUIT BOARD	28480	08780-20090
7	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
8	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
9	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
10	08780-00051	6	1	COVER 1GHZ AMPLIFIER/DOUBLER	28480	08780-00051
11	08780-20090	5	1	SPACER PRINTED CIRCUIT BOARD	28480	08780-20090
12	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
13	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
14	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
15	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
16	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
17	2190-0009	4	1	WASHER-LK INTL T NO. 8 .168-IN-ID	U1453	1908
18	0160-2437	1	1	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
19	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
20	0515-1111	9	1	SCREW-MACH M3 X 0.5 16MM-LG PAN-HD	28480	0515-1111
21	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
22				A14A2 AMPLIFIER/DOUBLER		

See introduction to this section for ordering information
*Indicates factory selected value

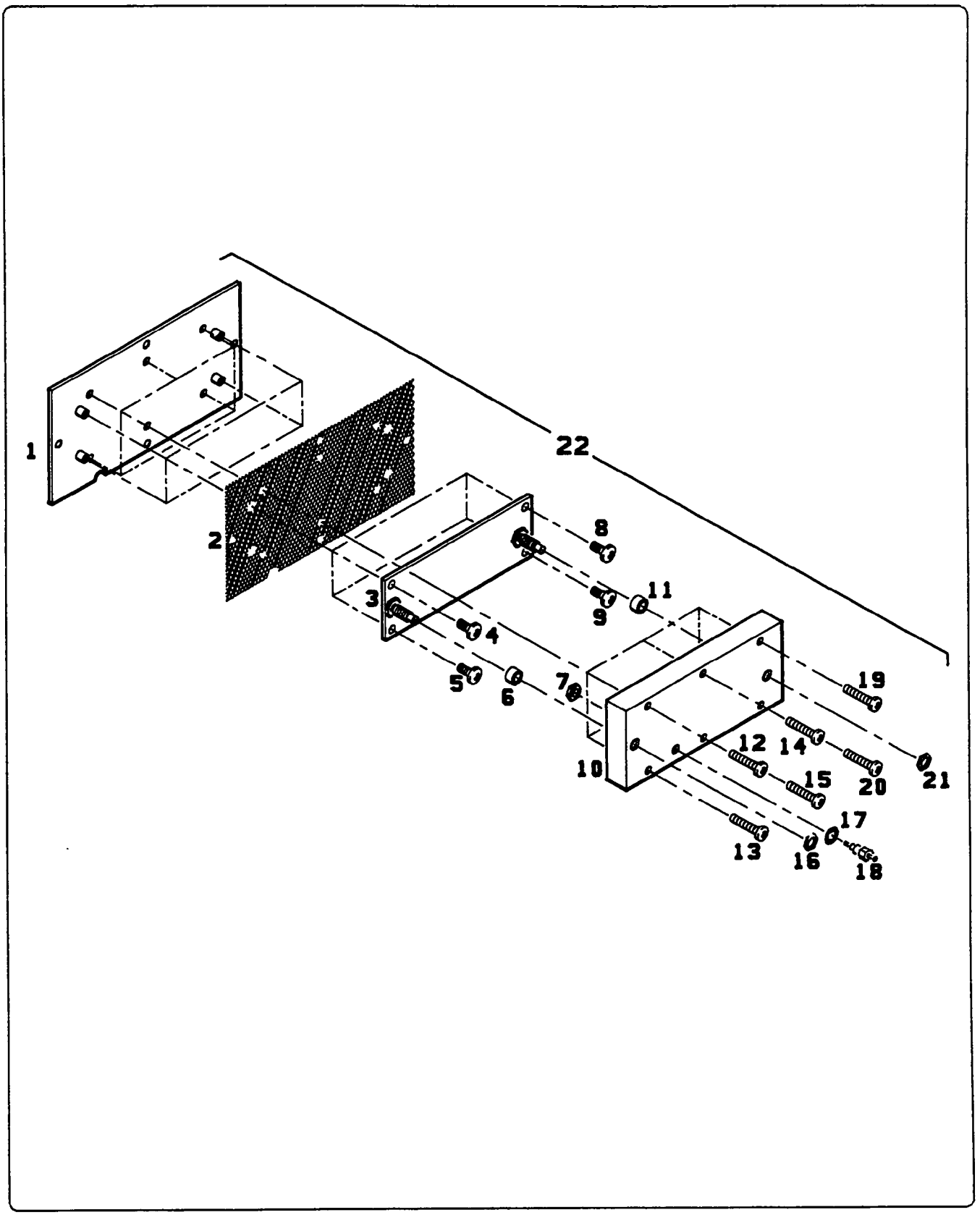


Figure 6-17. P/O Local Oscillator (LO) Multiplier Deck

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-18				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				A15A1 RF OUTPUT DECK INTERFACE		
2	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
3	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
4	08780-00010	7	1	DECK STRUCTURE RF OUTPUT	28480	08780-00010
5	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
6	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
7				AT11 PROGRAMMABLE STEP ATTENUATOR		
8	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
9	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
10	08780-20115	5	1	A15W1 STEP ATTENUATOR TO RF OUTPUT	28480	08780-20115
11	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
12	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
13	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
14						
(2746A AND BELOW)	08780-20072	3	1	A15W2 LO 8.05-11.0 GHZ ISOLATOR TO OUTPUT MIXER	28480	08780-20072
(2605A AND ABOVE)	08780-20155	3	1	A15W2 LO 8.05-11.0 GHZ ISOLATOR TO OUTPUT MIXER	28480	08780-20155
15				AT9 ISOLATOR		
16				AT8 OUTPUT MIXER		
17*				FACTORY SELECTED PAD A15AT10		
18	08780-20073	4	1	A15W3 PAD TO OUTPUT AMPLIFIER	28480	08780-20073
19				SHOWN ON FIGURE 6-19		
20	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
21	0955-0241	6	1	U-WAVE ISOLATOR 14.3 GHZ MAX	12168	T-007S01
22	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
23	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
24	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
25	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
26	0515-0919	3	1	SCREW-MACH M3 X 0.5 25MM-LG PAN-HD	28480	0515-0919
27	0515-0919	3	1	SCREW-MACH M3 X 0.5 25MM-LG PAN-HD	28480	0515-0919
28	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
29	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
30	0515-0919	3	1	SCREW-MACH M3 X 0.5 25MM-LG PAN-HD	28480	0515-0919
31	08780-20071	2	1	A15W5 I/Q COMBINER TO ISOLATOR	28480	08780-20071
32	08780-20074	5	1	A15W4 OUTPUT AMPLIFIER TO STEP ATTENUATOR	28480	08780-20074
32				A15A2 OUTPUT AMPLIFIER		
33				A15A3 OUTPUT AMPLIFIER (OPTION 064)		
33A						
34	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
35	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
36	0515-1667	0	1	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-1667
37	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
38	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
39	0515-1667	0	1	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-1667
40	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
41	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
42	0515-1667	0	1	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-1667
43	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
44	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
45	0515-1667	0	1	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-1667
46	08780-20045	0	1	A15W11 I/Q COMBINER TO PIN ATTENUATOR (OPTION 064)	28480	08780-20045
47				A15AT12 PIN ATTENUATOR (OPTION 064)		
48	08780-20075	6	1	A15W12 PIN ATTENUATOR OUT TO ISOLATOR (OPTION 064)	28480	08780-20075

See introduction to this section for ordering information
*Indicates factory selected value

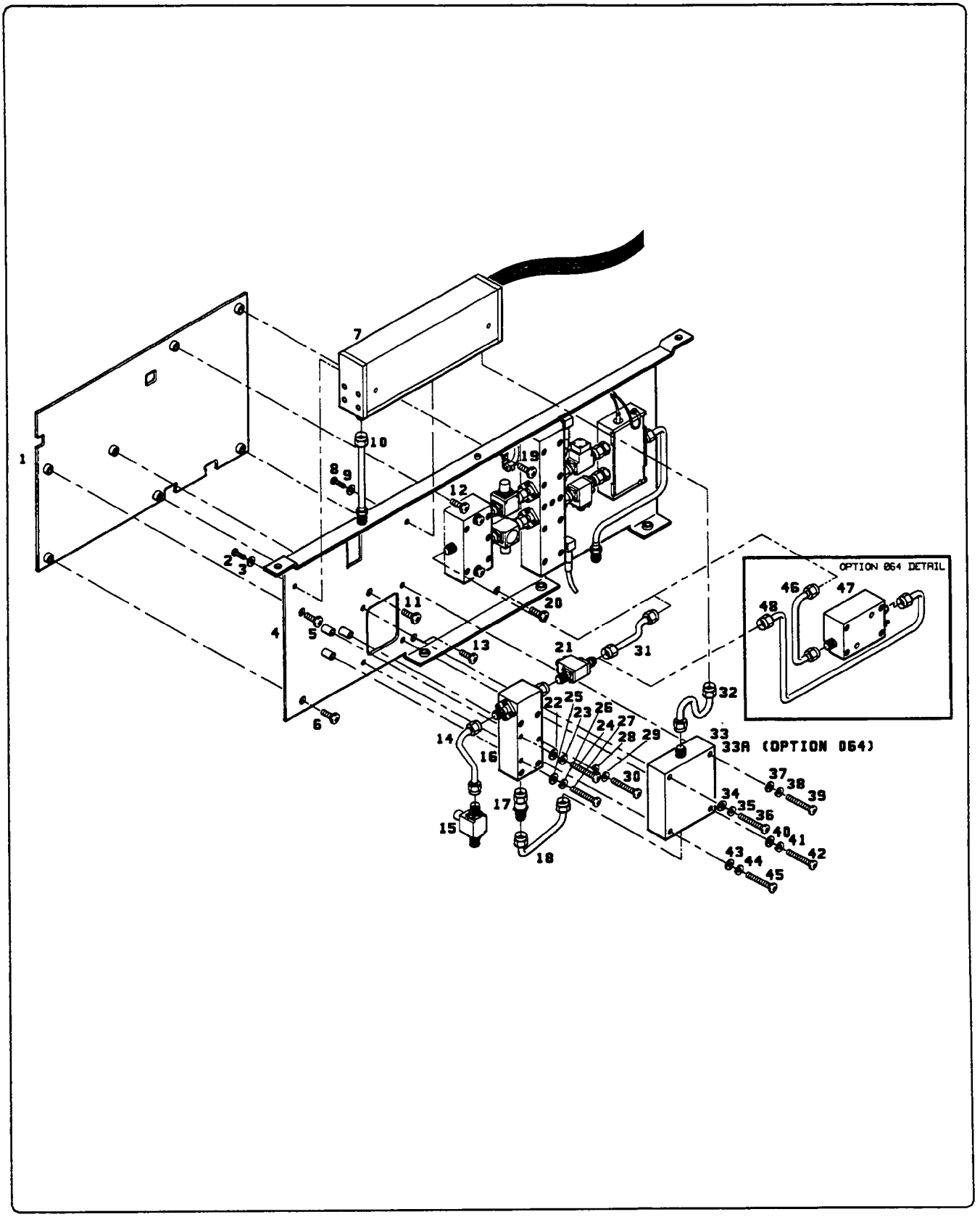


Figure 6-18. P/O Radio Frequency (RF) Output Deck

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-19				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				SHOWN ON FIGURE 6-18		
2	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
3	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
4	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
5	08780-67003	8	1	AT6 I/Q COMBINER	28480	08780-67003
6	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
7	0400-0082	8	1	GROMMET-CHAN NCH .09-IN-GRV-WD	28480	0400-0082
8	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
9	3050-0891	7	1	WASHER-FL MTLC 3.0 MM 3.3-MM-ID	28480	3050-0891
10	0955-0241	6	1	U-WAVE ISOLATOR 14.3 GHZ MAX AT5 Q ISOLATOR	12168	T-007S01
11	0955-0241	6	1	U-WAVE ISOLATOR 14.3 GHZ MAX AT4 I ISOLATOR	12168	T-007S01
12	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
13	2190-0584	0	1	WASHER-LK HLCL 3.0 MM 3.1-MM-ID	28480	2190-0584
14	0515-1667	0	1	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-1667
15	0515-1667	0	1	SCREW-MACH M3 X 0.5 22MM-LG PAN-HD	28480	0515-1667
16	08780-67004	9	1	AT3 DUAL MODULATOR	28480	08780-67004
17	08780-60101	3	1	A15W6 Q OUT TO DUAL MODULATOR	28480	08780-60101
18	08780-60100	2	1	A15W10 I OUT TO DUAL MODULATOR	28480	08780-60100
19	0960-0705	8	1	U-WAVE ISOLATOR 12 GHZ MAX AT2 Q ISOLATOR	28480	0960-0705
20	0960-0705	8	1	U-WAVE ISOLATOR 12 GHZ MAX AT1 I ISOLATOR	28480	0960-0705
21	08780-67005	0	1	Z1 I/Q SPLITTER	28480	08780-67005
22						
(2746A AND BELOW)	08780-20105	3	1	A15W9 8.0 GHZ TO I/Q SPLITTER	28480	08780-20105
(2805A AND ABOVE)	08780-20156	4	1	A15W9 8.0 GHZ TO I/Q SPLITTER	28480	08780-20156
23	08780-60092	1	1	A15W7 Q VARACTOR BIAS (BLUE)	28480	08780-60092
24	08780-60097	6	1	A15W8 I VARACTOR BIAS (PURPLE)	28480	08780-60097

See introduction to this section for ordering information
*Indicates factory selected value

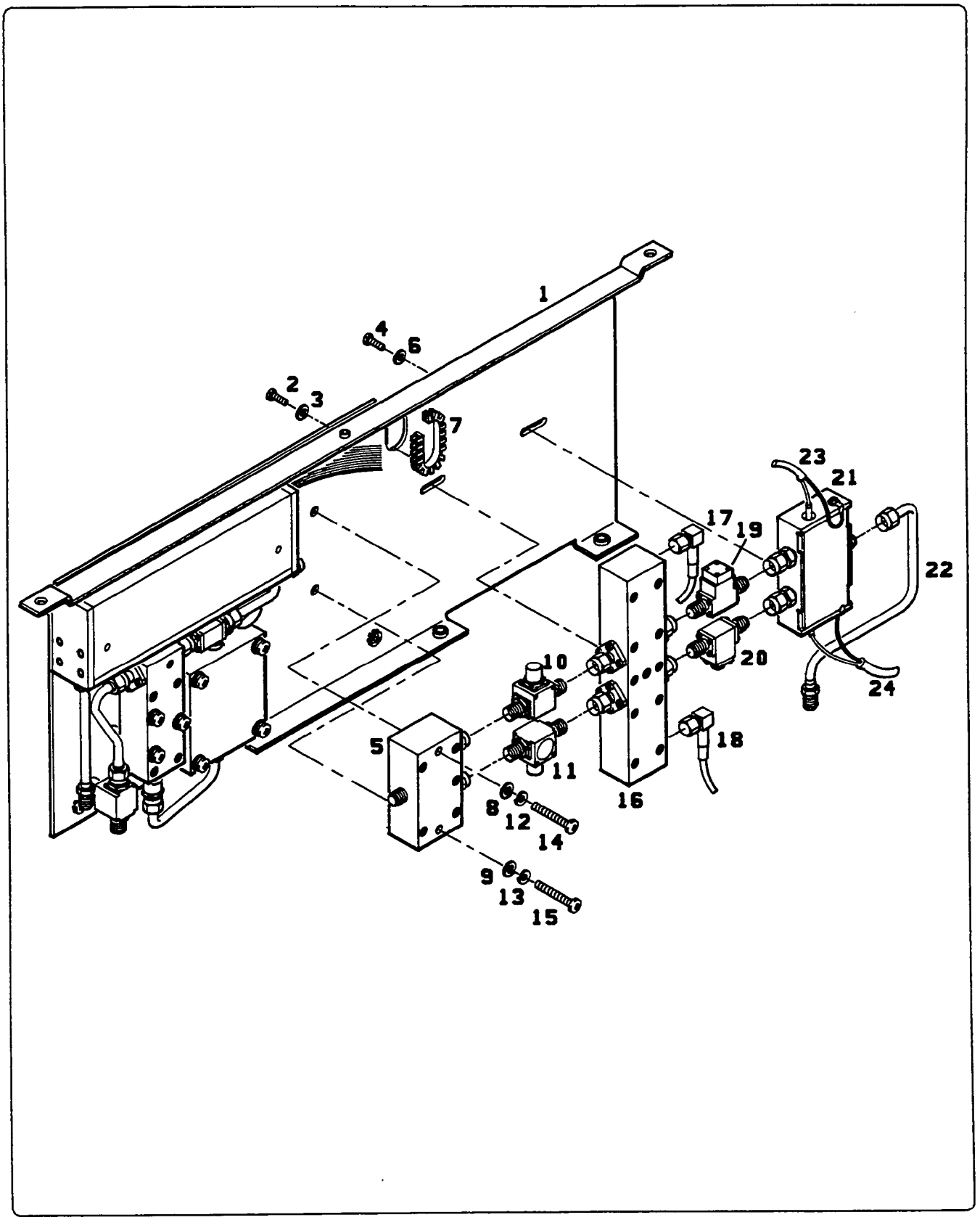


Figure 6-19. P/O Radio Frequency (RF) Output Deck

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-20				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				NSR P/O A16 REFERENCE OSCILLATOR POWER FROM A17 DISTRIBUTION BOARD		
2	1520-0094	7	1	SHOCK MOUNT .45-EFF-HGT 1-LB-LOAD-CAP	76005	J-2924-2-1
3	1520-0094	7	1	SHOCK MOUNT .45-EFF-HGT 1-LB-LOAD-CAP	76005	J-2924-2-1
4				W71 10 MHZ TIMEBASE OUT TO 10 MHZ REF OSC. SHOWN ON FIGURE 6-10		
5				A16 TIMEBASE QUARTZ CRYSTAL REF OSC		
6	1250-0911	4	1	CAP-COAX TO FIT M-SMB SHTG	28480	1250-0911
7	1520-0094	7	1	SHOCK MOUNT .45-EFF-HGT 1-LB-LOAD-CAP	76005	J-2924-2-1
8	08780-00015	2	1	BRACKET MOUNTING REF OSC	28480	08780-00015
9	0515-1114	2	1	SCREW-MACH M4 X 0.7 10MM-LG PAN-HD	28480	0515-1114
10	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
11	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885

See introduction to this section for ordering information
*Indicates factory selected value

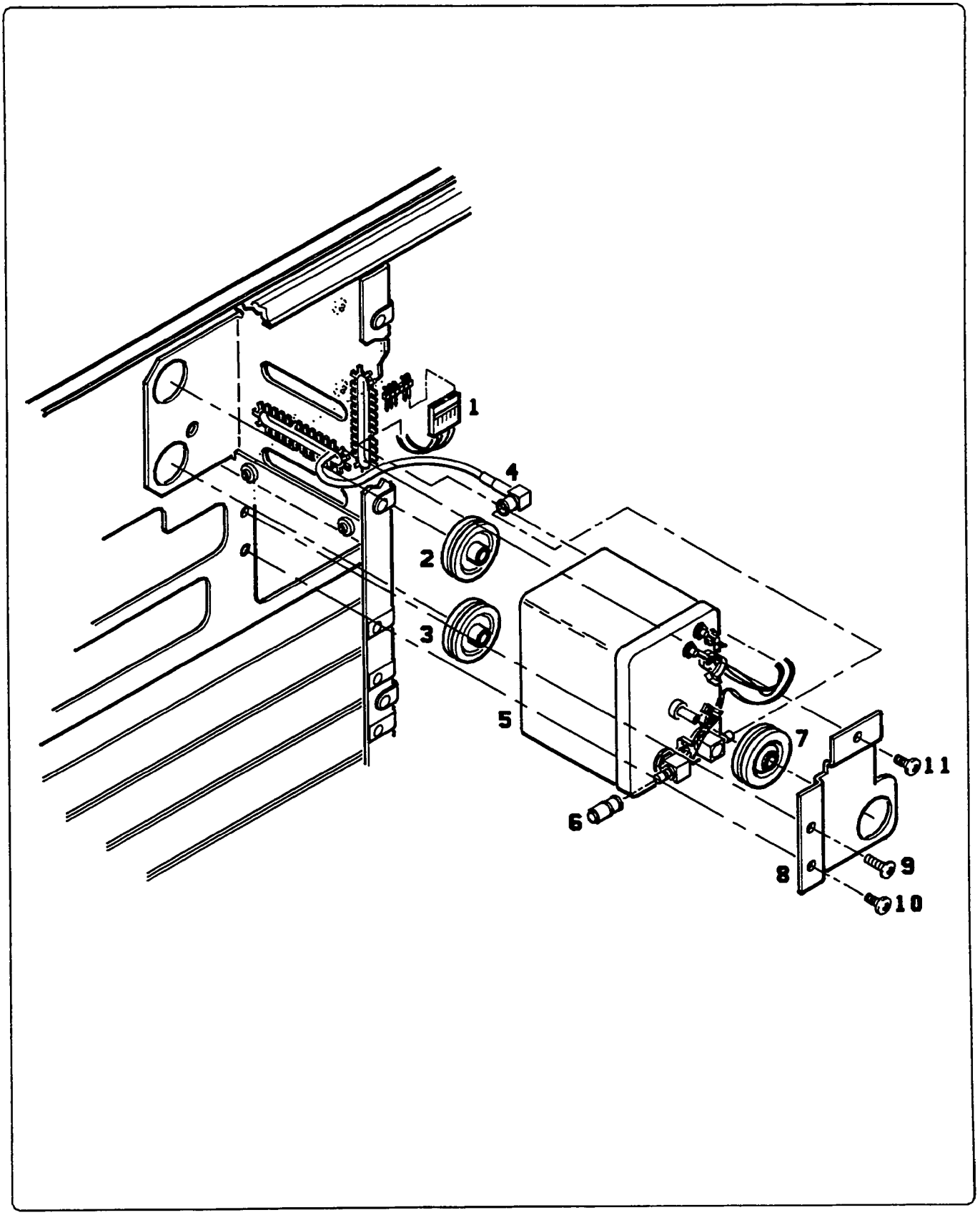


Figure 6-20. Internal Reference Oscillator

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-21				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
2	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
3	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
4	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
5	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
6	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
7	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
8	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
9	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
10	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
11	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
12	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
13				W14 A17 PWR DIST TO A11 MICROPROCESSOR. SHOWN ON FIGURE 6-10		
14	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
15	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
16	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
17	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
18	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331
19	0515-1331	5	1	SCREW-METRIC SPECIALTY M4 X 0.7 THD; 7MM	28480	0515-1331

See introduction to this section for ordering information
*Indicates factory selected value

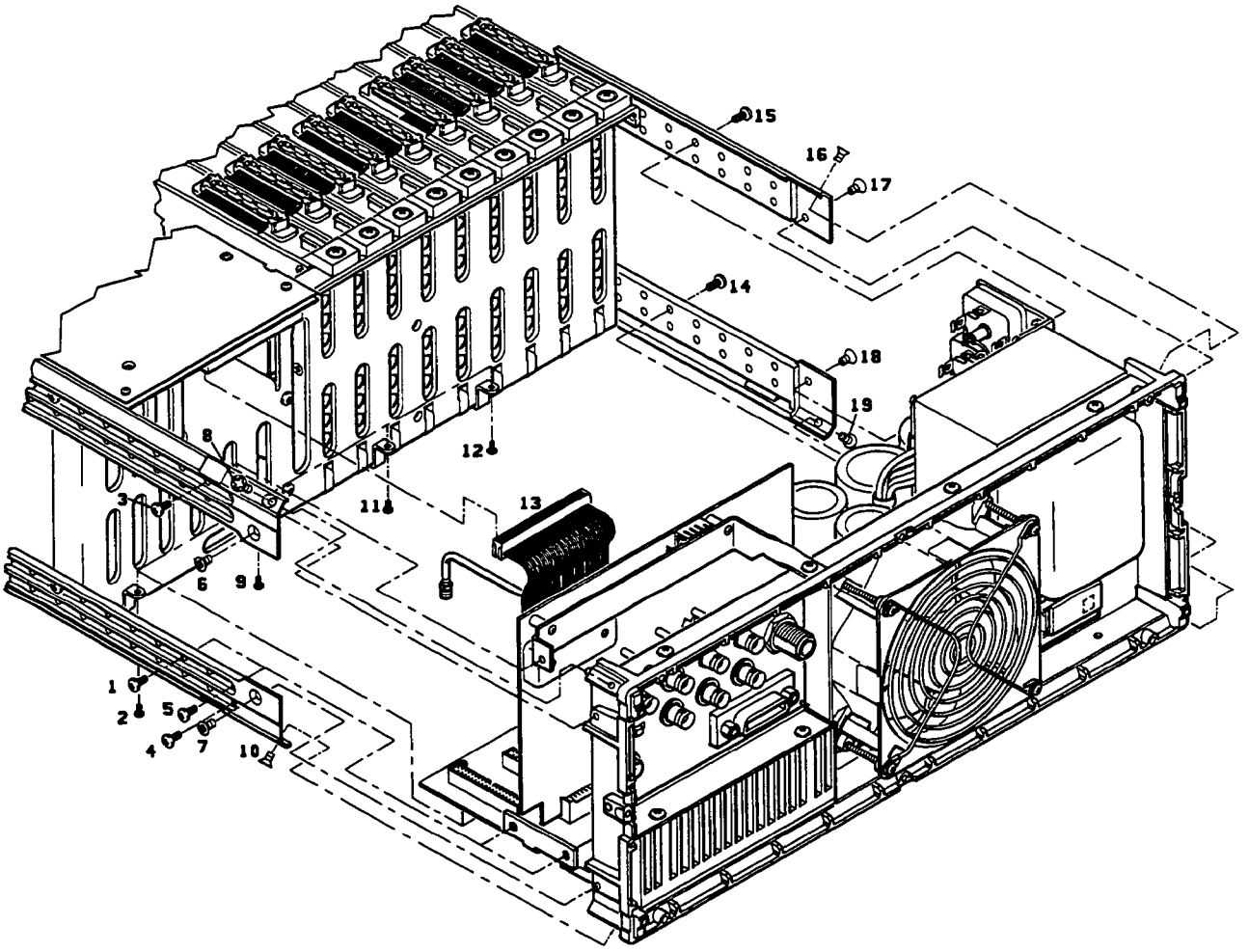
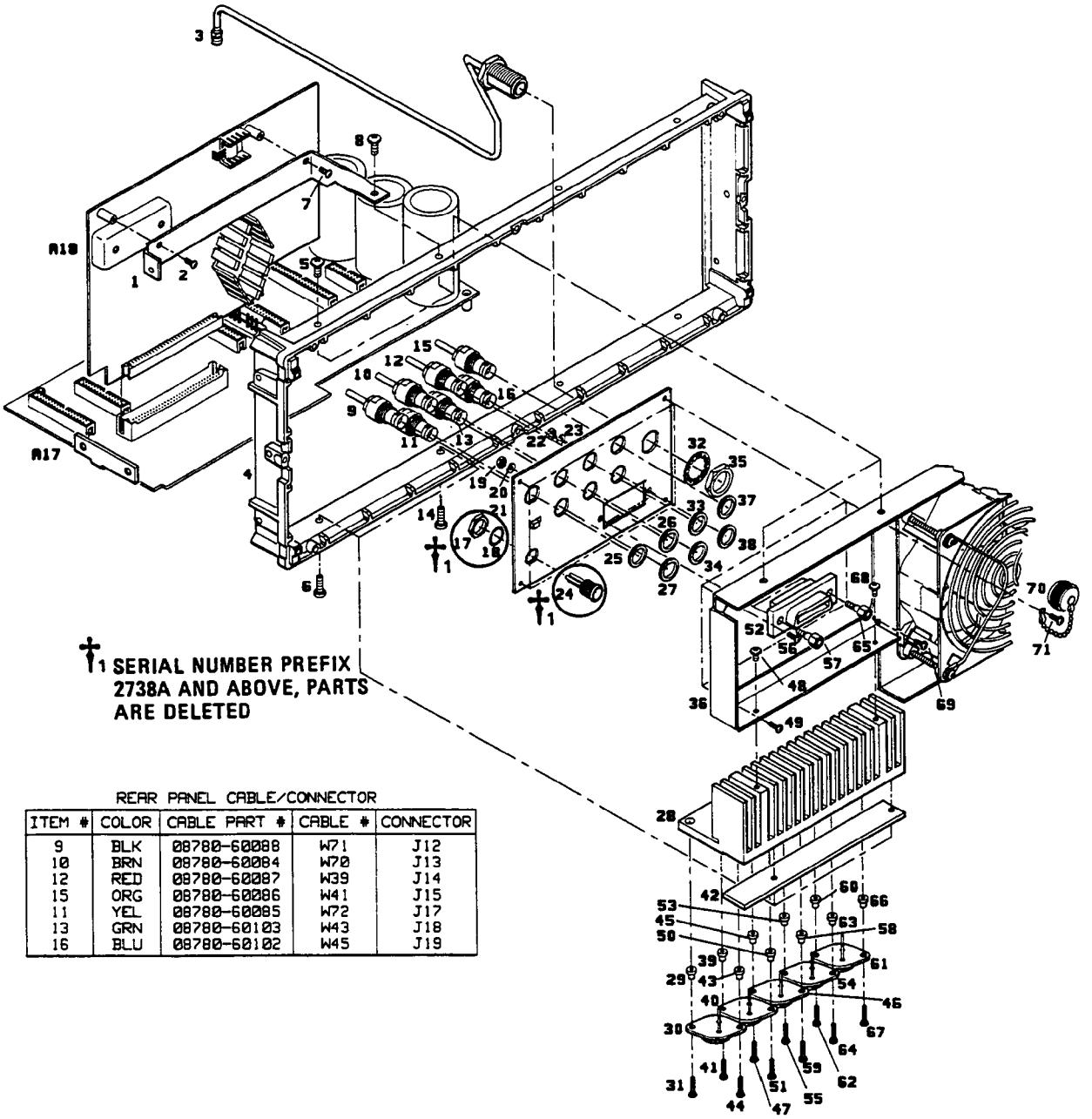


Figure 6-21. Rear Panel Module (Rails and Gusset)

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-22				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	08780-00021	0	1	BRACKET MOUNTING SUPPORT FOR A18	28480	08780-00021
2	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
3				W75 COHERENT CARRIER CABLE TO REAR PANEL CONNECTOR. SHOWN ON FIGURE 6-11		
4				SHOWN ON FIGURE 6-2		
5	0515-0887	4	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0887
6	0515-1091	4	1	SCREW-MACHINE ASSEMBLY M3.5 X 0.6	00000	ORDER BY DESCRIPTION
7	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
8	0515-1232	5	1	SCREW-MACH M3.5 X 0.6 8MM-LG PAN-HD	28480	0515-1232
9				J12 NSR P/O W71		
10				J13 NSR P/O W70		
11				J17 NSR P/O W72		
12				J14 NSR P/O W39		
13				J18 NSR P/O W43		
14	0515-1091	4	1	SCREW-MACHINE ASSEMBLY M3.5 X 0.6	00000	ORDER BY DESCRIPTION
15				J15 NSR P/O W41		
16				J19 NSR P/O W45		
17						
(2725A AND BELOW)				NSR P/O W73		
(2738A AND ABOVE)				PART IS DELETED		
18						
(2725A AND BELOW)	2190-0104	0	1	WASHER-LK INTL T 7/16 IN .439-IN-ID	78189	1922-04
(2738A AND ABOVE)				PART IS DELETED		
19				P/O ITEM 57		
20				P/O ITEM 57		
21	08780-00065	9	1	PANEL SUPPORT REAR CONNECTORS	28480	08780-00012
22				P/O ITEM 57		
23				P/O ITEM 57		
24						
(2725A AND BELOW)				J20 NSR P/O W73		
(2738A AND ABOVE)				PART IS DELETED		
25	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
26	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
27	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
28	08780-20024	5	1	HEATSINK POWER SUPPLY FET'S	28480	08780-20024
29	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
30				A17Q2		
31	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
32	2190-0120	0	1	WASHER-LK INTL T 5/8 IN .64-IN-ID	78189	1928-02
33	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
34	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
35	2950-0213	4	1	NUT-HEX-DBL-CHAM 5/8-24-THD .125-IN-THK	28480	2950-0213
36				PANEL REAR SHOWN ON FIGURE 6-23		
37	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
38	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
39	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
40				A17Q3		
41	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
42	08780-20101	9	1	SPACER PLATE HEATSINK	28480	08780-20101
43	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
44	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
45	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
46				A17Q4		
47	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
48	0515-0887	4	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0887
49	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886

See introduction to this section for ordering information
*Indicates factory selected value



REAR PANEL CABLE/CONNECTOR

ITEM #	COLOR	CABLE PART #	CABLE #	CONNECTOR
9	BLK	08780-60088	W71	J12
10	BRN	08780-60084	W70	J13
12	RED	08780-60087	W39	J14
15	ORG	08780-60086	W41	J15
11	YEL	08780-60085	W72	J17
13	GRN	08780-60103	W43	J18
16	BLU	08780-60102	W45	J19

Figure 6-22. Rear Panel Connectors

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
50	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
51	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
52				J21 NSR P/O W69. SEE FIGURE 6-10		
53	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
54				A17Q5		
55	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
56	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
57	1251-7002	0	1	SCREW KIT-AMP CHAMP CONN	28480	1251-7002
58	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
59	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
60	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
61				A17Q6		
62	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
63	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
64	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
65	1251-7002	0	1	SCREW KIT-AMP CHAMP CONN	28480	1251-7002
65				P/O ITEM 57		
66	1200-0147	3	1	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
67	0515-1452	1	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 14MM-LG	28480	0515-1452
68	0515-0887	4	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0887
69	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
70	6960-0041	3	1	CAP-COAX TO FIT F-N NON-SHTG 1.75-CH	28480	1250-0522
71	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-23				NOTE: THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1	3050-0894	0	1	WASHER-FL MTLC 5.0 MM 5.4-MM-ID	28480	3050-0894
2	2190-0587	3	1	WASHER-LK HLCL 5.0 MM 5.1-MM-ID	28480	2190-0587
3	0535-0005	0	1	NUT-HEX DBL-CHAM M5 X 0.8 5.1MM-THK	00000	ORDER BY DESCRIPTION
4	1906-0212	9	1	DIODE-FW BRDG 400V 35A	04713	MDA3504
5	2190-0586	2	1	WASHER-LK HLCL 4.0 MM 4.1-MM-ID	28480	2190-0586
6	0590-1228	7	1	THREADED INSERT-STDF M4 X 0.7 8-MM-LG	28480	0590-1228
7	0698-8818	3	1	RESISTOR 3.16 1% .125W F TC=0+-100	28480	0698-8818
8	0340-0044	4	1	TERMINAL-STUD DBL-TUR PRESS-MTG	83330	92-1500
9	0890-0096	1	1	TUBING-FLEX .04-ID TFE .016-WALL	28480	0890-0096
10	0160-6631	5	1	CAPACITOR-FXD 1UF +-10% 100VDC CER	28480	0160-6631
11	2190-0586	2	1	WASHER-LK HLCL 4.0 MM 4.1-MM-ID	28480	2190-0586
12	0698-8818	3	1	RESISTOR 3.16 1% .125W F TC=0+-100	28480	0698-8818
13	0590-1228	7	1	THREADED INSERT-STDF M4 X 0.7 8-MM-LG	28480	0590-1228
14	0340-0044	4	1	TERMINAL-STUD DBL-TUR PRESS-MTG	83330	92-1500
15	0890-0096	1	1	TUBING-FLEX .04-ID TFE .016-WALL	28480	0890-0096
16	0535-0005	0	1	NUT-HEX DBL-CHAM M5 X 0.8 5.1MM-THK	00000	ORDER BY DESCRIPTION
17	0160-6631	5	1	CAPACITOR-FXD 1UF +-10% 100VDC CER	28480	0160-6631
18	2190-0587	3	1	WASHER-LK HLCL 5.0 MM 5.1-MM-ID	28480	2190-0587
19	3050-0894	0	1	WASHER-FL MTLC 5.0 MM 5.4-MM-ID	28480	3050-0894
20	0515-1079	8	1	SCREW-MACHINE ASSEMBLY M3 X 0.5 8MM-LG	00000	ORDER BY DESCRIPTION
21	08780-00017	4	1	BRACKET FOR RECTIFIERS	28480	08780-00017
22				A17 DISTRIBUTION BOARD		
23	08780-00066	6	1	BRACKET FOR TRANSFORMER	28480	08780-00019
24	0535-0005	0	1	NUT-HEX DBL-CHAM M5 X 0.8 5.1MM-THK	00000	ORDER BY DESCRIPTION
25	3050-0006	9	1	WASHER-FL MTLC 4.0 MM 4.4-MM-ID	28480	3050-0893
26	3050-0893	9	1	WASHER-FL MTLC 4.0 MM 4.4-MM-ID	28480	3050-0893
27	0535-0005	0	1	NUT-HEX DBL-CHAM M5 X 0.8 5.1MM-THK	00000	ORDER BY DESCRIPTION
28	2190-0587	3	1	WASHER-LK HLCL 5.0 MM 5.1-MM-ID	28480	2190-0587
29	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
30	0515-0885	2	1	SCREW-MACH M4 X 0.7 8MM-LG PAN-HD	28480	0515-0885
31	2190-0587	3	1	WASHER-LK HLCL 5.0 MM 5.1-MM-ID	28480	2190-0587
32	3050-0894	0	1	WASHER-FL MTLC 5.0 MM 5.4-MM-ID	28480	3050-0894
33	3050-0894	0	1	WASHER-FL MTLC 5.0 MM 5.4-MM-ID	28480	3050-0894
34	9100-4501	7	1	TRANSFORMER-POWER 100/120/220/240V	95011	5180-2682
35	08780-00011	8	1	PANEL REAR	28480	08780-00011
36				SHOWN ON FIGURE 6-2		
37	08780-80002	5	1	COVER FOR TRANSFORMER	28480	08780-80002
38	0515-1600	1	1	SCREW-MACH M5 X 0.8 75MM-LG PAN-HD	28480	0515-1600
39	0515-1600	1	1	SCREW-MACH M5 X 0.8 75MM-LG PAN-HD	28480	0515-1600
40	0515-1600	1	1	SCREW-MACH M5 X 0.8 75MM-LG PAN-HD	28480	0515-1600
41	0515-1600	1	1	SCREW-MACH M5 X 0.8 75MM-LG PAN-HD	28480	0515-1600
42	08780-00022	1	1	PLATE AC COVER	28480	08780-00022
43	0960-0443	1	1	LINE MODULE-FILTERED	05245	F2058D
44	0515-0887	4	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0887
45	0515-1232	5	1	SCREW-MACH M3.5 X 0.6 8MM-LG PAN-HD	28480	0515-1232
46	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
47	7120-4296	7	1	LABEL-WARNING .688-IN-WD 1.5-IN-LG AL	28480	7120-4296
48	3160-0472	3	1	FAN-TBAX 108-CFM 24VDC	60399	TA450DC-A31257-16
49	0515-1232	5	1	SCREW-MACH M3.5 X 0.6 8MM-LG PAN-HD	28480	0515-1232
50	0515-0887	4	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0887
51	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
52	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
53	0515-1286	9	1	SCREW-MACH M3.5 X 0.6 47MM-LG PAN-HD	28480	0515-1286
54	3160-0092	3	1	FINGER GUARD	12330	055012
55	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6

See introduction to this section for ordering information
*Indicates factory selected value

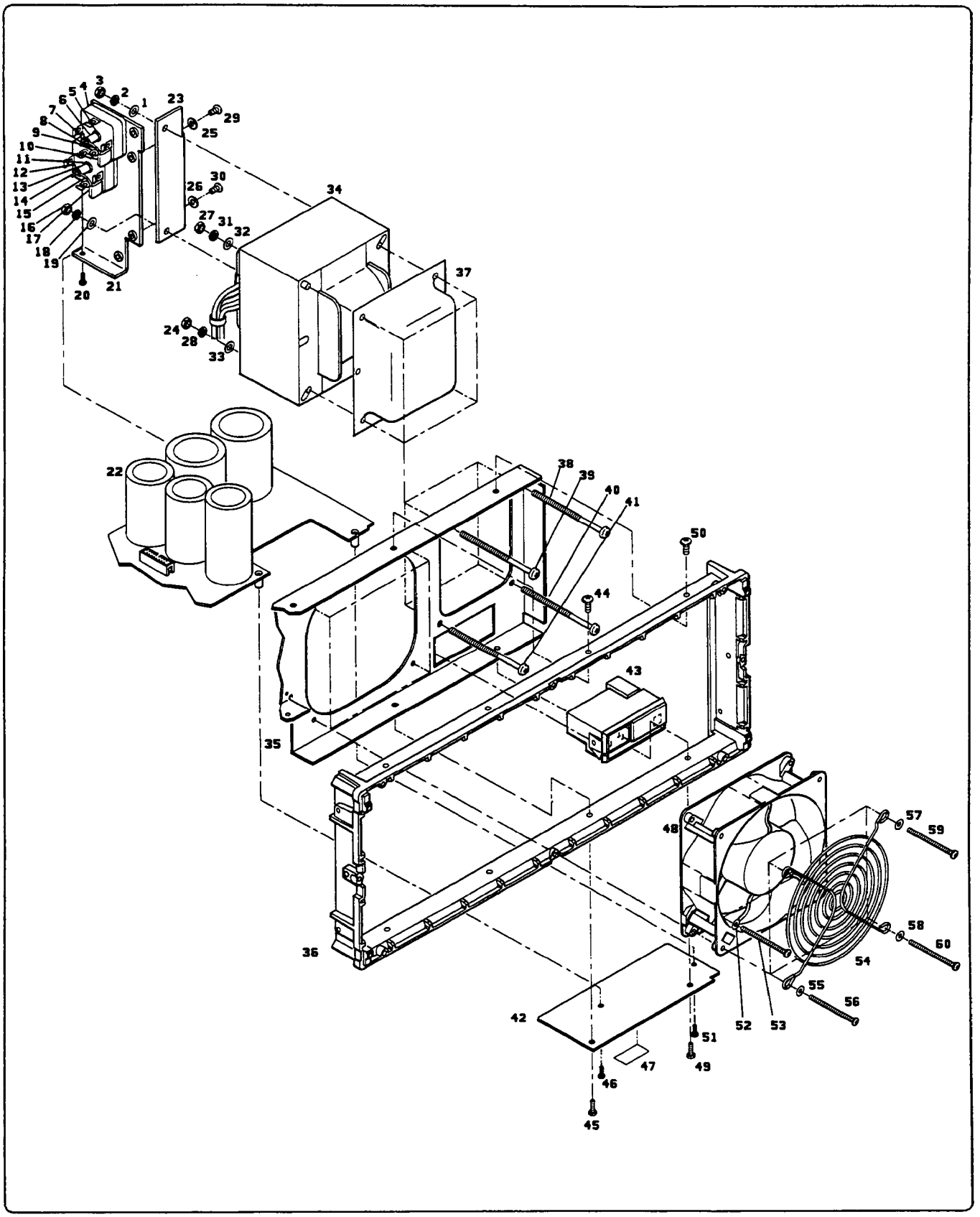

Figure 6-23. Partial Rear Panel (Power Module and Fan)

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Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
56	0515-1286	9	1	SCREW-MACH M3.5 X 0.6 47MM-LG PAN-HD	28480	0515-1286
57	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
58	3050-0227	3	1	WASHER-FL MTLC NO. 6 .149-IN-ID	80120	AN960C-6
59	0515-1286	9	1	SCREW-MACH M3.5 X 0.6 47MM-LG PAN-HD	28480	0515-1286
60	0515-1286	9	1	SCREW-MACH M3.5 X 0.6 47MM-LG PAN-HD	28480	0515-1286

See introduction to this section for ordering information
*Indicates factory selected value

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-24				NOTE:		
				THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				W88 FROM A15W1 TO REAR PANEL RF OUTPUT		
2				W79 FROM A13 IF DECK TO REAR PANEL COHERENT CARRIER. SHOWN ON FIGURE 6-11		
3				SHOWN ON FIGURE 6-2		
4	0515-1091	4	1	SCREW-MACHINE ASSEMBLY M3.5 X 0.6	00000	ORDER BY DESCRIPTION
5	0515-1091	4	1	SCREW-MACHINE ASSEMBLY M3.5 X 0.6	00000	ORDER BY DESCRIPTION
6	0515-1091	4	1	SCREW-MACHINE ASSEMBLY M3.5 X 0.6	00000	ORDER BY DESCRIPTION
7	0515-1091	4	1	SCREW-MACHINE ASSEMBLY M3.5 X 0.6	00000	ORDER BY DESCRIPTION
8	08780-00032	3	1	COVER REAR	28480	08780-00032
9				SHOWN ON FIGURE 6-22		
10				SHOWN ON FIGURE 6-23		
11	0400-0082	8	1	GROMMET-CHAN NCH .09-IN-GRV-WD	28480	0400-0082
12	0515-0887	4	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0887
13	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
14	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
15	0515-0887	4	1	SCREW-MACH M3.5 X 0.6 6MM-LG PAN-HD	28480	0515-0887
16	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
17	08780-00031	2	1	PLATE SPACER FOR HEATSINK	28480	08780-00031
18	0515-0886	3	1	SCREW-MACH M3 X 0.5 6MM-LG PAN-HD	28480	0515-0886
19	2190-0120	0	1	WASHER-LK INTL T 5/8 IN .64-IN-ID	78189	1928-02
20	2950-0213	4	1	NUT-HEX-DBL-CHAM 5/8-24-THD .125-IN-THK	28480	2950-0213

See introduction to this section for ordering information
*Indicates factory selected value

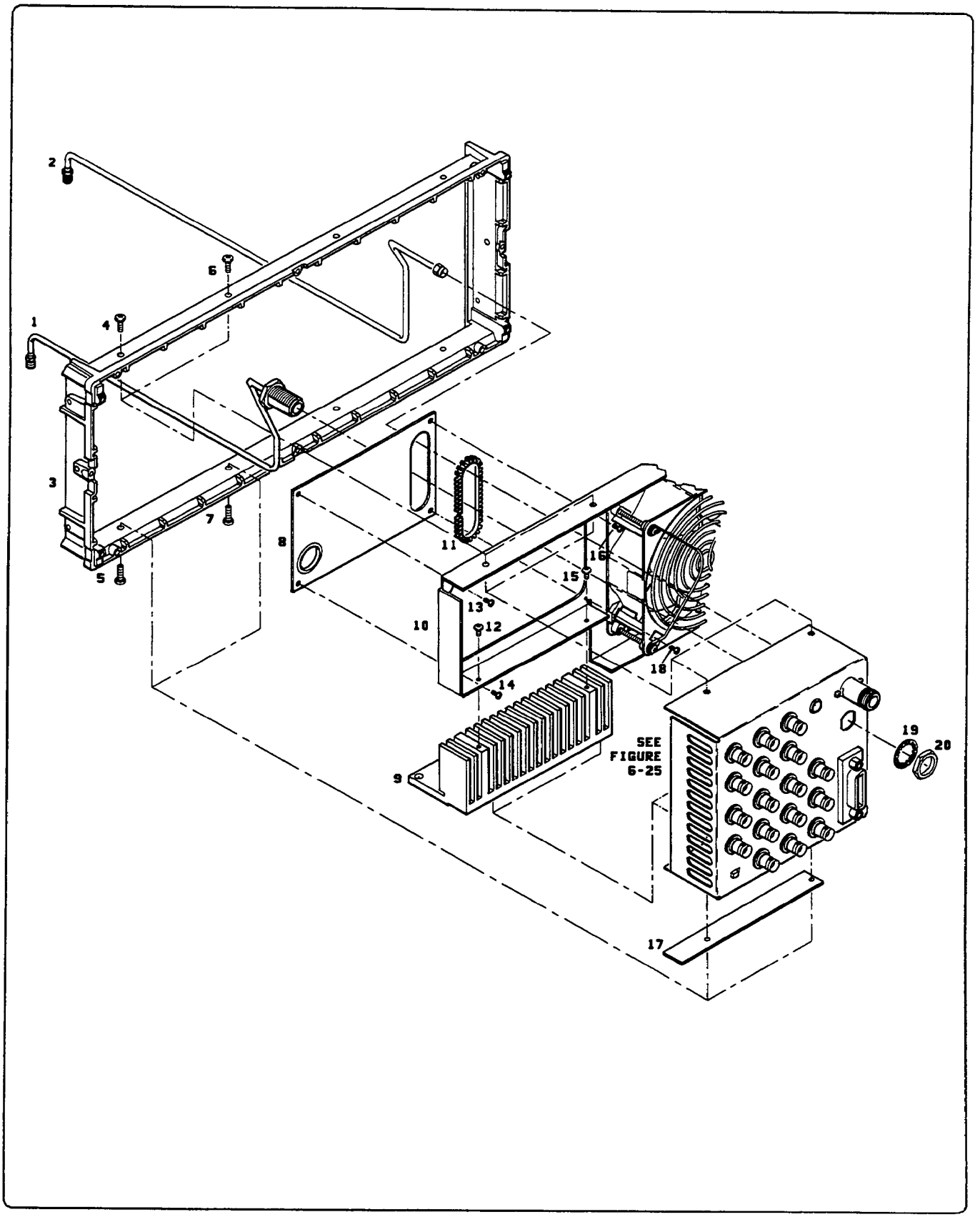

Figure 6-24. Partial Rear Panel (Option 001)

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
FIGURE 6-25				NOTE:		
				THE QTY COLUMN ON THIS PAGE SHOWS ONLY THE QUANTITY OF PARTS REPRESENTED BY THE ITEM NUMBER IN THE REFERENCE DESIGNATION COLUMN.		
1				J3 NSR P/O W82		
2				J2 NSR P/O W81		
3				J1 NSR P/O W80		
4				J6 NSR P/O W83		
5				J7 NSR P/O W84		
6				J10 NSR P/O W86		
7				J11 NSR P/O W87		
8				J14 NSR P/O W71		
9				J15 NSR P/O W70		
10				J19 NSR P/O W72		
11				J20 NSR P/O W43		
12				J16 NSR P/O W39		
13				J21 NSR P/O W45		
14				J17 NSR P/O W41		
15				J13 NSR P/O W10		
16				J12 NSR P/O W9		
17				J8 NSR P/O W85		
18	08780-20083	6	1	FLANGE CONNECTOR	28480	08780-20083
19	08780-20084	7	1	RING CONNECTOR	28480	08780-20084
20	08780-00030	1	1	PANEL CONNECTOR	28480	08780-00030
21				P/O ITEM 24		
(2725A AND BELOW)				PART IS DELETED		
(2738A AND ABOVE)						
22				P/O ITEM 47		
23				P/O ITEM 48		
24				J4 NSR P/O W73		
(2725A AND BELOW)				PART IS DELETED		
(2738A AND ABOVE)						
25	0515-1112	0	1	SCREW-MACH M3 X 0.5 20MM-LG PAN-HD	28480	0515-1112
26	0515-1112	0	1	SCREW-MACH M3 X 0.5 20MM-LG PAN-HD	28480	0515-1112
27				SHOWN ON FIGURE 6-24		
28	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
29	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
30	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
31	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
32				SHOWN ON FIGURE 6-24		
33	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
34	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
35	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
36	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
37	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
38	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
39	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
40	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
41	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
42	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
43	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
44	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
45	0590-1649	6	1	NUT-KNRLD-R 15/32-32-THD .08-IN-THK	00000	ORDER BY DESCRIPTION
46				J18 NSR P/O W69		
47	1251-7002	0	1	SCREW KIT-AMP CHAMP CONN	28480	1251-7002
48	1251-7002	0	1	SCREW KIT-AMP CHAMP CONN	28480	1251-7002

See introduction to this section for ordering information
*Indicates factory selected value

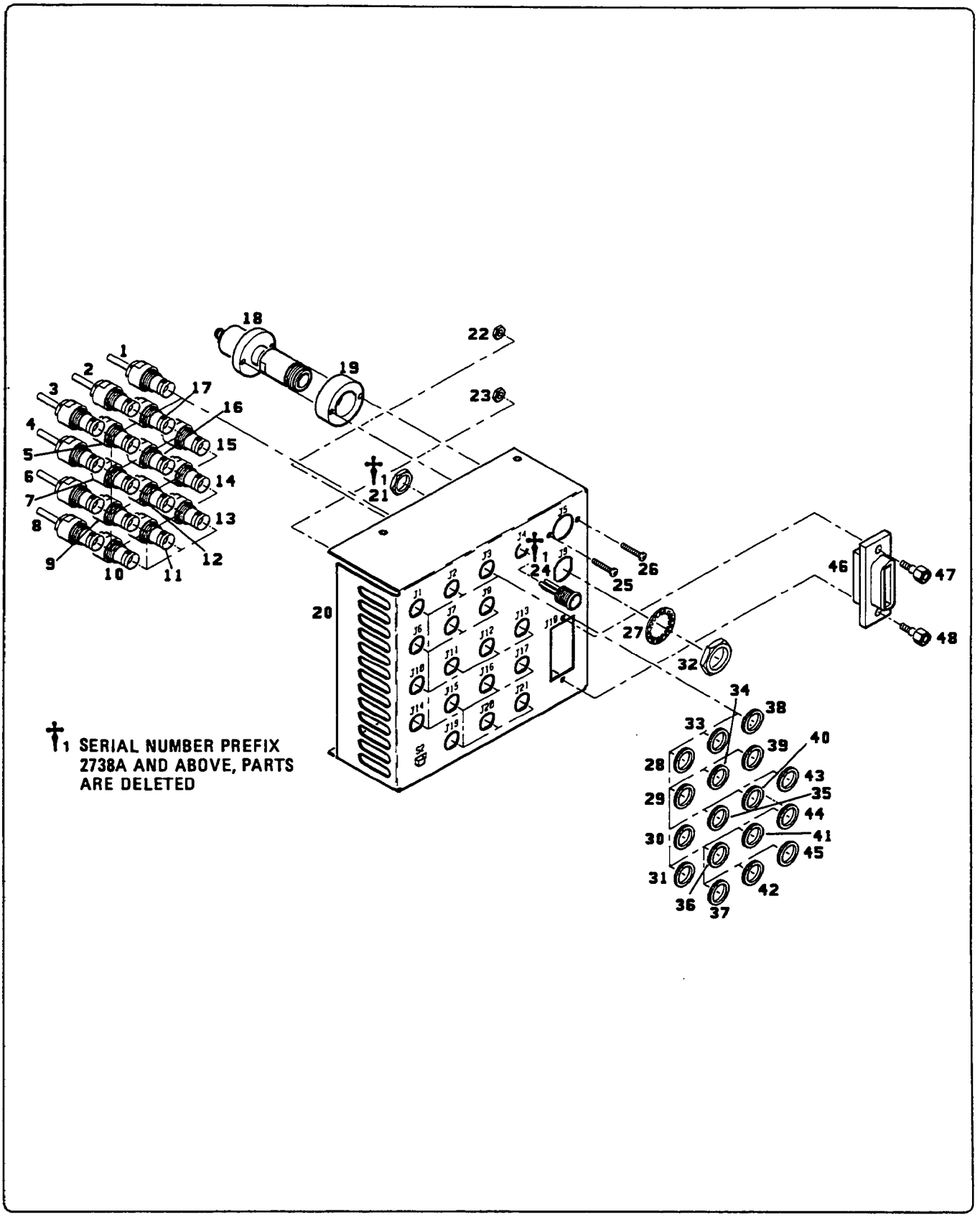

Figure 6-25. Rear panel Connectors (Option 001)

Table 6-3. Code List of Manufacturers

Mfr Code	Manufacturer Name	Address	Zip Code
C1433	AB ELEKTRONIK GMBH	SALZBURG AU	A-501
D8439	ROEDERSTEIN/RESISTA GMBH	LANDSHUT GM	8300
K7253	STC/STANTEL	DEVON EG	
K8479	HOLSWORTHY ELECTRONICS LTD	HOLSWORTHY EG	
S0545	NEC ELECTRONICS INC	MTN VIEW CA US	94043
S4013	HITACHI AMERICA LTD	SUNNYVALE CA US	94086
U1453	BARBER & COLEMAN LTD	SALE CHES EG	
00000	ANY SATISFACTORY SUPPLIER		
00115	ACE GLASS INC	VINELAND NJ	08360
00494	ADDRESSOGRAPH FARRINGTON	TREVOSE PA	44117
00779	AMP INC	HARRISBURG PA US	17111
00809	CROVEN CRYSTALS	WHITBY CN	L1N 5
00866	GOE ENGINEERING CO INC	ONTARIO CA US	91761
01295	TEXAS INSTRUMENTS INC	DALLAS TX US	75265
01417	CHRYSLER CORP DEFENSE OPN DIV	DETROIT MI	48203
01556	HELI-COIL PROD DIV MITE CORP	DANBURY CT	
01686	RCL ELECTRONICS INC	NORTHBROOK IL US	60062
01766	INTL CRYSTAL MFG CO INC	OKLAHOMA CITY OK	73102
02064	AMERICAN DRILL BUSHING CO	LOS ANGELES CA	90058
02114	FERROXCUBE CORP	SAUGERTIES NY US	12477
02570	CRAWFORD FITTING CO	SOLON OH	44139
02745	U S PLASTIC ROPE INC	MENLO PARK CA	94025
02886	DODGE-WASMUND MFG INC	PICO RIVERA CA	90660
03007	GUDEN H A CO INC	COPIAGUE LI NY	11726
03445	LERCO DIV SPACE LOK INC	BURBANK CA	91504
03508	GE CO SEMICONDUCTOR PROD DEPT	AUBURN NY US	13201
03764	COLT IND ENGINE ACCESSORIES	BELOIT WI	53511
03797	ELDEMA DIV GENISCO TECHNOLOGY CORP	COMPTON CA	90221
04072	BELL INDUSTRIES INC MILLER JW DIV	COMPTON CA	90224
04222	AVX CORP	GREAT NECK NY US	11021
04488	DUKE LABORATORIES INC	NORWALK CT	06856
04713	MOTOROLA INC	ROSELLE IL US	60195
05245	CORCOM INC	LIBERTYVILLE IL US	60048
05525	VANGUARD INSTRUMENT CORP	MELVILLE LI NY	11746
05545	BBL DIV DIOQUEST	COCKEYSVILLE MD	21030
05704	ALAC INC	GLENDALE CA	91209
05783	STEWART DIV WATKINS-JOHNSON CO	SANTA CRUZ CA	95060
05791	LYN-TRON INC	BURBANK CA US	91505
05820	EG & G INC	WELLESLEY MA US	02181
05876	U S POLYMERIC INC	STAMFORD CT	06904
06001	MEPCO/ELECTRA INC	MORRISTOWN NJ US	07960
06341	PRODUCTS/TECHNIQUES INC	LOS ANGELES CA	90059
06383	PANDUIT CORP	TINLEY PARK IL US	60477
06424	SPERRY U-WAVE ELEK DIV SPERRY RAND	CLEARWATER FL	33518
06560	JEFFERS ELECTRONICS INC	NOGALES AZ US	85621
06665	PRECISION MONOLITHICS INC	SANTA CLARA CA US	95054
06877	UNITRON INSTRUMENTS INC	WOODBURY NY	11797
07263	FAIRCHILD SEMICONDUCTOR CORP	CUPERTINO CA US	95014
07380	ANDREW CALIFORNIA CORP	CLAREMONT CA	91711
07653	FIDELITY CHEMICAL PRODUCTS CO	NEWARK NJ	07114
08111	MF ELECTRONICS CORP	NEW YORK NY	10010
08116	BOURNS PACIFIC MAGNETICS CORP	ROMOLAND CA	62380
08452	WESTINGHOUSE ELEC CORP WELDING EQPT	SYKESVILLE MD	21784
08712	BROOKS INSTR DIV EMERSON ELECTRIC	STATESBORO GA	30458
09023	CORNELL-DUBILIER ELECTRONICS	WAYNE NJ US	07470
09535	JOHNSON MATTHEY AND MALLORY LTD	TORONTO CN	
09969	DALE ELECTRONICS INC	YANKTON SD US	57078

Table 6-3. Code List of Manufacturers

Mfr Code	Manufacturer Name	Address		Zip Code
1A027	A G A CORP	SECAUCUS	NJ	07094
10582	CTS CORP ASHEVILLE DIV	SKYLAND	NC US	28776
10899	EASTERN AIR DEVICES INC	GREAT NECK	NY	11021
10960	T D R ELECTRONICS INC	BRISTOL	RI	02809
11045	AM CASTLE & CO INC	FRANKLIN PARK	IL US	60131
11236	CTS CORP	ELKHART	IN US	46514
11502	IRC INC	BOONE	NC US	28607
11591	STUART RADIATOR CO	SAN FRANCISCO	CA	94107
11707	IDEAL PRECISION METER CO INC	BROOKLYN	NY	11222
12168	NIBCO INC	ELKHART	IN	46514
12330	MONTROSE PRODUCTS CO	AUBURN	MA US	01501
12344	TALLY CORP	KENT	WA	98031
12360	ALBANY PROD CO DIV OF PNEUMO DYN	NORWALK	CT	06850
12474	BEL-RAY CO INC	FARMINGDALE	NJ	07727
12498	CRYSTALONICS, DIV TELEDYNE	CAMBRIDGE	MA	02140
13103	THERMALLOY INC	DALLAS	TX US	75234
13606	SPRAGUE ELECTRIC SEMICON DIV	CONCORD	NH	03301
14482	WATKINS-JOHNSON CO	PALO ALTO	CA US	94304
15542	MINI-CIRCUITS LAB	BROOKLYN	NY US	11235
16179	M/A-COM INC	BURLINGTON	MA US	01803
16299	CORNING ELECTRONICS	RALEIGH	NC US	27604
17856	SILICONIX INC	SANTA CLARA	CA US	95054
18324	SIGNETICS CORP	SUNNYVALE	CA US	94086
18873	DUPONT E I DE NEMOURS & CO	WILMINGTON	DE US	19801
19701	MEPCO/CENTRALAB INC	WEST PALM BEACH	FL US	33407
2M627	ROHM CORP	IRVINE	CA US	92713
23880	STANFORD APPLIED ELECTRONICS			95050
24226	GOWANDA ELECTRONICS CORP	GOWANDA	NY US	14070
24355	ANALOG DEVICES INC	NORWOOD	MA US	02062
24931	SPECIALTY CONNECTOR CO	FRANKLIN	IN US	46131
27014	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA	CA US	95052
27264	MOLEX INC	LISLE	IL US	60532
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO	CA	94304
3L585	RCA CORP	NEW YORK	NY US	10112
32159	WEST-CAP ARIZONA	SAN FERNANDO	CA US	91340
32293	INTERSIL INC	CUPERTINO	CA CA	95014
32559	BIVAR INC	SANTA ANA	CA	92705
32997	BOURNS INC	RIVERSIDE	CA US	92507
33095	SPECTRUM CONTROL INC	ERIE	PA US	16505
33399	TELE-TECH CORP	BOZEMAN	MT US	59771
34371	HARRIS CORP	MELBOURNE	FL US	32901
5N615	OMRON CORPORATION OF AMERICA	SCHAUMBURG	IL	60172
52063	EXAR INTEGRATED SYSTEMS INC	SUNNYVALE	CA	94086
55210	GETTIG ENGRG & MFG CO INC	SPRING MILLS	PA	16875
56289	SPRAGUE ELECTRIC CO	LEXINGTON	MA US	02173
6E259	AMETEK INC	PAOLI	PA US	19301
60399	NIDEC CORPORATION	TORRINGTON	CT US	06790
71785	TRW INC	CLEVELAND	OH US	44124
73138	BECKMAN INDUSTRIAL CORP	FULLERTON	CA US	92635
74970	EF JOHNSON CO	WASECA	MN US	56093
75263	KEYSTONE CARBON CO INC	ST MARY	PA US	15857
75915	LITTELFUSE INC	DES PLAINES	IL US	60016
76005	LORD CORP INDUSTRIAL PROD DIV	ERIE	PA US	16514
76381	3M CO	ST PAUL	MN US	55144
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF	ELGIN	IL	60126
79727	C-W INDUSTRIES	WARMINSTER	PA	18974
80120	SCHNITZER ALLOY PRODUCTS CO	ELIZABETH	NJ	07206
83259	PARKER SEAL CO DIV PARKER-HANNIFIN	LEXINGTON	KY	90231
83330	KULKA-SMITH INC	MANASQUAN	NJ US	08736
84411	AMERICAN SHIZUKI CORP	CANOGA PARK	CA US	91304
86928	SEASTROM MFG CO	GLENDALE	CA	91201
9M011	INTL RECTIFIER CORP	LOS ANGELES	CA US	90069
9N171	UNITRODE CORP	LEXINGTON	MA US	02173
91637	DALE ELECTRONICS INC	COLUMBUS	NE US	68601
92194	ALPHA WIRE CORP	ELIZABETH	NJ	07207
95011	FACIT-ODHNER INC	SECAUCUS	NJ	07094
98291	SEALECTRO CORP	TRUMBULL	CT US	06611
98978	INTL ELECTRONIC RESEARCH CORP	BURBANK	CA US	91502
99800	AMER PRCN IND INC DELEVAN DIV	AURORA	NY	14052
99899	NARDA MICROWAVE CORP THE	HAUPPAUGE	NY US	11788

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7 MANUAL CHANGES

7-1. Introduction

This section is no longer necessary to store information for older configurations of the Generator. New and old information are merged on replacement pages, which are then inserted into the main flow of text.

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7 MANUAL CHANGES

7-1. Introduction

This section contains manual change instructions for backdating the manual for Generators with serial number prefixes lower than the number listed on the title page of this manual.

7-2. How To Use This Section

To adapt the manual to your instrument, refer to Table 7-1. Make all of the manual changes listed opposite your instrument's serial number or prefix. The manual changes should be performed in the sequence shown in the table. For example, Change C should be done before Change B and Change B before Change A.

Manual change instructions or just information about a part is given in both a lettered change sequence and page number order.

If your instrument's serial number or prefix is not listed on the title page of this manual or in Table 7-1, it may be documented in a separate MANUAL CHANGES supplement. For more information about serial numbers, refer to INSTRUMENTS COVERED BY MANUAL in Section 1 of the Operating Manual.

Table 7-1. Manual Changes by Serial Number Prefix

Serial Number Prefix	Make Manual Changes
2635A	H,G,F,E,D,C,B,A
2641A	H,G,F,E,D,C,B
2643A	H,G,F,E,D,C
2644A	H,G,F,E,D
2650A	H,G,F,E
2708A	H,G,F
2715A	H,G
2716A	H

7-3. Manual Change Instructions

Note

This is a chronological sequence of changes. Immediately following this is a page number sequence of changes.

CHANGE A

Table 6-2:

Add A5A1C4 and C9 0160-3872 CD0 Capacitor-Fxd 2.2 +-0.25 pF 200 Vdc CER.

Change A5A1R10 through A5A1R13 and A5A1R32 through A5A1R35 to 0698-7196 CD8 Resistor 21.5 1% 0.05 W F TC=0+-100.

Change A2A2C45 to 0160-5348 CD9 Capacitor-Fxd 51 pF +-5% 100 Vdc CER.

Change A2A2C46 to 0160-4814 CD2 Capacitor-Fxd 150 pF +-5% 100 Vdc CER.

Change A2A2R67 to 0698-3156 CD2 Resistor 14.7 k 1% 0.125 W F TC=0+-100.

Change A2A2R86 to 0757-0280 CD3 Resistor 1 k 1% 0.125 W F TC=0+-100.

Change A2A2R92 to 0757-0394 CD0 Resistor 51.1 1% 0.125 W F TC=0+-100.

Delete A2A2R127 0757-0401 CD0 Resistor 100 1% 0.125 W TF TC=0+-100.

Change A2A2L19 to 9100-2254 CD3 Inductor RF-CH-MLD 390 nH 10%.

Change A2A2L20 and L33 to 9100-2249 CD6 Inductor RF-CH-MLD 150 nH 10%.

A11U3, A11U4 and A11U5 EPROMS were originally 08780-80024, 08780-80025, and 08780-80026 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested.

CHANGE B

Table 6-2:

A11U3, A11U4 and A11U5 EPROMS were 08780-80044, 08780-80045, and 08780-80046 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested.

CHANGE C

Table 6-2:

Change A2A2R44 to 0757-0444 CD1 Resistor 12.1 k 1% 0.125 W F TC=0+-100

Change A2A2R45 and A2A2R46 to 0757-0465 CD6 Resistor 100 k 1% 0.125 W F TC=0+-100

Add A2A2CR9 and A2A2CR10 1901-0539 CD3 Diode-sm sig schottky

Delete A2A2R128 and A2A2R129 0698-7238 CD9 Resistor 1.21 k 1% 0.05 W

Delete A2A2C66 0160-4831 CD3 Capacitor-Fxd 4700 pF+-10% 100 Vdc CER

CHANGE D

Table 6-2:

A5A1U1A may have HP Part Number 0363-0040 RFI strip-fingers Be-Cu Zinc Plated installed. The table shows the recommended replacement, no change to the manual is suggested.

Information purposes only for A18M2 1205-0353 heatsink. This heatsink on the A18 Power Control Assembly should be removed if your instrument has it installed.

CHANGE E

Table 6-2:

A11U3, A11U4 and A11U5 EPROMS were 08780-80047, 08780-80048, and 08780-80049 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested.

CHANGE F

Table 6-2:

A11U3, A11U4 and A11U5 EPROMS were 08780-80050, 08780-80051, and 08780-80052 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested.

CHANGE G

Table 6-2:

Change W1 to 08780-60055 CD6 Same description.
Change W2 to 08780-60056 CD7 Same description.
Change W3 to 08780-60057 CD8 Same description.
Change W4 to 08780-60058 CD9 Same description.
Change W5 to 08780-60059 CD0 Same description.
Change W6 to 08780-60060 CD3 Same description.
Change W7 to 08780-60061 CD4 Same description.
Change W8 to 08780-60062 CD5 Same description.
Change W98 to 08780-60127 CD3 Same description.

Change A4A2C47 to 0121-0452 CD4 Capacitor-V Trmr Air 1.3-5.4 pF

Change A4A2R48 to 0698-7284 CD5 Resistor 100 k 1% 0.05 W F TC=0+-100.

Change A4A2R50 to 0698-7236 CD7 Resistor 1 k 1% 0.05 W F TC=0+-100.

Delete A4A2R51 and show as Not Assigned.

A11U3, A11U4 and A11U5 Option 064 EPROMS were 08780-80039, 08780-80040, and 08780-80041 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested.

CHANGE H

Table 6-2:

Change A2A1 and A3A1 to 08780-60035 UHF Oscillator Board Assy.

A11U3, A11U4 and A11U5 Option 064 EPROMS were 08780-80053, 08780-80054, and 08780-80055 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested.

A15A1J2 may have 1200-0508 CD0 Socket IC 14-Cont Dip Sldr installed. The recommended part is shown in the table, no change to the manual is suggested.

Change A7A1R4 to 0698-7216 CD3 Resistor 147 1% 0.05 W F TC=0+-100

Change A7A2R76 and A7A2R77 to 0698-7256 CD1 Resistor 6.81 k 1% 0.05 W F TC=+-100.

Change A4A1R17 and A4A1R19 to 0698-7210 CD7 Resistor 82.5 1% 0.05 W F TC=+-100.

Change A4A1R18 to 0698-7213 CD0 Resistor 110 1% 0.05 W F TC=+-100.

Note These are the CHANGES LISTED IN PAGE NUMBER ORDER

Page 6-10, Table 6-2:
Change A2A1 to 08780-60035 CD2 UHF Oscillator Board Assembly. *(Change H)*

Page 6-13, Table 6-2:
Change A2A2C45 to 0160-5348 CD9 Capacitor-Fxd 51 pF +-5% 100 Vdc CER. *(Change A)*
Change A2A2C46 to 0160-4814 CD2 Capacitor-Fxd 150 pF +-5% 100 Vdc CER. *(Change A)*
Delete A2A2C66 0160-4831 CD3 Capacitor-Fxd 4700 pF+-10% 100 Vdc CER. *(Change C)*
Add A2A2CR9 and A2A2CR10 1901-0539 CD3 Diode-sm sig schottky. *(Change C)*

Page 6-14, Table 6-2:
Change A2A2L19 to 9100-2254 CD3 Inductor RF-CH-MLD 390 nH 10%. *(Change A)*
Change A2A2L20 and L33 to 9100-2249 CD6 Inductor RF-CH-MLD 150 nH 10%. *(Change A)*

Page 6-15, Table 6-2:
Change A2A2R44 to 0757-0444 CD1 Resistor 12.1 k 1% 0.125 W F TC=0+-100. *(Change C)*
Change A2A2R45 and A2A2R46 to 0757-0465 CD6 Resistor 100 k 1% 0.125 W F TC=0+-100. *(Change C)*
Change A2A2R67 to 0698-3156 CD2 Resistor 14.7 k 1% 0.125 W F TC=0+-100. *(Change A)*

Page 6-16, Table 6-2:
Change A2A2R86 to 0757-0280 CD3 Resistor 1 k 1% 0.125 W F TC=0+-100. *(Change A)*
Change A2A2R92 to 0757-0394 CD0 Resistor 51.1 1% 0.125 W F TC=0+-100. *(Change A)*
Delete A2A2R127 0757-0401 CD0 Resistor 100 1% 0.125 W TF. *(Change A)*
Delete A2A2R128 and A2A2R129 0698-7238 CD9 Resistor 1.21 k 1% 0.05 W. *(Change C)*

Page 6-17, Table 6-2:
Change A3A1 to 08780-60035 UHF Oscillator Board Assy. *(Change H)*

Page 6-26, Table 6-2:
Change A4A1R17 and A4A1R19 to 0698-7210 CD7 Resistor 82.5 1% 0.05 W F TC=+-100. *(Change H)*
Change A4A1R18 to 0698-7213 CD0 Resistor 110 1% 0.05 W F TC=+-100. *(Change H)*

Page 6-28, Table 6-2:
Change A4A2C47 to 0121-0452 CD4 Capacitor-V Trmr Air 1.3-5.4 pF. *(Change G)*

Page 6-29, Table 6-2:
Change A4A2R48 to 0698-7284 CD5 Resistor 100 k 1% 0.05 W F TC=0+-100. *(Change G)*
Change A4A2R50 to 0698-7236 CD7 Resistor 1 k 1% 0.05 W F TC=0+-100. *(Change G)*
Delete A4A2R51 and show as Not Assigned. *(Change G)*

Page 6-31, Table 6-2:
Add A5A1C4 and C9 0160-3872 CD0 Capacitor-Fxd 2.2 +-0.25 pF 200 Vdc CER. *(Change A)*

Page 6-32, Table 6-2:
Change A5A1R10 through A5A1R13 and A5A1R32 through A5A1R35 to 0698-7196 CD8 Resistor 21.5 1% 0.05 W F TC=0+-100. *(Change A)*

Page 6-33, Table 6-2:
A5A1U1A may have HP Part Number 0363-0040 RFI strip-fingers Be-Cu Zinc Plated installed. The table shows the recommended replacement, no change to the manual is suggested. *(Change D)*

Page 6-47, Table 6-2:
Change A7A1R4 to 0698-7216 CD3 Resistor 147 1% 0.05 W F TC=0+-100. *(Change H)*

Page 6-51, Table 6-2:
Change A7A2R76 and A7A2R77 to 0698-7256 CD1 Resistor 6.81 k 1% 0.05 W F TC=+-100. *(Change H)*

Page 6-86, Table 6-2:
A11U3, A11U4 and A11U5 EPROMS were originally 08780-80024, 08780-80025, and 08780-80026 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested. *(Change A)*

A11U3, A11U4 and A11U5 EPROMS were 08780-80044, 08780-80045, and 08780-80046 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested. *(Change B)*

A11U3, A11U4 and A11U5 EPROMS were 08780-80047, 08780-80048, and 08780-80049 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested. *(Change E)*

A11U3, A11U4 and A11U5 EPROMS were 08780-80050, 08780-80051, and 08780-80052 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested. *(Change F)*

A11U3, A11U4 and A11U5 Option 064 EPROMS were 08780-80039, 08780-80040, 08780-80041 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested. *(Change G)*

A11U3, A11U4 and A11U5 Option 064 EPROMS were 08780-80053, 08780-80054, and 08780-80055 respectively. However, the part numbers shown in Table 6-2 are the recommended replacements. Therefore, no manual changes are suggested. *(Change H)*

Page 6-92, Table 6-2:

A15A1J2 may have 1200-0508 CD0 Socket IC 14-Cont Dip Sldr installed. The recommended part is shown in the table, no change to the manual is suggested. *(Change H)*

Page 6-101, Table 6-2:

Information purposes only for A18M2 1205-0353 heatsink. This heatsink on the A18 Power Control Assembly should be removed if your instrument has it installed. *(Change D)*

Page 6-121, Table 6-2:

Change W1 to 08780-60055 CD6 Same description. *(Change G)*
Change W2 to 08780-60056 CD7 Same description. "
Change W3 to 08780-60057 CD8 Same description. "
Change W4 to 08780-60058 CD9 Same description. "
Change W5 to 08780-60059 CD0 Same description. "
Change W6 to 08780-60060 CD3 Same description. "
Change W7 to 08780-60061 CD4 Same description. "
Change W8 to 08780-60062 CD5 Same description. "
Change W98 to 08780-60127 CD3 Same description. *(Change G)*

8 SERVICE

8-1. Introduction

This section contains information for troubleshooting the Vector Generator. Included are block diagrams, schematic diagrams, principles of operation, and procedures for troubleshooting.

8-2. Failure Modes and Service Strategy

Instrument problems usually fall into four general categories: turn-on errors, operator errors, instrument performance out of specification and catastrophic or calibration failures. The troubleshooting strategy is different for each category. When the Vector Generator appears to be in a failure mode and needs service, assure yourself that the instrument settings do not exceed the specified performance shown in the table of specifications in Section 1. Refer to the Detailed Operating Instructions found in Section 3 of the Operating Manual for further information regarding instrument settings and performance.

8-3. Turn-on Errors

The MSG key contains an indicator that lights when the instrument has a message to display. The instrument may have up to three messages to display. Up to three messages can be displayed consecutively by repeatedly pressing the MSG key. Pressing and holding the key will display the message or warning on the front panel displays.

Powering up the instrument will automatically perform some self checks of the instrument. Any errors or problems will be reported via the MSG key. Error numbers 900 and above indicate that a hardware failure has occurred. Error numbers between 800 and 900 are warnings that a hardware failure may have occurred. Descriptions of the errors are found in the Detailed Operating Information in Section 3 of the Operating Manual.

8-4. Operator Errors

Apparent failures can result from using the Vector Generator beyond its designed capability. This operation may be the result of using the incorrect front panel controls or the wrong programming codes from a controller.

At times the operator may attempt to operate the instrument in an out of specification mode. Under certain conditions the Vector Generator allows the out of specification operation. Under other conditions it does not. A prohibited operation is generally indicated by a warning via the MSG key. The Detailed Operating Information in the Operating Manual contains descriptions of the warnings and the proper ranges for operation.

8-5. Instrument Performance Out of Specification

Two levels of testing can be performed to verify that the instrument is operating normally and within specification. The first level of testing is to perform the Operator's Checks in Section 3 of the Operating Manual. These checks involve the least amount of time and test equipment and can reveal much about overall operation. The second level of testing is done by performing the Performance Tests. These tests are located in Section 4 of the Operating Manual.

If a parameter is only slightly out of limits, it can sometimes be brought into specification by an adjustment. The procedures for all adjustments are in Section 5 of this manual. If the adjustment fails to bring the parameter into specification, use the troubleshooting procedures starting on Service Sheet BD1, Overall Troubleshooting.

8-6. Catastrophic or Calibration Failures

A failure of self-calibration will usually issue a warning message indicating that one of the calibration routines failed and left a portion of the instrument performance uncalibrated. Since the calibrations depend on data from the previous calibration, sometimes using special function 99.9 followed by a calibration will clear the problem. If the fault is not cleared, begin troubleshooting on Service Sheet BD1, Overall Troubleshooting, to isolate the fault to one or more subsystems of the instrument.

When a catastrophic failure such as no response to power up occurs, begin troubleshooting on Service Sheet BD1. The information there is used to quickly isolate the problem to one of the major functional subsystems of the instrument. Troubleshooting catastrophic failures in the instrument is structured into three levels:

a. The overall troubleshooting level, where problems are isolated to the power supply or one of the six subsystems. This level of troubleshooting is supported by Service Sheet BD1, which includes diagrams, theory of operation, and troubleshooting information.

b. The functional level of troubleshooting isolates the malfunction to a replaceable assembly. This level of troubleshooting is supported by Service Sheets BD2 through BD6, which include diagrams, theory of operation, and troubleshooting information.

c. Circuit level troubleshooting isolates the problem to a stage within the circuits shown on the schematic. Not all assemblies are supported by this level of troubleshooting. Service Sheet BD7 includes a circuit level block diagram, schematics, theory of operation, and troubleshooting information. It is expected that further troubleshooting, to the component level, depends on the skill and experience of the troubleshooter.

8-7. Service Sheets

The foldout pages in the last part of this section are the service sheets. They consist of block diagrams, circuit schematic diagrams, supplemental diagrams and associated troubleshooting information.

8-8. Block Diagrams

The block diagrams and related troubleshooting information are found on Service Sheets BD1 through BD7. Service Sheet BD1 is an overall block diagram that shows the major functional sections of the Vector Generator. It serves as an index to the other block diagrams and as a starting point for troubleshooting.

The troubleshooting block diagrams and related troubleshooting information are found on Service Sheets BD2 through BD7. Each troubleshooting block diagram shows enough information within the functional section to support the troubleshooting.

8-9. Schematic Diagrams

Some assemblies are supported with component level repair. Where applicable, schematic diagrams with the related figure for component location and related troubleshooting information are included. These schematic diagrams are aids for understanding operation and for troubleshooting the circuitry at the component level.

8-10. Supplemental Lettered Diagram

The lettered service sheet (Service Sheet A) shows top and bottom internal views of the instrument. These figures identify the interconnecting cables within the instrument, assemblies, and any other parts not found on the Illustrated Parts Breakdown (IPB) figures in Section 6.

8-11. Safety Considerations

8-12. Before Applying Power

Verify that the instrument is set to match the available line voltage and that the correct fuse is installed. An uninterrupted safety earth ground must be provided from the main power source to the instrument input wiring terminals, power cable, or supplied power cable set.

8-13. Warnings and Cautions

Pay attention to WARNINGS and CAUTIONS. They must be followed for your protection and to avoid damage to the equipment.

Warning

Maintenance described herein is performed with power supplied to the instrument and with protective covers removed. Such maintenance should be performed only by service-trained personnel who are aware of the hazards involved (for example, fire and electrical shock). Where maintenance can be performed without power supplied, the power should be removed.

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting the protective earth terminal will cause a potential shock hazard that could result in personal injury. (Grounding one conductor of a two conductor outlet is not sufficient protection.) In addition, verify that a common ground exists between the unit under test and this instrument prior to energizing either unit.

Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

If this instrument is to be energized via an autotransformer (for voltage reduction) make sure that the common terminal is connected to neutral (that is, the grounded side of the mains supply).

Servicing instructions are for use by service-trained personnel only. To avoid dangerous electric shock, do not perform any servicing unless qualified to do so.

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

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

For continued protection against fire hazard, replace the line fuse(s) only with 250V fuse(s) of the same current rating and type (for example normal blow, time delay, etc.). Do not use repaired fuses or short circuited fuse holders.

Caution

Do not disconnect or remove any boards in the Vector Generator unless the instrument is unplugged. Some boards contain devices that can be damaged if the board is removed when the power is on.

Caution

There are several components including MOS devices that can be damaged by electrostatic discharge. Use conductive foam and grounding straps when servicing is required on sensitive components. Use care when unplugging ICs from high-grip sockets.

Service Sheet BD1

Overall Troubleshooting

References

Principles of Operation

The Vector Signal Generator is composed of six subsystems. The subsystems are:

1. Local Oscillator
2. Frequency Modulation
3. RF Output
4. Digital/Vector Baseband
5. Digital Control Subsystem (including Front Panel)
6. Power Supply

General operation of the Vector Generator can be described in terms of the six subsystems. Refer to Figure 8-1 for the following description.

Local Oscillator Subsystem. Frequency generation is controlled by the Local Oscillator Subsystem. The Local Oscillator (LO) Subsystem produces an RF signal with a frequency range of 1 GHz to 1.375 GHz. This output signal is multiplied by eight in the RF Output system and then heterodyned (downconverted) to the 10 MHz to 3 GHz frequency range. The resolution of the LO Subsystem is 0.125 Hz to provide the 1 Hz resolution required at the Vector Generator output.

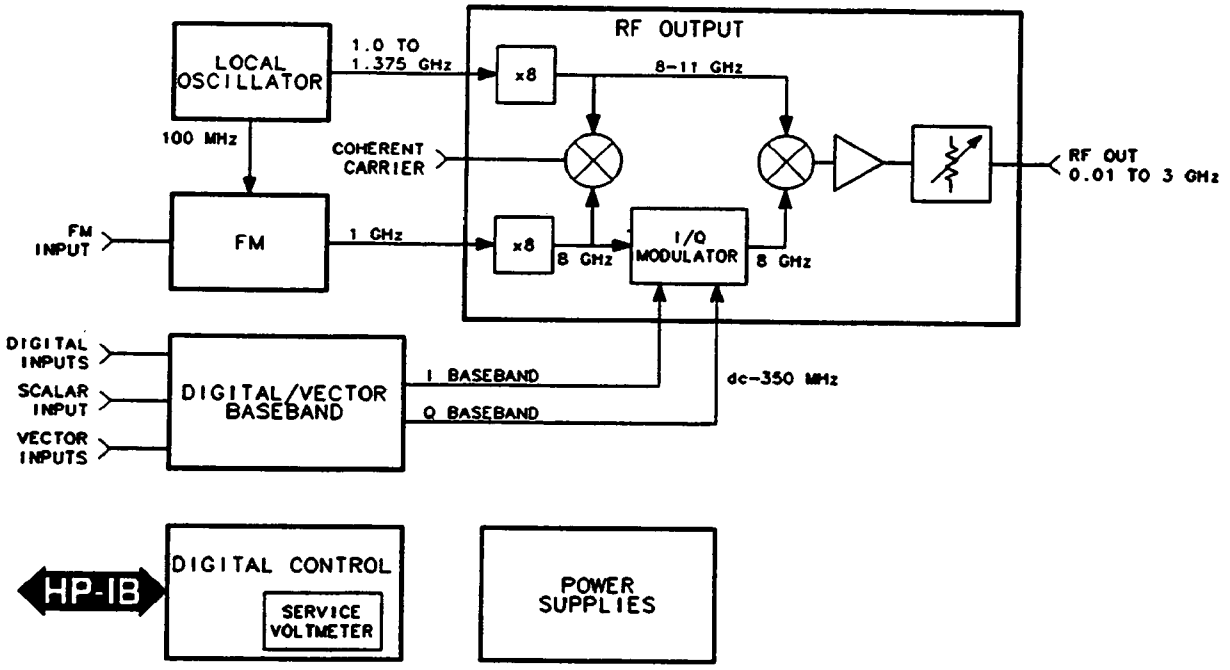

Figure 8-1. Simplified Block Diagram

FM Subsystem. The FM Subsystem produces a 1 GHz signal that is multiplied by eight in the RF Output Subsystem. The resulting 8 GHz signal is mixed with the multiplied LO Subsystem signal to produce the 10 MHz to 3 GHz RF output signal. In CW mode, a 1 GHz oscillator is phase locked to a fixed reference frequency from the LO Subsystem.

FM is introduced by modulating the 1 GHz oscillator in the FM Subsystem. The peak deviation of the 1 GHz signal is also multiplied by eight in the RF Output Subsystem. This provides a large frequency deviation (50 MHz) with a much smaller required deviation of the 1 GHz signal (6.125 MHz).

Digital/Vector Baseband Subsystem. To produce very accurate digital and vector modulation, the 8 GHz signal derived from the FM Subsystem is phase and amplitude modulated using an I/Q (In-phase/Quadrature-phase) modulator. A copy of the output signal without phase and amplitude modulation is provided for a phase reference.

Digital modulation, vector modulation and scalar (amplitude) modulation are all controlled by the Digital/Vector Baseband Subsystem. The modulated 8 GHz carrier is then mixed with the 8.01-11 GHz multiplied output of the LO Subsystem to produce a modulated RF output frequency in the frequency range of .01 to 3.0 GHz.

RF Output Subsystem. The RF Output Subsystem provides frequency multiplication for the LO Subsystem and the FM Subsystem. The I/Q modulator used for phase and amplitude modulation is also contained in the RF Output Subsystem. Control of the I/Q modulator is provided by the Digital/Vector Baseband Subsystem.

Output level control is provided via a step attenuator and a variable attenuator. During an instrument self-calibration, the actual power levels are measured for several frequencies so that correction factors can be generated for output level. The Digital Control Subsystem then corrects output levels for flatness and absolute level accuracy. A conventional feedback Automatic Level Control (ALC) system due to the phase shifts introduced by such a system.

Digital Control Subsystem. The Digital Control Subsystem processes front panel and HP-IB entries, displays instrument settings and controls the internal circuits. In addition, the DCU performs calculations for optimizing internal settings and creating correction factors during self-calibration.

Power Supply Subsystem. The power supply is responsible for producing the operating voltages required for the internal circuitry.

Detailed Discussion

The six subsystems of the Vector Generator are described in more detail below. Refer to the block diagram (BD1) for the following discussion.

Local Oscillator Subsystem. The Local Oscillator Subsystem generates a frequency between 1.0 and 1.375 GHz with a resolution of 0.125 Hz. The low phase noise and high stability of the LO Subsystem are transferred to the RF output signal of the Vector Generator. A reference signal is also produced for phase locking the 1 GHz oscillator of the FM Subsystem to the LO Subsystem.

The LO Subsystem is controlled by a separate, local controller. Communication between the LO Subsystem controller and the Digital Control Subsystem is done via a serial interface.

Frequency Modulation Subsystem. Frequency modulation is accomplished by frequency modulating the FM Subsystem 1 GHz oscillator. In CW mode and ac coupled FM mode, the 1 GHz oscillator is phase locked to a 100 MHz signal from the Local Oscillator (LO) Subsystem. In ac coupled FM mode, the 1 GHz oscillator is directly modulated by the front panel FM input signal.

The bandwidth of the 1 GHz phase locked loop is set at 1 Hz. This enables ac coupled frequency modulation to be accomplished outside the bandwidth of the phase locked loop. If frequency modulation were attempted within the bandwidth of the phase locked loop, the loop would simply cancel the frequency modulation by maintaining phase lock with a fixed reference.

In dc coupled FM mode, a separate 100 MHz voltage controlled oscillator is substituted for the 100 MHz reference frequency from the LO Subsystem. This substitute voltage controlled oscillator is directly controlled by the dc coupled FM input and in turn directly controls the frequency of the 1 GHz oscillator.

RF Output Subsystem. The RF output section is responsible for level control at the RF output, and vector, digital and scalar modulation of the RF output signal. The 1 GHz output of the FM Subsystem is multiplied by eight to produce an 8 GHz IF signal. The 8 GHz IF signal is then split into an In-phase (I) and Quadrature-phase (Q) component. The phase between the two components is 90 degrees (hence the term Quadrature-phase).

The amplitude of the I and Q components are controlled by the Digital/Vector Baseband Subsystem. The two signals are then combined. Since the recombination does not affect the phase, the two signals add vectorially producing an amplitude and phase that is dependent on the amplitude of each component.

The phase reference, the Coherent Carrier, is generated by mixing the multiplied output of the Local Oscillator Subsystem with the multiplied output of the Frequency Modulation Subsystem. The multiplied output of the Frequency Modulation Subsystem is taken before the I and Q components are modulated so there is no phase or amplitude modulation on the coherent carrier.

When the Vector Generator is frequency modulated, the coherent carrier will also be frequency modulated. This enables the coherent carrier to be used as the phase reference when the RF output is vector or digital modulated even when FM is used simultaneously.

Digital/Vector Baseband Subsystem. The Digital/Vector Baseband Subsystem combines the digital, vector and scalar signals into drive signals for the I and Q modulators in the RF output section.

Phase and amplitude modulation are produced by controlling the amplitude of the In-phase (I) and Quadrature-phase (Q) components in the RF Output Subsystem. The I and Q components are different in phase by 90 degrees. When the two components are combined, the resultant signal will have a phase and amplitude that is determined by the amplitude of the I and Q components.

Scalar modulation is produced by equally attenuating the I and Q component. This preserves the phase while changing the amplitude of the combined signal. Phase modulation is obtained by setting the amplitude of the I and Q components to the level required for the desired phase and amplitude.

Vector modulation enables the I and Q components to be controlled directly. By controlling the amplitude of the I and Q component, any amplitude and phase can be obtained.

Digital modulation maps the front panel digital inputs into various predetermined states. A state is defined as a unique phase and amplitude. For example, QPSK contains four different states that are equal in amplitude but occur 90 degrees apart (45, 135, 225 and 315 degrees).

Digital Control Subsystem. The Digital Control Subsystem is responsible for processing front panel or HP-IB inputs and setting the internal control lines appropriately. The data for each subsystem is sent via a serial bit stream by the DCU and then latched at the appropriate time in shift registers on each of the assemblies. In addition, the DCU contains an Analog to Digital Converter (ADC) that is used during calibration and diagnostics to measure various voltages within the instrument. The ADC is also used as a service voltmeter for measuring various internal circuit voltages during troubleshooting.

The Digital Control Subsystem performs a calibration when the front panel CAL key is pressed. The Digital Control Subsystem measures internal circuit parameters and adjusts the internal circuitry for optimum performance. In addition, calibration factors are generated for such items as correcting output level for accuracy and flatness. An automatic level control circuit cannot be used in this application due to the phase errors such a circuit would introduce in the output signal. The Digital Control unit uses RF output levels measured during the self-calibration to correct the output level settings to provide a flat frequency response and calibrated output levels.

Power Supply. The power supply is used to supply the voltages required to operate the other five subsystems. In addition, the power supply motherboard is also used as a signal and power distribution system to route signals and supply voltages to the other five subsystems.

The power supply has both regulation and current foldback circuits. Normally, the output voltage of each power supply is controlled by a regulator. However, when the current drawn increases beyond the safe limit of the supply, another circuit takes control of the series pass transistor to reduce the output voltage. This effectively limits the current in the supply to a safe level.

The power supply can be operated with no loads attached to isolate a problem to the power supply or elsewhere in the instrument. This is accomplished by disconnecting all cables from the A17 Power Distribution assembly.

Troubleshooting

The following Overall Level Procedure should be used to isolate a malfunction to one of the six subsystems. The appropriate Function Level Procedures (associated with BD2-BD7) should then be used to isolate the problem to the appropriate module.

Once the defective module has been identified and repaired or replaced, perform the Overall Level Procedure again to check for other possible malfunctions.

When the Overall Level Procedure can be run with no failures, do the Abbreviated Performance Tests in Section 4 before placing the instrument back into service.

Note

It is recommended that a DCFM calibration be performed once troubleshooting is complete. To perform the calibration, preset the Vector Generator and enable DCFM. After a half-hour warmup (with DCFM on), enter SPCL 23.4 ENT SPCL to run the calibration. This will reduce the carrier frequency change when going from ACFM or CW to DCFM.

Overall Level Procedure

The overall level procedure is broken into seven checks as follows:

Check 1 - Turn-On
Check 2 - Power Supply
Check 3 - Self Calibration
Check 4 - Local Oscillator Subsystem
Check 5 - Frequency Modulation Subsystem
Check 6 - RF Output Subsystem
Check 7 - Digital/Vector Baseband Subsystem

Troubleshooting Hints

The following items are general troubleshooting techniques that are extremely useful when troubleshooting the Vector Generator.

1. Check both the ribbon cable that carries power and control signals and any coaxial cables that carry RF signals for loose connections.

2. Any cables that look worn or frayed should be replaced or at least checked for repeatable continuity.

3. A wrench should always be used when tightening or loosening coaxial connectors.

4. When a coaxial cable is disconnected, the connectors should always be inspected for damage. Make sure that each connector is solidly mounted on the module and that the center conductor is not broken or bent.

5. Test equipment and personnel should be grounded to avoid static induced failures. Observe all electrostatic discharge (ESD) precautions.

6. After a module has been replaced or repaired, make sure that all coaxial connectors are properly tightened with a wrench and that all ribbon cable connectors are firmly seated in their sockets.

Test Equipment

Voltmeter	HP 3566A
Power Meter	HP 438A
Power Sensor	HP 8481A
Oscilloscope	HP 54201A
Frequency Counter	HP 5343A
Spectrum Analyzer	HP 8566B
Test Oscillator	HP 8116A

Check 1 - Turn-On

1. Set the LINE switch to standby. Remove all external cables from the front and rear panels of the Vector Generator, including the line cord.

2. Set the rear panel 10 MHz TIME BASE INT/EXT switch to INT and connect the short jumper cable between the 10 MHz TIMEBASE IN and OUT connectors on the rear panel. This enables the Vector Generator internal timebase.

3. Check that the Vector Generator is set for the correct line voltage by observing the line voltage selection card. This card is visible underneath the fuse on the back panel. The operating voltage that the instrument is set for will be visible without removing the line voltage selection card.

   If the selected line voltage is not correct, refer to Section 2 of the operating manual to set the line voltage to the correct voltage.

4. Connect the line cord to the Vector Generator and then set the LINE switch to ON.

5. Press the INSTR PRESET key on the front panel to set the Vector Generator to a known state. The Vector Generator should preset to the following conditions:

EXT CLK	NONE
CLK and DATA Levels	ECL
SPCL	Off
EXT FILTER	Off
DC COUP FM	Off
Carrier Frequency	70 MHz
Level	-100 dBm or -110 dBm
All Modulation	Off
RF Output	On
Knob	Off

If the instrument does not power up or presets to the wrong conditions, proceed to Check 2 to check the power supply. If the power supply is working correctly, proceed to BD6 to check the front panel and Digital Control Subsystem.

6. Set the LINE switch to standby for at least ten seconds.

7. Set the LINE switch to ON. The Vector Generator should light all of the front panel indicators and turn on all segments in the two displays. The LINE switch can be returned to standby briefly and then switched to on if the displays do not remain lighted long enough to observe all of the indicators. The displays should be checked after the indicators because the displays will remain on longer than the indicators.

   If all indications are correct up to this point, proceed with the next step.

   If the indicators and display segments do not turn on, proceed to BD6 to check the front panel.

8. Set the Vector Generator frequency to 100 MHz.

9. Set the line switch to STANDBY and remove the power cord from the instrument.

10. After a wait of at least 3 minutes, reconnect the power cord and set the line switch to ON. The frequency should still be set to 100 MHz and the message OVEN COLD should be displayed when the MSG key is pressed. The key may have to be pressed more than once since up to three messages can be displayed by repeatedly pressing the key.

If the frequency is correct and the OVEN COLD message is issued, proceed with the next check. The OVEN COLD message should go away within ten minutes of connecting the power cord. If it remains on, proceed to BD7 to troubleshoot the circuit.

If the frequency is not still at 100 MHz, there is a problem with the battery-backed RAM. Proceed to BD6 to verify the RAM.

If the OVEN COLD message is not issued and the frequency is still at 100 MHz, there may be a problem with the detector circuit or the 10 MHz reference oscillator. However, other messages can mask the OVEN COLD message. If UNCAL BASEBAND, UNCAL FM, and UNCAL LEVEL are the three messages, proceed with this check until the calibration problem is cleared. Otherwise, proceed to BD7 to isolate the problem.

Check 2 - Power Supply

1. Examine the six power supply status indicators on the A18 Power Control Assembly. The assembly is located toward the rear of the instrument opposite the transformer. Each indicator is labeled on the circuit side of the assembly. The status indicators are used to indicate whether the associated power supply has had a catastrophic failure (indicator off) or is nominally working. Note that an indicator that is lit does not guarantee that the associated supply is regulating at the proper voltage level.

   If any or all of the status indicators are off, proceed to service sheet BD7 to check the power supply.

   If all of the indicators are on, proceed with the next step.

2. Using the voltmeter, check the supply voltages on the A18 Power Control Assembly. The test points and tolerances of the voltages supplied by the power supply are given in table 8-1.

   If all voltages are within tolerance, proceed with Check 3 Calibration Check.

   If any or all voltages are not within tolerance, proceed to BD7 to troubleshoot the Power Supply Subsystem.

Note

Power supply ripple tolerance information is given on service sheet BD7. Checking power supply ripple is recommended whenever troubleshooting subtle performance problems. High power supply ripple can cause high spurious signals in the RF output signal, high residual FM and power-up problems.

Table 8-1. Power Supply Voltage Limits

Supply Name	A18-	Min. Voltage	Max. Voltage
-2 V	TP3	-2.16	-1.93
+24 V	TP4	+23.25	+24.74
+15 V	TP5	+14.53	+15.45
-15 V	TP6	-15.5	-14.4
+5.0 V	TP8	+4.84	+5.15
-5.2 V	TP9	-5.41	-4.98
+12 V	TP10	+10.0	+14.0

Check 3 - Self Calibration

1. Enter SPCL 99.9 ENT SPCL (Hz key) on the Vector Generator to preset the instrument to a known state and to load default calibration factors. The default calibration factors will ensure that this procedure will work as expected.

   Note that the displays will read "INSTRUMENT INITIALIZED" briefly to indicate that the special function was executed. The MSG indicator will also light to indicate that a message has been activated. The messages generated will indicate that the instrument has been initialized and that the instrument operation is no longer calibrated. Ignore these and any other messages.

2. Enter SPCL 10.1 ENT SPCL to enable the service errors/warnings. The service errors will help indicate problems when a calibration cannot be completed due to an instrument malfunction.

3. Press the CAL key on the Vector Generator. The Vector Generator will optimize the performance of the internal circuitry during the self-calibration. This process provides a good check of the functionality of much of the Vector Generator circuitry.

The calibration will adjust the Digital/Vector Baseband Subsystem (BASEBAND), the RF Output Subsystem (LEVEL) and then the FM Subsystem (FM) in that order. While each calibration is in process, a cursor will move back and forth in the right hand display to indicate that the calibration is in process. Pressing any front panel key will abort the calibration.

4. Once the calibration is complete, enter SPCL 51.0 ENT SPCL (Hz key) to read the error code generated by the calibration procedure. The number will be displayed on the front panel display.

   If the error code displayed is zero or greater than 99, proceed with the next step.

   If the error code displayed is between 1 and 5, there is a problem indicated with the Local Oscillator Subsystem. Proceed to service sheet BD2 to isolate the problem to part of the Local Oscillator Subsystem.

   If the error code displayed is 6, the calibration was aborted due to a front panel key press. Repeat the calibration and this step.

Note 

Calibration errors may help isolate a problem to one subsystem. However, the LEVEL and BASEBAND portion of the calibration are dependent on having sufficient power available at the RF output and on having the internal level detector working. For failures of both the LEVEL and BASEBAND calibration, use Check 6 to isolate the problem to either the RF Output Subsystem or the Digital/Vector Baseband Subsystem.

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5. Enter SPCL 51.2 ENT SPCL to check for errors that occurred during the LEVEL calibration. The error code will be displayed on the front panel display.

   If the error code displayed is zero, the LEVEL calibration was performed with no error. Proceed with the next step.

   If the error code displayed is between 200 and 255, a problem is indicated in the RF Output Subsystem. Proceed with Check 6 to further isolate the problem.

6. Enter SPCL 51.1 ENT SPCL to check for any errors that occurred during the BASEBAND portion of the calibration.

   If the error code displayed is zero, the LEVEL calibration was completed with no error. Proceed with the next step.

If the error code displayed is between 100 and 199, a problem is indicated in the Digital/Vector Baseband Subsystem. Proceed to BD6 to check the Digital/Vector Baseband Subsystem.

7. Enter SPCL 51.3 ENT SPCL to check for any errors that occurred during the FM portion of the calibration.

   If the error code displayed is zero, the calibration was performed with no problems. Proceed with the next step.

   If the error code displayed is between 50 and 99, a problem is indicated in the FM Subsystem. Proceed to Check 5 to check the Frequency Modulation Subsystem.

Check 4 - Local Oscillator Subsystem

1. Connect the power meter or the oscilloscope to the rear panel 10 MHz TIMEBASE OUT. This signal is the master frequency reference for the Vector Generator.

   The level should be at least +7 dBm (1.414 volts peak-to-peak into 50Ω).

   If the level is correct, proceed with the next step.

   If the level is not correct, proceed to BD7 to check the 10 MHz reference oscillator.

2. Connect the frequency counter to the COHERENT CARRIER output on the rear panel of the Vector Generator.

Note 

The Local Oscillator Subsystem can be checked without using a frequency counter by observing the front panel message key. However, it is possible for one of the internal phase locked loops to phase lock to the wrong frequency when a malfunction occurs. This would result in an incorrect frequency output even though the instrument indicates that phase lock has been established.

If a frequency counter is not used, monitor the MSG key as this check is performed. If the key indicator lights and the error number indicated when the MSG key is pressed is between 900 and 907, the Local Oscillator Subsystem has malfunctioned. Remember that the MSG key can indicate up to three errors by repeatedly pressing the key. This avoids the problem of another error masking a hardware failure.

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3. Connect the 10 MHz reference output of the frequency counter to the 10 MHz TIME BASE IN connector on the rear panel of the Vector Generator. The TIMEBASE INT/EXT switch should be left on the INT position for this check.

4. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

5. Set the Vector Generator frequency to 10 MHz and set the frequency increment to 99 MHz.

   If the MSG key indicator lights and indicates an error between 900 and 907 when pressed, proceed to service sheet BD2 to isolate the problem in the LO Subsystem.

   If the frequency counter measures 10 MHz ±1 count (on any resolution), proceed with the next step.

   If the frequency counter cannot measure the frequency or measures a frequency of 8 GHz, connect the frequency counter to A2J1, SUM OUT. This is the output of the Local Oscillator Subsystem before being routed to the RF Output Subsystem. If the frequency still cannot be measured, proceed to BD2 to troubleshoot the LO Subsystem. The correct frequency at this point is 1.00125 GHz at a level greater than +8 dBm.

6. Step the Vector Generator frequency from 10 MHz to 3 GHz in 99 MHz steps. This will ensure that all internal phase locked loops are tuned over their full range to check for phase lock.

   The frequency counter should agree with the set frequency within ±1 count. If the MSG key lights, verify that the error number is not between 900 and 907.

   If the frequency counter indication is correct at all frequencies and an error between 900 and 907 is not issued, proceed to Check 5 to check the Frequency Modulation Subsystem.

   If the frequency counter reading is unstable or the frequency cannot be measured, connect the frequency counter to A2J1, SUM OUT. To calculate the correct frequency at A2J1, add 8 GHz to the front panel frequency. The frequency at A2J1 will be one-eigth the calculated frequency (F=[Front Panel Setting+8 GHz]/8). For a front panel frequency of 109 MHz, the SUM OUT frequency would be 1.013625 GHz. The level at A2J1 for any setting should be between +8 and +12 dBm. If the level and frequency are correct, continue with the check. If the level or frequency is not correct, proceed to BD2 to troubleshoot the Local Oscillator Subsystem.

   If any or all of the frequencies are incorrect or an error message is issued that is between 900 and 907, proceed to service sheet BD2 to troubleshoot the Local Oscillator Subsystem.

Check 5 - Frequency Modulation Subsystem

1. Set the Vector Generator to 1 GHz.

2. Connect the spectrum analyzer to the COHERENT CARRIER output on the rear panel of the Vector Generator.

3. Select FM modulation by pressing the FM ON key. Set the FM range to 1 MHz peak-to-peak using the SET FM key and the numeric keypad.

4. Set the test oscillator to 208 kHz at an output level of 1 volt peak-to-peak (353 mVrms) into 50Ω.

5. Connect the test oscillator to the FM input of the Vector Generator.

6. Adjust the test oscillator frequency slightly to minimize the level of the carrier. This first carrier null should occur at a modulating rate of 208 kHz for a 1 MHz peak-to-peak deviation.

   If the test oscillator frequency required to minimize the carrier occurs between 192 kHz and 224 kHz, the FM accuracy is within specification. Proceed with the next step.

   If the test oscillator frequency is not between 192 kHz and 224 kHz when the first carrier null occurs, the FM circuitry is not within tolerance. Attempt to recalibrate the instrument and retry this check. If the problem remains, proceed to service sheet BD3 to troubleshoot the FM circuitry.

7. Set the FM range to 150 kHz peak-to-peak using the SET FM key and the numeric keypad.

8. Press the DC COUP FM key on the Vector Generator to select dc coupled FM.

9. Set the test oscillator for a frequency of 10 Hz at an output level of 1 volt peak-to-peak.

   The spectrum analyzer should show a deviation of 150 kHz. The actual center frequency is not as important as the size of the deviation.

   If the frequency deviation is 150 kHz ±10 kHz, proceed with the next step.

   If the frequency does not change or the deviation is more than 10 kHz in error, proceed to BD3 to isolate the problem in the DCFM portion of the FM Subsystem.

10. Select ac coupled FM by pressing the DC COUP FM key (the key indicator should turn off). Set the FM range to 50 MHz peak-to-peak using the SET FM key and the numeric keypad.

11. Set the test oscillator for a sine wave of 100 kHz at an output level of 1 volt peak-to-peak into 50Ω. Set the dc offset to 0 Vdc.

12. Measure the FM bandwidth on the spectrum analyzer. The FM bandwidth is measured by noting the two points on the displayed spectrum where all sidebands drop to less than 20 dB below the unmodulated carrier level. Refer to Figure 8-2.

    The FM bandwidth should be at least 50 MHz. Adjust the test oscillator as needed to set the FM bandwidth to 50 MHz. This condition guarantees that the peak deviation of the Vector Generator can meet the 50 MHz peak-to-peak maximum deviation.

    If the FM bandwidth can be adjusted for 50 MHz, proceed with the next check.

    If the FM bandwidth cannot be adjusted for 50 MHz, proceed to BD3 to troubleshoot the FM Subsystem.

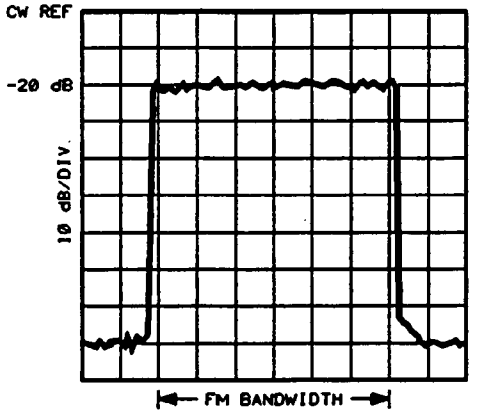


Figure 8-2. FM Bandwidth Measurement

Check 6 - RF Output Subsystem

Maximum Power.

1. Connect the power meter to the Vector Generator RF output.

2. Set the Vector Generator to 10 MHz and set the output level for a power meter reading of +10 dBm. This is the maximum specified power level for the 10 MHz to 2.5 GHz range.

3. Tune the Vector Generator from 10 MHz to 2.5 GHz in 100 MHz steps and reset the Vector Generator output level for a power meter reading of +10 dBm ±.1 dB at each frequency. Reset the power meter calibration factor as appropriate.

   If the Vector Generator can be set to +10 dBm for each frequency, proceed with the next step.

   If the Vector Generator cannot be set to +10 dBm, proceed to BD4 to troubleshoot the RF Output Subsystem.

4. Set the Vector Generator to 2.5 GHz and set the output level for a power meter reading of +4 dBm. This is the maximum specified power level for the 2.5 GHz to 3.0 GHz range.

5. Tune the Vector Generator from 2.5 GHz to 3.0 GHz in 100 MHz steps and reset the Vector Generator level for a +4 dBm power meter reading at each frequency. Reset the power meter calibration factor as appropriate.

   If the Vector Generator can be set to +4 dBm at each frequency, proceed with the next step.

   If the Vector Generator cannot be set to +4 dBm for each frequency, proceed to BD4 to troubleshoot the RF Output Subsystem.

Variable Attenuator.

6. Set the Vector Generator to 140 MHz at an output level of +12 dBm.

7. Enter SPCL 1.1 ENT SPCL on the Vector Generator to lock the attenuator range.

8. Using the SET LEVEL key and the knob, adjust the output level from +12 dBm to the minimum level possible. The change in level should be at least 17 dB (18 dB for instruments with Option 064 installed).

   If the change in level is at least 17 dB, proceed with step 9.

   If the change in level is less than 17 dB, proceed to service sheet BD4 to further isolate the problem.

9. Enter SPCL 1.0 ENT SPCL to unlock the step attenuator range.

Step Attenuator.

10. Reset the Vector Generator output level to maximum. Note the actual level as a reference for the following steps.

11. Select the 10 dB section of the step attenuator by using the following key sequence.

    SPCL 53.0 ENT 0 ENT
    SPCL 53.1 ENT 24 ENT
    SPCL 53.2 ENT 4 ENT
    SPCL 53.3 ENT 1 ENT

    The RF level should decrease by 10 dB ±2 dB.

    If the level changes correctly, proceed with the next step.

    If the level change is not correct, proceed to BD4 to check the RF level control.

12. Switch out the 10 dB section and select the 20 dB section of the step attenuator by entering the following key sequence.

    SPCL 53.3 ENT 2 ENT

    The level should be 20 dB ±2 dB below the reference (maximum level).

    If the level change is correct, proceed with the next step.

    If the level change is not correct, proceed to BD4 to check the RF level control.

13. Switch out the 20 dB section and select the first 40 dB section of the step attenuator by entering the following key sequence.

    SPCL 53.3 ENT 4 ENT

    The level should be 40 dB ±2 dB below the reference.

    If the level change is correct, proceed with the next step.

    If the level change is not correct, proceed to BD4 to check the RF level control.

14. Switch out the first 40 dB section and select the second 40 dB section of the step attenuator by entering the following key sequence.

    SPCL 53.3 ENT 8 ENT

    The level should be 40 dB ±2 dB below the reference.

    If the level change is correct, proceed with the next step.

    If the level change is not correct, proceed to BD4 to check the RF level control.

Coherent Carrier.

15. Connect the power meter to the rear panel COHERENT CARRIER output.

16. Tune the Vector Generator from 10 MHz to 3 GHz in 100 MHz steps. The COHERENT CARRIER level should remain greater than -20 dBm (greater than +9 dBm for an instrument with Option 002 installed).

    If the level is correct, proceed with the next check.

    If the level is not correct, proceed to BD4 to check the COHERENT CARRIER.

Check 7 - Digital/Vector Baseband Subsystem

Vector Modulation.

1. Connect the spectrum analyzer to the Vector Generator RF output.

2. Set the Vector Generator to 10 MHz and set the output level for a spectrum analyzer indication of 0 dBm. This will be the full scale reference to test vector modulation.

3. Select vector modulation mode with the VECTOR ON key. The key indicator will light to indicate that vector modulation has been selected and the I and Q input connector indicators will light to indicate that these connectors are active.

   The output level should drop to less than -50 dBm.

   If the power does drop, proceed with the next step.

   If the power does not drop, proceed to service sheet BD5 to further isolate the problem.

4. Set the test oscillator for a dc level of +0.5 volts into a 50Ω load. This will be used to check for full scale modulation of the I and Q channel.

5. Connect the +0.5 volts to the I input and observe the spectrum analyzer. The power should increase to the reference level established above (0 dBm).

   If the power level does increase, the I channel is working correctly.

   If the power level does not increase or is more than 5 dB different, proceed to service sheet BD5 to isolate the problem.

6. Connect the +0.5 Vdc signal to the Q input. The power should increase to the reference level (0 dBm).

If the level increases to within 5 dB of the reference, the Q channel is working correctly.

If the level does not increase to within 5 dB of the reference, proceed to BD5 to isolate the problem.

Scalar Modulation.

7. Select scalar modulation on the Vector Generator by pressing the SCALAR ON key. This will deactivate the vector modulation mode and will activate the scalar modulation mode.

8. Set the test oscillator for a +1 volt dc signal. The scalar input impedance is about 10kΩ so this level should not be set using a 50Ω termination. A voltmeter can be used to monitor the voltage at the scalar input for highest confidence.

9. Connect the +1 volt signal to the scalar input. The output level should increase from less than -50 dBm with no signal at the scalar input to 0 dBm with the +1 Vdc applied.

   If the level does increase to +0 dBm, scalar modulation is working. Continue with step 10 to check digital modulation.

   If the level does not change or is more than 3 dB away from the level set in step 2, proceed to service sheet BD5 to isolate the problem further.

Digital Modulation.

10. Set the Vector Generator to 10 MHz at an output level of -10 dBm.

11. Connect the rear panel coherent carrier output to channel 1 of the oscilloscope.

12. Connect the Vector Generator RF output to channel 2 of the oscilloscope. Viewing the coherent carrier and the modulated carrier will enable phase changes to be viewed on the oscilloscope.

13. Select QPSK by pressing the QPSK ON key. QPSK will enable four different phase states to be tested using the signals displayed on the oscilloscope.

14. Set the oscilloscope to trigger on the coherent carrier input and adjust the other controls to display the two 10 MHz signals. It is important to trigger on the coherent carrier to maintain a stable phase reference.

15. Note the position of zero crossing near the center of the display for the channel 2 (RF output) signal. This will be the phase reference (45°) for the following check.

16. Invert D0 by pressing INVERT INPUT and then 0. This should change the phase of the signal to 135°. The oscilloscope display should show a shift of 90° or one-quarter of a period (320 ns).

    If the signal does shift, continue with the next step.

    If the displayed signal does not shift, proceed to service sheet BD5 to isolate the problem.

17. Invert the D2 input (D3 input for Option 064) by pressing the INVERT INPUT key followed by a 2. The phase should now be 225° and the RF output signal (channel 2) should again shift one-quarter of a period (320 ns).

    If the signal does shift, continue with the next step.

    If the displayed signal does not shift, proceed to service sheet BD5 to isolate the problem.

18. Press the INVERT INPUT key followed by a 0. This should change the phase to 315° which will again shift the RF output signal (channel 2) by one-quarter of a period (320 ns).

    If the signal does shift, continue with the next step to check the remaining digital inputs.

    If the displayed signal does not shift, proceed to service sheet BD5 to isolate the problem.

19. Connect channel 1 of the oscilloscope to the I channel external filter output on the rear panel of the Vector Generator. Connect channel 2 to the Q channel external filter output.

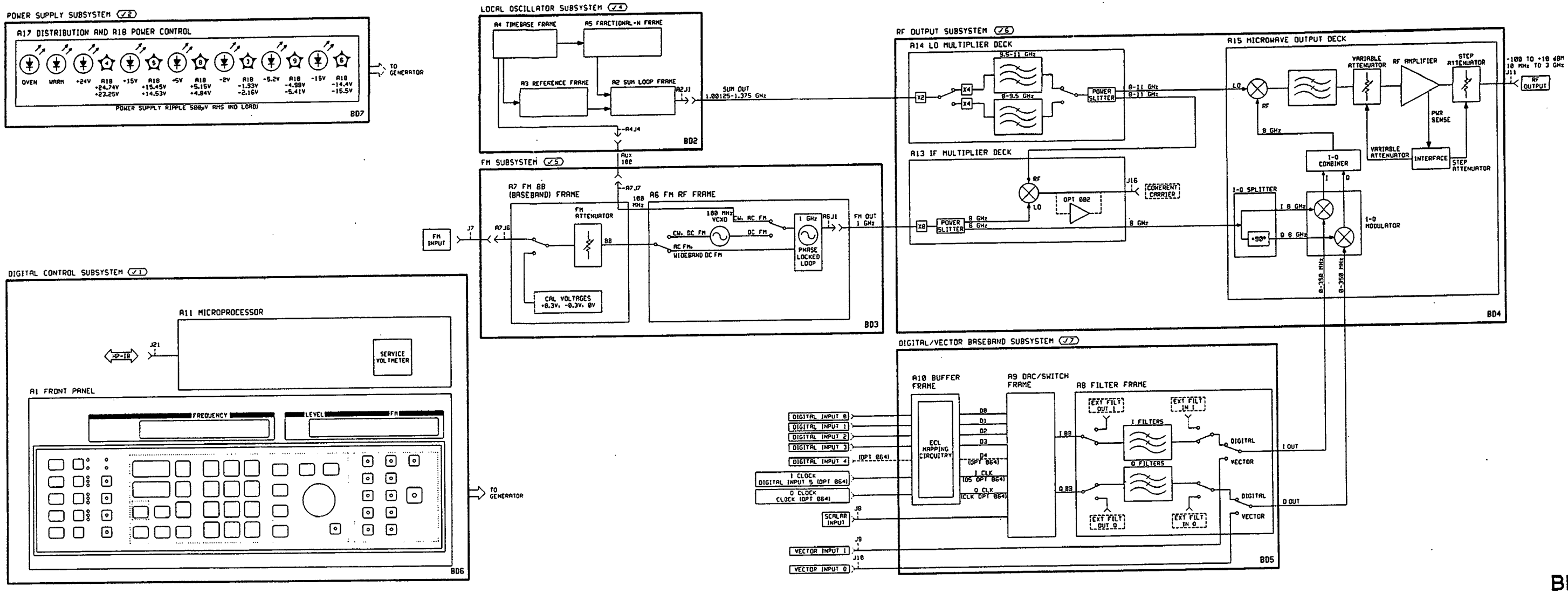
20. Set the oscilloscope to X versus Y mode of operation to display the Q channel versus the I channel output.

21. Select external filters by pressing the EXT FILTR key. This will route the modulating signals to the oscilloscope.

22. Set the psuedo-random bit sequence (PRBS) on using special function 7.1. This will toggle all of the digital inputs in a random manner so that all combinations can be observed on the oscilloscope.

    The oscilloscope should show a uniform pattern of dots on the screen. If the pattern is unbalanced or there are large holes in the pattern, proceed to service sheet BD5 to isolate the problem.

    If the pattern is even and symmetrical, the Digital/Vector Baseband Subsystem is nomimally working. Perform the Digital Input Checks on BD5 to complete the overall level procedure. This check verifies that all digital input signals are working.



BD1

Figure 8-3. BD1 Overall Block Diagram

Service Sheet BD2

Local Oscillator Subsystem

References

Principles of Operation

The Local Oscillator Subsystem is made up of four major assemblies, (refer to Figure 8-4):

A4 Time Base Frame
A3 Reference Loop Frame
A5 Fractional-N Loop Frame
A2 Sum Loop Frame

The Local Oscillator Subsystem provides a low phase noise CW signal, from 1001.25 to 1375 MHz, at the Sum Loop output, A2J1 SUM OUT. This signal is multiplied by 8 in the RF Output Subsystem and then used to downconvert the 8 GHz modulated carrier to produce an RF output signal between 10 MHz and 3 GHz. Since the spectral purity characteristics of the Sum Loop output are directly transferred to the Vector Generator RF Output signal, the Local Oscillator Subsystem has been designed for extremely low phase noise and spurious levels. This ensures excellent spectral purity at the RF Output.

A secondary function of the Local Oscillator Subsystem is to provide a 100 MHz reference signal, AUX 100, to the FM Subsystem. The use of the 100 MHz reference signal for phase locking the 1 GHz FM VCO is explained in detail in the theory of operation for BD3.

Frequency control of the RF Output signal is achieved by tuning the Local Oscillator Subsystem frequency. In order to produce the 1 Hz frequency resolution required at the Vector Generator output, the Local Oscillator Subsystem must be capable of 0.125 Hz resolution (1 Hz divided by eight).

A4 Timebase Frame

The Timebase Frame circuitry includes three assemblies:

A4A2 Timebase Loop assembly
A4A1 Timebase Divider assembly
A4A3 Controller assembly

The Timebase Frame provides low phase noise, fixed frequency reference signals to the A7 FM Baseband Frame, the A3 Reference Loop Frame, and the A5 Fractional-N Frame.

A4A2 Timebase Loop. The Timebase Loop assembly contains a Voltage Controlled Crystal Oscillator (VCXO). The open loop, or freerun, frequency of the oscillator is set for 100 MHz. This enables the oscillator to operate at approximately 100 MHz even when the phase locking circuitry is not operational. During normal operation, the VCXO is phase locked to an external 10 MHz reference signal from A4J6, REF IN. If this signal is not present, the oscillator will still operate at the 100 MHz freerun frequency. The 10 MHz reference is filtered to reduce spurious, then multiplied by 10 to produce a 100 MHz signal to be compared against the 100 MHz VCXO output.

If the Vector Generator rear panel 10 MHz Reference switch is set to EXT and no reference signal is supplied, the Ext Ref Detector will detect the absence of the reference signal and switch the VCXO tuning voltage from the output of the loop integrator to a fixed voltage of -6.8 Vdc. This will tune the VCXO to the center of its range.

Additional circuitry will detect the absence of VCXO oscillation and also loss of phase lock. The local controller is alerted whenever there is no external reference, phase lock is lost, or a malfunction occurs that stops oscillation of the VCXO. A front panel message "ERROR 1" indicates that one of these errors has occurred.

The 100 MHz VCXO output is amplified and sent through a power splitter to produce three copies of the 100 MHz signal. The first output is used as the feedback path to phase lock the VCXO. The second drives the A4A1 Timebase Divider assembly and is used by the A7 FM Baseband assembly. The third output drives the A3A2 Reference Loop assembly sampler.

A4A1 Timebase Divider. The Timebase Divider assembly multiplies, divides and filters the 100 MHz reference to generate 400 MHz, 10 MHz, 20 MHz, and 40 MHz reference signals. The multiplied signal is filtered to reduce spurious signals from the multiplication process.

A switch selects either the 20 MHz or 40 MHz reference signal for the A3 Reference Loop frame. When the input to the switch control line is low, the 20 MHz signal is selected and output to the A3 Reference Loop. Conversely, a high will select the 40 MHz output. The Vector Generator front panel frequency setting determines whether the 20 MHz or 40 MHz reference signal is used.

A4A3 CPU. The CPU assembly acts as a local controller to direct all functions of the Local Oscillator Subsystem.

A3 Reference Loop Frame

The Reference Loop Frame circuitry is divided into two assemblies:

A3A2 Reference Loop Assembly
A3A1 UHF Oscillator Assembly

The Reference Loop provides the 20 MHz coarse frequency steps required by the Sum Loop to cover the 1000-1380 MHz frequency range. When mixed in the Sum Loop with the fine resolution signal of the Fractional-N Loop output, a broadband, high resolution signal is created.

A3A1 UHF Oscillator. Two oscillators are used to cover the frequency range of 1000 MHz to 1380 MHz. One oscillator covers the 1000-1250 MHz range and the other covers 1250-1380 MHz. Which oscillator is used is selected by the local controller according to the Vector Generator front panel frequency setting.

A3A2 Reference Loop. The Reference Loop assembly uses a 100 MHz, +18 dBm reference signal from the Timebase frame to drive the Reference Loop Sampler. The Sampler acts as a harmonic mixer/phase detector by mixing harmonics of the 100 MHz reference with the Reference Loop VCO output. The mixing produces an IF signal ranging from dc to 50 MHz.

The Reference Loop maintains phase lock using either dc or IF phase locking. In the dc phase locking mode, the IF signal from the Sampler is zero Hz (dc). This occurs whenever the VCO frequency is exactly an integer multiple of the 100 MHz reference signal from the Timebase frame.

The second phase locking mode, IF phase locking, uses the 20/40 MHz signal from the Timebase frame. When IF phase locking is used, the output of the Sampler is compared to either a 20 MHz or 40 MHz signal from the Timebase frame. The VCO signal is adjusted to produce an IF signal from the sampler that is exactly the same frequency as the 20/40 MHz signal from the Timebase frame. The local controller selects dc or IF phase locking by selecting the appropriate feedback signal for the loop integrator.

To prevent the Reference Loop from phase locking on the wrong frequency, the VCO must be pretuned and the VCO swept about the correct frequency to acquire lock. The VCO is pretuned to within 50 MHz of the desired output frequency to ensure that the Reference Loop does not lock to the wrong harmonic of the 100 MHz signal input to the sampler.

Once the VCO signal is within 50 MHz of the desired frequency, it is swept about the desired frequency until phase lock is achieved. In dc phase locking mode, a beat detector is used to verify that the IF signal is indeed a dc signal. In IF phase locking mode, a slightly different method is used.

The switched 20/40 MHz reference signal from the Timebase frame is passed through a 90 degree power splitter to produce two phase coherent signals. The phase shifted signal is sent to the Quadrature Phase Detector (QPD) while the normal signal is routed to main phase detector. When the loop is phase locked, the output of the main phase detector is zero volts (zero phase error).

The phase shifted 20/40 MHz reference signal is mixed with the IF signal in the QPD and produces a positive or negative dc level depending on which sideband of the 100 MHz harmonic the the VCO is phase locked to. The Lock Decode Logic circuit uses the polarity to decode whether the IF lock point is upper sideband or lower sideband. The sideband information is used to prevent locking on the wrong harmonic by specifying whether the VCO output frequency should be below the 100 MHz harmonic (lower sideband) or above the 100 MHz harmonic (upper sideband).

A5 Fractional-N Frame

The Fractional-N Frame circuitry is divided into two assemblies:

A5A1 Fractional-N RF Assembly
A5A2 Fractional-N Loop Assembly

The Fractional-N Loop provides the 0.125 Hz fine tune steps required by the Sum Loop to control the output frequency in 1 Hz steps.

A5A1 Fractional-N RF. The RF assembly contains a VCO which operates over the range of 425-445 MHz. The VCO output is sent to the A2 Sum Loop and the A6 Fractional-N Loop mixer. The mixer is used to downconvert the 425-445 MHz VCO output signal to a 25-45 MHz IF signal.

A5A2 Fractional-N Loop Assembly. The IF signal from the RF assembly is input to the fractional divider, which divides the IF signal down to 104.2 KHz. This signal is then compared with a 104.2 kHz signal derived from the 10 MHz reference signal from the Timebase Loop (10 MHz divided by 96). The phase detector, which compares the two signals, outputs a dc signal proportional to the phase error between the two inputs. This signal is routed to the loop integrator to adjust the VCO frequency for a zero phase error.

In order to produce the high tuning resolution required by the A2 Sum Loop, the Fractional-N Loop must divide the output of the VCO by non-integer divisors. The frequency divider incorporated can only divide the frequency by integer divisors. In order to get the non-integer divisors required, the fractional divider alternates between the two closest divisors. As an example, to divide by 3.5 would simply require dividing by three and then four alternately. Dividing by 3.25 would require division by three for three cycles and then dividing by four for the last cycle.

By varying the time spent at each divisor, the divide by N number becomes the weighted average of the two integer divisions.

Because the divider is switching between two different divide numbers, large spurious signals are produced. To remove the unwanted spurious signals, the Analog Phase Interpolator circuitry introduces a correction signal which effectively cancels the spurious components in the signal.

A2 Sum Loop Frame

The Sum Loop Frame consists of two assemblies:

A2A1 UHF Oscillator Assembly
A2A2 Sum Loop Assembly

The Sum Loop covers a frequency range of 1001.25 MHz to 1375 MHz with a tuning resolution of 0.125 Hz.

A2A1 UHF Oscillator. Two VCOs are required to cover the 1001.25 MHz to 1375 MHz range. The first VCO covers the 1000 MHz to 1250 MHz frequency range. The second covers the 1250 MHz to 1380 MHz range. The VCO selected is dependent on the Vector Generator RF output frequency setting.

The output of the selected VCO is sent through a power splitter to produce the Sum Loop output and the VCO feedback signal.

A2A2 Sum Loop Assembly. The feedback signal from the UHF oscillator is mixed with the Reference Loop output to generate a 10 MHz to 20 MHz IF. The Reference Loop signal is tuned in steps of 20 MHz to provide 20 MHz steps at the Local Oscillator Subsystem output.

The IF signal is routed to the phase detector where it is compared to the reference signal derived from the A5 Fractional-N Loop output. The Fractional-N Loop output is divided by an integer number between 22 and 44. Since the Fractional-N Loop output range is 425 MHz to 445 MHz, this generates a divided signal in the range of 10 MHz to 20 MHz.

For normal phase locked operation, both inputs to the phase detector should be at the same frequency. The divide number is set by the local controller. The actual number is dependent on the Vector Generator RF output frequency.

The sense, or polarity, of the IF signal depends on whether the upper or lower sideband of the IF signal is used to phase lock the oscillator. To enable the phase locked loop to lock on either sideband, the sense of the feedback in the phase locked loop must be changed whenever phase lock moves from the upper to lower sideband or from the lower to upper sideband.

The Sideband Switch circuitry is used to set the sense of the feedback in the phase locked loop. By setting the sense of the feedback, the phase locked loop can be forced to lock on either the upper or lower sideband.

When the loop is unlocked, the Search Oscillator applies a triangle wave to the VCO tuning voltage to sweep the VCO through the lock range while the IF Detector circuit looks for an IF signal. When the IF frequency is within the low-pass filter passband, the IF Detector will disable the Search Oscillator. Once the IF is within 40 MHz of the Reference Loop, the loop can acquire phase lock.

Local Oscillator Subsystem Local Controller

The A4A3 CPU Assembly is the controller for the Local Oscillator Subsystem. It is a slave controller to the Vector Generator A11 Microprocessor assembly. The local controller is a version of the Z8 single-chip microprocessor. Communications with the master controller (A11) are accomplished via a two wire serial path at TTL levels.

Control of the four frames in the Local Oscillator Subsystem is accomplished via a private 8-bit data bus. This bus accesses various data latches within the four Local Oscillator Subsystem modules. A separate enable control line is used to latch the data for the appropriate module. In addition, each of the four modules has a phase phase-locked status output line which is fed back and read by the slave controller. The slave controller sends the Local Oscillator Subsystem status to the master controller. If the status message indicates a problem in the Local Oscillator Subsystem, an error message (904 through 907) will be issued via the Vector Generator front panel message function.

The major functions controlled in each of the four modules are as follows:

A4 Timebase Frame - Selection of the 20 MHz or 40 MHz reference output and the phase-locked status bit.

A5 Fractional-N Frame - Fractional-N divider IC which is controlled via a three wire handshake interface. The desired divide number requires sixteen digits to produce the frequency resolution needed. The number is sent to the Fractional-N divider IC as 16 four bit numbers on the four data lines. Additional control lines are needed to manage data transfer between the IC and the local controller. This requires four control lines, the data bus and the phase-locked status bit.

A3 RF Reference Frame - This module requires two sets of information. Four bits of data are sent to the frame to control the phase lock mode of the Reference Loop. In addition, the 8-bit DAC value for pretuning the VCO for proper operation is required. These are implemented with two enable lines, the data bus and the phase-locked status bit.

A2 Output Sum Loop - This module requires two sets of information. An 8-bit number is required to set the programmable divider that divides the Fractional-N Loop output. In addition, two other bits are required to select the appropriate VCO. These are implemented with two enable lines, the data bus and the phase-locked status bit.

Troubleshooting

It is assumed that the troubleshooting information on Service Sheet BD1 was used to isolate a malfunction to the Local Oscillator Subsystem. The following information will aid in isolating the defective module.

The troubleshooting procedure is divided into eight major checks as follows:

Check 1 - 10 MHz Reference Check
Check 2 - AUX 100 Signal Check
Check 3 - Local Oscillator Subsystem Output Check
Check 4 - A4 Timebase Frame
Check 5 - A3 Reference Loop Frame
Check 6 - A5 FRAC-N Frame
Check 7 - A2 Sum Loop Frame
Check 8 - LO Subsystem Control Signals/Power Supplies

Checks 1, 2 and 3 make up a functional verification of the Local Oscillator Subsystem. If no problems are found in these steps, the Local Oscillator Subsystem is functioning normally.

Troubleshooting Hints

The following items are general troubleshooting techniques that are useful when troubleshooting the Vector Generator.

1. Check both the ribbon cable that carries power and control signals and any coaxial cables that carry RF signals for loose connections.

2. Any cables that look worn or frayed should be replaced or at least checked for repeatable continuity.

3. A wrench should always be used when tightening or loosening coaxial connectors.

4. The coaxial connectors on a cable that is disconnected should always be inspected for damage. Make sure that each connector is solidly mounted on the module and that the center conductor is not broken or bent.

5. Test equipment and personnel should be grounded to avoid static induced failures. Observe all electrostatic discharge (ESD) precautions.

6. After a module has been replaced or repaired, make sure that all coaxial connectors are properly tightened with a wrench and that all ribbon cable connectors are firmly seated in their sockets.

Test Equipment

Frequency Counter ..... HP 5343A
Power Meter ..... HP 438A
Power Sensor ..... HP 8482A

Check 1 - 10 MHz Reference Check

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Verify that the front panel MSG key indicator is off. If it is on, press and hold the message key to display the message. Releasing the key and pressing it again will display any other messages. Up to three messages may be displayed by pressing the key repeatedly.

   If the message key is not lighted, proceed with the next step.

   If one of the messages displayed is between ERROR 904 and 907, one of the phase locked loops is unlocked. In this case, continue with the next step to further isolate the problem.

   If the message displayed is between ERROR 900 and 903, there is a digital communication problem in the LO Subsystem local controller. Proceed with Check 8 to isolate the problem.

3. Enable service errors on the Vector Generator by entering SPCL 10.1 ENT SPCL.

4. Press the CAL key on the Vector Generator to perform a self calibration.

5. When the calibration is complete, enter SPCL 51.0 ENT SPCL to display any calibration errors. Although self-calibration is not a thorough check of the LO Subsystem, it will point out some faults.

   If the error message displayed is zero, proceed with the next step.

   If the error displayed is between 1 and 5, there was a definite problem in the LO Subsystem. Proceed with the next check to further isolate the problem.

Note 

The following checks assume that the power supplies powering the Local Oscillator Subsystem are fully functional. The subsystem uses the +15V, -15V, +5V, and -5V supplies. Improper regulation or high ripple can lead to spurious signals and loss of phase lock. Refer to BD7, Power Supply Subsystem for troubleshooting the power supplies.

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6. Connect the power meter or oscilloscope to the cable that was connected to A4J6, REF IN. This is the 10 MHz reference signal from the internal reference oscillator. The level should be greater than +10 dBm as measured with the power meter or greater than 1 Volt peak using the oscilloscope with 50Ω input coupling.

   If the level is correct, reconnect the cable to A4J6, REF IN, and proceed with the next step.

   If the level is incorrect, proceed to BD7 to troubleshoot the internal reference oscillator and cabling.

7. Disconnect the violet cable from A4J6, REF IN. The Vector Generator front panel message light should light. Press and hold the message key to read the message. The message displayed should be REF UNLOCKED, ERROR 907.

   If the indication is correct, proceed with Check 2 to verify the auxiliary 100 MHz signal for the FM Subsystem.

   If the indication is incorrect, proceed with Check 4 to troubleshoot the A4 Timebase Frame.

Check 2 - Aux 100 Signal Check

1. Disconnect the green cable at A7J7, Aux 100.

2. Connect the power meter to the cable. The signal level should be greater than +10 dBm.

   If the power level is correct, proceed with the next step.

   If the level is not correct, proceed with Check 4 to isolate the problem further.

3. Connect the 10 MHz frequency reference output from the frequency counter to the 10 MHz TIMEBASE IN connector on the Vector Generator. Leave the INT/EXT switch on the Vector Generator set for INT. Using a common timebase eliminates measurement errors due to the absolute accuracy of the two different reference signals.

4. Connect the input of the frequency counter to the 100 MHz FM Reference signal, which was disconnected above. The frequency counter should indicate 100 MHz ±1 count on any resolution (due to being phase locked to the same reference frequency).

   If the frequency is correct, reconnect the cable to A7J7 and continue with the next check.

   If the frequency is not correct, proceed with Check 4 to further isolate the problem.

Check 3 - Local Oscillator Subsystem Output Check

Note

Some problems such as phase noise, spurious or intermittent faults are not checked by this procedure. Refer to the troubleshooting hints at the beginning of this procedure and on Service Sheet BD1 for information on troubleshooting these types of problems.

1. Connect the frequency counter to A2J1, SUM OUT. Connect the frequency counter 10 MHz reference output to the Vector Generator rear panel 10 MHz TIMEBASE IN.

2. Tune the Vector Generator from 10 MHz to 3079 MHz in 99 MHz steps. The LO Subsystem output frequency should be within 1 count of the frequency indicated in the following table for each step.

If all frequencies are correct, proceed with the next step.

If any or all frequencies are incorrect, proceed with Check 4 to isolate the problem.

Table 8-2. Sum Out Test Frequencies

Front Panel Frequency (MHz)	A2J1 Sum Out Frequency (MHz)	Front Panel Frequency (MHz)	A2J1 Sum Out Frequency (MHz)
10	1001.2500	1990	1248.7500
109	1013.6250	2089	1261.1250
208	1026.0000	2188	1273.5000
307	1038.3750	2287	1285.8750
406	1050.7500	2386	1298.2500
505	1063.1250	2485	1310.6250
604	1075.5000	2584	1323.0000
703	1087.8750	2683	1335.3750
802	1100.2500	2782	1347.7500
901	1112.6250	2881	1360.1250
1000	1125.0000	2980	1372.5000
1099	1137.3750	3000	1375.0000
1198	1149.7500	3079	1384.8750
1297	1162.1250		
1396	1174.5000		
1495	1186.8750		
1594	1199.2500		
1693	1211.6250		
1792	1224.0000		
1891	1236.3750		

3. Connect the power meter to A2J1, SUM OUT.

4. Tune the Vector Generator from 10 MHz to 3079 MHz in 99 MHz steps. Reset the power meter calibration factor at each step for the frequency indicated in the above table. The output level should remain between +8 dBm and +12 dBm.

   If the levels are correct, proceed with the next check.

   If the levels are not correct, proceed with Check 7.

Check 4 - A4 Timebase Frame

Note

This check assumes that the 10 MHz reference signal input at A4J6, REF IN, is correct. This signal was verified in a previous check.

1. Disconnect the violet cable from A4J6, REF IN. The Vector Generator front panel MSG key indicator should light. Press and hold the MSG key to display the message. Up to three messages can be viewed by repeatedly pressing the MSG key.

   The message REF UNLOCKED, ERROR 907 should be displayed (as at least one of the messages).

   If the message is displayed, reconnect the cable to A4J6, REF IN, and proceed with the next step.

   If the message is not displayed, there is a fault in the reference signal detection circuitry in the A4 Timebase.

2. Set the Vector Generator front panel frequency to 10 MHz.

3. Connect the frequency counter to A4J8, REF 100. The frequency counter external reference output should be connected to the Vector Generator 10 MHz TIMEBASE IN.

   The frequency should be 100 MHz ±1 count (at any counter resolution). The message "A3 UNLOCKED" should be indicated.

   If the frequency is correct, proceed with the next step.

   If the frequency is not correct, there is a fault in the A4A2 Timebase Loop portion of the A4 Timebase Frame.

4. Reconnect the cable to A4J8.

5. Disconnect the orange cable from A3J4, REF 100. Connect the power meter to the cable to measure the 100 MHz signal level.

   The signal level should be +18 dBm ±1 dB.

   If the signal level is correct, reconnect the cable and continue with the next step.

   If the signal level is not correct, there is a fault in the A4A2 Timebase Loop portion of the A4 Timebase Frame or the cable.

Note

In the following step, ensure that all outputs of the A4 Timebase Frame are terminated in 50 ohms even when they are not being measured. Leaving each cable connected until it is measured will ensure proper loading. When checking the 40 MHz output signal (20/40 MHz), set the Vector Generator front panel frequency to 208 MHz. This selects the 40 MHz signal. Resetting the Vector Generator to 10 MHz will reactivate the 20 MHz signal.

6. Check the signals at the cable or connector indicated in the following table. The frequency should be within ±1 count of the indicated value and the power level should be within the indicated tolerance.

   If all the signals are correct, reconnect all the cables and proceed with the next check.

   If any or all signals are not correct, the problem lies in the A4 Timebase Frame or the cable. The lower level assembly that is the source of the signal is shown on the block diagram.

Table 8-3. Timebase Loop Outputs

Signal	Cable/Connector	Level	Frequency
Aux 100	Green/A7J7	+10 dBm ±2 dB	100 MHz
20/40	Blue/A3J5	+15 dBm ±2 dB	20 MHz
		+15 dBm ±2 dB	40 MHz *
400 MHz	Orange/A5J3	+5 dBm ±2 dB	400 MHz
10 MHz	Blue/A5J4	+0 dBm ±1 dB	10 MHz
100 MHz	Yellow/A4J5	+15 dBm ±2 dB	100 MHz

* Set Vector Generator to 208 MHz for 40 MHz check.

Check 5 - A3 Reference Loop Frame

1. Disconnect the yellow cable at A2J4, REF LOOP, and connect the cable to the power meter.

2. Tune the Vector Generator from 10 MHz to 3079 MHz in 99 MHz steps. The signal level should be between +8 and +12 dBm at all frequencies.

   If the output level is correct, proceed with the next step.

   If the power is not correct at any or all frequencies, the A3 Reference frame or the cable is at fault.

3. Connect the frequency counter in place of the power meter. Verify

that the frequency counter 10 MHz reference output is connected to the Vector Generator rear panel 10 MHz TIMEBASE AUX IN.

4. Tune the Vector Generator from 10 to 3079 MHz in 99 MHz steps. The correct frequency for each front panel setting is shown in the following table. The frequency should agree with the indicated value within 1 count on any frequency counter resolution.

   If all frequencies are within 1 count of the indicated value, reconnect the cable and proceed with the next check.

   If any or all frequencies are incorrect, the A3 Reference Frame is at fault.

Table 8-4. Reference Loop Test Frequencies

Front Panel Frequency (MHz)	A2J4 Ref Out Frequency (MHz)	Front Panel Frequency (MHz)	A2J4 Ref Out Frequency (MHz)
10	1020.0	1990	1260.0
109	1000.0	2089	1280.0
208	1040.0	2188	1260.0
307	1020.0	2287	1300.0
406	1040.0	2386	1280.0
505	1080.0	2485	1300.0
604	1060.0	2584	1340.0
703	1100.0	2683	1320.0
802	1120.0	2782	1360.0
901	1100.0	2881	1380.0
1000	1140.0	2980	1360.0
1099	1120.0	3000	1360.0
1198	1160.0	3079	1400.0
1297	1180.0		
1396	1160.0		
1495	1200.0		
1594	1180.0		
1693	1200.0		
1792	1240.0		
1891	1220.0		

Check 6 - A5 FRAC-N Frame

1. Set the Vector Generator to 10 MHz.

2. Connect the frequency counter to A5J1, FRAC-N. Verify that the frequency counter 10 MHz reference output is connected to the Vector Generator rear panel 10 MHz TIMEBASE IN.

3. Measure the output frequency of the FRAC-N loop at each of the front panel settings in Table 8-5 below. The measured frequency should be within 1 count of the indicated value.

   If the frequencies are correct, proceed with the next step.

   If any or all frequencies are not correct, the A5 FRAC-N Frame is at fault.

Table 8-5. Fractional-N Loop Test Frequencies

Front Panel Frequency (MHz)	A5J1 Frac-N Out Frequency (MHz)	Front Panel Frequency (MHz)	A5J1 Frac-N Out Frequency (MHz)
10	431.2500	1990	438.7500
109	436.0000	2089	434.1250
208	434.0000	2188	432.0000
307	441.0000	2287	437.8750
406	440.7500	2386	438.0000
505	438.7500	2485	435.6250
604	434.0000	2584	442.0000
703	436.5000	2683	430.5000
802	434.5000	2782	441.0000
901	441.8750	2881	437.2500
1000	435.0000	2980	437.5000
1099	434.3750	3000	435.0000
1198	440.7500	3079	438.6250
1297	429.0000		
1396	435.0000		
1495	433.1250		
1594	442.7500		
1693	441.7500		
1792	432.0000		
1891	442.1250		

4. Connect the power meter to A5J1, FRAC-N.

5. Set the Vector Generator to each of the frequencies listed in the table above. The power level should be greater than 0 dBm for all the frequencies listed.

   If all levels are correct, proceed with the next check.

   If any or all of the levels are incorrect, the A5 FRAC-N Frame is at fault.

Check 7 - A2 Sum Loop Frame

Check 3 is used to verify the operation of the A2 Sum Loop Frame. If a frequency problem was found and the other frames have been verified, the problem is in the A2 Sum Loop frame.

If the output power of the A2 Sum Loop is incorrect but the frequency is correct, the problem is definitely in the A2 Sum Loop frame.

Check 8 - Local Oscillator Subsystem Control Signals/Power Supplies

This check is used to verify that the signals of the 37 pin connector plugged into the four frame assemblies have a continuous path to the source (or destination) of the signal. If a frame has been identified as the problem, this check can be used to isolate the problem to an input signal or power supply or the frame itself. Note that the connectors are identical and any of the frames can be connected to any of the four 37 pin connectors.

Note 

Refer to the block diagram figure for pin identification of the 37 pin connector and the 16 pin ribbon cable connector that connects to the A17 Distribution assembly.

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1. Using Table 8-6, check the signal path continuity between the power supply pins of the frame connector and the power supply test point on the A18 Power Control assembly. The resistance between the power supply test point and the 37 pin Local Oscillator frame connector should be 1 kΩ (due to a 1 kΩ resistor between the actual supply and the supply test point.) The resistance between the ground test point and the 37 pin Local Oscillator frame connector pins should be less than 50 ohms.

   If the power supply signal path is correct, proceed with the next step.

If any signal path shows a high impedance, use the additional information in the table to isolate the problem to the ribbon cable between the A17 Distribution assembly and the frames or to the connection between The A18 Power Control assembly and the A17 Distribution assembly.

Table 8-6. Local Oscillator Subsystem Power Supplies

Frame Connector Pin	A17J9-	Source Testpoint	Power Supply
12,31	15,14	A18TP5	+15 Vdc
15,32	9,12	A18TP8	+5 Vdc
17,18	5,3	A18TP9	-5 Vdc
36,37	4,2	A18TP6	-15 Vdc
13,14, 34,35	13,11, 8,6	A18TP13	Ground

2. Use Table 8-7 to check for continuity between each indicated signal and the source or destination of the signal. If there is continuity between the frame connector pin and the source or destination signal, proceed to BD6 to check the DUART. A successful test indicates that the information received by the Local Oscillator frame is correct.

   If there is an open (or short to ground) on any signal line, isolate the problem to a cable or the A17 Distribution assembly.

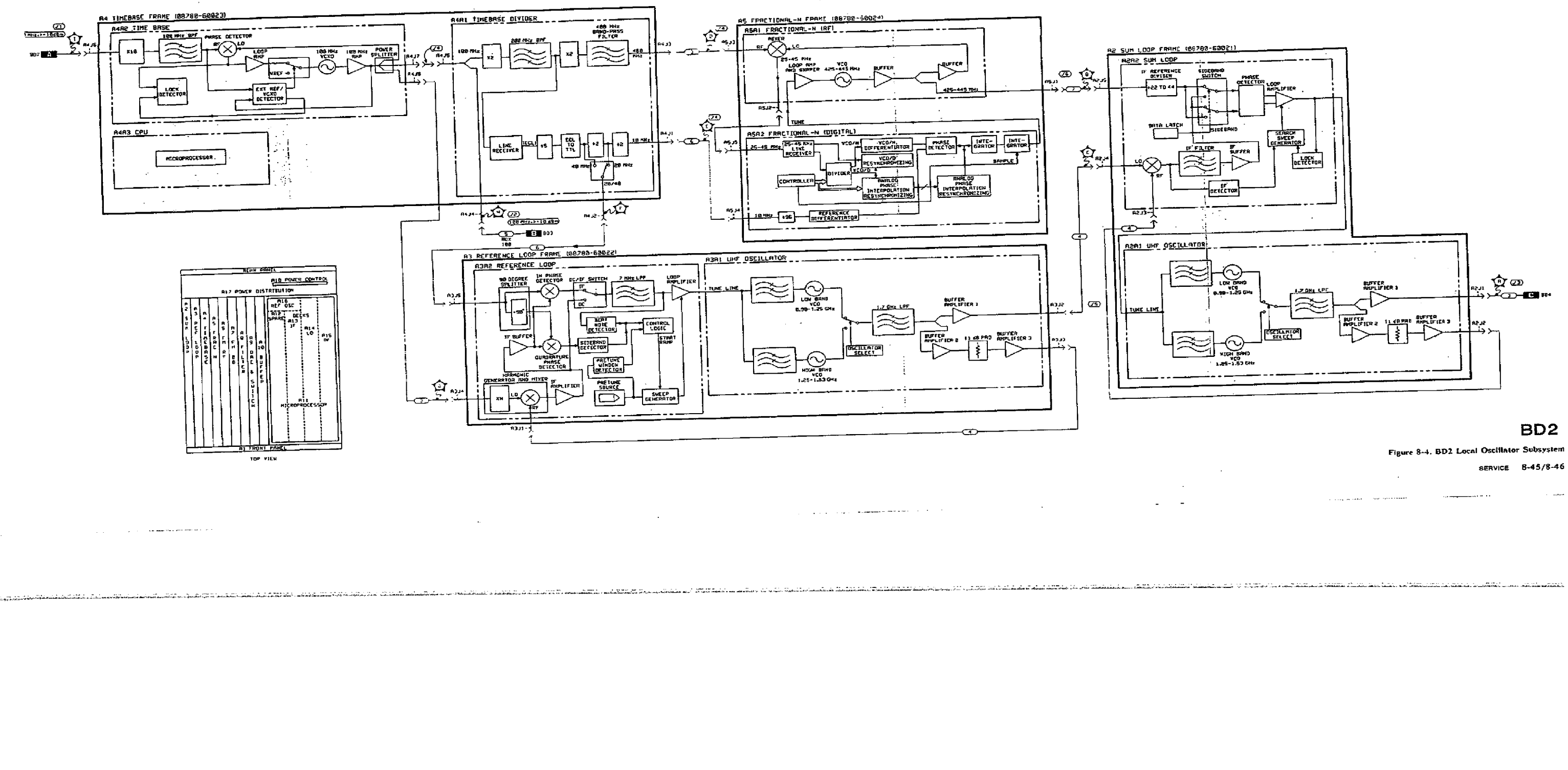
Table 8-7. Local Oscillator Subsystem Control Signals

Frame Connector Pin	A17J9-	Destination or Source Testpoint	Signal Name
16	7	A11J5-2	XMT
30	16	A11J5-6	RESET
33	10	A11J5-4	RCV

3. Table 8-8 lists all of the signals that the Local Oscillator Subsystem uses for control of the four frames. These signals comprise the private bus that the local controller uses for control. Use an ohmeter to determine whether the signal paths are continuous. Note that the connectors can be plugged onto any of the four Local Oscillator Subsystem frames.

Table 8-8. Local Oscillator Subsystem Private Bus

Frame Connector Pin	Signal Name
2	D2
3	D3
4	D4
5	D5
6	D6
7	CTL
8	C/D
9	EN-SUM
10	EN-REF
11	FLG
21	D1
22	D0
23	EN-RLD
24	EN-PRG
25	D7
26	REF LOCK
27	SUM LOCK
28	FRAC-N LOCK
29	I/O



BD2

Figure 8-4. BD2 Local Oscillator Subsystem

Service Sheet BD3

Frequency Modulation Subsystem

References

Principles of Operation

Frequency modulation is accomplished by frequency modulating the FM subsystem 1 GHz oscillator. In CW mode and ac coupled FM mode, the 1 GHz oscillator is phase locked to a 100 MHz signal from the Local Oscillator (LO) subsystem. In ac coupled FM mode, the 1 GHz oscillator is directly modulated by the FM input signal.

In dc coupled FM mode, a separate 100 MHz voltage controlled oscillator is substituted for the 100 MHz reference frequency from the LO subsystem. This substitute voltage controlled oscillator is directly controlled by the dc coupled FM input and in turn directly controls the frequency of the 1 GHz oscillator.

In ac coupled FM mode, the bandwidth of the 1 GHz phase locked loop is set at 1 Hz. This enables all frequency modulation to be accomplished outside the bandwidth of the phase locked loop. If frequency modulation were attempted within the bandwidth of the phase locked loop, the loop would simply cancel the frequency modulation by maintaining phase lock with a fixed reference.

For modulation rates just outside the phase locked loop bandwidth (1 to 10 Hz), the phase locked loop will attempt to correct for deviations. Since the deviations are outside the loop bandwidth, the phase locked loop will unlock. Modulation rates more than 10 times the loop bandwidth will not be detected by the phase detector of the phase locked loop.

The FM Subsystem is divided into the FM Baseband (BB) Frame and the FM RF Frame. Each frame is also divided into two sections as follows:

A6 FM RF Frame
- A6A1 1 GHz FM VCO Assembly
- A6A2 FM Phase Locked Loop (PLL) Assembly

A7 FM BB Frame
- A7A1 FM RF Assembly
- A7A2 FM Baseband Assembly

A6A1 1 GHz FM VCO Assembly

The 1 GHz FM VCO frequency is controlled by two different input signals. The VCO MOD signal is used to directly modulate the FM VCO for rates outside the phase locked loop bandwidth (>1 Hz). The FM VCO is phase locked directly to the 100 MHz reference from the Local Oscillator subsystem during ac coupled frequency modulation.

For dc coupled frequency modulation, the FM input signal directly controls the frequency of a separate crystal controlled 100 MHz VCXO. The ac coupled FM phase locking circuitry is disabled and the 100 MHz VCXO is substituted for the 100 MHz reference from the Local Oscillator subsystem. This effectively allows the FM input to frequency modulate the 100 MHz VCXO which in turn modulates the 1 GHz FM VCO.

During CW operation, the ac coupled FM phase locking circuitry is disabled and the 1 GHz FM VCO is phase locked directly to the 100 MHz reference from the Local Oscillator subsystem. The same phase detection circuitry that is used for dc coupled FM is used to phase lock the FM subsystem in CW mode.

A6A2 ACFM PLL Assembly

The ACFM PLL assembly serves as the main signal path switching network. The modulating signal from the FM BB frame is first applied to part of the AC/DC FM switch (K1) where the signal is routed to the 100 MHz VCXO in dc coupled FM mode, or to relay K2 for ac coupled FM mode.

Relay K2 is used to apply the modulating signal to the 1 GHz FM VCO in ac coupled FM mode. In dc coupled FM and CW modes, the relay applies the CW TUNE correction signal to the 1 GHz FM VCO. To achieve phase lock in CW and dc coupled FM modes, a triangle-wave generator is enabled and added to the CW TUNE signal. This sweeps the 1 GHz FM VCO over a limited range to enable the subsystem to phase lock. Once phase lock is established, the sweep generator is disabled.

The 100 MHz reference that the 1 GHz FM VCO is phase-locked to can be a fixed reference from the Local Oscillator subsystem or can be a tunable 100 MHz reference from the 100 MHz VCXO. Relay K4 is used to select which reference is applied to the FM phase detector being used.

AC coupled FM mode disables the dc coupled/CW phase detector on the A7A1 FM RF assembly and enables the ACFM phase detector in the A6A2 FM PLL assembly. The 1 GHz FM VCO signal and the 100 MHz reference are divided down to 2.5 MHz signals and then compared in the ACFM phase detector. The error signal from the phase detector is filtered and added to the VCO TUNE signal to tune the 1 GHz FM VCO to the appropriate frequency.

During CW and dc coupled FM modes, the first divider in each of the two divider chains (ACFM 1 GHz and ACFM 100 MHz Reference) is turned off to prevent spurious signals being generated in the divider circuitry.

To produce high performance frequency modulation, the 1 GHz FM VCO gain (in MHz/volt) must be known to account for differences in components and aging. The VCO frequency is measured during self calibration using the ACFM Calibration Counter. A calibration voltage is applied to the 1 GHz FM VCO and the frequency difference between 1 GHz and the actual frequency is measured. Another calibration voltage is applied and the process is repeated to complete the calibration.

A7A1 FM RF Assembly

The FM RF Assembly is used for phase locking in dc coupled FM and CW modes. The switched 100 MHz reference is multiplied by 10 and mixed with the 1 GHz FM VCO output to produce a dc IF signal. The amplitude of this signal is proportional to the phase difference between the two frequencies. This error voltage is amplified and filtered before applying it to the 1 GHz FM VCO.

The 100 MHz VCXO is also included on the FM RF assembly. The modulating signal is applied to the 100 MHz VCXO in dc coupled FM mode.

A7A2 FM Baseband Assembly

The FM Baseband assembly is used to condition the input signal so that a 0.5 volt peak signal corresponds to the full scale deviation of the selected FM range. Since the sensitivity of the 1 GHz FM VCO and the 100 MHz VCXO are fixed, the input signal must be scaled (attenuated) in order to provide different ranges. To provide the specified FM deviation ranges, the A7A2 FM Baseband assembly provides 0 to 65 dB of attenuation. The attenuators consist of a variable 3 dB attenuator and five step attenuators (2, 4, 8, 16 and 33 dB).

To overcome signal losses and to provide inversion of the input signal, an 18 dB gain video amplifier is included in the FM Baseband assembly. The selectable inverting/non-inverting video amplifier enables the use of the Vector Generator in a phase locked loop with negative or positive sense feedback voltages.

In addition, the FM Baseband assembly provides an overpower protection and calibration voltages. The overpower protection circuitry will disconnect the FM input if the input voltage exceeds 2.3 to 2.6 volts peak. Calibration voltages of +0.3, 0 and -0.3 volts dc are generated on this assembly for use in calibrating the FM circuitry.

Analog Diagnostics

The Vector Generator has a built in service voltmeter that can be used to measure internal voltages. The available voltages are shown on the block diagram as the inputs to the two Analog Diagnostics circuits. The service voltmeter will be used throughout the troubleshooting procedure to provide measurements of critical test points without the need to disassemble a frame.

When service errors are enabled (special function 10.1) and a calibration is performed, the analog diagnostics will generate an error code whenever a fault occurs in the FM portion of the calibration. The error code can be accessed using special function 51.3. A description of the errors can be found in Table 8-9.

Table 8-9. FM Error Codes

Code	Frame	Description
50	NA	Not used
51	A7	Ground voltage is at calibration limit
52	A7	Offset limit at Baseband Out with video amp non-inverting
53	A7	Cal factor offset limit at Baseband Out
54	A7	Residual count limit with zero volts applied (occurs when AUX 100 reference is missing)
55	A6	FM counter limit with -0.3 volts applied to VCO
56	A7	-0.3 volt reference out of tolerance
57	A7	Baseband Out limit with -0.3 volts applied
58	A6/A7	FM counter limit with +0.3 volts applied to VCO
59	A7	+0.3 volt reference out of tolerance

Table 8-9. FM Error Codes (Cont.)

Code	Frame	Description
60	A7	Baseband out limit with +0.3 volts applied
61	A7	Cal factor limit (gain through Baseband with amplifier non-inverting)
62	A6/A7	1 GHz VCO sensitivity (MHz/volt) out of tolerance
63	NA	Not used
64	A7	Baseband Out limit with +0.3 volts applied and 33 dB of attenuation
65	A7	Offset limit at Baseband Out with 33 dB of attenuation
66	A7	Cal factor limit (attenuation of 33 dB pad)
67	A7	Offset limit at Baseband Out with 16 dB of attenuation
68	A7	Baseband Out limit with +0.3 volts in and 16 dB of attenuation
69	A7	Cal factor limit (attenuation of 16 dB pad)
70	A7	Baseband Out limit with +0.3 volts in and 8 dB of attenuation
71	A7	Offset limit at Baseband Out with 8 dB of attenuation
72	A7	Cal factor limit (attenuation of 8 dB pad)
73	A7	Offset limit of Baseband Out with 4 dB of attenuation
74	A7	Baseband Out limit with +0.3 volts in and 4 dB of attenuation
75	A7	Cal factor limit (attenuation of 4 dB pad)
76	A7	Baseband Out limit with +0.3 volts in and 2 dB of attenuation
77	A7	Offset limit at Baseband Out with 2 dB of attenuation
78	A7	Cal factor limit (attenuation of 2 dB pad)
79	A7	Offset limit at Baseband Out with maximum variable attenuation
80	A7	Baseband Out limit with +0.3 volts in and maximum variable attenuation
81	A7	Baseband Out limit with +0.3 volts in and zero variable attenuation
82	A7	Offset limit at Baseband Out with zero variable attenuation
83	A7	Offset limit at Baseband Out with video amp in inverting mode
84	A7	Cal factor limit (Baseband offset with amplifier inverting)
85	A7	Baseband Out limit with +0.3 volts in and amplifier inverting
86	A7	Cal factor limit (gain through Baseband with amplifier inverting)
87	A7	Cal factor limit (variable attenuator parabola curve fit data)
88	A7	Cal factor limit (additional curve fit data)
89	A7	Cal factor (additional curve fit data)
90	NA	Not used
91	NA	Not used
92	NA	Not used
93	A7	+10 volt power supply limit
94	A7	-10 volt power supply limit
95	A6	Interrupt line fault
96	A6/A7	ac coupled FM unlocked

Troubleshooting

It is assumed that the troubleshooting information on Service Sheet BD1 was used to isolate a malfunction to the Frequency Modulation Subsystem. The following information will aid in isolating the defective module.

The troubleshooting procedure is divided into nine checks as follows:

Check 1 - CW
Check 2 - DCFM
Check 3 - ACFM
Check 4 - Calibration Voltages/Service Voltmeter
Check 5 - A7A2 FM Baseband
Check 6 - A6A1 1 GHz FM VCO
Check 7a - A7A1 DCFM/CW Phase Detector
Check 7b - A7A1 100 MHz VCXO
Check 8 - A6A2 ACFM Phase Detector
Check 9 - FM Subsystem Control Signals/Power Supplies

Check 9 is used once a fault is isolated. This check is used to verify that all power supplies and inputs to the frame are present.

Troubleshooting Hints

The following items are general troubleshooting techniques that are extremely useful when troubleshooting the Vector Generator.

1. Check both the ribbon cable that carries power and control signals and any coaxial cables that carry RF signals for loose connections.

2. Any cables that look worn or frayed should be replaced or at least checked for repeatable continuity.

3. A wrench should always be used when tightening or loosening coaxial connectors.

4. The coaxial connectors on a cable that is disconnected should always be inspected for damage. Make sure that each connector is solidly mounted on the module and that the center conductor is not broken or bent.

5. Test equipment and personnel should be grounded to avoid static induced failures. Observe all electrostatic discharge (ESD) precautions.

6. After a module has been replaced or repaired, make sure that all coaxial connectors are properly tightened with a wrench and that all ribbon cable connectors are firmly seated in their sockets.

Test Equipment

Spectrum Analyzer	HP 8566B
Frequency Counter	HP 5343A
Test Oscillator	HP 8116A
Oscilloscope	HP 54201A
Power Meter	HP 438A
Power Sensor	HP 8481A

Note

It is recommended that a DCFM calibration be performed once troubleshooting is complete. To perform the calibration, preset the Vector Generator and enable DCFM. After a half-hour warmup (with DCFM on), enter SPCL 23.4 ENT SPCL to run the calibration. This will reduce the frequency change when going from ACFM or CW to DCFM.

Check 1 - CW

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Connect the frequency counter 10 MHz frequency reference output to the rear panel Vector Generator 10 MHz TIME BASE IN. Using a common time base eliminates errors due to the accuracy of the two different reference signals.

3. Connect the frequency counter to A6J1, FM OUT. In CW mode, this should be a 1 GHz signal that is phase locked to the Local Oscillator 100 MHz reference.

   The frequency counter should measure 1 GHz ±1 count on any frequency counter resolution.

   If the frequency is incorrect, proceed to Check 6 to verify the 1 GHz FM VCO and then the CW/DCFM Phase Detector.

   If the frequency is correct, proceed with the next step.

4. Connect the spectrum analyzer to A6J1, FM OUT. Set the spectrum analyzer to view the 1 GHz signal.

   The level of the 1 GHz signal should be between +7 and +12 dBm.

   If the level is not correct, the A6A1 1 GHz FM VCO assembly is defective.

   If the level is correct, continue with Check 2 to verify the dc coupled FM mode.

Check 2 - DCFM

1. Enter SPCL 99.9 ENT SPCL on the Vector Generator to load default calibration factors. Ignore any messages in this and all subsequent steps unless instructed by the procedure to check for a given message.

2. Connect the frequency counter or spectrum analyzer to A6J1, FM OUT.

3. Press the FM ON key on the Vector Generator to select FM modulation. Set the FM range to 150 kHz peak-to-peak using the SET FM key and the numeric keypad.

4. Press the DC COUP FM key on the Vector Generator to select dc coupled FM.

5. Connect the test oscillator to the Vector Generator FM input. Set the test oscillator for a -0.5 volt dc output.

Note 

To set the test oscillator for a dc output, the ac waveform must be disabled. A power supply may be used in place of the test oscillator if the test oscillator available is not capable of producing only a dc offset.

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6. Slowly adjust the test oscillator output level from -0.5 to +0.5 Vdc. The frequency should vary 20 ±2 kHz with the lowest frequency occurring at +0.5 volts.

   If the frequency does not change or varies incorrectly, proceed to Check 6 to isolate the problem further. If the frequency change is correct, proceed with the next step.

7. Press the INVERT INPUT key followed by the 7 key on the Vector Generator.

8. Adjust the test oscillator output level from -0.5 to +0.5 Vdc. The frequency should change 20 ±2 kHz with the lowest frequency occurring at -0.5 volts.

   If the frequency change is incorrect, proceed to Check 5 to verify the FM Baseband circuitry.

   If the frequency change is correct, proceed with Check 3 to verify the ac coupled FM circuitry.

Check 3 - ACFM

1. Press INSTR PRESET on the Vector Generator to set the instrument to a known state.

2. Set the spectrum analyzer to display the 1 GHz FM VCO signal. Use 10 dB per division vertical sensitivity, a frequency span of 20 MHz and place the peak of the signal at the top of the screen. The top of the screen is now the CW reference level for the following measurements.

3. Press the FM ON key and then the SET FM key to set the FM range to 50 MHz. This will select ac coupled FM with a sensitivity of approximately 6.25 MHz (50 MHz divided by 8) peak-to-peak for a 1 volt peak-to-peak input signal.

4. Set the test oscillator for a sine wave of 3.125 MHz at an output level of 1 volt peak-to-peak. Set the dc offset to 0 Vdc.

Note

The test oscillator should be set as close to 3.125 MHz as possible. A frequency counter can be used to measure the test oscillator to set the frequency accurately.

If the test oscillator cannot be set exactly to 3.125 MHz, the actual peak deviation using the following procedure will be equal to two times the modulating rate.

---

5. Note the third upper sideband on the spectrum analyzer display. The sideband should be 9.375 MHz above the carrier frequency. The level should be approximately 20 dB below the CW reference level (the top of the screen).

6. Adjust the test oscillator level slightly until the third sideband is exactly 20 dB below the CW reference level. This condition guarantees that the FM subsystem can deliver the required 6.25 MHz peak-to-peak deviation.

   If the third sideband can be adjusted to be 20 dB below the CW reference level, proceed with step 9 to check the FM calibration.

   If the sideband cannot be adjusted to be 20 dB below the CW reference level, proceed with the next step.

7. Connect the test oscillator to A6J10, BB. Applying the signal at this point will give a fixed sensitivity between 5.7 and 8.3 MHz peak-to-peak (6.25 MHz nominal) for a 1 volt peak-to-peak signal.

8. Adjust the test oscillator level until the third sideband is exactly 20 dB below the CW reference level.

   If the third sideband can now be adjusted correctly, the fault is in the FM baseband circuit. Proceed with Check 5 to verify the FM Baseband assembly.

   If the third sideband still cannot be adjusted, the fault is in the 1 GHz FM VCO or the ACFM Phase Detector. Proceed with Check 6 to verify the 1 GHz FM VCO.

Note 

This step assumes that the A7A2 FM Baseband assembly is capable of generating the voltage required by this step. Typically, the voltage required should be less than 0.7 volts peak.

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9. Enter SPCL 10.1 ENT SPCL to enable service errors and warnings. The service errors should be able to pinpoint any malfunctions to a single frame.

10. Enter SPCL 20.3 ENT SPCL to begin an FM calibration. The calibration will adjust the FM signal path gain, calibrates the sensitivity of the 1 GHz FM VCO and calibrates the FM attenuators in the FM Baseband assembly.

    The display should indicate the FM calibration is taking place with the words CALIBRATING FM displayed and a cursor will move back and forth to indicate that the calibration is in process.

11. Once the calibration is complete, enter SPCL 51.3 ENT SPCL to read the error code generated by the calibration procedure. The code will be displayed on the front panel display.

    If the error code displayed is zero, there are no problems indicated. The FM subsystem appears to be working normally. If a problem is still suspected, the following checks can be used to verify portions of the subsystem.

    If the error code is other than zero, refer to Table 8-9 to determine which frame is the most likely cause of the error. Then proceed to the checks to verify that the associated frame is at fault.

Check 4 - Calibration Voltages/Service Voltmeter

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Set the service voltmeter to measure the internal Analog to Digital Converter (ADC) reference by entering SPCL 52.8 ENT SPCL. The display should indicate +10.000 ±0.002 volts. This voltage must be correct since all other measurements are referenced to this voltage.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is incorrect, proceed to service sheet BD6 to troubleshoot the Analog to Digital Converter circuit.

3. Set the service voltmeter to measure the instrument ground reference by entering SPCL 52.1 ENT SPCL. The display should indicate 0.000 ±0.002 volts.

   If the displayed voltage is correct, proceed with the next step to check the power supply references in the FM subsystem.

   If the displayed voltage is incorrect, proceed to service sheet BD6 to troubleshoot the Analog to Digital Converter circuit.

4. Set the FM analog diagnostics multiplexer to output the -11 volt power supply reference in the A6A2 FM PLL Assembly. To do this, execute the following key sequence on the Vector Generator. In the following sequence, ENT represents the ENT SPCL (Hz) key. The 53.X special functions enable the operator to set and reset control bits in the instrument from the front panel.

   SPCL 53.0 ENT 7 ENT
   SPCL 53.1 ENT 4 ENT
   SPCL 53.2 ENT 3 ENT
   SPCL 53.3 ENT 6 ENT

5. Set the service voltmeter to read the output of the analog diagnostic multiplexer by entering SPCL 52.2 ENT SPCL. The displayed voltage should be -11 ±0.5 volts.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is not correct, the problem is either in the A6 FM RF Frame or the cable carrying the power supply voltages and the connection to the Analog to Digital Converter. Use Check 9 to isolate the problem to the A6 FM RF frame or the input signals.

6. Set the analog multiplexer to enable the -10 volt reference in the A7A2 FM Baseband assembly. To enable the diagnostics multiplexer and output the -10 volt reference, enter the following key sequence. ENT represents the ENT SPCL key on the Vector Generator.

   SPCL 53.0 ENT 6 ENT
   SPCL 53.1 ENT 10 ENT
   SPCL 53.2 ENT 3 ENT
   SPCL 53.3 ENT 3 ENT

7. Set the service voltmeter to read the -10 volt reference by entering SPCL 52.5 ENT SPCL. The displayed voltage should be -10 ±0.5 volts.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is not correct, the problem is either in the A7 FM BB Frame or the input connector carrying the power supply voltages and the connection to the Analog to Digital Converter. Use the connector information on the block diagram to isolate the problem to the A7 FM BB frame or the input signals.

8. Set the analog multiplexer to enable the +10 volt reference in the A7A2 FM Baseband assembly. To enable the diagnostics multiplexer and output the +10 volt reference, enter the following key sequence. ENT represents the ENT SPCL key on the Vector Generator. Note that the first three key sequences (special function 51.0 through 51.2) are not required because these were set when the analog multiplexer was set to output the -10 volt reference.

   SPCL 53.3 ENT 5 ENT

9. Set the service voltmeter to read the +10 volt reference by entering SPCL 52.5 ENT SPCL. The displayed voltage should be +10 ±0.5 volts.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is not correct, the problem is either in the A7 FM BB Frame or the input connector carrying the power supply voltages and the connection to the Analog to Digital Converter. Use the connector information on the block diagram to isolate the problem to the A7 FM BB frame or the input signals.

Note

The next step uses the internal service voltmeter to check the voltage at A7J9, BB. This point can be monitored externally by connecting a voltmeter to the BB output (A7J9) of the A7 FM BB frame. A 50Ω load should also be connected to this output to maintain the impedance match.

---

10. Set the analog multiplexer to monitor the -0.3 volt calibration reference in the A7A2 FM Baseband assembly. To enable the diagnostics multiplexer, set the calibration voltage to -0.3 volts and output the calibration voltage, enter the following key sequences. ENT represents the ENT SPCL key on the Vector Generator.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 8 ENT
    SPCL 53.2 ENT 6 ENT
    SPCL 53.3 ENT 28 ENT

    The diagnostic multiplexer has now been set to connect BB out (A7J9) to the output of the diagnostic multiplexer and the calibration voltage reference is substituted for the FM input.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 15 ENT
    SPCL 53.2 ENT 15 ENT
    SPCL 53.3 ENT 16352 ENT

    The FM circuitry is now set for inverted operation with no attenuation in the signal path.

    SPCL 53.0 ENT 7 ENT
    SPCL 53.1 ENT 13 ENT
    SPCL 53.2 ENT 2 ENT
    SPCL 53.3 ENT 1 ENT

    A 50Ω load is now connected via the A7A1 FM RF frame.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 30 ENT
    SPCL 53.2 ENT 2 ENT
    SPCL 53.3 ENT 0 ENT

    The calibration voltage reference is now set for -0.3 volts at the input of the FM subsystem.

11. Set the service voltmeter to read the BB out signal by entering SPCL 52.5 ENT SPCL. The displayed voltage should be -0.3 ±0.1 volts.

    If the displayed voltage is correct, proceed with the next step.

    If the displayed voltage is not correct, connect a 50Ω load to A7J9, BB. If the displayed voltage is now correct, the A7A1 FM RF frame is at fault for not providing a 50Ω match. If the displayed voltage is still not correct, proceed to Check 5 to check the A7A2 FM Baseband assembly.

12. Set the calibration voltage reference to +0.3 volts. To set the calibration voltage, enter the following key sequences. ENT represents the ENT SPCL key on the Vector Generator.

    SPCL 53.3 ENT 1 ENT

13. Set the service voltmeter to read the BB out signal again by entering SPCL 52.5 ENT SPCL. The displayed voltage should be +0.3 ±0.1 volts.

    If the displayed voltage is correct, proceed with the next step.

    If the displayed voltage is not correct, proceed to Check 5 to check the A7A2 FM Baseband assembly.

14. Set the calibration voltage reference to 0 volts. To set the calibration voltage, enter the following key sequences. ENT represents the ENT SPCL key on the Vector Generator.

    SPCL 53.3 ENT 2 ENT

15. Set the service voltmeter to read the BB out signal again by entering SPCL 52.5 ENT SPCL. The displayed voltage should be +0 ±0.1 volts.

    If the displayed voltage is correct, proceed with the next step.

    If the displayed voltage is not correct, proceed to Check 5 to check the A7A2 FM Baseband assembly.

Check 5 - A7A2 FM Baseband

1. Press the INSTR PRESET key on the Vector Generator.

2. Press the FM ON key on the Vector Generator to select FM modulation. Set the FM range to 50 MHz peak-to-peak using the SET FM key and the numeric keypad.

3. Connect the test oscillator to the Vector Generator FM input.

4. Connect channel 1 of the oscilloscope to A7J9, BB OUT. Connect channel 2 of the oscilloscope to the FM input using a BNC tee to provide monitoring of the test oscillator signal. Use 50Ω input coupling for channel 1 and high impedance for channel 2.

5. Set the FM circuitry for inverted operation with no attenuation in the FM path with the following key sequence. With this setting, the output of the A7A2 FM Baseband assembly will approximately equal the FM input. In the following key sequences, ENT represents the ENT SPCL key.

   SPCL 53.0 ENT 6 ENT
   SPCL 53.1 ENT 15 ENT
   SPCL 53.2 ENT 15 ENT
   SPCL 53.3 ENT 16352 ENT

6. Set the test oscillator for a 1 MHz signal at a level of 1 volt peak-to-peak.

7. Set the FM circuitry for inverted operation using the following key sequence.

   SPCL 53.0 ENT 6 ENT
   SPCL 53.1 ENT 15 ENT
   SPCL 53.2 ENT 1 ENT
   SPCL 53.3 ENT 1 ENT

   The two signals displayed on the oscilloscope should be 180 degrees apart (one signal the inversion of the other). Entering a 0 (followed by ENT SPCL) should change the signals so that both signals have the same phase.

   If the phase changes correctly, proceed with the next step.

   If the phase does not change, the inverting/non-inverting video amplifier in the A7A2 FM BAseband assembly is at fault.

8. Set the variable attenuator in the A7A2 FM Baseband assembly for minimum attenuation by entering the following key sequence.

   SPCL 53.0 ENT 6 ENT
   SPCL 53.1 ENT 16 ENT
   SPCL 53.2 ENT 10 ENT
   SPCL 53.3 ENT 1 ENT

9. The oscilloscope channel 1 should now show a 1 MHz signal at an amplitude of at least 1 volt peak-to-peak. Use 50 ohm dc coupling on the oscilloscope when viewing the signal.

   If the signal is present, proceed with the next step.

   If the signal is not present, connect the test oscillator to A7J6, FM IN. If the signal appears on the oscilloscope, the FM input cable is faulty. If the signal is still not present, the A7A2 FM Baseband assembly is at fault.

10. Adjust the test oscillator amplitude for a signal of exactly 1 volt peak-to-peak on channel 1 of the oscilloscope display. Scaling the displayed signal will simplify the attenuator tests.

11. Enter the values 2, 4, 8, 16, 32, 64, 128 and 256 to check each bit of the DAC that controls the variable attenuator. Ignore the affects of any values other than those given in this step as they may produce incorrect results. Enter each value using the numeric keypad followed by the ENT SPCL (Hz) key.

    The channel 1 signal should be maximum at a value of 1 and should decrease to an amplitude of less than 700 mV peak-to-peak (typically less than 600 mV) when the attenuator setting is at 256.

    If the signal always decreases as the given values increase and the final level is less than 700 mV, the attenuator is working normally. Proceed with the next step.

    If the signal does not always decrease or the final level is not less than 700 mV peak-to-peak, the variable attenuator in the A7A2 FM Baseband assembly is at fault.

12. Set the variable attenuator to minimum attenuation and switch in the 2 dB step attenuator by entering the following key sequence.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 16 ENT
    SPCL 53.2 ENT 14 ENT
    SPCL 53.3 ENT 17 ENT

    The signal on the oscilloscope display should now be 795 ±10 mV peak-to-peak.

    If the displayed signal is correct, proceed with the next step.

    If the displayed signal is not correct, the 2 dB step attenuator in the A7A2 FM Baseband assembly is at fault.

13. Switch the 2 dB attenuator out and switch in the 4 dB step attenuator using the following key sequence.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 26 ENT
    SPCL 53.2 ENT 4 ENT
    SPCL 53.3 ENT 2 ENT

The signal on the oscilloscope display should now be 630 ±10 mV peak-to-peak.

If the displayed signal is correct, proceed with the next step.

If the displayed signal is not correct, the 4 dB step attenuator in the A7A2 FM Baseband assembly is at fault.

14. Switch out the 4 dB attenuator and switch in the 8 dB step attenuator using the following key sequence.

SPCL 53.3 ENT 0 ENT

The 4 dB attenuator has now been switched out.

SPCL 53.1 ENT 13 ENT
SPCL 53.2 ENT 1 ENT
SPCL 53.3 ENT 1 ENT

The signal displayed on the oscilloscope should now be 400 ±10 mV peak-to-peak.

If the displayed signal is correct, proceed with the next step.

If the displayed signal is not correct, the 8 dB step attenuator in the A7A2 FM Baseband assembly is at fault.

15. Switch out the 8 dB attenuator and switch in the 16 dB step attenuator using the following key sequence.

SPCL 53.3 ENT 0 ENT

The 8 dB attenuator has now been switched out.

SPCL 53.1 ENT 26 ENT
SPCL 53.2 ENT 4 ENT
SPCL 53.3 ENT 8 ENT

The signal on the oscilloscope display should now be 160 ±10 mV peak-to-peak.

If the displayed signal is correct, proceed with the next step.

If the displayed signal is not correct, the 16 dB step attenuator in the A7A2 FM Baseband assembly is at fault.

16. Switch out the 16 dB attenuator and switch in the 33 dB step attenuator using the following key sequence.

    SPCL 53.3 ENT 4 ENT

    The displayed signal should now be 20 ±10 mV peak-to-peak.

    If the signal is correct, proceed with the next step.

    If the signal is not correct, the 33 dB step attenuator in the A7A2 FM Baseband assembly is at fault.

Check 6 - A6A1 1 GHz FM VCO

1. Connect a frequency counter or spectrum analyzer to A6J1, FM OUT. This is the 1 GHz FM VCO output. Connect the 10 MHz frequency reference output of the frequency counter to the rear panel Vector Generator 10 MHz TIMEBASE IN. Using a common time base eliminates errors due to the accuracy of the two different reference signals.

2. Press the INSTR PRESET key to set the Vector Generator to a known state. If no keys have been pressed since the Service Voltmeter/Supply Check, the instrument does not have to be reset and the following step can be skipped.

Note

The following step uses the internal calibration reference as a testing stimulus. An external dc voltage can be substituted for the internal calibration voltage by connecting the voltage directly to A6J10, BB in.

3. Enable the 0 volt calibration reference and connect it to the BB out signal of the FM Baseband assembly. This is done by executing the following key sequences. ENT represents the ENT SPCL key in the following sequences.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 8 ENT
    SPCL 53.2 ENT 6 ENT
    SPCL 53.3 ENT 29 ENT

    The diagnostic multiplexer has now been set to connect BB out (A7J9) to the output of the diagnostic multiplexer and the calibration voltage reference is substituted for the FM input.

SPCL 53.1 ENT 15 ENT
SPCL 53.2 ENT 15 ENT
SPCL 53.3 ENT 16352 ENT

The FM circuitry is now set for inverted operation with no attenuation in the signal path.

SPCL 53.1 ENT 30 ENT
SPCL 53.2 ENT 2 ENT
SPCL 53.3 ENT 2 ENT

The calibration voltage reference is now set for +0.0 volts at the input of the FM subsystem. The output of the FM Baseband assembly can be checked with the service voltmeter by entering SPCL 52.5 ENT SPCL. The displayed voltage should be 0 ±0.1 volts.

4. Connect the FM Baseband out signal to the VCO MOD line by executing the following key sequence. Note that both phase detectors are disabled by the following sequence to permit measurement of the VCO in an open loop (not phase-locked) condition.

   SPCL 53.0 ENT 7 ENT
   SPCL 53.1 ENT 12 ENT
   SPCL 53.2 ENT 3 ENT
   SPCL 53.3 ENT 5 ENT

   The Baseband Out signal is now connected to the VCO MOD input of the 1 GHz FM VCO. Note that the CW Tune signal, normally used for CW phase locking is disabled by this step. In addition, the output of the ACFM phase detector has been disconnected from the VCO TUNE line. An error message (error 910) may be generated due to disabling the phase locked loop.

5. Connect the service voltmeter to measure the VCO TUNE signal by entering the following sequence. This will ensure that both inputs to the 1 GHz FM VCO are valid signals. Enter the following key sequence to connect the analog diagnostic multiplexer to the VCO TUNE signal. ENT represents the ENT SPCL key.

   SPCL 53.1 ENT 4 ENT
   SPCL 53.2 ENT 3 ENT
   SPCL 53.3 ENT 5 ENT

6. Connect the service voltmeter to the analog diagnostic multiplexer by entering SPCL 52.2 ENT SPCL. The display should indicate -5 ±1 volt.

   If the displayed voltage is correct, continue with the next step.

   If the voltage is incorrect, the 1 GHz FM VCO tuning may be adjusted incorrectly or there is a problem with the A6 FM RF frame.

7. Connect the service voltmeter to measure the VCO MOD signal at the input of the 1 GHz FM VCO. Set the analog diagnostic multiplexer by entering the following key sequence.

   SPCL 53.1 ENT 4 ENT
   SPCL 53.2 ENT 3 ENT
   SPCL 53.3 ENT 4 ENT

8. Connect the service voltmeter to the analog diagnostic multiplexer by entering SPCL 52.2 ENT SPCL. The voltage displayed should be 0 ±0.1 volts.

   If the displayed voltage is correct, proceed with the next step.

   If the voltage is not correct, the problem is probably in the connection between A7J9, BB (Baseband out) and A6J10, BB (Baseband in) or in the A6 FM RF frame itself. Use a voltmeter to isolate the problem to the cable or to the A6 FM RF frame.

9. Observe the frequency counter indication. The frequency should be 1.000 ±0.001 GHz.

   If the frequency is correct, proceed with the next step.

   If the frequency is not correct, the pretuning of the 1 GHz FM VCO is out of adjustment or the A6A1 1 GHz FM VCO is malfunctioning.

10. Change the calibration voltage reference to -0.3 volts by executing the following key sequence.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 30 ENT
    SPCL 53.2 ENT 2 ENT
    SPCL 53.3 ENT 0 ENT

    The calibration voltage reference is now set for -0.3 volts at the input of the FM subsystem. The signal at the input of the 1 GHz FM VCO (VCO MOD) can be checked by entering SPCL 52.2 ENT SPCL. The displayed voltage should be -0.3 ±0.1 volts.

11. Record the frequency counter reading and the actual calibration voltage level for determining the 1 GHz FM VCO sensitivity. The calibration voltage level is measured by entering SPCL 52.2 ENT SPCL and reading the level from the Vector Generator display.

    Low VCO Frequency _____MHz

    -0.3 Volt Reference _____Vdc

12. Change the calibration voltage reference to +0.3 volts by executing the following key sequence.

    SPCL 53.3 ENT 1 ENT

    The calibration voltage reference is now set for +0.3 volts at the input of the FM subsystem. The signal at the input of the 1 GHz FM VCO (VCO MOD) can be checked by entering SPCL 52.2 ENT SPCL. The displayed voltage should be +0.3 ±0.1 volts.

13. Record the frequency counter reading and the +0.3 volt calibration voltage level. The +0.3 calibration voltage level is measured by entering SPCL 52.2 ENT SPCL and reading the level on the Vector Generator display.

    High VCO Frequency _____MHz

    +0.3 Volt Reference _____Vdc

14. Calculate the VCO sensitivity using the results of the previous measurements.

    VCO Sensitivity = (Frequency Change)/(Voltage Change)

    Where:

    Frequency Change=(High VCO Frequency) - (Low VCO Frequency)

    Voltage Change = (+0.3 Volt Reference) - (-0.3 Volt Reference)

    The VCO sensitivity should be between 5.7 and 8.3 MHz/volt.

    If the sensitivity is correct, proceed with the next step.

    If the sensitivity is not correct, the A6A1 FM VCO is most likely defective. Check 7 can be used to verify all input signals to ensure that the problem is in the A6A1 frame.

15. Press the INSTR PRESET key on the Vector Generator to reset the FM VCO to 1 GHz.

16. Connect a power meter or spectrum analyzer to A6J1, FM OUT. The output level should be between +8 and +12 dBm.

    If the level is not correct, one of the amplifiers, the power splitter or the VCO on the A6A1 FM VCO assembly is defective.

    If the level is correct, proceed with the next step.

17. Connect the power meter to A6J2, CW VCO. The output level should be between +2 and +6 dBm.

    If the level is not correct, one of the amplifiers or a power splitter is defective on the A6A1 FM VCO assembly.

    If the level is correct, proceed with the next step.

18. Connect the power meter to A6J3, ACFM VCO. The output level should be between +2 and +6 dBm.

    If the level is not correct, one of the amplifiers or a power splitter is defective on the A6A1 FM VCO assembly.

    If the level is correct, proceed with the next check.

Check 7a - A7A1 DCFM/CW Phase Detector

1. Press INSTR PRESET to set the Vector Generator to a known state.

2. Connect the oscilloscope to A7J4, CW TUNE using a SMC tee. The SMC tee will enable the oscilloscope to display the DCFM/CW Phase Detector IF signal with the phase locked loop feedback in place.

3. Set the oscilloscope for dc (high impedance) coupling, vertical sensitivity to 0.5 volts per division and horizontal sensitivity to 10 milliseconds per division.

4. Activate the relock tuning ramp in the A6A2 PLL assembly by entering the following key sequence. This signal is used to sweep the 1 GHz FM VCO around 1 GHz so that phase lock can be established in CW and DCFM modes.

   SPCL 53.0 ENT 7 ENT
   SPCL 53.1 ENT 10 ENT
   SPCL 53.2 ENT 1 ENT
   SPCL 53.3 ENT 1 ENT

   The DCFM/CW Phase detector is now connected to the VCO MOD signal and the relock tuning ramp has been activated. The DCFM/CW Phase Detector is now mixing the 1 GHz FM VCO with the tenth harmonic of the 100 MHz reference from the LO subsystem. Since the 1 GHz FM VCO is sweeping ±3 MHz around 1 GHz, the IF signal should be sweeping from 3 MHz to dc to 3 MHz. The actual waveform is not as important as the fact that the signal passes through dc periodically. The waveform should look similar to Figure 8-5.

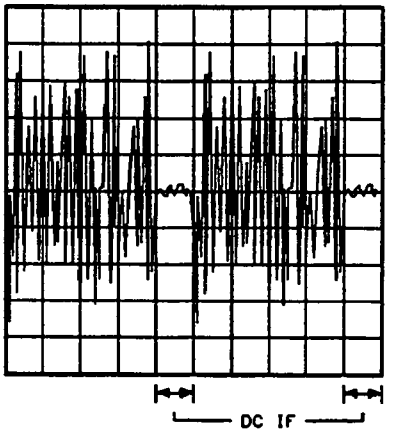

Figure 8-5. DCFM IF Sweep Waveform

If the signal is correct, proceed with Check 7b.

If the signal is not correct, proceed with the next step to check the inputs to the DCFM/CW Phase Detector.

5. Connect the spectrum analyzer to A6J2, CW VCO.

   The signal should be sweeping approximately ±6 MHz around 1 GHz and the level should be at least +0 dBm.

   If the signal is correct, proceed with the next step.

   If the signal frequency is not correct, the relock tuning ramp circuit in the A6A2 FM PLL assembly is at fault. If the level is not correct, the A6A1 1 GHz FM VCO is at fault.

6. Connect the spectrum analyzer to A6J7, 100 MHz.

   The signal should be at 100 MHz at a level between +8 and +12 dBm.

   If the signal is correct, the A7A1 FM RF frame is at fault.

   If the signal is not correct, troubleshoot the source of the signal.

Check 7b - A7A2 100 MHz VCXO

1. Press INSTR PRESET to set the Vector Generator to a known state.
2. Connect the test oscillator to the Vector Generator FM input.
3. Connect the spectrum analyzer to A7J2, VCXO.

   The 100 MHz signal should be less than -40 dBm since the VCXO is disabled in CW mode.

If the signal is correct, proceed with the next step.

If the signal is not correct, the A6A2 100 MHz VCXO is defective and may cause spurious signals in CW and ACFM modes.

4. Press the FM ON key and then the DC COUP FM key to select DCFM mode. Set the FM range to 150 kHz peak-to-peak using the SET FM key and the numeric keypad.

5. Set the test oscillator for a low frequency (<1 kHz) at an output level of 1 volt peak-to-peak. Set the offset to 0 Vdc.

6. The signal displayed on the spectrum analyzer should be 100 MHz and should be sweeping approximately ±1.8 kHz peak-to-peak and the amplitude should remain greater than +0 dBm.

   If the signal is correct, the 100 MHz VCXO is working correctly.

   If the signal is not correct, proceed with the next step.

7. Connect the oscilloscope to A7J9 DCFM and select 50 ohm dc coupling.

   The displayed signal should be approximately the same as the output of the test oscillator (1 volt peak-to-peak at a frequency less than 1 kHz).

   If the signal is correct, the problem is in the A7A1 FM RF assembly.

   If the signal is not correct, the problem is in the AC/DC FM switch in the A6A2 FM PLL assembly or in the output of the A7A2 FM Baseband assembly.

Check 8 - A7A2 ACFM Phase Detector

1. Press INSTR PRESET to set the Vector Generator to a known state.

2. Press the FM ON key to activate ACFM mode.

3. Connect the A7A2 diagnostic multiplexer to the 100 MHz input from the A7 FM BB frame (A6A2TPA). This reference is used when ACFM is selected. In the following sequence, ENT represents ENT SPCL (the Hz key).

   SPCL 53.0 ENT 7 ENT
   SPCL 53.1 ENT 4 ENT
   SPCL 53.2 ENT 3 ENT
   SPCL 53.3 ENT 1 ENT

4. Enable the service voltmeter to read the detected level of the 100 MHz reference frequency. This is accomplished by entering SPCL 52.2 ENT SPCL.

   The displayed voltage should be greater than +0.2 volts.

   If the indication is correct, continue with step 7.

   If the level is not correct, continue with the next step to isolate the problem.

5. Using a power meter or spectrum analyzer, check the level of the signal at A7J8, CW REF. This is the 100 MHz reference for the ACFM phase detector.

   The level should be at least +7 dBm.

   If the level is correct, the A7A2 FM PLL assembly is faulty.

   If the level is not correct, proceed with the next step.

6. Measure the level of the signal at the cable connected to A7J7, AUX 100 input. This is the 100 MHz reference from the Local Oscillator subsystem.

   The level should be at least +8 dBm.

   If the level is correct, the fault is either in the A7A2 FM Baseband assembly or the cable between A7J8, CW REF and A6J5, CW REF.

   If the level is not correct, the problem is in the Local Oscillator subsystem or the cable carrying the 100 MHz signal from the Local Oscillator subsystem to A7J7.

7. Connect the A7A2 diagnostic multiplexer to the REF/N signal (A6A2TP22) using the following key sequence. This signal is the 100 MHz CW REFERENCE signal divided by 140 that provides the 2.5 MHz reference for the ACFM phase detector.

   SPCL 53.3 ENT 2 ENT

8. Enable the service voltmeter to read the detected level of the REF/N signal. This is accomplished by entering SPCL 52.2 ENT SPCL.

   The displayed voltage should be greater than +2.8 volts (since the minimum TTL high level is +3.5 volts).

   If the indication is correct, continue with the next step.

   If the level is not correct, the A7A2 FM PLL assembly is at fault.

9. Connect the A7A2 diagnostic multiplexer to the VCO/N signal (A6A2TP9) using the following key sequence. This signal is the 1 GHz FM VCO feedback signal divided by 400 that provides the 2.5 MHz feedback for the ACFM phase detector.

   SPCL 53.3 ENT 3 ENT

10. Enable the service voltmeter to read the detected level of the VCO/N signal. This is accomplished by entering SPCL 52.2 ENT SPCL.

    The displayed voltage should be greater than +2.8 volts (since the minimum TTL high level is +3.5 volts).

    If the indication is correct, continue with the next step.

    If the level is not correct, the A7A2 FM PLL assembly is at fault. Note that the signal level from the 1 GHz FM VCO (A6J3) is checked in Check 7.

11. Disconnect the correction signal from the ACFM phase detector to the VCO TUNE signal by entering the following key sequence. This will enable the output voltage swing of the ACFM phase detector to be checked. An error message (error 912) will probably be generated by this key sequence.

    SPCL 53.1 ENT 12 ENT
    SPCL 53.2 ENT 1 ENT
    SPCL 53.3 ENT 1 ENT

Note 

The following step uses the internal calibration reference as a testing stimulus. An external dc voltage can be substituted for the internal calibration voltage by connecting the voltage directly to A6J10, BB in.

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12. Set the calibration voltage of the A7A2 FM Baseband assembly to set the 1 GHz FM VCO to a lower frequency. This simulates the 1 GHz FM VCO being too low in frequency. The ACFM phase detector should attempt to correct the frequency by decreasing the VCO TUNE voltage.

    SPCL 53.0 ENT 6 ENT
    SPCL 53.1 ENT 8 ENT
    SPCL 53.2 ENT 6 ENT
    SPCL 53.3 ENT 29 ENT

    The diagnostic multiplexer has now been set to connect BB out (A7J9) to the output of the diagnostic multiplexer and the calibration voltage reference is substituted for the FM input.

SPCL 53.1 ENT 15 ENT
SPCL 53.2 ENT 15 ENT
SPCL 53.3 ENT 16352 ENT

The FM circuitry is now set for inverted operation with no attenuation in the signal path. The output of the A7A2 FM Baseband assembly will now be the same polarity as the calibration voltage.

SPCL 53.1 ENT 30 ENT
SPCL 53.2 ENT 2 ENT
SPCL 53.3 ENT 0 ENT

The calibration voltage reference is now set for -0.3 volts at the input of the FM subsystem. However, with the FM input connected to the 1 GHz FM VCO, the actual voltage will be one-half of the set voltage due to loading by the 50 ohm input impedance of the 1 GHz FM VCO. The output of the FM Baseband assembly can be checked with the service voltmeter by entering SPCL 52.5 ENT SPCL. The displayed voltage should be -0.15 ±0.05 volts.

13. Connect the service voltmeter to the AC TUNE signal in the A6A2 FM PLL assembly by entering the following key sequence.

SPCL 53.0 ENT 7 ENT
SPCL 53.1 ENT 4 ENT
SPCL 53.2 ENT 3 ENT
SPCL 53.3 ENT 7 ENT

14. Display the service voltmeter reading of the AC TUNE signal by entering SPCL 52.2 ENT SPCL.

The voltage should be less than -12 volts.

If the voltage is incorrect, the problem is in the A6A2 FM PLL assembly.

15. Reset the VCO MOD voltage for a higher 1 GHz FM VCO frequency by changing the calibration voltage to +0.3 volts. Use the following sequence to reset the calibration voltage.

SPCL 53.0 ENT 6 ENT
SPCL 53.1 ENT 30 ENT
SPCL 53.2 ENT 2 ENT
SPCL 53.3 ENT 1 ENT

16. Connect the service voltmeter to the AC TUNE signal in the A6A2 FM PLL assembly. This is accomplished by entering SPCL 52.2 ENT SPCL.

    The voltage should be greater than +13.7 volts.

    If the voltage is incorrect, the problem is in the A6A2 FM PLL assembly.

Check 9 - FM Subsystem Control Signals/Power Supplies

This check is to verify the integrity of the input and output signal paths between the 37 pin connector on either the A6 FM RF or A7 FM BB frame and the source or destination of the signal. Note that the connectors are identical and either frame can be connected to either 37 pin connector.

Note

Refer to the block diagram figure for pin identification of the 37 pin FM frame cable connector and the 40 pin ribbon cable connector that connects to the A17 Distribution board.

1. Using Table 8-10, check the signal path resistance between the FM frame ribbon cable connector and the indicated power supply test point. The resistance between the indicated power supply test point and the 37 pin FM frame connector pin should be 1 kΩ (due to a 1 kΩ resistor between the actual supply and the supply test point). The resistance between the ground test point and the 37 pin FM frame connector pins should be less than 50Ω.

   If the power supply signal paths are correct, proceed with the next step.

   If any supply signal path shows a problem, use the additional information in the table to isolate the problem to the cable between the FM frames and the A17 Distribution board or to the path between the distribution board and the A18 Power Control board.

Table 8-10. FM Subsystem Power Supplies

Frame Connector Pin	A17J8-	Source Testpoint	Power Supply
12,31	15,14	A18TP5	+15 Vdc
15,32	9,12	A18TP8	+5 Vdc
17,18	5,3	A18TP9	-5 Vdc
36,37	4,2	A18TP6	-15 Vdc
1,10,11, 16,19,23, 24,25,26, 27,33	37,19,17, 7,1,30, 28,26,24, 22,10	A18TP13	Ground

2. The four signals in Table 8-11 are verified using Check 4 - Calibration Voltages/Service Voltmeter.

   If Check 4 passes, proceed with the next step.

   If the check fails, use an ohmmeter to check the continuity between the frame connector pin and the destination (A11J5).

   If there is continuity between the frame connector pin and the destination, proceed to BD6 to check The Analog to Digital Converter (ADC). It the ADC is working, the problem is in the FM frame.

   If the continuity test shows an open (or a short to ground), troubleshoot the problem to determine if the problem is a cable or the A17 Distribution board.

Table 8-11. FM Subsystem Diagnostic Signals

Frame Connector Pin	A17J8-	Destination or Source	Signal Name
3	33	A11J5-38	-ANALOG 1
21	34	A11J5-39	+ANALOG 1
4	31	A11J5-36	-ANALOG 4
22	32	A11J5-37	+ANALOG 4

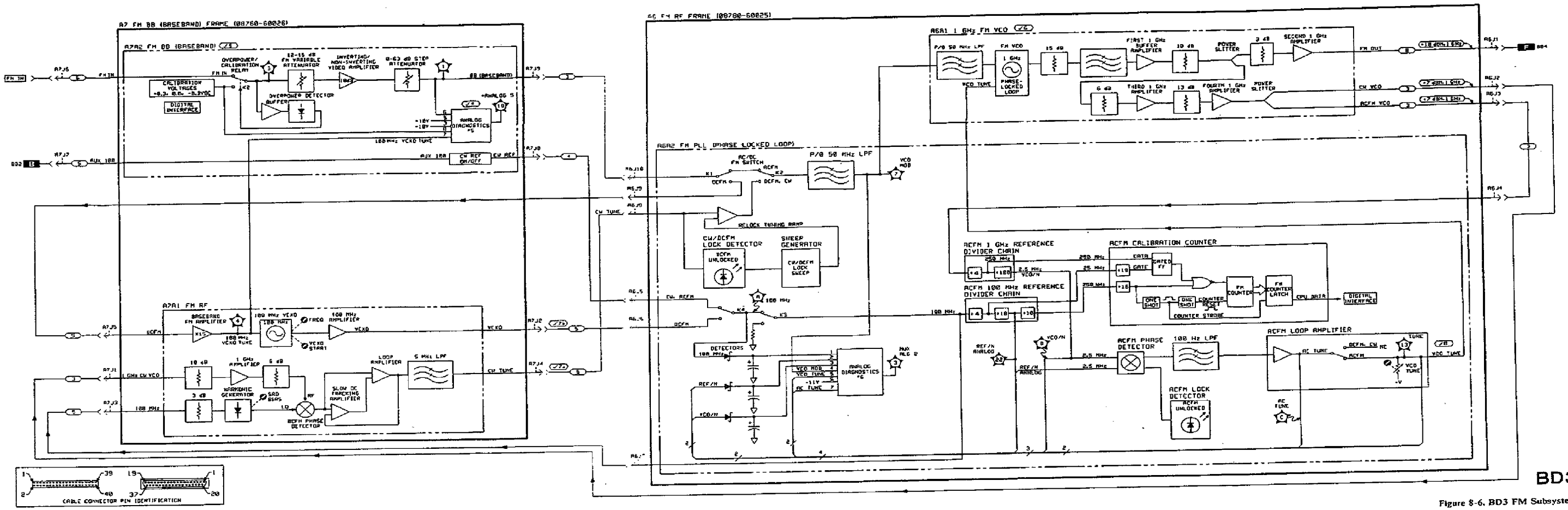
3. Use Table 8-12 to check for continuity between each signal and the A11J5 connector.

   If there is continuity between the frame connector pin and the source or destination signal, proceed to BD6 to check the Instrument Bus. A successful Instrument Bus test indicates that the information received by the FM frame is correct.

   If there is an open (or short to ground) on any signal line, isolate the problem to a cable or the A17 Distribution board.

Table 8-12. FM Subsystem Control Signals

Frame Connector Pin	A17J8-	Destination or Source	Signal Name
6	27	A11J5-45	XFR7
7	25	A11J5-43	XFR6
8	23	A11J5-16	NINT
9	21	A11J5-14	LOAD
28	20	A17U11-14	DATA OUT
29	18	A11J5-10	DATA IN
30	16	A17U11-12	CLK



BD3

Figure 8-6. BD3 FM Subsystem

Service Sheet BD4

RF Output Subsystem

References

Principles of Operation

The RF Output subsystem is responsible for combining the output signals of the FM subsystem and the Local Oscillator subsystem. In addition, phase and amplitude modulation are introduced under control of the Digital/Vector Baseband subsystem.

Output level control is accomplished by setting a variable attenuator and a 10 dB step attenuator to the settings required for the appropriate level. All level correction is done by the Digital Control subsystem. The output power level is measured during self-calibration and correction values are calculated to compensate for frequency response and temperature.

The RF Output subsystem is divided into three decks as follows:

A13 IF Multiplier Deck
A14 LO Multiplier Deck
A15 RF Output Deck

Each deck and its functions are described below.

A13 IF Multiplier Deck

The A13 IF Multiplier Deck is used to multiply the FM Subsystem output frequency by eight and to produce the rear panel Coherent Carrier reference signal. Multiplying the FM Subsystem output frequency increases the maximum peak deviation by a factor of eight. Downconverting the multiplied signal in the RF Output Deck maintains the maximum peak deviation while reducing the carrier frequency.

The rear panel Coherent Carrier reference signal is used as the reference for the modulated RF output signal. The Coherent Carrier is obtained by mixing the multiplied LO subsystem signal with the multiplied FM subsystem signal. The resultant IF signal is at the same frequency as the RF output frequency and will be FM modulated along with the RF output signal. Phase and amplitude modulation are not present in the Coherent Carrier signal.

A14 LO Multiplier Deck

The A14 LO Multiplier Deck is used to multiply the LO Subsystem output frequency by eight. The frequency quadruplers (X4) use Step Recovery Diodes (SRD) to provide the harmonic generation. The bias of the SRD is critical for optimizing the conversion efficiency for the fourth harmonic.

The signal from the LO Subsystem is first doubled and then input to a power amplifier. After being amplified, the signal is routed to a frequency quadrupler (X4) and then a bandpass filter. The filter is used to suppress spurious signals from the multiplication process.

The output signal frequency of the LO Multiplier will be between 8 and 11 GHz. Due to the multiplication process used, other harmonics of the input signal can appear within the 8 to 11 GHz output frequency range. For example, for an input frequency of 1 GHz, a 10 GHz harmonic is present and lies within the 8 to 11 GHz output frequency range. To prevent this, two signal paths are used to provide filtering for in-band harmonics.

For LO Multiplier Deck output frequencies between 8 and 9.5 GHz, a 8-9.5 GHz bandpass filter is used. Frequencies between 9.5 and 11 GHz use the 9.5 to 11 GHz bandpass filter. The amplifier routes the input signal to the appropriate path under control of the LO Interface assembly.

A portion of the LO Multiplier Deck output signal is fed to the IF Multiplier Deck to be used in generating the rear panel Coherent Carrier reference signal. The main signal is routed to the RF Output Deck.

A15 RF Output Deck

The RF Output Deck is responsible for phase/amplitude modulation and RF output level control. The major components of the RF Output Deck are:

- Z1 I/Q Splitter
- AT3 Dual Modulator
- AT6 I/Q Combiner
- AT12 PIN Attenuator (Option 064 only)
- AT8 Mixer
- AT10 Pad
- A2 RF Amplifier
- AT11 Step Attenuator

Each item is described below.

Z1 I/Q Splitter. The I/Q Splitter is used to produce two equal amplitude signals that are precisely 90 degrees apart in phase. The Quadrature-phase (Q) signal is 90 degrees ahead of the In-phase (I) signal.

The I PHASE and Q PHASE input signals provide a minimum of 25 degree phase adjustment range to provide compensation for phase differences between components in the modulation chain. During self-calibration, the proper settings for the adjustment signals are calculated for exact quadrature between the I and Q signals.

AT3 Dual Modulator. The Dual Modulator provides a means of varying the amplitudes of the I and Q signals. Controlling the I and Q signal amplitudes appropriately provides a means of phase modulating as well as amplitude modulating the RF output signal.

AT6 I/Q Combiner. The modulated I and Q signals are combined by adding the signals together. There are no phase shifts of either signal in the combiner.

The various isolators in the modulation chain are used to reduce channel to channel interference (crosstalk).

AT12 PIN Attenuator. The PIN attenuator provides 0 to 18 dB of variable attenuation to provide fine control of output level. The step attenuator is used for coarse control (10 dB steps) while the variable attenuator is used for fine control. The standard instrument has the variable attenuator built into the A2 RF Amplifier. The Option 064 instrument has the variable attenuator installed as a discrete package.

AT8 Mixer. The output mixer is used to combine the modulated IF signal and the output of the LO Multiplier Deck. The resultant 10 MHz to 3 GHz signal is the final output frequency.

AT10 Pad. The factory selected pad is used to match the gain of the RF amplifier to the particular deck where it will be used.

A2 RF Amplifier. The RF amplifier is used to amplify the IF signal from the mixer. The amplifier gain is temperature compensated by adjusting the actual variable attenuator setting in the standard instrument. The Option 064 instrument uses the temperature sensor and a dedicated circuit to temperature compensate the amplifier gain.

An RF detector is contained within the RF amplifier. During self-calibration, the RF detector is used to measure the output level to determine level corrections. The self-calibration takes the place of the traditional Automatic Level Control (ALC) circuits.

The standard instrument also has the 20 dB variable attenuator built into the RF amplifier. This provides the fine output level control. The Option 064 instrument has a discrete (separate) variable attenuator.

AT11 Step Attenuator. The step attenuator is used to change the output level in 10 dB steps. The step attenuator and variable attenuator together provide the level control over the entire specified range.

Analog Diagnostics

The Vector Generator has a built in service voltmeter that can be used to measure internal voltages. The available voltages are shown on the block diagram as the inputs to the two Analog Diagnostics circuits. The service voltmeter will be used throughout the troubleshooting procedure to provide measurements of critical test points without the need to disassemble a deck.

When a calibration is performed, the analog diagnostics will generate an error code whenever a fault occurs in the LEVEL portion of the calibration. The error code can be accessed using special function 51.2. A description of the errors can be found in Table 8-13.

Table 8-13. LEVEL Error Codes

Code	Description
200	RF Detector limit
201	+20 volt supply limit during calibration
202	+8 volt current limit during calibration
203	+2.5 volt reference limit during calibration
204	Temperature sensor limit during calibration
205	+7.4 volt supply limit during calibration
206	+15.6 volt supply limit during calibration
207	Not Used
208	RF detector offset limit at 10 MHz during variable attenuator calibration
209	Too many points required to characterize variable attenuator
210	RF detector offset limit at 10 MHz
211	RF detector offset limit at 200 MHz
212	RF detector offset limit at 500 MHz
213	RF detector offset limit at 1000 MHz
214	RF detector offset limit at 1500 MHz
215	RF detector offset limit at 2000 MHz
216	RF detector offset limit at 2500 MHz
217	RF detector offset limit at 3000 MHz
218-219	Not used
220	Maximum RF amplifier gain limit at 10 MHz
221	Maximum RF amplifier gain limit at 200 MHz
222	Maximum RF amplifier gain limit at 500 MHz
223	Maximum RF amplifier gain limit at 1000 MHz
224	Maximum RF amplifier gain limit at 1500 MHz
225	Maximum RF amplifier gain limit at 2000 MHz
226	Maximum RF amplifier gain limit at 2500 MHz
227	Maximum RF amplifier gain limit at 3000 MHz
228-229	Not used
230	RF amplifier adjustment range limit at 10 MHz
231	RF amplifier adjustment range limit at 200 MHz
232	RF amplifier adjustment range limit at 500 MHz
233	RF amplifier adjustment range limit at 1000 MHz
234	RF amplifier adjustment range limit at 1500 MHz
235	RF amplifier adjustment range limit at 2000 MHz
236	RF amplifier adjustment range limit at 2500 MHz
237	RF amplifier adjustment range limit at 3000 MHz
238-239	Not used
240	RF detector-offset limit during characterization of variable attenuator

Troubleshooting

It is assumed that the troubleshooting information on Service Sheet BD1 was used to isolate a malfunction to the RF Output Subsystem. The following information will aid in isolating the defective module.

The troubleshooting procedure is broken into nine checks as follows:

Check 1 - Coherent Carrier Check
Check 2 - Maximum Power Check
Check 3 - RF Level Control Check
Check 4 - I/Q Modulation Check
Check 5 - Service Voltmeter
Check 6 - A13 IF Multiplier Deck
Check 7 - A14 LO Multiplier Deck
Check 8 - A15 RF Output Deck
Check 9 - RF Output Subsystem Control Signals/Power Supplies

Check 9 is used once an assembly is isolated. This check is used to verify that all inputs of the deck are present.

Troubleshooting Hints

The following items are general troubleshooting techniques that are extremely useful when troubleshooting the Vector Generator.

1. Check the ribbon cable that carries power and control signals and any coaxial that carry RF signals for loose connections.

2. Any cables that look worn or frayed should be replaced or at least checked for repeatable continuity.

3. A wrench should always be used when tightening or loosening coaxial connectors. Use a torque wrench to tighten all SMA type connectors.

4. The coaxial connectors on a cable that is disconnected should always be inspected for damage. Make sure that each connector is solidly mounted on the deck and that the center conductor is not broken or bent.

5. Test equipment and personnel should be grounded to avoid static induced failures. Observe all electrostatic discharge (ESD) precautions.

6. After a module has been replaced or repaired, make sure that all coaxial connectors are properly tightened with a wrench and that all ribbon cable connectors are firmly seated in their sockets.

Test Equipment

Spectrum Analyzer ..... HP 8566B
Power Meter ..... HP 438A
Power Sensor ..... HP 8482A and HP 8481A
Test Oscillator ..... HP 8116A
Oscilloscope ..... HP 54201A

Check 1 - Coherent Carrier Check

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Connect the power meter to the Vector Generator rear panel Coherent Carrier output.

3. Set the Vector Generator frequency to 10 MHz. The level is typically greater than -20 dBm (greater than +9 dBm for Option 002).

   If the level is correct, proceed with the next step.

   If the level is not correct, proceed with Check 5 to begin isolating the problem.

4. Tune the Vector Generator from 10 MHz to 3 GHz in 100 MHz steps. The coherent carrier level should typically be at least -20 dBm for each frequency tested (greater than +9 dBm for Option 002).

   If the level is at least -20 dBm for each frequency, proceed with the next check.

   If the level is not correct at any or all frequencies, proceed with check 5 to begin isolating the problem.

Check 2 - Maximum Power Check

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Connect the power meter to the Vector Generator RF output.

3. Set the Vector Generator frequency to 10 MHz and level to +10 dBm. The Option 064 instrument should be set to +12 dBm.

   Adjust the Vector Generator output level until the power meter reads at least +10 dBm (+12 for Option 064).

If the level can be set to at least +10 dBm (+12 dBm), proceed with the next step.

If the level cannot be set to at least +10 dBm, proceed to Check 5 to begin isolating the problem.

4. Tune the Vector Generator from 10 MHz to 2.5 GHz in 100 MHz steps. Adjust the Vector Generator output level for a power meter reading of at least +10 dBm (+12 dBm for the Option 064) at each frequency step.

   If the level can be set to at least +10 dBm at each frequency, proceed with the next step.

   If the level cannot be set to at least +10 dBm at any or all frequencies, proceed with Check 5 to begin isolating the problem.

5. Set the Vector Generator to 2.5 GHz and adjust the output level for a power meter reading of +4.0 dBm. The Option 064 instrument should be left at +12 dBm.

6. Tune the Vector Generator from 2.5 to 3.0 GHz in 100 MHz steps. Adjust the output level at each frequency for a power meter reading of at least +4.0 dBm (+12 dBm for Option 064).

   If the level can be adjusted to at least +4.0 dBm for all frequencies, proceed with Check 3 to verify level control.

   If the level cannot be adjusted for at least +4.0 dBm at any or all frequencies, proceed with Check 5 to begin isolating the problem.

Check 3 - RF Level Control Check

1. Enter SPCL 99.9 ENT SPCL on the Vector Generator to load default calibration factors. Ignore any messages in this and all subsequent steps unless instructed by the procedure to check for a given message.

2. Press the CAL key on the Vector Generator to start an instrument self-calibration.

3. When the calibration is complete, enter SPCL 51.2 ENT SPCL to view the calibration error code. The code displayed should be zero.

   If the error code displayed is zero, proceed with the next step.

   If the error code displayed is between 200 and 300, the calibration failed. Proceed with Check 5 to begin isolating the problem. Table 8-13 details the message associated with each code.

4. Connect the spectrum analyzer to the Vector Generator RF output.

5. Set the Vector Generator to 140 MHz at a level of +7 dBm (+12 for Option 064). Note the level on the spectrum analyzer. This level will be the reference for the following step.

6. Adjust the spectrum analyzer to view the 140 MHz CW signal. The vertical sensitivity should be set to 5 dB per division. Set the peak of the signal to the top of the screen to provide a reference for the following steps.

7. Switch in the 10 dB attenuator section in the step attenuator by entering the following key sequence. ENT represents the ENT SPCL (Hz) key.

   SPCL 53.0 ENT 0 ENT
   SPCL 53.1 ENT 24 ENT
   SPCL 53.2 ENT 4 ENT
   SPCL 53.3 ENT 1 ENT

   The RF level should decrease by 10 ±2 dB.

   If the level change is correct, proceed with the next step.

   If the level change is not correct, proceed with Check 8 to isolate the problem within the A15 RF Output Deck.

8. Switch out the 10 dB attenuator section and switch in the 20 dB section with the following key sequence.

   SPCL 53.3 ENT 2 ENT

   The level should now be 20 ±2 dB below the reference level.

   If the level is correct, proceed with the next step.

   If the level is not correct, proceed with Check 8 to isolate the the problem within the A15 RF Output Deck.

9. Switch out the 20 dB attenuator section and switch in the first 40 dB section using the following key sequence.

   SPCL 53.3 ENT 4 ENT

   The level should now be 40 ±2 dB below the reference.

If the level is correct, proceed with the next step.

If the level is incorrect, proceed with Check 8 to isolate the problem within the A15 RF Output Deck.

10. Switch out the first 40 dB section and switch in the final 40 dB section with the following key sequence.

    SPCL 53.3 ENT 8 ENT

    The level should be 40 ±2 dB below the reference.

    If the level is correct, proceed with the next step.

    If the level is not correct, proceed with Check 8 to isolate the problem within the A15 RF Output Deck.

11. Press INSTR PRESET on the Vector Generator to reset the attenuator.

12. Set the Vector Generator to 140 MHz at an output level of +7 dBm. Use +12 dBm if Option 064 is installed.

13. If the instrument does not have Option 064 installed, skip this step. The Option 064 instrument has two variable attenuator ranges. The standard instrument has only one. Set the variable attenuator to the 0 to 18 dB attenuation range using the following key sequence.

    SPCL 53.0 ENT 0 ENT
    SPCL 53.1 ENT 23 ENT
    SPCL 53.2 ENT 1 ENT
    SPCL 53.3 ENT 1 ENT

14. Set the variable attenuator for minimum attenuation by entering the following key sequence.

    SPCL 53.0 ENT 0 ENT
    SPCL 53.1 ENT 11 ENT
    SPCL 53.2 ENT 12 ENT
    SPCL 53.3 ENT 4095 ENT

15. Vary the attenuator from minimum attenuation (4095) to maximum attenuation (0) using the knob or the numeric keys. The level should change at least 17 dB between the minimum and maximum attenuation settings. In addition, the power level at maximum attenuation should be less than -5 dBm.

If the level change is at least +17 dB, proceed with the next step.

If the level change is correct but the lowest level (at maximum attenuation) is greater than -5 dBm, the A15 RF Output Deck requires adjustment or repair.

If the level change is not correct, proceed with Check 8 to isolate the problem in the RF Output Deck.

16. Set the attenuator to minimum attenuation by entering SPCL 53.3 ENT 4095 ENT.

17. If the instrument does not have Option 064 installed, skip this step. Otherwise, activate the Option 064 extended attenuation range with the following key sequence. The extended range extends the attenuation range another 1 dB.

    SPCL 53.1 ENT 23 ENT
    SPCL 53.2 ENT 1 ENT
    SPCL 53.3 ENT 0 ENT

    The RF level should drop by at least 17 dB.

    If the level change is correct, proceed with the next step.

    If the level change is not correct, proceed with Check 8 to isolate the problem in the A15 RF Output Deck.

Check 4 - I/Q Modulation Check

1. Press INSTR PRESET on the Vector Generator to set the instrument to a known state.

2. Set the Vector Generator to 10 MHz at an output level of 0 dBm.

3. Connect channel 1 of the oscilloscope to the Vector Generator RF Output. Connect the rear panel Coherent Carrier reference signal to the oscilloscope external trigger input.

4. Set the oscilloscope to display several cycles of the waveform and select external triggering. External triggering is used to preserve the phase (time) reference supplied by the Coherent Carrier signal.

5. Press the 2 STATE ON key to select two state modulation. This mode enables the magnitude of the I and Q signals in the RF Output subsystem to be controlled from the front panel.

6. Press the SET I,Q key to access the direct control of the I and Q components. The preset setting is for 100% I component and 0% Q component.

7. Adjust the trigger level or sweep delay of the oscilloscope until the zero crossing of the rising edge of the signal occurs at the center of the screen. This is the arbitrary phase reference. If possible, adjust the vertical sensitivity for a 7 division peak-to-peak signal.

8. Set the II component to 50% using the numeric keypad. This should reduce the signal amplitude by 50% and should not change where the rising edge zero crossing occurs on the screen.

   If the amplitude changes correctly and the rising edge zero crossing does not shift, proceed with the next step.

   If the change is incorrect or the rising edge is no longer at center screen, proceed to Check 8 to isolate the problem further.

9. Enter 0% for the II component. This should reduce the RF output to minimum since the I and Q components of the RF output signal are nulled.

   If the displayed signal amplitude is less than 5% (typically less than 1%) of the magnitude when the II component is set to 100%, proceed with the next check.

   If the displayed signal amplitude is not less than 5%, proceed with Check 8 to isolate the problem.

10. Enter -100% for the II component. The signal amplitude should return to the original (100%) level and the *falling* edge zero crossing of the signal should now be at the center of the screen. This represents a 180° phase shift in the original signal.

    If the signal is correct, proceed with the next check.

    If the signal is not correct, proceed with Check 8 to isolate the problem.

11. Set the II component to -50%. The amplitude should drop to one-half of the value in the previous step and the falling edge zero crossing of the signal should appear at center screen.

    If the signal is correct, proceed with the next step.

    If the signal is not correct, proceed with Check 8 to isolate the problem.

12. Set the I1 component to 0%. This will minimize the effects of the I component when checking the Q component.

13. Press the SET I,Q key again to access the Q1 component. The preset state of the Q component is 0%.

14. Set the Q1 component to 100% using the numeric keypad. The zero crossing on the rising edge of the signal should now be 25 ±5 ns to the left of center screen. This represents a phase shift of 90° (±18°).

    If the signal is correct, proceed with the next step.

    If the signal is not correct, proceed with Check 8 to isolate the problem.

15. Set the Q1 component to 50% using the numeric keypad. The amplitude of the signal should decrease to one-half of the 100% level. The zero crossing of the rising edge should not change position.

    If the signal is correct, proceed with the next step.

    If the signal is not correct, proceed with Check 8 to isolate the problem.

16. Set the Q1 component to 0%. The signal amplitude should drop to less than 5% (typically less than 1%) of the amplitude when the Q1 component is set to 100%.

    If the signal is correct, proceed with the next step.

    If the signal is not correct, proceed with Check 8 to isolate the problem.

17. Set the Q1 component to -100%. The signal amplitude should return to the original (100%) level. The zero crossing of the *falling* edge should now be 25 ns to the left of center screen.

    If the signal is correct, proceed with the next step.

    If the signal is not correct, proceed with Check 8 to isolate the problem.

18. Set the Q1 component to -50%. The signal amplitude should drop to one-half the amplitude of the previous step. The zero crossing of the falling edge of the signal should still be 25 ns to the left of center screen.

    If the signal is correct, the RF Output Subsystem is working normally.

    If the signal is not correct, proceed with Check 8 to isolate the problem.

Check 5 - Service Voltmeter

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Set the service voltmeter to measure the internal Analog to Digital Converter (ADC) reference by entering SPCL 52.8 ENT SPCL. The display should indicate 10.000 ±0.002 volts. This voltage must be correct since the following checks use the service voltmeter for troubleshooting.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is incorrect, proceed to service sheet BD6 to troubleshoot the Analog to Digital Converter circuit.

3. Set the service voltmeter to measure the instrument ground reference by entering SPCL 52.1 ENT SPCL. The display should indicate 0.000 ±0.002 volts.

   If the displayed voltage is correct, proceed with the next step to check the power supply references in the LO subsystem.

   If the displayed voltage is incorrect, proceed to service sheet BD6 to troubleshoot the Analog to Digital Converter circuit.

4. Set the A14 LO Multiplier multiplexer to output the 7.6 volt bias voltage by entering the following key sequence. In the following sequence, ENT represents the ENT SPCL (Hz) key.

   SPCL 53.0 ENT 1 ENT
   SPCL 53.1 ENT 4 ENT
   SPCL 53.2 ENT 4 ENT
   SPCL 53.3 ENT 10 ENT

5. Set the service voltmeter to read the output of the analog diagnostic multiplexer by entering SPCL 52.4 ENT SPCL. The displayed voltage should be +7.6 ±0.5 volts.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is not correct, the problem is either in the A14 LO Multiplier Deck or the cable carrying the power supply voltages and the connection to the Analog to Digital Converter. Use Check 9 to isolate the problem to the A14 LO Multiplier Deck or the input signals.

6. Set the analog multiplexer to enable the +2.5 volt reference in the A15 RF Output Deck. To enable the diagnostics multiplexer and output the +2.5 volt reference, enter the following key sequence. ENT represents the ENT SPCL (Hz) key on the Vector Generator.

   SPCL 53.0 ENT 0 ENT
   SPCL 53.1 ENT 28 ENT
   SPCL 53.2 ENT 4 ENT
   SPCL 53.3 ENT 14 ENT

7. Set the service voltmeter to read the +2.5 volt reference by entering SPCL 52.3 ENT SPCL. The displayed voltage should be +2.5 ±0.3 volts.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is not correct, the problem is either in the A15 RF Output Deck or the input connector carrying the power supply voltages and the service voltmeter line. Proceed to Check 9 to isolate the problem to the A15 RF Output Deck or the cable.

8. Set the analog multiplexer to enable the bias supply to the RF amplifier by entering the following key sequence.

   SPCL 53.1 ENT 28 ENT
   SPCL 53.2 ENT 4 ENT
   SPCL 53.3 ENT 13 ENT

9. Read the bias voltage by entering SPCL 52.3 ENT SPCL. The voltage for a standard instrument should be +7.8 ±1 volts. An instrument with Option 064 installed should read -5 ±1 volts.

   If the voltage is correct, proceed with the next step.

   If the voltage is incorrect, the problem is either in the A15 RF Output Deck or the input connector carrying the power supply voltages and the service voltmeter connection. Use Check 9 to isolate the problem to the A15 RF Output Deck or the cable.

Note 

This voltage is also used by the instrument to determine whether Option 064 is installed. This voltage must be correct before troubleshooting other faults for an instrument with Option 064 installed.

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10. Set the analog multiplexer to monitor the +20 volt supply for the A15 RF Output Deck by entering the following key sequence.

    SPCL 53.1 ENT 28 ENT
    SPCL 53.2 ENT 4 ENT
    SPCL 53.3 ENT 9 ENT

11. Set the service voltmeter to read the +20 volt supply by entering SPCL 52.3 ENT SPCL. The displayed voltage should be be +10.5 ±1 volts. The voltage is scaled down to +10 volts on the deck to remain within the service voltmeter range.

    If the scaled voltage is correct, proceed with the next step.

    If the displayed voltage is not correct, proceed with Check 9 to isolate the problem to the A15 RF Output Deck or the power supply inputs.

Check 6 - A13 IF Multiplier Deck

1. Press the INSTR PRESET key on the Vector Generator.

Note 

Access to the following test points is from the bottom of the instrument. The decks do not have to be removed from the the instrument to access the test points. Take care not to damage any of the connectors when removing cables.

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2. Connect the power meter to the output of the mixer of the A13 IF Multiplier Deck. The power meter should be connected in place of the semi-rigid cable (W74 for standard, W79 for Option 001) that runs from the A13 IF Multiplier Deck to the rear panel.

3. Tune the Vector Generator from 10 MHz to 3 GHz while monitoring the power meter. The level should typically be greater than -20 dBm for a standard instrument or greater than +9 dBm for an instrument with Option 002 installed.

   If the level is correct, reconnect the cable to the mixer and proceed with the next step.

   If the level is not correct, check the power level of the FM and LO subsystem signals. The FM subsystem signal is routed to the IF Multiplier via a flexible cable (A13W3) that can be accessed from the bottom of the instrument. The 8 GHz signal level should be greater than +8 dBm. The signal from the A14 LO Multiplier (semi-rigid cable W76) should be between -2.8 and -13 dBm.

4. Connect the power meter to the directional coupler output of the A13 IF Multiplier Deck. This connection should be made in place of the semi-rigid cable (W77) that runs from the A13 IF Multiplier Deck to the A15 RF Output Deck. The output level of the directional coupler should be between +16 and +21 dBm.

   If the level is correct, proceed with the next step.

   If the level is not correct, check the power level of the FM Subsystem output signal. This is routed to the IF Multiplier via a flexible cable (A13W3) that can be accessed from the bottom of the instrument. If the signal level is less than +8 dBm, the fault is in the FM Subsystem. Otherwise, the A13 IF Multiplier Deck is faulty or requires adjustment.

Note All outputs of the A13 IF Multiplier Deck must be terminated correctly when making measurements. Reconnecting each cable after a measurement will ensure that each output is properly terminated.

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5. Connect the spectrum analyzer to the directional coupler output of the A13 IF Multiplier Deck. The connection should be made in place of the semi-rigid cable (W77) that runs from the A13 IF Multiplier Deck to the A15 RF Output Deck.

6. Adjust the spectrum analyzer to display the 8 GHz signal.

7. Disable the RF output by pressing the RF ON key (the key indicator should extinguish). The signal displayed on the spectrum analyzer should drop by at least 65 dB.

   If the signal drops by at least 65 dB, proceed with the next step.

   If the level does not drop by at least 65 dB, the A13 IF Multiplier Deck or the control signals are at fault. Check 9 can be used to isolate the problem to the A13 IF Multiplier Deck or the control signals.

8. Enable the RF output by pressing the RF ON key (the key indicator should light).

9. Connect the test oscillator to the Vector Generator FM input. The test oscillator will be used to check the flatness of the IF deck by varying the FM Subsystem frequency. Another signal generator can be used in place of the FM Subsystem signal if the generator can supply a +10 dBm signal from 994 MHz to 1006 MHz to A13W3.

Note

The following check uses a test oscillator set to a very low frequency to modulate the FM Subsystem output frequency. A dc voltage from -500 mV to +500 mV can be used in place of the test oscillator for finer control of the measurement. Setting the test oscillator frequency below 1 Hz will also make the measurement easier.

10. Set the test oscillator for a 10 Hz signal at an amplitude of 1 volt peak-to-peak into 50Ω.

11. Select dc coupled FM mode by pressing the FM ON key followed by the DC COUP FM key.

12. Enable wideband dc FM mode by entering SPCL 2.1 ENT SPCL. Set the range to 50 MHz peak-to-peak using the SET FM key and the numeric keypad.

    The spectrum analyzer should show a slowly varying signal from approximately 7975 to 8025 MHz (exact frequency is not critical). The variation in signal amplitude should not be greater than 1 dB. Larger variation can cause the instrument to produce incidental amplitude modulation during FM.

    If the signal flatness is correct, reconnect all cables and proceed with the next check.

    If the signal flatness is not correct, the A13 IF Multiplier Deck is at fault or requires adjustment.

Check 7 - A14 LO Multiplier Deck

1. Press the INSTR PRESET key on the Vector Generator.

2. Connect the power meter to the A14 LO Multiplier Deck in place of the semi-rigid cable (W76) that goes from the A14 LO Multiplier Deck to the A13 IF Multiplier Deck.

3. Tune the Vector Generator from 10 MHz to 3 GHz while monitoring the power meter. The level should remain between -2.8 and -13 dBm. The actual measurements of the power meter will be from 8 to 11 GHz. Set the power meter calibration factors appropriately.

If the level is correct, reconnect the cable and proceed with the next step.

If any or all levels were incorrect, measure the level of the signal from the LO Subsystem (A14W9). The signal should be between +8 and +12 dBm. If the signal level is not correct, the fault is in the LO Subsystem. If the level is correct, the A14 LO Multiplier Deck is faulty or requires adjustment.

Note All outputs of the A14 LO Multiplier Deck must be terminated correctly when making measurements. Reconnecting all cables after making measurements ensures that all outputs are terminated correctly.

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4. Connect the power meter to the A14 LO Multiplier in place of the semi-rigid cable (W78) that connects the A14 LO Multiplier to the A15 RF Output Deck.

5. Tune the Vector Generator from 10 MHz to 3.0 GHz while observing the power meter readings. The actual measurements of the power meter will be from 8 to 11 GHz. Set the power meter calibration factors appropriately. The power meter readings should remain between +10 and +18 dBm.

   If the levels are correct, proceed with the next step.

   If the level is not correct, check the power level of the input signal to the deck. If the input is not between +8 and +12 dBm, the fault is in the LO Subsystem. Otherwise, the A14 LO Multiplier Deck is faulty or requires adjustment.

6. Connect the spectrum analyzer in place of the power meter.

7. Adjust the spectrum analyzer to display the 8 to 11 GHz frequency range. This will be viewed to determine whether the filtering in the LO Multiplier Deck is working.

Note The spectrum analyzer span may have to be adjusted for a more thorough check of spurious levels.

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8. Tune the Vector Generator from 10 MHz to 1.5 GHz. The spurious signals should be at least 60 dB below the fundamental signal. The frequency of the fundamental signal will be the front panel frequency setting plus 8 GHz.

If all signals are at least 60 dB below the fundamental signal, proceed with the next step.

If any signal is not at least 60 dB below the fundamental signal, the A14 LO Multiplier is defective or requires adjustment.

9. Continue tuning the Vector Generator from 1.5 to 3.0 GHz. The spurious signals in the 8 to 11 GHz band should all be at least 60 dB below the fundamental signal (the front panel frequency setting plus 8 Ghz).

   If all signals are at least 60 dB below the fundamental signal, reconnect all cables and proceed with the next check.

   If any signal is not at least 60 dB below the fundamental signal, the A14 LO Multiplier is defective or the LO Multiplier requires adjustment.

Check 8 - A15 RF Output Deck

The A15 RF Output Deck verification is divided into three parts. The first part deals with producing the maximum power specification. The second checks the circuitry involved in output level control. The last check is used to verify the I/Q modulation circuitry in the A15 RF Output Deck.

Check 8a - A15 RF Output Deck Maximum Power

1. Press the PRESET key to set the Vector Generator to a known state.

2. Connect the power meter to the Vector Generator RF output.

3. Set the Vector Generator to 140 MHz at a level of +10 dBm. Set the level to +12 dBm if the Vector Generator has Option 064 installed.

4. Press the 2 STATE ON key to select two state modulation. This will enable control of the I and Q modulators so that the effects of the Digital/Vector Baseband Subsystem on the RF output level can be minimized.

5. Using the SET I,Q key and the numeric keypad, set the II and QI components to 100%. This will set the attenuation of the I and Q modulators to minimum.

6. Set the attenuation in the RF Output subsystem to minimum by entering the following key sequence. This should raise the output power to maximum to isolate a low power problem from a digital or vector modulation problem. In the following key sequence, ENT represents the ENT SPCL key (shifted Hz).

   SPCL 53.0 ENT 0 ENT
   SPCL 53.1 ENT 11 ENT
   SPCL 53.2 ENT 12 ENT
   SPCL 53.3 ENT 4095 ENT

   The output level should rise to greater than the level set on the Vector Generator front panel.

   If the level is now greater than the level set on the front panel, proceed with the next step.

   If the output level is still less than the level set on the front panel, use an SMC tee and the oscilloscope to verify that the level at A8J4 I OUT and A8J9 Q OUT is greater than +100 mVdc. The instrument cable should be connected to one leg of the tee and the oscilloscope (high impedance coupling) to the other leg. If the dc level is not correct, the fault is most likely in the Digital/Vector Baseband Subsystem or in the 50Ω load provided by the A15 RF Output Deck.

7. Tune the Vector Generator from 10 MHz to 3 GHz. The output level should be greater than +10 dBm from 10 MHz to 1.5 GHz and greater than +4 dBm from 1.5 GHz to 3 GHz. The level should be greater than +12 dBm from 10 MHz to 3 GHz if Option 064 is installed.

   If the levels are correct, proceed with the next check.

   If the levels are not correct, proceed with the next step.

8. Connect the spectrum analyzer to the output of the mixer on the A15 RF Output Deck. This point is accessed from the bottom of the instrument. A15W3 connects the amplifier to the mixer with the mixer being the component nearer the front of the instrument.

   The level should be greater than -20 dBm.

   If the level is correct, the fault is in the attenuator, RF amplifier, output connector or cabling.

   If the level is not correct and the output levels of the A13 IF Multiplier and A14 RF Multiplier decks were correct, the I-Q modulator, mixer or associated components are at fault.

Check 8b - A15 RF Output Deck Level Control

1. Press the PRESET key and then set the Vector Generator frequency to 140 MHz and output level to +14 dBm.

2. Press the RF ON key to turn off the RF output (key indicator should extinguish).

3. Set the analog diagnostic multiplexer in the A15 RF Output Deck to output the RF detector voltage by using the following key sequence.

   SPCL 53.0 ENT 0 ENT
   SPCL 53.1 ENT 28 ENT
   SPCL 53.2 ENT 4 ENT
   SPCL 53.3 ENT 8 ENT

4. Enable the service voltmeter to read the detector offset by entering SPCL 52.3 ENT SPCL. The displayed voltage should be between +4 and +10 volts.

   If the voltage is correct, record the offset for use in the next step.

   If the voltage is not correct, the fault is in the A15 RF Output Deck or the control and power supply signals. Use Check 9 to isolate the problem.

5. Press the RF ON key to turn the RF output signal on (the key indicator should light).

6. Connect the power meter to the Vector Generator RF output.

7. Set the Vector Generator output level to +7 dBm.

8. Set the variable attenuator for midrange by entering the following key sequence.

   SPCL 53.0 ENT 0 ENT
   SPCL 53.1 ENT 11 ENT
   SPCL 53.2 ENT 12 ENT
   SPCL 53.3 ENT 2047 ENT

9. Using the KNOB or step keys, adjust the variable attenuator setting for a power meter reading of +4.0 dBm ±0.1 dB.

   If the level can be adjusted, proceed with the next step.

   If the level cannot be adjusted, the fault is in the variable attenuator of the A15 RF Output Deck or one of the control signals. Use Check 9 to isolate the problem further.

10. Read the detector output by entering the following key sequence.

    SPCL 53.1 ENT 28 ENT
    SPCL 53.2 ENT 4 ENT
    SPCL 53.3 ENT 8 ENT

    SPCL 52.3 ENT

    The voltage displayed minus the detector offset measured in the previous step should be -6.8 ±2 volts for the standard instrument or -3.2 ±0.3 volts for an instrument with option 064 installed.

    If the calculated voltage is correct, proceed with the next step.

    If the calculated voltage is incorrect, the fault is in the circuitry associated with the RF detector or in the control signals. Use Check 9 to isolate the problem to the A15 RF Output Deck or one of the control signals.

11. Set the Vector Generator to control the variable attenuator by entering the following key sequence.

    SPCL 53.1 ENT 11 ENT
    SPCL 53.2 ENT 12 ENT
    SPCL 53.3 ENT 2047 ENT

12. Using the KNOB or step keys, adjust the variable attenuator setting for a meter reading of +8.0 dBm ±0.1 dB.

13. Read the detector output voltage by entering the following key sequences.

    SPCL 53.1 ENT 28 ENT
    SPCL 53.2 ENT 4 ENT
    SPCL 53.3 ENT 8 ENT

    SPCL 52.3 ENT

    The voltage displayed minus the detector offset measured previously should be -11 ±2 volts for the standard instrument or -5.5 ±0.6 volts for an instrument with Option 064 installed.

    If the calculated voltage is correct, proceed with the next step.

    If the calculated voltage is not correct, the fault is in the A15 RF Output Deck.

Check 8c - A15 RF Output Deck I/Q Modulation

1. Press the INSTR PRESET key to preset the Vector Generator.

2. Select 2 STATE modulation mode by pressing the 2 STATE ON key. This will enable control of the I and Q component magnitudes directly from the front panel.

Note

In the following steps, special function 52.6 (I component) or 52.7 (Q component) can be used in place of the voltmeter to monitor the required voltage. However, this involves a more complicated key sequence to set and then observe the voltage. Therefore, a voltmeter is recommended for the check.

The displayed voltage with special function 52.6 and 52.7 is ten times the actual voltage to provide a third digit of resolution.

---

3. Connect the voltmeter to A8J4, I OUT, using an SMC tee. The cable normally connected to A8J4 must be connected to one leg of the tee to provide the required 50Ω load.

4. Press the SET I,Q key to activate control of the I1 component of the 2 STATE modulation.

5. Using the KNOB or step keys, vary the I1 component setting from 100% to -100% while observing the voltmeter indication. The voltmeter should indicate +100 ±20 mVdc at 100% and smoothly decrease to -100 ±20 mVdc at -100%.

   If the voltage varies as indicated, proceed with the next step.

   If the voltage does not change or varies incorrectly, connect a 50Ω load to the SMC tee in place of the cable normally connected to A8J4. This will provide the required 50Ω load and help isolate the fault. If this step then works correctly, the fault is in the I/Q modulator in the A15 RF Output Deck. Otherwise, the Digital/Vector Subsystem is at fault.

6. Reconnect the instrument cable to A8J4 and connect the voltmeter to A8J9, Q OUT, using an SMC tee. The cable normally connected to A8J9 must be connected to one leg of the tee to provide the required 50Ω load.

7. Press the SET I,Q key to activate control of the Q1 component of the 2 STATE modulation.

8. Using the KNOB or step keys, vary the Q1 component from 100% to -100% while observing the voltmeter indication. The voltmeter should indicate +100 ±20 mVdc at 100% and smoothly decrease to -100 ±20 mVdc at -100%.

   If the voltage varies as indicated, proceed with the next step.

   If the voltage does not change or varies incorrectly, connect a 50Ω load to the SMC tee in place of the cable normally connected to A8J9. This will provide the required 50Ω load and help isolate the fault. If this step then works correctly, the fault is in the I/Q modulator in the A15 RF Output Deck. Otherwise, the Digital/Vector Subsystem is at fault.

9. Disconnect the voltmeter and reconnect the instrument cable to A8J9, Q OUT.

10. Set the Vector Generator to 10 MHz at an output level of +7 dBm.

11. Use the following key sequence to reset the variable attenuator to minimum attenuation. A calibration failure will clamp the RF output level and disable level control of the variable attenuator unless the following key sequence is entered.

    SPCL 53.0 ENT 0 ENT
    SPCL 53.1 ENT 11 ENT
    SPCL 53.2 ENT 12 ENT
    SPCL 53.3 ENt 4095 ENT

12. Connect the rear panel Coherent Carrier signal to the external trigger input of the oscilloscope. Connect channel 1 of the oscilloscope to the Vector Generator RF output.

13. Set the oscilloscope to 10 ns per division and select external triggering.

14. Using the SET I,Q key and the numeric keypad, set the I1 component to 10% and the Q1 component to 0%.

15. Adjust the Q1 component using the KNOB until the amplitude of the signal displayed on the oscilloscope is minimum. This point represents the drive level required to null the Q component. Record the Q null setting for use in subsequent steps.

    Q Null Setting _____

16. Using the SET I,Q key and the numeric keypad, set the I1 component to 0% and the Q1 component to 10%.

17. Adjust the I1 component using the KNOB until the amplitude of the displayed signal on the oscilloscope is minimum. This point represents the drive level required to null the I component. Record the I null setting for use in subsequent steps.

    I Null Setting _____

18. Using the SET I,Q key and the numeric keypad, set the I1 component to 100% and the Q1 component to the Q Null Setting measured above. This will minimize the effects of the Q component on the following check.

19. Using the SET I,Q key and the numeric keypad, set the I2 component to the I Null Setting measured above and the Q2 component to 100%.

20. Set the phase adjustment of the I/Q splitter to one extreme using the following key sequence.

    SPCL 53.0 ENT 0 ENT
    SPCL 53.1 ENT 0 ENT
    SPCL 53.2 ENT 11 ENT
    SPCL 53.3 ENT 0 ENT

21. Adjust the external trigger or sweep delay controls of the oscilloscope to place the zero crossing of the rising edge of the displayed signal at the center of the screen. This will be the phase reference for the following steps.

22. Change the state of DIGITAL INPUT 1 by pressing the INVERT INPUT key followed by the numeric 1 key. This will change the output to the I2 and Q2 settings entered above.

23. Enter the following key sequence to reset the I/Q splitter phase adjustment setting. Note that the entire key sequence must be entered even though the display may indicated the setting is already correct. The display is not updated until another special is entered.

    SPCL 53.3 ENT 0 ENT

24. Measure the time shift of the reference zero crossing. The zero crossing should have shifted by less than 25 ns (typically less than 20 ns). This represents the minimum quadrature angle. Note the actual measured shift for the next measurement.

If the phase (time) shift is correct, proceed with the next step.

If the phase shift is not correct, but is less than 25 ns (90°), the instrument may still function correctly. However, a phase mismatch is indicated within the I/Q modulator. Proceed with the next check to verify that quadrature can still be set.

If the phase shift is greater than 25 ns, quadrature cannot be achieved and digital/vector modulation will probably not meet specifications. The I/Q modulator is at fault.

25. Enter the following key sequence to set the I/Q splitter phase adjustment to the other extreme.

SPCL 53.3 ENT 2047 ENT

26. Adjust the external trigger or sweep delay controls of the oscilloscope to place the zero crossing of the rising edge of the displayed signal at the center of the screen. This will be the phase reference for the following steps.

27. Change the state of DIGITAL INPUT 1 by pressing the INVERT INPUT key followed by the numeric 1 key. This will change the RF output back to the I1 and Q1 settings (full scale I component and null Q component) entered above.

28. Enter the following key sequence to reset the I/Q splitter phase adjustment setting. Note that the entire key sequence must be entered even though the display may indicated the setting is already correct. The display is not updated until another special is entered.

SPCL 53.3 ENT 2047 ENT

29. Measure the time shift of the reference zero crossing. The zero crossing should have shifted by more than 7 ns more than the minimum quadrature shift measured previously (typically 28 ns). The shift must be more than 25 ns.

If the phase (time) shift is correct, proceed with the next step.

If the phase shift is not correct, but is greater than 25 ns (90°), the instrument may still function correctly. However, a phase mismatch or lack of phase compensation range is indicated in the I/Q modulator.

If the phase shift is less than 25 ns, quadrature cannot be achieved and digital/vector modulation will probably not meet specifications. The I/Q modulator is at fault.

Check 9 - RF Output Subsystem Control Signals/Power Supplies

This check is used to verify the integrity of the input and output signal paths between the connector of the A13 IF Multiplier, A14 LO Multiplier Decks and the A15 RF Output Deck and the source or destination of the signals.

Note

Refer to the block diagram figure for pin identification of the 26 pin deck ribbon cable connector. The 34 pin ribbon cable (A15 RF Output Deck to the A17 Distribution assembly) and the 16 pin (A13 IF Multiplier to A14 LO Multiplier) follow the same pin number conventions.

1. Using Table 8-14, 8-15 and 8-16 to check the signal path resistance between the deck cable connector and the indicated power supply test point. The resistance between the indicated power supply test point and the deck ribbon cable connector pin should be 1 kΩ (due to a 1 kΩ resistor between the actual supply and the supply test point). The resistance between the ground test point and the deck ribbon cable connector pins should be less than 50Ω.

   If the signal path between the power supply test point and the deck connector is correct, proceed with the next step.

   If the signal path for any power supply shows a problem, isolate the problem to the cable between the RF decks and the A17 Distribution board or to the path between the distribution board and the A18 Power Control board.

Table 8-14. A14 LO Multiplier Deck Power Supplies

Deck Connector Pin	A17J2-	Source Test Point	Power Supply
7, 8	7,8	A18TP4	+24 Vdc
9,10	9,10	A18TP5	+15 Vdc
5,6	5,6	A18TP8	+5 Vdc
3,4	3,4	A18TP6	-15 Vdc
1,2,11, 12,14,16, 18,20,22	1,2,11, 12,14,16, 18,20,22	A18TP13	Ground

Table 8-15. A13 IF Multiplier Deck Power Supplies

A13A1J2-	A14A1J7-	Source Test Point	Power Supply
7	7	A18TP4	+24 Vdc
9	9	A18TP5	+15 Vdc
13	13	A18TP8	+5 Vdc
15	15	A18TP6	-15 Vdc
2,4,6, 8,10,12, 14,16,18	2,4,6, 8,10,12, 14,16,18	A18TP13	Ground

Table 8-16. A15 RF Output Deck Power Supplies

Deck Connector Pin	A17J1-	Source Test Point	Power Supply
11,12	11,12	A18TP4	+24 Vdc
13,14	13,14	A18TP5	+15 Vdc
9,10	9,10	A18TP8	+5 Vdc
5,6	5,6	A18TP9	-5 Vdc
3,4	3,4	A18TP6	-15 Vdc
1,2,15, 16,18,20, 22,24,26	1,2,15, 16,18,20, 22,24,26	A18TP13	Ground

2. The four signals in Table 8-17 are verified using Check 5 - Service Voltmeter.

   If Check 5 passes, proceed with the next step.

   If the check fails, use an ohmmeter to check the continuity between the deck connector pin and the destination (A11J5).

   If there is continuity between the deck connector pin and the destination, proceed to BD6 to check the Analog to Digital Converter (ADC). It the ADC is working, the problem is in the decks.

   If the continuity test shows an open (or a short to ground), troubleshoot the problem to determine if the problem is a cable or the A17 Distribution board.

Table 8-17. RF Output Subsystem Diagnostic Signals

Deck Connector Pin	A17 Connection	Destination or Source	Signal Name Name
A15 Deck			
27	A17J1-27	A11J5-28	-ANALOG 2
29	A17J1-29	A11J5-29	+ANALOG 2
A14 Deck			
23	A17J2-23	A11J5-30	-ANALOG 3
25	A17J2-25	A11J5-31	+ANALOG 3

Note

One additional check should be done to verify that the analog readback signal from the A13 IF Multiplier Deck gets to the A14 LO Multiplier Deck. Verify that there is continuity between A13A1J2-1 and A14A1J7-1. This is the SRD BIAS voltage for the frequency quadrupler on the A13 IF Multiplier.

3. Use Table 8-18 and 8-19 to check for continuity between each signal and the A11J5 connector. Table 8-20 details the remaining connections between the A13 IF Multiplier Deck and the A14 LO Multiplier Deck.

   If there is continuity between the deck connector pin and the source or destination signal, proceed to BD6 to check the Instrument Bus. A successful Instrument Bus test indicates that the information received by the RF Output Subsystem deck is correct.

   If there is an open (or short to ground) on any signal line, isolate the problem to a cable or the A17 Distribution board.

Table 8-18. A14 LO Multiplier Deck Control Signals

Deck Connector Pin	A17J2-	Destination or Source	Signal Name
13	13	A11J5-8	CLK
15	15	A11J5-12	DATA OUT
17	17	A11J5-16	INT
19	19	A11J5-20	XFR1
21	21	A11J5-49	POWER UP

Table 8-19. A15 RF Output Deck Control Signals

Deck Connector Pin	A17J1-	Destination or Source	Signal Name
17	17	A11J5-8	CLK
19	19	A11J5-12	DATA OUT
21	21	A11J5-16	INT
23	23	A11J5-18	XFR0

Table 8-20. A13 IF Multiplier Deck Control Signals

A13J2-	A14J7-	Signal Name
1	1	SRD BIAS
3	3	NRF ON
5	5	RF ON
11	11	+7.6 Vdc

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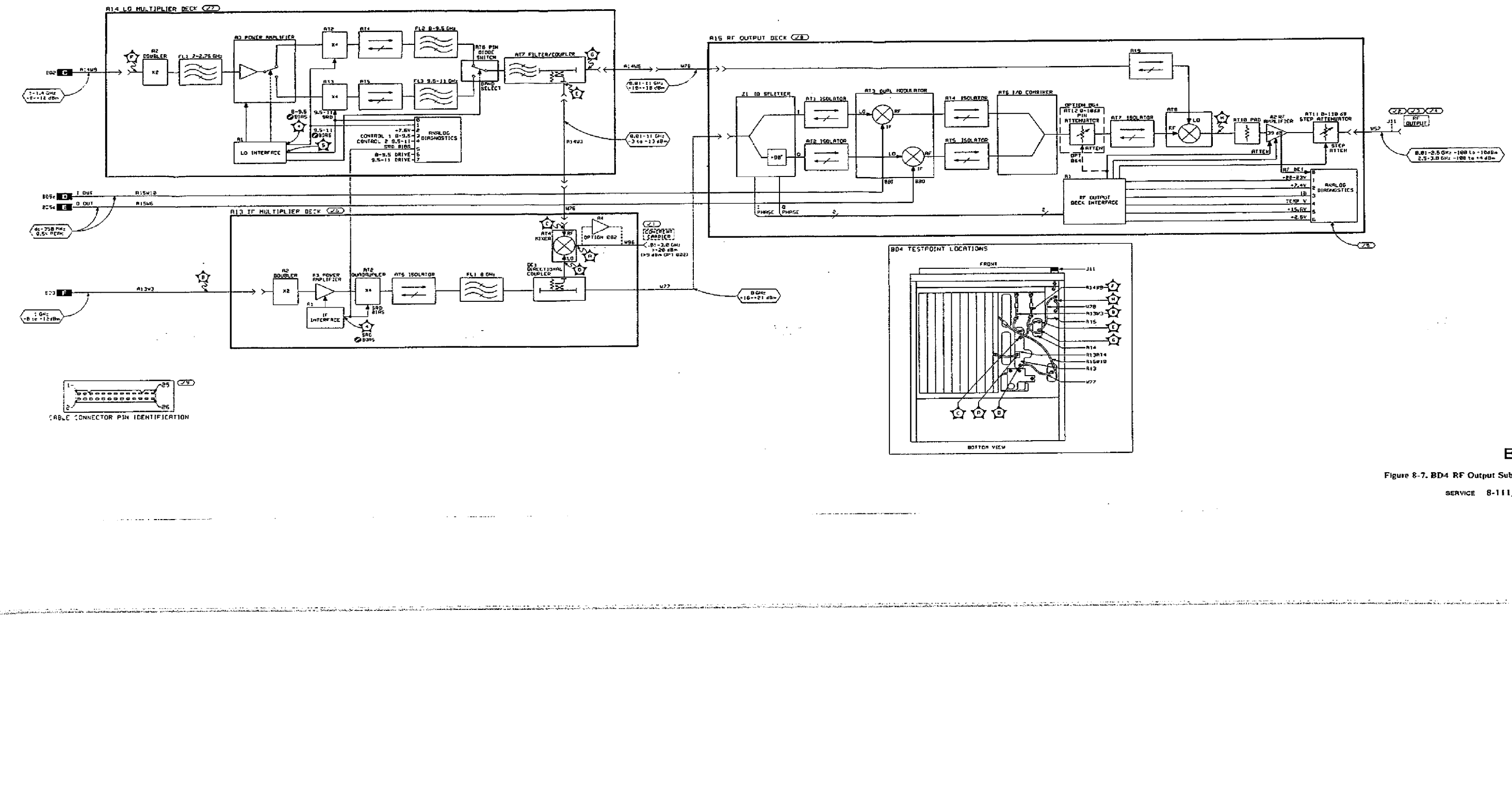

BD4

Figure 8-7. BD4 RF Output Subsystem

Service Sheet BD5

Digital/Vector Baseband Subsystem

References

Principles of Operation

Digital and Vector modulation combine phase modulation with traditional amplitude modulation to provide a higher effective modulation bandwidth. Digital modulation mode uses digital inputs to provide a limited number of phase and amplitude combinations known as "states". Vector modulation directly provides an unlimited number of phase and amplitude combinations with modulation rates up to 350 MHz. Digital modulation rates are limited to 150 MHz.

The vector modulation technique uses two signals with a difference in phase of 90 degrees. The two signals are termed the In-phase (I) and Quadrature-phase (Q) for the 0 degree and 90 degree component respectively. The I signal's absolute phase does not have to be 0 degrees as long as the I and Q signals maintain the 90 degree relationship to each other.

The amplitude of the I and Q components determines the phase and magnitude of the resultant signal when the I and Q signals are combined. Combining equal amplitude I and Q signals produces a signal with a phase of 45 degrees and a magnitude equal to the root of the sum of the squares of I and Q. Combining unequal amplitude I and Q signals will result in a signal with a phase between 0 (no Q component) and 360 degrees. Figure 8-8 illustrates the result of combining I and Q signals. The phase is determined as the arctangent of Q divided by I.

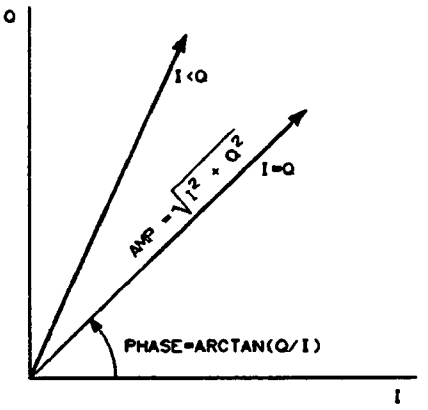

Figure 8-8. Vector Components

Vector modulation in the Vector Generator is accomplished by splitting the 8 GHz multiplied output of the 1 GHz FM VCO into two signals 90 degrees different in phase. Two modulators control the amplitude of the I and Q signal to enable the Digital/Vector Baseband subsystem to independently change the amplitude of the I and Q signals. Figure 8-9 illustrates the Vector Generator I-Q modulation system.

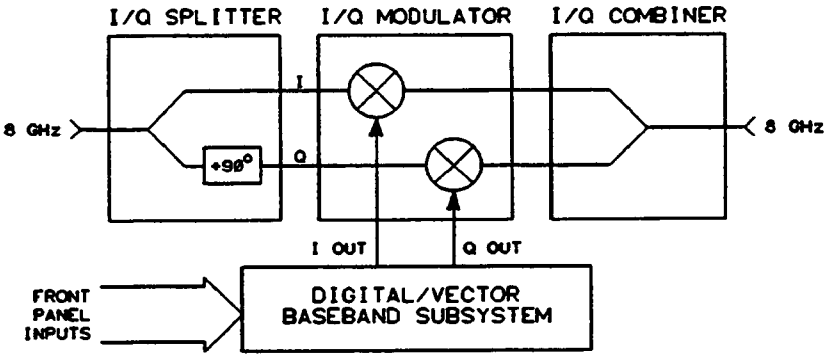

Figure 8-9. Vector Modulation

Digital modulation converts the digital inputs at the Vector Generator front panel to unique I and Q modulation levels to produce the states (phase/amplitude relationships) for digital modulation.

The Vector Generator has an option that extends the maximum digital modulation states from 16 (16 QAM) to 64 (64 QAM). This option, Option 064, affects two of the three frames in the Digital/Vector Baseband Subsystem.

The three frames in the Digital/Vector Baseband Subsystem are:

A10 Buffer Frame
A9 DAC/Switch Frame
A8 Filter Frame

The block diagram for the Digital/Vector Baseband Subsystem is divided among three figures as follows:

BD5a - Standard instrument A10 Buffer and A9 DAC/Switch Frames
BD5b - Option 064 instrument A10 Buffer and A9 DAC/Switch Frames
BD5c - A8 Filter Frame (common to standard and Option 064)

Each detailed discussion that follows will reference the figure corresponding to the discussion.

A10 Buffer Frame (Except Option 064)

Refer to BD5a for the following discussion regarding the A10 Buffer frame. This frame is different for the Option 064 instrument which is covered below.

The A10 Buffer Frame is used to convert the front panel digital inputs to ECL levels. The switching threshold can be set between -2.5 to +2.5 volts with the data threshold DAC. The switching threshold determines the level at which the output of the buffer will change from a logic low to a logic high. There is a small amount of hysteresis built into each buffer to improve noise immunity.

The I CLOCK and Q CLOCK inputs are also buffered and feature a switching threshold of 0 volts, -2 volts or "Auto Level". Auto Level determines the maximum and minimum level of the input signal and sets the switching threshold to halfway between the highest and lowest level.

Terminations for each of the digital inputs and the clocks can be selected as 50 ohms to ground or -2 volts. The clock termination can be set independently of the data terminations.

Gate Control provides a means to disable each of the digital inputs when they are not required for a selected modulation format. Invert Control is used to selectively invert one or more of the data inputs. The clock inputs can also be selectively inverted.

The Mapping Circuit combines the four digital inputs into the proper combination of outputs to match the modulation mode selected. The resulting five signals are the final outputs of the A10A1 Buffer assembly.

A9 DAC/Switch Frame (Except Option 064)

Refer to BD5a for the following discussion. The A9 DAC/Switch frame is different than the frame for the Option 064 instrument. The other frame will be covered below.

The retiming circuit is used to control whether the data is latched by a clock, fed through asynchronously or latched by two different clocks. The transparent latch passes the inputs to the outputs asynchronously. The master reset input to this latch will clear the outputs until the reset signal goes away. The outputs of this latch are only active when the TRANS EN signal is present at the latch. Without this signal present, the outputs are effectively disconnected from the I0-I2 and Q0-Q2 signal lines.

The One Clock Latch is used when the incoming data is to be synchronized. Using an external clock provides for a large modulation bandwidth since the data skew associated with asynchronous modulation is removed by latching the data at the clock transition. The outputs of the One Clock Latch are only active when the 1 CLK EN signal is active.

The Two Clock Latch provides a means of synchronizing the data in two groups. The I clock is used to synchronize the two least significant bits from the A10 Buffer frame while the Q clock is used to synchronize the two most significant bits from the A10 Buffer frame. The outputs of the Two Clock Latch are only active when the 2 CLK EN signal is active.

Once the data signals from the A10 Buffer frame are synchronized in the Retiming Circuit, the six signals are routed to an ECL To Gallium Arsenide (GaAs) Translator. This is required to match the drive levels to the GaAs switch.

The bias current for the I and Q modulators in the RF Output subsystem is produced by the I and Q Fullscale Current Sources and six current sinks. The bias (and hence the magnitude of the I and Q signals in the RF Output subsystem) is changed by switching in one or more current sinks (I and Q Current Source 0 to 2).

Each current sink removes a portion of the bias produced by the Fullscale Current Source when switched in. The combination of the front panel digital inputs determines which current sinks are switched in. The amount of current that each current sink removes depends on the modulation format selected. Each current sink is a programmable Digital to Analog Converter (DAC) which enables the magnitude of the current sunk to be digitally controlled. The GaAs switch is used to enable very fast switching of the current sinks to produce fast transitions from one bias level to the next.

The reference voltage for all of the DACs is provided via the Current Source Reference. With scalar modulation off, the voltage reference is set to +2.5 volts. With scalar modulation on, the scalar input supplies the reference to the DACs. This provides a method of accurately scaling the overall amplitude of the I-Q signal by scaling all of the currents in the DACs.

A10 Buffer Frame (Option 064)

Refer to BD5b for the following discussion of the A10 Buffer frame for the Option 064 instrument. Option 064 provides six digital inputs instead of the four provided by the standard instrument. In addition, one of the clocks found on the standard instrument is deleted.

The A10 Buffer frame is used to convert the front panel digital input signals to ECL levels. The switching threshold can be set between -2.5 and +2.5 volts with the data threshold DAC. The switching threshold determines the input signal level at which the output of the buffer will change from a logic low to a logic high. There is a small amount of hysteresis built into each buffer to improve noise immunity.

The Clock input is buffered and can be set up with a switching threshold of 0 volts, - 2 volts or "Auto Level". Auto Level automatically sets the switching level to midway between the highest and lowest level of the input signal.

A divide by six circuit is included to obtain the proper framing clock signal for the serial to parallel converter on the A9 DAC/Switch assembly. DIGITAL INPUT 5 can also be used as the framing clock so that the serial data can be latched at the appropriate time (framing). The serial to parallel function will be described further below.

Terminations for the six digital inputs and the clock input can be selected as 50 ohm impedance to either ground or -2 volts. The clock termination can be set independently of the data termination.

Gate Control provides a means of disabling each digital input when that input is not required for a selected modulation format. Invert Control is used to selectively invert one of the data inputs. The clock can also be inverted.

The Mapping circuit is used to combine the six digital input signals into the correct combinations of drive signals to match the modulation format selected. The resulting six signals are the output signals of the A10 Buffer frame.

A9 DAC/Switch Frame (Option 064)

Refer to BD5b for the following discussion. The A9 DAC/Switch frame processes six data inputs compared to the four processed by the standard instrument. In addition, a serial input mode is available with the Option 064 instrument.

The retiming circuit is used to control whether the data is latched by a clock, fed through asynchronously or converted from a serial data stream to parallel data. As in the standard instrument, the transparent latch passes the inputs to the outputs asynchronously. The outputs of this latch are only active when the TRANS EN signal is present at the latch. Without this signal present, the outputs are effectively disconnected from the I0-I2 and Q0-Q2 signal lines.

The Clocked Latch is used when the incoming data is to be synchronized. Using an external clock provides for a larger modulation bandwidth since the data skew associated with asynchronous modulation is removed by latching the data at the clock transition. The outputs of the Clocked Latch are only active when the CLK EN signal is active.

The Serial Mode Latch is used to convert a serial bit stream to a six bit parallel data word. The Serial to Parallel converter is driven by the main clock. The clock signal is also divided by six on the A10 Buffer frame to provide a means of latching the data into the Serial Mode Latch six bits at a time. An external framing signal can be supplied via DIGITAL INPUT 5. This signal controls when the digital data will be latched in the Serial Mode Latch. The framing clock (the clock divided by six) is disabled in this mode by setting the MS CLK signal on the A10 Buffer frame.

Once the data signals from the A10 Buffer frame are synchronized in the Retiming Circuit, the six signals are routed to an ECL To Gallium Arsenide (GaAs) Translator. This is required to match the drive levels to the GaAs switch.

The bias current for the I and Q modulators in the RF Output subsystem is produced by the I and Q Fullscale Current Sources and six current sinks. The bias (and hence the magnitude of the I and Q signals in the RF Output subsystem) is changed by switching in one or more current sinks (I and Q Current Source 0 to 2).

Each current sink removes a portion of the bias produced by the Fullscale Current Source when switched in. The combination of the front panel digital inputs determines which current sinks are switched in. The amount of current that each current sink removes depends on the modulation format selected. Each current sink is a programmable Digital to Analog Converter (DAC) which enables the magnitude of the current sunk to be digitally controlled. The GaAs switch is used to enable very fast switching of the current sinks to produce fast transitions from one bias level to the next.

The reference voltage for all of the DACs is provided via the Current Source Reference. With scalar modulation off, the voltage reference is set to +2.5 volts. With scalar modulation on, the scalar input supplies the reference to the DACs. This provides a method of accurately scaling the overall amplitude of the I-Q signal by scaling all of the currents in the DACs.

A8 Filter Frame (Standard and Option 064)

The A8 Filter frame is identical for the Option 064 and the standard instrument. Refer to BD5c for the following description.

There are four lowpass filters in both the I and Q channel. In digital modulation mode, one of the four internal filters (or an external filter) is switched in to limit the modulation signal bandwidth. This prevents the modulation bandwidth from exceeding the RF carrier frequency. The selected filter depends on the Vector Generator output frequency.

A provision is available to connect an external filter in place of the internal filters. This permits a custom filter to be used in special applications.

The drive signals output from the A8 Filter frame depend on the modulation selected. For vector modulation, the drive source is the VECTOR I and VECTOR Q signals from the front panel. The modulating signals are passed through a 13 to 15 dB variable attenuator to provide appropriate scaling. The actual scaling is determined during an instrument self-calibration.

In digital modulation mode, the I BB and Q BB signals from the A9 DAC/Switch frame are filtered by one of the five filters and then routed to the I and Q modulators in the RF Output subsystem. The magnitude of the digital modulation drive can only change in discrete steps (states). The vector modulation drive signals can vary continuously.

The Offset Voltage Generators are used to null the inherent offset voltages in the I and Q modulators. This is necessary to achieve the performance specified. The offsets required are calculated during an instrument self-calibration. The settings depend on whether vector or digital modulation is selected.

The four overload detectors are used to prevent excessive drive signals in the event of a failure or an input signal overload. The dc level of the signal after the Filter Overload Detectors can be read by the internal service voltmeter via the Analog Diagnostics interface.

Analog Diagnostics

The Vector Generator has a built in service voltmeter that can be used to measure the I and Q drive voltages via the Analog Diagnostics circuit. The service voltmeter will be used during the troubleshooting procedure to provide measurements without the need to disassemble a frame.

When service errors are enabled (special function 10.1) and a calibration is performed, the analog diagnostics will generate an error code whenever a fault occurs in the BASEBAND portion of the calibration. The error code can be accessed using special function 51.1. A description of the errors can be found in Table 8-21.

Table 8-21. BASEBAND Error Codes

Code	Description
100	Not used
101	Insufficient range of phase DAC
102	Not Used
103	Sweep DAC digital fade null
104	Bucket search digital fade null
105	Sweep DAC burst null
106	Bucket search burst null
107	Not used
108	Not used
109	Not used
110	Quadrature error exceeds 2 degrees
111	Full scale error (I-Q) exceeds 0.5 millivolts
112	CS error exceeds 0.5 millivolts
113	CS2 DAC burst null error
114	Analog cal loop count overflow
115	Vector/Digital power ratio out of range
116	Sweep DAC vector fade null
117	Bucket search vector fade null
120	Analog loop calibration did not converge
130	Quadrature adjustment did not converge
150	Calibration loop never converged
151	I attenuation out of range
152	Q attenuation out of range
153	Vector/Digital power factor out of range
160	Final check error
161	FS-I (full scale I) out of range
162	FS-Q (full scale Q) out of range
163	ICS0 (ICS0 current source) out of range
164	ICS1 (ICS1 current source) out of range
165	QCS0 (QCS0 current source) out of range

Table 8-21. BASEBAND Error Codes (Cont.)

Code	Description
166	QCS1 (QCS1 current source) out of range
167	Burst mode null I range
168	Burst mode null Q range
169	Null digital I range
170	Null digital Q range
171	Null vector I range
172	Null vector Q range
173	Analog attenuator I range
174	Analog attenuator Q range
175	Quadrature DAC range
181	I filter 1 gain out of range
182	I filter 2 gain out of range
183	I filter 3 gain out of range
191	Q filter 1 gain out of range
192	Q filter 2 gain out of range
193	Q filter 3 gain out of range
199	External filter gain out of range

Troubleshooting

It is assumed that the troubleshooting information on Service Sheet BD1 was used to isolate a malfunction to the Digital/Vector Baseband Subsystem. The following information will aid in isolating the defective module.

The troubleshooting procedure is broken into ten checks as follows:

Check 1 - CW
Check 2 - Vector Modulation
Check 3 - Scalar Modulation
Check 4 - Digital Modulation
Check 5 - Digital Input Checks
Check 6 - Calibration Voltages/Service Voltmeter
Check 7 - A8 Filter Frame
Check 8 - A9 DAC/Switch Frame
Check 9 - A10 Buffer Frame
Check 10 - Digital/Vector Baseband Control Signals/Power Supplies

Troubleshooting Hints

The following items are general troubleshooting techniques that are extremely useful when troubleshooting the Vector Generator.

1. Check both the ribbon cable that carries power and control signals and any coaxial cables that carry RF signals for loose connections.

2. Any cables that look worn or frayed should be replaced or at least checked for repeatable continuity.

3. A wrench should always be used when tightening or loosening coaxial connectors.

4. The coaxial connectors on a cable that is disconnected should always be inspected for damage. Make sure that each connector is solidly mounted on the module and that the center conductor is not broken or bent.

5. Test equipment and personnel should be grounded to avoid static induced failures. Observe all electrostatic discharge (ESD) precautions.

6. After a module has been replaced or repaired, make sure that all coaxial connectors are properly tightened with a wrench and that all ribbon cable connectors are firmly seated in their sockets.

7. When troubleshooting data signals that are ECL levels, be aware that the signals are only valid ECL levels when they are pulled down by termination resistors.

Test Equipment

Spectrum Analyzer ..... HP 8566B
Test Oscillator ..... HP 8116A
Power Meter ..... HP 438A
Power Sensor ..... HP 8482A
Oscilloscope ..... HP 54201A

Check 1 - CW

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Connect the spectrum analyzer to the Vector Generator RF output.

3. Set the Vector Generator to 140 MHz at a level of +7 dBm. Set the level to +12 dBm if the Vector Generator has Option 064 installed.

   The level should be within 2.5 dB of the set value and the frequency should be very stable.

   If the frequency and level are correct, proceed with Check 2.

   If the frequency is not stable, the fault is in the Local Oscillator subsystem or the FM subsystem. Use BD2 and BD3 to verify that each subsystem is working correctly.

   If the level is not correct, proceed with the next step.

4. Press the 2 STATE ON key to select two state modulation. This will enable control of the I and Q modulators so that the effects of the Digital/Vector Baseband Subsystem on the RF output level can be minimized.

5. Using the SET I,Q key and the numeric keypad, set the I1 and Q1 components to 100%. This will set the attenuation of the I and Q modulators to minimum.

6. Set the attenuation in the RF Output subsystem to minimum by entering the following key sequence. This should raise the output power to maximum to isolate a low power problem from a digital or vector modulation problem. In the following key sequence, ENT represents the ENT SPCL key (shifted Hz).

   SPCL 53.0 ENT 0 ENT
   SPCL 53.1 ENT 11 ENT
   SPCL 53.2 ENT 12 ENT
   SPCL 53.3 ENT 4095 ENT

   The output level should rise to greater than the level set on the Vector Generator.

   If the level is now greater than the level set on the front panel, proceed to Check 6 to begin isolating the problem.

   If the output level is still less than the level set on the front panel, proceed with the next step.

7. Using an SMC tee, connect the oscilloscope to A8J4 I OUT. Use high impedance input coupling. Connect the cable normally connected to A8J4 to the other leg of the tee.

   The level should be greater than +100 mVdc.

   If the dc level is correct, proceed with the next step.

   If the dc level is not correct, disconnect the instrument cable from the tee connector and set the input coupling of the oscilloscope to 50Ω. If the voltage is then correct, the fault is in the RF Output Subsystem. Otherwise, proceed with Check 6 to begin isolating the problem.

8. Using an SMC tee, connect the oscilloscope to A8J9 Q OUT. Use high impedance input coupling. Connect the cable normally connected to A8J9 to the other leg of the tee.

   The level should be greater than +100 mVdc.

   If the dc level is correct, proceed to BD4 to isolate the problem in the RF Output Subsystem.

   If the dc level is not correct, disconnect the instrument cable from the tee connector and set the input coupling to 50Ω. If the voltage is then correct, the fault is in the RF Output Subsystem. Otherwise, proceed with Check 6 to begin isolating the problem.

Check 2 - Vector Modulation

1. Press INSTR PRESET and then enter SPCL 10.1 ENT SPCL on the Vector Generator. Special function 10.1 is used to enable service errors during calibration.

2. Enter SPCL 20.1 ENT SPCL on the Vector Generator to initiate a calibration of the Digital/Vector Baseband subsystem. While the calibration is in process, the message CALIBRATING BASEBAND will be displayed on the Vector Generator display.

3. When the calibration is complete, enter SPCL 51.0 ENT SPCL to display any error codes for the calibration.

   If the error code displayed is zero, proceed with the next step.

If the error code displayed is between 1 and 5, proceed to BD2 to isolate the problem in the Local Oscillator subsystem.

If the error code displayed is 6, the calibration was interrupted by a front panel key entry. Retry this step.

If the error code is between 100 and 199, proceed with Check 6 to isolate the problem within the Digital/Vector Baseband subsystem.

4. Set the Vector Generator to 140 MHz at an output level of +7 dBm. Use an output level of +12 dBm for an instrument with Option 064 installed.

5. With the spectrum analyzer connected to the Vector Generator RF output, select vector modulation by pressing the VECTOR ON key.

   The signal level should drop by more than 40 dB when vector modulation is selected with no modulation input.

   If the signal level drops by more than 40 dB when vector modulation is selected, proceed with the next step.

   If the signal level does not drop by more than 40 dB when vector modulation is selected, proceed to Check 6 to isolate the problem.

6. Connect the test oscillator to the Vector Input I connector on the Vector Generator front panel.

7. Set the test oscillator to 1 kHz at an output level of 1 volt peak-to-peak. Set the dc offset to 0 volts.

   The spectrum analyzer should display a double sideband suppressed carrier signal. The carrier should be greater than 30 dB below the CW reference and there should be two sidebands each 1 kHz from the carrier at a level of about 7 ±2 dB below the CW reference level.

   If the spectrum analyzer display is correct, proceed with the next step.

   If the display is not correct, proceed to Check 6 to isolate the problem. A vector modulation problem is most likely to occur in the A8 Filter frame.

Note

The remainder of this check uses a modulating frequency range of 1 kHz to 50 MHz. The test can be run for modulation rates between dc and 350 MHz. The only limitations are due to the frequency range of the test oscillator used. For the purposes of verification, a frequency range of 1 kHz to 50 MHz is adequate.

8. Tune the test oscillator from 1 kHz to 50 MHz. The sideband amplitude should not change by more than than 3 dB. Ensure that the test oscillator amplitude remains constant for this check. Only one sideband, upper or lower, needs to be monitored for this check.

   If the sideband level does not change by more than 3 dB, proceed with the next step.

   If the sideband level changes by more than 3 dB, proceed with Check 7 to test the frequency response of the A8 Filter frame.

9. Connect the test oscillator to the Vector Generator Vector Q input.

10. Reset the test oscillator to 1 kHz at an output level of 1 volt peak-to-peak.

    The spectrum analyzer should display a double sideband suppressed carrier signal. The carrier should be greater than 30 dB below the CW reference and there should be two sidebands each 1 kHz from the carrier at a level of about 7 ±2 dB below the CW reference level.

    If the spectrum analyzer display is correct, proceed with the next step.

    If the display is not correct, proceed to Check 6 to isolate the problem. A vector modulation problem is most likely to occur in the A8 Filter frame.

12. Tune the test oscillator from 1 kHz to 50 MHz. The sideband amplitude should not change by more than than 3 dB.

    If the sideband level does not change by more than 3 dB, proceed with Check 3 to verify the scalar modulation circuitry.

    If the sideband level changes by more than 3 dB, proceed with Check 7 to test the frequency response of the A8 Filter frame.

Check 3 - Scalar Modulation

1. Press INSTR PRESET on the Vector Generator to set the instrument to a known state.

2. Set the Vector Generator to 10 MHz at an output level of +7 dBm. If the Vector Generator has Option 064 installed, use an output level of +12 dBm.

3. Connect the spectrum analyzer to the Vector Generator RF output.

4. Select scalar modulation by pressing the SCALAR ON key.

   The carrier level should drop by at least 40 dB with no signal connected to SCALAR INPUT.

   If the level drops by more than 40 dB, proceed with the next step.

   If the level does not change, proceed to Check 6 to isolate the problem. Scalar modulation problems can only be caused by the A8 Filter frame or the A9 DAC/Switch frame.

5. Connect the test oscillator to the SCALAR INPUT connector on the Vector Generator.

6. Set the test oscillator to 100 Hz at an output level of 0.22 Vrms with dc offset of 0.6 volts. For a 50 ohm output impedance on the test oscillator, 0.22 Vrms corresponds to a test oscillator setting of 0.320 volts peak-to-peak.

   The spectrum analyzer should display the carrier with two sidebands each spaced 100 Hz away from the carrier.

   If the indicated sidebands are present, proceed with the next step.

   If the indicated sidebands are not present, proceed to Check 6 to begin isolating the problem.

7. Tune the test oscillator from 100 Hz to 500 kHz. The level of the sidebands should not change by more than 3 dB.

   If the level of the sidebands does not change by more than 3 dB, proceed with Check 4 to verify the digital modulation circuitry.

   If the levels change by more than 3 dB, the scalar frequency response is out of tolerance. Proceed with Check 7 to check the frequency response of the scalar circuitry.

Check 4 - Digital Modulation

1. Press INSTR PRESET on the Vector Generator to set the instrument to a known state.

2. Set the Vector Generator to 10 MHz at an output level of +7 dBm. If the Vector Generator has Option 064 installed, use an output level of +12 dBm.

3. Connect Channel A of the oscilloscope to the Vector Generator rear panel Coherent Carrier connector. Connect Channel B to the Vector Generator RF output.

4. Adjust the oscilloscope to display two periods of the signals. Set the oscilloscope to trigger on the coherent carrier which is the phase reference.

5. Select Quadrature Phase Shift Keying (QPSK) on the Vector Generator.

6. Note the position of a zero crossing of the RF output signal near the center of the display. This point will be the reference for the phase measurements. If the oscilloscope has delta time markers, set the reference marker to this point.

7. Press the INVERT INPUT key followed by the 0 key on the Vector Generator. This will simulate a change in the logic level at DIGITAL INPUT 0.

   The zero crossing of the RF output signal should move toward the left by about 25 ns (or the right by 75 ns). The relationship between phase and time for the 10 MHz carrier is 3.6 degrees per nanosecond. A shift of 25 ns corresponds to a phase change of 90 degrees.

   If the time shift is about 25 ns, continue with the next step.

   If the zero crossing did not change or is more than 10 ns off, proceed with Check 6 to isolate the problem.

8. Press the INVERT INPUT key followed by the 2 key.

   The zero crossing should now be 50 ns to the left of the reference (or 50 ns to the right). This corresponds to a phase change of 180 degrees (or -180 degrees) from the reference.

   If the time shift is correct, proceed with the next step.

   If the zero crossing did not change or is more than 10 ns off, proceed with check 5 to isolate the problem.

9. Press the INVERT INPUT key followed by the 0 key.

   The zero crossing should be 75 ns to the left (or 25 ns to the right) of the reference. This corresponds to a +270 (or -90) degree phase change.

   If the zero crossing did not change or is more than 10 ns off, proceed with Check 6 to isolate the problem.

10. If no trouble has been found up to this point, perform Check 5 to verify all digital input signals.

Check 5 - Digital Input Checks

The digital inputs are different depending on whether the instrument has Option 064 installed. Use Check 5a for the standard instrument and Check 5b for an Option 064 instrument.

Check 5a - Digital Input Checks (Except Option 064)

1. Press the INSTR PRESET key to preset the Vector Generator.
2. Set the Vector Generator to 10 MHz at a level of +7 dBm.
3. Select 16 QAM modulation mode by pressing the 16 QAM ON key.
4. Connect the rear panel COHERENT CARRIER to Channel A of the oscilloscope. Connect the Vector Generator RF output to Channel B.
5. Adjust the oscilloscope to display two periods of the signals. Set the oscilloscope to trigger on the coherent carrier signal to provide an overall phase reference.

   There are two references that must be noted on the RF output signal. Note the position of a zero crossing near the center of the display (or adjust delay to center the zero crossing). This will be the phase reference. The peak-to-peak amplitude of the signal should also be noted as an amplitude reference. 16 QAM will change both amplitude and phase depending on the states of the digital inputs.

6. Connect a 50Ω termination to DIGITAL INPUT 0. This simulates a change from a logical low level to a logical high level.

The display should change in phase and magnitude. The absolute change is not as important as the fact that the phase and amplitude changes. The amplitude should decrease by about 25% ±5% (to 0.75 times the reference amplitude). The zero crossing should and the zero crossing should shift about 7 ±5 ns to the left of the reference.

If the display does change correctly, proceed with the next step.

If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

7. Repeat the previous step for each of the inputs. Refer to Table 8-22 for the appropriate phase shift. The amplitude of all the other states should be 75% ±5% of the reference amplitude. A Negative time indicates that the zero crossing shifts to the right of the reference.

   If the display changes as indicated, proceed with the next step.

   If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

Table 8-22. 16 QAM Measurements

DIGITAL INPUT 0 1 2 3	Phase Change	Time Shift to Nearest Crossing
0 0 0 0	Reference	Reference
1 0 0 0	26°	7 ± 5 ns
0 1 0 0	117°	17 ± 5 ns
0 0 1 0	-26°	-7 ± 5 ns
0 0 0 1	-63°	-17 ±5 ns

8. Select one clock mode by pressing the EXT CLK key once (the ONE indicator should be lighted).

9. Connect a 50Ω termination to DIGITAL INPUT 0. This simulates a change from a logical low level to a logical high level.

   The oscilloscope display should not change since the clock signal has not been received by the Vector Generator.

   If the RF output signal does not change, proceed with the next step.

   If the RF output signal does change, the fault is probably in the A10 Buffer frame or the A9 DAC/Switch frame. Proceed to Check 8 to isolate the problem.

10. With the 50Ω termination still connected to DIGITAL INPUT 0, connect a second 50Ω termination to DIGITAL INPUT 4 (I CLOCK). This simulates a clock pulse which should latch the current digital information into the Vector Generator.

    The display should change in phase and magnitude. The absolute change is not as important as the fact that the phase and amplitude changes. The amplitude should decrease by 25% ±5% and the zero crossing should shift 7 ±5 ns to the left of the reference.

    If the display does change correctly, proceed with the next step.

    If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

11. Repeat the previous two steps for each of the four inputs. Refer to Table 8-22 for the appropriate phase shift. The amplitude should be 75% of the reference level (25% decrease from the reference. A negative time indicates that the zero crossing shifts to the right of the reference.

    If the display changes as indicated, proceed with the next step.

    If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

12. Select two clock mode by pressing the EXT CLK key once (the TWO indicator should be lighted).

13. Connect a 50Ω termination to DIGITAL INPUT 0. This simulates a change from a logical low level to a logical high level.

    The oscilloscope display should not change since the clock signal has not been received by the Vector Generator.

    If the RF output signal does not change, proceed with the next step.

    If the RF output signal does change, the fault is probably in the A10 Buffer frame or the A9 DAC/Switch frame. Proceed to Check 8 to isolate the problem.

14. With the 50Ω termination still connected to DIGITAL INPUT 0, connect a second 50Ω termination to DIGITAL INPUT 4 (I CLOCK) and then remove the termination. This simulates a clock pulse which should latch the current digital information into the Vector Generator.

The display should change in phase and magnitude. The absolute change is not as important as the fact that the phase and amplitude changes. The amplitude should decrease by about 25% ±5% and the zero crossing should shift about 7 ±5 ns to the left of the reference.

If the display does change correctly, proceed with the next step.

If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

Note

The following check uses DIGITAL INPUT 4 (I CLOCK) to test DIGITAL INPUT 0 and 1 and DIGITAL INPUT 5 (Q CLOCK) to test DIGITAL INPUT 2 and 3. The I CLOCK should only affect the DIGITAL INPUT 0 and 1 inputs. The Q CLOCK should only affect the DIGITAL INPUT 2 and 3 inputs.

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15. Repeat the previous two steps for each of the four inputs. Refer to Table 8-22 for the appropriate phase shift. The amplitude should be 75% (25% decrease) of the reference level for each state. A negative time indicates that the zero crossing shifts to the right of the reference.

    If the display changes as indicated, the Vector Generator Digital/Vector Baseband subsystem is working normally.

    If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

Check 5b - Digital Input Checks (Option 064)

1. Press the INSTR PRESET key to preset the Vector Generator.
2. Set the Vector Generator to 10 MHz at a level of +12 dBm.
3. Select 64 QAM modulation mode by pressing the 64 QAM ON key.
4. Connect the rear panel COHERENT CARRIER to Channel A of the oscilloscope. Connect the Vector Generator RF output to Channel B.
5. Adjust the oscilloscope to display two periods of the signals. Set the oscilloscope to trigger on the coherent carrier signal to provide an overall phase reference.

There are two references that must be noted on the RF output signal. Note the position of a zero crossing near the center of the display (or adjust delay to center the zero crossing). This will be the phase reference. The peak-to-peak amplitude of the signal should also be noted as an amplitude reference. 64 QAM will change both amplitude and phase depending on the states of the digital inputs.

6. Connect a 50Ω termination to DIGITAL INPUT 0. This simulates a change from a logical low level to a logical high level.

   The display should change in phase and magnitude. The absolute change is not as important as the fact that the phase and amplitude changes. The amplitude should decrease by about 13% ±5% and the zero crossing should shift about 3 ±5 ns to the left of the reference.

   If the display does change correctly, proceed with the next step.

   If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

7. Repeat the previous step for each of the inputs. Refer to Table 8-23 for the appropriate phase shift and amplitude change. A negative time indicates that the zero crossing shifts to the right of the reference.

   If the display changes as indicated, proceed with the next step.

   If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

Table 8-23. 64 QAM Measurements

DIGITAL INPUT						Magnitude Decrease	Time Shift to Nearest Crossing
0	1	2	3	4	5		
0	0	0	0	0	0	Reference	Reference
1	0	0	0	0	0	13%	3 ±5 ns
0	1	0	0	0	0	23%	6 ±5 ns
0	0	1	0	0	0	29%	15 ±5 ns
0	0	0	1	0	0	13%	-3 ±5 ns
0	0	0	0	1	0	23%	-6 ±5 ns
0	0	0	0	0	1	29%	-15 ±5 ns

8. Select parallel clock mode by pressing the EXT CLK key once (the PAR indicator should be lighted).

9. Connect a 50Ω termination to DIGITAL INPUT 0. This simulates a change from a logical low level to a logical high level.

   The oscilloscope display should not change since the clock signal has not been received by the Vector Generator.

   If the RF output signal does not change, proceed with the next step.

   If the RF output signal does change, the fault is probably in the A10 Buffer frame or the A9 DAC/Switch frame. Proceed to Check 8 to isolate the problem.

10. With the 50Ω termination still connected to DIGITAL INPUT 0, connect a second 50Ω termination to DIGITAL INPUT 6 (CLOCK). This simulates a clock pulse which should latch the current digital information into the Vector Generator.

    The display should change in phase and magnitude. The absolute change is not as important as the fact that the phase and amplitude changes. The amplitude should decrease by about 13% ±5% and the zero crossing should shift about 3 ±5 ns to the left of the reference.

    If the display does change correctly, proceed with the next step.

    If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

11. Repeat the previous two steps for the remainder of the six inputs. Refer to Table 8-23 for the appropriate phase shift and amplitude change. A negative time indicates that the zero crossing shifts to the right of the reference.

    If the display changes as indicated, proceed with the next step.

    If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

12. Select serial clock mode by pressing the EXT CLK key once (the SER indicator should be lighted).

13. Connect a 50Ω termination to DIGITAL INPUT 0. This simulates a change from a logical low level to a logical high level.

    The oscilloscope display should not change since the clock signal has not been received by the Vector Generator.

If the RF output signal does not change, proceed with the next step.

If the RF output signal does change, the fault is probably in the A10 Buffer frame or the A9 DAC/Switch frame. Proceed to Check 8 to isolate the problem.

14. With the 50Ω termination still connected to DIGITAL INPUT 0, connect a second 50Ω termination to DIGITAL INPUT 6 (CLOCK) and then remove the termination. This simulates a clock pulse which should latch the current digital information into the serial to parallel converter.

15. Remove the first 50Ω termination from DIGITAL INPUT 0 and then connect and disconnect the second termination to DIGITAL INPUT 6 (CLOCK) five more times to simulate a total of six clock pulses. As the last clock pulse is received, the information in the serial to parallel converter is latched into the Vector Generator.

The display should change in phase and magnitude. The absolute change is not as important as the fact that the phase and amplitude changes. The amplitude should decrease by about 29% ±5% and the zero crossing should shift about 15 ±5 ns to the right of the reference.

If the display does change correctly, proceed with the next step.

If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

16. Enable the framing clock by entering SPCL 9.1 ENT SPCL. The framing clock enables DIGITAL INPUT 5 to control when the digital data is latched from the serial to parallel converter.

17. Connect one 50Ω terminator to DATA INPUT 0. This will control the first bit into the six bit shift register.

18. Connect the second 50Ω termination to DIGITAL INPUT 6 (CLOCK) to move the data at DIGITAL INPUT 0 into the shift register.

19. Disconnect the 50Ω termination from DIGITAL INPUT 0. This will prevent additional logical high level bits from entering the shift register.

20. Connect a 50Ω load to DIGITAL INPUT 5 to latch the first bit into the Vector Generator. This corresponds to having DIGITAL INPUT 0 active for parallel data.

The display should change in phase and magnitude. The absolute change is not as important as the fact that the phase and amplitude changes. The amplitude should decrease by about 13% ±5% and the zero crossing should shift about 3 ±5 ns to the left of the reference.

If the display does change correctly, proceed with the next step.

If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

21. Connect one of the 50Ω terminations to DIGITAL INPUT 6 (CLOCK) to move the bit in the serial to parallel converter to the DIGITAL INPUT 1 position. There should be no termination at DIGITAL INPUT 0 for the remainder of this check.

22. Connect the other 50Ω termination to DIGITAL INPUT 5. This will latch the bit into the next higher position (DIGITAL INPUT 1).

    The amplitude displayed should decrease by 23% ±5% and the zero crossing should occur at 6 ±5 ns to the left of the phase reference.

    If the signal changes correctly, proceed with the next step.

    If the signal change is incorrect, proceed to Check 8 to isolate the problem.

23. Repeat the previous two steps for the remaining four positions. Refer to Table 8-23 for the appropriate phase shift and amplitude change. A negative time indicates that the zero crossing shifts to the right of the reference.

    If the display changes as indicated, the Vector Generator Digital/Vector Baseband subsystem is working normally.

    If the display does not change or changes incorrectly, proceed to Check 8 to troubleshoot the problem.

Check 6 - Calibration Voltages/Service Voltmeter

1. Press the INSTR PRESET key on the Vector Generator to set the instrument to a known state.

2. Set the service voltmeter to measure the internal Analog to Digital Converter (ADC) reference by entering SPCL 52.8 ENT SPCL. The display should indicate 10.000 ±0.002 volts. This voltage must be correct since all other measurements are referenced to this voltage.

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is incorrect, proceed to BD6 to troubleshoot the Analog to Digital Converter circuit.

3. Set the service voltmeter to measure the instrument ground reference by entering SPCL 52.1 ENT SPCL. The display should indicate 0.000 ±0.002 volts.

   If the displayed voltage is correct, proceed with the next step to check the power supply references in the Digital/Vector Baseband subsystem.

   If the displayed voltage is incorrect, proceed to service sheet BD6 to troubleshoot the Analog to Digital Converter circuit.

4. Connect the voltmeter to A8J4 I OUT using a SMC tee. This is the same point that is monitored by the analog diagnostics of the Vector Generator.

5. Set the service voltmeter to read the output of the analog diagnostic multiplexer by entering SPCL 52.6 ENT SPCL. The displayed voltage should be ten times the reading on the voltmeter (±5%).

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is not correct, the problem is either in the A8 Filter Frame or the cable carrying the power supply voltages and the connection to the service voltmeter. Use Check 10 to isolate the problem to the cable, frame or service voltmeter.

6. Connect the voltmeter to A8J9 Q OUT using a SMC tee connector. This is the same point monitored by the analog diagnostics for the Q channel.

7. Set the service voltmeter to read the Q channel output by entering SPCL 52.7 ENT SPCL. The displayed voltage should be ten times the reading on the voltmeter (±5%).

   If the displayed voltage is correct, proceed with the next step.

   If the displayed voltage is not correct, the problem is either in the A8 Filter Frame or the input connector carrying the power supply voltages and the connection to the Analog to Digital Converter. Use Check 10 to isolate the problem to the cable, frame or service voltmeter.

Note The following checks use the internal service voltmeter to check the voltages at the output of the I and Q channel. These voltages may be monitored externally by connecting the voltmeter to A8J4 I OUT or A8J9 Q OUT. The voltmeter should read one-tenth the voltage indicated in each check.

Check 7 - A8 Filter Frame

The A8 Filter frame is checked for dc response and for ac (frequency) response. Check 7a is used to check the dc offset and drive capability of the A8 Filter frame. Check 7b is used to check the frequency response and attenuation capabilities for vector modulation. Check 6c is used to check the frequency response of the digital modulation filters.

Check 7a - A8 Filter Frame dc (Static) Checks

1. Enter SPCL 99.9 ENT SPCL to load default calibration factors into the Vector Generator. Ignore any messages generated by the initialization.

2. Remove any cables from the Vector Generator front panel input connectors. Set the Vector Generator to 100 MHz at an output level of 0 dBm.

3. Press the VECTOR ON key to select vector modulation.

4. Connect an SMC 50Ω load to A8J4 I OUT and A8J9 Q OUT to isolate the Digital/Vector Baseband subsystem from the RF Output section.

5. Set the I and Q offset DACs for maximum positive offset and set the A8 Filter frame calibration reference to 0 volts. This is accomplished with the following key sequences.

   SPCL 53.0 ENT 3 ENT
   SPCL 53.1 ENT 16 ENT
   SPCL 53.2 ENT 12 ENT
   SPCL 53.3 ENT 4095 ENT

   The Q offset DAC is now set for maximum positive offset.

   SPCL 53.1 ENT 28 ENT
   SPCL 53.2 ENT 12 ENT
   SPCL 53.3 ENT 4095 ENT

   The I offset DAC is now set for maximum positive offset.

   SPCL 53.1 ENT 44 ENT
   SPCL 53.2 ENT 2 ENT
   SPCL 53.3 ENT 0 ENT

   The calibration references are now set to 0 volts.

SPCL 53.1 ENT 48 ENT
SPCL 53.2 ENT 1 ENT
SPCL 53.3 ENT 0 ENT

The calibration references have now been substituted for the vector modulation inputs.

6. Measure the I channel offset by entering SPCL 52.6 ENT SPCL and then the Q channel offset by entering SPCL 52.7 ENT SPCL. The voltage displayed on the Vector Generator display should be +0.5 ±0.05 volts for both channels.

   If the voltage is correct, proceed with the next step.

   If the voltage is not correct, the offset generator, variable attenuator, equalizer, switch or calibration reference in the A8 Filter frame is at fault.

7. Set the offset generators to the most negative offset using the following key sequences.

   SPCL 53.1 ENT 16 ENT
   SPCL 53.2 ENT 12 ENT
   SPCL 53.3 ENT 0 ENT

   The Q channel offset DAC has now been set to provide maximum negative offset to the Q channel baseband signal.

   SPCL 53.1 ENT 28 ENT
   SPCL 53.2 ENT 12 ENT
   SPCL 53.3 ENT 0 ENT

   The I channel offset has now been set to the maximum negative offset.

8. Measure the I channel offset by entering SPCL 52.6 ENT SPCL and then the Q channel offset by entering SPCL 52.7 ENT SPCL. The voltage displayed on the Vector Generator display should be -0.5 ±0.1 volts for both channels.

   If the voltage is correct, proceed with the next step.

   If the voltage is not correct, the offset generator, variable attenuator, equalizer, switch or calibration reference in the A8 Filter frame is at fault.

9. Reconnect the vector inputs in place of the calibration voltage references by entering the following key sequence.

   SPCL 53.1 ENT 48 ENT
   SPCL 53.2 ENT 1 ENT
   SPCL 53.3 ENT 1 ENT

10. Measure the I channel offset by entering SPCL 52.6 ENT SPCL and then the Q channel offset by entering SPCL 52.7 ENT SPCL. The voltage displayed on the Vector Generator display should be -0.5 ±0.1 volts for both channels.

    If the voltage is correct, proceed with the next step.

    If the voltage is not correct, an additional offset has been added due to an input signal at the vector input or a fault in the vector modulation input switch. Setting this bit has the effect of substituting the front panel inputs for the calibration references. If connecting a 50Ω load to the inputs does not cure the problem, check the cable for a broken ground or stray signal sensitivity.

11. Select 16 QAM modulation and scalar modulation by pressing 16 QAM ON key and SCALAR ON key.

12. Set the I and Q offset DACs for maximum positive offset. This is accomplished with the following key sequences.

    SPCL 53.0 ENT 3 ENT
    SPCL 53.1 ENT 16 ENT
    SPCL 53.2 ENT 12 ENT
    SPCL 53.3 ENT 4095 ENT

    The Q offset DAC is now set for maximum positive offset.

    SPCL 53.1 ENT 28 ENT
    SPCL 53.2 ENT 12 ENT
    SPCL 53.3 ENT 4095 ENT

    The I offset DAC is now set for maximum positive offset.

13. Measure the I channel offset by entering SPCL 52.6 ENT SPCL and then the Q channel offset by entering SPCL 52.7 ENT SPCL. The voltage displayed on the Vector Generator display should be +0.5 ±0.05 volts for both channels.

    If the voltage is correct, proceed with the next step.

    If the voltage is not correct, disconnect the cables from A8J2 I BB and A8J7 Q BB and recheck the offset voltages. If the offsets are now correct, proceed with Check 8 to check the A9 DAC/Switch frame. If the offsets are still wrong, the fault is in the A8 Filter frame.

14. Disable scalar modulation by pressing the SCALAR ON key again (the indicator should turn off).

15. Measure the I and Q baseband signals using SPCL 52.6 ENT SPCL and SPCL 52.7 ENT SPCL respectively. Note the voltages for use in the next step (nominally +0.7 volts).

16. Tune the Vector Generator to 200 MHz, 400 MHz and 1000 MHz to switch the four filters into the signal path. Measure the baseband voltages at each frequency using SPCL 52.6 ENT SPCL and SPCL 52.7 ENT SPCL.

    The voltages should not vary by more than 5% (±0.04 volts for a 0.7 volt level) for each filter.

    If the voltage does not vary by more than 5%, proceed with Check 7b to test the frequency response of the A8 Filter frame.

    If the voltage varies by more than 5%, one of the filters or a switch is defective in the A8 Filter frame.

Check 7b - A8 Filter Frame Vector Frequency Response Checks

Note

This check can be performed for frequencies between dc and 350 MHz instead of the 1 kHz to 50 MHz frequency range used. The test oscillator and oscilloscope must have sufficient bandwidth if a broader bandwidth check is desired.

1. Press the INSTR PRESET key on the Vector Generator to preset the instrument.

2. Set the Vector Generator to 100 MHz at a level of 0 dBm.

3. Select vector modulation by pressing the VECTOR ON key.

4. Set the variable attenuator for the I modulation signal to minimum attenuation using the following key sequence.

   SPCL 53.0 ENT 3 ENT
   SPCL 53.1 ENT 0 ENT
   SPCL 53.2 ENT 16 ENT
   SPCL 53.3 ENT 65535 ENT

   The I and Q channel attenuator is now set for the minimum nominal attenuation of 12 dB.

5. Connect the test oscillator to the VECTOR INPUT I connector on the Vector Generator.

6. Connect the oscilloscope to A8J4 I OUT. Use 50Ω dc coupling on the oscilloscope.

7. Set the test oscillator to 1 kHz at an output level of 1 volt peak-to-peak.

   The oscilloscope should show a 1 kHz signal at a level of 0.25 ±0.1 volts peak-to-peak.

   If the signal level is correct, proceed with the next step.

   If the signal is not correct, the problem is in the cable between the front panel and A8J5 VEC I or in the A8 Filter frame.

8. Adjust the oscilloscope so that the signal is displayed over 10 divisions. This will simplify the following measurement.

9. Set the variable attenuator for maximum attenuation using the following key sequence.

   SPCL 53.3 ENT 0 ENT

   The attenuator is now set for more than 15 dB of attenuation. The displayed signal should now be less than 7 divisions high (<70% of the reference set in the previous step).

   If the signal is correct, proceed with the next step.

   If the signal is not correct, the variable attenuator in the A8 Filter is at fault.

10. Reset the variable attenuators to minimum attenuation with the following key sequence.

    SPCL 53.3 ENT 65535 ENT

11. Tune the test oscillator from 1 kHz to 50 MHz while observing the oscilloscope display.

    The signal should remain greater than 7 divisions high over the 1 kHz to 50 MHz range.

    If the signal does remain more than 7 divisions high over the 1 kHz to 50 MHz range, proceed with the next step.

    If the signal does not remain more than 7 divisions high, the A8 Filter frame is at fault.

12. Repeat the entire check with the test oscillator connected to the VECTOR INPUT Q connector and the oscilloscope connected to A8J9 Q OUT.

Check 7c - A8 Filter Frame Digital Filter Checks

1. Press the INSTR PRESET key on the Vector Generator to preset the instrument.
2. Set the Vector Generator to 100 MHz at a level of 0 dBm.
3. Select scalar modulation by pressing the SCALAR ON key.
4. Connect the test oscillator to the SCALAR INPUT connector on the Vector Generator.
5. Connect the oscilloscope to A8J4 I OUT. Use 50Ω dc coupling on the oscilloscope.
6. Set the test oscillator to 1 kHz at an output level of 0.25 volt peak-to-peak (into 50 ohms) with a dc offset of 0.5 volts.
7. Adjust the oscilloscope so that the signal is displayed over 10 divisions. This will simplify the following measurements.
8. Tune the test oscillator from 1 kHz to 20 MHz while observing the oscilloscope display.

   The signal should remain greater than 7 divisions high over the 1 kHz to 20 MHz range.

   If the signal does remain more than 7 divisions high over the 1 kHz to 20 MHz range, proceed with the next step.

   If the signal does not remain more than 7 divisions high, the filter in the A8 Filter frame associated with the carrier frequency is at fault.
9. Repeat the previous step for Vector Generator output frequencies of 200 MHz, 400 MHz and 1000 MHz.

Note 

This check will not test the entire frequency response for each filter. A more complete test can be done using a high pass filter and a spectrum analyzer. The high pass filter must be used to block any dc offset at the output of the A8 Filter frame. The 3 dB bandwidth frequencies for the 100 MHz, 200 MHz, 400 MHz and 1000 MHz carrier frequency filters are 30 MHz, 60 MHz, 120 MHz and 150 MHz respectively.

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10. Repeat the entire check with the oscilloscope connected to A8J9 Q OUT to test the Q channel filters.

Check 8 - A9 DAC/Switch Frame

1. Press INSTR PRESET to set the Vector Generator to a known state.

2. Enter SPCL 30.0 ENT SPCL on the Vector Generator to begin the diagnostic to test the four I channel DACs. The check will test the full scale, 2/3 scale and 1/3 scale setting for each of the four DACs in the I channel. The 1/3 scale check will test alternating zeros and ones while the 2/3 scale check will test alternating ones and zeros. The full scale test checks maximum range of the DAC.

3. The message I CHAN DEBUG will be displayed while the diagnostic is run. When the diagnostic is complete, enter SPCL 51.0 ENT SPCL to display the results.

   If a value of zero is displayed, the diagnostic ran successfully. Proceed with the next step.

   If a value other than zero is displayed, connect a 50Ω load to A8J4 I OUT and then re-run the diagnostic. If the diagnostic then passes, the problem is either low power from the A13 IF Multiplier Deck or the I modulator in the RF Output subsystem.

   If the diagnostic still does not pass, proceed with Check 10 to verify the A10 Buffer frame. The diagnostic depends on the A10 Buffer frame to run. If the A10 Buffer frame is working normally, the fault lies in the A9 DAC/Switch frame.

4. Enter SPCL 31 ENT SPCL to run the diagnostic that tests the four DACs in the Q channel.

5. When the Q CHAN DEBUG message disappears, enter SPCL 51.0 ENT SPCL to display the diagnostic results.

   If a value of zero is displayed, the diagnostic ran successfully. Proceed with the next step.

   If a value other than zero is displayed, connect a 50Ω load to A8J9 Q OUT and then re-run the diagnostic. If the diagnostic then passes, the problem is either low power from the A13 IF Multiplier Deck or the Q modulator in the RF Output subsystem.

If the diagnostic still does not pass, proceed with Check 10 to verify the A10 Buffer frame. If the A10 Buffer frame is working, the A9 DAC/Switch frame is defective.

6. If Check 3 and 6 passed and the checks have worked to this point, proceed to Check 9b to test the input termination and thresholds.

   If Check 6 failed, proceed to Check 9a to check the A10 Buffer frame. If Check 9a passes, the problem is in the A9 DAC/Switch frame.

   If Check 6 passed but Check 3 (Scalar modulation) failed, the problem is in the scalar input cable or the Current Source Reference in the A9 DAC/Switch frame.

Check 9 - A10 Buffer Frame

The A10 Buffer frame is responsible for converting the input signals to ECL levels and for providing enable and invert controls over the inputs. The check is divided into A10 Buffer frame output checks and threshold/termination checks.

Check 9a - A10 Buffer Frame Output Checks

1. Press INSTR PRESET to preset the instrument to a known state.

2. Select 16QAM modulation format and 2 clock mode. If the Vector Generator has Option 064 installed, select 64QAM modulation format and enable the parallel clock mode.

3. Using a SMC tee, connect the voltmeter to A10J13 D0. This is the output of the front panel DIGITAL INPUT 0 after being buffered.

   The voltage level should be less than -1.4 volts (ECL low logic level).

   If the level is correct, proceed with the next step.

   If the level is not correct, try changing the cable connection at the A9 DAC/Switch frame (ECL must be properly terminated to provide valid logic levels) to check the termination. If connecting the cable to a different data path cures the problem, the fault is in the A9 DAC/Switch frame. Otherwise, the problem is in the A10 Buffer frame or one of the cables.

4. Invert the logic level by pressing the INVERT INPUT key and then entering a 0 on the numeric keypad.

   The level should increase to more than -1.2 volts (ECL high logic level).

   If the level changes correctly, proceed with the next step.

   If the level is not correct, try changing the cable connection at the A9 DAC/Switch frame to check the termination. If connecting the cable to a different data path cures the problem, the fault is in the A9 DAC/Switch frame. Otherwise, the fault lies in the A10 Buffer frame or one of the cables.

5. Connect a 50Ω termination to the front panel DIGITAL INPUT 0 connector. This will simulate an ECL high logic level.

   The level should decrease to less than -1.4 volts.

   If the level changes correctly, proceed with the next step.

   If the level change is not correct, the problem is in the input connector/cable or the A10 Buffer frame. If the instrument calibrates correctly and a digital input does not work, the problem is in the input data buffer for that input.

6. Repeat this procedure for front panel inputs DIGITAL INPUT 1 through 5 (1 through 6 for Option 064). The corresponding outputs for DIGITAL INPUT 1 through 5 are D1 through D3 and then I CLK and Q CLK. For an Option 064 instrument, the corresponding outputs for DIGITAL INPUT 1 through 6 are D1 through D5 and CLK.

7. For an instrument without Option 064, check A9J6 MR by selecting BURST ON and then repeating the previous check for DIGITAL INPUT 3 (remember to set the input to non-inverting before starting the procedure).

Check 9b - A10 Buffer Frame Threshold/Termination Checks

1. Press INSTR PRESET to set the Vector Generator to a known state.

2. Select 16QAM modulation format with 2 clock mode. Use 64QAM modulation format with parallel (PAR) clock mode for an instrument with Option 064.

3. With DATA ECL threshold selected and CLK ECL threshold selected, measure the voltage at each of the digital inputs.

   The voltage should be -2.0 ±0.1 Vdc.

   If the voltage is correct, proceed with the next step.

   If the voltage is not correct, the termination relay in the A10 Buffer frame is at fault.

4. Change the DATA and CLK threshold levels to GND. Measure the voltage at each of the digital inputs.

   The voltage should be 0 ±0.05 Vdc.

   If the voltage is correct, proceed with the next step.

   If the voltage is not correct, the termination relay in the A10 Buffer frame is at fault.

5. Set the DATA threshold to variable (VAR) and the CLOCK threshold to AUTO. Measure the voltage at each of the digital inputs.

   The voltage should be 0 ±0.05 Vdc.

   If the voltage is correct, proceed with the next step.

   If the voltage is not correct, the fault is in the A10 Buffer frame.

6. Connect the function generator to DIGITAL INPUT 0 and to channel 1 of the oscilloscope. Connect the trigger output of the function generator to DIGITAL INPUT 4 (l clock). Connect the trigger output to DIGITAL INPUT 6 (clock) for Option 064.

7. Connect channel 2 of the oscilloscope to A10J13 D0 using an SMC tee (to preserve the ECL termination).

8. Set the function generator for a triangle wave at a frequency of 20 kHz. The actual frequency used is not important. Set the amplitude to 5 volts peak-to-peak with no offset.

9. Adjust the threshold (using the SET VAR key) from -2.5 to +2.5 volts and verify that the point at which the logic level at A10J13 changes varies with the input level.

   If the trigger point changes with the threshold level, proceed with the next step.

   If the trigger level does not change with the threshold, the threshold DAC or input buffer in the A10 Buffer frame is at fault.

10. Repeat the previous step for the DIGITAL INPUT 1 through 3 (1 through 5 for Option 064). Reconnect the function generator trigger output to the DIGITAL INPUT 5 (Q clock) connector to check DIGITAL INPUT 2 and 3 (Option 064 remains connected to DIGITAL INPUT 6).

11. Reduce the function generator amplitude to 0.5 volts peak-to-peak.

12. Vary the function generator offset from -2.0 to +2.0 volts and verify that the clock(s) signal (A10J7 Q CLK and A10J8 I CLK or A10J7 CLK) does not disappear. The AUTO level threshold places the threshold at one-half the peak-to-peak amplitude of the input signal.

    If the clock signal(s) remain active, the A10 Buffer frame is fully functional.

    If the clock signal(s) disappear for any offset, the AUTO level circuit or the clock buffer(s) in the A10 Buffer frame is(are) at fault.

Check 10 - Digital/Vector Baseband Control Signals/Power Supplies

This check is used to verify the integrity of the input and output signal paths between the 37 pin ribbon cable connector on the A8 Filter, A9 DAC/Switch or A10 Buffer frame and the source or destination of the signals. Note that the connectors are identical and any of the three frames can be connected to any of the three 37 pin connectors.

Note 

Refer to the block diagram figure for pin identification of the 37 pin Digital/Vector Baseband frame cable connector and the 40 pin ribbon cable connector that connects to the A17 Distribution assembly.

1. Using Table 8-24, check the signal path resistance between the ribbon cable connector and the indicated power supply test point. The resistance between the indicated power supply test point and the 37 pin frame connector pin should be 1 kΩ (due to a 1 kΩ resistor between the actual supply and the supply test point). The resistance between the ground test point and the 37 pin frame connector pins should be less than 50Ω.

If the power supply signal paths are correct, proceed with the next step.

If any supply signal path shows a problem, use the additional information in the table to isolate the problem to the cable between the Digital/Vector Baseband frames and the A17 Distribution assembly or to the path between the A17 assembly and the A18 Power Control assembly.

Table 8-24. Digital/Vector Baseband Subsystem Power Supplies

Frame Connector Pin	A17J7-	Source Test Point	Power Supply
13,14	13,11	A18TP4	+24 Vdc
12,31	15,14	A18TP5	+15 Vdc
15,32	9,12	A18TP8	+5 Vdc
34,35	8,6	A18TP3	-2 Vdc
17,18	5,3	A18TP9	-5 Vdc
36,37	4,2	A18TP6	-15 Vdc
1,10,11, 16,19,23, 24,25,26, 27,33	37,19,17, 7,1,30, 28,26,24, 22,10	A18TP13	Ground

2. The four signals in Table 8-25 are verified using Check 6 - Calibration Voltages/Service Voltmeter.

   If Check 6 passes, proceed with the next step.

   If the check fails, use an ohmmeter to check the continuity between the frame connector pin and the destination (A11J5).

   If there is continuity between the frame connector pin and the destination, proceed to BD6 to check The Analog to Digital Converter (ADC). If the ADC is working, the problem is in the Digital/Vector Baseband frame.

   If the continuity test shows an open (or a short to ground), troubleshoot the problem to determine if the problem is a cable or the A17 Distribution assembly.

Table 8-25. Digital/Vector Baseband Subsystem Diagnostic Signals

Frame Connector Pin	A17J7-	Destination or Source	Signal Name
4	31	A11J5-32	-ANALOG 6
22	32	A11J5-33	+ANALOG 6
3	33	A11J5-34	-ANALOG 5
21	34	A11J5-35	+ANALOG 5

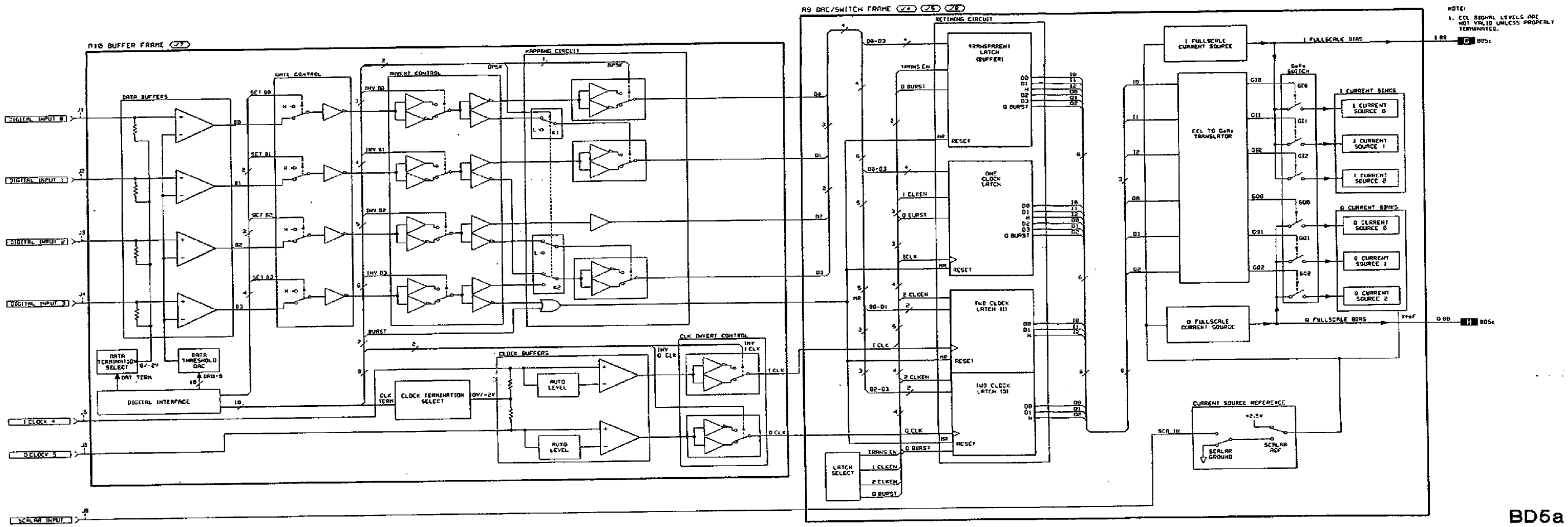
3. Use Table 8-26 to check for continuity between each signal and the A11J5 connector.

   If there is continuity between the frame connector pin and the source or destination signal, proceed to BD6 to check the Instrument Bus. A successful Instrument Bus test indicates that the information received by the appropriate frame is correct.

   If there is an open (or short to ground) on any signal line, isolate the problem to a cable or the A17 Distribution assembly.

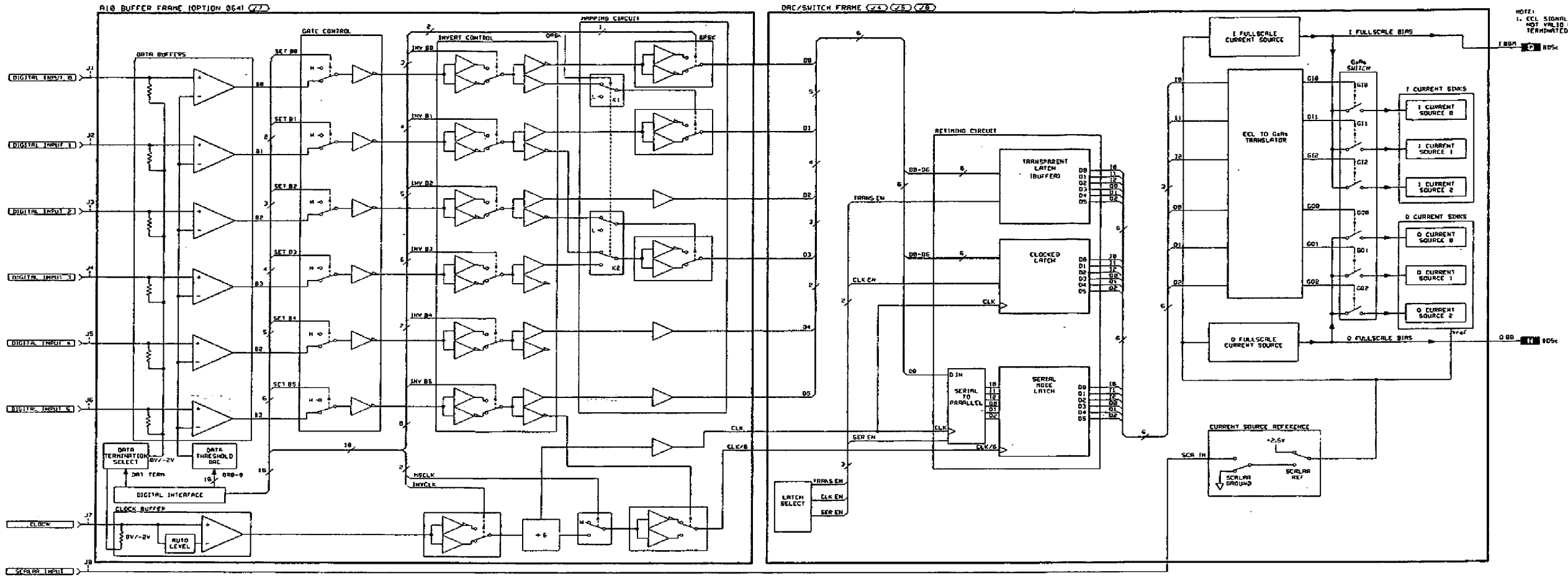
Table 8-26. Digital/Vector Baseband Subsystem Control Signals

Frame Connector Pin	A17J7-	Destination or Source	Signal Name
5	29	A11J5-41	XFR5
6	27	A11J5-26	XFR4
7	25	A11J5-24	XFR3
8	23	A11J5-16	NINT
28	20	A17U11-13	DATA OUT
30	16	A17U11-11	CLK



BD5a

Figure 8-10. BD5a P/O Digital/Vector Baseband Subsystem (Except Option 064)



BD5b

Figure 8-11. BD5b P/O Digital/Vector Baseband Subsystem (Option 064)

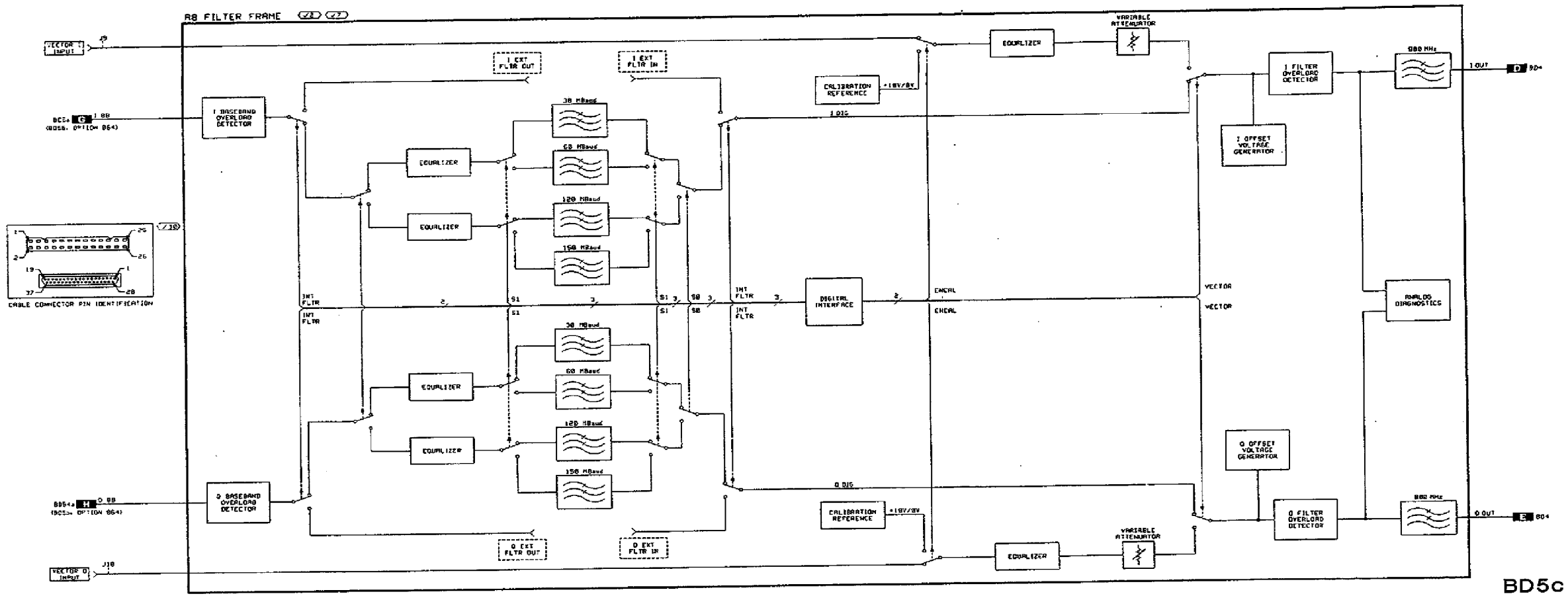


Figure 8-12. BD5c P/O Digital/Vector Baseband Subsystem

Service Sheet BD6

Digital Control Subsystem

References

Principles of Operation

The Digital Control Subsystem processes front panel and HP-IB inputs to the Vector Generator and sets the internal control signals as necessary for the operation of the instrument. The heart of the Digital Control Subsystem is a microprocessor that sends and receives data through serial interfaces to communicate with the other subsystems. In addition, a DUART (Dual Universal Asynchronous Receiver/Transmitter) is used to send data to the Local Oscillator Subsystem which contains its own local controller.

The Digital Control Subsystem also contains an Analog-to-Digital Converter (ADC) that is used during calibration and as a service voltmeter to measure voltages at critical nodes within the instrument.

The Digital Control Subsystem consists primarily of three assemblies:

A11 Microprocessor Assembly
A1A2 Keyboard Assembly
A1A3 Front Panel Interface Assembly

A11 Microprocessor Assembly

The A11 Microprocessor Assembly contains the circuits required to control the instrument and process the inputs from the front panel or HP-IB. The A11 Microprocessor Assembly consists of the following circuits:

- Clock Generator
- Power Up/Reset
- Microprocessor
- RAM
- ROM
- Address and Control Signal Decode and Bank Select
- Diagnostic Switches and Indicator Lamps
- A/D Converter
- System Timer
- Instrument Bus Interface
- Dual Universal Asynchronous Receiver/Transmitter (DUART)
- HP-IB Interface
- Keyboard Scanner
- Front Panel Driver

Clock Generator. All clocks are derived from a 16 MHz source (A11Y1). A clock divider divides this into several signals from 500 kHz to 8 MHz that clock the microprocessor and other circuits on the A11 Microprocessor assembly.

Power Up/Reset. This circuit buffers the Power Up/Reset signal generated by the A18 Power Control assembly when the instrument is turned on. The buffered output enables the RAM and enables the Digital Control Subsystem. When the instrument is turned on, this signal stays low momentarily to reset the microprocessor and other circuits on A11. The Digital Control Subsystem can also be reset by momentarily grounding A11TP6. This is normally done when running the instrument's built-in self-tests to begin the test.

Microprocessor. The microprocessor is a Motorola 6809 running at 2 MHz. It processes the user inputs and instructions in ROM to configure the instrument into a desired operating mode. It also uses the analog-to-digital converter during a self-calibration to optimize the performance of each subsystem. The microprocessor sends control data to the other subsystems of the instrument through the Instrument Bus Interface and the DUART (described below).

RAM. The RAM is divided into four "banks" of 2048 bytes each. The bank selected depends on the RAM bank select circuits and the address from the microprocessor. The addresses of three of the RAM banks overlap each other while the fourth bank is available regardless of the RAM bank selected. This enables the microprocessor to have 8 kbytes of RAM available while only using 4 kbytes of memory space. In normal operation banks 1 and 4 are available (bank 4 is always available).

The instrument state storage registers associated with the SAVE and RECALL keys are contained in bank 2. Output section data is stored in bank 3. These two banks are selected only when access to this data is required. The 4 kbytes of address space used by the RAM is at memory locations 0000H through 0FFFH of the microprocessor. Battery back-up circuits preserve the RAM contents when the power is turned off.

ROM. The ROM is also divided into banks - six banks of 32 kbytes each. Bank 1 is always available to the microprocessor and the other five banks share common addresses. The ROM bank select circuits and the address requested by the microprocessor determine which bank is selected. Bank 1 of the ROM occupies addresses 1080H through 7FFFH (slightly less than 32 kbytes are actually available). The other five banks overlap at addresses 8000H through FFFFH. There are three ROM ICs (A11U3, U4 and U5) with each IC containing two banks (64k per ROM).

Address and Control Signal Decode and Bank Select. A11U7 and U8 decode the address and control signals from the microprocessor and select the control signals for RAM, ROM, or I/O. They also decode bank select data, which is latched into the ICs from the microprocessor by A11U6.

The I/O decoding circuitry (A11U34 and U47) decodes the addresses from the microprocessor used to select I/O functions. These functions (including the display, keyboard, HP-IB and serial data interfaces, timer, diagnostic switch and analog-to-digital converter) use memory addresses 1000H through 107FH of the microprocessor. Many of the I/O addresses are not fully decoded, resulting in multiple addresses for some functions.

Diagnostic Switches and Indicator Lamps. The A11 Microprocessor assembly has a four-section switch (A11S1) and 8 indicators (A11DS2 and DS3) that are used for troubleshooting. The switch setting selects various built-in self-tests to check the operation of the Digital Control Subsystem. The indicators indicate whether the selected test passed or failed and gives specific failure data for some tests.

Analog-to-Digital Converter. The microprocessor controls the analog-to-digital converter used to measure internal circuit nodes during calibration and troubleshooting. Two analog multiplexers (A11U17 and U18) select the analog input from one of the other subsystems.

The selected signal is routed to an input amplifier (A11U25, which must have very low noise) and then to a triple-slope integrator (A11U15, U23 and U24).

The microprocessor starts the conversion and the 16-bit system timer (A11U30) counts the clock output from A11U22. At the end of the conversion this output is stopped and the converter sends an EOC signal back to the microprocessor. The microprocessor then reads the output of the timer, completing the conversion cycle. A 17th bit is available to the microprocessor on A11U35 for better resolution.

System Timer. The system timer performs the following functions:

1. Provides a 50 ms interrupt to the microprocessor for system timing. This interrupt is input to the 6809 on the IRQ interrupt line. It is used by the firmware for various timed functions.

2. Counts the clock output of the analog-to-digital converter. This function is described above in the discussion of the analog-to-digital Converter.

3. Generates a baud rate clock for the DUART. This clock enables the DUART to perform serial communications at 19.2k baud.

4. Generates a pseudo-random bit sequence (PRBS) clock. This clock is connected to the Non-maskable Interrupt input of the microprocessor. This clock is used by special function 7.1 to change the digital modulation state randomly. The random settings produce a "test pattern" which places the Vector Generator output into each state of the selected digital modulation mode without the need for external inputs.

Instrument Bus Interface. The instrument bus interface enables communication with the other subsystems of the instrument (except for the Local Oscillator Subsystem). This is a bit serial interface and can be used both to send and to receive data on the bus. Only the FM Subsystem (FM calibration counter) sends data back to the microprocessor.

The interface addresses each deck or frame with one of the XFR0-7 lines. SER CLK clocks each data bit out on the bus; the number of bits sent varies depending on the destination. After the entire bit stream has been sent, the interface activates the XFR line latching the data into the shift registers at the destination.

The LOAD signal is sent out when data is required from the FM Subsystem. It directs the FM Subsystem to latch the data for serial transmission. An interrupt line allows a subsystem to request service from the microprocessor. Upon receiving an interrupt, the processor polls each subsystem to find which subsystem(s) require service and then takes the necessary action.

Dual Universal Asynchronous Receiver Transmitter (DUART). This serial interface IC (A11U27) has two ports - one to communicate with the Local Oscillator Subsystem and one designated as the rear panel "Vector System Interface". The DUART sends data to the Local Oscillator Subsystem at 19.2 kbaud rate using TTL logic levels. Data is sent as needed while data is received via interrupts. This enables the microprocessor to receive asynchronous messages when it is too busy to poll the IC to see if data has been received.

HP-IB Interface. The HP-IB controller IC (A11U31) is addressed in the I/O space of the microprocessor. The HP-IB controller notifies the microprocessor that data has been received over HP-IB by issuing an interrupt. Each of these interrupts goes to the FIRQ input of the microprocessor. The HP-IB controller IC is the only source of interrupts on the FIRQ input, enabling the microprocessor to disable HP-IB interrupts simply by masking FIRQ.

Keyboard Scanner. An 8041 microcontroller (A11U29) acts as a keyboard scanner. This scanner sends data to the microprocessor whenever the microprocessor asks for information. The 8041 processes the data from the rotary pulse generator (RPG) knob as well as the keyboard.

Front Panel Driver. The microprocessor writes data to the alphanumeric (LCD) displays and the front panel indicators using a bit serial manner using a peripheral interface adapter (A11U28). All display data is latched at the destination so there is no need to update the display images.

A1A2 Keyboard Assembly

The keyboard contains all front panel keys and some of the front panel indicators. There is no active circuitry on this assembly (the IC package mounted on the assembly is a resistor array).

The keys are arranged in an 8 by 8 matrix. The 8 rows are driven by the keyboard scanner on the A11 Microprocessor assembly and the 8 columns are read by the scanner. Initially, the column signals are pulled up to +5V by the keyboard scanner.

If no key is pressed, the row scan signals are not passed to the corresponding column signals and the scanner detects a constant +5V from the columns (since they are all open circuit). Pressing a key connects the corresponding row and column on the keyboard. When that row signal is changed by the keyboard scanner, the column signal also changes. The scanner then decodes which key is pressed since each key has a distinct row and column associated with it.

The indicators on the front panel are driven by latches on the A1A3 Front Panel Interface Assembly.

A1A3 Front Panel Interface Assembly

This assembly contains the circuits controlling the alphanumeric (LCD) displays and the front panel indicators. Some of these indicators are mounted directly on this assembly. The assembly also passes signals between the keyboard scanner and the keyboard assembly.

Six serial input/parallel output shift registers serve as drivers for the indicator lamps. These registers latch data from the microprocessors and drive the lamps on both this assembly and the keyboard assembly. The microprocessor sends serial data to the latches using three lines - a data line, a clock line, and a load shift register line.

The control circuits for the alphanumeric displays consist of a one-shot multivibrator that generates clock pulses to the display drivers, a +6.3V voltage regulator, and buffers for the control to the display drivers. The display drivers are built into the alphanumeric displays.

The control signals to the display drivers are not TTL logic levels. These signals are buffered by open collector gates pulled up to +6.3V.

Bias voltages for the displays control the viewing angle. The +15 volt supply provides the bias voltage and a thermistor on the A1A3 Front Panel Interface assembly lowers the bias voltage when there is a danger of overheating. The thermistor also helps to keep the viewing angle constant over temperature.

Troubleshooting

It is assumed that the troubleshooting information on Service Sheet BD1 was used to isolate a malfunction to the Digital Control Subsystem. The following information will aid in isolating the defective assembly or component.

The troubleshooting procedure is broken into thirteen checks as follows:

Check 1 - A11 Power Supplies
Check 2 - Power Up/Down Circuit
Check 3 - Clock Generator
Check 4 - ROM Self-Test
Check 5 - RAM Self-Tests
Check 6 - Battery Backup Self-Tests
Check 7 - Instrument Bus Self-Test
Check 8 - DUART Self-Test
Check 9 - Front Panel Tests
Check 10 - Display Signal Signature Analysis
Check 11 - A1A3 Front Panel Interface Assembly
Check 12 - Keyboard and Keyboard Scanner
Check 13 - ADC Self-Tests

Test Equipment

Digital Voltmeter ..... HP 3456A
Oscilloscope ..... HP 54201A
Signature Analyzer ..... HP 5005B

Caution 

The A11 Microprocessor Assembly contains a number of extremely static-sensitive parts. Be sure to wear a grounded wrist strap at all times when troubleshooting this assembly.

Check 1 - A11 Power Supplies

1. Remove the top cover from the instrument.
2. Remove the three recessed screws from A11 that are near the side of the instrument.
3. Raise the assembly until it is vertical and fasten it to the screw on the transformer with an elastic cord. This will hold the assembly in place.
4. Power on the instrument and measure the +15V, +5V, and -5V supplies according to the following table. If any of these supplies are out of tolerance, go to BD7 and troubleshoot the power supply.

Table 8-27. A11 Power Supply Test Limits

Power Supply	Test Point	Minimum Voltage	Maximum Voltage
+15V	A11TP11	+14.5	+15.5
+5V	A11TP2	+4.8	+5.2
-15V	A11TP9	-15.5	-14.5

Check 2 - Power Up/Down Circuit

1. Using the oscilloscope, check the voltage at A11U19 pin 6. The signal should be a steady dc level greater than +3.5 volts.

   If the signal is correct, proceed with the next check.

   If the signal is less than +3.5 volts or is oscillating with the lowest level below +0.7 volts and the peak level greater than +1.0 volts, proceed with the next step.

2. Check the voltage at U19-9 and U19-10. These signals are the inputs to the power up/down circuit and should both be at a high level for normal operation.

   If both signals are a steady dc level greater than +3.5 volts, A11U19 is at fault.

   If the voltages at U19 pins 9 and 10 are not greater than +3.5 volts or are oscillating, proceed to BD7 to check the power-up circuit on the A18 Power Control assembly.

Check 3 - Clock Generator

1. Connect the oscilloscope to U46-1. This is the master clock for the Digital Control Subsystem. The signal should be a distorted square wave at a frequency of 16 MHz (period = 62.5 ns).

   If the frequency is correct, proceed with the next step.

   If the signal is not present, A11Y1 is at fault.

2. With 16 MHz present at U46 pin 1, check for clock signals according to the following table (these signals are all distorted square waves):

   If all clock signals are present, proceed with the next check.

   If any or all of the signals are incorrect, A11U46 is at fault.

Table 8-28. A11U46 Clock Generator Outputs

Test Point A11U46-	Frequency	Period
pin 3	8 MHz	125 ±25 ns
pin 4	4 MHz	250 ±50 ns
pin 5	2 MHz	500 ±100 ns
pin 6	1 MHz	1.0 ±0.2 μs
pin 11	500 kHz	2.0 ±0.4 μs

Vector Generator Self-Tests

The Vector Generator has a number of self-tests that help isolate problems in the Digital Control Subsystem. The procedure for executing each test is the same. The procedure is as follows:

a. Power on the instrument.

b. Set the four-section service switch on the A11 Microprocessor Assembly to the correct setting for the desired test. The Least Significant Bit (LSB) of the switch will always be nearest the edge of the board. The Most Significant Bit (MSB) is towards the center of the board. To set the switch to a "0" or a "1", depress the switch in the direction of the marking on the board corresponding to the desired setting.

c. Ground A11TP6 (RESET) **momentarily** (do not leave A11TP6 grounded). Grounding this test point will reset the microprocessor. Removing the ground will start the self-test.

d. At the beginning of the self-test, each of the eight service indicators on A11 (DS2A-D and DS3A-D) will light one at a time. Watch this pattern to ensure that all service indicators are working properly. The self-test results will be interpreted incorrectly if there is a defective service indicator.

e. After the preceding "walking one" pattern is displayed, the indicators will briefly display the service switch setting and then the test will begin.

The time required to run each test depends on the test. The results will appear almost instantaneously for some tests while other tests will take some time. A few of the tests requires the service switch be set to other positions while the test is running.

Each test will repeat indefinitely, but without repeating the "walking one" pattern or the display of the switch setting.

The test results will appear on the service indicators. Each service indicator has a different meaning for each test and some tests do not use all the indicators. In some tests the indicators will not be used, the test merely sets the instrument to a state where certain readings can be taken. In other tests all eight indicators will light upon successful completion of the test.

In the tests using the service indicators, an indicator that does not light denotes a failed portion of the test. Once a portion of a test fails, the indicator will remain unlit even if subsequent repeats or the test pass. This ensures that intermittent problems are reported. Restarting the test will reset this feature.

To run another self-test, first set the service switch to the new setting, then briefly ground A11TP6 again. It is not necessary to turn off the instrument.

Check 4 - ROM Self-Test

Set the service switch to 0010 and execute the self-test using the directions given above. This test is used to check check the integrity of the Vector Generator read-only memory (ROM).

If all the indicators light, the ROM is functional. Proceed with the next check.

If one or more indicators do not light, one of the ROMs was found to be bad. Use the following table to determine which IC to replace. The LSB of the service indicators is the rightmost one towards the center of the board.

Note 

If one of the RAM Self-tests (Check 5) fails as well, A11U6 may be at fault.

Table 8-29. ROM Self-Test Results

Unlit Service Indicator	Faulty ROM
Indicator 0 or 1	A11U5
Indicator 2 or 3	A11U4
Indicator 4 or 5	A11U3

Check 5 - RAM Self-Tests

1. Set the service switch to 1010 and start the self-test using the procedure given above. This test will do a quick check of the Vector Generator Random-access Memory (RAM). This test is run automatically each time the instrument is powered on.

   If the test passes (all service indicators lit), go on to the next step.

   If any or all indicators do not light, the RAM IC (A11U2) is probably at fault.

2. Set the service switch to 0011. Briefly touch A11TP6 to ground to reset the microprocessor and run the self-test. This is a more thorough test of the RAM.

   If the test passes (all indicators lit), proceed with the next check.

   If this test fails (not all service indicators lit), the RAM IC (A11U2) is probably at fault. If the ROM self-test fails along with one or both of the RAM self-tests, A11U6 may be at fault. This IC affects addressing of both RAM and ROM.

Check 6 - Battery Backup Self-Tests

1. Set the service switch to 0000 and run the self-test. This test checks the the battery which maintains the contents of RAM when the power is turned off. This tests should not be run unless the RAM self-test (previous check) has passed.

   If the test passes (all indicators lit), proceed with the next step.

   If the test fails (not all service indicators lit), the the RAM (A11U2) or the bank select chips (A11U6 and U7) are at fault.

2. Turn off the power to the instrument and set the service switch to 0001.

3. Wait about 20 seconds, then turn the power back on.

4. Reset the microprocessor by briefly grounding A11TP6. The self test is now reading the patterns written to RAM in the previous test.

   If the test passes, proceed with the next check.

   If the test fails (not all service indicators lit), the battery on A11 is at fault.

Check 7 - Instrument Bus Self-Test

1. With the instrument set to STANDBY, remove W14 (the 50-pin ribbon cable from A11 to the A17 Distribution assembly) from A11J5.

2. Power up the instrument by grounding A18TP17. This is necessary because removing W14 disconnects the front panel line switch from the power supply.

3. Connect a jumper wire from A11TP14, SER DATA OUT, to A11TP17, SER IN. This will enable the microprocessor to read back what is sent out on SER DATA OUT.

4. Set the service switch to 0111 and start the self-test by momentarily grounding A11TP6. This test will send out four different data patterns on the DATA OUT line and verify that the same pattern is returned on the DATA IN line. The test also toggles the LOAD line and transfer clocks (XFR0-7).

   If the test passes (all service indicators lit) proceed with the next step.

   If the test does not pass (one or more indicators not lit), the Instrument Bus Driver circuits on A11 is at fault.

5. Check the LOAD line at A11U48 pin 14. This line is used when the microprocessor receives data from the FM Subsystem. There should be a signal close to a square wave (the duty cycle may not be exactly 50%) with a period of about 400 to 450 μs.

   If the signal is correct, proceed with the next step.

   If the signal is not correct, the Instrument Bus Driver circuit on the A11 Microprocessor assembly is at fault.

6. Check the lines XFR0-7 with an oscilloscope according to the following table. They should have the same period as the LOAD line (about 400 to 450 μs) but with a low level pulse having a very short duty cycle - around 5 μs.

   If the signals are correct, proceed with the next check.

   If any or all signals are not correct, the Instrument Bus Driver circuit on the A11 Microprocessor assembly is at fault.

Table 8-30. XFR0-7 Instrument Data Transfer Clocks

XFR Line	A11U50-
XFR0	pin 18
XFR1	pin 17
XFR2	pin 16
XFR3	pin 15
XFR4	pin 14
XFR5	pin 13
XFR6	pin 12
XFR7	pin 11

Check 8 - DUART Self-Test

1. Set the instrument to STANDBY and remove W14 (the 50-pin ribbon cable between the A11 Microprocessor and A17 Distribution assemblies) from A11 J5.

2. Power on the instrument by grounding A18TP17. This is required because removing W14 disconnects the front panel line switch from the power supply.

3. Connect a jumper wire from A11TP15, TXA, to A11TP16, RXB. This connects the output of channel A to the input of channel A.

4. Connect a jumper wire from A11TP18, TXB, to A11TP19, RXB. This connects the output of channel B to the input of channel B.

5. Set the service switch to 0110 and momentarily ground A11TP6 to start the test. The test will check that both channels work by using the input of the channel to read the pattern transmitted at the output of the same channel. channel A is used to send information to the local controller in the Local Oscillator Subsystem. Channel B (TXB and RXB) goes to the System Interface (unused at this time).

   If the test passes (all service indicators lit) the DUART is function correctly. Reconnect W14 and proceed with the next check.

   If the test fails, the fault is in the DUART or the associated circuitry.

Check 9 - Front Panel Tests

1. Set the service switch to 0100 and start the self-test. Two different patterns will scroll across the alphanumeric display - the first from left to right and the second from right to left. Verify that each display position shows the proper pattern without faintness or fuzziness.

   After the patterns are scrolled across the display, the indicators will begin to light in groups. Each column of indicators in the keyboard portion of the front panel will light in a left to right sequence. This is followed by three different groups of indicators on the connector portion of the front panel lighting sequentially. Once this is complete, the entire test will start again.

If the pattern on the alphanumeric displays is correct and all indicators light at least once during the test, proceed with Check 12 to verify the Keyboard.

If the alphanumeric displays are not working correctly or any indicators do not light, proceed with the next check.

Note

All the signals to the two alphanumeric displays are in parallel except for INAR and INAL. If one display is working properly and the other is not, go to Check 11 - A1A3 Front Panel Interface Assembly. Check these two signals with the signature analyzer. If they are both correct, then the problem is in the faulty display.

If only one or two indicators do not light, try replacing the indicators. If more than two do not light, the problem is not the indicators themselves.

Check 10 - Display Signal Signature Analysis

A11U28 is a PIA (Peripheral Interface Adapter) that writes data serially to the front panel indicator lamps and alphanumeric displays. This test verifies that the signals from A11U28 are reaching the A1A3 Front Panel Interface assembly. A1A3 is behind the keyboard so the keyboard must be removed to perform this test.

1. Turn the instrument off.
2. Remove the six small screws at the bottom of the keyboard. They are just above the BNC connectors at the bottom of the front panel and are spaced about three inches apart.
3. Gently pull down the keyboard assembly and detach it from the front panel.
4. Detach the small ribbon cable from the rotary pulse generator to the A1A3 Front Panel Interface assembly at A1A3J1.
5. Detach the large ribbon cable from the connector on the A1A2 keyboard and set the keyboard assembly aside.
6. Detach the two ribbon cables from A1A3 to the alphanumeric displays at A1A3J2 and J5.
7. Turn the instrument back on.

8. Set the service switch on the microprocessor assembly to 1100 and short A11TP6 to start the test.

9. Set up the signature analyzer as indicated in Table 8-31.

Table 8-31. Front Panel Signature Analysis Setup

SA Probe	Clock Edge	A11 Test Point
Clock	Falling	TP20 (SA CLK)
Start	Rising	TP3 (SAST2)
Stop	Falling	TP3 (SAST2)
Ground	-----	TP21 (GND)

10. Use the signature analyzer to check the front panel interface assembly signatures according to the signatures indicated in Table 8-32. Use the test points on A1A3 for this part of the check.

    If all the signatures are correct proceed with the next check.

    If any or all of the signatures are incorrect, proceed with the next step.

Table 8-32. A1A3 Front Panel Interface Assembly Signatures

Signal	A1A3 Test Point	A11 Test Point	Signature
DSPPWO	J4 pin 31	U28 pin 10	31CA
DSPSYNC	J4 pin 30	U28 pin 11	FCUA
INAR	J4 pin 29	U28 pin 12	AP93
KBRD	J4 pin 28	U28 pin 13	9795
SDAT	J4 pin 25	U28 pin 15	H559
INAL	J4 pin 24	U28 pin 16	0H83
ISA	J4 pin 23	U28 pin 17	A8FC
RESET	J4 pin 22	U28 pin 19	2C79
SCLK	J4 pin 26	U35 pin 12	95UU

11. Turn the instrument off and remove the cable from A11J1 (W13). This is the cable from A11 to A1A3.

12. Power up the instrument by grounding A18TP17 (A18 is the A18 Power Control assembly at the rear of the instrument). This is necessary because removing W13 disconnects the front panel switch.

13. Run self-test 1100 again.

14. Check the signatures indicated in Table 8-32 again but use the test points for A11. These test points are all on A11U28 except for SCLK, which is on A11U35.

    If all the signatures are correct, the fault is in W13 or the A1A3 Front Panel Interface assembly. Proceed with the next check to verify the A1A3 Front Panel Interface assembly.

    If any of the signatures are incorrect on A11, the front panel driver (A11U28) or its inputs are at fault.

Check 11 - A1A3 Front Panel Interface Assembly

1. Remove power from the instrument and reattach W13 to A11J1.

2. Turn the instrument on (the front panel switch should work with W13 reconnected).

3. The power supplies to A1A3 must be verified first. Check the +5V supply at A1A3J4 pins 2 and 3 and check the +15V supply at A1A3J4 pin 34.

   If both voltages are present, proceed with the next step.

   If either of these voltages is not present, check the +5V and +15V supplies on the A18 Power Control assembly. If the voltages are present on A18, check the two cables supplying the voltage to A1A3 - W55 from the A17 Distribution assembly to the A11 Microprocessor Assembly and W13 from A11 to A1A3.

4. Measure the voltage at U1 pin 2. This is the supply voltage for the alphanumeric displays; it should be about +6.3 volts.

   If the voltage is correct, proceed with the next step.

   If the voltage is not correct, A1A3U1 is at fault.

5. Set up the signature analyzer as indicated by Table 8-31.

6. Verify the signatures given in Table 8-33. These are the drive signals to the alphanumeric display latches (the latches are not part of A1A3 but are built into the displays themselves). A1A3R12 is a resistor array. As viewed from the front of the instrument, it is the single row of 10 pins between U7 and J5.

   If the signatures are correct and both displays work correctly, proceed with the next step.

   If the signatures are correct but one or both of the displays were not working properly, replace the faulty display(s).

   If any of the signatures are incorrect, the A1A3 Front Panel Interface is at fault.

Table 8-33. Alphanumeric Display Drive Signatures

Signal	Test Point A1A3R1	Signature
INAL	pin 3	2U18
ϕ2	pin 5	3921
ISA	pin 6	8A50
INAR	pin 7	8F08
SYNC	pin 8	P961
PWO	pin 9	1321
ϕ1	pin 10	09P2

7. With the signature analyzer set up as indicated in Table 8-31, check the signatures at pins 1 through 7 and 15 of A1A3U2, U3, U4, U5, U6 and U10. The signatures should all be C930. Note that pin 15 of A1A3U6 may be difficult to probe.

   If all of the signatures are correct and all indicators light, proceed with the next step.

   If all signatures are correct and one or more indicators do not light, the indicator or the A1A3 Front Panel Interface assembly is at fault.

   If any or all of the signatures are incorrect, the A1A3 Front Panel Interface is at fault.

Check 12 - Keyboard and Keyboard Scanner

This test checks the operation of the front panel keyboard. It should be run after verifying the performance of the front panel alphanumeric display. If the front panel is disassembled, first reattach the front panel by reversing the procedure in Check 10. Be sure to reattach all the cables, including the ones to the alphanumeric displays.

1. Set the service switch to 0101 and run the self-test by briefly grounding A11TP6 to reset the microprocessor.

2. Depress each key on the front panel one at a time. When each key is pressed, the alphanumeric display should show the name of the key. When the KNOB is turned, the display will show the direction of rotation (CW or CCW). If a key has an indicator lamp, it will not light during this test.

   If all keys show the proper key name or direction of rotation, the front panel is working correctly.

   If one or more keys does not work, the operation of the keyboard scanner (A11U29) must be checked. Proceed with the next step.

3. Set the line switch to STANDBY.

4. Remove the cable to A1A3 (W13) from A11J1.

5. Power on the instrument by grounding A18TP17. This is necessary because removing W13 disconnects the front panel switch.

6. Making sure that the self-test (0101) is still running, use an oscilloscope to check pins 1 through 8 of A11R44. These are the outputs of the keyboard scanner and should all show pulses. Pins 1 through 7 will show positive-going pulses with an amplitude of about 100 mV. Pin 8 will show negative-going pulses with a slightly lower amplitude. The pulses are not regular and may be difficult to trigger on.

   If pulses are present on all pins, the problem is in the keyboard itself or the connecting cables between A11 and the A1A2 keyboard.

   If any of the pins 1 through 8 on R44 fail to show pulse activity, A11U29, U26 or R44 or the related circuitry is at fault.

Note 

There are two cables connecting A11 and the keyboard - one from A11 to the A1A3 front panel interface (W13) and one from A1A3 to the keyboard (W12). A1A3 is used only as an interconnect path to the keyboard and contains no circuitry related to the operation of the keyboard.

Check 13 - ADC Self-Tests

1. Set the service switch to 1000 and start the self-test. The ADC self-test makes three conversions and displays the results as three four digit hexadecimal numbers on the front panel LCDs. The first two typically vary by no more than one count; the third by no more than two counts.

   If the test passes (all indicators lit) and the displayed values are stable, proceed with the next step.

   If any service indicator is not lit, proceed with the next step.

   If the displayed numbers are not stable, A11U24, U25, C4 or the related circuitry is at fault.

2. Set the line switch to STANDBY.

3. Remove W14 (the 50-pin cable from A11 to the A17 Distribution Assembly) from A11J5.

4. Power on the instrument by grounding TP17 on the A18 Power Control assembly. This is necessary because removing W14 disconnects the front panel switch from the power supply.

5. Set the service switch to 1011 and run the self-test. The self-test will be used to check each channel in the ADC's input multiplexer.

6. Change the service switch setting to 0000. **Do not** reset the microprocessor (that is, do not ground A11TP6) for the remainder of this check.

7. Check the voltage at A11U17-8 and A11U18-8. The voltage at both pins should be 0 ±0.2 Vdc.

   If the voltages are correct, proceed with the next step.

   If either or both voltages are incorrect, the associated multiplexer (A11U17 or U18) is at fault.

8. Change the service switch setting to 0111. **Do not** reset the microprocessor.

9. Check the voltage at A11U17-8 and A11U18-8. The voltage at A11U17-8 should be +10.0 ±0.2 Vdc and the voltage at A11U18-8 should be 0 ±0.2 Vdc.

If both voltages are correct, proceed with the next step.

If either or both voltages are incorrect, the associated multiplexer (A11U17 or U18) is at fault.

10. Use the switch settings indicated in Table 8-34 to check the remaining channels of each multiplexer. **Do not** reset the microprocessor (that is, do not ground A11TP6) for each multiplexer channel test. Test each channel as follows:

    a. Connect the oscilloscope probe to the output of multiplexer U17 (A11U17 pin 8).

    d. Set the service switch to the setting indicated in the table.

    e. Connect A11TP11 (+15V) to the indicated A17 input and verify that the oscilloscope displays a +15 volt signal.

    f. Disconnect A11TP11 from the input and connect A11TP9 (-15V). The oscilloscope should show -15 Vdc.

    g. Reconnect the oscilloscope to A11U18-8.

    h. Connect A11TP11 (+15V) to the indicated A11U18 input and very that the oscilloscope displays a +15 volt signal.

    i. Disconnect A11TP11 from the A11U18 input and connect A11TP9 (-15V) to the A11U18 input. The oscilloscope should show -15 Vdc.

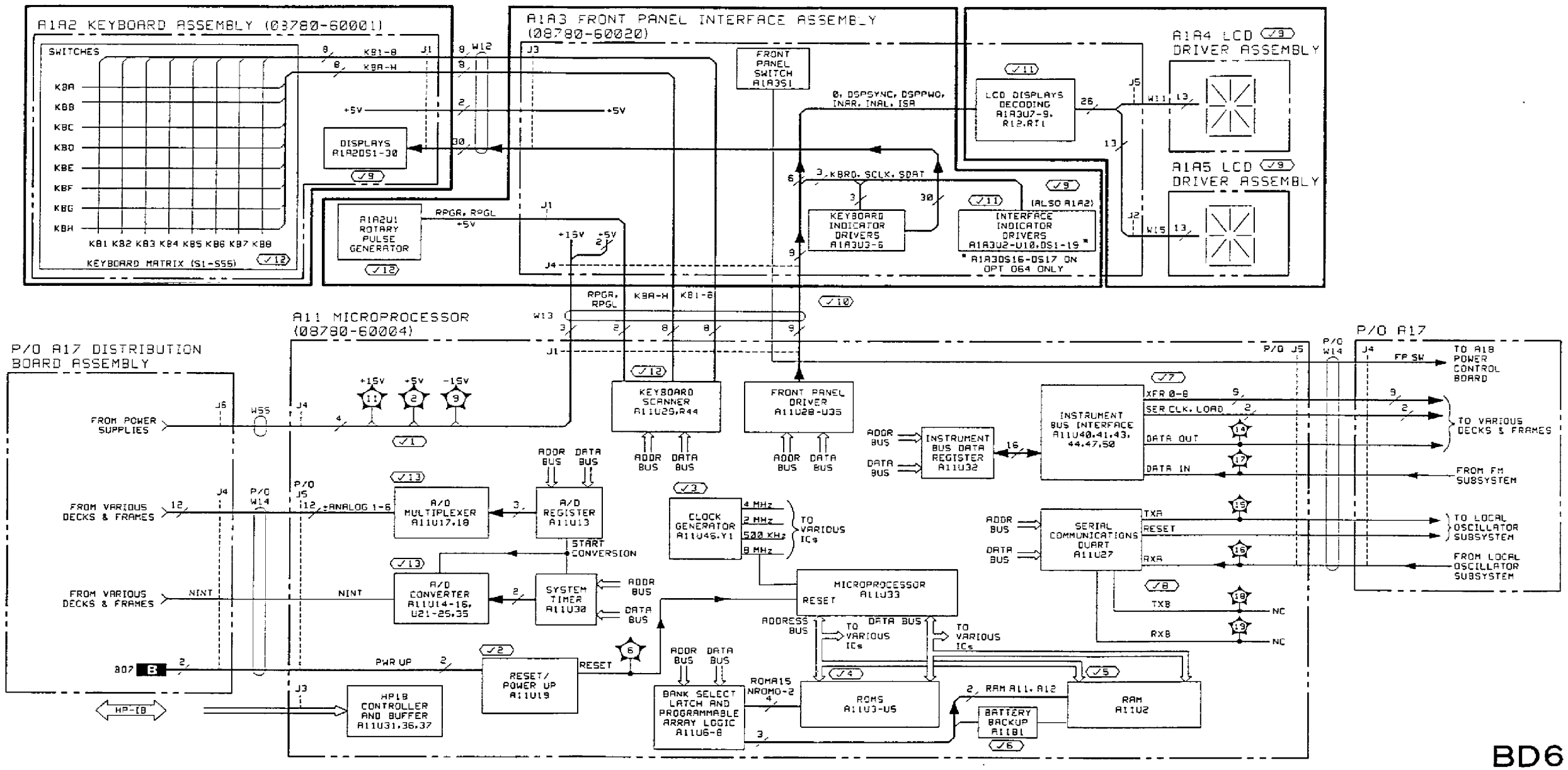
    j. Repeat this procedure for each switch setting and indicated multiplexer inputs.

    If all channels work, the ADC multiplexers are working.

    If any or all channels are not working, replace the appropriate multiplexer (A11U17 or U18).

Table 8-34. ADC Multiplexer Test Points

Switch Setting	Input to Test A11U17 pin 8	Input to Test A11U18 pin 8
0001	A11U17 pin 5	A11U18 pin 5
0010	A11U17 pin 6	A11U18 pin 6
0011	A11U17 pin 7	A11U18 pin 7
0100	A11U17 pin 12	A11U18 pin 12
0101	A11U17 pin 11	A11U18 pin 11
0110	A11U17 pin 10	A11U18 pin 10



BD6

Figure 8-13. BD6 Digital Control Subsystem

Service Sheet BD7

Power Supply Subsystem

References

Principles of Operation

The power supply of the HP 8780A Vector Signal Generator is located on two assemblies with some parts mounted on the A19 rear panel assembly. The two boards are the A17 Distribution assembly and the A18 Power Control assembly. The timebase oscillator is also part of the Power Supply Subsystem and most of the support circuitry can be found on the A18 Power Control assembly.

The parts of the power supply on the rear panel assembly are the line module, transformer, rectifier bracket with two diode bridges, heat sink with five power FETs mounted which connect to the A17 Distribution assembly, fan, time base switch, and various cables which route power and control signals to the decks and frames.

The A17 Distribution assembly has a minimum of active parts and contains all of the high current circuitry necessary for rectification, regulation, and protection. It also routes power and control signals to several connectors on the board. Various cable assemblies deliver the power and control signals from these connectors to the decks and frames of the Vector Generator.

The A18 Power Control assembly has all the low current circuitry necessary to drive the six power supply regulators. The six regulators control the following power supply voltages:

+24 Vdc
+15 Vdc
+5 Vdc
-2 Vdc
-5 Vdc
-15 Vdc

The A18 Power Control assembly also has circuitry to power the 10 MHz reference oscillator and to detect the status (warm or cold) of the reference oscillator oven. An interrupt is generated to notify the microprocessor when the oven is cold.

The 10 MHz TIMEBASE INT/EXT switch on the rear panel of the Vector Generator is routed to the A18 Power Control assembly via the A17 Distribution assembly. This switch is used to turn off the reference oscillator when an external 5 or 10 MHz frequency reference is used in order to prevent spurs from the slight difference in frequency between the external reference frequency and the reference oscillator frequency.

The A18 Power Control assembly also contains a circuit to split the 10 MHz reference signal in order to route this signal to both the rear panel connector and the Local Oscillator Subsystem.

The Power Supply Subsystem is divided into Power Supply Circuitry and Reference Oscillator Support Circuitry. Each is discussed in detail below.

Power Supplies

Auxiliary Supplies. Several support circuits provide bias and offset voltages to other circuitry on the A18 Power Control assembly. These are the +32V, +10V, -3V and -10V auxiliary supplies (Service Sheet A18b, functional block H).

A18VR8, R20, and C30 provide a -3V supply to the operational amplifiers that control the +24V and +15V regulators. This negative bias is required because otherwise it would be impossible to turn the positive voltage regulators completely off (0 Vdc).

A18VR5, R17, R19, and Q1 provide a +10V supply to the operational amplifiers that control the negative voltage regulators for the same reason as stated above (to turn the supplies completely off). They also supply +10V as an offset voltage in the foldback circuitry of the positive voltage regulators. This will be discussed later in the section on regulation.

A18VR6, R18, R21, and Q2 provide -10V as an offset voltage in the foldback circuitry of the negative voltage regulators. They also supply the negative voltage to the operational amplifier that regulates +5 Vdc.

A18VR27, R502, C44, and Q4 provide a +32V supply to the operational amplifiers controlling the +24V and +15V regulators. C44 provides extra decoupling of the unregulated +24V supply to ensure the spectral purity of the time base oscillator.

Status Indicators. A visual indication of the status of the supplies is provided by A18DS1 and DS2, the four segment LED arrays (Service Sheet A18b, functional block L): DS1a (+24V to reference oscillator oven), DS1b (+5V), DS1c (+24V), DS1d (+15V), DS2b (-2V), DS2c (-5V), DS2d (-15V). DS2a (Service Sheet A18b, functional block G) is the oven warm indicator.

Voltage Reference and Power Up Circuitry. The circuitry that provides reference voltages for the regulators at power up is located on the A18 Power Control assembly (Service Sheet A18b, functional block I). All reference voltages are derived from A18U7, which provides a fixed +2.5V reference. A18U2A buffers this reference to the +24V regulator. A18U2B buffers the reference to all other regulators.

When the LINE switch is set to STANDBY, A18R4, R202h, and R510 pull up the base of A18Q5, saturating it. Its collector voltage drops to around +0.2 volt and closes relay A18K1, shorting the input of A18U2A to ground. Thus the reference voltage to all supplies is 0V and all supplies are regulating to 0V. When the LINE switch is set to ON or when A18TP17 is shorted to ground, A18Q5 is cut off and the relay opens. This allows the +2.5V output of A18U7 to be applied to the input of A18U2A. All supplies can then regulate to the appropriate voltages.

When the relay opens, A18C2 charges up through A18R1 and R2, so VREF1 (the output of A18U2A) rises exponentially to +2.5V and the +24V supply follows. A18U12A compares the +24V supply minus 17.3V (the sum of zener diodes A18VR3 and VR9) applied to the non-inverting input to the +3.9V of A18VR4. While this input voltage (around +6.7V after power-up) is below the 3.9V zener voltage, VREF2 (the output of A18U2B) is low. As soon as this input goes above the 3.9V zener voltage, the input of A18U2B rises exponentially through A18R7 and C37 and all the other voltage regulators follow VREF2 (+2.5V). If the +24V regulator fails, VREF2 goes low and the other supplies will shut down. This prevents overheating of the instrument since the fan uses the +24V supply.

Thermal shutdown can also occur when the instrument overheats and causes the resistance of thermistor A17RT1 to drop. This lowers the voltage on the THSD line at the input to A18U12B. If this voltage falls below the voltage across resistor A18R206c, the open collector output of A18U12B will go low. Relay A18K1 will close and thus turn off the supplies.

Power Up and Down signals are provided to the microprocessor by the power supply. Comparator A18U12C generates these signals by comparing the +5V supply to the 4.7V zener voltage of A18VR7. This signal will also go low if the +24V supply fails or if thermal shutdown through A18U12B occurs.

Voltage Regulation and Current Foldback Circuitry. The +24V, +15V, +5V, -2V, -5V, and -15V regulator and current foldback circuits all work similarly (Service Sheets A17a and A18a). Only the operation of the +5V circuitry will be discussed. The operation of the other supplies can then be inferred from this discussion and by comparing the +5V schematic to the schematics of the other supplies. Refer to Figure 8-14 and the schematics for the following discussion.

The +5V supply (Service Sheet A18a, functional block C) operates linearly in one of two modes, regulation or foldback. A18U5A is the foldback amplifier and A18U5B is the regulation amplifier. The outputs of these operational amplifiers are ORed together by diodes A18CR22E and CR22F. The output of the controlling amplifier will be at a lower voltage than the output of the other amplifier. Thus, the diode at the output of the amplifier which is not controlling will be reverse biased and that amplifier will not influence the output voltage of the controlling amplifier. The controlling voltage is applied to the gate of the pass transistor Q4 (Service Sheet A17a, functional block J).

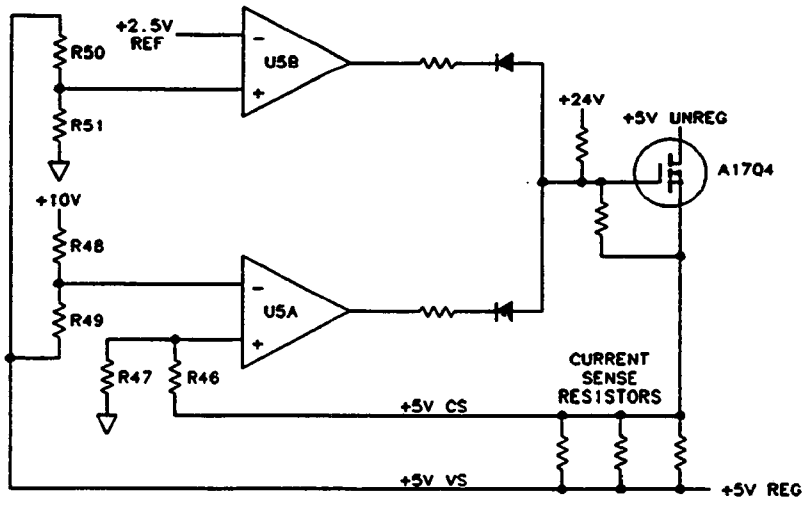


Figure 8-14. +5 Volt Supply Circuit

Note

The pass transistors (power FETs) of the +24V, +15V, +5V, -5V and -15V supplies are not part of the A17 Distribution assembly and have reference designators Q6, Q3, Q4, Q5 and Q2. The pass transistor for the -2V supply is mounted on the A18 Power Control assembly and has reference designator A18Q7 (Service Sheet A18a, functional block E).

In regulation mode, the voltage is sensed at a point on the A17 Distribution assembly and is routed to the A18 A17 Power Control assembly, where it is divided down by A18R50 and R51. This divided voltage is applied to the inverting input of A18U5B, where it is compared to the +2.5V reference voltage (VREF2) at the non-inverting input. The amplifier is set up to have very high gain at dc, so its output will go to whatever voltage necessary to make the divided voltage equal to the reference.
This output voltage is applied to the gate of Q4, which is a power MOSFET device used as the series pass element. A18R309, R310, and C43 (not shown) are used to provide ac compensation to the feedback loop of the regulator circuit. This prevents the supply from oscillating.

The configuration of the regulating amplifier for the negative supplies is slightly different. The voltage dividing network on the negative supplies divides the voltage between the +2.5V reference voltage (VREF2) (+2.5V) and the negative supply, providing a signal near ground for the non-inverting input of the amplifier. The inverting input is tied to circuit ground and the regulating amplifier compares the two signals to provide the controlling voltage for the power FET. For example, on the -5V supply the inverting input of A18U4A is tied to ground through A18R71. This ground point is compared to the voltage provided by the voltage dividing network of A18R68, R69 and R70. The output voltage from the amplifier controls the pass transistor Q5 to make the voltage from the voltage divider equal to the ground reference.

In foldback mode, A18U5A compares the voltage drop across the parallel combination of the current sense resistors A17R6, R7, and R13 (Service Sheet A17a, functional block O) to the voltage drop across A18R46. Under normal conditions, the voltage dividing network of A18R46 and R47 holds the voltage at the inverting input of the amplifier below the regulated voltage applied to the non-inverting input through A18R49. If the supply starts to draw more current, the voltage at the current sense point increases and pulls up the voltage at the inverting input. When this voltage exceeds the regulated voltage, the output of A18U5A will start to go low until it takes over control of the gate of the FET. The voltage at the voltage sense point will begin to drop, causing the output of the voltage regulation amplifier to go high and thus give up control to the foldback amplifier. As the load resistance on the supply drops and the load tries to draw more current, the foldback circuit continues to lower the supply voltage. This results in even less current being supplied to the load.

If the load resistance drops to zero ohms, the supply voltage will drop to zero volts but a finite amount of current will still be allowed to flow through the short. This is the foldback short-circuit current and it is typically set at around one-tenth of the maximum rated current of the supply. The offset voltage supplied by the +10V via A18R48 is what causes foldback to this finite current.

Overvoltage Protection (Crowbar) Circuitry. Crowbars (SCRs A17Q7 through Q12, Service Sheet A17a) on each regulated supply protect the instrument when there is loss of regulation - that is, when the voltage goes above some maximum tolerance. In addition, there is an SCR (A17Q1, Service Sheet A17a, functional block F) connected from the +15V unregulated supply to the -15V unregulated supply which triggers when the voltage between these two points becomes excessive. An example is when the instrument is connected to a line voltage higher than the voltage the instrument is set to. When this input crowbar trips, the instrument line fuse will blow.

Normally, when one of the output crowbars on a supply trips, it sends that supply into current foldback mode. In the event that the foldback circuit also fails and the SCR does not draw enough current to blow the line fuse, one of the crowbar drivers will turn on (transistor arrays A18U15 and U16, Service Sheet A18b, functional block J). This triggers the input crowbar A17Q1 and blows the line fuse.

The zener diodes in the gate leads of the SCRs set the trip point voltages of the crowbars. The resistors in series with the output SCRs are used to sense the current being pulled by the SCRs. When the current is such that the voltage across one of these resistors exceeds one base-emitter drop, the input SCR A17Q1 is triggered, blowing the fuse. For example, if the +5V supply exceeds about 6V, it will fire A17Q12. If the +5V foldback circuit also fails, the current through the SCR and A17R22 will exceed 5 amps but this is not enough current in the +5V transformer secondary to blow the line fuse. The drop across A17R22 will be high enough to turn on A18U16C which will trip the input crowbar SCR A17Q1. The input crowbar can now draw enough transformer secondary current to blow the line fuse.

Reverse Voltage Protection. All supplies are protected against excess reverse voltage by clamping diodes to ground. These are diodes A17CR5, 6, 7, 8, 9, and 10 (Service Sheet A17a).

Reference Oscillator Support Circuitry

All of the support circuitry for the Reference Oscillator (10 MHz Reference Oscillator) is on the A18 Power Control assembly. The power lines and oven monitor line are routed from the A18 Power Control assembly through the Distribution assembly to connector A17J3 which connects to the reference oscillator.

+12V Regulator. The +12V Regulator (Service Sheet A18b, functional block K) provides the supply voltage for the 10 MHz Reference Oscillator. A18U8 is an LM723 regulator IC used to drop the +24V regulated supply down to +12V. The output voltage of the regulator is set by A18R13 and R14. A18R11 brings the IC's internal reference (+7.15V) to its non-inverting input at pin 5. The combination of R11 and C3 generate a voltage ramp to this input when the instrument is turned on so that the +12V will rise slowly. A18C3 and C4 filter noise. A18R12 is a current sense resistor. When excessive current is drawn through A18R12 to the load, the regulator will shut down.

A18Q3, R15, R16 and R132 are a transistor switch circuit that turns off the regulator (and thus the Reference Oscillator) when the rear panel TIME BASE switch is in the EXT position. This switch is routed through the Distribution assembly to the A18 Power Control assembly. In the INT position, the switch grounds the base of A18Q3 and turns it off, allowing A18U8 pin 13 to float so the regulator can operate properly. In the EXT position, the rear panel switch is open, allowing A18R15 to pull up the base of A18Q3. This saturates A18Q3 and pulls A18U8 pin 13 low, turning off the regulator. A18TP2 allows convenient operation of this function when there is no rear panel switch. Connecting A18TP2 to ground will turn on A18U8.

Oven Cold Interrupt. The Oven Cold Interrupt circuitry (Service Sheet A18b, functional block G) generates an interrupt to the microprocessor when the time base oven is below operating temperature. The TBO MON line returning from the Reference Oscillator goes high (about +20V) when the oven is cold, otherwise it is near ground. A18Q6 is a transistor switch that saturates when the oven is cold and is cut off when it warms up. When the oven is warm, the collector of A18Q6 goes high and the oven warm indicator A18DS2a will light. A18U13B and U13A buffer the signal from the collector of Q6. A18U14 is a serial-to-parallel converter used with the instrument bus serial data transfer system that provides an interrupt enable signal to A18U13A. When the oven is cold and the interrupt is enabled, the NINT signal at the output of A18U13A goes low. This sends an interrupt to the microprocessor.

Reference Splitter. The Reference Splitter (Service Sheet A18b, functional block M) is located under the metal can on the A18 Power Control assembly. This is a 10 MHz splitter used to divide the signal from the Reference Oscillator so that it can be routed to both the rear panel connector and the Local Oscillator Subsystem. It is made up of a discrete Wilkinson power splitter tuned to 10 MHz (A18C23, L2, L3, C24, C25, and R104), an amplifier (A18U3), and a pad (A18R100, R101, R102). A18C20 and C21 are dc blocking coupling capacitors. A18U1 and its associated circuitry (A18R511, R512, C45 and L1) provide a decoupled +9.8V bias voltage for the amplifier.

Troubleshooting

It is assumed that the troubleshooting information on Service Sheet BD1 was used to isolate a malfunction to the Power Supply Subsystem. The following information will aid in isolating the defective assembly or component.

The troubleshooting procedure is divided into thirteen checks as follows:

Check 1 - Preliminary Check
Check 2 - dc Tolerance and Ripple
Check 3 - Unregulated Supplies
Check 4 - Auxiliary Supplies
Check 5 - Status Indicators
Check 6 - Power Up Circuitry (A18b, functional block I)
Check 7 - VREF2 +2.5V Reference Voltage
Check 8 - Individual Supplies
Check 9 - Subtle Problems
Check 10 - Reference Oscillator Support Circuitry
Check 11 - Reference Splitter
Check 12 - Reference Oscillator +12V Supply
Check 13 - Reference Oscillator Indicators

Test Equipment

Digital Voltmeter	HP 3456A
Dynamic Signal Analyzer	HP 3561A
Oscilloscope	HP 54201A
Power Meter	HP 438A
Power Sensor	HP 8482A

Troubleshooting Hint

Access to many points on the A18 Power Control assembly is easier from the circuit side of the board. If you are having difficulty probing this board, try turning the instrument around so you are facing the front of the instrument.

Warning 

Hazardous line voltages are present whenever the line cable is connected, even if the LINE switch is set to STANDBY. Whenever removing or replacing components or internal cables, first disconnect the line cable.

Dropping a cable or metal object onto the A17 Distribution assembly can cause a short circuit that can destroy the power supply traces on the board. Always disconnect the line cord when handling cables near the rear of the instrument.

Check 1 - Preliminary Check

1. Connect the line cord to the Vector Generator and set the LINE switch to ON. The line voltage setting for the Vector Generator must be correct for this check. Refer to BD1 to check the line voltage setting.

   If the Vector Generator does not blow the main line fuse when first plugged in or when the LINE switch is set to ON, proceed with the next step.

   If the line fuse blows when the instrument is first plugged in or when the line switch is set to ON, unplug the the line cable and remove the loads on the supplies according to Check 2 - dc Tolerance and Ripple. If the fuse still blows even with the supplies unloaded, unplug the line cable and remove the six power FETs (five are mounted on the heat sink underneath A17 and one is mounted directly on A18). Replace them one by one until the supply with the short is found. Use the following table to match each supply with its power FET.

Caution 

The FETs are very sensitive to Electrostatic Discharge (ESD). Use proper ESD precautions whenever the FETs are handled.

Table 8-35. Power Supply FETs

Power Supply	Power FET*
+24V	Q6
+15V	Q3
+5V	Q4
-2V	A18Q7
-5V	Q5
-15V	Q2

*FETs Q2 through Q6 are not part of the A17 assembly.

2. Observe the six status indicators, DS1b-d and DS2b-d, at the top of the A18 Power Control assembly at the rear of the instrument. The label indicating the supply each indicator represents is located under each indicator on the opposite (circuit) side of the board.

   If all the indicators are lighted, proceed with Check 2.

   If all indicators fail to light, proceed with the next step to verify the line switch signal path.

   If any indicators fail to light, go to Check 3 - Unregulated Supplies.

Caution 

A voltage supply is not guaranteed to be working properly even if its status indicator is lit. Voltages must be measured at the power supply test points to guarantee proper operation.

3. With the front panel switch set to ON, measure the voltage at A18TP17, FPSW. This test point is the power-up signal that is set to ground when the LINE switch is set for ON.

   If the voltage is near 0 Vdc, proceed with Check 3.

   If the voltage is greater than +1 Vdc, proceed with the next step to verify the integrity of the front panel switch signal path.

4. The signal from the front panel switch, FP SW, is routed to the A18 Power Control Assembly according to the following diagram. Note that the switch is mounted to the A1A3 Front Panel Interface assembly. Refer to the BD6 Display Signal Signature Analysis check for the procedure on accessing the A1A3 Front Panel Interface assembly.

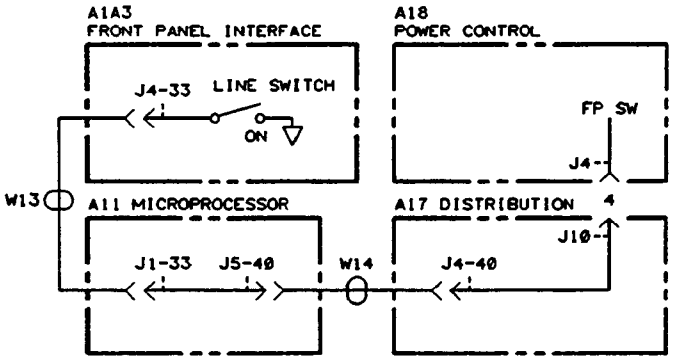


Figure 8-15. FPSW Signal Path

With the Vector Generator power cord removed, use an ohmmeter to ensure the integrity of this signal path. In particular, make sure that cables W13 (from the A1A3 Front Panel Interface to the A11 Microprocessor) and W14 (from A11 to the A17 Power Distribution assembly) are firmly connected and not open. Some service procedures require one of these cables to be disconnected - remember to reconnect them when finished.

Check 2 - dc Tolerance and Ripple

1. Set the LINE switch to STANDBY and unplug the line cable from the Vector Generator.

2. Remove the load on the power supplies by disconnecting all cables to the A17 Distribution assembly. These includes the ribbon cables between the A17 Distribution assembly and each frame and deck, the cables between the A17 Distribution assembly and the A11 Microprocessor assembly and the cable to the Reference Oscillator at A17J3. This last cable is located underneath A17 and the instrument must be turned on its side to get to it.

3. Plug the line cable into the instrument and ground A18TP17, FPSW, to turn on the power supplies. Use the ground test point near A18TP17. This is required since the LINE switch is disconnected when the power supply loads are removed.

4. Measure the supply voltages for both dc tolerance and ac ripple according to Table 9-PS. Use the bracket that holds the A18 Power Control assembly to the instrument frame as the ground reference. The dynamic signal analyzer must be used to measure the power supply ripple which is at a very low level. If any supply is not within tolerance, go to Check 9 - Subtle Problems.

Note

For ripple on the power supplies to be at a minimum, it is important to have solid ground connections. Make sure the screws holding A18 to the grounding bracket are firmly in place. In particular, make sure that the solder connection from A17 to the frame is solid. This solder joint is located underneath A17 near the side of the instrument by the heat sink containing the power FETs.

Table 8-36. Power Supply Test Points and Tolerances

Power Supply	Test Point (A18)	Minimum Voltage (Unloaded)	Maximum Voltage (Unloaded)	Ripple (Unloaded)
+24V	TP4	+23.25V	+24.74V	No ripple component >0.50 mVrms (1.4 mVp-p)
+15V	TP5	+14.53V	+15.45V	
+5V	TP8	+4.84V	+5.15V	
-2V	TP3	-2.16V	-1.93V	
-5V	TP9	-5.41V	-4.98V	
-15V	TP6	-15.50V	-14.40V	

Check 3 - Unregulated Supplies

1. Set the LINE switch to STANDBY and unplug the line cable. If the load to the power supplies has not been disconnected, remove the load according to the procedure given in Check 2.

2. Plug the line cable back in and check the unregulated power supplies according to the following table.

   If the unregulated supplies are correct, proceed with the next check.

   If any or all unregulated supplies are not correct, the fault is in the transformer, rectifying diodes, filter capacitors or line module.

Table 8-37. Unregulated Power Supply Test Points

Power Supply	A18 Test Points	Typical Values
+24V	TP7	+42V
+15V	TP15	+22V
+5V	TP12	+11V
-5V	TP11	-11V
-15V	TP14	-22V

Check 4 - Auxiliary Supplies

Using the voltmeter, check the auxiliary power supplies according to the following table. All supplies should be within 10% of the typical voltages since each is set by a zener diode. The voltage will either be close to the typical or else will be clearly failing. These supplies provide the offset and bias voltages for the power supplies and control circuitry on the A18 Power Control assembly.

Table 8-38. Auxiliary Power Supply Test Points

Auxiliary Supply	Typical Voltage	A18 Test Points	Regulating Zener Diode
+32V	+32.3V	emitter Q4	A18VR27
+10V	+10.3V	emitter Q1	A18VR5
-3V	-3.3V	U6 pin 4	A18VR8
-10V	-10.3V	emitter Q2	A18VR6

Check 5 - Status Indicators

1. Check the eight status indicators DS1a-d and DS2a-d at the top of A18. DS1a and DS2a indicate the status of the time base oven; the other six give a quick check on the status of the regulated power supplies. With the LINE switch set to STANDBY, only the two oven monitor status indicators DS1a and DS2a should be lit. If the instrument has just been connected to the line mains, DS2a may not be lit if the time base oven has not had time to warm up.

If the DS1a and DS2a indicators are lighted, proceed with the next step.

If the indicators are not lighted (and DS2a does not light after a 10 minute warmup), proceed with the Reference Oscillator Support Circuitry check.

2. Short A18TP17 to ground (the power supply loads must be disconnected). This has the same effect as setting the LINE switch to ON. Disconnecting the loads ensures that a short elsewhere in the instrument will not affect the troubleshooting. Check the six power supply status indicators DS1b-d and DS2b-d.

   If one or more of the six power supply indicators light, proceed with the +2.5V Reference Voltage check.

   If none of the six power supply indicators light, proceed with the next check.

Check 6 - Power Up Circuitry (A18b, functional block I)

1. Using the voltmeter, measure the voltage at A18TP16, VREF. This is the reference voltage controlling all the power supplies. The voltage should be +2.5 ±0.05 Vdc.

   If this voltage is correct, troubleshoot the +24 volt supply according to the Individual Supplies check. If the +24 volt supply is not working, none of the other supplies will work.

   If +2.5 volts is not present at A18TP16, go to the next step.

2. With A18TP17 still shorted to ground, measure the voltage at A18K1 pin 6 (note that pins 3, 4, and 5 are cut off). This should be close to the unregulated +5V supply voltage measured at A18TP12.

   If the voltage is at A18K1-6 is correct (about +9 or +10 Vdc), the fault is probably in A18U7, U2 or K1. Verify that the auxilliary +10V and -10V supplies are present when checking A18U7 and U2.

   If the voltage at A18K1 is not correct, proceed with the next step.

3. Measure the voltage at A18U12 pin 7. The voltage should be above +0.2 Vdc.

If the voltage is correct, the problem is most likely in A18U12 or A18Q5.

If the voltage is less than +0.2 Vdc, the thermistor, A17TR1, has shorted indicating a thermal shutdown.

Note

Once +2.5 Vdc has been established at A18TP16, proceed with the next check.

Check 7 - VREF2 +2.5V Reference Voltage

1. With +2.5V present at A18TP16, VREF, check the status indicators according to Table 8-39.

   If the +24V supply and at least one other supply is working, proceed with the next check to troubleshoot the supply or supplies that are not working.

   If none of the supplies are working, proceed with the next check to troubleshoot only the +24V supply, then return to this step.

   If only the +24V supply is working, proceed with the next step.

Table 8-39. Power Supply Status Indicators

Power Supply	Indicator
+24V	DS1c
+15V	DS1d
+5V	DS1b
-2V	DS2b
-5V	DS2c
-15V	DS2d

2. Measure VREF2 at A18U2 pin 7. The voltage should be +2.5 ±0.05 Vdc.

   If the voltage is correct, proceed with the next check.

   If the voltage is not correct, proceed with the next step.

3. Check the inputs to A18U2B and U12A. The input voltages to A18U12A are set by zener diodes A18VR3, VR4, and VR9. Under normal operating conditions the voltage at A18U12 pin 4 should be about +3.9V and the voltage at pin 5 should be about +6.7V. The open collector output of U12A at pin 2 should be pulled up to +2.5V by VREF1 (U2 pin 1) through R7.

   If the voltage is correct and the +2.5 Vdc voltage has been restored at A18U2-7, repeat this check to verify the other supplies. Even if all the status indicators are lighted, measure the dc voltage and ripple at the power supply test points according to the dc Tolerance and Ripple check.

   If the voltage is not correct, check the components listed above until the fault is isolated.

Check 8 - Individual Supplies

Each of the six regulated power supplies has nearly identical circuitry. The same procedure applies to each supply. The +24V supply must be working before any other supply will work.

1. Verify that the op amp of the supply in question is getting the proper bias voltages at pins 4 and 8. Refer to Table 8-40 to find the typical bias voltages. The -22V bias voltage for A18U4, U10, and U11 is the -15V unregulated supply measured at A18TP14. The other bias voltages are from the auxiliary supplies (see Check 4).

   If the bias voltage is correct, proceed with the next step.

   If the bias voltage is not correct, the fault is in the source of the bias voltage or the IC itself. Refer to Check 4 to check the source of the bias voltage.

Table 8-40. Power Supply Op Amps

Power Supply	IC	Positive Bias - pin 8 (typical)	Negative Bias - pin 4 (typical)	Regulator Output Test Point	Foldback Output Test Point
+24V	A18U9	+32.3V	-3.3V	pin 7	pin 1
+15V	A18U6	+32.3V	-3.3V	pin 7	pin 1
+5V	A18U5	+10.3V	-10.3V	pin 7	pin 1
-2V	A18U11	+10.3V	-22V	pin 7	pin 1
-5V	A18U4	+10.3V	-22V	pin 1	pin 7
-15V	A18U10	+10.3V	-22V	pin 1	pin 7

2. The IC for each power supply has both a regulator amplifier and a foldback amplifier with outputs at pins 1 and 7 respectively. The diodes at these outputs form a wired-OR configuration that gives control of the power FET to the amplifier with the lower output voltage. If the output voltage of the foldback amplifier is lower than the output of the regulating amplifier, the supply is in current foldback mode. Using Table 8-40, check the regulating and current foldback outputs of the supply in question.

   If the regulator output is in control of the power FET, the control is correct. However, an open power FET will cause the output of the regulating op amp to rise near its supply voltage while the output of the current foldback amplifier may also remain high. Troubleshoot the power FET if this condition exists.

   If the current foldback amplifier is in control of the power FET, too much current is being drawn from the supply. With the loads removed there are three likely reasons for a supply to go into current foldback:

   - an overvoltage condition. If the supply loses regulation, too high a voltage will cause the SCR crowbar on A17 to fire and draw enough current to send the supply into foldback. This may happen if the regulating op amp fails or if there is a short in the power FET. Troubleshoot the regulating op amp and the diode at its output - if this diode is open, the supply will also lose regulation. The power FETs on each supply are identical and can be exchanged to determine if they are the cause of the problem.

   - a short on the A17 Distribution assembly or the A18 Power Control assembly. Disconnect the line power cable and measure the resistance across the supply in question using a four-wire ohmmeter. Measure directly from ground to the test point on A17 called out in the table below ("A" and "K" refer to the anode and cathode of the SCR crowbar and are marked on the board). Do not measure to the test points on A18. You are looking for a reading close to zero ohms, since the normal resistances on these lines (with the loads disconnected but A18 still plugged in) can be very low - sometimes around 20 ohms.

   - too high a resistance across the current sense resistors on A17 (the current sense resistor for the -2V supply is A18R63). These are very low resistances - measure them with a four-wire ohmmeter. A burned trace can also increase this resistance enough to send the supply into foldback. Consult the table below for the resistors and their nominal parallel resistance.

Table 8-41. A17 Test Points and Current Sense Resistances

Power Supply	A17 Test Point	Current Sense Resistors	Parallel Resistance
+24V	A17Q10 A	A17R11	0.150 ohm
+15V	A17Q8 A	A17R8 A17R14	0.075 ohm
+5V	A17Q12 A	A17R6 A17R7 A17R13	0.050 ohm
-2V	A17Q7 K	A18R63	0.390 ohm
-5V	A17Q9 K	A18R9 A18R12	0.075 ohm
-15V	A17Q11 K	A17R10	0.150 ohm

A = Anode, K = Cathode

Note

A partial short can cause a supply to go into partial foldback. The output of the foldback amplifier will begin to drop and the supply voltage may fall slightly, but not all the way to zero. Be alert for this condition.

3. Once all supplies are functioning, remove the line power cord. Reconnect all cables to the A17 Distribution assembly.

4. Reconnect the power cord and set the line switch to ON (or ground A18TP17).

   If all of the supplies are working, proceed to the dc Tolerance and Ripple check for a final verification.

   If a single supply fails, isolate the fault by unplugging each frame/deck ribbon cable connector until the fault is cleared. The frame associated with the cable that clears the fault is the problem.

   If the line fuse blows, disconnect the line power cord and remove all the power FETs, including A18Q7. The faulty supply can be isolated by replacing the power FETs one by one. Even if there is a short elsewhere in the instrument, a blown fuse indicates a possible malfunction of the foldback circuitry on that supply.

Check 9 - Subtle Problems

1. If the power supply ripple is out of specification, it is a good idea to replace the large filter capacitor on the unregulated supply. Too much ripple can be a warning of capacitor failure later on.

2. If the dc level falls significantly when the load is reconnected, it is likely that the load is drawing too much current. The problem is probably not in the power supply itself.

3. If the dc level is out of specification, check the voltage dividing network at the input to the regulating op amp to see if the resistances of the resistors have drifted out of tolerance. If all the supplies are slightly out of tolerance, measure the voltage of the 2.5V reference at A18TP16. It should be within about 50 millivolts of 2.5V.

   The following table identifies the voltage divider for each supply.

Table 8-42. Power Supply Voltage Dividers

Power Supply	Resistor (A18)	Nominal Value (Ohms)
+24V	R28 R29 R30	196 4.64k 562
+15V	R40 R41 R42	6.19k 6.19k 619
+5V	R51 R50	5.11k 5.11k
-2V	R55 R56 R57	100 11.0k 9.09k
-5V	R68 R69 R70	7.5k 909 14.7k
-15V	R79 R80 R81	68.1 2.15k 13.3k

Check 10 - Reference Oscillator Support Circuitry

Note

The circuitry that supplies voltage to the internal 10 MHz reference oscillator is located on the A18 Power Control assembly. This circuitry will not function without the +24V regulated supply. If the oscillator is not working, check status indicator DS1c to be sure that the +24V supply is working. If it is not lit, go back to Check 1 and repair the +24V supply before proceeding.

1. Verify that the 10 MHz TIME BASE INT/EXT switch is set to INT and that the BNC jumper cable is connected between the 10 MHz TIME BASE OUT and IN connectors on the Vector Generator rear panel. Also make sure that the wires from the time base oscillator to connector A17J3 underneath A17 are firmly connected.

2. Using the power meter, measure the signal level at the cable connected to A4J6 and at the 10 MHz TIMEBASE AUX output connector on the Vector Generator rear panel. The measurement at the A4J6 connector is made by connecting the power meter to the cable rather than the A4J6 jack. The levels should be between +7 and +10 dBm.

   If both signals are correct, the reference oscillator is working. Proceed with the Reference Oscillator Indicators check to complete the verification.

   If either level is not correct, proceed with the next step.

3. Remove the jumper cable and measure the 10 MHz signal at the 10 MHz TIME BASE OUT rear panel connector. The level should be between +7 and +10 dBm.

   If this signal is present, the problem is in either the time base splitter on A18 or the connecting cables. Proceed with the next check to isolate the problem.

   If there is no signal at 10 MHz TIME BASE OUT, proceed with the Reference Oscillator +12V Supply check.

Note

The time base splitter is grounded through the three SMC connectors on A18 and the screw connecting the ground bracket to A18 near the shielding can. Make sure these connections are solid.

Check 11 - Reference Splitter

1. Reconnect the jumper cable, then disconnect the brown cable (W70) and the violet cable (W7) from the A18 Power Control assembly.

2. Measure the signal at the output of the brown cable (W70). The signal should be at 10 MHz with a level between +7 and +10 dBm.

   If the signal is correct, proceed with the next step.

   If the signal is not correct, the fault is in the cable (W70) or the jumper cable.

3. Reconnect the brown cable (W70) to the A18 Power Control assembly.

4. Measure the signal at A18J3 (the input to W7, the violet cable) and A18J2. There should be a 10 MHz signal at +7 to +10 dBm.

   If both signals are correct, the fault is in a cable or connector.

   If either or both signals are incorrect, proceed with the next step.

5. Measure the output of regulator A18U1 at pin 2. This is typically near +9.8Vdc with no discernible ripple.

   If the voltage is correct, proceed with the next step.

   If the voltage is not correct, the regulator (A18U3) or its input (unregulated) voltage is at fault.

6. Measure the dc voltages at pins 1 and 2 of A18U3. There should be about +1V at pin 1 and +5V at pin 2.

   If the voltages are correct, proceed with the next step.

   If the voltages are not correct, A18U3 or its associated circuitry is at fault.

7. Using the oscilloscope with ac input coupling, measure the 10 MHz signals at the input (pin 1) and output (pin 2) of A18U3. With the load at A18J3 disconnected, the output signal amplitude should be 5 to 10 times the input signal amplitude.

   If the gain is correct, proceed with the next check.

   If the gain is not correct, A18U3 or the associated circuitry is at fault.

Check 12 - Reference Oscillator +12V Supply

1. Set the Vector Generator LINE switch to ON and verify that the 10 MHz TIME BASE INT/EXT switch is set to INT.

2. Measure the voltage at A18TP10, 12V. The voltage should be +12 ±0.5 Vdc.

   If the voltage is present but there is no signal output at 10 MHz TIME BASE OUT, the problem is in the reference oscillator or its connecting cables.

   If the voltage is not correct, proceed with the next step.

3. Regulator A18U8 supplies the +12V for the oscillator. Measure its own supply voltage at pins 11 and 12. This is the +24V regulated supply.

   If +24 Vdc is present, proceed with the next step.

   If +24 Vdc is not present, the fault is in the +24V supply or the interconnections.

4. Connect A18TP2 to ground and measure the voltage at A18TP10 again. Grounding A18TP2 cuts off A18Q3 and has the same effect as setting the TIME BASE switch to INT.

   If +12 Vdc is not present at A18TP10, the problem is most likely in the 10 MHz TIME BASE INT/EXT switch.

   If +12 Vdc is still not present, the problem is most likely in A18U8 or Q3.

Check 13 - Reference Oscillator Indicators

1. With the power cord plugged in and the LINE switch set to STANDBY, observe the A18DS1A OVEN indicator. This indicator monitors the +24 Vdc applied to the reference oscillator oven (even in the STANDBY mode).

   If the indicator is lighted, proceed with the next step.

If the indicator is not lighted, verify that there is +20 to +30 Vdc at A17J3-6 and A17J10-8. The J3 connector is located on the bottom of the A17 Distribution assembly and carries all control signals to the reference oscillator. If the voltage is present at both places, the indicator circuit on the A18 Power Control assembly is at fault. If either voltage is not present, the unregulated +15 volt supply, A17CR11 or the connections between A17CR11, A17J3-8 and A17J10-8 are at fault.

Note

The +20 to +30 Vdc required by the reference oscillator is supplied by the +24 Vdc power supply once the line switch is set to ON. If a fault only occurs when the line switch is set to ON, diode A17CR12 or the +24 Vdc supply is most likely at fault.

---

2. Set the LINE switch to ON. Status indicator A18DS2a should light to indicate that the oscillator is warm. This indicator may be off for as long as ten minutes after having the power cord plugged in.

   If the indicator lights within 10 minutes of having the power cord plugged in, the reference oscillator and all support circuitry is working properly.

   If the indicator does not light, proceed with the next step.

3. Measure the signal level at A17J3-4. This is the reference oscillator oven monitor signal. The voltage should be approximately 1.5 Vdc below the oven power supply voltage (+20 - 30 Vdc) when the power cord is first plugged in and should drop to approximately +3.5 Vdc once the oven is warm.

   If the signal is as indicated, the fault is in the A18 Power Control assembly OVEN MONITOR circuit.

   If the signal is not as indicated, the fault is in the reference oscillator. Refer to the reference oscillator operating and service manual (HP part number 10811-90002) for repair information.

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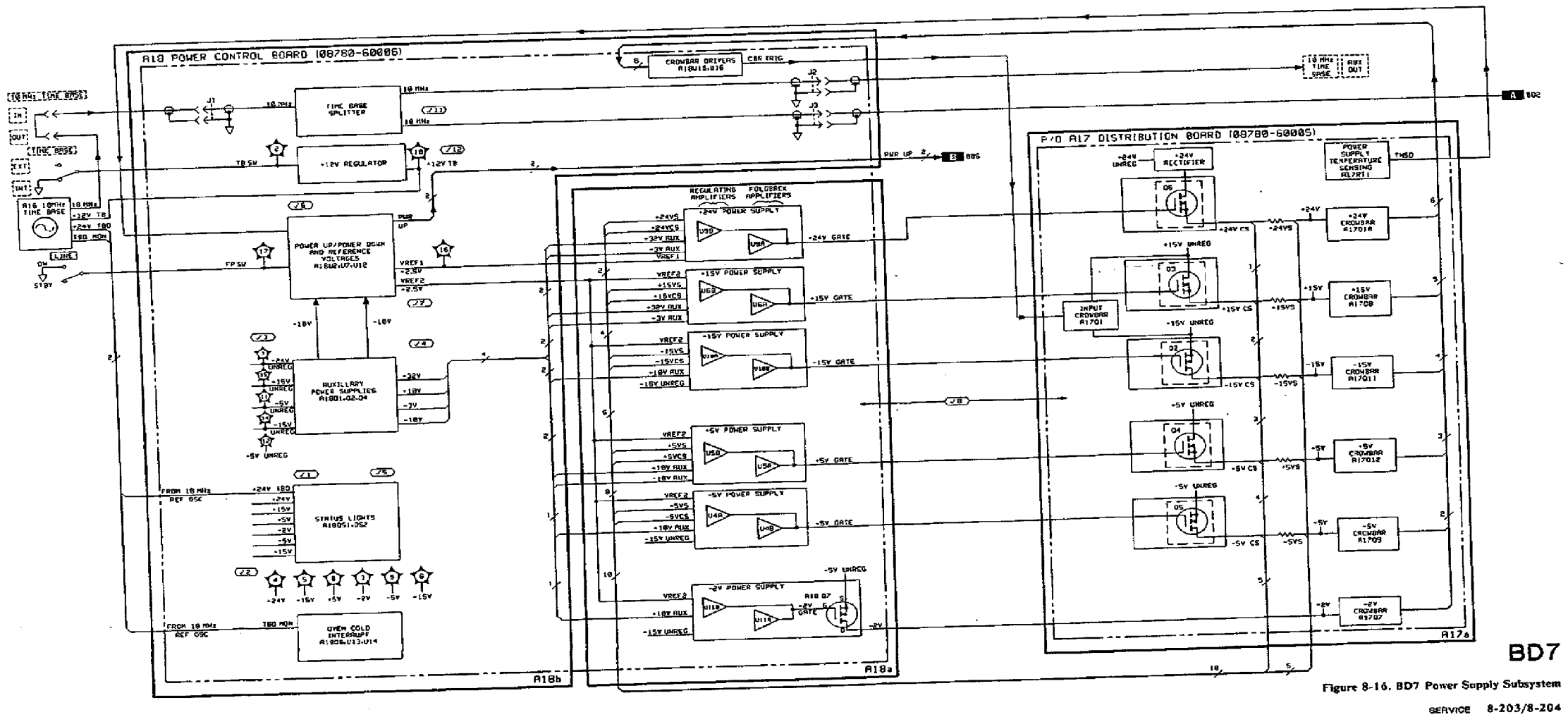


BD7

Figure 8-16. BD7 Power Supply Subsystem

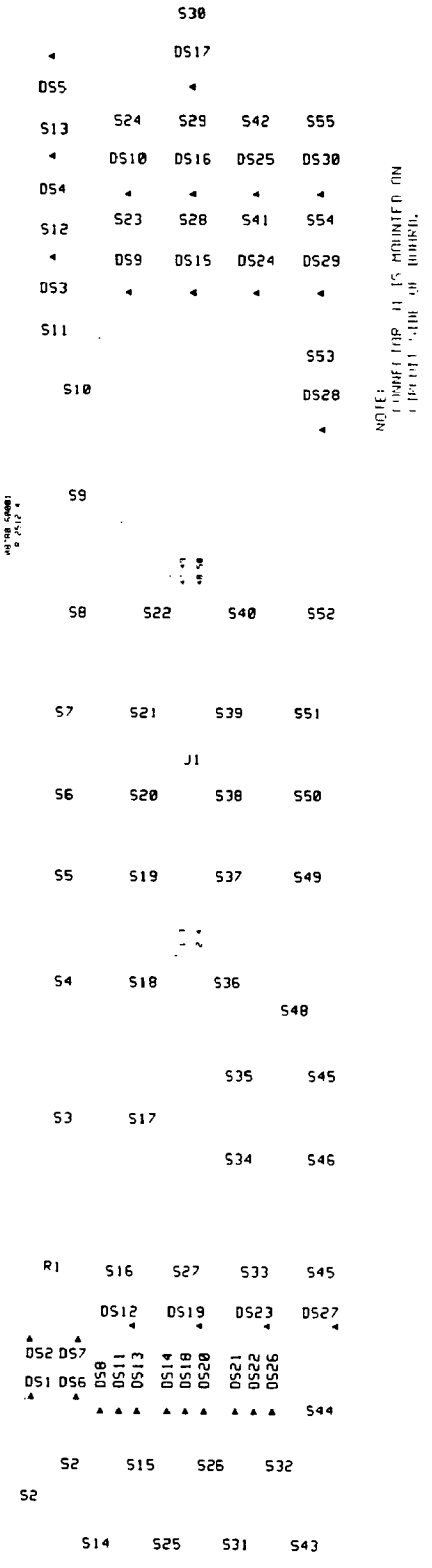
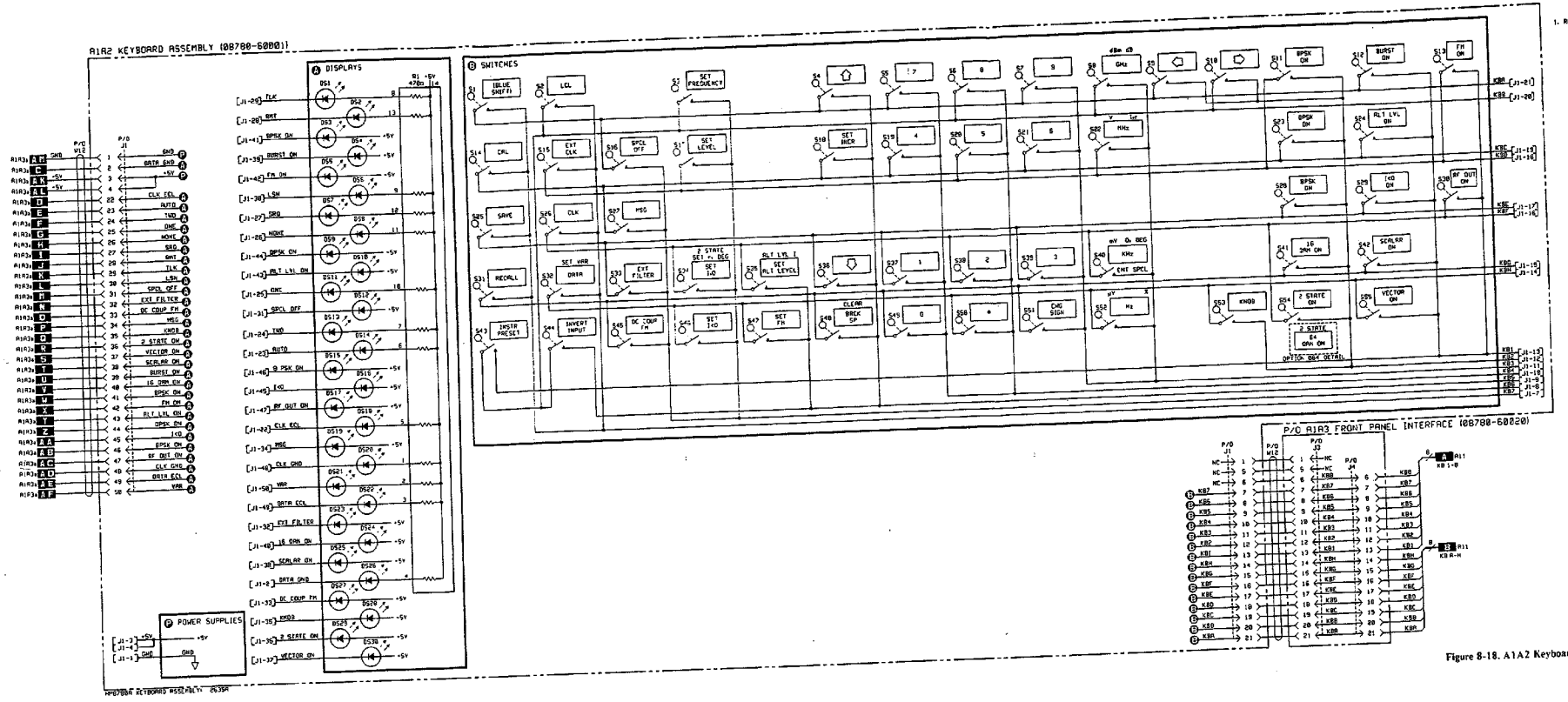


Figure 8-17. A1A2 Keyboard Assembly Component Locations



A1A2

Figure 8-18. A1A2 Keyboard Assembly Schematic Diagram

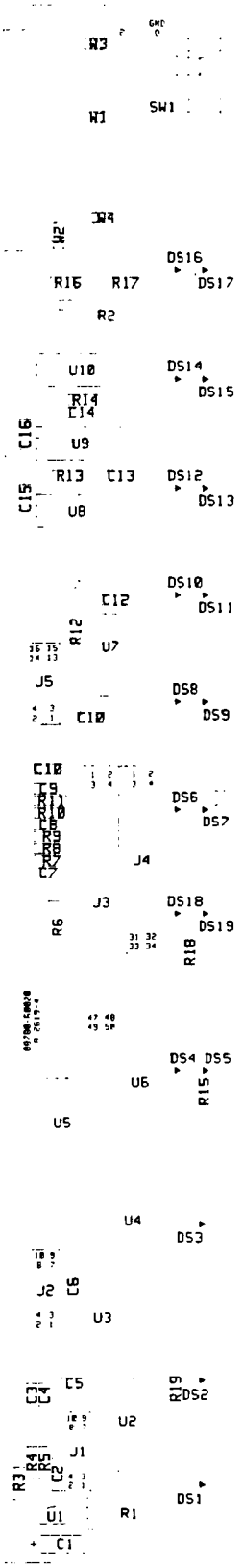
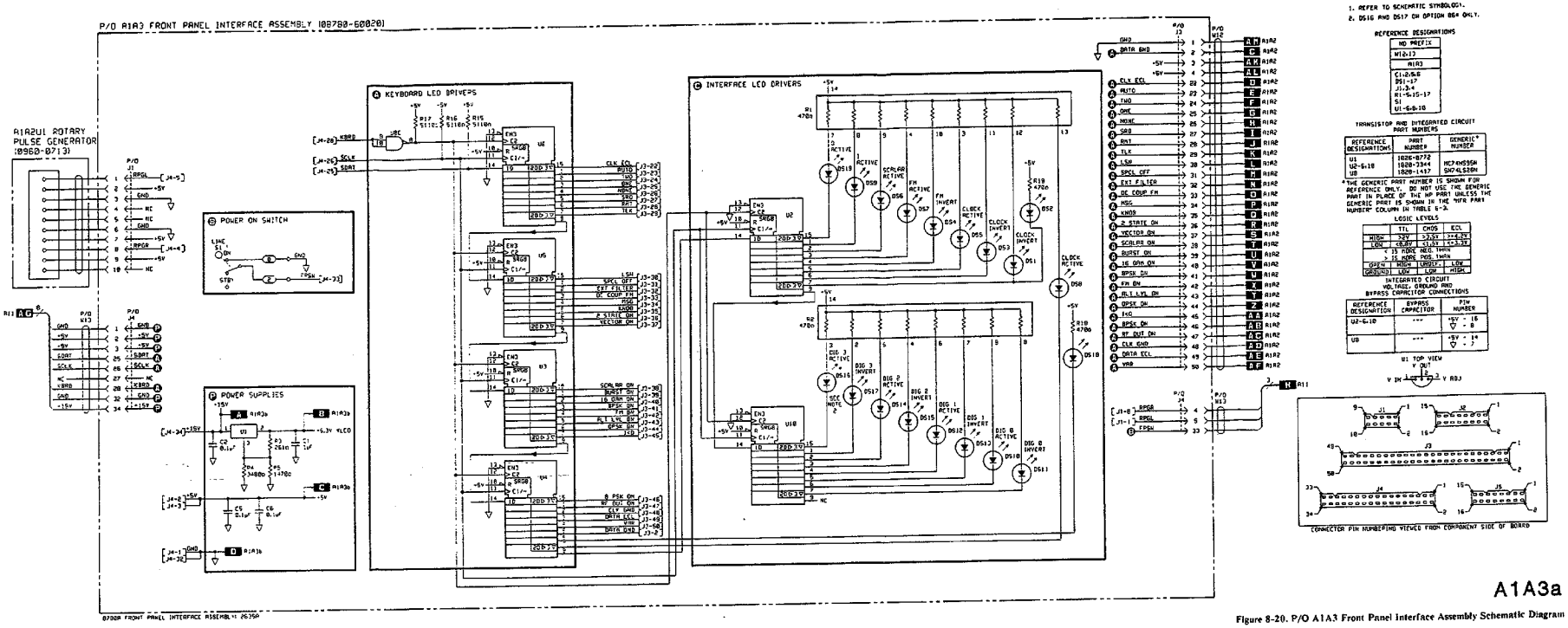


Figure 8-19. A1A3 Front Panel Interface Assembly Component Locations



A1A3a

Figure 8-20. P/O A1A3 Front Panel Interface Assembly Schematic Diagram

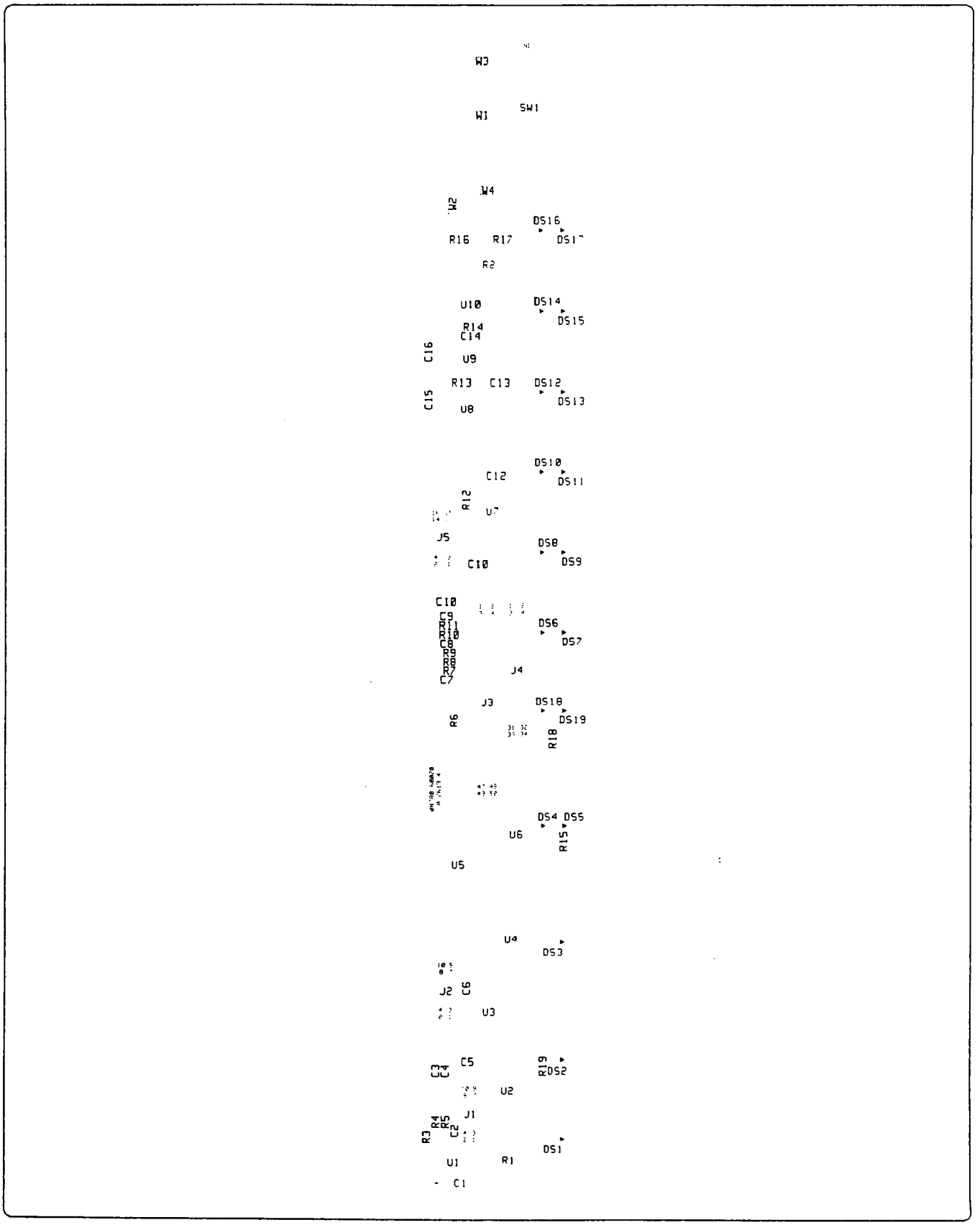
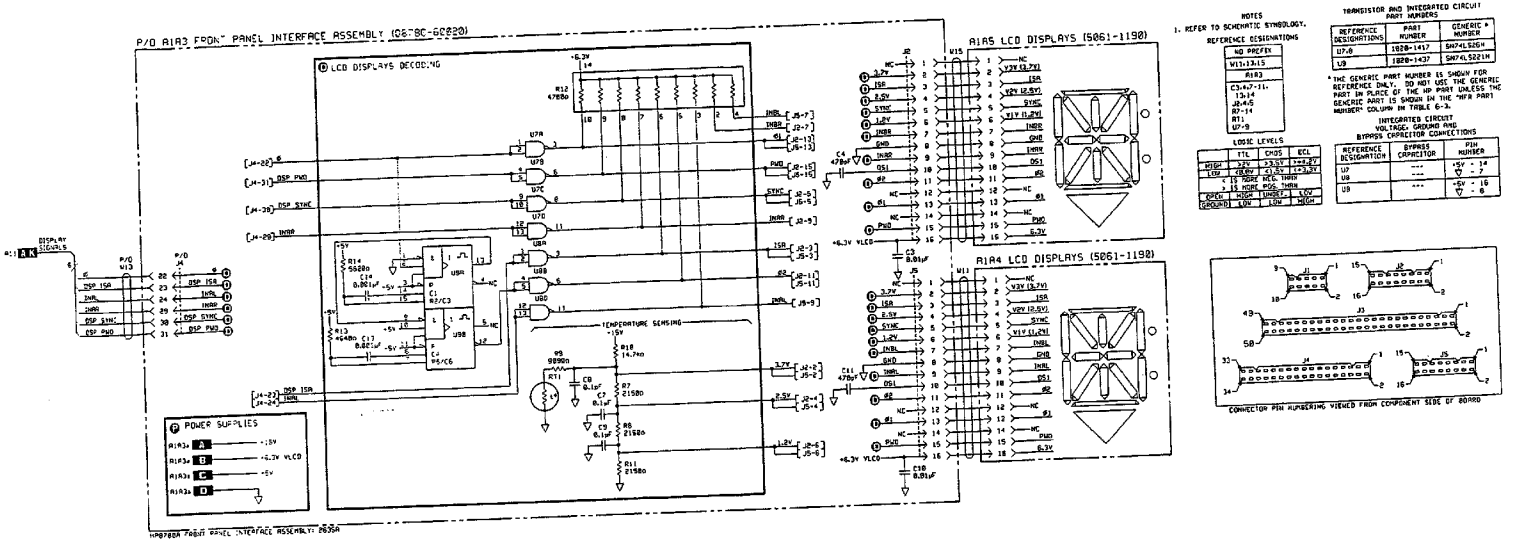


Figure 8-21. A1A3 Front Panel Interface Assembly Component Locations



A1A3b

Figure 8-22. P/O A1A3 Front Panel Interface Assembly Schematic Diagram

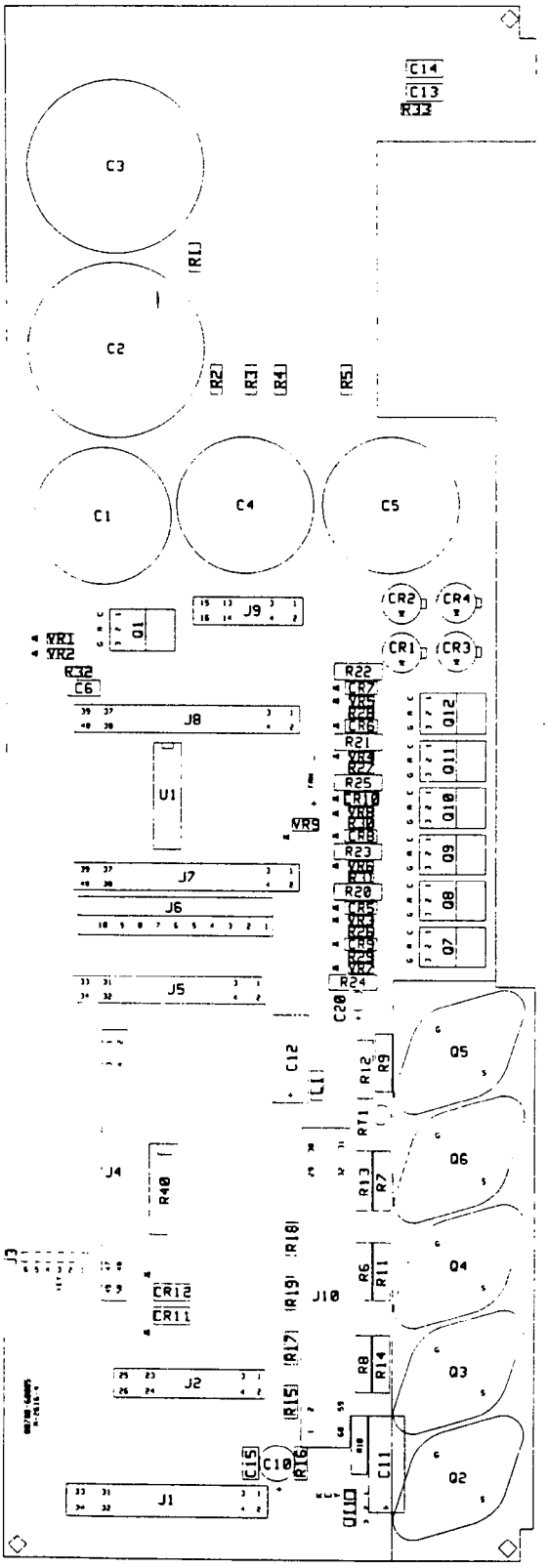


Figure 8-23. A17 Distribution Board Assembly Component Locations

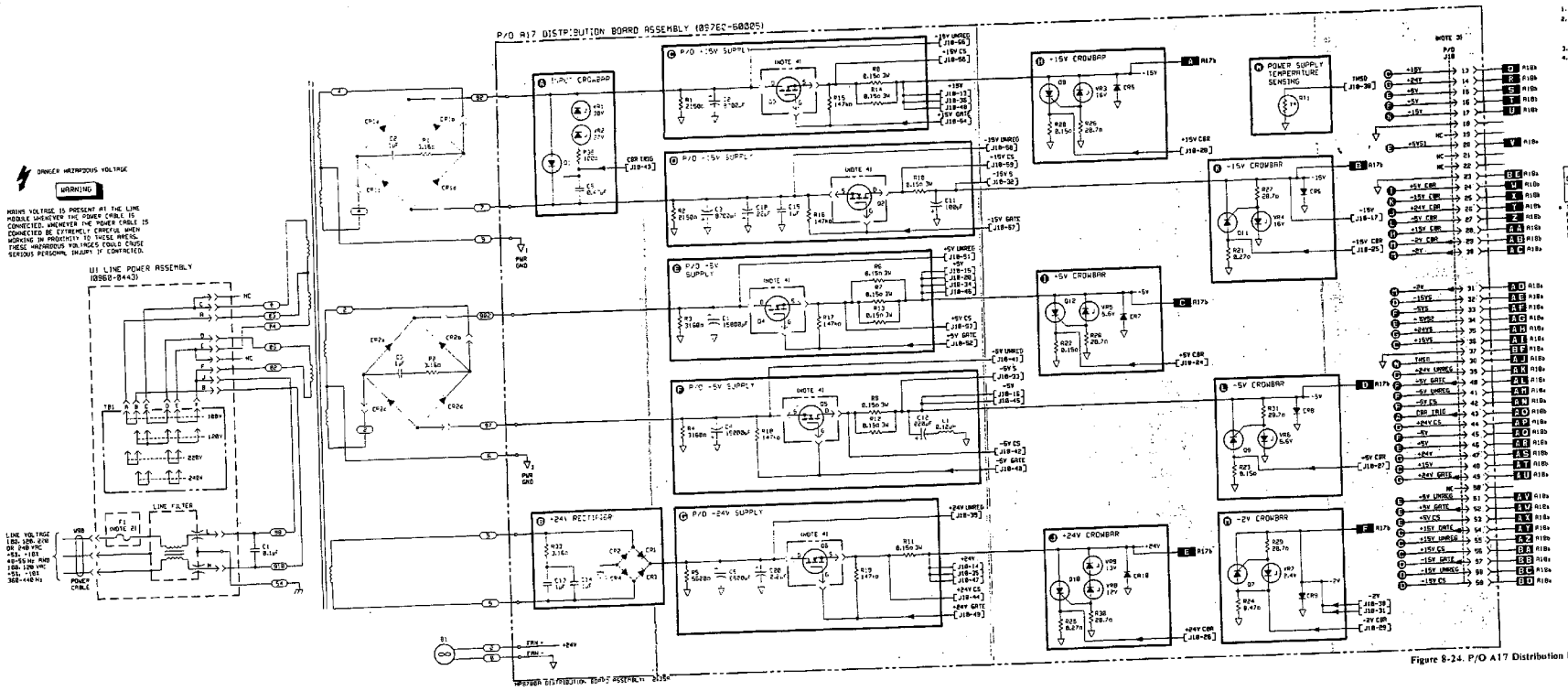


Figure 8-24. P/O A17 Distribution Board Assembly Schematic Diagram

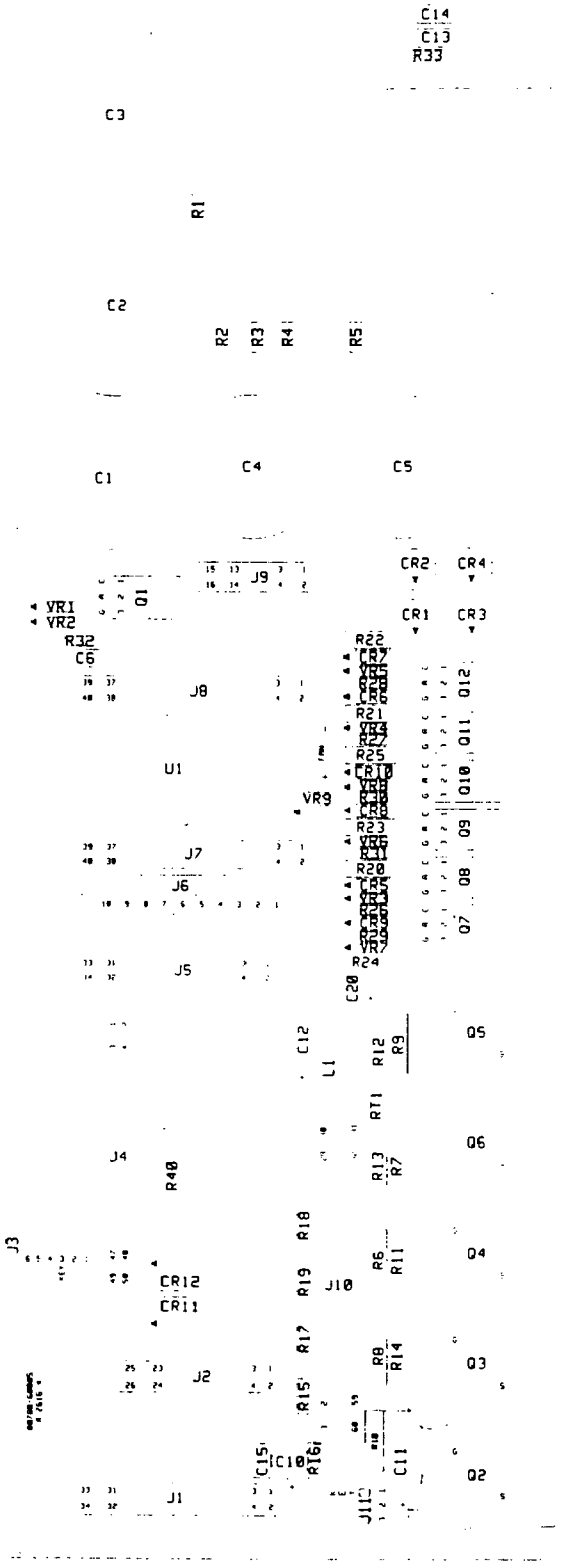


Figure 8-25. A17 Distribution Board Assembly Component Locations

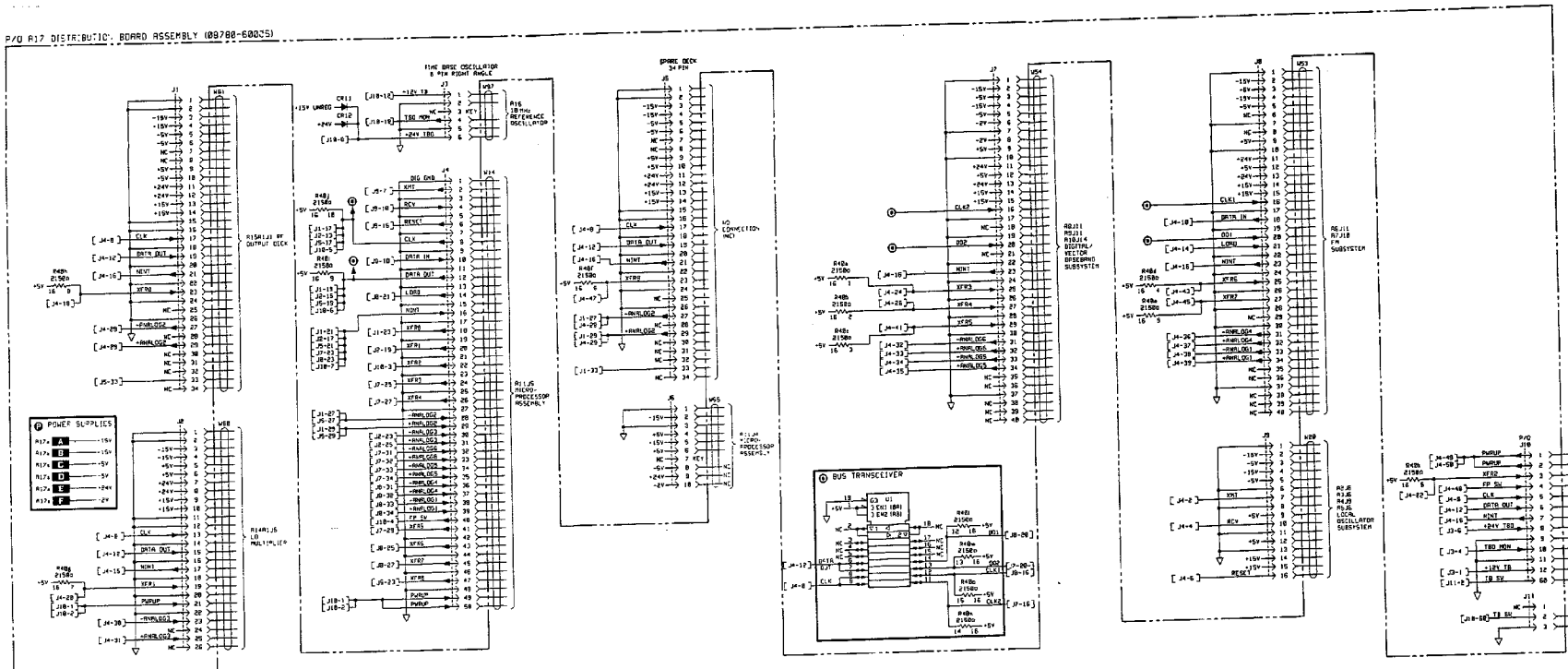


Figure 8-26. P/O A17 Distribution Board Assembly Schematic Diagram

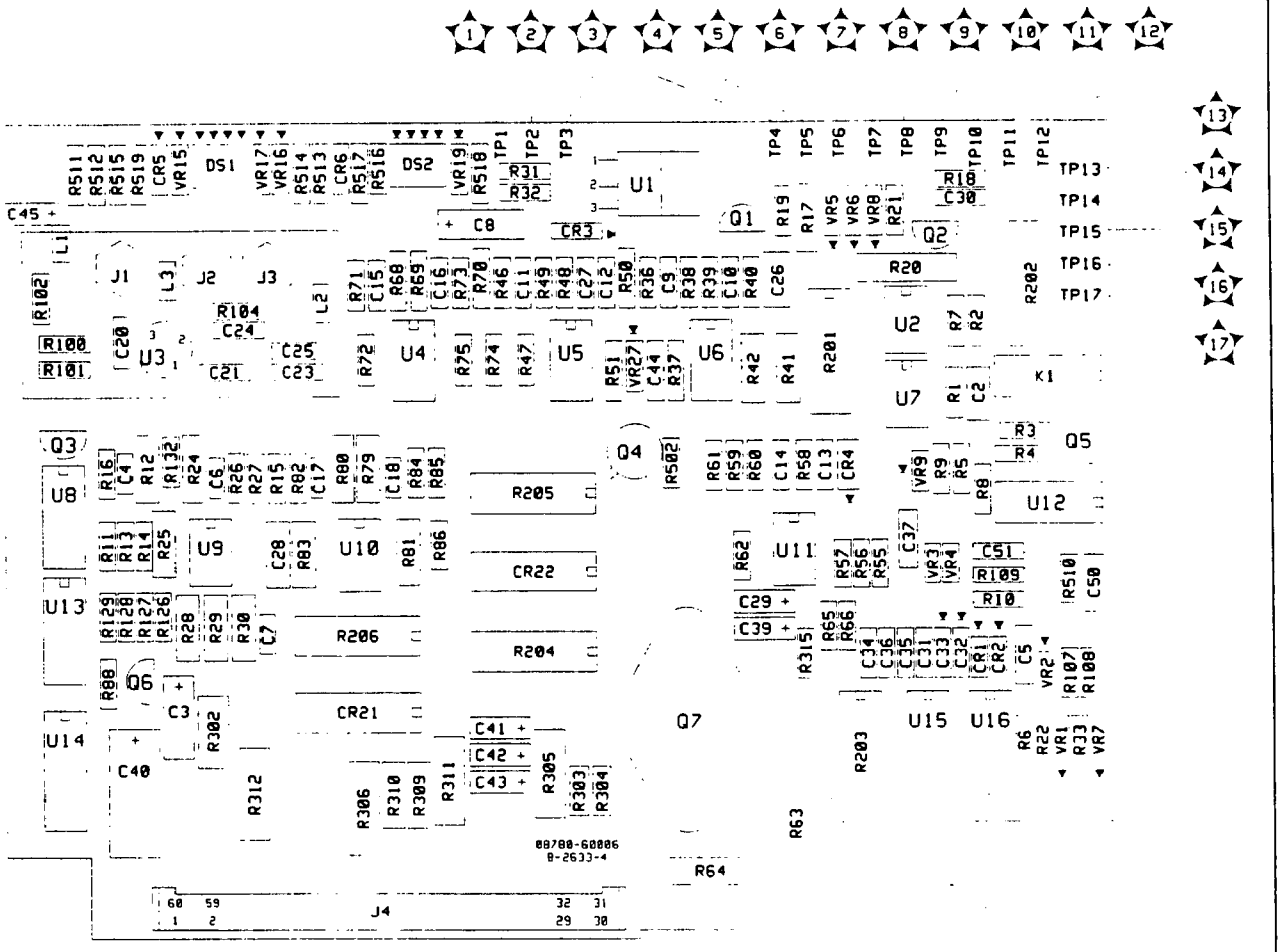
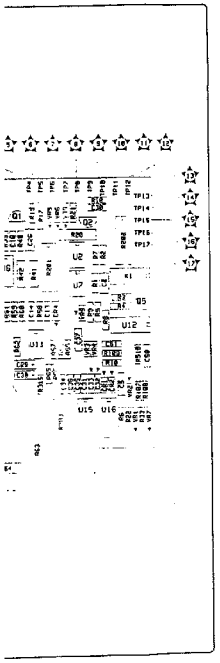
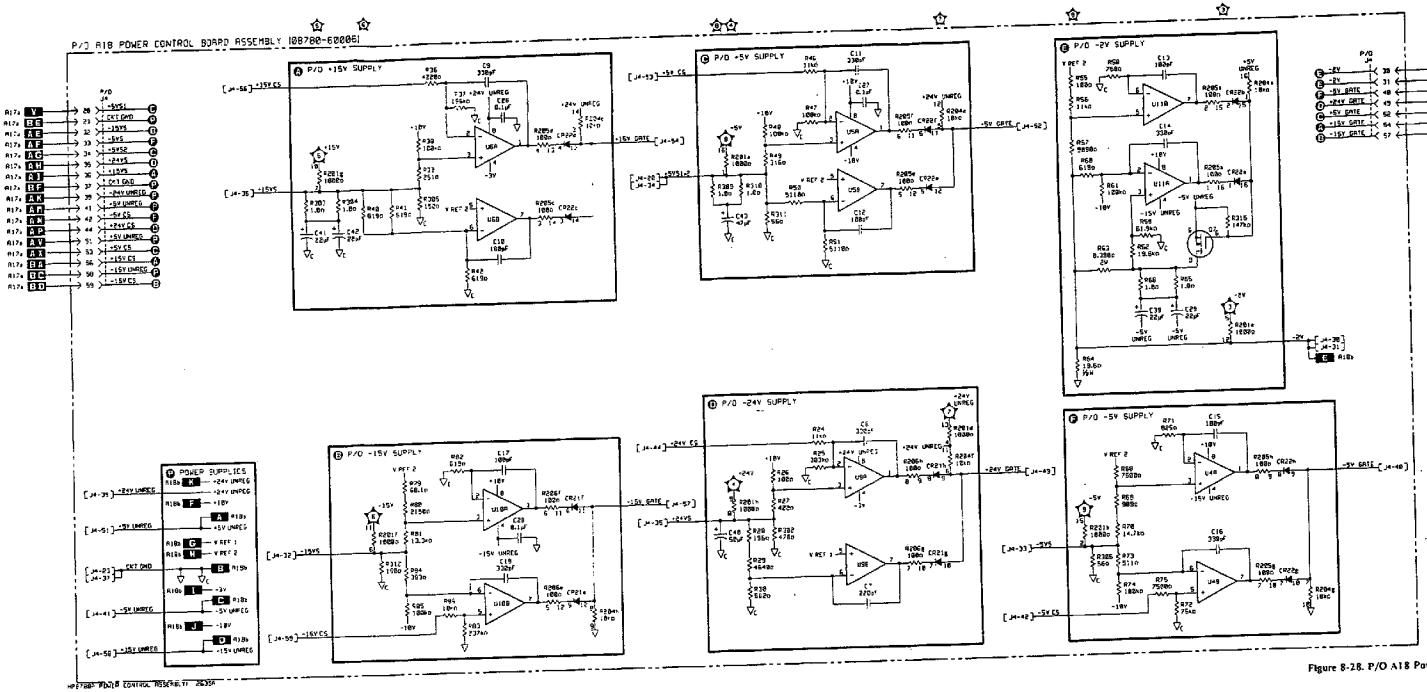


Figure 8-27. A18 Power Control Board Assembly Component Locations



embly Component Locations



A18a

Figure 8-28. P/O A18 Power Control Board Assembly Schematic Diagram

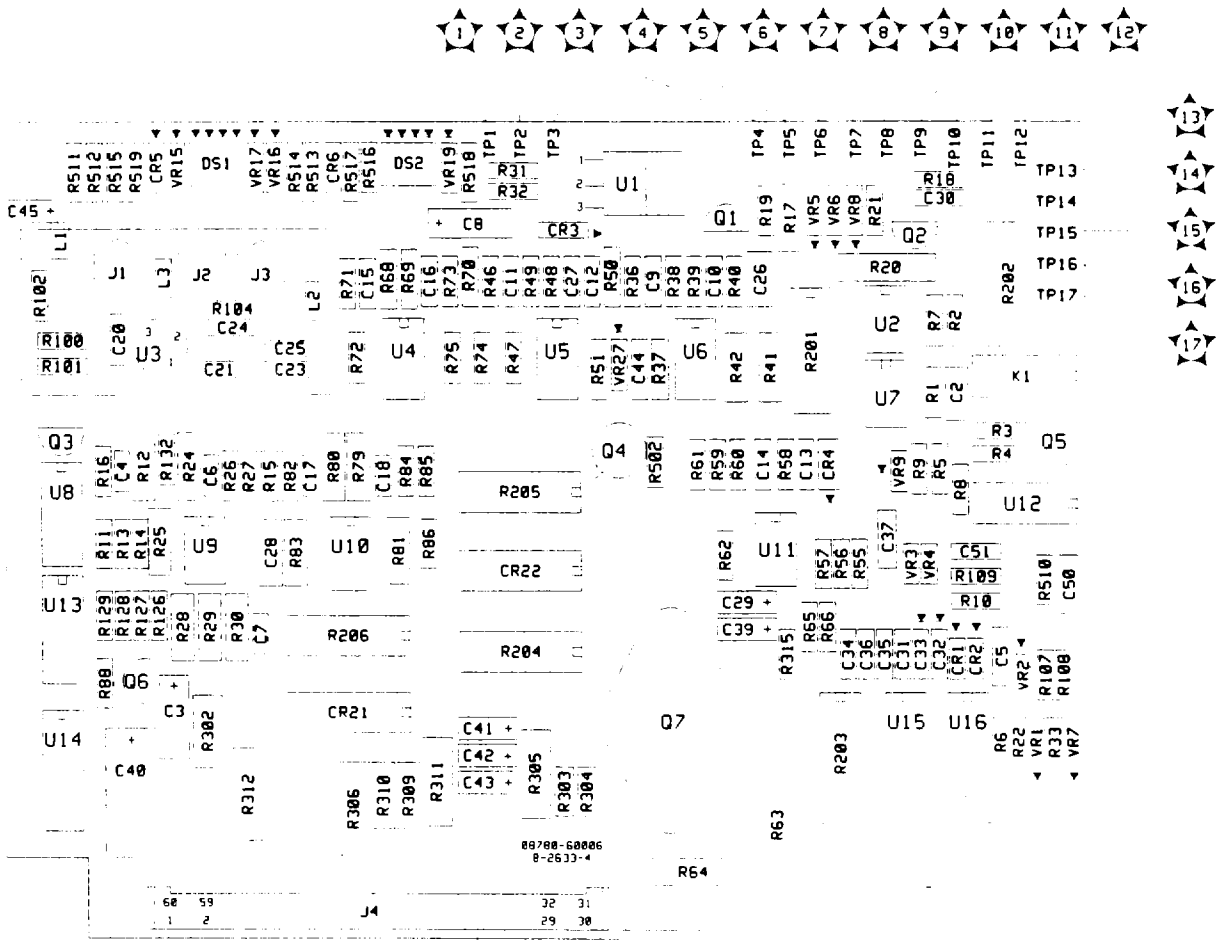


Figure 8-27. A18 Power Control Board Assembly Component Locations

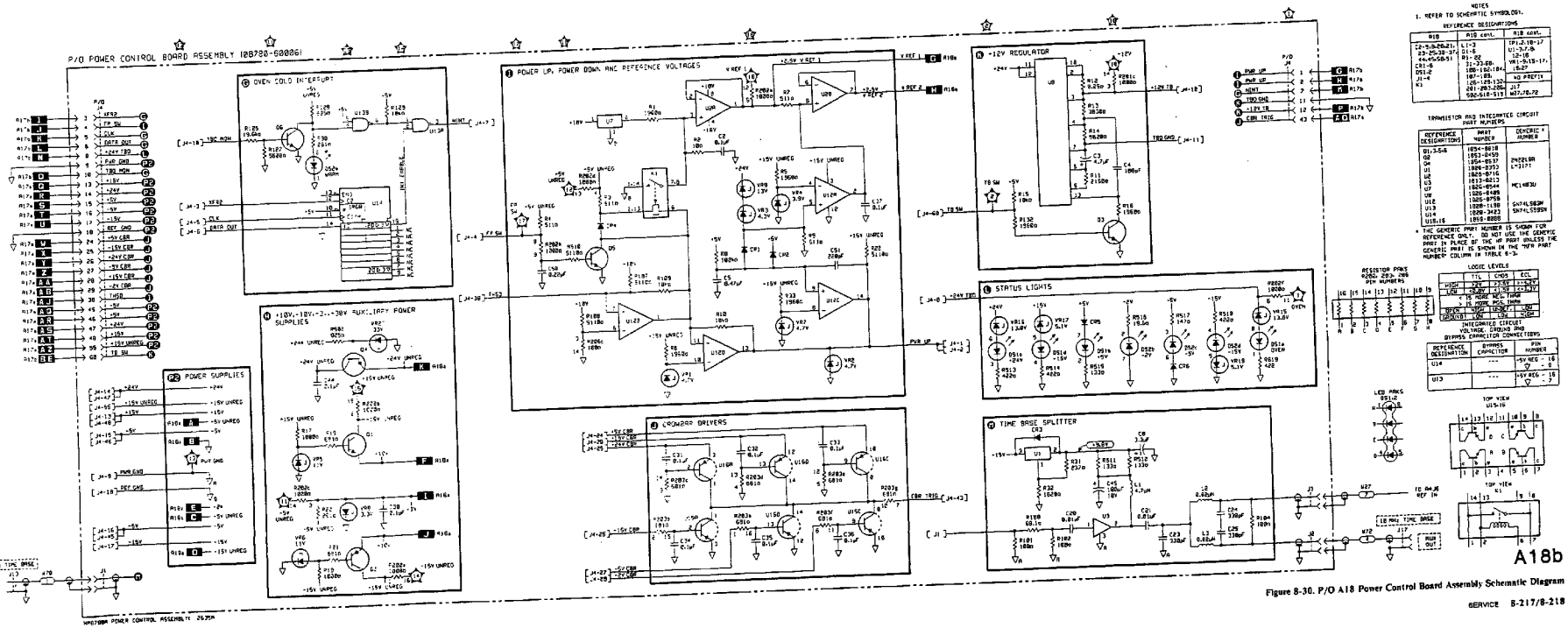


Figure 8-30. P/O A18 Power Control Board Assembly Schematic Diagram

Service Sheet A Disassembly

References

- Internal Views ..... Service Sheet B
- Parts Identification ..... Section 6
- Block Diagrams 1 through 7 ..... Section 8

Procedures

Service Sheet A provides top and bottom cover removal, cleaning, and some front panel disassembly. Parts identification figures are included on the foldout to aid in part location.

Warning **Before beginning any disassembly procedure, be sure that the line (Mains) voltage is disconnected. Voltages exist that can cause personal injury.**

Caution Be aware of special screws and captive nuts. The stripping of these threads can cause grounding problems if that screw or nut is used as a ground point.

TOP AND BOTTOM COVER REMOVAL AND REPLACEMENT

a. Position the instrument with the appropriate cover up.

b. Remove the two plastic standoffs (rear panel feet) on the rear frame by removing the screws from each standoff.

c. Unscrew the screw at the middle rear edge of the cover. This is a captive screw and will cause the top cover to move away from the frame.

d. Slide the cover away from the front frame and remove it.

e. To replace cover slide it into position, engage screw and tighten. Be careful that the cover fits into the slot provided.

CLEANING

Warning 

Before cleaning, make sure the Vector Generator is disconnected from the power source. This is to eliminate the possiblity of electrical shock.

Caution 

In procedures that call for a vacuum cleaner an electrostatic discharging wrist strap must be worn to protect sensitive devices from being damaged. This wrist strap must be connected to a properly grounded dissipative table or floor mat to prevent the electrostatic charge build up. In procedures that call for a vacuum cleaner to remove dust, do not use a blower or compressed air. Doing so will cause the dust to be transferred throughout the instrument.

Fan

a. At the rear of the instrument, remove four screws and washers that secure the finger guard and fan to rear panel.

b. Remove the fan and finger guard.

c. Using a vacuum cleaner and a soft-bristle brush, remove dust from the fan and its housing.

d. Replace the fan and finger guard.

Area of Fan Output

a. Inside the instrument, locate the power supply filter capacitor area.

b. Using a vacuum cleaner and a soft-bristle brush, remove dust from the entire area this includes the air passage holes to the frames.

c. Remove dust from the A17 Distribution Board Assembly and A18 Power Control Assembly.

Caution

In the next step, do not let the cleaning solution touch circuit portions of the printed circuit board. This could cause residual flux on solder connections to liquify and contaminate the edge connectors.

d. Remove the two screws holding the A18 Power Control Assembly. The two screws are near the top of the assembly and screw into standoffs mounted on component side of the board.

e. Disconnect the three coaxial cables that are connected to and located on the circuit side of the A18 Power Control Assembly.

f. Remove the A18 Power Control Assembly. Clean the connector using a lint-free cloth saturated with cleaning solution. Rub the printed circuit board connector, as much as is possible to access, to remove any foreign material.

g. Rinse the printed circuit board connector with deionized water and wipe dry.

Note

Before returning the printed circuit board to its place, it is a good idea to inspect for heat damage. A printed circuit board that is mounted near the front of the fan, produces relatively high amounts of heat. Heat discoloration of the board material can be a sign that the fan is not working properly.

h. Carefully insert the printed circuit board into its A17 Distribution board connector. (The component side of board faces the rear of the instrument.)

FRONT PANEL BEZEL REMOVAL

a. The front panel bezel can be removed using the following procedure in conjunction with Figure 8-31 Front Panel Bezel Removal.

b. Remove the six screws item numbers 4,5,7,8,9, and 10 as shown in the figure.

c. Pull out at the bottom of the bezel and slide down to release from being held by the clips (one clip is shown as item number 3 in the figure).

d. Disconnect cables item numbers 2 and 6.

A1A2 KEYBOARD REMOVAL

a. The A1A2 Keyboard Assembly can be removed using the following procedure in conjunction with Figure 8-32 A1A2 Keyboard Removal.

b. Remove screws item numbers 1,3,4,5,6,7,11, and 13 as shown in the figure.

c. Remove the assembly while moving the rotary pulse generator cable item 12 through the opening in the board.

FRAME REMOVAL

a. The following procedure in conjunction with Figure 8-33 Frame Removal is used for the removal of a typical frame.

b. Remove the ribbon cable connector item number 5 in the figure.

c. Remove all coaxial cables item number 6 in the figure.

d. Remove the two screws at the ends (ears) of the frame items numbered 1 and 8 in the figure.

e. Lift frame straight up. The grip of the spring loaded clip at the base of the frame must be overcome.

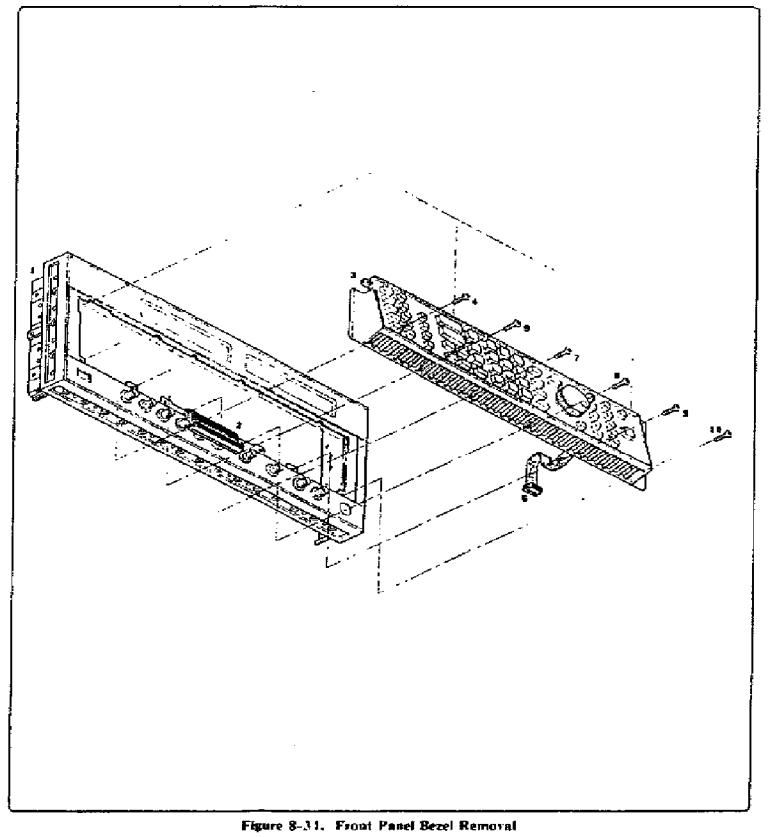


Figure 8-31. Front Panel Bezel Removal

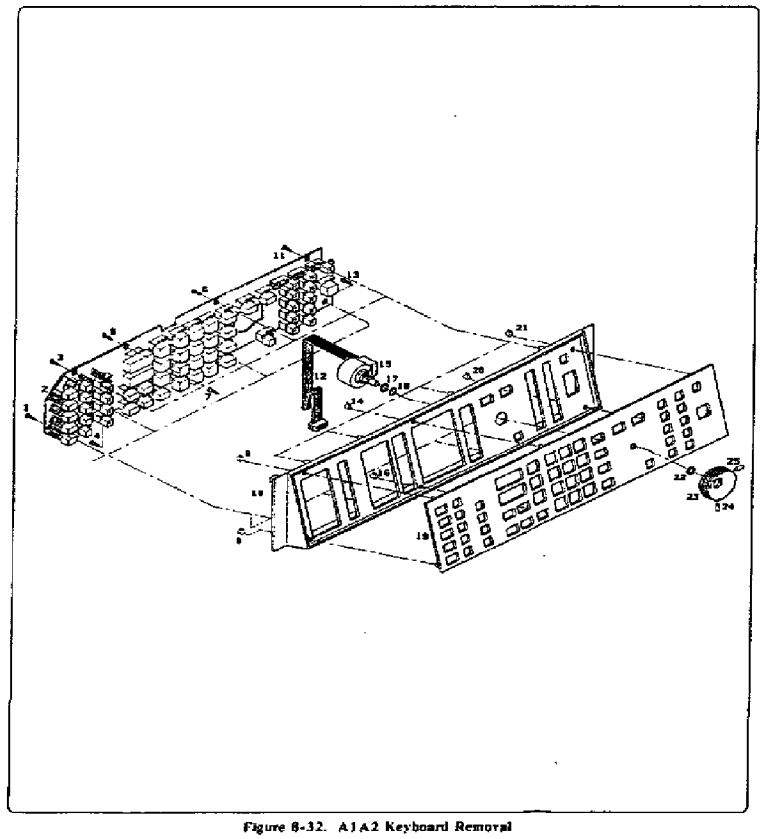


Figure 8-32. A1A2 Keyboard Removal

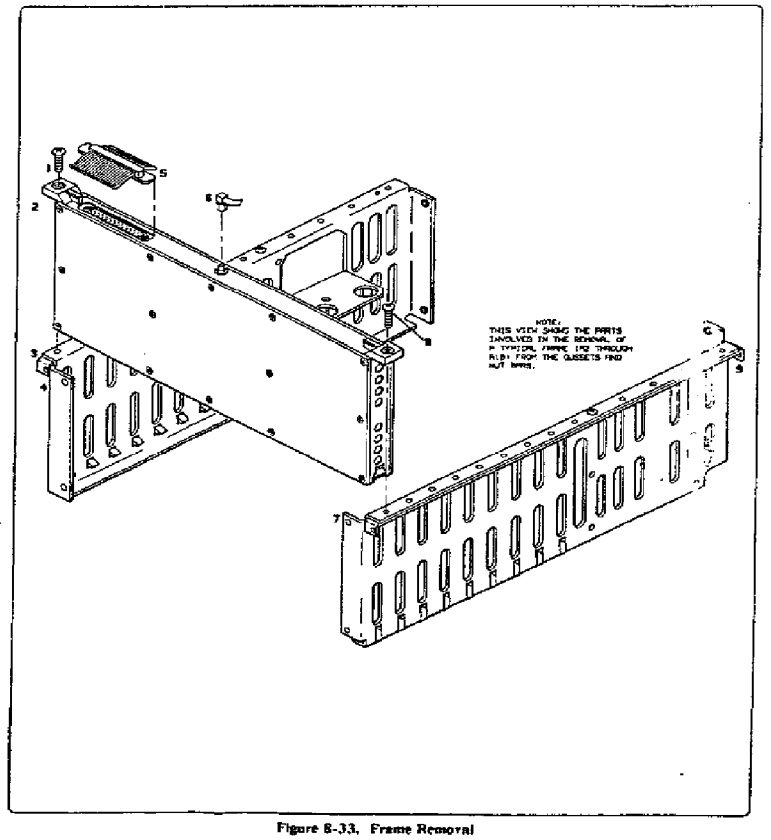


Figure 8-33. Frame Removal

Service Sheet B Internal Views

References

- Parts Identification ..... Section 6
- Block Diagrams 1 through 7 ..... Section 8

General Information

Service Sheet B shows the internal views, and also the front and rear panel with callouts. The internal views show major assemblies and test points of the A18 Power Control Assembly. The front panel view shows assembly numbers of the front panel assemblies, and connector J numbers with associated cable numbers. The rear panel view shows connector J numbers and associated cables. Some chassis parts are identified in the rear panel view.

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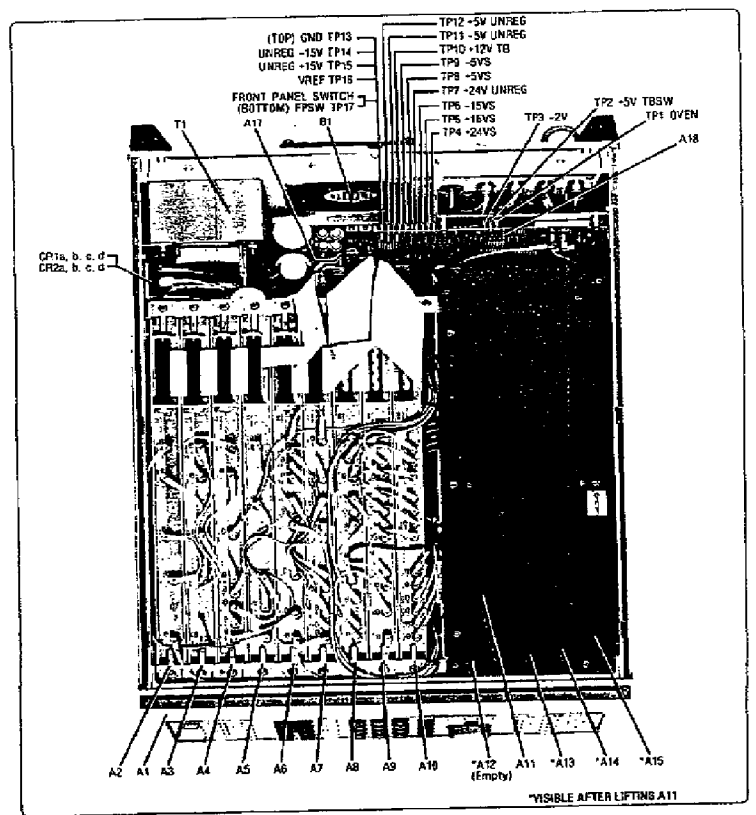


Figure 8-34. Top Internal View

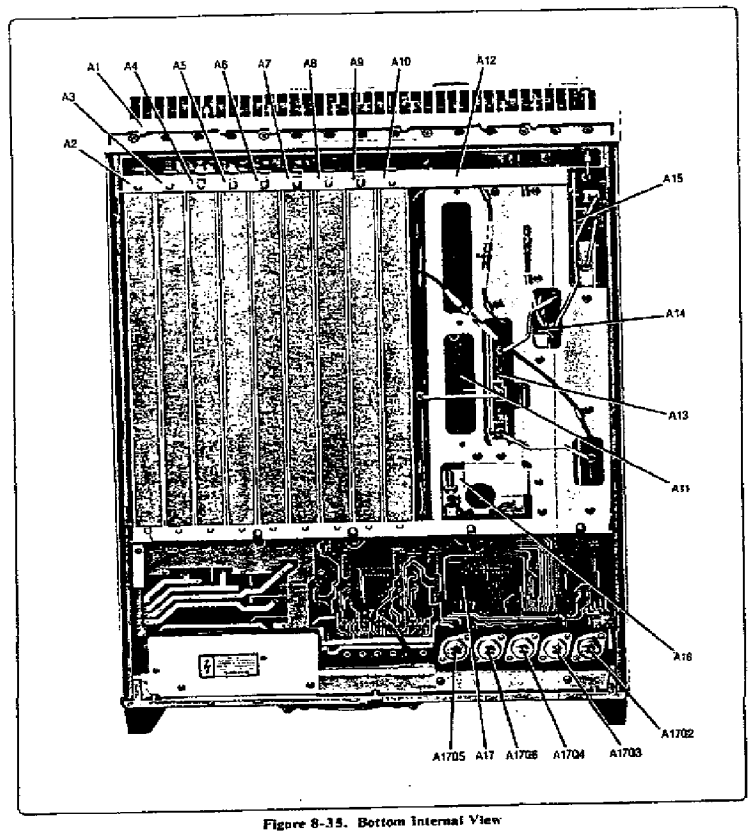


Figure 8-35. Bottom Internal View

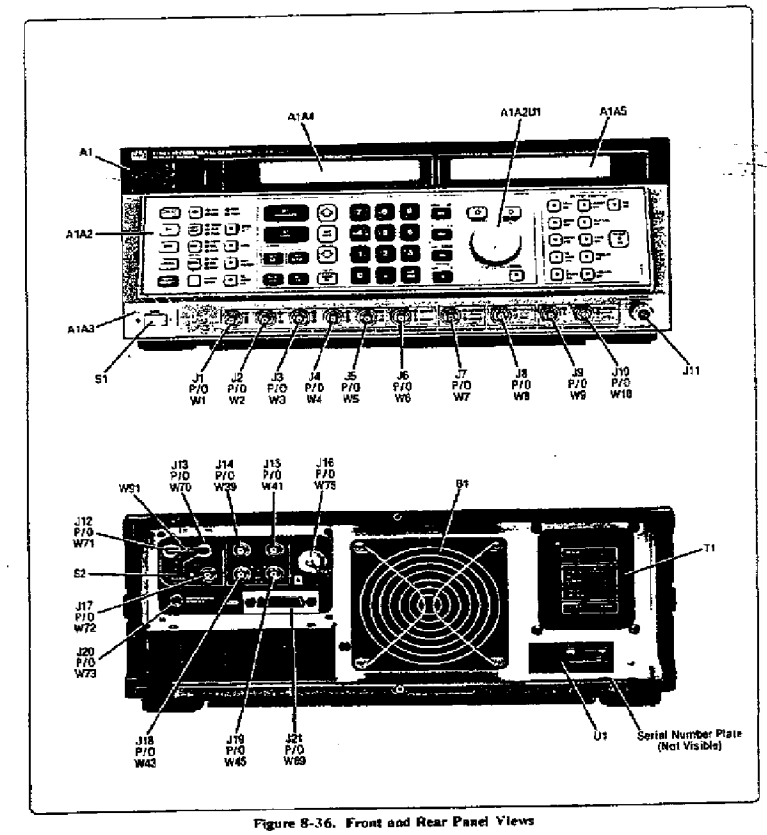


Figure 8-36. Front and Rear Panel Views

Table 8-43. Schematic Diagram Notes (1 of 5)

REFERENCE DESIGNATIONS ON SCHEMATICS

Reference designations within assembly borders (— — — —) are abbreviated. That is, the basic reference designation is shown without the assembly identifier. Thus, capacitor C1 within the border of A2 is actually A2C1. Reference designations outside assembly borders are complete as shown (such as, W1, W2, J5, and J7).

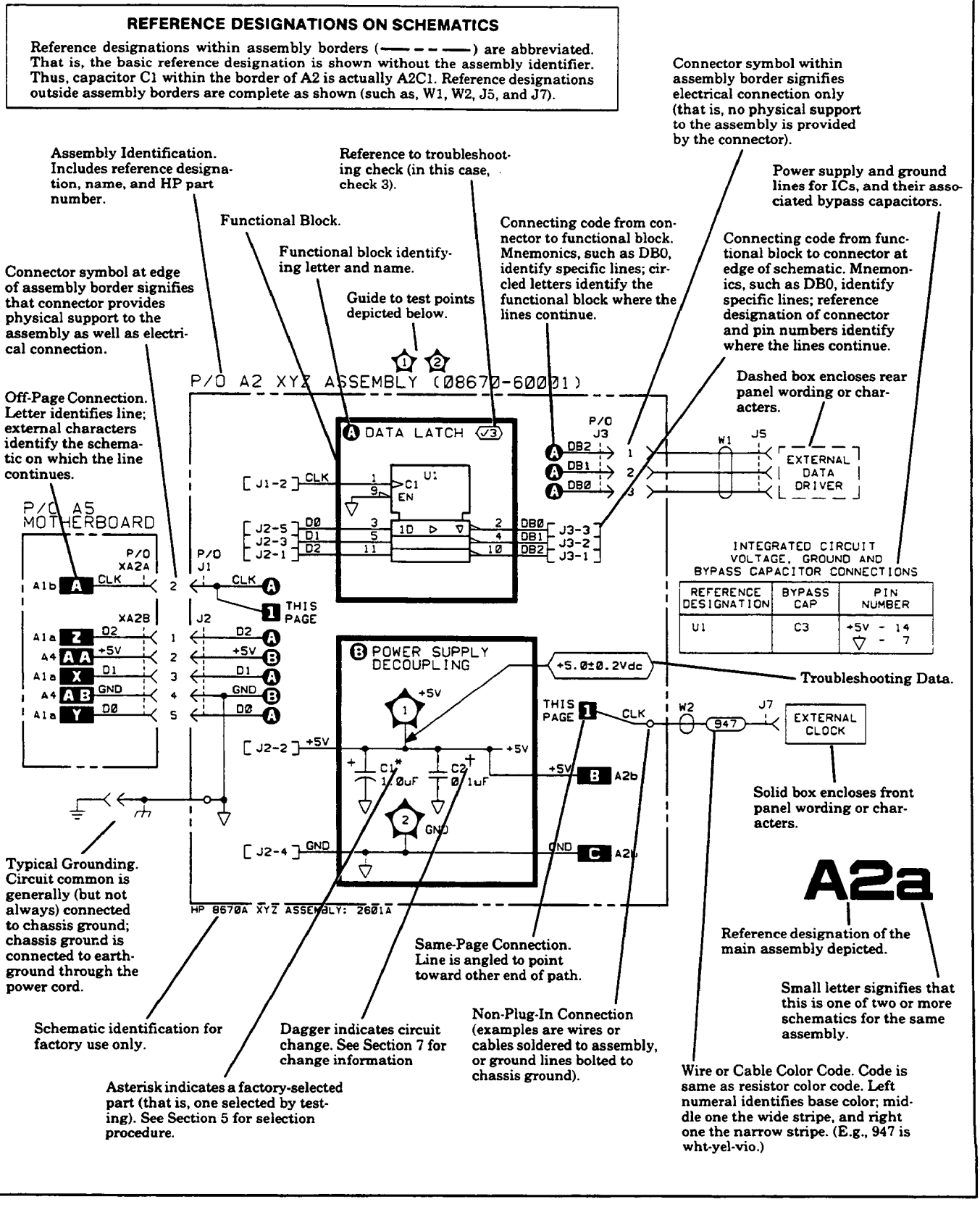


Table 8-43. Schematic Diagram Notes (2 of 5)

SCHEMATIC DIAGRAM NOTES

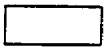
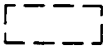
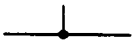
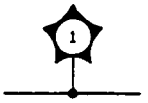
Logic Symbols	See text and figures for logic symbology that follow this table.
*	Asterisk identifies a factory-selected part (that is, one selected by testing). Value shown is only typical. See Section 5 for selection procedure.
†	Dagger indicates circuit change. See Section 7 for change information.
○	Manual Control.
⊘	Tool-Aided Adjustment
	Solid box encloses front panel wording or characters.
	Dashed box encloses rear panel wording or characters.
	Assembly Border. Encloses a repairable part.
	Electromagnetic Shielding.
	Heavy line indicates path of main signal flow; arrow signifies direction of flow.
	Heavy dashed line indicates path of main feedback; arrow signifies direction of flow.
	Junction. A simple branching or joining of circuit paths.
	Non-Plug-In Connection. Examples are wires soldered to pc boards and ground lines bolted to chassis ground.
	Potentiometer. Wiper moves toward CW with clockwise rotation of control.
	Numbered test points signify that a measuring aid is provided, such as a metal post.
	Lettered testpoints with arrows signify that no measuring aid is provided.
	Wire or Cable Color Code. Code is same as resistor color code. Left numeral identifies base color; middle one the wide stripe, and right one the narrow stripe. (Example, 947 indicates a white base, a yellow wide stripe, and a violet narrow stripe.)
	Hexagon contains troubleshooting information. A checkmark with number is reference to a troubleshooting check located elsewhere.
⏚	Earth Ground. A direct connection to earth or to a structure that has a similar function (for example, the frame of an air, sea, or land vehicle).

Table 8-43. Schematic Diagram Notes (3 of 5)

SCHEMATIC DIAGRAM NOTES

Chassis Ground. A connection to the instrument's chassis or frame.

Circuit Common. All points similarly marked are connected. Numbers or letters may accompany the symbol to signify different common points.

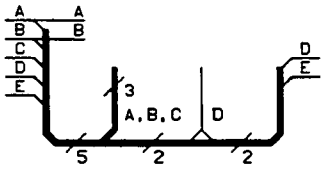
Functional Block Letter. Identifies a functional block within a schematic.

AK A5a

Off-page connection indicates that the circuit path continues on another schematic. Enclosed letters (such as AK) identify the specific line. External characters, such as A5a, identify the schematic containing the other end of the line.

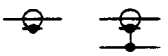
2 THIS PAGE

Same-page connection indicates that the circuit path continues elsewhere on the same schematic. The line is angled to point toward the other end of the circuit path. Enclosed number identifies the specific line.



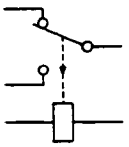
Bundled Circuit Paths. One bold line represents multiple paths. (Normal-sized lines represent single paths.) Letters or mnemonics identify individual paths; numbers indicate the number of paths represented by the bundle. Paths enter and leave the bundle at 45° angles. Paths that branch away from, as well as continue on with the bundle (such as path D), are indicated by a delta ( ).

Polarized capacitor, such as electrolytic.



Coaxial Cable

Switch. Contacts with triangles are momentary or automatic-return contacts. Contacts with circles when closed remain closed.



Relay. Pole is shown in the de-energized position. Pole moves in the direction of arrow when energized.

PN Junction Diode

Voltage Regulation (Zener) Diode

Varactor Diode

PIN Diode

Table 8-43. Schematic Diagram Notes (4 of 5)

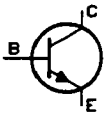
SCHEMATIC DIAGRAM NOTES

Schottky (Hot Carrier) Diode

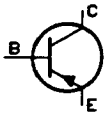
Light Emitting Diode (LED)

Semiconductor Controlled Rectifier (SCR), P-Type Gate.

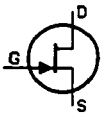
Semiconductor Controlled Rectifier (SCR), N-Type Gate.



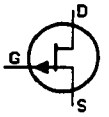
NPN Bipolar Transistor



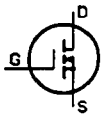
PNP Bipolar Transistor



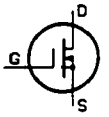
N-Channel JFET



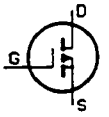
P-Channel JFET



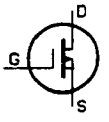
N-Channel MOSFET, Enhancement Type



N-Channel MOSFET, Depletion Type



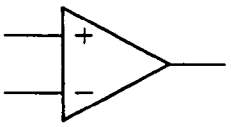
P-Channel MOSFET, Enhancement Type



P-Channel MOSFET, Depletion Type

Table 8-43. Schematic Diagram Notes (5 of 5)

SCHEMATIC DIAGRAM NOTES



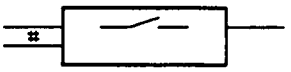
Operational Amplifier

Highpass Filter

Bandpass Filter

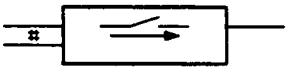
Lowpass Filter

Notch Filter

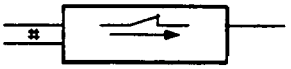


Bidirectional Analog Switch (Make). An analog signal can pass in either direction as long as the digital signal (#) is active. (The switch is shown in its inactive state.)

Bidirectional Analog Switch (Break). An analog signal will be blocked (that is, the switch is opened) when the digital signal (#) is active. (The switch is shown in its inactive state.)



Unidirectional Analog Switch (Make). An analog signal can pass only when the digital signal (#) is active. (The switch is shown in its inactive state.) The analog signal can pass only in the direction of the arrow.



Unidirectional Analog Switch (Break). An analog signal will be blocked (that is, the switch is opened) when the digital signal (#) is active. (The switch is shown in its inactive state.) When the signal flows, it flows only in the direction of the arrow.

8-14. Logic Symbols

Logic symbols used in this manual conform to the American National Standard ANSI/IEEE Std. 91-1984. This standard supersedes MIL-STD-806B. Tables 8-44 through 8-49 give a brief summary of the symbols used for logic devices, and the associated qualifiers and indicators. Not all of the symbols listed have been used in this manual, but they are included in the tables for the sake of completeness.[1]

General Qualifying Symbols. The following table shows the characters generally used to define the basic function of a device represented by a logic symbol or element. The characters are placed near the top center or geometric center of the symbol or symbol element.

Table 8-44. General Qualifying Symbols

Symbol	Description	Example
&	AND gate or function.	SN7400
≥1	OR gate or function. The symbol was chosen to indicate that at least one active input is needed to activate the output.	SN7402
=1	Exclusive OR. One and only one input must be active to activate the output.	SN7486
=	Logic identity. All inputs must stand at same state.	SN74180
2k	An even number of inputs must be active.	SN74180
2k + 1	An odd number of inputs must be active.	SN74ALS86
1	The output stands at its 1-state if and only if the input stands at its 1-state.	SN7404
> or <	Greater than or less than input of a magnitude comparator.	SN7485
▷ or ◁	A buffer or element with more than usual output capability (symbol is oriented in the direction of signal flow).	SN7406
	Schmitt trigger; element with hysteresis.	SN74LS18
X/Y	Coder, code converter (DEC/BCD, BIN/OUT, BIN/7-SEG, etc).	SN74LS347
MUX	Multiplexer/data selector.	SN74150
DMUX or DX	Demultiplexer.	SN74138
Σ	Adder.	SN74LS385
P-Q	Subtracter.	SN74LS385
CPG	Look-ahead carry generator.	SN74182
π	Multiplier.	SN74LS384
COMP	Magnitude comparator.	SN74LS682
ALU	Arithmetic logic unit.	SN74LS381
	Retriggerable monostable.	SN74LS422
1 	Nonretriggerable monostable (one-shot).	SN74121
G 	Astable element. Showing waveform is optional.	SN74LS320
!G 	Synchronously starting astable.	SN74LS624
G! 	Astable element that stops with a completed pulse.	•

[1]Portions of this logic symbology summary are from "1981 Supplement to the TTL Data Book for Design Engineers". copyright © 1981 Texas Instruments Incorporated. Reproduced by permission.

Table 8-44. General Qualifying Symbols (Cont'd)

Symbol	Description	Example
SRGm	Shift register. m = number of bits.	SN74LS595
CTRm	Counter. m = number of bits; cycle length = 2^m.	SN54LS590
CTR DIVm	Counter with cycle length = m.	SN74LS668
RCTRm	Asynchronous (ripple-carry) counter; cycle length = 2^m.	•
ROM	Read-only memory.	SN74187
RAM	Random-access read/write memory.	SN74170
FIFO	First-in, first-out memory.	SN74LS222
I = 0	Element powers up cleared to 0 state.	SN74AS877
Φ	Highly complex function; "gray box" symbol with limited detail shown under special rules.	SN74LS608

Gate Symbols. The ANSI/IEEE standard defines new symbols for the basic gate functions, but also permits the use of the MIL-STD-806B symbols for these gates, as shown in the following figure. In this manual, the distinctively shaped AND-gate, OR-gate, Exclusive-OR-gate, and Inverter symbols will be used for those gates which are not part of a complex logic device. The new symbols will be used for those gates embedded within a logic symbol, signifying that they are one element of a more complex logic device.

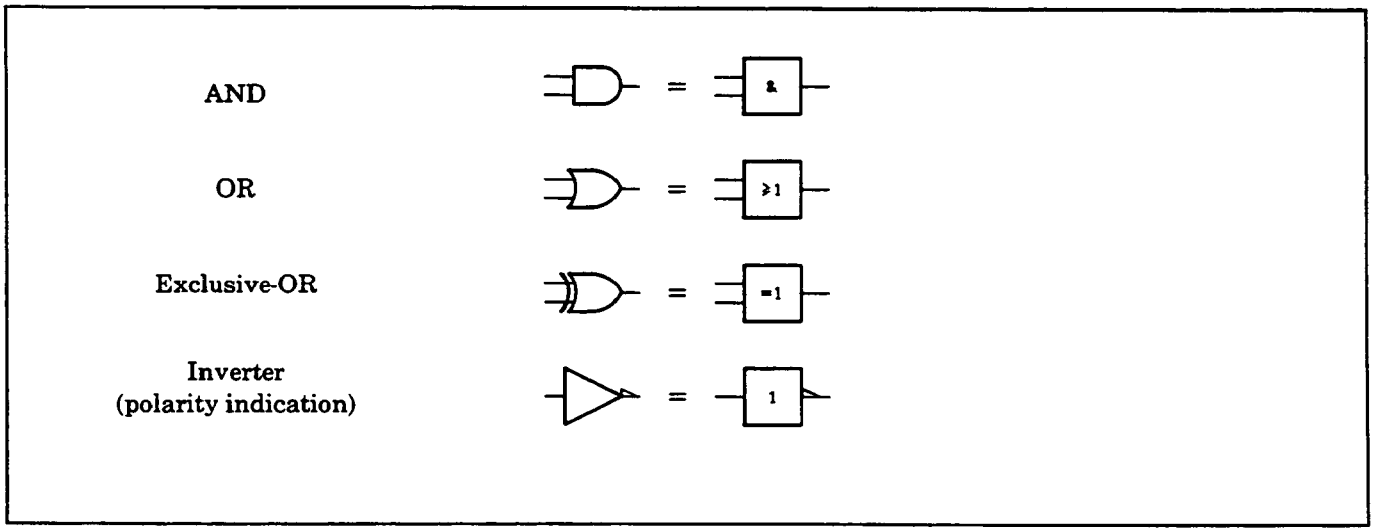
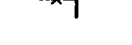


Figure 8-37. Gate Symbols

Qualifying Symbols for Inputs and Outputs. The symbols shown in the following table are used to indicate the external states of both gate and complex logic devices, and their relationship to internal states.

Table 8-45. Qualifying Symbols for Inputs and Outputs

Symbol	Description
	Active-low input. Equivalent to —◁ in positive logic.
	Active-low output. Equivalent to ▷— in positive logic.
	Active-low input in the case of right-to-left signal flow.
	Active-low output in the case of right-to-left signal flow.
	Signal flow from right-to-left. If not otherwise indicated, signal flow is from left-to-right.
	Bidirectional signal flow.
	Dynamic input. The transition from the external 0 state to the external 1 state produces a transitory internal 1 state. At all other times, the internal logic state is 0.
	Nonlogic connection. A label inside the device symbol will usually define the nature of the input or output.
	Analog input or output.
	Digital input or output

Qualifying Symbols for Internal Connections. The internal connections between elements abutted together in logic symbol are indicated by the symbols shown in the following table. Note that the internal (virtual) input is an input originating somewhere else in the device and is not connected directly to a pin. The internal (virtual) output is likewise not connected to a pin.

Table 8-46. Qualifying Symbols for Internal Connections

Symbol	Description
	Internal connection. 1 state on left produces 1 state on right.
	Negated internal connection. 1 state on left produces 0 state on right.
	Dynamic internal connection. Transition from 0 to 1 on left produces transitory 1 state on right.
	Internal input (virtual input). It always stands at its internal 1 state unless affected by an overriding dependency relationship.
	Internal output (virtual output). Its affect on an internal input to which it is connected is indicated by dependency notation.

Symbols Inside the Outline. The following table shows some of the symbols used inside the outline of a logic symbol. Note particularly that open-collector, open-emitter, and three-state outputs have distinctive symbols. Also note than an EN (Enable) input affects all the outputs of the circuit and has no effect on inputs. When an Enable input affects only certain outputs and/or affects one or more inputs, a form of dependency notation will indicate this (refer to the following paragraph).

Table 8-47. Symbols Inside the Outline

Symbol	Description
	Postponed output (of a pulse-triggered flip-flop). The output changes when input initiating change (e.g., a C input) returns to its initial external state or level.
	Bi-threshold input (input with hysteresis).
	NPN open-collector or similar output that can supply a relatively low-impedance L level when not turned off. Requires external pull-up. Capable of positive-logic wired-AND connection.
	Passive-pull-up output is similar to NPN open-collector output but is supplemented with a built-in passive pull-up.
	NPN open-emitter or similar output that can supply a relatively low-impedance H level when not turned off. Requires external pull-down. Capable of positive-logic wired-OR connection.
	Passive-pull-down output is similar to NPN open-emitter output but is supplemented with a built-in passive pull-down.
	3-state output.
	Output with more than usual output capability (symbol is oriented in the direction of signal flow).
	Enable input When at its internal 1-state, all outputs are enabled. When at its internal 0-state, open-collector and open-emitter outputs are off, 3 state outputs are at normally defined internal logic states and at external high-impedance state, and all other outputs (e.g., totem poles) are at the internal 0-state.
J, K, R, S, T	Usual meanings associated with flip-flops (e.g., R = reset, T = toggle).
	Data input to a storage element equivalent to 
	Shift right (left) inputs, m = 1, 2, 3 etc. If m = 1, it is usually not shown.
	Counting up (+) or down (−) inputs. m = 1, 2, 3 etc. If m = 1, it is usually not shown.
	Bit grouping. 0 and m, in this case, are the exponents of 2.
	The contents-setting input, when active, causes the content of a register to take on the indicated value.
	The content output is active if the content of the register is as indicated.
	Input line grouping. . . . indicates two or more terminals used to implement a single logic input. e.g., The paired expander inputs of SN7450. 
	Fixed-state output always stands at its internal 1 state. For example, see SN74185.

Dependency Notation. Dependency notation is a way to simplify symbols from complex IC elements by denoting the relationship between inputs, outputs, or inputs and outputs, without actually showing all the elements and interconnections involved. The information provided by dependency notation supplements that provided by the qualifying symbols for an element's function. The following table contains a summary of the 11 types of dependency notations.

Table 8-48. Summary of Dependency Notation

Type of Dependency	Letter Symbol*	Affecting Input At Its 1-State	Affecting Input At Its 0-State
Address	A	Permits action (address selected).	Prevents action (address not selected).
Control	C	Permits action.	Prevents action.
Enable	EN	Permits action.	1. Prevents action of affected inputs. 2. Imposes external high-impedance state on open-circuit and 3-state outputs (internal state of 3-state output is unaffected). 3. Imposes high-impedance L-level on passive-pulldown outputs and high-impedance H-level on passive pullup outputs. 4. Imposes 0-state on other outputs.
AND	G	Permits action.	Imposes 0 state.
Mode	M	Permits action (mode selected).	Prevents action (mode not selected).
Negate	N	Complements state.	No effect.
RESET	R	Affected output reacts as it would to S = 0, R = 1.	No effect.
SET	S	Affected output reacts as it would to S = 1, R = 0.	No effect.
OR	V	Imposes 1 state.	Permits action.
Transmission	X	Transmission path established.	Transmission path not established.
Interconnection	Z	Imposes 1 state.	Imposes 0 state.

*These letter symbols appear at the AFFECTING input or output and are followed by a number. Each input or output AFFECTED by that input is labeled with that same number. When the labels EN, R, and S appear at inputs without the following numbers, the descriptions above do not apply. The action of these inputs is described under "Symbols Inside the Outline".

The following table contains examples of dependency notation using the "G" (AND) and "C" (Control) dependency symbols. Refer to the ANSI/IEEE Std. 91-1984 for a complete explanation of dependency notation.

Table 8-49. Examples of Dependency Notation

Symbol	Description
G1 1	The input affecting other inputs or outputs with an AND or Control relationship is labeled with a "G" or a "C", followed by an identifying number. The affected input or output is labeled with the same number. In this example, "1" is controlled by "G1".
C1 1D	When the affected input or output already has a functional label (D is used here), that label will be prefixed by the identifying number.
G1 G2 1,2X	If an input or output is affected by more than one input, then the identifying numbers of each affecting input will appear in the label of the affected one, separated by commas. In this example "X" is controlled by "G1" and "G2".

Control Blocks. A common control block is often used in conjunction with an array of related elements. (See the following figure.) A control block is the point of placement for inputs and outputs associated with more than one element of the array, or with no element of the array. Such inputs and outputs will be labeled when appropriate. Refer to the following paragraph for an example of the use of control blocks.

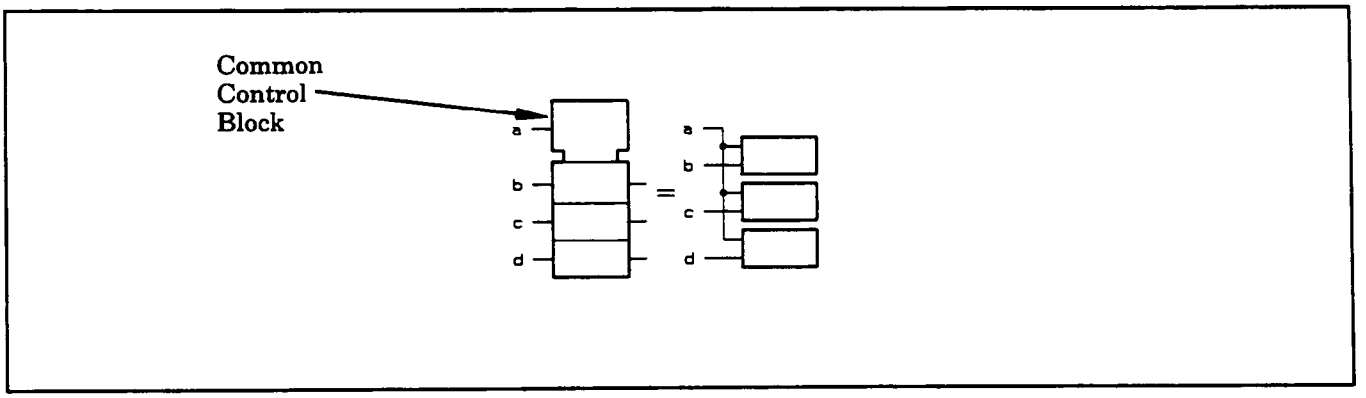


Figure 8-38. Common Control Block

Logic Device Notation Example. The various logic symbols are combined to represent more complex devices that perform more difficult functions. The control block symbol can simplify understanding of many complex devices. An example of such a device is given here. (See the following figure.) This example is typical of the symbols used in schematic diagrams in this manual.

This device is used as an interface between an external controller and the HP-IB microcomputer on the Data Bus.

In this example, G1 controls both EN2 and EN3. The logic level on pin 11 determines whether data is transmitted or received.

With a LOW at G1 (pin 9), the device is enabled for operation. A HIGH at pin 11 sets the device into the transmit mode and the data on the left-side inputs will pass to the right-side outputs.

A LOW at pin 11 sets the device into the receive mode and the data on the right-side inputs will pass to the left-side outputs.

A HIGH at G1 disables the device (by driving all inputs and outputs to a high impedance state) preventing any data transfer.

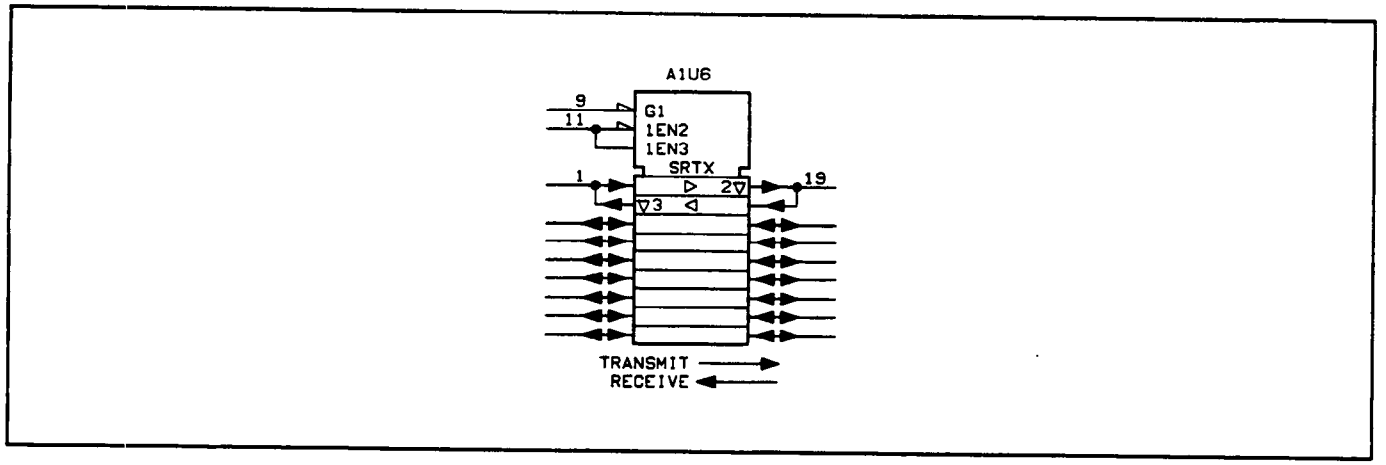


Figure 8-39. 3-State Bidirectional Transceiver

HEWLETT hp PACKARD

OPERATING AND SERVICE MANUAL

MODIFICATIONS

8780A OPTION H02

The 8780A Option H02 is a standard HP 8780A Vector Signal Generator that has been modified to allow Phase Modulation of the RF carrier. This capability is available by connecting a suitable modulation source to the front panel (Rear panel if Options 001 or 064 are also installed) ØM INPUT connector. Option H02 is not compatible with a combination of 001 and 064.

Specification changes: Add the following specifications to Table 1-1 of the 8780A Operating Manual.

Electrical Characteristic	Performance Limits	Conditions
Phase Modulation Sensitivity:	1 Volt/Radian +/- 15%	750MHz carrier 10
Distortion:	7% Maximum	MHz Mod Freq 750MHz carrier 5MHz Mod Freq

Add the following changes to the 8780A Supplemental Characteristics on Table 1-2.

Phase Modulation

Modulation Frequency Range	DC to 10 MHz
Modulation Signal Level (into 50 Ohms) (Maximum Safe Level 5 Volts RMS)	0 to 1.5 Volt Peak

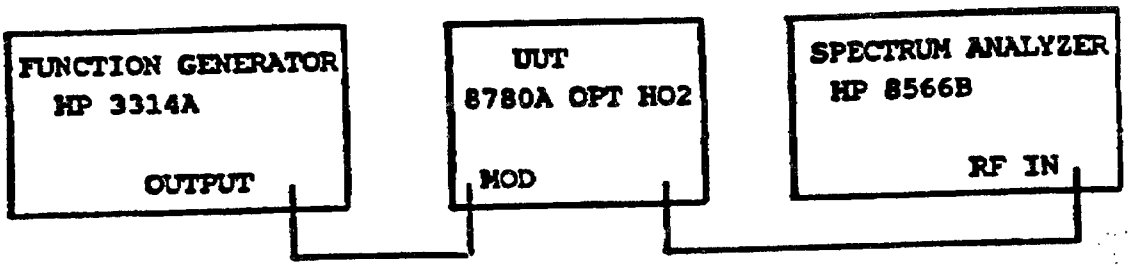
OPERATION:

Phase Modulation is accomplished by connecting a suitable modulation ~~source~~ to the front panel (Rear panel if Option 001 or 064) ØM INPUT connector. Phase Modulation, as a mode of operation, is always active. It is not necessary to select Phase Modulation and it is not possible to prevent it except by removing the modulation source.

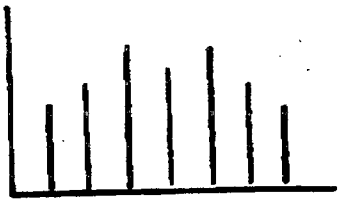
0-80148

Add the following tests for Phase Modulation Sensitivity and Phase Modulation Distortion.

1.0 PHASE MODULATION Sensitivity



TYPICAL WAVEFORM



PROCEDURE

1. Connect equipment as shown above. It is not necessary to enable the phase modulation mode. It is hardwired.

2. Set the function generator to 10 Mhz sine wave at 3.0 volt amplitude. (ie. 1.5 V peak.)

3. Set HP 8780A opt HO2 to 750 Mhz at 0 dBm level CW.

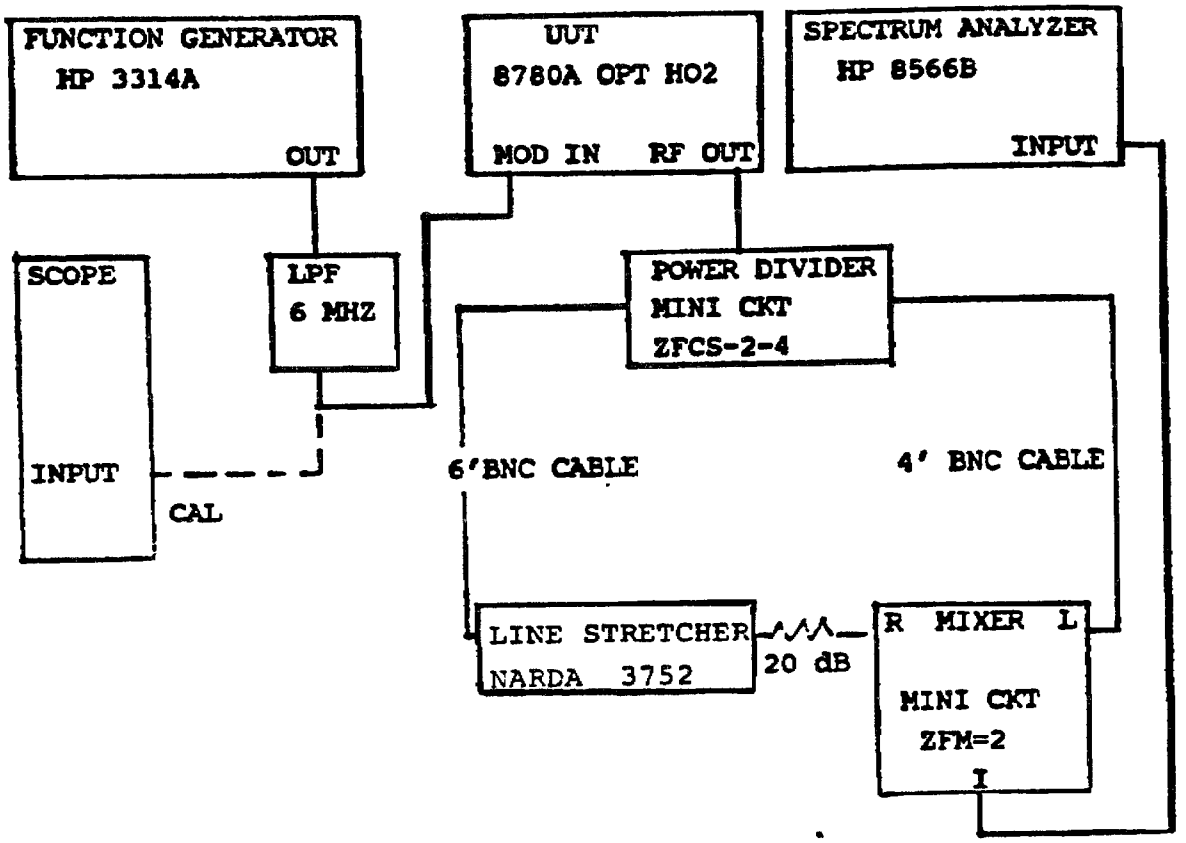
4. Set Spectrum analyzer controls as follows.

Center Frequency	750 Mhz
Span	50 Mhz
Resolution Bandwidth	300 Khz
Video Bandwidth	3 Khz
Reference Level	+10 dBm

5. Measure first Sideband to Carrier ratio. _____dBc.

The ratio should be between -1.5 and +3.2 dBc.

2.0 PHASE MODULATION Distortion



PROCEDURE

1. Connect equipment as shown above.

2. Set function generator to 5.0 Mhz sinewave at 3 volt amplitude. (1.5 V peak into 50 ohms)

3. Connect output of cable from LPF to the 50 ohm input of scope and adjust function generator amplitude level for 3.0 Volt peak to peak.

4. Connect output cable from LPF to Phase Modulation Input on the 8780A Opt HO2.

5. Set 8780A frequency to 750 Mhz at +10 dBm level CW.

6. Set Spectrum Analyzer controls as follows.

Stop Frequency	26 Mhz
Start Frequency	1 Mhz
Resolution Bandwidth	100 Khz
Video Bandwidth	3 Khz
Reference Level	-20 dBm

6. Adjust the line stretcher to peak the frequency demodulated signal at 5 Mhz.

7. Measure the second and third harmonic to carrier ratio.

(example) 2nd (-30) dBc
3rd (-40) dBc

8. Since this test setup acts like a frequency discriminator (measures peak frequency deviation) it is necessary to subtract an additional 6 dB from the measured 2nd harmonic and 9.5 db from the 3rd harmonic for correct calculation of the distortion of a phase modulated signal.

(example) 2nd (-36) dBc
3rd (-49.5) dBc

9. Calculate Total Harmonic Distortion.

$$THD = \sqrt{(2nd)^2 + (3rd)^2}$$

$$THD = \sqrt{(10^{(-36/20)})^2 + (10^{(-49.5/20)})^2}$$

$$= 1.62*10^{-2}$$

THD*100=1.62%

The distortion should be 7% maximum at 5 MHZ

THD _____%

REPLACEABLE PARTS:

Make the following changes to Table 6-3 in the 8780A Service Manual:

ADD: A101	08780-62001 QTY. 1 PHASE MODULATOR
CHANGE ITEM 53 ON FIG. 6-6 TO	08780-02002 QTY.1 PANEL CONNECTOR (H02 WITH 001)
ADD: ITEM 54 TO FIG. 6-6,	0590-1649 QTY.1 NUT-KNURLED RING
ADD: W99 TO FIG. 6-11,	08780-60139 QTY.1 CABLE ASSY. DIG. 6 (H02 ONLY)
	08780-60113 QTY.1 CABLE ASSY. DIG. 2 (H02 WITH 064)

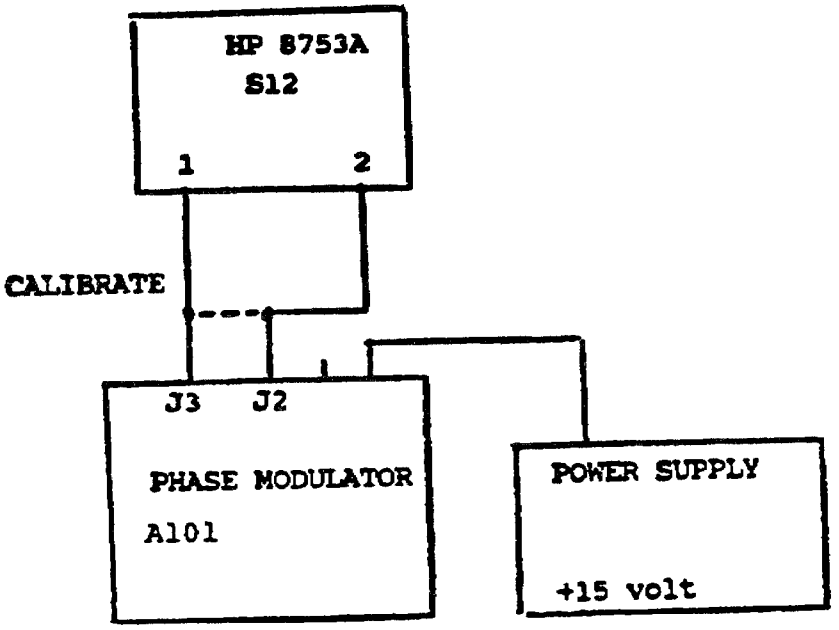
SERVICE:

Phase Modulation in the 8780A is accomplished by inserting a phase modulator between the A6 FM frame and the A13 IF Multiplier Deck (see fig.1). The signal at this point is a fixed 1 GHz which is multiplied up to 8 GHz in the IF Multiplier Deck, therefore a narrow band phase modulator with a linear range of about =/- 12 degrees is used to obtain specified performance. The following tests for insertion loss return loss and modulation sensitivity will determine if the phase modulator is operating correctly. The phase modulator is not a repairable assembly and must be replaced if it fails.

1501 PAGE MILL ROAD, PALO ALTO, CALIFORNIA, 94304, U.S.A.

PHASE MODULATOR ASSEMBLY PRE TESTS

1. INSERTION LOSS J2 TO J3



PROCEDURE

1. Connect equipment as shown above.

2. Set Frequency range on HP8753A to 900 to 1100 MHZ

3. Set HP8753A to S12 and calibrate by connecting a thru line.

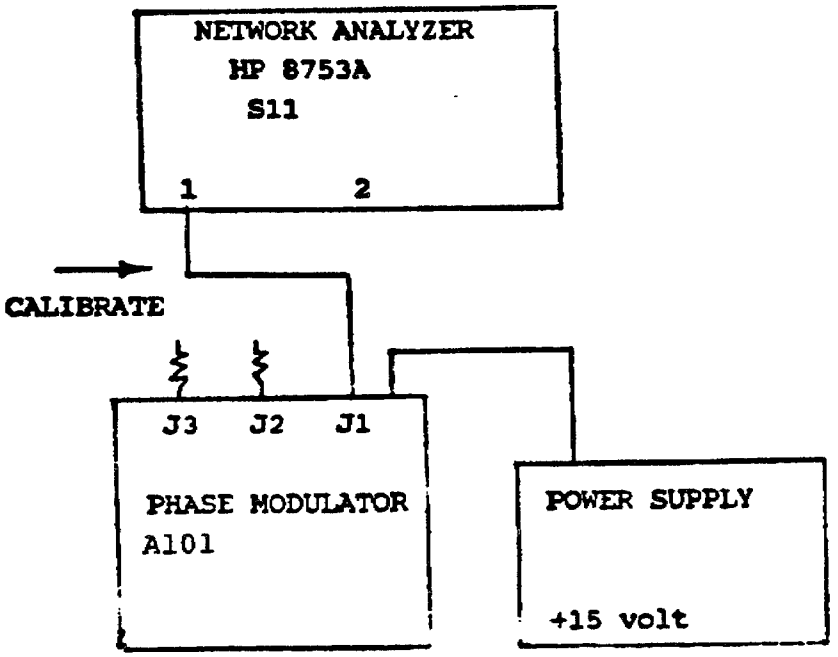
4. Connect +15 volt to phase modulator.

5. Measure the insertion loss (S12) of the phase modulator.

S12=_____dB

The insertion loss should be less than 1.0 dB from 950-1050 MHZ.

2. MODULATION PORT RETURN LOSS (J1)



PROCEDURE

1. Connect equipment as shown above.

2. Set Frequency range on HP8753A to 0.3 TO 100 MHZ

3. Set HP8753A to S11 and calibrate using the APC 3.5 kit.

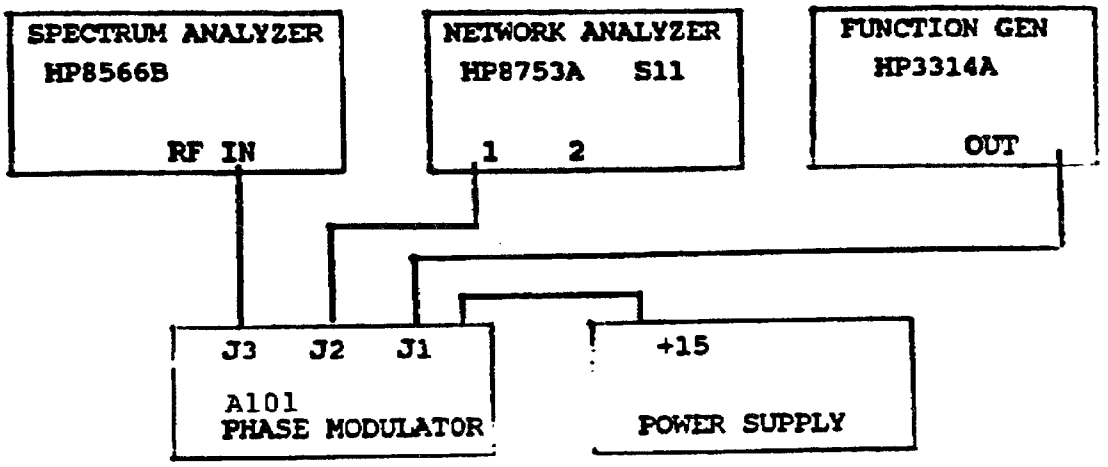
4. Connect +15 volt to phase modulator.

5. Measure the return loss (S11) of the phase modulator.

S11=_____dB

The return loss should be greater than -15 dB from 0.3 TO 10 MHZ.

3. MODULATION SENSITIVITY



PROCEDURE

1. Connect equipment as shown above.

2. Set Frequency on HP8753A to 1.0 GHZ CW., Level +10 dBm., Meas S11

3. Set HP3314A Function Generator to 10 MHZ , Level 3.0 volt.

4. Set HP8566B Spectrum Analyzer to center frequency of 1.0 GHZ ,Span 100 MHZ.

5. Measure the carrier to upper sideband ratio.

Pusb/Carrier_____dBc

The sidebands should be -20.7+-1.3 dBc.

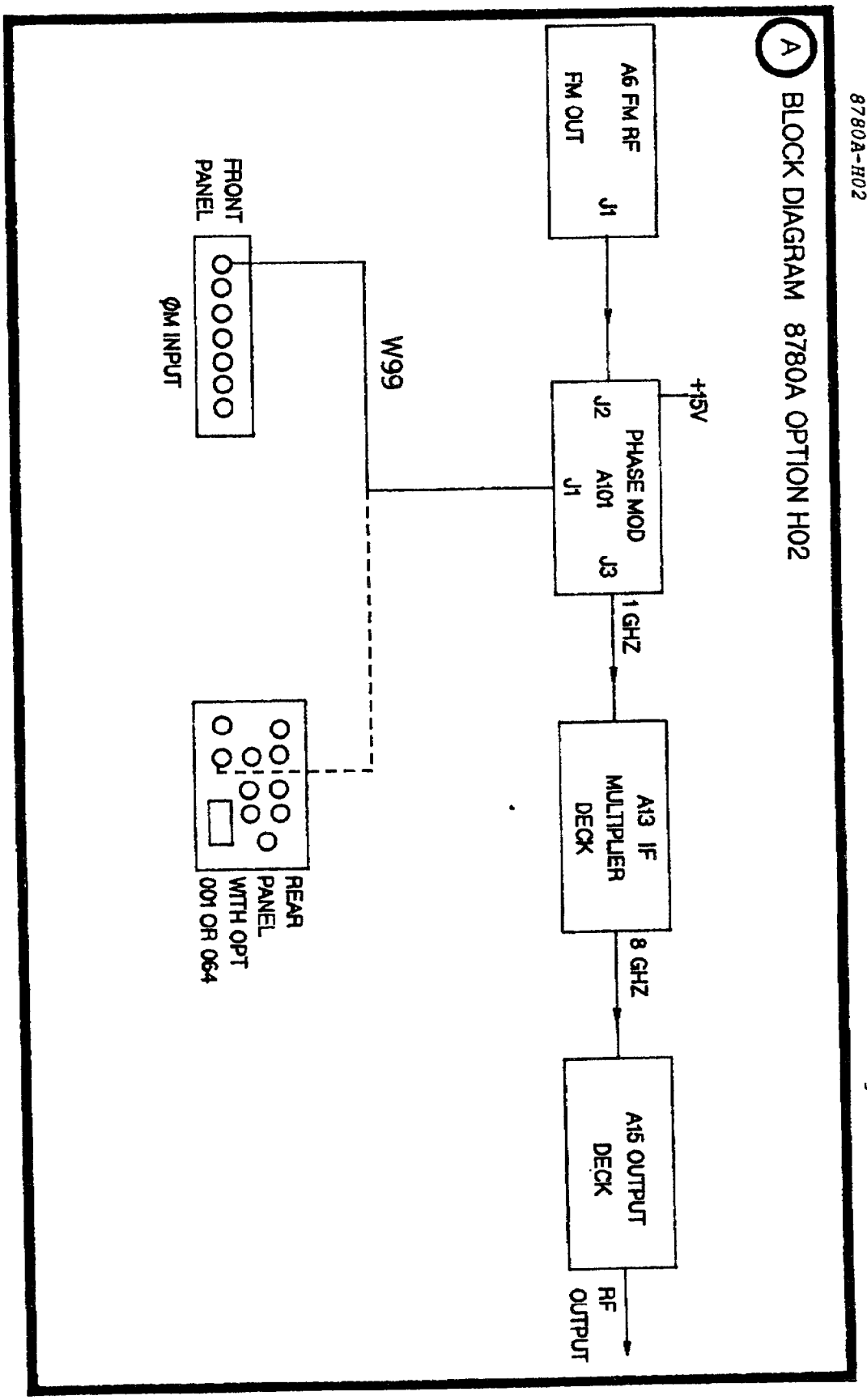

A
BLOCK DIAGRAM 8780A OPTION H02
A6 FM RF
FM OUT
J1
PHASE MOD
J2
A101
J1
J3
+15V
1 GHZ
A13 IF
MULTIPLIER
DECK
8 GHZ
A15 OUTPUT
DECK
RF
OUTPUT
W99
FRONT
PANEL
ØM INPUT
REAR
PANEL
WITH OPT
001 OR 064

FIGURE 1

In all other respects the 8780A H02 is identical to the standard 8780A and all the information in the Operating and Service Manual applies to this option.

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OPERATING AND SERVICE MANUAL

MODIFICATIONS

8780A OPTION H03

The 8780A Option H03 is a standard HP 8780A Vector Signal Generator that has been modified to allow Digital Sweep of the output frequency.

Specification changes: Add the following specifications to Table 1-1 of the 8780A Operating Manual.

ELECTRICAL CHARACTERISTIC	PERFORMANCE LIMITS	CONDITIONS
Digital Sweep Frequency Deviation	0 Hz to 999.999 KHz	Special function 90.1 select
Sweep Time	.001 KHz/Sec. to 999.999 KHz/Sec.	Special function 90.2 select

OPERATION:

To use the Digital Sweep capabilities of the 8780A H03, the sweep parameters are first stored in the deviation and sweep time registers, then the desired sweep operation is selected. To enter the frequency deviation, select special function 90.1 and enter the peak deviation from the center frequency in Hz. This function (SP90.1) also turns the Sweep on. To enter the sweep rate, select special function 90.2 and enter the sweep rate in KHz/Sec. Three sweep operations are available from the front panel; SHIFT SWEEP OFF will cause the instrument to stop sweeping when it reaches the center frequency, SHIFT SWEEP ON will cause the instrument to start sweeping, SHIFT SINGLE SWEEP will cause the instrument to execute a single sweep. Selecting any other key while a sweep is in progress will cause the instrument to go to the center frequency and stop sweeping. Digital Sweep data is not stored in the instrument state STORE/RECALL registers. The initial and PRESET values for these functions are given below.

Frequency Deviation	1.000 KHz
Sweep Time	1.000 KHz/Sec.
Sweep Off	Enabled
Sweep On	Disabled
Single Sweep	Disabled

HP-IB OPERATIONS:

The following are HP-IB mnemonics for Digital Sweep operation.

SWEEP OFF : SO
SWEEP ON : SW
SINGLE SWEEP: SG ← SG

Deviation and time can be set with the SSP (Select Special) mnemonic. For example, to set the deviation to 200 KHz;

output 719; "SSP 90.1 EN 200 KZ"

to set the sweep rate to 2 KHz/Sec,

output 719; "SSP 90.2 EN 2 EN"

REPLACEABLE PARTS:

Make the following changes to Table 6-3 in the 8780A Service Manual:

CHANGE: A11 U3 TO 08780-82004
A11 U4 TO 08780-82005
A11 U5 TO 08780-82006

CHANGE ITEM 19 IN FIGURE 6-5 TO 08780-02003

SERVICE.

The electrical changes necessary for Option H03 are completely contained in microprocessor rom changes (see the replaceable parts section above). To check that the correct rom program is installed, use special function 50.0 and see that software version 03.2 is displayed.

In all other respects the 8780A H03 is identical to the standard 8780A and all the information in the Operating and Service Manual applies to this Option.

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ENCL: 8780a

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Manufacturing Part No. 08780-90036