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Agilent Technologies
Innovating the HP Way

June 8, 2000

Dear Customer,

As of November 1, 1999, four of Hewlett-Packard's businesses, test and measurement, semiconductor products, health care solutions, and chemical analysis became a new company, Agilent Technologies. Now, many of your Hewlett-Packard products and services are in the care of Agilent Technologies.

At Agilent Technologies, we are working diligently to make this transition as smooth as possible for you. However, as a result of this transition, the products and related documentation contained in this shipment may be labeled with either the Hewlett-Packard name and logo, the Agilent Technologies name and logo, or a combination of both. Information in this package may refer to Hewlett-Packard (HP), but applies to your Agilent Technologies product. Hewlett-Packard and Agilent branded products with the same model number are interchangeable.

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If you have questions about Agilent Technologies products and services, please visit our website at http://www.agilent.com.

Sincerely,

Rebranding Team

HP 8901B
MODULATION ANALYZER
Service Manual

SERIAL NUMBERS

This manual provides complete information for instruments with serial-number prefixes:

2314A to 2914A and all *MAJOR* changes that occur to your instrument.

rev.12NOV92

For additional important information about serial numbers, refer to "INSTRUMENTS COVERED BY THIS MANUAL" in Section 1.

Fourth Edition

Service Manual (Volume 1, 2, 3) HP Part 08901-90114

Other Documents Available:
Operation and Calibration Manual HP Part 08901-90113
Basic Operation and Application Guide 08901-90117
Microfiche Operation and Calibration Manual HP Part 08901-90115
Microfiche Service Manual HP Part 08901-90116

Printed in U.S.A. : April 1995

HEWLETT PACKARD

1 Regulatory Information

(Updated March 1999)

Safety Considerations

GENERAL

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

This product has been designed and tested in accordance with *IEC Publication 1010*, "Safety Requirements for Electronic Measuring Apparatus," and has been supplied in a safe condition. This instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

SAFETY EARTH GROUND

A 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.

SAFETY SYMBOLS


Indicates instrument damage can occur if indicated operating limits are exceeded.


Indicates hazardous voltages.


Indicates earth (ground) terminal

WARNING	**A WARNING note 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	A CAUTION note denotes a hazard. It calls attention to an operation 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 an CAUTION note until the indicated conditions are fully understood and met.

Safety Considerations for this Instrument

WARNING **This product is a Safety Class I instrument (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.**

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 the earth terminal of the power source.

If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

No operator serviceable parts in this product. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.

Servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.

The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the product from all voltage sources while it is being opened.

The power cord is connected to internal capacitors that my remain live for 5 seconds after disconnecting the plug from its power supply.

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

Always use the three-prong ac power cord supplied with this product. Failure to ensure adequate earth grounding by not using this cord may cause product damage.

This product is designed for use in Installation Category II and Pollution Degree 2 per *IEC 1010* and *IEC 664* respectively. FOR INDOOR USE ONLY.

This product has autoranging line voltage input, be sure the supply voltage is within the specified range.

To prevent electrical shock, disconnect instrument from mains (line) before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.

Ventilation Requirements: When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the product by 4° C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

Product Markings

CE - the CE mark is a registered trademark of the European Community. A CE mark accompanied by a year indicated the year the design was proven.

CSA - the CSA mark is a registered trademark of the Canadian Standards Association.

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.

SAFETY SYMBOLS


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


Indicates hazardous voltages.


Indicates earth (ground) terminal.

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

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

WARNING

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).

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

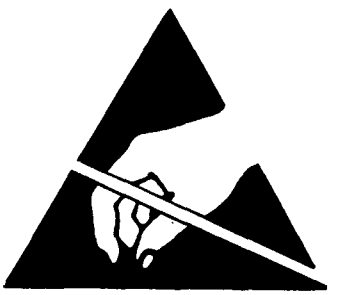
If this instrument is to be energized via an autotransformer (for voltage reduction) make sure the common terminal is connected to the earth terminal of the power source.

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 fuseholders.



ATTENTION
Static Sensitive
Devices

This instrument was constructed in an ESD (electro-static discharge) protected environment. This is because most of the semi-conductor devices used in this instrument are susceptible to damage by static discharge.

Depending on the magnitude of the charge, device substrates can be punctured or destroyed by contact or mere proximity of a static charge. The results can cause degradation of device performance, early failure, or immediate destruction.

These charges are generated in numerous ways such as simple contact, separation of materials, and normal motions of persons working with static sensitive devices.

When handling or servicing equipment containing static sensitive devices, adequate precautions must be taken to prevent device damage or destruction.

Only those who are thoroughly familiar with industry accepted techniques for handling static sensitive devices should attempt to service circuitry with these devices.

In all instances, measures must be taken to prevent static charge build-up on work surfaces and persons handling the devices.

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Section 6
REPLACEABLE PARTS

6-1. INTRODUCTION TO THIS SECTION

This section contains information for ordering parts. Table 6-1 lists reference designations, and Table 6-2 lists abbreviations that are used in the Replaceable Parts List. Table 6-3 lists all replaceable parts in the instrument. Table 6-4 contains the names and addresses that correspond to the manufacturer's code numbers listed in Table 6-3. Also included in this section are photographs and drawings to aid in identifying and ordering chassis mounted parts and mechanical parts.

6-2. REFERENCE DESIGNATIONS AND ABBREVIATIONS USED IN THIS MANUAL

Table 6-1 lists the reference designation letters for electrical parts in the instrument. The letter designations found in Table 6-1 are coupled with numeric designations to provide a unique reference designation for each part in the instrument. For example A17R1 is the reference designation of a particular resistor R1 on assembly A17.

Table 6-2 lists abbreviations used in the parts list and on schematics.

6-3. REPLACEABLE PARTS LIST

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

a. Electrical assemblies and their components with reference designations in alphanumeric order.

b. Chassis-Mounted parts with reference designations in alphanumeric order.

c. Mechanical parts with reference designations in alphanumeric order.

For your convenience, the Replaceable Parts List is paginated so that each assembly listing can be removed from Section 6 and collated into Section 8 with its corresponding service information.

Ordering Parts.

Instrument Serial Numbers.

Attached to the rear of the instrument is a serial-number plate. The first four digits and the letter are the instrument serial-number prefix. The last five digits (serial-number suffix) are unique to each instrument. When parts in the instrument are changed, the serial-number prefix of the instrument may also change. This means that sometimes a part will be listed more than once in the the replaceable parts list along with a serial-number prefix or range of serial-number prefixes. Find the serial-number prefix on the serial plate of your instrument and order the part listed under the corresponding prefix in the table. If no serial prefix information is listed, the part is compatible in instruments of all serial numbers.

NOTE

It is possible that some assemblies in your instrument have been updated (through service or retrofitting) to reflect changes made to instruments with serial-number prefixes later than that shown on your instrument serial-number tag. Be sure to note the board number of the assembly being repaired or replaced when ordering parts for your instrument.

How to Order

To order a part in the Replaceable Parts List, call or write the nearest Hewlett-Packard Sales Office. Have the following information ready to speed the ordering process:

1. The Hewlett-Packard part number with the check digit. (The check digit will ensure accurate and timely processing of your order.)
2. The quantity required.
3. An approved purchase order number. (Sometimes required.)

NOTE

Within the USA, it is better to order directly from the HP Parts Center in Mountain View California. Ask your nearest HP office for information and forms for the "Direct Order System".

Replaceable Parts List Updating (Manual Updates)

A "MANUAL UPDATES" packet is shipped with the manual, when necessary, to provide the most current information available at the time of shipment. These packets consist of replacement and addition pages which should be incorporated into the manual to bring it up to date.

Hewlett-Packard offers a Documentation Update Service that will provide you with further updates as they become available. If you operate or service instruments of different serial prefixes, we strongly recommend that you join this service immediately to ensure that you manual is kept current. For more information, refer to the Documentation Update Service reply card included in this manal, or call: Technical Writing Department (509) 922-4001,

or write:

Hewlett-Packard Company
Technical Writing Department
24001 E. Mission - TAF C-34
Spokane, WA 99220

6-4. MECHANICAL AND CHASSIS PART LOCATIONS AND REFERENCE DESIGNATIONS

Most mechanical parts are identified in Figures 6-1 to 6-9. These figures are located at the end of this section. Major mechanical parts have reference designations that begin with the letters MP. To find the part number and description of a mechanical part, find the part in one of the photographs or drawings, and then look up the reference designation in Table 6-3. Mechanical hardware, such as screws, are listed under the part which they attach. For example, the screws that attach the fan (B1) to the rear panel are listed under B1.

6-5. RECOMMENDED SPARES LIST

Stocking spare parts for an instrument is often done to ensure quick return to service after a malfunction occurs. Hewlett-Packard has prepared 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. You can request a complimentary copy of the "Recommended Spares" list from your nearest Hewlett-Packard office.

When stocking parts to support more than one instrument 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.

Table 6–1. *Reference Designations*

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; FET
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

Table 6–2. *Abbreviations (1 of 2)*

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
BECU ..... beryllium copper
BFO ..... beat frequency oscillator
BH ..... binder head
BKDN ..... breakdown
BP ..... bandpass
BPF ..... bandpass filter
BRS ..... brass
BWO ..... backware-wave oscillator
CAL ..... calibrate
ccw ..... counter-clockwise
CER ..... ceramic
CHAN ..... channel
cm ..... centimeter
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
cm ..... centimeter
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 ..... double sideband
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 ..... incandescent
INCL ..... include(s)
INP ..... input
INS ..... insulation
INT ..... internal
kg ..... kilogram
kHz ..... kilohertz
k ..... 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)
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 ..... meter (distance)
mA ..... milliampere
MAX ..... maximum
M ..... 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 ..... minute (time)
...' ..... minute (plane angle)
MINAT ..... miniature
mm ..... millimeter

NOTE

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

Table 6–2. 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
SS ..... Service Sheet
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
UNDEF ..... undefined
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-tune 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	femto	10^{-15}
a	atto	10^{-18}

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1						
A1	08901-60143	0	1	KEYBOARD AND DISPLAY ASSEMBLY	28480	08901-60143
A1C1	0180-0228	6	5	CAPACITOR-FXD 22UF +-10% 15VDC TA	56289	150D226X9015B2
A1C2	0160-2291	5	1	CAPACITOR-FXD .18UF +-10% 80VDC POLYE	28480	0160-2291
A1C3	0160-0576	5	44	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C4	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C5	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C7	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C8	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C9	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C10	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C11	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C12	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C15	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C16	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C18	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1CR1	1901-1098	1	71	DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A1CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A1CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A1CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A1DS1	1990-0759	6	4	LED-LIGHT BAR MODULE LUM-INT = 3MCD	28480	HLMP-2620
	1200-0423	8	4	SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0423
A1DS2	1990-0759	6		LED-LIGHT BAR MODULE LUM-INT = 3MCD	28480	HLMP-2620
	1200-0423	8		SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0423
A1DS3	1990-1273	1	28	LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS4	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS5	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS6	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS7	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS8	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS9	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS10	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS11	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS12	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS13	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS14	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS15	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS16	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS17	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS18	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS19	1990-0759	6		LED-LIGHT BAR MODULE LUM-INT = 3MCD	28480	HLMP-2620
	1200-0423	8		SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0423
A1DS20				NOT ASSIGNED		
A1DS21	1990-0759	6		LED-LIGHT BAR MODULE LUM-INT = 3MCD	28480	HLMP-2620
	1200-0423	8		SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0423
A1DS22	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS23	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613

†Refer to Section 7 for update information *Factory selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1DS24	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS25	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS26	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS27	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS28	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS29	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS30	1990-0699	3	2	LED-LIGHT BAR MODULE LUM-INT = 7MCD	28480	1LM1-2350
	1200-0901	7	2	SOCKET-STRP 8-CONT W-WRAP	28480	1200-0901
2305A TO 2914A						
A1DS31†	1990-0670	0	5	LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0670
A1DS32†	1990-0670	0		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0670
A1DS33†	1990-0670	0		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0670
A1DS34†	1990-0670	0		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0670
A1DS35†	1990-0670	0		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0670
A1DS36†	1990-0678	8	2	LED-LAMP-GRN LUM-INT = 800UCD IF = 30MA-MA	28480	1990-0678
A1DS37†	1990-0950	3	5	LED-LAMP-RED LUM-INT = 1MCD IF = 13MA-MAX	28480	1990-0950
2920A AND ABOVE						
A1DS31†	1990-0487	7	5	LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0487
A1DS32†	1990-0487	7		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0487
A1DS33†	1990-0487	7		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0487
A1DS34†	1990-0487	7		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0487
A1DS35†	1990-0487	7		LED-LAMP-YLW LUM-INT = 1MCD IF = 20MA-MAX	28480	1990-0487
A1DS36†	1990-0835	9	2	LED-LAMP-GRN LUM-INT = 6MCD IF = 30MA-MAX	28480	HLMP-1523
A1DS37†	1990-1273	1	5	LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS38	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	28480	1990-1273
A1DS39	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	28480	1990-1273
A1DS40	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	28480	1990-1273
A1DS41	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	28480	1990-1273
2305A TO 2914A						
A1DS42†	1990-0950	3		LED-LAMP-RED LUM-INT = 1MCD IF = 13MA-MAX	28480	1990-0950
A1DS43†	1990-0950	3		LED-LAMP-RED LUM-INT = 1MCD IF = 13MA = MAX	28480	1990-0950
A1DS44†	1990-0950	3		LED-LAMP-RED LUM-INT = 1MCD IF = 13MA = MAX	28480	1990-0950
A1DS45†	1990-0678	8		LED-LAMP-GRN LUM-INT = 800UCD IF = 30MA-MAX	28480	1990-0678
2920A AND ABOVE						
A1DS42†	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS43†	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS44†	1990-1273	1		LED-LAMP-RED LUM-INT = 8.6MCD BVR = 5V	01542	QLMP-1613
A1DS45†	1990-0835	9		LED-LAMP-GRN LUM-INT = 6MCD IF = 30MA = MAX	28480	HLMP-1523
A1DS46	1990-0699	3		LED-LIGHT BAR MODULE LUM-INT = 7MCD	28480	1LM1-2350
	1200-0901	7		SOCKET-STRP 8-CONT W-WRAP	28480	1200-0901
A1J1	1251-5169	6	5	CONNECTOR 6-PIN M POST TYPE	28480	1251-5169
A1J2	1200-0507	9	2	SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0507

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1MP1	5041-0252	7	12	KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP2	5041-0943	3	1	KEY CAP HALF LOCAL	28480	5041-0943
A1MP3	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP4	5041-0319	7	5	KEY CAP-HALF GRAY-LIT	28480	5041-0319
A1MP5	5041-0484	7	1	KEY CAP HALF YELLOW LED	28480	5041-0484
A1MP6	5041-0351	7	1	KAY CAP QUARTER	28480	5041-0351
A1MP7	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP8	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP9	5041-0319	7		KEY CAP-HALF GRAY-LIT	28480	5041-0319
A1MP10	5041-0386	8	5	KEY CAP FULL BK-LIT	28480	5041-0386
A1MP11	5041-0508	6	1	KEY CAP/HALF GR	28480	5041-0508
A1MP12	5041-0286	7	2	KEY CAP LT PIPE	28480	5041-0286
A1MP13	5041-0286	7		KEY CAP LT PIPE	28480	5041-0286
A1MP14	5041-0451	8	1	KEY CAP LT P/BLUE	28480	5041-0451
A1MP15	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP16	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP17	5041-0319	7		KEY CAP-HALF GRAY-LIT	28480	5041-0319
A1MP18	5041-0386	8		KEY CAP FULL BK-LIT	28480	5041-0386
A1MP19	5041-0835	2	1	KEY CAP/FULL 7 LT GY	28480	5041-0835
A1MP20	5041-0832	9	1	KEY CAP/FULL 4 LT GY	28480	5041-0832
A1MP21	5041-0829	4	1	KEY CAP/FULL 1 LT GY	28480	5041-0829
A1MP22	5041-0838	5	1	KEY CAP/FULL 0 LT GY	28480	5041-0838
A1MP23	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP24	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP25	5041-0319	7		KEY CAP-HALF GRAY-LIT	28480	5041-0319
A1MP26	5041-0386	8		KEY CAP FULL BK-LIT	28480	5041-0386
A1MP27	5041-0836	3	1	KEY CAP/FULL 8 LT GY	28480	5041-0836
A1MP28	5041-0833	0	1	KEY CAP/FULL 5 LT GY	28480	5041-0833
A1MP29	5041-0830	7	1	KEY CAP/FULL 2 LT GY	28480	5041-0830
A1MP30	5041-0839	6	1	KEY CAP/FULL GY DOT	28480	5041-0839
A1MP31	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP32	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP33	5041-0319	7		KEY CAP-HALF GRAY-LIT	28480	5041-0319
A1MP34	5041-0386	8		KEY CAP FULL BK-LIT	28480	5041-0386
A1MP35	5041-0837	4	1	KEY CAP/FULL 9 LT GY	28480	5041-0837
A1MP36	5041-0834	1	1	KEY CAP/FULL 6 LT GY	28480	5041-0834
A1MP37	5041-0831	8	1	KEY CAP/FULL 3 LT GY	28480	5041-0831
A1MP38	5041-1672	7	1	KEY CAP/FULL CLEAR	28480	5041-1672
A1MP39	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP40	5041-0252	7		KEY CAP QUARTER GY-LIT	28480	5041-0252
A1MP41	5041-0310	8	1	KEY CAP HALF GY	28480	5041-0310
A1MP42	5041-0386	8		KEY CAP FULL BK-LIT	28480	5041-0386
A1MP43	5041-2753	7	1	KEY CAP-FULL MHZ	28480	5041-2753
A1MP44	5041-2750	4	1	KEY CAP-FULL KHZ UP	28480	5041-2750
A1MP45	5041-2751	5	1	KEY CAP-FULL KHZ DN	28480	5041-2751
A1MP46	5041-2752	6	1	KEY CAP-FULL SPCL	28480	5041-2752
A1R1	1810-0279	5	1	NETWORK-RES 10-SIP4.7K OHM X 9	01121	210A472
A1R2	1810-0207	9	1	NETWORK-RES 8-SIP22.0K OHM X 7	01121	208A223
A1R3	0757-0199	3	16	RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A1R4	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC = 0 + -100	28480	0757-0123
A1R5	0757-0461	2	4	RESISTOR 68.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6812-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to section 7) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1R6	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A1R7	0698-0082	7	23	RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A1R8	0698-3453	2	1	RESISTOR 196K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1963-F
A1R9	0757-0461	2		RESISTOR 68.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6812-F
A1R10	0757-0461	2		RESISTOR 68.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6812-F
A1R11	0757-0447	4	5	RESISTOR 16.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1622-F
A1R12	1810-0402	6	10	NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R13	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R14	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R15	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R16	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R17	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R18	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R19	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R20	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R21	1810-0402	6		NETWORK-RES 16-DIP330.0 OHM X 8	01121	316B331
A1R22	1810-0370	7	7	NETWORK-RES 8-SIP220.0 OHM X 7	01121	208A221
A1R23	1810-0370	7		NETWORK-RES 8-SIP220.0 OHM X 7	01121	208A221
A1R24	1810-0370	7		NETWORK-RES 8-SIP220.0 OHM X 7	01121	208A221
A1R25	1810-0370	7		NETWORK-RES 8-SIP220.0 OHM X 7	01121	208A221
A1R26	1810-0370	7		NETWORK-RES 8-SIP220.0 OHM X 7	01121	208A221
A1R27	1810-0370	7		NETWORK-RES 8-SIP220.0 OHM X 7	01121	208A221
A1R28	0698-3438	3	10	RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A1R29				NOT ASSIGNED		
A1R30				NOT ASSIGNED		
A1R31				NOT ASSIGNED		
A1R32				NOT ASSIGNED		
A1R33	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A1R34	1810-0370	7		NETWORK-RES 8-SIP220.0 OHM X 7	01121	208A221
A1S1	5060-9436	7	46	PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S2	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S3	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S4	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S5	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S6	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S7	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S8	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S9	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S10	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S11	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S12	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S13	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S14	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S15	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S16	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S17	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S18	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S19	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S20	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1S21	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S22	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S23	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S24	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S25	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S26	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S27	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S28	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S29	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S30	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S31	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S32	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S34	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S35	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S36	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S37	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S38	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S39	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S40	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S41	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S42	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S43	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S44	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S45	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1S46	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
A1TP1	1251-0600	0	101	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1U1	1820-1729	3	19	IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U2	1820-2075	4	5	IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A1U3	1990-0574	3	10	DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8	10	SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U4	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U5	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U6	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U7	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U8	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U9	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U10	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803

†Refer to Section 7 for update information *Factory selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1U11	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U12	1990-0574	3		DISPLAY-NUM-SEG 1-CHAR .43-H	28480	5082-7651
	1200-0803	8		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0803
A1U13	1826-0412	1	2	IC COMPARATOR PRCN DUAL 8-DIP-P PKG	27014	LM393N
A1U14	1820-1144	6	2	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A1U15	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A1U16	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U17	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A1U18	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A1U19	1820-1427	8	1	IC DCDR TTL LS 2-TO-4-LINE DUAL 2-INP	01295	SN74LS156N
A1U20	1820-1198	0	10	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A1U21	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A1U22	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U23	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U24	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U25	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U26	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U27	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U28	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U29	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U30	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U31	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U32	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U33	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U34	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U35	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U36	1820-1216	3	15	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A1U37	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A1U38	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A1U39	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U40	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1U41	1820-2075	4		IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A1W1	8150-0447	6	1	WIRE 24AWG BK 300V PVC 7X32 80C	28480	8150-0447
	0362-0227	1	1	CONNECTOR-SGL CONT SKT 1.14-MM-BSC-SZ	28480	0362-0227
A1W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A1W3	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A1W4	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A1W5	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A2						
A2	08901-60008	6	1	AUDIO FILTERS ASSEMBLY	28480	08901-60008
A2C1	0180-1746	5	35	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2C2	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2C3	0160-4650	4	2	CAPACITOR-FXD 1380PF +-1% 500VDC MICA	28480	0160-4650
A2C4	0160-4650	4		CAPACITOR-FXD 1380PF +-1% 500VDC MICA	28480	0160-4650
A2C5	0160-2055	9	28	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C6	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C7	0160-4648	0	2	CAPACITOR-FXD 1650PF +-1% 500VDC MICA	28480	0160-4648
A2C8	0160-4648	0		CAPACITOR-FXD 1650PF +-1% 500VDC MICA	28480	0160-4648
A2C9	0160-0134	1	2	CAPACITOR-FXD 220PF +-5% 300VDC MICA	28480	0160-0134
A2C10	0160-4649	1	1	CAPACITOR-FXD 214PF +-1% 500VDC MICA	28480	0160-4649
A2C11	0180-1714	7	2	CAPACITOR-FXD 330UF+-10% 6VDC TA	56289	150D337X9006S2
A2C12	0140-0229	3	1	CAPACITOR-FXD 380PF +-1% 300VDC MICA	72136	DM15F381F0300WV1C
A2C13	0180-2206	4	5	CAPACITOR-FXD 60UF+-10% 6VDC TA	56289	150D606X9006B2
A2C14	0140-0196	3	2	CAPACITOR-FXD 150PF +-5% 300VDC MICA	72136	DM15F151J0300WV1CR
A2C15	0180-2206	4		CAPACITOR-FXD 60UF+-10% 6VDC TA	56289	150D606X9006B2
A2C16	0180-2206	4		CAPACITOR-FXD 60UF+-10% 6VDC TA	56289	150D606X9006B2
A2C17	0140-0194	1	1	CAPACITOR-FXD 110PF +-5% 300VDC MICA	72136	DM15F111J0300WV1CR
A2C18				NOT ASSIGNED		
A2C19	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C20	0180-2141	6	2	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A2C21	0160-4084	8	34	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A2C22				NOT ASSIGNED		
A2C23	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C24				NOT ASSIGNED		
A2C25	0180-1714	7		CAPACITOR-FXD 330UF+-10% 6VDC TA	56289	150D337X9006S2
A2C26	0160-4849	3	1	CAPACITOR-FXD 9100PF +-1% 100VDC	28480	0160-4849
A2C27	0160-2302	9	3	CAPACITOR-FXD 4000PF +-1% 100VDC MICA	28480	0160-2302
A2C28				NOT ASSIGNED		
A2C29△	0160-6606	4	1	CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-6606
A2C30	0140-0154	3	1	CAPACITOR-FXD 1300PF +-5% 500VDC MICA	72136	DM20F132J0500WV1CR
A2C31	0160-4759	4	1	CAPACITOR-FXD 6800PF +-1% 200VDC	28480	0160-4759
A2C32	0160-3538	5	1	CAPACITOR-FXD 750PF +-5% 100VDC MICA	28480	0160-3538
A2C33	0160-3536	3	1	CAPACITOR-FXD 620PF +-5% 100VDC MICA	28480	0160-3536
A2C34	0140-0198	5	4	CAPACITOR-FXD 200PF +-5% 300VDC MICA	72136	DM15F201J0300WV1CR
A2C35				NOT ASSIGNED		
A2C36	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C37	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2C38	0160-2222	2	1	CAPACITOR-FXD 1500PF +-5% 300VDC MICA	28480	0160-2222
A2CR1	1901-0040	1	34	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A2CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A2J1	1250-1220	0	31	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4	36	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9	37	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A2J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) △ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A2L1	9140-0137	1	4	INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A2L2	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A2L3	9140-0293	0	2	INDUCTOR RF-CH-MLD 906UH 2% .2DX.45LG	28480	9140-0293
A2L4	9140-0293	0		INDUCTOR RF-CH-MLD 906UH 2% .2DX.45LG	28480	9140-0293
A2L5	9100-1653	4	1	INDUCTOR RF-CH-MLD 910UH 5% .2DX.45LG	28480	9100-1653
A2L6	9140-0291	8	1	INDUCTOR RF-CH-MLD 824UH 2% .2DX.45LG	28480	9140-0291
A2L7	9100-1645	4	1	INDUCTOR RF-CH-MLD 390UH 5% .2DX.45LG	28480	9100-1645
A2L8	9140-0292	9	1	INDUCTOR RF-CH-MLD 375UH 2% .2DX.45LG	28480	9140-0292
A2L9	9140-0280	5	1	INDUCTOR 13MH 2% .25DX.7LG	28480	9140-0280
A2L10	9100-1660	3	1	INDUCTOR RF-CH-MLD 2MH 5% .23DX.57LG	28480	9100-1660
A2L11	9140-0281	6	1	INDUCTOR 16MH 2% .25DX.7LG	28480	9140-0281
A2L12	9100-1654	5	1	INDUCTOR RF-CH-MLD 1.1MH 5% .23DX.57LG	28480	9100-1654
A2L13	9100-1651	2	1	INDUCTOR RF-CH-MLD 750UH 5% .2DX.45LG	28480	9100-1651
A2L14	9100-1648	7	1	INDUCTOR RF-CH-MLD 560UH 5% .2DX.45LG	28480	9100-1648
A2MP1	08901-00022	8	1	COVER AUD FILTER	28480	08901-00022
	2360-0113	2	31	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2MP2	08901-00014	8	1	ENCL SHLD DIVDR	28480	08901-00014
A2MP3	08901-00015	9	1	COVER ENCL SHLD	28480	08901-00015
A2MP4	08901-00050	2	1	SPACER #1	28480	08901-00050
A2MP5	08901-00051	3	1	SPACER #2	28480	08901-00051
A2MP6	08901-00052	4	1	SPACER #3	28480	08901-00052
A2MP7	08901-00053	5	1	SPACER #4	28480	08901-00053
A2Q1	1854-0475	5	4	TRANSISTOR-DUAL NPN PD = 750MW	28480	1854-0475
A2Q2	1854-0071	7	32	TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A2Q3	1853-0007	7	21	TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A2Q4	1854-0477	7	14	TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A2Q5	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A2Q6	1853-0012	4	3	TRANSISTOR PNP 2N2904A SI TO-39 PD = 600MW	01295	2N2904A
A2Q7	1854-0013	7	1	TRANSISTOR NPN 2N2218A SI TO-5 PD = 800MW	04713	2N2218A
2314A TO 2422A						
A2R1	0757-0442	9	74	RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A2R2	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
2426A AND ABOVE						
A2R1	0757-0290	5		RESISTOR 6.19K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-6191-F
A2R2	0757-0290	5		RESISTOR 6.19K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-6191-F
A2R3	0699-0140	0	2	RESISTOR 524 .1% .1W F TC = 0 + -15	28480	0699-0140
A2R4	0699-0139	7	2	RESISTOR 660 .1% .1W F TC = 0 + -15	28480	0699-0139
A2R5	0698-8556	6	2	RESISTOR 1.62K .1% .125W F TC = 0 + -10	28480	0698-8556
A2R6	2100-3052	4	1	RESISTOR-TRMR 50 10% C SIDE-ADJ 17-TRN	02111	43P500
A2R7	0699-0140	0		RESISTOR 524 .1% .1W F TC = 0 + -15	28480	0699-0140
A2R8	0699-0144	4	2	RESISTOR 10K .01% .1W F TC = 0 + -5	28480	0699-0144
A2R9	0699-0145	5	4	RESISTOR 1.1174K .01% .1W F TC = 0 + -5	28480	0699-0145
A2R10	0698-3451	0	3	RESISTOR 133K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1333-F
A2R11	0698-7219	6	2	RESISTOR 196 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-196R-F
A2R12	0698-7244	7	4	RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A2R13	0698-7244	7		RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F
A2R14	0698-7244	7		RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F
A2R15	0698-7244	7		RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F
A2R16	0698-3457	6	2	RESISTOR 316K 1% .125W F TC = 0 + -100	28480	0698-3457
A2R17	0698-7260	7	17	RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A2R18				NOT ASSIGNED		
A2R19	0698-8823	0	1	RESISTOR 8.25 1% .125W F TC = 0 + -100	28480	0698-8823
A2R20	0698-3451	0		RESISTOR 133K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1333-F
A2R21				NOT ASSIGNED		
A2R22	0698-6414	1	5	RESISTOR 1K .1% .1W F TC = 0 + -5	28480	0698-6414
A2R23	0699-0176	2	1	RESISTOR 415 .1% .1W F TC = 0 + -15	28480	0699-0176
A2R24	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A2R25				NOT ASSIGNED		
A2R26	0757-0280	3	91	RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A2R27	0698-8475	8	3	RESISTOR 1.799K .1% .1W F TC = 0 + -5	28480	0698-8475
A2R28	0698-3430	5	10	RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F
A2R29	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A2R30	0698-8556	6		RESISTOR 1.62K .1% .125W F TC = 0 + -10	28480	0698-8556
A2R31	0699-0161	5	1	RESISTOR 580 .1% .1W F TC = 0 + -15	28480	0699-0161
A2R32	0699-0143	3	2	RESISTOR 825 .1% .1W F TC = 0 + -15	28480	0699-0143
A2R33	0757-0394	0	18	RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A2R34	0757-0180	2	1	RESISTOR 31.6 1% .125W F TC = 0 + -100	28480	0757-0180
A2R35	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A2R36	0698-8475	8		RESISTOR 1.799K .1% .1W F TC = 0 + -5	28480	0698-8475
A2R37	0699-0144	4		RESISTOR 10K .01% .1W F TC = 0 + -5	28480	0699-0144
A2R38	0699-0145	5		RESISTOR 1.1174K .01% .1W F TC = 0 + -5	28480	0699-0145
A2R39	0757-0400	9	3	RESISTOR 90.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-90R9-F
A2R40	2100-0552	3	3	RESISTOR-TRMR 50 10% C SIDE-ADJ 1-TRN	28480	2100-0552
A2R41	0699-0159	1	1	RESISTOR 860 .1% .1W F TC = 0 + -15	28480	0699-0159
A2R42	0698-8475	8		RESISTOR 1.799K .1% .1W F TC = 0 + -5	28480	0698-8475
A2R43	0698-3434	9	2	RESISTOR 34.8 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-34R8-F
A2R44	2100-0552	3		RESISTOR-TRMR 50 10% C SIDE-ADJ 1-TRN	28480	2100-0552
A2R45	0699-0160	4	1	RESISTOR 940 .1% .1W F TC = 0 + -15	28480	0699-0160
A2R46	0698-3136	8	4	RESISTOR 17.8K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1782-F
A2R47	0698-3243	8	2	RESISTOR 178K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1783-F
A2R48	0698-6414	1		RESISTOR 1K .1% .1W F TC = 0 + -5	28480	0698-6414
A2R50	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A2R51	0757-0399	5	2	RESISTOR 82.5 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-82R5-F
A2RT1	0837-0027	6	2	THERMISTOR DISC 30-OHM TC = -3.9%/C-DEG	28480	0837-0027
A2RT2	0839-0011	2	1	THERMISTOR DISC 100-OHM TC = -3.8%/C-DEG	28480	0839-0011
A2RT3	0837-0027	6		THERMISTOR DISC 30-OHM TC = -3.9%/C-DEG	28480	0837-0027
A2TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2422A						
A2U1	1826-0582	6	7	IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A2U2	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
2426A AND ABOVE						
A2U1	1826-0606	5		ANALOG SWITCH 4 SPST 16-CERDIP	17856	DG201BK
A2U2	1826-0606	5		ANALOG SWITCH 4 SPST 16-CERDIP	17856	DG201BK
A2U3	1826-0413	2	5.	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
2314A TO 2422A						
A2U4	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
2426A AND ABOVE						
A2U4	1826-0606	5		ANALOG SWITCH 4 SPST 16-CERDIP	17856	DG201BK
A2U5	1826-0109	3	1	IC OP AMP WB TO-99 PKG	34371	HA2-2625-B0593
A2W1	08901-20096	8	1	CABLE SEMI RIGID AM	28480	08901-20096
A2W2	08901-20095	7	1	CABLE SEMI RIGID FM	28480	08901-20095

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A3						
A3	08901-60009	7	1	AUDIO DE-EMPHASIS AND OUTPUT ASSEMBLY	28480	08901-60009
A3C1	0180-0058	0	9	CAPACITOR-FXD 50UF +75-10% 25VDC AL	56289	30D506G025CC2
A3C2	0180-0058	0		CAPACITOR-FXD 50UF +75-10% 25VDC AL	56289	30D506G025CC2
A3C3	0180-2929	8	8	CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
2314A TO 2505A						
A3C4	0160-3858	2	2	CAPACITOR-FXD .039UF +-2% 200VDC	28480	0160-3858
2514A AND ABOVE						
A3C4	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A3C5	0160-4613	9	2	CAPACITOR-FXD .1UF +-1% 50VDC POLYSTY	28480	0160-4613
2314A TO 2505A						
A3C6	0160-3858	2		CAPACITOR-FXD .039UF +-2% 200VDC	28480	0160-3858
2514A AND ABOVE						
A3C6	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A3C7	0160-4613	9		CAPACITOR-FXD .1UF +-1% 50VDC POLYSTY	28480	0160-4613
A3C8	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C9	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C10	0160-3879	7	90	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C11	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C12	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C13	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C14	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C15	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C16	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C17	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C18	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C19	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C21	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C22	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C23	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C24Δ	0160-6606	4		CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-6606
A3C25	0160-4317	0	1	CAPACITOR-FXD 1200PF +-1% 100VDC MICA	28480	0160-4317
A3C26	0140-0213	5	2	CAPACITOR-FXD 2000PF +-1% 300VDC MICA	72136	DM19F202F0300WV1CR
A3C27	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C28	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C29	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C30	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C31	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C32	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C33	0140-0213	5		CAPACITOR-FXD 2000PF +-1% 300VDC MICA	72136	DM19F202F0300WV1CR

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A3C34Δ	0160-6606	4		CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-6606
A3C35				NOT ASSIGNED		
A3C36	0140-0196	3		CAPACITOR-FXD 150PF +-5% 300VDC MICA	72136	DM15F151J0300WV1CR
A3C37	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3C38				NOT ASSIGNED		
A3C39	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C40	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C41	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C42	0160-2204	0	3	CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A3C43	0160-2201	7	1	CAPACITOR-FXD 51PF +-5% 300VDC MICA	28480	0160-2201
A3C44	0180-0291	3	9	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A3C45				NOT ASSIGNED		
A3C46				NOT ASSIGNED		
2314A TO 2505A						
A3C47	0160-3165	4	1	CAPACITOR-FXD .047UF +-2% 50VDC POLYE	28480	0160-3165
A3C48	0160-2302	9		CAPACITOR-FXD 4000PF +-1% 100VDC MICA	28480	0160-2302
2514A AND ABOVE						
A3C47	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A3C48	0160-4217	9		CAPACITOR-FXD 3900PF +-1% 500VDC MICA	28480	0160-4217
A3C49	0160-5201	3	2	CAPACITOR-FXD .01UF +-1% 200VDC	28480	0160-5201
A3C50	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C51	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C52	0160-5201	3		CAPACITOR-FXD .01UF +-1% 200VDC	28480	0160-5201
2314A TO 2505A						
A3C53	0160-2302	9		CAPACITOR-FXD 4000PF +-1% 100VDC MICA	28480	0160-2302
2514A AND ABOVE						
A3C53	0160-4217	9		CAPACITOR-FXD 3900PF +-1% 500VDC MICA	28480	0160-4217
A3C54				NOT ASSIGNED		
A3C55	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C56	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C57	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C58	0180-0116	1	4	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3C59	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C60	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C61	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C62	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C63				NOT ASSIGNED		
A3C64	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3C65	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3C66				NOT ASSIGNED		
A3C67				NOT ASSIGNED		
A3C68	0180-0058	0		CAPACITOR-FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2

†Refer to section 7 for update information *Factory selected component (Refer to Section 7) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A3C69	0180-0058	0		CAPACITOR-FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A3C70	0160-0134	1		CAPACITOR-FXD 220PF +-5% 300VDC MICA	28480	0160-0134
A3C71				NOT ASSIGNED		
A3C72	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3C73	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C74	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3C75	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C76	0180-0197	8	53	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3C77	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3CR1	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A3CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR5	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR8				NOT ASSIGNED		
A3CR9	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A3L1	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q=60	28480	9140-0137
A3L2	9100-1633	0	1	INDUCTOR RF-CH-MLD 68UH 5% .166DX.385LG	28480	9100-1633
A3L3	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q=60	28480	9140-0137
A3MP1	08901-00021	7	1	COVER AUD DE-EMP	28480	08901-00021
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3Q1	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
2314A TO 2505A						
A3R1	0698-7353	9	1	RESISTOR 19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1902-F
2514A AND ABOVE						
A3R1	0698-6942	0		RESISTOR 25K .1% .125W F TC=0+-50	24546	C4-1/8-2502-F
A3R2	0698-5091	8	1	RESISTOR 45K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4502-F
A3R3	0757-0349	5	1	RESISTOR 22.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2262-F
2314A TO 2505A						
A3R4	0698-6343	5	2	RESISTOR 9K .1% .125W F TC=0+-25	28480	0698-6343
2514A AND ABOVE						
A3R4	0698-8191	5		RESISTOR 12.5K .1% .125W F TC=0+-25	24546	C4-1/8-TO-1252-F
A3R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3R6				NOT ASSIGNED		
A3R7	0698-0085	0	16	RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3R8	0698-3159	5	3	RESISTOR 26.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2612-F
A3R9	0698-3161	9	4	RESISTOR 38.3K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3832-F
A3R10				NOT ASSIGNED		
A3R11	0757-0441	8	10	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3R12	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3R13	0757-0438	3	40	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3R14	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A3R15				NOT ASSIGNED		
A3R16	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A3R17	0757-0465	6	29	RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A3R18	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A3R19	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A3R20	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A3R21	0683-2265	1	3	RESISTOR 22M 5% .25W FC TC = -900/ + 1200	01121	CB2265
A3R22	0757-0279	0	19	RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A3R23	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A3R24				NOT ASSIGNED		
A3R25	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A3R26	0698-7236	7	21	RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A3R27	2100-3273	1	2	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
A3R28	0698-3156	2	7	RESISTOR 14.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1472-F
2314A TO 2505A						
A3R29	0698-8046	9	1	RESISTOR 16K .1% .125W F TC = 0 + -25	19701	MF4C1/8-T9-1602-B
2514A AND ABOVE						
A3R29	0698-6942	0		RESISTOR 25K .1% .125W F TC = 0 + -50	24546	C4-1/8-2502-F
A3R30	0698-7264	1	1	RESISTOR 14.7K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1472-F
A3R31	0698-8191	5	1	RESISTOR 12.5K .1% .125W F TC = 0 + -25	19701	MF4C1/8-T9-1252-B
A3R32	0698-7643	0	2	RESISTOR 6.25K .1% .125W F TC = 0 + -25	19701	MF4C1/8-T9-6251-B
A3R33	0699-0069	2	2	RESISTOR 2.15M 1% .125W F TC = 0 + -100	28480	0699-0069
A3R34	0698-8642	1	1	RESISTOR 56.2K .1% .125W F TC = 0 + -25	28480	0698-8642
A3R35	0698-8731	9	12	RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
2314A TO 2505A						
A3R36	0698-6614	3	1	RESISTOR 7.5K .1% .125W F TC = 0 + -25	28480	0698-6614
2514A AND ABOVE						
A3R36	0698-8307	5		RESISTOR 7.4K .25% .125W F TC = 0 + -50	24546	C4-1/8-TO-7401-F
A3R37	0698-7643	0		RESISTOR 6.25K .1% .125W F TC = 0 + -25	19701	MF4C1/8-T9-6251-B
A3R38	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A3R39	0698-7251	6	3	RESISTOR 4.22K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-4221-F
A3R40	0698-7224	3	2	RESISTOR 316 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-316R-F
A3R41	0698-3157	3	10	RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A3R42				NOT ASSIGNED		
A3R43	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A3R44	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A3R45	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A3R46	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A3R47	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A3R48	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A3R49	0698-3159	5		RESISTOR 26.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2612-F
A3R50	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731

†Refer to Section 7 for update information *Factory Selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A3R51△	0698-6414	1		RESISTOR 1K .1% .1W F TC = 0 + -5	28480	0698-6414
A3R52	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A3R53	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A3R54	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A3R55△	0698-6414	1		RESISTOR 1K .1% .1W F TC = 0 + -5	28480	0698-6414
A3R56	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A3R57	0757-0439	4	7	RESISTOR 6.81K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6811-F
A3R58				NOT ASSIGNED		
A3R59	0757-0401	0	49	RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A3R60	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A3R61	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A3R62	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A3R63	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A3R64	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A3R65	0698-7272	1	1	RESISTOR 31.6K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-3162-F
A3TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3U1	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
A3U2	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
A3U3	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
A3U4	1826-0753	3	4	IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-C	04713	MC34004BL
A3U5	1826-0371	1	6	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A3U6	1826-0059	2	10	IC OP AMP GP TO-99 PKG	01295	LM201AL
A3U7	1826-0783	9	6	IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A3U8	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A3U9	1826-0753	3		IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-C	04713	MC34004BL
A3U10	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A3U11	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
2314A TO 2422A						
A3U12	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A3U13	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A3U14	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A3U15	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
2426A AND ABOVE						
A3U12	1826-0606	5		ANALOG SWITCH 4 SPST 16-CERDIP	17856	DG201BK
A3U13	1826-0606	5		ANALOG SWITCH 4 SPST 16-CERDIP	17856	DG201BK
A3U14	1826-0606	5		ANALOG SWITCH 4 SPST 16-CERDIP	17856	DG201BK
A3U15	1826-0606	5		ANALOG SWITCH 4 SPST 16-CERDIP	17856	DG201BK
A3U16	1820-1195	7	11	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A3U17	1820-1418	7	1	IC DCDR TTL LS BCD-TO-DEC 4-TO-10-LINE	01295	SN74LS42N
A3U18	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A3U19	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A3U20	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N

†Refer to Section 7 for update information *Factory selected component (Refer to Section 5) △ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A3U21	1820-1272	1	1	IC BFR TTL LS NOR QUAD 2-INP	01295	SN74LS33N
A3U22	1820-1112	8	5	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A3U23	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A3VR1	1902-0041	4	10	DIODE-ZNR 5.11V 5% DO-35 PD = .4W	28480	1902-0041
A3VR2	1902-0048	1	2	DIODE-ZNR 6.81V 5% DO-35 PD = .4W	28480	1902-0048
A3VR3	1902-0048	1		DIODE-ZNR 6.81V 5% DO-35 PD = .4W	28480	1902-0048
A3VR4	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD = .4W	28480	1902-0041
A3VR5	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD = .4W	28480	1902-0041

†Refer to section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A4						
A4	08901-60184	9	1	FM DEMODULATOR ASSEMBLY	28480	08901-60184
A4C1	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A4C2	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A4C3	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C4	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C5	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C6	0160-4492	2	3	CAPACITOR-FXD 18PF +-5% 200VDC CER 0+-30	28480	0160-4492
A4C7	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A4C8	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A4C9	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A4C10	0160-4492	2		CAPACITOR-FXD 18PF +-5% 200VDC CER 0+-30	28480	0160-4492
A4C11	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C12	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C13	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A4C14	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A4C15	0160-4806	2	1	CAPACITOR-FXD 39PF +-5% 100VDC CER 0+-30	28480	0160-4806
A4C16	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C17	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C18	0160-4832	4	32	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A4C19	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C20	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A4C21	0180-0094	4	7	CAPACITOR-FXD 100UF +75-10% 25VDC AL	56289	30D107G025DD2
A4C22	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C23	0180-0094	4		CAPACITOR-FXD 100UF +75-10% 25VDC AL	56289	30D107G025DD2
A4C24	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A4C25	0180-0094	4		CAPACITOR-FXD 100UF +75-10% 25VDC AL	56289	30D107G025DD2
A4C26	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A4C27	0160-5699	3	3	CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	28480	0160-5699
A4C28	0160-5699	3		CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	28480	0160-5699
A4C29	0160-0162	5	1	CAPACITOR-FXD .022UF +-10% 200VDC POLYE	28480	0160-0162
A4C30	0160-0153	4	3	CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A4C31	0160-4805	1	2	CAPACITOR-FXD 47PF +-5% 100VDC CER 0+-30	28480	0160-4805
A4C32	0160-4808	4	1	CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4808
A4C33	0160-5491	3	1	CAPACITOR-FXD 240PF +-5% 100VDC CER	28480	0160-5491
A4C34				NOT ASSIGNED		
A4C35	0160-4799	2	1	CAPACITOR-FXD 2.2PF +-.25PF 100VDC CER	28480	0160-4799
A4C36	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A4C37	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C38	0160-4801	7	3	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A4C39	0160-3501	2	5	CAPACITOR-FXD 4UF +-10% 50VDC MET-POLYC	28480	0160-3501
A4C40				NOT ASSIGNED		
A4C41	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C42	0160-4812	0	5	CAPACITOR-FXD 220PF +-5% 100VDC CER	28480	0160-4812
A4C43	0160-4791	4	1	CAPACITOR-FXD 10PF +-5% 100VDC CER 0+-30	28480	0160-4791
A4C44	0160-4795	8	2	CAPACITOR-FXD 4.7PF +-.5PF 100VDC CER	28480	0160-4795
A4C45	0160-5719	8	1	CAPACITOR-FXD 620PF +-5% 100VDC CER	28480	0160-5719

†Refer to Section 7 for update information *Factory selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A4C46	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A4C47	0160-4822	2	6	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A4C48	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A4C49	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A4C50	0160-4819	7	2	CAPACITOR-FXD 2200PF +-5% 100VDC CER	28480	0160-4819
A4C51	0160-4819	7		CAPACITOR-FXD 2200PF +-5% 100VDC CER	28480	0160-4819
A4CR1	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4CR6	08901-80037	3	4	MATCH DIODE SET	28480	08901-80037
A4CR7	08901-80037	3		MATCH DIODE SET	28480	08901-80037
A4CR8	08901-80037	3		MATCH DIODE SET	28480	08901-80037
A4CR9	08901-80037	3		MATCH DIODE SET	28480	08901-80037
A4CR10	1901-0518	8	28	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A4CR11	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A4CR12	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A4CR13	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A4CR14	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4CR15	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4CR16	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A4DS1	1990-0325	2	2	LED-LAMP LUM-INT = 800UCD IF = 50MA-MAX	28480	5082-4403
A4DS2	1990-0325	2		LED-LAMP LUM-INT = 800UCD IF = 50MA-MAX	28480	5082-4403
A4J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A4J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A4J3	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A4L1	9140-0098	3	2	INDUCTOR RF-CH-MLD 2.2UH 10%	28480	9140-0098
A4L2	9140-0098	3		INDUCTOR RF-CH-MLD 2.2UH 10%	28480	9140-0098
A4L3	9100-2272	5	2	INDUCTOR RF-CH-MLD 47UH 10% .105DX.26LG	28480	9100-2272
A4L4	9100-2272	5		INDUCTOR RF-CH-MLD 47UH 10% .105DX.26LG	28480	9100-2272
A4MP1	08901-00020	6	1	COVER FM D MOD	28480	08901-00020
	2190-0008	3	12	WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A4Q1	1854-0210	6	4	TRANSISTOR NPN 2N2222 SI TO-18 PD = 500MW	04713	2N2222
A4Q2	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q3	1853-0020	4	23	TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A4Q4	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A4Q5	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071

†Refer to section 7 for update information *Factory selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A4Q6	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A4Q7	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A4Q8	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A4Q9	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q10	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A4Q11	1858-0032	8	5	TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A4Q12	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A4Q13	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A4Q14	1854-0210	6		TRANSISTOR NPN 2N2222 SI TO-18 PD = 500MW	04713	2N2222
A4Q15	1854-0210	6		TRANSISTOR NPN 2N2222 SI TO-18 PD = 500MW	04713	2N2222
A4Q16	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q17	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A4Q18	1854-0475	5		TRANSISTOR-DUAL NPN PD = 750MW	28480	1854-0475
A4Q19	1858-0032	8		TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A4Q20	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q21	1855-0020	8	4	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0020
A4Q22	1855-0049	1	2	TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	28480	1855-0049
A4Q23	1854-0637	1	6	TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
	1200-0173	5	19	INSULATOR-XSTR DAP-GL	28480	1200-0173
A4Q24	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q25	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A4Q26	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A4Q27	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q28	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
	1205-0361	3	2	HEAT SINK SGL TO-5/TO-39-CS	13103	2226C
A4Q29	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q30	1858-0032	8		TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A4Q31	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q32	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A4Q33	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
	1205-0361	3		HEAT SINK SGL TO-5/TO-39-CS	13103	2226C
A4Q34	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A4Q35	1855-0020	8		TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0020
A4R1	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A4R2	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F
A4R3	0698-3155	1	22	RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R4	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A4R5	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A4R6	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A4R7	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R8	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R9	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R10	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R11	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R12	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R13	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A4R14	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A4R15	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R16	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F

†Refer to section 7 for update information. *Factory selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A4R17	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R18	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A4R19	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R20	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R21	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R22	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R23	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R24	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A4R25	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R26	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R27	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R28	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A4R29	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R30	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R31	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R32	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R33	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R34	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R35	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R36	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R37	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A4R38	0698-0084	9	21	RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A4R39	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A4R40	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A4R41	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R42	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A4R43				NOT ASSIGNED		
A4R44				NOT ASSIGNED		
A4R45	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A4R46	0698-3160	8	7	RESISTOR 31.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3162-F
A4R47	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A4R48	0757-0403	2	5	RESISTOR 121 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-121R-F
A4R49	0698-8833	2	1	RESISTOR 10K .1% .125W F TC = 0 + -10	28480	0698-8833
A4R50	2100-3273	1		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
A4R51	0698-3904	8	1	RESISTOR 14.7K .1% .1W F TC = 0 + -10	28480	0698-3904
A4R52	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A4R53	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A4R54	0698-3441	8	13	RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A4R55	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A4R56	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F
A4R57	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F
A4R58	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A4R59	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A4R60	0757-0400	9		RESISTOR 90.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-90R9-F
A4R61	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A4R62	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A4R63	0757-0346	2	16	RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A4R64	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A4R65	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A4R66	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A4R67	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A4R68	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A4R69	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A4R70	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R71	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A4R72	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R73	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R74	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A4R75	0698-8821	8	2	RESISTOR 5.62 1% .125W F TC = 0 + -100	28480	0698-8821
A4R76	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R77	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A4R78	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A4R79	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R80	0698-3432	7	5	RESISTOR 26.1 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-26R1-F
A4R81	0698-3432	7		RESISTOR 26.1 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-26R1-F
A4R82	0698-3160	8		RESISTOR 31.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3162-F
A4R83	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A4R84	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A4R85	2100-3352	7	2	RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	28480	2100-3352
A4R86	0698-3454	3	5	RESISTOR 215K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2153-F
A4R87	0698-0083	8	15	RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A4R88	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A4R89	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A4R90	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R91	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A4R92	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A4R93	0698-8549	7	3	RESISTOR 2.1K .5% .1W F TC = 0 + -5	28480	0698-8549
A4R94	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R95	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A4R96	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R97	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A4R98	0757-0395	1	2	RESISTOR 56.2 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-56R2-F
A4R99	0699-0139	7		RESISTOR 660 .1% .1W F TC = 0 + -15	28480	0699-0139
A4R100	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R101	0698-8827	4	12	RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A4R102	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A4R103	0698-3160	8		RESISTOR 31.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3162-F
A4R104	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A4R105	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A4R106	0698-3446	3	7	RESISTOR 383 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-383R-F
A4TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A4TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A4TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A4TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A4TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A4TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A4VR1	1902-0680	7	9	DIODE-ZNR 1N827 6.2V 5% DO-7 PD = .4W	24046	1N827

†Refer to section 7 for update information *Factory selected Component (Refer to section 7) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A5						
2314A TO 2544A						
A5	08902-60005	4	1	VOLTMETER ASSEMBLY	28480	08902-60005
2550A TO 2635A						
A5	08902-60101	1	1	VOLTMETER ASSEMBLY	28480	08902-60101
2635A AND ABOVE						
A5	08901-60284	0	1	VOLTMETER ASSEMBLY	28480	08901-60284
A5C1	0180-2929	8		CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
A5C2	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A5C3	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A5C4	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A5C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A5C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A5C7	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A5C8	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A5C9	0180-0094	4		CAPACITOR-FXD 100UF +75-10% 25VDC AL	56289	30D107G025DD2
A5C10	0180-0374	3	6	CAPACITOR-FXD 10UF +-10% 20VDC TA	56289	150D106X9020B2
A5C11	0160-4387	4	3	CAPACITOR-FXD 47PF +-5% 200VDC CER 0 +-30	28480	0160-4387
A5C12	0180-0374	3		CAPACITOR-FXD 10UF +-10% 20VDC TA	56289	150D106X9020B2
A5C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C14	0180-1704	5	1	CAPACITOR-FXD 47UF +-10% 6VDC TA	56289	150D476X9006B2
A5C15	0180-0374	3		CAPACITOR-FXD 10UF +-10% 20VDC TA	56289	150D106X9020B2
A5C16	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A5C17	0180-0374	3		CAPACITOR-FXD 10UF +-10% 20VDC TA	56289	150D106X9020B2
A5C18	0160-3501	2		CAPACITOR-FXD 4UF +-10% 50VDC MET-POLYC	28480	0160-3501
A5C19	0160-0970	3	1	CAPACITOR-FXD .47UF +-10% 80VDC POLYE	28480	0160-0970
A5C20	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
2314A TO 2627A						
A5C21	0160-3878	6	51	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A5C22	0160-3402	2	3	CAPACITOR-FXD 1UF +-5% 50VDC MET-POLYC	28480	0160-3402
A5C23	0160-3501	2		CAPACITOR-FXD 4UF +-10% 50VDC MET-POLYC	28480	0160-3501
A5C24	0160-3501	2		CAPACITOR-FXD 4UF +-10% 50VDC MET-POLYC	28480	0160-3501
A5C25	0160-3402	2		CAPACITOR-FXD 1UF +-5% 50VDC MET-POLYC	28480	0160-3402
2635A AND ABOVE						
A5C21-25				NOT ASSIGNED		
A5C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C27	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C28	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C29	0180-2929	8		CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
A5C30	0160-4807	3	4	CAPACITOR-FXD 33PF +-5% 100VDC CER 0 +-30	28480	0160-4807
A5C31	0160-4397	6	1	CAPACITOR-FXD .1UF +-1% 100VDC POLYSTY	28480	0160-4397
A5C32	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C33	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5C34	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A5C35	0160-4805	1		CAPACITOR-FXD 47PF +-5% 100VDC CER 0 +-30	28480	0160-4805

†Refer to Section 7 for update information *Factory selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A5CR1	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A5CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A5CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A5CR8	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A5CR9	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A5CR10	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A5CR11	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR12	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A5CR13	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A5CR14	1901-0880	7	9	DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A5CR15	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5CR16	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A5L1	9140-0210	1	8	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A5MP1	08901-00019	3	1	COVER VOLT MTR	28480	08901-00019
	2190-0008	3		WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5Q1	1854-0810	2	7	TRANSISTOR NPN SI PD = 625MW FT = 200MHZ	28480	1854-0810
A5Q2	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A5Q3	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A5Q4	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A5Q5	1855-0414	4	2	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A5Q6	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A5Q7	1854-0810	2		TRANSISTOR NPN SI PD = 625MW FT = 200MHZ	28480	1854-0810
A5R1	1810-0126	1	1	NETWORK-RES 14-DIP10.0K OHM X 13	11236	760-1-R10K
A5R2	2100-3358	3	2	RESISTOR-TRMR 1M 20% C SIDE-ADJ 1-TRN	28480	2100-3358
A5R3	0698-8549	7		RESISTOR 2.1K .5% .1W F TC = 0 + -5	28480	0698-8549
2314A TO 2443A						
A5R4	0699-0074	9	2	RESISTOR 14.7M 1% .125W F TC = 0 + -150	28480	0699-0074
2449A AND ABOVE						
A5R4	0699-0073	8		RESISTOR 10M 1% .125W F TC = 0 + -150	28480	0699-0073
A5R5	0757-0288	1	3	RESISTOR 9.09K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-9091-F
A5R6	0698-8549	7		RESISTOR 2.1K .5% .1W F TC = 0 + -5	28480	0698-8549
A5R7	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A5R8	0698-8731	9		RESISTOR 4.8K .1% .1W F TC = 0 + -15	28480	0698-8731
A5R9	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A5R10	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A5R11	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A5R12	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A5R13	0698-3154	0	12	RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A5R14	0698-3132	4	11	RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2443A						
A5R15	0699-0074	9		RESISTOR 14.7M 1% .125W F TC = 0 + -150	28480	0699-0074
2449A AND ABOVE						
A5R15	0699-0073	8		RESISTOR 10M 1% .125W F TC = 0 + -150	28480	0699-0073
A5R16	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A5R17	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A5R18	2100-3358	3		RESISTOR-TRMR 1M 20% C SIDE-ADJ 1-TRN	28480	2100-3358
A5R19	0757-0461	2		RESISTOR 68.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6812-F
A5R20	0698-3150	6	7	RESISTOR 2.37K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2371-F
A5R21	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A5R22	0699-0222	9	1	RESISTOR 10.5K .1% .1W F TC = 0 + -15	28480	0699-0222
A5R23	2100-3351	6	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	28480	2100-3351
A5R24	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A5R25	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A5R26	0757-0439	4		RESISTOR 6.81K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6811-F
A5R27	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A5R28	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A5R29	0757-0458	7	8	RESISTOR 51.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5112-F
A5R30	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F
A5R31	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A5R32	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A5R33	0698-6286	5	1	RESISTOR 100M 10% .25W FC TC = -900/ + 1200	01121	CB1071
A5R34	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A5R35	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A5R36	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A5R37	0757-0458	7		RESISTOR 51.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5112-F
A5R38	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
2314A TO 2443A						
A5R39	0698-3457	6		RESISTOR 316K 1% .125W F TC = 0 + -100	28480	0698-3457
2449A AND ABOVE						
A5R39	0698-3454	3		RESISTOR 215K 1% .125W F TC = 0 + -100	24546	C4-1/8-2153-F
A5R40	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A5R41	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A5R42	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A5R43	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
2314A TO 2627A						
A5R44	0757-0420	3	9	RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A5R45	0698-3152	8	7	RESISTOR 3.48K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3481-F
A5R46	0698-6360	6	3	RESISTOR 10K .1% .125W F TC = 0 + -25	28480	0698-6360
A5R47	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A5R48	0698-6360	6		RESISTOR 10K .1% .125W F TC = 0 + -25	28480	0698-6360
A5R49	0699-0847	4	3	RESISTOR 1.96K .1% .125W F TC = 0 + -50	28480	0699-0847
A5R50	0699-0847	4		RESISTOR 1.96K .1% .125W F TC = 0 + -50	28480	0699-0847
2635A AND ABOVE						
A5R44-R50				NOT ASSIGNED		

†Refer to section 7 for update information *Factory selected Component (Refer to section 7) Δ Latest part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A5R51	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A5R52	0698-6631	4	1	RESISTOR 2.5K .1% .125W F TC = 0 + -25	28480	0698-6631
A5R53	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A5R54	0698-3156	2		RESISTOR 14.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1472-F
A5R55	0698-6362	8	1	RESISTOR 1K .1% .125W F TC = 0 + -25	28480	0698-6362
A5R56	0699-0847	4		RESISTOR 1.96K .1% .125W F TC = 0 + -50	28480	0699-0847
A5R57	0757-0467	8	3	RESISTOR 121K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1213-F
A5R58	0757-0463	4	3	RESISTOR 82.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8252-F
A5R59	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A5R60	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A5R61	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A5R62	0757-0467	8		RESISTOR 121K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1213-F
A5R63	0698-3243	8		RESISTOR 178K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1783-F
A5R64	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A5R65	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A5R66	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A5R67	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A5R68	0698-3443	0	5	RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A5R69	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A5R70	0757-0419	0	7	RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
A5R71	0757-0405	4	4	RESISTOR 162 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-162R-F
A5R72	0757-0419	0		RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
A5R73	2100-3103	6	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A5R74	0699-0239	8	1	RESISTOR 59K .1% .1W F TC = 0 + -15	28480	0699-0239
A5R75	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A5R76	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A5R77	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A5R78	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A5R79	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A5R80	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A5R81	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A5TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5U1	1826-0471	2	2	IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2627A						
A5U2	1826-0969	3	1	RMS/DC 10-METAL BPLR	28480	1826-0969
2635A AND ABOVE						
A5U2				NOT ASSIGNED		
A5U3	1826-0371	1		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A5U4	1826-0098	9	3	IC COMPARATOR PRCN TO-99 PKG	27014	LM211H
A5U5	1826-0098	9		IC COMPARATOR PRCN TO-99 PKG	27014	LM211H
A5U6	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
2314A TO 2627A						
A5U7	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
2635A AND ABOVE						
A5U7				NOT ASSIGNED		
A5U8	1826-0371	1		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A5U9	1826-0180	0	2	IC TIMER TTL MONO/ASTBL	01295	NE555P
A5U10	1826-0605	4	3	IC MULTIPLXR 8-CHAN-ANLG 16-DIP-C PKG	17856	DG508BK
A5U11	1826-0605	4		IC MULTIPLXR 8-CHAN-ANLG 16-DIP-C PKG	17856	DG508BK
A5U12	1826-0605	4		IC MULTIPLXR 8-CHAN-ANLG 16-DIP-C PKG	17856	DG508BK
A5U13	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A5U14	1820-1211	8	1	IC GATE TTL LS EXCL-OR QUAD 2-INP	01295	SN74LS86N
A5U15	1820-1411	0	13	IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A5U16	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A5U17	1826-0371	1		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A5U18	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A5W1				NOT ASSIGNED		
2314A TO 2627A						
A5W2				NOT ASSIGNED		
2635A AND ABOVE						
A5W2	8159-0005	6		RESISTOR ZERO OHMS 22 AWG LEAD DIA 284	80 815	0-0005
A5VR1	1902-0946	8	1	DIODE-ZNR 3.3V 5% DO-35 PD = .4W TC = -.039%	28480	1902-0946
A5VR2	1902-3082	9	1	DIODE-ZNR 4.64V 5% DO-35 PD = .4W	28480	1902-3082
A5VR3	1902-3024	9	1	DIODE-ZNR 2.87V 5% DO-7 PD = .4W TC = -.07%	28480	1902-3024
A5VR4	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD = .4W	24046	1N827

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A6						
A6	08901-60186	1	1	AM DEMODULATOR ASSEMBLY	28480	08901-60186
A6C1	0180-0058	0		CAPACITOR-FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A6C2	0180-0058	0		CAPACITOR-FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A6C3	0160-4636	6	1	CAPACITOR-FXD 255PF +-1% 100VDC MICA	28480	0160-4636
A6C4	0160-2660	2	1	CAPACITOR-FXD 20PF +-2% 500VDC CER 0+-30	28480	0160-2660
A6C5	0160-4635	5	1	CAPACITOR-FXD 212PF +-1% 100VDC MICA	28480	0160-4635
A6C6	0160-4795	8		CAPACITOR-FXD 4.7PF +-.5PF 100VDC CER	28480	0160-4795
A6C7	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A6C8	0121-0105	4	2	CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304324 9/35PF N650
A6C9	0160-4833	5	7	CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A6C10				NOT ASSIGNED		
A6C11	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A6C12				NOT ASSIGNED		
A6C13				NOT ASSIGNED		
A6C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6C15	0160-4835	7	8	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6C16	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	28480	0160-4812
A6C17	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6C18	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A6C19	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A6C20	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6C21	0160-4833	5		CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A6C22	0160-4833	5		CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A6C23	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	28480	0160-4812
A6C24	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A6C25	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A6C26	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A6C27				NOT ASSIGNED		
A6C28				NOT ASSIGNED		
A6C29	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A6C30	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6C31	0160-3501	2		CAPACITOR-FXD 4UF +-10% 50VDC MET-POLYC	28480	0160-3501
A6C32	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A6C33				NOT ASSIGNED		
A6C34	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A6C35				NOT ASSIGNED		
A6C36	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A6C37	0160-5528	7	1	CAPACITOR-FXD .22UF +-5% 100VDC	28480	0160-5528
A6C38	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A6C39	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A6C40	0160-3539	6	1	CAPACITOR-FXD 820PF +-5% 100VDC MICA	28480	0160-3539
A6C41	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A6C42	0160-4807	3		CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A6C43*	0160-4334	1	1	CAPACITOR-FXD 290PF +-1% 300VDC MICA	28480	0160-4334

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A6C44	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A6C45	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A6C46	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6C47	0180-2929	8		CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
A6C48				NOT ASSIGNED		
A6C49				NOT ASSIGNED		
A6C50	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
2314A TO 2334A						
*A6C51**	0160-0340	1	1	CAPACITOR-FXD 600PF +-1% 300VDC MICA	28480	0160-0340
2340A AND ABOVE						
*A6C51**	0160-4678	6		CAPACITOR-FXD 560PF +-1% 100VDC MICA	28480	0160-4678
A6C52	0180-2613	7	1	CAPACITOR-FXD 390UF +-10% 6VDC TA	56289	150D397X9006R2-DJB
A6C53	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A6C54	0160-4833	5		CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A6C55	0160-4535	4	1	CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A6C56	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A6C57	0160-4833	5		CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A6C58	0160-4825	5	2	CAPACITOR-FXD 560PF +-5% 100VDC CER	28480	0160-4825
A6C59	0160-4825	5		CAPACITOR-FXD 560PF +-5% 100VDC CER	28480	0160-4825
A6C60	0160-4810	8	1	CAPACITOR-FXD 330PF +-5% 100VDC CER	28480	0160-4810
A6C61	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A6C62	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A6C63	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	28480	0160-4812
A6C64	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A6C65	0180-0376	5	2	CAPACITOR-FXD .47UF +-10% 35VDC TA	56289	150D474X9035A2
A6C66	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A6C67	0160-5714	3	1	CAPACITOR-FXD .68UF +-10% 100VDC CER	28480	0160-5714
A6C68	0160-4789	0	1	CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	28480	0160-4789
A6C69	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A6C70	0160-4509	2	1	CAPACITOR-FXD .033UF +-5% 50VDC	28480	0160-4509
A6CR1-CR4				NOT ASSIGNED		
A6CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A6CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A6CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A6CR8	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A6CR9	1901-0539	3	3	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A6CR10	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A6CR11				NOT ASSIGNED		
A6CR12				NOT ASSIGNED		
A6CR13	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A6CR14	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A6CR15	08901-80024	8	2	DET DIODES-MATCH	28480	08901-80024
A6CR16	08901-80024	8		DET DIODES-MATCH	28480	08901-80024
A6CR17	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A6CR18	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A6CR19	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150

†Refer to Section 7 for update information *Factory selected component (Refer to section 4) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A6CR20	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A6CR21	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A6J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A6J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A6J3	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A6J4	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A6L1	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A6L2	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A6L3	9140-0271	4	1	INDUCTOR RF-CH-MLD 13.3UH 2%	28480	9140-0271
A6L4	9140-0272	5	1	INDUCTOR RF-CH-MLD 32UH 2% .166DX.385LG	28480	9140-0272
A6L5	9140-0273	6	1	INDUCTOR RF-CH-MLD 47.6UH 2%	28480	9140-0273
A6L6				NOT ASSIGNED		
A6L7	9100-1652	3	1	INDUCTOR RF-CH-MLD 820UH 5% .2DX.45LG	28480	9100-1652
A6L8*	9140-0274	7	1	INDUCTOR RF-CH-MLD 80UH 2% .166DX.385LG	28480	9140-0274
A6L9	9100-1666	9	1	INDUCTOR RF-CH-MLD 3.6MH 5% .23DX.57LG	28480	9100-1666
A6L10	9140-0131	5	4	INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	28480	9140-0131
A6MP1	08901-00109	2	1	COVER AM DEMOD	28480	08901-00109
	2190-0008	3		WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A6Q1	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A6Q2	1858-0010	2	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MPQ2906
A6Q3				NOT ASSIGNED		
A6Q4	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A6Q5	1854-0404	0	13	TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
2314A TO 2428A						
A6Q6	1855-0420	2	5	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
2432A AND ABOVE						
A6Q6	1855-0265	3		TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI		
A6Q7	1855-0421	3	1	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A6Q8	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A6Q9	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A6Q10	1853-0281	9	13	TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A6Q11	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A6Q12	1854-0215	1	1	TRANSISTOR NPN SI PD = 350MW FT = 300MHZ	04713	2N3904
A6Q13	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A6Q14	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
A6Q15	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A6Q16	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A6Q17	1855-0082	2	1	TRANSISTOR J-FET P-CHAN D-MODE SI	28480	1855-0082
A6Q18	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A6Q19	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A6Q20	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A6Q1	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A6Q22-Q28				NOT ASSIGNED		
A6Q29	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A6Q30	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A6Q31	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A6R1	0757-1108	6	1	RESISTOR 300 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-301-F
A6R2	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A6R3	0698-3446	3		RESISTOR 383 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-383R-F
A6R4	0698-3447	4	6	RESISTOR 422 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-422R-F
A6R5	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A6R6	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A6R7	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A6R8	0757-0441	8		RESISTOR 8.25K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8251-F
A6R9	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A6R10	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A6R11				NOT ASSIGNED		
A6R12				NOT ASSIGNED		
A6R13	0698-3160	8		RESISTOR 31.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3162-F
A6R14	0757-0458	7		RESISTOR 51.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5112-F
A6R15	0757-0458	7		RESISTOR 51.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5112-F
A6R16	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A6R17	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A6R18	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A6R19	0698-3445	2	8	RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F
A6R20	0757-0441	8		RESISTOR 8.25K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8251-F
A6R21	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A6R22	0698-3150	6		RESISTOR 2.37K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2371-F
A6R23	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A6R24	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A6R25	0698-3445	2		RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F
A6R26	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A6R27	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A6R28	0757-0458	7		RESISTOR 51.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5112-F
A6R29	0757-0458	7		RESISTOR 51.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5112-F
A6R30	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A6R31	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A6R32	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A6R33	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A6R34	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A6R35	0757-0338	2	4	RESISTOR 1K 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-1001-F
A6R36	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A6R37	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A6R38	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A6R39	0757-0443	0	3	RESISTOR 11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1102-F
A6R40				NOT ASSIGNED		

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A6R41	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A6R42	0757-0338	2		RESISTOR 1K 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-1001-F
A6R43				NOT ASSIGNED		
A6R44	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A6R45				NOT ASSIGNED		
A6R46	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A6R47				NOT ASSIGNED		
A6R48				NOT ASSIGNED		
A6R49	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A6R50	0698-3152	8		RESISTOR 3.48K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3481-F
A6R51	0698-4488	5	1	RESISTOR 26.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2672-F
A6R52	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A6R53				NOT ASSIGNED		
A6R54	0698-4472	7	1	RESISTOR 7.68K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-7681-F
A6R55	0698-3150	6		RESISTOR 2.37K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2371-F
A6R56	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A6R57	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A6R58	0698-3432	7		RESISTOR 26.1 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-26R1-F
A6R59				NOT ASSIGNED		
A6R60	0699-0148	8	2	RESISTOR 31.6K .1% .1W F TC = 0 + -15	28480	0699-0148
A6R61	0757-0200	7	5	RESISTOR 5.62K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5621-F
A6R62	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A6R63	0698-3152	8		RESISTOR 3.48K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3481-F
A6R64	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A6R65	2100-3207	1	2	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	28480	2100-3207
A6R66	0698-8955	9	1	RESISTOR 13.5K .1% .1W F TC = 0 + -10	28480	0698-8955
A6R67	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A6R68	0757-0419	0		RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
A6R69	0699-0149	9	1	RESISTOR 28.7K .1% .1W F TC = 0 + -15	28480	0699-0149
A6R70	0698-3447	4		RESISTOR 422 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-422R-F
A6R71	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A6R72	0699-0096	5	2	RESISTOR 12K .1% .1W F TC = 0 + -10	28480	0699-0096
A6R73	0698-4454	5	3	RESISTOR 523 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-523R-F
A6R74	0698-4454	5		RESISTOR 523 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-523R-F
A6R75	0699-0096	5		RESISTOR 12K .1% .1W F TC = 0 + -10	28480	0699-0096
A6R76	0698-4454	5		RESISTOR 523 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-523R-F
A6R77	0757-0444	1	4	RESISTOR 12.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1212-F
A6R78	0757-0443	0		RESISTOR 11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1102-F
A6R79	0699-0148	8		RESISTOR 31.6K .1% .1W F TC = 0 + -15	28480	0699-0148
A6R80	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A6R81	0698-4626	3	1	RESISTOR 1.47K 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-1471-F
A6R82	0698-3440	7	7	RESISTOR 196 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-196R-F
A6R83-R86				NOT ASSIGNED		
A6R87	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A6R88	0699-0143	3		RESISTOR 825 .1% .1W F TC = 0 + -15	28480	0699-0143
A6R89	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A6R90	0757-0447	4		RESISTOR 16.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1622-F
A6R91	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A6R92	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A6R93	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A6R94	0757-0338	2		RESISTOR 1K 1% .25W F TC=0+-100	24546	C5-1/4-TO-1001-F
A6R95	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A6R96	0698-8979	7	1	RESISTOR 11.6K 1% .125W F TC=0+-100	28480	0698-8979
A6R97	0698-3153	9	7	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A6R98	0757-0440	7	6	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A6R99	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A6R100	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A6R101	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A6R102	0698-3432	7		RESISTOR 26.1 1% .125W F TC=0+-100	03888	PME55-1/8-T0-26R1-F
A6R103	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A6R104	0698-3454	3		RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A6R105	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A6R106				NOT ASSIGNED		
A6R107	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A6R108	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A6R109	0698-8825	2	1	RESISTOR 681K 1% .125W F TC=0+-100	28480	0698-8825
A6R110	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A6R111				NOT ASSIGNED		
A6R112	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A6R113	0683-2265	1		RESISTOR 22M 5% .25W FC TC=-900/+1200	01121	CB2265
A6R114	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A6R115	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R116				NOT ASSIGNED		
A6R117	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A6R118	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A6R119	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A6R120	0757-0317	7	2	RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A6R121	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A6R122	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A6R123				NOT ASSIGNED		
A6R124	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A6R125	0683-2265	1		RESISTOR 22M 5% .25W FC TC=-900/+1200	01121	CB2265
A6R126	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A6R127				NOT ASSIGNED		
A6R128	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A6R129	0698-3454	3		RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A6TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A6TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A6U1	1826-0035	4	2	IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM308AH
A6U2	1826-0043	4	4	IC OP AMP GP TO-99 PKG	3L585	CA307T
A6U3	1826-0035	4		IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM308AH
A6U4	1826-0716	8	1	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE
A6U5	1826-0606	5	7	IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A6U6	1826-0102	6	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LM312H
A6U7	1826-0026	3	1	IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A6U8	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A6U9	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A6U10	1820-1197	9	4	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A6VR1				NOT ASSIGNED		
A6VR2	1902-0072	1	1	DIODE-ZNR 7.87V 2% DO-35 PD=.4W	28480	1902-0072
A6VR3	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	24046	1N827
A6VR4	1902-3059	0	5	DIODE-ZNR 3.83V 5% DO-35 PD=.4W	28480	1902-3059

†Refer to section 7 for update information *Factory Selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A10						
2314A TO 2515A						
A10	08901-60141	8	1	POWER SUPPLY REGULATORS ASSEMBLY	28480	08901-60141
2517A TO 3116A						
A10	08901-60269	1	1	POWER SUPPLY REGULATORS ASSEMBLY	28480	08901-60269
3122A AND ABOVE						
A10	08901-60311	4	1	POWER SUPPLY REGULATORS ASSEMBLY	28480	08901-60311
A10C1	0180-0229	7	6	CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A10C2	0160-4831	3	2	CAPACITOR-FXD 4700PF +-10% 100VDC CER	28480	0160-4831
A10C3	0160-4831	3		CAPACITOR-FXD 4700PF +-10% 100VDC CER	28480	0160-4831
A10C4	0160-5098	6	4	CAPACITOR-FXD .22UF +-10% 50VDC CER	16299	CAC05X7R224J050A
A10C5	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A10C6	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A10C7	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A10C8	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A10C9	0180-1794	3	1	CAPACITOR-FXD 22UF+-10% 35VDC TA	56289	150D226X9035R2
A10C10	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A10C11	0160-4812	0		CAPACITOR-FXD 220PF +-5% 100VDC CER	28480	0160-4812
A10C12	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A10C13	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A10C14	0160-4830	2	2	CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A10C15	0160-4830	2		CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A10C16	0180-2141	6		CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A10C17	0160-5098	6		CAPACITOR-FXD .22UF +-10% 50VDC CER	16299	CAC05X7R224J050A
A10C18	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A10C19	0160-5098	6		CAPACITOR-FXD .22UF +-10% 50VDC CER	16299	CAC05X7R224J050A
A10C20	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A10CR1	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200M1 4NS	9N171	1N4150
A10CR5	1901-0028	5	7	DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR6	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR8	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR9	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR10	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR11	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR12	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR13	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR14	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A10CR15	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A10CR16	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A10DS1	1990-0485	5	5	LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	5082-4984
A10DS2	1990-0485	5		LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	5082-4984
A10DS3	1990-0485	5		LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	5082-4984
A10DS4	1990-0485	5		LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	5082-4984
A10DS5	1990-0485	5		LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	5082-4984
A10F1	2110-0083	6	3	FUSE 2.5A 250V NTD 1.25X.25 UL	28480	2110-0083
	2110-0643	4	4	FUSEHOLDER-CLIP TYPE 15A 250 V	28480	2110-0643
A10F2	2110-0036	9	1	FUSE 8A 125V NTD 1.25X.25 UL	75915	312008
	2110-0643	4		FUSEHOLDER-CLIP TYPE 15A 250 V	28480	2110-0643
A10F3	2110-0083	6		FUSE 2.5A 250V NTD 1.25X.25 UL	28480	2110-0083
	2110-0643	4		FUSEHOLDER-CLIP TYPE 15A 250 V	28480	2110-0643
A10F4	2110-0083	6		FUSE 2.5A 250V NTD 1.25X.25 UL	28480	2110-0083
	2110-0643	4		FUSEHOLDER-CLIP TYPE 15A 250 V	28480	2110-0643
A10J1	1251-5635	1	1	CONNECTOR 12-PIN M POST TYPE	28480	1251-5635
A10MP1	5001-0178	2	2	BRACKET-ANGLE	28480	5001-0178
	2190-0007	2	3	WASHER-LK INTL T NO. 6 .141-IN-ID	28480	2190-0007
	2360-0191	6	3	SCREW-MACH 6-32 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A10MP2	5001-0178	2		BRACKET-ANGLE	28480	5001-0178
	2190-0007	2		WASHER-LK INTL T NO. 6 .141-IN-ID	28480	2190-0007
	2360-0191	6		SCREW-MACH 6-32 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A10Q1	1884-0005	0	1	THYRISTOR-SCR VRRM = 50	04713	MCR649P-2
	0340-0875	9	1	INSULATOR-XSTR THRM-CNDCT	28480	0340-0875
	2190-0004	9	11	WASHER-LK INTL T NO. 4 .115-IN-ID	28480	2190-0004
	2200-0141	8	11	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
A10Q2	1854-0798	5	1	TRANSISTOR NPN SI DARL PD = 1W	04713	MPS-U45
	2190-0004	9		WASHER-LK INTL T NO. 4 .115-IN-ID	28480	2190-0004
	08901-00137	6	1	HEAT SINK, PC	28480	08901-00137
	2200-0141	8		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
A10Q3	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A10Q4	1884-0273	4	3	THYRISTOR-SCR 2N4101 TO-66	3L585	2N4101
	0340-0681	5	4	INSULATOR-XSTR THRM-CNDCT GRA	28480	0340-0681
	2190-0004	9		WASHER-LK INTL T NO. 4 .115-IN-ID	28480	2190-0004
	2200-0141	8		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
A10Q5	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A10Q6	1884-0273	4		THYRISTOR-SCR 2N4101 TO-66	3L585	2N4101
	0340-0681	5		INSULATOR-XSTR THRM-CNDCT GRA	28480	0340-0681
	2190-0004	9		WASHER-LK INTL T NO. 4 .115-IN-ID	28480	2190-0004
	2200-0141	8		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
A10Q7	1884-0273	4		THYRISTOR-SCR 2N4101 TO-66	3L585	2N4101
	0340-0681	5		INSULATOR-XSTR THRM-CNDCT GRA	28480	0340-0681
	2190-0004	9		WASHER-LK INTL T NO. 4 .115-IN-ID	28480	2190-0004
	2200-0141	8		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
A10Q8	1884-0073	2	1	THYRISTOR-SCR TO-5 VRRM = 100	28480	1884-0073
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A10Q9	1854-0474	4	3	TRANSISTOR NPN SI PD = 310MW FT = 100MHZ	04713	2N5551
A10Q10	1858-0008	8	2	TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MHQ6001
A10Q11	1858-0008	8		TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MHQ6001
A10Q12	1853-0414	0	1	TRANSISTOR PNP 2N6423 SI TO-66 PD = 35W	04713	2N6423
	0340-0681	5		INSULATOR-XSTR THRM-CNDCT GRA	28480	0340-0681
	2190-0004	9		WASHER-LK INTL T NO. 4 .115-IN-ID	28480	2190-0004
	2200-0141	8		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141

†Refer to Section 7 for update information *Factory selected component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A10Q13	1854-0474	4		TRANSISTOR NPN SI PD = 310MW FT = 100MHZ	04713	2N5551
A10Q14	1854-0474	4		TRANSISTOR NPN SI PD = 310MW FT = 100MHZ	04713	2N5551
A10R1	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A10R2	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A10R3	0811-3290	7	1	RESISTOR .1 5% 2W PW TC = 0 + -800	28480	0811-3290
A10R4	0811-3293	0	2	RESISTOR .18 5% 2W PW TC = 0 + -800	28480	0811-3293
A10R5	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A10R6	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A10R7	0757-0289	2	9	RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A10R8	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A10R9	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A10R10	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A10R11	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A10R12	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A10R13	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A10R14	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A10R15	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A10R16	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A10R17	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A10R18	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A10R19	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A10R20	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A10R21	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A10R22	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A10R23	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A10R24	2100-3350	5	2	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
A10R25	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A10R26	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A10R27	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F
A10R28	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A10R29	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A10R30	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A10R31	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A10R32	0698-3624	9	1	RESISTOR 150 5% 2W MO TC = 0 + -200	28480	0698-3624
A10R33	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A10R34	0698-3601	2	1	RESISTOR 10 5% 2W MO TC = 0 + -200	27167	FP42-2-T00-10R0-J
A10R35	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A10R36	0757-0444	1		RESISTOR 12.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1212-F
A10R37	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A10R38	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A10R39	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A10R40	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A10R41	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A10R42	0698-3136	8		RESISTOR 17.8K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1782-F
A10R43	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A10R44	0757-0402	1	8	RESISTOR 110 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-111-F
A10R45	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A10R46	0757-0274	5	5	RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F

†Refer to section 7 for update information *Factory selected component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A10R47	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A10R48	0811-3293	0		RESISTOR .18 5% 2W PW TC = 0 + -800	28480	0811-3293
A10R49	8110-0180	0	1	RIBBON-RES .157-OHM/FT .0253X.0625	28480	8110-0180
2314A TO 2619A						
A10R50	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
2622A AND ABOVE						
A10R50	0698-5805	5		RESISTOR 511 1% .125W F TC = 0 + -100	28480	0698-5805
A10R51	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
2314A TO 2517A						
A10R52	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
2531A AND ABOVE						
A10R52	0698-3156	2		RESISTOR 14.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1472-F
A10R53	0757-0444	1		RESISTOR 12.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1212-F
2314A TO 2619A						
A10R54	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
2622A AND ABOVE						
A10R54	0698-5805	5		RESISTOR 4K 1% .125W F TC = 0 + -100		
A10R55	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A10R56	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A10R57	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A10R58	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A10R59	0698-3160	8		RESISTOR 31.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3162-F
A10R60	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A10R61	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A10R62	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A10TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A10TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A10TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A10TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A10TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A10TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A10TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A10U1	1820-5543	7	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	28480	1820-5543
A10U2	1820-5543	7	1	IC OP AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	28480	1820-5543
A10VR1	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD = .4W	24046	1N827
A10VR2	1902-0968	4	1	DIODE-ZNR 27V 5% DO-35 PD = .4W TC = + .095%	28480	1902-0968
A10VR3	1902-3214	9	2	DIODE-ZNR 16.2V 2% DO-35 PD = .4W	28480	1902-3214
A10VR4	1902-3214	9		DIODE-ZNR 16.2V 2% DO-35 PD = .4W	28480	1902-3214
A10VR5	1902-0960	6	2	DIODE-ZNR 12V 5% DO-35 PD = .4W TC = + .077%	28480	1902-0960

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 7). Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A10VR6△	1902-3182	0		DIODE-ZNR 12.1V 5% DO-35 PD=.4W TC=+.077%	28480	1902-3182
A10VR7	1902-3333	3	1	DIODE-ZNR 46.4V 5% DO-35 PD=.4W	28480	1902-3333
A10VR8	1902-0952	6	2	DIODE-ZNR 5.6V 5% DO-35 PD=.4W TC=+.046%	28480	1902-0952
A10VR9	1902-0952	6		DIODE-ZNR 5.6V 5% DO-35 PD=.4W TC=+.046%	28480	1902-0952
A10VR10	1902-3301	5	1	DIODE-ZNR 34.8V 5% DO-35 PD=.4W	28480	1902-3301
A10VR11	1902-0943	5	3	DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943
A10VR12	1902-0943	5		DIODE-ZNR 2.4V 5% DO-35 PD=.4W TC=-.037%	28480	1902-0943

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). △ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A11						
2314A TO 2635A						
A11	08901-60093	9	1	COUNTER ASSEMBLY (EXCEPT OPTION 002)	28480	08901-60093
A11	08901-60018	8	1	COUNTER ASSEMBLY (OPTION 002 ONLY)	28480	08901-60018
2636A AND ABOVE						
A11	08902-60107	7	1	COUNTER ASSEMBLY (EXCEPT OPTION 002)	28480	08901-60107
A11	08902-60106	6	1	COUNTER ASSEMBLY (OPTION 002 ONLY)	28480	08901-60106
A11C1	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C2	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A11C3	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C4	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C5	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C6	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A11C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A11C9	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A11C10	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C11	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C13	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C14	0121-0105	4		CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304324 9/35PF N650
A11C15	0160-0161	4	2	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A11C16	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C17	0160-0572	1	10	CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A11C18	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C19	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C20	0160-3874	2	1	CAPACITOR-FXD 10PF +-.5PF 200VDC CER	28480	0160-3874
A11C21	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C22	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A11C23	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11C24	0160-0570	9	3	CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A11C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A11C26	0140-0198	5		CAPACITOR-FXD 200PF +-5% 300VDC MICA	72136	DM15F201J0300WV1CR
A11C27	0160-3875	3	4	CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A11C28	0140-0198	5		CAPACITOR-FXD 200PF +-5% 300VDC MICA	72136	DM15F201J0300WV1CR
A11C29	0160-0939	4	1	CAPACITOR-FXD 430PF +-5% 300VDC MICA	28480	0160-0939
A11C30	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A11CR1	1901-0179	7	18	DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A11CR2	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A11CR3	1901-0535	9	9	DIODE-SM SIG SCHOTTKY	28480	1901-0535
A11CR4	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A11CR5	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A11CR6	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A11DS1	1990-0647	1	1	LED-LAMP LUM-INT = 12MCD IF = 20MA-MAX	28480	5082-4558
A11J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A11J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A11J3	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A11J4	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A11J5	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A11J6	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A11L1				NOT ASSIGNED		
A11L2	9100-2248	5	1	INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A11MP1	08901-00033	1	1	COVER COUNTER	28480	08901-00033
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A11MP2	08901-00063	7	1	LABEL I D (EXCEPT OPT. 002)	28480	08901-00063
A11Q1	1853-0540	3	2	TRANSISTOR PNP SI TO-92 PD = 625MW	04713	1853-0540
A11Q2	1853-0540	3		TRANSISTOR PNP SI TO-92 PD-625MW	04713	1853-0540
A11Q3	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A11Q4	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A11Q5	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A11R1	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A11R2	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A11R3	0698-8812	7	1	RESISTOR 1 1% .125W F TC = 0 + -100	28480	0698-8812
A11R4	0698-8816	1	1	RESISTOR 2.15 1% .125W F TC = 0 + -100	28480	0698-8516
A11R5	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A11R6	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A11R7	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A11R8	0757-0463	4		RESISTOR 82.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8252-F
A11R9	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A11R10	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A11R11	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A11R12	1810-0204	6	1	NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A11R13	0757-0397	3	15	RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A11R14	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A11R15	0698-3445	2		RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A11R16	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1001-F
A11R17	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A11R18	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A11R19	0698-3153	8		RESISTOR 3.83K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3831-F
A11R20	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A11R21	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A11R22	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A11R23	0757-0398	4	3	RESISTOR 75 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-75R0-F
A11R24	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A11R25	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A11R26	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A11R27	0698-3429	2	4	RESISTOR 19.6 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-19R6-F
A11R28	0698-3445	2		RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F
A11R29	0698-3445	2		RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F
A11R30	0757-0424	7	2	RESISTOR 1.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1101-F
A11R31	0757-1000	7	1	RESISTOR 51.1 1% .5W F TC = 0 + -100	28480	0757-1000
A11R32	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A11R33	0698-3432	7		RESISTOR 26.1 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-26R1-F
A11R34	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A11R35	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A11R36	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A11R37	1810-0206	8	7	NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A11R38	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A11R39	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A11TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A11TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A11TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A11TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A11TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A11TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A11TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A11U1	1820-0817	8	4	IC FF ECL D-M/S DUAL	04713	MC10131P
A11U2	1820-0803	2	1	IC GATE ECL OR-NOR TPL	04713	MC10105P
A11U3	1820-1425	6	1	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	SN74LS132N
A11U4	1820-1416	5	2	IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A11U5	1820-1193	5	4	IC CNTR TTL LS BIN ASYNCHRO	01295	SN74LS197N
A11U6	1820-0693	8	2	IC FF TTL S D-TYPE POS-EDGE-TRIG	01295	SN74S74N
A11U7	1820-1217	4	1	IC MUXR/DATA-SEL TTL LS 8-TO-1-LINE	01295	SN74LS151N
A11U8	1820-1251	6	2	IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A11U9	1820-1193	5		IC CNTR TTL LS BIN ASYNCHRO	01295	SN74LS197N
A11U10	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A11U11	1820-1193	5		IC CNTR TTL LS BIN ASYNCHRO	01295	SN74LS197N
A11U12	1820-1199	1	4	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A11U13	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A11U14	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
	1200-0638	7	2	SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0638
A11U15	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
	1200-0638	7		SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0638
A11U16	1820-0693	8		IC FF TTL S D-TYPE POS-EDGE-TRIG	01295	SN74S74N
A11U17	1820-1240	3	1	IC DCDR TTL S 3-TO-8-LINE 3-INP	01295	SN74S138N
A11U18	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A11U19	1820-1193	5		IC CNTR TTL LS BIN ASYNCHRO	01295	SN74LS197N
A11U20	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A11U21	1820-0723	5	2	IC RCVR TTL LINE RCVR DUAL 2-INP	01295	SN75107AN
A11Y1	0410-0423	2	1	CRYSTAL-QUARTZ 10.000 MHZ (EXCEPT OPT. 002)	28480	0410-0423

†Refer to Section 7 for update information *Factory selected component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A13	**08901-60244 – SERIAL PREFIX 2314A TO 2718A**					
A13	08901-60244	2	1	CONTROLLER ASSEMBLY	28480	08901-60244
A13C1	0180-2111	0	3	CAPACITOR-FXD 33UF+-10% 35VDC TA	56289	150D336X9035SA
A13C2	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C3	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A13C4	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A13C5	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A13C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C8	0180-0100	3	2	CAPACITOR-FXD 4.7UF+-10% 35VDC TA	56289	150D475X9035B2
A13C9	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C11	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C12	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C13	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C16	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C17	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C18	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
2314A TO 2627A						
A13C19	0160-4805	1	3	CAPACITOR-FXD 47PF +-5% 100VDC CER 0+-30	28480	0160-4805
A13C20	0160-4805	1		CAPACITOR-FXD 47PF +-5%% 100VDC CER 0+-30	28480	0160-4805
2635A TO 2718A						
A13C19				NOT ASSIGNED		
A13C20				NOT ASSIGNED		
A13C21Δ	0180-5098	6		CAPACITOR-FXD .22UF+-10% 50VDC TA	28480	0180-5098
A13C22				NOT ASSIGNED		
A13CR1	1901-0159	3	1	DIODE-PWR RECT 400V 750MA DO-41	28480	1901-0159
A13CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A13CR5	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A13CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13DS1	1990-0534	5	4	LED-LAMP LUM-INT = 2.2MCD IF = 20MA-MAX	28480	5082-4555
A13DS2	1990-0534	5		LED-LAMP LUM-INT = 2.2MCD IF = 20MA-MAX	28480	5082-4555
A13DS3	1990-0534	5		LED-LAMP LUM-INT = 2.2MCD IF = 20MA-MAX	28480	5082-4555
A13DS4	1990-0534	5		LED-LAMP LUM-INT = 2.2MCD IF = 20MA-MAX	28480	5082-4555

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 7) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A13	**08901-60244 – SERIAL PREFIX 2314A TO 2718A**					
2314A TO 2627A						
A13L1	9140-0238	3	1	INDUCTOR RF-CH-MLD 82UH 5% .166DX.385LG	28480	9140-0238
2635A TO 2718A						
A13L1				NOT ASSIGNED		
A13MP1	4040-0749	4	2	EXTR-PC BD BRN POLYC .062-BD-THKNS	28480	4040-0749
	1480-0073	6	4	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A13MP2	4040-0751	8	1	EXTR-PC BD ORN POLYC .062-BD-THKNS	28480	4040-0751
	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A13Q1	1853-0393	4	1	TRANSISTOR PNP SI TO-18 PD = 500MW	28480	1853-0393
A13Q2	1858-0032	8		TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A13Q3	1853-0459	3	8	TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A13R1	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A13R2	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A13R3	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A13R4	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A13R5	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A13R6	0698-3156	2		RESISTOR 14.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1472-F
A13R7	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A13R8	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A13R9	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R10	0757-0419	0		RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
2314A TO 2544A						
A13R11	0698-3454	3		RESISTOR 215K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2153-F
2550A TO 2718A						
A13R11	0757-0458	7		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-5111-F
A13R12	2100-2522	1	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	30983	ET50X103
A13R13	0698-6624	5	3	RESISTOR 2K .1% .125W F TC = 0 + -25	28480	0698-6624
A13R14	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A13R15	0698-6624	5		RESISTOR 2K .1% .125W F TC = 0 + -25	28480	0698-6624
A13R16	0698-6624	5		RESISTOR 2K .1% .125W F TC = 0 + -25	28480	0698-6624
A13R17	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R18	0698-6360	6		RESISTOR 10K .1% .125W F TC = 0 + -25	28480	0698-6360
A13R19	0698-6348	0	1	RESISTOR 3K .1% .125W F TC = 0 + -25	28480	0698-6348
A13R20	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R21	0757-0459	8	2	RESISTOR 56.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5622-F
A13R22	0757-0441	8		RESISTOR 8.25K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8251-F
A13R23	0757-0439	4		RESISTOR 6.81K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6811-F
A13R24	0698-3162	0	2	RESISTOR 46.4K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4642-F
A13R25	0698-3161	9		RESISTOR 38.3K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3832-F
A13R26	0757-0447	4		RESISTOR 16.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1622-F
A13R27	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R28	0757-0418	9	3	RESISTOR 619 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-619R-F
A13R29	1810-0229	5	1	NETWORK-RES 8-SIP330.0 OHM X 7	01121	208A331
A13R30	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R31				NOT ASSIGNED		

†Refer to Section 7 for update information. *Factory selected Component (Refer to Section 5). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A13	**08901-60244 – SERIAL PREFIX 2314A TO 2718A**					
A13TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP10	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP11	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP12	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP13	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP14	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13TP15	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A13U1	1818-1968	7	1	IC CMOS 16384 (16K) STAT RAM 250-NS 3-S	28480	1818-1968
	1200-0565	9	1	SOCKET-IC 24-CONT DIP-SLDR	28480	1200-0565
A13U2	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A13U3	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
2314A TO 2333A						
A13U4	08902-80064	6	1	ROM #3	28480	08901-80064
2334A TO 2428A						
A13U4	08902-80068	0	1	ROM #3	28480	08901-80068
2432A TO 2550A						
A13U4	08902-80073	7	1	ROM #3	28480	08901-80073
2551A ONLY						
A13U4	08901-80083	9	1	ROM #3	24840	08901-80083
2608A TO 2642A						
A13U4	08901-80089	5	1	ROM #3	24840	08901-80089
2644A TO 2702A						
A13U4	08901-80092	0	1	ROM #3	24840	08901-80092
2718A ONLY						
A13U4	08902-80107	8	1	ROM #3	28480	08901-80107
	1200-0553	5	3	SOCKET-IC 28-CONT DIP-SLDR	28480	1200-0553
A13U5	1820-1281	2	1	IC DCDR TTL LS 2-TO-4-LINE DUAL 2-INP	01295	SN74LS139N
A13U6	1826-0275	4	1	IC 78L12A V RGLTR TO-92	04713	MC78L12ACP

†Refer to Section 7 for update information. *Factory selected component (Refer to section 6). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A13	**08901-60244 – SERIAL PREFIX 2314A TO 2718A**					
2314A TO 2333A						
A13U7	08901-80063	5	1	ROM #2	28480	08901-60063
2334A TO 2428A						
A13U7	08901-80067	9	1	ROM #2	28480	08901-80067
2432A TO 2550A						
A13U7	08901-80072	6	1	ROM #2	28480	08901-80072
2551A ONLY						
A13U7	08901-80082	8	1	ROM #2	28480	08901-80082
2608A TO 2642A						
A13U7	08901-80088	4	1	ROM #2	28480	08901-80088
2644A TO 2702A						
A13U7	08901-80091	9	1	ROM #2	28480	08901-80091
2718A ONLY						
A13U7	08901-80106	7	1	ROM #2	28480	08901-80106
	1200-0553	5		SOCKET-IC 28-CONT DIP-SLDR	28480	1200-0553
A13U8	1820-2027	6	1	IC-STATIC MEMORY INTERFACE	28480	1820-2027
	1200-0552	4	2	SOCKET-IC 40-CONT DIP-SLDR	28480	1200-0552
A13U9	1820-1928	4	1	IC-F8-MPU; CLK FREQ = 2 MHZ	28480	1820-1928
	1200-0552	4		SOCKET-IC 40-CONT DIP-SLDR	28480	1200-0552
2314A TO 2333A						
A13U10	08901-80062	4	1	ROM #1	28480	08901-60062
2334A TO 2428A						
A13U10	08901-80066	8	1	ROM #1	28480	08901-80066
2432A TO 2550A						
A13U10	08901-80071	5	1	ROM #1	28480	08901-80071
2551A ONLY						
A13U10	08901-80081	7	1	ROM #1	28480	08901-80081
2608A TO 2642A						
A13U10	08901-80087	3	1	ROM #1	28480	08901-80087
2644A TO 2702A						
A13U10	08901-80090	8	1	ROM #1	28480	08901-80090
2718A ONLY						
A13U10	08901-80105	6	1	ROM #1	28480	08901-80105
	1200-0553	5		SOCKET-IC 28-CONT DIP-SLDR	28480	1200-0553
A13U11	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A13U12	1820-1917	1	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A13U13	1820-1287	8	1	IC BFR TTL LS NAND QUAD 2-INP	01295	SN74LS37N
A13U14				NOT ASSIGNED		
A13U15				NOT ASSIGNED		
A13VR1	1902-0777	3	1	DIODE-ZNR 1N825 6.2V 5% DO-7 PD = .4W	04713	1N825
A13W1	8159-0005	0	8	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A13W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A13	**08901-60196 – SERIAL PREFIX 2804A AND ABOVE**					
A13	08901-60196	4	1	CONTROLLER ASSEMBLY	28480	08901-60196
A13BT1	1420-0322	2		BATTERY 2.8V .2A-HR LI/I PIN	28480	1420-0322
	08901-00195	6	1	BATTERY INSULATOR	28480	08901-00195
A13C1	0180-0116	1	1	CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A13C2	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C3	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A13C4				NOT ASSIGNED		
A13C5	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A13C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C8				NOT ASSIGNED		
A13C9				NOT ASSIGNED		
A13C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C11	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C12	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C13	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C16	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A13C17Δ	0180-0100	3		CAPACITOR-FXD 4.7UF+-10% 35VDC TA	28480	0180-0100
A13C18	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A13C19				NOT ASSIGNED		
A13C20				NOT ASSIGNED		
A13C21	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A13C22	0160-4818	2	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	28480	0160-4818
A13CR1	1901-0159	3	1	DIODE-PWR RECT 400V 750MA DO-41	28480	1901-0159
A13CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13CR4	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A13CR5	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A13CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A13DS1	1990-1110	5	4	LED-LAMP LUM-INT = 1.51MCD IF = 20MA-MAX	28480	1990-1110
A13DS2	1990-1110	5		LED-LAMP LUM-INT = 1.5MCD IF = 20MA-MAX	28480	1901-1110
A13DS3	1990-1110	5		LED-LAMP LUM-INT = 1.5MCD IF = 20MA-MAX	28480	1990-1110
A13DS4	1990-1110	5		LED-LAMP LUM-INT = 1.5MCD IF = 20MA-MAX	28480	1990-1110
A13L1				NOT ASSIGNED		
A13MP1	4040-0749	4	2	EXTR-PC BD BRN POLYC .062-BD-THKNS	28480	4040-0749
	1480-0116	8	4	PIN-ROLL .062-IN-DIA .25-IN-LG STL	28480	1480-0116
A13MP2	4040-0751	8	1	EXTR-PC BD ORN POLYC .062-BD-THKNS	28480	4040-0751
	1480-0116	8		PIN-ROLL .062-IN-DIA .25-IN-LG STL	28480	1480-0116
A13Q1	1853-0393	4	1	TRANSISTOR PNP SI TO-18 PD = 500MW	28480	1853-0393
A13Q2	1858-0032	8		TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A13Q3	1853-0459	3	8	TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A13	**08901-60196 – SERIAL PREFIX 2804A AND ABOVE**					
A13R1	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A13R2	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A13R3				NOT ASSIGNED		
A13R4				NOT ASSIGNED		
A13R5				NOT ASSIGNED		
A13R6	0698-3156	2		RESISTOR 14.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1472-F
A13R7	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A13R8	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A13R9	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R10	0757-0419	0		RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
A13R11[Δ]	0698-3454	3		RESISTOR 215K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2153-F
A13R12	2100-2522	1	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	30983	ET50X103
A13R13	0698-6624	5	3	RESISTOR 2K .1% .125W F TC = 0 + -25	28480	0698-6624
A13R14	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A13R15	0698-6624	5		RESISTOR 2K .1% .125W F TC = 0 + -25	28480	0698-6624
A13R16	0698-6624	5		RESISTOR 2K .1% .125W F TC = 0 + -25	28480	0698-6624
A13R17	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R18	0698-6360	6		RESISTOR 10K .1% .125W F TC = 0 + -25	28480	0698-6360
A13R19	0698-6348	0	1	RESISTOR 3K .1% .125W F TC = 0 + -25	28480	0698-6348
A13R20	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R21	0757-0459	8	2	RESISTOR 56.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5622-F
A13R22	0757-0441	8		RESISTOR 8.25K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8251-F
A13R23	0757-0439	4		RESISTOR 6.81K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6811-F
A13R24	0698-3162	0	3	RESISTOR 46.4K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4642-F
A13R25	0698-3161	9		RESISTOR 38.3K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3832-F
A13R26	0757-0447	4		RESISTOR 16.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1622-F
A13R27	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R28	0757-0418	9	3	RESISTOR 619 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-619R-F
A13R29	1810-0229	5	1	NETWORK-RES 8-SIP330.0 OHM X 7	01121	208A331
A13R30	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A13R31	1810-0286	4	1	NETWORK-RES 16-DIP 10.0K OHM X 15	01121	316A103
A13TP16	1251-5730	7	1	CONNECTOR 15-PIN M POST TYPE	28480	1251-5730
A13U1	ILJ6-0001	2	1	IC CMOS 16384 (16K) STAT RAM 250-NS 3-S	28480	ILJ6-0001
	1200-0541	1	1	SOCKET-IC 24-CONT DIP-SLDR	28480	1200-0541
A13U2	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A13U3	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A13U4				NOT ASSIGNED		
A13U5				NOT ASSIGNED		
A13U6	1826-0275	4	1	IC 78L12A V RGLTR TO-92	04713	MC78L12ACP
A13U7				NOT ASSIGNED		
A13U8	1820-2027	6	1	IC-STATIC MEMORY INTERFACE	28480	1820-2027
	1200-0654	7	2	SOCKET-IC 40-CONT DIP-SLDR	28480	1200-0654
A13U9	1820-1928	4	1	IC-F8-MPU; CLK FREQ = 2 MHZ	28480	1820-1928
	1200-0654	7	2	SOCKET-IC 40-CONT DIP-SLDR	28480	1200-0654
A13U10				NOT ASSIGNED		
A13U11	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N

[1]Refer to section 7 for update information. [2]Factory selected Component (Refer to Section 5). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A13	**08901-60196 – SERIAL PREFIX 2804A AND ABOVE**					
A13U12	1820-1917	1	1	IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A13U13	1820-1287	8	1	IC BFR TTL LS NAND QUAD 2-INP	01295	SN74LS37N
2314A TO 3001A						
A13U14△	08901-80111	4	1	ROM #1	28480	08901-80111
3005A TO 3026A						
A13U14	08901-80116	9	1	ROM #1	28480	08901-80116
3028A TO 3104A						
A13U14	08901-80117	0	1	ROM #1	28480	08901-80117
3104A ONLY						
A13U14	08901-80121	8	1	ROM #1	28480	08901-80121
3116A AND ABOVE						
A13U14	08901-80128	3	1	ROM #1	28480	08901-80128
	1200-0567	1	1	SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A13U15	1820-1205	9	1	IC GATE TTL LS NAND DUAL 4-INP	01295	1820-1205
A13VR1	1902-0777	3	1	DIODE-ZNR 1N825 6.2V 5% DO-7 PD=.4W	04713	1N825
A13W1	8159-0005	0	11	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A13W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). △ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A14						
2314A TO 2514A						
A14	08901-60223	7	1	REMOTE INTERFACE ASSEMBLY	28480	08901-60223
2515A AND ABOVE						
A14	08901-60268	0	1	REMOTE INTERFACE ASSEMBLY	28480	08901-60268
A14C1	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A14C2	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A14C3	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C4	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C5	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C6	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C7	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C8	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C9	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C11	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C12	0160-4833	5		CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A14C13	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C16	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C17	0160-4814	2		CAPACITOR-FXD 150PF +-5% 100VDC CER	28480	0160-4814
A14C18	0160-4833	5		CAPACITOR-FXD .022UF +-10% 100VDC CER	28480	0160-4833
A14CR1	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A14J1	1251-5649	7	1	CONNECTOR 20-PIN M POST TYPE	28480	1251-5649
	1251-4460	8	2	CLIP-CABLE PLUG RTNG-DUAL INLINE 16 CONT	28480	1251-4460
A14MP1	4040-0749	4		EXTR-PC BD BRN POLYC .062-BD-THKNS	28480	4040-0749
	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A14MP2	4040-0752	9	1	EXTR-PC BD YEL POLYC .062-BD-THKNS	28480	4040-0752
	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A14R1	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A14R2	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A14R3	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A14R4	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
2515A TO 3005A						
A14R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
3019A AND ABOVE						
A14R5	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	28480	0698-0084

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 2) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A14R6	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A14R7	1810-0136	3	1	NETWORK-RES 10-SIP MULTI-VALUE	28480	1810-0136
A14R8	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A14R9	0698-7224	3		RESISTOR 316 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-316R-F
2314A TO 2614A						
A14R10				NOT ASSIGNED		
2515A AND ABOVE						
A14R10	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1002-F
A14S1	3101-1973	7	1	SWITCH-SL 7-1A DIP-SLIDE-ASSY .1A 50VDC	28480	3101-1973
	1200-0485	2	1	SOCKET-IC 14-CONT DIP DIP-SLDR	28480	1200-0485
A14TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A14U1	1820-1689	4	2	IC SER-XMTR/RCVR TTL QUAD	28480	1820-1689
A14U2	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A14U3	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A14U4	1820-1416	5		IC SCHMITT-TRIG TTL LS INV HEX 1-INP	01295	SN74LS14N
A14U5	1820-1689	4		IC SER-XMTR/RCVR TTL QUAD	28480	1820-1689
A14U6	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A14U7	1820-1905	7	1	IC GATE TTL LS NOR DUAL 5-INP	07263	74LS260PC
2314A TO 2614A						
A14U8	1820-0706	4	1	IC COMPTR TTL MAGTD 5-BIT	07263	9324PC
2515A AND ABOVE						
A14U8	1820-2740	0		IC COMPTR TTL LS MAGTD 2-INP 8-BIT	01295	SN74LS688N
A14U9	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A14U10	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A14U11	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A14U12	1820-0621	2	1	IC BFR TTL NAND QUAD 2-INP	01295	SN7438N
A14U13	1820-2100	6	1	IC MICPROC-ACCESS NMOS DUAL 8-BIT	07263	3861EPC
	1200-0654	7	1	SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
A14U14				NOT ASSIGNED		
A14U15	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A14U16	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A14U17	08901-80004	4	1	PROM PROGRAMMED	28480	08901-80004
A14U18				NOT ASSIGNED		
A14U19	1820-0054	5	1	IC GATE TTL NAND QUAD 2-INP	01295	SN7400N
A14U20	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A14U21	1820-1200	5	3	IC INV TTL LS HEX	01295	SN74LS05N
A14U22	1820-1200	5		IC INV TTL LS HEX	01295	SN74LS05N
A14VR1	1902-3182	0	1	DIODE-ZNR 12.1V 5% DO-35 PD = .4W	28480	1902-3182

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A15						
2314A TO 2414A						
A15	08901-60183	8	1	RF INPUT CONTROL ASSEMBLY	28480	08901-60183
2422A TO 3028A						
A15	08901-60256	6	1	RF INPUT CONTROL ASSEMBLY	28480	08901-60256
3050A AND ABOVE						
A15	08901-60313	6	1	RF INPUT CONTROL ASSEMBLY	28480	08901-60313
2314A TO 2414A						
A15AT1				NOT ASSIGNED		
A15AT2				NOT ASSIGNED		
A15AT3				NOT ASSIGNED		
2422A AND ABOVE						
A15AT1	0699-1289	0		RESISTOR-FIXED ATTENUATION: 20DB	28480	0699-1289
A15AT2	0699-1288	9		RESISTOR-FIXED ATTENUATION: 10DB	28480	0699-1288
A15AT3	0699-1289	0		RESISTOR-FIXED ATTENUATION: 20DB	28480	0699-1289
2314A TO 2531A						
A15C1	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
2544A AND ABOVE						
A15C1	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
2314A TO 3028A						
A15C2	0160-6222	0	2	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-6222
3050A and above						
A15C2	0160-4106	5	2	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4106
2314A TO 2531A						
A15C3	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
2544A AND ABOVE						
A15C3	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15C4	0180-2929	8		CAPACITOR-FXD 68UF+-10% 10VDC TA	28480	0180-2929
2314A TO 2531A						
A15C5	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A15C6	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
2544A AND ABOVE						
A15C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A15C6	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A15C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A15C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). △ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2531A						
A15C9	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A15C10	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A15C11	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
2544A AND ABOVE						
A15C9	0160-4832	4		CAPACITOR-FXD .01JF +-20% 100VDC CER	28480	0160-4832
A15C10	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A15C11	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A15C12	0160-4502	5	1	CAPACITOR-FXD 390PF +-5% 100VDC CER	28480	0160-4502
2314A TO 2414A						
A15C13	0160-4768	5	2	CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4768
2422A AND ABOVE						
A15C13	0160-4062	2		CAPACITOR-FXD 470PF +-10% 50VDC CER	28480	0160-4062
A15C14	0160-4768	5		CAPACITOR-FXD 470PF 5% 100VDC CER	28480	0160-4768
2314A TO 2531A						
A15C15	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A15C16	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A15C17	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A15C18	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A15C19	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A15C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
2544A AND ABOVE						
A15C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C16	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A15C17	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A15C18	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C19	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A15C20	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A15C21	0180-0058	0		CAPACITOR-FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A15C22	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
2314A TO 2531A						
A15C23	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A15C24	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
2544A AND ABOVE						
A15C23	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A15C24	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A15C25	0160-4492	2		CAPACITOR-FXD 18PF +-5% 200VDC CER 0+-30	28480	0160-4492
2314A TO 2531A						
A15C26	0160-3877	5	9	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
2544A AND ABOVE						
A15C26	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A15C27	0180-2205	3	1	CAPACITOR-FXD .33UF+-10% 35VDC TA	56289	150D334X9035A2
2314A TO 3028A						
A15C28	0160-6222	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-6222
3050A and above						
A15C28	0160-4106	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4106
2314A TO 2414A						
A15C29				NOT ASSIGNED		
2422A AND ABOVE						
A15C29	0160-4616	2		CAPACITOR-FXD 560PF +-5% 200VDC CER	28480	0160-4616
A15CR1	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A15CR2				NOT ASSIGNED		
A15CR3	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A15CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A15CR5				NOT ASSIGNED		
A15CR6				NOT ASSIGNED		
A15CR7	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A15CR8	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A15J1	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A15J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
2314A TO 2531A						
A15K1	0490-1185	3	1	RELAY-REED 1A 500MA 100VDC 5VDC-COIL	28480	0490-1185
2544A TO 3028A						
A15K1	0490-1452	7	1	RELAY-REED 1A 500MA 100VDC 5VDC-COIL	28480	0490-1452
3050A AND ABOVE						
A15K1	0490-1745	1	1	RELAY-REED 1A 500MA 100VDC 5VDC-COIL	28480	0490-1745
A15K2	0490-1158	0	4	RELAY 2C 5VDC-COIL 1A 28VDC	28480	0490-1158
A15K3	0490-1158	0		RELAY 2C 5VDC-COIL 1A 28VDC	28480	0490-1158
A15K4	0490-1158	0		RELAY 2C 5VDC-COIL 1A 28VDC	28480	0490-1158
A15K5	0490-1158	0		RELAY 2C 5VDC-COIL 1A 28VDC	28480	0490-1158
A15L1	9100-2257	6	1	INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A15L2	9100-2261	2	1	INDUCTOR RF-CH-MLD 2.7UH 10% .105DX.26LG	28480	9100-2261
A15L3	9140-0142	8	1	INDUCTOR RF-CH-MLD 2.2UH 10% .105DX.26LG	28480	9140-0142
A15L4	9100-2258	7	1	INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG	28480	9100-2258

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5) Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A15MP1	08901-00032	0	1	COVER FR INPUT	28480	08901-00032
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A15MP2	5001-0176	0	14	GROUND STRAP	28480	5001-0176
A15MP3	5001-0176	0		GROUND STRAP	28480	5001-0176
A15MP4	08901-00054	6	1	SUPPORT-SHIELD	28480	08901-00054
A15MP5	0363-0158	9	1	RFI STRIP-FINGERS BE-CU ZINC PLATED	28480	0363-0158
A15MP6	0363-0159	0	2	RFI STRIP-FINGERS BE-CU ZINC PLATED	28480	0363-0159
2314A TO 2414A						
A15MP7				NOT ASSIGNED		
A15MP8				NOT ASSIGNED		
2422A AND ABOVE						
A15MP7	0363-0205	7		CONNECTOR FINGER	28480	0363-0205
A15MP8	0363-0205	7		CONNECTOR FINGER	28480	0363-0205
A15MP9	3050-0023	7	1	WASHER-FL NM NO.6 NM .144-IN-ID	28480	3050-0023
A15Q1	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A15Q2	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A15Q3-Q5				NOT ASSIGNED		
A15Q6	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A15Q7	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A15Q8	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A15Q9	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A15Q10	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A15Q11	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A15R1	0698-7209	4	14	RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A15R2	0757-0421	4	10	RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A15R3	0698-7195	7	4	RESISTOR 19.6 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-19R6-F
A15R4	0698-7195	7		RESISTOR 19.6 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-19R6-F
A15R5	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A15R6				NOT ASSIGNED		
A15R7	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A15R8	0757-0421	4		RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A15R9	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
2314A TO 2414A						
A15R10	0698-7207	2	1	RESISTOR 61.9 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-61R9-F
2422A AND ABOVE						
A15R10	0699-1213	0		RESISTOR 61.59 1% .1W F TC = 0 + -200	28480	0699-1213
A15R11	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A15R12	0757-0421	4		RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A15R13	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A15R14	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2414A						
A15R15	0699-0136	4	2	RESISTOR 122 1% .25W F TC = 0 + -100	28480	0699-0136
2422A AND ABOVE						
A15R15				NOT ASSIGNED		
A15R16	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A15R17	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A15R18				NOT ASSIGNED		
2314A TO 2414A						
A15R19	0699-0136	4		RESISTOR 122 1% .25W F TC = 0 + -100	28480	0699-0136
A15R20	0699-0132	0	2	RESISTOR 248 1% .25W F TC = 0 + -100	28480	0699-0132
A15R21	0699-0133	1	3	RESISTOR 61.1 1% .25W F TC = 0 + -100	28480	0699-0133
2422A AND ABOVE						
A15R19				NOT ASSIGNED		
A15R20				NOT ASSIGNED		
A15R21				NOT ASSIGNED		
A15R22	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A15R23	0757-0421	4		RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A15R24	0699-0071	6	3	RESISTOR 4.64M 1% .125W F TC = 0 + -100	28480	0699-0071
A15R25	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A15R26	0699-0071	6		RESISTOR 4.64M 1% .125W F TC = 0 + -100	28480	0699-0071
2314A TO 2414A						
A15R27	0699-0137	5	1	RESISTOR 96.3 1% .5W F TC = 0 + -100	28480	0699-0137
2422A AND ABOVE						
A15R27				NOT ASSIGNED		
A15R28	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
2314A TO 2414A						
A15R29	0699-0135	3	3	RESISTOR 71.2 1% .25W F TC = 0 + -100	28480	0699-0135
A15R30	0699-0134	2	1	RESISTOR 96.3 1% .25W F TC = 0 + -100	28480	0699-0134
2422A AND ABOVE						
A15R29				NOT ASSIGNED		
A15R30				NOT ASSIGNED		
A15R31	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A15R32	0757-0421	4		RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A15R33	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A15R34	0698-7212	9	7	RESISTOR 100 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-100R-F
A15R35	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A15R36	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A15R37	0698-3452	1	1	RESISTOR 147K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1473-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2414A						
A15R38	0699-0133	1		RESISTOR 61.1 1% .25W F TC = 0 + -100	28480	0699-0133
2422A AND ABOVE						
A15R38				NOT ASSIGNED		
A15R39	0698-3266	5	1	RESISTOR 237K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2373-F
2314A TO 2414A						
A15R40	0699-0132	0		RESISTOR 248 1% .25W F TC = 0 + -100	28480	0699-0132
2422A AND ABOVE						
A15R40				NOT ASSIGNED		
A15R41	0699-0071	6		RESISTOR 4.64M 1% .125W F TC = 0 + -100	28480	0699-0071
A15R42	2100-3054	6	1	RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	02111	43P503
A15R43	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A15R44	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
2314A TO 2414A						
A15R45	0699-0133	1		RESISTOR 61.1 1% .25W F TC = 0 + -100	28480	0699-0133
2422A AND ABOVE						
A15R45				NOT ASSIGNED		
A15R46	0698-7242	5	1	RESISTOR 1.78K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1781-F
A15R47*	0698-3442	9	4	RESISTOR 237 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-237R-F
A15R48	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A15R49	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A15R50	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A15R51	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A15R52	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A15R53	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A15R54	0698-3454	3		RESISTOR 215K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2153-F
A15R55	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A15R56	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A15R57	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A15R58	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1621-F
A15R59	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A15R60	0698-3460	1	1	RESISTOR 422K 1% .125W F TC = 0 + -100	28480	0698-3460
A15R61	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
2314A TO 2531A						
A15R62	0698-7212	9		RESISTOR 100 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-100R-F
2544A AND ABOVE						
A15R62				NOT ASSIGNED		

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A15TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A15U1	1826-0013	8	3	IC OP AMP LOW-NOISE TO-99 PKG	06665	SSS741CJ
A15U2	1826-0098	9		IC COMPARATOR PRCN TO-99 PKG	27014	LM211H
A15U3	1826-0191	3	2	IC COMPARATOR GP DUAL TO-100 PKG	27014	LM319H
2314A TO 2631A						
A15W1				NOT ASSIGNED		
2644A AND ABOVE						
A15W1	8150-4819	4		WIRE 22 AWG 1X22 105C	28480	8150-4819

†Refer to Section 7 for update information *Factory Selected Component ‡Refer to Section 7 Δ From part Change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A16		**08901-60250 – SERIAL PREFIX 2314A TO 2636A**				
		OPTION 030 ONLY				
A16	08901-60250	0	1	BUFFER/AMPLIFIER ASSEMBLY	28480	08901-60250
A16C1	0160-4535	4	12	CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A16C2	0160-4835	7	20	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A16C3	0160-4801	7	2	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A16C4	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A16C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A16C6	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A16C7	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A16C8	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A16C9	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A16C10	0180-0094	4	1	CAPACITOR-FXD 100UF+75-10% 25VDC AL	56289	30D107G025DD2
A16E1	9170-0847	3	2	CORE SHIELDING BEAD	02114	56-590-65/3B
A16E2	9170-0847	3		CORE SHIELDING BEAD	02114	56-590-65/3B
A16J1	1250-1425	7	7	CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4	7	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9	7	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A16J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A16J3	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A16L1	9140-0137	1	4	INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A16MP1	08901-00149	0	1	BOARD COVER, BUFFER/AMP	28480	08901-00149
A16Q1	1854-0637	1	2	TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
A16Q2	1853-0281	9	2	TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A16Q3	1854-0378	7	2	TRANSISTOR NPN 2N5109 SI TO-39 PD = 800MW	3L585	2N5109
A16Q4	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
A16Q5	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A16Q6	1854-0378	7		TRANSISTOR NPN 2N5109 SI TO-39 PD = 800MW	3L585	2N5109
A16R1	0698-3444	1	1	RESISTOR 316 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-316R-F
A16R2	0757-0418	9	2	RESISTOR 619 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-619R-F
A16R3	0698-3431	6	5	RESISTOR 23.7 1% .125W F TC = 0 +-100	03888	PME55-1/8-T0-23R7-F
A16R4	0757-0421	4	1	RESISTOR 825 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-825R-F
A16R5	0757-0402	1		RESISTOR 110 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-111-F
A16R6	0698-0084	9	16	RESISTOR 2.15K 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-2151-F
A16R7	0698-3401	0	1	RESISTOR 215 1% .5W F TC = 0 +-100	28480	0698-3401
A16R8	0757-0394	0	4	RESISTOR 51.1 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-51R1-F
A16R9	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-1472-F
A16R10	0757-0444	1	2	RESISTOR 12.1K 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-1212-F
A16R11	0757-0418	9		RESISTOR 619 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-619R-F
A16R12	0698-3431	6		RESISTOR 23.7 1% .125W F TC = 0 +-100	03888	PME55-1/8-T0-23R7-F
A16R13	0757-1094	9	7	RESISTOR 1.47K 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-1471-F
A16R14	0698-3431	6		RESISTOR 23.7 1% .125W F TC = 0 +-100	03888	PME55-1/8-T0-23R7-F
A16R15	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-2151-F
A16R16	0698-0082	7	5	RESISTOR 464 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-4640-F
A16R17	0698-3443	0	9	RESISTOR 287 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-287R-F
A16R18	0698-3431	6		RESISTOR 23.7 1% .125W F TC = 0 +-100	03888	PME55-1/8-T0-23R7-F
A16R19	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-51R1-F
A16R20	0698-3431	6		RESISTOR 23.7 1% .125W F TC = 0 +-100	03888	PME55-1/8-T0-23R7-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17	**08901-60145 – SERIAL PREFIX 2314A TO 2636A**					
A17	08901-60145	2	1	INPUT MIXER ASSEMBLY	28480	08901-60145
A17C1	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C2	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C3	0160-3873	1	4	CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A17C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C7	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A17C9	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C11	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C12	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C13	0160-4497	7	1	CAPACITOR-FXD 82PF +-5% 200VDC CER 0+-30	28480	0160-4497
A17C14	0160-4652	6	1	CAPACITOR-FXD 960PF +-1% 500VDC MICA	00853	RDM19F961F5C
A17C15	0160-4647	9	1	CAPACITOR-FXD 154PF +-1% 500VDC MICA	28480	0160-4647
A17C16	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C17	0160-4646	8	1	CAPACITOR-FXD 444PF +-1% 500VDC MICA	28480	0160-4646
A17C18	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C19	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A17C20	0160-4641	3	1	CAPACITOR-FXD 3520PF +-1% 50VDC	28480	0160-4641
A17C21	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C22	0160-4651	5	1	CAPACITOR-FXD 817PF +-1% 500VDC MICA	00853	RDM19F(817)F5C
A17C23	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C24	0180-0376	5		CAPACITOR-FXD .47UF+-10% 35VDC TA	56289	150D474X9035A2
A17C25	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A17C26	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A17C27	08901-00064	8	1	STRAP/CAPACITOR	28480	08901-00064
2314A TO 2332A						
A17C28				NOT ASSIGNED		
2333A TO 2636A						
A17C28	0160-5491	3		CAPACITOR-FXD 240PF +-5% 100VDC CER	28480	0160-5491
A17CR1	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR6	1901-0518	8		DIODE-SM SIG SCHOTTKY	9N171	1N41500
A17DS1	1990-0524	3	1	LED-LAMP LUM-INT = 1MCD IF = 20MA-MAX BVR = 5V	28480	5082-4550
A17J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A17J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17	**08901-60145 – SERIAL PREFIX 2314A TO 2636A**					
A17J3	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A17L1	9100-3922	4	21	INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L4	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L5	9100-1641	0	1	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A17L6	9100-1621	6	1	INDUCTOR RF-CH-MLD 18UH 10% .166DX.385LG	28480	9100-1621
A17L7	9140-0131	5		INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	28480	9140-0131
2314A TO 2348A						
A17L8	08901-80002	2	1	INDUCR VARIABLE	28480	08901-80002
2406A TO 2636A						
A17L8	9140-0840	3	1	INDUCR VARIABLE	28480	9140-0840
A17L9	9140-0131	5		INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	28480	9140-0131
A17L10	9100-1626	1	1	INDUCTOR RF-CH-MLD 36UH 5% .166DX.385LG	28480	9100-1626
2314A TO 2348A						
A17L11	08901-80001	1	1	INDUCR VARIABLE	28480	08901-80001
2406A TO 2636A						
A17L11	9140-0841	4	1	INDUCR VARIABLE	28480	9140-0841
A17L12	9140-0303	3	1	INDUCTOR RF-CH-MLD 89.3UH 2%	28480	9140-0303
A17L13	9140-0131	5		INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	28480	9140-0131
A17L14	9100-1621	6	1	INDUCTOR RF-CH-MLD 18UH 10% .166DX.385LG	28480	9100-1621
A17MP1	08901-00030	8	1	COVER MIXER	28480	08901-00030
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2190-0008	3		WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
A17MP2	5001-0176	0		GROUND STRAP	28480	5001-0176
A17MP3	5001-0176	0		GROUND STRAP	28480	5001-0176
A17MP4	0363-0159	0		RFI STRIP-FINGERS BE-CU ZINC PLATED	28480	0363-0159
2314A TO 2413A						
A17MP5	08662-00040	0	3	SHIELD COMP SMALL	28480	08662-00040
A17MP6	08662-00038	6	3	SHIELD CKT SM	28480	08662-00038
2414A TO 2636A						
A17MP5				NOT ASSIGNED		
A17MP6				NOT ASSIGNED		
A17Q1	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A17Q2	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A17Q3	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A17Q4	1854-0632	6	1	TRANSISTOR NPN SI PD = 180MW FT = 4GHZ	25403	BFR-91
A17Q5	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020

†Refer to Section 7 for update information *Factory selected component ◊Refer to Section 5 Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17	**08901-60145 – SERIAL PREFIX 2314A TO 2636A**					
A17Q6	1854-0720	3	1	TRANSISTOR NPN SI PD = 500MW FT = 4GHZ	28480	1854-0720
A17Q7	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A17Q8	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A17R1	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A17R2	0757-0200	7		RESISTOR 5.62K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5621-F
A17R3	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A17R4	0698-8821	8		RESISTOR 5.62 1% .125W F TC = 0 + -100	28480	0698-8821
A17R5	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A17R6	0698-0087	2	1	RESISTOR 316 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-3160-F
A17R7	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A17R8	0699-0135	3		RESISTOR 71.2 1% .25W F TC = 0 + -100	28480	0699-0135
A17R9	0699-0135	3		RESISTOR 71.2 1% .25W F TC = 0 + -100	28480	0699-0135
A17R10	0698-7204	9	3	RESISTOR 46.4 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-46R4-F
A17R11	0698-7220	9	2	RESISTOR 215 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-215R-F
A17R12	0698-7204	9		RESISTOR 46.4 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-46R4-F
A17R13	0757-0467	8		RESISTOR 121K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1213-F
A17R14	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A17R15	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A17R16	0699-0392	4	1	RESISTOR 34.8 1% .125W F TC = 0 + -100	28480	0699-0392
A17R17	0757-0439	4		RESISTOR 6.81K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6811-F
A17R18	0757-0441	8		RESISTOR 8.25K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8251-F
A17R19	0698-7204	9		RESISTOR 46.4 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-46R4-F
A17R20	0757-0799	9	1	RESISTOR 121 1% .5W F TC = 0 + -100	28480	0757-0799
A17R21	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A17R22	0698-7205	0	7	RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A17R23	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A17R24	0698-7216	3	2	RESISTOR 147 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-147R-F
A17R25	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A17R26	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A17R27	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A17R28	0757-0278	9	3	RESISTOR 1.78K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1781-F
A17R29	0757-0278	9		RESISTOR 1.78K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1781-F
A17R30	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17R31	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17R32	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A17R33	0757-0403	2		RESISTOR 121 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-121R-F
A17R34	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A17R35	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17R36	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17R37	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A17R38	0757-0403	2		RESISTOR 121 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-121R-F
A17R39	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17R40	0757-0403	2		RESISTOR 121 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-121R-F
A17R41	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A17R42	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17T1	08901-80031	7	1	TRANSFORMER ENCP	28480	08901-80031
A17U1	08901-67001	3	1	MIXER CIRCUIT	28480	08901-67001
	0340-0850	0	2	INSULATOR-XSTR TFE	28480	0340-0850
	1251-1556	7	24	CONNECTOR-SGL CONT SKT .018-IN-BSC-SZ	28480	1251-1556
A17U2	1826-0412	1		IC COMPARATOR PRCN DUAL 8-DIP-P PKG	27014	LM393N

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 2) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17	**08902-60104 – SERIAL PREFIX 2642A AND ABOVE**					
A17	08902-60104	4	1	INPUT MIXER ASSEMBLY	28480	08902-60104
A17C1	0160-3879	7	8	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C3	0160-3873	1	1	CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A17C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C7	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C8	0180-0197	8	2	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A17C9	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A17C11	0160-4535	4	5	CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A17C12	0160-4835	7	5	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A17C13	0160-4812	0	1	CAPACITOR-FXD 220PF +-5% 100VDC CER	28480	0160-4812
A17C14	0160-4652	6	1	CAPACITOR-FXD 960PF +-1% 500VDC MICA	00853	RDM19F961F5C
A17C15	0160-4647	9	1	CAPACITOR-FXD 154PF +-1% 500VDC MICA	28480	0160-4647
A17C16	0180-2929	8	1	CAPACITOR-FXD 68UF+-10% 10VDC TA	28480	0180-2929
A17C17	0160-4646	8	1	CAPACITOR-FXD 444PF +-1% 500VDC MICA	28480	0160-4646
A17C18	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A17C19	0160-4814	2	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	28480	0160-4814
A17C20	0160-4641	3	1	CAPACITOR-FXD 3520PF +-1% 50VDC	28480	0160-4641
A17C21	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A17C22	0160-4651	5	1	CAPACITOR-FXD 817PF +-1% 500VDC MICA	00853	RDM19F(817)F5C
A17C23	0160-0576	5	2	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A17C24	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A17C25	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A17C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A17C27	08901-00064	8	1	STRAP/CAPACITOR	28480	08901-00064
A17C28	0160-4512	7	2	CAPACITOR-FXD 120PF +-5% 200VDC CER	28480	0160-4512
A17C29	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A17C30	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A17C31	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A17C32	0160-4822	2	1	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A17C33	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A17C34	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A17C35	0160-4512	7		CAPACITOR-FXD 120PF +-5% 200VDC CER	28480	0160-4512
A17C36	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A17CR1[Δ]	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A17CR2[Δ]	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A17CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A17CR6	1901-0518	8	2	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A17CR7	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17	**08902-60104 – SERIAL PREFIX 2642A AND ABOVE**					
A17CR8	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	8N171	1N4150
A17CR9	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	8N171	1N4150
A17DS1	1990-0524	3	1	LED-LAMP LUM-INT = 1MCD IF = 20MA-MAX BVR = 5V	28480	5082-4550
A17E1	9170-0847	3	1	CORE-SHIELDING BEAD	02114	56-590-65/3B PARYLENE
A17J1	1250-1425	7	2	CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
A17J2	1250-1220	0	2	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4	2	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A17J3	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A17J4	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
A17L1	9100-3922	4	4	INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L4	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A17L5	9100-4434	5	1	INDUCTOR 240UH 2% .165DX.385LF Q = 65	28480	9100-4434
A17L6	9100-3313	7	1	INDUCTOR RF-CH-MLD 22UH 5% .166DX.385LG	28480	9100-3313
A17L7	9100-1625	0	1	INDUCTOR RF-CH-MLD 33UH 5% .166DX.385LG	28480	9100-1625
A17L8	9140-0840	3	1	COIL-VAR 18UH-56.3UH Q = 20 PC-MTG	28480	9140-0840
A17L10	9100-1626	1	1	INDUCTOR RF-CH-MLD 36UH 5% .166DX.385LG	28480	9100-1626
A17L11	9140-0841	4	1	COIL-VAR 6.1UH-19.1UH Q = 20 PC-MTG	28480	9140-0841
A17L12	9140-0303	3	2	INDUCTOR RF-CH-MLD 89.3UH 2%	28480	9140-0303
A17L14	9140-0454	5	1	INDUCTOR RF-CH-MLD 18UH 5% .166DX.385LG	28480	9140-0454
A17MP1	08902-00026	3	1	COVER-MIXER	28480	08902-00026
	2360-0113	2	1	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A17MP2	5001-0176	0	2	GROUND STRAP	28480	5001-0176
A17MP3	0363-0159	0	1	RFI STRIP-FINGERS BE-CU ZINC PLATED	28480	0363-0159
A17Q1	1853-0281	9	4	TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A17Q2	1853-0314	9	2	TRANSISTOR PNP 2N2905A SI TO-39 PD = 600MW	04713	2N2905A
A17Q3	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A17Q4	1854-1032	2	1	TRANSISTOR NPN SI PD = 2.5W	04713	MRF581
A17Q5	1853-0020	4	2	TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A17Q6	1854-1032	2	1	TRANSISTOR NPN SI PD = 2.5W	04713	1854-1032
A17Q7	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A17Q8	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A17Q9	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A17Q10	1853-0314	9		TRANSISTOR PNP 2N2905A SI TO-39 PD = 600MW	04713	2N2905A
A17Q11	1854-0610	0	1	TRANSISTOR NPN SI TO-46 FT = 800MHZ	28480	1854-0610
A17Q12	1858-0008	8	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	MHQ6001
A17Q13	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD = 400MW	04713	2N2907A
A17R1	0757-0442	9	1	RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A17R2	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5621-F
A17R3	0698-3154	0	5	RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A17R4	0698-8821	8	3	RESISTOR 5.62 1% .125W F TC = 0 + -100	28480	0698-8821
A17R5	0698-8821	8		RESISTOR 5.62 1% .125W F TC = 0 + -100	28480	0698-8821

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17	**08902-60104 – SERIAL PREFIX 2642A AND ABOVE**					
A17R6	0698-0087	2	1	RESISTOR 316 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-3160-F
A17R7	0698-0085	0	2	RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A17R8	0699-0135	3	2	RESISTOR 71.2 1% .25W F TC = 0 + -100	28480	0699-0135
A17R9	0699-0135	3		RESISTOR 71.2 1% .25W F TC = 0 + -100	28480	0699-0135
A17R10	0698-7204	9	3	RESISTOR 46.4 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-46R4-F
A17R11	0698-7220	9	1	RESISTOR 215 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-215R-F
A17R12	0698-7204	9		RESISTOR 46.4 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-46R4-F
A17R13	0757-0421	4	1	RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A17R14	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A17R15	0757-0422	5	2	RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A17R16	0699-0392	4	1	RESISTOR 34.8 1% .125W F TC = 0 + -100	28480	0699-0392
A17R17	0757-0439	4	1	RESISTOR 6.81K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6811-F
A17R18	0757-0441	8	1	RESISTOR 8.25K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8251-F
A17R19	0698-7204	9		RESISTOR 46.4 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-46R4-F
A17R20	0757-0799	9	1	RESISTOR 121 1% .5W F TC = 0 + -100	28480	0757-0799
A17R21	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A17R22	0698-7205	0	3	RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A17R23	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A17R24	0698-7223	2	1	RESISTOR 287 1% .05W TF TC = 0 + -100	24546	C3-1/8-TO-287R-F
A17R25	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A17R26	0757-0274	5	1	RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A17R27	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A17R28	0757-0278	9	1	RESISTOR 1.78K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1781-F
A17R29	0757-0294	9	2	RESISTOR 17.8 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-17R8-F
A17R30	0698-3441	8	1	RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A17R31	0698-3431	6	1	RESISTOR 23.7 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-23R7-F
A17R32	0757-0418	9	3	RESISTOR 619 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-619R-F
A17R33	0698-3443	0	3	RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A17R34	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A17R35	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A17R36	0757-0294	9		RESISTOR 17.8 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-17R8-F
A17R37	0757-0394	0	2	RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A17R38	0757-0180	2	1	RESISTOR 31.6 1% .125W F TC = 0 + -100	28480	0757-0180
A17R39	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A17R40	0757-0418	9		RESISTOR 619 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-619R-F
A17R41	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A17R42	0757-0401	0	2	RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17R43	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A17R44	0757-0418	9		RESISTOR 619 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-619R-F
A17R45	0698-4037	0	2	RESISTOR 46.4 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-46R4-F
A17R46	0698-8821	8		RESISTOR 5.62 1% .125W F TC = 0 + -100	28480	0698-8821
A17R47	0698-4037	0		RESISTOR 46.4 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-46R4-F
A17R48	0698-3438	3	1	RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A17R49	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A17R50	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A17T1	08901-80031	7	1	XFMR TORD14.OTRN	28480	08901-80031
A17U1	08901-67001	3	1	MIXER CIRCUIT	28480	08901-67001
	0340-1098	0	1	INSULATOR-XSTR TFE	28480	0340-1098
	1251-1556	7	12	CONNECTOR-SGL CONT SKT .018-IN-BSC-SZ	28480	1251-1556

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A18						
A18	08901-60004	2	1	IF AMPLIFIER ASSEMBLY	28480	08901-60004
A18C1	0180-0094	4		CAPACITOR-FXD 100UF+75-10% 25VDC AL	56289	30D107G025DD2
A18C2	0180-0094	4		CAPACITOR-FXD 100UF+75-10% 25VDC AL	56289	30D107G025DD2
A18C3	0160-3459	9	45	CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A18C4	0180-2620	6	14	CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A18C5	0180-2619	3	7	CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	D22GS1B15K
A18C6	0160-0156	7	1	CAPACITOR-FXD 3900PF +-10% 200VDC POLYE	28480	0160-0156
A18C7	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
A18C8	0140-0198	5		CAPACITOR-FXD 200PF +-5% 300VDC MICA	72136	DM15F201J0300WV1CR
A18C9	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A18C10	0160-2242	6	2	CAPACITOR-FXD 2.4PF +-.25PF 500VDC CER	28480	0160-2242
A18C11	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A18C12	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A18C13Δ	0160-6623	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-6623
A18C14	0160-2266	4	1	CAPACITOR-FXD 24PF +-5% 500VDC CER 0+-30	28480	0160-2266
A18C15	0160-2199	2	10	CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A18C16	0160-2205	1	1	CAPACITOR-FXD 120PF +-5% 300VDC MICA	28480	0160-2205
A18C17	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A18C18	0160-2242	6		CAPACITOR-FXD 2.4PF +-.25PF 500VDC CER	28480	0160-2242
A18C19	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A18C20	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A18C21	0160-2265	3	1	CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
A18CR1	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A18CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A18CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A18CR4	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A18CR5	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A18CR6	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A18CR7	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
2314A TO 2441A						
A18E1				NOT ASSIGNED		
2443A AND ABOVE						
A18E1	9170-0029	3		CORE SHIELDING BEAD	28480	9170-0029
A18J1	1250-1205	1	6	CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1205
A18J2	1250-1205	1		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1205
A18L1	9100-1628	3	1	INDUCTOR RF-CH-MLD 43UH 5% .166DX.385LG	28480	9100-1628
A18L2	9140-0237	2	1	INDUCTOR RF-CH-MLD 200UH 5% .166DX.385LG	28480	9140-0237
A18MP1	08901-00029	5	1	COVER IF AMPLIFIER	28480	08901-00029
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078

†Refer to section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A18Q1	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A18Q2	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A18Q3	1853-0018	0	1	TRANSISTOR PNP SI TO-72 PD = 200MW FT = 1GHZ	28480	1853-0018
A18Q4	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A18Q5	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A18Q6	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A18Q7	1854-0610	0	5	TRANSISTOR NPN SI TO-46 FT = 800MHZ	28480	1854-0610
A18R1	0698-3429	2		RESISTOR 19.6 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-19R6-F
A18R2	0698-3429	2		RESISTOR 19.6 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-19R6-F
A18R3	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A18R4	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A18R5	0757-0278	9		RESISTOR 1.78K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1781-F
A18R6	0698-3153	9		RESISTOR 3.83K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3831-F
A18R7	0698-3434	9		RESISTOR 34.8 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-34R8-F
A18R8	0757-0418	8		RESISTOR 619 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-619R-F
A18R9	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A18R10	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A18R11	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A18R12	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A18R13	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A18R14	0757-0338	2		RESISTOR 1K 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-1001-F
A18R15	0698-3429	2		RESISTOR 19.6 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-19R6-F
A18R16	0698-3446	3		RESISTOR 383 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-383R-F
A18R17	0698-3446	3		RESISTOR 383 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-383R-F
A18R18	0698-3445	2		RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F
A18R19	2100-0552	3		RESISTOR-TRMR 50 10% C SIDE-ADJ 1-TRN	28480	2100-0552
A18R20	0698-3150	6		RESISTOR 2.37K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2371-F
A18R21	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A18R22	0698-3440	7		RESISTOR 196 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-196R-F
A18R23	2100-3350	5		RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
A18R24	0698-3446	3		RESISTOR 383 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-383R-F
A18R25	0757-0402	1		RESISTOR 110 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-111-F
A18R26	0757-0395	1		RESISTOR 56.2 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-56R2-F
A18R27	0757-0402	1		RESISTOR 110 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-111-F
A18R28	0698-3151	7	6	RESISTOR 2.87K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2871-F
A18R29	0698-3447	4		RESISTOR 422 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-422R-F
A18R30	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A18R31	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A18R32	0698-3431	6	4	RESISTOR 23.7 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-23R7-F
A18R33	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

A19 08901-60024, 08901-60274 – SERIAL PREFIX 2314A TO 2806A

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2619A						
A19	08901-60024	6	1	LO DIVIDER ASSEMBLY	28480	08901-60024
2622A TO 2806A						
A19	08901-60274	8	1	LO DIVIDER ASSEMBLY	28480	08901-60274
A19C1	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A19C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C3	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C4	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C5	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C6	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C7	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C8	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C9	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C10	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A19C11	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C12	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A19C13	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C14	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A19C15	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C16	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
2314A TO 2622A						
A19C17	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER 2	8480 0	160-3878
2622A TO 2806A						
A19C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A19C18	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A19C19	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C20	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C21	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C22	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C23	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C24	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A19C26	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C27	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A19C28	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C29	0160-0690	4	2	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	28480	0160-0690
A19C30	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A19C31	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C32	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877

†Refer to section 7 for update information *Factory Selected Component (Refer to Section 5) Δ First part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08901-60024, 08901-60274 – SERIAL PREFIX 2314A TO 2806A**					
A19C33	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C34	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A19C35	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C36	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C37	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
2314A TO 2348A						
A19C38	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
2406A TO 2806A						
A19C38	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A19C39	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C40	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C41	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C42	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C43*	0160-4491	1	1	CAPACITOR-FXD 8.2PF +-5% 200VDC CER	28480	0160-4491
A19C44	0160-3568	1	2	CAPACITOR-FXD 2.7PF +-5% 200VDC CER	51642	100-100-NP0-279J
A19C45	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C46	0160-3568	1		CAPACITOR-FXD 2.7PF +-5% 200VDC CER	51642	100-100-NP0-279J
A19C47	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C48	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C49	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	28480	0160-0690
A19C50	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C51	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C52	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C53	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C54	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C55	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C56	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A19C57	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C58	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C59	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A19C60	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A19C61	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A19C62	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A19C63	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
2314A TO 2619A						
A19C64-C70				NOT ASSIGNED		
2622A TO 2806A						
A19C64	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C65	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A19C66	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C67	0160-4835	7		CAPACTIOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A19C68	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C69	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C70	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08901-60024, 08901-60274 – SERIAL PREFIX 2314A TO 2806A**					
A19CR1	1901-0033	2	8	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
2314A TO 2411A						
A19CR2	0122-0072	6	4	DIODE-VVC 2.2PF 5% C3/C25-MIN = 4.5	04713	BB105B
A19CR3	0122-0072	6		DIODE-VVC 2.2PF 5% C3/C25-MIN = 4.5	04713	BB105B
A19CR4	0122-0072	6		DIODE-VVC 2.2PF 5% C3/C25-MIN = 4.5	04713	BB105B
A19CR5	0122-0072	6		DIODE-VVC 2.2PF 5% C3/C25-MIN = 4.5	04713	BB105B
2413A TO 2806A						
A19CR2	0122-0161	4		DIODE-VVC 2.15PF 7% BVR = 30	25088	BB505B
A19CR3	0122-0161	4		DIODE-VVC 2.15PF 7% BVR = 30	25088	BB505B
A19CR4	0122-0161	4		DIODE-VVC 2.15PF 7% BVR = 30	25088	BB505B
A19CR5	0122-0161	4		DIODE-VVC 2.15PF 7% BVR = 30	25088	BB505B
A19CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A19CR7	1901-1097	0	2	DIODE-PIN	28480	1901-1097
A19CR8	1901-1097	0		DIODE-PIN	28480	1901-1097
A19CR9	1901-0639	4	1	DIODE-PIN	28480	5082-3080
A19CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A19E1	9170-0029	3	5	CORE-SHIELDING BEAD	28480	9170-0029
A19E2	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A19J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A19J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A19J3	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A19L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L4	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L5	9135-0068	6	2	INDUCTOR RF-CH-MLD 33NH 6% .102DX.26LG	28480	9135-0068
A19L6	9135-0073	3	3	INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A19L7	9135-0068	6		INDUCTOR RF-CH-MLD 33NH 6% .102DX.26LG	28480	9135-0068
A19L8	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A19L9				PART OF ETCHED CIRCUIT BOARD		
A19L10	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L11	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L12	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L13	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A19L14	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A19L15				PART OF ETCHED CIRCUIT BOARD		

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08901-60024, 08901-60274 - SERIAL PREFIX 2314A TO 2806A**					
2314A TO 2619A						
A19MP1	08901-00028	4	1	COVER LO DIVDR	28480	08901-00028
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	28480	ORDER BY DESCRIPTION
2314A TO 2806A						
A19MP1	08901-00166	1		COVER LO DIVDER	28480	08901-00166
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	28480	ORDER BY DESCRIPTION
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A19MP2	5001-0176	0		GROUND STRAP	28480	5001-0176
A19MP3	5001-0176	0		GROUND STRAP	28480	5001-0176
A19MP4	08662-00041	1	1	SHIELD COMPONENT LGE	28480	08662-00041
A19MP5	08662-00039	7	1	SHIELD CKT LGE	28480	08662-00039
A19Q1	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A19Q2	1853-0020	4		TRANSISTOR PNP SI PD=300MW FT=150MHZ	28480	1853-0020
A19Q3	1853-0020	4		TRANSISTOR PNP SI PD=300MW FT=150MHZ	28480	1853-0020
A19Q4	1858-0032	8		TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A19R1	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A19R2	0698-7227	6	4	RESISTOR 422 1% .05W F TC=0+-100	24546	C3-1/8-TO-422R-F
A19R3	0698-7227	6		RESISTOR 422 1% .05W F TC=0+-100	24546	C3-1/8-TO-422R-F
A19R4	0698-7227	6		RESISTOR 422 1% .05W F TC=0+-100	24546	C3-1/8-TO-422R-F
A19R5	0698-7227	6		RESISTOR 422 1% .05W F TC=0+-100	24546	C3-1/8-TO-422R-F
A19R6	0698-7232	3	4	RESISTOR 681 1% .05W F TC=0+-100	24546	C3-1/8-TO-681R-F
A19R7	0698-7232	3		RESISTOR 681 1% .05W F TC=0+-100	24546	C3-1/8-TO-681R-F
A19R8	0698-7232	3		RESISTOR 681 1% .05W F TC=0+-100	24546	C3-1/8-TO-681R-F
A19R9	0698-7232	3		RESISTOR 681 1% .05W F TC=0+-100	24546	C3-1/8-TO-681R-F
A19R10	0698-3437	2	1	RESISTOR 133 1% .125W F TC=0+-100	24546	C4-1/8-T0-133R-F
A19R11	0757-0402	1		RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
A19R12	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A19R13	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A19R14	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A19R15	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
2314A TO 2619A						
A19R16	0698-7209	4		RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-TO-75R0-F
A19R17	0698-7238	9	1	RESISTOR 1.21K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1211-F
2622A TO 2806A						
A19R16	0757-0280	3		RESISTOR 1K 1% .125W FTC=0+-100	24546	C3-1/8-TO-1001-F
A19R17	0698-3151	7		RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-TO-2871-F
A19R18	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A19R19	0698-7201	6	1	RESISTOR 34.8 1% .05W F TC=0+-100	24546	C3-1/8-TO-34R8-F
A19R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
2314A TO 2348A						
A19R21	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
2406A TO 2619A						
A19R21	0698-7214	1		RESISTOR 121 1% .05W F TC=0+-100	24546	C3-1/8-TO-121R-F
2622A TO 2806A						
A19R21	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F

†Refer to section 7 for update information   *Factory Selected Component (Refer to Section 5)   Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08901-60024, 08901-60274 – SERIAL PREFIX 2314A TO 2806A**					
A19R22	0757-0440	7		RESISTOR 7.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-7501-F
A19R23	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A19R24	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A19R25	0698-3158	4	6	RESISTOR 23.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2372-F
A19R26	1810-0203	5	3	NETWORK-RES 8-SIP470.0 OHM X 7	01121	208A471
2413A TO 2348A						
A19R27	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
2406A TO 2619A						
A19R27	0698-7205	0		RESISTOR 51.1 .% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
2622A TO 2806A						
A19R27	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-261R-F
A19R28	1810-0203	5		NETWORK-RES 8-SIP470.0 OHM X 7	01121	208A471
A19R29	1810-0203	5		NETWORK-RES 8-SIP470.0 OHM X 7	01121	208A471
A19R30	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A19R31	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A19R32	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
2314A TO 2619A						
A19R33	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A19R34	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
2622A TO 2806A						
A19R33	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-751-F
A19R34	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-751R-F
A19R35	0698-7195	7		RESISTOR 19.6 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-19R6-F
A19R36	0757-0276	7		RESISTOR 61.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6192-F
A19R37	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A19R38	0698-3151	7		RESISTOR 2.87K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2871-F
A19R39	0757-0276	7		RESISTOR 61.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6192-F
A19R40	0698-7229	8	5	RESISTOR 511 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-511R-F
A19R41	2100-2413	9	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	30983	ET50X201
A19R42	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R43	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R44	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R45	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R46	0698-7229	8		RESISTOR 511 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-511R-F
A19R47	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R48	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A19R49	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F

[1] Refer to section 7 for update information. * Factory selected component (Refer to section 7). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08901-60024, 08901-60274 – SERIAL PREFIX 2314A TO 2806A**					
A19R50	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R51	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R52	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R53	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R54	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R55	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R56	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R57	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R58	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R59	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R60	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A19R61	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R62	0698-3158	4		RESISTOR 23.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2372-F
2314A TO 2622A						
*A19R63**	0757-0276	7	3	RESISTOR 61.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6192-F
2622A TO 2806A						
*A19R63**	0757-0398	4	3	RESISTOR 75 1% .1252 F TC = 0 + -100	24546	C4-1/8-TO-75R-F
A19R64	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R65				NOT ASSIGNED		
A19R66	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A19R67	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R68	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R69	0698-3447	4		RESISTOR 422 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-422R-F
A19R70	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R71	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A19R72*	0757-0422	5	10	RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R73				NOT ASSIGNED		
A19R74*	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R75	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R76	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A19R77	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A19R78	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A19R79	0757-0726	2	1	RESISTOR 511 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-511R-F
A19R80	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A19R81	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A19R82	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A19R83	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R84	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R85	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
2314A TO 2348A						
A19R86	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
2406A TO 2806A						
A19R86	0698-7205	0		RESISTOR 51.1 .% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F

[illegible] Refer to section 7 for update information. * Factory selected component. Refer to section 6. Δ Extra part charge.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08901-60024, 08901-60274 – SERIAL PREFIX 2314A TO 2806A**					
2314A TO 2619A						
A19R87	0698-7209	4		RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-TO-75R0-F
2622A TO 2806A						
A19R87	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A19R88	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A19R89	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A19R90	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A19R91	0698-7247	0	2	RESISTOR 2.87K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2871-F
A19R92	0698-3151	7		RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A19R93	0698-7247	0		RESISTOR 2.87K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2871-F
A19R94	0698-7208	3	1	RESISTOR 68.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-68R1-F
A19R95	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-TO-511R-F
A19R96	0757-0397	3		RESISTOR 68.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-68R1-F
A19R97	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A19R98	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-TO-511R-F
A19R99	0698-3439	4	2	RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A19R100	0757-0397	3		RESISTOR 68.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-68R1-F
A19R101	0757-0397	3		RESISTOR 68.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-68R1-F
A19R102	0698-3439	4		RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A19R103	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A19R104	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A19R105	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A19R106	0698-7209	4		RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-TO-75R0-F
A19R107	0757-0397	3		RESISTOR 68.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-68R1-F
A19R108	0698-7209	4		RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-TO-75R0-F
A19R109	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-TO-511R-F
A19R110	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
2314A TO 2619A						
A19R111-R116				NOT ASSIGNED		
2622A TO 2806A						
A19R111	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8/TO-261R-F
A19R112	0698-7205	0		RESISTOR 51.1 1% .15W F TC=0+-100	24546	C3-1/8-TO 51R1-F
A19R113	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-TO-261R-F
A19R114	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-TO-261R-F
A19R115	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-TO-261R-F
A19R116	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-TO-261R-F
A19TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A19TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600

‡Refer to section 7 for update information *Factory Selected Component (Refer to section 5) Δ Indicates part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08901-60024, 08901-60274 – SERIAL PREFIX 2314A TO 2806A**					
A19U1	1820-1225	4	1	IC FF ECL D-M/S DUAL	04713	MC10231P
A19U2	1826-0372	2	6	IC MISC 8-DIP-P PKG	28480	1826-0372
A19U3	1826-0013	8		IC OP AMP LOW-NOISE TO-99 PKG	06665	SSS741CJ
A19U4	08901-67002	4	1	FREQUENCY DUBLER	28480	08901-67002
	0340-0850	0		INSULATOR-XSTR TFE	28480	0340-0850
	1251-1556	7		CONNECTOR-SGL CONT SKT .018-IN-BSC-SZ	28480	1251-1556
A19U5	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A19U6	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
2314A TO 2619A						
A19U7	1820-1940	0	2	IC CNTR ECL BIN SYNCHRO POS-EDGE-TRIG	28480	1820-1940
A19U8	1820-1940	0		IC CNTR ECL BIN SYNCHRO POS-EDGE-TRIG	28480	1820-1940
2622A TO 2806A						
A19U7	1820-3485	2		IC PRESCR ECL	04713	MC12090L
A19U8	1820-3485	2		IC PRESCR ECL	04713	MC12090L
A19U9	1820-0796	2	1	IC GATE ECL NOR QUAD 2-INP	04713	MC1662L
A19U10	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A19U11	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A19U12	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A19U13	1820-1400	7	2	IC GATE ECL AND QUAD 2-INP	04713	MC10104P
A19U14	1820-1400	7		IC GATE ECL AND QUAD 2-INP	04713	MC10104P
A19U15	1820-0828	1	2	IC DCDR ECL BIN 3-TO-8-LINE 3-INP	04713	MC10162P
A19U16	1820-0802	1	2	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A19U17	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A19U18	1820-0828	1		IC DCDR ECL BIN 3-TO-8-LINE 3-INP	04713	MC10162P
A19U19	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A19U20	1820-1052	5	1	IC XLTR ECL ECL-TO-TTL QUAD 2-INP	04713	MC10125L
A19VR1	1902-0943	5		DIODE-ZNR 2.4V 5% DO-35 PD = .4W TC = -.037%	28480	1902-0943
A19VR2	1902-0049	2	3	DIODE-ZNR 6.19V 5% DO-35 PD = .4W	28480	1902-0049
A19VR3	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD = .4W	28480	1902-0049
A19VR4	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD = .4W	28480	1902-0049
A19W1	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A19W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A19W3				NOT ASSIGNED		
A19W4	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

†Refer to section 7 for update information *Factory Selected Component (Refer to section 6) Δ Errata part change

Table 6-3. Replaceable Parts

A19 08902-60126 – SERIAL PREFIX 2909A AND ABOVE

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	08902-60126	0	1	LO DIVIDER ASSEMBLY	28480	08902-60126
A19C1	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A19C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C3	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C4	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C5	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C6	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C7	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C8	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C9	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C10	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A19C11	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C12	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A19C13	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C14	0160-4832	4		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-4832
A19C15	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C16	0160-4830	2		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-4830
A19C17	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A19C18	0160-4832	4		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-4832
A19C19				NOT ASSIGNED		
A19C20				NOT ASSIGNED		
A19C21	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C22	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C23	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C24	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C25	0160-4832	4		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-4832
A19C26	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C27	0160-4832	4		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-4832
A19C28				NOT ASSIGNED		
A19C29	0160-0690	4	2	CAPACITOR-FXD 1PF +-.5PF 100VDC CER	28480	0160-0690
A19C30	0160-4832	4		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-4832
A19C31	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C32	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C33	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C34	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A19C35	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C36	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C37	0160-0571	0	7	CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A19C38	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A19C39	0160-4830	2		CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A19C40	0160-4830	2		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-4830
A19C41	0160-4830	2		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-4830
A19C42	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A19C43*	0160-4491	1	1	CAPACITOR-FXD 8.2PF +-5% 200VDC CER	28480	0160-4491

†Refer to Section 7 for update information   *Factory selected Component (Refer to section 5)   Δ Field part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08902-60126 – SERIAL PREFIX 2909A AND ABOVE**					
A19C44	0160-3568	1	2	CAPACITOR-FXD 2.7PF +-5% 200VDC CER	51642	100-100-NP0-279J
A19C45	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C46	0160-3568	1		CAPACITOR-FXD 2.7PF +-5% 200VDC CER	51642	100-100-NP0-279J
A19C47	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C48	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C49	0160-0690	4		CAPACITOR-FXD 1PF +-.5PF 100VDC CER	28480	0160-0690
A19C50	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C51	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C52	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C53	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C54	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C55	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C56	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A19C57	0160-4822	2		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-4822
A19C58	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A19C59	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A19C60	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C61	0160-4835	7		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4835
A19C62	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A19C63	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A19C64	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A19C65	0160-0576	5		CAPACITOR-FXD .1UF +-10% 100VDC CER	28480	0160-0576
A19C66				NOT ASSIGNED		
A19C67	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A19C68				NOT ASSIGNED		
A19C69				NOT ASSIGNED		
A19C70				NOT ASSIGNED		
A19CR1	1901-0033	2	8	DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A19CR2	0122-0161	4		DIODE-VVC 2.2PR 7% BVR = 30V	28480	0122-0161
A19CR3	0122-0161	4		DIODE-VVC 2.2PR 7% BVR = 30V	28480	0122-0161
A19CR4	0122-0161	4		DIODE-VVC 2.2PR 7% BVR = 30V	28480	0122-0161
A19CR5	0122-0161	4		DIODE-VVC 2.2PR 7% BVR = 30V	28480	0122-0161
A19CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A19CR7	1901-1097	0	2	DIODE-PIN	28480	1901-1097
A19CR8	1901-1097	0		DIODE-PIN	28480	1901-1097
A19CR9	1901-0639	4	1	DIODE-PIN	28480	5082-3080
A19CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A19E1	9170-0029	3	11	CORE-SHIELDING BEAD	28480	9170-0029
A19E2	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A19J1	1250-1425	7		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A19J2	1250-1425	7		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A19J3	1250-1425	7		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08902-60126 – SERIAL PREFIX 2909A AND ABOVE**					
A19L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L4	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L5	9135-0068	6	2	INDUCTOR RF-CH-MLD 33NH 6% .102DX.26LG	28480	9135-0068
A19L6	9135-0073	3	3	INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A19L7	9135-0068	6		INDUCTOR RF-CH-MLD 33NH 6% .102DX.26LG	28480	9135-0068
A19L8	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A19L9				PART OF ETCHED CIRCUIT BOARD		
A19L10	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L11	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L12	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A19L13	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A19L14	9135-0073	3		INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9135-0073
A19L15				PART OF ETCHED CIRCUIT BOARD		
A19MP1	08901-00166	1	1	COVER LO DIVIDER	28480	08901-00166
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A19MP2	5001-0176	0		GROUND STRAP	28480	5001-0176
A19MP3	5001-0176	0		GROUND STRAP	28480	5001-0176
A19MP4	08662-00041	1	1	SHIELD COMPONENT LGE	28480	08662-00041
A19MP5	08662-00039	7	1	SHIELD CKT LGE	28480	08662-00039
A19Q1	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A19Q2	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A19Q3	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A19Q4	1858-0032	8		TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3146E
A19R1	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A19R2	0698-7227	6	9	RESISTOR 422 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-422R-F
A19R3	0698-7227	6		RESISTOR 422 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-422R-F
A19R4	0698-7227	6		RESISTOR 422 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-422R-F
A19R5	0698-7227	6		RESISTOR 422 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-422R-F
A19R6	0698-7232	3		RESISTOR 681 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-681R-F
A19R7	0698-7232	3		RESISTOR 681 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-681R-F
A19R8	0698-7232	3		RESISTOR 681 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-681R-F
A19R9	0698-7232	3		RESISTOR 681 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-681R-F
A19R10	0698-3437	2	1	RESISTOR 133 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-133R-F
A19R11	0757-0402	1		RESISTOR 110 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-111-F
A19R12	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R13	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R14	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R15	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R16	0757-0280	3		RESISTOR 1K 1% .5W .125W F TC = 0 + -100	28480	0757-0280
A19R17	0698-3151	7		RESISTOR 2.87K 1% .125W F TC = 0 + -100	24546	0698-3151
A19R18	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R19	0698-7201	6	1	RESISTOR 34.8 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-34R8-F
A19R20	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A19R21	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-51.1R-F
A19R22	0757-0440	7		RESISTOR 7.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-7501-F
A19R23	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A19R24	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A19R25	0698-3158	4		RESISTOR 23.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2372-F

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08902-60126 – SERIAL PREFIX 2909A AND ABOVE**					
A19R26	1810-0203	5	3	NETWORK-RES 8-SIP470.0 OHM X 7	01121	208A471
A19R27	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-2610-F
A19R28	1810-0203	5		NETWORK-RES 8-SIP470.0 OHM X 7	01121	208A471
A19R29	1810-0203	5		NETWORK-RES 8-SIP470.0 OHM X 7	01121	208A471
A19R30	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-51R1-F
A19R31	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A19R32	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A19R33	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-2610-F
A19R34	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C3-1/8-TO-751-F
A19R35	0698-7195	7	2	RESISTOR 19.6 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-19R6-F
A19R36	0757-0276	7		RESISTOR 61.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6192-F
A19R37	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-51R1-F
A19R38	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	0757-0394
A19R39	0757-0276	7		RESISTOR 61.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6192-F
A19R40	0757-0416	7		RESISTOR 511 1%.125W F TC = 0 + -100	24546	0757-0416
A19R41	2100-2413	9	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	30983	ET50X201
A19R42	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R43	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R44	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R45	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R46	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-511R-F
A19R47	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R48	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	0757-0346
A19R49	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R50	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R51	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R52	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R53	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R54	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R55	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R56	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R57	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R58	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R59	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R60	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A19R61	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R62	0698-3158	4		RESISTOR 23.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2372-F
A19R63*	0757-0398	4	3	RESISTOR 75 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-75R0-F
A19R64	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R65				*NOT ASSIGNED*		
A19R66	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A19R67	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R68	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R69	0698-3447	4		RESISTOR 422 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-422R-F
A19R70	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R71	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08902-60126 – SERIAL PREFIX 2909A AND ABOVE**					
A19R72*	0757-0422	5	11	RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R73				NOT ASSIGNED		
A19R74*	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A19R75	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R76	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A19R77	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A19R78	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A19R79	0757-0726	2	1	RESISTOR 511 1% .25W F TC = 0 + -100	24546	C5-1/4-TO-511R-F
A19R80	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A19R81	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A19R82	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A19R83	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R84	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R85	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R86	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-51R1-F
A19R87	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-51R1-F
A19R88	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A19R89	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A19R90	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A19R91	0698-7247	0	5	RESISTOR 2.87K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2871-F
A19R92	0698-3151	7		RESISTOR 2.87K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2871-F
A19R93	0698-7247	0		RESISTOR 2.87K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2871-F
A19R94	0698-7208	3	1	RESISTOR 68.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-68R1-F
A19R95	0698-7229	8		RESISTOR 511 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-511R-F
A19R96	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R97	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A19R98	0698-7229	8		RESISTOR 511 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-511R-F
A19R99	0698-3439	4	4	RESISTOR 178 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-178R-F
A19R100	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R101	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R102	0698-3439	4		RESISTOR 178 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-178R-F
A19R103	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A19R104	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A19R105	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A19R106	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A19R107	0757-0397	3		RESISTOR 68.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-68R1-F
A19R108	0698-7209	4		RESISTOR 75 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-75R0-F
A19R109	0698-7229	8		RESISTOR 511 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-511R-F
A19R110	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A10R111	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	28480	0698-3132
A19R112	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A19R113	0698-3132	4		RESISTOR 261 1% .126W F TC = 0 + -100	24546	C4-1/8-TO-2610-F
A19R114	0698-3132	4		RESISTOR 261 1% .126W F TC = 0 + -100	24546	C4-1/8-TO-2610-F
A19R115	0698-3132	4		RESISTOR 261 1% .126W F TC = 0 + -100	24546	C4-1/8-TO-2610-F
A19R116	0698-3132	4		RESISTOR 261 1% .126W F TC = 0 + -100	24546	C4-1/8-TO-2610-F

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19	**08902-60126 – SERIAL PREFIX 2909A AND ABOVE**					
A19TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A19TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A19U1	1820-1225	4	1	IC FF ECL D-M/S DUAL	04713	MC10231P
A19U2	1826-0372	2	6	IC MISC 8-DIP-P PKG	28480	1826-0372
A19U3	1826-0013	8	2	IC OP AMP LOW-NOISE TO-99 PKG	06665	SSS741CJ
A19U4	08901-67002	4	1	FREQUENCY DUBLER	28480	08901-67002
	0340-1098	0		INSULATOR-XSTR TFE	28480	0340-1098
	1251-1556	7		CONNECTOR-SGL CONT SKT .018-IN-BSC-SZ	28480	1251-1556
A19U5	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A19U6	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A19U7	1820-1940	0	2	IC CNTR ECL BIN SYNCHRO POS-EDGE-TRIG	28480	1820-1940
A19U8	1820-1940	0		IC CNTR ECL BIN SYNCHRO POS-EDGE-TRIG	28480	1820-1940
A19U9	1820-0796	2	1	IC GATE ECL NOR QUAD 2-INP	04713	MC1662L
A19U10	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A19U11	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A19U12	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A19U13	1820-1400	7	2	IC GATE ECL AND QUAD 2-INP	04713	MC10104P
A19U14	1820-1400	7		IC GATE ECL AND QUAD 2-INP	04713	MC10104P
A19U15	1820-0828	1	2	IC DCDR ECL BIN 3-TO-8-LINE 3-INP	04713	MC10162P
A19U16	1820-0802	1	2	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A19U17	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A19U18	1820-0828	1		IC DCDR ECL BIN 3-TO-8-LINE 3-INP	04713	MC10162P
A19U19	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A19U20	1820-1052	5	1	IC XLTR ECL ECL-TO-TTL QUAD 2-INP	04713	MC10125L
A20U21	1820-1225	4		IC FF ECL D-M/S DUAL	04713	MC10216P
A19VR1	1902-0943	5		DIODE-ZNR 2.4V 5% DO-35 PD = .4W TC = -.037%	28480	1902-0943
A19VR2	1902-0049	2	3	DIODE-ZNR 6.19V 5% DO-35 PD = .4W	28480	1902-0049
A19VR3	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD = .4W	28480	1902-0049
A19VR4	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD = .4W	28480	1902-0049
A19W1	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A19W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A19W3				NOT ASSIGNED		
A19W4	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60185 – SERIAL PREFIX 2315A TO 2622A**					
A20	08901-60185	0	1	LO CONTROL ASSEMBLY	28480	08901-60185
A20C1	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A20C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A20C3	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A20C4	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A20C5	0180-2853	7	2	CAPACITOR-FXD 10UF+-20% 100VDC TA	56289	109D106X0100C2
A20C6	0180-0490	4	1	CAPACITOR-FXD 68UF+-10% 6VDC TA	90201	TDC686K006WLF
A20C7	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A20C8	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C9	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A20C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C11	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C12	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A20C13	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A20C14	0160-0153	4		CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A20C15	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C16	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C17	0160-0161	4		CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A20C18	0180-2853	7		CAPACITOR-FXD 10UF+-20% 100VDC TA	56289	109D106X0100C2
A20C19	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C21	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A20C22	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A20C23	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A20CR1	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR5	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR8	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR9	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR10	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR11	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR12	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR13	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR14	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR15	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR16	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR17	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR18	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR19	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR20	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR21	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR22	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR23	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A20CR24	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR25	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60185 – SERIAL PREFIX 2315A TO 2622A**					
A20CR26	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR27	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20E1	9170-0847	3		CORE SHIELDING BEAD	28480	9170-0847
A20MP1	08901-00104	7	1	COVER LO CONT BD	28480	08901-00104
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A20Q1	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A20Q2	1853-0034	0	8	TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A20Q3	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A20Q4	1853-0034	0		TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A20Q5	1854-0247	9	8	TRANSISTOR NPN SI TO-39 PD = 1W FT = 800MHZ	28480	1854-0247
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A20Q6	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A20Q7	1853-0034	0		TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A20Q8	1854-0023	9	4	TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0023
A20Q9	1854-0023	9		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0023
A20Q10	1855-0273	3	2	TRANSISTOR J-FET P-CHAN D-MODE TO-92 SI	28480	1855-0273
A20Q11	1855-0273	3		TRANSISTOR J-FET P-CHAN D-MODE TO-92 SI	28480	1855-0273
A20Q12	1854-0023	9		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0023
A20Q13	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A20Q14	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A20Q15	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A20Q16	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A20Q17				NOT ASSIGNED		
A20Q18	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A20Q19	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A20Q20	1854-0022	8	4	TRANSISTOR NPN SI TO-39 PD = 700MW	07263	S17843
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A20Q21	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A20Q22	1854-0022	8		TRANSISTOR NPN SI TO-39 PD = 700MW	07263	S17843
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A20Q23	1853-0012	4		TRANSISTOR PNP 2N2904A SI TO-39 PD = 600MW	01295	2N2904A
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A20Q24	1853-0316	1	1	TRANSISTOR-DUAL PNP PD = 500MW	28480	1853-0316
A20Q26	1854-0022	8		TRANSISTOR NPN SI TO-39 PD = 700MW	07263	S17843
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A20Q27	1854-0022	8		TRANSISTOR NPN SI TO-39 PD = 700MW	07263	S17843
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A20Q28	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A20R1	2100-3274	2	2	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A20R2	0698-7275	4	2	RESISTOR 42.2K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-4222-F
A20R3	0698-7243	6	2	RESISTOR 1.96K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1961-F
A20R4	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A20R5	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R6	0698-7258	3	2	RESISTOR 8.25K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-8251-F
A20R7	0698-7270	9	1	RESISTOR 26.1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2612-F
A20R8	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R9	0698-7212	9		RESISTOR 100 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-100R-F
A20R10	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A20R11	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60185 – SERIAL PREFIX 2315A TO 2622A**					
A20R12	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R13	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R14	0698-7279	8	1	RESISTOR 61.9K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-6192-F
A20R15	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R16				NOT ASSIGNED		
A20R17	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R18	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
2314A TO 2348A						
A20R19	0698-7267	4	1	RESISTOR 19.6K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1962-F
A20R20	0698-7259	4	3	RESISTOR 9.09K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-9091-F
A20R21	0698-7251	6		RESISTOR 4.22K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-4221-F
A20R22	0698-7240	3	1	RESISTOR 1.47K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1471-F
A20R23	0698-7220	9		RESISTOR 215 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-215R-F
A20R24	0757-0470	3	2	RESISTOR 162K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1623-F
A20R25	0698-7282	3	1	RESISTOR 82.5K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-8252-F
A20R26	0698-7274	3	1	RESISTOR 38.3K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-3832-F
2406A TO 2622A						
120R19	0698-7279	8		RESISTOR 61.9K 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-6192-F
A20R20	0698-7271	0		RESISTOR 28.7K 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-2872-F
A20R21	0698-7263	0		RESISTOR 13.3K 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-1332-F
A20R22	0698-7255	0		RESISTOR 6.19K 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-6191-F
A20R23	0698-7246	9		RESISTOR 2.61K A% .05W F TC = 0 + _100	24546	C3-1/8-TO-2611-F
A20R24	0698-3260	9		RESISTOR 464K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-4643-F
A20R25	0698-3266	5		RESISTOR 237K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-2373-F
A20R26	0698-7286	7		RESISTOR 121K 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-1213-F
A20R27	0698-7261	8	1	RESISTOR 11K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1102-F
A20R28	0698-7253	8	3	RESISTOR 5.11K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-5111-F
A20R29	0698-7216	3		RESISTOR 147 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-147R-F
A20R30	0698-7251	6		RESISTOR 4.22K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-4221-F
A20R31	0698-7259	4		RESISTOR 9.09K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-9091-F
A20R32	0698-7284	5	5	RESISTOR 100K 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-1003-F
A20R33	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R34	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R35	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R36	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R37	0698-7288	9	3	RESISTOR 147K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1473-F
A20R38	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R39	0698-7284	5		RESISTOR 100K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1003-F
A20R40	0698-7243	6		RESISTOR 1.96K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1961-F
A20R41	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R42	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R43	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A20R44	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R45	0698-7288	9		RESISTOR 147K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1473-F
A20R46	0698-7275	4		RESISTOR 42.2K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-4222-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60185 – SERIAL PREFIX 2315A TO 2622A**					
A20R47	0757-0460	1	3	RESISTOR 61.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A20R48	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A20R49	0698-7253	8		RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-F
A20R50	0757-0290	5	2	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A20R51	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A20R52	0698-7258	3		RESISTOR 8.25K 1% .05W F TC=0+-100	24546	C3-1/8-T0-8251-F
A20R53	0698-7253	8		RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-F
A20R54				NOT ASSIGNED		
A20R55				NOT ASSIGNED		
A20R56	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A20R57	0757-0462	3	1	RESISTOR 75K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7502-F
A20R58	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A20R59	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A20R60	0698-7259	4		RESISTOR 9.09K 1% .05W F TC=0+-100	24546	C3-1/8-T0-9091-F
A20R61	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A20R62	0698-8744	4	1	RESISTOR 2K .05% .1W F TC=0+-15	28480	0698-8744
A20R63	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A20R64	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A20R65	0699-0381	1	2	RESISTOR 40K .1% .1W F TC=0+-15	28480	0699-0381
A20R66	0699-0381	1		RESISTOR 40K .1% .1W F TC=0+-15	28480	0699-0381
A20R67	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A20R68	0699-0118	2	1	RESISTOR 20K .1% .1W F TC=0+-5	28480	0699-0118
A20R69	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A20R70	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A20R71	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A20R72	0698-7257	2	1	RESISTOR 7.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-7501-F
A20R73	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A20R74	0757-0158	4	1	RESISTOR 619 1% .5W F TC=0+-100	28480	0757-0158
A20R75	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A20R76	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A20R77	0698-7218	5	1	RESISTOR 178 1% .05W F TC=0+-100	24546	C3-1/8-TO-178R-F
A20R78	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A20R79	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A20R80	0698-7286	7	1	RESISTOR 121K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1213-F
A20R81	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A20R82	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A20R83	0698-7288	9		RESISTOR 147K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1473-F
A20R84	0698-7262	9	1	RESISTOR 12.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1212-F
A20R85	0699-0069	2		RESISTOR 2.15M 1% .125W F TC=0+-100	28480	0699-0069
A20TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20U1	1826-0043	4		IC OP AMP GP TO-99 PKG	3L585	CA307T
A20U2	1820-1547	3	1	IC MULTIPLXR 8-CHAN-ANLG 16-DIP-C PKG	04713	MC14051BCL
A20U3	1820-1198	0		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A20U4	1826-0217	4	1	IC OP AMP GP DUAL TO-99 PKG	07933	RC4558T
A20U5	1826-0557	5	1	IC OP AMP GP QUAD 14-DIP-C PKG	27014	LM348J

†Refer to Section I for update information *Factory selected component (Refer to Section V) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60185 – SERIAL PREFIX 2315A TO 2622A**					
A20U6	1820-1200	5		IC INV TTL LS HEX	01295	SN74LS05N
A20U7	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U8	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A20U9	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A20U10	1826-0188	8	2	IC CONV 8-B-D/A 16-DIP-C PKG	04713	MC1408L-8
A20U11	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A20U12	1826-0188	8		IC CONV 8-B-D/A 16-DIP-C PKG	04713	MC1408L-8
A20U13	1990-0643	7	2	OPTO-ISOLATOR LED-PCNDCT IF = 40MA-MAX	03911	CLM6500
A20U14	1990-0643	7		OPTO-ISOLATOR LED-PCNDCT IF = 40MA-MAX	03911	CLM6500
A20U15	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A20U16	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U17	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U18	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U19	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U20	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U21	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U22	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U23	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A20VR1	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD = .4W	28480	1902-0041
A20VR2	1902-0064	1	4	DIODE-ZNR 7.5V 5% DO-35 PD = .4W TC = +.05%	28480	1902-0064
A20VR3	1902-0064	1		DIODE-ZNR 7.5V 5% DO-35 PD = .4W TC = +.05%	28480	1902-0064
A20VR4	1902-0064	1		DIODE-ZNR 7.5V 5% DO-35 PD = .4W TC = +.05%	28480	1902-0064
A20VR5	1902-0064	1		DIODE-ZNR 7.5V 5% DO-35 PD = .4W TC = +.05%	28480	1902-0064

†Refer to section 7 for update information *Factory Selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60262 – SERIAL PREFIX 2627A AND ABOVE**					
A20	08901-60262	4	1	LO CONTROL ASSEMBLY	28480	08901-60262
A20C1	0160-4835	7	3	CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A20C2	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A20C3	0180-1746	5	2	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A20C4	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A20C5	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A20C6	0180-0269	5	1	CAPACITOR-FXD 1UF+50-10% 150VDC AL	56289	30D105G150BA2
A20C7	0160-4801	7	2	CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A20C8	0160-4832	4	8	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20C9	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A20C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20C11	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20C12	0160-4807	3	1	CAPACITOR-FXD 33PF +-5% 100VDC CER 0+-30	28480	0160-4807
A20C13	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A20C14	0160-4814	2	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	28480	0160-4814
A20C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20C16	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20C17	0160-0161	4	1	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A20C18	0160-3324	7	1	CAPACITOR-FXD 1UF +-5% 100VDC MET-POLYC	28480	0160-3324
A20C19	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20C20	0180-1997	8	1	CAPACITOR-FXD 20UF+50-10% 150VDC AL	28480	0180-1997
A20C21	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20C22	0160-4822	2	2	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A20C23	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4822
A20C24	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A20CR1	1901-1085	6	2	DIODE-SM SIG SCHOTTKY	28480	1901-1085
A20CR2	1901-1085	6		DIODE-SM SIG SCHOTTKY	28480	1901-1085
A20CR3				NOT ASSIGNED		
A20CR4				NOT ASSIGNED		
A20CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR8	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR9	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR10	1901-0518	8	6	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR11	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR12	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR13	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR14	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR15	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR16	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR17	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR18	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR19	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR20	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150

†Refer to section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60262 – SERIAL PREFIX 2627A AND ABOVE**					
2535A TO 2718A						
A20CR21				NOT ASSIGNED		
2804A AND ABOVE						
A20CR21	1901-0518	8	7	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR22	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20CR23				NOT ASSIGNED		
A20CR24	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A20CR25	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A20DS1				NOT ASSIGNED		
A20DS2				NOT ASSIGNED		
A20DS3	1990-0717	6	2	LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	HLMP-1501
A20DS4	1990-0717	6		LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	HLMP-1501
A20L1	9100-3922	4	3	INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A20L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A20L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A20MP1	08901-00104	7	1	CVR LO CONT BD	28480	08901-00104
	2360-0113	2	2	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A20Q1	1854-0477	7	5	TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A20Q2	1853-0034	0	3	TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A20Q3	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A20Q4	1853-0034	0		TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A20Q5	1854-0378	7	1	TRANSISTOR NPN 2N5109 SI TO-39 PD = 800MW	3L585	2N5109
A20Q6	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A20Q7	1853-0034	0		TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A20Q8	1853-0594	7	3	TRANSISTOR-DUAL PNP 2N3808 TO-78	28480	1853-0594
A20Q9	1855-0292	6	2	TRANSISTOR J-FET 2N5432 N-CHAN D-MODE	17856	2N5432
A20Q10	1855-0292	6		TRANSISTOR J-FET 2N5432 N-CHAN D-MODE	17856	2N5432
A20Q11	1855-0423	5	1	TRANSISTOR MOSFET N-CHAN E-MODE	17856	VN10KM
A20Q12	1854-0813	5	3	TRANSISTOR NPN 2N3501S SI TO-39 PD = 1W	28480	1854-0813
A20Q13	1853-0462	8	2	TRANSISTOR PNP 2N3635 SI TO-39 PD = 1W	28480	1853-0462
A20Q14				NOT ASSIGNED		
A20Q15				NOT ASSIGNED		
A20Q16	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A20Q17				NOT ASSIGNED		
A20Q18				NOT ASSIGEND		
A20Q19	1853-0594	7		TRANSISTOR-DUAL PNP 2N3808 TO-78	28480	1853-0594
A20Q20	1854-0474	4	3	TRANSISTOR NPN SI PD = 310MW FT = 100MHZ	04713	2N5551
A20Q21	1854-0474	4		TRANSISTOR NPN SI PD = 310MW FT = 100MHZ	04713	2N5551
A20Q22	1854-0813	5	3	TRANSISTOR NPN 2N3501S SI TO-39 PD = 1W	28480	1854-0813
A20Q23	1853-0462	8	2	TRANSISTOR PNP 2N3635 SI TO-39 PD = 1W	28480	1853-0462
A20Q24	1853-0594	7		TRANSISTOR-DUAL PNP 2N3808 TO-78	28480	1853-0594
A20Q25				NOT ASSIGNED		
A20Q26	1854-0813	5	3	TRANSISTOR NPN 2N3501S SI TO-39 PD = 1W	28480	1854-0813
A20Q27	1854-0474	4		TRANSISTOR NPN SI PD = 310MW FT = 100MHZ	04713	2N5551
A20Q28	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A

[illegible] Refer to section [illegible] for update information. * Factory selected component (Refer to section [illegible]). Δ Exact part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60262 – SERIAL PREFIX 2627A AND ABOVE**					
A20R1	2100-3161	6	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	02111	43P203
A20R2	0757-0463	4	1	RESISTOR 82.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8252-F
A20R3	0698-7284	5	2	RESISTOR 100K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1003-F
A20R4	0698-7284	5		RESISTOR 100K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1003-F
A20R5	0698-7260	7	4	RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R6	0699-0381	1	1	RESISTOR 40K .1% .1W F TC = 0 + -15	28480	0699-0381
A20R7	0699-0122	8	2	RESISTOR 4.8K .1% .125W F TC = 0 + -25	28480	0699-0122
A20R8	0699-0122	8		RESISTOR 4.8K .1% .125W F TC = 0 + -25	28480	0699-0122
A20R9	0698-6360	6	1	RESISTOR 10K .1% .125W F TC = 0 + -25	28480	0698-6360
A20R10	0698-8049	2	1	RESISTOR 64K .1% .125W F TC = 0 + -25	19701	MF4C1/8-T9-6402-B
A20R11	0757-0289	2	3	RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A20R12	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3481-F
A20R13	0698-3154	0	4	RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A20R14	0698-8212	1	1	RESISTOR 6K .25% .125W F TC = 0 + -25	19701	MF4C1/4-T9-6001-C
A20R15	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R16	1810-0204	6	1	NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A20R17	0698-7244	7	4	RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F
A20R18	0698-7244	7		RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F
A20R19	0698-7279	8	1	RESISTOR 61.9K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-6192-F
A20R20	0698-3449	6	1	RESISTOR 28.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2872-F
A20R21	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A20R22	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-6191-F
A20R23	0698-0085	0	2	RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A20R24	0698-3260	9	1	RESISTOR 464K 1% .125W F TC = 0 + -100	28480	0698-3260
A20R25	0698-3266	5	1	RESISTOR 237K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2373-F
A20R26	0698-7286	7	2	RESISTOR 121K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1213-F
A20R27				NOT ASSIGNED		
A20R28				NOT ASSIGNED		
A20R29	0698-3438	3	1	RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A20R30	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A20R31	0698-7259	4	2	RESISTOR 9.09K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-9091-F
2535A TO 2718A						
A20R32	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
2804A AND ABOVE						
A20R32	0698-7259	4		RESISTOR 9.09K 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-9091-F
A20R33	0698-7244	7		RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F
A20R34	0698-7244	7		RESISTOR 2.15K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-2151-F
2535A TO 2718A						
A20R35	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
2804A AND ABOVE						
A20R35	0698-3152	8		RESISTOR 3.48K 1 % .125W F TC + 0 + -100	24546	C4-1/8-TO-3481-F

†Refer to section 7 for update information *Factory selected Component (Refer to Section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60262 – SERIAL PREFIX 2627A AND ABOVE**					
A20R36	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A20R37	1810-0206	8	1	NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A20R38				NOT ASSIGNED		
A20R39				NOT ASSIGNED		
A20R40	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A20R41				NOT ASSIGNED		
A20R42	0757-0123	3	4	RESISTOR 34.8K 1% .125W F TC = 0 + -100	28480	0757-0123
A20R43	0698-7248	1	2	RESISTOR 3.16K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-3161-F
A20R44	0698-7260	7		RESISTOR 10K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1002-F
A20R45	0698-3152	8		RESISTOR 3.48K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3481-F
A20R46	0698-7276	5	1	RESISTOR 46.4K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-4642-F
A20R47	0698-3159	5		RESISTOR 26.1K 1% .125W F TC = 0 + -100	28480	0689-3159
A20R48	0757-0123	3		RESISTOR 34.8K 1% .125W F TC = 0 + -100	28480	0757-0123
A20R49				NOT ASSIGNED		
A20R50				NOT ASSIGNED		
A20R51	0698-7261	8	1	RESISTOR 11K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1102-F
A20R52	0698-7258	3	1	RESISTOR 8.25K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-8251-F
A20R53				NOT ASSIGNED		
A20R54				NOT ASSIGNED		
A20R55				NOT ASSIGNED		
A20R56	0698-7236	7	7	RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R57	0698-3162	0		RESISTOR 46.4K 1% .125W F TC = - + -100	24546	C4-1/8-TO-4642-F
A20R58	0757-0199	3	1	RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A20R59	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R60	0698-7259	4		RESISTOR 9.09K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-9091-F
A20R61	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R60-R69				NOT ASSIGNED		
A20R70	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R71	0698-3439	4	1	RESISTOR 178 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-178R-F
A20R72	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R73	0698-0082	7	1	RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A20R74	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A20R75	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R76	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A20R77	0698-7286	7		RESISTOR 121K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1213-F
A20R78	0699-0069	2	1	RESISTOR 2.15M 1% .125W F TC = 0 + -100	28480	0699-0069
A20R79				NOT ASSIGNED		
A20R80				NOT ASSIGNED		
A20R81				NOT ASSIGNED		
A20R82	0698-7248	1		RESISTOR 3.16K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-3161-F
A20TP1	1251-0600	0	4	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A20U1	1826-0989	7	4	IC OP AMP GP 8-DIP-C PKG	27014	LM307J
A20U2	1826-0605	4	1	IC MULTIPLXR 8-CHAN-ANLG 16-DIP-C PKG	17856	DG508BK
A20U3	1820-1198	0	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS03N
A20U4	1826-0990	0	1	IC OP AMP GP DUAL 8-DIP-C PKG	04713	MC1458U
A20U5	1826-0716	8	1	IC OP AMP LOW-NOISE DUAL 8-DIP-C PKG	18324	NE5532AFE

†Refer to section 7 for update information *Factory Selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A20	**08901-60262 – SERIAL PREFIX 2627A AND ABOVE**					
A20U6	1820-1199	1	2	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A20U7	1820-1195	7	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A20U8	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A20U9	1820-1216	3	2	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A20U10	1826-0188	8	2	IC CONV 8-B-D/A 16-DIP-C PKG	04713	MC1408L-8
A20U11	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A20U12	1826-0188	8		IC CONV 8-B-D/A 16-DIP-C PKG	04713	MC1408L-8
A20U13	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A20U14	1826-0606	5	2	IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A20U15	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A20U16	1820-1411	0	7	IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U17	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U18	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U19	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U20	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U21	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U22	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A20U23	1826-0606	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A20VR1	1902-0955	9	1	DIODE-ZNR 7.5V 5% DO-35 PD = .4W TC = +.062%	28480	1902-0955
A20W1	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

†Refer to Section 7 for update information *Factory selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A21						
A21	08901-60025	7	1	LOW FREQUENCY VCXO FILTER ASSEMBLY	28480	08901-60025
A21C1	0160-2028	6	3	CAPACITOR-FXD 2700PF +-5% 500VDC MICA	28480	0160-2028
A21C2	0160-2534	9	2	CAPACITOR-FXD 300PF +-1% 300VDC MICA	28480	0160-2534
A21C3	0160-2028	6		CAPACITOR-FXD 2700PF +-5% 500VDC MICA	28480	0160-2028
A21C4	0160-2028	6		CAPACITOR-FXD 2700PF +-5% 500VDC MICA	28480	0160-2028
A21C5	0160-2534	9		CAPACITOR-FXD 300PF +-1% 300VDC MICA	28480	0160-2534
A21J1	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A21J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A21L1	9140-0112	2	5	INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A21L2	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A21MP1	08901-00025	1	1	COVER VCOX FILTER	28480	08901-00025
A21MP2	5001-0176	0		GROUND STRAP	28480	5001-0176
A21MP3	5001-0176	0		GROUND STRAP	28480	5001-0176
A21MP4	08901-00044	4	1	GASKT-VCOX FILTER	28480	08901-00044

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A22						
A22	08901-60007	5	1	LOW FREQUENCY VCXO ASSEMBLY	28480	08901-60007
A22C1	0180-0094	4		CAPACITOR-FXD 100UF+75-10% 25VDC AL	56289	30D107G025DD2
A22C2	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C3	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C4	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C5	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C6	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C7	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C9	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C10	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C11	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C12	0160-3456	6	2	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A22C13	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A22C14	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C15	0160-4678	6	1	CAPACITOR-FXD 560PF +-1% 100VDC MICA	28480	0160-4678
A22C16	0160-4679	7	1	CAPACITOR-FXD 270PF +-1% 300VDC MICA	28480	0160-4679
A22C17	0160-4456	8	1	CAPACITOR-FXD 750PF +-1% 300VDC MICA	28480	0160-4456
A22C18	0160-2328	9	1	CAPACITOR-FXD 200PF +-1% 300VDC MICA	28480	0160-2328
A22C19	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C20	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C21	0160-2032	2	1	CAPACITOR-FXD 510PF +-5% 500VDC MICA	28480	0160-2032
A22C22	0160-2030	0	1	CAPACITOR-FXD 1200PF +-5% 500VDC MICA	28480	0160-2030
A22C23	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C24	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C25	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A22C26	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C27	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A22C28	0160-4680	0	1	CAPACITOR-FXD 4000PF +-5% 100VDC MICA	28480	0160-4680
A22CR1	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A22CR2	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A22CR3	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A22CR4	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A22CR5	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A22CR6	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A22CR7	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A22CR8	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
2314A TO 2411A						
A22CR9	0122-0065	7	7	DIODE-VVC 29PF 3%	28480	0122-0065
A22CR10	0122-0065	7		DIODE-VVC 29PF 3%	28480	0122-0065
A22CR11	0122-0065	7		DIODE-VVC 29PF 3%	28480	0122-0065
A22CR12	0122-0065	7		DIODE-VVC 29PF 3%	28480	0122-0065
2413A AND ABOVE						
A22CR9	0122-0167	0		DIODE-VVC 5.05PF 10% C3/C25-MIN=5	28480	0122-0167
A22CR10	0122-0167	0		DIODE-VVC 5.05PF 10% C3/C25-MIN=5	28480	0122-0167
A22CR11	0122-0167	0		DIODE-VVC 5.05PF 10% C3/C25-MIN=5	28480	0122-0167
A22CR12	0122-0167	0		DIODE-VVC 5.05PF 10% C3/C25-MIN=5	28480	0122-0167

†Refer to Section 7 for update information *Factory selected Component †Refer to section 7 Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A22CR13	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A22CR14	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A22CR15	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A22CR16	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A22E1	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A22E2	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A22J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A22L1	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A22L2△	9140-0264	5	3	INDUCTOR RF-CH-MLD 1.2UH 5%	28480	9140-0264
A22L3	9140-0325	9	1	INDUCTOR RF-CH-MLD 10UH 2% .312DX.969LG	06560	004414-012G
A22L4	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A22L5	9100-1615	8	1	INDUCTOR RF-CH-MLD 1.2UH 10%	28480	9100-1615
A22L6	9140-0324	8	1	INDUCTOR RF-CH-MLD 6.8UH 2% .312DX.969LG	06560	004414-010G
A22L7	9100-1616	9		INDUCTOR RF-CH-MLD 1.5UH 10%	28480	9100-1616
A22L8	9140-0180	4	1	INDUCTOR RF-CH-MLD 2.7UH 10%	28480	9140-0180
A22L9	9100-1616	9		INDUCTOR RF-CH-MLD 1.5UH 10%	28480	9100-1616
A22L10	9140-0112	2		INDUCTOR RF-CH-MLD 4.7UH 10%	28480	9140-0112
A22MP1	08901-00026	2	1	COVER LF VCXO	28480	08901-00026
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A22MP2	5001-0176	0		GROUND STRAP	28480	5001-0176
A22MP3	5001-0176	0		GROUND STRAP	28480	5001-0176
A22Q1	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A22Q2	1853-0012	4		TRANSISTOR PNP 2N2904A SI TO-39 PD = 600MW	01295	2N2904A
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A22Q3	1854-0610	0		TRANSISTOR NPN SI TO-46 FT = 800MHZ	28480	1854-0610
A22Q4	1854-0610	0		TRANSISTOR NPN SI TO-46 FT = 800MHZ	28480	1854-0610
A22Q5	1854-0247	9		TRANSISTOR NPN SI TO-39 PD = 1W FT = 800MHZ	28480	1854-0247
A22Q6	1854-0247	9		TRANSISTOR NPN SI TO-39 PD = 1W FT = 800MHZ	28480	1854-0247
A22Q7	1854-0610	0		TRANSISTOR NPN SI TO-46 FT = 800MHZ	28480	1854-0610
A22Q8	1854-0610	0		TRANSISTOR NPN SI TO-46 FT = 800MHZ	28480	1854-0610
A22Q9	1853-0001	1	1	TRANSISTOR PNP SI TO-39 PD = 600MW	28480	1853-0001
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A22R1	0757-0401	0		RESISTOR 100 1% .125W F TC = 0+-100	24546	C4-1/8-T0-101-F
A22R2	0757-0401	0		RESISTOR 100 1% .125W F TC = 0+-100	24546	C4-1/8-T0-101-F
A22R3	0757-0422	5		RESISTOR 909 1% .125W F TC = 0+-100	24546	C4-1/8-T0-909R-F
A22R4	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-1001-F
A22R5	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-4641-F
A22R6	0757-0439	4		RESISTOR 6.81K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-6811-F
A22R7	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0+-100	03888	PME55-1/8-T0-21R5-F
A22R8	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-4641-F
A22R9	0757-0439	4		RESISTOR 6.81K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-6811-F
A22R10	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0+-100	03888	PME55-1/8-T0-21R5-F

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). △ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A22R11	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A22R12	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A22R14	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A22R15	0698-8004	9	4	RESISTOR 200K .1% .1W F TC = 0 + -15	07716	MAR-1/10-T10-2003-B
A22R16	0698-8004	9		RESISTOR 200K .1% .1W F TC = 0 + -15	07716	MAR-1/10-T10-2003-B
A22R17	0698-3445	2		RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F
A22R18	0757-0398	4		RESISTOR 75 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-75R0-F
A22R19	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A22R20	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A22R21	0698-8004	9		RESISTOR 200K .1% .1W F TC = 0 + -15	07716	MAR-1/10-T10-2003-B
A22R22	0698-8004	9		RESISTOR 200K .1% .1W F TC = 0 + -15	07716	MAR-1/10-T10-2003-B
A22R23	0757-0400	9		RESISTOR 90.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-90R9-F
A22R24	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A22R25	0698-3430	5		RESISTOR 21.5 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-21R5-F
A22R26	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A22R27	0698-3435	0	1	RESISTOR 38.3 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-38R3-F
A22R28	0757-0421	4		RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A22R29	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A22R30	0698-3156	2		RESISTOR 14.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1472-F
A22R31	0698-3446	3		RESISTOR 383 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-383R-F
A22R32	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A22R33	0757-0403	2		RESISTOR 121 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-121R-F
A22R34	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A22R35	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A22R36	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A22R37	0757-0399	5		RESISTOR 82.5 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-82R5-F
A22R38	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A22R39	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A22T1	08660-60369	0	2	TRANSFORMER-RF GRN	28480	08660-60369
A22T2	08660-60369	0		TRANSFORMER-RF GRN	28480	08660-60369
A22TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A22TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
2314A TO 2551A						
A22Y1	0410-1181	1	1	CRYSTAL-QUARTZ 9.26 MHZ HC-42/U-HLDR	28480	0410-1181
	1200-0758	2	2	SOCKET-XTAL 2-CONT HC-25/U DIP-SLDR	28480	1200-0758
A22Y2	0410-1182	2	1	CRYSTAL-QUARTZ 11.26 MHZ HC-42/U-HLDR	28480	0410-1182
	1200-0758	2		SOCKET-XTAL 2-CONT HC-25/U DIP-SLDR	28480	1200-0758
2608A AND ABOVE						
A22Y1	0410-1615	6	1	CRYSTAL 9.26 MHZ	28480	0410-1615
	1400-0973	7	2	CLIP CMPNT .129D .154 DIA STL	28480	1400-0973
A22Y2	0410-1615	6	1	CRYSTAL 9.26 MHZ	28480	0410-1615
	1400-0973	7	2	CLIP CMPNT .129D .154 DIA STL	28480	1400-0973

†Refer to section 7 for update information *Factory selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A23						
A23	08901-60144	1	1	SAMPLER ASSEMBLY	28480	08901-60144
A23C1	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A23C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A23C3	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A23C4	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A23C5	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A23C6	0180-2617	1	7	CAPACITOR-FXD 6.8UF +-10% 35VDC TA	25088	D6R8GS1B35K
*A23C7	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A23C8	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A23C9	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A23C10	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A23C11	0180-2618	2	1	CAPACITOR-FXD 33UF +-10% 10VDC TA	25088	D33GS1B10K
A23C12	0180-2617	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	25088	D6R8GS1B35K
A23C13	0180-2617	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	25088	D6R8GS1B35K
A23C14	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A23C15	0180-2617	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	25088	D6R8GS1B35K
A23C16	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A23C17	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A23C18	0160-3876	4	6	CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A23C19	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A23C20	0160-3873	1		CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A23C21	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A23C22	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A23C23	0160-3873	1		CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A23C24	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A23C25	0160-3873	1		CAPACITOR-FXD 4.7PF +-.5PF 200VDC CER	28480	0160-3873
A23C26	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A23C27	0180-1745	4	1	CAPACITOR-FXD 1.5UF +-10% 20VDC TA	56289	150D155X9020A2
A23C28	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A23C29	0180-0291	3		CAPACITOR-FXD 1UF +-10% 35VDC TA	56289	150D105X9035A2
A23C30	0160-5699	3		CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-30	28480	0160-5699
A23C31	0180-0291	3		CAPACITOR-FXD 1UF +-10% 35VDC TA	56289	150D105X9035A2
A23C32	0180-2617	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	25088	D6R8GS1B35K
A23C33	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A23C34	0180-0291	3		CAPACITOR-FXD 1UF +-10% 35VDC TA	56289	150D105X9035A2
A23C35	0180-0197	8		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A23C36	0180-2617	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	25088	D6R8GS1B35K
A23C37	0160-4653	7	1	CAPACITOR-FXD .1UF +-5% 100VDC MET-POLYP	28480	0160-4653
A23C38	0180-0291	3		CAPACITOR-FXD 1UF +-10% 35VDC TA	56289	150D105X9035A2
A23C39	0180-0291	3		CAPACITOR-FXD 1UF +-10% 35VDC TA	56289	150D105X9035A2
A23C40	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A23C41	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A23C42	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A23C43	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A23C44	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571

†Refer to Section 7 for update information *Factory selected component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A23C45*△	0160-3568	1	1	CAPACITOR-FXD 2.7PF +-.25PF 200VDC CER	28480	0160-3568
A23CR1	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A23CR2	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A23CR3	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD=.4W	28480	1902-0041
A23CR4	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A23CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A23CR6	1906-0098	9	4	DIODE-MATCHED 1V	28480	1906-0098
A23CR7	1906-0098	9		DIODE-MATCHED 1V	28480	1906-0098
A23CR8	1906-0098	9		DIODE-MATCHED 1V	28480	1906-0098
A23CR9	1906-0098	9		DIODE-MATCHED 1V	28480	1906-0098
A23CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A23CR11	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A23CR12	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A23CR13	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A23CR14	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A23CR15	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A23DS1	1990-0326	3	2	LED-LAMP LUM-INT=300UCD IF=50MA-MAX	28480	5082-4444
A23DS2	1990-0326	3		LED-LAMP LUM-INT=300UCD IF=50MA-MAX	28480	5082-4444
A23E1	9170-0029	3		CORE-SHIELDING BEAD	28480	9170-0029
A23J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A23J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A23L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A23L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A23L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A23L4	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A23L5	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A23L6	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A23L7-L9				PART OF ETCHED CIRCUIT BOARD		
A23L10	9100-2250	9	2	INDUCTOR RF-CH-MLD 180NH 10% .105DX.26LG	28480	9100-2250
A23L11	9100-2250	9		INDUCTOR RF-CH-MLD 180NH 10% .105DX.26LG	28480	9100-2250
A23L12				PART OF ETCHED CIRCUIT BOARD		
A23L13				PART OF ETCHED CIRCUIT BOARD		
A23L14	9140-0144	0	3	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A23L15	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A23L16	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A23MP1	08901-00024	0	1	COVER SAMP	28480	08901-00024
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A23MP2	5001-0176	0		GROUND STRAP	28480	5001-0176
A23MP3	5001-0176	0		GROUND STRAP	28480	5001-0176

[1]Refer to Section 7 for update information. *Factory selected component (Refer to Section 7). △ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
2314A TO 2413A						
A23MP4	08662-00040	0		SHIELD COMP SMALL	28480	08662-00040
A23MP5	08662-00038	6		SHIELD CKT SM	28480	08662-00038
2414A AND ABOVE						
A23MP4				NOT ASSIGNED		
A23MP5				NOT ASSIGNED		
A23Q1	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A23Q2	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A23Q3	1854-0023	9		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0023
A23Q4	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A23Q5	1854-0210	6		TRANSISTOR NPN 2N2222 SI TO-18 PD=500MW	04713	2N2222
A23Q6	1853-0281	9		TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
	1205-0037	0	1	HEAT SINK TO-18-CS	28480	1205-0037
A23Q7	1853-0038	4	1	TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0038
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A23Q8	1853-0020	4		TRANSISTOR PNP SI PD=300MW FT=150MHZ	28480	1853-0020
A23Q9	1855-0049	1		TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	28480	1855-0049
A23Q10	1853-0020	4		TRANSISTOR PNP SI PD=300MW FT=150MHZ	28480	1853-0020
A23Q11	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A23Q12	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A23R1	0757-0288	1		RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
A23R2	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A23R3	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A23R4	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A23R5	0757-0405	4		RESISTOR 162 1% .125W F TC=0+-100	24546	C4-1/8-T0-162R-F
A23R6	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A23R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A23R8	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A23R9	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A23R10	0757-0405	4		RESISTOR 162 1% .125W F TC=0+-100	24546	C4-1/8-T0-162R-F
A23R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A23R12	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A23R13	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A23R14	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A23R15	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A23R16	0698-3631	8	1	RESISTOR 330 5% 2W MO TC=0+-200	28480	0698-3631
A23R17	0698-3399	5	1	RESISTOR 133 1% .5W F TC=0+-100	28480	0698-3399
A23R18	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A23R19	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A23R20	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A23R21	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A23R22	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A23R23	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-TO-51R1-F
A23R24	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A23R25	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A23R26	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827

†Refer to Section 7 for update information   *Factory Selected Component (Refer to Section 5)   Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A23R27	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A23R28	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A23R29	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A23R30	0698-3151	7		RESISTOR 2.87K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2871-F
A23R31	0698-3151	7		RESISTOR 2.87K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2871-F
A23R32	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A23R33	2100-2633	5	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	30983	ET50X102
A23R34	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A23R35	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A23R36	0698-7212	9		RESISTOR 100 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-100R-F
A23R37	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A23R38	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A23R39	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A23R40	0698-3162	0		RESISTOR 46.4K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4642-F
A23R41	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A23R42	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A23R43	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A23R44	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A23R45	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A23R46	0698-3260	9	3	RESISTOR 464K 1% .125W F TC = 0 + -100	28480	0698-3260
A23R47	0698-3260	9		RESISTOR 464K 1% .125W F TC = 0 + -100	28480	0698-3260
A23R48	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A23R49	0698-3260	9		RESISTOR 464K 1% .125W F TC = 0 + -100	28480	0698-3260
A23R50	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A23R51	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A23R52	0757-0421	4		RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A23R53	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A23R54	2100-2521	0	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	30983	ET50X202
A23R55*△	0757-0278	9	48	RESISTOR 1.78K 1% .125W F TC = 0 + -100	28480	0757-0278
A23R56	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A23R57	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A23R58	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A23R59	0757-0379	1	1	RESISTOR 12.1 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-12R1-F
A23R60	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A23R61	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A23R62	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A23R63	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A23T1	08901-80042	0	1	SAMPLER TRANS	28480	08901-80042
A23TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A23U1	1826-0138	8	3	IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A23U2	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
A23VR1	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD = .4W	28480	1902-0041
A23VR2	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD = .4W	28480	1902-0041
A23VR3	1902-0041	4		DIODE-ZNR 5.11V 5% DO-35 PD = .4W	28480	1902-0041
A23VR4	1902-0554	4	2	DIODE-ZNR 10V 5% PD = 1W IR = 10UA	28480	1902-0554
A23VR5	1902-0554	4		DIODE-ZNR 10V 5% PD = 1W IR = 10UA	28480	1902-0554
A23W1	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005

†Refer to Section 7 for update information *Factory selected Component (Refer to Section 6) △ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A24						
A24	08901-60021	3	1	HIGH FREQUENCY VCO ASSEMBLY	28480	08901-60021
A24C1	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A24C2	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A24C3	0160-0575	4	12	CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A24C4	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C5	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C6	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A24C7	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A24C8	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A24C9	0160-0573	2	1	CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573
A24C10	0160-3402	2		CAPACITOR-FXD 1UF +-5% 50VDC MET-POLYC	28480	0160-3402
A24C11	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A24C12Δ	0160-5951	0	1	CAPACITOR-FXD 390PF +-5% 50VDC CER 0+-30	28480	0160-5951
A24C13	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A24C14	0160-5034	0	1	CAPACITOR-FXD 120PF +-2% 50VDC CER 0+-30	95275	VJ0805A121GH
A24C15	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C16				NOT ASSIGNED		
A24C17	0160-4519	4	1	CAPACITOR-FXD 9.1PF +-.5PF 200VDC CER	28480	0160-4519
A24C18	0160-4103	2	1	CAPACITOR-FXD 220PF +-5% 100VDC CER	72982	8121-M100-COG-221J
A24C19	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C20	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C21	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C22	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C23	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C24	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C25	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C26	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C27	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C28	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C29	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A24C30				NOT ASSIGNED		
A24C31	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A24C32	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A24C33	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A24C34	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A24C35	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A24C36	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A24CR1	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A24CR2	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A24CR3Δ	0122-0173	8		DIODE-VVC 29PF 7% BVR=30	28480	0122-0173
A24CR4Δ	0122-0173	8		DIODE-VVC 29PF 7% BVR=30	28480	0122-0173

[1]Refer to section 7 for update information. *Factory selected Component (Refer to section 4). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A24CR5	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A24CR6	1901-0880	7		DIODE-GEN PRP 125MA DO-35	28480	1901-0880
A24J1	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A24J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A24L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A24L2	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A24L3	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A24L4	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A24L5	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A24L6	9100-2251	0	2	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A24L7	08901-00068	2	1	INDUCTOR	28480	08901-00068
A24L8	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A24L9				PART OF ETCHED CIRCUIT BOARD		
A24L10				PART OF ETCHED CIRCUIT BOARD		
A24MP1	08901-00023	9	1	COVER HF VCO	28480	08901-00023
A24MP2	5001-0176	0		GROUND STRAP	28480	5001-0176
A24MP3	5001-0176	0		GROUND STRAP	28480	5001-0176
A24MP4	08662-00040	0		SHLD COMP SMALL	28480	08662-00040
A24MP5	08662-00038	6		SHIELD CKT SM	28480	08662-00038
A24MP6	08901-00043	3	1	GASKT-HF VCO	28480	08901-00043
A24Q1	1854-0247	9		TRANSISTOR NPN SI TO-39 PD = 1W FT = 800MHZ	28480	1854-0247
	0340-0834	0	1	INSULATOR-XSTR POLYI	28480	0340-0834
A24Q2	1855-0020	8		TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0020
A24Q3	1855-0020	8		TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0020
A24Q4	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A24Q5	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A24Q6	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A24Q7	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A24Q8	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD = 360MW	04713	2N3251
A24R1	0698-7236	7		RESISTOR 1K 1% .05W F TC = 0 + -100	24546	C3-1/8-T0-1001-F
A24R2	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A24R3	0698-3449	6	2	RESISTOR 28.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2872-F
A24R4	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A24R5	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A24R6	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A24R7	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A24R8	0757-0402	1		RESISTOR 110 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-111-F
A24R9	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A24R10	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A24R11	0698-3151	7		RESISTOR 2.87K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2871-F
A24R12	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A24R13	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A24R14	0757-0405	4		RESISTOR 162 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-162R-F
A24R15	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A24R16				NOT ASSIGNED		

†Refer to Section I for update information. ‡Factory Selected Component (Refer to section 5). Δ Exact part number

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A24R17	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A24R18	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A24R19	0698-3405	4	1	RESISTOR 422 1% .5W F TC = 0 + -100	28480	0698-3405
A24R20	0698-7195	7		RESISTOR 19.6 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-19R6-F
A24R21	0757-0402	1		RESISTOR 110 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-111-F
A24R22	0757-0402	1		RESISTOR 110 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-111-F
A24R23	0698-7219	6		RESISTOR 196 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-196R-F
A24R24	0698-7206	1	1	RESISTOR 56.2 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-56R2-F
A24R25	0698-7222	1	1	RESISTOR 261 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-261R-F
A24R26	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A24R27	0698-7199	1	1	RESISTOR 28.7 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-28R7-F
A24TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A24TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A24TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A24U1	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A24U2	1826-0372	2		IC MISC 8-DIP-P PKG	28480	1826-0372
A24U3	1820-5543	7	1	IC OP-AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	28480	1820-5543

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A25						
2314A TO 2608A						
A25	08901-60137	2	1	AUDIO MOTHER BOARD ASSEMBLY	28480	08901-60137
2619A AND ABOVE						
A25	08902-60116	8	1	AUDIO MOTHER BOARD ASSEMBLY	28480	08902-60116
A25C1	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A25C2	0160-3466	8	1	CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A25J1	1250-0836	2	1	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0836
A25J2	1251-7998	3	4	CONN-POST TYPE .100-PIN-SPCG 16-CONT	28480	1251-7998
A25J3	1251-7998	3		CONN-POST TYPE .100-PIN-SPCG 16-CONT	28480	1251-7998
A25J4	1251-5169	6		CONNECTOR 6-PIN M POST TYPE	28480	1251-5169
A25J5	1251-5643	1	1	CONNECTOR 4-PIN M POST TYPE	28480	1251-5643
A25R1	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A25R2	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A25XA1				NOT ASSIGNED		
A25XA2	1251-2035	9	8	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A25XA3	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A25XA4	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A25XA5	1251-1365	6	6	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A25XA6	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A25XA7	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A25XA8	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A25XA9-XA49				NOT ASSIGNED		
A25XA50	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A25XA51	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A25XA52	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A25XA53	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365

†Refer to Section 7 for update information *Factory selected component (Refer to Section ...) Δ Parts part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A26						
A26	08901-60142	9	1	POWER SUPPLY MOTHER BOARD ASSEMBLY	28480	08901-60142
A26C1	0160-0889	3	1	CAPACITOR-FXD .33UF +-10% 80VDC POLYE	28480	0160-0889
A26C2	0160-0168	1	1	CAPACITOR-FXD .1UF +-10% 200VDC POLYE	28480	0160-0168
A26C3	0180-3017	7	1	CAPACITOR-FXD .045F+75-10% 25VDC AL	28480	0180-3017
	2190-0034	5	10	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
	2680-0099	1	8	SCREW-MACH 10-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A26C4	0180-0480	2	1	CAPACITOR-FXD 4500UF+75-10% 25VDC AL	00853	500452U025AA2A
	2190-0034	5		WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
	2680-0099	1		SCREW-MACH 10-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A26C5	0160-4065	5	2	CAPACITOR-FXD .1UF +-20% 250VAC(RMS)	28480	0160-4065
A26C6	0180-3110	1	1	CAPACITOR-FXD .013F+75-10% 40VDC AL	28480	0180-3110
	2190-0034	5		WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
	2680-0099	1		SCREW-MACH 10-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A26C7	0180-0677	9	1	CAPACITOR-FXD 5800UF+75-10% 40VDC AL	28480	0180-0677
	2190-0034	5		WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A26C7	2680-0099	1		SCREW-MACH 10-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A26C8	0180-1797	6	1	CAPACITOR-FXD 50UF+50-10% 150VDC AL	56289	39D506F150FJ4
A26C9	0180-2207	5	1	CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A26CR1	1901-0662	3	6	DIODE-PWR RECT 100V 6A	04713	MR751
A26CR2	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A26CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A26CR4	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A26CR5	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A26CR6	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A26CR7	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A26CR8	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	28480	1901-0028
A26F1	2110-0331	7	1	FUSE .3A 250V .25X.27	28480	2110-0331
	1251-8305	8	4	CABLE CLAMP-RECT CONN	28480	1251-8305
A26J1	1251-3412	8	1	CONNECTOR 6-PIN M POST TYPE	28480	1251-3412
A26J2	1251-5169	6		CONNECTOR 6-PIN M POST TYPE	28480	1251-5169
A26J3	1251-5169	6		CONNECTOR 6-PIN M POST TYPE	28480	1251-5169
A26J4				NOT ASSIGNED		
A26J5	1251-5636	2	1	CONNECTOR 11-PIN M POST TYPE	28480	1251-5636
A26J6	1251-8041	9	1	CONN-POST TYPE .156-PIN-SPCG 8-CONT	28480	1251-8041
A26K1	0490-0618	5	1	RELAY 2C 24VDC-COIL 5A 115VAC	28480	0490-0618
A26MP1	08901-20049	1	1	SHIELD/HI VOLTAGE	28480	08901-20049
	0361-0207	5	1	RIVET-BLIND DR-PIN RNDH .125DIA	00000	ORDER BY DESCRIPTION
	2190-0008	3		WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
	2360-0119	8	1	SCREW-MACH 6-32 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	3050-0003	3	2	WASHER-FL NM NO. 6 .141-IN-ID .375-IN-OD	28480	3050-0003
	3050-0227	3	2	WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
	7120-4163	7	1	LABEL-WARNING .5-IN-WD 1-IN-LG AL	28480	7120-4163

‡Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ First part Usage

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A26Q1	1884-0276	7	1	THYRISTOR-TRIAC TO-220AB	28480	1884-0276
A26R1	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A26R2	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R3	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A26R4	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A26R5	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A26R6	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A26VR1	1902-3381	1	2	DIODE-ZNR 68.1V 5% DO-7 PD=.4W TC=+.079%	28480	1902-3381
A26VR2	1902-3381	1		DIODE-ZNR 68.1V 5% DO-7 PD=.4W TC=+.079%	28480	1902-3381
A26XA1-XA9				NOT ASSIGNED		
A26XA10	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365

◊Refer to Section 7 for update information

*Factory Selected Component (Refer to Section 5)

△ Errata part change

Table 6-3. Replaceable Parts

A27 08901-60140 – SERIAL PREFIX 2314A TO 2635A

Reference Designation	HP Part Number	CD	Qty.	Description	Mfr. Code	Mfr. Part Number
A27	08901-60140	7	1	DIGITAL MOTHER BOARD ASSEMBLY	28480	08901-60140
A27C1	0160-4389	6	27	CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C2	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C3	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C4	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C5	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C6	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C7	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C8	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C9	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C10	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C11	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C12	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C13	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C14	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C15	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C16	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C17	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C18	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C19	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C20	0160-4389	6		CAPACITOR-FXD 100PF +-.5PF 200VDC CER	28480	0160-4389
A27C21	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27C22	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27C23	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27C24	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27J1	1251-8417	3	2	CONN POST HDR 16	28480	1251-8417
A27J2	1251-8417	3		CONN POST HDR 16	28480	1251-8417
A27J3	1200-0507	9		SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0507
A27J4	1251-5169	6		CONNECTOR 6-PIN M POST TYPE	28480	1251-5169
A27XA1-XA10				NOT ASSIGNED		
A27XA11A	1251-6050	6	5	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-6050
A27XA12A	1251-6050	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-6050
A27XA12B	1251-6052	8	3	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-6052
A27XA13A	1251-6050	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-6050
A27XA13B	1251-6052	8		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-6052
A27XA14A	1251-6050	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-6050
A27XA14B	1251-6052	8		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-6052

†Refer to Section 7 for update information *Factory selected component (Refer to Section 5) Δ [illegible]

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A27	**08902-60102 – SERIAL PREFIX 2636A AND ABOVE**					
A27	08902-60102	2	1	DIGITAL MOTHER BOARD ASSEMBLY	28480	08902-60102
A27C1	0160-4389	6	28	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C2	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C3	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C4	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C5	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C6	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C7	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C8	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C9				NOT ASSIGNED		
A27C10	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C11	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C12	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C13	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C14	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C15	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C16	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C17	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C18	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C19	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C20	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A27C21	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27C22	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27C23	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27C24	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A27J1	1251-8417	3	2	CONN POST HDR 16	28480	1251-8417
A27J2	1251-8417	3		CONN POST HDR 16	28480	1251-8417
A27J3	1200-0507	9		SOCKET-IC 16-CONT DIP-SLDR	28480	1200-0507
	1251-4460	8		CLIP-CABLE PLUG RTNG-DUAL INLINE 16 CONT	28480	1251-4460
A27J4	1251-5169	6		CONNECTOR 6-PIN M POST TYPE	28480	1251-5169
A27XA1-XA10				NOT ASSIGNED		
A27XA11A	1251-1365	6	5	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A27XA12A	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A27XA12B	1251-2035	9	3	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A27XA13A	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A27XA13B	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A27XA14A	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A27XA14B	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035

†Refer to section 7 for update information *Factory selected component (listed in section 7) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A28						
A28	08901-60229	3	1	RF MOTHERBOARD ASSEMBLY	28480	08901-60229
A28C1	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A28C2	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A28C3	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A28C4	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A28J1	1251-4966	9	1	CONNECTOR 8-PIN M POST TYPE	28480	1251-4966
A28J2	1251-7998	3		CONN-POST TYPE .100-PIN-SPCG 16-CONT	28480	1251-7998
A28J3	1251-7998	3		CONN-POST TYPE .100-PIN-SPCG 16-CONT	28480	1251-7998
A28XA1-XA14				NOT ASSIGNED		
A28XA15	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A28XA16	1251-0472	4	7	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472
A28XA17	1251-0472	4		CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472
A28XA18	1251-0472	4		CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472
A28XA19	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A28XA20	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A28XA21	1251-0472	4		CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472
A28XA22	1251-0472	4		CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472
A28XA23	1251-0472	4		CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472
A28XA24	1251-0472	4		CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472

†Refer to Section 7 for update information   *Factory Selected Component (Refer to [illegible])   Δ [illegible]

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A29						
A29	08901-60181	6	1	SERIES REGULATOR HEAT SINK ASSEMBLY	28480	08901-60181
A29MP1	1400-0017	0	1	CLAMP-CABLE .312-DIA .375-WD NYL	28480	1400-0017
	2190-0006	1	1	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0006
	2360-0127	8	1	SCREW-MACH 6-32 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2420-0002	6	1	NUT-HEX-DBL-CHAM 6-32-THD .109-IN-THK	28480	2420-0002
	3050-0227	3		WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
A29MP2	08901-20218	6	1	HEATSINK	28480	08901-20218
	2200-0107	6	4	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A29Q1	1853-0344	5	1	TRANSISTOR PNP 2N5876 SI TO-3 PD = 150W	04713	2N5876
	0340-0486	8	4	INSULATOR-COVER NYLON	28480	0340-0486
	2360-0123	4	4	SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	5001-5501	5	4	TRANS SPACER TO3	28480	5001-5501
A29Q2	1853-0411	7	1	TRANSISTOR PNP 2N6050 SI DARL TO-3	28480	1853-0411
	0340-0486	8		INSULATOR-COVER NYLON	28480	0340-0486
	2360-0123	4		SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	5001-5501	5		TRANS SPACER TO3	28480	5001-5501
A29Q3	1854-0669	9	1	TRANSISTOR NPN 2N6057 SI TO-3 PD = 150W	04713	2N6057
	0340-0486	8		INSULATOR-COVER NYLON	28480	0340-0486
	2360-0123	4		SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	5001-5501	5		TRANS SPACER TO3	28480	5001-5501
A29Q4	1854-0743	0	1	TRANSISTOR NPN 2N5878 SI TO-3 PD = 150W	01295	2N5878
	0340-0486	8		INSULATOR-COVER NYLON	28480	0340-0486
	2360-0123	4		SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	5001-5501	5		TRANS SPACER TO3	28480	5001-5501
A29W1	08901-60233	9	1	HEATSINK CABLE 01B	28480	08901-60233

†Refer to Section 7 for update information. *Factory selected components. Refer to Section 7. Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A30						
A30	0960-0443	1	1	LINE MODULE-FILTERED	28480	0960-0443
A30C1	0160-4065	5		CAPACITOR-FXD .1UF +-20% 250VAC(RMS)	28480	0160-4065
A30TB1				LINE VOLTAGE SELECTOR CARD (P/O A30) (NOT SEPARATELY REPLACEABLE)		

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Parts part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A31						
A31	08901-60242	0	1	REMOTE INTERFACE CONNECTOR ASSEMBLY	28480	08901-60242
A31J1	1251-3283	1	1	CONNECTOR 24-PIN F MICRORIBBON	28480	1251-3283
A31J2	1251-5240	4	1	CONNECTOR 20-PIN M POST TYPE	28480	1251-5240
A31MP1	0380-0644	4	2	STANDOFF-HEX .327-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
	2190-0034	5		WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
A31MP2	1530-1098	4	2	CLEVIS 0.070-IN W SLT: 0.454-IN PIN CTR	00000	ORDER BY DESCRIPTION
	2190-0019	6	2	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
	2200-0109	8	2	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2260-0002	6	2	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	28480	2260-0002

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 7) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A32						
A32	08901-60227	1	1	POWER REFERENCE OSCILLATOR ASSEMBLY	28480	08901-60227
	08901-00194	5	1	P.C. SHIELD	28480	08901-00194
A32C1	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A32C2	0160-3036	8	2	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
	2190-0009	4	2	WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
	2580-0002	4	2	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
A32C3	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
	2190-0009	4		WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
	2580-0002	4		NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
A32C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A32C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A32C6	0160-2027	5	1	CAPACITOR-FXD 300PF +-5% 500VDC MICA	28480	0160-2027
A32C7	0160-3070	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-3070
A32C8	0180-0100	3		CAPACITOR-FXD 4.7UF +-10% 35VDC TA	56289	150D475X9035B2
A32C9	0160-2255	1	1	CAPACITOR-FXD 8.2PF +-.25PF 500VDC CER	28480	0160-2255
	4330-0145	9		INSULATOR-BEAD GLASS	28480	4330-0145
A32C10	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A32C11	0160-0179	4	1	CAPACITOR-FXD 33PF +-5% 300VDC MICA	28480	0160-0179
A32C12	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A32C13	0160-4006	4	1	CAPACITOR-FXD 36PF +-5% 300VDC GL	28480	0160-4006
A32C14	0160-4007	5	1	CAPACITOR-FXD 200PF +-5% 300VDC GL	28480	0160-4007
A32CR1	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A32CR2	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A32CR3	0122-0299	9	1	DIODE-VVC 82PF 5% C2/C20-MIN = 2 BVR = 20V	28480	0122-0299
A32J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A32L1	08901-80043	1	1	COIL VARIABLE	28480	08901-80043
A32L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A32L3	08901-80044	2	1	COIL 3 1/2 TURNS	28480	08901-80044
A32MP1	08901-20232	4	1	OSC COVER	28480	08901-20232
A32Q1	1854-0247	9		TRANSISTOR NPN SI TO-39 PD = 1W FT = 800MHZ	28480	1854-0247
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A32Q2	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A32R1	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-1002-F
A32R2*	0757-1094	9	10	RESISTOR 1.47K 1% .125W F TC = 0 +-100	24546	C4-1/8-T0-1471-F
A32R3	0811-3234	9	1	RESISTOR 10K 1% .05W PWW TC = 0 +-10	20940	140-1/20-1002-F
A32R4	2100-3154	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	02111	43P102
A32R5*	0811-3381	7	1	RESISTOR 7.1K 1% .05W PWW TC = 0 +-10	28480	0811-3381

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 7) Δ Exact part number

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A32R6	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A32R7	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A32R8	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A32R9	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A32R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A32R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A32R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A32R13	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A32R14	0757-0398	4		RESISTOR 75 1% .125W F TC=0+-100	24546	C4-1/8-T0-75R0-F
A32R15	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A32R16	0698-8581	7	1	RESISTOR 50.5 1% .125W F TC=0+-25	28480	0698-8581
A32U1	1826-0013	8		IC OP AMP LOW-NOISE TO-99 PKG	06665	SSS741CJ
A32U2	1820-0223	0	1	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A32VR1	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	24046	1N827
A32VR2*	1902-0956	0	1	DIODE-ZNR 8.2V 5% DO-35 PD=.4W TC=+.065%	28480	1902-0956

†Refer to Section 7 for update information *Factory selected component (refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

A50

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A50	08901-60220	4	1	AM CALIBRATOR ASSEMBLY	28480	08901-60220
A50C1	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C2	0180-0058	0		CAPACITOR-FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A50C3	0180-0058	0		CAPACITOR-FXD 50UF+75-10% 25VDC AL	56289	30D506G025CC2
A50C4	0180-2617	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	25088	D6R8GS1B35K
A50C5	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C6	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	D22GS1B15K
A50C7	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C8	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C9	0160-0207	9	1	CAPACITOR-FXD .01UF +-5% 200VDC POLYE	28480	0160-0207
A50C10	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	D22GS1B15K
A50C11	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C12	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C13	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C14	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	D22GS1B15K
A50C15	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	D22GS1B15K
A50C16	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A50C17	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C18	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C19	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C20	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C21				NOT ASSIGNED		
A50C22	0160-3454	4	1	CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A50C23	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C24	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C25	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C26	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C27	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C28	0160-3691	1	1	CAPACITOR-FXD 75PF +-1% 100VDC MICA	28480	0160-3691
A50C29	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	D22GS1B15K
A50C30	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A50C31	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C32	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C33	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C34	0160-2414	4	1	CAPACITOR-FXD .022UF +-5% 200VDC POLYE	28480	0160-2414
A50C35	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C36	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C37	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C38	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C39	0180-2619	3		CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	D22GS1B15K
A50C40	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C41	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C42	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A50C43	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C44	0160-0127	2	1	CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A50C45	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084

†Refer to Section 7 for update information *Factory selected component (Refer to Section 5) Δ Latest part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A50C46	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C47	0160-0153	4		CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A50C48	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C49	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A50C50	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A50C51	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C52	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50C53	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A50C54	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A50CR1	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR2	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR3	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR4	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR5	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR6	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR7	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR8	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A50CR9	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A50CR10	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A50CR11	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A50CR12	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A50E1	9170-0847	3	4	CORE-SHIELDING BEAD	02114	56-590-65/3B PARYLENE
A50E2	9170-0847	3		CORE-SHIELDING BEAD	02114	56-590-65/3B PARYLENE
A50J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A50J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A50L1	9100-1635	2	9	INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A50L2	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A50L3	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A50L4	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A50L5	9100-1637	4	2	INDUCTOR RF-CH-MLD 120UH 5% .166DX.385LG	28480	9100-1637
A50L6	9100-1637	4		INDUCTOR RF-CH-MLD 120UH 5% .166DX.385LG	28480	9100-1637
A50L7	9100-3913	3	1	INDUCTOR RF-CH-MLD 3.3UH 5% .166DX.385LG	28480	9100-3913
A50L8	9140-0179	1	1	INDUCTOR RF-CH-MLD 22UH 10% .166DX.385LG	28480	9140-0179
A50MP1	08901-00129	6	1	COVER AM CAL	28480	08901-00129
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A50MP2	08901-00114	9	1	LABEL AM CAL	28480	08901-00114
A50Q1	1854-0811	3	1	TRANSISTOR NPN SI PD = 625MW FT = 100MHZ	28480	1854-0811
A50Q2	1854-0345	8	3	TRANSISTOR NPN 2N5179 SI TO-72 PD = 200MW	04713	2N5179
A50Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD = 200MW	04713	2N5179
A50Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD = 200MW	04713	2N5179
A50Q5	1854-0475	5		TRANSISTOR-DUAL NPN PD = 750MW	28480	1854-0475
A50Q6	1854-0019	3	2	TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0019

†Refer to section 7 for update information. *Factory selected component (Refer to Section 5). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A50Q7	1854-0019	3		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0019
A50Q8	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q9	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q10	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q11	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q12	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q13	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q14	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A50Q15	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q16	1853-0034	0		TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A50Q17	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A50Q18	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q19	1853-0034	0		TRANSISTOR PNP SI TO-18 PD = 360MW	28480	1853-0034
A50Q20	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD = 500MW	04713	2N2222A
A50Q21	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50Q22	1853-0020	4		TRANSISTOR PNP SI PD = 300MW FT = 150MHZ	28480	1853-0020
A50Q23	1854-0071	7		TRANSISTOR NPN SI PD = 300MW FT = 200MHZ	28480	1854-0071
A50R1	0757-0346	2		RESISTOR 10 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-10R0-F
A50R2	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A50R3	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A50R4	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A50R5	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A50R6	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A50R7	0698-3152	8		RESISTOR 3.48K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3481-F
A50R8	0698-5466	1	1	RESISTOR 5.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5701-F
A50R9	0698-3153	9		RESISTOR 3.83K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3831-F
A50R10	0698-3150	6		RESISTOR 2.37K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2371-F
A50R11	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A50R12	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A50R13	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A50R14	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A50R15	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A50R16	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A50R17	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A50R18	0698-3158	4		RESISTOR 23.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2372-F
A50R19	0698-3158	4		RESISTOR 23.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2372-F
A50R20	0698-4439	6	2	RESISTOR 3.24K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3241-F
A50R21	0698-4439	6		RESISTOR 3.24K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3241-F
A50R22	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A50R23	0757-0447	4		RESISTOR 16.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1622-F
A50R24	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A50R25	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A50R26	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A50R27	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A50R28	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A50R29	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A50R30	0698-3431	6		RESISTOR 23.7 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-23R7-F

†Refer to section 7 for update information *Factory selected component (Refer to Section 8) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A50R31	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A50R32	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A50R33	0698-3431	6		RESISTOR 23.7 1% .125W F TC = 0 + -100	03888	PME55-1/8-T0-23R7-F
A50R34	0698-3438	3		RESISTOR 147 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-147R-F
A50R35	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A50R36	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A50R37	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A50R38	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A50R39	2100-3207	1		RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	28480	2100-3207
A50R40	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A50R41	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A50R42	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A50R43	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A50R44	0757-0421	4		RESISTOR 825 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-825R-F
A50R45	2100-3349	2	2	RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	28480	2100-3349
A50R46	0698-3442	9		RESISTOR 237 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-237R-F
A50R47	0698-3447	4		RESISTOR 422 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-422R-F
A50R48	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A50R49	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A50R50	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A50R51	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A50R52	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A50R53	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A50R54	0757-0419	0		RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
A50R55	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A50R56	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A50R57	0757-0419	0		RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
A50R58	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A50R59	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A50R60	0698-3153	9		RESISTOR 3.83K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3831-F
A50R61	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A50R62	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A50R63	0757-0440	7		RESISTOR 7.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-7501-F
A50R64	0757-0440	7		RESISTOR 7.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-7501-F
A50R65	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A50R66	0698-4190	6	1	RESISTOR 50 .25% .125W F TC = 0 + -100	03888	PME55-1/8-T0-50R0-C
A50R67	0698-3488	3	1	RESISTOR 442 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-422R-F
A50R68	0757-0428	1		RESISTOR 1.62K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1621-F
A50R69	0698-6235	4	1	RESISTOR 96.25 .5% .125W F TC = 0 + -100	24546	C4-1/8-T0-96R25-D
A50R70	0757-0439	4		RESISTOR 6.81K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6811-F
A50R71	0698-7982	0	1	RESISTOR 71.16 .1% .25W F TC = 0 + -50	19701	MF52C1/4-T2-71R16-B
A50R72	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A50R73	0757-0419	0		RESISTOR 681 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-681R-F
A50R74	0698-3445	2		RESISTOR 348 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-348R-F
A50R75	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A50R76	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A50R77	0698-7981	9	1	RESISTOR 96.25 .1% .25W F TC = 0 + -50	19701	MF52C1/4-T2-96R25-B
A50R78	0757-0424	7		RESISTOR 1.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1101-F
A50R79	0698-3442	9		RESISTOR 237 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-237R-F
A50R80	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F

*Refer to section 7 for update information. **Factory selected component. Refer to Section 7. Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A50R81	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F
A50R82	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A50R83	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A50R84	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A50R85	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A50R86	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A50R87	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A50R88	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A50R89	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A50R90	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A50R91	0757-0402	1		RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
A50R92	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A50R93	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R94	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A50R95	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A50R96	0698-6343	5		RESISTOR 9K .1% .125W F TC=0+-25	28480	0698-6343
A50R97	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A50R98	0698-3491	8	1	RESISTOR 1K .1% .125W F TC=0+-50	28480	0698-3491
A50R99	0698-3449	6		RESISTOR 28.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2872-F
A50R100	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R101	0698-4158	6	1	RESISTOR 100K .1% .125W F TC=0+-50	28480	0698-4158
A50R102	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A50R103	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R104	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A50R105	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R106	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A50R107	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A50R108	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A50R109	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A50TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A50TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A50TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A50U1	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A50U2	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A50U3	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A50U4	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A50U5	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A50U6	1826-0180	0		IC TIMER TTL MONO/ASTBL	01295	NE555P
A50U7	1820-1963	7	2	IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	3L585	CD4013BAE
A50U8	1826-0138	8		IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A50U9	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A50U10	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A50VR1	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	24046	1N827
A50VR2	1902-3059	0		DIODE-ZNR 3.83V 5% DO-35 PD=.4W	28480	1902-3059
A50VR3	1902-3104	6	3	DIODE-ZNR 5.62V 5% DO-35 PD=.4W	28480	1902-3104

*Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 7). Δ Exact part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A51						
A51	08901-60013	3	1	FM CALIBRATOR ASSEMBLY	28480	08901-60013
A51C1	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C2	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C3	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C4	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C5	0180-2206	4		CAPACITOR-FXD 60UF+-10% 6VDC TA	56289	150D606X9006B2
A51C6	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A51C7	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C8	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C9	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A51C10				NOT ASSIGNED		
A51C11	0160-2207	3	1	CAPACITOR-FXD 300PF +-5% 300VDC MICA	28480	0160-2207
A51C12	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A51C13	0180-2206	4		CAPACITOR-FXD 60UF+-10% 6VDC TA	56289	150D606X9006B2
A51C14	0160-4040	6	1	CAPACITOR-FXD 1000PF +-5% 100VDC CER	28480	0160-4040
A51C15	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A51C16	0140-0205	5	1	CAPACITOR-FXD 62PF +-5% 300VDC MICA	72136	DM15E620J0300WV1CR
A51C17	0160-3535	2	1	CAPACITOR-FXD 560PF +-5% 300VDC MICA	28480	0160-3535
A51C18	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A51C19	0160-0574	3	2	CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A51C20	0121-0436	4 *	1	CAPACITOR-V TRMR-AIR 2.6-23.5PF 350V	74970	189-0509-125
A51C21	0160-0574	3		CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A51C22	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C23	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C24	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51C25	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A51CR1	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A51CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
2314A TO 2411A						
A51CR3	0122-0065	7		DIODE-VVC 29PF 3%	28480	0122-0065
2413A AND ABOVE						
A22CR3	0122-0162	5		DIODE-VVC 29PF 10% BVR=30	25088	BB409
A51CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
2314A TO 2411A						
A51CR5	0122-0065	7		DIODE-VVC 29PF 3%	28480	0122-0065
A51CR6	0122-0065	7		DIODE-VVC 29PF 3%	28480	0122-0065
2413A AND ABOVE						
A51CR5	0122-0173	8		DIODE-VVC 29PF 10% C3/C25-MIN=5 BVR=30V	25088	BB809 SELECTED
A51CR6	0122-0173	8		DIODE-VVC 29PF 10% C3/C25-MIN=5 BVR=30V	25088	BB809 SELECTED

†Refer to Section 7 for update information *Factory selected Component (Refer to section 7) Δ Exchange part only

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A51CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A51CR8	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A51E1	9170-0847	3		CORE-SHIELDING BEAD	02114	56-590-65/3B PARYLENE COATED
A51E2	9170-0847	3		CORE-SHIELDING BEAD	02114	56-590-65/3B PARYLENE COATED
A51J1	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A51J2	1250-1220	0		CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A51L1	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A51L2	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A51L3	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A51L4	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A51L5	9100-1635	2		INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A51L6	9140-0310	2	1	INDUCTOR RF-CH-MLD 390NH 5% .105DX.26LG	28480	9140-0310
A51L7	9140-0309	9	1	INDUCTOR RF-CH-MLD 1.8UH 5% .105DX.26LG	28480	9140-0309
A51MP1	08901-00040	0	1	COVER-FM CAL	28480	08901-00040
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A51Q1	1853-0034	0		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A51Q2	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A51Q3	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A51Q4	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A51Q5	1853-0034	0		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A51Q6	1853-0034	0		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A51Q7	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A51Q8	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A51Q9	1854-0475	5		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A51Q10	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A51Q11	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A51Q12	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A51Q13	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A51R1	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A51R2	0757-0443	0		RESISTOR 11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1102-F
A51R3	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A51R4	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A51R5	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A51R6	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A51R7	0698-6502	8	3	RESISTOR 3.32K .25% .125W F TC=0+-50	28480	0698-6502
A51R8	0698-6502	8		RESISTOR 3.32K .25% .125W F TC=0+-50	28480	0698-6502
A51R9	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A51R10	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A51R11	0698-8068	5	2	RESISTOR 4.99K .25% .125W F TC=0+-25	19701	MF4C1/8-T9-4991-C

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) ∆ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A51R12	2100-3349	2		RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	28480	2100-3349
A51R13	0698-8068	5		RESISTOR 4.99K .25% .125W F TC = 0 + -25	19701	MF4C1/8-T9-4991-C
A51R14	0698-8024	3	1	RESISTOR 3.09K .25% .125W F TC = 0 + -50	19701	MF4C1/8-T2-3091-C
A51R15	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A51R16	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A51R17	0698-3155	1		RESISTOR 4.64K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4641-F
A51R18	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A51R19	0757-0464	5	1	RESISTOR 90.9K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-9092-F
A51R20	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A51R21	0698-7215	2	1	RESISTOR 133 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-133R-F
A51R22	0698-7839	6	1	RESISTOR 222 .5% .125W F TC = 0 + -50	19701	MF4C1/8-T2-222R-D
A51R23	0698-5439	8	2	RESISTOR 1K .25% .125W F TC = 0 + -50	28480	0698-5439
A51R24*△	0698-3159	5	1	RESISTOR 26.1K 1% .125W F TC = 0 + -50	28480	0698-3159
A51R25				*NOT ASSIGNED*		
A51R26	0698-5439	8		RESISTOR 1K .25% .125W F TC = 0 + -50	28480	0698-5439
A51R27	0698-6502	8		RESISTOR 3.32K .25% .125W F TC = 0 + -50	28480	0698-6502
A51R28	0698-3440	7		RESISTOR 196 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-196R-F
A51R29	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A51R30	0698-3157	3		RESISTOR 19.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1962-F
A51R31	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A51R32*	0757-0288	1		RESISTOR 9.09K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-9091-F
A51R33	0757-0447	4		RESISTOR 16.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1622-F
A51R34	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A51R35	0757-0401	0		RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A51R36	0757-0441	8		RESISTOR 8.25K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-8251-F
A51R37	0698-7205	0		RESISTOR 51.1 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-51R1-F
A51R38	0698-7212	9		RESISTOR 100 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-100R-F
A51R39	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A51R40	0698-7212	9		RESISTOR 100 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-100R-F
A51R41	0757-0416	7		RESISTOR 511 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-511R-F
A51R42	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A51R43	0698-3132	4		RESISTOR 261 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2610-F
A51R44	0698-7212	9		RESISTOR 100 1% .05W F TC = 0 + -100	24546	C3-1/8-TO-100R-F
A51R45	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A51R46	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A51TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A51TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A51TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A51U1	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A51U2	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A51U3	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A51U4	1826-0371	1		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A51U5	1820-1963	7		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	3L585	CD4013BAE
A51U6	1826-0138	8		IC COMPARATOR GP QUAD 14-DIP-P PKG	01295	LM339N
A51U7	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A51U8	1820-1411	0		IC LCH TTL LS D-TYPE 4-BIT	01295	SN74LS75N
A51U9	1820-0723	5		IC RCVR TTL LINE RCVR DUAL 2-INP	01295	SN75107AN
A51VR1	1902-3059	0		DIODE-ZNR 3.83V 5% DO-35 PD = .4W	28480	1902-3059
A51VR2	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD = .4W	24046	1N827
A51VR3	1902-3104	6		DIODE-ZNR 5.62V 5% DO-35 PD = .4W	28480	1902-3104
A51VR4	1902-3104	6		DIODE-ZNR 5.62V 5% DO-35 PD = .4W	28480	1902-3104

*Refer to section 7 for specific information. *Factory selected component, refer to section 7. △ Latest part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A52						
A52	08901-60131	6	1	AUDIO COUNTER/DISTORTION ANALYZER ASSY	28480	08901-60131
A52C1	0180-2929	8		CAPACITOR-FXD 68UF+-10% 10VDC TA	28480	0180-2929
A52C2	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A52C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A52C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A52C5	0160-5098	6		CAPACITOR-FXD .22UF +-10% 50VDC CER	16299	CAC05X7R224J050A
A52C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A52C7	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A52C8	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A52C9	0160-4797	0	1	CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A52C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A52C11	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C12	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C13	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A52C14	0160-4267	9	6	CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-4267
A52C15	0160-5340	1	6	CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A52C16	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A52C17	0160-4267	9		CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-4267
A52C18	0160-4768	5		CAPACITOR-FXD 470PF +-5% 100VDC CER	28480	0160-4768
A52C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C20	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C21	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C22	0160-4267	9		CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-4267
A52C23	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A52C24	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A52C25	0160-4267	9		CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-4267
A52C26	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A52C27	0160-4267	9		CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-4267
A52C28	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A52C29	0160-5340	1		CAPACITOR-FXD .03UF +-1% 200VDC	28480	0160-5340
A52C30	0160-4267	9		CAPACITOR-FXD .02UF +-1% 200VDC	28480	0160-4267
A52C31	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A52C32	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A52C33	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C34	0160-3674	0	2	CAPACITOR-FXD .47UF +-5% 100VDC	28480	0160-3674
A52C35	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A52C36	0160-5036	2	3	CAPACITOR-FXD .27UF +-2% 100VDC	28480	0160-5036
A52C37	0160-5036	2		CAPACITOR-FXD .27UF +-2% 100VDC	28480	0160-5036
A52C38	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C39	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A52C40	0160-5036	2		CAPACITOR-FXD .27UF +-2% 100VDC	28480	0160-5036
A52C41	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A52C42	0160-4801	7		CAPACITOR-FXD 100PF +-5% 100VDC CER	28480	0160-4801
A52C43	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A52C44	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A52C45	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832

[illegible] to section 7 for update information. *Factory selected component, refer to section 6. Δ Erratic part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A52C46	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A52C47	0160-4787	8	1	CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-30	28480	0160-4787
A52CR1	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A52CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A52CR3				NOT ASSIGNED		
A52CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A52CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A52CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A52CR7	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A52CR8	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A52J1	1250-1425	7	2	CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
A52J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
A52L1	9100-3562	8	1	INDUCTOR RF-CH-MLD 4.7UH 5% .166DX.385LG	28480	9100-3562
A52L2	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A52L3	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A52MP1	08901-00074	0	1	CVR AUDIO MEAS	28480	08901-00074
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2190-0008	3		WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
A52R1	0698-8822	9	2	RESISTOR 6.81 1% .125W F TC=0+-100	28480	0698-8822
A52R2	0698-8822	9		RESISTOR 6.81 1% .125W F TC=0+-100	28480	0698-8822
A52R3	0699-0790	6	2	RESISTOR 100K .1% .1W F TC=0+-15	28480	0699-0790
A52R4	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A52R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A52R6	0699-0790	6		RESISTOR 100K .1% .1W F TC=0+-15	28480	0699-0790
A52R7	1810-0206	8		NETWORK-RES 8-SIP10.0K OHM X 7	01121	208A103
A52R8	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A52R9	0699-0778	0	1	RESISTOR 3.717K .1% .1W F TC=0+-15	28480	0699-0778
A52R10	0699-0785	9	1	RESISTOR 24.14K .1% .1W F TC=0+-15	28480	0699-0785
A52R11	0699-0780	4	4	RESISTOR 4.64K .1% .1W F TC=0+-15	28480	0699-0780
A52R12	0699-0777	9	1	RESISTOR 3.622K .1% .1W F TC=0+-15	28480	0699-0777
A52R13	0699-0789	3	1	RESISTOR 72.42K .1% .1W F TC=0+-15	28480	0699-0789
A52R14	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A52R15				NOT ASSIGNED		
A52R16	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A52R17	0699-0782	6	1	RESISTOR 14.16K .1% .1W F TC=0+-15	28480	0699-0782
A52R18	0699-0780	4		RESISTOR 4.64K .1% .1W F TC=0+-15	28480	0699-0780
A52R19				NOT ASSIGNED		
A52R20	0699-0784	8	1	RESISTOR 17.55K .1% .1W F TC=0+-15	28480	0699-0784
A52R21				NOT ASSIGNED		
A52R22	0699-0776	6	1	RESISTOR 2.712K .1% .1W F TC=0+-15	28480	0699-0776
A52R23	0699-0780	4		RESISTOR 4.64K .1% .1W F TC=0+-15	28480	0699-0780
A52R24	0699-0788	2	1	RESISTOR 54.3K .1% .1W F TC=0+-15	28480	0699-0788
A52R25	0699-0787	1	1	RESISTOR 49.25K .1% .1W F TC=0+-15	28480	0699-0787
A52R26	0699-0786	0	1	RESISTOR 28.12K .1% .1W F TC=0+-15	28480	0699-0786
A52R27	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A52R28	0699-0791	7	1	RESISTOR 103.2K .1% .1W F TC=0+-15	28480	0699-0791
A52R29	0699-0057	8	3	RESISTOR 9K .1% .1W F TC=0+-5	28480	0699-0057
A52R30	0698-6414	1		RESISTOR 1K .1% .1W F TC=0+-5	28480	0698-6414

[Refer to section 7 for update information] *Factory selected component (Refer to section 6) Δ Latest part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A52R31	0699-0779	1	1	RESISTOR 4.523K .1% .1W F TC = 0 + -15	28480	0699-0779
A52R32	0699-0780	4		RESISTOR 4.64K .1% .1W F TC = 0 + -15	28480	0699-0780
A52R33	0698-6414	1		RESISTOR 1K .1% .1W F TC = 0 + -5	28480	0698-6414
A52R34	0699-0781	5	1	RESISTOR 7.18K .1% .1W F TC = 0 + -15	28480	0699-0781
A52R35	0699-0057	8		RESISTOR 9K .1% .1W F TC = 0 + -5	28480	0699-0057
A52R36	0699-0783	7	1	RESISTOR 14K .1% .1W F TC = 0 + -15	28480	0699-0783
A52R37	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A52R38	2100-3352	7		RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	28480	2100-3352
A52R39	0699-0057	8		RESISTOR 9K .1% .1W F TC = 0 + -5	28480	0699-0057
A52R40	0698-6414	1		RESISTOR 1K .1% .1W F TC = 0 + -5	28480	0698-6414
A52R41	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A52R42	0698-3158	4		RESISTOR 23.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2372-F
A52R43	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A52R44	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A52R45	0698-8827	4		RESISTOR 1M 1% .125W F TC = 0 + -100	28480	0698-8827
A52R46	0757-0420	3		RESISTOR 750 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-751-F
A52R47	2100-3354	9	1	RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	28480	2100-3354
A52R48	0757-0458	7		RESISTOR 51.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5112-F
A52R49	0698-3161	9		RESISTOR 38.3K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3832-F
2314A ONLY						
A52R50	0698-3161	9		RESISTOR 38.3K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3832-F
2332A AND ABOVE						
A52R50				NOT ASSIGNED		
A52R51	0698-3450	9	10	RESISTOR 42.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4222-F
A52R52	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A52R53	0698-3136	8		RESISTOR 17.8K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1782-F
A52R54	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A52R55	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A52R56	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A52R57	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A52R58	0757-0199	3		RESISTOR 21.5K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2152-F
A52R59	0757-0290	5		RESISTOR 6.19K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-6191-F
A52R60	0757-0418	9		RESISTOR 619 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-619R-F
A52TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A52TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A52TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A52TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A52TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A52U1	1826-0421	2	1	IC CONV RMS/DC 14-DIP-C PKG	24355	AD536AJ
A52U2	1826-0606	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A52U3	1826-0753	3		IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-C	04713	MC34004BL
A52U4	1826-0753	3		IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-C	04713	MC34004BL
2314A TO 2515A						
A52U5	1826-0606	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A52U6	1826-0606	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
2517A AND ABOVE						
A52U5	1826-1012	9		ANALOG SWITCH 4 SPST 16-PIN	17856	DG201BP
A52U6	1826-1012	9		ANALOG SWITCH 4 SPST 16-PIN	17856	DG201BP

†Refer to section 7 for update information. *Factory selected Component. ‡Refer to section 7a. Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A52U7	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A52U8	1820-2096	9	2	IC CNTR TTL LS BIN DUAL 4-BIT	01295	SN74LS393N
A52U9	1820-1144	6		IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A52U10	1820-1417	6	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS26N
A52U11	1820-1445	0	1	IC LCH TTL LS 4-BIT	01295	SN74LS375N
A52U12	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A52U13	1826-0191	3		IC COMPARATOR GP DUAL TO-100 PKG	27014	LM319H
A52U14	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A52U15	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A52U16	1820-2096	9		IC CNTR TTL LS BIN DUAL 4-BIT	01295	SN74LS393N
A52U17	1820-5543	7	1	IC OP-AMP LOW-BIAS-H-IMPD DUAL 8-DIP-C	28480	1820-5543
A52U18	1826-0783	9		IC OP AMP LOW-NOISE 8-DIP-C PKG	52063	XR5534ACN
A52U19	1826-0606	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A52VR1	1902-0961	7	2	DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.082%	28480	1902-0961
A52VR2	1902-0961	7		DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.082%	28480	1902-0961
A52W1	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A52W2	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
2314A ONLY						
A52W3				NOT ASSIGNED		
2332A AND ABOVE						
A52W3	8159-0005	0		RESISTOR-ZERO OHMS 22 AWG LEAD DIA.	28480	8159-0005

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A53						
A53	08901-60130	5	1	POWER METER ASSEMBLY	28480	08901-60130
A53C1	0180-2111	0		CAPACITOR-FXD 33UF +-10% 35VDC TA	56289	150D336X9035SA
A53C2	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A53C3	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A53C4	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A53C5	0180-2929	8		CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
A53C6	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A53C7	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A53C8	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C9	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C10	0160-4624	2	3	CAPACITOR-FXD 8200PF +-5% 50VDC CER	28480	0160-4624
A53C11	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C12	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C13	0180-2929	8		CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
A53C14	0160-2290	4	3	CAPACITOR-FXD .15UF +-10% 80VDC POLYE	28480	0160-2290
A53C15	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A53C16	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C17	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C18	0160-4624	2		CAPACITOR-FXD 8200PF +-5% 50VDC CER	28480	0160-4624
A53C19	0160-2290	4		CAPACITOR-FXD .15UF +-10% 80VDC POLYE	28480	0160-2290
A53C20	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A53C21	0160-4624	2		CAPACITOR-FXD 8200PF +-5% 50VDC CER	28480	0160-4624
A53C22	0160-2290	4		CAPACITOR-FXD .15UF +-10% 80VDC POLYE	28480	0160-2290
A53C23	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A53C24	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A53C25	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C26	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C27	0160-0157	8	1	CAPACITOR-FXD 4700PF +-10% 200VDC POLYE	28480	0160-0157
A53C28	0180-2111	0		CAPACITOR-FXD 33UF +-10% 35VDC TA	56289	150D336X9035SA
A53C29	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A53C30	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A53C31	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C32	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A53C33	0160-5546	9	2	CAPACITOR-FXD .039UF +-5% 100VDC	28480	0160-5546
A53C34	0160-5546	9		CAPACITOR-FXD .039UF +-5% 100VDC	28480	0160-5546
A53C35	0180-1746	5		CAPACITOR-FXD 15UF +-10% 20VDC TA	56289	150D156X9020B2
A53C36	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C37	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C38	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C39	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C40	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C41	0160-5370	7	1	CAPACITOR-FXD 2.2UF +-5% 50VDC MET-POLYC	28480	0160-5370
A53C42	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C43	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C44	0160-3674	0		CAPACITOR-FXD .47UF +-5% 100VDC	28480	0160-3674
A53C45	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A53C46	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C47	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C48	0160-3324	7	1	CAPACITOR-FXD 1UF +-5% 100VDC MET-POLYC	28480	0160-3324
A53C49	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A53C50	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A53C51	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53C52	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A53C53	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A53CR1	1901-0895	4	2	DIODE-SM SIG SCHOTTKY	28480	1901-0895
A53CR2	1901-0895	4		DIODE-SM SIG SCHOTTKY	28480	1901-0895
A53CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A53CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A53CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A53K1	0490-1063	6	2	RELAY-REED 2A 500MA 50VDC 5VDC-COIL 10VA	28480	0490-1063
A53K2	0490-1063	6		RELAY-REED 2A 500MA 50VDC 5VDC-COIL 10VA	28480	0490-1063
A53MP1	08901-00075	1	1	COVER, RF POWER	28480	08901-00075
	2190-0008	3		WASHER-LK EXT T NO. 6 .141-IN-ID	28480	2190-0008
	2360-0113	2		SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A53Q1				NOT ASSIGNED		
A53Q2	1854-0810	2		TRANSISTOR NPN SI PD = 625MW FT = 200MHZ	28480	1854-0810
A53Q3	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD = 800MW	01295	2N2219A
	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A53Q4	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A53Q5	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A53Q6	1854-0810	2		TRANSISTOR NPN SI PD = 625MW FT = 200MHZ	28480	1854-0810
A53Q7	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A53Q8	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A53Q9	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A53Q10	1854-0810	2		TRANSISTOR NPN SI PD = 625MW FT = 200MHZ	28480	1854-0810
A53Q11	1854-0810	2		TRANSISTOR NPN SI PD = 625MW FT = 200MHZ	28480	1854-0810
A53Q12	1854-0810	2		TRANSISTOR NPN SI PD = 625MW FT = 200MHZ	28480	1854-0810
A53Q13	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A53Q14	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A53Q15	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A53R1	0699-0075	0	1	RESISTOR 21.5M 1% .125W F TC = 0+-150	28480	0699-0075
A53R2	0698-3450	9		RESISTOR 42.2K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-4222-F
A53R3	0698-3159	5		RESISTOR 26.1K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-2612-F
A53R4	0698-3450	9		RESISTOR 42.2K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-4222-F
A53R5	0698-3156	2		RESISTOR 14.7K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-1472-F
A53R6	0757-0459	8		RESISTOR 56.2K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-5622-F
A53R7	0698-3431	6		RESISTOR 23.7 1% .125W F TC = 0+-100	03888	PME55-1/8-T0-23R7-F
A53R8	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-1001-F
A53R9	0757-0444	1		RESISTOR 12.1K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-1212-F
A53R10	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-1002-F
A53R11	0757-0463	4		RESISTOR 82.5K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-8252-F
A53R12	0757-0346	2		RESISTOR 10 1% .125W F TC = 0+-100	24546	C4-1/8-T0-10R0-F
A53R13	2100-2655	1	2	RESISTOR-TRMR 100K 10% C TOP-ADJ 1-TRN	73138	82PR100K
A53R14	0698-3160	8		RESISTOR 31.6K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-3162-F
A53R15	0698-3451	0		RESISTOR 133K 1% .125W F TC = 0+-100	24546	C4-1/8-T0-1333-F
A53R16	2100-2655	1		RESISTOR-TRMR 100K 10% C TOP-ADJ 1-TRN	73138	82PR100K

†Refer to section 7 for update information *Factory selected component. Refer to section 4 Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A53R17	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A53R18	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A53R19	0811-3351	1	1	RESISTOR 11K .025% .05W PWW TC = 0 + -10	28480	0811-3351
A53R20	0811-3348	6	2	RESISTOR 111.11 .025% .05W PWW TC = 0 + -10	28480	0811-3348
A53R21	0698-3450	9		RESISTOR 42.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4222-F
A53R22	0757-0438	3		RESISTOR 5.11K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5111-F
A53R23	0698-3150	6		RESISTOR 2.37K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2371-F
A53R24	0811-3350	0	1	RESISTOR 10K .025% .05W PWW TC = 0 + -10	28480	0811-3350
A53R25	0811-3349	7	1	RESISTOR 1K .025% .05W PWW TC = 0 + -10	28480	0811-3349
A53R26	0811-3348	6		RESISTOR 111.11 .025% .05W PWW TC = 0 + -10	28480	0811-3348
A53R27	0757-0289	2		RESISTOR 13.3K 1% .125W F TC = 0 + -100	19701	MF4C1/8-T0-1332-F
A53R28	0698-3450	9		RESISTOR 42.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4222-F
A53R29	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A53R30	0698-3150	6		RESISTOR 2.37K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2371-F
A53R31	0698-3450	9		RESISTOR 42.2K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4222-F
A53R32	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A53R33	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A53R34	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A53R35	0757-0200	7		RESISTOR 5.62K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5621-F
A53R36	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A53R37	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A53R38	0757-0460	1		RESISTOR 61.9K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6192-F
A53R39	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A53R40	2100-2514	1	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	30983	ET50W203
A53R41	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A53R42	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A53R43	0757-0460	1		RESISTOR 61.9K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-6192-F
A53R44	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A53R45	0757-0200	7		RESISTOR 5.62K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-5621-F
A53R46	0757-0442	9		RESISTOR 10K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1002-F
A53R47	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A53R48	0757-0422	5		RESISTOR 909 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-909R-F
A53R49	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A53R50	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A53R51	0698-3446	3		RESISTOR 383 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-383R-F
A53R52	0698-0085	0		RESISTOR 2.61K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2611-F
A53R53	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A53R54	0698-3152	8		RESISTOR 3.48K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3481-F
A53R55	0698-3459	8	1	RESISTOR 383K 1% .125W F TC = 0 + -100	28480	0698-3459
A53R56	0698-8638	5	1	RESISTOR 3.16K .1% .125W F TC = 0 + -25	28480	0698-8638
A53R57	0757-0279	0		RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A53R58	0698-3160	8		RESISTOR 31.6K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3162-F
A53R59	0698-0083	8		RESISTOR 1.96K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1961-F
A53R60	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A53R61	0698-3156	2		RESISTOR 14.7K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1472-F
A53R62	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A53R63	0757-0470	3		RESISTOR 162K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1623-F
A53R64	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F
A53R65	0811-1557	5	1	RESISTOR 15 5% 3W PW TC = 0 + -20	28480	0811-1557
A53R66	0698-3444	1		RESISTOR 316 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-316R-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A53R67	0699-0842	9	1	RESISTOR 6.19K .1% .125W F TC=0+-25	28480	0699-0842
A53R68	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A53R69	0698-3158	4		RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
A53R70	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A53R71	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A53R72	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A53R73	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A53R74	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A53R75	0698-3406	5	1	RESISTOR 1.33K 1% .5W F TC=0+-100	28480	0698-3406
A53R76	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
2314A TO 2428A						
A53R77	0698-3391	7	1	RESISTOR 21.5 1% .5W F TC=0+-100	28480	0698-3391
2432A AND ABOVE						
A53R77	0698-3388	2		RESISTOR 14.7 1% .5W F TC=0+-100	24546	C4-1/8-TO-14R7-F
A53R78	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A53TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A53TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A53TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A53TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A53TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A53TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A53TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A53U1Δ	1826-0990	0	1	IC OP AMP GP DUAL TO-99 PKG	28480	1826-0990
A53U2	1826-0111	7	1	IC OP AMP GP DUAL TO-99 PKG	3L585	CA1458T
A53U3	1826-0043	4		IC OP AMP GP TO-99 PKG	3L585	CA307T
A53U4	1826-0606	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A53U5	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A53U6	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A53U7	1826-0043	4		IC OP AMP GP TO-99 PKG	3L585	CA307T
A53U8	1826-0606	5		IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A53U9	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A53U10	1820-1934	2	1	IC CONV 8-B-D/A 16-DIP-C PKG	06665	DAC-08EQ
A53U11	1820-1729	3		IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A53U12	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A53U13	1826-0371	1		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A53U14	1820-0535	7	2	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A53U15	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A53U16	1820-1422	3	1	IC MV TTL LS MONOSTBL RETRIG	01295	SN74LS122N
A53U17	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
A53VR1	1902-3002	3	2	DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%	28480	1902-3002
A53VR2	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%	28480	1902-3002
A53VR3	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	24046	1N827
A53VR4	1902-0947	9	1	DIODE-ZNR 3.6V 5% DO-35 PD=.4W TC=-.036%	28480	1902-0947
A53VR5	1902-0680	7		DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	24046	1N827

†Refer to Section 7 for update information. *Factory Selected Component (Refer to Section 5). Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A54				**08901-60252 – SERIAL PREFIX 2314A TO 2636A**		
				OPTION 030 ONLY		
A54	08901-60252	2	1	IF AMPLIFIER/DETECTOR ASSEMBLY	28480	08901-60252
A54C1	0180-0116	1	4	CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A54C2	0180-0197	8	1	CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A54C3	0180-0116	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A54C4	0160-4832	4	14	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C7	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C8	0160-4797	0	6	CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A54C9	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C10	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C11	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C12	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C13	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C15	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A54C16	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C17	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C18	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C19	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C20	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A54C21	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C22	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C23	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C24	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54C25	0160-4789	0	1	CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	28480	0160-4789
A54C26	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C27	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A54C28	0160-5550	5	1	CAPACITOR-FXD .1UF +-5% 100VDC MET-POLYC	28480	0160-5550
A54C29	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A54CR1	1901-0518	8	6	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54CR2	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54CR3	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54CR4	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A54FL1				SEE A71		
A54FL2				SEE A71		
A54J1	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A54J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A54L1	9100-1642	1	2	INDUCTOR RF-CH-MLD 270UH 5% .2DX.45LG	28480	9100-1642
A54L2	9100-1642	1		INDUCTOR RF-CH-MLD 270UH 5% .2DX.45LG	28480	9100-1642

†Refer to Section 7 for update information *Factory selected component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A54				**08901-60252 – SERIAL PREFIX 2314A TO 2636A**		
				OPTION 030 ONLY		
A54MP1	08901-00151	4	1	BOARD COVER, IF AMP/DET	28480	08901-00151
A54Q1	1853-0459	3	7	TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A54Q2	1854-0404	0	9	TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A54Q3	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A54Q4	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A54Q5	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A54Q6	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A54Q7	1855-0235	7	1	TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	28480	1855-0235
A54Q8	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A54Q9	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A54Q10	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A54Q11	1855-0420	2	3	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A54Q12	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A54Q13	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A54Q14	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A54R1	0699-0678	9	4	RESISTOR 900 .01% .1W F TC = 0 + -5	28480	0699-0678
A54R2	0699-0681	4	4	RESISTOR 100 .01% .1W F TC = 0 + -5	28480	0699-0681
A54R3	0698-3441	8	18	RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R4	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R5	0757-0274	5	14	RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A54R6	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R7	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R8	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A54R9	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A54R10	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R11	0699-0678	9		RESISTOR 900 .01% .1W F TC = 0 + -5	28480	0699-0678
A54R12	0699-0681	4		RESISTOR 100 .01% .1W F TC = 0 + -5	28480	0699-0681
A54R13	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R14	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R15	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A54R16	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R17	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R18	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A54R19	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A54R20	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R21	0699-0678	9		RESISTOR 900 .01% .1W F TC = 0 + -5	28480	0699-0678
A54R22	0699-0681	4		RESISTOR 100 .01% .1W F TC = 0 + -5	28480	0699-0681
A54R23	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A54R24	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R25	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A54R26	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A54R27	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R28	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R29	0698-6317	3	1	RESISTOR 500 .1% .125W F TC = 0 + -25	03888	PME55-1/8-T9-500R-B
A54R30	0699-0825	8	1	RESISTOR 281.2 .1% .125W F TC = 0 + -25	28480	0699-0825
A54R31				SEE A71		
A54R32				SEE A71		
A54R33	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A54R34	0757-0401	0	1	RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A54R35	0698-3154	0	3	RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F

†Refer to section 7 for update information. *Factory selected component. Refer to section 7. Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A54				**08901-60252 – SERIAL PREFIX 2314A TO 2636A**		
				OPTION 030 ONLY		
A54R36	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A54R37	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R38	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A54R39	0757-0444	1		RESISTOR 12.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1212-F
A54R40	0757-0465	6	5	RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A54R41	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A54R42	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R43	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R44	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A54R45	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R46	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R47	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A54R48	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A54R49	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A54R50	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A54R51	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A54TP1	1251-0600	0	2	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A54TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A54U1	1826-0154	8	5	IC SWITCH ANLG DUAL TO-100 PKG	17856	DG200BA
A54U2	1826-0154	8		IC SWITCH ANLG DUAL TO-100 PKG	17856	DG200BA
A54U3	1826-0154	8		IC SWITCH ANLG DUAL TO-100 PKG	17856	DG200BA
A54U4	1826-0606	5	1	IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A54U5	1826-0154	8		IC SWITCH ANLG DUAL TO-100 PKG	17856	DG200BA
A54U6				SEE A71		
A54U7	1820-1195	7	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A54U8	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N

†Refer to Section 7 for update information *Factory selected component (Refer to Section 7) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A55				**08901-60251 – SERIAL PREFIX 2314A TO 2636A**		
				OPTION 030 ONLY		
A55	08901-60251	1	1	IF CHANNEL FILTER ASSEMBLY	28480	08901-60251
A55C1	0180-0116	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A55C2	0180-0116	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A55C3	0180-2929	8	1	CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
A55C4	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A55C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A55C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A55C7	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A55C8	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A55C9	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A55C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A55C11	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A55C12	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A55C13	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A55C14	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A55C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A55C16	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A55C17	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A55C18	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A55C19	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A55C20	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A55C21	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A55C22	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A55C23	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A55C24	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A55CR1	1901-1098	1	6	DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A55CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A55CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A55CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A55CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A55CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A55CR7	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A55DS1	1990-0717	6	1	LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	HLMP-1501
A55E1	9170-0847	3	2	CORE-SHIELDING BEAD	02114	56-590-65/3B
A55E2	9170-0847	3		CORE-SHIELDING BEAD	02114	56-590-65/3B
A55J1	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A55J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A55L1	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A55L2	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A55L3	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A55				**08901-60251 – SERIAL PREFIX 2314A TO 2636A**		
				OPTION 030 ONLY		
A55MP1	08901-00150	3	1	BOARD COVER, IF CHAN FLTR	28480	08901-00150
A55P1-54				NOT ASSIGNED		
A55P55	1251-4700	9	1	CONNECTOR 3-PIN M POST TYPE	28480	1251-4700
A55Q1	1855-0421	3	1	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A55Q2	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A55Q3	1854-0668	8	2	TRANSISTOR NPN SI TO-18 PD = 500MW	28480	1854-0668
A55Q4	1854-0668	8		TRANSISTOR NPN SI TO-18 PD = 500MW	28480	1854-0668
A55Q5	1853-0430	0	1	TRANSISTOR PNP 2N4959 SI TO-72 PD = 200MW	04713	2N4959
A55Q6	1854-0345	8	1	TRANSISTOR NPN 2N5179 SI TO-72 PD = 200MW	04713	2N5179
A55Q7	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A55Q8	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A55Q9	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A55Q10	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A55Q11	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A55Q12	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A55R1	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A55R2	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A55R3	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A55R4	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A55R5	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A55R6	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A55R7	0757-0400	9	3	RESISTOR 90.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-90R9-F
A55R8	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R9	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A55R10	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A55R11	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A55R12	0757-0405	4		RESISTOR 162 1% .125W F TC = O + -100	24546	C4-1/8-TO-162R-F
A55R13	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R14	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A55R15	0757-0405	4		RESISTOR 162 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-162R-F
A55R16	0698-0082	7		RESISTOR 464 1% .1252 F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A55R17	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R18	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R19	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A55R20	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R21	0757-1094	9		RESISTOR 1.47K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1471-F
A55R22	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A55R23	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A55R24	0699-0678	9		RESISTOR 900 .01% .1W F TC = 0 + -5	28480	0699-0678
A55R25	0699-0681	4		RESISTOR 100 .01% .1W F TC = 0 + -5	28480	0699-0681
A55R26	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A55R27	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A55R28	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A55R29	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A55R30	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A55				**08901-60251 – SERIAL PREFIX 2314A TO 2636A**		
				OPTION 030 ONLY		
A55R31	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A55R32	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A55R33	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A55R34	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A55R35	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R36	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R37	0698-3443	0		RESISTOR 287 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-287R-F
A55R38	0757-0400	9		RESISTOR 90.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-90R9-F
A55R39	0757-0400	9		RESISTOR 90.9 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-90R9-F
A55R40	0757-0280	3	2	RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A55R41	0757-0280	3		RESISTOR 1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1001-F
A55R42	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A55R43	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A55R44	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A55T1	08901-80070	4	1	TRANSFORMER/FLTR	28480	08901-80070
A55U1	1826-0154	8		IC SWITCH ANLG DUAL TO-100 PKG	17856	DG200BA
A55U2	1820-0535	7	1	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A55U3	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A55U4	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A55U5	1826-0043	4	1	IC OP AMP GP TO-99 PKG	3L585	CA307T

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A71				**08902-60109 – SERIAL PREFIX 2642A AND ABOVE**		
				OPTION 030 ONLY		
A71	08902-60109	9	1	IF AMPLIFIER/DETECTOR ASSEMBLY (OPTION 030 ONLY)	28480	08902-60109
A71C1	0180-0116	1	4	CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A71C2	0180-0197	8	1	CAPACITOR-FXD 2.2UF +-10% 20VDC TA	56289	150D225X9020A2
A71C3	0180-0116	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A71C4	0160-4832	4	14	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C7	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C8	0160-4797	0	6	CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A71C9	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C10	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C11	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C12	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C13	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C15	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A71C16	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C17	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C18	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C19	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C20	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A71C21	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C22	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C23	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C24	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71C25	0160-4789	0	1	CAPACITOR-FXD 15PF +-5% 100VDC CER 0+-30	28480	0160-4789
A71C26	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C27	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A71C28	0160-5550	5	1	CAPACITOR-FXD .1UF +-5% 100VDC MET-POLYC	28480	0160-5550
A71C29	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A71CR1	1901-0518	8	6	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A71CR2	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A71CR3	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A71CR4	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A71CR5	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A71FL1△	9135-0268	8		FILTER-CERAMIC BANDPASS; 455KHZ CENTER	28480	9135-0268
A71FL2△	9135-0267	7		FILTER-CERAMIC BANDPASS; 455KHZ CENTER	28480	9135-0267
A71J1	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A71J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078

†Refer to Section 7 for update information *Factory selected component (Refer to section 7) △ Electrical part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A71				**08902-60109 – SERIAL PREFIX 2642A AND ABOVE**		
				OPTION 030 ONLY		
A71L1	9100-1642	1	2	INDUCTOR RF-CH-MLD 270UH 5% .2DX.45LG	28480	9100-1642
A71L2	9100-1642	1		INDUCTOR RF-CH-MLD 270UH 5% .2DX.45LG	28480	9100-1642
A71MP1	08902-00034	3	1	BOARD COVER, IF AMP/DET	28480	08902-00034
A71Q1	1853-0459	3	7	TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A71Q2	1854-0404	0	9	TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A71Q3	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A71Q4	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A71Q5	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A71Q6	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A71Q7	1855-0235	7	1	TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	28480	1855-0235
A71Q8	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A71Q9	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A71Q10	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A71Q11	1855-0420	2	3	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A71Q12	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A71Q13	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A71Q14	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A71R1	0699-0678	9	4	RESISTOR 900 .01% .1W F TC = 0 + -5	28480	0699-0678
A71R2	0699-0681	4	4	RESISTOR 100 .01% .1W F TC = 0 + -5	28480	0699-0681
A71R3	0698-3441	8	18	RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R4	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R5	0757-0274	5	14	RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A71R6	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R7	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R8	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A71R9	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A71R10	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R11	0699-0678	9		RESISTOR 900 .01% .1W F TC = 0 + -5	28480	0699-0678
A71R12	0699-0681	4		RESISTOR 100 .01% .1W F TC = 0 + -5	28480	0699-0681
A71R13	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R14	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R15	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A71R16	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R17	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R18	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A71R19	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A71R20	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R21	0699-0678	9		RESISTOR 900 .01% .1W F TC = 0 + -5	28480	0699-0678
A71R22	0699-0681	4		RESISTOR 100 .01% .1W F TC = 0 + -5	28480	0699-0681
A71R23	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A71R24	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R25	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-3161-F
A71R26	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A71R27	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R28	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R29	0698-6317	3	1	RESISTOR 500 .1% .125W F TC = 0 + -25	03888	PME55-1/8-T9-500R-B
A71R30	0699-0825	8	1	RESISTOR 281.2 .1% .125W F TC = 0 + -25	28480	0699-0825

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 6) Δ Exchange

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A71				**08902-60109 – SERIAL PREFIX 2642A AND ABOVE**		
				OPTION 030 ONLY		
A71R31Δ	0699-1655	4		RESISTOR 158.1 .1% .125W F TC = 0 + -25	28480	0699-1655
A71R32Δ	0699-1637	2		RESISTOR 203.2 .1% .125W F TC = 0 + -25	28480	0699-1637
A71R33	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A71R34	0757-0401	0	1	RESISTOR 100 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-101-F
A71R35	0698-3154	0	3	RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A71R36	0757-0394	0		RESISTOR 51.1 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-51R1-F
A71R37	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R38	0698-3441	8		RESISTOR 215 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-215R-F
A71R39	0757-0444	1		RESISTOR 12.1K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1212-F
A71R40	0757-0465	6	5	RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A71R41	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A71R42	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R43	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R44	0757-0274	5		RESISTOR 1.21K 1% .125W F TC = 0 + -100	24546	C4-1/8-TO-1211-F
A71R45	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R46	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R47	0698-0082	7		RESISTOR 464 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4640-F
A71R48	0698-0084	9		RESISTOR 2.15K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-2151-F
A71R49	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A71R50	0757-0465	6		RESISTOR 100K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-1003-F
A71R51	0698-3154	0		RESISTOR 4.22K 1% .125W F TC = 0 + -100	24546	C4-1/8-T0-4221-F
A71TP1	1251-0600	0	2	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A71TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A71U1	1826-1020	9	5	ANALOG SWITCH 2 SPST 10-METAL	17856	DG200ABA
A71U2	1826-1020	9		ANALOG SWITCH 2 SPST 10-METAL	17856	DG200ABA
A71U3	1826-1020	9		ANALOG SWITCH 2 SPST 10-METAL	17856	DG200ABA
A71U4	1826-0606	5	1	IC SWITCH ANLG QUAD 16-DIP-C PKG	17856	DG201BK
A71U5	1826-1020	9		ANALOG SWITCH 2 SPST 10-METAL	17856	DG200ABA
A71U6Δ	1826-1314	4		RMS DC 14-CERDIP BPLR	28480	1826-1314
A71U7	1820-1195	7	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A71U8	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N

*Refer to section 7 for update information. Factory selected Component. Refer to section 5. Δ Errata part change.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A72				**08902-60108 – SERIAL PREFIX 2642A AND ABOVE**		
				OPTION 030 ONLY		
A72	08902-60108	8	1	IF CHANNEL FILTER ASSEMBLY (OPTION 030 ONLY) (DOES NOT INCLUDE FL1,FL2,R5,R6,R9&R10)		28480 08902-60108
A72C1	0180-0116	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A72C2	0180-0116	1		CAPACITOR-FXD 6.8UF +-10% 35VDC TA	56289	150D685X9035B2
A72C3	0180-2929	8	1	CAPACITOR-FXD 68UF +-10% 10VDC TA	28480	0180-2929
A72C4	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A72C5	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A72C6	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A72C7	0160-5469	5		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-5469
A72C8	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A72C9	0160-5469	5		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-5469
A72C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A72C11	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A72C12	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A72C13	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A72C14	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A72C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A72C16	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A72C17	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A72C18	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A72C19	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A72C20	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A72C21	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A72C22Δ	0160-4535	4		CAPACITOR-FXD 1UF +-10% 50VDC CER	28480	0160-4535
A72C23	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A72C24	0160-4797	0		CAPACITOR-FXD 3.3PF +-.25PF 100VDC CER	28480	0160-4797
A72CR1	1901-1098	1	6	DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A72CR2	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A72CR3	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A72CR4	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A72CR5	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A72CR6	1901-1098	1		DIODE-SWITCHING 1N4150 50V 200MA 4NS	9N171	1N4150
A72CR7	1901-0518	8		DIODE-SM SIG SCHOTTKY	28480	1901-0518
A72DS1	1990-0717	6	1	LED-LAMP LUM-INT = 800UCD IF = 30MA-MAX	28480	HLMP-1501
A72E1	9170-0847	3	2	CORE-SHIELDING BEAD	02114	56-590-65/3B
A72E2	9170-0847	3		CORE-SHIELDING BEAD	02114	56-590-65/3B

†Refer to Section 7 for update information *Factory selected component (Refer to Section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A72				**08902-60108 – SERIAL PREFIX 2642A AND ABOVE**		
				OPTION 030 ONLY		
				NOTE		
				FOR INFORMATION ABOUT SELECTING FILTERS FL1-FL2, SEE SERVICE SHEET 33, NOTE 2		
A72FL1	08901-80079	3		OPTION 032 12.5 KHZ FILTER WHEN FILTER OPTIONS INSTALLED ARE 032 AND 037.	28480	08901-80079
A72FL1	08901-80080	6		OPTION 033 25 KHZ FILTER WHEN FILTER OPTIONS INSTALLED ARE 033 AND 032 OR 033 AND 037	28480	08901-80080
A72FL1	08901-80085	1		OPTION 035 30 KHZ FILTER WHEN FILTER OPTIONS INSTALLED ARE 035 AND 032, 035 AND 033, OR 035, AND 037	28480	08901-80085
A72FL2	08901-80079	3		OPTION 032 12.5 KHZ FILTER WHEN FILTER OPTIONS INSTALLED ARE 032 AND 037.	28480	08901-80079
A72FL2	08901-80080	6		OPTION 033 25 KHZ FILTER WHEN FILTER OPTIONS INSTALLED ARE 033 AND 032 OR 033 AND 037	28480	08901-80080
A72FL2	08901-80086	2		OPTION 035 30 KHZ FILTER WHEN FILTER OPTIONS INSTALLED ARE 035 AND 032, 035 AND 033, OR 035, AND 037	28480	08901-80086
A72J1	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A72J2	1250-1425	7		CONNECTOR-RF SMC M SGL-HOLE-RR 50-OHM	28480	1250-1425
	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A72J3	1251-4700	9	1	CONNECTOR 3-PIN M POST TYPE	28480	1251-4700
A72L1	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A72L2	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A72L3	9140-0137	1		INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q = 60	28480	9140-0137
A72MP1	08902-00033	2	1	BOARD COVER, IF CHAN FLTR	28480	08902-00033
A72Q1	1855-0421	3	1	TRANSISTOR J-FET 2N5114 P-CHAN D-MODE	17856	2N5114
A72Q2	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A72Q3	1854-0668	8	2	TRANSISTOR NPN SI TO-18 PD = 500MW	28480	1854-0668
A72Q4	1854-0668	8		TRANSISTOR NPN SI TO-18 PD = 500MW	28480	1854-0668
A72Q5	1853-0430	0	1	TRANSISTOR PNP 2N4959 SI TO-72 PD = 200MW	04713	2N4959
	9170-0847	3		CORE-SHIELDING BEAD	02114	56-590-65/3B
A72Q6	1854-0345	8	1	TRANSISTOR NPN 2N5179 SI TO-72 PD = 200MW	04713	2N5179
A72Q7	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A72Q8	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A72Q9	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A72Q10	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459
A72Q11	1854-0404	0		TRANSISTOR NPN SI TO-18 PD = 360MW	28480	1854-0404
A72Q12	1853-0459	3		TRANSISTOR PNP SI PD = 625MW FT = 200MHZ	28480	1853-0459

†Refer to section 7 for update information *Factory Selected Component (Refer to section 6) Δ Exact part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A72				**08902-60108 – SERIAL PREFIX 2642A AND ABOVE**		
				OPTION 030 ONLY		
A72R1	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A72R2	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A72R3	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A72R4	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A72R5*				NOT SEPARATELY REPLACEABLE P/O FL1 FACTORY SELECTED FOR FILTER OPTIONS		
A72R6*				NOT SEPARATELY REPLACEABLE P/O FL2 FACTORY SELECTED FOR FILTER OPTIONS		
A72R7	0757-0400	9	3	RESISTOR 90.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-90R9-F
A72R8	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R9*				NOT SEPARATELY REPLACEABLE P/O FL1 FACTORY SELECTED FOR FILTER OPTIONS		
A72R10*				NOT SEPARATELY REPLACEABLE P/O FL2 FACTORY SELECTED FOR FILTER OPTIONS		
A72R11	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A72R12	0757-0405	4		RESISTOR 162 1% .125W F TC=O+-100	24546	C-4-1/8-TO-162R-F
A72R13	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R14	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A72R15	0757-0405	4		RESISTOR 162 1% .125W F TC=0+-100	24546	C4-1/8-T0-162R-F
A72R16	0698-0082	7		RESISTOR 464 1% .1252 F TC=0+-100	24546	C4-1/8-T0-4640-F
A72R17	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R18	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R19	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A72R20	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R21	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A72R22	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A72R23	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A72R24	0699-0678	9		RESISTOR 900 .01% .1W F TC=0+-5	28480	0699-0678
A72R25	0699-0681	4		RESISTOR 100 .01% .1W F TC=0+-5	28480	0699-0681
A72R26	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A72R27	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A72R28	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A72R29	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A72R30	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A72R31	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A72R32	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A72R33	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A72R34	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-TO-1211-F
A72R35	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R36	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R37	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A72R38	0757-0400	9		RESISTOR 90.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-90R9-F
A72R39	0757-0400	9		RESISTOR 90.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-90R9-F
A72R40	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A72R41	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A72R42	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A72R43	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A72R44	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A72T1	08901-80070	4	1	TRANSFORMER/FLTR	28480	08901-80070
A72U1	1826-0154	8		IC SWITCH ANLG DUAL TO-100 PKG	17856	DG200BA
A72U2	1820-0535	7	1	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A72U3	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A72U4	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A72U5	1826-0989	7	4	IC OP AMP GP 8-DIP-C PKG	27014	LM307J

†Refer to Section 7 for update information   *Factory Selected Component (Refer to Section 5)   Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
2305A TO 2340A						
B1	08901-60094	0	1	FAN ASSEMBLY, 115V-50/60HZ (EXCEPT OPTION 004)	28480	08901-60095
	86701-00017	3		SHIELDING DISK	28480	86701-00017
	1520-0067	4	5	SHOCK MOUNT .44-EFF-HGT .31-OD (FOR FAN IN REAR PANEL)	28480	1520-0067
	0400-0009	9		GROMMET-RND .125-IN-ID .25-IN-GRV-OD	28480	0400-0009
	1251-3201	3		CONNECTOR 3-PIN F POST TYPE	28480	1251-3201
	1251-4283	3		CONTACT-CONN U/W-POST-TYPE FEM CAP	28480	1251-4283
2348A AND ABOVE						
B1	08901-60306	7	1	FAN ASSEMBLY, 115V-50/60 HZ (EXCEPT OPTION 004)	28480	08901-60306
	0624-0216	4		SCREW-TPG 8-32 .375-IN-LG PAN-HD-POZI	28480	0624-0216
	3160-0300	6		FINGERGUARD	28480	3160-0300
	86701-00017	3		SHIELDING DISK	28480	86701-00017
	1520-0067	4	5	SHOCK MOUNT .44-EFF-HGT .31-OD (FOR FAN IN REAR PANEL)	28480	1520-0067
B1	08901-60307	8	1	FAN ASSEMBLY, 115V-48/480 HZ (OPTION 004 ONLY)	28480	08901-603075
	0400-0009	9		GROMMET-RND .125-IN-ID .25-IN-GRV-OD	28480	0400-0009
	1251-3201	3		CONNECTOR 3-PIN F POST TYPE	28480	1251-3201
	1251-3897	3	3	CONTACT-CONN U/W-POST-TYPE FEM CRP	28480	1251-3897
	1520-0067	4		SHOCK MOUNT .44-EFF-HGT .31-OD	28480	1520-0067
	86701-00017	3		FAN SHIELD	28480	86701-00017
C10	0160-3968	5	1	CAPACITOR-FXD .47UF +-10PF 250VAC(RMS) (OPTION 004 ONLY)	28480	0160-3968
CR1	1906-0231	2	1	DIODE-CT-RECT 200V 15A	28480	1906-0231
	1200-0043	8	1	INSULATOR-XSTR ALUMINUM	28480	1200-0043
	2200-0107	6	2	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
F1	2110-0083	6	1	FUSE 2.5A 250V NTD 1.25X.25 UL (FOR 115V OPERATION)	28480	2110-0083
F1	2110-0043	8	1	FUSE 1.5A 250V NTD 1.25X.25 UL (FOR 230V OPERATION)	28480	2110-0043
J1	8150-0005	2		WIRE 22AWG BK 300V PVC 7X30 105C RF INPUT (EXCEPT OPTION 001)	28480	8150-0005
	2190-0104	0	2	WASHER-LK INTL T 7/16 IN .439-IN-ID	28480	2190-0104
	2950-0132	6	2	NUT-HEX-DBL-CHAM 7/16-28-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
	08731-210	2	2	LOCKING NUT	28480	08731-210
J2				MODULATION OUTPUT/AUDIO INPUT P/O W9 NSR (J2 APPEARS ON THE REAR PANEL OF OPTION 001 INSTRUMENTS)		
J3	1250-1811	5	6	ADAPTER-COAX STR F-N F-SMA CALIBRATION OUTPUT, AM/FM (EXCEPT OPTION 001) (INCLUDES ATTACHING HARDWARE)	28480	1250-1811

†Refer to Section 7 for update information *Factory Selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
2314A TO 2332A						
J4	1250-1811	5		ADAPTER-COAX STR F-N F-SMA CALIBRATION OUTPUT, RF POWER (EXCEPT OPTION 001) (INCLUDES ATTACHING HARDWARE)	28480	1250-1811
2333A AND ABOVE						
J4	1250-1895	5		ADAPTER-COAX STR F-N F-SMA CALIBRATION OUTPUT, RF POWER (EXCEPT OPTION 001)	28480	1251-1895
J5	1250-0083	1	4	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM OUTPUT, AM	28480	1250-0083
	2190-0016	3	7	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2950-0001	8	7	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J6	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM OUTPUT, FM	28480	1250-0083
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2950-0001	8		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J7	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM OUTPUT, RECORDER	28480	1250-0083
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2950-0001	8		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J8				OUTPUT, IF P/O W26 NSR		
J9				TIME BASE 10 MHZ OUTPUT P/O W22 NSR (OPTION 002 ONLY)		
J10				TIME BASE 10 MHZ INPUT P/O W23 NSR (OPTION 002 ONLY)		
J11	1250-1811	5		ADAPTER-COAX STR F-N F-SMA AM/FM CAL OUTPUT, REAR (OPTION 001 ONLY) (INCLUDES ATTACHING HARDWARE)	28480	1250-1811
2314A TO 2332A						
J12	1250-1811	5		ADAPTER-COAX STR F-N F-SMA CALIBRATION OUTPUT, RF POWER (OPTION 001 ONLY) (INCLUDES ATTACHING HARDWARE)	28480	1250-1811
2333A AND ABOVE						
J12	1250-1895	5		ADAPTER-COAX STR F-N F-SMA CALIBRATION OUTPUT, RF POWER (OPTION 001 ONLY)	28480	1251-1895
J13	1250-1811	5		ADAPTER-COAX STR F-N F-SMA LO OUTPUT, REAR (OPTION 003 ONLY) (INCLUDES ATTACHING HARDWARE)	28480	1250-1811

†Refer to Section 7 for update information *Factory Selected Component (Refer to Section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
J13	1250-1811	5	2	ADPT F N F SMA: OPTION 030 ONLY "LO OUT" (INCLUDES ATTACHING HARDWARE)	28480	1250-1811
J14	1250-1811	5		ADAPTER-COAX STR F-N F-SMA LO INPUT, REAR (OPTION 003 ONLY) (INCLUDES ATTACHING HARDWARE)	28480	1250-1811
J14	1250-1811	5		ADPT F N F SMA: OPTION 030 ONLY "LO IN" (INCLUDES ATTACHING HARDWARE)	28480	1250-1811
J15	08662-60304	5		CONN ASSY RF INPUT, REAR (OPTION 001 ONLY)	28480	08662-60304
	2190-0104	0		WASHER-LK INTL T 7/16 IN .439-IN-ID	28480	2190-0104
	2950-0132	6		NUT-HEX-DBL-CHAM 7/16-28-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
	08731-210	2		LOCKING NUT	28480	08731-210
J16	1510-0091	3	3	BINDING POST SGL SGL-TUR JGK RED RF SWITCH 1	28480	1510-0091
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2950-0001	8		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J17	1510-0091	3		BINDING POST SGL SGL-TUR JGK RED RF SWITCH 2	28480	1510-0091
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2950-0001	8		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J18				RF SWITCH GROUND		
	1510-0091	3		BINDING POST SGL SGL-TUR JGK RED	28480	1510-0091
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2950-0001	8		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
J19				FREQ OFFSET TTL OUT		
	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2950-0001	8		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
2314A TO 2514A						
MP1	5020-8805	8	1	FRONT FRAME	28480	5020-8805
	2360-0114	3	6	SCREW-MACH 6-32 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
MP2	5020-8837	6	4	CORNER STRUT	28480	5020-8837
	2360-0115	4	28	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0119	8	1	SCREW-MACH 6-32 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2510-0192	6	16	SCREW-MACH 8-32 .25-IN-LG 100 DEG (MP2 TO MP1, MP16)	00000	ORDER BY DESCRIPTION
2515A AND ABOVE						
MP1	5020-5805	4	1	FRONT FRAME	28480	5020-5805
	2360-0114	3	6	SCREW-MACH 6-32 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
MP2	5020-5837	2	4	CORNER STRUT	28480	5020-5837
	2360-0115	4	28	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0119	8	1	SCREW-MACH 6-32 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	0515-1331	5	16	SCREW-METRIC SPECIALTY M4 X 0.7 THD;6 (MP2 TO MP1, MP16)	28480	0515-1331
MP3	5041-8802	9	1	TRIM, TOP	28480	5041-8802
MP4	5062-3704	4	2	STRAP HANDLE 18 IN.	28480	5062-3704
MP5	5062-3735	1	1	COVER-TOP ASSY	28480	5062-3735
	0510-0043	4	2	RETAINER-RING E-R EXT .141-IN-DIA STL	28480	0510-0043
	0510-1171	1	2	RETAINER-PUSH ON RND EXT .265-IN-DIA STL	28480	0510-1171
MP6	5062-3747	5	1	COV-BOTTOM ASSY	28480	5062-3747
	0510-0043	4		RETAINER-RING E-R EXT .141-IN-DIA STL	28480	0510-0043
	0510-1171	1		RETAINER-PUSH ON RND EXT .265-IN-DIA STL	28480	0510-1171

†Refer to section 7 for update information *Factory selected component. Refer to section VI Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
MP7	08902-00066	1	2	SIDE COVER	28480	08902-00066
MP8	08901-00206	0	1	WINDOW	28480	08901-00206
MP9	5041-8819	8	2	STRAP, HANDLE, CAP-FRONT	28480	5041-8819
	0515-1239	2		SCREW-MACH M3 X 0.8 12MM-LG	00000	ORDER BY DESCRIPTION
MP10	5041-8820	1	2	STRAP, HANDLE, CAP-REAR	28480	5041-8820
	0515-1239	2		SCREW-MACH M3 X 0.8 12MM-LG	00000	ORDER BY DESCRIPTION
MP11	5041-8801	8	4	FOOT (STANDARD)	28480	5041-8801
MP12	5001-0540	2	2	TRIM, SIDE	28480	5001-0540
MP13	1460-1345	5	2	TILT STAND SST	28480	1460-1345
2314A TO 2912A						
MP14	08901-00097	7	1	FRONT PANEL (EXCEPT OPT 001)	28480	08901-00097
MP14	08901-00107	0	1	FRONT PANEL (OPT 001 ONLY)	28480	08901-00107
	0510-1148	2	3	RETAINER-PUSH ON KB-TO-SHFT EXT	28480	0510-1148
2914A TO 3019A						
MP14	08901-00200	4	1	FRONT PANEL (EXCEPT OPT 001)	28480	08901-00200
MP14	08901-00201	5	1	FRONT PANEL (OPT 001 ONLY)	28480	08901-00201
	0510-1148	2	3	RETAINER-PUSH ON KB-TO-SHFT EXT	28480	0510-1148
3026A AND ABOVE						
MP14	08901-00200	4	1	FRONT PANEL	28480	08901-00200
	6960-0150	3	3	HOLE PLUG .500D	28480	6960-0150
	6960-0148	9	1	HOLE PLUG .688D	28480	6960-0148
	6960-0154	7	1	HOLE PLUG .812D	28480	6960-0154
2314A TO 2912A						
MP15	08901-00100	3	1	FRONT SUB-PANEL	28480	08901-00100
	5040-6928	4		STRIP DIVIDER	28480	5040-6928
	2190-0003	8	7	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
	2200-0149	6	11	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	3050-0105	6	7	WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0105
	5040-6888	5	4	LIGHT PIPES	28480	5040-6888
2914A ONLY						
MP15	08901-00209	3	1	FRONT SUB-PANEL	28480	08901-00209
	5040-6928	4		STRIP DIVIDER	28480	5040-6928
	2190-0003	8	7	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
	2200-0149	6	11	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	3050-0105	6	7	WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0105
	5040-6888	5	4	LIGHT PIPES	28480	5040-6888
2920A AND ABOVE						
MP15†	08901-00209	3	1	FRONT SUB-PANEL	28480	08901-00209
	2190-0003	8	7	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
	2200-0149	6	11	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	3050-0105	6	7	WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0105
	0380-1230	6		SPACER-RND .45-IN-LG .147-IN-ID	00000	ORDER BY DESCRIPTION
	5041-3616	3	4	LIGHT PIPES (SEE SECTION 7)	28480	5040-3616

†Refer to section 7 for update information *Factory selected Component (Refer to section 7) Δ Recent part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
2314A TO 2334A						
MP16	08901-20230	2	1	REAR PANEL	28480	08901-20230
2348A TO 2514A						
MP16	08901-20233	5	1	REAR PANEL	28480	08901-20233
2515A AND ABOVE						
MP16	08901-20272	2		REAR PANEL	28480	08901-20272
2314A TO 2449A						
MP17	08901-00078	4	1	CENTER STRUT	28480	08901-00078
	0624-0100	5	111	SCREW-TPG 4-40 .5-IN-LG PAN-HD-POZI STL	28480	0624-0100
	2200-0107	6	8	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0116	5	2	SCREW-MACH 6-32 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
	2360-0117	6	14	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2505A TO 2909A						
MP17	08901-00078	4	1	CENTER STRUT	28480	08901-00078
	0624-0653	3	111	SCREW 440X1/2 TAPTITE T-10 PNTX	28480	0624-0653
	2200-0107	6	8	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0116	5	2	SCREW-MACH 6-32 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
	2360-0117	6	14	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2619A AND ABOVE						
MP17	08901-00171	8	1	CENTER STRUT	28480	08901-00171
	0624-0653	3	111	SCREW 440X1/2 TAPTITE T-10 PNTX	28480	0624-0653
	2200-0107	6	8	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0116	5	2	SCREW-MACH 6-32 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
	2360-0117	6	14	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP18	5041-8821	2	4	FOOT, REAR	28480	5041-8821
	0515-1232	4		SCREW-MACH M3.5 X 0.6 8MM-LG PAN-HD	00000	ORDER BY DESCRIPTION
2314A TO 2909A						
MP19	08901-00076	2	1	SUPPORT BRACKET AUD TOP	28480	08901-00076
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	08662-20028	6	10	HOLE PLUG	28480	08662-20028
2619A AND ABOVE						
MP19	08901-00169	4	1	SUPPORT BRACKET AUD TOP	28480	08901-00169
	2360-0115	4		SCREW-MACH 6-32 .321-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	08662-20028	6	10	HOLE PLUG	28480	08662-20028
MP20	08901-00009	1	1	POWER SUPPLY SUPPORT BRACKET	28480	08901-00009
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP20	08901-00108	1	1	POWER SUPPLY SUPPORT BRACKET (OPT 002 ONLY)	28480	08901-00108
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION

†Refer to section 7 for update information *Factory selected component (Refer to section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
MP21	08901-00047	7	1	SUPPORT BRACKET DIGTL	28480	08901-00047
MP22	08901-20159	4	1	WIRE DUCT	28480	08901-20159
	2190-0006	1	4	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0006
	2360-0197	2	4	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	28480	2360-0197
	3050-0227	3	4	WASHER-FL MTLC NO. 6 .149-IN-ID	28480	3050-0227
2314A TO 2909A						
MP23	08901-00035	3	1	GASKET (BETWEEN EXTRUSION AND A27)	28480	08901-00035
2619A AND ABOVE						
MP23				NOT ASSIGNED		
MP24	08901-00088	6	1	PC BD GUIDE	28480	08901-00088
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	08662-20028	6		HOLE PLUG	28480	08662-20028
MP25	08901-80007	7	4	SHOCK MOUNT	28480	08901-80007
MP26				NOT ASSIGNED		
MP27	5062-4033	4	1	INFORMATION TRAY	28480	5062-4033
MP28	08901-00046	6	1	FAN COVER	28480	08901-00046
MP29				NOT ASSIGNED		
MP30	08901-20160	7	1	WIRE DUCT COVER	28480	08901-20160
MP31	08901-00140	1	1	REAR WIRE DUCT SUPPORT	28480	08901-00140
MP32	08901-90085	2	1	SPECIAL FUNCTION INFORMATION CARD	28480	08901-90085
MP33	08901-90086	3	1	OPERATING INFORMATION CARD	28480	08901-90086
MP34	1600-0692	1	3	STAMPING-BE-CU CLIP WINDOW RETAINING	28480	1600-0692
MP35	08901-00131	0	1	SPACING BRACKET	28480	08901-00131
	2200-0105	4	2	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP36	08901-00086	4	1	SHOCK MOUNT BRACKET, FRONT	28480	08901-00086
	0400-0010	2	4	GROMMET-RND .25-IN-ID .375-IN-GRV-OD	28480	0400-0010
	2190-0017	4	4	WASHER-LK HLCL NO. 8 .168-IN-ID	28480	2190-0017
	2580-0002	4	2	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
MP37	08901-00079	5	1	SHOCK MOUNT BRACKET, REAR	28480	08901-00079
	0400-0010	2		GROMMET-RND .25-IN-ID .375-IN-GRV-OD	28480	0400-0010
	2190-0017	4		WASHER-LK HLCL NO. 8 .168-IN-ID	28480	2190-0017
	2580-0002	4		NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
2314A TO 2449A						
MP38	08901-20158	3	1	EXTRUSION ASSY LO	28480	08901-20158
	0403-0005	1	3	BUMPER FOOT-SCR .5-IN-MAX-OD.188-IN-THK	28480	0403-0005
	0624-0100	5		SCREW-TPG 4-40 .5-IN-LG PAN-HD-POZI STL	28480	0624-0100
	2190-0756	8	3	WASHER-FL MTLC NO. 5 .13-IN-ID .25-IN-OD	28480	2190-0756
2505A AND ABOVE						
MP38	08901-20158	3	1	EXTRUSION ASSY LO	28480	08901-20158
	0403-0005	1	3	BUMPER FOOT-SCR .5-IN-MAX-OD.188-IN-THK	28480	0403-0005
	0624-0653	3	111	SCREW 440X1/2 TAPTITE T-10 PNTX	28480	0624-0653
	2190-0756	8	3	WASHER-FL MTLC NO. 5 .13-IN-ID .25-IN-OD	28480	2190-0756
MP39	08901-00099	9	1	SCREEN, RFI	28480	08901-00099
MP40	08901-20164	1	1	FRONT WINDOW	28480	08901-20164
MP41	08901-00095	5	1	GASKET, EXTRUSION	28480	08901-00095

†Refer to section 7 for update information *Factory selected component (Refer to section 7) △ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
2314A TO 2449A						
MP42	08901-20219	7	1	EXTRUSION ASSY, AUD FRONT	28480	08901-20219
	0624-0100	5		SCREW-TPG 4-40 .5-IN-LG PAN-HD-POZI STL	28480	0624-0100
2505A TO 2608A						
MP42	08901-20219	7	1	EXTRUSION ASSY, AUD FRONT	28480	08901-20219
	0624-0653	3	111	SCREW 440X1/2 TAPTITE T-10 PNTX	28480	0624-0653
2619A AND ABOVE						
MP42	08901-20278	8	1	EXTRUSION ASSY, AUD FRONT	28480	08901-20278
	0624-0653	3	111	SCREW 440X1/2 TAPTITE T-10 PNTX	28480	0624-0653
2314A TO 2426A						
MP43	08901-20161	8	1	EXTRUSION ASSY, AUD REAR	28480	08901-20161
2428A TO 2449A						
MP43	08901-20259	5		EXTRUSION ASSY, AUD REAR	28480	08901-20259
2505A TO 2608A						
MP43	08901-20259	5		EXTRUSION ASSY, AUD REAR	28480	08901-20259
	0624-0653	3	111	SCREW 440X1/2 TAPTITE T-10 PNTX	28480	0624-0653
	0624-0100	5		SCREW-TPG 4-40 .5-IN-LG PAN-HD-POZI STL	28480	0624-0100
2619A AND ABOVE						
MP43	08901-20279	9		EXTRUSION ASSY, AUD REAR	28480	08901-20279
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PN-HD-POZI	00000	ORDER BY DESCRIPTION
2314A TO 2635A						
MP44	08901-20155	0	1	EXTRUSION ASSY, DIGTL	28480	08901-20155
2636A AND ABOVE						
MP44	08902-20054	9	1	EXTRUSION ASSY, DIGTL	28480	08902-20054
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PN-HD-POZI	00000	ORDER BY DESCRIPTION
MP45				NOT ASSIGNED		
2314A TO 2635A						
MP46	08901-00121	8	1	OSCILLATOR MOUNTING PLATE	28480	08901-00121
	0360-0272	2	1	TERMINAL-SLDR LUG LK-MTG FOR-#4-SCR	28480	0360-0272
	2200-0119	0	3	SCREW-MACH 4-40 1-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2636A AND ABOVE						
MP46	08902-00025	2	1	OSCILLATOR MOUNTING PLATE	28480	08902-00025
	0360-0272	2	1	TERMINAL-SLDR LUG LK-MTG FOR-4-SCR	28480	0360-0272
	2200-0119	0	3	SCREW-MACH 4-40 1-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION

†Refer to section 7 for update information *Factory Selected Component (Refer to section 5) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
MP47	08901-20165	2	1	DISPLAY BD SHIELD	28480	08901-20165
	2190-0003	8		WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
	2200-0149	6		SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	3050-0105	6		WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0105
MP48	08901-00102	5	1	DISPLAY BOARD INSULATOR	28480	08901-00102
	0380-0003	9	4	SPACER-RND .125-IN-LG .18-IN-ID	00000	ORDER BY DESCRIPTION
	2200-0149	6		SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP49	6960-0002	4	6	PLUG-HOLE DOME-HD FOR .5-D-HOLE STL	28480	6960-0002
MP50	6960-0009	1	1	PLUG-HOLE FL-HD FOR .438-D-HOLE BRS	28480	6960-0009
MP51	6960-0013	7	1	PLUG-HOLE DOME-HD FOR .812-D-HOLE STL	28480	6960-0013
2314A TO 2608A						
MP52	08901-00090	0	1	DUCT SUPPORT	28480	08901-00090
	2190-0018	5	2	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
	3030-0139	4	2	SCREW-SKT HD CAP 6-32 .375-IN-LG SST	00000	ORDER BY DESCRIPTION
	08662-20028	6		HOLE PLUG	28480	08662-20028
2619A AND ABOVE						
MP52	08901-00172	9	1	DUCT SUPPORT	28480	08901-00172
	2190-0018	5	2	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
	3030-0139	4	2	SCREW-SKT HD CAP 6-32 .375-IN-LG SST	00000	ORDER BY DESCRIPTION
	08662-20028	6		HOLE PLUG	28480	08662-20028
MP53	08901-00089	7	1	RTNR DIGTL	28480	08901-00089
MP54	08901-20231	3	1	CENTER STRUT BRACE	28480	08901-20231
2314A TO 2608A						
MP55	08901-00077	3	1	SUPPORT BRACKET, AND BOTTOM	28480	08901-00077
2619A AND ABOVE						
MP55	08901-00170	7	1	SUPPORT BRACKET, AND BOTTOM	28480	08901-00170
MP56	7120-1254	1	1	NAMEPLATE .312-IN-WD .54-IN-LG AL "HP LOGO"	28480	7120-1254
MP57	7120-1927	5	1	LABEL-BLANK .625-IN-WD 1.5-IN-LG AL "HP HEWLETT-PACKARD MADE IN USA"	28480	7120-1927
MP58				NOT ASSIGNED		
MP59	7120-4296	7	1	LABEL-WARNING .688-IN-WD 1.5-IN-LG AL "WARNING: HAZARDOUS VOLTAGE..."	28480	7120-4296
2314A TO 2514A						
MP60	7120-5911	5	1	LABEL-WARNING 1-IN-WD 7-IN-LG PPR	28480	7120-5911
2515A AND ABOVE						
MP60	7120-8607	2		LABEL..."THIS INSTRUMENT USES METRIC AND ENGLISH HARDWARE..." "CAUTION: METRIC THREADED FASTNERS..."	28480	7120-8607
MP61	7120-8053	2	1	LABEL-WARNING 15.1-MM-WD 45.6-MM-LG "WARNING: FOR CONTINUED PROTECTION AGAINST FIRE..."	28480	7120-8053
MP62	7120-8138	4	1	LABEL-WARNING 6-MM-WD 51-MM-LG VINYL "CAUTION: REMOVE 4 REAP FEET BEFORE REMOVING ANY COVER..."	28480	7120-8138

†Refer to Section 7 for update information. *Factory Selected Component (Refer to section 5). Δ Errata per change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
MP63	7120-8968	8	1	LABEL-SHIPPING YEL W/BLK IMAGE HP PACKAGING LIST	28480	7120-8968
2314A TO 2804A						
MP64	08901-00116	1	1	BOTTOM COVER INSULATOR	28480	08901-00116
2806A AND ABOVE						
MP64	08901-00193	4	1	BOTTOM COVER INSULATOR	28480	08901-00193
2314A TO 2608A						
MP65	08901-00127	4	1	BAFFLE AIR REAR LEFT	28480	08901-00127
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2619A AND ABOVE						
MP65	08901-00173	0	1	BAFFLE AIR REAR LEFT	28480	08901-00173
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP66	08901-00126	3	1	BAFFLE AIR FRONT RIGHT	28480	08901-00126
	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
2314A TO 2635A						
MP67	08901-00125	2	1	REAR AIR BAFFLE	28480	08901-00125
	2200-0103	2	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
2636A AND ABOVE						
MP67	08902-00040	7	1	REAR AIR BAFFLE	28480	08902-00040
	2200-0103	2	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
2314A TO 2608A						
MP68	08901-00123	0	1	AIR DUCT COVER	28480	08901-00123
2619A AND ABOVE						
MP68	08901-00177	4	1	AIR DUCT COVER	28480	08901-00177
MP69	08902-20025	4	1	INPUT SWITCH COVER	28480	08902-20025
2314A TO 2449A						
MP70	0624-0100	5		SCREW-TPG 4-40 .5-IN-LG PAN-HD-POZI STL	28480	0624-0100
2505A AND ABOVE						
MP70	0624-0653	3	111	SCREW 440X1/2 TAPTITE T-10 PNTX (ATTACH MOTHERBOARDS TO FRAME)	28480	0624-0653
MP71	8160-0097	3	1	RFI ROUND STRIP CNDCT-ELSTMR .07-IN-OD	28480	8160-0097
MP72	7120-7032	5	1	LABEL-INFORMATION .325-IN-WD 1.75-IN-LG (OPTION 004 ONLY) "OPERATION AT 360-440 HZ..."	28480	7120-7032
MP73				NOT ASSIGNED		
MP74				NOT ASSIGNED		

†Refer to section 7 for update information *Factory selected component (Refer to section 6) Δ Errata part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
MP75	5020-8806	9	1	REAR FRAME	28480	5020-8806
MP76	T88695	4	1	VOLTAGE INFORMATION LABEL	28480	T88695
2314A TO 2432A						
MP77				NOT ASSIGNED		
2441A AND ABOVE						
MP77	08901-00157	0		COVER, AUDIO SECTION, FULL BLANK	28480	08901-00157
2314A TO 2449A						
MP78				NOT ASSIGNED		
2505A AND ABOVE						
MP78	8710-1637	6	1	TORX BIT, T-10	28480	8710-1637
	1400-0510	8		CLAMP-CABLE .15-DIA .62-WD NYL	28480	1400-0510
2314A TO 2636A						
MP79				NOT ASSIGNED		
2642A AND ABOVE						
MP79	08902-00024	1	1	SWITCH MOUNTING PLATE	28480	08902-00024
MP80△	08901-00214	0	2	SPACER (BETWEEN T1 AND MP16)	28480	08901-00214
MP81△	08901-00211	7	1	BD RETAINING BRACKET (FOR RETAINING A13 AND A14)	28480	08901-00211
	0380-0003	9	5	SPACER .125L.181ID	28480	0380-0003
	2360-0115	4	1	SCREW-MACHINE 6-32 .312PNPD	28480	2360-0115
	2190-0006	1	1	LOCK WASHER .141ID	28480	2190-0006
2314A TO 2912A						
S1	3101-2080	9	1	SWITCH-RKR BASIC DPDT 3A 250VAC SLDR-LUG	28480	3101-2080
	5041-1418	9	1	ROCKER	28480	5041-1418
	2200-0164	5	2	SCREW-MACH 4-40 .188-IN-LG UNCT 82 DEG	00000	ORDER BY DESCRIPTION
2914A AND ABOVE						
S1	3101-2915	9	1	SWITCH-RKR PRI-SW SPDT 5A 120VAC	02392	U11 J50 ZQE WHITE
T1	9100-4255	8	1	TRANSFORMER-POWER 100/120/220/240V	28480	9100-4255
	7100-1283	4	1	TRANSFORMER COVER	28480	7100-1283
	08901-00140	1		BRACKET	28480	08901-00140
	2190-0034	5	6	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0034
	2680-0131	2	2	SCREW-MACH 10-32 2.25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2680-0132	3	4	SCREW-MACH 10-32 2.5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	2740-0002	4	2	NUT-HEX-DBL-CHAM 10-32-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
	3050-0006	6	2	WASHER-SHLDR NO. 10 .2-IN-ID .5-IN-OD	28480	3050-0006
	3050-0226	2	4	WASHER-FL MTLC NO. 10 .203-IN-ID	28480	3050-0226
	1400-0249	0	6	CABLE TIE .062-.625-DIA .091-WD NYL	06383	PLTIM-8
W1-W8				NOT ASSIGNED		

†Refer to section 7 for update information *Factory Selected Component (Refer to section 6) △ Exact part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
W9	08901-60049	5		COAX CABLE ASSY (1) A52J2 - MODULATION OUT/AUDIO IN (EXCEPT OPT 001)	28480	08901-60049
W10	08901-60177	0	1	COAX CABLE ASSY (9) CALIBRATION OUTPUT, AM/FM (EXCEPT OPTION 001)	28480	08901-60177
W11	08901-60178	1	1	COAX CABLE ASSY (98) CALIBRATION OUTPUT, RF POWER (ALL INSTRUMENTS INCL OPT 001)	28480	08901-60178
W12	08901-60166	7	1	COAX CABLE ASSY (9) CALIBRATION OUTPUT, AM/FM (OPTION 001 ONLY)	28480	08901-60166
W13	08901-60225	9	1	WIRING HARNESS A1J1 - A26J1	28480	08901-60225
W14	08901-60175	8	1	RIBBON CABLE ASSY A1J2 - A27J3	28480	08901-60175
W15	08901-60118	9	1	COAX CABLE ASSY (0) A15J1 - INPUT (ALL INSTRUMENTS INCL OPT 001)	28480	08901-60172
W16	08901-60053	1	1	COAX CABLE ASSY (935) A2J1 - A6J1	28480	08901-60053
W17	08901-60056	4	1	COAX CABLE ASSY (947) A2J2 - A4J3	28480	08901-60056
W18	08901-60154	3	1	COAX CABLE ASSY (3) A11J1 - A19J1	28480	08901-60154
W19	08901-60064	4	1	COAX CABLE ASSY (934) A11J2 - A51J2	28480	08901-60064
W20	08901-60055	3	1	COAX CABLE ASSY (94) A11J3 - A4J2	28480	08901-60055
W21	08901-60169	0	1	COAX CABLE ASSY (4) A11J4 - Y1J1 (OPTION 002 ONLY)	28480	08901-60169
	1400-0510	8	.5	CLAMP-CABLE .15-DIA .62-WD NYL	28480	1400-0510
W22	08901-60163	4	1	COAX CABLE ASSY (2) A11J5 - REAR TIME BASE OUTPUT (OPTION 002 ONLY)	28480	08901-60163
W23	08901-60161	2	1	COAX CABLE ASSY (5) A11J6 - REAR TIME BASE INPUT	28480	08901-60161
W24	08901-60054	2	1	COAX CABLE ASSY (926) A4J1 - A6J3	28480	08901-60054
W25	08901-60043	9	1	COAX CABLE ASSY (957) A6J2 - A18J1	28480	08901-60043
W26	08901-60044	0	1	COAX CABLE ASSY (902) A6J4 - OUTPUT IF	28480	08901-60044
W27	08901-60243	1	1	RIBBON CABLE ASSY A14J1 - A31J2	28480	08901-60243
W28	08901-60076	8	1	COAX CABLE ASSY (92) A50J1 - A51J1	28480	08901-60076
W29	08901-60157	6	1	COAX CABLE ASSY (914) A52J1 - A25J1	28480	08901-60157

†Refer to section 7 for update information *Factory selected Component (Refer to section 5) Δ From last change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
W30				NOT ASSIGNED (EXCEPT OPTION 030)		
2314A TO 2636A						
W30	08901-60253	3	1	CABLE ASSEMBLY: A16J1 TO A55J2 (8) (OPTION 030 ONLY)	28480	08901-60253
2642A AND ABOVE						
W30	08902-60051	0	1	CABLE ASSEMBLY: A16J1 TO A55J2 (8) (OPTION 030 ONLY)	28480	08902-60051
W31				NOT ASSIGNED		
W32	08901-60078	0	1	COAX CABLE ASSY (7) A17J3 - A19J3 (EXCEPT OPTION 003)	28480	08901-60078
W33	08901-60168	9	1	COAX CABLE ASSY (927) A17J3 - REAR LO INPUT (OPTION 003 ONLY)	28480	08901-60168
2314A TO 2636A						
W33	08901-60168	9	1	CABLE ASSEMBLY: A17J3 TO S2 PORT 2 (927) (OPTION 030 ONLY)	28480	08901-60168
2642A AND ABOVE						
W33	08902-60019	0	1	CABLE ASSEMLBY: A17J3 TO S2 PORT 2 (927) (OPTION 030 ONLY)	28480	08902-60019
W34	08901-60167	8	1	COAX CABLE ASSY (90) A19J3 - REAR LO OUTPUT (OPT 003 ONLY)	28480	08901-60167
2314A TO 2636A						
W34	08901-60167	8	1	CABLE ASSEMLBY: A19J3 TO S2 PORT 1 (90) (OPTION 030 ONLY)	28480	08901-60167
2642A AND ABOVE						
W34[△]	08902-60133	9	1	CABLE ASSEMLBY: A19J3 TO S2 PORT 1 (156) (OPTION 030 ONLY)	28480	08902-60133
W35	08901-20083	3	1	SEMI-RIGID COAX CABLE ASSY (OPT 003 ONLY)	28480	08901-20083
W36	08901-60057	5	1	COAX CABLE ASSY (91) A21J2 - A23J1	28480	08901-60057
W37	08901-60061	1	1	COAX CABLE ASSY (934) A17J2 - A15J2	28480	08901-60061
W38	08901-60063	3	1	COAX CABLE ASSY (916) A21J1 - A22J1	28480	08901-60063
W39	08901-60058	6	1	COAX CABLE ASSY (93) A23J2 - A24J2	28480	08901-60058
W40	08901-60060	0	1	COAX CABLE ASSY (905) A17J1 - A18J2	28480	08901-60060

†Refer to section 7 for update information *Factory selected component. Refer to section 5. △ Exact part change

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
W41	08901-60179	2	1	WIRE HARNESS ASSY - RF POWER (EXCEPT OPT 001)	28480	08901-60179
W42	08901-60241	9	1	WIRE HARNESS ASSY - RF POWER (OPT 001 ONLY)	28480	08901-60241
W43				NOT ASSIGNED		
W44	08901-60059	7	1	COAX CABLE ASSY (956) A19J2 - A24J1	28480	08901-60059
W45	08901-60072	4	1	WIRING HARNESS - DIGTL A26J3 - A27J4	28480	08901-60072
	1251-3275	1	6	CONNECTOR 6-PIN F POST TYPE	28480	1251-3275
	1251-3897	3	34	CONTACT-CONN U/W-POST-TYPE FEM CRP	28480	1251-3897
	1400-0510	8		CLAMP-CABLE .15-DIA .62-WD NYL	28480	1400-0510
2314A TO 2608A						
W46	08901-60230	6	1	RIBBON CABLE ASSY A25J2 - A27J2	28480	08901-60230
	1400-1151	5	2	CLAMP-CABLE .625-WD NYL	28480	1400-1151
2619A AND ABOVE						
W46	08902-60039	4	1	RIBBON CABLE ASSY A25J2 - A27J2	28480	08902-60039
	1400-1151	5	2	CLAMP-CABLE .625-WD NYL	28480	1400-1511
W47	08901-60231	7	2	RIBBON CABLE ASSY A27J1 - A28J3	28480	08901-60231
	1400-1511	1	1	CABLE CLAMP	28480	1400-1511
W48	08901-60231	7		RIBBON CABLE ASSY A25J3 - A28J2	28480	08901-60231
	1400-1151	5		CLAMP-CABLE .625-WD NYL	28480	1400-1151
W49	08901-60071	3	1	WIRING HARNESS - AUDIO A25J4 - A26J2	28480	08901-60071
	1251-3275	1		CONNECTOR 6-PIN F POST TYPE	28480	1251-3275
	1251-3897	3		CONTACT-CONN U/W-POST-TYPE FEM CRP	28480	1251-3897
W50	08901-60232	8	1	WIRING HARNESS A26J6 - A28J1	28480	08901-60232
	1251-3275	1		CONNECTOR 6-PIN F POST TYPE	28480	1251-3275
	1251-3897	3		CONTACT-CONN U/W-POST-TYPE FEM CRP	28480	1251-3897
W51	08901-60176	9	1	WIRING HARNESS A25J5 - AM OUTPUT, FM OUTPUT, RECORDER OUTPUT AND FREQ OFFSET TTL OUT	28480	08901-60176
	1400-0510	8		CLAMP-CABLE .15-DIA .62-WD NYL	28480	1400-0510
W52	8120-1378	1		CABLE ASSY 18AWG 3-CNDCT JGK-JKT	28480	8120-1378
2314A TO 2411A						
W53				NOT ASSIGNED		
2413A AND ABOVE						
W53	08901-60258	8	1	COAX CABLE ASSEMBLY (1) A52J2 - MODULATION OUT/AUDIO IN (OPTION 001 ONLY)	28480	08901-60258

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
				MISCELLANEOUS PARTS		
W54				NOT ASSIGNED		
W55	08901-60255	5	1	WIRING HARNESS: A55P55 TO S2 (BRN/RED/ORN) OPTION 030 ONLY	28480	08901-60255
2314A TO 2636A						
W56	08901-20248	2	1	CABLE ASSEMBLY SEMI-RIGID: REAR PANEL J14 TO S2 PORT 3: OPTION 030 ONLY	28480	08901-60248
W57	08901-20249	3	1	CABLE ASSEMBLY SEMI-RIGID: S2 PORT 4 TO REAR PANEL J13; OPTION 030 ONLY	28480	08901-20249
2642A AND ABOVE						
W56	08902-60036	1	1	CABLE ASSEMBLY SEMI-RIGID; REAR PANEL J14 TO S2 PORT 3; OPTION 030 ONLY	28480	08902-60036
W57	08902-60037	2	1	CABLE ASSEMBLY SEMI-RIGID: S2 PORT 4 TO REAR PANEL J13; OPTION 030 ONLY	28480	08902-60037
Y1	0960-0529	4	1	OSCILLATOR-CRYSTAL OVENIZED; 10MHZ; 1	28480	0960-0529
	2190-0006	1		WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0006
	2360-0203	1	4	SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
	3050-0227	3		WASHER-FL MTLC NO.6 .149-IN-ID	28480	3050-0227

Table 6-4. Code List of Manufacturers

Mfr. Code	Manufacturer Name	Address	Zip Code
00000	ANY SATISFACTORY SUPPLIER		
00853	SANGAMO ELEC CO S CAROLINA DIV	PICKENS, SC	29671
01121	ALLEN-BRADLEY CO	MILWAUKEE, WI	53204
01295	TEXAS INSTR INC SEMICOND CMPNT DIV	DALLAS, TX	75222
02111	SPECTROL ELECTRONICS CORP	CITY OF IND, CA	91745
02114	FERROXCUBE CORP	SAUGERTIES, NY	12477
03888	K D I PYROFILM CORP	WHIPPANY, NJ	07981
03911	CLAIREX CORP	MT VERNON, NY	10050
04713	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX, AZ	85008
06560	JEFFERS ELECTRONICS INC	NOGALES, AZ	85621
06665	PRECISION MONOLITHICS INC	SANTA CLARA, CA	95050
07263	FAIRCHILD SEMICONDUCTOR DIV	MOUNTAIN VIEW, CA	94042
07716	TRW INC BURLINGTON DIV	BURLINGTON, IA	52601
07933	RAYTHEON CO SEMICONDUCTOR DIV HQ	MOUNTAIN VIEW, CA	94040
08713	CATALYST RESEARCH CORPORATION	BALTIMORE, MA	21209-9987
11236	CTS OF BERNE INC	BERNE, IN	46711
13103	THERMALLOY CO	DALLAS, TX	75234
16299	CORNING GLASS WKS COMPONENT DIV	RALEIGH, NC	27604
17856	SILICONIX INC	SANTA CLARA, CA	95054
18324	SIGNETICS CORP	SUNNYVALE, CA	94086
18736	VOLTRONICS CORP	HANOVER, NJ	07936
19701	MEPCO/ELECTRA CORP	MINERAL WELLS, TX	76067
20932	EMCON DIV ITW	SAN DIEGO, CA	92129
20940	MICRO-OHM CORP	EL MONTE, CA	91731
24046	TRANSITRON ELECTRONIC CORP	WAKEFIELD, MA	01880
24355	ANALOG DEVICES INC	NORWOOD, MA	02062
24546	CORNING GLASS WORKS (BRADFORD)	BRADFORD, PA	16701
25088	SIEMENS CORP	ISELIN, NJ	08830
25403	N.V. PHILIPS-ELCOMA DEPARTMENT	EINDHOVEN, HL	02876
27014	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA, CA	95051
27167	CORNING GLASS WORKS (WILMINGTON)	WILMINGTON, NC	28401
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO, CA	94304
3L585	RCA CORP SOLID STATE DIV	SOMERVILLE, NJ	
30983	MEPCO/ELECTRA CORP	SAN DIEGO, CA	92121
34371	HARRIS SEMICON DIV HARRIS-INTERTYPE	MELBOURNE, FL	32901
51642	CENTRE ENGINEERING INC	STATE COLLEGE, PA	16801
51959	VILCAN INC INC	SAN DIEGO, CA	92138
52063	EXAR INTEGRATED SYSTEMS INC	SUNNYVALE, CA	94086
52763	STETTNER ELECTRONICS INC	CHATTANOOGA, TN	13035
56289	SPRAGUE ELECTRIC CO	NORTH ADAMS, MA	01247
72136	ELECTRO MOTIVE CORP	FLORENCE, SC	06226
72982	ERIE TECHNOLOGICAL PRODUCTS INC	ERIE, PA	16512
73138	BECKMAN INSTRUMENTS INC HELIPOT DIV	FULLERTON, CA	92634
74970	JOHNSON E F CO	WASECA, MN	56093
75915	LITTELFUSE INC	DES PLAINES, IL	60016
90201	MALLORY CAPACITOR CO	INDIANAPOLIS, IN	46206

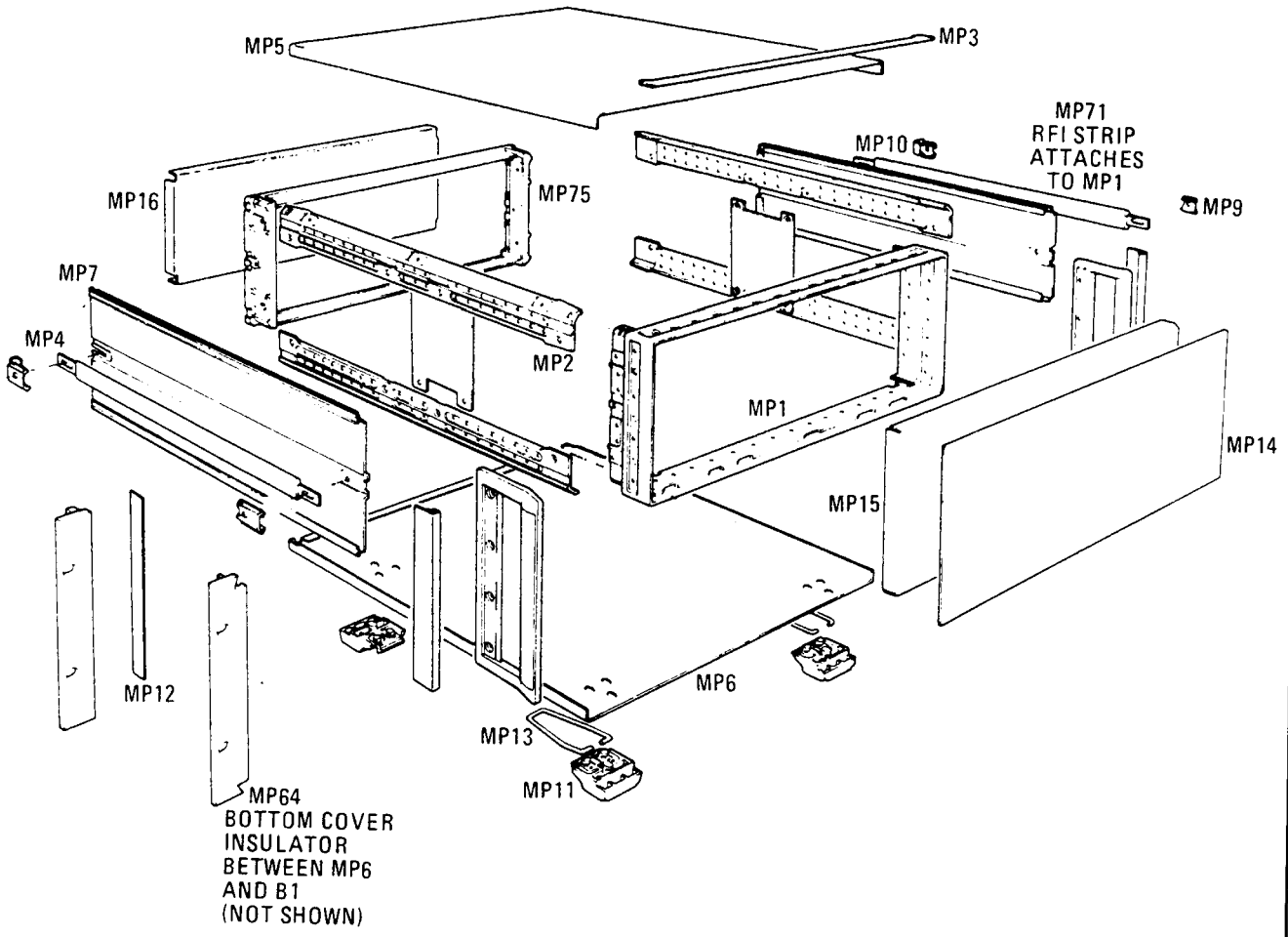


Figure 6–1. *Cabinet Parts*

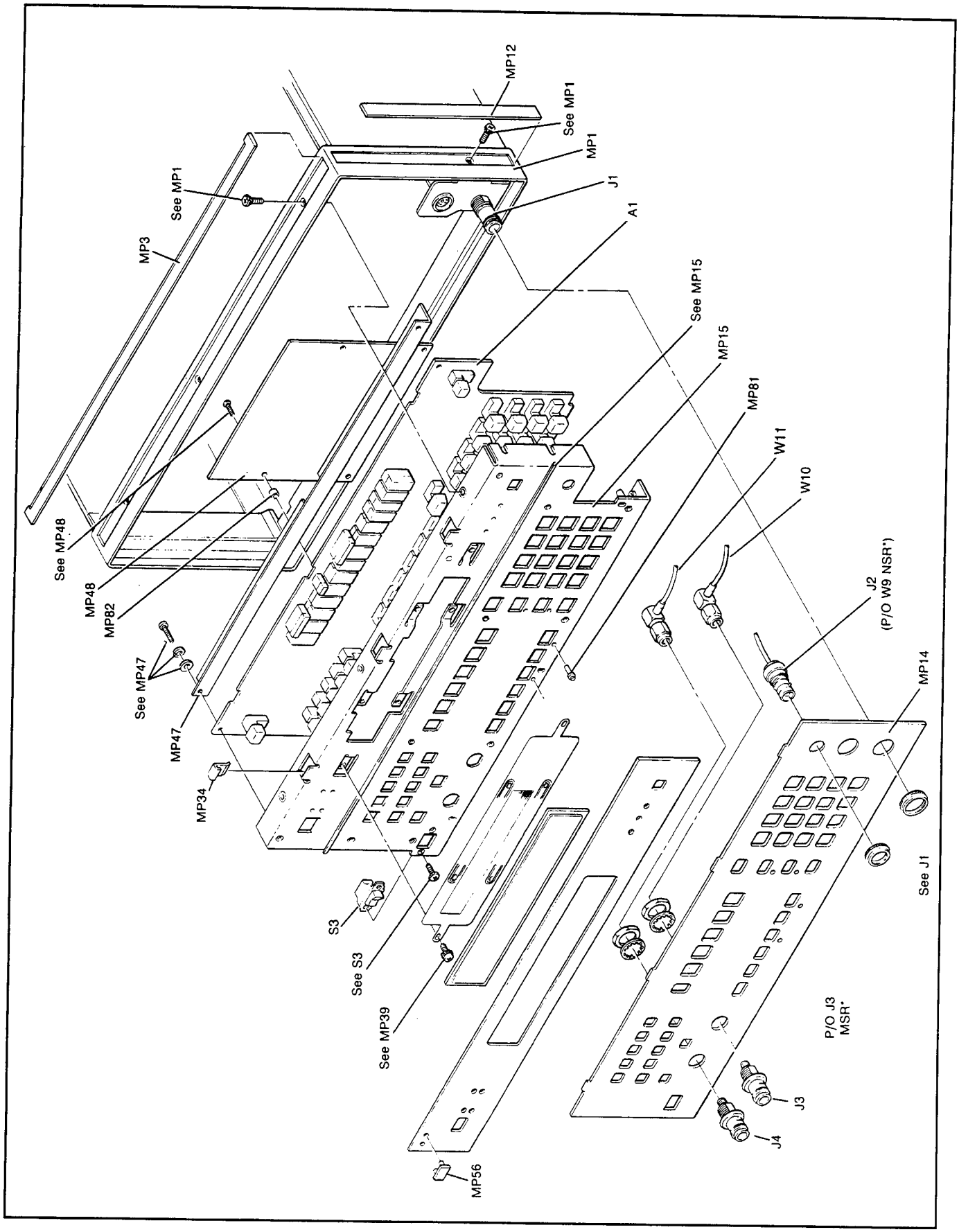


Figure 6–2. *Exploded View of the Front Panel*

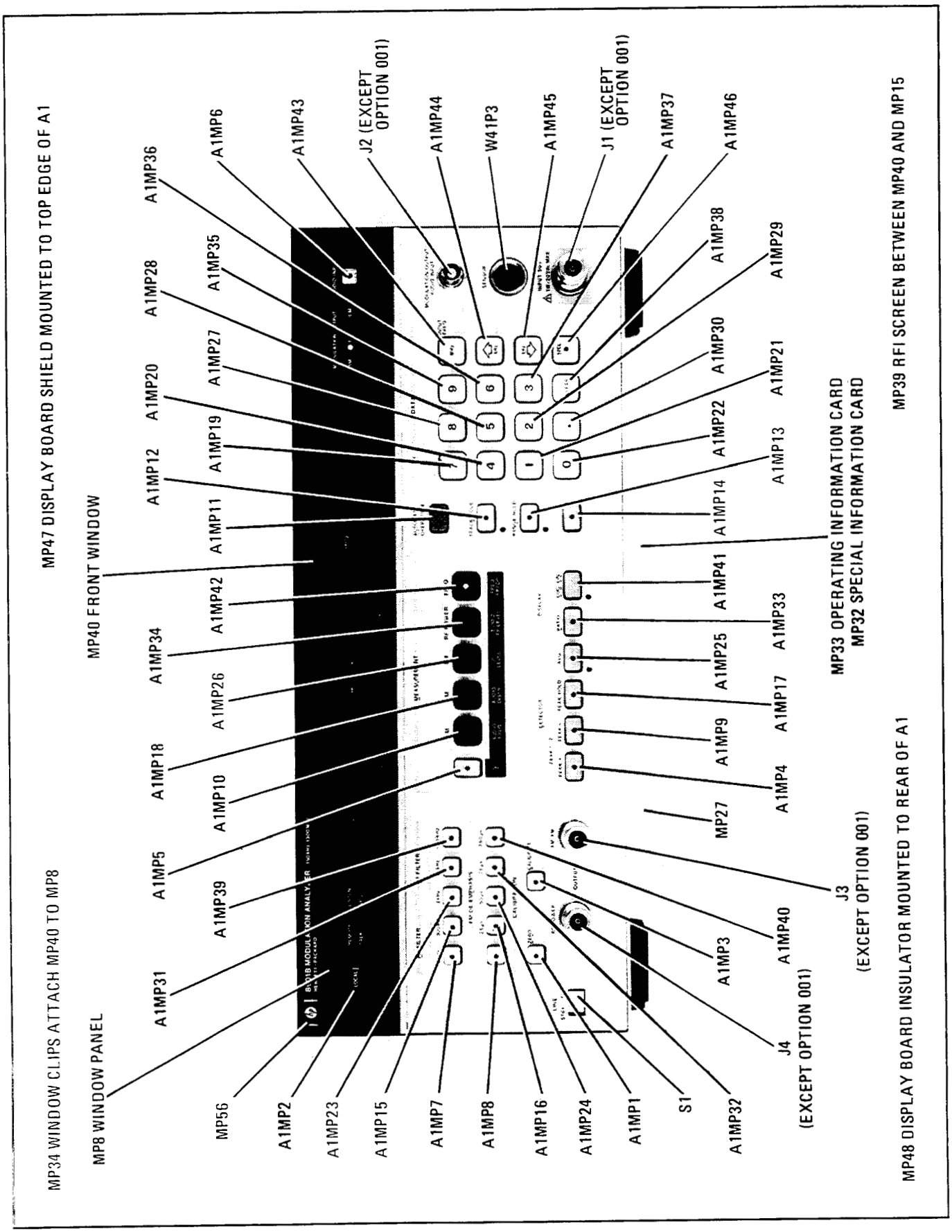


Figure 6–3. *Parts Identification (Front View)*

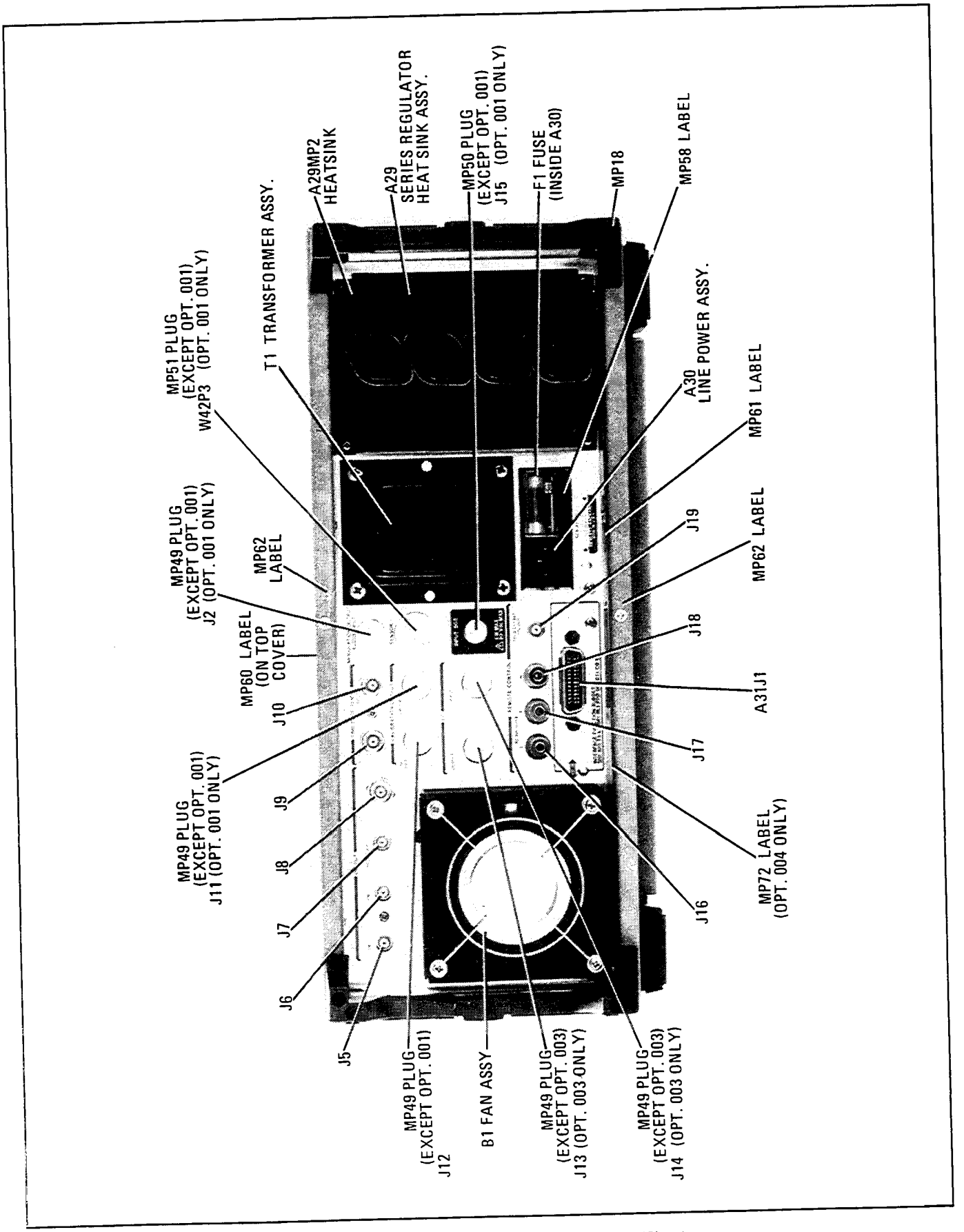


Figure 6–4. *Parts Identification (Rear View)*

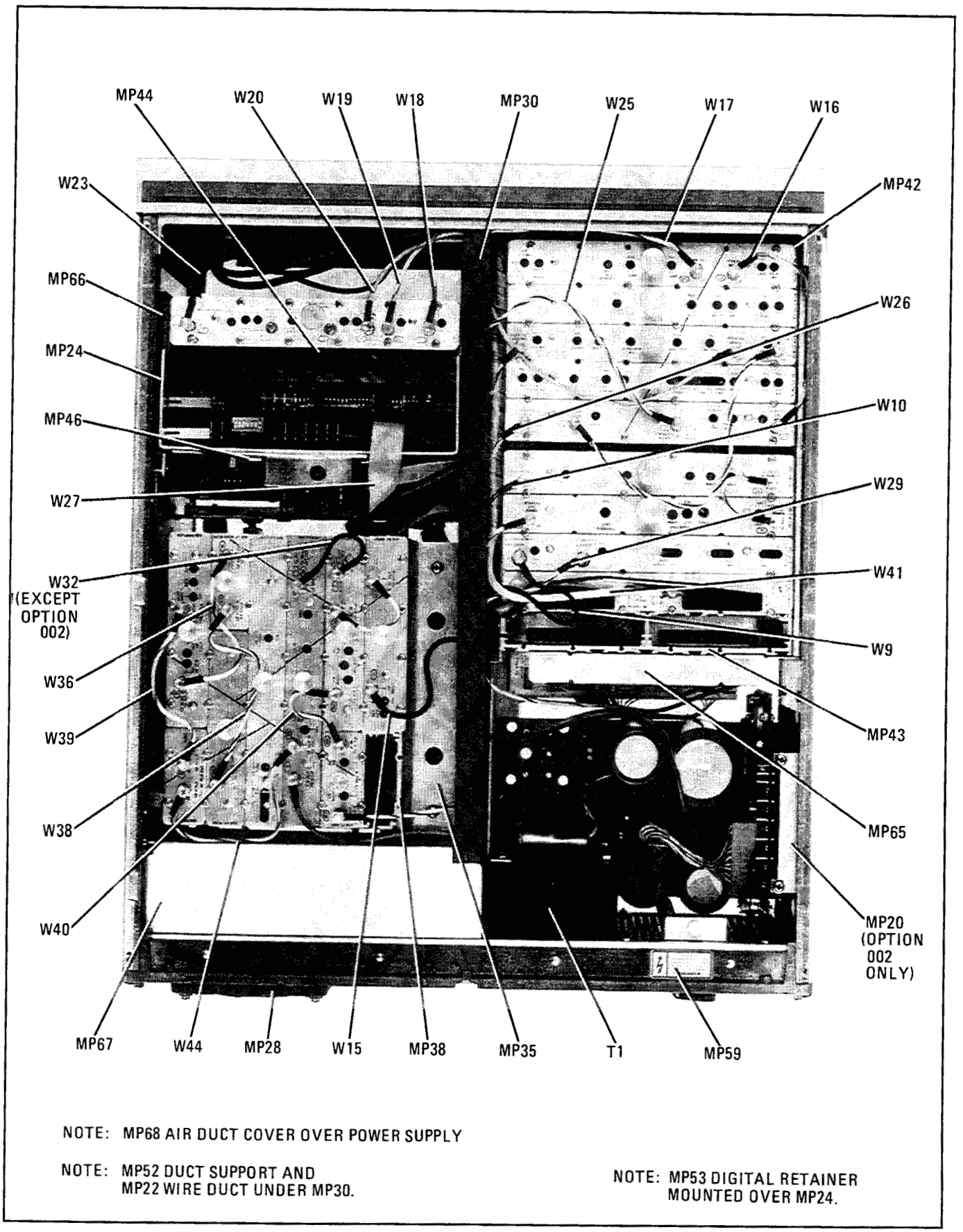


Figure 6–5. *Parts and Cable Identication (Top View)*

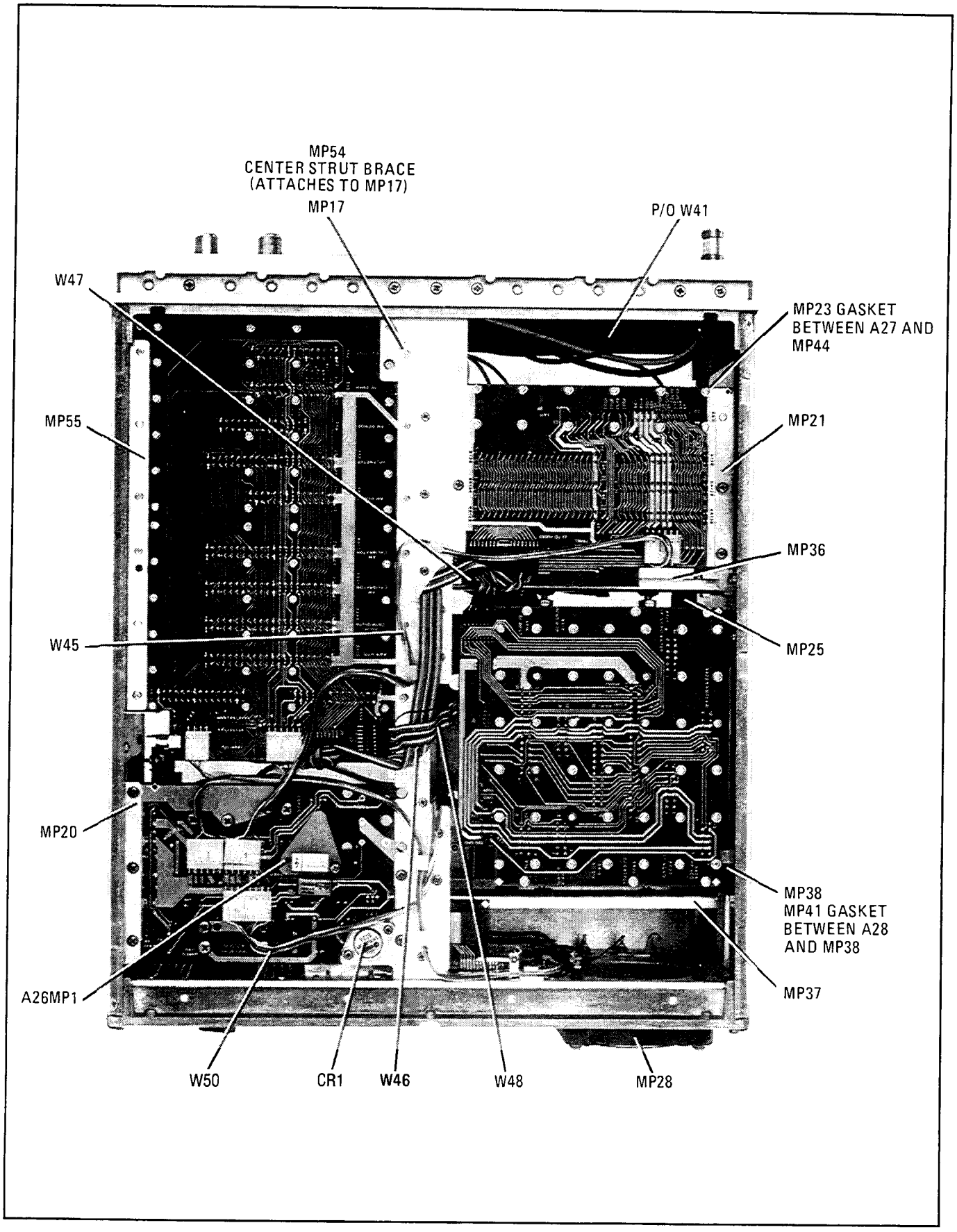


Figure 6–6. *Parts and Cable Identication (Bottom View)*

Section 7
INSTRUMENT CHANGES

7-1. INTRODUCTION TO THIS SECTION

This section contains instrument modification recommendations and procedures that could improve the performance and reliability of your instrument. Refer to *Instruments Covered by This Manual,* paragraph 1-5 in Section 1 for important information about serial number coverage.

7-2. FIRMWARE CHANGE SUMMARY *(2314A TO 2644A)*

Description

The instrument has undergone several changes in firmware. This article summarizes the changes and should be helpful in deciding whether to update firmware to a more recent edition.

The firmware is changed whenever anomalies are found in the instrument's operation which can be corrected by altering the Controller's program. Firmware is also changed to add new features which may be only changes in the program or which may also result from instrument hardware changes.

Since the program resides in the ROMs (the firmware), the ROMs are altered each time the program is changed. At that time the new ROMs are given new part numbers and the software (the program) date is changed. (To display the software date, key in Special Function 42.0.) Always update firmware with the latest edition, which is backward compatible. (See Service Sheet 24 for ROM identification.)

Summary of Software Editions

1. **Software date code: 167.1983** ***(2314A to 2333A)***

   ROM part numbers:

   ROM 1, 08901-80062
   ROM 2, 08901-80063
   ROM 3, 08901-80064

   This is a preliminary edition of software which should be replaced by the most recent edition.

2. **Software date code: 272.1983** ***(2334A to 2426A)***

   ROM part numbers:

   ROM 1, 08901-80066
   ROM 2, 08901-80067
   ROM 3, 08901-80068

   This is the first edition of software in production instruments.

3. **Software date code: 115.1984** ***(2432A to 2550A)***

   ROM part numbers:

   ROM 1, 08901-80071
   ROM 2, 08901-80072
   ROM 3, 08901-80073

Change 1 adds a few function settings not stored by the Store/Recall feature. Previously, when the settings were recalled, the functions were set to their current settings instead of the stored settings. The unstored functions were: (1) manually selected Tuned RF Level filtering (Special Function 4), (2) power sensor calibration factor table entry when entry is in progress, (3) the last calibrated power sensor type, (4) the HP-IB SRQ mask, and (5) the HP-IB Status Byte.

Change 4 increases RF Power measurement resolution by a factor of 10 to allow the instrument's power meter to be similar to other power meters. 1 mW now reads 1000.0 μW instead of 1.000 mW.

Change 5 adds Special Functions 23 and 24 which are used with Option Series 030, Selective Power measurements. New hardware and firmware Change 17 (below) must also be added to implement this feature. Compatibility with all other measurements is maintained.

4. **Software date code: 304.1985** ***(2551A only)***

ROM part numbers:

ROM 1, 08901-80081
ROM 2, 08901-80082
ROM 3, 08901-80083

Change 7 increases digital averaging to reduce display bounce during noisy SINAD measurements (Special Function 5.1).

Change 11 adds Special Function 31 which corrects for the noise floor when using the average detector in Tuned RF Level on the lowest range. Special Function 31.0 disables the noise floor correction. Special Function 31.1 enables the noise floor correction. Special Function 31.2 displays the noise-floor correction status.

Change 13 adds Special Function 7.4 to increase the display resolution of RF frequency to 0.1 Hz below 10 MHz and 1 Hz above 10 MHz.

Change 14 improves the repeatability of the Set Reference feature in Tuned RF Level by averaging several readings when computing the calibration reference.

Change 15 extends the frequency offset mode range to 200 GHz.

Change 16 adds Special Function 47 which displays certain instrument configuration details for troubleshooting purposes. After keying in 47.0 SPCL the display will be of the form

<New Opt. Series 030><Old Opt. Series 030>

where 1 is yes and 0 is no. The new Option Series 030 refers to instruments with serial prefix 2642A and above; old refers to older versions of the HP 8901B Modulation Analyzer (which shares the firmware).

Change 17 adds hardware identification of certain instrument configuration details needed for Option Series 030 measurements. (Refer also to Change 16 above.)

Change 18 adds Special Functions 49.C to read the Option Series 030 IF RMS Detector.

Change 19 increases the averaging time in Tuned RF Level for instruments when Special Function 32.1 is in effect. (See also Change 12.)

5. **Software date code: 70.1986** *(2608A to 2642A)*

ROM part numbers:

ROM 1, 08901-80087
ROM 2, 08901-80088
ROM 3, 08901-80089

Change 12 adds Special Function 32 which alters several default conditions for specialized applications. Special Function 32.0 sets the "normal" defaults. Special Function 32.1 sets the "special" defaults (RF power resolution 0.001 dB and minimum audio frequency resolution 0.1 Hz). Special Function 32.2 displays the status of this special function.

Change 20 updates the original firmware released for the Option 030 for more efficient operation. The new firmware is compatible with all instruments.

6. **Software date code: 149.1986** *(2644A to 2702A)*

ROM part numbers:

ROM 1, 08901-80090
ROM 2, 08901-80091
ROM 3, 08901-80092

Change 21 allows for displaying the previously entered frequency when displaying RF Power Calibration Factors.

Change 22 prevents the instrument when in Tuned RF Level range to range calibration from generating a 10 dB error.

Change 23 adds increased "ERROR 01" limits up to ± 100 kHz for the testing of drifting signal generators (when in Track Mode) Tuned RF level.

7. **Software date code: 351.1986** *(2718A and Above)*

ROM part numbers:

ROM 1, 08901-80105
ROM 2, 08901-80106
ROM 3, 08902-80107

Change 24 updates the firmware to increase averaging (special function 32.1) and to reduce settling time when making power meter measurments.

7–3. CABINET PARTS COLOR CHANGE

(2912A and above)

NOTE

Serial prefix 2912A changes the color of the instrument covers and accessories. The old color cover and accessories are no longer availiable. If your instrument has serial prefixes 2911A and below, and you must replace one of these parts, we recommend that you order the full set of covers and accessories. Affected cabinet parts are MP3-12, MP14, MP18, and MP27, (see Table 6-3).

7–4. A1 LEDS, A1DS31-37 AND A1DS42-45.

(2314A to 2914A)

If the serial prefix of your instrument falls within 2314A to 2914A and you must replace A2DS31-37 or A1DS42-45 you must also order a new spacer and light pipe listed under MP15 (2920A and above) in the miscellaneous replaceable parts list.

Section 8
SERVICE

8-1. INTRODUCTION TO THIS SECTION

This section contains information for troubleshooting and repairing the Modulation Analyzer. Included are troubleshooting tests, block and schematic diagrams, and principles of operation.

8-2. HOW THE SECTION IS ORGANIZED

Section 8 is contained in this and two other volumes as:

Volume 2

- General Service Information:
  Safety Considerations
  Service Tools and Aids
  General Troubleshooting Information
  Assembly and Service Sheet Cross Reference Index
  Assembly Locations
  Schematic Diagram Notes
- Service Aids:
  Special Functions
  Error Messages
  Power-Up Checks
  Controller Test LEDs and Test Points
  Signature Analysis
- Disassembly (for the front panel)
- Block Diagram (BD) Theory and Troubleshooting
  The circuit descriptions and troubleshooting procedures for all the block diagrams.
- BD1 through BD5 Block Diagrams
  Block Diagrams (foldouts) for the Modulation Analyzer.

Volume 3

- Schematic Diagram Theory and Troubleshooting
  Circuit descriptions and troubleshooting procedures for Service Sheets (SS) 1 through 34.

Volume 4

- SS1 through SS35 Schematic Diagrams
  Schematic Diagrams (foldouts) and Component Locator Diagrams for the Modulation Analyzer.
- SSA Summary
  Service Special Functions and Error Message Summary.
- SSB and SSC Summary
  Direct Control Special Function Summary.

8-3. SAFETY CONSIDERATIONS

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 cord, or supplied power cord set. In addition, verify that a common ground exists between the Modulation Analyzer and all test equipment.

Safety

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

WARNING

Maintenance described herein is performed with power supplied to the instrument and with the 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). When 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 disconnection of the protective earth terminal will create a potential shock hazard that could result in personal injury. Grounding one conductor of a two conductor outlet is not sufficient. Whenever it is likely that the protection has been impaired, the instrument must be made inoperative (that is, secured against unintended operation).

If this instrument is to be energized via an autotransformer, make sure that the autotransformer's common terminal is connected to the earth terminal of the power source.

Capacitors inside the instrument can still be charged even if the instrument is disconnected from its source of supply.

Make sure that only 250 volt fuses with the required rated current and of the specified type (normal blow, time delay, etc.) are used for replacement. Do not use repaired fuses or short-circuited fuseholders. To do so could create a shock or fire hazard.

A13BT1 is a Lithium battery. The following procedure is recommended for its disposal:

Discharge A13BT1 by soldering a 50 kΩ resistor across both battery terminals. Complete discharge will occur after one year, at 25°C.

Under Resource Conservation Recovery Act (RCRA) regulations, the completely discharged battery is considered "nonhazardous." However, the user must be responsible for individual state regulations for battery disposal.

CAUTION

Do not unplug any boards in the Modulation Analyzer unless the instrument is unplugged or switched to STBY (standby). Some boards contain devices which can be damaged if the board is removed when the power is on. Use conductive foam when removing MOS devices from sockets. Use care when unplugging ICs from high-grip sockets.

8-4. SERVICE TOOLS, AIDS, AND INFORMATION

Service Accessory Kit

The Service Accessory Kit (HP 08901-60287) contains extender boards, extender cables, and other items needed for servicing the Modulation Analyzer. The extender boards have a height that matches the assembly extrusions and, for 12 pin connectors, improves the mechanical stability of the extended assembly. The kit contains a special Digital Test/Extender Board (HP 08901-60081) which facilitates troubleshooting of the A13 Controller and A14 Remote Interface Assemblies (see Figure 8A-1).

The kit also contains a special conductive polyurethane foam pad (HP 4208-0094) that is required for the protection of MOS devices as cautioned in paragraph 8-3.

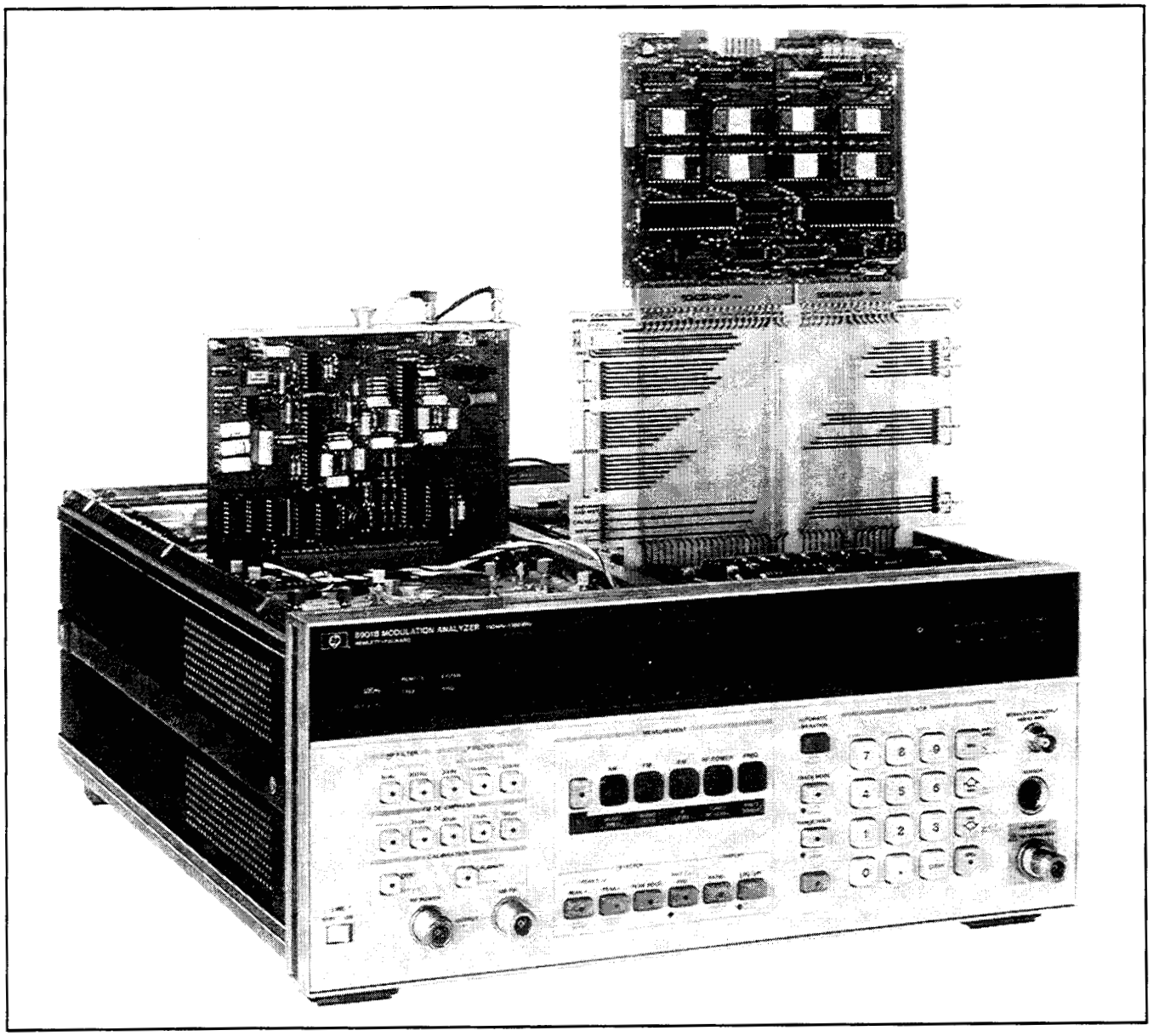


Figure 8A-1. Assemblies on Extender Boards

Heat-Staking Tool

The front-panel pushbutton switches have small plastic pins protruding from the back. These tabs fit through holes in the front-panel printed-circuit board (assembly A1) and are melted down to hold the switch in place. This process is known as heat staking. The heat-staking tool is a standard soldering iron with a special tip attached (see Figure 8A-2). The special tip may be ordered as HP part number 5020-8160.

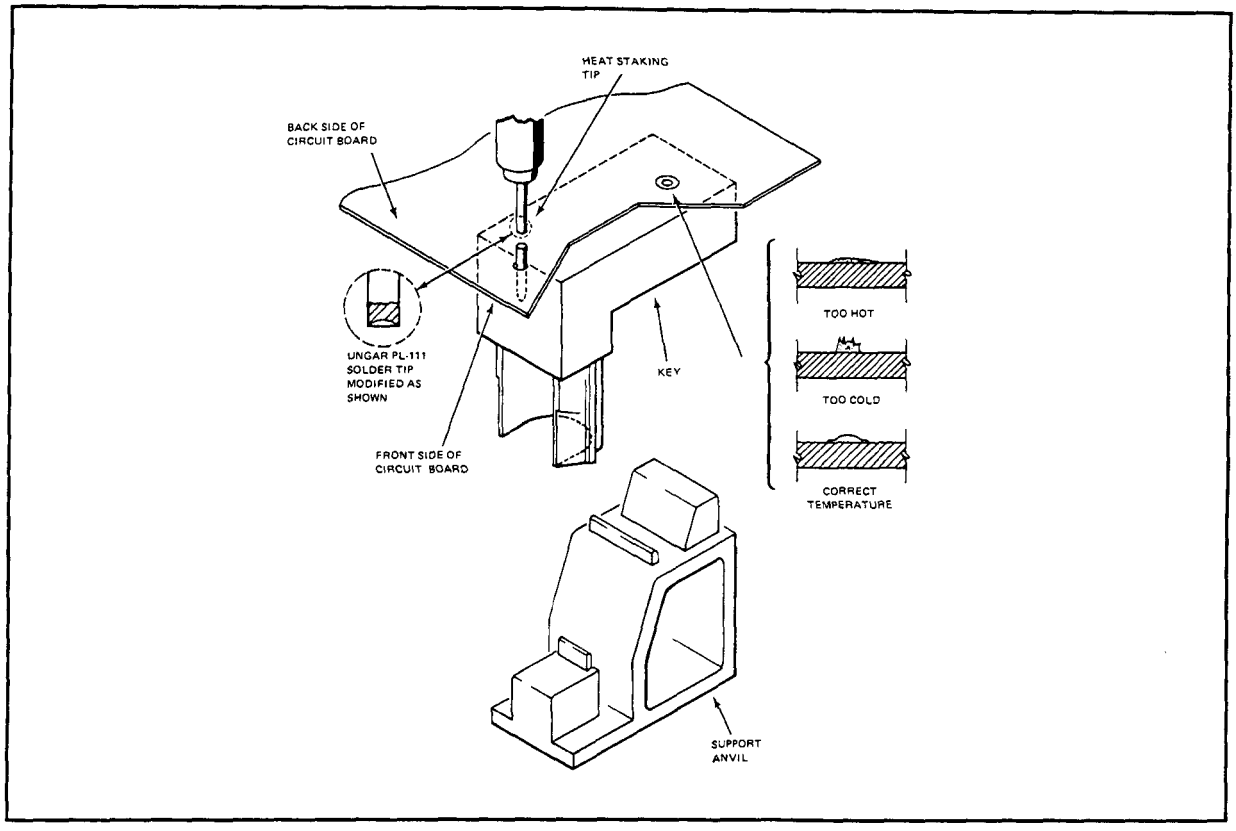


Figure 8A-2. *Heat-Staking Tip*

Assembly Locations

Assemblies in the Modulation Analyzer are numbered sequentially from front to back, left to right, and top to bottom as shown in Figures 8A-3 and 8A-3a. However, to facilitate the direct use of assemblies from other HP 8901 or 8902 series instruments, the sequence in the Audio Section of the instrument is interrupted after A6. Assemblies A50 to A55 replace assemblies A7 to A9. Assemblies A13 and A14 have color-coded board extractors. (For example, assembly A13 has a brown left extractor and orange right extractor. Thus, the color code of A13 is 13.) Assembly A1 is part of the front-panel assembly of the instrument. Instruments with serial prefixes ***2642A and above*** have slots for assemblies A71 and A72 sandwiched between A11 and A13. Switch S4 is behind A14. Assemblies A71 and A72 and switch S2 enable the HP 8901B to be fitted with Option Series 030 Selective Power Measurements.

Parts and Cable Locations

The locations of individual components mounted on printed-circuit boards or other assemblies are shown adjacent to the schematic diagram on the appropriate service sheet. The part reference designator is the assembly designator plus the part designator. For example, A6R9 is resistor R9 on the A6 assembly. For specific component descriptions and ordering information, refer to Table 6-3, *Replaceable Parts,* in Section 6. Chassis and frame parts, as well as mechanical parts and cables, are identified on Figures 6-1 through 6-6.

Major mechanical parts have reference designations that begin with the letters MP. Other mechanical parts, such as screws, are listed in the replaceable-parts list below the part to which they fasten. To find the part number and description of a mechanical part, find the part in one of the figures in Section 6 or Section 8. The part in the figure will be labeled with its reference designator. Look up that reference designator in the *Replaceable Parts* table. If the part is a fastener, such as a screw, nut, or washer, look to the figure for the part to which it fastens. Then, look up the fastened part in the parts list. Just below it are the part numbers and a description of the desired hardware.

Other Service Documents

Service Notes, Manual Updates, and other service literature are available through Hewlett-Packard. For further information about Manual Updates, refer to Volume 1, paragraph 1-6.

Recommended Test Equipment and Accessories

Test equipment and test accessories required to maintain the Modulation Analyzer are listed in Tables 1-2 and 1-3. Equipment other than that listed may be used if it meets the listed critical specifications.

8-5. GENERAL TROUBLESHOOTING

Instrument problems usually fall into three general categories: operator errors, operation out of specification, and catastrophic failures. The troubleshooting strategy is different for each category.

Operator Errors

Apparent failures sometimes can result from using the instrument outside of its range. Usually, the instrument can sense the condition and will display an error message. At other times it cannot: for example when it attempts to measure signals with frequencies higher than 1300 MHz. Consult the *Specifications* table (Table 1-1) and the *Detailed Operating Instructions* in Section 3 for more operation limitations.

Operation Out of Specification

The specifications are listed in Volume 1, Table 1-1. Performance tests that can be used to verify the specifications are found in Volume 1, Section 4. If instrument performance is only slightly out of limits, it can sometimes be corrected by an adjustment. The procedures for adjustments are in Volume 1, Section 5. References listed for each adjustment indicate which service sheet to consult when the adjustment procedure fails. In general, however, it is also a good practice to perform the troubleshooting checks on Service Sheet BD1, since they take only a few minutes and reveal much information.

Catastrophic Failures

Begin troubleshooting catastrophic failures by performing the troubleshooting checks on Service Sheet BD1. The simple procedures there take only a few minutes and will quickly differentiate a control (digital) problem from a hardware (analog) problem. The checks give cross-references to the detailed block diagrams (Service Sheets BD2 to BD5) which then direct you to the necessary schematic.

The troubleshooting information found on all service sheets consists of a series of performance checks. The purpose of the checks is not to identify which circuit or component has failed but rather to verify whether the assembly or circuit is operating correctly. Information on the possible cause of failure is given in the form of hints whenever they can be given reliably. The limits given in the troubleshooting checks are rather loose to facilitate the use of general-purpose equipment (usually an oscilloscope). If a slightly out-of-tolerance condition is suspected, the test can usually be run more rigorously paying greater attention to measurement accuracy.

Troubleshooting on the block diagram level normally utilizes User and Service Special Functions, while troubleshooting on the schematic level often utilizes Direct Control Special Functions. Direct Control Special Functions will require some study of their operation before using them for the first time.

Table 8A–1. *Assembly and Service Sheet Cross Reference Index*

Reference Designator	Assembly Name	Schematic Service Sheet Number	Block Diagram
A1	Keyboard and Display	25, 26, 27	5
A2	Audio Filters	12	4
A3	Audio De-emphasis and Output	13	4
A4	FM Demodulator	10, 11	3
A5	Voltmeter	14, 15	4
A6	AM Demodulator	8, 9	3
A7–A9	(Not Assigned)		
A10	Power Supply Regulators	31, 32	5
A11	Counter	22, 23	5
A12	(Not Assigned)		
A13	Controller	24	5
A14	Remote Interface	28	5
A15	RF Input	4	2
A16	Buffer Amplifier (Option Series 030)	5	2
A17	Input Mixer	5	2
A18	IF Amplifier	5	2
A19	LO Divider	17	2
A20	LO Control	20, 21	2
A21	Low Frequency VCXO Filter	19	2
A22	Low Frequency VCXO	19	2
A23	Sampler	18	2
A24	High Frequency VCO	18	2
A25	Audio Motherboard	35	
A26	Power Supply Motherboard	31, 32	5
A27	Digital Motherboard	35	
A28	RF Motherboard	35	
A29	Series Regulator Heat Sink	31, 32	5
A30	Line Power	31	5
A31	Remote Interface Connector	28	5
A32	Power Reference Oscillator	3	2
A33–A49	(Not Assigned)		
A50	AM Calibrator	30	3
A51	FM Calibrator	29	3
A52	Audio Counter/Distortion Analyzer	16	4
A53	Power Meter	1, 2	2
A54	IF Channel Filter (Option Series 030)	7	3
A55	IF Amplifier/Detector (Option Series 030)	6	3
A56–A69	(Not Assigned)		
A71	IF Channel Filter (Option Series 030)	33	3
A72	IF Amplifier/Detector (Option Series 030)	34	3

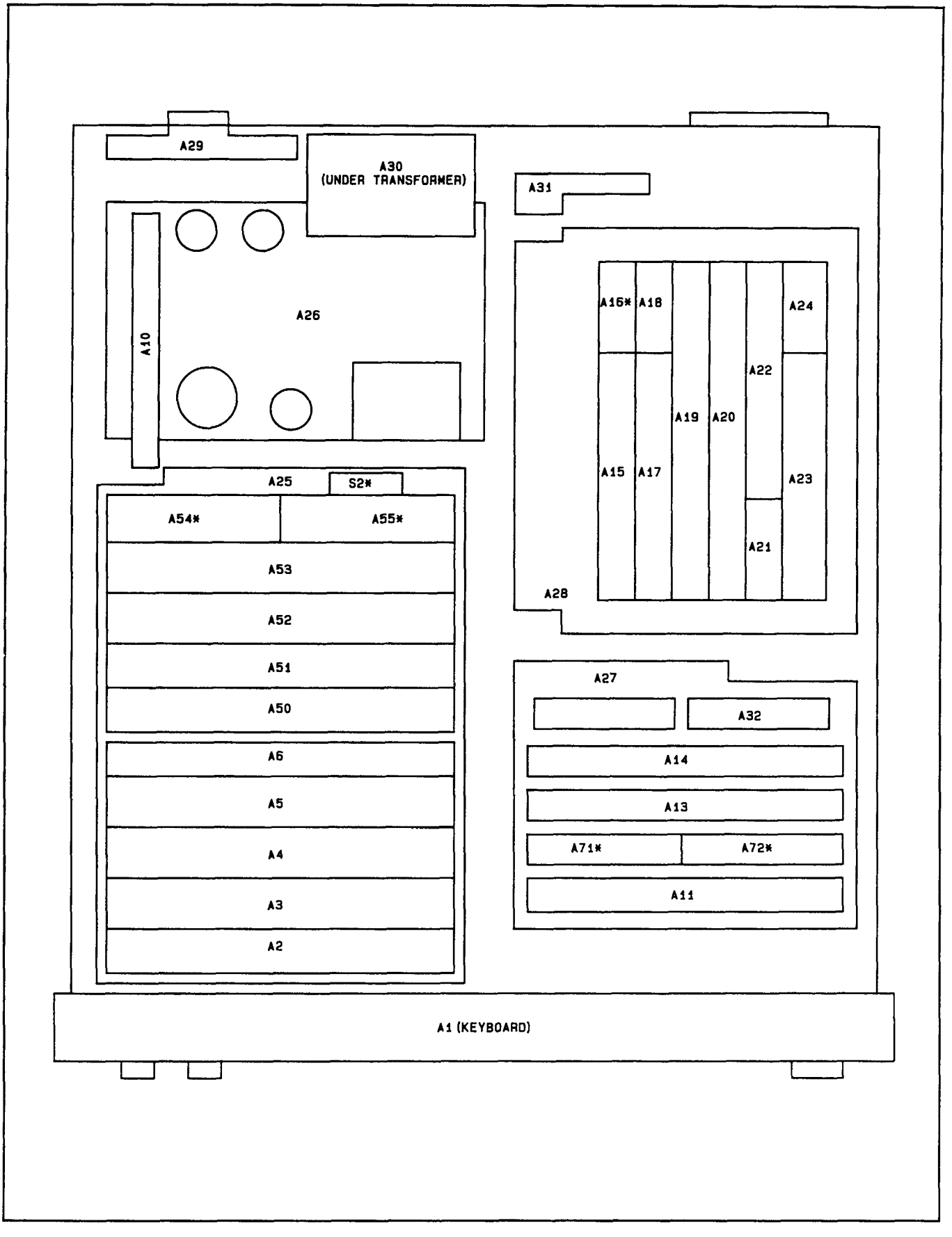


Figure 8A–3. *Assembly Locations* ***(2314A to 2636A)***

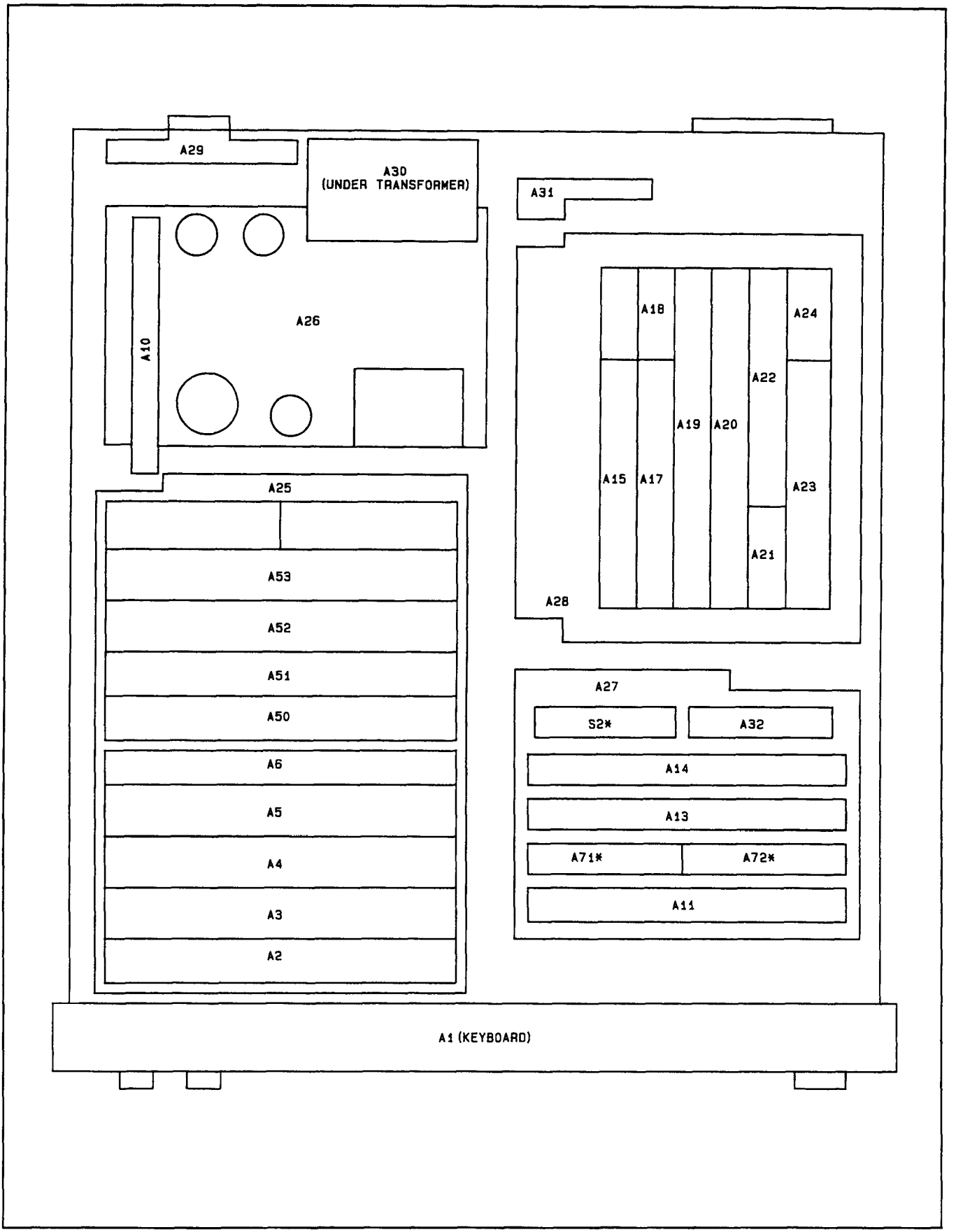


Figure 8A–3a. *Assembly Locations* ***(2642A and Above)***

8-6. SCHEMATIC SYMBOLOGY AND SCHEMATIC DIAGRAM NOTES

Table 8A-6 summarizes the symbology used in presenting many devices found in the instrument. The logic symbols used in this manual are based on the Institute of Electrical and Electronic Engineers (IEEE) in IEEE-STD 91-1984, *Graphic Symbols for Logic Functions*. This publication may be purchased from:

Institute of Electrical and Electronic Engineers
345 East 47th Street
New York, NY 10017

Table 8A-6. *Schematic Diagram Notes (1 of 11)*

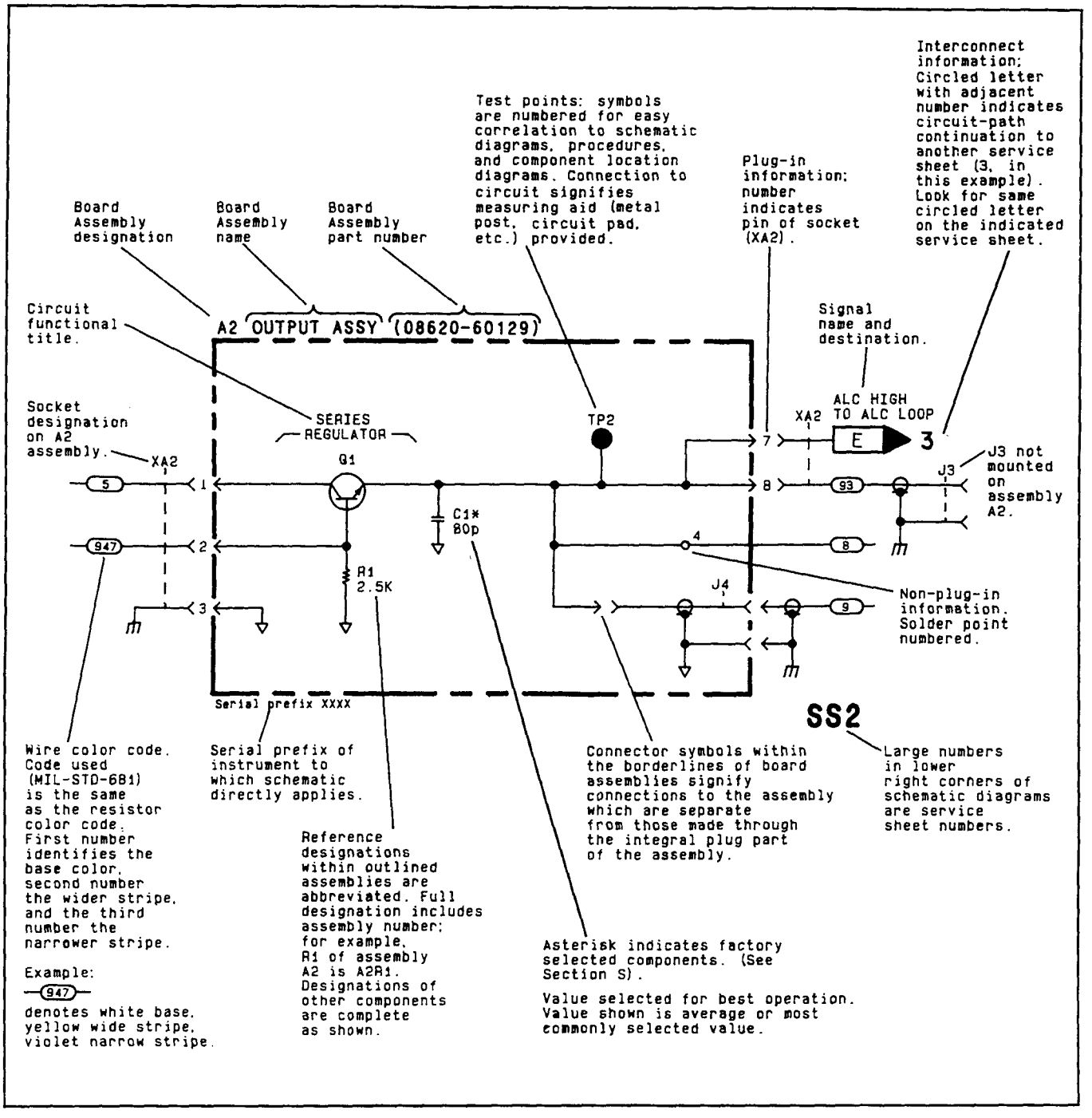


Table 8A–6. *Schematic Diagram Notes (2 of 11)*

Values for all components are marked in units of farads, henries, and ohms unless otherwise specified.

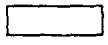
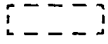
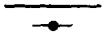
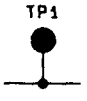
*	Asterisk denotes a factory-selected value. Value shown is typical. See Section V.
	Tool-aided adjustment.
	Encloses front-panel designation.
	Encloses rear-panel designation
	Circuit assembly borderline.
	Other assembly borderline.
	Heavy line with arrows indicates path and direction of main signal.
	Heavy dashed line with arrows indicates path and direction of main feedback.
	Indicates stripline (i.e., RF transmission line above ground).
	Wiper moves toward cw with clockwise rotation of control (as viewed from shaft or knob).
	Numbered Test Point measurement aid provided.
	Encloses wire or cable color code. Code used is the same as the resistor color code. First number identifies the base color, second number identifies the wider stripe, and the third number identifies the narrower stripe, e.g., (947) denotes white base, yellow wide stripe, violet narrow stripe.
	A direct conducting connection to earth, or a conducting connection to a structure that has a similar function (e.g., the frame of an air, sea, or land vehicle).
	A conducting connection to a chassis or frame.
	Common connections. All like-designation points are connected.
	Letter = off-page connection. Number = Service Sheet number for off-page connection. In the example, signal flow is continued on Service Sheet 12, at the point marked
	Number (only) = on-page connection.

Table 8A–6. *Schematic Diagram Notes (3 of 11)*

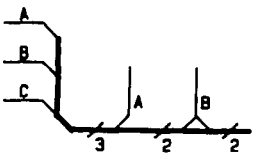
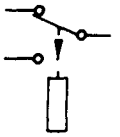
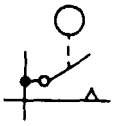
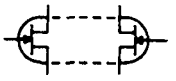
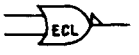
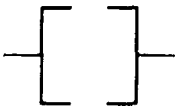
	Indicates multiple paths represented by only one line. Letters or names identify individual paths. Numbers indicate number of paths represented by the line.
	Coaxial or shielded cable.
	Ferrite bead. (Increases the self-inductance of the conductor passing through the bead.)
	Relay. Contact moves in direction of arrow when energized.
	Indicates a pushbutton switch with a momentary (ON) position.
	Feedthrough capacitor. (Acts as a feedthrough terminal when mounted on a chassis or a frame.)
	Indicates a PIN diode.
	Indicates a current regulation diode.
	Indicates a voltage regulation diode.
	Indicates a capacitive (varactor) diode.
	Indicates a Schottky (hot-carrier) diode.
	Light-emitting diode.
	Multiple transistors in a single package—physical location of the pins is shown in package outline on schematic.
	Identification of logic families as shown (in this case, ECL).

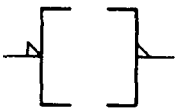
Table 8A–6. Schematic Diagram Notes (4 of 11)

DIGITAL SYMBOLOGY REFERENCE INFORMATION

Input and Output Indicators

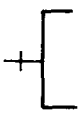


Implied Indicator—Absence of polarity indicator (see below) implies that the active state is a relative high voltage level. Absence of negation indicator (see below) implies that the active state is a relative high voltage level at the input or output.

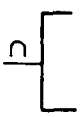


Polarity Indicator—The active state is a relatively low voltage level.

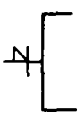
Dynamic Indicator—The active state is a transition from a relative low to a relative high voltage level.



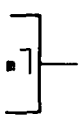
Inhibit Input—Input that, when active, inhibits (blocks) the active state outputs of a digital device.



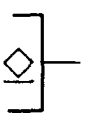
Analog Input—Input that is a continuous signal function (e.g., a sine wave).



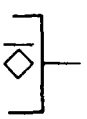
Polarity Indicator used with Inhibit Indicator—Indicates that the relatively low level signal inhibits (blocks) the active state outputs of a digital device.



Output Delay—Binary output changes state only after the referenced input (m) returns to its inactive state (m should be replaced by appropriate dependency or function symbols).



Open Collector Output.



Open Emitter Output.

Three-state Output—Indicates outputs can have a high impedance (disconnect) state in addition to the normal binary logic states.

Table 8A-6. *Schematic Diagram Notes (5 of 11)*

DIGITAL SYMBOLOGY REFERENCE INFORMATION

Combinational Logic Symbols and Functions

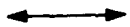
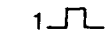
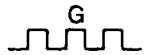
Σ	Summing Junction—Outputs added together at a common point.
&	AND—All inputs must be active for the output to be active.
≥1	OR—One or more inputs being active will cause the output to be active.
≥m	Logic Threshold—m or more inputs being active will cause the output to be active (replace m with a number).
=1	EXCLUSIVE OR—Output will be active when one (and only one) input is active.
=m	m and only m—Output will be active when m (and only m) inputs are active (replace m with a number).
=	Logic Identity—Output will be active only when all or none of the inputs are active (i.e., when all inputs are identical, output will be active).
	Amplifier—The output will be active only when the input is active (can be used with polarity or logic indicator at input or output to signify inversion).
X/Y	Signal Level Converter—Input level(s) are different than output level(s).
	Bilateral Switch—Binary controlled switch which acts as an on/off switch to analog or binary signals flowing in both directions. Dependency notation should be used to indicate affecting/affected inputs and outputs. Note: amplifier symbol (with dependency notation) should be read to indicate unilateral switching.
X→Y	Coder—Input code (X) is converted to output code (Y) per weighted values or a table.
(Functional Labels)	The following labels are to be used as necessary to ensure rapid identification of device function.
MUX	Multiplexer—The output is dependent only on the selected input.
DEMUX	Demultiplexer—Only the selected output is a function of the input.
CPU	Central Processing Unit

Table 8A–6. *Schematic Diagram Notes (6 of 11)*

DIGITAL SYMBOLOGY REFERENCE INFORMATION

Sequential Logic Functions

1 	Monostable—Single shot multivibrator. Output becomes active when the input becomes active. Output remains active (even if the input becomes inactive) for a period of time that is characteristic of the device and/or circuit.
G 	Oscillator—The output is a uniform repetitive signal which alternates between the high and low state values. If an input is shown, then the output will be active if an only if the input is in the active state.
FF	Flip-Flop—Binary element with two stable states, set and reset. When the flip-flop is set, its outputs will be in their active states. When the flip-flop is reset, its outputs will be in their inactive states.
T	Toggle Input—When active, causes the flip-flop to change states.
S	Set Input—When active, causes the flip-flop to set.
R	Reset Input—When active, causes the flip-flop to reset.
J	J Input—Analogous to set input.
K	K Input—Analogous to reset input.
D	Data Input—Always enabled by another input (generally a C input—see Dependency Notation). When the D input is dependency-enabled, a high level at D will set the flip-flop; a low level will reset the flip-flop. Note: strictly speaking, D inputs have no active or inactive states—they are just enabled or disabled.
+m	Count-Up Input—When active, increments the contents (count) of a counter by "m" counts (m is replaced with a number).
−m	Count-Down Input—When active, decrements the contents (count) of a counter by "m" counts (m is replaced with a number).
→m	Shift Right (Down) Input—When active, causes the contents of a shift register to shift to the right or down "m" places (m is replaced with a number).
←m	Shift Left (Up) Input—When active, causes the contents of a shift register to shift to the left or up "m" places (m is replaced with a number).

NOTE

For the four functions shown above, if m is one, it is omitted.

(Functional Labels)	The following functional labels are to be used as necessary in symbol build-ups to ensure rapid identification of device function.
mCNTR	Counter—Array of flip-flops connected to form a counter with modules m (m is replaced with a number that indicates the number of states: 5 CNTR, 10 CNTR, etc.).

Table 8A-6. Schematic Diagram Notes (7 of 11)

DIGITAL SYMBOLOGY REFERENCE INFORMATION

Sequential Logic Functions (Cont'd)

REG	Register—Array of unconnected flip-flops that form a simple register or latch.
SREG	Shift Register—Array of flip-flops that form a register with internal connections that permit shifting the contents from flip-flop to flip-flop.
ROM	Read Only Memory—Addressable memory with read-out capability only.
RAM	Random Access Memory—Addressable memory with read-in and read-out capability.

Dependency Notation

Cm	Control Dependency—Binary affecting input used where more than a simple AND relationship exists between the C input and the affected inputs and outputs (used only with D-type flip-flops).
Gm	Gate (AND) Dependency—Binary affecting input with an AND relationship to those inputs or outputs labeled with the same identifier. The m is replaced with a number or letter (the identifier).
Vm	OR Dependency—Binary affecting input with an OR relationship to those inputs or outputs labeled with the same identifier. The m is replaced with a number or the letter (the identifier).
mAm	Address Dependency—Binary affecting inputs of affected outputs. The m prefix is replaced with a number that differentiates between several address inputs, indicates dependency, or indicates demultiplexing of address inputs and outputs. The m suffix indicates the number of cells that can be addressed.
ENm	Enable Dependency—Binary affecting input which, when active enables all outputs. When inactive open-collector and open-emitter outputs are off, and three-state outputs are at an external high impedance state. When the enable input affects only certain inputs and outputs, they will be numbered to indicate the logic connection.
Xm	Transmission Dependency—Binary affecting input which bidirectionally connects dependent inputs and outputs.
Mm	Mode Dependency—Binary affecting input used to indicate that the effects of particular inputs and outputs of an element depend on the mode in which the element is operating. The m is replaced with a number or letter (the identifier).
Zm	Interconnection Dependency—Indicates the existence of internal logic connections between inputs, outputs, internal inputs, and/or internal outputs. The m is replaced with a number (the identifier).
,	Comma—AND Function.
/	Slant—OR Function.

NOTE

The identifier (m) is omitted if it is one—that is, when there is only one dependency relationship of that kind in a particular device. When this is done, the dependency indicator itself (G, C, EN, or V) is used to prefix or suffix the affected (dependent) input or output.

Table 8A–6. *Schematic Diagram Notes (8 of 11)*

DIGITAL SYMBOLOGY REFERENCE INFORMATION

Miscellaneous

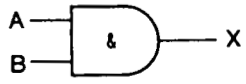
Schmitt Trigger—Input characterized by hysteresis; one threshold for positive going signals and a second threshold for negative going signals.

Active

Active State—A binary physical or logical state that corresponds to the true state of an input, an output, or a function. The opposite of the inactive state.

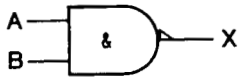
Table 8A–6. Schematic Diagram Notes (9 of 11)

AND GATE



A	B	X
H	H	H
H	L	L
L	H	L
L	L	L

NAND GATE



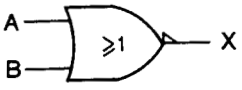
A	B	X
H	H	L
H	L	H
L	H	H
L	L	H

OR GATE WITH INVERTED INPUTS

OR GATE

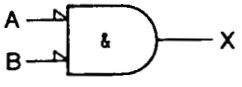
A	B	X
H	H	H
H	L	H
L	H	H
L	L	L

NOR GATE

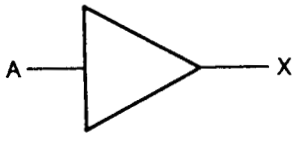


A	B	X
H	H	L
H	L	L
L	H	L
L	L	H

AND GATE WITH INVERTED INPUTS

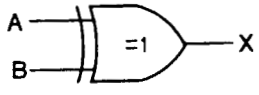


BUFFER

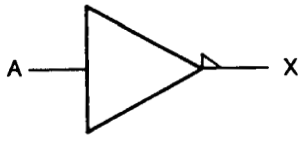


A	X
H	H
L	L

EXCLUSIVE-OR GATE



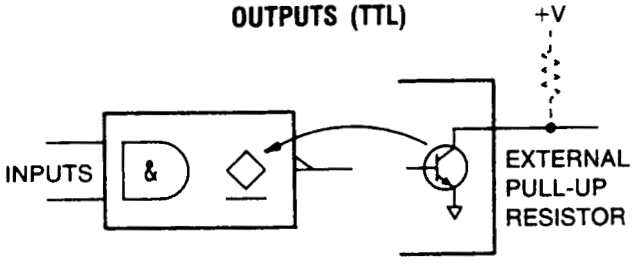
A	B	X
H	H	L
H	L	H
L	H	H
L	L	L



A	X
H	L
L	H

INVERTER

OPEN COLLECTOR OUTPUTS (TTL)



OPEN EMITTER OUTPUTS (ECL)

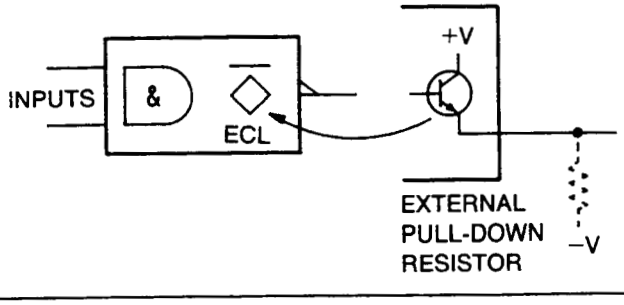
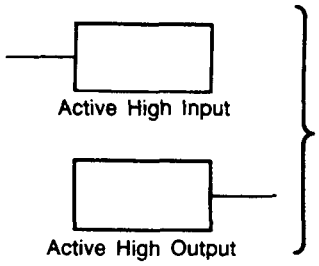
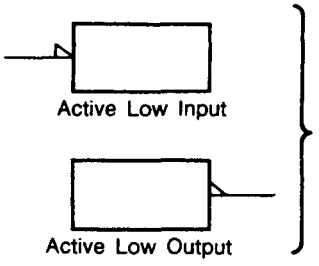


Table 8A–6. Schematic Diagram Notes (10 of 11)

ACTIVE LEVELS

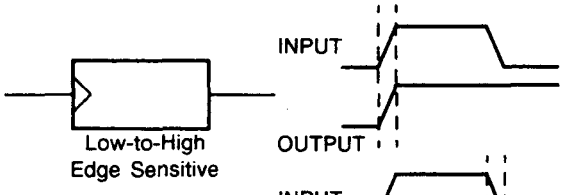


ACTIVE HIGH inputs and outputs are indicated by the absence of the polarity indicator symbol.

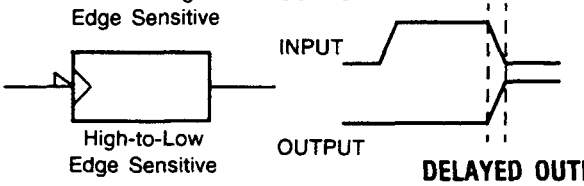


ACTIVE LOW inputs and outputs are indicated by the presence of the polarity indicator symbol (▷).

EDGE SENSITIVE INPUTS

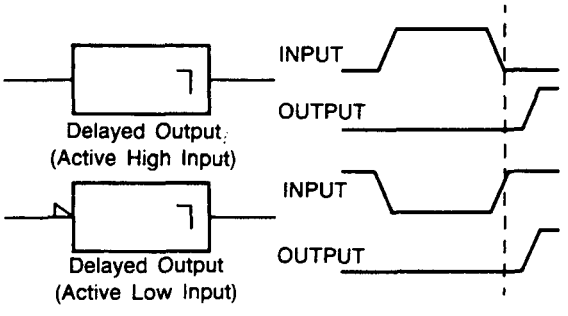


EDGE SENSITIVE (low-to-high) inputs are indicated by the presence of the dynamic indicator symbol (⊣▷).



EDGE SENSITIVE (high-to-low) inputs are indicated by the presence of both the dynamic indicator and the polarity indicator symbols (⊣▷).

DELAYED OUTPUT RESPONSE



OUTPUT DELAY indicator symbol (⌐) shows that the output becomes effective *after* the input signal returns to its inactive state.

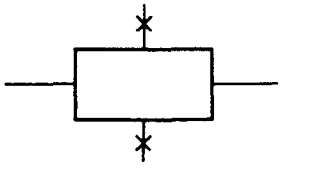
INHIBIT INPUTS

INHIBIT indicator symbol (+) indicates an input that, when active, inhibits (blocks) the output(s) from achieving their active states (the outputs remain inactive).

ANALOG LINES

ANALOG indicator symbol (∩) indicates a line that has an analog input or output.

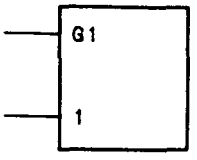
NONLOGIC CONNECTION



The Nonlogic Connection symbol (X) indicates a connection that does not carry any logic information.

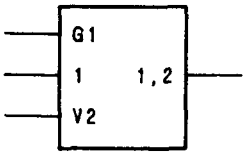
Table 8A–6. *Schematic Diagram Notes (11 of 11)*

AND



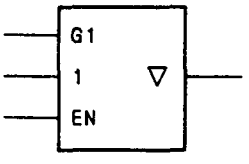
The input that controls or gates other inputs is labeled with a C or a G, followed by an identifying number.
The controlled or gated input or output is labeled with the same number. In this example, 1 is controlled by G1.

OR



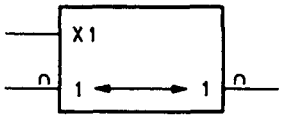
When a V input is active, the output will be in its active state. With the V input inactive, the device functions as if the V input doesn't exist.

ENABLE



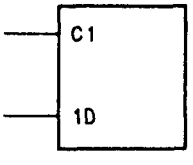
When the EN input is active, the output is enabled to function normally. When the EN input is inactive, the three-state output (▽), in this case, becomes a high impedance, effectively removing that device from the circuit.

TRANSMISSION

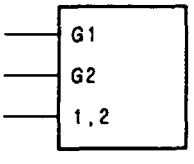


When the X1 input is active, the associated input-output pair are bi-directionally connected together. When X1 is inactive, the connection is broken.

CONTROL

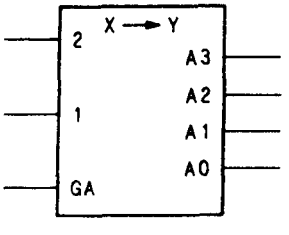


When the controlled or gated input or output already has a functional label (D is used here), that label will be prefixed by the identifying number.



If the input or output is affected by more than one gate or control input, then the identifying numbers of each gate or control input will appear separated by commas.

ADDRESS



When GA is active, the active address line (0 through 3) is the decoded value of the 1 and 2 binary inputs. When the controlled address lines have a functional value, that value will be prefixed by the identifying letter.

8-7. SPECIAL FUNCTIONS

General

Special Functions extend user control of the instrument beyond that normally available from the front panel. They are intended for the user who has a thorough understanding of the instrument and the service technician who needs arbitrary control of the instrument functions. During normal use, the Modulation Analyzer safeguards itself against invalid measurements. Safeguards come in the form of automatic tuning and ranging, overpower protection, squelch, modulation output blanking, and error messages. When Special Functions are used, some of these safeguards are removed, and thus there is a degree of risk that the measurement may be invalid. However, there is no risk of damage to the instrument.

To enter a Special Function, enter the Special Function code (usually a prefix, decimal, and suffix), then press the SPCL key. The Special Function code will appear on the display as it is being entered. If a mistake is made during entry of the Special Function code, press the CLEAR key and start over. When a Special Function is entered, the light in the SPCL key will usually go on (if it is not already on). The readout on the display will depend on the Special Function entered. The readout may be a measured quantity, an instrument setting, a special code, or, in some cases, the display is unaltered. Special Functions can be entered from the HP-IB by issuing the Special Function code followed by the code SP or sp.

The Special Functions are grouped by prefix range as follows:

0: **Direct Control Special Functions.** These functions are used for service. They halt the functioning of the Controller and configure the instrument hardware as dictated by the suffix. All software safeguards are relinquished.

1-39: **User Special Functions.** These functions are used during normal instrument operation when a special configuration, measurement, or information is required. Many of the instrument safeguards remain implemented. More information on User Special Functions can be found under *Special Functions* in the *Detailed Operating Instructions* in Section 3 and on the Operating Information pull-out cards.

40-99: **Service Special Functions.** These functions are used to assist in troubleshooting an instrument fault. The functions available are quite diverse and include special internal measurements, software control, and special service tests and configurations. Safeguards are generally relinquished.

Direct Control Special Functions (Prefix 0)

Communication between the instrument's Controller and its hardware is via the Instrument Bus. During normal instrument operation, the Instrument Bus carries measurement results, status information, and commands (which control hardware). The Direct Control Special Functions halt the bus activity and send out commands as determined by the code suffix. One command is sent for each Special Function entry. A summary of the Direct Control Special Functions and codes is contained in Service Sheets A and B.

Direct Control Special Function Code Format. The Direct Control Special Function code is in the form 0.*esd*, where 0 is the prefix (which may be omitted) and *esd* represents a three-digit hexadecimal number. The significance of *esd* (which stands for enable, select, and data) is discussed in the Principles of Operation for Service Sheet BD5. Specific Direct Control Special Function codes are used in the troubleshooting section of the individual service sheets.

As the Direct Control code is entered, the code will appear on the display. Pressing the SPCL key initiates the Special Function. The display will then be in the form 00*rrrr.wwww*, where each digit represents a binary bit (0 or 1). The *rrrr* is the *d* (data) read back from the Instrument Bus. The *wwww* is the *d* (data) written to the bus. Thus *rrrr* and *wwww* are normally the binary form of the

hexadecimal value for *d*. Exceptions to this are Special Functions 0.5*sd* and 0.6*sd*, which control the display itself.

The hexadecimal characters A, B, C, D, E, and F are displayed on entry as A, b, C, d, E, and F, and they are entered from the keyboard as Shift 0, Shift 1, Shift 2, etc., or from the HP-IB as X0, X1, X2, etc. Table 8B-1 summarizes the hexadecimal entry and readback for Direct Control Special Functions.

Table 8B-1. *Hexadecimal Information for Direct Control Special Functions*

Hexadecimal Character	Decimal Equivalent	Binary Equivalent	Keystroke Entry	HP-IB Code Entry	Display On Entry
0	0	0000	0	0	0
1	1	0001	1	1	1
2	2	0010	2	2	2
3	3	0011	3	3	3
4	4	0100	4	4	4
5	5	0101	5	5	5
6	6	0110	6	6	6
7	7	0111	7	7	7
8	8	1000	8	8	8
9	9	1001	9	9	9
A	10	1010	S (Shift) 0	X0	A
B	11	1011	S (Shift) 1	X1	b
C	12	1100	S (Shift) 2	X2	C
D	13	1101	S (Shift) 3	X3	d
E	14	1110	S (Shift) 4	X4	E
F	15	1111	S (Shift) 5	X5	F

Direct Control Special Function Applications. Direct Control Special Functions are most often used to provide manual control of various switches or digital-to-analog devices in the hardware. The following examples illustrate how to use Direct Control Special Functions:

Example 1

In the path of the demodulated audio signal is a set of selectable, active high-pass filters which are located on the A3 Audio De-emphasis and Output Assembly. A simplified diagram of the filters is shown in Figure 8B-1. The filters and through path are selected by analog switches U12A, U12B, and U12C. Table 8B-2, which is associated with the troubleshooting of the filters, lists the Direct Control Special Functions normally used to control the switches.

Table 8B-2. *Audio High-Pass Filter and FM Pre-Display De-Emphasis Direct Control Special Functions*

Check	Direct Control Special Function	
	Pre-Display On	Pre-Display Off
Thru Path	0.141	0.149
50 Hz HPF	0.142	0.14A
300 Hz HPF	0.144	0.14C

To insert the 50 Hz High-Pass Filter, key in 0.142 SPCL or .142 SPCL. The display will show 000010.0010, indicating that the Controller received *d* =2 from the keyboard (or HP-IB), issued it to the Instrument Bus, and read it back. If the circuitry on the assembly is working properly, switch U12A will close and the audio signal will pass through the 50 Hz High-Pass Filter.

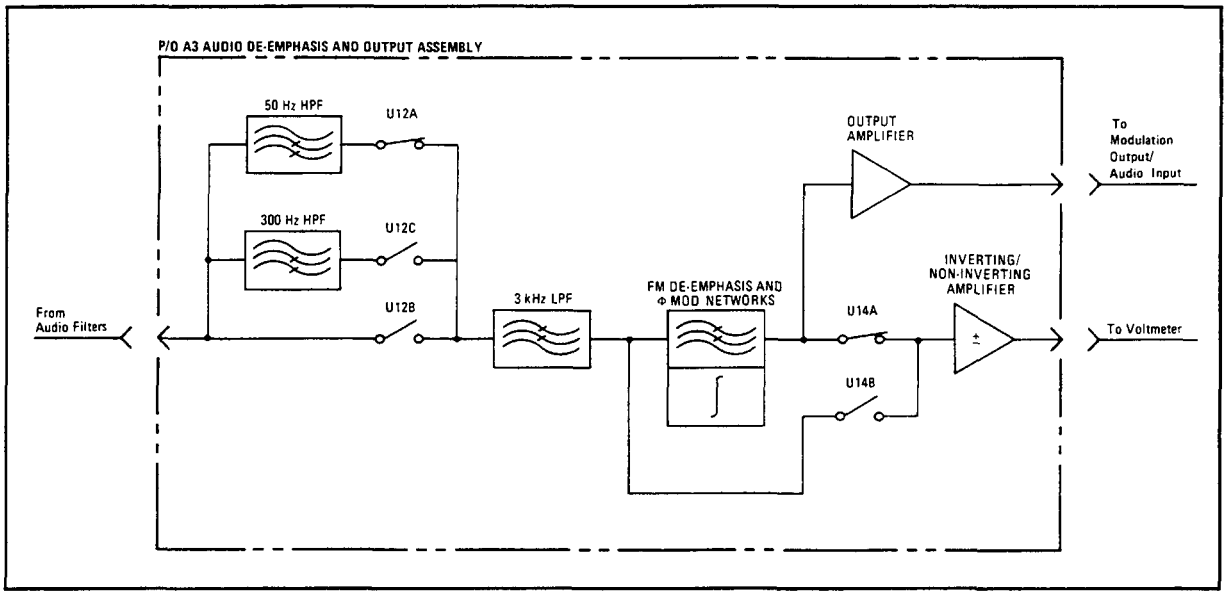


Figure 8B–1. *Example Showing High-Pass Filter Switching*

Notice that the display no longer shows a measurement result. No annunciators are lighted (except those related to HP-IB, if the Special Function is entered via HP-IB), and only the SPCL key is lighted. If any key other than a number key, S (Shift) key, or the LCL key is pressed, the instrument hardware will revert back to the measurement mode it was in before the Direct Control Special Function was entered. Thus, in this example, unless the 50 Hz High-Pass Filter had been previously selected with the front-panel key, it would be removed from the audio path, when any other key is pressed. (However, note that there are some Service Special Functions that will maintain the requested configurations even if another key is pressed.)

Table 8B-2 indicates that 0.14A will also select the 50 Hz High-Pass Filter. Any Direct Control Special Function of the form 0.14*d* also controls the pre-display filter on/off switches U14A and U14B. For pre-display on (0.142), U14A is closed. For pre-display off (0.14A), U14B is closed. As it turns out, 0.14*d* codes other than those shown in the table will also affect the high-pass filters. For example, 0.147 will close U12A, U12B, and U12C, simultaneously (with U14A also closed). This fact is ascertained from the service sheet schematic.

Example 2

A second example from the A3 assembly illustrates data readback when using the Direct Control Special Function. One of the means of detecting an overrange of the audio circuits is by the Audio Overvoltage Detector. The detector is on the audio input line before any active (and hence, distortable) filters (see Figure 8B-2). The audio input line is the same as in the previous example. The Audio Overvoltage Detector senses the peak signal level on the line and U9 compares it against a reference. If the detected level rises above the reference, the output of U9 goes low and resets flip-flop U19D. Other flip-flops (not shown) are also reset and open the audio path ahead of the detector (without intervention of the Controller). U21D and U21C, when enabled, invert the output of U19D twice. The output of U21C is across the least-significant bit of the readback data line of the Instrument Bus. In the normal measurement cycle, the Controller reads the status of the Audio Overvoltage Detector (by enabling U21D and reading the output of U21C) and displays an error if U9 has tripped.

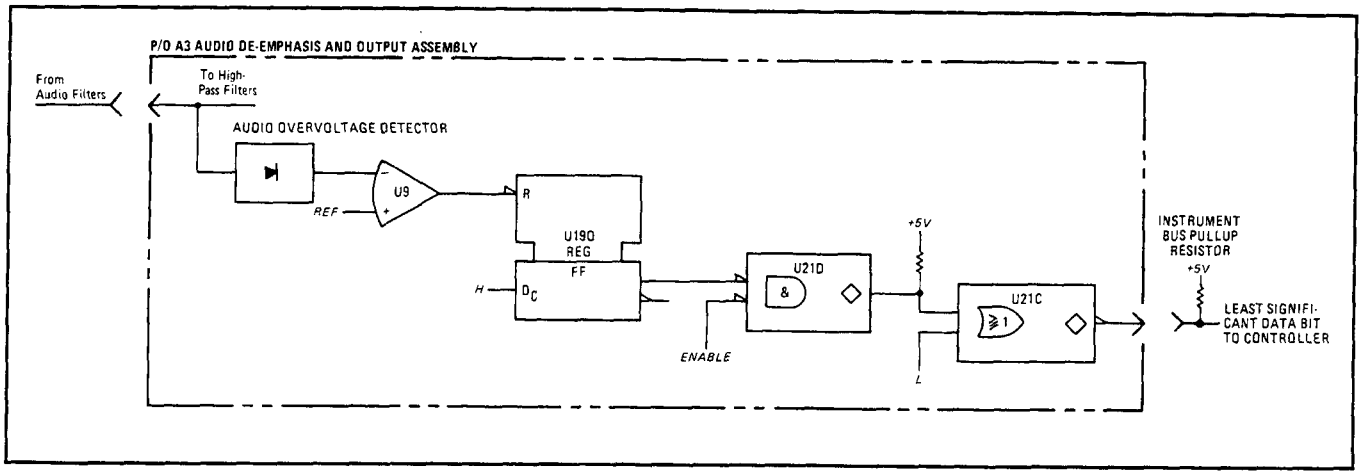


Figure 8B–2. *Example Showing Audio Overvoltage Detector Readback*

At this point in the discussion, a more detailed description of the Instrument Bus is needed. Data (*d*) is read out from the I/O port of the Controller to the Instrument Bus through buffers (TTL inverters). However, data is read back to the I/O port directly, bypassing the buffers. An I/O port outputs a low by actively pulling the line to ground. It outputs a high by allowing the output to be passively pulled up by an external pull-up resistor. When a Controller I/O port inputs data from other circuits of the Modulation Analyzer, these circuits must operate against the passive pull-up resistor.

Readback devices that are read out to the data lines, such as U12C, are similarly configured. U21C has an open-collector TTL output. When not outputting data, its output device is off, pulling it to a high-impedance (inactive) state. When it outputs data, a low is produced by switching the output device to ground. A high is produced by switching the device off and allowing the output to be passively pulled up. The readback lines are low true (that is, $r = 1$ when the line is low).

When U12D is disabled (enable is high), its output is low. Therefore, U21C is high (inactive) and has no effect on the data line. U12D is enabled by Direct Control Special Function 0.15*d*. The value of *d* is arbitrary to enable U21D, but the least-significant bit must be 0 (that is, *d* must be even) to switch off the output device of the I/O data port.

To clarify this concept, suppose that U19D has not been reset. If Direct Control Special Function 0.152 is entered, the display will show 000010.0010. (0.15*d* also controls FM squelch. Using 0.152 deactivates squelch.) The four digits following the decimal are 0010 because $d = 2$ was received by the Controller from the keyboard and issued to the Instrument Bus. The set flip-flop (U19D) puts a high on the input of U21D and an inactive high on the least-significant data line. This is read by the Controller as $r = 0$ and thus is the same as the bit issued. The other three data readback lines are unaffected by the readback command and remain 001. Therefore, the *d* read back is 0010.

If U19D is reset, U21D puts a low on the least-significant data bit ($r = 1$), and the data read back is 0011. The display is therefore 000011.0010. (Note that *rrrr* is different from *wwww*.) If *d* is keyed as a hexadecimal F, the display is 001111.1111 regardless of the state of U21D. This is because all output devices on the data I/O port of the Controller are on (logical 1).

One final note, after a Direct Control Special Function is entered, it is periodically issued to the Instrument Bus. If a fault causes *rrrr* to indicate a malfunction, the display will begin to read correctly as soon as the fault is removed.

Service Special Functions (Prefix 40-99)

The Service Special Functions are used to perform a variety of tasks related to service. The functions are cataloged below. A suffix N indicates that a parameter other than 0 may be required to complete the Special Function code. Information within pointed brackets appears on the Modulation Analyzer display. See Table 8B-1 for entry of hexadecimal suffixes (A, B, C, D, E, and F).

40.0 Controller Reset. Initializes the Controller to its power-up state and is equivalent to switching the POWER switch to STBY and back to ON. Because this function affects the HP-IB hardware, it is unavailable from HP-IB (causes Error 24). See *Default Conditions and Power-Up Sequence* in Section 3.

41.0 Controller Clear. Initializes the Controller to its power-up state but bypasses the operational checks and is equivalent to pressing the blue key and INSTR PRESET (Instrument Preset) or giving the device clear command via HP-IB. Leaves HP-IB hardware unaffected but clears any service request message (SRQ) being issued by the Measuring Receiver, sets the service request condition to its power-up state, and clears all bits in the status byte. See *Default Conditions and Power-Up Sequence* in Section 3.

42.0 Display Software Date. Displays the date of the software in the form <day of year>.<year>. The display times out after 5s.

43.N Measurement Progress and Service Error Message Display Control. Measurement Progress Error Messages are Errors 40 through 64. Service Error Messages are Errors 65 through 89. Refer to *Error Messages*, paragraph 8-8.

N=0 Disables display of Service Error Messages (65 to 89).

N=1 Enables display of Service Error Messages (65 to 89). Cleared by the AUTOMATIC OPERATION key.

N=2 Enables display of Service Error Messages (65 to 89). Not cleared by the AUTOMATIC OPERATION key.

N=40 to N=89 Enables measurement to pause on the Measurement Progress and Service Error Message determined by N. See *Error Messages*, paragraph 8-8.

N=140 to N=189 Enables measurement to halt on the Measurement Progress and Service Error Message determined by N. See *Error Messages*, paragraph 8-8.

45.N AM and FM Calibrator and RF Power Reference Control. See Service Sheets 30 (AM Calibrator), 29 (FM Calibrator), and 3 (RF Power Reference).

N	AM Calibrator		FM Calibrator Frequency	RF Power Reference
	Channel A	Channel B		
0	Off	Off	Low	Off
1	On	Off	Low	Off
2	Off	On	Low	Off
3	On	On	Low	Off
4	Switching 33% AM		Low	Off
5	Switching 100% AM		Low	Off
6	On	Off	High	Off
7	Off	On	High	Off
8	On	On	High	Off
9	Switching 33% AM		High	Off
10	Switching 100% AM		High	Off
11	On	Off	Switching	Off
12	Off	On	Switching	Off
13	On	On	Switching	Off
14	Switching 33% AM		Switching	Off
15	Switching 100% AM		Switching	Off
16	Off	Off	Low	On
17	On	Off	Low	On
18	Off	On	Low	On
19	On	On	Low	On
20	Switching 33% AM		Low	On
21	Switching 100% AM		Low	On
22	On	Off	High	On
23	Off	On	High	On
24	On	On	High	On
25	Switching 33% AM		High	On
26	Switching 100% AM		High	On
27	On	Off	Switching	On
28	Off	On	Switching	On
29	On	On	Switching	On
30	Switching 33% AM		Switching	On
31	Switching 100% AM		Switching	On

46.N Count Internal Signals. The Counter counts the internal signal selected by N for 100 ms and displays the count. This is equivalent to measuring the frequency of the signal with 10 Hz resolution for most signals. See Service Sheets 22 and 23.

N=1 Intermediate Frequency. See Service Sheet 10.

N=2 Voltage-to-Time Converter. 10 000 counts equal 1V, but includes a 0.6V offset. See Service Sheet 15 or Special Functions 49 and 50.

N=3 FM Calibrator. See Service Sheet 29.

N=4 High Frequency VCO Divided by 8. This is the 40 to 80 MHz signal proportional to the LO frequency. See Service Sheet 17.

N=8 Selected Time Base Reference. The display should read 1000000±1. See Service Sheet 22.

N=9 External Time Base Reference. The display should read 1000000±1 when an external reference is connected. See Service Sheet 22.

N=A Internal Time Base Reference. The display should read 1000000±1 when no external reference is connected. See Service Sheet 22.

N=B Audio Counter Input. If the Audio Frequency measurement mode has been selected, the frequency of the signal at the input of Audio Counter is displayed. (The frequency is measured with the Counter in the A11 Counter Assembly. The Audio Counter in the A52 Audio Counter/Distortion Assembly is not exercised except for its Schmitt trigger input.) See Service Sheet 16.

47.0 Instrument Configuration Display ***(2314A and Above).*** Displays certain instrument configuration details in the following form

<New Opt. Series 030>< Old Opt. Series 030>

where 1 is yes and 0 is no. The new Option Series 030 refers to instruments with serial prefixed 2642A and above; old refers to older versions of the HP 8901B Modulation Analyzer.

49.N Display Internal Voltages. The Voltmeter measures and displays the internal voltage (in volts) selected by N. This special function also controls the rear-panel RECORDER output as explained in the following note.

N=0 Ground. See Service Sheet 15.

N=1 RF Peak Detector Ground. See Service Sheet 4.

N=2 RF Peak Detector ÷3. See Service Sheets 4 and 15.

N=3 RF Peak Detector. See Service Sheet 4.

N=4 ×10 AM Calibrator. See Service Sheet 30.

N=5 ×1 AM Calibrator. See Service Sheet 30.

N=6 Audio Range Detector. See Service Sheet 13.

N=7 RMS-to-DC Converter. See Service Sheet 16.

N=8 Ground. See Service Sheet 15.

N=9 Audio Average Detector. See Service Sheet 14.

N=A Audio Peak Detector. See Service Sheet 14.

N=B IF Average Detector. See Service Sheet 8.

N=C IF RMS Detector (Option Series 030) ***(2314A and Above).*** See Service Sheet 34.

N=D IF Peak Detector. See Service Sheet 9.

N=E ALC Current. See Service Sheet 8.

N=F RF Average Power or Sensor Identifier. To read average power, precede with Special Function 0.212. To read sensor identifier, precede with Special Function 0.211. See Service Sheet 2.

NOTE

The suffix N can also be two digits, XY. The displayed result is equivalent to the display of 49.X SPCL minus the display of 49.Y SPCL. For example, 49.3 SPCL or 49.30 SPCL gives a display of the level from the RF Peak Detector with respect to ground. 49.31 SPCL gives a display of the level from the RF Peak Detector with respect to the level from the RF Peak Detector ground.

The rear-panel RECORDER output is connected to the output of the Voltmeter's selector switch (see Service Sheet 15). During normal operation, the selector is constantly being switched between the various inputs. Each voltage measurement also includes a separate measurement of ground. The displayed result is derived from the difference between the selected voltage and ground readings.

The switching at the RECORDER output can be halted by keying in Special Function 49.XY with X equal to 0 or 8 and Y equal to the desired input. The dc level at the RECORDER output is constant and equal to the selected input; the displayed measurement result is equal to the result using Special Function 49.Y. This feature is useful for troubleshooting the Voltmeter and for improving the accuracy of the RF Power measurement (see Recorder Output *in Section 3).*

50.N Display Internal Voltages. The Voltmeter measures and displays the internal voltage (in volts) selected by N. See also the previous note.

N=0 Ground. See Service Sheet 15.

N=1 −15V Supply. The display should read between 2.8500 and 3.1500. See Service Sheet 15.

N=2 −5V Supply. The display should read between 2.8500 and 3.1500. See Service Sheet 15.

N=3 +5V Supply. The display should read between 2.8500 and 3.1500. See Service Sheet 15.

N=4 +15V Supply. The display should read between 2.8500 and 3.1500. See Service Sheet 15.

N=5 +40V Supply. The display should read between 2.8500 and 3.1500. See Service Sheets 15 and 20.

N=6 IF Amplifier/Detector (option series 030.) See Service Sheet 34.

52.N Read-Only Memory Verification. The Controller displays the checksum of the read-only memory (ROM) specified by N. When specifying a ROM, use N=1 through 3. The display is in the form <actual checksum>.<expected checksum>. An initial zero (or zeros) will be blanked. Thus, for example, 24.024 would be a valid checksum, 24.124 would be invalid. The display times out after approximately 5s. See Service Sheet 24.

54.N Local Oscillator Test. The Controller sequences the local oscillator (LO) through groups of tests specified by N and returns a fault code corresponding to the tests that failed. For N=1 to N=5, four tests are performed for each group. If all tests in the group pass, 0 will be displayed. If any tests fail, the test numbers appear on the display in the positions indicated. (The digit positions are numbered under the display window.) All leading zeros in the display are blanked. For example, in the group defined by N=1, a simultaneous time base (Test 2) and HF VCO or Divider (Test 4) failure will result in the display " 20004" (three leading zeros blanked). The tests are continuously sequenced, and the display will be updated as the fault is corrected. The tests are most easily visualized by referring to Figures 8D-1 through 8D-4.

N=0 Performs all tests in the group listed for N=1 through N=5 (below). Displays the number of the first test that failed. If no test fails, 0 is displayed.

NOTE

If the display is not zero, it is important that all other tests be checked (N=1 through N=5). Some LO faults cause more than one test to fail. For example, if the HF VCO÷8 output fails, the following tests will fail:

N=1, Test 4,
N=2, Tests 5, 6, and 7,
N=3, Tests 9 and 10,
N=4, Tests 17 and 18.

This is because a frequency measurement of the LO is made in these particular tests. If the +40V Supply fails, the following tests will fail:

N=2, Tests 5 and 6,
N=3, Tests 9 and 10,
N=4, Tests 17 and 18.

Begin troubleshooting at the lowest-numbered test.

This test is run automatically at power-up. Results are not displayed, but a pass-fail indication is made on internal LEDs. (See Power-up Check, *paragraph 8-9.)*

Counter Tests

N=1 Test 1. Undefined.

N=1 Test 2. Time Base Test. See Service Sheets 22 and 23.

Tests the 6.25 kHz TTL time base signal to determine if it toggles within a reasonable length of time. The Controller looks at A11U15D's output for 260 μs. At least one transition (high-to-low or low-to-high) of the clock should occur during this time. If no clock transition occurs, 2 will be displayed in digit position 3. However, if a transition is detected, a second (verification) check is made by the Controller.

N=1 Test 3. Counter Test. See Service Sheet 23.

Counts the selected Time Base, which should be exactly 1000000. If the result is not 1000000, 3 will be displayed in digit position 6.

N=1 Test 4. HF VCO and Divider Output. See Service Sheets 17 and 18.

Connects the DAC output to the HF VCO and counts the LO frequency to determine if it is within certain limits. The Controller turns off the Sweep-Up and Sweep-Down Current Sources and LF VCXO tune filter, allowing the HF VCO to free run. The Controller then outputs the approximate center frequency code to the tuning DAC and checks if the HF VCO output is between 250 and 800 MHz. If the frequency is not within these limits, 4 will be displayed in digit position 8.

DAC and HF VCO Range Tests

N=2 Test 5. HF VCO Top of Range Test. See Service Sheet 18.

Tests the DAC's ability to drive the HF VCO to the top of its frequency range. The DAC is programmed to output the highest tune voltage. If the HF VCO does not tune to between 655 and 800 MHz, 5 will be displayed in digit position 2.

N=2 Test 6. HF VCO Bottom of Range Test. See Service Sheet 18.

Tests the DAC's ability to drive the HF VCO to the bottom of its frequency range. The DAC is programmed by the Controller to output the lowest tune voltage. If the HF VCO does not tune to between 280 and 310 MHz, 6 will be displayed in digit position 4.

NOTE

Test 6 is not always conclusive. The test may not always detect a failure of the VCO to tune to the bottom of the band. If the VCO does fail to tune to the bottom of its band, the instrument will not tune to certain frequencies in the track mode.

N=2 Test 7. HF VCO Mid-Range Test. See Service Sheet 18.

Tests the DAC's ability to control the HF VCO near the center of its frequency range. The DAC is programmed by the Controller to output a tune voltage near the center of the range. If the HF VCO does not tune to between 454 and 575 MHz, 7 will be displayed in digit position 6.

N=2 Test 8. Undefined.

DAC and HF VCO Incremental Range Tests

N=3 Test 9. Gain Test For Most Significant DAC. See Service Sheet 20.

Tests the gain of the most significant DAC. The Controller sends a hexadecimal 55 to the most-significant DAC (MSDAC) and a hexadecimal AA to the least-significant DAC (LSDAC). The Controller then counts the frequency of the HF VCO. The MSDAC is then changed to AA. The Controller again counts the frequency of the HF VCO and then computes the difference between the first and second frequencies. This difference should fall between 139 and 285 MHz. If it does not, 9 will be displayed in digit position 2.

N=3 Test 10. Gain Test For Least Significant DAC. See Service Sheet 20.

Tests the gain of the least significant DAC. The Controller sends a hexadecimal AA to the most-significant DAC (MSDAC) and a hexadecimal 55 to the least-significant DAC (LSDAC). The Controller then counts the frequency of the HF VCO. The LSDAC is then changed to AA. The Controller again counts the output of the HF VCO and then computes the difference between the first and second frequencies. This difference should fall between 1.95 and 4.5 MHz. If it does not, 10 will be displayed in digit positions 3 and 4.

N=3 Test 11. Undefined.

N=3 Test 12. Undefined.

LF VCXO Lock Acquisition Tests

N=4 Test 13. Phase Lock Loop Acquisition. See Service Sheets 18 and 20.

Tests the HF VCO's ability to lock to the LF VCXO. The Controller turns off the Sweep Current Sources and the LF VCXO tune filter. It then programs the DAC to output a tune voltage which causes the HF VCO to operate near the center of its frequency range. The Controller rapidly switches the DAC output to the LF VCXO (with the DAC still programmed to midrange). The sampler loop is then closed and the output of the HF VCO is counted. If the HF VCO is operating properly, it will drift until it locks to a harmonic of the LF VXCO (via the sampler). If the HF VCO frequency has moved more than 2 MHz, it has failed to lock to a harmonic of the LF VCXO, and 13 will be displayed in digit positions 1 and 2.

N=4 Test 14. Phase Lock Loop Stability. See Service Sheet 20.

Tests the ability of the HF VCO to follow step changes in the LF VCXO. The Controller sends the DAC a code which forces the LF VCXO to the bottom of its frequency range. The frequency of the HF VCO is counted. The DAC is then instructed to quickly slew the LF VCXO to the top of its frequency range and then back down to the bottom again. When the DAC output voltage reaches minimum, the HF VCO is again counted. The frequency

change of the HF VCO should be less than 100 kHz. If it is not, 14 will be displayed in digit positions 3 and 4.

N=4 Test 15. Undefined.

N=4 Test 16. Undefined.

LF VCXO Lock Range Tests

N=5 Test 17. LF VCXO Range Test. See Service Sheets 19 and 20.

Tests to see if the DAC moves the LF VCXO within the proper frequency limits. Since the LF VCXO frequency cannot be measured directly, an indirect process is used. The Controller sends a hexadecimal 00 to the DAC, which drives the LF VCXO to its minimum frequency. This frequency change causes a proportional change in the HF VCO frequency, which is measured by the Counter. The Controller then sends a hexadecimal FF to the DAC, driving the LF VCXO to its highest frequency. The HF VCO output is again counted. The difference between the highest and lowest frequencies from the HF VCO should be between 2.95 and 5.5 MHz. If the frequency difference does not fall within this range, 17 will be displayed in digit positions 1 and 2.

N=5 Test 18. Gain of the LF VCXO Drive. See Service Sheets 19 and 20.

Tests the gain of the LF VCXO. This is the hardest test in this series for the instrument to pass. The Controller sends a hexadecimal 55 to the most-significant DAC (MSDAC) and a hexadecimal AA to the least-significant DAC (LSDAC) and then counts the frequency of the HF VCO. The Controller then changes the MSDAC to a hexadecimal AA and the LSDAC to a hexadecimal 55, and again counts the frequency of the HF VCO. The difference between the first and second frequencies should be within the range of 1.05 and 2.4 MHz. If it is not, 18 will be displayed in digit positions 3 and 4.

N=5 Test 19. Undefined.

N=5 Test 20. Undefined.

55.0 Sweep Doubler Band. Sweeps the LO slowly back and forth across the doubler band. See Service Sheet 17.

56.0 Sweep Bands 4 through 8. Sweeps the LO slowly and sequentially across bands 4 through 8. See Service Sheet 17.

57.0 Sweep Bands DBLR through 3. Sweeps the LO slowly and sequentially across bands DBLR through 3. See Service Sheet 17.

60.0 Key Scan. The keyboard is scanned and a key code is displayed and output to the HP-IB. The key codes are shown in Figure 8B-3.

To use the Key Scan Special Function, remove the instrument top cover. Key in 60.0 SPCL then jumper A13TP3 (INT) to A13TP1 (GND) on the A13 Controller Assembly. Press the front-panel keys and observe the display. If two or more keys are pressed simultaneously, the display shows the code corresponding to the first one found in its normal scan. See Service Sheet 25.

Two simple programs for displaying the key codes on a computing controller are shown in Table 8B-3. Removal of the top and bottom covers is unnecessary. The Modulation Analyzer is assumed to have HP-IB address 14.

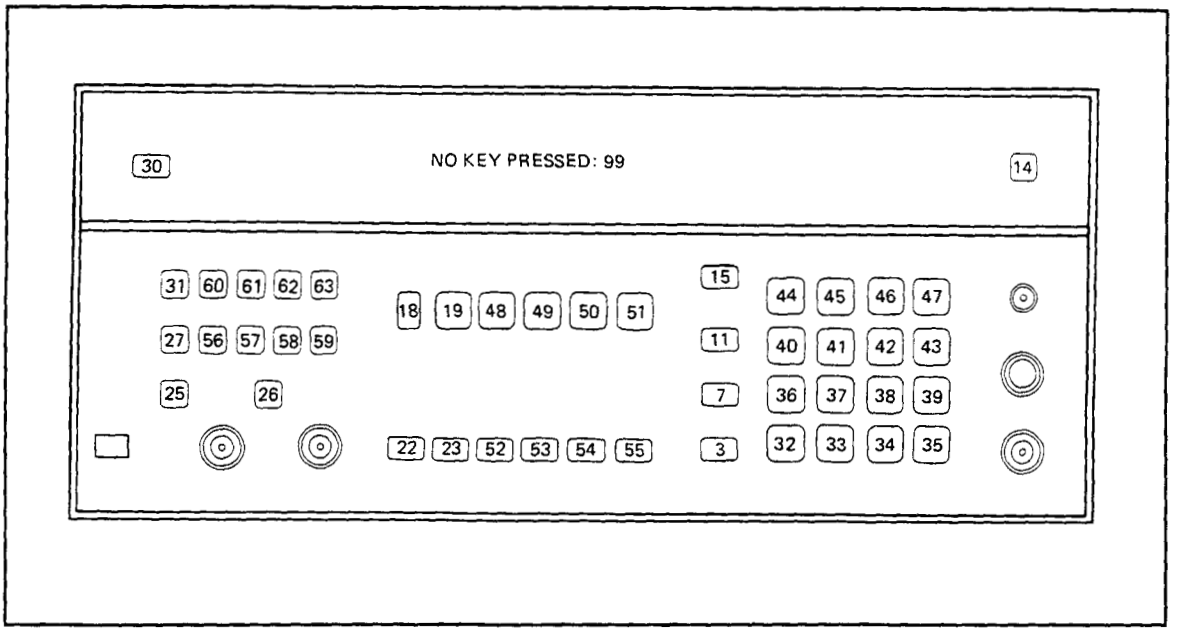


Figure 8B-3. *Key Codes for Key Scan (Service Special Function 60)*

Table 8B-3. *Key Scan Programs*

HP 9825A (HPL)	HP 85A (BASIC)
0: rem 714;llo 7	10 REMOTE 714
1: wrt 714, "60.0SP"	20 LOCAL LOCKOUT 7
2: red 714,A	30 OUTPUT 714; "60.0SP"
3: dsp A	40 ENTER 714
4: jmp -2	50 DISP A
5: end	60 GOTO 40
	70 END

61.N Display HP-IB Status. Displays the status of the HP-IB lines selected by N. The display is in binary. See Service Sheet 28 for troubleshooting and a complete list of HP-IB mnemonics.

NOTE

Information within pointed brackets appears on the Measuring Receiver's display.

N=0 <Addressed to Talk>.<Addressed to Listen>. This function reads back and displays the present state of the Talk and Listen Address flip-flops (A14U16A and B). For example, if the display shows 1.0, the Modulation Analyzer is addressed to talk (and unaddressed to listen). This means the Talk Address flip-flop is set (and the Listen Address flip-flop is reset).

N=1 <DAV>.<RFD><DAC>. This function reads back and displays the present state of the three bus handshake lines. <DAV> reflects the state of the Data Valid bus handshake line as being driven by the Modulation Analyzer (1=being driven; 0=not being driven). Thus, when in Listen Only, this display will always show 0 for <DAV>. The <RFD> and <DAC> always track the bus lines Ready For Data and Data Accepted. For example, 1 for <RFD> means line Ready For Data is true (high).

N=2 <ATN>.<REN>. This function reads back and displays the present state of the ATN (Attention) bus control line and the state of the Remote Enable Flip-Flop. A 1 for either <ATN> or <REN> indicates ATN is true (low at the bus) or that the Remote Enable Flip-Flop is set.

N=3 <SPM>.<SRQ>. This function reads back and displays the state of the Serial-Poll flip-flop and the state of the SRQ bus-control line as being driven by the Modulation Analyzer is in serial-poll mode (SPM) or that it is presently driving the SRQ bus control line.

N=4 PIO Port A. This function inputs and displays (without modifying) the data at PIO port A (A14U13). Leading zeros are blanked. The following table interprets the display.

PIO Port A

A14U13 Pin	2	37	36	31	30	25	24	19
Display Digit	1	2	3	4	5	6	7	8
Mnemonic	IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1
1 = True								

N=5 PIO Port B. This function is similar to the function above except PIO port B is displayed. The display is interpreted as shown in the table below.

PIO Port B

A14U13 Pin	1	38	35	32	29	26	23	20
Display Digit	1	2	3	4	5	6	7	8
Mnemonic	ATN	ARD	AAD	SRQ	RNL	ATT	ATL	SDV
1 = True								

8-8. ERROR MESSAGES

General

The instrument generates error messages to indicate operating problems, incorrect keyboard entries, or service-related problems. The error message is cleared when the error condition is removed.

Error Message Catagories

Errors 01 through 19, 30 through 39, and 90 through 99. These are Operating Error Messages, which indicate that not all conditions have been met to assure a calibrated measurement. Operating Error Messages can usually be cleared by readjustment of the front-panel controls. The Error Disable Special Function 8 can be used to selectively disable certain error messages. More information on Operating Error Messages and error message disabling can be found under *Error Message Summary* and *Error Disable* in Section 3 and on the *Operating Information* pull-out card.

Errors 20 through 29. These are Entry Error Messages, which indicate that an invalid key sequence or keyboard entry has been made. These errors require that a new keyboard entry or function selection be made. More information on Entry Error Messages can be found under *Error Message Summary* in Section 3 and on the *Operating Information* pull-out card.

Errors 40 through 64. These are Measurement Progress Error Messages which indicate if a given segment of the measurement cycle has been traversed. These messages are not normally enabled.

Errors 65 through 89. These are Service Error Messages which provide additional service-related information and are discussed below. Service Error Messages do not necessarily infer that the instrument has a problem but may indicate a normal phenomenon under the particular circumstances. These messages are not normally enabled.

Enabling Measurement Progress and Service Error Messages

Service Error Messages (Errors 40 through 89) are not normally displayed. When a service-related problem is suspected, enable the display Measurement Progress and Service Error Messages by keying in Special Function 43.N with N determined as follows:

N=0 Disables display of Service Error Messages 65 through 89.

N=1 Enables display of Service Error Messages 65 through 89. Cleared by AUTOMATIC OPERATION key.

N=2 Enables display of Service Error Messages 65 through 89. Not cleared by AUTOMATIC OPERATION key.

N=40 through N=89 and N=140 through N=189. Enables measurement to pause or halt on Measurement Progress and Service Error Message indicated by N. See the following paragraphs for details.

Measurement Progress Error Messages (Errors 40 through 64)

These Service Error Messages are used to check the progress of a measurement. Refer to Table 8B-4, *Measurement Progress Error Codes* and Figure 8D-5, *Modualtion Analyzer Software Supervisor Flow Chart.* To see if the measurement progresses through a particular segment of the flow chart, enable the error code corresponding to the segment in either of the two following ways:

1. To cause the measurement to pause momentarily (approximately $^1/_2$ second) and display the error code when the segment is encountered and then to continue on, key in 43.N SPCL, where the suffix N is the error code of the segment.
2. To cause the measurement to halt and display the error code when the segment is encountered, key in 43.N SPCL, where N is the error code of the segment plus 100. Press CLEAR to exit.

Table 8B–4. Measurement Progress Error Codes

Error Code	Flow Chart Segment
44	Non-Measurement Display
46	Measurement Display
48	Set Up Hardware
50	Frequency Tuning
52	Signal Leveling
54	Audio Ranging
56	Measure
58	Manipulate
60	Exit Manipulate

Service Error Messages (Errors 65 through 89)

These Service Error Messages are quite diverse and are enabled in three ways.

1. Special Function 43.1 enables the Service Error Messages and allows the AUTOMATIC OPERATION key to clear them.
2. Special Function 43.2 enables the Service Error Messages but does not allow AUTOMATIC OPERATION to clear them.
3. Special Function 43.N enables the measurement to pause or halt when the Service Error Message specified by N or 100 minus N is encountered. The two alternatives are as follows:
   a. To cause the measurement to pause (approximately $^1/_2$ second) when a specified Service Error Message occurs, key in 43.N SPCL, where N is the Service Error Message code. After pausing and displaying the Service Error Message code, the measurement will continue on.
   b. To cause the measurement to halt when a specified Service Error Message occurs, key in 43.N SPCL, where N is the specified Service Error Message code plus 100. Once the measurement is halted, pressing any key will terminate the halt feature unless testpoint TEST A on the A13 Controller Assembly is grounded. If the testpoint is grounded, pressing any key allows the measurement to proceed until the error is encountered again (permitting single-stepping of the measurement cycle). Press the AUTOMATIC OPERATION key rapidly twice in succession to exit this function.

The Service Error Messages are as follows:

Error 70. Phase Lock Loop Step-Down. The LO phase lock loop has stepped to a lower harmonic of the LF VCXO in an attempt to tune the LO to the required frequency. Stepping down once is occasionally necessary during normal tuning. See Service Sheet BD2 and *Service Special Function 54* in paragraph 8-7.

Error 71. Phase Lock Loop Step-Up. This error message is the same as Error 70 except that the loop has stepped to a higher harmonic.

Error 72. Audio Overload. The Audio Overvoltage Detector has tripped. This may have been due to the nature of the audio signal (for example, a high-frequency audio signal which overrides the circuits preceeding a low-pass filter) or due to a problem in the audio circuits. See Service Sheet BD4.

Error 73. No IF Signal Found after Finding an RF Input. An RF input signal has been sensed by the Peak RF Level Detector but no IF signal has been sensed by the IF Level Detector. See Service Sheets 4 and 9.

Error 74. FM Calibrator Underdeviation. The frequency deviation of the FM Calibrator is less than 30 kHz. See Service Sheet 29.

Error 75. FM Calibrator Overdeviation. The frequency deviation of the FM Calibrator is greater than 38 kHz. See Service Sheet 29.

Error 76. AM Calibrator Modulators Unequal. The difference between the ×10 AM Cal signal for the two channels is greater than 0.6V. See Service Sheet 30.

Error 77. AM Calibrator Channel B Out of Range. The AM Cal level from Channel B is not within the range of +1.8 to +2.2V. An unterminated CALIBRATION AM/FM OUTPUT will cause this error. See Service Sheet 30.

Error 78. Key Not Found. A key closure was not found after a keyboard interrupt (except when a keyboard entry is in progress). See Service Sheet 25.

Error 79. Audio Autorange Rangeback. The audio autorange routine has found the audio signal level is too high, has changed to a less sensitive range, and has immediately found the signal is too low. The routine does not then range back, but instead displays Error 79 and remains on the low-sensitivity range for the rest of the measurement cycle. The error signifies that the routine would normally have ranged back but did not actually do it. This may have been due to the nature of the audio signal (for example, the voice signal) or due to a problem in the audio gain stages or detection circuits. See Service Sheet BD4.

Error 80. Audio Settling Timeout. First-time measurement results are not output to the display until the measurement result has settled or until one second has elapsed, whichever is first. Settling is determined by comparing successive measurements. This error message indicates that a one-second timeout has occurred. This may be due to the nature of the signal or an instability in the audio circuits. See Service Sheet BD4.

Error 81. LO Tuning Adjusted to Center Signal in IF Passband. This error message only occurs in automatic tuning, low-noise lock. If the signal in the IF drifts out of the acceptable pass-band limits (see the spectrum diagram in *RF Frequency Tuning* in Section 3) but is still acceptable, the LO frequency will be adjusted to center the signal in the IF passband. When this occurs, Error 81 will be displayed. In certain situations it is possible to trick the Controller into making this tuning adjustment when the signal is properly tuned; for example, when the IF signal has an excessively high AM depth (greater than 99% at normal RF signal levels) which cannot be accurately counted during the trough. Also note that if tuning adjustments are necessary three times in a row (without any intervening measurement), then the full auto-tuning sequence will be initiated, searching the entire spectrum for a signal.

Error 82. Unable to Make Audio Count. The audio count routine utilizes the main Counter in its frequency count sequence. The Controller initializes the Counter, which then waits for a "stop count" signal from the Audio Counter. If this "stop count" signal does not occur within 100 ms the audio count routine will time out. See Service Sheets 16 and 23.

Error 89. Software Error. Perform the Read Only Memory Verification. See *Service Special Function 52.N* in paragraph 8-7.

8-9. POWER-UP CHECKS

When the Modulation Analyzer is first turned on (or if 40.0 SPCL is entered), the instrument goes through a series of operational checks. If a check fails, an error code is displayed for two seconds on the four internal TEST LEDs on the A13 Controller Assembly. The sequence then continues on to the next check.

Except for the check of the front-panel LED annunciators, no indication of the power-up sequence or its results is given on the front-panel display. The principal advantage to using the Power-Up Checks is that the keyboard and display need not be operational.

To use the Power-Up Checks, remove the top cover, remove any jumpers that may be on the four TEST test points (A, B, C, and D) on the A13 Controller Assembly, remove any signal at the INPUT and switch POWER to STBY for five seconds (to discharge the supplies) and back to ON. Observe the four TEST LEDs on the top of the Controller Assembly as the instrument powers up. The LEDs should light in the following sequence:

1. Indeterminate for about $1/4$ second.
2. ( )( )( )(1) for about 2 seconds.
3. ( )( )(2)( ) for about $1/4$ second.
4. ( )(4)( )( ) for about $1/4$ second.
5. (8)(4)(2)(1) for about 10 seconds.
6. ( )( )( )(1), with (1) blinking indefinitely until a key is pressed.

The Power-Up Checks proper begin at step 2 and are carried out in the following order:

1. **Front-Panel Annunciator Check.** All front-panel LEDs and display segments and decimal points are lighted and remain so throughout the tests that follow and for a few seconds afterwards. Failure of one or more LEDs or display segments to light indicates that the respective components or drive circuits have failed. See Service Sheets 26 and 27.
2. **Read Only Memory Check.** The checksum of each of the read only memories (ROMs) is read and compared against a stored reference (stored in ROM 1). This is similar to issuing a series of 52.N SPCL commands (see *Service Special Functions,* paragraph 8-7). When a wrong checksum is found, the four TEST LEDs blink for one second with the binary code of the ROM number. For example, if ROM 3 is faulty, the TEST LEDs will blink ( )( )(2)(1) (that is, a binary 3). The check then continues on to the next ROM. See Service Sheets BD5 and 24. If no faulty ROM is found, a steady ( )( )( )(1) appears for about 2 seconds.
3. **Random Access Memory Check.** Data is written into and retrieved from the random access memory (RAM). During the test, ( )( )(2)( ) is output to the TEST LEDs for about 2 seconds. If the data read back differs from the data entered, the failure is indicated by outputting the same code for an additional 2 seconds. See Service Sheet 24.
4. **Instrument Bus Parity Check.** A parity check of the data lines of the Instrument Bus is made. A failure is indicated by ( )( )(2)(1) on the TEST LEDs for about 2 seconds. See Service Sheets BD5, 15, and 24.
5. **Local Oscillator Check.** The Local Oscillator (LO) is given a series of tests similar to issuing the 54.0 SPCL command (see *Service Special Functions*, paragraph 8-7). During the test, ( )(4)( )( ) is output to the TEST LEDs for about second. A failure is indicated by outputting the same code for an additional 2 seconds. See Service Sheet BD2.
6. **Keyboard Check.** The keyboard is scanned to see if any keys are down. If a key is down, error code ( )(4)( )(1) is output to the TEST LEDs for 2 seconds. See Service Sheets BD5 and 25.

8-10. CONTROLLER TEST LEDS AND TEST POINTS

Near the top edge of the A13 Controller Assembly are located four testpoints and four associated LED annunciators labeled TEST which are used primarily for troubleshooting the instrument. The LED annunciators are labeled (from left to right) 8, 4, 2, and 1 and are associated with test points A, B, C, and D respectively.

The label on the annunciators is sometimes used to represent a binary weighting. They function in the following ways:

1. At instrument power-up the TEST annunciators light in a certain sequence that indicates proper functioning of several vital areas of the instrument. A failure in any of the areas is indicated on the annunciators. For details see *Power-Up Checks* in paragraph 8-9.
2. After power-up, annunciator 1 toggles once for each measurement cycle.
3. After power-up, annunciator 2 toggles once for each keyboard interrupt (that is, each time a key is pressed).
4. After power-up, annunciator 4 toggles once for each HP-IB interrupt.

Grounding of certain of the TEST testpoints alters instrument operation in the following ways:

1. Grounding testpoint A is used to alter the measurement halt function of Special Function 43.N. See *Service Error Messages* in paragraph 8-8.
2. Grounding testpoint B causes some of the power-up sequence to be bypassed and thus shortens the turn-on time of the instrument. The power-up checks are now invalid.
3. Grounding testpoint C initiates the Counter signature analysis troubleshooting routine. See Service Sheet 23.
4. Grounding testpoint D initiates the Keyboard signature analysis troubleshooting routine. The signature analyzer's start and stop leads are then connected to testpoint A and the probe is connected to testpoint B. See Service Sheet 25.

Whenever a testpoint is grounded, the associated annunciator is extinguished.

8-11. SIGNATURE ANALYSIS

Signature analysis is a simple method of verifying the operation of digital circuitry. When properly used, signature analysis can detect extremely subtle hardware faults. Signatures must identically match those given in the signature tables. If everything is working correctly, signatures will all match exactly. If they don't match, by even one digit, something is wrong.

The Counter, Controller, and Keyboard and Display Assemblies are designed for troubleshooting with signature analysis. Signature Analysis is a method of digital signal tracing using test routines programmed in the Modulation Analyzer's ROM. With the Modulation Analyzer's Controller executing the signature analysis routine, the signature analyzer's test probe is used to check nodes in the circuit under test. The signature analyzer converts the signals at the node into a four-digit "signature", which it displays. This signature is then compared to the signature in the troubleshooting checks adjacent to the appropriate schematic. These two signatures must be identical.

Signature analysis can be speeded up if the following considerations are kept in mind:

1. Make sure that every step is performed as described in the set-up procedure. That is, make sure that the clock, start, and stop connections and triggering are correct.
2. Double-check that the signatures are being taken at the correct node.
3. Make sure that the signature analyzer probe is making good contact with the pin being checked. Oxidation on pins can cause invalid signatures due to poor contact.
4. When you think you have found a bad signature, double check to make sure.
5. When checking a node, check that the unstable-signature indicator is not blinking.

8-12. GENERAL DISASSEMBLY PROCEDURES

Top Cover Removal

1. Remove the two top plastic standoffs on the rear panel by removing the Pozidriv screws from each standoff.
2. Unscrew the Pozidriv screw at the middle of the rear edge of the top cover. This is a captive screw and will cause the top cover to push away from the frame.
3. Lift the top cover off the instrument.

Bottom Cover Removal

1. Turn the instrument upside down.
2. Remove the two top plastic standoffs on the rear panel by removing the Pozidriv screws from each standoff.
3. Unscrew the Pozidriv screw at the middle of the rear edge of the bottom cover. This is a captive screw and will cause the bottom cover to push away from the frame.
4. Lift the bottom cover off the instrument.

Side Cover Removal

1. Remove the two screws holding each side panel strap handle in place (there is one screw at either end of each strap handle).
2. Remove the strap handle caps and the strap handles.
3. Slide the side panel towards the rear of the instrument and then pull it off.

Information Card Tray Removal

1. Turn the instrument upside down.
2. Remove two plastic feet from one side of the bottom cover.
3. Rotate the information card tray away from the remaining two plastic feet and remove.

8-13. FRONT-PANEL DISASSEMBLY PROCEDURE

Front-Panel Assembly Removal

1. Remove the information card tray (refer to Information Card Tray Removal).
2. Remove the knurled nuts on the RF input (Type-N) and the modulation output/audio input (BNC) connectors.
3. Pry up the plastic trim strip on the top of the instrument's front frame with a small screwdriver.
4. Remove the three screws in the channel covered by the trim strip.
5. Remove the two outside screws and the center screw from the channel on the bottom of the front frame.
6. Pull the front-panel assembly outwards.
7. To completely separate the front panel from the instrument, disconnect the ribbon cable connectors and the RF cables.

A1 Keyboard and Display Assembly Removal

1. Remove the front-panel assembly from the instrument (refer to Front-Panel Assembly Removal Procedure).
2. To separate the A1 Keyboard and Display Assembly from the front-dress panel MP14 and sub-panel MP15, first remove the Keyboard and Display insulator MP48 by unscrewing the four pan-head screws, and removing the washers and spacers which hold it in place.
3. Remove the six remaining screws and washers which fasten the A1 assembly to the sub-panel.
4. Disconnect the front panel LINE switch S3 jumpers at the A1 assembly.
5. Separate the A1 assembly from the front-dress panel and sub-panel.

Front-Dress Panel and Display Window Removal

1. Remove the front-panel assembly from the instrument (refer to Front-Panel Assembly Removal Procedure).
2. To remove the front display window MP40, remove the three retaining clips and slide the screen straight up (towards the top edge of the front sub-panel).
3. To remove the front-dress panel MP14, remove the front-panel jacks (if present) and slide the dress panel downward (toward the bottom edge of the front panel). The bottom edge of the front dress panel will have to be pulled out slightly to allow for clearance of the LINE switch.

REPLACEMENT OF PUSHBUTTON SWITCHES AND ANNUNCIATOR LEDS

Key Cap Replacement

1. To replace a front-panel pushbutton key cap, pull it off and snap on a new one. You will have to either remove the Keyboard from the Front Panel Assembly (refer to Front Panel Disassembly Procedure) or carefully use a pair of pliers to remove the keycap.

NOTE

Watch the angular position of the key cap as you snap it in place, since eight different positions for installation are possible.

Key Cap Led Replacement

Many of the front-panel pushbutton key caps have molded-in clear lenses which are illuminated by miniature LEDs located in the center portion of the switch at the circuit board. During production of the instrument, the LEDs are first soldered in place and then the switch is slid down around them and heat staked in place. If replacement of the LED becomes necessary (due to burnout), it can be replaced without having to remove the switch. To replace a key cap LED, use the following procedure:

1. Remove the pushbutton key cap (refer to Key Cap Replacement Procedure).
2. Place the Modulation Analyzer on a table top. Lower the front panel so that it is facing downward (refer to the Front-Panel Disassembly Procedure). Unsolder the LED leads on the circuit side of the printed circuit board as you pull the LED down through the middle of the switch stem with a pair of small tweezers.
3. Insert a new LED (one with long leads). Make sure the polarity is right. Pull the leads through the circuit board and solder.
4. Clip off the excess LED lead length on the circuit side of the keyboard.
5. Put the front panel in place. Snap on the key cap. With the instrument power on, test the switch function to make sure that the LED works.

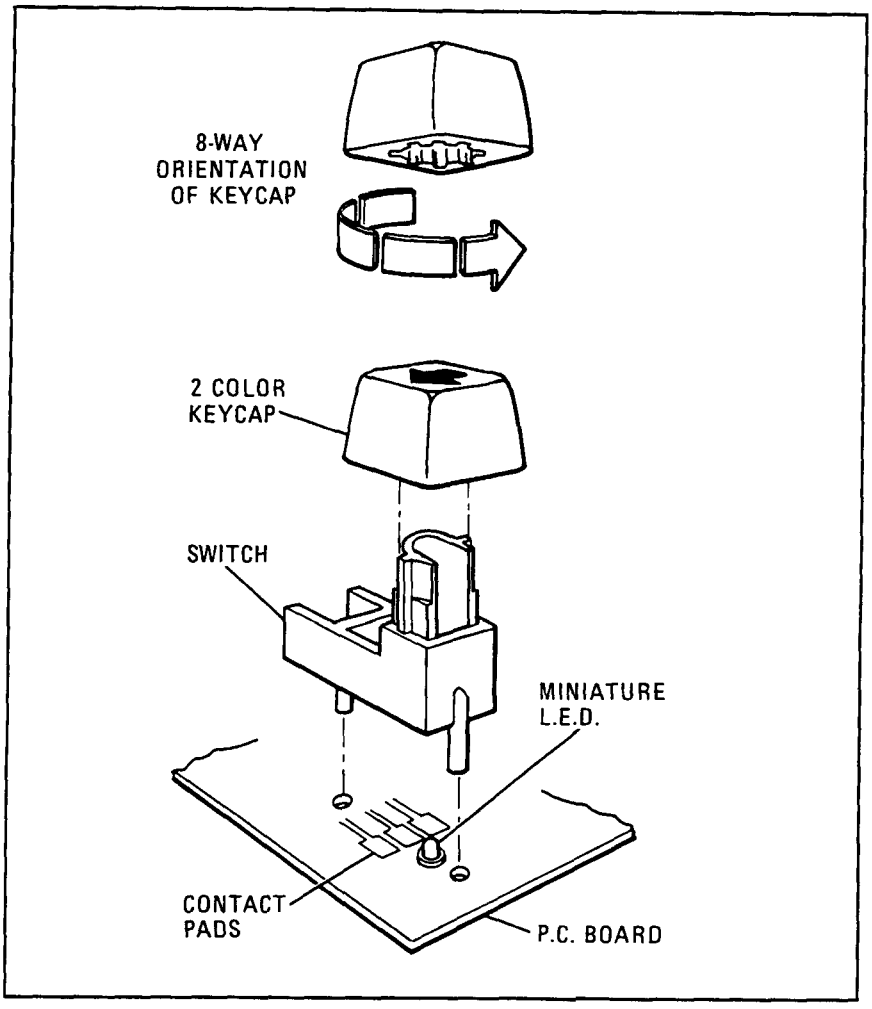


Figure 8C–1. *Front-Panel Pushbutton Switch Assembly*

Switch Replacement

The front-panel switches have a very high cycle life. However, if one becomes faulty and needs replacement, follow the procedure outlined below:

1. Remove the pushbutton key cap. You will have to pull hard. Use your free hand to hold the board down as you pull.
2. Lower the front panel (refer to the Front-Panel Disassembly Procedure).
3. Remove the switch by chipping away the melted plastic tabs at the circuit of the keyboard which hold the switch in place.
4. To assure long life and reliable electrical performance, the circuit board contact traces (which are found underneath the switch) should be clean and free of surface imperfections. Clean the switch contact pads before installing a new switch. Make sure the LEDs are not tilted and that there is no excess solder around the leads.
5. For reliable operation, any method of assembly must assure that the switch is mounted tightly against the pc board. To facilitate the heat staking operation, specially molded support anvils (HP 5040-6881) can be ordered.

NOTE

The following operation should be done in a well ventilated area. If the heat staking tip is too hot, the plastic will vaporize and emit fumes. These fumes, however, are non-toxic.

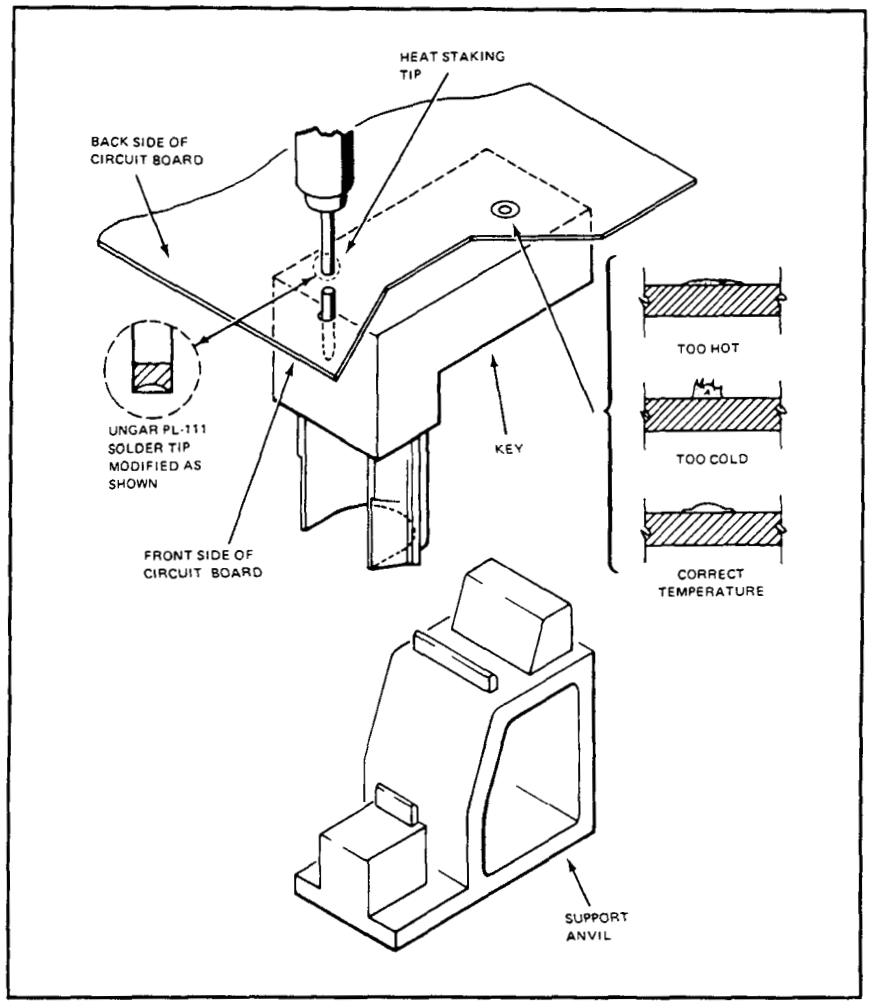


Figure 8C–2. *Typical Assembly for Heat Staking Operation*

6. To assure proper switch assembly, verify that the switch is pushed firmly against the circuit board and, with the hot (440°C or 825°F) staking tip, push down on each of the posts (2) of the switch. Each post should take about one second to stake. With the proper cycle, the post should turn a darker color and, in about ten seconds, return to its original bright red color. The correctly staked post should have a smooth round "rivet" like top.

CAUTION

Do not disturb the assembly for at least 10 seconds after heat staking.

If not enough heat is applied, the plastic will tend to stick to the tip of the iron.

If too much heat is applied, the plastic will fume profusely, the "rivet" will be irregularly shaped, and the plastic will be permanently discolored.

If the staking tool is worn or flaked, it will cause a misshaped rivet and/or a contamination deposit on the surface.

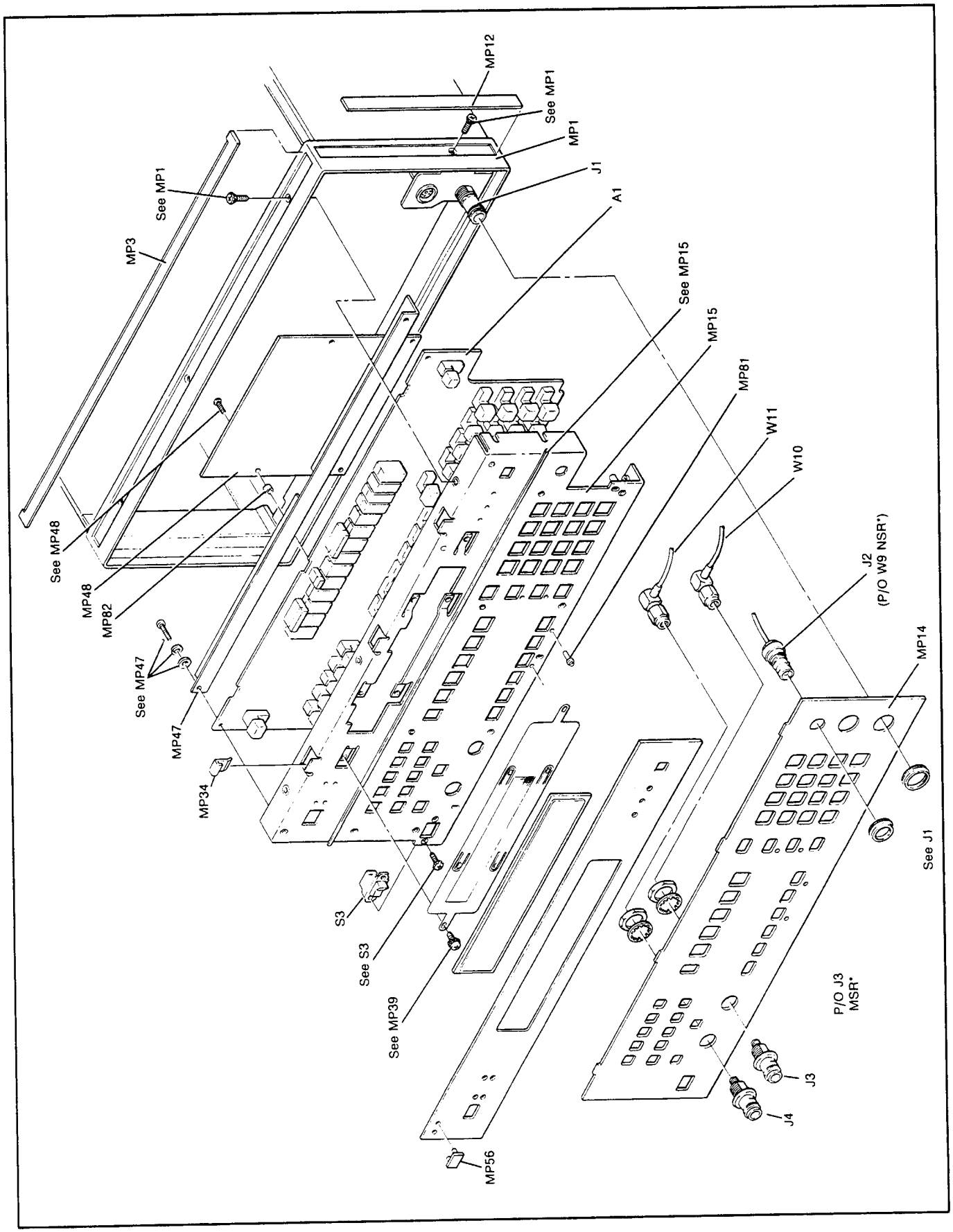


Figure 8C–3. *Illustrated Parts Breakdown of the Front Panel*

Table 8C–1. *Item Number Reference Designator Description*

Number	Reference Designator	Description
1	MP60	Knurled Nut (Opt 010 only)
2	MP13	Front Dress Panel
3	MP58	HP Logo
4	MP40	Front Display Window
5	P/O MP15	Divider Strip
6	MP39	Front Panel Display RFI Shield
7	M15	Front Sub-Panel
8	MP34	Retaining Clip
9	S1	Front Panel LINE Switch
10	See MP60	Star Washer
11	See S1	Lock Washer
12	See S1	Machine Screw
13	W32	Calibration Output Cable Assembly (Opt. 010 only except in combination with Option 001)
14	A1	Keyboard and Display Assembly
15	MP47	A1 Support Shield
16	See MP47	Washer
17	See MP47	Lock Washer
18	See MP47	Machine Screw
19	W20	Cable
20	W24	Cable
21	See MP15	Keyboard and Display Insulator
22	See MP15	Machine Screw
23	See MP15	Lock Washer
24	See MP15	Washer
25	See MP15	Spacer
26	See MP15	Machine Screw
27	See MP15	Lock Washer
28	See MP15	Washer
29	W19	Cable Assembly (BNC to SMC jacks)
30	See MP60	Star Washer
31	W1	Cable Assembly (Type N to SMC jacks)
32	See MP59	Star Washer
33	MP59	Knurled Nut (except Opt 001)
34	MP60	Knurled Nut (except Opt 001)

Service Sheet BD1

BLOCK

- **Overall Instrument**

PRINCIPLES OF OPERATION

NOTE

The following discussions cover the principles of operation of the Modulation Analyzer. Each discussion is based on and referenced to a service sheet. An introductory-level discussion of the principles of operation can be found in Section 1 of the Operation and Calibration Manual *under the title,* Principles of Operation for Simplified Block Diagram.

General

The Modulation Analyzer is a general-purpose, tuned, signal-measuring instrument. The Overall Block Diagram breaks up the instrument's functions so they correspond to those of a receiver: RF Block, IF Block, and Audio Block. The Digital Block (using the receiver analogy) roughly corresponds to the human operator. Each of the functional blocks is shown in greater detail in Service Sheets BD2 through BD5.

Sensor Module

During normal operation, the RF input signal is applied to an external Sensor Module such as the HP 11722A. The Input Switch in the Sensor Module routes the RF signal to the Power Sensor when the RF Power measurement mode is selected. The Power Sensor converts the RF input signal to a chopped dc voltage which is proportional to the average power level of the signal. For other measurement modes, the switch routes the input signal to the INPUT connector of the Modulation Analyzer. The Sensor Module also contains a resistor which provides a means for the Modulation Analyzer to identify the type of Power Sensor in the Sensor Module.

Power Meter

The Power Sensor and Power Meter amplify the dc voltage from the Power Sensor's transducer so the voltage can be measured by the Voltmeter in the Audio Block. To minimize the effect of dc drift in the amplifiers (which may even exceed the dc voltage from the transducer itself), the transducer's output is converted to an ac voltage by a chopper in the Power Sensor. The chopper drive comes from the 220 Hz Multivibrator. The resultant ac signal is ac coupled to the narrow-band Input Amplifier, and the gain of this amplifier is autoranged by the Controller. The amplified ac signal is converted back to dc by the Synchronous Detector, which full-wave rectifies the ac signal by rechopping it in phase. Noise on the resultant dc signal is filtered by the Noise Filters to stabilize the displayed reading. The heaviest filtering is done on the most sensitive ranges and results in an increase in the measurement response time. Before an RF power measurement is initiated, the switch at the output of the Power Meter connects the Sensor Identifier Resistor circuit to the Voltmeter. The voltage across the resistor indicates the type of Power Sensor present.

The Zeroing DAC is set by the Controller to cancel any dc offset of the Power Sensor when no input is applied. In the zeroing sequence, the RF Input to the Power Sensor is switched out, a power reading is taken, and the Zeroing DAC is automatically adjusted for a zero reading. (In actual implementation, the Zeroing DAC is adjusted for a pre-determined offset voltage reading. The offset is subtracted out in subsequent power measurements by the Controller. The Voltmeter then operates in its most linear region.)

Calibration of the Power Sensor is verified by connecting the Sensor Module to the CALIBRATION RF POWER OUTPUT connector, which outputs a calibrated 1 mW signal from the 50 MHz Power Reference Oscillator. If desired, a calibration factor can be stored and used to correct subsequent power readings as explained in the *Detailed Operating Instructions* in Section 3.

RF Input

The Modulation Analyzer measures RF signals in the frequency range from 150 kHz to 1300 MHz and power levels of −25 to +30 dBm into its 50 ohm input. The voltage, sensed at the input by the RF Level Detector, is used to help set the proper input attenuation and, if the input exceeds 1W, to trip the Overpower Protection relay. When RF Level (Special Function 35) is selected, the Voltmeter reads the output from the RF Level Detector. The controller converts the output from the Voltmeter into power in watts.

The 5.25 MHz High-Pass Filter is manually selectable. Since the IF will generally respond to signals 2.5 MHz and below, the filter eliminates any low frequencies which may be present on the input. For signals in the range of 150 kHz to 10 MHz, the filter should be switched out.

The Input Attenuator is set to provide the Input Mixer with an optimum input level. The attenuator pads are set by the Controller which receives signal level information from the RF and IF level detectors (via the Voltmeter).

Input Mixer and IF

The Input Mixer down-converts the RF input to the intermediate frequency (IF). The IF frequency is normally the frequency of the LO minus the frequency of the RF signal.

The IF is centered at 1.5 MHz for input signals 10 to 1300 MHz. (However, an IF of 455 kHz can be manually selected.) For signals between 2.5 MHz and 10 MHz the IF is 455 kHz. Below 2.5 MHz, the signal is passed directly into the IF without being down converted (unless the 455 kHz IF has been manually selected).

The IF Amplifier is a low-noise, 33 dB amplifier. When the 1.5 MHz IF is selected, the frequency response is determined by the 2.5 MHz Low-Pass Filter. When the 455 kHz IF is selected, the 455 kHz Bandpass IF Filter preceeding the First IF Amplifier determines the IF response.

The IF signal is sent to the the 2.5 MHz Low-Pass Filter where it is buffered and sent to both the rear-panel IF OUTPUT connector and to the FM Demodulator circuitry. The IF Peak Detectors sense the presence of the IF signal (and thus the input RF signal) during an automatic signal search (via the IF Present and Stop Sweep lines). The Voltmeter measures detected IF level (via the IF Peak Level line) to help determine the setting of input attenuation.

Selective Power Options (Option Series 030)

The Selective Power Options (Option Series 030) add a set of selectable bandpass filters and a programmable IF amplifier to enable the instrument to make accurate adjacent-channel power and single-sideband noise measurements on transmitters and signal generators. For these measurements, the instrument is first tuned to the incoming signal using the 455 kHz IF. The IF level is then measured with the IF RMS Detector after the IF is bandpass filtered and amplified. Next, the RF frequency is offset (as required by the specific test), and the IF level is again measured. The ratio of the two IF level measurements is the relative adjacent-channel power or single-sideband noise. (Refer to *Selective Power Measurements* in the *Detailed Operating Instructions* in Section 3.)

Two bandpass filters in series define the measurement bandwidth. The First Channel Filters are one of two pairs of IF filters. The Option Series 030 specifies the pairs of channel filters installed in the instrument. The pair of Second Channel Filters have bandwidths of 30 kHz (for adjacent channel power measurements) or 2.5 kHz (for single-sideband noise measurements). Filter selection is listed in Table 8D-1. The measurement bandwidth indicated in the table is the total bandwidth of the selected filters. In addition to determining the total measurement bandwidth, the second filter pair remove broadband noise generated by the preceding IF amplifiers. The Programmable IF Amplifier, governed

by the Controller, keeps the IF signal within the linear range of the IF RMS Detector and increase the dynamic measurement range to 95 dB.

Table 8D–1. Option Series 030 Filter Selection

Option Number	Typical Measurement Application	Typical Channel Spacing	Measurement Bandwidth
032	Adjacent Channel Power	12.5 kHz	8.5 kHz
033	Adjacent Channel Power	20 or 25 kHz	16 kHz
035	Adjacent Channel Power	60 kHz	30 kHz
037	SSB Noise	–	2.5 kHz

At frequencies above 300 MHz, a low-noise, external LO is recommended for best performance. The LO is conveniently switched by the LO Input Switch. (This feature is not allowed in combination with Option 003, rear-panel LO connections.)

AM Demodulator

The AM Demodulator is an automatic leveling control (ALC) loop with a relatively slow response time. The IF signal is amplified and detected by the AM and IF Average Detector, and the dc component of the detected signal is compared to a stable, dc reference. If the dc voltage is different from the reference, the difference is amplified by the ALC Feedback Amplifier which drives the Current-Variable Amplifier to force the detected voltage to equal the reference.

Since the AM on the IF carrier is too fast for the ALC loop to respond to, the ALC loop produces an ac voltage in the detector which is proportional to the AM. The ALC Bandwidth and Defeat line can be used either to completely defeat the ALC action or to speed up the ALC response time in response to variations in IF level (at the sacrifice of accuracy at low AM rates).

After demodulation, the recovered AM is filtered and processed by the Audio Circuits. The unfiltered AM from the AM and IF Average Detector (containing both ac and dc components) is sent to the rear-panel AM OUTPUT connector. The dc component from the detector is measured by the Voltmeter (1) to determine setting of the RF input attenuators when the ALC loop is switched off, (2) to determine the IF Level in the IF Level measurement mode (where it is compared to the ALC reference).

FM Demodulator

The FM Demodulator consists of IF Limiters and an FM Discriminator (frequency-to-voltage converter). The limiter-amplifier provides 66 dB of gain and limits the output voltage swing to approximately 1 Vpp to reduce the influence of AM and noise on FM measurements. The signal from the limiters also drives a Counter input for measuring the IF frequency. The FM Discriminator produces a voltage linearly proportional to the IF frequency, and the FM variations in the IF frequency appear as an ac component on the output. The ac component is amplified, filtered, and then processed by the Audio Circuits. The output from the FM Discriminator (with both ac and dc components) is sent to the rear-panel FM OUTPUT connector. The filtered dc component is used to tune the LO in the track-tune mode.

Audio Circuits

The signal from the AM or FM Demodulators is filtered by a 260 kHz Low-Pass Filter. Before the audio signal is measured or sent to the MODULATION OUTPUT/AUDIO INPUT connector, it is processed further by various filters, amplifiers, and attenuators. For FM, the audio may also be de-emphasized. For ΦM the signal is integrated. Factors which control the audio processing are: measurement mode, selected features, audio level, input frequency, and any selected special functions. Table 8D-2 summarizes the types of signal processing.

Table 8D–2. *Types of Audio Signal Processing*

Type of Processing	Selections Available
High-Pass Filters	<20 Hz (through path) 50 Hz 300 Hz
Low-Pass Filters	3 kHz 15 kHz >20 kHz (low ringing) >200 kHz (260 kHz LPF)
FM De-emphasis Networks	25 μs 50 μs 75 μs 750 μs None
FM De-emphasis Selection	Pre-display On Pre-display Off
Signal Polarity	Inverting Non-inverting
Relative Gain	0 dB 20 dB 40 dB

The Audio Range Detectors are used to determine the audio gain (the Audio Range Level line) and to sense audio overloading (the Audio Overvoltage Status line).

Voltmeter

The demodulated signal is detected by both the Audio Average Detector and the Audio Peak Detector. The detector outputs are two of several Voltmeter inputs switched by the Input Selector. The Voltmeter consists of a Voltage-to-Time Converter whose output is applied to the Counter. The Voltage-to-Time Converter produces a Stop-Count pulse with an interval between pulses proportional to the dc input voltage. The pulse gates the Counter, which counts the 10 MHz time base reference. The count accumulated during the gate interval is proportional to the input voltage.

Other inputs into the Voltmeter include:

- RF Peak Level
- IF Peak Level
- IF Average Level (normally equal to the ALC reference)
- Audio Range Level
- RF Average Power Level
- AM Calibration
- Audio Distortion (from an audio rms-to-dc coverter)
- Various service-related voltages not shown.

The output from the Input Selector is always present at the rear-panel RECORDER OUTPUT connector. Normally, the output is constantly switching between inputs, but by means of special functions any of the measurement results can be selected and held. This feature is especially useful for making precise RF power measurements.

Audio Distortion Analyzer

The input to the Distortion Analyzer is selected by the Output Switch. The input can be either the internal demodulated RF signal or an audio signal input to the front-panel MODULATION OUTPUT/AUDIO INPUT connector. The distortion measurement is limited to audio signals with a frequency of 400 Hz or 1 kHz.

The distortion measurement consists of measuring the rms level of the total audio signal then remeasuring the signal after it passes through a notch filter that removes the fundamental of the signal—leaving the distortion components, hum, and noise. Both measurements use the RMS-to-DC Converter to obtain true rms measurements. The dc level from the RMS-to-DC Converter is measured by the Voltmeter. The Post-Notch Amplifier and the Audio Amplifier optimize the signal level into the RMS-to-DC Converter. The Controller computes the distortion as the ratio of the output of the Notch Filter to its input (with corrections made to account for amplifier gain). (In the SINAD measurement mode, the reciprocal of distortion is computed.)

Audio Counter

The input to the Audio Counter is selected by the Output Switch. As with the Audio Distortion Analyzer, the input can be either the internally demodulated RF signal or an audio signal input to the front-panel MODULATION OUTPUT/AUDIO INPUT connector.

The audio signal is first conditioned by the Schmitt Trigger to make it compatible with the digital circuits it drives. When a frequency count is to be made, the Controller, after clearing both the Counter and Audio Counter and after opening the Audio Switch, arms the Counter Control Logic. The first signal pulse from the Schmitt Trigger causes the Counter Control Logic to close the Audio Switch and the Counter Gate switch (in the main Counter). The number of cycles of the audio signal are counted by the Audio Counter. The number of time-base reference pulses are counted by the main Counter. After a fixed period of time, the Controller readies the count to to stop. The next signal pulse from the Schmitt Trigger causes the two switches to open. The counts in the two counters are then read back, and the audio frequency is computed and displayed.

Local Oscillator

The heart of the LO is a 320 to 650 MHz High-Frequency, Voltage-Controlled Oscillator (HF VCO). After passing through the programmable LO Divider, the HF VCO signal becomes the LO drive to the Input Mixer. The LO Divider is programmed to divide the HF VCO by powers of two from 2^{-1} to 2^{8}, (that is, from a times 2 divide by 256). Thus the LO can tune from 1300 MHz to 1.25 MHz in ten octave ranges. A fixed divide-by-eight output from the LO Dividers is the LO (HF VCO÷8) input to the Counter.

There are four tuning modes:

- manual tuning and low noise,
- automatic tuning and low noise,
- automatic tuning and signal tracking,
- manual tuning and signal tracking.

Manual Tuning and Low Noise. Consider the sequence followed for manual tuning. When a frequency is entered from the Keyboard, the LO is configured as in Figure 8D-1. The Digital-to-Analog Converter (DAC) is connected to the HF VCO tune input as shown. Knowing the desired frequency, the Controller computes the octave number (n) for the LO Divider and sets the DAC to its midrange. Then, an iterative sequence of counting the LO and adjusting the DAC is carried out until the LO is near the correct frequency.

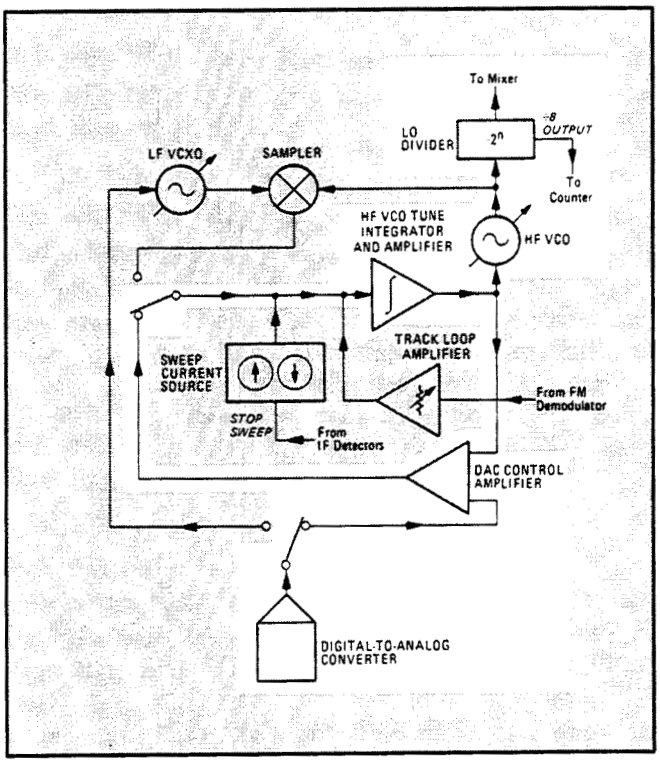


Figure 8D–1. *LO Configuration: DAC to HF VCO*

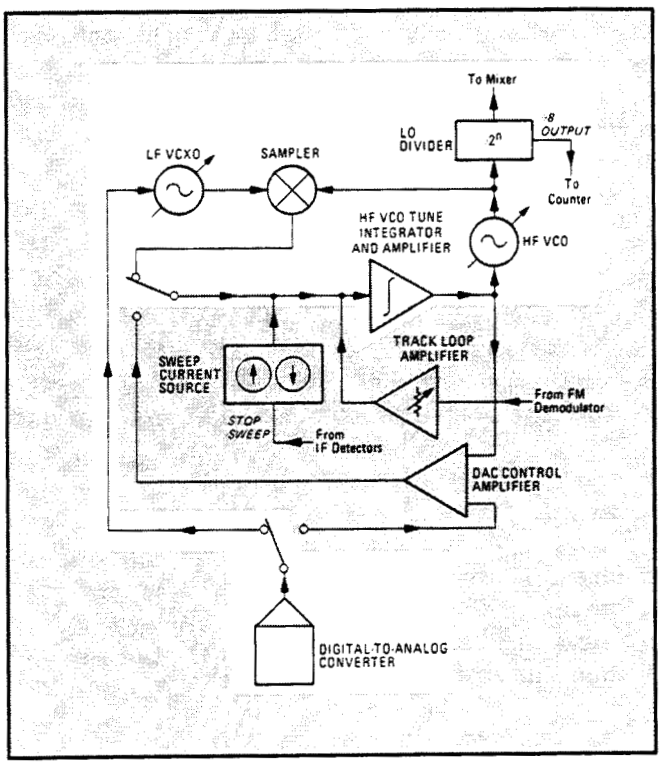


Figure 8D–2. *LO Configuration: DAC to LF VCXO*

Next, the LO is configured as a phase-lock-loop as shown in Figure 8D-2. The DAC is now connected to the tune input of a highly stable, Low-Frequency, Voltage-Controlled, Crystal Oscillator (LF VCXO).

The LF VCXO drives the Sampler at a nominal (but tunable) 2 MHz rate. The other input to the Sampler is the HF VCO. The Sampler drives the HF VCO tune line through the Tune Integrator and Amplifier. The HF VCO is thus phase locked to a harmonic of the LF VCXO, which greatly improves the noise and frequency stability of the HF VCO.

Before closing the phase-lock-loop, the DAC is set near the low end of its range. When the loop is first locked, the LO frequency is slightly low, but after an iterative sequence of counting the HF VCO and tuning the LF VCXO by the DAC, the LO is brought to within 500 Hz of the desired frequency. During the process of fine tuning the LO, the DAC may reach the end of its tuning range. If this happens, the Controller will break the lock loop, set the DAC to the other end of its range, and lock will be re-established to a different harmonic of the LF VCXO.

Automatic Tuning and Low Noise. The automatic tune mode is similar to the manual tune mode except the LO is first swept from the top to the bottom of each octave range by the Sweep Current Source. See Figure 8D-3. If the LO sweeps past a signal at the INPUT, the down-converted signal appears in the IF and is detected by the IF Detectors. The signal on the Stop Sweep line immediately turns off the Sweep Current Source. With no input to the Tune Integrator and Amplifier, the HF VCO will remain approximately tuned to the input signal, and the frequency of the LO (and thus the input) can be determined by the Controller. Once the signal has been found after a sweep of all octaves, it is found four more times by sweeping just the octave where it was first found and two octaves above it. This is necessary in case the signal has AM which was in a deep trough when the fundamental of the LO passed through and was out of the trough when the strong third harmonic of the LO passed through.

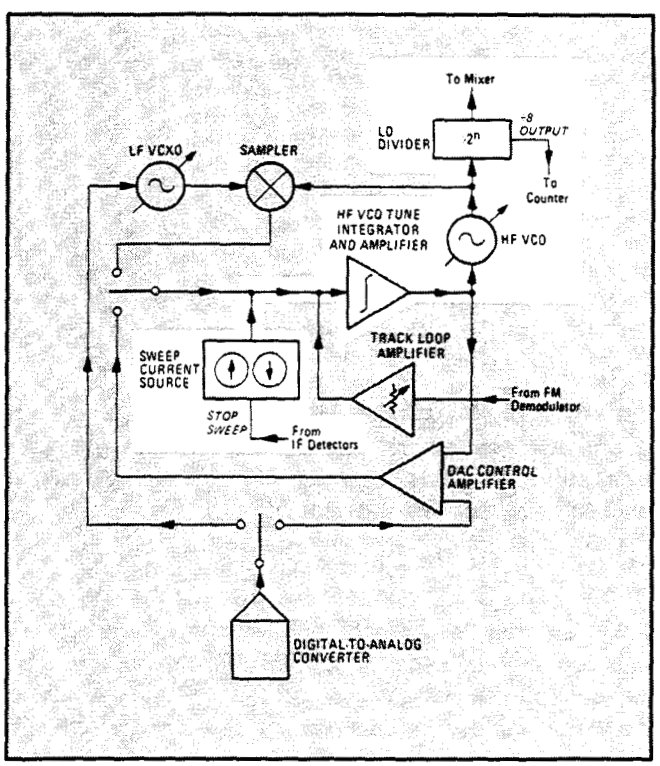


Figure 8D-3. *LO Configuration: HF VCO Sweep*

Having now found an input signal, the Controller manipulates the LO through a series of tuning sequences to search for the fundamental of the input that was found. Once the fundamental of the input signal is identified, the LO is tuned to approximately 1.5 MHz above that signal. The Controller then accurately counts the LO and the IF and thus determines the frequency of the input signal. (Signal frequency = LO frequency − intermediate frequency.)

At this point the LO is configured as in Figure 8D-1, and the tuning continues as in the manual tune mode using the computed frequency in place of a keyboard-entered frequency.

Automatic Tuning and Signal Tracking. In the track mode an automatic signal search is performed as described above. When a signal is found, the the LO is configured as in Figure 8D-4. Here, a dc voltage from the FM Demodulator is fed back to the HF VCO tune line to form a frequency lock loop. If the frequency of the input signal changes, the HF VCO is tuned to follow it. The gain of the loop depends on the octave number of the LO Divider. This gain variation is compensated for by adjusting the gain of the Track Loop Amplifier in the tune line.

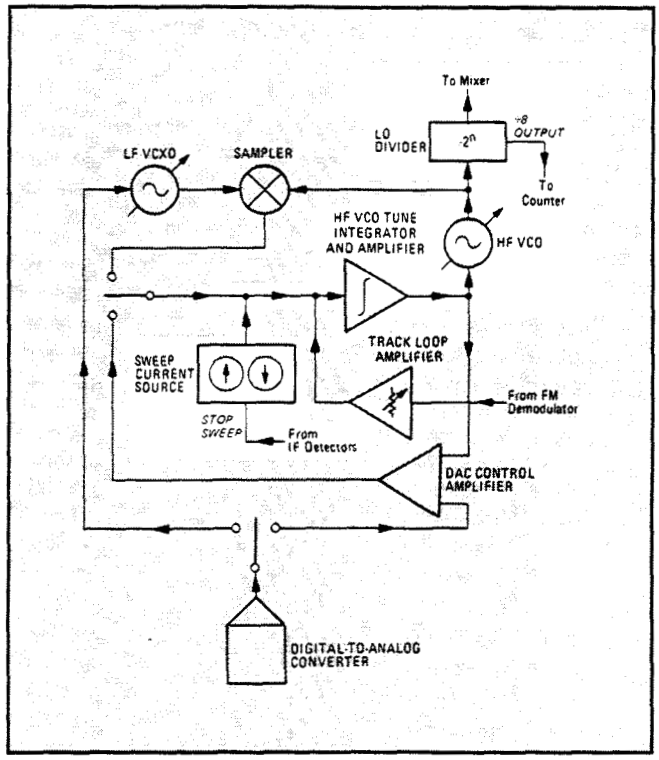


Figure 8D-4. *LO Configuration: Track*

Manual Tuning and Signal Tracking. In the manual track tune mode the LO is first tuned as in the manual tune mode discussed above. The LO is then configured as in Figure 8D-4. Manual track tuning permits the tracking of a moving signal in the presence of stronger signals. Track tuning has a slightly higher residual FM level than low-noise tuning.

Counter

Operation of the Counter is conventional. The input signal to the Counter is gated by a train of periodic time base pulses via the Time Base 6.25 kHz line. The period of the pulse train pulses is accurately known. While the Counter is gated, the Counter increments one count for each input cycle. When the time base disables the Counter, the accumulated count is transferred to storage registers (in this case, the Controller), and the Counter is cleared. When the time base again gates the Counter, the count sequence repeats. The stored count is then processed by the Controller (it is multiplied by an appropriate scale factor) and transferred to the display or used internally by the Controller. The Controller itself also forms the final stages of the Counter and keeps track of the number of time base pulses that occur while the Counter is gated.

The time base is derived from a 10 MHz reference. The reference can be either internal or external. Switching to external is done automatically when an external reference is applied to the rear-panel TIME BASE 10 MHz INPUT connector. The Time Base Dividers divide the 10 MHz reference by

1600. The output from the dividers becomes the Counter gate. A 2 MHz output (from a divide-by-five) is used as the Controller clock.

The Input Selector selects one of several possible inputs to the Counter. When the Voltmeter function is selected, the 10 MHz reference, gated by the Stop Count switch, is counted. The Stop Count switch closes when the Controller initiates a Ramp Gate pulse; it remains closed until opened by the Voltage-to-Time Converter. When the audio frequency function is selected, the 10 MHz reference is counted as for the Voltmeter function. The Stop Count switch, however, is now controlled by the Counter Control Logic of the Audio Counter.

AM and FM Calibrators

The FM Calibrator consists of a 10.1 MHz VCO which toggles between two frequencies at a 10 kHz rate. Selecting the FM Calibration mode initiates a sequence of measurement cycles. During a measurement cycle, the VCO is measured by the Counter at the upper frequency and then measured at the lower frequency. The Controller then computes the deviation (one-half the difference between the two frequencies). The Controller then allows the FM Source to toggle at its 10 kHz rate. When the signal from the CALIBRATION AM/FM OUTPUT is connected to the INPUT of the Modulation Analyzer (either directly, or through a Sensor Module), the FM on the calibrator signal is measured, and the FM calibration factor (the ratio of the measured FM to the computed FM) is displayed.

The AM Calibrator receives its input from the output of the 10.1 MHz VCO of the FM Calibrator, which is not toggled during AM calibration. This signal is limited and applied to the Amplitude Modulator. The AM Source toggles the modulator at a 10 kHz rate between a nominal level and twice that level to produce 33% AM.

To enhance the accuracy of the calibrator, measurements are made at the output of the modulator with the Amplifier/Detector while the AM Source is off. From these measurements the actual AM depth is computed. As with the FM Calibrator, the AM Calibrator output, when measured by the instrument, displays the AM calibration factor.

Power Supplies

The instrument is run from five regulated supplies: +40V, +15V, −15V, +5V, and −5V. The +15V supply continues to power the high-stability, time base reference (Option 002) when POWER is switched to STBY.

Controller and Remote Interface

The Controller plays a key role in governing the instrument operation. The Microprocessor in the Controller outputs information to configure the instrument, reads back and processes measurement results, reads back vital status information to prevent invalid measurements, and services interrupts from the Keyboard or Remote Interface. Information from the Input/Output (I/O) port of the Microprocessor is carried to the rest of the instrument by the Instrument Bus. Typically, the data on the Instrument Bus is decoded and latched at the various assemblies, then the decoded information is distributed to the appropriate circuit.

Information within the Controller itself is handled by three main buses: the ROM Control (ROMC) Bus (which coordinates the various devices which make up the Controller), the Address Bus (which addresses ROM and RAM), and the Data Bus (which carries information to or from ROM and RAM). Since the Remote Interface also contains Controller devices, these buses are also distributed to it. A battery backup to the RAM devices makes the memory non-volatile; that is, the instrument remembers key values even with the power switched off.

The Remote Interface receives inputs from the external interface bus (HP-IB), processes the information, and interrupts the Controller in a manner similar to the Keyboard. The Remote Interface also processes the measurement information and outputs it on the HP-IB if requested and is designed to make operation from an external computing controller as similar as possible to operation from the front panel.

Instrument Software Supervisor Flowchart

The instrument's software is structured in a form called the supervisor. See Figure 8D-5. It is a loop that is continuously traversed, with measurements made near the end, after checks for proper frequency tuning, proper RF and IF level, and correct audio range. Arithmetic manipulation (for example, for the ratio function) follows the measurement, and the program then loops back up to the display.

The frequency, level, and audio blocks verify that the instrument is adjusted to make an accurate measurement. A measurement is not made until all of the tests are passed in immediate succession. If a test is not passed, corrective action is taken. The decision after that block forces the program back to the top of the supervisor, bypassing the measurement for that loop.

The software interface with the hardware makes use of two concepts called software state and hardware state. The software state is stored in 38 bytes of RAM and totally describes the state of the instrument. On power-up, the initialization procedure loads the software state from ROM. Keyboard and HP-IB entry routines modify only the software state and do not affect the hardware immediately. The setup block in the supervisor is where the hardware state is made to conform with the software state. Setup is not the only place where hardware is affected; the frequency tuning, leveling, audio ranging, and measurement blocks manipulate the hardware as well.

In a normal, stable measurement cycle, the program takes the measurement display branch at the top of the supervisor and so avoids the time overhead associated with the setup block. However, if the program loops back before taking a measurement, or if an error condition exists, the non-measurement display branch will be traversed, thus lighting an appropriate display and going through the setup block.

The Keyboard and HP-IB interrupt the flow around the loop, forcing the Microprocessor to execute a short program and then return to the loop as shown in the diagram. Since the supervisor can be interrupted at any point but always returns to a single location, Keyboard and HP-IB interrupts must abort the current measurement and start a new measurement cycle.

The Keyboard and HP-IB can be thought of as a medium through which the user requests a certain instrument setup. It is important to note that the actual instrument setup is guaranteed to conform to the Keyboard request only at the moment a measurement is taken. The Controller may change the instrument hardware at other times to optimize its tuning, leveling, and ranging functions. For example, in troubleshooting, 3.1 SPCL may be keyed in to check if the 455 kHz IF filter is being selected properly. If there is no RF input signal and the instrument is trying to auto-tune, it would be discovered that both IF filters (wide 455 kHz and 1.5 MHz) are being used. The proper test would have been to use a Direct Control Special Function (0.031 SPCL).

The microprocessor-based Controller interacts closely with the hardware of the instrument. Many circuits are used by the Controller for different functions at different times. Thus, a specific failure in one circuit can show up as a collection of symptoms that superficially seem unrelated. For example, a failure of the squelch detector in the FM Demodulator can result in frequency errors when tuning to an RF signal with large amounts of AM. The appearance of several symptoms can often be used as an advantage since they provide many avenues to pursue when tracking down a problem.

A distinct difference exists between special functions used for service (that is, Direct Control Special Functions and Service Special Functions) and those used for normal instrument operation. When service special functions are used, normal instrument functions are suspended. When the special function mode is left to resume normal measurements, all effects of these special functions on hardware are lost (with some exceptions such as AM or FM calibration and enabling of service errors). (Refer to paragraph 8-7 for details.) As an example, a Direct Control Special Function can be used to activate a particular Input Attenuator to check its operation. But once normal measurements are resumed, the attenuator setting will revert back to what it was before the Direct Control Special Function was invoked.

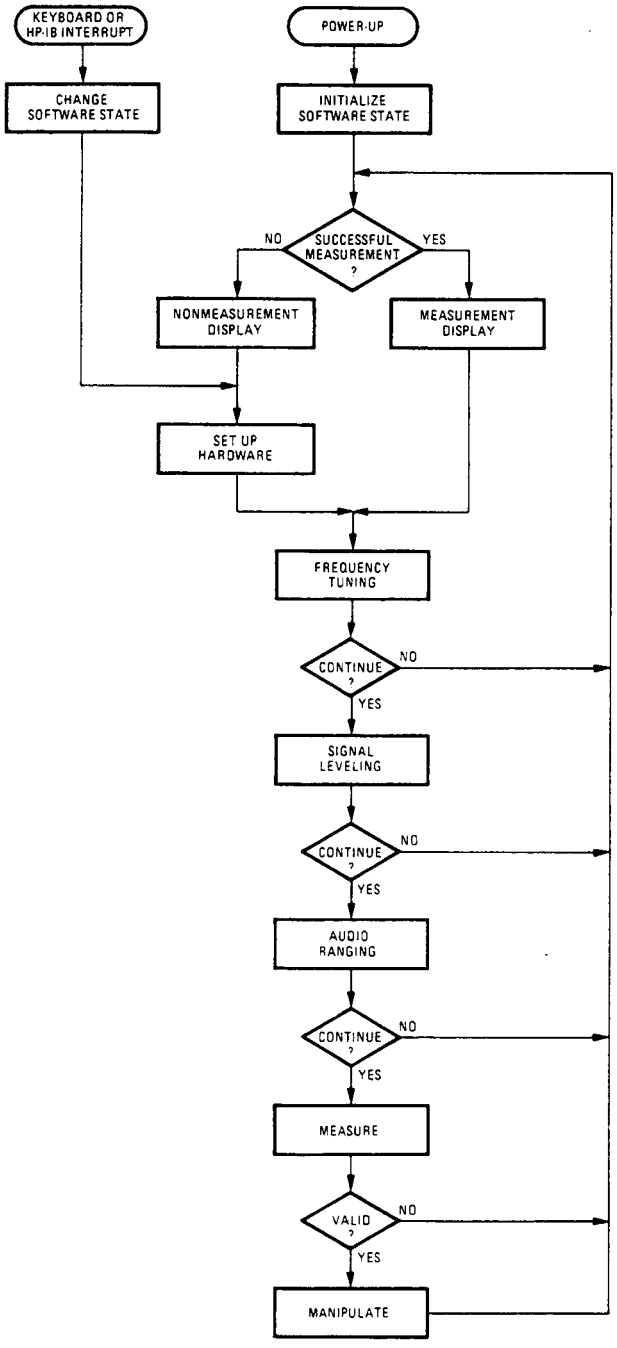


Figure 8D–5. *Modulation Analyzer Software Supervisor Flow Chart*

TROUBLESHOOTING

General

The troubleshooting checks that follow are a starting place for locating an instrument fault. They are easy to perform and give much key information in a short amount of time. In most instances they can differentiate between an instrument hardware failure and a Controller or software problem. The checks should be done in order.

⟨√1⟩ Line Check

Procedure: Remove instrument top cover (three screws) and switch POWER to ON.

Normal Indication:

1. The fan runs indicating power is present on the power transformer secondaries.
2. The five green LEDs on the A10 Power Supply Regulators Assembly are lighted indicating that the supplies are nominally operating.

If Indication Abnormal:

1. Check the rear-panel line fuse and line voltage selector. Check Mains wiring. (See Service Sheet 31.)
2. Check the individual regulators. (See Service Sheet BD5.)

⟨√2⟩ Power-Up Checks

Procedure: If there are any jumpers on the TEST test points on the A13 Controller Assembly, remove them. Switch POWER to STBY for five seconds and back to ON. Note the sequencing of the four TEST LEDs on the top of the Controller Assembly as the instrument powers up.

Normal Indication: The four TEST LEDs light in the following sequence:

1. Indeterminate for about 1/4 second.
2. ( ) ( ) ( ) (1) for about 2 seconds. This indicates the start of the power-up routines and the run of the Read Only Memory Check.
3. ( ) ( ) (2) ( ) for about 1/4 second. This indicates the start of the power-up routines and the run of the Random Access Memory Check.
4. ( ) (4) ( ) ( ) for about 1/4 second. This indicates the running of the Local Oscillator Check.
5. (8) (4) (2) (1) for about 10 seconds. This indicates that all power-up checks passed and that a visual front-panel check can be made. (See ⟨√3⟩ below.)
6. ( ) ( ) ( ) (1), with (1) blinking indefinitely until a key is pressed. The behavior of the LED (1) is also affected by the presence of an input signal.

Any other sequence indicates a failure of the check. Passing this check indicates that the Controller is functioning properly and that there is no catastrophic failure in the following circuits:

Read Only Memory,
Random Access Memory,
Instrument Bus,
Local Oscillator (tuning only),
Keyboard (only that no key is down).

If Indication Abnormal: If the TEST LEDs come on and remain in the random state of step 1 above, unplug the A14 Remote Interface Assembly and try again. If still faulty, check the Controller Kernel. (See Service Sheet BD5.)

If other indications appear in or after step 2 above, consult *Power-Up Checks,* paragraph 8-9, which discusses the individual checks, documents the error indications, and cross references to the service sheets.

⟨√3⟩ Front-Panel LED Check

Procedure: Disconnect any connection to the INPUT connector. Switch POWER to STBY and back to ON.

Normal Indication: After less than one second, all front-panel LEDs and display segments and decimal points should light for about 10 seconds. The display should blank for one second, then show "−−" with the MHz annunciator. The FREQ key, the AUTO TUNING, and the FM MODULATION OUTPUT annunciators should all light. This indicates that the Controller is able to output to the front-panel LED and display latches which are all operative.

If Indication Abnormal: If one or more LEDs or display segments fail, check the respective components and drive circuits. (See Service Sheets 26 and 27.) Also check the CPU I/O port. (See Service Sheet BD5.)

⟨√4⟩ Measurement Error Check

Procedure: Key in 43.1 SPCL to enable Service Errors. Make the measurement in which the fault appears.

Normal Indication: As the Special Function code is entered, 43.1 should appear in the display. This indicates that the Controller responds to keyboard interrupts. After pressing the SPCL key, measurements should proceed as normal.

If Indication Abnormal: If the keys have no effect, check the Keyboard interrupt. (See Service Sheet 25.) If the keystrokes produce an erroneous display, check the Keyboard. (See Service Sheet BD5.) If the measurement is improper or error messages appear in the display, consult the error message tables (see *Error Messages* in the *Detailed Operating Instructions* of the *Operation and Calibration Manual,* or see *Error Messages,* paragraph 8-8, or see *Error Codes* in the *Operating Information* pullout card) or consult the block diagram service sheet that documents the section of the instrument that appears to have the fault. (See Service Sheets BD2 through BD5.)

NOTE

For problems that are exclusive to the HP-IB, see Service Sheet BD5.

Service Sheet BD2

BLOCK

- **RF**

PRINCIPLES OF OPERATION

General

The RF Block Diagram documents the Power Meter, Power Reference Oscillator, RF Input, IF Amplifier, and Local Oscillator. The diagram also shows a typical Sensor Module connected to the Modulation Analyzer's INPUT and SENSOR connectors.

Sensor Module

The Modulation Analyzer is designed to be used with an external module containing a Power Sensor, RF switch, and interconnecting cable. The Sensor Module permits direct connection of either the Power Sensor or the RF INPUT to the RF source being measured. The direct connection to the Power Sensor minimizes power measurement errors that result from insertion and mismatch losses in interconnecting cables and connectors. The instrument's Controller switches the RF signal between the input to the Power Sensor and the front-panel RF INPUT depending on the measurement being made. This internal switching eliminates the need for manual reconnection and shortens measurement time.

The RF Power Sensing Element in the Power Sensor converts the absorbed RF power to a dc voltage proportional to the average power level. The element may be a thermocouple or a diode. Because the voltage from the RF Power Sensing Element is very small, dc amplifiers, which are subject to drift, are unsuitable for the first stages of amplification. Instead, the voltage is converted to a 220 Hz ac signal by the Chopper and then ac coupled into the AC Amplifier. The AC Amplifier is actually integrated in the first stage of Amplifier 1 in the A53 Power Meter Assembly.

The Power Meter circuitry in the Modulation Analyzer is designed to work with a wide variety of power sensors with varying frequency and sensitivity ranges. The power sensors contain a Sensor Identifier Resistor which is unique for each type. The particular sensor is identified by driving the resistor with a known current and measuring the voltage across it. If no Power Sensor is connected, the instrument makes RF level measurements using the RF Peak Detector in the A15 RF Input Assembly. (Refer to *RF Level,* in the *Detailed Operating Instructions* of the *Operation and Calibration Manual.*)

Power Meter Assembly (A53)

The Power Meter Assembly contains circuitry for amplifying and detecting the small ac signal from the external Power Sensor and for controlling the external input switch and Power Reference Oscillator. AC Amplifiers 1 and 2 and Attenuators 1 and 2 accurately amplify the chopped dc voltage from the external RF Power Sensing Element. (The AC Amplifier in the Power Sensor forms the first stage of Amplifier 1.) The amplifiers have a bandpass response tuned to 220 Hz to minimize noise. Table 8D-3 lists the attenuation for the power meter ranges. (The ranges are not listed in terms of absolute power because the sensitivity of the power sensors varies with type. Also, the attenuation in dB is the voltage attenuation; a step of 20 dB of attenuation corresponds to a 10 dB step in power level.) Special Function 10 controls selection of the attenuators.

Table 8D–3. *Power Meter Attenuator Selection*

Power Meter Range	Attenuator 1 (dB)	Attenuator 2 (dB)
1 (most sensitive)	0	0
2	0	20
3	0	40
4	40	20
5 (least sensitive)	40	40

The amplified ac signal, which is proportional to the input power, is converted to dc by the Synchronous Detector. The Synchronous Detector is a unity-gain amplifier which alternates between a non-inverting configuration and an inverting configuration at a 220 Hz rate. The 220 Hz drive signal is synchronized with the signal that drives the Chopper in the Power Sensor. Since the phase shift between the signal from the Power Sensor Chopper and the input of the Synchronous Detector is zero, the ac signal is full-wave rectified and has a dc component proportional to the output of the RF Power Sensing Element of the Power Sensor. After filtering by the Noise Filters, the dc voltage representing the recovered power level of the input signal is measured by the Voltmeter. The 220 Hz drive signal for the Power Sensor Chopper and for the Synchronous Detector is generated by the 220 Hz Multivibrator.

The Ground Regulator is a unity-gain, non-inverting amplifier which assures minimum voltage difference between the Sensor Ground and the Power Meter Assembly ground. High current flow through the ground return of the interconnecting cable causes the voltage difference, especially if the cable is quite long.

The Zeroing Control Digital-to-Analog Converter (DAC) compensates for the small dc offset voltage generated by the Power Sensing Element when no RF is present. To zero the sensor, the Controller switches the Input Switch of the Sensor Module away from the Power Sensor and measures the output from the Power Meter. If the output does not correspond to 0W power, the Zeroing Control DAC is programed to inject a current into the RF Power Sensing Element to cancel the offset. (To keep the Synchronous Detector in its most-linear range, the voltage corresponding to 0W input power is offset slightly above 0 Vdc. The offset voltage is subtracted out by the Controller when actual power measurements are made.) The DAC remains set until re-zeroing is requested.

The Sensor Module Switch Control and Switch Drive One-Shot control switching of the Input Switch in the external Sensor Module. The circuitry is designed to drive latching-type RF switches which may or may not have automatic drive disconnect. The Power Reference Oscillator Control switches on the 50 MHz Oscillator when requested. To enable the assembly of a user-built sensor module, the switching voltages are made available at the rear-panel REMOTE CONTROL RF SWITCH connectors.

The rear-panel FREQ OFFSET TTL OUT connector outputs a dc voltage that indicates the state of the Frequency Offset Mode and whether the entered LO frequency is above or below 18 GHz. This feature is useful for controlling external microwave down converters, such as the HP 11793A, whose output is fed to the input of the Modulation Analyzer. Special Function 27 controls the Frequency Offset Mode. Table 8D-4 shows the status of the FREQ OFFSET TTL OUT voltage.

Table 8D–4. *Status of FREQ OFFSET TTL OUT Connector*

State of Frequency Offset Mode	Entered LO Frequency (GHz)	Nominal Voltage (Vdc) at FREQ OFFSET TTL OUT
Not Offset	Any	0
Offset	0	0
Offset	0 <frequency ≤18	+5
Offset	18 <frequency ≤40.7	+3

Power Reference Oscillator Assembly (A32)

Since the Power Meter uses an open-loop measurement technique (as opposed to a dc substitution technique), an independent power reference is required to calibrate (that is, determine the sensitivity of) the external Power Sensor. The Power Reference Oscillator produces a 50 MHz RF signal which is set, during calibration of the reference, to deliver 1 mW to a 50Ω load. The output of the oscillator is accurately controlled by the Automatic Leveling Control (ALC) Loop. A Level Detector at the output of the oscillator senses the peak RF level. The level is compared to a stable, dc reference by the Level Error Amplifier. The error is amplified and fed back to the level-control circuitry in the oscillator to correct the error.

RF Input Assembly (A15)

The RF Input Assembly is the instrument's front end. It receives the RF input signal and attenuates it to an optimum level for the Input Mixer.

The RF level is sensed by the RF Level Detector. The output of the detector is buffered by the Detector Amplifier and applied to the Voltmeter. The Controller uses the RF Level detector when automatically setting the RF Attenuator and when making RF Level (Special Function 35) measurements. The RF Level Detector senses the peak of the RF voltage including AM envelope peaks.

The Overpower Detector compares the detected RF level with a reference. If the RF level (with AM envelope) exceeds 1W, the Overpower Protection relay is de-activated (opened) and latched. Pressing any key will reset the relay.

If the instrument is tuned to a frequency greater than 10 MHz, the 5.25 MHz High-Pass Filter can be switched in to eliminate low-frequency signals on the input which can pass directly into the IF. Special Function 3 controls the selection of the 5.25 MHz High-Pass Filter (as well as the IF filter).

The Input Attenuator consists of one 10 dB pad and two 20 dB pads for a range of 0 to 50 dB. The RF path is switched between the thru-lines and attenuator pads by RF relays as determined by the Controller.

Input Mixer Assembly (A17)

The Input Mixer Assembly converts the RF input signal to the IF. Part of the IF filtering is included in this assembly. In the automatic tuning mode, the Local Oscillator (LO) is tuned so that the LO frequency minus the signal frequency equals the IF. Using manual tuning, it is also possible to tune the LO so that the IF responds to the image; that is, when the signal frequency minus LO frequency equals the IF. In this case, the phase of the FM and ΦM is inverted.

The Input Mixer has two modes of operation. (1) For input signals in the range 2.5 to 1300 MHz, the Input Mixer down converts the input signal to the 1.5 MHz or the 455 kHz IF. (2) For signals below 2.5 MHz, the Input Mixer passes the signal directly into the IF. (Down conversion can be extended below 2.5 MHz using the 455 kHz IF and manual tuning.) The normal operating signal level is less than −16 dBm for AM and −6 dBm for FM and ΦM.

The LO signal for the Input Mixer comes from the LO Dividers through the LO Amplifier.

(The next two paragraphs apply to 2314A to 2636A.)

The IF frequency response is determined by the IF Filters and the IF amplifier in the A18 IF Amplifier Assembly. The 455 kHz Wide Bandpass Filter in the A17 Input Mixer Assembly determines the response of the 455 kHz IF. The 455 kHz Wide Bandpass Filter is switched in automatically for input signals in the range of 2.5 to 10 MHz. When the 455 kHz IF is chosen, the 455 KHZ IF annunciator lights.

Automatic IF filter selection provides the optimum IF frequency and IF filter selection for each measurement mode. The frequency response of the IF filter is determined by the RF input blocking capacitors (not shown), the 4 MHz Low-Pass Filter, and (principally) the 2.5 MHz Low-Pass Filter

in the A6 AM Demodulator Assembly (in Service Sheet BD3). Special Function 3 controls the IF frequency selection (as well as the 5.25 MHz High-Pass Filter in the RF Input Assembly).

(The next three paragraphs apply to 2642A and above.)

The IF frequency response for most measurements is determined by the IF filters and the IF amplifiers here and in the A18 IF Amplifier Assembly. The 455 kHz Wide Bandpass Filter in the A17 Input Mixer Assembly determines the response of the 455 kHz IF except in the case of the Selective Power measurements. The 455 kHz Wide Bandpass Filter is switched in automatically for input signals in the range of 2.5 to 10 MHz. (In the Selective Power measurement mode, the narrower channel filters in the A72 Channel Filter and A71 IF Amplifier/Detector Assemblies determine the frequency response.) When the 455 kHz IF is chosen, the 455 KHZ IF annunciator lights.

Automatic IF filter selection provides the optimum IF frequency and IF filter selection for each measurement mode. The frequency response of the IF filter is determined by the RF input blocking capacitors (not shown), 4 MHz Low-Pass Filters 1 and 2, and (principally) the 2.5 MHz Low-Pass Filter in the A6 AM Demodulator Assembly (in Service Sheet BD3). Special Function 3 controls the IF frequency selection (as well as the 5.25 MHz High-Pass Filter in the RF Input Assembly).

The First and Second IF Amplifiers function as buffers and provide the same IF gain for the assembly as in older instrument configurations.

Buffer Amplifier Assembly (A16) (2314A to 2636A)

The Buffer Amplifier contains two amplifers used to split the IF signal from the Input Mixer. The upper path is a unity gain amplifier used to drive the A18 IF Amplifier. The lower path has a gain of 9dB and used to provide IF input to the A55 IF Channel Filter when the Modulation Analyzer is in the Selective Power Measurement mode.

IF Amplifier Assembly (A18)

The IF Amplifier increases the signal from the Input Mixer Assembly to a level suitable to drive the AM and FM Demodulators. The IF strip is designed for low noise, linear phase shift vs. frequency (that is, constant group delay) to minimize FM distortion, and for flat frequency response to minimize incidental AM (that is, AM occurring as the result of FM).

Local Oscillator

The Local Oscillator consists of the LO Divider Assembly (A19), LO Control Assembly (A20), Low Frequency VCXO Filter Assembly (A21), Low Frequency VCXO Assembly (A22), Sampler Assembly (A23), and High Frequency VCO Assembly (A24). The overall operation and different tuning modes of the LO are described in the *Principles of Operation* for Service Sheet BD1.

High Frequency VCO Assembly (A24)

The High-Frequency, Voltage-Controlled Oscillator (HF VCO) has a nominal frequency range of 320 to 650 MHz. The output is buffered by two Output Buffer Amplifiers. One output drives the LO Divider, the other drives the Sampler. The tune input to the HF VCO has a switchable lead-lag network (Tune Voltage Filter) to reduce phase noise. The network is switched out while the LO is tuning and is switched in when tuned.

LO Divider Assembly (A19)

The signal from the HF VCO, after passing through the LO Divider Assembly, is the LO drive to the Input Mixer. The LO Divider Assembly has one Doubler stage (640 to 1300 MHz LO range), one through path (320 to 640 MHz range), and eight LO Dividers (1.25 to 325 MHz ranges). Each divider is a high-speed, divide-by-two device. The Divider Output Gates enable and cascade the appropriate dividers for the range selected. The first three dividers are always enabled. The 40 to 81.25 MHz output of the third divider is the LO (HF VCO÷8) input to the Counter.

To prevent mistuning on the doubler range (which can result from spurious LO signals) the input to the Doubler is filtered by a tunable, Doubler Input Filter. The filter primarily suppresses the third harmonic of the HF VCO which becomes the $^3/_2$ harmonic of the doubled signal. The Doubler High-Pass Filter following the Doubler suppresses feedthrough of the fundamental frequency (the $^1/_2$ harmonic).

Low Frequency VCXO and Filter Assemblies (A22 and A21)

The Low-Frequency, Voltage-Controlled, Crystal Oscillator (VCXO) is a highly stable, tunable, reference oscillator to which the HF VCO is locked in the low-noise tune modes. It consists of two tunable crystal oscillators (nominally 9.26 and 11.26 MHz) mixed together to produce a 2 MHz output. The two oscillators can each be tuned approximately 6.25 kHz in opposition for a total tuning range of 2 MHz ±6.25 kHz. This tuning scheme allows a broad tuning range while retaining the high stability of the individual oscillators. The 2 MHz Low-Pass Filter and 2 MHz Bandpass Filter (A21) reject unwanted mixing products which appear as spurious AM and FM residual tones. Careful selection of the crystal frequencies minimizes the output of spurious mixing products.

Sampler Assembly (A23)

The Sampler is the phase detector of the phase lock loop. The tunable 2 MHz signal from the LF VCXO (A21) drives the Sampling Bridge through the 2 MHz Limiter and Impulse Generator. The output of the impulse generator is a train of extremely short-duration pulses with the repetition rate of the 2 MHz signal. The two pulses momentarily turn on the diodes (that is, close the switch) of the Sampling Bridge and pass the signal from the HF VCO (A24). The output from the Sampling Bridge is thus the HF VCO sampled at a 2 MHz rate. If the two signals are harmonically coherent, the output is a dc voltage with a level determined by the phase and amplitude of the HF VCO. The action of the phase lock loop tunes the HF VCO to drive the voltage to zero. If the relationship is not strictly harmonic (that is, phase lock is broken), the output is a beat note with a frequency equal to the difference between the HF VCO and the nearest harmonic of the LF VCXO. The output of the Sampling Bridge, which is the phase error voltage, is smoothed and buffered by the Sampler Amplifier.

The tune voltage for the HF VCO is supplied by the HF VCO Tune Integrator and Amplifier. The tune integrator has several sources of input: the Sampler Amplifier, the Track Loop Amplifier, the Sweep Up Current Source, the Sweep Down Current Source, and the DAC Control Amplifier. Only one input is active at a time. If one of the sweep current sources is active, the tune integrator sweeps the HF VCO. If the input is one of the amplifier outputs, the HF VCO Tune Integrator and Amplifier is configured as part of a feedback loop.

The grounding switch at the input of the HF VCO Tune Integrator and Amplifier is open only when the Sampler Amplifier is connected to its input. When the amplifier is not connected, the switch is closed to keep signals at the Sampler Amplifier output from coupling into the tune integrator. The Out-of-Lock Detector at the Sampler Amplifier output senses the presence of ripple and lights the OUT OF LOCK annunciator to indicate lock has broken. A BW Control line also lights the annunciator when the Tune Voltage Filter (in the HF VCO Assembly) has not been turned on. This line also controls the bandwidth of the HF VCO Tune Integrator and Amplifier. The bandwidth is narrowed in the low-noise phase lock and the track modes (that is, whenever the instrument is properly tuned).

The No-HF-VCO Detector lights the NO HF VCO annunciator if the amplitude of the signal from the HF VCO is too low. The 700 MHz Low-Pass Filter in the Sampling Bridge input line filters out harmonics of the HF VCO to assure proper sampler gain.

LO Control Assembly (A20)

The LO Control Assembly contains the digital decoders and latches for the entire RF Section (that is, the section housing assemblies A15 through A24) and the low-frequency analog circuits that control and tune the LO.

The Digital-to-Analog Converters (DACs) drive either the LF VCXO (through the LF VCXO Tune Amplifier) or the HF VCO (through the DAC Control Amplifier and HF VCO Tune Integrator and Amplifier). The DAC outputs a current proportional to the weighting of the bits of its digital input. The amplifiers following the DAC convert the current into a tune voltage.

The LF VCXO Tune Filter filters the tune line of the LF VCXO to reduce phase noise in the low-noise phase lock mode. The filtering is necessary because the tune-line input is external to the phase lock loop.

The Sweep Down Current Source sweeps the HF VCO when the Controller searches for the input signal. The Sweep Up Current Source is the retrace for the sweep.

The Track Loop Amplifier is used only in the track tune modes. Its input is the dc output from the FM Demodulator which is proportional to the IF center frequency. If the input signal changes frequency, the HF VCO is tuned via the Track Loop Amplifier and HF VCO Tune Integrator and Amplifier (in A23) to keep the IF at a nominal 1.5 MHz. (Track tuning is not permitted with the 455 kHz IF. Thus the track mode is the only tuning mode where the LO "locks" to the input signal (that is, a frequency lock loop is formed). The Track Loop Amplifier has a different gain for each LO range. This compensates for the change in LO tuning sensitivity caused by the LO Dividers.

TROUBLESHOOTING

General

Procedures for checking the RF Section of the instrument are given below. The blocks or points to check are marked on the block diagram by a hexagon with a check mark and a number inside, for example, ⟨√3⟩ . Before performing any check, perform all the checks on Service Sheet BD1.

CAUTION

Tighten SMA connectors to 0.8 to 1.1 N·m (7 to 10 in·lb). Tighten SMC connectors to 0.6 N·m (5 in·lb). Hand tightening of connectors is insufficient. Hand-tightened connectors can work loose and cause reduced performance or malfunctions.

Equipment

Oscilloscope	HP 1740A
Power Supply	HP 6215A
Signal Generator	HP 8640B
Spectrum Analyzer	HP 8559A/182T
Voltmeter	HP 3455A

⟨√1⟩ Overpower Protection Check

1. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument.
2. Set the power supply to 20 Vdc. Touch the +20V lead to the Modulation Analyzer's INPUT (the minus side should be at ground). The display should show Error 06. If faulty, see Service Sheet 4 and check the Overpower Protection.

NOTE

If step 2 is repeated, it is necessary to first perform step 3 in order to discharge the input dc blocking capacitor. Also, disconnect the supply from the INPUT before setting the voltage to 20 Vdc.

3. Set the supply to zero (without turning it off) and while still connected to the INPUT, press CLEAR. Error 06 should go away. If it doesn't, see Service Sheet 4 and check the Overpower Protection.

⟨√2⟩ RF Detector Check

1. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Connect the CALIBRATION RF POWER OUTPUT to A15J2 (RF IN).
2. Key in 45.16 SPCL to turn on the RF power calibrator. Key in 35.0 SPCL to measure RF level with the RF peak level. The display should read between 0.6 and 1.6 mW. If faulty, see Service Sheet 4 and check detector circuits.

⟨√3⟩ Local Oscillator Tuning Check

1. Key in 54.0 SPCL. If the display shows other than 0, see *Special Function 54.N*, paragraph 8-7.

⟨√4⟩ Local Oscillator Level Check

1. Set RF spectrum analyzer to measure a 0 dBm, 0 to 1400 MHz signal. Connect its input to the end of the cable connected to A17J3 (LO IN).
2. Key in 57.0 SPCL to cause the LO to sweep sequentially across bands DBLR through 3. The LO signal should sweep slowly from above 1300 to below 40 MHz. The sweep will occur over five bands. As the low end of a band is reached, the sweep will stop, jump up slightly in frequency, then continue to sweep. Throughout the sweep, the LO should maintain an amplitude of at least 0 dBm. If it does not, see Service Sheet 17 and check the dividers and gates associated with the bad band.

NOTE

The sweep can be halted by pressing the SPCL key. If the power level is marginal at a particular frequency, halt the sweep at the frequency and make a more precise measurement with a power meter.

3. Set the spectrum analyzer to view a 0 to 40 MHz signal.
4. Key in 56.0 SPCL to cause the LO to sweep sequentially across bands 4 through 8. The LO signal should sweep slowly from above 40 to below 1.25 MHz in the manner described in step 2 above. If the amplitude is not at least 0 dBm, see Service Sheet 17 and check the dividers and gates associated with the bad band.

NOTE

The low-frequency bands can also be viewed on an oscilloscope. The oscilloscope should have a 50Ω termination. The signal should be a squarewave with an amplitude of 0.5 Vpp or greater.

⟨√5⟩ Track Mode Check

NOTE

This check assumes that ⟨√3⟩ Local Oscillator Tuning Check *and* ⟨√4⟩ Local Oscillator Level Check *give positive results, but that track-mode tuning is suspected to be faulty.*

1. Set signal generator to approximately 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.
2. Connect high-impedance, dc coupled oscilloscope to the rear-panel FM OUTPUT.
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. After the Modulation Analyzer is tuned, press MHz, then S (Shift) FREQ ERROR. The oscilloscope should show −1 to +1 Vdc. If it does not, see Service Sheet 11 and begin by checking the Charge-Count Discriminator.
4. Adjust the oscilloscope to vertically center the trace. Adjust the signal generator's frequency until the displayed frequency error is 500 kHz. The oscilloscope display should move down to between −3.2 and −2.8V. If faulty, see Service Sheet 11 and check the Charge-Count Discriminator.
5. Adjust the signal generator's frequency until the displayed frequency error is −500 kHz. The oscilloscope display should move up to between 2.8 to 3.2V. If faulty, see Service Sheet 11 and check the Charge-Count Discriminator.
6. Adjust the signal generator's frequency until the displayed frequency error is 0.0 kHz. Key in 3.1 SPCL to set the IF to 455 kHz. The oscilloscope display should move down to between −8 to −6V. If faulty, see Service Sheet 11 and check the Charge-Count Discriminator. If not faulty, see Service Sheet 20 and check the Track Loop Amplifier.

⟨√6⟩ Input Mixer and IF Check

NOTE

This check assumes that ⟨√5⟩ Local Oscillator Tuning Check *and* ⟨√6⟩ Local Oscillator Level Check *give positive results.*

1. Set signal generator to approximately 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.
2. Connect an ac coupled oscilloscope to rear-panel IF OUTPUT. Switch the input impedance of the oscilloscope to 50Ω or terminate the input in 50Ω using a tee.
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 1.3 SPCL to set the attenuation range to 20 dB. Key in 20 MHz on the Modulation Analyzer to manual Tune. The waveform should be a sinewave 80 to 126 mVpp with a period of between 645 and 690 ns (that is, nominally 1.5 MHz). If faulty, see Service Sheets BD3, 5, and 9, and check the Input Mixer, IF Filters, IF Amplifiers, and FM IF Buffer.
4. Key in 3.1 SPCL to set the IF to 455 kHz. The waveform should be a sine wave 67 to 106 mVpp with a period of 2.19 to 2.21 μs (that is, nominally 455 kHz). If faulty, see Service Sheet 5 and check the 455 kHz Wide Bandpass Filter ***(2314A to 2636A)*** and in addition the First and Second IF Amplifiers ***(2642A and Above)***.

⟨√7⟩ Power Meter Check

1. Perform *Performance Test 8—Power Meter* in Section 4. If the Zero Set test fails, see Service Sheet 2 and check the Zeroing DAC. If the Range-to-Range Error test fails, see Service Sheets 1 and 2 and check the Attenuators, Amplifiers, Synchronous Detector, and Noise Filter. If the Accuracy within a Range test fails, see Service Sheet 1 and check the Synchronous Detector.

⟨√8⟩ Power Reference Oscillator Check

1. Perform *Performance Test 6 or 7—Power Reference* in Section 4. (Either of the two procedures can be followed.) If faulty, see Service Sheet 3.

⟨√9⟩ Sensor Module Switch Control Check

1. With no power sensor or sensor module connected to the SENSOR connector, connect a high-impedance, dc coupled oscilloscope to pin A of the SENSOR connector. (See Service Sheet 1 for the location of pin A.)
2. Set the oscilloscope sweep to 20 ms per division and vertical sensitivity to 10V per division.
3. Alternately press RF POWER and FREQ. Each time a new key is pressed, the signal on the oscilloscope display should drop to −15V for approximately 30 ms, then return to 0V. If faulty, see Service Sheet 2 and check the Sensor Module Switch Control.
4. Connect an ohmmeter to pin B of the SENSOR connector. Press FREQ, then press RF POWER. The resistance should be less than 5Ω for each setting. If faulty, see Service Sheet 2 and check the Sensor Module Switch Control.

Service Sheet BD3

BLOCK

- IF

PRINCIPLES OF OPERATION

General

The IF Block Diagram documents the circuits that further amplify, filter, level detect, and demodulate the IF signal. The diagram also documents the AM and FM calibrators.

NOTE

The following two paragraphs contain operating principles for both the A54, A55, and A71, A72 Option Series 030 assemblies. The A54 and A55 Assemblies are used in instruments with serial prefixes prior to 2636A; the A71 and A72 Assemblies are used in instruments with serial prefixes 2642A and above.

Channel Filter Assembly (A55 or A72, Option Series 030)

The A55 (A72) Channel Filter Assembly and A54 (A71) IF Amplifier/Detector Assembly are used only in the Selective Power measurement mode. The assemblies are installed only in Option Series 030 (the Selective Power Option) as defined in Table 8D-1. The Adjacent-Channel Power measurement is controlled by Special Function 24.

The 455 kHz IF signal is routed through an IF Step-Up Transformer to one of two channel filter paths. The channel filter path is determined by Special Function 24: First Channel 1 Filter (the "wide" filter) is selected by Special Functions 24.1 and 24.2; First Channel 2 Filter (the "narrow" filter) is selected by Special Functions 24.3, 24.4, 24.5, and 24.6. Four filters are available (specified by the option number) and two filter options must be chosen. Of the two filter options, the wider-bandwidth filter becomes First Channel 1 Filter; the narrower-bandwidth filter becomes First Channel 2 Filter. (Again, refer to Table 8D-1.) The total IF measurement bandwidth is the series combination of the First Channel Filters and the Second Channel Filters in the A54 IF Amplifier/Detector Assembly.

Each channel has an input channel buffer (0 dB gain) and an output channel amplifier (6 dB gain). The channel output has a selectable gain of 0 or 20 dB (the Channel Output Attenuator followed by the Channel Output Amplifier).

IF Amplifier/Detector Assembly (A54 or A71, Option Series 030)

The 455 kHz IF signal from the A55 (A72) Channel Filter Assembly is further amplified and filtered by the A54 (A71) IF Amplifier/Detector Assembly, which also converts the IF level to a dc voltage which is then measured by the Voltmeter.

The IF gain is determined by the combination of selectable Attenuators 1 through 4 and fixed-gain Amplifiers 1 through 3. Attenuators 1 through 3 have 0 and 20 dB steps. Attenuator 4 has 5 dB steps from 0 to 15 dB.

The Second Channel 1 Filter is always a 33 kHz wide bandpass filter. It is selected by Special Functions 24.1, 24.2, 24.3, or 24.4. The Second Channel 2 Filter is always a 2.5 kHz wide bandpass filter and has the same nominal bandwidth as the Option 037 filter in the A55 Channel Filter Assembly. It is selected by Special Function 24.5 or 24.6 for SSB noise measurements. The Channel Output Amplifier has 33 dB gain. The IF RMS Detector converts the 455 kHz level to its dc rms level equivalent.

AM Demodulator Assembly (A6)

The down-converted signal from the IF Amplifier is filtered by a 2.5 MHz Low-Pass Filter. The AM IF Buffer drives the AM Demodulator. The FM IF Buffer drives the FM Demodulator and rear-panel IF OUTPUT connector.

The AM is demodulated by means of a precision, half-wave rectifier in an automatic level control (ALC) circuit. The buffered IF signal is amplified by a Current-Variable Amplifier then rectified (detected) by the AM and IF Average Level Detector. The detected signal, after carrier filtering, represents the carrier level (dc component) plus AM (ac component). The ac component accurately represents the AM only if the dc component is known or set to a known level. The detected signal is filtered and amplified by the Level Amplifier and Carrier Filter. The signal is then compared to a constant ALC Reference by the BW Control and Level Comparison Amplifier. The output of this amplifier is the carrier level error. The error voltage is amplified by the Resistor Drive Amplifier which sets the current input to the Current-Variable Amplifier. Current-variable resistors in the amplifier adjust the amplifier gain to cause the dc component of the carrier to equal the ALC Reference.

The amount of filtering in the Bandwidth Control and Level Comparison Amplifier determines the minimum AM rate which can be accurately demodulated. An ALC Bandwidth Control line sets the ALC loop for a fast or slow response. The feedback loop may also be defeated by the ALC Defeat line. Special Function 6 controls the ALC loop.

The second output of the AM and IF Average Level Detector is buffered by the AM Output Buffer. One output of the buffer is fed to the rear-panel AM OUTPUT connector. The other output is fed to the audio circuits for filtering and audio processing.

The output of the FM IF Buffer is detected by two detectors. The IF Peak Detector output is read by the Voltmeter. It is used in the automatic tuning routine and for making Tuned RF Level measurements using the IF Peak Detector. (Refer to the *Tuned RF Level* detailed operating instruction in the *Operation and Calibration Manual.* The IF Present Detector is used to stop the LO sweep during a signal search (independent of the Controller).

The Voltmeter also receives IF level information from the output of the Level Amplifier and Carrier Filter. The IF level is measured after completion of tuning to confirm that the AM ALC loop is operating within range.

The IF Level measurement mode (invoked by pressing the S (shift) and IF LEVEL keys) compares the level from the Level Amplifier and Carrier Filter with the ALC reference and displays the ratio of the two (normally 100% unless the IF signal is too low or Special Function 6.2 is used).

The voltage from the Resistor Drive Amplifier is an indication of the ALC current driving the input resistor circuit. It is used for setting the Input Attenuator, (see Service Sheet BD2) when the ALC is on. (When the ALC is off, the Input Attenuator is set using the IF Peak Detector for FM or the level read on the IF AVG Level line for AM.)

FM Demodulator (A4)

The signal from the FM IF Buffer drives the FM IF Limiters. The limiters strip AM and noise off the IF to minimize demodulation of AM by the FM Demodulator (called incidental FM). The three stages each have 22 dB of gain. The output of the limiters is a squarewave which drives a Precision Limiter. This limiter clamps the upper and lower levels of the squarewave to highly-stable references required by the Charge-Count Discriminator. For each cycle of the IF signal, the discriminator passes a fixed quantity of charge through the feedback resistor of an amplifier. The voltage developed at the amplifier's output is proportional to the amount of charge delivered per unit of time. Fluctuations in IF frequency (FM) produce fluctuations in the voltage at the output of the discriminator. The demodulated FM passes through the FM Output Amplifier and on to the audio circuits for further filtering and audio processing.

The Squelch Switch grounds the output of the discriminator whenever the IF level detected by the Squelch Detector is insufficient. This squelch action attenuates the large noisy output that results when

discriminating only noise and speeds recovery of the audio circuits from tuning-induced transients. The Controller also activates squelch during certain other measurement modes.

The signal from the FM IF Limiters also drives the Counter via the Counter IF Buffer.

FM Calibrator Assembly (A51)

The heart of the FM Calibrator is a 10.1 MHz VCO. A 10 kHz trapezoidal wave is applied to the tune line of the VCO, which generates FM. During the calibration measurement, the VCO input is switched to the upper frequency, f_U, and the frequency is measured by the Counter. Then the VCO input is switched to the lower frequency, f_L, and the frequency is again measured. The Controller calculates the peak deviation as

$$FM = \frac{f_U - f_L}{2}.$$

A measurement of residual FM is also made on the unmodulated VCO and entered into the calculation of the FM calibration factor. The FM signal is then measured, and the calibration factor is calculated and shown on the display. The sensitivity of the VCO and tune voltage are designed to give approximately 34 kHz peak deviation.

To prevent ringing of the demodulated signal in the audio circuits, the modulation signal is given a slow risetime by the Trapezoid Generator—a soft limiter which receives its input from the Triangle Generator. The Triangle Generator and Mode Control comparator together form a relaxation oscillator. The output from the Mode Control comparator switches between a positive and negative output current.

The Triangle Generator (an integrator) generates a negative or positive ramp depending on its input. When its output reaches the Mode Control reference, the comparator output switches to initiate a ramp in the opposite direction.

Special Function 12 controls the FM Calibrator and permits its use with another Modulation Analyzer or modulation analyzer.

AM Calibrator Assembly (A50)

The RF input to the AM Calibrator is the unmodulated 10.1 MHz from the FM Calibrator. The signal passes through a Limiter to the inputs of two similar Amplifiers (A and B) and through to two similar Modulators (A and B). Current Source B switches Modulator B on and off while Current Source A latches Modulator A on. The outputs from the two Modulators are summed in the Summing Amplifier, and the summed signal appears (after attenuation) at the CALIBRATION AM/FM OUTPUT connector. If both signal paths are identical, the output from the calibrator is periodically toggling between a specific RF level and twice that level. This produces 33.33% AM.

Rather than relying of the two signal paths being identical, the AM is computed by careful, static measurement of the signal levels from the Modulators during a calibration sequence. First, Modulator A is switched off and the voltage from the Amplifier/Detector is measured with Modulator B on, via the ×1 DC Amplifier (V_B). This voltage is also measured via the ×10 DC Amplifier (V_{10B}). Then Modulator B is switched off, Modulator A switched on, and the level is measured via the ×10 DC Amplifier (V_{10A}). AM is then calculated by the formula

$$\%AM = \frac{100\%}{3 - \frac{2}{10}\frac{V_{10A} - V_{10B}}{V_B}}.$$

For near-identical modulators the formula can be written in the form

$$\%AM = \frac{100\%}{3 - \epsilon}$$

where ϵ is a small error term which need not be determined with great accuracy. Note that if Modulators A and B are identical, ϵ approaches zero, and the formula reduces to 100%/3 or 33.33%.

A measurement of residual AM is also made on the unmodulated RF and entered into the calculation of the AM calibration factor. The AM signal is then measured and the calibration factor is calculated and shown on the display.

To prevent ringing of the demodulated signal in the audio circuits, the modulation squarewave is given a slow risetime by the Current Sources. Special Function 13 controls the AM Calibrator and permits its use with another Modulation Analyzer or Measuring Receiver.

TROUBLESHOOTING

General

Procedures for checking the IF Section of the instrument are given below. The blocks or points to check are marked on the block diagram by a hexagon with a check mark and a number inside, for example, ⟨√3⟩ . Before performing any check, perform all the checks on Service Sheet BD1.

CAUTION

Tighten SMC connectors to 0.6 N·m (5 in·lb). Hand tightening of connectors is insufficient. Hand-tightened connectors can work loose and cause reduced performance or malfunctions.

Equipment

Audio Synthesizer	HP 3336C
Oscilloscope	HP 1740A
SignalGenerator	HP 8640B

⟨√1⟩ FM IF Buffer Check

1. Perform the Input Mixer and IF Check on Service Sheet BD2.

⟨√2⟩ IF Detector Check

NOTE

This check assumes that the ⟨√1⟩ FM IF Buffer Check *gives positive results.*

1. Set the signal generator to 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.
2. Connect an ac coupled oscilloscope to rear-panel IF OUTPUT. Switch the input impedance of the oscilloscope to 50Ω or terminate the input in 50Ω using a tee.
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 20 MHz. If Error 01 appears, press MHz again. Key in 1.3 SPCL to set the attenuation range to 20 dB. Adjust the signal generator level for a 100 mVpp waveform on the oscilloscope.
4. Key in 49. S (Shift) 3 SPCL. This causes the IF level to be displayed. The display should read between 0.85 and 0.95. If it does not, see Service Sheet 9 and check the IF Peak Detector.
5. Switch signal generator's RF off.
6. Press CLEAR to clear the IF Present Latch. Key in 0.0 S (Shift) 4 SPCL. The display now reads the IF Present status. The display should read 000000.0000. If faulty, see Service Sheet 9 and check the IF Present Detector.
7. Switch the signal generator's RF on. The display should read 000001.0000 indicating that IF has been detected. If faulty, see Service Sheet 9 and check the IF Present Detector.

NOTE

To repeat steps 5 through 7, it is necessary to press CLEAR first to clear the IF Present Latch.

⟨√3⟩ AM Demodulator Check

NOTE

This check assumes that the ⟨√1⟩ IF FM Buffer Check *gives positive results.*

1. Set the signal generator to 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.
2. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 20 MHz. Press AM. Key in 49. S (Shift) 1 SPCL. This causes the average IF level (which the ALC loop is supposed to hold constant) to be displayed. The display should read between 2.096 and 2.104. If only slightly out of limits, perform the *Adjustment 8—ALC Reference* in Section 5; otherwise, see Service Sheet 8.
3. Connect a high-impedance, ac coupled oscilloscope to rear-panel AM OUTPUT.
4. Modulate the signal generator with 50% AM at a 400 Hz rate. The oscilloscope should show the demodulated AM with an ac amplitude of 750 to 850 mVpp. If faulty, see Service Sheet 8.
5. Key in 6.1 SPCL to set the ALC response time to fast. The amplitude should drop between 40 and 120 mVpp. If faulty, see Service Sheet 8 and check the Bandwidth Control and Level Comparison Amplifier.

⟨√4⟩ FM Demodulator Check

NOTE

This check assumes that the ⟨√1⟩ FM IF Buffer Check *gives positive results.*

1. Set the signal generator to 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.
2. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 20 MHz. Press FM. Allow the instrument to tune then press MHz. Pressing the MHz key sets tuning to manual.
3. Connect a high-impedance, dc coupled oscilloscope to A4J2 (IF OUT). The waveform should be TTL pulses with a period of approximately 670 ns. If faulty, see Service Sheet 10 and check the IF Limiters.
4. Reconnect the cable to A4J2. Connect the ac coupled oscilloscope to the rear-panel FM OUTPUT.
5. Modulate the signal generator with 100 kHz peak deviation FM at a 1 kHz rate. The oscilloscope should show the demodulated FM with an ac amplitude of 1.0 to 1.4 Vpp. If faulty, see Service Sheet 11 and check the Charge-Count Discriminator.

NOTE

A slight fuzziness on the waveform is normal. It is the doubled 1.5 MHz IF carrier.

6. Connect the oscilloscope to A4TP5 (FM OUT). The waveform should be 3.6 to 4.4 Vpp. If faulty, see Service Sheet 11 and check the FM Output Amplifier and Squelch.

NOTE

This waveform will have even more of the doubled 1.5 MHz carrier on it.

⟨√5⟩ FM Calibrator Check

1. Connect a high-impedance, ac coupled oscilloscope (with 10:1 divider probe) to A51TP2 (TRAPEZOID OUT).
2. Press FM and CALIBRATE. The waveform should be trapezoidal with round edges and an ac amplitude of 300 to 340 mVpp and period of 90 to 110 μs. (Ignore Error 08 in the display.) If faulty, see Service Sheet 29 and check the trapezoid generation circuits.
3. Key in 12.1 SPCL and 46.3 SPCL. This sets the FM Calibrator to CW and causes the display to show its frequency. The display should read between 1009000 and 1011000. If only slightly out of limits, perform the *Adjustment 9—FM Calibrator* in Section 5. Otherwise, see Service Sheet 29 and check the 10.1 MHz VCO.
4. Key in 12.0 SPCL. This causes the display to read the computed peak deviation. The display should read between 31 and 37 kHz. If only slightly out of limits, perform *Adjustment 9—FM Calibrator.* Otherwise, see Service Sheet 29 and check the 10.1 MHz VCO.
5. Key in 12.1 SPCL. Connect the ac coupled oscilloscope to the CALIBRATION AM/FM OUTPUT. Switch the input impedance of the oscilloscope to 50Ω or terminate the input in 50Ω using a tee. The waveform should be approximately sinusoidal and have an ac amplitude of 35 to 45 mVpp. If faulty, see Service Sheet 29 and check the Output Amplifier. If it is good, see Service Sheet 30 and check the RF path through the AM Calibrator.

⟨√6⟩ AM Calibrator Check

1. Connect an ac coupled oscilloscope to the CALIBRATION AM/FM OUTPUT. Switch the input impedance of the oscilloscope to 50Ω or terminate the input in 50Ω using a tee.
2. Key in 13.1 SPCL to set the AM Calibrator to CW. The waveform should be approximately sinusoidal with an ac amplitude of 35 to 45 mVpp. If faulty, see Service Sheet 30 and check the RF path beginning at the input of the FM Calibrator.
3. Key in 13.0. This causes the display to show the AM depth. The display should show between 33.0 and 33.7%. If faulty, see Service Sheet 30 and begin by checking the Modulators.
4. Press AM then CALIBRATE. The waveform should show the carrier with AM. The AM envelope should be a rounded squarewave with a period of 90 to 110 μs. The amplitude of the peak should be twice that of the trough. If faulty, see Service Sheet 30 and check the 10 kHz Modulation Oscillator.

⟨√7⟩ Channel Filter Check (Option Series 030) *(2314A to 2636A)*

1. Set the signal generator or audio synthesizer to between 454 and 456 kHz CW at −10 dBm (70.7 mVrms into 50Ω). Connect its RF output to A55J2 (IF IN) on the Modulation Analyzer.
2. Connect a high-impedance, ac coupled oscilloscope to A55J1 (IF OUT).
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 0.2D0 SPCL to switch in the Channel Output Attenuator and select channel 1. Fine tune the signal source to peak the signal on the oscilloscope. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The 455 kHz waveform on the oscilloscope should have an amplitude between 640 and 1000 mVpp. If faulty, see Service Sheet 33 and check the circuits of channel 1.
4. Set the oscilloscope gain for a display of 6 divisions peak-to-peak. Key in 0.2D1 SPCL to switch out the Channel Output Attenuator. Decrease the oscilloscope's vertical gain by a factor of 10. The waveform should be between 5.9 and 6.1 divisions peak-to-peak. If faulty, see Service Sheet 6 and check the Channel Output Attenuator.
5. Increase the signal source frequency until the waveform drops to 3 divisions peak-to-peak. Record the signal source's frequency.
6. Decrease the signal source frequency until the waveform rises to 6 divisions peak-to-peak then drops to 3 divisions peak-to-peak. Note the signal source's frequency. The difference between this frequency and the frequency in step 5 should be as indicated in Table 8D-9. (The filter bandwidth depends on the option installed.) If faulty, see Service Sheet 6 and check the First Channel 1 Filter.

Table 8D-9. *Bandwidth of First Channel 1 Filter,* ⟨√7⟩ *Step 6*

Option Combination	Frequency Difference Limits (kHz)	
	Minimum	Maximum
032 and 035 033 and 035 035 and 037	25.0	35.0
032 and 033 033 and 037	12.4	16.9
032 and 037	6.4	10.4

7. Key in 0.2D3 SPCL to select channel 2. Set the signal source frequency to 455 kHz then fine tune the source to peak the signal on the oscilloscope. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The 455 kHz waveform on the oscilloscope should have an amplitude between 4 and 7 divisions peak-to-peak. If faulty, see Service Sheet 6 and check the circuits of channel 2.
8. Set the oscilloscope gain for a display of 6 divisions peak-to-peak. Increase the signal source frequency until the waveform drops to 3 divisions peak-to-peak. Record the signal source's frequency.
9. Decrease the signal source frequency until the waveform rises to 6 divisions peak-to-peak then drops to 3 divisions peak-to-peak. Note the signal source's frequency. The difference between this frequency and the frequency in step 8 should be as indicated in Table 8D-10. If faulty, see Service Sheet 6 and check the First Channel 2 Filter.

Table 8D–10. *Bandwidth of First Channel 2 Filter,* ⟨√7⟩ *Step 9*

Option Combination	Frequency Difference Limits (kHz)	
	Minimum	Maximum
032 and 037 033 and 037 035 and 037	3.0	7.0
032 and 033 032 and 035	6.4	10.4
033 and 035	12.4	16.9

10. Key in 23.1 to switch the LO to external. The EXT LO indicator on A55 should go on and the LO input switch should make an audible click. If faulty, see Service Sheet 6 and check the LO Input Switch (S4) Control.

⟨√7⟩ Channel Filter Check (Option Series 030) *(2642A and Above)*

1. Set the signal generator or audio synthesizer to between 454 and 456 kHz CW at −10 dBm (70.7 mVrms into 50Ω). Connect its RF output to A72J2 (IF IN) on the Measuring Receiver.
2. Connect a high-impedance, ac coupled oscilloscope to A72J1 (IF OUT).
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 0.3D0 SPCL to switch in the Channel Output Attenuator and select channel 1. Fine tune the signal source to peak the signal on the oscilloscope. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The 455 kHz waveform on the oscilloscope should have an amplitude between 640 and 1000 mVpp. If faulty, see Service Sheet 33 and check the circuits of channel 1.
4. Set the oscilloscope gain for a display of 6 divisions peak-to-peak. Key in 0.3D1 SPCL to switch out the Channel Output Attenuator. Decrease the oscilloscope's vertical gain by a factor of 10. The waveform should be between 5.9 and 6.1 divisions peak-to-peak. If faulty, see Service Sheet 33 and check the Channel Output Attenuator.
5. Increase the signal source frequency until the waveform drops to 3 divisions peak-to-peak. Record the signal source's frequency.
6. Decrease the signal source frequency until the waveform rises to 6 divisions peak-to-peak then drops to 3 divisions peak-to-peak. Note the signal source's frequency. The difference between this frequency and the frequency in step 5 should be as indicated in Table 8D-11. (The filter bandwidth depends on the option installed.) If faulty, see Service Sheet 33 and check the First Channel 1 Filter.

Table 8D–11. *Bandwidth of First Channel 1 Filter,* ⟨√7⟩ *Step 6*

Option Combination	Frequency Difference Limits (kHz)	
	Minimum	Maximum
032 and 035 033 and 035 035 and 037	25.0	35.0
032 and 033 033 and 037	12.4	16.9
032 and 037	6.4	10.4

7. Key in 0.3D3 SPCL to select channel 2. Set the signal source frequency to 455 kHz then fine tune the source to peak the signal on the oscilloscope. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The 455 kHz waveform on the oscilloscope should have an amplitude between 4 and 7 divisions peak-to-peak. If faulty, see Service Sheet 33 and check the circuits of channel 2.

8. Set the oscilloscope gain for a display of 6 divisions peak-to-peak. Increase the signal source frequency until the waveform drops to 3 divisions peak-to-peak. Record the signal source's frequency.

9. Decrease the signal source frequency until the waveform rises to 6 divisions peak-to-peak then drops to 3 divisions peak-to-peak. Note the signal source's frequency. The difference between this frequency and the frequency in step 8 should be as indicated in Table 8D-12. If faulty, see Service Sheet 33 and check the First Channel 2 Filter.

Table 8D-12. *Bandwidth of First Channel 2 Filter,* ⟨√7⟩ *Step 9*

Option Combination	Frequency Difference Limits (kHz)	
	Minimum	Maximum
032 and 037 033 and 037 035 and 037	3.0	7.0
032 and 033 032 and 035	6.4	10.4
033 and 035	12.4	16.9

10. Key in 23.1 to switch the LO to external. The EXT LO indicator on A72 should go on and the LO input switch should make an audible click. If faulty, see Service Sheet 33 and check the LO Input Switch (S4) Control.

⟨√8⟩ IF Amplifier/Detector Check (Option Series 030) *(2314A to 2636A)*

1. Set the signal generator or audio synthesizer to between 454 and 456 kHz CW at −70 dBm (70.7 μVrms into 50Ω). Connect its RF output to A54J2 (IF IN) on the Modulation Analyzer.

2. Connect a high-impedance, ac coupled oscilloscope to A54J1 (TEST JACK).

3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 0.577 SPCL and 0.2E7 SPCL to switch in maximum IF gain and select the Second Channel 1 Filter. Fine tune the signal source to peak the signal on the oscilloscope. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The 455 kHz waveform on the oscilloscope should have an amplitude between 1 and 2 Vpp. If faulty, see Service Sheet 7 and check the circuits of channel 1.

4. Key in 50.6 SPCL to read the IF with the IF RMS Detector. Calculate

   reading of step 3 × 1.63.

   The Modulation Analyzer's display should read within 10% of the calculated value. If faulty, see Service Sheet 7 and check the IF RMS Detector.

5. Set the signal source level for a Modulation Analyzer display of 2.00.

6. Key in the Direct Control Special Functions listed in Table 8-13 followed each time by 50.6 SPCL. For each setting, the Modulation Analyzer's display should be as indicated. If faulty, see Service Sheet 7 and check the corresponding attenuator.

Table 8D–13. Attenuation Stepping, ⟨√8⟩ Step 6

Direct Control Special Function	Attenuator	Display Limits	
		Minimum	Maximum
0.250	1	0.12	0.22
0.255	2	0.18	0.22
0.253	3	0.18	0.22
0.257, 0.2EB	4, 5 dB	1.02	1.24
0.250	4, 10 dB	0.57	0.70
0.2EE	4, 15 dB	0.32	0.39

7. Key in 0.2E7 SPCL and 50.6 SPCL. Increase the signal source frequency until the display drops to 1.0. Record the signal source's frequency.
8. Decrease the signal source frequency until the display rises to 2.0 then drops to 1.0. Note the signal source's frequency. The difference between this frequency and the frequency in step 7 should be between 33 and 55 kHz. If faulty, see Service Sheet 7 and check the Second Channel 1 Filter.
9. Key in 0.25F SPCL to select channel 2. Key in 50.6 SPCL. Set the signal source frequency to 455 kHz then fine tune the source to peak the signal on the Modulation Analyzer's display. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The display should read between 1.5 and 2.5. If faulty, see Service Sheet 7 and check Second Channel 2 Filter.
10. Set the signal source level for a Modulation Analyzer display of 2.00.
11. Increase the signal source frequency until the display drops to 1.0. Record the signal source's frequency.
12. Decrease the signal source frequency until the display rises to 2.0 then drops to 1.0. Note the signal source's frequency. The difference between this frequency and the frequency in step 11 should be between 3 and 7 kHz. If faulty, see Service Sheet 7 and check the Second Channel 2 Filter.
13. Key in 0.2F0 SPCL to read back the Option Series 030 Installed Indicator. The Modulation Analyzer should display 000001.0000. If faulty, see Service Sheet 7 and check the Option Series 030 Installed Indicator.

⟨√8⟩ IF Amplifier/Detector Check (Option Series 030) *(2642A and Above)*

1. Set the signal generator or audio synthesizer to between 454 and 456 kHz CW at −70 dBm (70.7 μVrms into 50Ω). Connect its RF output to A71J2 (IF IN) on the Measuring Receiver.
2. Connect a high-impedance, ac coupled oscilloscope to A71J1 (TEST JACK).
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Key in 0.397 SPCL and 0.3E7 SPCL to switch in maximum IF gain and select the Second Channel 1 Filter. Fine tune the signal source to peak the signal on the oscilloscope. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The 455 kHz waveform on the oscilloscope should have an amplitude between 1 and 2 Vpp. If faulty, see Service Sheet 34 and check the circuits of channel 1.
4. Key in 49.C SPCL to read the IF with the IF RMS Detector. Calculate

   reading of step 3 × 1.63.

   The Measuring Receiver's display should read within 10% of the calculated value. If faulty, see Service Sheet 34 and check the IF RMS Detector.
5. Set the signal source level for a Measuring Receiver display of 2.00.
6. Key in the Direct Control Special Functions listed in Table 8-13 followed each time by 49.C SPCL. For each setting, the Measuring Receiver's display should be as indicated. If faulty, see Service Sheet 34 and check the corresponding attenuator.

Table 8D–13. *Attenuation Stepping,* ⟨√8⟩ *Step 6*

Direct Control Special Function	Attenuator	Display Limits	
		Minimum	Maximum
0.396	1	0.12	0.22
0.395	2	0.18	0.22
0.393	3	0.18	0.22
0.397, 0.3EB	4, 5 dB	1.02	1.24
0.3ED	4, 10 dB	0.57	0.70
0.3EE	4, 15 dB	0.32	0.39

7. Key in 0.3E7 SPCL and 49.C SPCL. Increase the signal source frequency until the display drops to 1.0. Record the signal source's frequency.
8. Decrease the signal source frequency until the display rises to 2.0 then drops to 1.0. Note the signal source's frequency. The difference between this frequency and the frequency in step 7 should be between 33 and 55 kHz. If faulty, see Service Sheet 34 and check the Second Channel 1 Filter.
9. Key in 0.39F SPCL to select channel 2. Key in 49.C SPCL. Set the signal source frequency to 455 kHz then fine tune the source to peak the signal on the Measuring Receiver's display. (Filter passband ripple can be as high as 2 dB. Find the highest peak of the ripple.) The display should read between 1.5 and 2.5. If faulty, see Service Sheet 34 and check Second Channel 2 Filter.
10. Set the signal source level for a Measuring Receiver display of 2.00.
11. Increase the signal source frequency until the display drops to 1.0. Record the signal source's frequency.
12. Decrease the signal source frequency until the display rises to 2.0 then drops to 1.0. Note the signal source's frequency. The difference between this frequency and the frequency in step 11 should be between 3 and 7 kHz. If faulty, see Service Sheet 34 and check the Second Channel 2 Filter.
13. Key in 0.3F0 SPCL to read back the Option Series 030 Installed Indicator. The Measuring Receiver should display 000001.0000. If faulty, see Service Sheet 34 and check the Option Series 030 Installed Indicator.

Service Sheet BD4

BLOCK

- **Audio**

PRINCIPLES OF OPERATION

General

The Audio Block Diagram documents the audio circuits which process the demodulated IF signal and convert the audio signal to dc for measurement by an internal digital voltmeter. The audio circuits include amplifiers, filters, attenuators, switches, ac to dc converters, an integrator, a counter, a distortion analyzer, etc.

Audio Filters Assembly (A2)

The residual IF carrier on the demodulated AM or FM is filtered by the 260 kHz Low-Pass Filter in each path. These filters determine the audio bandwidth when LP FILTER is set to >200 kHz. 20 dB Attenuator 1 partially determines the audio gain in the FM and ΦM modes.

The demodulated signal passes through Amplifier 1, which has a gain of 8.9 dB, and when selected, the 15 kHz or >20 kHz Low-Pass Filter further filters the signal. The 15 kHz Low-Pass Filter is automatically selected for the 455 kHz IF. The >20 kHz Low-Pass Filter can also be selected. The 6 dB Attenuator in the through-path matches the 6 dB loss through the two filters.

Amplifier 2 has 13.7 dB of gain. 20 dB Attenuator 2 gives further audio-range control. Amplifier 3 has 20 dB of gain. Amplifiers 1, 2, and 3 distribute the audio gain for optimum noise reduction and distortion. Special Function 2 controls the overall audio gain. Table 8D-12 lists the modulation ranges and the associated attenuation. (The ranges in the table apply only for the PEAK+, PEAK−, and AVG audio detectors.)

Table 8D-12. *Attenuation vs. Modulation Range*

Modulation Range			20 dB Attenuator	
AM Depth (%)	FM Deviation (kHz)*	ΦM Deviation (rad)	1	2
40	4	4	out	out
100	40	40	out	in
100	400	400	in	in

* With 750 μs FM DE-EMPHASIS and PRE-DISPLAY selected the FM ranges are 0.4, 4, and 40 kHz.

Audio De-emphasis and Output Assembly (A3)

The Audio De-emphasis and Output Assembly contains audio filters, FM de-emphasis networks, a ΦM integrator, audio output amplifiers, and two audio level detectors.

The 50 and 300 Hz High-Pass and 3 kHz Low-Pass Filters are active filters selected from the front panel. The four FM de-emphasis networks are single-pole, low-pass filters with time constants of 750, 75, 50, and 25 μs. The 750 μs network also adds 20 dB of gain.

The phase deviation of the RF input signal is recovered by integrating the demodulated FM with the Phase Modulation Integrator. In mathematical terms, the instantaneous phase deviation is the integral of the instantaneous frequency deviation.

The audio output path to the Voltmeter (A5) is through the Inverting/Non-Inverting Amplifier. The amplifier usually has a gain of −1, but when PEAK+ is selected or, for FM and ΦM, when the input signal is down converted by the Input Mixer (A17), the gain is +1. By using PRE-DISPLAY, the input to the amplifier can be selected to include the FM de-emphasis networks.

The Absolute Peak Detector, the Audio Overvoltage Detector, and the Voltmeter together sense the audio signal level to determine the audio range. The Audio Overvoltage Detector compares the audio voltage to a reference. If the audio level is too high, the Audio Overvoltage Detector reacts quickly to set the audio gain to minimum and to set a status flag which can be read by the Controller. The output of the Absolute Peak Detector (which detects the greater of the positive and negative peaks) is read by the Voltmeter.

If automatic ranging has been selected, the Controller reduces the audio gain depending on the following conditions governed by the Controller: (1) the magnitude of the positive or negative peak of the audio signal or (2) the voltage read from the Audio Peak Detector of the A5 Voltmeter Assembly. Most often the audio autoranging is determined by the voltage read from the Audio Peak Detector. However, situations arise where the predominant component of the audio signal is filtered out by one of the active filters in the audio chain (for example, a 10 kHz signal into the 3 kHz Low-Pass Filter). Having the Absolute Peak Detector ahead of the active filters prevents such situations from overdriving the audio circuits.

The front-panel MODULATION OUTPUT/AUDIO INPUT is driven by an inverting Output Amplifier via the A52 Audio Counter/Distortion Analyzer Assembly. The output of this connector is always affected by audio filtering and FM de-emphasis, when selected.

Voltmeter Assembly (A5)

The Voltmeter consists of an average detector, a peak detector, and a voltage-to-time converter.

The Audio Average Detector consists of a precision Half-Wave Rectifier and a Summer and Filter. The summer amplifier adds the input signal, weighted by a factor of one, to the inverted and half-wave-rectified input, weighted by a factor of two. The resultant sum is a full-wave-rectified output. After filtering, the output dc voltage is equal to the signal's rectified average.

The Audio Peak Detector captures the positive, ac peak. The Sample-and-Hold Switch controls the transfer of the detector's output to the Voltage-to-Time Converter (via the Buffer Amplifier) and also controls the discharging of the Audio Peak Detector. Special Function 5 controls the discharge rate.

The voltage is actually measured by the Voltage-to-Time Converter. The Input Selectors select one of many dc inputs into the converter. The output of the selectors is a reference input to a Comparator. The Comparator's other input is a linear ramp. As the ramp (initiated by the Counter) rises, the Counter counts the time base reference (10 MHz). When the ramp voltage equals the level of the Comparator's other input, the Comparator signals the Counter to stop counting. The accumulated count represents the dc voltage. Ground is measured separately and subtracted from the Voltmeter measurement.

Special Functions 49 and 50 allow direct access and display of the Voltmeter readings.

Audio Counter/Distortion Analyzer (A52)

Inputs to the Audio Counter/Distortion Analyzer come from either the internal audio circuits via the Output Amplifiers in the A3 Audio De-emphasis and Output Assembly or from the external MODULATION OUTPUT/AUDIO INPUT as determined by the Internal/External Source Switch.

The distortion (plus noise) on a 400 Hz or 1 kHz audio signal is measured by comparing the level of the input signal with the level of that same signal which has had the fundamental removed by a notch filter. The distortion measurement result (which also includes noise) is the ratio of the signal, with fundamental removed, to the unfiltered signal. In both measurements, the signal level is measured by the RMS-to-DC Converter which is then read by the Voltmeter. The voltage from the RMS-to-DC Converter can be measured and displayed by means of Special Function 30, which automatically switches the Input/Output Switch to the external, audio input position.

Since the notch-filter frequency is fixed at either 1 kHz or 400 Hz, the signal being measured should be within ±5% of the selected frequency. Amplifier 1 and Amplifier 2, which together have an overall gain of 0, 20, or 40 dB, are programmed to provide an optimum level to the RMS-to-DC Converter. The voltage measured when the Notch Select Switch is set to include the Notch Filters is the numerator in the distortion calculation. The voltage measured when the Notch Select Switch is set to bypass the Notch Filters is the denominator in the distortion calculation. Since the signal minus its fundamental is often noisy, the signal to the Voltmeter is filtered by an active Ripple Filter to smooth the voltage readings. Special Function 29 puts the instrument in the SINAD measurement mode. The SINAD measurement is the same as the Audio Distortion measurement except that the reciprocal of the distortion measurement is displayed.

To calculate the frequency of an internal or external audio signal, the Controller counts signals from both the Audio Counter and the main Counter (on Service Sheet BD5). First, the analog audio signal is conditioned by the Schmitt Trigger to make it compatible with the digital circuits that follow. To begin the count, the Controller resets Counter Stages 1–4. At this time, Count/Pulse Switch 2 is set to receive the output from Counter Stage 2 and the Output Switch is closed. Count/Pulse Switch 1 is readied but not closed until the next pulse from the Schmitt Trigger triggers the Counter Gate Control and sets Count/Pulse Switch 1 to receive pulses from the Schmitt Trigger. The Counter Stages 1–4 now begin counting pulses from the Schmitt Trigger. Overflows from Stage 4 (every 65 536 counts) are counted by the Controller via the Output Switch and Instrument Bus.

Coincident with the closing of Count/Pulse Switch 1, the Voltmeter/Audio Gate (on Service Sheet BD5) closes and the main Counter begins counting the 10 MHz time base reference. After 100 ms, the Controller enables the Counter Gate Control to respond to the next pulse from the Schmitt Trigger. When the pulse arrives, it triggers the Counter Gate Control to open Count/Pulse Switch 1 and the Voltmeter/Audio Gate via the Stop Count Buffer. If no pulse is received from the Schmitt Trigger after a fixed time, the count sequence is aborted.

The count from Audio Counter Stages 1–4 is read back in two steps. First, the Controller reads back the count of Stages 3 and 4 by sending a series of pulses into Stage 3 via Count/Pulse Switch 2, looking for the overflow from Stage 4. By knowing the number of pulses sent to Stage 3, the Controller can calculate the accumulated count. Next, the Controller sends 255 pulses to Stages 3 and 4 to fill them, sets Count/Pulse Switch 2 to the output of Stage 2, and sends a series of pulses to Stage 1 via Count/Pulse Switch 1 while looking for an overflow from Stage 4. Again, by knowing the number of pulses sent to Stage 1, the Controller can calculate the accumulated count from Stages 1 and 2. The count from the main Counter is also read back by the Controller. Knowing the counts of the Audio and main Counters (including overflows), the Controller calculates and displays the signal frequency.

TROUBLESHOOTING

General

Procedures for checking the Audio Section of the instrument are given below. The blocks or points to check are marked on the block diagram by a hexagon with a check mark and a number inside, for example, ⟨√3⟩ . Before performing any check, perform all the checks on Service Sheet BD1.

CAUTION

Tighten SMC connectors to 0.6 N· m (5 in· lb). Hand tightening of connectors is insufficient. Hand-tightened connectors can work loose and cause reduced performance or malfunctions.

Equipment

Audio Synthesizer	HP 3336C
Oscilloscope	HP 1740A
Signal Generator	HP 8640B

⟨√1⟩ Audio Filters and Gain Check

1. Set the audio synthesizer to 1 kHz at −17 dBm. (The synthesizer output impedance should be 50Ω.) Connect its output to A2J1 (AM IN).

CAUTION

If the Modulation Analyzer is to be turned off, disconnect the audio synthesizer first to prevent damage to the CMOS switches.

2. Connect a high-impedance, ac coupled oscilloscope (with 10:1 divider probe) to A2TP4 (AMPL 3 OUT).

3. Set the signal generator to approximately 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.

4. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Press AM. Key in 2.1 SPCL to set the audio gain to maximum. The oscilloscope should show the 1 kHz sinusoidal waveform with an ac amplitude of 2.4 to 2.8 Vpp. If faulty, see Service Sheet 12 and check the audio path beginning at the 260 kHz Low-Pass Filter at the AM output.

5. Increase the synthesizer frequency to 260 kHz without altering the amplitude. The waveform should have an ac amplitude of 1.2 to 1.6 Vpp. If faulty, see Service Sheet 12 and check the 260 kHz Low-Pass Filter at the AM output as well as checking to see if the 15 kHz or >20 kHz are in the circuit. (They should be out.)

NOTE

This is not a valid measurement of the filter bandwidth since the source impedance is incorrect. It will, however, show up a severe problem. For a more precise test of bandwidth, see Service Sheet 12 or perform Performance Test 4—Audio Filters *in Section 4.*

6. Set the synthesizer level to −27 dBm and frequency to 1 kHz. Connect its output to A2J2 (FM IN). Press FM. The waveform should have an ac amplitude of 3.0 to 3.6 Vpp. If faulty, see Service Sheet 12 and check the 260 kHz Low-Pass Filter at the FM output.
7. Increase the synthesizer frequency to 260 kHz. The waveform should have an ac amplitude of 1.1 to 1.5 Vpp. If faulty, see Service Sheet 12 and check the 260 kHz Low-Pass Filter at the FM output.

NOTE

This is not a valid measurement of the filter bandwidth since the source impedance is incorrect. It will, however, show up a severe problem. For a more precise test of bandwidth, see Service Sheet 12 or perform Performance Test 4—Audio Filters *in Section 4.*

8. Set the synthesizer level to −17 dBm and frequency to 1 kHz. Key in 2.2 SPCL to reduce the audio gain by 20 dB. The waveform should have an ac amplitude of 950 to 1150 mVpp. If faulty, see Service Sheet 12 and check 20 dB Attenuator 1.
9. Key in 2.3 SPCL to reduce the audio gain another 20 dB. The waveform should have an ac amplitude of 95 to 115 mVpp. If faulty, see Service Sheet 12 and check 20 dB Attenuator 2.
10. Key in 2.2 SPCL. Set the synthesizer frequency to 110 kHz. Set LP FILTER to >20 kHz. The waveform should have an ac amplitude of 400 to 600 mVpp. If faulty, see Service Sheet 12 and check the >20 kHz Low-Pass Filter.
11. Set the synthesizer frequency to 15 kHz. Set LP FILTER to 15 kHz. The waveform should have an amplitude of 600 to 900 mVpp. If faulty, see Service Sheet 12 and check the 15 kHz Low-Pass Filter.

⟨√2⟩ Audio Filters and De-emphasis Check

NOTE

This check assumes that ⟨√1⟩ Audio Filters and Gain Check *gives positive results.*

1. Set the audio synthesizer to 1 kHz at −17 dBm. (The synthesizer output impedance should be 50Ω.) Connect its output to A2J2 (FM IN).
2. Connect a high-impedance, ac coupled oscilloscope (with 10:1 divider probe) to A3TP3 (DE-EM OUT).
3. Set the signal generator to approximately 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.
4. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Press FM. Key in 2.2 SPCL to set the audio gain to an intermediate range. The oscilloscope should show a sinusoidal waveform with an ac amplitude of 1.9 to 2.3 Vpp. If faulty, see Service Sheet 13 and check the audio path beginning at the high-pass filters.

5. Set the synthesizer frequency to 300 Hz. Set HP FILTER to 300 Hz. The waveform should have an ac amplitude of 1.3 to 1.7 Vpp. If faulty, see Service Sheet 13 and check the 300 Hz High-Pass Filter.
6. Set the synthesizer frequency to 50 Hz. Set HP FILTER to 50 Hz. The waveform should have an ac amplitude of 1.3 to 1.7 Vpp. If faulty, see Service Sheet 13 and check the 50 Hz High-Pass Filter.
7. Set the synthesizer frequency to 3 kHz. Set HP FILTER off and the LP FILTER to 3 kHz. The waveform should have an ac amplitude of 1.2 to 1.8 Vpp. If faulty, see Service Sheet 13 and check the 3 kHz Low-Pass Filter.
8. Set the LP FILTER off and FM DE-EMPHASIS to PRE-DISPLAY. Set the synthesizer frequency and FM DE-EMPHASIS as listed in Table 8D-13. For each setting, the ac amplitude of the waveform should be as indicated. If faulty, see Service Sheet 13 and check the appropriate de-emphasis filter.

Table 8D-13. *Amplitude at A3TP3,* ⟨√2⟩ *Step 8*

Synthesizer Frequency (Hz)	FM DE-EMPHASIS (μs)	Waveform Amplitude Limits (Vpp)	
		Minimum	Maximum
6366	25	1.3	1.7
3183	50	1.3	1.7
2122	75	1.3	1.7
212.2	750*	1.3	1.7
* Key in 2.3 SPCL to reduce the gain by 20 dB.			

9. Key in 2.2 SPCL. Switch PRE-DISPLAY off. The waveform should have an ac amplitude of 1.9 to 2.3 Vpp. If faulty, see Service Sheet 13 and check the Pre-Display Switching.
10. Set the synthesizer frequency to 1 kHz. Press ΦM. The waveform should have an ac amplitude of 1.9 to 2.3 Vpp. If faulty, see Service Sheet 13 and check the Phase Modulation Integrator.
11. Press PEAK−. The waveform should not noticeably change amplitude. If faulty, see Service Sheet 13 and check the Inverting/Non-Inverting Amplifier.
12. Press FM. Switch off all FM DE-EMPHASIS. Connect the oscilloscope to MODULATION OUTPUT/AUDIO INPUT. The waveform should have an ac amplitude of 1.9 to 2.3 Vpp. If faulty, see Service Sheet 13 and check the Output Amplifiers.
13. Key in 49.6 SPCL. This causes the output of the audio range detector to be displayed. The display should read 0.4 to 0.6. If faulty, see Service Sheet 13 and check the Absolute Peak Detector.
14. Key in 0.15 SPCL. The display now shows the audio overvoltage status. The display should read 000000.0000. If faulty, see Service Sheet 13 and check the Audio Overvoltage Detector.
15. Increase the synthesizer level to +10 dBm. The display should read 000001.0000 indicating that an audio overload has been detected. If faulty, see Service Sheet 13 and check the Audio Overvoltage Detector.

NOTE

To repeat steps 13 and 14, it is necessary to press CLEAR first to clear the audio overvoltage latch.

⟨√3⟩ Audio Average and Peak Detector Check

NOTE

This check assumes that ⟨√2⟩ Audio Filters and De-emphasis Check *gives positive results.*

1. Set the audio synthesizer to 1 kHz at −17 dBm. (The synthesizer output impedance should be 50Ω.) Connect its output to A2J2 (FM IN).
2. Connect a high-impedance, ac coupled oscilloscope (with 10:1 divider probe) to A3TP3 (DE-EM OUT).
3. Set the signal generator to approximately 20 MHz CW at 0 dBm. Connect its RF output to the Modulation Analyzer's INPUT.
4. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Press FM. Key in 2.2 SPCL to set the audio gain to an intermediate range. Fine adjust the synthesizer level for an ac waveform of 2 Vpp.
5. Connect a dc coupled oscilloscope to A5TP4 (AVG OUT). (Check the dc reference of the oscilloscope.) The level on the oscilloscope should be 660 to 760 mVdc. If faulty, see Service Sheet 14 and check the Average Detector.
6. Connect oscilloscope to rear-panel RECORDER OUTPUT. Key in 49.0 S (Shift) 0 SPCL to switch the output of the Audio Peak Detector to the RECORDER OUTPUT. The level on the oscilloscope should be 0.9 to 1.1 Vdc. If faulty, see Service Sheet 14 and check the Audio Peak Detector. Also check the Input Selectors to the Voltage-to-Time Converter; see Service Sheet 15.
7. Remove then reconnect the synthesizer output. The waveform should drop and rise (in a step-like manner) in less than one second. If faulty, see Service Sheet 13 and check the Sample-and-Hold Switch.
8. Key in 5.1 SPCL to set the Audio Peak Detector time constant to slow. Again key in 49.0 S 0 SPCL. Repeat step 7 above. The decay and rise time should be about two seconds.

⟨√4⟩ Voltage-to-Time Converter Check

1. Key in 50.3 SPCL. This causes the +5V supply to be displayed. The display should read 2.85 to 3.15. If faulty, see Service Sheet 15 and begin troubleshooting with the Voltage-to-Time Converter.
2. Check the Input Selectors by keying in the Service Special Functions listed for 49.N and 50.N. Consult *Service Special Functions* in *Special Functions,* paragraph 8-7, for more information. If any reading seems faulty when the input is known to be good, see Service Sheet 15 and check the Input Selectors.

⟨√5⟩ Parity Check

1. Perform the Power-Up Checks on Service Sheet BD1.

⟨√6⟩ Distortion Analyzer Check

1. Set the audio synthesizer to 1 kHz at 1 Vrms (into a high impedance). Connect its output to A52J1 (AUDIO IN).
2. Connect an ac coupled, high-impedance oscilloscope to the MODULATION OUTPUT/AUDIO INPUT.
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. The 1 kHz audio signal should be displayed with an amplitude between 2.6 and 3.0 Vpp. If faulty, see Service Sheet 16 and check the Internal/External Source Switch.

4. Readjust the level from the synthesizer for a display of 3 Vpp. Key in 30.0 SPCL to set the instrument to measure External Audio RMS Level. The 1 kHz signal should disappear. If faulty, see Service Sheet 16 and check the Internal/External Source Switch.
5. Connect the oscilloscope to A52TP4 (BUF OUT). Connect the synthesizer to the MODULATION OUTPUT/AUDIO INPUT. The 1 kHz audio signal should be displayed with an amplitude between 2.8 and 3.2 Vpp. If faulty, see Service Sheet 16 and check the Audio Input Buffer.
6. Connect the oscilloscope to A52TP2 (AMPL 1 OUT). Key in 2.3 SPCL to assure that the 20 dB attenuator of Amplifier 1 is in. The amplitude of the displayed audio signal should be between 2.8 and 3.2 Vpp. If faulty, see Service Sheet 16 and check Amplifier 1 and the Notch Select Switch.
7. Reduce the amplitude of the signal from the synthesizer by 10 (that is, −20 dB). Key in 2.4 SPCL to bypass the 20 dB attenuator. The amplitude of the displayed audio signal should be between 2.8 and 3.2 Vpp. If faulty, see Service Sheet 16 and check Amplifier 1.
8. DC couple the oscilloscope and connect it to A52TP1 (RMS OUT). The oscilloscope should display a voltage between 0.9 and 1.2 Vdc. If faulty, see Service Sheet 16 and check the RMS-to-DC Converter and the Ripple Filter.
9. AC couple the oscilloscope and connect it to A52TP3 (NOTCH FLTR OUT). Key in 0.2 S (Shift) 0 S 4 SPCL to keep the Notch Select Switch in the through position, keep the gain of Amplifier 1 at 20 dB, switch in the 400 Hz Notch Filter, and set the gain of Amplifier 2 to 20 dB. The amplitude of the displayed audio signal should be between 2.7 and 3.3 Vpp. If faulty, see Service Sheet 16 and check the Notch Filters and Amplifier 2.
10. Key in 0.2 S 0 S 0 SPCL to reduce the gain of Amplifier 2 by 20 dB. The amplitude of the displayed audio signal should be between 270 and 330 mVpp. If faulty, see Service Sheet 16 and check Amplifier 2.
11. Key in 0.2 S 0 6 SPCL to switch in the 1 kHz Notch Filter and increase the gain of Amplifier 2 by 20 dB. The 1 kHz audio signal should disappear into the noise. If faulty, see Service Sheet 16 and check the Notch Filter.
12. Set the synthesizer frequency to 400 Hz. Key in 0.2 S 0 S 4 SPCL to insert the 400 Hz Notch Filter. The 400 Hz audio signal should disappear into the noise. If faulty, see Service Sheet 16 and check the Notch Filter.
13. Connect the oscilloscope again to A52TP2. Key in 0.2 S 0 7 SPCL to set the Notch Filter to 1 kHz, keep the gain of Amplifier 2 at 20 dB, set the gain of Amplifier 1 to 0 dB, and set the Notch Select Switch to the notch filter position. The 400 Hz audio signal should have an amplitude between 2.7 and 3.3 Vpp. If faulty, see Service Sheet 17 and check the Notch Select Switch.

⟨√7⟩ Audio Counter Check

1. Set the audio synthesizer to 1 kHz at 1 Vrms (into a high impedance). Connect its output to the MODULATION OUTPUT/AUDIO INPUT.
2. Connect an ac coupled, high-impedance oscilloscope to A52TP4 (BUF OUT).
3. Press the blue key, then press INSTR PRESET (the AUTOMATIC OPERATION key) to preset the instrument. Press S (Shift) AUDIO FREQ. Press AUDIO INPUT. The 1 kHz audio signal should be displayed on the oscilloscope with an amplitude between 2.6 and 3.0 Vpp. If faulty, perform ⟨√6⟩.

4. Set the synthesizer to 100 mVrms (into a high impedance) and set the frequency as shown in Table 8D-14. For each setting, the displayed frequency should be within the limits indicated. If faulty, see Service Sheet 16 and begin by checking the Counter Buffer and Schmitt Trigger.

Table 8D-14. *Displayed Frequency,* ⟨√7⟩ *Step 4*

Synthesizer Frequency (Hz)	Displayed Count (kHz)	
	Minimum	Maximum
1 000	0.99998	1.00002
20	0.0199800	0.0200200
250 000	249.997	250.003

Service Sheet BD5

BLOCKS

- **Digital**
- **Power Supply**

PRINCIPLES OF OPERATION

General

The Digital and Power Supply Block Diagram documents the Controller, Counter, Keyboard and Display, Remote Interface (HP-IB), and the Power Supply.

Counter Assembly (A11)

The Counter consists of a 10 MHz Reference Oscillator, Time Base Dividers, Input Selector, four counter stages, and counter control circuits. The input to Stages 2 through 4 is selected by the Input Selector switch. When the LO frequency is counted, counter Stage 1 is enabled and fed into Stage 2. The input to Stage 1 is the High Frequency VCO signal divided by eight (HF VCO ÷8). When the Voltmeter or Audio Counter input is selected, the Selected 10 MHz Time Base Reference (from the Time Base Select Switch), gated by the Voltmeter/Audio Gate (the VOLTMETER/AUDIO line), is the input to Stage 2. Other signals which can be counted are the IF, the 10.1 MHz VCO of the FM Calibrator (the CALIBRATED FM 2 line), three 10 MHz Time Base References (Internal, External, or Selected). Counting of the Internal and External Time Base Reference is useful as a Counter self-check. Special Function 46 controls the Input Selector.

The Counter counts in binary. Stage 1 is a divide-by-eight, and Stages 2 through 4 are divide-by-sixteens. Additional stages of counting are contained in the Microprocessor (in A13), which counts the output carries from Stage 4 via the Counter Output and Time Base Gate.

At the end of a count sequence, the Time Base disables the Counter via the Counter Gate Control. The Counter Transfer Logic then transfers the count of the individual stages in parallel to the Controller (A13) via the Counter Output and Time Base Gate. First, the output from Stage 4 is transferred. Then the output from Stage 3 is loaded into Stage 4, and the output from Stage 4 is again transferred. The transfer process is again repeated with Stage 2 loading into Stage 4 via Stage 3, and transferring. Finally, Stage 1 is loaded into Stage 4 via Stages 2 and 3, and transferred. (The output from Stage 1 is used only when counting the LO frequency.)

To make a voltage measurement, the Voltage-to-Time Converter (in the A5 Voltmeter Assembly of Service Sheet BD4) generates a pulse whose time interval is proportional to its dc input voltage. During this time interval, the Counter counts the Selected 10 MHz Time Base Reference (via the VOLTMETER/AUDIO line). The count thus accumulated is proportional to the input voltage. The count is initiated when the Counter Gate Control enables the Input Selector and the Voltage-to-Time Converter (via the Ramp Gate). The Voltage-to-Time Converter then closes the Voltmeter/Audio Gate (via the Stop Count line) and the Selected Time Base Reference passes into Counter Stage 2. When the time interval ends, the Voltmeter/Audio Gate is opened. The Controller disables the Counter and transfers the accumulated count to the Controller.

The Audio Counter also makes use of the Stop Count line to control the counting of the Selected Time Base Reference during the count sequence. (See the discussion of the Audio Counter in Block Diagram BD4.)

The Selected Time Base Reference is either the standard 10 MHz Reference Oscillator, the Option 002 10 MHz High-Stability, Crystal Oscillator, or an external input from the rear-panel TIME BASE 10 MHz INPUT connector. For Option 002, the crystal from the 10 MHz Reference Oscillator is removed and the oscillator's circuitry is driven by the High-Stability, Crystal Oscillator. In either case, when

an external reference is applied, a detector senses the signal and throws the Time Base Select Switch to the external position. This switching is done in such a way as to minimize the interruption of the reference, since (after it is divided by five) it is also the Controller clock.

The Time Base Dividers divide the 10 MHz reference by 1600. During a frequency count, Controller synchronizes itself to the 6.25 kHz Time Base signal (via the Counter Output and Time Base Gate). Since the Controller controls the enable period of the Counter (via the Counter Gate Control), the Time Base signal ultimately determines the Counter accuracy. (The Counter is enabled for more than one period of the 6.25 kHz Time Base signal. The number of periods is counted by the Microprocessor via the Counter Output and Time Base Gate.)

Controller Assembly (A13)

The Controller consists of the Central Processing Unit (CPU), Static Memory Interface (SMI), Read-Only Memory (ROM), CPU External Register (or random-access memory, RAM), Memory Select Decoders, and input/output interface circuitry. The CPU and SMI form the Microprocessor. When the Controller interfaces with the HP-IB via the A14 Remote Interface Assembly, the Microprocessor also includes the Peripheral Input/Output (PIO in A14).

The Controller's program is stored in ROM. To retrieve information from ROM, the SMI, under control of the CPU, outputs the appropriate address on the Address Bus. Two of the sixteen address bits are decoded by the Memory Select Decoders to enable one of the ROMs. The fourteen other address bits address the individual ROMs. The enabled ROM then outputs eight bits of data onto the Data Bus from the location corresponding to the input address. ROM information may be either a program instruction or data. In a similar manner, temporary information is written to or read from RAM. The RAM is addressed by eight of the eleven address bits; it inputs or outputs eight data bits.

The RAM is non-volatile, that is, it is not erased when the instrument is powered down or unplugged. When either the +12V or +5V Power Supply voltage drops, the +12V and +5V Power Supply Drop Detector disables the RAM (which prevents data access for read or write operations), and the Battery supplies power to the RAM and associated circuits.

The CPU interprets bytes from the ROM as data or instructions depending on the context of the program. If the byte is an instruction, the outcome depends on the nature of the instruction. A simple instruction (such as add or shift) is executed immediately, and the instruction in the next address is fetched. More complex instructions fetch additional data or instructions from following addresses and, in the case of jumps and subroutine calls, cause program execution to move to another location in memory.

When a front-panel key is pressed, an interrupt is generated. The interrupt causes program execution to jump to a specified address where the interrupt service subroutine is located. The subroutine interrogates the Keyboard to determine which key was pressed and then takes the appropriate action. HP-IB codes and commands interrupt the Microprocessor in a similar way.

The CPU communicates with the SMI and PIO through the ROM Control (ROMC) lines and the Data Bus. The CPU manipulates data (arithmetic and logic computations) and contains the clocking and control circuitry. The clock is normally derived from the Counter's Time Base Reference; however, if the clock fails (to an open circuit) or if the Counter Assembly is unplugged, a clock (internal to the CPU) will continue to generate clock pulses. The SMI interfaces with the external ROM and RAM.

The CPU also contains bidirectional input/output (I/O) ports to communicate with the instrument's hardware via the Instrument Bus. Four I/O bits are reserved for servicing of the Controller. Four LEDs driven from the port indicate errors encountered during power-up verification tests, measurement cycles, and Keyboard and HP-IB interrupts. Four test points on the port can be used to initiate troubleshooting routines which use signature analysis. See *Controller Test LEDs and Test Points,* paragraph 8-10.

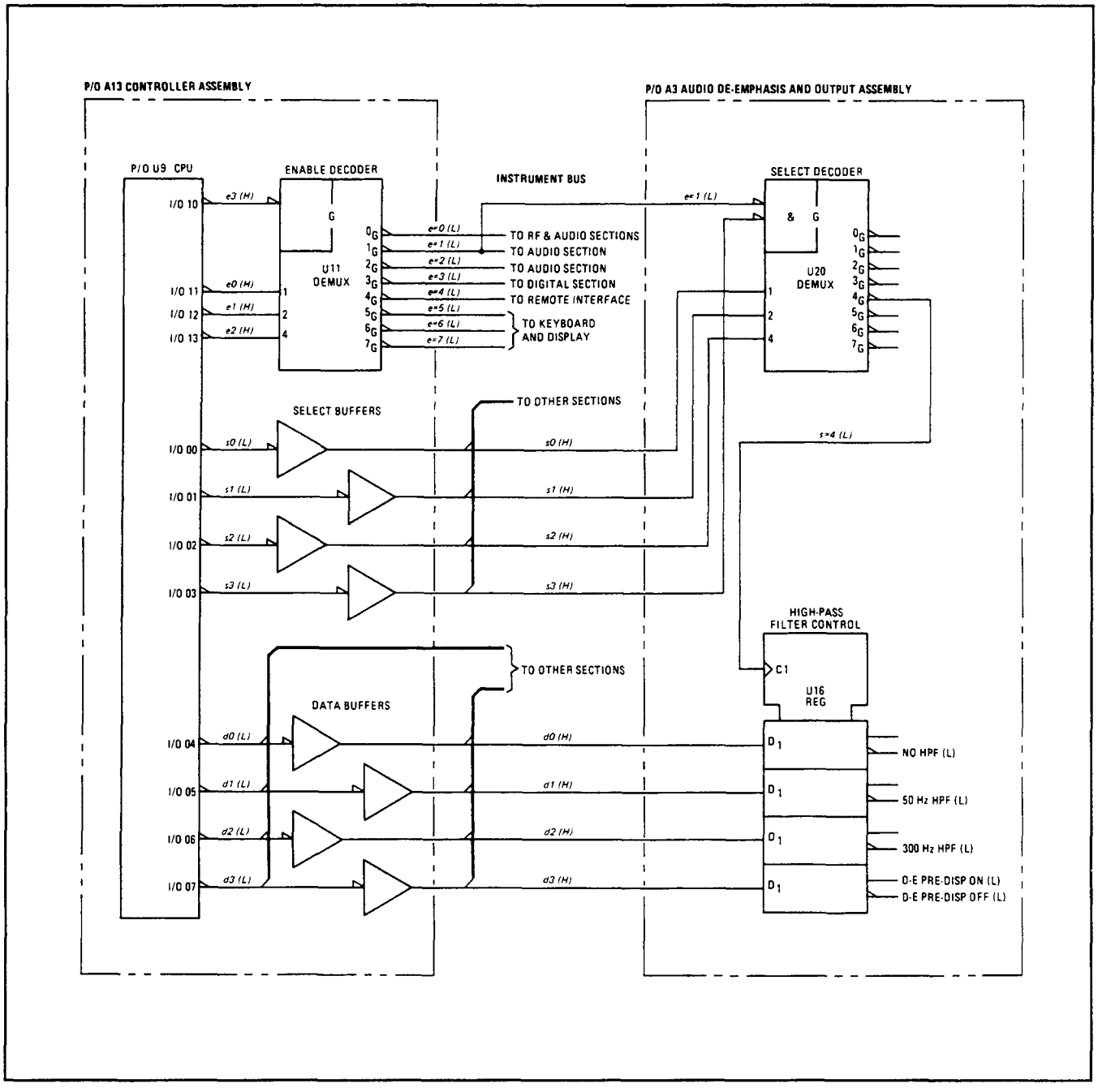


Figure 8D–7. *Example Showing Instrument Bus Hookup*

Instrument Bus

Figure 8D-7 shows a typical hookup on the Instrument Bus. The Instrument Bus lines are broken down into three groups: enable (e), select (s), and data (d). The enable code (*e*0 to *e*3) comes from I/O lines 10 through 13 of the CPU (A13U9).

Three of the enable lines (e0, e1, and e2) are decoded by the Enable Decoder (A13U11) to activate one of eight unique enable lines (e=0 to e=7). The fourth line (e3) enables the decoder itself. The enable lines run to various instrument sections. Typically, each line is dedicated to a specific section or operational function; for example, enable line e=1 controls audio-related functions in the Audio Section.

The select (s0 to s3) and data (d0 to d3) lines come from I/O ports 00 to 07. The eight lines run in parallel to all sections of the instrument where they are decoded on the assemblies. (In the RF Section

one assembly, the A20 LO Control Assembly, decodes the Instrument Bus for the entire section.) Up to 16 data codes for each of the 16 select codes are possible for each active enable line. The select code typically selects a functional category on an assembly, and the data code selects the specific function or configuration. On a given assembly, the select codes are decoded only while the corresponding enable line is active. The data codes are, in turn, decoded and latched only when triggered by the decoded select line. The latched data drive the digital-to-analog devices which control the instrument hardware.

On the schematic diagrams the lines leaving the I/O ports of the CPU are labeled with a mnemonic such as s2(L) for I/O line 02. The "s" indicates a select code, "2" indicates that it is the third, least-significant bit of the undecoded select code, and "(L)" indicates that the line is true (1) when the logic level is low. All bit-position numbering begins with 0. The select codes go out on the Instrument Bus through Select Buffers, which are simple inverters. Thus s2(L) goes out on the bus as s2(H). Decoded codes are labeled as e=1(L) for example. The "e" indicates an enable code, "=" indicates decoding, "1" indicates a decoded hexadecimal 1 (binary 0001), and "(L)" indicates the logic level corresponding to a true. The mnemonic "e=1" corresponds to $e3e2e1e0 = 0001$. Data codes are also buffered. However, unbuffered data lines are also connected to the Instrument Bus for reading back data to the I/O ports.

Figure 8D-7 illustrates how the 50 Hz High-Pass Filter is selected. The filter (not shown) is activated when the output line of the High-Pass Filter Control (A3U16) labeled 50 Hz HPF(L) goes low. Register U16 is simply a latch; it does not decode the data. To activate the 50 Hz High-Pass Filter, the CPU sends out the binary enable code 0001 (hexadecimal 1), select code 0100 (hexadecimal 4), and data code 0010 (hexadecimal 2). The Enable Decoder activates the line e=1(L). The decoder was enabled because e3(H) was low. Since s3(H) is low, and since e=1(L) is also low, the Select Decoder (A3U20) is enabled. The three least-significant bits of the select code are decoded and activate the s=4(L) line out of the decoder. This line clocks the data into the High-Pass Filter Control latch. Since the d1(H) line is high, the 50 Hz HPF(L) line goes low. This selects the 50 Hz High-Pass Filter.

There is a direct relationship between the codes output on the Instrument Bus and the Direct Control Special Functions discussed in paragraph 8-7. The enable, select, and data codes, combined into a hexadecimal number "esd", create the Direct Control suffix. In the example used in the previous paragraph, the suffix is 142 (corresponding to Direct Control code 0.142). Instrument control can be visualized as a series of Direct Control Special Functions issued under program control.

The example above decoded only three of the four select code bits and used the data bits directly (or inverted them). Notice that if the code $esd = 147$ were issued, the through path (NO HPF), 50 Hz High-Pass Filter, 300 Hz High-Pass Filter, and De-emphasis Pre-Display On switches would all be activated. On some assemblies the data codes may be decoded and select codes above 7 may be used. On other assemblies certain select codes are used to enable readback devices which read back status or measurement data onto the unbuffered data lines. This is discussed in more detail in connection with Direct Control Special Functions in Service Aids.

Keyboard and Display Assembly (A1)

The Keyboard and Display Assembly is both an input peripheral and an output peripheral to the Controller. The pressing of a key is sensed by the Keystroke Detector. The detector interrupts the Microprocessor which then enters an interrupt service routine. The routine causes the key rows and columns to be scanned sequentially via the Key Row and Column Scanner to ascertain which key is down. This scan is accomplished by driving the rows in sequence with the select decoder and reading the state of the columns with the data-readback lines. If no key closure is found (due, perhaps, to key bounce), the scan repeats. If no key closure is found after 50 ms, the Microprocessor leaves the key-service routine and returns to the measurement being made prior to the key interrupt (starting at the beginning of the measurement cycle).

Lighting of the key and annunciator lights, display digits, and decimal points is by a straight forward decoding of the Instrument Bus. Note that the lights in the keys do not light as a direct result of a key closure. Instead the Microprocessor, having recognized a key closure, sends the command out on the Instrument Bus to light the key light.

Remote Interface Assembly (A14)

The Remote Interface Assembly interfaces the Controller with the Hewlett-Packard Interface Bus (HP-IB). It performs necessary handshake operations, interprets the HP-IB control lines, and is both an input and output peripheral to the Controller.

The Remote Interface Assembly consists of Handshake Logic, HP-IB Input/Output Transceivers, Interface Control Logic, Address Decoder, part of the Microprocessor, and Instrument Bus interface circuits.

As an input peripheral, the Remote Interface accepts a byte from the HP-IB data lines under control of the bus handshake lines. It then interprets the data byte and the bus-control lines to see if the byte is an address (talk or listen), a command, or a data byte. When a byte is processed, one of three things happens: (1) the byte is ignored, (2) the byte is processed in hardware (for example, some bus commands), or (3) the byte causes a Microprocessor interrupt (for example, codes received while addressed to listen). The Microprocessor treats an HP-IB interrupt as it would an interrupt from the Keyboard. However, the HP-IB interrupt service routine first checks whether the byte is a command (for example, Device Clear), address, or data (for example, "M1"). If the byte is an address or command, it is processed. If the byte is data, the routine first checks whether the instrument is in remote. If it is, the incoming byte is processed as program code. If not, the byte is ignored. After processing a byte, Microprocessor tells the Remote Interface what to do next (for example, input another byte, set a status latch, or prepare to output a byte).

As an output peripheral, the Remote Interface takes a byte of status or measurement data from the Microprocessor and processes it over the HP-IB. It does this only after determining that the Modulation Analyzer has been addressed to talk. The require-service message (SRQ) is also output via the Remote Interface.

The Handshake Logic controls the asynchronous transfer of bytes over the HP-IB. The bytes are transferred without interrupting the Microprocessor in two cases: when the byte is data but the Modulation Analyzer is not addressed to listen, or when the byte is not an interrupting bus command. The Handshake Logic also provides the means for the Microprocessor to complete the handshake if the byte is an interrupting type.

When the Modulation Analyzer is accepting bytes, the Handshake Logic (1) monitors the Microprocessor and HP-IB and signals the HP-IB talker or bus controller when the Modulation Analyzer is ready to receive, (2) tells the Microprocessor when valid data is on the HP-IB, and (3) tells the HP-IB talker when the Microprocessor has accepted the data. When the Modualtion Analyzer is outputting data or status bytes, the Handshake Logic (1) tells the Microprocessor when the HP-IB listener is ready to receive, (2) provides the Microprocessor with logic to tell the listener when data is valid, and (3) tells the Microprocessor when the listener has accepted data.

The HP-IB Input/Output transceiver acts as an HP-IB buffer and send/receive switch. It is controlled by the Interface Control Logic.

The Interface Control Logic, together with the Address Decoder, determines the talk or listen status of the interface and whether or not the Microprocessor should be interrupted. The ROM in the Interface Control Logic is addressed by two of the HP-IB data lines, the Address Decoder, and one of the HP-IB control lines (Attention, ATN). The ROM contains the control information for the Interface Control Logic and the Microprocessor.

If the Modulation Analyzer's listen address is recognized by the Address Decoder, the Microprocessor attempts to set the Remote Enable Flip-Flop. If the HP-IB Remote Enable (REN) control line is true, the flip-flop is set (if not already set), and the Microprocessor sets a status bit in memory. Each time the Microprocessor performs any remote-dependent operation, it checks both the status bit and the flip-flop output (Remote Enable Latch, RNL). Both must be set for the instrument to remain in remote. If REN goes false at any time, the Remote Enable Flip-Flop is cleared, and the instrument is no longer in remote.

The Address Decoder compares the address set by the Address Switches with the five least-significant I/O bytes to determine if the instrument is being addressed. The Interface Control Logic looks at the

output of the Address Decoder and the next two input bits to determine if it is a talk or listen address and if the instrument should respond to it. The result of this determination modifies the address to the ROM in the Interface Control Logic.

The Address Readback outputs the address from the Address Switches to the Instrument Bus data lines when Special Function 21 (HP-IB Address) is selected. The Controller reads the HP-IB address from the Address Switches. (See *HP-IB Address* in the *Detailed Operating Instructions* in the *Operation and Calibration Manual.*)

The HP-IB input/output is directly handled by a portion of the Microprocessor that resides in the Remote Interface Assembly—the Peripheral Input/Output (PIO). The PIO is a device that routes the HP-IB data to and from the CPU and the HP-IB. It provides a communication link between the CPU and the Remote Interface hardware, and provides the means for interrupting the CPU. One of the two, eight-bit PIO output ports connects to the HP-IB data lines. The other output port connects to the Handshake Logic and Interface Control Logic.

NOTE

For purposes of troubleshooting the Controller, the Remote Interface Assembly may be unplugged. Provision has been made to allow the instrument to work with only the loss of HP-IB operation.

Although the Remote Interface Assembly receives data and operating information from the PIO, it is primarily through the Instrument Bus that it is controlled. (Commands such as SRQ that need rapid processing come from the PIO.) A Select Decoder decodes the select lines when enabled by code e=4. The decoded select lines enable or disable parts of the Remote Interface Assembly. Special Function 61 provides a means of reading back HP-IB status information to the front-panel display.

Power Supply Assemblies (A10 and A26)

The five regulated power supplies are: +15V, −15V, +40V, +5V, and −5V. Each supply has its own secondary winding on the Line Transformer and all supplies except the +40V Supply have their own full-wave rectifier. The latter four supplies are referenced from the +15V supply. Each supply is a series regulator type. When the instrument is switched to STBY, the +15V supply remains on and supplies current only to the High-Stability, Crystal Oscillator (Option 002). In STBY, the other supplies become referenced to 0V and thereby shut themselves off. The supply switching is via the ON/STBY Relay. The fan is also switched by the relay.

TROUBLESHOOTING

General

Procedures for checking the Digital and Power Supply Sections of the instrument are given below. The blocks or points to check are marked on the block diagram by a hexagon with a check mark and a number inside, for example, ⟨√3⟩ . Before performing any check, perform all the checks on Service Sheet BD1.

CAUTION

Tighten SMC connectors to 0.6 N· m (5 in· lb). Hand tightening connectors is insufficient. Hand-tightened connectors can work loose and cause reduced performance or malfunctions.

Equipment

Digital Test/Extender Board	HP 08901-60081
Oscilloscope	HP 1740A
Signature Analyzer	HP 5005A
Voltmeter	HP 3455A

⟨√1⟩ Time Base Reference Check

1. Disconnect any input to the rear-panel TIME BASE 10 MHz INPUT.
2. Connect high-impedance, dc coupled oscilloscope to A11J5 (INT 10 MHZ OUT). The waveform should be a TTL square wave with a period of 100 ns. If faulty, see Service Sheet 22 and check the 10 MHz Time Base Reference Oscillator.
3. Check A11TP4 (TB) with an oscilloscope. The waveform should be TTL pulses with a period of 160 μs. If faulty, see Service Sheet 22 and check the Time Base Divider.

⟨√2⟩ Counter Check

NOTE

This check assumes that the ⟨√1⟩ Time Base Reference Check give positive results. For Option 002, disconnecting the cable from the time base reference halts the Controller.

1. Connect a jumper cable between A11J5 (INT 10 MHZ OUT) and A11J1 (÷8 IN). Key in 46.4 SPCL. This switches the Counter to measure the HF VCO divided by 8. The display should read 1000000±1. If faulty, see Service Sheet 23.
2. Disconnect the jumper from A11J1 and connect it to A11J3 (IF IN). Key in 46.2 SPCL. This switches the Counter to measure the IF. The display should read 1000000±1. If faulty, see Service Sheet 23 and check the Input Selector.
3. Disconnect the jumper from A11J3 and connect it to A11J2 (10 MHZ IN). Key in 46.3 SPCL. This switches the Counter to measure the output of the FM Calibrator. The display should read 1000000±1. If faulty, see Service Sheet 23 and check the Input Selector.
4. Remove the jumper cable. Short A11TP1 (GND) to A11TP6 (VM GATE). Key in 46.2 SPCL. This switches the Counter to measure the 10 MHz time base reference via the Voltage-to-Time Converter input. The display should read 1000000±1. If faulty, see Service Sheet 23 and check the Input Selector and Voltmeter Gate logic.

⟨√3⟩ Controller Kernel Check

CAUTION

MOS and CMOS ICs can be damaged by static charges and circuit transients. Do not remove the A13 Controller Assembly or the A14 Remote Interface Assembly from the instrument while power is applied. Discharge the board and replacement IC to the same potential. (Use a conductive foam pad such as provided in the Service Accessory Kit HP 08901-60089.) When unplugging ICs, place the board on a conductive pad. When the IC is unplugged, insert it into the foam also.

A13 also contains a soldered-in battery. To prevent shorting out the battery, do not lay the board on a metal surface.

Several ICs on these assemblies are held in high-grip sockets. Both the socket and the device can be damaged if an attempt is made to remove the device with an IC extraction tool. The recommended procedure is to first ground the tip of a small blade-type screwdriver, then slide the tip between the IC and the socket and slowly pry up the IC one pair of pins at a time.

1. Switch POWER to STBY. Extend the A13 Controller Assembly with the Digital Test/Extender Board. Switch POWER to ON.
2. Check A13TP12 (+12V) with dc voltmeter. The voltage should be between +11.4 and +12.6 Vdc. If faulty, see Service Sheet 24 and check the +12V Regulator.
3. Short A13TP9 (RESET) to A13TP10 (+5V). This resets the Controller and forces a short write (instruction) cycle. Connect a high-impedance, dc coupled oscilloscope to A13TP4 (WRT) or the WRT test point on the extender board. The waveform should be TTL pulses with a period of 2 μs. If faulty, see Service Sheet 24 and check the clock and Φ lines and the Power-On Reset circuit.
4. Set the ROMC switches on extender board to GND. This forces the SMI to step through its addresses. On the extender board, connect the signature analyzer clipleads as follows:

Clock ..... WRT
Start ..... ADDRESS 15
Stop ..... ADDRESS 15
Ground ..... GND

5. Set the signature analyzer's start, stop, and clock to trigger as follows:

Start ..... Falling Edge
Stop ..... Falling Edge
Clock ..... Rising Edge

6. Check the test points on the extender board with the signature analyzer probe as listed in Table 8D-15. If all signatures are bad except GND, see Service Sheet 24 and replace the SMI. If only one ADDRESS line is faulty, see Service Sheet 24 and check the SMI and the address line.
7. Check the RAM WRT and CPU READ test points on the extender board with an oscilloscope. RAM WRT should be a TTL high, CPU READ should be a TTL square wave with a period of 2 μs. If faulty, see Service Sheet 24 and check the SMI and the load on the first two lines.
8. Switch POWER to STBY. Remove A13U1 (CPU External Register or RAM) from its socket.

Table 8D–15. *Address Line Signatures,* ⟨√3⟩ *Step 6*

Test Point	Signature	Test Point	Signature
+5V*	0001	ADDRESS 8	HC89
GND	0000	ADDRESS 7	52F8
ADDRESS 15	755U	ADDRESS 6	UPFH
ADDRESS 14	3827	ADDRESS 5	0AFA
ADDRESS 13	3C96	ADDRESS 4	5H21
ADDRESS 12	HAP7	ADDRESS 3	7F7F
ADDRESS 11	1293	ADDRESS 2	CCCC
ADDRESS 10	HPP0	ADDRESS 1	5555
ADDRESS 9	2H70	ADDRESS 0	UUUU
* Test point on Controller Assembly A13TP10 (+5V).			

9. Switch POWER to ON. Check the CONTROL BUS test points on the extender board with the signature analyzer probe as listed in Tables 8-16a through 8-16h. If signatures are faulty, see Service Sheet 24 and check the Decoders and ROMs.

NOTE

The signatures below are valid only for the firmware with the specified ROM part numbers. Consult Section 7, Instrument Changes, *or the* Manual Changes Packet *for signatures corresponding to other firmware part numbers.*

Table 8D–16a. *Data Line Signatures,* ⟨√3⟩ *Step 9* ***(2314A to 2333A)***

Test Point	Signature*	Test Point	Signature*
DATA 0 DATA 1 DATA 2 DATA 3	Replace with latest parts.	DATA 4 DATA 5 DATA 6 DATA 7	Replace with latest parts.
*Valid ROM part numbers:	**ROM Number**	**Part Number**	
	1	08901-80062	
	2	08901-80063	
	3	08901-80064	

Table 8D–16b. *Data Line Signatures,* ⟨√3⟩ *Step 9* ***(2334A to 2426A)***

Test Point	Signature*	Test Point	Signature*
DATA 0	4F0C	DATA 4	3FH0
DATA 1	2C60	DATA 5	48FC
DATA 2	10H0	DATA 6	9H29
DATA 3	C14U	DATA 7	89CU
*Valid ROM part numbers:	**ROM Number**	**Part Number**	
	1	08901-80066	
	2	08901-80067	
	3	08901-80068	

Table 8D–16c. *Data Line Signatures,* ⟨√3⟩ *Step 9* ***(2432A to 2550A)***

Test Point	Signature*	Test Point	Signature*
DATA 0	AA89	DATA 4	43HA
DATA 1	P326	DATA 5	H133
DATA 2	F2CC	DATA 6	2H0U
DATA 3	8A55	DATA 7	5A6A

*Valid ROM part numbers:	ROM Number	Part Number
	1	08901-80071
	2	08901-80072
	3	08901-80073

Table 8D–16d. *Data Line Signatures,* ⟨√3⟩ *Step 9* ***(2519A to 2523A)***

Test Point	Signature*	Test Point	Signature*
DATA 0	04C0	DATA 4	8344
DATA 1	H656	DATA 5	F017
DATA 2	UA85	DATA 6	60H7
DATA 3	A0U6	DATA 7	5U3F

*Valid ROM part numbers:	ROM Number	Part Number
	1	08901-80076
	2	08901-80077
	3	08901-80078

Table 8D–16e. *Data Line Signatures,* ⟨√3⟩ *Step 9* ***(2528A and 2546A)***

Test Point	Signature*	Test Point	Signature*
DATA 0	4454	DATA 4	HC6U
DATA 1	P20F	DATA 5	1862
DATA 2	UCHA	DATA 6	8066
DATA 3	H5PF	DATA 7	8A44

*Valid ROM part numbers:	ROM Number	Part Number
	1	08901-80084
	2	08901-80077
	3	08901-80078

Table 8D–16f. *Data Line Signatures,* ⟨√3⟩ *Step 9* ***(2551A only)***

Test Point	Signature*	Test Point	Signature*
DATA 0	00C2	DATA 4	4742
DATA 1	9904	DATA 5	U1UH
DATA 2	0731	DATA 6	U02U
DATA 3	CC13	DATA 7	82UF

*Valid ROM part numbers:	ROM Number	Part Number
	1	08901-80081
	2	08901-80082
	3	08901-80083

Table 8D–86g. Data Signatures, (√2) Step 6 (2608A to 2642A)

ROM	Start/Stop Pin On U5	Signature on CONTROL BUS DATA Test Point*							
		0	1	2	3	4	5	6	7
1	4	66H1	CH10	H8HC	2C9F	4726	71P8	A687	7H68
2	5	A2CC	PC7C	A7HP	61AA	P38F	7P8H	F2CP	4PCC
3	6	C5AP	0F28	U741	6A33	2474	52UU	A404	3314

* Valid ROM part numbers:

ROM Number	Part Number
1	08901-80087
2	08901-80088
3	08901-80089

Table 8D–86h. Data Signatures, (√2) Step 6 (2644A to 2702A)

ROM	Start/Stop Pin On U5	Signature on CONTROL BUS DATA Test Point*							
		0	1	2	3	4	5	6	7
1	4	40U9	2P98	F90H	CA3P	AUHP	8882	235U	5U7P
2	5	9H41	7631	CAH2	14P5	F488	6F71	063H	74A1
3	6	1055	2501	H3H4	FPUP	F4P5	4CHA	8APP	202C

* Valid ROM part numbers:

ROM Number	Part Number
1	08902-80090
2	08902-80091
3	08902-80092

Table 8D–16i. Data Line Signatures, (√3) Step 9 (2718A and above)

Test Point	Signature*	Test Point	Signature*
DATA 0	AU23	DATA 4	7A46
DATA 1	F8A4	DATA 5	H187
DATA 2	56H1	DATA 6	252P
DATA 3	F364	DATA 7	4FU3

*Valid ROM part numbers:

ROM Number	Part Number
1	08901-80105
2	08901-80106
3	08902-80107

⟨√4⟩ CPU External Register (RAM) Check

1. Perform the Power-Up Checks on Service Sheet BD1.

⟨√5⟩ CPU I/O Port Check

1. If the Digital Test/Extender Board is not already extending A12 or A13, plug it into the empty slot in the Digital Section.

NOTE

Check that the ROMC switches on the extender board are in the OPEN position.

2. Key in 0.2 SPCL. Check the INSTRUMENT BUS test points on the extender board with an oscilloscope or signature analyzer probe (used as a logic probe) as listed in Table 8D–17. If faulty, see Service Sheet 24 and check the CPU and I/O port decoders and buffers.

Table 8D–17. *Instrument Bus Data,* ⟨√4⟩ *Step 2*

Test Point	Measured Signal
ENABLE 2	Low-Going TTL Pulses, Period ≈60 ms
SELECT 0 to 3	TTL Low
DATA (H) 0 to 3	TTL Low
DATA (L) 0 to 3	TTL High

3. Key in 0.2 S (Shift) 5 S 5 SPCL. Recheck the test points listed in Table 8D–18. If faulty, see Service Sheet 24 and check the CPU and I/O port decoders and buffers.

Table 8D–18. *Instrument Bus Data,* ⟨√4⟩ *Step 3.*

Test Point	Measured Signal
SELECT 0 to 3	TTL High
DATA (H) 0 to 3	TTL High
DATA (L) 0 to 3	TTL Low

4. Key in the Special Functions listed in Table 8D–19. For each entry, the indicated ENABLE test point on the extender board should show low-going TTL pulses with a period of approximately 60 ms. All other ENABLE test points should be TTL highs. If faulty, see Service Sheet 24 and check the Enable Decoder and CPU.

Table 8D–19. *Instrument Bus Data,* ⟨√4⟩ *Step 4*

Special Function	Test Point
0.0	ENABLE 0
0.1	ENABLE 1
0.3	ENABLE 3
0.4	ENABLE 4
0.5	ENABLE 5
0.6	ENABLE 6
0.7	ENABLE 7

⟨√6⟩ Keyboard Key Check

1. Key in 60.0 SPCL. As the Special Function code is entered, 60.0 should appear in the display. This indicates that the Controller responds to keyboard interrupts. If faulty, see ⟨√7⟩ and ⟨√8⟩. While the SPCL key is down, 35 should appear in the display. After releasing the SPCL key, 99 should appear in the display. If another number appears, continue on.
2. Jumper A13TP3 (INT) to A13TP15 (GND). This defeats the keyboard interrupt.
3. Press the keys one at a time and compare the display with the key codes shown in Figure 8D-8. If a code other than 99 appears in the display with no key pressed, the key corresponding to the displayed key code is probably stuck down; see Service Sheet 25. If a wrong code appears for one or more keys, check the corresponding key and decoder; see Service Sheet 25.

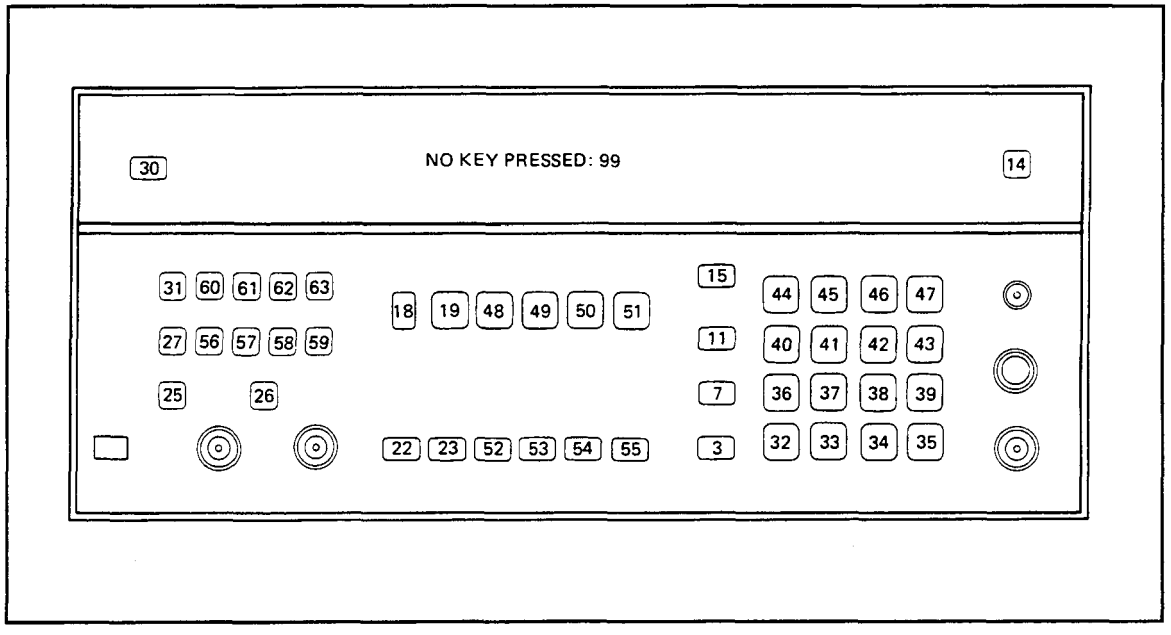


Figure 8D-8. *Key Codes for Key Scan*

⟨√7⟩ Keyboard Interrupt Check

1. Connect high-impedance, dc coupled oscilloscope to A13TP3 (INT). The voltage should read a TTL high. Pressing any key should result in a TTL low which should remain low for 40 to 60 ms after the key is released. If faulty, see Service Sheet 25 and check the Keystroke Detector.

⟨√8⟩ Front-Panel LED Check

1. Perform the Front-Panel LED Check on Service Sheets 26 and 27.

⟨√9⟩ HP-IB Check

1. See Service Sheet 28.

⟨√10⟩ Nonvolatile Memory Backup Check

1. Measure A13TP13 (BATT) with a dc voltmeter. The voltages should be between 2.7 and 2.9 Vdc. Repeat the measurement with POWER set to STBY. The voltage should not change. If faulty, see Service Sheet 24 and check the Nonvolatile Memory Supply.

   Hint: The switching point between the normal and backup memory is adjustable. See *Adjustment 22—Battery Backup* in Section 5.

⟨√11⟩ Power Supply Check

1. Check test points A10TP2 through TP7 with a dc voltmeter. The voltages should be within the limits shown on Block Diagram 5. If a short on the supply is suspected, continue with step 2. If a regulator is suspected, see Service Sheets 31 and 32.

NOTE

The supplies are interdependent. Often a short on one supply will shut down another. All supplies are dependent on the +15V Supply.

The switched +15V Supply line is normally grounded when the instrument is in standby. The +15V Supply (unswitched) LED should remain lighted when the POWER is set to STBY.

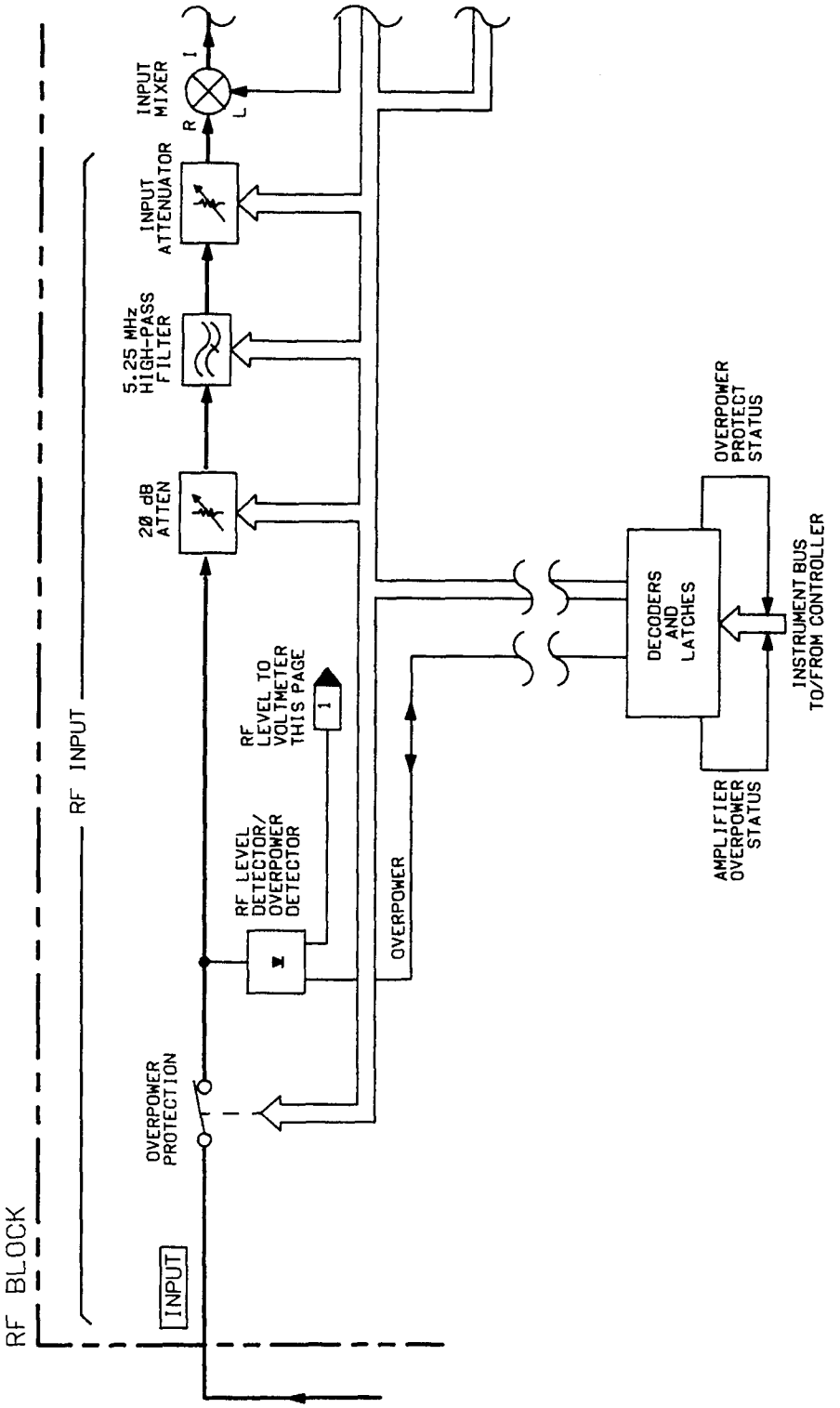
2. Remove the plugs connected to A26J6 (RF SECTION), A26J3 (DIGITAL SECTION), and A26J2 (AUDIO SECTION) one at a time and observe the five power supply LEDs. (The plugs are located on the circuit side of the A26 Power Supply Motherboard.) An extinguished LED will light when the short is removed from the supply. The assemblies in the faulty section can then be removed one at a time until the one with the short is discovered.
3. Remove the plug connected to A26J1 (KEYBOARD). (This plug is on the component side.) Jumper pins 2 and 6 of A26J1 (where the green and black wires of W13 normally connect) to turn the instrument on. If the short is on the A1 Keyboard and Display Assembly, the extinguished LED will light. If the short still persists, see Service Sheets 31 and 32 and check the faulty regulator.

CHANGES

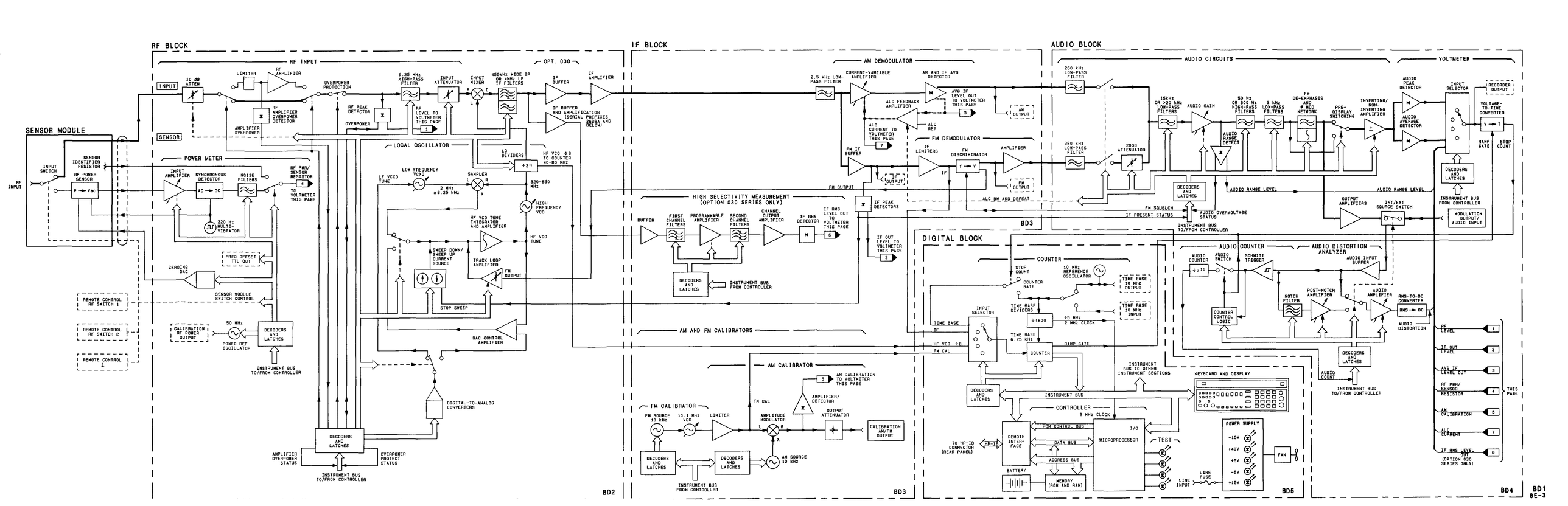
All serial prefixes

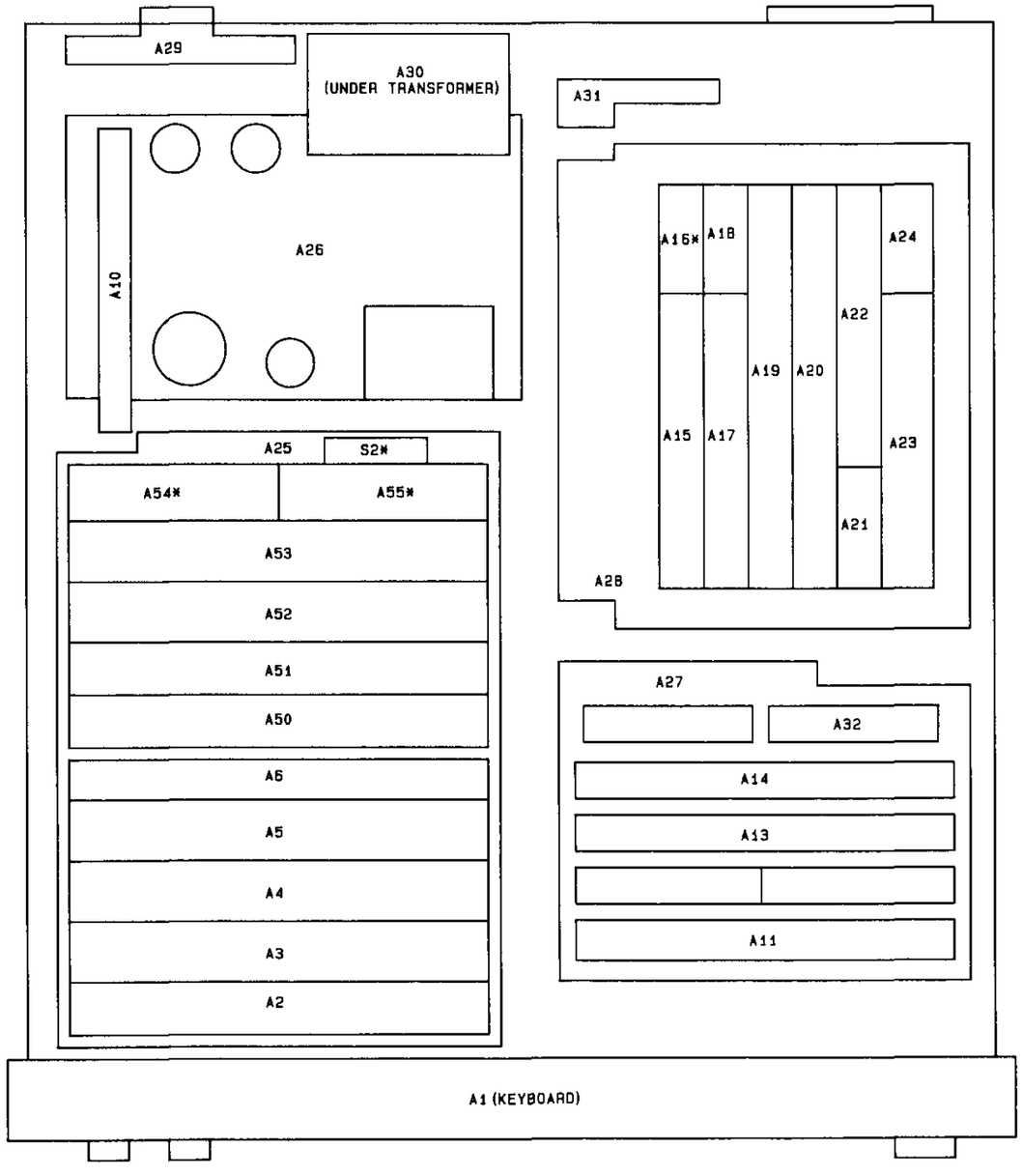
On the Block Diagram:

- Replace the RF INPUT portion of the schematic with the partial on page 8E-2.1.



RF BLOCK (P/O ERRATA)

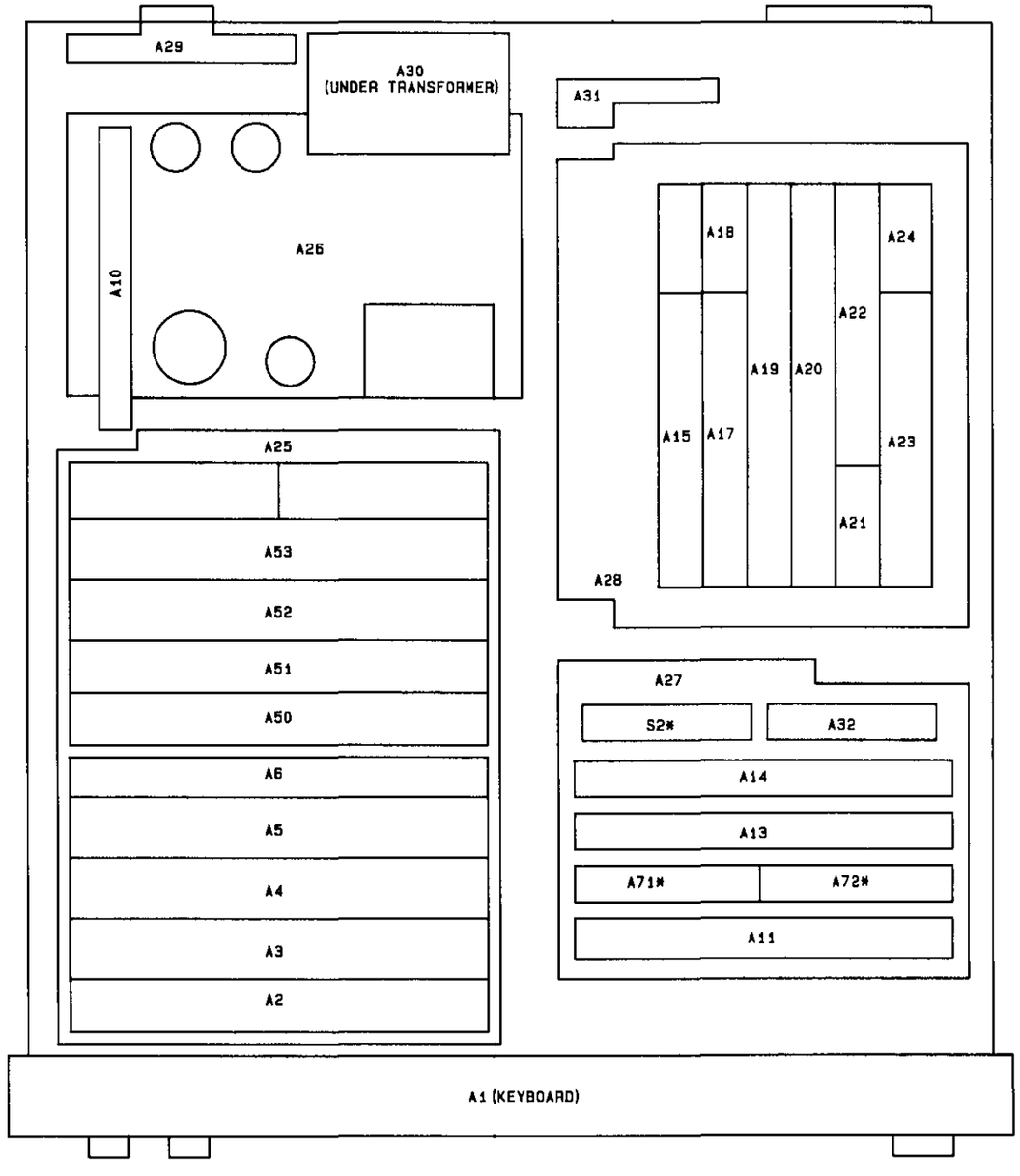

RF BLOCK
IF BLOCK
AUDIO BLOCK
DIGITAL BLOCK
SENSOR MODULE
RF INPUT
OPT. 030
INPUT
SENSOR
10 dB ATTEN
LIMITER
RF AMPLIFIER
OVERPOWER PROTECTION
AMPLIFIER OVERPOWER
RF AMPLIFIER OVERPOWER DETECTOR
RF PEAK DETECTOR
OVERPOWER
5.25 MHz HIGH-PASS FILTER
INPUT ATTENUATOR
INPUT MIXER
455kHz WIDE BP OR 4MHz LP IF FILTERS
IF BUFFER
IF AMPLIFIER
IF BUFFER AND AMPLIFICATION (SERIAL PREFIXES 2838A AND BELOW)
RF LEVEL TO VOLTMETER THIS PAGE
POWER METER
INPUT SWITCH
SENSOR IDENTIFIER RESISTOR
RF POWER SENSOR
P → Vac
INPUT AMPLIFIER
SYNCHRONOUS DETECTOR
AC → DC
NOISE FILTERS
RF PWR/ SENSOR RESISTOR
TO VOLTMETER THIS PAGE
320 Hz MULTI-VIBRATOR
FREQ OFFSET TTL OUT
ZEROING DAC
SENSOR MODULE SWITCH CONTROL
REMOTE CONTROL RF SWITCH 1
REMOTE CONTROL RF SWITCH 2
REMOTE CONTROL 1
CALIBRATION RF POWER OUTPUT
50 MHz
POWER REF OSCILLATOR
DECODERS AND LATCHES
INSTRUMENT BUS TO/FROM CONTROLLER
LOCAL OSCILLATOR
LO DIVIDERS
÷2ⁿ
HF VCO ÷8 TO COUNTER 40-80 MHz
LOW FREQUENCY VCXO
LF VCXO TUNE
2 MHz ±6.25 kHz
SAMPLER
320-650 MHz
HIGH FREQUENCY VCO
HF VCO TUNE INTEGRATOR AND AMPLIFIER
HF VCO TUNE
SWEEP DOWN/ SWEEP UP CURRENT SOURCE
TRACK LOOP AMPLIFIER
FM OUTPUT
STOP SWEEP
DAC CONTROL AMPLIFIER
DIGITAL-TO-ANALOG CONVERTERS
AMPLIFIER OVERPOWER STATUS
OVERPOWER PROTECT STATUS
BD2
AM DEMODULATOR
2.5 MHz LOW-PASS FILTER
CURRENT-VARIABLE AMPLIFIER
AM AND IF AVG DETECTOR
AVG IF LEVEL OUT TO VOLTMETER THIS PAGE
AM OUTPUT
ALC FEEDBACK AMPLIFIER
ALC REF
ALC CURRENT TO VOLTMETER THIS PAGE
FM IF BUFFER
FM DEMODULATOR
IF LIMITERS
FM DISCRIMINATOR
f → V
AMPLIFIER
FM OUTPUT
IF OUTPUT
FM OUTPUT
ALC PM AND DEFEAT
HIGH SELECTIVITY MEASUREMENT (OPTION 030 SERIES ONLY)
BUFFER
FIRST CHANNEL FILTERS
PROGRAMMABLE AMPLIFIER
SECOND CHANNEL FILTERS
CHANNEL OUTPUT AMPLIFIER
IF RMS DETECTOR
IF RMS LEVEL OUT TO VOLTMETER THIS PAGE
IF PEAK DETECTORS
IF OUT LEVEL TO VOLTMETER THIS PAGE
DECODERS AND LATCHES
INSTRUMENT BUS FROM CONTROLLER
AM AND FM CALIBRATORS
AM CALIBRATOR
AM CALIBRATION TO VOLTMETER THIS PAGE
FM CAL
AMPLITUDE MODULATOR
AMPLIFIER/ DETECTOR
OUTPUT ATTENUATOR
CALIBRATION AM/FM OUTPUT
FM CALIBRATOR
FM SOURCE 10 kHz
10.1 MHz VCO
LIMITER
AM SOURCE 10 kHz
INSTRUMENT BUS FROM CONTROLLER
BD3
AUDIO CIRCUITS
260 kHz LOW-PASS FILTER
280 kHz LOW-PASS FILTER
20dB ATTENUATOR
15kHz OR >20 kHz LOW-PASS FILTERS
AUDIO GAIN
AUDIO RANGE DETECT
50 Hz OR 300 Hz HIGH-PASS FILTERS
3 kHz LOW-PASS FILTERS
FM DE-EMPHASIS AND ✱ WGD NETWORK
PRE-DISPLAY SWITCHING
INVERTING/ NON-INVERTING AMPLIFIER
VOLTMETER
AUDIO PEAK DETECTOR
AUDIO AVERAGE DETECTOR
INPUT SELECTOR
RECORDER OUTPUT
VOLTAGE-TO-TIME CONVERTER
V → T
RAMP GATE
STOP COUNT
DECODERS AND LATCHES
INSTRUMENT BUS FROM CONTROLLER
MODULATION OUTPUT/ AUDIO INPUT
AUDIO RANGE LEVEL
OUTPUT AMPLIFIERS
INT/EXT SOURCE SWITCH
FM SQUELCH
IF PRESENT STATUS
AUDIO OVERVOLTAGE STATUS
INSTRUMENT BUS TO/FROM CONTROLLER
BD4
DIGITAL BLOCK
COUNTER
STOP COUNT
COUNTER GATE
10 MHz REFERENCE OSCILLATOR
TIME BASE 10 MHz OUTPUT
TIME BASE 10 MHz INPUT
TIME BASE DIVIDERS
÷1600
25 MHz 2 MHz CLOCK
TIME BASE
IF
HF VCO ÷8
FM CAL
INPUT SELECTOR
TIME BASE 6.25 kHz
RAMP GATE
COUNTER
INSTRUMENT BUS TO OTHER INSTRUMENT SECTIONS
KEYBOARD AND DISPLAY
DECODERS AND LATCHES
INSTRUMENT BUS
CONTROLLER
2 MHz CLOCK
ROM CONTROL BUS
DATA BUS
ADDRESS BUS
REMOTE INTER-FACE
MICROPROCESSOR
I/O
TEST
TO HP-IB CONNECTOR (REAR PANEL)
HP-IB
BATTERY
MEMORY (ROM AND RAM)
POWER SUPPLY
-15V
+40V
+5V
-5V
+15V
FAN
LINE INPUT
LINE FUSE
BD5
AUDIO COUNTER
AUDIO COUNTER
AUDIO SWITCH
SCHMITT TRIGGER
÷2 16
COUNTER CONTROL LOGIC
AUDIO DISTORTION ANALYZER
AUDIO INPUT BUFFER
NOTCH FILTER
POST-NOTCH AMPLIFIER
AUDIO AMPLIFIER
RMS-TO-DC CONVERTER
RMS → DC
AUDIO DISTORTION
DECODERS AND LATCHES
AUDIO COUNT
INSTRUMENT BUS TO/FROM CONTROLLER
RF LEVEL
IF OUT LEVEL
AVG IF LEVEL OUT
RF PWR/ SENSOR RESISTOR
AM CALIBRATION
ALC CURRENT
IF RMS LEVEL OUT (OPTION 030 SERIES ONLY)
THIS PAGE
BD4
BD1
8E-3



*Option 030 assemblies only available for instruments with serial number prefixes 2314A TO 2636A.

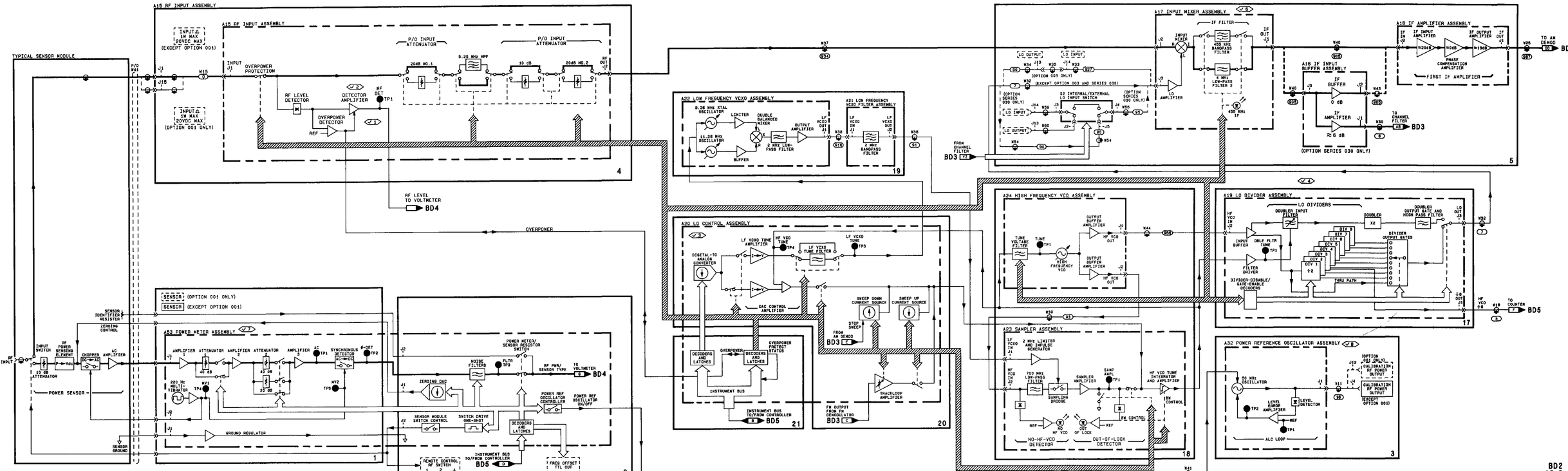
OVERALL BLOCK DIAGRAM **BD 1**

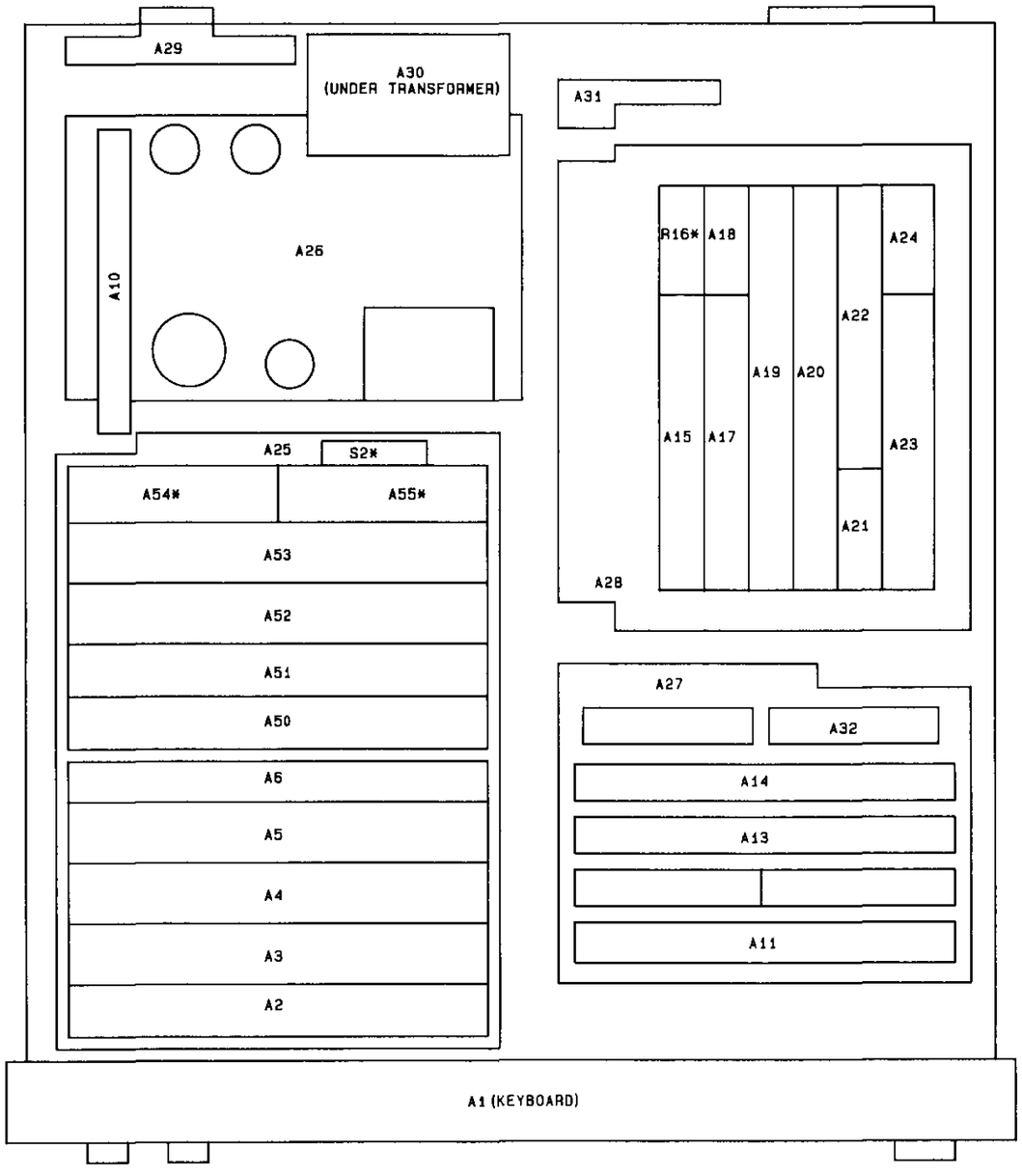
SEE REVERSE SIDE



*Option 030 assemblies only available for instruments with serial number prefixes 2542A and above.

Block Diagram Assembly Locations

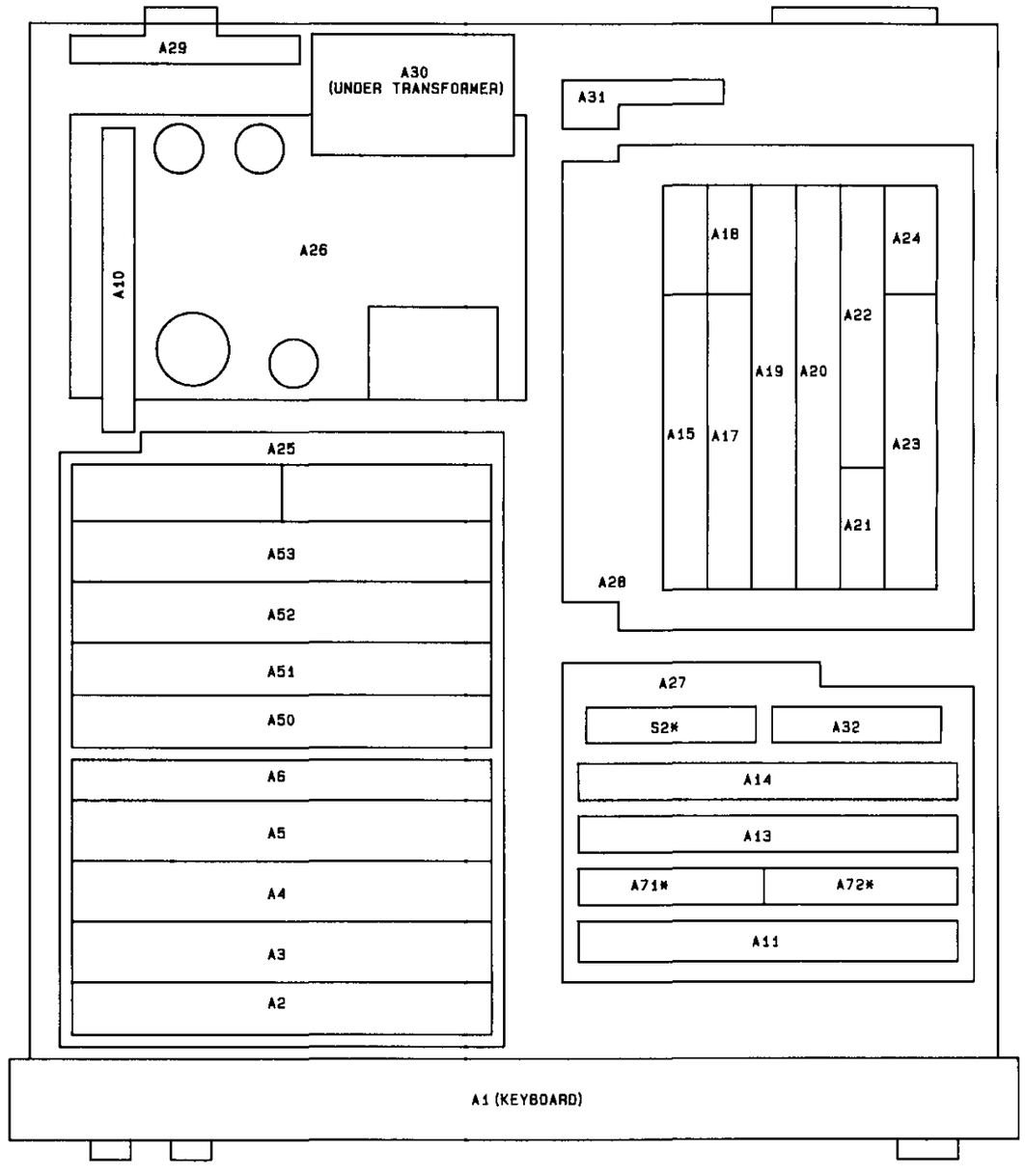

TYPICAL SENSOR MODULE
A15 RF INPUT ASSEMBLY
INPUT ⚠ 1W MAX 20VDC MAX (EXCEPT OPTION 001)
INPUT ⚠ 1W MAX 20VDC MAX (OPTION 001 ONLY)
OVERPOWER PROTECTION
P/O INPUT ATTENUATOR
20dB NO.1
5.25 MHz HPF
10 dB
20dB NO.2
RF OUT
RF LEVEL DETECTOR
OVERPOWER DETECTOR
DETECTOR AMPLIFIER
RF DET
REF
RF LEVEL TO VOLTMETER
BD4
OVERPOWER
A22 LOW FREQUENCY VCXO ASSEMBLY
9.28 MHz XTAL OSCILLATOR
11.28 MHz OSCILLATOR
LIMITER
DOUBLE BALANCED MIXER
BUFFER
2 MHz LOW-PASS FILTER
OUTPUT AMPLIFIER
LF VCXO OUT
A21 LOW FREQUENCY VCXO FILTER ASSEMBLY
LF VCXO IN
LF VCXO OUT
2 MHz BANDPASS FILTER
19
FROM CHANNEL FILTER BD3
A17 INPUT MIXER ASSEMBLY
IF FILTER
LO OUTPUT
LO INPUT
(OPTION 003 ONLY)
(EXCEPT OPTION 003 AND SERIES 030)
50 INTERNAL/EXTERNAL LO INPUT SWITCH
(OPTION SERIES 030 ONLY)
INPUT MIXER
LO AMPLIFIER
455 KHz BANDPASS FILTER
2 MHz LOW-PASS FILTER 2
455 KHz IF
A16 IF INPUT BUFFER ASSEMBLY
IF BUFFER AMPLIFIER
0 dB
≈5 dB
(OPTION SERIES 030 ONLY)
TO CHANNEL FILTER BD3
A18 IF AMPLIFIER ASSEMBLY
IF INPUT AMPLIFIER
≈20dB
≈0dB
≈13dB
IF OUTPUT AMPLIFIER
PHASE COMPENSATION AMPLIFIER
FIRST IF AMPLIFIER
TO AM DEMOD BD3
5
A24 HIGH FREQUENCY VCO ASSEMBLY
TUNE VOLTAGE FILTER
TUNE
HIGH FREQUENCY VCO
OUTPUT BUFFER AMPLIFIER
HF VCO OUT
A19 LO DIVIDER ASSEMBLY
LO DIVIDERS
HF VCO IN
DOUBLER INPUT FILTER
DOUBLER X2
DOUBLER OUTPUT GATE AND HIGH PASS FILTER
LO OUT
INPUT BUFFER
DBLR FLTR TUNE
FILTER DRIVER
DIVIDER-DISABLE/GATE-ENABLE DECODER
DIVIDER OUTPUT GATES
DIV 8
DIV 4
DIV 2
DIV 1
÷2
THRU PATH
÷8 OUT
HF VCO ÷8
TO COUNTER BD5
17
A20 LO CONTROL ASSEMBLY
DIGITAL-TO ANALOG CONVERTER
LF VCXO TUNE AMPLIFIER
HF VCO TUNE
LF VCXO TUNE FILTER
LF VCXO TUNE
DAC CONTROL AMPLIFIER
SWEEP DOWN CURRENT SOURCE
SWEEP UP CURRENT SOURCE
STOP SWEEP
FROM AM DEMOD BD3
DECODERS AND LATCHES
OVERPOWER
OVERPOWER PROTECT STATUS
INSTRUMENT BUS
INSTRUMENT BUS TO/FROM CONTROLLER BD5
FM OUTPUT FROM FM DEMODULATOR BD3
TRACKLOOP AMPLIFIER
21
20
A23 SAMPLER ASSEMBLY
LF VCXO IN
HF VCO IN
2 MHz LIMITER AND IMPULSE GENERATOR
700 MHz LOW-PASS FILTER
SAMPLING BRIDGE
SAMPLER AMPLIFIER
SAMP ANRC
HF VCO TUNE INTEGRATOR AND AMPLIFIER
IBX CONTROL
FM CONTROL
NO-HF-VCO DETECTOR
NO HF VCO
OUT-OF-LOCK DETECTOR
OUT OF LOCK
18
A32 POWER REFERENCE OSCILLATOR ASSEMBLY
50 MHz OSCILLATOR
LEVEL ERROR AMPLIFIER
LEVEL DETECTOR
ALC LOOP
OPTION 003 ONLY: CALIBRATION RF POWER OUTPUT
EXCEPT OPTION 003: CALIBRATION RF POWER OUTPUT
3
SENSOR (OPTION 001 ONLY)
SENSOR (EXCEPT OPTION 001)
SENSOR IDENTIFIER RESISTER
ZEROING CONTROL
A53 POWER METER ASSEMBLY
RF INPUT
INPUT SWITCH
RF POWER SENSING ELEMENT
10 dB ATTENUATOR
CHOPPER
AC AMPLIFIER
POWER SENSOR
AMPLIFIER 1
ATTENUATOR 1
AMPLIFIER 2
ATTENUATOR 2
AMPLIFIER 3
AC TP1
SYNCHRONOUS DETECTOR
A-DET TP2
40 dB
20 dB
220 Hz MULTI VIBRATOR
TP4
WV1
TP5
WV2
POWER METER/ SENSOR RESISTOR SWITCH
NOISE FILTERS
FLTR TP3
RF PWR/ SENSOR TYPE
TO VOLTMETER BD4
ZEROING DAC
POWER REF OSCILLATOR CONTROLLER
POWER REF OSCILLATOR ON/OFF
SENSOR MODULE SWITCH CONTROL
SWITCH DRIVE ONE-SHOT
DECODERS AND LATCHES
GROUND REGULATOR
SENSOR GROUND
REMOTE CONTROL RF SWITCH
INSTRUMENT BUS TO/FROM CONTROLLER BD5
FREQ OFFSET TTL OUT
1
2
BD2
8E-5



*Option 030 assemblies only available for instruments with serial number prefixes 2314A TO 2636A.

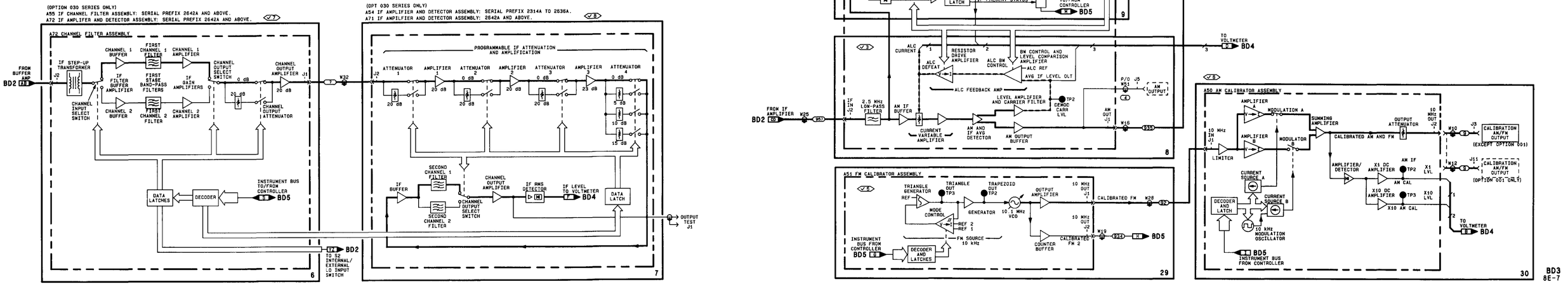
RF SECTION BD2

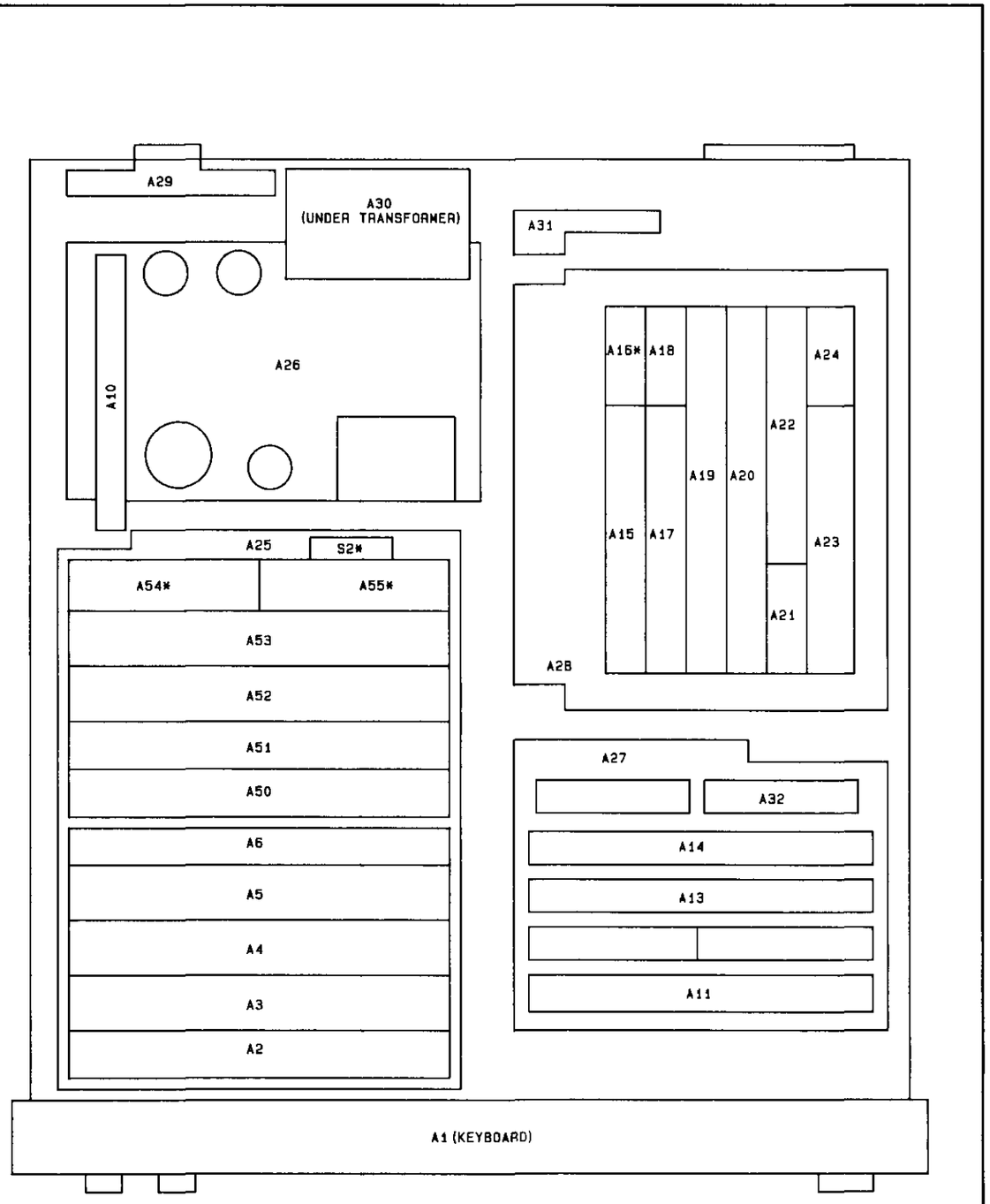
SEE REVERSE SIDE



*Option 030 assemblies only available for instruments with serial number prefixes 2642A and above.

Block Diagram Assembly Locations

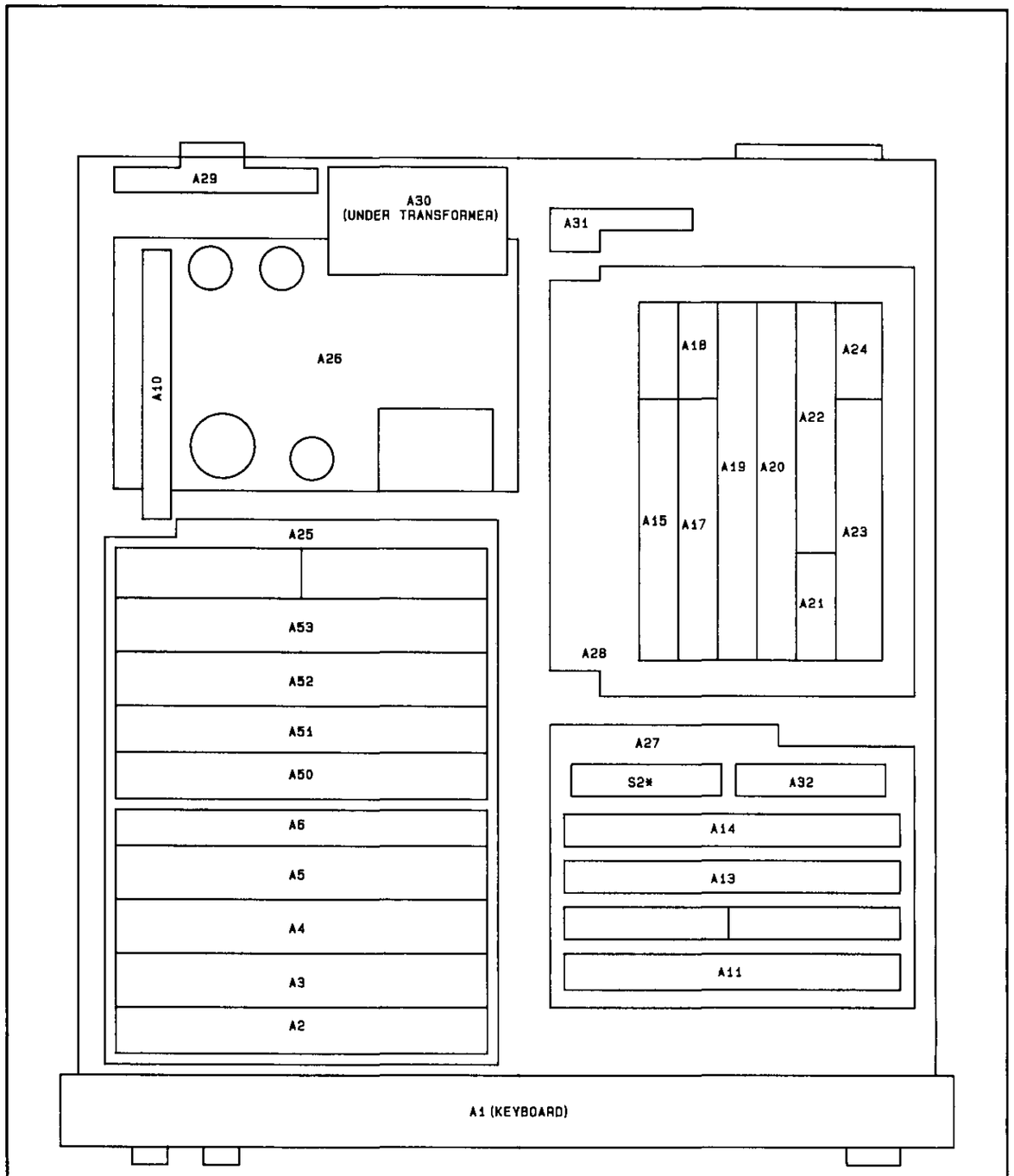

(OPTION 030 SERIES ONLY)
A55 IF CHANNEL FILTER ASSEMBLY: SERIAL PREFIX 2642A AND ABOVE.
A72 IF AMPLIFIER AND DETECTOR ASSEMBLY: SERIAL PREFIX 2642A AND ABOVE.
A72 CHANNEL FILTER ASSEMBLY
FROM BUFFER AMP BD2 A8
IF STEP-UP TRANSFORMER
CHANNEL INPUT SELECT SWITCH
CHANNEL 1 BUFFER
IF FILTER BUFFER AMPLIFIER
CHANNEL 2 BUFFER
FIRST CHANNEL 1 FILTER
FIRST STABE BAND-PASS FILTERS
FIRST CHANNEL 2 FILTER
CHANNEL 1 AMPLIFIER
IF GAIN AMPLIFIERS
CHANNEL 2 AMPLIFIER
CHANNEL OUTPUT SELECT SWITCH
0 dB
20 dB
CHANNEL OUTPUT ATTENUATOR
CHANNEL OUTPUT AMPLIFIER
DATA LATCHES
DECODER
INSTRUMENT BUS TO/FROM CONTROLLER
BD5
TO SZ INTERNAL/ EXTERNAL LO INPUT SWITCH
BD2
6
(OPT 030 SERIES ONLY)
A54 IF AMPLIFIER AND DETECTOR ASSEMBLY: SERIAL PREFIX 2314A TO 2636A.
A71 IF AMPLIFIER AND DETECTOR ASSEMBLY: 2642A AND ABOVE.
PROGRAMMABLE IF ATTENUATION AND AMPLIFICATION
ATTENUATOR 1
AMPLIFIER 1
ATTENUATOR 2
AMPLIFIER 2
ATTENUATOR 3
AMPLIFIER 3
ATTENUATOR 4
20 dB
0 dB
25 dB
5 dB
10 dB
15 dB
IF BUFFER
SECOND CHANNEL 1 FILTER
SECOND CHANNEL 2 FILTER
CHANNEL OUTPUT AMPLIFIER
CHANNEL OUTPUT SELECT SWITCH
IF RMS DETECTOR
IF LEVEL TO VOLTMETER
BD4
DATA LATCH
OUTPUT TEST J1
7
A6 AM DEMODULATOR ASSEMBLY
FM IF BUFFER
IF DETECTOR BUFFER
IF PEAK DETECTOR
IF PRESENT DETECTOR
IF PRESENT LATCH
IF PRESENT STATUS
IF OUT LEVEL
STOP SWEEP
TO LO CONTROL
BD2
DECODER AND LATCH
INSTRUMENT BUS TO/FROM CONTROLLER
BD5
9
A4 FM DEMODULATOR ASSEMBLY
COUNTER IF BUFFER
IF LIMITERS
STAGE 1
STAGE 2
STAGE 3
DISC IN TP2
PRECISION LIMITER
CHARGE-COUNT DISCRIMINATOR
DISC OUT TP3
SQUELCH SWITCH
SQUELCH DETECTOR
FW OUTPUT AMPLIFIER
FM OUT J3
TP5
FM OUT
FW SQUELCH
TO LO CONTROL
BD2
10
11
TO COUNTER
BD5
A2 AUDIO FILTERS ASSEMBLY
FM IN J2
AM IN J1
260 kHz LOW-PASS FILTER
P/O BD4
TO/FROM AUDIO DE-EMPHASIS AND OUTPUT ASSEMBLY
BD4
TO VOLTMETER
BD4
ALC CURRENT
ALC DEFEAT
RESISTOR DRIVE AMPLIFIER
ALC BW CONTROL
BW CONTROL AND LEVEL COMPARISON AMPLIFIER
ALC REF
AVG IF LEVEL OUT
ALC FEEDBACK AMP
LEVEL AMPLIFIER AND CARRIER FILTER
TP2
DEMOD CARR LVL
AM OUT J1
AM OUTPUT
FROM IF AMPLIFIER W26
BD2
IF IN J2
2.5 MHz LOW-PASS FILTER
AM IF BUFFER
CURRENT VARIABLE AMPLIFIER
AM AND IF AVG DETECTOR
AM OUTPUT BUFFER
8
A51 FM CALIBRATOR ASSEMBLY
TRIANGLE GENERATOR
REF
TRIANGLE OUT TP3
TRAPEZOID OUT TP2
MODE CONTROL
GENERATOR
10.1 MHz VCO
OUTPUT AMPLIFIER
10 MHz OUT J1
CALIBRATED FM
W28
BD2
10 MHz OUT J2
CALIBRATED FM 2
W19
BD5
REF 2
REF 1
FM SOURCE 10 kHz
COUNTER BUFFER
INSTRUMENT BUS FROM CONTROLLER BD5
DECODER AND LATCHES
29
A50 AM CALIBRATOR ASSEMBLY
AMPLIFIER A
AMPLIFIER B
MODULATION A
MODULATOR B
SUMMING AMPLIFIER
OUTPUT ATTENUATOR
10 MHz OUT J2
10 MHz IN J1
LIMITER
CALIBRATED AM AND FM
CALIBRATION AM/FM OUTPUT
(EXCEPT OPTION 001)
CURRENT SOURCE A
CURRENT SOURCE B
DECODER AND LATCH
10 kHz MODULATION OSCILLATOR
BD5 INSTRUMENT BUS FROM CONTROLLER
AMPLIFIER/ DETECTOR
X1 DC AMPLIFIER
AM IF
AM CAL
X1 LVL
X10 DC AMPLIFIER
X10 LVL
X10 AM CAL
CALIBRATION AM/FM OUTPUT
(OPTION 001 ONLY)
TO VOLTMETER
BD4
30
BD3
8E-7



*Option 030 assemblies only available for instruments with serial number prefixes 2314A TO 2636A.

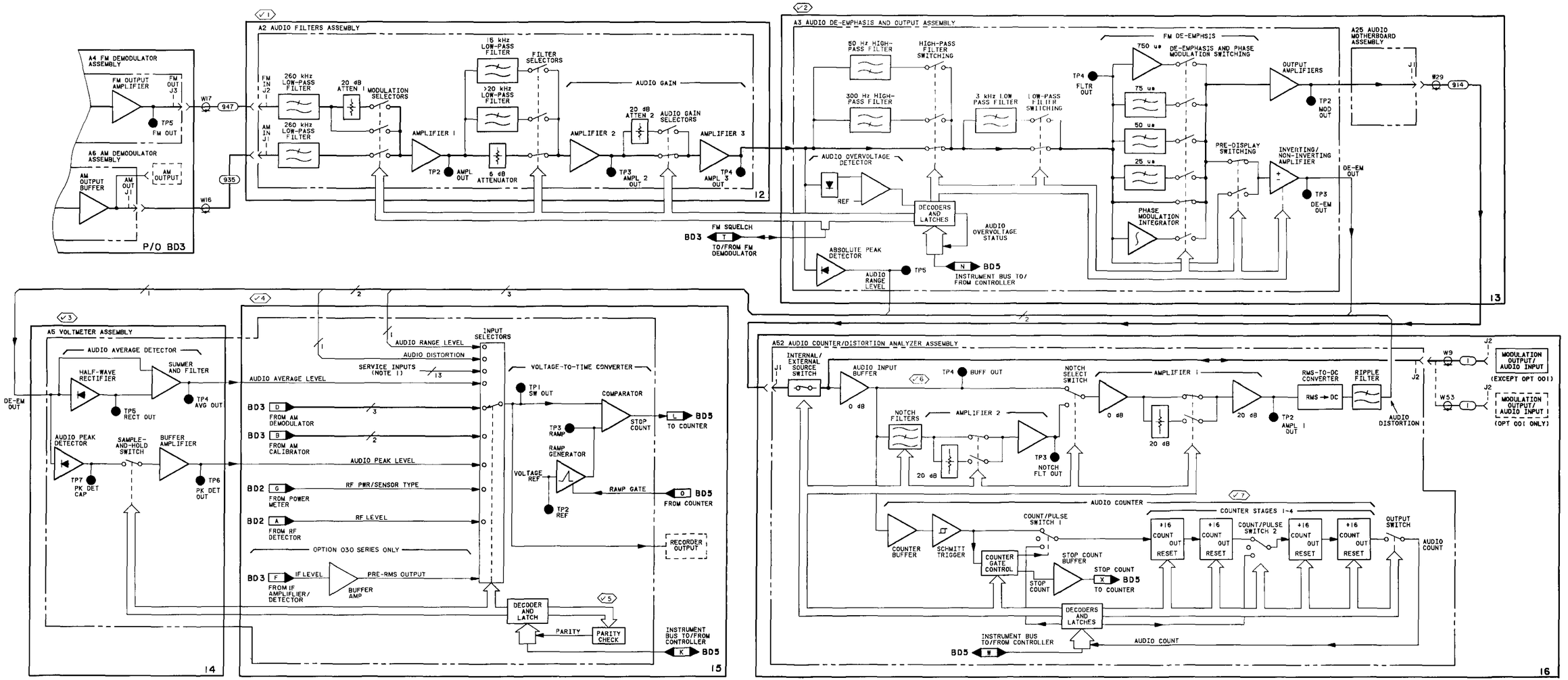
IF SECTION BD3

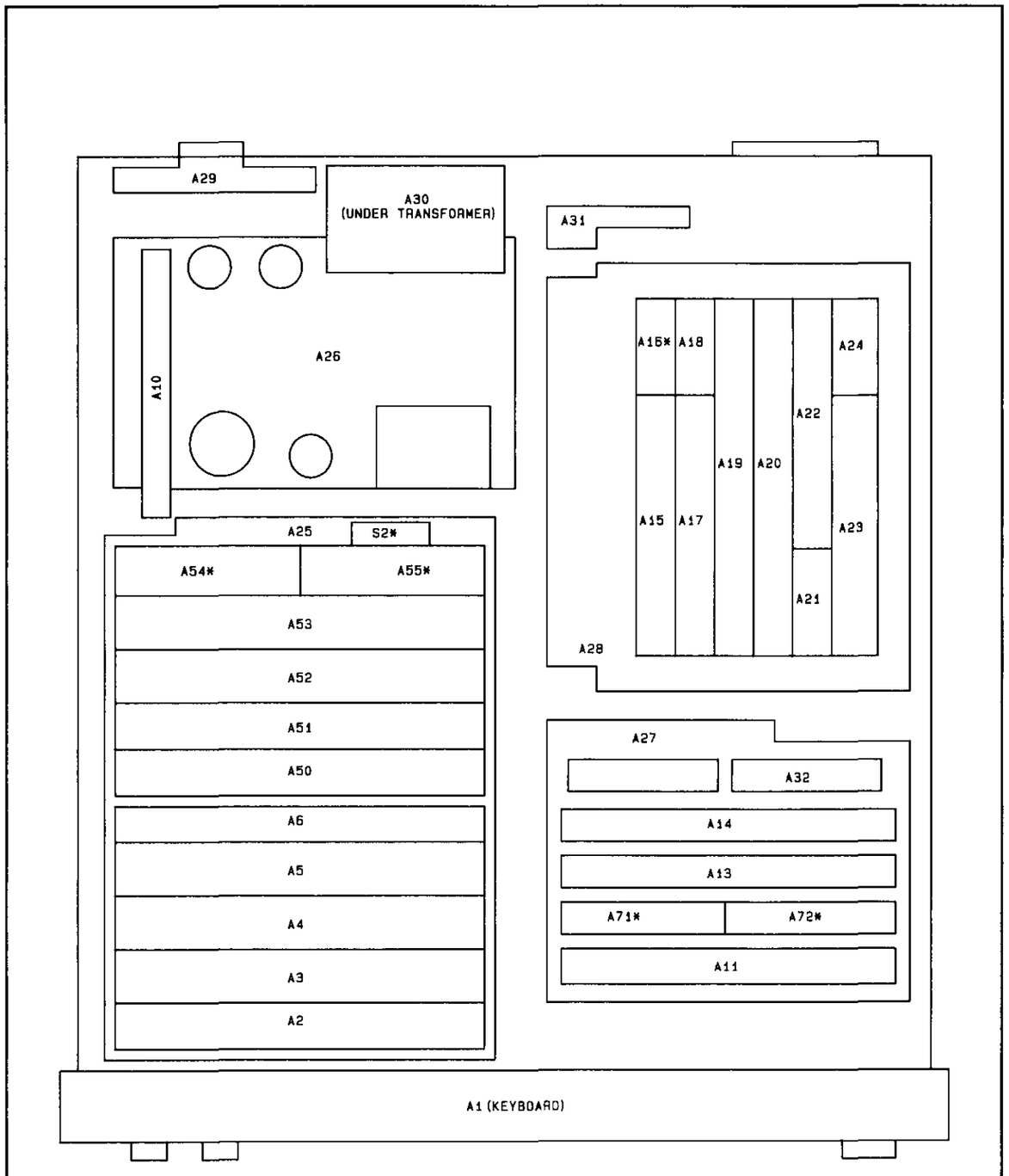
SEE REVERSE SIDE



*Option 030 assemblies only available for instruments with serial number prefixes 2642A and above.

Block Diagram Assembly Locations

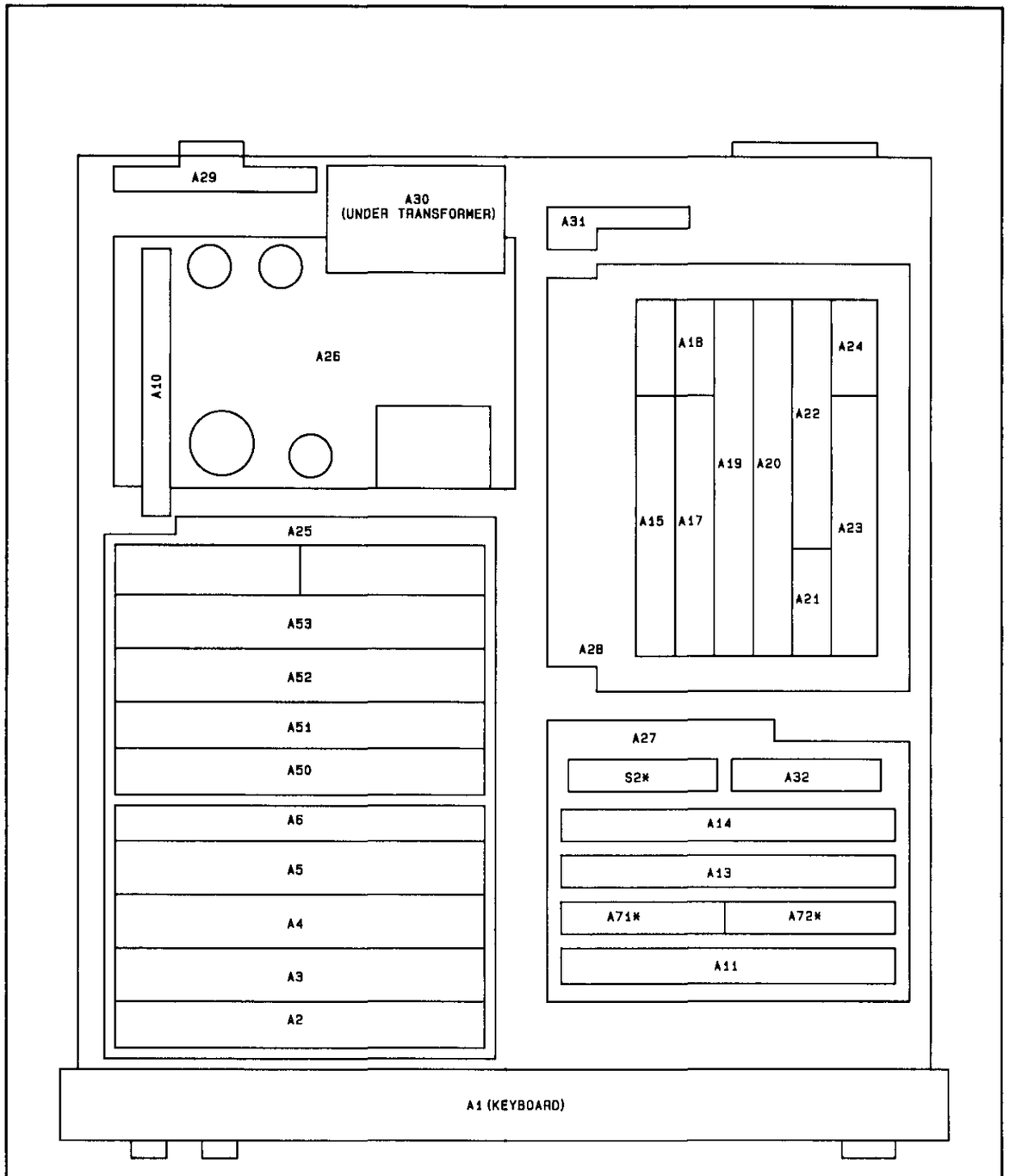

A4 FM DEMODULATOR ASSEMBLY
FM OUTPUT AMPLIFIER
FM OUT J3
TP5 FM OUT
A6 AM DEMODULATOR ASSEMBLY
AM OUTPUT BUFFER
AM OUT J1
AM OUTPUT
P/O BD3
W17
947
935
W16
A2 AUDIO FILTERS ASSEMBLY
FM IN J2
AM IN J1
260 kHz LOW-PASS FILTER
260 kHz LOW-PASS FILTER
20 dB ATTEN 1
MODULATION SELECTORS
15 kHz LOW-PASS FILTER
>20 kHz LOW-PASS FILTER
FILTER SELECTORS
AUDIO GAIN
AMPLIFIER 1
TP2 AMPL OUT
6 dB ATTENUATOR
AMPLIFIER 2
20 dB ATTEN 2
AUDIO GAIN SELECTORS
TP3 AMPL 2 OUT
AMPLIFIER 3
TP4 AMPL 3 OUT
12
A3 AUDIO DE-EMPHASIS AND OUTPUT ASSEMBLY
50 Hz HIGH-PASS FILTER
300 Hz HIGH-PASS FILTER
HIGH-PASS FILTER SWITCHING
3 kHz LOW PASS FILTER
LOW-PASS FILTER SWITCHING
AUDIO OVERVOLTAGE DETECTOR
REF
DECODERS AND LATCHES
AUDIO OVERVOLTAGE STATUS
ABSOLUTE PEAK DETECTOR
AUDIO RANGE LEVEL
TP5
FM SQUELCH
BD3 T
TO/FROM FM DEMODULATOR
N BD5
INSTRUMENT BUS TO/FROM CONTROLLER
FM DE-EMPHSIS
750 us
75 us
50 us
25 us
DE-EMPHASIS AND PHASE MODULATION SWITCHING
PHASE MODULATION INTEGRATOR
PRE-DISPLAY SWITCHING
INVERTING/ NON-INVERTING AMPLIFIER
TP4 FLTR OUT
OUTPUT AMPLIFIERS
TP2 MOD OUT
TP3 DE-EM OUT
DE-EM OUT
A25 AUDIO MOTHERBOARD ASSEMBLY
J1
W29
914
13
A5 VOLTMETER ASSEMBLY
AUDIO AVERAGE DETECTOR
HALF-WAVE RECTIFIER
SUMMER AND FILTER
TP5 RECT OUT
TP4 AVG OUT
DE-EM OUT
AUDIO PEAK DETECTOR
SAMPLE-AND-HOLD SWITCH
BUFFER AMPLIFIER
TP7 PK DET CAP
TP6 PK DET OUT
14
AUDIO RANGE LEVEL
AUDIO DISTORTION
SERVICE INPUTS (NOTE 1)
13
INPUT SELECTORS
AUDIO AVERAGE LEVEL
BD3 D FROM AM DEMODULATOR
3
BD3 B FROM AM CALIBRATOR
2
AUDIO PEAK LEVEL
BD2 G FROM POWER METER
RF PWR/SENSOR TYPE
BD2 A FROM RF DETECTOR
RF LEVEL
OPTION 030 SERIES ONLY
BD3 F FROM IF AMPLIFLIER/ DETECTOR
IF LEVEL
BUFFER AMP
PRE-RMS OUTPUT
VOLTAGE-TO-TIME CONVERTER
TP1 SW OUT
COMPARATOR
STOP COUNT
L BD5 TO COUNTER
TP3 RAMP
RAMP GENERATOR
VOLTAGE REF
TP2 REF
RAMP GATE
O BD5 FROM COUNTER
RECORDER OUTPUT
DECODER AND LATCH
PARITY
PARITY CHECK
INSTRUMENT BUS TO/FROM CONTROLLER
K BD5
15
A52 AUDIO COUNTER/DISTORTION ANALYZER ASSEMBLY
INTERNAL/ EXTERNAL SOURCE SWITCH
AUDIO INPUT BUFFER
0 dB
TP4 BUFF OUT
NOTCH SELECT SWITCH
AMPLIFIER 1
NOTCH FILTERS
AMPLIFIER 2
20 dB
TP3 NOTCH FLT OUT
0 dB
20 dB
20 dB
TP2 AMPL 1 OUT
RMS-TO-DC CONVERTER
RMS → DC
RIPPLE FILTER
AUDIO DISTORTION
J2
W9
MODULATION OUTPUT/ AUDIO INPUT
(EXCEPT OPT 001)
W53
MODULATION OUTPUT/ AUDIO INPUT
(OPT 001 ONLY)
AUDIO COUNTER
COUNTER STAGES 1-4
COUNTER BUFFER
SCHMITT TRIGGER
COUNT/PULSE SWITCH 1
COUNTER GATE CONTROL
STOP COUNT BUFFER
STOP COUNT
X BD5 STOP COUNT TO COUNTER
+16 COUNT OUT RESET
+16 COUNT OUT RESET
COUNT/PULSE SWITCH 2
+16 COUNT OUT RESET
+16 COUNT OUT RESET
OUTPUT SWITCH
AUDIO COUNT
DECODERS AND LATCHES
INSTRUMENT BUS TO/FROM CONTROLLER
BD5 W
AUDIO COUNT
16



*Option 030 assemblies only available for instruments with serial number prefixes 2314A TO 2636A.

AUDIO SECTION BD4

SEE REVERSE SIDE



*Option 030 assemblies only available for instruments with serial number prefixes 2642A and above.

Block Diagram Assembly Locations

A11 COUNTER ASSEMBLY
FROM LO DIVIDERS
FROM FM DEMODULATOR
FROM FM CALIBRATOR
FROM AUDIO COUNTER/ DISTORTION ANALYZER
FROM VOLTMETER
HF VCO ÷8
STAGE 1
STAGE 2
STAGE 3
STAGE 4
INPUT SELECTOR
COUNTER OUTPUT AND TIME BASE GATE
COUNT TRANSFER LOGIC
EXT TB REF
INT TB REF
SELECTED TB REF
VOLTMETER/AUDIO
VM/AUDIO GATE
STOP COUNT
VOLTMETER/AUDIO GATE
FROM XTAL OSCILLATOR (OPTION 002 ONLY)
THIS PAGE, UPPER RIGHT
TIME BASE 10 MHz INPUT
10 MHz REFERENCE OSCILLATOR
(EXCEPT OPTION 002)
TIME BASE DIVIDERS
TIME BASE SELECT SWITCH
COUNTER GATE CONTROL
RAMP GATE
TO VOLTMETER
CLOCK IN
CLOCK OUT
DECODER AND LATCH
(OPTION 002 ONLY)
TIME BASE 10 MHz OUTPUT
INSTRUMENT BUS TO/FROM LO CONTROL
INSTRUMENT BUS
BUFFERED SELECT #0-#3
BUFFERED DATA #0-#3
UNBUFFERED DATA #0-#3
AUDIO COUNTER/ DISTORTION ANALYZER
INSTRUMENT BUS FROM
FM CALIBRATOR
AM CALIBRATOR
POWER METER
VOLTMETER
AUDIO DE-EMPHASIS
AM DEMODULATOR
IF CHANNEL FILTER
INSTRUMENT BUS TO/FROM
A10 POWER SUPPLY REGULATORS ASSEMBLY
LINE TRANSFORMER
A26 POWER SUPPLY MOTHERBOARD ASSEMBLY
RECTIFIERS
LINE FUSE
LINE INPUT
P/O ON/STBY RELAY
POWER ON/STBY
FAN
+15V REGULATOR
-15V REGULATOR
+40V REGULATOR
+5V REGULATOR
-5V REGULATOR
SENSE INPUT
HIGH-STABILITY CRYSTAL OSCILLATOR (OPTION 002 ONLY)
TO COUNTER THIS PAGE
LEFT PORTION OF DIAGRAM
+15V (UNSWITCHED)
A1 KEYBOARD AND DISPLAY ASSEMBLY
DIGIT DECODERS
DISPLAY AND DECIMAL POINT LATCHES
LED DECODERS
KEY AND ANNUNCIATOR LIGHT LATCHES
KEYSTROKE DETECTOR
KEY ROW AND COLUMN SCANNERS
FROM KEY SWITCHES
TO KEY SWITCHES
A14 REMOTE INTERFACE ASSEMBLY
REMOTE ENABLE (REN)
INTERFACE CLEAR (IFC)
TALK/LISTEN
ATTENTION
HP-IB I/O
HANDSHAKE
DATA I/O
SERVICE REQUEST (SRQ)
HP-IB
HANDSHAKE LOGIC
INTERFACE CONTROL LOGIC
ADDRESS READBACK
ADDRESS SWITCHES
ADDRESS DECODER
ENABLE REMOTE FLIP-FLOP
SELECT DECODER
P/O MICROPROCESSOR
PERIPHERAL INPUT/OUTPUT PIO
READ ONLY MEMORY (ROM)
MEMORY SELECT DECODER
CONTROL BUS
A13 CONTROLLER ASSEMBLY
+12V AND +5V POWER SUPPLY DROP DETECTOR
NONVOLATILE MEMORY SUPPLY
BATTERY
+12V REGULATOR
CPU EXTERNAL REGISTER (RAM)
MEMORY SELECT DECODERS
STATIC MEMORY INTERFACE (SMI)
CENTRAL PROCESSING UNIT (CPU)
POWER-ON RESET
ENABLE DECODER
BUFFER
ADDRESS A0-A15
DATA DB0-DB7
TEST
EXT INT