

Troubleshooting and Repair Manual

Volume 2

HP 85680B and HP 85670A
Spectrum Analyzer RF Section



HP Part No. 85680-90137V2 Microfiche Part No. 85680-90138
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HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error-free.

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Safety Symbols

The following safety symbols are used throughout this manual. Familiarize yourself with each of the symbols and its meaning before operating this instrument.

Caution



The *caution* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a *caution* sign until the indicated conditions are fully understood and met.

Warning



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

General Safety Considerations

Warning



Before this instrument is switched on, make sure it has been properly grounded through the protective conductor of the ac power cable to a socket outlet provided with protective earth contact.

Any interruption of the protective (grounding) conductor, inside or outside the instrument, or disconnection of the protective earth terminal can result in personal injury.

Warning



There are many points in the instrument which can, if contacted, cause personal injury. Be extremely careful.

Any adjustments or service procedures that require operation of the instrument with protective covers removed should be performed only by trained service personnel.

Caution



Before this instrument is switched on, make sure its primary power circuitry has been adapted to the voltage of the ac power source.

Failure to set the ac power input to the correct voltage could cause damage to the instrument when the ac power cable is plugged in.

Contents

Volume 1

RF Section General Information	General information on the contents of the manual, including storage, shipment, and packaging.
Spectrum Analyzer Overall Troubleshooting	Troubleshooting index, special messages, diagnostic functions, error correction routine, sweep system block diagram and troubleshooting, mnemonics listing, and Spectrum Analyzer Overall Block Diagram.
RF Section Analog Troubleshooting	Phase lock loop operation, start frequency tuning equations, and phase lock troubleshooting.
RF Section Digital Troubleshooting	Instrument preset checks, digital storage verification, and RF Digital Troubleshooting Block Diagram.
A5 Front Panel through A18 275 MHz Phase Lock Oscillator	Service sheets containing circuit descriptions, troubleshooting information, replacement procedures, replaceable parts lists, parts identification, signature analysis troubleshooting diagrams, block diagrams, component locations, and schematic diagrams.

Volume 2

A19 Second IF Amplifier through A27 10 MHz Frequency Standard	Service sheets containing circuit descriptions, troubleshooting information, replacement procedures, replaceable parts lists, parts identification, signature analysis troubleshooting diagrams, block diagrams, component locations, and schematic diagrams.
General Parts Listing	Replaceable parts information and parts identification figures.
Major Assembly and Component Locations	Major assembly and component locations.

A19 and A20

A19 Second IF Amplifier, Circuit Description

A19 Second IF Amplifier receives 301.4 MHz from A23 Second Converter, filters it, and sends the amplified signal to A20 Third Converter. The overall gain of the assembly is about 18 dB.

Amplifier (A)

The common-emitter amplifier circuit consists of Q1 for amplification and Q2 for active bias. The circuit gain is approximately 19 dB. R5, R6, and R7 form a 6 dB pad at the output of the amplifier.

301.4 MHz Bandpass Filter (B)

The 301.4 Bandpass Filter rejects the image frequency from A23A3 Second Converter. The 3 dB bandwidth of the filter is about 9 MHz. The coupling capacitance in the circuit is provided by the trace on the PC board. The 301.4 MHz output signal is sent to A20 Third Converter.

Output Amplifier (C)

The common emitter amplifier drives the third converter (A20) and provides reverse isolation. The circuit gain is approximately 17 dB.

A20 Third Converter, Circuit Description

A20 Third Converter receives 301.4 MHz from A19 Second IF Amplifier and mixes it with 280 MHz to provide the 21.4 MHz IF OUTPUT to the rear panel. It also sends 280 MHz to A21 275 MHz Phase Lock.

280 MHz Crystal Oscillator (A)

Q2 and associated circuitry form a modified Colpitts oscillator with the Surface-Acoustic-Wave Resonator Z1 in the feedback path. C3 and C4 form a capacitive voltage divider to set the feedback level. C5 and L3 provide the output path to the two buffer amplifiers.

280 MHz Buffer Amplifier 1 (D)

280 MHz Buffer Amplifier 1 isolates the signal to A21 275 MHz Phase Lock. The circuit is a common-emitter amplifier in which R6, R7 and R8 set the bias for Q5. The output of Q5 is sent through a 6 dB resistive pad to A21.

280 MHz Buffer Amplifier 2 (B)

280 MHz Buffer Amplifier 2 isolates the signal to the Balanced Mixer. R12, R13, and R14 set the bias for Q1. L6 and C12 transform the impedance to drive the LO port of U1.

Balanced Mixer (C)

The Balanced Mixer U1 mixes 301.4 MHz from A19 Second IF Amplifier with the signal from the 280 MHz Crystal Oscillator and sends the difference frequency to the 21.4 MHz Variable Gain Amplifier.

21.4 MHz Variable Gain Amplifier (E)

The 21.4 MHz Variable Gain Amplifier amplifies the signal from the Balanced Mixer and sends it to the rear panel. Q3 has a fixed gain that is set by R19. R16 through R18 and R20 set the bias of Q3. Q4, the second stage, has a variable gain determined by R21 and PIN diode CR1. The gain is varied by changing the current through CR1, which is driven by the PIN Driver.

PIN Driver (F)

The current drive for CR1 is supplied by the PIN Driver, which consists of Q6 and associated circuitry. The shaping network the emitter circuit of Q6 shapes the AMP CAL signal to provide the proper gain variation with input voltage in the second stage of the 21.4 MHz Variable Gain Amplifier.

HP Part Number 85680-60039

A19 Second IF Amplifier

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A19	85680-60039	7	1	BOARD ASSEMBLY, SECOND IF AMPLIFIER	28480	85680-60039
A19C1	0160-3876	4	1	CAPACITOR-FXD 47PF +-20% 200VDC CER	04222	SR202C470MAAH
A19C2	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A19C3	0160-3877	5	1	CAPACITOR-FXD 100PF +-20% 200VDC CER	04222	SR202C101MAAH
A19C4	0160-3877	5	1	CAPACITOR-FXD 100PF +-20% 200VDC CER	04222	SR202C101MAAH
A19C5	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A19C6	0160-3877	5	1	CAPACITOR-FXD 100PF +-20% 200VDC CER	04222	SR202C101MAAH
A19C7	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A19C8	0160-2247	1	1	CAPACITOR-FXD 3.9PF +-.25PF 500VDC CER	52763	2RDPLX0503R9NPO
A19C9	0121-0493	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V PC-MT	74970	187-0306-125
A19C10	0121-0493	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V PC-MT	74970	187-0306-125
A19C11	0121-0493	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V PC-MT	74970	187-0306-125
A19C12	0121-0493	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V PC-MT	74970	187-0306-125
A19C13	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A19J1	1250-2112	1	1	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A19J2	1250-2112	1	1	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A19L1	9100-2251	0	1	INDUCTOR RF-CH-MLD 220NH +-10% .105D-INX	24226	10M220K
A19L2	85680-80009	3	1	INDUCTOR 35nH	28480	85680-80009
A19L3	85680-80014	0	1	INDUCTOR TRANSFORMER	28480	85680-80014
A19L4	85680-80008	2	1	INDUCTOR 50nH	28480	85680-80008
A19L5	85680-80008	2	1	INDUCTOR 50nH	28480	85680-80008
A19L6	85680-80016	2	1	INDUCTOR TRANSFORMER	28480	85680-80016
A19L7	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A19L8	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH +-10% .105D-INX.2	32159	1A1002M +-10%
A19MP1				NOT ASSIGNED		
A19MP2	2190-0557	7	2	WASHER-LK INTL T NO. 10 .195-IN-ID	78189	1210-06-00-0551
A19MP3	2200-0101	0	3	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	77250	
A19MP4	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	74163	500220
A19MP5	85680-00038	0	3	STRIP SHIELDING	28480	85680-00038
A19MP6	85680-20067	7	1	LID, 2nd IF AMPLIFIER	28480	85680-20067
A19MP7	0340-0628	0	2	INSULATOR-XSTR NYLON WHITE	13103	7717-133N
A19Q1	1854-0686	0	1	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	25403	
A19Q2	1853-0451	5	1	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	04713	
A19Q3	1854-0345	8	1	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A19R1	0757-0200	7	1	RESISTOR 5.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A19R2	0757-0200	7	1	RESISTOR 5.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A19R3	0757-0200	7	1	RESISTOR 5.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A19R4	0698-0082	7	1	RESISTOR 464 1% .125W TF TC=0+-100	19701	SFR25H
A19R5*	0757-0418	9	1	RESISTOR 619 +-1% .125W TF TC=0+-100	19701	SFR25H
A19R6*	0698-3438	3	1	RESISTOR 147 1% .125W TF TC=0+-100	19701	SFR25H
A19R7*	0757-0418	9	1	RESISTOR 619 +-1% .125W TF TC=0+-100	19701	SFR25H
A19R8	0698-3154	0	1	RESISTOR 4.22K 1% .125W TF TC=0+-100	19701	SFR25H
A19R9	0698-3154	0	1	RESISTOR 4.22K 1% .125W TF TC=0+-100	19701	SFR25H
A19R10	0757-0419	0	1	RESISTOR 681 +-1% .125W TF TC=0+-100	19701	SFR25H

*Indicates factory-selected value

85680-60039 Parts List

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HP Part Number 85680-60171

A20 Third Converter

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A20	85680-60171	8	1	BOARD ASSEMBLY, THIRD CONVERTER	28480	85680-60171
A20C1	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A20C2	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A20C3	0160-2261	9	1	CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	52763	2RDPLX05015RNP0
A20C4	0160-2248	2	1	CAPACITOR-FXD 4.3pF 500 V	52763	
A20C5	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A20C6	0160-3878	6	1	CAPACITOR-FXD 1000pF 100 V	04222	SR201C102MAAH
A20C7	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C8	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C9	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A20C10	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C12	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C13	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A20C14	0160-3565	8	1	CAPACITOR-FXD 6.8pF 100VDC CER		FD11COG2A6R8D
A20C15	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C17	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C18	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C19	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C20	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C21	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C22	0180-0116	1	1	CAPACITOR-FXD 6.8uF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A20C23	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C24	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C25	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C26	0160-3874	2	1	CAPACITOR-FXD 10PF +- .5PF 200VDC CER		FD12C0G2D100D
A20C27	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 V	04222	SA105C103MAAH
A20C28	0160-4084	8	1	CAPACITOR-FXD 0.1uF 50 V	56289	1C20X7R104M050B
A20CR1	1901-1070	9	1	DIODE-PIN 110V	28480	
A20CR2	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A20CR3	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A20CR4	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A20E1	9170-0029	3	1	CORE-SHIELDING BEAD	02114	56-590-65A2/4A
A20J2	1250-2112	1	1	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A20J3	1250-2112	1	1	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A20L1	85680-80013	9	1	INDUCTOR-ADJ. AMPLITUDE PEAK	28480	85680-80013
A20L2	9100-2891	4	1	INDUCTOR RF-CH-MLD 50NH +-10% .105D-INX.	24226	10M050K-1
A20L3	9100-2248	5	1	INDUCTOR RF-CH-MLD 120NH +-10% .105D-INX	24226	10M120K
A20L4	9100-2252	1	1	INDUCTOR RF-CH-MLD 270NH +-10% .105D-INX	24226	10M270K
A20L5	9100-2255	4	1	INDUCTOR RF-CH-MLD 470NH +-10% .105D-INX	24226	10M470K
A20L6	9100-2891	4	1	INDUCTOR RF-CH-MLD 50NH +-10% .105D-INX.	24226	10M050K-1
A20L7	9100-2255	4	1	INDUCTOR RF-CH-MLD 470NH +-10% .105D-INX	24226	10M470K
A20L10	9140-0178	0	1	INDUCTOR RF-CH-MLD 12UH +-10% .166D-INX.	99800	1537-38
A20L11	9140-0178	0	1	INDUCTOR RF-CH-MLD 12UH +-10% .166D-INX.	99800	1537-38
A20L12	9140-0178	0	1	INDUCTOR RF-CH-MLD 12UH +-10% .166D-INX.	99800	1537-38
A20L13	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A20L14	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH +-10% .105D-INX.2	32159	1A1002M +-10%
A20L15	9140-0114	4	1	INDUCTOR RF-CH-MLD 10UH +-10% .166D-INX.	99800	1537-36

*Indicates factory-selected value

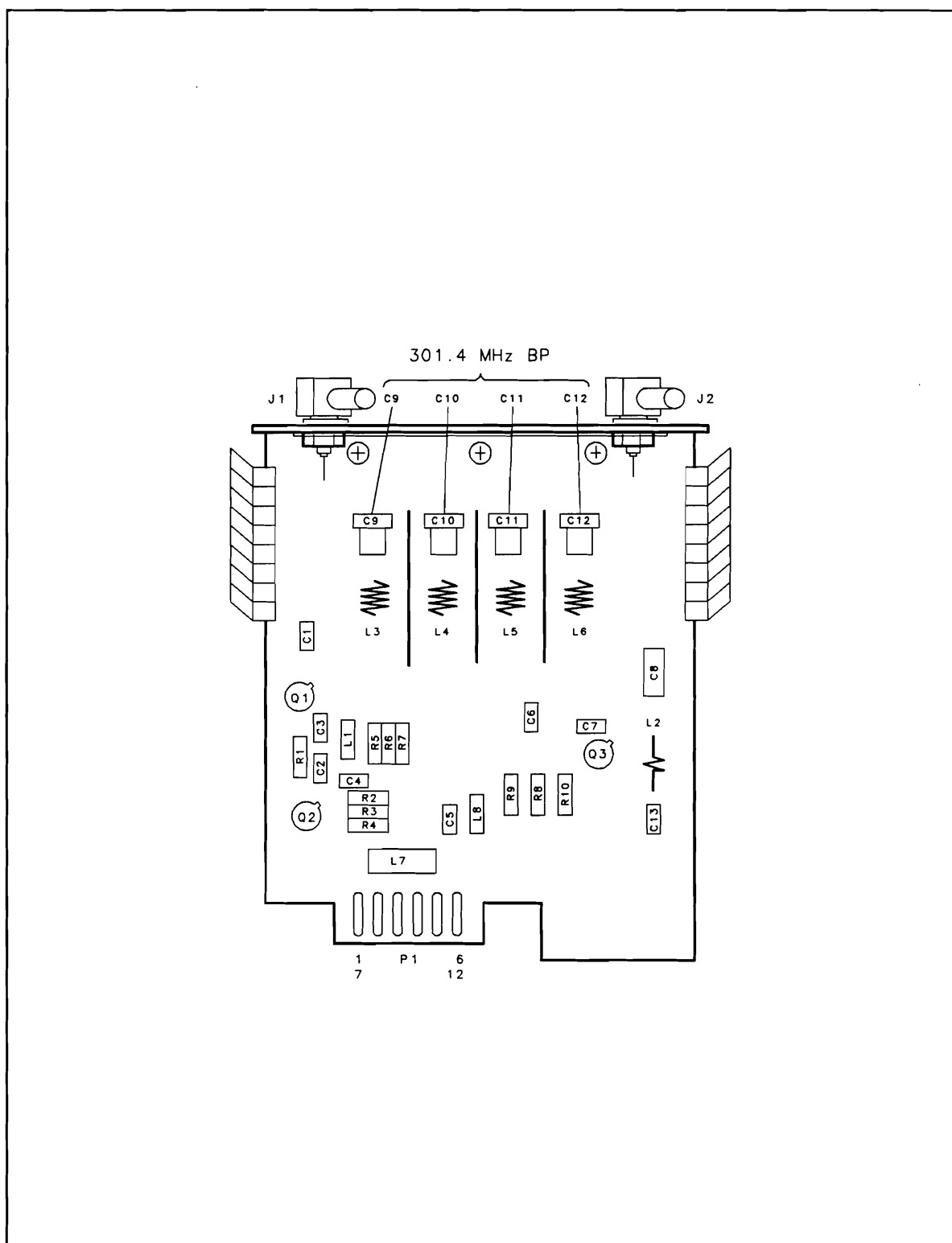
85680-60171 Parts List

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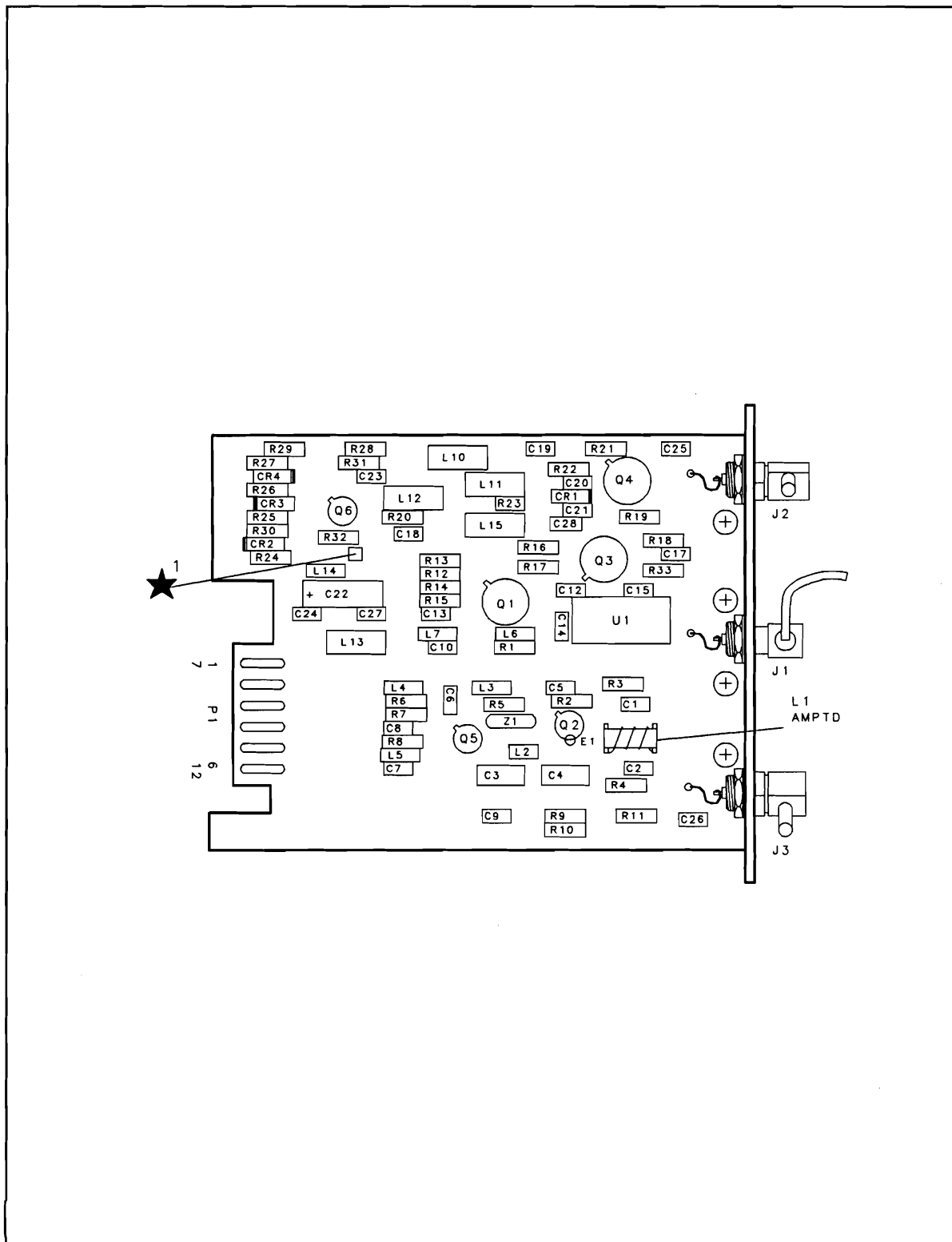
HP Part Number 85680-60171
A20 Third Converter

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A20Z1	1GA1-8000	2	1	SAW RESONATOR	28480	1GA1-8000

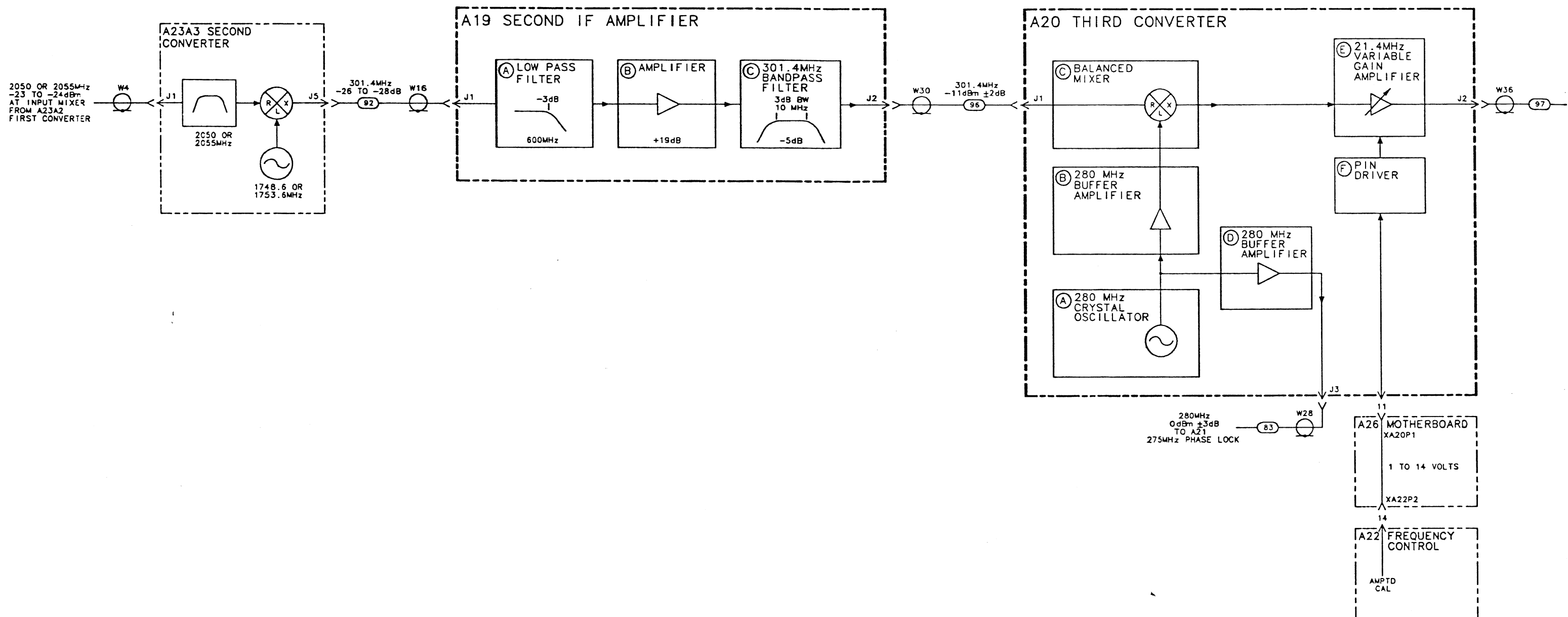
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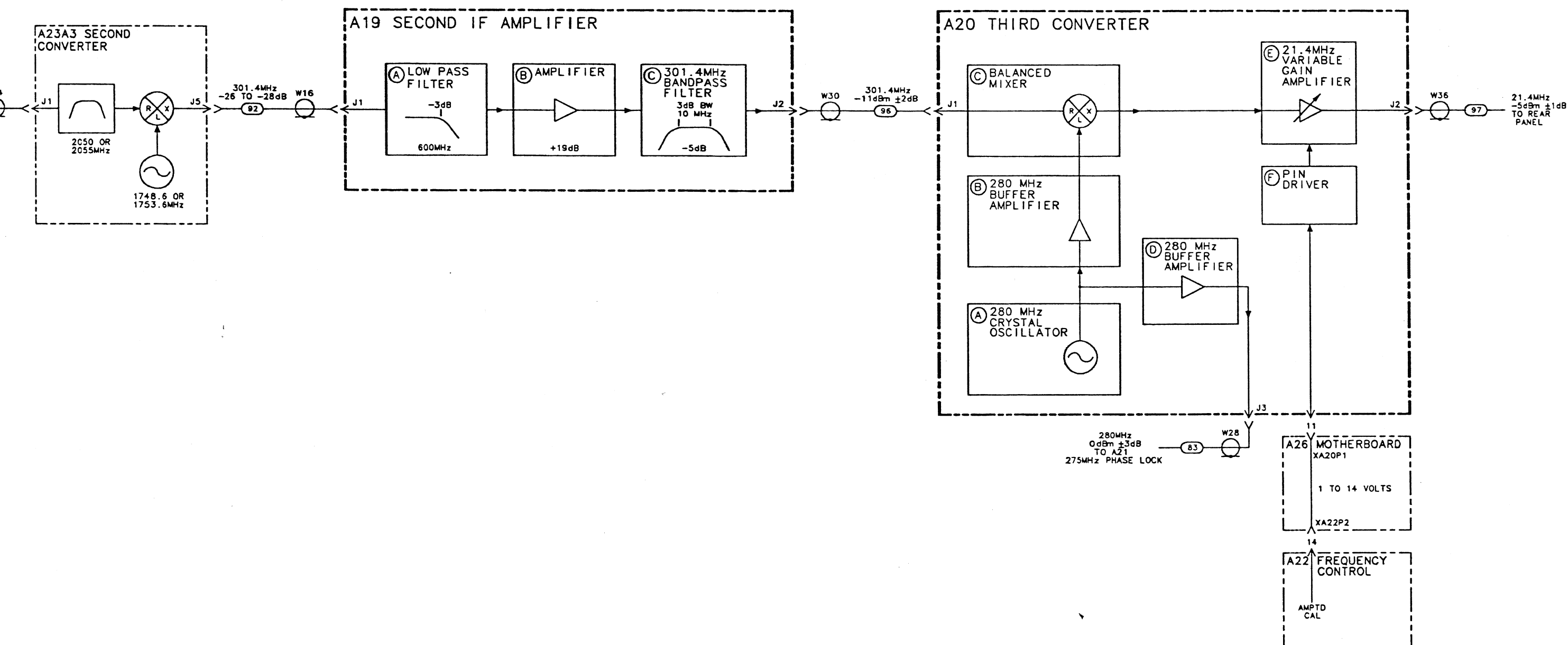


A19 Second IF Amplifier Component Locations, 85680-60039



A20 Third Converter Component Locations, 85680-60171





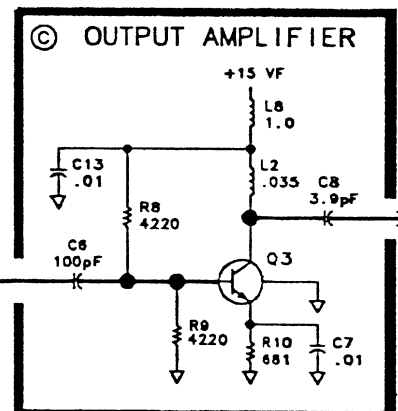
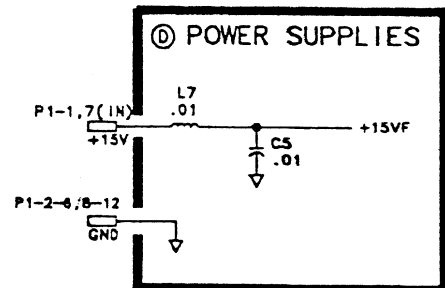
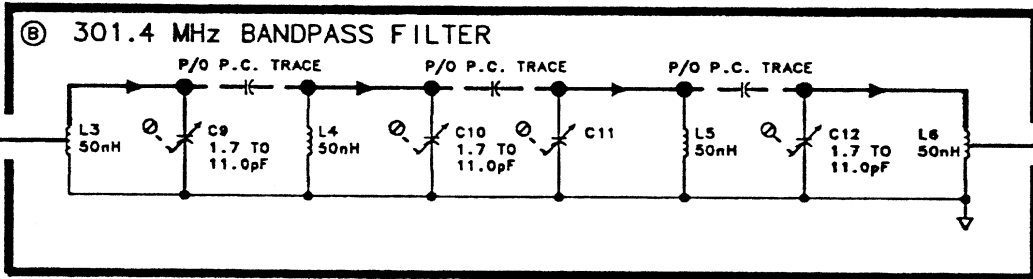
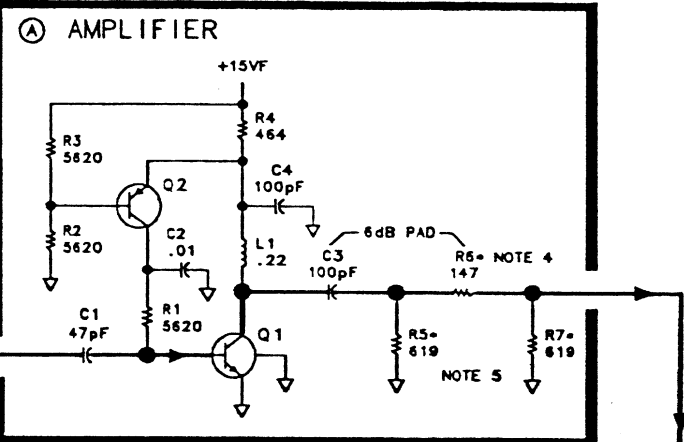
A19 SECOND IF AMPLIFIER AND A20 THIRD CONVERTER, BLOCK DIAGRAM

A19 SECOND IF AMPLIFIER
85680-60039
(SERIAL PREFIX: 2408A)

P1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	+15V		D
7	+15V		D
2	GND		D
8	GND		D
3	GND		D
9	GND		D
4	GND		D
10	GND		D
5	GND		D
11	GND		D
6	GND		D
12	GND		D

CABLE 92, W16
301.4MHz
-26 TO -28dBm
FOR -10dBm SIGNAL
AT INPUT
MIXER FROM A23A4
SECOND CONV



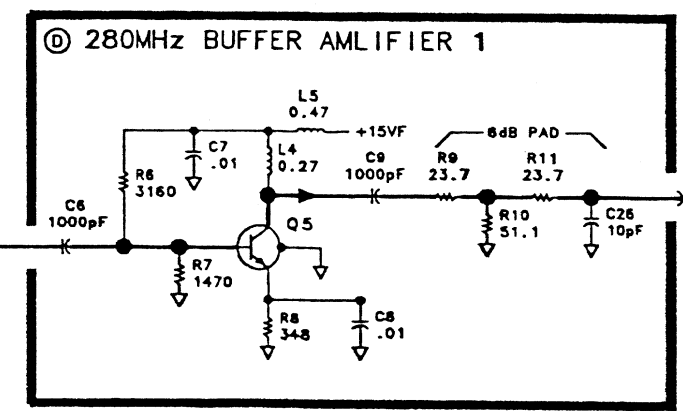
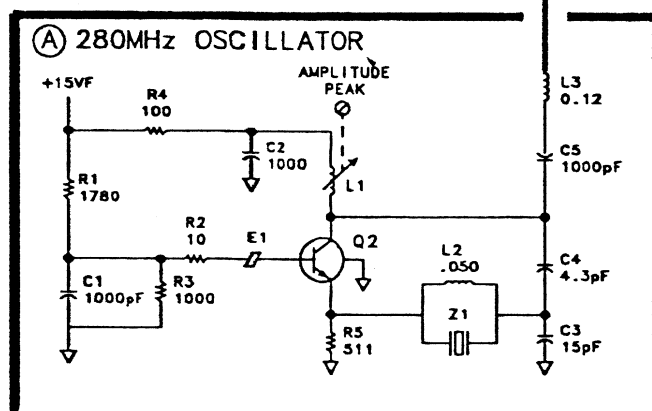
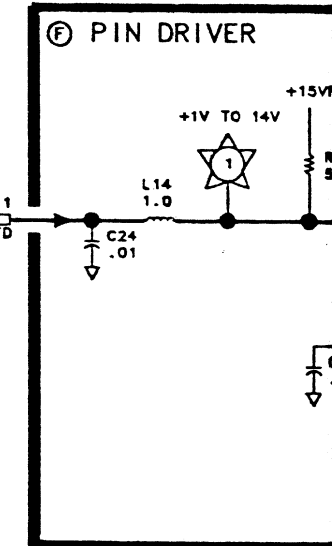
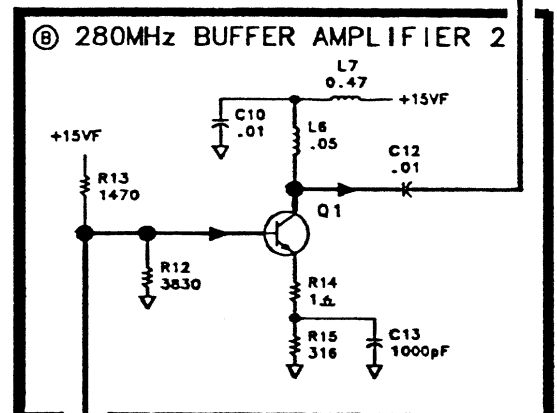
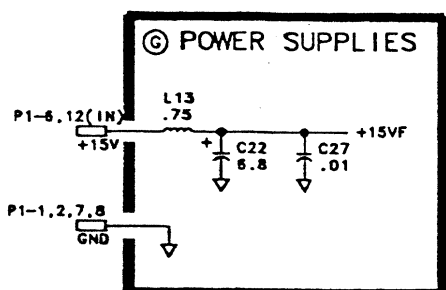
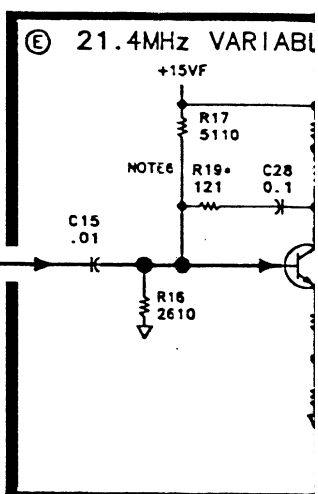
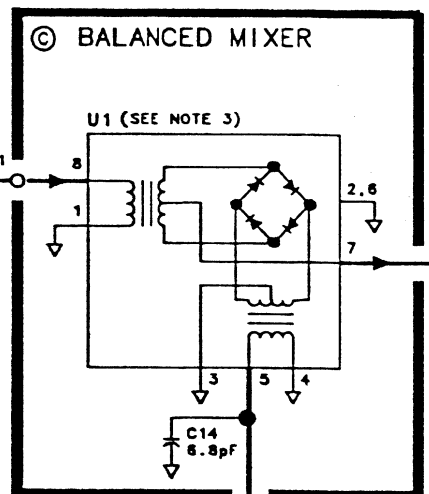
CABLE 98, W30
301.4MHz-11dBm ±2dB
FOR -10dBm SIGNAL AT
INPUT MIXER
TO A20 THIRD
CONVERTER

A20 THIRD CONVERTER
85680-60171
(SERIAL PREFIX: 2408A)

P1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	GND		G
7	GND		G
2	GND		G
8	GND		G
3	GND		NC
9	GND		NC
4	GND		NC
10	GND		NC
5	GND		NC
11	AMPTD CAL	A22P2-14	F
6	+15V		G
12	+15V		G

301.4MHz -11dBm ±2dB
WITH -10dBm
AT A23A2J3
FROM A19 SECOND
IF AMPLIFIER



CABLE 280MHz
TO A2
PHASE

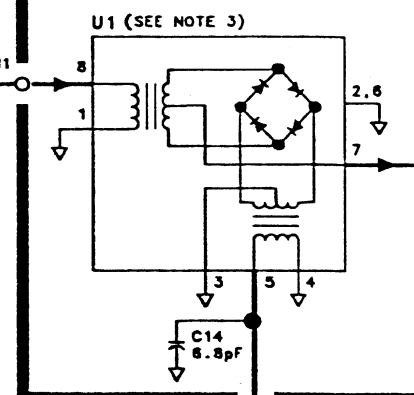
A20 THIRD CONVERTER 85680-60171 (SERIAL PREFIX: 2408A)

P1

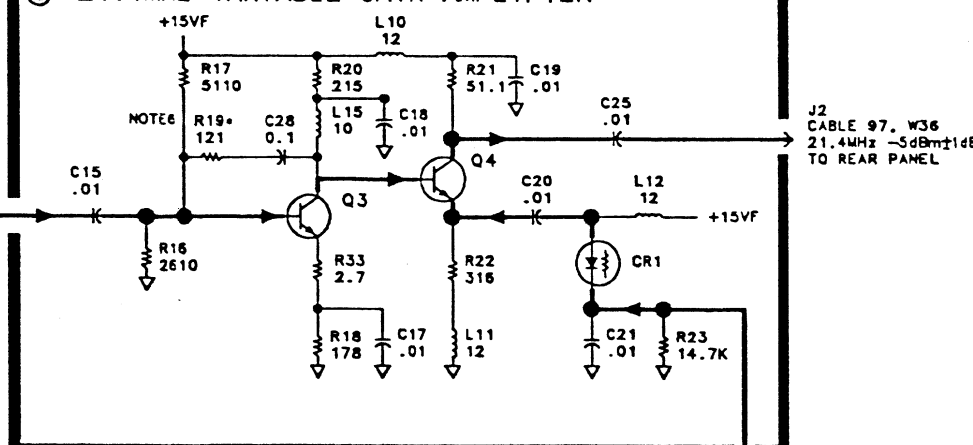
PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	GND		G
7	GND		G
2	GND		G
8	GND		G
3	GND		NC
9	GND		NC
4	GND		NC
10	GND		NC
5	GND		NC
11	AMPTD CAL	A22P2-14	F
6	+15V		G
12	+15V		G

301.4MHz -11dBm \pm 2dB
WITH -10dBm
AT A23A2J3
FROM A19 SECOND
IF AMPLIFIER

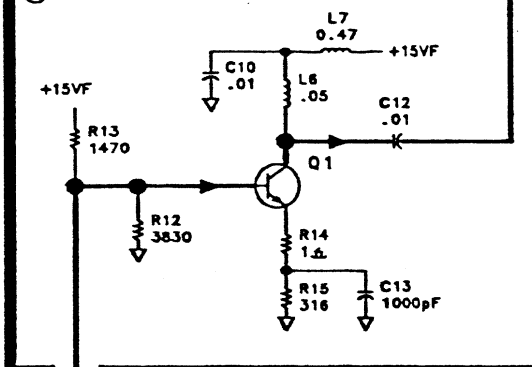
Ⓒ BALANCED MIXER



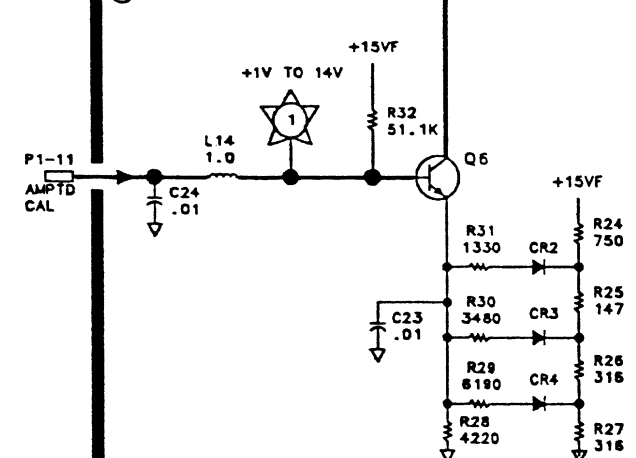
Ⓔ 21.4MHz VARIABLE GAIN AMPLIFIER



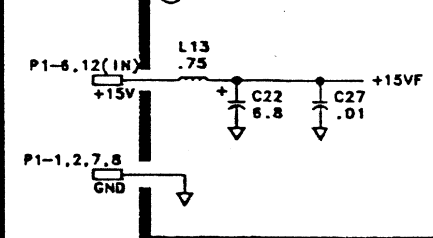
Ⓕ 280MHz BUFFER AMPLIFIER 2



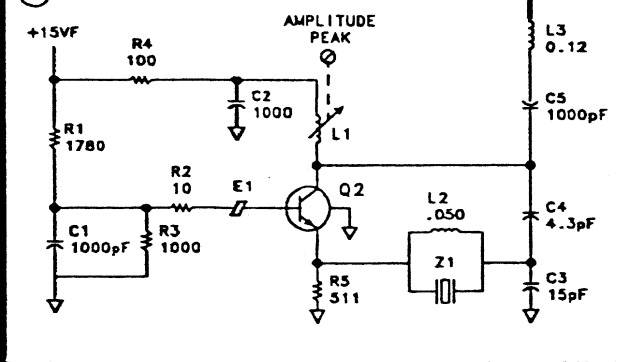
Ⓖ PIN DRIVER



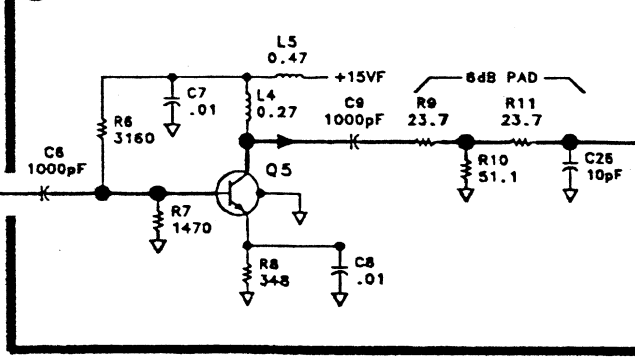
Ⓒ POWER SUPPLIES



Ⓐ 280MHz OSCILLATOR



Ⓓ 280MHz BUFFER AMPLIFIER 1



NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED, FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IS IN OHMS (Ω) CAPACITANCE IS IN MICROFARADS (μ F) INDUCTANCE IS IN MICROHENRIES (μ H)
3. A20U1 PIN CONFIGURATION:
MARKED
1 2 3 4
0 0 0 0
0 0 0 0
8 7 6 5
BOTTOM
VIEW
PIN 1 INDICATED BY SQUARE PAD ON P.C. BOARD.
4. A19R6+ IS A FACTORY-SELECTED COMPONENT. ACCEPTABLE VALUES RANGE BETWEEN 1210 AND 1780.
5. A19R5+ AND A19R7+ ARE FACTORY-SELECTED COMPONENTS. ACCEPTABLE VALUES RANGE BETWEEN 5110 AND 7500.
6. A20R19+ IS A FACTORY-SELECTED COMPONENT. ACCEPTABLE VALUES RANGE BETWEEN 00 AND 2370.

A 19

A 20

A21

A21 275 MHz Phase Lock, Circuit Description

In A21 275 MHz Phase Lock, the signal from A18 275 MHz Phase Lock Oscillator is mixed with 280 MHz from A20 Third Converter, and the difference frequency is compared with the reference signal from A11 50 MHz Voltage-Tuned Oscillator. (Refer to the circuit description of the Pilot Third Local Oscillator.)

A21A1 275 MHz Mixer (E) (F) (G)

A21A1 275 MHz Mixer is mounted on a shielding support forming a shielding box to keep higher frequency components isolated from the phase detector circuitry. The signal from A18 275 Phase Lock Oscillator is nominally either 275 MHz or 277.5 MHz (depending on the reference frequency from A11 50 MHz Voltage-Tuned Oscillator) and is fed directly to the Mixer U6. The signal from A20 Third Converter is fixed at 280 MHz. This is filtered and attenuated before being fed to the Mixer U6. C29 acts with 50 Ω input and output impedances to form a 433 MHz low-pass filter. L6, R31, and R32 attenuate the signal 20 dB. The output of the Mixer is nominally at 5 MHz or 2.5 MHz, the difference of the input frequencies, and this is filtered by the 80 MHz LPF to remove high frequency components. This filter is made up of L7, L8, C23, C24, and C25.

Low Noise Amplifier (H)

The signal from the 275 MHz Mixer is amplified by the Low Noise Amplifier. R19, R22, R23, C27, and Q2 form a circuit to actively bias Q5. Q5, R38, C8, and R21 form the first stage of amplification, and Q1, R20, R24, R25, and C10 form the second stage.

Buffer Amplifier (I)

L1, C11, and C12 form a 15 MHz low-pass filter in the Buffer Amplifier. C13 couples the signal to the limiting amplifier consisting of Q4, Q3, R15, L2, R18, R17, R16, and C14. This amplifier limits to produce output voltage levels compatible with ECL logic.

Phase Detector (A)

The Phase Detector compares the output frequency of the 275 MHz Mixer with the reference frequency from A11 50 MHz Voltage-Tuned Oscillator to generate the 275 MHz TUNE signal.

The Phase Detector is composed of dual D flip-flop U1 and NOR gate U3A. U2R1 through U2R6, R1, and R2 bias the ECL lines. C15 is a bypass capacitor. R33 ties the D inputs of the flip-flops high so that when a clock line goes high, it triggers the matching flip-flop, causing its positive output to go high and its inverted output to go low. U3A resets both flip-flops together whenever both become set.

Lock Detector (B)

Signals from the positive and inverted outputs of both flip-flops of U1 are fed to NOR gates U3B and U3C. The outputs of these gates are tied together and biased by resistor U2R4. R4 and C22 filter this to provide a signal whose voltage, whenever the loop is locked, is higher than the threshold voltage set by R5 and R6. When the loop is locked, the output of U4 goes low, turning off unlocked LED DS1. CR1 limits this low level on HUL3 to -0.6 V. Whenever the loop is unlocked, the filtered voltage from R4 and C22 is less than the threshold and voltage, and the output of U4 goes high. R7 limits the current through DS1, which lights to indicate UNLOCKED. VR2 and DS1 set the high level on HUL3 to approximately $+3.2$ V. Line HUL3 goes to A12 RF Section Interface to indicate to A15 Controller the status of the loop.

Loop Amplifier and Filters (C)

The Loop Amplifier receives signals from the Phase Detector flip-flops of U1. Signals from the positive output of one flip-flop and the negative output of the other flip-flop are filtered and summed together in the Loop Amplifier. Since opposite flip-flop polarities are summed, an error current will be produced to charge or discharge C26 if the flip-flop input signals differ in frequency or phase. R10, R11, C16, R12, R13, and C17 filter the signals to the Loop Amplifier. C21, C26, and R14 filter the summed signal. R8, R9 and C18 bias the amplifier to the center of the ECL voltage level range, approximately -1.3 V.

High and Low Clamps (D)

The High and Low Clamps limit the output of the Loop Amplifier to the range required by A18 275 MHz Phase Lock Oscillator. VR3 and VR4 form the Low Clamp and limit the low voltage to about $+4$ V. CR3 limits the low voltage to -0.6 V for transients during turn-on.

R27, Q6, R29 and R28 form the High Clamp. The upper voltage limit is set by R28. CR2 protects Q6. R39 limits the current in the 275 MHz TUNE line as it is sent to A18.

HP Part Number 85680-60016

A21 275 MHz Phase Lock

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A21	85680-60016	0	1	BOARD ASSEMBLY 275 MHz PHASE LOCK	28480	85680-60016
A21A1	85680-60033	1	1	275MHZ MIXER BOARD ASSEMBLY (SEPARATE PARTS LIST INCLUDED IN THIS SECTION)	28480	85680-60033
A21C1	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2-DYS
A21C2	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A21C3	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2-DYS
A21C4	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A21C5	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2-DYS
A21C6	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A21C7	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C8	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C9	0160-4084	8	1	CAP-FXD 0.1uF 50 V	56289	1C20X7R104M050B
A21C10	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C11	0160-2307	4	1	CAPACITOR-FXD 47PF +-5% 300VDC MICA	09023	CD15ED470J03
A21C12	0140-0193	0	1	CAPACITOR-FXD 82PF +-5% 300VDC MICA	09023	CD15ED820J03
A21C13	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C14	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C15	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C16	0160-3536	3	1	CAPACITOR-FXD 620PF +-5% 100VDC MICA	09023	CD15FC621J03
A21C17	0160-3536	3	1	CAPACITOR-FXD 620PF +-5% 100VDC MICA	09023	CD15FC621J03
A21C18	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C19	0160-4084	8	1	CAP-FXD 0.1uF 50 V	56289	1C20X7R104M050B
A21C20	0160-4084	8	1	CAP-FXD 0.1uF 50 V	56289	1C20X7R104M050B
A21C21	0140-0196	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	09023	CD15FD151J03
A21C22	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAAH
A21C26	0160-0194	3	1	CAPACITOR-FXD .015UF +-10% 200VDC POLYE	84411	HEW-238M
A21C27	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A21CR1	1901-0050	3	1	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A21CR2	1901-0050	3	1	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A21CR3	1901-0050	3	1	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A21DS1	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A21J1	85680-60079	5	1	CABLE ASSEMBLY COAX (INCLUDES W19)	28480	85680-60079
A21J2	85680-60077	3	1	CABLE ASSEMBLY COAX (INCLUDES W28)	28480	85680-60077
A21J3	85680-60078	4	1	CABLE ASSEMBLY COAX (INCLUDES W29)	28480	85680-60078
A21L1	9140-0111	1	1	INDUCTOR RF-CH-MLD 3.3UH +-10% .166D	99800	1537-24
A21L2	9100-1644	3	1	INDUCTOR RF-CH-MLD 330UH +-5% .2D	99800	2500-04
A21L4	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH +-10% .166D	99800	1537-30
A21L5	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH +-10% .166D	99800	1537-30
A21L6	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH +-10% .166D	99800	1537-30
A21MP1				NOT ASSIGNED		
A21MP2	0520-0131	2	8	SCREW-MACH 2-56 .438-IN-LG PAN-HD-POZI	77250	
A21MP3	0590-0533	5	8	THREADED INSERT-NUT 2-56 .06-IN-LG SST	46384	KFS2-256
A21MP4	0890-0324	8	1	TUBING-FLEX .032-ID TFE .012-WALL	09795	II-TW,FR-1
A21MP5	2190-0112	0	8	WASHER-LK HLCL NO. 2 .088-IN-ID	77339	
A21MP6	2190-0557	7	3	WASHER-LK INTL T NO. 10 .195-IN-ID	78189	1210-06-00-0551
A21MP7	2200-0101	0	4	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	77250	
A21MP8	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	74163	500220

*Indicates factory-selected value

HP Part Number 85680-60016

A21 275 MHz Phase Lock

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A21MP9	85680-20076	8	1	LID 275MHZ PHASE LOCK	28480	85680-20076
A21MP10	85680-20081	5	1	SHIELD, 275MHZ MIXER	28480	85680-20081
A21MP11	86701-40001	9	1	EXTRACTOR PC	28480	86701-40001
A21Q1	1854-0019	3	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A21Q2	1853-0007	7	1	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A21Q3	1853-0451	5	1	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	04713	
A21Q4	1853-0451	5	1	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	04713	
A21Q5	1854-0247	9	1	TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	04713	
A21Q6	1853-0007	7	1	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A21R1	0757-0399	5	1	RESISTOR 82.5 +-1% .125W TF TC=0+-100	19701	SFR25H
A21R2	0698-3437	2	1	RESISTOR 133 1% .125W TF TC=0+-100	19701	SFR25H
A21R4	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R5	0757-0424	7	1	RESISTOR 1.1K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R6	0698-3156	2	1	RESISTOR 14.7K 1% .125W TF TC=0+-100	19701	SFR25H
A21R7	0698-3152	8	1	RESISTOR 3.48K 1% .125W TF TC=0+-100	19701	SFR25H
A21R8	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R9	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R10	0698-0082	7	1	RESISTOR 464 1% .125W TF TC=0+-100	19701	SFR25H
A21R11	0698-0082	7	1	RESISTOR 464 1% .125W TF TC=0+-100	19701	SFR25H
A21R12	0698-0082	7	1	RESISTOR 464 1% .125W TF TC=0+-100	19701	SFR25H
A21R13	0698-0082	7	1	RESISTOR 464 1% .125W TF TC=0+-100	19701	SFR25H
A21R14	0757-0424	7	1	RESISTOR 1.1K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R15	0757-1094	9	1	RESISTOR 1.47K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R16	0698-3439	4	1	RESISTOR 178 1% .125W TF TC=0+-100	19701	SFR25H
A21R17	0698-3132	4	1	RESISTOR 261 1% .125W TF TC=0+-100	19701	SFR25H
A21R18	0757-0416	7	1	RESISTOR 511 +-1% .125W TF TC=0+-100	19701	SFR25H
A21R19	0757-0290	5	1	RESISTOR 6.19K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R20	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	19701	SFR25H
A21R21	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	19701	SFR25H
A21R22	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R23	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R24	0698-3430	5	1	RESISTOR 21.5 1% .125W TF TC=0+-100	19701	SFR25H
A21R25	0757-0422	5	1	RESISTOR 909 +-1% .125W TF TC=0+-100	19701	SFR25H
A21R27	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R28	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R29	0698-3153	9	1	RESISTOR 3.83K 1% .125W TF TC=0+-100	19701	SFR25H
A21R33	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A21R38	0757-0316	6	1	RESISTOR 42.2 +-1% .125W TF TC=0+-100	19701	SFR25H
A21R39	0757-0416	7	1	RESISTOR 511 +-1% .125W TF TC=0+-100	19701	SFR25H
A21TP1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A21TP2	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A21TP3	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A21TP4	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A21TP5	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A21TP6	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A21TP7	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A21TP8	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	

HP Part Number 85680-60016

A21 275 MHz Phase Lock

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A21U1	1820-0817	8	1	IC FF ECL D-M/S DUAL	04713	MC10131P
A21U2	1810-0204	6	1	NETWORK-RES 8-SIP 1.0K OHM X 7	11236	750-81
A21U3	1820-0802	1	1	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A21U4	1820-0223	0	1	IC OP AMP GP TO-99 PKG	27014	LM301AH
A21U5	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A21VR2	1902-0126	6	1	DIODE-ZNR 2.61V 5% DO-7 PD=.4W TC=-.072%	04713	
A21VR3	1902-3082	9	1	DIODE-ZNR 4.64V 5% DO-35 PD=.4W	04713	
A21VR4	1902-0064	1	1	DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.05%	04713	

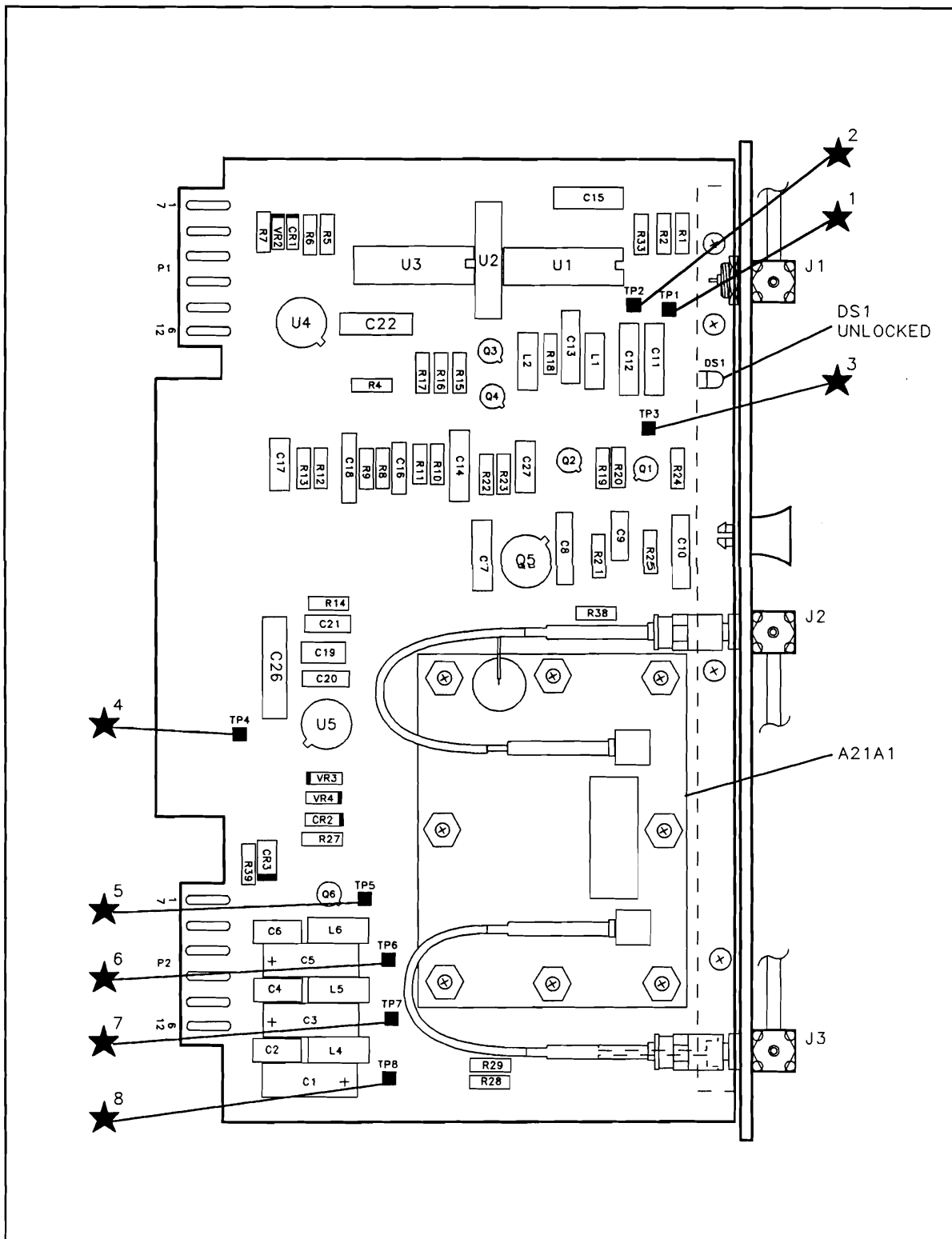
**Indicates factory-selected value*

HP Part Number 85680-60033

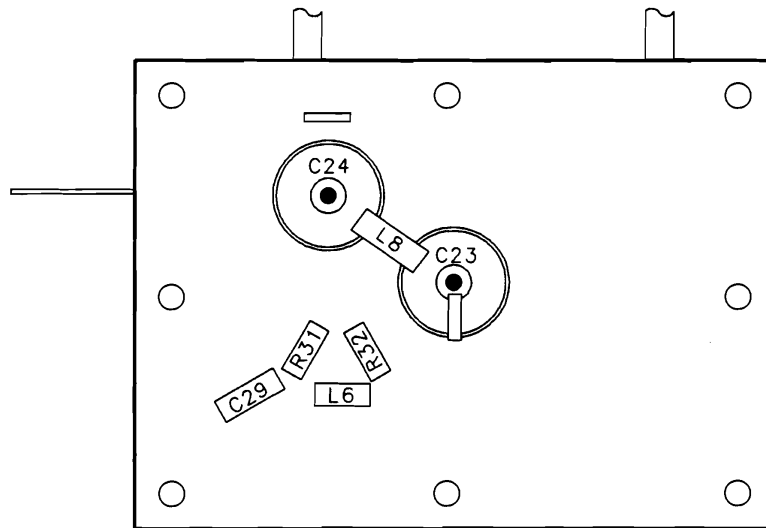
A21A1 275 MHz Mixer

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A21A1	85680-60033	1	1	BOARD ASSEMBLY 275MHZ MIXER	28480	85680-60033
A21A1C23	0140-0074	6	1	CAPACITOR-FDTHRU 56PF 10% 500V MICA		666-053-01A0-560K
A21A1C24	0140-0077	9	1	CAPACITOR-FDTHRU 100PF 10% 500V MICA		666-053-01A0-101K
A21A1C25	0140-0074	6	1	CAPACITOR-FDTHRU 56PF 10% 500V MICA		666-053-01A0-560K
A21A1C29	0160-4385	2	1	CAP-FXD 15pF 200 V		RPE121-105C0G150J200V
A21A1J2	85680-60091	1	1	CABLE ASSEMBLY SHORT 83 (INCLUDES W39)	28480	85680-60091
A21A1J3	85680-60092	2	1	CABLE ASSEMBLY SHORT 84 (INCLUDES W40)	28480	85680-60092
A21A1L6	9100-2249	6	1	INDUCTOR RF-CH-MLD 150NH +-10% .105D	24226	10M150K
A21A1L7	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH +-10% .105D	24226	10M180K
A21A1L8	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH +-10% .105D	24226	10M180K
A21A1MP1				NOT ASSIGNED		
A21A1MP2	0890-0324	8	1	TUBING-FLEX .032-ID TFE .012-WALL	09795	II-TW,FR-1
A21A1MP3	0890-0324	8	1	TUBING-FLEX .032-ID TFE .012-WALL	09795	II-TW,FR-1
A21A1R31	0698-7207	2	1	RESISTOR 61.9 +-1% .05W TF TC=0+-100	19701	5063J
A21A1R32	0698-7207	2	1	RESISTOR 61.9 +-1% .05W TF TC=0+-100	19701	5063J
A21A1U6	0955-0063	0	1	U-WAVE MIXER 500 MHZ MAX	15542	SRA-1-32
A21A1W1	8151-0014	5	1	WIRE 24AWG 1X24	94130	
A21A1W2	8151-0014	5	1	WIRE 24AWG 1X24	94130	

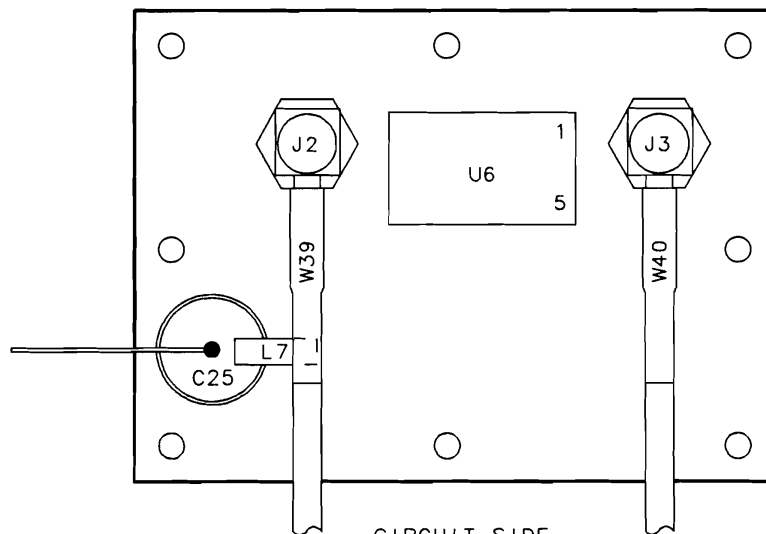
**Indicates factory-selected value*



A21 275 MHz Phase Lock Component Locations, 85680-60016

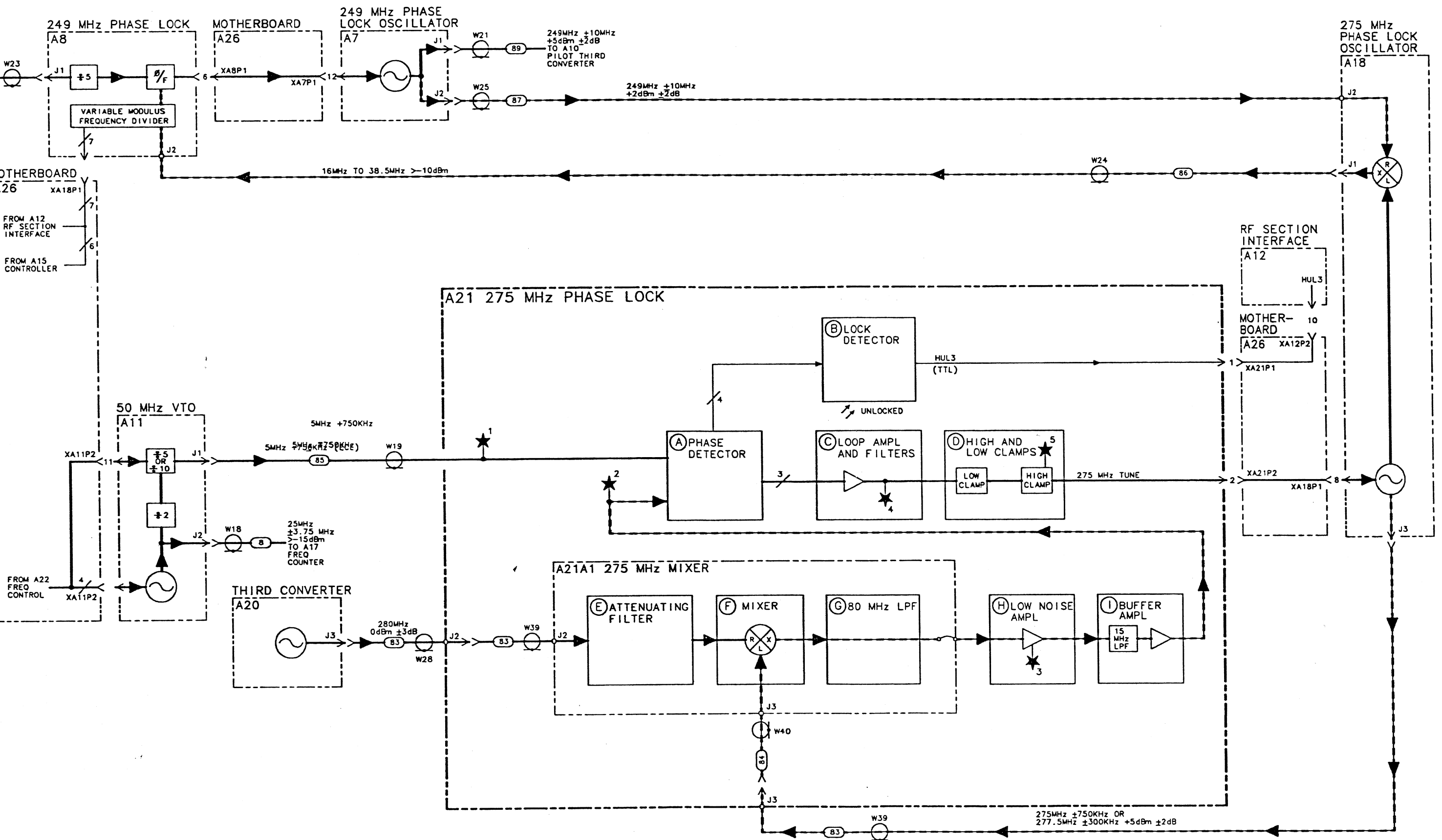


COMPONENT SIDE



CIRCUIT SIDE

A21A1 275 MHz Mixer Component Locations, 85680-60033



A21 275 MHz PHASE LOCK, BLOCK DIAGRAM

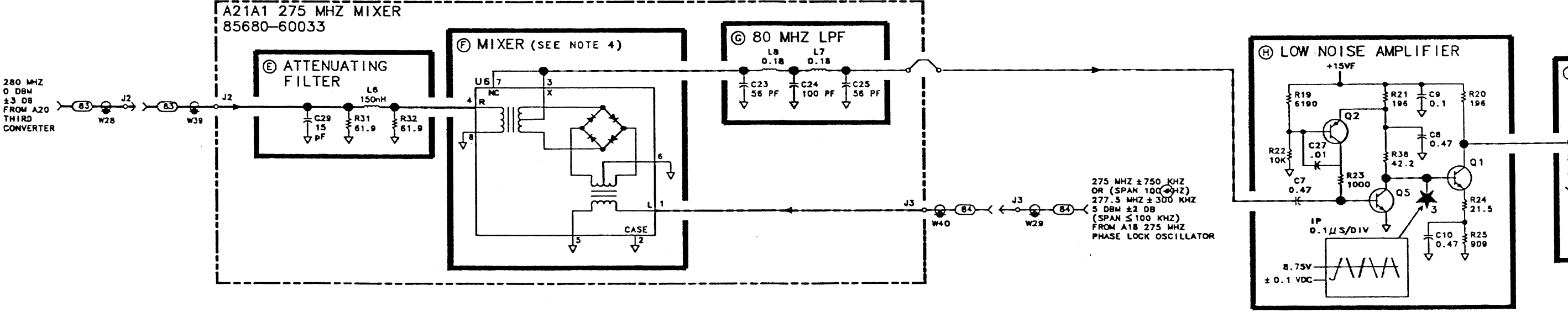
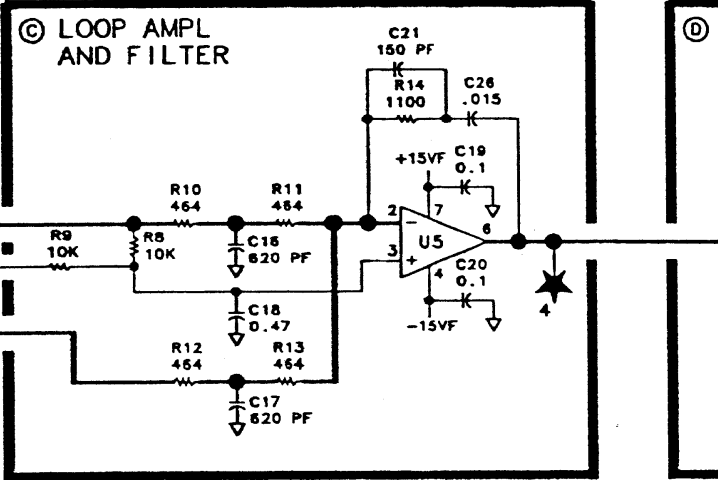
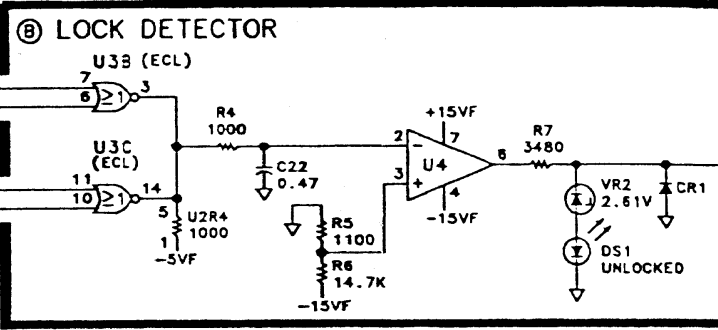
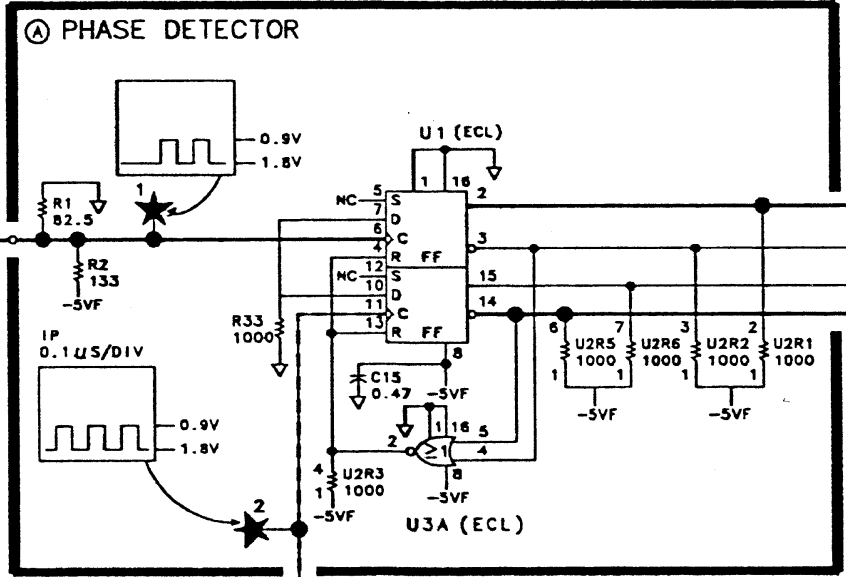
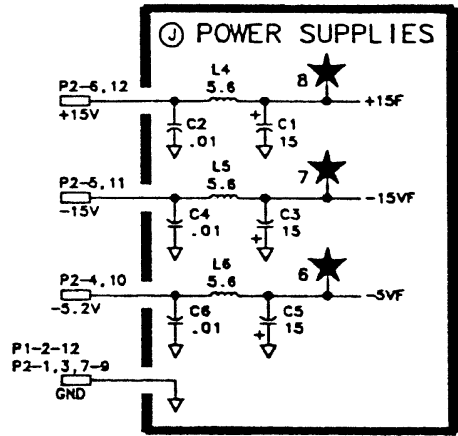
A21 275 MHZ PHASE LOCK
85680-60016
(SERIAL PREFIX: 2408A)

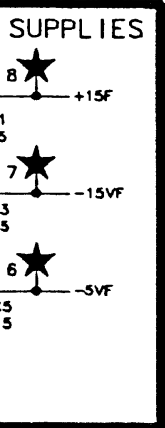
P1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	HUL3	A12P2-10	B
7	GND		J
2	GND		J
8	GND		J
3	GND		J
9	GND		J
4	GND		J
10	GND		J
5	GND		J
11	GND		J
6	GND		J
12	GND		J

P2

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	GND		J
7	GND		J
2	275 MHZ TUNE	A18,P1-8	D
8	GND		J
3	GND		J
9	GND		J
4	-5.2V		J
10	-5.2V		J
5	-15V		J
11	-15V		J
6	+15V		J
12	+15V		J





± 750 KHZ OR
± 300 KHZ
FROM A11 50 MHZ
TUNE
ATOR

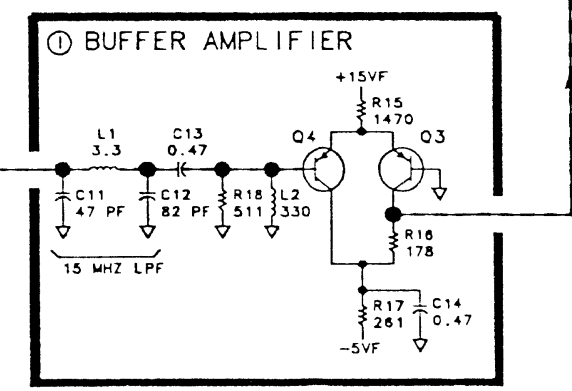
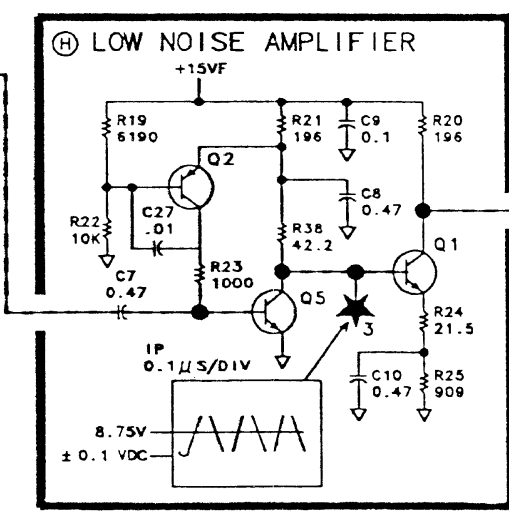
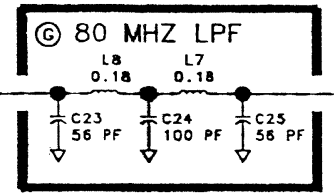
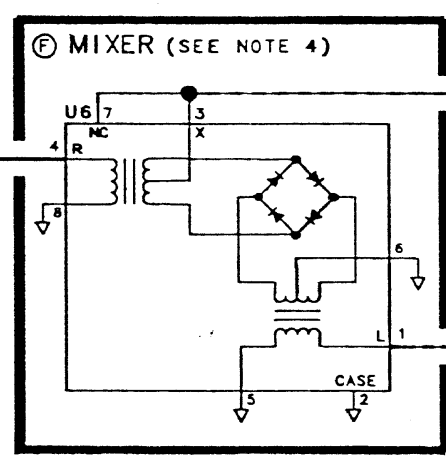
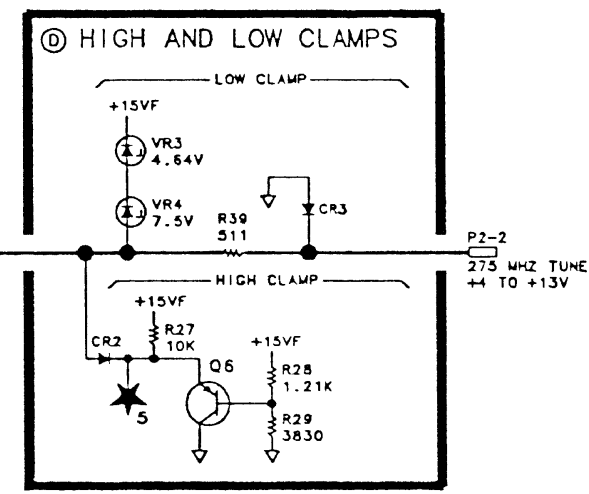
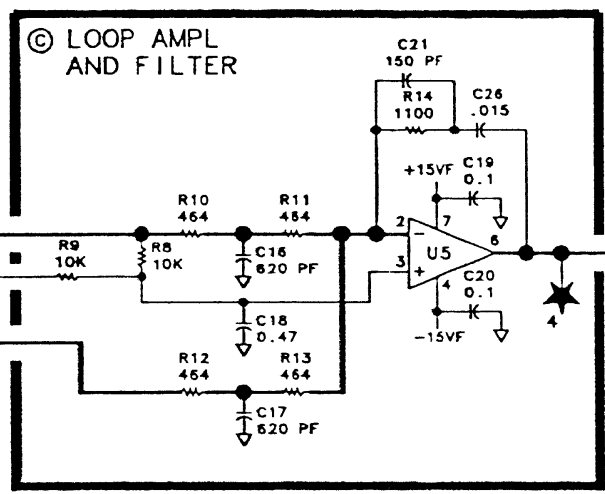
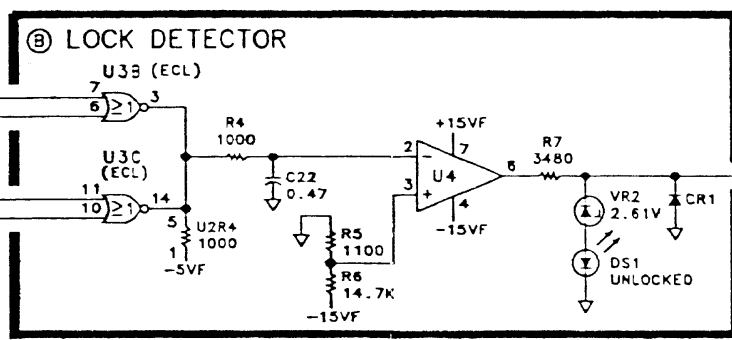
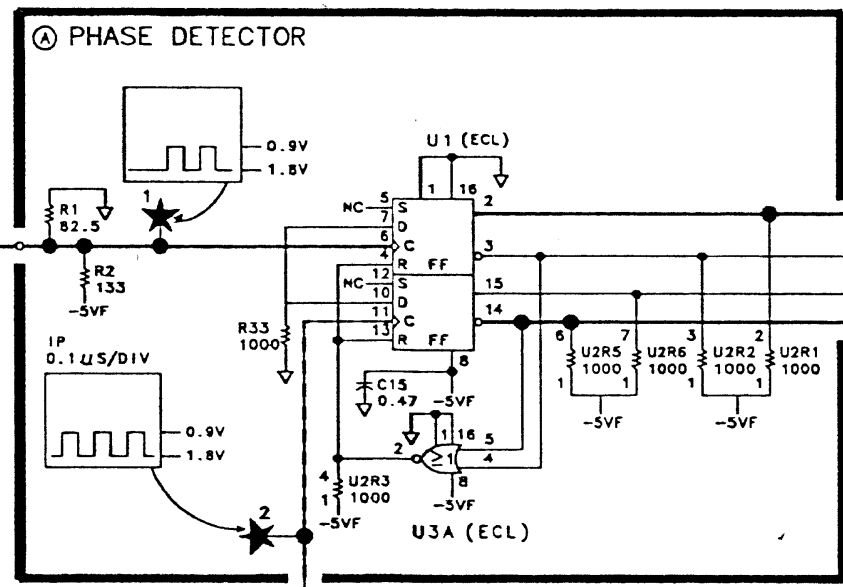
R

R32
61.9

W19

W29

W40



275 MHZ ± 750 KHZ
OR (SPAN 100 KHZ)
277.5 MHZ ± 300 KHZ
5 DBM ± 2 DB
(SPAN ≤ 100 KHZ)
FROM A18 275 MHZ
PHASE LOCK OSCILLATOR

NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IS IN OHMS (Ω), CAPACITANCE IS IN MICROFARADS (μF), INDUCTANCE IS IN MICROHENRIES (μH).
3. ECL LOGIC LEVELS ARE TYPICALLY:
-0.9V=LOGIC HIGH
-1.8V=LOGIC LOW
4. A21A106 PIN CONFIGURATION:
MARKED

1	2	3	4
5	6	7	8

 BOTTOM VIEW
5. U2 (1000 Ω)
6. MNEMONIC TABLE:

MNEMONIC	DESCRIPTION
HUL3	HIGH-275 MHZ LOOP UNLOCKED
7. UNLESS OTHERWISE INDICATED: SIGNALS ENTER AT LEFT SIDE AND EXIT RIGHT SIDE OF FUNCTION BLOCKS.
8. U30 AND U27 ARE NOT USED.

A22

A22 Frequency Control, Circuit Description

A22 Frequency Control provides tuning voltage to A11 50 MHz Voltage-Tuned Oscillator (VTO), current to A23A1 YIG-Tuned Oscillator (YTO), sweep to the selected oscillator, and bias to the YTO. It provides latching of data for A23 RF Converter, A6 YIG-Tuned Oscillator Phase Lock, and A11 50 MHz Voltage-Tuned Oscillator. It also indicates to A12 RF Section Interface an over-range of the phase lock voltage, and supplies a frequency analog voltage to A20 Third Converter.

Sweep Generator (A)

The Sweep Generator, with the Sweep Reference Voltage and the Sweep Generator Current Source, provides the sweep signal for the VTO and YTO and the horizontal display signal to the IF Section. A control line is provided so that the sweep may be stopped by A15 Controller.

The timing capacitor C16 is a stable polycarbonate capacitor which receives a constant drive current from Q11B to provide a ramp for sweeping frequency. The base-emitter voltage of Q11B sets the current. This voltage is determined by the Sweep Generator Current Source and by the output of U16A in the Sweep Reference Voltage circuit. U16A is offset and buffered by Q11A, Q9, and associated circuitry. Q11A and Q11B track thermally for temperature compensation. R90 and R92 provide gain to the op amp U16B. SLOW potentiometer R88 and FAST potentiometer R91 adjust sweep times to fit the particular characteristic curve of Q11. Q14 acts as a buffer when the sweep is stopped by the Sweep Stop Switch circuit (HSWP is low).

Q17, Q19, and associated circuitry buffer C16 and provide a usable drive for the Sweep.

Comparator U18 and associated circuitry detect the start voltage of the sweep and hold it at -5 V when Reset Switch Q21 is turned off. R103 and C31 improve the stability of the feedback loop, and CR1 prevents leakage of the charge on C16 during sweep time.

U17B and associated circuitry provide an offset sweep of 0 V to $+10\text{ V}$ for horizontal display control to the IF Section.

Sweep Reference Voltage (B)

Voltage from Q10 is amplified to about $+10\text{ V}$ and buffered by U16A. Q10 causes a variation in the voltage at TP15 of about $30\text{ mV}/^{\circ}\text{C}$ to aid in temperature compensation of the Sweep Generator. R96 and R97 provide gain, and C15 is a filter. R128 isolates TP15 from external loading at U16A pin 1. (During normal operation this voltage might vary from about $+9\text{ V}$ to about $+11\text{ V}$, depending on the ambient temperature.) SWP REF potentiometer R94 sets the positive input voltage to U16A.

Sweep Generator Current Source (C)

Q16, Q18, Q20, Q27, Q28, and Q29 are switches controlled by Latch U34, which is loaded by decoded address 5 (ADD 5). These transistors switch resistors to provide appropriate currents for selected sweep times. Current through Q12 (which is used for temperature compensation) causes a linear increase in the base-emitter voltage of Q11B, causing an exponential increase in sweep time. Thus, when all six transistor switches are saturated, a 10 ms sweep will result, but if Q18 is off, a $\times 10$ multiplier is added, causing a 100 ms sweep (see schematic for other multipliers).

Sweep Stop Switch (E)

A logic 0 at the base of Q26 (HSWP is low) causes Q13 to divert charging current from timing capacitor C16 to ground, stopping the sweep. DS3 provides a sweep-stop indication on the board.

Address Decoder (D)

Decoder U35 decodes the Address Bus and routes a load pulse to each of the seven locations noted on the schematic. U36 inverts LBIO for U35.

Bus Address 6 Latch (F)

Latch U31 provides latching for functions elsewhere in the RF Section of the spectrum analyzer and turns on Reset Switch Q21 in the Sweep Generator. Decoded address 6 (ADD 6) loads U31.

Sweep Attenuator (G)

U17A, U14, and U13 provide an $N/1023$ Attenuator to the analog SWEEP voltage, while U29, U10 and associated circuitry provide attenuations of $\times 1$, $\times .1$, and $\times .01$. U14 is a multiplying digital-to-analog converter (DAC) whose reference (pin 17) sweeps ± 5 V while its output, buffered by U13, sweeps ± 5 V $\times N/1023$, where N is the binary number at the U14 inputs. U30, U32, U33 latch data for the Sweep Attenuator and for A11 50 MHz Voltage-Tuned Oscillator. C27 narrows the bandwidth of U13 to lower noise in FM Coil Sweeps.

Sweep Select Switches (H)

U24 latches control information for U7 and U20, which gate the attenuated sweep to a specific oscillator and grounds unswept lines. The VTO SWEEP, YTO MAIN COIL SWEEP, and YTO FM COIL SWEEP are selectable.

Reference Voltages (I)

VR1 provides a voltage that is buffered and amplified by U12 and inverted by U15. These two op amp outputs provide tune reference voltages: -10.285 V YTO tuning reference and $+10.285$ V tuning reference. TUNE REF adjustment R17 sets these voltages. The -10.285 YTO tuning reference is tested at TP13. C6, C7, and C12 provide noise filtering.

VTO Tune DAC (J)

U25, U26, U27, and U28 latch data for digital-to-analog converters (DACs) U9 and U6. U9, buffered by U8, converts the ten most-significant bits into a voltage which coarse-tunes the VTO. U6, buffered by U5, converts the ten least-significant bits. The output of U5 is attenuated approximately 1/500 by R6 through R9. R7 LSD VTO adjusts this attenuation. The attenuated voltage is used for fine tuning. U38 sums the voltages and provides the VTO tuning voltage. This tuning voltage should range from 0 to +10.23 V as observed at TP9. TP18 is used to measure the output of U9, TP7 the output of U6.

YTO Drive Circuits

The following circuits provide control currents or bias voltages to A23A1 YIG-Tuned Oscillator: YTO Tune DAC, YTO Main Coil Tune Driver, YTO FM Coil Driver, YTO Main Coil Fixed Driver, -10 V Bias, and YTO filter.

YTO Tune DAC (K)

U4 is a 10-bit digital-to-analog converter (DAC) controlled by data latched in U22 and U23 and buffered by U3. Full scale output (adjusted by YTO potentiometer R25) should be 10.230 V between zero setting and 1023 setting at the input to U4.

YTO Main Coil Tune Driver (L)

U1 sums SWEEP and YTO TUNE through R31 and R32. It drives Darlington pair Q8 and Q7 to provide a linear voltage-to-current function across R51. CR3 and CR4 are clamps. R35 and R36 provide gain. R48, VR7, and R49 provide 0 V bias for Q8 and Q7. C24, R50, and CR8 provide startup compensation to the YTO magnet structure. STOP potentiometer R35 adjusts the stop point in YTO tuning.

YTO Main Coil Fixed Driver (N)

R34, R40, C18, and R41 provide a tuning reference voltage, U37 compares this to the voltage at the wiper of R39 START adjustment. The resulting voltage level is converted to a corresponding current by Q3 and Q4. This adjusts the start point of the YTO when the tuning DACs are set to zero.

YTO FM Coil Driver (M)

Q24 and Q25 provide a high-current voltage source for voltage-to-current conversion across FM SWP potentiometer R64 and R65 to drive the FM coil of the YTO. For spans ≥ 1 MHz and ≤ 20 MHz, the FM Coil Driver sweeps frequency. U19 drives Q24, Q25, R16, and R62 from the sweep- and phase-correction voltages summed by R30, R33 and R57, R58. C19, C20, C5, L4, and L5 filter a spurious response from the YTO phase lock loop.

–10 V Bias (P)

Differential pair Q23A and Q23B drive Q22 to provide a high-current –10 V bias to the YTO, R53 is a current source, and R55, R56 feed back the output voltage to the base of Q23B.

YTO Filter (R)

Q6 acts to switch Q5, which switches C26 and R47 across the main coil of the YTO. In FM COIL and VTO sweeps, this helps reduce open-loop noise in the YTO. VR6 and CR5 protect C26 and Q5 from inductive flyback. R45, R46, VR5 are level-shifters.

Frequency Analog Voltage (0)

AMPL CAL is a voltage to compensate for gain rolloff in the signal first converter and to set IF gain. It results from the summing of the YTO TUNE and YTO MAIN COIL SWEEP voltages with the REF LEVEL CAL voltage from the front panel. U21C is a buffer, and U21D sums the two inputs. Potentiometer R66 provides the TILT adjustment in wide spans, and CR2 provides temperature compensation for IF gains.

YTO Phase Lock Limit Indicators (Q)

The phase-correction voltage must not exceed ± 5 V for best operation, so U21A and U21B detect these limits and provide visual indications (DS1 and DS2) and logic levels to A12 RF Section Interface. VR8 and VR9 limit the positive swing of the output voltage, while CR6 and CR7 limit the negative swing.

A22 Frequency Control, Troubleshooting

The A22 Frequency Control assembly generates the sweep ramp and tune voltages used by the swept oscillators in the analyzer. A key element in this operation is the 10-bit DAC. At the end of this troubleshooting information is a short theory on 10-bit DACs. Verification of most functional blocks on this assembly can be made without removing it from the instrument.

Sweep Generator

Operation of the Sweep Generator can be checked with the KSF (**SHIFT** **RES BW**) function. Using sweep times of 20 ms, 30 ms 50 ms, 100 ms, 1 s and 100 s and KSF, the Sweep Generator Current Source (C) circuitry is exercised. The sweep time is 10 ms times the multiplier value for each switch that is off. The 100 s measurement may show a reading such as 8 s. The internal counter resets to zero at 100 s. Thus, the proper reading would be 108 s.

Figure 1 shows the waveforms in the Sweep Generator. The sweep ramp is generated in the following manner. Initially, C16 is charged to -5 V and Q21 is on. Current from Q11B charges C16 until it reaches $+5\text{ V}$. It is held at this level because HSWP goes low. The reset pulse turns Q21 off, causing U18 pin 6 to go negative, forward-biasing CR1 and discharging C16 to -5 V (for example, until U18 pin 6 reaches $+3.11\text{ V}$). When HSWP goes high, a new sweep is started. LED DS3 is on when the sweep is stopped.

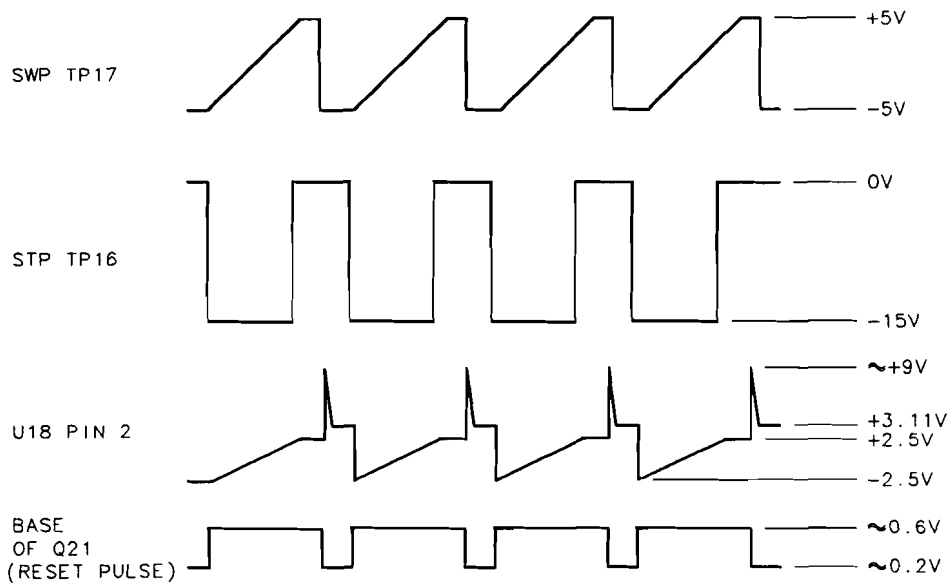


Figure 1. A22 Sweep Generator Waveforms

Table 1 is a truth table showing the states of the Sweep Generator Current Source transistors for sweep times from 20 milliseconds to 1500 seconds.

Table 1. Sweep Generator Current Source Truth Table

Sweep Time	Q16	Q18	Q20	Q27	Q28	Q29
milliseconds						
20	ON	ON	ON	ON	ON	OFF
30	ON	ON	ON	ON	OFF	OFF
50	ON	ON	OFF	ON	ON	ON
75	ON	ON	OFF	ON	OFF	ON
100	ON	OFF	ON	ON	ON	ON
150	ON	OFF	ON	ON	OFF	ON
200	ON	OFF	ON	ON	ON	OFF
300	ON	OFF	ON	ON	OFF	OFF
500	ON	OFF	OFF	ON	ON	ON
750	ON	OFF	OFF	ON	OFF	ON
seconds						
1	OFF	ON	ON	ON	ON	ON
1.5	OFF	ON	ON	ON	OFF	ON
2	OFF	ON	ON	ON	ON	OFF
3	OFF	ON	ON	ON	OFF	OFF
5	OFF	ON	OFF	ON	ON	ON
7.5	OFF	ON	OFF	ON	OFF	ON
10	OFF	OFF	ON	ON	ON	ON
15	OFF	OFF	ON	ON	OFF	ON
20	OFF	OFF	ON	ON	ON	OFF
30	OFF	OFF	ON	ON	OFF	OFF
50	OFF	OFF	OFF	ON	ON	ON
75	OFF	OFF	OFF	ON	OFF	ON
100	OFF	OFF	ON	OFF	ON	ON
150	OFF	OFF	ON	OFF	OFF	ON
200	OFF	OFF	ON	OFF	ON	OFF
300	OFF	OFF	ON	OFF	OFF	OFF
500	OFF	OFF	OFF	OFF	ON	ON
750	OFF	OFF	OFF	OFF	OFF	ON
1000	OFF	OFF	OFF	OFF	ON	OFF
1500	OFF	OFF	OFF	OFF	OFF	OFF

Sweep Attenuator

The Sweep Attenuator is a 10-bit DAC whose reference voltage is swept from -5 V to $+5\text{ V}$. U13 pin 6 is the $\pm 5\text{ V}$ sweep times $N/1024$, where N is supplied by the processor. This output is multiplied by 1, 0.1, or 0.01 as shown in Table 2, depending on the frequency span.

Table 2. Sweep Attenuator Multipliers versus Frequency Spans

Frequency Span	X1 (U29B)	X0.1(U29A)	X0.01 (U29C)
Span > 170 MHz	ON		
20 MHz < Span ≤170 MHz		ON	
2 MHz < Span ≤20 MHz	ON		
1 MHz < Span ≤2 MHz		ON	
50 kHz < Span ≤1 MHz	ON		
5 kHz < Span ≤50 kHz		ON	
Span ≤ 5 kHz			ON

Each time a new multiplier is switched in, the output at U13 pin 6 will be the full ± 5 V sweep ramp.

This attenuated sweep is routed to the appropriate sweep circuit depending on the frequency span, as shown in Table 3.

Table 3. Sweep Circuit vs Frequency Spans

Frequency Span	Sweep Circuit
Spans > 20 MHz	YTO Main Coil
1 MHz < Span ≤20 MHz	YTO FM Coil
Span ≤ 1 MHz	50 MHz VTO

Due to a rounding error in the processor, the switching points of 20 MHz and 1 MHz are not exact when using the RPG to set the frequency Span.

All lines are grounded when not used. The YTO is being phase locked during the 0 V time period that occurs on the voltages at TP10, TP8, TP5, and TP4.

Operation of the Sweep Attenuator DAC can be verified by using **SHIFT** **CF STEP SIZE** (KSJ). Measure the voltage at TP10. Set the analyzer to **SINGLE** Sweep, **EXT** Trigger. Key in KSJ and 0 GHz. Press the DATA **↑** key repeatedly. The voltage at TP10 should start at approximately 0 V and double with each step to -5 V. If **LINE** Trigger is used, it will step +5 V. It is good procedure to use the DATA keys when checking the various DACs. This way, each bit is checked for operation.

HP Part Number 85680-60156
A22 Frequency Control

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A22	85680-60156	9	1	BOARD ASSEMBLY FREQUENCY CONTROL	28480	85680-60156
A22C1	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C5	0160-2253	9	1	CAP-FXD 6.8pF 500 V	52763	
A22C6	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C7	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C8	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C9	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A22C10	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C11	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A22C12	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C13	0160-3448	6	1	CAP-FXD 1000pF 1 kV		808-548 X5E 102K
A22C14	0160-3448	6	1	CAP-FXD 1000pF 1 kV		808-548 X5E 102K
A22C15	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C16	0160-3402	2	1	CAP-FXD 1uF 50 V POLYC-MET	84411	HEW-249
A22C17	0180-0094	4	1	CAP-FXD 100uF 25 V AL-ELCTLT	56289	30D107G025DD2-DSM
A22C18	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22C19	0160-2306	3	1	CAPACITOR-FXD 27PF +-5% 300VDC MICA	09023	RDM15E270J3C
A22C20	0160-2201	7	1	CAPACITOR-FXD 51PF +-5% 300VDC MICA	09023	CD15ED510J03
A22C21	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A22C22	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A22C23	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A22C24	0180-1745	4	1	CAPACITOR-FXD 1.5UF+-10% 20VDC TA	56289	150D155X9020A2-DYS
A22C26	0180-0229	7	1	CAP-FXD 33uF 10 V TA	56289	150D336X9010B2-DYS
A22C27	0140-0198	5	1	CAPACITOR-FXD 200PF +-5% 300VDC MICA	09023	CD15FD201J03
A22C28	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A22C29	0160-3448	6	1	CAP-FXD 1000pF 1 kV		808-548 X5E 102K
A22C30	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A22C31	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA	09023	CD15FD101J03
A22C32	0160-4298	6	1	CAPACITOR-FXD 4700PF +-20% 250VDC CER		815-250V X5R 472M
A22C33	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A22CR1	1901-0586	0	1	DIODE-GEN PRP 30V 25MA TO-72	17856	
A22CR2	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A22CR3	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A22CR4	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A22CR5	1901-0050	3	1	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	1N4150
A22CR6	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A22CR7	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A22CR8	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A22CR9	1901-0535	9	1	DIODE-SCHOTTKY SM SIG		
A22CR10	1901-0535	9	1	DIODE-SCHOTTKY SM SIG		
A22CR11	1901-0535	9	1	DIODE-SCHOTTKY SM SIG		
A22CR12	1901-0535	9	1	DIODE-SCHOTTKY SM SIG		
A22DS1	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A22DS2	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A22DS3	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A22J1	1200-1204	5	1	SOCKET-IC 14-CONT DIP DIP-SLDR	00779	2-641609-2
A22J3	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	98291	51-053-0349-BE8

**Indicates factory-selected value*

HP Part Number 85680-60156

A22 Frequency Control

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A22J4	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	98291	51-053-0349-BE8
A22L1	08558-80011	6	1	INDUCTOR-FILTER COIL BLUE	28480	08558-80011
A22L2	08558-80011	6	1	INDUCTOR-FILTER COIL BLUE	28480	08558-80011
A22L3	08558-80011	6	1	INDUCTOR-FILTER COIL BLUE	28480	08558-80011
A22L4	9100-1651	2	1	INDUCTOR RF-CH-MLD 750UH +-5% .2D-INX.45	99800	2500-22
A22L5	9100-1648	7	1	INDUCTOR RF-CH-MLD 560UH +-5% .2D-INX.45	99800	2500-16
A22MP1	4040-0750	7	1	EXTR-PC BD RED POLYC .062-IN-BD-THKNS		
A22MP2	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	72962	99-012-062-0250
A22MP3	1205-0011	0	3	HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
A22MP5	0360-0353	0	1	BRACKET-RTANG .406-LG X .343-LG .312-WD	79963	176-144
A22MP6	0361-0006	2	1	RIVET-SEMITUB OVH .146DIA .156LG	12014	R-4013
A22MP7	2190-0112	0	4	WASHER-LK HLCL NO. 2 .088-IN-ID	77339	
A22MP10	0520-0128	7	4	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	77250	
A22MP11	0590-0533	5	4	THREADED INSERT-NUT 2-56 .06-IN-LG SST	46384	KFS2-256
A22MP12				NOT ASSIGNED		
A22MP13	0340-0628	0	1	INSULATOR-XSTR NYLON WHITE	13103	7717-133N
A22MP14	0890-0644	5	1	SLEEVING-FLEX .102-ID NEMA-3 .018-WALL	79074	VARFIL B-A-1
A22MP15	8151-0013	4	1	WIRE 22AWG 1X22	92194	298
A22Q3	1854-0023	9	1	TRANSISTOR NPN SI TO-18 PD=360MW	25403	
A22Q4	1854-0039	7	1	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	2N3053S
A22Q5	1853-0007	7	1	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A22Q6	1853-0007	7	1	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A22Q7	1854-0039	7	1	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	2N3053S
A22Q8	1854-0023	9	1	TRANSISTOR NPN SI TO-18 PD=360MW	25403	
A22Q9	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q10	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q11	1853-0388	7	1	TRANSISTOR-DUAL PNP TO-78 PD=600MW	04713	
A22Q12	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q13	1855-0020	8	1	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	04713	SFE793
A22Q14	1855-0209	5	1	TRANSISTOR J-FET P-CHAN D-MODE SI	04713	
A22Q16	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q17	1855-0305	2	1	TRANSISTOR J-FET 2N4117A N-CHAN D-MODE	17856	2N4117A
A22Q18	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q19	1853-0451	5	1	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	04713	
A22Q20	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q21	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q22	1854-0039	7	1	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	2N3053S
A22Q23	1853-0594	7	1	TRANSISTOR-DUAL PNP 2N3808 PD=600MW	04713	2N3808
A22Q24	1854-0039	7	1	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	2N3053S
A22Q25	1853-0001	1	1	TRANSISTOR PNP SI TO-39 PD=600MW	27014	
A22Q26	1853-0020	4	1	TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A22Q27	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q28	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22Q29	1854-0071	7	1	TRANSISTOR NPN SI TO-92 PD=300MW	56289	
A22R6	0698-7929	5	1	RESISTOR 9.09K +-0.1% .125W TF TC=0+-50	19701	5033R
A22R7	2100-2574	3	1	RESISTOR-TRMR 500 10% TKF SIDE-ADJ 1-TRN	73138	82PAR500
A22R8	0698-6323	1	1	RESISTOR 100 +-0.1% .125W TF TC=0+-25	91637	CMF-55-1, T-9
A22R9	0698-6353	7	1	RESISTOR 50K +-0.1% .125W TF TC=0+-25	19701	5033R

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A22 Frequency Control

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A22R10	0698-4037	0	1	RESISTOR 46.4 1% .125W TF TC=0+-100	19701	SFR25H
A22R11	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R13	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R14	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R16	0698-3439	4	1	RESISTOR 178 1% .125W TF TC=0+-100	19701	SFR25H
A22R17	2100-4020	8	1	RESISTOR-TRMR 2K 10% TF SIDE-ADJ 26-TRN	18612	1280-2K-10%
A22R18	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R19	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R20	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R21	0698-8889	8	1	RESISTOR 16K +-0.01% .125W TF TC=0+-10		PR1/8
A22R22	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R23	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R24	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R25	2100-1755	0	1	RESISTOR-TRMR 100 5% WW SIDE-ADJ 1-TRN		CT-106-4-100
A22R27	0698-7794	2	1	RESISTOR 10K +-0.25% .125W TF TC=0+-100	19701	5033R
A22R28	0698-5439	8	1	RESISTOR 1K +-0.25% .125W TF TC=0+-50	19701	5033R
A22R29	0698-8322	4	1	RESISTOR 111 +-0.25% .125W TF TC=0+-100	19701	5033R
A22R30	0757-0421	4	1	RESISTOR 825 +-1% .125W TF TC=0+-100	19701	SFR25H
A22R31	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R32	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R33	0698-3153	9	1	RESISTOR 3.83K 1% .125W TF TC=0+-100	19701	SFR25H
A22R34	0698-6348	0	1	RESISTOR 3K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R35	2100-3962	5	1	RESISTOR-TRMR 5K 10% TF SIDE-ADJ 25-TRN	18612	1280
A22R36	0698-6353	7	1	RESISTOR 50K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R37	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R38	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R39	2100-3962	5	1	RESISTOR-TRMR 5K 10% TF SIDE-ADJ 25-TRN	18612	1280
A22R40	0698-6353	7	1	RESISTOR 50K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R41	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R42	0698-8885	4	1	RESISTOR 20K +-0.01% .125W TF TC=0+-10		PR1/8
A22R43	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A22R44	0811-3492	1	1	RESISTOR 133 +-1% 12W PWI TC=0+-2	01686	AL-10
A22R45	0757-0465	6	1	RESISTOR 100K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R46	0757-0417	8	1	RESISTOR 562 +-1% .125W TF TC=0+-100	19701	SFR25H
A22R47	0698-3439	4	1	RESISTOR 178 1% .125W TF TC=0+-100	19701	SFR25H
A22R48	0698-3154	0	1	RESISTOR 4.22K 1% .125W TF TC=0+-100	19701	SFR25H
A22R49	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R50	0757-0279	0	1	RESISTOR 3.16K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R51	0811-3492	1	1	RESISTOR 133 +-1% 12W PWI TC=0+-2	01686	AL-10
A22R52	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A22R53	0757-0279	0	1	RESISTOR 3.16K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R54	0698-3393	9	1	RESISTOR 28.7 1% .5W TF TC=0+-100	19701	5053R
A22R55	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	19701	SFR25H
A22R56	0698-7050	3	1	RESISTOR 4.48K +-0.5% .125W TF TC=0+-50	19701	5033R
A22R57	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	19701	SFR25H
A22R58	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	19701	SFR25H
A22R59	0757-0290	5	1	RESISTOR 6.19K +-1% .125W TF TC=0+-100	19701	SFR25H

*Indicates factory-selected value

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A22 Frequency Control

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A22R61	0698-3398	4	1	RESISTOR 46.4 1% .5W TF TC=0+-100	19701	MF7C-1
A22R62	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A22R63	0698-3398	4	1	RESISTOR 46.4 1% .5W TF TC=0+-100	19701	MF7C-1
A22R64	2100-1755	0	1	RESISTOR-TRMR 100 5% WW SIDE-ADJ 1-TRN		CT-106-4-100
A22R65	0757-0795	5	1	RESISTOR 75 +-1% .5W TF TC=0+-100	19701	5053R
A22R66	2100-2522	1	1	RESISTOR-TRMR 10K 10% TKF SIDE-ADJ 1-TRN	73138	82PAR10K
A22R67	0757-0447	4	1	RESISTOR 16.2K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R68	0757-0199	3	1	RESISTOR 21.5K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R69	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R70	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R71	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R72	0698-3158	4	1	RESISTOR 23.7K 1% .125W TF TC=0+-100	19701	SFR25H
A22R73	0698-3158	4	1	RESISTOR 23.7K 1% .125W TF TC=0+-100	19701	SFR25H
A22R74	0698-3158	4	1	RESISTOR 23.7K 1% .125W TF TC=0+-100	19701	SFR25H
A22R75	0698-3158	4	1	RESISTOR 23.7K 1% .125W TF TC=0+-100	19701	SFR25H
A22R76	0698-3158	4	1	RESISTOR 23.7K 1% .125W TF TC=0+-100	19701	SFR25H
A22R77	0698-3158	4	1	RESISTOR 23.7K 1% .125W TF TC=0+-100	19701	SFR25H
A22R78	0698-7421	2	1	RESISTOR 40K +-0.25% .125W TF TC=0+-100	19701	5033R
A22R79	0698-3454	3	1	RESISTOR 215K 1% .125W TF TC=0+-100	19701	SFR25H
A22R80	0698-3451	0	1	RESISTOR 133K 1% .125W TF TC=0+-100	19701	SFR25H
A22R81	0698-8848	9	1	RESISTOR 57.2K +-0.25% .125W TF TC=0+-10	K8479	H8
A22R82	0698-7421	2	1	RESISTOR 40K +-0.25% .125W TF TC=0+-100	19701	5033R
A22R83	0698-3194	8	1	RESISTOR 20K .25% .125W TF TC=0+-50	19701	5033R
A22R84	0757-0289	2	1	RESISTOR 13.3K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R85	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R86	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R87	0757-0444	1	1	RESISTOR 12.1K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R88	2100-3109	2	1	RESISTOR-TRMR 2K 10% TKF SIDE-ADJ 17-TRN	73138	89PR2K
A22R89	0698-3457	6	1	RESISTOR 316K 1% .125W TF TC=0+-100	19701	SFR25H
A22R90	0698-3442	9	1	RESISTOR 237 1% .125W TF TC=0+-100	19701	SFR25H
A22R91	2100-3052	4	1	RESISTOR-TRMR 50 10% TKF SIDE-ADJ 17-TRN	73138	89PR50
A22R92	0698-3446	3	1	RESISTOR 383 1% .125W TF TC=0+-100	19701	SFR25H
A22R93	0698-3450	9	1	RESISTOR 42.2K 1% .125W TF TC=0+-100	19701	SFR25H
A22R94	2100-3154	7	1	RESISTOR-TRMR 1K 10% TKF SIDE-ADJ 17-TRN	73138	89PR1K
A22R95	0757-0279	0	1	RESISTOR 3.16K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R96	0698-3152	8	1	RESISTOR 3.48K 1% .125W TF TC=0+-100	19701	SFR25H
A22R97	0757-0459	8	1	RESISTOR 56.2K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R98	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R99	0683-3355	2	1	RESISTOR 3.3M 5% .25W CC TC=-900/+1100	01121	CB3355
A22R100	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	19701	SFR25H
A22R101	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	19701	SFR25H
A22R102	0757-0279	0	1	RESISTOR 3.16K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R103	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A22R104	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R105	0698-3160	8	1	RESISTOR 31.6K 1% .125W TF TC=0+-100	19701	SFR25H
A22R106	0757-0346	2	1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A22R107	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A22R108	0698-6360	6	1	RESISTOR 10K +-0.1% .125W TF TC=0+-25	19701	5033R

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Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A22R109	0698-6619	8	1	RESISTOR 15K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R110	0698-6322	0	1	RESISTOR 4K +-0.1% .125W TF TC=0+-25	91637	CMF-55-1, T-9
A22R111	0698-6360	6	1	RESISTOR 10K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R112	0698-8865	0	1	RESISTOR 4.45K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R114	0757-0465	6	1	RESISTOR 100K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R120	0698-3161	9	1	RESISTOR 38.3K 1% .125W TF TC=0+-100	19701	SFR25H
A22R121	0698-3161	9	1	RESISTOR 38.3K 1% .125W TF TC=0+-100	19701	SFR25H
A22R122	0698-3161	9	1	RESISTOR 38.3K 1% .125W TF TC=0+-100	19701	SFR25H
A22R123	0757-0279	0	1	RESISTOR 3.16K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R124	0757-0279	0	1	RESISTOR 3.16K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R126	0757-0416	7	1	RESISTOR 511 +-1% .125W TF TC=0+-100	19701	SFR25H
A22R127	0757-0444	1	1	RESISTOR 12.1K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R128	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R129	0757-0428	1	1	RESISTOR 1.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A22R130	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R131	0811-1185	5	1	RESISTOR 10K +-0.01% .05W PN TC=0+-10	20940	140
A22R132	0698-6360	6	1	RESISTOR 10K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R133	0698-6360	6	1	RESISTOR 10K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R134	0698-6360	6	1	RESISTOR 10K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R135	0698-8949	1	1	RESISTOR 20.57K +-0.1% .125W TF TC=0+-25	19701	5033R
A22R136	0698-8948	0	1	RESISTOR 19.46K +-0.1% .125W TF TC=0+-25	19701	5033R
A22TP1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP2	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP3	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP4	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP5	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP6	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP7	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP8	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP9	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP10	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP11	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP12	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP13	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP14	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP15	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP16	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP17	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22TP18	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A22U1	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
A22U2	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
A22U3	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
A22U4	1826-0684	9	1	D/A 12-BIT 18-CBRZ/SDR CMOS	24355	AD7541BD(SEL)
A22U5	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
A22U6	1826-0684	9	1	D/A 12-BIT 18-CBRZ/SDR CMOS	24355	AD7541BD(SEL)
A22U7	1826-0416	5	1	ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	LF13331D
A22U8	5180-2314	0	1	IC OSC M1 OPAMP	28480	5180-2314

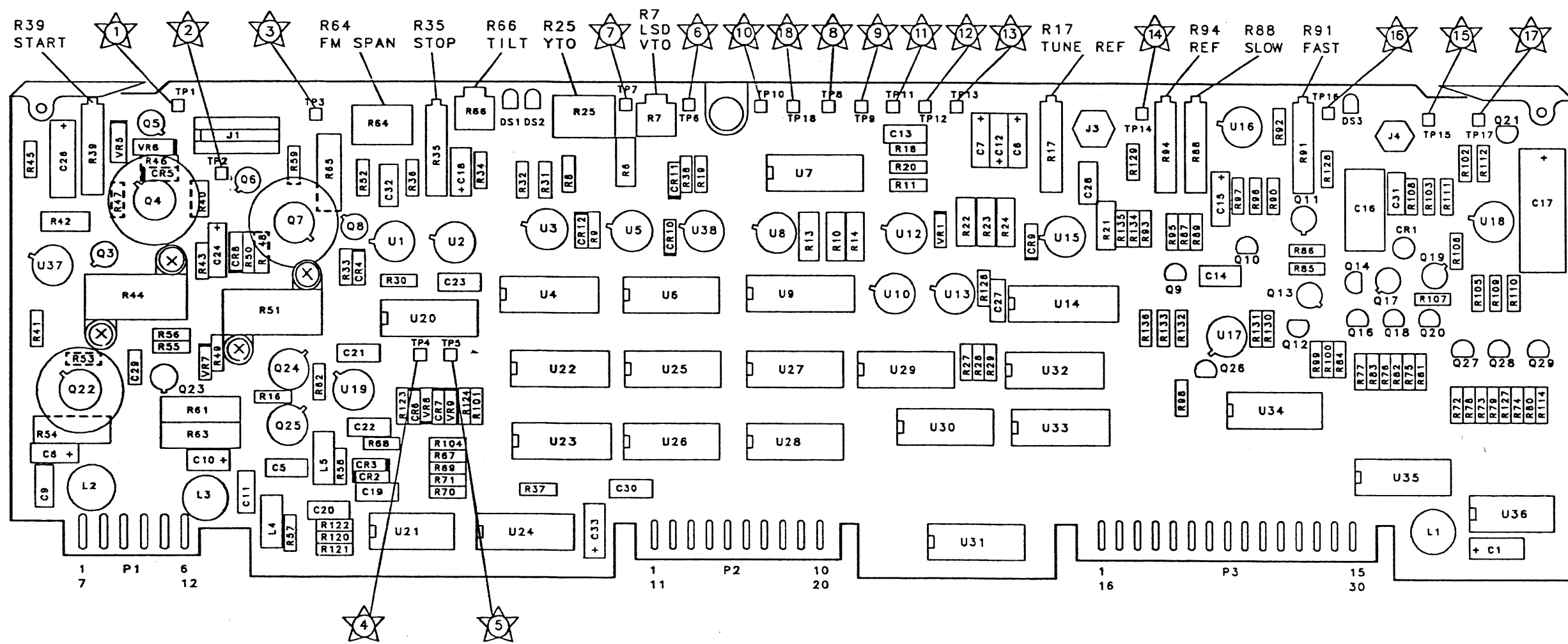
*Indicates factory-selected value

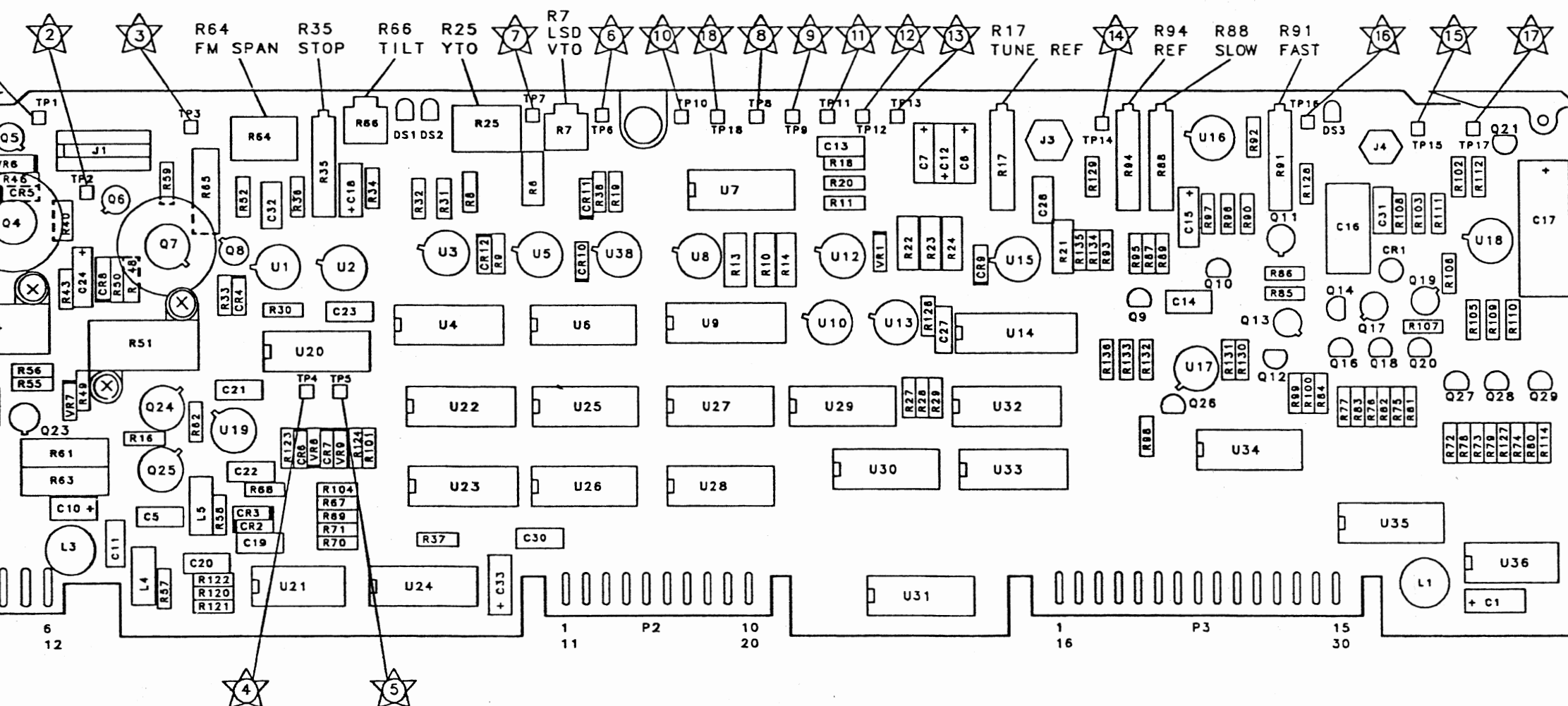
85680-60156 Parts List

Page 5 of 6

HP Part Number 85680-60156
A22 Frequency Control

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A22U9	1826-0684	9	1	D/A 12-BIT 18-CBRZ/SDR CMOS	24355	AD7541BD(SEL)
A22U10	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
A22U12	1826-0471	2	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-07CJ SELECTED
A22U13	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
A22U14	1826-0684	9	1	D/A 12-BIT 18-CBRZ/SDR CMOS	24355	AD7541BD(SEL)
A22U15	1826-0471	2	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-07CJ SELECTED
A22U16	5081-8117	3	1	SCREENED 1826-0092	28480	5081-8117
A22U17	5081-8117	3	1	SCREENED 1826-0092	28480	5081-8117
A22U18	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A22U19	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	LF256H
A22U20	1826-0417	6	1	ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	LF13333D
A22U21	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	27014	LM324N
A22U22	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U23	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U24	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U25	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U26	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U27	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U28	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U29	1826-0416	5	1	ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	LF13331D
A22U30	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U31	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U32	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U33	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U34	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM CL	01295	SN74LS174N
A22U35	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A22U36	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A22U37	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
A22U38	5180-2314	0	1	IC OSC M1 OPAMP	28480	5180-2314
A22VR1	1902-0625	0	1	DIODE-ZNR 1N829 6.2V 5% DO-35 PD=.25W	04713	1N829
A22VR5	1902-0184	6	1	DIODE-ZNR 16.2V 5% DO-35 PD=.4W	04713	
A22VR6	1902-3059	0	1	DIODE-ZNR 3.83V 5% DO-35 PD=.4W	04713	
A22VR7	1902-0033	4	1	DIODE-ZNR 1N823 6.2V 5% DO-7 PD=.4W	04713	1N823
A22VR8	1902-3036	3	1	DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	04713	
A22VR9	1902-3036	3	1	DIODE-ZNR 3.16V 5% DO-7 PD=.4W TC=-.064%	04713	





A22 FREQUENCY CONTROL
85680-60156 (SHEET 1 OF 2)
(SERIAL PREFIX: 2408A)

P1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	GND		S
7	GND		S
2	+20V		R
8	+20V		R
3	NC		
9	NC		
4	-15V		S
10	-15V		S
5	NC		
11	NC		
6	+15V		S
12	+15V		S

P2

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	HTVL	A12,P2-14	Q
11	HTVH	A12,P2-15	Q
2	YTO LOCK	A6,P2-8	M
12	NC		
3	NC		
13	AMPTD CAL	A5,P1-1	O
4	50 MHz TUNE	A11,P2-7	J
14	AMPTD CAL	A20,P1-11	O
5	50 MHz GND	A11,P2-8	J
15	GND		S
6	50 MHz SWEEP	A11,P2-9	H
16	GND		S
7	NC		
17	LLOH	A23,P1-1,2	F
8	HDIV	A11,P2-11	G
18	LHLD	A6,P2-9	F
9	HFLT	A11,P2-12	G
19	HBWW	A6,P2-12	F
10	HCND	A6,P2-10	F
20	NC		F

P3

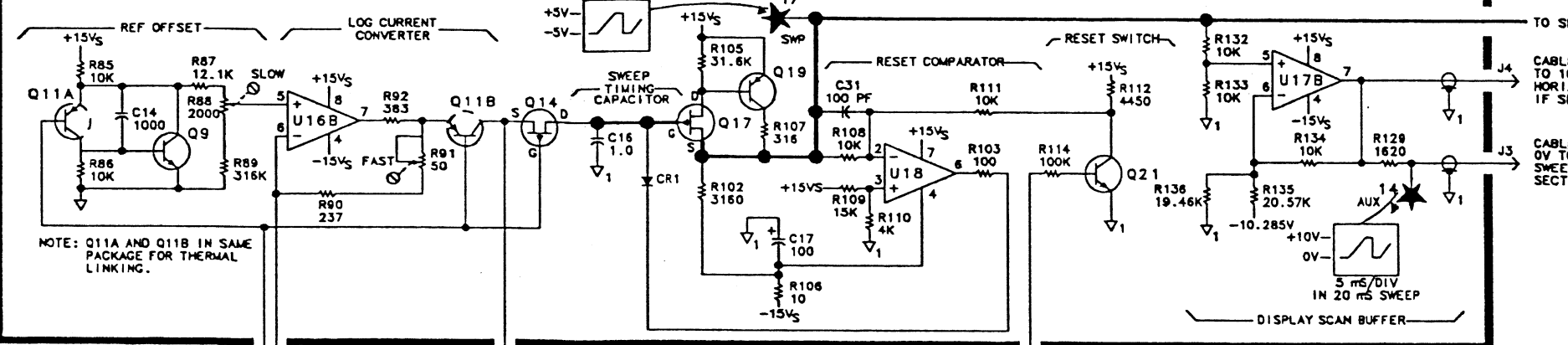
PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	HSWP	A12,P2-7	E
16	HSWP	A12,P2-7	E
2	IOB15	A15,P2-30	C
17	IOB14	A15,P2-12	C
3	IOB13	A15,P2-29	C
18	IOB12	A15,P2-11	C
4	IOB11	A15,P2-28	C
19	IOB10	A15,P2-10	C
5	IOB9	A15,P2-27	C
20	IOB8	A15,P2-9	C
6	IOB7	A15,P2-26	C
21	IOB6	A15,P2-8	C
7	IOB5	A15,P2-25	C
22	IOB4	A15,P2-7	C
8	IOB3	A15,P2-24	C
23	IOB2	A15,P2-6	C
9	IOB1	A15,P2-23	C
24	IOB0	A15,P2-5	C
10	NC		
25	ADR4	A15,P2-4	D
11	ADR3	A15,P2-21	D
26	ADR2	A15,P2-3	D
12	ADR1	A15,P2-20	D
27	ADR0	A15,P2-2	D
13	LB10	A15,P2-19	D
28	LB10	A15,P2-19	D
14	GND		S
29	GND		S
15	+5V		S
30	+5V		S

J1

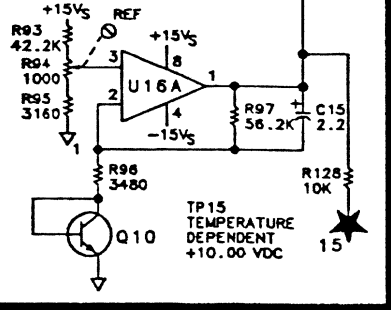
PIN	SIGNAL	FUNCTION BLOCK
1	GND	N
2	NC	
3	+20V	R
4	NC	
5	NC	
6	-10V	P
7	NC	
8	-10V	P
9	NC	
10	+20V	R
11	MAIN COIL	R
12	NC	
13	NC	
14	FM COIL	M

P3-24 IOB 0
P3-9 IOB 1
P3-23 IOB 2
P3-8 IOB 3
P3-22 IOB 4
P3-7 IOB 5
P3-21 IOB 6
P3-6 IOB 7
P3-20 IOB 8
P3-5 IOB 9
P3-19 IOB 10
P3-4 IOB 11
P3-18 IOB 12
P3-3 IOB 13
P3-17 IOB 14
P3-2 IOB 15

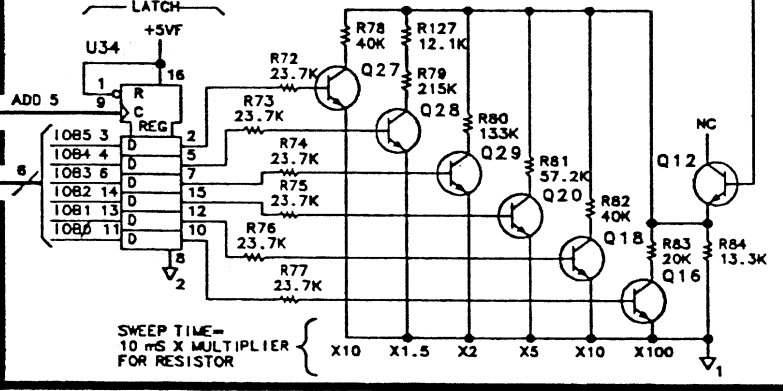
Ⓐ SWEEP GENERATOR



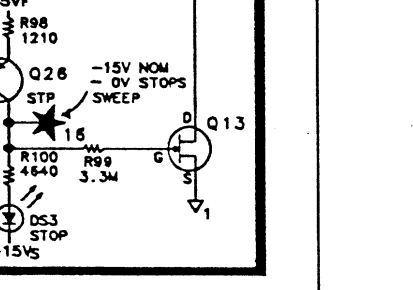
Ⓑ SWEEP REFERENCE VOLTAGE



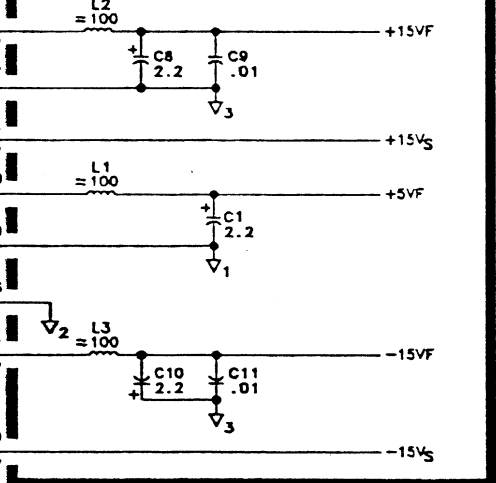
Ⓒ SWEEP GENERATOR CURRENT SOURCE



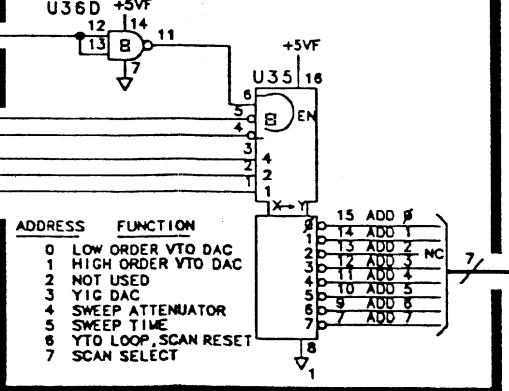
Ⓓ SWEEP STOP SWITCH



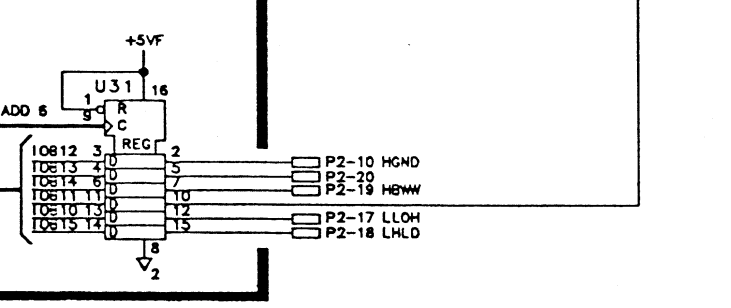
Ⓔ POWER SUPPLIES



Ⓕ ADDRESS DECODER



Ⓖ BUS ADDRESS 6 LATCH



L	TO/FROM	FUNCTION BLOCK
		S
		S
		R
		R
		S
		S
		S
		S

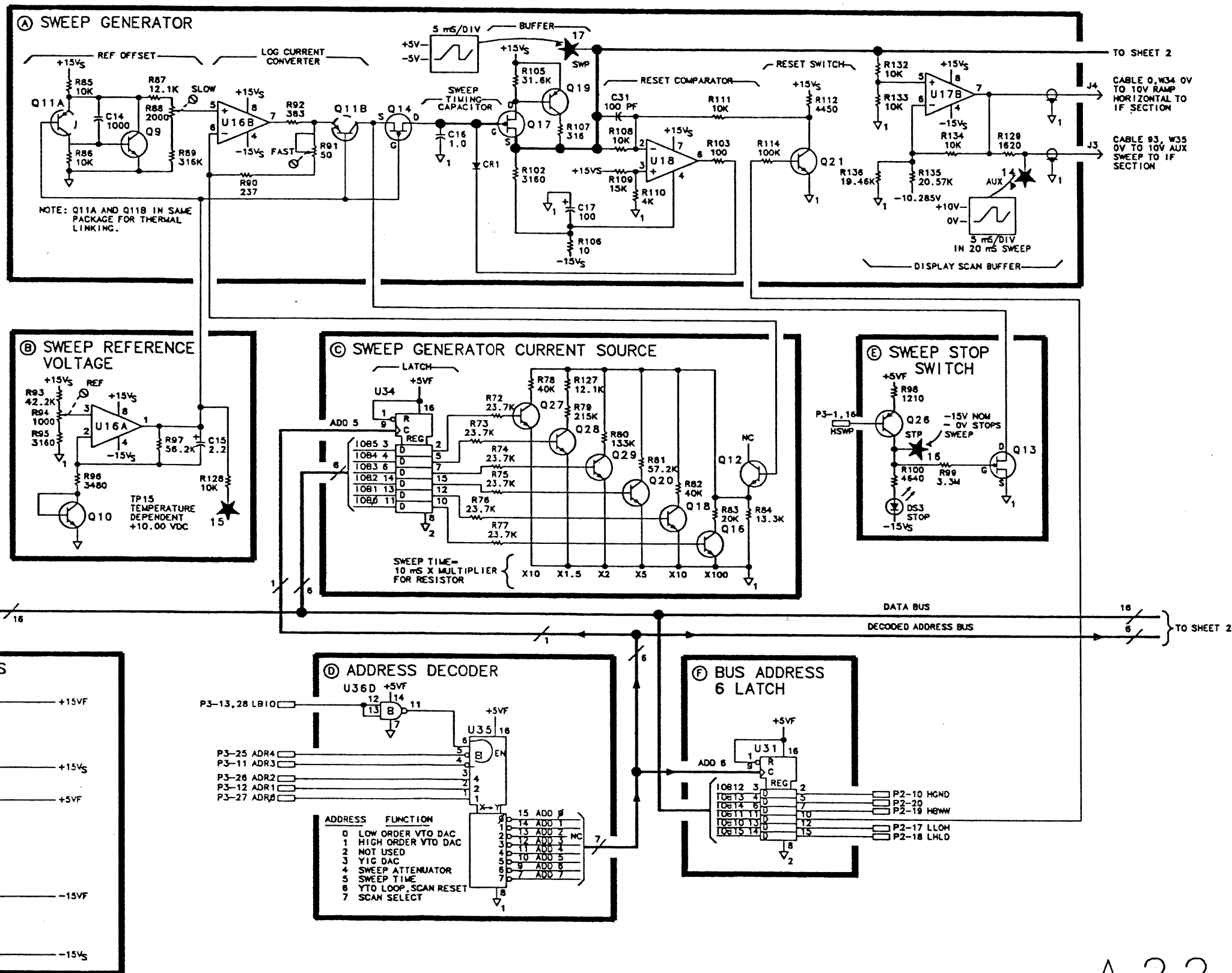
L	TO/FROM	FUNCTION BLOCK
	A12,P2-14	Q
	A12,P2-15	Q
	A6,P2-8	M
	A5,P1-1	O
	A11,P2-7	J
	A20,P1-11	O
	A11,P2-8	J
		S
	A11,P2-9	H
		S

L	TO/FROM	FUNCTION BLOCK
	A23,P1-1,2	F
	A11,P2-11	G
	A6,P2-9	F
	A11,P2-12	G
	A6,P2-12	F
	A6,P2-10	F
		F

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	HSWP	A12,P2-7	E
16	HSWP	A12,P2-7	E
2	IOB15	A15,P2-30	C
17	IOB14	A15,P2-12	C
3	IOB13	A15,P2-29	C
18	IOB12	A15,P2-11	C
4	IOB11	A15,P2-28	C
19	IOB10	A15,P2-10	C
5	IOB9	A15,P2-27	C
20	IOB8	A15,P2-9	C
6	IOB7	A15,P2-26	C
21	IOB6	A15,P2-8	C
7	IOB5	A15,P2-25	C
22	IOB4	A15,P2-7	C
8	IOB3	A15,P2-24	C
23	IOB2	A15,P2-6	C
9	IOB1	A15,P2-23	C
24	IOB0	A15,P2-5	C
10	NC		
25	ADR4	A15,P2-4	D
11	ADR3	A15,P2-21	D
26	ADR2	A15,P2-3	D
12	ADR1	A15,P2-20	D
27	ADR0	A15,P2-2	D
13	LB10	A15,P2-19	D
28	LB10	A15,P2-19	D
14	GND		S
29	GND		S
15	+5V		S
30	+5V		S

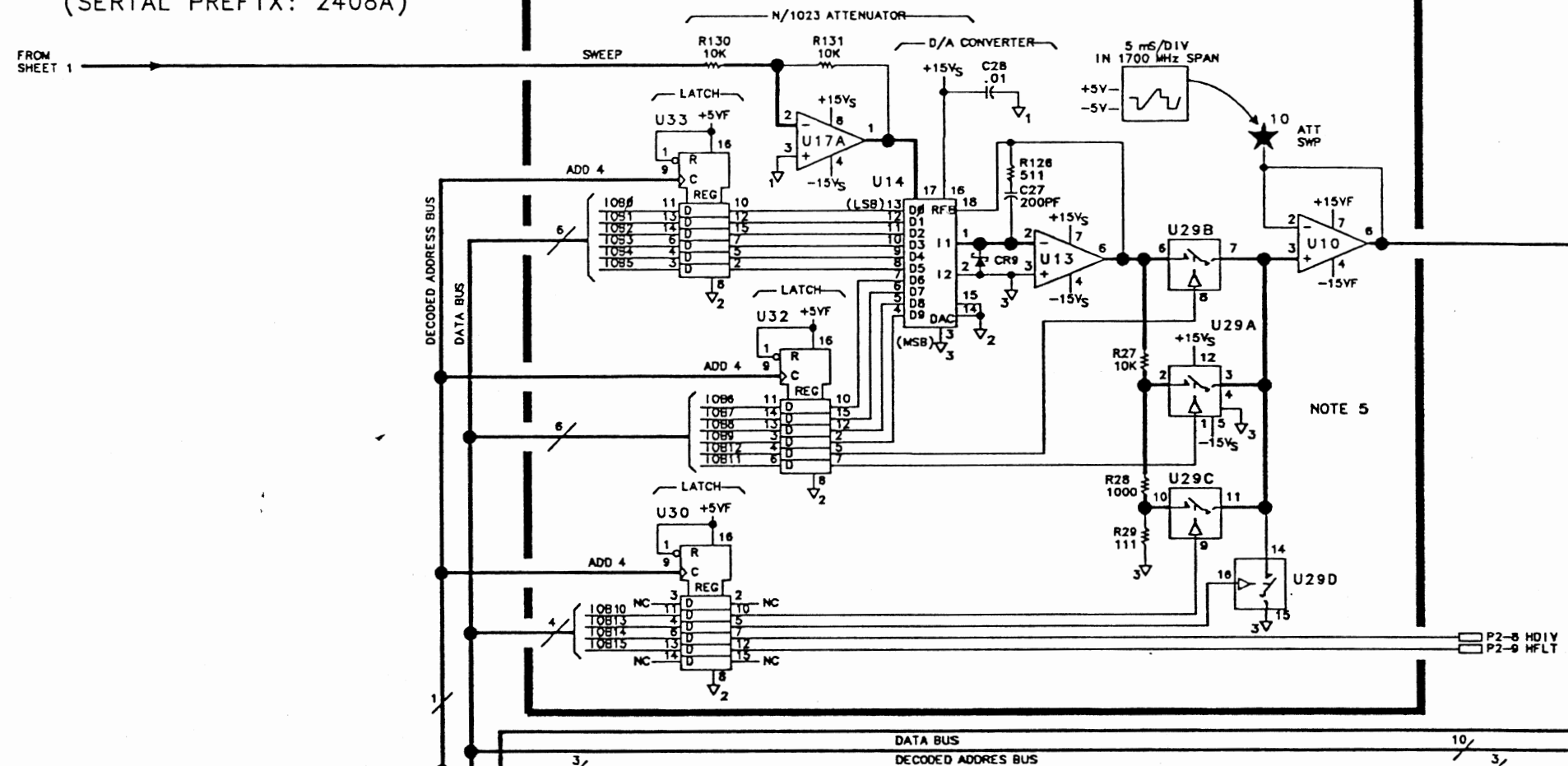
PIN	SIGNAL	FUNCTION BLOCK
1	GND	N
2	NC	
3	+20V	R
4	NC	
5	NC	
6	-10V	P
7	NC	
8	-10V	P
9	NC	
10	+20V	R
11	MAIN COIL	R
12	NC	
13	NC	
14	FM COIL	M

P3-24 IOB 8	
P3-9 IOB 1	
P3-23 IOB 2	
P3-8 IOB 3	
P3-22 IOB 4	
P3-7 IOB 5	
P3-21 IOB 6	
P3-6 IOB 7	
P3-20 IOB 8	
P3-5 IOB 9	
P3-19 IOB 10	
P3-4 IOB 11	
P3-18 IOB 12	
P3-3 IOB 13	
P3-17 IOB 14	
P3-2 IOB 15	



A22 FREQUENCY CONTROL
85680-60156 (SHEET 2 OF 2)
(SERIAL PREFIX: 2408A)

© SWEEP ATTENUATOR



⑦ YTO MAIN COIL FIXED DRIVER

⑥ FREQ ANALOG VOLTAGE

12 + U21C 14

13 -

TILT

R67 16.2K

R65 10K

+15V

R101 19.6K

10 + U21D 8

9 -

R69 1000

R70 10K

R37 1000

C33 2.2

R58 21.5K

C30 .01

R104 5110

R71 1000

CR2

+15V

① VTO TUNE DAC

The diagram shows the VTO TUNE DAC section. It consists of three 8255 PPI chips (U25, U26, U27) connected to an 8085 microprocessor. Each chip has an 8-bit DAC (D0-D7) and a 10.285V reference. The DAC outputs are connected to op-amp buffers (U5, U8, U38) and a summing junction. The summing junction output is connected to the VTO input of the VTO TUNE DAC section. The circuit also includes a 15V supply, a 10.285V reference, and various resistors (R7, R8, R9, R10, R13, R14) and capacitors (C10, C11).

① YTO MAIN COIL TUNE DRIVER

④ YTO FM COIL DRIVER

The circuit diagram shows a YTO FM COIL DRIVER. It features an input stage with resistors R57 (4k840), R58 (4k840), and R59 (6190), and capacitors C5 (8.8pF), C19 (27pF), and C20 (51pF). The signal is then amplified by a U19 op-amp configured as a voltage follower, with feedback capacitors C21 and C22. The output stage consists of a push-pull arrangement of transistors Q24 and Q25, with resistors R61 (46.4), R62 (100), R63 (46.4), R64 (100), and R65 (75). The output is connected to an FM SWP input of a YTO FM coil, which is also connected to a 1.5 MHz/V 20 MHz SPAN signal source. A 13.3V signal is also shown.

YTO FILTER

P1-2, 8 +20V

R45 100K

VR5 16.2V

R46 562

Q5

VR6 3.8V

C28 33

R47 178

CR5

Q6

J1-3, 10 +20V

J1-11 MAIN COIL

-15V

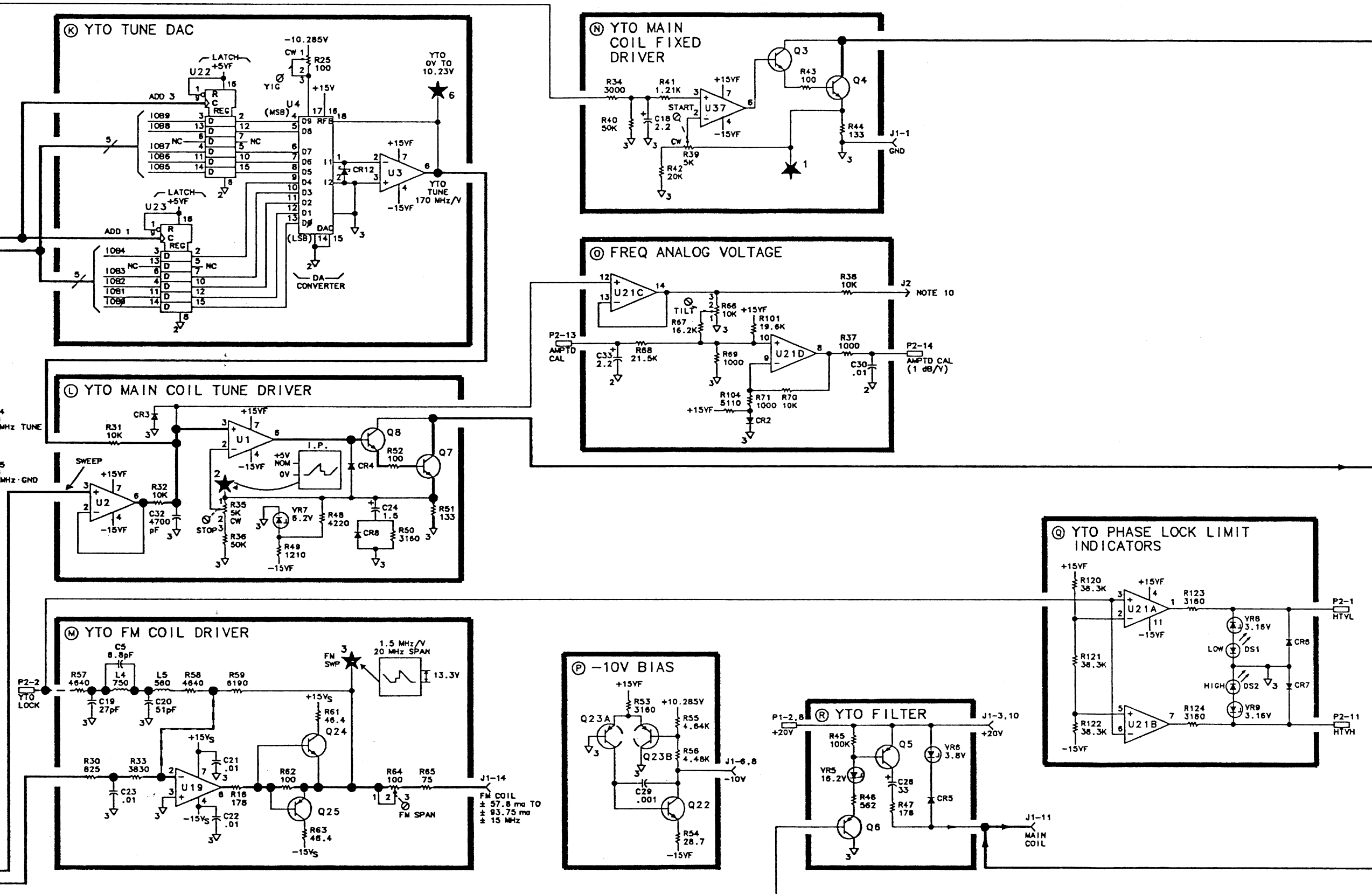
④ YTO
IND

+15V
R12
38.

R12
38.

R12
38.

-15V



NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IS IN OHMS (Ω), CAPACITANCE IS IN MICROFARADS (μF), INDUCTANCE IS IN MICROHENRIES (μH).
3. TEST VOLTAGES ASSUME INSTRUMENT PRESET (I.P.) CONDITION UNLESS NOTED.
4. MNEMONIC TABLE:

MNEMONIC	DESCRIPTION
HTVL	HIGH-TUNE VOLTAGE LOW
HTVH	HIGH-TUNE VOLTAGE HIGH
LLOH	LOW INDICATES 2ND LO SHIFTED HIGH (1753.6 MHz)
HDIV	HIGH-TURN ON: 2 ON A11 50 MHz VTO
LHLD	LOW-HOLD PHASE LOCK VOLTAGE ON A8 YTO PHASE LOCK
LOVTO	LOW OUTPUT VTO
HOVTO	HIGH OUTPUT VTO
HFLT	HIGH-TURN ON FILTER ON A11, 50 MHz VTO
HSWW	HIGH-WIDE YTO LOOP BW (100 kHz) A8 YTO PHASE LOCK
WGND	HIGH-GROUND OUTPUT OF PHASE DET., A8 YTO PHASE LOCK
HSWP	HIGH-SWEEPING
IOB-15	INST. BUS DATA BITS #1-15
ADR-4	INST. BUS ADDRESS BITS #1-4
ADD-7	DECODED ADDRESS BUS BITS #1-7
LB10	LOW-BOTTOM BOX I/O STROBE
5. U7, 20 AND 29 ARE QUAD JFET ANALOG SWITCHES. THE SWITCHES IN U7 AND U29 ARE CLOSED WHEN THEIR CONTROL INPUTS (PINS 1, 8, 9, AND 18) ARE HIGH. U20A AND U20C ARE CLOSED WHEN THEIR CONTROL INPUTS ARE HIGH; U20B AND U20D ARE OPEN WHEN THEIR CONTROL INPUTS ARE HIGH. CLOSED RESISTANCE FROM INPUT TO OUTPUT IS TYPICALLY 150-200 OHMS.
6. UNLESS OTHERWISE INDICATED, LOGIC LEVELS ARE TTL:
2V TO +5.0V = LOGIC '1' = HIGH
0V TO +0.8V = LOGIC '0' = LOW
7. U36A, B, C ARE NOT USED: INPUT PINS MAY BE TIED TOGETHER.
8. U7D NOT USED: INPUT PINS 6, 7, 8 NO CONNECTION.
9. UNLESS OTHERWISE INDICATED: SIGNALS ENTER AT LEFT SIDE AND EXIT AT RIGHT SIDE OF FUNCTION BLOCKS.
10. CONNECTOR FOR J2 IS NOT INSTALLED.

A23

A23 RF Converter, Circuit Description

A23 RF Converter has two conversion paths. In the first, the signal from the RF Attenuator in A5 Front Panel is mixed with a signal from A23A4 First LO Distribution in A23A2 First Converter. The output is filtered, converted by A23A3 Second Converter, and the 301.4 MHz output delivered to A19 Second IF Amplifier.

The second conversion path starts with A23A6 Comb Generator. This assembly takes 20 MHz from A16 20 MHz Reference and forms a pulse containing the harmonics of 20 MHz. This pilot signal is applied to A23A5 Pilot First Converter, which mixes power from A23A4 First LO Distribution with the pilot signal. The output is filtered, down-converted by A23A3 Second Converter, and sent to A9 Pilot Second IF Amplifier.

A23A4 First LO Distribution takes power from A23A1 YIG-Tuned Oscillator and splits and amplifies it for delivery to A23A2 First Converter, A23A5 Pilot First Converter, and the auxiliary 1ST LO OUT on the rear panel. This assembly also contains the bias circuitry for A23A3 Second Converter and A23A6 Comb Generator.

Note



Reference designations in this circuit description are abbreviated. For the full reference designation, add the prefix of the assembly or subassembly in which it is located. For example, Q1 in A23A3A2 Second LO is actually A23A3A2Q1.

A23A2 First Converter

The input signal from A5 Front Panel travels through the 1700 MHz Low-Pass Filter that is formed by a series of traces on the printed circuit board. The diodes in U1 form a balanced mixer. The first LO signal from A23A4 First LO Distribution is attenuated by A23T2 and then fed to the diodes through a balun. One diode is fed from the center conductor; the other, from the shield. Thus the diodes are driven 180 degrees out of phase. The signal from the 1700 MHz Low-Pass Filter travels through the alternately-conducting diodes, mixing with the LO signal from A23A4. The resulting IF signal is fed through a split-output line that is covered by a small block of polyiron to improve the mixer balance and to absorb some of the unwanted higher-order mixing products. The 6 dB pad (R1, R2, and R3) provides a frequency-independent termination for the mixer. The output from the pad is fed through the 5 GHz Low-Pass Filter which further attenuates the unwanted mixing products. This filter is also formed by printed circuit board traces. The output from the filter is the first IF out.

A23T2 Attenuator

A23T2, a 2 dB attenuator, minimizes the interaction between the First Converter and the A23A4A3 LO FET Amplifier.

A23A5 Pilot First Converter

A23A5 Pilot First Converter is identical to A23A2 First Converter except that the pad is 2 dB instead of 6 dB.

A23A6 Comb Generator

A23A6 Comb Generator consists of a 20 MHz comb generator and equalization circuitry. The combs are generated by the step recovery diode CR1. A 20 MHz signal from A16 20 MHz Reference is applied to a high-pass filter formed by L1 and C1. C2 and L1 match the impedance of the input to the impedance of CR1. Forward bias is applied to the diode through R4 and L4. When the 20 MHz driving signal is in the positive part of its cycle, CR1 conducts and stores a charge determined by the amount of drive power and the magnitude of the bias. When the drive goes negative, the charge is removed from the diode until all the charge that was stored during the positive part of the cycle (less recombination losses) is gone. Then the voltage across the diode abruptly changes, and a current pulse (generated in the loop formed by L3, C3, and CR1) causes a large, very narrow, negative-going pulse to be generated across CR1. This pulse is equalized in the frequency domain by the bridged pad formed by R1, R2, C4, C5, and the printed circuit board transmission line. R5 through R7 form a 12 dB pad for the proper output level. The comb is then available to A23A5 Pilot First Converter.

A23A4 First LO Distribution

A23A4 First LO Distribution consists of A23A4A1 Coupler/Splitter, A23A4A2 RF Converter Bias, A23A4A3 First LO Amplifier, and A23A4A4 Pilot First LO Amplifier.

A23A4A1 Coupler/Splitter. Power from A23A1 YIG-Tuned Oscillator is applied to A23A4A1 Coupler/Splitter. This power is propagated through a directional coupler which couples power to A23A4A3 First LO Amplifier. The directional coupler is formed by printed circuit board traces with R1 and R2 forming the termination for the coupled portion of the signal. The main power component travels through the directional coupler in a 3 dB power splitter (formed by printed circuit board traces and R3 and R4) which provides isolation between J4 and J3. One output of the splitter goes ultimately to the rear panel auxiliary 1ST LO OUT. The other input goes through a 6 dB pad (R5, R6, and R7) to A23A4A4 Pilot First LO Amplifier.

A23A4A4 Pilot First LO Amplifier. This amplifier boosts the LO drive by a nominal 10 dB, and its output drives A23A5 Pilot First Converter.

A23A4A3 First LO Amplifier. The power from the directional coupler is applied to A23A4A3 First LO Amplifier. This amplifier, identical to A23A4A4 Pilot First LO Amplifier, provides an LO signal to A23A2 First Converter.

A23A4A2 RF Converter Bias. This assembly contains the circuitry to bias A23A6 Comb Generator, A23A3 Second Converter, A23A4A3 First LO Amplifier, and A23A4A4 Pilot First LO Amplifier. Transistor Q1, with its associated circuitry, forms a variable current source to bias A23A6 Comb Generator. R4 and R5 form a voltage divider to fix the base voltage and

hence the emitter voltage of Q1. The value of R6 determines the amount of emitter current flow. C2 provides low frequency filtering. E1, VR1, and C5 form a transient limiting network to protect the First LO Amplifier and the Pilot First LO Amplifier, which are easily rendered inoperative by small transients (>5.1 V) on their power leads. R8, R9, and C7 provide filtered negative bias for A23A3A2 Second LO. Transistor Q2, with its associated circuitry, drives shift diode CR3 in A23A3 Second Converter. When the LLOH line from A22 Frequency Control is high, Q2 does not conduct, and -15 V is present at its collector, back-biasing the shift diode in A23A3 Second Converter. When LLOH goes low, Q2 becomes a current source, forward biasing the shift diode and illuminating DS1 to indicate that the Second LO is in its high frequency state.

A23A3 Second Converter

A23A3 Second Converter consists of a first IF filter, pilot first IF filter, second mixer, pilot second mixer, and the following subassemblies: A23A3A1 Pilot Second LO Buffer, A23A3A2 Second LO, and A23A3A3 Second LO Buffer.

A23A3A2 Second LO. A23A3A2 Second LO is actually composed of Q1 on the printed circuit board A23A3A2 and the second LO cavity Z9. R1 and R2 provide bias for Q1. The inductance and capacitance of the printed circuit board traces make Q1 unstable enough to oscillate. The cavity Z9 determines the frequency of that oscillation. The frequency of Z9 can be changed by forward biasing CR3, which effectively shorts out a small part of the cavity, making its frequency higher.

A23A3A3 Second LO Buffer. A probe inserted into Z9 couples power into A23A3A3 Second LO Buffer. The printed circuit board transmission lines serve to match the cavity impedances to those of Q1. C3 provides an ac ground for one of the lines. Q2 and R1 provide bias for Q1. The output of this amplifier drives the second mixer cavity Z4.

A23A3A1 Pilot Second LO Buffer. A23A3A1 Pilot Second LO Buffer works in the same way as A23A3A3 Second LO Buffer, except that the output drives the pilot second mixer cavity Z8.

First IF. The 2050 MHz (or 2055 MHz, depending on the state of the Second LO) first IF signal is applied through J1 to the three-pole 2052.5 MHz Bandpass Filter. The resonant frequencies of the cavities Z1, Z2, and Z3 determine the shape and frequency of the filter output signal. The filter output is coupled to the second mixer diode CR1, where it is mixed with power from A23A3A3 Second LO Buffer. The resulting second IF, 301.4 MHz, goes into the Matching Filter (C6, C7, and L2), which matches the impedance of CR1 to 50Ω . L1 and R1 provide a dc return for the diode.

Pilot First IF. The pilot first IF is applied through J2 to the 2017.6 MHz Bandpass Filter composed of Z5, Z6, and Z7. The output of the filter is coupled into the pilot second mixer diode CR2, where it is mixed with power from A23A3A1 Pilot Second LO Buffer. The resulting pilot second IF, 269 (± 10) MHz goes into the Matching Filter (C8, C9, and L4) which matches the impedance of CR2 to 50Ω . L3 and R2 provide a dc return for the diode. C10, C11, and L5 form a 450 MHz low-pass filter.

A23 RF Converter Removal and Installation

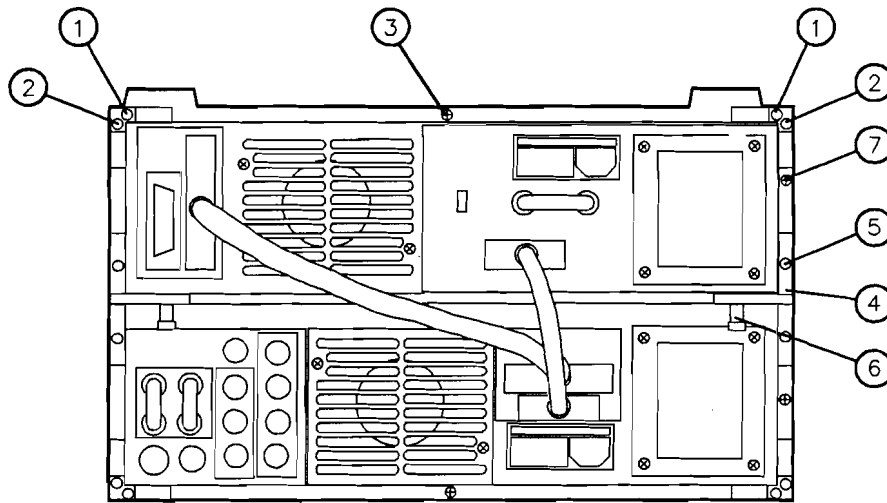


Figure 1. A23 RF Converter Removal and Installation

Removal

Warning



Remove ac line cord from both instruments before proceeding with this procedure.

1. Position instrument upside down. Remove feet ① by removing screws ② as shown in Figure 1.
2. Remove cover from bottom of RF Section (now on top of instrument) by loosening pozi-drive screw ③.
3. Remove foot ④ indicated in Figure 1 from rear of instrument by first removing screw ⑤, then loosening thumbscrew ⑥.
4. Remove RF Section right side cover by loosening pozi-drive screw ⑦.
5. Remove four pozi-drive screws from RF Section right side frame used to attach RF Converter to side frame. Location of these screws is indicated on top of RF Converter Assembly.
6. Remove two straight-slot screws, (location indicated on top of RF Converter assembly), used to attach RF Converter to Motherboard.
7. Position instrument on its right side.
8. Slide RF Converter out of instrument slowly being careful not to pinch or bind cables.
9. If removing RF Converter for adjustment, turn Converter upside- down so that Second Converter adjustments are facing upwards.
10. If removing RF Converter for repair or replacement, disconnect all cables from the Converter: 80 (gray/black) cable from A23A3J6, 92 (white/red) cable from A23A3J5, 7

(violet) cable from A23A6J1, RF input cable from Limiter, 90 (white/black) cable from A23A4A1J4 and two ribbon cables; one from the YTO A23A1 and the other from the RF Converter Bias assembly A23A4A2. (Note position in which ribbon cables are connected for reference when reinstalling RF Converter.)

Installation

Warning



Remove ac line cord from both instruments before proceeding with this procedure.

1. Position instrument on right side.
2. Place RF Converter next to instrument and connect cables if necessary: 80 (gray/black) cable to A23A3J6, 92 (white/red) cable to A23A3J5, 7 (violet) cable to A23A6J1, 90 (white/black) cable to A23A4A1J4, ribbon cable from A22 Frequency Control to A23A1 YTO, and ribbon cable from Motherboard to A23A4A2 RF Converter Bias assembly.
3. Position RF Converter so that A23A3 Second Converter is facing downwards.
4. Slide RF Converter into instrument being careful not to pinch or bind cables.
5. Insert straight-slot screws (location indicated on top of RF Converter assembly) into threaded holes in Motherboard and screw in slightly. Do not tighten these screws yet.
6. Position instrument upside-down.
7. Replace four pozi-drive screws to the RF Section side frame (location indicated on top of RF Converter assembly) and tighten.
8. Tighten two straight-slot screws installed in Step 5.
9. Replace RF Section right-side cover and tighten screw ⑦ shown in Figure 1.
10. Replace foot ④ and tighten screw ⑤.
11. Install and tighten thumbscrew ⑥.
12. Replace cover on bottom of RF Section and tighten screw ③.
13. Replace feet ① and tighten screws ②.
14. Position instrument upright.

HP Part Number 85680-60054
A23 RF Converter

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A23	85680-60054	6		1	RF CONVERTER	28480	85680-60054
A23A1	5086-7246	7		1	YIG-TUNED OSCILLATOR, 2-4GHZ	28480	5086-7246
A23A2	85680-60060	4		1	FIRST CONVERTER ASSEMBLY (SIGNAL) (A SEPARATE PARTS LIST IS INCLUDED IN THIS SECTION)	28480	85680-60060
A23A3	85680-60052	4		1	SECOND CONVERTER ASSEMBLY (A SEPARATE PARTS LIST IS INCLUDED IN THIS SECTION)	28480	85680-60052
A23A3A1	85680-60129	6		1	PILOT SECOND LO BUFFER BOARD ASSEMBLY	28480	85680-60129
A23A3A2	85680-60029	5		1	SECOND LO BOARD ASSEMBLY	28480	85680-60029
A23A3A3	85680-60128	5		1	SECOND LO BUFFER BOARD ASSEMBLY (SIGNAL)	28480	85680-60128
A23A4	85680-60057	9		1	FIRST LO DISTRIBUTION ASSEMBLY (A SEPARATE PARTS LIST IS INCLUDED IN THIS SECTION)	28480	85680-60057
A23A4A1	85680-60055	7		1	COUPLER/SPLITTER	28480	85680-60055
A23A4A2	85680-60032	0		1	RF CONVERTER BIAS BOARD ASSEMBLY	28480	85680-60032
A23A4A3	5086-7244	5		1	FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIXES: 2408A-2841A)	28480	5086-7244
A23A4A3	0955-0473	6		1	FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIX: 2925A)	28480	0955-0473
A23A4A4	5086-7244	5		1	PILOT FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIXES: 2408A-2841A)	28480	5086-7244
A23A4A4	0955-0473	6		1	PILOT FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIX: 2925A)	28480	0955-0473
A23A5	85680-60061	5		1	PILOT FIRST CONVERTER (A SEPARATE PARTS LIST IS INCLUDED IN THIS SECTION)	28480	85680-60061
A23A6	85680-60058	0		1	COMB GENERATOR (A SEPARATE PARTS LIST IS INCLUDED IN THIS SECTION)	28480	85680-60058
A23AT1	5086-7284	3		1	LIMITER	28480	5086-7284
A23AT2	0955-0124	4		1	2dB ATTENUATOR (SERIAL PREFIXES: 2408A-2635A)	28480	0955-0124
A23FL1	9135-0104	1		1	LOW-PASS FILTER (SIGNAL) (INCLUDES COAX CABLE, A23A2 TO A23A3)	28480	9135-0104
A23FL2	9135-0145	0		1	LOW-PASS FILTER (PILOT)(INCLUDES COAX CABLE, A23A5-A23A3)	28480	9135-0145
A23W5	85680-20096	2		1	COAX CABLE, A23A1 TO A23A4A1	28480	85680-20096
A23W6	85680-20097	3		1	COAX CABLE, A23A4A1 TO A23A4A3	28480	85680-20097
A23W7	85680-20159	8		1	COAX CABLE, A23A4A3 TO A23AT2 (FOR USE WITH A23AT2 ONLY) (SERIAL PREFIXES: 2408A-2635A)	28480	85680-20159
A23W7	85680-20092	8		1	COAX CABLE, A23A4A3 TO A23A2 (FOR USE WITH A23A4A3 HP PART NUMBER 5086-7244 AND WITHOUT A23AT2) (SERIAL PREFIXES: 2714A-2841A)	28480	85680-20092
A23W7	85680-20235	1		1	COAX CABLE, A23A4A3 TO A23A2 (FOR USE WITH A23A4A3 HP PART NUMBER 0955-0473) (SERIAL PREFIX: 2925A)	28480	85680-20235
A23W8	85680-20098	4		1	COAX CABLE, A23A4A1 TO A23A4A4	28480	85680-20098
A23W9	85680-20093	9		1	COAX CABLE, A23A6 TO A23A5	28480	85680-20093

**Indicates factory-selected value*

HP Part Number 85680-60054
A23 RF Converter

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23W10	85680-20095	1	1	COAX CABLE, A23A4A4 TO A23A5	28480	85680-20095
A23W13	85680-60090	0	1	RIBBON CABLE, A23A4A2 TO A26	28480	85680-60090
A23W14	85680-60087	5	1	RIBBON CABLE, A23A1 TO A22	28480	85680-60087
A23W15	85680-60071	7	1	COAX CABLE, A16 TO A23A6	28480	85680-60071

HP Part Number 85680-60060

A23A2 First Convertor

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23A2	85680-60060	4	1	FIRST CONVERTER ASSEMBLY	28480	85680-60060
A23A2E1	08558-40013	4	2	HARMONIC SUPPRESSOR	28480	08558-40013
A23A2E2	08558-40013	4	1	HARMONIC SUPPRESSOR	28480	08558-40013
A23A2J1	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A2J2	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A2J3	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A2MP1	08558-00050	5	1	BALUN SHORT SMALL	28480	08558-00050
A23A2MP2	85680-00078	8	1	BALUN SHORT LARGE	28480	85680-00078
A23A2MP3	08558-00052	7	1	FIRST CONVERTER GASKET	28480	08558-00052
A23A2MP4	2200-0167	8	12	SCREW-MACH 4-40 .375-IN-LG 82 DEG	77250	
A23A2MP5	85680-20061	1	1	FIRST CONVERTER COVER	28480	85680-20061
A23A2MP6	85680-20060	0	1	FIRST CONVERTER MOUNTING	28480	85680-20060
A23A2MP7				NOT ASSIGNED		
A23A2MP8	0470-0440	9	1	COATING DOW CORNING 3140 SIL-RBR-RTV 1P	71984	3140
A23A2MP9	08558-40014	5	1	MODE SUPPRESSOR	28480	08558-40014
A23A2MP10	2190-0067	4	3	WASHER-LK INTL T 1/4 IN .256-IN-ID	78189	1914-05
A23A2R1	0699-2744	4	1	RESISTOR 147 +-1% .05W MO TC=0+-100	28480	0699-2744
A23A2R2	0699-1109	3	1	RESISTOR 38.3 +-1% .05W TF TC=0+-100	19701	5023R
A23A2R3	0699-2744	4	1	RESISTOR 147 +-1% .05W MO TC=0+-100	28480	0699-2744
A23A2U1	5062-0785	5	1	DIODE ASSEMBLY	28480	5062-0785
A23A2W1	08558-20096	1	1	CABLE BALUN	28480	08558-20096

**Indicates factory-selected value*

HP Part Number 85680-60052
A23A3 Second Converter

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23A3	85680-60052	4	1	SECOND CONVERTER ASSEMBLY	28480	85680-60052
A23A3C1	0160-2437	1	1	CAPACITOR-FEED THRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A23A3C2	0160-2437	1	1	CAPACITOR-FEED THRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A23A3C3	0160-2437	1	1	CAPACITOR-FEED THRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A23A3C4	0160-2437	1	1	CAPACITOR-FEED THRU 5000PF +80 -20% 200V	33095	54-713-033-X5V-502Z
A23A3C5	0160-3036	8	1	CAPACITOR-FEED THRU 5000PF +80 -20% 200V	33095	54-713-011-X5V-502Z
A23A3C6	0160-5435	5	1	CAPACITOR-FEED THRU 8.5PF 8% 200V CER		2425-081-X5E0-809BF
A23A3C7	0140-0075	7	1	CAPACITOR-FEED THRU 22PF 10% 500V MICA		666-053-01A0-220K
A23A3C8	0160-4959	6	1	CAP-FXD 10pF 200 V		2425-078 X5E 100J
A23A3C9	0160-3875	3	1	CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30		FD12C0G2D220J
A23A3C10	0160-3873	1	1	CAPACITOR-FXD 4.7PF +- .5PF 200VDC CER		FD12C0G2D4R7D
A23A3C11	0160-4237	3	1	CAP-FXD 6.2pF 250 V MICA		2930-041-6.2PF+-10
A23A3CR1	1901-0951	3	1	DIODE-SCHOTTKY SM SIG	28480	
A23A3CR2	1901-0951	3	1	DIODE-SCHOTTKY SM SIG	28480	
A23A3CR3	1901-0639	4	1	DIODE-PIN	28480	
A23A3J1	1250-1157	2	1	CONNECTOR-RF SMA FEM THD-HOLE 50-OHM	16179	2058-5029-00
A23A3J2	1250-1157	2	1	CONNECTOR-RF SMA FEM THD-HOLE 50-OHM	16179	2058-5029-00
A23A3J3	1250-0691	7	1	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-045-4610-220
A23A3J4	1250-0691	7	1	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-045-4610-220
A23A3J5	1250-1435	9	1	BODY-RF CONNECTOR 50 OHM SMC JACK BACK	24931	37JR111-1
A23A3J6	1250-1435	9	1	BODY-RF CONNECTOR 50 OHM SMC JACK BACK	24931	37JR111-1
A23A3L1	9100-1613	6	1	INDUCTOR RF-CH-MLD 470NH +-20% .166D-INX	99800	1537-06
A23A3L2	85680-80010	6	1	INDUCTOR MATCH	28480	85680-80010
A23A3L3	9100-1613	6	1	INDUCTOR RF-CH-MLD 470NH +-20% .166D-INX	99800	1537-06
A23A3L4	85680-80012	8	1	INDUCTOR PILOT	28480	85680-80012
A23A3L5	85680-80011	7	1	INDUCTOR LP	28480	85680-80011
A23A3MP1	85680-00012	0	1	SECOND CONVERTER COVER	28480	85680-00012
A23A3R1	0698-8818	3	1	RESISTOR 3.16 +-1% .125W TF TC=0+-100	91637	CMF-55-1
A23A3R2	0698-8818	3	1	RESISTOR 3.16 +-1% .125W TF TC=0+-100	91637	CMF-55-1
A23A3W16	85680-60083	1	1	COAX CABLE ASSEMBLY, 92, A3A3 TO A19	28480	85680-60083
A23A3W17	85680-60074	0	1	COAX CABLE ASSEMBLY, 80, A3A3 TO A9	28480	85680-60074
A23A3W41	85680-60246	8	1	WIRING HARNESS, SECOND CONVERTER BIAS	28480	85680-60246
A23A3A1	85680-60129	6	1	BOARD ASSEMBLY, PILOT SECOND LO BUFFER	28480	85680-60129
A23A3A1C1	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A23A3A1C2	0180-0291	3	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2-DYS
A23A3A1C3	0160-0562	9	1	CAPACITOR-FXD 100PF +-10% 100VDC CER	95275	VJ0805A101KFB
A23A3A1MP1	85680-20083	7	1	INPUT PROBE	28480	85680-20083
A23A3A1MP2	85680-20084	8	1	OUTPUT PROBE	28480	85680-20084
A23A3A1Q1	1GS1-4211	2	1	TRANSISTOR TC131 PKG.	28480	1GS1-4211
A23A3A1Q2	1853-0451	5	1	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	04713	
A23A3A1R1	0698-3438	3	1	RESISTOR 147 1% .125W TF TC=0+-100	19701	SFR25H
A23A3A1R2	0698-7192	4	1	RESISTOR 14.7 +-1% .05W TF TC=0+-100	19701	5063J
A23A3A1R3	0698-7248	1	1	RESISTOR 3.16K +-1% .05W TF TC=0+-100	19701	5063J
A23A3A1R4	0698-7260	7	1	RESISTOR 10K +-1% .05W TF TC=0+-100	19701	5063J

**Indicates factory-selected value*

HP Part Number 85680-60052
A23A3 Second Converter

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23A3A1R5	0698-7236	7	1	RESISTOR 1K +-1% .05W TF TC=0+-100	19701	5063J
A23A3A2	85680-60029	5	1	BOARD ASSEMBLY, SECOND LO	28480	85680-60029
A23A3A2MP1	3050-0239	7	1	WASHER-FL NM NO. 8 .17-IN-ID .375-IN-OD	73734	33-112
A23A3A2Q1	1GS1-4210	1	1	TRANSISTOR TC131 PKG.	28480	1GS1-4210
A23A3A2R1	0683-2215	1	1	RESISTOR 220 5% .25W CF TC=0-400	2M627	R-25J
A23A3A2R2	0698-3377	9	1	RESISTOR 47 5% .125W CC TC=-270/+540	01121	BB4705
A23A3A3	85680-60128	5	1	BOARD ASSEMBLY, SECOND LO BUFFER (SIGNAL)	28480	85680-60128
A23A3A3C1	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A23A3A3C2	0180-0291	3	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2-DYS
A23A3A3C3	0160-0562	9	1	CAPACITOR-FXD 100PF +-10% 100VDC CER	95275	VJ0805A101KFB
A23A3A3MP1	85680-20083	7	1	INPUT PROBE	28480	85680-20083
A23A3A3MP2	85680-20084	8	1	OUTPUT PROBE	28480	85680-20084
A23A3A3Q1	1GS1-4211	2	1	TRANSISTOR TC131 PKG.	28480	1GS1-4211
A23A3A3Q2	1853-0451	5	1	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	04713	
A23A3A3R1	0698-3438	3	1	RESISTOR 147 1% .125W TF TC=0+-100	19701	SFR25H
A23A3A3R2	0698-7192	4	1	RESISTOR 14.7 +-1% .05W TF TC=0+-100	19701	5063J
A23A3A3R3	0698-7248	1	1	RESISTOR 3.16K +-1% .05W TF TC=0+-100	19701	5063J
A23A3A3R4	0698-7260	7	1	RESISTOR 10K +-1% .05W TF TC=0+-100	19701	5063J
A23A3A3R5	0698-7236	7	1	RESISTOR 1K +-1% .05W TF TC=0+-100	19701	5063J

HP Part Number 85680-60057
A23A4 First LO Distribution

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23A4	85680-60057	9	1	FIRST LO DISTRIBUTION ASSEMBLY	28480	85680-60057
A23A4MP1	85680-00014	2	1	MICRO CIRCUIT BRACKET	28480	85680-00014
A23A4MP2	0380-0409	9	4	SPACER, .125L .114ID	28480	0380-0409
A23A4A1	85680-60055	7	1	COUPLER/SPLITTER	28480	85680-60055
A23A4A1J1	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A4A1J2	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A4A1J3	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A4A1J4	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A4A1MP2	85680-00020	0	1	MOUNT, COUPLER/SPLITTER	28480	85680-00020
A23A4A1MP3	85680-00021	1	1	GASKET, COUPLER/SPLITTER	28480	85680-00021
A23A4A1MP4	85680-20082	6	1	COVER, COUPLER/SPLITTER	28480	85680-20082
A23A4A1MP6	2190-0067	4	1	WASHER-LK INTL T 1/4 IN .256-IN-ID	78189	1914-05
A23A4A1R1	0698-7212	9	1	RESISTOR 100 +-1% .05W TF TC=0+-100	19701	5063J
A23A4A1R2	0698-7212	9	1	RESISTOR 100 +-1% .05W TF TC=0+-100	19701	5063J
A23A4A1R3	0698-7212	9	1	RESISTOR 100 +-1% .05W TF TC=0+-100	19701	5063J
A23A4A1R4	0699-2033	4	1	RESISTOR 237 +-1% .05W TF TC=0+-100	91637	CMF-50-21
A23A4A1R5	0699-2034	5	1	RESISTOR 422 +-1% .05W TF TC=0+-100	91637	CMF-50-21
A23A4A1R6	0699-2028	7	1	RESISTOR 12.1 +-1% .05W TF TC=0+-100	91637	CMF-50-21
A23A4A1R7	0699-2034	5	1	RESISTOR 422 +-1% .05W TF TC=0+-100	91637	CMF-50-21
A23A4A2	85680-60032	0	1	BOARD ASSEMBLY, RF CONVERTER BIAS	28480	85680-60032
A23A4A2C1	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A23A4A2C2	0180-0229	7	1	CAPACITOR-FXD 33uF 10 V TA	56289	150D336X9010B2-DYS
A23A4A2C3	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A23A4A2C4	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A23A4A2C5	0180-0229	7	1	CAPACITOR-FXD 33uF 10 V TA	56289	150D336X9010B2-DYS
A23A4A2C6	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2-DYS
A23A4A2C7	0180-0229	7	1	CAPACITOR-FXD 33uF 10 V TA	56289	150D336X9010B2-DYS
A23A4A2C8	0160-3878	6	1	CAPACITOR-FXD 1000pF 100 V	04222	SR201C102MAAH
A23A4A2CR1	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A23A4A2CR2	1901-0734	0	1	DIODE-PWR RECT 1N5818 30V 1A	04713	1N5818
A23A4A2DS1	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A23A4A2E1	9170-0029	3	1	CORE-SHIELDING BEAD	02114	56-590-65A2/4A
A23A4A2J1	1200-1204	5	1	SOCKET-IC 14-CONT DIP DIP-SLDR	00779	2-641609-2
A23A4A2L1	9100-1623	8	1	INDUCTOR RF-CH-MLD 27UH +-5% .166D-INX.3	99800	1537-48
A23A4A2L2	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A23A4A2Q1	1853-0007	7	1	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A23A4A2Q2	1853-0007	7	1	TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A23A4A2R2	0757-0405	4	1	RESISTOR 162 +-1% .125W TF TC=0+-100	19701	SFR25H
A23A4A2R3	0757-0465	6	1	RESISTOR 100K +-1% .125W TF TC=0+-100	19701	SFR25H
A23A4A2R4	0698-0085	0	1	RESISTOR 2.61K 1% .125W TF TC=0+-100	19701	SFR25H
A23A4A2R5	0698-3154	0	1	RESISTOR 4.22K 1% .125W TF TC=0+-100	19701	SFR25H
A23A4A2R6	2100-1773	2	1	RESISTOR-TRMR 1K 5% WW TOP-ADJ 1-TRN		CT-100-4-1K

**Indicates factory-selected value*

HP Part Number 85680-60057
A23A4 First LO Distribution

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23A4A2R7	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A23A4A2R8	0698-3442	9	1	RESISTOR 237 1% .125W TF TC=0+-100	19701	SFR25H
A23A4A2R9	0698-3442	9	1	RESISTOR 237 1% .125W TF TC=0+-100	19701	SFR25H
A23A4A2TP1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A23A4A2VR1	1902-3104	6	1	DIODE-ZNR 5.62V 5% DO-35 PD=.4W	04713	
A23A4A2W38	85680-60245	7	1	WIRING HARNESS, BIAS TO A23A3W41	28480	85680-60245
A23A4A3	5086-7244	5	1	FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIXES: 2408A-2841A)	28480	5086-7244
A23A4A3	0955-0473	6	1	FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIX: 2925A)	28480	0955-0473
A23A4A4	5086-7244	5	1	PILOT FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIXES: 2408A-2841A)	28480	5086-7244
A23A4A4	0955-0473	6	1	PILOT FIRST LO AMPLIFIER, FET, 2-4 GHZ (SERIAL PREFIX: 2925A)	28480	0955-0473

HP Part Number 85680-60061

A23A5 Pilot First Converter

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23A5	85680-60061	5	1	PILOT FIRST CONVERTER	28480	85680-60061
A23A5E1	08558-40013	4	1	HARMONIC SUPPRESSOR	28480	08558-40013
A23A5J1	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A5J2	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A5J3	1250-1796	5	1	CONNECTOR-RF SMA FEM SGL-HOLE-RR 50-OHM	16179	2056-5110-00
A23A5MP1	08558-00050	5	1	SMALL BALUN SHORT	28480	08558-00050
A23A5MP2	85680-00078	8	1	LARGE BALUN SHORT	28480	85680-00078
A23A5MP3	08558-00052	7	1	GASKET	28480	08558-00052
A23A5MP4	2200-0167	8	14	SCREW-MACH 4-40 .375-IN-LG 82 DEG	77250	
A23A5MP5	85680-20061	1	1	COVER FIRST CONVERTER	28480	85680-20061
A23A5MP6	85680-20105	4	1	MOUNT	28480	85680-20105
A23A5MP7				NOT ASSIGNED		
A23A5MP8	0470-0440	9	1	COATING DOW CORNING 3140 SIL-RBR-RTV 1P	71984	3140
A23A5MP9	08558-40014	5	1	MODE SUPPRESSOR	28480	08558-40014
A23A5MP10	2190-0067	4	3	WASHER-LK INTL T 1/4 IN .256-IN-ID	78189	1914-05
A23A5R1	0699-2027	6	1	RESISTOR 11 +-1% .05W TF TC=0+-100	91637	CMF-50-21
A23A5R2	0698-7228	7	1	RESISTOR 464 +-1% .05W TF TC=0+-100	19701	5063J
A23A5R3	0698-7228	7	1	RESISTOR 464 +-1% .05W TF TC=0+-100	19701	5063J
A23A5U1	5062-0785	5	1	DIODE ASSEMBLY	28480	5062-0785
A23A5W1	08558-20096	1	1	CABLE BALUN	28480	08558-20096

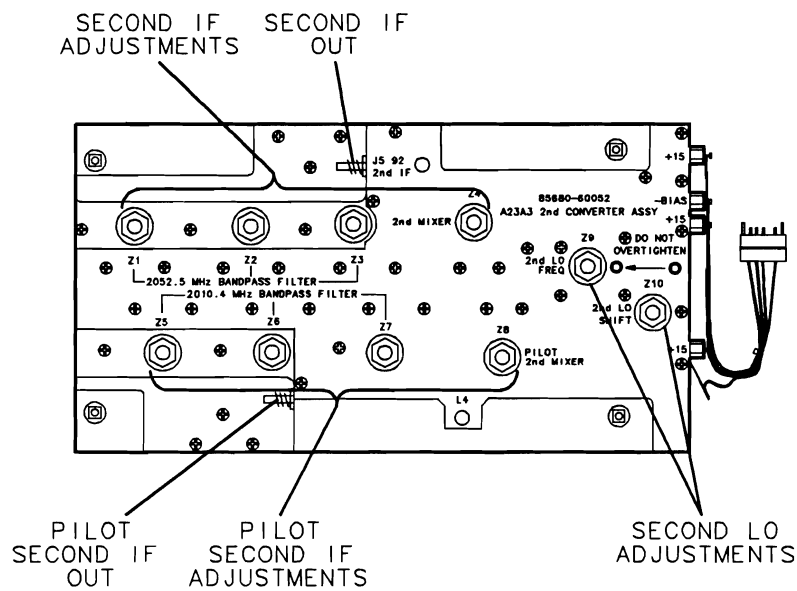
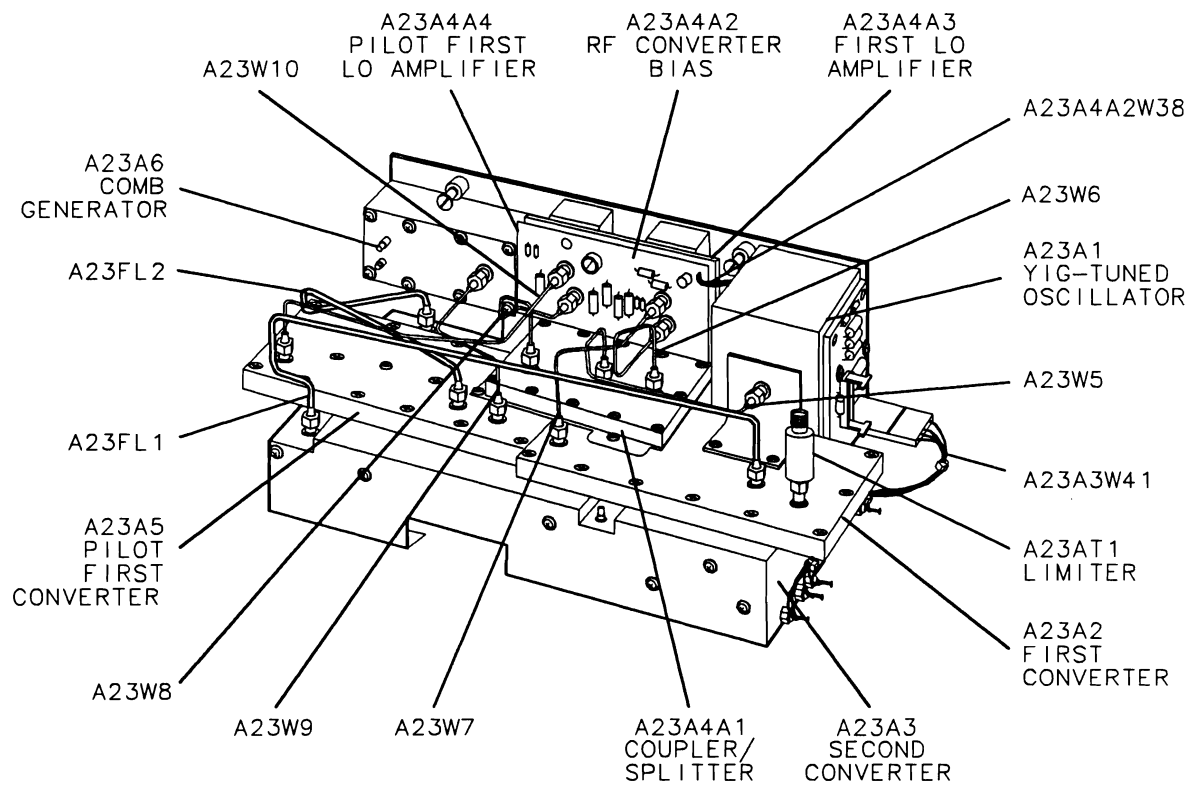
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HP Part Number 85680-60058

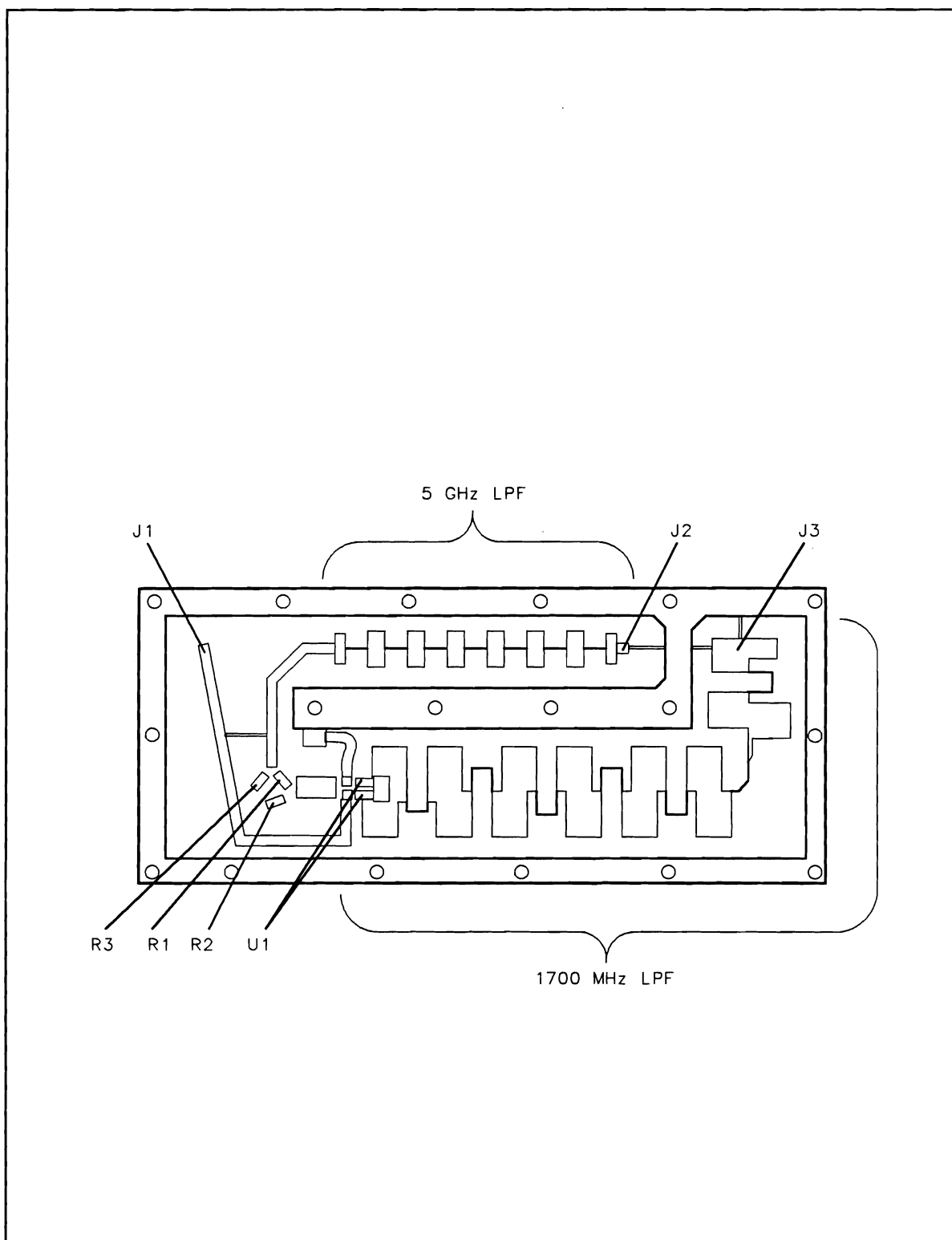
A23A6 Comb Generator

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A23A6	85680-60058	0	1	COMB GENERATOR ASSEMBLY	28480	85680-60058
A23A6C1	0160-2529	2	1	CAPACITOR MIC 160PF 300V	28480	0160-2529
A23A6C2	0160-2020	8	1	CAPACITOR MIC 910PF 100V	28480	0160-2020
A23A6C3	0160-0573	2	1	CAPACITOR CER 4700PF 100V	28480	0160-0573
A23A6C4	0160-0571	0	1	CAPACITOR CER 470PF 100V	28480	0160-0571
A23A6C5	0160-3875	3	1	CAPACITOR CER 22PF 200V	28480	0160-3875
A23A6C6	0160-3879	7	1	CAPACITOR CER .01UF 100V	28480	0160-3879
A23A6C7	0121-0507	0	1	CAPACITOR-VARIABLE QTZ	28480	0121-0507
A23A6C8	0160-3036	8	1	CAPACITOR CER 5000PF 200V	28480	0160-3036
A23A6CR1	1901-0189	9	1	DIODE SR 25V 07	28480	1901-0189
A23A6J1	1250-1220	0	1	CONNECTOR RF M SMC	28480	1250-1220
A23A6J2	1250-1796	5	1	CONNECTOR RF SMA	28480	1250-1796
A23A6L1	9100-2258	7	1	INDUCTOR, 1.2UH 10%	28480	9100-2258
A23A6L2	85680-80002	6	1	INDUCTOR, ADJUSTABLE, COMB PEAK	28480	85680-80002
A23A6L3	85680-80003	7	1	INDUCTOR	28480	85680-80003
A23A6L4	9140-0179	1	1	INDUCTOR, 22UH 10%	28480	9140-0179
A23A6MP1				NOT ASSIGNED		
A23A6MP2	3050-0945	2	1	WASHER FLAT .200ID	28480	3050-0945
A23A6MP4	2190-0009	4	1	WASHER LOCK .168ID 8	28480	2190-0009
A23A6MP5	2190-0124	4	1	WASHER LOCK .195ID10	28480	2190-0124
A23A6MP6	2190-0067	4	1	WASHER LOCK .256ID	28480	2190-0067
A23A6MP7	2580-0002	4	1	NUT-HEX 8-32	28480	2580-0002
A23A6MP8	2950-0078	9	1	NUT-HEX 10-32	28480	2950-0078
A23A6MP9	85680-00016	4	1	LID, COMB GENERATOR	28480	85680-00016
A23A6MP10	85680-20059	7	1	COMB GENERATOR CAVITY	28480	85680-20059
A23A6MP11	2200-0105	4	1	SCREW-MACH 4-40 .312-IN-LG	28480	2200-0105
A23A6MP12	3050-0944	1	1	WASHER FLAT .250ID	28480	3050-0944
A23A6R1	0699-1903	5	1	RESISTOR 51.1 1% .05W	24546	C3-1/8-T0-51R1-F
A23A6R2	0698-7198	0	1	RESISTOR 26.1 1% .05W	24546	C3-1/8-T0-26R1-F
A23A6R4	0698-7212	9	1	RESISTOR 100 1% .05W	24546	C3-1/8-T0-100R-F
A23A6R5*	0699-1968	2	2	RESISTOR 68.1 1% .05W	24546	C3-1/8-T0-68R1-F
A23A6R6*	0699-1970	6	1	RESISTOR 178 1% .05W	24546	C3-1/8-T0-178R-F
A23A6R7*	0699-1968	2	1	RESISTOR 68.1 1% .05W	24546	C3-1/8-T0-68R1-F
A23A6W1	85680-60177	4	1	CABLE ASSEMBLY, 906, BIAS	28480	85680-60177

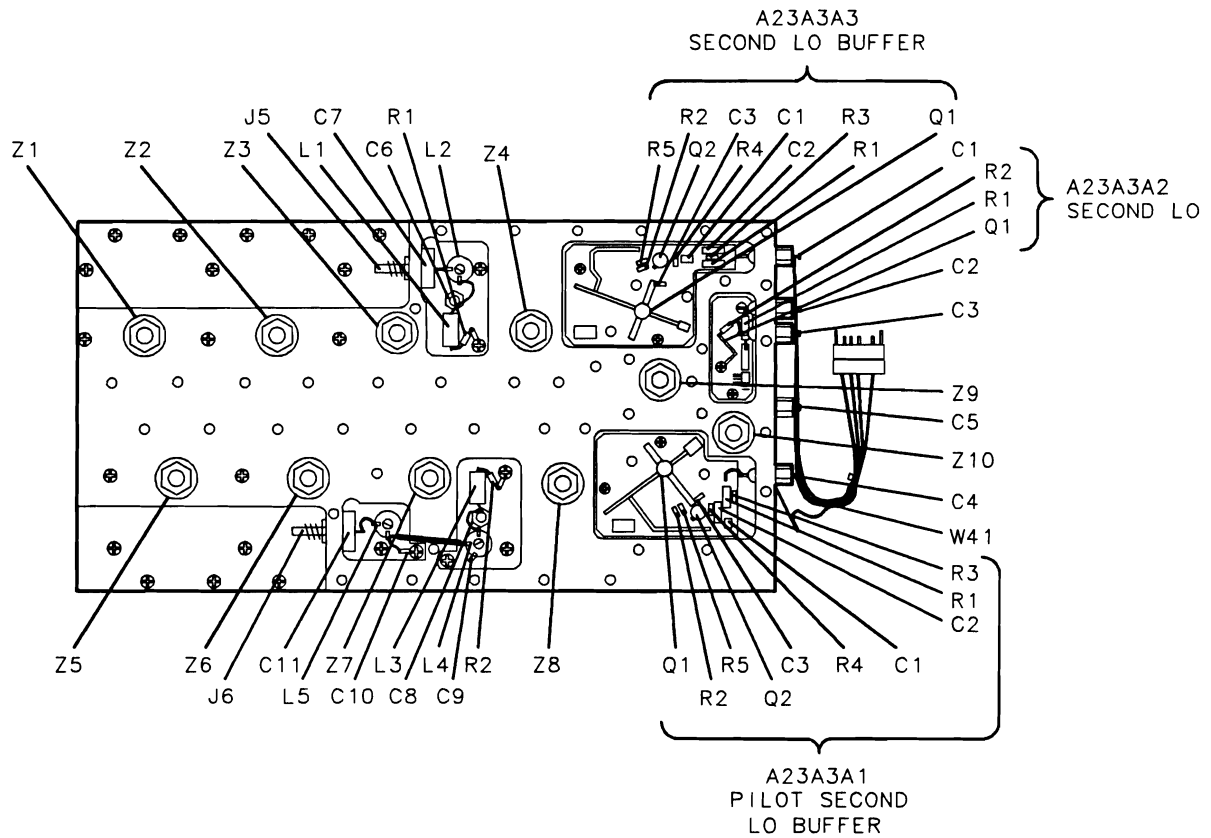
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A23 RF Converter Assembly and Component Locations

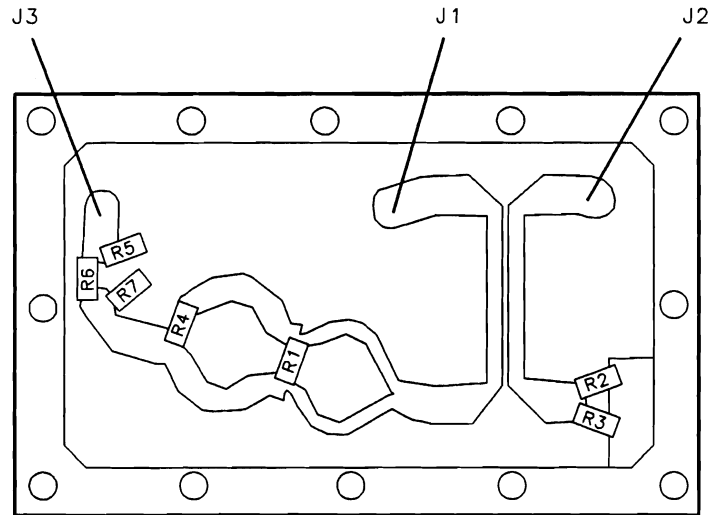


A23A2 First Converter Component Locations, 85680-60060

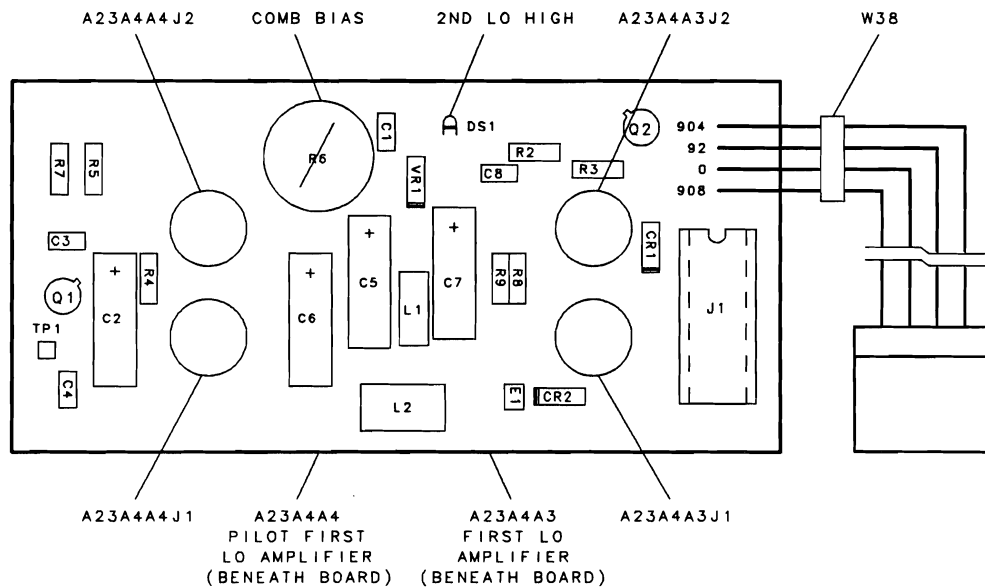


A23A3 Second Converter Component Locations, 85680-60052

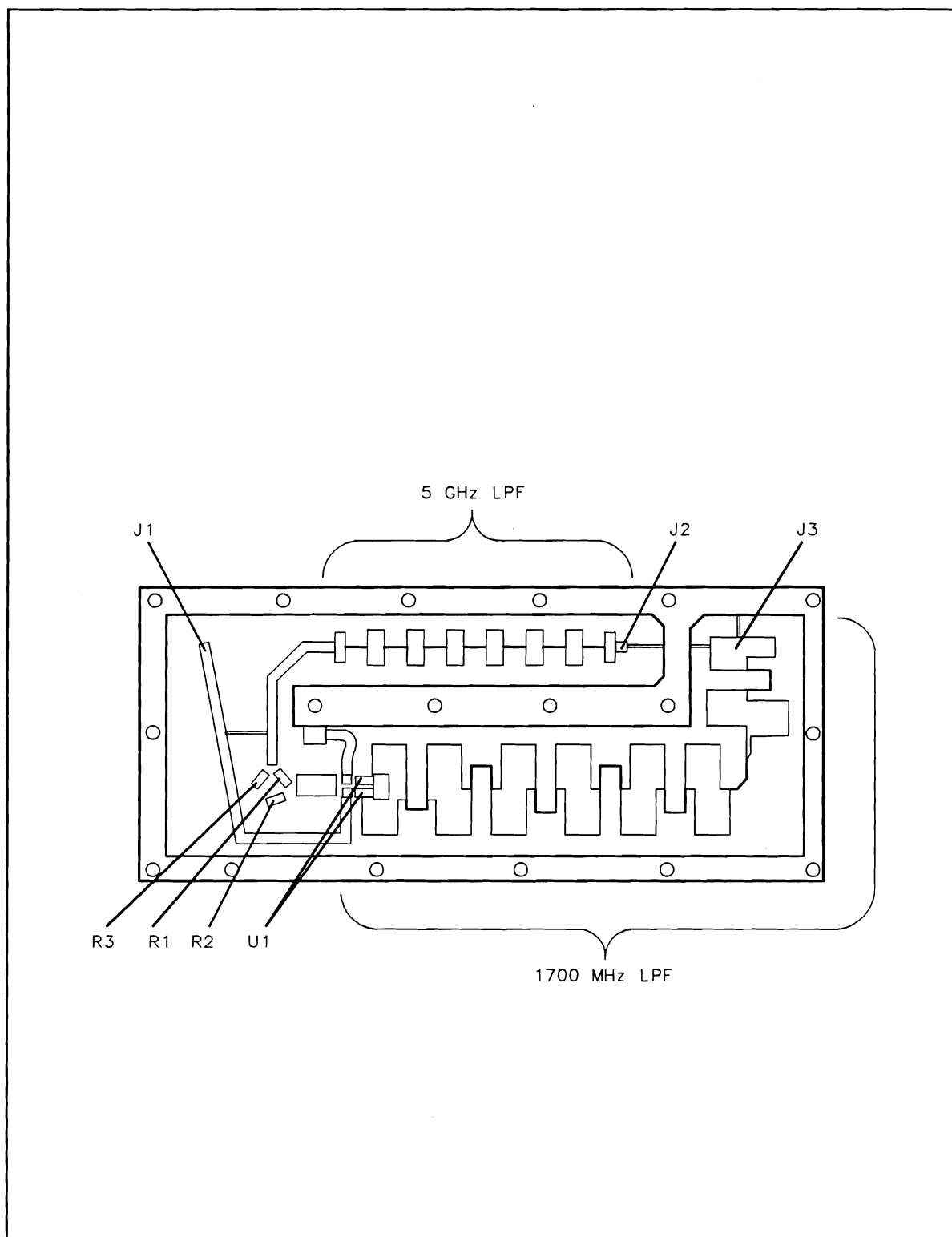
**A23A4A1 COUPLER/SPLITTER
85680-60055**



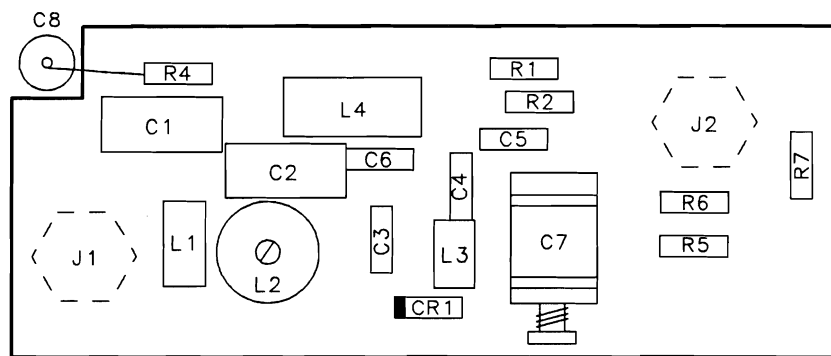
**A23A4A2 RF CONVERTER BIAS
85680-60032**



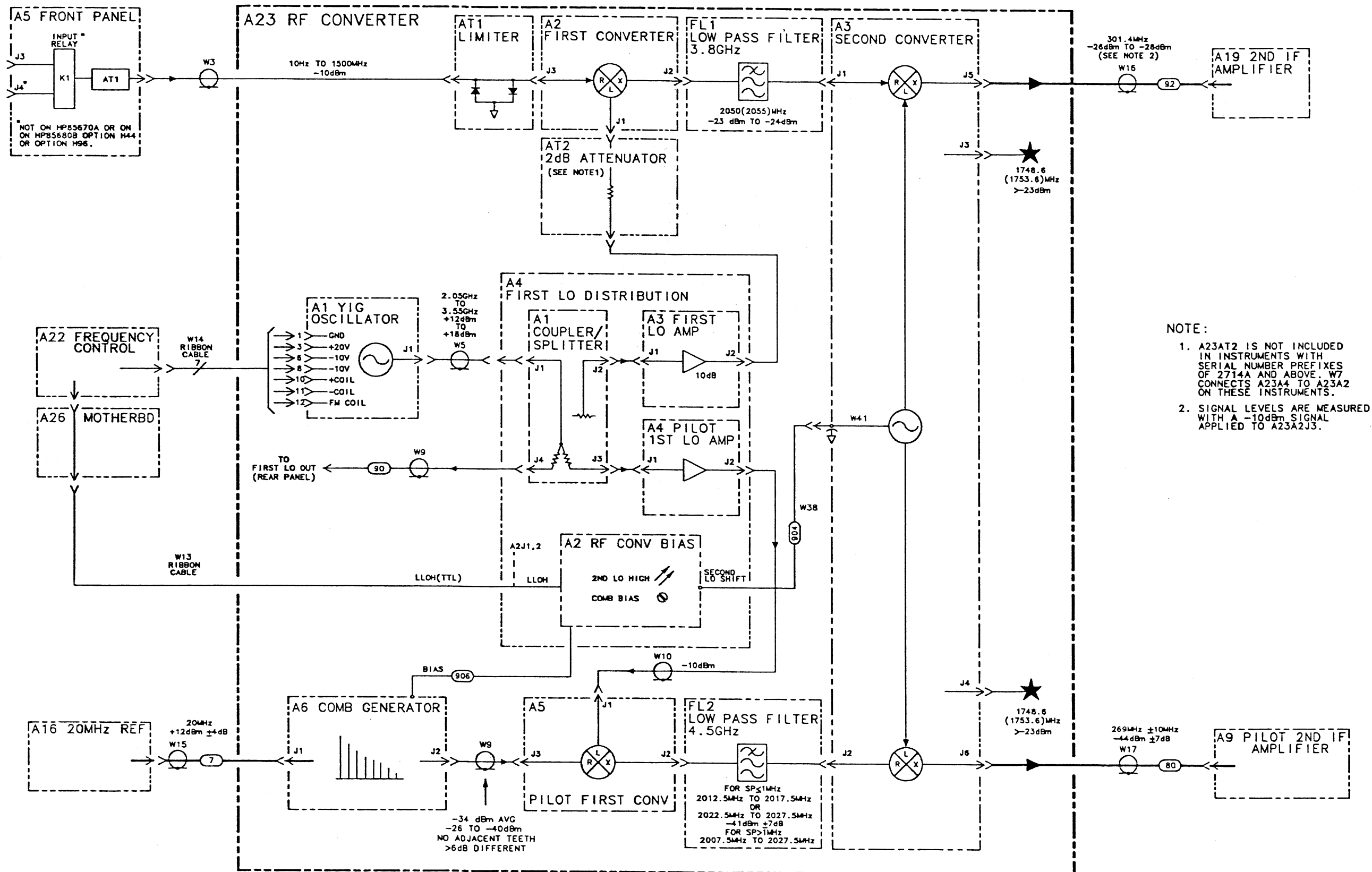
A23A4 First LO Distribution Assembly and Component Locations, 2 Views



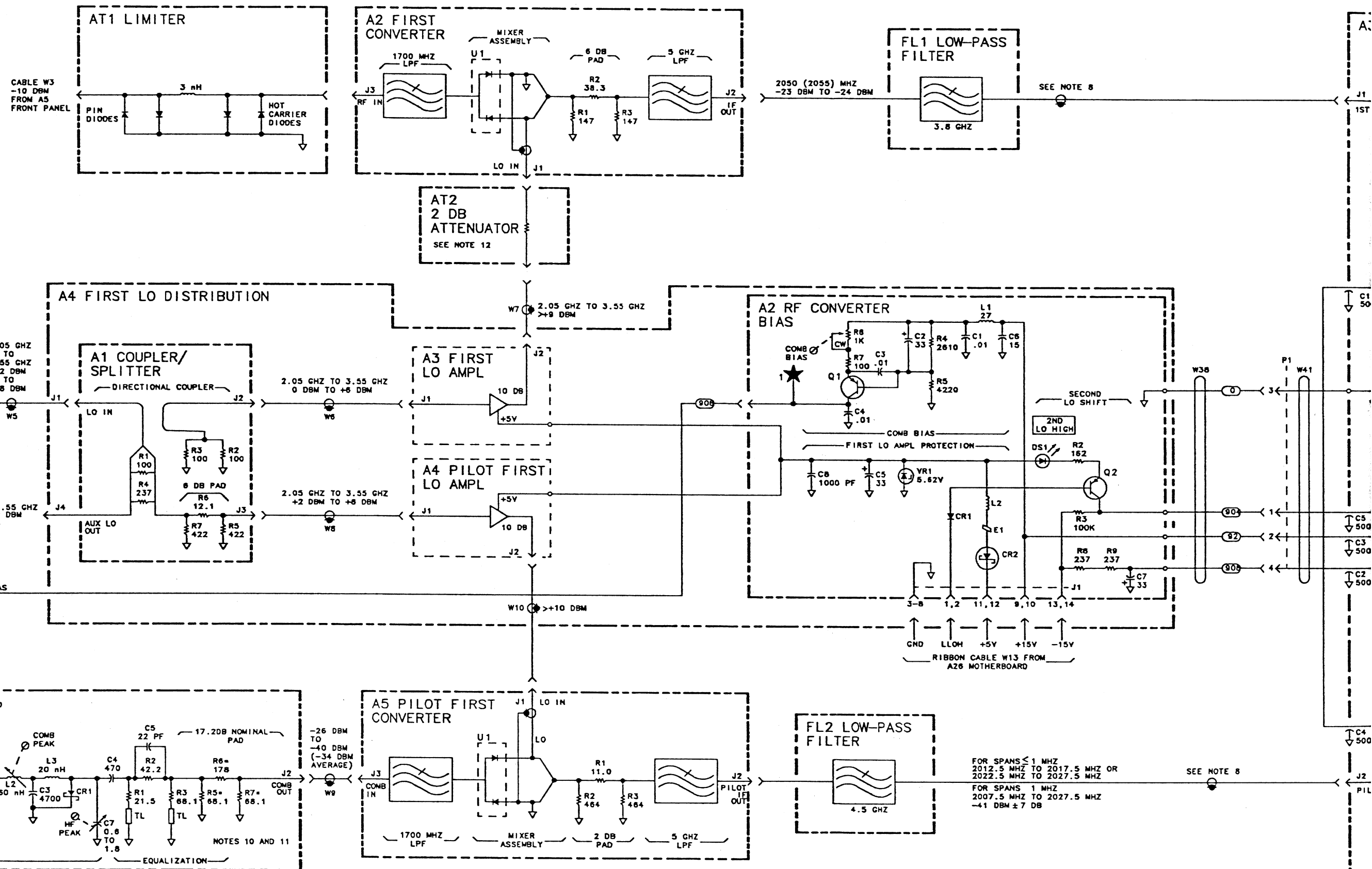
A23A5 Pilot First Converter Component Locations, 85680-60061

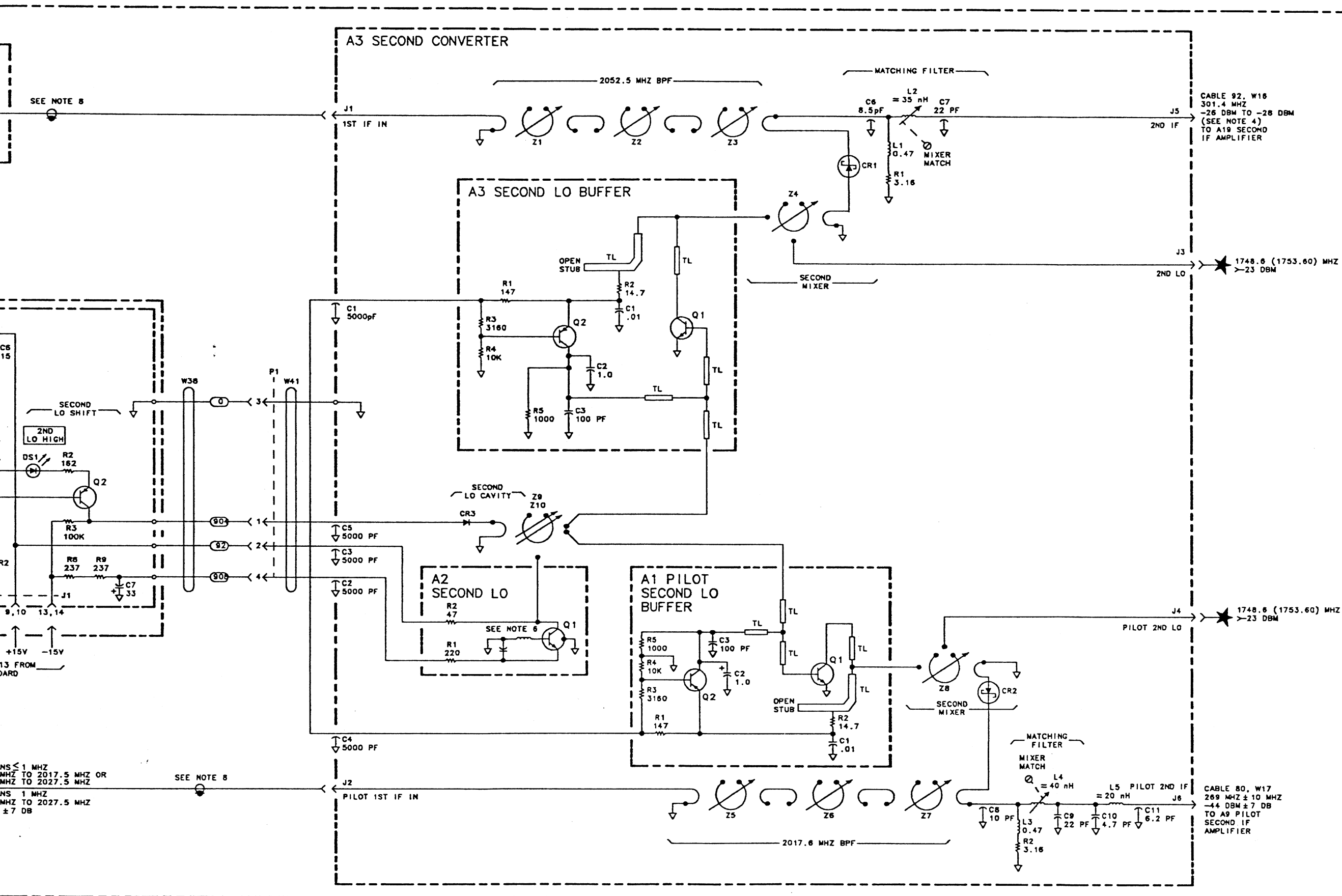


A23A6 Comb Generator Board Assembly Component Locations, 85680-60006



A23 RF CONVERTER, BLOCK DIAGRAM





- 7 NOTES:

MNEMONIC	DESCRIPTION
LLOH	LOW PLACES SECOND L IN HIGH FREQUENCY STATE

A24

A24 Voltage Regulator, Circuit Description

A24 Voltage Regulator provides +20 V, +15 V, +5 V, -15 V, and -5.2 V regulated voltages to the RF Section. It also provides overvoltage protection, provides for thermal shutdown at temperatures above 85°C, controls fan operation, and ensures power-up and power-down operation that will not invalidate date in the A15 Controller. The A24 Voltage Regulator also controls power to the oscillator and the oven in the A27 10 MHz Frequency Standard of the standard HP 85680B, or to the oscillator in the A14 TCXO Buffer of the HP 85670A and the HP 85680B Options H44 and H96.

Voltage Regulator Control (A)

When the front-panel LINE switch is in STANDBY, the STBY SW line is grounded, the Fan Relay on the Motherboard is energized through CR1, and the fan is turned off.

When the STBY SW line is grounded, Q7 is turned on through CR2, and Q5 is turned on, shutting off the current source to the -15 V REG circuit. In the same manner, Q3 is turned on, which turns off the +20 V REG circuit. When these two supplies are turned off, the remaining regulated supplies are also shut off.

When the operating temperature exceeds 85°C, the THERMISTOR lines are activated through thermistor A26RT1, unbalancing the bridge on the input of op amp U1. U1 senses the unbalance and drives Q8 to saturation, shutting off the regulated power supplies. TEMP indicator DS1 lights to indicate thermal shutdown.

+20 V REG (D)

Q1 through Q3 and associated circuitry are a current source that drives the Darlington pair A26Q2B and A26Q2E on the Motherboard (see Figure 2). Q10 and associated circuitry are a Foldback Current Limit that monitors both sides of current sense resistor A26R9.

Q9, with its associated circuitry, forms a crowbar circuit. An overvoltage shorts the supply through Q9, which turns on the current limit transistor Q10. CR17 is a reverse protection diode that prohibits the voltage from being pulled negative, since the crowbar circuit protects against positive overvoltage only. DS2 is then +20 V indicator LED on the board.

VR5 provides a voltage reference for the positive input of op amp U2. The divided +20 V sense voltage is the negative input. The +20 V ADJ potentiometer R60 adjusts the regulated voltage of the circuit. (The other regulator circuits are referenced from +20 V REG, so if R60 is adjusted for +20 V, the other regulated voltages will also be within tolerance.) VR3 and VR4 assure proper operating conditions for op amp U2 when the instrument is in STANDBY.

–15 V REG, –5.2 V REG, +5 V REG and +15 V REG (C) (F) (G) (H)

These circuits are similar in operation to that of +20 V REG.

Power Up (E)

The Power Up circuit is designed to provide the HPUP signal to the A15 Controller only after all regulated supplies are operating at correct voltages. If line power is lost, or if the front-panel LINE switch is placed in STANDBY, HPUP is deactivated before the supply voltages fall below operating levels.

If line power is removed from the instrument, the voltage at the output of U7B is momentarily driven low and unbalances comparator U7A through CR22 to deactivate the HPUP line. If the LINE switch is placed in STANDBY, U7A is unbalanced through CR21. The short RC time constant provided by R90 and C11 provides enough time for the HPUP line to go low before power is removed.

When the LINE switch is placed ON, or when line power is restored, C11 slowly charges because of the long RC time constant provided by R96. Thus, all regulated supplies have time to reach their operating voltages before the HPUP line goes high.

Frequency Reference Supply and Control (B)

Standard HP 85680B

This circuit controls the oven and oscillator power in the A27 10 MHz Frequency Standard, signals A23 RF Section Interface when the oven is cold, and provides a front-panel LED indication when the LINE switch is in STANDBY. The circuit is designed so that oscillator power is removed but oven power remains on when the instrument is in STANDBY. Oscillator power is also removed when an external time base is used.

When the LINE switch is ON, +20 V provides oven power (OVN PWR). When the LINE switch is in STANDBY, the unregulated +25 V provides oven power through diodes CR4 through CR7, and Q19, but +20 V is removed from Q23, and the oscillator power is turned off.

When an external time base is used, the HINT line goes low, turning off Q22 and Q23 to remove oscillator power.

The oven monitor (OVN MTR) line from A27 10 MHz Frequency Standard keeps comparator U8 balanced when the oven is at operating temperature. If the oven is cold, U8 drives the HOVC lines high, signaling A12 RF Section Interface.

When the LINE switch is in STANDBY, –15 V is removed from the base of Q21. Q21 turns on, sending the STBY LED signal to the front panel to run on the STANDBY indicator LED. If the instrument has line power but the regulated power is off, the STANDBY indicator is lit.

Zener diode VR1 allows proper operation of the circuit when cable W2 is disconnected from the panel.

HP 85670A and HP 85680B Option H44 and H96

This circuit controls the oscillator power in the A14 TCXO Buffer and provides a front-panel LED indication when the LINE switch is in STANDBY. The circuit is designed so that

oscillator power is removed when the instrument is in STANDBY, or when an external time base is used.

When the LINE switch is ON, Q23 is turned on to provide oscillator power (OSC PWR). When the LINE switch is in STANDBY, +20 V is removed from Q23, and the oscillator power is turned off.

When an external time base is used, the HINT line goes low, turning off Q22 and Q23 to remove oscillator power.

When the LINE switch is in STANDBY, -15 V is removed from the base of Q21. Q21 turns on, sending the STBY LED signal to the front panel to run on the STANDBY indicator LED. If the instrument has line power but the regulated power is off, the STANDBY indicator is lit.

Zener diode VR1 allows proper operation of the circuit when cable W2 is disconnected from the panel.

HP Part Number 85680-60154

A24 Voltage Regulator

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A24	85680-60154	7	1	BOARD ASSEMBLY, VOLTAGE REGULATOR	28480	85680-60154
A24C1	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2-DYS
A24C2	0160-0154	5	1	CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	84411	HEW-238M
A24C3	0180-0373	2	1	CAPACITOR-FXD .68UF+-10% 35VDC TA	56289	150D684X9035A2-DYS
A24C4	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A24C5	0180-2214	4	1	CAPACITOR-FXD 90uF 16 V AL-ELCTLT	56289	30D906G016CC2-DSM
A24C6	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A24C7	0160-0159	0	1	CAPACITOR-FXD 6800PF +-10% 200VDC POLYE	84411	HEW-238M
A24C8	0180-1846	6	1	CAPACITOR-FXD 2.2UF+-10% 35VDC TA	56289	150D225X9035B2-DYS
A24C9	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A24C10	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A24C11	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A24C12	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	04222	SA101C103KAAH
A24C14	0160-0159	0	1	CAPACITOR-FXD 6800PF +-10% 200VDC POLYE	84411	HEW-238M
A24C15	0180-1846	6	1	CAPACITOR-FXD 2.2UF+-10% 35VDC TA	56289	150D225X9035B2-DYS
A24C16	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A24C17	0160-0157	8	1	CAPACITOR-FXD 4700pF 200 V POLYE-FL	84411	HEW-238M
A24C18	0180-0373	2	1	CAPACITOR-FXD .68UF+-10% 35VDC TA	56289	150D684X9035A2-DYS
A24C19	0160-0157	8	1	CAPACITOR-FXD 4700pF 200 V POLYE-FL	84411	HEW-238M
A24C20	0180-0373	2	1	CAPACITOR-FXD .68UF+-10% 35VDC TA	56289	150D684X9035A2-DYS
A24C21	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A24C22	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A24C23	0160-4084	8	1	CAPACITOR-FXD 0.1uF 50 V	56289	1C20X7R104M050B
A24CR1	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR2	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR3	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR4	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR5	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR6	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR7	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR8	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR9	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR13	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR14	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR15	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR16	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR17	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR18	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR19	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR20	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR21	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR22	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A24CR25	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR26	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24CR27	1901-0028	5	1	DIODE-POWER RECT 400V 750MA DO-29	04713	
A24DS1	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A24DS2	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401

*Indicates factory-selected value

85680-60154 Parts List

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HP Part Number 85680-60154
A24 Voltage Regulator

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A24DS3	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A24DS4	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A24DS5	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A24DS6	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A24E1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24E2	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24MP1	4040-0750	7	1	EXTRACTOR-PC BD RED POLYC .062-IN-BD-THK		
A24MP2	4040-0752	9	1	EXTRACTOR-PC BD YEL POLYC .062-IN-BD-THK		
A24MP3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	72962	99-012-062-0250
A24MP4	0360-0353	0	1	BRACKET-RTANG .406-LG X .343-LG .312-WD	79963	176-144
A24MP5	0361-0006	2	1	RIVET-SEMITUB OVH .146DIA .156LG	12014	R-4013
A24MP6	0403-0026	6	1	PLUG-HOLE BDR-HD FOR .19-D-HOLE NYL	02768	207-120241-03-0101
A24MP7				NOT ASSIGNED		
A24MP8	0590-0519	7	5	THREADED INSERT-NUT 4-40 .062-IN-LG STL	46384	KF2-440-ET
A24MP9	3050-1071	7	5	WASHER-RECTANGULAR 10.28 MM LG 5.59 MM	04713	B09002A001
A24MP10	2200-0105	4	5	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	77250	
A24Q1	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q2	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q3	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q4	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q5	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q6	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q7	1853-0457	1	1	TRANSISTOR PNP SI PD=350MW FT=100MHZ	04713	2N5400
A24Q8	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q9	1884-0281	4	1	THYRISTOR-SCR 2N6505 TO-220AB VRRM=100	04713	2N6505
A24Q10	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q11	1884-0281	4	1	THYRISTOR-SCR 2N6505 TO-220AB VRRM=100	04713	2N6505
A24Q12	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q13	1884-0281	4	1	THYRISTOR-SCR 2N6505 TO-220AB VRRM=100	04713	2N6505
A24Q14	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q15	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q16	1884-0281	4	1	THYRISTOR-SCR 2N6505 TO-220AB VRRM=100	04713	2N6505
A24Q17	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q18	1884-0281	4	1	THYRISTOR-SCR 2N6505 TO-220AB VRRM=100	04713	2N6505
A24Q19	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q20	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24Q21	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q22	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A24Q23	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A24R1	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R2	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R3	0698-4405	6	1	RESISTOR 107 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A24R4	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R5	0698-3150	6	1	RESISTOR 2.37K 1% .125W TF TC=0+-100	19701	SFR25H
A24R6	0757-0199	3	1	RESISTOR 21.5K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R7	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R8	0698-6362	8	1	RESISTOR 1K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R9	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H

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A24 Voltage Regulator

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A24R10	0757-0438	3		1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R11	0757-0442	9		1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R12	0757-0199	3		1	RESISTOR 21.5K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R13	0757-0401	0		1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R14	0757-0442	9		1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R20	0698-3440	7		1	RESISTOR 196 1% .125W TF TC=0+-100	19701	SFR25H
A24R21	0757-0442	9		1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R22	0757-0438	3		1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R23	0757-0438	3		1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R24	0757-0438	3		1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R25	0757-0346	2		1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A24R26	0757-0438	3		1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R27	0698-6362	8		1	RESISTOR 1K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R28	0757-0442	9		1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R29	0757-0199	3		1	RESISTOR 21.5K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R30	0757-0442	9		1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R31	0757-0199	3		1	RESISTOR 21.5K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R32	0757-0465	6		1	RESISTOR 100K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R33	0698-3260	9		1	RESISTOR 464K 1% .125W TF TC=0+-100	19701	SFR25H
A24R34	0698-3150	6		1	RESISTOR 2.37K 1% .125W TF TC=0+-100	19701	SFR25H
A24R35	0757-0438	3		1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R50	0698-6362	8		1	RESISTOR 1K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R51	0757-0442	9		1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R52	0757-0401	0		1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R53	0757-0428	1		1	RESISTOR 1.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R54	0757-0395	1		1	RESISTOR 56.2 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R55	0698-3439	4		1	RESISTOR 178 1% .125W TF TC=0+-100	19701	SFR25H
A24R56	0757-0279	0		1	RESISTOR 3.16K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R57	0757-0458	7		1	RESISTOR 51.1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R58	0757-0458	7		1	RESISTOR 51.1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R59	0757-0440	7		1	RESISTOR 7.5K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R60	2100-1973	4		1	RESISTOR-TRMR 200 10% WW TOP-ADJ 20-TRN	32997	3005P-DM3-201
A24R61	0698-5556	0		1	RESISTOR 3.3K +-1% .125W TF TC=0+-25	91637	CMF-55-1, T-9
A24R62	0757-0278	9		1	RESISTOR 1.78K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R63	0757-0280	3		1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R64	0757-0278	9		1	RESISTOR 1.78K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R65	0757-0346	2		1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A24R66	0698-3444	1		1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A24R70	0698-6362	8		1	RESISTOR 1K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R71	0757-0442	9		1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R72	0757-0399	5		1	RESISTOR 82.5 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R73	0757-0416	7		1	RESISTOR 511 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R74	0757-0294	9		1	RESISTOR 17.8 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R75	0757-0398	4		1	RESISTOR 75 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R76	0757-0280	3		1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R77	0698-6322	0		1	RESISTOR 4K +-0.1% .125W TF TC=0+-25	91637	CMF-55-1, T-9
A24R78	0698-6348	0		1	RESISTOR 3K +-0.1% .125W TF TC=0+-25	19701	5033R

**Indicates factory-selected value*

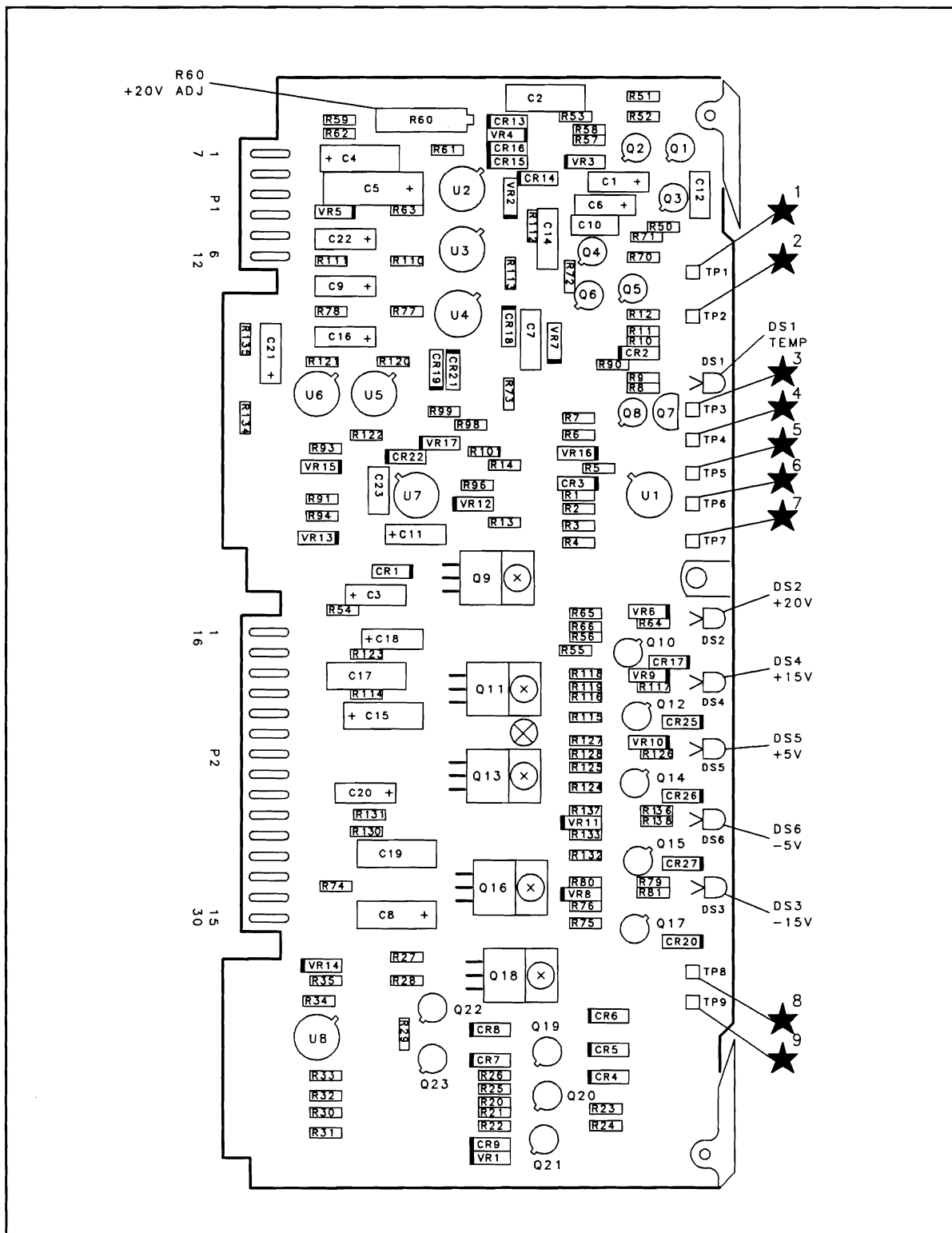
HP Part Number 85680-60154
A24 Voltage Regulator

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A24R79	0757-0428	1	1	RESISTOR 1.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R80	0757-0346	2	1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A24R81	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A24R90	0757-0400	9	1	RESISTOR 90.9 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R91	0698-3150	6	1	RESISTOR 2.37K 1% .125W TF TC=0+-100	19701	SFR25H
A24R93	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R94	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R96	0698-8827	4	1	RESISTOR 1M +-1% .125W TF TC=0+-100	19701	SFR25H
A24R98	0698-6360	6	1	RESISTOR 10K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R99	0757-0428	1	1	RESISTOR 1.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R101	0698-6963	5	1	RESISTOR 5.55K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R110	0698-6362	8	1	RESISTOR 1K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R111	0698-6348	0	1	RESISTOR 3K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R112	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R113	0757-0416	7	1	RESISTOR 511 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R114	0757-0294	9	1	RESISTOR 17.8 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R115	0757-0400	9	1	RESISTOR 90.9 +-1% .125W TF TC=0+-100	19701	SFR25H
A24R116	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R117	0757-0428	1	1	RESISTOR 1.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R118	0757-0346	2	1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A24R119	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A24R120	0698-5361	5	1	RESISTOR 2.822K +-0.1% .1W TF TC=0+-5	19701	5023Z
A24R121	0698-6362	8	1	RESISTOR 1K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R122	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	19701	SFR25H
A24R123	0698-3429	2	1	RESISTOR 19.6 1% .125W TF TC=0+-100	19701	SFR25H
A24R124	0698-3443	0	1	RESISTOR 287 1% .125W TF TC=0+-100	19701	SFR25H
A24R125	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R126	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A24R127	0757-0346	2	1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A24R128	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A24R130	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	19701	SFR25H
A24R131	0698-3429	2	1	RESISTOR 19.6 1% .125W TF TC=0+-100	19701	SFR25H
A24R132	0698-3438	3	1	RESISTOR 147 1% .125W TF TC=0+-100	19701	SFR25H
A24R133	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A24R134	0698-6320	8	1	RESISTOR 5K +-0.1% .125W TF TC=0+-25	91637	CMF-55-1, T-9
A24R135	0698-8911	7	1	RESISTOR 1.3K +-0.1% .125W TF TC=0+-25	19701	5033R
A24R136	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A24R137	0757-0346	2	1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A24R138	0698-3444	1	1	RESISTOR 316 1% .125W TF TC=0+-100	19701	SFR25H
A24TP1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP2	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP3	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP4	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP5	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP6	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP7	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP8	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A24TP9	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	

HP Part Number 85680-60154
A24 Voltage Regulator

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A24U1	1826-1058	3	1	IC OP AMP GP 8-T0-99 PKG	06665	OP-02CJ
A24U2	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD T0-99 PKG	27014	LF256H
A24U3	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD T0-99 PKG	27014	LF256H
A24U4	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD T0-99 PKG	27014	LF256H
A24U5	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD T0-99 PKG	27014	LF256H
A24U6	1826-0371	1	1	IC OP AMP LOW-BIAS-H-IMPD T0-99 PKG	27014	LF256H
A24U7	1826-0425	6	1	IC OP AMP GP DUAL T0-99 PKG	34371	HA2-2655-5
A24U8	1826-1058	3	1	IC OP AMP GP 8-T0-99 PKG	06665	OP-02CJ
A24VR1	1902-3082	9	1	DIODE-ZENER 4.64V 5% D0-35 PD=.4W	04713	
A24VR2	1902-0556	6	1	DIODE-ZENER 20V 5% PD=1W IR=5UA	04713	
A24VR3	1902-0041	4	1	DIODE-ZENER 5.11V 5% D0-35 PD=.4W	04713	
A24VR4	1902-3082	9	1	DIODE-ZENER 4.64V 5% D0-35 PD=.4W	04713	
A24VR5	1902-0686	3	1	DIODE-ZENER 6.2V 2% D0-7 PD=.4W	04713	1N825
A24VR6	1902-3256	9	1	DIODE-ZENER 23.7V 5% D0-35 PD=.4W	04713	
A24VR7	1902-0556	6	1	DIODE-ZENER 20V 5% PD=1W IR=5UA	04713	
A24VR8	1902-0184	6	1	DIODE-ZENER 16.2V 5% D0-35 PD=.4W	04713	
A24VR9	1902-0184	6	1	DIODE-ZENER 16.2V 5% D0-35 PD=.4W	04713	
A24VR10	1902-3104	6	1	DIODE-ZENER 5.62V 5% D0-35 PD=.4W	04713	
A24VR11	1902-3104	6	1	DIODE-ZENER 5.62V 5% D0-35 PD=.4W	04713	
A24VR12	1902-0184	6	1	DIODE-ZENER 16.2V 5% D0-35 PD=.4W	04713	
A24VR13	1902-3082	9	1	DIODE-ZENER 4.64V 5% D0-35 PD=.4W	04713	
A24VR14	1902-3082	9	1	DIODE-ZENER 4.64V 5% D0-35 PD=.4W	04713	
A24VR15	1902-0064	1	1	DIODE-ZENER 7.5V 5% D0-35 PD=.4W	04713	
A24VR16	1902-3082	9	1	DIODE-ZENER 4.64V 5% D0-35 PD=.4W	04713	
A24VR17	1902-0686	3	1	DIODE-ZENER 6.2V 2% D0-7 PD=.4W	04713	1N825

**Indicates factory-selected value*

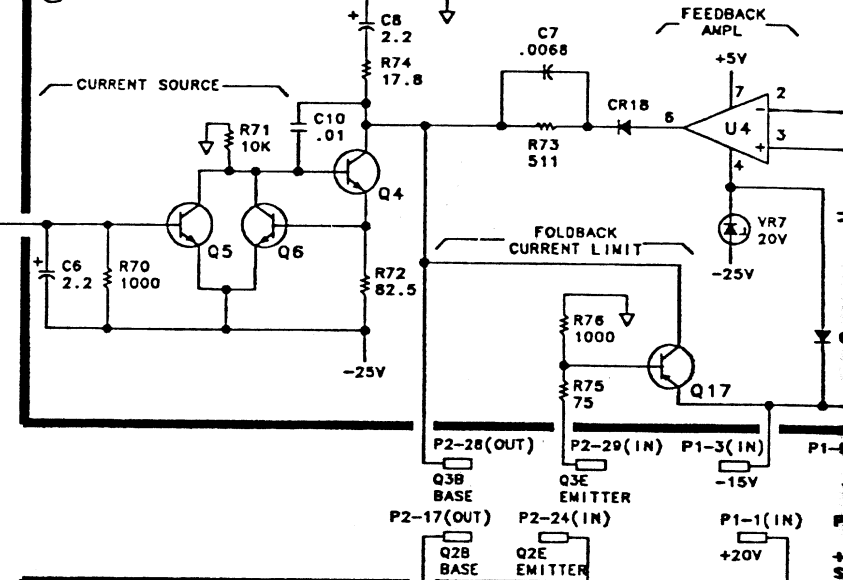
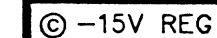


A24 Voltage Regulator Component Locations, 85680-60154

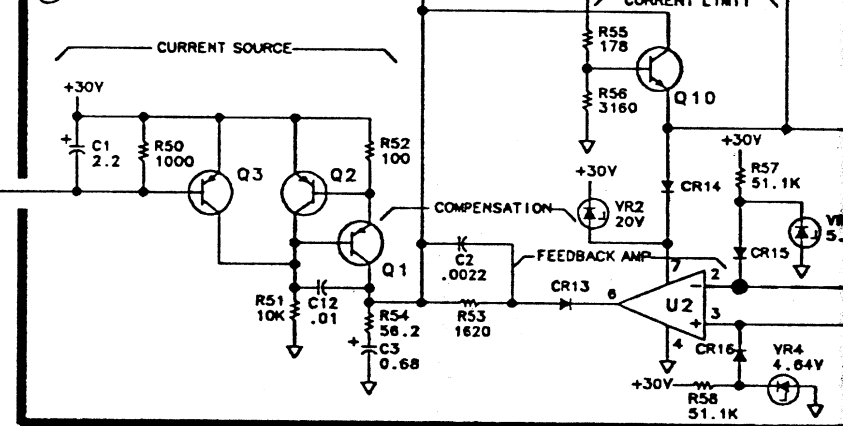
P2

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1 16	K1 FAN(RELAY) +30V	A26, K1 A26	A I
2 17	GND Q2 BASE	A26, Q2	I D
3 18	GND Q4 BASE	A26, Q4	I G
4 19	HTR PWR THERMISTOR	A27, J3-4 A26, RT1	B A
5 20	OYN MNTR THERMISTOR	A27, J3-3 A26, RT1	B A
6 21	GND Q5 BASE	A26, Q5	I H
7 22	OSC PWR Q5 EMITTER	A27, J3-2 A26, Q5	B H
8 23	HOVC Q4 EMITTER	A12, P2-32 A26, Q4	B G
9 24	HINT Q2 EMITTER	INT/EXT SWITCH A26, Q2	B D
10 25	HOVC -25V	A12P2-32 A26	B I
11 26	GND Q1 BASE	A26, Q1	I F
12 27	HPUP Q1 EMITTER	A15, P2-32 A26, Q3	E F
13 28	GND Q3 BASE	A26, Q3	I C
14 29	+25V Q3 EMITTER	A26 A26, Q3	I C
15 30	STBY LED STBY SW	A5, P1-2 A5, P1-3	B A

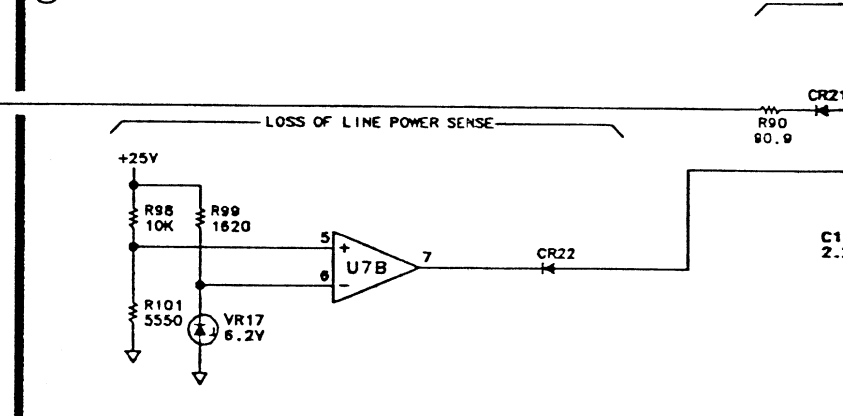
① POWER SUPPLIES

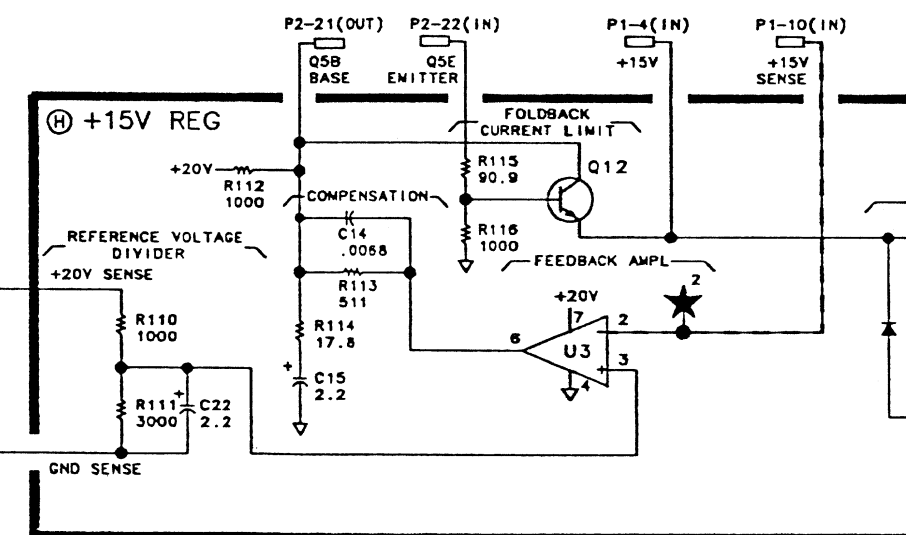
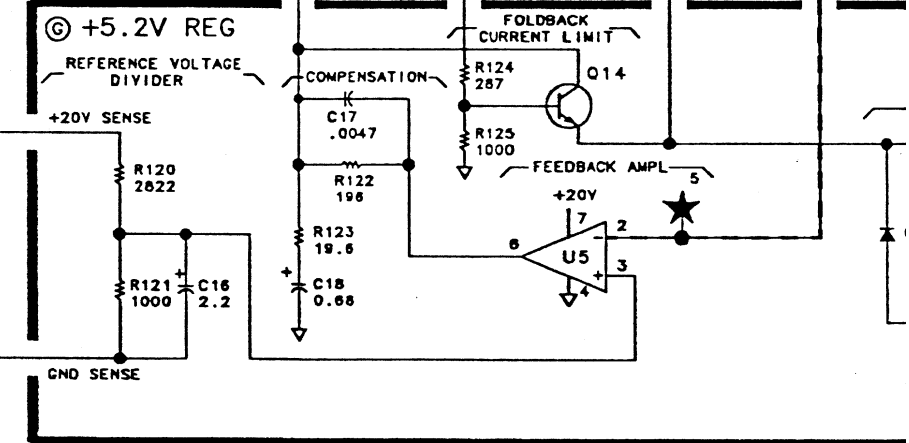
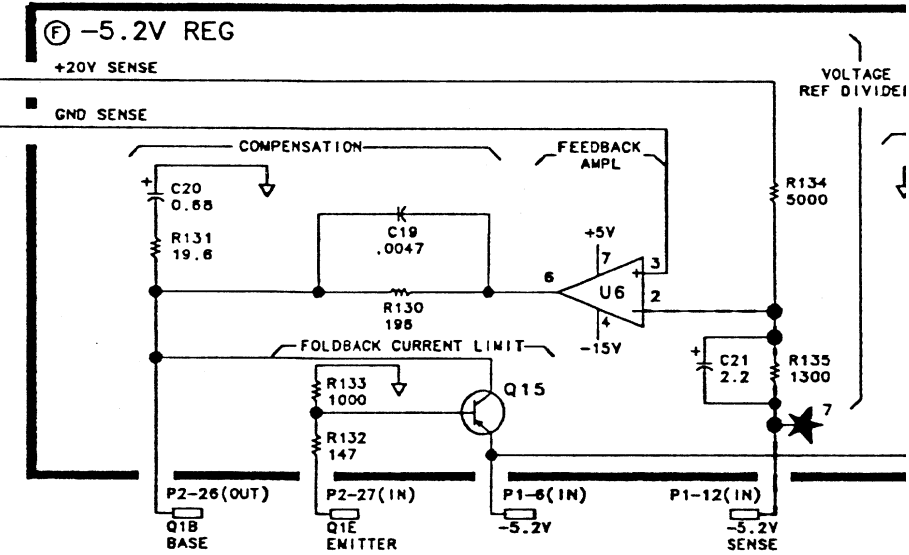
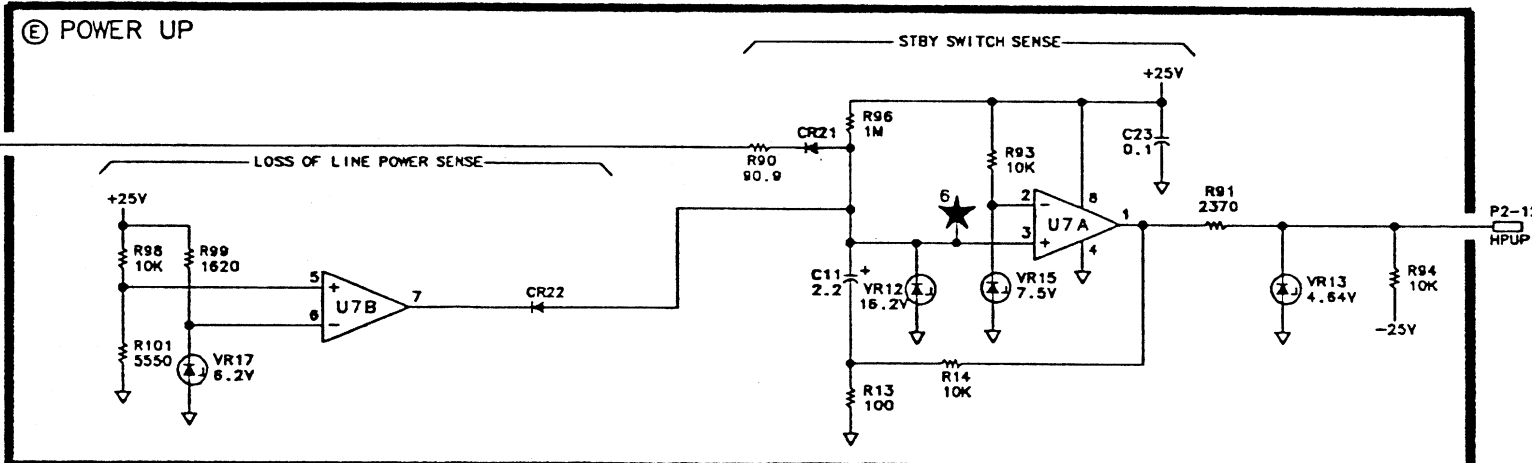
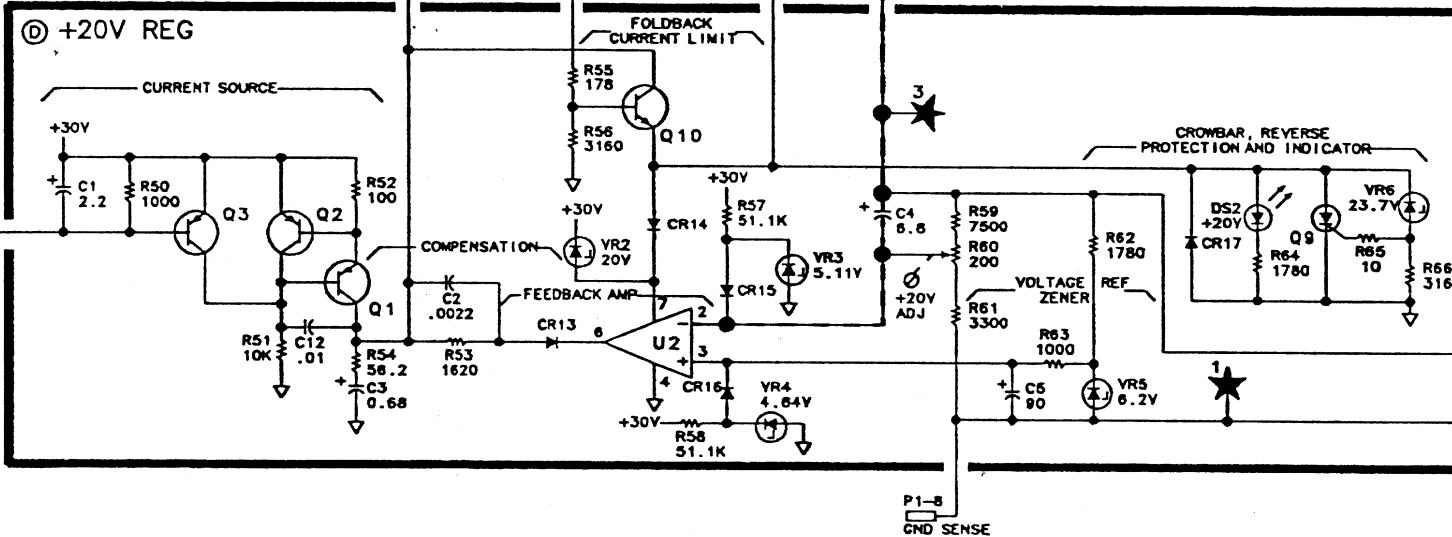
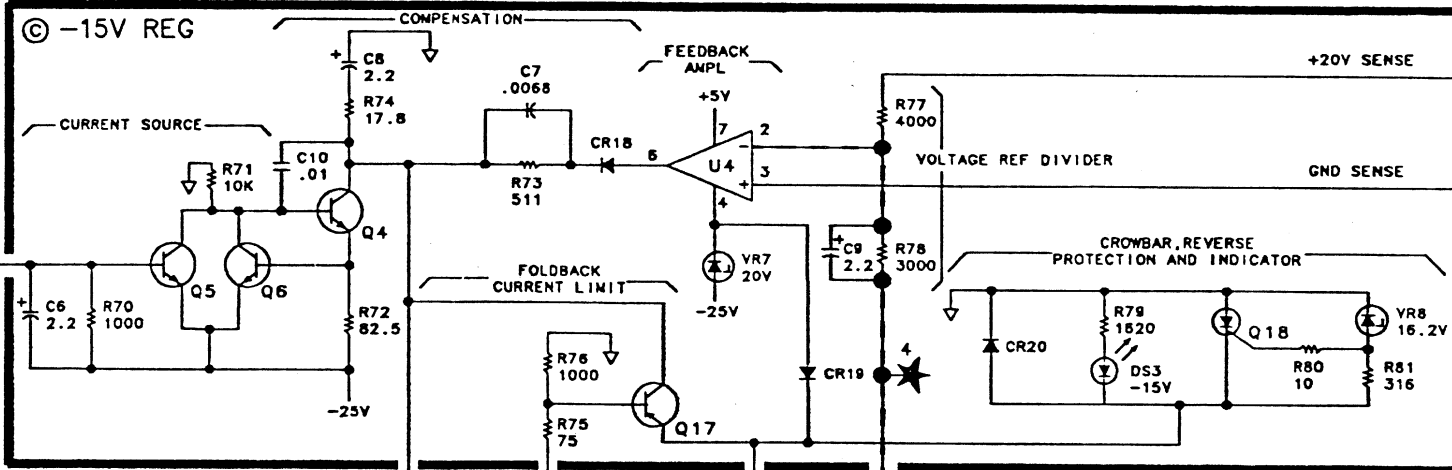


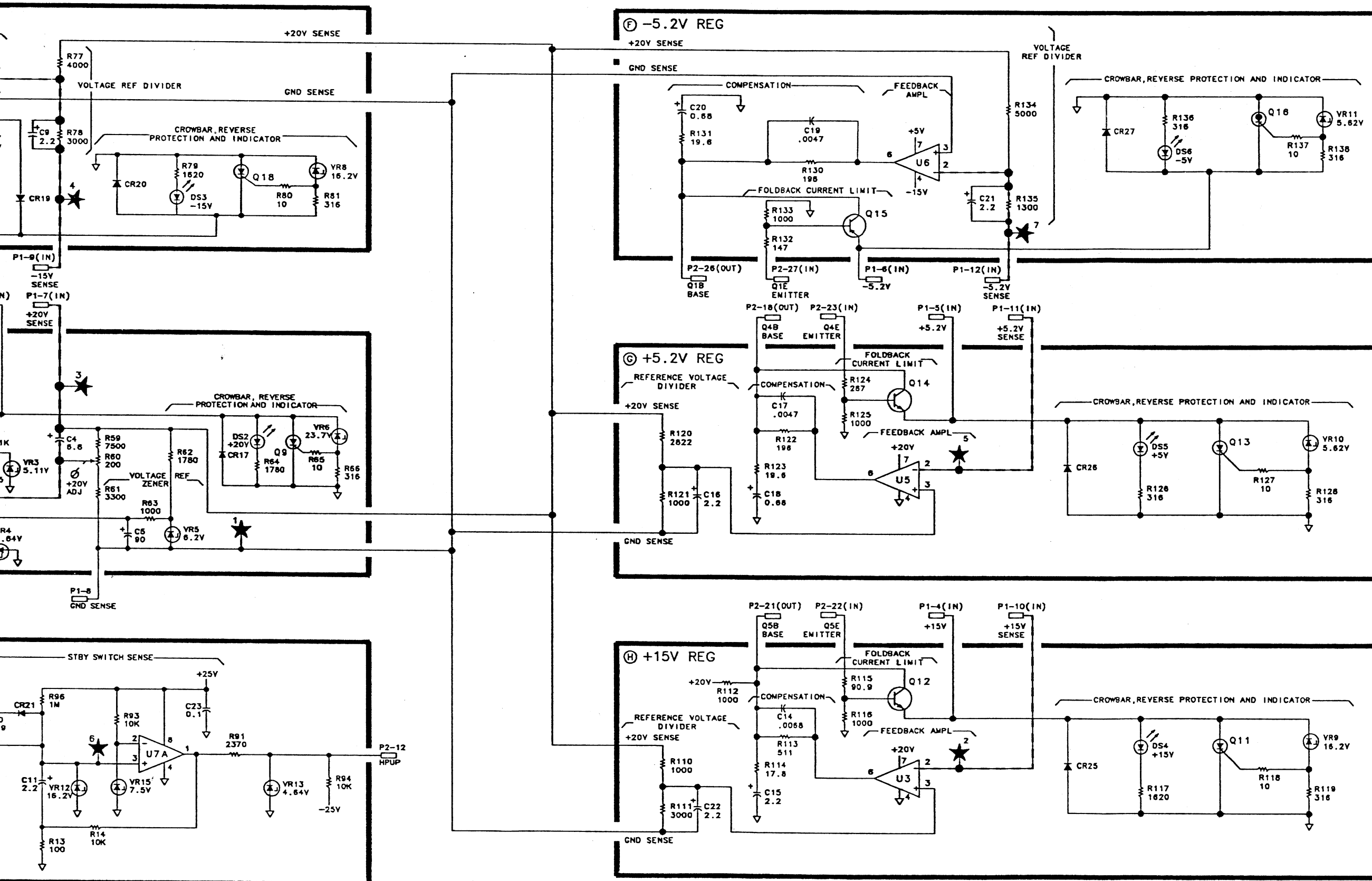
Ⓢ +20V REG



Ⓔ POWER UP







NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
2. UNLESS OTHERWISE INDICATED: RESISTANCE IS IN OHMS (Ω) CAPACITANCE IS IN MICROFARADS (μF) INDUCTANCE IS IN MICROHENRIES (μH)
3. UNLESS OTHERWISE INDICATED: SIGNALS ENTER AT LEFT SIDE AND EXIT AT RIGHT SIDE OF FUNCTION BLOCKS.

4. MNEMONIC TABLE:

MNEMONIC	DESCRIPTION
HINT	EXT TIMEBASE 0V = EXT +5V = INT
HPUP	POWER UP +5V = POWER UP 0V = POWER DOWN
HOVC	OVEN COLD +5V = OVEN COLD 0V = OVEN ON
HTR PWR	HEATER POWER
OVN MNTR	OVEN MONITOR

A25 and A26

A25 Rectifier, Circuit Description

Power is supplied to the instrument through the Power Line Module and the Line Voltage Selector to the primary of transformer T1. Three center-tapped secondaries provide the rectified outputs.

Diodes CR1 through CR4 form a full-wave rectifier that provides an unregulated ± 10 V; CR5 through CR8, an unregulated ± 25 V; and CR9 and CR10, an unregulated +30 V. These are regulated by A24 Voltage Regulator to +5 V, -5.2 V, +15 V, -15 V, and +20 V. LED indicator DS1 indicates the presence of unregulated voltages.

CR1 and Q1 form a crowbar circuit for overvoltage protection. Fuses for the unregulated supplies are located on A26 Motherboard.

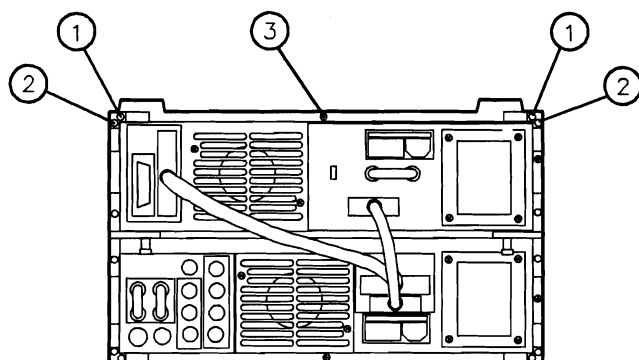
RF Section Internal Fuse Replacement

Warning

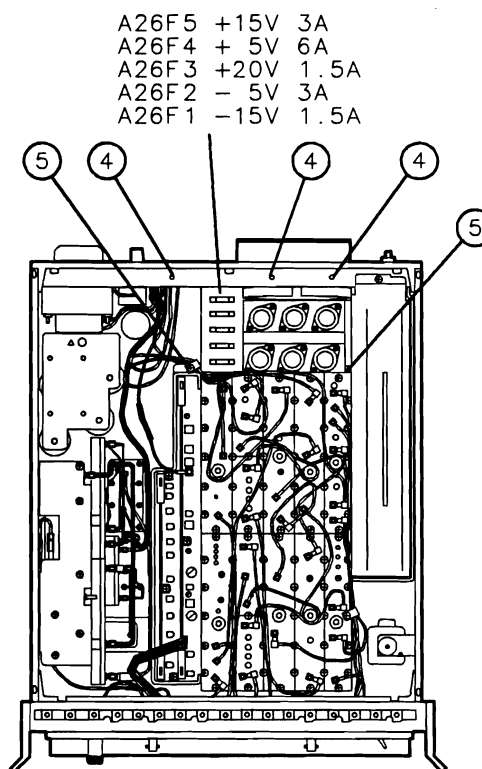
Remove ac line cords from both instruments before proceeding with this procedure.



1. Position instrument upside-down as show in View A of Figure 1.
2. Remove feet ① from rear of RF Section by removing screws ②.
3. Remove bottom cover from RF Section by loosening screw ③.
4. Remove shield from over fuses by removing rear screws ④ and front screws ⑤ shown in View B of Figure 1.
5. Location of fuses is shown in View B.



VIEW A



VIEW B

Figure 1. RF Section Internal Fuse Replacement

HP Part Number 85680-60155

A25 Rectifier

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A25	85680-60155	8	1	BOARD ASSEMBLY, RECTIFIER	28480	85680-60155
A25C1	0170-0064	7	1	CAP-FXD 0.47uF 100 V POLYE-FL	84411	663UW47491W
A25C2	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A25C3	0170-0064	7	1	CAP-FXD 0.47uF 100 V POLYE-FL	84411	663UW47491W
A25C4	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A25C5	0170-0064	7	1	CAP-FXD 0.47uF 100 V POLYE-FL	84411	663UW47491W
A25C6	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A25C7	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A25CR1	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR2	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR3	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR4	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR5	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR6	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR7	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR8	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR9	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25CR10	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	MR751
A25DS1	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A25F1	2110-0003	0	1	FUSE 3A 250V NTD FE UL	75915	312 003
A25MP1	0380-0810	6	4	STANDOFF-RVT-ON .437-IN-LG 6-32-THD	88245	B 1530-B-7/16-18
A25MP2	2110-0726	4	2	FUSEHOLDER-CLP-TYP.25D-FUSE	13060	1115-0597T
A25MP3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	72962	99-012-062-0250
A25MP4	2360-0331	6	8	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	72962	ESLOK
A25MP5	4040-0750	7	1	EXTR-PC BD RED POLYC .062-IN-BD-THKNS 1-		
A25MP6	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-IN-BD-THKNS 1-		
A25MP7	85680-00041	5	2	INSULATOR, RECTIFIER	28480	85680-00041
A25MP8	85680-00042	6	1	SHIELD, RECTIFIER	28480	85680-00042
A25MP9				NOT ASSIGNED		
A25MP10	0590-0519	7	1	THREADED INSERT-NUT 4-40 .062-IN-LG STL	46384	KF2-440-ET
A25MP11	3050-1071	7	1	WASHER-RECTANGULAR 10.28 MM LG 5.59 MM	04713	B09002A001
A25MP12	2200-0105	4	1	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	77250	
A25MP13	3050-0016	8	4	WASHER-FL MTLC NO. 6 .147-IN-ID	10630	
A25Q1	1884-0281	4	1	THYRISTOR-SCR 2N6505 TO-220AB VRRM=100	04713	2N6505
A25R1	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A25R2	0757-0405	4	1	RESISTOR 162 +-1% .125W TF TC=0+-100	19701	SFR25H
A25R3	0757-0818	3	1	RESISTOR 825 +-1% .5W TF TC=0+-100	19701	5053R
A25VR1	1902-0657	8	1	DIODE-ZNR 43.2V 5% D0-15 PD=1W TC=+.08%	04713	

*Indicates factory-selected value

HP Part Number 85680-60127
A26 Motherboard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26	85680-60127	4	1	BOARD ASSEMBLY-MOTHERBOARD	28480	85680-60127
A26C1	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C2	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C3	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C4	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C5	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C6	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C7	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C8	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C9	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C10	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C11	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C12	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C13	0160-3448	6	1	CAP-FXD 1000pF 1 kV		808-548 X5E 102K
A26C14	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C15	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C16	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C17	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C18	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C19	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C20	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C21	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C22	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C23	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C24	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C25	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C26	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C27	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C28	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C29	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C30	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C31	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C32	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C33	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C34	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C35	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C36	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C37	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C38	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C39	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C40	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C41	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C42	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C43	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C44	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C45	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C46	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K

**Indicates factory-selected value*

HP Part Number 85680-60127
A26 Motherboard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26C47	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C48	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C49	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C50	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C51	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C52	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26CR1	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	04713	
A26CR2	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	04713	
A26CR3	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	04713	
A26F1	2110-0043	8	1	FUSE 1.5A 250V NTD FE UL	75915	312 01.5
A26F2	2110-0003	0	1	FUSE 3A 250V NTD FE UL	75915	312 003
A26F3	2110-0043	8	1	FUSE 1.5A 250V NTD FE UL	75915	312 01.5
A26F4	2110-0056	3	1	FUSE 6A 250V NTD FE UL	75915	312 006
A26F5	2110-0003	0	1	FUSE 3A 250V NTD FE UL	75915	312 003
A26K1	0490-0618	5	1	RELAY 2C 24VDC-COIL 5A 115VAC	77342	R40-E0161-1
A26L1	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L2	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L3	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L4	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L5	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L6	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L7	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L8	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L9	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L10	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L11	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L12	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L13	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L14	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L15	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L16	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L17	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L18	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L19	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L20	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L21	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L22	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L23	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L24	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L25	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L26	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L27	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L28	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26MP1				NOT ASSIGNED		
A26MP2	2110-0726	4	10	FUSEHOLDER-CLP-TYP.25D-FUSE	13060	1115-0597T
A26MP4	0380-1681	1	3	STANDOFF-PRESS-IN .188 IN LONG 6-32 THD	46384	KFE-632-6
A26MP5	0590-0526	6	12	THREADED INSERT-NUT 4-40 .065-IN-LG SST	46384	KFS2-440
A26MP6	0590-0970	4	2	THREADED INSERT-NUT 6-32 .062-IN-LG STL	46384	KF2-632-Z

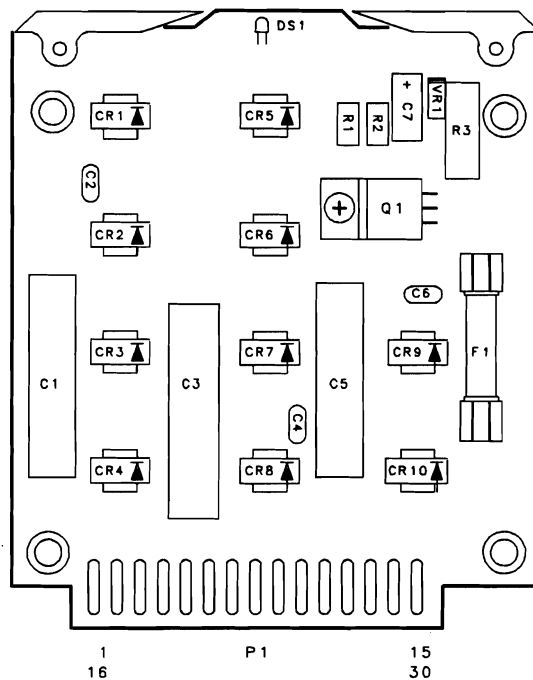
HP Part Number 85680-60127
A26 Motherboard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26MP8	0380-1680	0	1	SPACER-PRESS-IN 0.188 IN LG 0.143 IN ID	46384	KFE-143-6-ET
A26MP9	85680-00026	6	1	INSULATOR P/S	28480	85680-00026
A26MP10	85680-20199	6	1	POWER HEAT SINK	28480	85680-20199
A26MP11	0340-1114	1	6	INSULATOR-XSTR THRM-CNDCT TO-3ADH	55285	K-4-05
A26MP12	2200-0111	2	10	SCREW-MACH 4-40 .5-IN-LG PAN-HD-POZI	77250	
A26MP13	1200-0081	4	12	INSULATOR-FLG-BSHG NYLON	26365	974 307
A26MP14	2200-0109	8	2	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	77250	
A26P1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26P2	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26P3	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26P4	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26Q1	1853-0351	4	1	TRANSISTOR PNP 2N6053 SI DARL TO-3	04713	2N6053
A26Q2	1854-0611	1	1	TRANSISTOR NPN 2N6055 SI DARL TO-3	04713	2N6055
A26Q3	1853-0351	4	1	TRANSISTOR PNP 2N6053 SI DARL TO-3	04713	2N6053
A26Q4	1854-0611	1	1	TRANSISTOR NPN 2N6055 SI DARL TO-3	04713	2N6055
A26Q5	1854-0611	1	1	TRANSISTOR NPN 2N6055 SI DARL TO-3	04713	2N6055
A26R4	0811-3493	2	1	RESISTOR .47 +-10% 7W PWI TC=0+-800	11502	PW-7A
A26R5	0811-3493	2	1	RESISTOR .47 +-10% 7W PWI TC=0+-800	11502	PW-7A
A26R6	0811-3493	2	1	RESISTOR .47 +-10% 7W PWI TC=0+-800	11502	PW-7A
A26R7	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R8	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R9	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R10	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R11	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R12	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R13	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R14	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R15	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26RT1	0837-0126	6	1	THERMISTOR DISC 1K-OHM TC=-4.4%/C-DEG		STD-0163
A26U1	1826-0117	3	1	IC V RGLTR-FXD-POS 11.5/12.5V TO-3 PKG	27014	LM7812KC
A26XA5P1	1252-3179	6	1	CONNECTOR-MALE HEADER 7-PIN	18873	69167-107
A26XA6P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA6P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA7P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA8P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA8P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA9P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA10P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA11P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA11P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA12P1	1251-7312	5	1	CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	00779	1-530843-6
A26XA12P2	1251-2026	8	1	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS		SCM18D/7-1HP
A26XA15P1	1251-7312	5	1	CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	00779	1-530843-6
A26XA15P2	1251-2026	8	1	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS		SCM18D/7-1HP
A26XA15P3	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA16P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA16P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03

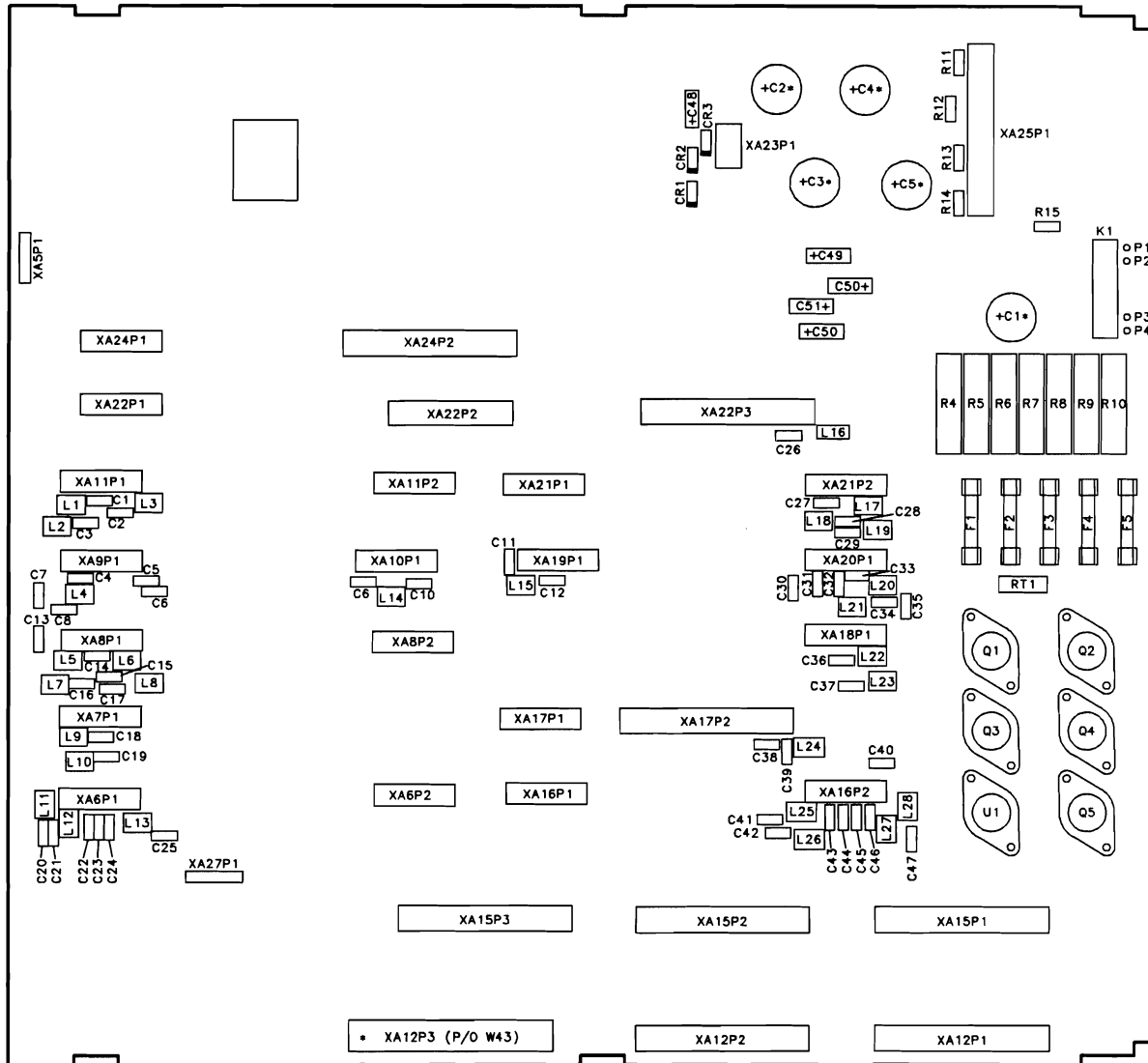
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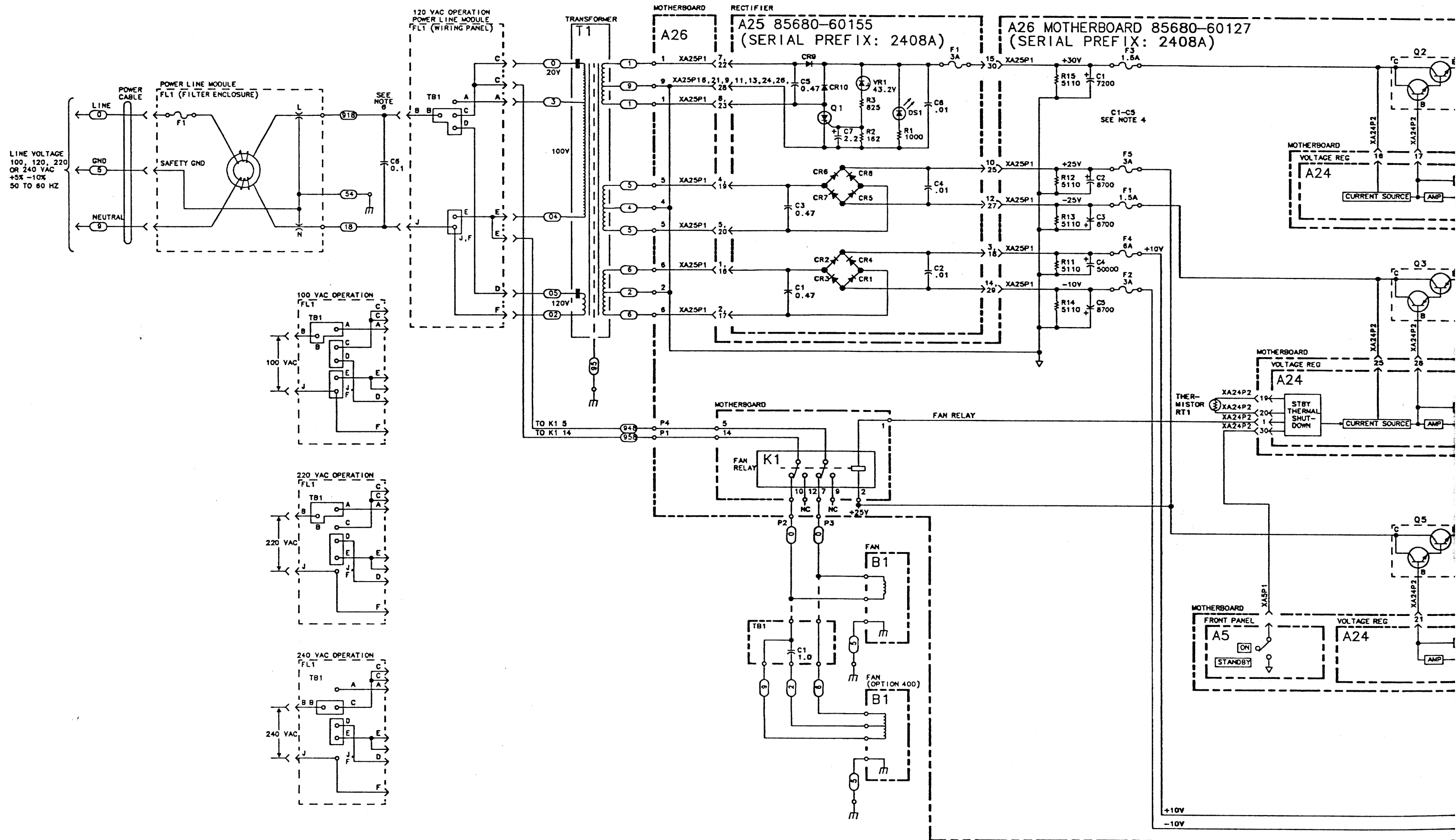
HP Part Number 85680-60127
A26 Motherboard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26XA17P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA17P2	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA18P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA19P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA20P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA21P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA21P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA22P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA22P2	1251-2034	8	1	CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS		SCM10D/7-1HP
A26XA22P3	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA23P1	1200-1204	5	1	SOCKET-IC 14-CONT DIP DIP-SLDR	00779	2-641609-2
A26XA24P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA24P2	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA25P1	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA27P1	1252-2689	1	1	CONNECTOR-MALE HEADER 6-PIN		

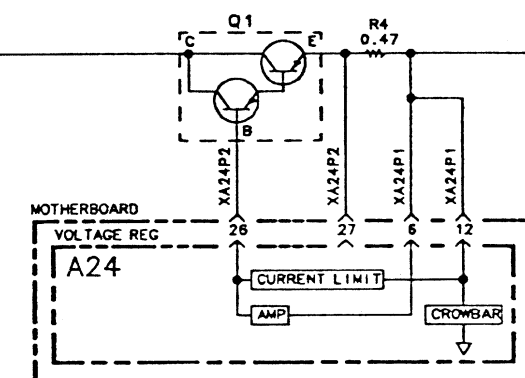
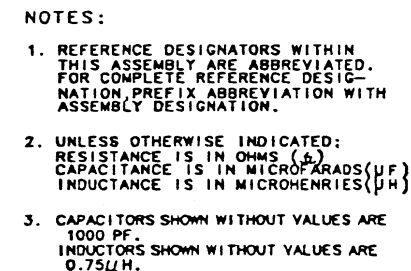


A25 Rectifier Component Locations, 85680-60155

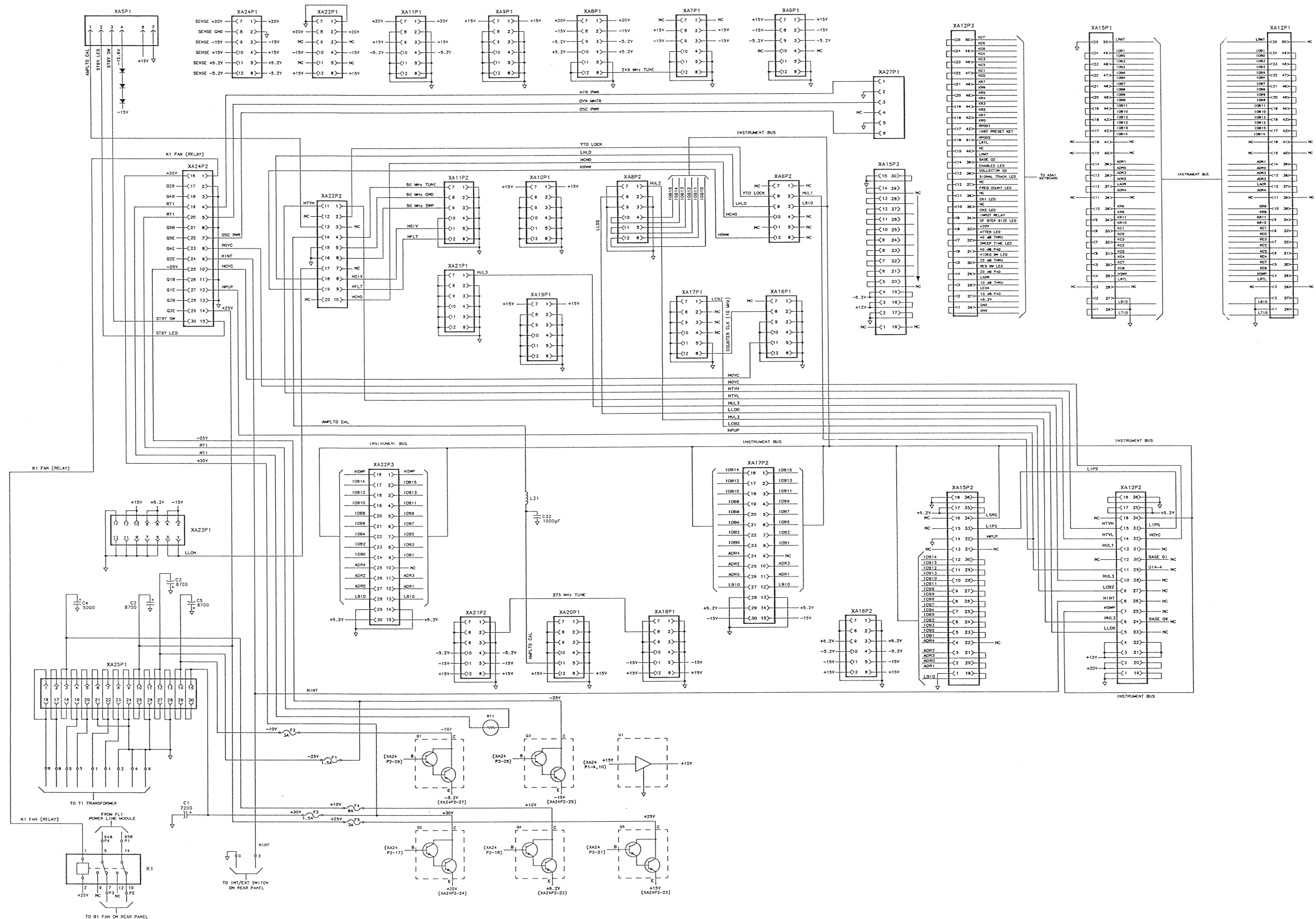




A26 MOTHERBOARD 85680-60127
(SERIAL PREFIX: 2408A)




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A26 MOTHERBOARD
85680-60127
(SERIAL PREFIX: 2408A)
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- NOTES:
1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION, EXCEPT CABLE DESIGNATORS, WHICH ARE COMPLETE AS SHOWN.
 2. UNLESS OTHERWISE INDICATED: RESISTANCE IS IN OHMS (Ω) CAPACITANCE IS IN FARADS (μF) INDUCTANCE IS IN MICRONEEES (μH)
 3. MEMORICAN TABLE

MNEMONIC	DESCRIPTION
MUL1	HIGH-TO-STOP UNLOCKED
MUL2	HIGH-TO-288 MHz LOOP
MUL3	HIGH-TO-288 MHz LOOP UNLOCKED
LB10	LOW-TO-STOP SECTION 1/0 STROKE
LT10	LOW-TO-STOP SECTION 1/0 STROKE
HL10	LOW-TO-LOW TO PHASE-LOCK
HC10	LOW-TO-LOW TO PHASE-LOCK
HOV1	HIGH-DIVIDE TO BY TWO
HOV2	HIGH-DIVIDE TO ALTERNATOR
HSWP	HIGH-SLEEPING
LSTP	LOW-STOP PROCESSOR
LL00	LOW-LOW 24 DIVIDER
MINT	HIGH-INTERNAL FREQUENCY
LCB2	LOW-COMPUTER
LCR2	LOW-COMPUTER PRESET
LSM2	LOW-SERVICE REQUEST
LNMT	LOW-NOMOTE
LRTL	LOW-RETURN TO LOCAL
LREQ	LOW-REQUEST
LREQ	LOW-REQUEST PRESET
LAOR	LOW-ADDRESS
HS1M	HIGH-START MEMORY
LS0B	LOW-STOP OFF BUS
LNMT	LOW-NOMOTE
LD5R	LOW-DIGITAL STORAGE READY
HTVL	HIGH-TO TIME VOLTAGE, LOW
HTVH	HIGH-TO TIME VOLTAGE, HIGH
LL0H	LOW-TO LOW SHIFT HIGH
LL0H	LOW-TO HIGH
1000-15	INSTRUMENT BUS DATA BITS 0-15 (HIGH TRIST)
AD20-5	INSTRUMENT BUS ADDRESS BITS 0-5 (HIGH TRIST)
KD0-11	KEY CODE OF THRU 11
KD0-7	KEY CODE OF THRU 7
HOVC	HIGH-OVERFLOW CODE
LTOR	LOW-TRACKING GENERATOR
LIDA	INTERNAL DATA AND ADDRESS BITS (LOW TRIST)
HSWP	HIGH-TO-STOP LOOP BW

A27

A27 10 MHz Frequency Standard Circuit Description

The 10 MHz Frequency Standard provides a stable frequency reference signal for the A16 20 MHz Reference. The A16 20 MHz Reference in turn provides stable frequency reference signals of 10 MHz and 20 MHz to the rest of the instrument.

Alternately, the rear-panel FREQ REFERENCE jumper cable can be removed and an external 10 MHz reference signal can be connected to the EXTERNAL FREQUENCY REFERENCE INPUT on the rear panel of the instrument. The performance of the spectrum analyzer will be degraded unless the frequency reference phase noise and spurious signals are less than -140 dBc single sideband (1 Hz) referred to 10 MHz at a 100 Hz to 10 kHz offset.

The A27A1 Regulator Board assembly provides +12 V regulated voltage to the A27A2 Quartz Crystal Oscillator. Voltage Regulator IC, U1, provides +12 V regulation with C1 and C3 providing compensation and CR1 providing reverse-bias protection.

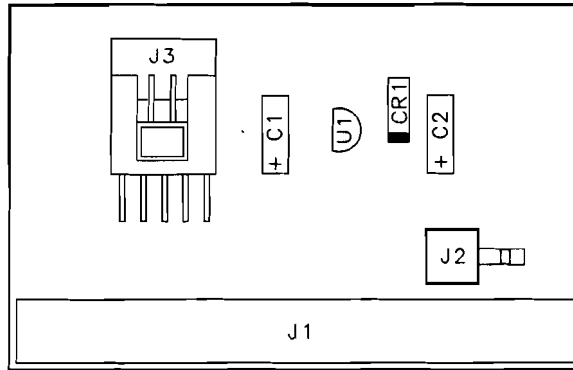
The A27A2 Quartz Crystal Oscillator is an extremely stable, compact, low-power source of 10 MHz. It has a very fast warm-up time, exhibits excellent temperature characteristics, and has low phase noise and power consumption.

The A27A2 Quartz Crystal Oscillator has the ability to be adjusted over a range of 20 Hz (2×10^{-6}), yet the control is sensitive enough to allow adjustment to better than 0.1 Hz (1×10^{-8}).

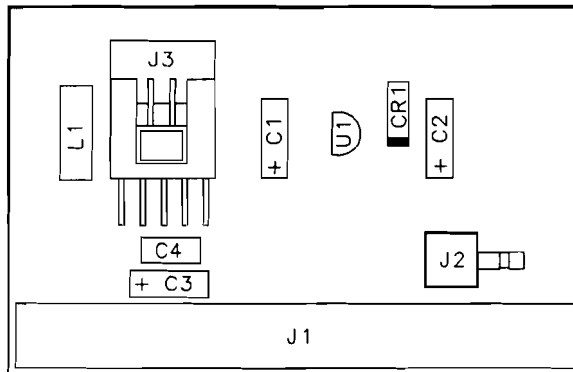
HP Part Number 5062-1916
A27 10 MHz Frequency Standard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A27	5062-1916	6	1	10 MHz FREQUENCY STANDARD ASSEMBLY (SERIAL PREFIX: 2841A)	28480	5062-1916
A27A1	5062-1909	7	1	BOARD ASSEMBLY, 10 MHz FREQUENCY STANDARD REGULATOR (SERIAL NUMBERS: 2841A04215-2841A04422)	28480	5062-1909
A27A1C1	0180-2205	3	1	CAPACITOR-FXD .33UF +-10% 35VDC TA	28480	0180-2205
A27A1C2	0180-0197	8	1	CAPACITOR-FXD 2.2UF +-10% 20VDC TA	28480	0180-0197
A27A1CR1	1901-0518	8	1	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A27A1J1	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A27A1J2	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	28480	1250-0543
A27A1J3	1252-2162	5	1	CONNECTOR 5-PIN/ROW 1-ROW	28480	1252-2162
A27A1MP2	5021-7433	8	1	SHOCK-MOUNT STANDOFF	28480	5021-7433
A27A1U1	1826-0275	4	1	IC V RGLTR-FXD-POS 11.5/12.5V TO-92 PKG	28480	1826-0275
A27A1	5062-4837	6	1	BOARD ASSEMBLY, 10 MHz FREQUENCY STANDARD REGULATOR (SERIAL NUMBERS: 2841A04423 AND ABOVE)	28480	5062-4837
A27A1C1	0180-2205	3	1	CAPACITOR-FXD .33UF +-10% 35VDC TA	28480	0180-2205
A27A1C2	0180-0197	8	1	CAPACITOR-FXD 2.2UF +-10% 20VDC TA	28480	0180-0197
A27A1C3	0180-0116	1	1	CAPACITOR-FXD 6.8UF 35V TA	28480	0180-0116
A27A1C4	0160-3097	1	1	CAPACITOR-FXD .47UF 50V CER	28480	0160-3097
A27A1CR1	1901-0518	8	1	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A27A1J1	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A27A1J2	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	28480	1250-0543
A27A1J3	1252-2162	5	1	CONNECTOR 5-PIN/ROW 1-ROW	28480	1252-2162
A27A1L1	9140-0400	1	1	INDUCTOR 8.2UH 5%	28480	9140-0400
A27A1MP2	5021-7433	8	1	SHOCK-MOUNT STANDOFF	28480	5021-7433
A27A1U1	1826-0275	4	1	IC V RGLTR-FXD-POS 11.5/12.5V TO-92 PKG	28480	1826-0275
A27A2	10811-60111	8	1	OSCILLATOR, 10 MHZ QUARTZ CRYSTAL SEE HP 10811A/B QUARTZ CRYSTAL OSCILLATOR OPERATING AND SERVICE MANUAL, PART NUMBER 10811-90002.	28480	10811-60111
A27MP1	5021-7432	7	1	TOP COVER/BACKET	28480	5021-7432
A27W1	5062-1922	4	1	CABLE ASSEMBLY, WIRE HARNESS, 5-WIRE (A27A1J3 TO A26XA27P1) (SERIAL PREFIXES: 2728A-2747A)	28480	5062-1922
A27W1	5062-6449	0	1	CABLE ASSEMBLY, WIRE HARNESS, 5-WIRE (A27A1J3 TO A26XA27P1) (SERIAL PREFIX:2748A)	28480	5062-6449

**Indicates factory-selected value*



A27A1 10 MHz FREQUENCY STANDARD REGULATOR, COMPONENT LOCATION: 5062-1909



A27A1 10 MHz FREQUENCY STANDARD REGULATOR, COMPONENT LOCATION: 5062-4837

A27A1 10 MHz Frequency Standard Regulator Component Locations, 5062-1909 and 5062-4837

HP 85670A

HP 85670A RF Section

The HP 85670A is the RF Section of the HP 8567A Spectrum Analyzer. The HP 85670A is similar to the HP 85680B RF Section of the HP 8568B Spectrum Analyzer. The major assemblies that are different between the HP 85670A and the HP 85680B are listed below.

- A5 Front Panel Assembly
- A5A1 Keyboard
- A14 TCXO Buffer/A14Y1 TCXO of the HP 85670A replaces A27 10 MHz Frequency Reference of the HP 85680B
- A15 Controller
- A16 20 MHz Reference (HP 85670A Option 001 only)
- A26 Motherboard

These HP 85670A assemblies have part number changes from the standard HP 85680B assemblies. The assembly changes are documented either behind the tab for the assembly that changed or in this section of the manual. Parts lists for each of the HP 85670A assemblies are located in this section of the manual. Component locations, schematic diagrams, and other service sheets for the HP 85670A assemblies are incorporated onto the component location, schematic diagram, or appropriate service sheet of the standard HP 85680B version where possible. However, many instances require that an HP 85670A assembly have its own component location, schematic diagram, or service sheet. These versions are located in this section of the manual.

Table 1-1. HP 85670A Service Sheet Locations

Service Sheet	Manual Tab
A5 Front Panel Circuit Description	HP 85670A
A5 Front Panel Parts List	HP 85670A
A5A1 Keyboard Parts List	HP 85670A
A5A1 Keyboard Component Location	A5
A5A4 RF Input Connector Assembly	HP 85670A
A5 Front Panel Schematic Diagram	HP 85670A
A12 Keyboard Matrix	HP 85670A
A14 TCXO Buffer Circuit Description	HP 85670A
A14 TCXO Buffer Parts List	HP 85670A
A14 TCXO Buffer Component Location	HP 85670A
A14 TCXO Buffer Schematic Diagram	HP 85670A
A15 Table of Firmware History for HP 85670A	HP 85670A
A15 Controller Parts List	HP 85670A
A15 Controller Component Location	A15
A15 Controller Schematic Diagram	A15
A16 20 MHz Reference Parts List	HP 85670A
A16 20 MHz Reference Component Location	A16
A16 20 MHz Reference Schematic Diagram	A16
A26 Motherboard Parts List	HP 85670A
A26 Motherboard Component Locations	HP 85670A
A25 Rectifier and A26 Motherboard Power Distribution Diagram	HP 85670A
A26 Motherboard Interconnect Diagram	HP 85670A

A5 Front Panel, Circuit Description

A5 Front Panel includes the following subassemblies:

- A5A1 Keyboard
- A5A2 Rotary Pulse Generator
- A5A3 DC Input Connector

Also included is AT1 Step Attenuator (0 to 70 dB in 10-dB steps).

A5A1 Keyboard

A5A1 Keyboard includes all the front-panel pushbutton key-switches and indicator LEDs. (Refer to A12 RF Section Interface for a description of the key-switch circuitry.) The LEDs, which are driven by A12, indicate the status of pushbuttons, except for INSTR CHECK indicators I (DS2) and II (DS3).

The INSTR CHECK indicators are used with a self-test routine that is run whenever the LINE switch is placed ON or the **INSTR PRESET** key is pressed. The self-test routine checks the digital circuitry in the A15 Controller, portions of A12 RF Section Interface, and A3 Digital Storage in the IF-Display Section. Both LEDs are lit until the self-test routine is completed. If both LEDs remain on, the trouble is probably in A15, INSTR CHECK II indicates probable trouble in A12 or the Instrument Bus, and INSTR CHECK I indicates probable trouble in the A3 Digital Storage section of the IF-Display Section.

A5A2 Rotary Pulse Generator

A5A2 Rotary Pulse Generator (RPG) is operated by the DATA knob on the front panel. The rate and direction of rotation of the knob are transmitted to A12 RF Section Interface on the 01 and the 02 lines.

A5A3 DC Input Connector

A5A3 DC Input Connector is only used for signals which have no DC component.

ON/STANDBY Control

When the LINE switch is in STANDBY, a circuit is completed to A26 Motherboard to light STANDBY indicator LED DS1. The LED is lit when the instrument is in STANDBY or when regulated power to the instrument is removed during thermal shutdown.

Reference Level Amplitude Calibration

AMPTD CAL screwdriver adjustment R3 provides a REF LEVEL CAL voltage to A22 Frequency Control.

CAL OUTPUT

The CAL OUTPUT connector provides a 20 MHz, -10 dBm signal from A16 20 MHz Reference.

	KC0	KC1	KC2	KC3	KC4	KC5	KC6	KC7	
KR0	SPACE Hz μV μsec			MHz -dBm sec		BACK SPACE	kHz mV msec		RF SECTION
KR1	(SAVE) RECALL	- HOLD		0-1.5 GHz		.	GHz +dBm dB	
KR2	0	1	2	3	4	5	6	7	
KR3	8	9			SIGNAL INPUT 1	FREQ COUNT	SIGNAL INPUT 2		
KR4		A AUTO	B AUTO	C AUTO	D AUTO	E AUTO	F RES BW	G VIDEO BW	
KR5	H SWEEP TIME	I ATTEN	J CF STEP SIZE	K PEAK SEARCH	MARKER L OFF	MARKER M NORMAL	N MKR → CF	O Δ	
KR6	P ZOOM	Q MKR/Δ → STP SIZE	R MKR → REF LVL	S SIGNAL TRACK	T ↓	U ↑	V CENTER FREQUENCY	W FREQUENCY SPAN	
KR7	X START FREQ	Y STOP FREQ	Z REFERENCE LEVEL						
KR8	NORMAL	a CLEAR- WHITE TRACE A	b MAX HOLD TRACE A	c OFF A-B	d VIEW TRACE A	e BLANK TRACE A	f A-B → A	g CLEAR- WHITE TRACE B	IF-DISPLAY SECTION
KR9	h MAX HOLD TRACE B	i A → B	j VIEW TRACE B	k BLANK TRACE B	l B-DL → B	m OFF DISPLAY LINE	n ENTER DISPLAY LINE	o OFF THRESHOLD	
KR10	p ENTER THRESHOLD	q ENTER dB/DIV	r LIN	s SHIFT	t CONT	u SINGLE	v FREE RUN	w LINE	
KR11	x EXT	y VIDEO	z ● LOWER LEFT		l ● LOWER RIGHT				
NOTE: INSTR PRESET AND LCL ARE NOT PART OF THE MATRIX.									
SIGNAL INPUT 1 ● SIGNAL INPUT 2 ● ARE NOT PART OF HP 85670A OR HP 85680B OPTION H44 & OPTION H96.									

Figure 1. A12 Keyboard Matrix
HP 85670

A14 TCXO Buffer Circuit Description

The TCXO Buffer Printed Circuit Board Assembly provides mounting for the Temperature Compensated Crystal Oscillator (TCXO), and contains a TCXO output buffer circuit, power switching, and filtering.

Q2 is a power switch to remove power from the TCXO and the Buffer when the Rear Panel External Input Switch is in 'External.' This prevents the TCXO output from interfering with the external reference signal. C5 to C8, and L2 filter the +12 V. C11 and C12 filter the OSC PWR switch control line. OSC PWR is approximately +20 V when HIGH and provides approximately 1 mA to the base of Q2, saturating it.

C1, C3, and C4 are dc blocking capacitors. C2 and L1 form a 10 MHz filter to attenuate harmonics of the reference oscillator. R1 and R2 set the bias for Q1 at 4.5 mA. R3 is the emitter load for Q1 emitter follower. This buffer amplifier isolates the TCXO's TTL output from the 50 ohm load on the A16 board.

Table 1-2. A15 Table of Firmware History for HP 85670A

Revision	Instrument Serial Numbers	EPROM	HP Part Number	Date Code
A	2541A00101 through 2602A00247	U37	85670-80001	4.6.85
		U38	85670-80002	
		U39	85670-80003	
		U40	85670-80004	
B	2635A00248 through 2635A00357	U37	85670-80011	9.9.86
		U38	85670-80013	
		U39	85670-80012	
		U40	85670-80014	
C	2718A00358 and Above	U37	85670-80019	7.4.87
		U38	85670-80021	
		U39	85670-80020	
		U40	85670-80022	

A5 Front Panel Assembly for HP 85670A

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5				HP 85670A FRONT PANEL ASSEMBLY (NOT AVAILABLE FOR FIELD REPLACEMENT)		
A5A1	85670-60019	1	1	KEYBOARD ASSEMBLY	28480	85670-60019
A5A2	0960-0684	2	1	ROTARY PULSE GENERATOR	28480	0960-0684
A5A4				RF INPUT CONNECTOR ASSEMBLY, TYPE N (ASSEMBLED VERSION IS NOT AVAILABLE. REFER TO A5A4 RF INPUT CONNECTOR ASSEMBLY DRAWING IN THIS SECTION TO ORDER PARTS)		
A5A4	85670-60004	4	1	(OPTION 001) 75-OHM INPUT CONNECTOR ASSEMBLY (INCLUDES COAX CABLE)	28480	85670-60004
A5A4W1	85670-20002	8	1	RIGID CABLE (A5A4-A5AT1)(REFER TO A5A4 FOR OPTION 001)	28480	85670-20002
A5AT1	5086-7815	6	1	INPUT ATTENUATOR (INCLUDES PROM FOR A12U17)	28480	5086-7815
A5DS1	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5DS2	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A5DS3	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A5MP1	0370-3069	2	1	RPG KNOB	28480	0370-3069
A5MP2	85680-00013	1	1	ATTENUATOR BRACKET	28480	85680-00013
A5MP4	85680-40004	4	1	LED MOUNT	28480	85680-40004
A5MP5	5021-8699	0	1	FRONT PANEL BEZEL	28480	5021-8699
A5MP6	85670-00002	6	1	LOWER SUB PANEL	28480	85670-00002
A5MP6	85680-00009	5	1	(OPTION 001) LOWER SUB PANEL	28480	85680-00009
A5MP7	85680-00011	9	1	KEYBOARD SUB PANEL	28480	85680-00011
A5MP8	85670-00009	3	1	KEYBOARD DRESS PANEL	28480	85670-00009
A5MP9	85680-00108	5	1	LOWER DRESS PANEL	28480	85680-00108
A5MP9	85670-00008	2	1	(OPTION 001) LOWER DRESS PANEL	28480	85670-00008
A5R3	2100-2488	8	1	RESISTOR-VAR CONTROL 10K 10% LIN	28480	2100-2488
A5SW1	3101-2193	5	1	SWITCH-TGL PRI-SW SPDT 2A 250VAC SLDR-LU	09353	U11J60ZG W/7868-14 W/5310
A5W2	85680-60244	6	1	WIRING HARNESS	28480	85680-60244
A5W3	85680-60101	4	1	COAX CABLE (A5AT1-A23A2)	28480	85680-60101
A5W31	85680-60065	9	1	CAL OUT CABLE ASSEMBLY (INCLUDES COAX CABLE AND FRONT-PANEL CONNECTOR)	28480	85680-60065
A5W31	85680-60187	6	1	(OPTION 001) CAL OUT CABLE ASSEMBLY (INCLUDES COAX CABLE AND FRONT-PANEL CONNECTOR)	28480	85680-60187
A5W42	5062-0704	8	1	WIRING HARNESS (A5AT1-A5A1)	28480	5062-0704

*Indicates factory-selected value

HP Part Number 85670-60019
A5A1 Keyboard Assembly

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A1	85670-60019	1	1	BOARD ASSEMBLY KEYBOARD	28480	85670-60019
A5A1DS1	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS2	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS3	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS4	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS5	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS6	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS7	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS8	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS9	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1DS10	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5A1E1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E2	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E3	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E4	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E5	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E6	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E7	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E8	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E9	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E10	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E11	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E12	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E13	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E14	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1E15	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A5A1J1	1251-5549	6	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	18873	68025-650
A5A1MP1				NOT ASSIGNED		
A5A1MP3	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP4	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP5	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP6	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP7	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP8	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP9	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP10	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP11	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1MP12	5041-3929	1	1	SPACER LED .450	28480	5041-3929
A5A1S1	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S2	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S3	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S4	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S5	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S6	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S7	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S8	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S9	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436

**Indicates factory-selected value*

HP Part Number 85670-60019
A5A1 Keyboard Assembly

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A1S10	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S11	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S12	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S13	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S14	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S15	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S16	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S17	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S18	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S19	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S20	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S21	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S22	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S23	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S24	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S25	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S26	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S27	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S28	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S29	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S30	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S31	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S32	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S33	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S34	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S35	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S36	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S37	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S38	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S39	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S40	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S41	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S42	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S43	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S44	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S45	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S46	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S47	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S48	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1S49	5060-9436	7	1	SWITCH-PB SPST-NO MOM	71468	5560-9436
A5A1U1	1810-0203	5	1	NETWORK-RES 8-SIP 470.0 OHM X 7	11236	750-81
A5A1U2	1810-0203	5	1	NETWORK-RES 8-SIP 470.0 OHM X 7	11236	750-81

HP Part Number 85670-60001

A14 TCXO Buffer

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14	85670-60001	1	1	BOARD ASSEMBLY, TCXO BUFFER	28480	85670-60001
A14C1	0160-4831	3	1	CAPACITOR-FXD 4700pF +-10% 100VDC CER	28480	0160-4831
A14C2	0160-4822	2	1	CAPACITOR-FXD 1000pF +-5% 100VDC CER	28480	0160-4822
A14C3	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C4	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C5	0180-2141	6	1	CAPACITOR-FXD 3.3UF +-10% 50VDC TA	28480	0180-2141
A14C6	0160-4830	2	1	CAPACITOR-FXD 2200pF +-10% 100VDC CER	28480	0160-4830
A14C7	0160-4830	2	1	CAPACITOR-FXD 2200pF +-10% 100VDC CER	28480	0160-4830
A14C8	0180-2141	6	1	CAPACITOR-FXD 3.3UF +-10% 50VDC TA	28480	0180-2141
A14C9	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C10	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C11	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C12	0180-0291	3	1	CAPACITOR-FXD 1UF +-10% 35VDC TA	28480	0180-0291
A14J1	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	28480	1250-0543
A14L1	9100-3911	1	1	INDUCTOR RF-CH-MLD 220NH 5%	28480	9100-3911
A14L2	9100-1645	4	1	INDUCTOR RF-CH-MLD 390NH 5%	28480	9100-1645
A14MP2	5000-9043	6	1	EXTRACTOR PIN	28480	5000-9043
A14MP3	5040-6843	2	1	PC BOARD EXTRACTOR	28480	5040-6843
A14MP4	85680-20201	1	1	INSULATOR TCXO	28480	85680-20201
A14Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A14Q2	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A14R1	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-TO-2151-F
A14R2	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-TO-3831-F
A14R3	0698-7243	6	1	RESISTOR 1.96K 1% .125W F TC=0+-100	28480	0698-7243
A14R4	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-TO-7501-F
A14R5	2100-3154	7	1	RESISTOR-TRMR 1K C-SIDE MOJ 17-TRN	28480	2100-3154
A14Y1	1813-0458	8	1	TCXO 10.0 MHz	28480	1813-0458

*Indicates factory-selected value

85670-60001 Parts List

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HP Part Number 85670-60002

A15 Controller

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15	85670-60002	2	1	BOARD ASSEMBLY, CONTROLLER (SERIAL PREFIX: 2541A)	28480	85670-60002
A15BT1	1420-0331	3	1	BATTERY 3.68V 1.75A-HR LITHIUM THIONYL		15-51-04-410-000
A15C1	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C2	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C3	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C4	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C5	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C6	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C7	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C8	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C10	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C11	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C12	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C13	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C15	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C17	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C18	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C19	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C20	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C22	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C23	0160-4554	7	1	FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C24	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A15C25	0160-4535	4	1	CAPACITOR-FXD 1UF +-10% 50VDC CER	04222	SR305C105KAAH
A15C29	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER 0+-3	04222	SA102A101JAAH
A15C30	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	04222	SA101C103KAAH
A15C31	0160-4808	4	1	CAPACITOR-FXD 470PF +-5% 100VDC CER 0+-3	04222	SA101A471JAAH
A15C32	0180-2207	5	1	CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2-DYS
A15C34	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER 0+-3	04222	SA102A101JAAH
A15CR3	1901-0518	8	1	DIODE-SCHOTTKY SM SIG	28480	
A15DS1	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS2	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS3	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS4	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS5	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS6	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS7	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS8	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS9	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS10	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS11	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS12	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS13	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS14	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15E1	1251-4787	2	1	SHUNT-DIP 8 POSITION DUAL INLINE PKG	00779	435704-8
A15J1	1251-5926	3	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	18873	67997-650
A15J2	1251-5905	8	1	CONN-POST TYPE .100-PIN-SPCG 24-CONT	18873	67997-624

*Indicates factory-selected value

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HP Part Number 85670-60002

A15 Controller

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15J3	1200-0607	0	1	16-PIN IC SOCKET	00779	641600-1/TUBED 2-641600
A15J5	1251-5619	1	1	CONN-POST TYPE .100-PIN-SPCG 4-CONT	18873	68000-604
A15L1	9140-0875	4	1	INDUCTOR 80uH 10%	28480	9140-0875
A15MP1	1400-1267	4	1	HOLDER-BAT .531-.656-DIA FOR AA CELLS	91833	91
A15MP3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	72962	99-012-062-0250
A15MP4	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-IN-BD-THKNS 1-		
A15MP5	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-IN-BD-THKNS 1-		
A15MP6	0361-0026	6	1	RIVET-SEMITUB OVH .089DIA .125LG	12014	R-4008-1/8
A15MP11	1200-0567	1	1	SOCKET-IC 28-CONT DIP DIP-SLDR	00779	2-641605-1
A15Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A15Q2	1853-0213	7	1	TRANSISTOR PNP 2N4236 SI TO-5 PD=1W	04713	2N4236
A15R2	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R3	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R4	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R5	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R6	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R7	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R8	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R9	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R10	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R11	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R12	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R13	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R14	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R18	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R19	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R21	0698-7212	9	1	RESISTOR 100 +-1% .05W TF TC=0+-100	19701	5063J
A15SW1	3101-2197	9	1	SWITCH-DIP RKR 6-1A 0.05A 30VDC	81073	76YY2346S
A15TP1	1252-0569	2	1	CONN-POST TYPE .150-PIN-SPCG 9-CONT	00779	87221-8
A15TP2	1251-8427	5	1	CONN-POST TYPE .150-PIN-SPCG 5-CONT	00779	87221-4
A15U1	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U2	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U3	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U4	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A15U5	1820-3401	2	1	IC BFR TTL ALS OR QUAD 2-INP	01295	SN74ALS1032AN
A15U6	1820-2548	6	1	IC-GENERAL PURPOSE INTERFACE BUS ADAPTER	01295	TMS9914ANL
A15U7	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A15U8	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A15U9	1820-3449	8	1	IC-PARALLEL INTERFACE/TIMER/8MHZ/MC68000	04713	MC68230L8
A15U10	1820-2102	8	1	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A15U11	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A15U12	1820-1208	3	1	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A15U13	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	01295	SN74LS11N
A15U14	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	28480	1818-3183
A15U14	1818-3305	0	0	ALTERNATE - IC CMOS 65536 (64K) STAT RAM	28480	1818-3305
A15U15	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	28480	1818-3183
A15U15	1818-3305	0	0	ALTERNATE - IC CMOS 65536 (64K) STAT RAM	28480	1818-3305
A15U16	85680-80077	5	1	EPROM-PROGRAMMED	28480	85680-80077

HP Part Number 85670-60002
A15 Controller

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15U17	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	28480	1818-3183
A15U17	1818-3305	0	0	ALTERNATE - IC CMOS 65536 (64K) STAT RAM	28480	1818-3305
A15U18	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	28480	1818-3183
A15U18	1818-3305	0	0	ALTERNATE - IC CMOS 65536 (64K) STAT RAM	28480	1818-3305
A15U20	5180-2330	0	1	IC 16R4 PAL PRGMD	28480	5180-2330
A15U21	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U22	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A15U23	1810-0394	5	1	NETWORK-RES 8-SIP 6.8K OHM X 7	11236	750-81
A15U24	1820-1851	2	1	IC ENCDR TTL LS	01295	SN74LS148N
A15U25	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U26	1820-3532	0	1	IC-16 BIT MICROPROCESSOR /8 MHZ	04713	MC68000P8
A15U27	1820-3173	5	1	IC FF CMOS/74HC J-K NEG-EDGE-TRIG PRESET	04713	MC74HC112N
A15U28	1820-1281	2	1	IC DCDR TTL LS 2-TO-4-LINE DUAL	01295	SN74LS139AN
A15U29	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U30	1820-3513	7	1	IC-INTERFACE XCVR BCD UP/DOWN INSTRUMENT	27014	DS75161AN
A15U31	1820-3431	8	1	IC-INTERFACE XCVR BCD UP/DOWN INSTRUMENT	27014	DS75160AN
A15U32	1820-2675	0	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS646NT
A15U33	1810-0279	5	1	NETWORK-RES 10-SIP 4.7K OHM X 9	11236	750-101
A15U34	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A15U35	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRESET	01295	SN74LS74AN
A15U36	1820-2675	0	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS646NT
A15U37	85670-80019	3	1	EPROM PRGMD	28480	85670-80019
A15U38	85670-80021	7	1	EPROM PRGMD	28480	85670-80021
A15U39	85670-80020	6	1	EPROM PRGMD	28480	85670-80020
A15U40	85670-80022	8	1	EPROM PRGMD	28480	85670-80022
A15U41	1810-0344	5	1	NETWORK-RES 10-SIP 6.8K OHM X 9	11236	750-101
A15U42	85660-80070	4	1	IC1618 PAL PRGMD	28480	85660-80070
A15U43	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A15U44	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U45	1820-3562	6	1	IC BFR TTL ALS INV HEX	01295	SN74ALS1005N
A15U46	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U47	1820-1208	3	1	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A15Y1	1813-0196	1	1	CLOCK-OSCILLATOR-CRYSTAL 14.7456 MHZ	28480	1813-0196
A15Y1	1813-0129	0	0	CLOCK-OSCILLATOR-XTAL 14.7456-MHZ 0.01% (ALTERNATE PART FOR 1813-0196)	00815	HS-100(14.7456MHZ)

**Indicates factory-selected value*

HP Part Number 85670-60008
A16 20 MHz Reference

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A16	85670-60008	8	1	BOARD ASSEMBLY 20 MHz REFERENCE	28480	85670-60008
A16C1	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C2	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C3	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C4	0140-0193	0	1	CAPACITOR-FXD 82PF +-5% 300VDC MICA	09023	CD15ED820J03
A16C5	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C6	0140-0205	5	1	CAPACITOR-FXD 62PF +-5% 300VDC MICA	09023	CD15ED620J03
A16C7	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C8	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C9	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C10	0160-2264	2	1	CAPACITOR-FXD 20PF +-5% 500VDC CER 0+-30	52763	2RDPLX05020RNP0
A16C11	0121-0457	9	1	CAPACITOR-V TRMR-PSTN .8-8.5PF 750V	18736	TP9
A16C12	0121-0451	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A16C13	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C14	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C15	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C16	0160-2202	8	1	CAPACITOR-FXD 75PF +-5% 300VDC MICA	09023	CD15ED750J03
A16C17	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C18	0160-2260	8	1	CAP-FXD 13pF 500 V	52763	
A16C19	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C20	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A16C21	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A16C22	0140-0198	5	1	CAPACITOR-FXD 200PF +-5% 300VDC MICA	09023	CD15FD201J03
A16C23	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A16C24	0140-0210	2	1	CAPACITOR-FXD 270PF +-5% 300VDC MICA 0+7	09023	CD15FD271J03
A16C25	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C26	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C27	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C28	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C29	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA 0+7	09023	CD15FD101J03
A16C30	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA 0+7	09023	CD15FD101J03
A16C31	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C32	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C33	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C34	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C35	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C36	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C37	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C38	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C39	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2-DYS
A16C40	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A16C41	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A16C42	0160-3879	7	1	CAPACITOR-FXD .01UF +-20% 100VDC CER	04222	SR201C103MAAH
A16C43	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C44	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C45	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z
A16C46	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER		805-504 Y5V 103Z

**Indicates factory-selected value*

HP Part Number 85670-60008
A16 20 MHz Reference

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A16C47	0160-2247	1	1		CAPACITOR-FXD 3.9PF +-.25PF 500VDC CER	52763	2RDPLX0503R9NP0
A16CR1	1901-0639	4	1		DIODE-PIN	28480	
A16CR2	1901-0535	9	1		DIODE-SCHOTTKY SM SIG		
A16CR3	1901-0040	1	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A16CR4	1901-0040	1	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	71468	
A16DS1	1990-0486	6	1		LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A16E1	9170-0029	3	1		CORE-SHIELDING BEAD	02114	56-590-65A2/4A
A16E2	9170-0029	3	1		CORE-SHIELDING BEAD	02114	56-590-65A2/4A
A16J1	1250-2112	1	1		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A16J2	1250-2112	1	1		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A16J3	1250-2112	1	1		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A16J4	85680-60067	1	1		CABLE ASSEMBLY COAX 3 (INCLUDES W26)	28480	85680-60067
A16J5	85680-60068	2	1		CABLE ASSEMBLY COAX 4 (INCLUDES W23)	28480	85680-60068
A16J6	1250-2112	1	1		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	98291	051-047-0259-220
A16L1	9140-0143	9	1		INDUCTOR RF-CH-MLD 3.3UH +-10% .105D-INX	99800	1025-32
A16L2	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L3	9140-0142	8	1		INDUCTOR RF-CH-MLD 2.2UH +-10% .105D-INX	99800	1025-28
A16L4	9140-0114	4	1		INDUCTOR RF-CH-MLD 10UH +-10% .166D-INX.	99800	1537-36
A16L5	9100-2250	9	1		INDUCTOR RF-CH-MLD 180NH +-10% .105D-INX	24226	10M180K
A16L6	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L7	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L8	9100-2256	5	1		INDUCTOR RF-CH-MLD 560NH +-10% .105D-INX	24226	10M560K
A16L9	9100-2259	8	1		INDUCTOR RF-CH-MLD 1.5UH +-10% .105D-INX	99800	1025-24
A16L10	9100-2256	5	1		INDUCTOR RF-CH-MLD 560NH +-10% .105D-INX	24226	10M560K
A16L11	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L12	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L13	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L14	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L15	9140-0179	1	1		INDUCTOR RF-CH-MLD 22UH +-10% .166D-INX.	99800	1537-44
A16L16	9100-2257	6	1		INDUCTOR RF-CH-MLD 820NH +-10% .105D-INX	32159	1A 8203M +-10%
A16MP1					NOT ASSIGNED		
A16MP2	86701-40001	9	1		EXTRACTOR, PC	28480	86701-40001
A16MP3	85680-20065	5	1		LID, 20MHZ REFERENCE	28480	85680-20065
A16MP4	2950-0078	9	6		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	74163	500220
A16MP5	2190-0557	7	6		WASHER-LK INTL T NO. 10 .195-IN-ID	78189	1210-06-00-0551
A16MP6	1200-0173	5	1		INSULATOR-XSTR TO-5		
					NOTE: USED UNDER Y1 20MHZ XTAL		
A16MP7	2200-0101	0	5		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	77250	
A16Q1	1854-0023	9	1		TRANSISTOR NPN SI TO-18 PD=360MW	25403	
A16Q2	1854-0023	9	1		TRANSISTOR NPN SI TO-18 PD=360MW	25403	
A16Q3	1854-0023	9	1		TRANSISTOR NPN SI TO-18 PD=360MW	25403	
A16Q4	1854-0247	9	1		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	04713	
A16Q5	1854-0247	9	1		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	04713	
A16Q6	1854-0247	9	1		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	04713	
A16Q7	1854-0019	3	1		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A16Q8	1853-0007	7	1		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A16R1	0757-0398	4	1		RESISTOR 75 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R2	0757-0378	0	1		RESISTOR 11 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1

HP Part Number 85670-60008
A16 20 MHz Reference

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A16R3	0757-0378	0	1	RESISTOR 11 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A16R4	0698-3443	0	1	RESISTOR 287 1% .125W TF TC=0+-100	19701	SFR25H
A16R5	0757-0422	5	1	RESISTOR 909 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R6	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	19701	SFR25H
A16R7	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R8	0698-3443	0	1	RESISTOR 287 1% .125W TF TC=0+-100	19701	SFR25H
A16R9	0757-0422	5	1	RESISTOR 909 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R10	0757-0398	4	1	RESISTOR 75 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R11	0757-0394	0	1	RESISTOR 51.1 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R12*	0698-3443	0	1	RESISTOR 287 1% .125W TF TC=0+-100	19701	SFR25H
A16R13	0698-3404	3	1	RESISTOR 383 1% .5W TF TC=0+-100	19701	5053R
A16R14	0698-3439	4	1	RESISTOR 178 1% .125W TF TC=0+-100	19701	SFR25H
A16R15	0757-0395	1	1	RESISTOR 56.2 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R16	0757-0200	7	1	RESISTOR 5.62K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R17	0757-0449	6	1	RESISTOR 20K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R18	0757-0422	5	1	RESISTOR 909 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R19	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R20	0698-3446	3	1	RESISTOR 383 1% .125W TF TC=0+-100	19701	SFR25H
A16R21	0757-0346	2	1	RESISTOR 10 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A16R22	0757-0378	0	1	RESISTOR 11 +-1% .125W TF TC=0+-100	91637	CMF-55-1, T-1
A16R23	0698-0082	7	1	RESISTOR 464 1% .125W TF TC=0+-100	19701	SFR25H
A16R24	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R25	0757-0465	6	1	RESISTOR 100K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R26	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	19701	SFR25H
A16R27	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	19701	SFR25H
A16R28	0698-3150	6	1	RESISTOR 2.37K 1% .125W TF TC=0+-100	19701	SFR25H
A16R29	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R30	0757-0459	8	1	RESISTOR 56.2K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R31	2100-3161	6	1	RESISTOR-TRMR 20K 10% TKF SIDE-ADJ 17-TR	73138	89PR20K
A16R32	0757-0462	3	1	RESISTOR 75K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R33	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	19701	SFR25H
A16R34	0757-0274	5	1	RESISTOR 1.21K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R35	0698-3443	0	1	RESISTOR 287 1% .125W TF TC=0+-100	19701	SFR25H
A16R36	0757-0398	4	1	RESISTOR 75 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R37	0757-0422	5	1	RESISTOR 909 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R38	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R39	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R40	0698-7196	8	1	RESISTOR 21.5 +-1% .05W TF TC=0+-100	19701	5063J
A16R41	0698-7207	2	1	RESISTOR 61.9 +-1% .05W TF TC=0+-100	19701	5063J
A16R42	0698-7201	6	1	RESISTOR 34.8 +-1% .05W TF TC=0+-100	19701	5063J
A16R43	0698-7196	8	1	RESISTOR 21.5 +-1% .05W TF TC=0+-100	19701	5063J
A16R44	0698-7203	8	1	RESISTOR 42.2 +-1% .05W TF TC=0+-100	19701	5063J
A16R45	0698-7201	6	1	RESISTOR 34.8 +-1% .05W TF TC=0+-100	19701	5063J
A16R46	0698-7196	8	1	RESISTOR 21.5 +-1% .05W TF TC=0+-100	19701	5063J
A16R47	0757-0397	3	1	RESISTOR 68.1 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R48	0698-3151	7	1	RESISTOR 2.87K 1% .125W TF TC=0+-100	19701	SFR25H
A16R49	0698-3441	8	1	RESISTOR 215 1% .125W TF TC=0+-100	19701	SFR25H

**Indicates factory-selected value*

HP Part Number 85670-60008
A16 20 MHz Reference

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A16R50	0698-3437	2	1	RESISTOR 133 1% .125W TF TC=0+-100	19701	SFR25H
A16R51	2100-3123	0	1	RESISTOR-TRMR 500 10% TKF SIDE-ADJ 17-TR	73138	89PR500
A16R52	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R53	0698-3437	2	1	RESISTOR 133 1% .125W TF TC=0+-100	19701	SFR25H
A16R54	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R55	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R56	0757-0402	1	1	RESISTOR 110 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R57	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	19701	SFR25H
A16R58	0698-3443	0	1	RESISTOR 287 1% .125W TF TC=0+-100	19701	SFR25H
A16R59	0757-0422	5	1	RESISTOR 909 +-1% .125W TF TC=0+-100	19701	SFR25H
A16R60	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	19701	SFR25H
A16R61	0698-3160	8	1	RESISTOR 31.6K 1% .125W TF TC=0+-100	19701	SFR25H
A16R62	0757-0422	5	1	RESISTOR 909 +-1% .125W TF TC=0+-100	19701	SFR25H
A16T1	85680-80004	8	1	TRANSFORMER RF	28480	85680-80004
A16T2	85662-80002	4	1	COIL ASSEMBLY-TRANSFER	28480	85662-80002
A16TP1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A16TP2	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A16TP3	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A16TP4	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	97300	
A16U1	1858-0032	8	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	27014	LM3146
A16U2	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A16U3	5081-8117	3	1	SCREENED 1826-0092	28480	5081-8117
A16VR1	1902-0048	1	1	DIODE-ZNR 6.81V 5% D0-35 PD=.4W	04713	
A16Y1	0410-1293	6	1	CRYSTAL 20.0 MHz		

HP Part Number 85680-60196
A26 Motherboard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26	85680-60196	7	1	BOARD ASSEMBLY-MOTHERBOARD	28480	85680-60196
A26C1	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C2	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C3	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C4	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C5	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C6	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C7	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C8	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C9	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C10	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C11	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C12	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C13	0160-3448	6	1	CAP-FXD 1000pF 1 kV		808-548 X5E 102K
A26C14	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C15	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C16	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C17	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C18	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C19	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C20	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C21	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C22	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C23	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C24	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C25	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C26	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C27	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C28	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C29	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C30	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C31	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C32	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C33	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C34	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C35	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C36	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C37	0160-3878	6	1	CAP-FXD 1000pF 100 V	04222	SR201C102MAAH
A26C38	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C39	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C40	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C41	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C42	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C43	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C44	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C45	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C46	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K

**Indicates factory-selected value*

HP Part Number 85680-60196

A26 Motherboard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26C47	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER		808-542 X5E 102K
A26C48	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C49	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C50	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C51	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26C52	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2-DYS
A26CR1	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	04713	
A26CR2	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	04713	
A26CR3	1901-0028	5	1	DIODE-PWR RECT 400V 750MA DO-29	04713	
A26F1	2110-0043	8	1	FUSE 1.5A 250V NTD FE UL	75915	312 01.5
A26F2	2110-0003	0	1	FUSE 3A 250V NTD FE UL	75915	312 003
A26F3	2110-0043	8	1	FUSE 1.5A 250V NTD FE UL	75915	312 01.5
A26F4	2110-0056	3	1	FUSE 6A 250V NTD FE UL	75915	312 006
A26F5	2110-0003	0	1	FUSE 3A 250V NTD FE UL	75915	312 003
A26K1	0490-0618	5	1	RELAY 2C 24VDC-COIL 5A 115VAC	77342	R40-E0161-1
A26L1	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L2	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L3	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L4	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L5	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L6	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L7	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L8	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L9	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L10	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L11	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L12	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L13	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L14	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L15	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L16	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L17	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L18	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L19	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L20	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L21	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L22	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L23	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L24	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L25	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L26	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L27	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26L28	9100-1788	6	1	CORE-FERRITE CHOKE-WIDEBAND IMP:680	02114	VK200 20/4B
A26MP2	2110-0726	4	10	FUSEHOLDER-CLP-TYP.25D-FUSE	13060	1115-0597T
A26MP4	0380-1681	1	3	STANDOFF-PRESS-IN .188 IN LONG 6-32 THD	46384	KFE-632-6
A26MP5	0590-0526	6	12	THREADED INSERT-NUT 4-40 .065-IN-LG SST	46384	KFS2-440
A26MP6	0590-0970	4	2	THREADED INSERT-NUT 6-32 .062-IN-LG STL	46384	KF2-632-Z
A26MP8	0380-1680	0	1	SPACER-PRESS-IN 0.188 IN LG 0.143 IN ID	46384	KFE-143-6-ET

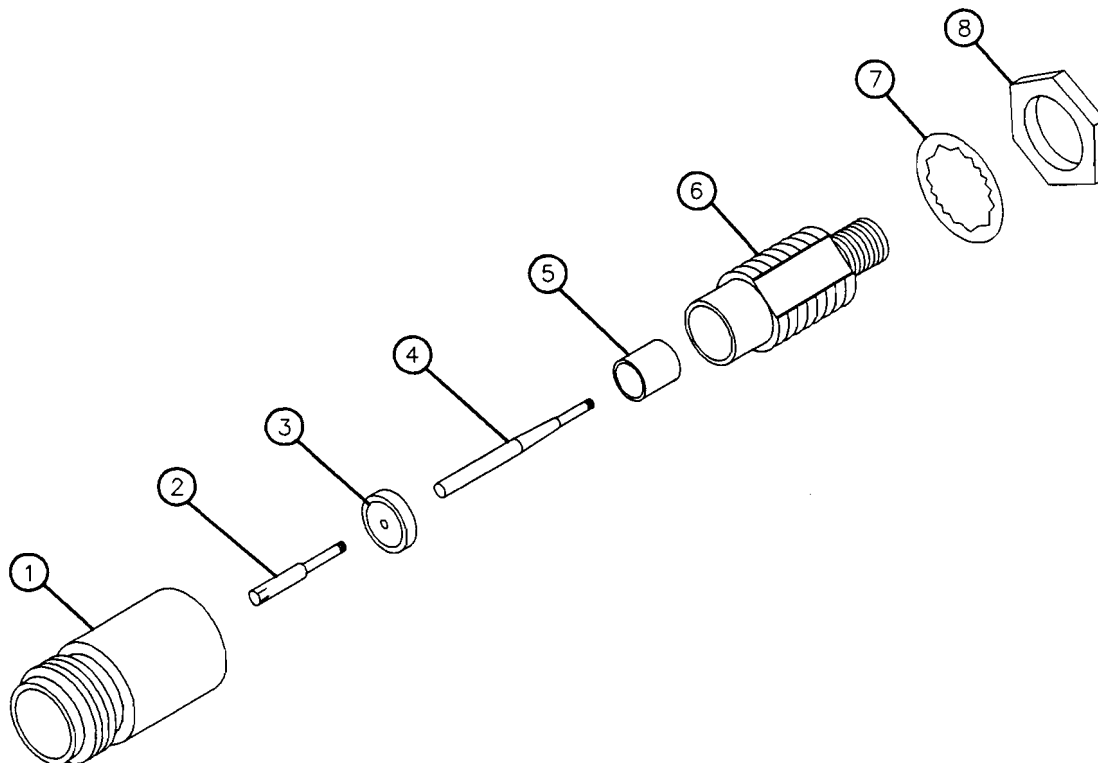
HP Part Number 85680-60196
A26 Motherboard

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A26MP9	85680-00026	6	1	INSULATOR P/S	28480	85680-00026
A26MP10	85680-20199	6	1	POWER HEAT SINK	28480	85680-20199
A26MP11	0340-1114	1	6	INSULATOR-XSTR THRM-CNDCT TO-3ADH	55285	K-4-05
A26MP12	2200-0111	2	10	SCREW-MACH 4-40 .5-IN-LG PAN-HD-POZI	77250	
A26MP13	1200-0081	4	12	INSULATOR-FLG-BSHG NYLON	26365	974 307
A26MP14	2200-0109	8	2	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	77250	
A26MP15	8150-3431	4	1	WIRE 30AWG BL 42V KYNAR (PVF) 1X30 105C	71124	BR212/1-30-021
A26P1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26P2	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26P3	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26P4	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	27264	16-06-0034
A26Q1	1853-0351	4	1	TRANSISTOR PNP 2N6053 SI DARL TO-3	04713	2N6053
A26Q2	1854-0611	1	1	TRANSISTOR NPN 2N6055 SI DARL TO-3	04713	2N6055
A26Q3	1853-0351	4	1	TRANSISTOR PNP 2N6053 SI DARL TO-3	04713	2N6053
A26Q4	1854-0611	1	1	TRANSISTOR NPN 2N6055 SI DARL TO-3	04713	2N6055
A26Q5	1854-0611	1	1	TRANSISTOR NPN 2N6055 SI DARL TO-3	04713	2N6055
A26R4	0811-3493	2	1	RESISTOR .47 +-10% 7W PWI TC=0+-800	11502	PW-7A
A26R5	0811-3493	2	1	RESISTOR .47 +-10% 7W PWI TC=0+-800	11502	PW-7A
A26R6	0811-3493	2	1	RESISTOR .47 +-10% 7W PWI TC=0+-800	11502	PW-7A
A26R7	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R8	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R9	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R10	0811-3494	3	1	RESISTOR 1.27 +-10% 7W PWI TC=0+-600	11502	PW-7A
A26R11	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R12	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R13	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R14	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26R15	0757-0438	3	1	RESISTOR 5.11K +-1% .125W TF TC=0+-100	19701	SFR25H
A26RT1	0837-0126	6	1	THERMISTOR DISC 1K-OHM TC=-4.4%/C-DEG		STD-0163
A26U1	1826-0117	3	1	IC V RGLTR-FXD-POS 11.5/12.5V TO-3 PKG	27014	LM7812KC
A26XA5P1	1252-3179	6	1	CONNECTOR-MALE HEADER 7-PIN	18873	69167-107
A26XA6P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA6P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA7P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA8P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA8P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA9P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA10P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA11P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA11P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA12P1	1251-7312	5	1	CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	00779	1-530843-6
A26XA12P2	1251-2026	8	1	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS		SCM18D/7-1HP
A26XA14P2	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA15P1	1251-7312	5	1	CONNECTOR-PC EDGE 25-CONT/ROW 2-ROWS	00779	1-530843-6
A26XA15P2	1251-2026	8	1	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS		SCM18D/7-1HP
A26XA15P3	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA16P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03

**Indicates factory-selected value*

HP Part Number 85680-60196
A26 Motherboard

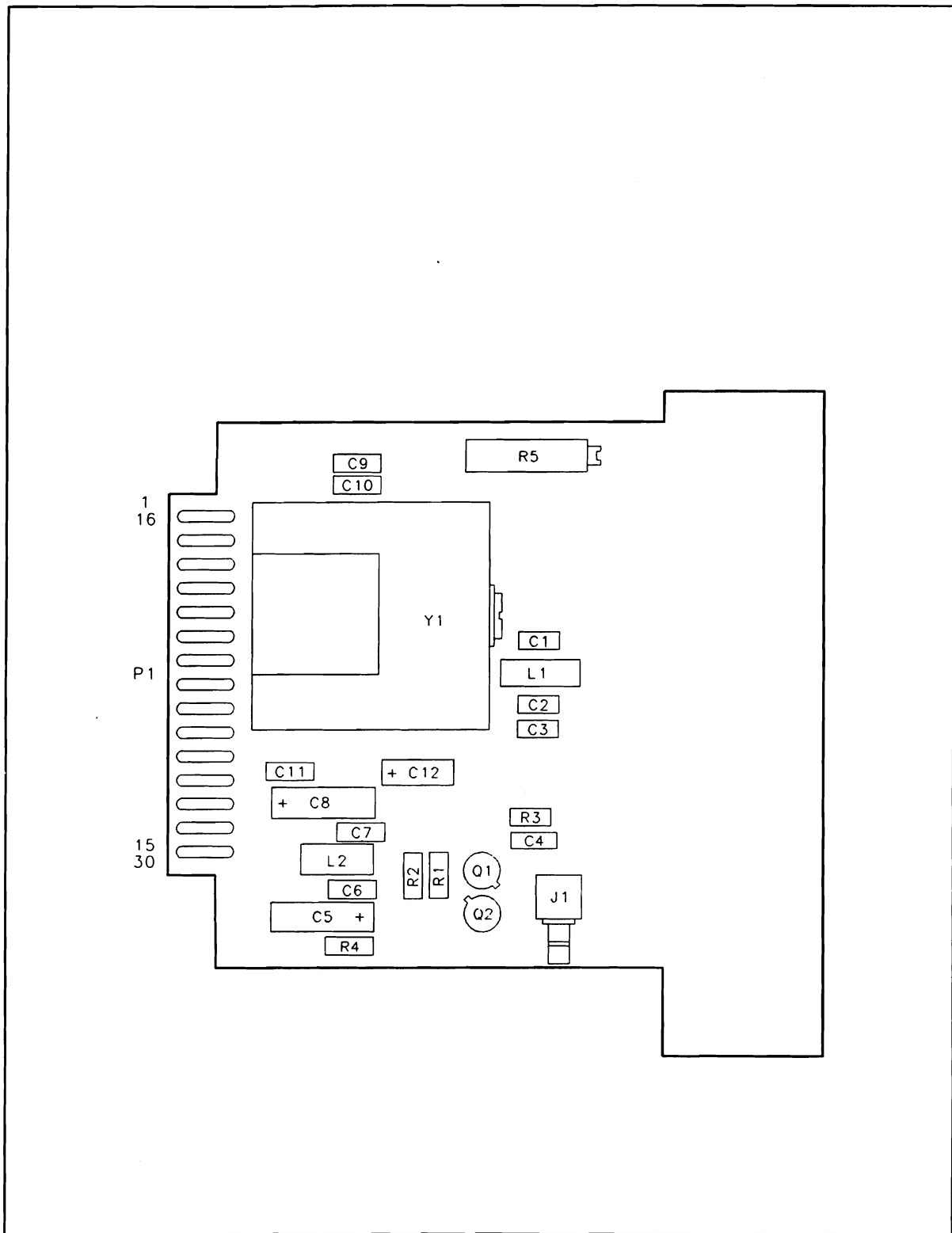
Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
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A26XA17P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA17P2	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA18P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA19P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA20P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA21P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA21P2	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA22P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA22P2	1251-2034	8	1	CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS		SCM10D/7-1HP
A26XA22P3	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA23P1	1200-1204	5	1	SOCKET-IC 14-CONT DIP DIP-SLDR	00779	2-641609-2
A26XA24P1	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	26742	220-620-03
A26XA24P2	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03
A26XA25P1	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	26742	220-624-03



Item	HP Part Number	Description	Mfr Code	Mfr Part Number
1	1250-0914	Body: RF Connector (Type N)	02660	131-150
2	1250-0915	Contact: RF Connector (Type N)	02660	131-149
3	5040-0306	Insulator	28480	5040-0306
4	08555-20093	Center Conductor	28480	08555-20093
5	08555-20094	Body: Bulkhead	28480	08555-20094
6	2190-0104	Washer: Lock 0.439 inch ID	0000J	OBD
7	2950-0132	Nut: Hex 7/16-28	0000J	OBD
8	08761-2027	Insulator	28480	08761-2027

A5A4 RF Input Connector Assembly
HP 85670A

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A14 TCXO Buffer Component Locations, 85680-60200 and 85670-60001
HP 85670A

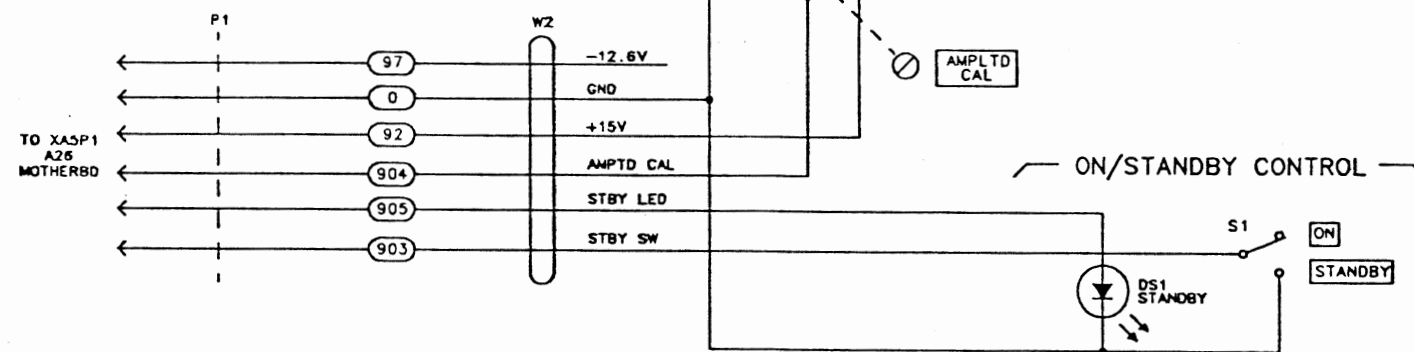
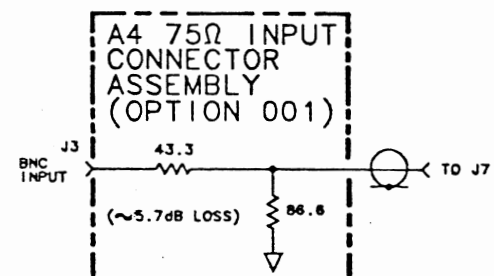
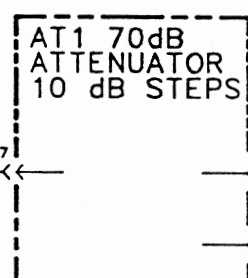
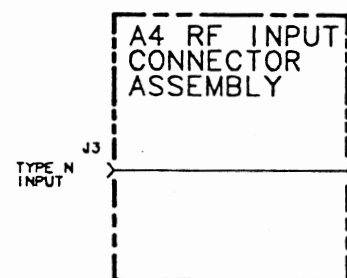
A5 FRONT PANEL
85670A
(SERIAL PREFIX: 2541A)

A1 KEYBOARD
85670-60019

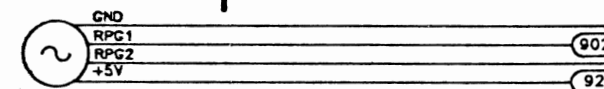
FRONT PANEL KEYS (EXCEPT: LCL, INS)

CAL OUT
20 MHz
-10 dBm
 ± 0.2 dB

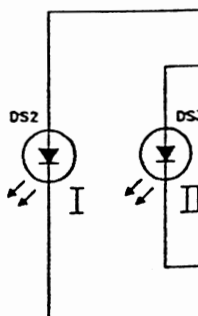
FROM A16
20 MHz REF



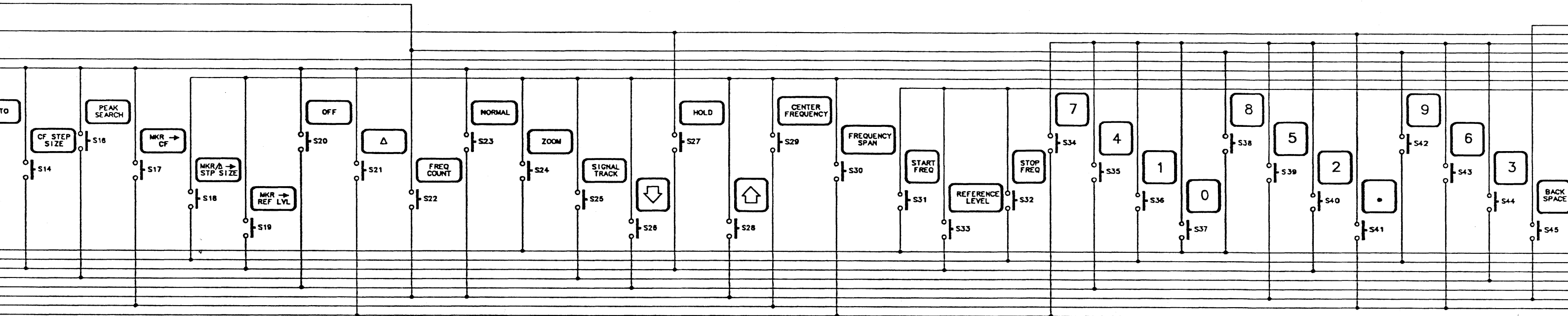
A5A2 ROTARY
PULSE GENERATOR



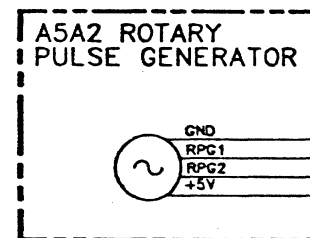
INST CHECK INDIC



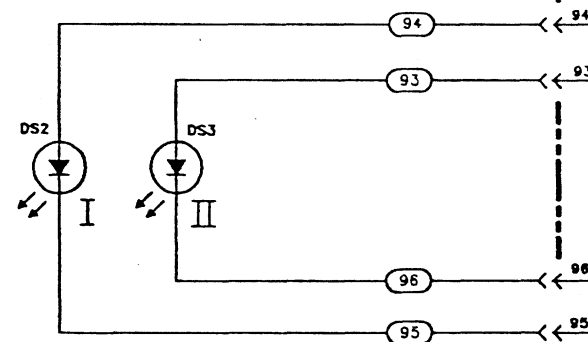
FRONT PANEL KEYS (EXCEPT: LCL, INSTR PRESET)



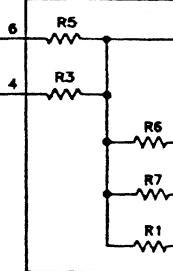
INDICATOR LEDS



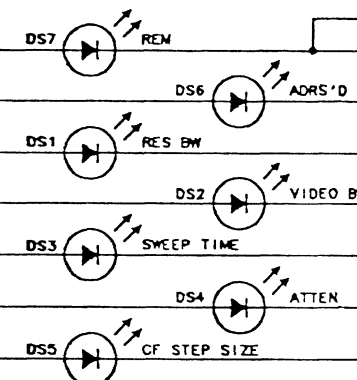
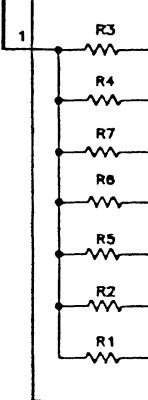
INST CHECK INDICATORS



U2
(470Ω)



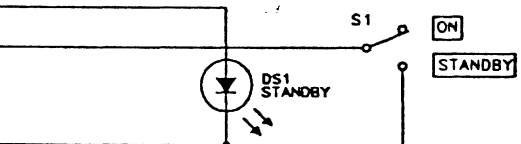
U1
(470Ω)



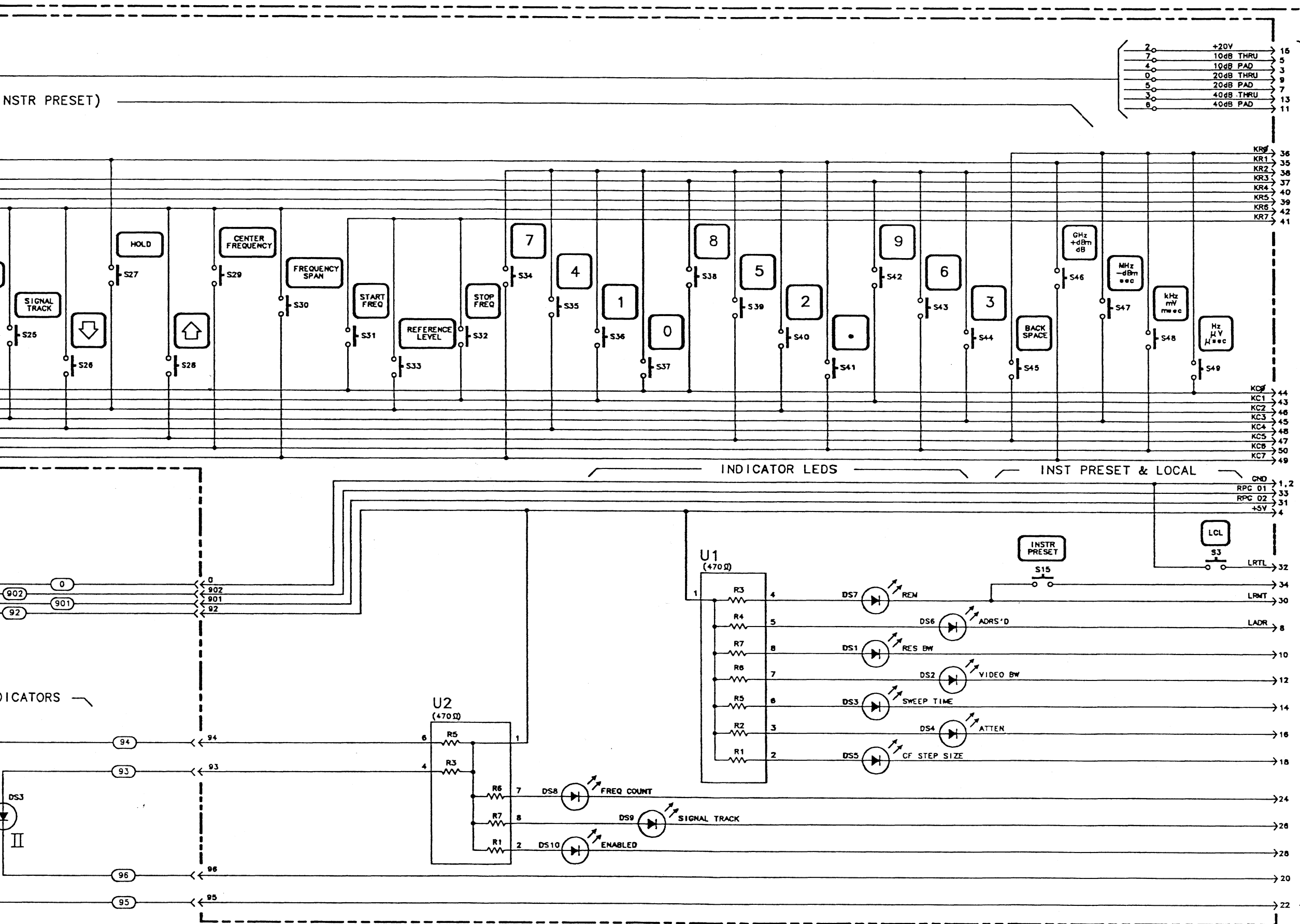
AMPLTD CAL

AMPLTD CAL

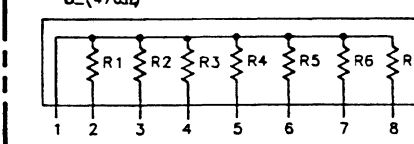
ON/STANDBY CONTROL



INSTR PRESET)



- NOTES:
1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
 2. UNLESS OTHERWISE INDICATED: RESISTANCE IS IN OHMS (Ω) CAPACITANCE IS IN MICROFARADS (μF) INDUCTANCE IS IN MICROHENRIES (μH)
 3. U1 AND U2 PIN CONFIGURATION: U1 (470h)



4. MNEUMONIC TABLE

MNEUMONIC	DESCRIPTION
KR0-7	KEY ROWS 0-7
KC0-7	KEY COLUMNS 0-7
LRTL	LOW-RETURN TO LOCAL
LRMT	LOW-REMOTE
LADR	LOW-ADDRESS LED ON

W43
RIBBON CABLE
FROM A12
RF SECTION
INTERFACE

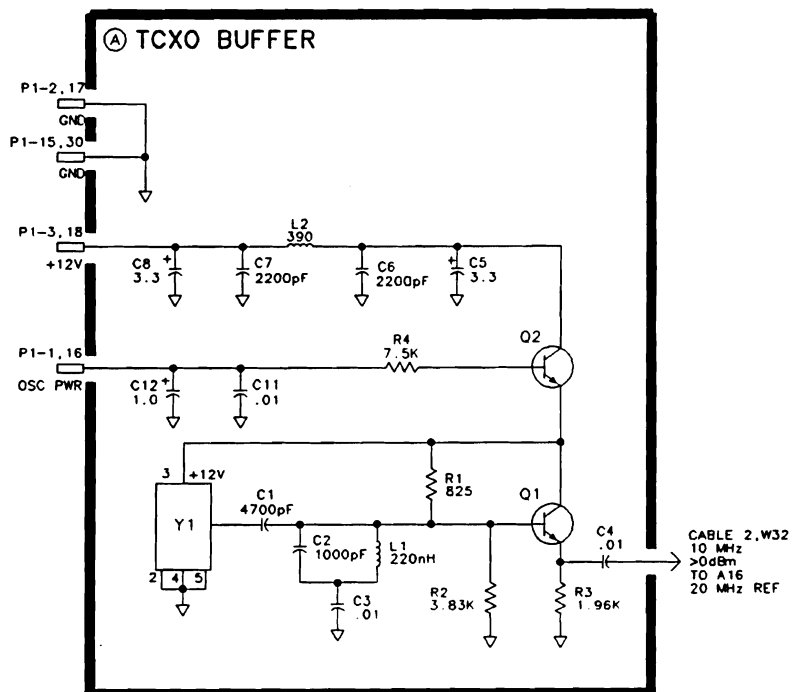
A5

A5 FRONT PANEL, SCHEMATIC DIAGRAM

A14 TCXO BUFFER
 85670-60001
 (SERIAL PREFIX: 2541A)
 85680-60200
 (SERIAL PREFIX: 2517A)

NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
2. UNLESS OTHERWISE INDICATED:
 RESISTANCE IS IN OHMS (Ω)
 CAPACITANCE IS IN MICROFARADS (μF)
 INDUCTANCE IS IN MICROHENRIES (μH)
3. C9, C10 AND R5 ARE NOT USED.



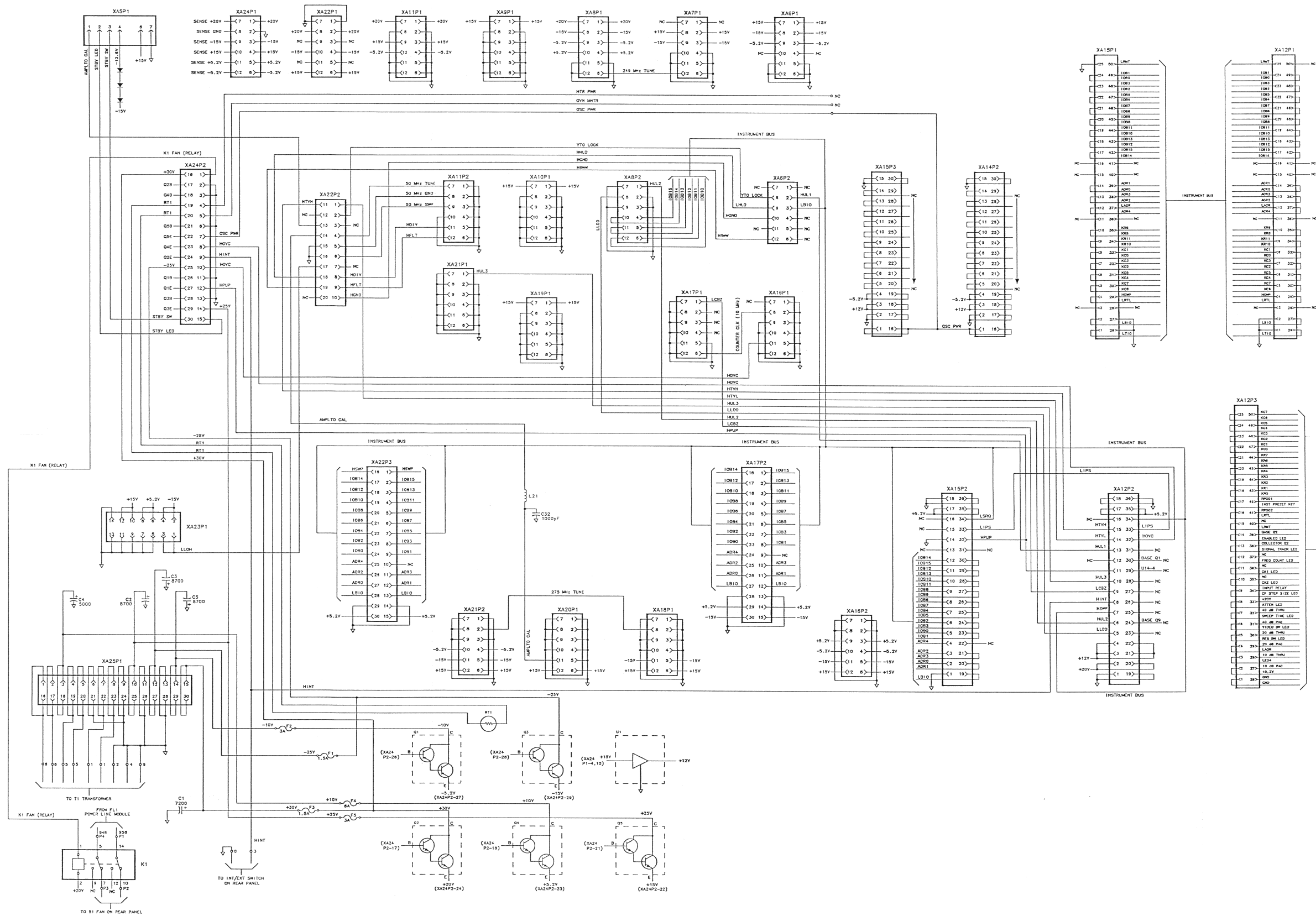
A14

A14 TCXO Buffer Schematic Diagram, 85670-60001
 HP 85670A



HP 85670A

A26 MOTHERBOARD
85680-60196
(SERIAL PREFIX: 2517A)



- | SYMBOLIC | DESCRIPTION |
|----------|---|
| MU1 | HIGH-240 MHz UNLOCKED |
| MU2 | HIGH-240 MHz LOCKED |
| MU3 | HIGH-21 MHz UNLOCKED |
| MU10 | LOW-FREQUENCY I/O STROBE |
| LT10 | HIGH-TO-DISPLAY SECTION I/O STROBE |
| HLND | HIGH-TO-I/O PHASE-LOCK MODE |
| HLND | HIGH-TO-I/O PHASE-LOCK MODE |
| HLV1 | HIGH-TO-VIDE VTO BY TWO |
| HLV2 | HIGH-TO-VIDE FILTER ON |
| LOWL | LOW-TO-MEMORY |
| LSTD | LOW-TO-STOP PROCESSOR |
| LSTD | LOW-TO-249 DIVIDER NUMBERS |
| HLNT | HIGH-TO-INTERNAL FREQUENCY REDUCED |
| LCR2 | LOW-COUNTER BUSY |
| HPUP | HIGH-POWER UP |
| NSPD | LOW-SERVICE REQUEST |
| LNMT | LOW-TO-MEMORY |
| LNRL | LOW-TO-RETURN TO LOCAL |
| LNRE | LOW-REMOTE REQUEST |
| LINS | LOW-INSTRUMENT PRESENT |
| LADR | LOW-TO-ADDRESS |
| HLTH | HIGH-TO-STOP MEMORY CYCLE |
| LSMT | LOW-STATUS OF BUS |
| LSMT | LOW-STATUS MEMORY |
| LDST | LOW-TO-DISITAL STORAGE READY |
| HTVL | HIGH-TO-TUNE VOLTAGE |
| HTVM | HIGH-TO-TUNE VOLTAGE HIGH |
| HTVM | HIGH-TO-TUNE SHIFT HIGH |
| HLPOW | HIGH-TO-POWER ON |
| IN08-15 | INSTRUMENT BUS DATA BITS 0-7 (HIGH TRUE) |
| ACR0-5 | INSTRUMENT BUS ADDRESS BITS 0-5 (HIGH TRUE) |
| KIO0-11 | KEY ROW 0-11 |
| KCO0-7 | KEY COLUMN 0 THRU 7 |
| MCOV | MEASUREMENT COOLD |
| LTDR | LOW-TO-TRACKING GENERATOR REQUEST |
| LIGA | LOW-INTERNAL DATA AND ADDRESS BITS (LOW TRUE) |
| HLBW | HIGH-TO-LOCAL BW |

Options

List of Options

Option 001 - 75 Ω Input

This option has a 75 Ω BNC RF input instead of the standard 50 Ω input.

Option 400 - 400 Hz Line Frequency

This option allows for operation using a 400 Hz line frequency. The rear panel fan is changed and a Printed Circuit board assembly with a start-up capacitor is added for this option.

Option 010 - Rack Mount Slide Kit

This option supplies the necessary hardware and installation instructions for mounting an instrument on slides into a rack of 482.6 mm (19 inch) spacing. The heavy-duty slides are designed specifically to support the weight of this spectrum analyzer. Option 010 is also available as a kit (HP Part Number 5062-6407).

Option 080 - Information Cards in Japanese

This option provides information cards for the tray beneath the RF Section in the Japanese language.

Option 081 - Information Cards in French

This option provides information cards for the tray beneath the RF Section in the French language.

Option 462 - Impulse Bandwidth

This option is the Impulse Bandwidth/6 dB Bandwidth option. Resolution bandwidths from 1 kHz through 3 MHz are impulse bandwidths. Resolution bandwidths from 10 Hz through 300 Hz are 6 dB bandwidths. Not available on HP 8567A.

Option 908 - Rack Flange Kit (without handles)

This option supplies the necessary hardware and installation instructions for mounting an instrument, without handles, into a rack of 482.6 mm (19 inch) spacing. Option 908 is also available as a kit (HP Part Number 5062-3986).

Option 913 - Rack Flange Kit (with handles)

This option supplies the necessary hardware and installation instructions for mounting an instrument, with handles, into a rack of 482.2 mm (19 inch) spacing. Option 913 is also available as a kit (HP Part Number 5062-3986).

Option H44 and Option H96

HP 85680B Option H44 is the RF section used with HP 8568B Option E44. HP 85680B Option H96 is the RF section used with HP 8568B Option E96. The HP 85680B Options H44 and H96 major assemblies that are different than the standard HP 85680B are listed below.

- A5 Front Panel Assembly
- A5A1 Keyboard
- A14 TCXO Buffer/A14Y1 TCXO of the HP 85680B Option H44 and of Option H96 replace A27 10 MHz Frequency Reference of the standard HP 85680B
- A15 Controller
- A26 Motherboard

These HP 85680B Option H44 and Option H96 assemblies have part number changes from the standard HP 85680B assemblies. The assembly changes are documented in the section of the manual of the assembly that changed, in the HP 85670A section, or in this section of the manual. Parts lists, component locations, schematic diagrams, and other service sheets for the H44 and H96 option assemblies are incorporated onto the component location, schematic diagram, or appropriate service sheet of the standard HP 85680B version where possible. Some of these assemblies are common to the HP 85670A assemblies and wherever possible, the services sheets are located in the HP 85670A section of the manual. However, some instances require that an HP 85680B Option H44 or H96 assembly have its own component location, schematic diagram, or service sheet. These versions are located in this section of the manual.

Table 1-1. HP 85680B Option H44 and Option H96 Service Sheet Locations

Service Sheet	Manual Tab
A5 Front Panel Circuit Description	Options
A5 Front Panel Parts List (H44)	Options
A5 Front Panel Parts List (H96)	Options
A5A1 Keyboard Parts List	HP 85670A
A5A1 Keyboard Component Location	A5
A5 Front Panel Schematic Diagram	Options
A12 Keyboard Matrix	Options
A14 TCXO Buffer Circuit Description	HP 85670A
A14 TCXO Buffer Parts List	Options
A14 TCXO Buffer Component Location	HP 85670A
A14 TCXO Buffer Schematic Diagram	Options
A15 Table of Firmware History for HP 85680B Option H44	Options
A15 Table of Firmware History for HP 85680B Option H96	Options
A15 Controller Parts List (H44)	Options
A15 Controller Parts List (H96)	Options
A15 Controller Component Location	A15
A15 Controller Schematic Diagram	A15
A26 Motherboard Parts List	HP 85670A
A26 Motherboard Component Locations	HP 85670A
A25 Rectifier and A26 Motherboard Power Distribution Diagram	HP 85670A
A26 Motherboard Interconnect Diagram	HP 85670A

A5 Front Panel, Circuit Description

A5 Front Panel includes the following subassemblies:

- A5A1 Keyboard
- A5A2 Rotary Pulse Generator
- A5A3 DC Input Connector

Also included is AT1 Step Attenuator (0 to 70 dB in 10-dB steps).

A5A1 Keyboard

A5A1 Keyboard includes all the front-panel pushbutton key-switches and indicator LEDs. (Refer to A12 RF Section Interface for a description of the key-switch circuitry.) The LEDs, which are driven by A12, indicate the status of pushbuttons, except for INSTR CHECK indicators I (DS2) and II (DS3).

The INSTR CHECK indicators are used with a self-test routine that is run whenever the LINE switch is placed ON or the **INSTR PRESET** key is pressed. The self-test routine checks the digital circuitry in the A15 Controller, portions of A12 RF Section Interface, and A3 Digital Storage in the IF-Display Section. Both LEDs are lit until the self-test routine is completed. If both LEDs remain on, the trouble is probably in A15, INSTR CHECK II indicates probable trouble in A12 or the Instrument Bus, and INSTR CHECK I indicates probable trouble in the A3 Digital Storage section of the IF-Display Section.

A5A2 Rotary Pulse Generator

A5A2 Rotary Pulse Generator (RPG) is operated by the DATA knob on the front panel. The rate and direction of rotation of the knob are transmitted to A12 RF Section Interface on the 01 and the 02 lines.

A5A3 DC Input Connector

A5A3 DC Input Connector is only used for signals which have no DC component.

ON/STANDBY Control

When the LINE switch is in STANDBY, a circuit is completed to A26 Motherboard to light STANDBY indicator LED DS1. The LED is lit when the instrument is in STANDBY or when regulated power to the instrument is removed during thermal shutdown.

Reference Level Amplitude Calibration

AMPTD CAL screwdriver adjustment R3 provides a REF LEVEL CAL voltage to A22 Frequency Control.

CAL OUTPUT

The CAL OUTPUT connector provides a 20 MHz, -10 dBm signal from A16 20 MHz Reference.

	KC0	KC1	KC2	KC3	KC4	KC5	KC6	KC7	
KR0	SPACE Hz μV μsec			MHz -dBm sec		BACK SPACE	& kHz mV msec		RF SECTION
KR1	(SAVE) RECALL	- HOLD		0-1.5 GHz		.	GHz +dBm dB	
KR2	0	1	2	3	4	5	6	7	
KR3	8	9			SIGNAL INPUT 1	= FREQ COUNT	SIGNAL INPUT 2		
KR4		A AUTO	B AUTO	C AUTO	D AUTO	E AUTO	F RES BW	G VIDEO BW	
KR5	H SWEEP TIME	I ATTEN	J CF STEP SIZE	K PEAK SEARCH	MARKER L OFF	MARKER M NORMAL	N MKR→ CF	O Δ	
KR6	P ZOOM	Q MKR/Δ→ STP SIZE	R MKR→ REF LVL	S SIGNAL TRACK	T ↓	U ↑	V CENTER FREQUENCY	W FREQUENCY SPAN	
KR7	X START FREQ	Y STOP FREQ	Z REFERENCE LEVEL						IF-DISPLAY SECTION
KR8	NORMAL	a CLEAR- WHITE TRACE A	b MAX HOLD TRACE A	c OFF A-B	d VIEW TRACE A	e BLANK TRACE A	f A-B→A	g CLEAR- WHITE TRACE B	
KR9	h MAX HOLD TRACE B	i A→B	j VIEW TRACE B	k BLANK TRACE B	l B-DL →B	m OFF DISPLAY LINE	n ENTER DISPLAY LINE	o OFF THRESHOLD	
KR10	p ENTER THRESHOLD	q ENTER dB/DIV	r LIN	s SHIFT	t CONT	u SINGLE	v FREE RUN	w LINE	
KR11	x EXT	y VIDEO	z ● LOWER LEFT		l ● LOWER RIGHT				
NOTE: INSTR PRESET AND LCL ARE NOT PART OF THE MATRIX.									
SIGNAL INPUT 1 ● SIGNAL INPUT 2 ● ARE NOT PART OF HP 85670A OR HP 85680B OPTION H44 & OPTION H96.									

Figure 1. A12 Keyboard Matrix
HP 85680B Options H44 and H96

Table 1-2. A15 Table of Firmware History for HP 85680B Option H96

Revision	Instrument Serial Numbers	EPROM	HP Part Number	Date Code
A	2517A01566 and Above	U37	85680-80083	4.6.85
		U38	85680-80084	
		U39	85680-80085	
		U40	85680-80086	

Table 1-3. A15 Table of Firmware History for HP 85680B Option H44

Revision	Instrument Serial Numbers	EPROM	HP Part Number	Date Code
A	2634A02817 through 2732A03952	U37	85680-80104	3.12.86
		U38	85680-80106	
		U39	85680-80105	
		U40	85680-80107	
B	2732A03953 and Above	U37	85680-80132	9.27.89
		U38	85680-80134	
		U39	85680-80133	
		U40	85680-80135	

**A5 Front Panel Assembly
for HP 85680B Option H44**

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5				HP 85680B-OPTION H44 FRONT PANEL ASSEMBLY (NOT AVAILABLE FOR FIELD REPLACEMENT)		
A5A1	85670-60019	1	1	KEYBOARD ASSEMBLY	28480	85670-60019
A5A2	0960-0684	2	1	ROTARY PULSE GENERATOR	28480	0960-0684
A5A3				DC INPUT CONNECTOR ASSEMBLY (INCLUDES A5A3F1, A5A3J3, AND A5A3W4)		
A5A3F1	1535-3716	7	1	OEM FUSE; 1/8 AMP	28480	1535-3716
A5A3J3	1250-1557	6	1	ADAPTER-COAX, STR. F-BNC M-SMC (INCLUDES A5A3F1)	28480	1250-1557
A5A3W4	85680-20198	5	1	RIGID CABLE (A5A3J1-A5AT1)	28480	85680-20198
A5AT1	5086-7815	6	1	INPUT ATTENUATOR (INCLUDES PROM FOR A12U17)	28480	5086-7815
A5DS1	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5DS2	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A5DS3	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A5MP1	0370-3069	2	1	RPG KNOB	28480	0370-3069
A5MP2	85680-00013	1	1	ATTENUATOR BRACKET	28480	85680-00013
A5MP4	85680-40004	4	1	LED MOUNT	28480	85680-40004
A5MP5	5021-8699	0	1	FRONT PANEL BEZEL	28480	5021-8699
A5MP6	85680-00009	5	1	LOWER SUB PANEL	28480	85680-00009
A5MP7	85680-00011	9	1	KEYBOARD SUB PANEL	28480	85680-00011
A5MP8	85680-00109	6	1	KEYBOARD DRESS PANEL	28480	85680-00109
A5MP9	85680-00108	5	1	LOWER DRESS PANEL	28480	85680-00108
A5R3	2100-2488	8	1	RESISTOR-VAR CONTROL 10K 10% LIN	28480	2100-2488
A5SW1	3101-2193	5	1	SWITCH-TGL PRI-SW SPDT 2A 250VAC SLDR-LU	09353	U11J60ZG W/7868-14 W/5310
A5W2	85680-60244	6	1	WIRING HARNESS	28480	85680-60244
A5W3	85680-60101	4	1	COAX CABLE (A5AT1-A23A2)	28480	85680-60101
A5W31	85680-60065	9	1	CAL OUT CABLE ASSEMBLY (INCLUDES COAX CABLE AND FRONT-PANEL CONNECTOR)	28480	85680-60065
A5W42	5062-0704	8	1	WIRING HARNESS (A5AT1-A5A1)	28480	5062-0704

*Indicates factory-selected value

A5 Front Panel Assembly for HP 85680B Option H96

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5				HP 85680B-OPTION H96 FRONT PANEL ASSEMBLY (NOT AVAILABLE FOR FIELD REPLACEMENT)		
A5A1	85670-60019	1	1	KEYBOARD ASSEMBLY	28480	85670-60019
A5A2	0960-0684	2	1	ROTARY PULSE GENERATOR	28480	0960-0684
A5A3				DC INPUT CONNECTOR ASSEMBLY (INCLUDES A5A3F1, A5A3J3, AND A5A3W4)		
A5A3F1	1535-3716	7	1	OEM FUSE; 1/8 AMP	28480	1535-3716
A5A3J3	1250-1557	6	1	ADAPTER-COAX, STR. F-BNC M-SMC (INCLUDES A5A3F1)	28480	1250-1557
A5A3W4	85680-20198	5	1	RIGID CABLE (A5A3J1-A5AT1)	28480	85680-20198
A5AT1	5086-7815	6	1	INPUT ATTENUATOR (INCLUDES PROM FOR A12U17)	28480	5086-7815
A5DS1	1990-0487	7	1	LED-LAMP LUM-INT=2MCD BVR=5V	28480	HLMP-1401
A5DS2	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A5DS3	1990-0486	6	1	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V	28480	HLMP-1301
A5MP1	0370-3069	2	1	RPG KNOB	28480	0370-3069
A5MP2	85680-00013	1	1	ATTENUATOR BRACKET	28480	85680-00013
A5MP4	85680-40004	4	1	LED MOUNT	28480	85680-40004
A5MP5	5021-8699	0	1	FRONT PANEL BEZEL	28480	5021-8699
A5MP6	85680-00009	5	1	LOWER SUB PANEL	28480	85680-00009
A5MP7	85680-00011	9	1	KEYBOARD SUB PANEL	28480	85680-00011
A5MP8	85680-00107	4	1	KEYBOARD DRESS PANEL	28480	85680-00107
A5MP9	85680-00108	5	1	LOWER DRESS PANEL	28480	85680-00108
A5R3	2100-2488	8	1	RESISTOR-VAR CONTROL 10K 10% LIN	28480	2100-2488
A5SW1	3101-2193	5	1	SWITCH-TGL PRI-SW SPDT 2A 250VAC SLDR-LU	09353	U11J60ZG W/7868-14 W/5310
A5W2	85680-60244	6	1	WIRING HARNESS	28480	85680-60244
A5W3	85680-60101	4	1	COAX CABLE (A5AT1-A23A2)	28480	85680-60101
A5W31	85680-60065	9	1	CAL OUT CABLE ASSEMBLY (INCLUDES COAX CABLE AND FRONT-PANEL CONNECTOR)	28480	85680-60065
A5W42	5062-0704	8	1	WIRING HARNESS (A5AT1-A5A1)	28480	5062-0704

*Indicates factory-selected value

HP Part Number 85680-60200

A14 TCXO Buffer

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A14	85680-60200	4	1	BOARD ASSEMBLY, TCXO BUFFER	28480	85680-60200
A14C1	0160-4831	3	1	CAPACITOR-FXD 4700pF +-10% 100VDC CER	28480	0160-4831
A14C2	0160-4822	2	1	CAPACITOR-FXD 1000pF +-5% 100VDC CER	28480	0160-4822
A14C3	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C4	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C5	0180-2141	6	1	CAPACITOR-FXD 3.3UF +-10% 50VDC TA	28480	0180-2141
A14C6	0160-4830	2	1	CAPACITOR-FXD 2200pF +-10% 100VDC CER	28480	0160-4830
A14C7	0160-4830	2	1	CAPACITOR-FXD 2200pF +-10% 100VDC CER	28480	0160-4830
A14C8	0180-2141	6	1	CAPACITOR-FXD 3.3UF +-10% 50VDC TA	28480	0180-2141
A14C9	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C10	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C11	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
A14C12	0180-0291	3	1	CAPACITOR-FXD 1UF +-10% 35VDC TA	28480	0180-0291
A14J1	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	28480	1250-0543
A14L1	9100-3911	1	1	INDUCTOR RF-CH-MLD 220NH 5%	28480	9100-3911
A14L2	9100-1645	4	1	INDUCTOR RF-CH-MLD 390NH 5%	28480	9100-1645
A14MP2	5000-9043	6	1	EXTRACTOR PIN	28480	5000-9043
A14MP3	5040-6843	2	1	PC BOARD EXTRACTOR	28480	5040-6843
A14MP4	85680-20201	1	1	INSULATOR TCXO	28480	85680-20201
A14Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A14Q2	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A14R1	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A14R2	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A14R3	0698-7243	6	1	RESISTOR 1.96K 1% .125W F TC=0+-100	28480	0698-7243
A14R4	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A14R5	2100-3154	7	1	RESISTOR-TRMR 1K C-SIDE MOJ 17-TRN	28480	2100-3154
A14Y1	1813-0494	2	1	TCXO 10.0 MHz	28480	1813-0494

*Indicates factory-selected value

HP Part Number 85680-60202

A15 Controller (Option H96)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15	85680-60202	6	1	BOARD ASSEMBLY, CONTROLLER (OPTION H96) (SERIAL PREFIX: 2517A)	28480	85680-60202
A15BT1	1420-0331	3	1	BATTERY 3.68V 1.75A-HR LITHIUM THIONYL		15-51-04-410-000
A15C1	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C2	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C3	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C4	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C5	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C6	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C7	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C8	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C10	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C11	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C12	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C13	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C15	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C17	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C18	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C19	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C20	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C22	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C23	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C24	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A15C25	0160-4535	4	1	CAPACITOR-FXD 1UF +-10% 50VDC CER	04222	SR305C105KAAH
A15C29	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER 0+-3	04222	SA102A101JAAH
A15C30	0160-4832	4	1	CAPACITOR-FXD .01UF +-10% 100VDC CER	04222	SA101C103KAAH
A15C31	0160-4808	4	1	CAPACITOR-FXD 470PF +-5% 100VDC CER 0+-3	04222	SA101A471JAAH
A15C32	0180-2207	5	1	CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2-DYS
A15C34	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER 0+-3	04222	SA102A101JAAH
A15CR3	1901-0518	8	1	DIODE-SCHOTTKY SM SIG	28480	
A15DS1	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS2	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS3	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS4	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS5	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS6	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS7	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS8	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS9	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS10	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS11	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS12	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS13	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS14	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15E1	1251-4787	2	1	SHUNT-DIP 8 POSITION DUAL INLINE PKG	00779	435704-8
A15J1	1251-5926	3	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	18873	67997-650
A15J2	1251-5905	8	1	CONN-POST TYPE .100-PIN-SPCG 24-CONT	18873	67997-624

**Indicates factory-selected value*

HP Part Number 85680-60202
A15 Controller (Option H96)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15J3	1200-0607	0	1	16-PIN IC SOCKET	00779	641600-1/TUBED 2-641600
A15J5	1251-5619	1	1	CONN-POST TYPE .100-PIN-SPCG 4-CONT	18873	68000-604
A15L1	9140-0875	4	1	INDUCTOR 80uH 10%	28480	9140-0875
A15MP1	1400-1267	4	1	HOLDER-BAT .531-.656-DIA FOR AA CELLS	91833	91
A15MP3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	72962	99-012-062-0250
A15MP4	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-IN-BD-THKNS 1-		
A15MP5	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-IN-BD-THKNS 1-		
A15MP6	0361-0026	6	1	RIVET-SEMITUB OVH .089DIA .125LG	12014	R-4008-1/8
A15MP11	1200-0567	1	1	SOCKET-IC 28-CONT DIP DIP-SLDR	00779	2-641605-1
A15Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A15Q2	1853-0213	7	1	TRANSISTOR PNP 2N4236 SI TO-5 PD=1W	04713	2N4236
A15R2	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R3	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R4	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R5	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R6	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R7	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R8	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R9	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R10	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R11	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R12	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R13	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R14	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R18	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R19	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R21	0698-7212	9	1	RESISTOR 100 +-1% .05WTF TC=0+-100	19701	5063J
A15SW1	3101-2197	9	1	SWITCH-DIP RKR 6-1A 0.05A 30VDC	81073	76YY2346S
A15TP1	1252-0569	2	1	CONN-POST TYPE .150-PIN-SPCG 9-CONT	00779	87221-8
A15TP2	1251-8427	5	1	CONN-POST TYPE .150-PIN-SPCG 5-CONT	00779	87221-4
A15U1	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U2	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U3	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U4	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A15U5	1820-3401	2	1	IC BFR TTL ALS OR QUAD 2-INP	01295	SN74ALS1032AN
A15U6	1820-2548	6	1	IC-GENERAL PURPOSE INTERFACE BUS ADAPTER	01295	TMS9914ANL
A15U7	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A15U8	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A15U9	1820-3449	8	1	IC-PARALLEL INTERFACE/TIMER/8MHZ/MC68000	04713	MC68230L8
A15U10	1820-2102	8	1	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A15U11	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A15U12	1820-1208	3	1	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A15U13	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	01295	SN74LS11N
A15U14	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L
A15U14	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U15	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L
A15U15	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U17	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L

HP Part Number 85680-60202
A15 Controller (Option H96)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15U17	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U18	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L
A15U18	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U20	5180-2330	0	1	IC 16R4 PAL PRGMD	28480	5180-2330
A15U21	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U22	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A15U23	1810-0394	5	1	NETWORK-RES 8-SIP 6.8K OHM X 7	11236	750-81
A15U24	1820-1851	2	1	IC ENCDR TTL LS	01295	SN74LS148N
A15U25	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U26	1820-3532	0	1	IC-16 BIT MICROPROCESSOR /8 MHZ	04713	MC68000P8
A15U27	1820-3173	5	1	IC FF CMOS/74HC J-K NEG-EDGE-TRIG PRESET	04713	MC74HC112N
A15U28	1820-1281	2	1	IC DCDR TTL LS 2-TO-4-LINE DUAL	01295	SN74LS139AN
A15U29	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U30	1820-3513	7	1	IC-INTERFACE XCVR BCD UP/DOWN INSTRUMENT	27014	DS75161AN
A15U31	1820-3431	8	1	IC-INTERFACE XCVR BCD UP/DOWN INSTRUMENT	27014	DS75160AN
A15U32	1820-2675	0	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS646NT
A15U33	1810-0279	5	1	NETWORK-RES 10-SIP 4.7K OHM X 9	11236	750-101
A15U34	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A15U35	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRESET	01295	SN74LS74AN
A15U36	1820-2675	0	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS646NT
A15U37	85680-80083	3	1	EPROM PRGMD	28480	85680-80083
A15U38	85680-80084	4	1	EPROM PRGMD	28480	85680-80084
A15U39	85680-80085	5	1	EPROM PRGMD	28480	85680-80085
A15U40	85680-80086	6	1	EPROM PRGMD	28480	85680-80086
A15U41	1810-0344	5	1	NETWORK-RES 10-SIP 6.8K OHM X 9	11236	750-101
A15U42	85660-80070	4	1	IC1618 PAL PRGMD	28480	85660-80070
A15U43	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A15U44	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U45	1820-3562	6	1	IC BFR TTL ALS INV HEX	01295	SN74ALS1005N
A15U46	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U47	1820-1208	3	1	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A15Y1	1813-0196	1	1	CLOCK-OSCILLATOR-CRYSTAL 14.7456 MHZ	28480	1813-0196
A15Y1	1813-0129	0	0	CLOCK-OSCILLATOR-XTAL 14.7456-MHZ 0.01% (ALTERNATE PART FOR 1813-0196)	00815	HS-100(14.7456MHZ)

**Indicates factory-selected value*

HP Part Number 85680-60217
A15 Controller (Option H44)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15	85680-60217	3	1	BOARD ASSEMBLY, CONTROLLER (OPTION H44) (SERIAL PREFIX: 2634A)	28480	85680-60217
A15B71	1420-0331	3	1	BATTERY 3.68V 1.75A-HR LITHIUM THIONYL		15-51-04-410-000
A15C1	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C2	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C3	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C4	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C5	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C6	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C7	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C8	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C10	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C11	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C12	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C13	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C15	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C17	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C18	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C19	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C20	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C22	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C23	0160-4554	7	1	CAPACITOR-FXD 0.01uF 50 VDC +-20% CER	04222	SA105C103MAAH
A15C24	0160-4574	1	1	CAPACITOR-FXD 1000PF +-10% 100VDC CER	04222	SA101C102KAAH
A15C25	0160-4535	4	1	CAPACITOR-FXD 1uF +-10% 50VDC CER	04222	SR305C105KAAH
A15C29	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER 0+-3	04222	SA102A101JAAH
A15C30	0160-4832	4	1	CAPACITOR-FXD .01uF +-10% 100VDC CER	04222	SA101C103KAAH
A15C31	0160-4808	4	1	CAPACITOR-FXD 470PF +-5% 100VDC CER 0+-3	04222	SA101A471JAAH
A15C32	0180-2207	5	1	CAPACITOR-FXD 100uF+-10% 10VDC TA	56289	150D107X9010R2-DYS
A15C34	0160-4801	7	1	CAPACITOR-FXD 100PF +-5% 100VDC CER 0+-3	04222	SA102A101JAAH
A15CR3	1901-0518	8	1	DIODE-SCHOTTKY SM SIG	28480	
A15DS1	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS2	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS3	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS4	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS5	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS6	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS7	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS8	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS9	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS10	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS11	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS12	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS13	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15DS14	1990-0958	7	1	LED-LAMP IF=7MA-MAX BVR=5V	28480	HLMP-1700
A15E1	1251-4787	2	1	SHUNT-DIP 8 POSITION DUAL INLINE PKG	00779	435704-8
A15J1	1251-5926	3	1	CONN-POST TYPE .100-PIN-SPCG 50-CONT	18873	67997-650
A15J2	1251-5905	8	1	CONN-POST TYPE .100-PIN-SPCG 24-CONT	18873	67997-624

**Indicates factory-selected value*

HP Part Number 85680-60217
A15 Controller (Option H44)

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15J3	1200-0607	0	1	16-PIN IC SOCKET	00779	641600-1/TUBED 2-641600
A15J5	1251-5619	1	1	CONN-POST TYPE .100-PIN-SPCG 4-CONT	18873	68000-604
A15L1	9140-0875	4	1	INDUCTOR 80uH 10%	28480	9140-0875
A15MP1	1400-1267	4	1	HOLDER-BAT .531-.656-DIA FOR AA CELLS	91833	91
A15MP3	1480-0073	6	2	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	72962	99-012-062-0250
A15MP4	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-IN-BD-THKNS 1-		
A15MP5	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-IN-BD-THKNS 1-		
A15MP6	0361-0026	6	1	RIVET-SEMITUB OVH .089DIA .125LG	12014	R-4008-1/8
A15MP11	1200-0567	1	1	SOCKET-IC 28-CONT DIP DIP-SLDR	00779	2-641605-1
A15Q1	1854-0477	7	1	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A15Q2	1853-0213	7	1	TRANSISTOR PNP 2N4236 SI TO-5 PD=1W	04713	2N4236
A15R2	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R3	0698-3157	3	1	RESISTOR 19.6K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R4	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R5	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R6	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R7	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R8	0757-0442	9	1	RESISTOR 10K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R9	0698-3260	9	1	RESISTOR 464K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R10	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R11	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R12	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R13	0698-3440	7	1	RESISTOR 196 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R14	0757-0401	0	1	RESISTOR 100 +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R18	0757-0280	3	1	RESISTOR 1K +-1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R19	0698-3155	1	1	RESISTOR 4.64K 1% .125W TF TC=0+-100	2M627	CRB14 OR CRB25
A15R21	0698-7212	9	1	RESISTOR 100 +-1% .05W TF TC=0+-100	19701	5063J
A15SW1	3101-2197	9	1	SWITCH-DIP RKR 6-1A 0.05A 30VDC	81073	76YY2346S
A15TP1	1252-0569	2	1	CONN-POST TYPE .150-PIN-SPCG 9-CONT	00779	87221-8
A15TP2	1251-8427	5	1	CONN-POST TYPE .150-PIN-SPCG 5-CONT	00779	87221-4
A15U1	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U2	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U3	1810-0446	8	1	NETWORK-RES 8-SIP 1.5K OHM X 7	11236	750-81
A15U4	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A15U5	1820-3401	2	1	IC BFR TTL ALS OR QUAD 2-INP	01295	SN74ALS1032AN
A15U6	1820-2548	6	1	IC-GENERAL PURPOSE INTERFACE BUS ADAPTER	01295	TMS9914ANL
A15U7	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A15U8	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A15U9	1820-3449	8	1	IC-PARALLEL INTERFACE/TIMER/8MHZ/MC68000	04713	MC68230L8
A15U10	1820-2102	8	1	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A15U11	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A15U12	1820-1208	3	1	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A15U13	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	01295	SN74LS11N
A15U14	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L
A15U14	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U15	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L
A15U15	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U17	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L

HP Part Number 85680-60217
A15 Controller (Option H44)

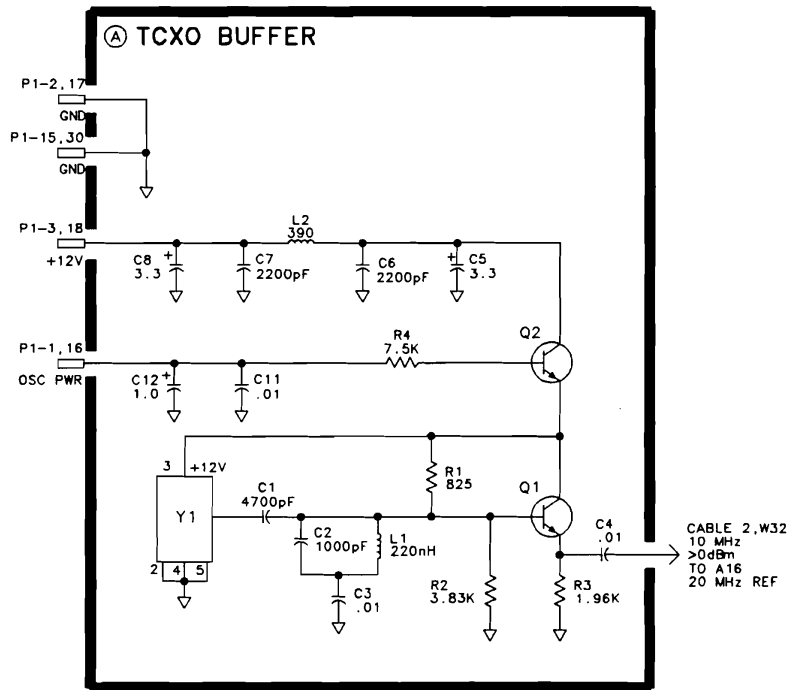
Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A15U17	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U18	1818-3183	2	1	IC CMOS 65536 (64K) STAT RAM 150-NS 3-S	S0545	UPD4364C-15L
A15U18	1818-3305	0	0	ALTERNATE-IC CMOS 65536 (64K) STAT RAM	S0562	TC5565APL-15
A15U20	5180-2330	0	1	IC 16R4 PAL PRGMD	28480	5180-2330
A15U21	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U22	1820-2024	3	1	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
A15U23	1810-0394	5	1	NETWORK-RES 8-SIP 6.8K OHM X 7	11236	750-81
A15U24	1820-1851	2	1	IC ENCDR TTL LS	01295	SN74LS148N
A15U25	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U26	1820-3532	0	1	IC-16 BIT MICROPROCESSOR /8 MHZ	04713	MC68000P8
A15U27	1820-3173	5	1	IC FF CMOS/74HC J-K NEG-EDGE-TRIG PRESET	04713	MC74HC112N
A15U28	1820-1281	2	1	IC DCDR TTL LS 2-TO-4-LINE DUAL	01295	SN74LS139AN
A15U29	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U30	1820-3513	7	1	IC-INTERFACE XCVR BCD UP/DOWN INSTRUMENT	27014	DS75161AN
A15U31	1820-3431	8	1	IC-INTERFACE XCVR BCD UP/DOWN INSTRUMENT	27014	DS75160AN
A15U32	1820-2675	0	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS646NT
A15U33	1810-0279	5	1	NETWORK-RES 10-SIP 4.7K OHM X 9	11236	750-101
A15U34	1820-1997	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRL-IN	01295	SN74LS374N
A15U35	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG PRESET	01295	SN74LS74AN
A15U36	1820-2675	0	1	IC TRANSCEIVER TTL LS BUS OCTL	01295	SN74LS646NT
A15U37	85680-80132	3	1	EPROM PRGMD	28480	85680-80132
A15U38	85680-80134	5	1	EPROM PRGMD	28480	85680-80134
A15U39	85680-80133	4	1	EPROM PRGMD	28480	85680-80133
A15U40	85680-80135	6	1	EPROM PRGMD	28480	85680-80135
A15U41	1810-0344	5	1	NETWORK-RES 10-SIP 6.8K OHM X 9	11236	750-101
A15U42	85660-80070	4	1	IC1618 PAL PRGMD	28480	85660-80070
A15U43	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	04713	LM339J
A15U44	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U45	1820-3562	6	1	IC BFR TTL ALS INV HEX	01295	SN74ALS1005N
A15U46	1810-0205	7	1	NETWORK-RES 8-SIP 4.7K OHM X 7	11236	750-81
A15U47	1820-1208	3	1	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A15Y1	1813-0196	1	1	CLOCK-OSCILLATOR-CRYSTAL 14.7456 MHZ	28480	1813-0196
A15Y1	1813-0129	0	0	CLOCK-OSCILLATOR-XTAL 14.7456-MHZ 0.01% (ALTERNATE PART FOR 1813-0196)	00815	HS-100(14.7456MHZ)

**Indicates factory-selected value*

A14 TCXO BUFFER
 85670-60001
 (SERIAL PREFIX: 2541A)
 85680-60200
 (SERIAL PREFIX: 2517A)

NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
2. UNLESS OTHERWISE INDICATED:
 RESISTANCE IS IN OHMS (Ω)
 CAPACITANCE IS IN MICROFARADS (μF)
 INDUCTANCE IS IN MICROHENRIES (μH)
3. C9, C10 AND R5 ARE NOT USED.



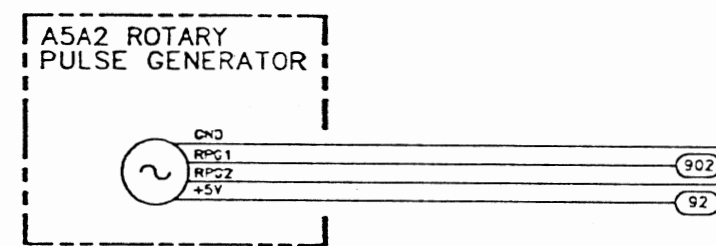
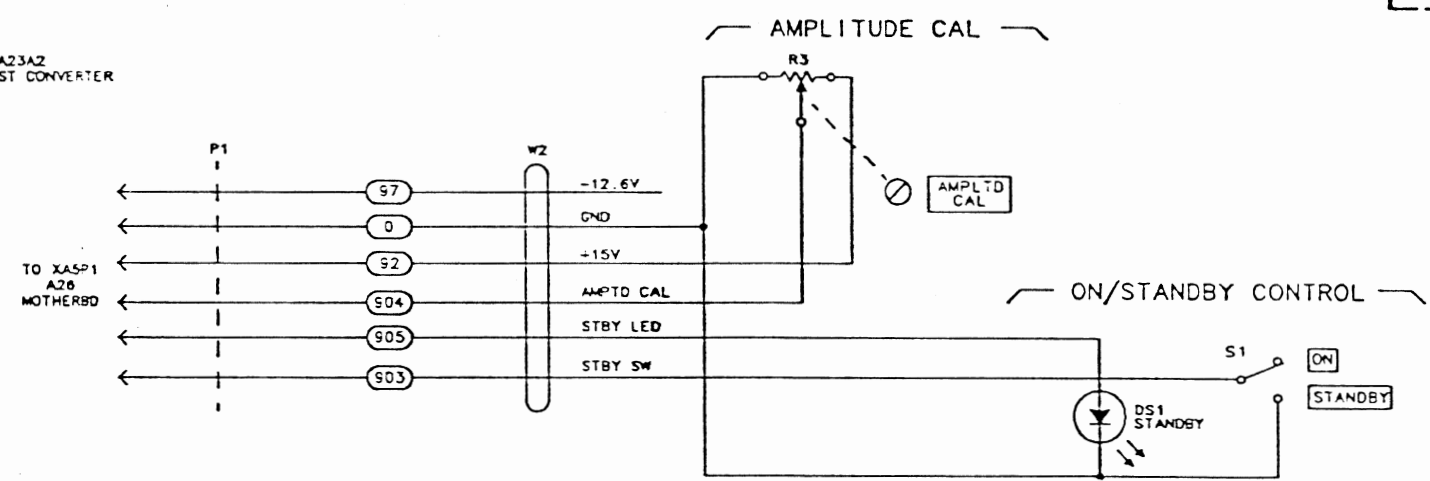
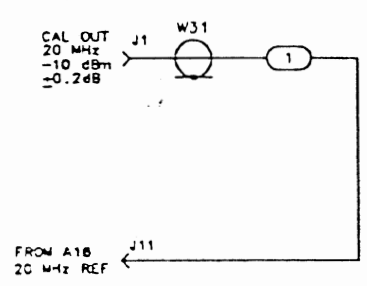
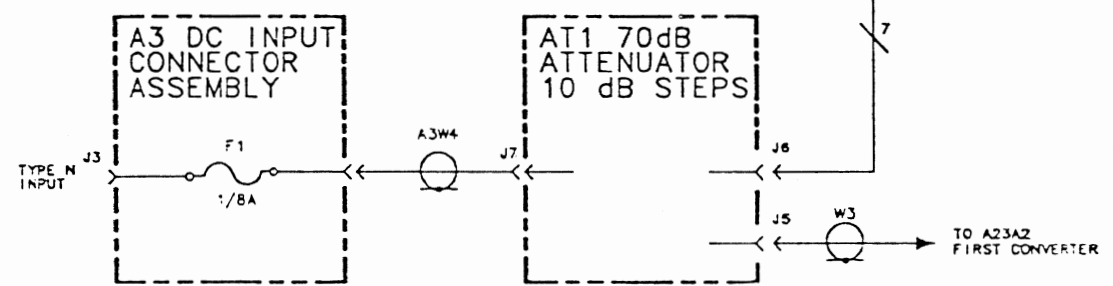
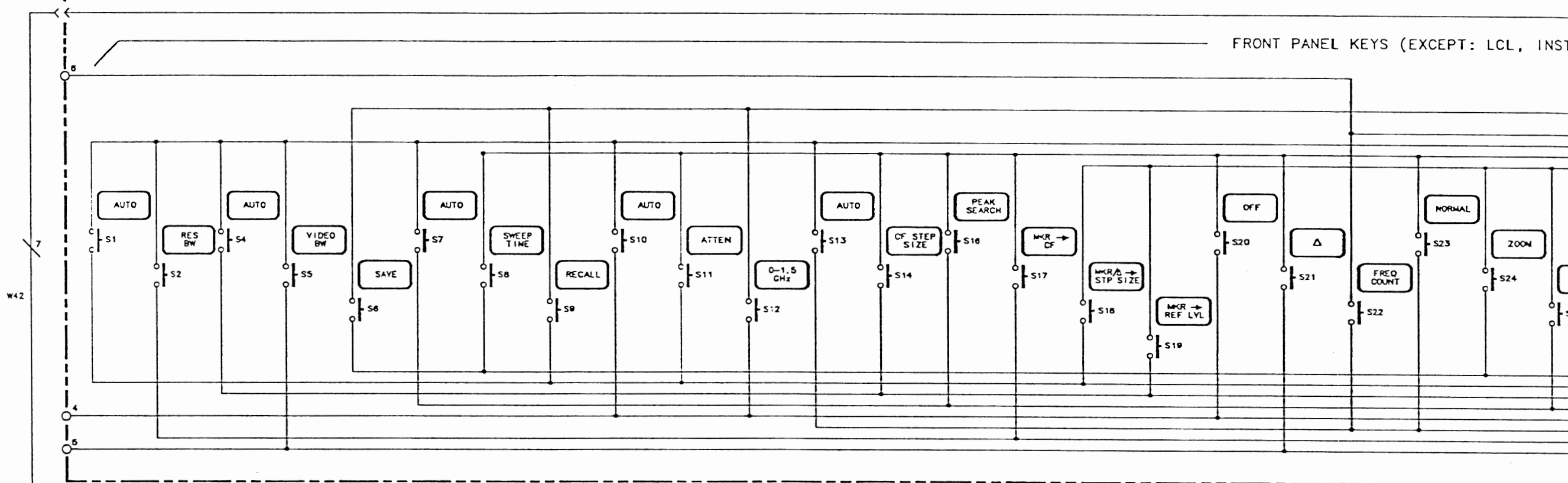
A14

A14 TCXO Buffer Schematic Diagram, 85670-60200
Options H44 and H96

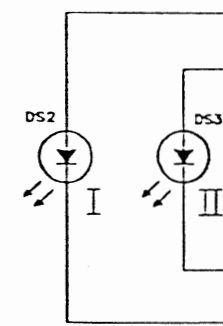
A5 FRONT PANEL
85680B OPTION H44
(SERIAL PREFIX: 2634A)
85680B OPTION H96
(SERIAL PREFIX: 2517A)

A1 KEYBOARD (NOTE 5)

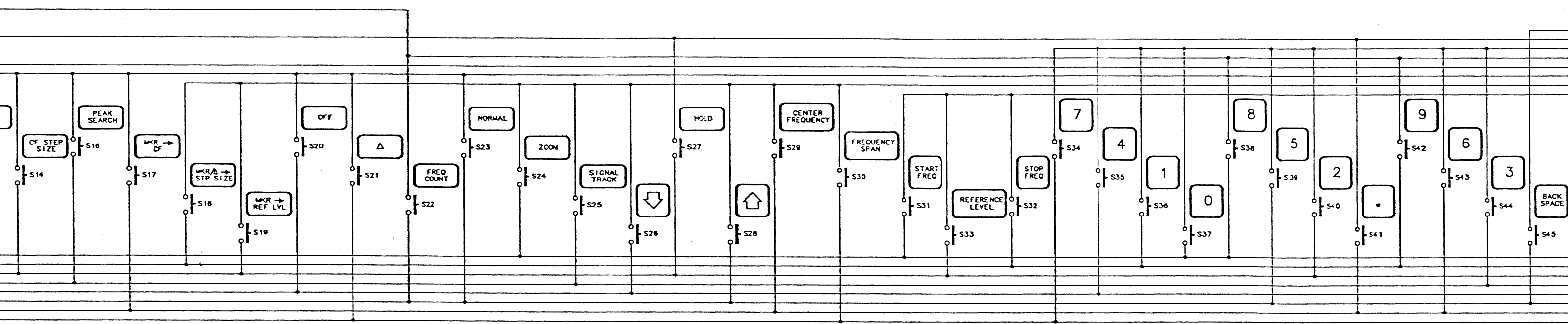
FRONT PANEL KEYS (EXCEPT: LCL, INST)



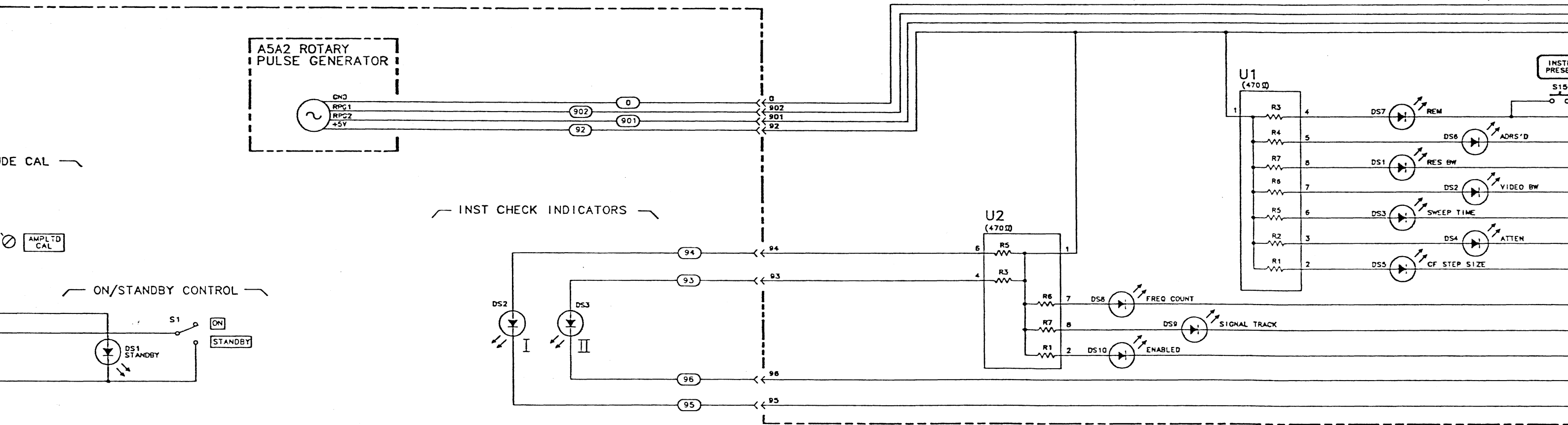
INST CHECK INDICA

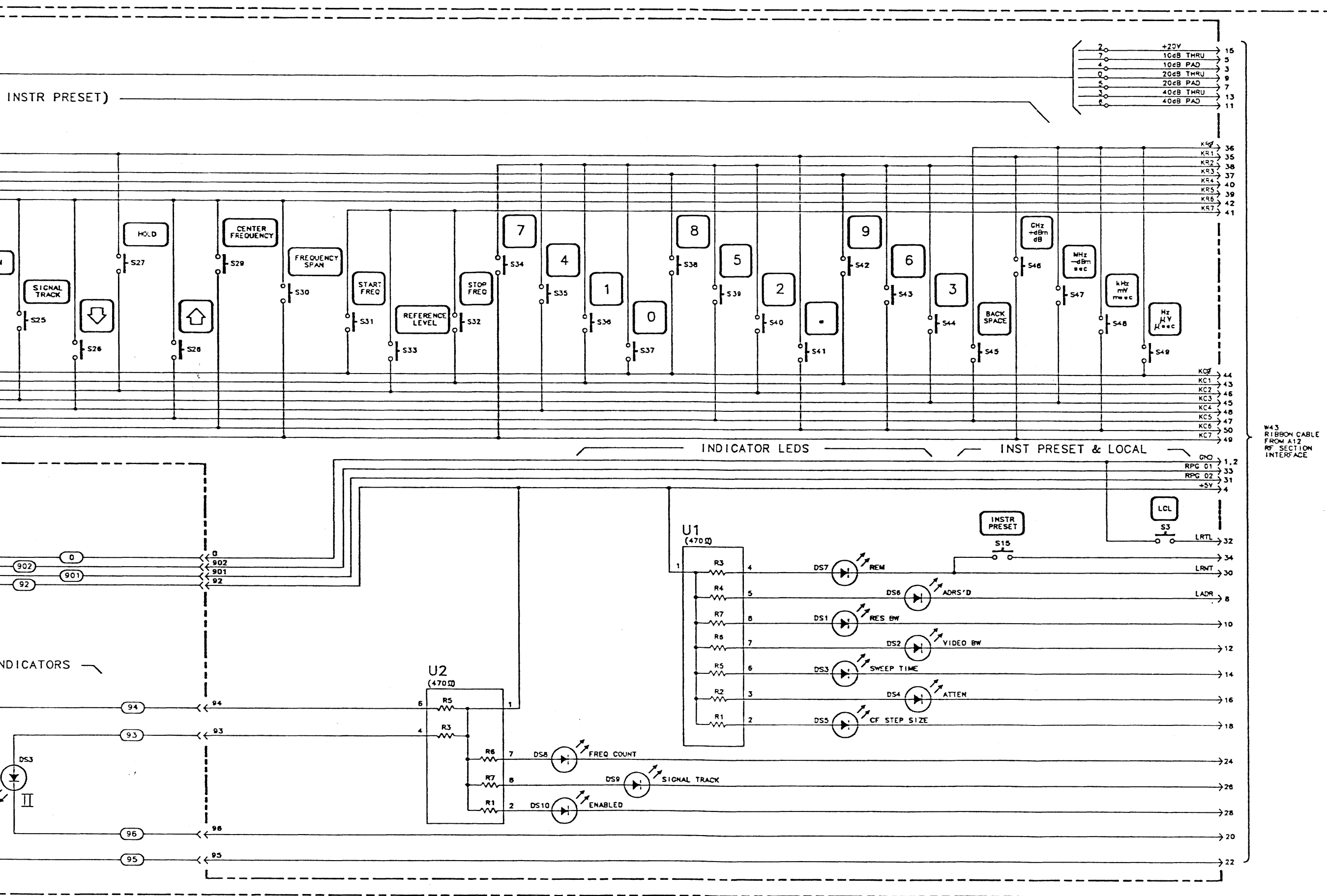


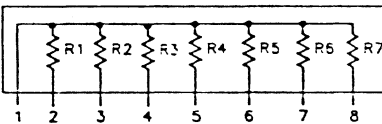
FRONT PANEL KEYS (EXCEPT: LCL, INSTR PRESET)



INDICATOR LEDS





- NOTES:
1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. FOR COMPLETE REFERENCE DESIGNATION, PREFIX ABBREVIATION WITH ASSEMBLY DESIGNATION.
 2. UNLESS OTHERWISE INDICATED: RESISTANCE IS IN OHMS (Ω) CAPACITANCE IS IN MICROFARADS (μF) INDUCTANCE IS IN MICROHENRIES (μH)
 3. U1 AND U2 PIN CONFIGURATION:
U₁ (470 Ω)

 4. PNEUMONIC TABLE

PNEUMONIC	DESCRIPTION
KRO-7	KEY ROWS 0-7
KCO-7	KEY COLUMNS 0-7
LRTL	LOW-RETURN TO LOCAL
LRMT	LOW-REMOTE
LADR	LOW-ADDRESS LED ON
 5. THE KEYBOARD PART NUMBER FOR EARLY VERSIONS OF 85680B OPTIONS H44 AND H96 IS 85680-60019. THE KEYBOARD PART NUMBER FOR LATER VERSIONS IS 85670-60019. WHEN ORDERING A REPLACEMENT KEYBOARD, ORDER PART NUMBER 85670-60019 FOR ALL VERSIONS. A PART LIST AND COMPONENT LOCATION FOR 85680-60019 IS LOCATED IN THE A5 FRONT PANEL SECTION OF THIS MANUAL. A PART LIST AND COMPONENT LOCATION FOR 85670-60019 IS LOCATED IN THE HP 85670A SECTION OF THIS MANUAL.

W43
RIBBON CABLE
FROM A12
RF SECTION
INTERFACE

General Parts Listing

Introduction

This chapter contains information on ordering replacement parts and assemblies. The parts lists document all assembly versions up to the time that the manual is printed.

Table 1 lists reference designations, abbreviations, and value multipliers used in the parts lists.

Table 2 lists the names and addresses that correspond to the manufacturer code numbers in the parts lists.

Table 3 lists the various types of AC power cables that are available, their description, and part numbers.

Table 4 lists all major assemblies, part numbers, and descriptions of the assemblies.

Table 5 lists cables, part numbers, and descriptions of the cables .

Table 6 lists miscellaneous parts, part numbers, and descriptions of the parts.

Figures 1 through 7 illustrate the locations of instrument assemblies and hardware with the part numbers listed.

General Parts List Format

The following information is listed for each part:

1. The Hewlett-Packard part number.
2. The part number check digit (CD).
3. The total quantity (Qty) in the assembly. (This number is stated once and only at the first mention of the part.)
4. The description of the part.
5. A five-digit code indicating a typical manufacturer of the part.
6. The manufacturer part number.

Ordering Information

To order a part listed in the general parts table, quote the HP part number, include the check digit, and indicate the quantity required. Address and mail the order to the Hewlett-Packard Sales and Service Office nearest you. The check digit ensures accurate and timely processing of your order.

To order a part that is not listed in the general parts table, include the function and description of the part, and the number of parts required. Address and mail the order to the Hewlett-Packard Sales and Service Office nearest you.

Direct Mail-Order System

Within the USA, Hewlett-Packard can supply parts through a direct mail-order system. Advantages of using the system are as follows:

1. Direct ordering and shipment from the Hewlett-Packard Parts Center in Mountain View, California.
2. No maximum or minimum quantity requirement on any mail order. (There is a minimum-order quantity imposed on orders made through the Hewlett-Packard Sales and Service Offices when the orders require billing and invoicing.)
3. Prepaid transportation. (There is a handling charge added to each order.)
4. No invoices.

A check or money order must accompany direct-mail orders. Mail-order forms and specific ordering information are available from Hewlett-Packard Sales and Service Offices.

Direct Phone-Order System

A phone-order system is available within the USA for regular and hotline replacement parts service. Hewlett-Packard has provided a toll-free phone number, and accepts Mastercard or Visa for orders.

Regular Orders

The toll-free phone number is (800) 227-8164. It is available 6 am to 5 pm (Pacific time), Monday through Friday. Regular orders require a four-day delivery time.

Hotline Orders

The hotline service for ordering emergency parts is available 24 hours a day, 365 days a year. There is an additional charge on hotline orders to cover the cost of freight and special handling.

The toll-free hotline phone number is (800) 227-8164, available 6 am to 5 pm (Pacific time), Monday through Friday. The phone number for after-hours, weekends, and holidays is (415) 968-2347. Hotline orders are normally delivered the following business day.

Table 1. Reference Designations, Abbreviations, and Multipliers (1 of 4)

REFERENCE DESIGNATIONS					
A	Assembly	F	Fuse	RT	Thermistor
AT	Attenuator, Isolator, Limiter, Termination	FL	Filter	S	Switch
B	Fan, Motor	HY	Circulator	T	Transformer
BT	Battery	J	Electrical Connector (Stationary Portion), Jack	TB	Terminal Board
C	Capacitor	K	Relay	TC	Thermocouple
CP	Coupler	L	Coil, Inductor	TP	Test Point
CR	Diode, Diode Thyristor, Step Recovery Diode, Varactor	M	Meter	U	Integrated Circuit, Microcircuit
DC	Directional Coupler	MP	Miscellaneous Mechanical Part	V	Electron Tube
DL	Delay Line	P	Electrical Connector (Movable Portion), Plug	VR	Breakdown Diode (Zener), Voltage Regulator
DS	Annunciator, Lamp, Light Emitting Diode (LED), Signaling Device (Visible)	Q	Silicon Controlled Rectifier (SCR), Transistor, Triode Thyristor	W	Cable, Wire, Jumper
E	Miscellaneous Electrical Part	R	Resistor	X	Socket
				Y	Crystal Unit (Piezoelectric, Quartz)
				Z	Tuned Cavity, Tuned Circuit
ABBREVIATIONS					
A		BSC	Basic	CNDCT	Conducting, Conductive, Conductivity, Conductor
A	Across Flats, Acrylic, Air (Dry Method), Ampere	BTN	Button	CONT	Contact, Continuous, Control, Controller
ADJ	Adjust, Adjustment	C		CONV	Converter
ANSI	American National Standards Institute (formerly USASI-ASA)	C	Capacitance, Capacitor, Center Tapped, Cermet, Cold, Compression	CPRSN	Co mpression
ASSY	Assembly	CCP	Carbon Composition Plastic	CUP-PT	Cup Point
AWG	American Wire Gage	CD	Cadmium, Card, Cord	CW	Clockwise, Continuous Wave
B		CER	Ceramic	D	
BCD	Binary Coded Decimal	CHAM	Chamfer	D	Deep, Depletion, Depth, Diameter, Direct Current
BD	Board, Bundle	CHAR	Character, Characteristic, Charcoal	DA	Darlington
BE-CU	Beryllium Copper	CMOS	Complementary Metal Oxide Semiconductor		
BNC	Type of Connector				
BRG	Bearing, Boring				
BRS	Brass				

Table 1. Reference Designations, Abbreviations, and Multipliers (2 of 4)

ABBREVIATIONS					
DAP-GL	Diallyl Phthalate Glass	FT	Current Gain Bandwidth Product (Transition Frequency), Feet, Foot	JFET	Junction Field Effect Transistor
DBL	Double				
DCDR	Decoder			K	
DEG	Degree				
D-HOLE	D-Shaped Hole	FXD	Fixed	K	Kelvin, Key, Kilo, Potassium
DIA	Diameter				
DIP	Dual In-Line Package	G		KNRLD	Knurled
DIP-SLDR	Dip Solder			KVDC	Kilovolts
D-MODE	Depletion Mode	GEN	General, Generator		Direct Current
DO	Package Type Designation	GND	Ground		
DP	Deep, Depth, Diametric Pitch, Dip	GP	General Purpose, Group	L	
DP3T	Double Pole Three Throw	H		LED	Light Emitting Diode
DPDT	Double Pole Double Throw			LG	Length, Long
DWL	Dowell	H	Henry, High	LIN	Linear, Linearity
		HDW	Hardware	LK	Link, Lock
		HEX	Hexadecimal, Hexagon, Hexagonal	LKG	Leakage, Locking
				LUM	Luminous
	E	HLCL	Helical		
E-R	E-Ring	HP	Hewlett-Packard Company, High Pass	M	
EXT	Extended, Extension, External, Extinguish				
		I		M	Male, Maximum, Mega, Mil, Milli, Mode
	F	IC	Collector Current, Integrated Circuit	MA	Milliampere
F	Fahrenheit, Farad, Female, Film (Resistor), Fixed, Flange, Frequency	ID	Identification, Inside Diameter	MACH	Machined
FC	Carbon Film/Composition, Edge of Cutoff Frequency, Face	IF	Forward Current, Intermediate Frequency	MAX	Maximum
		IN	Inch	MC	Molded Carbon Composition
FDTHRU	Feedthrough	INCL	Including	MET	Metal, Metallized
FEM	Female	INT	Integral, Intensity, Internal	MHZ	Megahertz
FIL-HD	Fillister Head			MINTR	Miniature
FL	Flash, Flat, Fluid	J		MIT	Miter
FLAT-PT	Flat Point			MLD	Mold, Molded
FR	Front	J-FET	Junction Field Effect Transistor	MM	Magnetized Material, Millimeter
FREQ	Frequency			MOM	Momentary
				MTG	Mounting
				MTLC	Metallic
				MW	Milliwatt

Table 1. Reference Designations, Abbreviations, and Multipliers (3 of 4)

ABBREVIATIONS					
N		PLSTC	Plastic	SMA	Subminiature, A Type (Threaded Connector)
N	Nano, None	PNL	Panel	SMB	Subminiature, B Type (Slip-on Connector)
N-CHAN	N-Channel	PNP	Positive Negative Positive (Transistor)		
NH	Nanohenry	POLYC	Polycarbonate	SMC	Subminiature, C-Type (Threaded Connector)
NM	Nanometer, Nonmetallic	POLYE	Polyester	SPCG	Spacing
NO	Normally Open, Number	POT	Potentiometer		
NOM	Nominal	POZI	Pozidriv Recess	SPDT	Single Pole Double Throw
NPN	Negative Positive Negative (Transistor)	PREC	Precision	SPST	Single Pole Single Throw
NS	Nanosecond, Non-Shorting, Nose	PRP	Purple, Purpose	SQ	Square
NUM	Numeric	PSTN	Piston	SST	Stainless Steel
NYL	Nylon (Polyamide)	PT	Part, Point, Pulse Time	STL	Steel
O		PW	Pulse Width	SUBMIN	Subminiature
OA	Over-All	Q		SZ	Size
		Q	Figure of Merit	T	
OD	Outside Diameter	R		T	Teeth, Temperature, Thickness, Time, Timed, Tooth, Typical
OP AMP	Operational Amplifier	R	Range, Red, Resistance, Resistor, Right, Ring		
OPT	Optical, Option, Optional	REF	Reference	TA	Ambient Temperature, Tantalum
P		RES	Resistance, Resistor	TC	Temperature Coefficient
PA	Picoampere, Power Amplifier	RF	Radio Frequency	THD	Thread, Threaded
PAN-HD	Pan Head	RGD	Rigid	THK	Thick
PAR	Parallel, Parity	RND	Round	TO	Package Type Designation
PB	Lead (Metal), Pushbutton	RR	Rear	TPG	Tapping
PC	Printed Circuit	RVT	Rivet, Riveted	TR-HD	Truss Head
PCB	Printed Circuit Board	S		TRMR	Trimmer
P-CHAN	P-Channel	SAWR	Surface Acoustic Wave Resonator	TRN	Turn, Turns
PD	Pad, Power Dissipation	SEG	Segment	TRSN	Torsion
PF	Picofarad, Power Factor	SGL	Single		
PKG	Package	SI	Silicon, Square Inch		
		SL	Slide, Slow		
		SLT	Slot, Slotted		

Table 1. Reference Designations, Abbreviations, and Multipliers (4 of 4)

ABBREVIATIONS					
U		VAR	Variable	Y	
		VDC	Volts—Direct Current		
UCD	Microcandela			YIG	Yttrium-Iron-Garnet
UF	Microfarad				
UH	Microhenry	W			
UL	Microliter,			Z	
	Underwriters'	W	Watt, Wattage,		
	Laboratories, Inc.		White, Wide, Width		
UNHDND	Unhardened	W/SW	With Switch	ZNR	Zener
		WW	Wire Wound		
V		X			
V	Variable, Violet,				
	Volt, Voltage	X	By (Used with		
VAC	Vacuum, Volts—		Dimensions),		
	Alternating Current		Reactance		

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

Table 2. Manufacturers Code List

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
00039	NEC ELECTRONICS INC	MTN VIEW, CA	US	94043
00046	UNITRODE CORP	LEXINGTON, MA	US	02173
00075	ARIZONA COIL INC	NOGALES, AZ	US	85621
00273	STILLWATER MFG CO	EAST FREEDOM, MA	US	02717
00278	MCCOY ELECTRONICS CO	HOLLY SPRINGS, PA	US	17065
00350	EXAR INTEGRATED SYSTEMS INC	SUNNYVALE, CA	US	94086
00466	NORELCO NORTH AMER PHILIPS LTG CORP	LOS ANGELES, CA	US	90021
00493	UNITED CHEMI-CON INC	COMPTON, CA	US	90220
00746	ROHM CORP	IRVINE, CA	US	92713
00779	NICHICON (AMERICA) CORP	SCHAUMBERG, IL	US	60195
00830	KYOCERA INTERNATIONAL INC	SAN DIEGO, CA	US	
00901	UNION CARBIDE CORP	DANBURY, CT	US	06810
01064	SCHAAL BROS INC	BERTHOUD, CO	US	80513
01074	HOLSWORTHY ELECTRONICS LTD	HOLSWORTHY	EG	
01128	RES-NET CORP	WHIPPANY, NJ	US	07981
01131	WESTERN THERMISTOR CORP	OCEANSIDE, CA	US	92054
01136	ELCO INDUSTRIES INC	ROCKFORD, IL	US	61125
01172	R C D COMPONENTS INC	BEDFORD, NH	US	03102
01185	MAGNET WIRE CORP	NEW YORK, NY	US	10013
01230	AEROVOX CORP	NEW BEDFORD, MA	US	02741
01250	GTE SYLVANIA ELEK COMPONENTS GROUP	WALTHAM, MA	US	02154
01339	GETTIG ENGRG & MFG CO INC	SPRING MILLS, PA	US	16875
01380	AMP INC	HARRISBURG, PA	US	17111
01409	CROVEN CRYSTALS	WHITBY	CN	L1N 5
01417	NEL FREQUENCY CONTROLS INC	BURLINGTON, WI	US	53105
01452	SANGAMO WESTON INC	NORCROSS, GA	US	30071
01461	GOE ENGINEERING CO INC	ONTARIO, CA	US	91761
01468	STETTNER & CO	LAUF	GM	D-856
01478	BOYD CORP	PLEASANTON, CA	US	94566
01542	HP DIV 01 SAN JOSE COMPONENTS	SAN JOSE, CA	US	95131
01590	PLESSEY SEMICONDUCTORS	SANTA ANA, CA	US	92705
01607	ALLEN-BRADLEY CO INC	EL PASO, TX	US	79935
01688	MURATA CORPORATION OF AMERICA	MARIETTA, GA	US	30067
01691	TRW INC SEMICONDUCTOR DIV	LAWNDALE, CA	US	90260
01698	TEXAS INSTRUMENTS INC	DALLAS, TX	US	75265
01708	JUBULATION	SANTA CRUZ, CA	US	95060
01736	ALLIED ELECTRONICS CORP	CHICAGO, IL	US	60612
01760	MATSUO ELECTRONICS OF AMERICA	HUNTINGTON BEACH, CA	US	90245
01795	SYNERTEK	SANTA CLARA, CA	US	95051
01850	AROMAT CORP	MOUNTAINSIDE, NJ	US	07092
01854	RCL ELECTRONICS INC	NORTHBROOK, IL	US	60062
01869	PULSE ENGINEERING INC	SAN DIEGO, CA	US	92111
01876	HP DIV 02 SCD IC'S	SANTA CLARA, CA	US	95050
01885	HAMILTON STANDARD CONTROLS INC	WINDWOR LOCKS, CT	US	06096
01886	COILCRAFT INC	CARY, IL	US	60013
01887	FERROXCUBE CORP	SAUGERTIES, NY	US	12477

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
01898	HI-G CO INC	HARTFORD, CT	US	06114
01916	BUNKER RAMO CORP AMPHENOL CONN DIV	BROADVILLE, IL	US	60153
01921	RCA CORP	NEW YORK, NY	US	10112
01923	NYLOGRIP PRODUCTS	WALTHAM, MA	US	02154
01924	ITW FASTEX	DES PLAINES, IL	US	60016
01939	ELPAC INC COMPONENTS DIV	IRVINE, CA	US	92664
01943	HP DIV 04 SPD CABLES 64	PALO ALTO, CA	US	94304
01953	HP DIV 04 SPD MOLDING 91	PALO ALTO, CA	US	94304
01973	GE CO SEMICONDUCTOR PROD DEPT	AUBURN, NY	US	13201
01991	TRANSITRON ELECTRONIC CORP	WAKEFIELD, MA	US	01880
01992	KDI PYROFILM CORP	WHIPPANY, NJ	US	07981
01993	MARKEL CORP	NORRISTOWN, PA	US	19404
02010	AVX CORP	GREAT NECK, NY	US	11021
02030	NATIONAL WIRE & CABLE CO INC	LOS ANGELES, CA	US	90031
02037	MOTOROLA INC	ROSELLE, IL	US	60195
02038	UNICORP	ORANGE, NJ	US	07050
02062	HP DIV 05 MSD	SAN JOSE, CA	US	94304
02086	WESTINGHOUSE ELEC CORP SEMICON DEPT	YOUNGWOOD, PA	US	15697
02091	ULTRONIX INC	GRAND JUNCTION, CO	US	81501
02123	EG & G INC	WELLESLEY, MA	US	02181
02139	MEPCO/ELECTRA INC	MORRISTOWN, NJ	US	07960
02145	RAYCHEM CORP	MENLO PARK, CA	US	94025
02160	PANDUIT CORP	TINLEY PARK, IL	US	60477
02170	AMATOM ELEK HARDWARE DIV OF MITE	NEW ROCHELLE, NY	US	06515
02172	JEFFERS ELECTRONICS INC	NOGALES, AZ	US	85621
02180	PRECISION MONOLITHICS INC	SANTA CLARA, CA	US	95054
02191	CORNING COMPONENTS INC	CORNING, NY	US	14830
02194	ROBINSON NUGENT INC	NEW ALBANY, IN	US	47150
02210	MILTON ROSS CO	SOUTHAMPTON, PA	US	18966
02215	KELVIN ELECTRIC CO	VAN NUYS, CA	US	91401
02236	SILICON TRANSISTOR CORP	CHELMSFORD, MA	US	11530
02237	FAIRCHILD SEMICONDUCTOR CORP	CUPERTINO, CA	US	95014
02273	TRW INC BURLINGTON DIV	BURLINGTON, IA	US	52601
02290	RAYTHEON CO SEMICONDUCTOR DIV HQ	MOUNTAIN VIEW, CA	US	94040
02296	HP DIV 08 COLO SPRGS	COLORADO SPRGS, CO	US	80907
02344	GE CO MINIATURE LAMP PROD DEPT	CLEVELAND, OH	US	44112
02362	HP DIV 09 LID COMPONENTS	LOVELAND, CO	US	80537
02363	HP DIV C5 COLORADO IC	FT COLLINS, CO	US	80525
02366	KOA SPEER ELECTRONICS INC	BRADFORD, PA	US	16701
02367	CORNELL-DUBILIER/SANGAMO	WAYNE, NJ	US	07470
02379	TEXAS CAPACITOR CO INC	HOUSTON, TX	US	77036
02392	C & K COMPONENTS INC	NEWTON, MA	US	02158
02408	DIXON INDUSTRIES CORPORATION	BRISTOL, RI	US	02809
02414	BURNDY CORP	NORWALK, CT	US	06856
02415	DALE ELECTRONICS INC	YANKTON, SD	US	57078
02440	THOMPSON BREMER DIV VARE	CHICAGO, IL	US	60622

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
02465	ANILLO INDUSTRIES INC	ORANGE, CA	US	92667
02483	CTS CORP	ELKHART, IN	US	46514
02484	CTS CORP PASO ROBLES	PASO ROBLES, CA	US	93446
02499	IRC INC	BOONE, NC	US	28607
02501	TELEDYNE INDUSTRIES INC	LOS ANGELES, CA	US	90067
02556	MONTROSE PRODUCTS CO	AUBURN, MA	US	01501
02567	OMTRONICS MFG INC	OMAHA, NE	US	68105
02569	CRYSTALONICS, DIV TELEDYNE	CAMBRIDGE, MA	US	02140
02572	TELEDYNE THERMATICS	ELM CITY, NC	US	27822
02574	RLC ELECTRONICS INS	MT KISCO, NY	US	10549
02577	HAMLIN INC	LAKE MILLS, WI	US	53551
02582	CLAROSTAT MFG CO INC	DOVER, NH	US	03820
02598	UNITRODE CORP	WATERTOWN, MA	US	02172
02603	NATIONAL WIRE & STAMPING INC	ENGLEWOOD, CO	US	80110
02608	THERMALLOY INC	DALLAS, TX	US	75234
02619	SOLITRON DEVICES INC (DIODES)	TAPPAN, NY	US	10983
02634	SPRAGUE ELECTRIC SEMICON DIV	CONCORD, NH	US	03301
02664	SEMTECH CORP	NEWBURY PARK, CA	US	91320
02668	EDISON ELEK DIV MCGRAW-EDISON	MANCHESTER, NH	US	03130
02675	AMERICAN COMPONENTS INC	CONSHOHOCKEN, PA	US	19428
02682	ITT SEMICONDUCTORS DIV	TUSTIN, CA	US	92680
02685	LOBAUGH ROLLIN J	SOUTH SAN FRANC, CA	US	94080
02686	WATKINS-JOHNSON CO	PALO ALTO, CA	US	94304
02688	MICROSEMI CORP	SCOTSDALE, AZ	US	85252
02696	CORNING GLASS WORKS ELEK PROD DIV	CORNING, NY	US	14830
02706	WARD LEONARD HAGERSTOWN DIV	HAGERSTOWN, MD	US	21740
02713	GENERAL INSTRUMENT CORP (DIODE)	HICKSVILLE, NY	US	11802
02718	VALOR ELECTRONICS INC	SANTA ANA, CA	US	92705
02734	AMETEK INC RODAN DIV	ANAHEIM, CA	US	92806
02739	MINI-CIRCUITS LAB	BROOKLYN, NY	US	11235
02744	ELEC-TROL INC	SAUGUS, CA	US	91350
02761	FENWAL ELECTRONICS INC	SADDLE BROOK, NJ	US	07662
02763	TELEDYNE SEMICONDUCTOR	MOUNTAIN VIEW, CA	US	94043
02771	ANSLEY ELECTRIC	LOS ANGELES, CA	US	90032
02788	M/A-COM INC	BURLINGTON, MA	US	01803
02798	CORNING ELECTRONICS	RALEIGH, NC	US	27604
02803	CODI SEMICONDUCTOR	LINDEN, NJ	US	07410
02805	COOPER INDUSTRIES INC	HOUSTON, TX	US	77210
02813	U S CAPACITOR CORP	BURBANK, CA	US	91504
02826	DENNISON MFG CO	FRAMINGHAM, MA	US	01701
02856	MOHAWK SPRING CO INC	ARLINGTON HEIGH, IL	US	60008
02865	ALPHA INDUSTRIES INC	WOBURN, MA	US	01801
02877	ANGSTROHM PRECISION INC	VAN NUYS, CA	US	91405
02883	SILICONIX INC	SANTA CLARA, CA	US	95054
02910	SIGNETICS CORP	SUNNYVALE, CA	US	94086
02923	CHOMERICS INC	WOBURN, MA	US	01801

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
02928	VISHAY INTERTECHNOLOGY INC	MALVERN, PA	US	19355
02937	VOLTRONICS CORP	HANOVER, NJ	US	07936
02946	DUPONT E I DE NEMOURS & CO	WILMINGTON, DE	US	19801
02995	MEPCO/CENTRALAB INC	RIVIERA, FL	US	33404
03038	INTL RECTIFIER CORP	LOS ANGELES, CA	US	90069
03122	EMCON DIV ITW	SAN DIEGO, CA	US	92129
03123	MICRO-OHM CORP	EL TORO, CA	US	92630
03171	SOLITRON DEVICES INC	PALM BEACH, FL	US	33404
03172	TRW MICROWAVE	SUNNYVALE, CA	US	94086
03174	ANZAC ELEK DIV ADAMS-RUSSEL CO INC	WALTHAM, MA	US	02154
03206	DUPONT CONNECTOR SYSTEMS	CAMP HILL, PA	US	17011
03232	PRODUCT COMPONENT CORP	MT VERNON, NY	US	10553
03239	WAVETEK	SAN DIEGO, CA	US	92111
03257	M-TRON INDUSTRIES INC	YANKTON, SD	US	57078
03259	STANFORD APPLIED ENGINEERING	SANTA CLARA, CA	US	95054
03263	ELECTRONIZED CHEMICALS CORP	BURLINGTON, MA	US	01803
03273	GOWANDA ELECTRONICS CORP	GOWANDA, NY	US	14070
03282	GENERAL CABLE CORP	NEW YORK, NY	US	10017
03285	ANALOG DEVICES INC	NORWOOD, MA	US	02062
03291	AVANTEK INC	SANTA CLARA, CA	US	95054
03292	CORNING GLASS WORKS	CORNING, NY	US	14830
03297	EMC TECHNOLOGY INC	CHERRY HILL, NJ	US	08034
03316	SPECIALTY CONNECTOR CO	FRANKLIN, IN	US	46131
03317	AEG-TELEFUNKEN CORP	ENGLEWOOD, NJ	US	07632
03334	NV PHILIPS ELCOMA	EINDHOVEN	NE	02876
03352	SWISS AUTOMATICS INC	COLUMBUS, NE	US	68601
03371	USM CORP NYLOK FASTENER DIV	TORRANCE, CA	US	90501
03380	GRIES/DYNACAST CO DIV COATES-CLARK	NEW ROCHELLE, NY	US	10802
03389	VARADYNE INC	SANTA MONICA, CA	US	90404
03394	METHODE ELECTRONICS INC	CHICAGO, IL	US	60656
03395	MEPCO/CENTRALAB INC	WEST PALM BEACH, FL	US	33407
03406	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA, CA	US	95052
03412	CORNING GLASS WORKS (WILMINGTON)	WILMINGTON, NC	US	28401
03418	MOLEX INC	LISLE, IL	US	60532
03428	NONOTUCK MFG CO	HADLEY FALLS, MA	US	01075
03441	F-DYNE ELECTRONICS CO	BRIDGEPORT, CT	US	06605
03521	JOHANSON DIELECTRICS INC	BURBANK, CA	US	91510
03530	STACKPOLE COMPONENT CO	RALEIGH, NC	US	27620
03545	TELEDYNE PHILBRICK NEXUS	DEDHAM, MA	US	02026
03594	CARTER SEMICONDUCTORS	LOWELL, MA	US	01850
03621	M/A-COM CABLEWAVE MINI PROD	BURLINGTON, MA	US	01803
03627	SOLID STATE DEVICES INC	LA MIRADA, CA	US	90638
03647	INSTRUMENT SPECIALTIES CO INC	DEL WATER GAP, PA	US	07424
03651	MEPCO/ELECTRA CORP	SAN DIEGO, CA	US	92121
03658	ALPHA IND MICROELECTRONICS DIVISION	COLMAR, PA	US	18915
03706	WEST-CAP ARIZONA	SAN FERNANDO, CA	US	91340

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
03714	INTERSIL INC	CUPERTINO, CA	CA	95014
03724	BIVAR INC	SANTA ANA, CA	US	92705
03740	ERIE TECH PROD INC ERIE FREQ CONT	CARLISLE, PA	US	17013
03744	BOURNS INC	RIVERSIDE, CA	US	92507
03746	SPECTRUM CONTROL INC	ERIE, PA	US	16505
03747	COLORADO CRYSTAL CORP	LOVELAND, CO	US	80537
03762	TELE-TECH CORP	BOZEMAN, MT	US	59771
03793	SILICON GENERAL INC	SAN JOSE, CA	US	95134
03794	ADVANCED MICRO DEVICES INC	SUNNYVALE, CA	US	94086
03795	MOTOROLA INC	FRANKLIN PARK, IL	US	60131
03799	HARRIS CORP	MELBOURNE, FL	US	32901
03811	INTEL CORP	SANTA CLARA, CA	US	95054
03827	FAIR RITE PRODUCTS CORP	WALLKILL, NY	US	12589
03849	MICROSYSTEMS INTERNATIONAL LTD	OTTAWA	CN	
03910	GENERAL ELECTRIC CO	PHILADELPHIA, PA	US	19124
03923	SIEMENS CORP	ISELIN, NJ	US	08830
03938	MIDLAND-ROSS CORP	CLEVELAND, OH	US	44113
03972	OHMITE MFG CO	SKOKIE, IL	US	60076
03973	HP DIV 45 NMD	SANTA ROSA, CA	US	95401
04068	LABINAL COMPONENTS & SYSTEMS INC	ELK GROVE VILLA, IL	US	60007
04078	SGS-THOMSON MICROELECTRONICS INC	PHOENIX, AZ	US	85022
04092	MONOLITHIC MEMORIES INC	SANTA CLARA, CA	US	95054
04121	SEMICONDUCTOR CIRCUITS INC	HAVERHILL, MA	US	01830
04150	VICLAN INC	SAN DIEGO, CA	US	92138
04169	SANGAMO ELECTRIC CO	SPRINGFIELD, IL	US	62702
04181	AHAM-TOR	RANCHO, CA	US	91702
04182	SHALLCROSS INC	NORTHBROK, IL	US	60062
04200	SPRAGUE ELECTRIC CO	LEXINGTON, MA	US	02173
04204	SPS TECHNOLOGIES	NEWTOWN, PA	US	18940
04213	STIMPSON EDWIN B CO INC	BROOKLYN, NY	US	11705
04225	THOMAS & BETTS CORP	RARITAN, NJ	US	08869
04234	DELBERT BLINN CO	POMONA, CA	US	91766
04261	INSULECTRO CORP	BURLINGAME, CA	US	94010
04314	VLN CORP VICTOREEN INSTRUMENT DIV	CLEVELAND, OH	US	44103
04379	AMETEK INC	PAOLI, PA	US	19301
04393	CENTRE ENGINEERING INC	STATE COLLEGE, PA	US	16801
04418	ALLEN MFG CO	HARTFORD, CT	US	06101
04423	G.E. CERAMICS, INC.	CHATTANOOGA, TN	US	37405
04458	BLILEY ELECTRIC CO	ERIE, PA	US	16508
04464	BRAND REX CO	WILLIMANTIC, CT	US	06226
04475	CAMBRIDGE THERMIONIC CORP	CAMBRIDGE, MA	US	02138
04486	ITT CORP	NEW YORK, NY	US	10022
04492	CENTRALAB INC	MILWAUKEE, WI	US	53209
04504	GENERAL INSTRUMENT CORP	CLIFTON, NJ	US	07012
04507	TRW INC	CLEVELAND, OH	US	44124
04514	DOW CORNING CORP	MIDLAND, MI	US	48641

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
04522	ELECTRO MOTIVE CORP	FLORENCE, SC	US	06226
04550	GENERAL ELECTRIC CO	FAIRFIELD, CT	US	06430
04563	ERIE TECHNOLOGICAL PRODUCTS INC	ERIE, PA	US	16512
04564	ESSEX INTERNATIONAL INC	FORT WAYNE, IN	US	46804
04567	ITT HARPER DIV	CHICAGO, IL	US	60606
04568	BECKMAN INDUSTRIAL CORP	FULLERTON, CA	US	92635
04581	BARWOOD MFG CORP	EVERETT, MA	US	02149
04605	FISCHER SPECIAL MFG CO	CINCINNATI, OH	US	45206
04615	J F D ELECTRONICS CORP	BROOKLYN, NY	US	11219
04645	SIGNALITE DIV GENERAL INST CORP	NEPTUNE, NJ	US	07753
04648	PIEZO CRYSTAL CO	CARLSILE, PA	US	17013
04670	EF JOHNSON CO	WASECA, MN	US	56093
04672	TRW INC PHILADELPHIA DIV	PHILADELPHIA, PA	US	19108
04703	LITTELFUSE INC	DES PLAINES, IL	US	60016
04719	MARWEDEL C W	SAN FRANCISCO, CA	US	94103
04726	3M CO	ST PAUL, MN	US	55144
04733	BELL INDUSTRIES INC MILLER JW DIV	COMPTON, CA	US	90224
04757	OAK SWITCH SYSTEMS INC	CRYSTAL LAKE, IL	US	60014
04776	POTTER & BRUMFIELD INC	PRINCETON, IN	US	47671
04805	ILLINOIS TOOL WORKS INC SHAKEPROOF	ELGIN, IL	US	60126
04821	TILLEY MFG CO	MORGAN HILL, CA	US	94070
04822	STACKPOLE CARBON CO	ST MARYS, PA	US	15857
04828	TINNERMAN PRODUCTS INC	CLEVELAND, OH	US	44101
04830	STEWART STAMPING CORP	YONKERS, NY	US	10704
04853	VARFLEX CORP	ROME, NY	US	13440
04880	ZIERICK MFG CO	MT KISCO, NY	US	10549
04935	MEPCO ELECTRA CORP	MORRISTOWN, NJ	US	07960
04939	SCHNITZER ALLOY PRODUCTS CO	ELIZABETH, NJ	US	07206
04977	ITT CORP COMPONENTS DIV	NEW YORK, NY	US	10022
04990	GRAYHILL INC	LA GRANGE, IL	US	60525
05016	MONITOR PRODUCTS CO INC	OCEANSIDE, CA	US	92054
05065	TEXAS INSTRUMENTS INC	ATTLEBORO, MA	US	02703
05088	VARO INC	GARLAND, TX	US	75046
05098	VICTORY ENGINEERING CORP	SPRINGFIELD, NJ	US	07081
05108	KULKA-SMITH INC	MANASQUAN, NJ	US	08736
05131	ELECTRONIC DEVICES INC	YONKERS, NY	US	10710
05160	VRN INTERNATIONAL	ST PETERSBURG, FL	US	33710
05176	AMERICAN SHIZUKI CORP	CANOGA PARK, CA	US	91304
05232	BRADY W H CO	MILWAUKEE, WI	US	53209
05293	PRECISION METAL PRODUCT CO	STONEHAM, MA	US	02180
05347	UNIMICA	NEW YORK, NY	US	10013
05350	WILMINGTON FIBRE SPECIALTY CO	NEW CASTLE, DE	US	19720
05364	LITTON PRECISION PROD INC	VAN NUYS, CA	US	91409
05368	FCP INC	OLATHE, KS	US	66062
05400	REESE J RAMSEY INC	NEW YORK, NY	US	10007
05436	BURR-BROWN CORP	TUCSON, AZ	US	85706

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
05447	BERGQUIST CO	MINNEAPOLIS, MN	US	55420
05453	ICO-RALLY CORP	SUNNYVALE, CA	US	94303
05461	ITT HARPER INC	MORTON GROVE, IL	US	60053
05466	EMHART CORP	FARMINGTON, CT	US	06032
05507	MILLER DIAL & NAMEPLATE CO	EL MONTE, CA	US	91734
05518	AUGAT INC	MANSFIELD, MA	US	02048
05524	DALE ELECTRONICS INC	COLUMBUS, NE	US	68601
05535	KEYSTONE ELECTRONICS CORP	NEW YORK, NY	US	10012
05545	NATIONAL TEL TRONICS CORP	YONKERS, NY	US	10701
05559	ALPHA WIRE CORP	ELIZABETH, NJ	US	07207
05568	JACOBSON MFG CO INC	KENILWORTH, NJ	US	07033
05589	UNIFORM TUBES	COLLEGEVILLE, PA	US	19426
05623	CAMDEN WIRE CO INC	CAMDEN, NY	US	13316
05630	WESTON COMPONENTS	ARCHBALD, PA	US	18403
05648	MAGNECRAFT ELECTRIC CO	CHICAGO, IL	US	60630
05661	ALCO ELECTRONIC PRODUCTS INC	NORTH ANDOVER, MA	US	01845
05668	VITRAMON INC	MONROE, CT	US	06468
05683	WECKESSER CO INC	CHICAGO, IL	US	60641
05704	SAN FERNANDO ELECTRIC MFG CO	SAN FERNANDO, CA	US	91341
05742	P C A ELECTRONICS INC	SEPULVEDA, CA	US	91343
05768	MALCO-A MICRODOT CO	PASADENA, CA	US	91030
05769	ITT SEAELECTRO CORP	TRUMBULL, CT	US	06611
05792	INTL ELECTRONIC RESEARCH CORP	BURBANK, CA	US	91502
05809	MARSHALL IND CAPACITOR DIV	MONROVIA, CA	US	91016
05826	AMER PRCN IND INC DELEVAN DIV	AURORA, NY	US	14052
05879	AMPHENOL CORPORATION	DANBURY, CT	US	06810
05917	RIFA AB	STOCKHOLM	SW	S-163
05943	TEXAS INSTRUMENTS DEUTSCHLAND GMBH	FREISING	GM	8050
05946	VALVO GMBH	HAMBURG	GM	2000
05951	WICKMANN-WERKE A G	WITTEN-ANNEN	GM	5870
05959	MARQUARDT GMBH	RIETHEIM	GM	D-720
05967	VTM A/S	GLOSTRUP	DK	2080
05982	CELDUC CONSTR ELECTRIQUES DU CENTRE	SORBIERS	FR	42
05985	SESCOSEM	SAINT EGREVE	FR	75781
05992	EFCO COMPOSANTS	NANTERRE	FR	
05993	CORNING GLASS EUROPE SOVCOR	LE VESINET	FR	
06003	SESCOSEM (63)	PARIS	FR	75781
06032	STC/STANTEL	DEVON	EG	
06039	SEAELECTRO LTD	PORTSMOUTH	EG	
06058	BOURNS TRIMPOT LTD	MIDDLESEX	EG	
06118	ROEDERSTEIN/RESISTA GMBH	LANDSHUT	GM	8300
06121	SIEMENS AG	MUNICH	GM	8000
06127	WIMA	MANNHEIM	GM	6800
06252	AB ELEKTRONIK GMBH	SALZBURG	AU	A-501
06328	SCHURTER AG	LUZERN	SW	CH-60
06330	CONDENSATEURS FRIBOURG S A	FRIBOURG	SW	

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
06337	PHILLIPS GLOEILAMPENFABRIEKEN N V	EINDHOVEN	HL	
06344	FUJITSU MICROELECTRONICS INC	SANTA CLARA, CA	US	95054
06347	HITACHI AMERICA LTD	SUNNYVALE, CA	US	94086
06352	TDK CORPORATION OF AMERICA	SKOKIE, IL	US	60076
06354	TOSHIBA CORP	TOKYO	JP	
06424	E-SIL COMPONENTS LTD	SUNDERLAND	EG	SR4 6
06501	BARBER & COLEMAN LTD	SALE CHES	EG	
06563	SIEMENS CORP COMPONENTS GROUP	SCOTTSDALE, AZ	US	85252
06650	AEG-TELEFUNKEN	HEILBRONN	GM	7100
06665	SAMTEC	NEW ALBANY, IN	US	47150
06784	MIDWEST COMPONENTS	MUSKEGON, MI	US	49443
06857	TRAK MICROWAVE CORP	TAMPA, FL	US	33614
06860	HUBER & SUHNER AG	HERISAU	SW	
06900	JUDD WIRE	BURLINGTON, MA	US	01803
06916	SONY CORP	TOYKO	JP	141
06951	TRW RESISTIVE PRODUCTS DIV	CORPUS CHRISTI, TX	US	78411
07041	R.A.F. ELECTRONIC HARDWARE INC	STRATFORD, CT	US	06497
07050	MICRO POWER SYSTEMS	SANTA CLARA, CA	US	95050
07158	EATON CORP	CLEVELAND, OH	US	44144
07179	AAVID ENGINEERING INC	LACONIA, NH	US	03247
07221	SUPERTEX INC	SUNNYVALE, CA	US	94086
07284	PAKTRON DIV ITW	VIENNA, VA	US	22180
07338	J K L COMPONENTS CORP	LOS ANGELES, CA	US	90064
07379	SAN-O INDUSTRIAL CORP	BOHEMIA LI, NY	US	11716
07398	BEL FUSE INC	JERSEY CITY, NJ	US	07302
07477	AMERICAN OIL & SUPPLY CO	NEWARK, NJ	US	07105
07766	LA RADIOTECHNIQUE COMPELEC	VILLEVRBANNE	FR	
07798	REMTEK CORP	SUNNYVALE, CA	US	
08097	SPRAGUE-GOODMAN ELECTRONICS	NEW HYDE PARK, NY	US	11040
08113	KAHGAN ELECTRONICS CORP	HEMPSTEAD, NY	US	11550
08123	COIL-Q CORP	BRONXVILLE, NY	US	
08259	DALE ELECTRONICS INC	TEMPE, AZ	US	85252
08261	STAR MICRONICS INC	NEW YORK, NY	US	
08335	SOURIAU INC	SAUGUS, CA	US	95203
08369	FILECA	STE GENEVIEVE	FR	
08560	OXLEY DEV LTD	CUMBRIA	EG	
08666	PANEL COMPONENTS CORP	SANTA ROSA, CA	US	
08709	PANASONIC INDUSTRIAL CO	SECAUCUS, NJ	US	07094
08778	MADISON CABLE CORP	WORCHESTER, MA	US	01603
08779	MITSUBISHI ELECTRONICS AMERICA	SUNNYVALE, CA	US	94086
08781	CATALYST RESEARCH CORP	BALTIMORE, MD	US	
08810	ROCKWELL INTERNATIONAL	ANAHEIM, CA	US	
08838	AND (ALPHA NUMERIC DISPLAYS)	BURLINGAME, CA	US	
08852	METELICS CORP	SUNNYVALE, CA	US	
09043	GLOW-LITE DIV OF DUTCH BOY	PAULS VALLEY, OK	US	
09050	XENELL	WYNNEWOOD, OK	US	

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
09126	ASJ PTE LTD	JURONG TOWN	SG	
09171	RHOMBUS INDUSTRIES INC	HUNTINGTON BEACH, CA	US	92649
09226	NEC ELECTRONICS INC	SANTA CLARA, CA	US	
09235	FOX ELECTRONICS	FT MEYERS, FL	US	33910
09283	TOPAZ SEMICONDUCTOR	SAN JOSE, CA	US	95132
09441	APPLIED ENGINEERING PRODUCT CO	HAMDEM, CT	US	
09448	WAMCO INC	FOUNTAIN VALLEY, CA	US	
09454	PRECISION RESISTIVE PRODS INC	MEDIAPOLIS, IA	US	52637
09507	HP DIV 53 SAD	ROHNERT PARK, CA	US	94928
09538	TUSONIX	TUCSON, AZ	US	85740
09694	ELECTRONIC ESSENTIALS	WOODSIDE, NY	US	
09849	NDK AMERICA INC	CUPERTINO, CA	US	54014
09855	KOWASANGYO CORP	TOKYO	JP	
09859	CERA-MITE CORP	GRAFTON, WI	US	53024
09862	HITACHI CABLE LTD	TOKYO	JP	
09914	UNITRODE CORP	LEXINGTON, MA	US	
09939	MURATA ERIE NORTH AMERICA INC	SMYRNA, GA	US	30080
09955	BOYD CORP	DENVER, CO	US	
10183	TADIRAN	TEL-AVIV	IS	
10200	ELECTRONIC CONCEPTS INC	EATONTOWN, NJ	US	
10290	COMMODORE SEMICONDUCTOR GROUP	NORRISTOWN, PA	US	
10302	CENTENNIAL PLASTICS	YELLVIELLE, AR	US	
10358	VOGT AG	LOSTORF	GM	
10401	NEW SYSTEMS MOLDING CORP	LOVELAND, CO	US	80537
10407	LSI LOGIC CORP	MILPITAS, CA	US	95035
10421	EPSON	TORRENCE, CA	US	
10443	HP DIV 64 NID	CORVALLIS, OR	US	
10456	PLASTEC PRODUCTS INC	FORT COLLINS, CO	US	
10457	JERMYN INDUSTRIES LTD (63)	KENT SEVENOAKS	EG	
10481	DALE ELECTRONICS INC	NORFOLK, NE	US	68701
10549	SCI MANUFACTURING INC	HUNTSVILLE, AL	US	35805
10572	XICOR, INC	MILPITAS, CA	US	
10631	GASKET SPECIALTIES	BRISBANE, CA	US	
10784	SHINNITTOKU ELECTRIC CO LTD	MINATO-KU TOKYO	JP	145
10795	STANDEX - PAUL SMITH DIVISION	CINCINNATI, OH	US	
10858	LINEAR TECHNOLOGY CORP	MILPITAS, CA	US	95035
10881	THOMSON-CSF	COURBEVOIE	FR	
10905	FIRA	LYON	FR	
11047	TEKA PRODUCTS INC	WOODSIDE, NY	US	
11111	SEEQ TECHNOLOGY INC	SAN JOSE, CA	US	
11171	SYNERGY MICROWAVE CORP	FAIRFIELD, NJ	US	
11187	VLSI TECHNOLOGY INC	SAN JOSE, CA	US	95131
11212	INDUCTOR SUPPLY, INC.	HUNTINGTON BEACH, CA	US	
11248	MICRON DIV OF R G ALLEN CO INC	NORTH HOLLYWOOD, CA	US	
11263	W GUNTHER GMBH	NURNBERG	GM	
11298	AVEL-LINDBURG	DANBURY	CT	

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
11345	CYPRESS SEMICONDUCTOR CORP	SAN JOSE, CA	US	95134
11357	BRISTOL ROYAL WORKSHOP BLIND	BRISTOL	EG	
11412	ISOLANTITE MFG COMPANY INC	STIRLING, NJ	US	
11421	KYOCERA CORPORATION	KYOTO	JP	
11599	MICRO-COAX COMPONENTS, INC	COLLEGEVILLE, PA	US	19426
11677	SARONIX	PALO ALTO, CA	US	
11684	JOSLYN DEFENSE SYSTEMS INC	BURLINGTON, VT	US	05401
11686	KYUSHU DENTSU CO LTD	NAGASAKI	JP	
11699	CENTRAL SEMICONDUCTOR CORP	HAUPPAUGE, NY	US	11788
11703	POWER GENERAL	CANTON, MA	US	
11708	THOMSON SEMICONDUCTORS	VELIZY VILLACOU	FR	78140
11723	CTL COMPONENTS LTD	LONDON	EG	SW19
11781	MIDLAND-ROSS CORP	LIVINGSTON, NJ	US	07039
11844	ELECTREY S A	MONTERREY	MX	64000
11892	EVOX/RIFA INC	LINCOLNSHIRE, IL	US	60015
11920	MIYAMA DENSEN CO LTD	TOKYO	JP	
11946	BKC INTERNATIONAL ELECTRONICS	LAWRENCE, MA	US	01841
11961	ALEXCO ENGINEERING SUPPLIES	COWDENBEATH	EG	KY4 9
11981	POWEREX	YOUNGWOOD, PA	US	15697
12125	SAMSUNG SEMICONDUCTOR INC	SANTA CLARA, CA	US	95054
12127	RF MONOLITHICS INC	DALLAS, TX	US	75234
12131	PRESIDIO COMPONENTS INC	SAN DIEGO, CA	US	92121
12186	DALLAS SEMICONDUCTOR CORP	DALLAS, TX	US	75244
12213	STACKPOLE ELECTRONICS INC	RALEIGH, NC	US	27620
12261	ERIE SPECIALTY PRODUCTS INC	ERIE, PA	US	16512
12340	KEMET ELECTRONICS CORPORATION	GREENVILLE, SC	US	29606
12355	INTERCONNECTION PRODUCTS INC	SANTA ANA, CA	US	92707
12382	LATTICE SEMICONDUCTOR CORP	BEAVERTON, OR	US	97006
12395	FEI MICROWAVE, INC.	SUNNYVALE, CA	US	94086
12418	OWL WIRE AND CABLE	CANASTATA, NY	US	13032
12456	WIRE PRO INC	SALEM, NJ	US	08079
12465	INTERNATIONAL POWER DEVICES	BRIGHTON, MA	US	02135
12473	AVX-RALEIGH DIVISION	RALEIGH, NC	US	27604
12482	BRADFORD ELECTRONICS INC	BRADFORD, PA	US	16701
12513	BUNNELL PLASTICS, INC	MICKLETON, NJ	US	08056
12516	MICROTRONICS ASSOCIATES PTE LTD	SINGAPORE	SG	1334
12580	SOUTH AMERICAN DEVELOPMENT CO	HYDE PARK, NY	US	12538
12656	BEYSCHLAG GMBH	HEIDE	GM	
12703	CHAMPION TECHNOLOGIES INC	FRANKLIN PARK, IL	US	60131
12830	KETEMA	BENSALEM, PA	US	19020
12845	WARTH INTERNATIONAL LTD	EAST GRINSTEAD	EG	RH192
12896	DOWKEY MICROWAVE INC	VENTURA, CA	US	93003

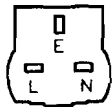

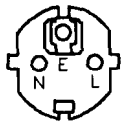
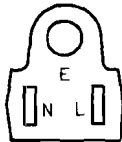
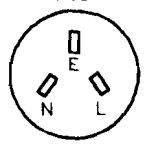
PLUG TYPE **	CABLE HP PART NUMBER	PLUG DESCRIPTION	CABLE LENGTH CM (INCHES)	CABLE COLOR	FOR USE IN COUNTRY
250V 	8120-1351 8120-1703	Straight* BS1363A 90°	229 (90) 229 (90)	Mint Gray Mint Gray	Great Britain, Cyprus, Nigeria, Singapore, Zimbabwe
250V 	8120-1369 8120-0696	Straight* NZSS198/ASC112 90°	201 (79) 221 (87)	Gray Gray	Argentina, Australia, New Zealand, Mainland China
250V 	8120-1689 8120-1692	Straight* CEE7-Y11 90°	201 (79) 201 (79)	Mint Gray Mint Gray	East and West Europe, Central African Republic, United Arab Republic (unpolarized in many nations)
125V 	8120-1348 8120-1538	Straight* NEMA5-15P 90°	203 (80) 203 (80)	Black Black	United States Canada, Japan (100 V or 200 V), Brazil, Colombia, Mexico, Phillipines, Saudia Arabia, Taiwan
	8120-1378	Straight* NEMA5-15P	203 (80)	Jade Gray	
	8120-4753	Straight	230 (90)	Jade Gray	
	8120-1521 8120-4754	90° 90°	203 (80) 230 (90)	Jade Gray Jade Gray	
250V 	8120-5182 8120-5181	Straight* NEMA5-15P 90°	200 (78) 200 (78)	Jade Gray Jade Gray	Israel
* Part number for plug is industry identifier for plug only. Number shown for cable is HP Part Number for complete cable, including plug. ** E = Earth Ground; L = Line; N = Neutral.					

Table 3. AC Power Cables Available

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Table 4. RF Section Assemblies

Reference Designator	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A5	85670-60003	3	1	FRONT PANEL ASSEMBLY (HP 85670A) (SERIAL NUMBER PREFIXES: 2541A AND ABOVE) (NOT AVAILABLE FOR FIELD REPLACEMENT)	28480	85670-60003
A5	85670-60005	5	1	FRONT PANEL ASSEMBLY, 75Ω (HP 85670A OPTION 001)(SERIAL NUMBER PREFIXES: 2541A AND ABOVE) (NOT AVAILABLE FOR FIELD REPLACEMENT)	28480	85670-60005
A5	85680-60050	2	1	FRONT PANEL ASSEMBLY, 75Ω (HP 85680B OPTION 001) (SERIAL NUMBER PREFIXES: 2408A-2503A) (NOT AVAILABLE FOR FIELD REPLACEMENT)	28480	85680-60050
A5	85680-60051	3	1	FRONT PANEL ASSEMBLY (HP 85680B) (SERIAL NUMBER PREFIXES: 2408A-2503A)	28480	85680-60051
A5	85680-60188	7	1	FRONT PANEL ASSEMBLY, 75Ω (HP 85680B OPTION 001) (SERIAL NUMBER PREFIXES: 2517A AND ABOVE) (NOT AVAILABLE FOR FIELD REPLACEMENT)	28480	85680-60188
A5	85680-60189	8	1	FRONT PANEL ASSEMBLY (HP 85680B) (SERIAL NUMBER PREFIXES: 2517A AND ABOVE) (NOT AVAILABLE FOR FIELD REPLACEMENT)	28480	85680-60189
A5	85680-60203	7	1	FRONT PANEL ASSEMBLY (HP 85680B OPTION H96) (SERIAL NUMBER PREFIXES: 2517A AND ABOVE) (NOT AVAILABLE FOR FIELD REPLACEMENT)	28480	85680-60203
A5	85680-60218	4	1	FRONT PANEL ASSEMBLY (HP 85680B OPTION H44) (SERIAL NUMBER PREFIXES: 2634A AND ABOVE) (NOT AVAILABLE FOR FIELD REPLACEMENT)	28480	85680-60218
A5A1	85670-60019	1	1	KEYBOARD ASSEMBLY (HP 85670A; HP 85680B OPTION H96; HP 85680B OPTION H44)	28480	85670-60019
A5A1	85680-60019	3	1	KEYBOARD ASSEMBLY (INCLUDES A5A5) (HP 85680B)	28480	85680-60019
A5A2	5060-0329	9	1	ROTARY PULSE GENERATOR (RPG) (SERIAL NUMBER PREFIXES: 2408A- 2415A)	28480	5060-0329
A5A2	0960-0684	2	1	ROTARY PULSE GENERATOR (RPG) (SERIAL NUMBER PREFIXES: 2431A AND ABOVE)	28480	0960-0684
A5A3	85680-60059	1	1	DC INPUT CONNECTOR ASSEMBLY	28480	85680-60059
A5A3	85680-60116	1	1	DC INPUT CONNECTOR ASSEMBLY, 75Ω (HP 85680B OPTION 001)	28480	85680-60116
A5A4	85680-60053	5	1	BLOCKING CAPACITOR ASSEMBLY	28480	85680-60053
A5A4	85670-60004	4	1	75Ω INPUT CONNECTOR ASSEMBLY (HP 85670A OPTION 001)	28480	85670-60004
A5A5	85680-60117	2	1	INPUT SELECT SWITCHES (STANDARD HP 85680B ONLY)	28480	85680-60117
A5AT1	08568-60118	4	1	INPUT ATTENUATOR (SERIAL NUMBER PREFIXES: 2408A-2732A) (INCLUDES A12U17 PROM)	28480	08568-60118
A5AT1	5086-7815	6	1	INPUT ATTENUATOR (SERIAL NUMBER PREFIXES: 2840A AND ABOVE) (INCLUDES A12U17 PROM)	28480	5086-7815
A5K1	3106-0024	7	1	INPUT RELAY (STANDARD HP 85680B ONLY)	28480	3106-0024

Table 4. RF Section Assemblies (continued)

Reference Designator	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A6	85680-60011	5	1	YIG-TUNED OSCILLATOR (YTO) PHASE LOCK BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2408A-2714A)	28480	85680-60011
A6	85680-60152	5	1	YIG-TUNED OSCILLATOR (YTO) PHASE LOCK BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2718A AND ABOVE)	28480	85680-60152
A7	85680-60013	7	1	249 MHZ PHASE LOCK OSCILLATOR BOARD ASSEMBLY	28480	85680-60013
A8	85680-60123	0	1	249 MHZ PHASE LOCK BOARD ASSEMBLY	28480	85680-60123
A9	85680-60140	1	1	PILOT SECOND IF AMPLIFIER BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2408A-2541A)	28480	85680-60140
A9	85680-60210	6	1	PILOT SECOND IF AMPLIFIER BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2601A AND ABOVE)	28480	85680-60210
A10	85680-60010	4	1	PILOT THIRD CONVERTER BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2408A-2541A)	28480	85680-60010
A10	85680-60211	7	1	PILOT THIRD CONVERTER BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2601A AND ABOVE)	28480	85680-60211
A11	85680-60017	1	1	50 MHZ VOLTAGE-TUNED OSCILLATOR BOARD ASSEMBLY	28480	85680-60017
A12	85680-60168	3	1	RF SECTION INTERFACE BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2408A-2431A)	28480	85680-60168
A12	85680-60181	0	1	RF SECTION INTERFACE BOARD ASSEMBLY (SERIAL NUMBER PREFIXES: 2445A AND ABOVE)	28480	85680-60181
A14	85670-60001	1	1	TCXO BUFFER BOARD ASSEMBLY (HP 85670A)	28480	85670-60001
A14	85680-60200	4	1	TCXO BUFFER BOARD ASSEMBLY (HP 85680B OPTION H96) (HP 85680B OPTION H44)	28480	85680-60200
A14Y1	1813-0458	8	1	10 MHZ TCXO (HP 85670A)	28480	1813-0458
A14Y1	1813-0494	2	1	10 MHZ TCXO (HP 85680B OPTION H96; HP 85680B OPTION H44)	28480	1813-0494
A15	85670-60002	2	1	CONTROLLER BOARD ASSEMBLY (HP 85670A) (SERIAL NUMBER PREFIXES: 2541A AND ABOVE)	28480	85670-60002
A15	85680-60174	1	1	CONTROLLER BOARD ASSEMBLY (HP 85680B) (SERIAL NUMBER PREFIXES: 2408A)	28480	85680-60174
A15	85680-60180	9	1	CONTROLLER BOARD ASSEMBLY (HP 85680B) (SERIAL NUMBER PREFIXES: 2413A-2445A)	28480	85680-60180
A15	85680-60182	1	1	CONTROLLER BOARD ASSEMBLY (HP 85680B) (SERIAL NUMBER PREFIXES: 2503A AND ABOVE)	28480	85680-60182
A15	85680-60202	6	1	CONTROLLER BOARD ASSEMBLY (HP 85680B OPTION H96) (SERIAL NUMBER PREFIXES: 2517A AND ABOVE)	28480	85680-60202
A15	85680-60217	3	1	CONTROLLER BOARD ASSEMBLY (HP 85680B OPTION H44) (SERIAL NUMBER PREFIXES: 2634A AND ABOVE)	28480	85680-60217
A16	85680-60005	7	1	20 MHZ REFERENCE BOARD ASSEMBLY	28480	85680-60005

Table 4. RF Section Assemblies (continued)

Reference Designator	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A16	85670-60008	8	1	20 MHZ REFERENCE BOARD ASSEMBLY, 75Ω (HP 85670A OPTION 001)	28480	85670-60008
A17	85680-60131	0	1	FREQUENCY COUNTER BOARD ASSEMBLY	28480	85680-60131
A18	85680-60015	9	1	275 MHZ PHASE LOCK OSCILLATOR BOARD ASSEMBLY	28480	85680-60015
A19	85680-60039	7	1	SECOND IF AMPLIFIER BOARD ASSEMBLY	28480	85680-60039
A20	85680-60171	8	1	THIRD CONVERTER BOARD ASSEMBLY	28480	85680-60171
A21	85680-60016	0	1	275 MHZ PHASE LOCK BOARD ASSEMBLY	28480	85680-60016
A21A1	85680-60033	1	1	275 MHZ MIXER BOARD ASSEMBLY (PART OF A21)	28480	85680-60033
A22	85680-60156	9	1	FREQUENCY CONTROL BOARD ASSEMBLY	28480	85680-60156
A23	85680-60054	6	1	RF CONVERTER	28480	85680-60054
A23A1	5086-7246	7	1	YIG-TUNED OSCILLATOR, 2-4 GHz	28480	5086-7246
A23A2	85680-60060	4	1	FIRST CONVERTER ASSEMBLY (SIGNAL)	28480	85680-60060
A23A3	85680-60052	4	1	SECOND CONVERTER ASSEMBLY	28480	85680-60052
A23A3A1	85680-60129	6	1	PILOT SECOND LO BUFFER BOARD ASSEMBLY	28480	85680-60129
A23A3A2	85680-60029	5	1	SECOND LO BOARD ASSEMBLY	28480	85680-60029
A23A3A3	85680-60128	5	1	SECOND LO BUFFER BOARD ASSEMBLY (SIGNAL)	28480	85680-60128
A23A4	85680-60057	9	1	FIRST LO DISTRIBUTION ASSEMBLY	28480	85680-60057
A23A4A1	85680-60055	7	1	COUPLER/SPLITTER	28480	85680-60055
A23A4A2	85680-60032	0	1	RF CONVERTER BIAS BOARD ASSEMBLY	28480	85680-60032
A23A4A3	5086-7244	5	1	FIRST LO AMPLIFIER, FET, 2-4 GHz (SERIAL NUMBER PREFIXES: 2408A-2841A)	28480	5086-7244
A23A4A3	0955-0473	6	1	FIRST LO AMPLIFIER, FET, 2-4 GHz (SERIAL NUMBER PREFIXES: 2925A AND ABOVE)	28480	0955-0473
A23A4A4	5086-7244	5	1	PILOT FIRST LO AMPLIFIER, FET, 2-4 GHz (SERIAL NUMBER PREFIXES: 2408A-2841A)	28480	5086-7244
A23A4A4	0955-0473	6	1	PILOT FIRST LO AMPLIFIER, FET, 2-4 GHz (SERIAL NUMBER PREFIXES: 2925A AND ABOVE)	28480	0955-0473
A23A5	85680-60061	5	1	PILOT FIRST CONVERTER ASSEMBLY	28480	85680-60061
A23A6	85680-60058	0	1	COMB GENERATOR ASSEMBLY	28480	85680-60058
A23AT1	5086-7284	3	1	LIMITER, 0-1.8 GHZ	28480	5086-7284
A23AT2	0955-0124	4	1	2 dB ATTENUATOR (SERIAL NUMBER PREFIXES: 2408A-2635A)	28480	0955-0124
A24	85680-60154	7	1	VOLTAGE REGULATOR BOARD ASSEMBLY	28480	85680-60154
A25	85680-60155	8	1	RECTIFIER BOARD ASSEMBLY	28480	85680-60155

Table 4. RF Section Assemblies (continued)

Reference Designator	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
A26	85680-60127	4	1	MOTHERBOARD ASSEMBLY (HP 85680B)	28480	85680-60127
A26	85680-60196	7	1	MOTHERBOARD ASSEMBLY (HP 85670A; HP 85680B OPTION H96; HP 85680B OPTION H44)	28480	85680-60196
A27	85680-60095	5	1	10 MHZ FREQUENCY STANDARD ASSEMBLY (INCLUDES A27A1)(STANDARD HP 85680B ONLY) (SERIAL NUMBER PREFIXES: 2408A-2840A)	28480	85680-60095
A27	5062-1916	6	1	10 MHZ FREQUENCY STANDARD ASSEMBLY (INCLUDES A27A1 AND A27A2) (STANDARD HP 85680B ONLY) (SERIAL NUMBER PREFIXES: 2841A AND ABOVE)	28480	5062-1916
A27A1	0960-0477	1	1	10 MHZ QUARTZ CRYSTAL OSCILLATOR (STANDARD HP 85680B ONLY) (SERIAL NUMBER PREFIXES: 2408A- 2840A)	28480	0960-0477
A27A1	5062-1909	7	1	10 MHZ FREQUENCY STANDARD REGULATOR BOARD ASSEMBLY (STANDARD HP 85680B ONLY) (SERIAL NUMBER PREFIXES: 2841A)	28480	5062-1909
A27A1	5062-4837	6	1	10 MHZ FREQUENCY STANDARD REGULATOR BOARD ASSEMBLY (STANDARD HP 85680B ONLY) (SERIAL NUMBER PREFIXES: 2841A AND ABOVE)	28480	5062-4837
A27A2	10811-60111	8	1	10 MHZ QUARTZ CRYSTAL OSCILLATOR ASSEMBLY (STANDARD HP 85680B ONLY) (SERIAL NUMBER PREFIXES: 2841A AND ABOVE)	28480	10811-60111
A29	85680-60172	9	1	REAR PANEL ASSEMBLY	28480	85680-60172

Table 5. RF Section Cables

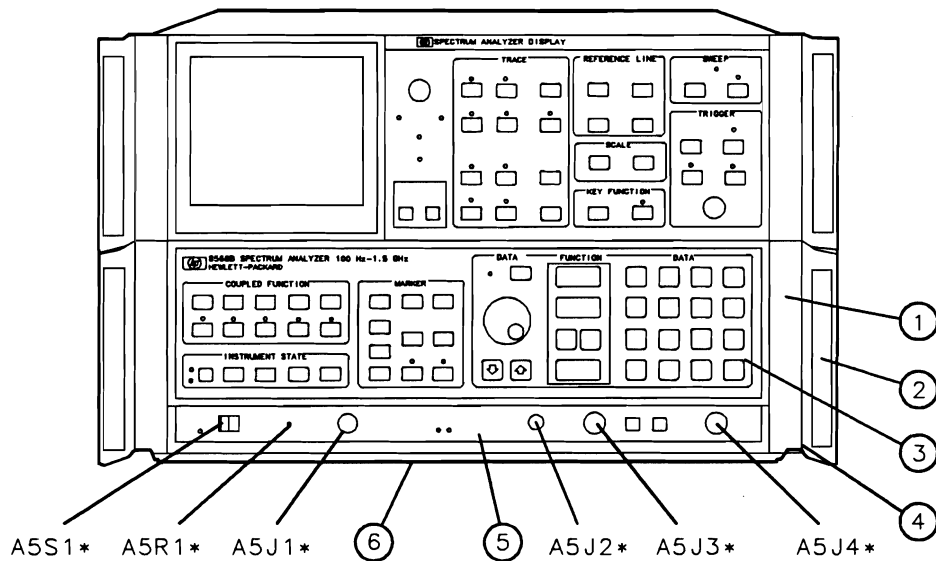
Reference Designator	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
W1	85680-20100	9	1	CABLE ASSEMBLY, A5K1 TO A5AT1 (HP 85680B)	28480	85680-20100
W1	85670-20002	8	1	CABLE ASSEMBLY, RF INPUT TO A5AT1 (HP 85670A)	28480	85670-20002
W2	85680-60243	5	1	CABLE ASSEMBLY, PANEL POWER (HP 85680B)	28480	85680-60243
W2	85680-60244	6	1	CABLE ASSEMBLY, PANEL POWER (HP 85670A AND HP 85680B OPTION H44 AND OPTION H96)	28480	85680-60244
W3	85680-60101	4	1	CABLE ASSEMBLY, A5AT1 TO A23AT1	28480	85680-60101
W5	85680-20096	2	1	CABLE ASSEMBLY, A23A1 TO A23A4A1	28480	85680-20096
W6	85680-20097	3	1	CABLE ASSEMBLY, A23A4A1 TO A23A4A3	28480	85680-20097
W7	85680-20235	1	1	CABLE ASSEMBLY, A23AT2 TO A23A4A3	28480	85680-20235
W8	85680-20098	4	1	CABLE ASSEMBLY, A23A4A1 TO A23A4A4	28480	85680-20098
W9	85680-20093	9	1	CABLE ASSEMBLY, A23A6 TO A23A5	28480	85680-20093
W10	85680-20095	1	1	CABLE ASSEMBLY, A23A5 TO A23A4A4	28480	85680-20095
W12	85680-60097	7	1	CABLE ASSEMBLY, COAX 90, A23A4A1 TO REAR PANEL J1 (1ST LO OUT)	28480	85680-60097
W13	85680-60090	0	1	CABLE ASSEMBLY, RF CONVERTER POWER, A23A4A2 TO A26 (RIBBON CABLE)	28480	85680-60090
W14	85680-60087	5	1	CABLE ASSEMBLY, YTO DRIVER, A22 TO A23A1 (RIBBON CABLE)	28480	85680-60087
W15	85680-60071	2	1	CABLE ASSEMBLY, COAX 7, A16 TO A23A6	28480	85680-60071
W16	85680-60083	1	1	CABLE ASSEMBLY, COAX 92, A23A3 TO A19	28480	85680-60083
W17	85680-60074	7	1	CABLE ASSEMBLY, COAX 80, A23A3 TO A9	28480	85680-60074
W18	85680-60072	8	1	CABLE ASSEMBLY, COAX 8, A11 TO A17	28480	85680-60072
W19	85680-60079	5	1	CABLE ASSEMBLY, COAX 85, A11 TO A21	28480	85680-60079
W20	85680-60075	1	1	CABLE ASSEMBLY, COAX 81, A9 TO A10	28480	85680-60075
W21	85680-60082	0	1	CABLE ASSEMBLY, COAX 89, A7 TO A10	28480	85680-60082
W22	85680-60076	2	1	CABLE ASSEMBLY, COAX 82, A10 TO A6	28480	85680-60076
W23	85680-60068	2	1	CABLE ASSEMBLY, COAX 4, A16 TO A8	28480	85680-60068
W24	85680-60080	6	1	CABLE ASSEMBLY, COAX 86, A18 TO A8	28480	85680-60080
W25	85680-60081	9	1	CABLE ASSEMBLY, COAX 87, A7 TO A18	28480	85680-60081
W26	85680-60067	1	1	CABLE ASSEMBLY, COAX 3, A16 TO A6	28480	85680-60067
W27	85680-60073	9	1	CABLE ASSEMBLY, COAX 9, A6 TO A17	28480	85680-60073
W28	85680-60077	3	1	CABLE ASSEMBLY, COAX 83, A20 TO A21	28480	85680-60077
W29	85680-60078	0	1	CABLE ASSEMBLY, COAX 85, A18 TO A21	28480	85680-60078
W30	85680-60084	2	1	CABLE ASSEMBLY, COAX 96, A19 TO A20	28480	85680-60084
W31	85680-60065	9	1	CABLE ASSEMBLY, COAX 1, A16 TO FRONT PANEL A6J1 (CAL OUTPUT)	28480	85680-60065

Table 5. RF Section Cables (continued)

Reference Designator	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
W31	85670-60187	6	1	CABLE ASSEMBLY, COAX 1, A16 TO FRONT PANEL A6J1 (CAL OUTPUT) (HP 85670A OPTION 001 (75 OHM OPTION) ONLY)	28480	85670-60187
W32	85680-60066	0	1	CABLE ASSEMBLY, COAX 2, A27 TO A16	28480	85680-60066
W33	85680-60070	6	1	CABLE ASSEMBLY, COAX 6, A17 TO REAR PANEL J1 PIN 5 (COAX INTERCONNECT)	28480	85680-60070
W34	85680-60063	7	1	CABLE ASSEMBLY, COAX 0, A22 TO REAR PANEL J1 PIN 4 (COAX INTERCONNECT)	28480	85680-60063
W35	85680-60064	8	1	CABLE ASSEMBLY, COAX 93, A22 TO REAR PANEL J1 PIN 3 (COAX INTERCONNECT)	28480	85680-60064
W36	85680-60085	3	1	CABLE ASSEMBLY, COAX 97, A20 TO REAR PANEL J1 PIN 1 (COAX INTERCONNECT)	28480	85680-60085
W37	85680-60069	3	1	CABLE ASSEMBLY, COAX 5, A16 TO REAR PANEL J3 (TIME BASE IN/OUT)	28480	85680-60069
W38	85680-60245	7	1	CABLE ASSEMBLY, BIAS, A23A4A2 TO W41	28480	85680-60245
W39	85680-60091	1	1	CABLE ASSEMBLY, SHORT 83, A21 TO A21A1	28480	85680-60091
W40	85680-60092	2	1	CABLE ASSEMBLY, SHORT 84, A21 TO A21A1	28480	85680-60092
W41	85680-60246	8	1	CABLE ASSEMBLY, BIAS, A23A3 TO W38	28480	85680-60246
W42	5062-0704	8	1	CABLE ASSEMBLY, A5AT1 TO A5A1	28480	5062-0704
W43	85680-60056	8	1	CABLE ASSEMBLY, A5A1J1 TO A12P3 (INCLUDES XA12P3)	28480	85680-60056
W44	5062-1921	3	1	BUS CABLE ASSEMBLY, A15 CONTROLLER TO REAR PANEL (INCLUDES J4 AND W44P1)	28480	5062-1921
W45	5061-5465	6	1	HP-IB CABLE ASSEMBLY, A15 CONTROLLER TO REAR PANEL (INCLUDES A29, J5, W45P1 AND W45P2)	28480	5061-5465

Table 6. RF Section Miscellaneous Parts

Reference Designator	HP Part Number	CD	Qty	Description	Mfr Code	Mfr Part Number
AT1	11593A	9	1	50-OHM TERMINATION	28480	11593A
B1	3160-0308		1	FAN 115V 120-CFM	28480	3160-0308
B1	3160-0087		1	FAN 115V 95-CFM 400HZ (HP 85680B OPTION 400)	28480	3160-0087
C1	0180-2603	3	1	CAPACITOR-FXD 7200UF +75-10% 50VDC AL	28480	0180-2603
C2	0180-0453	9	1	CAPACITOR-FXD 8700UF +75-10% 40VDC AL	28480	0180-0453
C3	0180-0453	9	1	CAPACITOR-FXD 8700UF +75-10% 40VDC AL	28480	0180-0453
C4	0180-2782	1	1	CAPACITOR-FXD .05F +75-10% 15VDC AL	28480	0180-2782
C5	0180-0453	9	1	CAPACITOR-FXD 8700UF +75-10% 40VDC AL	28480	0180-0453
C6	0160-4065	8	1	CAPACITOR-FXD .1UF ±20% 250VDC PAP	28480	0160-4065
C7						
C8						
F1	2110-0007	4	1	FUSE 1A 250 V SLOW-BLO 1.25 X .25 UL IEC	28480	2110-0007
F1	2110-0002	9	1	FUSE 2A 250V FAST-BLO 1.25 X .25 UL IEC	28480	2110-0002
FL1	0960-0448	6	1	LINE MODULE FILTER (DOES NOT INCLUDE FL1MP1)	28480	0960-0448
FL1MP1	7121-3777	9	1	LABEL, IN LINE V LA	28480	7121-3777
FL1MP1	7120-7716	2	1	LABEL, LINE MODULE (50-400 HZ) (HP 85680B OPTION 400)	28480	7120-7716
J1	1251-7498	8	1	CONNECTOR 5-PIN F D SERIES (INTERCONNECT)	28480	1251-7498
J2				1ST LO OUT, PART OF W12 AND NOT SEPARATELY REPLACEABLE		
J3				FREQ REFERENCE, PART OF W37 AND NOT SEPARATELY REPLACEABLE		
J4				CONNECTOR, 50-PIN 50-WIRE BUS, PART OF W44 AND NOT SEPARATELY REPLACEABLE		
J5	1252-0224	6	1	CONNECTOR, 24-PIN HP-IB (PART OF W45)	28480	1252-0224
K1	0490-0618	5	1	RELAY 2C 24VDC-COIL 5A 115VAC (PART OF A26, REFER TO A26K1)	28480	0490-0618
S1	3101-0530	8	1	SWITCH DPDT (FREQ REFERENCE)	28480	3101-0530
TB1	85662-20086	8	1	TERMINAL BOARD, PC 400 HZ CAP (HP 85680B OPTION 400)	28480	85662-20086
TB1C1	0170-0073	8	1	CAPACITOR-FXD 1UF ±10% 600VDC (HP 85680B OPTION 400)	28480	0170-0073
TB1MP1	85680-00051	3	1	BRACKET, TERMINAL BOARD/CAP (HP 85680B OPTION 400)	28480	85680-00051
T1	9100-3946	2	1	TRANSFORMER, POWER 110V 60HZ	28480	9100-3946



*REFER TO PARTS LIST OF A5 FRONT PANEL TAB FOR PART NUMBER INFORMATION.

**REFER TO THE MISCELLANEOUS PARTS LIST OF THIS SECTION FOR PART NUMBER INFORMATION.

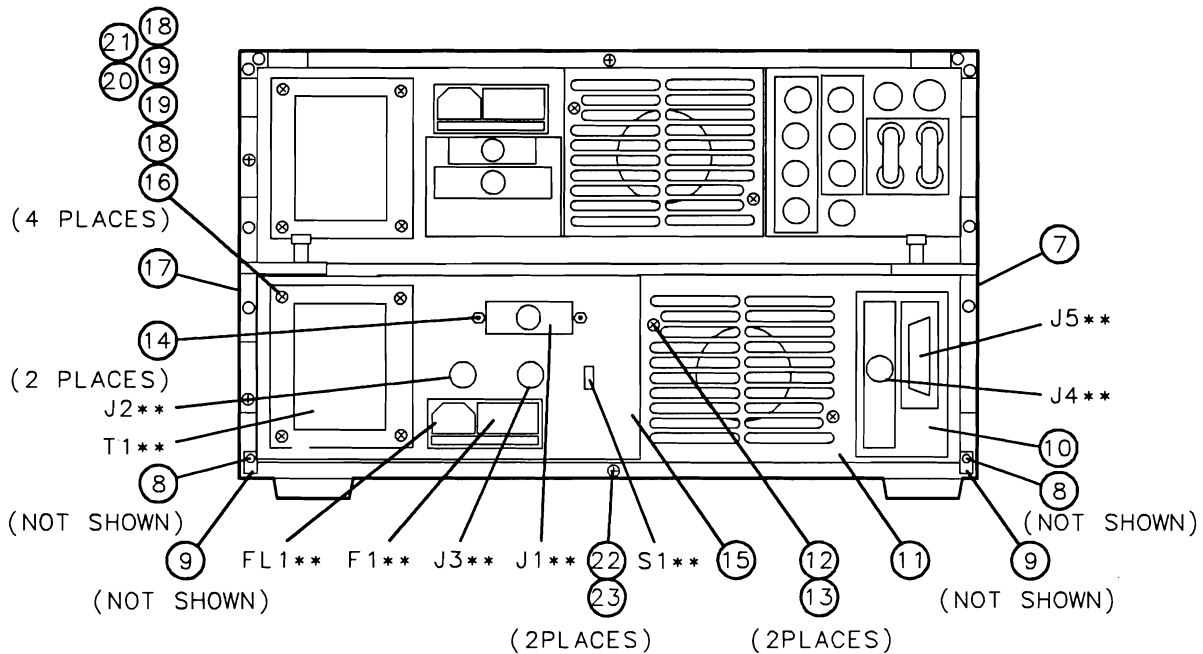


Figure 1. Overall Instrument Parts Identification, Front and Rear View (1 of 2)

Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
1	5021-8699	0	BEZEL FRONT *	28480	5021-8699
	85680-20125	8	BEZEL FRONT **	28480	85680-20125
2	5062-3989	7	KIT, FRONT HANDLES *	28480	5062-3989
	5061-0089	0	KIT, FRONT HANDLES **	28480	5061-0089
3	85680-00106	3	KEYBOARD DRESS PANEL, HP 85680B	28480	85680-00106
	85680-00107	4	KEYBOARD DRESS PANEL, HP 85680B OPT H96	28480	85680-00107
	85680-00109	6	KEYBOARD DRESS PANEL, HP 85680B OPT H44	28480	85680-00109
	85670-00009	3	KEYBOARD DRESS PANEL, HP 85670A	28480	85670-00009
4	5021-8403	4	FRAME FRONT *	28480	5021-8403
	5020-8803	6	FRAME FRONT **	28480	5020-8803
5	85680-00102	9	LOWER DRESS PANEL, HP 85680B OPT 001	28480	85680-00102
	85680-00103	0	LOWER DRESS PANEL, HP 85680B	28480	85680-00103
	85680-00108	5	LOWER DRESS PANEL, HP 85670A AND HP 85680B OPTIONS H44 AND H96	28480	85680-00108
	85670-00008	2	LOWER DRESS PANEL, HP 85670A OPTION 001	28480	85670-00008
6	5062-4033	4	TRAY ASSEMBLY - INFORMATION PULLOUT CARDS	28480	5062-4033
7	5021-8540	0	LOCK FOOT, LOWER RIGHT	28480	5021-8540
8	0515-1232	5	SCREW M3.5 X 8 PAN HD *	28480	0515-1232
	2360-0332	7	SCREW, 6-32, .312-IN-LG PAN HD **	28480	2360-0332
9	5041-8821	2	FOOT, LOWER RIGHT/LEFT	28480	5041-8821
10	85680-20162	3	SUPPORT, PC, REAR	28480	85680-20162
11	5002-0659	6	FAN HOUSING GRILL	28480	5002-0659
12	2360-0219	9	SCREW, 6-32, 1.375-IN-LG PAN HD	28480	2360-0219
13	2190-0018	5	WASHER, LK	28480	2190-0018
14	1251-2942	7	SCREW, 4-40 (INCLUDES NUT & WASHER)	28480	1251-2942
15	85680-00091	5	PANEL, REAR	28480	85680-00091
16	2510-0137	9	SCREW, 8-32 PAN HD	28480	2510-0137
17	5021-8538	6	LOCK FOOT, LOWER LEFT	28480	5021-8538
18	3050-0139	6	WASHER, FL .172 ID X 8	28480	3050-0139
19	0390-0006	3	INSULATOR, BUSHING, .173 ID	28480	0360-0006
20	2190-0017	4	WASHER, LK .168 ID X 8	28480	2190-0017
21	2580-0004	6	NUT-HEX 8-32	28480	2580-0004
22	0510-0952	4	RETAINER RING FOR SCREW (23)	28480	0510-0952
23	0515-1245	0	SCREW, COVER MOUNTING, 6-32, .460 IN-LG FLATHD *	28480	0515-1245
	2360-0196	1	SCREW, COVER MOUNTING, 6-32, .375 FLATHD **	28480	2360-0196
* Serial Number Prefixes 2517A and above. ** Serial Number Prefixes 2408 to 2503A.					

Figure 1. Overall Instrument Parts Identification, Front and Rear View (2 of 2)

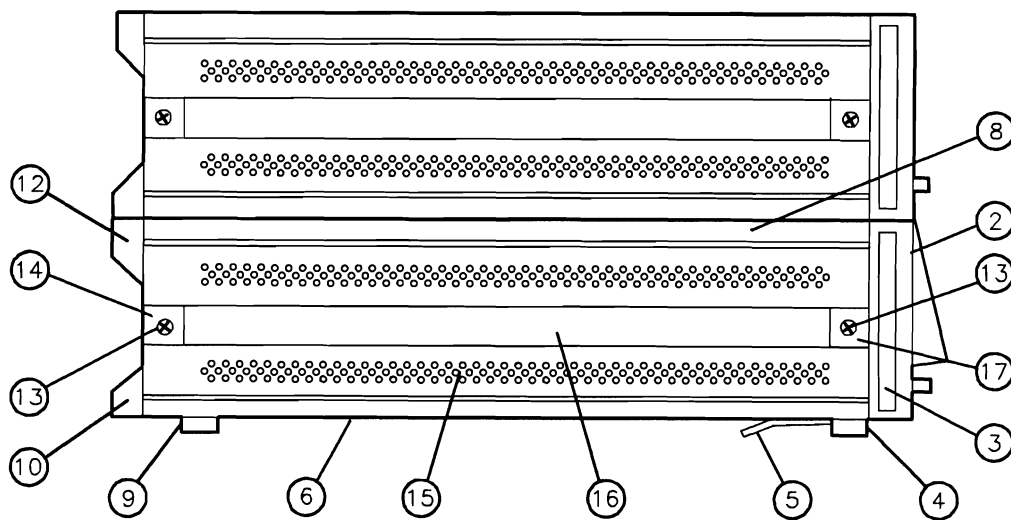
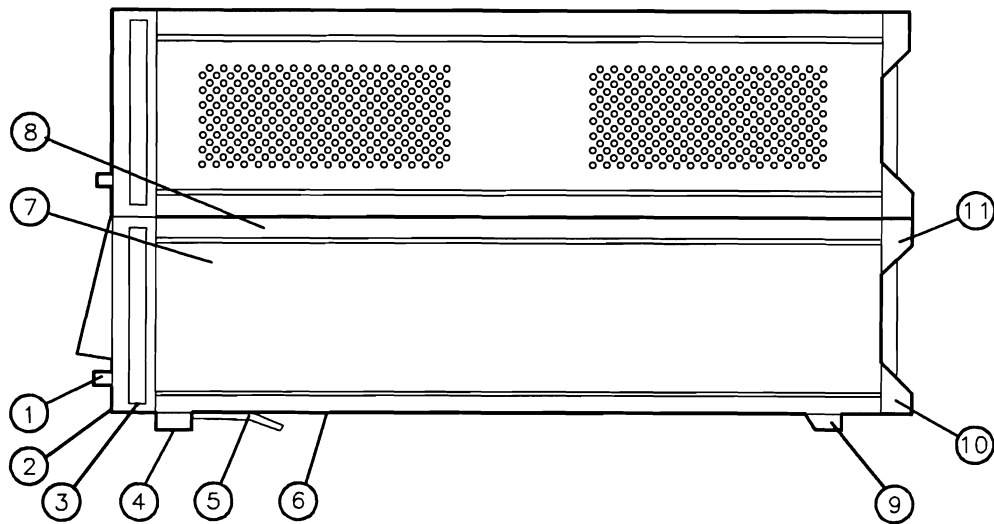


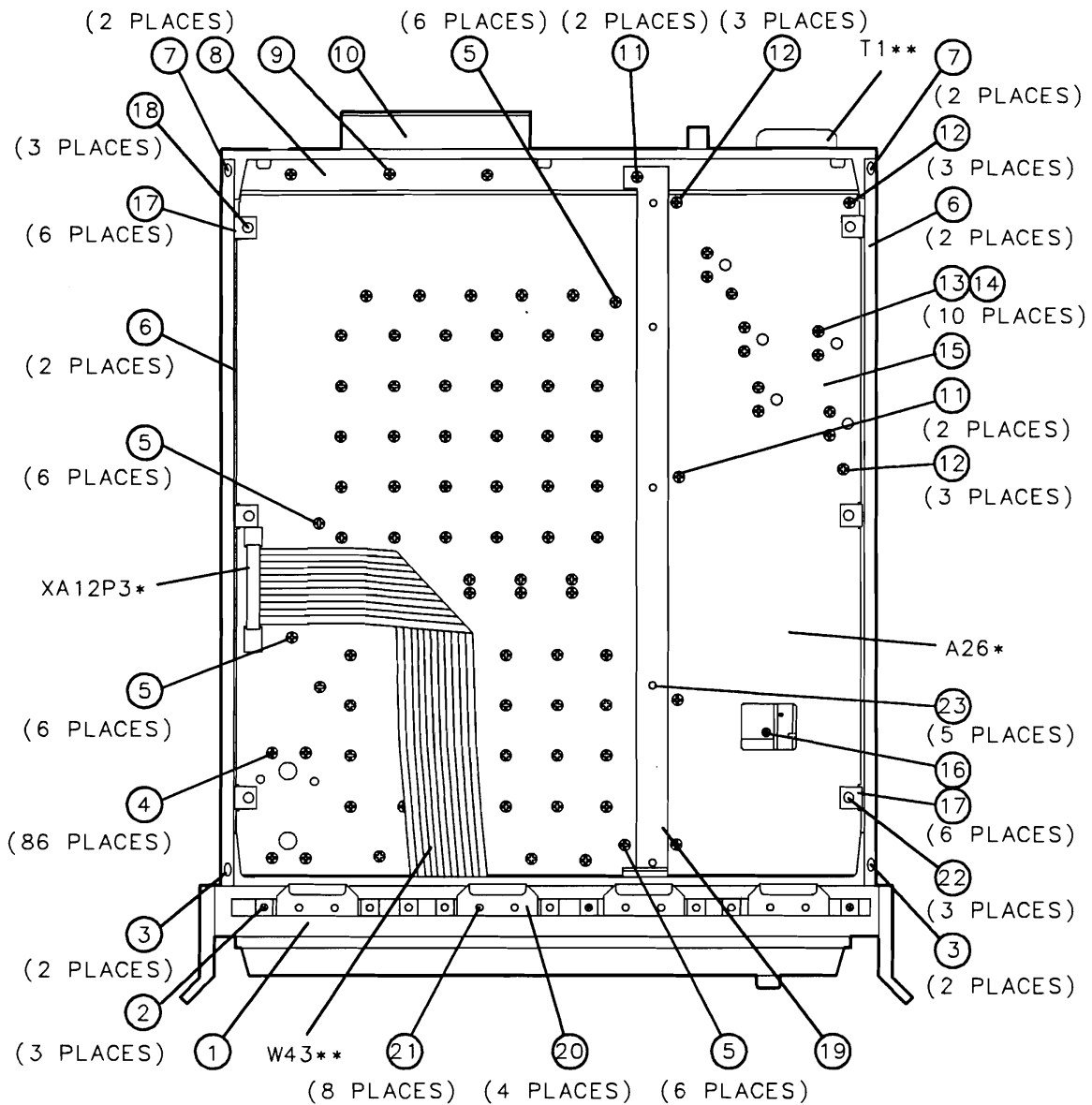
Figure 2. Overall Instrument Parts identification, Right Side and Left Side View (1 of 2)

Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
1	1250-0780	5	ADAPTER, COAX TYPE N (M) TO BNC (F)	90949	31-216-1020
2	5020-8803	6	FRAME, FRONT	28480	5020-8803
3	5062-3989	7	TRIM STRIP	28480	5062-3989
4	5041-8801	8	FOOT, BOTTOM	28480	5041-8801
6	5062-3747	5	COVER, BOTTOM 18 IN *	28480	5062-3747
	5060-9847	4	COVER, BOTTOM 18 IN **	28480	5060-9847
7	5062-3757	7	COVER, SIDE *	28480	5062-3757
	5060-9857	6	COVER, SIDE **	28480	5060-9857
8	5062-3735	1	COVER, TOP, 18 IN *	28480	5062-3735
	5060-9835	0	COVER, TOP, 18 IN **	28480	5060-9835
9	5041-8801	8	FOOT, BOTTOM	28480	5041-8801
10	5041-8821	2	FOOT, REAR	28480	5041-8821
11	5021-8538	6	LOCK FOOT, LOWER LEFT	28480	5021-8538
12	0521-8540	2	LOCK FOOT, LOWER RIGHT	28480	5021-8540
13	0515-1132	4	SCREW, METRIC 5.0 X 10 FLAT HD *	28480	0515-1132
	2680-0172	1	SCREW, 10-32, .375-IN-LG FLAT HD **	28480	2680-0172
14	5041-8820	1	COVER, STRAP HANDLE, REAR *	28480	5041-8820
	5040-7220	1	COVER, STRAP HANDLE, REAR **	28480	5040-7220
15	5062-3837	4	COVER, SIDE, PERFORATED *	28480	5062-3837
	5060-9937	3	COVER, SIDE, PERFORATED **	28480	5060-9937
16	5062-3704	4	STRAP HANDLE ASSY - 18 IN	28480	5062-3704
17	5041-8819	8	COVER, STRAP HANDLE, FRONT *	28480	5041-8819
	5040-7219	8	COVER, STRAP HANDLE, FRONT **	28480	5040-7219
* Serial Number Prefixes 2517A and above.					
** Serial Numbers 2408A to 2503A.					

Figure 2. Overall Instrument Parts identification, Right Side and Left Side View (2 of 2)

Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
1	0515-2086	9	SCREW, METRIC 4 X 7 *	28480	0515-2086
	2510-0195	9	SCREW, 8-32, .375-IN-LG 100 DEG **	28480	2510-0195
2	5021-5837	2	STRUT, CORNER *	28480	5021-5837
	5020-8837	6	STRUT, CORNER, 18 IN **	28480	5020-8837
3	85680-00077	7	COVER, CONTROLLER	28480	85680-00077
4	2200-0105	4	SCREW, 4-40, .312-IN-LG, PAN HD	28480	2200-0105
5	2200-0145	2	SCREW, 4-40, .438-IN-LG PAN HD	28480	2200-0145
6	3050-0105	6	WASHER, FL FOR SCREW (5)	28480	3050-0105
7	2190-0003	8	WASHER-LK FOR SCREW (5)	28480	2190-0003
8	1400-0017	4	CLAMP-CABLE .312-DIA. .375-WIDE	28480	1400-0017
9	85680-00088	0	CONTROLLER, SHIELD *	28480	85680-00088
	85680-00034	6	CONTROLLER, SHIELD **	28480	85680-00034
10	85680-00037	9	TOP MOUNT, FREQUENCY STANDARD	28480	85680-00037
11	1520-0094	7	ISOLATION MOUNT	28480	1520-0094
12	0515-2086	9	SCREW, METRIC 4 X 7 *	28480	0515-2086
	2510-0192	6	SCREW, 8-32, .25-IN-LG 100 DEG **	28480	2510-0192
13	0515-0907	9	SCREW, METRIC, 3.0 X 8 FLAT HD *	28480	0515-0907
	2360-0116	5	SCREW, 6-32, .312-IN-LG 82 DEG **	28480	2360-0116
	2190-0724	0	WASHER, LOCK, FOR SCREW (13)	28480	2190-0724
14	5021-8403	4	FRAME, FRONT *	28480	5021-8403
	5020-8803	6	FRAME, FRONT **	28480	5020-8803
15	85680-20125	8	BEZEL, MAINFRAME	28480	85680-20125
16	85680-20056	4	SHIELDING BOX	28480	85680-20056
17	2360-0195	0	SCREW, 6-32, .312-IN-LG, 100 DEG	28480	2360-0195
18	2190-0018	5	WASHER, LK FOR SCREW (17)	28480	2190-0018
19	3050-1260	6	WASHER, FL FOR SCREW (17)	28480	3050-1260
20	85680-00073	3	COVER, FREQUENCY CONTROL	28480	85680-00073
21	85680-00006	2	SHIELD, FREQUENCY CONTROL	28480	85680-00006
22	85680-00019	7	COVER, CAPACITOR	28480	85680-00019
23	85680-00022	2	GUIDE, RECTIFIER BOARD	28480	85680-00022
24	85680-20183	7	FRAME REAR *	28480	85680-20183
	85680-20072	0	FRAME REAR **	28480	85680-20072
25	85680-20066	6	GUIDE, PC BOARD	28480	85680-20066
26	86701-00007	1	GUARD, FAN	28480	86701-00007
27	85680-00032	4	SHIELD, POWER TRANSISTOR	28480	85680-00032
28	2360-0119	8	SCREW, 6-32, .438-IN-LG, PAN HD	28480	2360-0119
29	3050-1260	6	WASHER, FLAT .147 ID 6 FOR SCREW (28)	28480	3050-1260
30	85680-00039	1	BOTTOM MOUNT, FREQUENCY STANDARD	28480	85680-00039
31	85680-00044	8	CABLE COVER, CLEAR PLASTIC	28480	85680-00044
	2200-0171	4	SCREW 4-40 .750 FLAT HD FOR COVER (31)	28480	2200-0171
* Serial Number Prefixes 2517A and above.					
** Serial Numbers 2408A to 2503A.					

Figure 3. RF Section Parts Identification, Bottom View (2 of 2)



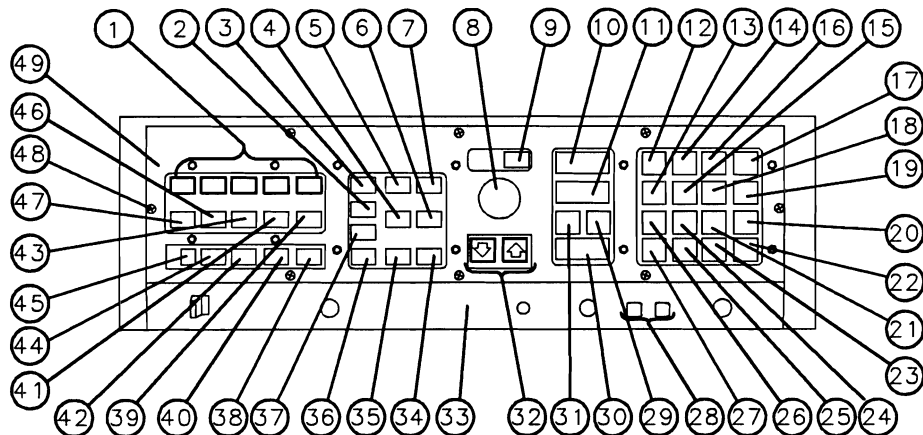
* REFER TO PARTS LISTS OF A25 RECTIFIER/A26 MOTHERBOARD TAB FOR PART NUMBER INFORMATION

** REFER TO PARTS LISTS OF THIS SECTION FOR PART NUMBER INFORMATION

Figure 4. RF Section Parts Identification, Top View (1 of 2)

Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
1	5021-8403	4	FRAME, FRONT *	28480	5021-8403
	5020-8803	7	FRAME, FRONT **	28480	5020-8803
2	0515-0907	9	SCREW, METRIC, 3.0 X 8 FLAT HD *	28480	0515-0907
	2360-0116	5	SCREW, 6-32, .312-IN-LG 82 DEG FLAT HD **	28480	2360-0116
3	0515-2086	9	SCREW, METRIC, 4 X 7, FLAT HD *	28480	0515-2086
	2510-0192	6	SCREW, 8-32, .25-IN-LG 100 DEG FLAT HD **	28480	2510-0192
4	2200-0105	4	SCREW, 4-40, .312-IN-LG PAN HD	28480	2200-0105
5	2360-0113	2	SCREW, 6-32, .25-IN-LG PAN HD	28480	2360-0113
6	5021-5837	2	STRUT, CORNER 18 IN *	28480	5021-5837
	5020-8837	6	STRUT, CORNER 18 IN **	28480	5020-8837
7	0515-2086	9	SCREW, METRIC, 4 X 7, FLAT HD *	28480	0515-2086
	2510-0195	9	SCREW, 8-32, .375-IN-LG 100 DEG **	28480	2510-0195
8	85680-20183	7	FRAME, REAR *	28480	85680-20183
	85680-20072	4	FRAME, REAR **	28480	85680-20072
9	2360-0115	4	SCREW, 6-32, .750-IN-LG PAN HD	28480	2360-0115
10	86701-00007	1	GUARD, FAN	28480	86701-00007
11	2360-0490	8	SCREW, 6-32, .500 -IN-LG 100 DEG FLAT HD	28480	2360-0490
12	2360-0333	8	SCREW, 6-32, .25-IN-LG 100 DEG FLAT HD	28480	2360-0333
13	2680-0129	8	SCREW, 10-32, .312-IN-LG PAN HD	28480	2680-0129
14	2190-0011	8	WASHER, LK FOR SCREW (13)	02440	1022
15	85680-00031	3	SHIELD, POWER SUPPLY	28480	85680-00031
16	2200-0103	2	SCREW, 4-40, .25-IN-LG PAN HD	28480	2200-0103
17	85680-00001	7	BRACKET, MOTHERBOARD MOUNT	28480	85680-00001
18	2360-0115	4	SCREW, 6-32, .312-IN-LG PAN HD	28480	2360-0115
19	85680-20180	1	SUPPORT, MOTHERBOARD	28480	85680-20180
20	1600-0367	7	LOCK LINK	28480	1600-0367
21	2360-0331	6	SCREW, 6-32, .250-IN-LG PAN HD	28480	2360-0331
22	2360-0182	5	SCREW 6-32 .312-IN-LG FLAT HD	28480	2360-0182
23	2360-0117	6	SCREW 6-32 .375-IN-LG PAN HD	28480	2360-0117
24	85680-00023	3	SUPPORT INSULATOR	28480	85680-00023
* Serial Number Prefixes 2517A and above.					
** Serial Number Prefixes 2408A to 2503A.					

Figure 4. RF Section Parts Identification, Top View (2 of 2)

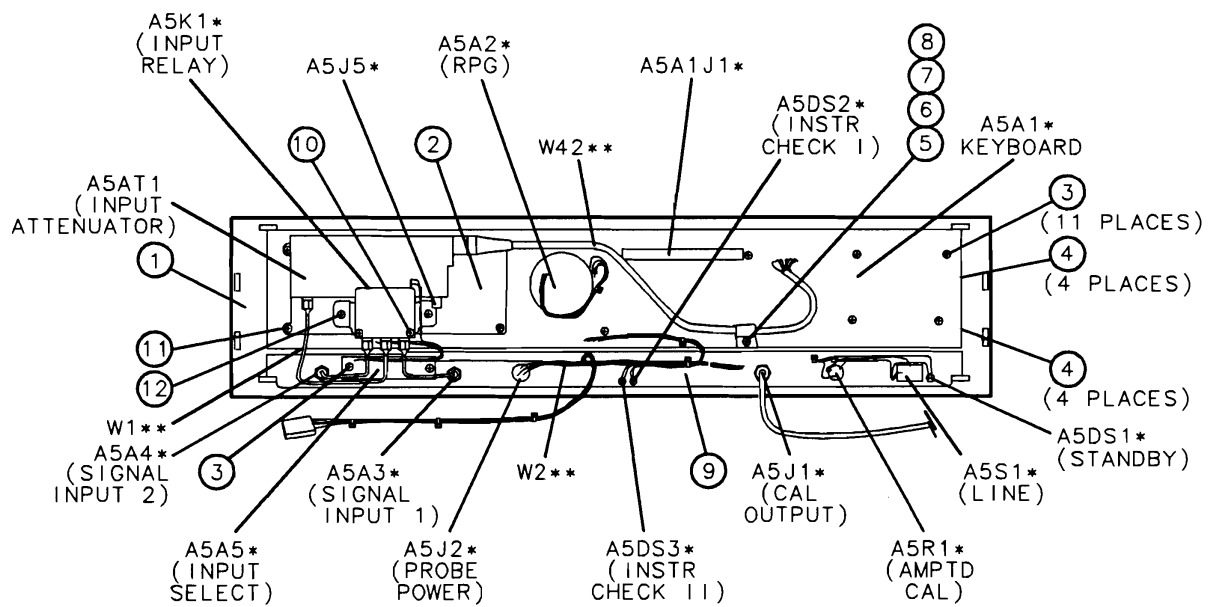


Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
1	5041-0706	6	KEY, AUTO	28480	5041-0706
2	5041-0712	4	KEY, MKR→CF	28480	5041-0712
3	5041-0938	6	KEY, PEAK SEARCH	28480	5041-0938
4	5041-0716	8	KEY, Δ	28480	5041-0716
5	5041-0692	9	KEY, OFF	28480	5041-0692
6	5041-0717	9	KEY, ZOOM	28480	5041-0717
7	5041-0698	5	KEY, NORMAL	28480	5041-0698
8	0370-3069	2	KNOB, ROUND	28480	0370-3069
9	5041-0725	9	KEY, HOLD	28480	5041-0725
10	5041-0673	6	KEY, CENTER FREQUENCY	28480	5041-0673
11	5041-0674	7	KEY, FREQUENCY SPAN	28480	5041-0674
12	5041-0751	1	KEY, 7	28480	5041-0751
13	5041-0748	6	KEY, 4	28480	5041-0748
14	5041-0752	2	KEY, 8	28480	5041-0752
15	5041-0749	7	KEY, 5	28480	5041-0749

Figure 5. RF Section Parts Identification, Front Panel, Front View (1 of 2)

Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
16	5041-0753	3	KEY, 9	28480	5041-0753
17	5041-0727	1	KEY, GHz +dBm dB	28480	5041-0727
18	5041-0750	0	KEY, 6	28480	5041-0750
19	5041-0728	2	KEY, MHz -dBm sec	28480	5041-0728
20	5041-0729	3	KEY, kHz mV msec	28480	5041-0729
21	5041-0828	3	KEY, 3	28480	5041-0828
22	5041-0730	6	KEY, Hz μV μsec	28480	5041-0730
23	5041-0757	7	KEY, BACK SPACE	28480	5041-0757
24	5041-0827	2	KEY, 2	28480	5041-0827
25	5041-0755	5	KEY, .	28480	5041-0755
26	5041-0826	1	KEY, 1	28480	5041-0826
27	5041-0754	4	KEY, 0	28480	5041-0754
28	5041-0318	3	KEY, SIGNAL INPUT ⓪	28480	5041-0318
29	5041-0669	0	KEY, STOP FREQ	28480	5041-0669
30	5041-0675	8	KEY, REFERENCE LEVEL	28480	5041-0675
31	5041-0668	9	KEY, START FREQ	28480	5041-0668
32	5041-0756	6	KEY, ⬇ ⬆	28480	5041-0756
33	85680-00048	2	PANEL, FRONT LOWER DRESS	28480	85680-00048
33	85680-00025	5	PANEL, FRONT LOWER DRESS (OPT 001)	28480	85680-00025
34	5041-0937	5	KEY, SIGNAL TRACK	28480	5041-0937
35	5041-0718	0	KEY, FREQ COUNT	28480	5041-0718
36	5041-0715	7	KEY, MKR → REF LVL	28480	5041-0715
37	5041-0714	6	KEY, MKR/Δ → STP SIZE	28480	5041-0714
38	5041-0720	4	KEY, INSTR PRESET	28480	5041-0720
39	5041-0711	3	KEY, CF STEP SIZE	28480	5041-0711
40	5041-0721	5	KEY, 0-1.5 GHz	28480	5041-0721
41	5041-0710	2	KEY, ATTEN	28480	5041-0710
42	5041-0775	9	KEY, RECALL	28480	5041-0775
43	5041-0709	9	KEY, SWEEP TIME	28480	5041-0709
44	5041-0095	6	KEY, SAVE	28480	5041-0095
45	5041-0726	0	KEY, LCL	28480	5041-0726
46	5041-0708	8	KEY, VIDEO BW	28480	5041-0708
47	5041-0707	7	KEY, RES BW	28480	5041-0707
48	0624-0264	2	SCREW, 4-40, .312-IN-LG FL HD	28480	0624-0264
49	85680-00011	1	PANEL, SUB UPPER	28480	85680-00011
* Serial Number Prefixes 2517A and above. ** Serial Number Prefixes 2408A to 2503A.					

Figure 5. RF Section Parts Identification, Front Panel, Front View (2 of 2)



* REFER TO PARTS LISTS OF A5 FRONT PANEL TAB FOR PART NUMBER INFORMATION
 ** REFER TO CABLE PARTS LIST OF THIS SECTION FOR PART NUMBER INFORMATION

Figure 6. RF Section Parts Identification, Front Panel, Rear View (1 of 2)

Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
1	5021-8699	0	FRONT BEZEL *	28480	5021-8699
	85680-20125	8	FRONT BEZEL **	28480	85680-20125
2	85680-00013	1	BRACKET, ATTENUATOR	28480	85680-00013
3	2200-0105	4	SCREW, 4-40, .312-IN-LG PAN HD	28480	2200-0105
4	0510-1148	2	RETAINER, PUSH-ON	28480	0510-1148
5	2200-0147	4	SCREW, 4-40, .500-IN-LG PAN HD	28480	2200-0147
6	2190-0003	8	WASHER, LK FOR SCREW (5)	28480	2190-0003
7	3050-0105	6	WASHER, FL FOR SCREW (5)	28480	3050-0105
8	1400-0619	8	CLAMP, CABLE	05683	5/16-HFR
9	85680-00009	5	PANEL, SUB LOWER	28480	85680-00009
10	0520-0136	0	SCREW 2-56. .625-IN-LG PAN HD	28480	0520-0136
11	2200-0111	2	SCREW, 4-40, .5-IN-LG PAN HD	28480	2200-0111
12	2200-0103	1	SCREW, 4-40, .25-IN-LG PAN HD	28480	2200-0103
* Serial Numbers 2517A and above.					
** Serial Numbers 2408A to 2503A.					

Figure 6. RF Section Parts Identification, Front Panel, Rear View (2 of 2)

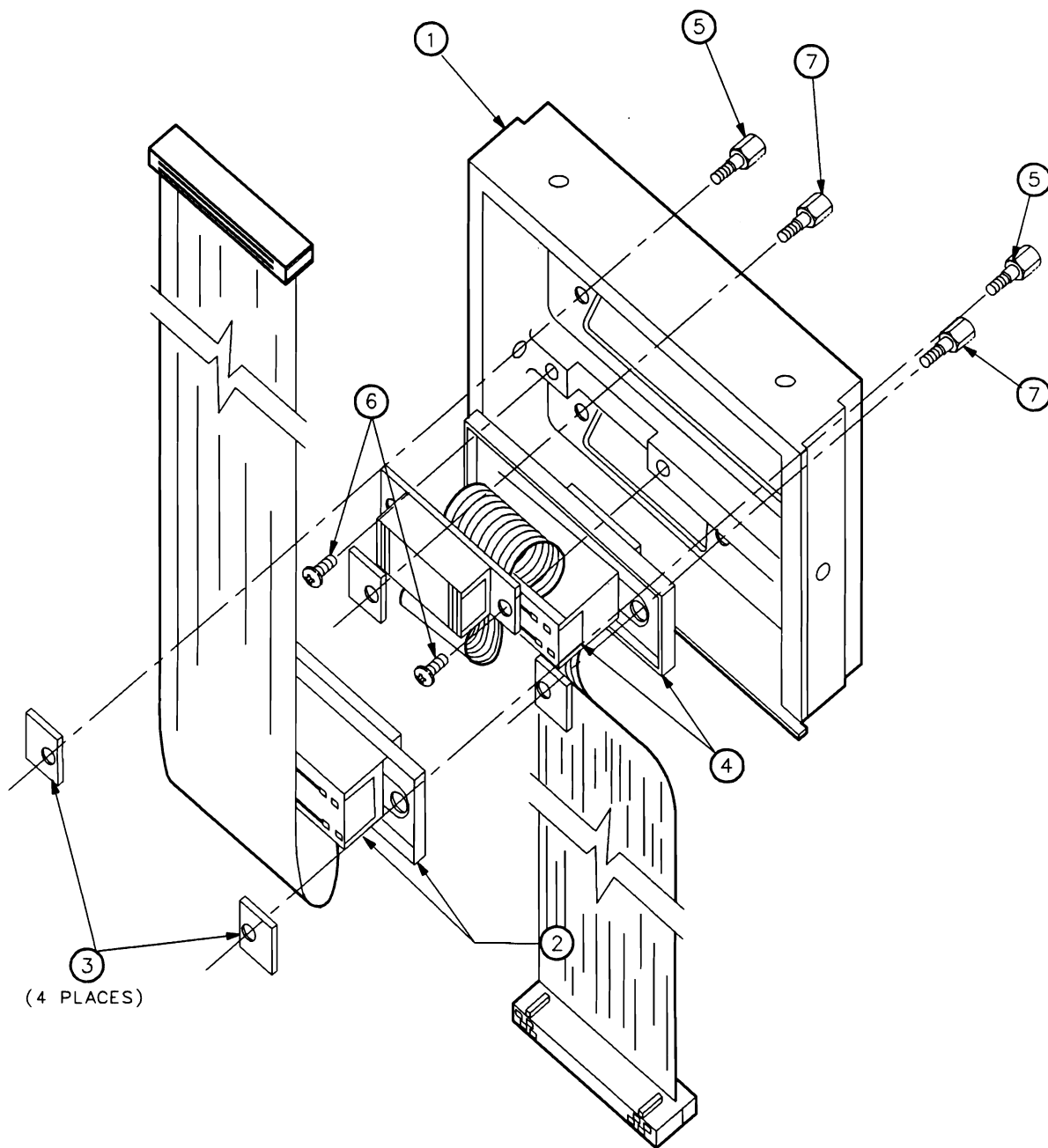


Figure 7. Interconnect Cable Assembly Parts Identification (1 of 2)

Item	HP Part Number	CD	Description	Mfr Code	Mfr Part Number
1	85680-60172	3	INTERCONNECT CABLE ASSEMBLY	28480	85680-60172
	85680-20162	3	REAR SUPPORT	28480	85680-20162
2	5062-1921	3	ANALYZER BUS CABLE ASSEMBLY	28480	5062-1921
3	5001-8748	8	LOCKING PLATE	28480	5001-8748
4	5061-5465	6	HP-IB CABLE ASSEMBLY	28480	5061-5465
5	5021-3292	9	ANALYZER BUS STANDOFF	28480	5021-3292
6	0624-0206	2	SCREW 6-32 .250-IN-LG PAN HD	28480	0624-0206
7	1251-7002	0	HP-IB CONNECTOR KIT	28480	1251-7002
	6960-0079	5	PLUG-HOLE .188 DIA (NOT SHOWN)	28480	6960-0079

Figure 7. Interconnect Cable Assembly Parts Identification (2 of 2)

Major Assembly and Component Locations

Major Assembly and Component Locations

Assembly	Location	Assembly	Location
A5	FRONT PANEL	A16	20 MHZ REFERENCE BOARD
A5A1	KEYBOARD	A17	FREQUENCY COUNTER BOARD
A5A2	ROTARY PULSE GENERATOR (RPG)	A18	275 MHZ PHASE LOCK OSCILLATOR
A5A3	DC INPUT CONNECTOR	A19	SECOND IF AMPLIFIER BOARD
A5A4	BLOCKING CAPACITOR ASSY	A20	THIRD CONVERTER BOARD
A5A5	INPUT SELECT BOARD	A21	275 MHZ PHASE LOCK BOARD
A5AT1	INPUT ATTENUATOR	A22	FREQUENCY CONTROL BOARD
A5K1	INPUT RELAY	A23	RF CONVERTER BOARD
A5R1	ROTARY PULSE GENERATOR (RPG)	A23A1	YIG OSCILLATOR
A5S1	LINE SWITCH	A23A2	FIRST CONVERTER
A6	YIG-TUNED OSCILLATOR PHASE LOCKED	A23A3	SECOND CONVERTER
A7	249 MHZ PHASE LOCK OSCILLATOR	A23A4	FIRST LO DISTRIBUTION BOARD
A8	249 MHZ PHASE LOCK BOARD	A23A5	PILOT FIRST CONVERTER
A9	PILOT SECOND IF AMPLIFIER BOARD	A23A6	COMB GENERATOR BOARD
A10	PILOT THIRD CONVERTER BOARD	A23AT1	LIMITER
A11	50 MHZ VOLTAGE-TUNED OSCILLATOR	A23AT2	2 dB ATTENUATOR
A12	RF SECTION INTERFACE BOARD	A24	VOLTAGE REGULATOR BOARD
A14	TCXO BUFFER (HP 85670A AND HP 85680B OPTION H44 AND OPTION H96 ONLY)	A25	RECTIFIER BOARD
A15	CONTROLLER BOARD	A26	MOTHERBOARD
		A27	10 MHZ FREQUENCY STANDARD (STANDARD HP 85680B ONLY)
		T1	TRANSFORMER

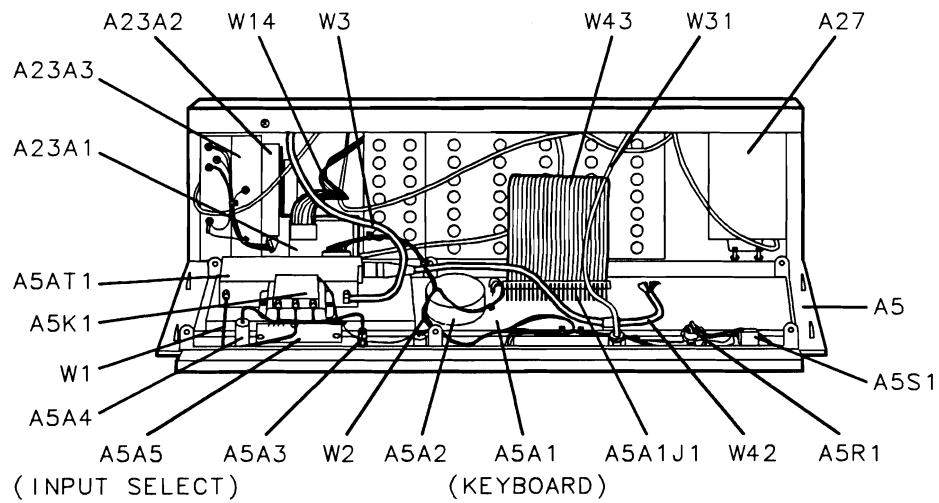


Figure 1. Major Assembly and Component Locations, Top and Front Views

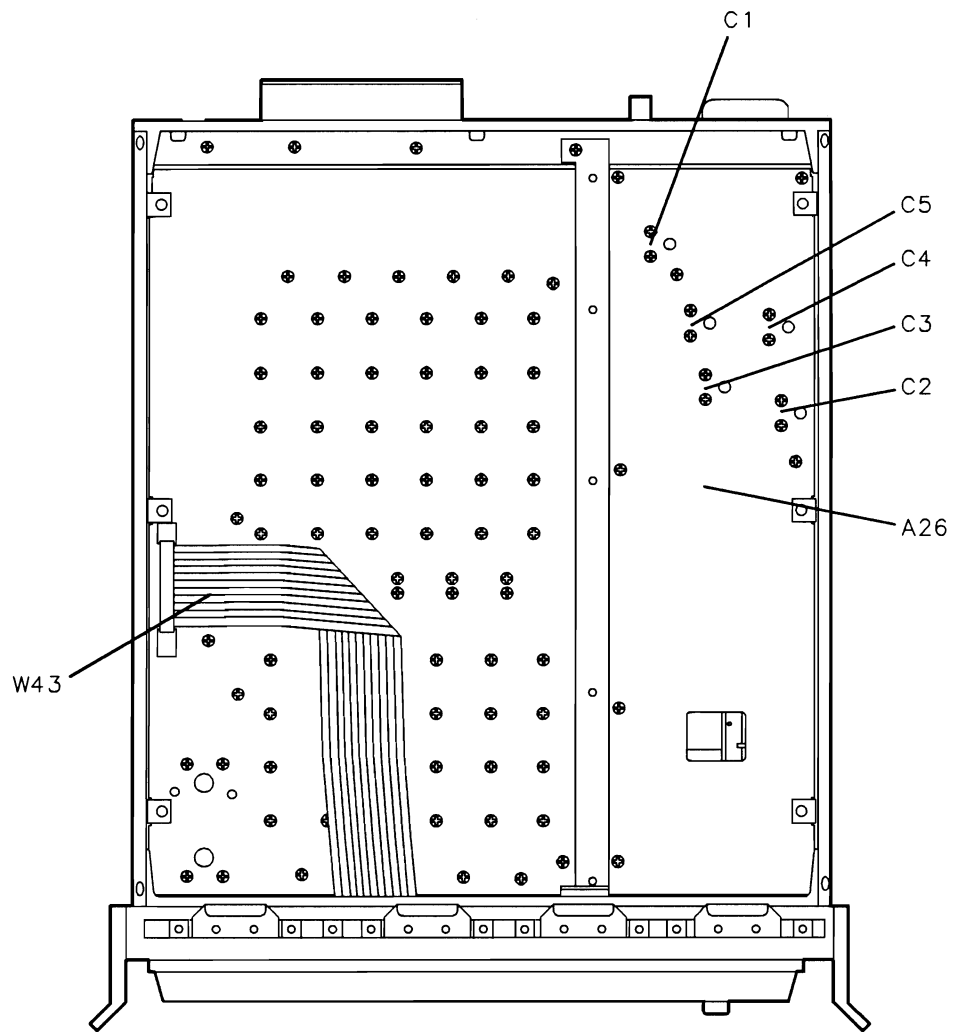


Figure 2. Major Assembly and Component Locations, Bottom View

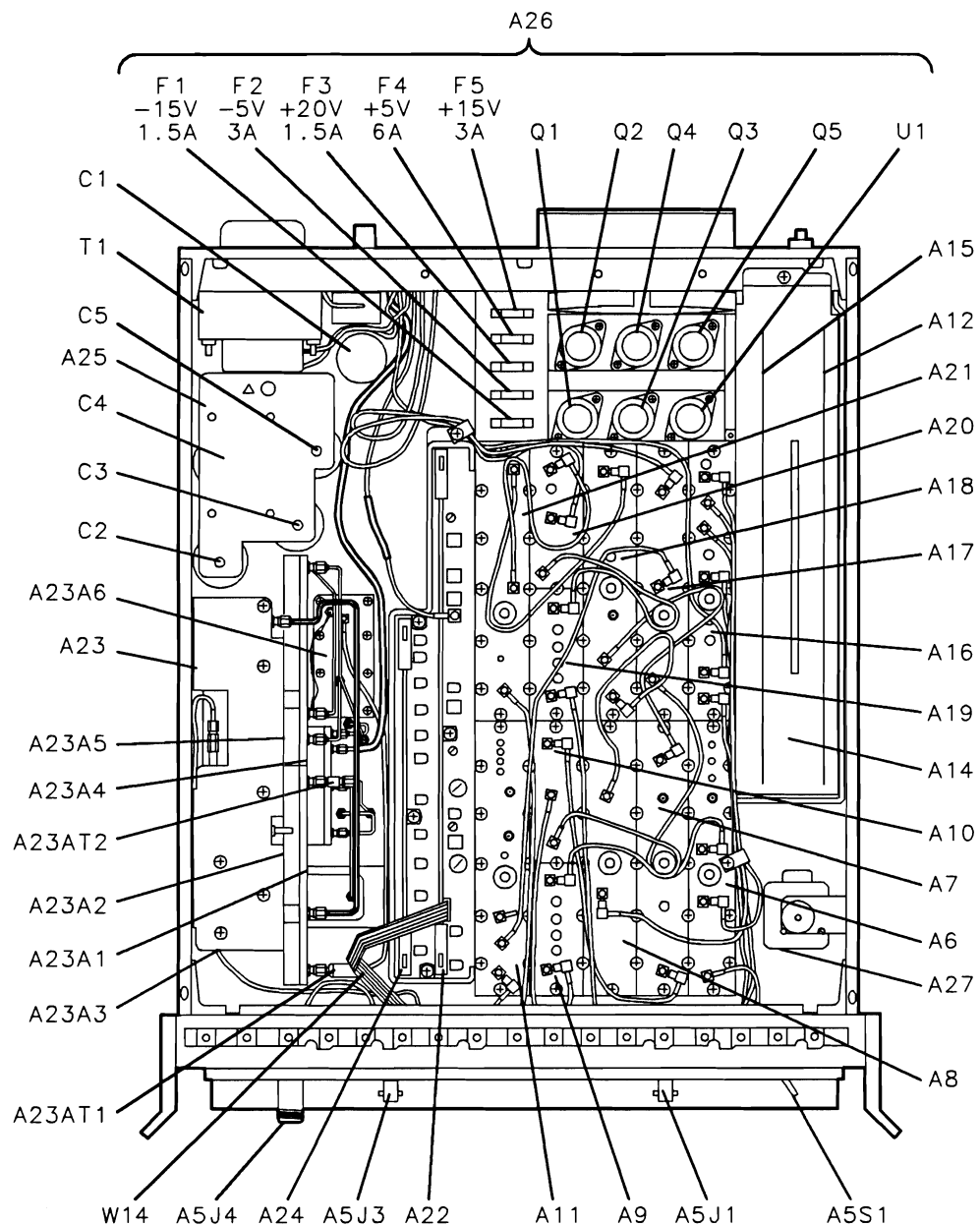


Figure 3. Major Assembly and Component Locations, Top View

4 Major Assembly and Component Locations